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Naval Facilities Engineering Command

Groundwater Sample Results, Level 2 Laboratory Report, Level 4 Laboratory Report, Electronic Data Deliverable, Data Validation Report, Sample Location Report, SDG J238301

Bay Head Road Annex
NSWC Annapolis
Maryland

December 2020

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TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
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TestAmerica Job ID: 320-23830-1

Client Project/Site: Former Bay Head Road Annex (RFP JU06-01)

For:
AECOM Technical Services Inc.
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Arlington, Virginia 22201

Attn: Kurt Vangelder

Authorized for release by:
12/15/2016 2:11:41 PM

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LINKS

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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

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

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Definitions/Glossary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Qualifiers

LCMS

Qualifier	Qualifier Description
E	Result exceeded calibration range.
M	Manual integrated compound.
D	The reported value is from a dilution.
J	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 320-23830-1

Laboratory: TestAmerica Sacramento

Narrative

CASE NARRATIVE

Client: AECOM Technical Services Inc.

Project: Former Bay Head Road Annex (RFP JU06-01)

Report Number: 320-23830-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica West Sacramento attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the applicable methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

TestAmerica utilizes USEPA approved methods and DOD QSM, where applicable, in all analytical work. The samples presented in this report were analyzed for the parameter(s) listed on the analytical methods summary page in accordance with the method(s) indicated. A summary of QC data for these analyses is included at the back of the report.

All parameters for which TestAmerica West Sacramento has certification were evaluated to the QSM specified reporting convention or to the client specified format if different from QSM. Parameters not certified under QSM, if any, were evaluated to the detection limit (DL) and include qualified results where applicable.

The sample(s) that contain constituents flagged with U are undetected. The result associated with this flag is the limit of detection (LOD).

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 11/26/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.4 C.

PFAS

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.

The concentration of one or more analytes associated with the following samples exceeded the instrument calibration range: DPT-16-19-GW-21-25 (320-23830-1), DPT-16-19-GW-31-35 (320-23830-2), DPT-16-18-GW-21-25 (320-23830-3), DPT-16-18-GW-21-25 (320-23830-3[MS]), DPT-16-18-GW-21-25 (320-23830-3[MSD]) and DPT-16-23-GW-21-25 (320-23830-7). These analytes have been qualified; however, the peak(s) did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range.

Job ID: 320-23830-1 (Continued)

Laboratory: TestAmerica Sacramento (Continued)

The following samples were diluted to bring the concentration of target analytes within the calibration range: DPT-16-19-GW-21-25 (320-23830-1), DPT-16-19-GW-31-35 (320-23830-2), DPT-16-18-GW-21-25 (320-23830-3), DPT-16-18-GW-21-25 (320-23830-3[MS]), DPT-16-18-GW-21-25 (320-23830-3[MSD]) and DPT-16-23-GW-21-25 (320-23830-7). Elevated reporting limits (RLs) are provided.

Due to the high concentration of Perfluorooctanoic acid (PFOA) and Perfluorooctane Sulfonate (PFOS), the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 320-139917 and analytical batch 320-141834 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

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

Detection Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Client Sample ID: DPT-16-19-GW-21-25 — Lab Sample ID: 320-23830-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.34	M	0.0025	0.00075	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	2.0	E	0.0040	0.0013	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.17		0.0025	0.00092	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.37	D M	0.025	0.0075	ug/L	10		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS) - DL	2.6	D	0.040	0.013	ug/L	10		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	0.13	D	0.025	0.0092	ug/L	10		537 (Modified)	Total/NA

Client Sample ID: DPT-16-19-GW-31-35 — Lab Sample ID: 320-23830-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.71	E M	0.0025	0.00073	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.62	E	0.0039	0.0013	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.33		0.0025	0.00090	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.93	D M	0.025	0.0073	ug/L	10		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS) - DL	0.68	D	0.039	0.013	ug/L	10		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	0.21	D	0.025	0.0090	ug/L	10		537 (Modified)	Total/NA

Client Sample ID: DPT-16-18-GW-21-25 — Lab Sample ID: 320-23830-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.69	E J M	0.0026	0.00077	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	1.6	E J	0.0041	0.0013	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.15		0.0026	0.00095	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.84	D M J	0.026	0.0077	ug/L	10		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS) - DL	2.0	D J	0.041	0.013	ug/L	10		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	0.11	D	0.026	0.0095	ug/L	10		537 (Modified)	Total/NA

Client Sample ID: DPT-16-18-GW-31-35 — Lab Sample ID: 320-23830-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.24	M	0.0027	0.00080	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.37		0.0043	0.0014	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.057		0.0027	0.00098	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-16-18-GW-31-35-DUP — Lab Sample ID: 320-23830-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.25	M	0.0026	0.00079	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.38		0.0042	0.0013	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.060		0.0026	0.00097	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-GW-EB-112316 — Lab Sample ID: 320-23830-6

No Detections.

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Client Sample ID: DPT-16-23-GW-21-25 — Lab Sample ID: 320-23830-7

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.66	E M	0.0026	0.00076	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.83	E	0.0041	0.0013	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.32		0.0026	0.00094	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.84	D M	0.026	0.0076	ug/L	10		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS) - DL	0.96	D	0.041	0.013	ug/L	10		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	0.24	D	0.026	0.0094	ug/L	10		537 (Modified)	Total/NA

Client Sample ID: DPT-16-23-GW-31-35 — Lab Sample ID: 320-23830-8

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.34	M	0.0027	0.00080	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.27		0.0043	0.0014	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.11		0.0027	0.00098	ug/L	1		537 (Modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Client Sample ID: DPT-16-19-GW-21-25

Lab Sample ID: 320-23830-1
Date Collected: 11/23/16 10:15
Matrix: Water
Date Received: 11/26/16 09:00

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.34	M	0.0025	0.00075	ug/L		11/29/16 20:20	12/09/16 16:09	1
Perfluorooctane Sulfonate (PFOS)	2.0	E	0.0040	0.0013	ug/L		11/29/16 20:20	12/09/16 16:09	1
Perfluorobutanesulfonic acid (PFBS)	0.17		0.0025	0.00092	ug/L		11/29/16 20:20	12/09/16 16:09	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*90*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:09*	*1*
13C4 PFOS	*60*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:09*	*1*
18O2 PFHxS	*58*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:09*	*1*

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.37	D M	0.025	0.0075	ug/L		11/29/16 20:20	12/12/16 18:52	10
Perfluorooctane Sulfonate (PFOS)	2.6	D	0.040	0.013	ug/L		11/29/16 20:20	12/12/16 18:52	10
Perfluorobutanesulfonic acid (PFBS)	0.13	D	0.025	0.0092	ug/L		11/29/16 20:20	12/12/16 18:52	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*126*		*25 - 150*	*11/29/16 20:20*	*12/12/16 18:52*	*10*
13C4 PFOS	*104*		*25 - 150*	*11/29/16 20:20*	*12/12/16 18:52*	*10*
18O2 PFHxS	*113*		*25 - 150*	*11/29/16 20:20*	*12/12/16 18:52*	*10*

Client Sample ID: DPT-16-19-GW-31-35

Lab Sample ID: 320-23830-2
Date Collected: 11/23/16 11:00
Matrix: Water
Date Received: 11/26/16 09:00

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.71	E M	0.0025	0.00073	ug/L		11/29/16 20:20	12/09/16 16:17	1
Perfluorooctane Sulfonate (PFOS)	0.62	E	0.0039	0.0013	ug/L		11/29/16 20:20	12/09/16 16:17	1
Perfluorobutanesulfonic acid (PFBS)	0.33		0.0025	0.00090	ug/L		11/29/16 20:20	12/09/16 16:17	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*72*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:17*	*1*
13C4 PFOS	*93*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:17*	*1*
18O2 PFHxS	*41*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:17*	*1*

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.93	D M	0.025	0.0073	ug/L		11/29/16 20:20	12/12/16 19:00	10
Perfluorooctane Sulfonate (PFOS)	0.68	D	0.039	0.013	ug/L		11/29/16 20:20	12/12/16 19:00	10
Perfluorobutanesulfonic acid (PFBS)	0.21	D	0.025	0.0090	ug/L		11/29/16 20:20	12/12/16 19:00	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*112*		*25 - 150*	*11/29/16 20:20*	*12/12/16 19:00*	*10*
13C4 PFOS	*110*		*25 - 150*	*11/29/16 20:20*	*12/12/16 19:00*	*10*
18O2 PFHxS	*98*		*25 - 150*	*11/29/16 20:20*	*12/12/16 19:00*	*10*

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Client Sample ID: DPT-16-18-GW-21-25

Lab Sample ID: 320-23830-3
Date Collected: 11/23/16 11:40
Matrix: Water
Date Received: 11/26/16 09:00

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.69	E J M	0.0026	0.00077	ug/L		11/29/16 20:20	12/09/16 16:24	1
Perfluorooctane Sulfonate (PFOS)	1.6	E J	0.0041	0.0013	ug/L		11/29/16 20:20	12/09/16 16:24	1
Perfluorobutanesulfonic acid (PFBS)	0.15		0.0026	0.00095	ug/L		11/29/16 20:20	12/09/16 16:24	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*64*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:24*	*1*
13C4 PFOS	*69*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:24*	*1*
18O2 PFHxS	*57*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:24*	*1*

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.84	D M J	0.026	0.0077	ug/L		11/29/16 20:20	12/12/16 19:07	10
Perfluorooctane Sulfonate (PFOS)	2.0	D J	0.041	0.013	ug/L		11/29/16 20:20	12/12/16 19:07	10
Perfluorobutanesulfonic acid (PFBS)	0.11	D	0.026	0.0095	ug/L		11/29/16 20:20	12/12/16 19:07	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*99*		*25 - 150*	*11/29/16 20:20*	*12/12/16 19:07*	*10*
13C4 PFOS	*101*		*25 - 150*	*11/29/16 20:20*	*12/12/16 19:07*	*10*
18O2 PFHxS	*108*		*25 - 150*	*11/29/16 20:20*	*12/12/16 19:07*	*10*

Client Sample ID: DPT-16-18-GW-31-35

Lab Sample ID: 320-23830-4
Date Collected: 11/23/16 12:20
Matrix: Water
Date Received: 11/26/16 09:00

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.24	M	0.0027	0.00080	ug/L		11/29/16 20:20	12/09/16 16:47	1
Perfluorooctane Sulfonate (PFOS)	0.37		0.0043	0.0014	ug/L		11/29/16 20:20	12/09/16 16:47	1
Perfluorobutanesulfonic acid (PFBS)	0.057		0.0027	0.00098	ug/L		11/29/16 20:20	12/09/16 16:47	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*80*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:47*	*1*
13C4 PFOS	*100*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:47*	*1*
18O2 PFHxS	*68*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:47*	*1*

Client Sample ID: DPT-16-18-GW-31-35-DUP

Lab Sample ID: 320-23830-5
Date Collected: 11/23/16 12:20
Matrix: Water
Date Received: 11/26/16 09:00

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.25	M	0.0026	0.00079	ug/L		11/29/16 20:20	12/09/16 16:54	1
Perfluorooctane Sulfonate (PFOS)	0.38		0.0042	0.0013	ug/L		11/29/16 20:20	12/09/16 16:54	1
Perfluorobutanesulfonic acid (PFBS)	0.060		0.0026	0.00097	ug/L		11/29/16 20:20	12/09/16 16:54	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*84*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:54*	*1*
13C4 PFOS	*101*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:54*	*1*
18O2 PFHxS	*67*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:54*	*1*

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Client Sample ID: DPT-GW-EB-112316

Lab Sample ID: 320-23830-6
Date Collected: 11/23/16 13:15
Matrix: Water
Date Received: 11/26/16 09:00

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0017	U	0.0022	0.00065	ug/L		11/29/16 20:20	12/09/16 17:02	1
Perfluorooctane Sulfonate (PFOS)	0.0026	U	0.0035	0.0011	ug/L		11/29/16 20:20	12/09/16 17:02	1
Perfluorobutanesulfonic acid (PFBS)	0.0017	U	0.0022	0.00080	ug/L		11/29/16 20:20	12/09/16 17:02	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*120*		*25 - 150*	*11/29/16 20:20*	*12/09/16 17:02*	*1*
13C4 PFOS	*107*		*25 - 150*	*11/29/16 20:20*	*12/09/16 17:02*	*1*
18O2 PFHxS	*110*		*25 - 150*	*11/29/16 20:20*	*12/09/16 17:02*	*1*

Client Sample ID: DPT-16-23-GW-21-25

Lab Sample ID: 320-23830-7
Date Collected: 11/23/16 13:35
Matrix: Water
Date Received: 11/26/16 09:00

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**0.66**	**E M**	0.0026	0.00076	ug/L		11/29/16 20:20	12/09/16 17:39	1
Perfluorooctane Sulfonate (PFOS)	**0.83**	**E**	0.0041	0.0013	ug/L		11/29/16 20:20	12/09/16 17:39	1
Perfluorobutanesulfonic acid (PFBS)	**0.32**		0.0026	0.00094	ug/L		11/29/16 20:20	12/09/16 17:39	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*76*		*25 - 150*	*11/29/16 20:20*	*12/09/16 17:39*	*1*
13C4 PFOS	*87*		*25 - 150*	*11/29/16 20:20*	*12/09/16 17:39*	*1*
18O2 PFHxS	*47*		*25 - 150*	*11/29/16 20:20*	*12/09/16 17:39*	*1*

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**0.84**	**D M**	0.026	0.0076	ug/L		11/29/16 20:20	12/12/16 19:30	10
Perfluorooctane Sulfonate (PFOS)	**0.96**	**D**	0.041	0.013	ug/L		11/29/16 20:20	12/12/16 19:30	10
Perfluorobutanesulfonic acid (PFBS)	**0.24**	**D**	0.026	0.0094	ug/L		11/29/16 20:20	12/12/16 19:30	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*116*		*25 - 150*	*11/29/16 20:20*	*12/12/16 19:30*	*10*
13C4 PFOS	*112*		*25 - 150*	*11/29/16 20:20*	*12/12/16 19:30*	*10*
18O2 PFHxS	*105*		*25 - 150*	*11/29/16 20:20*	*12/12/16 19:30*	*10*

Client Sample ID: DPT-16-23-GW-31-35

Lab Sample ID: 320-23830-8
Date Collected: 11/23/16 14:00
Matrix: Water
Date Received: 11/26/16 09:00

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**0.34**	**M**	0.0027	0.00080	ug/L		11/29/16 20:20	12/09/16 17:47	1
Perfluorooctane Sulfonate (PFOS)	**0.27**		0.0043	0.0014	ug/L		11/29/16 20:20	12/09/16 17:47	1
Perfluorobutanesulfonic acid (PFBS)	**0.11**		0.0027	0.00098	ug/L		11/29/16 20:20	12/09/16 17:47	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*77*		*25 - 150*	*11/29/16 20:20*	*12/09/16 17:47*	*1*
13C4 PFOS	*107*		*25 - 150*	*11/29/16 20:20*	*12/09/16 17:47*	*1*
18O2 PFHxS	*52*		*25 - 150*	*11/29/16 20:20*	*12/09/16 17:47*	*1*

Isotope Dilution Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Method: 537 (Modified) - Perfluorinated Hydrocarbons

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	3C4 PFO/ (25-150)	3C4 PFOS (25-150)	3O2 PFHx (25-150)					
320-23830-1	DPT-16-19-GW-21-25	90	60	58					
320-23830-1 - DL	DPT-16-19-GW-21-25	126	104	113					
320-23830-2	DPT-16-19-GW-31-35	72	93	41					
320-23830-2 - DL	DPT-16-19-GW-31-35	112	110	98					
320-23830-3	DPT-16-18-GW-21-25	64	69	57					
320-23830-3 - DL	DPT-16-18-GW-21-25	99	101	108					
320-23830-3 MS	DPT-16-18-GW-21-25	70	69	58					
320-23830-3 MS - DL	DPT-16-18-GW-21-25	109	102	107					
320-23830-3 MSD	DPT-16-18-GW-21-25	68	75	61					
320-23830-3 MSD - DL	DPT-16-18-GW-21-25	110	110	113					
320-23830-4	DPT-16-18-GW-31-35	80	100	68					
320-23830-5	DPT-16-18-GW-31-35-DUP	84	101	67					
320-23830-6	DPT-GW-EB-112316	120	107	110					
320-23830-7	DPT-16-23-GW-21-25	76	87	47					
320-23830-7 - DL	DPT-16-23-GW-21-25	116	112	105					
320-23830-8	DPT-16-23-GW-31-35	77	107	52					
LCS 320-139917/2-A	Lab Control Sample	122	114	116					
MB 320-139917/1-A	Method Blank	115	110	115					

Surrogate Legend

13C4 PFOA = 13C4 PFOA
13C4 PFOS = 13C4 PFOS
18O2 PFHxS = 18O2 PFHxS

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-139917/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 141453 — **Prep Batch: 139917**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		11/29/16 20:20	12/09/16 15:54	1
Perfluorooctane Sulfonate (PFOS)	0.0030	U	0.0040	0.0013	ug/L		11/29/16 20:20	12/09/16 15:54	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		11/29/16 20:20	12/09/16 15:54	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*115*		*25 - 150*	*11/29/16 20:20*	*12/09/16 15:54*	*1*
13C4 PFOS	*110*		*25 - 150*	*11/29/16 20:20*	*12/09/16 15:54*	*1*
18O2 PFHxS	*115*		*25 - 150*	*11/29/16 20:20*	*12/09/16 15:54*	*1*

Lab Sample ID: LCS 320-139917/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 141453 — **Prep Batch: 139917**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanoic acid (PFOA)	0.0400	0.0345		ug/L		86	60 - 140
Perfluorooctane Sulfonate (PFOS)	0.0371	0.0334		ug/L		90	60 - 140
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0366		ug/L		104	50 - 150

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFOA	*122*		*25 - 150*
13C4 PFOS	*114*		*25 - 150*
18O2 PFHxS	*116*		*25 - 150*

Lab Sample ID: 320-23830-3 MS — **Client Sample ID: DPT-16-18-GW-21-25**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 141453 — **Prep Batch: 139917**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanoic acid (PFOA)	0.69	E J M	0.0414	0.667	E 4 M	ug/L		-49	60 - 140
Perfluorooctane Sulfonate (PFOS)	1.6	E J	0.0384	1.62	E 4	ug/L		-28	60 - 140
Perfluorobutanesulfonic acid (PFBS)	0.15		0.0366	0.186	4	ug/L		96	50 - 150

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C4 PFOA	*70*		*25 - 150*
13C4 PFOS	*69*		*25 - 150*
18O2 PFHxS	*58*		*25 - 150*

Lab Sample ID: 320-23830-3 MSD — **Client Sample ID: DPT-16-18-GW-21-25**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 141453 — **Prep Batch: 139917**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	0.69	E J M	0.0446	0.684	E 4 M	ug/L		-7	60 - 140	3	30
Perfluorooctane Sulfonate (PFOS)	1.6	E J	0.0414	1.56	E 4	ug/L		-175	60 - 140	4	30

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

Lab Sample ID: 320-23830-3 MSD — **Client Sample ID: DPT-16-18-GW-21-25**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 141453 — **Prep Batch: 139917**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanesulfonic acid (PFBS)	0.15		0.0394	0.184		ug/L		84	50 - 150	1	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C4 PFOA	*68*		*25 - 150*
13C4 PFOS	*75*		*25 - 150*
18O2 PFHxS	*61*		*25 - 150*

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

Lab Sample ID: 320-23830-3 MS — **Client Sample ID: DPT-16-18-GW-21-25**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 141834 — **Prep Batch: 139917**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanoic acid (PFOA) - DL	0.84	D M J	0.0414	0.882	D M 4	ug/L		108	60 - 140
Perfluorooctane Sulfonate (PFOS) - DL	2.0	D J	0.0384	1.98	D 4	ug/L		-15	60 - 140
Perfluorobutanesulfonic acid (PFBS) - DL	0.11	D	0.0366	0.149	D	ug/L		119	50 - 150

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C4 PFOA - DL	*109*		*25 - 150*
13C4 PFOS - DL	*102*		*25 - 150*
18O2 PFHxS - DL	*107*		*25 - 150*

Lab Sample ID: 320-23830-3 MSD — **Client Sample ID: DPT-16-18-GW-21-25**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 141834 — **Prep Batch: 139917**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA) - DL	0.84	D M J	0.0446	0.857	D M 4	ug/L		45	60 - 140	3	30
Perfluorooctane Sulfonate (PFOS) - DL	2.0	D J	0.0414	1.89	D 4	ug/L		-251	60 - 140	5	30
Perfluorobutanesulfonic acid (PFBS) - DL	0.11	D	0.0394	0.148	D	ug/L		108	50 - 150	0	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C4 PFOA - DL	*110*		*25 - 150*
13C4 PFOS - DL	*110*		*25 - 150*
18O2 PFHxS - DL	*113*		*25 - 150*

QC Association Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

LCMS

Prep Batch: 139917

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23830-1 - DL	DPT-16-19-GW-21-25	Total/NA	Water	3535	
320-23830-1	DPT-16-19-GW-21-25	Total/NA	Water	3535	
320-23830-2	DPT-16-19-GW-31-35	Total/NA	Water	3535	
320-23830-2 - DL	DPT-16-19-GW-31-35	Total/NA	Water	3535	
320-23830-3 - DL	DPT-16-18-GW-21-25	Total/NA	Water	3535	
320-23830-3	DPT-16-18-GW-21-25	Total/NA	Water	3535	
320-23830-4	DPT-16-18-GW-31-35	Total/NA	Water	3535	
320-23830-5	DPT-16-18-GW-31-35-DUP	Total/NA	Water	3535	
320-23830-6	DPT-GW-EB-112316	Total/NA	Water	3535	
320-23830-7	DPT-16-23-GW-21-25	Total/NA	Water	3535	
320-23830-7 - DL	DPT-16-23-GW-21-25	Total/NA	Water	3535	
320-23830-8	DPT-16-23-GW-31-35	Total/NA	Water	3535	
MB 320-139917/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-139917/2-A	Lab Control Sample	Total/NA	Water	3535	
320-23830-3 MS	DPT-16-18-GW-21-25	Total/NA	Water	3535	
320-23830-3 MS - DL	DPT-16-18-GW-21-25	Total/NA	Water	3535	
320-23830-3 MSD	DPT-16-18-GW-21-25	Total/NA	Water	3535	
320-23830-3 MSD - DL	DPT-16-18-GW-21-25	Total/NA	Water	3535	

Analysis Batch: 141453

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23830-1	DPT-16-19-GW-21-25	Total/NA	Water	537 (Modified)	139917
320-23830-2	DPT-16-19-GW-31-35	Total/NA	Water	537 (Modified)	139917
320-23830-3	DPT-16-18-GW-21-25	Total/NA	Water	537 (Modified)	139917
320-23830-4	DPT-16-18-GW-31-35	Total/NA	Water	537 (Modified)	139917
320-23830-5	DPT-16-18-GW-31-35-DUP	Total/NA	Water	537 (Modified)	139917
320-23830-6	DPT-GW-EB-112316	Total/NA	Water	537 (Modified)	139917
320-23830-7	DPT-16-23-GW-21-25	Total/NA	Water	537 (Modified)	139917
320-23830-8	DPT-16-23-GW-31-35	Total/NA	Water	537 (Modified)	139917
MB 320-139917/1-A	Method Blank	Total/NA	Water	537 (Modified)	139917
LCS 320-139917/2-A	Lab Control Sample	Total/NA	Water	537 (Modified)	139917
320-23830-3 MS	DPT-16-18-GW-21-25	Total/NA	Water	537 (Modified)	139917
320-23830-3 MSD	DPT-16-18-GW-21-25	Total/NA	Water	537 (Modified)	139917

Analysis Batch: 141834

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23830-1 - DL	DPT-16-19-GW-21-25	Total/NA	Water	537 (Modified)	139917
320-23830-2 - DL	DPT-16-19-GW-31-35	Total/NA	Water	537 (Modified)	139917
320-23830-3 - DL	DPT-16-18-GW-21-25	Total/NA	Water	537 (Modified)	139917
320-23830-7 - DL	DPT-16-23-GW-21-25	Total/NA	Water	537 (Modified)	139917
320-23830-3 MS - DL	DPT-16-18-GW-21-25	Total/NA	Water	537 (Modified)	139917
320-23830-3 MSD - DL	DPT-16-18-GW-21-25	Total/NA	Water	537 (Modified)	139917

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Client Sample ID: DPT-16-19-GW-21-25 — Lab Sample ID: 320-23830-1

Date Collected: 11/23/16 10:15 — **Matrix: Water**
Date Received: 11/26/16 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			248.9 mL	0.5 mL	139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)		1			141453	12/09/16 16:09	CBW	TAL SAC
Total/NA	Prep	3535	DL		248.9 mL	0.5 mL	139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	10			141834	12/12/16 18:52	SBC	TAL SAC

Client Sample ID: DPT-16-19-GW-31-35 — Lab Sample ID: 320-23830-2

Date Collected: 11/23/16 11:00 — **Matrix: Water**
Date Received: 11/26/16 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			254.6 mL	0.5 mL	139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)		1			141453	12/09/16 16:17	CBW	TAL SAC
Total/NA	Prep	3535	DL		254.6 mL	0.5 mL	139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	10			141834	12/12/16 19:00	SBC	TAL SAC

Client Sample ID: DPT-16-18-GW-21-25 — Lab Sample ID: 320-23830-3

Date Collected: 11/23/16 11:40 — **Matrix: Water**
Date Received: 11/26/16 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			241.5 mL	0.5 mL	139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)		1			141453	12/09/16 16:24	CBW	TAL SAC
Total/NA	Prep	3535	DL		241.5 mL	0.5 mL	139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	10			141834	12/12/16 19:07	SBC	TAL SAC

Client Sample ID: DPT-16-18-GW-31-35 — Lab Sample ID: 320-23830-4

Date Collected: 11/23/16 12:20 — **Matrix: Water**
Date Received: 11/26/16 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			233.6 mL	0.5 mL	139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)		1			141453	12/09/16 16:47	CBW	TAL SAC

Client Sample ID: DPT-16-18-GW-31-35-DUP — Lab Sample ID: 320-23830-5

Date Collected: 11/23/16 12:20 — **Matrix: Water**
Date Received: 11/26/16 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			236.6 mL	0.5 mL	139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)		1			141453	12/09/16 16:54	CBW	TAL SAC

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Client Sample ID: DPT-GW-EB-112316

Lab Sample ID: 320-23830-6
Date Collected: 11/23/16 13:15
Matrix: Water
Date Received: 11/26/16 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			288.2 mL	0.5 mL	139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)		1			141453	12/09/16 17:02	CBW	TAL SAC

Client Sample ID: DPT-16-23-GW-21-25

Lab Sample ID: 320-23830-7
Date Collected: 11/23/16 13:35
Matrix: Water
Date Received: 11/26/16 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			244.8 mL	0.5 mL	139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)		1			141453	12/09/16 17:39	CBW	TAL SAC
Total/NA	Prep	3535	DL		244.8 mL	0.5 mL	139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	10			141834	12/12/16 19:30	SBC	TAL SAC

Client Sample ID: DPT-16-23-GW-31-35

Lab Sample ID: 320-23830-8
Date Collected: 11/23/16 14:00
Matrix: Water
Date Received: 11/26/16 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			234.5 mL	0.5 mL	139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)		1			141453	12/09/16 17:47	CBW	TAL SAC

Laboratory References:

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

Certification Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Laboratory: TestAmerica Sacramento

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17

Method Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

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: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-23830-1	DPT-16-19-GW-21-25	Water	11/23/16 10:15	11/26/16 09:00
320-23830-2	DPT-16-19-GW-31-35	Water	11/23/16 11:00	11/26/16 09:00
320-23830-3	DPT-16-18-GW-21-25	Water	11/23/16 11:40	11/26/16 09:00
320-23830-4	DPT-16-18-GW-31-35	Water	11/23/16 12:20	11/26/16 09:00
320-23830-5	DPT-16-18-GW-31-35-DUP	Water	11/23/16 12:20	11/26/16 09:00
320-23830-6	DPT-GW-EB-112316	Water	11/23/16 13:15	11/26/16 09:00
320-23830-7	DPT-16-23-GW-21-25	Water	11/23/16 13:35	11/26/16 09:00
320-23830-8	DPT-16-23-GW-31-35	Water	11/23/16 14:00	11/26/16 09:00

COC No. A 42927

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~~Marietta, OH 45750~~

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CHAIN-OF-CUSTODY RECORD

320-23830 Chain of Custody

Company Name: AECOM

Project Contact: KURT VAN GELDER

Contact Phone #:

Turn Around Requirements: 14 DAY

Location: Former Bay Head Rd Annapolis

Project ID: 60444465

Sampler (print): MIKE GLINSKI

Signature:

Program: ☐ CWA ☐ RCRA ☐ DOD ☐ AFCEE ☐ Other

ADDITIONAL REQUIREMENTS

Sample I.D. No.	Comp	Grab	Date	Time	Matrix*	NUMBER OF CONTAINERS	Hold	PFOA	PFOS	PFBS	TOTAL # (LAB USE)
DPT-16-19-GW-21-25			11/23/16	1015	GW	2		✓	✓	✓	
DPT-16-19-GW-31-35				1100	GW	2		✓	✓	✓	
DPT-16-18-GW-21-25				1140	GW	2		✓	✓	✓	
DPT-16-18-GW-21-25-MS				↓	↓	2		✓	✓	✓	
DPT-16-18-GW-21-25-MSD				↓	↓	2		✓	✓	✓	
DPT-16-18-GW-31-35				1220	GW	2		✓	✓	✓	
DPT-16-18-GW-31-35-DUP				1220	↓	2		✓	✓	✓	
DPT-GW-EB-112316				1315	↓	2		✓	✓	✓	
DPT-16-23-GW-21-25				1335	↓	2		✓	✓	✓	
DPT-16-23-GW-31-35				1400	↓	2		✓	✓	✓	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
	11/25/16	1700	TRANSFER TO FEDEX		11/25/16	1700	

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
				11/26/16	0900	2.4°C

*Water (W), Soil (S), Solid Waste (SD), Unknown (X)

Page 1 of 1

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 320-23830-1

Login Number: 23830
List Number: 1
Creator: Hytrek, Cheryl

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ANALYTICAL REPORT

Job Number: 320-23830-1

Job Description: Former Bay Head Road Annex (RFP JU06-01)

For:
AECOM Technical Services Inc.
3101 Wilson Blvd.
Suite 900
Arlington, VA 22201

Attention: Kurt Vangelder

Approved for release.
Jill Kellmann
Manager of Project Management
12/28/2016 10:40 AM

Jill Kellmann, Manager of Project Management
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4402
jill.kellmann@testamericainc.com
12/28/2016
Revision: 1

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Qualifiers

LCMS

Qualifier	Qualifier Description
E	Result exceeded calibration range.
M	Manual integrated compound.
D	The reported value is from a dilution.
J	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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)

CASE NARRATIVE

Client: AECOM Technical Services Inc.

Project: Former Bay Head Road Annex (RFP JU06-01)

Report Number: 320-23830-1

Revision - December 28, 2016
Revision created due to a missing CCVL from the initial level 4 data package.

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica West Sacramento attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the applicable methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

TestAmerica utilizes USEPA approved methods and DOD QSM, where applicable, in all analytical work. The samples presented in this report were analyzed for the parameter(s) listed on the analytical methods summary page in accordance with the method(s) indicated. A summary of QC data for these analyses is included at the back of the report.

All parameters for which TestAmerica West Sacramento has certification were evaluated to the QSM specified reporting convention or to the client specified format if different from QSM. Parameters not certified under QSM, if any, were evaluated to the detection limit (DL) and include qualified results where applicable.

The sample(s) that contain constituents flagged with U are undetected. The result associated with this flag is the limit of detection (LOD).

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT
The samples were received on 11/26/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.4 C.

PFAS
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.

The concentration of one or more analytes associated with the following samples exceeded the instrument calibration range: DPT-16-19-GW-21-25 (320-23830-1), DPT-16-19-GW-31-35 (320-23830-2), DPT-16-18-GW-21-25 (320-23830-3), DPT-16-18-GW-21-25 (320-23830-3[MS]), DPT-16-18-GW-21-25 (320-23830-3[MSD]) and DPT-16-23-GW-21-25 (320-23830-7). These analytes have been qualified; however, the peak(s) did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range.

The following samples were diluted to bring the concentration of target analytes within the calibration range: DPT-16-19-GW-21-25 (320-23830-1), DPT-16-19-GW-31-35 (320-23830-2), DPT-16-18-GW-21-25 (320-23830-3), DPT-16-18-GW-21-25 (320-23830-3[MS]), DPT-16-18-GW-21-25 (320-23830-3[MSD]) and DPT-16-23-GW-21-25 (320-23830-7). Elevated reporting limits (RLs) are provided.

Due to the high concentration of Perfluorooctanoic acid (PFOA) and Perfluorooctane Sulfonate (PFOS), the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 320-139917 and analytical batch 320-141834 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

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

Detection Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Client Sample ID: DPT-16-19-GW-21-25 — Lab Sample ID: 320-23830-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.34	M	0.0025	0.00075	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	2.0	E	0.0040	0.0013	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.17		0.0025	0.00092	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.37	D M	0.025	0.0075	ug/L	10		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS) - DL	2.6	D	0.040	0.013	ug/L	10		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	0.13	D	0.025	0.0092	ug/L	10		537 (Modified)	Total/NA

Client Sample ID: DPT-16-19-GW-31-35 — Lab Sample ID: 320-23830-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.71	E M	0.0025	0.00073	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.62	E	0.0039	0.0013	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.33		0.0025	0.00090	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.93	D M	0.025	0.0073	ug/L	10		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS) - DL	0.68	D	0.039	0.013	ug/L	10		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	0.21	D	0.025	0.0090	ug/L	10		537 (Modified)	Total/NA

Client Sample ID: DPT-16-18-GW-21-25 — Lab Sample ID: 320-23830-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.69	E J M	0.0026	0.00077	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	1.6	E J	0.0041	0.0013	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.15		0.0026	0.00095	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.84	D M J	0.026	0.0077	ug/L	10		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS) - DL	2.0	D J	0.041	0.013	ug/L	10		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	0.11	D	0.026	0.0095	ug/L	10		537 (Modified)	Total/NA

Client Sample ID: DPT-16-18-GW-31-35 — Lab Sample ID: 320-23830-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.24	M	0.0027	0.00080	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.37		0.0043	0.0014	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.057		0.0027	0.00098	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-16-18-GW-31-35-DUP — Lab Sample ID: 320-23830-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.25	M	0.0026	0.00079	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.38		0.0042	0.0013	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.060		0.0026	0.00097	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-GW-EB-112316 — Lab Sample ID: 320-23830-6

No Detections.

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Client Sample ID: DPT-16-23-GW-21-25 — Lab Sample ID: 320-23830-7

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.66	E M	0.0026	0.00076	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.83	E	0.0041	0.0013	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.32		0.0026	0.00094	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.84	D M	0.026	0.0076	ug/L	10		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS) - DL	0.96	D	0.041	0.013	ug/L	10		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	0.24	D	0.026	0.0094	ug/L	10		537 (Modified)	Total/NA

Client Sample ID: DPT-16-23-GW-31-35 — Lab Sample ID: 320-23830-8

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.34	M	0.0027	0.00080	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.27		0.0043	0.0014	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.11		0.0027	0.00098	ug/L	1		537 (Modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Client Sample ID: DPT-16-19-GW-21-25

Lab Sample ID: 320-23830-1

Date Collected: 11/23/16 10:15
Matrix: Water
Date Received: 11/26/16 09:00

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.34	M	0.0025	0.00075	ug/L		11/29/16 20:20	12/09/16 16:09	1
Perfluorooctane Sulfonate (PFOS)	2.0	E	0.0040	0.0013	ug/L		11/29/16 20:20	12/09/16 16:09	1
Perfluorobutanesulfonic acid (PFBS)	0.17		0.0025	0.00092	ug/L		11/29/16 20:20	12/09/16 16:09	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*90*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:09*	*1*
13C4 PFOS	*60*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:09*	*1*
18O2 PFHxS	*58*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:09*	*1*

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.37	D M	0.025	0.0075	ug/L		11/29/16 20:20	12/12/16 18:52	10
Perfluorooctane Sulfonate (PFOS)	2.6	D	0.040	0.013	ug/L		11/29/16 20:20	12/12/16 18:52	10
Perfluorobutanesulfonic acid (PFBS)	0.13	D	0.025	0.0092	ug/L		11/29/16 20:20	12/12/16 18:52	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*126*		*25 - 150*	*11/29/16 20:20*	*12/12/16 18:52*	*10*
13C4 PFOS	*104*		*25 - 150*	*11/29/16 20:20*	*12/12/16 18:52*	*10*
18O2 PFHxS	*113*		*25 - 150*	*11/29/16 20:20*	*12/12/16 18:52*	*10*

Client Sample ID: DPT-16-19-GW-31-35

Lab Sample ID: 320-23830-2

Date Collected: 11/23/16 11:00
Matrix: Water
Date Received: 11/26/16 09:00

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.71	E M	0.0025	0.00073	ug/L		11/29/16 20:20	12/09/16 16:17	1
Perfluorooctane Sulfonate (PFOS)	0.62	E	0.0039	0.0013	ug/L		11/29/16 20:20	12/09/16 16:17	1
Perfluorobutanesulfonic acid (PFBS)	0.33		0.0025	0.00090	ug/L		11/29/16 20:20	12/09/16 16:17	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*72*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:17*	*1*
13C4 PFOS	*93*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:17*	*1*
18O2 PFHxS	*41*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:17*	*1*

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.93	D M	0.025	0.0073	ug/L		11/29/16 20:20	12/12/16 19:00	10
Perfluorooctane Sulfonate (PFOS)	0.68	D	0.039	0.013	ug/L		11/29/16 20:20	12/12/16 19:00	10
Perfluorobutanesulfonic acid (PFBS)	0.21	D	0.025	0.0090	ug/L		11/29/16 20:20	12/12/16 19:00	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*112*		*25 - 150*	*11/29/16 20:20*	*12/12/16 19:00*	*10*
13C4 PFOS	*110*		*25 - 150*	*11/29/16 20:20*	*12/12/16 19:00*	*10*
18O2 PFHxS	*98*		*25 - 150*	*11/29/16 20:20*	*12/12/16 19:00*	*10*

Client Sample ID: DPT-16-18-GW-21-25 — Lab Sample ID: 320-23830-3

Date Collected: 11/23/16 11:40 **Matrix: Water**
Date Received: 11/26/16 09:00

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.69	E J M	0.0026	0.00077	ug/L		11/29/16 20:20	12/09/16 16:24	1
Perfluorooctane Sulfonate (PFOS)	1.6	E J	0.0041	0.0013	ug/L		11/29/16 20:20	12/09/16 16:24	1
Perfluorobutanesulfonic acid (PFBS)	0.15		0.0026	0.00095	ug/L		11/29/16 20:20	12/09/16 16:24	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*64*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:24*	*1*
13C4 PFOS	*69*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:24*	*1*
18O2 PFHxS	*57*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:24*	*1*

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.84	D M J	0.026	0.0077	ug/L		11/29/16 20:20	12/12/16 19:07	10
Perfluorooctane Sulfonate (PFOS)	2.0	D J	0.041	0.013	ug/L		11/29/16 20:20	12/12/16 19:07	10
Perfluorobutanesulfonic acid (PFBS)	0.11	D	0.026	0.0095	ug/L		11/29/16 20:20	12/12/16 19:07	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*99*		*25 - 150*	*11/29/16 20:20*	*12/12/16 19:07*	*10*
13C4 PFOS	*101*		*25 - 150*	*11/29/16 20:20*	*12/12/16 19:07*	*10*
18O2 PFHxS	*108*		*25 - 150*	*11/29/16 20:20*	*12/12/16 19:07*	*10*

Client Sample ID: DPT-16-18-GW-31-35 — Lab Sample ID: 320-23830-4

Date Collected: 11/23/16 12:20 **Matrix: Water**
Date Received: 11/26/16 09:00

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.24	M	0.0027	0.00080	ug/L		11/29/16 20:20	12/09/16 16:47	1
Perfluorooctane Sulfonate (PFOS)	0.37		0.0043	0.0014	ug/L		11/29/16 20:20	12/09/16 16:47	1
Perfluorobutanesulfonic acid (PFBS)	0.057		0.0027	0.00098	ug/L		11/29/16 20:20	12/09/16 16:47	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*80*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:47*	*1*
13C4 PFOS	*100*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:47*	*1*
18O2 PFHxS	*68*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:47*	*1*

Client Sample ID: DPT-16-18-GW-31-35-DUP — Lab Sample ID: 320-23830-5

Date Collected: 11/23/16 12:20 **Matrix: Water**
Date Received: 11/26/16 09:00

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.25	M	0.0026	0.00079	ug/L		11/29/16 20:20	12/09/16 16:54	1
Perfluorooctane Sulfonate (PFOS)	0.38		0.0042	0.0013	ug/L		11/29/16 20:20	12/09/16 16:54	1
Perfluorobutanesulfonic acid (PFBS)	0.060		0.0026	0.00097	ug/L		11/29/16 20:20	12/09/16 16:54	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*84*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:54*	*1*
13C4 PFOS	*101*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:54*	*1*
18O2 PFHxS	*67*		*25 - 150*	*11/29/16 20:20*	*12/09/16 16:54*	*1*

Client Sample ID: DPT-GW-EB-112316 — Lab Sample ID: 320-23830-6

Date Collected: 11/23/16 13:15 **Matrix: Water**
Date Received: 11/26/16 09:00

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0017	U	0.0022	0.00065	ug/L		11/29/16 20:20	12/09/16 17:02	1
Perfluorooctane Sulfonate (PFOS)	0.0026	U	0.0035	0.0011	ug/L		11/29/16 20:20	12/09/16 17:02	1
Perfluorobutanesulfonic acid (PFBS)	0.0017	U	0.0022	0.00080	ug/L		11/29/16 20:20	12/09/16 17:02	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*120*		*25 - 150*	*11/29/16 20:20*	*12/09/16 17:02*	*1*
13C4 PFOS	*107*		*25 - 150*	*11/29/16 20:20*	*12/09/16 17:02*	*1*
18O2 PFHxS	*110*		*25 - 150*	*11/29/16 20:20*	*12/09/16 17:02*	*1*

Client Sample ID: DPT-16-23-GW-21-25 — Lab Sample ID: 320-23830-7

Date Collected: 11/23/16 13:35 **Matrix: Water**
Date Received: 11/26/16 09:00

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**0.66**	**E M**	0.0026	0.00076	ug/L		11/29/16 20:20	12/09/16 17:39	1
Perfluorooctane Sulfonate (PFOS)	**0.83**	**E**	0.0041	0.0013	ug/L		11/29/16 20:20	12/09/16 17:39	1
Perfluorobutanesulfonic acid (PFBS)	**0.32**		0.0026	0.00094	ug/L		11/29/16 20:20	12/09/16 17:39	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*76*		*25 - 150*	*11/29/16 20:20*	*12/09/16 17:39*	*1*
13C4 PFOS	*87*		*25 - 150*	*11/29/16 20:20*	*12/09/16 17:39*	*1*
18O2 PFHxS	*47*		*25 - 150*	*11/29/16 20:20*	*12/09/16 17:39*	*1*

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**0.84**	**D M**	0.026	0.0076	ug/L		11/29/16 20:20	12/12/16 19:30	10
Perfluorooctane Sulfonate (PFOS)	**0.96**	**D**	0.041	0.013	ug/L		11/29/16 20:20	12/12/16 19:30	10
Perfluorobutanesulfonic acid (PFBS)	**0.24**	**D**	0.026	0.0094	ug/L		11/29/16 20:20	12/12/16 19:30	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*116*		*25 - 150*	*11/29/16 20:20*	*12/12/16 19:30*	*10*
13C4 PFOS	*112*		*25 - 150*	*11/29/16 20:20*	*12/12/16 19:30*	*10*
18O2 PFHxS	*105*		*25 - 150*	*11/29/16 20:20*	*12/12/16 19:30*	*10*

Client Sample ID: DPT-16-23-GW-31-35 — Lab Sample ID: 320-23830-8

Date Collected: 11/23/16 14:00 **Matrix: Water**
Date Received: 11/26/16 09:00

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**0.34**	**M**	0.0027	0.00080	ug/L		11/29/16 20:20	12/09/16 17:47	1
Perfluorooctane Sulfonate (PFOS)	**0.27**		0.0043	0.0014	ug/L		11/29/16 20:20	12/09/16 17:47	1
Perfluorobutanesulfonic acid (PFBS)	**0.11**		0.0027	0.00098	ug/L		11/29/16 20:20	12/09/16 17:47	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*77*		*25 - 150*	*11/29/16 20:20*	*12/09/16 17:47*	*1*
13C4 PFOS	*107*		*25 - 150*	*11/29/16 20:20*	*12/09/16 17:47*	*1*
18O2 PFHxS	*52*		*25 - 150*	*11/29/16 20:20*	*12/09/16 17:47*	*1*

Default Detection Limits

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Prep: 3535

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	0.0025	0.00092	ug/L	537 (Modified)
Perfluorooctane Sulfonate (PFOS)	0.0040	0.0013	ug/L	537 (Modified)
Perfluorooctanoic acid (PFOA)	0.0025	0.00075	ug/L	537 (Modified)

Isotope Dilution Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Method: 537 (Modified) - Perfluorinated Hydrocarbons

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

		Percent Isotope Dilution Recovery (Acceptance Limits)		
Lab Sample ID	**Client Sample ID**	**3C4 PFO/ (25-150)**	**3C4 PFO: (25-150)**	**3O2 PFHx (25-150)**
320-23830-1	DPT-16-19-GW-21-25	90	60	58
320-23830-1 - DL	DPT-16-19-GW-21-25	126	104	113
320-23830-2	DPT-16-19-GW-31-35	72	93	41
320-23830-2 - DL	DPT-16-19-GW-31-35	112	110	98
320-23830-3	DPT-16-18-GW-21-25	64	69	57
320-23830-3 - DL	DPT-16-18-GW-21-25	99	101	108
320-23830-3 MS	DPT-16-18-GW-21-25	70	69	58
320-23830-3 MS - DL	DPT-16-18-GW-21-25	109	102	107
320-23830-3 MSD	DPT-16-18-GW-21-25	68	75	61
320-23830-3 MSD - DL	DPT-16-18-GW-21-25	110	110	113
320-23830-4	DPT-16-18-GW-31-35	80	100	68
320-23830-5	DPT-16-18-GW-31-35-DUP	84	101	67
320-23830-6	DPT-GW-EB-112316	120	107	110
320-23830-7	DPT-16-23-GW-21-25	76	87	47
320-23830-7 - DL	DPT-16-23-GW-21-25	116	112	105
320-23830-8	DPT-16-23-GW-31-35	77	107	52
LCS 320-139917/2-A	Lab Control Sample	122	114	116
MB 320-139917/1-A	Method Blank	115	110	115

Surrogate Legend

13C4 PFOA = 13C4 PFOA
13C4 PFOS = 13C4 PFOS
18O2 PFHxS = 18O2 PFHxS

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-139917/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 141453 — **Prep Batch: 139917**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		11/29/16 20:20	12/09/16 15:54	1
Perfluorooctane Sulfonate (PFOS)	0.0030	U	0.0040	0.0013	ug/L		11/29/16 20:20	12/09/16 15:54	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		11/29/16 20:20	12/09/16 15:54	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*115*		*25 - 150*	*11/29/16 20:20*	*12/09/16 15:54*	*1*
13C4 PFOS	*110*		*25 - 150*	*11/29/16 20:20*	*12/09/16 15:54*	*1*
18O2 PFHxS	*115*		*25 - 150*	*11/29/16 20:20*	*12/09/16 15:54*	*1*

Lab Sample ID: LCS 320-139917/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 141453 — **Prep Batch: 139917**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanoic acid (PFOA)	0.0400	0.0345		ug/L		86	60 - 140
Perfluorooctane Sulfonate (PFOS)	0.0371	0.0334		ug/L		90	60 - 140
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0366		ug/L		104	50 - 150

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFOA	*122*		*25 - 150*
13C4 PFOS	*114*		*25 - 150*
18O2 PFHxS	*116*		*25 - 150*

Lab Sample ID: 320-23830-3 MS — **Client Sample ID: DPT-16-18-GW-21-25**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 141453 — **Prep Batch: 139917**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanoic acid (PFOA)	0.69	E J M	0.0414	0.667	E 4 M	ug/L		-49	60 - 140
Perfluorooctane Sulfonate (PFOS)	1.6	E J	0.0384	1.62	E 4	ug/L		-28	60 - 140
Perfluorobutanesulfonic acid (PFBS)	0.15		0.0366	0.186	4	ug/L		96	50 - 150

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C4 PFOA	*70*		*25 - 150*
13C4 PFOS	*69*		*25 - 150*
18O2 PFHxS	*58*		*25 - 150*

Lab Sample ID: 320-23830-3 MSD — **Client Sample ID: DPT-16-18-GW-21-25**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 141453 — **Prep Batch: 139917**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	0.69	E J M	0.0446	0.684	E 4 M	ug/L		-7	60 - 140	3	30
Perfluorooctane Sulfonate (PFOS)	1.6	E J	0.0414	1.56	E 4	ug/L		-175	60 - 140	4	30

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

Lab Sample ID: 320-23830-3 MSD **Client Sample ID: DPT-16-18-GW-21-25**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 141453 **Prep Batch: 139917**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanesulfonic acid (PFBS)	0.15		0.0394	0.184		ug/L		84	50 - 150	1	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C4 PFOA	*68*		*25 - 150*
13C4 PFOS	*75*		*25 - 150*
18O2 PFHxS	*61*		*25 - 150*

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

Lab Sample ID: 320-23830-3 MS **Client Sample ID: DPT-16-18-GW-21-25**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 141834 **Prep Batch: 139917**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanoic acid (PFOA) - DL	0.84	D M J	0.0414	0.882	D M 4	ug/L		108	60 - 140
Perfluorooctane Sulfonate (PFOS) - DL	2.0	D J	0.0384	1.98	D 4	ug/L		-15	60 - 140
Perfluorobutanesulfonic acid (PFBS) - DL	0.11	D	0.0366	0.149	D	ug/L		119	50 - 150

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C4 PFOA - DL	*109*		*25 - 150*
13C4 PFOS - DL	*102*		*25 - 150*
18O2 PFHxS - DL	*107*		*25 - 150*

Lab Sample ID: 320-23830-3 MSD **Client Sample ID: DPT-16-18-GW-21-25**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 141834 **Prep Batch: 139917**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA) - DL	0.84	D M J	0.0446	0.857	D M 4	ug/L		45	60 - 140	3	30
Perfluorooctane Sulfonate (PFOS) - DL	2.0	D J	0.0414	1.89	D 4	ug/L		-251	60 - 140	5	30
Perfluorobutanesulfonic acid (PFBS) - DL	0.11	D	0.0394	0.148	D	ug/L		108	50 - 150	0	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C4 PFOA - DL	*110*		*25 - 150*
13C4 PFOS - DL	*110*		*25 - 150*
18O2 PFHxS - DL	*113*		*25 - 150*

QC Association Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

LCMS

Prep Batch: 139917

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23830-1 - DL	DPT-16-19-GW-21-25	Total/NA	Water	3535	
320-23830-1	DPT-16-19-GW-21-25	Total/NA	Water	3535	
320-23830-2	DPT-16-19-GW-31-35	Total/NA	Water	3535	
320-23830-2 - DL	DPT-16-19-GW-31-35	Total/NA	Water	3535	
320-23830-3	DPT-16-18-GW-21-25	Total/NA	Water	3535	
320-23830-3 - DL	DPT-16-18-GW-21-25	Total/NA	Water	3535	
320-23830-4	DPT-16-18-GW-31-35	Total/NA	Water	3535	
320-23830-5	DPT-16-18-GW-31-35-DUP	Total/NA	Water	3535	
320-23830-6	DPT-GW-EB-112316	Total/NA	Water	3535	
320-23830-7 - DL	DPT-16-23-GW-21-25	Total/NA	Water	3535	
320-23830-7	DPT-16-23-GW-21-25	Total/NA	Water	3535	
320-23830-8	DPT-16-23-GW-31-35	Total/NA	Water	3535	
MB 320-139917/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-139917/2-A	Lab Control Sample	Total/NA	Water	3535	
320-23830-3 MS	DPT-16-18-GW-21-25	Total/NA	Water	3535	
320-23830-3 MS - DL	DPT-16-18-GW-21-25	Total/NA	Water	3535	
320-23830-3 MSD	DPT-16-18-GW-21-25	Total/NA	Water	3535	
320-23830-3 MSD - DL	DPT-16-18-GW-21-25	Total/NA	Water	3535	

Analysis Batch: 141453

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23830-1	DPT-16-19-GW-21-25	Total/NA	Water	537 (Modified)	139917
320-23830-2	DPT-16-19-GW-31-35	Total/NA	Water	537 (Modified)	139917
320-23830-3	DPT-16-18-GW-21-25	Total/NA	Water	537 (Modified)	139917
320-23830-4	DPT-16-18-GW-31-35	Total/NA	Water	537 (Modified)	139917
320-23830-5	DPT-16-18-GW-31-35-DUP	Total/NA	Water	537 (Modified)	139917
320-23830-6	DPT-GW-EB-112316	Total/NA	Water	537 (Modified)	139917
320-23830-7	DPT-16-23-GW-21-25	Total/NA	Water	537 (Modified)	139917
320-23830-8	DPT-16-23-GW-31-35	Total/NA	Water	537 (Modified)	139917
MB 320-139917/1-A	Method Blank	Total/NA	Water	537 (Modified)	139917
LCS 320-139917/2-A	Lab Control Sample	Total/NA	Water	537 (Modified)	139917
320-23830-3 MS	DPT-16-18-GW-21-25	Total/NA	Water	537 (Modified)	139917
320-23830-3 MSD	DPT-16-18-GW-21-25	Total/NA	Water	537 (Modified)	139917

Analysis Batch: 141834

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23830-1 - DL	DPT-16-19-GW-21-25	Total/NA	Water	537 (Modified)	139917
320-23830-2 - DL	DPT-16-19-GW-31-35	Total/NA	Water	537 (Modified)	139917
320-23830-3 - DL	DPT-16-18-GW-21-25	Total/NA	Water	537 (Modified)	139917
320-23830-7 - DL	DPT-16-23-GW-21-25	Total/NA	Water	537 (Modified)	139917
320-23830-3 MS - DL	DPT-16-18-GW-21-25	Total/NA	Water	537 (Modified)	139917
320-23830-3 MSD - DL	DPT-16-18-GW-21-25	Total/NA	Water	537 (Modified)	139917

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Client Sample ID: DPT-16-19-GW-21-25 — Lab Sample ID: 320-23830-1

Date Collected: 11/23/16 10:15
Date Received: 11/26/16 09:00
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)		1	141453	12/09/16 16:09	CBW	TAL SAC
Total/NA	Prep	3535	DL		139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	10	141834	12/12/16 18:52	SBC	TAL SAC

Client Sample ID: DPT-16-19-GW-31-35 — Lab Sample ID: 320-23830-2

Date Collected: 11/23/16 11:00
Date Received: 11/26/16 09:00
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)		1	141453	12/09/16 16:17	CBW	TAL SAC
Total/NA	Prep	3535	DL		139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	10	141834	12/12/16 19:00	SBC	TAL SAC

Client Sample ID: DPT-16-18-GW-21-25 — Lab Sample ID: 320-23830-3

Date Collected: 11/23/16 11:40
Date Received: 11/26/16 09:00
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)		1	141453	12/09/16 16:24	CBW	TAL SAC
Total/NA	Prep	3535	DL		139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	10	141834	12/12/16 19:07	SBC	TAL SAC

Client Sample ID: DPT-16-18-GW-31-35 — Lab Sample ID: 320-23830-4

Date Collected: 11/23/16 12:20
Date Received: 11/26/16 09:00
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)		1	141453	12/09/16 16:47	CBW	TAL SAC

Client Sample ID: DPT-16-18-GW-31-35-DUP — Lab Sample ID: 320-23830-5

Date Collected: 11/23/16 12:20
Date Received: 11/26/16 09:00
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)		1	141453	12/09/16 16:54	CBW	TAL SAC

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Client Sample ID: DPT-GW-EB-112316 — Lab Sample ID: 320-23830-6

Date Collected: 11/23/16 13:15 — **Matrix: Water**
Date Received: 11/26/16 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)		1	141453	12/09/16 17:02	CBW	TAL SAC

Client Sample ID: DPT-16-23-GW-21-25 — Lab Sample ID: 320-23830-7

Date Collected: 11/23/16 13:35 — **Matrix: Water**
Date Received: 11/26/16 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)		1	141453	12/09/16 17:39	CBW	TAL SAC
Total/NA	Prep	3535	DL		139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	10	141834	12/12/16 19:30	SBC	TAL SAC

Client Sample ID: DPT-16-23-GW-31-35 — Lab Sample ID: 320-23830-8

Date Collected: 11/23/16 14:00 — **Matrix: Water**
Date Received: 11/26/16 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			139917	11/29/16 20:20	JER	TAL SAC
Total/NA	Analysis	537 (Modified)		1	141453	12/09/16 17:47	CBW	TAL SAC

Laboratory References:

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

Certification Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Laboratory: TestAmerica Sacramento

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17

Method Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

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: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23830-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-23830-1	DPT-16-19-GW-21-25	Water	11/23/16 10:15	11/26/16 09:00
320-23830-2	DPT-16-19-GW-31-35	Water	11/23/16 11:00	11/26/16 09:00
320-23830-3	DPT-16-18-GW-21-25	Water	11/23/16 11:40	11/26/16 09:00
320-23830-4	DPT-16-18-GW-31-35	Water	11/23/16 12:20	11/26/16 09:00
320-23830-5	DPT-16-18-GW-31-35-DUP	Water	11/23/16 12:20	11/26/16 09:00
320-23830-6	DPT-GW-EB-112316	Water	11/23/16 13:15	11/26/16 09:00
320-23830-7	DPT-16-23-GW-21-25	Water	11/23/16 13:35	11/26/16 09:00
320-23830-8	DPT-16-23-GW-31-35	Water	11/23/16 14:00	11/26/16 09:00

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 140564

Lab Sample ID: IC 320-140564/4 Client Sample ID:

Date Analyzed: 12/03/16 13:48 Lab File ID: 03DEC2016A_004.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	3.28	Incomplete Integration	chandrasenas	12/05/16 09:42
Perfluoroundecanoic acid (PFUnA)	3.97	Incomplete Integration	chandrasenas	12/05/16 09:42

Lab Sample ID: IC 320-140564/7 Client Sample ID:

Date Analyzed: 12/03/16 14:11 Lab File ID: 03DEC2016A_007.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.53	Baseline	chandrasenas	12/05/16 09:41
Perfluorooctanoic acid (PFOA)	2.89	Baseline	chandrasenas	12/05/16 09:41

Lab Sample ID: IC 320-140564/9 Client Sample ID:

Date Analyzed: 12/03/16 14:26 Lab File ID: 03DEC2016A_009.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorotridecanoic Acid (PFTriA)	4.50	Incomplete Integration	chandrasenas	12/05/16 09:44

537 (Modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 141453

Lab Sample ID: CCV 320-141453/4 CCVL Client Sample ID:

Date Analyzed: 12/09/16 11:21 Lab File ID: 09DEC2016A_004.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane Sulfonate (PFOS)	3.19	Assign Peak	westendorfc	12/09/16 11:56

Lab Sample ID: 320-23830-1 Client Sample ID: DPT-16-19-GW-21-25

Date Analyzed: 12/09/16 16:09 Lab File ID: 09DEC2016A_039.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.81	Isomers	westendorfc	12/11/16 11:48

Lab Sample ID: 320-23830-2 Client Sample ID: DPT-16-19-GW-31-35

Date Analyzed: 12/09/16 16:17 Lab File ID: 09DEC2016A_040.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.81	Isomers	westendorfc	12/11/16 11:49

Lab Sample ID: 320-23830-3 Client Sample ID: DPT-16-18-GW-21-25

Date Analyzed: 12/09/16 16:24 Lab File ID: 09DEC2016A_041.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.80	Isomers	westendorfc	12/11/16 11:49

537 (Modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 141453

Lab Sample ID: 320-23830-3 MS Client Sample ID: DPT-16-18-GW-21-25 MS

Date Analyzed: 12/09/16 16:32 Lab File ID: 09DEC2016A_042.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.80	Isomers	westendorfc	12/11/16 11:50

Lab Sample ID: 320-23830-3 MSD Client Sample ID: DPT-16-18-GW-21-25 MSD

Date Analyzed: 12/09/16 16:39 Lab File ID: 09DEC2016A_043.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.80	Isomers	westendorfc	12/11/16 11:51

Lab Sample ID: 320-23830-4 Client Sample ID: DPT-16-18-GW-31-35

Date Analyzed: 12/09/16 16:47 Lab File ID: 09DEC2016A_044.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.81	Isomers	westendorfc	12/11/16 11:52

Lab Sample ID: 320-23830-5 Client Sample ID: DPT-16-18-GW-31-35-DUP

Date Analyzed: 12/09/16 16:54 Lab File ID: 09DEC2016A_045.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.80	Isomers	westendorfc	12/11/16 11:52

537 (Modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 141453

Lab Sample ID: 320-23830-7 Client Sample ID: DPT-16-23-GW-21-25

Date Analyzed: 12/09/16 17:39 Lab File ID: 09DEC2016A_051.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.79	Isomers	westendorfc	12/11/16 11:53

Lab Sample ID: 320-23830-8 Client Sample ID: DPT-16-23-GW-31-35

Date Analyzed: 12/09/16 17:47 Lab File ID: 09DEC2016A_052.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.80	Isomers	westendorfc	12/11/16 11:54

Lab Sample ID: CCV 320-141453/59 Client Sample ID:

Date Analyzed: 12/09/16 18:32 Lab File ID: 09DEC2016A_058.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorododecanoic acid (PFDoA)	4.14	Baseline	westendorfc	12/11/16 11:57

537 (Modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 141834

Lab Sample ID: 320-23830-1 DL Client Sample ID: DPT-16-19-GW-21-25 DL

Date Analyzed: 12/12/16 18:52 Lab File ID: 12DEC2016C_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.79	Isomers	chandrasenas	12/14/16 08:21

Lab Sample ID: 320-23830-2 DL Client Sample ID: DPT-16-19-GW-31-35 DL

Date Analyzed: 12/12/16 19:00 Lab File ID: 12DEC2016C_006.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.80	Isomers	chandrasenas	12/14/16 08:22

Lab Sample ID: 320-23830-3 DL Client Sample ID: DPT-16-18-GW-21-25 DL

Date Analyzed: 12/12/16 19:07 Lab File ID: 12DEC2016C_007.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.79	Isomers	chandrasenas	12/14/16 08:22

Lab Sample ID: 320-23830-3 MS DL Client Sample ID: DPT-16-18-GW-21-25 MS DL

Date Analyzed: 12/12/16 19:15 Lab File ID: 12DEC2016C_008.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.79	Isomers	chandrasenas	12/14/16 08:23

537 (Modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 141834

Lab Sample ID: 320-23830-3 MSD DL Client Sample ID: DPT-16-18-GW-21-25 MSD DL

Date Analyzed: 12/12/16 19:22 Lab File ID: 12DEC2016C_009.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.79	Isomers	chandrasenas	12/14/16 08:23

Lab Sample ID: 320-23830-7 DL Client Sample ID: DPT-16-23-GW-21-25 DL

Date Analyzed: 12/12/16 19:30 Lab File ID: 12DEC2016C_010.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.79	Isomers	chandrasenas	12/14/16 08:23

Lab Sample ID: CCV 320-141834/14 Client Sample ID:

Date Analyzed: 12/12/16 20:00 Lab File ID: 12DEC2016C_014.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.44	Isomers	chandrasenas	12/14/16 08:29

537 (Modified)

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCMPFCSU_00046	03/01/17	11/03/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00007	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00007	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00008	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00011	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00008	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00008	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00012	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00017	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00009	1000 uL	13C2 PFUnA	1 ug/mL
.LCM2PFHxDA_00008	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA_00007	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
.LCM4PFHPA_00007	05/27/21	Wellington Laboratories, Lot M4PFHpA0516			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
.LCM5PFPEA_00008	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
.LCM8FOSA_00011	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
.LCMPFBA_00008	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
.LCMPFDA_00011	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFDoA_00008	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
.LCMPFHxA_00012	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00008	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
.LCMPFNA_00008	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
.LCMPFOA_00012	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
.LCMPFOS_00017	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00009	02/12/21	Wellington Laboratories, Lot MPFUdA0216			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC-L1_00021	12/28/16	08/03/16	MeOH/H2O, Lot 90285	5 mL	LCMPFCSU_00044	250 uL	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
							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
					LCPFCSP_00057	25 uL	Perfluorobutyric acid	0.5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.442 ng/mL
							Perfluorodecanoic acid	0.5 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorododecanoic acid	0.5 ng/mL
							Perfluorodecane Sulfonic acid	0.482 ng/mL
							Perfluoroheptanoic acid	0.5 ng/mL
							Perfluoroheptanesulfonic Acid	0.476 ng/mL
							Perfluorohexanoic acid	0.5 ng/mL
							Perfluorohexadecanoic acid	0.5 ng/mL
							Perfluorohexanesulfonic acid	0.455 ng/mL
							Perfluorononanoic acid	0.5 ng/mL
							Perfluorooctanoic acid (PFOA)	0.5 ng/mL
							Perfluorooctadecanoic acid	0.5 ng/mL
							Perfluorooctane Sulfonate (PFOS)	0.464 ng/mL
							Perfluorooctane Sulfonamide	0.5 ng/mL
							Perfluoropentanoic acid	0.5 ng/mL
							Perfluorotetradecanoic acid	0.5 ng/mL
							Perfluorotridecanoic acid	0.5 ng/mL
							Perfluoroundecanoic acid	0.5 ng/mL
.LCMPFCSU_00044	12/28/16	06/28/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00006	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00006	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00007	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00010	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00007	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00010	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00007	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00011	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00007	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00007	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00011	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00015	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00008	1000 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00006	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00006	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00006	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00007	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00010	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00007	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00010	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00007	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00011	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00007	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00007	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00011	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00015	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00008	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00057	02/01/17	08/03/16	Methanol, Lot 090285	10000 uL	LCPFCSP_00056	1000 uL	Perfluorobutyric acid	0.1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid	0.091 ug/mL
							Perfluorononanoic acid	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctane Sulfonate (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
..LCPFCSP_00056	02/01/17	08/01/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00004	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00005	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00005	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS_00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid	0.91 ug/mL
					LCPFNA_00005	200 uL	Perfluorononanoic acid	1 ug/mL
					LCPFOA_00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctane Sulfonate (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00005	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
...LCPFBA_00004	01/30/20	Wellington Laboratories, Lot PFBA0115			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBS_00004	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFHpS_00008	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00004	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00001	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid	45.5 ug/mL
...LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
...LCPFOA_00006	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
...LCPFOS-br_00001	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
...LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA_00004	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L2_00022	12/28/16	08/03/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00044	250 uL	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
							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
					LCPFCSP_00057	50 uL	Perfluorobutyric acid	1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL
							Perfluorodecanoic acid	1 ng/mL
							Perfluorododecanoic acid	1 ng/mL
							Perfluorodecane Sulfonic acid	0.964 ng/mL
							Perfluoroheptanoic acid	1 ng/mL
							Perfluoroheptanesulfonic Acid	0.952 ng/mL
							Perfluorohexanoic acid	1 ng/mL
							Perfluorohexadecanoic acid	1 ng/mL
							Perfluorohexanesulfonic acid	0.91 ng/mL
							Perfluorononanoic acid	1 ng/mL
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctadecanoic acid	1 ng/mL
							Perfluorooctane Sulfonate (PFOS)	0.928 ng/mL
							Perfluorooctane Sulfonamide	1 ng/mL
							Perfluoropentanoic acid	1 ng/mL
							Perfluorotetradecanoic acid	1 ng/mL
							Perfluorotridecanoic acid	1 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoroundecanoic acid	1 ng/mL
.LCMPFCSU_00044	12/28/16	06/28/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00006	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00006	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00007	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00010	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00007	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00010	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00007	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00011	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00007	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00007	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00011	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00015	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00008	1000 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00006	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00006	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00006	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00007	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00010	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00007	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00010	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00007	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00011	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00007	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00007	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00011	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00015	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00008	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00057	02/01/17	08/03/16	Methanol, Lot 090285	10000 uL	LCPFCSP_00056	1000 uL	Perfluorobutyric acid	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid	0.091 ug/mL
							Perfluorononanoic acid	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctane Sulfonate (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL
							Perfluoropentanoic acid	0.1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
..LCPFCSP_00056	02/01/17	08/01/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00004	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00005	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00005	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS_00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid	0.91 ug/mL
					LCPFNA_00005	200 uL	Perfluorononanoic acid	1 ug/mL
					LCPFOA_00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctane Sulfonate (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00005	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
...LCPFBA_00004	01/30/20	Wellington Laboratories, Lot PFBA0115			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBS_00004	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
...LCPFHpS_00008	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00004	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00001	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid	45.5 ug/mL
...LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
...LCPFOA_00006	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
...LCPFOS-br_00001	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
...LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA_00004	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L3_00019	12/28/16	08/03/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00044	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 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
					LCPFCSP_00057	250 uL	Perfluorobutyric acid	5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL
							Perfluorodecanoic acid	5 ng/mL
							Perfluorododecanoic acid	5 ng/mL
							Perfluorodecane Sulfonic acid	4.82 ng/mL
							Perfluoroheptanoic acid	5 ng/mL
							Perfluoroheptanesulfonic Acid	4.76 ng/mL
							Perfluorohexanoic acid	5 ng/mL
							Perfluorohexadecanoic acid	5 ng/mL
							Perfluorohexanesulfonic acid	4.55 ng/mL
							Perfluorononanoic acid	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5 ng/mL
							Perfluorooctadecanoic acid	5 ng/mL
							Perfluorooctane Sulfonate (PFOS)	4.64 ng/mL
							Perfluorooctane Sulfonamide	5 ng/mL
							Perfluoropentanoic acid	5 ng/mL
							Perfluorotetradecanoic acid	5 ng/mL
							Perfluorotridecanoic acid	5 ng/mL
							Perfluoroundecanoic acid	5 ng/mL
.LCMPFCSU_00044	12/28/16	06/28/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00006	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00006	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00007	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00010	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00007	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00010	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00007	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00011	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00007	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00007	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00011	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00015	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00008	1000 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00006	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM2PFTeDA_00006	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00006	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00007	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00010	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00007	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00010	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00007	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00011	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00007	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00007	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00011	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00015	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00008	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00057	02/01/17	08/03/16	Methanol, Lot 090285	10000 uL	LCPFCSP_00056	1000 uL	Perfluorobutyric acid	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid	0.091 ug/mL
							Perfluorononanoic acid	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctane Sulfonate (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
..LCPFCSP_00056	02/01/17	08/01/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00004	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00005	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00005	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS_00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid	0.91 ug/mL
					LCPFNA_00005	200 uL	Perfluorononanoic acid	1 ug/mL
					LCPFOA_00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005	200 uL	Perfluorooctadecanoic acid	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFOS-br_00001	200 uL	Perfluorooctane Sulfonate (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00005	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
...LCPFBA_00004	01/30/20	Wellington Laboratories, Lot PFBA0115			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBS_00004	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
...LCPFHpS_00008	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00004	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00001	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid	45.5 ug/mL
...LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
...LCPFOA_00006	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
...LCPFOS-br_00001	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
...LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA_00004	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L4_00022	12/28/16	08/03/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00044	250 uL	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
							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
					LCPFCSP_00056	100 uL	Perfluorobutyric acid	20 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	17.68 ng/mL
							Perfluorodecanoic acid	20 ng/mL
							Perfluorododecanoic acid	20 ng/mL
							Perfluorodecane Sulfonic acid	19.28 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoroheptanoic acid	20 ng/mL
							Perfluoroheptanesulfonic Acid	19.04 ng/mL
							Perfluorohexanoic acid	20 ng/mL
							Perfluorohexadecanoic acid	20 ng/mL
							Perfluorohexanesulfonic acid	18.2 ng/mL
							Perfluorononanoic acid	20 ng/mL
							Perfluorooctanoic acid (PFOA)	20 ng/mL
							Perfluorooctadecanoic acid	20 ng/mL
							Perfluorooctane Sulfonate (PFOS)	18.56 ng/mL
							Perfluorooctane Sulfonamide	20 ng/mL
							Perfluoropentanoic acid	20 ng/mL
							Perfluorotetradecanoic acid	20 ng/mL
							Perfluorotridecanoic acid	20 ng/mL
							Perfluoroundecanoic acid	20 ng/mL
.LCMPFCSU_00044	12/28/16	06/28/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00006	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00006	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00007	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00010	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00007	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00010	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00007	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00011	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00007	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00007	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00011	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00015	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00008	1000 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00006	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00006	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00006	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00007	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00010	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00007	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00010	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00007	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00011	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00007	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00007	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00011	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00015	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00008	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00056	02/01/17	08/01/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00004	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00005	200 uL	Perfluorodecanoic acid	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFDoA_00005	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS_00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid	0.91 ug/mL
					LCPFNA_00005	200 uL	Perfluorononanoic acid	1 ug/mL
					LCPFOA_00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctane Sulfonate (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00005	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00004	01/30/20	Wellington Laboratories, Lot PFBA0115			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00004	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
..LCPFHpS_00008	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00004	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00001	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid	45.5 ug/mL
..LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
..LCPFOA_00006	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00001	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
..LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00004	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L4_00023	02/01/17	09/30/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00045	250 uL	18O2 PFHxS	47.3 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
					LCPFCSP_00056	100 uL	Perfluorobutanesulfonic acid (PFBS)	17.68 ng/mL
							Perfluorooctanoic acid (PFOA)	20 ng/mL
							Perfluorooctane Sulfonate (PFOS)	18.56 ng/mL
.LCMPFCSU_00045	03/01/17	08/31/16	Methanol, Lot Baker 115935	50000 uL	LCMPFHxS_00007	1000 uL	18O2 PFHxS	0.946 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFOA_00011	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00015	1000 uL	13C4 PFOS	0.956 ug/mL
..LCMPFHxS_00007	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFOA_00011	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00015	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCPFCSP_00056	02/01/17	08/01/16	Methanol, Lot 090285	10000 uL	LCPFBS_00004	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFOA_00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctane Sulfonate (PFOS)	0.928 ug/mL
..LCPFBS_00004	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFOA_00006	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00001	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
LCPFC-L5_00020	12/28/16	08/03/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00044	250 uL	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
							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
					LCPFCSP_00056	250 uL	Perfluorobutyric acid	50 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ng/mL
							Perfluorodecanoic acid	50 ng/mL
							Perfluorododecanoic acid	50 ng/mL
							Perfluorodecane Sulfonic acid	48.2 ng/mL
							Perfluoroheptanoic acid	50 ng/mL
							Perfluoroheptanesulfonic Acid	47.6 ng/mL
							Perfluorohexanoic acid	50 ng/mL
							Perfluorohexadecanoic acid	50 ng/mL
							Perfluorohexanesulfonic acid	45.5 ng/mL
							Perfluorononanoic acid	50 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
							Perfluorooctadecanoic acid	50 ng/mL
							Perfluorooctane Sulfonate (PFOS)	46.4 ng/mL
							Perfluorooctane Sulfonamide	50 ng/mL
							Perfluoropentanoic acid	50 ng/mL
							Perfluorotetradecanoic acid	50 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorotridecanoic acid	50 ng/mL
							Perfluoroundecanoic acid	50 ng/mL
.LCMPFCSU_00044	12/28/16	06/28/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00006	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00006	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00007	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00010	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00007	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00010	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00007	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00011	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00007	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00007	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00011	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00015	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00008	1000 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00006	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00006	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00006	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00007	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00010	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00007	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00010	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00007	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00011	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00007	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00007	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00011	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00015	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00008	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00056	02/01/17	08/01/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00004	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00005	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00005	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS_00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid	0.91 ug/mL
					LCPFNA_00005	200 uL	Perfluorononanoic acid	1 ug/mL
					LCPFOA_00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctane Sulfonate (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFPeA_00005	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00004	01/30/20	Wellington Laboratories, Lot PFBA0115			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00004	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
..LCPFHpS_00008	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00004	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00001	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid	45.5 ug/mL
..LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
..LCPFOA_00006	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00001	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
..LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00004	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L6_00019	12/28/16	08/03/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00044	250 uL	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
							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
					LCPFCSP_00056	1000 uL	Perfluorobutyric acid	200 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	176.8 ng/mL
							Perfluorodecanoic acid	200 ng/mL
							Perfluorododecanoic acid	200 ng/mL
							Perfluorodecane Sulfonic acid	192.8 ng/mL
							Perfluoroheptanoic acid	200 ng/mL
							Perfluoroheptanesulfonic Acid	190.4 ng/mL
							Perfluorohexanoic acid	200 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexadecanoic acid	200 ng/mL
							Perfluorohexanesulfonic acid	182 ng/mL
							Perfluorononanoic acid	200 ng/mL
							Perfluorooctanoic acid (PFOA)	200 ng/mL
							Perfluorooctadecanoic acid	200 ng/mL
							Perfluorooctane Sulfonate (PFOS)	185.6 ng/mL
							Perfluorooctane Sulfonamide	200 ng/mL
							Perfluoropentanoic acid	200 ng/mL
							Perfluorotetradecanoic acid	200 ng/mL
							Perfluorotridecanoic acid	200 ng/mL
							Perfluoroundecanoic acid	200 ng/mL
.LCMPFCSU_00044	12/28/16	06/28/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00006	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00006	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00007	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00010	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00007	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00010	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00007	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00011	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00007	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00007	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00011	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00015	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00008	1000 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00006	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00006	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00006	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00007	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00010	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00007	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00010	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00007	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00011	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00007	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00007	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00011	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00015	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00008	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00056	02/01/17	08/01/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00004	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00005	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00005	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid	1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHpS_00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid	0.91 ug/mL
					LCPFNA_00005	200 uL	Perfluorononanoic acid	1 ug/mL
					LCPFOA_00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctane Sulfonate (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00005	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00004	01/30/20	Wellington Laboratories, Lot PFBA0115			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00004	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
..LCPFHpS_00008	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00004	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00001	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid	45.5 ug/mL
..LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
..LCPFOA_00006	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00001	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
..LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00004	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC2-L1_00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU_00005	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
					LCPFC2SP_00014	25 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.474 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.479 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							N-ethylperfluoro-1-octanesulfonamide	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
.LCMPFC2SU_00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M_00001	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00001	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00001	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00001	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00001	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00001	200 uL	M2-8:2FTS	0.958 ug/mL
..LCd-NEtFOSA-M_00001	03/10/19	WELLINGTON, Lot dNEtFOSA0314M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00001	01/28/19	WELLINGTON, Lot dNMeFOSA0114M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00001	01/31/18	WELLINGTON, Lot d3NMeFOSAA0113			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00001	05/08/20	WELLINGTON, Lot d5NEtFOSAA0515			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00001	07/15/17	WELLINGTON, Lot M262FTS0714			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00001	04/13/17	WELLINGTON, Lot M282FTS0414			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00014	01/20/17	07/20/16	Methanol, Lot 104453	5000 uL	LCPFC2SP_00013	500 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.0958 ug/mL
							N-ethylperfluoro-1-octanesulfonamide	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
..LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002	200 uL	N-ethylperfluoro-1-octanesulfonamide	1 ug/mL
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00001	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
...LC6:2FTS_00001	10/03/17	WELLINGTON, Lot 62FTS1014			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC8:2FTS_00001	10/03/17	WELLINGTON, Lot 82FTS1014			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
...LCN-EtFOSA-M_00002	07/14/19	WELLINGTON, Lot NEtFOSA0714M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
...LCN-EtFOSAA_00001	01/29/18	WELLINGTON, Lot NEtFOSAA0113			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSA-M_00001	07/15/19	WELLINGTON, Lot NMeFOSA0714M			(Purchased Reagent)		MeFOSA	50 ug/mL
...LCN-MeFOSAA_00001	12/09/19	WELLINGTON, Lot NMeFOSAA1214			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L2_00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU_00005	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
					LCPFC2SP_00014	50 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ng/mL
							N-ethylperfluoro-1-octanesulfonamide	1 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							MeFOSA	1 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
.LCMPFC2SU_00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M_00001	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00001	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00001	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00001	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00001	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00001	200 uL	M2-8:2FTS	0.958 ug/mL
..LCd-NEtFOSA-M_00001	03/10/19	WELLINGTON, Lot dNEtFOSA0314M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00001	01/28/19	WELLINGTON, Lot dNMeFOSA0114M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00001	01/31/18	WELLINGTON, Lot d3NMeFOSAA0113			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00001	05/08/20	WELLINGTON, Lot d5NEtFOSAA0515			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00001	07/15/17	WELLINGTON, Lot M262FTS0714			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00001	04/13/17	WELLINGTON, Lot M282FTS0414			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00014	01/20/17	07/20/16	Methanol, Lot 104453	5000 uL	LCPFC2SP_00013	500 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.0958 ug/mL
							N-ethylperfluoro-1-octanesulfonamide	0.1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
..LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002	200 uL	N-ethylperfluoro-1-octanesulfo namide	1 ug/mL
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00001	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
...LC6:2FTS_00001	10/03/17	WELLINGTON, Lot 62FTS1014			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
...LC8:2FTS_00001	10/03/17	WELLINGTON, Lot 82FTS1014			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
...LCN-EtFOSA-M_00002	07/14/19	WELLINGTON, Lot NEtFOSA0714M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
...LCN-EtFOSAA_00001	01/29/18	WELLINGTON, Lot NEtFOSAA0113			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSA-M_00001	07/15/19	WELLINGTON, Lot NMeFOSA0714M			(Purchased Reagent)		MeFOSA	50 ug/mL
...LCN-MeFOSAA_00001	12/09/19	WELLINGTON, Lot NMeFOSAA1214			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L3_00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU_00005	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
					LCPFC2SP_00014	250 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	4.74 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	4.79 ng/mL
							N-ethylperfluoro-1-octanesulfo namide	5 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							MeFOSA	5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCMPFC2SU_00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M_00001	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00001	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00001	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00001	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00001	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00001	200 uL	M2-8:2FTS	0.958 ug/mL
..LCd-NEtFOSA-M_00001	03/10/19	WELLINGTON, Lot dNEtFOSA0314M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00001	01/28/19	WELLINGTON, Lot dNMeFOSA0114M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00001	01/31/18	WELLINGTON, Lot d3NMeFOSAA0113			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00001	05/08/20	WELLINGTON, Lot d5NEtFOSAA0515			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00001	07/15/17	WELLINGTON, Lot M262FTS0714			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00001	04/13/17	WELLINGTON, Lot M282FTS0414			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00014	01/20/17	07/20/16	Methanol, Lot 104453	5000 uL	LCPFC2SP_00013	500 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane 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
..LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002	200 uL	N-ethylperfluoro-1-octanesulfo namide	1 ug/mL
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00001	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
...LC6:2FTS_00001	10/03/17	WELLINGTON, Lot 62FTS1014			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
...LC8:2FTS_00001	10/03/17	WELLINGTON, Lot 82FTS1014			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
...LCN-EtFOSA-M_00002	07/14/19	WELLINGTON, Lot NEtFOSA0714M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
...LCN-EtFOSAA_00001	01/29/18	WELLINGTON, Lot NEtFOSAA0113			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSA-M_00001	07/15/19	WELLINGTON, Lot NMeFOSA0714M			(Purchased Reagent)		MeFOSA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCN-MeFOSAA_00001	12/09/19	WELLINGTON, Lot NMeFOSAA1214			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L4_00003	02/26/17	09/22/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU_00008	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
					LCPFC2SP_00017	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	18.96 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	19.16 ng/mL
							N-ethylperfluoro-1-octanesulfo namide	20 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	20 ng/mL
							MeFOSA	20 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	20 ng/mL
.LCMPFC2SU_00008	02/26/17	08/26/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M_00002	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00002	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00002	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00002	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00002	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00002	200 uL	M2-8:2FTS	0.958 ug/mL
..LCd-NEtFOSA-M_00002	03/10/19	WELLINGTON, Lot dNEtFOSA0314M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00002	06/10/21	WELLINGTON, Lot dNMeFOSA0616M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00002	01/20/21	WELLINGTON, Lot d3NMeFOSAA0116			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00002	12/07/20	WELLINGTON, Lot d5NEtFOSAA1115			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00002	01/08/21	WELLINGTON, Lot M262FTS0116			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00002	01/08/21	WELLINGTON, Lot M282FTS0116			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00017	03/02/17	09/02/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00002	100 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.474 ug/mL
					LC8:2FTS_00002	100 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.479 ug/mL
					LCN-EtFOSA-M_00003	100 uL	N-ethylperfluoro-1-octanesulfo namide	0.5 ug/mL
					LCN-EtFOSAA_00002	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCN-MeFOSA-M_00002	100 uL	MeFOSA	0.5 ug/mL
					LCN-MeFOSAA_00003	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
..LC6:2FTS_00002	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LC8:2FTS_00002	10/23/20	WELLINGTON, Lot 82FTS1015			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSA-M_00003	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	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_00002	05/24/21	WELLINGTON, Lot NMeFOSA0714M			(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
LCPFC2-L5_00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU_00005	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
					LCPFC2SP_00013	250 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ng/mL
							N-ethylperfluoro-1-octanesulfonamide	50 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	50 ng/mL
							MeFOSA	50 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	50 ng/mL
.LCMPFC2SU_00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M_00001	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00001	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00001	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00001	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00001	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00001	200 uL	M2-8:2FTS	0.958 ug/mL
..LCd-NEtFOSA-M_00001	03/10/19	WELLINGTON, Lot dNEtFOSA0314M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00001	01/28/19	WELLINGTON, Lot dNMeFOSA0114M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00001	01/31/18	WELLINGTON, Lot d3NMeFOSAA0113			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00001	05/08/20	WELLINGTON, Lot d5NEtFOSAA0515			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00001	07/15/17	WELLINGTON, Lot M262FTS0714			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00001	04/13/17	WELLINGTON, Lot M282FTS0414			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002	200 uL	N-ethylperfluoro-1-octanesulfonamide	1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00001	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
..LC6:2FTS_00001	10/03/17	WELLINGTON, Lot 62FTS1014			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
..LC8:2FTS_00001	10/03/17	WELLINGTON, Lot 82FTS1014			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSA-M_00002	07/14/19	WELLINGTON, Lot NEtFOSA0714M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
..LCN-EtFOSAA_00001	01/29/18	WELLINGTON, Lot NEtFOSAA0113			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSA-M_00001	07/15/19	WELLINGTON, Lot NMeFOSA0714M			(Purchased Reagent)		MeFOSA	50 ug/mL
..LCN-MeFOSAA_00001	12/09/19	WELLINGTON, Lot NMeFOSAA1214			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L6_00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU_00005	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
					LCPFC2SP_00013	1000 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	189.6 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	191.6 ng/mL
							N-ethylperfluoro-1-octanesulfo namide	200 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	200 ng/mL
							MeFOSA	200 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	200 ng/mL
.LCMPFC2SU_00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M_00001	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00001	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00001	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00001	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00001	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00001	200 uL	M2-8:2FTS	0.958 ug/mL
..LCd-NEtFOSA-M_00001	03/10/19	WELLINGTON, Lot dNEtFOSA0314M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00001	01/28/19	WELLINGTON, Lot dNMeFOSA0114M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00001	01/31/18	WELLINGTON, Lot d3NMeFOSAA0113			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00001	05/08/20	WELLINGTON, Lot d5NEtFOSAA0515			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00001	07/15/17	WELLINGTON, Lot M262FTS0714			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00001	04/13/17	WELLINGTON, Lot M282FTS0414			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002	200 uL	N-ethylperfluoro-1-octanesulfo namide	1 ug/mL
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00001	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
..LC6:2FTS_00001	10/03/17	WELLINGTON, Lot 62FTS1014			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
..LC8:2FTS_00001	10/03/17	WELLINGTON, Lot 82FTS1014			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSA-M_00002	07/14/19	WELLINGTON, Lot NEtFOSA0714M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
..LCN-EtFOSAA_00001	01/29/18	WELLINGTON, Lot NEtFOSAA0113			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSA-M_00001	07/15/19	WELLINGTON, Lot NMeFOSA0714M			(Purchased Reagent)		MeFOSA	50 ug/mL
..LCN-MeFOSAA_00001	12/09/19	WELLINGTON, Lot NMeFOSAA1214			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFCIC_00020	03/01/17	12/01/16	MeOH/H2O, Lot 09285	5 mL	LCMPFCSU_00046	250 uL	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
							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
					LCPFACMXB_00007	125 uL	Perfluorobutanesulfonic acid (PFBS)	44.25 ng/mL
							Perfluorooctane Sulfonate (PFOS)	47.75 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
.LCMPFCSU_00046	03/01/17	11/03/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00007	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00007	1000 uL	13C4-PFHpA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCM5PFPEA_00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00008	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00011	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00008	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00008	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00012	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00017	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00009	1000 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00008	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00007	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00007	05/27/21	Wellington Laboratories, Lot M4PFHpA0516			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00008	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00011	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00008	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00011	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00008	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00012	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00008	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00008	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00012	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00017	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00009	02/12/21	Wellington Laboratories, Lot MPFUdA0216			(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
							Perfluorooctane Sulfonate (PFOS)	1.91 ug/mL
							Perfluorooctanoic acid (PFOA)	2 ug/mL
LCPFCSP_00070	05/15/17	11/15/16	Methanol, Lot 090285	10000 uL	LCPFBA_00005	100 uL	Perfluorobutyric acid	0.5 ug/mL
					LCPFBS_00005	100 uL	Perfluorobutane Sulfonate	0.442 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00005	100 uL	Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00005	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00006	100 uL	Perfluorodecane Sulfonate	0.482 ug/mL
							Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00005	100 uL	Perfluoroheptanoic acid	0.5 ug/mL
					LCPFHpS_00009	100 uL	Perfluoroheptane Sulfonate	0.476 ug/mL
							Perfluoroheptanesulfonic Acid	0.476 ug/mL
					LCPFHxA_00004	100 uL	Perfluorohexanoic acid	0.5 ug/mL
					LCPFHxDA_00006	100 uL	Perfluorohexadecanoic acid	0.5 ug/mL
					LCPFHxS-br_00002	100 uL	Perfluorohexane Sulfonate	0.455 ug/mL
							Perfluorohexanesulfonic acid	0.455 ug/mL
					LCPFNA_00005	100 uL	Perfluorononanoic acid	0.5 ug/mL
					LCPFOA_00006	100 uL	Perfluorooctanoic acid (PFOA)	0.5 ug/mL
					LCPFODA_00005	100 uL	Perfluorooctadecanoic acid	0.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFOS-br_00002	100 uL	Perfluorooctane Sulfonate (PFOS)	0.464 ug/mL
					LCPFOSA_00006	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA_00005	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFTeDA_00004	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA_00004	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA_00005	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
.LCPFBA_00005	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
.LCPFBS_00005	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutane Sulfonate	44.2 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
.LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
.LCPFDS_00006	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
							Perfluorodecane Sulfonic acid	48.2 ug/mL
.LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
.LCPFHpS_00009	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptane Sulfonate	47.6 ug/mL
							Perfluoroheptanesulfonic Acid	47.6 ug/mL
.LCPFHxA_00004	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
.LCPFHxDA_00006	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00002	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexane Sulfonate	45.5 ug/mL
							Perfluorohexanesulfonic acid	45.5 ug/mL
.LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
.LCPFOA_00006	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
.LCPFOS-br_00002	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
.LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
.LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
.LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
.LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
.LCPFUdA_00005	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL

Reagent

LC6:2FTS_00001

r: 7/20/15 SV
S: 7/20/15 SV

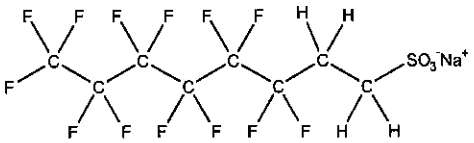
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 6:2FTS **LOT NUMBER:** 62FTS1014

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_8H_4F_{13}SO_3Na$ **MOLECULAR WEIGHT:** 450.15

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol

47.4 ± 2.4 µg/ml (6:2FTS anion)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 10/03/2014

EXPIRY DATE: (mm/dd/yyyy) 10/03/2017

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:** 03/27/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

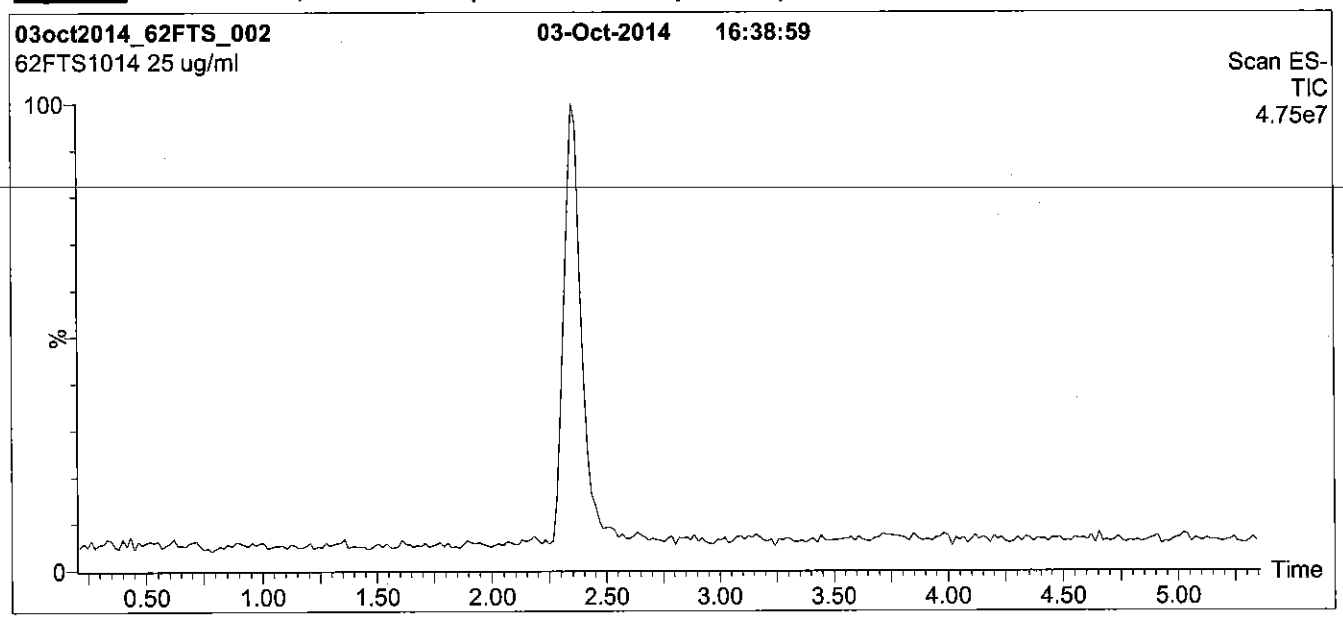
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

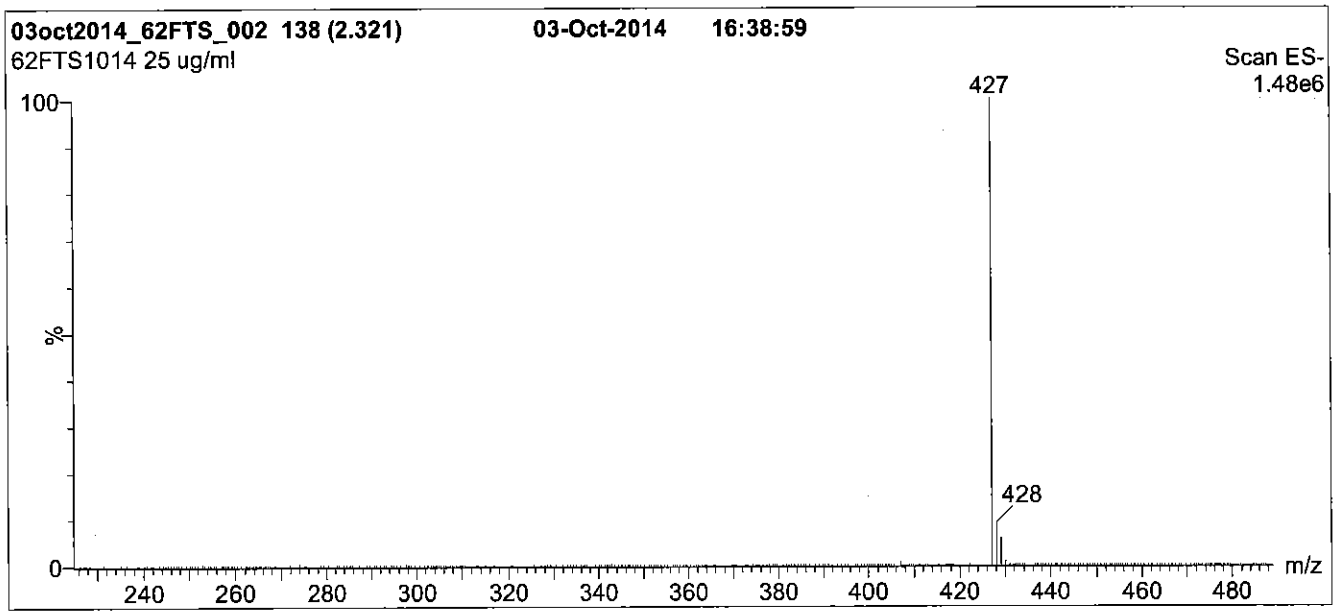
CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

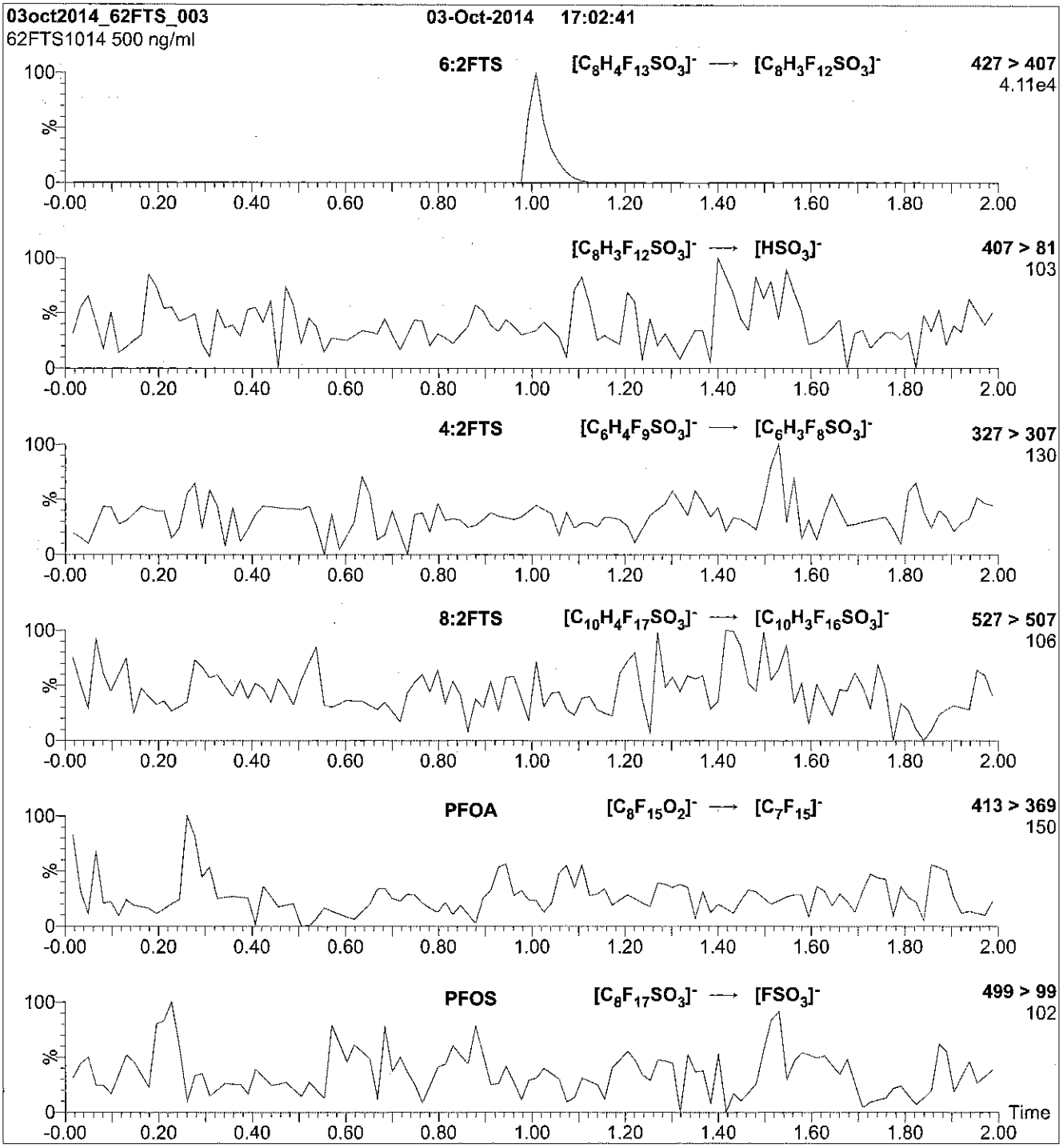
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 25

Reagent

LC6:2FTS_00002

R: 8/23/16 SBC

715544
ID: LC6:2FTS_00002
Exp: 06/25/21 Prpd: SBC
6:2FTS

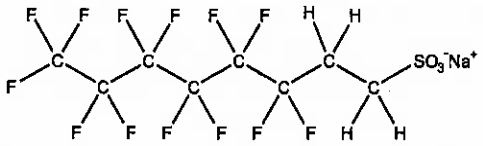
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 6:2FTS **LOT NUMBER:** 62FTS0616

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_8H_4F_{13}SO_3Na$ **MOLECULAR WEIGHT:** 450.15

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol

47.4 ± 2.4 µg/ml (6:2FTS anion)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 06/25/2016

EXPIRY DATE: (mm/dd/yyyy) 06/25/2021

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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

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

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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.

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

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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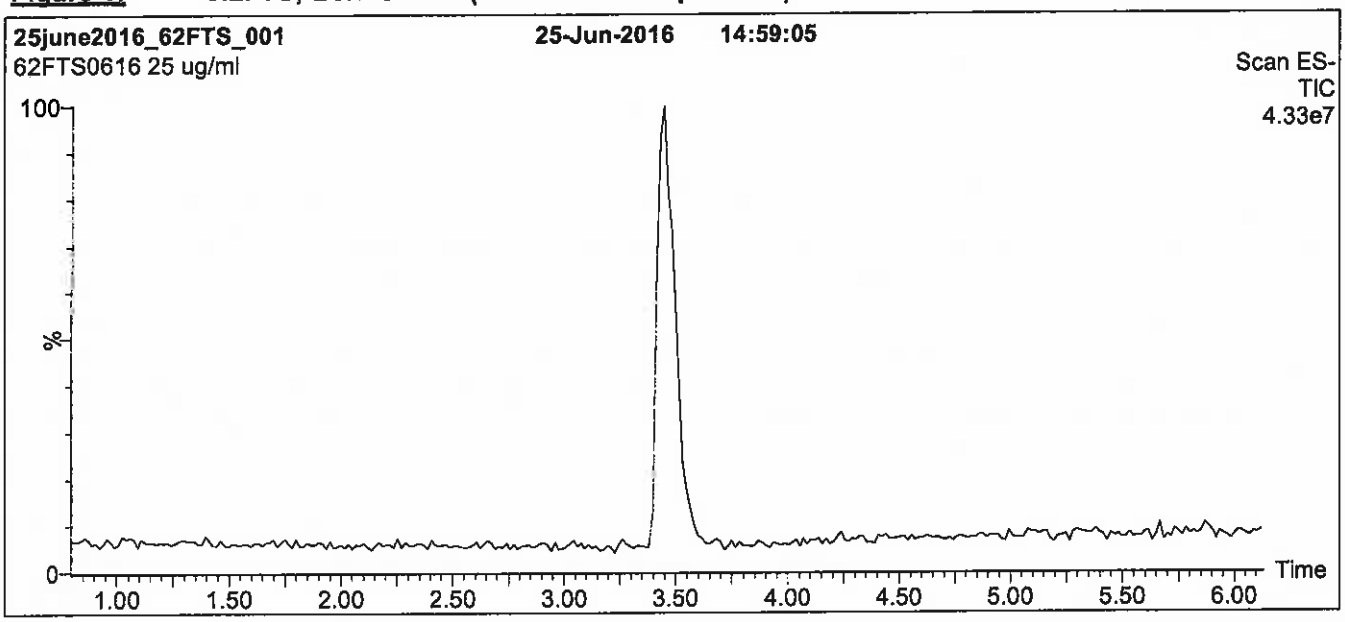
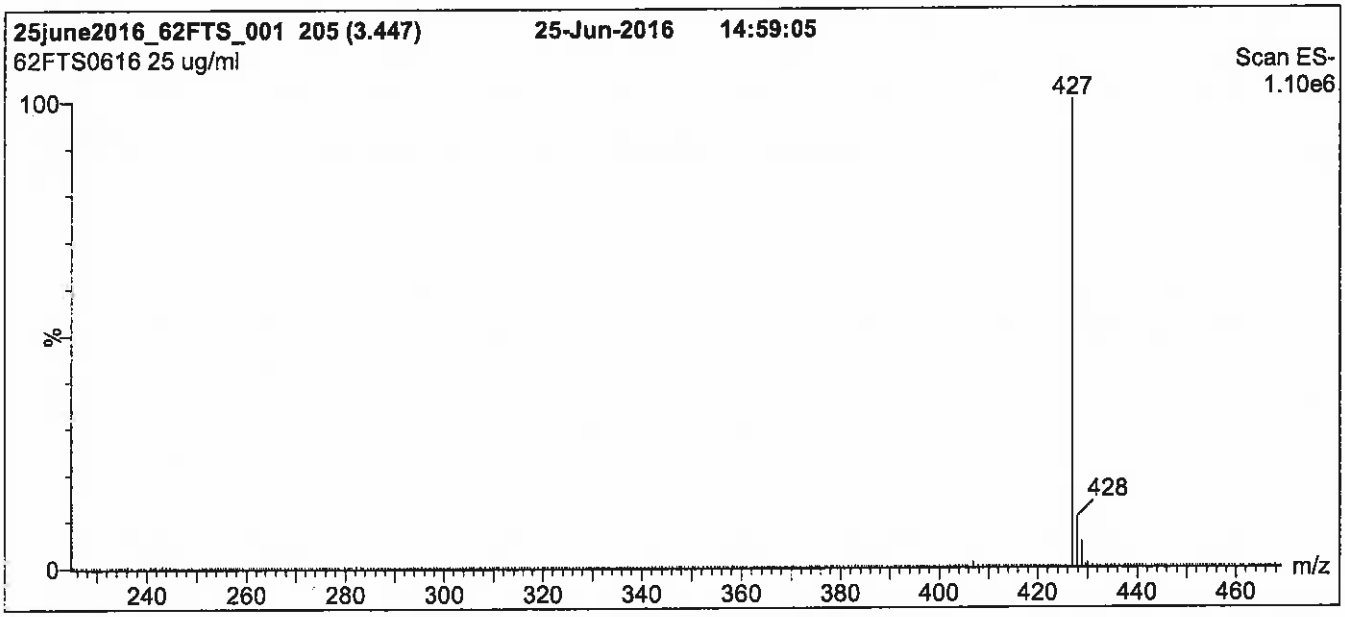
Figure 1: **6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

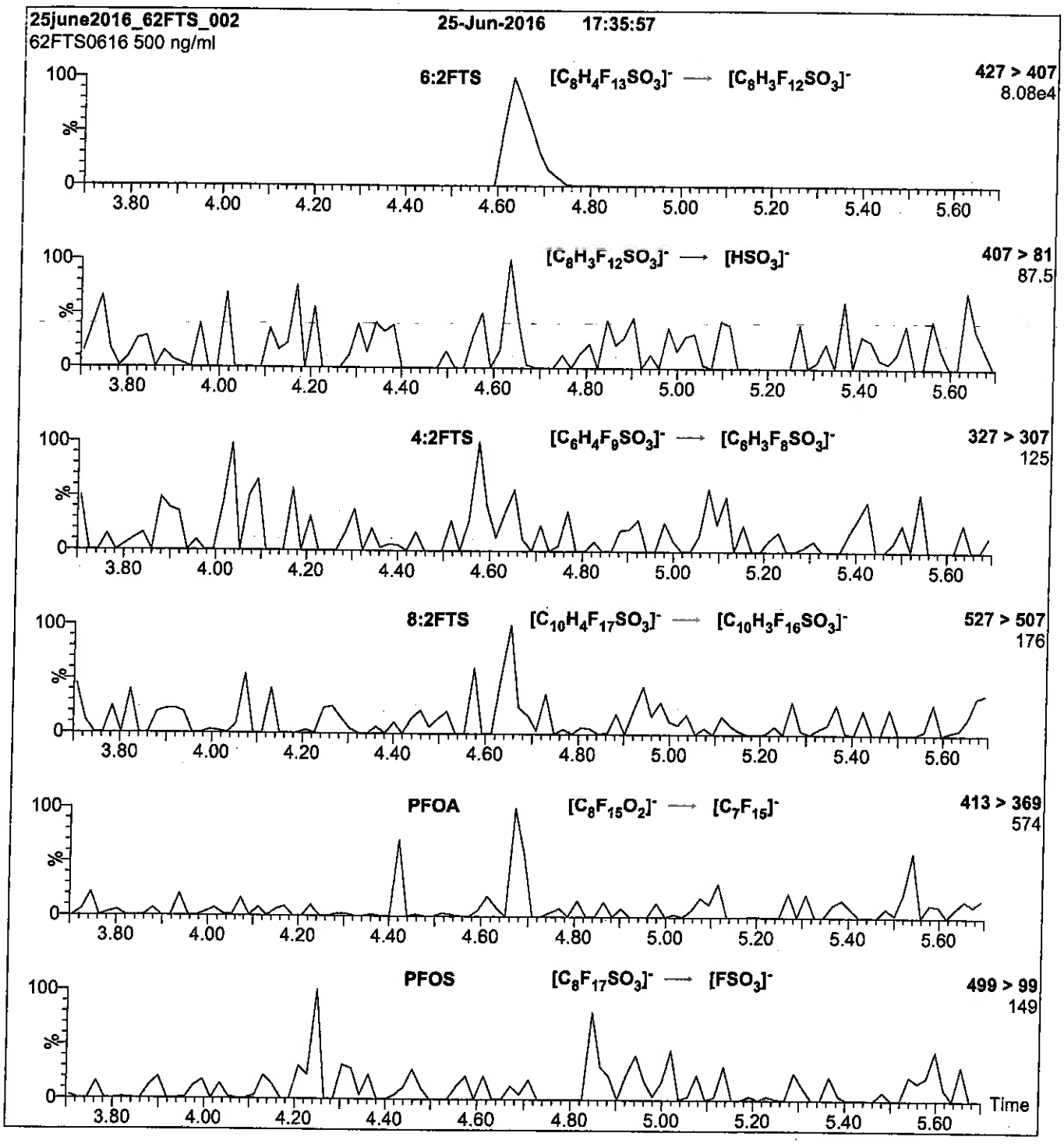
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LC8:2FTS_00001

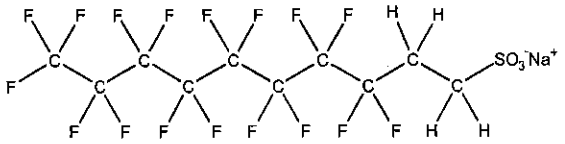
r: 7/16/15 SV
S: 7/22/15 SV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 8:2FTS **LOT NUMBER:** 82FTS1014
COMPOUND: Sodium 1H,1H,2H,2H-perfluorodecane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_{10}H_4F_{17}SO_3Na$ **MOLECULAR WEIGHT:** 550.16
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
47.9 ± 2.4 µg/ml (8:2FTS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/03/2014
EXPIRY DATE: (mm/dd/yyyy) 10/03/2017
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:** 03/27/2015 (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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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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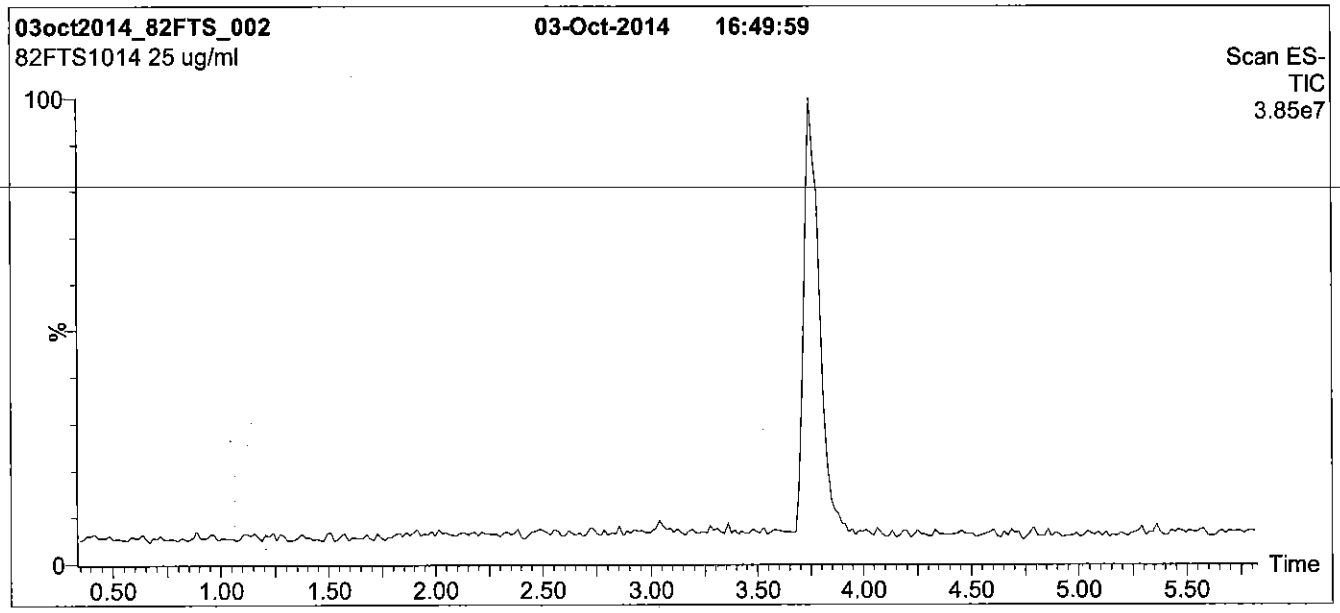
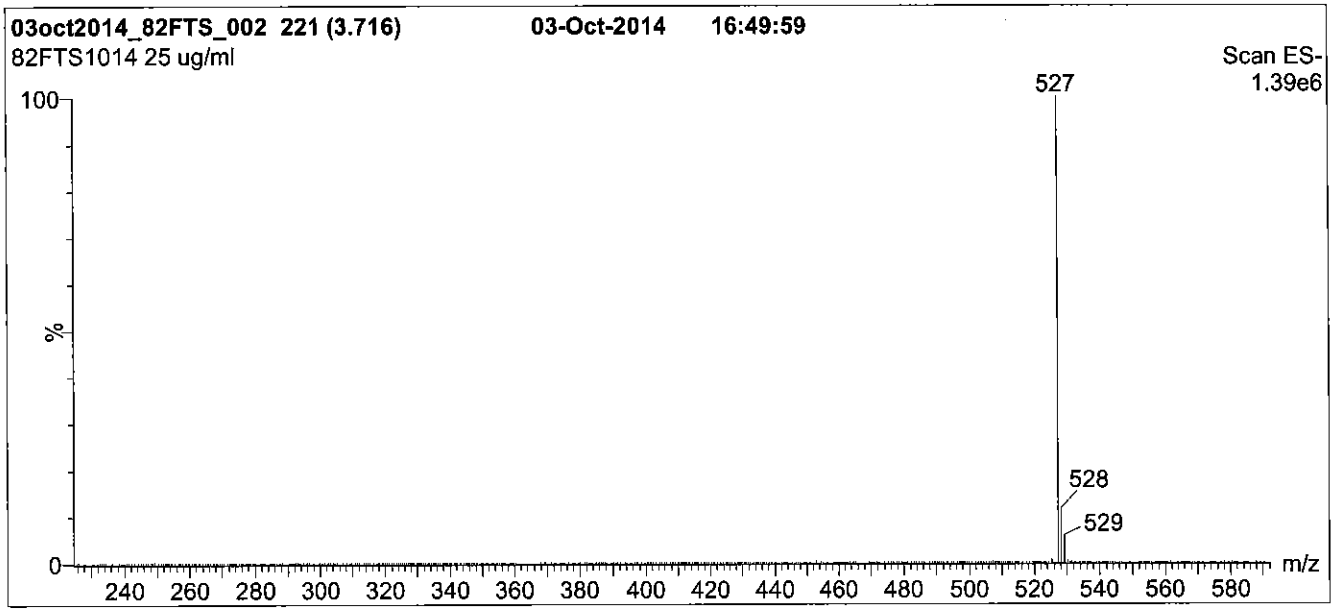
Figure 1: **8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

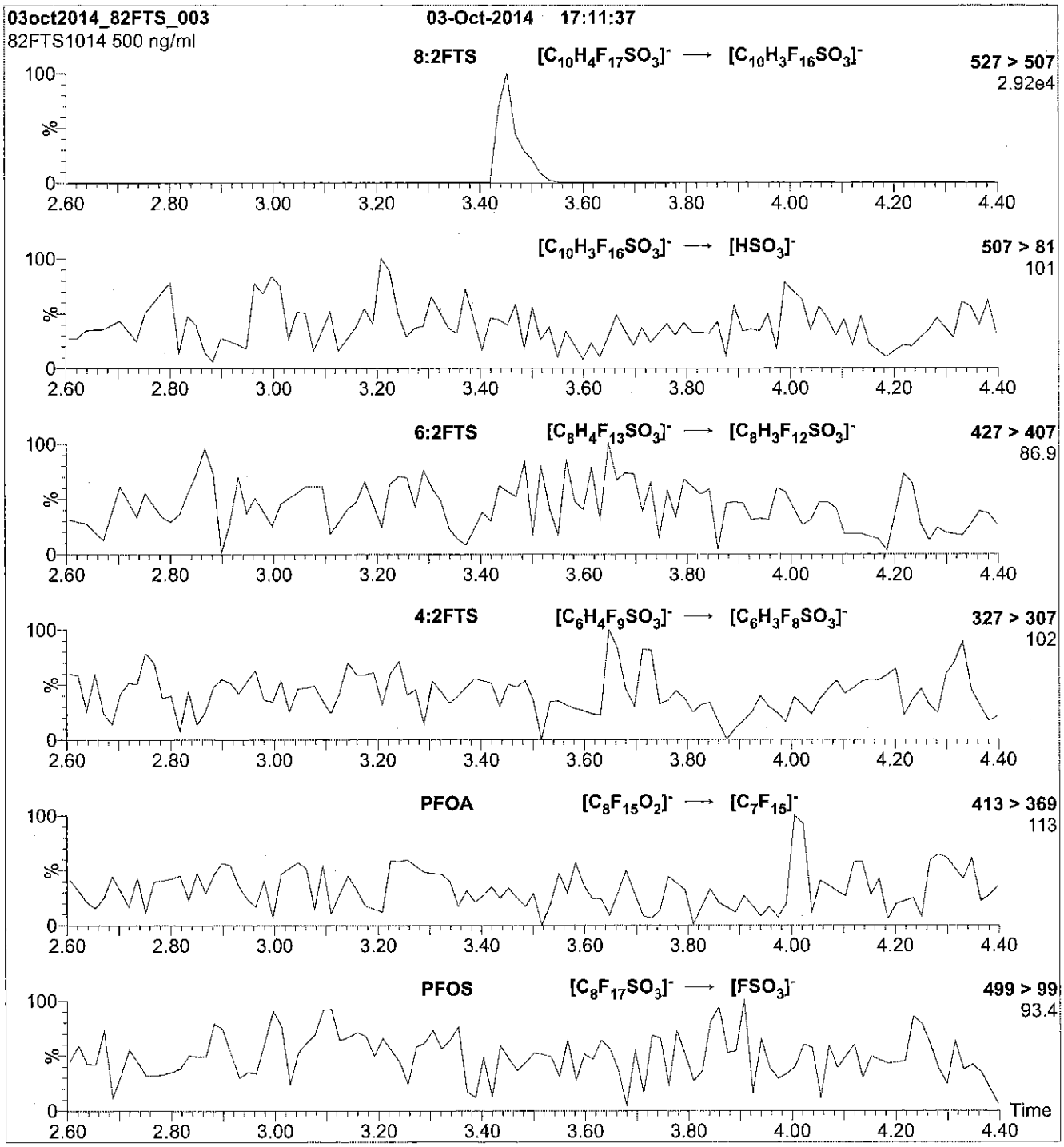
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LC8:2FTS_00002

R: 8/23/16 SBC

715545
ID: LC8:2FTS_00002
Exp: 10/23/20 Prpd: SBC
8:2FTS

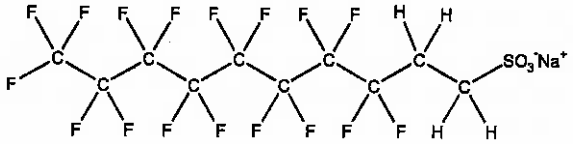
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 8:2FTS **LOT NUMBER:** 82FTS1015

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_{10}H_4F_{17}SO_3Na$ **MOLECULAR WEIGHT:** 550.16

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol

47.9 ± 2.4 µg/ml (8:2FTS anion)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 10/23/2015

EXPIRY DATE: (mm/dd/yyyy) 10/23/2020

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: B.G. Chittim **Date:** 10/27/2015 (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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CALA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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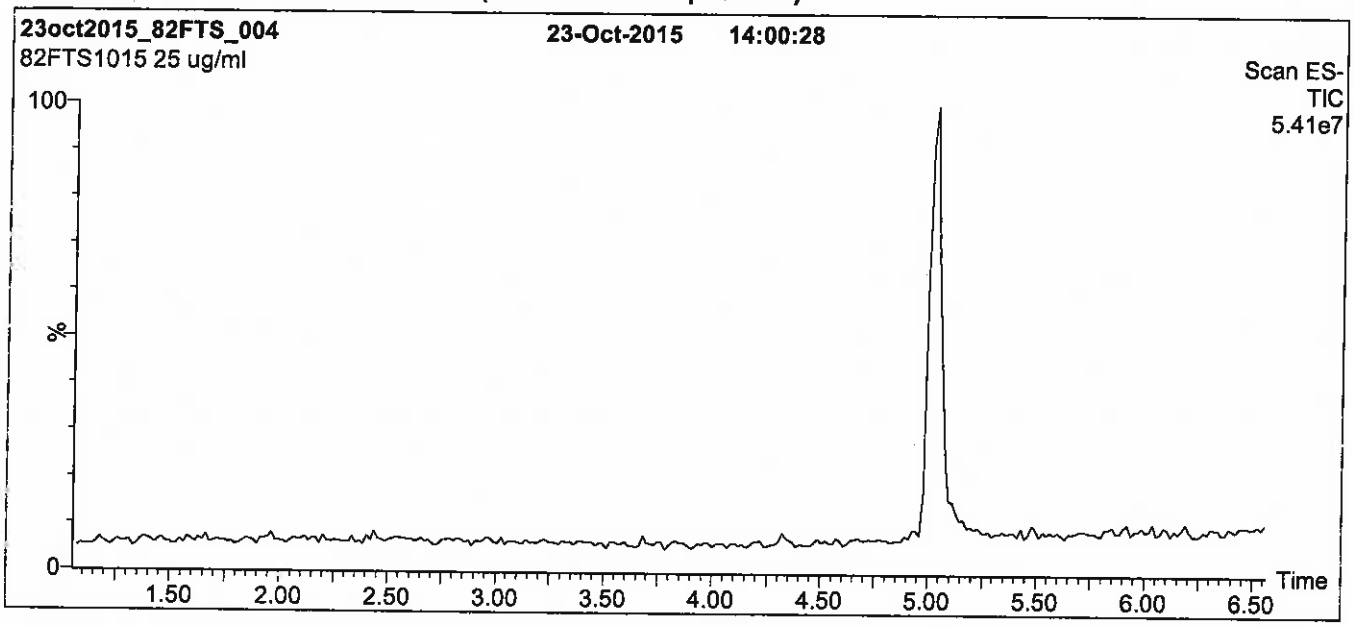

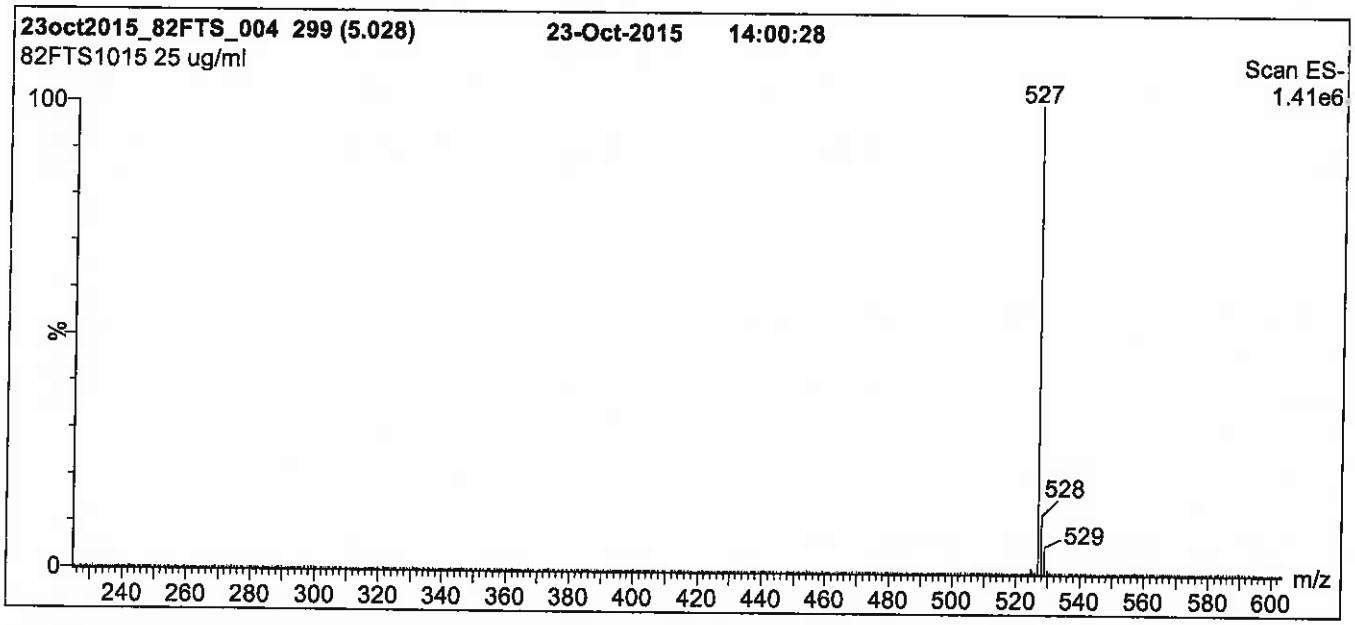

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1.7 µm, 2.1 x 100 mm

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

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
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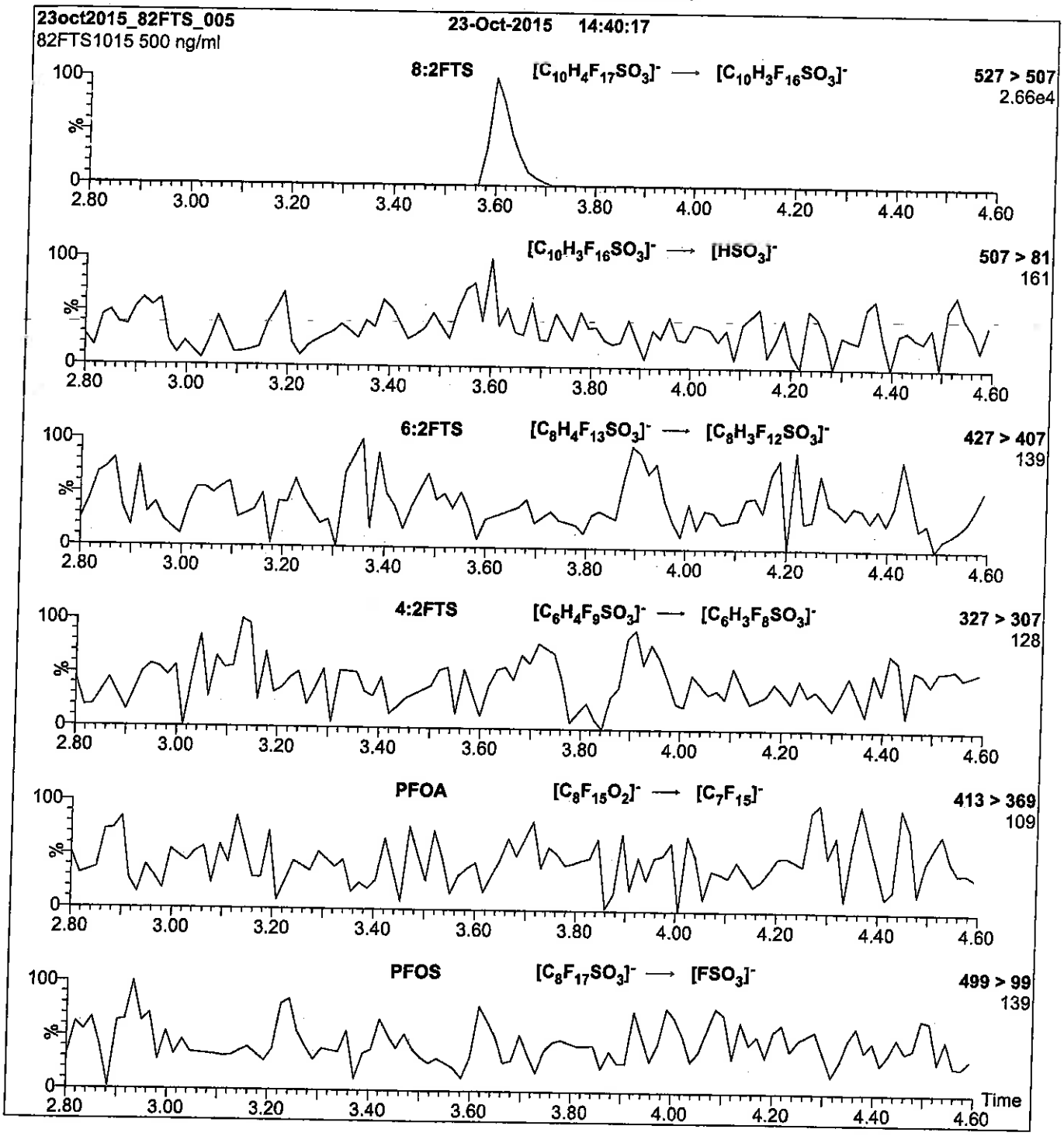


Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCd-NEtFOSA-M_00001

r: 7/16/15 SV

WELLINGTON LABORATORIES

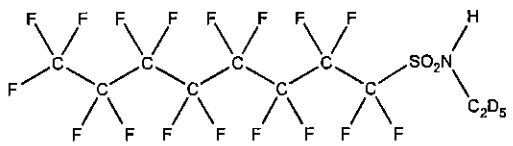
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d-N-EtFOSA-M
COMPOUND: N-ethyl-d_5-perfluoro-1-octanesulfonamide

LOT NUMBER: dNEtFOSA0314M

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$C_{10}D_5HF_{17}NO_2S$	**MOLECULAR WEIGHT:**	532.23
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_5$
LAST TESTED: (mm/dd/yyyy)	03/10/2014		
EXPIRY DATE: (mm/dd/yyyy)	03/10/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: B.G. Chittim **Date:** 04/01/2015 (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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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO/IEC 17025 REFERENCE MATERIAL PRODUCER

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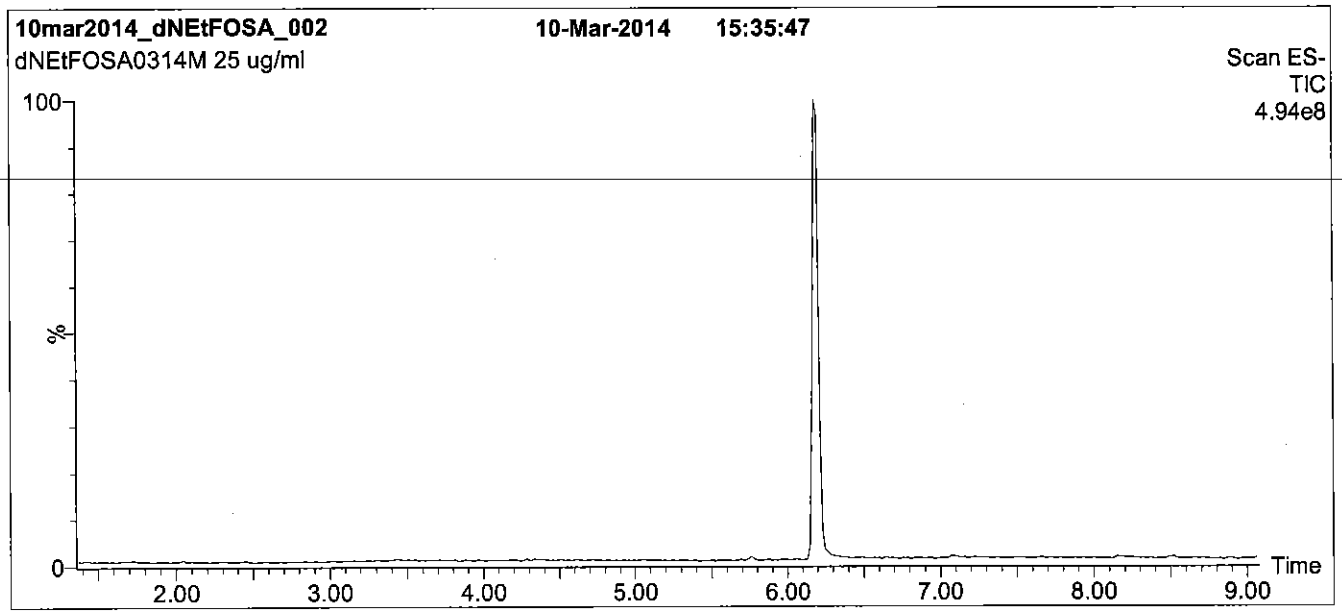
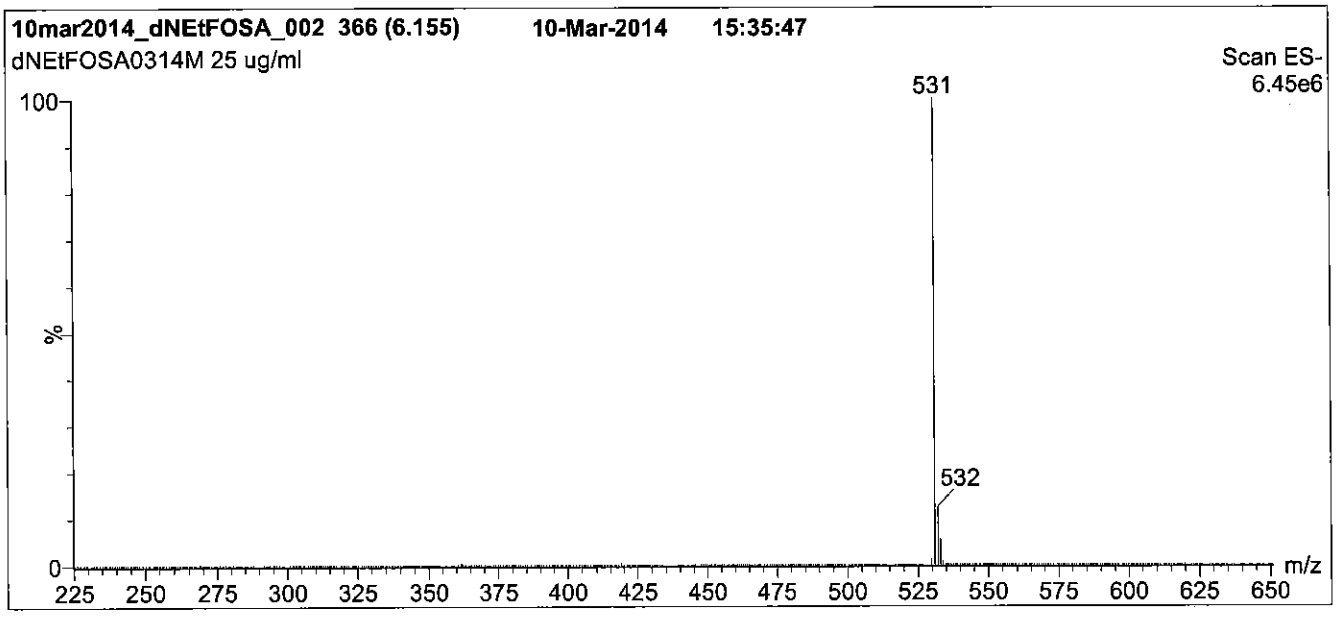
Figure 1: **d-N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

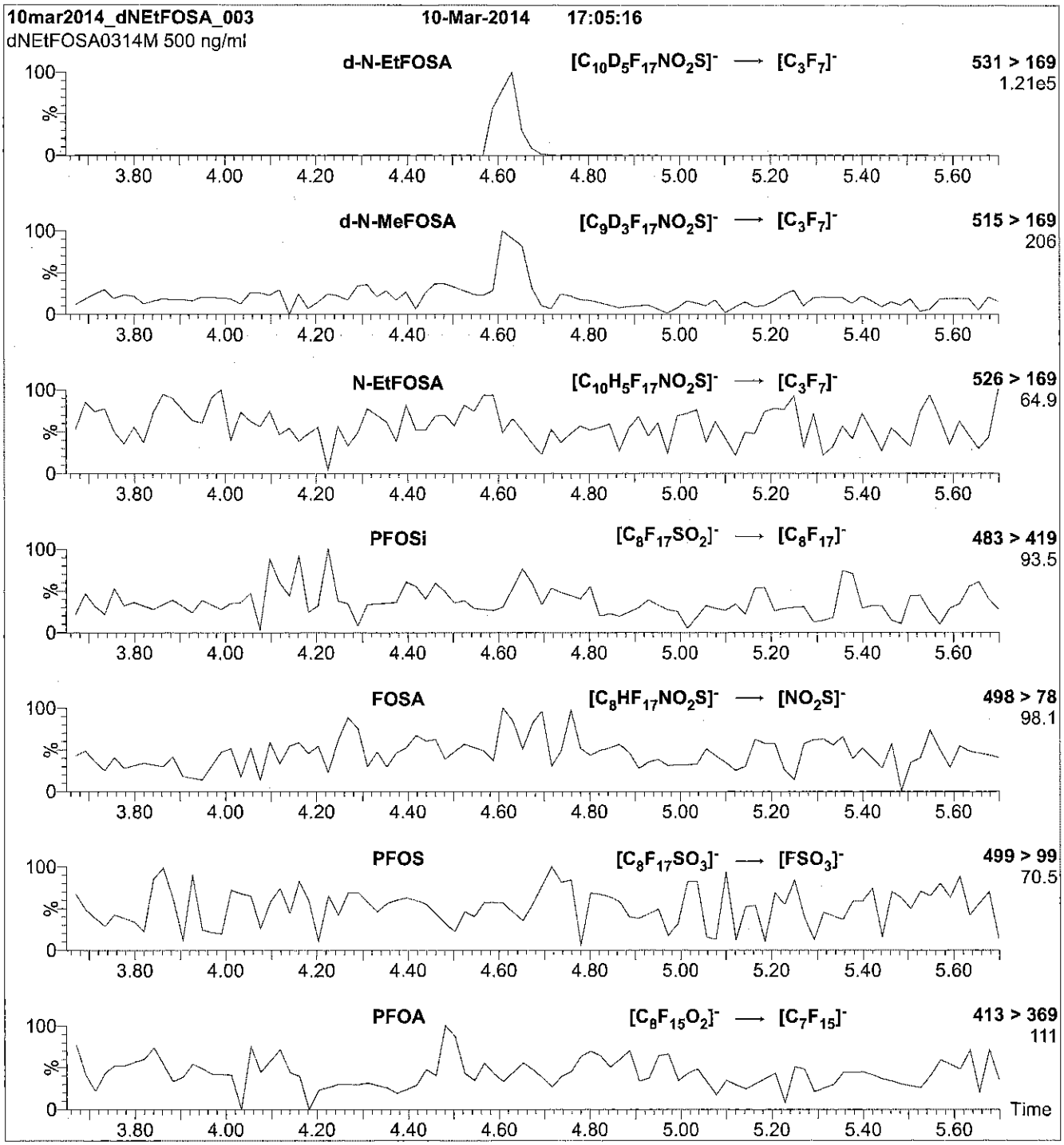
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 100
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 µl (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 µl/min

MS Parameters

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

Reagent

LCd-NEtFOSA-M_00002

R: 7/6/16 CBW

671571
ID: LCd-NEtFOSA-M_00002
Exp: 03/10/19 Prpd: CBW
d-N-EtFOSA-M

WELLINGTON LABORATORIES

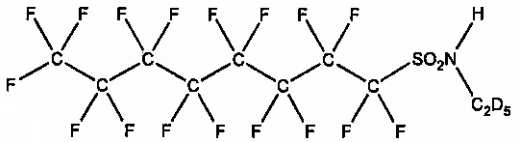
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d-N-EtFOSA-M
COMPOUND: N-ethyl-d_5-perfluoro-1-octanesulfonamide

LOT NUMBER: dNEtFOSA0314M

STRUCTURE:

CAS #: Not available



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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED

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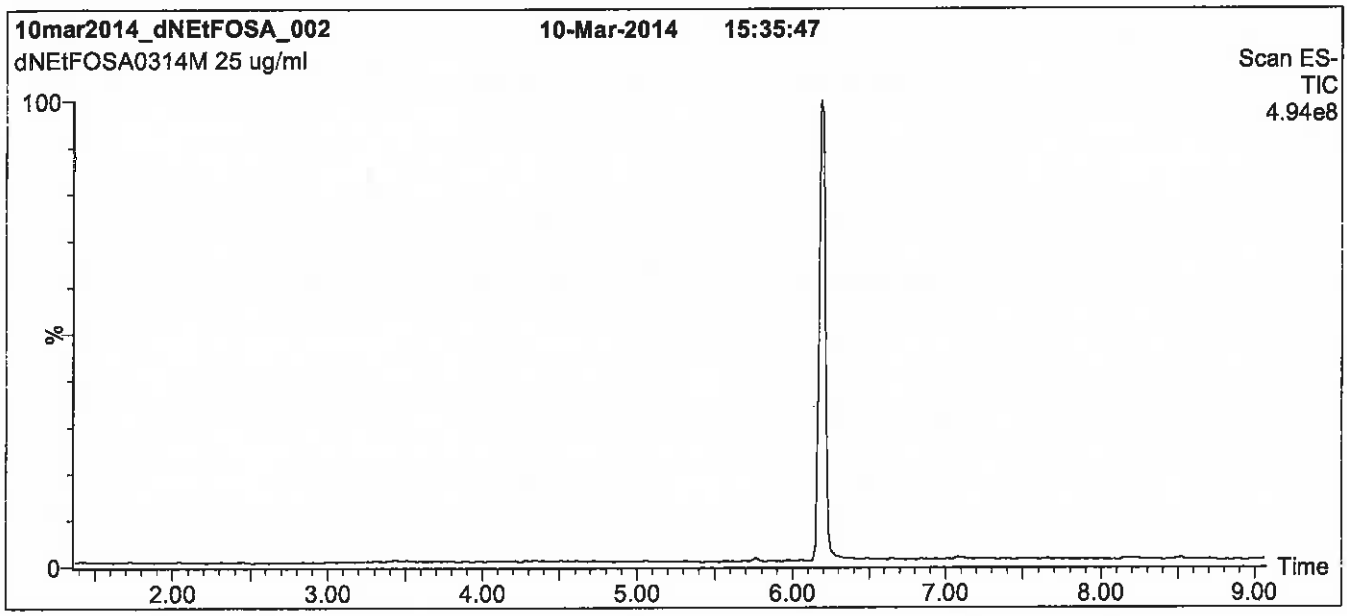
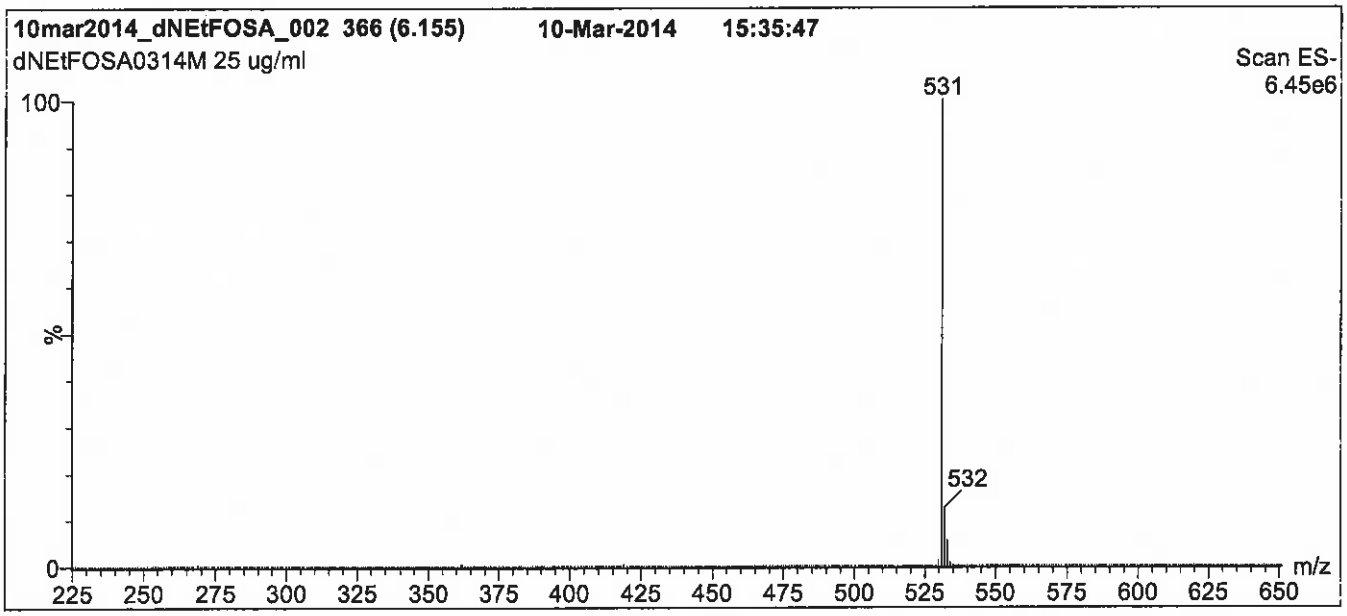
Figure 1: **d-N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

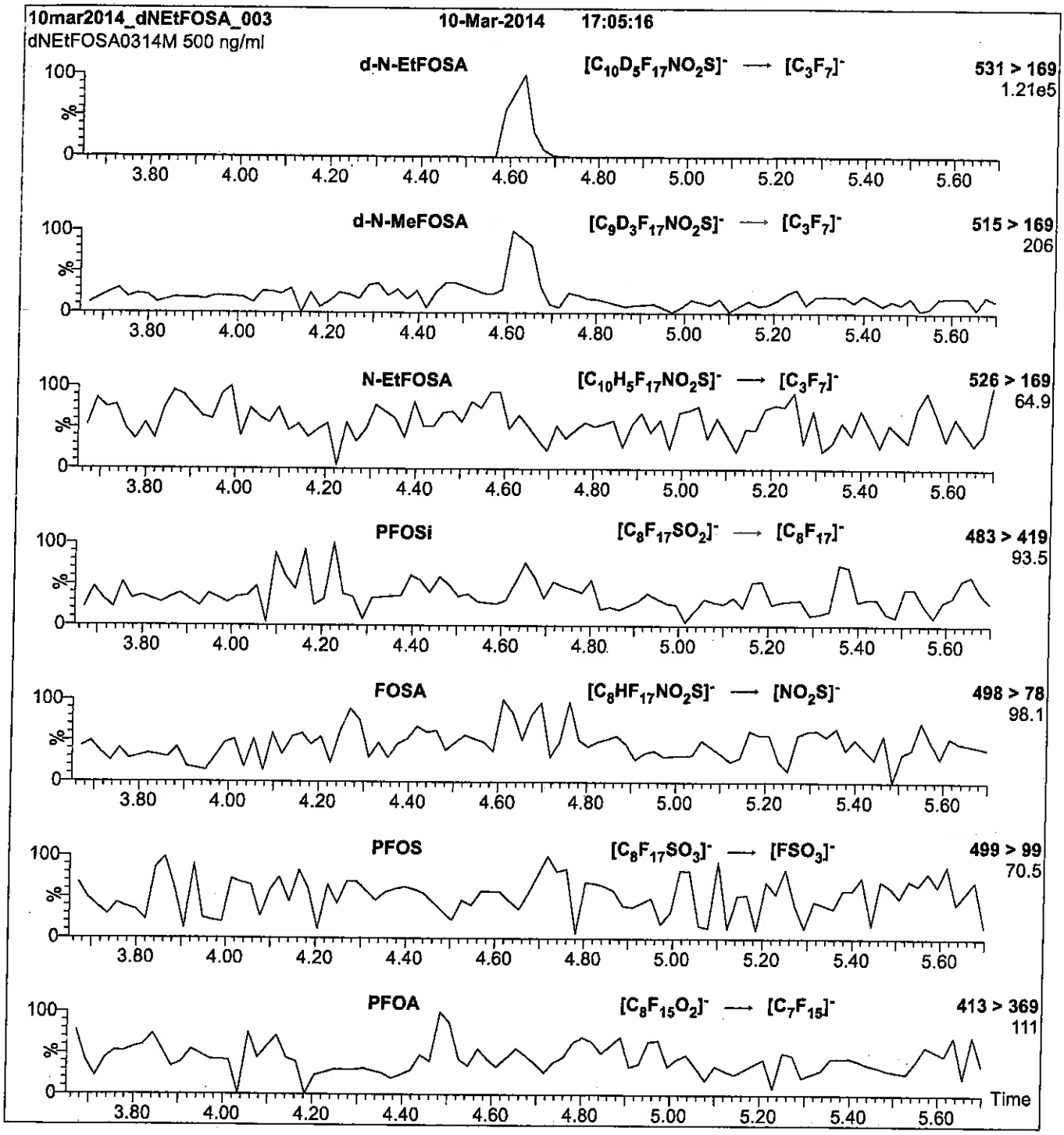
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 100
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 µl (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 µl/min

MS Parameters

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

Reagent

LCd-NMeFOSA-M_00001

r: 7/16/15 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

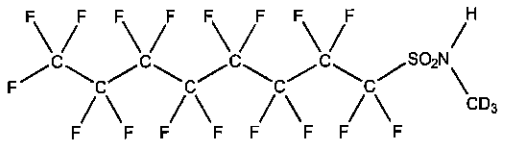
PRODUCT CODE: d-N-MeFOSA-M

LOT NUMBER: dNMeFOSA0114M

COMPOUND: N-methyl-d_3-perfluoro-1-octanesulfonamide

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$C_9D_3HF_{17}NO_2S$	**MOLECULAR WEIGHT:**	516.19
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	01/28/2014		
EXPIRY DATE: (mm/dd/yyyy)	01/28/2019		
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:** 04/01/2015 (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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where x is expressed as a relative standard uncertainty of the individual parameter.

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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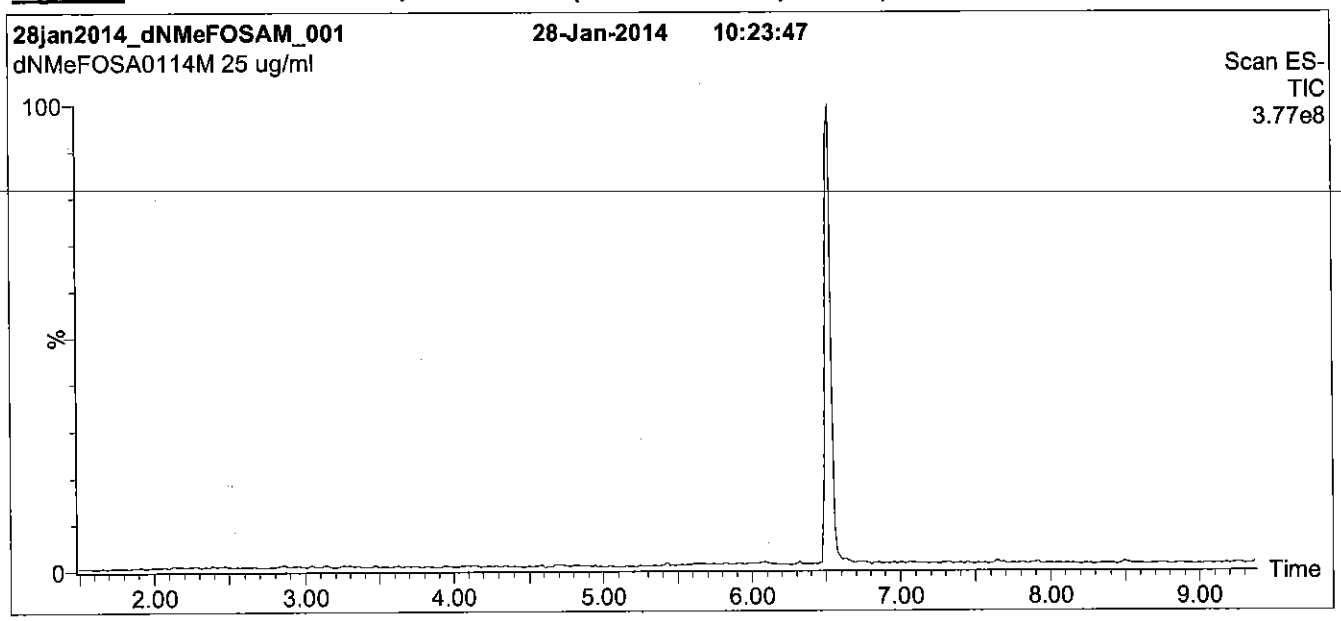

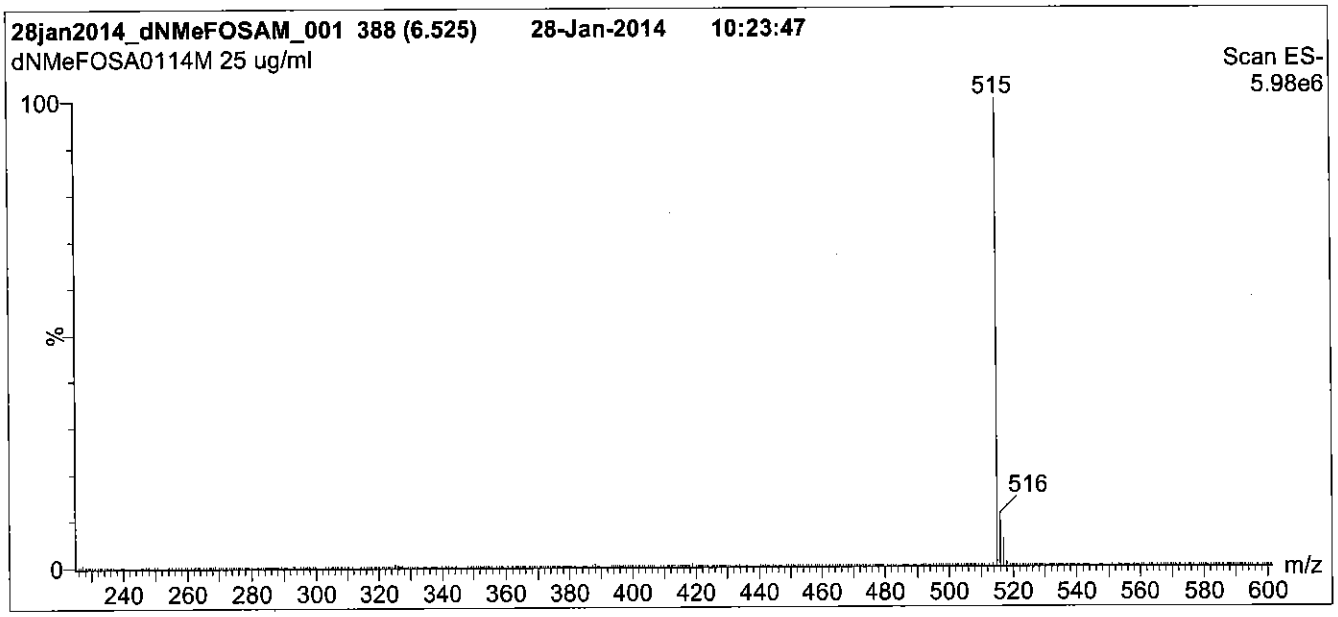

Conditions for Figure 1:

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Chromatographic Conditions

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

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

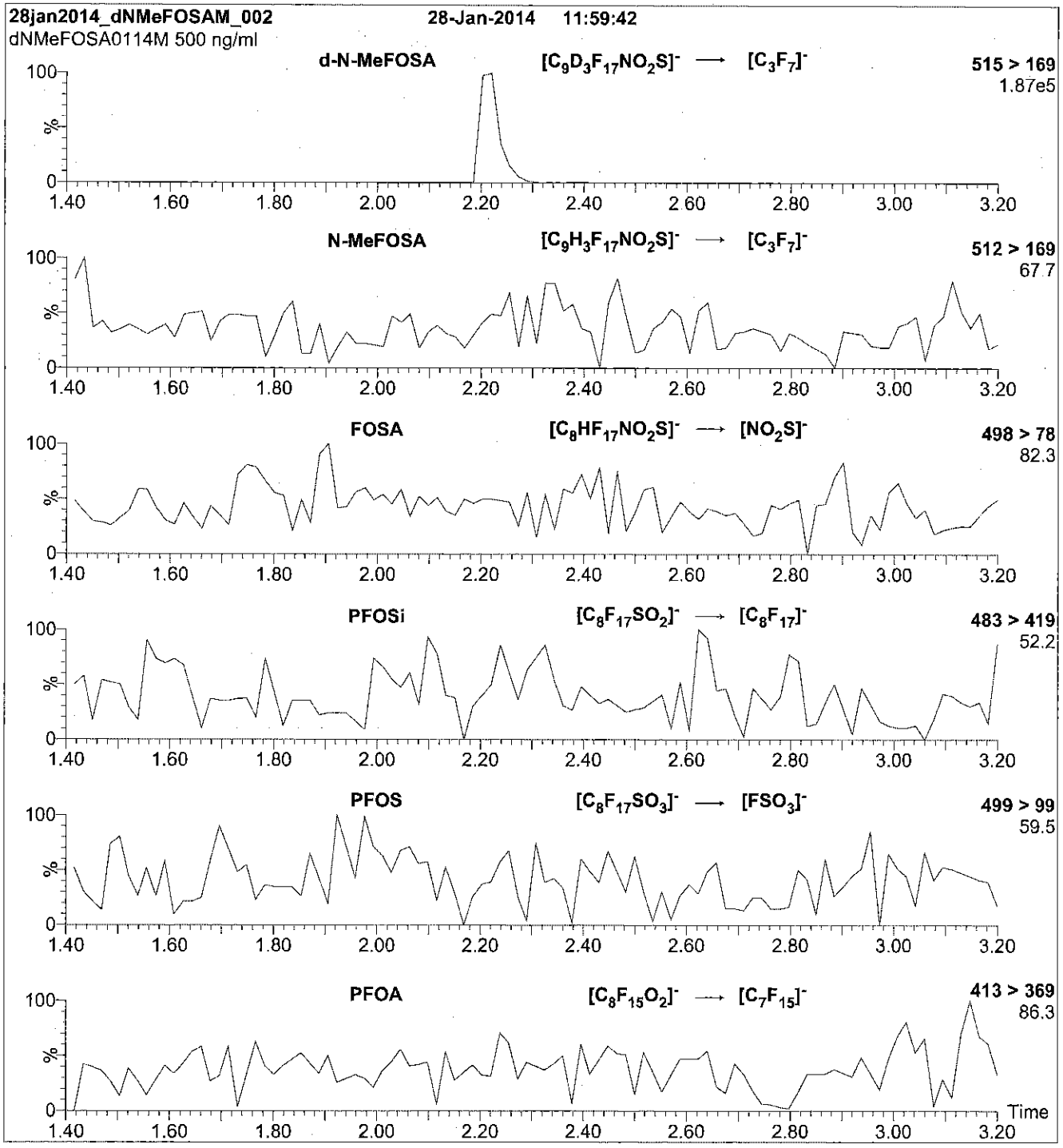
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 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 µl (500 ng/ml d-N-MeFOSA-M)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCd-NMeFOSA-M_00002

R: 7/6/16 CBW

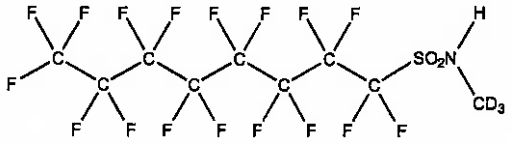
671625
ID: LCd-NMeFOSA-M_00002
Exp: 06/13/21 Prpd: CBW
d-N-MeFOSA-M

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d-N-MeFOSA-M
LOT NUMBER: dNMeFOSA0616M
COMPOUND: N-methyl-d_3-perfluoro-1-octanesulfonamide

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $C_9D_3HF_{17}NO_2S$
MOLECULAR WEIGHT: 516.19
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥98% $^2H_3$
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.

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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CALA

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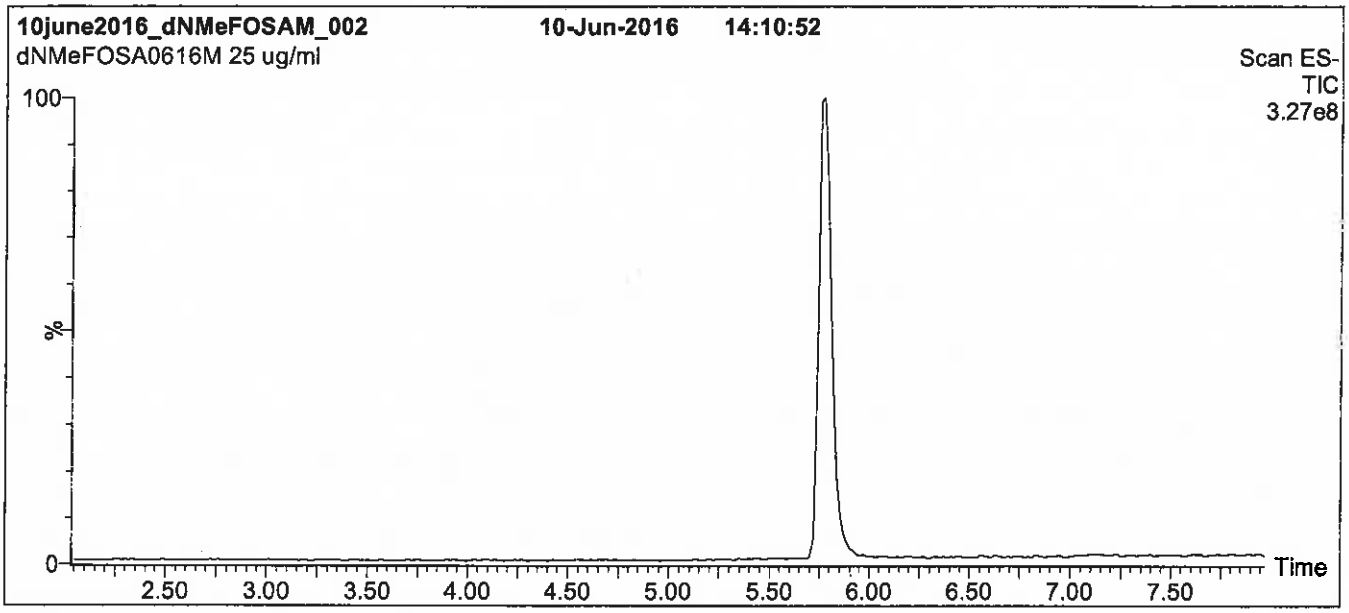

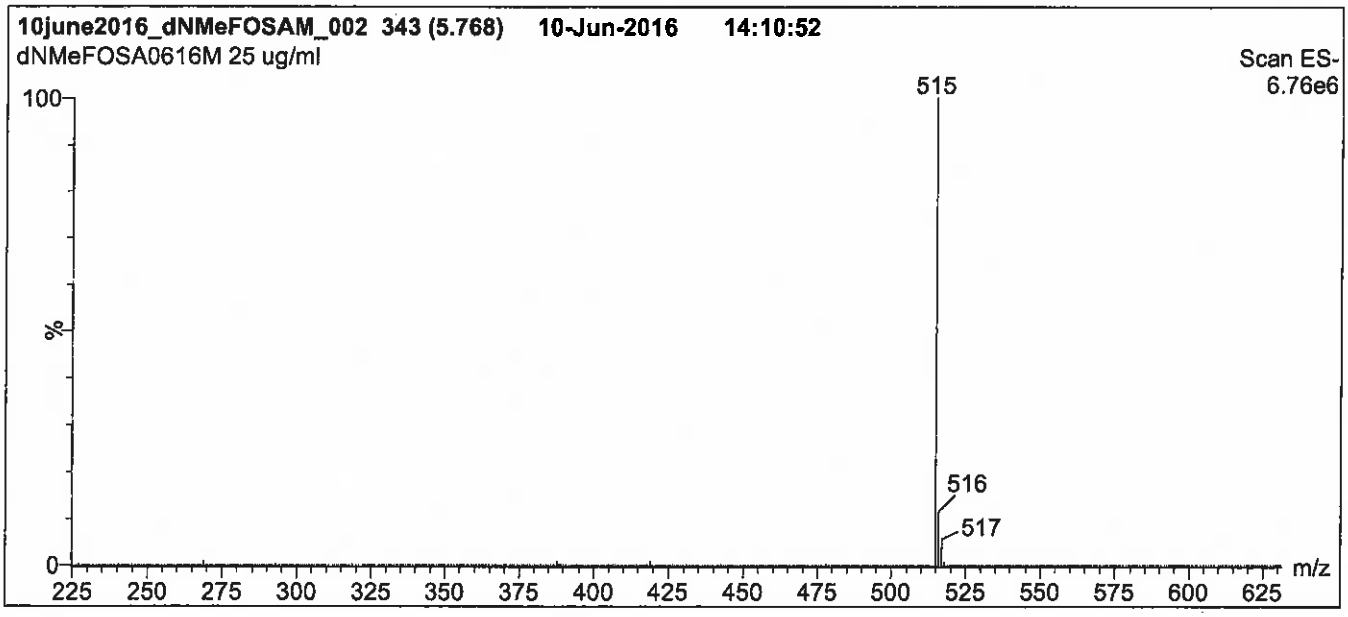

Conditions for Figure 1:

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

Chromatographic Conditions

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

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

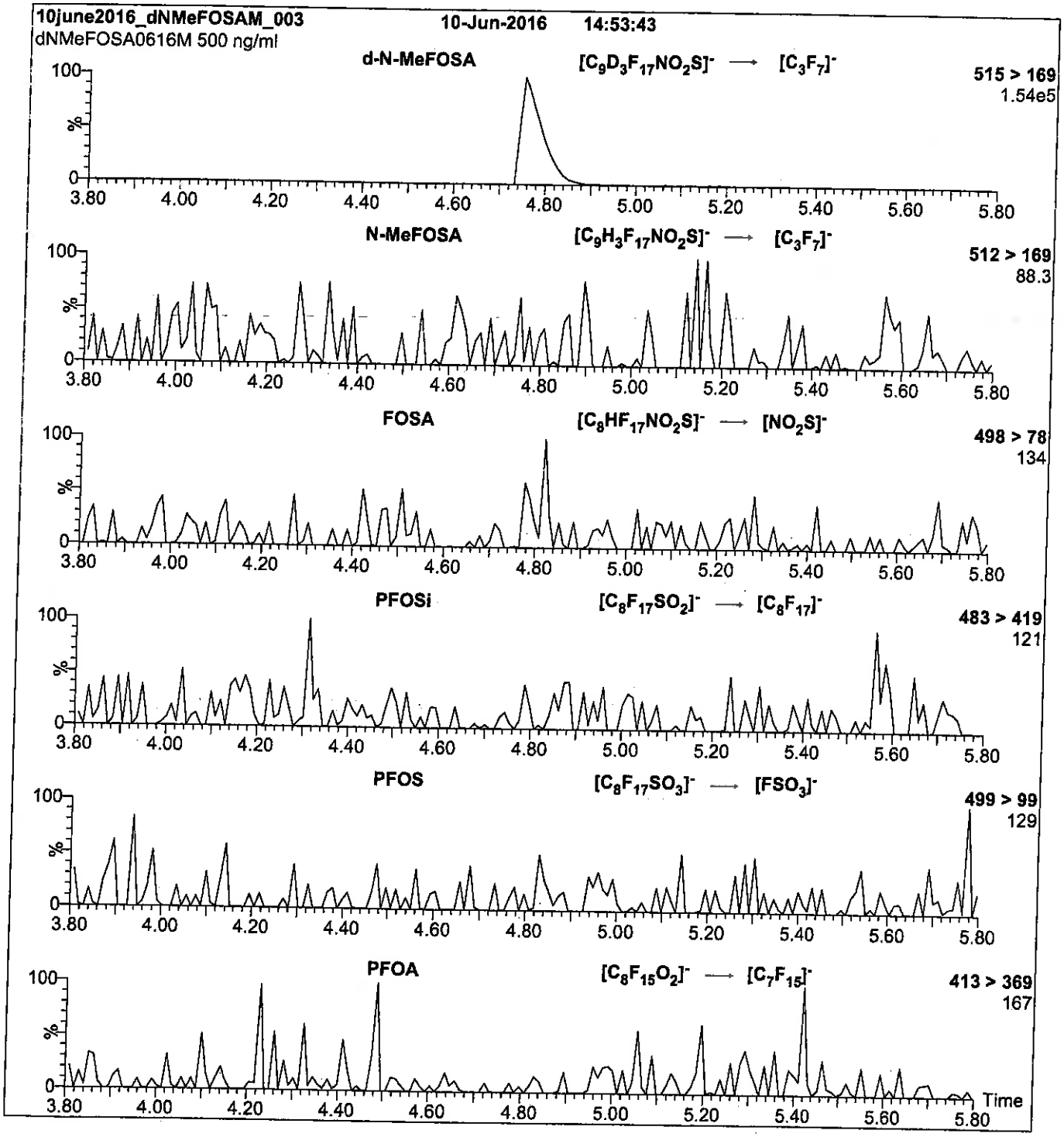
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCd3-NMeFOSAA_00001

r: 7/16/15 SKV

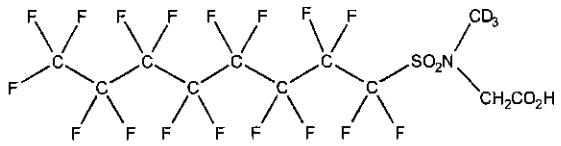
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d3-N-MeFOSAA **LOT NUMBER:** d3NMeFOSAA0113

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_{11}D_3H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	574.23
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	01/31/2013		
EXPIRY DATE: (mm/dd/yyyy)	01/31/2018		
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.

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Certified By: B.G. Chittim **Date:** 04/06/2015 (mm/dd/yyyy)

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO/IEC/GUIDE 34 REFERENCE MATERIAL PRODUCER

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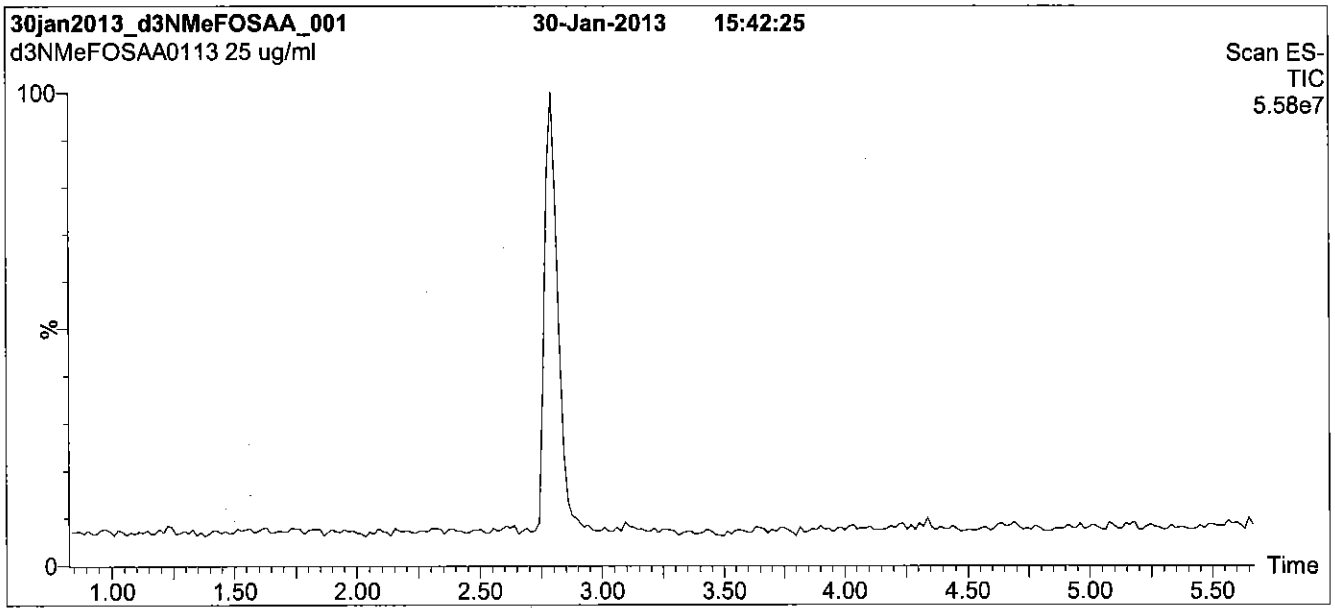

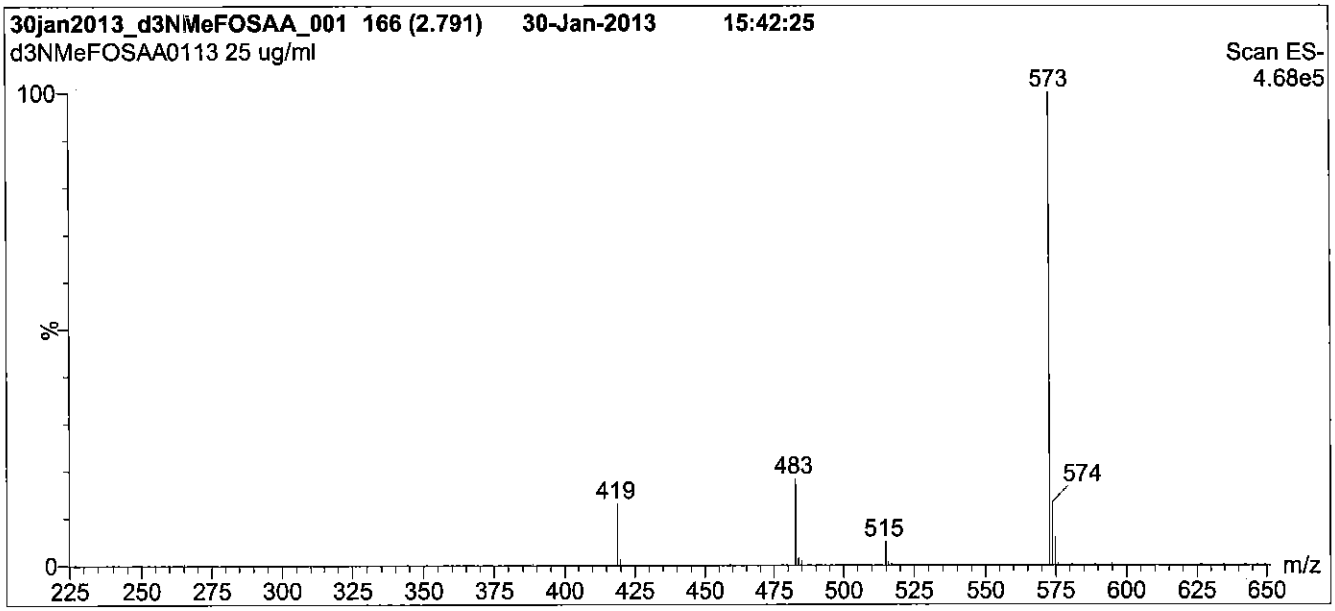

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1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

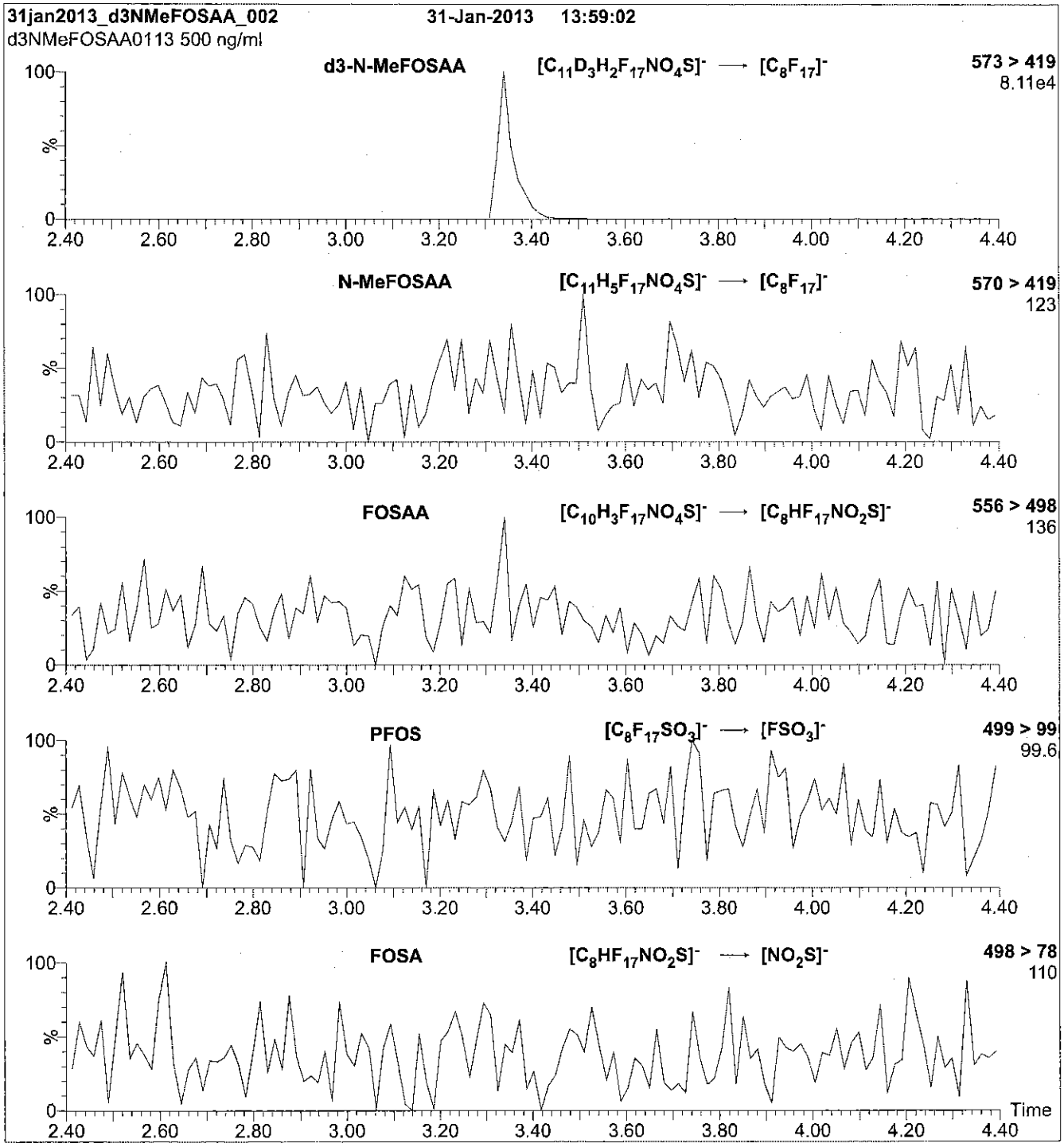
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml d3-N-MeFOSAA)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCd3-NMeFOSAA_00002

R: 7/6/16 CBW

671572
ID: LCd3-NMeFOSAA_00002
Exp: 01/20/21 Prpd: CBW
d3-N-MeFOSAA

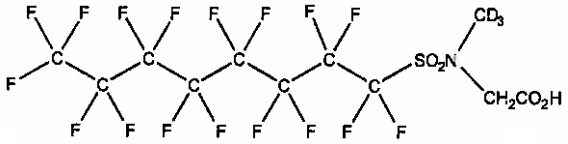
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d3-N-MeFOSAA **LOT NUMBER:** d3NMeFOSAA0116

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_{11}D_3H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	574.23
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	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:** 01/25/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

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

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

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QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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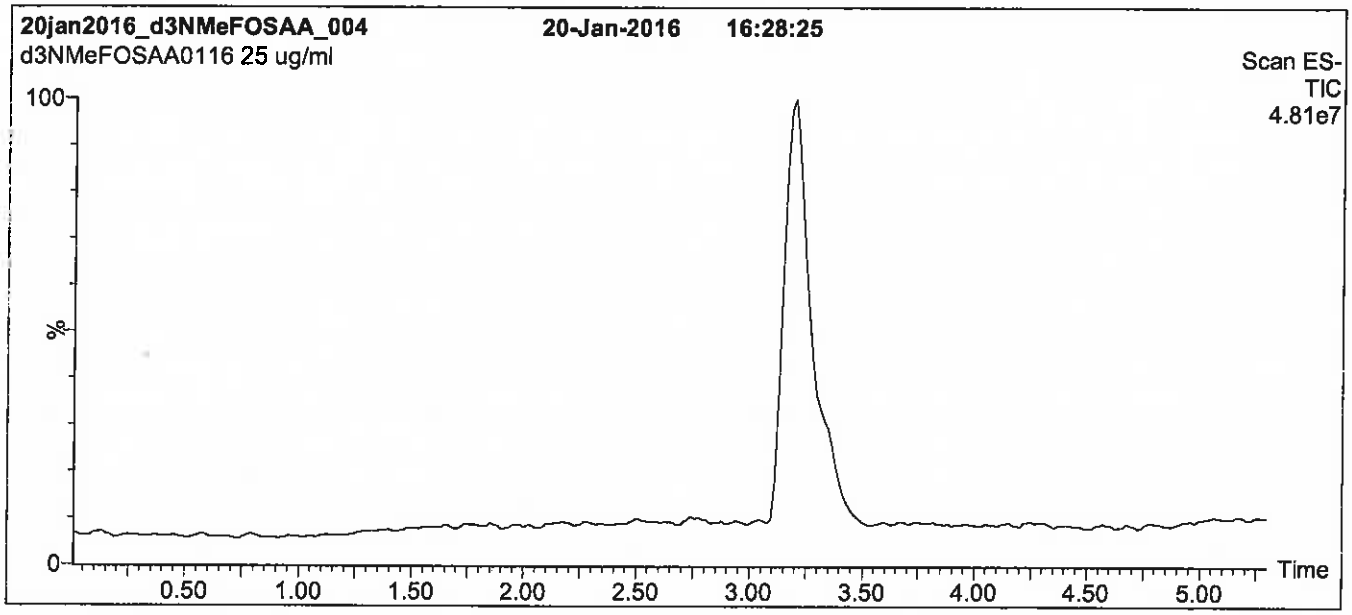
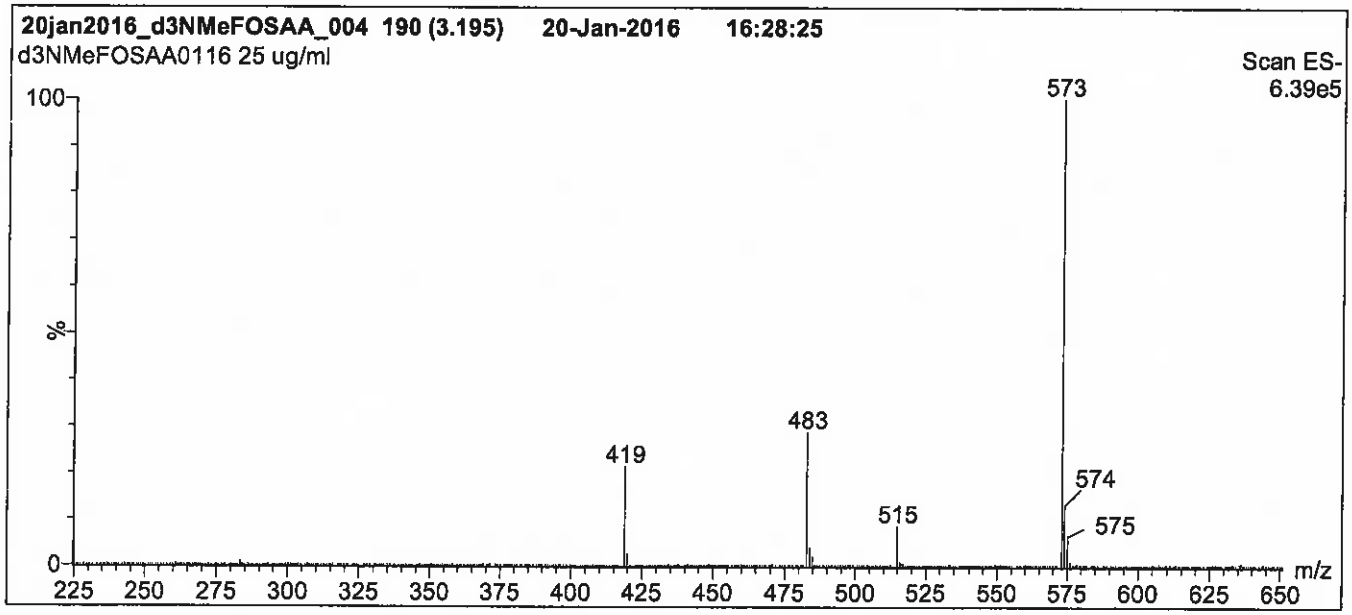
Figure 1: **d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

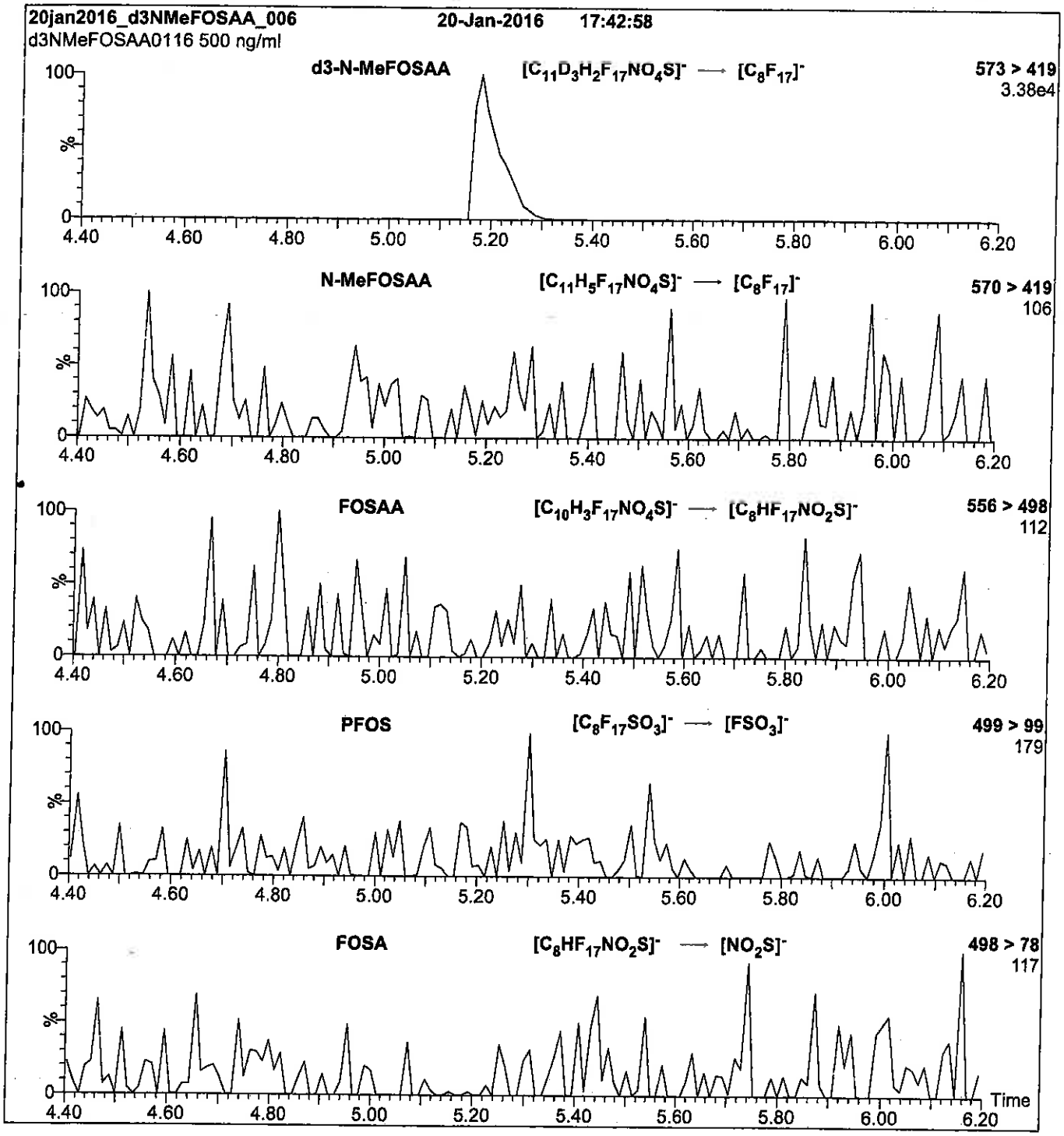
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml d3-N-MeFOSAA)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 25

Reagent

LCd5-NEtFOSAA_00001

P: 7/10/15 SKW

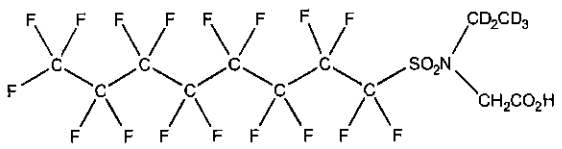
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d5-N-EtFOSAA **LOT NUMBER:** d5NEtFOSAA0515

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_{12}D_5H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	590.27
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_5$
LAST TESTED: (mm/dd/yyyy)	05/08/2015		
EXPIRY DATE: (mm/dd/yyyy)	05/08/2020		
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:** 05/11/2015 (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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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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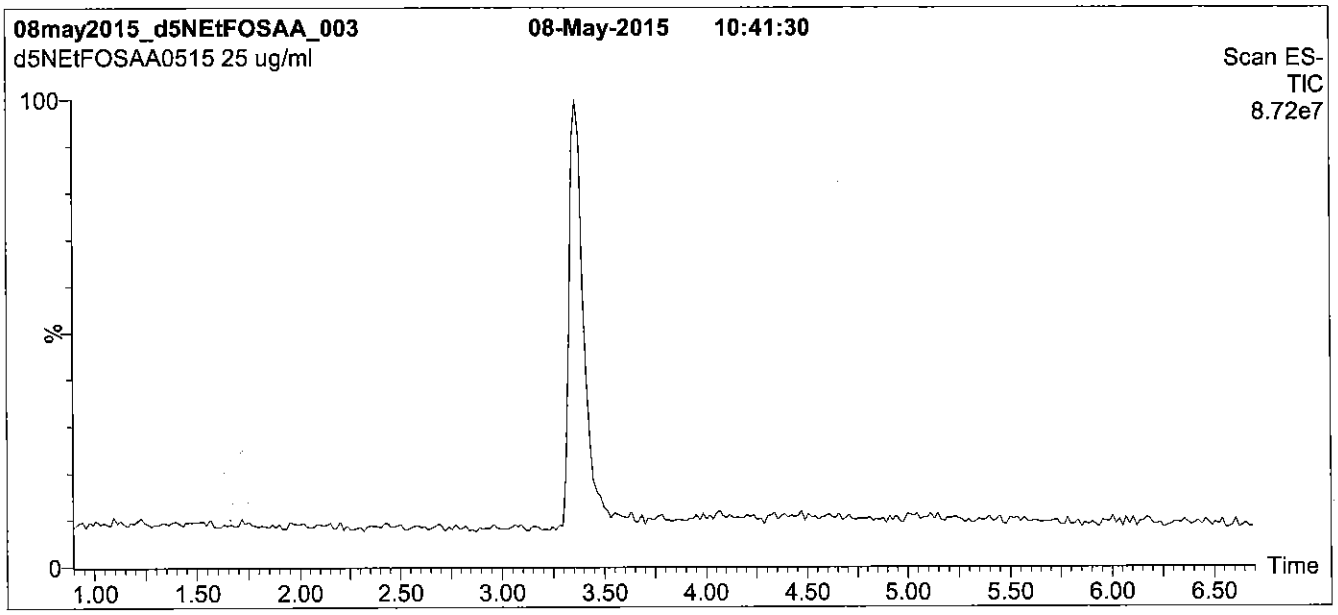
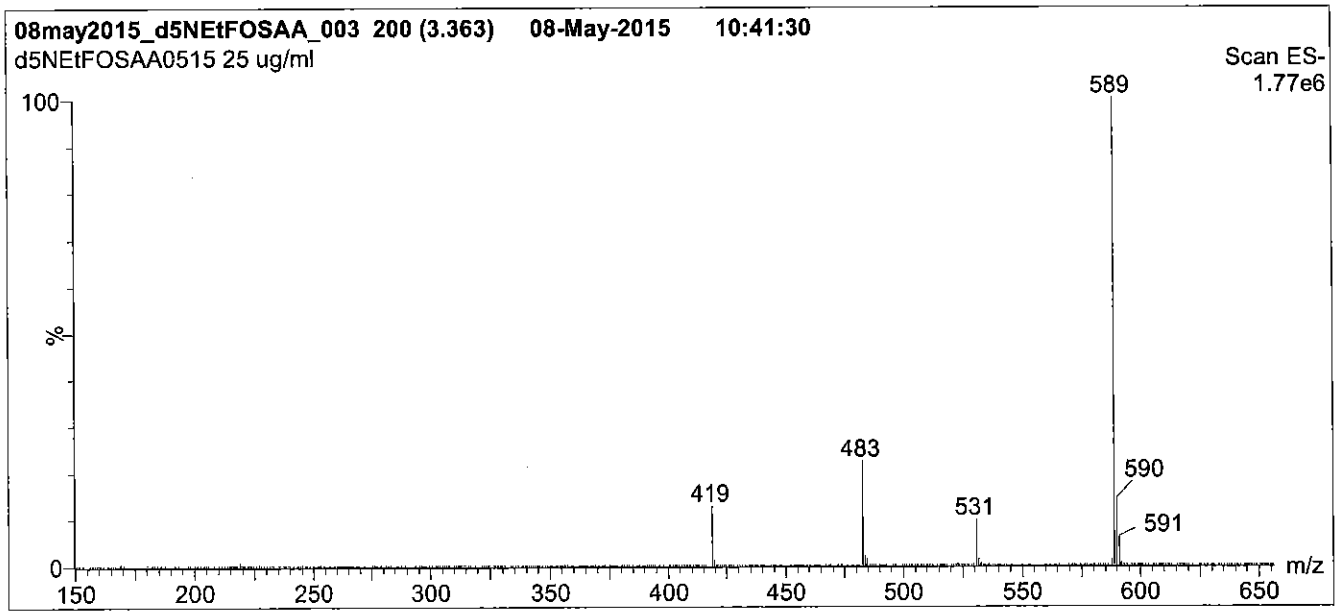
Figure 1: **d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

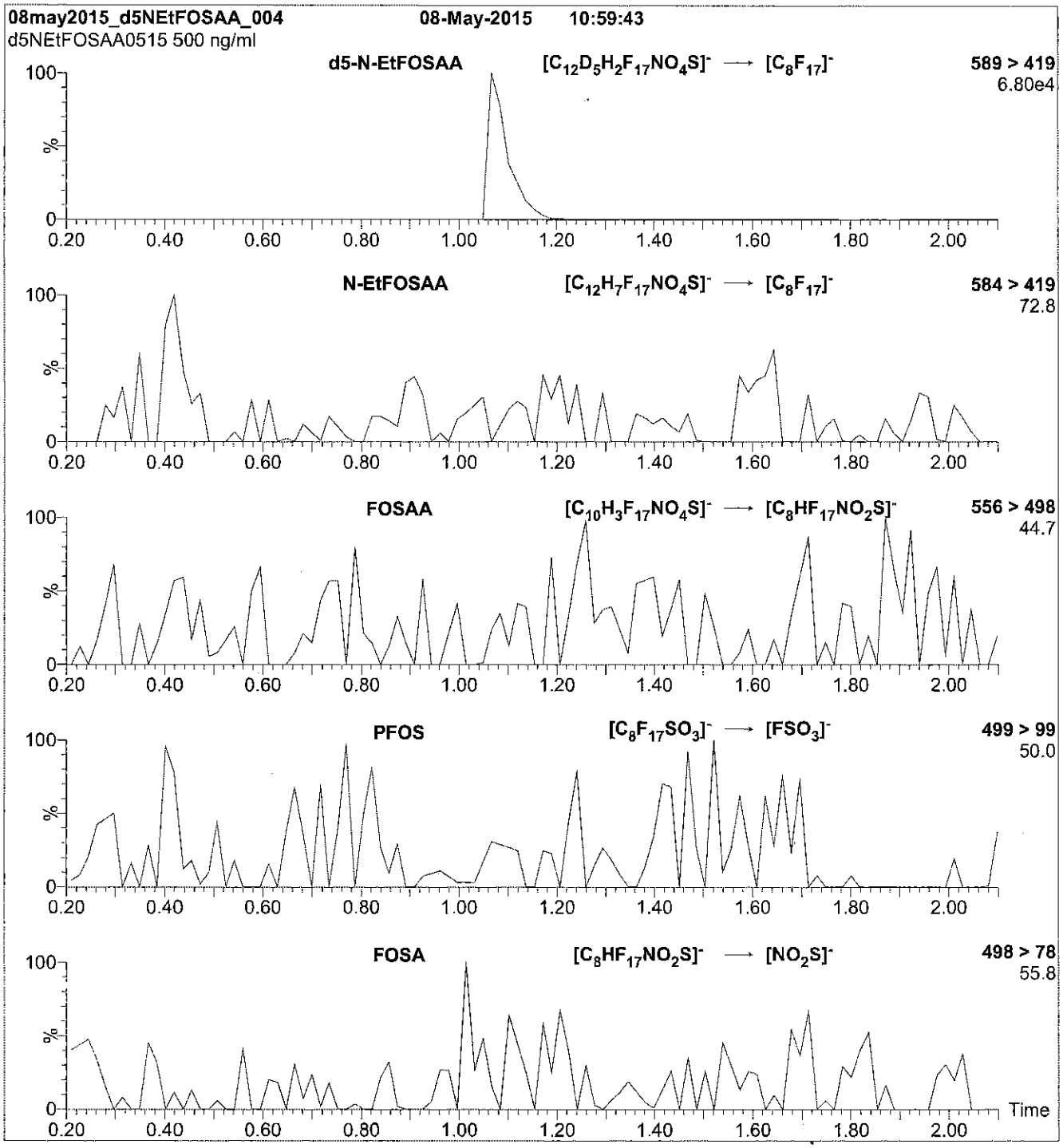
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 25

Reagent

LCd5-NEtFOSAA_00002

R: 7/6/16 CBW

671603
ID: LCd5-NEtFOSAA_00002
Exp: 12/07/20 Prpd: CBW
d5-N-EtFOSAA

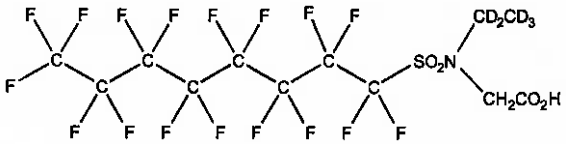
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d5-N-EtFOSAA **LOT NUMBER:** d5NEtFOSAA1115

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_{12}D_5H_3F_{17}NO_4S$ **MOLECULAR WEIGHT:** 590.27

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

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥98% $^2H_6$

LAST TESTED: (mm/dd/yyyy) 12/07/2015

EXPIRY DATE: (mm/dd/yyyy) 12/07/2020

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:** 12/07/2015 (mm/dd/yyyy)

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

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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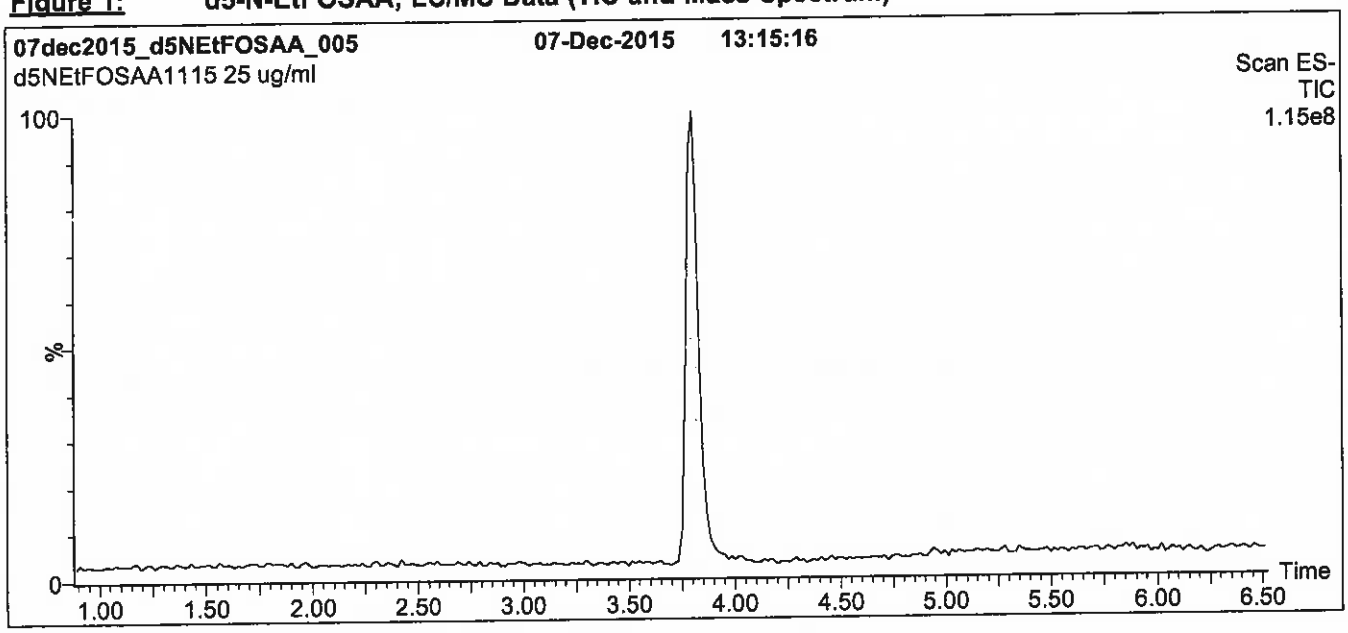
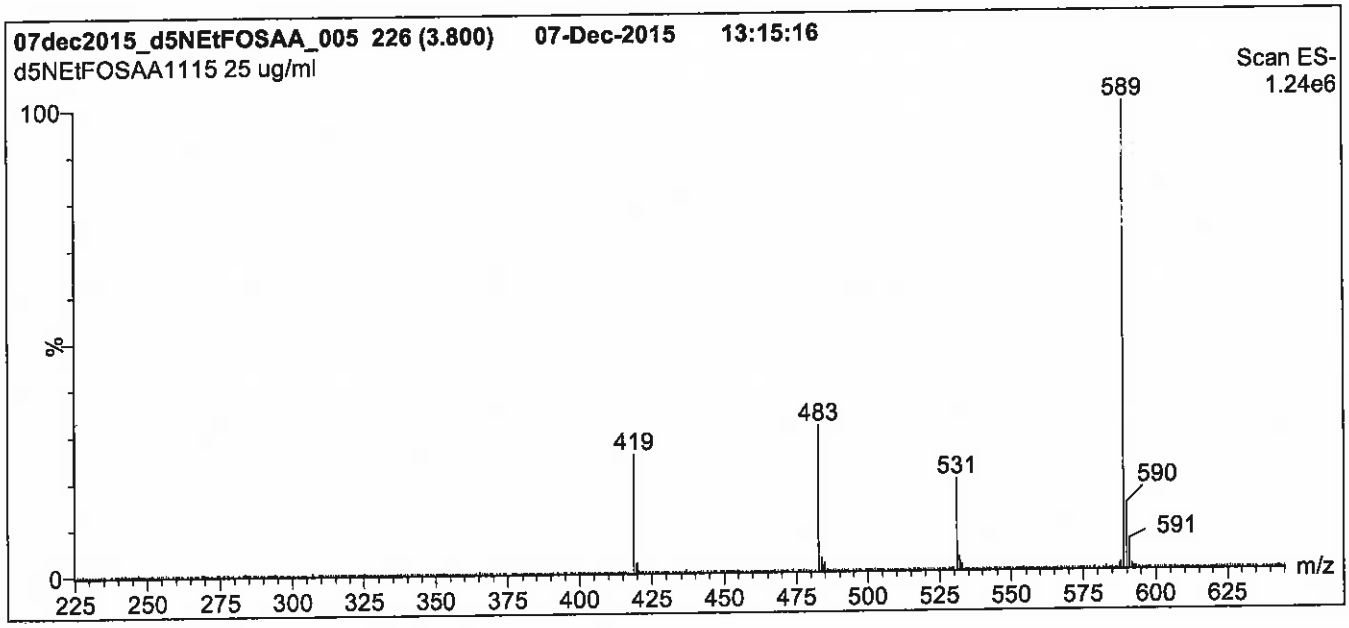




Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

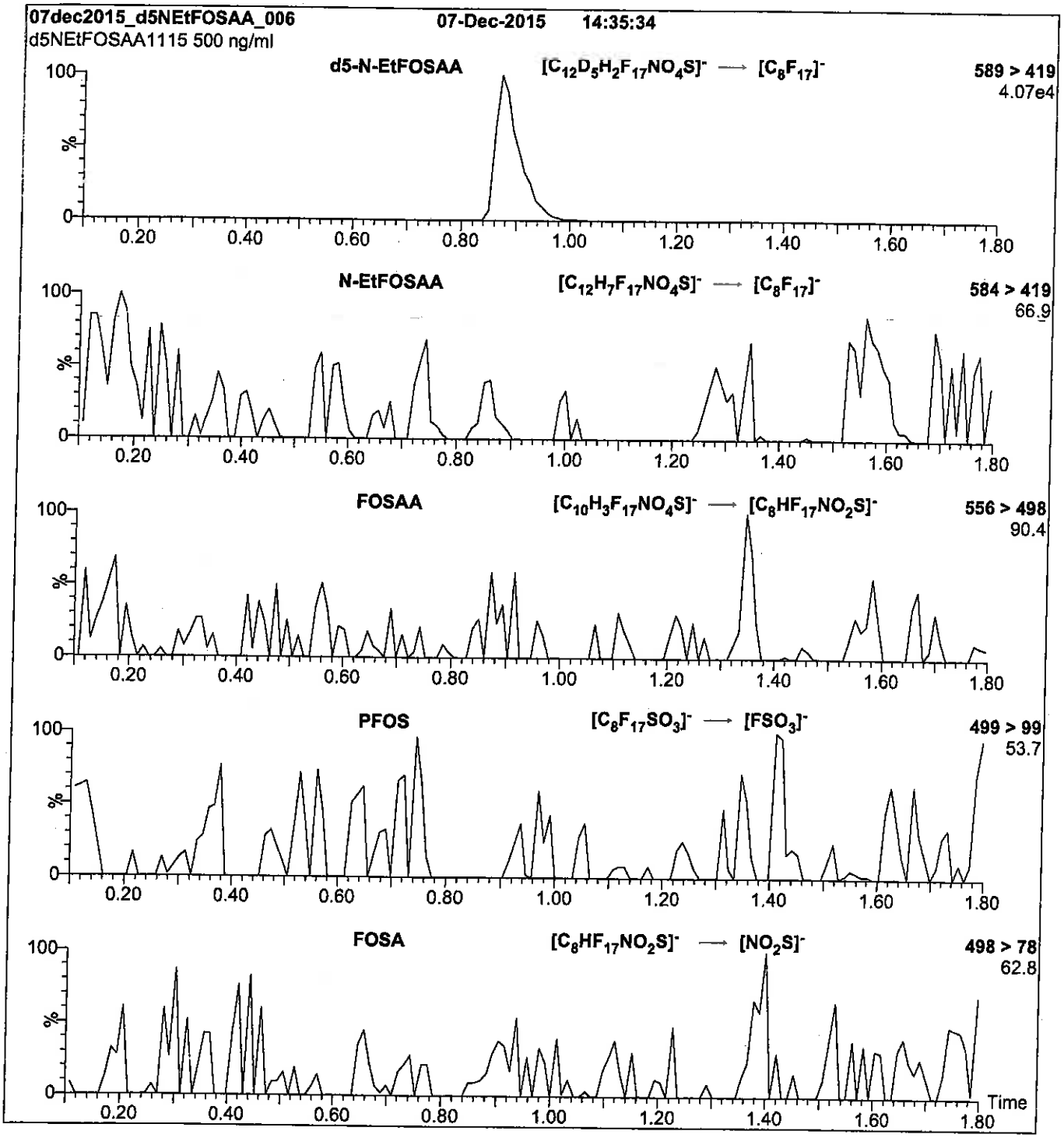
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml d5-N-EtFOSAA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 25
Flow:	300 µl/min	

Reagent

LCM2-6:FTS_00001

r: 7/16/15 SKV
S: 7/20/15 SKV

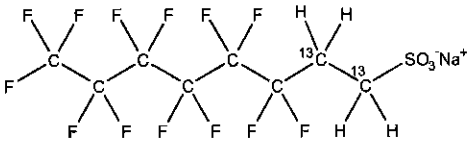
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-6:2FTS **LOT NUMBER:** M262FTS0714

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_6H_4F_{13}SO_3Na$ **MOLECULAR WEIGHT:** 452.13

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol

47.5 ± 2.4 µg/ml (M2-6:2FTS anion)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ^{13}C (1,2-$^{13}C_2$)

LAST TESTED: (mm/dd/yyyy) 07/15/2014

EXPIRY DATE: (mm/dd/yyyy) 07/15/2017

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/27/2015 (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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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

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

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

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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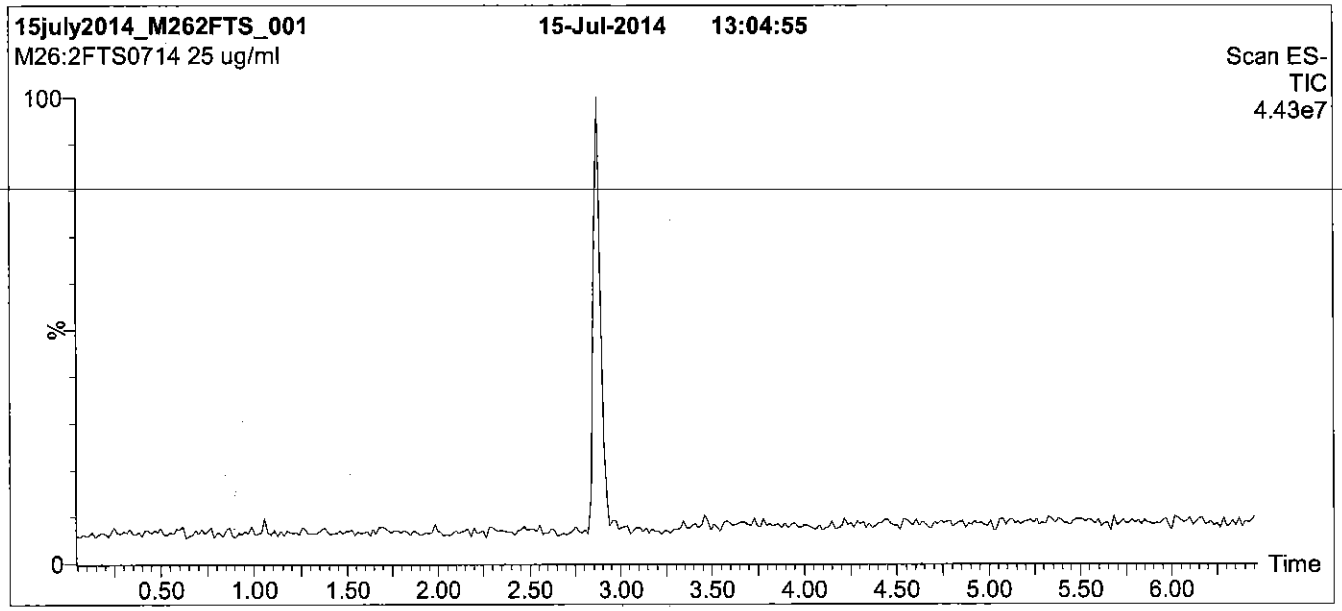
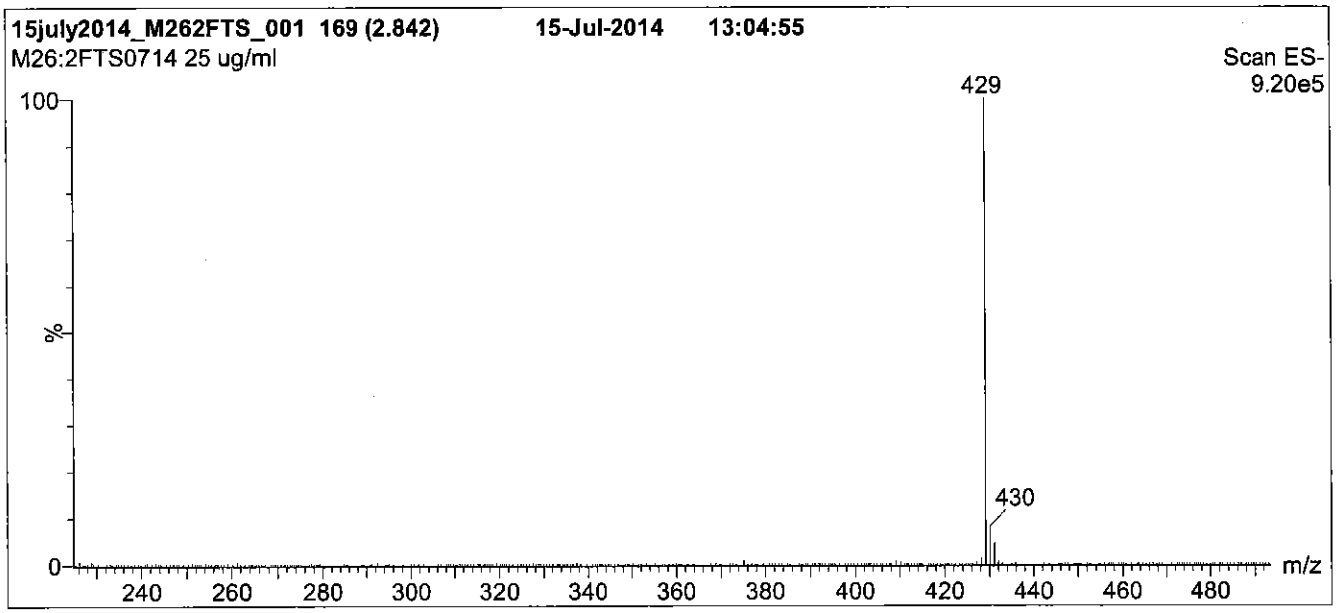
Figure 1: **M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

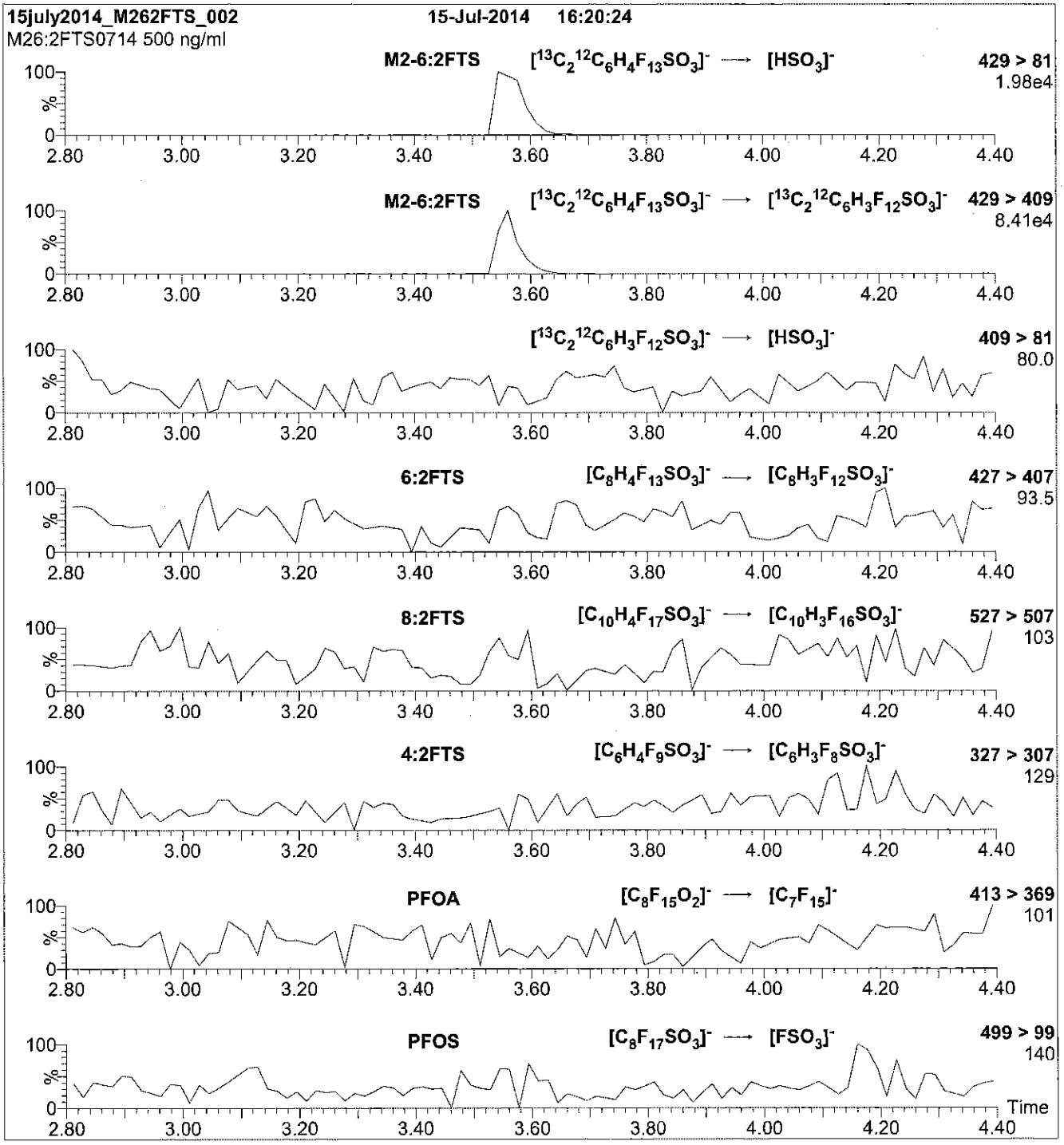
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM2-6:FTS_00002

R: 7/6/16 CBW

671575
ID: LCM2-6:FTS_00002
Exp: 01/08/21 Prpd: CBW
M2-6:2FTS

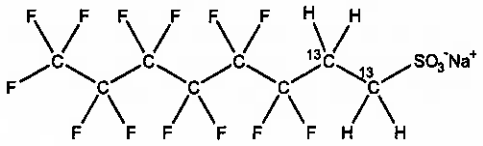
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-6:2FTS **LOT NUMBER:** M262FTS0116

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6H_4F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	452.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.5 ± 2.4 µg/ml (M2-6:2FTS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	01/08/2016		
EXPIRY DATE: (mm/dd/yyyy)	01/08/2021		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
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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

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CALA

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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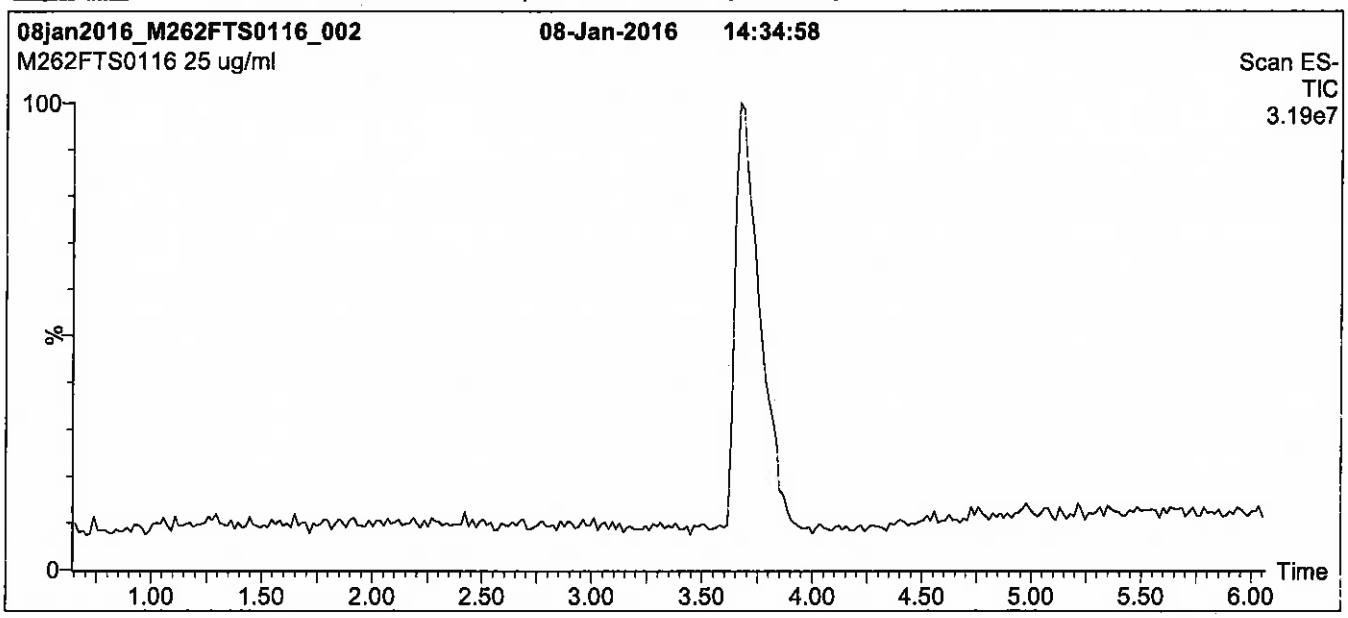
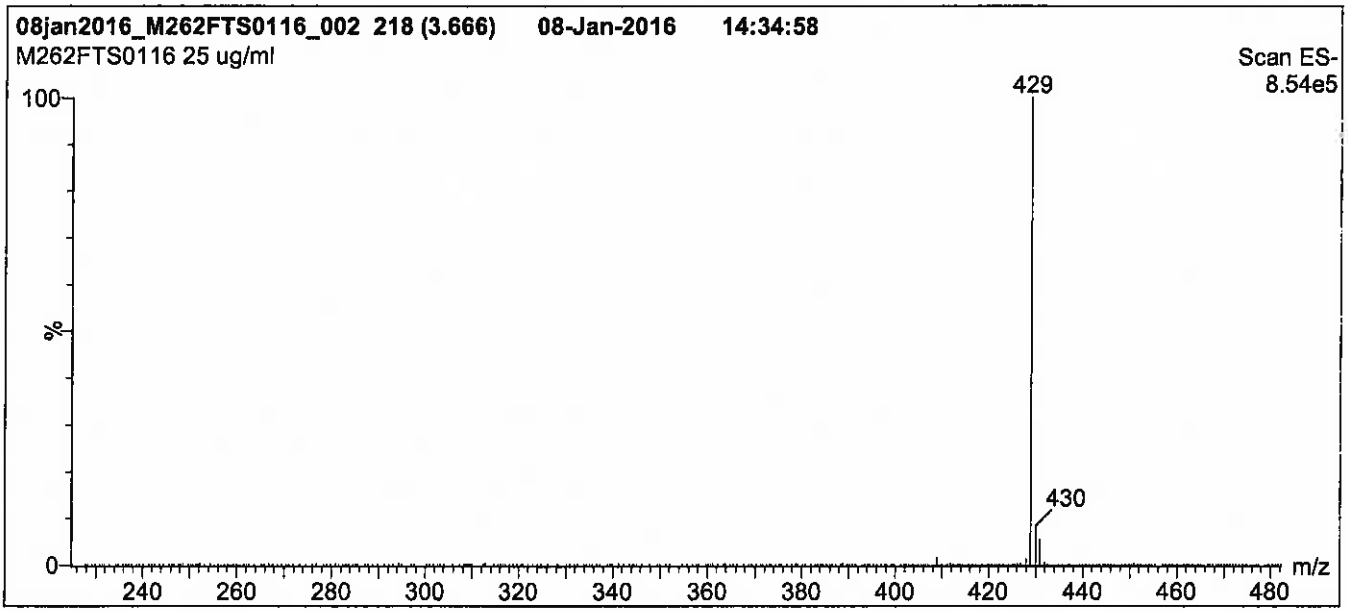
Figure 1: **M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

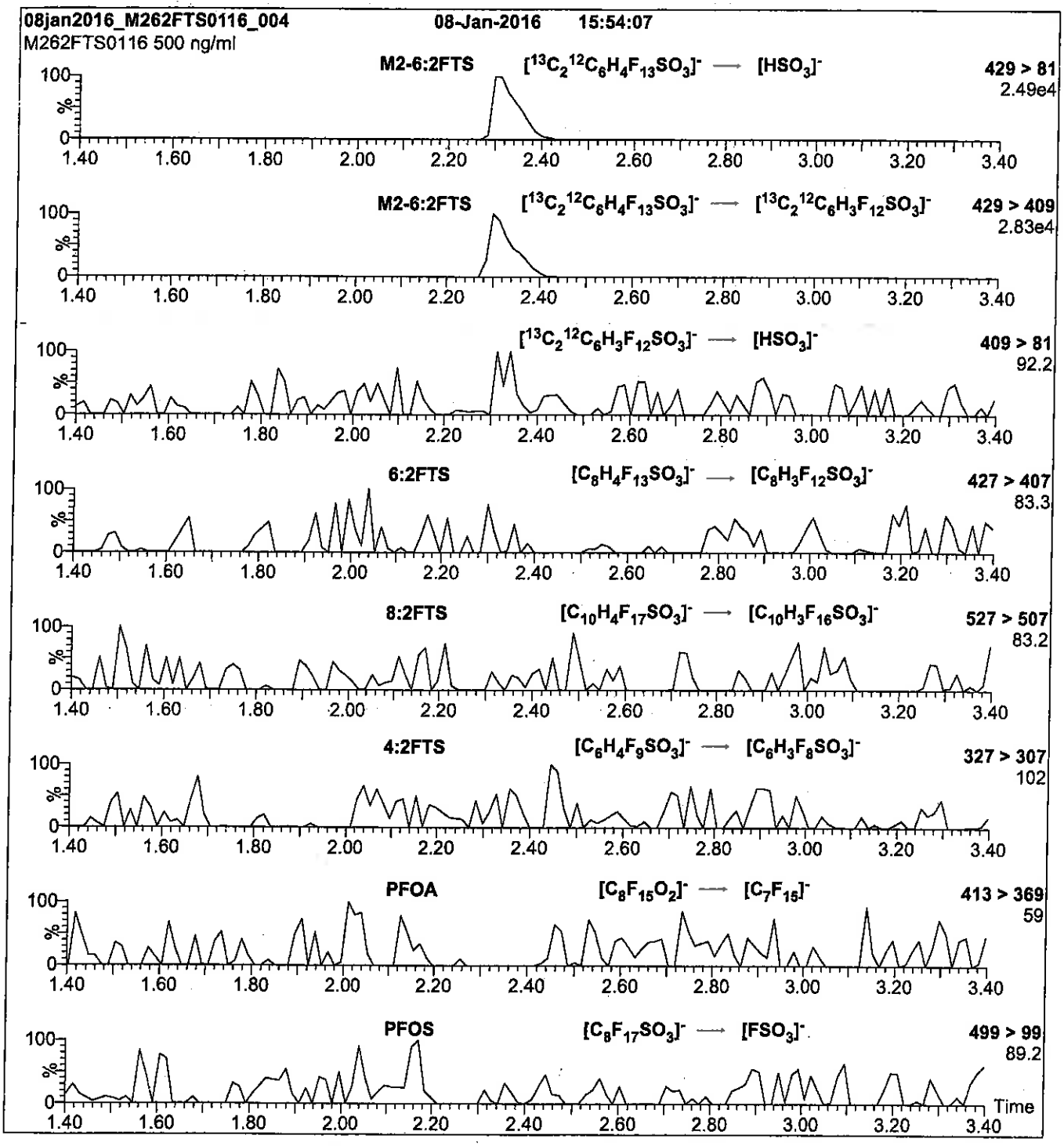
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 25

Reagent

LCM2-8:2FTS_00001

r: 7/16/15 BV
S: 7/22/15 STV

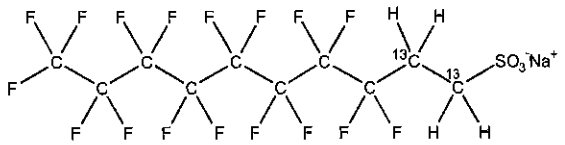
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0414

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_8H_4F_{17}SO_3Na$ **MOLECULAR WEIGHT:** 552.15

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol

47.9 ± 2.4 µg/ml (M2-8:2FTS anion)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ^{13}C ($1,2\text{-}^{13}C_2$)

LAST TESTED: (mm/dd/yyyy) 04/13/2014

EXPIRY DATE: (mm/dd/yyyy) 04/13/2017

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

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

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO/IEC 17025 REFERENCE MATERIAL PRODUCER

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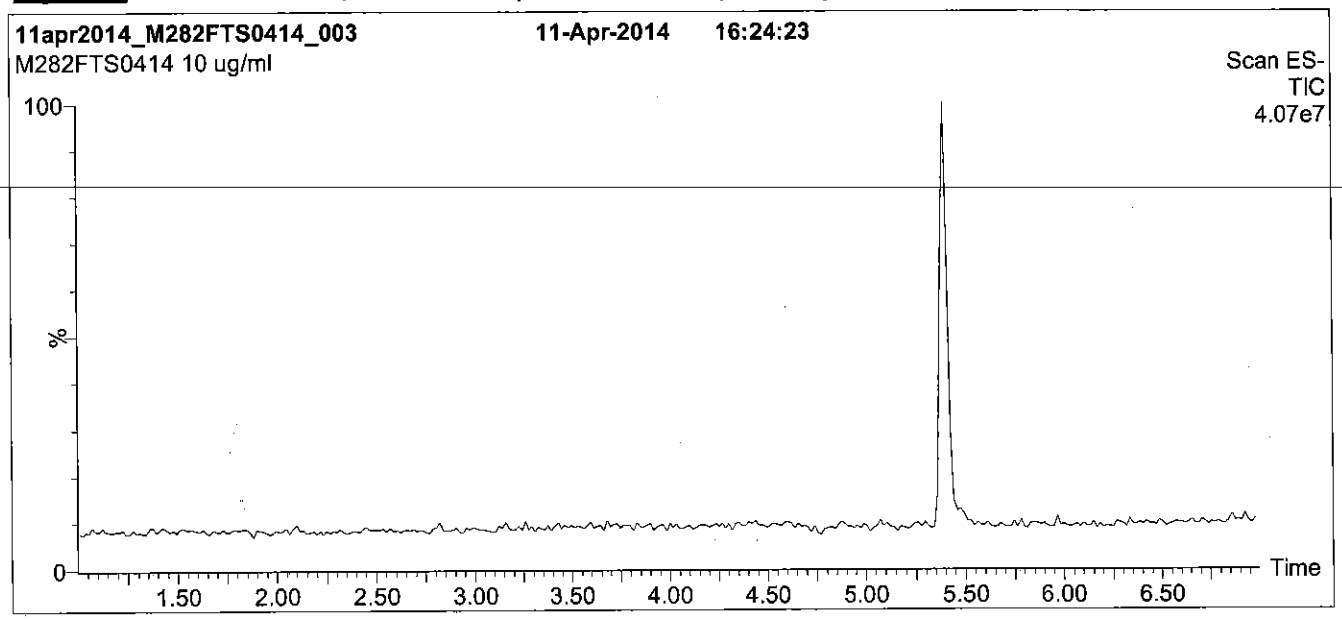
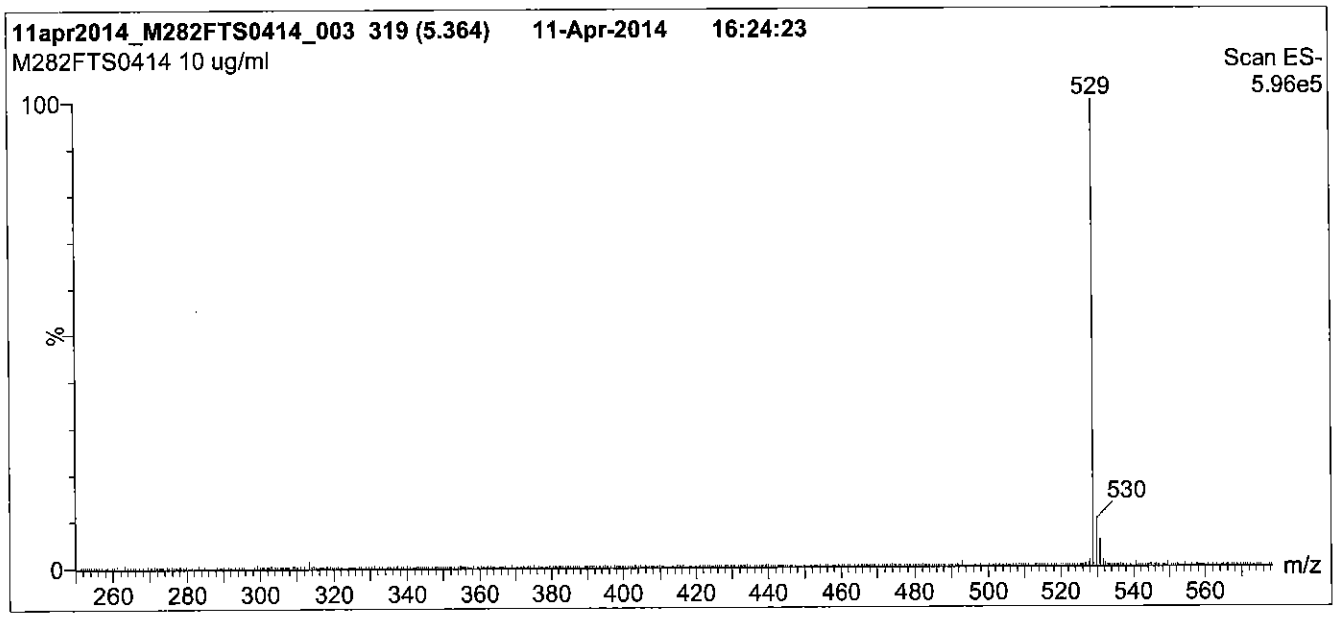




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

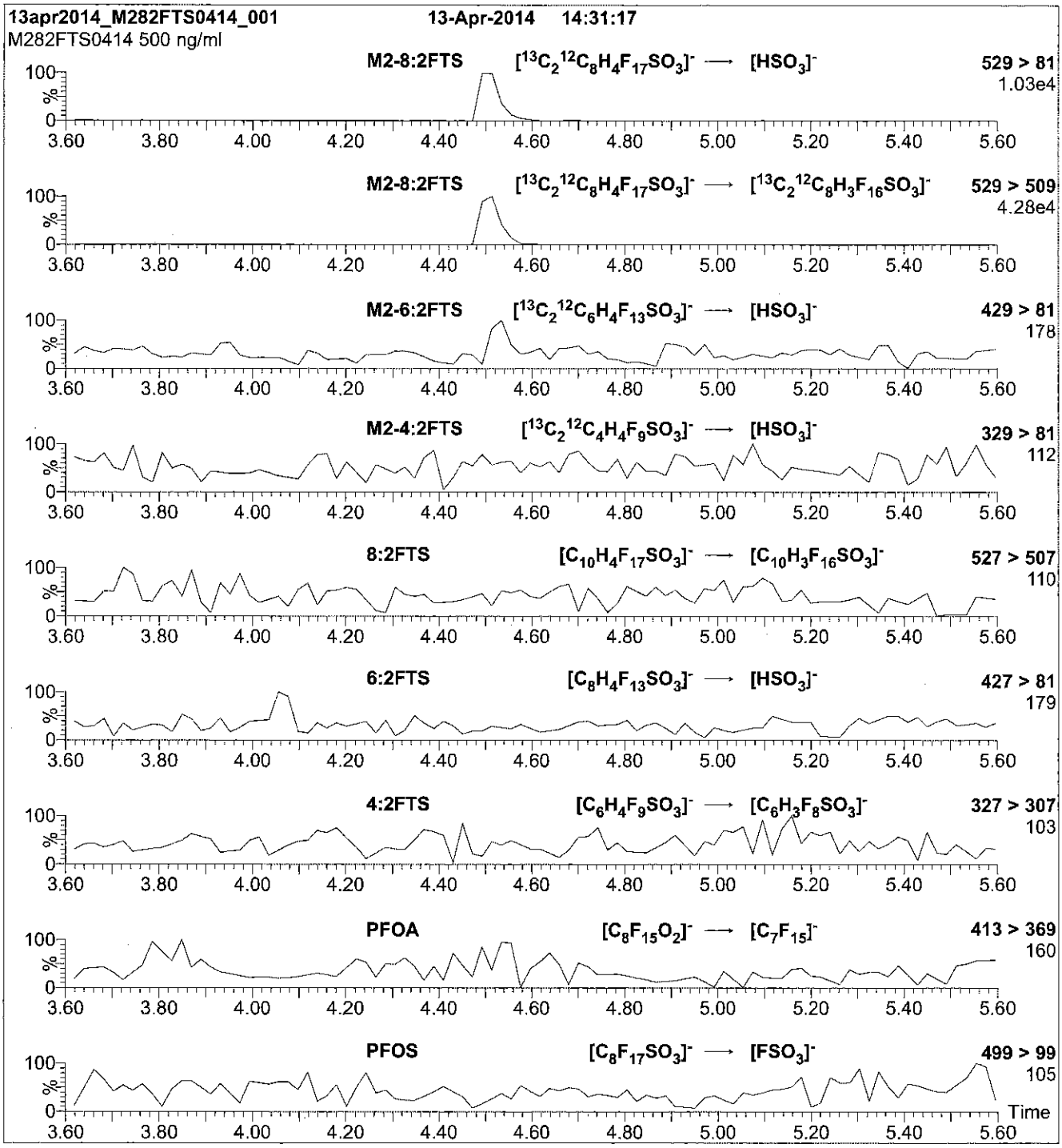
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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 µl/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 25

Reagent

LCM2-8:2FTS_00002

R: 7/6/16 cw

671602
ID: LCM2-8:2FTS_00002
Exp: 01/08/21 Prpd: CBW
M2-8:2FTS

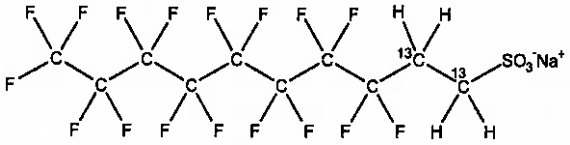
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0116

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

STRUCTURE: **CAS #:** Not available



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CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
47.9 ± 2.4 µg/ml (M2-8:2FTS anion)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ^{13}C (1,2-$^{13}C_2$)

LAST TESTED: (mm/dd/yyyy) 01/08/2016

EXPIRY DATE: (mm/dd/yyyy) 01/08/2021

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 01/18/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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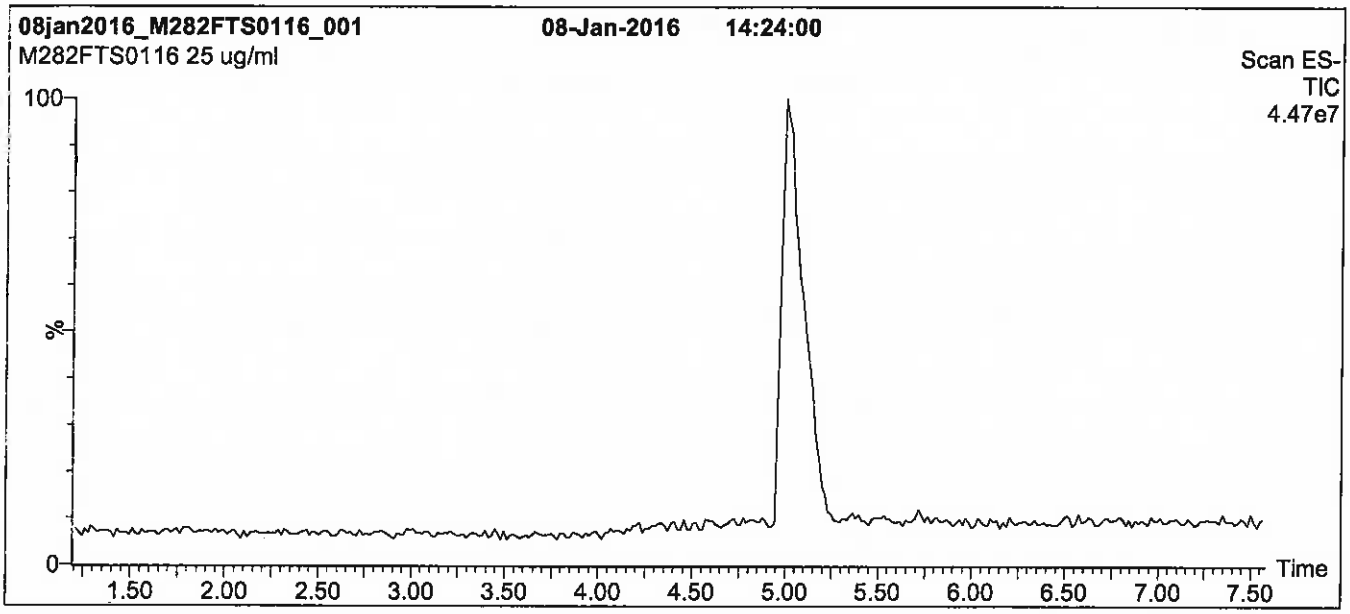
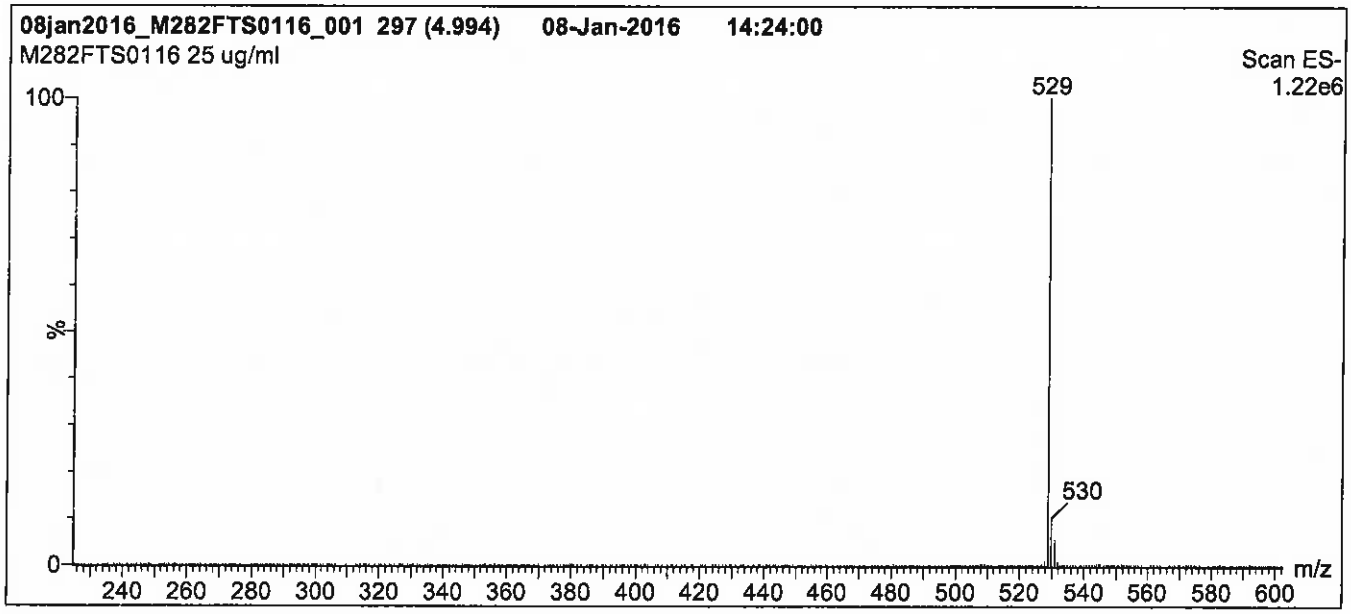
Figure 1: **M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

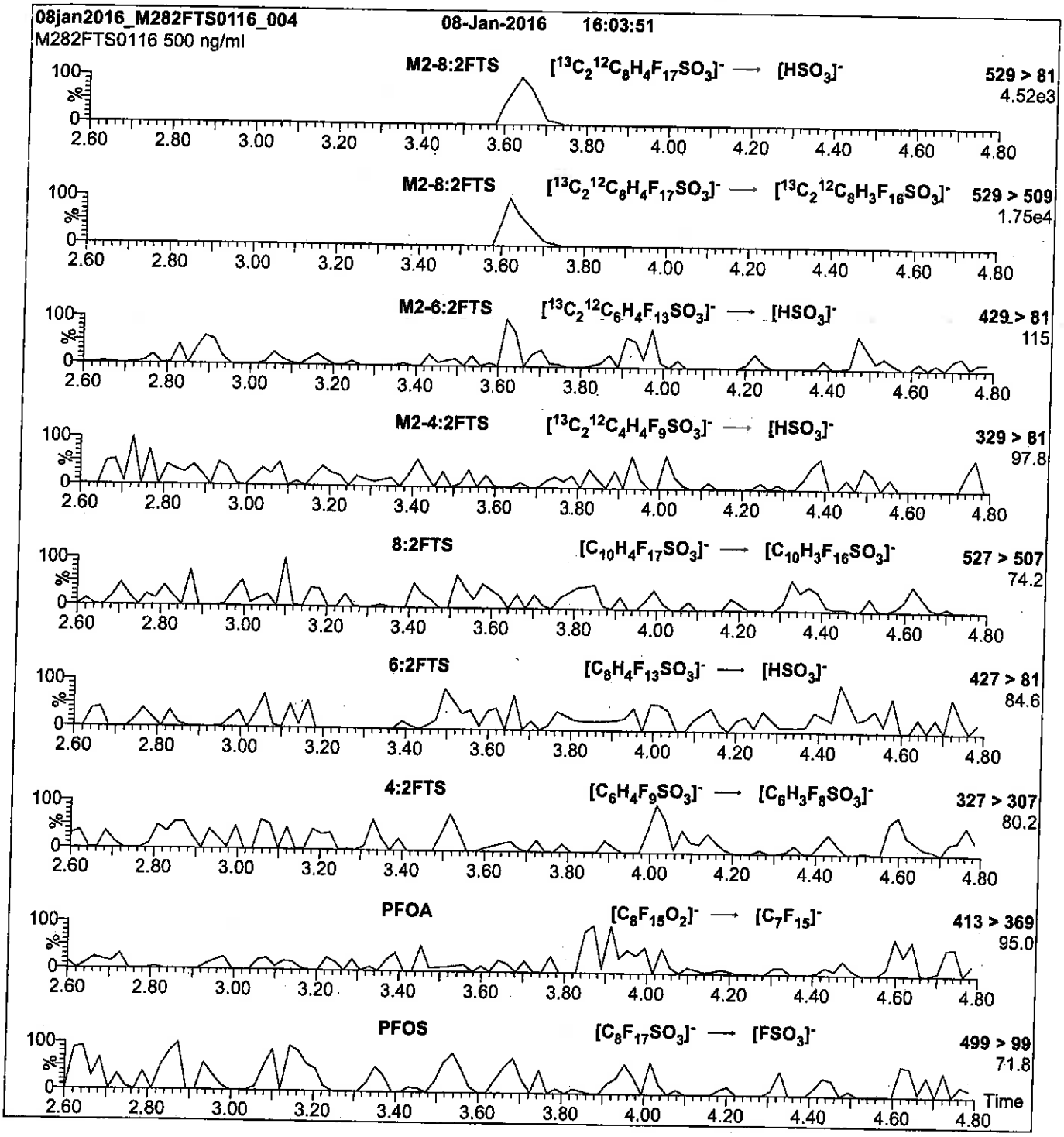
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 30

Reagent

LCM2PFHxDA_00008

R: SBC 9/22/16

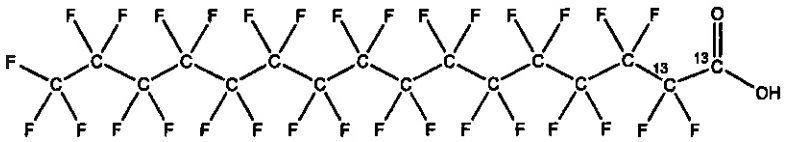
739512
ID: LCM2PFHxDA_00008
Exp: 01/07/21 Prpd: SBC
13C2-PFHxDA at 50ug/mL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFHxDA
LOT NUMBER: M2PFHxDA1112
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexadecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_{14}HF_{31}O_2$
MOLECULAR WEIGHT: 816.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 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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SYNTHESIS / CHARACTERIZATION:

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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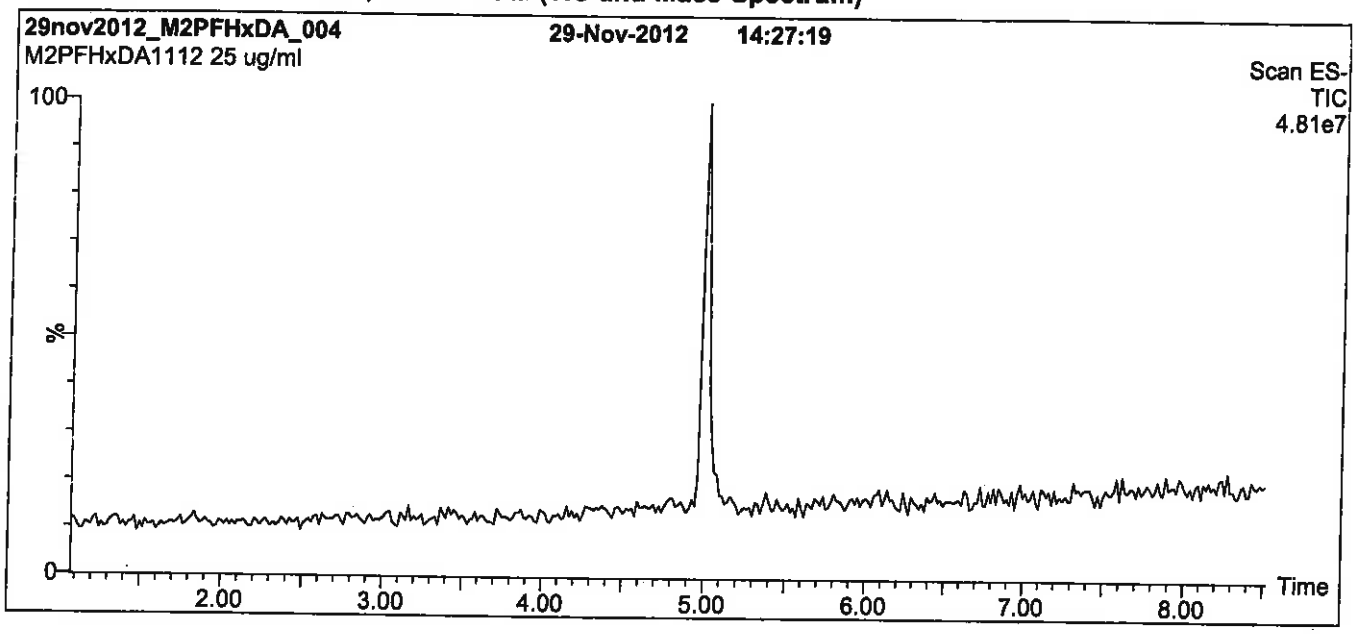
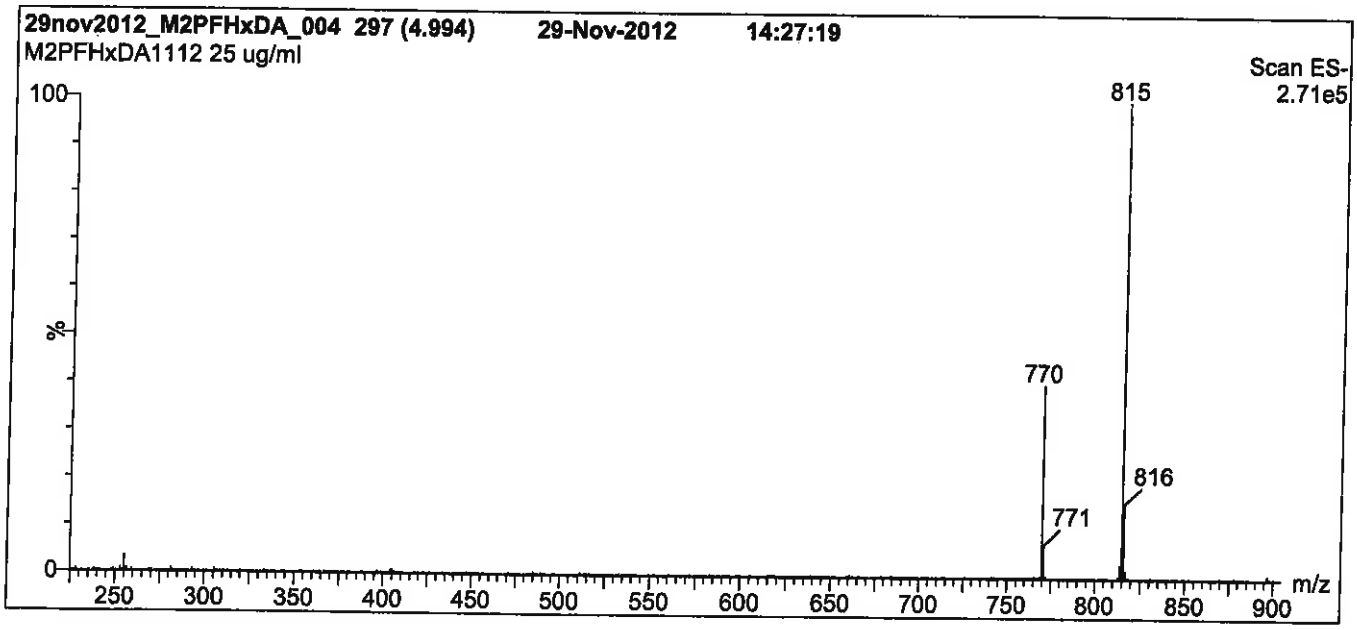
Figure 1: **M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc 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

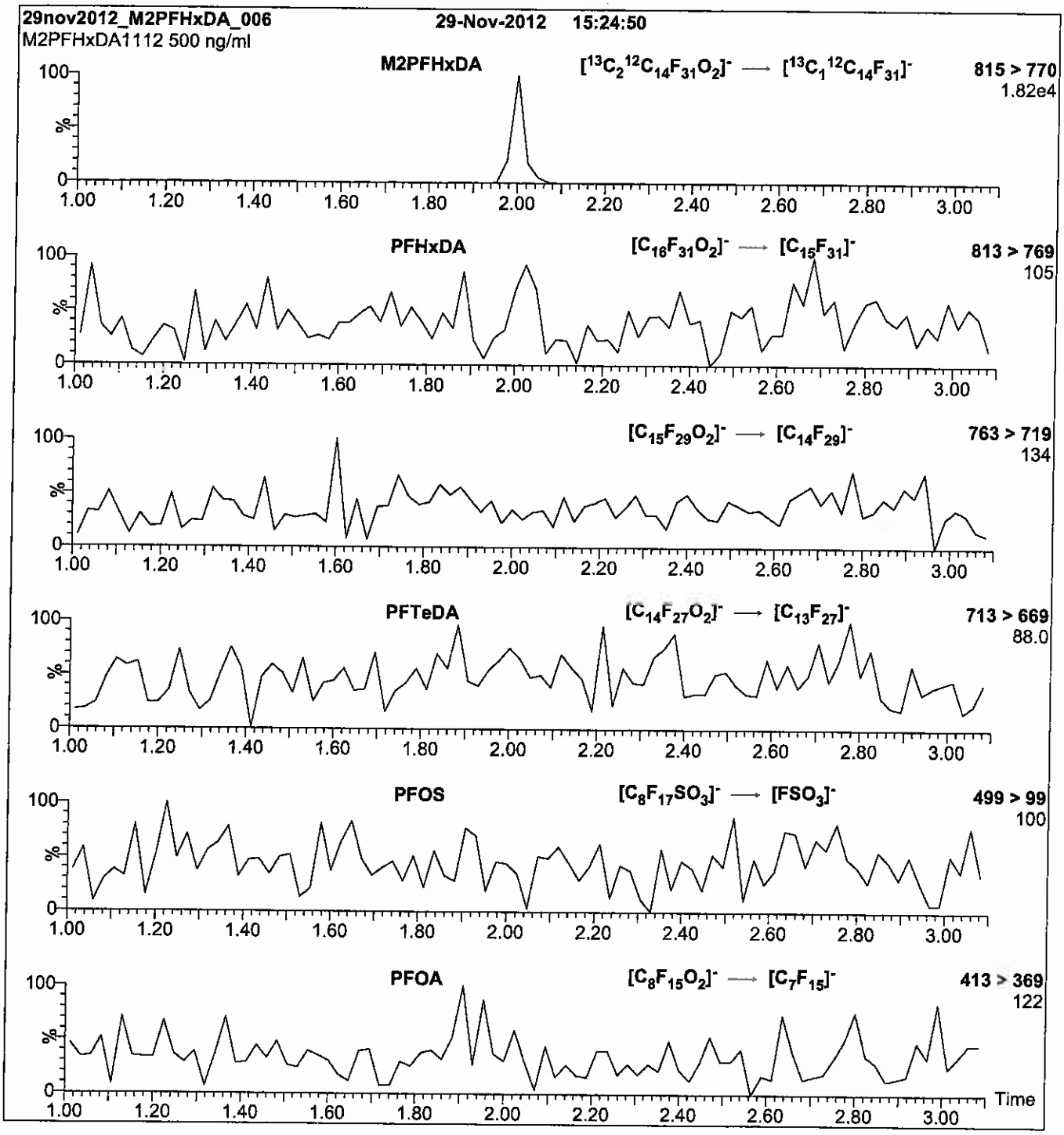
Flow: 300 µl/min

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)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 15
Flow:	300 µl/min	

Reagent

LCM2PFTeDA_00007

Scanned 10/14/16 R: SBC 9/22/16

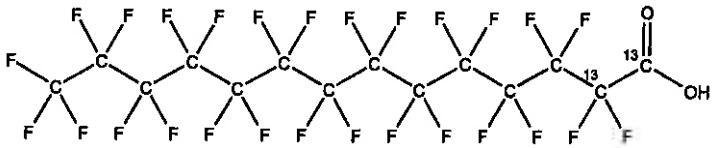
739563
ID: LCM2PFTeDA_00007
Exp: 12/07/20 Prpd: SBC
13C2-PFTeDA at 50ug/mL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFTeDA
LOT NUMBER: M2PFTeDA1115
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]tetradecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_{12}HF_{27}O_2$
MOLECULAR WEIGHT: 716.10
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 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

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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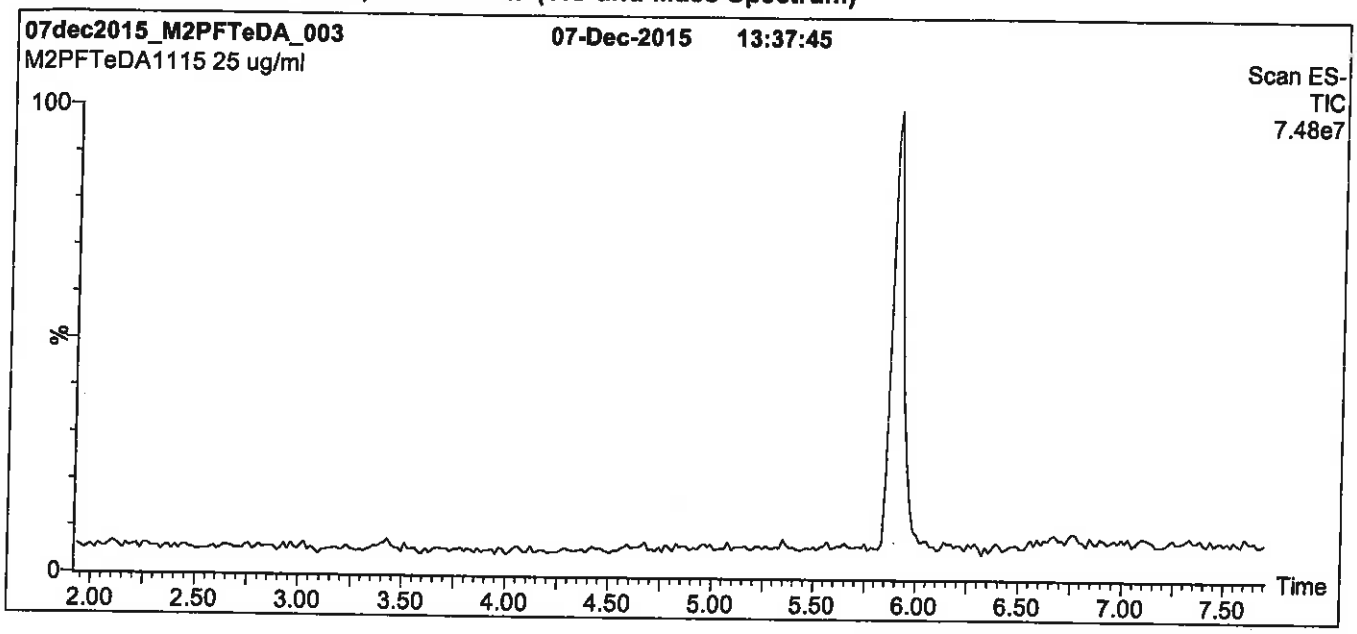
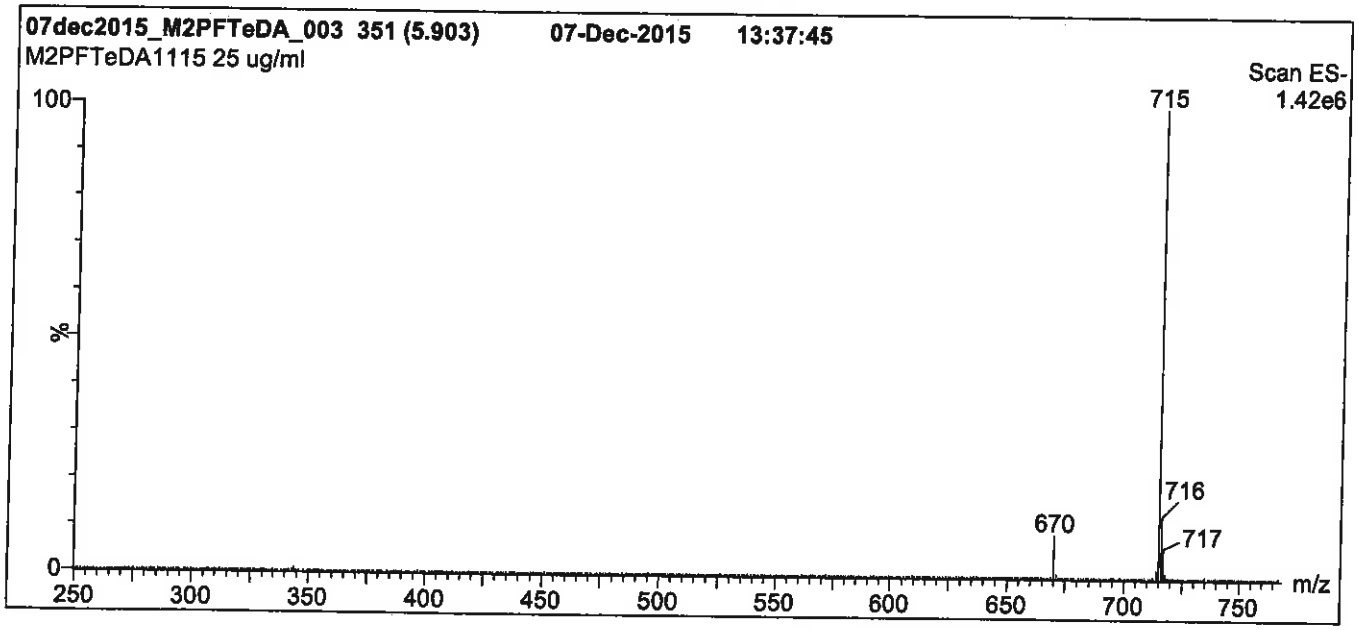
Figure 1: **M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

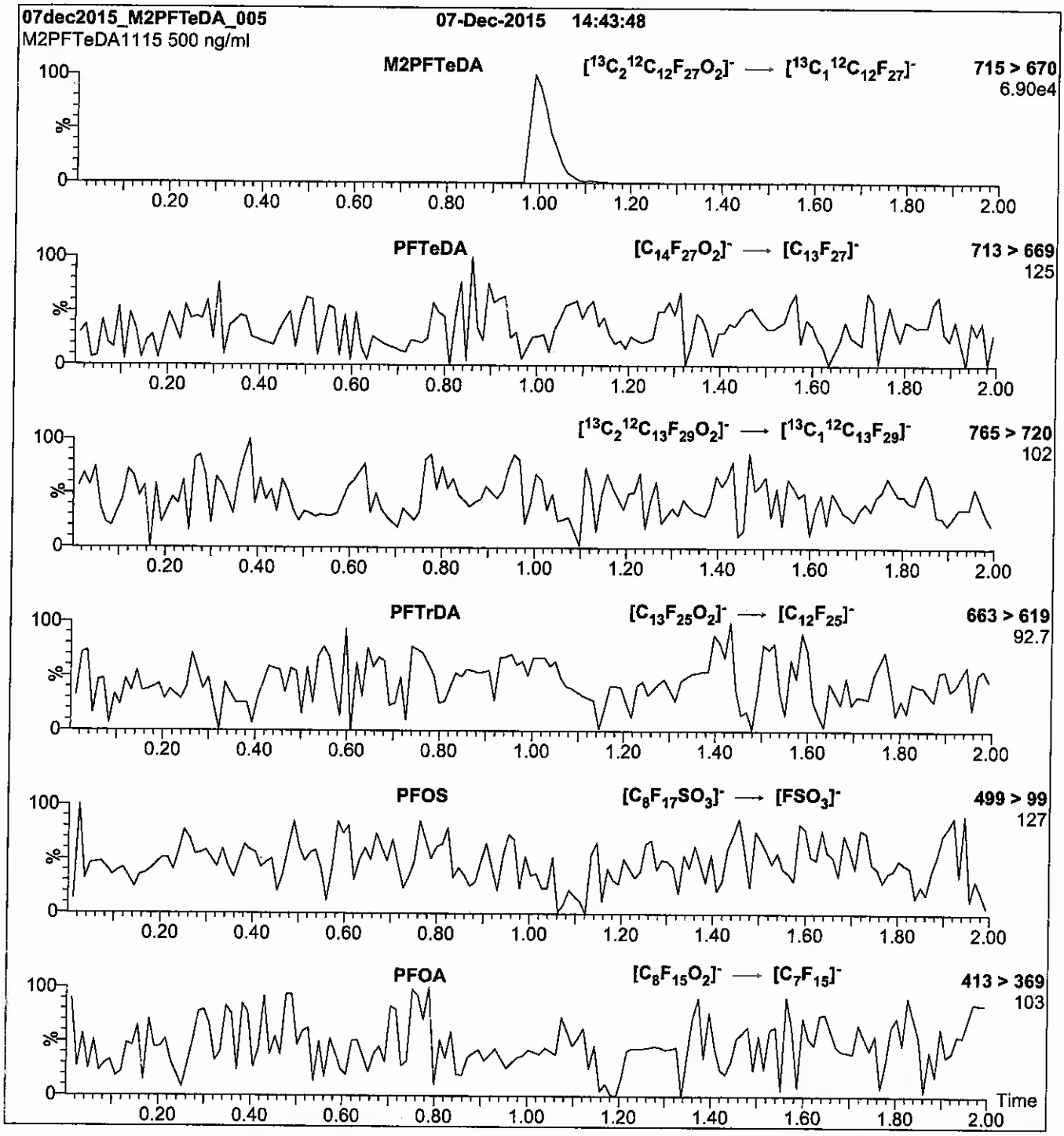
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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 µl/min

MS Parameters

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

Reagent

LCM4PFHPA_00007

R: SBC 2/22/16

739567
ID: LCM4PFHPA_00007
Exp: 05/27/21 Prpd: SBC
13C4-Perfluoroheptanoic a

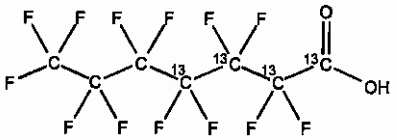
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

Scanned 10/14/16 SBC

PRODUCT CODE: M4PFHpA
LOT NUMBER: M4PFHpA0516
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]heptanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_3HF_{13}O_2$
MOLECULAR WEIGHT: 368.03
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy) 05/27/2016
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)

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HOMOGENEITY:

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UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

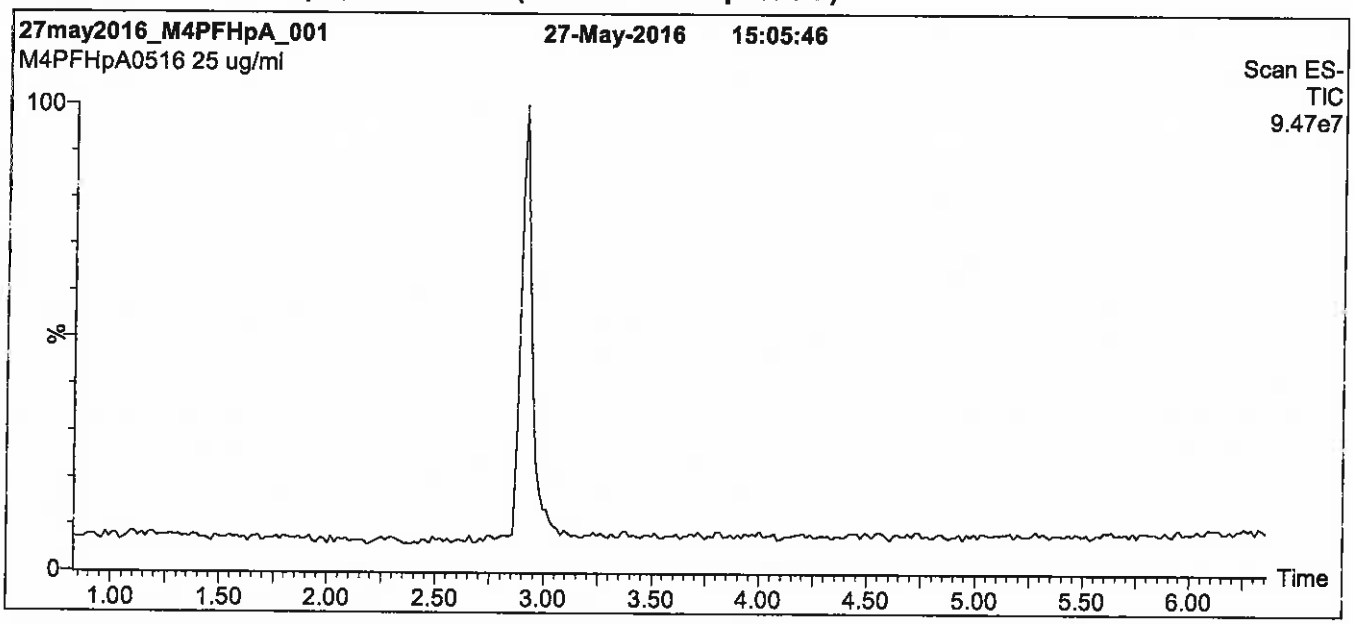
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

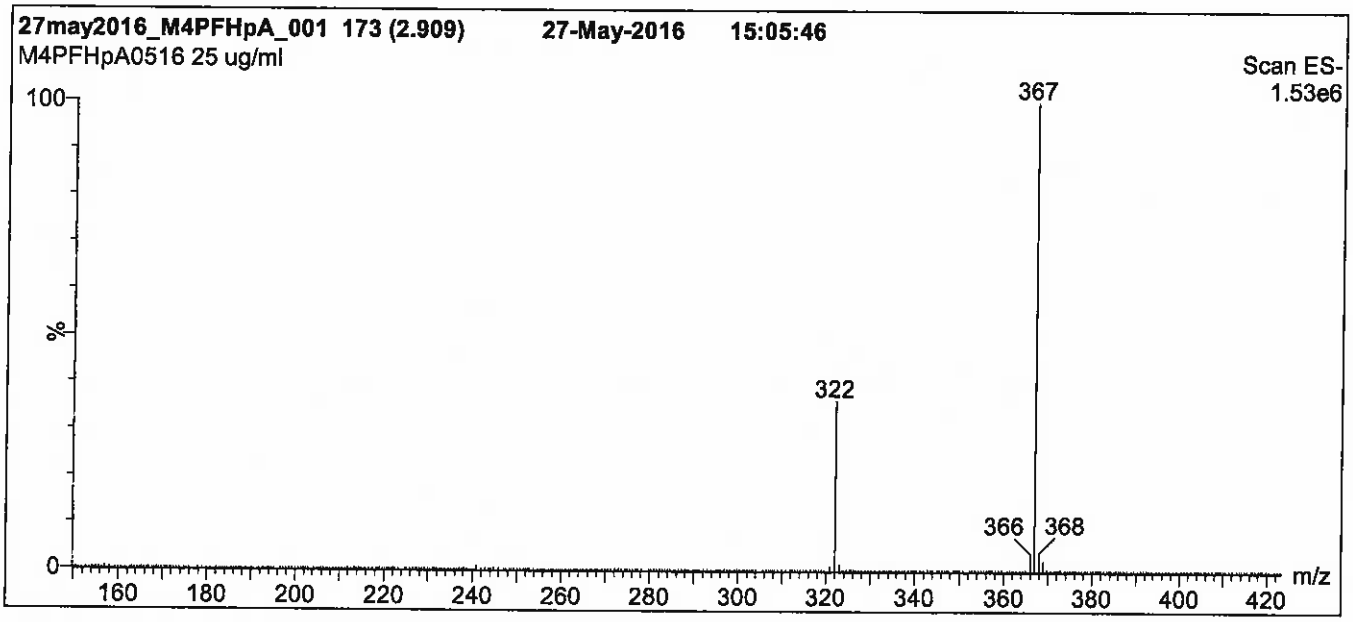
CALA Testing

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

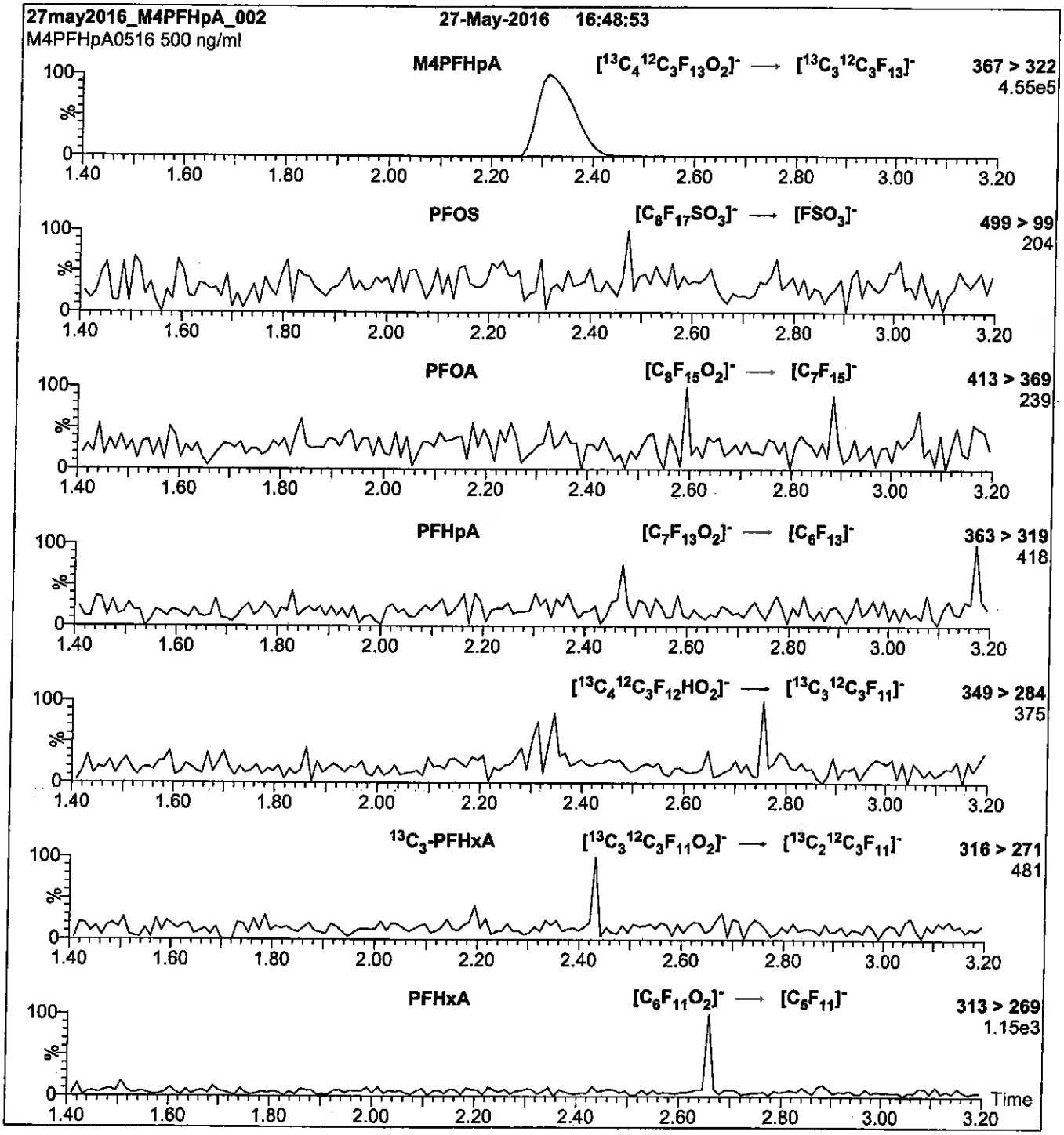
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M4PFHpA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.35e-3 Collision Energy (eV) = 11
Flow:	300 µl/min	

Reagent

LCM5PFPEA_00008

R: SBC 9/22/16

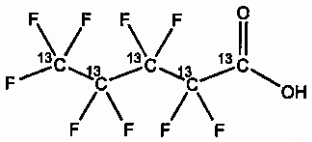
739590
ID: LCM5PFPEA_00008
Exp: 05/22/20 Prpd: SBC
13C5-Perfluoropentanoic a

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

Scanned 10/14/16 SR

PRODUCT CODE:	M5PFPeA	**LOT NUMBER:**	M5PFPeA0515
COMPOUND:	Perfluoro-n-[$^{13}C_5$]pentanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_5HF_9O_2$	**MOLECULAR WEIGHT:**	269.01
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	05/22/2015		
EXPIRY DATE: (mm/dd/yyyy)	05/22/2020		
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 < 0.1% of perfluoro-n-pentanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/25/2015 (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:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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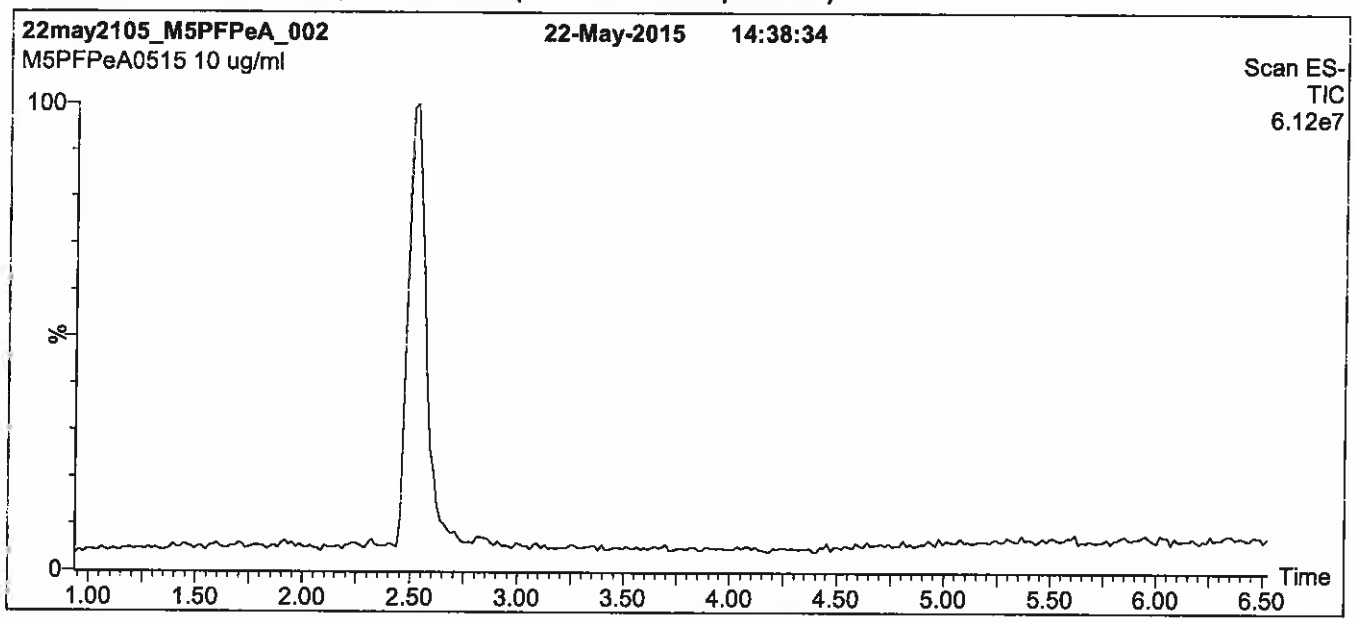
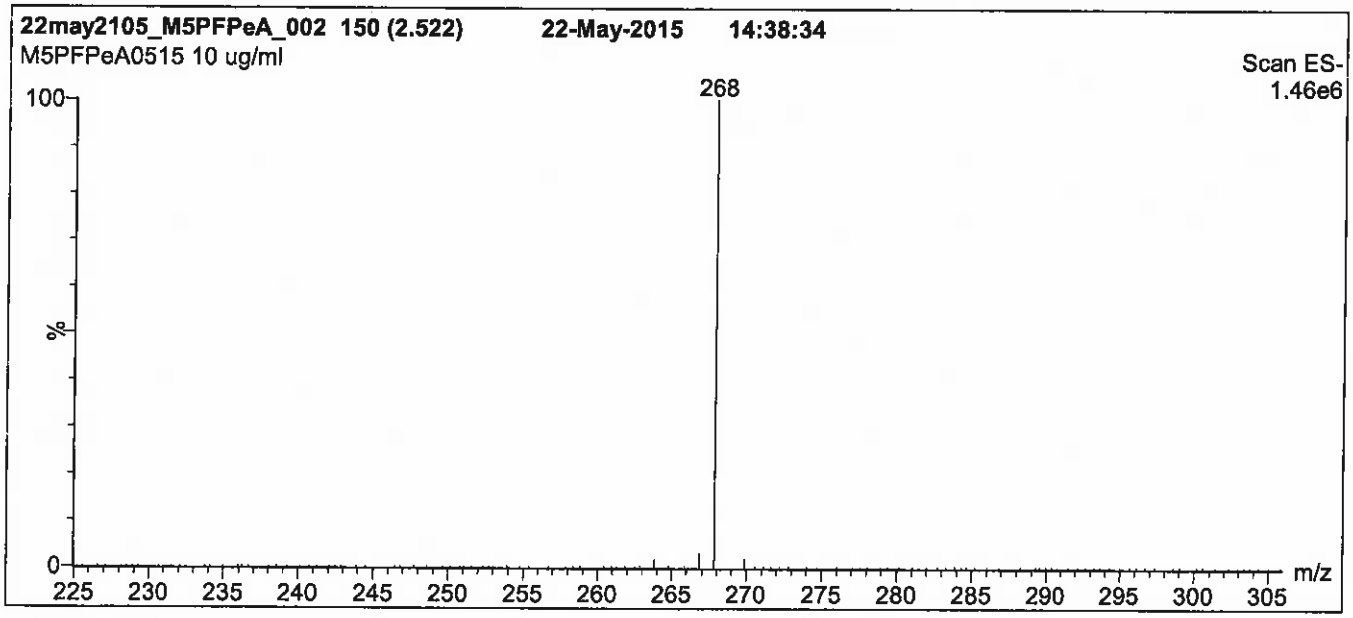
Figure 1: **M5PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

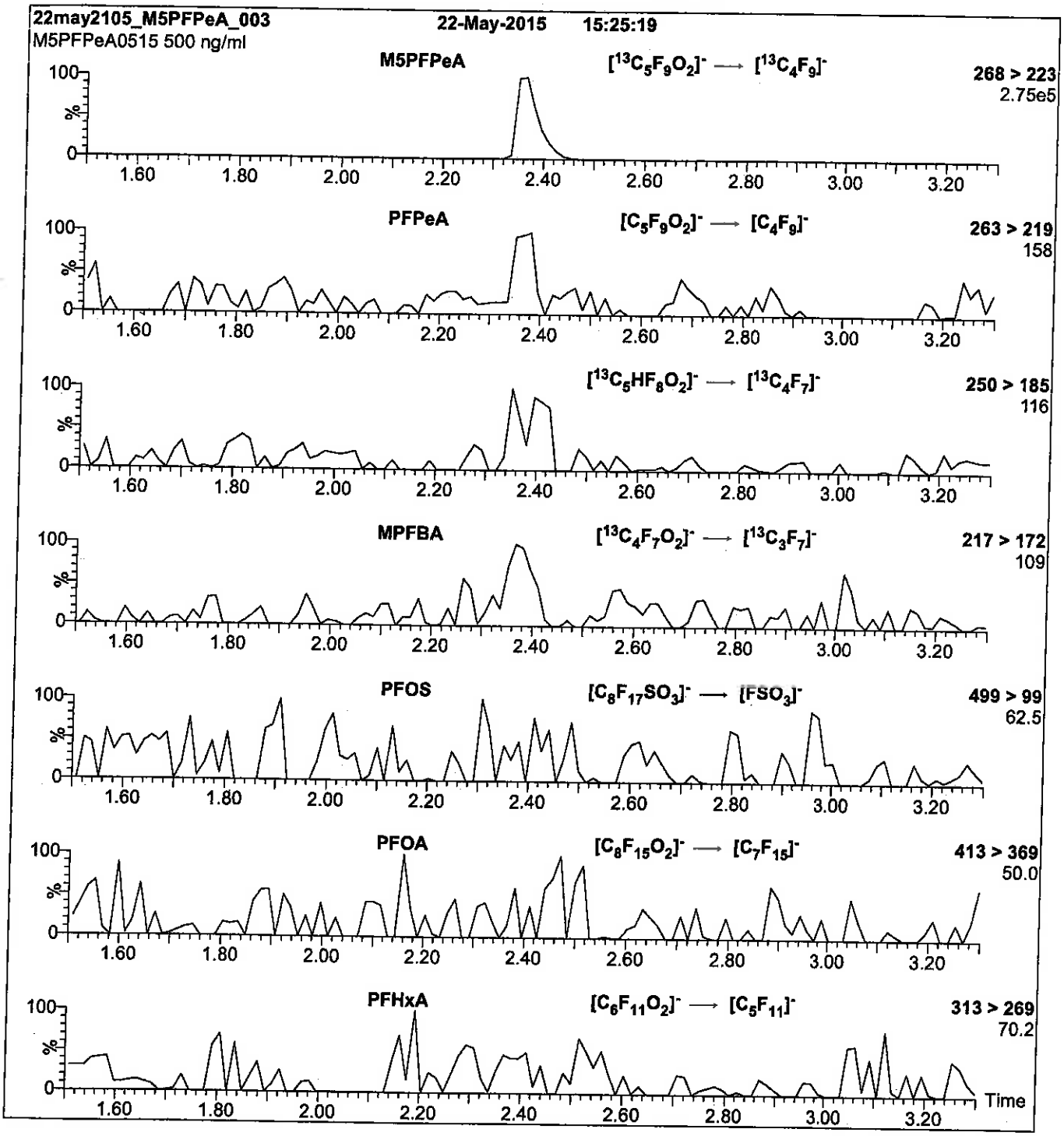
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 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)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.35e-3 Collision Energy (eV) = 9
Flow:	300 µl/min	

Reagent

LCM8FOSA_00011

R: SBC 9/22/16
Scanned 10/14/16

739615
ID: LCM8FOSA_00011
Exp: 12/22/17 Prpd: SBC
13C8-Perfluorooctanesulfo

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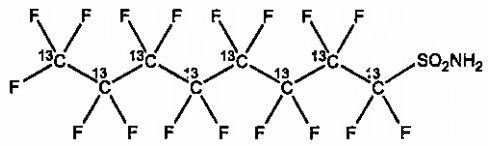
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: M8FOSA1215I

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	507.09
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	12/22/2015		
EXPIRY DATE: (mm/dd/yyyy)	12/22/2017		
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:** 01/14/2016 (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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CALA

ANAB ACCREDITED

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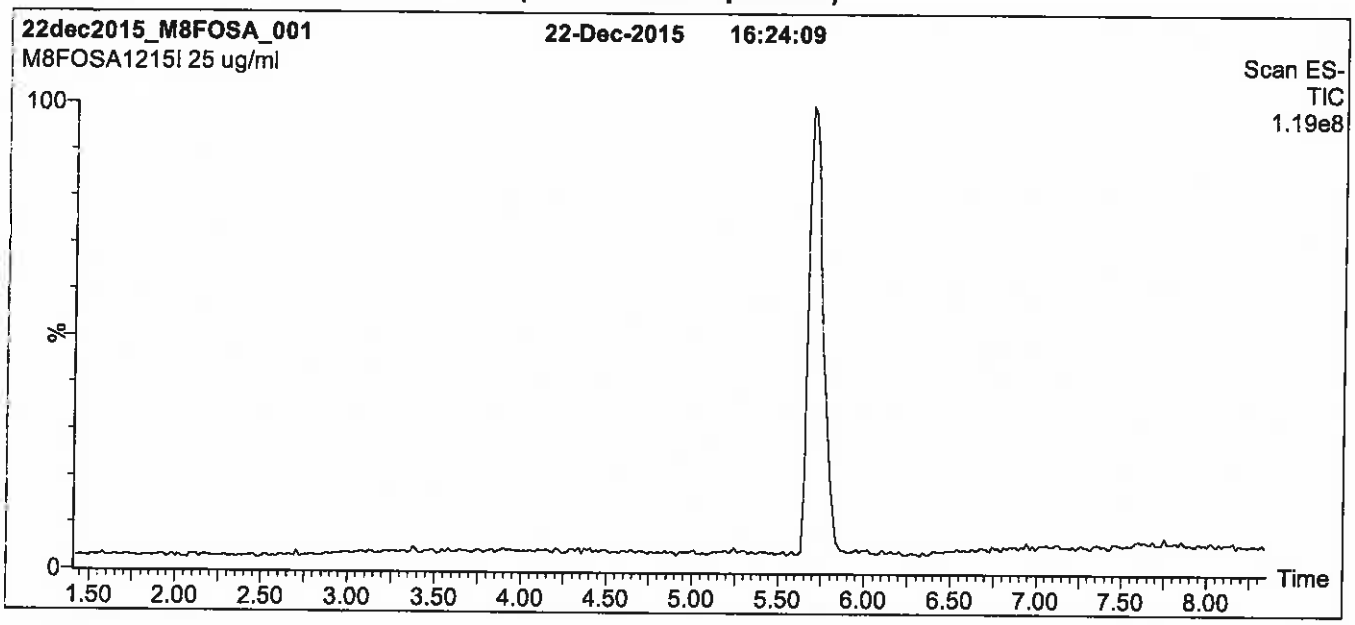
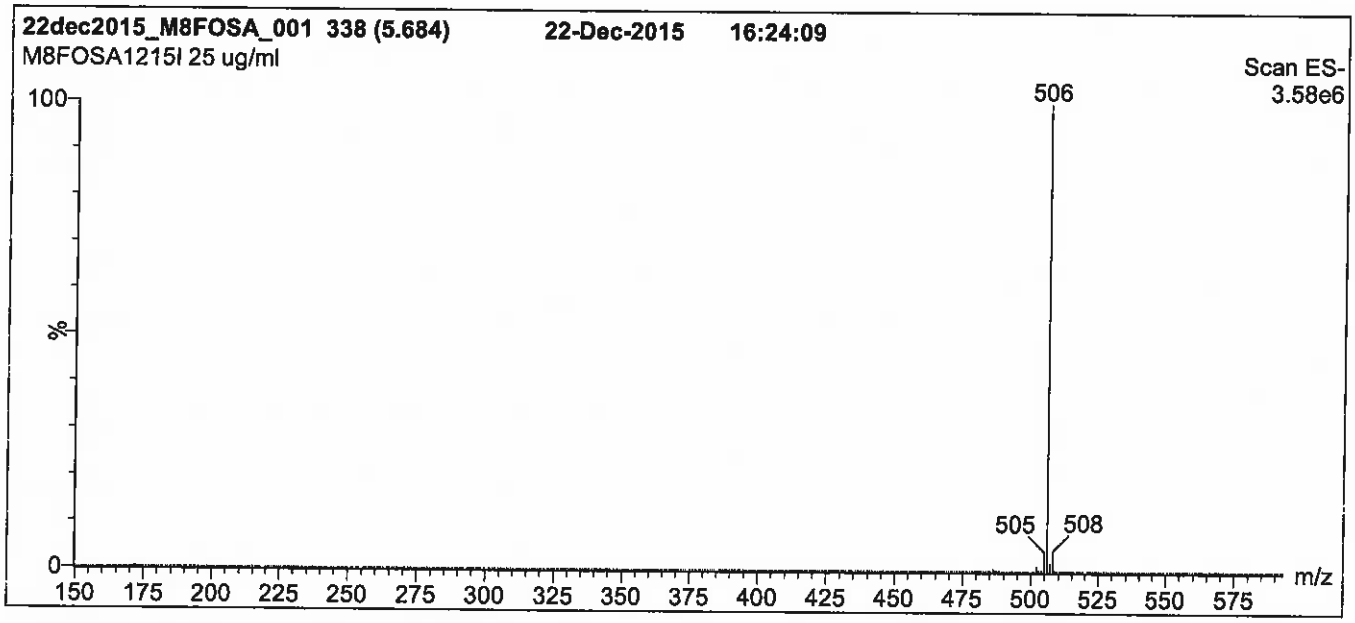
Figure 1: **M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

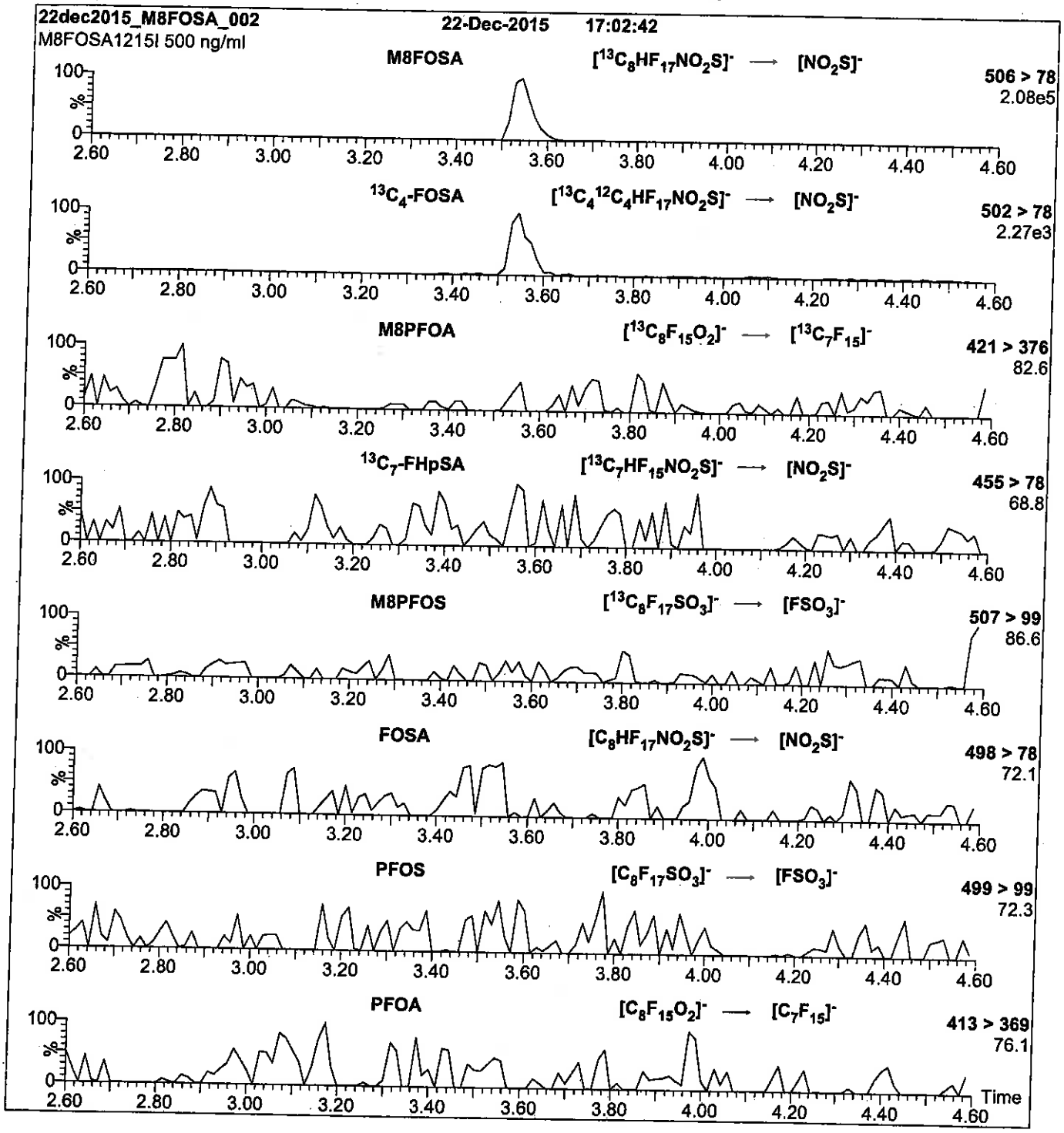
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
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)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 30
Flow:	300 µl/min	

Reagent

LCMPFBA_00008

R: SBC 9/22/16

739593
ID: LCMPFBA_00008
Exp: 05/24/21 Prpd: SBC
13C4-Perfluorobutanoic ac

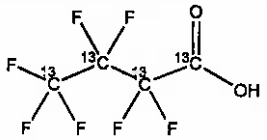
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16 SR

PRODUCT CODE: MPFBA
LOT NUMBER: MPFBA0516
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]butanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4HF_7O_2$
MOLECULAR WEIGHT: 218.01
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy) 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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/30/2016 (mm/dd/yyyy)

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

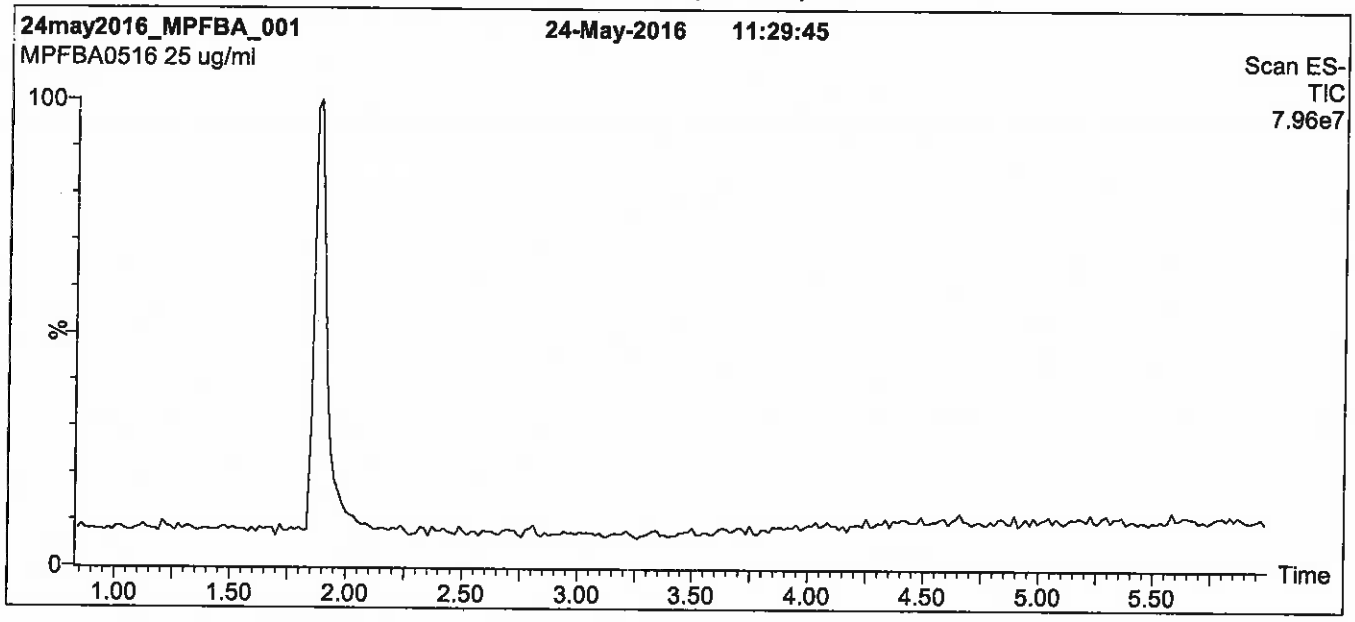
At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

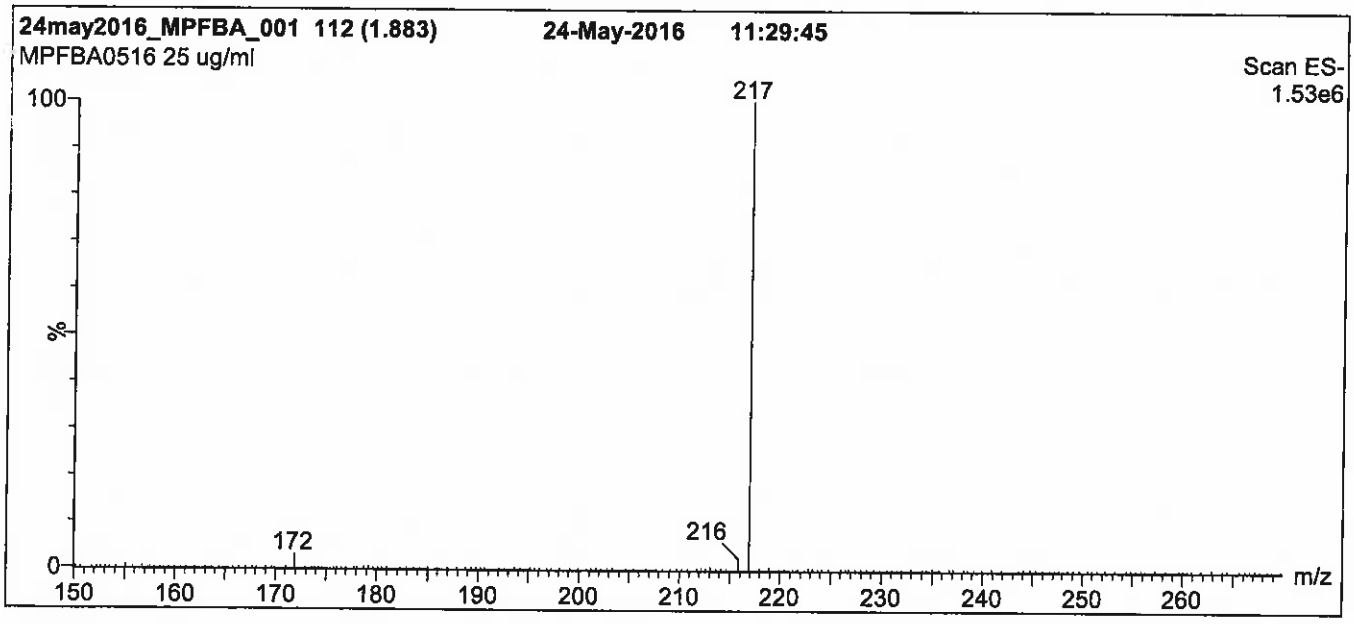
QUALITY MANAGEMENT:

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).

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

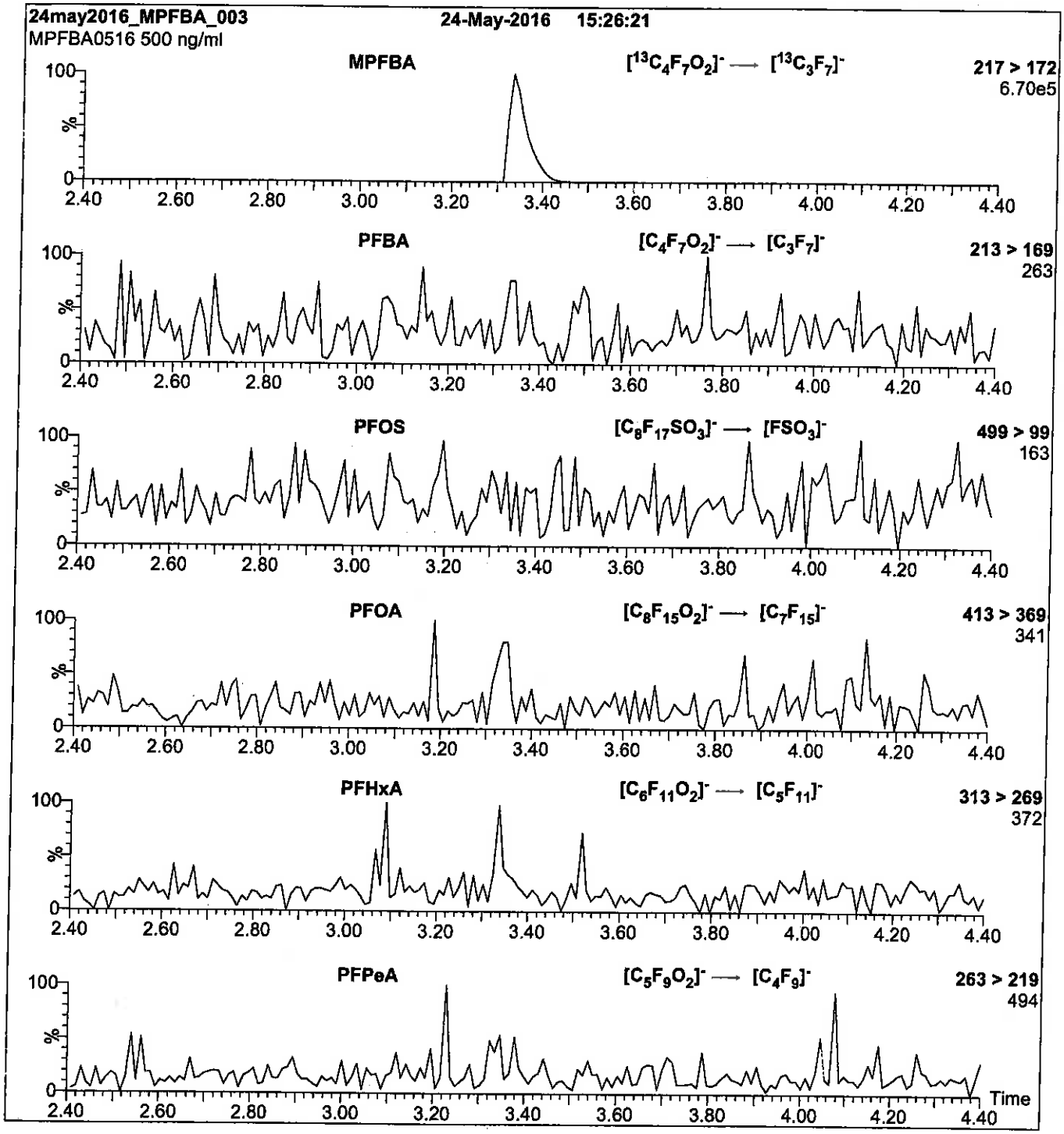
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop Injection 10 µl (500 ng/ml MPFBA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.50e-3 Collision Energy (eV) = 10
Flow:	300 µl/min	

Reagent

LCMPFDA_00011

Scanned 10/14/16 R: SBC 9/22/16

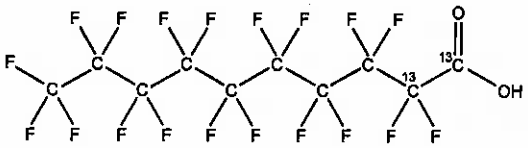
739609
ID: LCMPFDA_00011
Exp: 08/19/20 Prpd: SBC
13C2-Perfluorodecanoic a

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDA
LOT NUMBER: MPFDA0815
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_8HF_{19}O_2$
MOLECULAR WEIGHT: 516.07
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 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.
- Contains < 0.1% of $^{13}C_1$-PFNA.

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

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

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

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CALA Testing Accreditation Inc. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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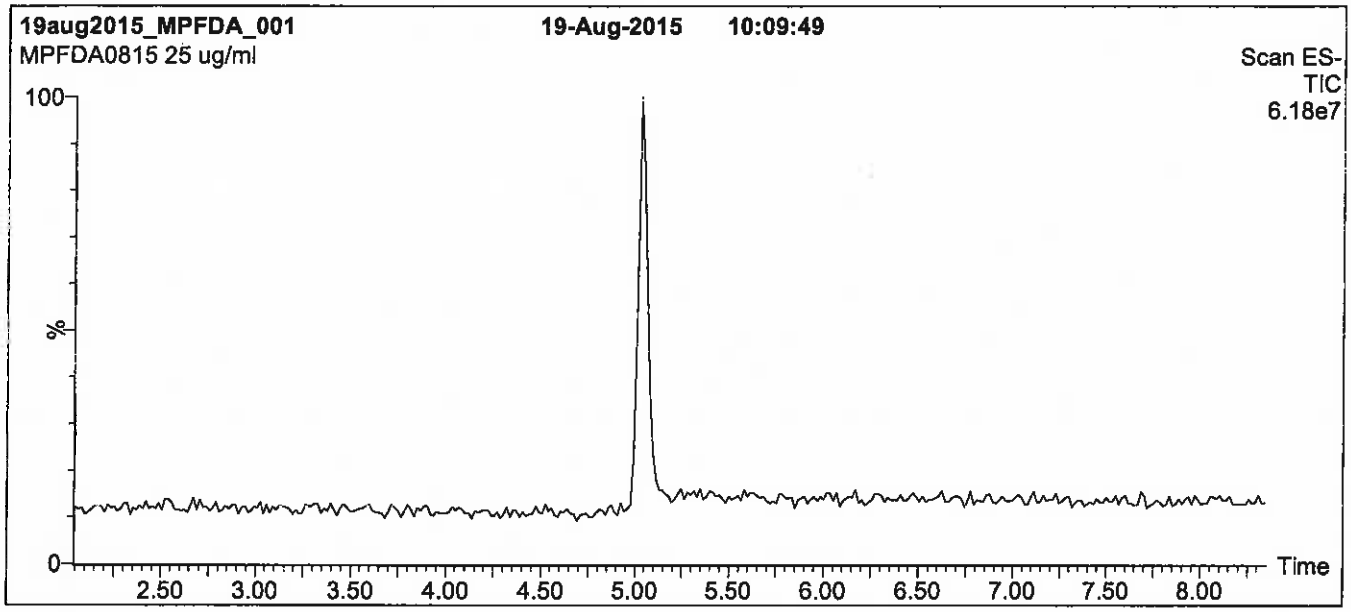
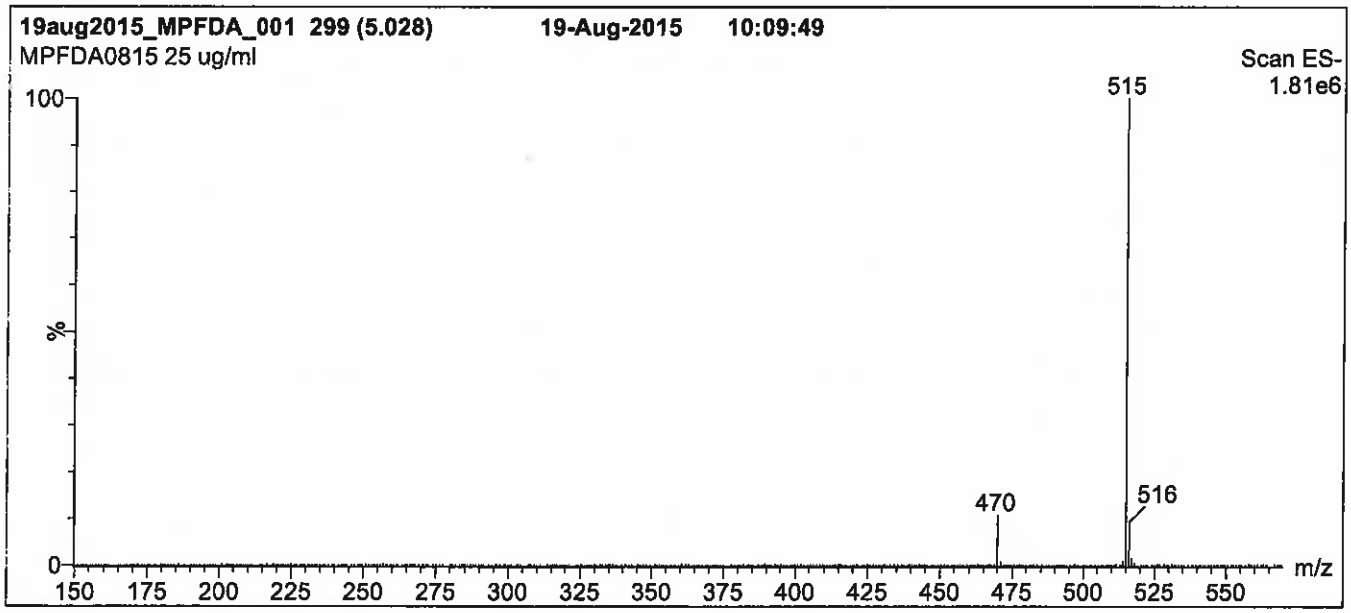




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

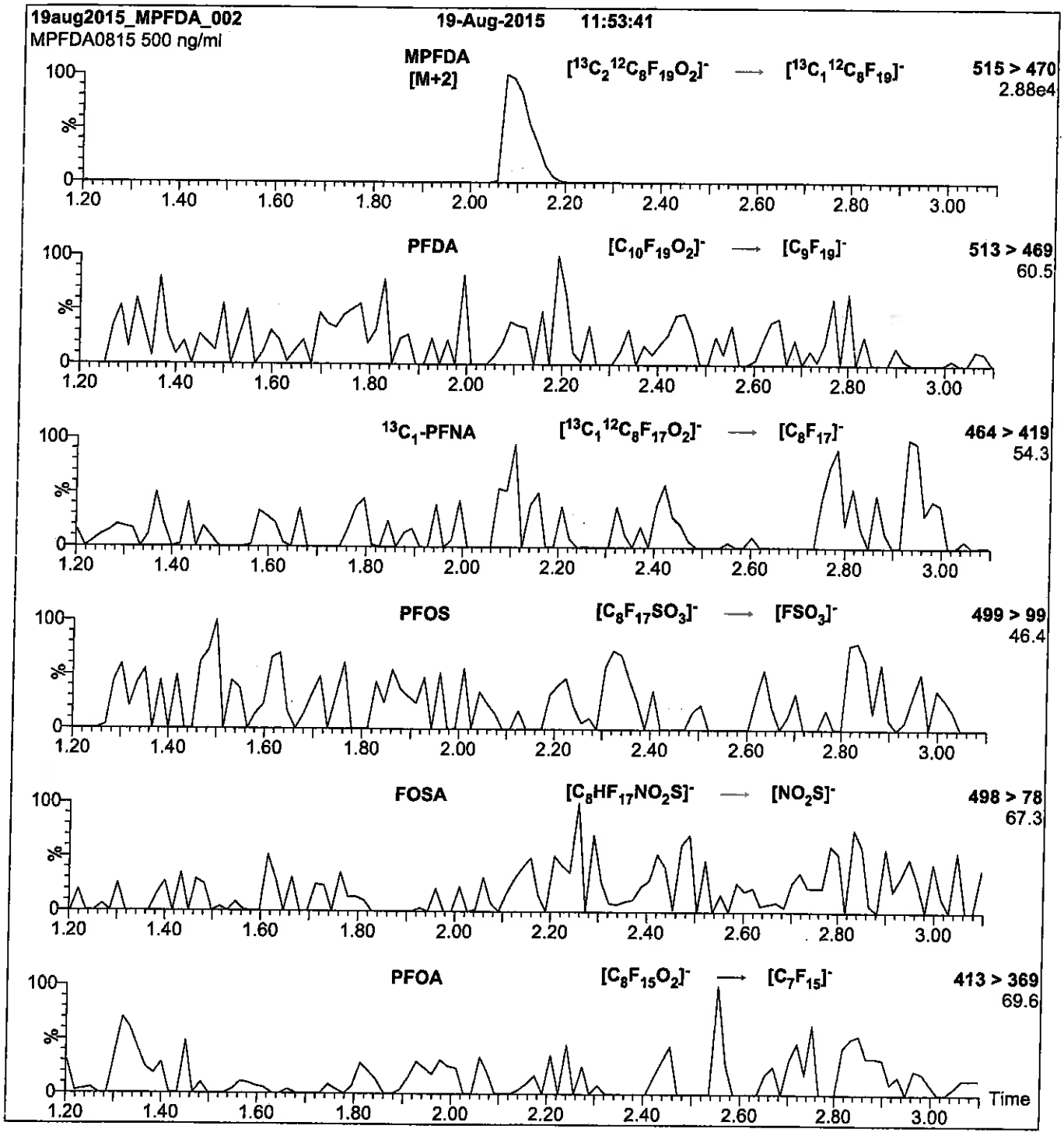
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 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)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.35e-3 Collision Energy (eV) = 13
Flow:	300 µl/min	

Reagent

LCMPFDoA_00008

R: SBC 9/22/16

739598
ID: LCMPFDoA_00008
Exp: 04/08/21 Prpd: SBC
13C2-Perfluorododecanoic

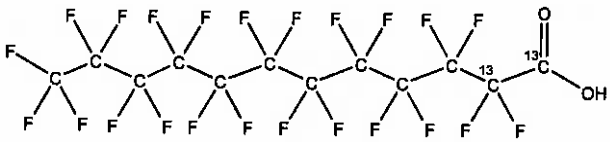
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16 SR

PRODUCT CODE: MPFDoA
LOT NUMBER: MPFDoA0416
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]dodecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_{10}HF_{23}O_2$
MOLECULAR WEIGHT: 616.08
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
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

INTENDED USE:

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HAZARDS:

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HOMOGENEITY:

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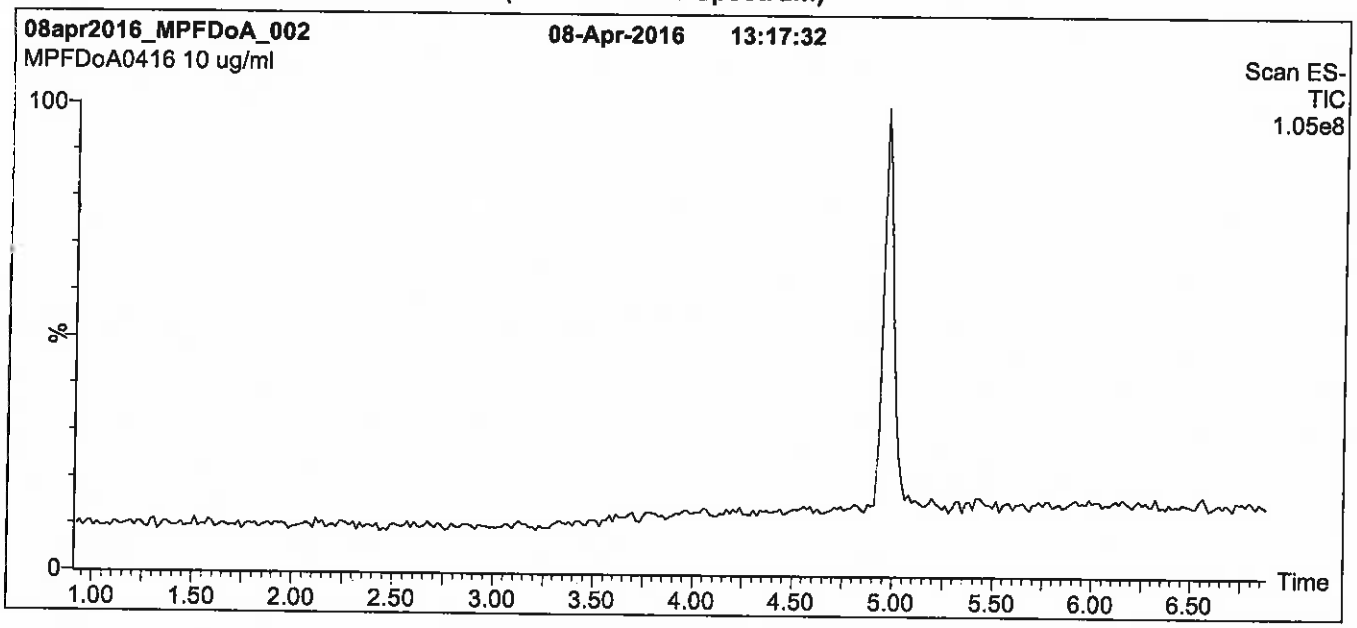
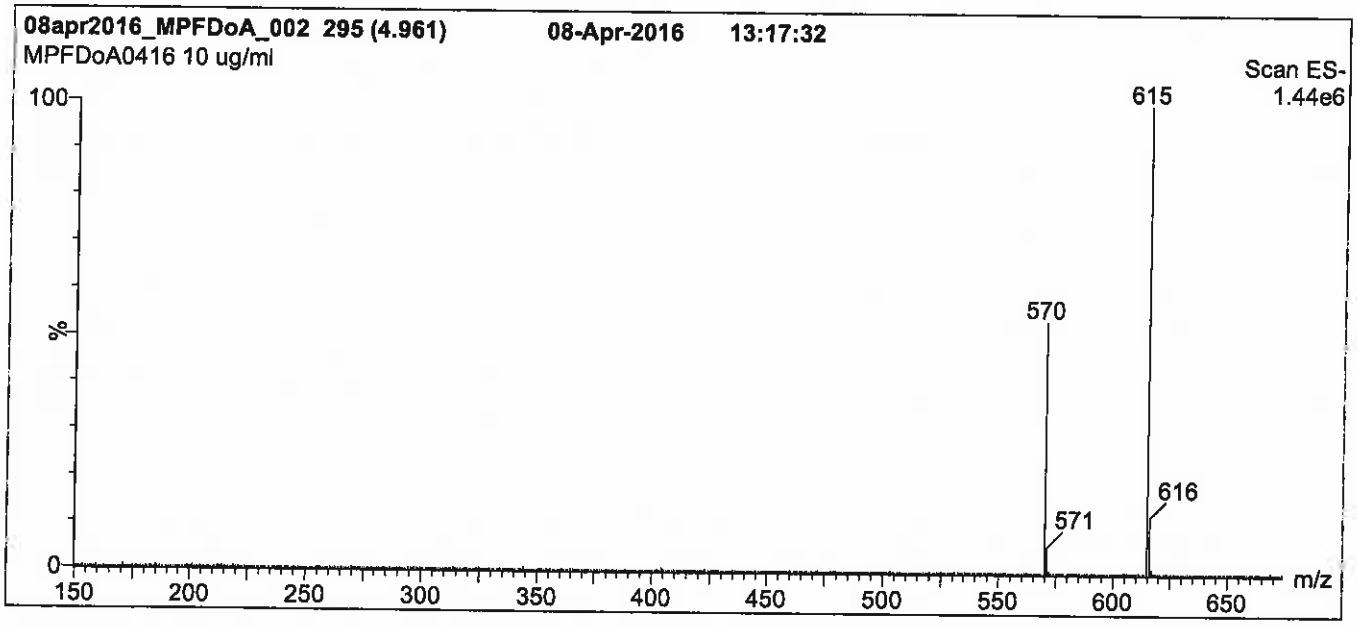
Figure 1: **MPFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

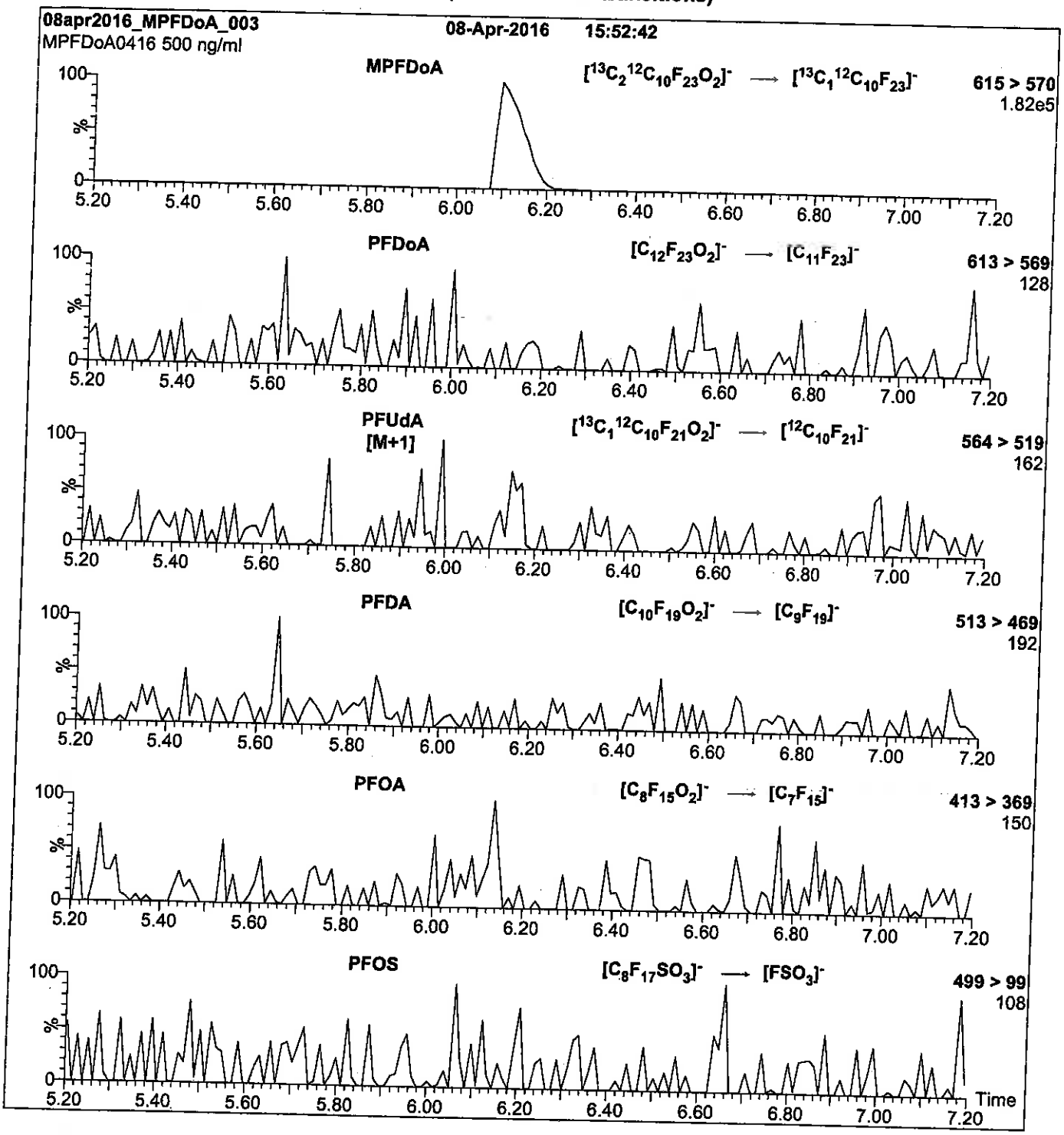
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCMPFHxA_00012

Scanned 10/14/16 SR R: SBC 9/22/16

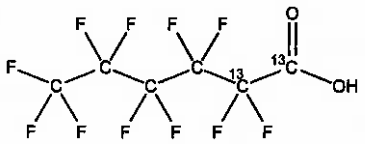
739612
ID: LCMPFHxA_00012
Exp: 04/08/21 Prpd: SBC
13C2-Perfluorohexanoic ac

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFHxA
LOT NUMBER: MPFHxA0416
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_4HF_{11}O_2$
MOLECULAR WEIGHT: 316.04
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 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.
- 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:** 04/29/2016 (mm/dd/yyyy)

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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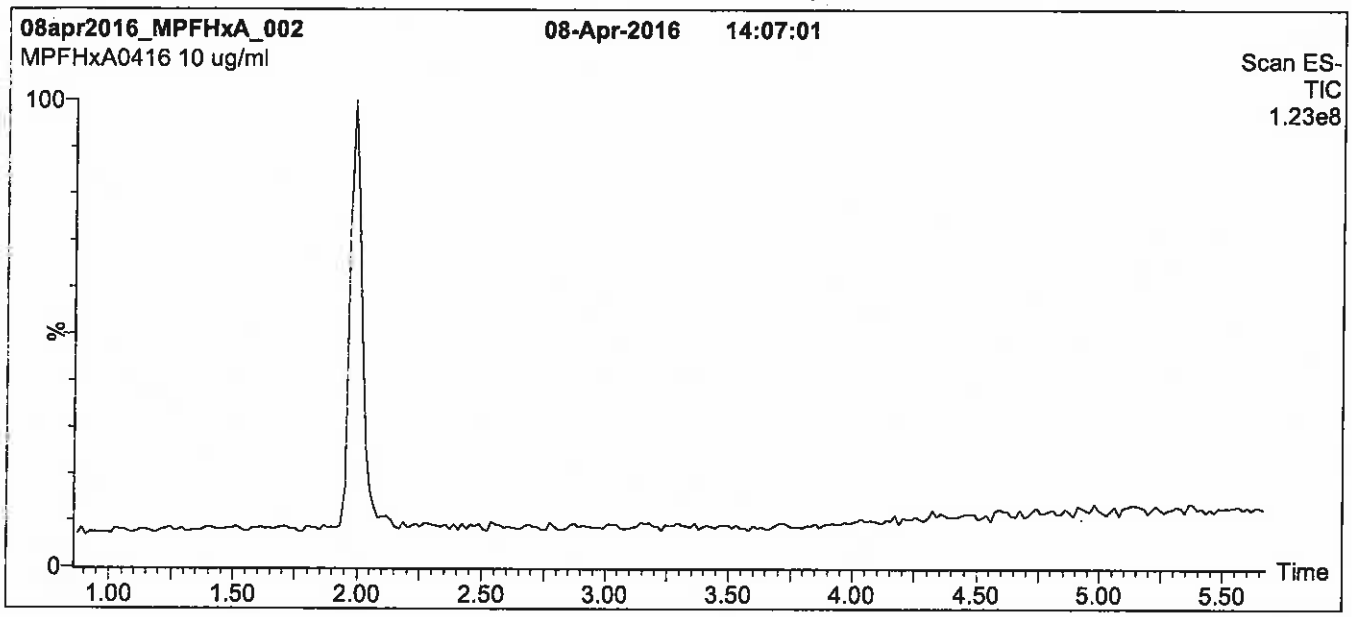
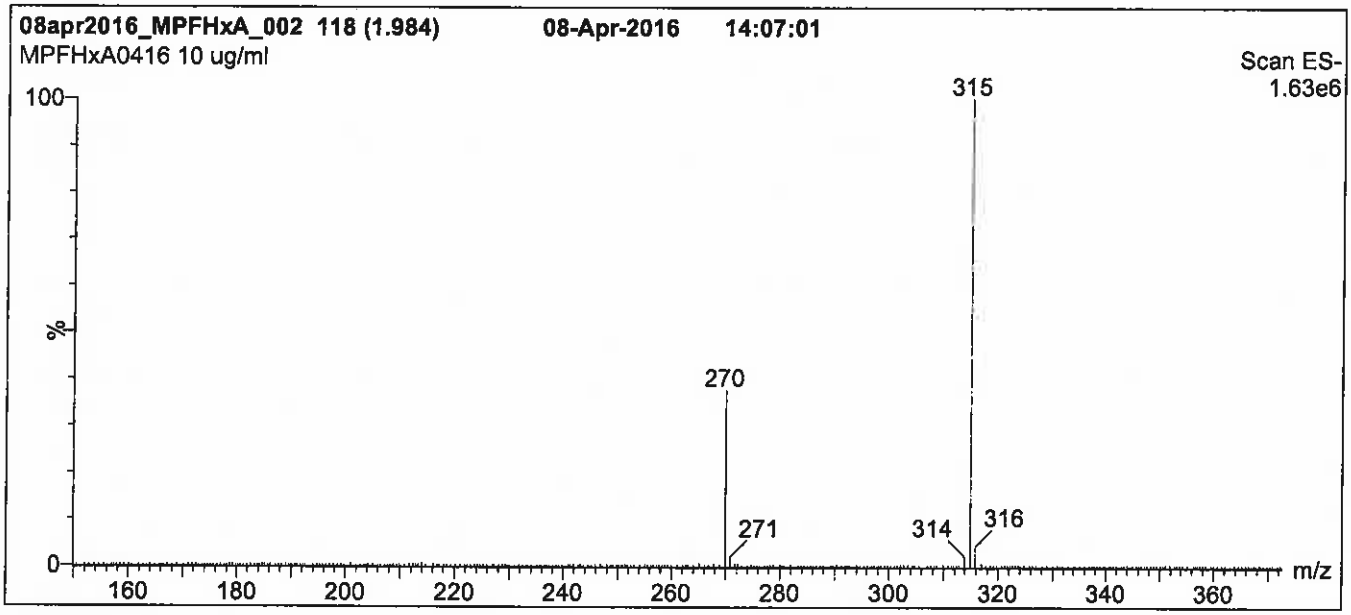
Figure 1: **MPFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

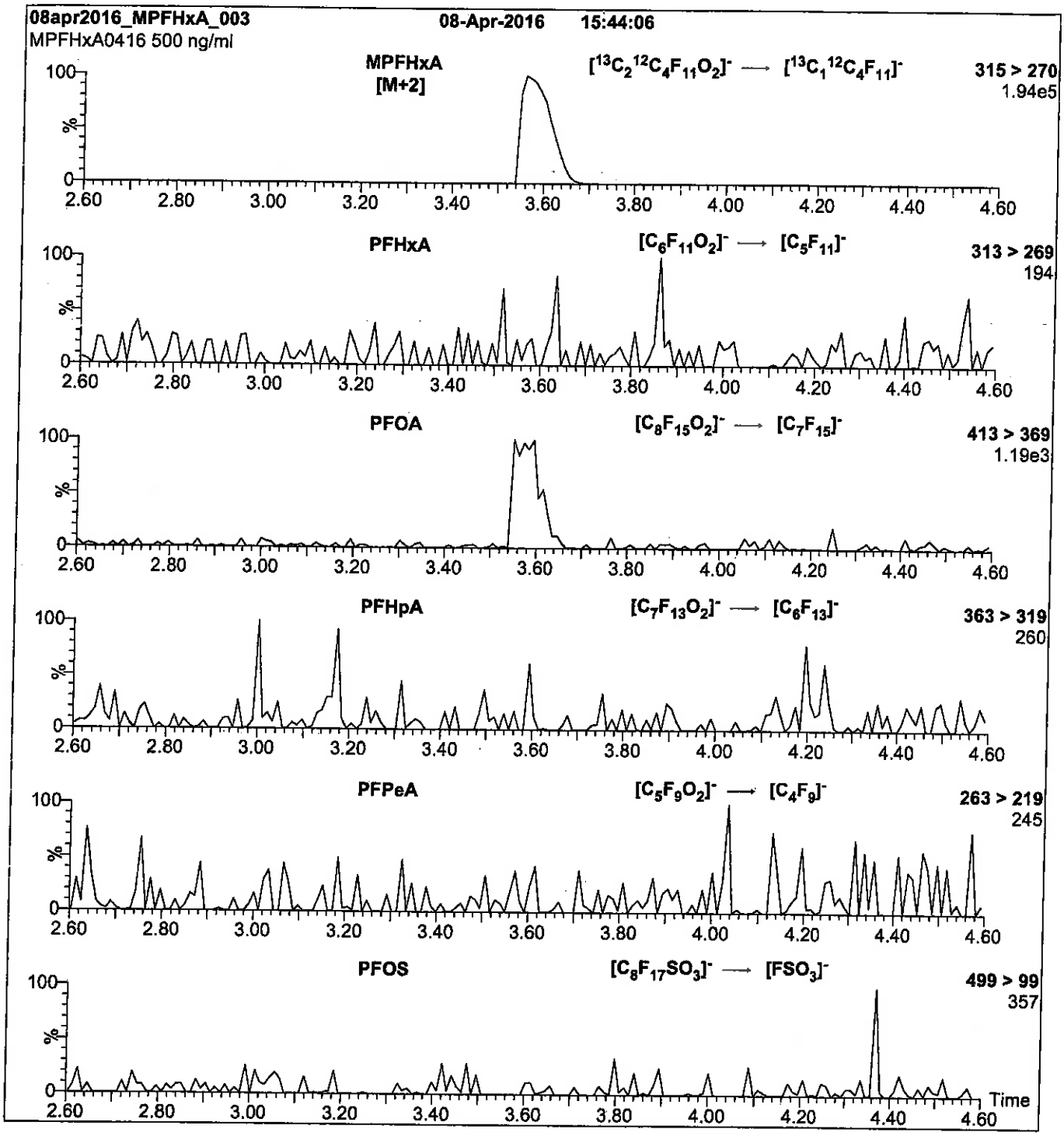
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 10
Flow:	300 µl/min	

Reagent

LCMPFHxS_00008

R: SBC 9/22/16

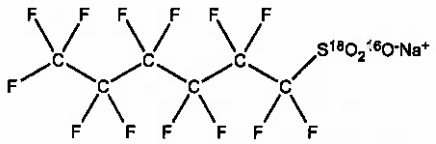
739601
ID: LCMPFHxS_00008
Exp: 10/23/20 Prpd: SBC
18O2-Perfluorohexanesulfo

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16 SR

PRODUCT CODE:	MPFHxS	**LOT NUMBER:**	MPFHxS1015
COMPOUND:	Sodium perfluoro-1-hexane[$^{18}O_2$]sulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_6F_{13}S^{18}O_2{}^{16}ONa$	**MOLECULAR WEIGHT:**	426.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.3 ± 2.4 µg/ml (MPFHxS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	>94% ($^{18}O_2$)
LAST TESTED: (mm/dd/yyyy)	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.
- The response factor for MPFHxS ($C_6F_{13}S^{18}O_2{}^{16}O^-$) has been observed to be up to 10% lower than for PFHxS ($C_6F_{13}S^{16}O_3^-$) when both compounds are injected together. This difference may vary between instruments.
- Due to the isotopic purity of the starting material ($^{18}O_2$ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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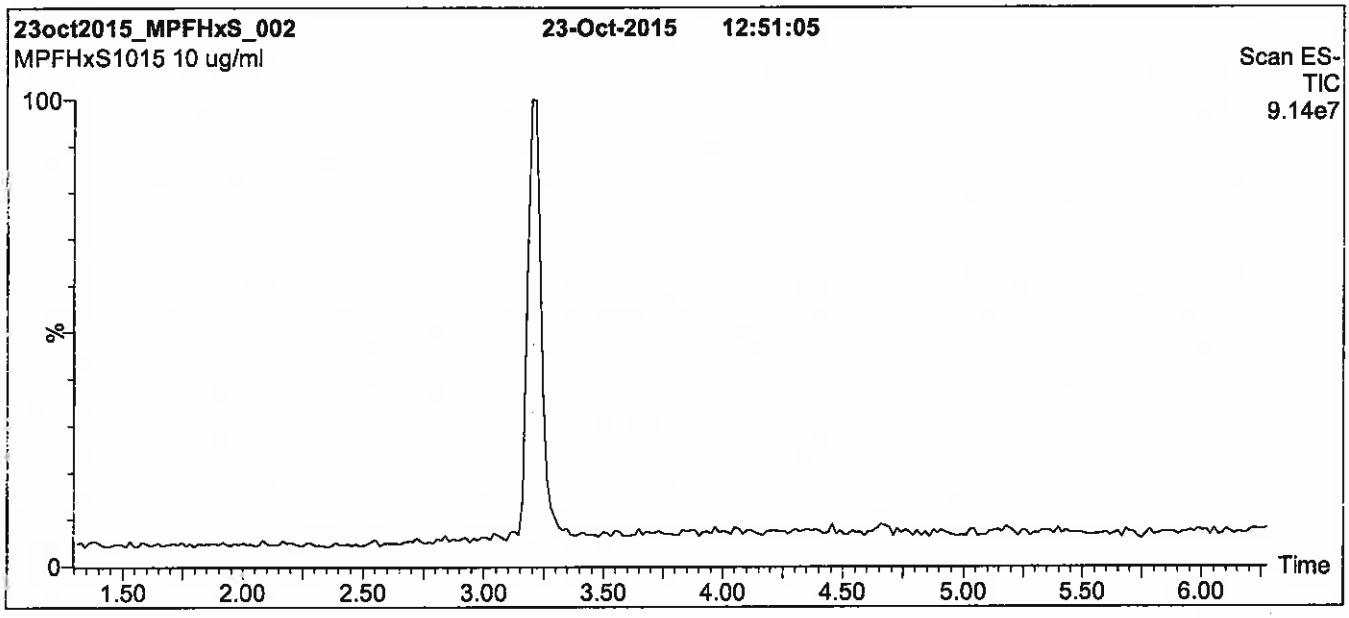
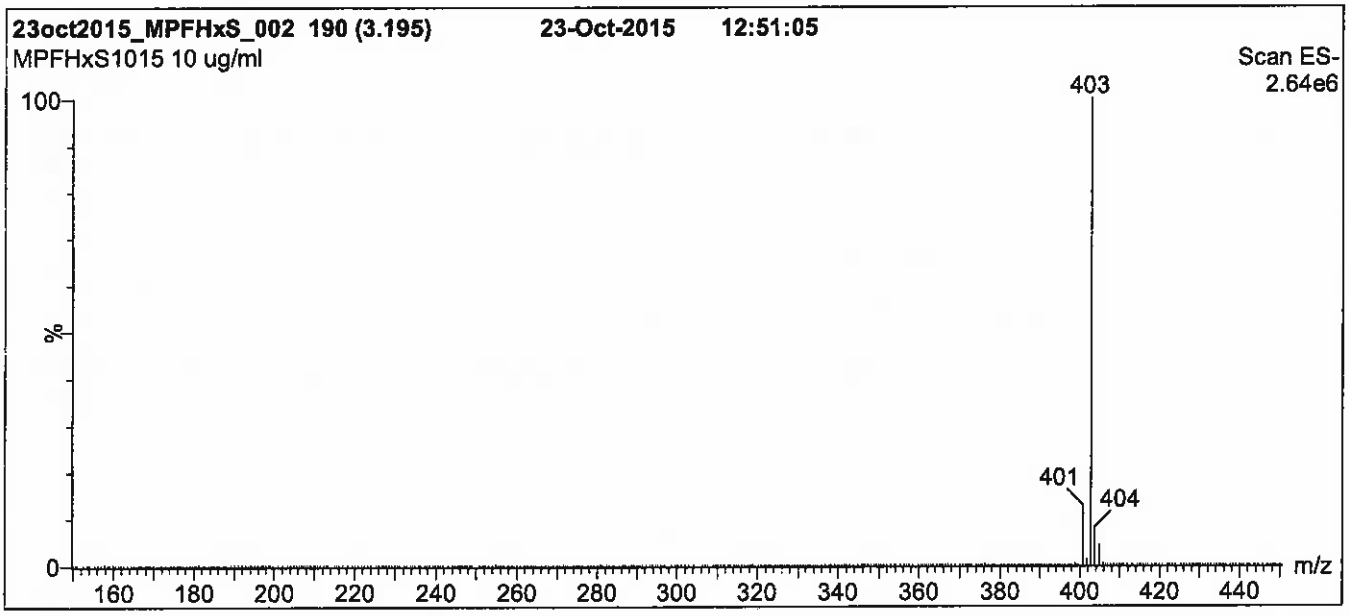




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

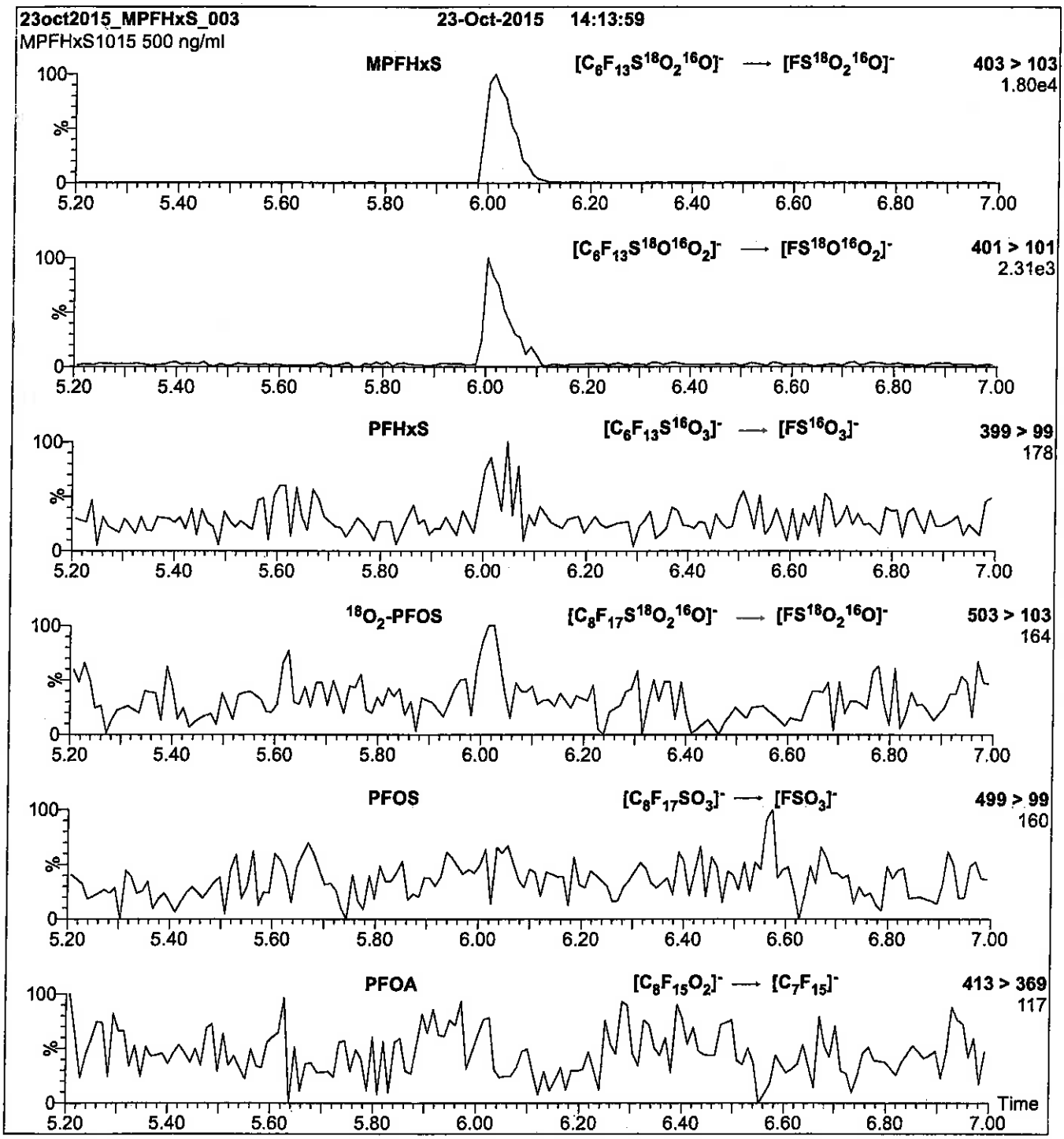
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFNA_00008

Scanned 10/14/16 R: SBC 9/22/16

739637
ID: LCMPFNA_00008
Exp: 04/13/19 Prpd: SBC
13C5-Perfluorononanoic aci

WELLINGTON LABORATORIES

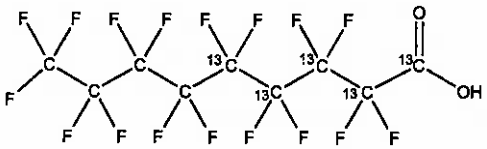
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFNA0414

STRUCTURE:

CAS #: Not available



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

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/13/2014
EXPIRY DATE: (mm/dd/yyyy) 04/13/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/01/2015 (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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SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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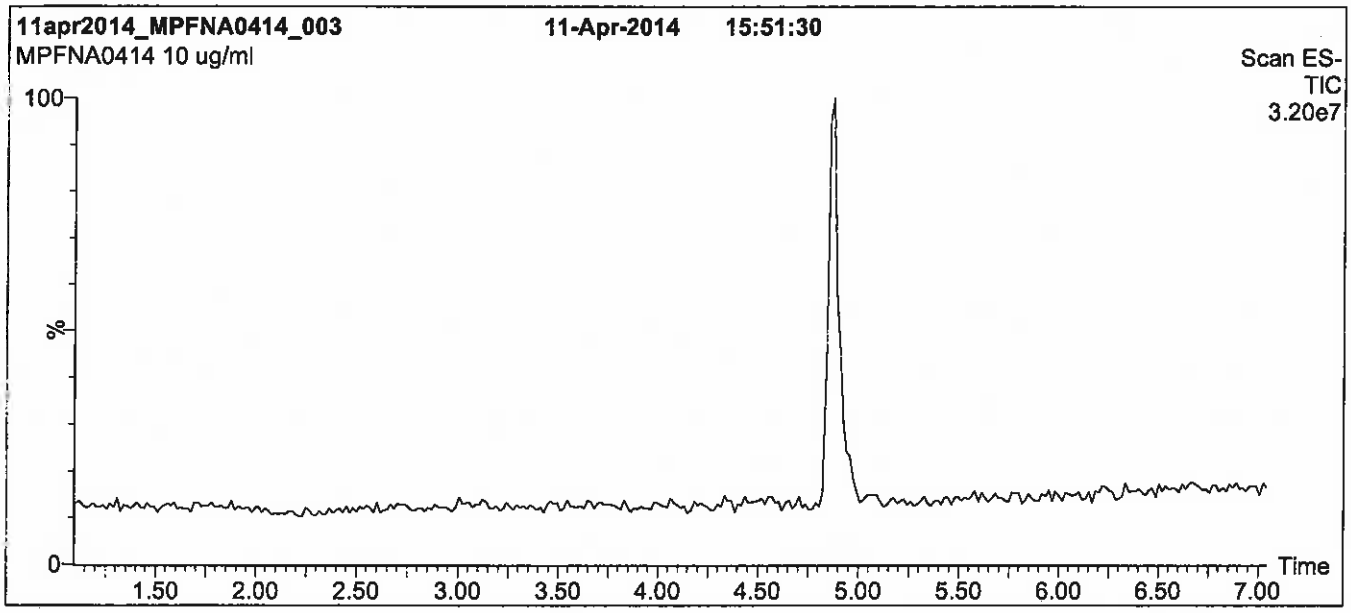
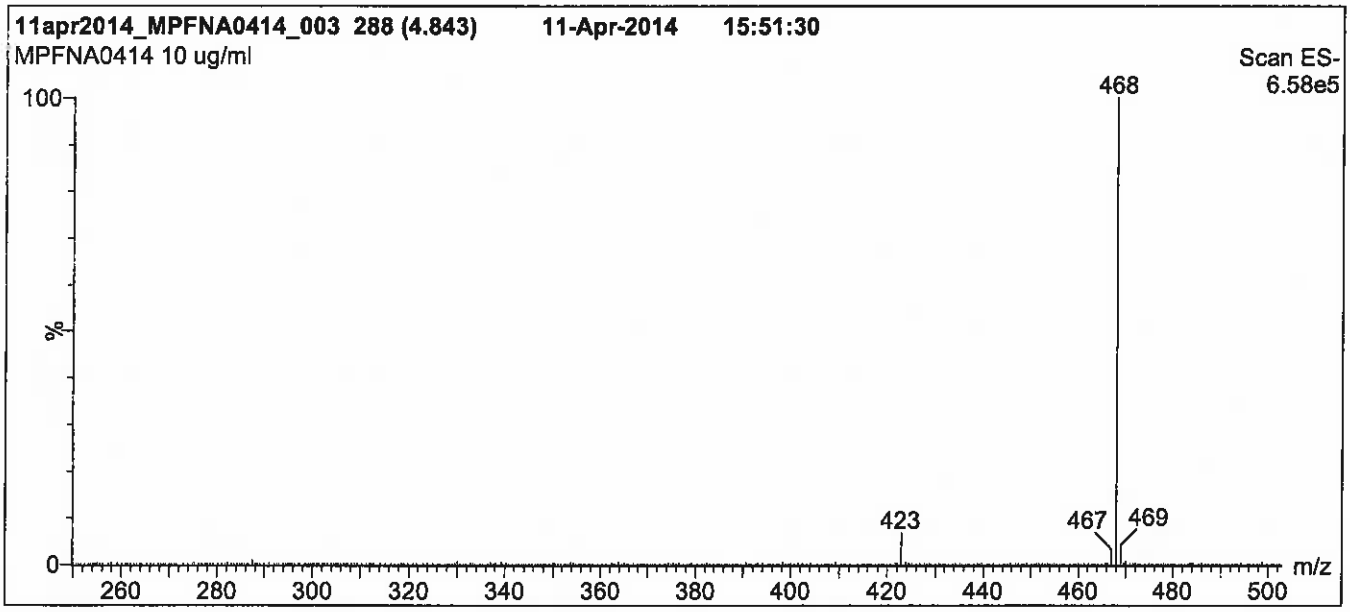
Figure 1: **MPFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

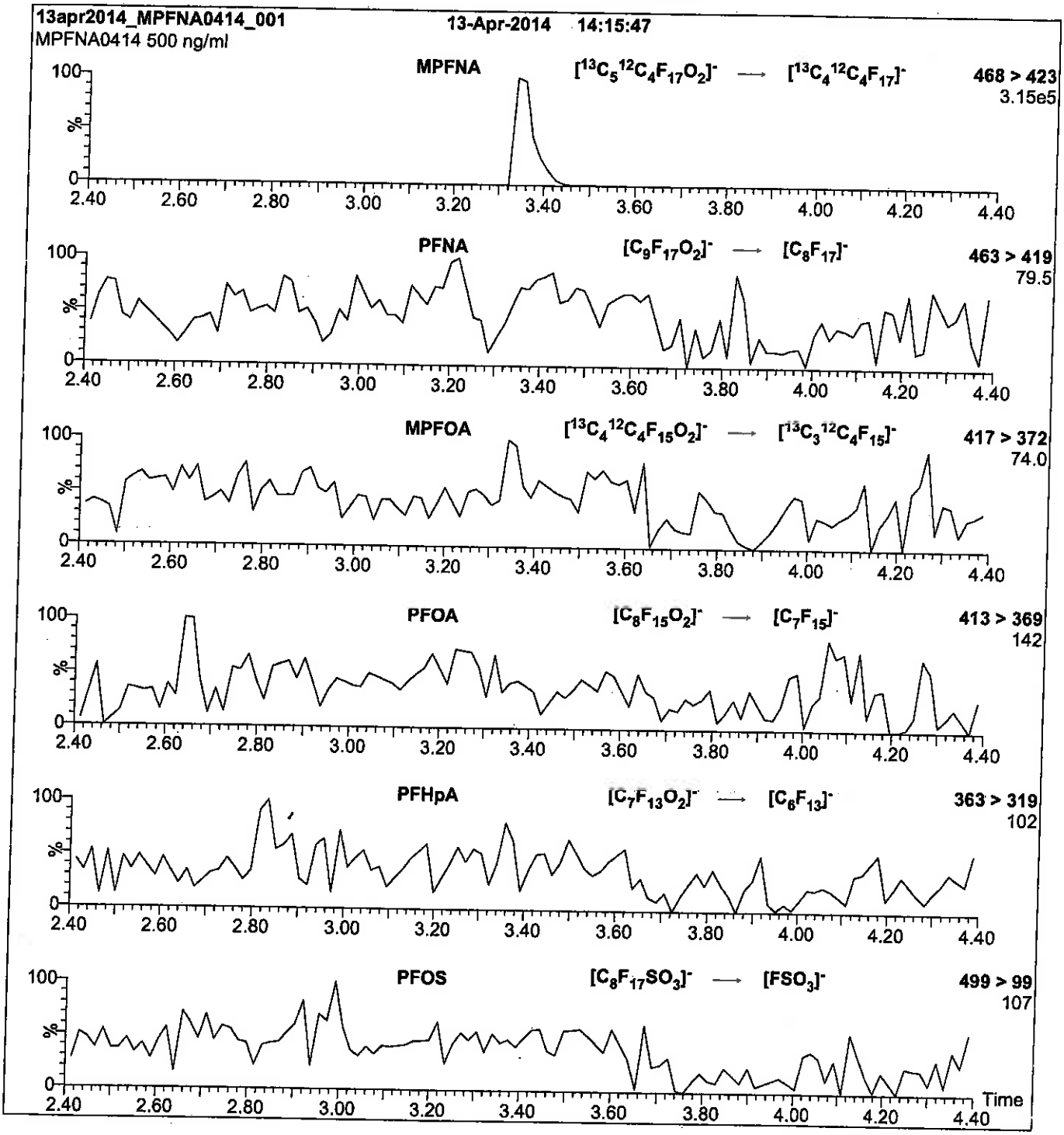
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCMPFOA_00012

R: SBC 9/22/16

738683
ID: LCMPFOA_00012
Exp: 01/22/21 Prpd: SBC
13C4-Perfluorooctanoic ac

WELLINGTON LABORATORIES

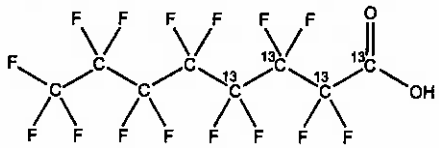
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFOA0116

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_4HF_{15}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

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

MOLECULAR WEIGHT: 418.04
SOLVENT(S): Methanol
Water (<1%)

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- 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:** 02/01/2016 (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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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17025 REFERENCE MATERIAL PRODUCER

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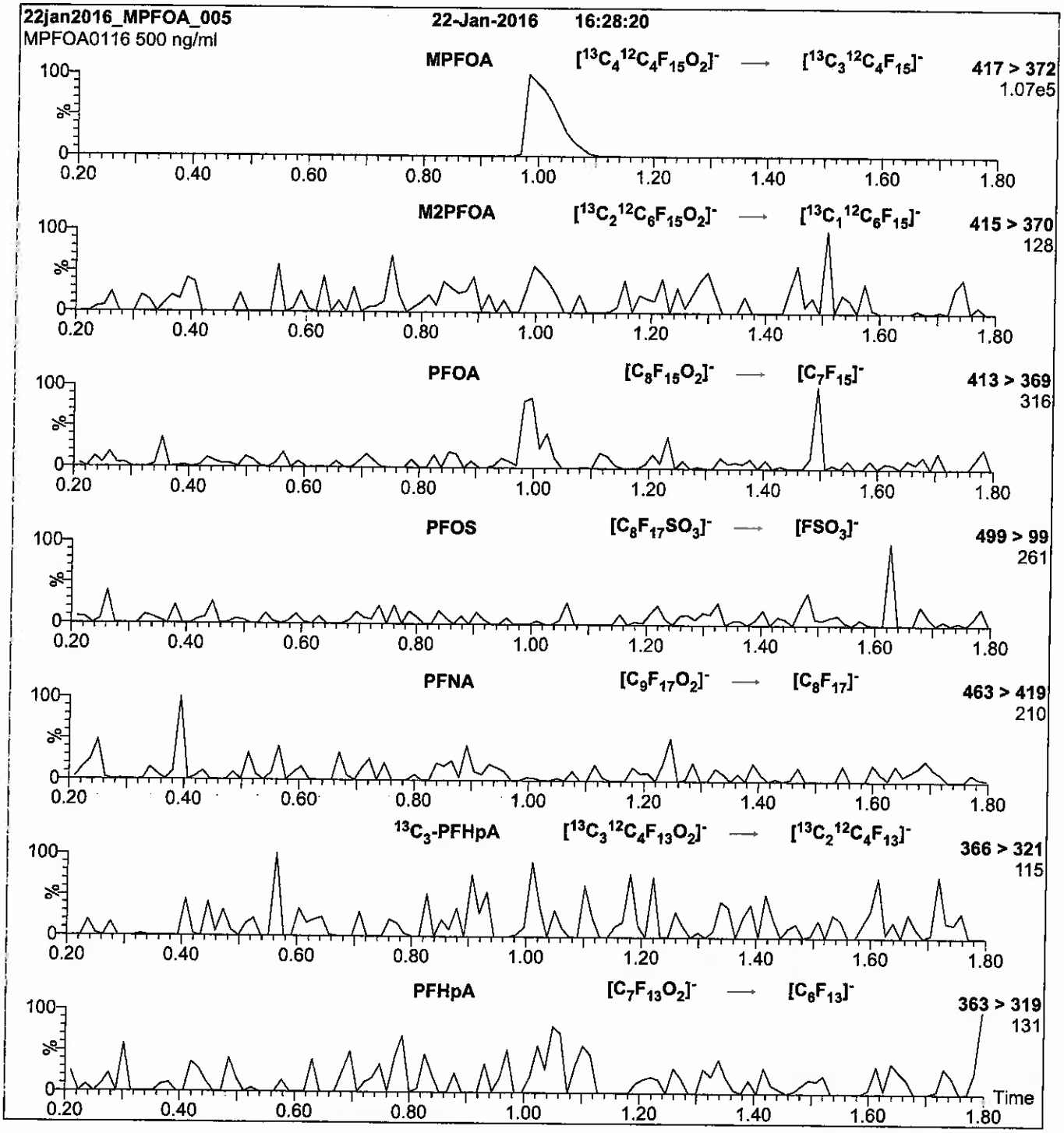
Figure 2: **MPFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

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

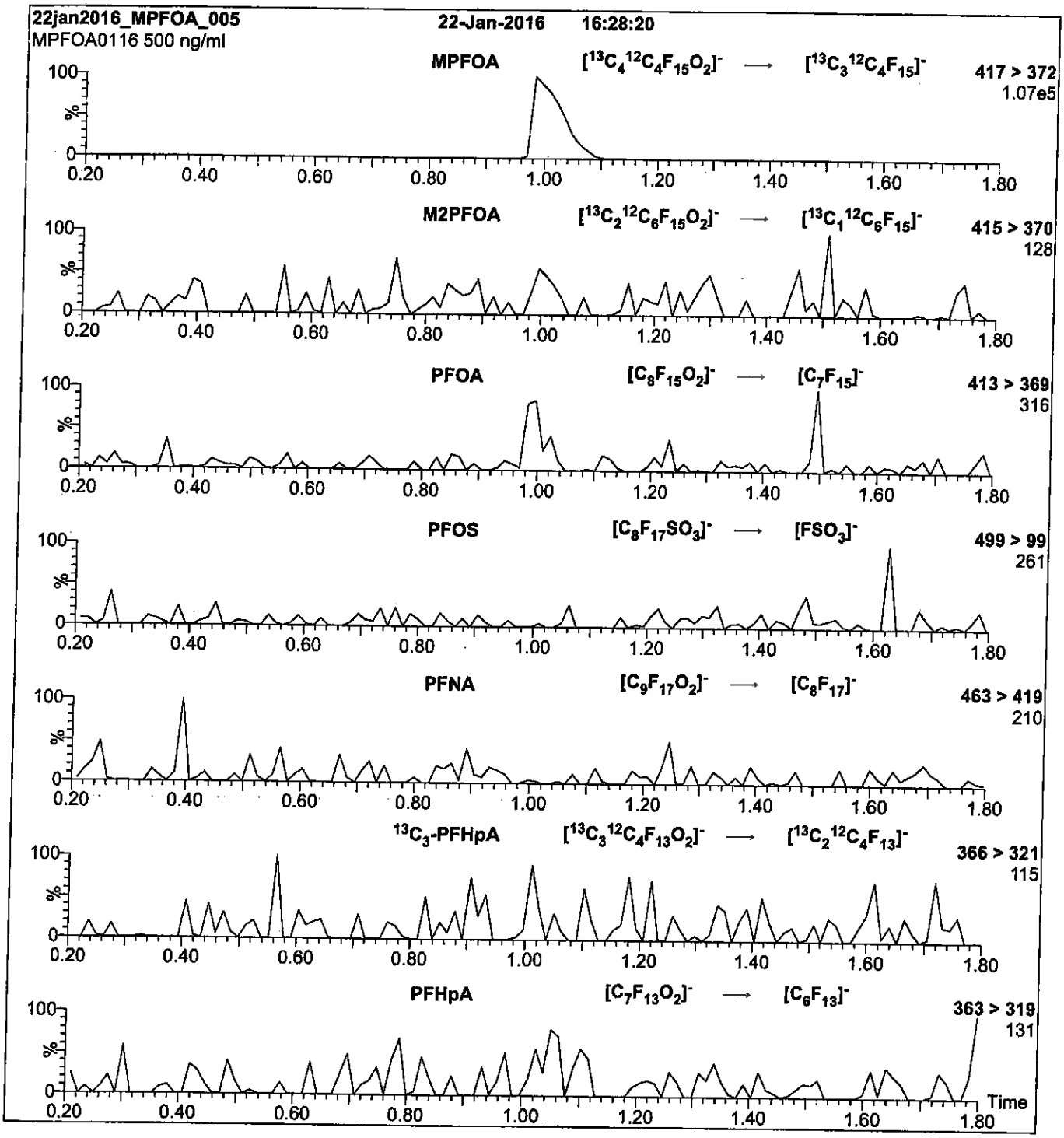
Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFOA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.58e-3 Collision Energy (eV) = 10
Flow:	300 µl/min	

Reagent

LCMPFOS_00017

R: 9/9/16 SBC

728309
ID: LCMPFOS_00017
Exp: 08/03/21 Prpd: SBC
13C4-Perfluorooctanesulfo

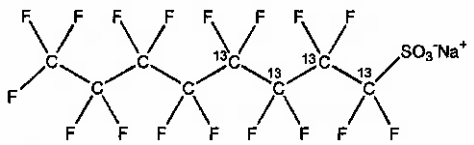
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0816

COMPOUND: Sodium perfluoro-1-[1,2,3,4-$^{13}C_4$]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_4F_{17}SO_3Na$ **MOLECULAR WEIGHT:** 526.08

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol

47.8 ± 2.4 µg/ml (MPFOS anion)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)

LAST TESTED: (mm/dd/yyyy) 08/03/2016

EXPIRY DATE: (mm/dd/yyyy) 08/03/2021

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-$^{13}C_3$]heptanesulfonate.

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

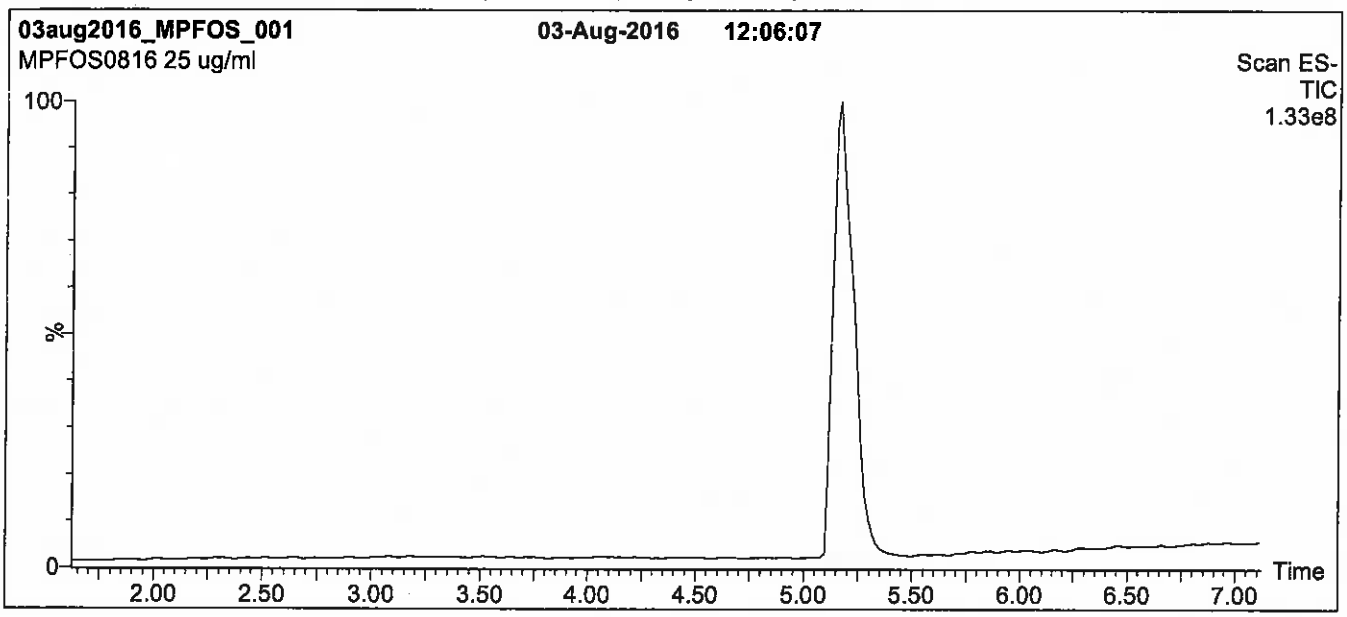
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

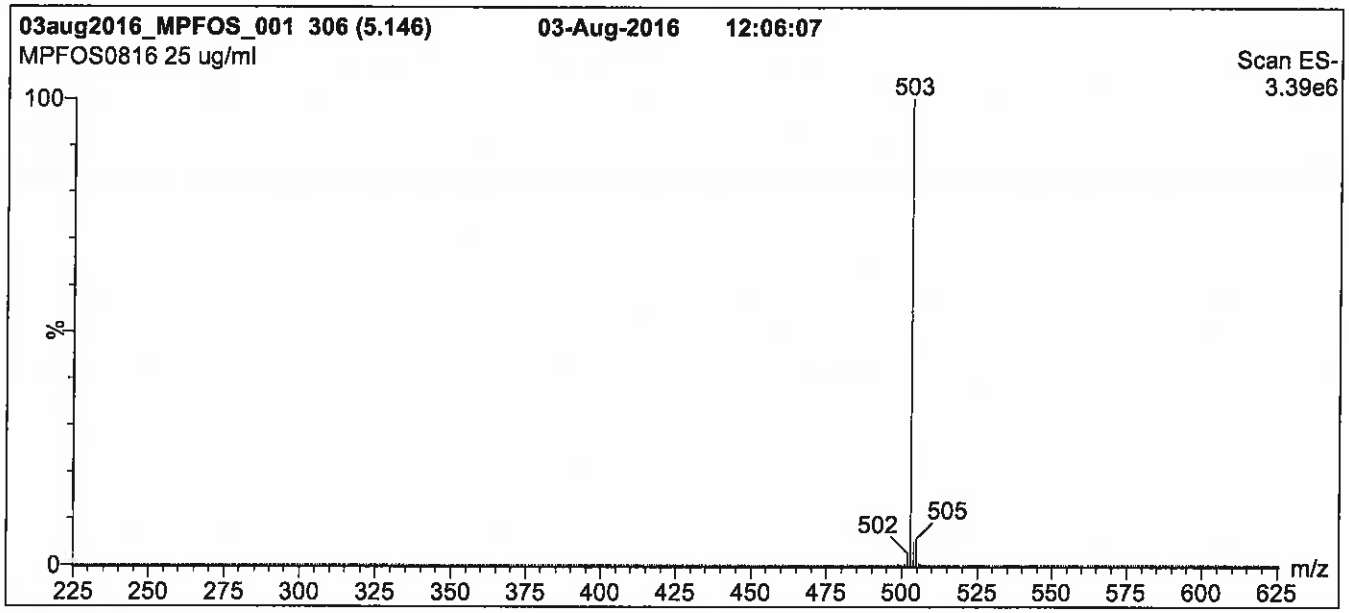
CALA

ANAB ACCREDITED

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

Figure 1: **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 RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

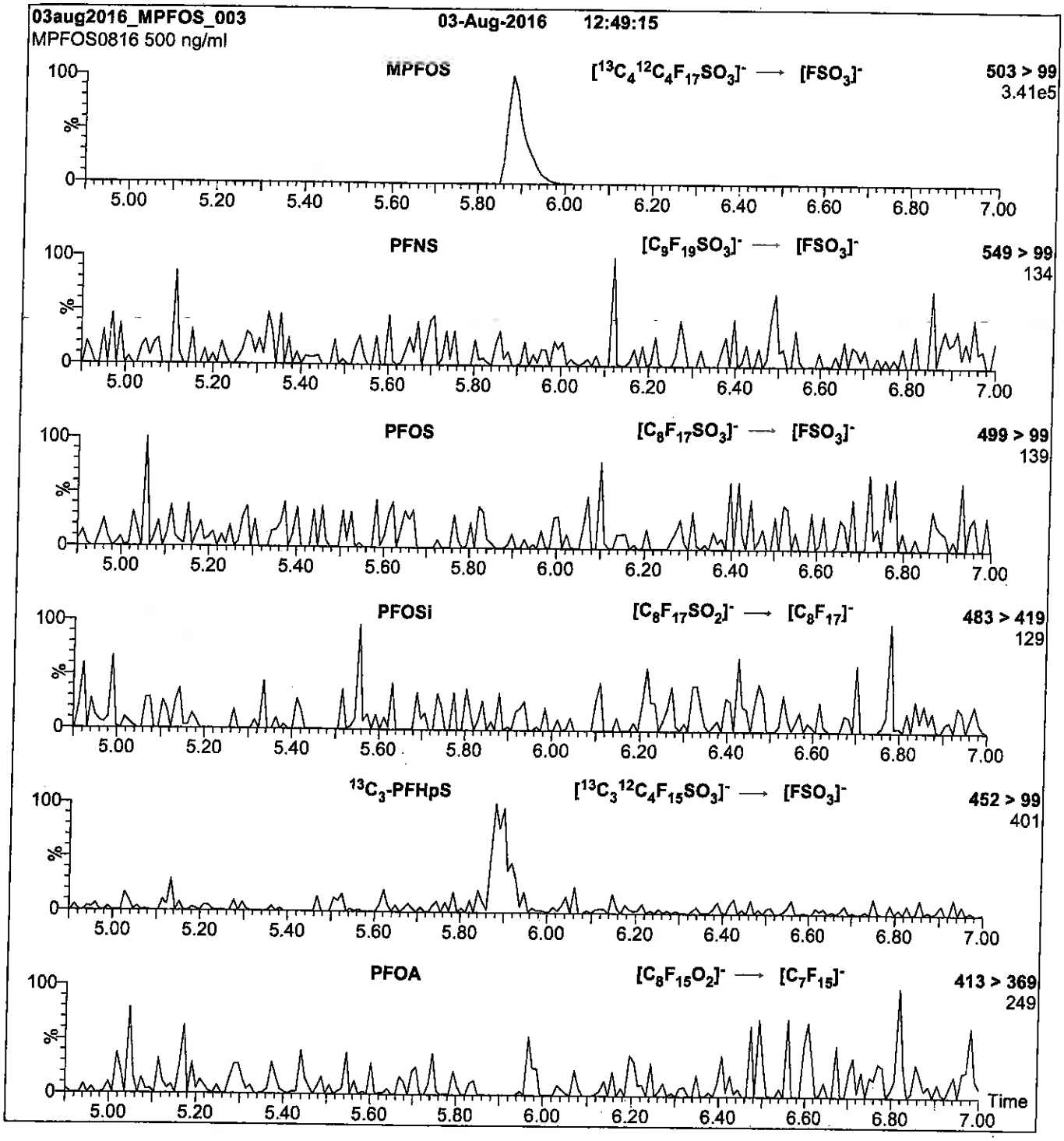
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 40

Reagent

LCMPFUdA_00009

R: SBC 9/22/16

739604
ID: LCMPFUdA_00009
Exp: 02/12/21 Prpd: SBC
13C2-Perfluoroundecanoic

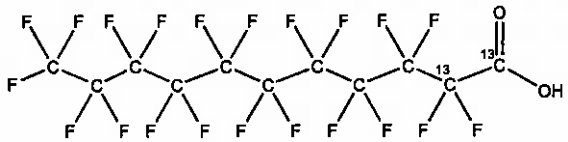
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16 SBC

PRODUCT CODE: MPFUdA
LOT NUMBER: MPFUdA0216
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]undecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_9HF_{21}O_2$
MOLECULAR WEIGHT: 566.08
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 02/12/2016
EXPIRY DATE: (mm/dd/yyyy) 02/12/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Presence of 1-$^{13}C_1$-PFUdA (~1%; see Figure 2), 2-$^{13}C_1$-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ^{13}C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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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:

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

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

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

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TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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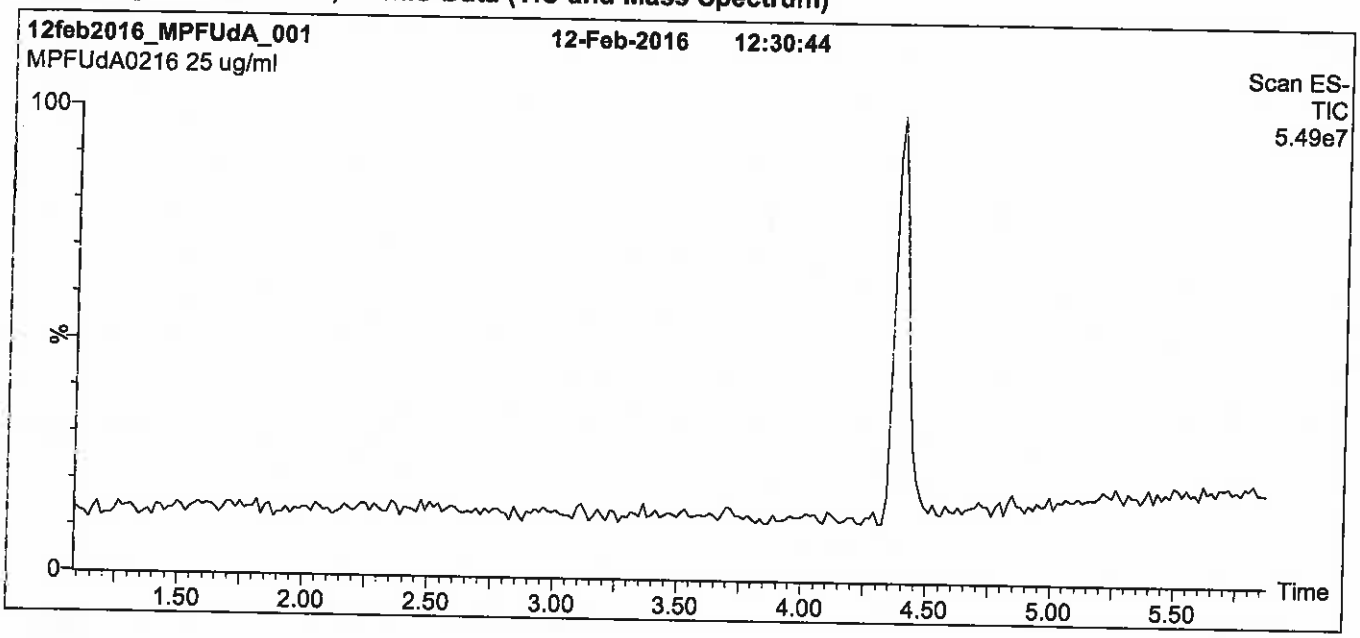
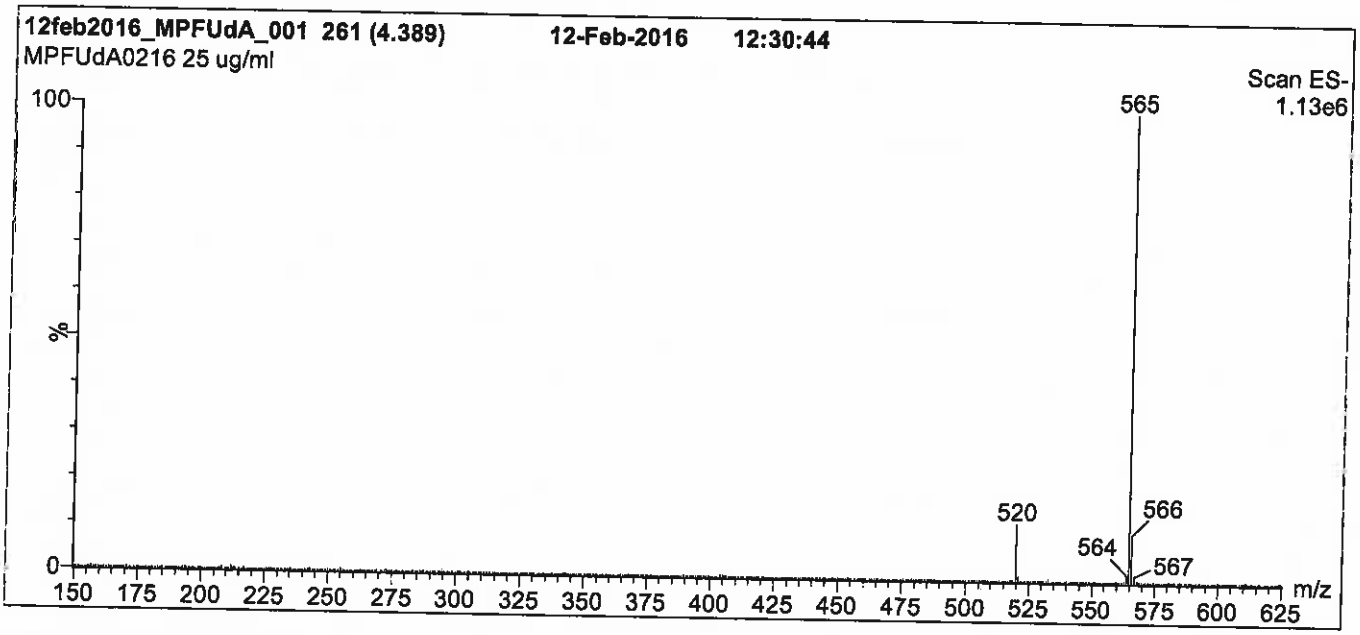
CALA testing

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

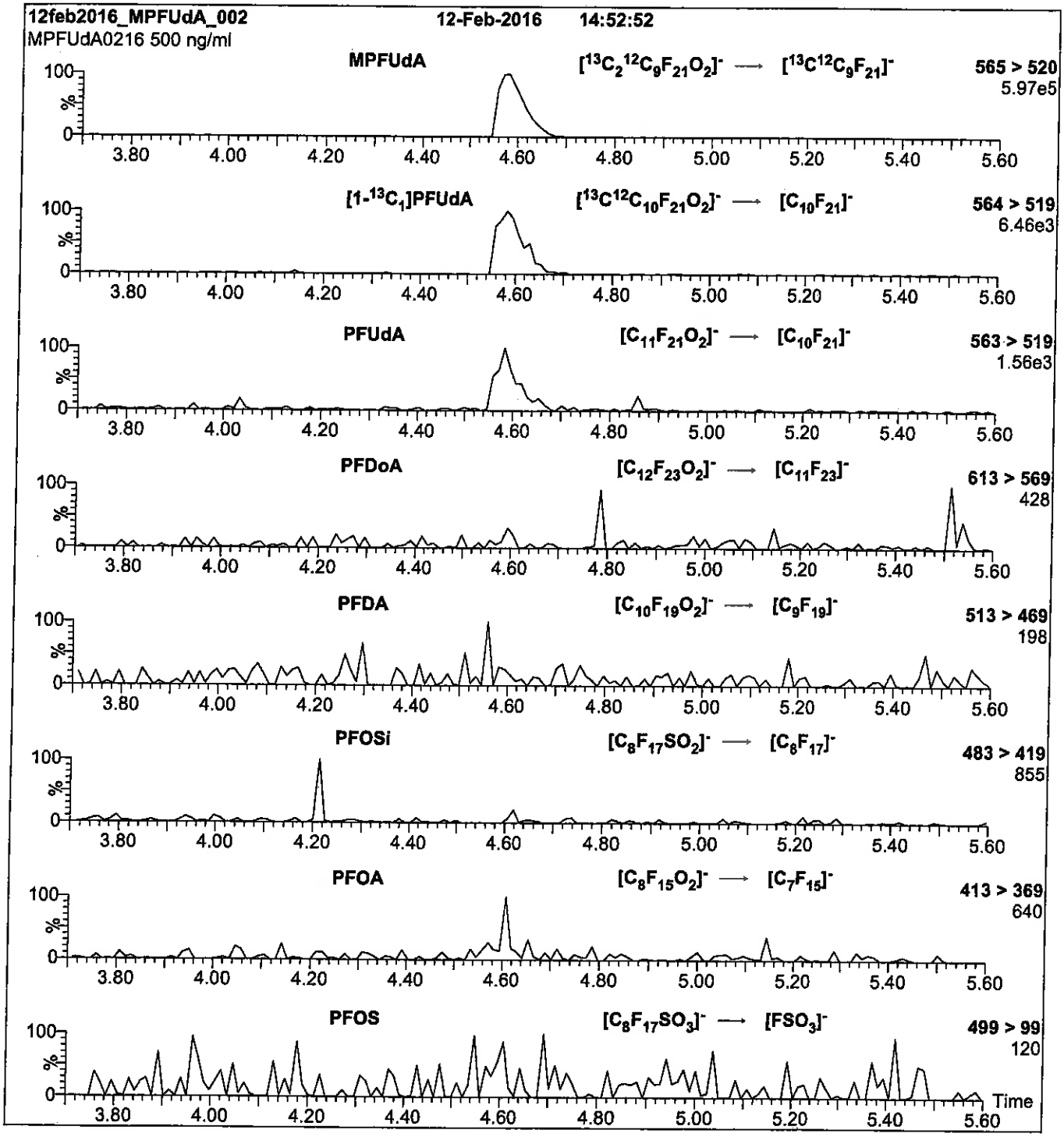
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% MeOH / 20% H_2O

Flow: 300 µl/min

MS Parameters

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

Reagent

LCN-EtFOSA-M_00002

r: 7/16/15 SW

WELLINGTON LABORATORIES

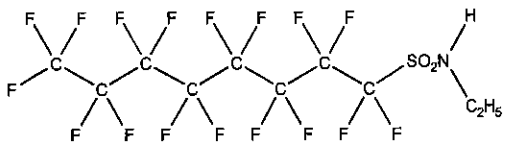
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-EtFOSA-M
COMPOUND: N-ethylperfluoro-1-octanesulfonamide

LOT NUMBER: NEtFOSA0714M

STRUCTURE:

CAS #: 4151-50-2



MOLECULAR FORMULA: $C_{10}H_6F_{17}NO_2S$
MOLECULAR WEIGHT: 527.20
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/14/2014
EXPIRY DATE: (mm/dd/yyyy) 07/14/2019
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:** 04/01/2015 (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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where x is expressed as a relative standard uncertainty of the individual parameter.

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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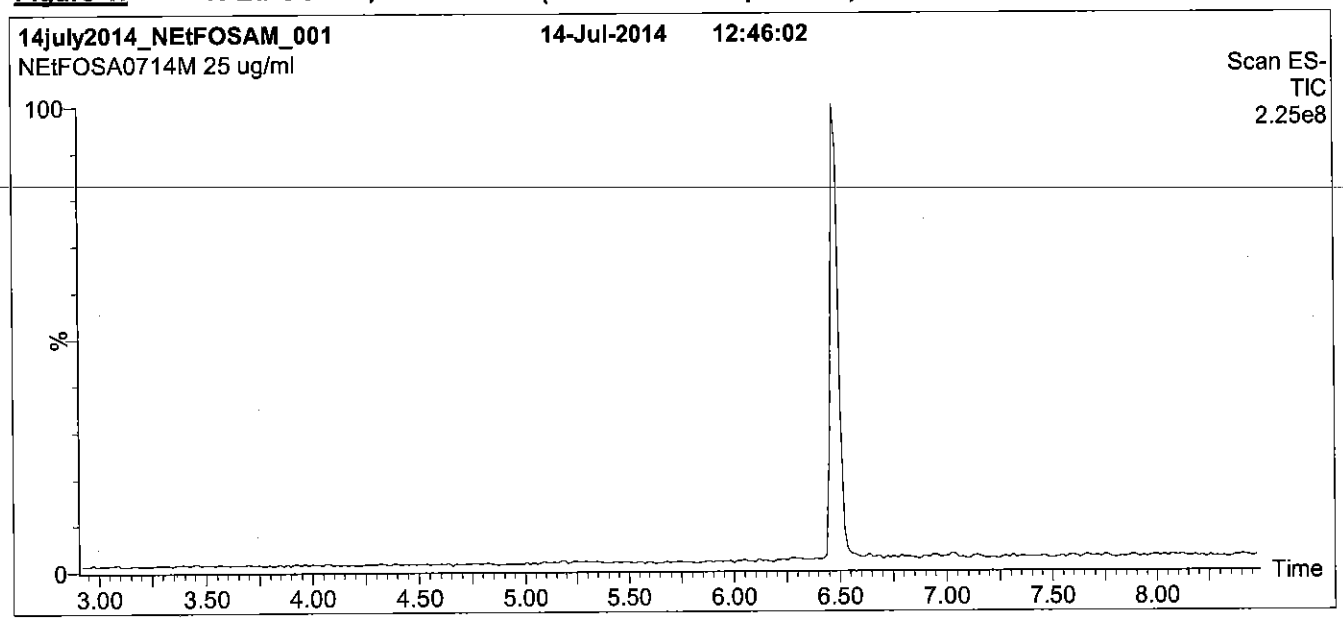
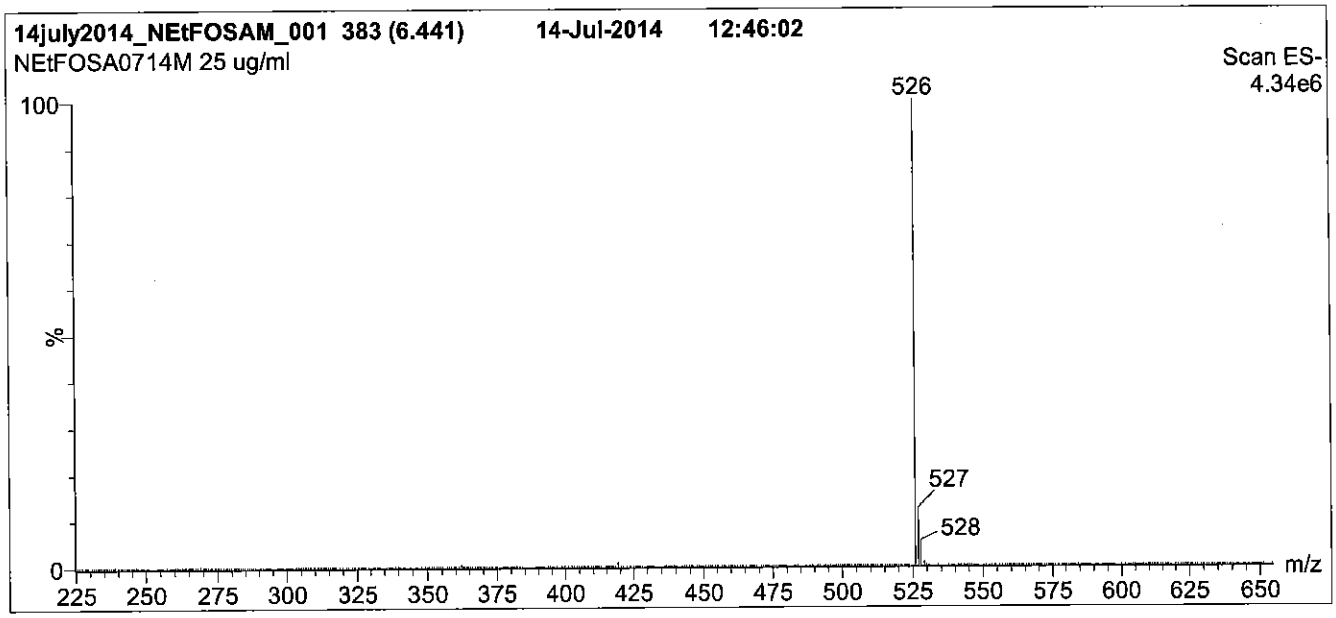
CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

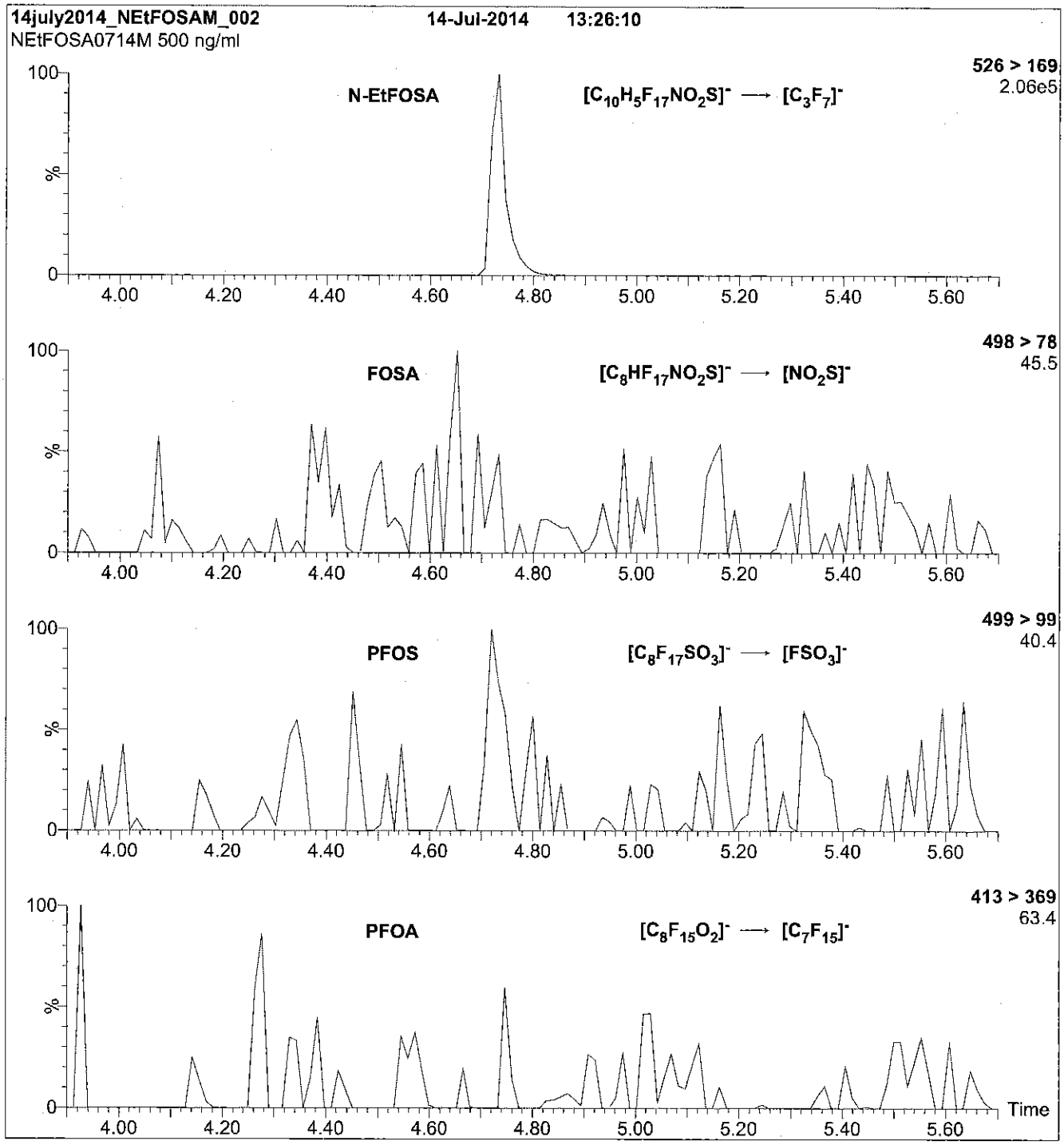
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCN-EtFOSA-M_00003

R: 8/23/16 SBC

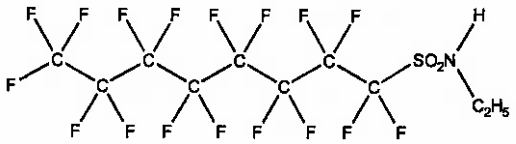
715563
ID: LCN-EtFOSA-M_00003
Exp: 05/24/21 Prpd: SBC
N-EtFOSA-M

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: $C_{10}H_8F_{17}NO_2S$
MOLECULAR WEIGHT: 527.20
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/24/2016
EXPIRY DATE: (mm/dd/yyyy) 05/24/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/27/2016 (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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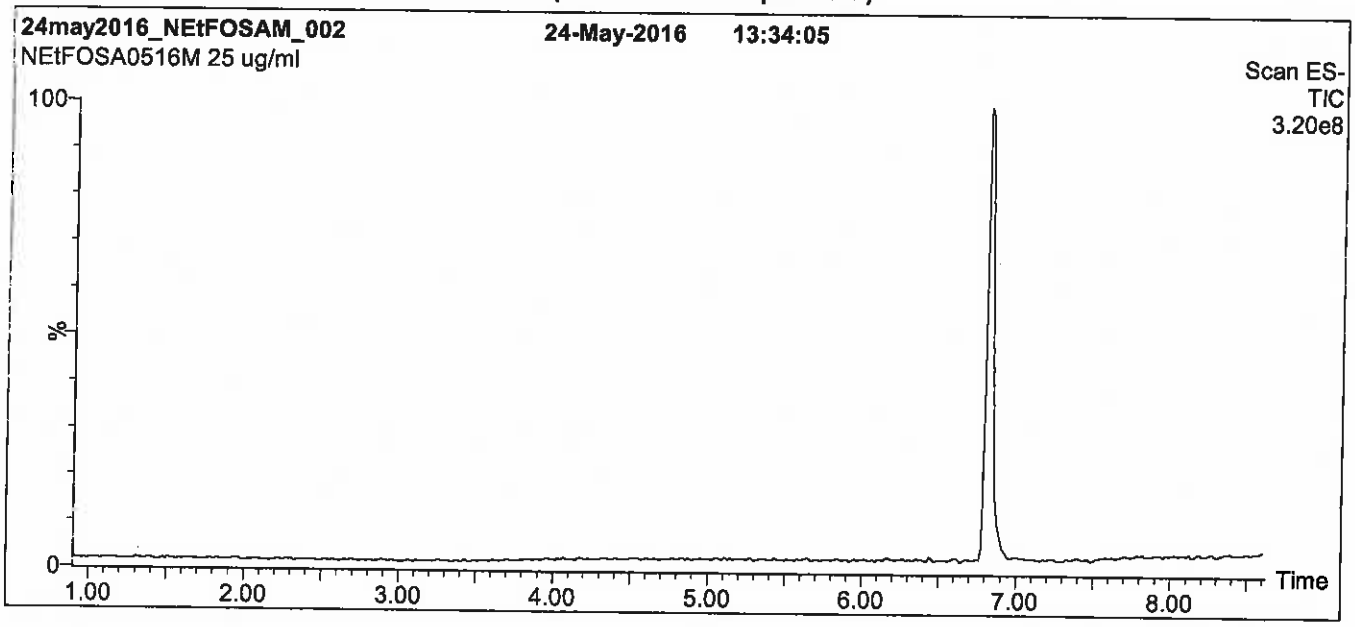
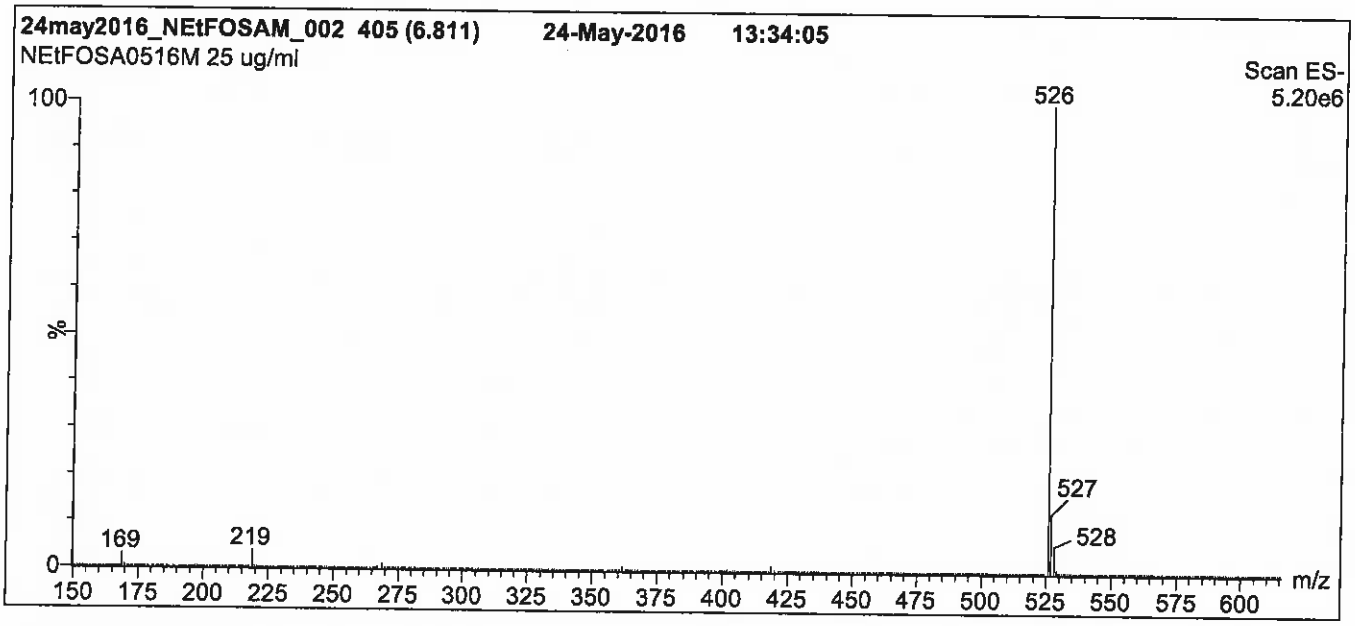
Figure 1: **N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

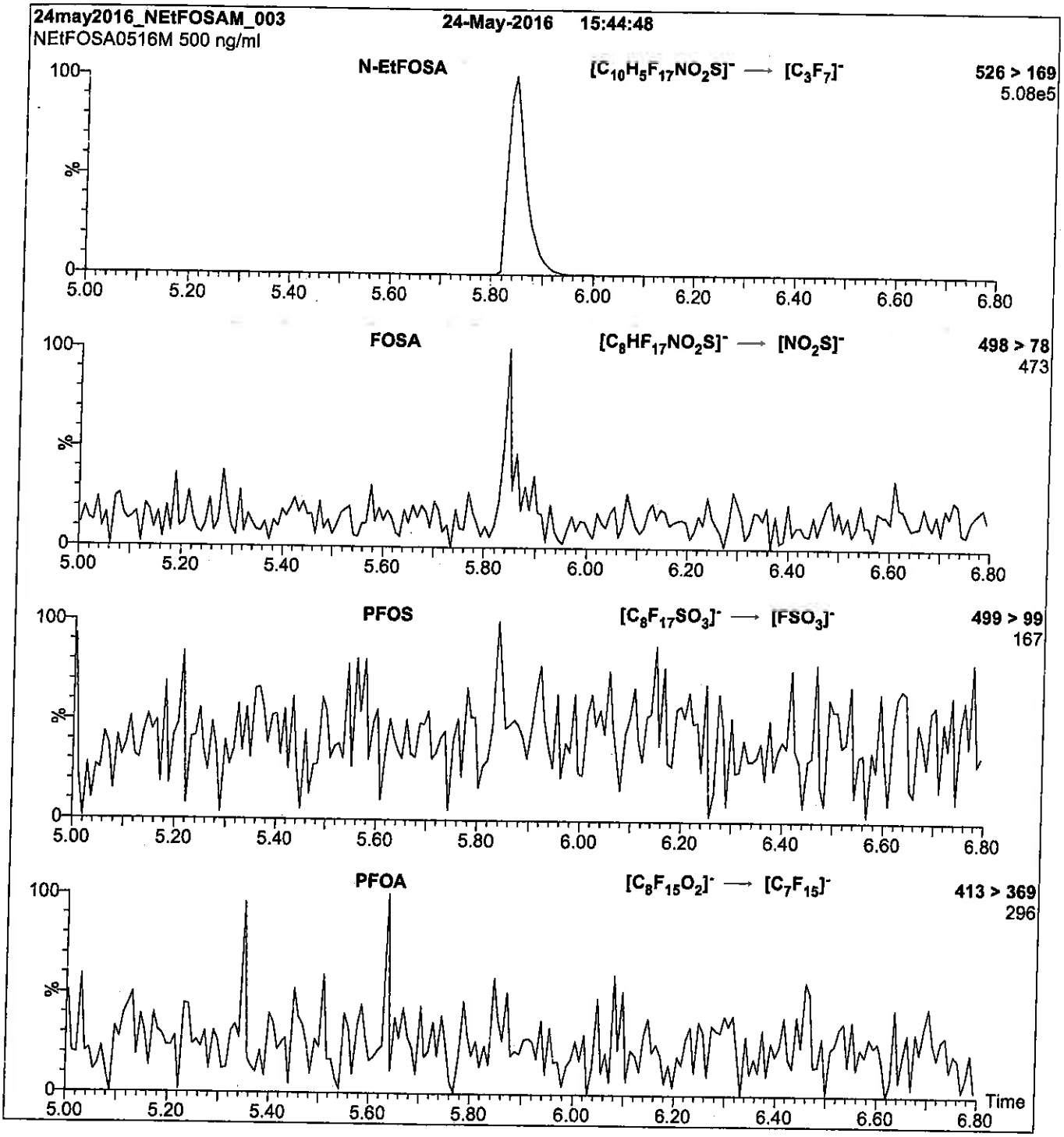
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml N-EtFOSA-M)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.54e-3 Collision Energy (eV) = 30
Flow:	300 µl/min	

Reagent

LCN-EtFOSAA_00001

r: 7/1d/15 SKV

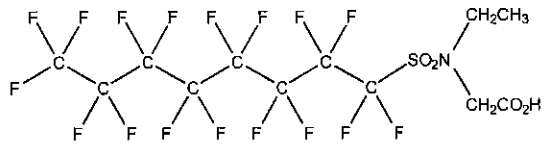
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-EtFOSAA **LOT NUMBER:** NEtFOSAA0113

COMPOUND: N-ethylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** 2991-50-6



MOLECULAR FORMULA: $C_{12}H_8F_{17}NO_4S$ **MOLECULAR WEIGHT:** 585.23

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

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 01/29/2013

EXPIRY DATE: (mm/dd/yyyy) 01/29/2018

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:** 04/06/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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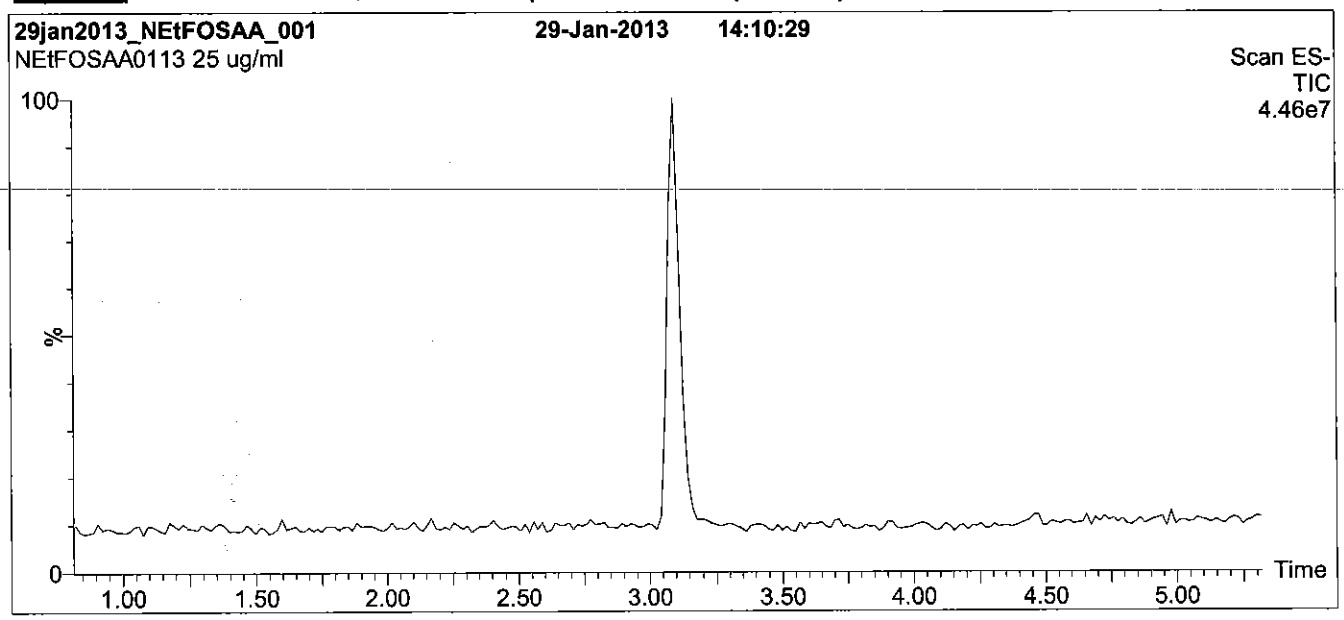
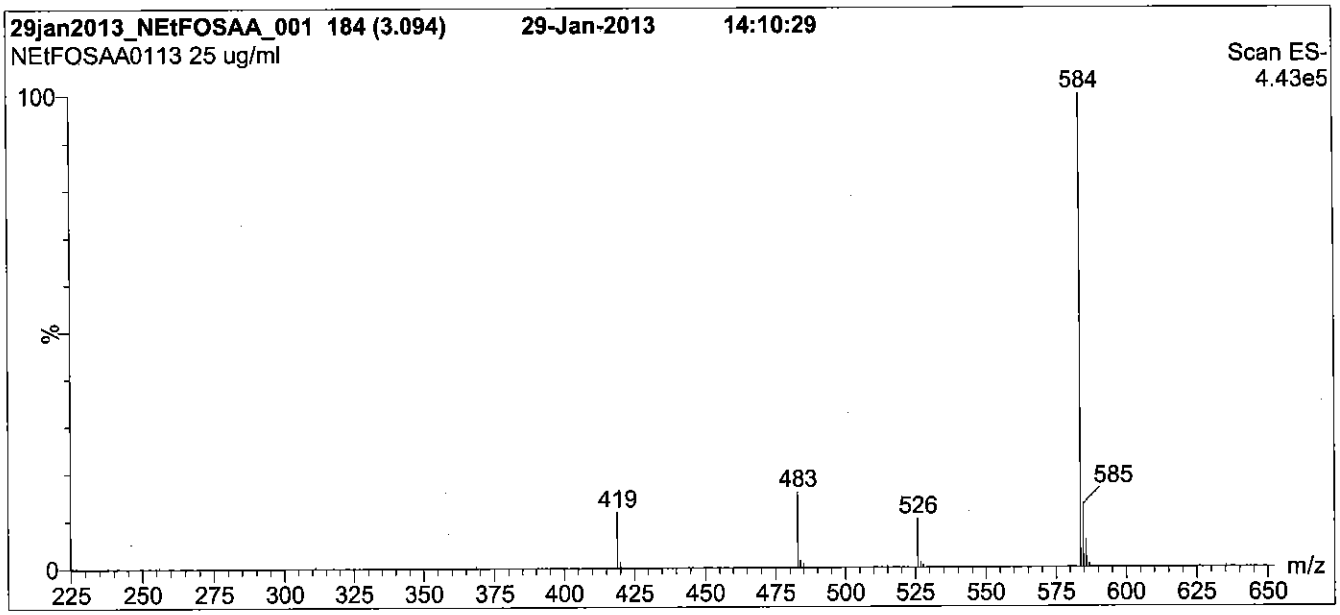




Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

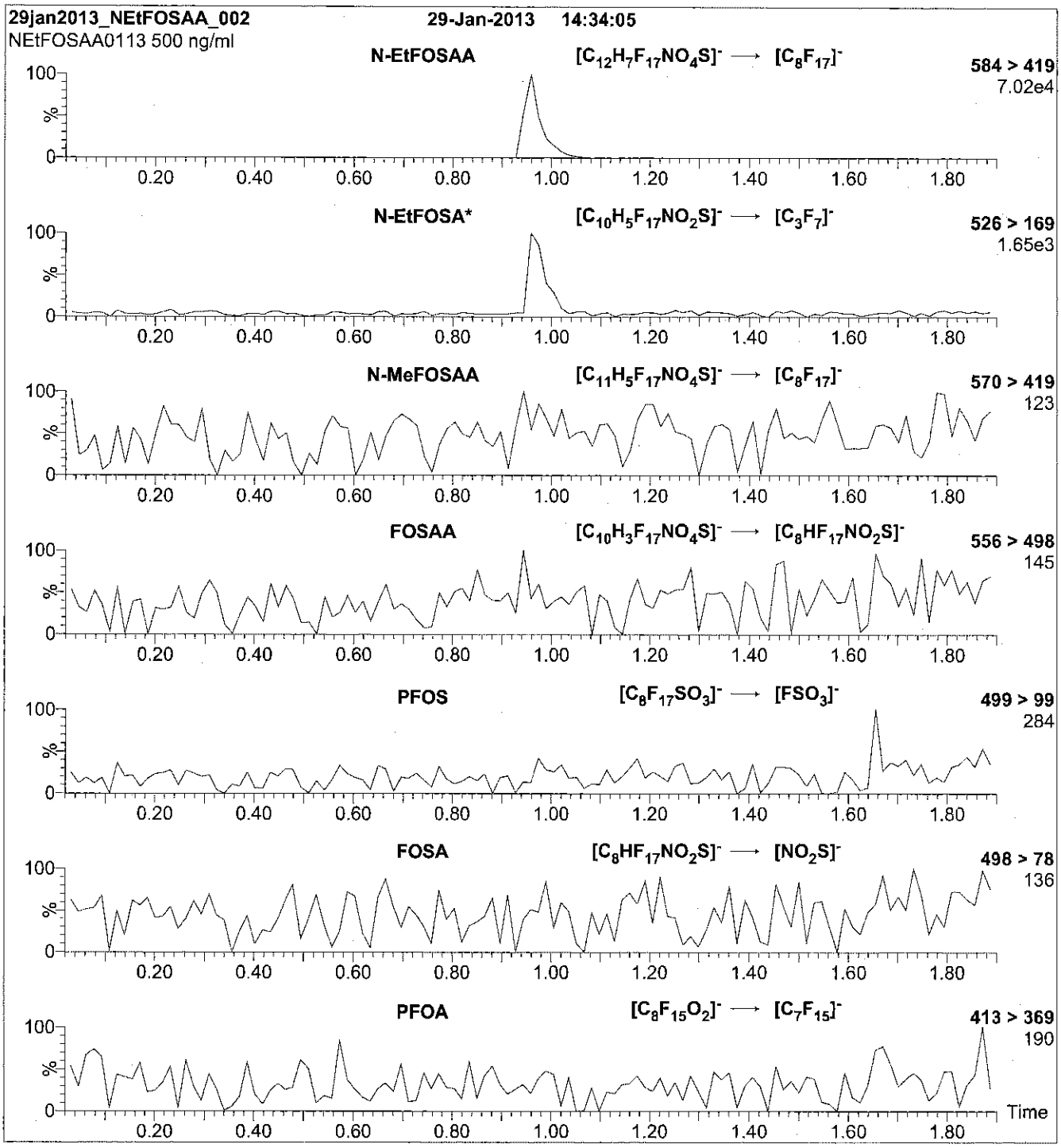
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Note: N-EtFOSA is formed by fragmentation of N-EtFOSAA.

Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCN-EtFOSAA_00002

R: 8/23/16 SBC

715561
ID: LCN-EtFOSAA_00002
Exp: 01/20/21 Prpd: SBC
N-EtFOSAA

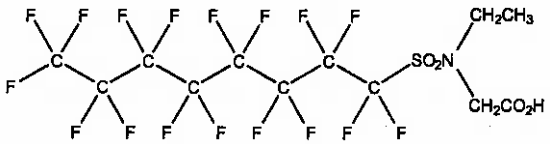
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: N-EtFOSAA **LOT NUMBER:** NEtFOSAA0116

COMPOUND: N-ethylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** 2991-50-6



MOLECULAR FORMULA: $C_{12}H_8F_{17}NO_4S$ **MOLECULAR WEIGHT:** 585.23

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

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 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
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CALA

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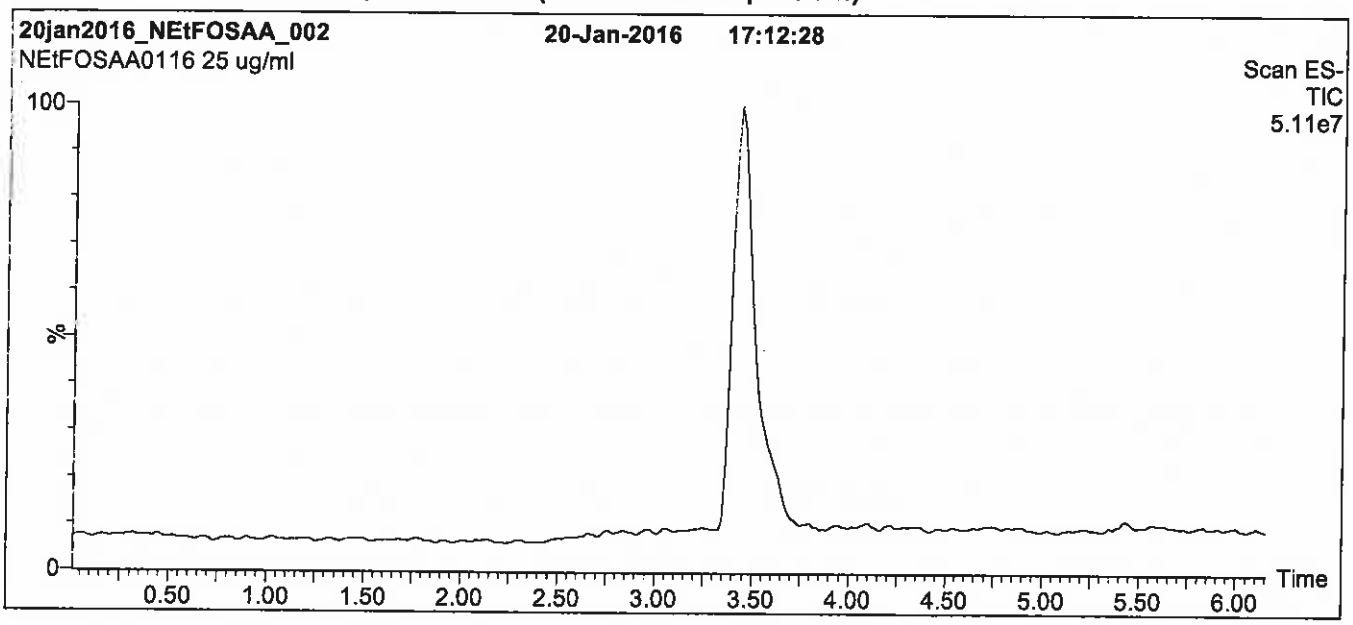
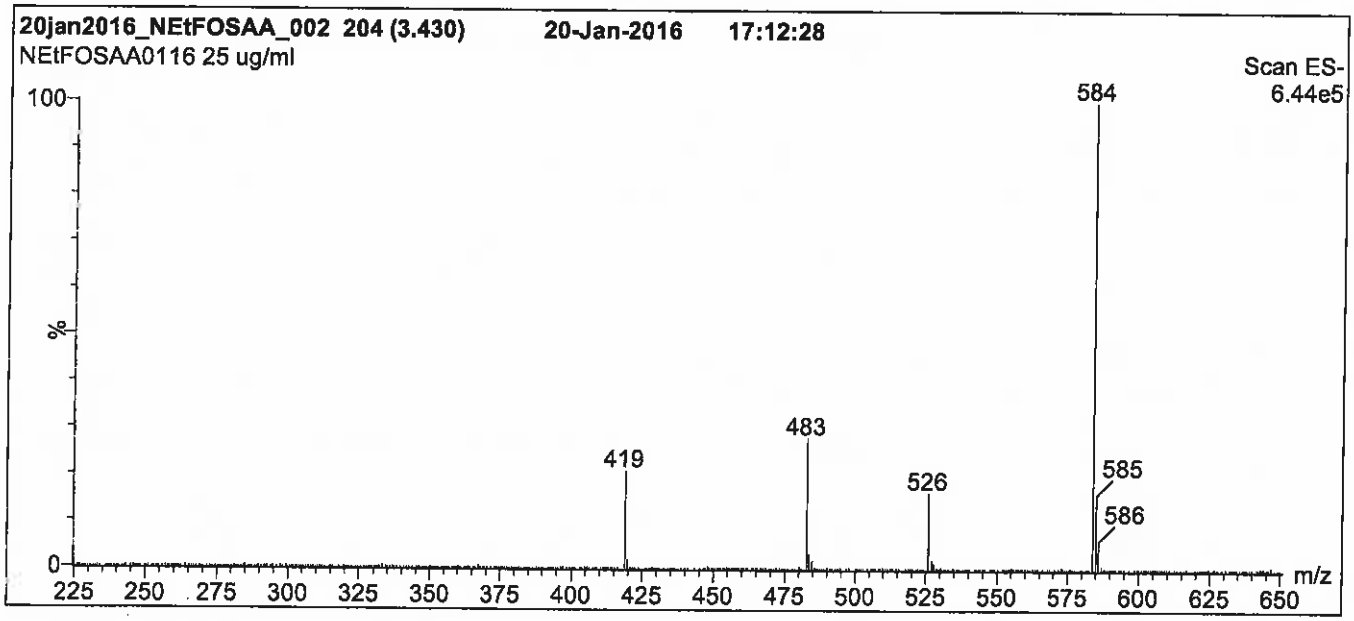




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

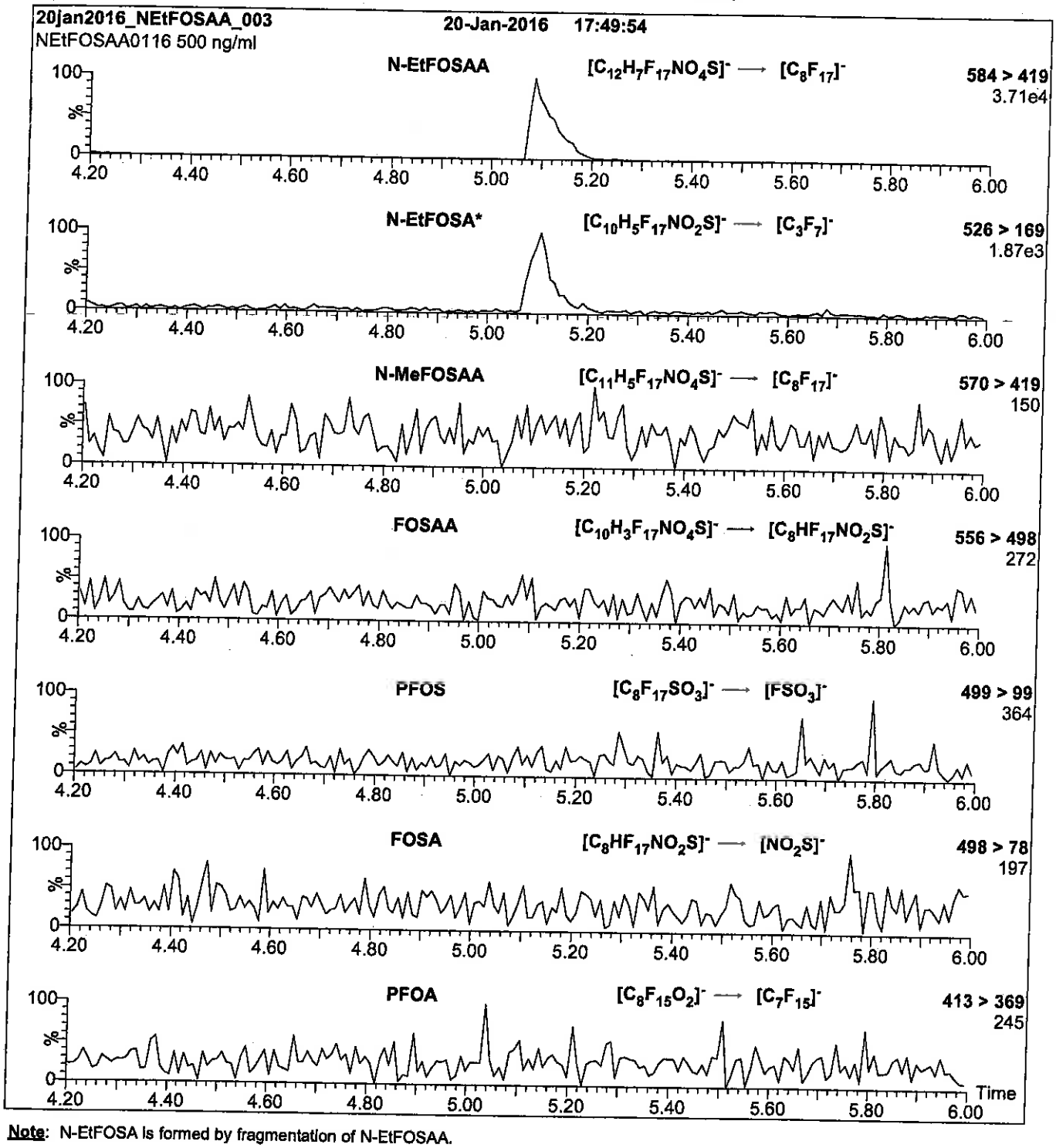
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Note: N-EtFOSA is formed by fragmentation of N-EtFOSAA.

Conditions for Figure 2:

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

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(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 25

Reagent

LCN-MeFOSA-M_00001

r: 7/16/15 SKV

WELLINGTON LABORATORIES

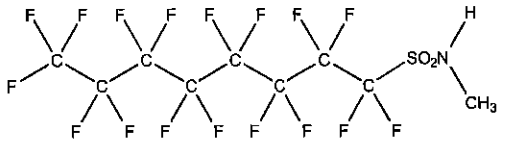
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-MeFOSA-M
COMPOUND: N-methylperfluoro-1-octanesulfonamide

LOT NUMBER: NMeFOSA0714M

STRUCTURE:

CAS #: 31506-32-8



MOLECULAR FORMULA: $C_9H_4F_{17}NO_2S$
MOLECULAR WEIGHT: 513.17
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/15/2014
EXPIRY DATE: (mm/dd/yyyy) 07/15/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

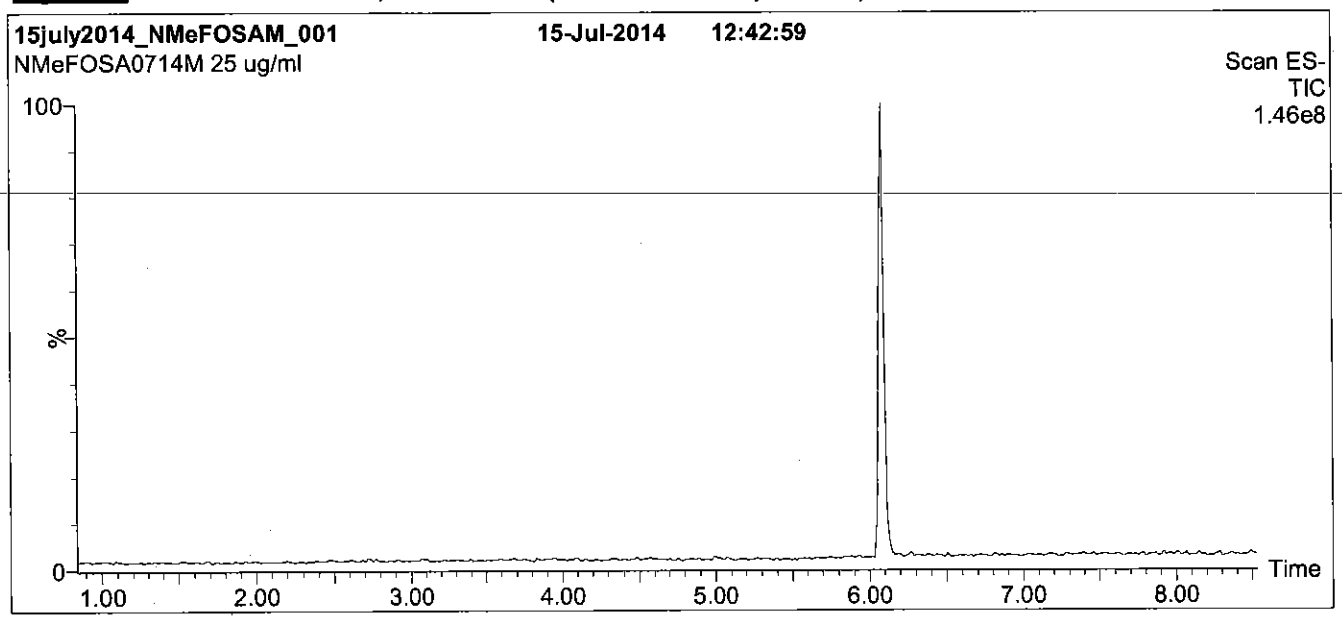
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

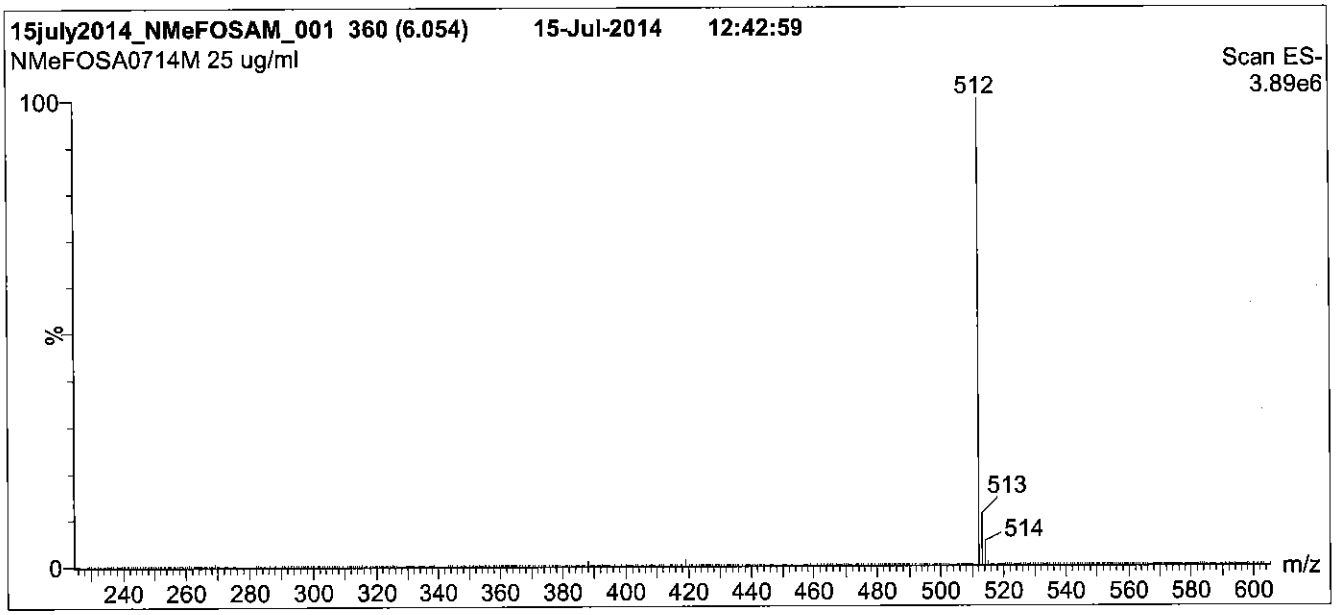
CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

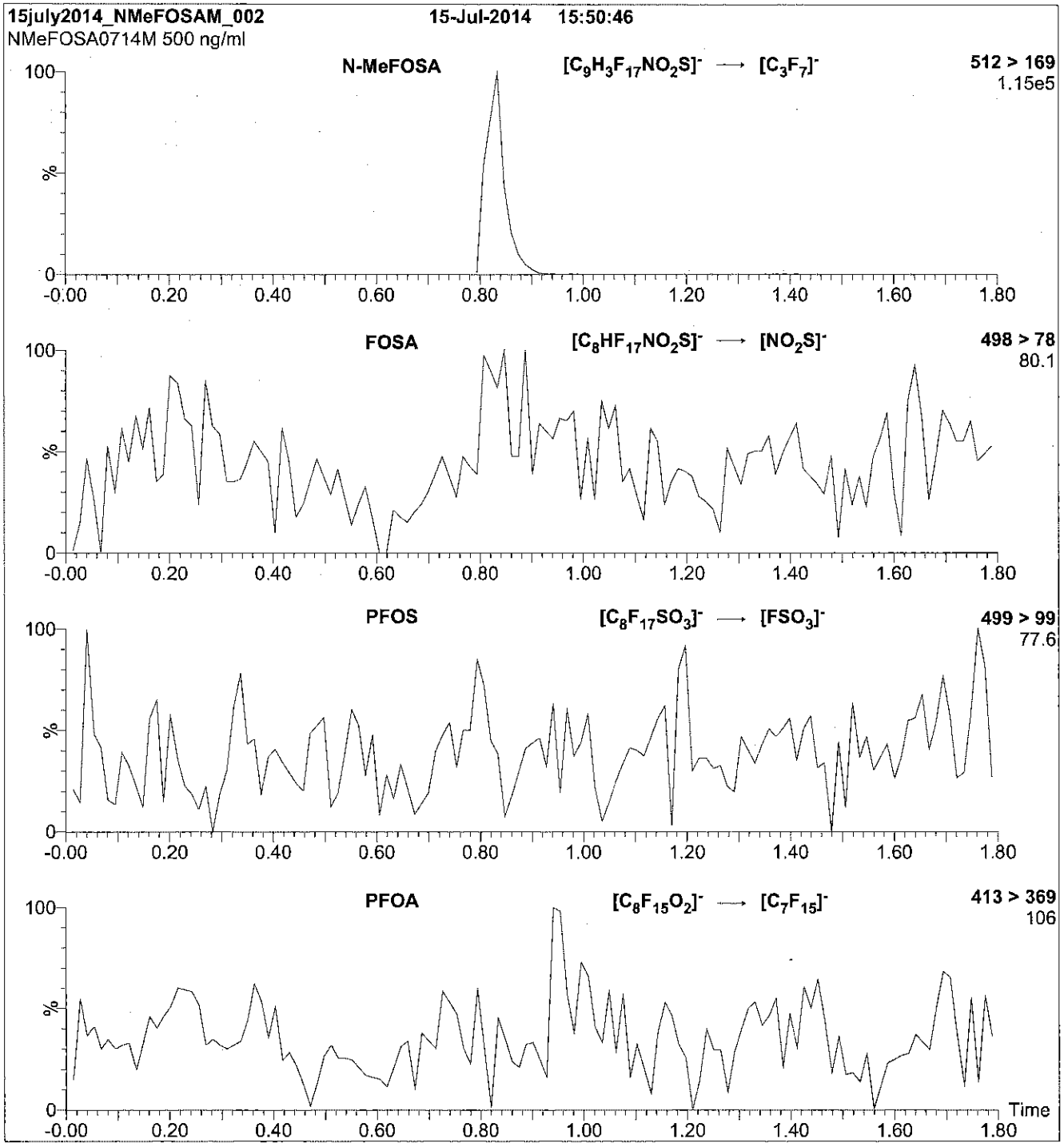
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 30

Reagent

LCN-MeFOSA-M_00002

R: 8/23/16 SBC

715564
ID: LCN-MeFOSA-M_00002
Exp: 05/24/21 Prpd: SBC
N-MeFOSA-M

WELLINGTON LABORATORIES

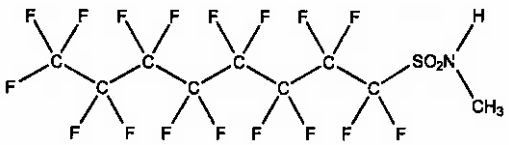
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-MeFOSA-M
COMPOUND: N-methylperfluoro-1-octanesulfonamide

LOT NUMBER: NMeFOSA0516M

STRUCTURE:

CAS #: 31506-32-8



MOLECULAR FORMULA:	$C_8H_4F_{17}NO_2S$	**MOLECULAR WEIGHT:**	513.17
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/24/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/24/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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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HAZARDS:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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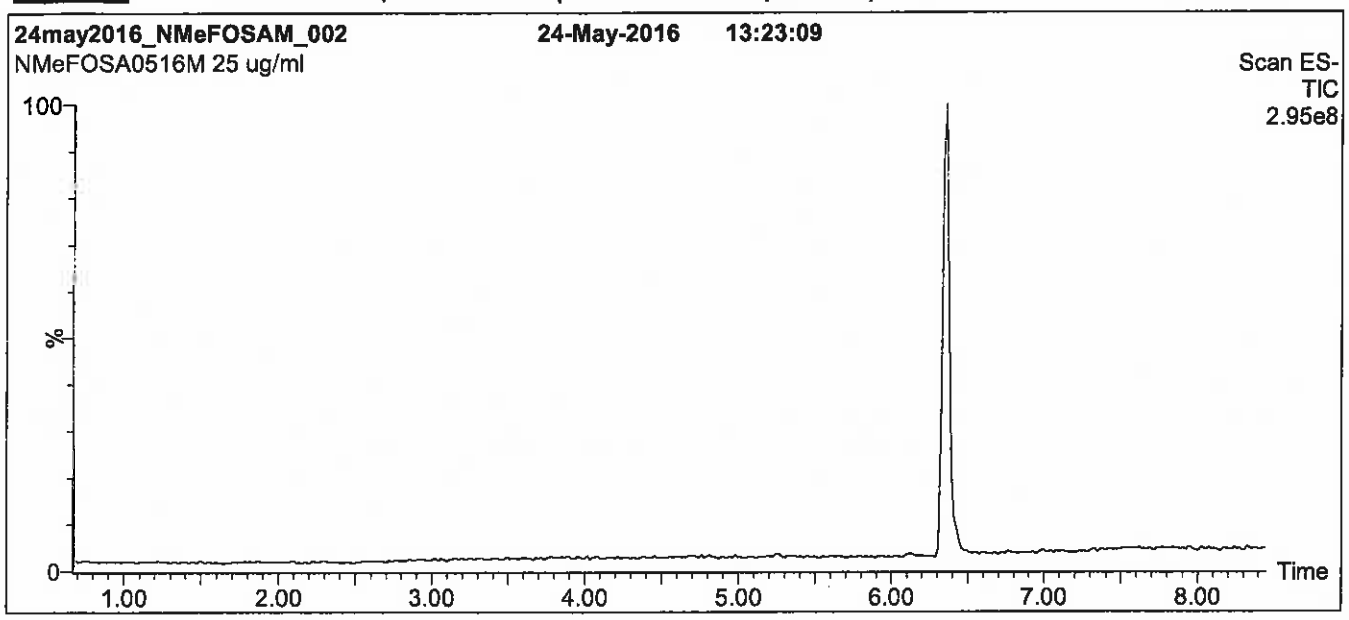

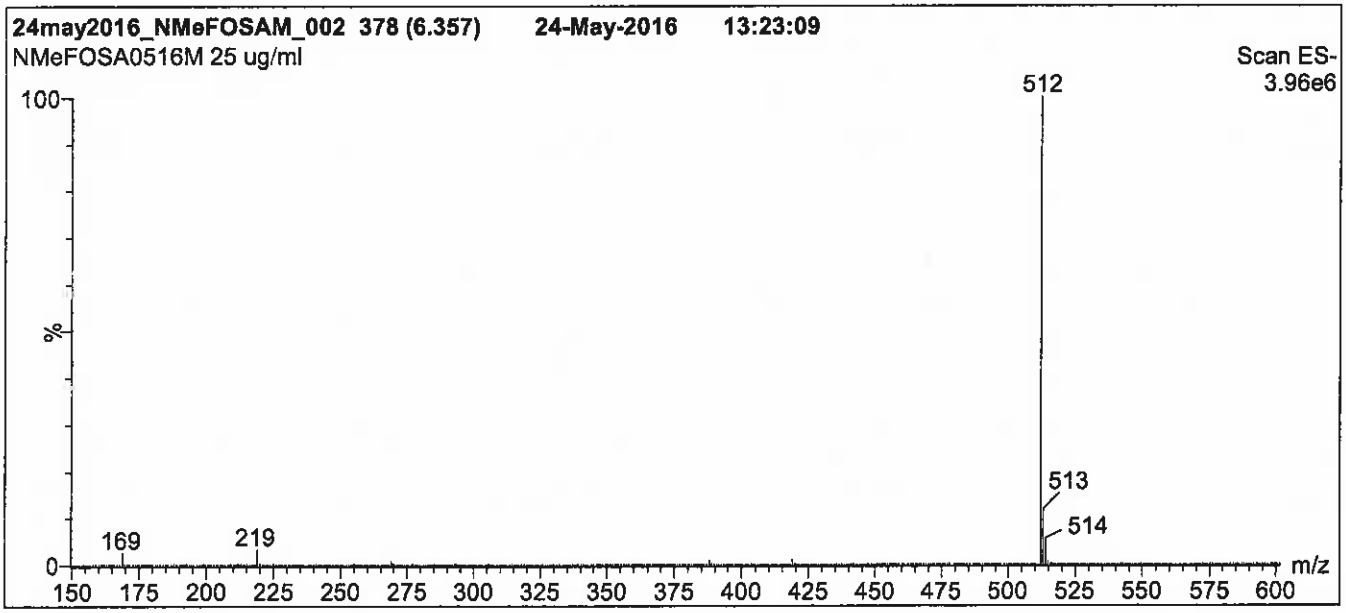

Conditions for Figure 1:

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

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

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
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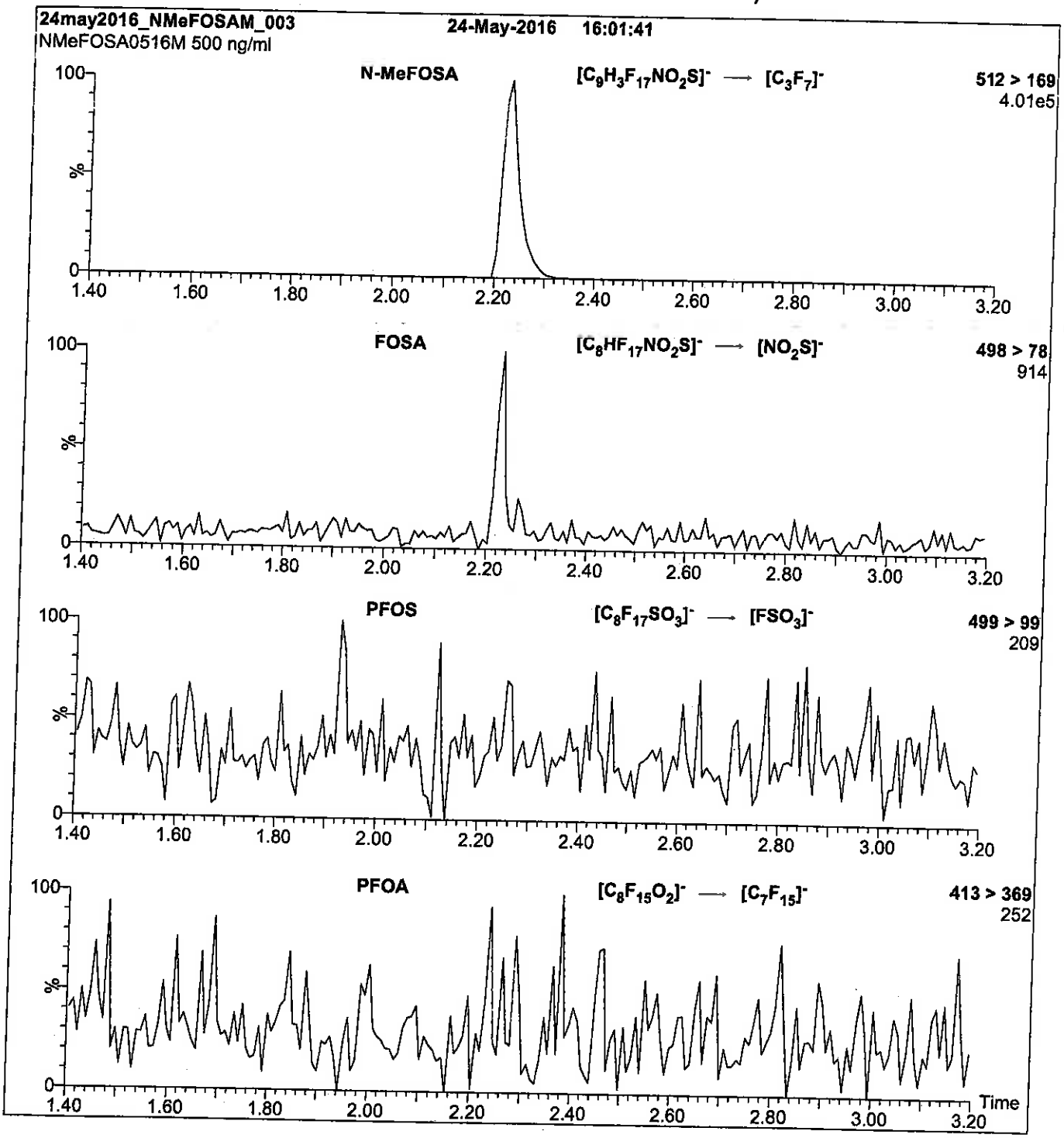
Figure 2: **N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

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

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 30

Reagent

LCN-MeFOSAA_00001

r: 7/10/15 SKU

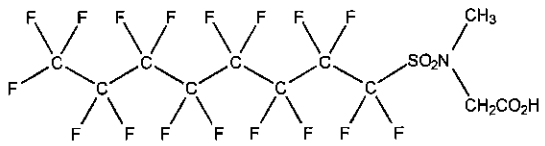
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-MeFOSAA **LOT NUMBER:** NMeFOSAA1214

COMPOUND: N-methylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** 2355-31-9



MOLECULAR FORMULA: $C_{11}H_6F_{17}NO_4S$ **MOLECULAR WEIGHT:** 571.21

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

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 12/09/2014

EXPIRY DATE: (mm/dd/yyyy) 12/09/2019

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- 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:** 04/06/2015 (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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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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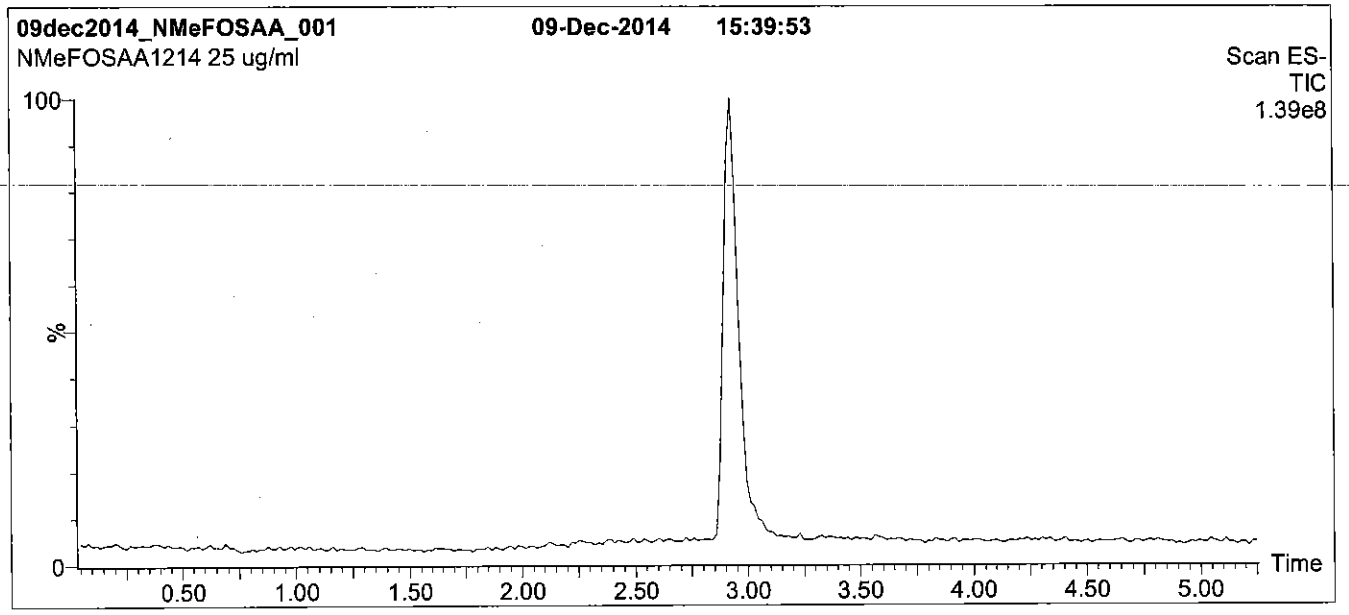
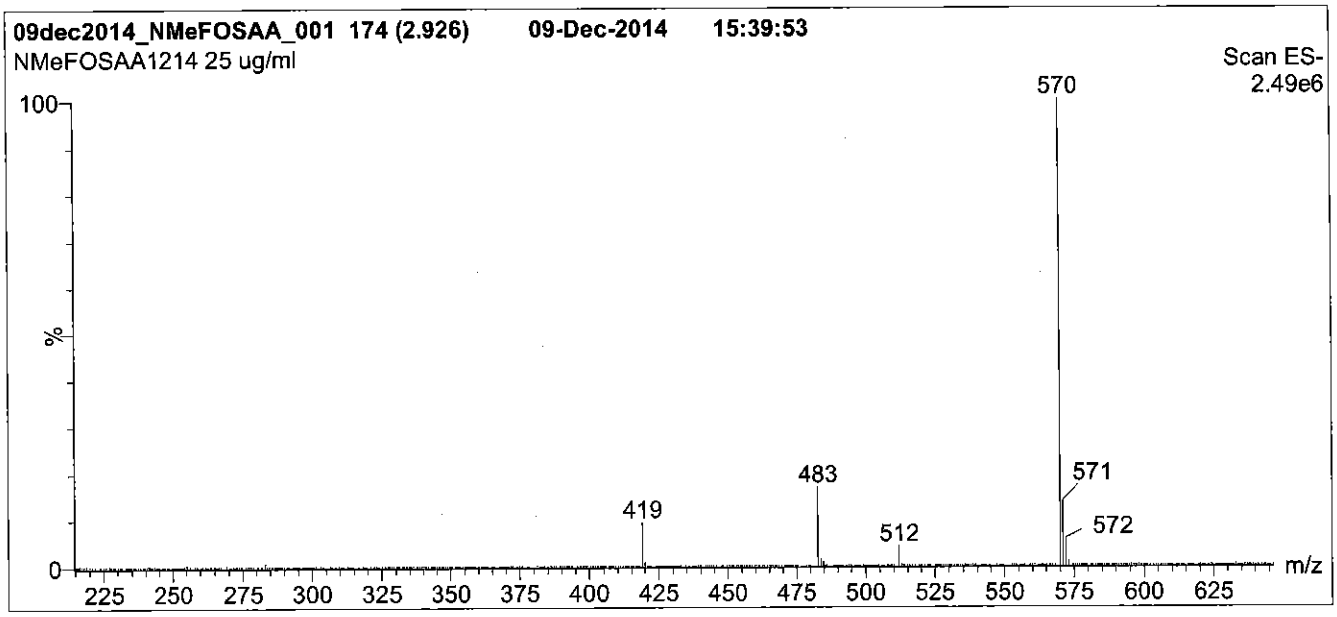
Figure 1: **N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

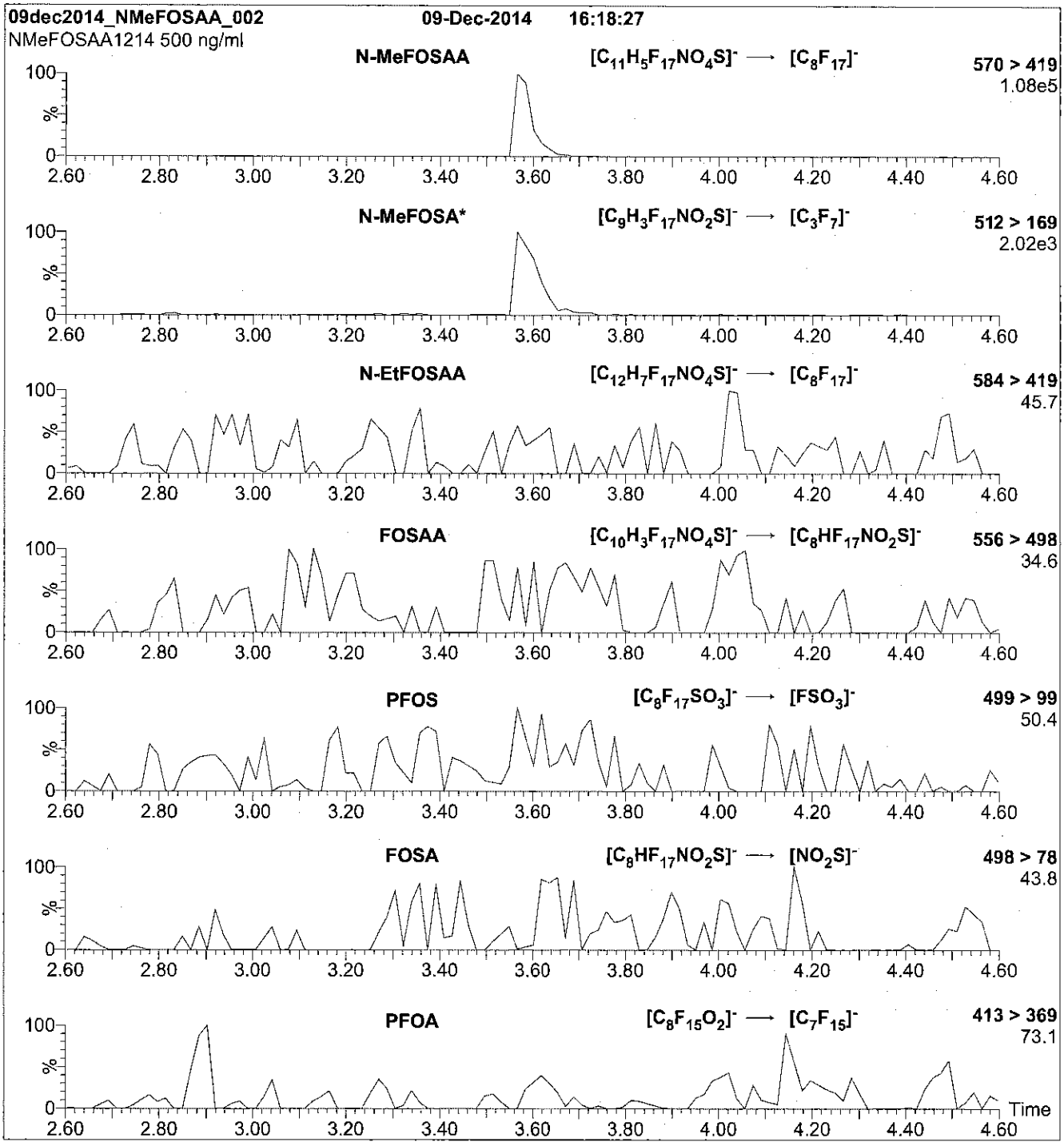
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (215 - 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 fragmentation of N-MeFOSAA.

Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCN-MeFOSAA_00003

R: 8/23/16 SBC

715562
ID: LCN-MeFOSAA_00003
Exp: 01/20/21 Prpd: SBC
N-MeFOSAA

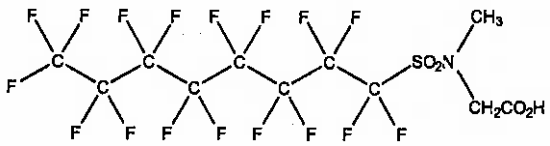
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-MeFOSAA **LOT NUMBER:** NMeFOSAA0116

COMPOUND: N-methylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** 2355-31-9



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CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 01/20/2016

EXPIRY DATE: (mm/dd/yyyy) 01/20/2021

RECOMMENDED STORAGE: Refrigerate ampoule

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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.

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Certified By: B.G. Chittim **Date:** 01/21/2016 (mm/dd/yyyy)

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CALA Testing

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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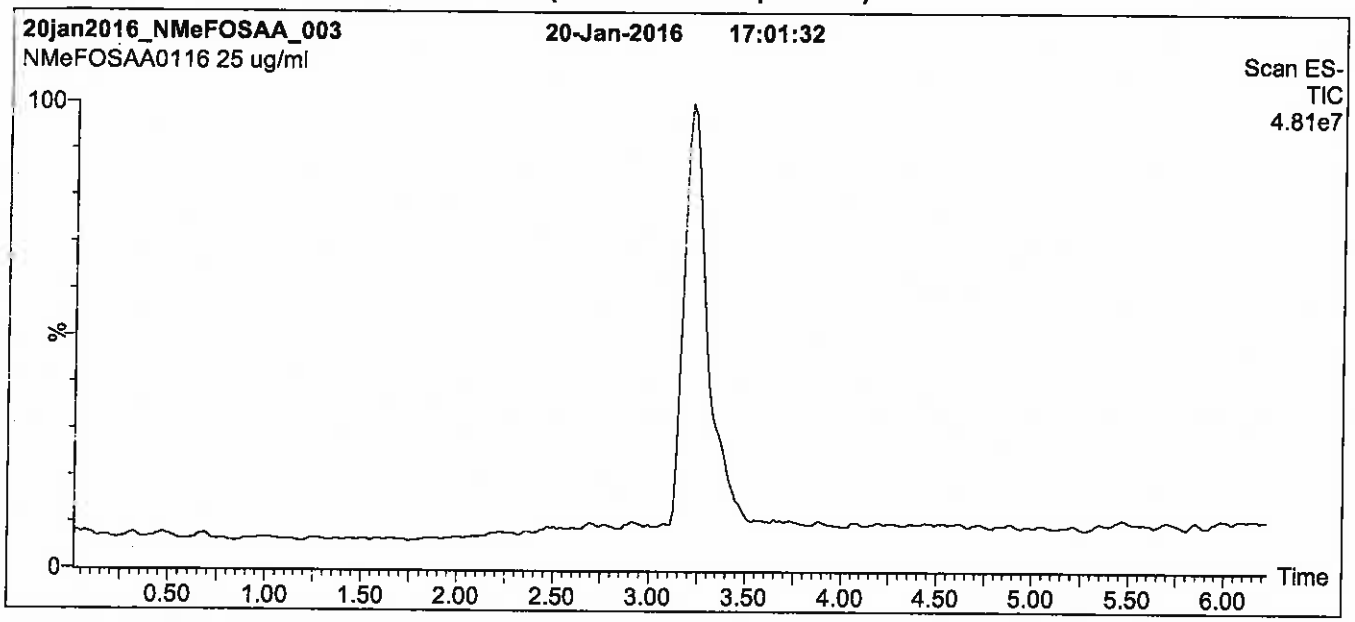

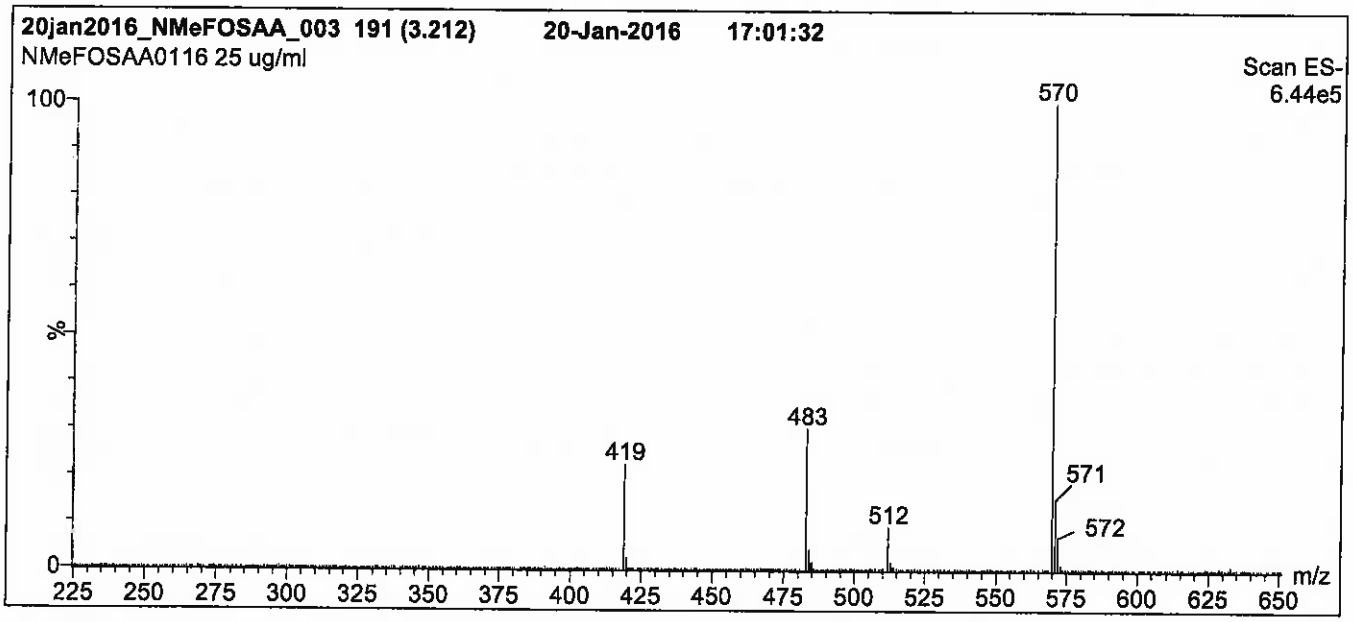

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Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

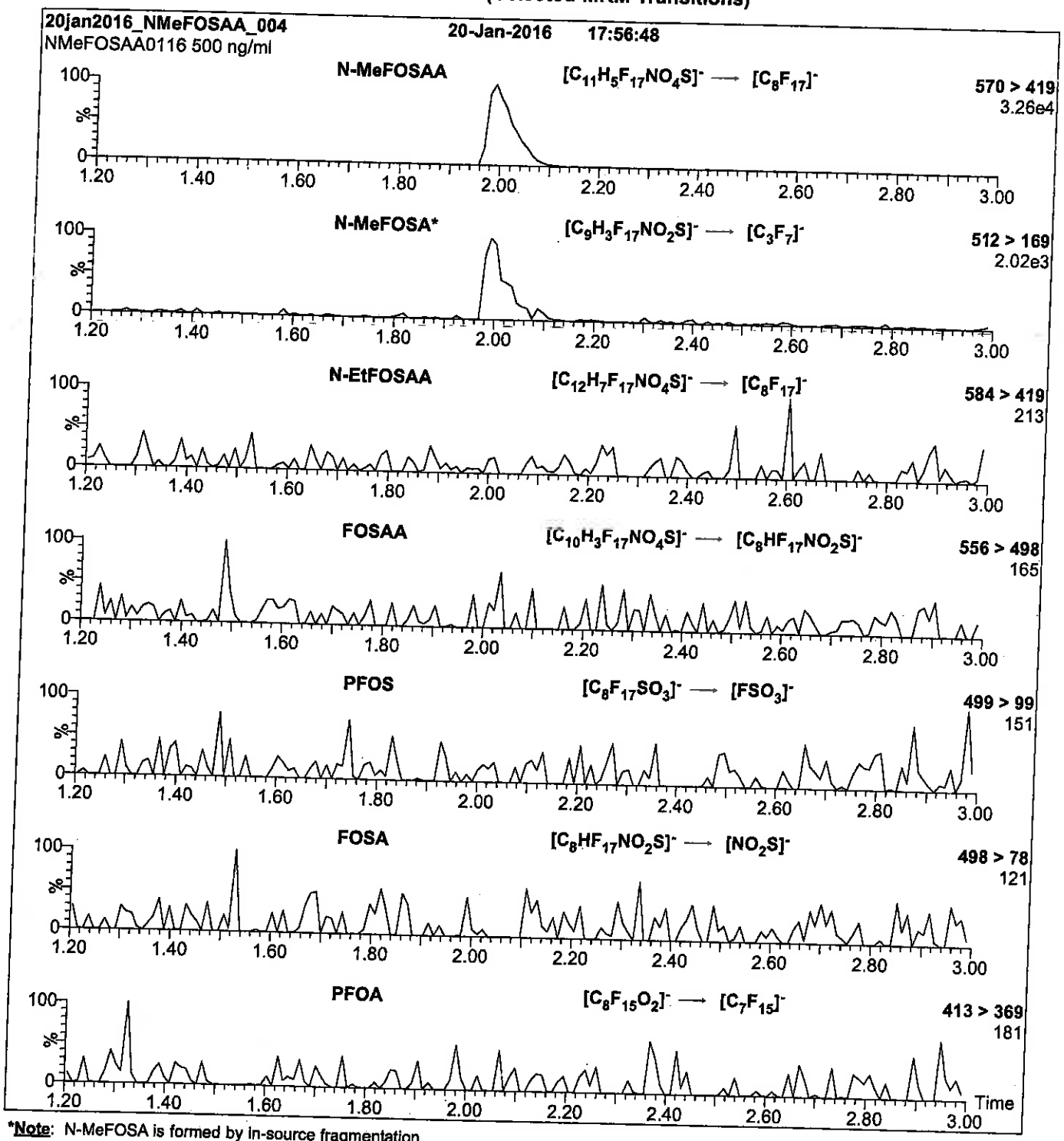
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



***Note**: N-MeFOSA is formed by in-source fragmentation.

Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 25

Reagent

LCPFACMXB_00007

P: 12/30/15 CW

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 (C_4-C_{14}, C_{16}, and C_{18}) and four native perfluoroalkylsulfonates (C_4, C_6, C_8 and C_{10}). 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.

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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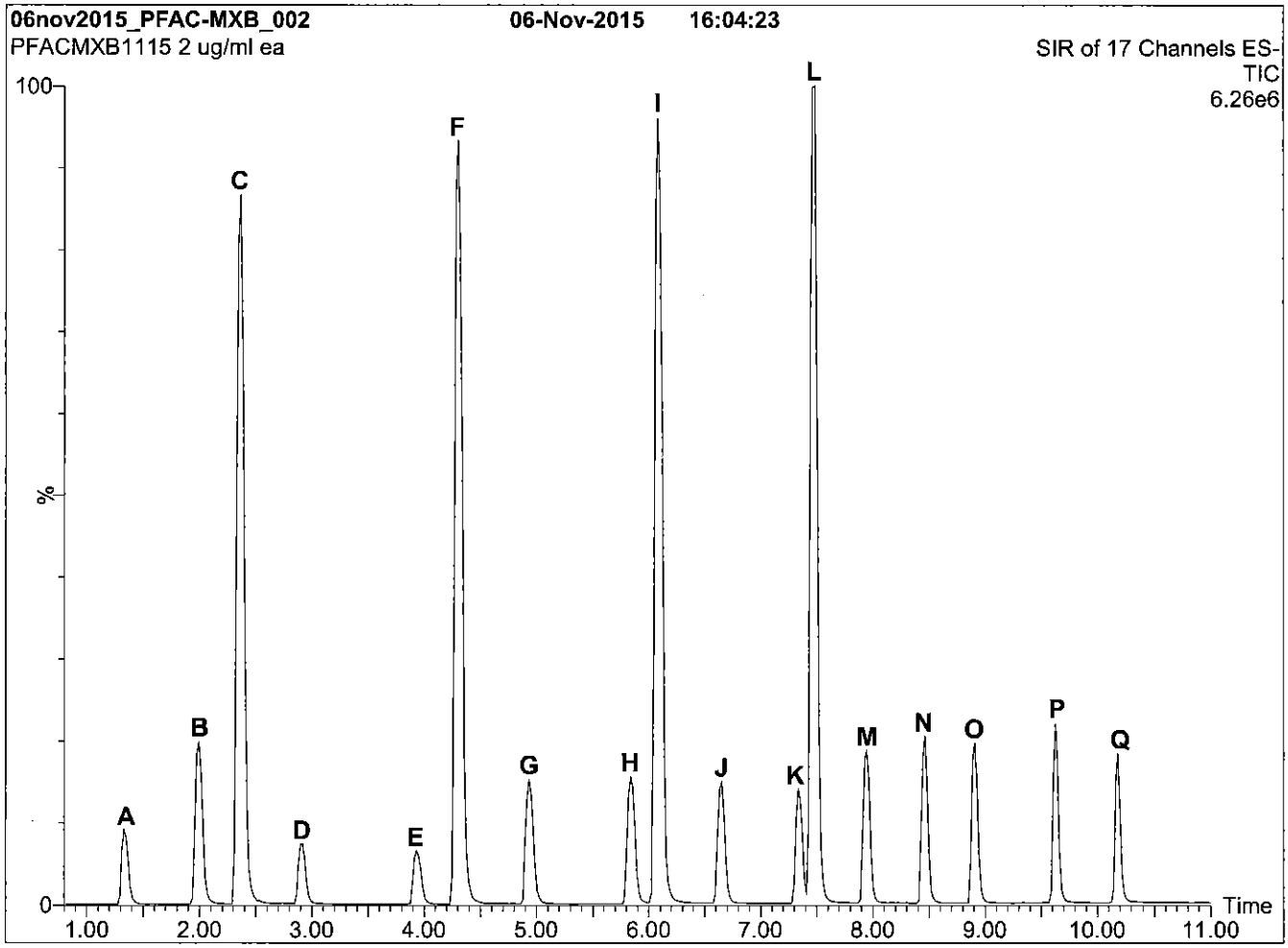
Table A: **PFAC-MXB; Components and Concentrations (ng/ml, ± 5% in Methanol / Water (<1%))**

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-butanesulfonate	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 RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% H_2O / 45% (80:20 MeOH:ACN)
(both with 10 mM NH_4OAc 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 µl/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)**

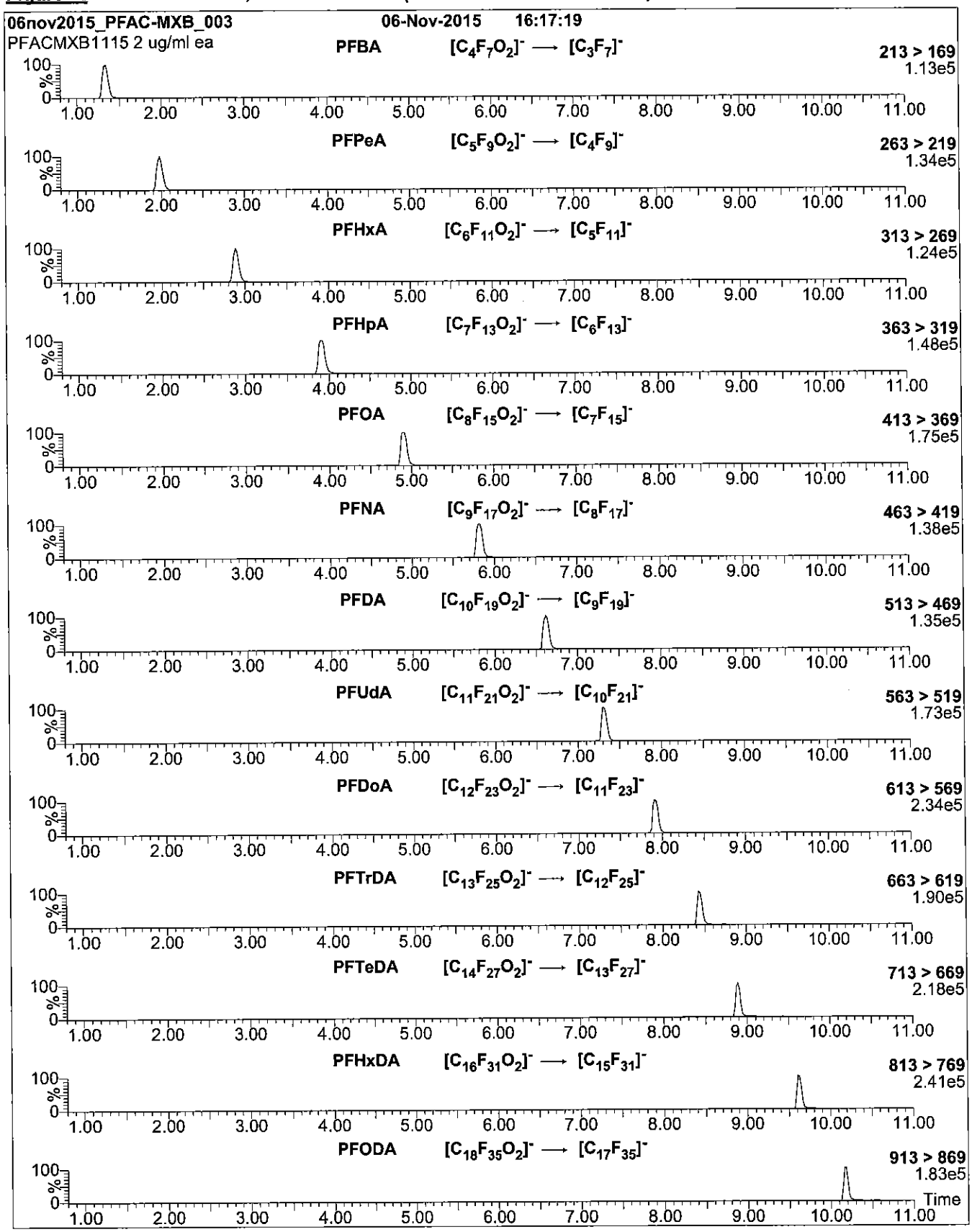
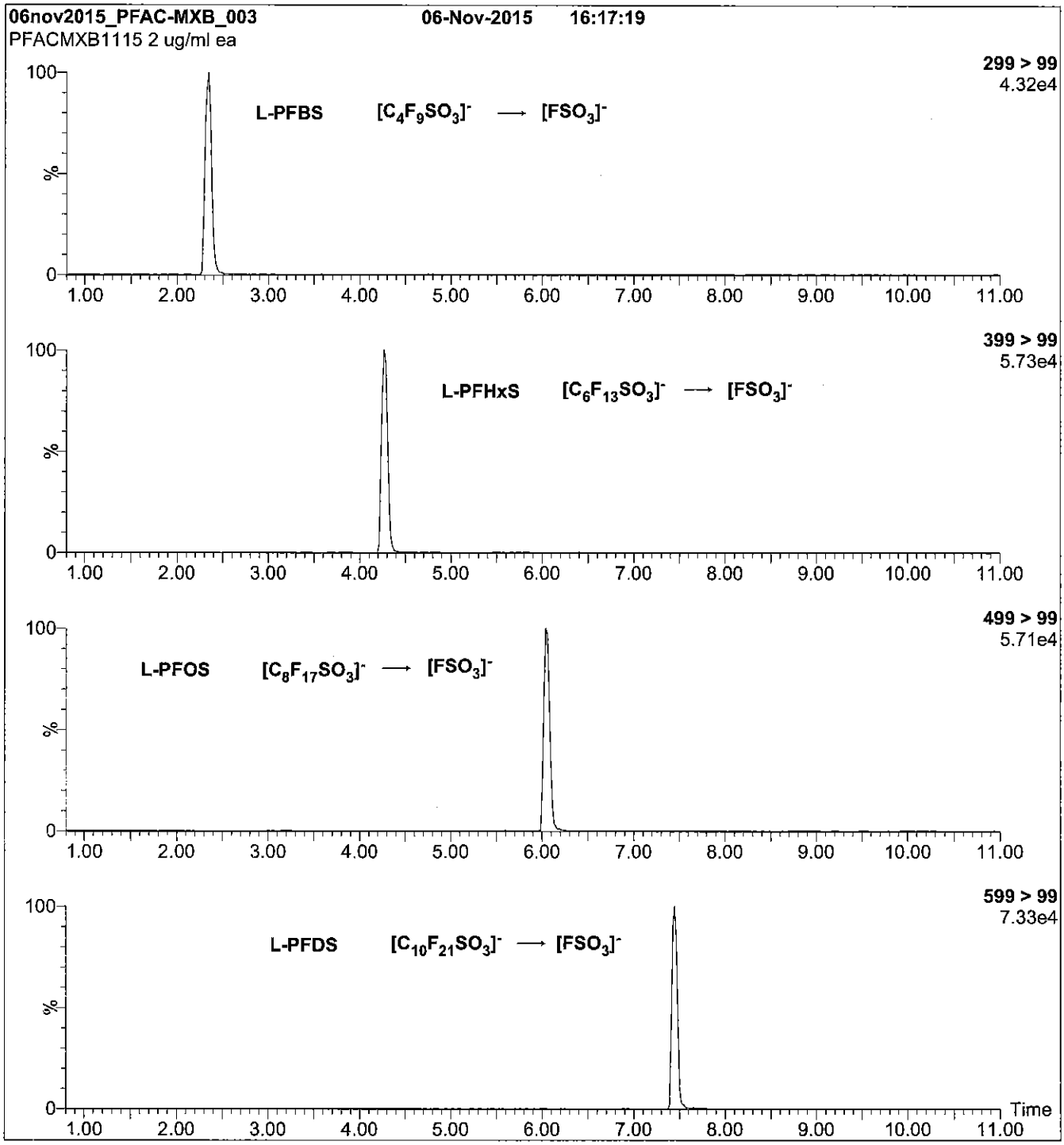


Figure 3: **PFAC-MXB; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figures 2 and 3:

Injection: on-column (PFAC-MXB)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.24e-3

Collision Energy (eV) = 8-50 (variable)

Reagent

LCPFBA_00004

R: 2/25/16 CBW

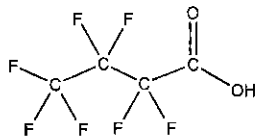
587895
ID: LCPFBA_00004
Exp: 01/30/20 Prpd: CBW
PF-n-butanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFBA
LOT NUMBER: PFBA0115
COMPOUND: Perfluoro-n-butanoic acid

STRUCTURE:
CAS #: 375-22-4



MOLECULAR FORMULA: $C_4HF_7O_2$
MOLECULAR WEIGHT: 214.04
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/30/2015
EXPIRY DATE: (mm/dd/yyyy) 01/30/2020
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:** 03/25/2015 (mm/dd/yyyy)

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

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TRACEABILITY:

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CALA Testing Accreditation by A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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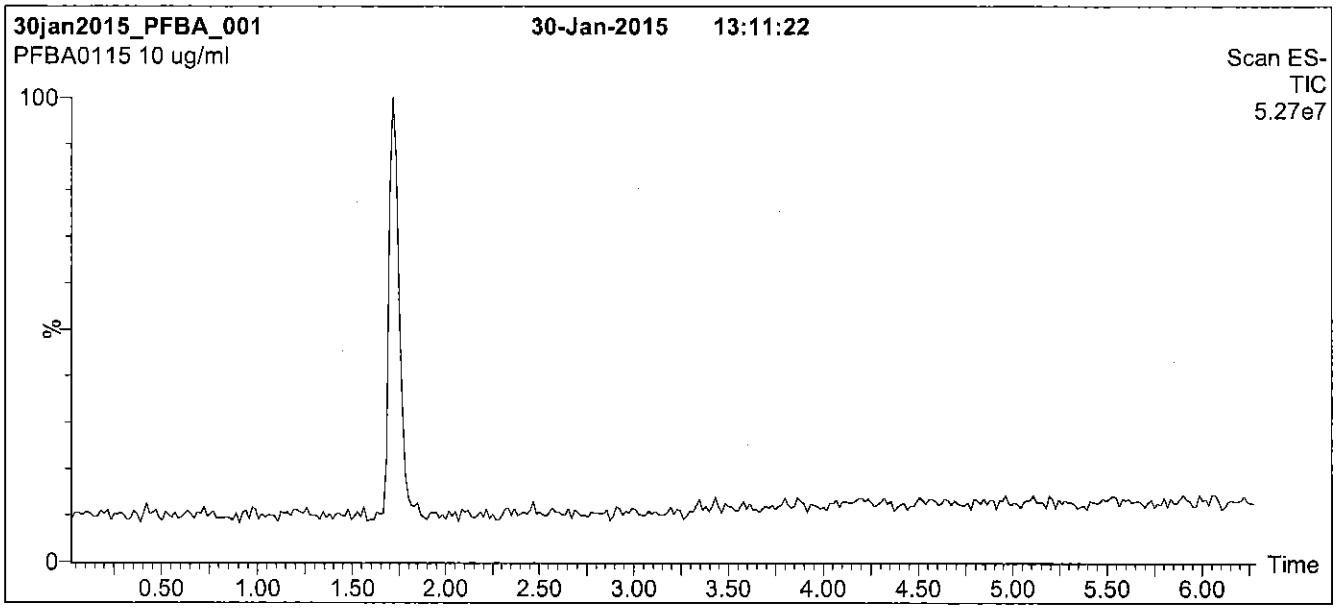
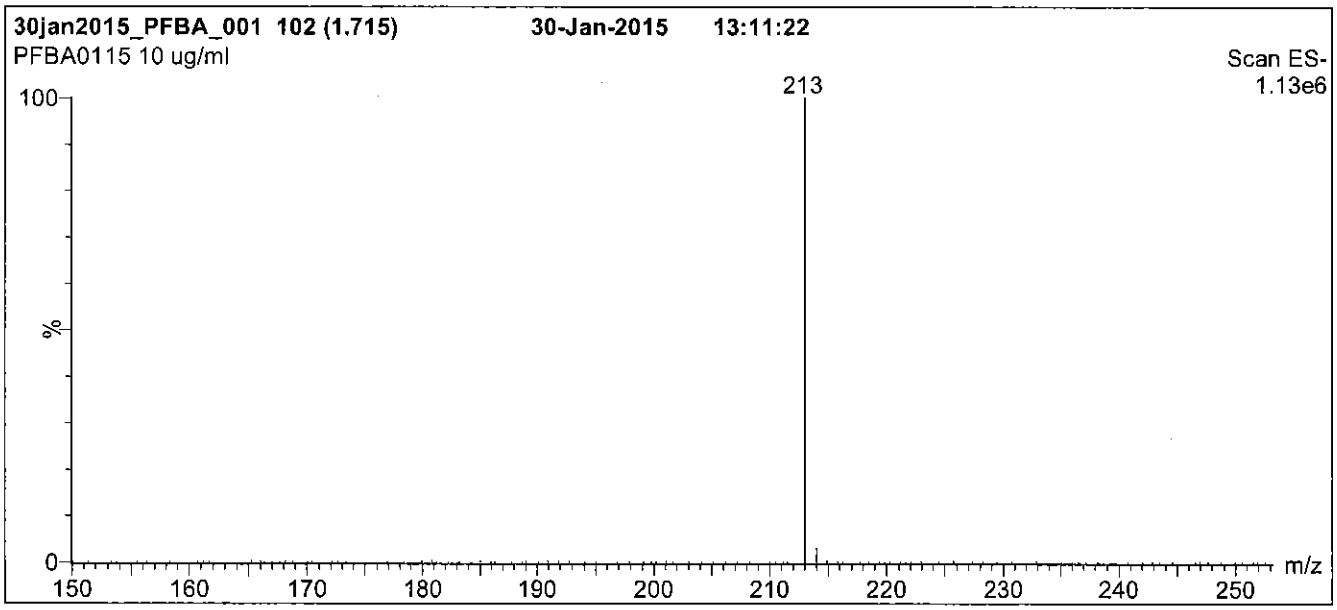
Figure 1: **PFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

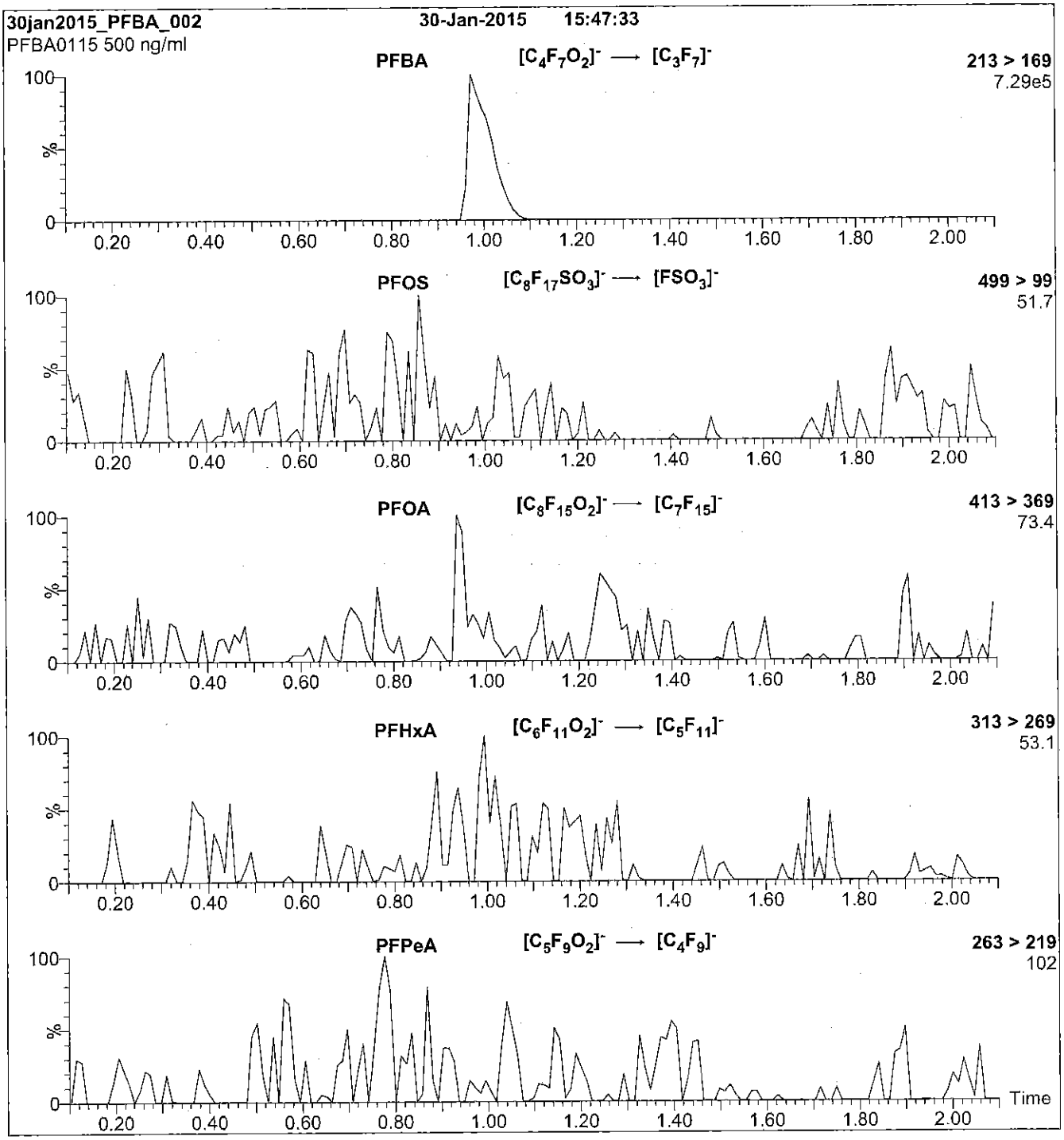
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 8.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFBA_00005

Scanned 10/16/14

R: SBC 9/13/16

730531
ID: LCPFBA_00005
Exp: 05/27/21 Prpd: SBC
PF-n-butanoic acid

730532
ID: LCPFBA_00006
Exp: 05/27/21 Prpd: SBC
PF-n-butanoic acid

WELLINGTON LABORATORIES

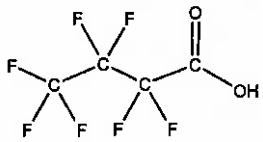
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFBA
COMPOUND: Perfluoro-n-butanoic acid

LOT NUMBER: PFBA0516

STRUCTURE:

CAS #: 375-22-4



MOLECULAR FORMULA: $C_4HF_7O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 214.04
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)

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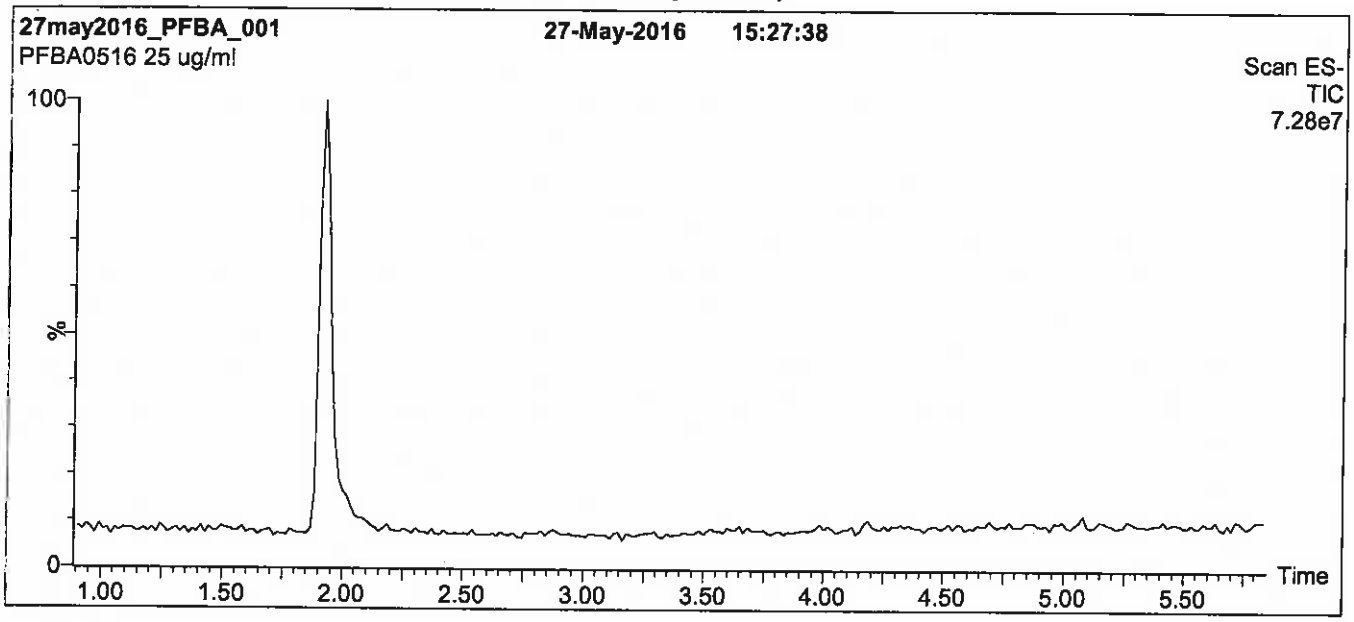
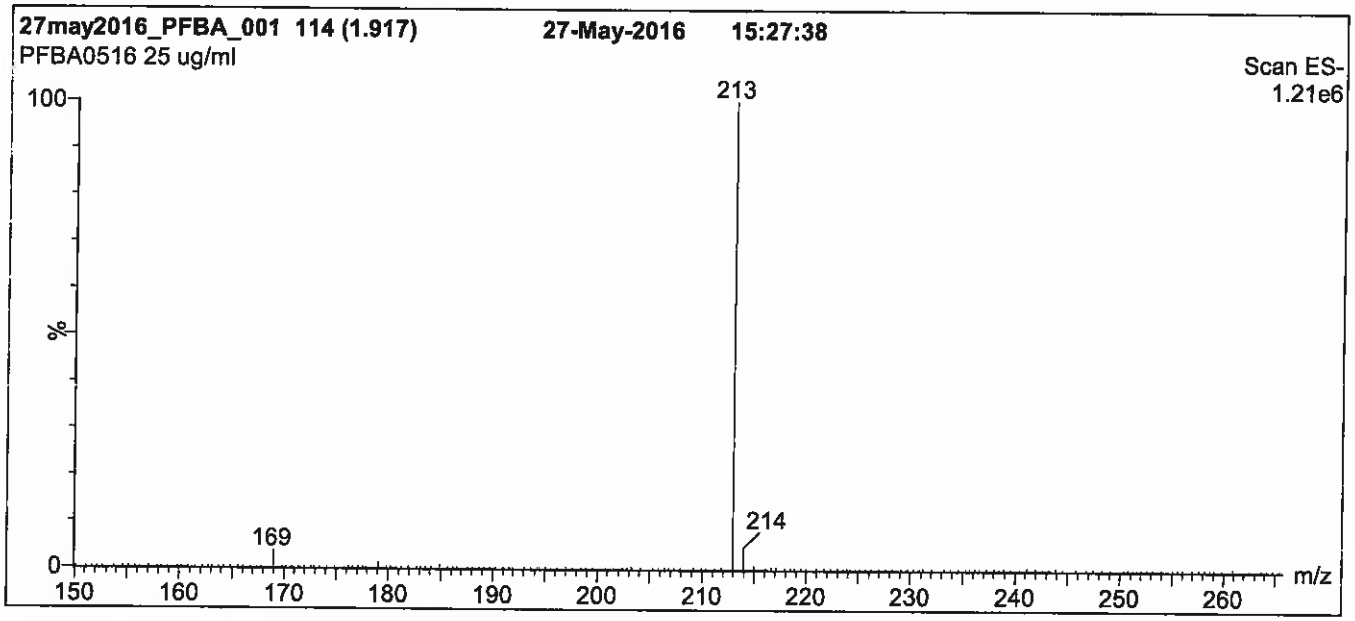
Figure 1: **PFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

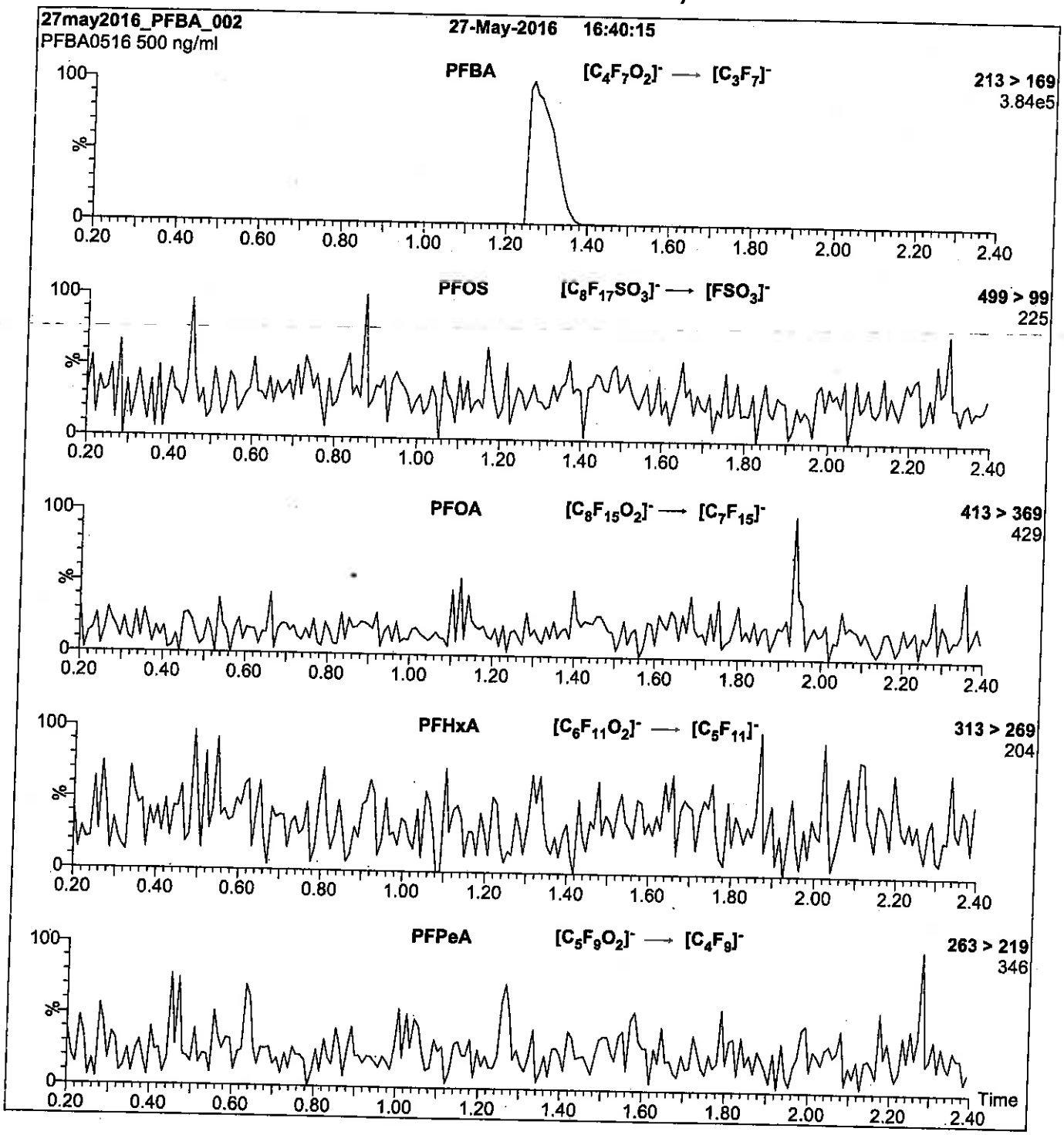
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFBA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.62e-3 Collision Energy (eV) = 10
Flow:	300 µl/min	

Reagent

LCPFBS_00004

605236
ID: LCPFBS_00004
Exp: 10/09/19 Prpd: CBW
PF-1-butanesulfonate K sa

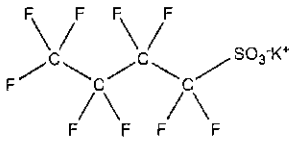
Rec. 3/29/16 JRB ✓

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: L-PFBS
LOT NUMBER: LPFBS1014
COMPOUND: Potassium perfluoro-1-butanesulfonate

STRUCTURE:
CAS #: 29420-49-3



MOLECULAR FORMULA: $C_4F_9SO_3K$
MOLECULAR WEIGHT: 338.19
CONCENTRATION: 50.0 ± 2.5 µg/ml (K salt)
44.2 ± 2.2 µg/ml (PFBS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/09/2014
EXPIRY DATE: (mm/dd/yyyy) 10/09/2019
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:** 04/02/2015 (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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HOMOGENEITY:

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UNCERTAINTY:

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

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

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

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

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

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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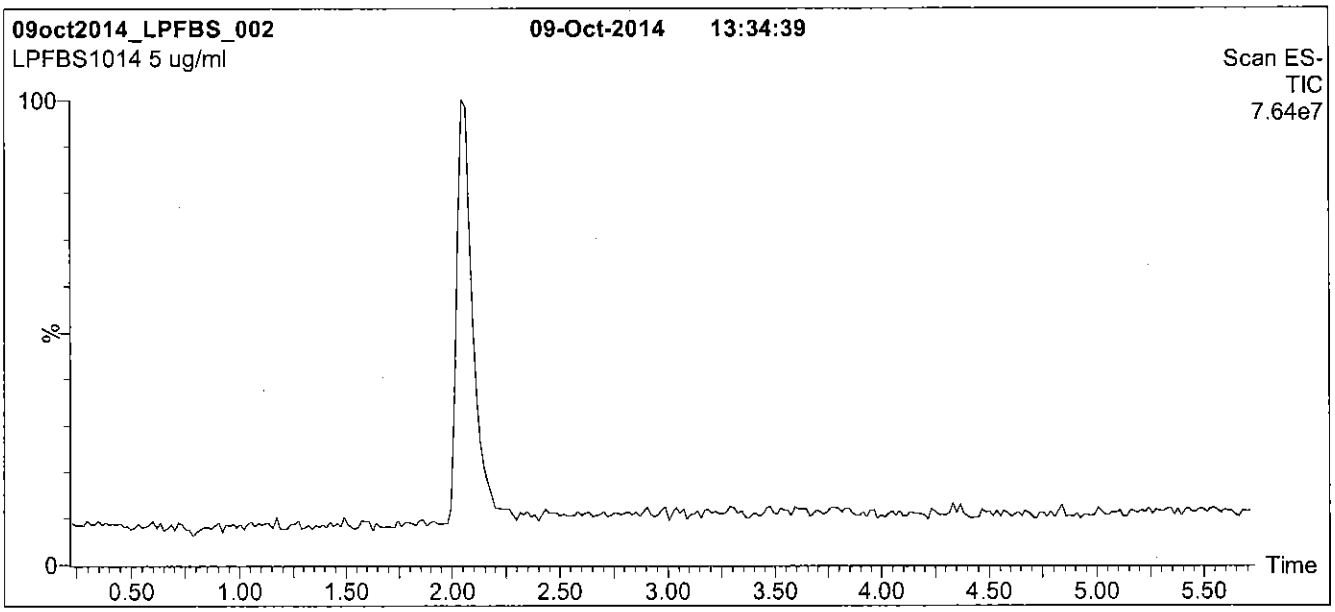
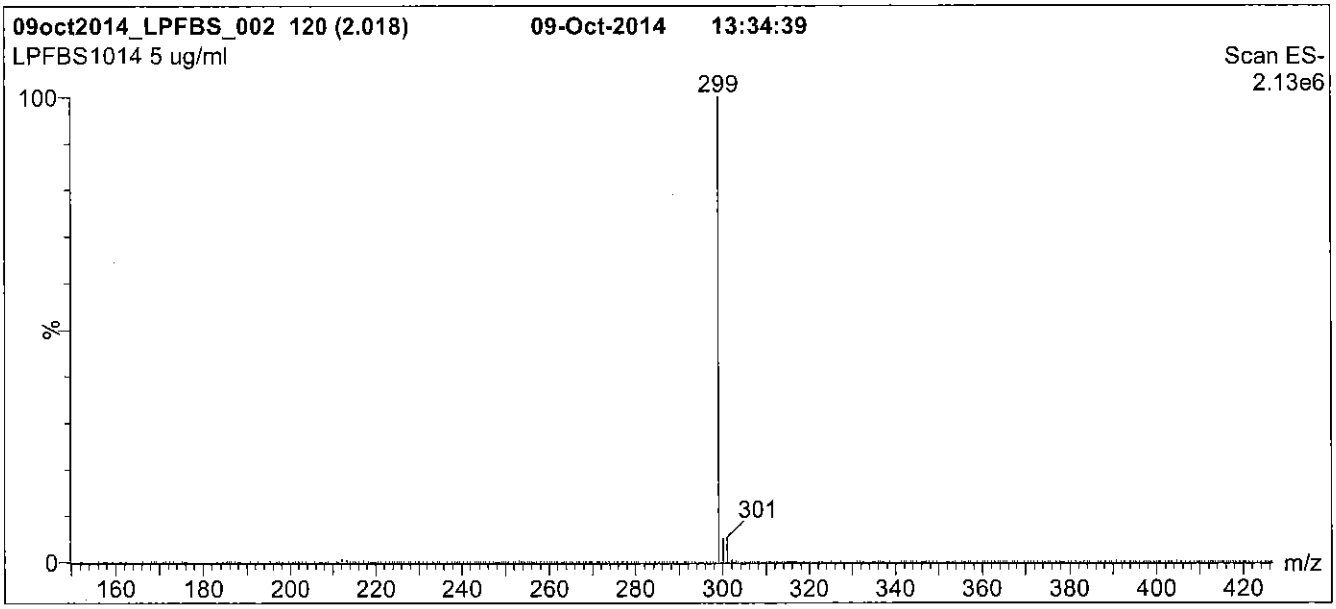
CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

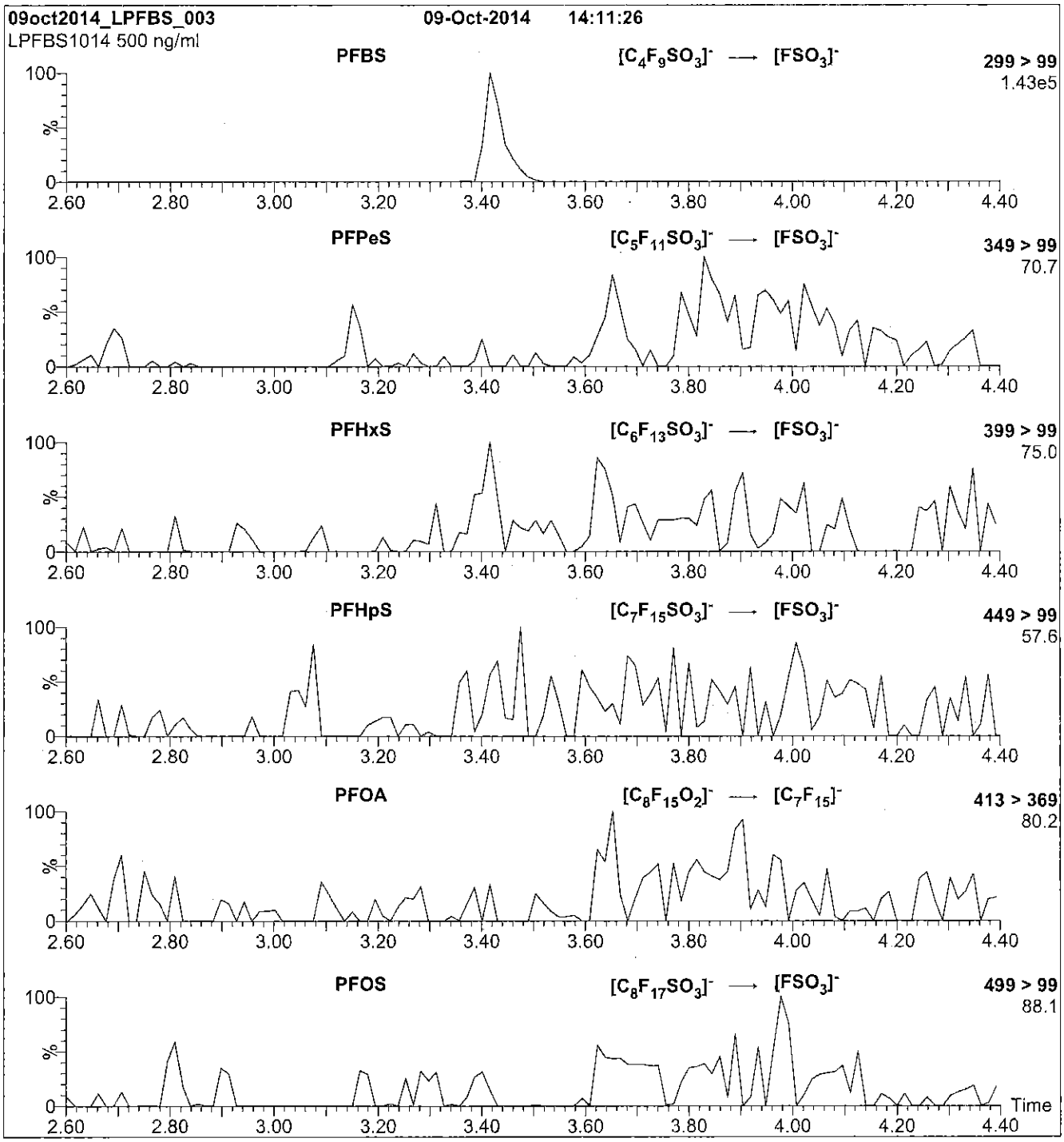
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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: **L-PFBS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFBS)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFBS_00005

R: 9/9/16 SBC

728306
ID: LCM2-8:2FTS_00003
Exp: 01/08/21 Prpd: SBC
M2-8:2FTS

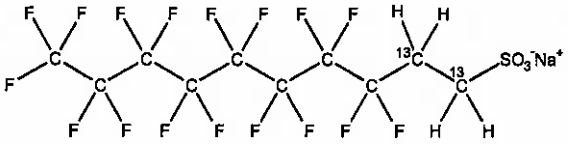
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0116

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8H_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	552.15
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.9 ± 2.4 µg/ml (M2-8:2FTS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	01/08/2016		
EXPIRY DATE: (mm/dd/yyyy)	01/08/2021		
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 ^{34}S (due to natural isotopic abundance) therefore both native 8:2FTS and M2-8:2FTS will produce signals in the m/z 529 to m/z 509 channel during SRM analysis. We recommend using the m/z 529 to m/z 81 transition to monitor for M2-8:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 01/18/2016 (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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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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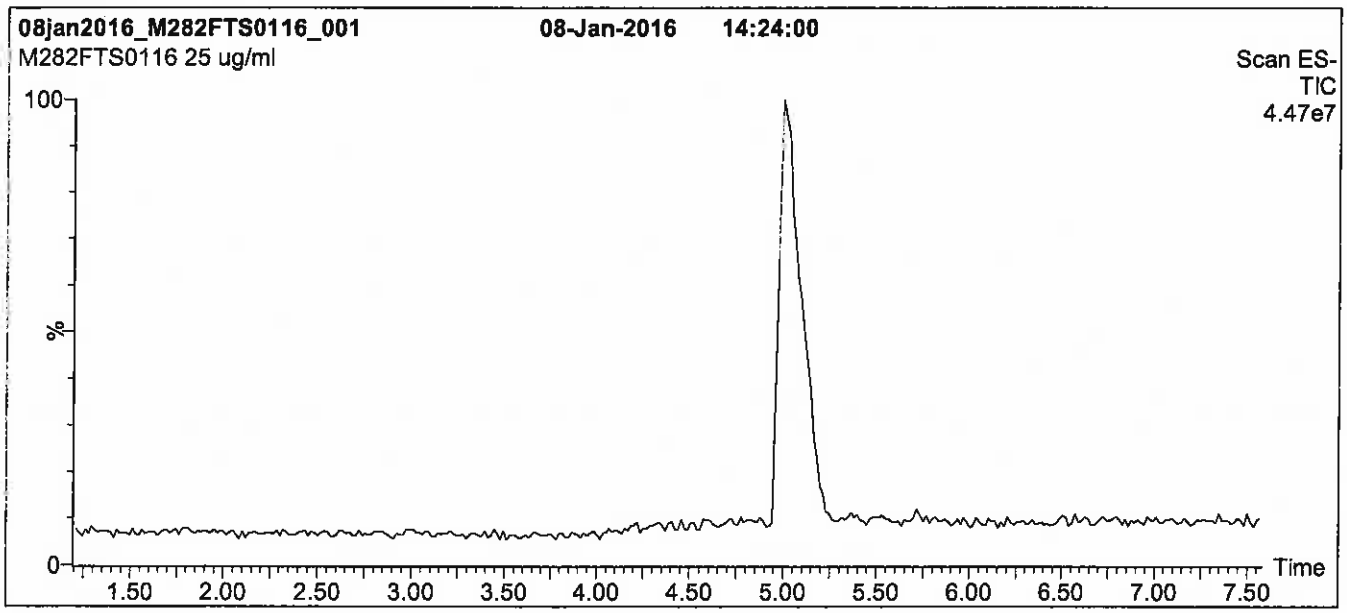
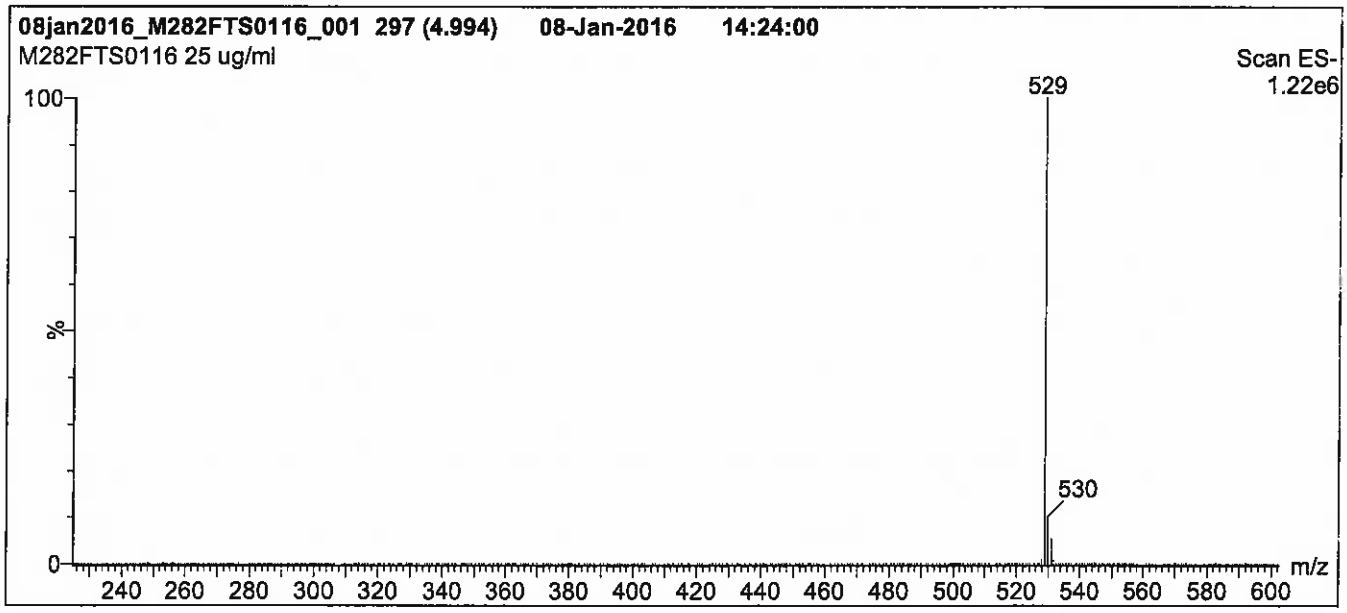
Figure 1: **M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

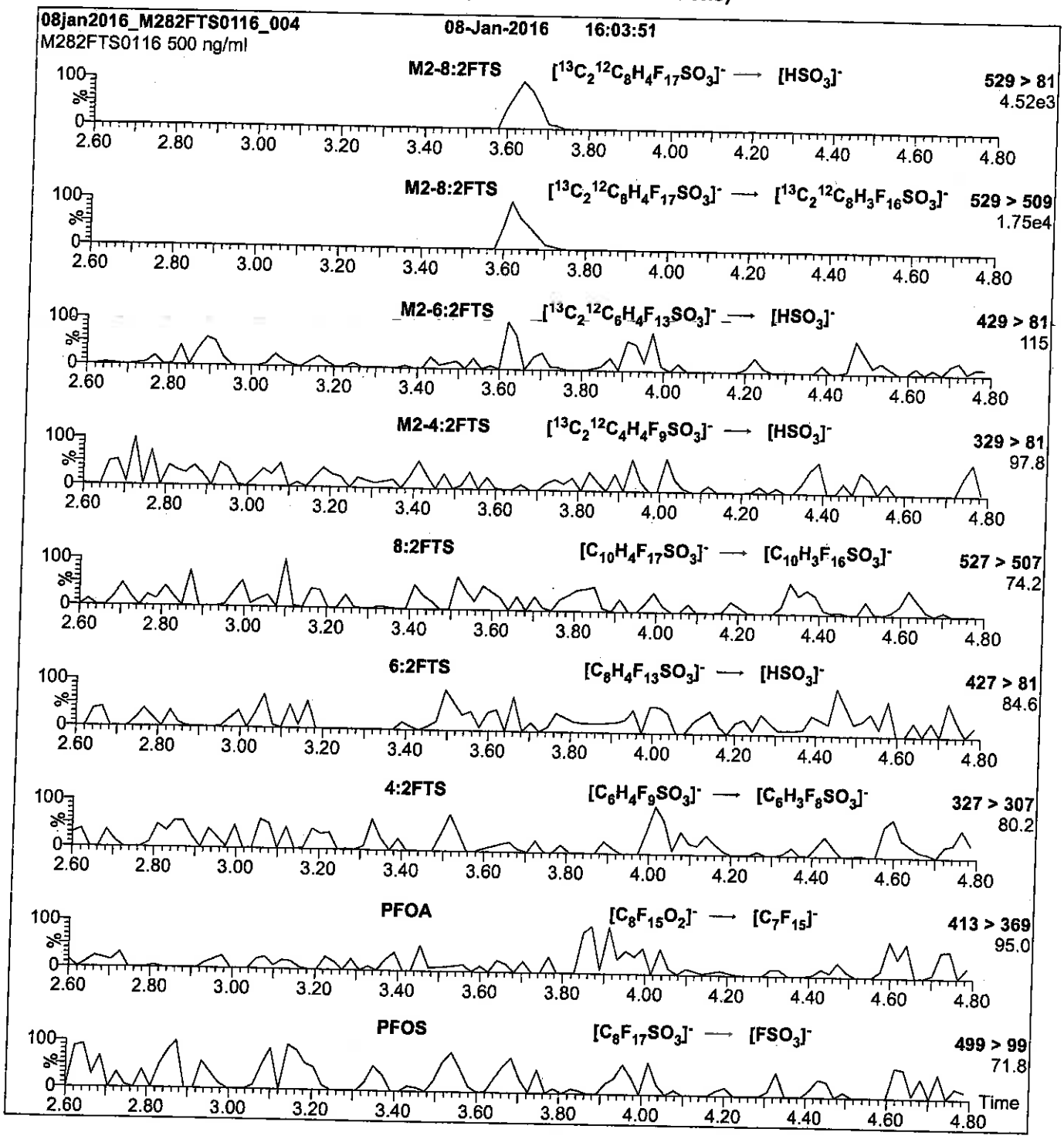
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 30

R: SBC 9/13/16

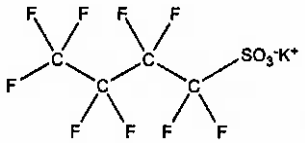
730511
ID: LCPFBS_00005
Exp: 03/15/21 Prpd: SBC
PF-1-butanesulfonate K sa

730512
ID: LCPFBS_00006
Exp: 03/15/21 Prpd: SBC
PF-1-butanesulfonate K sa

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFBS
LOT NUMBER: LPFBS0316
COMPOUND: Potassium perfluoro-1-butanesulfonate
STRUCTURE:
CAS #: 29420-49-3



MOLECULAR FORMULA: $C_4F_9SO_3K$
MOLECULAR WEIGHT: 338.19
CONCENTRATION: 50.0 ± 2.5 µg/ml (K salt)
44.2 ± 2.2 µg/ml (PFBS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 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)

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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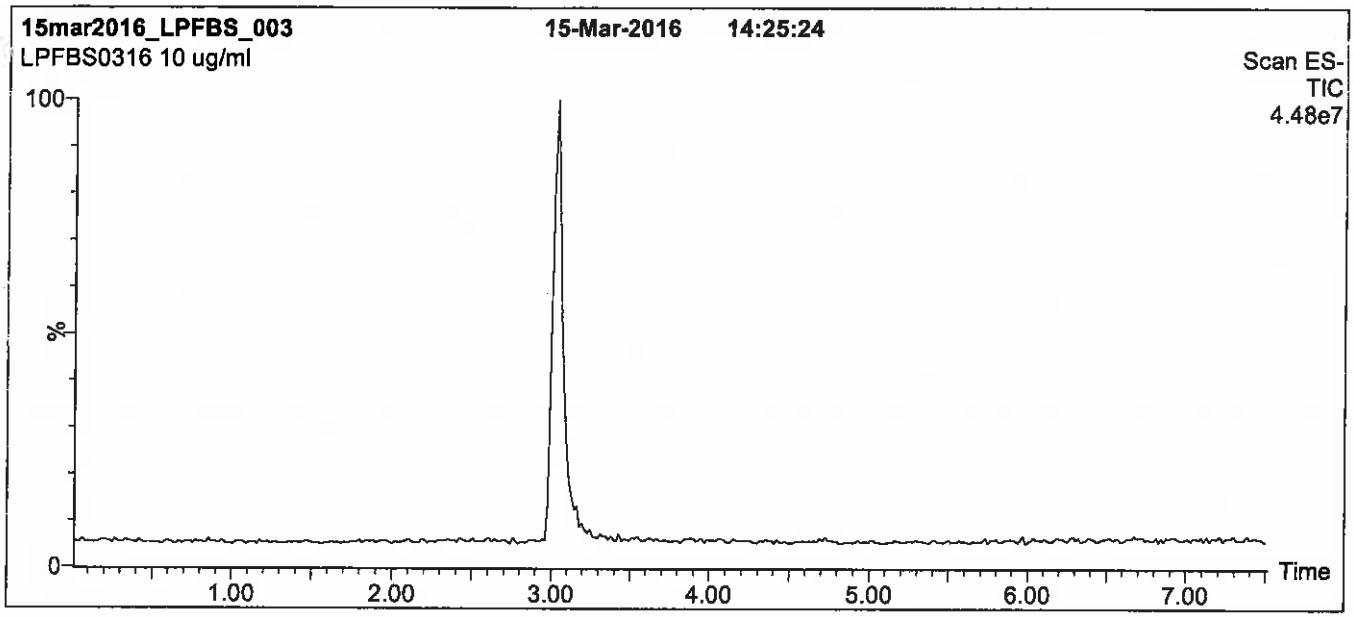
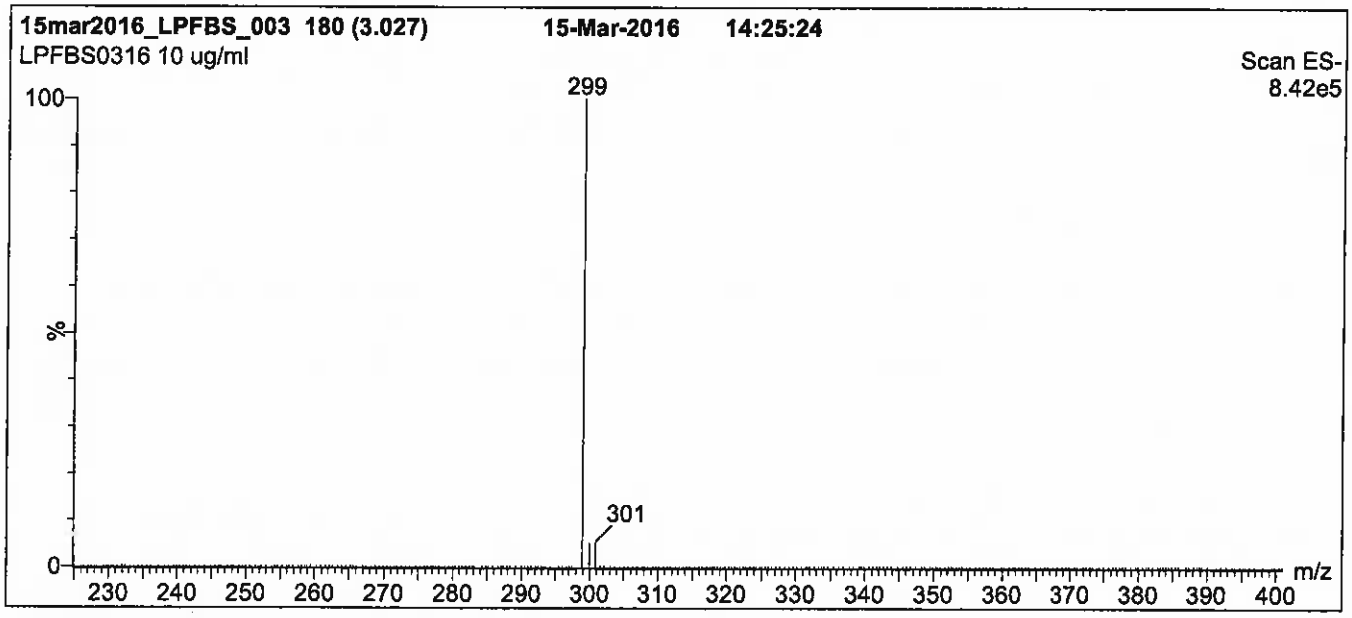
Figure 1: **L-PFBS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

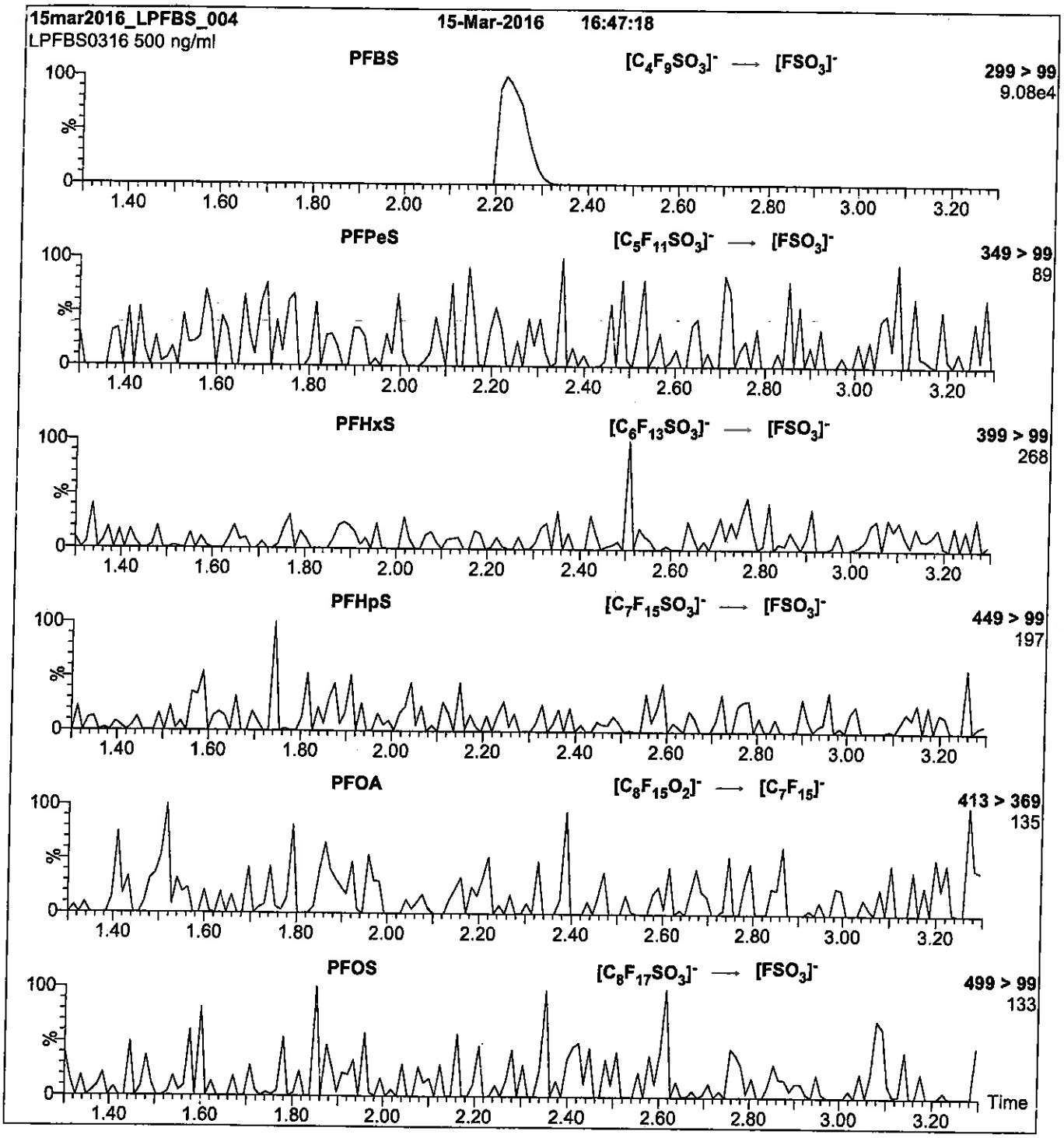
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFBS)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 25

Reagent

LCPFDA_00005

R: 7/6/16 CBW

671576
ID: LCPFDA_00005
Exp: 07/02/23 Rpd: CBW
PF-n-decanoic acid

WELLINGTON LABORATORIES

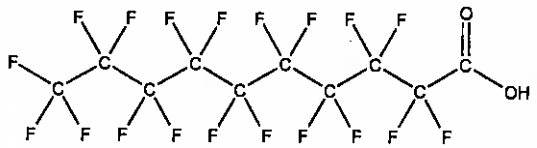
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFDA
COMPOUND: Perfluoro-n-decanoic acid

LOT NUMBER: PFDA0615

STRUCTURE:

CAS #: 335-76-2



MOLECULAR FORMULA: $C_{10}HF_{19}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 514.08
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 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 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.6% PFNA and ~ 0.3% PFOA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/24/2015 (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.

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UNCERTAINTY:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

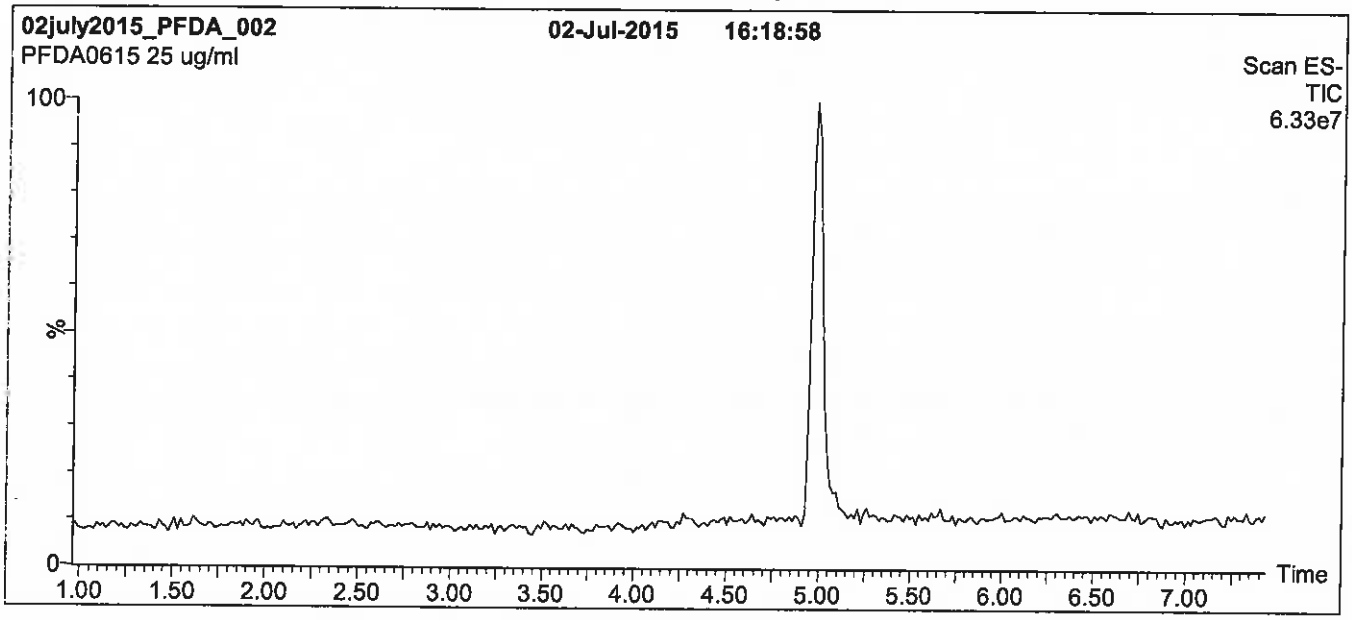
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

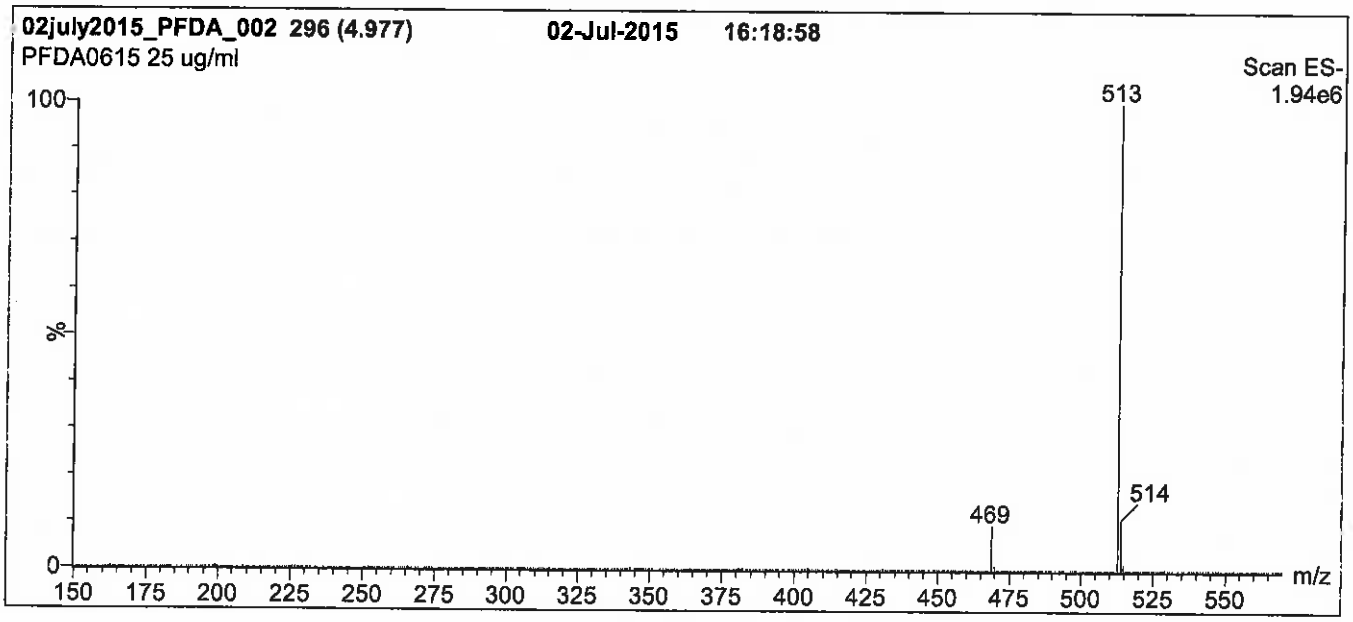
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

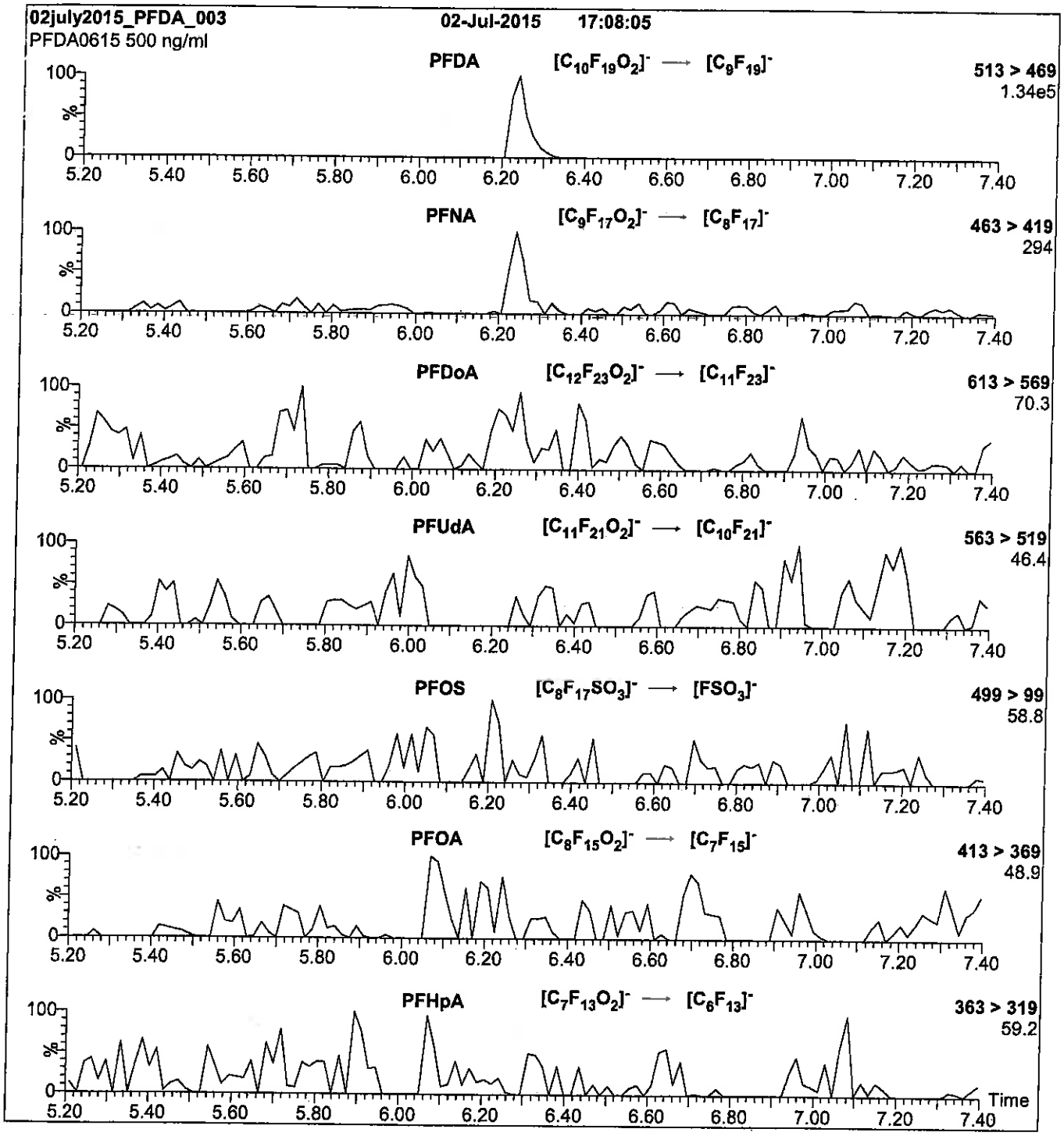
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.62e-3
Collision Energy (eV) = 13

Reagent

LCPFDoA_00005

R: 7/6/16 ca

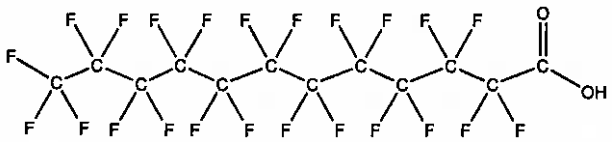
671601
ID: LCPFDoA_00005
Exp: 01/30/20 Prpd: CBW
PF-n-dodecanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFDoA
LOT NUMBER: PFDoA0115
COMPOUND: Perfluoro-n-dodecanoic acid

STRUCTURE:
CAS #: 307-55-1



MOLECULAR FORMULA: $C_{12}HF_{23}O_2$
MOLECULAR WEIGHT: 614.10
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/30/2015
EXPIRY DATE: (mm/dd/yyyy) 01/30/2020
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:** 03/25/2015 (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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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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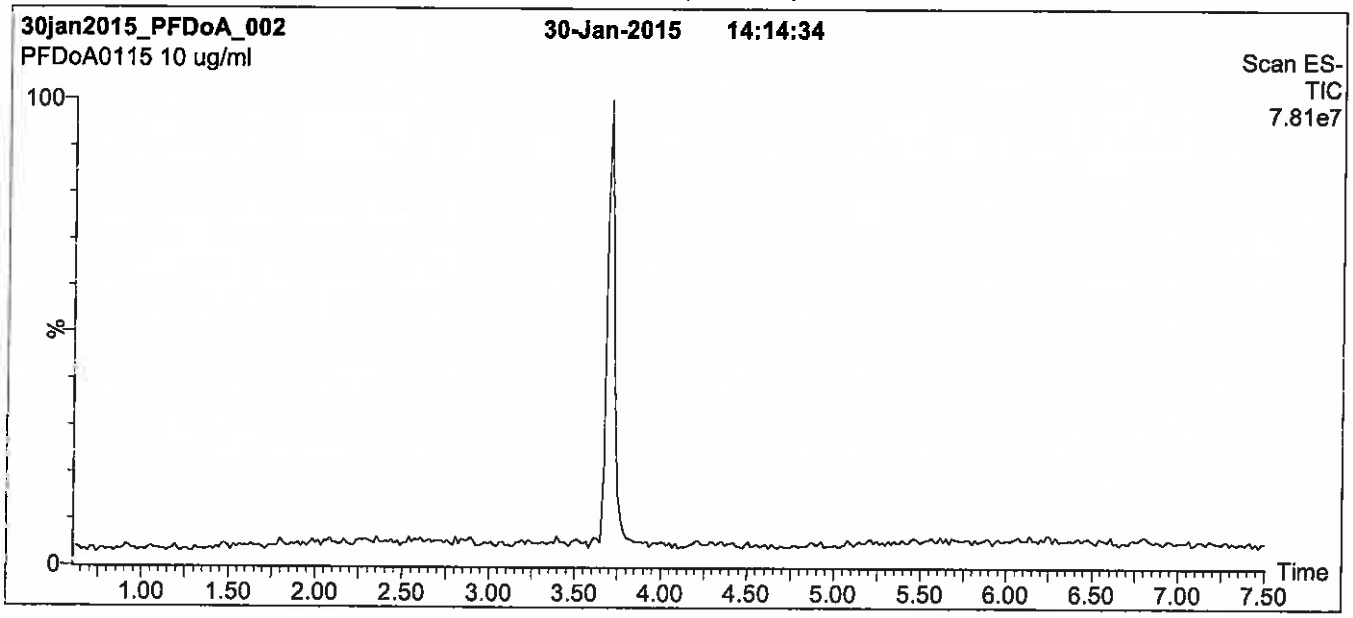
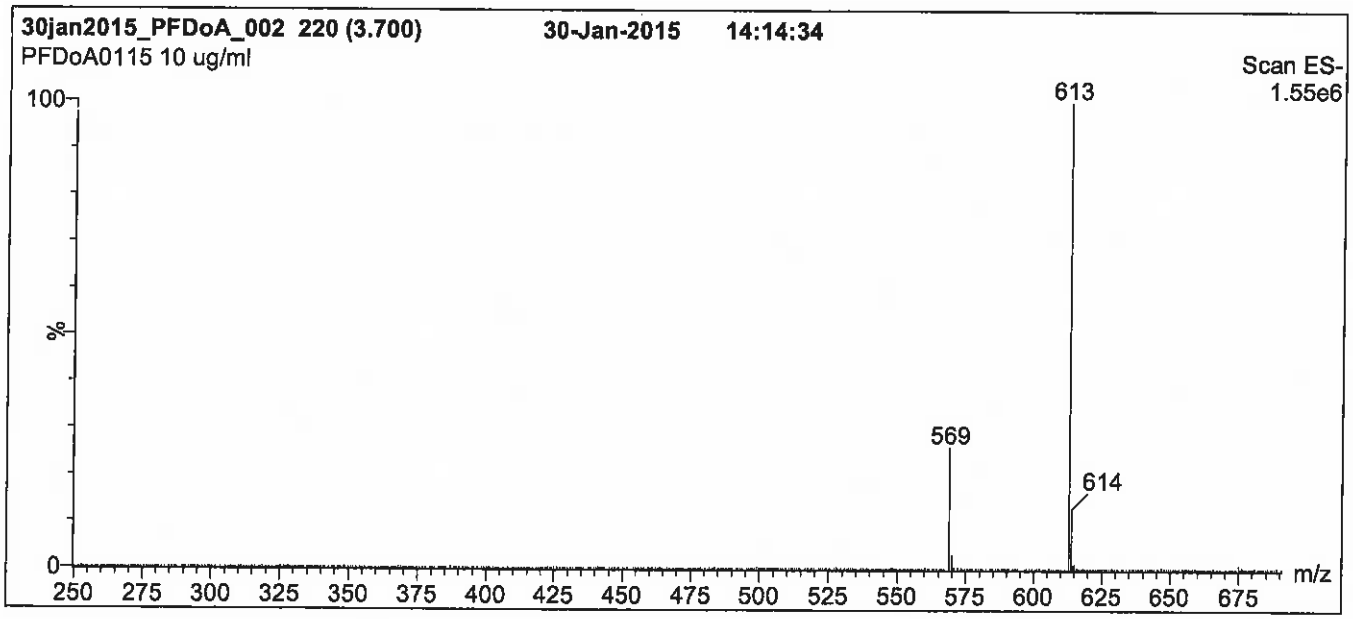
Figure 1: **PFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

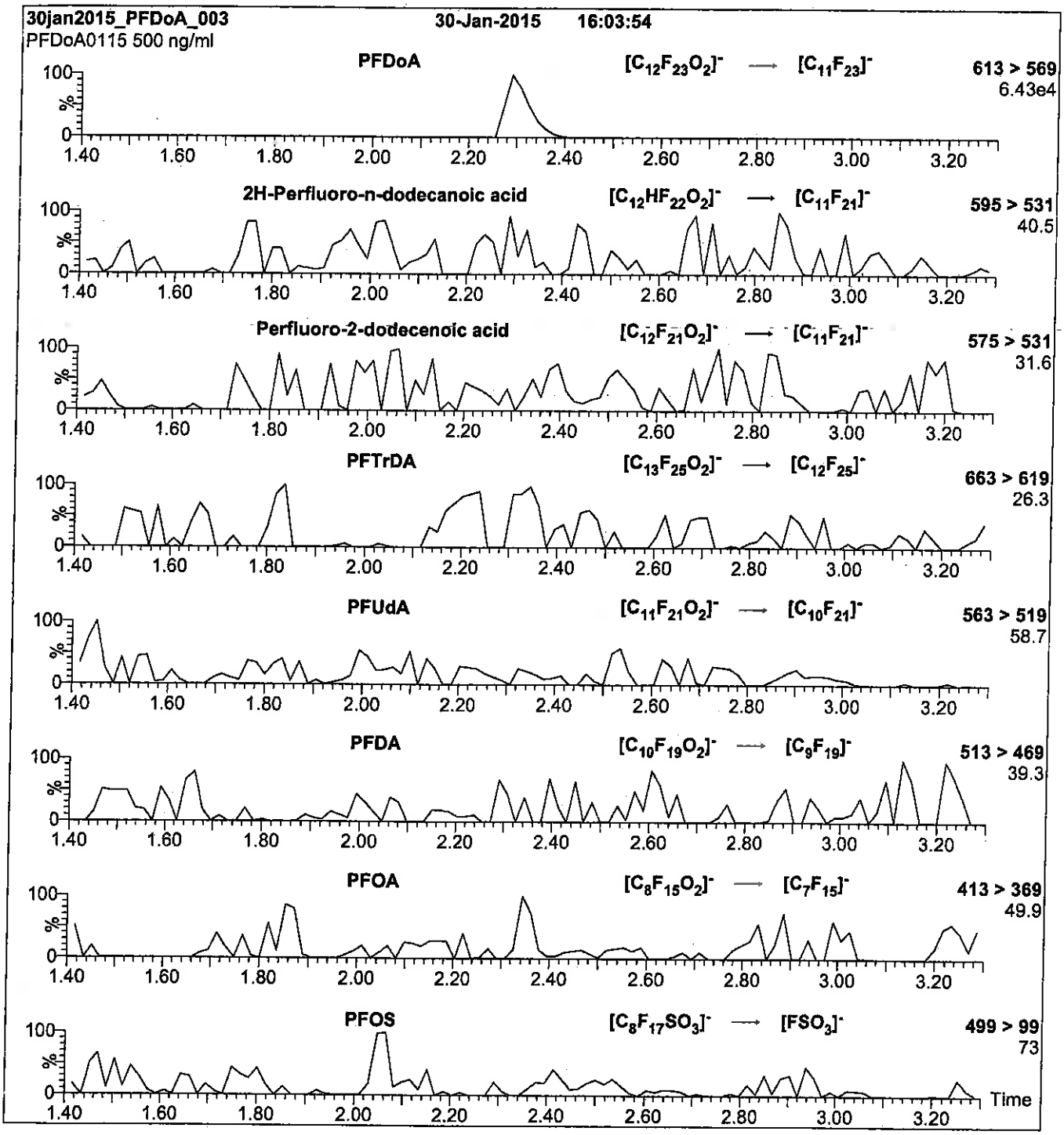
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1000 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFDoA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.28e-3 Collision Energy (eV) = 13
Flow:	300 µl/min	

Reagent

LCPFDS_00005

605240
ID: LCPFDS_00005
Exp: 07/02/20 Prpd: CBW
PF-1-decanesulfonate sodi

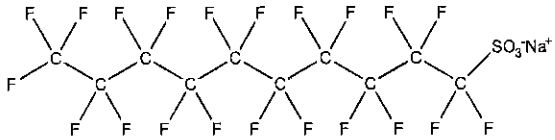
Rec. 3/29/16 JRB

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFDS
LOT NUMBER: LPFDS0615
COMPOUND: Sodium perfluoro-1-decanesulfonate

STRUCTURE:
CAS #: 2806-15-7



MOLECULAR FORMULA: $C_{10}F_{21}SO_3Na$
MOLECULAR WEIGHT: 622.13
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
48.2 ± 2.4 µg/ml (PFDS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 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)

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

INTENDED USE:

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CALA

ANAB ACCREDITED

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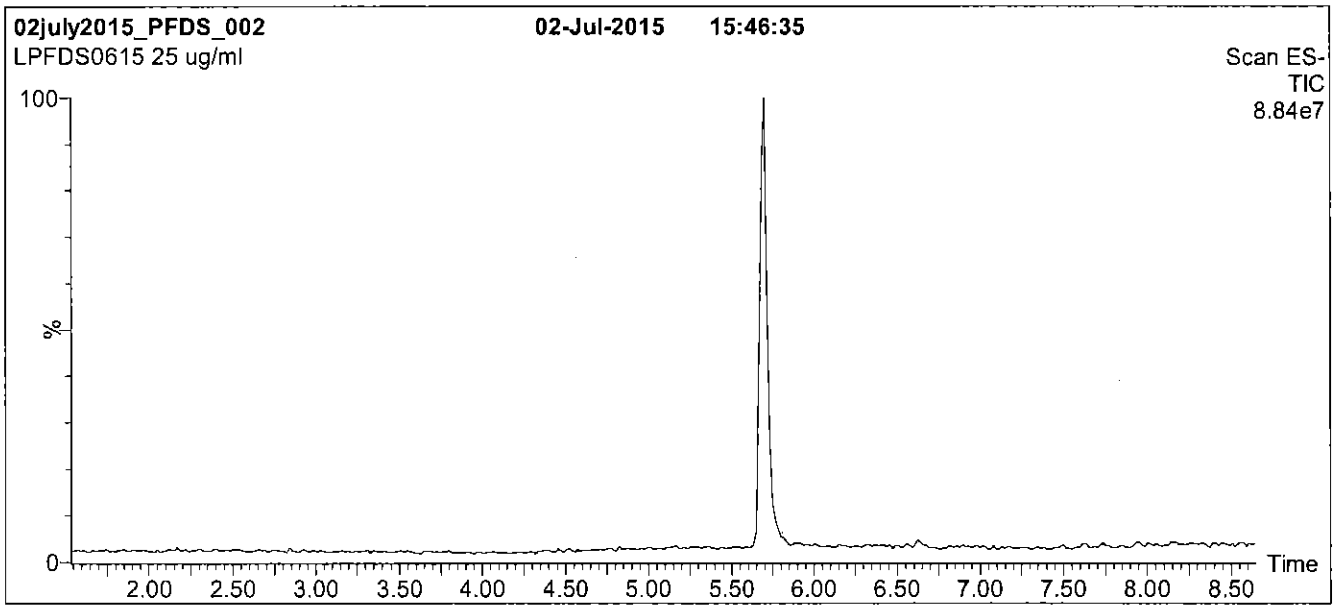
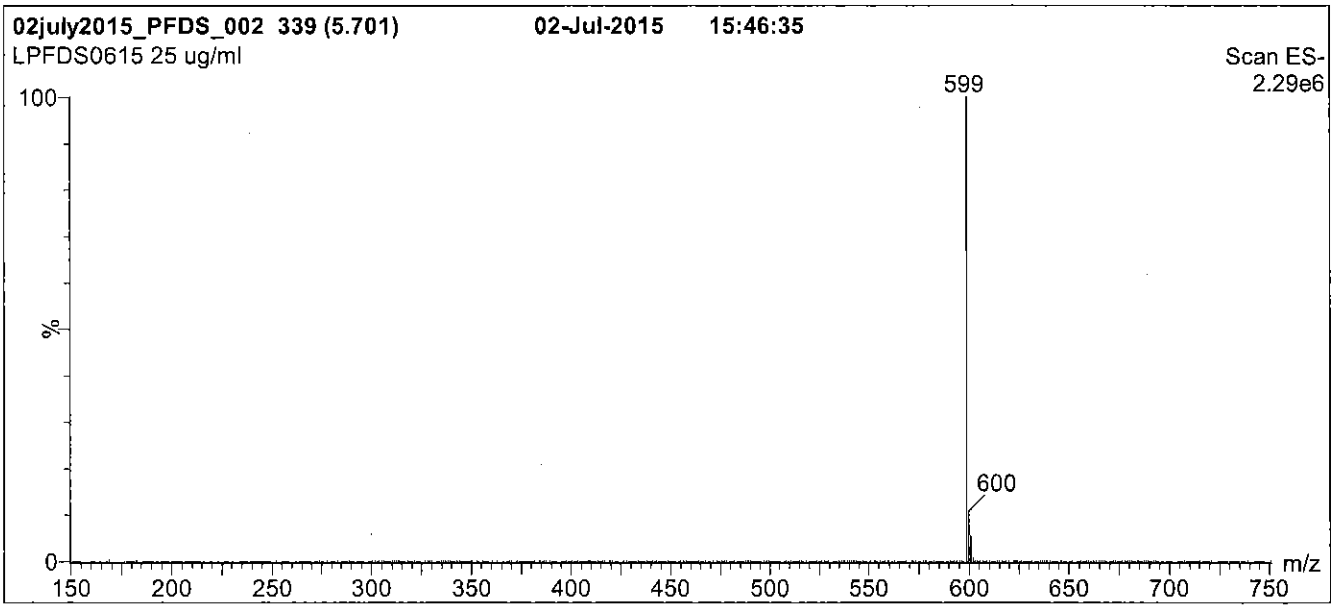
Figure 1: **L-PFDS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

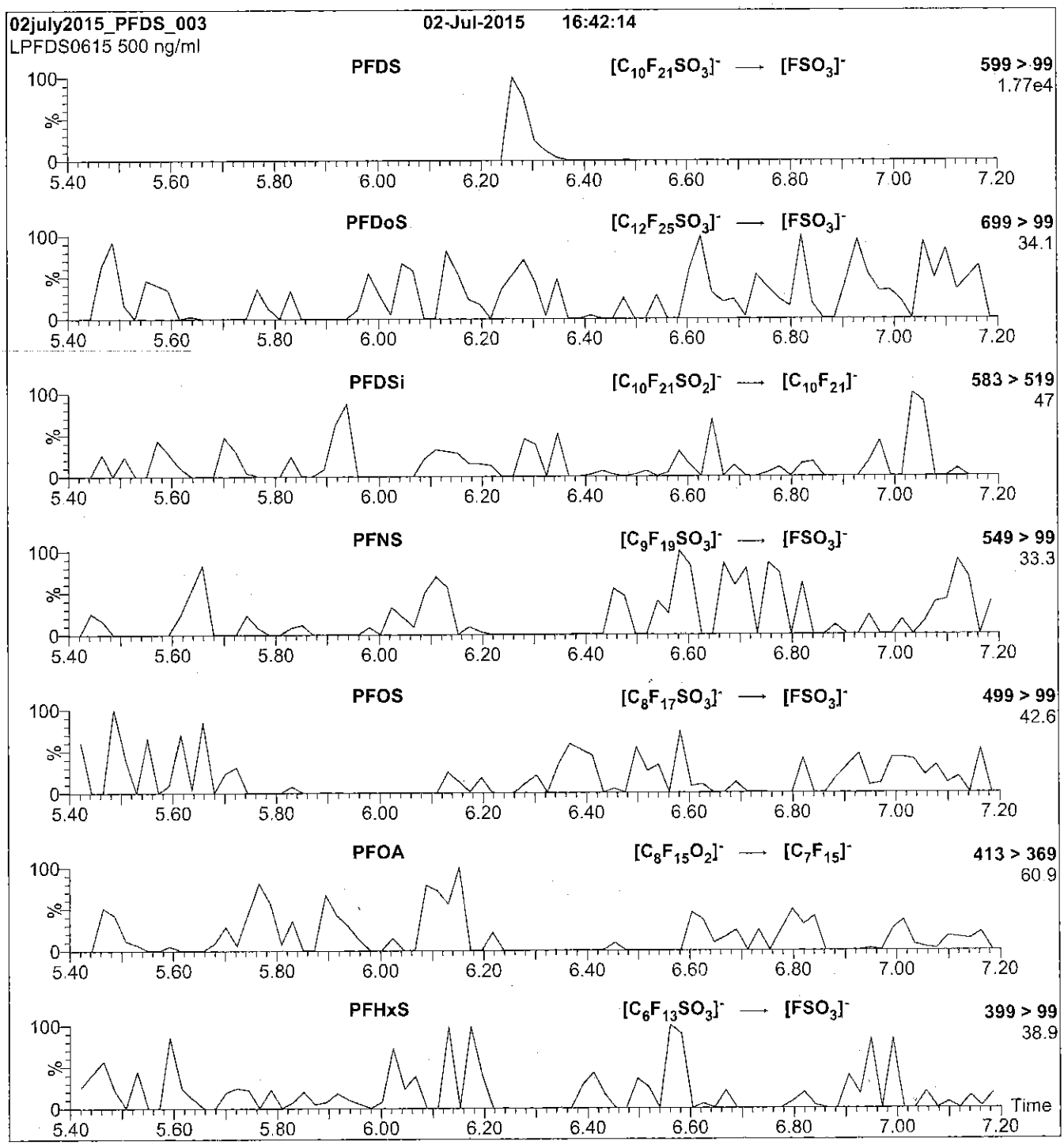
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 70.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFDS)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 50

Reagent

LCPFHpA_00005

609699
ID: LCPFHpA_00005
Exp: 01/22/21 Prpd: CBW
PF-n-heptanoic acid

R: 4/7/16 CBW

WELLINGTON LABORATORIES

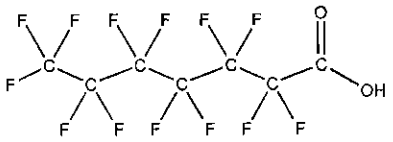
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHpA
COMPOUND: Perfluoro-n-heptanoic acid

LOT NUMBER: PFHpA0116

STRUCTURE:

CAS #: 375-85-9



MOLECULAR FORMULA: $C_7HF_{13}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 364.06
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
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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO Guide 34 REFERENCE MATERIAL PRODUCER

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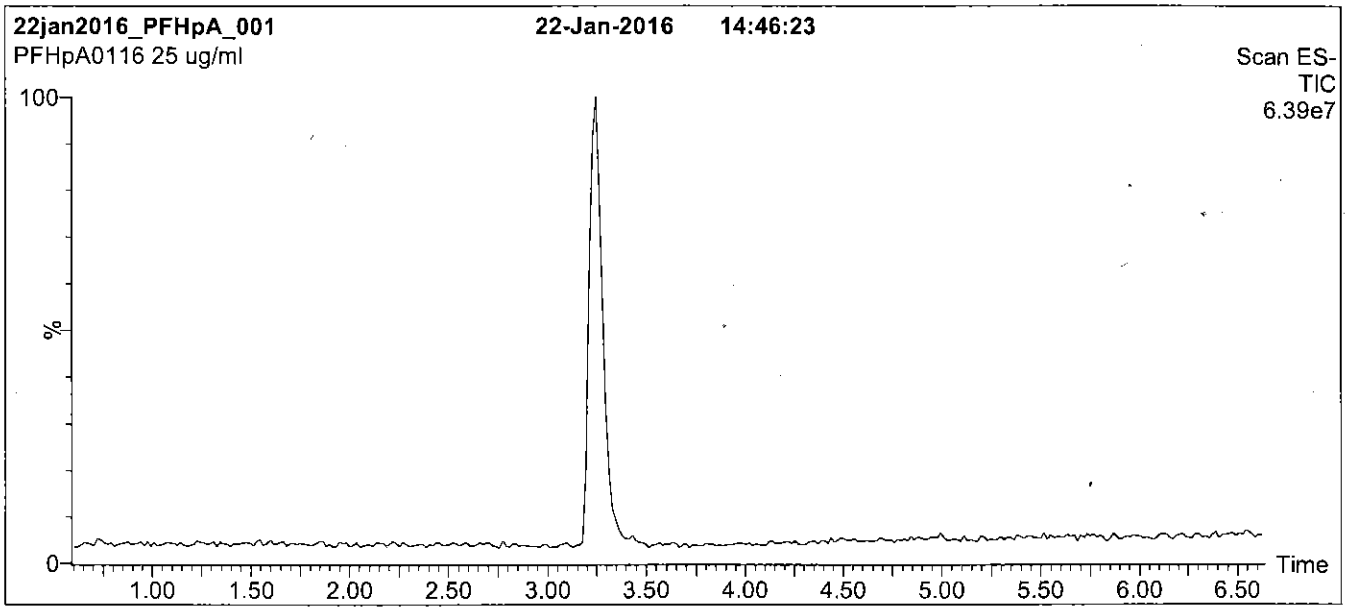
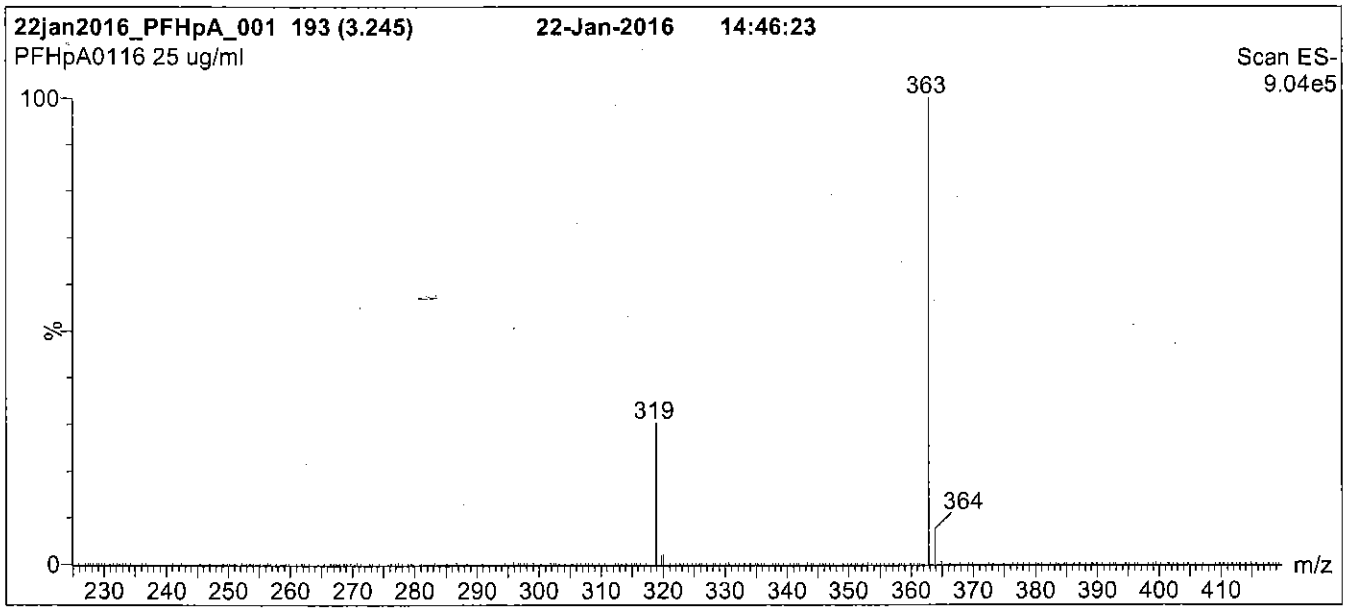
Figure 1: **PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

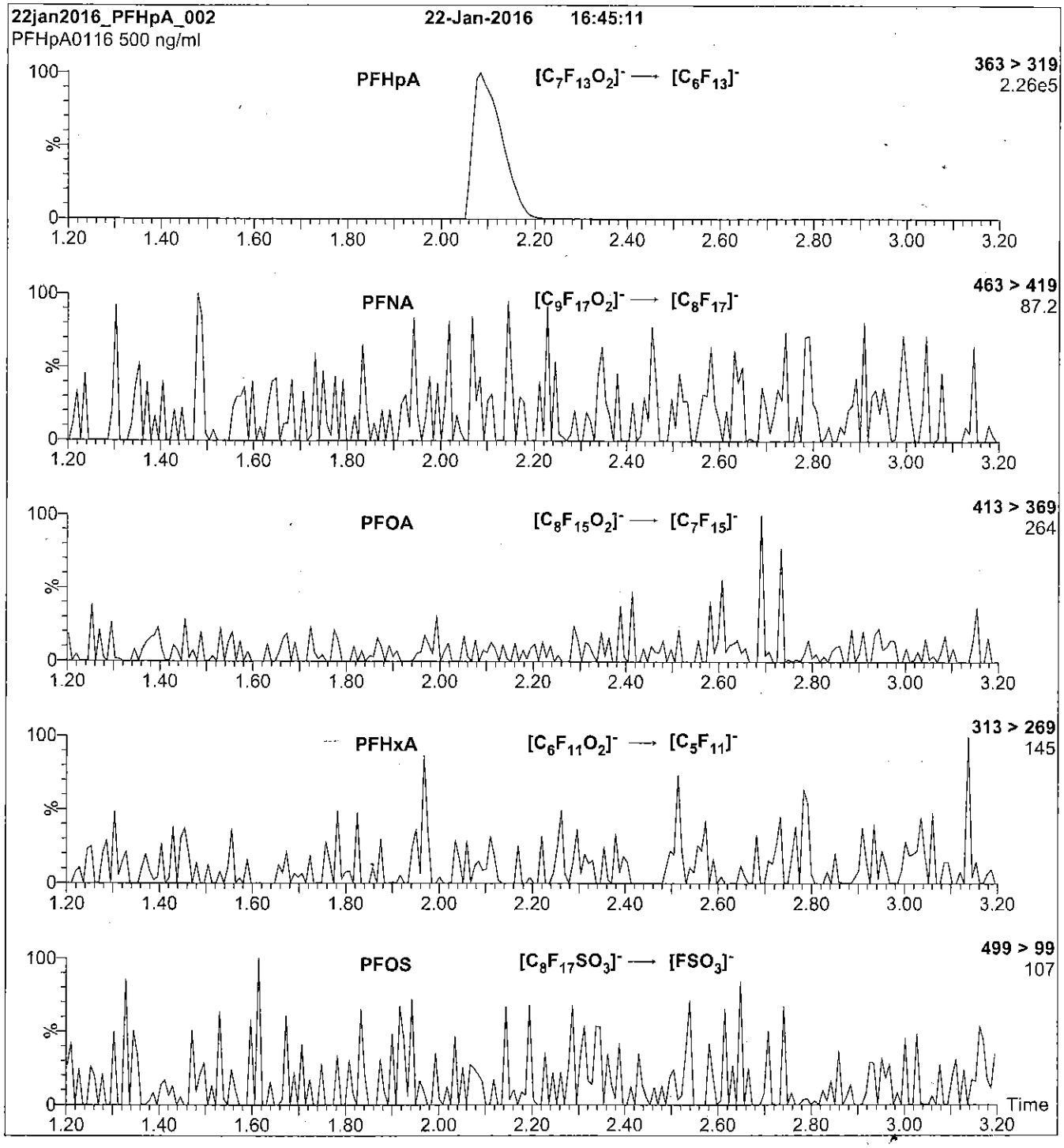
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFHpS_00008

R: 5/10/16 CBW

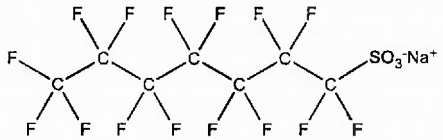
627751
ID: LCPFHpS_00008
Exp: 11/06/20 Prpd: CBW
PFHpS at 47.6ug/mL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: L-PFHpS
LOT NUMBER: LPFHpS1115
COMPOUND: Sodium perfluoro-1-heptanesulfonate

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $C_7F_{15}SO_3Na$
MOLECULAR WEIGHT: 472.10
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
47.6 ± 2.4 µg/ml (PFHpS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/06/2015
EXPIRY DATE: (mm/dd/yyyy) 11/06/2020
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 ~ 0.1% 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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HAZARDS:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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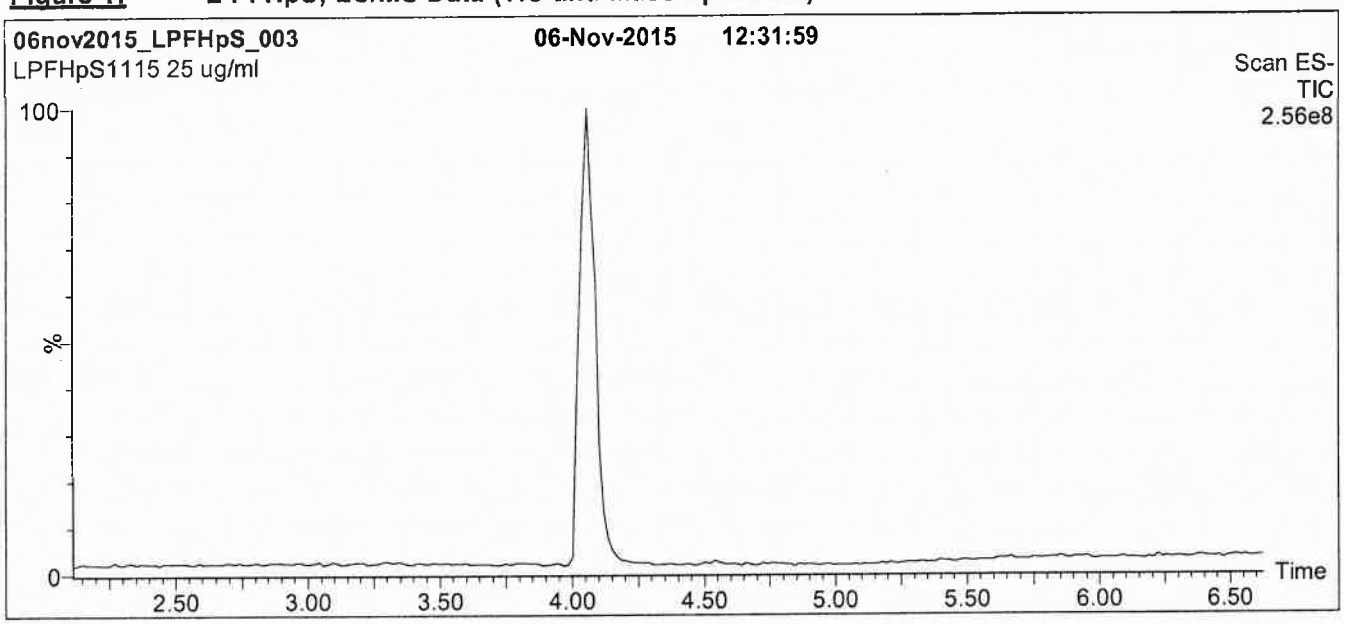
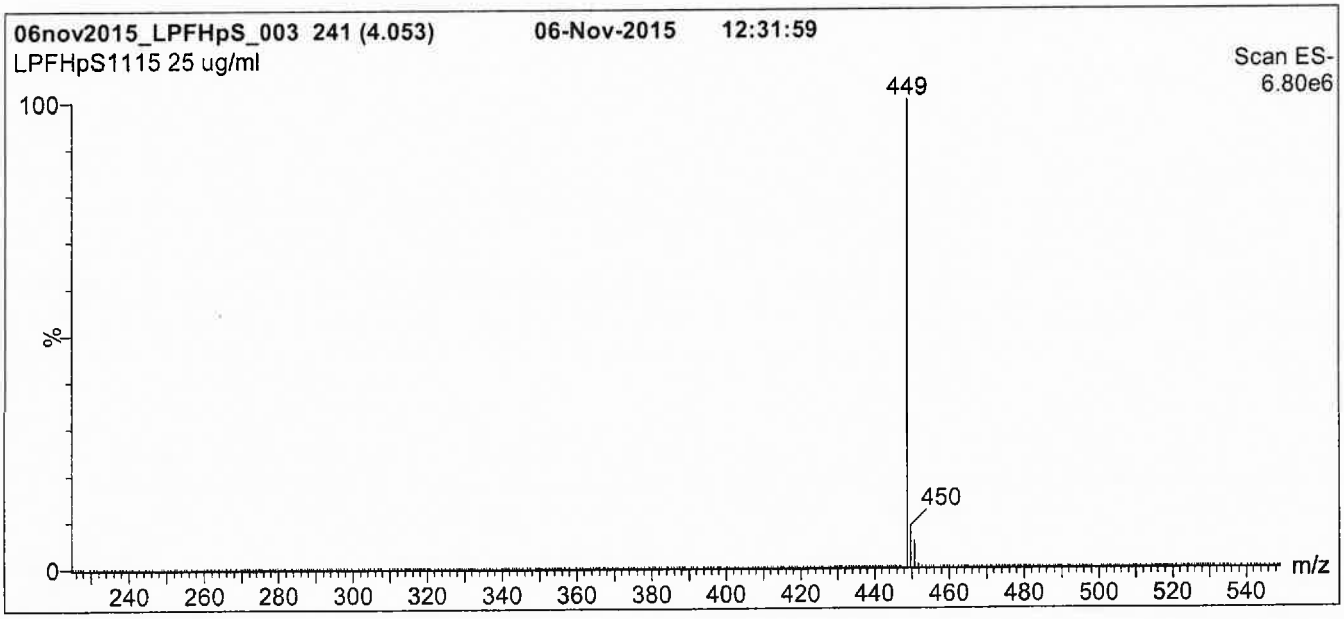




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

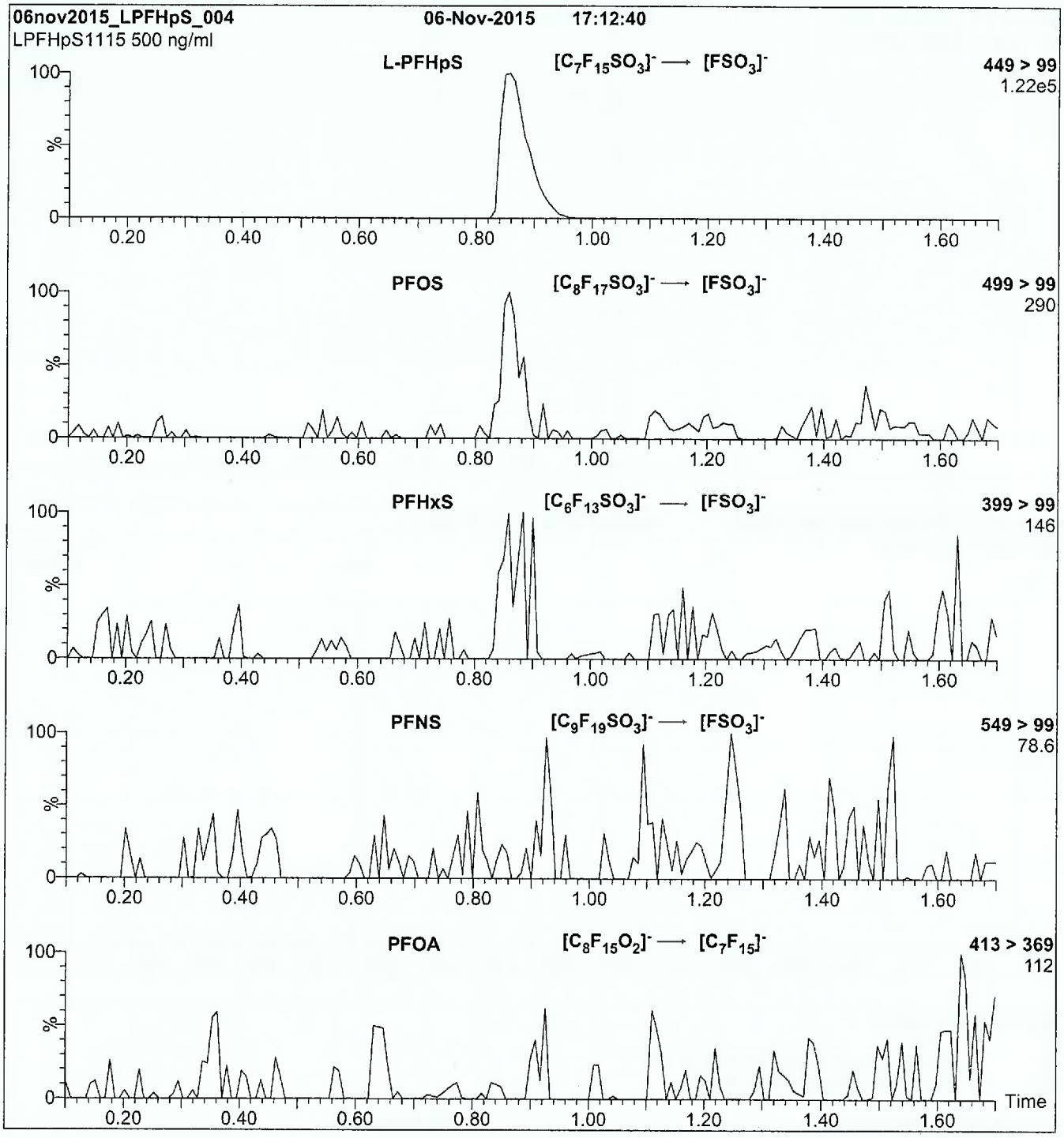
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFHpS)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 35

Reagent

LCPFHpS_00009

Scanned 10/14/16 SR R: SBC 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

WELLINGTON LABORATORIES

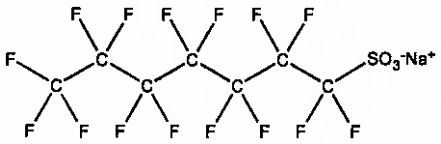
CERTIFICATE OF ANALYSIS DOCUMENTATION

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 ± 2.5 µg/ml (Na salt)
47.6 ± 2.4 µg/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 ($C_8F_{17}SO_3Na$).

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Certified By: B.G. Chittim **Date:** 11/09/2015 (mm/dd/yyyy)

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CALA

ANAB ACCREDITED

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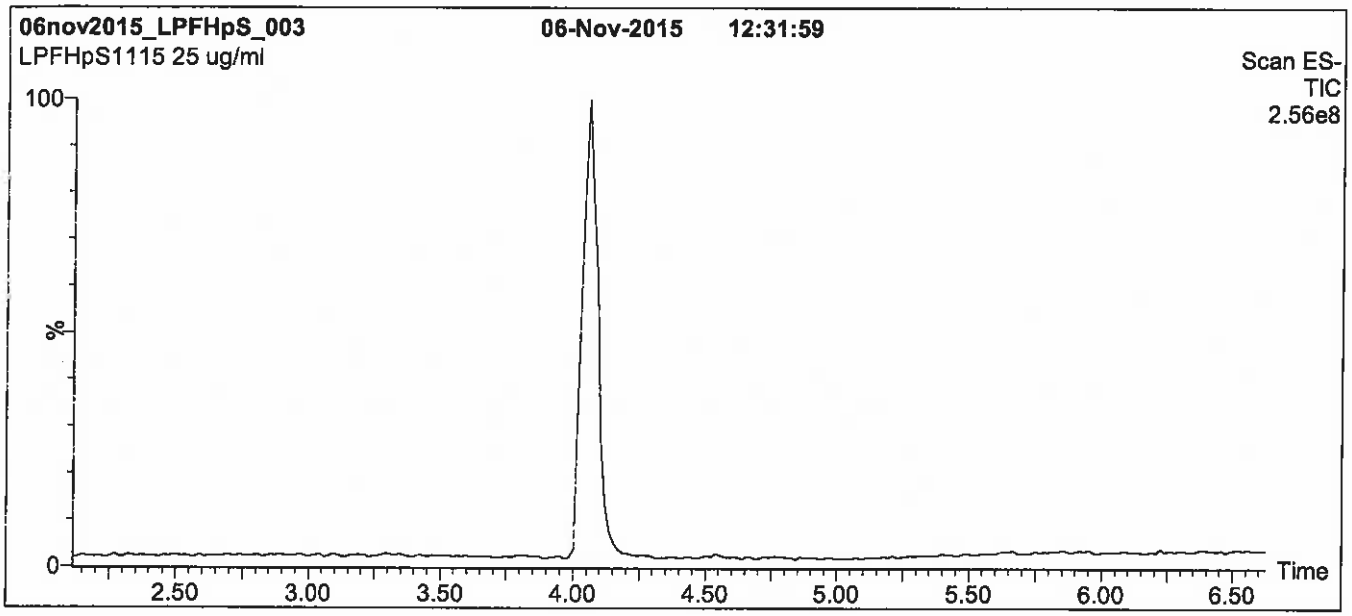
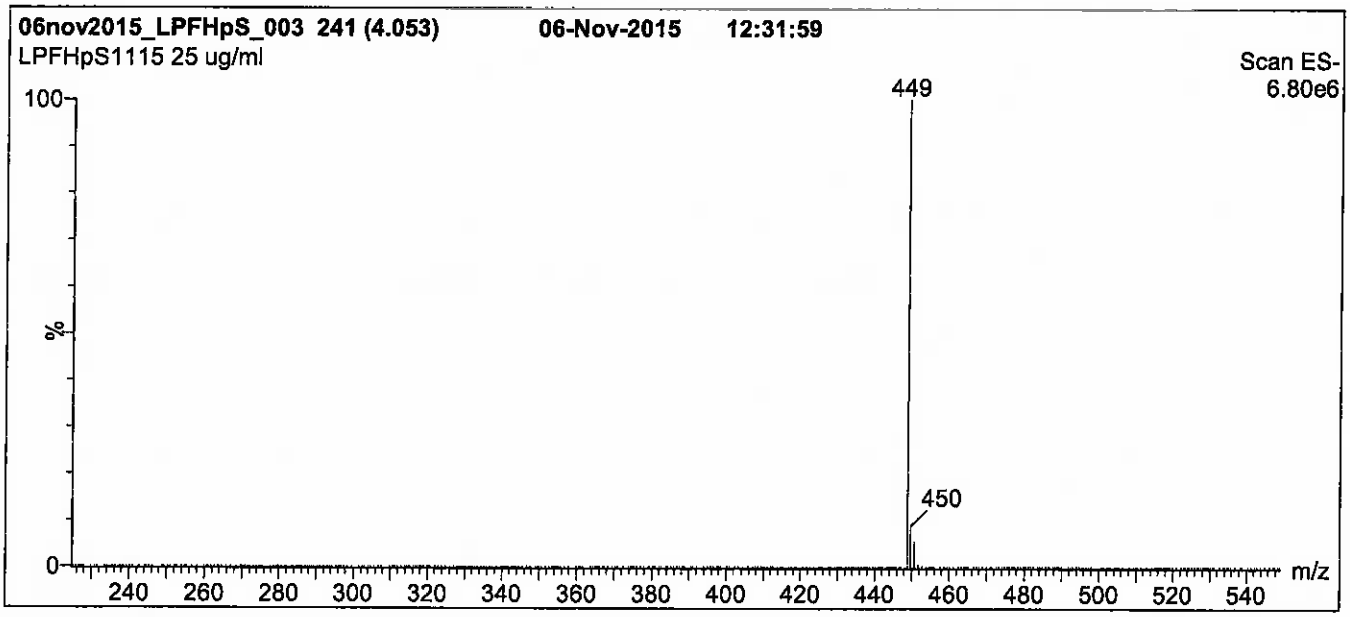
Figure 1: **L-PFHpS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

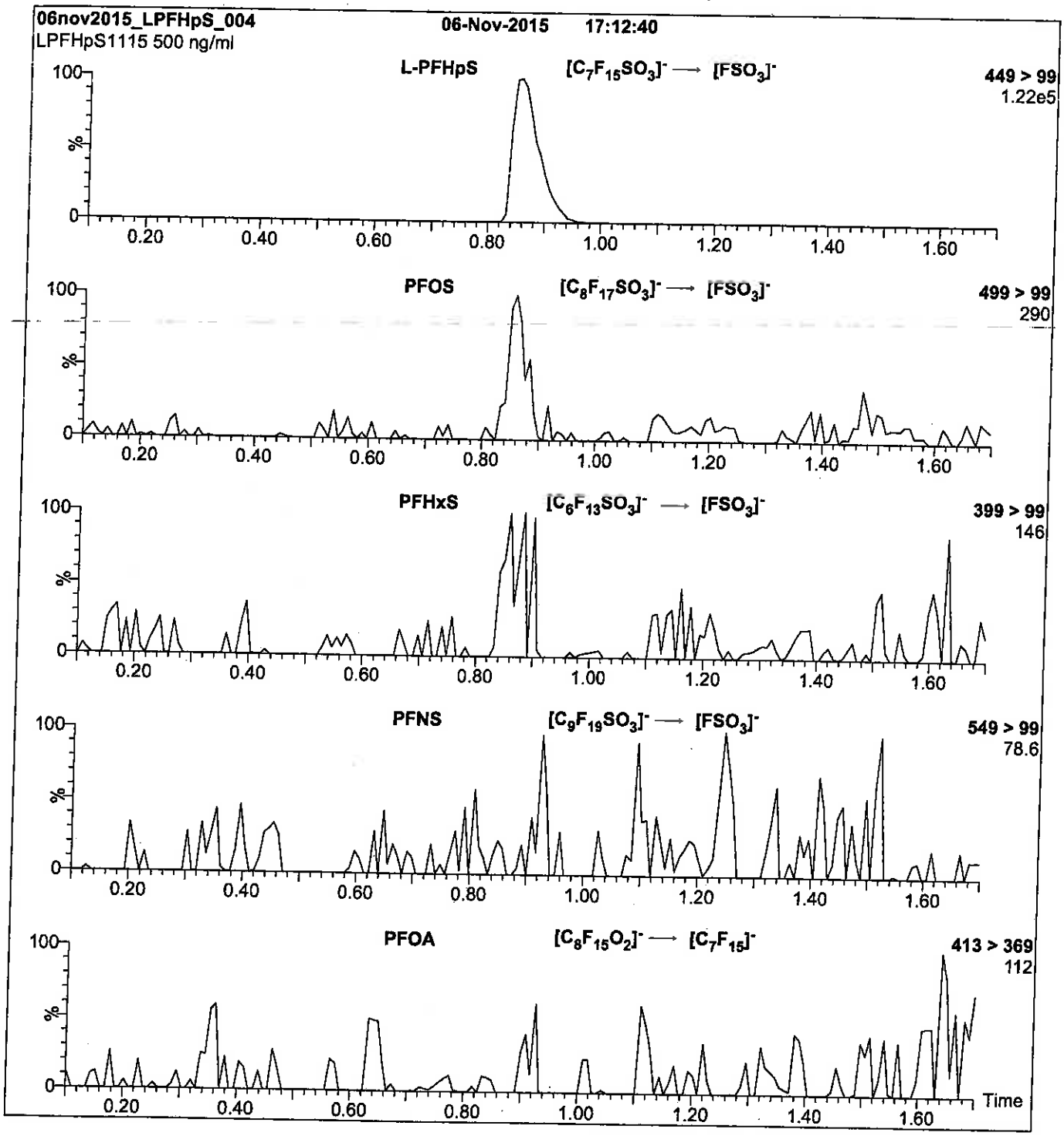
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFHpS)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 35

Reagent

LCPFHxA_00004

609702
ID: LCPFHxA_00004
Exp: 12/22/20 Prpd: CBW
PF-n-hexanoic acid

R: 4/7/16 CBW

WELLINGTON LABORATORIES

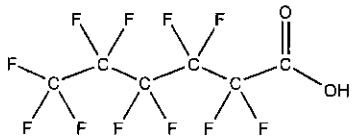
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: PFHxA1215

STRUCTURE:

CAS #: 307-24-4



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

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

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

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CALA Testing Accreditation No. A 1226

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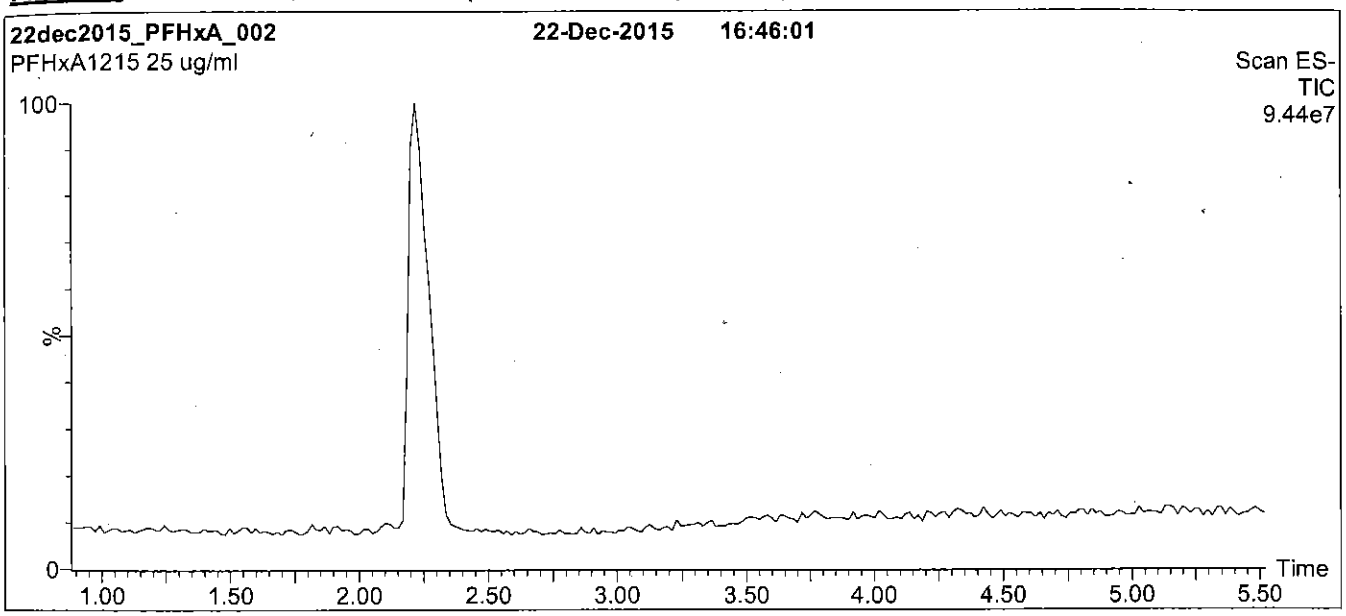
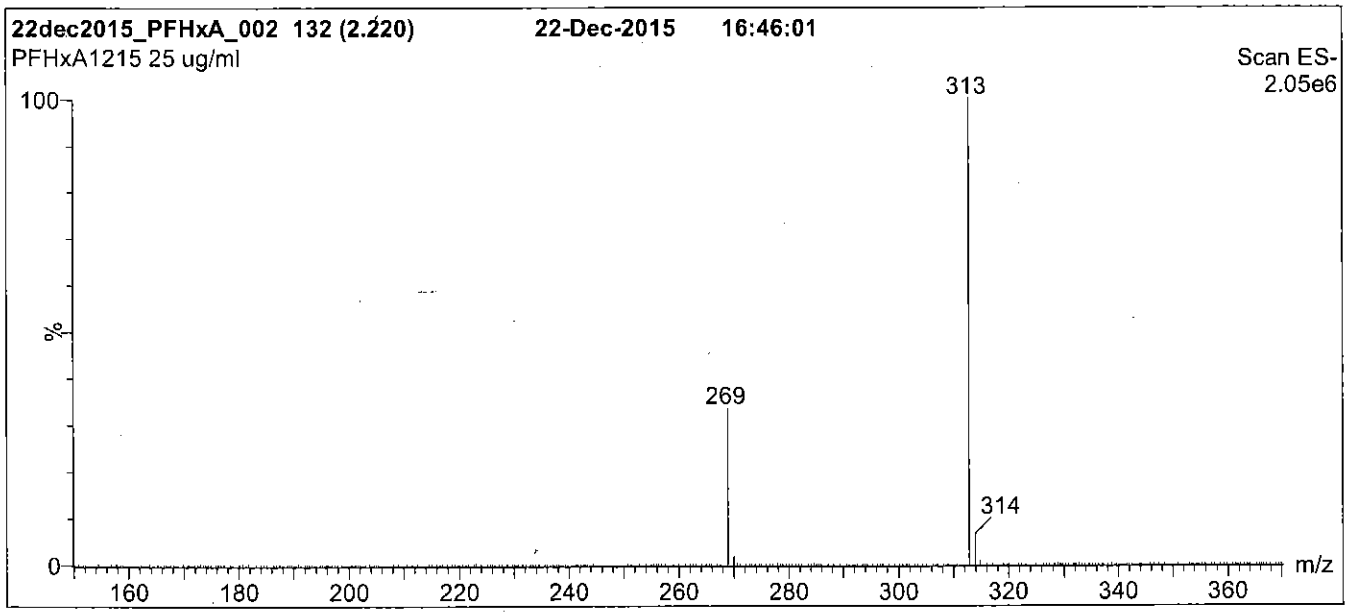
Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

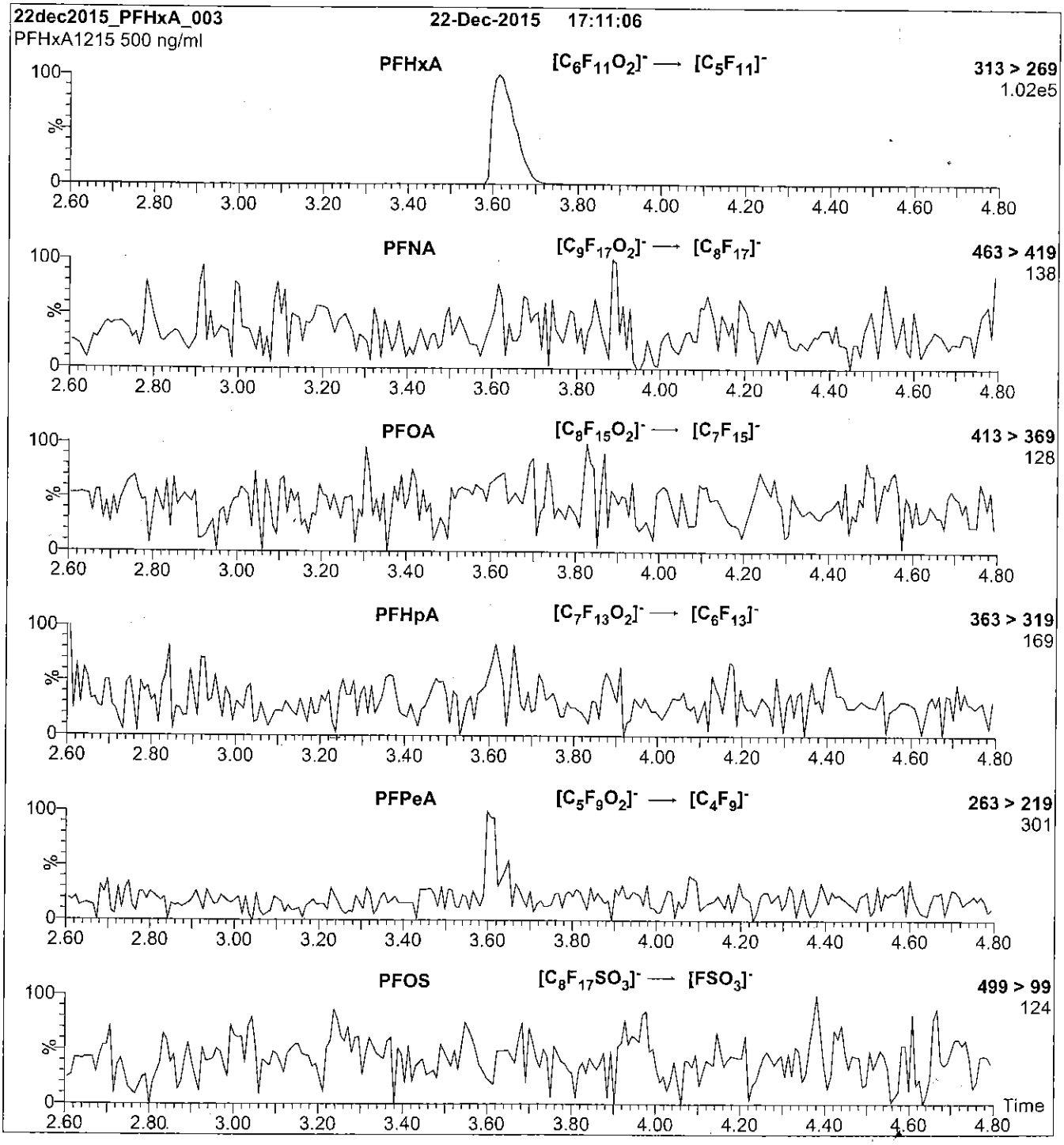
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 10

Reagent

LCPFHxDA_00006

R: SBC 9/13/16
Scanned 10/14/16 SR

730630
ID: LCPFHxDA_00006
Exp: 05/25/21 Prpd: SBC
PFHxDA stock 50ug/mL

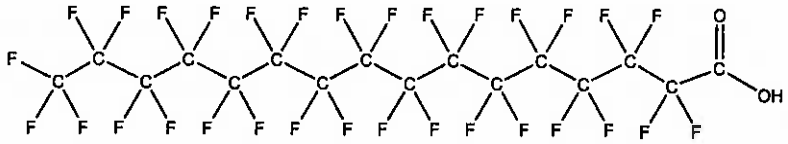
730631
ID: LCPFHxDA_00007
Exp: 05/25/21 Prpd: SBC
PFHxDA stock 50ug/mL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHxDA
LOT NUMBER: PFHxDA0516
COMPOUND: Perfluoro-n-hexadecanoic acid

STRUCTURE:
CAS #: 67905-19-5



MOLECULAR FORMULA: $C_{16}HF_{31}O_2$
MOLECULAR WEIGHT: 814.13
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/25/2016
EXPIRY DATE: (mm/dd/yyyy) 05/25/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.4% of PFODA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/27/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

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CALA Testing Accreditation Canada

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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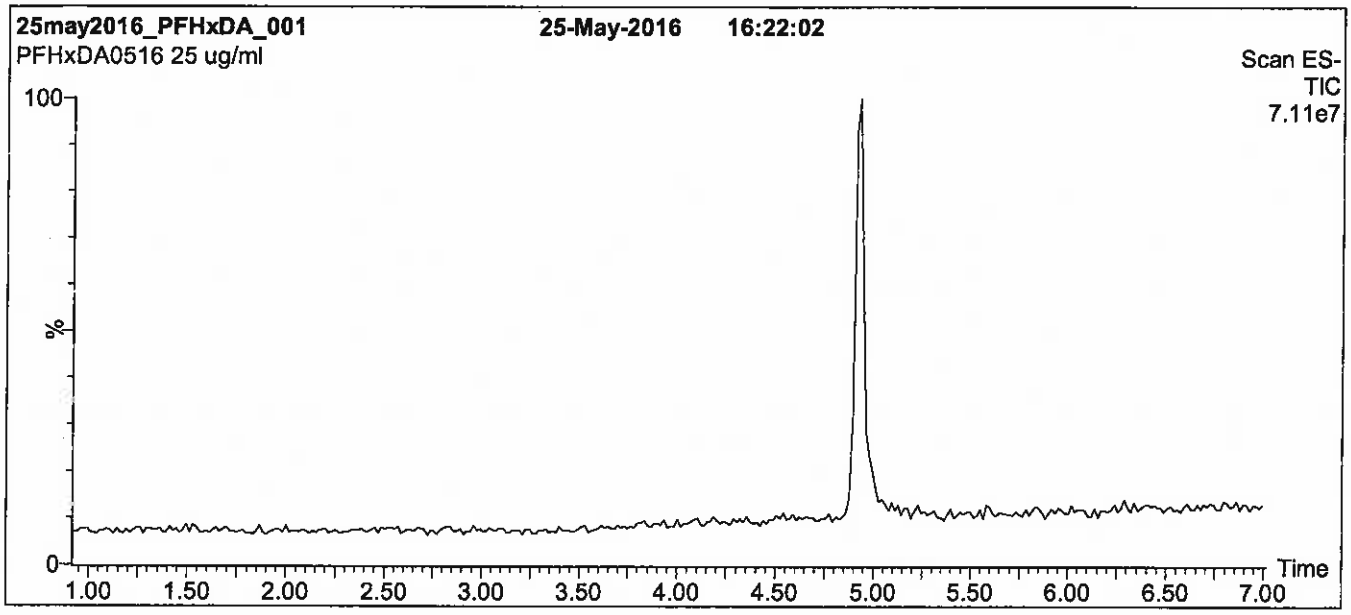
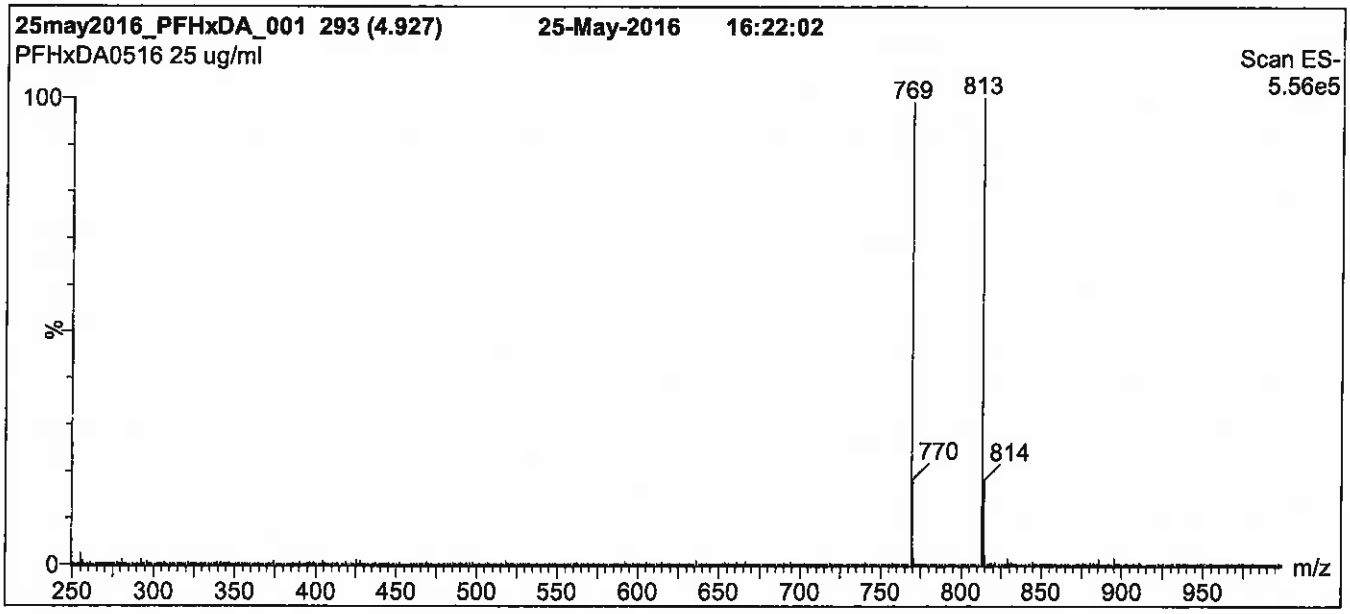
Figure 1: **PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 70% (80:20 MeOH:ACN) / 30% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 95% organic over 6 min and hold for 2.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

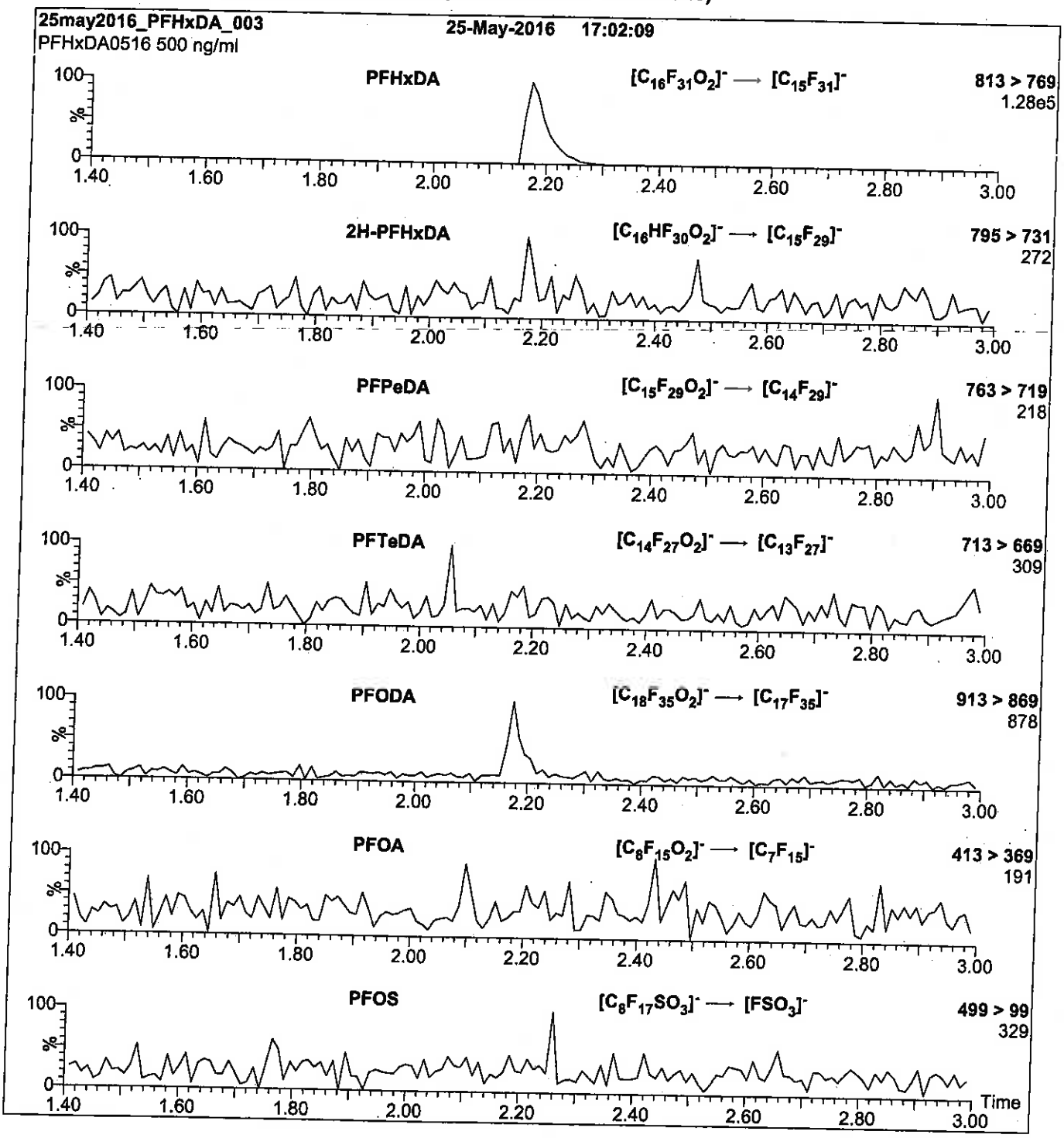
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 15

Reagent

LCPFHxS-br_00001

566007
ID: LCPFHxS-br_00001
Exp: 07/03/20 Prpd: CBW
Potassium Perfluorohexane

Pi 12/9/15 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFHxSK
LOT NUMBER:	brPFHxSK0615
CONCENTRATION:	50.0 ± 2.5 µg/ml (total potassium salt)
	45.5 ± 2.3 µg/ml (total PFHxS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	06/29/2015
LAST TESTED: (mm/dd/yyyy)	07/03/2015
EXPIRY DATE: (mm/dd/yyyy)	07/03/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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

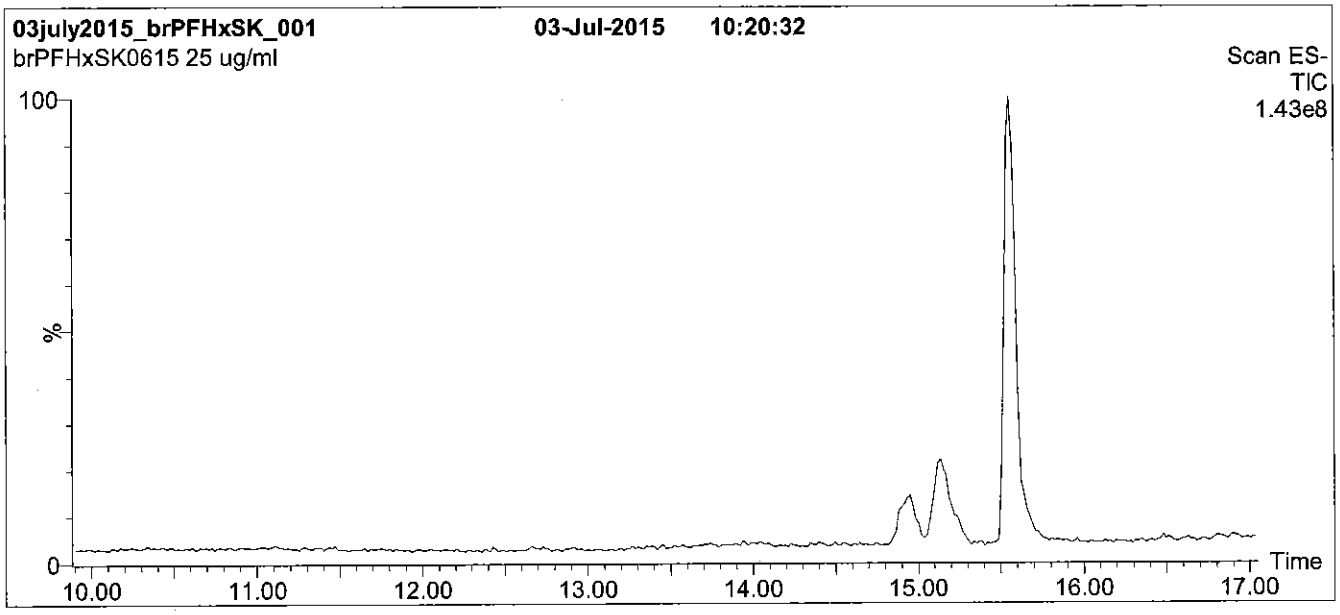
Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

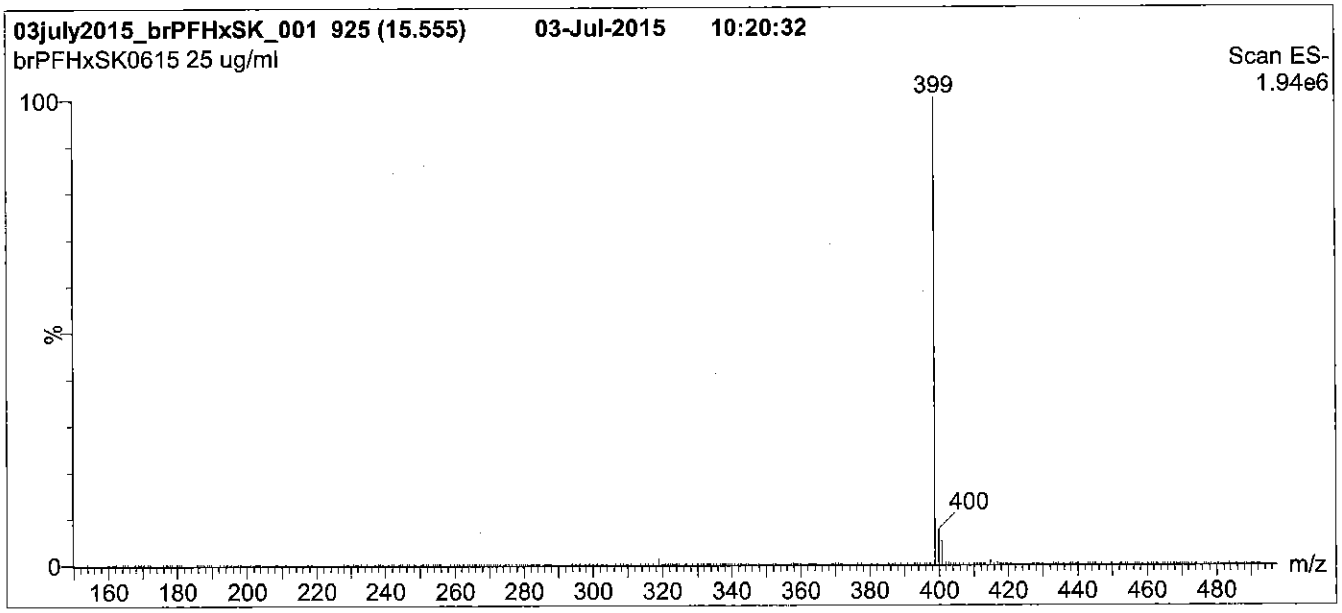
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)(CF_3)CF_2CF_2SO_3^-K^+$	0.2
7	Other Unidentified Isomers		0.5

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

Certified By: 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 RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

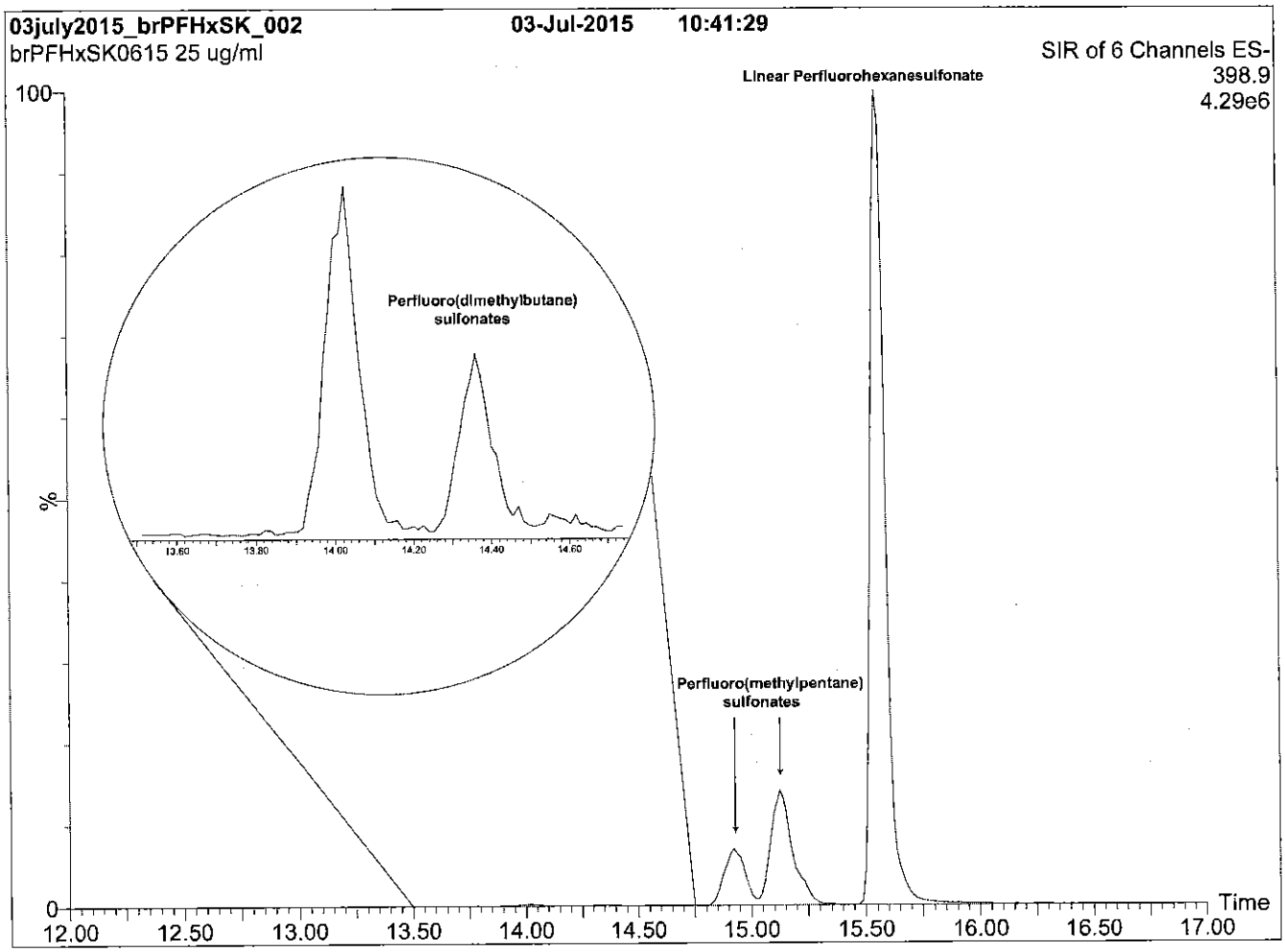
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

Figure 2: **br-PFHxSK; LC/MS Data**



Conditions for Figure 2:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

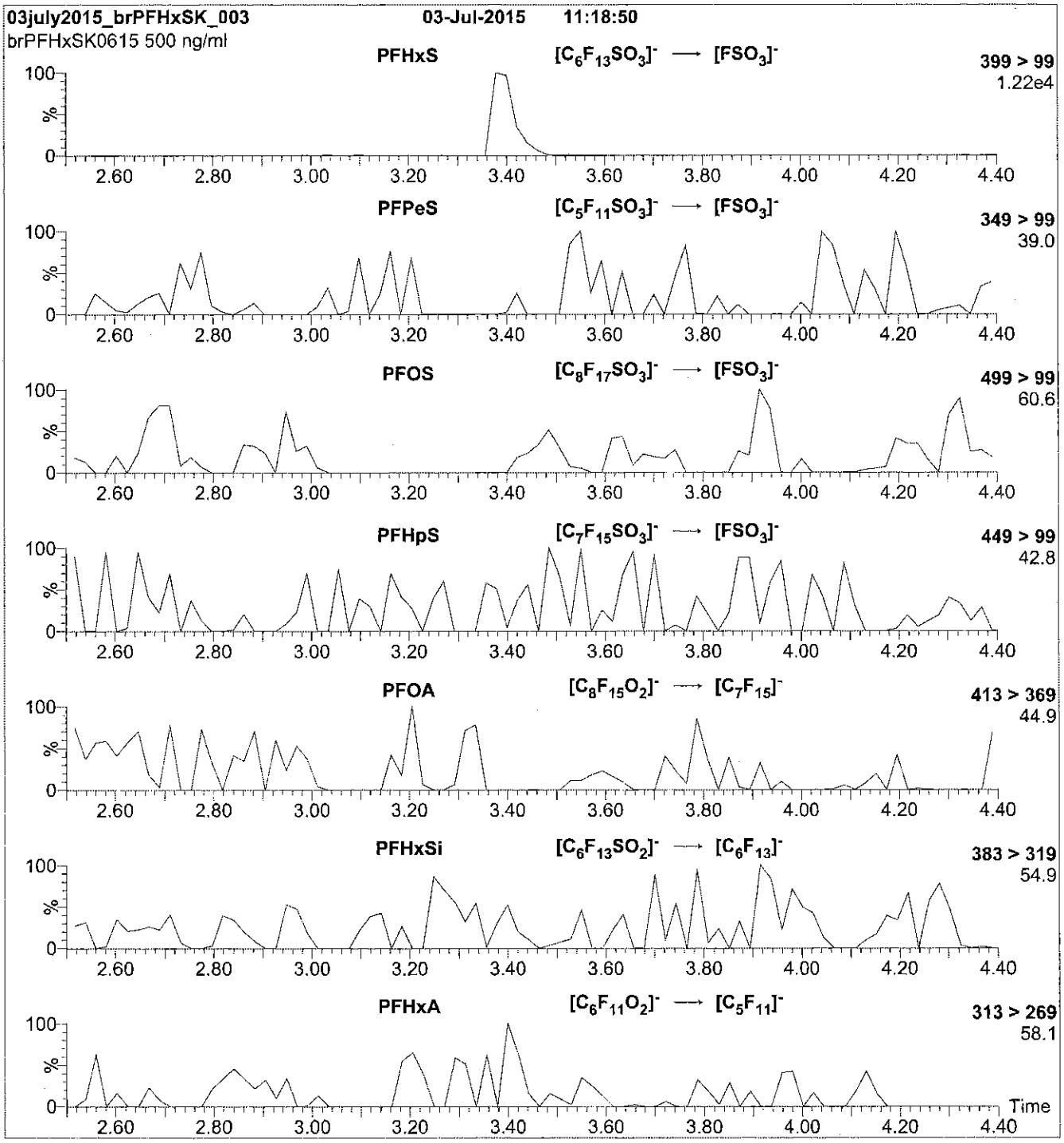
Flow: 300 µl/min

MS Parameters

Experiment: SIR (6 channels)

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

Figure 3: **br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection:	Direct loop injection 10 µl (500 ng/ml br-PFHxSK)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.54e-3 Collision Energy (eV) = 30
Flow:	300 µl/min	

Reagent

LCPFHxS-br_00002

SBC
R: 9/13/16

730513
ID: LCPFHxS-br_00002
Exp: 07/03/20 Prpd: SBC
Potassium Perfluorohexane

730514
ID: LCPFHxS-br_00003
Exp: 07/03/20 Prpd: SBC
Potassium Perfluorohexane

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFHxSK
LOT NUMBER:	brPFHxSK0615
CONCENTRATION:	50.0 ± 2.5 µg/ml (total potassium salt)
	45.5 ± 2.3 µg/ml (total PFHxS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	06/29/2015
LAST TESTED: (mm/dd/yyyy)	07/03/2015
EXPIRY DATE: (mm/dd/yyyy)	07/03/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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CALA

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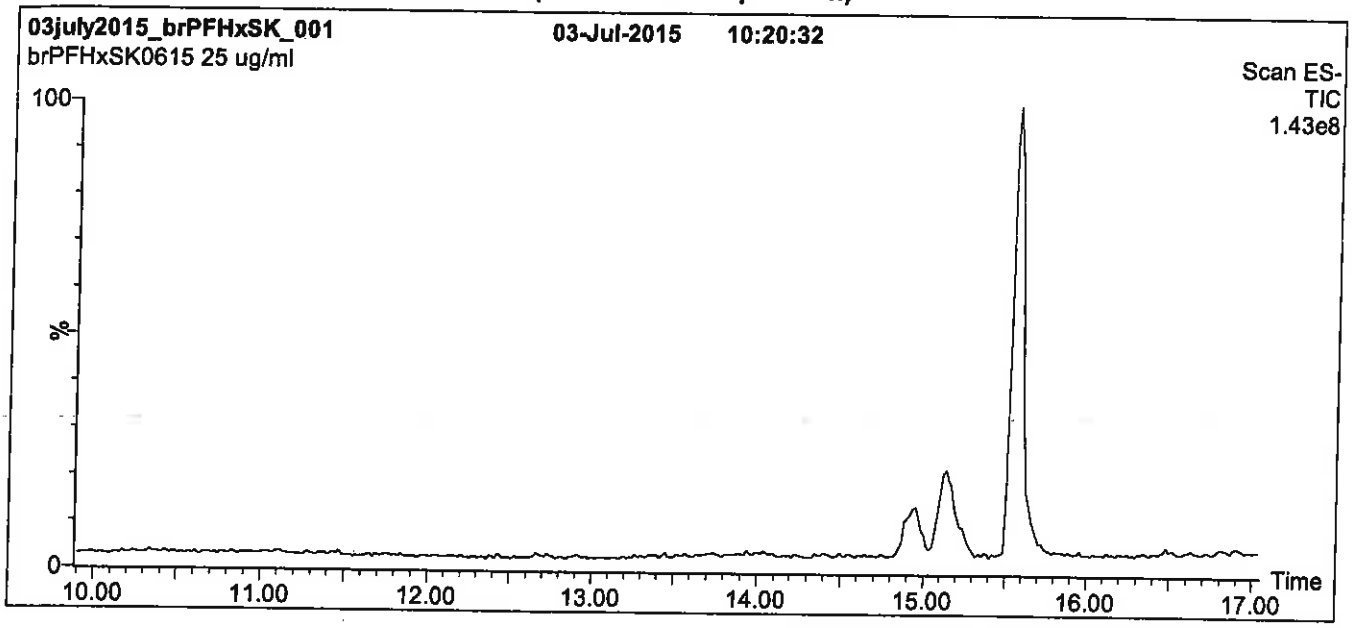
Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

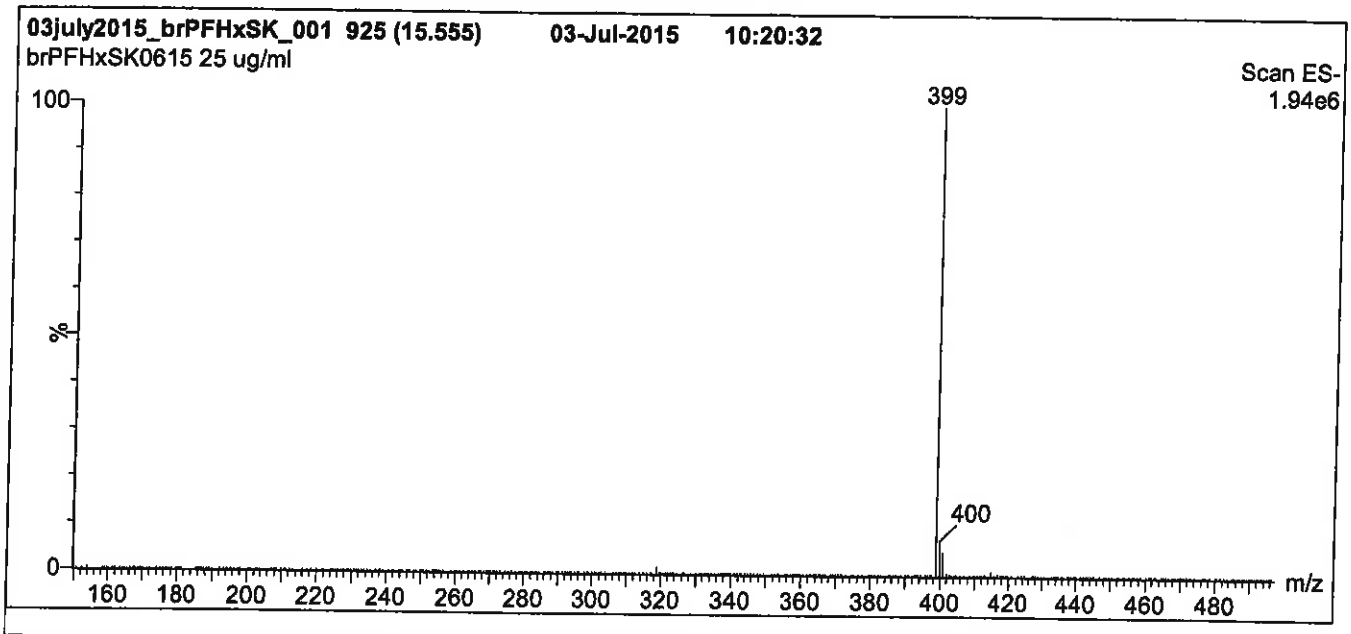
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)(CF_3)CF_2CF_2SO_3^-K^+$	0.2
7	Other Unidentified Isomers		0.5

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

Certified By: 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 RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

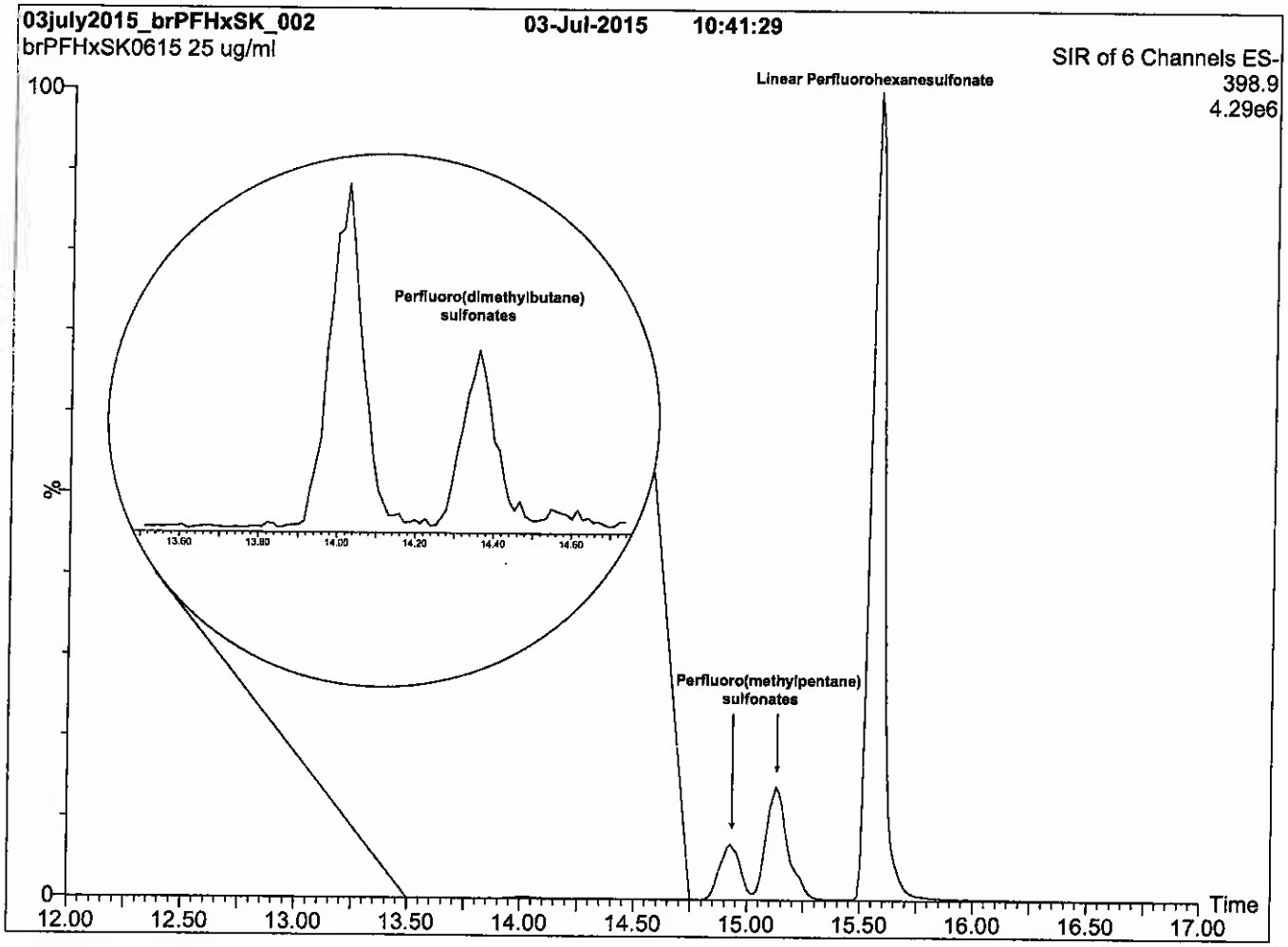
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

Figure 2: **br-PFHxSK; LC/MS Data**



Conditions for Figure 2:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

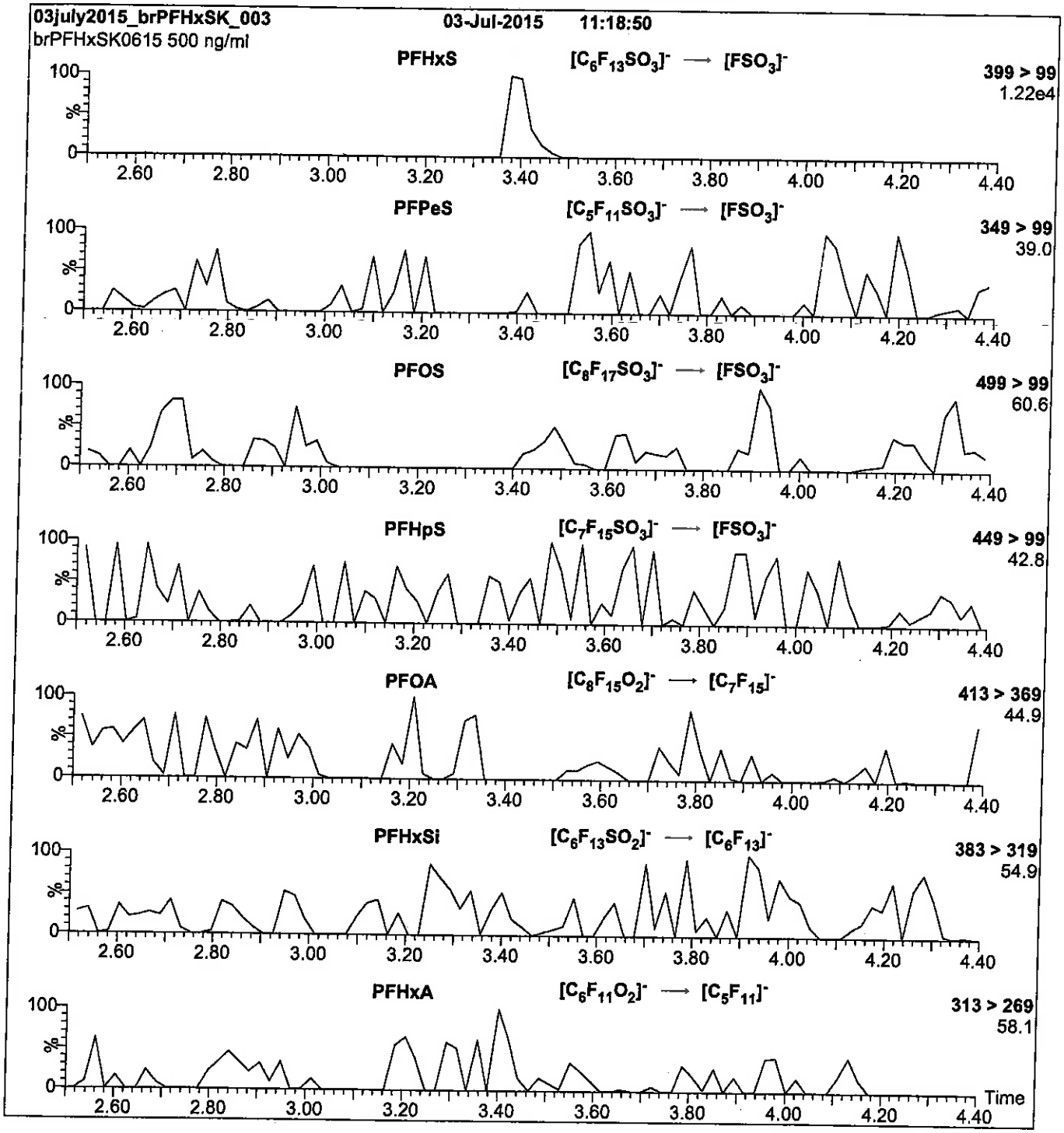
Flow: 300 µl/min

MS Parameters

Experiment: SIR (6 channels)

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

Figure 3: **br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: Direct loop injection
10 µl (500 ng/ml br-PFHxSK)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 30

Reagent

LCPFNA_00005

609703
ID: LCPFNA_00005
Exp: 10/23/20 Prpd: CBW
PF-n-nonanoic acid

R: 4/7/16 CBW

WELLINGTON LABORATORIES

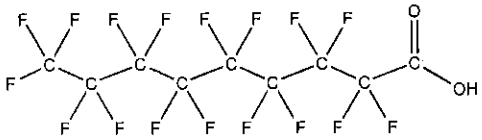
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: PFNA1015

STRUCTURE:

CAS #: 375-95-1



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

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

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

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HOMOGENEITY:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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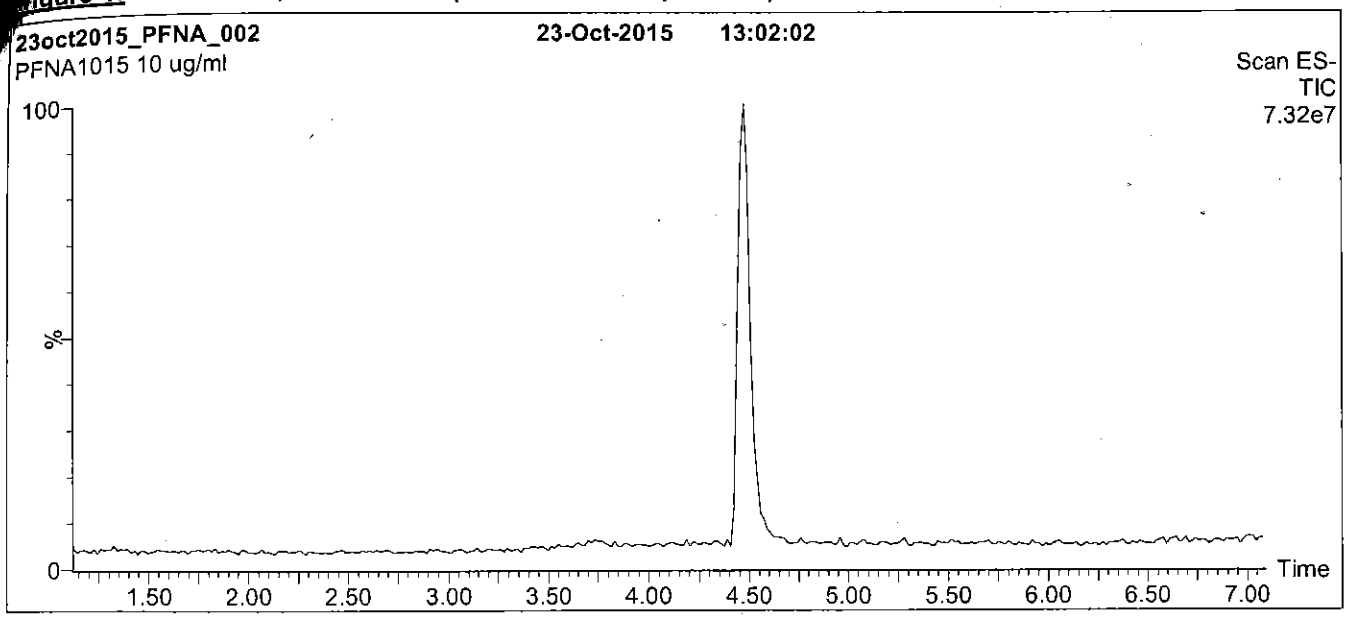
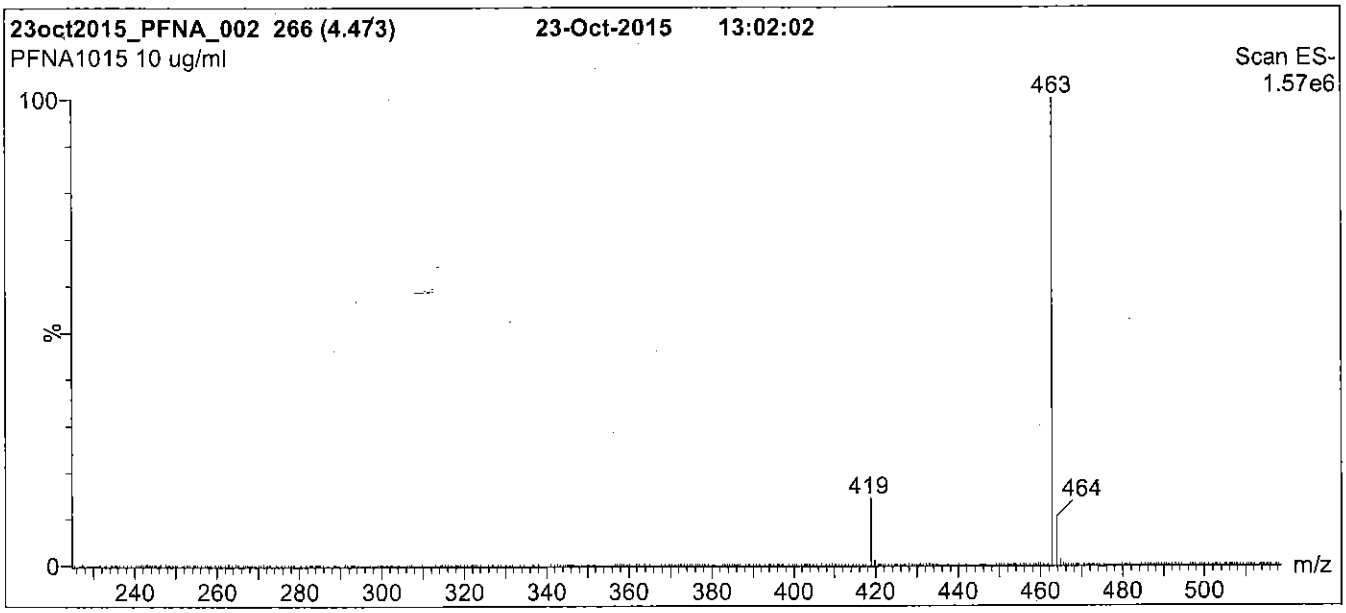
Figure 1: **PFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

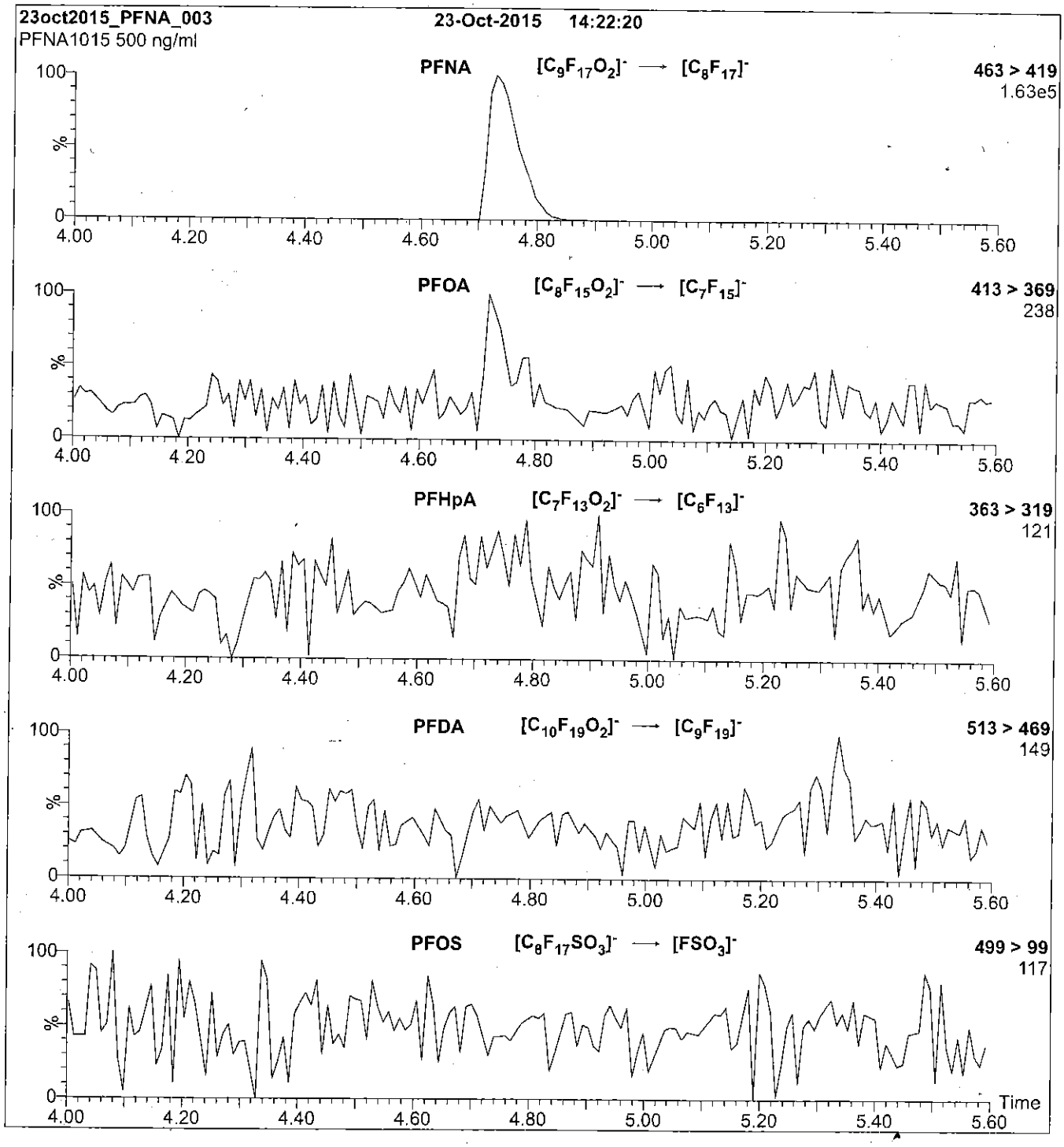
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCPFOA_00006

R-7/6/16 CBW

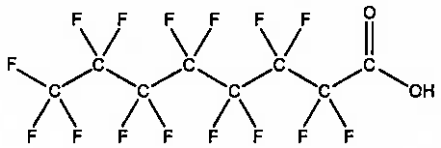
671577
ID: LCPFOA_00006
Exp: 11/06/20 Prpd: CBW
PF-n-octanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFOA
LOT NUMBER: PFOA1115
COMPOUND: Perfluoro-n-octanoic acid

STRUCTURE:
CAS #: 335-67-1



MOLECULAR FORMULA: $C_8HF_{15}O_2$
MOLECULAR WEIGHT: 414.07
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/06/2015
EXPIRY DATE: (mm/dd/yyyy) 11/06/2020
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:** 11/11/2015 (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:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA

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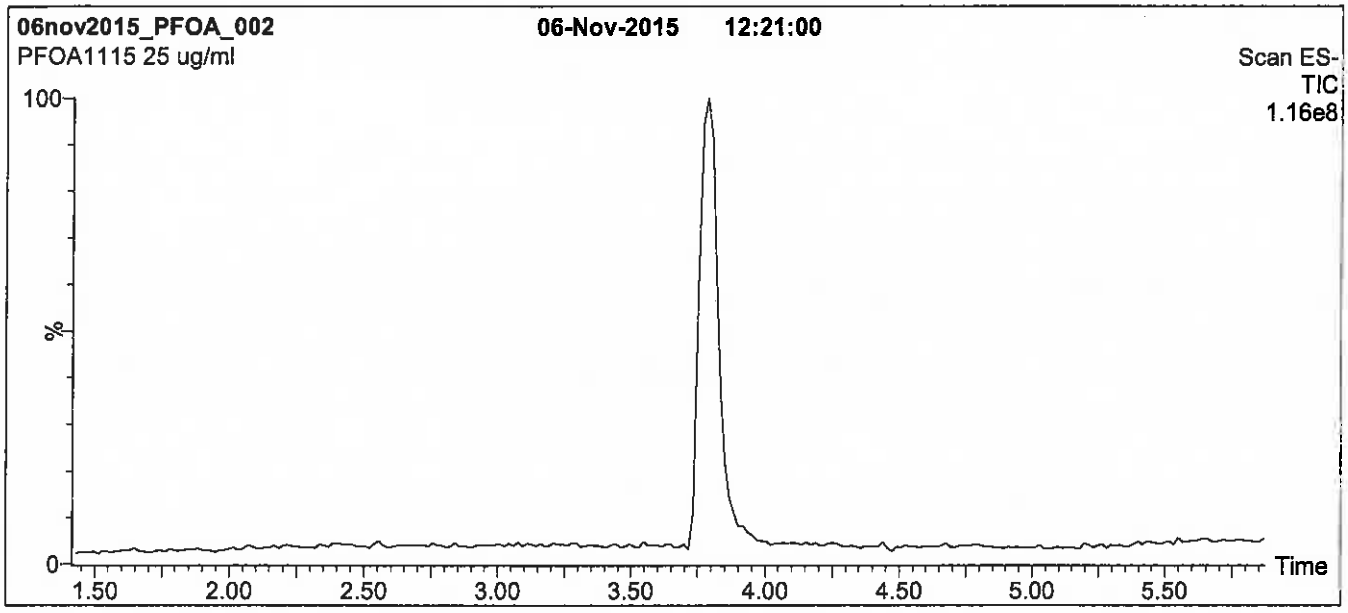
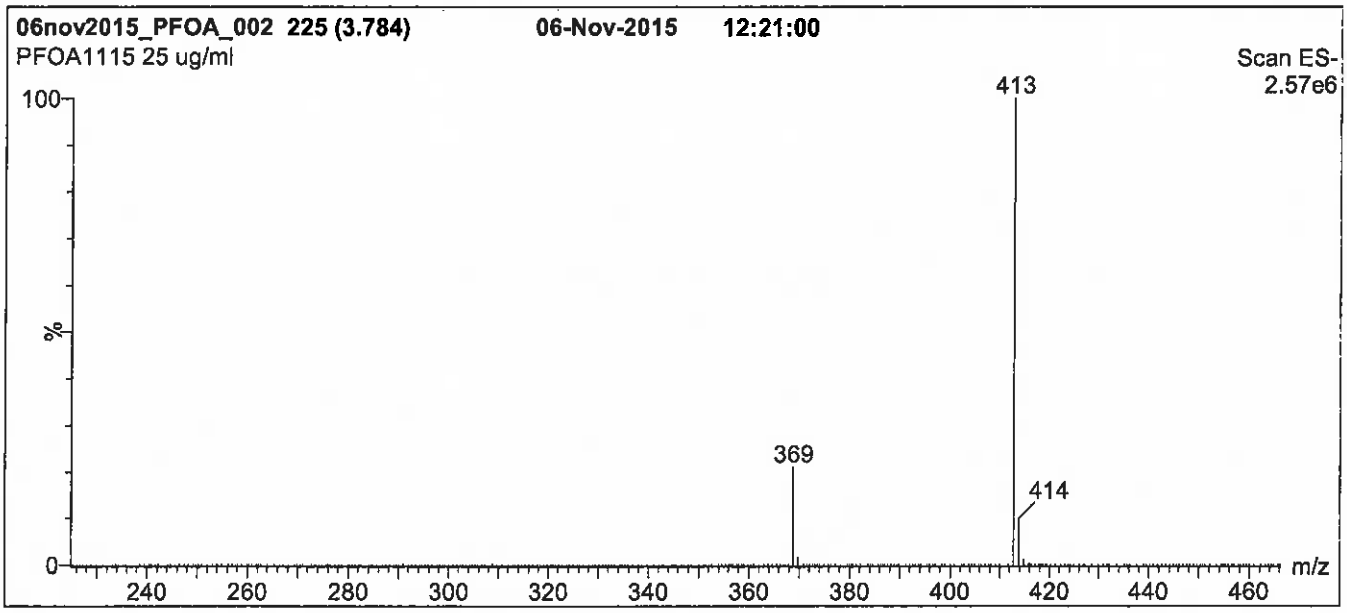
Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

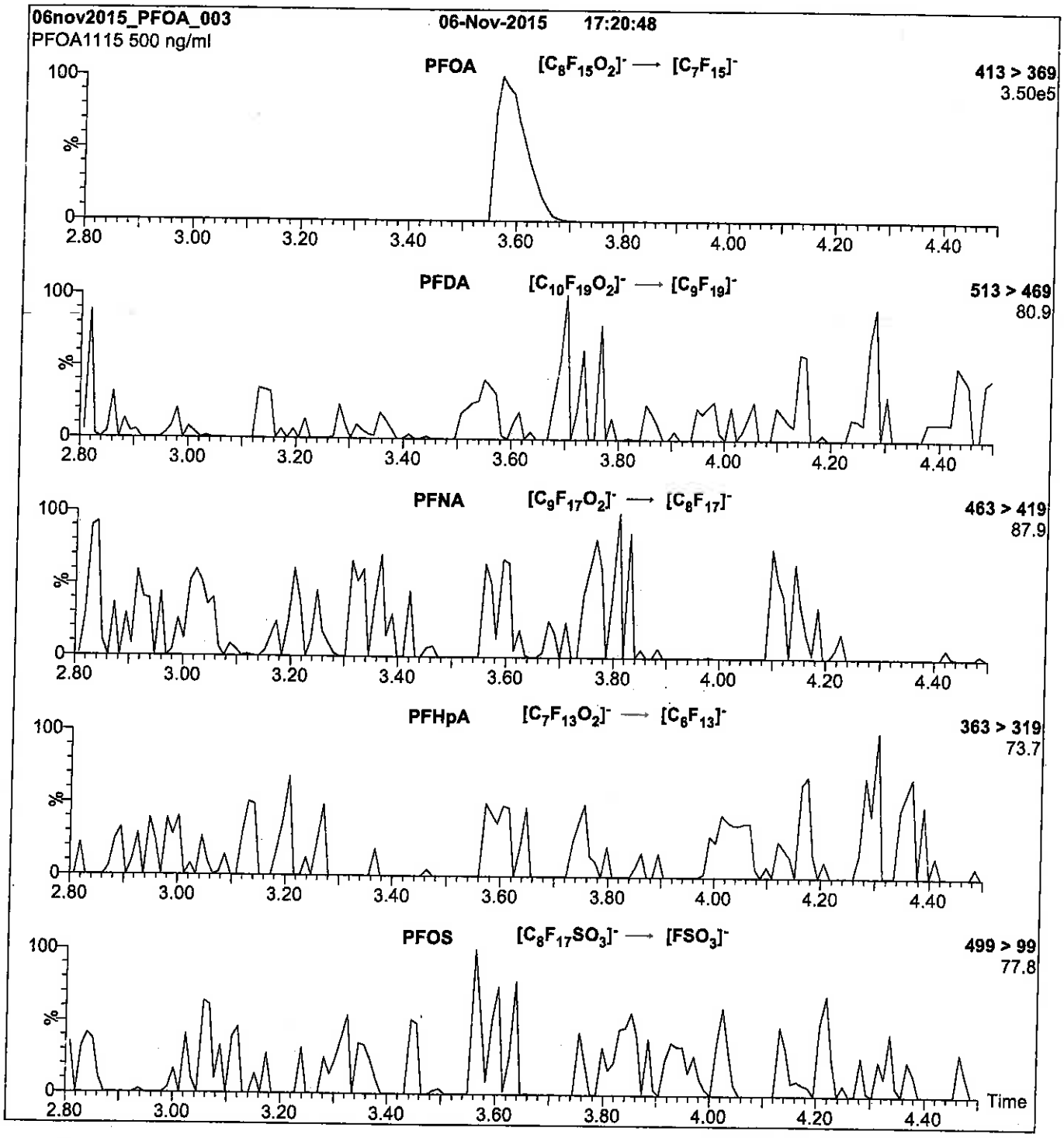
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 10

Reagent

LCPFODA_00005

605234
ID: LCPFODA_00005
Exp: 01/30/20 Prpd: CBW
PFODA stock 50ug/mL

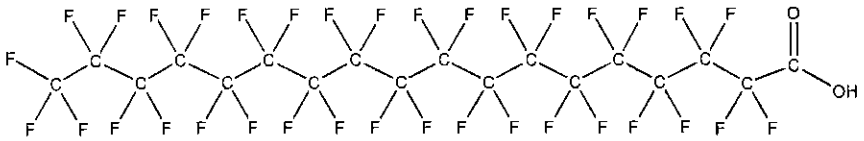
Rec. 3/29/16 JRB

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFODA
LOT NUMBER: PFODA0115
COMPOUND: Perfluoro-n-octadecanoic acid

STRUCTURE:
CAS #: 16517-11-6



MOLECULAR FORMULA: $C_{18}HF_{35}O_2$
MOLECULAR WEIGHT: 914.14
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/30/2015
EXPIRY DATE: (mm/dd/yyyy) 01/30/2020
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.
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Certified By: B.G. Chittim **Date:** 03/25/2015 (mm/dd/yyyy)

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QUALITY MANAGEMENT:

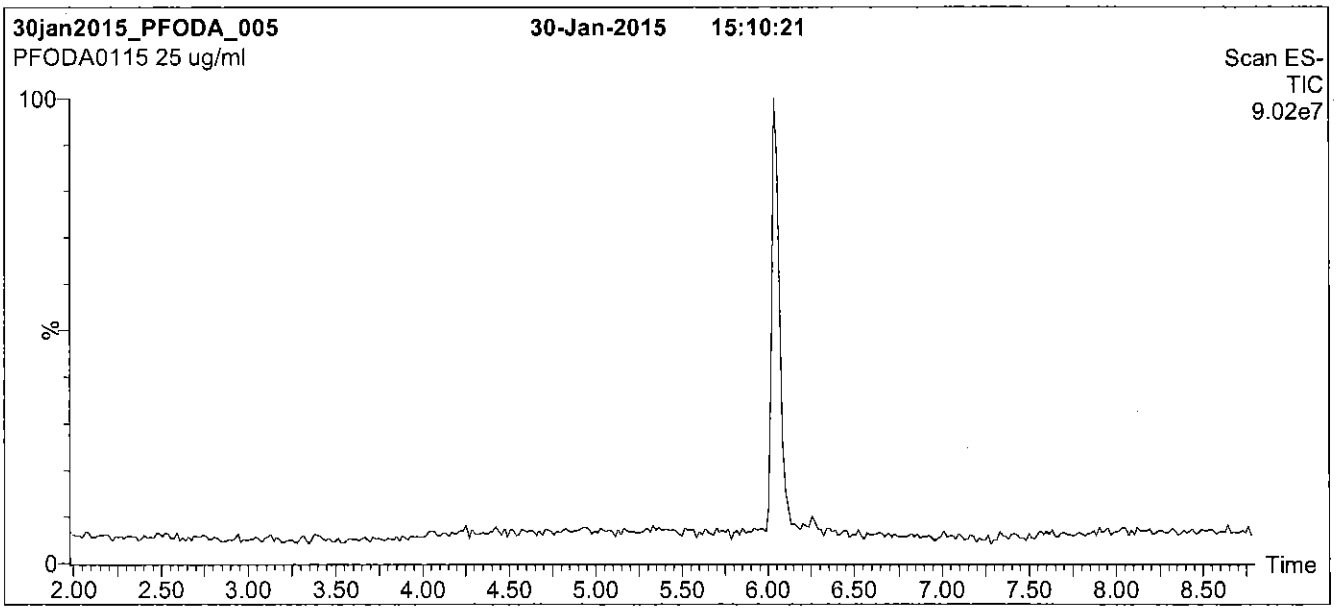
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

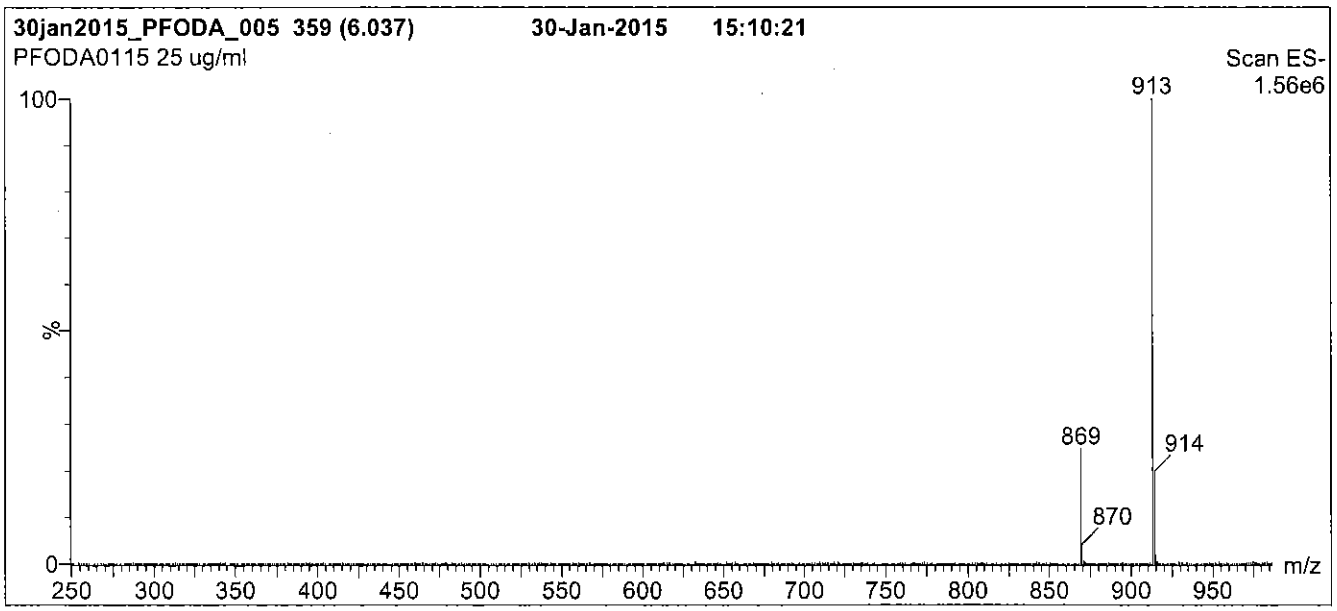
CALA Testing Accreditation No. A1226

ANAB ACCREDITED Certificate of REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

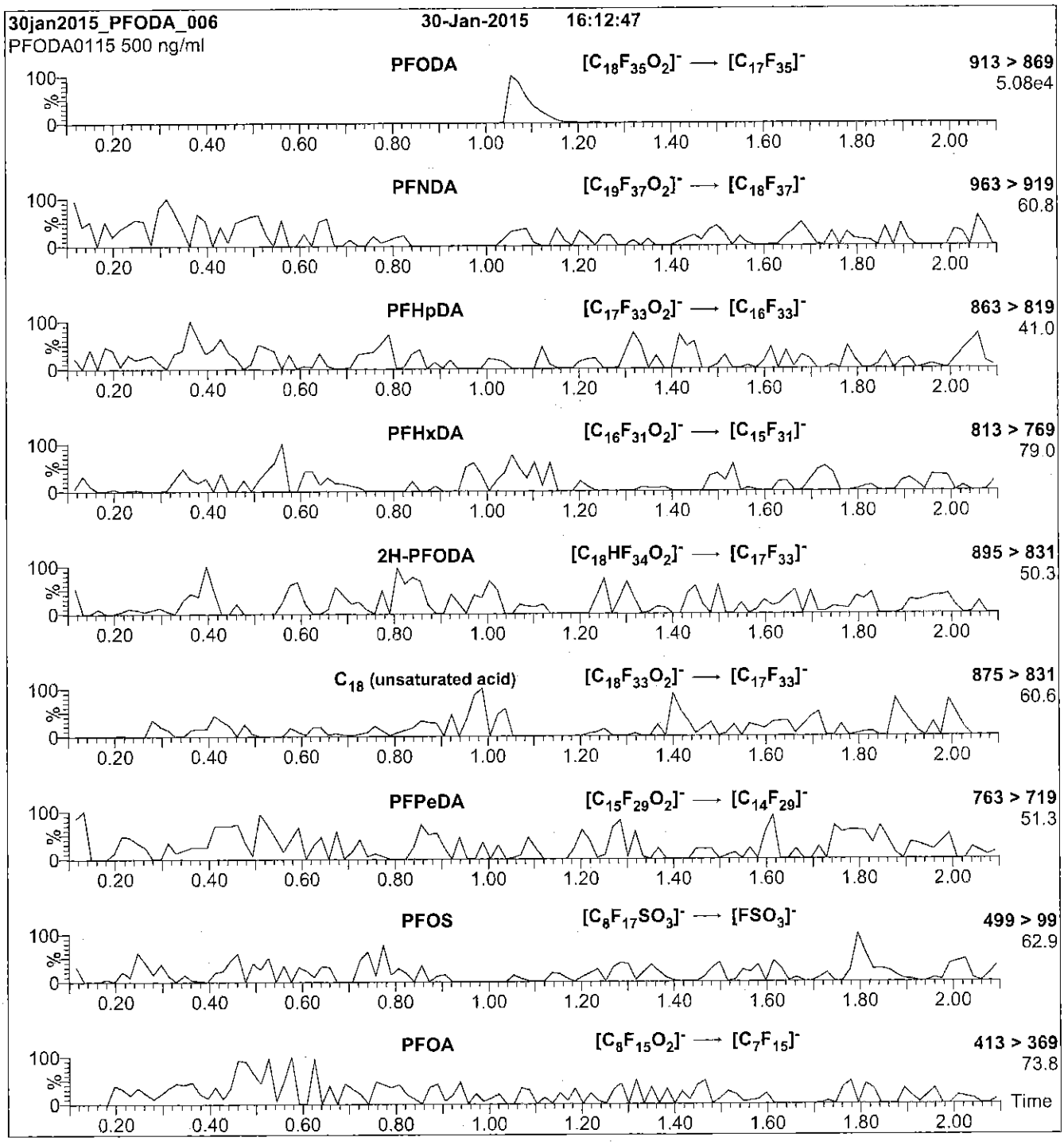
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1000 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 15

Reagent

LCPFOS-br_00001

566008
ID: LCPFOS-br_00001
Exp: 10/14/20 Pipd: CBW
Potassium Perfluorooctane

P: 12/9/15 SAV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFOSK
LOT NUMBER:	brPFOSK1015
CONCENTRATION:	50 ± 2.5 µg/ml (total potassium salt)
	46.4 ± 2.3 µg/ml (total PFOS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	10/13/2015
LAST TESTED: (mm/dd/yyyy)	10/14/2015
EXPIRY DATE: (mm/dd/yyyy)	10/14/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

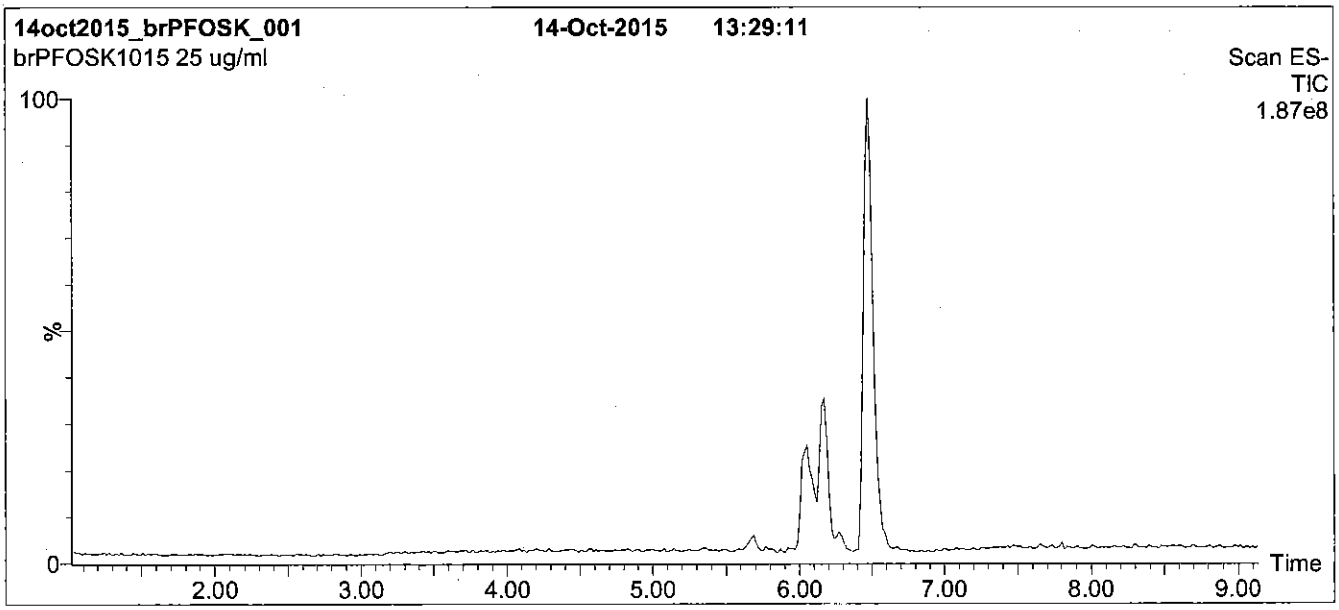
Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

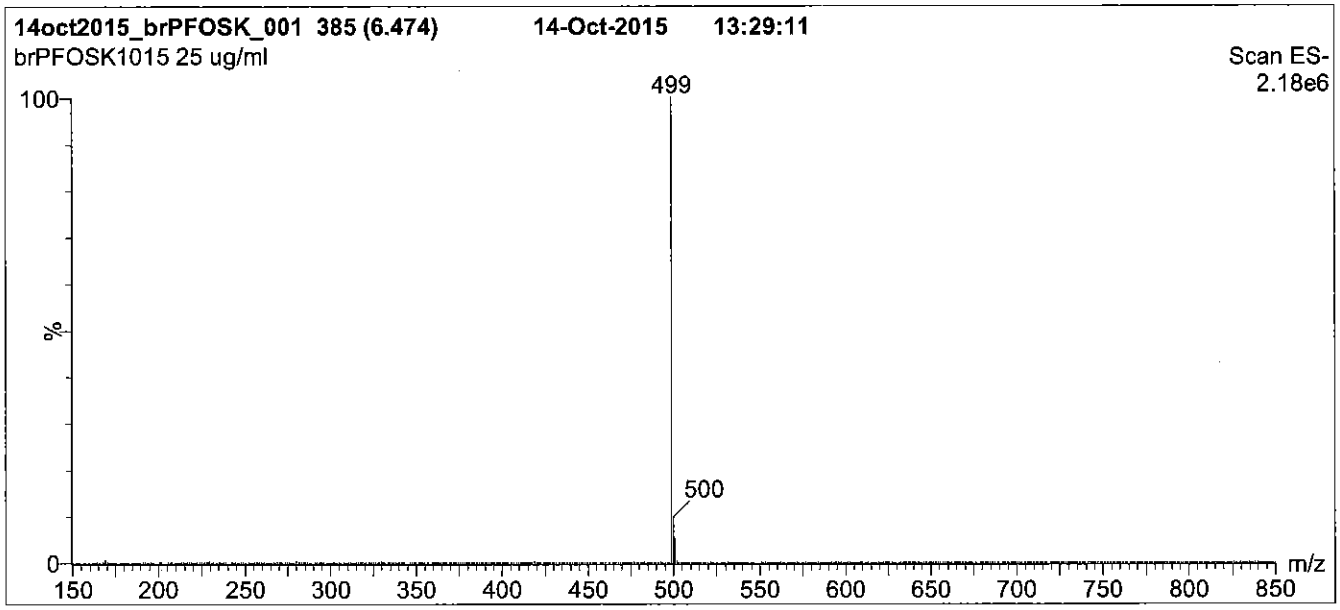
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-C(CF_3)_2CF_2CF_2CF_2CF_2SO_3^-K^+$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2-C(CF_3)_2-CF_2CF_2CF_2SO_3^-K^+$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF(CF_3)-CF_2CF_2CF_2SO_3^-K^+$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF_2-CF(CF_3)-CF_2CF_2SO_3^-K^+$	0.07

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

Certified By: B.G. Chittim **Date:** 10/15/2015 (mm/dd/yyyy)

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

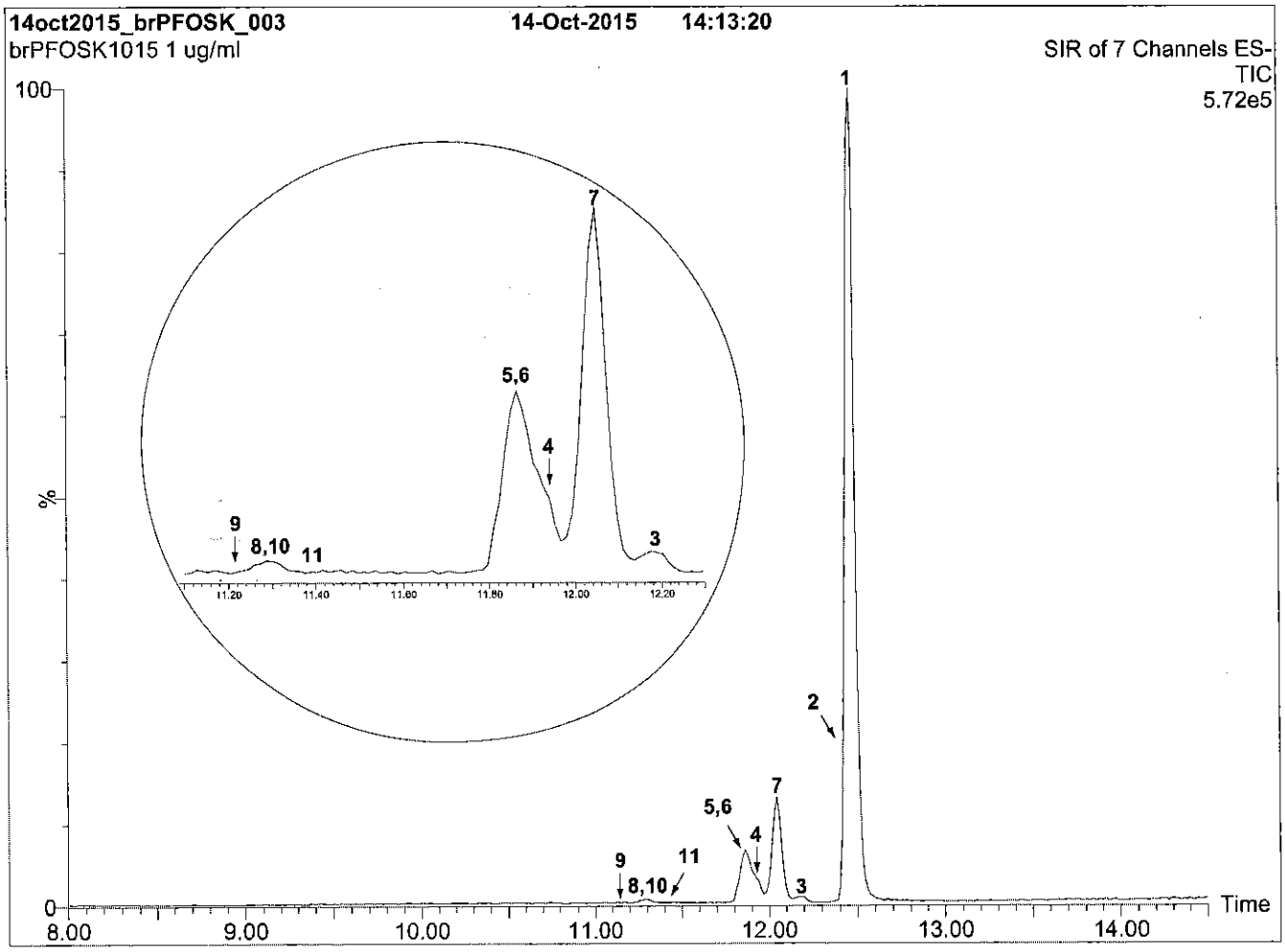
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-PFOSK; LC/MS Data (SIR)**



Conditions for Figure 2:

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

Chromatographic Conditions:

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

Injection: 1.0 µg/ml of br-PFOSK

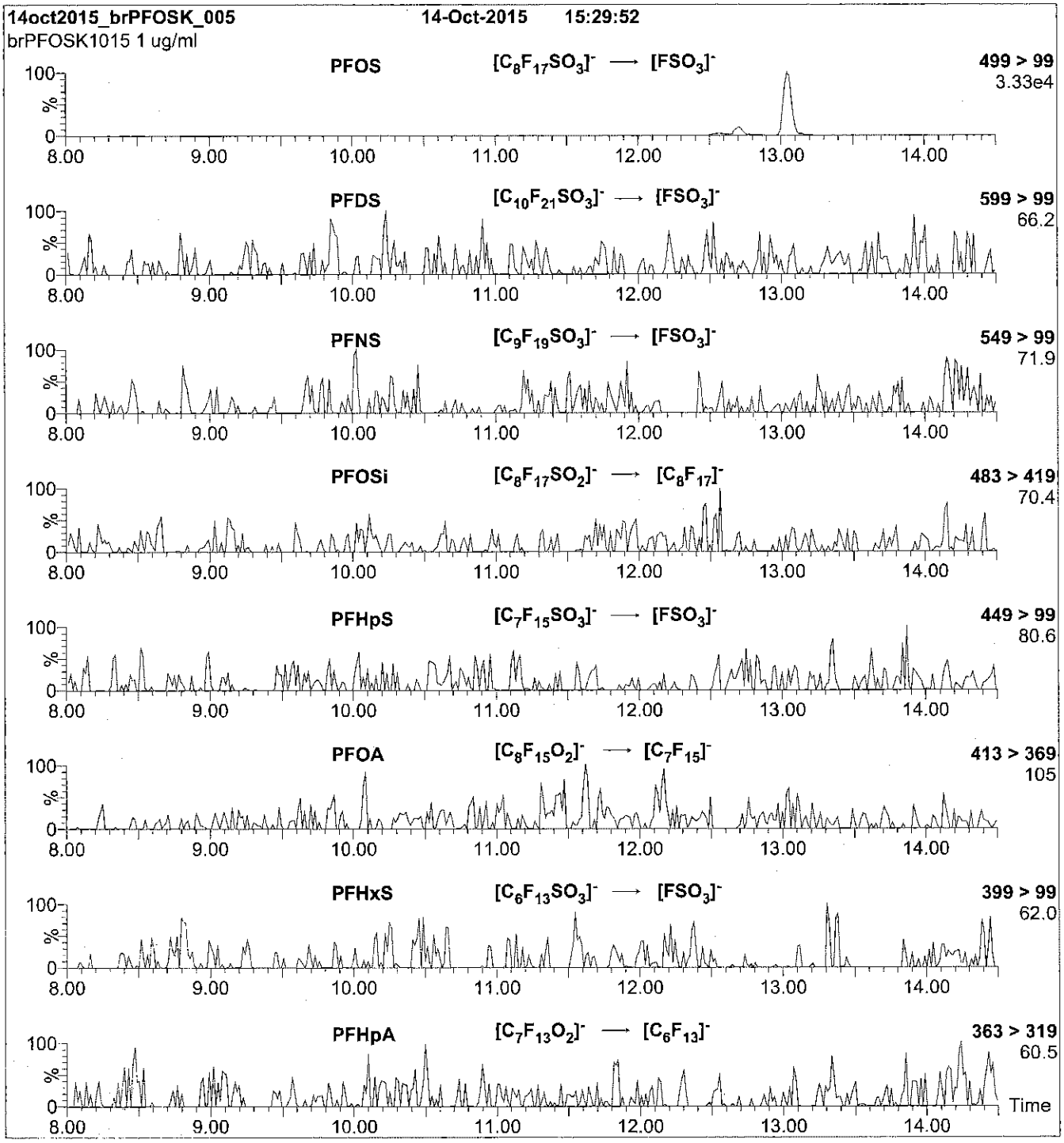
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

Flow: 300 µl/min

MS Conditions:

SIR (ES^-)
Source = 110 °C
Desolvation = 325 °C
Cone Voltage = 60V

Figure 3: **br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.06e-3
Collision Energy (eV) = 11-50 (variable)

Reagent

LCPFOS-br_00002

Scanned 10/14/16 SR

R: SBC 9/13/16

730515
ID: LCPFOS-br_00002
Exp: 10/14/20 Prpd: SBC
Potassium Perfluorooctane

730516
ID: LCPFOS-br_00003
Exp: 10/14/20 Prpd: SBC
Potassium Perfluorooctane

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFOSK
LOT NUMBER:	brPFOSK1015
CONCENTRATION:	50 ± 2.5 µg/ml (total potassium salt)
	46.4 ± 2.3 µg/ml (total PFOS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	10/13/2015
LAST TESTED: (mm/dd/yyyy)	10/14/2015
EXPIRY DATE: (mm/dd/yyyy)	10/14/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

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:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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

CALA Testing Accredited No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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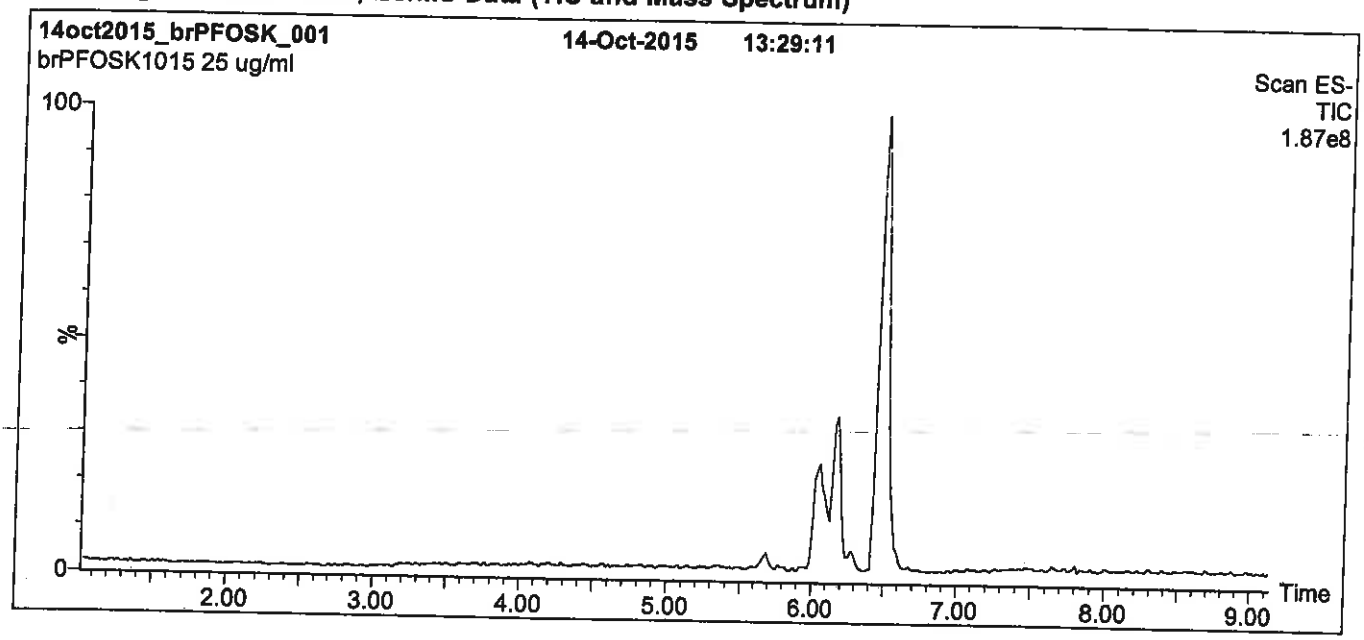
Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

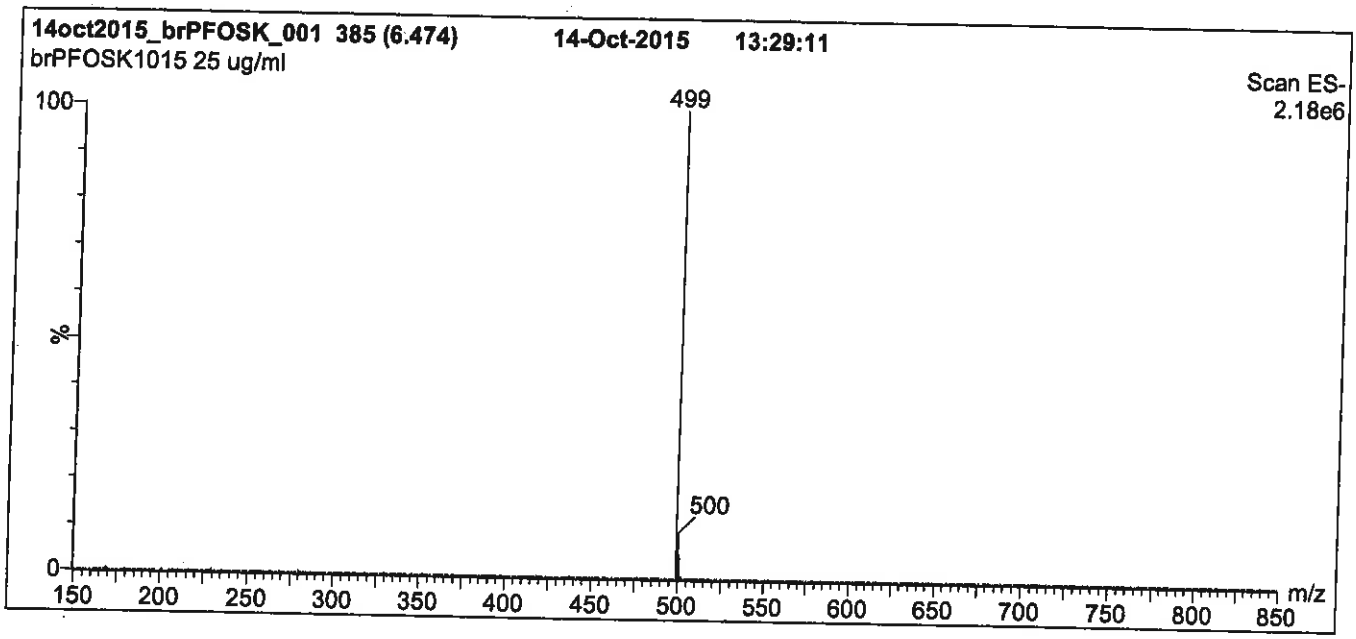
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-C(CF_3)_2CF_2CF_2CF_2CF_2SO_3^-K^+$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2-C(CF_3)_2-CF_2CF_2CF_2SO_3^-K^+$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF(CF_3)-CF_2CF_2CF_2SO_3^-K^+$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF_2-CF(CF_3)-CF_2CF_2SO_3^-K^+$	0.07

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

Certified By: B.G. Chittim **Date:** 10/15/2015 (mm/dd/yyyy)

Figure 1: br-PFOSK; LC/MS Data (TIC and Mass Spectrum)





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

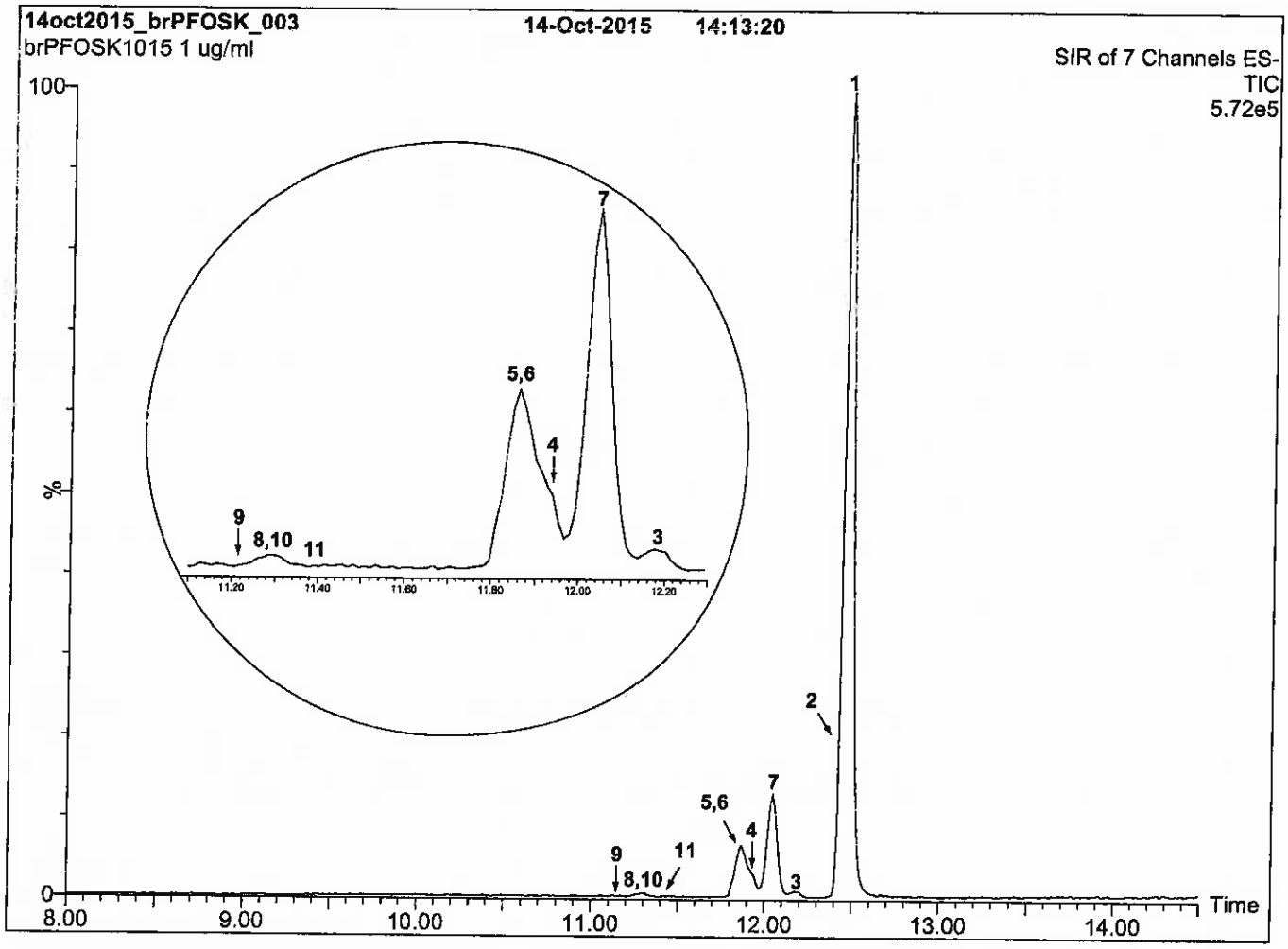
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-PFOSK; LC/MS Data (SIR)**



Conditions for Figure 2:

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

Chromatographic Conditions:

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

Injection: 1.0 µg/ml of br-PFOSK

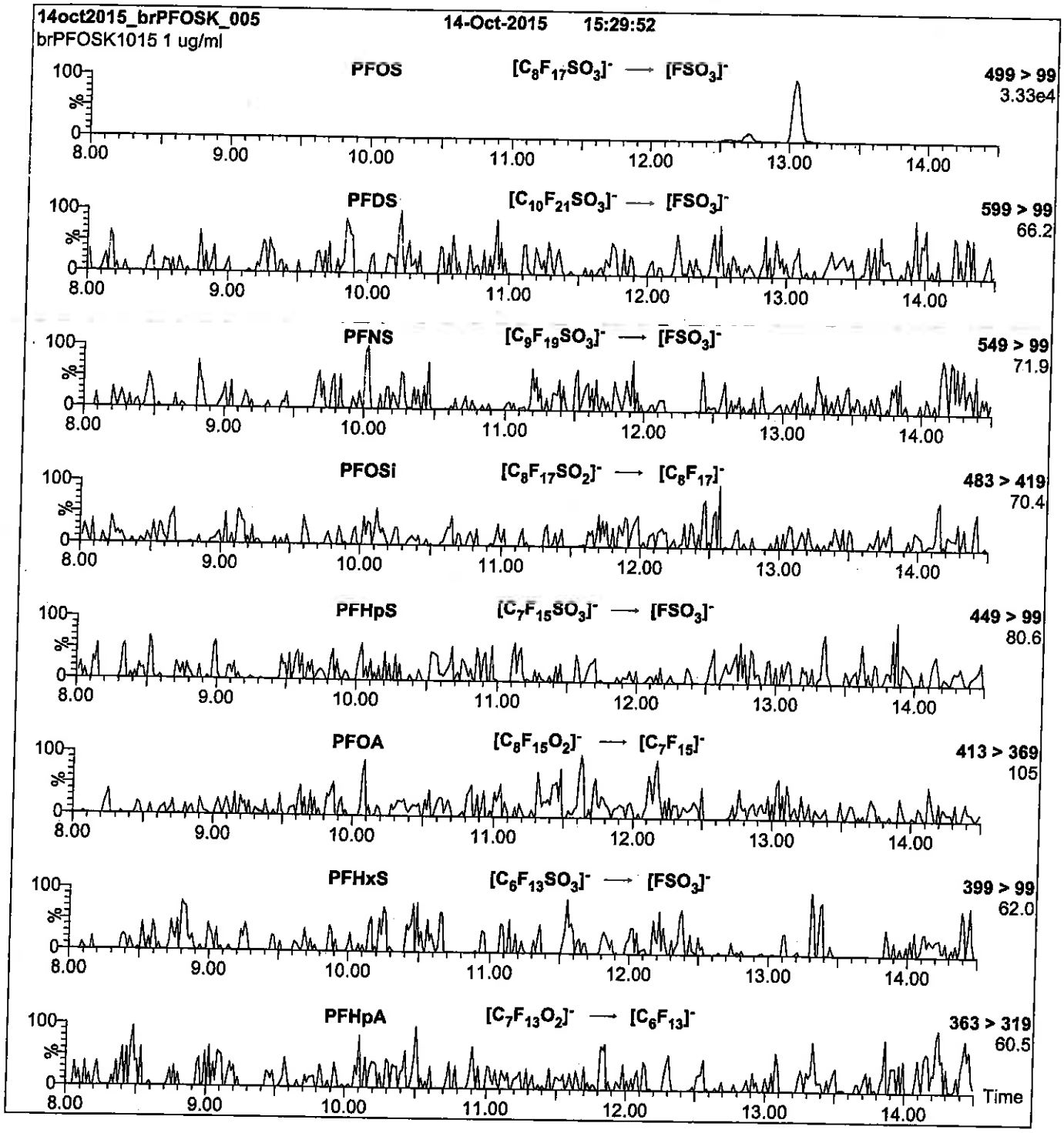
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

Flow: 300 µl/min

MS Conditions:

SIR (ES^-)
Source = 110 °C
Desolvation = 325 °C
Cone Voltage = 60V

Figure 3: **br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.06e-3
Collision Energy (eV) = 11-50 (variable)

Reagent

LCPFOSA_00006

Rec 12/30/15 CW

WELLINGTON LABORATORIES

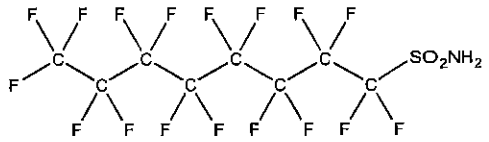
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FOSA-I
COMPOUND: Perfluoro-1-octanesulfonamide

LOT NUMBER: FOSA0815I

STRUCTURE:

CAS #: 754-91-6



MOLECULAR FORMULA:	$C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	499.14
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/02/2015		
EXPIRY DATE: (mm/dd/yyyy)	09/02/2017		
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:** 09/11/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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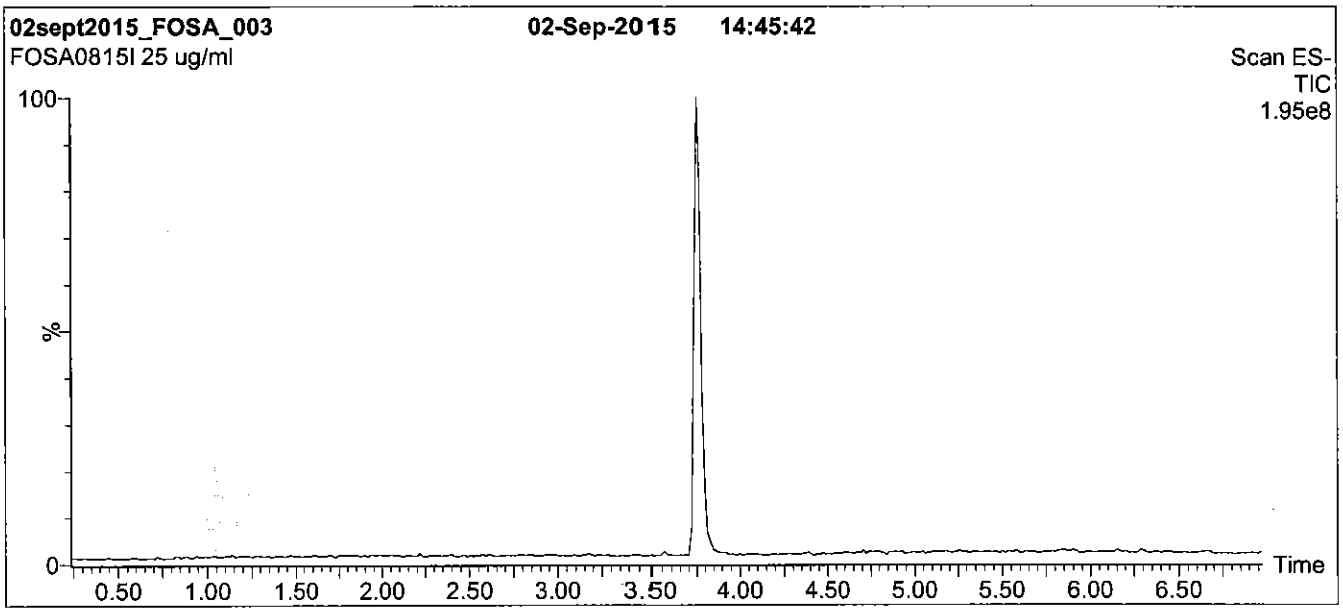
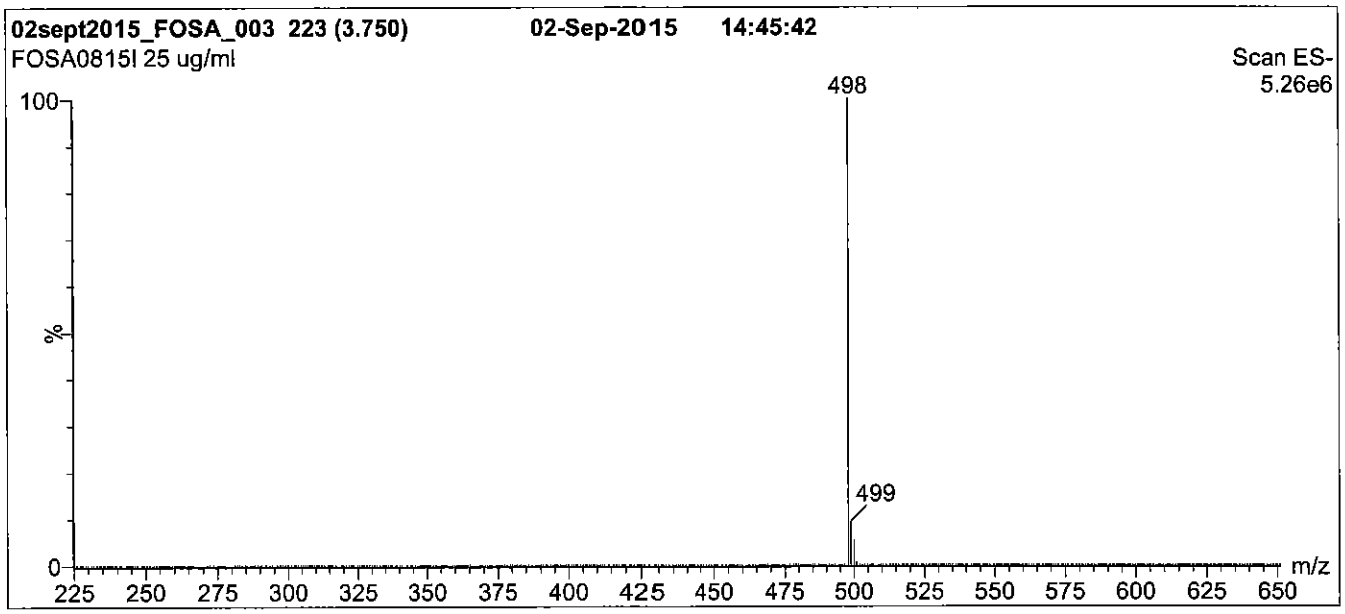
Figure 1: **FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

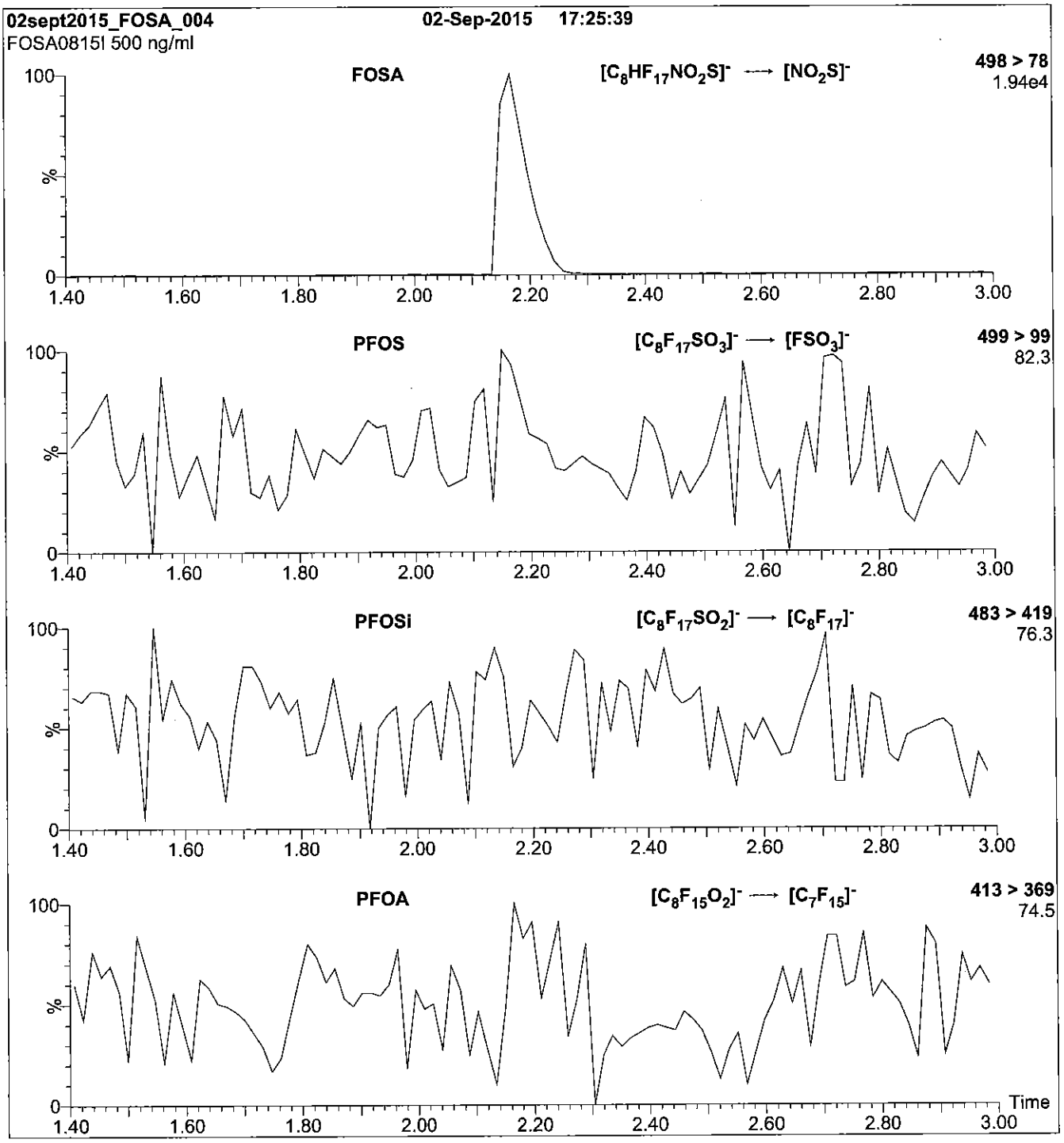
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 30

Reagent

LCPFPeA_00005

R: 7/6/16 CBW

671579
ID: LCPFPeA_00005
Exp: 01/30/20 Prpd: CBW
PF-n-pentanoic acid

WELLINGTON LABORATORIES

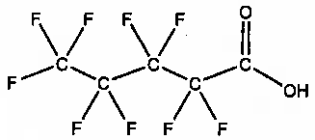
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFPeA
COMPOUND: Perfluoro-n-pentanoic acid

LOT NUMBER: PFPeA0115

STRUCTURE:

CAS #: 2706-90-3



MOLECULAR FORMULA: $C_5HF_9O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 264.05
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/30/2015
EXPIRY DATE: (mm/dd/yyyy) 01/30/2020
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 ~ 0.3% 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:** 03/26/2015 (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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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

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

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TRACEABILITY:

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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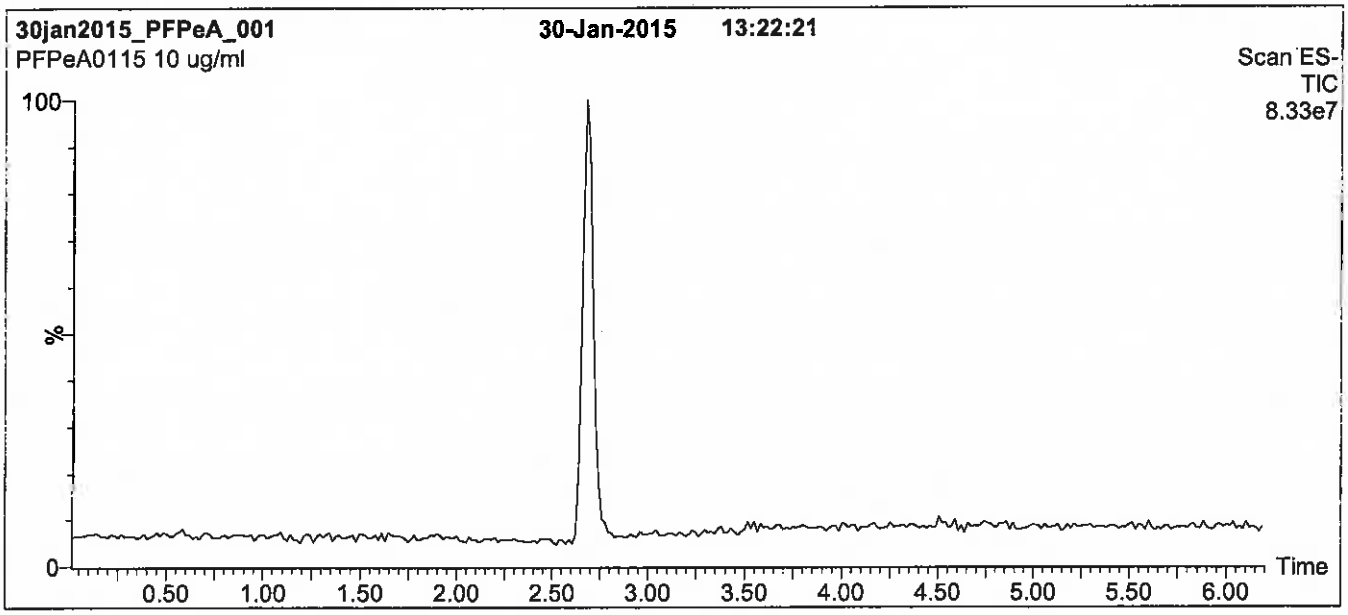
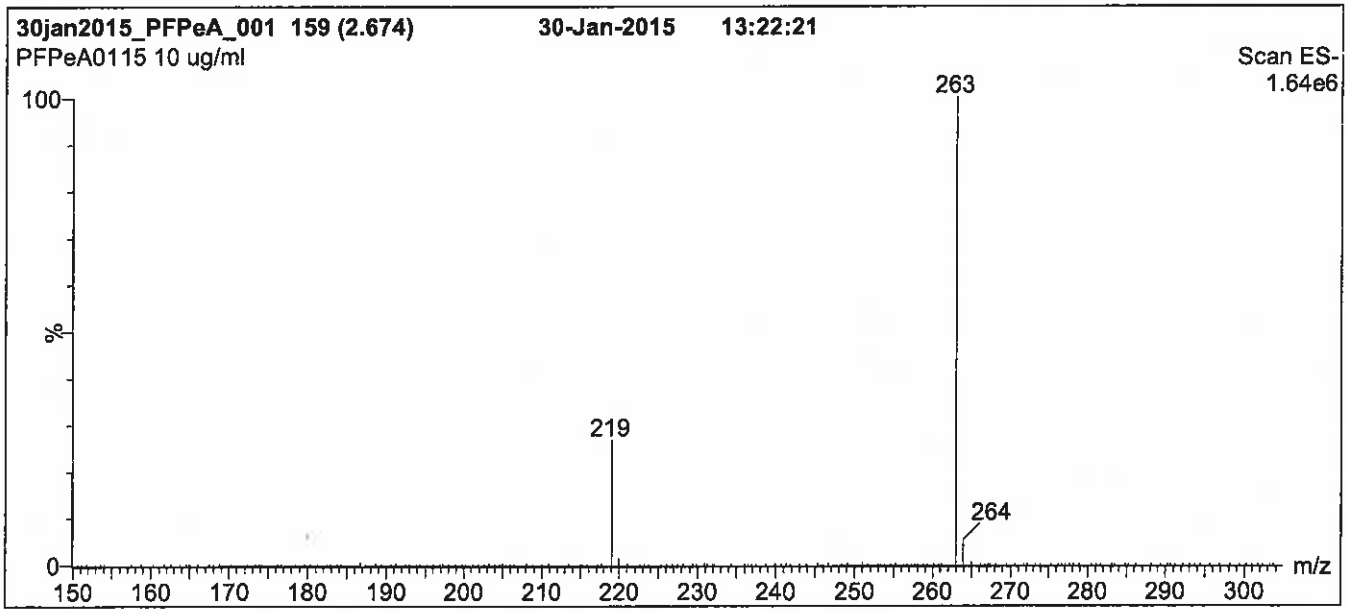
Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

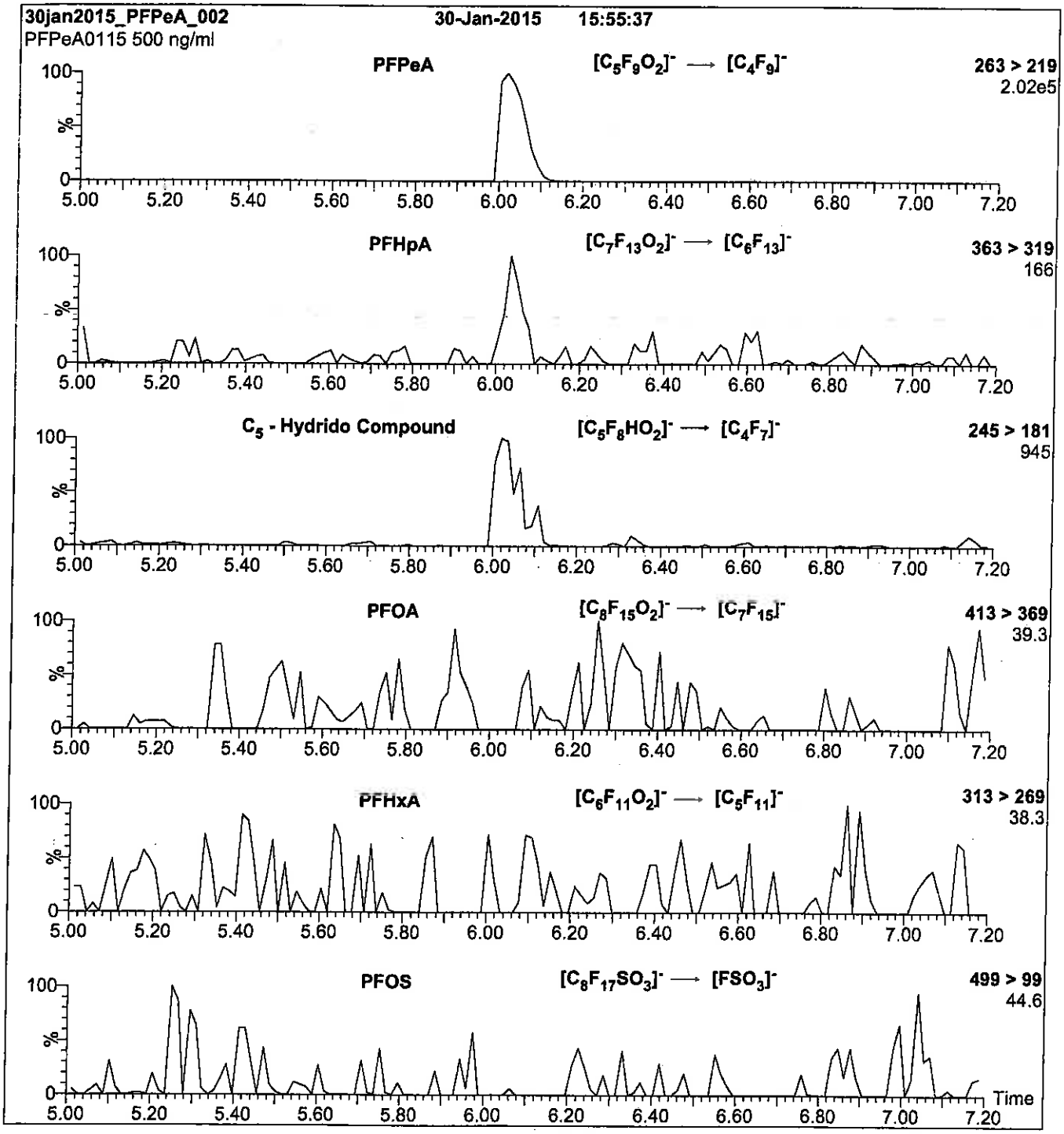
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 9

Reagent

LCPFTeDA_00004

R: 4/7/16 CBW

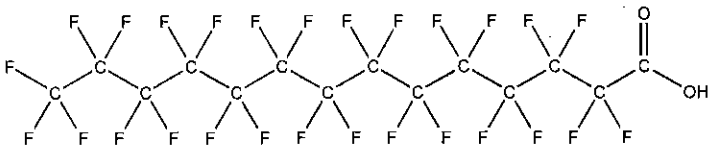
609696
ID: LCPFTeDA_00004
Exp: 12/09/20 Prpd: CBW
PF-n-tetradecanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFTeDA
LOT NUMBER: PFTeDA1215
COMPOUND: Perfluoro-n-tetradecanoic acid

STRUCTURE:
CAS #: 376-06-7



MOLECULAR FORMULA: $C_{14}HF_{27}O_2$
MOLECULAR WEIGHT: 714.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/09/2015
EXPIRY DATE: (mm/dd/yyyy) 12/09/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/09/2015 (mm/dd/yyyy)

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

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

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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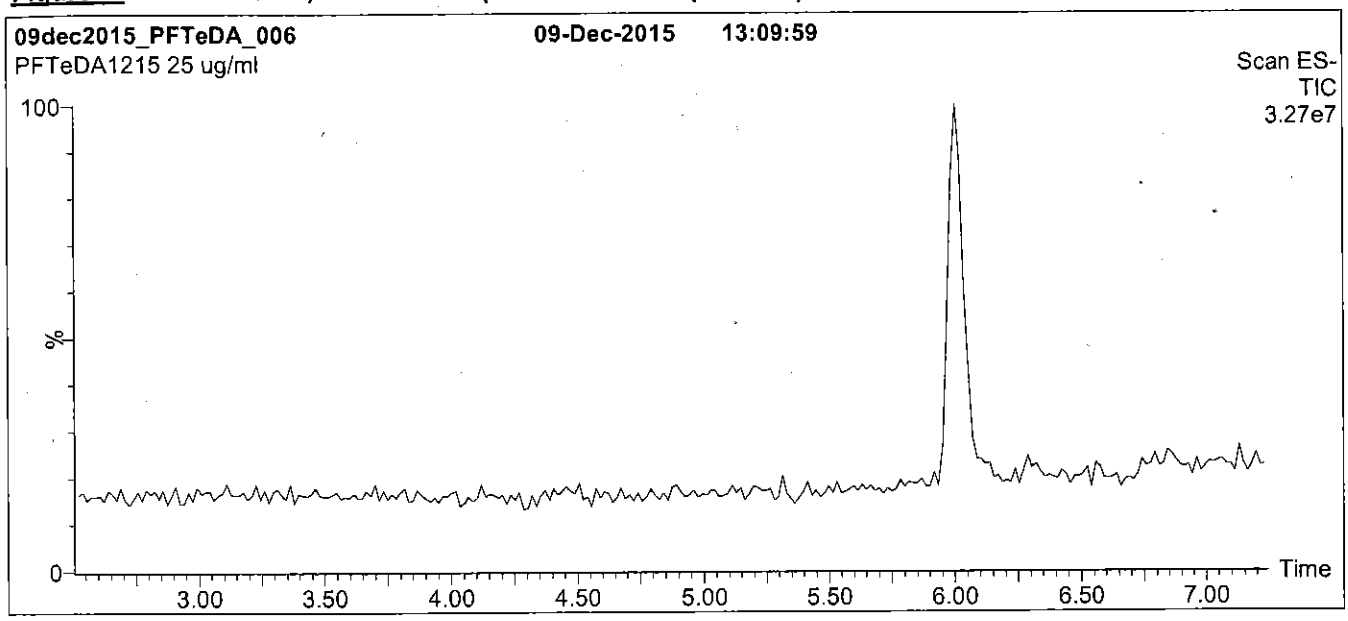
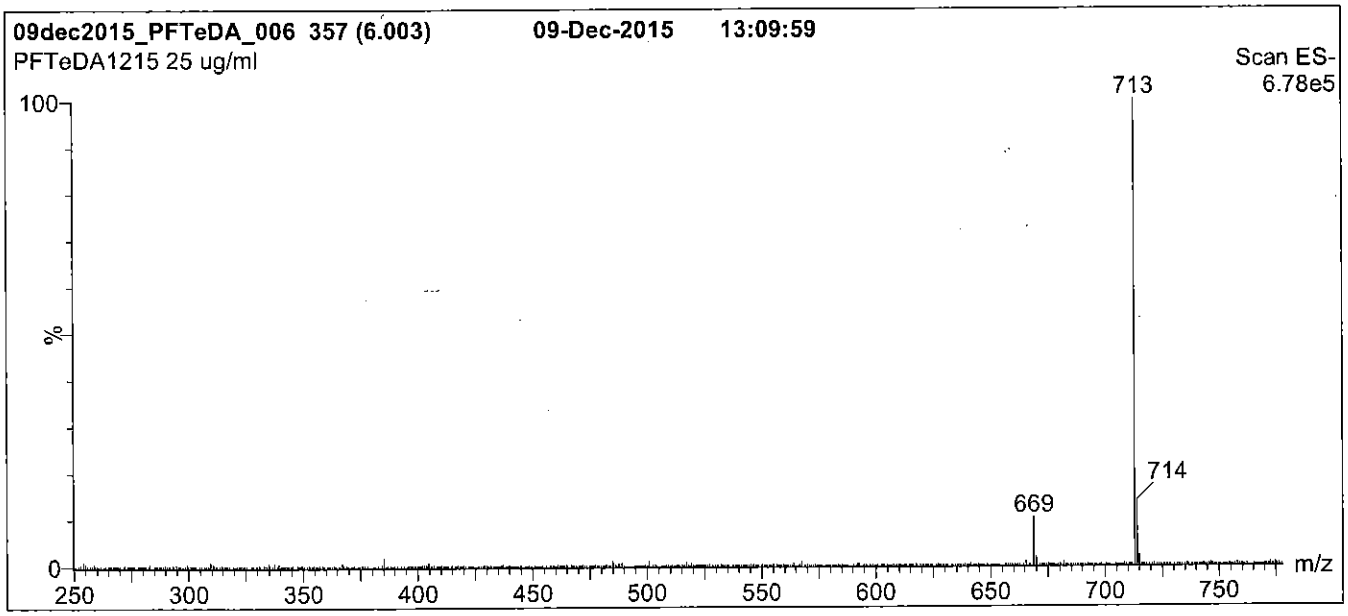
Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

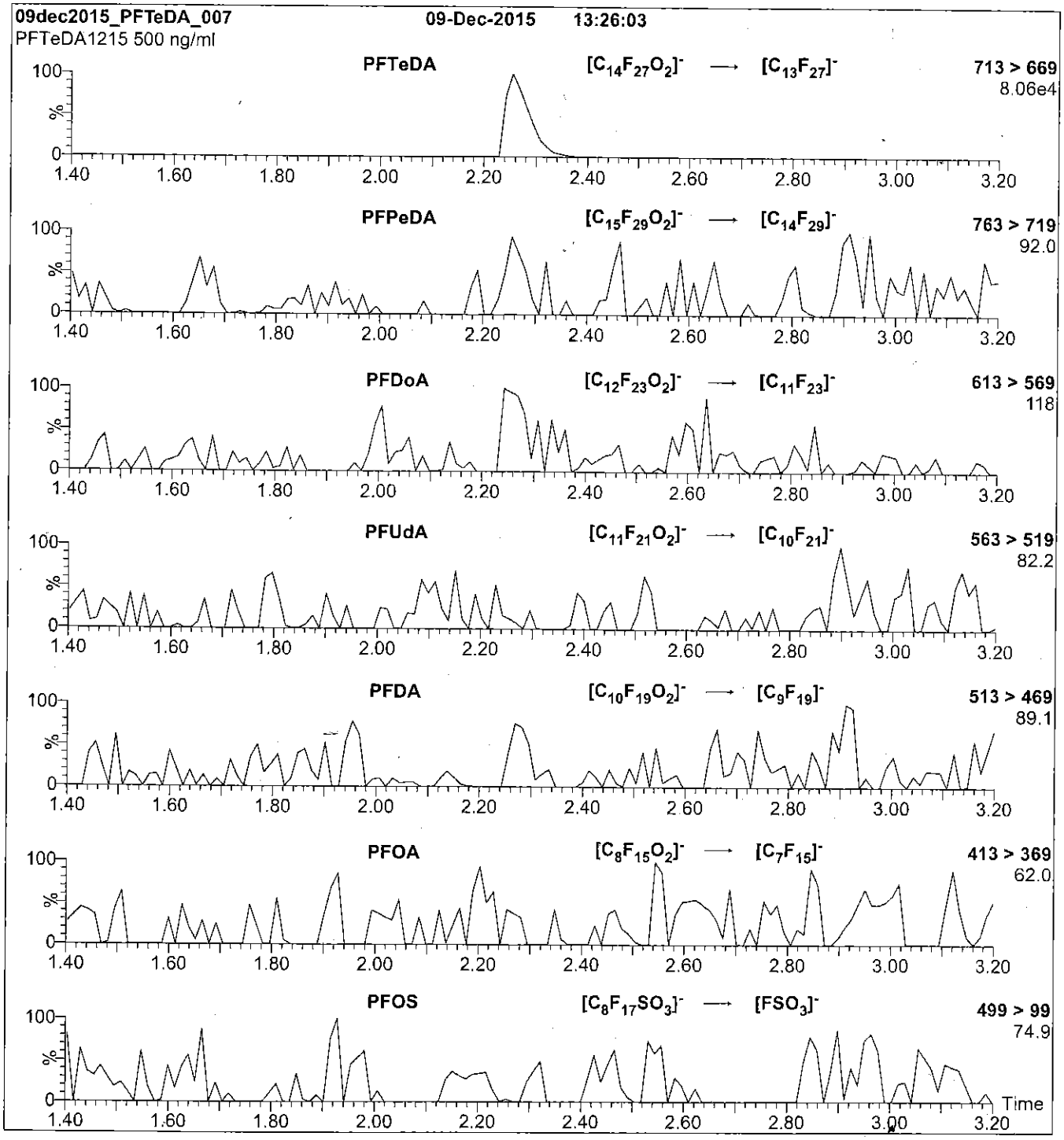
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 14

Reagent

LCPFTrDA_00004

609697
ID: LCPFTrDA_00004
Exp: 12/10/18 Prpd: CBW
PF-n-tridecanoic acid

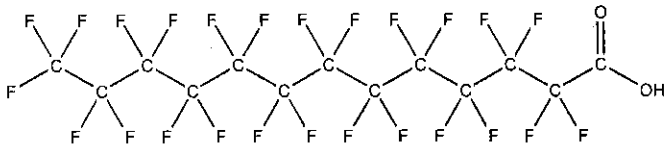
R: 4/7/16 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTrDA
LOT NUMBER: PFTrDA1213
COMPOUND: Perfluoro-n-tridecanoic acid

STRUCTURE:
CAS #: 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{25}O_2$
MOLECULAR WEIGHT: 664.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/10/2013
EXPIRY DATE: (mm/dd/yyyy) 12/10/2018
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.
- Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$); ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/25/2015 (mm/dd/yyyy)

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

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

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

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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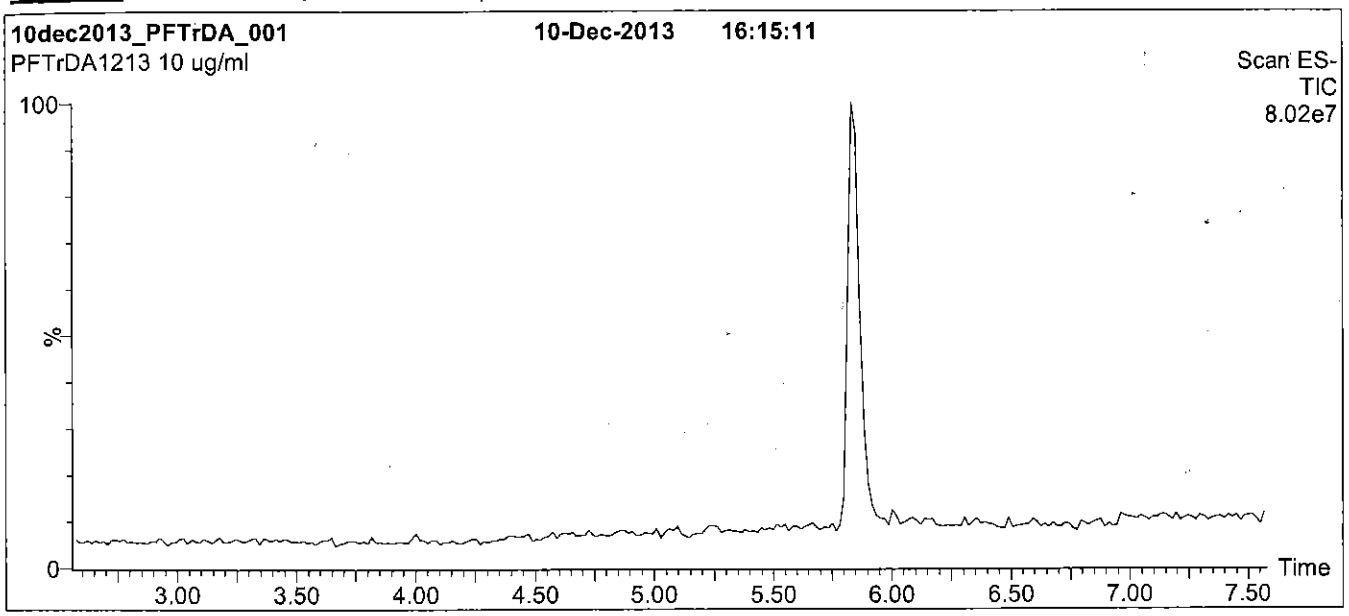
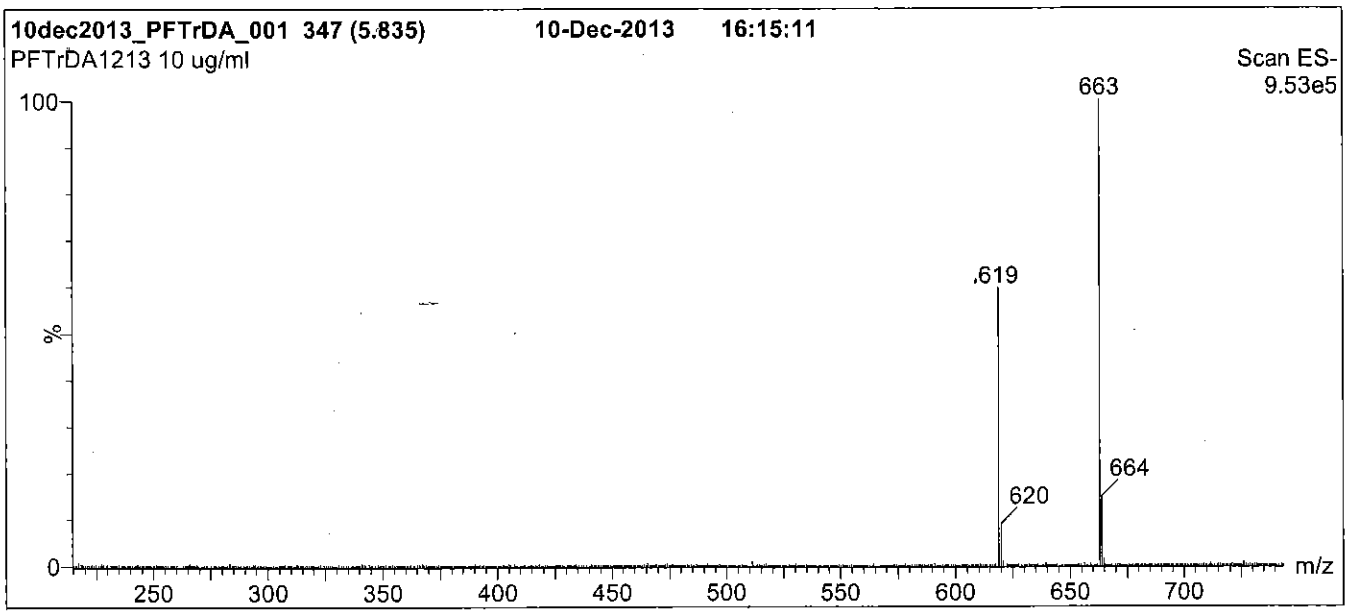
Figure 1: **PFTrDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

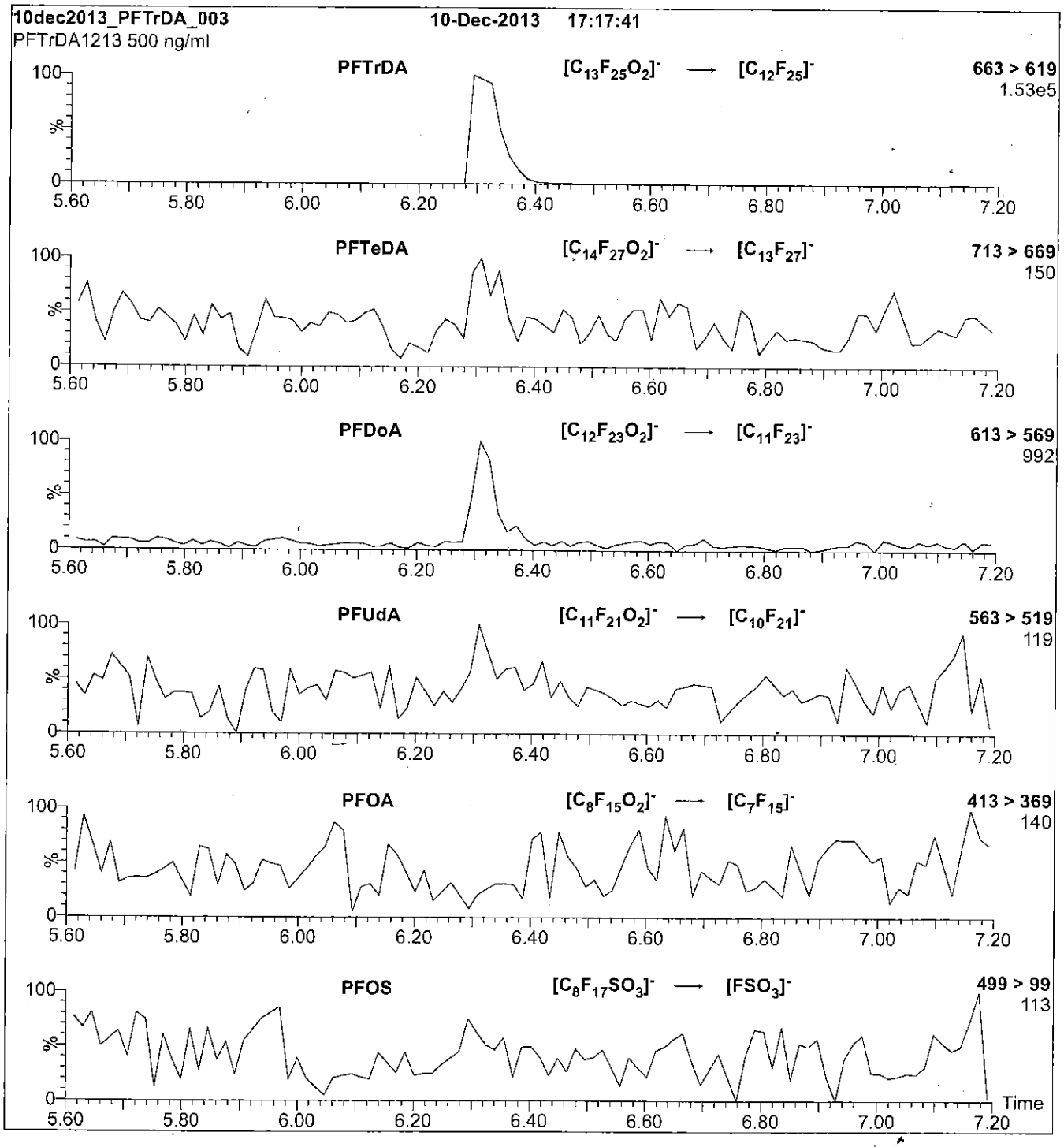
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (215 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 22.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFUdA_00004

605242
ID: LCPFUdA_00004
Exp: 08/19/20 Prpd: CBW
PF-n-undecanoic acid

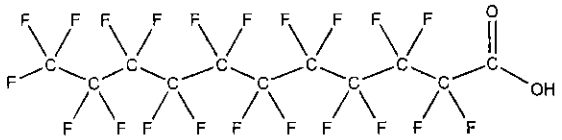
Rec. 3/29/16 JRB ✓

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 ± 2.5 µg/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

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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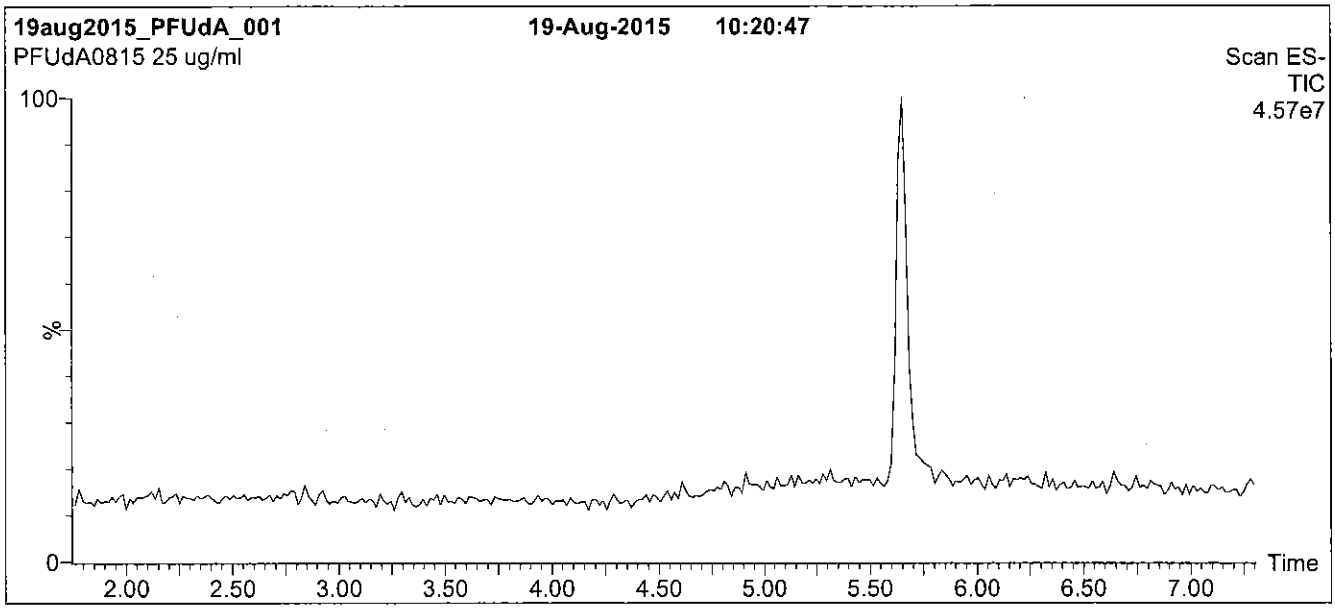

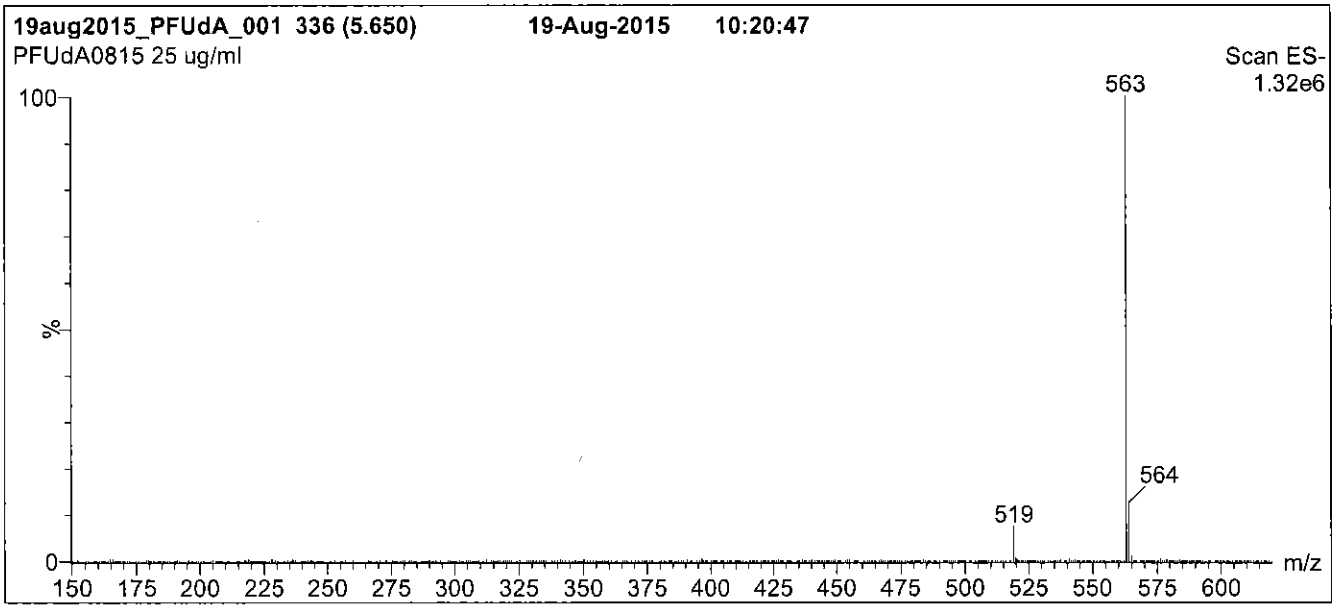

Conditions for Figure 1:

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

Chromatographic Conditions

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

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

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
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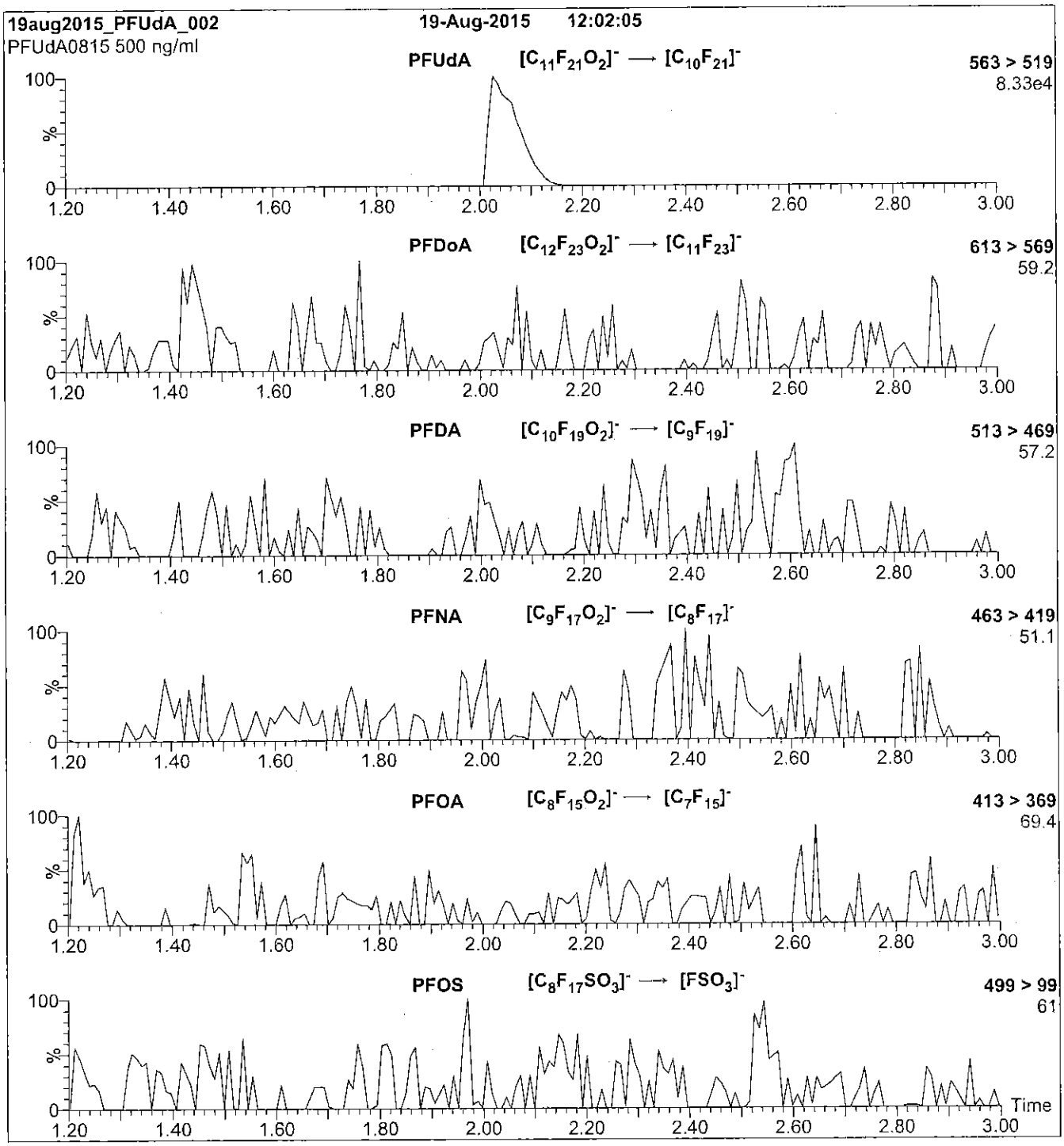
Figure 2: **PFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 11

Reagent

LCPFUdA_00005

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

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COMPOUND: Perfluoro-n-undecanoic acid

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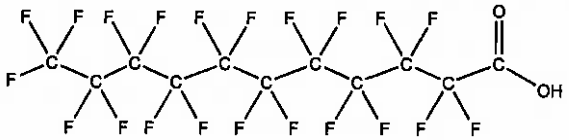

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CALA

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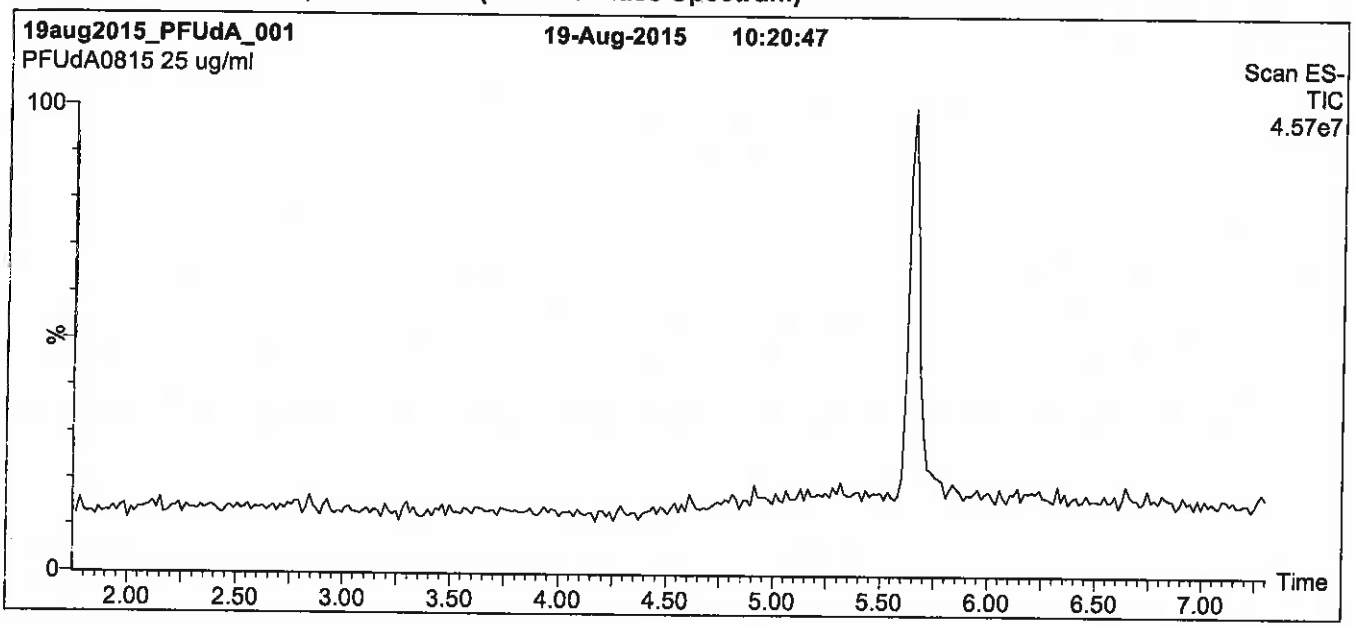

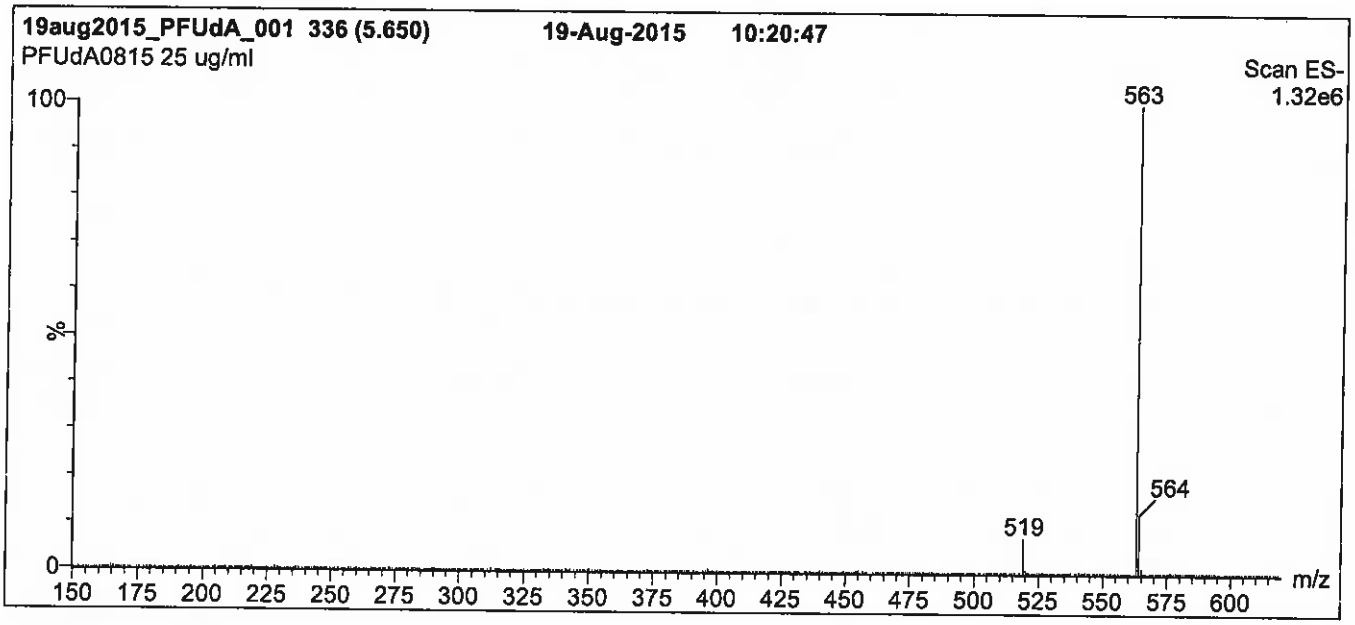

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Time: 10 min

Flow: 300 µl/min

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Source: Electrospray (negative)
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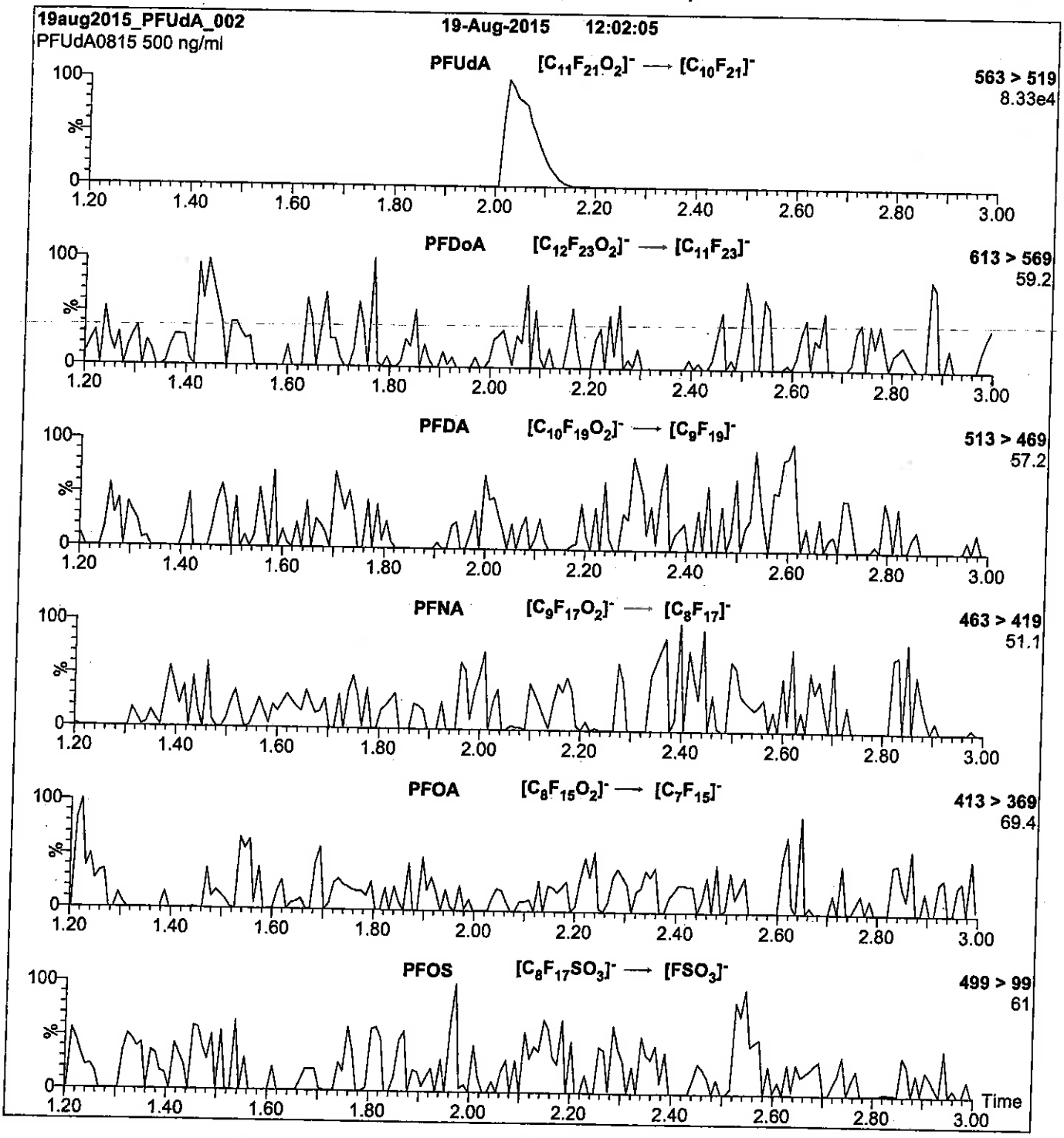
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-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.: 320-23830-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxS #	PFOA #	PFOS #
DPT-16-19-GW-21-25	320-23830-1	58	90	60
DPT-16-19-GW-21-25 DL	320-23830-1 DL	113	126	104
DPT-16-19-GW-31-35	320-23830-2	41	72	93
DPT-16-19-GW-31-35 DL	320-23830-2 DL	98	112	110
DPT-16-18-GW-21-25	320-23830-3	57	64	69
DPT-16-18-GW-21-25 DL	320-23830-3 DL	108	99	101
DPT-16-18-GW-31-35	320-23830-4	68	80	100
DPT-16-18-GW-31-35 -DUP	320-23830-5	67	84	101
DPT-GW-EB-112316	320-23830-6	110	120	107
DPT-16-23-GW-21-25	320-23830-7	47	76	87
DPT-16-23-GW-21-25 DL	320-23830-7 DL	105	116	112
DPT-16-23-GW-31-35	320-23830-8	52	77	107
	MB 320-139917/1-A	115	115	110
	LCS 320-139917/2-A	116	122	114
DPT-16-18-GW-21-25 MS	320-23830-3 MS	58	70	69
DPT-16-18-GW-21-25 MS DL	320-23830-3 MS DL	107	109	102
DPT-16-18-GW-21-25 MSD	320-23830-3 MSD	61	68	75
DPT-16-18-GW-21-25 MSD DL	320-23830-3 MSD DL	113	110	110

	QC LIMITS
PFHxS = 18O2 PFHxS	25-150
PFOA = 13C4 PFOA	25-150
PFOS = 13C4 PFOS	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.: 320-23830-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 09DEC2016A_038.d

Lab ID: LCS 320-139917/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	0.0400	0.0345	86	60-140	
Perfluorooctane Sulfonate (PFOS)	0.0371	0.0334	90	60-140	
13C4 PFOA	0.100	0.122	122	25-150	
13C4 PFOS	0.0956	0.109	114	25-150	
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0366	104	50-150	
18O2 PFHxS	0.0946	0.110	116	25-150	

Column to be used to flag recovery and RPD values

FORM III 537 (Modified)

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 09DEC2016A_042.d

Lab ID: 320-23830-3 MS Client ID: DPT-16-18-GW-21-25 MS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	0.0414	0.69	0.667	-49	60-140	E 4 M
Perfluorooctane Sulfonate (PFOS)	0.0384	1.6	1.62	-28	60-140	E 4
13C4 PFOA	0.104	0.066	0.0723	70	25-150	
13C4 PFOS	0.0990	0.068	0.0685	69	25-150	
Perfluorobutanesulfonic acid (PFBS)	0.0366	0.15	0.186	96	50-150	4
18O2 PFHxS	0.0979	0.056	0.0566	58	25-150	

Column to be used to flag recovery and RPD values

FORM III 537 (Modified)

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 12DEC2016C_008.d

Lab ID: 320-23830-3 MS DL Client ID: DPT-16-18-GW-21-25 MS DL

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	0.0414	0.84	0.882	108	60-140	D M 4
Perfluorooctane Sulfonate (PFOS)	0.0384	2.0	1.98	-15	60-140	D 4
13C4 PFOA	0.104	0.10	0.112	109	25-150	
13C4 PFOS	0.0990	0.10	0.101	102	25-150	
Perfluorobutanesulfonic acid (PFBS)	0.0366	0.11	0.149	119	50-150	D
18O2 PFHxS	0.0979	0.11	0.105	107	25-150	

Column to be used to flag recovery and RPD values

FORM III 537 (Modified)

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 09DEC2016A_043.d

Lab ID: 320-23830-3 MSD Client ID: DPT-16-18-GW-21-25 MSD

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	0.0446	0.684	-7	3	30	60-140	E 4 M
Perfluorooctane Sulfonate (PFOS)	0.0414	1.56	-175	4	30	60-140	E 4
13C4 PFOA	0.111	0.0760	68			25-150	
13C4 PFOS	0.107	0.0798	75			25-150	
Perfluorobutanesulfonic acid (PFBS)	0.0394	0.184	84	1	30	50-150	
18O2 PFHxS	0.105	0.0638	61			25-150	

Column to be used to flag recovery and RPD values

FORM III 537 (Modified)

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 12DEC2016C_009.d

Lab ID: 320-23830-3 MSD DL Client ID: DPT-16-18-GW-21-25 MSD DL

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	0.0446	0.857	45	3	30	60-140	D M 4
Perfluorooctane Sulfonate (PFOS)	0.0414	1.89	-251	5	30	60-140	D 4
13C4 PFOA	0.111	0.123	110			25-150	
13C4 PFOS	0.107	0.117	110			25-150	
Perfluorobutanesulfonic acid (PFBS)	0.0394	0.148	108	0	30	50-150	D
18O2 PFHxS	0.105	0.120	113			25-150	

Column to be used to flag recovery and RPD values

FORM III 537 (Modified)

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Lab File ID: 09DEC2016A_037.d Lab Sample ID: MB 320-139917/1-A

Matrix: Water Date Extracted: 11/29/2016 20:20

Instrument ID: A8_N Date Analyzed: 12/09/2016 15:54

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-139917/2-A	09DEC2016A_038.d	12/09/2016 16:02
DPT-16-19-GW-21-25	320-23830-1	09DEC2016A_039.d	12/09/2016 16:09
DPT-16-19-GW-31-35	320-23830-2	09DEC2016A_040.d	12/09/2016 16:17
DPT-16-18-GW-21-25	320-23830-3	09DEC2016A_041.d	12/09/2016 16:24
DPT-16-18-GW-21-25 MS	320-23830-3 MS	09DEC2016A_042.d	12/09/2016 16:32
DPT-16-18-GW-21-25 MSD	320-23830-3 MSD	09DEC2016A_043.d	12/09/2016 16:39
DPT-16-18-GW-31-35	320-23830-4	09DEC2016A_044.d	12/09/2016 16:47
DPT-16-18-GW-31-35-DUP	320-23830-5	09DEC2016A_045.d	12/09/2016 16:54
DPT-GW-EB-112316	320-23830-6	09DEC2016A_046.d	12/09/2016 17:02
DPT-16-23-GW-21-25	320-23830-7	09DEC2016A_051.d	12/09/2016 17:39
DPT-16-23-GW-31-35	320-23830-8	09DEC2016A_052.d	12/09/2016 17:47
DPT-16-19-GW-21-25 DL	320-23830-1 DL	12DEC2016C_005.d	12/12/2016 18:52
DPT-16-19-GW-31-35 DL	320-23830-2 DL	12DEC2016C_006.d	12/12/2016 19:00
DPT-16-18-GW-21-25 DL	320-23830-3 DL	12DEC2016C_007.d	12/12/2016 19:07
DPT-16-18-GW-21-25 MS DL	320-23830-3 MS DL	12DEC2016C_008.d	12/12/2016 19:15
DPT-16-18-GW-21-25 MSD DL	320-23830-3 MSD DL	12DEC2016C_009.d	12/12/2016 19:22
DPT-16-23-GW-21-25 DL	320-23830-7 DL	12DEC2016C_010.d	12/12/2016 19:30

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23830-1

SDG No.:

Client Sample ID: DPT-16-19-GW-21-25 | Lab Sample ID: 320-23830-1

Matrix: Water | Lab File ID: 09DEC2016A_039.d

Analysis Method: 537 (Modified) | Date Collected: 11/23/2016 10:15

Extraction Method: 3535 | Date Extracted: 11/29/2016 20:20

Sample wt/vol: 248.9(mL) | Date Analyzed: 12/09/2016 16:09

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 141453 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.34	M	0.0025	0.0020	0.00075
1763-23-1	*Perfluorooctane Sulfonate (PFOS)*	*2.0*	*E*	*0.0040*	0.0030	*0.0013*
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.17		0.0025	0.0020	0.00092

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	90		25-150
STL00991	13C4 PFOS	60		25-150
STL00994	18O2 PFHxS	58		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_039.d				
Lims ID:	320-23830-A-1-A				
Client ID:	DPT-16-19-GW-21-25				
Sample Type:	Client				
Inject. Date:	09-Dec-2016 16:09:36	ALS Bottle#:	23	Worklist Smp#:	39
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-23830-a-1-a				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	A8-PC\A8	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\A8_N.m				
Limit Group:	LC PFC_DOD ICAL				
Last Update:	11-Dec-2016 11:57:49	Calib Date:	03-Dec-2016 15:33:40		
Integrator:	Picker				
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK012				
First Level Reviewer: westendorfc		Date:	11-Dec-2016 11:48:37		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.850	1.852	-0.002	1.000	24101384	83.1				
298.90 > 99.00	1.850	1.852	-0.002	1.000	11336949		2.13(0.00-0.00)			
D 10 18O2 PFHxS										
403.00 > 84.00	2.464	2.460	0.004		8594918	27.5		58.2	319233	
D 14 13C4 PFOA										
417.00 > 372.00	2.813	2.805	0.008		9852564	44.9		89.9	495599	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.813	2.805	0.008	1.000	35741992	169.2			177628	M
413.00 > 169.00	2.720	2.805	-0.085	0.967	25758473		1.39(0.90-1.10)		203152	
18 Perfluorooctane sulfonic acid										E
499.00 > 80.00	3.073	3.150	-0.077	1.000	157856874	979.9			195549	E
499.00 > 99.00	3.188	3.150	0.038	1.037	47039741		3.36(0.90-1.10)		940281	
D 17 13C4 PFOS										
503.00 > 80.00	3.188	3.166	0.022		7095889	28.8		60.3	33497	

QC Flag Legend

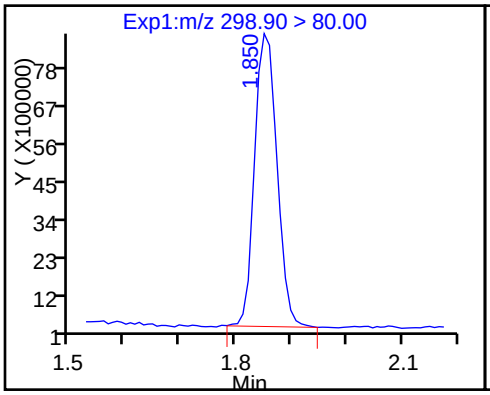
Processing Flags
E - Exceeded Maximum Amount
Review Flags
M - Manually Integrated

Report Date: 11-Dec-2016 11:58:00 Chrom Revision: 2.2 05-Dec-2016 12:37:22

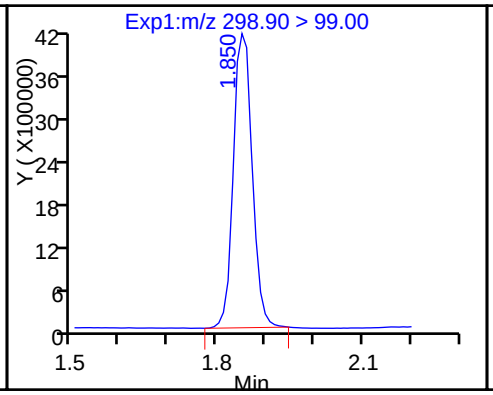
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_039.d				
Injection Date:	09-Dec-2016 16:09:36	Instrument ID:	A8_N		
Lims ID:	320-23830-A-1-A	Lab Sample ID:	320-23830-1		
Client ID:	DPT-16-19-GW-21-25				
Operator ID:	A8-PC\A8	ALS Bottle#:	23	Worklist Smp#:	39
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

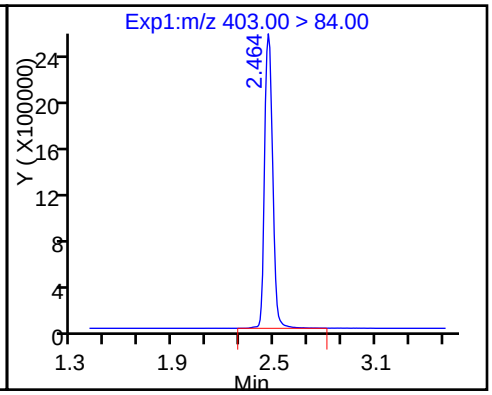
5 Perfluorobutanesulfonic acid



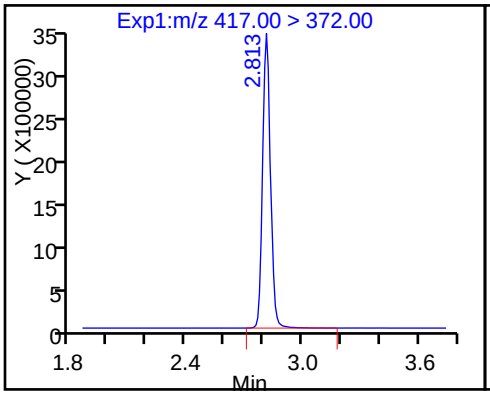
5 Perfluorobutanesulfonic acid



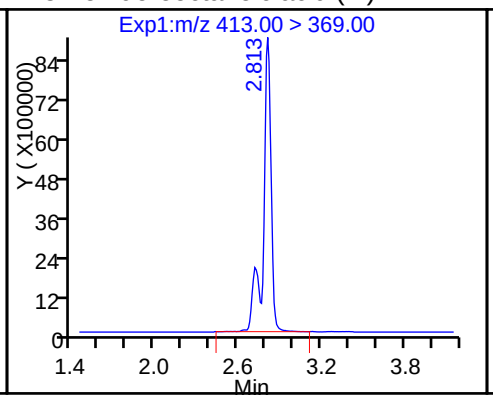
D 10 18O2 PFHxS



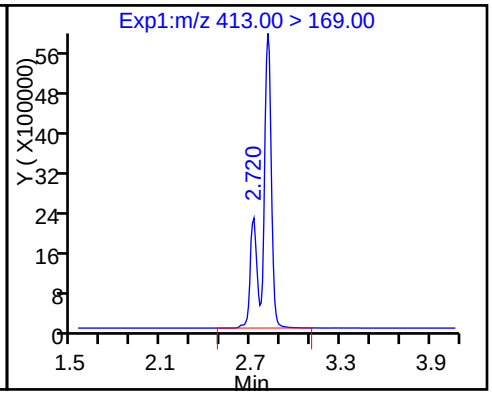
D 14 13C4 PFOA



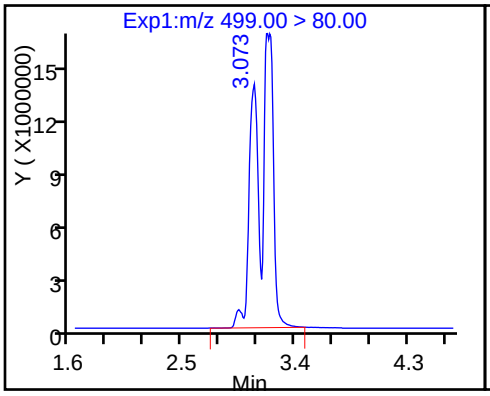
15 Perfluorooctanoic acid (M)



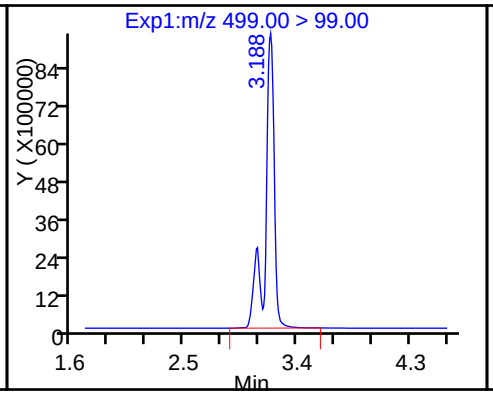
15 Perfluorooctanoic acid



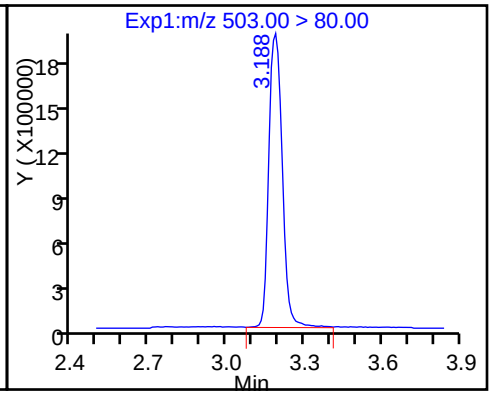
18 Perfluorooctane sulfonic acid



18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

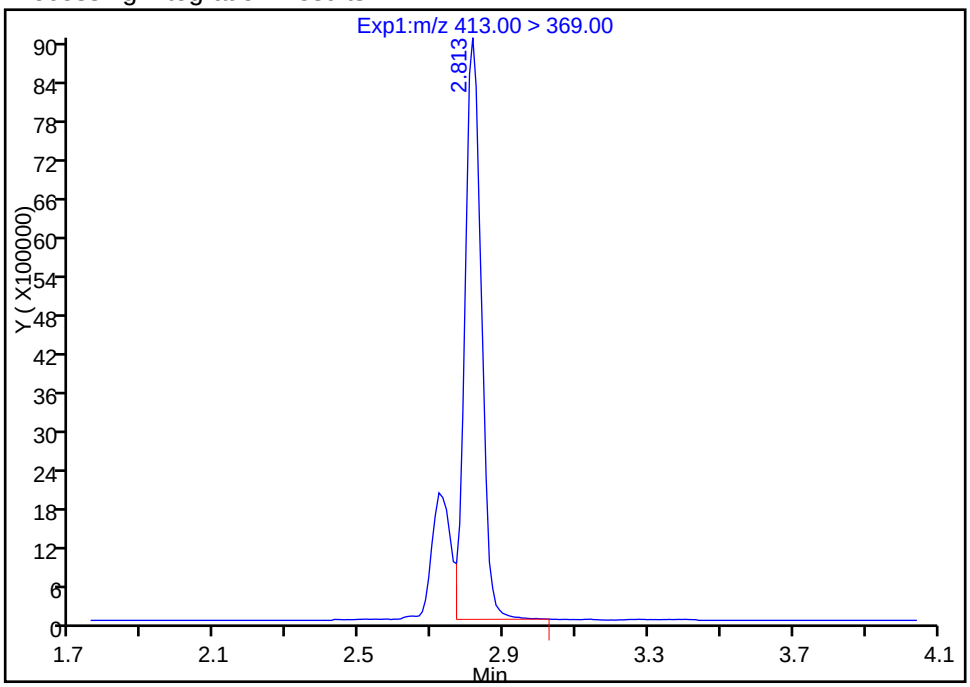
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_039.d				
Injection Date:	09-Dec-2016 16:09:36	Instrument ID:	A8_N		
Lims ID:	320-23830-A-1-A	Lab Sample ID:	320-23830-1		
Client ID:	DPT-16-19-GW-21-25				
Operator ID:	A8-PC\A8	ALS Bottle#:	23	Worklist Smp#:	39
Injection Vol:	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

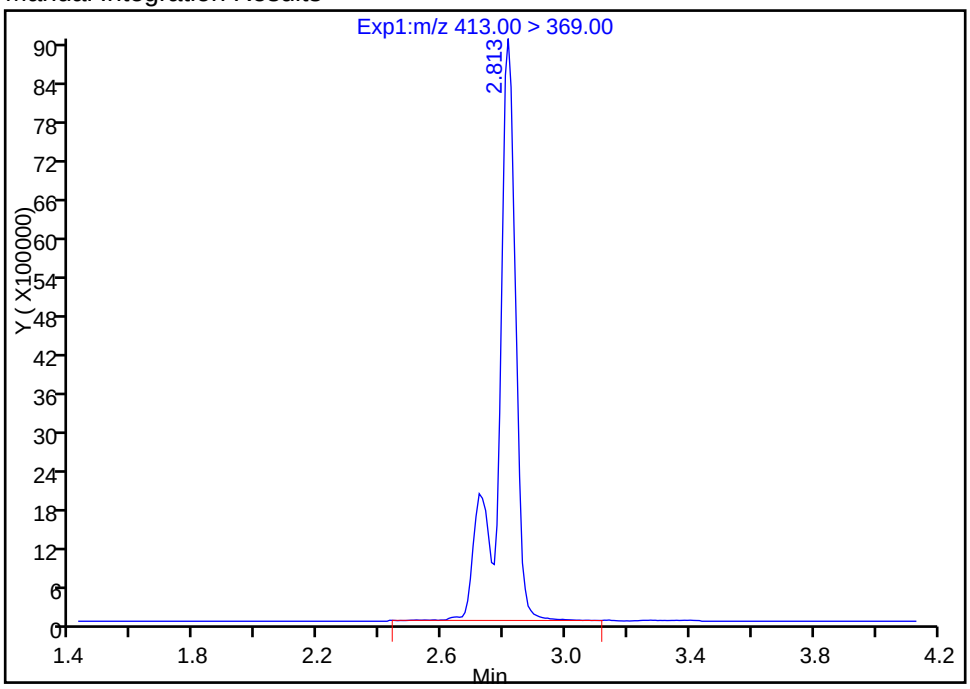
Processing Integration Results

RT: 2.81
Area: 28414829
Amount: 134.5257
Amount Units: ng/ml



Manual Integration Results

RT: 2.81
Area: 35741992
Amount: 169.2151
Amount Units: ng/ml



Reviewer: westendorfc, 11-Dec-2016 11:48:37

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23830-1

SDG No.:

Client Sample ID: DPT-16-19-GW-21-25 DL | Lab Sample ID: 320-23830-1 DL

Matrix: Water | Lab File ID: 12DEC2016C_005.d

Analysis Method: 537 (Modified) | Date Collected: 11/23/2016 10:15

Extraction Method: 3535 | Date Extracted: 11/29/2016 20:20

Sample wt/vol: 248.9(mL) | Date Analyzed: 12/12/2016 18:52

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 141834 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	*Perfluorooctanoic acid (PFOA)*	*0.37*	*D M*	*0.025*	0.020	*0.0075*
1763-23-1	Perfluorooctane Sulfonate (PFOS)	2.6	D	0.040	0.030	0.013
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*0.13*	*D*	*0.025*	0.020	*0.0092*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	126		25-150
STL00991	13C4 PFOS	104		25-150
STL00994	18O2 PFHxS	113		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_005.d				
Lims ID:	320-23830-A-1-A				
Client ID:	DPT-16-19-GW-21-25				
Sample Type:	Client				
Inject. Date:	12-Dec-2016 18:52:44	ALS Bottle#:	46	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Sample Info:	320-23830-a-1-a 10X				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	A8-PC\A8	Instrument ID:	A8_N		

Method:	\\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\A8_N.m		
Limit Group:	LC PFC_DOD ICAL		
Last Update:	14-Dec-2016 08:29:39	Calib Date:	03-Dec-2016 15:33:40
Integrator:	Picker		
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d		

Column 1 :			Det: EXP1
Process Host:	XAWRK003		

First Level Reviewer: chandrasenas Date: 14-Dec-2016 08:21:55

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.839	1.849	-0.010	1.000	3551336	6.31				
298.90 > 99.00	1.839	1.849	-0.010	1.000	1491696		2.38(0.00-0.00)			
D 10 18O2 PFHxS										
403.00 > 84.00	2.447	2.446	0.001		1667708	5.34		11.3	301786	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.791	2.791	0.0	1.000	5389796	18.2			30675	M
413.00 > 169.00	2.791	2.791	0.0	1.000	3642487		1.48(0.90-1.10)		167342	
D 14 13C4 PFOA										
417.00 > 372.00	2.799	2.791	0.008		1383660	6.31		12.6	165056	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.136	3.135	0.001	1.000	36356114	131.0			182432	
499.00 > 99.00	3.160	3.135	0.025	1.008	8291991		4.38(0.90-1.10)		363255	
D 17 13C4 PFOS										
503.00 > 80.00	3.160	3.159	0.001		1222072	4.97		10.4	23810	

QC Flag Legend

Review Flags

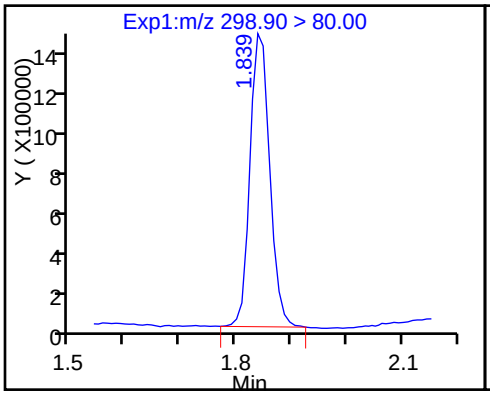
M - Manually Integrated

Report Date: 14-Dec-2016 08:29:43 Chrom Revision: 2.2 05-Dec-2016 12:37:22

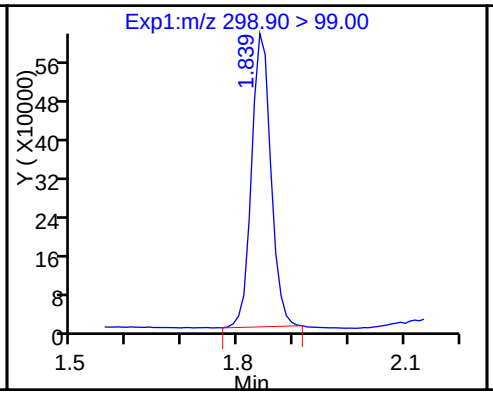
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_005.d				
Injection Date:	12-Dec-2016 18:52:44	Instrument ID:	A8_N		
Lims ID:	320-23830-A-1-A	Lab Sample ID:	320-23830-1		
Client ID:	DPT-16-19-GW-21-25				
Operator ID:	A8-PC\A8	ALS Bottle#:	46	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

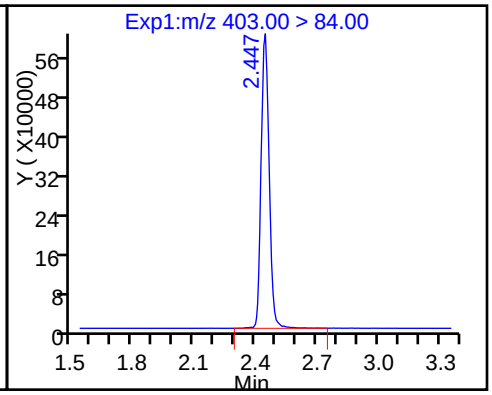
5 Perfluorobutanesulfonic acid



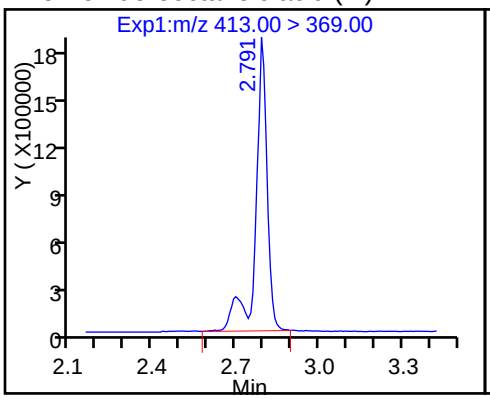
5 Perfluorobutanesulfonic acid



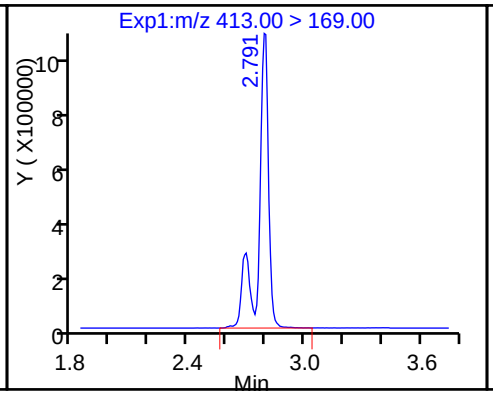
D 10 18O2 PFHxS



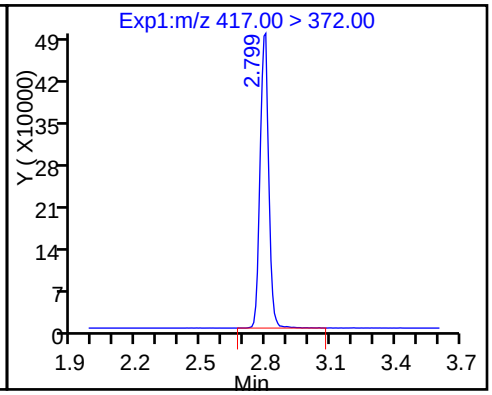
15 Perfluorooctanoic acid (M)



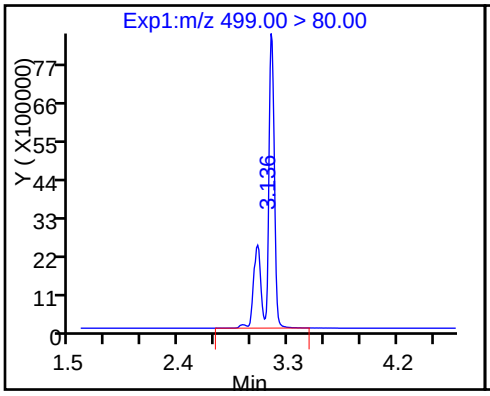
15 Perfluorooctanoic acid



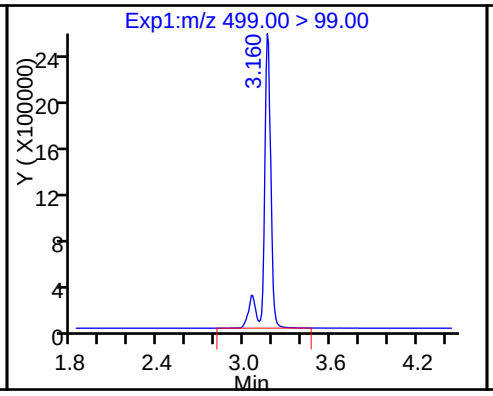
D 14 13C4 PFOA



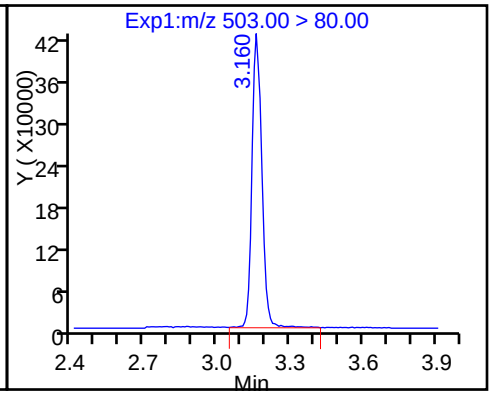
18 Perfluorooctane sulfonic acid



18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

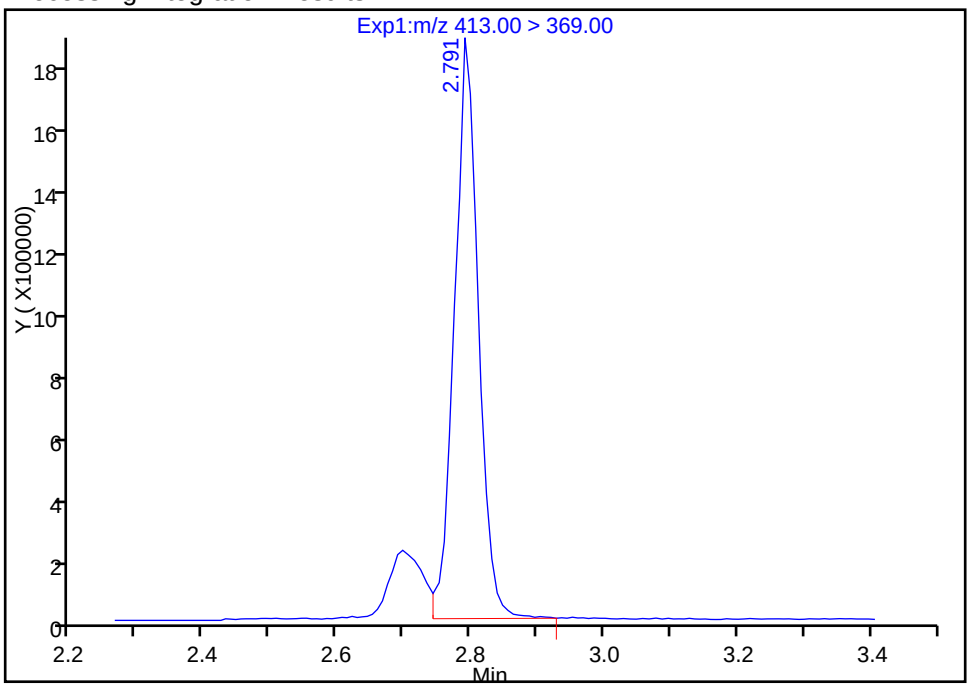
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_005.d				
Injection Date:	12-Dec-2016 18:52:44	Instrument ID:	A8_N		
Lims ID:	320-23830-A-1-A	Lab Sample ID:	320-23830-1		
Client ID:	DPT-16-19-GW-21-25				
Operator ID:	A8-PC\A8	ALS Bottle#:	46	Worklist Smp#:	5
Injection Vol:	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

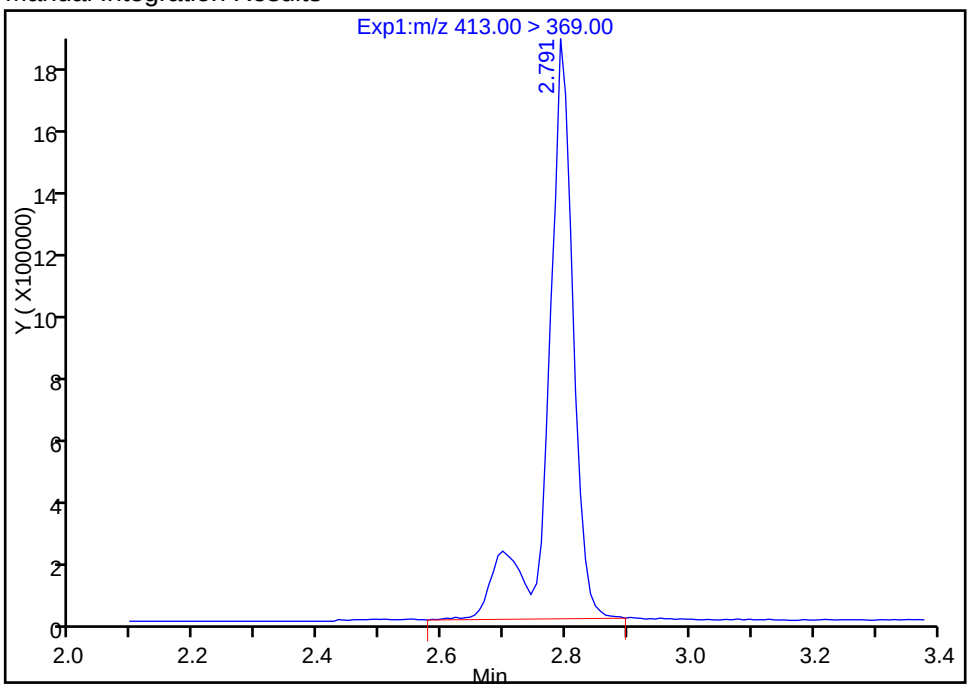
Processing Integration Results

RT: 2.79
Area: 4649943
Amount: 15.675733
Amount Units: ng/ml



Manual Integration Results

RT: 2.79
Area: 5389796
Amount: 18.169901
Amount Units: ng/ml



Reviewer: chandrasenas, 14-Dec-2016 08:21:55

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23830-1

SDG No.:

Client Sample ID: DPT-16-19-GW-31-35 | Lab Sample ID: 320-23830-2

Matrix: Water | Lab File ID: 09DEC2016A_040.d

Analysis Method: 537 (Modified) | Date Collected: 11/23/2016 11:00

Extraction Method: 3535 | Date Extracted: 11/29/2016 20:20

Sample wt/vol: 254.6(mL) | Date Analyzed: 12/09/2016 16:17

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 141453 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	*Perfluorooctanoic acid (PFOA)*	*0.71*	*E M*	*0.0025*	0.0020	*0.00073*
1763-23-1	*Perfluorooctane Sulfonate (PFOS)*	*0.62*	*E*	*0.0039*	0.0029	*0.0013*
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.33		0.0025	0.0020	0.00090

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	72		25-150
STL00991	13C4 PFOS	93		25-150
STL00994	18O2 PFHxS	41		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_040.d
Lims ID: 320-23830-A-2-A
Client ID: DPT-16-19-GW-31-35
Sample Type: Client
Inject. Date: 09-Dec-2016 16:17:09 ALS Bottle#: 24 Worklist Smp#: 40
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-23830-a-2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 11-Dec-2016 11:57:49 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: westendorfc Date: 11-Dec-2016 11:49:05

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.852	1.852	0.0	1.000	33718489	165.6				
298.90 > 99.00	1.852	1.852	0.0	1.000	17047878		1.98(0.00-0.00)			
D 10 18O2 PFHxS										
403.00 > 84.00	2.461	2.460	0.001		6032996	19.3		40.8	204634	
D 14 13C4 PFOA										
417.00 > 372.00	2.814	2.805	0.009		7931088	36.2		72.3	423193	
15 Perfluorooctanoic acid										EM
413.00 > 369.00	2.806	2.805	0.001	1.000	61884686	364.0			503224	EM
413.00 > 169.00	2.814	2.805	0.009	1.003	48112138		1.29(0.90-1.10)		0.0	
18 Perfluorooctane sulfonic acid										E
499.00 > 80.00	3.067	3.150	-0.083	1.000	78273226	314.2			357990	E
499.00 > 99.00	3.077	3.150	-0.073	1.003	17354629		4.51(0.90-1.10)		196278	
D 17 13C4 PFOS										
503.00 > 80.00	3.183	3.166	0.017		10972332	44.6		93.3	189368	

QC Flag Legend

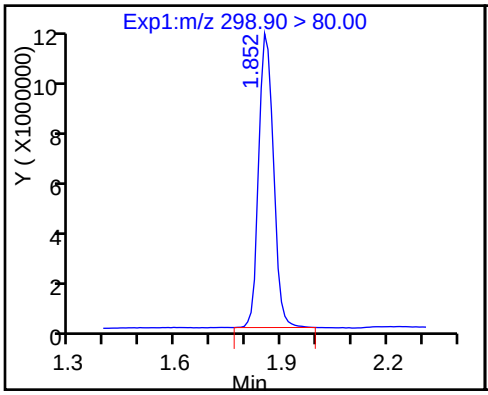
Processing Flags
E - Exceeded Maximum Amount
Review Flags
M - Manually Integrated

Report Date: 11-Dec-2016 11:58:01 Chrom Revision: 2.2 05-Dec-2016 12:37:22

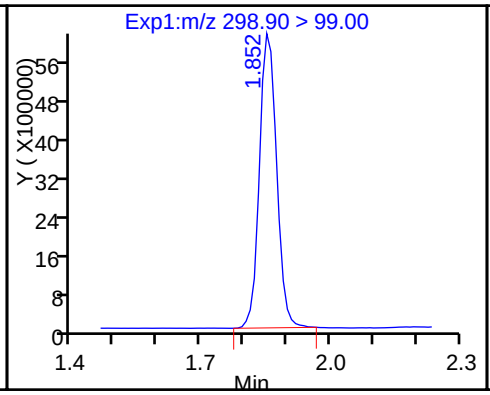
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_040.d				
Injection Date:	09-Dec-2016 16:17:09	Instrument ID:	A8_N		
Lims ID:	320-23830-A-2-A	Lab Sample ID:	320-23830-2		
Client ID:	DPT-16-19-GW-31-35				
Operator ID:	A8-PC\A8	ALS Bottle#:	24	Worklist Smp#:	40
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

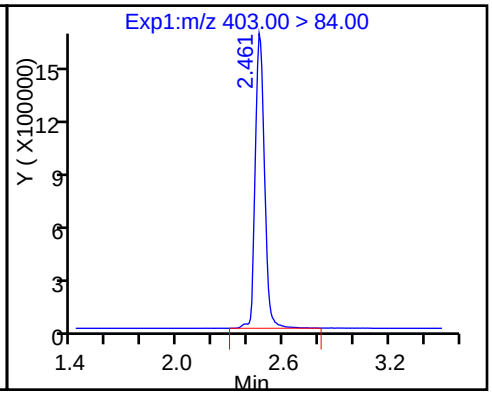
5 Perfluorobutanesulfonic acid



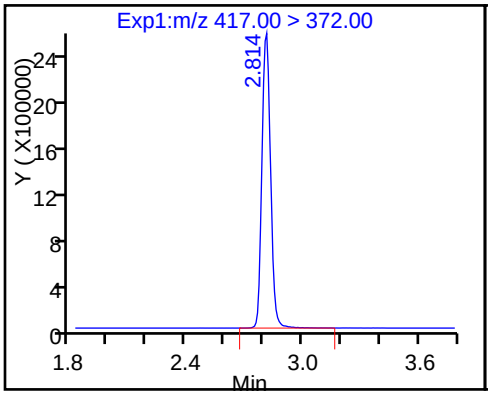
5 Perfluorobutanesulfonic acid



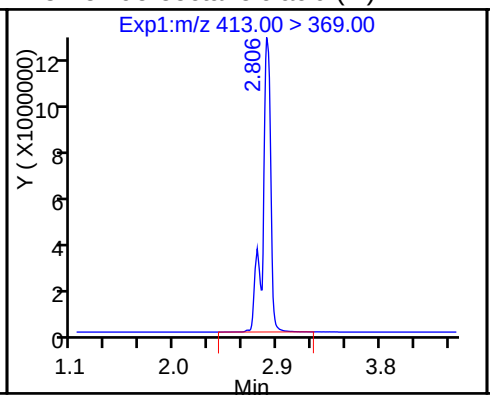
D 10 18O2 PFHxS



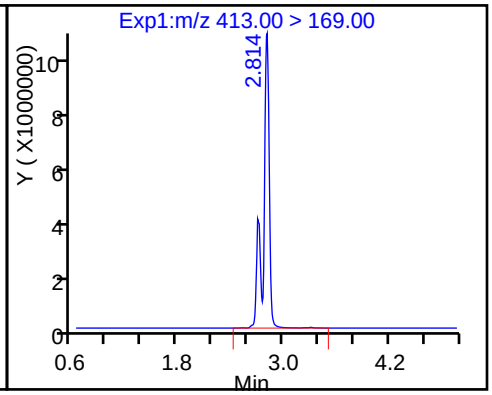
D 14 13C4 PFOA



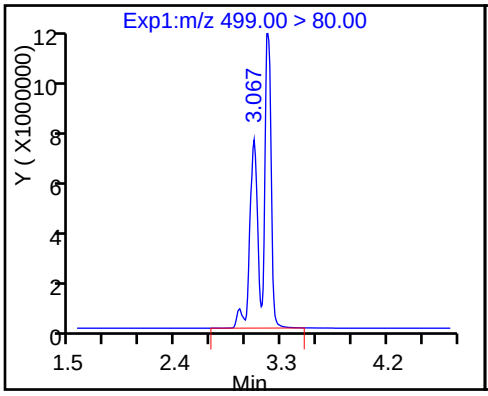
15 Perfluorooctanoic acid (M)



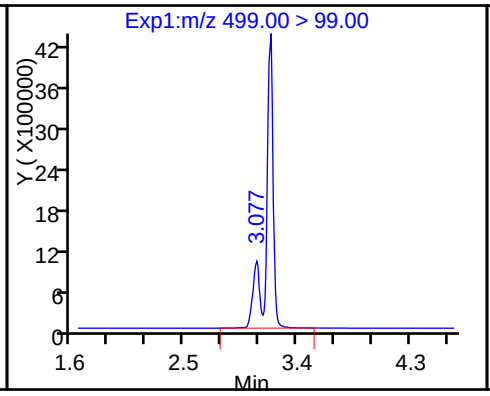
15 Perfluorooctanoic acid



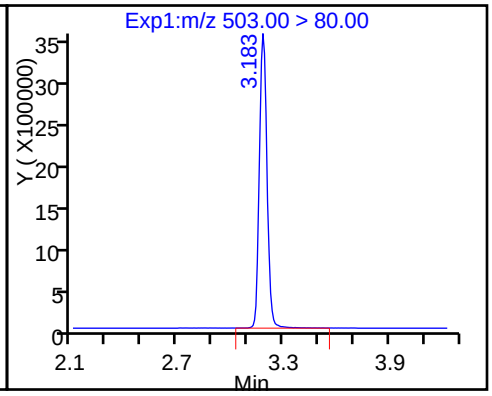
18 Perfluorooctane sulfonic acid



18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

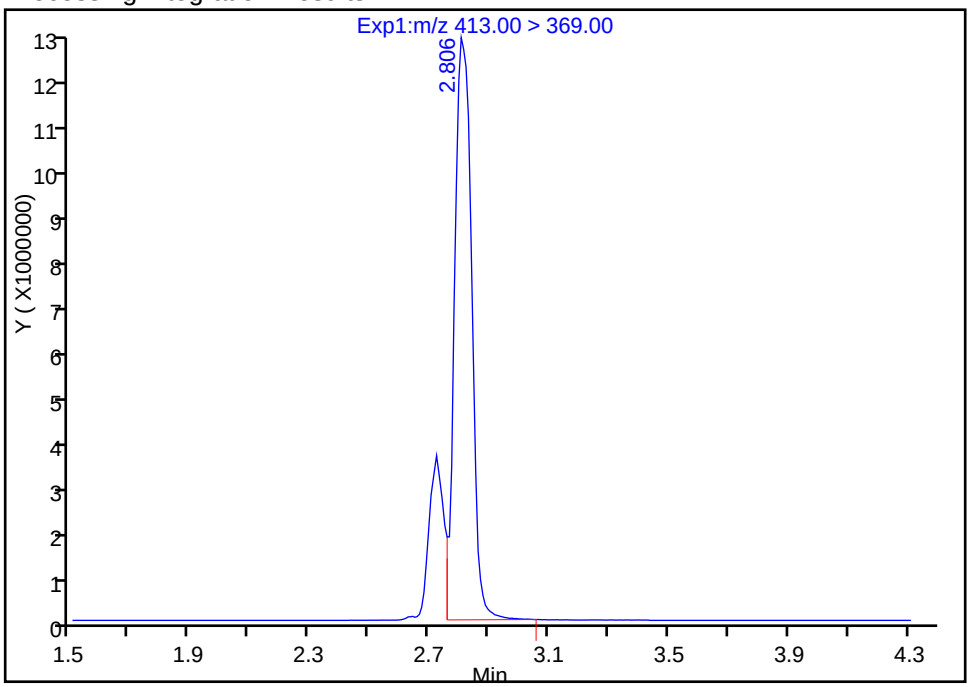
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_040.d				
Injection Date:	09-Dec-2016 16:17:09	Instrument ID:	A8_N		
Lims ID:	320-23830-A-2-A	Lab Sample ID:	320-23830-2		
Client ID:	DPT-16-19-GW-31-35				
Operator ID:	A8-PC\A8	ALS Bottle#:	24	Worklist Smp#:	40
Injection Vol:	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

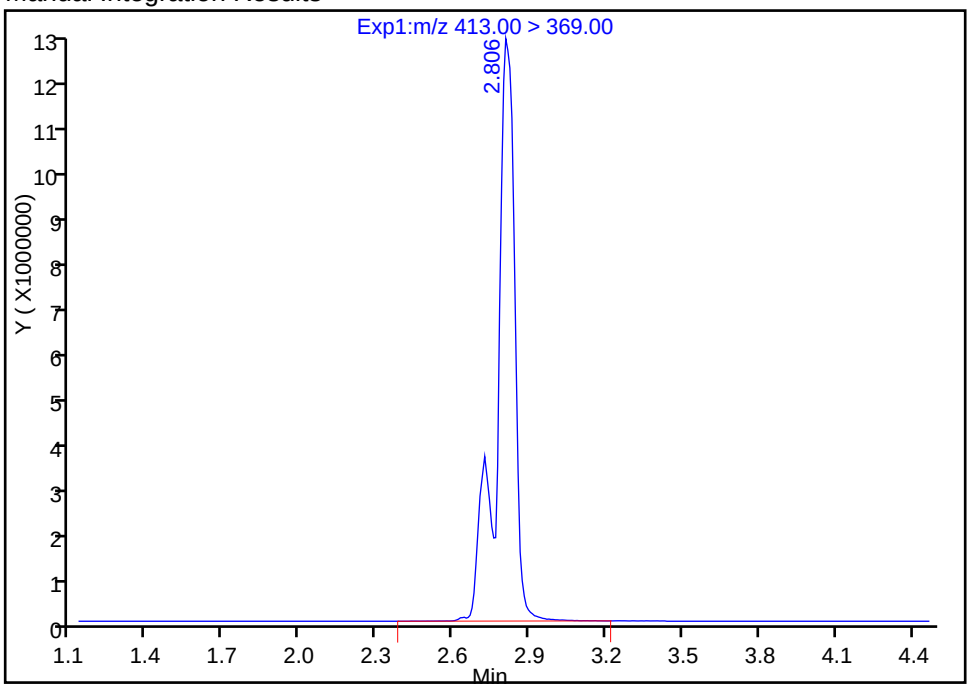
Processing Integration Results

RT: 2.81
Area: 49740890
Amount: 292.5435
Amount Units: ng/ml



Manual Integration Results

RT: 2.81
Area: 61884686
Amount: 363.9653
Amount Units: ng/ml



Reviewer: westendorfc, 11-Dec-2016 11:49:05

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23830-1

SDG No.:

Client Sample ID: DPT-16-19-GW-31-35 DL | Lab Sample ID: 320-23830-2 DL

Matrix: Water | Lab File ID: 12DEC2016C_006.d

Analysis Method: 537 (Modified) | Date Collected: 11/23/2016 11:00

Extraction Method: 3535 | Date Extracted: 11/29/2016 20:20

Sample wt/vol: 254.6(mL) | Date Analyzed: 12/12/2016 19:00

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 141834 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.93	D M	0.025	0.020	0.0073
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.68	D	0.039	0.029	0.013
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*0.21*	*D*	*0.025*	0.020	*0.0090*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	112		25-150
STL00991	13C4 PFOS	110		25-150
STL00994	18O2 PFHxS	98		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_006.d
Lims ID: 320-23830-A-2-A
Client ID: DPT-16-19-GW-31-35
Sample Type: Client
Inject. Date: 12-Dec-2016 19:00:15 ALS Bottle#: 47 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Sample Info: 320-23830-a-2-a 10X
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 14-Dec-2016 08:29:39 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: chandrasenas Date: 14-Dec-2016 08:22:18

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.849	1.849	0.0	1.000	5354619	10.9				
298.90 > 99.00	1.849	1.849	0.0	1.000	2271164		2.36(0.00-0.00)			
D 10 18O2 PFHxS										
403.00 > 84.00	2.455	2.446	0.009		1452143	4.65		9.8	121318	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.800	2.791	0.009	1.000	12420014	47.2			113032	M
413.00 > 169.00	2.800	2.791	0.009	1.000	8483570		1.46(0.90-1.10)		261628	
D 14 13C4 PFOA										
417.00 > 372.00	2.800	2.791	0.009		1228285	5.60		11.2	93110	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.050	3.135	-0.085	1.000	10150149	34.4			136450	
499.00 > 99.00	3.145	3.135	0.010	1.031	2016571		5.03(0.90-1.10)		40993	
D 17 13C4 PFOS										
503.00 > 80.00	3.169	3.159	0.010		1298514	5.28		11.0	51618	

QC Flag Legend

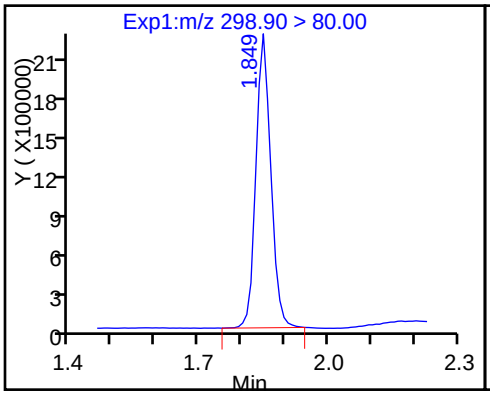
Review Flags
M - Manually Integrated

Report Date: 14-Dec-2016 08:29:44 Chrom Revision: 2.2 05-Dec-2016 12:37:22

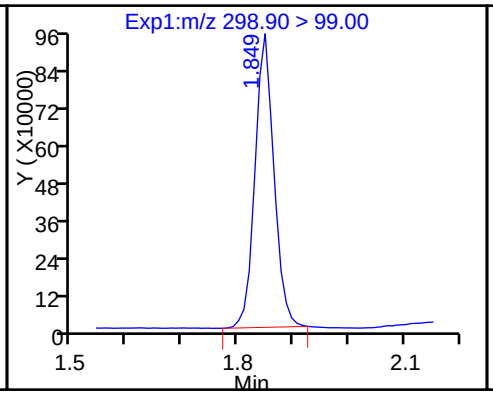
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_006.d				
Injection Date:	12-Dec-2016 19:00:15	Instrument ID:	A8_N		
Lims ID:	320-23830-A-2-A	Lab Sample ID:	320-23830-2		
Client ID:	DPT-16-19-GW-31-35				
Operator ID:	A8-PC\A8	ALS Bottle#:	47	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

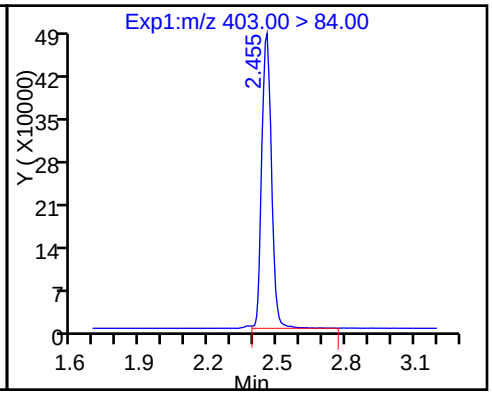
5 Perfluorobutanesulfonic acid



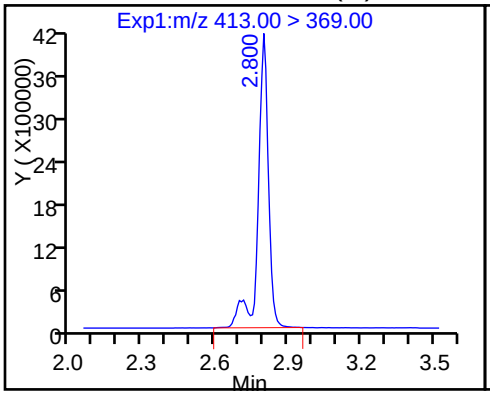
5 Perfluorobutanesulfonic acid



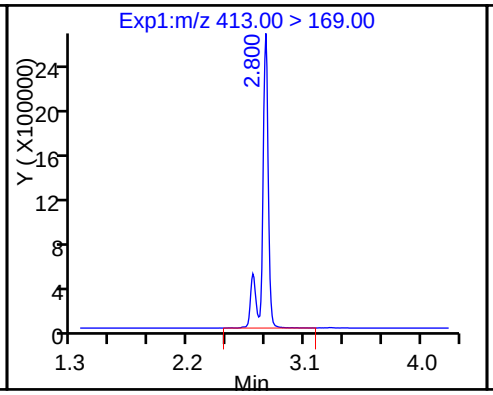
D 10 18O2 PFHxS



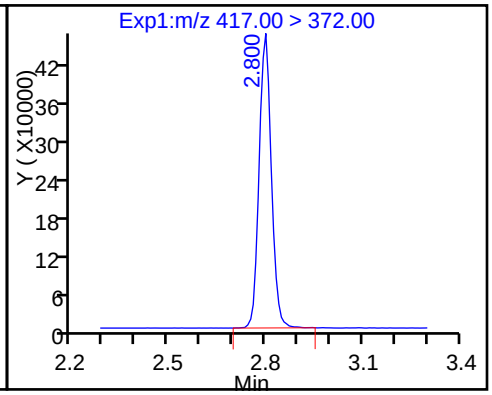
15 Perfluorooctanoic acid (M)



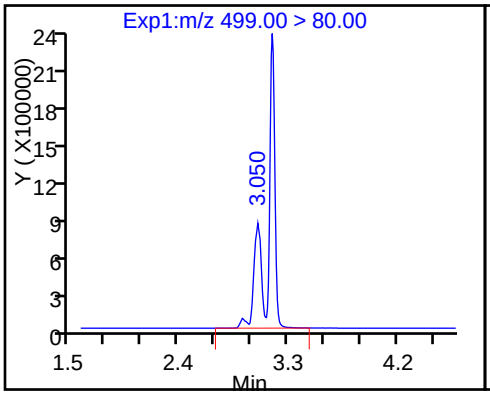
15 Perfluorooctanoic acid



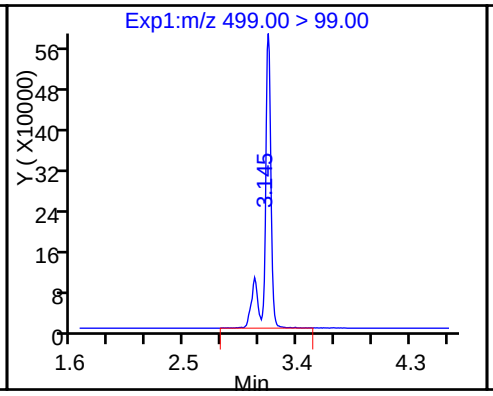
D 14 13C4 PFOA



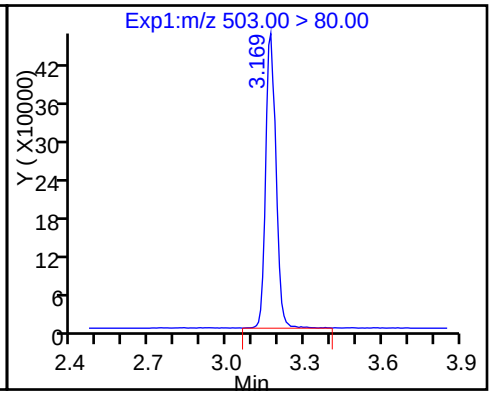
18 Perfluorooctane sulfonic acid



18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

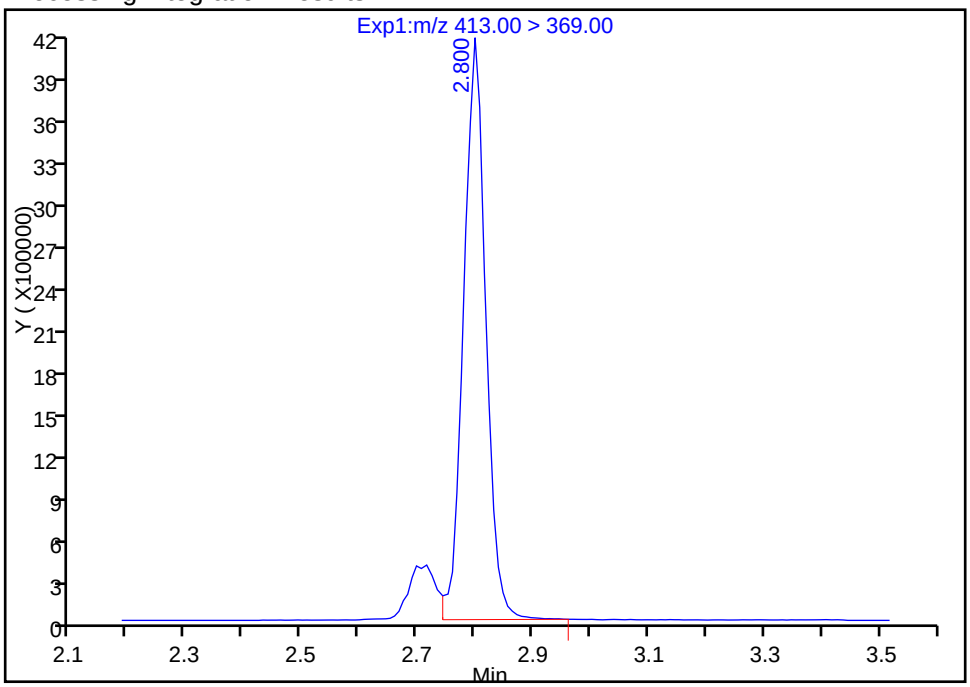
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_006.d				
Injection Date:	12-Dec-2016 19:00:15	Instrument ID:	A8_N		
Lims ID:	320-23830-A-2-A	Lab Sample ID:	320-23830-2		
Client ID:	DPT-16-19-GW-31-35				
Operator ID:	A8-PC\A8	ALS Bottle#:	47	Worklist Smp#:	6
Injection Vol:	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

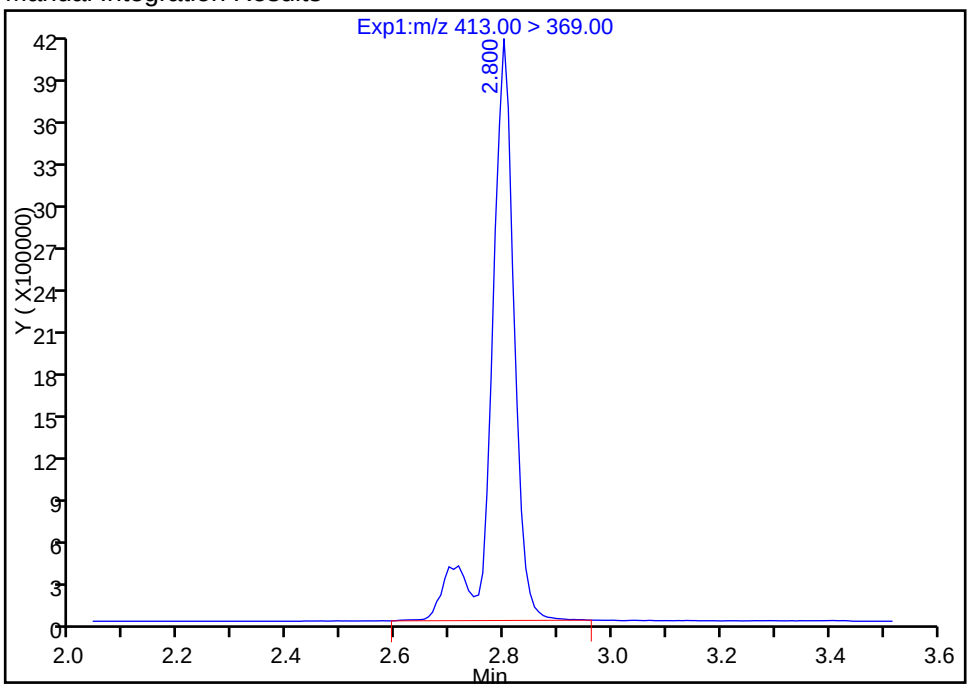
Processing Integration Results

RT: 2.80
Area: 11128611
Amount: 42.262135
Amount Units: ng/ml



Manual Integration Results

RT: 2.80
Area: 12420014
Amount: 47.166381
Amount Units: ng/ml



Reviewer: chandrasenas, 14-Dec-2016 08:22:18

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23830-1

SDG No.:

Client Sample ID: DPT-16-18-GW-21-25 | Lab Sample ID: 320-23830-3

Matrix: Water | Lab File ID: 09DEC2016A_041.d

Analysis Method: 537 (Modified) | Date Collected: 11/23/2016 11:40

Extraction Method: 3535 | Date Extracted: 11/29/2016 20:20

Sample wt/vol: 241.5(mL) | Date Analyzed: 12/09/2016 16:24

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 141453 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	*Perfluorooctanoic acid (PFOA)*	*0.69*	*E J M*	*0.0026*	0.0021	*0.00077*
1763-23-1	*Perfluorooctane Sulfonate (PFOS)*	*1.6*	*E J*	*0.0041*	0.0031	*0.0013*
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.15		0.0026	0.0021	0.00095

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	64		25-150
STL00991	13C4 PFOS	69		25-150
STL00994	18O2 PFHxS	57		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_041.d
Lims ID: 320-23830-A-3-A
Client ID: DPT-16-18-GW-21-25
Sample Type: Client
Inject. Date: 09-Dec-2016 16:24:42 ALS Bottle#: 25 Worklist Smp#: 41
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-23830-a-3-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 11-Dec-2016 11:57:49 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: westendorfc Date: 11-Dec-2016 11:49:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.529	1.537	-0.008		5985656	17.8		35.6	682109	
1 Perfluorobutyric acid										
212.90 > 169.00	1.537	1.545	-0.008	1.000	3370158	32.2			2497	
D 4 13C5-PFPeA										
267.90 > 223.00	1.804	1.813	-0.009		9254297	35.0		70.0	231018	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.804	1.813	-0.009	1.000	8435026	44.9			11691	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.842	1.852	-0.010	1.000	20847417	72.9				
298.90 > 99.00	1.842	1.852	-0.010	1.000	9378618		2.22(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.093	2.103	-0.010		8640263	36.4		72.8	635994	
7 Perfluorohexanoic acid										E
313.00 > 269.00	2.093	2.103	-0.010	1.000	35393383	214.9			60482	E
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.371	2.431	-0.060	1.000	23167878	117.8				
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.433	2.438	-0.005	1.000	2997696	27.4			4679	
D 11 13C4-PFHpA										
367.00 > 322.00	2.425	2.453	-0.028		5322676	25.7		51.3	368593	
D 10 18O2 PFHxS										
403.00 > 84.00	2.451	2.460	-0.009		8475290	27.1		57.4	806993	
D 47 M2-6:2FTS										
429.00 > 409.00	2.773	2.765	0.008		74317	0.7042		0.0		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.773	2.765	0.008	1.000	1331143	NR				
D 14 13C4 PFOA										
417.00 > 372.00	2.796	2.805	-0.009		7027893	32.1		64.1	396561	

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	2.796	2.805	-0.009	1.000	49982059	331.7			609649	EM
413.00 > 169.00	2.773	2.805	-0.032	0.992	36688583		1.36(0.90-1.10)		189168	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.812	2.805	0.007	1.000	5613428	28.2				
18 Perfluorooctane sulfonic acid										E
499.00 > 80.00	3.164	3.150	0.014	1.000	144900261	789.5			503147	E
499.00 > 99.00	3.172	3.150	0.022	1.003	35987373		4.03(0.90-1.10)		629357	
D 17 13C4 PFOS										
503.00 > 80.00	3.164	3.166	-0.002		8083748	32.9		68.7	69241	
D 19 13C5 PFNA										
468.00 > 423.00	3.172	3.174	-0.002		3690951	22.2		44.4	178089	
20 Perfluorononanoic acid										
463.00 > 419.00	3.180	3.174	0.006	1.000	2367477	32.2			475	
D 21 13C8 FOSA										
506.00 > 78.00	3.487	3.489	-0.002		383765	0.9540		1.9	45586	
D 42 M2-8:2FTS										
529.00 > 509.00	3.521	3.519	0.002		3189	0.0328		0.0		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.521	3.519	0.002	1.000	47236	NR				
24 Perfluorodecanoic acid										
513.00 > 469.00	3.529	3.531	-0.002	1.000	64746	0.9217			475	
D 23 13C2 PFDA										
515.00 > 470.00	3.537	3.531	0.006		3656652	23.2		46.3	167475	
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.448	3.683	-0.235	1.000	560	NR				
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.815	3.842	-0.027	1.000	2290	0.0212				
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.841	3.847	-0.006		1475	0.0185		0.0		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.770	3.859	-0.089	1.000	18378	0.3595			374	
D 27 13C2 PFUnA										
565.00 > 520.00	3.867	3.859	0.008		2398436	20.2		40.4	185060	
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.962	3.990	-0.028		8156	0.0776		0.0		
54 MeFOSA										
512.00 > 169.00	4.237	3.999	0.238	1.000	346	NR				
D 30 13C2 PFDoA										
615.00 > 570.00	4.163	4.156	0.007		2332016	20.8		41.6	222300	
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.178	4.175	0.003		805	0.008118		0.0		
D 32 13C2-PFTeDA										
715.00 > 670.00	4.672	4.664	0.008		9863374	42.7		85.3	1022944	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.681	4.664	0.017	1.000	33431	0.3867			352	
713.00 > 169.00	4.654	4.664	-0.010	0.994	3669		9.11(0.00-0.00)		633	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 34 13C2-PFHxDA										
815.00 > 770.00	5.091	5.081	0.010		5874572	45.3		90.6	235909	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.091	5.081	0.010	1.000	72709	0.8156			217	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.459	5.444	0.015	1.000	4104	0.0886			6.5	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

E - Exceeded Maximum Amount

Review Flags

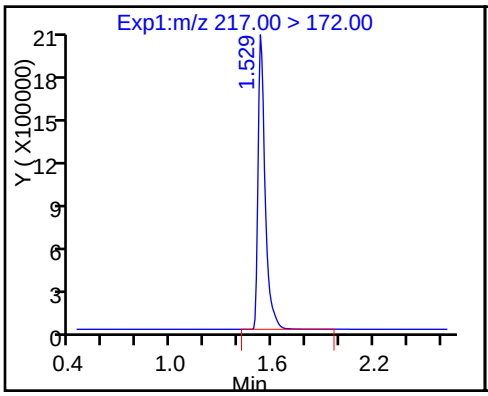
M - Manually Integrated

Report Date: 11-Dec-2016 11:58:02 Chrom Revision: 2.2 05-Dec-2016 12:37:22

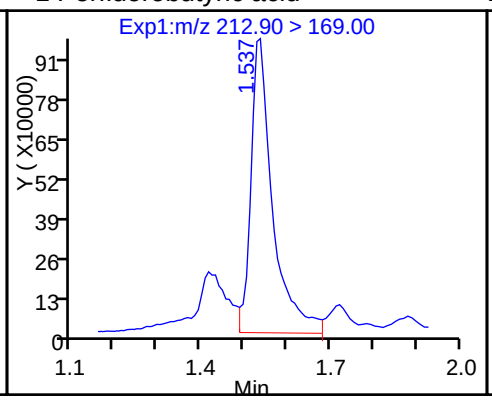
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_041.d				
Injection Date:	09-Dec-2016 16:24:42	Instrument ID:	A8_N		
Lims ID:	320-23830-A-3-A	Lab Sample ID:	320-23830-3		
Client ID:	DPT-16-18-GW-21-25				
Operator ID:	A8-PC\A8	ALS Bottle#:	25	Worklist Smp#:	41
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

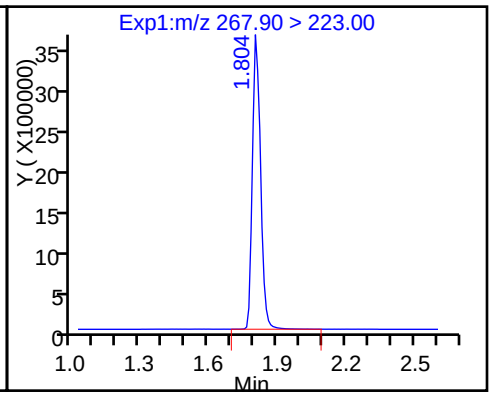
D 2 13C4 PFBA



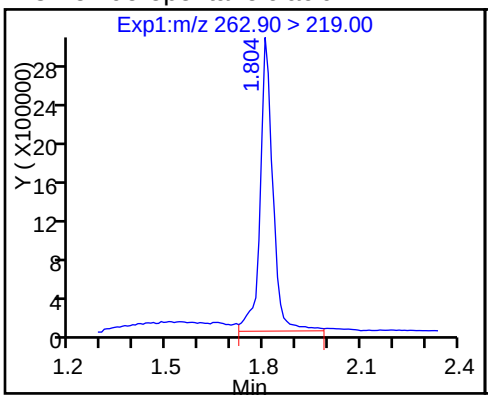
1 Perfluorobutyric acid



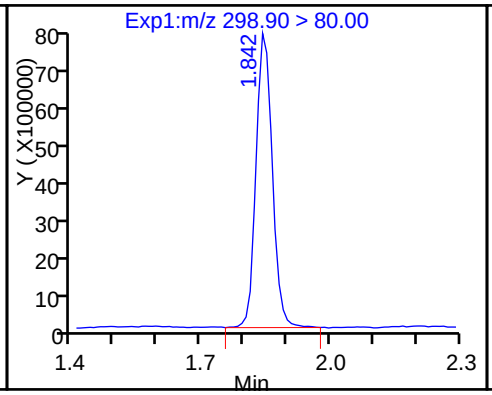
D 4 13C5-PFPeA



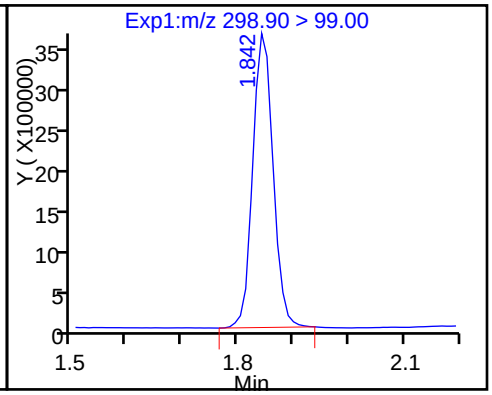
3 Perfluoropentanoic acid



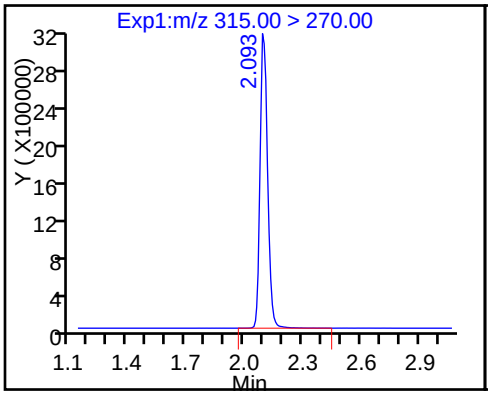
5 Perfluorobutanesulfonic acid



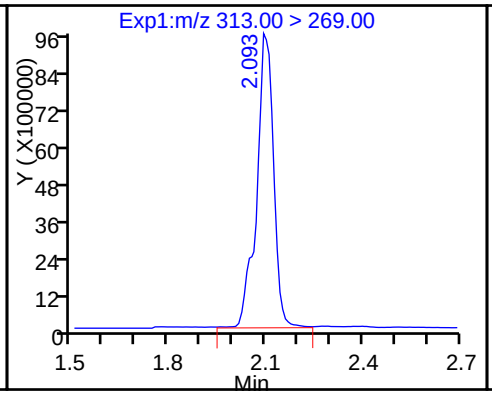
5 Perfluorobutanesulfonic acid



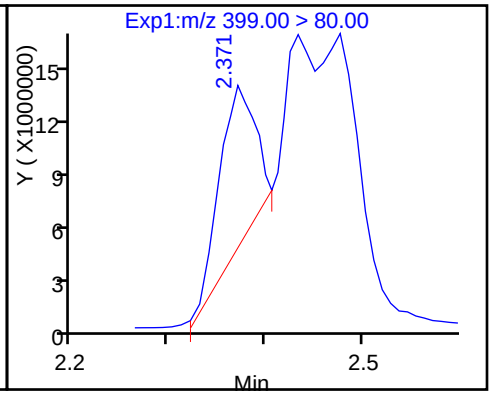
D 6 13C2 PFHxA



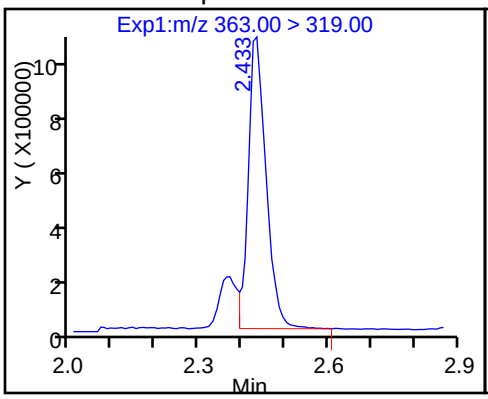
7 Perfluorohexanoic acid



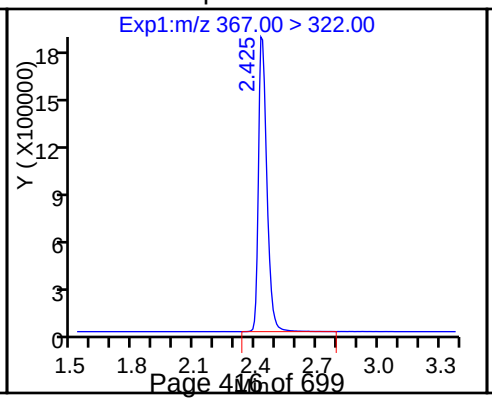
9 Perfluorohexanesulfonic acid



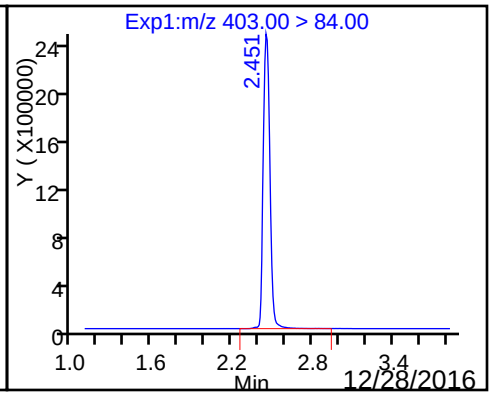
12 Perfluoroheptanoic acid



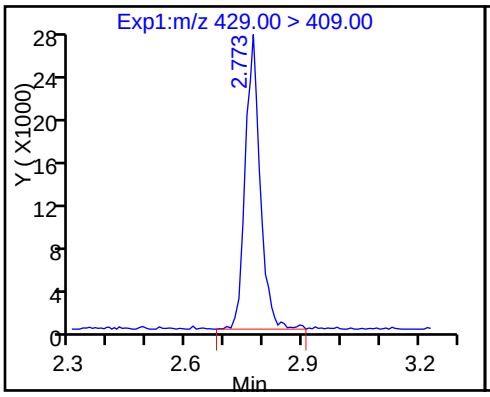
D 11 13C4-PFHpA



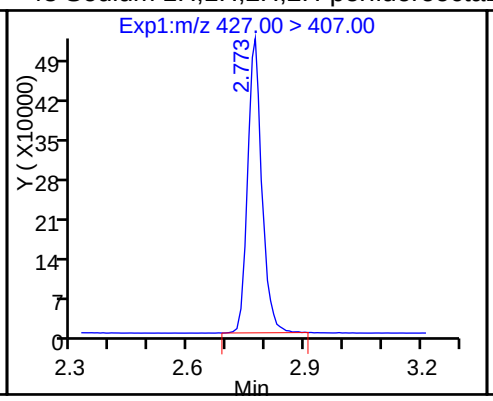
D 10 18O2 PFHxS



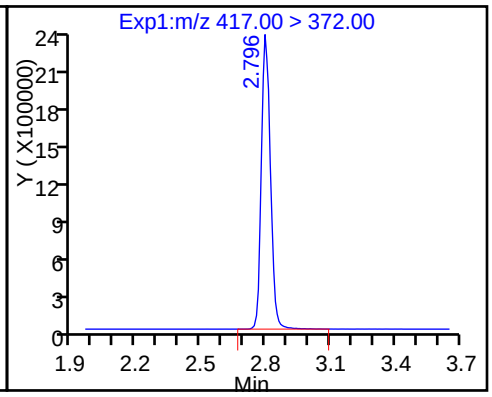
D 47 M2-6:2FTS



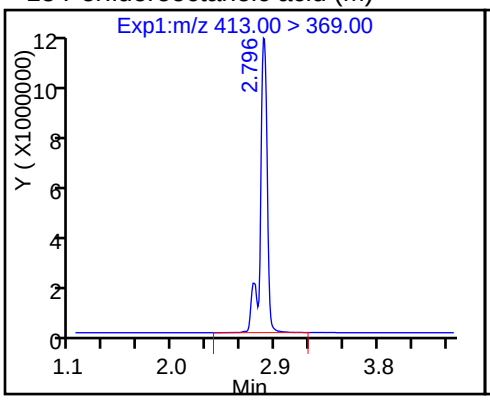
48 Sodium 1H,1H,2H,2H-perfluorooctane



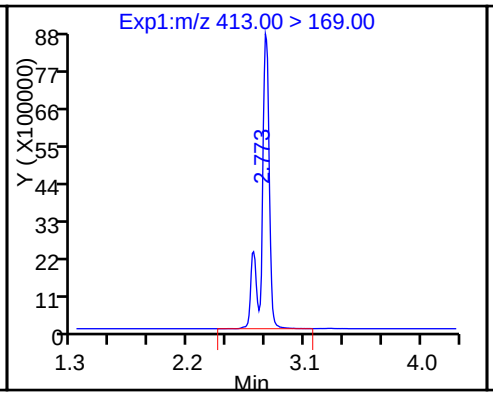
D 14 13C4 PFOA



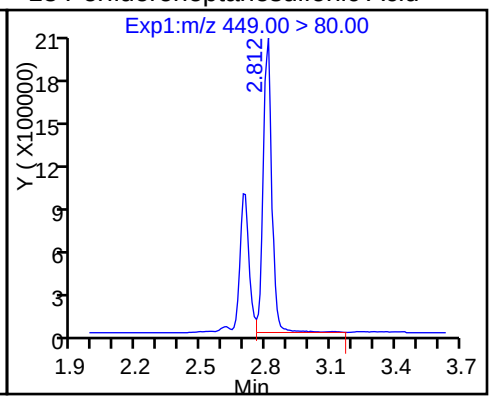
15 Perfluorooctanoic acid (M)



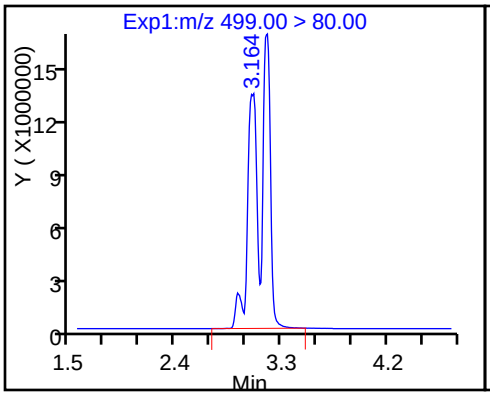
15 Perfluorooctanoic acid



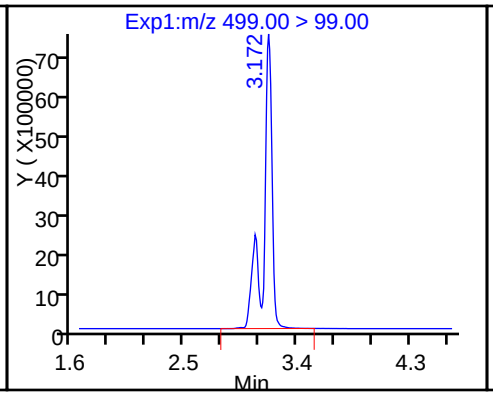
13 Perfluoroheptanesulfonic Acid



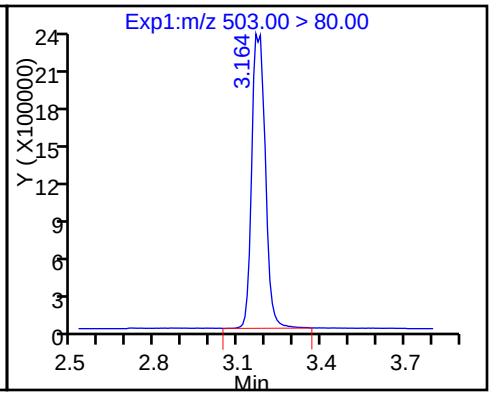
18 Perfluorooctane sulfonic acid



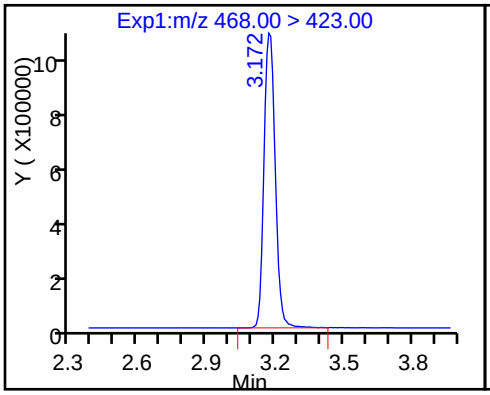
18 Perfluorooctane sulfonic acid



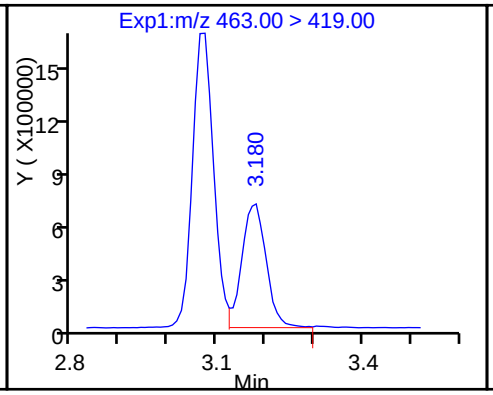
D 17 13C4 PFOS



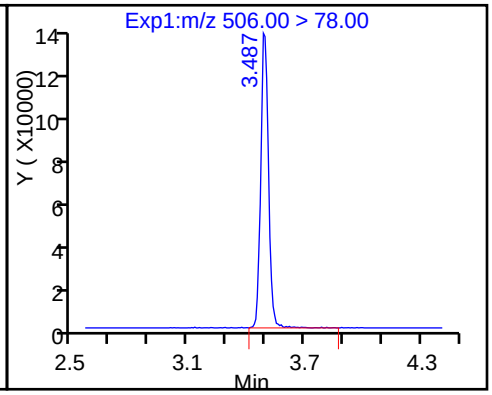
D 19 13C5 PFNA



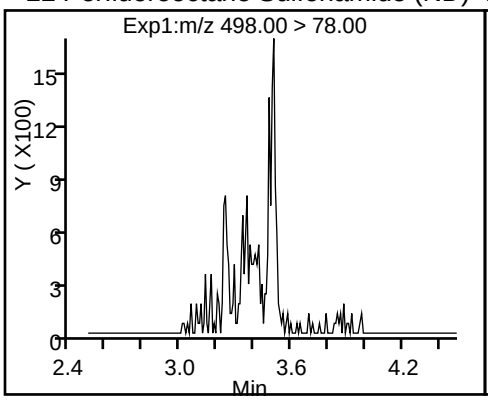
20 Perfluorononanoic acid



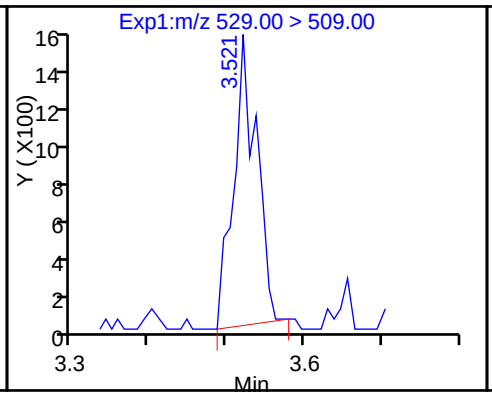
D 21 13C8 FOSA



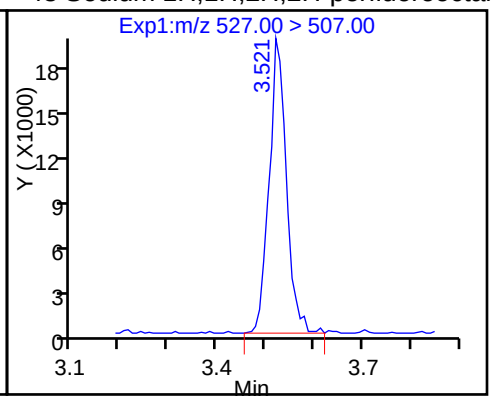
22 Perfluorooctane Sulfonamide (ND)



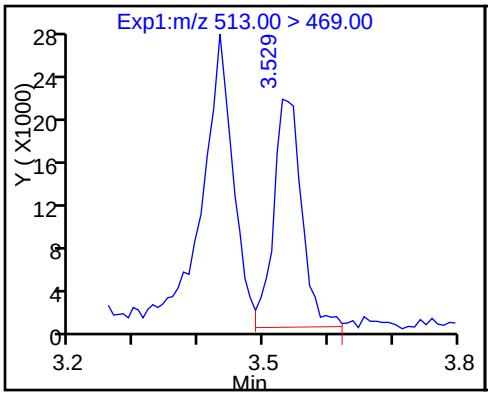
D 42 M2-8:2FTS



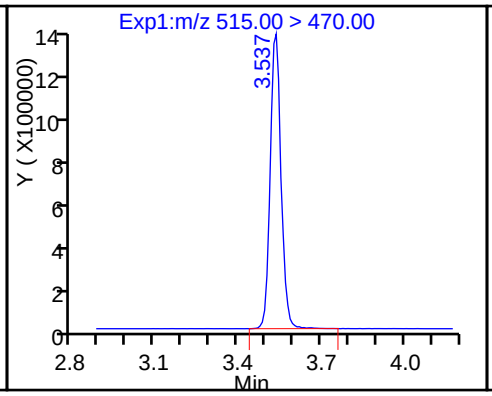
43 Sodium 1H,1H,2H,2H-perfluorooctane



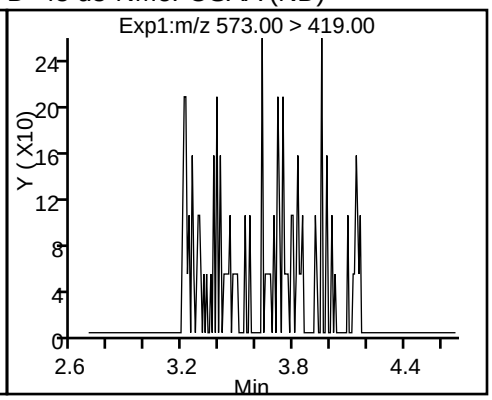
24 Perfluorodecanoic acid



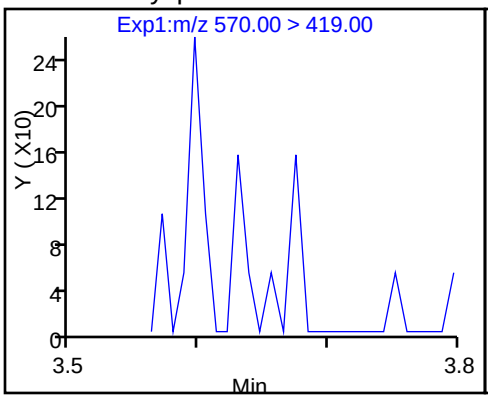
D 23 13C2 PFDA



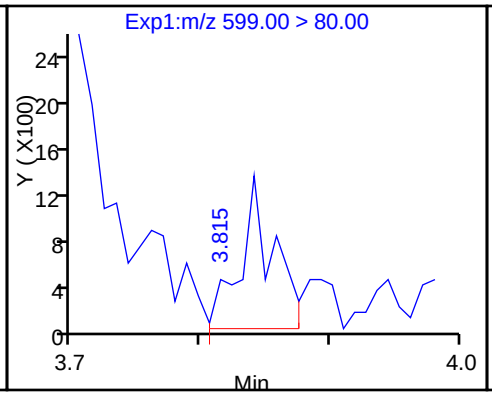
D 45 d3-NMeFOSAA (ND)



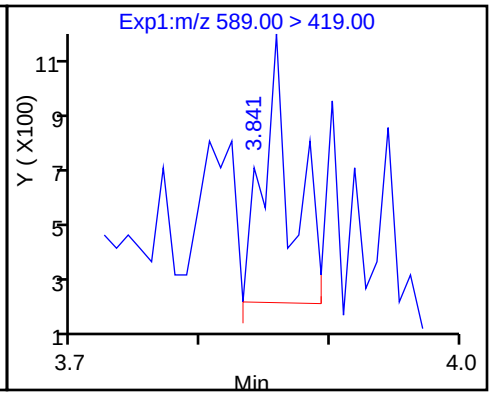
44 N-methyl perfluorooctane sulfonami



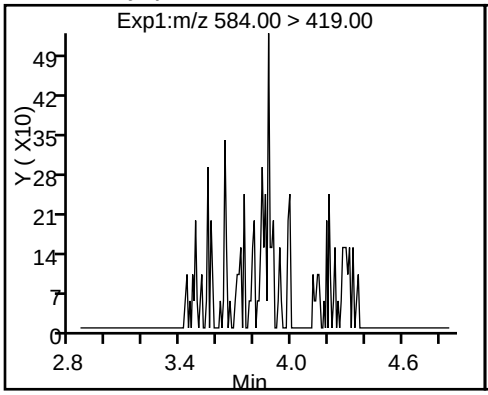
26 Perfluorodecane Sulfonic acid



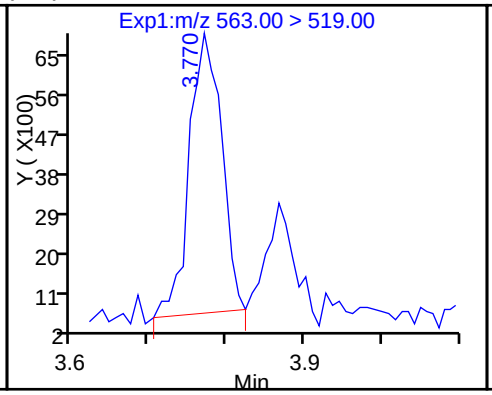
D 46 d5-NEtFOSAA



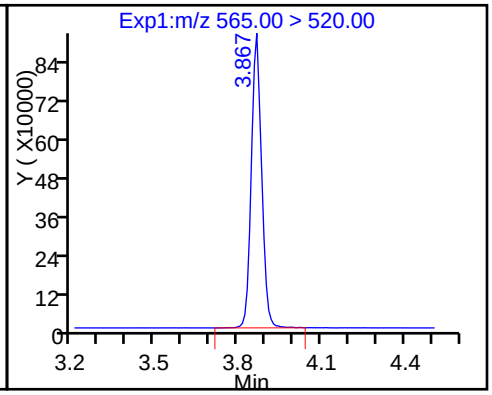
49 N-ethyl perfluorooctane sulfonamid (ND)



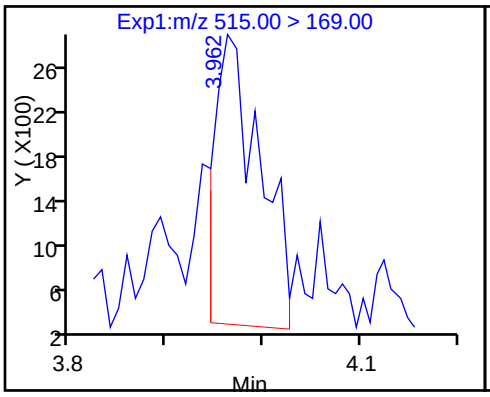
28 Perfluoroundecanoic acid



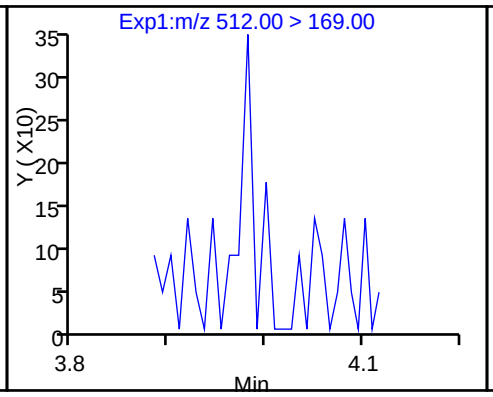
D 27 13C2 PFUnA



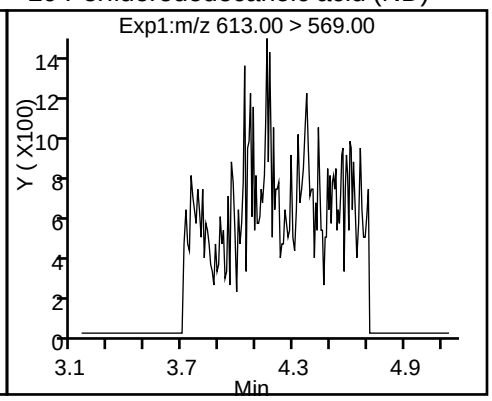
D 52 d-N-MeFOSA-M



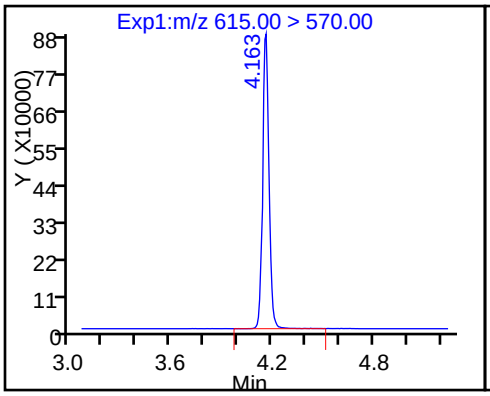
54 MeFOSA



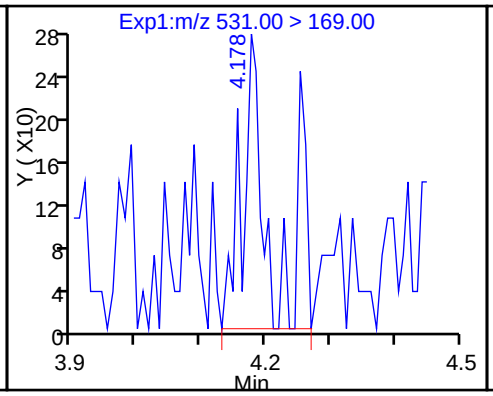
29 Perfluorododecanoic acid (ND)



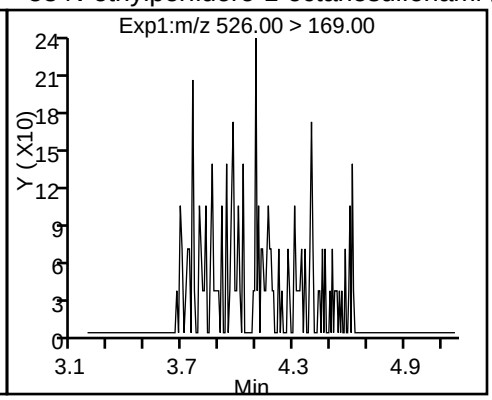
D 30 13C2 PFDoA



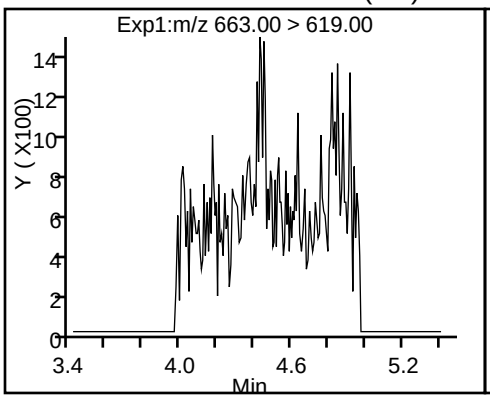
D 51 d-N-EtFOSA-M



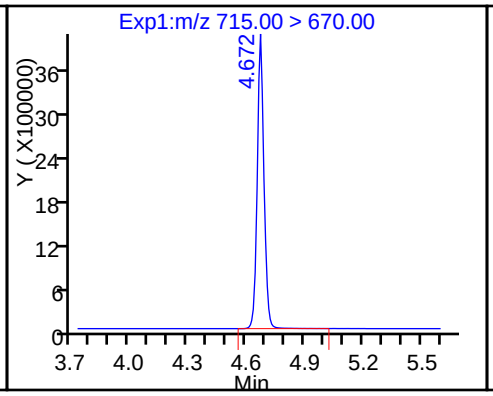
53 N-ethylperfluoro-1-octanesulfonami (ND)



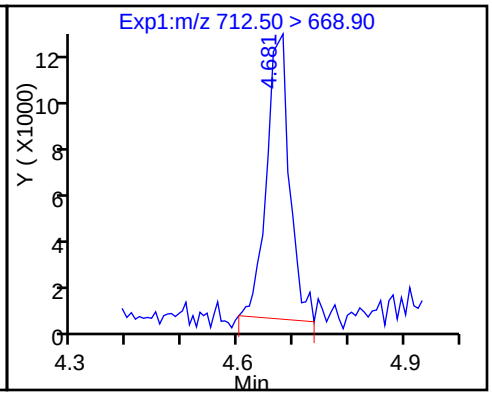
31 Perfluorotridecanoic acid (ND)



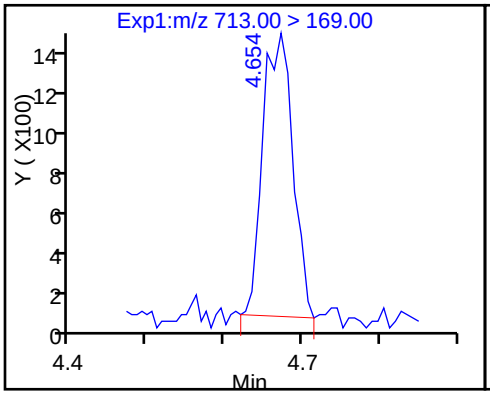
D 32 13C2-PFTeDA



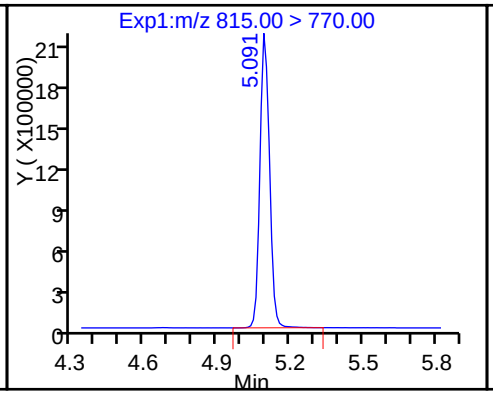
33 Perfluorotetradecanoic acid



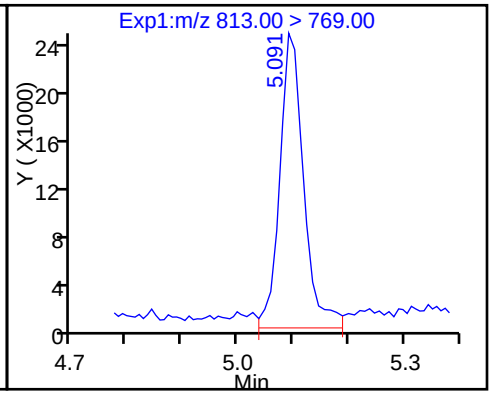
33 Perfluorotetradecanoic acid



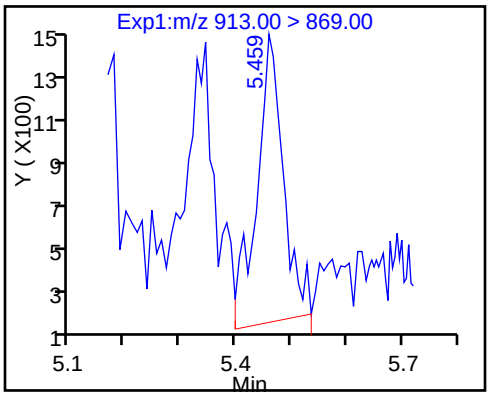
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

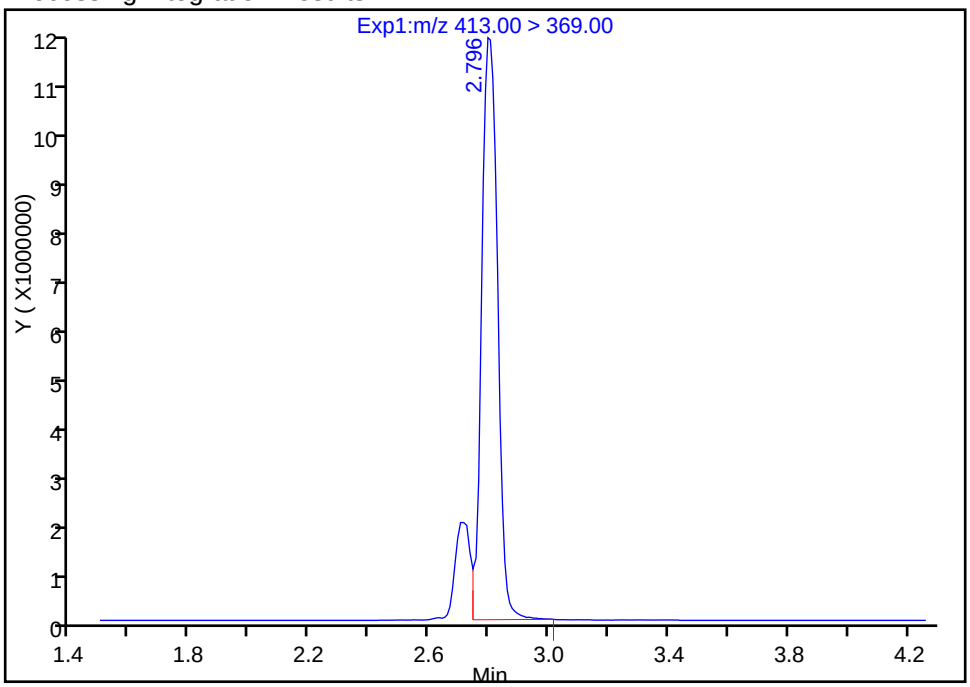
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_041.d				
Injection Date:	09-Dec-2016 16:24:42	Instrument ID:	A8_N		
Lims ID:	320-23830-A-3-A	Lab Sample ID:	320-23830-3		
Client ID:	DPT-16-18-GW-21-25				
Operator ID:	A8-PC\A8	ALS Bottle#:	25	Worklist Smp#:	41
Injection Vol:	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

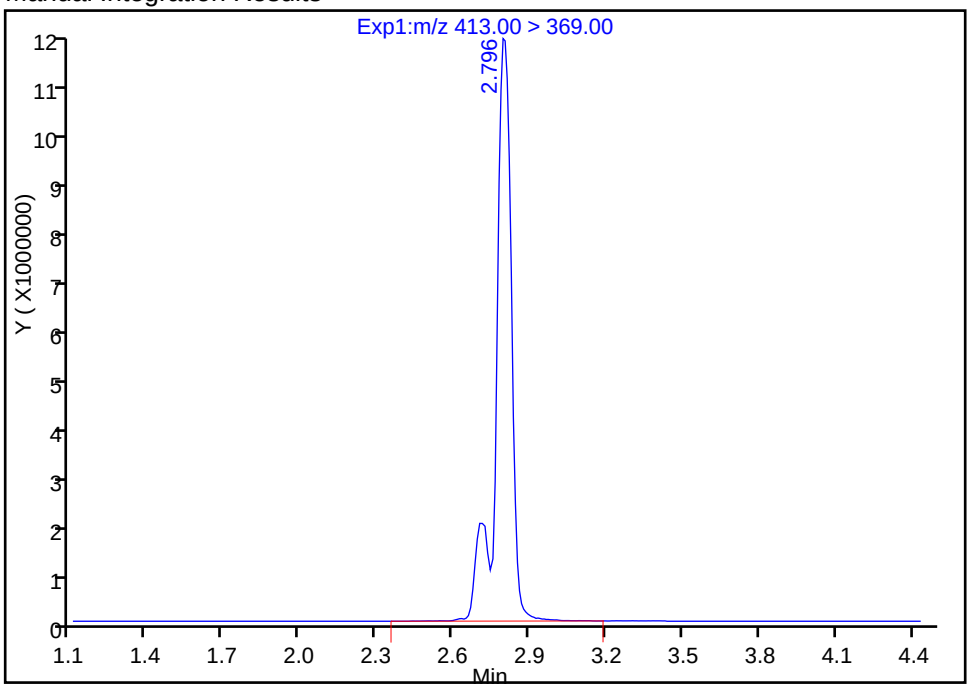
Processing Integration Results

RT: 2.80
Area: 42823540
Amount: 284.2281
Amount Units: ng/ml



Manual Integration Results

RT: 2.80
Area: 49982059
Amount: 331.7406
Amount Units: ng/ml



Reviewer: westendorfc, 11-Dec-2016 11:49:55

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23830-1

SDG No.:

Client Sample ID: DPT-16-18-GW-21-25 DL | Lab Sample ID: 320-23830-3 DL

Matrix: Water | Lab File ID: 12DEC2016C_007.d

Analysis Method: 537 (Modified) | Date Collected: 11/23/2016 11:40

Extraction Method: 3535 | Date Extracted: 11/29/2016 20:20

Sample wt/vol: 241.5(mL) | Date Analyzed: 12/12/2016 19:07

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 141834 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.84	D M J	0.026	0.021	0.0077
1763-23-1	Perfluorooctane Sulfonate (PFOS)	2.0	D J	0.041	0.031	0.013
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*0.11*	*D*	*0.026*	0.021	*0.0095*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	99		25-150
STL00991	13C4 PFOS	101		25-150
STL00994	18O2 PFHxS	108		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_007.d
Lims ID: 320-23830-A-3-A
Client ID: DPT-16-18-GW-21-25
Sample Type: Client
Inject. Date: 12-Dec-2016 19:07:45 ALS Bottle#: 48 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Sample Info: 320-23830-a-3-a 10X
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 14-Dec-2016 08:29:39 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: chandrasenas Date: 14-Dec-2016 08:22:50

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.527	1.534	-0.007		1278895	3.81		7.6	139585	
1 Perfluorobutyric acid										
212.90 > 169.00	1.527	1.534	-0.007	1.000	738707	3.30			1850	
D 4 13C5-PFPeA										
267.90 > 223.00	1.802	1.810	-0.008		1390127	5.25		10.5	92620	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.802	1.810	-0.008	1.000	1093787	3.88			4078	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.840	1.849	-0.009	1.000	2736745	5.10				
298.90 > 99.00	1.840	1.849	-0.009	1.000	1158103		2.36(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.095	2.098	-0.003		1222618	5.15		10.3	124729	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.095	2.098	-0.003	1.000	5893884	25.3			54805	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.448	2.424	0.024	1.000	35682921	96.7				
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.426	2.431	-0.005	1.000	475618	2.46			2991	
D 11 13C4-PFHpA										
367.00 > 322.00	2.421	2.431	-0.010		940761	4.54		9.1	88206	
D 10 18O2 PFHxS										
403.00 > 84.00	2.448	2.446	0.002		1590094	5.09		10.8	138297	
D 47 M2-6:2FTS										
429.00 > 409.00	2.770	2.758	0.012		11975	0.1135		0.0		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.755	2.766	-0.011	1.000	169462	NR				

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	2.793	2.791	0.002	1.000	9396620	40.4			73962	M
413.00 > 169.00	2.691	2.791	-0.100	0.964	6359841		1.48(0.90-1.10)		23529	
D 14 13C4 PFOA										
417.00 > 372.00	2.785	2.791	-0.006		1083913	4.94		9.9	78260	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.793	2.799	-0.006	1.000	625626	2.14				
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.162	3.135	0.027	1.000	25925210	96.1			543182	
499.00 > 99.00	3.162	3.135	0.027	1.000	5129399		5.05(0.90-1.10)		250173	
D 19 13C5 PFNA										
468.00 > 423.00	3.162	3.159	0.003		602823	3.62		7.2	34804	
D 17 13C4 PFOS										
503.00 > 80.00	3.162	3.159	0.003		1188296	4.83		10.1	42126	
20 Perfluorononanoic acid										
463.00 > 419.00	3.162	3.167	-0.005	1.000	393072	3.27			473	
D 21 13C8 FOSA										
506.00 > 78.00	3.494	3.490	0.004		41209	0.1024		0.2	4462	
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.503	3.509	-0.006	0.998	4603	NR				
D 42 M2-8:2FTS										
529.00 > 509.00	3.511	3.509	0.002		383	0.003943		0.0		
24 Perfluorodecanoic acid										
513.00 > 469.00	3.528	3.524	0.004	1.000	8034	0.1166			168	
D 23 13C2 PFDA										
515.00 > 470.00	3.528	3.524	0.004		358606	2.27		4.5	12159	
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.664	3.672	-0.008		1417	0.0195		0.0		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.865	3.844	0.021	1.009	769	NR				
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.830	3.844	-0.014		3183	0.0400		0.0		
D 27 13C2 PFUnA										
565.00 > 520.00	3.847	3.853	-0.006		215474	1.81		3.6	38437	
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.934	3.984	-0.050		405	0.003853		0.0		
D 30 13C2 PFDoA										
615.00 > 570.00	4.144	4.143	0.001		223799	2.00		4.0	9750	
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.165	4.170	-0.005		779	0.007856		0.0		
D 32 13C2-PFTeDA										
715.00 > 670.00	4.647	4.655	-0.008		833187	3.60		7.2	156177	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.071	5.070	0.001	1.000	7845	-0.5778			82.0	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.071	5.070	0.001		520861	4.02		8.0	51109	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.300	5.429	-0.129	1.000	2764	0.0622			22.4	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Review Flags

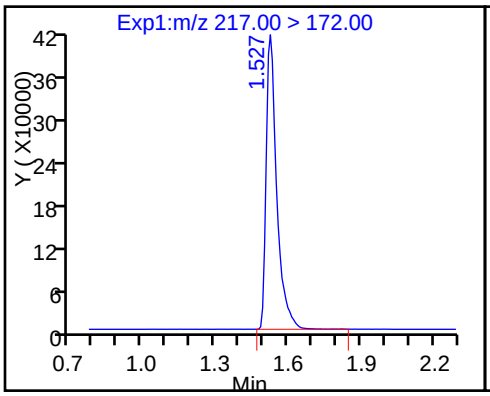
M - Manually Integrated

Report Date: 14-Dec-2016 08:29:45 Chrom Revision: 2.2 05-Dec-2016 12:37:22

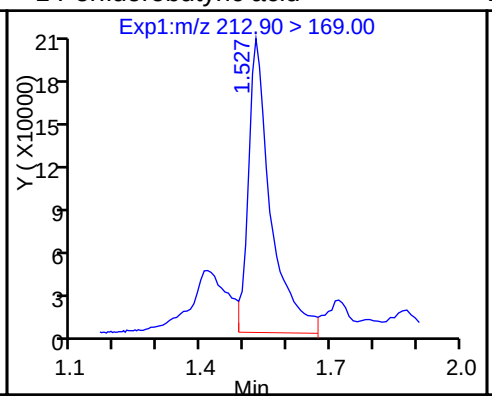
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_007.d				
Injection Date:	12-Dec-2016 19:07:45	Instrument ID:	A8_N		
Lims ID:	320-23830-A-3-A	Lab Sample ID:	320-23830-3		
Client ID:	DPT-16-18-GW-21-25				
Operator ID:	A8-PC\A8	ALS Bottle#:	48	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

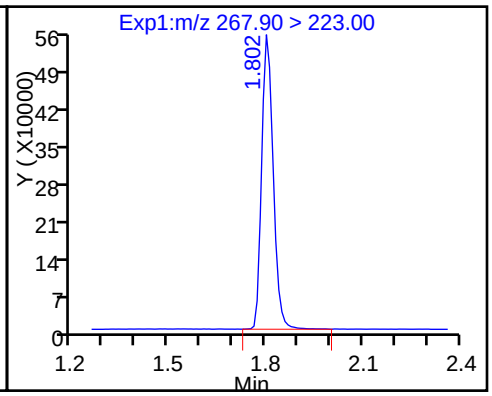
D 2 13C4 PFBA



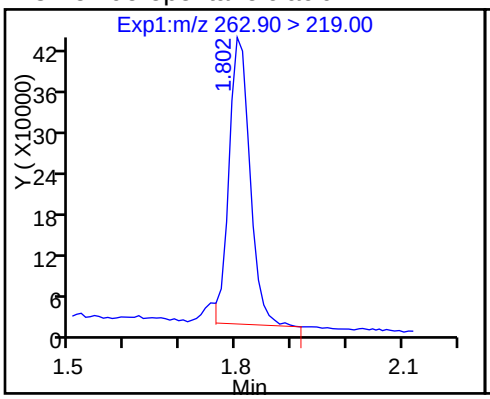
1 Perfluorobutyric acid



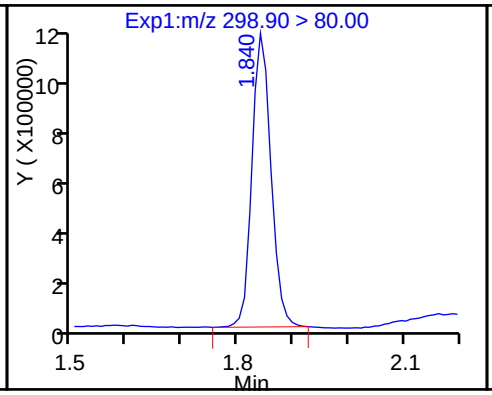
D 4 13C5-PFPeA



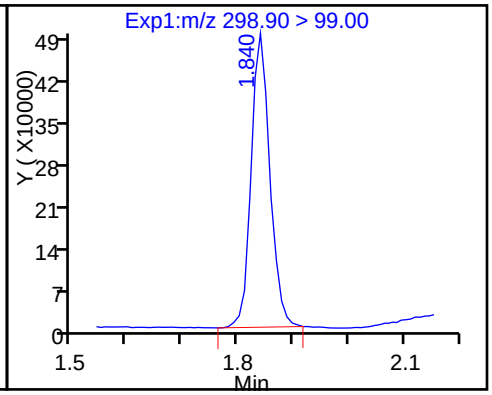
3 Perfluoropentanoic acid



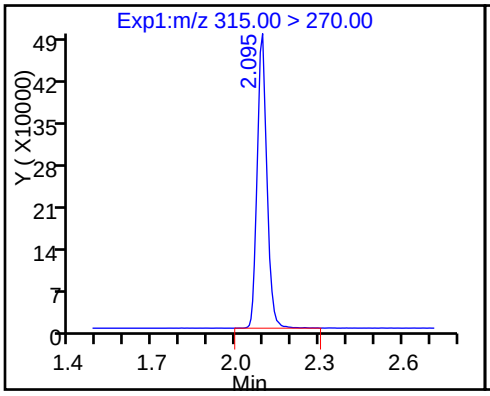
5 Perfluorobutanesulfonic acid



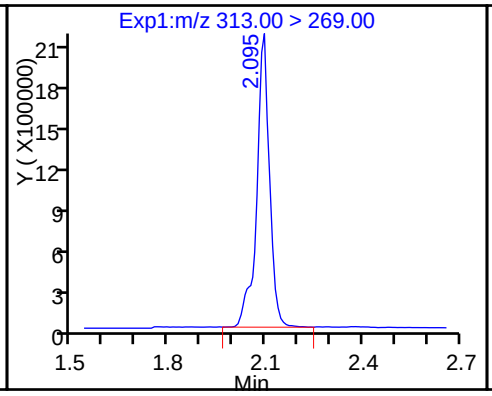
5 Perfluorobutanesulfonic acid



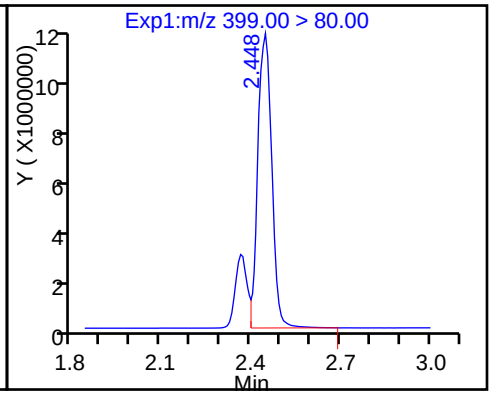
D 6 13C2 PFHxA



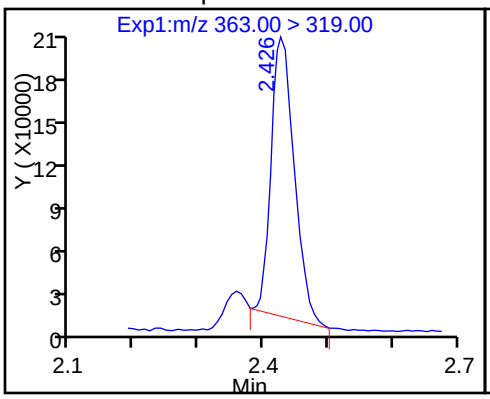
7 Perfluorohexanoic acid



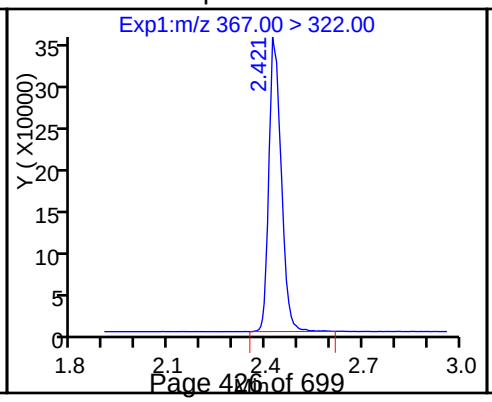
9 Perfluorohexanesulfonic acid



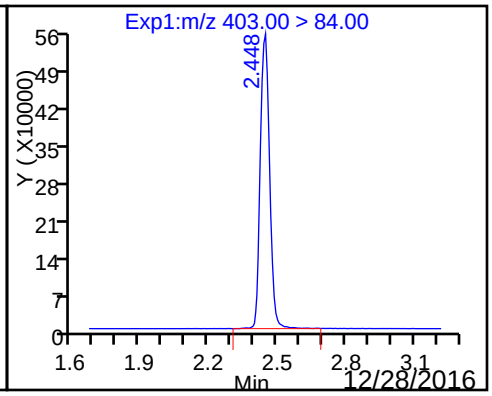
12 Perfluoroheptanoic acid



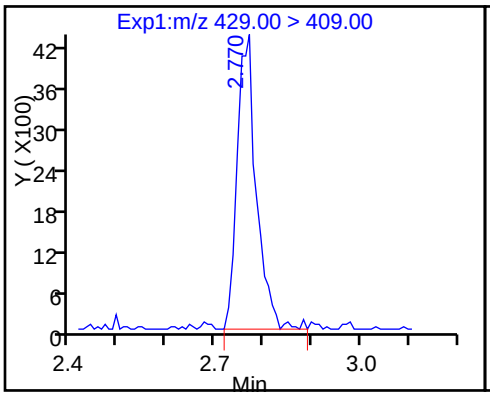
D 11 13C4-PFHpA



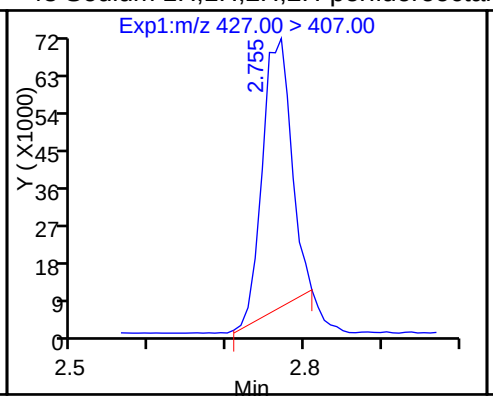
D 10 18O2 PFHxS



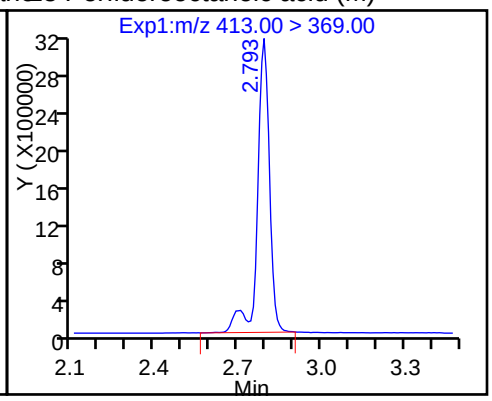
D 47 M2-6:2FTS



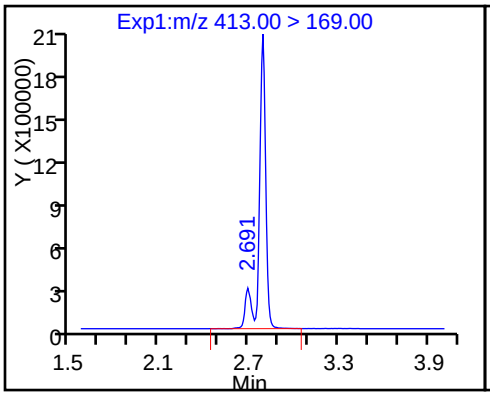
48 Sodium 1H,1H,2H,2H-perfluorooctane



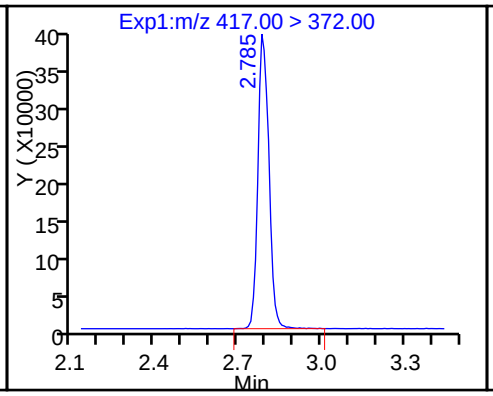
15 Perfluorooctanoic acid (M)



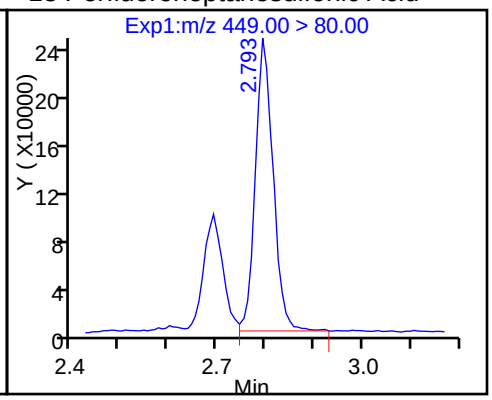
15 Perfluorooctanoic acid



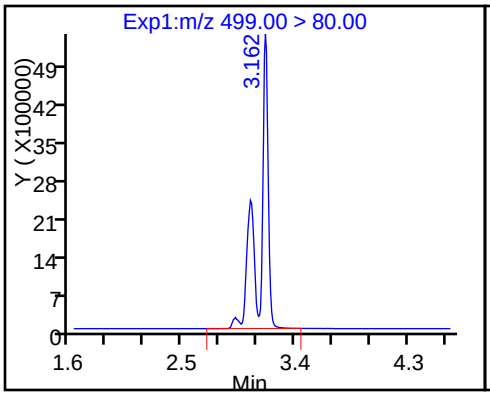
D 14 13C4 PFOA



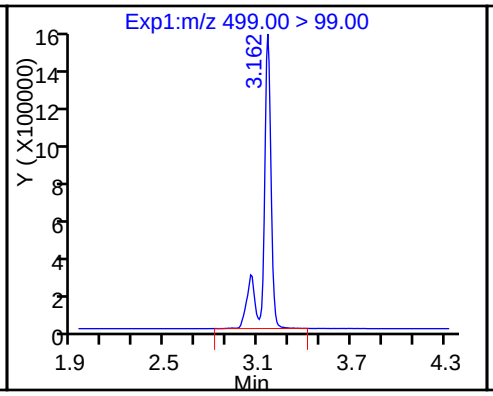
13 Perfluoroheptanesulfonic Acid



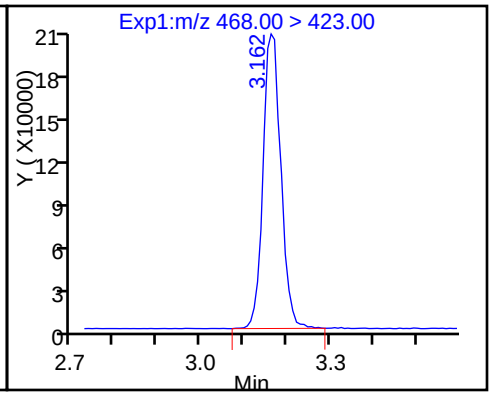
18 Perfluorooctane sulfonic acid



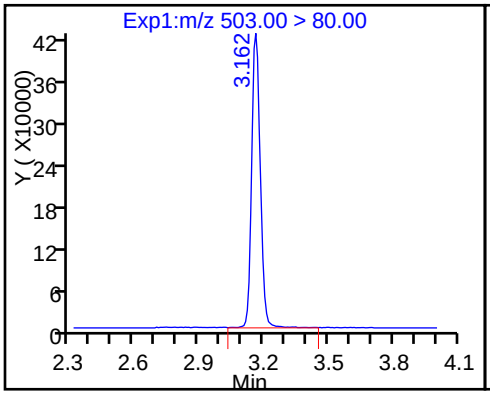
18 Perfluorooctane sulfonic acid



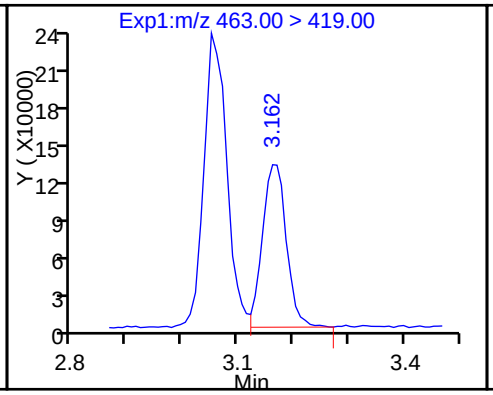
D 19 13C5 PFNA



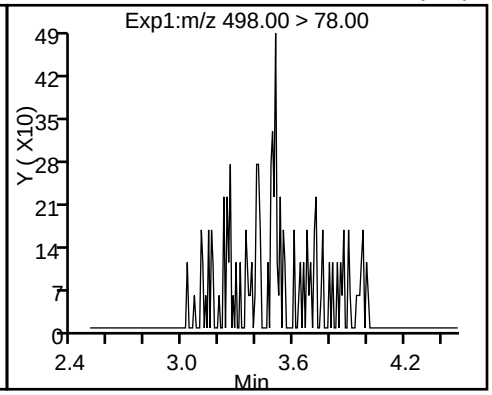
D 17 13C4 PFOS



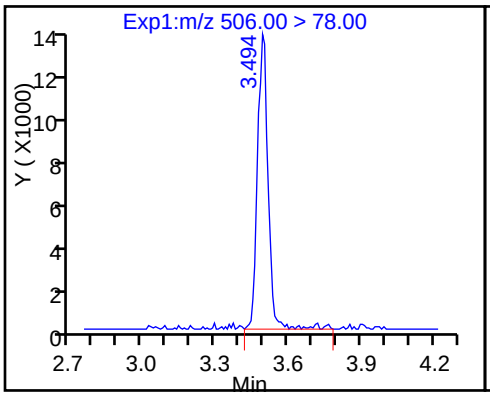
20 Perfluorononanoic acid



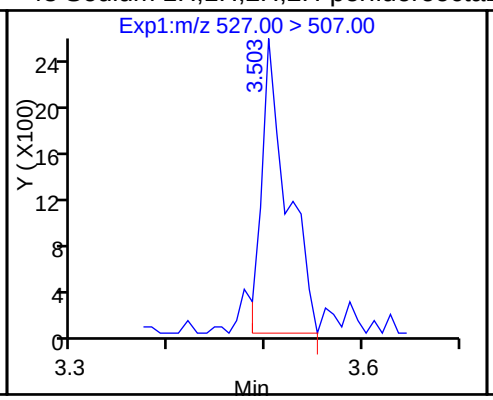
22 Perfluorooctane Sulfonamide (ND)



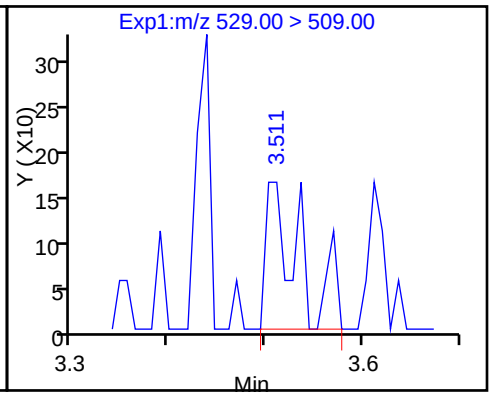
D 21 13C8 FOSA



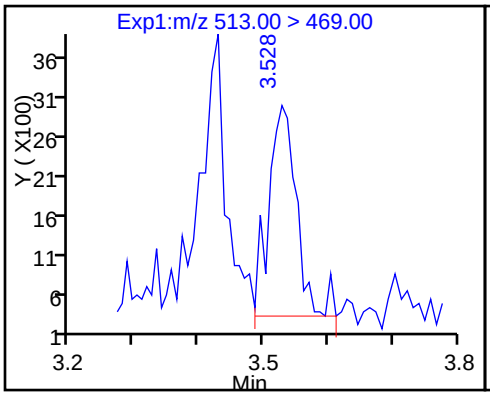
43 Sodium 1H,1H,2H,2H-perfluorooctane



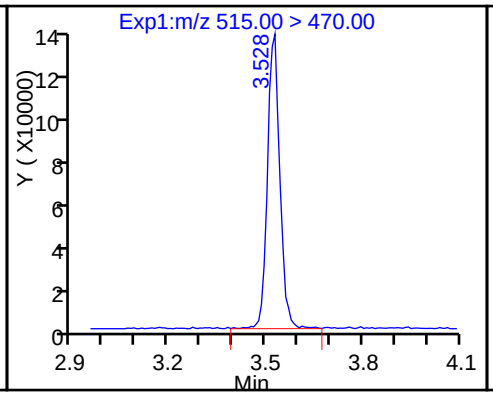
D 42 M2-8:2FTS



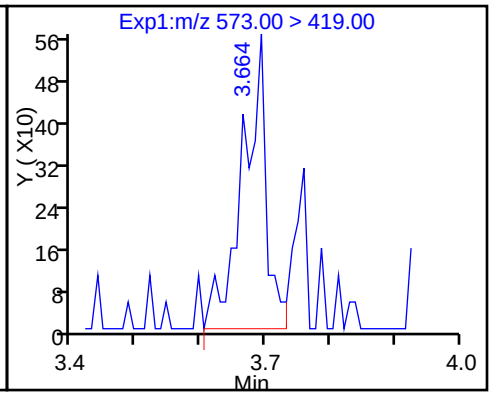
24 Perfluorodecanoic acid



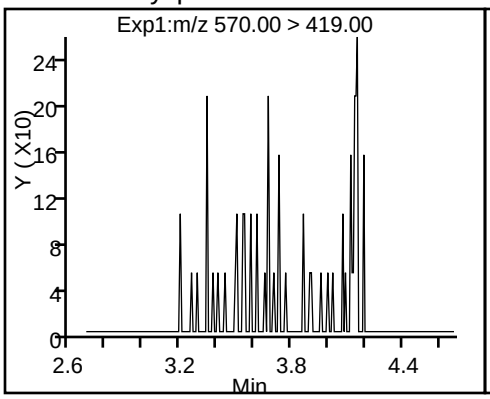
D 23 13C2 PFDA



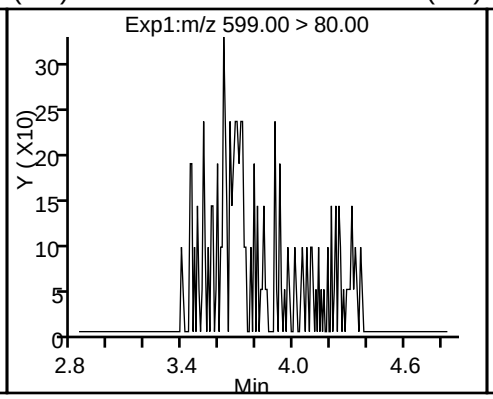
D 45 d3-NMeFOSAA



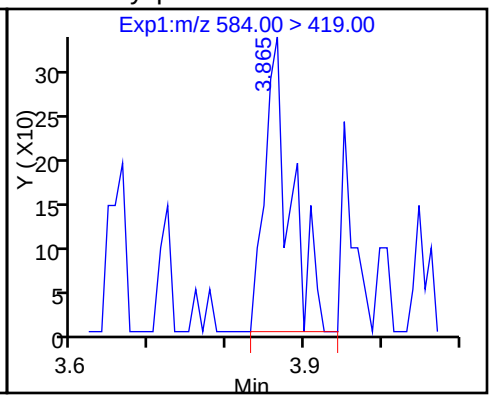
44 N-methyl perfluorooctane sulfonami (ND)



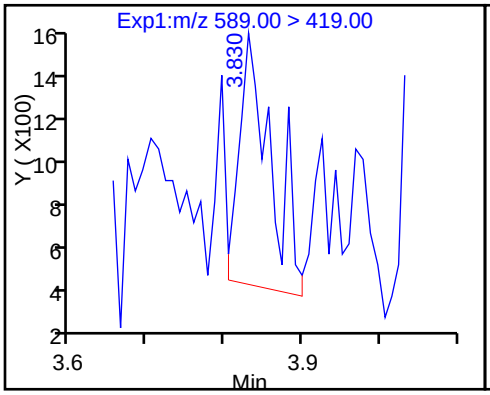
26 Perfluorodecane Sulfonic acid (ND)



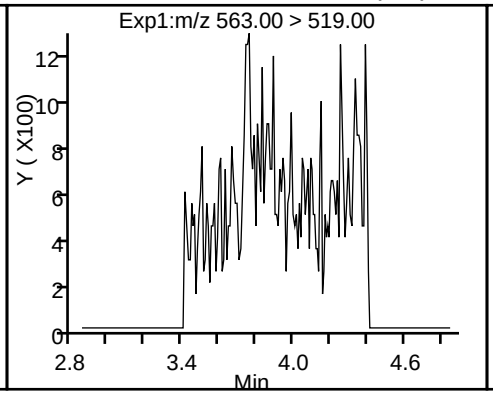
49 N-ethyl perfluorooctane sulfonamid



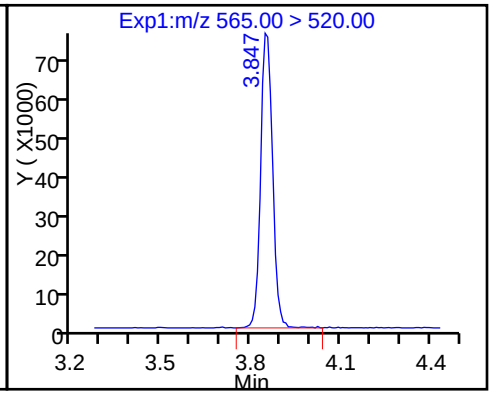
D 46 d5-NEtFOSAA



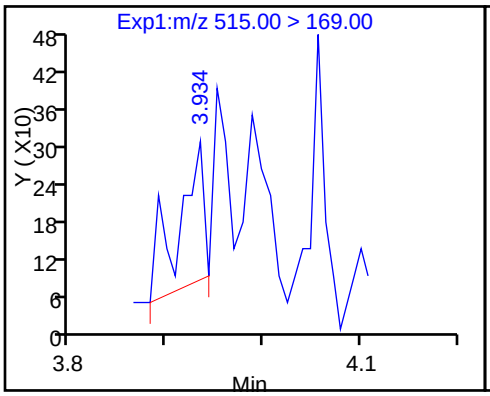
28 Perfluoroundecanoic acid (ND)



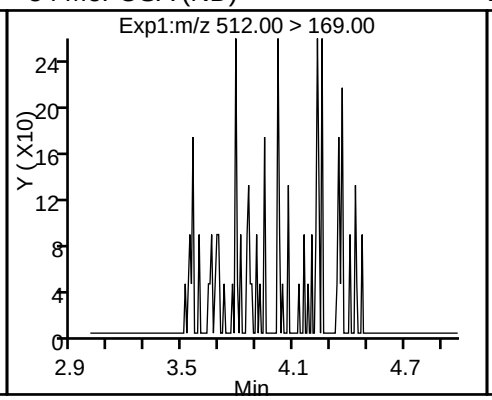
D 27 13C2 PFUnA



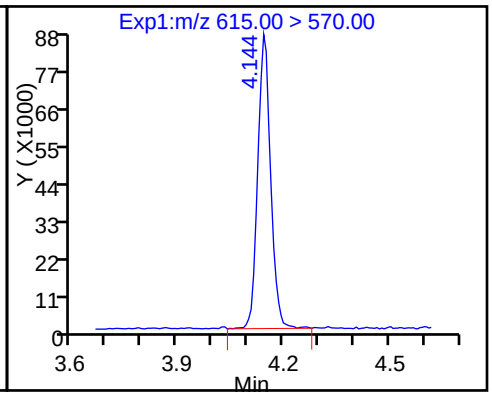
D 52 d-N-MeFOSA-M



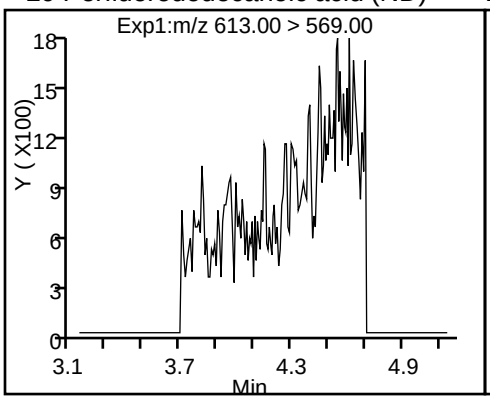
54 MeFOSA (ND)



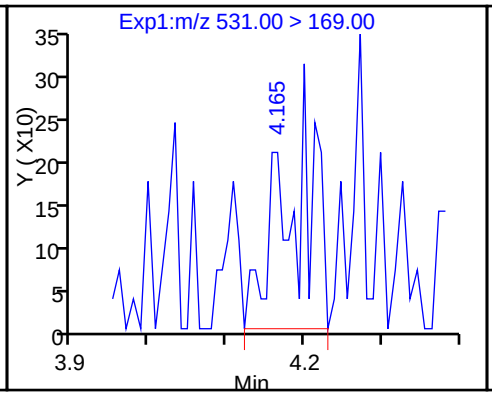
D 30 13C2 PFDoA



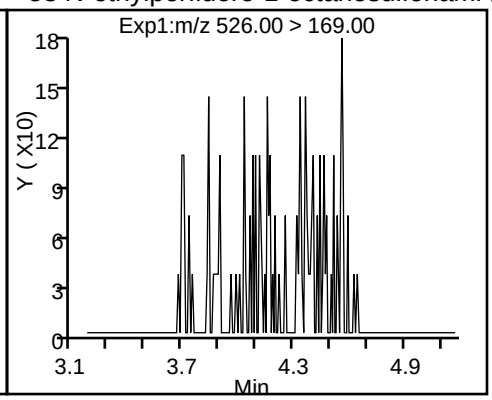
29 Perfluorododecanoic acid (ND)



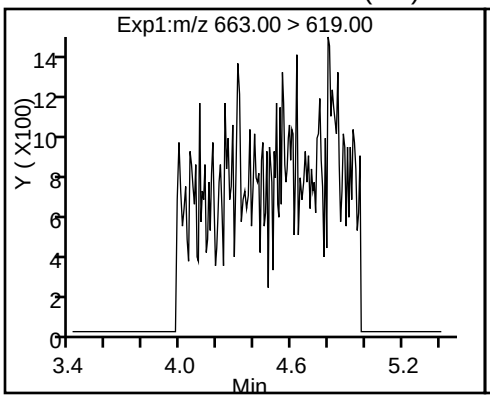
D 51 d-N-EtFOSA-M



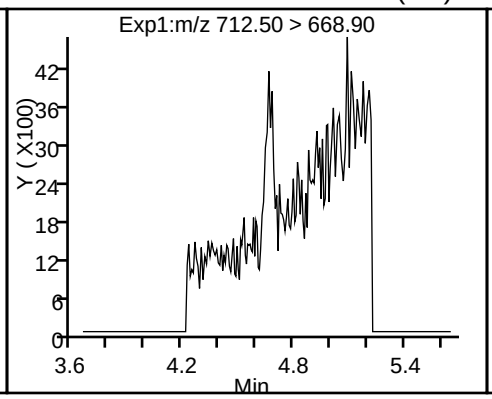
53 N-ethylperfluoro-1-octanesulfonami (ND)



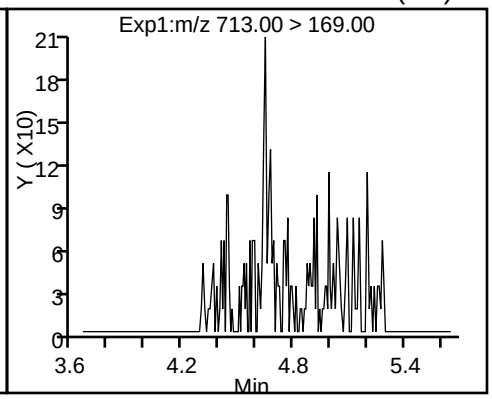
31 Perfluorotridecanoic acid (ND)



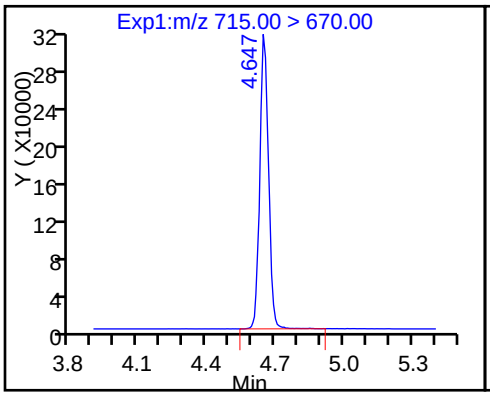
33 Perfluorotetradecanoic acid (ND)



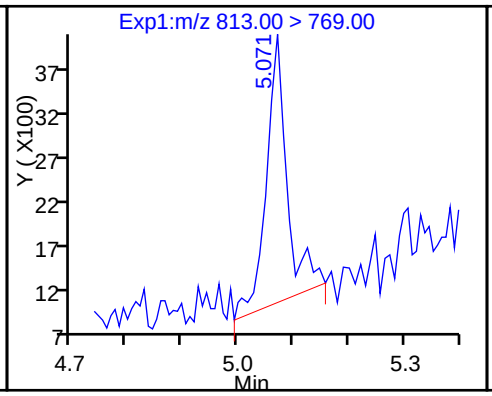
33 Perfluorotetradecanoic acid (ND)



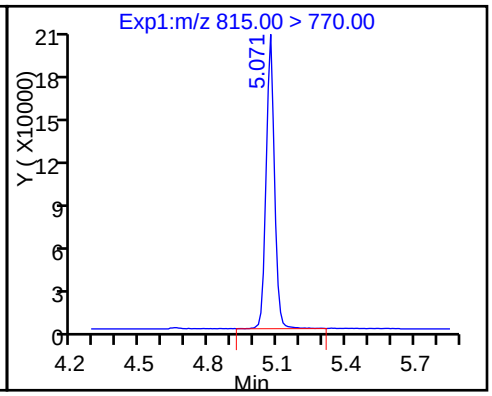
D 32 13C2-PFTeDA



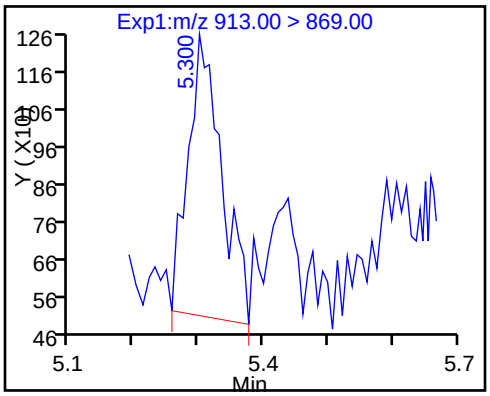
35 Perfluorohexadecanoic acid



D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

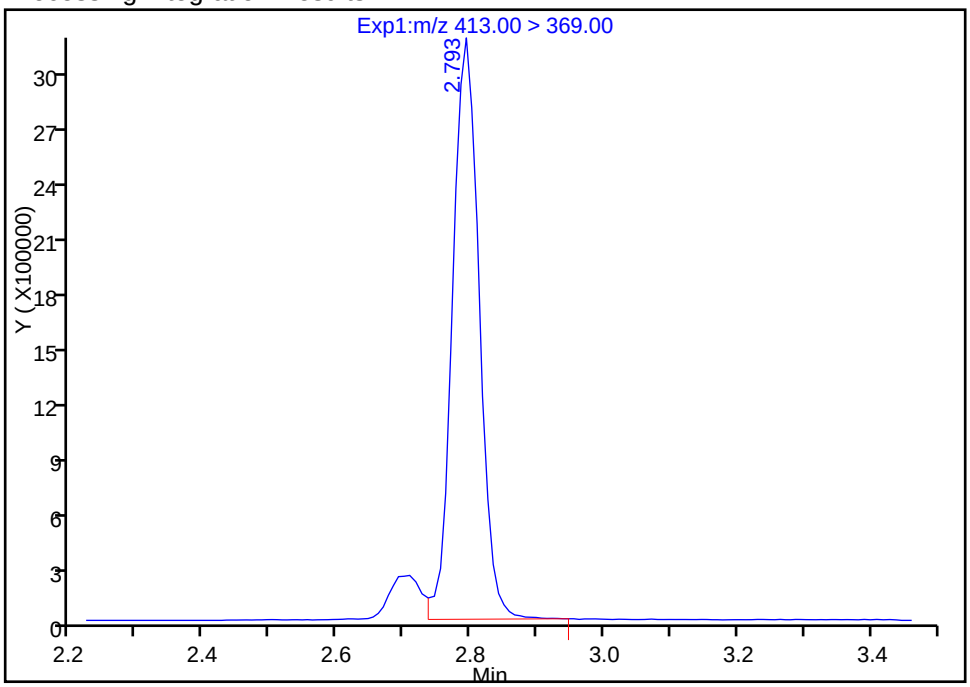
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_007.d				
Injection Date:	12-Dec-2016 19:07:45	Instrument ID:	A8_N		
Lims ID:	320-23830-A-3-A	Lab Sample ID:	320-23830-3		
Client ID:	DPT-16-18-GW-21-25				
Operator ID:	A8-PC\A8	ALS Bottle#:	48	Worklist Smp#:	7
Injection Vol:	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

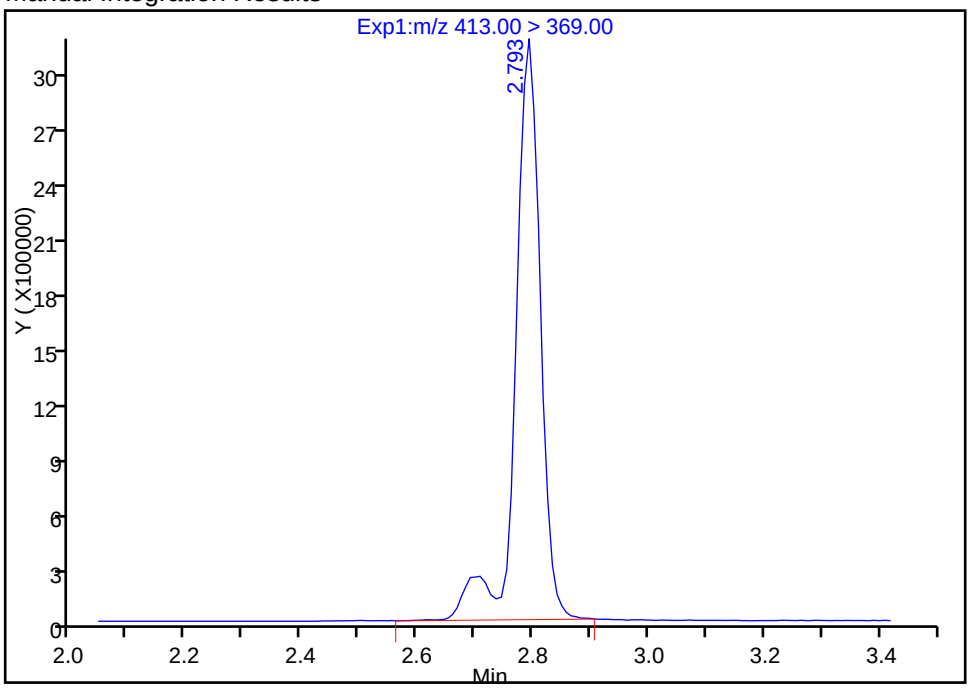
Processing Integration Results

RT: 2.79
Area: 8656447
Amount: 37.252452
Amount Units: ng/ml



Manual Integration Results

RT: 2.79
Area: 9396620
Amount: 40.437738
Amount Units: ng/ml



Reviewer: chandrasenas, 14-Dec-2016 08:22:50

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23830-1

SDG No.:

Client Sample ID: DPT-16-18-GW-31-35 | Lab Sample ID: 320-23830-4

Matrix: Water | Lab File ID: 09DEC2016A_044.d

Analysis Method: 537 (Modified) | Date Collected: 11/23/2016 12:20

Extraction Method: 3535 | Date Extracted: 11/29/2016 20:20

Sample wt/vol: 233.6(mL) | Date Analyzed: 12/09/2016 16:47

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 141453 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.24	M	0.0027	0.0021	0.00080
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.37		0.0043	0.0032	0.0014
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.057		0.0027	0.0021	0.00098

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	80		25-150
STL00991	13C4 PFOS	100		25-150
STL00994	18O2 PFHxS	68		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_044.d				
Lims ID:	320-23830-A-4-A				
Client ID:	DPT-16-18-GW-31-35				
Sample Type:	Client				
Inject. Date:	09-Dec-2016 16:47:15	ALS Bottle#:	28	Worklist Smp#:	44
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-23830-a-4-a				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	A8-PC\A8	Instrument ID:	A8_N		

Method:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\A8_N.m		
Limit Group:	LC PFC_DOD ICAL		
Last Update:	11-Dec-2016 11:57:49	Calib Date:	03-Dec-2016 15:33:40
Integrator:	Picker		
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d		

Column 1 :			Det: EXP1
Process Host:	XAWRK012		

First Level Reviewer: westendorfc		Date:	11-Dec-2016 11:52:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.852	1.852	0.0	1.000	9063699	26.7				
298.90 > 99.00	1.842	1.852	-0.010	0.995	3788594		2.39(0.00-0.00)			
D 10 18O2 PFHxS										
403.00 > 84.00	2.451	2.460	-0.009		10054394	32.2		68.1	414374	
D 14 13C4 PFOA										
417.00 > 372.00	2.797	2.805	-0.008		8722455	39.8		79.6	378659	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.805	2.805	0.0	1.000	21183304	113.3			1027895	M
413.00 > 169.00	2.797	2.805	-0.008	0.997	13754689		1.54(0.90-1.10)		406690	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.055	3.150	-0.095	1.000	46579846	173.7			359932	
499.00 > 99.00	3.165	3.150	0.015	1.036	10942220		4.26(0.90-1.10)		429858	
D 17 13C4 PFOS										
503.00 > 80.00	3.165	3.166	-0.001		11809325	48.0		100	270693	

QC Flag Legend

Review Flags

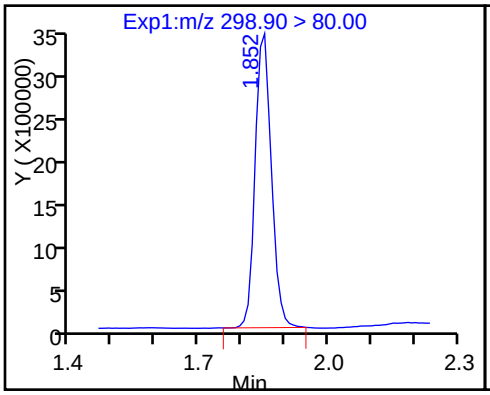
M - Manually Integrated

Report Date: 11-Dec-2016 11:58:05 Chrom Revision: 2.2 05-Dec-2016 12:37:22

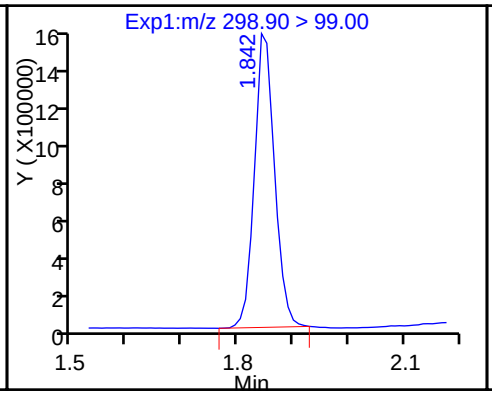
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_044.d				
Injection Date:	09-Dec-2016 16:47:15	Instrument ID:	A8_N		
Lims ID:	320-23830-A-4-A	Lab Sample ID:	320-23830-4		
Client ID:	DPT-16-18-GW-31-35				
Operator ID:	A8-PC\A8	ALS Bottle#:	28	Worklist Smp#:	44
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

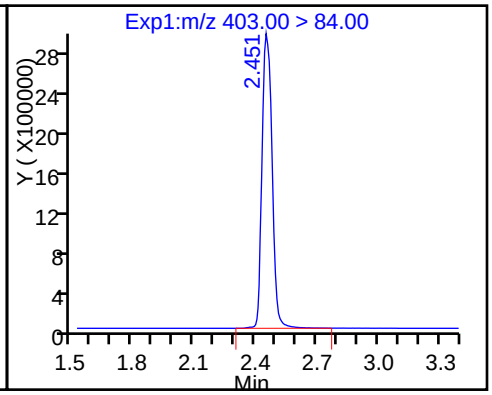
5 Perfluorobutanesulfonic acid



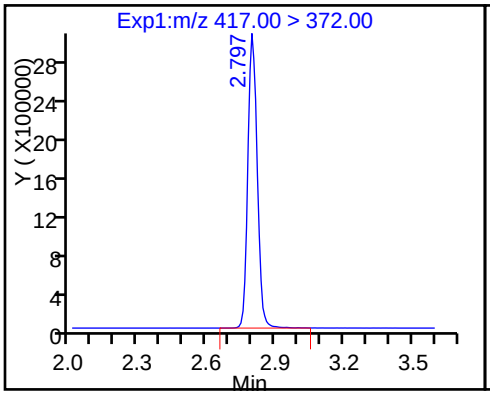
5 Perfluorobutanesulfonic acid



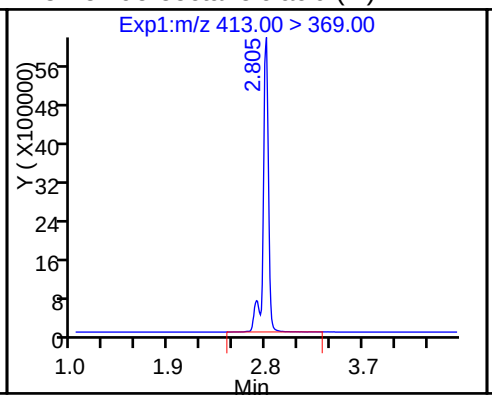
D 10 18O2 PFHxS



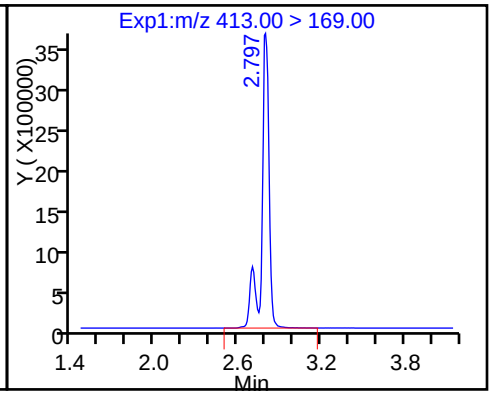
D 14 13C4 PFOA



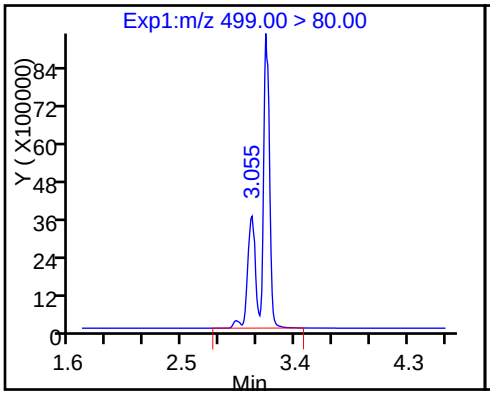
15 Perfluorooctanoic acid (M)



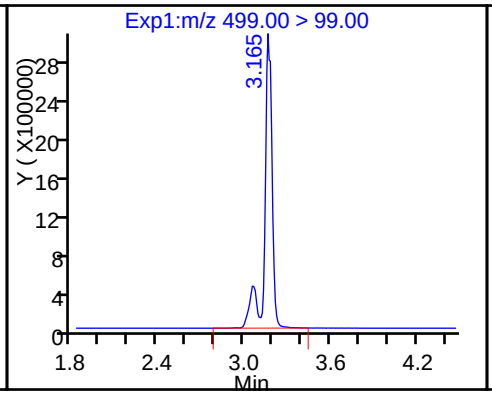
15 Perfluorooctanoic acid



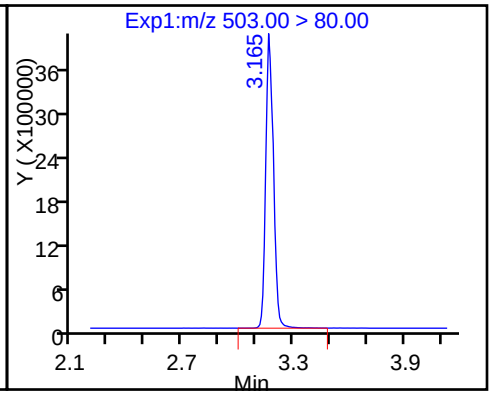
18 Perfluorooctane sulfonic acid



18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

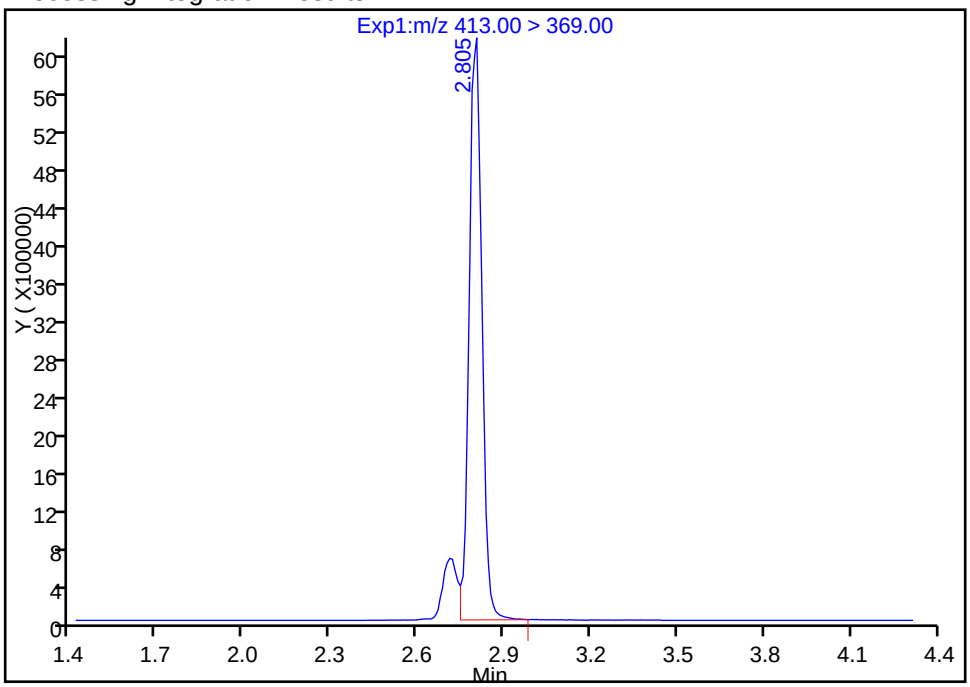
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_044.d				
Injection Date:	09-Dec-2016 16:47:15	Instrument ID:	A8_N		
Lims ID:	320-23830-A-4-A	Lab Sample ID:	320-23830-4		
Client ID:	DPT-16-18-GW-31-35				
Operator ID:	A8-PC\A8	ALS Bottle#:	28	Worklist Smp#:	44
Injection Vol:	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

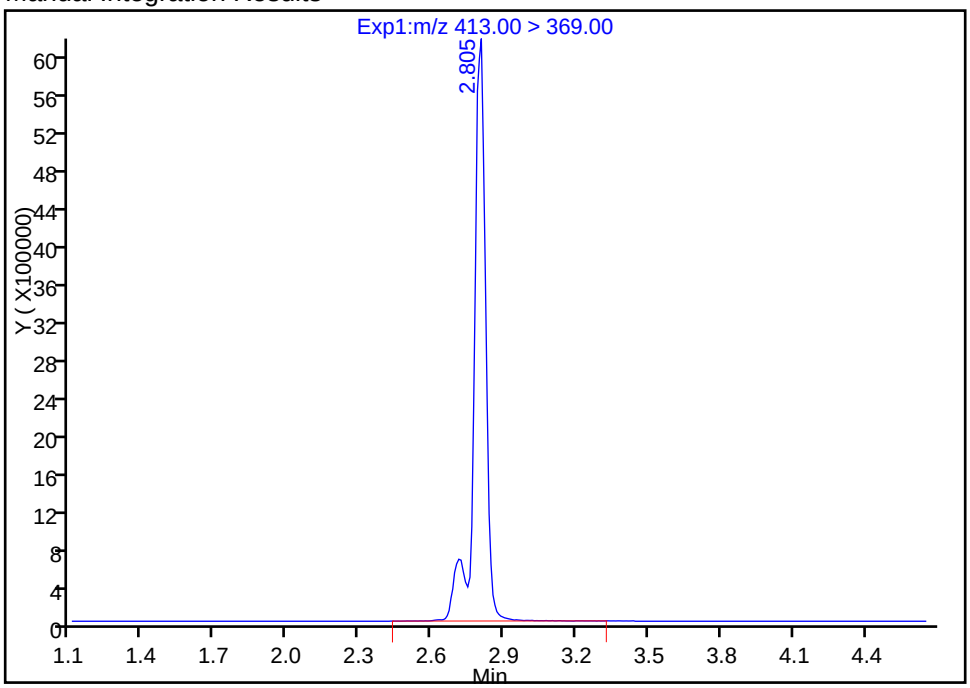
Processing Integration Results

RT: 2.81
Area: 18816213
Amount: 100.6244
Amount Units: ng/ml



Manual Integration Results

RT: 2.81
Area: 21183304
Amount: 113.2830
Amount Units: ng/ml



Reviewer: westendorfc, 11-Dec-2016 11:52:01

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23830-1

SDG No.:

Client Sample ID: DPT-16-18-GW-31-35-DUP | Lab Sample ID: 320-23830-5

Matrix: Water | Lab File ID: 09DEC2016A_045.d

Analysis Method: 537 (Modified) | Date Collected: 11/23/2016 12:20

Extraction Method: 3535 | Date Extracted: 11/29/2016 20:20

Sample wt/vol: 236.6(mL) | Date Analyzed: 12/09/2016 16:54

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 141453 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.25	M	0.0026	0.0021	0.00079
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.38		0.0042	0.0032	0.0013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.060		0.0026	0.0021	0.00097

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	84		25-150
STL00991	13C4 PFOS	101		25-150
STL00994	18O2 PFHxS	67		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_045.d				
Lims ID:	320-23830-A-5-A				
Client ID:	DPT-16-18-GW-31-35-DUP				
Sample Type:	Client				
Inject. Date:	09-Dec-2016 16:54:45	ALS Bottle#:	29	Worklist Smp#:	45
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-23830-a-5-a				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	A8-PC\A8	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\A8_N.m				
Limit Group:	LC PFC_DOD ICAL				
Last Update:	11-Dec-2016 11:57:49	Calib Date:	03-Dec-2016 15:33:40		
Integrator:	Picker				
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK012				
First Level Reviewer: westendorfc		Date:	11-Dec-2016 11:52:17		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.852	1.852	0.0	1.000	9465964	28.2				
298.90 > 99.00	1.842	1.852	-0.010	0.995	3974590		2.38(0.00-0.00)			
D 10 18O2 PFHxS										
403.00 > 84.00	2.451	2.460	-0.009		9963260	31.9		67.4	370922	
D 14 13C4 PFOA										
417.00 > 372.00	2.796	2.805	-0.009		9158204	41.8		83.5	524096	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.796	2.805	-0.009	1.000	22942217	116.9			395452	M
413.00 > 169.00	2.796	2.805	-0.009	1.000	15417259		1.49(0.90-1.10)		432737	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.045	3.150	-0.105	1.000	48435546	179.6			230158	
499.00 > 99.00	3.172	3.150	0.022	1.042	11364399		4.26(0.90-1.10)		353753	
D 17 13C4 PFOS										
503.00 > 80.00	3.164	3.166	-0.002		11878438	48.3		101	435032	

QC Flag Legend

Review Flags

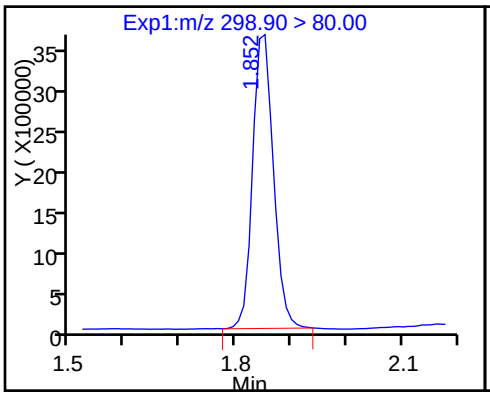
M - Manually Integrated

Report Date: 11-Dec-2016 11:58:06 Chrom Revision: 2.2 05-Dec-2016 12:37:22

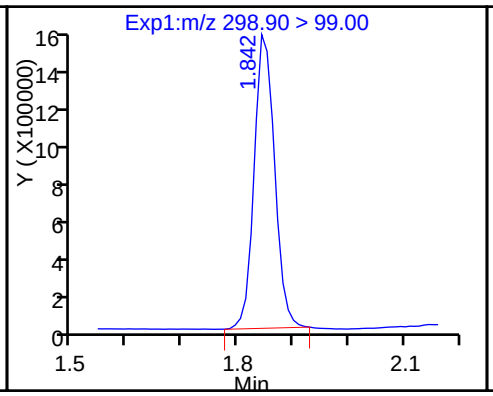
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_045.d				
Injection Date:	09-Dec-2016 16:54:45	Instrument ID:	A8_N		
Lims ID:	320-23830-A-5-A	Lab Sample ID:	320-23830-5		
Client ID:	DPT-16-18-GW-31-35-DUP				
Operator ID:	A8-PC\A8	ALS Bottle#:	29	Worklist Smp#:	45
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

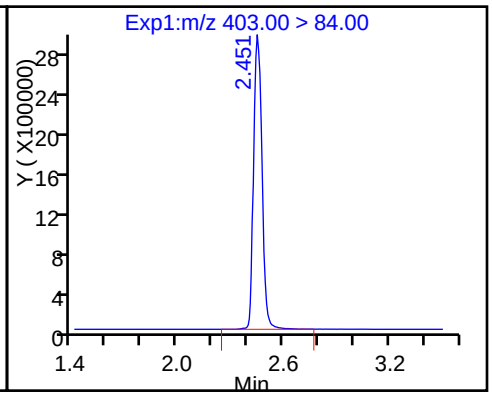
5 Perfluorobutanesulfonic acid



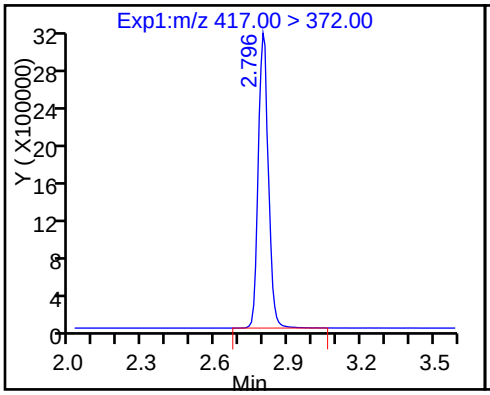
5 Perfluorobutanesulfonic acid



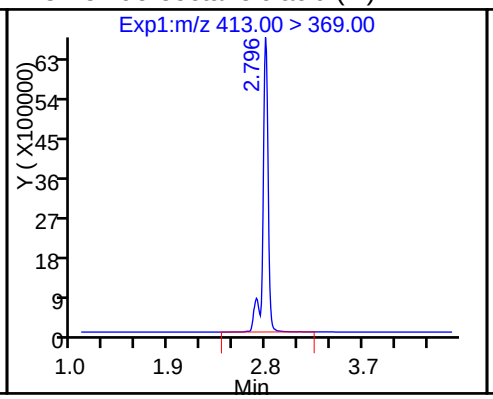
D 10 18O2 PFHxS



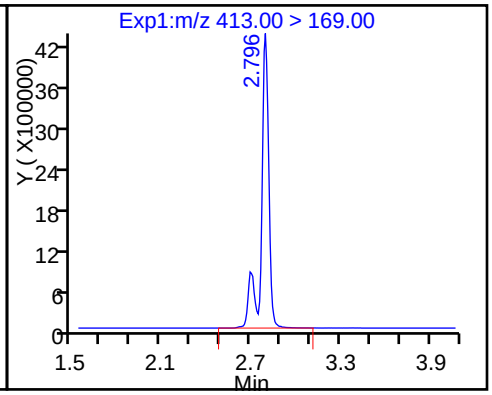
D 14 13C4 PFOA



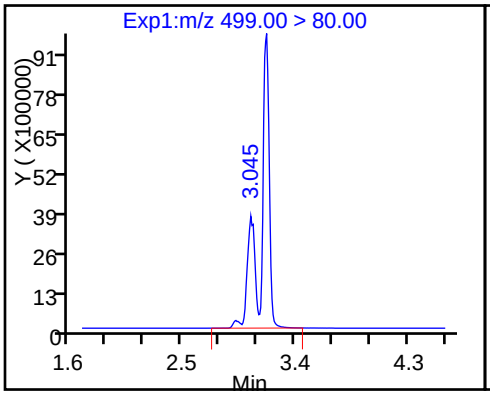
15 Perfluorooctanoic acid (M)



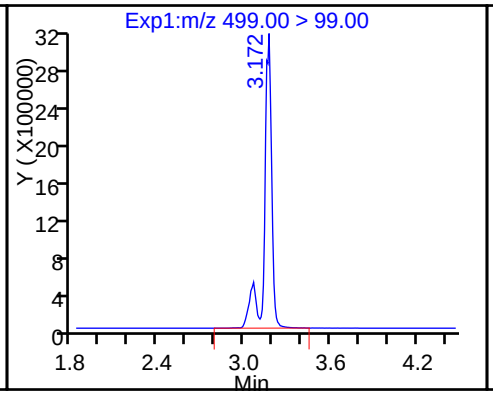
15 Perfluorooctanoic acid



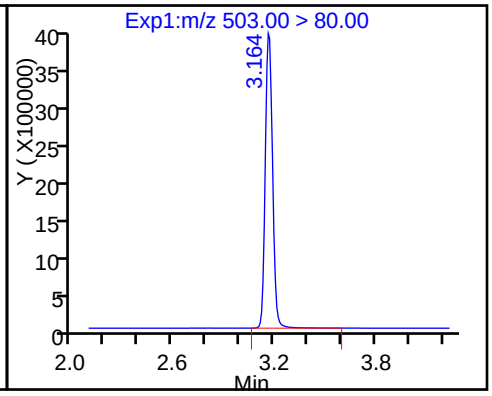
18 Perfluorooctane sulfonic acid



18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

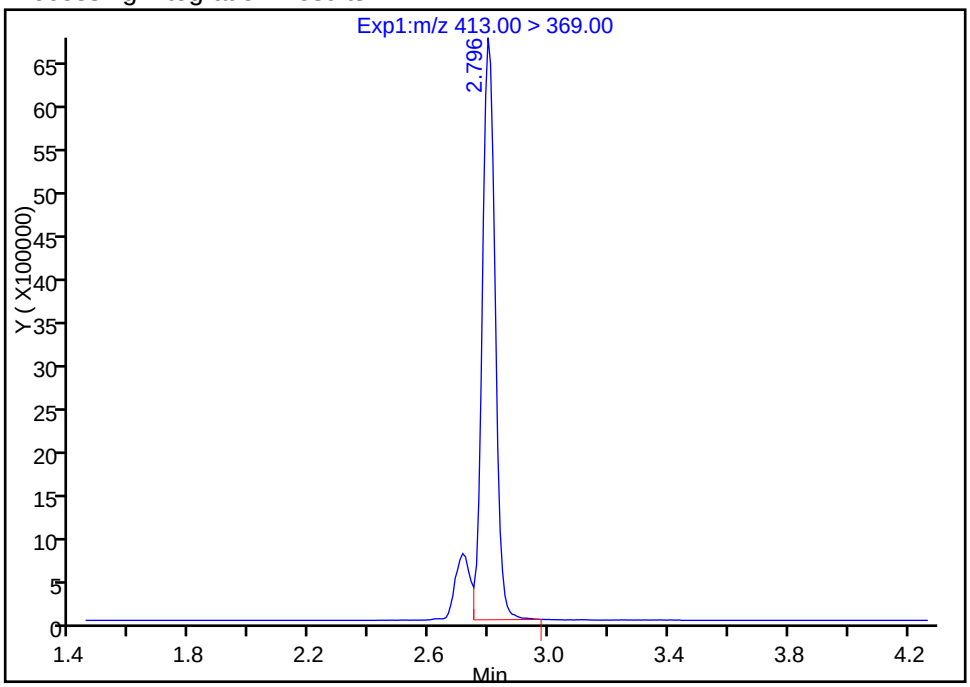
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_045.d				
Injection Date:	09-Dec-2016 16:54:45	Instrument ID:	A8_N		
Lims ID:	320-23830-A-5-A	Lab Sample ID:	320-23830-5		
Client ID:	DPT-16-18-GW-31-35-DUP				
Operator ID:	A8-PC\A8	ALS Bottle#:	29	Worklist Smp#:	45
Injection 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

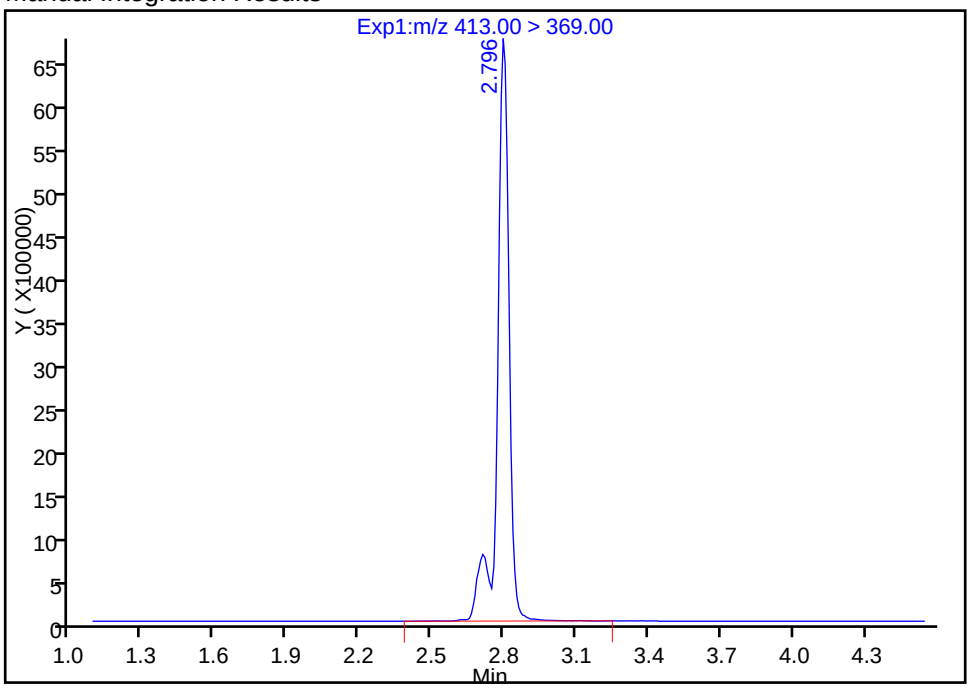
Processing Integration Results

RT: 2.80
Area: 20137143
Amount: 102.5645
Amount Units: ng/ml



Manual Integration Results

RT: 2.80
Area: 22942217
Amount: 116.8516
Amount Units: ng/ml



Reviewer: westendorfc, 11-Dec-2016 11:52:17

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23830-1

SDG No.:

Client Sample ID: DPT-GW-EB-112316 | Lab Sample ID: 320-23830-6

Matrix: Water | Lab File ID: 09DEC2016A_046.d

Analysis Method: 537 (Modified) | Date Collected: 11/23/2016 13:15

Extraction Method: 3535 | Date Extracted: 11/29/2016 20:20

Sample wt/vol: 288.2(mL) | Date Analyzed: 12/09/2016 17:02

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 141453 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0017	U	0.0022	0.0017	0.00065
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.0026	U	0.0035	0.0026	0.0011
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0017	U	0.0022	0.0017	0.00080

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	120		25-150
STL00991	13C4 PFOS	107		25-150
STL00994	18O2 PFHxS	110		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_046.d
Lims ID: 320-23830-A-6-A
Client ID: DPT-GW-EB-112316
Sample Type: Client
Inject. Date: 09-Dec-2016 17:02:15 ALS Bottle#: 30 Worklist Smp#: 46
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-23830-a-6-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 11-Dec-2016 11:57:49 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: westendorfc Date: 11-Dec-2016 11:52:26

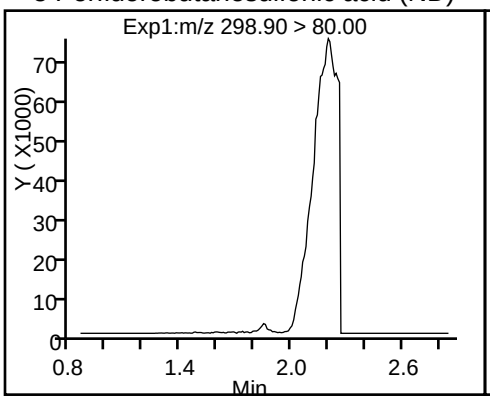
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 10 18O2 PFHxS										
403.00 > 84.00	2.460	2.460	0.0		16286182	52.1		110	1009234	
D 14 13C4 PFOA										
417.00 > 372.00	2.805	2.805	0.0		13177442	60.1		120	1204772	
D 17 13C4 PFOS										
503.00 > 80.00	3.173	3.166	0.007		12598695	51.2		107	628695	

Report Date: 11-Dec-2016 11:58:06 Chrom Revision: 2.2 05-Dec-2016 12:37:22

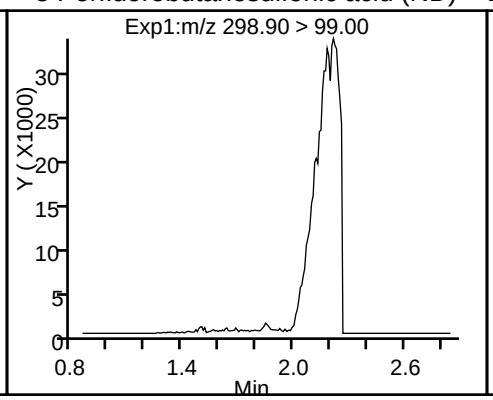
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_046.d				
Injection Date:	09-Dec-2016 17:02:15	Instrument ID:	A8_N		
Lims ID:	320-23830-A-6-A	Lab Sample ID:	320-23830-6		
Client ID:	DPT-GW-EB-112316				
Operator ID:	A8-PC\A8	ALS Bottle#:	30	Worklist Smp#:	46
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

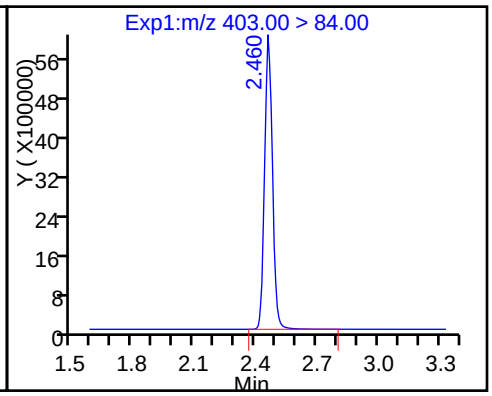
5 Perfluorobutanesulfonic acid (ND)



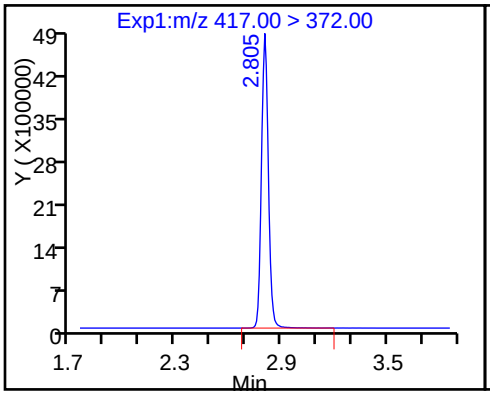
5 Perfluorobutanesulfonic acid (ND)



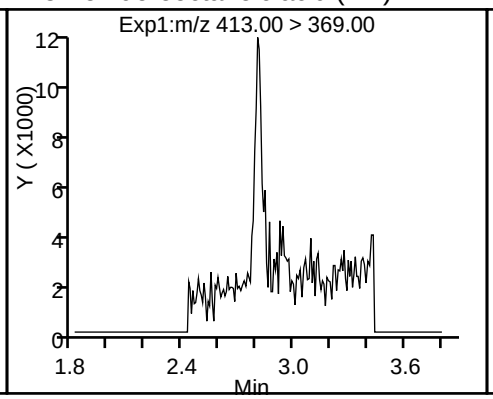
D 10 18O2 PFHxS



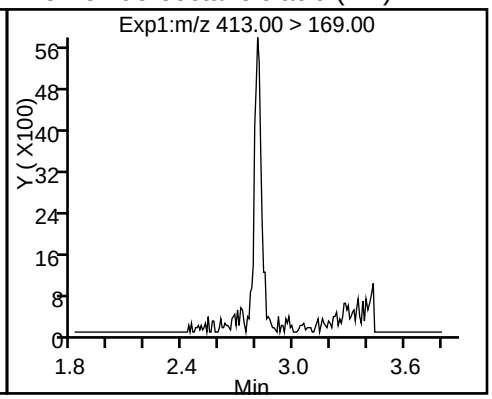
D 14 13C4 PFOA



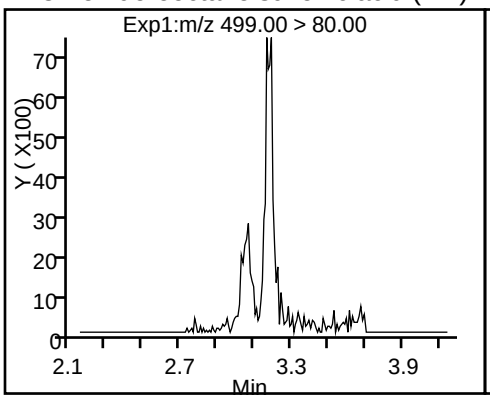
15 Perfluorooctanoic acid (ND)



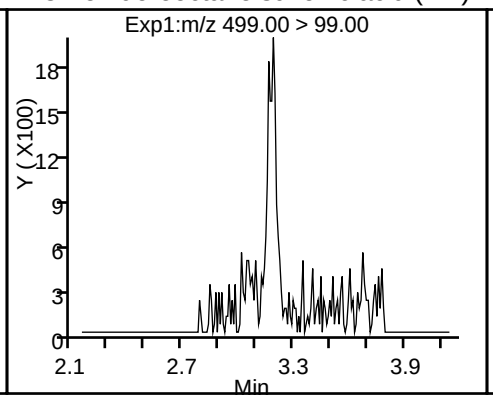
15 Perfluorooctanoic acid (ND)



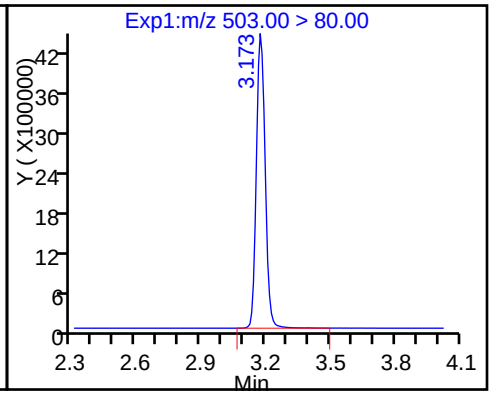
18 Perfluorooctane sulfonic acid (ND)



18 Perfluorooctane sulfonic acid (ND)



D 17 13C4 PFOS



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23830-1

SDG No.:

Client Sample ID: DPT-16-23-GW-21-25 | Lab Sample ID: 320-23830-7

Matrix: Water | Lab File ID: 09DEC2016A_051.d

Analysis Method: 537 (Modified) | Date Collected: 11/23/2016 13:35

Extraction Method: 3535 | Date Extracted: 11/29/2016 20:20

Sample wt/vol: 244.8(mL) | Date Analyzed: 12/09/2016 17:39

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 141453 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	*Perfluorooctanoic acid (PFOA)*	*0.66*	*E M*	*0.0026*	0.0020	*0.00076*
1763-23-1	*Perfluorooctane Sulfonate (PFOS)*	*0.83*	*E*	*0.0041*	0.0031	*0.0013*
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.32		0.0026	0.0020	0.00094

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	76		25-150
STL00991	13C4 PFOS	87		25-150
STL00994	18O2 PFHxS	47		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_051.d				
Lims ID:	320-23830-A-7-A				
Client ID:	DPT-16-23-GW-21-25				
Sample Type:	Client				
Inject. Date:	09-Dec-2016 17:39:44	ALS Bottle#:	31	Worklist Smp#:	47
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-23830-a-7-a				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	A8-PC\A8	Instrument ID:	A8_N		

Method:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\A8_N.m		
Limit Group:	LC PFC_DOD ICAL		
Last Update:	11-Dec-2016 11:58:10	Calib Date:	03-Dec-2016 15:33:40
Integrator:	Picker		
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d		

Column 1 :			Det: EXP1
Process Host:	XAWRK012		

First Level Reviewer: westendorfc		Date:	11-Dec-2016 11:53:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.849	1.849	0.0	1.000	36308118	155.7				
298.90 > 99.00	1.849	1.849	0.0	1.000	18177437		2.00(0.00-0.00)			
D 10 18O2 PFHxS										
403.00 > 84.00	2.455	2.462	-0.007		6911340	22.1		46.8	379724	
D 14 13C4 PFOA										
417.00 > 372.00	2.792	2.799	-0.006		8341025	38.0		76.1	532443	
15 Perfluorooctanoic acid										EM
413.00 > 369.00	2.792	2.799	-0.006	1.000	57938317	324.0			481987	EM
413.00 > 169.00	2.698	2.799	-0.100	0.967	45808504		1.26(0.90-1.10)		168941	
18 Perfluorooctane sulfonic acid										E
499.00 > 80.00	3.145	3.057	0.088	1.000	94851498	407.9			406329	E
499.00 > 99.00	3.137	3.057	0.080	0.997	22663810		4.19(0.90-1.10)		151995	
D 17 13C4 PFOS										
503.00 > 80.00	3.169	3.167	0.002		10242092	41.6		87.1	119797	

QC Flag Legend

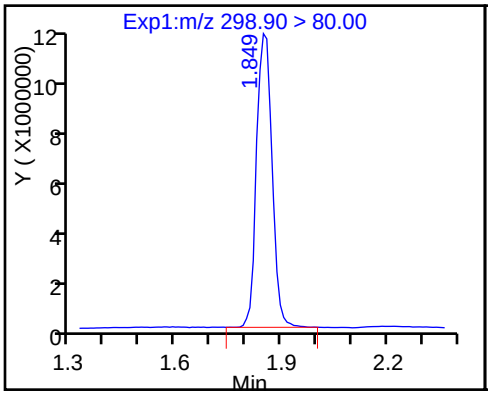
Processing Flags
E - Exceeded Maximum Amount
Review Flags
M - Manually Integrated

Report Date: 11-Dec-2016 11:58:13 Chrom Revision: 2.2 05-Dec-2016 12:37:22

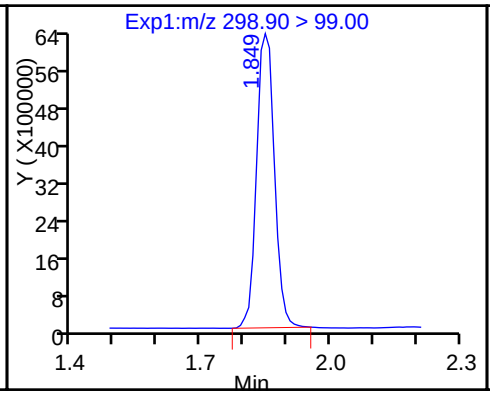
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_051.d				
Injection Date:	09-Dec-2016 17:39:44	Instrument ID:	A8_N		
Lims ID:	320-23830-A-7-A	Lab Sample ID:	320-23830-7		
Client ID:	DPT-16-23-GW-21-25				
Operator ID:	A8-PC\A8	ALS Bottle#:	31	Worklist Smp#:	47
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

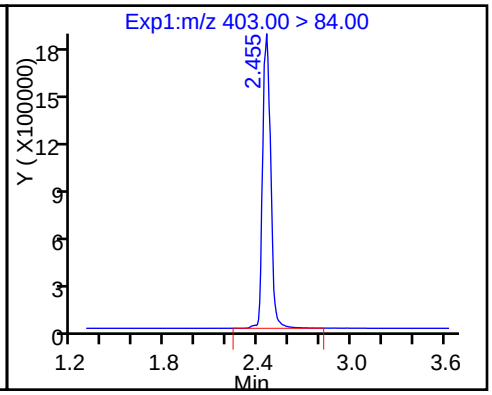
5 Perfluorobutanesulfonic acid



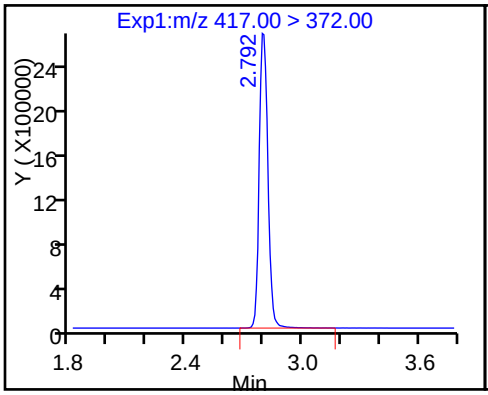
5 Perfluorobutanesulfonic acid



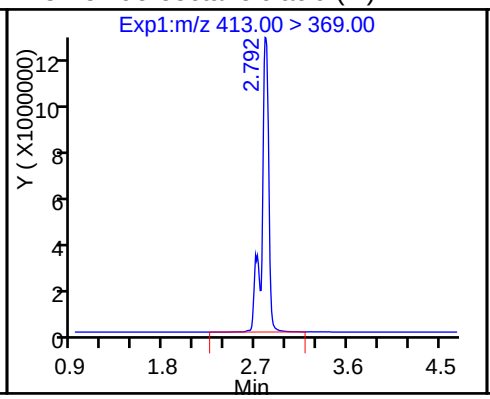
D 10 18O2 PFHxS



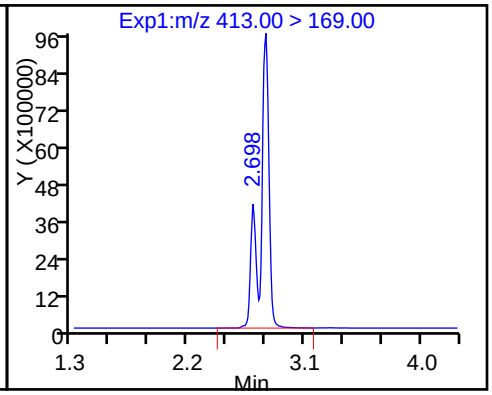
D 14 13C4 PFOA



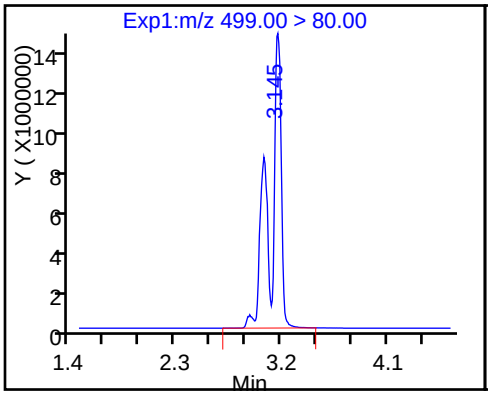
15 Perfluorooctanoic acid (M)



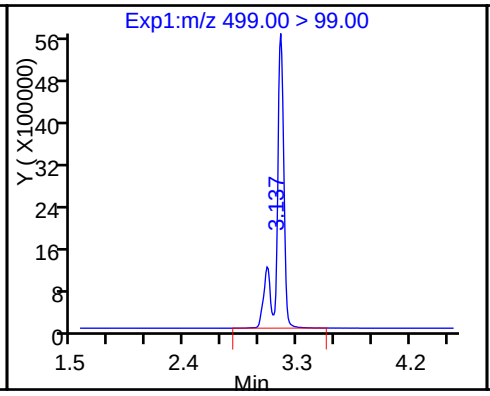
15 Perfluorooctanoic acid



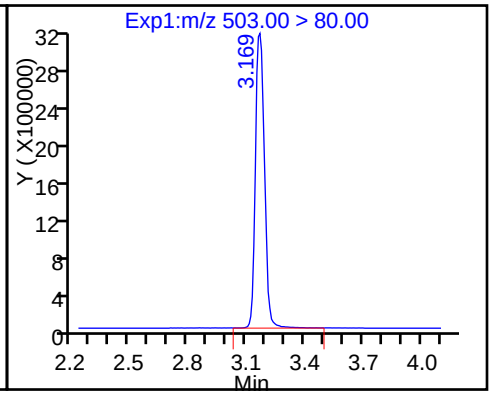
18 Perfluorooctane sulfonic acid



18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

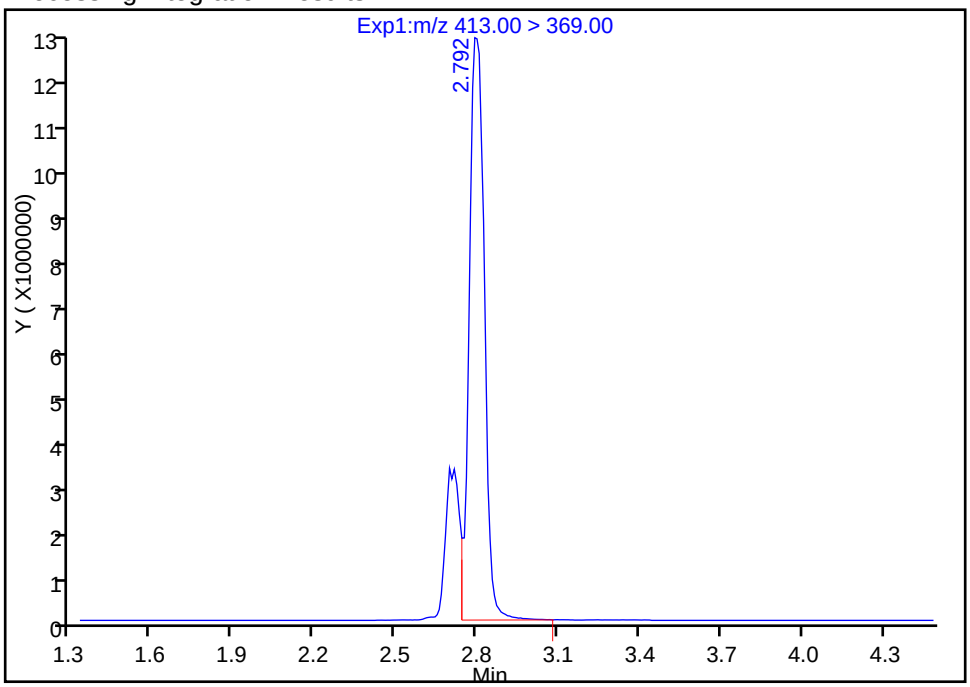
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_051.d				
Injection Date:	09-Dec-2016 17:39:44	Instrument ID:	A8_N		
Lims ID:	320-23830-A-7-A	Lab Sample ID:	320-23830-7		
Client ID:	DPT-16-23-GW-21-25				
Operator ID:	A8-PC\A8	ALS Bottle#:	31	Worklist Smp#:	47
Injection Vol:	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

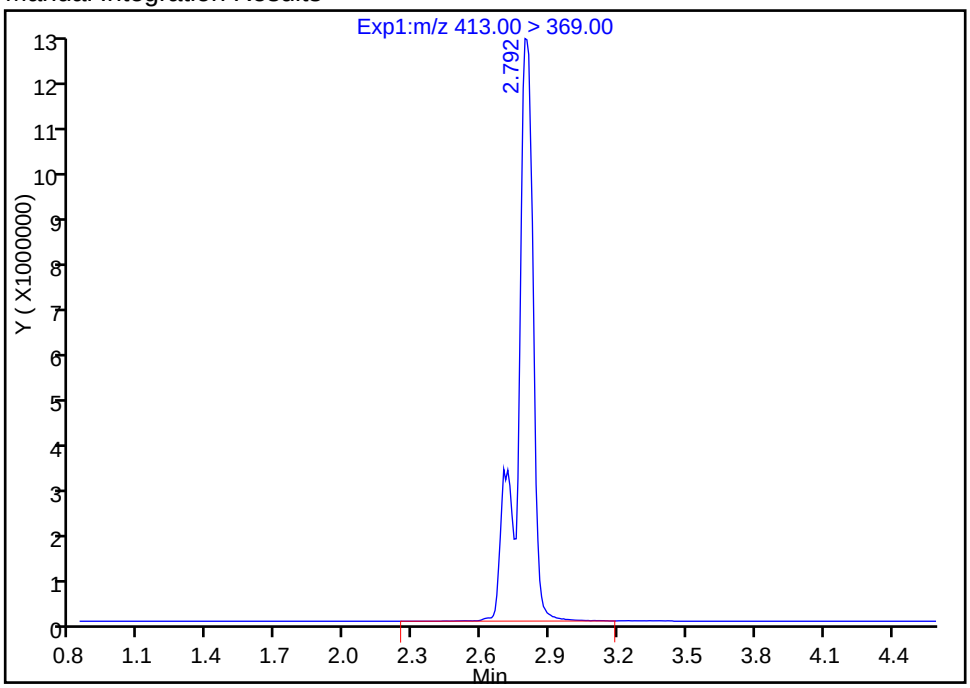
Processing Integration Results

RT: 2.79
Area: 46740975
Amount: 261.3894
Amount Units: ng/ml



Manual Integration Results

RT: 2.79
Area: 57938317
Amount: 324.0083
Amount Units: ng/ml



Reviewer: westendorfc, 11-Dec-2016 11:53:40

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23830-1

SDG No.:

Client Sample ID: DPT-16-23-GW-21-25 DL | Lab Sample ID: 320-23830-7 DL

Matrix: Water | Lab File ID: 12DEC2016C_010.d

Analysis Method: 537 (Modified) | Date Collected: 11/23/2016 13:35

Extraction Method: 3535 | Date Extracted: 11/29/2016 20:20

Sample wt/vol: 244.8(mL) | Date Analyzed: 12/12/2016 19:30

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 141834 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.84	D M	0.026	0.020	0.0076
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.96	D	0.041	0.031	0.013
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*0.24*	*D*	*0.026*	0.020	*0.0094*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	116		25-150
STL00991	13C4 PFOS	112		25-150
STL00994	18O2 PFHxS	105		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_010.d				
Lims ID:	320-23830-A-7-A				
Client ID:	DPT-16-23-GW-21-25				
Sample Type:	Client				
Inject. Date:	12-Dec-2016 19:30:15	ALS Bottle#:	51	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Sample Info:	320-23830-a-7-a 10X				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	A8-PC\A8	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\A8_N.m				
Limit Group:	LC PFC_DOD ICAL				
Last Update:	14-Dec-2016 08:29:39	Calib Date:	03-Dec-2016 15:33:40		
Integrator:	Picker				
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK003				

First Level Reviewer: chandrasenas Date: 14-Dec-2016 08:23:57

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.839	1.849	-0.010	1.000	6041740	11.6				
298.90 > 99.00	1.839	1.849	-0.010	1.000	2585000		2.34(0.00-0.00)			
D 10 18O2 PFHxS										
403.00 > 84.00	2.447	2.446	0.001		1549865	4.96		10.5	90402	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.791	2.791	0.0	1.000	11240825	41.1			68240	M
413.00 > 169.00	2.791	2.791	0.0	1.000	7692122		1.46(0.90-1.10)		262504	
D 14 13C4 PFOA										
417.00 > 372.00	2.791	2.791	0.0		1275484	5.82		11.6	157110	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.143	3.135	0.008	1.000	14032981	47.0			154063	
499.00 > 99.00	3.159	3.135	0.024	1.005	2776984		5.05(0.90-1.10)		111342	
D 17 13C4 PFOS										
503.00 > 80.00	3.159	3.159	0.0		1314407	5.34		11.2	56737	

QC Flag Legend

Review Flags

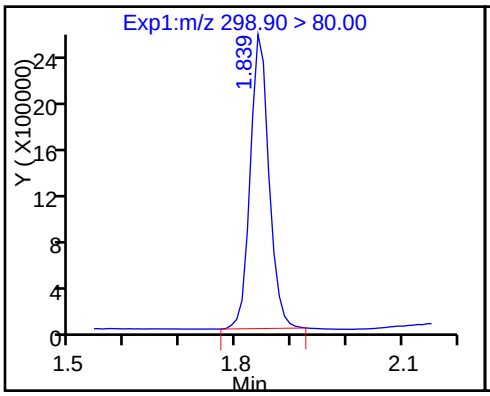
M - Manually Integrated

Report Date: 14-Dec-2016 08:29:48 Chrom Revision: 2.2 05-Dec-2016 12:37:22

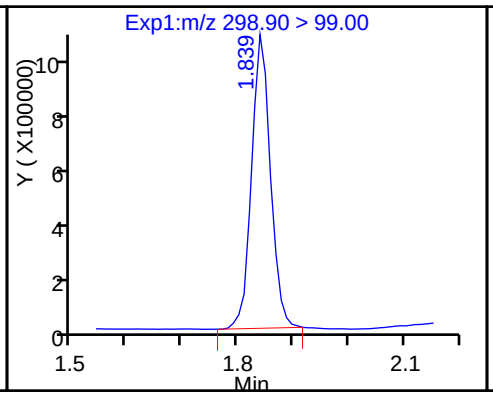
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_010.d				
Injection Date:	12-Dec-2016 19:30:15	Instrument ID:	A8_N		
Lims ID:	320-23830-A-7-A	Lab Sample ID:	320-23830-7		
Client ID:	DPT-16-23-GW-21-25				
Operator ID:	A8-PC\A8	ALS Bottle#:	51	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

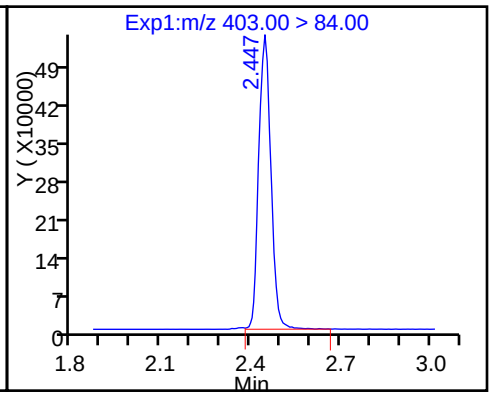
5 Perfluorobutanesulfonic acid



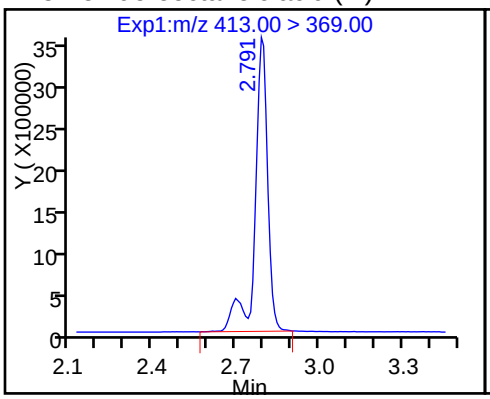
5 Perfluorobutanesulfonic acid



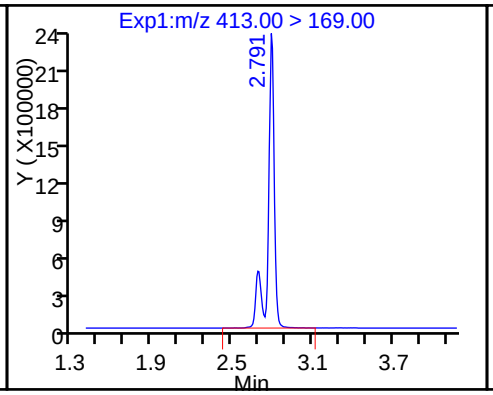
D 10 18O2 PFHxS



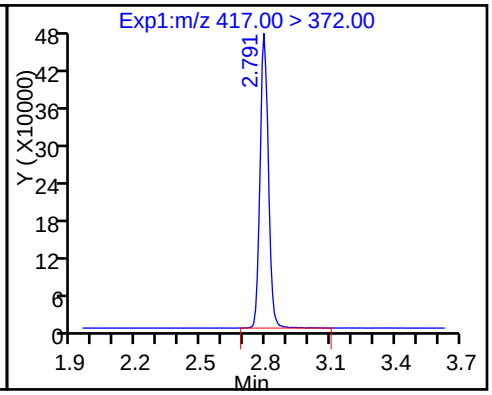
15 Perfluorooctanoic acid (M)



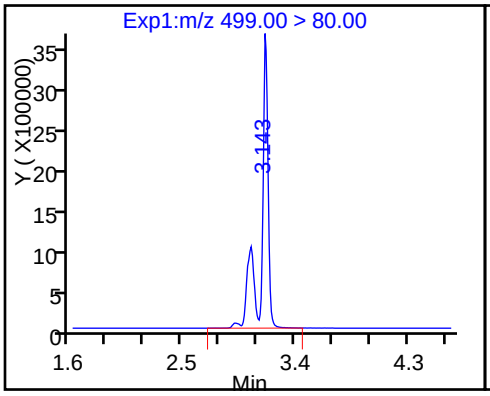
15 Perfluorooctanoic acid



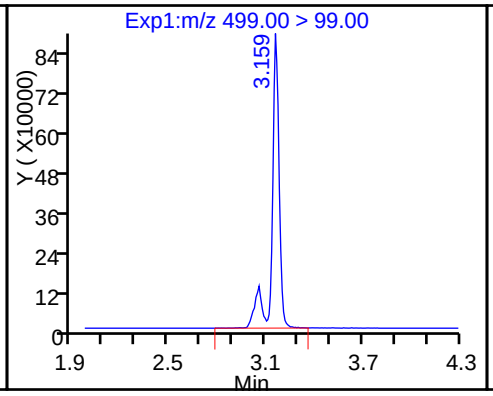
D 14 13C4 PFOA



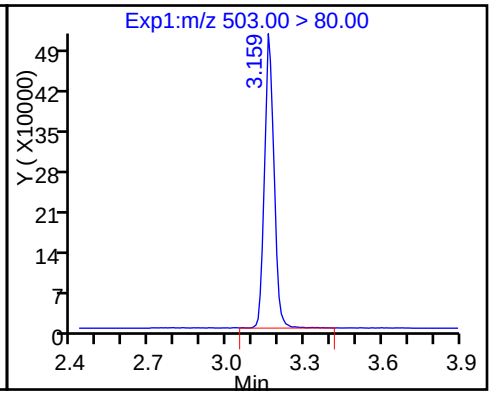
18 Perfluorooctane sulfonic acid



18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

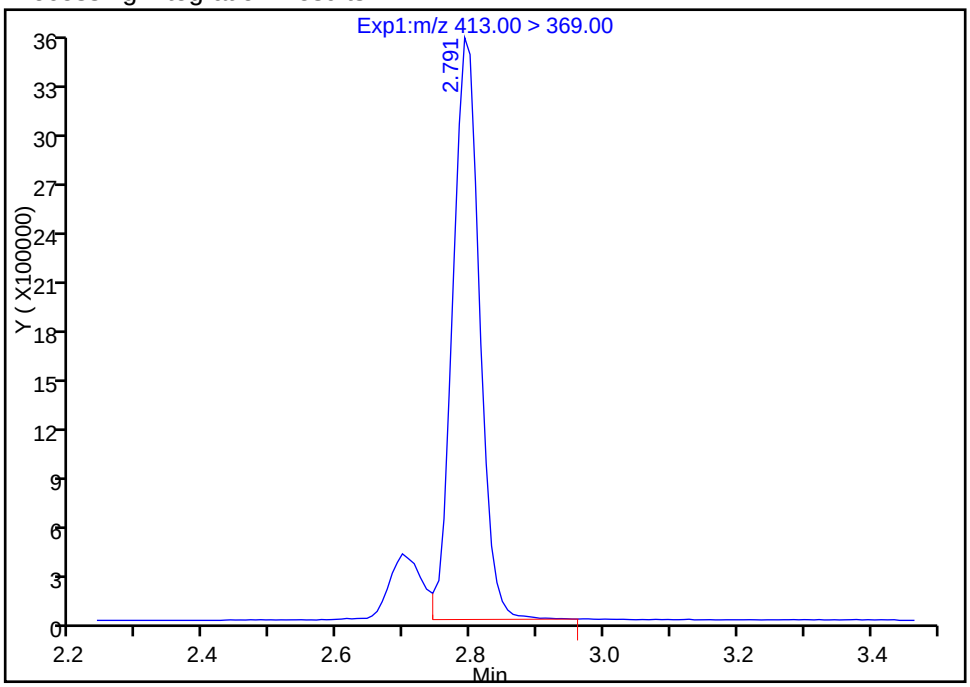
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_010.d				
Injection Date:	12-Dec-2016 19:30:15	Instrument ID:	A8_N		
Lims ID:	320-23830-A-7-A	Lab Sample ID:	320-23830-7		
Client ID:	DPT-16-23-GW-21-25				
Operator ID:	A8-PC\A8	ALS Bottle#:	51	Worklist Smp#:	10
Injection Vol:	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

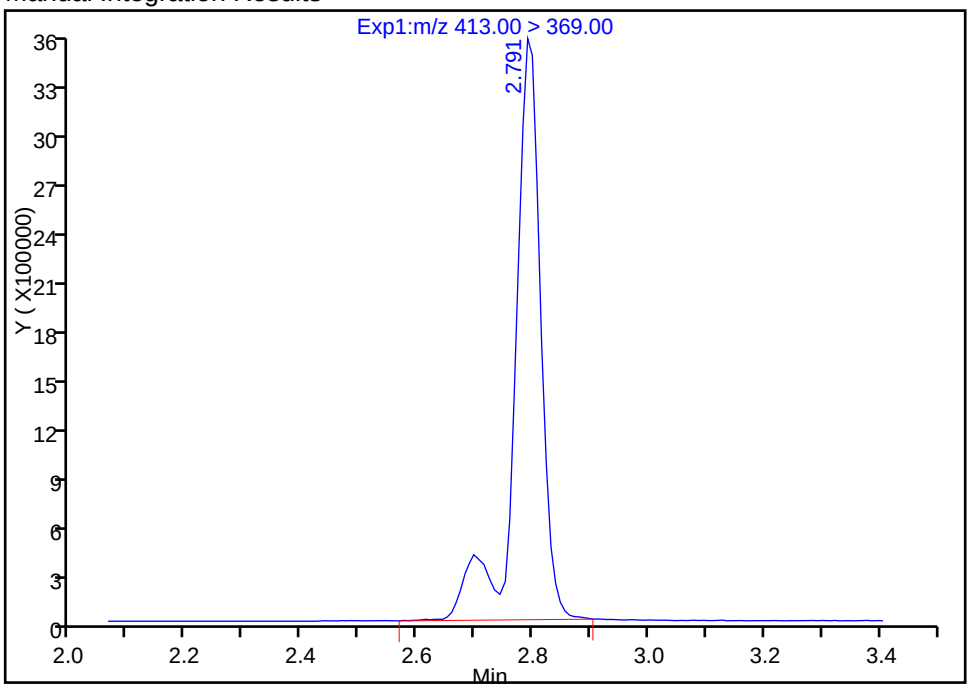
Processing Integration Results

RT: 2.79
Area: 9951527
Amount: 36.393542
Amount Units: ng/ml



Manual Integration Results

RT: 2.79
Area: 11240825
Amount: 41.108610
Amount Units: ng/ml



Reviewer: chandrasenas, 14-Dec-2016 08:23:57

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-23830-1
SDG No.:
Client Sample ID: DPT-16-23-GW-31-35
Lab Sample ID: 320-23830-8
Matrix: Water
Lab File ID: 09DEC2016A_052.d
Analysis Method: 537 (Modified)
Date Collected: 11/23/2016 14:00
Extraction Method: 3535
Date Extracted: 11/29/2016 20:20
Sample wt/vol: 234.5(mL)
Date Analyzed: 12/09/2016 17:47
Con. Extract Vol.: 0.5(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: Acquity ID: 2.1(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 141453
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.34	M	0.0027	0.0021	0.00080
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.27		0.0043	0.0032	0.0014
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11		0.0027	0.0021	0.00098

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	77		25-150
STL00991	13C4 PFOS	107		25-150
STL00994	18O2 PFHxS	52		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_052.d				
Lims ID:	320-23830-B-8-A				
Client ID:	DPT-16-23-GW-31-35				
Sample Type:	Client				
Inject. Date:	09-Dec-2016 17:47:14	ALS Bottle#:	32	Worklist Smp#:	48
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-23830-b-8-a				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	A8-PC\A8	Instrument ID:	A8_N		

Method:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\A8_N.m		
Limit Group:	LC PFC_DOD ICAL		
Last Update:	11-Dec-2016 11:58:10	Calib Date:	03-Dec-2016 15:33:40
Integrator:	Picker		
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d		

Column 1 :			Det: EXP1
Process Host:	XAWRK012		

First Level Reviewer: westendorfc		Date:	11-Dec-2016 11:54:42

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.842	1.849	-0.007	1.000	13919514	53.8				
298.90 > 99.00	1.842	1.849	-0.007	1.000	6240002		2.23(0.00-0.00)			
D 10 18O2 PFHxS										
403.00 > 84.00	2.443	2.462	-0.019		7674444	24.6		51.9	262388	
D 14 13C4 PFOA										
417.00 > 372.00	2.796	2.799	-0.002		8394055	38.3		76.6	400724	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.796	2.799	-0.002	1.000	28405548	157.8			372495	M
413.00 > 169.00	2.788	2.799	-0.010	0.997	18864884		1.51(0.90-1.10)		559068	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.035	3.057	-0.022	1.000	36587591	128.3			463326	
499.00 > 99.00	3.164	3.057	0.107	1.042	6473844		5.65(0.90-1.10)		147383	
D 17 13C4 PFOS										
503.00 > 80.00	3.164	3.167	-0.003		12558164	51.0		107	194147	

QC Flag Legend

Review Flags

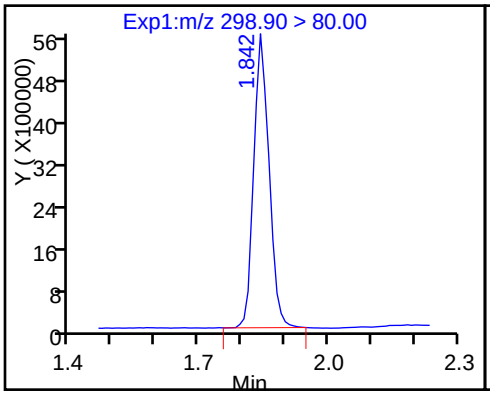
M - Manually Integrated

Report Date: 11-Dec-2016 11:58:14 Chrom Revision: 2.2 05-Dec-2016 12:37:22

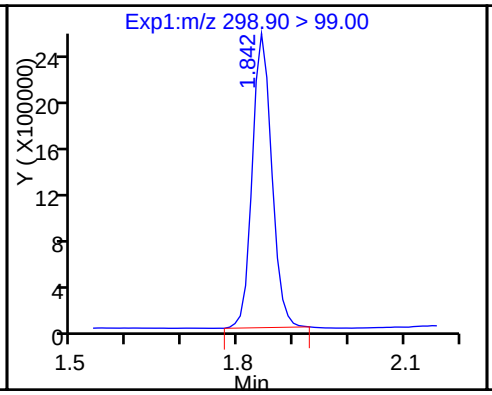
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_052.d				
Injection Date:	09-Dec-2016 17:47:14	Instrument ID:	A8_N		
Lims ID:	320-23830-B-8-A	Lab Sample ID:	320-23830-8		
Client ID:	DPT-16-23-GW-31-35				
Operator ID:	A8-PC\A8	ALS Bottle#:	32	Worklist Smp#:	48
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

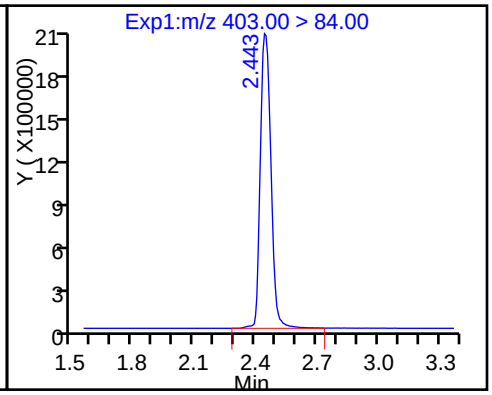
5 Perfluorobutanesulfonic acid



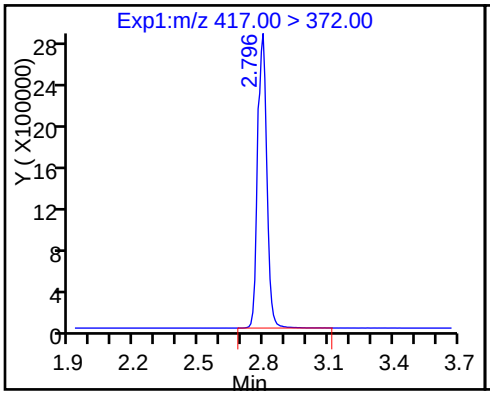
5 Perfluorobutanesulfonic acid



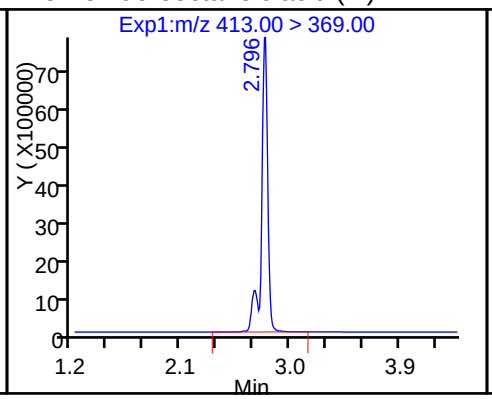
D 10 18O2 PFHxS



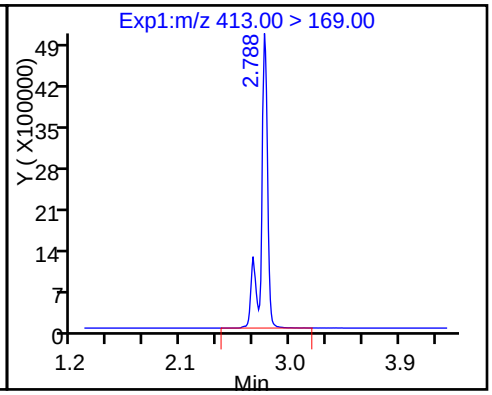
D 14 13C4 PFOA



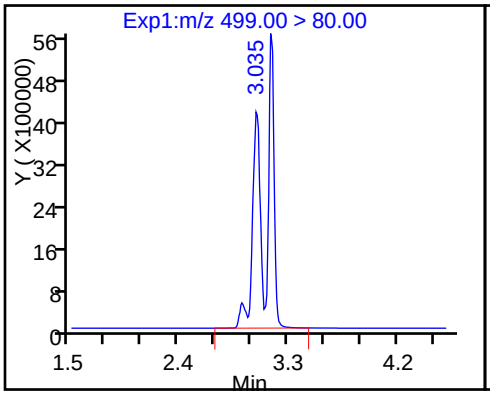
15 Perfluorooctanoic acid (M)



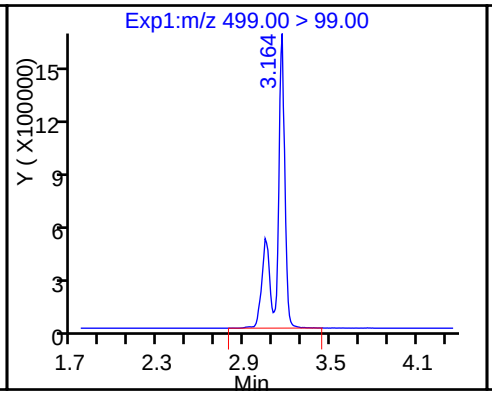
15 Perfluorooctanoic acid



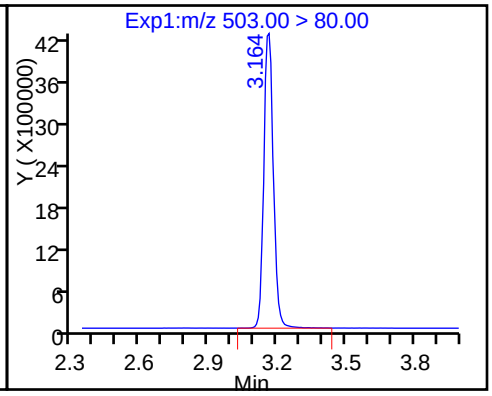
18 Perfluorooctane sulfonic acid



18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

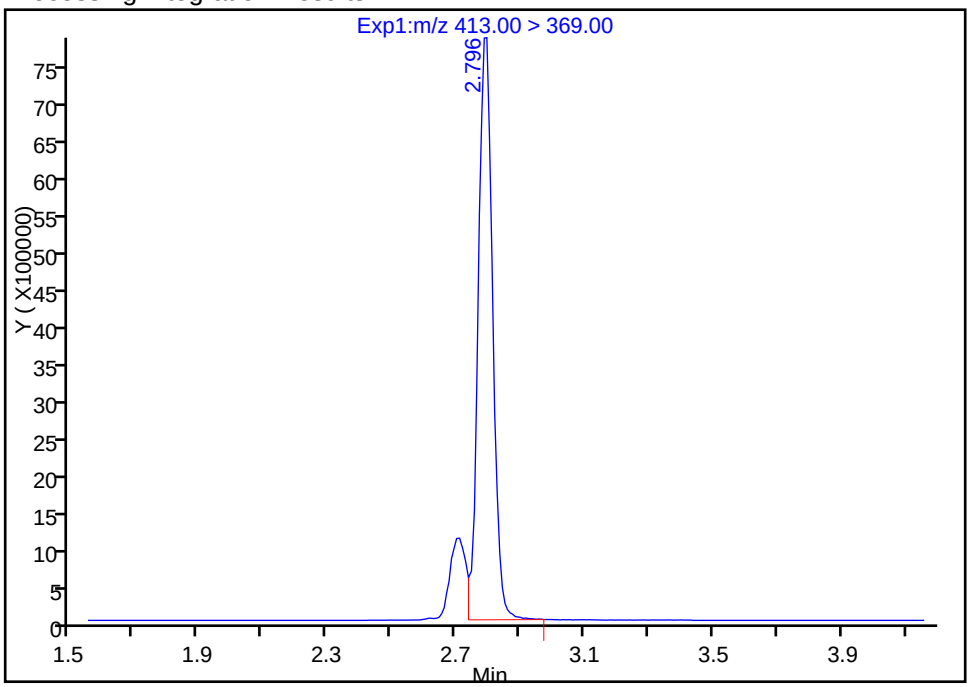
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_052.d				
Injection Date:	09-Dec-2016 17:47:14	Instrument ID:	A8_N		
Lims ID:	320-23830-B-8-A	Lab Sample ID:	320-23830-8		
Client ID:	DPT-16-23-GW-31-35				
Operator ID:	A8-PC\A8	ALS Bottle#:	32	Worklist Smp#:	48
Injection Vol:	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

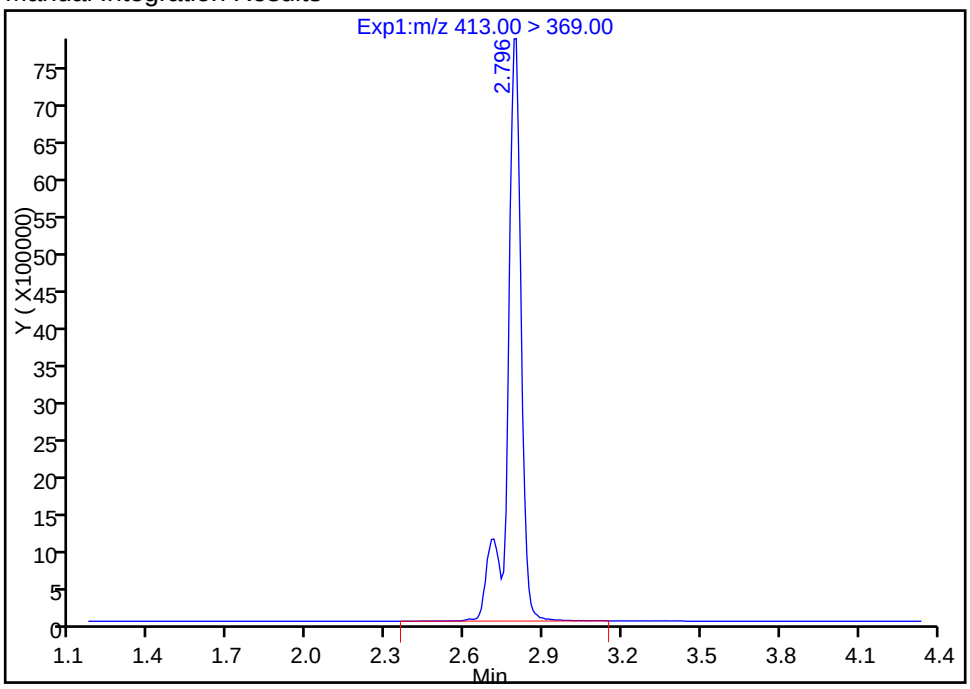
Processing Integration Results

RT: 2.80
Area: 24480005
Amount: 136.0346
Amount Units: ng/ml



Manual Integration Results

RT: 2.80
Area: 28405548
Amount: 157.8487
Amount Units: ng/ml



Reviewer: westendorfc, 11-Dec-2016 11:54:42

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.: 320-23830-1 Analy Batch No.: 140564

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-140564/4	03DEC2016A_004.d
Level 2	IC 320-140564/13	03DEC2016A_013.d
Level 3	IC 320-140564/5	03DEC2016A_005.d
Level 4	IC 320-140564/14	03DEC2016A_014.d
Level 5	IC 320-140564/6	03DEC2016A_006.d
Level 6	IC 320-140564/15	03DEC2016A_015.d
Level 7	IC 320-140564/7	03DEC2016A_007.d
Level 8	IC 320-140564/16	03DEC2016A_016.d
Level 9	IC 320-140564/8	03DEC2016A_008.d
Level 10	IC 320-140564/17	03DEC2016A_017.d
Level 11	IC 320-140564/9	03DEC2016A_009.d
Level 12	IC 320-140564/18	03DEC2016A_018.d

ANALYTE	LVL 1 LVL 11	LVL 2 LVL 12	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	1.582 1.574		1.574		1.574		1.582		1.574		1.327 - 1.827	1.577
Perfluoropentanoic acid (PFPeA)	1.868 1.858		1.858		1.858		1.868		1.858		1.611 - 2.111	1.861
Perfluorobutanesulfonic acid (PFBS)	1.906 1.896		1.897		1.897		1.907		1.897		1.720 - 2.080	1.900
Perfluorohexanoic acid (PFHxA)	2.170 2.157		2.164		2.163		2.171		2.160		1.914 - 2.414	2.164
Perfluoroheptanoic acid (PFHpA)	2.521 2.501		2.512		2.516		2.512		2.510		2.262 - 2.762	2.512
Perfluorohexanesulfonic acid (PFHxS)	+++++ 2.526		2.535		2.531		2.527		2.525		2.281 - 2.781	2.529
6:2FTS		+++++ 2.838		2.830		2.838		2.840		2.830	2.586 - 3.086	2.835
Perfluorooctanoic acid (PFOA)	+++++ 2.868		2.894		2.880		2.894		2.884		2.637 - 3.137	2.884
Perfluoroheptanesulfonic Acid (PFHpS)	2.902 2.884		2.886		2.888		2.886		2.884		2.638 - 3.138	2.888
Perfluorooctane Sulfonate (PFOS)	+++++ 3.249		3.259		3.255		3.259		3.257		3.008 - 3.508	3.256
Perfluorononanoic acid (PFNA)	3.275 3.249		3.268		3.263		3.267		3.257		3.013 - 3.513	3.263
Perfluorooctane Sulfonamide (FOSA)	3.581 3.571		3.573		3.576		3.573		3.570		3.324 - 3.824	3.574
8:2FTS		3.601 3.589		3.579		3.588		3.592		3.579	3.338 - 3.838	3.588
Perfluorodecanoic acid (PFDA)	3.632 3.613		3.632		3.618		3.623		3.620		3.373 - 3.873	3.623

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1 Analy Batch No.: 140564

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

ANALYTE	LVL 1 LVL 11	LVL 2 LVL 12	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		3.774 3.752		3.760		3.760		3.756		3.750	3.509 - 4.009	3.759
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		3.931 3.927		3.935		3.926		3.931		3.925	3.679 - 4.179	3.929
Perfluorodecanesulfonic acid (PFDS)	3.945 3.921		3.944		3.938		3.939		3.928		3.686 - 4.186	3.936
Perfluoroundecanoic acid (PFUnA)	3.971 3.947		3.953		3.956		3.956		3.946		3.705 - 4.205	3.955
MeFOSA		4.063 4.061		4.051		4.051		4.063		4.051	3.807 - 4.307	4.057
N-EtFOSA-M		4.253 4.249		4.239		4.240		4.244		4.245	3.995 - 4.495	4.245
Perfluorododecanoic acid (PFDoA)	4.261 4.236		4.254		4.253		4.253		4.242		4.000 - 4.500	4.250
Perfluorotridecanoic Acid (PFTriA)	4.535 4.501		4.515		4.521		4.524		4.510		4.268 - 4.768	4.518
Perfluorotetradecanoic acid (PFTeA)	4.778 4.746		4.770		4.761		4.764		4.750		4.511 - 5.011	4.762
Perfluoro-n-hexadecanoic acid (PFHxDA)	5.208 5.160		5.196		5.191		5.187		5.177		4.936 - 5.436	5.187
Perfluoro-n-octadecanoic acid (PFODA)	5.584 5.536		5.565		5.561		5.563		5.547		5.309 - 5.809	5.559
13C4 PFBA	1.582 1.565		1.574		1.574		1.574		1.574		1.324 - 1.824	1.574
13C5-PFPeA	1.868 1.858		1.858		1.858		1.868		1.858		1.611 - 2.111	1.861
13C2 PFHxA	2.179 2.157		2.164		2.163		2.162		2.160		1.914 - 2.414	2.164
13C4-PFHpA	2.521 2.501		2.512		2.508		2.512		2.510		2.261 - 2.761	2.511
18O2 PFHxS	2.544 2.518		2.535		2.531		2.535		2.525		2.281 - 2.781	2.531
M2-6:2FTS		2.840 2.838		2.830		2.838		2.840		2.830	2.586 - 3.086	2.836
13C4 PFOA	2.886 2.868		2.886		2.880		2.886		2.876		2.630 - 3.130	2.880
13C4 PFOS	3.267 3.249		3.259		3.263		3.259		3.257		3.009 - 3.509	3.259
13C5 PFNA	3.275 3.249		3.268		3.263		3.267		3.257		3.013 - 3.513	3.263
13C8 FOSA	3.581 3.562		3.565		3.576		3.573		3.570		3.321 - 3.821	3.571
M2-8:2FTS		3.601 3.589		3.579		3.596		3.592		3.587	3.341 - 3.841	3.591

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1 Analy Batch No.: 140564

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

ANALYTE	LVL 1 LVL 11	LVL 2 LVL 12	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
13C2 PFDA	3.640 3.621		3.624		3.627		3.623		3.620		3.376 - 3.876	3.626
d3-NMeFOSAA		3.765 3.752		3.760		3.751		3.756		3.750	3.506 - 4.006	3.756
d5-NEtFOSAA		3.931 3.919		3.918		3.918		3.931		3.917	3.672 - 4.172	3.922
13C2 PFUnA	3.971 3.947		3.961		3.956		3.965		3.946		3.708 - 4.208	3.958
d-N-MeFOSA-M		4.054 4.052		4.051		4.051		4.055		4.042	3.801 - 4.301	4.051
d-N-EtFOSA-M		4.244 4.239		4.231		4.240		4.244		4.236	3.989 - 4.489	4.239
13C2 PFDoA	4.261 4.236		4.262		4.253		4.253		4.242		4.001 - 4.501	4.251
13C2-PFTeDA	4.778 4.738		4.762		4.761		4.764		4.750		4.509 - 5.009	4.759
13C2-PFHxDA	5.208 5.171		5.196		5.180		5.187		5.177		4.936 - 5.436	5.187

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1 Analy Batch No.: 140564

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-140564/4	03DEC2016A_004.d
Level 2	IC 320-140564/13	03DEC2016A_013.d
Level 3	IC 320-140564/5	03DEC2016A_005.d
Level 4	IC 320-140564/14	03DEC2016A_014.d
Level 5	IC 320-140564/6	03DEC2016A_006.d
Level 6	IC 320-140564/15	03DEC2016A_015.d
Level 7	IC 320-140564/7	03DEC2016A_007.d
Level 8	IC 320-140564/16	03DEC2016A_016.d
Level 9	IC 320-140564/8	03DEC2016A_008.d
Level 10	IC 320-140564/17	03DEC2016A_017.d
Level 11	IC 320-140564/9	03DEC2016A_009.d
Level 12	IC 320-140564/18	03DEC2016A_018.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 9	LVL 2 LVL 6 LVL 10	LVL 3 LVL 7 LVL 11	LVL 4 LVL 8 LVL 12		B	M1	M2								
13C4 PFBA	310185 395986 320580		331347 365089 291784		Ave		335828.500				11.4		50.0			
13C5-PFPeA	254875 312687 249553		258388 288538 223232		Ave		264545.467				11.9		50.0			
13C2 PFHxA	230194 279196 219710		235263 254328 206225		Ave		237485.877				10.9		50.0			
13C4-PFHpA	200488 249965 193077		209795 229496 161658		Ave		207413.233				14.7		50.0			
18O2 PFHxS	293993 367326 302399		309858 340372 260105		Ave		312342.301				12.0		50.0			
M2-6:2FTS		91389 101069 97657		86632 132540 123901	Ave		105531.519				17.5		50.0			
13C4 PFOA	219399 265152 198189		227804 241383 163620		Ave		219257.923				16.1		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.: 320-23830-1 Analy Batch No.: 140564

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

ANALYTE	CF				CURVE TYPE	COEFFICIENT			#	MIN CF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 5 LVL 9	LVL 2 LVL 6 LVL 10	LVL 3 LVL 7 LVL 11	LVL 4 LVL 8 LVL 12		B	M1	M2								
13C4 PFOS	228339 292548 236006		232908 275934 210320		Ave		246009.066				12.7		50.0			
13C5 PFNA	162836 202161 157087		167249 178407 130751		Ave		166415.157				14.2		50.0			
13C8 FOSA	382785 462525 385863		396984 446533 338985		Ave		402279.103				11.3		50.0			
M2-8:2FTS		89009 92918 86527		81776 112285 120341	Ave		97142.4774				15.9		50.0			
13C2 PFDA	153345 184278 148117		157229 175727 128207		Ave		157817.020				12.7		50.0			
d3-NMeFOSAA		66435 73365 62459		67366 86475 79076	Ave		72529.4733				12.4		50.0			
d5-NEtFOSAA		76443 81901 68389		76375 93004 81834	Ave		79657.5967				10.3		50.0			
13C2 PFUnA	116625 141738 112505		121719 129709 90276		Ave		118762.217				14.6		50.0			
d-N-MeFOSA-M		93925 110531 95888		97701 123254 109309	Ave		105101.257				10.8		50.0			
d-N-EtFOSA-M		87118 101086 93356		94000 114956 104475	Ave		99165.2500				9.9		50.0			
13C2 PFDoA	107060 131990 106770		108978 121360 96346		Ave		112083.837				11.2		50.0			
13C2-PFTeDA	220709 269763 220622		228021 257560 190365		Ave		231173.483				12.4		50.0			
13C2-PFHxDA	122044 151839 117867		129673 147280 109649		Ave		129725.210				12.9		50.0			

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

FORM VI

CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1 Analy Batch No.: 140564

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10		B	M1	M2								
Perfluorobutanoic acid (PFBA)	285568 214032	350423	286663	280973	351800	AveID		0.8740				8.8		35.0			
Perfluoropentanoic acid (PFPeA)	300210 177640	305783	267561	251941	316000	AveID		1.0148				12.2		35.0			
Perfluorobutanesulfonic acid (PFBS)	504086 300541	615867	490253	486734	626278	AveID		1.5960				14.4		50.0			
Perfluorohexanoic acid (PFHxA)	235776 165590	261205	221801	208409	271706	AveID		0.9531				8.6		35.0			
Perfluoroheptanoic acid (PFHpA)	221302 150068	245911	215700	198314	250864	AveID		1.0271				5.9		35.0			
Perfluorohexanesulfonic acid (PFHxS)	+++++ 259457	382897	373893	318646	405919	AveID		1.0976				7.2		35.0			
6:2FTS	74414	+++++ 95077	114411	73191	96558	AveID		0.8401				11.7		35.0			
Perfluorooctanoic acid (PFOA)	+++++ 154270	264619	266474	208682	291075	AveID		1.0719				7.8		35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	288964 206923	350751	264304	290052	344790	AveID		1.1771				9.2		50.0			
Perfluorooctane Sulfonate (PFOS)	+++++ 232098	303437	248775	257626	311027	AveID		1.0852				1.7		35.0			
Perfluorononanoic acid (PFNA)	173474 124497	190216	158219	153501	196312	AveID		0.9963				5.5		35.0			
Perfluorooctane Sulfonamide (FOSA)	370100 253291	455589	375193	365380	452435	AveID		0.9341				10.2		35.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI

CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1 Analy Batch No.: 140564

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10		B	M1	M2								
8:2FTS	68103	78395 87944	105918	66735	89333	AveID		0.8560				14.0		35.0			
Perfluorodecanoic acid (PFDA)	156640 117857	171719	147102	143186	173721	AveID		0.9605				3.8		35.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	52006	47238 67834	82772	53845	69682	AveID		0.8583				18.3		35.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	53051	50866 65238	81472	49948	65231	AveID		0.7657				17.0		35.0			
Perfluorodecanesulfonic acid (PFDS)	142463 129604	184058	155987	152444	180118	AveID		0.6398				3.9		50.0			
Perfluoroundecanoic acid (PFUnA)	154250 89091	133679	130643	111061	140855	AveID		1.0657				12.2		35.0			
MeFOSA	71380	74884 88180	109492	72155	93127	AveID		0.8080				14.0		35.0			
N-EtFOSA-M	73063	72158 91173	110071	72107	94707	AveID		0.8605				12.9		35.0			
Perfluorododecanoic acid (PFDoA)	106404 88867	120759	100943	100016	121390	AveID		0.9490				3.8		35.0			
Perfluorotridecanoic Acid (PFTriA)	106898 87470	118653	100348	100682	125535	AveID		0.9498				3.6		50.0			
Perfluorotetradecanoic acid (PFTeA)	219098 152968	234056	215694	192030	235101	AveID		1.8536				8.9		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	254818 94562	143517	184956	107642	153296	L1ID	0.7490	0.9930							0.9980		0.9900
Perfluoro-n-octadecanoic acid (PFODA)	100080 89220	110258	119152	114581	134794	AveID		0.9929				8.1		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.: 320-23830-1 Analy Batch No.: 140564

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-140564/4	03DEC2016A_004.d
Level 2	IC 320-140564/13	03DEC2016A_013.d
Level 3	IC 320-140564/5	03DEC2016A_005.d
Level 4	IC 320-140564/14	03DEC2016A_014.d
Level 5	IC 320-140564/6	03DEC2016A_006.d
Level 6	IC 320-140564/15	03DEC2016A_015.d
Level 7	IC 320-140564/7	03DEC2016A_007.d
Level 8	IC 320-140564/16	03DEC2016A_016.d
Level 9	IC 320-140564/8	03DEC2016A_008.d
Level 10	IC 320-140564/17	03DEC2016A_017.d
Level 11	IC 320-140564/9	03DEC2016A_009.d
Level 12	IC 320-140564/18	03DEC2016A_018.d

ANALYTE	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
		LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
13C4 PFBA	Ave	15509259 14589192	18254473	16567343	16029004	19799279	50.0 50.0	50.0	50.0	50.0	50.0
13C5-PFPeA	Ave	12743752 11161582	14426922	12919402	12477636	15634346	50.0 50.0	50.0	50.0	50.0	50.0
13C2 PFHxA	Ave	11509685 10311260	12716423	11763139	10985481	13959775	50.0 50.0	50.0	50.0	50.0	50.0
13C4-PFHpA	Ave	10024418 8082881	11474824	10489748	9653835	12498264	50.0 50.0	50.0	50.0	50.0	50.0
18O2 PFHxS	Ave	13905891 12302944	16099619	14656306	14303487	17374498	47.3 47.3	47.3	47.3	47.3	47.3
M2-6:2FTS	Ave	4800798	4340981 5885296	6295656	4115043	4638709	47.5	47.5 47.5	47.5	47.5	47.5
13C4 PFOA	Ave	10969960 8181000	12069172	11390215	9909434	13257596	50.0 50.0	50.0	50.0	50.0	50.0
13C4 PFOS	Ave	10914613 10053294	13189624	11132983	11281105	13983781	47.8 47.8	47.8	47.8	47.8	47.8

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1 Analy Batch No.: 140564

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

ANALYTE	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
		LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
13C5 PFNA	Ave	8141793 6537549	8920352	8362456	7854327	10108070	50.0 50.0	50.0	50.0	50.0	50.0
13C8 FOSA	Ave	19139237 16949269	22326638	19849207	19293148	23126232	50.0 50.0	50.0	50.0	50.0	50.0
M2-8:2FTS	Ave	4450751	4263521 5764339	5378444	3917070	4144623	47.9	47.9 47.9	47.9	47.9	47.9
13C2 PFDA	Ave	7667226 6410340	8786342	7861453	7405870	9213875	50.0 50.0	50.0	50.0	50.0	50.0
d3-NMeFOSAA	Ave	3668263	3321758 3953776	4323749	3368323	3122973	50.0	50.0 50.0	50.0	50.0	50.0
d5-NEtFOSAA	Ave	4095032	3822164 4091711	4650188	3818745	3419439	50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFUnA	Ave	5831263 4513820	6485474	6085968	5625237	7086903	50.0 50.0	50.0	50.0	50.0	50.0
d-N-MeFOSA-M	Ave	5526561	4696243 5465444	6162693	4885054	4794382	50.0	50.0 50.0	50.0	50.0	50.0
d-N-EtFOSA-M	Ave	5054297	4355916 5223764	5747792	4699997	4667809	50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFDoA	Ave	5353024 4817286	6067987	5448882	5338479	6599493	50.0 50.0	50.0	50.0	50.0	50.0
13C2-PFTeDA	Ave	11035471 9518260	12877999	11401035	11031119	13488161	50.0 50.0	50.0	50.0	50.0	50.0
13C2-PFHxDA	Ave	6102203 5482429	7363997	6483658	5893329	7591947	50.0 50.0	50.0	50.0	50.0	50.0

Curve Type Legend:
Ave = Average

FORM VI

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1 Analy Batch No.: 140564

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-140564/4	03DEC2016A_004.d
Level 2	IC 320-140564/13	03DEC2016A_013.d
Level 3	IC 320-140564/5	03DEC2016A_005.d
Level 4	IC 320-140564/14	03DEC2016A_014.d
Level 5	IC 320-140564/6	03DEC2016A_006.d
Level 6	IC 320-140564/15	03DEC2016A_015.d
Level 7	IC 320-140564/7	03DEC2016A_007.d
Level 8	IC 320-140564/16	03DEC2016A_016.d
Level 9	IC 320-140564/8	03DEC2016A_008.d
Level 10	IC 320-140564/17	03DEC2016A_017.d
Level 11	IC 320-140564/9	03DEC2016A_009.d
Level 12	IC 320-140564/18	03DEC2016A_018.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Perfluorobutanoic acid (PFBA)		AveID	142784 42806432	7008467	286663	14048645	1758998	0.500 200	20.0	1.00	50.0	5.00
Perfluoropentanoic acid (PFPeA)		AveID	150105 35527936	6115663	267561	12597041	1580002	0.500 200	20.0	1.00	50.0	5.00
Perfluorobutanesulfonic acid (PFBS)		AveID	222806 53135654	10888534	433384	21513660	2768149	0.442 177	17.7	0.884	44.2	4.42
Perfluorohexanoic acid (PFHxA)		AveID	117888 33117925	5224102	221801	10420431	1358530	0.500 200	20.0	1.00	50.0	5.00
Perfluoroheptanoic acid (PFHpA)		AveID	110651 30013620	4918226	215700	9915679	1254320	0.500 200	20.0	1.00	50.0	5.00
Perfluorohexanesulfonic acid (PFHxS)		AveID	+++++ 47221104	6968734	340243	14498414	1846932	+++++ 182	18.2	0.910	45.5	4.55
6:2FTS		AveID	352721	+++++ 18026595	2169230	69385	4576863	4.74	+++++ 190	19.0	0.948	47.4
Perfluorooctanoic acid (PFOA)		AveID	+++++ 30853962	5292388	266474	10434085	1455373	+++++ 200	20.0	1.00	50.0	5.00

FORM VI

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1 Analy Batch No.: 140564

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	137547 39398056	6678298	251617	13806464	1641199	0.476 190	19.0	0.952	47.6	4.76
Perfluorooctane Sulfonate (PFOS)		AveID	+++++ 43077470	5631788	230863	11953842	1443163	+++++ 186	18.6	0.928	46.4	4.64
Perfluorononanoic acid (PFNA)		AveID	86737 24899337	3804327	158219	7675034	981559	0.500 200	20.0	1.00	50.0	5.00
Perfluorooctane Sulfonamide (FOSA)		AveID	185050 50658186	9111782	375193	18269014	2262174	0.500 200	20.0	1.00	50.0	5.00
8:2FTS		AveID	326213	37551 16850029	2029390	63932	4279048	4.79	0.479 192	19.2	0.958	47.9
Perfluorodecanoic acid (PFDA)		AveID	78320 23571490	3434382	147102	7159278	868604	0.500 200	20.0	1.00	50.0	5.00
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	260030	23619 13566790	1655435	53845	3484088	5.00	0.500 200	20.0	1.00	50.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	265257	25433 13047697	1629443	49948	3261537	5.00	0.500 200	20.0	1.00	50.0
Perfluorodecanesulfonic acid (PFDS)		AveID	68667 24987612	3548629	150371	7347809	868168	0.482 193	19.3	0.964	48.2	4.82
Perfluoroundecanoic acid (PFUnA)		AveID	77125 17818228	2673576	130643	5553051	704273	0.500 200	20.0	1.00	50.0	5.00
MeFOSA		AveID	356898	37442 17635948	2189848	72155	4656344	5.00	0.500 200	20.0	1.00	50.0
N-EtFOSA-M		AveID	365313	36079 18234509	2201423	72107	4735360	5.00	0.500 200	20.0	1.00	50.0
Perfluorododecanoic acid (PFDoA)		AveID	53202 17773370	2415187	100943	5000795	606951	0.500 200	20.0	1.00	50.0	5.00

FORM VI

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1 Analy Batch No.: 140564

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Perfluorotridecanoic Acid (PFTriA)		AveID	53449 17494025	2373060	100348	5034109	627673	0.500 200	20.0	1.00	50.0	5.00
Perfluorotetradecanoic acid (PFTeA)		AveID	109549 30593527	4681126	215694	9601518	1175506	0.500 200	20.0	1.00	50.0	5.00
Perfluoro-n-hexadecanoic acid (PFHxDA)		L1ID	127409 18912385	2870345	184956	5382109	766480	0.500 200	20.0	1.00	50.0	5.00
Perfluoro-n-octadecanoic acid (PFODA)		AveID	50040 17844066	2205153	119152	5729058	673971	0.500 200	20.0	1.00	50.0	5.00

Curve Type Legend:

AveID = Average isotope dilution
L1ID = Linear 1/conc IsoDil

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_004.d
Lims ID: IC L1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 03-Dec-2016 13:48:41 ALS Bottle#: 37 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L1_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub3

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 05-Dec-2016 10:24:05 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:42:37

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.582	1.574	0.008		15509259	46.2		92.4	1670611	
1 Perfluorobutyric acid										
212.90 > 169.00	1.582	1.577	0.005	1.000	142784	0.5267		105	902	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.868	1.861	0.007	1.000	150105	0.5803		116	1311	
D 4 13C5-PFPeA										
267.90 > 223.00	1.868	1.861	0.007		12743752	48.2		96.3	785537	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.906	1.900	0.006	1.000	222806	0.4748		107		
298.90 > 99.00	1.906	1.900	0.006	1.000	90815		2.45(0.00-0.00)	107		
7 Perfluorohexanoic acid										
313.00 > 269.00	2.170	2.164	0.006	1.000	117888	0.5373		107	2866	
D 6 13C2 PFHxA										
315.00 > 270.00	2.179	2.164	0.015		11509685	48.5		96.9	1035144	
D 11 13C4-PFHpA										
367.00 > 322.00	2.521	2.511	0.010		10024418	48.3		96.7	941002	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.521	2.512	0.009	1.000	110651	0.5374		107	1512	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.544	2.531	0.013	1.000	195583	0.6061		133		
D 10 18O2 PFHxS										
403.00 > 84.00	2.544	2.531	0.013		13905891	44.5		94.1	1599849	
D 14 13C4 PFOA										
417.00 > 372.00	2.886	2.880	0.006		10969960	50.0		100	702523	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.902	2.887	0.015	1.000	176658	0.7512		150	2006	
413.00 > 169.00	2.902	2.887	0.015	1.000	83124		2.13(0.90-1.10)	150	4894	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.902	2.888	0.014	1.000	137547	0.5117		108		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.267	3.258	0.009	1.000	118203	0.4770		103	15866	
499.00 > 99.00	3.250	3.258	-0.008	0.995	0		0.00(0.90-1.10)	103		
D 17 13C4 PFOS										
503.00 > 80.00	3.267	3.259	0.008		10914613	44.4		92.8	963774	
D 19 13C5 PFNA										
468.00 > 423.00	3.275	3.263	0.012		8141793	48.9		97.8	521938	
20 Perfluorononanoic acid										M
463.00 > 419.00	3.275	3.263	0.012	1.000	86737	0.5346		107	1741	M
D 21 13C8 FOSA										
506.00 > 78.00	3.581	3.571	0.010		19139237	47.6		95.2	555083	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.581	3.574	0.007	1.000	185050	0.5175		104	16767	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.632	3.623	0.009	1.000	78320	0.5318		106	2431	
D 23 13C2 PFDA										
515.00 > 470.00	3.640	3.626	0.014		7667226	48.6		97.2	219644	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.945	3.936	0.009	1.000	68667	0.4701		97.5		
28 Perfluoroundecanoic acid										M
563.00 > 519.00	3.971	3.955	0.016	1.000	77125	0.6205		124	2113	M
D 27 13C2 PFUnA										
565.00 > 520.00	3.971	3.958	0.013		5831263	49.1		98.2	341809	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.261	4.250	0.011	1.000	53202	0.5236		105	752	
D 30 13C2 PFDoA										
615.00 > 570.00	4.261	4.251	0.010		5353024	47.8		95.5	191441	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.535	4.518	0.017	1.000	53449	0.5256		105	91.0	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.778	4.759	0.019		11035471	47.7		95.5	488569	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.778	4.761	0.017	1.000	109549	0.5520		110	60.5	
713.00 > 169.00	4.770	4.761	0.009	0.998	20451		5.36(0.00-0.00)	110	3502	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.208	5.186	0.022		6102203	47.0		94.1	113568	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.208	5.186	0.022	1.000	127409	0.4441		88.8	179	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.584	5.559	0.025	1.000	50040	0.4708		94.2	82.2	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L1_00021 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2016 10:24:06 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_004.d

Injection Date: 03-Dec-2016 13:48:41 Instrument ID: A8_N

Lims ID: IC L1

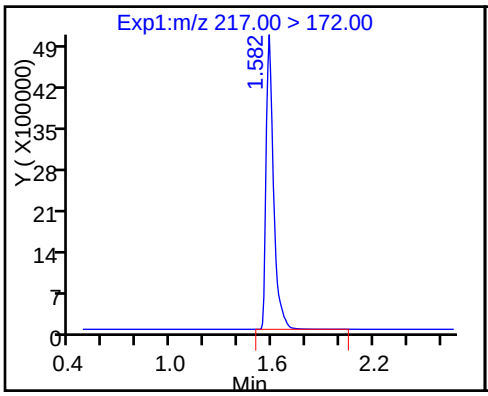
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4

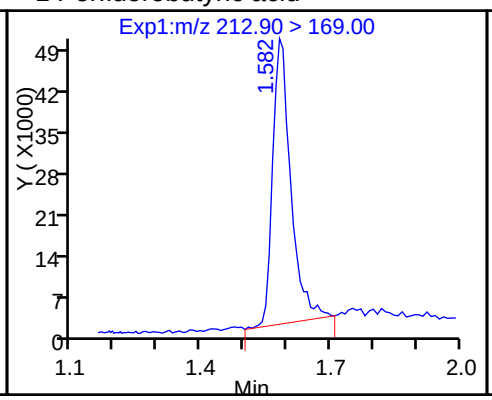
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

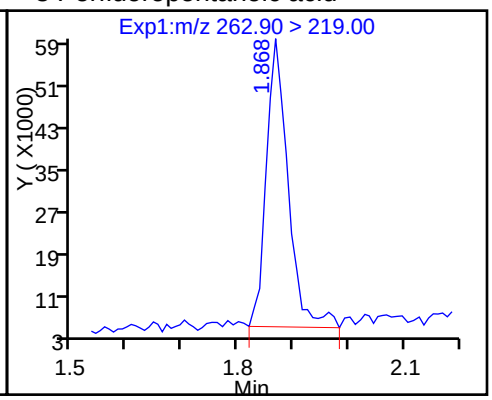
D 2 13C4 PFBA



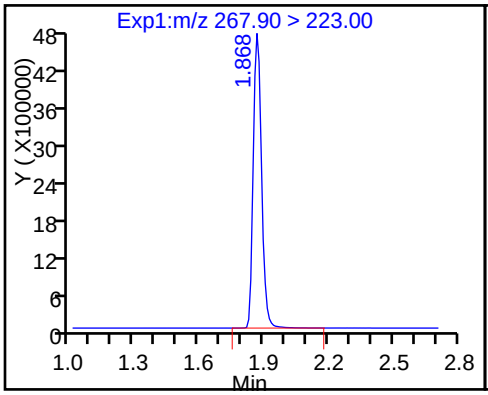
1 Perfluorobutyric acid



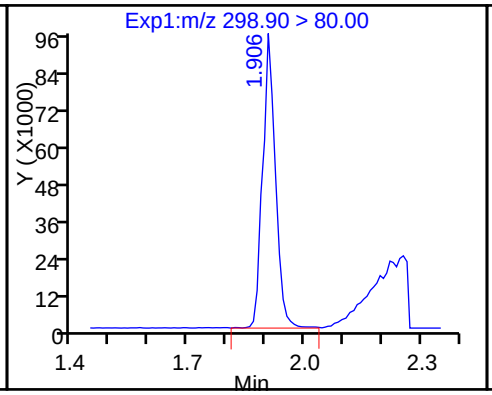
3 Perfluoropentanoic acid



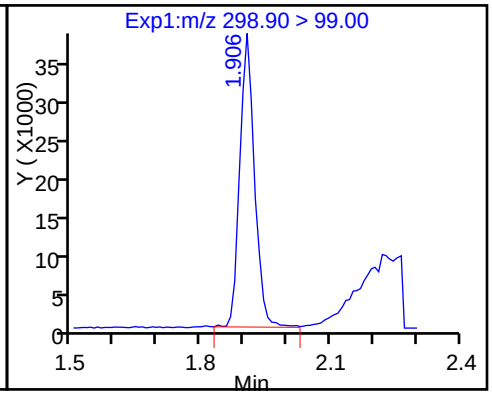
D 4 13C5-PFPeA



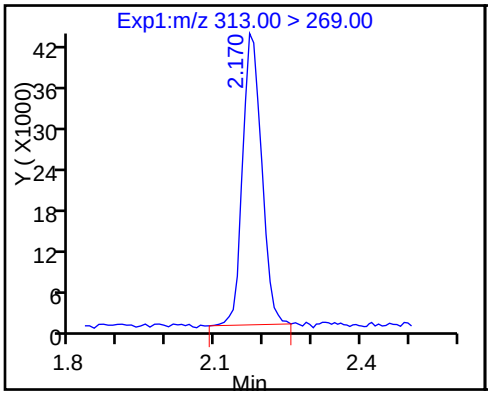
5 Perfluorobutanesulfonic acid



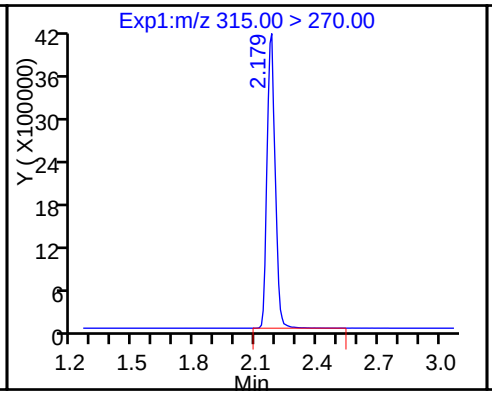
5 Perfluorobutanesulfonic acid



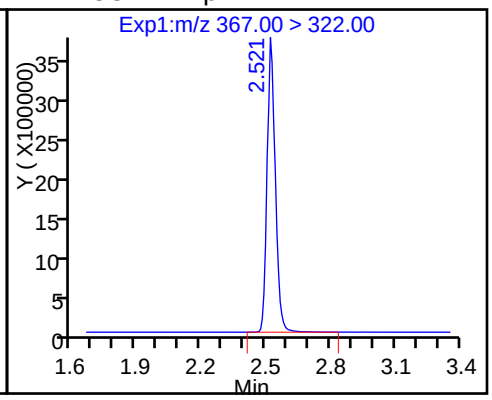
7 Perfluorohexanoic acid



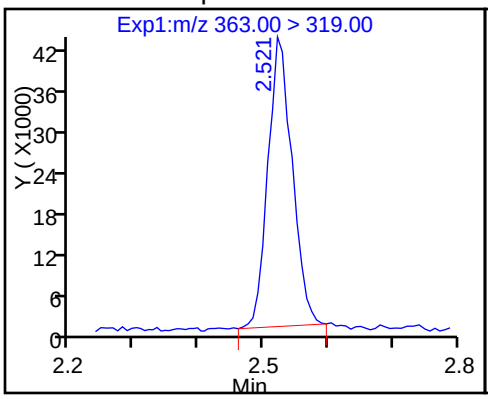
D 6 13C2 PFHxA



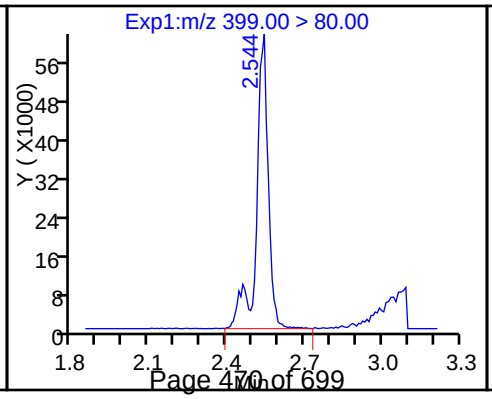
D 11 13C4-PFHpA



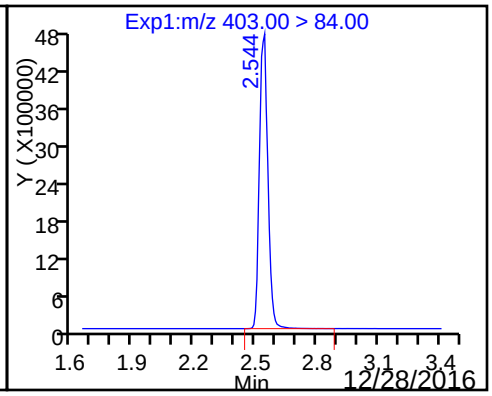
12 Perfluoroheptanoic acid



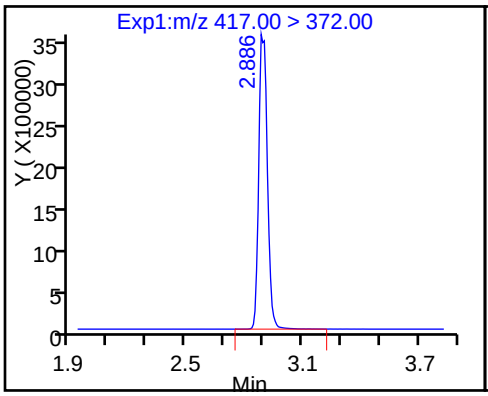
9 Perfluorohexanesulfonic acid



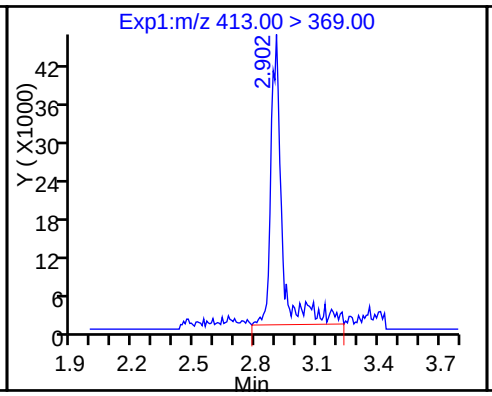
D 10 18O2 PFHxS



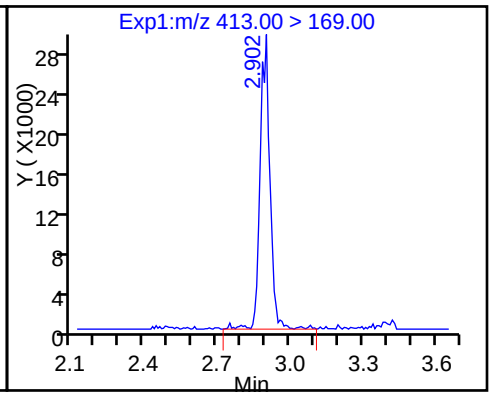
D 14 13C4 PFOA



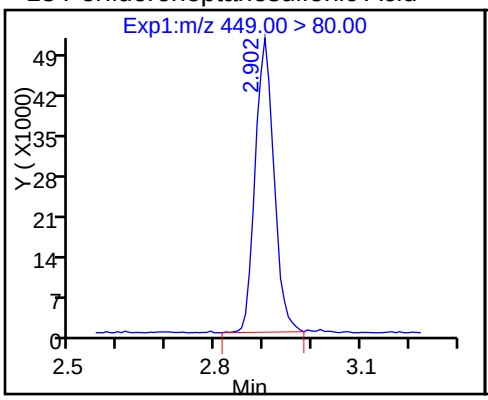
15 Perfluorooctanoic acid



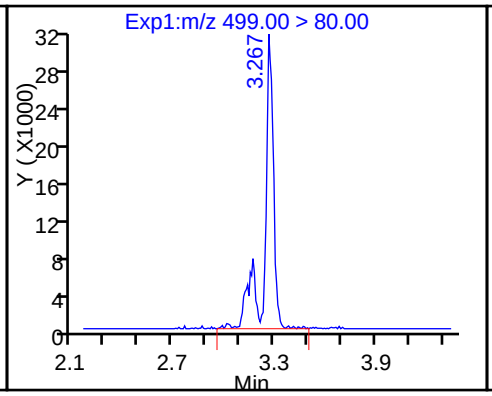
15 Perfluorooctanoic acid



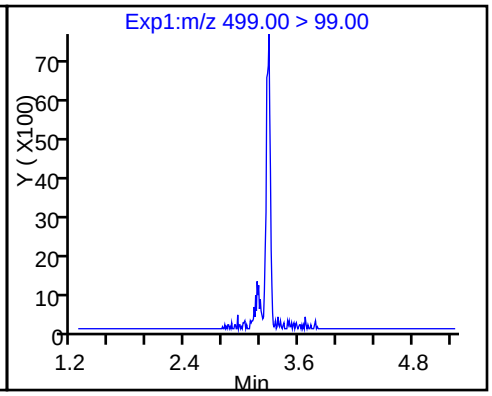
13 Perfluoroheptanesulfonic Acid



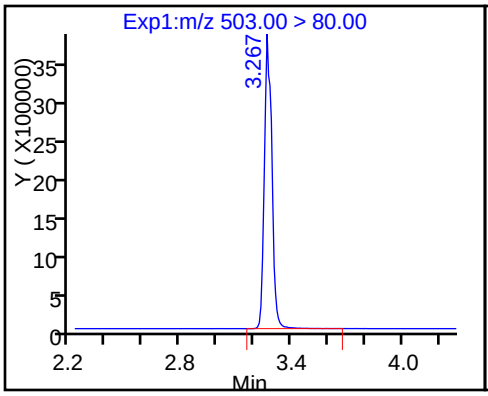
18 Perfluorooctane sulfonic acid



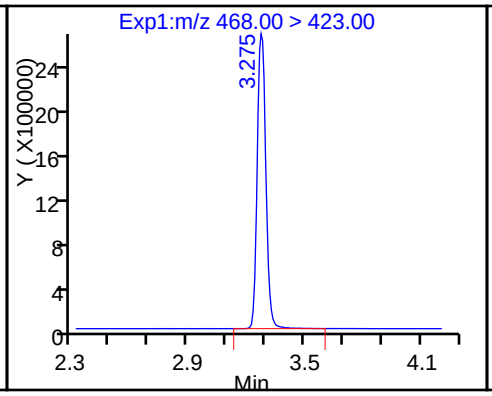
18 Perfluorooctane sulfonic acid



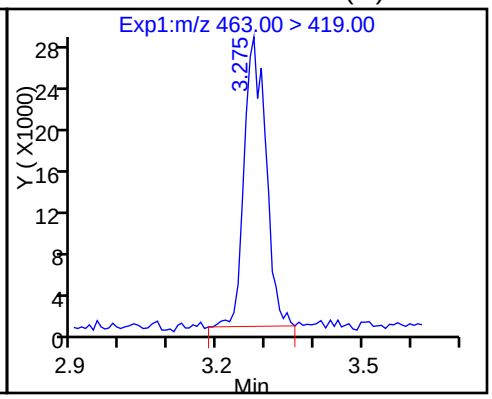
D 17 13C4 PFOS



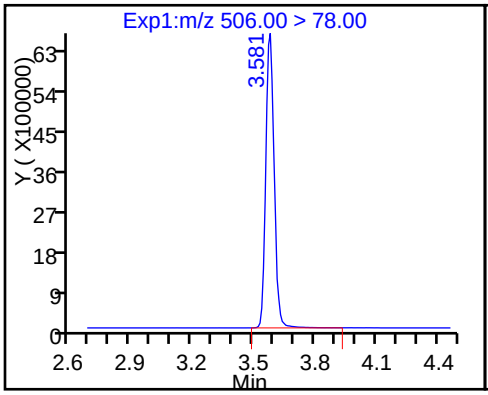
D 19 13C5 PFNA



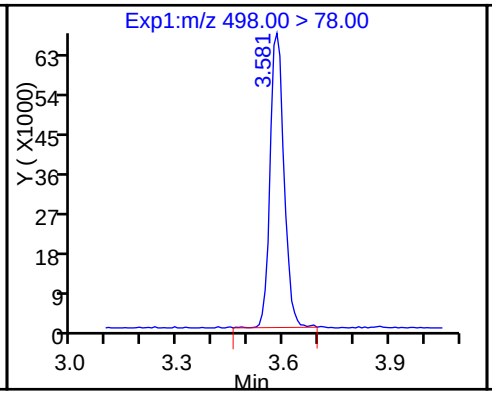
20 Perfluorononanoic acid (M)



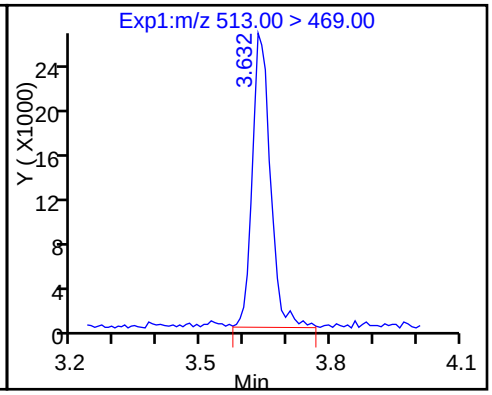
D 21 13C8 FOSA



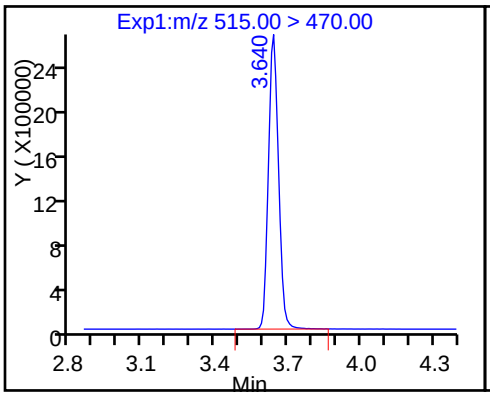
22 Perfluorooctane Sulfonamide



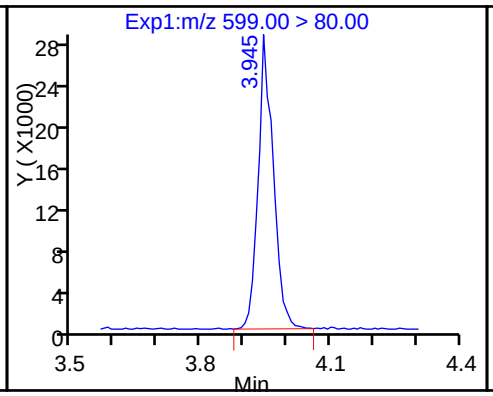
24 Perfluorodecanoic acid



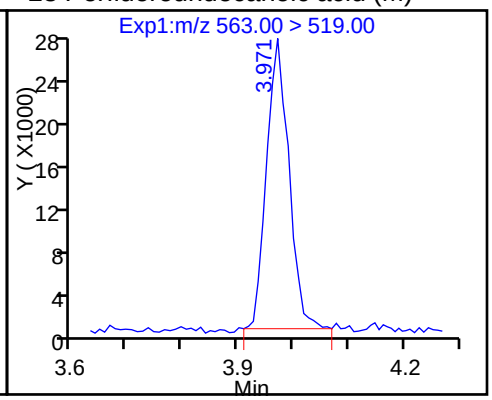
D 23 13C2 PFDA



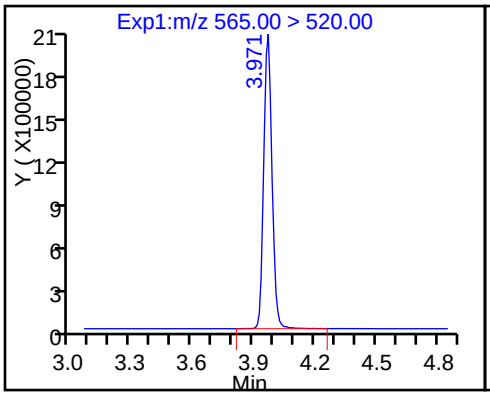
26 Perfluorodecane Sulfonic acid



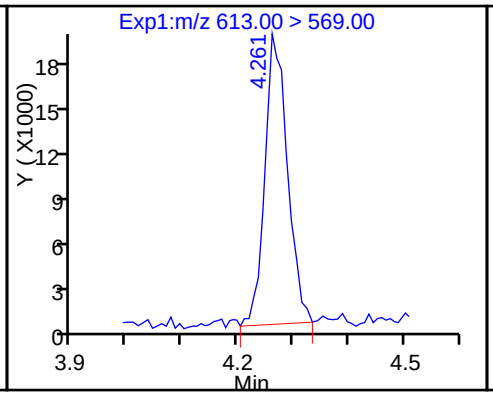
28 Perfluoroundecanoic acid (M)



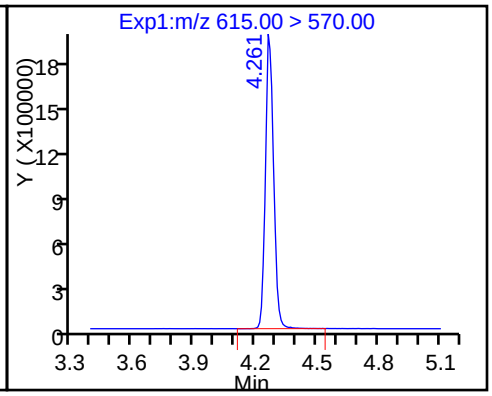
D 27 13C2 PFUnA



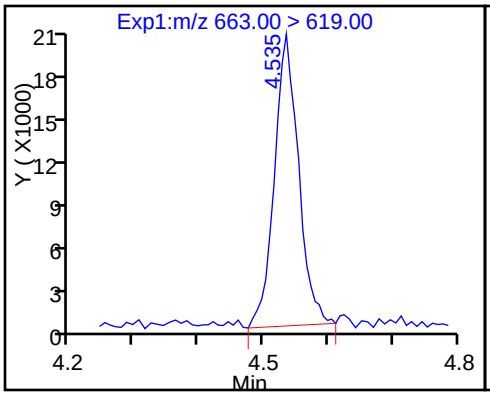
29 Perfluorododecanoic acid



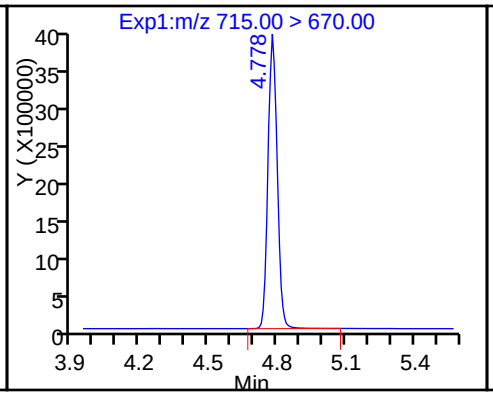
D 30 13C2 PFDoA



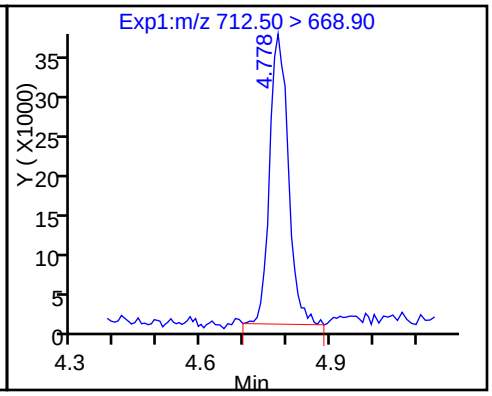
31 Perfluorotridecanoic acid



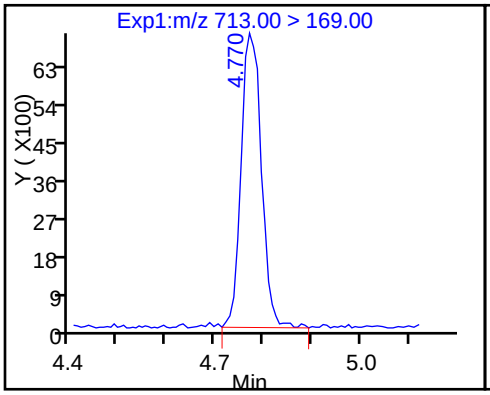
D 32 13C2-PFTeDA



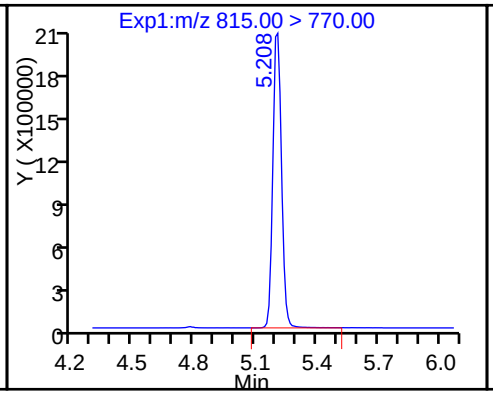
33 Perfluorotetradecanoic acid



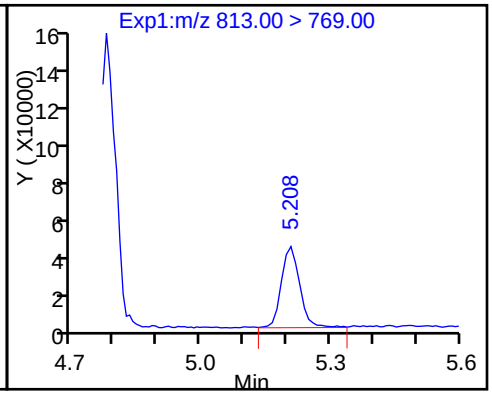
33 Perfluorotetradecanoic acid



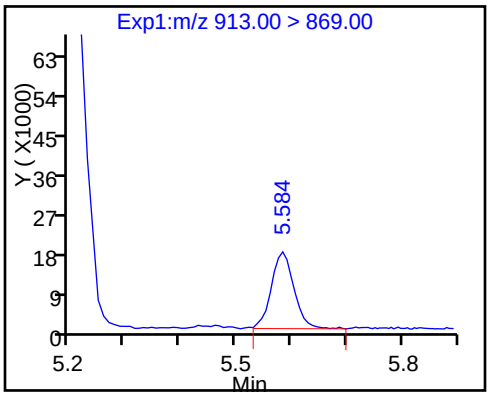
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

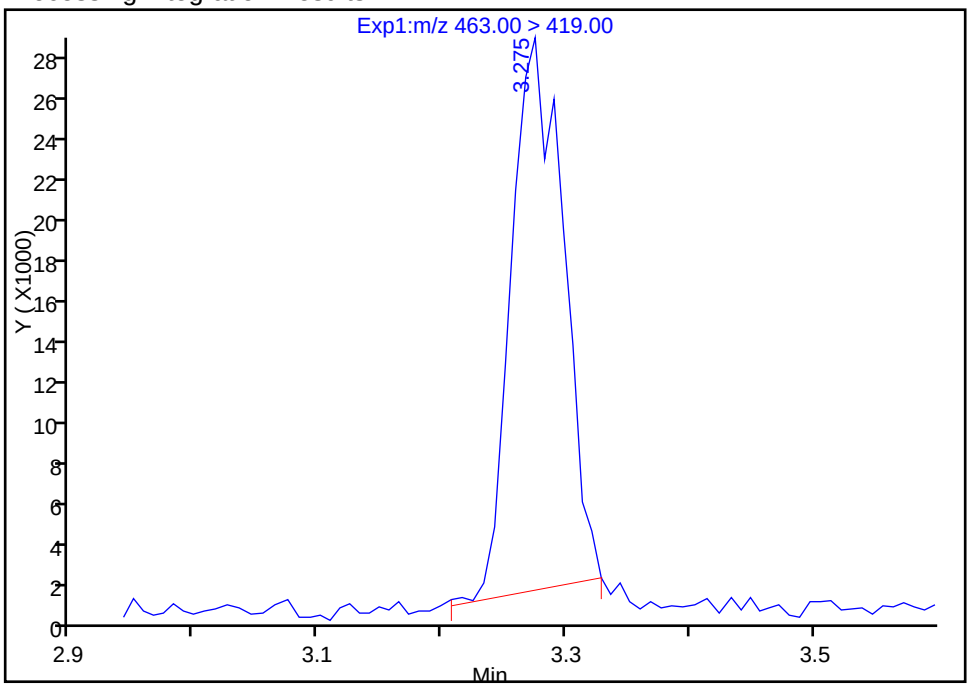
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_004.d				
Injection Date:	03-Dec-2016 13:48:41	Instrument ID:	A8_N		
Lims ID:	IC L1				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	37	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

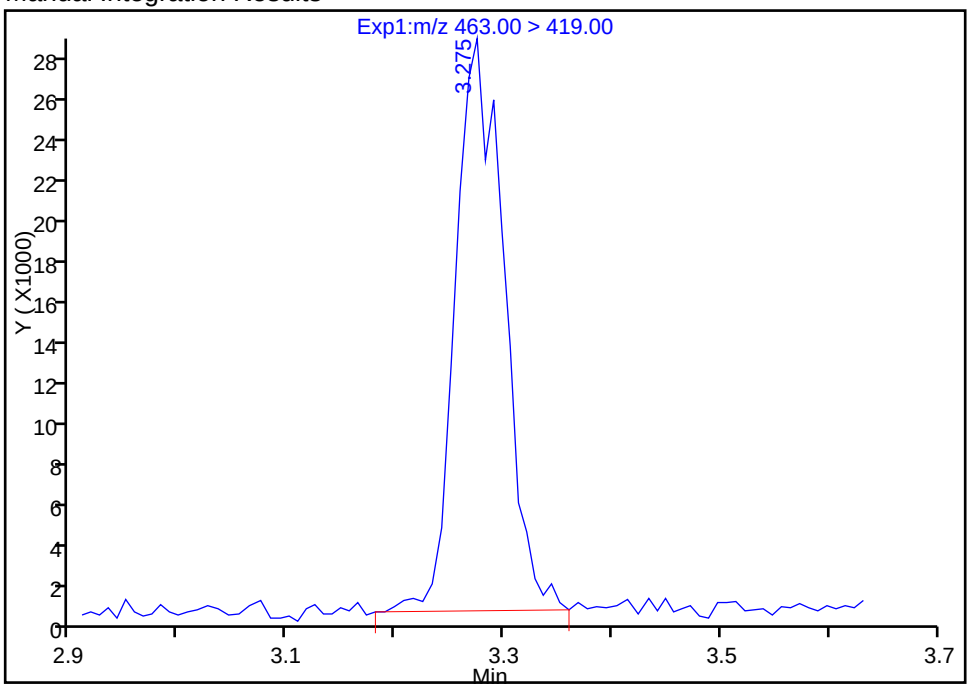
Processing Integration Results

RT: 3.28
Area: 78587
Amount: 0.492646
Amount Units: ng/ml



Manual Integration Results

RT: 3.28
Area: 86737
Amount: 0.534631
Amount Units: ng/ml



Reviewer: chandrasenas, 05-Dec-2016 09:42:37

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

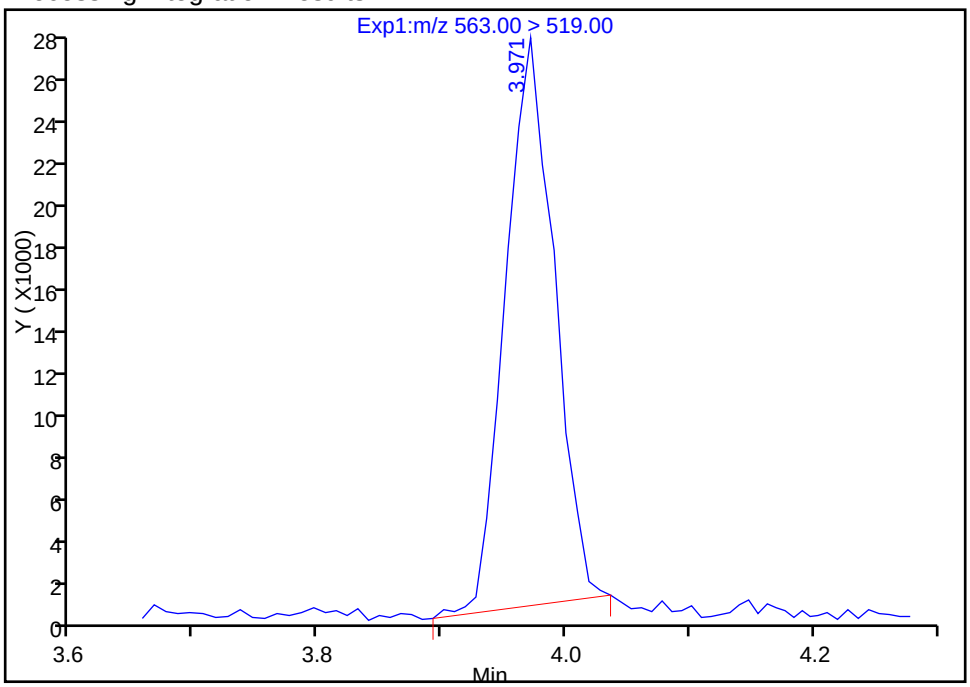
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_004.d				
Injection Date:	03-Dec-2016 13:48:41	Instrument ID:	A8_N		
Lims ID:	IC L1				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	37	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

28 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 1

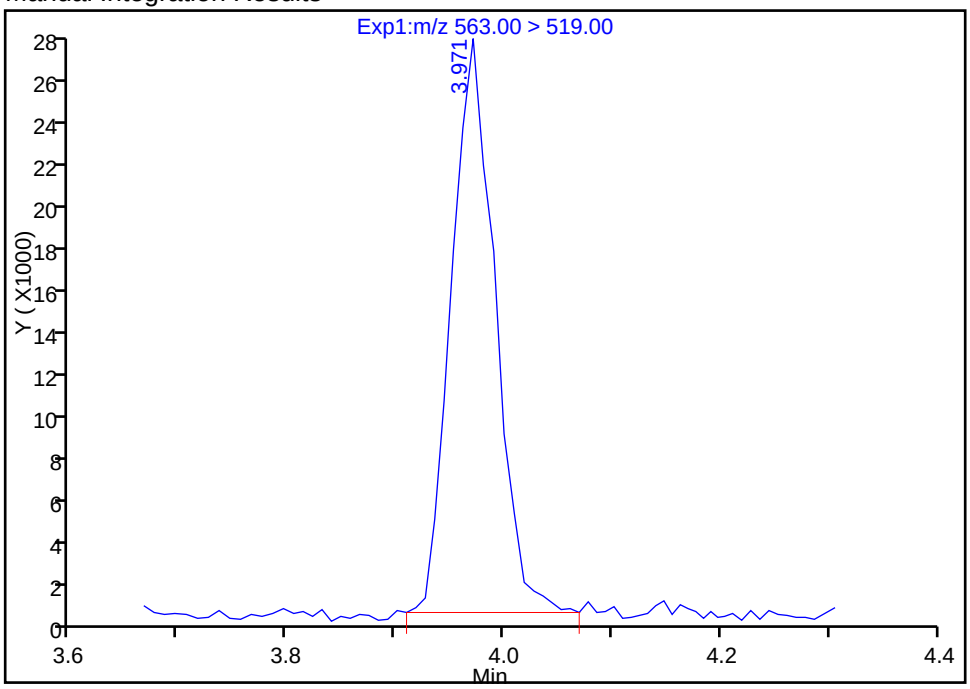
Processing Integration Results

RT: 3.97
Area: 74499
Amount: 0.603647
Amount Units: ng/ml



Manual Integration Results

RT: 3.97
Area: 77125
Amount: 0.620524
Amount Units: ng/ml



Reviewer: chandrasenas, 05-Dec-2016 09:42:37

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_005.d
Lims ID: IC L2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 03-Dec-2016 13:56:13 ALS Bottle#: 38 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L2_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub3

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 05-Dec-2016 10:24:08 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:43:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.574	1.574	0.0		16567343	49.3		98.7	1253121	
1 Perfluorobutyric acid										
212.90 > 169.00	1.574	1.577	-0.003	1.000	286663	0.9899		99.0	1783	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.858	1.861	-0.003	1.000	267561	1.02		102	2233	
D 4 13C5-PFPeA										
267.90 > 223.00	1.858	1.861	-0.003		12919402	48.8		97.7	738841	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.897	1.900	-0.003	1.000	433384	0.8763		99.1		
298.90 > 99.00	1.897	1.900	-0.003	1.000	173533		2.50(0.00-0.00)	99.1		
7 Perfluorohexanoic acid										
313.00 > 269.00	2.164	2.164	0.0	1.000	221801	0.9891		98.9	4857	
D 6 13C2 PFHxA										
315.00 > 270.00	2.164	2.164	0.0		11763139	49.5		99.1	702628	
D 11 13C4-PFHpA										
367.00 > 322.00	2.512	2.511	0.001		10489748	50.6		101	757325	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.512	2.512	0.0	1.000	215700	1.00		100	2505	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.535	2.531	0.004	1.000	340243	1.00		110		
D 10 18O2 PFHxS										
403.00 > 84.00	2.535	2.531	0.004		14656306	46.9		99.2	569002	
D 14 13C4 PFOA										
417.00 > 372.00	2.886	2.880	0.006		11390215	51.9		104	1255788	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.894	2.887	0.007	1.000	266474	1.09		109	2568	
413.00 > 169.00	2.886	2.887	-0.001	0.997	153584		1.74(0.90-1.10)	109	8517	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.886	2.888	-0.002	1.000	251617	0.9178		96.4		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.259	3.258	0.001	1.000	230863	0.9134		98.4	60496	
499.00 > 99.00	3.268	3.258	0.010	1.003	49554		4.66(0.90-1.10)	98.4	7390	
D 17 13C4 PFOS										
503.00 > 80.00	3.259	3.259	0.0		11132983	45.3		94.7	553508	
D 19 13C5 PFNA										
468.00 > 423.00	3.268	3.263	0.005		8362456	50.3		101	686636	
20 Perfluorononanoic acid										
463.00 > 419.00	3.268	3.263	0.005	1.000	158219	0.9495		94.9	2139	
D 21 13C8 FOSA										
506.00 > 78.00	3.565	3.571	-0.006		19849207	49.3		98.7	435087	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.573	3.574	-0.001	1.000	375193	1.01		101	37696	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.632	3.623	0.009	1.000	147102	0.9741		97.4	6264	
D 23 13C2 PFDA										
515.00 > 470.00	3.624	3.626	-0.002		7861453	49.8		99.6	210924	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.944	3.936	0.008	1.000	150371	1.01		105		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.953	3.955	-0.003	1.000	130643	1.01		101	3153	
D 27 13C2 PFUnA										
565.00 > 520.00	3.961	3.958	0.003		6085968	51.2		102	355525	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.254	4.250	0.004	1.000	100943	0.9761		97.6	1508	
D 30 13C2 PFDoA										
615.00 > 570.00	4.262	4.251	0.011		5448882	48.6		97.2	155924	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.515	4.518	-0.003	1.000	100348	0.9695		96.9	172	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.762	4.759	0.003		11401035	49.3		98.6	776058	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.770	4.761	0.009	1.000	215694	1.07		107	105	
713.00 > 169.00	4.762	4.761	0.001	0.998	35526		6.07(0.00-0.00)	107	12035	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.196	5.186	0.010		6483658	50.0		100.0	170445	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.196	5.186	0.010	1.000	184956	0.9549		95.5	215	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.565	5.559	0.006	1.000	119152	1.10		110	244	

Reagents:

LCPFC-L2_00022 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2016 10:24:08 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_005.d

Injection Date: 03-Dec-2016 13:56:13 Instrument ID: A8_N

Lims ID: IC L2

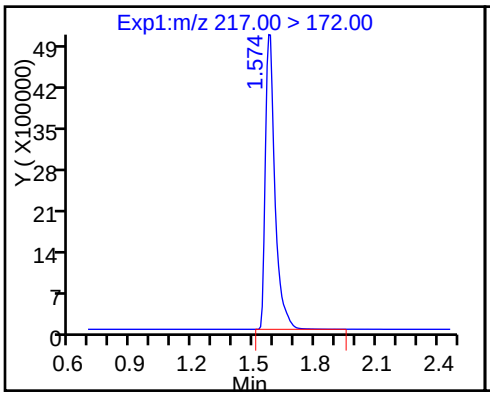
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

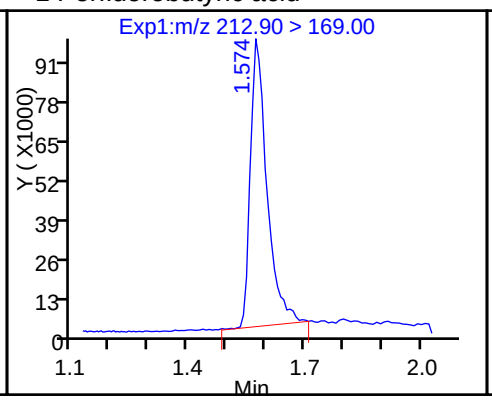
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

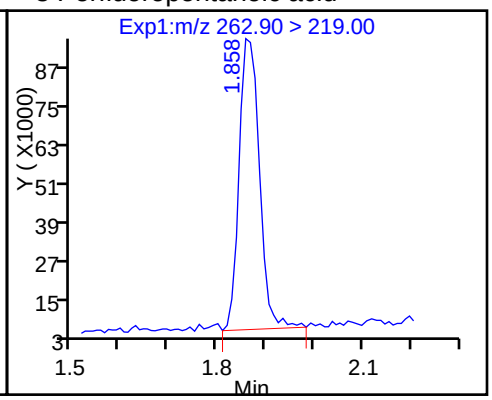
D 2 13C4 PFBA



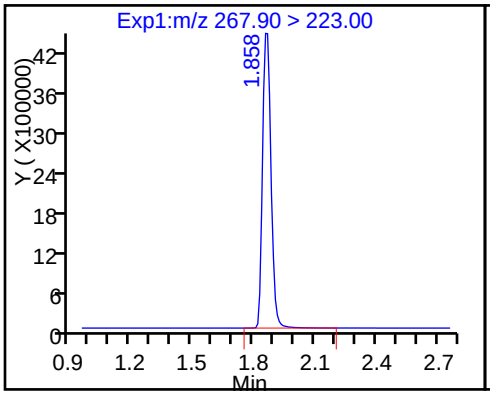
1 Perfluorobutyric acid



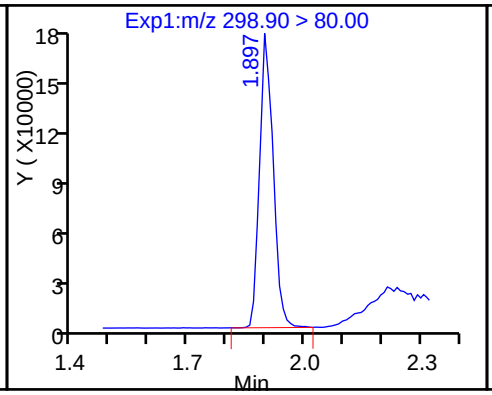
3 Perfluoropentanoic acid



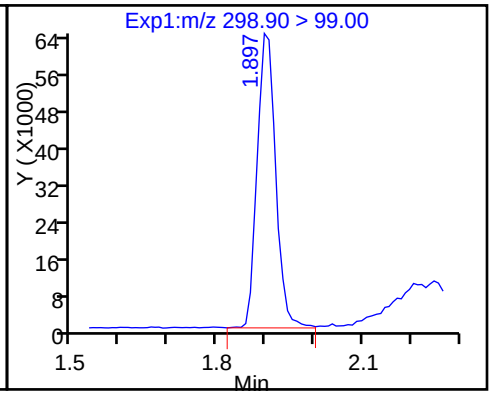
D 4 13C5-PFPeA



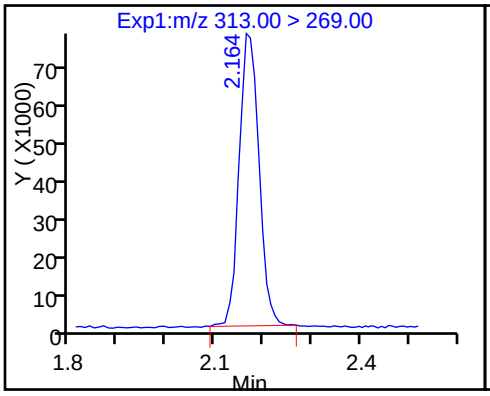
5 Perfluorobutanesulfonic acid



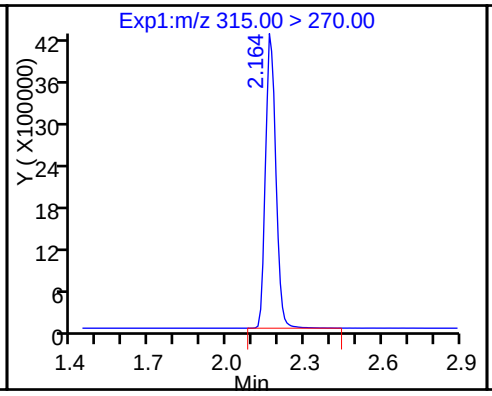
5 Perfluorobutanesulfonic acid



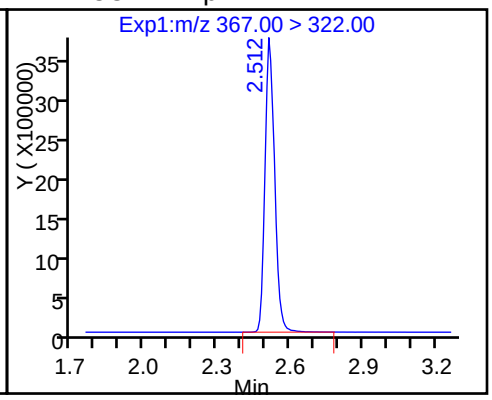
7 Perfluorohexanoic acid



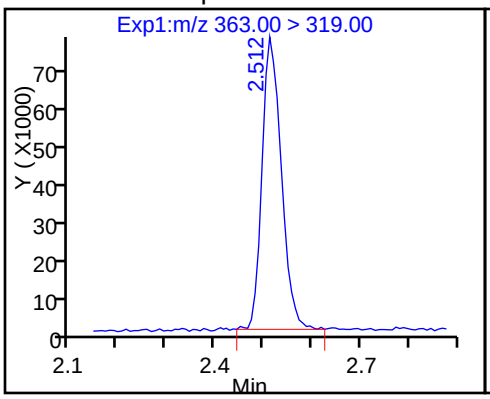
D 6 13C2 PFHxA



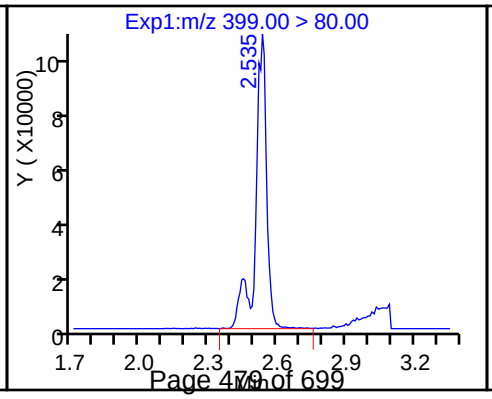
D 11 13C4-PFHpA



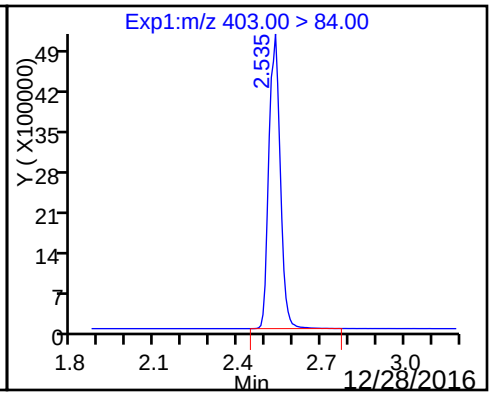
12 Perfluoroheptanoic acid



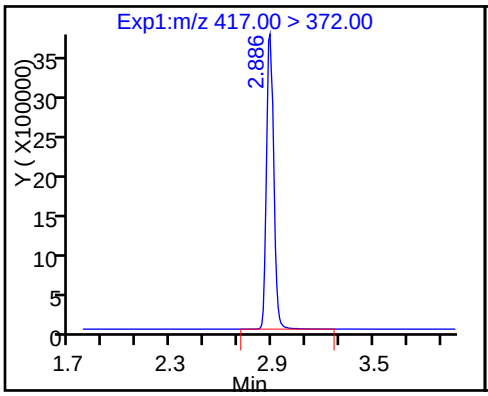
9 Perfluorohexanesulfonic acid



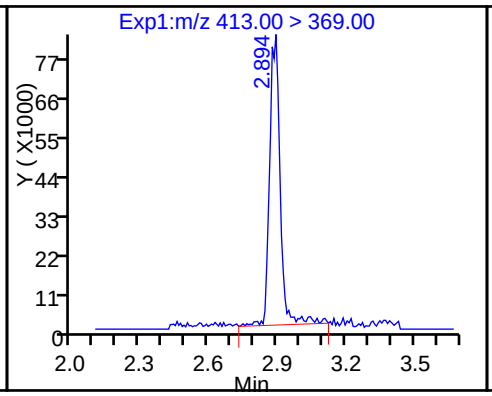
D 10 18O2 PFHxS



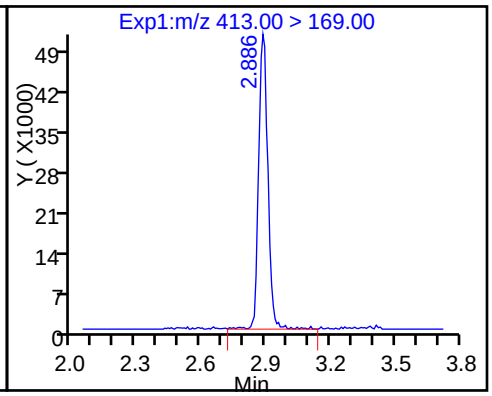
D 14 13C4 PFOA



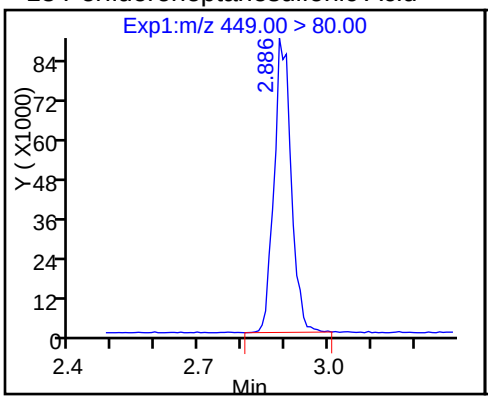
15 Perfluorooctanoic acid



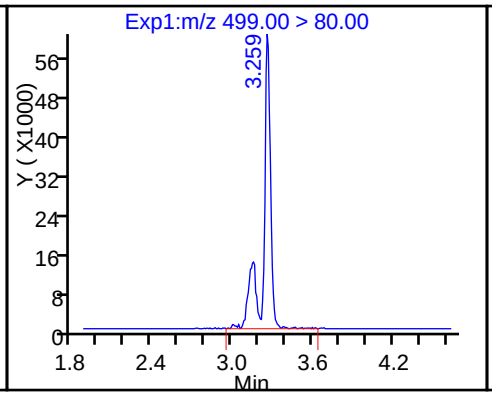
15 Perfluorooctanoic acid



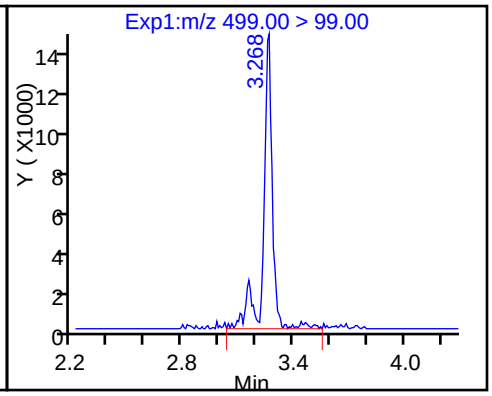
13 Perfluoroheptanesulfonic Acid



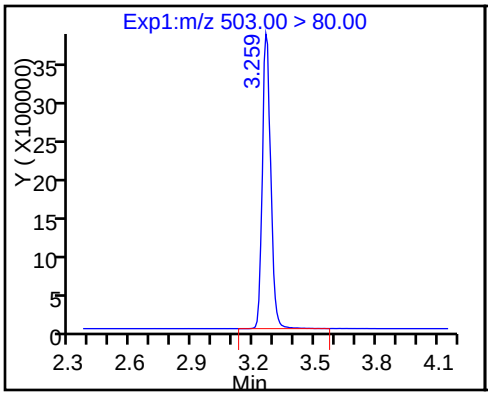
18 Perfluorooctane sulfonic acid



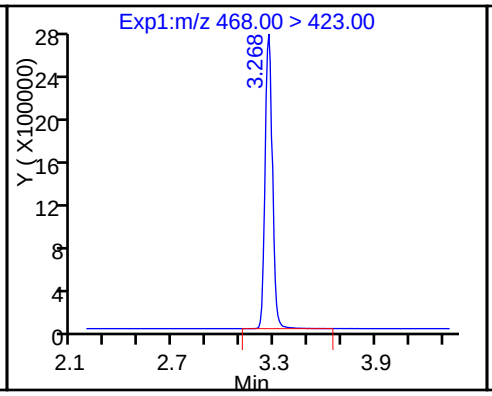
18 Perfluorooctane sulfonic acid



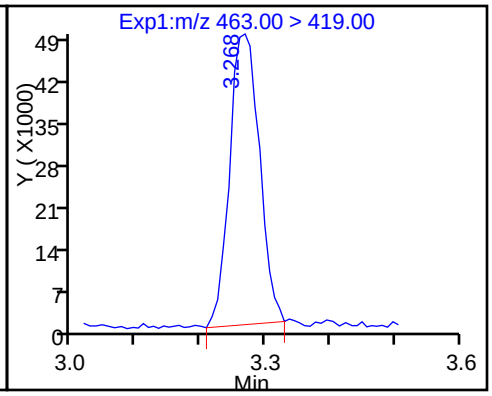
D 17 13C4 PFOS



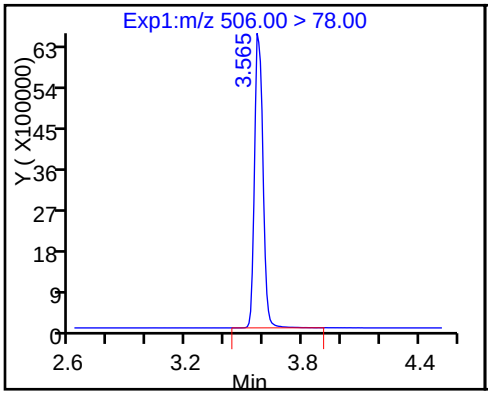
D 19 13C5 PFNA



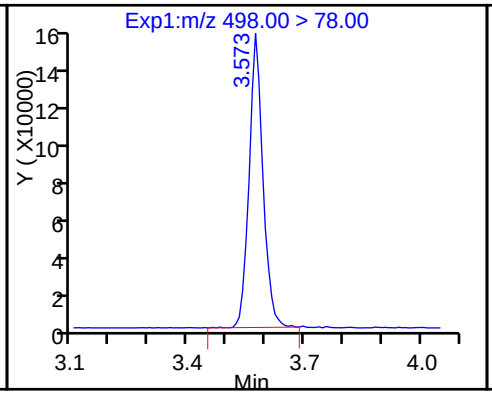
20 Perfluorononanoic acid



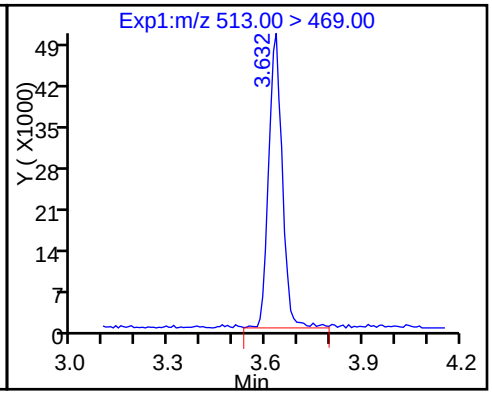
D 21 13C8 FOSA



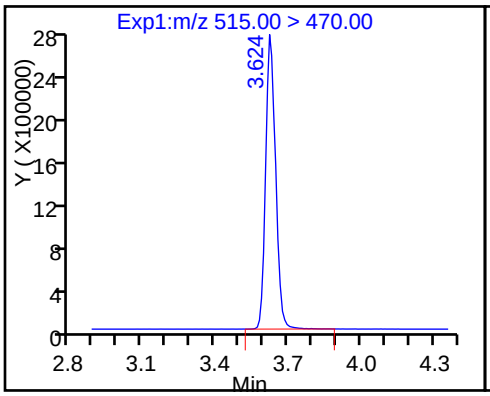
22 Perfluorooctane Sulfonamide



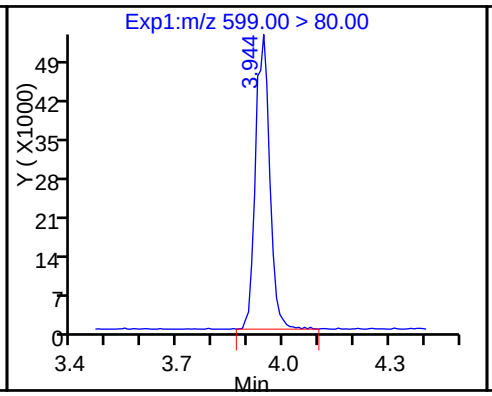
24 Perfluorodecanoic acid



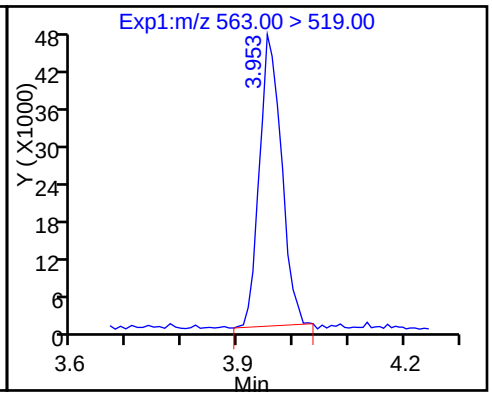
D 23 13C2 PFDA



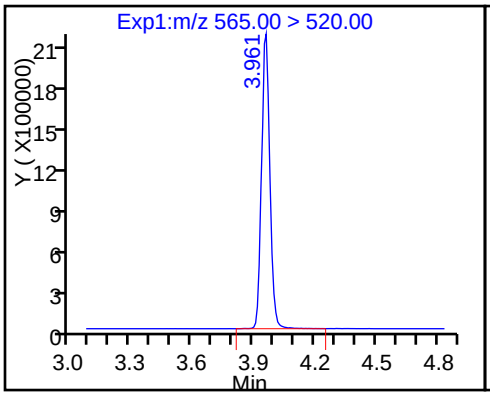
26 Perfluorodecane Sulfonic acid



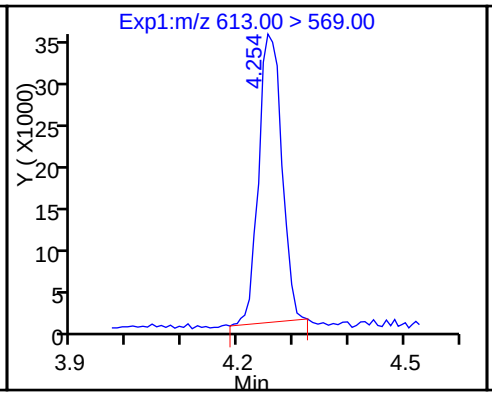
28 Perfluoroundecanoic acid



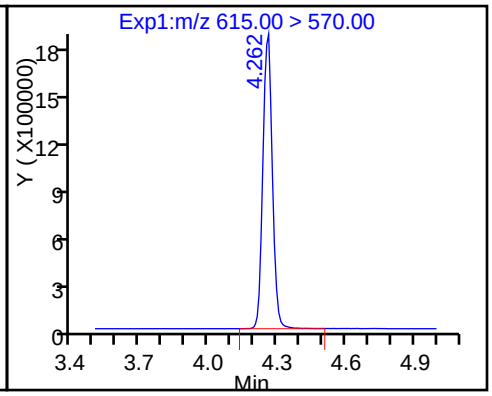
D 27 13C2 PFUnA



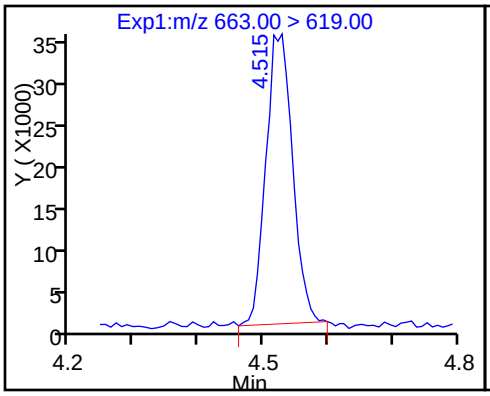
29 Perfluorododecanoic acid



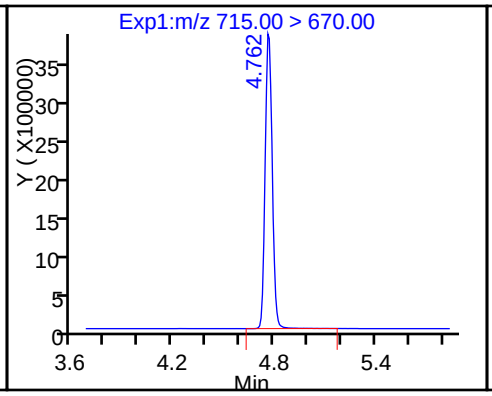
D 30 13C2 PFDoA



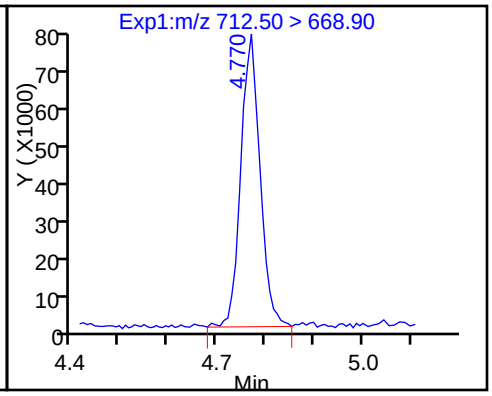
31 Perfluorotridecanoic acid



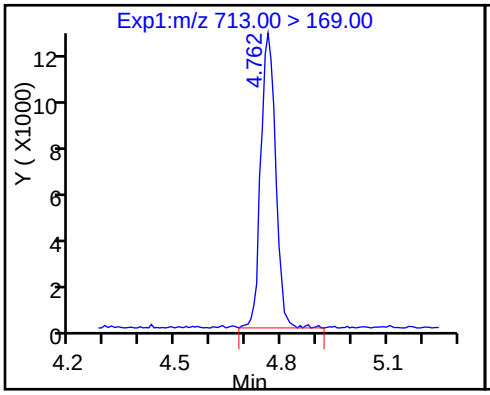
D 32 13C2-PFTeDA



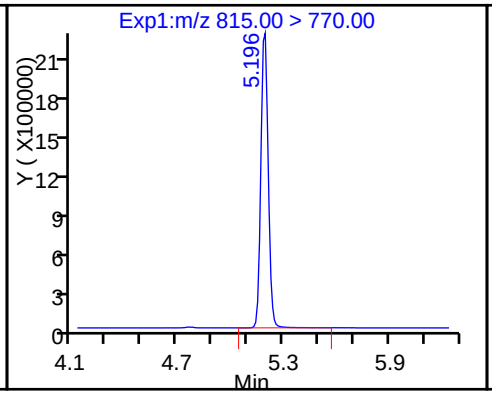
33 Perfluorotetradecanoic acid



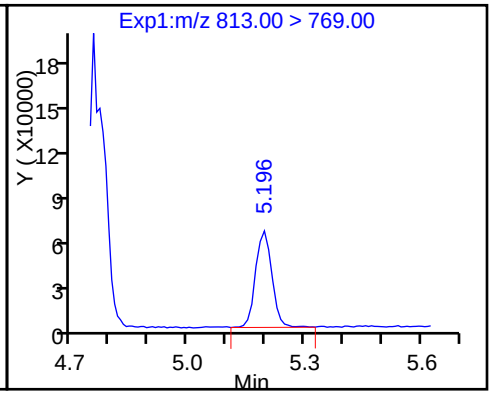
33 Perfluorotetradecanoic acid



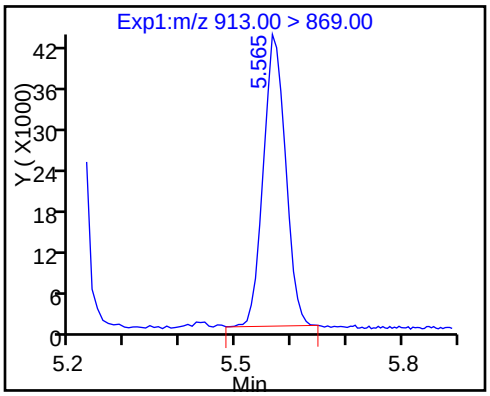
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_006.d
Lims ID: IC L3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 03-Dec-2016 14:03:44 ALS Bottle#: 39 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L3_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub3

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 05-Dec-2016 10:24:10 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:43:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.574	1.574	0.0		19799279	59.0		118	1507463	
1 Perfluorobutyric acid										
212.90 > 169.00	1.574	1.577	-0.003	1.000	1758998	5.08		102	10276	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.858	1.861	-0.003	1.000	1580002	4.98		99.6	13754	
D 4 13C5-PFPeA										
267.90 > 223.00	1.858	1.861	-0.003		15634346	59.1		118	910049	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.897	1.900	-0.003	1.000	2768149	4.72		107		
298.90 > 99.00	1.897	1.900	-0.003	1.000	1152600		2.40(0.00-0.00)	107		
7 Perfluorohexanoic acid										
313.00 > 269.00	2.163	2.164	-0.001	1.000	1358530	5.11		102	38617	
D 6 13C2 PFHxA										
315.00 > 270.00	2.163	2.164	-0.001		13959775	58.8		118	866927	
D 11 13C4-PFHpA										
367.00 > 322.00	2.508	2.511	-0.003		12498264	60.3		121	1070818	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.516	2.512	0.004	1.000	1254320	4.89		97.7	16816	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.531	2.531	0.0	1.000	1846932	4.58		101		
D 10 18O2 PFHxS										
403.00 > 84.00	2.531	2.531	0.0		17374498	55.6		118	872275	
D 14 13C4 PFOA										
417.00 > 372.00	2.880	2.880	0.0		13257596	60.5		121	935997	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.880	2.887	-0.007	1.000	1455373	5.12		102	23006	
413.00 > 169.00	2.888	2.887	0.001	1.003	828495		1.76(0.90-1.10)	102	49224	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.888	2.888	0.0	1.000	1641199	4.77		100		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.255	3.258	-0.003	1.000	1443163	4.55		98.0	374092	
499.00 > 99.00	3.255	3.258	-0.003	1.000	319030		4.52(0.90-1.10)	98.0	32937	
D 17 13C4 PFOS										
503.00 > 80.00	3.263	3.259	0.004		13983781	56.8		119	604878	
D 19 13C5 PFNA										
468.00 > 423.00	3.263	3.263	0.0		10108070	60.7		121	545062	
20 Perfluorononanoic acid										
463.00 > 419.00	3.263	3.263	0.0	1.000	981559	4.87		97.5	16647	
D 21 13C8 FOSA										
506.00 > 78.00	3.576	3.571	0.005		23126232	57.5		115	745838	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.576	3.574	0.002	1.000	2262174	5.24		105	133644	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.618	3.623	-0.005	1.000	868604	4.91		98.1	29437	
D 23 13C2 PFDA										
515.00 > 470.00	3.627	3.626	0.001		9213875	58.4		117	291561	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.938	3.936	0.002	1.000	868168	4.64		96.2		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.956	3.955	0.001	1.000	704273	4.66		93.2	19079	
D 27 13C2 PFUnA										
565.00 > 520.00	3.956	3.958	-0.002		7086903	59.7		119	336150	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.253	4.250	0.003	1.000	606951	4.85		96.9	11284	
D 30 13C2 PFDoA										
615.00 > 570.00	4.253	4.251	0.002		6599493	58.9		118	172819	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.521	4.518	0.003	1.000	627673	5.01		100	1096	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.761	4.759	0.002		13488161	58.3		117	1155339	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.761	4.761	0.0	1.000	1175506	4.80		96.1	484	
713.00 > 169.00	4.761	4.761	0.0	1.000	194335		6.05(0.00-0.00)	96.1	68892	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.180	5.186	-0.006		7591947	58.5		117	144235	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.191	5.186	0.005	1.000	766480	5.09		102	693	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.561	5.559	0.002	1.000	673971	5.14		103	887	

Reagents:

LCPFC-L3_00019 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2016 10:24:11 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_006.d

Injection Date: 03-Dec-2016 14:03:44 Instrument ID: A8_N

Lims ID: IC L3

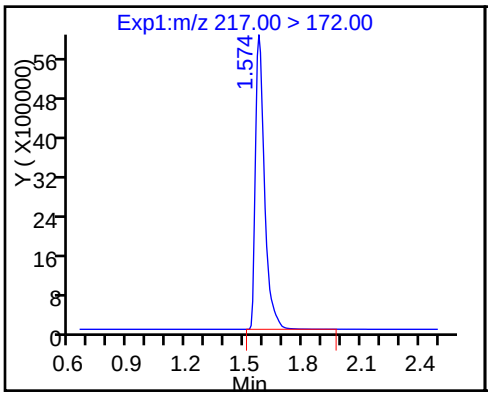
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 39 Worklist Smp#: 6

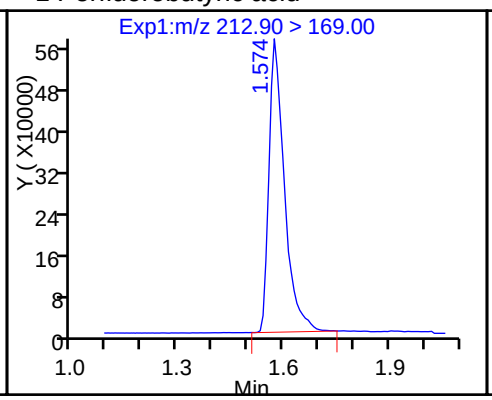
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

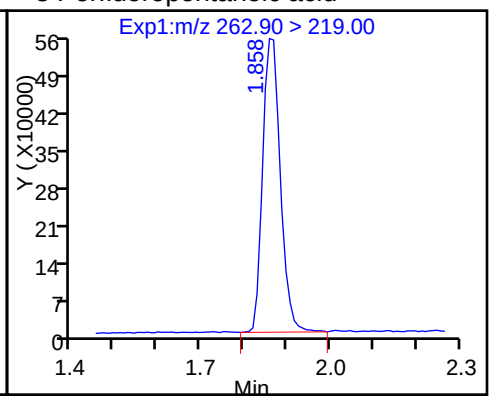
D 2 13C4 PFBA



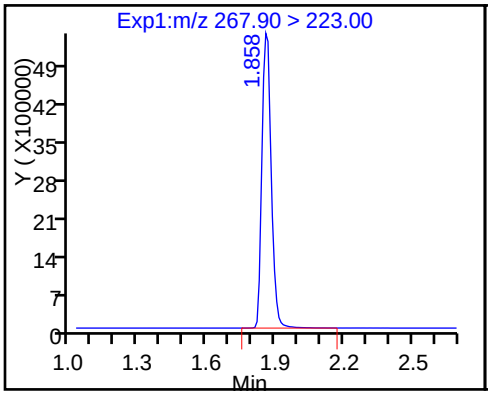
1 Perfluorobutyric acid



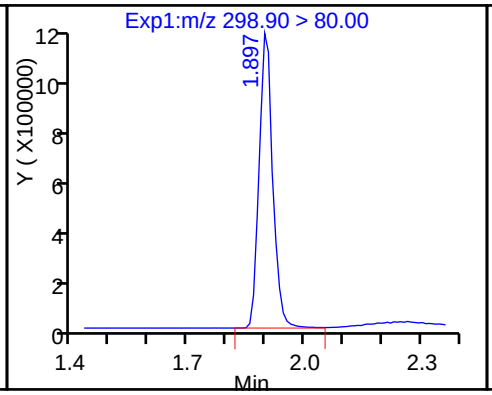
3 Perfluoropentanoic acid



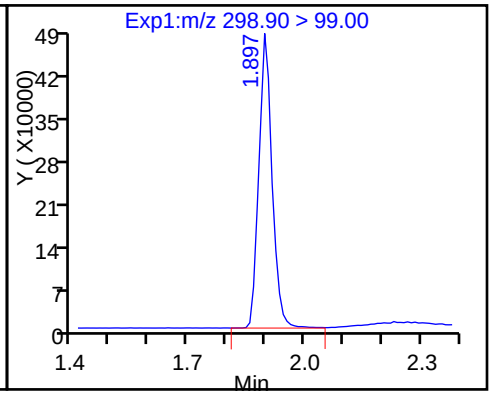
D 4 13C5-PFPeA



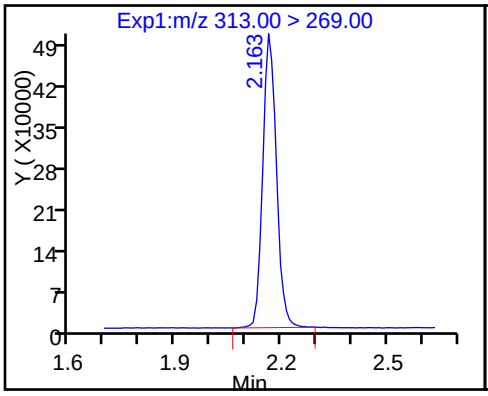
5 Perfluorobutanesulfonic acid



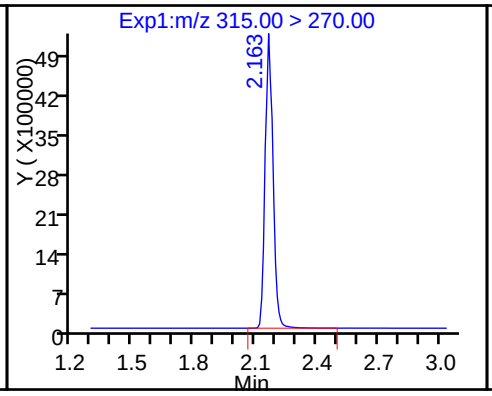
5 Perfluorobutanesulfonic acid



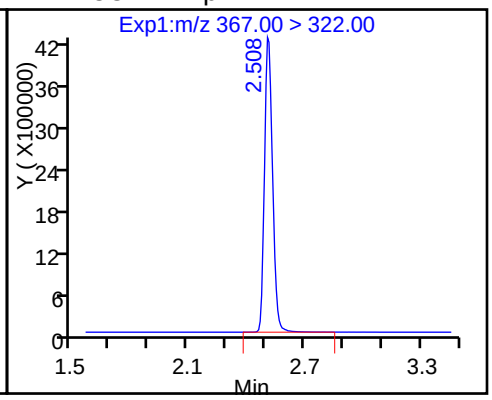
7 Perfluorohexanoic acid



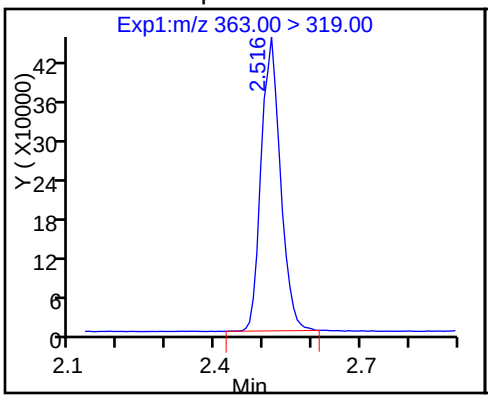
D 6 13C2 PFHxA



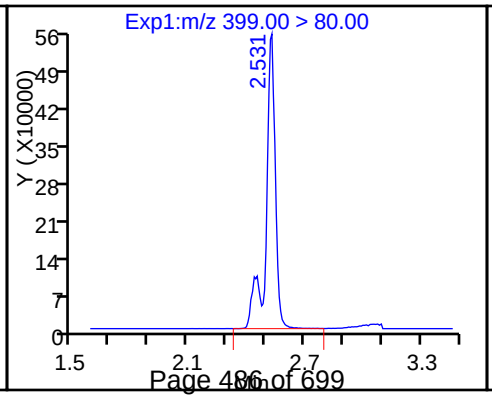
D 11 13C4-PFHpA



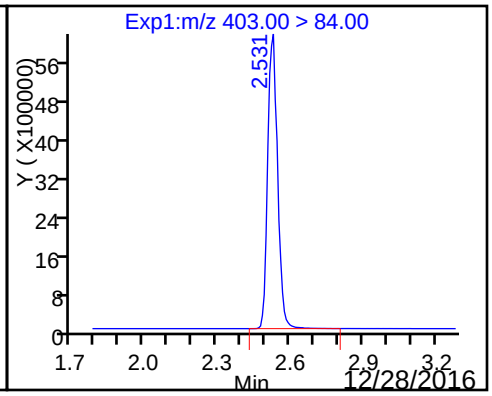
12 Perfluoroheptanoic acid



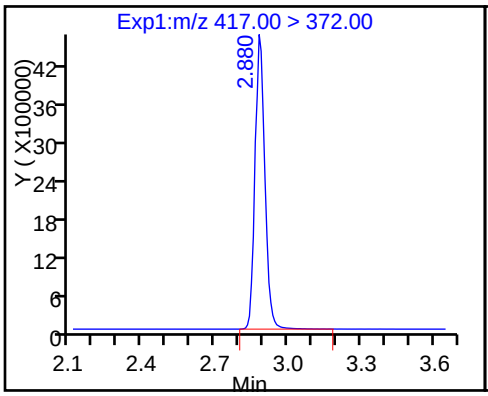
9 Perfluorohexanesulfonic acid



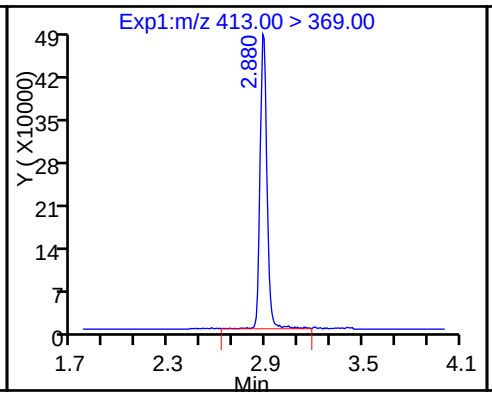
D 10 18O2 PFHxS



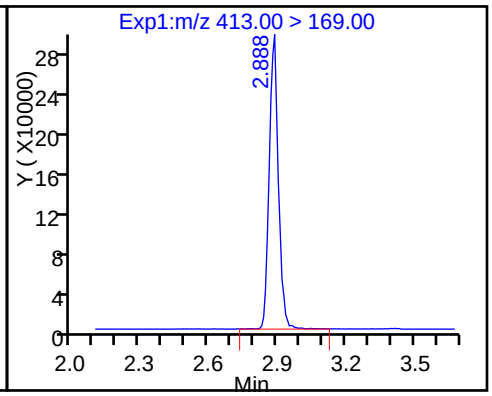
D 14 13C4 PFOA



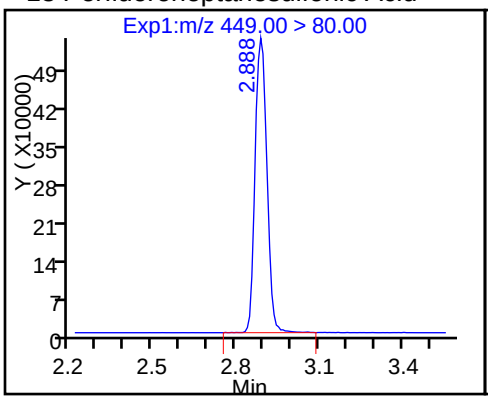
15 Perfluorooctanoic acid



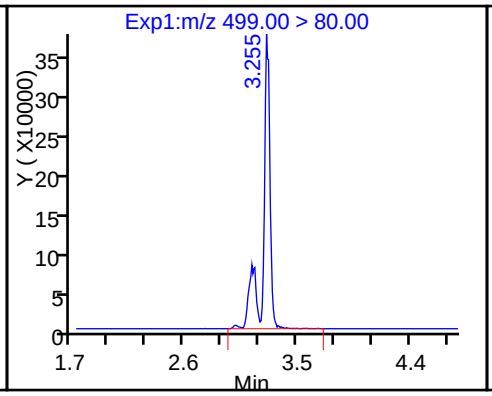
15 Perfluorooctanoic acid



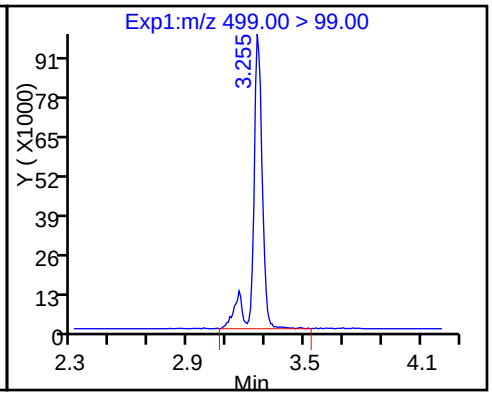
13 Perfluoroheptanesulfonic Acid



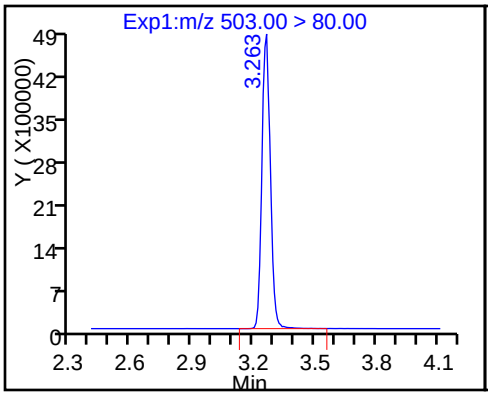
18 Perfluorooctane sulfonic acid



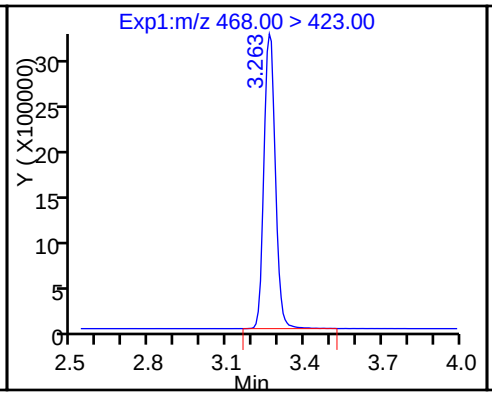
18 Perfluorooctane sulfonic acid



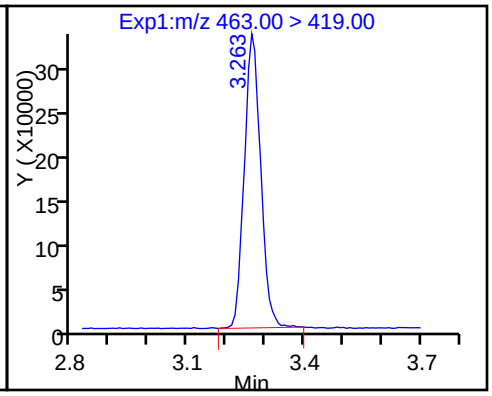
D 17 13C4 PFOS



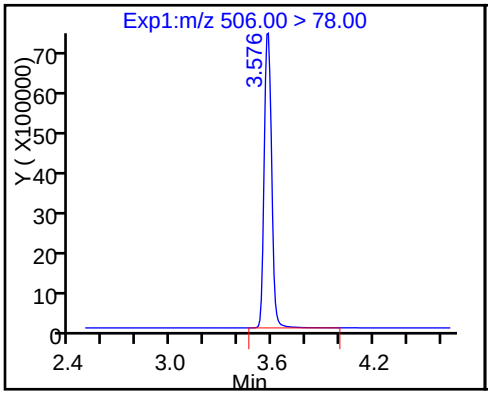
D 19 13C5 PFNA



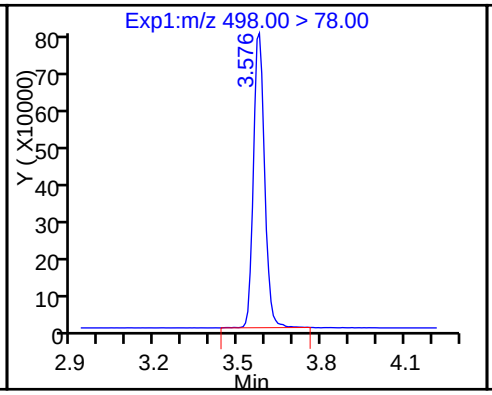
20 Perfluorononanoic acid



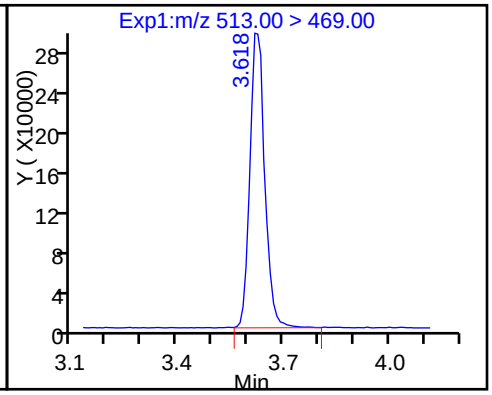
D 21 13C8 FOSA



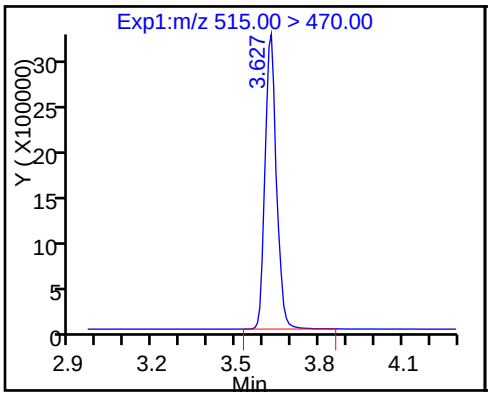
22 Perfluorooctane Sulfonamide



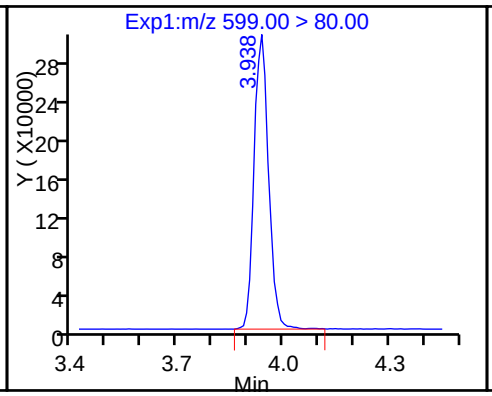
24 Perfluorodecanoic acid



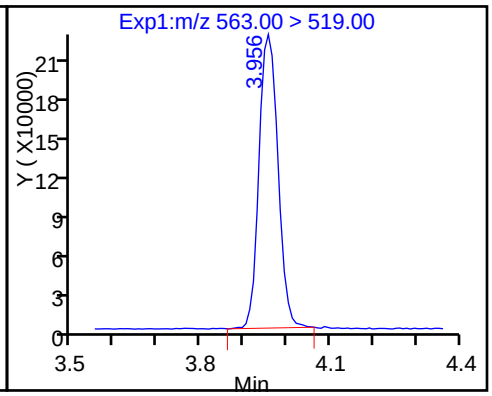
D 23 13C2 PFDA



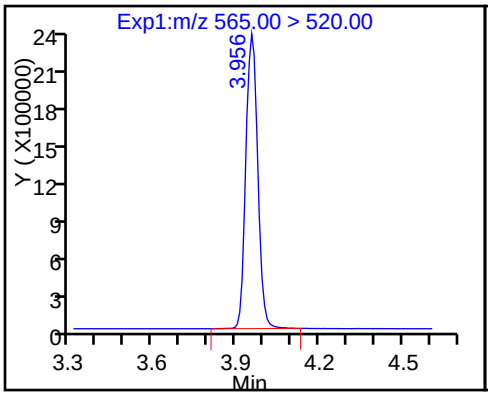
26 Perfluorodecane Sulfonic acid



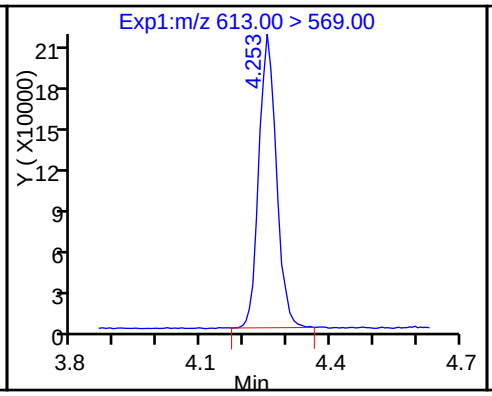
28 Perfluoroundecanoic acid



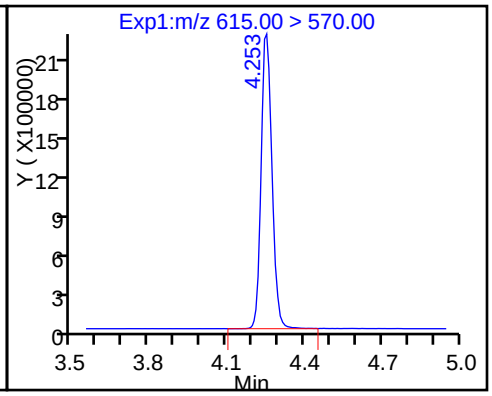
D 27 13C2 PFUnA



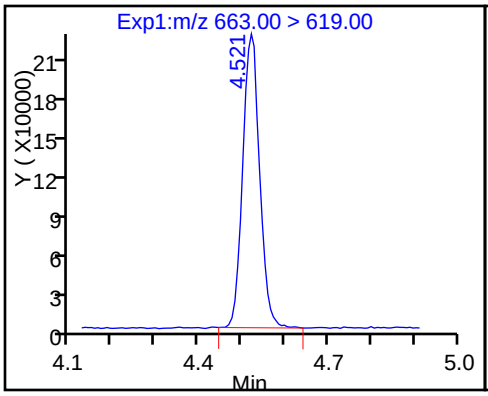
29 Perfluorododecanoic acid



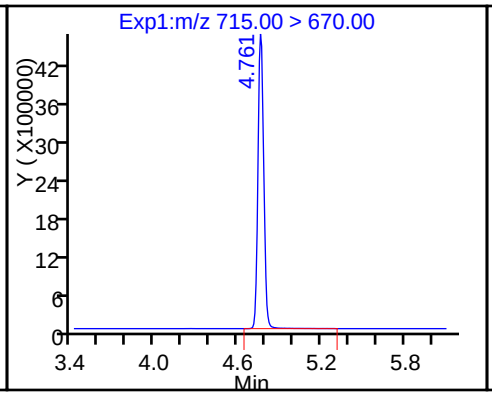
D 30 13C2 PFDoA



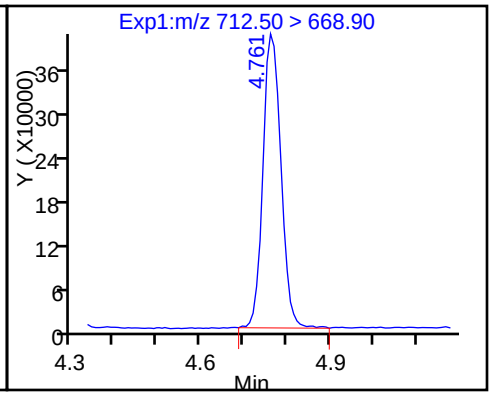
31 Perfluorotridecanoic acid



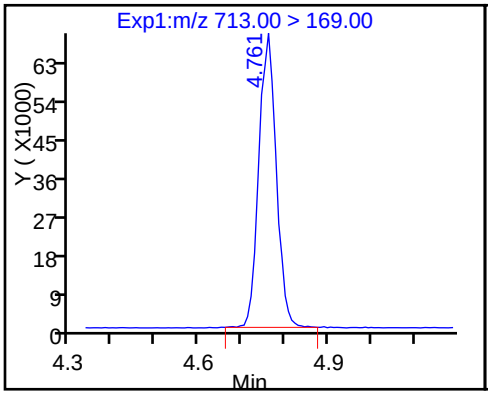
D 32 13C2-PFTeDA



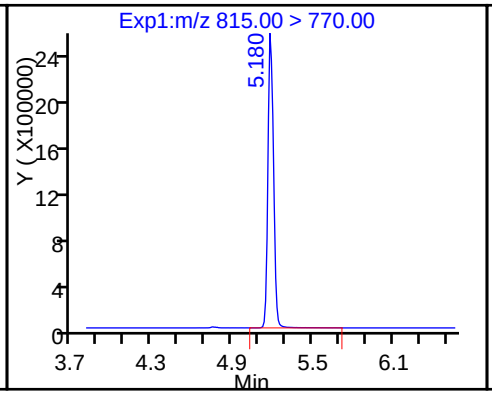
33 Perfluorotetradecanoic acid



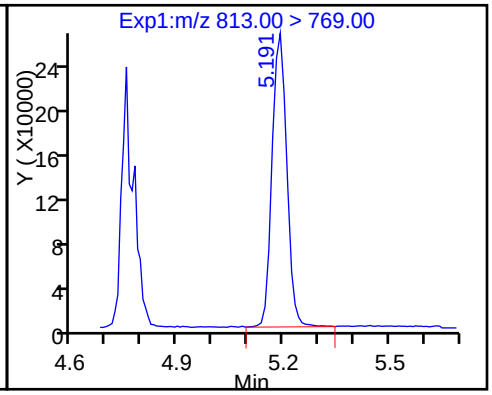
33 Perfluorotetradecanoic acid



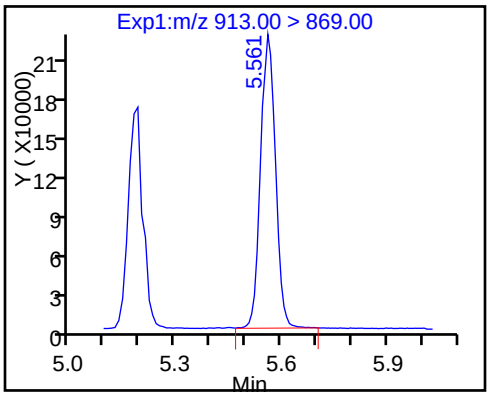
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_007.d
Lims ID: IC L4
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 03-Dec-2016 14:11:14 ALS Bottle#: 40 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L4_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub3

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 05-Dec-2016 10:24:13 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:41:57

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.574	1.574	0.0		18254473	54.4		109	916244	
1 Perfluorobutyric acid										
212.90 > 169.00	1.582	1.577	0.005	1.000	7008467	22.0		110	42848	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.868	1.861	0.007	1.000	6115663	20.9		104	53754	
D 4 13C5-PFPeA										
267.90 > 223.00	1.868	1.861	0.007		14426922	54.5		109	1030803	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.907	1.900	0.007	1.000	10888534	20.0		113		
298.90 > 99.00	1.897	1.900	-0.003	0.995	4709173		2.31(0.00-0.00)	113		
7 Perfluorohexanoic acid										
313.00 > 269.00	2.171	2.164	0.007	1.000	5224102	21.6		108	141802	
D 6 13C2 PFHxA										
315.00 > 270.00	2.162	2.164	-0.002		12716423	53.5		107	709396	
D 11 13C4-PFHpA										
367.00 > 322.00	2.512	2.511	0.001		11474824	55.3		111	830208	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.512	2.512	0.0	1.000	4918226	20.9		104	66176	
9 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.527	2.531	-0.004	1.000	6968734	18.7		102		M
D 10 18O2 PFHxS										
403.00 > 84.00	2.535	2.531	0.004		16099619	51.5		109	1076833	
D 14 13C4 PFOA										
417.00 > 372.00	2.886	2.880	0.006		12069172	55.0		110	656359	

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	2.894	2.887	0.007	1.000	5292388	20.5		102	50246	M
413.00 > 169.00	2.886	2.887	-0.001	0.997	3252983		1.63(0.90-1.10)	102	188817	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.886	2.888	-0.002	1.000	6678298	20.6		108		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.259	3.258	0.001	1.000	5631788	18.8		101	741165	
499.00 > 99.00	3.259	3.258	0.001	1.000	1257953		4.48(0.90-1.10)	101	196382	
D 17 13C4 PFOS										
503.00 > 80.00	3.259	3.259	0.0		13189624	53.6		112	527854	
D 19 13C5 PFNA										
468.00 > 423.00	3.267	3.263	0.004		8920352	53.6		107	500218	
20 Perfluorononanoic acid										
463.00 > 419.00	3.267	3.263	0.004	1.000	3804327	21.4		107	70301	
D 21 13C8 FOSA										
506.00 > 78.00	3.573	3.571	0.002		22326638	55.5		111	379770	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.573	3.574	-0.001	1.000	9111782	21.8		109	354493	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.623	3.623	0.0	1.000	3434382	20.3		102	104771	
D 23 13C2 PFDA										
515.00 > 470.00	3.623	3.626	-0.003		8786342	55.7		111	333180	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.939	3.936	0.003	1.000	3548629	20.1		104		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.956	3.955	0.001	1.000	2673576	19.3		96.7	68734	
D 27 13C2 PFUnA										
565.00 > 520.00	3.965	3.958	0.007		6485474	54.6		109	683577	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.253	4.250	0.003	1.000	2415187	21.0		105	47125	
D 30 13C2 PFDoA										
615.00 > 570.00	4.253	4.251	0.002		6067987	54.1		108	181188	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.524	4.518	0.006	1.000	2373060	20.6		103	5080	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.764	4.759	0.005		12877999	55.7		111	442175	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.764	4.761	0.003	1.000	4681126	20.8		104	1697	
713.00 > 169.00	4.756	4.761	-0.005	0.998	771098		6.07(0.00-0.00)	104	90317	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.187	5.186	0.001		7363997	56.8		114	132680	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.187	5.186	0.001	1.000	2870345	23.1		115	2476	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.563	5.559	0.004	1.000	2205153	18.3		91.5	3091	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L4_00022 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2016 10:24:13 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_007.d

Injection Date: 03-Dec-2016 14:11:14 Instrument ID: A8_N

Lims ID: IC L4

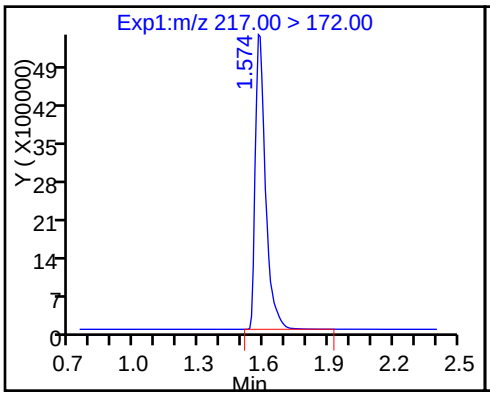
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 7

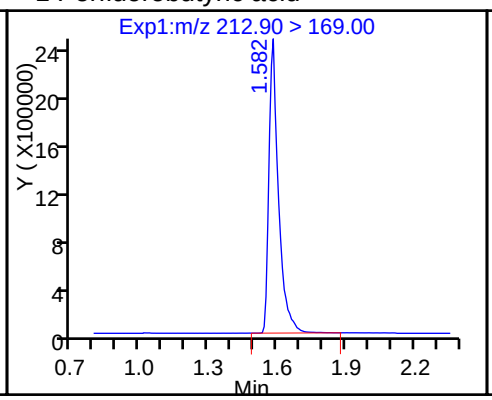
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

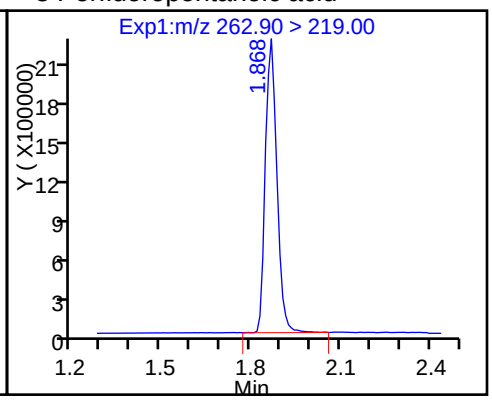
D 2 13C4 PFBA



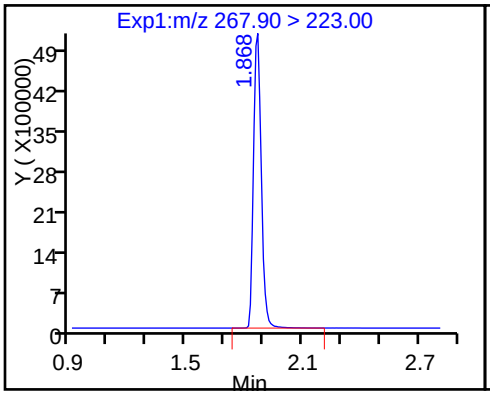
1 Perfluorobutyric acid



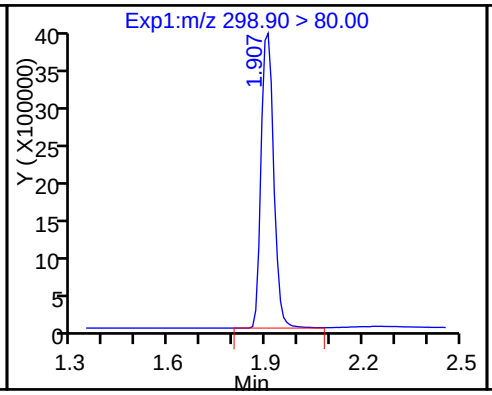
3 Perfluoropentanoic acid



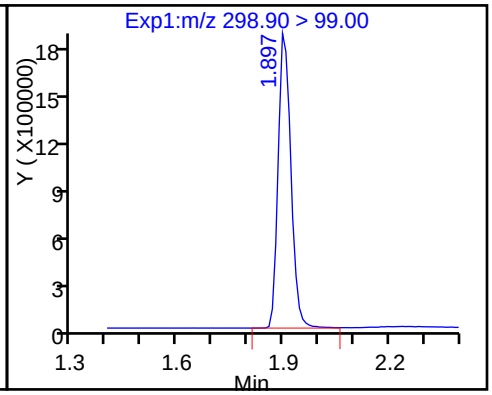
D 4 13C5-PFPeA



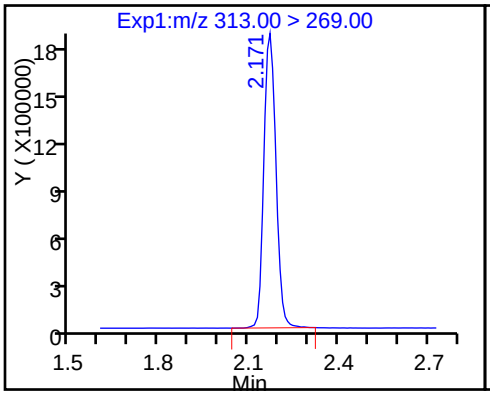
5 Perfluorobutanesulfonic acid



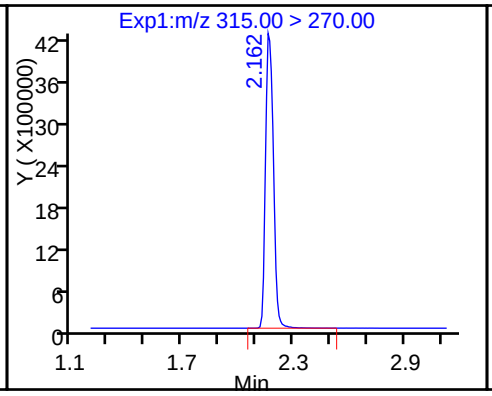
5 Perfluorobutanesulfonic acid



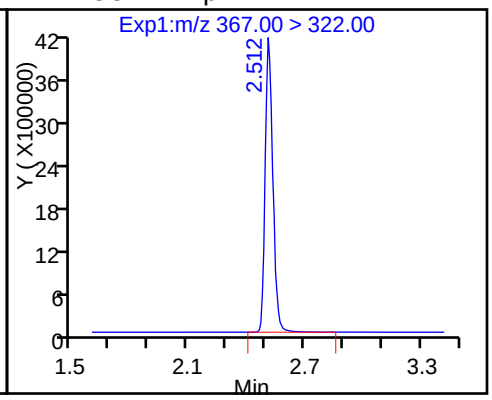
7 Perfluorohexanoic acid



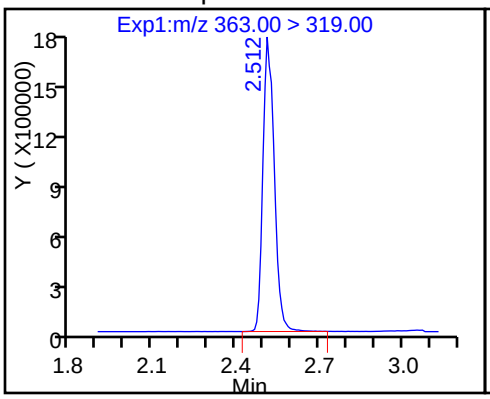
D 6 13C2 PFHxA



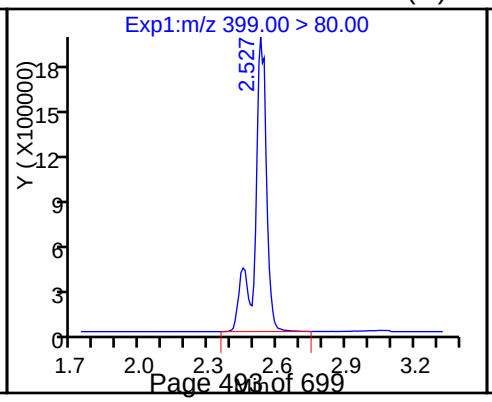
D 11 13C4-PFHpA



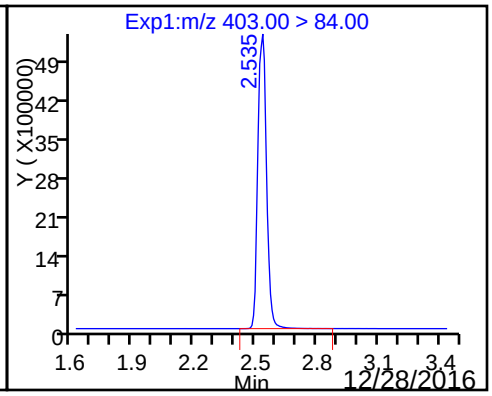
12 Perfluoroheptanoic acid



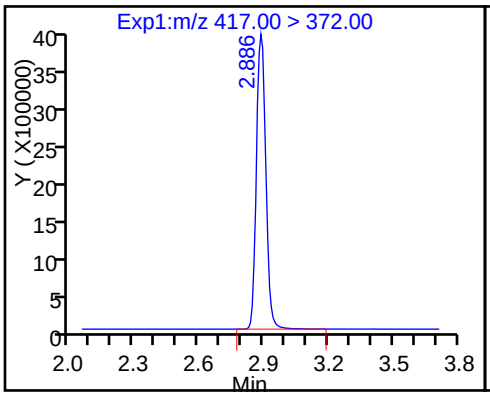
9 Perfluorohexanesulfonic acid (M)



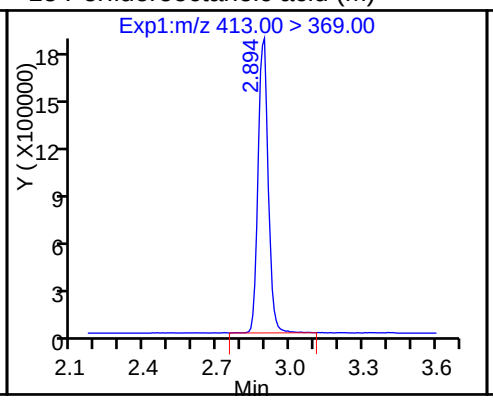
D 10 18O2 PFHxS



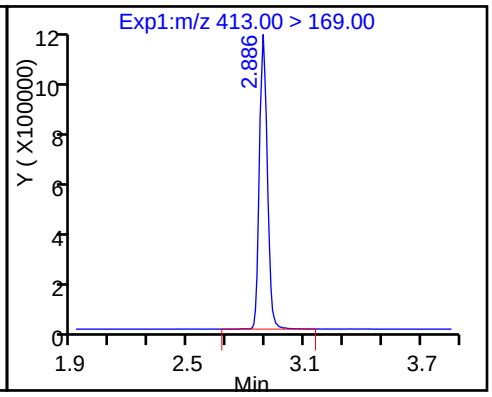
D 14 13C4 PFOA



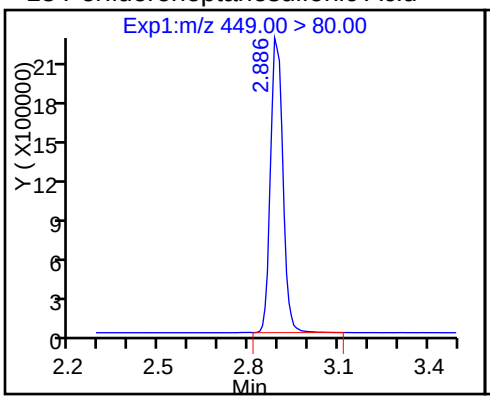
15 Perfluorooctanoic acid (M)



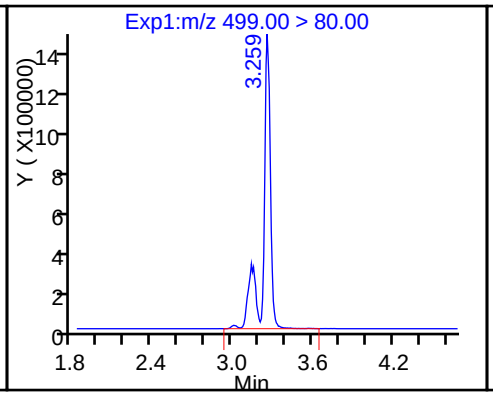
15 Perfluorooctanoic acid



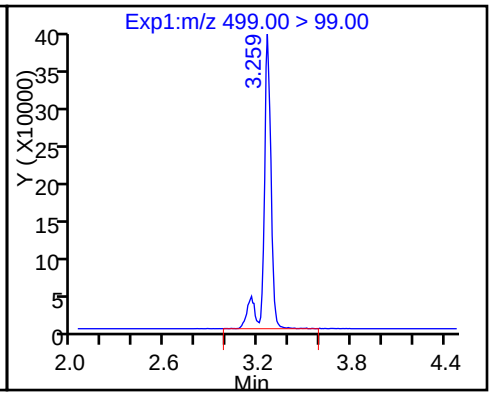
13 Perfluoroheptanesulfonic Acid



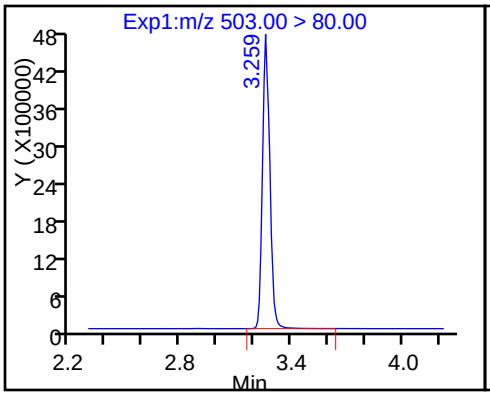
18 Perfluorooctane sulfonic acid



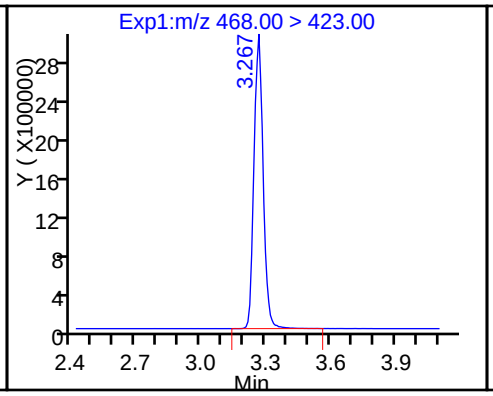
18 Perfluorooctane sulfonic acid



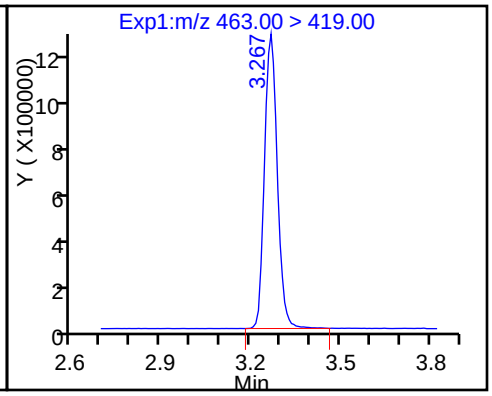
D 17 13C4 PFOS



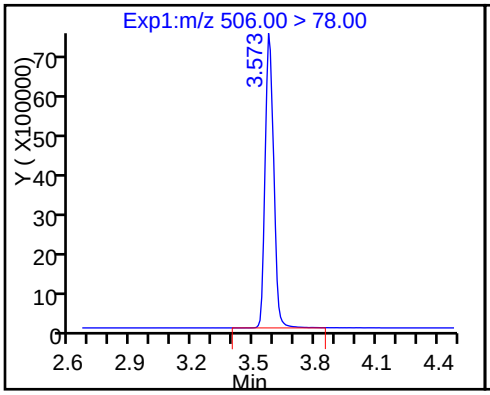
D 19 13C5 PFNA



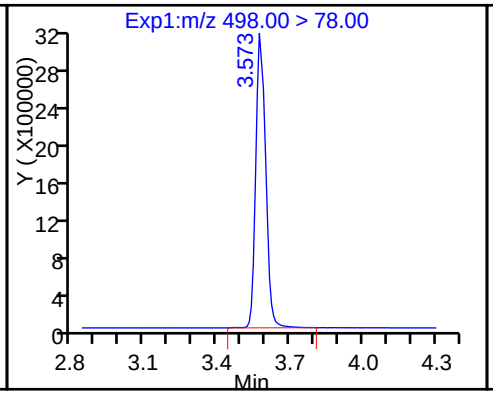
20 Perfluorononanoic acid



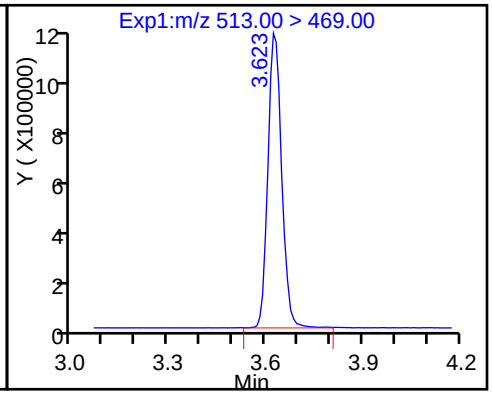
D 21 13C8 FOSA



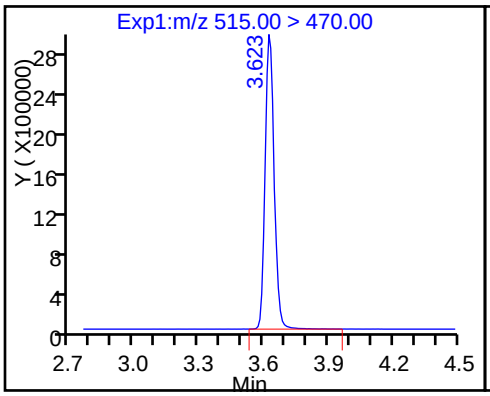
22 Perfluorooctane Sulfonamide



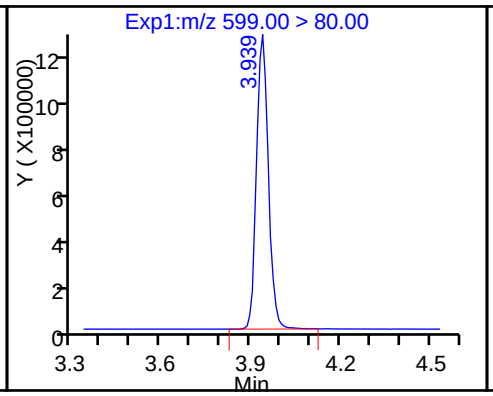
24 Perfluorodecanoic acid



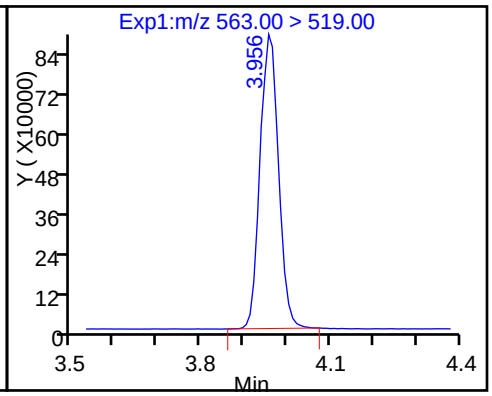
D 23 13C2 PFDA



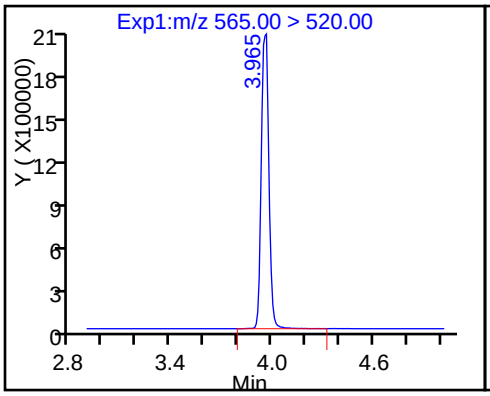
26 Perfluorodecane Sulfonic acid



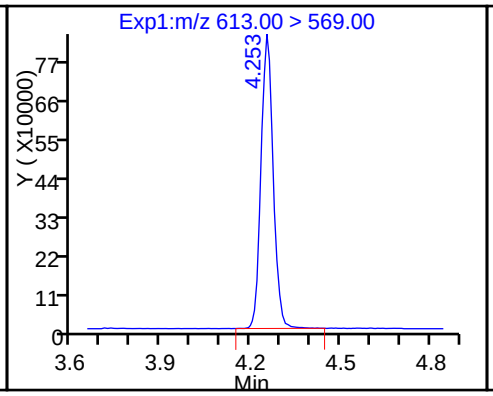
28 Perfluoroundecanoic acid



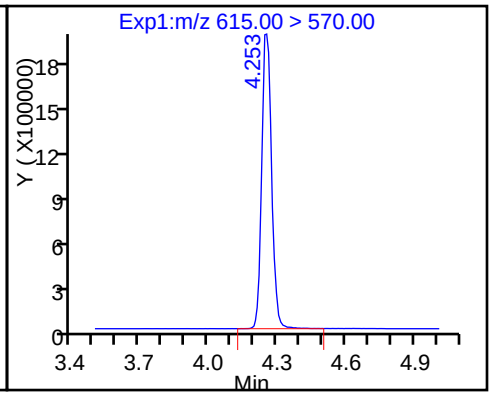
D 27 13C2 PFUnA



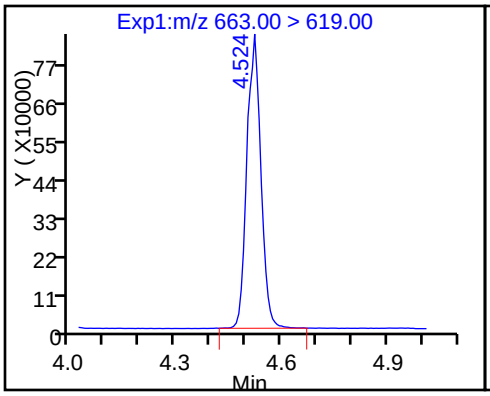
29 Perfluorododecanoic acid



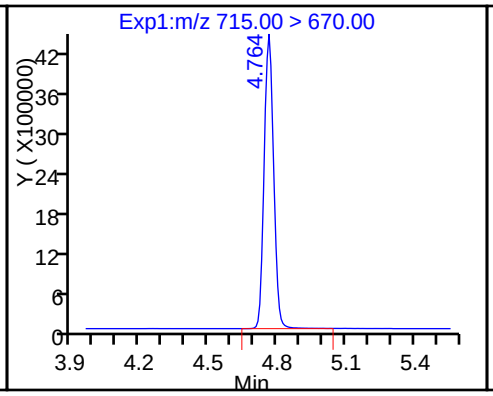
D 30 13C2 PFDoA



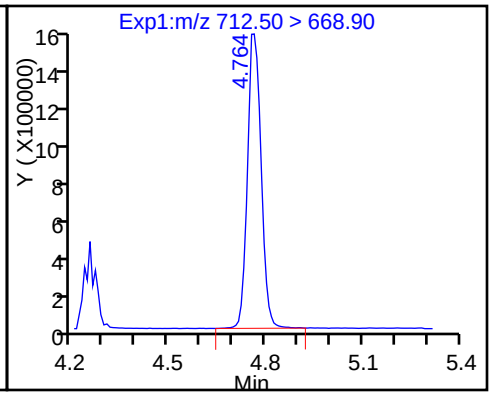
31 Perfluorotridecanoic acid



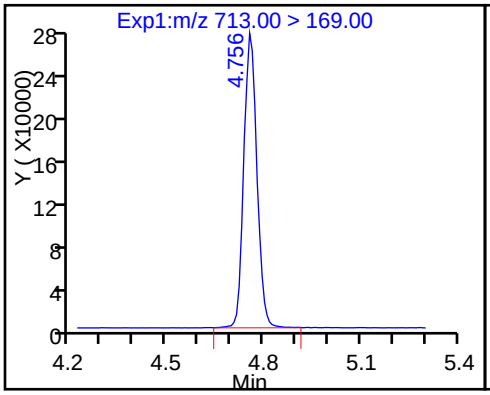
D 32 13C2-PFTeDA



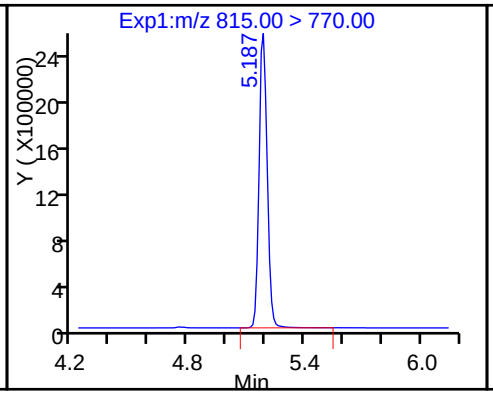
33 Perfluorotetradecanoic acid



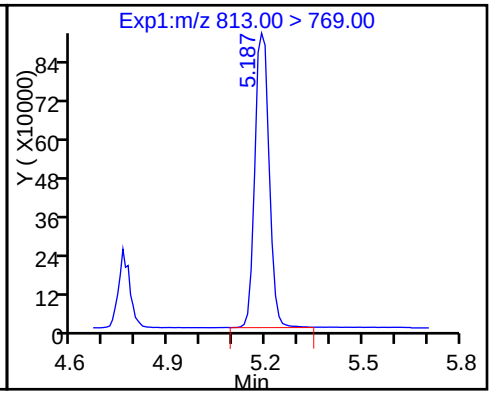
33 Perfluorotetradecanoic acid



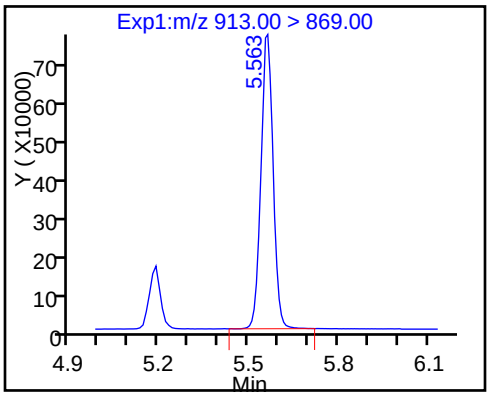
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

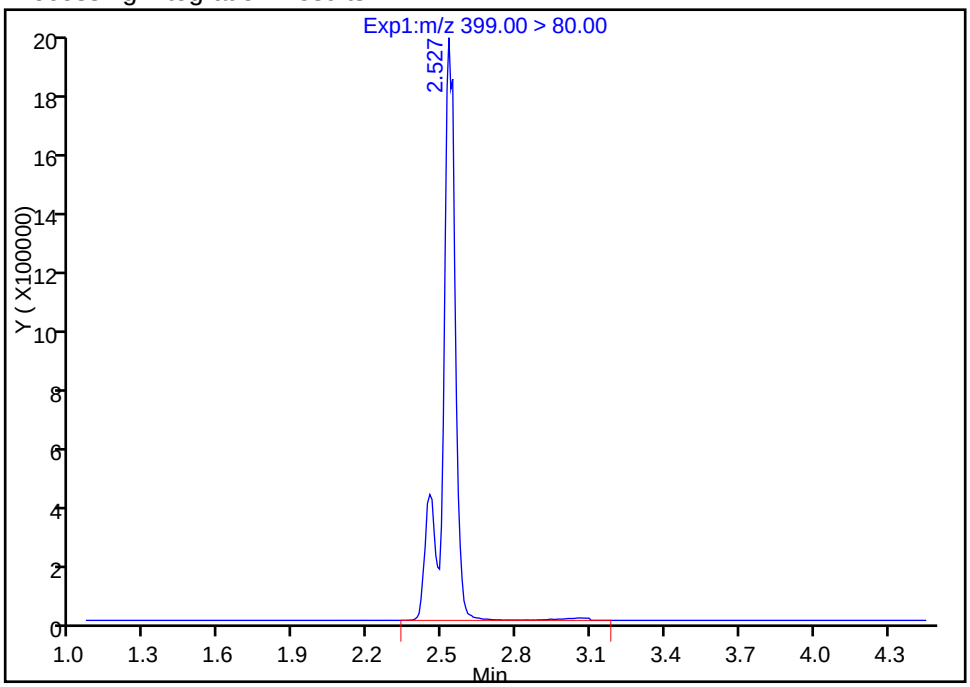
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_007.d				
Injection Date:	03-Dec-2016 14:11:14	Instrument ID:	A8_N		
Lims ID:	IC L4				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	40	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

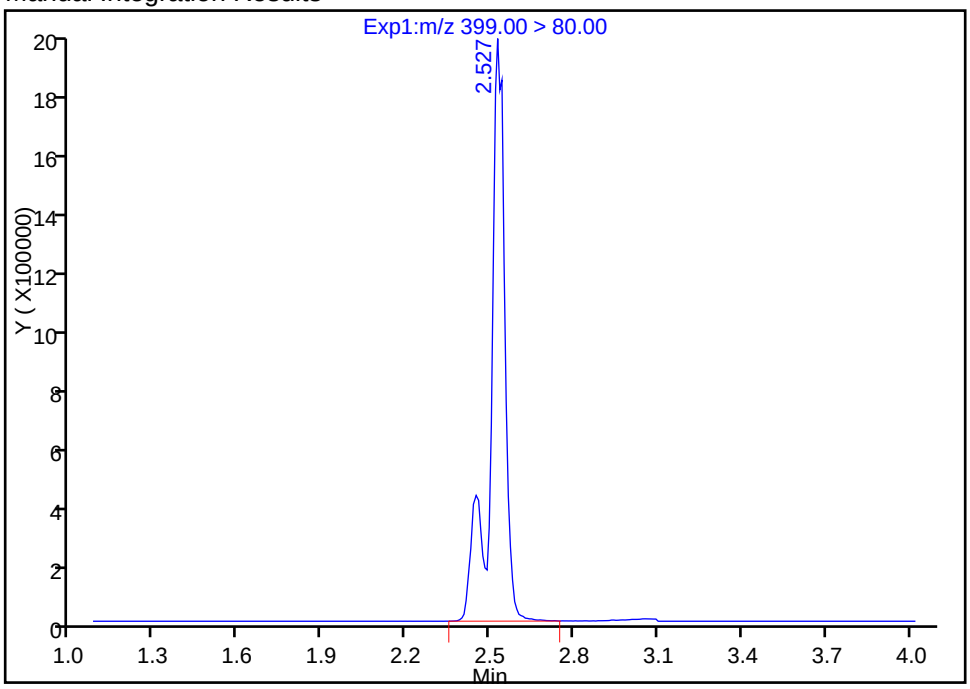
Processing Integration Results

RT: 2.53
Area: 7050184
Amount: 18.826548
Amount Units: ng/ml



Manual Integration Results

RT: 2.53
Area: 6968734
Amount: 18.653631
Amount Units: ng/ml



Reviewer: chandrasenas, 05-Dec-2016 09:41:57

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

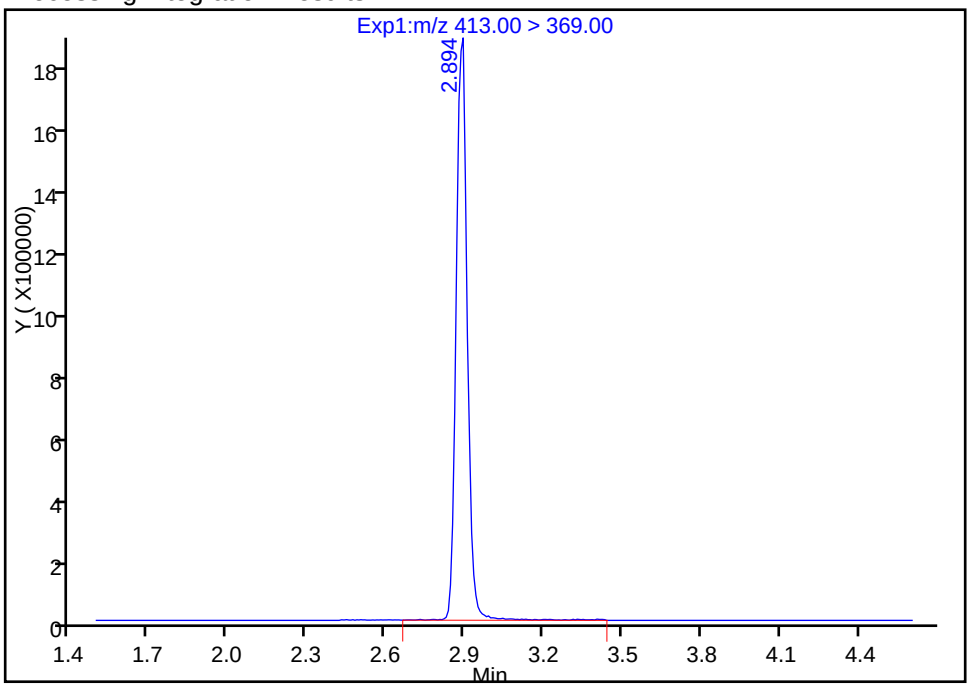
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_007.d				
Injection Date:	03-Dec-2016 14:11:14	Instrument ID:	A8_N		
Lims ID:	IC L4				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	40	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

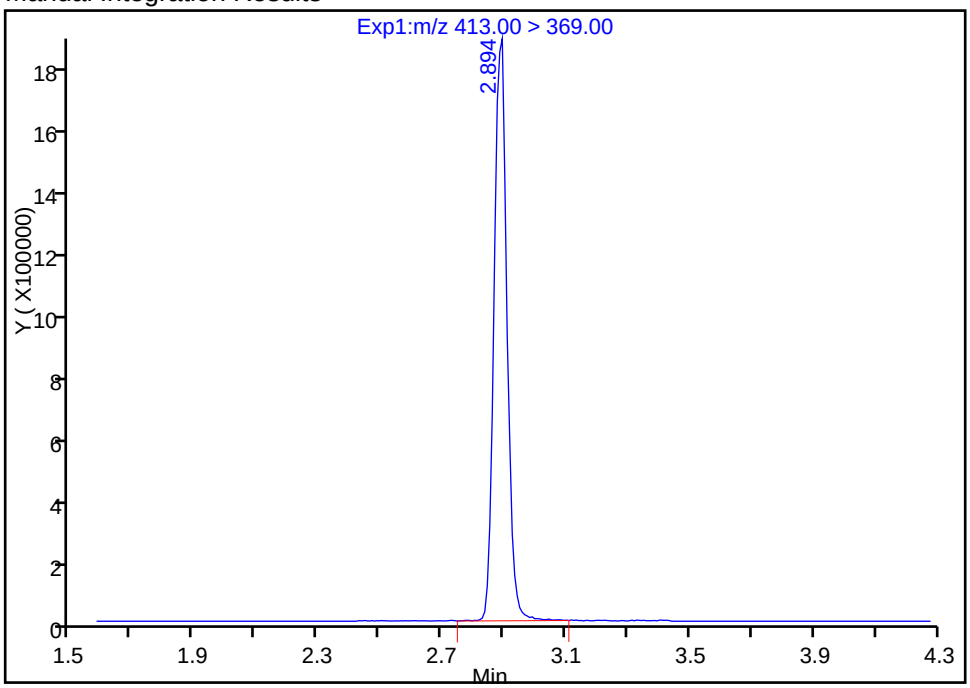
Processing Integration Results

RT: 2.89
Area: 5360428
Amount: 20.662890
Amount Units: ng/ml



Manual Integration Results

RT: 2.89
Area: 5292388
Amount: 20.454262
Amount Units: ng/ml



Reviewer: chandrasenas, 05-Dec-2016 09:41:57

Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_008.d
Lims ID: IC L5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 03-Dec-2016 14:18:44 ALS Bottle#: 41 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L5_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub3

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 05-Dec-2016 10:24:15 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:43:57

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.574	1.574	0.0		16029004	47.7		95.5	1234710	
1 Perfluorobutyric acid										
212.90 > 169.00	1.574	1.577	-0.003	1.000	14048645	50.1		100	74155	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.858	1.861	-0.003	1.000	12597041	49.7		99.5	116129	
D 4 13C5-PFPeA										
267.90 > 223.00	1.858	1.861	-0.003		12477636	47.2		94.3	1170062	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.897	1.900	-0.003	1.000	21513660	44.6		101		
298.90 > 99.00	1.897	1.900	-0.003	1.000	9875959		2.18(0.00-0.00)	101		
7 Perfluorohexanoic acid										
313.00 > 269.00	2.160	2.164	-0.004	1.000	10420431	49.8		99.5	246256	
D 6 13C2 PFHxA										
315.00 > 270.00	2.160	2.164	-0.004		10985481	46.3		92.5	787845	
D 11 13C4-PFHpA										
367.00 > 322.00	2.510	2.511	-0.001		9653835	46.5		93.1	803660	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.510	2.512	-0.002	1.000	9915679	50.0		100	147911	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.525	2.531	-0.006	1.000	14498414	43.7		96.0		
D 10 18O2 PFHxS										
403.00 > 84.00	2.525	2.531	-0.006		14303487	45.8		96.8	5055434	
D 14 13C4 PFOA										
417.00 > 372.00	2.876	2.880	-0.004		9909434	45.2		90.4	408580	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.884	2.887	-0.003	1.000	10434085	49.1		98.2	197146	
413.00 > 169.00	2.876	2.887	-0.011	0.997	6358650		1.64(0.90-1.10)	98.2	316749	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.884	2.888	-0.004	1.000	13806464	49.7		104		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.257	3.258	-0.001	1.000	11953842	46.7		101	39071	
499.00 > 99.00	3.248	3.258	-0.010	0.997	2570510		4.65(0.90-1.10)	101	263704	
D 17 13C4 PFOS										
503.00 > 80.00	3.257	3.259	-0.002		11281105	45.9		95.9	268992	
D 19 13C5 PFNA										
468.00 > 423.00	3.257	3.263	-0.006		7854327	47.2		94.4	841834	
20 Perfluorononanoic acid										
463.00 > 419.00	3.257	3.263	-0.006	1.000	7675034	49.0		98.1	142675	
D 21 13C8 FOSA										
506.00 > 78.00	3.570	3.571	-0.001		19293148	48.0		95.9	389510	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.570	3.574	-0.004	1.000	18269014	50.7		101	626245	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.620	3.623	-0.003	1.000	7159278	50.3		101	175242	
D 23 13C2 PFDA										
515.00 > 470.00	3.620	3.626	-0.006		7405870	46.9		93.9	311468	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.928	3.936	-0.008	1.000	7347809	48.7		101		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.946	3.955	-0.009	1.000	5553051	46.3		92.6	133337	
D 27 13C2 PFUnA										
565.00 > 520.00	3.946	3.958	-0.012		5625237	47.4		94.7	281129	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.242	4.250	-0.008	1.000	5000795	49.4		98.7	86155	
D 30 13C2 PFDoA										
615.00 > 570.00	4.242	4.251	-0.009		5338479	47.6		95.3	147109	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.510	4.518	-0.008	1.000	5034109	49.6		99.3	21741	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.750	4.759	-0.009		11031119	47.7		95.4	553742	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.750	4.761	-0.011	1.000	9601518	48.5		97.0	4445	
713.00 > 169.00	4.750	4.761	-0.011	1.000	1523287		6.30(0.00-0.00)	97.0	181298	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.177	5.186	-0.009		5893329	45.4		90.9	104400	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.177	5.186	-0.009	1.000	5382109	50.0		100	6406	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.547	5.559	-0.012	1.000	5729058	54.0		108	9772	

Reagents:

LCPFC-L5_00020 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2016 10:24:16 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_008.d

Injection Date: 03-Dec-2016 14:18:44 Instrument ID: A8_N

Lims ID: IC L5

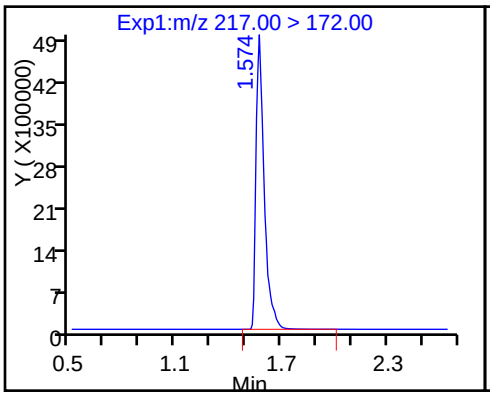
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 8

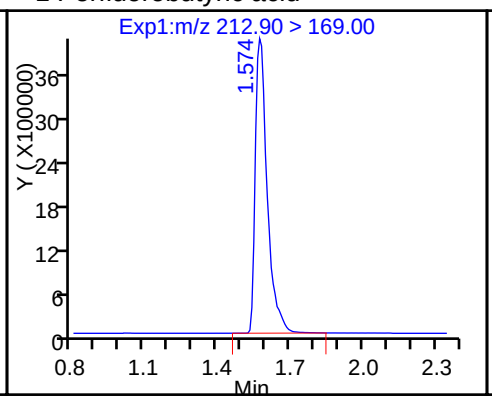
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

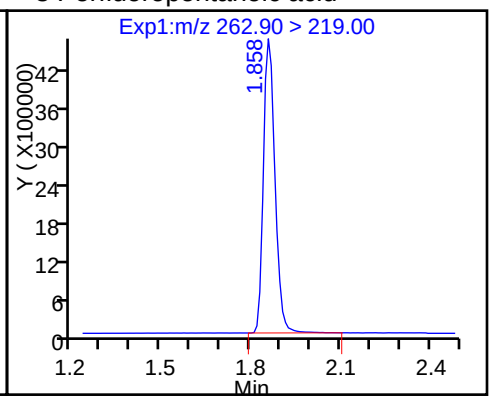
D 2 13C4 PFBA



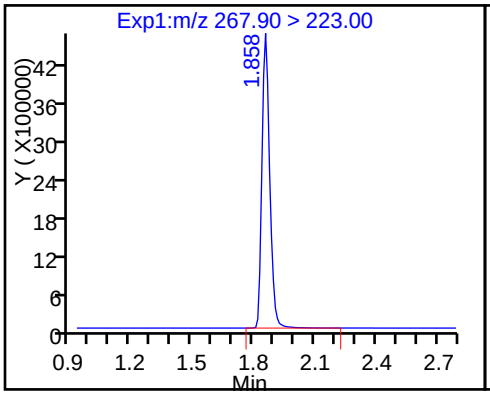
1 Perfluorobutyric acid



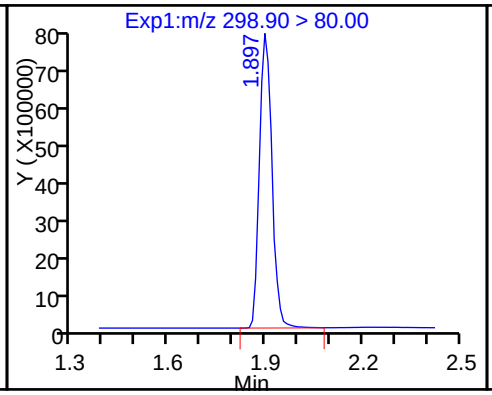
3 Perfluoropentanoic acid



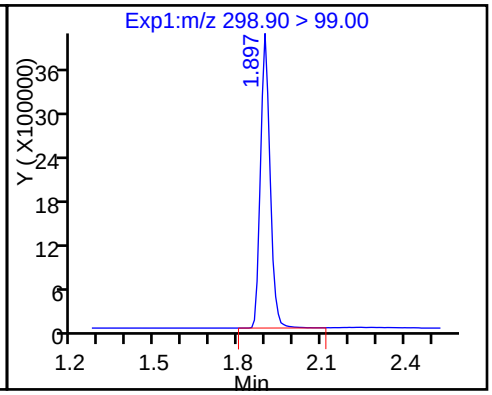
D 4 13C5-PFPeA



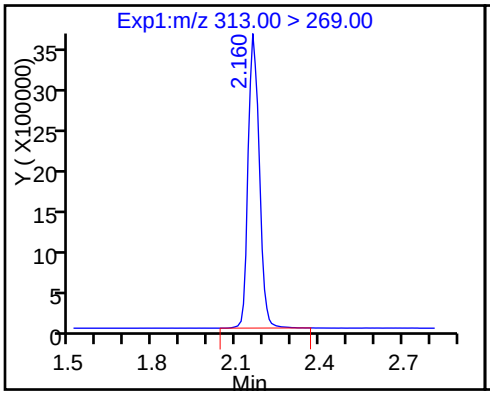
5 Perfluorobutanesulfonic acid



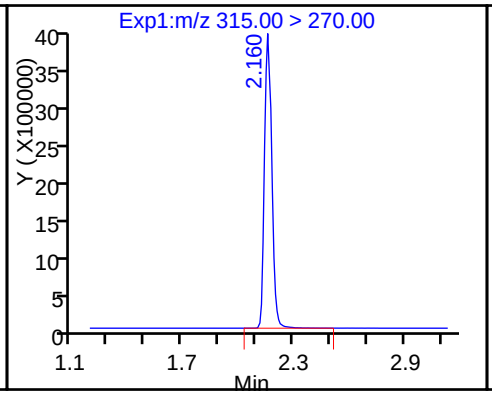
5 Perfluorobutanesulfonic acid



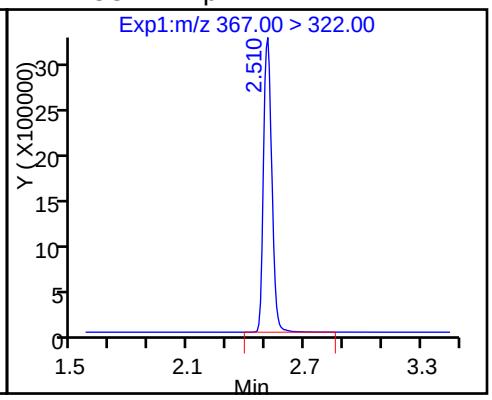
7 Perfluorohexanoic acid



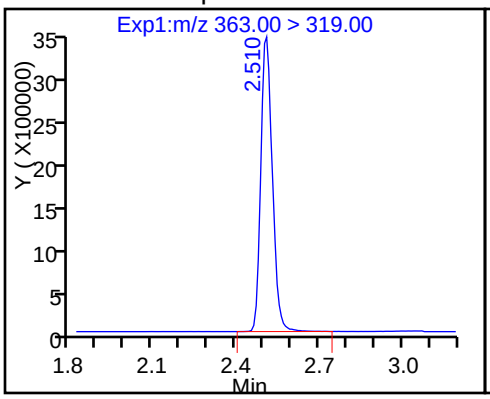
D 6 13C2 PFHxA



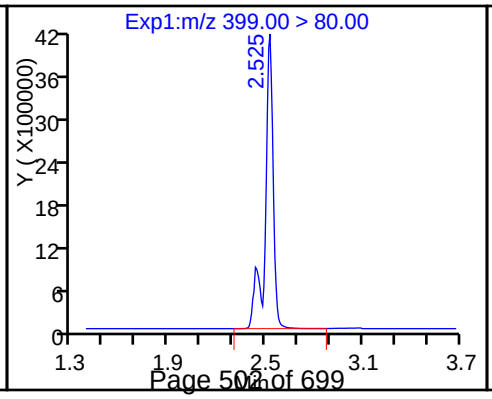
D 11 13C4-PFHpA



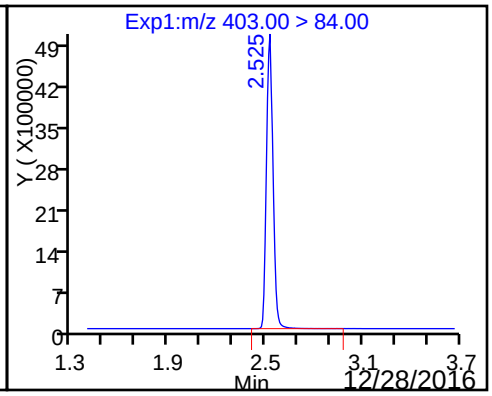
12 Perfluoroheptanoic acid



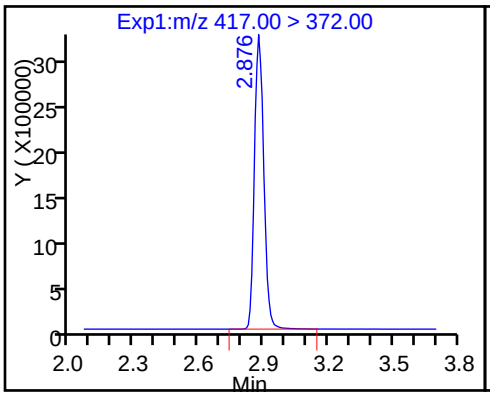
9 Perfluorohexanesulfonic acid



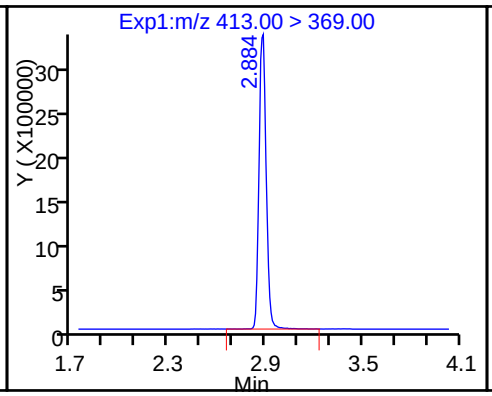
D 10 18O2 PFHxS



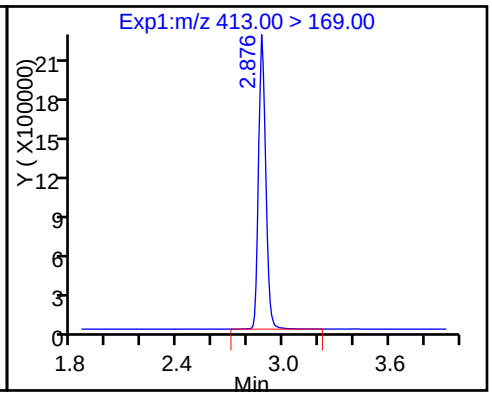
D 14 13C4 PFOA



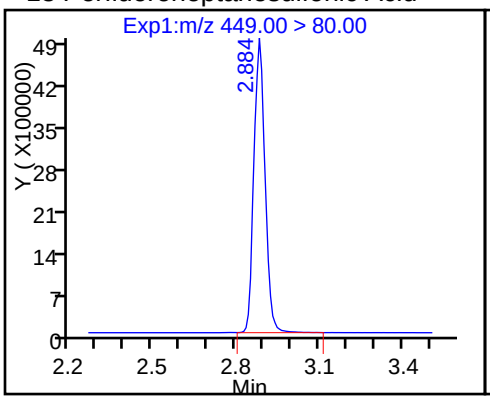
15 Perfluorooctanoic acid



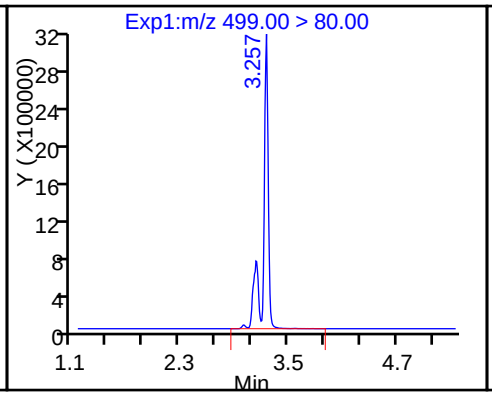
15 Perfluorooctanoic acid



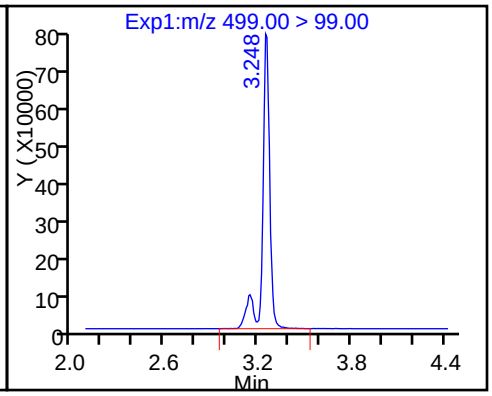
13 Perfluoroheptanesulfonic Acid



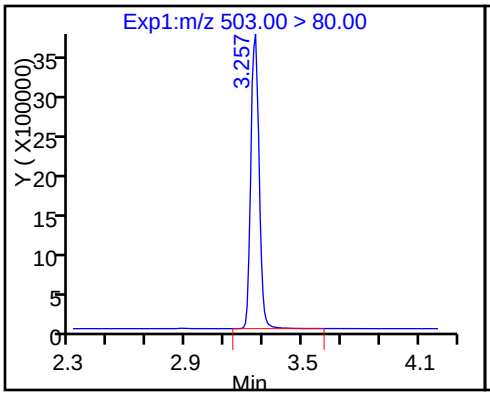
18 Perfluorooctane sulfonic acid



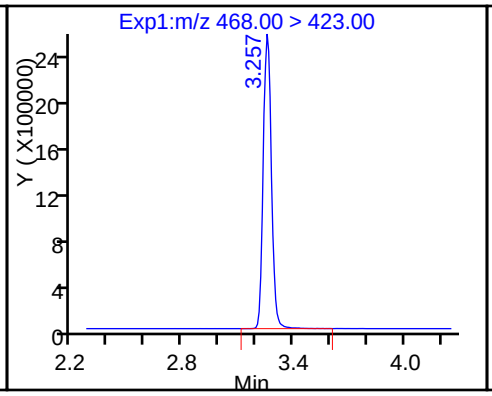
18 Perfluorooctane sulfonic acid



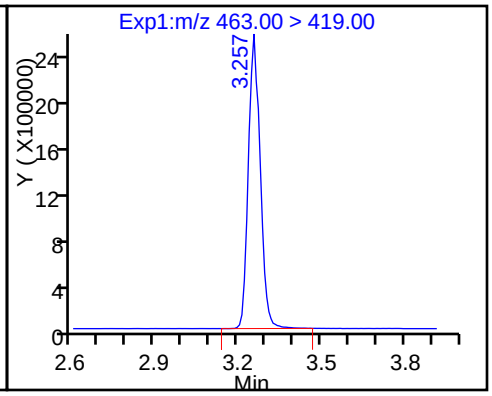
D 17 13C4 PFOS



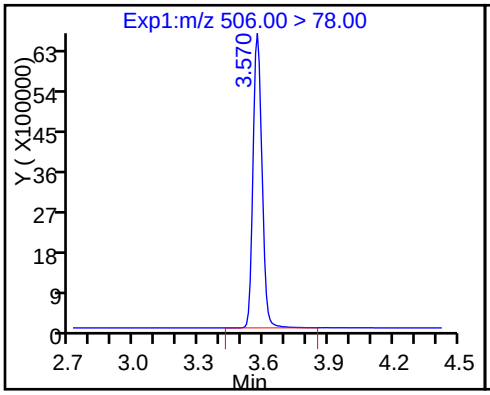
D 19 13C5 PFNA



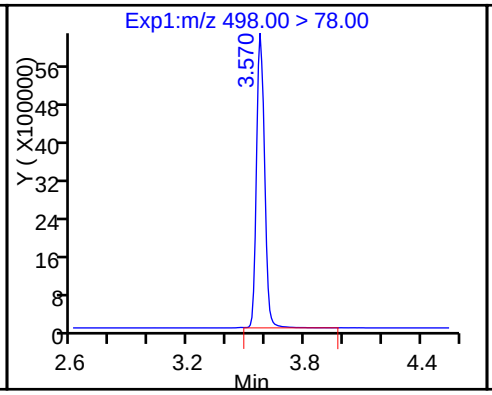
20 Perfluorononanoic acid



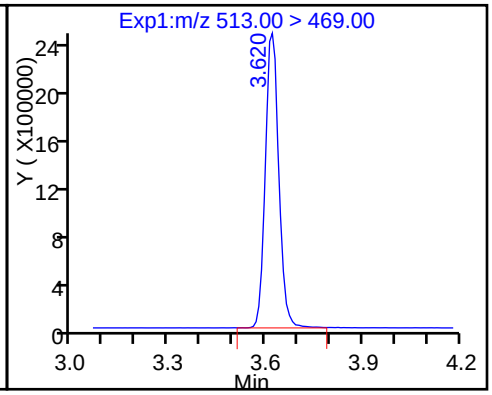
D 21 13C8 FOSA



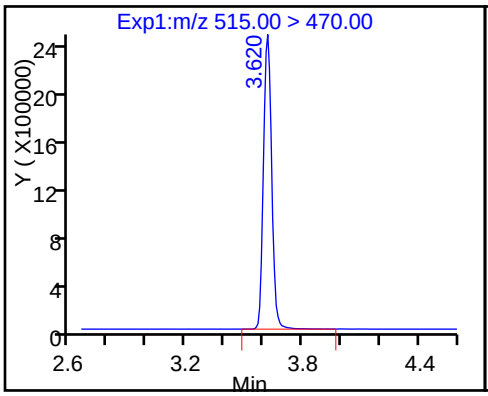
22 Perfluorooctane Sulfonamide



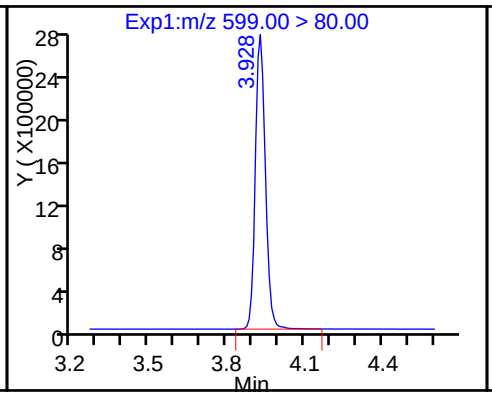
24 Perfluorodecanoic acid



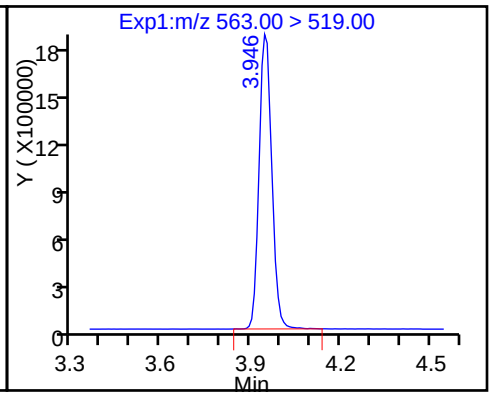
D 23 13C2 PFDA



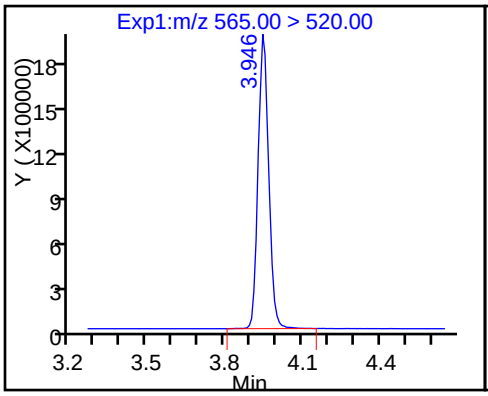
26 Perfluorodecane Sulfonic acid



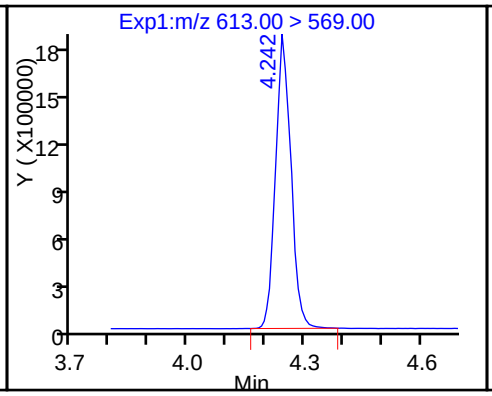
28 Perfluoroundecanoic acid



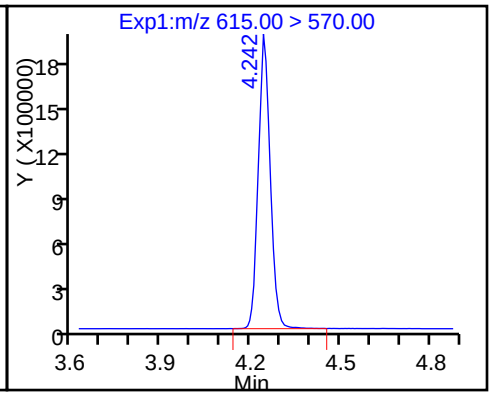
D 27 13C2 PFUnA



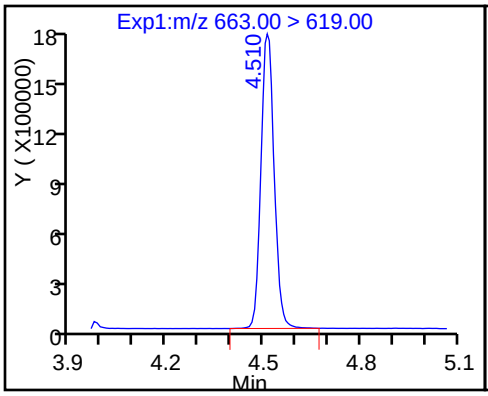
29 Perfluorododecanoic acid



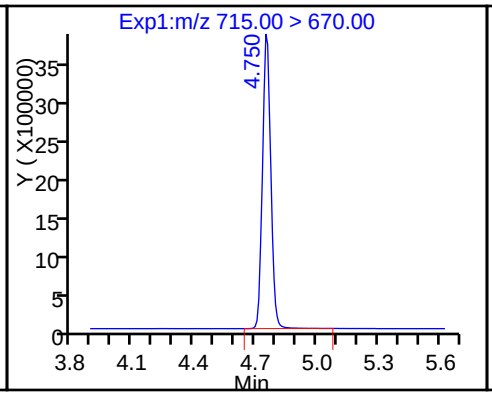
D 30 13C2 PFDoA



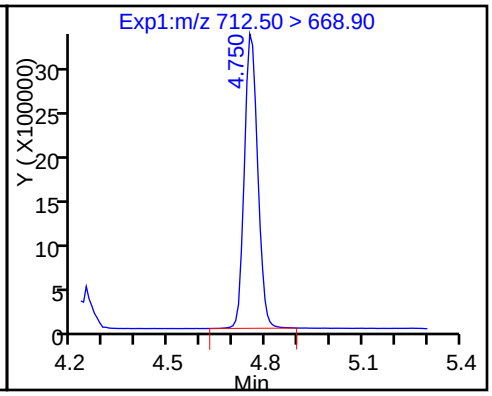
31 Perfluorotridecanoic acid



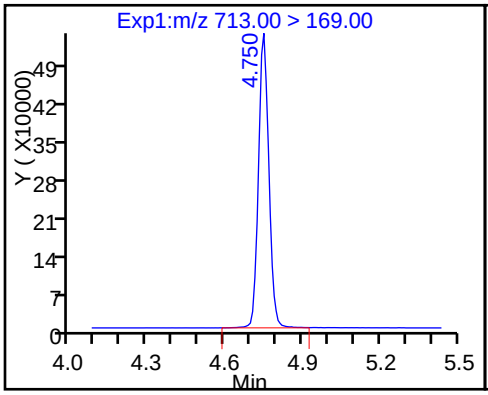
D 32 13C2-PFTeDA



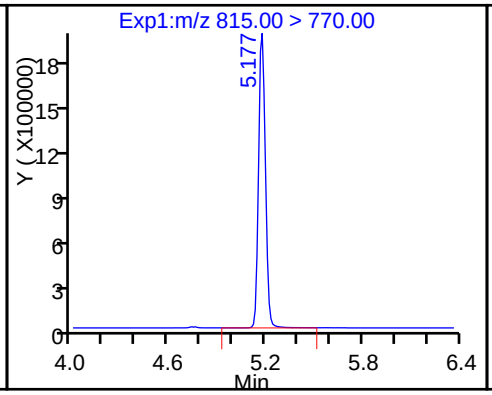
33 Perfluorotetradecanoic acid



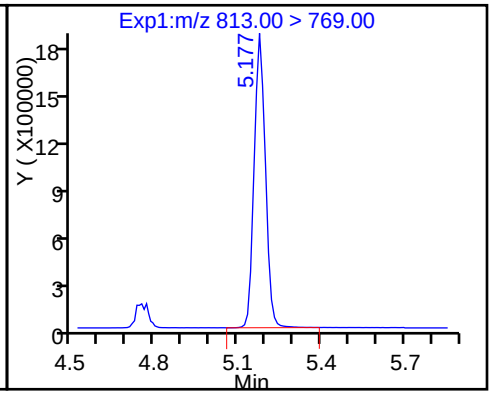
33 Perfluorotetradecanoic acid



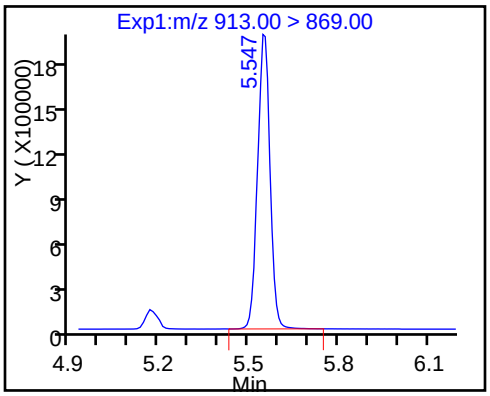
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_009.d
Lims ID: IC L6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 03-Dec-2016 14:26:13 ALS Bottle#: 42 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L6_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub3

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 05-Dec-2016 10:24:17 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:44:26

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.565	1.574	-0.009		14589192	43.4		86.9	865034	
1 Perfluorobutyric acid										
212.90 > 169.00	1.574	1.577	-0.003	1.000	42806432	167.9		83.9	195743	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.858	1.861	-0.003	1.000	35527936	156.8		78.4	261830	
D 4 13C5-PFPeA										
267.90 > 223.00	1.858	1.861	-0.003		11161582	42.2		84.4	966643	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.896	1.900	-0.004	1.000	53135654	128.0		72.4		
298.90 > 99.00	1.896	1.900	-0.004	1.000	29815085		1.78(0.00-0.00)	72.4		
7 Perfluorohexanoic acid										
313.00 > 269.00	2.157	2.164	-0.007	1.000	33117925	168.5		84.2	581515	
D 6 13C2 PFHxA										
315.00 > 270.00	2.157	2.164	-0.007		10311260	43.4		86.8	509947	
D 11 13C4-PFHpA										
367.00 > 322.00	2.501	2.511	-0.010		8082881	39.0		77.9	826093	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.501	2.512	-0.011	1.000	30013620	180.8		90.4	294610	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.526	2.531	-0.005	1.000	47221104	165.4		90.9		
D 10 18O2 PFHxS										
403.00 > 84.00	2.518	2.531	-0.013		12302944	39.4		83.3	1330084	
D 14 13C4 PFOA										
417.00 > 372.00	2.868	2.880	-0.012		8181000	37.3		74.6	486964	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.868	2.887	-0.019	1.000	30853962	175.9		88.0	291973	
413.00 > 169.00	2.876	2.887	-0.011	1.003	20504099		1.50(0.90-1.10)	88.0	540708	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.884	2.888	-0.004	1.000	39398056	159.1		83.6		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.249	3.258	-0.009	1.000	43077470	188.7		102	75165	
499.00 > 99.00	3.249	3.258	-0.009	1.000	9992099		4.31(0.90-1.10)	102	2648708	
D 17 13C4 PFOS										
503.00 > 80.00	3.249	3.259	-0.010		10053294	40.9		85.5	90966	
D 19 13C5 PFNA										
468.00 > 423.00	3.249	3.263	-0.014		6537549	39.3		78.6	482383	
20 Perfluorononanoic acid										
463.00 > 419.00	3.249	3.263	-0.014	1.000	24899337	191.1		95.6	358972	
D 21 13C8 FOSA										
506.00 > 78.00	3.562	3.571	-0.009		16949269	42.1		84.3	560152	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.571	3.574	-0.003	1.000	50658186	160.0		80.0	335690	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.613	3.623	-0.010	1.000	23571490	191.4		95.7	488396	
D 23 13C2 PFDA										
515.00 > 470.00	3.621	3.626	-0.005		6410340	40.6		81.2	207594	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.921	3.936	-0.015	1.000	24987612	185.7		96.3		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.947	3.955	-0.008	1.000	17818228	185.2		92.6	329189	
D 27 13C2 PFUnA										
565.00 > 520.00	3.947	3.958	-0.011		4513820	38.0		76.0	155727	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.236	4.250	-0.014	1.000	17773370	194.4		97.2	287464	
D 30 13C2 PFDoA										
615.00 > 570.00	4.236	4.251	-0.015		4817286	43.0		86.0	195663	
31 Perfluorotridecanoic acid										M
663.00 > 619.00	4.501	4.518	-0.017	1.000	17494025	191.2		95.6	67382	M
D 32 13C2-PFTeDA										
715.00 > 670.00	4.738	4.759	-0.021		9518260	41.2		82.3	367157	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.746	4.761	-0.015	1.000	30593527	171.3		85.7	17849	
713.00 > 169.00	4.746	4.761	-0.015	1.000	5666745		5.40(0.00-0.00)	85.7	258419	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.171	5.186	-0.015		5482429	42.3		84.5	117464	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.160	5.186	-0.026	1.000	18912385	196.9		98.5	16230	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.536	5.559	-0.023	1.000	17844066	186.5		93.3	33443	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L6_00019 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2016 10:24:18 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_009.d

Injection Date: 03-Dec-2016 14:26:13 Instrument ID: A8_N

Lims ID: IC L6

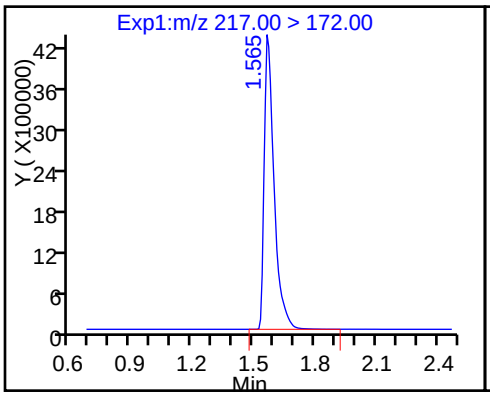
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 42 Worklist Smp#: 9

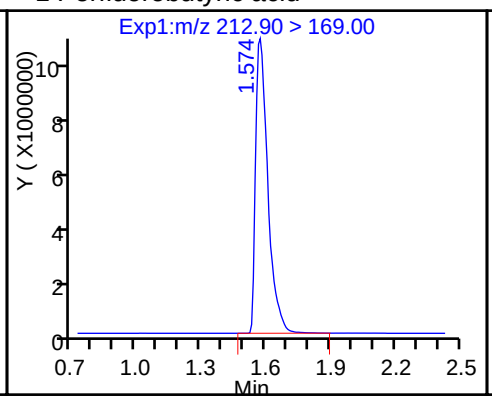
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

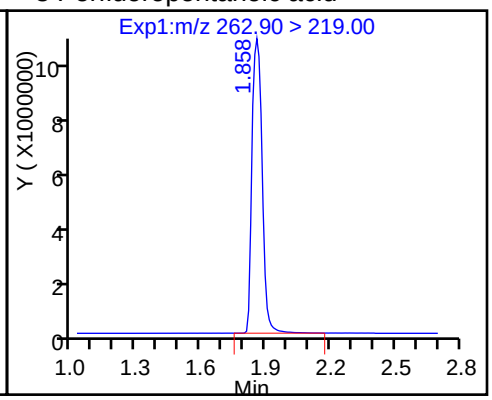
D 2 13C4 PFBA



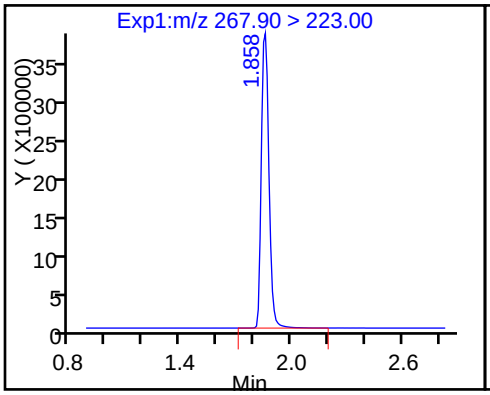
1 Perfluorobutyric acid



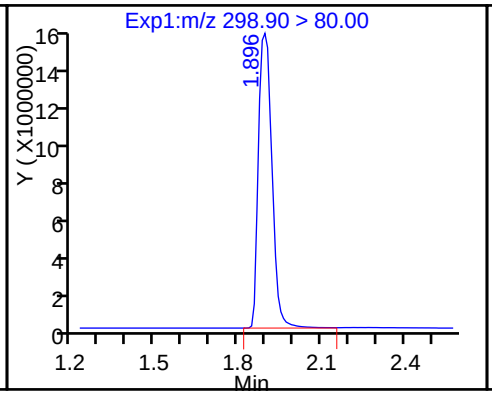
3 Perfluoropentanoic acid



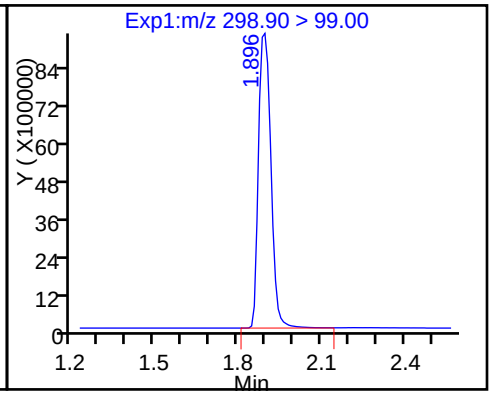
D 4 13C5-PFPeA



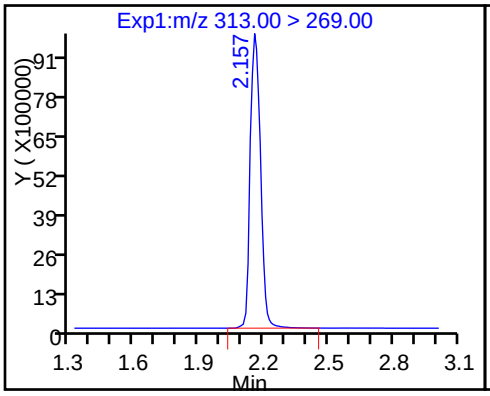
5 Perfluorobutanesulfonic acid



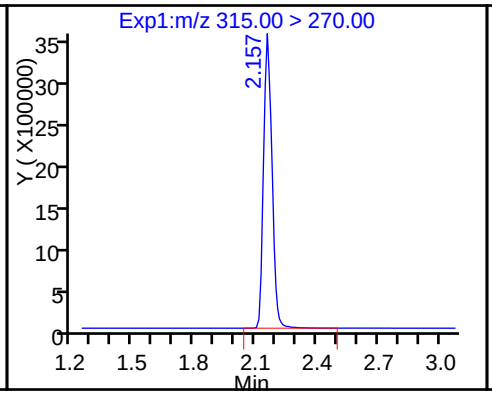
5 Perfluorobutanesulfonic acid



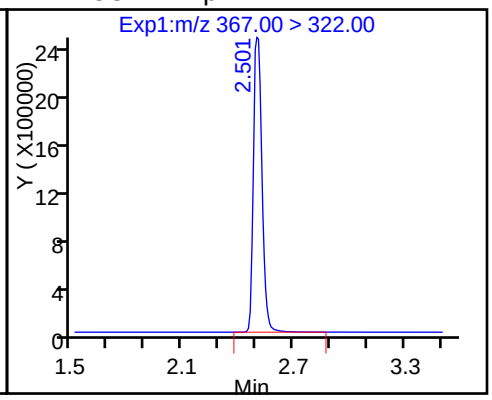
7 Perfluorohexanoic acid



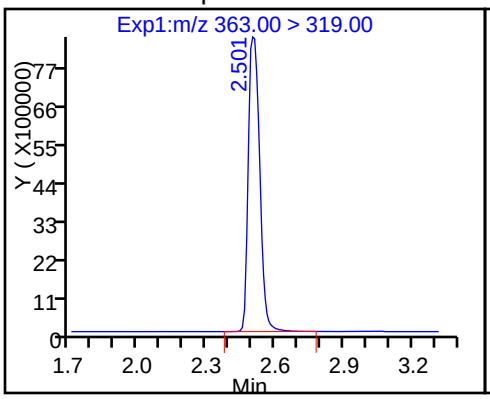
D 6 13C2 PFHxA



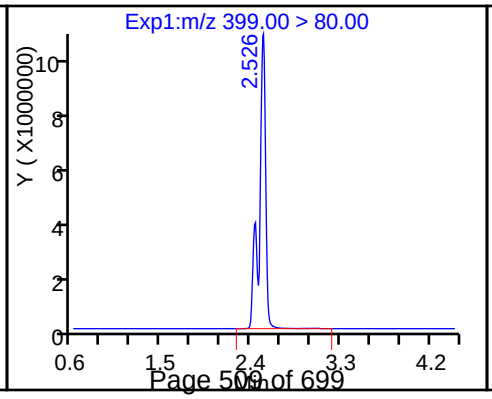
D 11 13C4-PFHpA



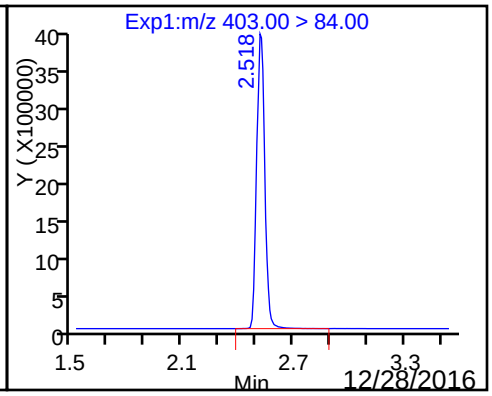
12 Perfluoroheptanoic acid



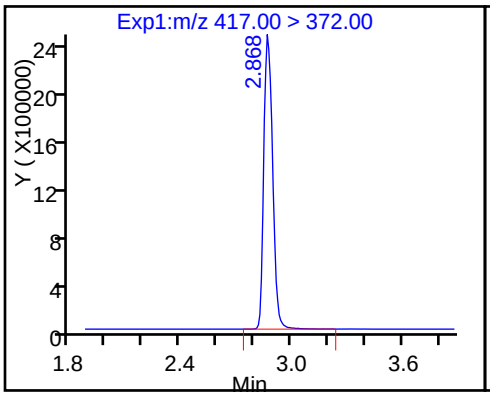
9 Perfluorohexanesulfonic acid



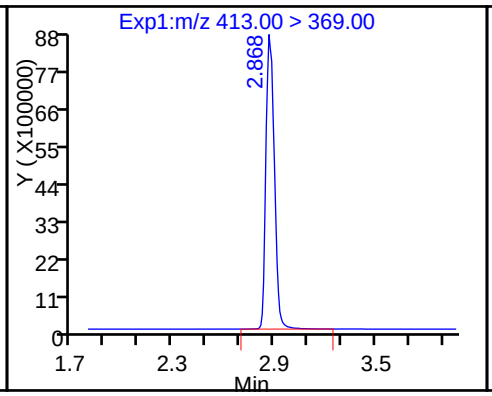
D 10 18O2 PFHxS



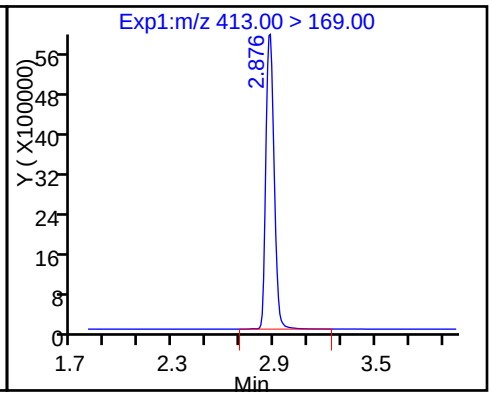
D 14 13C4 PFOA



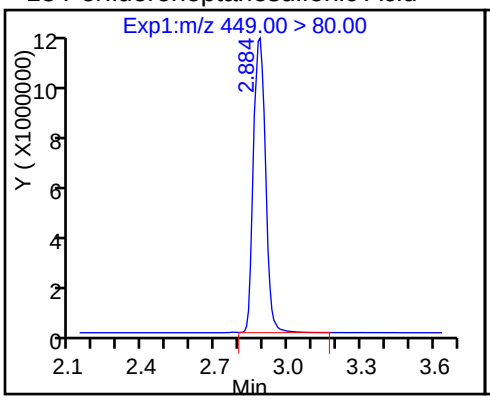
15 Perfluorooctanoic acid



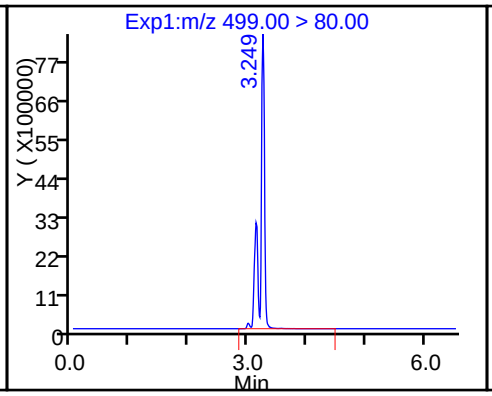
15 Perfluorooctanoic acid



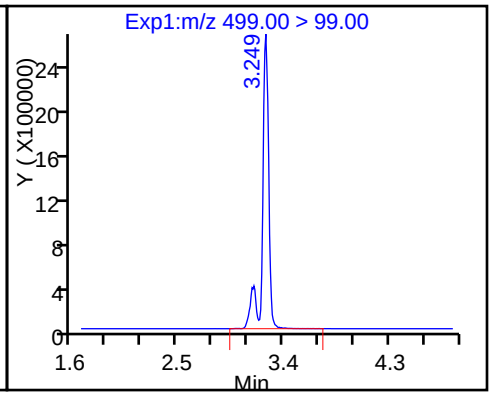
13 Perfluoroheptanesulfonic Acid



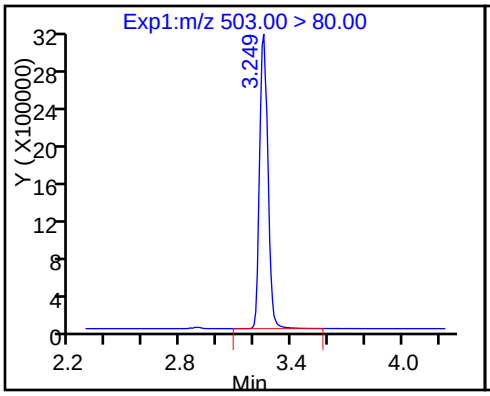
18 Perfluorooctane sulfonic acid



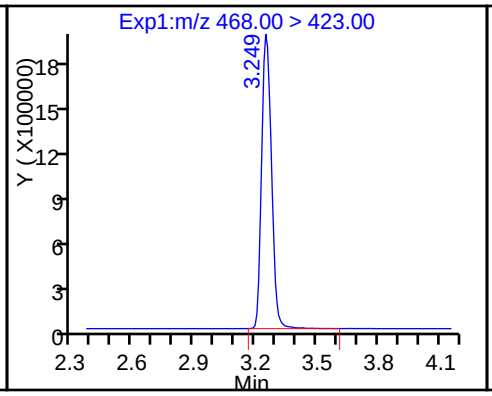
18 Perfluorooctane sulfonic acid



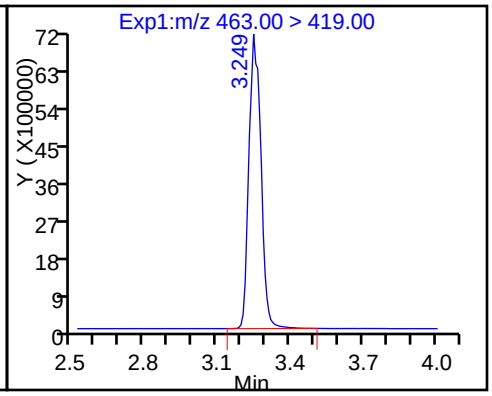
D 17 13C4 PFOS



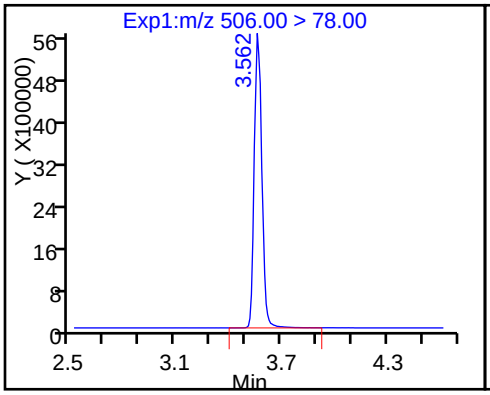
D 19 13C5 PFNA



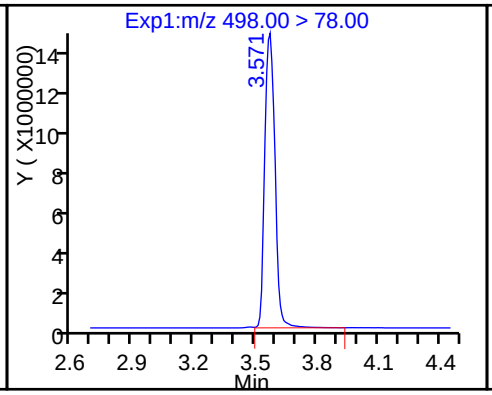
20 Perfluorononanoic acid



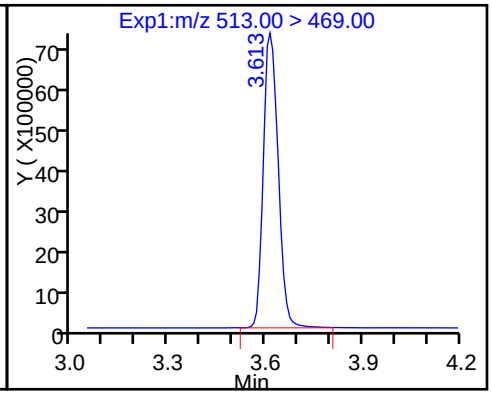
D 21 13C8 FOSA



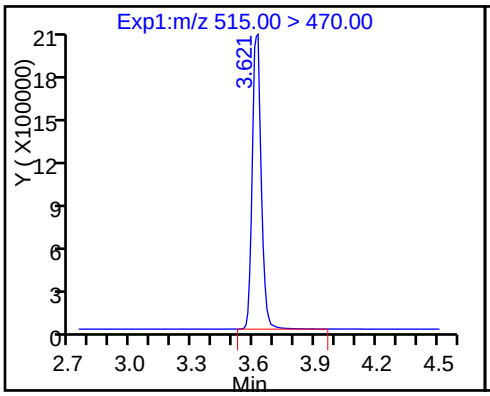
22 Perfluorooctane Sulfonamide



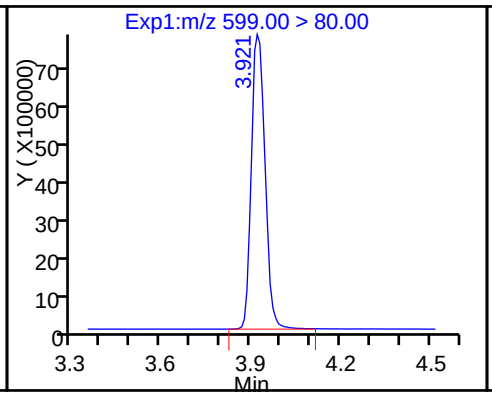
24 Perfluorodecanoic acid



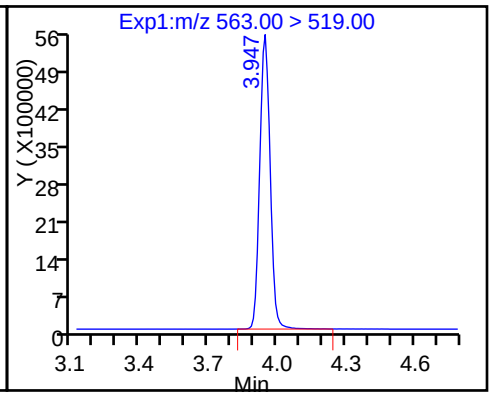
D 23 13C2 PFDA



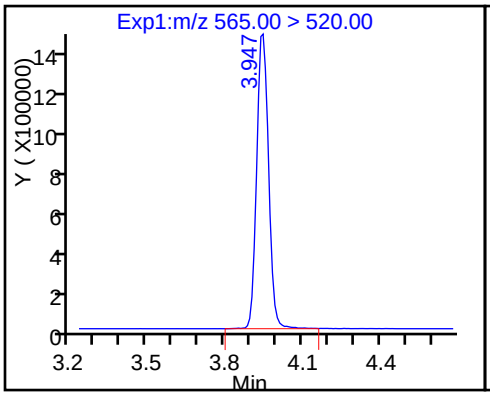
26 Perfluorodecane Sulfonic acid



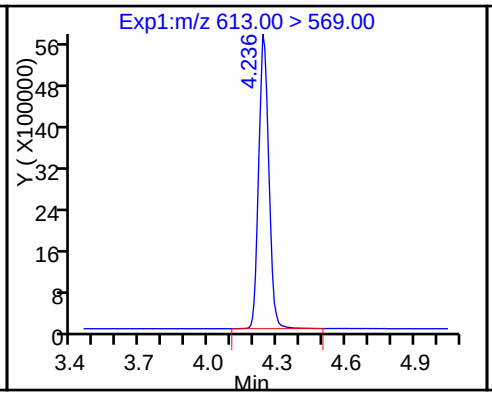
28 Perfluoroundecanoic acid



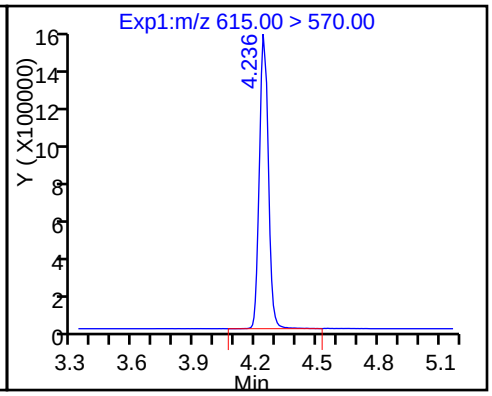
D 27 13C2 PFUnA



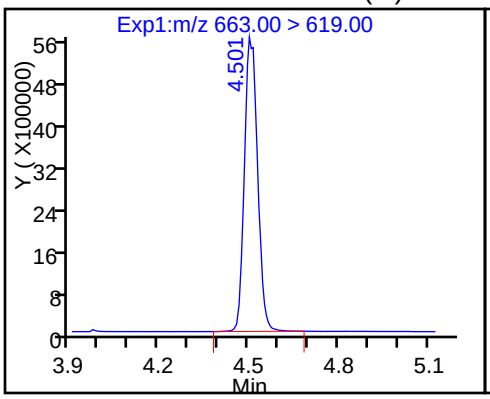
29 Perfluorododecanoic acid



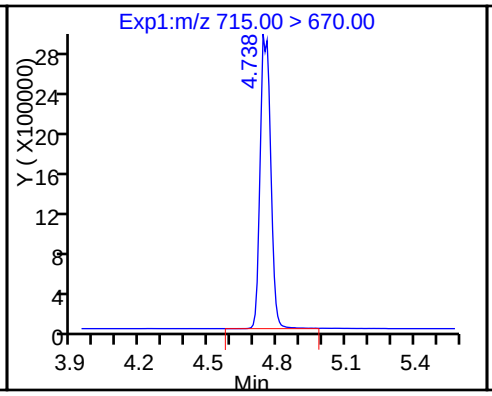
D 30 13C2 PFDoA



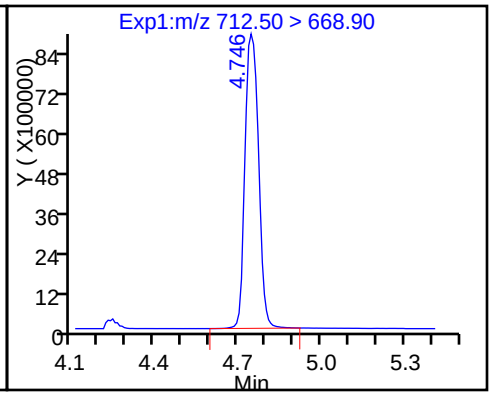
31 Perfluorotridecanoic acid (M)



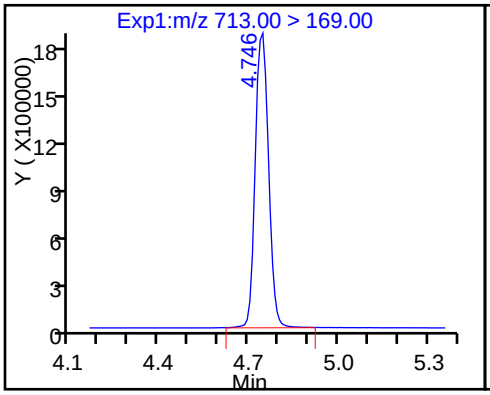
D 32 13C2-PFTeDA



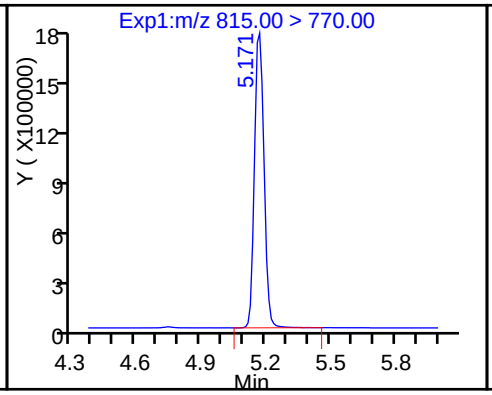
33 Perfluorotetradecanoic acid



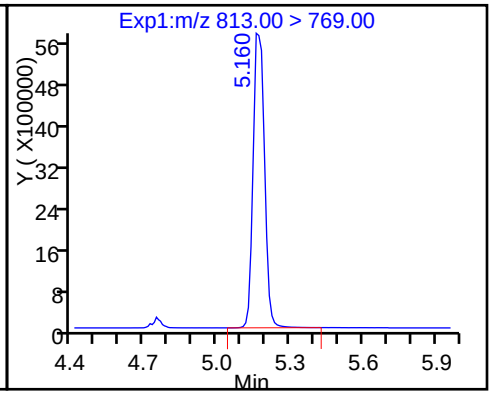
33 Perfluorotetradecanoic acid



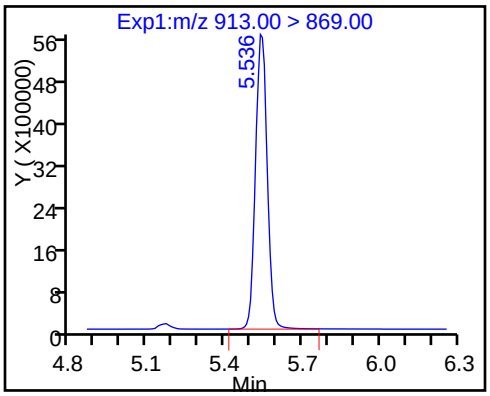
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

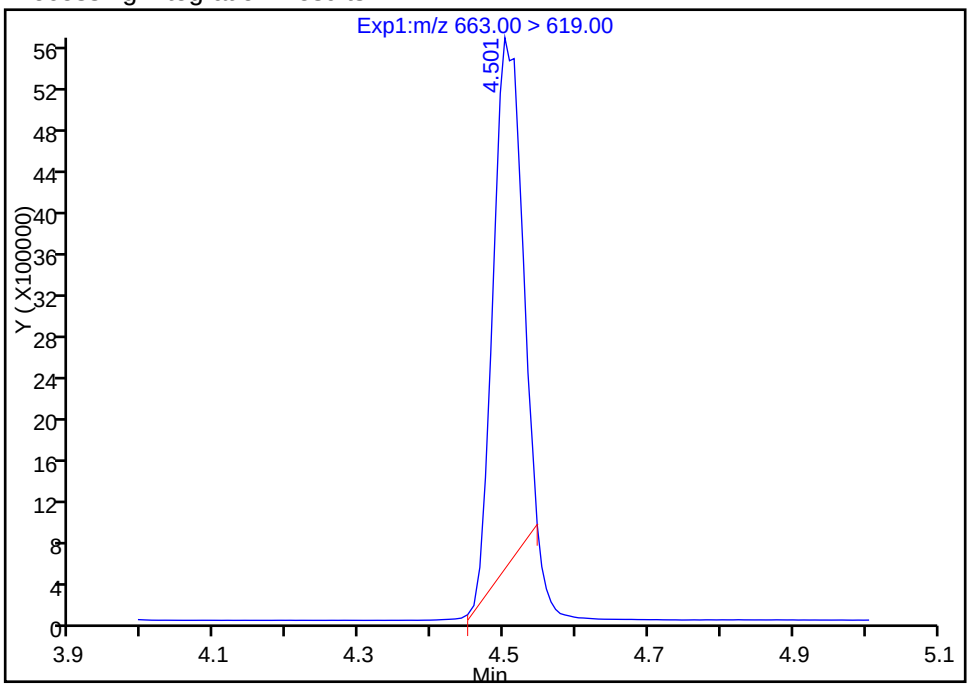
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_009.d				
Injection Date:	03-Dec-2016 14:26:13	Instrument ID:	A8_N		
Lims ID:	IC L6				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	42	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

31 Perfluorotridecanoic acid, CAS: 72629-94-8

Signal: 1

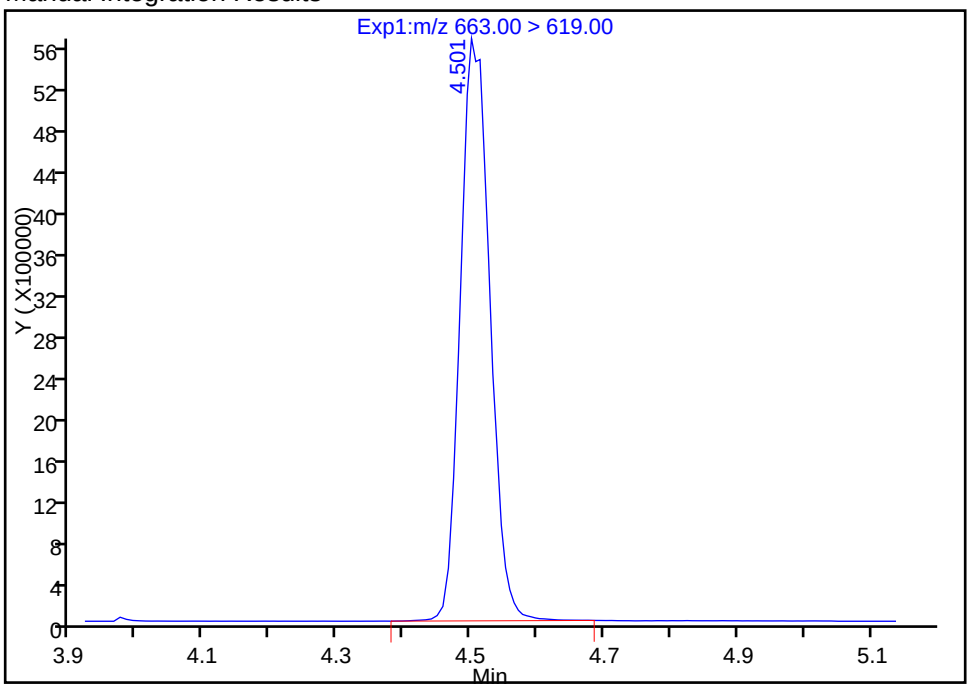
Processing Integration Results

RT: 4.50
Area: 14077685
Amount: 158.7746
Amount Units: ng/ml



Manual Integration Results

RT: 4.50
Area: 17494025
Amount: 191.1674
Amount Units: ng/ml



Reviewer: chandrasenas, 05-Dec-2016 09:44:26

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_013.d
Lims ID: IC L1 Add-on
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 03-Dec-2016 14:56:13 ALS Bottle#: 46 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L1 ADD ON
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub3

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 05-Dec-2016 10:28:00 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:47:53

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.840	2.836	0.004	1.000	40088	0.5222		110		
D 47 M2-6:2FTS										
429.00 > 409.00	2.840	2.836	0.004		4340981	41.1		86.6		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.601	3.588	0.013	1.000	37551	0.4928		103		
D 42 M2-8:2FTS										
529.00 > 509.00	3.601	3.591	0.010		4263521	43.9		91.6		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.765	3.756	0.009		3321758	45.8		91.6		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.774	3.759	0.015	1.002	23619	0.4142		82.8		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.931	3.922	0.009		3822164	48.0		96.0		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.931	3.929	0.002	1.000	25433	0.4345		86.9		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	4.054	4.051	0.003		4696243	44.7		89.4		
54 MeFOSA										
512.00 > 169.00	4.063	4.057	0.006	1.000	37442	0.4934		98.7		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.244	4.239	0.005		4355916	43.9		87.9		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.253	4.245	0.008	1.000	36079	0.4813		96.3		

Reagents:

LCPFC2-L1_00002 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2016 10:28:00 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_013.d

Injection Date: 03-Dec-2016 14:56:13 Instrument ID: A8_N

Lims ID: IC L1 Add-on

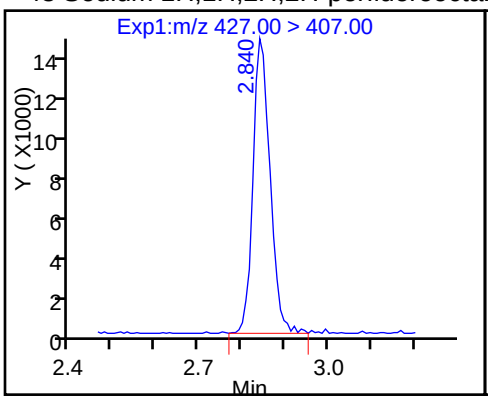
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 46 Worklist Smp#: 13

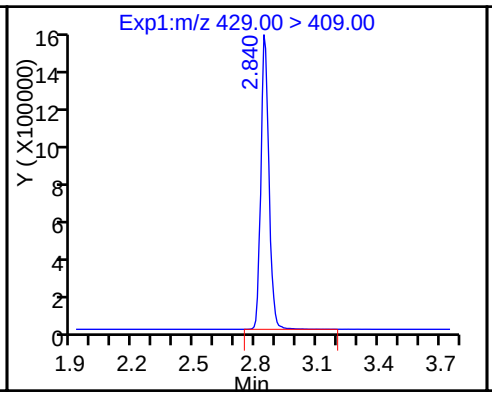
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

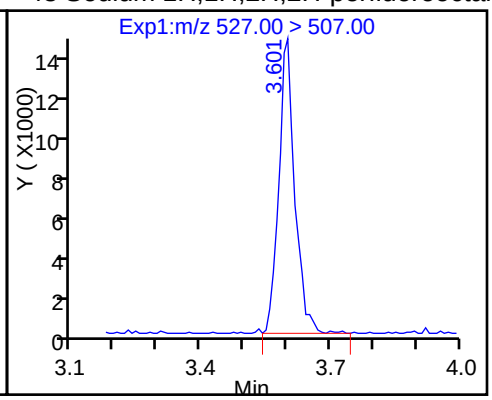
48 Sodium 1H,1H,2H,2H-perfluorooctane



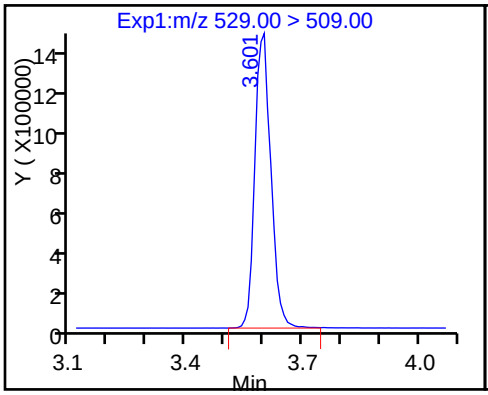
D 47 M2-6:2FTS



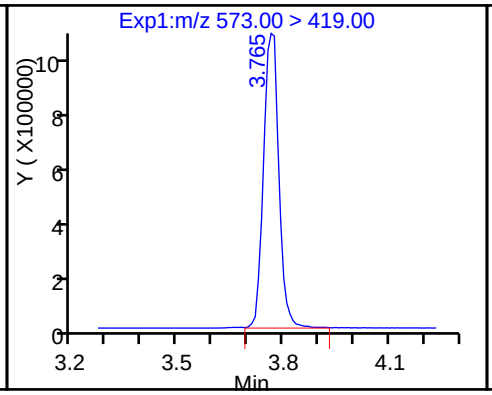
43 Sodium 1H,1H,2H,2H-perfluorooctane



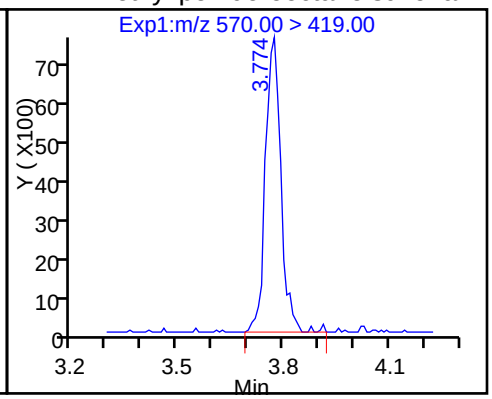
D 42 M2-8:2FTS



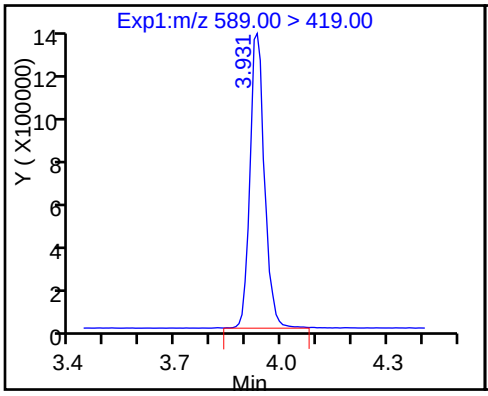
D 45 d3-NMeFOSAA



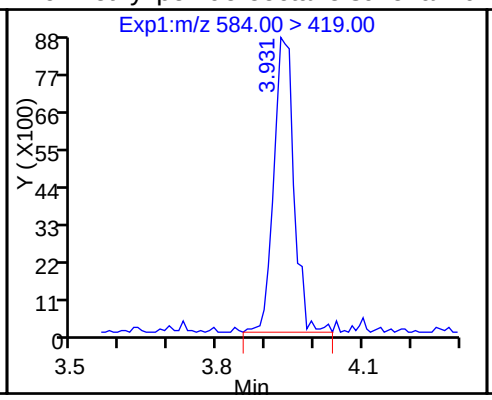
44 N-methyl perfluorooctane sulfonami



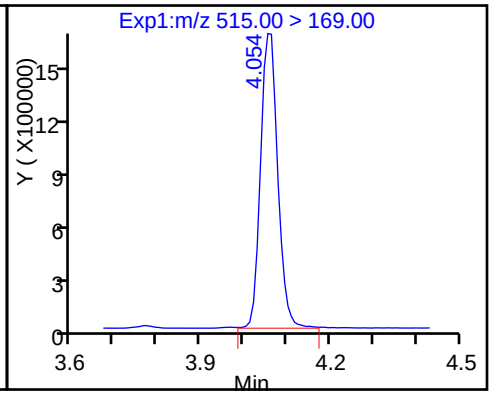
D 46 d5-NEtFOSAA



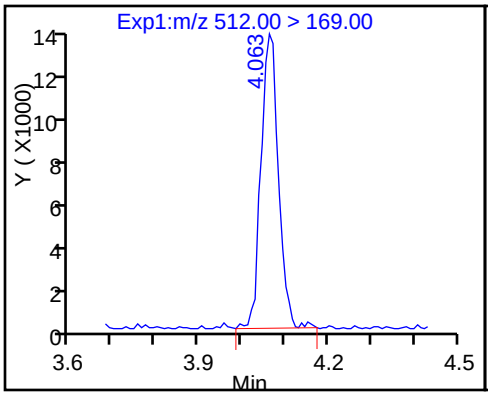
49 N-ethyl perfluorooctane sulfonamid



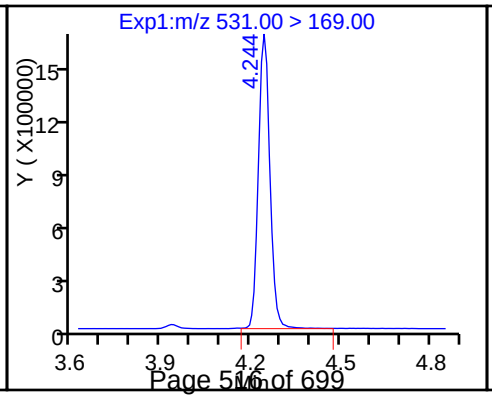
D 52 d-N-MeFOSA-M



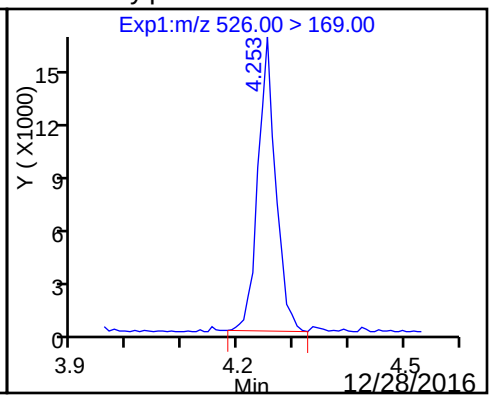
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_014.d
Lims ID: IC L2 Add-on
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 03-Dec-2016 15:03:43 ALS Bottle#: 47 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L2 ADD ON
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub3

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 05-Dec-2016 10:28:01 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:48:07

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.830	2.836	-0.006	1.000	69385	0.9534		101		
D 47 M2-6:2FTS										
429.00 > 409.00	2.830	2.836	-0.006		4115043	39.0		82.1		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.579	3.588	-0.009	1.000	63932	0.9133		95.3		
D 42 M2-8:2FTS										
529.00 > 509.00	3.579	3.591	-0.012		3917070	40.3		84.2		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.760	3.756	0.004		3368323	46.4		92.9		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.760	3.759	0.001	1.000	53845	0.9312		93.1		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.918	3.922	-0.004		3818745	47.9		95.9		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.935	3.929	0.006	1.004	49948	0.8541		85.4		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	4.051	4.051	0.0		4885054	46.5		93.0		
54 MeFOSA										
512.00 > 169.00	4.051	4.057	-0.006	1.000	72155	0.9140		91.4		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.231	4.239	-0.008		4699997	47.4		94.8		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.239	4.245	-0.006	1.000	72107	0.8915		89.1		

Reagents:

LCPFC2-L2_00002 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2016 10:28:03 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_014.d

Injection Date: 03-Dec-2016 15:03:43 Instrument ID: A8_N

Lims ID: IC L2 Add-on

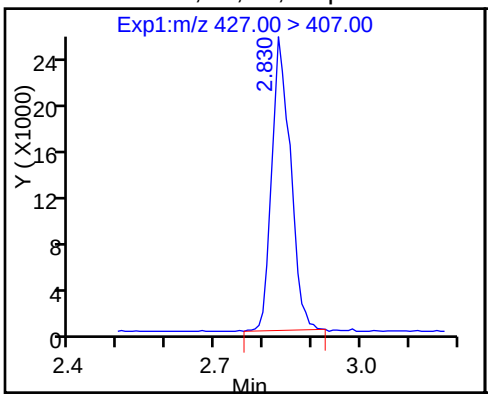
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 47 Worklist Smp#: 14

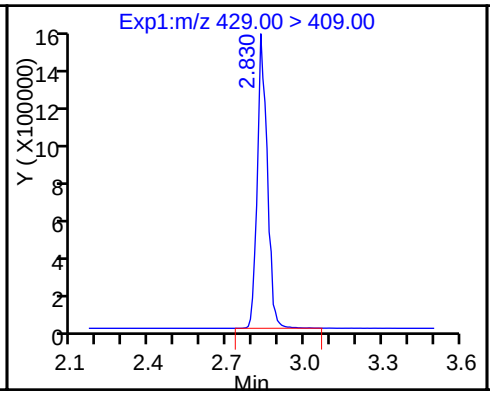
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

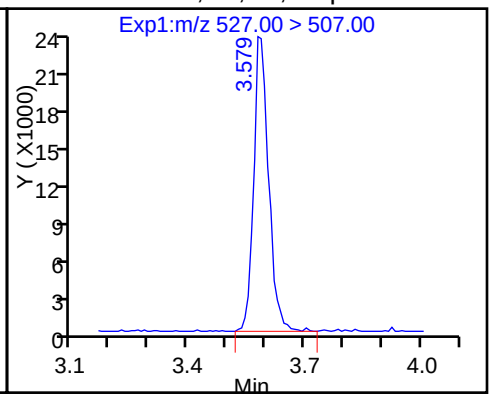
48 Sodium 1H,1H,2H,2H-perfluorooctane



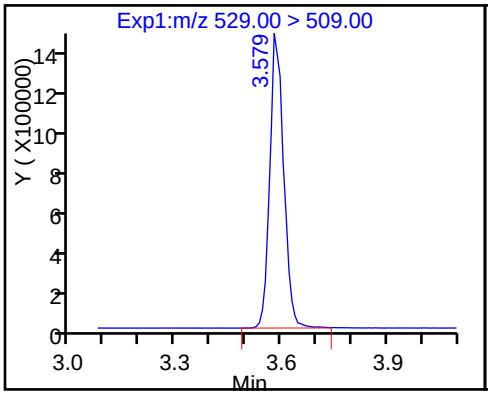
D 47 M2-6:2FTS



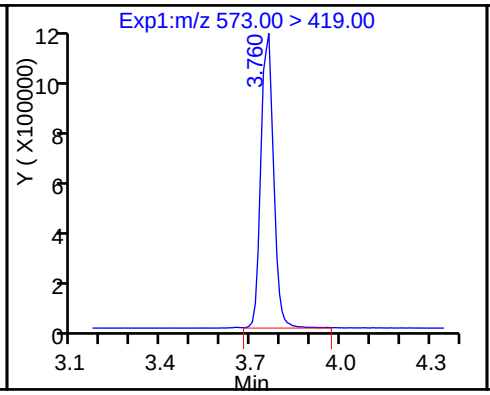
43 Sodium 1H,1H,2H,2H-perfluorooctane



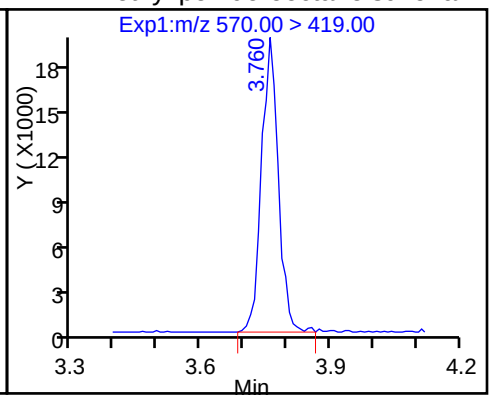
D 42 M2-8:2FTS



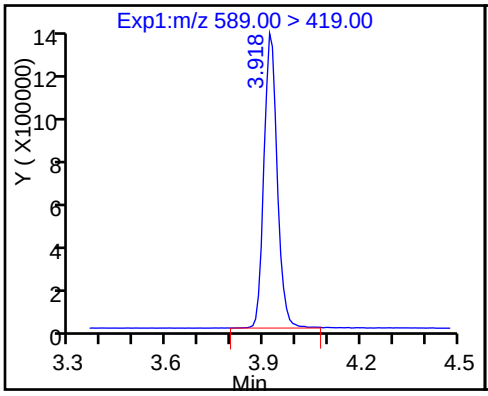
D 45 d3-NMeFOSAA



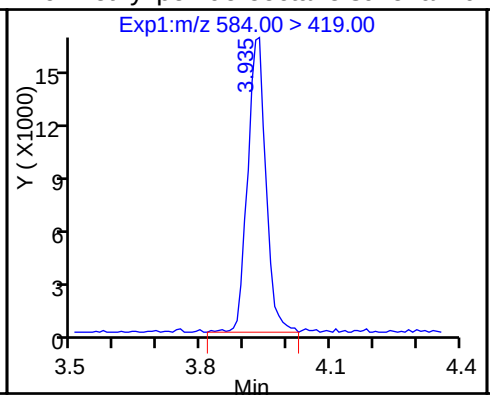
44 N-methyl perfluorooctane sulfonami



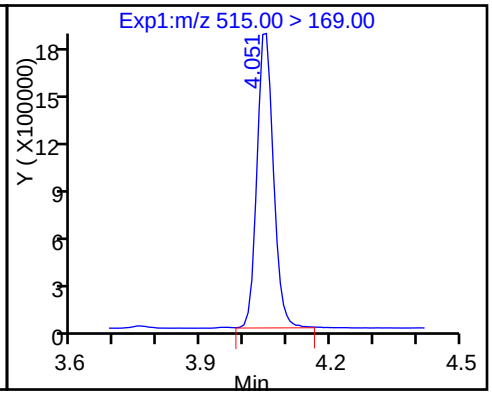
D 46 d5-NEtFOSAA



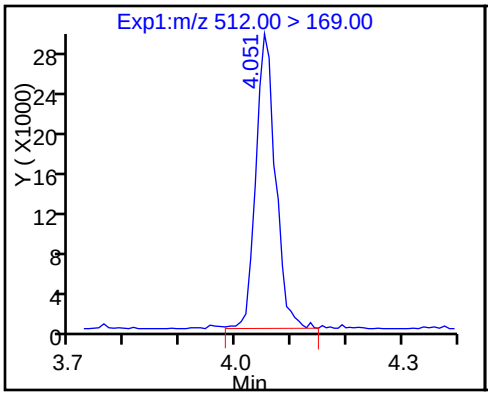
49 N-ethyl perfluorooctane sulfonamid



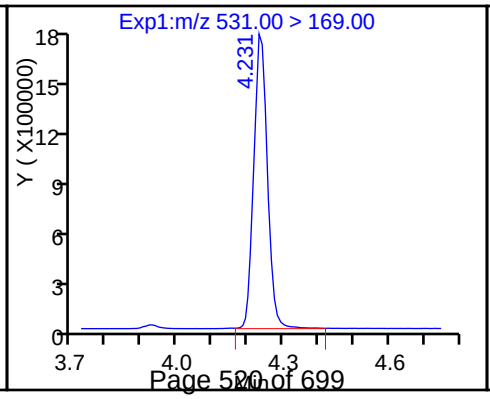
D 52 d-N-MeFOSA-M



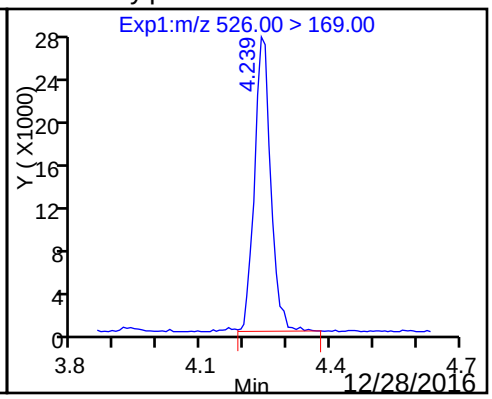
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_015.d
Lims ID: IC L3 Add-on
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 03-Dec-2016 15:11:13 ALS Bottle#: 48 Worklist Smp#: 15
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L3 ADD ON
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub3

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 05-Dec-2016 10:28:04 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:48:18

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.838	2.836	0.002	1.000	352721	4.15		87.6		
D 47 M2-6:2FTS										
429.00 > 409.00	2.838	2.836	0.002		4800798	45.5		95.8		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.588	3.588	0.0	0.998	326213	4.10		85.6		
D 42 M2-8:2FTS										
529.00 > 509.00	3.596	3.591	0.005		4450751	45.8		95.7		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.751	3.756	-0.005		3668263	50.6		101		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.760	3.759	0.001	1.002	260030	4.13		82.6		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.918	3.922	-0.004		4095032	51.4		103		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.926	3.929	-0.003	1.002	265257	4.23		84.6		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	4.051	4.051	0.0		5526561	52.6		105		
54 MeFOSA										
512.00 > 169.00	4.051	4.057	-0.006	1.000	356898	4.00		79.9		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.240	4.239	0.001		5054297	51.0		102		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.240	4.245	-0.005	1.000	365313	4.20		84.0		

Reagents:

LCPFC2-L3_00002 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2016 10:28:05 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_015.d

Injection Date: 03-Dec-2016 15:11:13 Instrument ID: A8_N

Lims ID: IC L3 Add-on

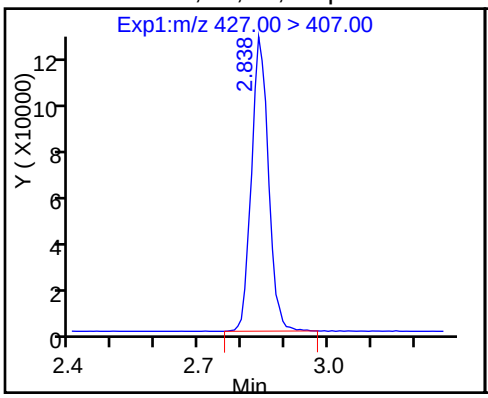
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 48 Worklist Smp#: 15

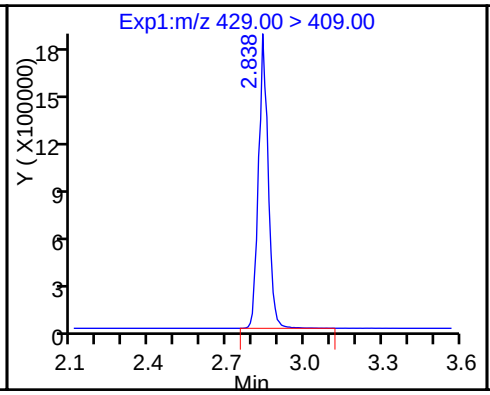
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

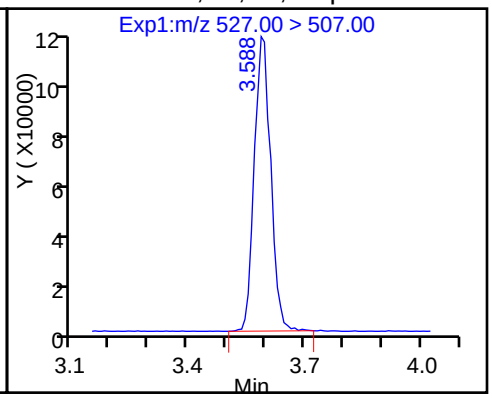
48 Sodium 1H,1H,2H,2H-perfluorooctane



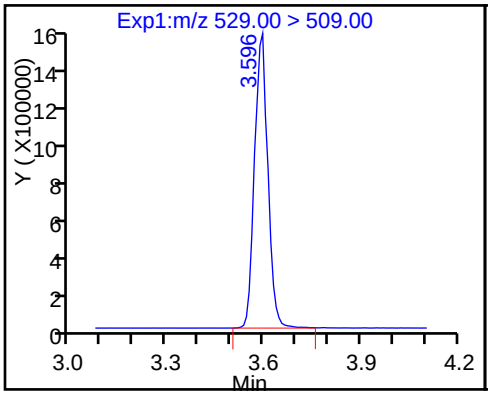
D 47 M2-6:2FTS



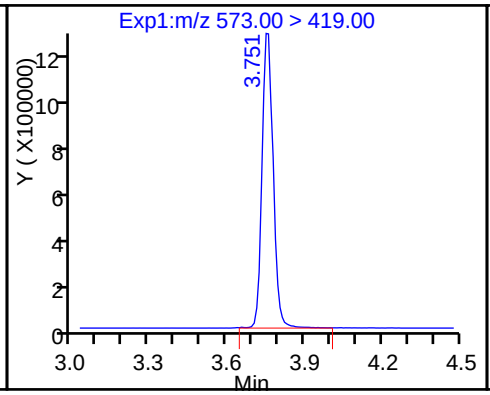
43 Sodium 1H,1H,2H,2H-perfluorooctane



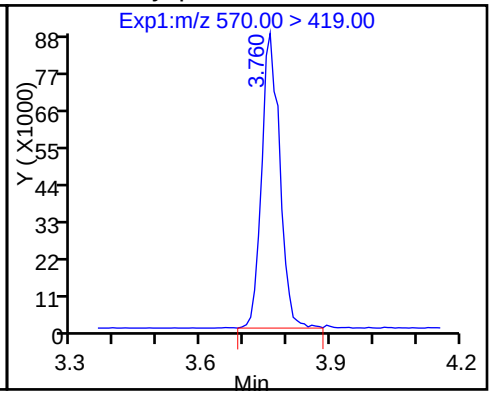
D 42 M2-8:2FTS



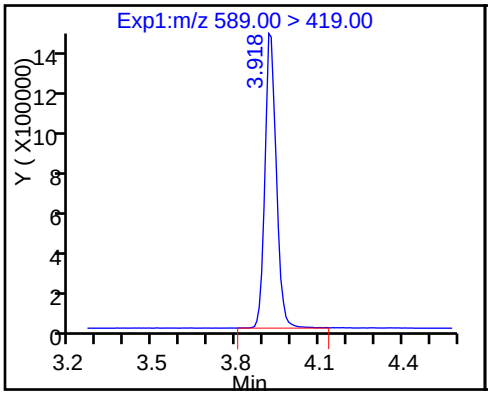
D 45 d3-NMeFOSAA



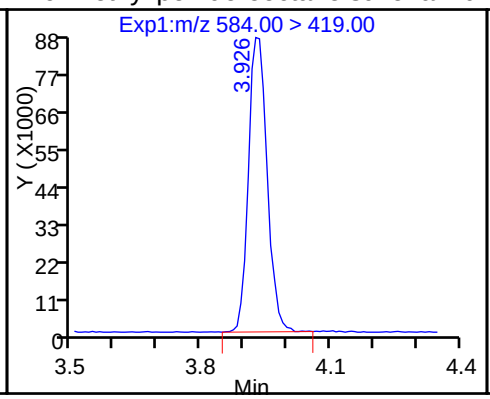
44 N-methyl perfluorooctane sulfonami



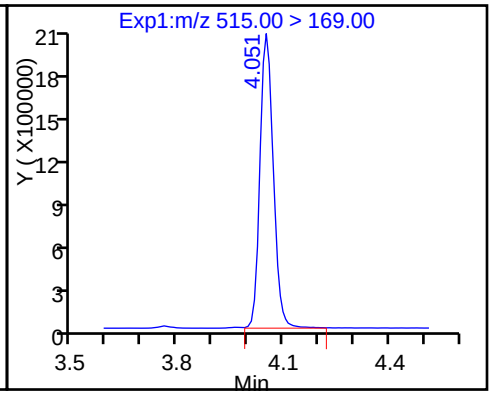
D 46 d5-NEtFOSAA



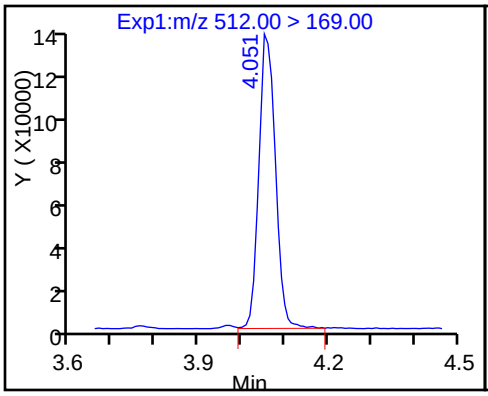
49 N-ethyl perfluorooctane sulfonamid



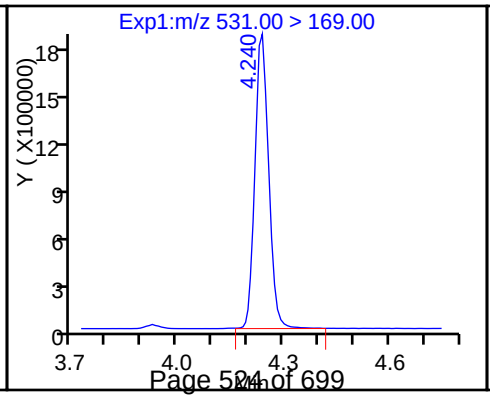
D 52 d-N-MeFOSA-M



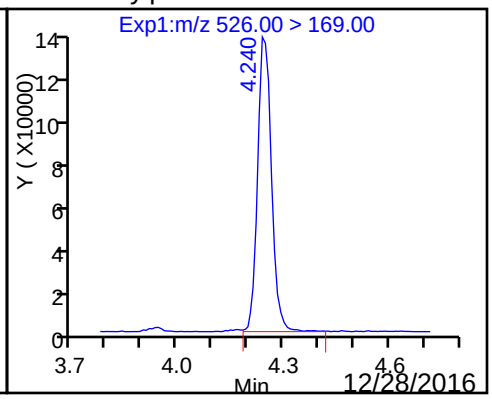
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_016.d
Lims ID: IC L4 Add-on
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 03-Dec-2016 15:18:43 ALS Bottle#: 49 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L4 ADD ON
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub3

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 05-Dec-2016 10:28:06 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:47:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.840	2.836	0.004	1.000	2169230	19.5		103		
D 47 M2-6:2FTS										
429.00 > 409.00	2.840	2.836	0.004		6295656	59.7		126		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.592	3.588	0.004	1.000	2029390	21.1		110		
D 42 M2-8:2FTS										
529.00 > 509.00	3.592	3.591	0.001		5378444	55.4		116		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.756	3.756	0.0		4323749	59.6		119		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.756	3.759	-0.003	1.000	1655435	22.3		112		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.931	3.922	0.009		4650188	58.4		117		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.931	3.929	0.002	1.000	1629443	22.9		114		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	4.055	4.051	0.004		6162693	58.6		117		
54 MeFOSA										
512.00 > 169.00	4.063	4.057	0.006	1.000	2189848	22.0		110		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.244	4.239	0.005		5747792	58.0		116		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.244	4.245	-0.001	1.000	2201423	22.3		111		

Reagents:

LCPFC2-L4_00003 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2016 10:28:06 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_016.d

Injection Date: 03-Dec-2016 15:18:43 Instrument ID: A8_N

Lims ID: IC L4 Add-on

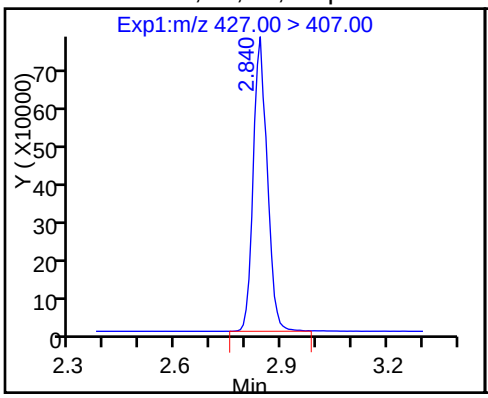
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 49 Worklist Smp#: 16

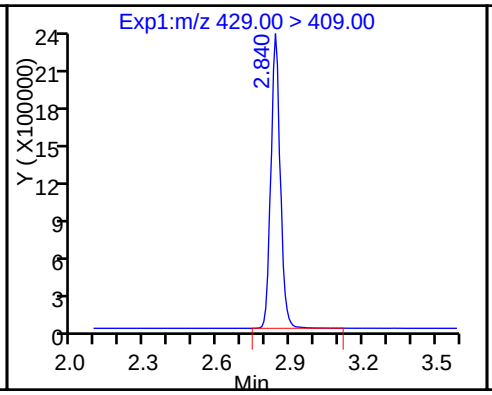
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

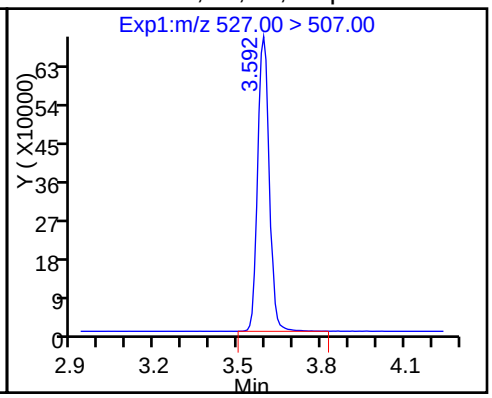
48 Sodium 1H,1H,2H,2H-perfluorooctane



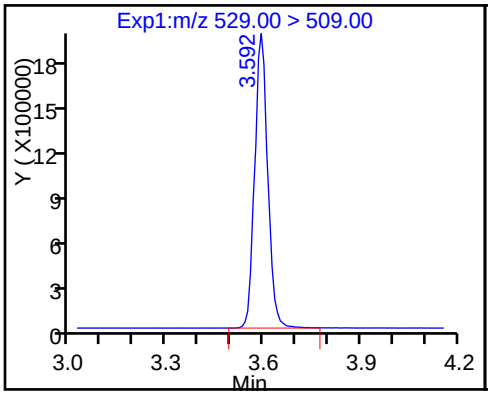
D 47 M2-6:2FTS



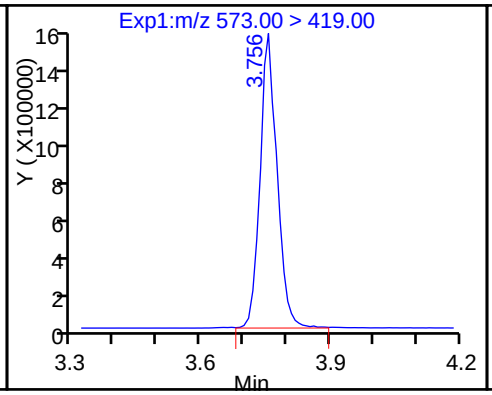
43 Sodium 1H,1H,2H,2H-perfluorooctane



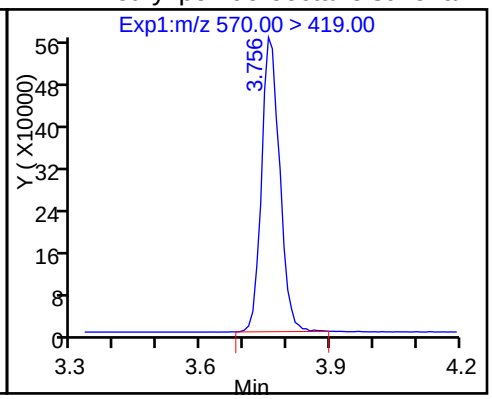
D 42 M2-8:2FTS



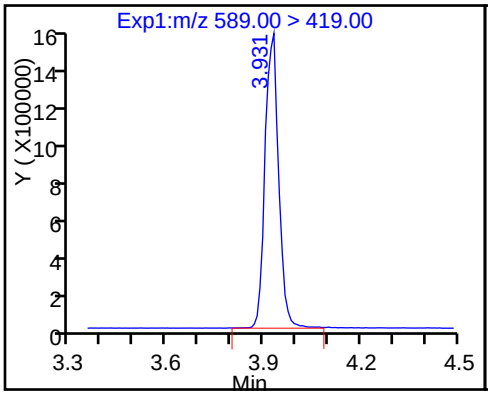
D 45 d3-NMeFOSAA



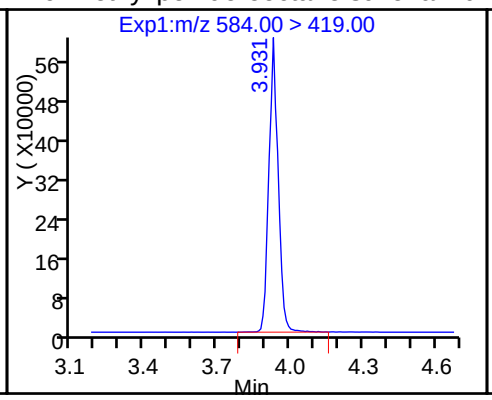
44 N-methyl perfluorooctane sulfonami



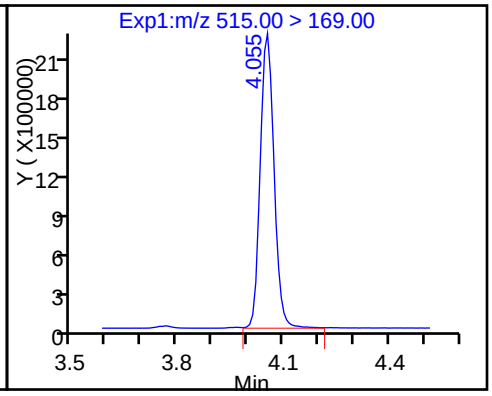
D 46 d5-NEtFOSAA



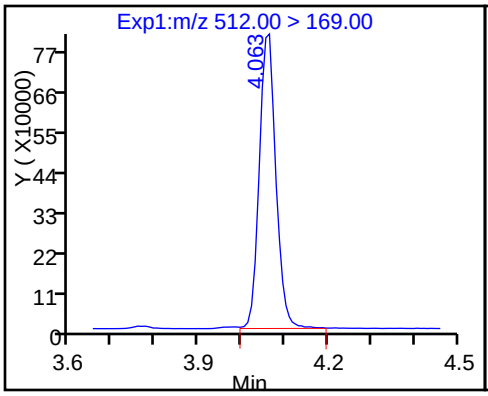
49 N-ethyl perfluorooctane sulfonamid



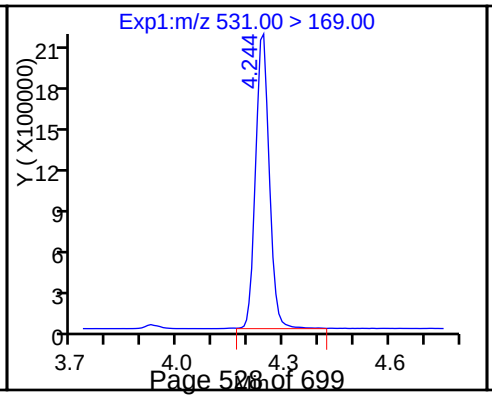
D 52 d-N-MeFOSA-M



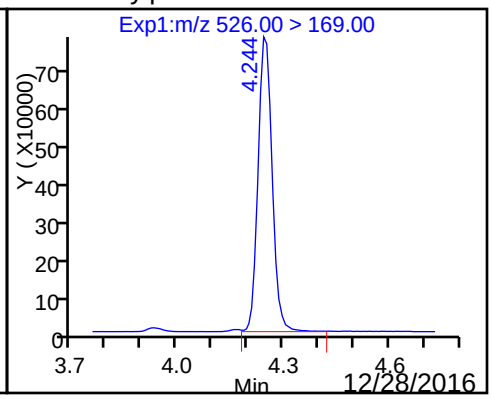
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_017.d
Lims ID: IC L5 Add-on
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 03-Dec-2016 15:26:12 ALS Bottle#: 50 Worklist Smp#: 17
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L5 ADD ON
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub3

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 05-Dec-2016 10:28:07 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:48:43

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.830	2.836	-0.006	1.000	4576863	55.8		118		
D 47 M2-6:2FTS										
429.00 > 409.00	2.830	2.836	-0.006		4638709	44.0		92.5		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.579	3.588	-0.009	0.998	4279048	57.8		121		
D 42 M2-8:2FTS										
529.00 > 509.00	3.587	3.591	-0.004		4144623	42.7		89.1		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.750	3.756	-0.006		3122973	43.1		86.1		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.750	3.759	-0.009	1.000	3484088	65.0		130		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.917	3.922	-0.005		3419439	42.9		85.9		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.925	3.929	-0.004	1.002	3261537	62.3		125		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	4.042	4.051	-0.009		4794382	45.6		91.2		
54 MeFOSA										
512.00 > 169.00	4.051	4.057	-0.006	1.000	4656344	60.1		120		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.236	4.239	-0.003		4667809	47.1		94.1		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.245	4.245	0.0	1.000	4735360	58.9		118		

Reagents:

LCPFC2-L5_00002 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2016 10:28:08 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_017.d

Injection Date: 03-Dec-2016 15:26:12 Instrument ID: A8_N

Lims ID: IC L5 Add-on

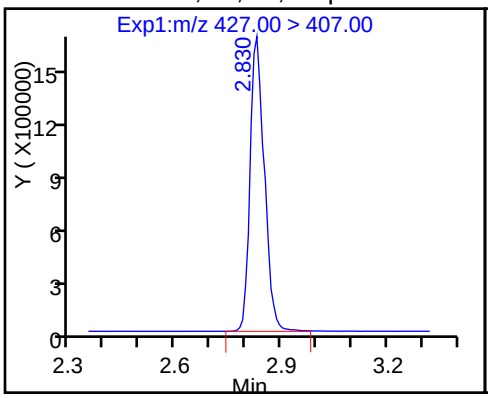
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 50 Worklist Smp#: 17

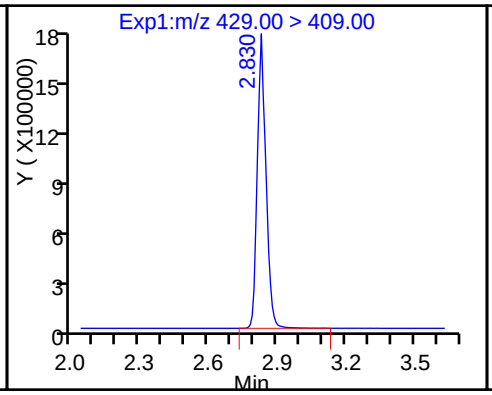
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

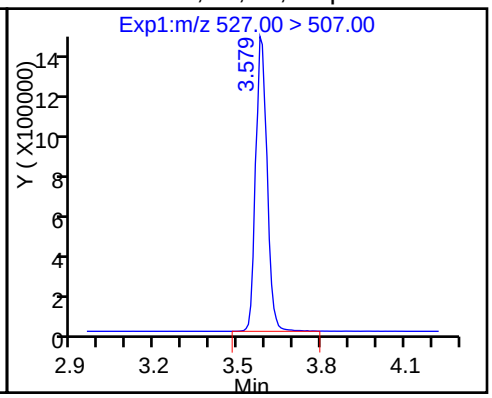
48 Sodium 1H,1H,2H,2H-perfluorooctane



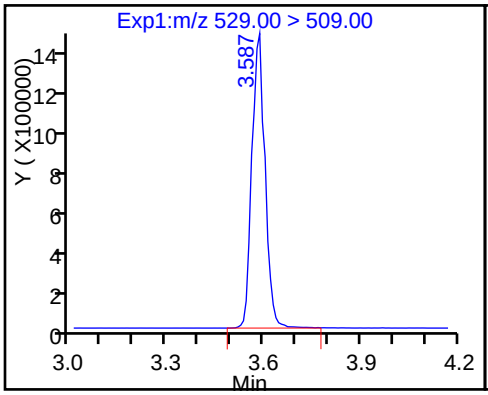
D 47 M2-6:2FTS



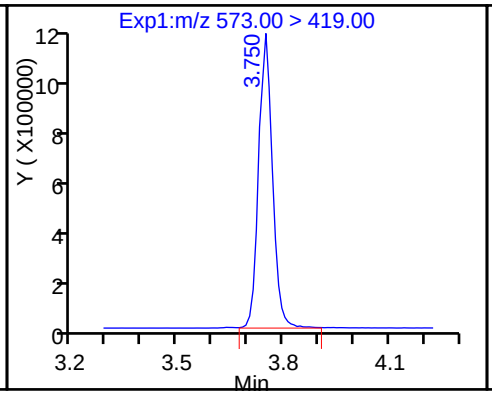
43 Sodium 1H,1H,2H,2H-perfluorooctane



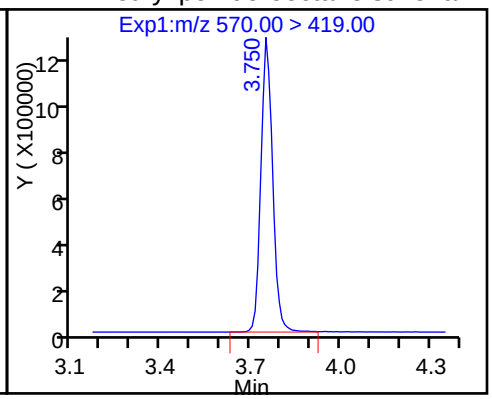
D 42 M2-8:2FTS



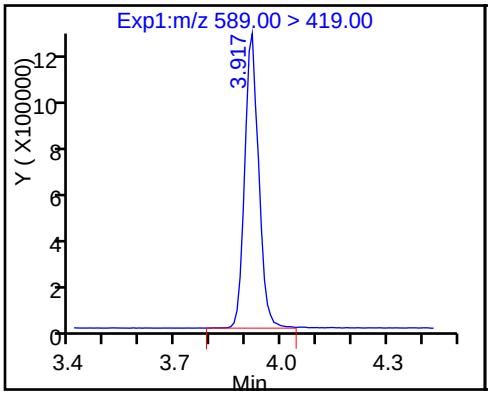
D 45 d3-NMeFOSAA



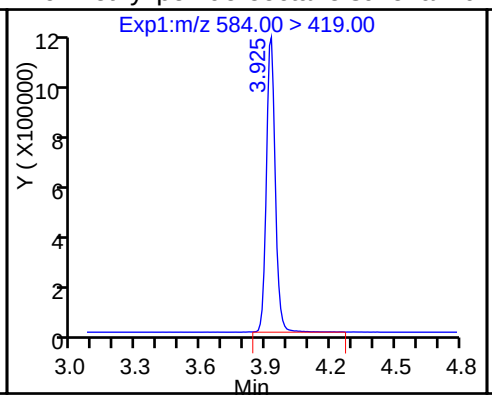
44 N-methyl perfluorooctane sulfonami



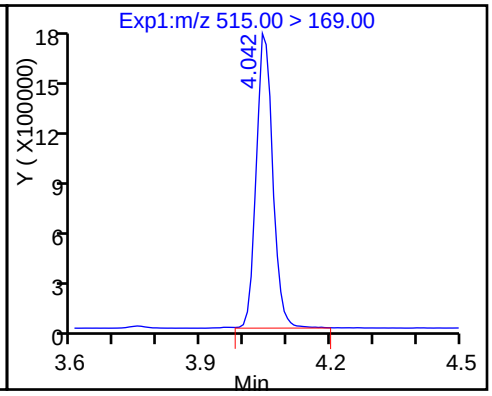
D 46 d5-NEtFOSAA



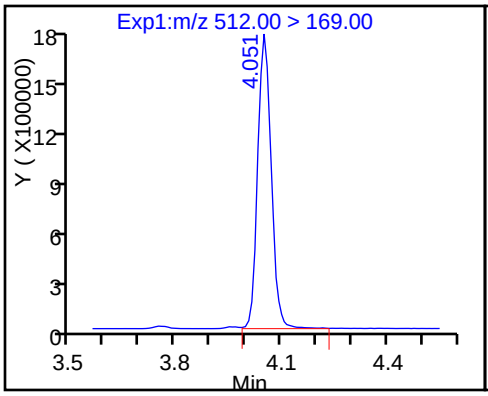
49 N-ethyl perfluorooctane sulfonamid



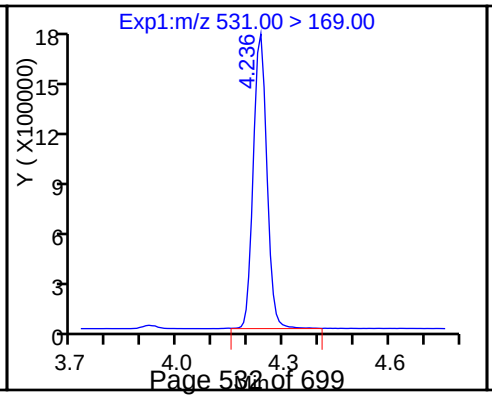
D 52 d-N-MeFOSA-M



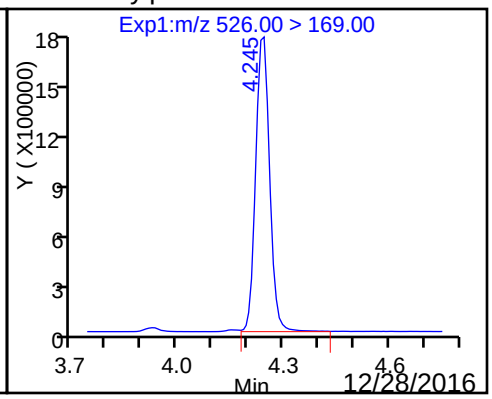
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
Lims ID: IC L6 Add-on
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 03-Dec-2016 15:33:40 ALS Bottle#: 51 Worklist Smp#: 18
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L6 ADD ON
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub3

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 05-Dec-2016 10:28:09 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:49:51

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.838	2.836	0.002	1.000	18026595	173.2		91.3		
D 47 M2-6:2FTS										
429.00 > 409.00	2.838	2.836	0.002		5885296	55.8		117		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.589	3.588	0.001	1.000	16850029	163.6		85.4		
D 42 M2-8:2FTS										
529.00 > 509.00	3.589	3.591	-0.002		5764339	59.3		124		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.752	3.756	-0.004		3953776	54.5		109		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.752	3.759	-0.007	1.000	13566790	199.9		99.9		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.919	3.922	-0.003		4091711	51.4		103		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.927	3.929	-0.002	1.002	13047697	208.2		104		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	4.052	4.051	0.001		5465444	52.0		104		
54 MeFOSA										
512.00 > 169.00	4.061	4.057	0.004	1.000	17635948	199.7		99.8		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.239	4.239	0.0		5223764	52.7		105		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.249	4.245	0.003	1.000	18234509	202.8		101		

Reagents:

LCPFC2-L6_00002 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2016 10:28:09 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Injection Date: 03-Dec-2016 15:33:40 Instrument ID: A8_N

Lims ID: IC L6 Add-on

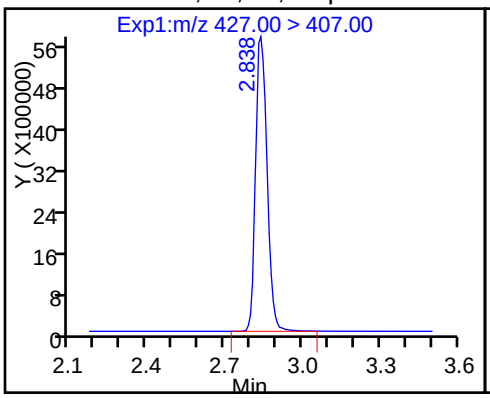
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 51 Worklist Smp#: 18

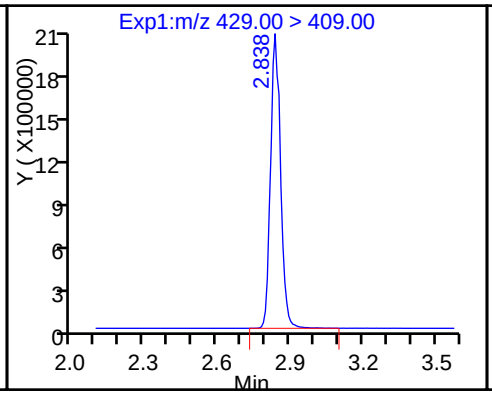
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

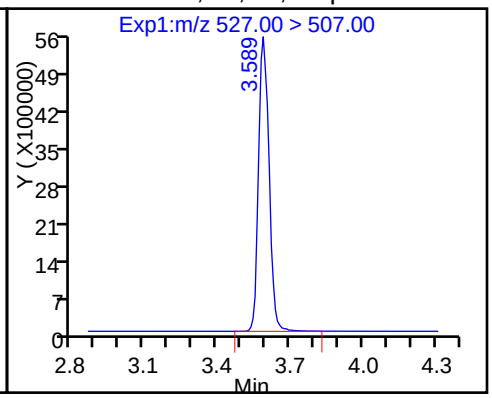
48 Sodium 1H,1H,2H,2H-perfluorooctane



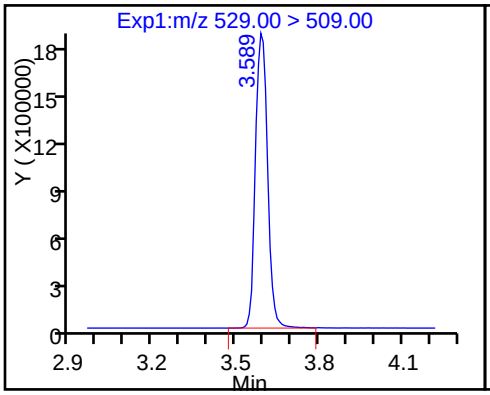
D 47 M2-6:2FTS



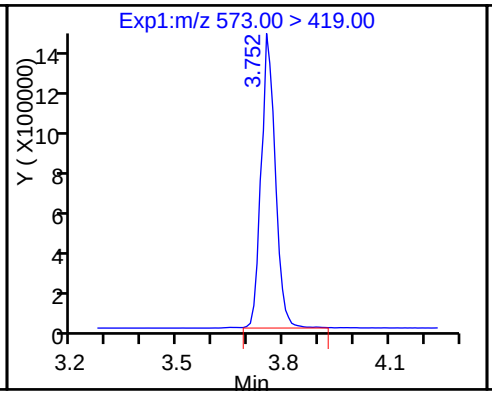
43 Sodium 1H,1H,2H,2H-perfluorooctane



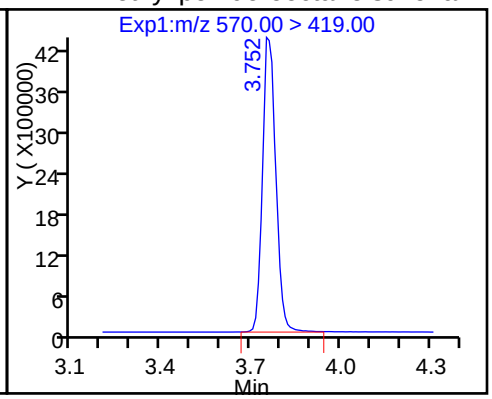
D 42 M2-8:2FTS



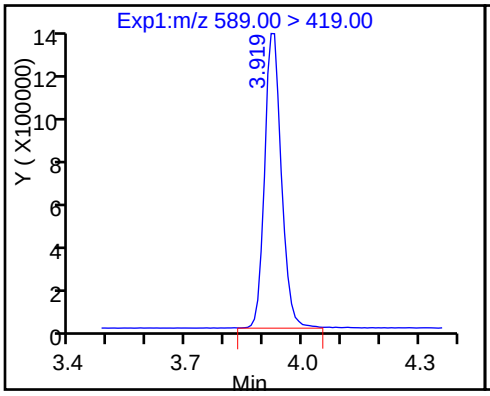
D 45 d3-NMeFOSAA



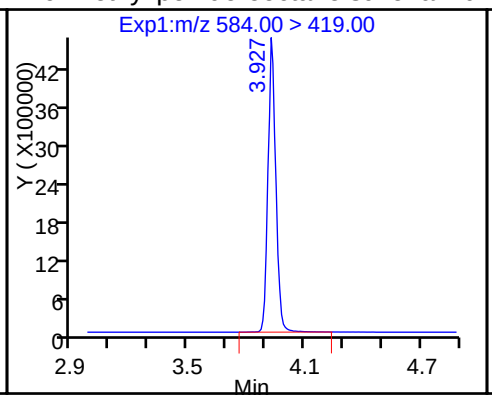
44 N-methyl perfluorooctane sulfonami



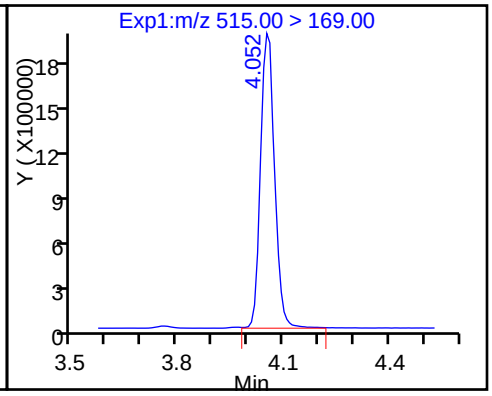
D 46 d5-NEtFOSAA



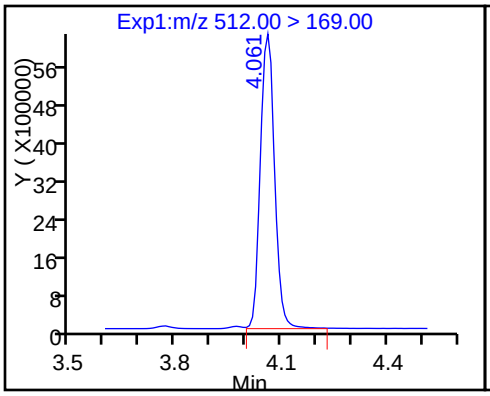
49 N-ethyl perfluorooctane sulfonamid



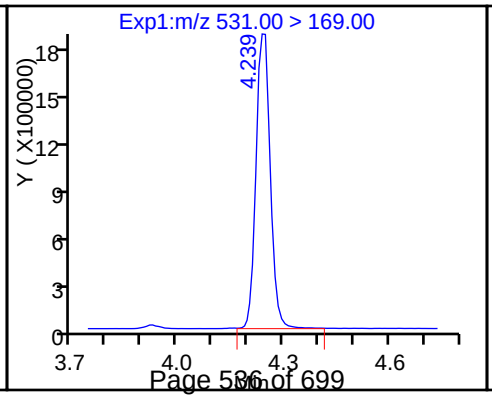
D 52 d-N-MeFOSA-M



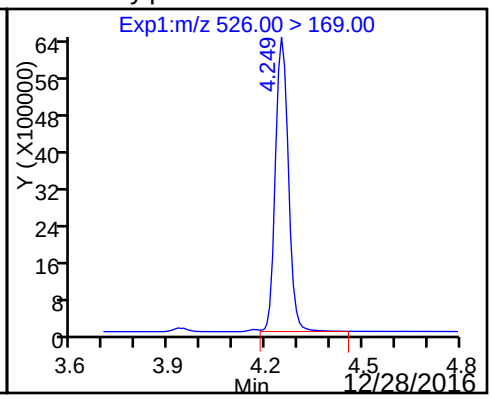
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Lab Sample ID: ICV 320-140564/11 Calibration Date: 12/03/2016 14:41

Instrument ID: A8_N Calib Start Date: 12/03/2016 13:48

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/03/2016 15:33

Lab File ID: 03DEC2016A_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8740	0.8445		48.3	50.0	-3.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.015	0.9455		46.6	50.0	-6.8	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.596	1.545		42.8	44.3	-3.2	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9531	0.8739		45.8	50.0	-8.3	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.027	0.9517		46.3	50.0	-7.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.098	0.9678		41.7	47.3	-11.8	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.177	1.212		49.0	47.6	3.0	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	0.9942		46.4	50.0	-7.2	25.0
Perfluorononanoic acid (PFNA)	AveID	0.996	0.9336		46.9	50.0	-6.3	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.085	0.9006		39.6	47.8	-17.0	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9341	0.8796		47.1	50.0	-5.8	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9605	0.9194		47.9	50.0	-4.3	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6398	0.6253		47.2	48.3	-2.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.066	0.9541		44.8	50.0	-10.5	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9490	0.9026		47.6	50.0	-4.9	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9498	0.8737		46.0	50.0	-8.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.854	1.715		46.3	50.0	-7.5	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9305		46.1	50.0	-7.8	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9929	1.003		50.5	50.0	1.1	25.0
13C4 PFBA	Ave	335829	312410		46.5	50.0	-7.0	50.0
13C5-PFPeA	Ave	264545	243307		46.0	50.0	-8.0	50.0
13C2 PFHxA	Ave	237486	229267		48.3	50.0	-3.5	50.0
13C4-PFHpA	Ave	207413	195333		47.1	50.0	-5.8	50.0
18O2 PFHxS	Ave	312342	294291		44.6	47.3	-5.8	50.0
13C4 PFOA	Ave	219258	198224		45.2	50.0	-9.6	50.0
13C4 PFOS	Ave	246009	225320		43.8	47.8	-8.4	50.0
13C5 PFNA	Ave	166415	156724		47.1	50.0	-5.8	50.0
13C8 FOSA	Ave	402279	382595		47.6	50.0	-4.9	50.0
13C2 PFDA	Ave	157817	146344		46.4	50.0	-7.3	50.0
13C2 PFUnA	Ave	118762	109554		46.1	50.0	-7.8	50.0
13C2 PFDoA	Ave	112084	109278		48.7	50.0	-2.5	50.0
13C2-PFTeDA	Ave	231173	214390		46.4	50.0	-7.3	50.0
13C2-PFHxDA	Ave	129725	121978		47.0	50.0	-6.0	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_011.d
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 03-Dec-2016 14:41:13 ALS Bottle#: 44 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICV_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 05-Dec-2016 10:26:23 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:47:22

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.566	1.574	-0.008		15620513	46.5		93.0	1612048	
1 Perfluorobutyric acid										
212.90 > 169.00	1.566	1.577	-0.011	1.000	13190679	48.3			70053	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.848	1.861	-0.013	1.000	11502032	46.6			76938	
D 4 13C5-PFPeA										
267.90 > 223.00	1.848	1.861	-0.013		12165345	46.0		92.0	911947	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.887	1.900	-0.013	1.000	20121282	42.8				
298.90 > 99.00	1.887	1.900	-0.013	1.000	9272505		2.17(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.158	2.164	-0.006	1.000	10017573	45.8			244705	
D 6 13C2 PFHxA										
315.00 > 270.00	2.158	2.164	-0.006		11463370	48.3		96.5	672140	
D 11 13C4-PFHpA										
367.00 > 322.00	2.499	2.511	-0.012		9766668	47.1		94.2	852072	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.499	2.512	-0.013	1.000	9294490	46.3			100010	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.514	2.531	-0.017	1.000	13456842	41.7				
D 10 18O2 PFHxS										
403.00 > 84.00	2.514	2.531	-0.017		13919947	44.6		94.2	810316	
D 14 13C4 PFOA										
417.00 > 372.00	2.870	2.880	-0.010		9911203	45.2		90.4	548349	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.870	2.887	-0.017	1.000	9853753	46.4			123535	
413.00 > 169.00	2.862	2.887	-0.025	0.997	6029090		1.63(0.90-1.10)		244064	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.870	2.888	-0.018	1.000	13003397	49.0				
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.244	3.258	-0.014	1.000	9689735	39.6			1641854	
499.00 > 99.00	3.235	3.258	-0.023	0.997	2361166		4.10(0.90-1.10)		256440	
D 17 13C4 PFOS										
503.00 > 80.00	3.235	3.259	-0.024		10770309	43.8		91.6	336185	
D 19 13C5 PFNA										
468.00 > 423.00	3.244	3.263	-0.019		7836220	47.1		94.2	638662	
20 Perfluorononanoic acid										
463.00 > 419.00	3.244	3.263	-0.019	1.000	7315987	46.9			101636	
D 21 13C8 FOSA										
506.00 > 78.00	3.557	3.571	-0.014		19129770	47.6		95.1	889404	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.565	3.574	-0.009	1.000	16827146	47.1			307442	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.607	3.623	-0.016	1.000	6727679	47.9			161083	
D 23 13C2 PFDA										
515.00 > 470.00	3.607	3.626	-0.019		7317194	46.4		92.7	293278	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.912	3.936	-0.024	1.000	6797886	47.2				
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.938	3.955	-0.017	1.000	5226274	44.8			120213	
D 27 13C2 PFUnA										
565.00 > 520.00	3.938	3.958	-0.020		5477711	46.1		92.2	312875	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.224	4.250	-0.026	1.000	4931801	47.6			90828	
D 30 13C2 PFDoA										
615.00 > 570.00	4.232	4.251	-0.019		5463889	48.7		97.5	309492	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.503	4.518	-0.015	1.000	4773745	46.0			36970	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.732	4.759	-0.027		10719523	46.4		92.7	360593	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.740	4.761	-0.021	1.000	9370597	46.3			4744	
713.00 > 169.00	4.732	4.761	-0.029	0.998	1459995		6.42(0.00-0.00)		102221	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.158	5.186	-0.028		6098899	47.0		94.0	113553	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.158	5.186	-0.028	1.000	5084325	46.1			4219	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.523	5.559	-0.036	1.000	5482963	50.5			9364	

Reagents:

LCPFCIC_00020 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2016 10:26:23 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_011.d

Injection Date: 03-Dec-2016 14:41:13 Instrument ID: A8_N

Lims ID: ICV

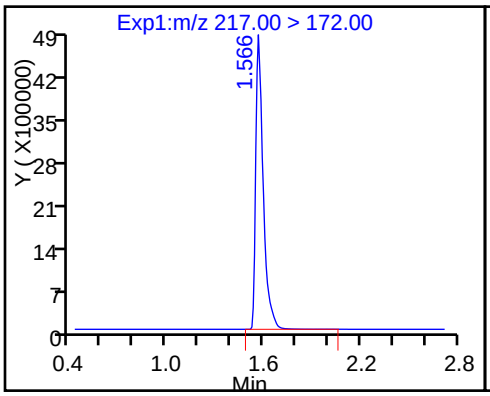
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 44 Worklist Smp#: 11

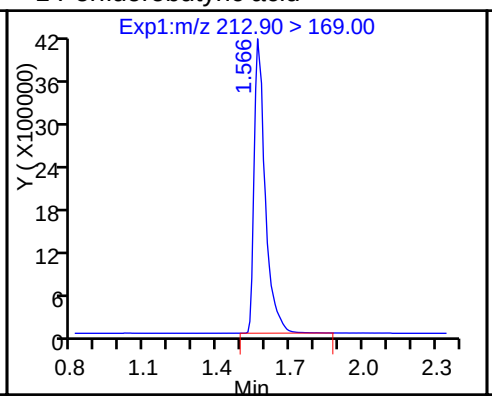
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

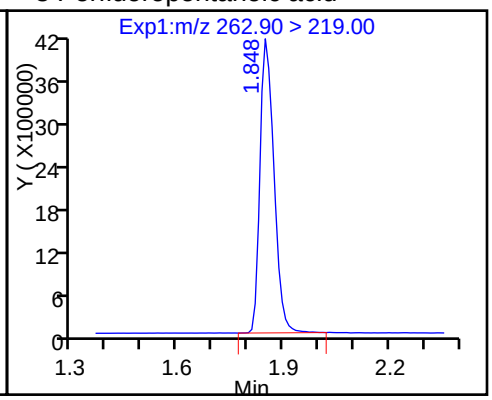
D 2 13C4 PFBA



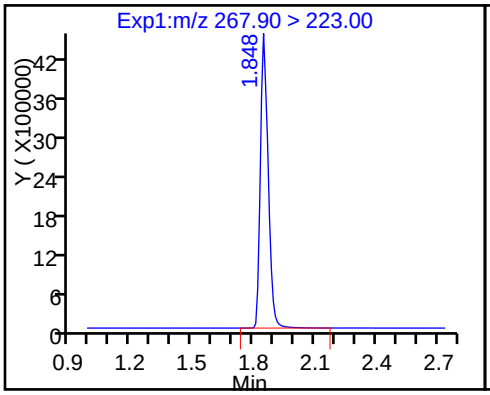
1 Perfluorobutyric acid



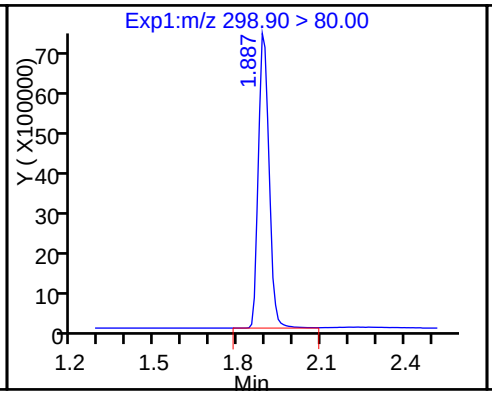
3 Perfluoropentanoic acid



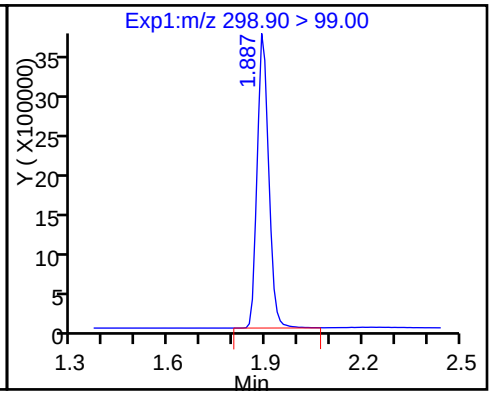
D 4 13C5-PFPeA



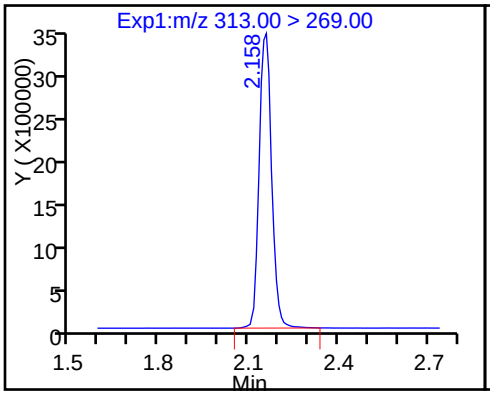
5 Perfluorobutanesulfonic acid



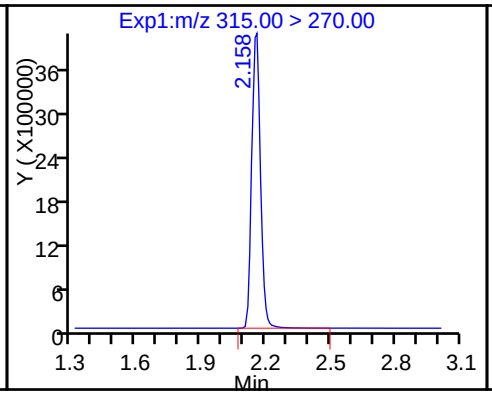
5 Perfluorobutanesulfonic acid



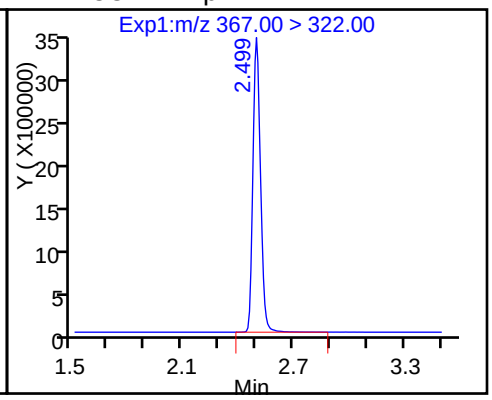
7 Perfluorohexanoic acid



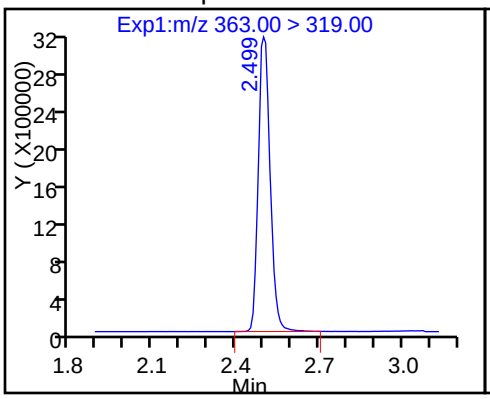
D 6 13C2 PFHxA



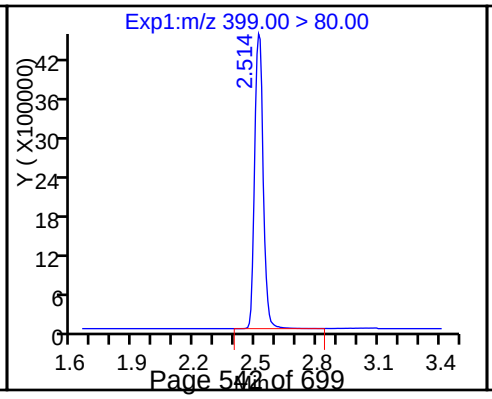
D 11 13C4-PFHpA



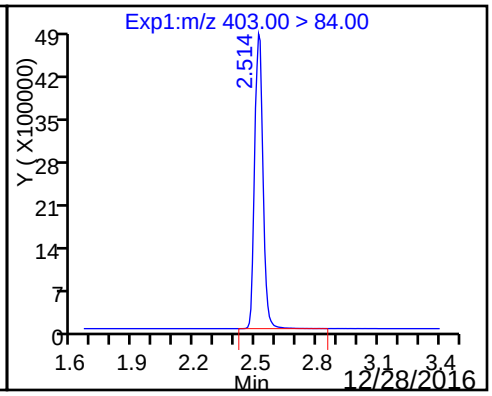
12 Perfluoroheptanoic acid



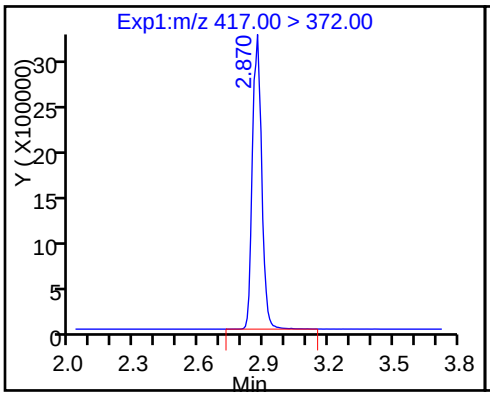
9 Perfluorohexanesulfonic acid



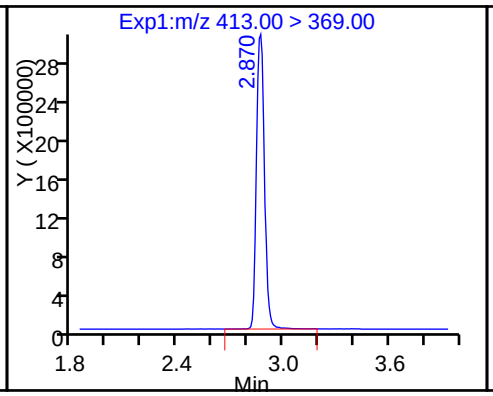
D 10 18O2 PFHxS



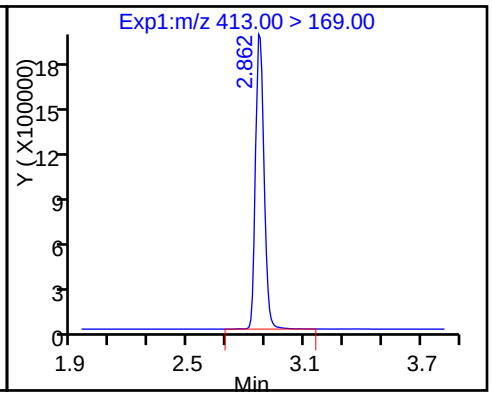
D 14 13C4 PFOA



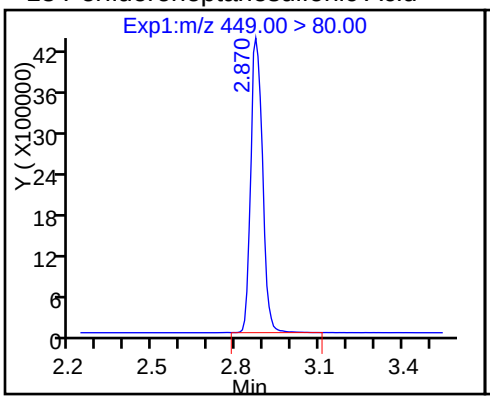
15 Perfluorooctanoic acid



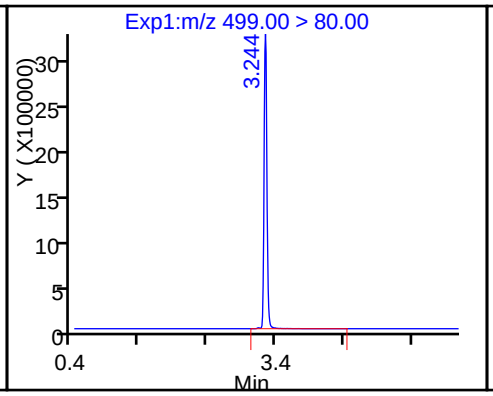
15 Perfluorooctanoic acid



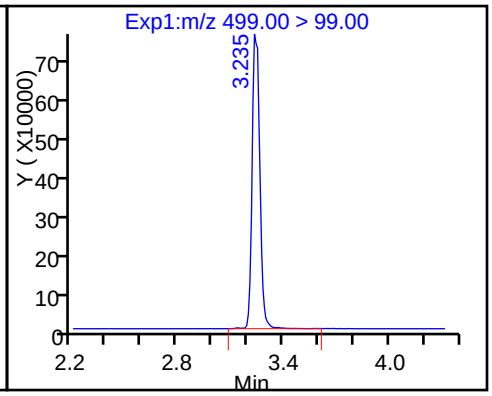
13 Perfluoroheptanesulfonic Acid



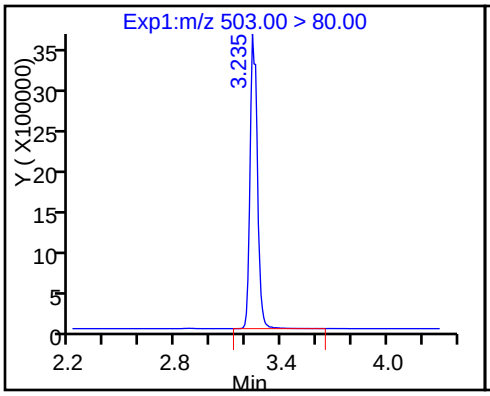
18 Perfluorooctane sulfonic acid



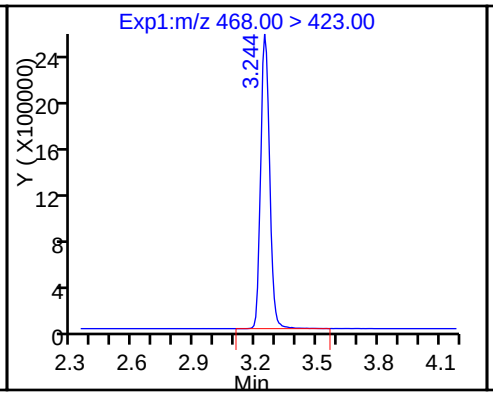
18 Perfluorooctane sulfonic acid



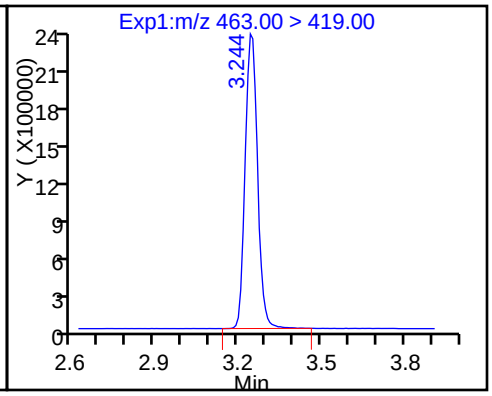
D 17 13C4 PFOS



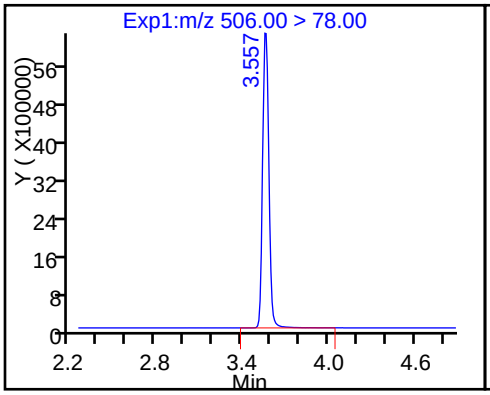
D 19 13C5 PFNA



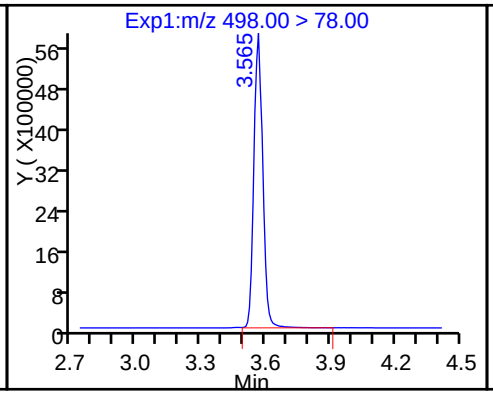
20 Perfluorononanoic acid



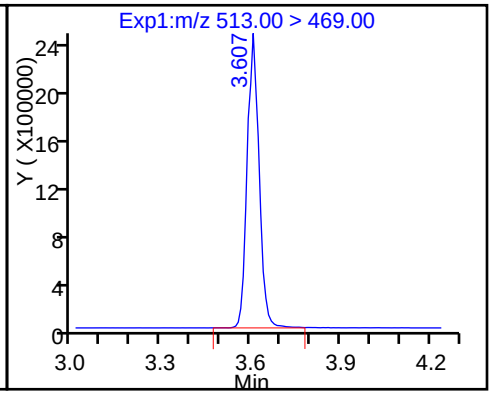
D 21 13C8 FOSA



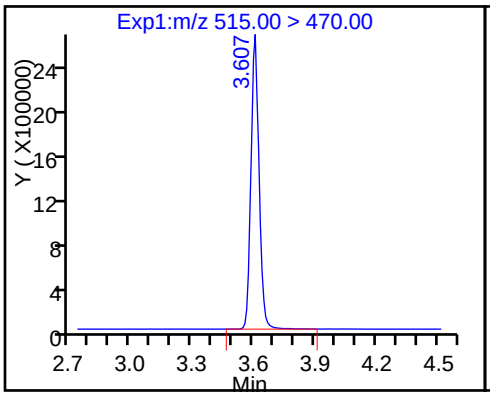
22 Perfluorooctane Sulfonamide



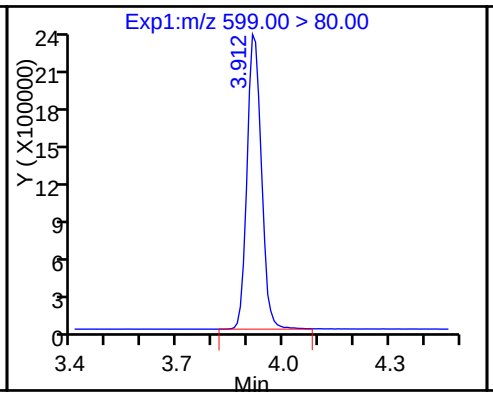
24 Perfluorodecanoic acid



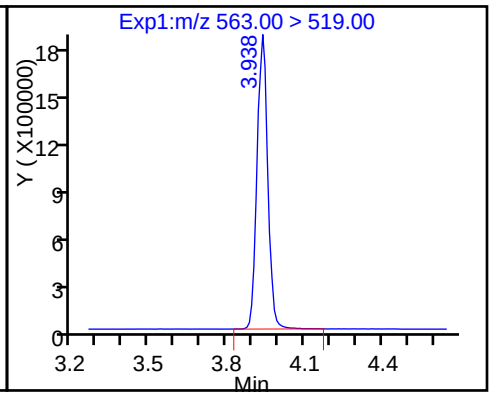
D 23 13C2 PFDA



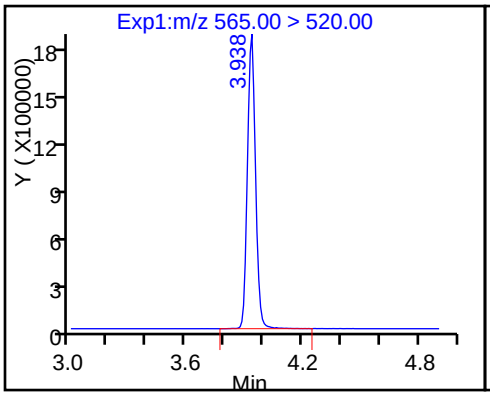
26 Perfluorodecane Sulfonic acid



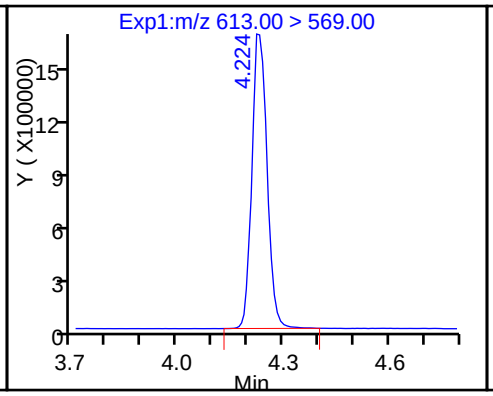
28 Perfluoroundecanoic acid



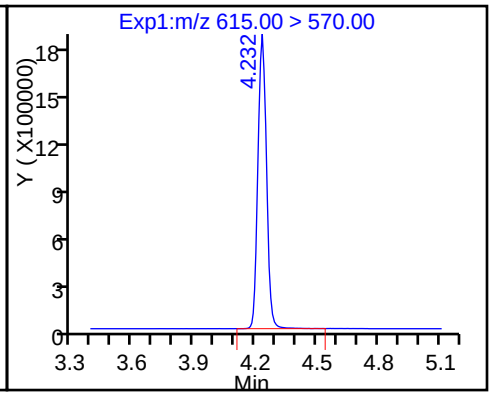
D 27 13C2 PFUnA



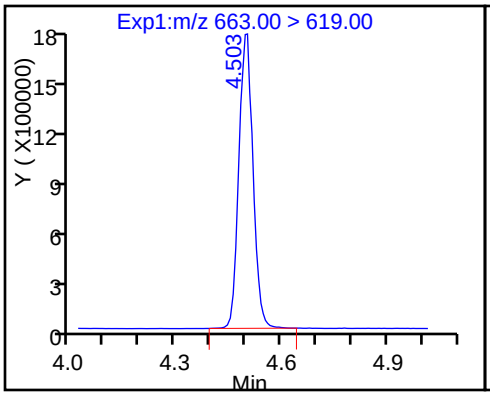
29 Perfluorododecanoic acid



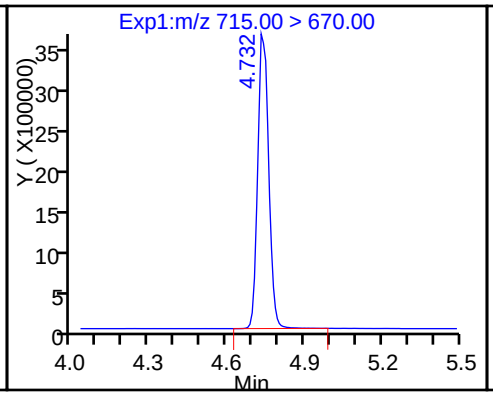
D 30 13C2 PFDoA



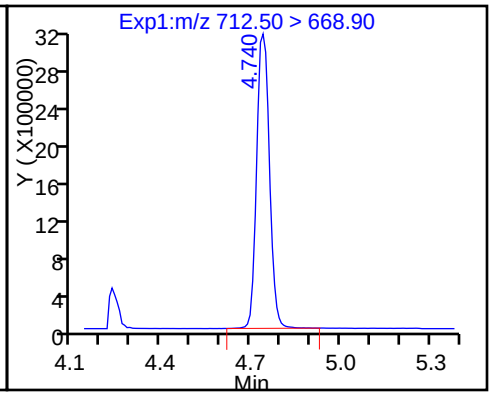
31 Perfluorotridecanoic acid



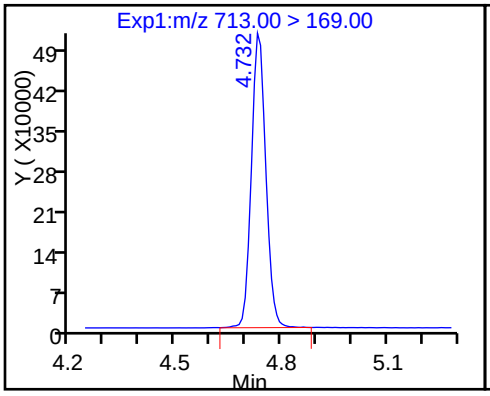
D 32 13C2-PFTeDA



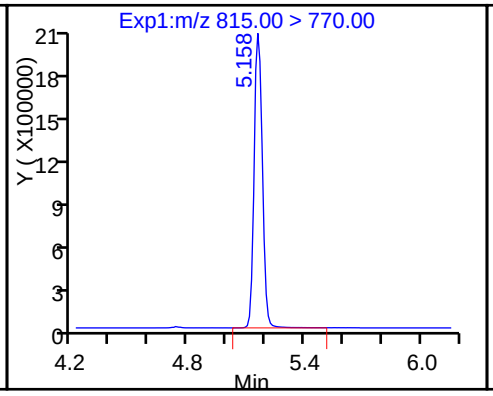
33 Perfluorotetradecanoic acid



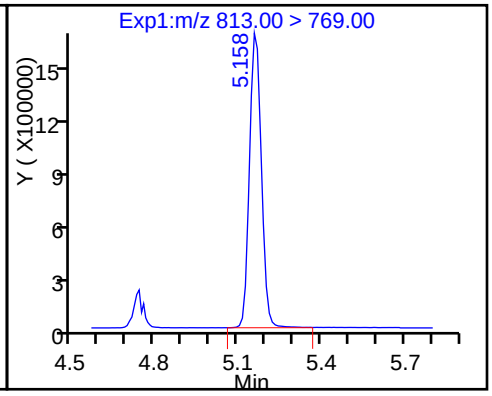
33 Perfluorotetradecanoic acid



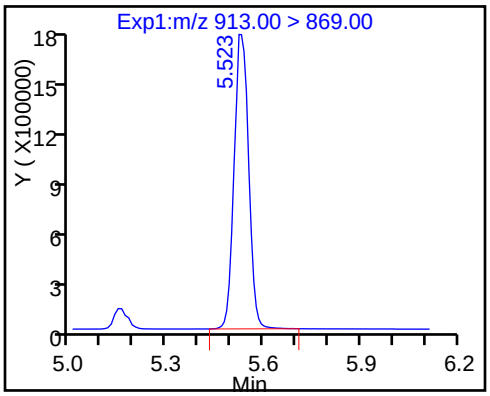
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Lab Sample ID: CCV 320-141182/5 Calibration Date: 12/08/2016 10:19

Instrument ID: A8_N Calib Start Date: 12/03/2016 13:48

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/03/2016 15:33

Lab File ID: 08DEC2016A_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8740	0.8916		1.02	1.00	2.0	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.015	1.076		1.06	1.00	6.0	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.596	1.530		0.847	0.884	-4.1	50.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9531	0.8975		0.942	1.00	-5.8	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.027	1.016		0.989	1.00	-1.1	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.098	1.208		1.00	0.910	10.0	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	1.092		1.02	1.00	1.9	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.177	1.138		0.921	0.952	-3.3	50.0
Perfluorononanoic acid (PFNA)	AveID	0.996	0.9702		0.974	1.00	-2.6	50.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.085	1.018		0.870	0.928	-6.2	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9341	0.9323		0.998	1.00	-0.2	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9605	0.9345		0.973	1.00	-2.7	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6398	0.6037		0.910	0.964	-5.6	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.066	1.082		1.01	1.00	1.5	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9490	0.9221		0.972	1.00	-2.8	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9498	0.9282		0.977	1.00	-2.3	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.854	1.877		1.01	1.00	1.2	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.711		0.968	1.00	-3.2	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9929	1.071		1.08	1.00	7.9	50.0
13C4 PFBA	Ave	335829	342371		51.0	50.0	1.9	50.0
13C5-PFPeA	Ave	264545	259517		49.0	50.0	-1.9	50.0
13C2 PFHxA	Ave	237486	240001		50.5	50.0	1.1	50.0
13C4-PFHpA	Ave	207413	225428		54.3	50.0	8.7	50.0
18O2 PFHxS	Ave	312342	323095		48.9	47.3	3.4	50.0
13C4 PFOA	Ave	219258	231455		52.8	50.0	5.6	50.0
13C4 PFOS	Ave	246009	252180		49.0	47.8	2.5	50.0
13C5 PFNA	Ave	166415	176329		53.0	50.0	6.0	50.0
13C8 FOSA	Ave	402279	403532		50.2	50.0	0.3	50.0
13C2 PFDA	Ave	157817	157120		49.8	50.0	-0.4	50.0
13C2 PFUnA	Ave	118762	117099		49.3	50.0	-1.4	50.0
13C2 PFDoA	Ave	112084	107895		48.1	50.0	-3.7	50.0
13C2-PFTeDA	Ave	231173	225220		48.7	50.0	-2.6	50.0
13C2-PFHxDA	Ave	129725	124333		47.9	50.0	-4.2	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37630.b\08DEC2016A_003.d
Lims ID: CCV L2
Client ID:
Sample Type: CCVL
Inject. Date: 08-Dec-2016 10:19:34 ALS Bottle#: 38 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L2
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37630.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 08-Dec-2016 15:17:05 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: westendorfc Date: 08-Dec-2016 11:29:29

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.534	1.542	-0.008		17118552	51.0		102	905231	
1 Perfluorobutyric acid										
212.90 > 169.00	1.542	1.542	0.0	1.000	305251	1.02		102	3402	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.820	-0.010		12975826	49.0		98.1	983588	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.820	-0.010	1.000	279169	1.06		106	2566	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.849	1.858	-0.009	1.000	436991	0.8474		95.9		
298.90 > 99.00	1.849	1.858	-0.009	1.000	183469		2.38(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.105	2.109	-0.004		12000054	50.5		101	739286	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.105	2.109	-0.004	1.000	215410	0.9417		94.2	7890	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.466	2.380	0.086	1.000	355103	1.00		110		
D 11 13C4-PFHpA										
367.00 > 322.00	2.440	2.448	-0.008		11271388	54.3		109	788000	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.440	2.448	-0.008	1.000	229029	0.9892		98.9	2644	
D 10 18O2 PFHxS										
403.00 > 84.00	2.457	2.465	-0.008		15282401	48.9		103	889355	
D 14 13C4 PFOA										
417.00 > 372.00	2.799	2.808	-0.009		11572740	52.8		106	1035136	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.807	2.808	-0.001	1.000	252839	1.02		102	3175	
413.00 > 169.00	2.807	2.808	-0.001	1.000	159730		1.58(0.90-1.10)		6376	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.815	2.824	-0.009	1.000	273274	0.9206		96.7		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.185	3.069	0.116	1.000	238218	0.8705		93.8	32361	
499.00 > 99.00	3.185	3.069	0.116	1.000	56537		4.21(0.90-1.10)		4509	
D 17 13C4 PFOS										
503.00 > 80.00	3.176	3.185	-0.009		12054200	49.0		103	606607	
D 19 13C5 PFNA										
468.00 > 423.00	3.185	3.185	0.0		8816465	53.0		106	959723	
20 Perfluorononanoic acid										
463.00 > 419.00	3.185	3.185	0.0	1.000	171072	0.9738		97.4	2622	
D 21 13C8 FOSA										
506.00 > 78.00	3.500	3.509	-0.009		20176612	50.2		100	794521	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.500	3.509	-0.009	1.000	376230	1.00		99.8	47955	
D 23 13C2 PFDA										
515.00 > 470.00	3.542	3.543	-0.001		7856021	49.8		99.6	254758	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.542	3.543	-0.001	1.000	146824	0.9729		97.3	7526	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.853	3.855	-0.002	1.000	146771	0.9097		94.4		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.870	3.881	-0.011	1.000	126661	1.01		101	3413	
D 27 13C2 PFUnA										
565.00 > 520.00	3.870	3.881	-0.011		5854952	49.3		98.6	348571	
D 30 13C2 PFDoA										
615.00 > 570.00	4.164	4.168	-0.004		5394734	48.1		96.3	197857	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.164	4.175	-0.011	1.000	99484	0.9716		97.2	2454	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.428	4.433	-0.005	1.000	100142	0.9772		97.7	1992	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.673	4.679	-0.006		11261010	48.7		97.4	840753	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.681	4.679	0.002	1.000	202481	1.01		101	1684	
713.00 > 169.00	4.673	4.679	-0.006	0.998	34194		5.92(0.00-0.00)		12780	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.102	5.101	0.001		6216653	47.9		95.8	134049	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.102	5.101	0.001	1.000	184577	0.9685		96.8	174	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.467	5.467	0.0	1.000	115561	1.08		108	136	

Reagents:

LCPFC-L2_00022 Amount Added: 1.00 Units: mL

Report Date: 08-Dec-2016 15:17:06 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37630.b\08DEC2016A_003.d

Injection Date: 08-Dec-2016 10:19:34 Instrument ID: A8_N

Lims ID: CCV L2

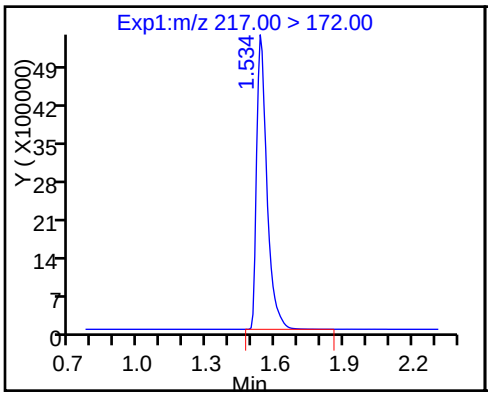
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

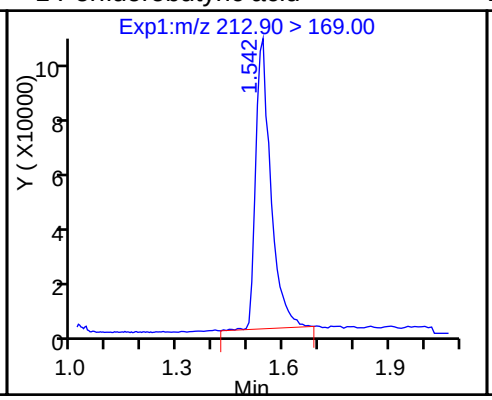
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

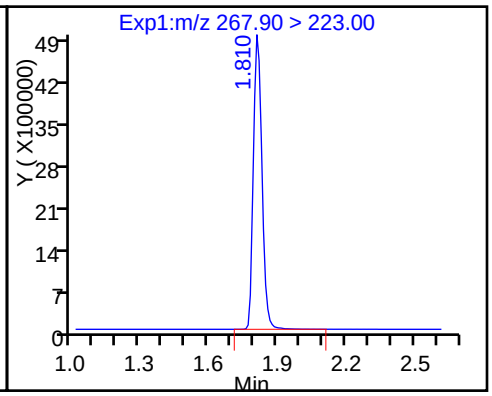
D 2 13C4 PFBA



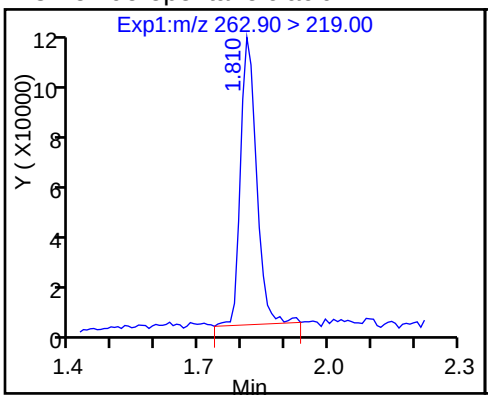
1 Perfluorobutyric acid



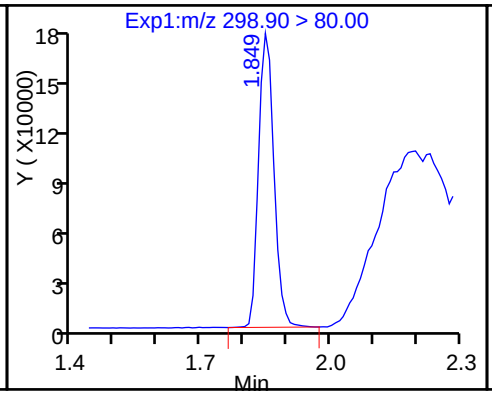
D 4 13C5-PFPeA



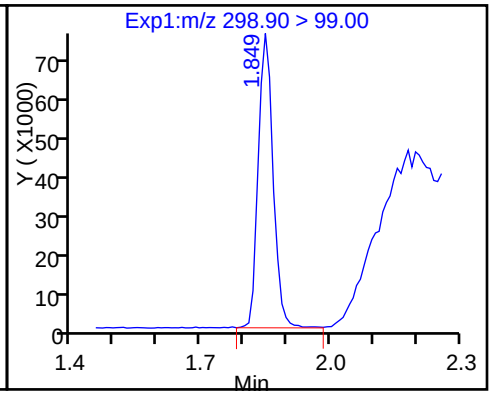
3 Perfluoropentanoic acid



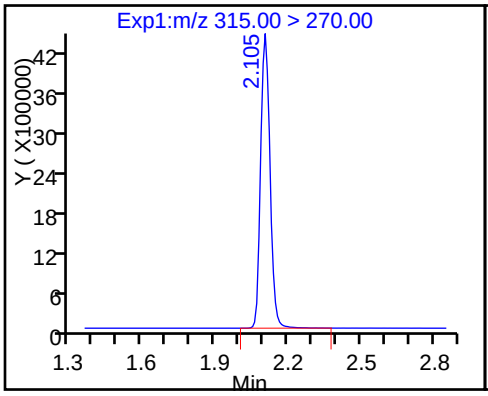
5 Perfluorobutanesulfonic acid



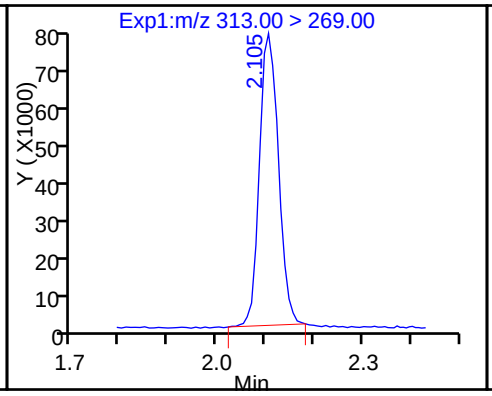
5 Perfluorobutanesulfonic acid



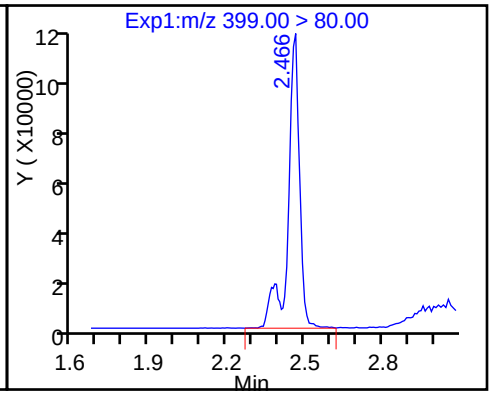
D 6 13C2 PFHxA



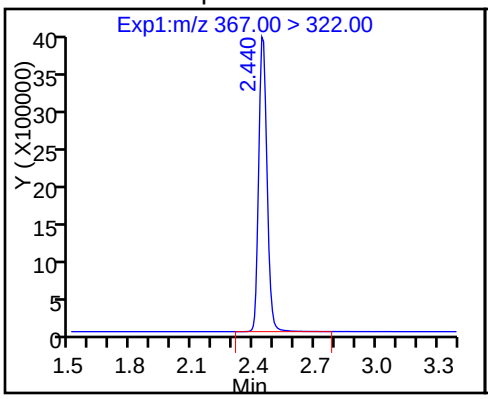
7 Perfluorohexanoic acid



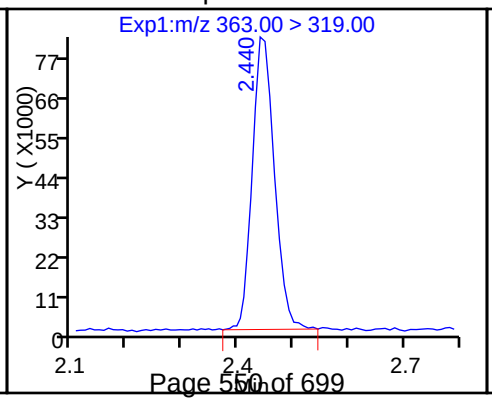
9 Perfluorohexanesulfonic acid



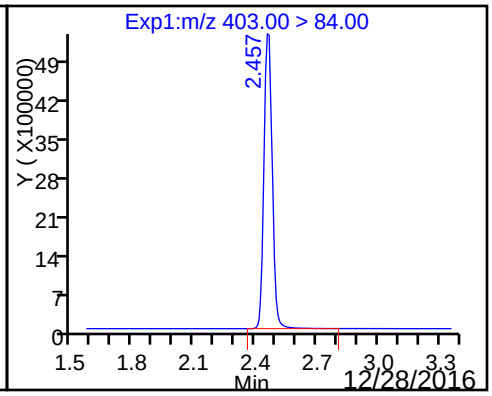
D 11 13C4-PFHpA



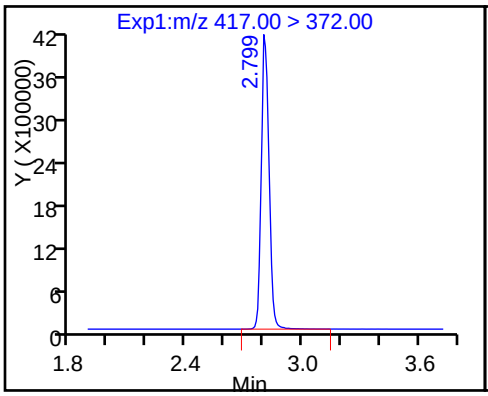
12 Perfluoroheptanoic acid



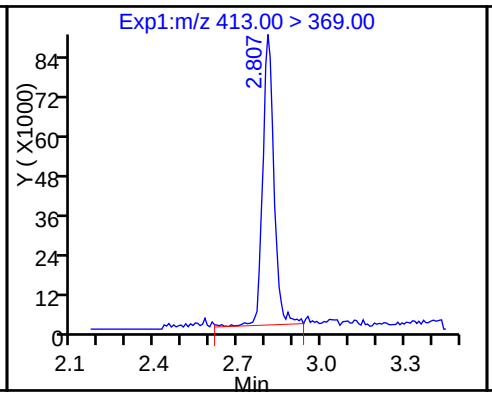
D 10 18O2 PFHxS



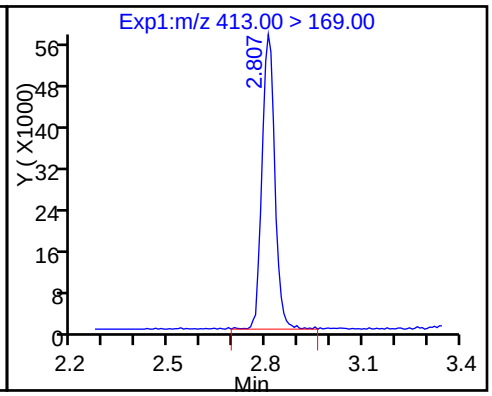
D 14 13C4 PFOA



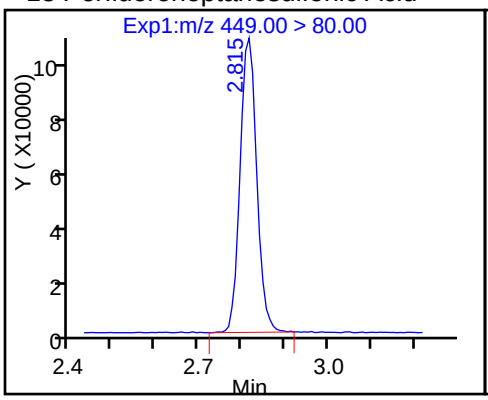
15 Perfluorooctanoic acid



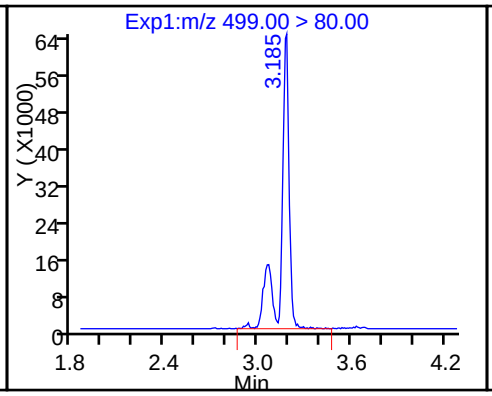
15 Perfluorooctanoic acid



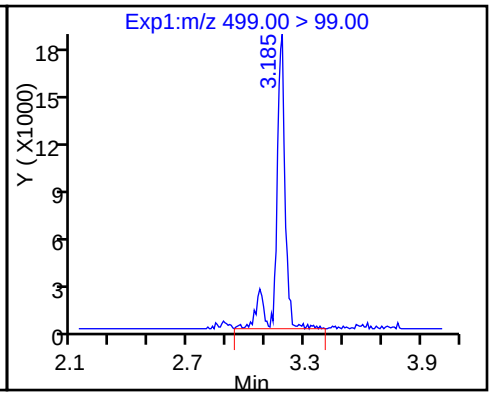
13 Perfluoroheptanesulfonic Acid



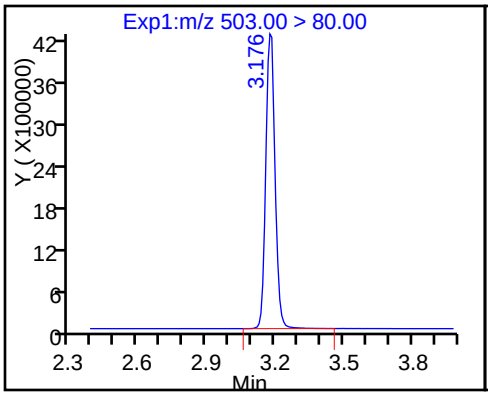
18 Perfluorooctane sulfonic acid



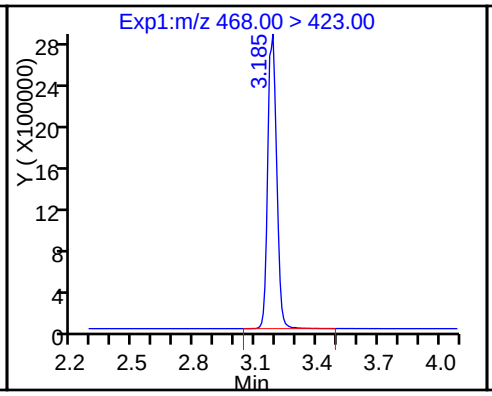
18 Perfluorooctane sulfonic acid



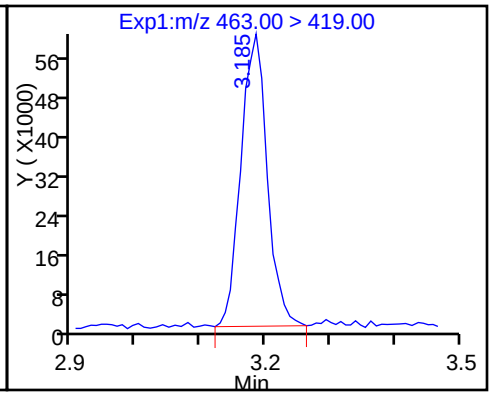
D 17 13C4 PFOS



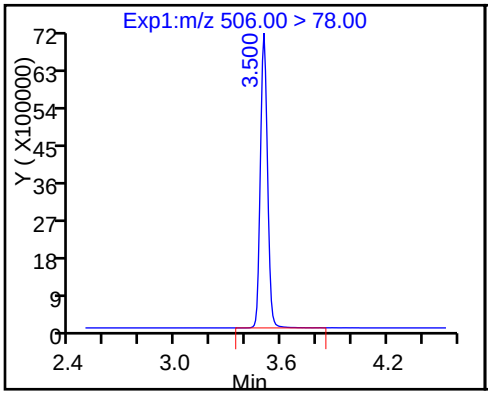
D 19 13C5 PFNA



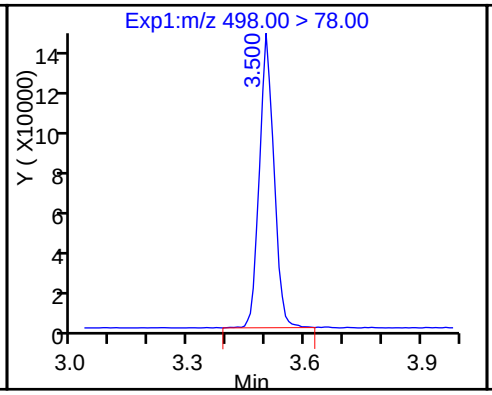
20 Perfluorononanoic acid



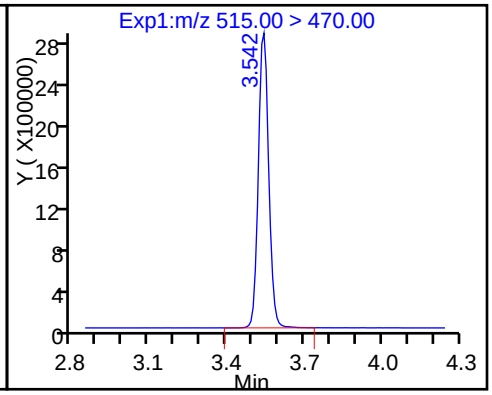
D 21 13C8 FOSA



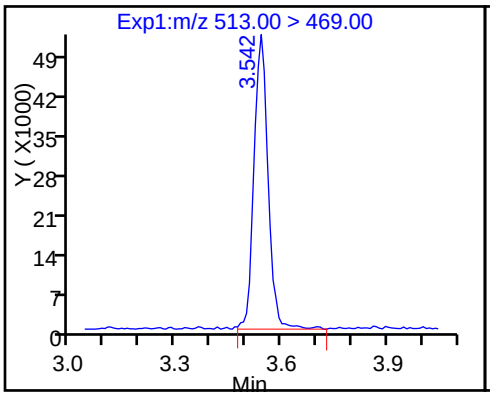
22 Perfluorooctane Sulfonamide



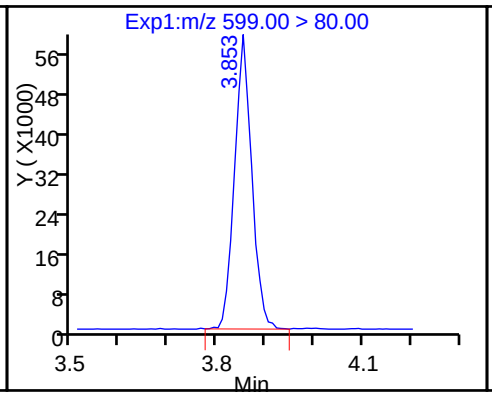
D 23 13C2 PFDA



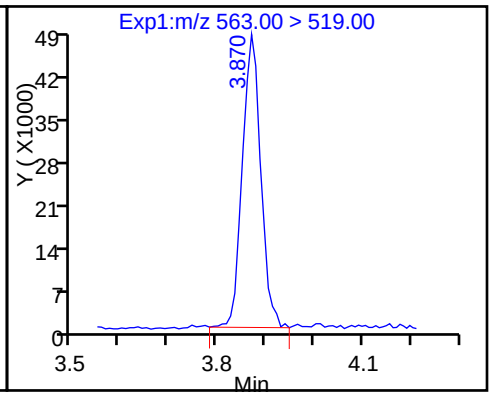
24 Perfluorodecanoic acid



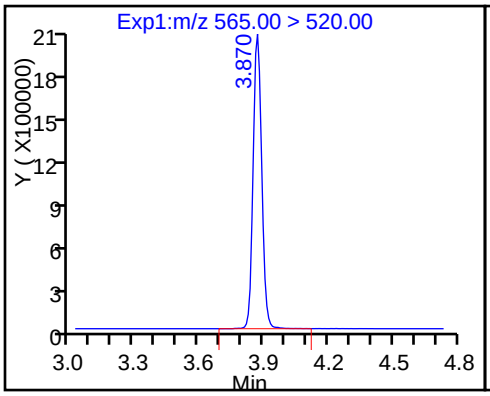
26 Perfluorodecane Sulfonic acid



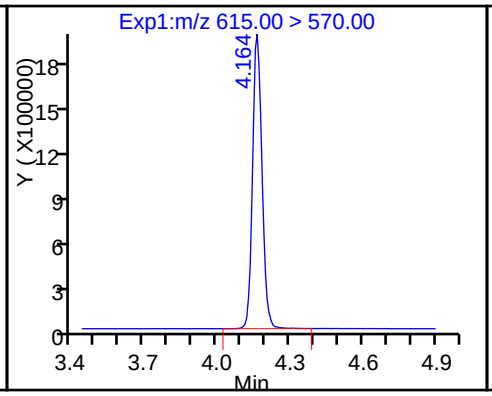
28 Perfluoroundecanoic acid



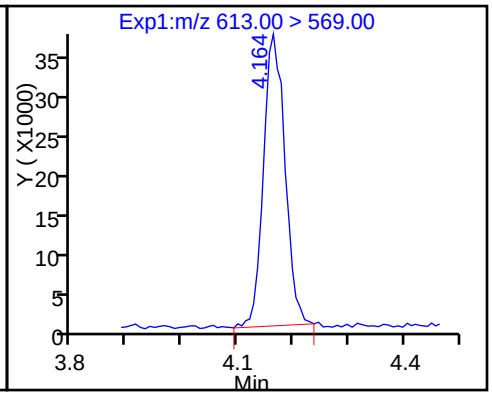
D 27 13C2 PFUnA



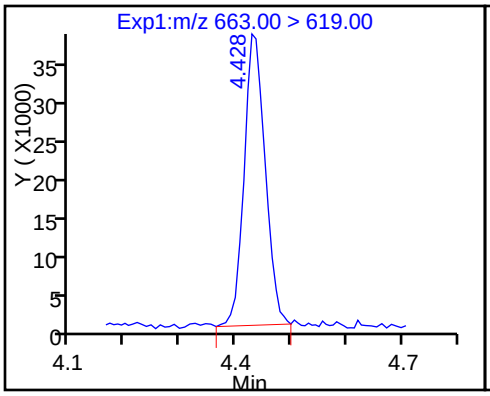
D 30 13C2 PFDoA



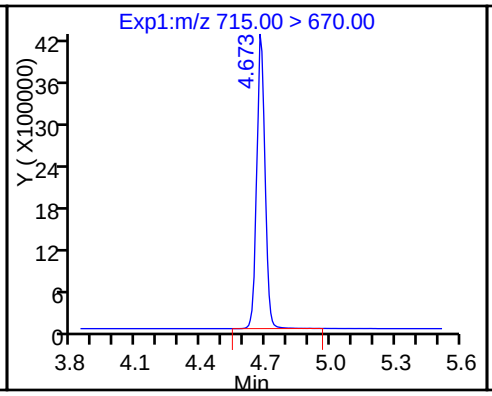
29 Perfluorododecanoic acid



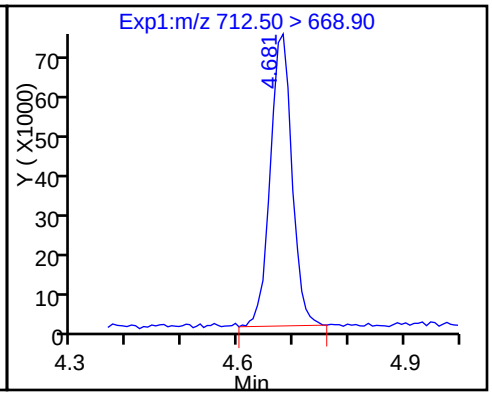
31 Perfluorotridecanoic acid



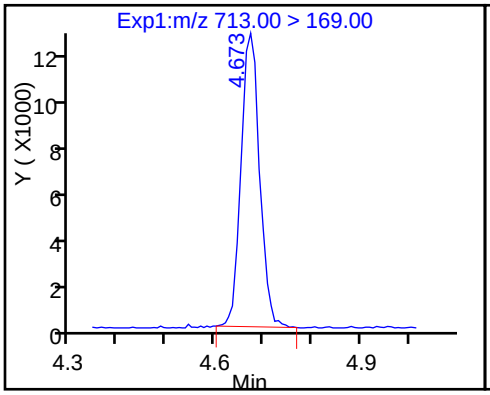
D 32 13C2-PFTeDA



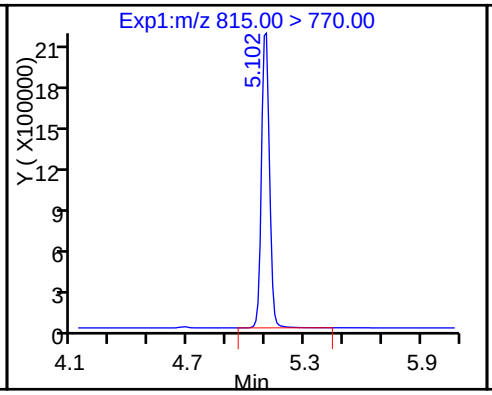
33 Perfluorotetradecanoic acid



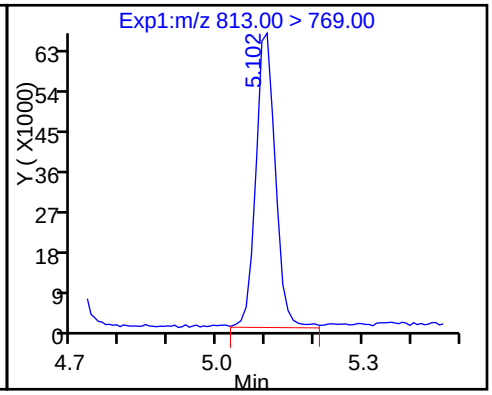
33 Perfluorotetradecanoic acid



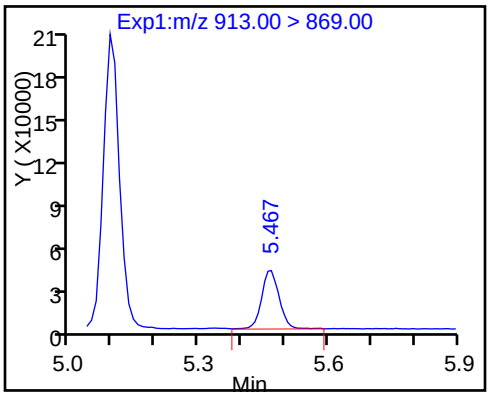
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Lab Sample ID: CCV 320-141453/4 Calibration Date: 12/09/2016 11:21

Instrument ID: A8_N Calib Start Date: 12/03/2016 13:48

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/03/2016 15:33

Lab File ID: 09DEC2016A_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	0.8740	0.8861		1.01	1.00	1.4	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.015	1.105		1.09	1.00	8.9	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.596	1.465		0.811	0.884	-8.2	50.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9531	0.9546		1.00	1.00	0.2	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.027	1.014		0.987	1.00	-1.3	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.098	1.183		0.981	0.910	7.8	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.177	1.122		0.907	0.952	-4.7	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	1.115		1.04	1.00	4.0	50.0
Perfluorononanoic acid (PFNA)	AveID	0.996	0.9209		0.924	1.00	-7.6	50.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.085	1.038		0.888	0.928	-4.3	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9341	0.9240		0.989	1.00	-1.1	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9605	0.9567		0.996	1.00	-0.4	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6398	0.5719		0.862	0.964	-10.6	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.066	1.037		0.973	1.00	-2.7	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9490	0.9181		0.967	1.00	-3.3	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9498	0.9065		0.954	1.00	-4.6	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.854	1.567		0.846	1.00	-15.4	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.490		0.746	1.00	-25.4	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9929	0.9059		0.912	1.00	-8.8	50.0
13C4 PFBA	Ave	335829	337937		50.3	50.0	0.6	50.0
13C5-PFPeA	Ave	264545	274291		51.8	50.0	3.7	50.0
13C2 PFHxA	Ave	237486	246386		51.9	50.0	3.7	50.0
13C4-PFHpA	Ave	207413	220314		53.1	50.0	6.2	50.0
18O2 PFHxS	Ave	312342	325053		49.2	47.3	4.1	50.0
13C4 PFOA	Ave	219258	237288		54.1	50.0	8.2	50.0
13C4 PFOS	Ave	246009	250374		48.6	47.8	1.8	50.0
13C5 PFNA	Ave	166415	177341		53.3	50.0	6.6	50.0
13C8 FOSA	Ave	402279	394358		49.0	50.0	-2.0	50.0
13C2 PFDA	Ave	157817	156675		49.6	50.0	-0.7	50.0
13C2 PFUnA	Ave	118762	122198		51.4	50.0	2.9	50.0
13C2 PFDoA	Ave	112084	108772		48.5	50.0	-3.0	50.0
13C2-PFTeDA	Ave	231173	211994		45.9	50.0	-8.3	50.0
13C2-PFHxDA	Ave	129725	114825		44.3	50.0	-11.5	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_004.d
Lims ID: CCV L2
Client ID:
Sample Type: CCVL
Inject. Date: 09-Dec-2016 11:21:19 ALS Bottle#: 38 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L2
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 09-Dec-2016 13:39:50 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: westendorfc Date: 09-Dec-2016 11:56:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.542	1.537	0.005		16896852	50.3		101	1020623	
1 Perfluorobutyric acid										
212.90 > 169.00	1.542	1.537	0.005	1.000	299458	1.01		101	2139	
D 4 13C5-PFPeA										
267.90 > 223.00	1.816	1.813	0.003		13714547	51.8		104	1728622	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.816	1.813	0.003	1.000	303093	1.09		109	2416	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.855	1.851	0.004	1.000	420972	0.8114		91.8		
298.90 > 99.00	1.855	1.851	0.004	1.000	174259		2.42(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.111	2.111	0.0		12319320	51.9		104	908693	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.111	2.111	0.0	1.000	235192	1.00		100	7905	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.467	2.389	0.078	1.000	350044	0.9811		108		
D 11 13C4-PFHpA										
367.00 > 322.00	2.452	2.445	0.007		11015680	53.1		106	684465	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.452	2.445	0.007	1.000	223445	0.9875		98.7	2457	
D 10 18O2 PFHxS										
403.00 > 84.00	2.467	2.468	-0.001		15375008	49.2		104	951578	
D 14 13C4 PFOA										
417.00 > 372.00	2.812	2.805	0.007		11864394	54.1		108	677822	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.821	2.813	0.008	1.000	264472	1.04		104	2312	
413.00 > 169.00	2.812	2.813	-0.001	0.997	146337		1.81(0.90-1.10)		9081	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.821	2.813	0.008	1.000	267363	0.9072		95.3		
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.189	3.084	0.105	1.000	241217	0.8878		95.7	21468	M
499.00 > 99.00	3.189	3.084	0.105	1.000	55608		4.34(0.90-1.10)		3584	M
D 17 13C4 PFOS										
503.00 > 80.00	3.189	3.181	0.008		11967869	48.6		102	729772	
D 19 13C5 PFNA										
468.00 > 423.00	3.189	3.190	-0.001		8867036	53.3		107	594883	
20 Perfluorononanoic acid										
463.00 > 419.00	3.189	3.190	-0.001	1.000	163320	0.9243		92.4	2946	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.504	3.497	0.007	1.000	364376	0.9892		98.9	43775	
D 21 13C8 FOSA										
506.00 > 78.00	3.504	3.505	-0.001		19717907	49.0		98.0	1755351	
D 23 13C2 PFDA										
515.00 > 470.00	3.554	3.548	0.006		7833756	49.6		99.3	398577	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.554	3.548	0.006	1.000	149896	1.00		99.6	5866	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.867	3.859	0.008	1.000	138028	0.8617		89.4		
D 27 13C2 PFUnA										
565.00 > 520.00	3.884	3.877	0.007		6109890	51.4		103	443084	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.884	3.877	0.007	1.000	126662	0.9726		97.3	4465	
D 30 13C2 PFDoA										
615.00 > 570.00	4.184	4.171	0.013		5438620	48.5		97.0	245678	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.177	4.171	0.006	1.000	99861	0.9674		96.7	2611	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.448	4.443	0.005	1.000	98599	0.9544		95.4	2168	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.697	4.690	0.007		10599708	45.9		91.7	541969	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.697	4.690	0.007	1.000	170500	0.8456		84.6	1115	
713.00 > 169.00	4.697	4.690	0.007	1.000	32351		5.27(0.00-0.00)		11618	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.123	5.113	0.010		5741254	44.3		88.5	154594	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.123	5.113	0.010	1.000	162088	0.7464		74.6	159	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.491	5.484	0.007	1.000	98540	0.9124		91.2	158	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L2_00022 Amount Added: 1.00 Units: mL

Report Date: 09-Dec-2016 13:39:50 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_004.d

Injection Date: 09-Dec-2016 11:21:19 Instrument ID: A8_N

Lims ID: CCV L2

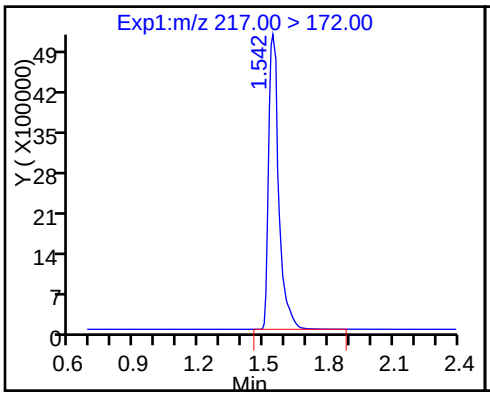
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 4

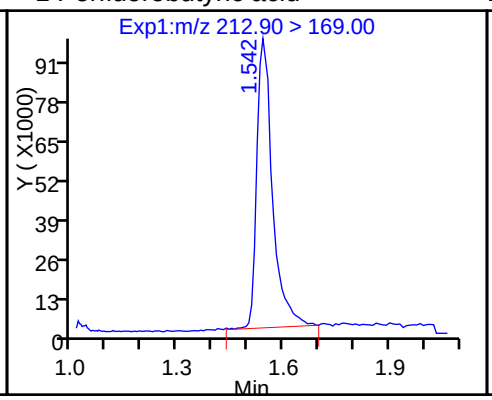
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

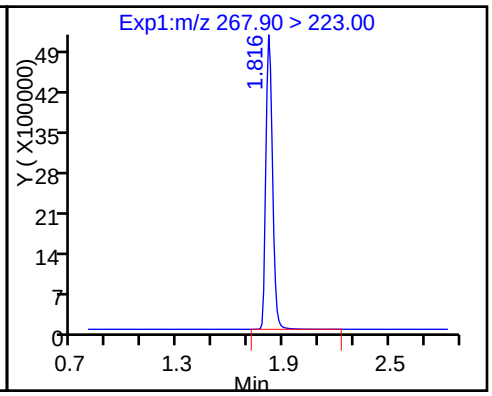
D 2 13C4 PFBA



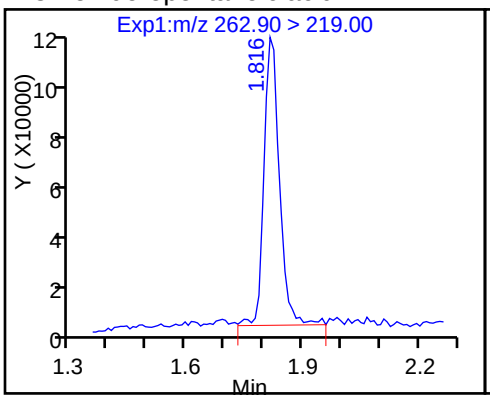
1 Perfluorobutyric acid



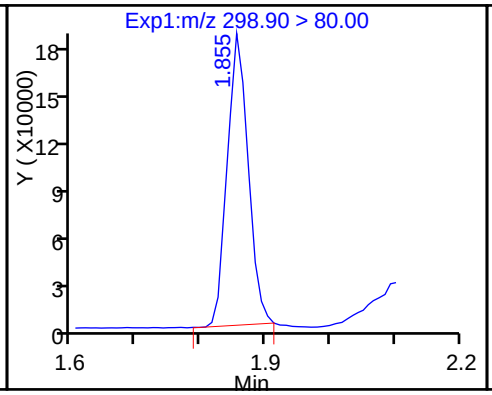
D 4 13C5-PFPeA



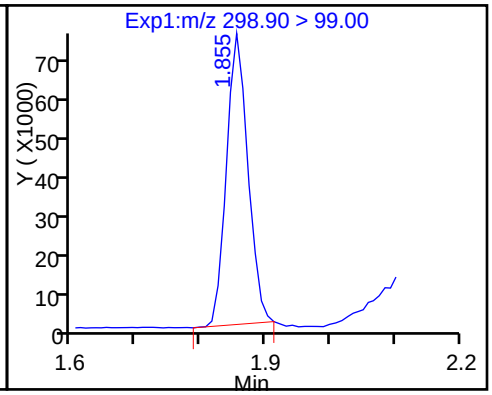
3 Perfluoropentanoic acid



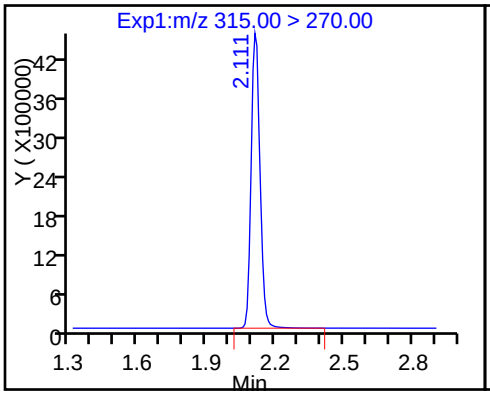
5 Perfluorobutanesulfonic acid



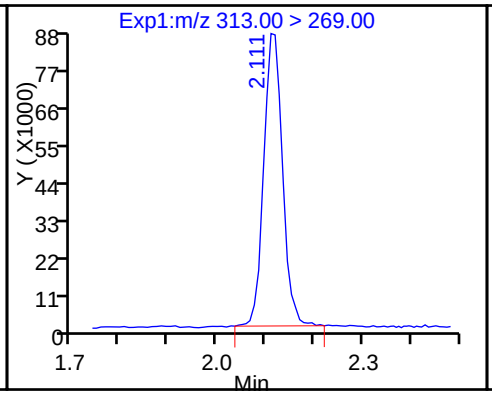
5 Perfluorobutanesulfonic acid



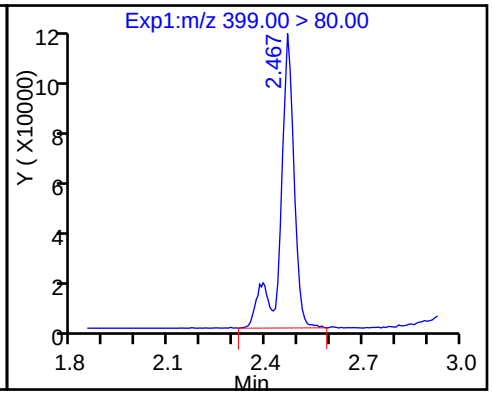
D 6 13C2 PFHxA



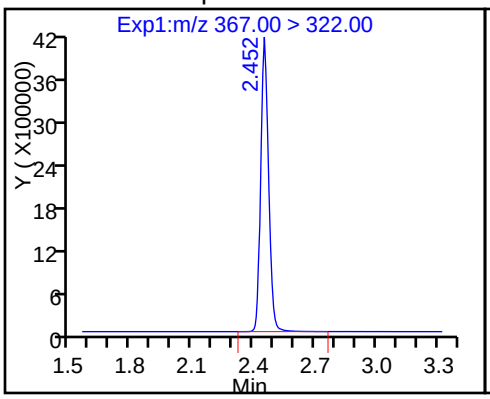
7 Perfluorohexanoic acid



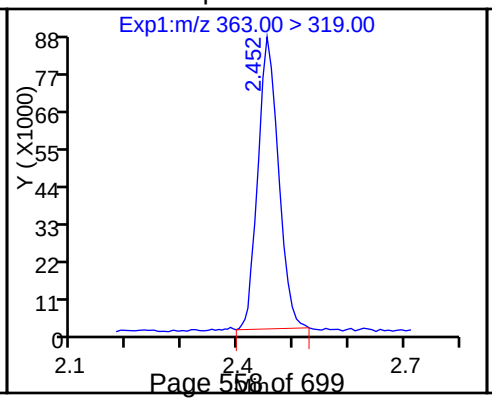
9 Perfluorohexanesulfonic acid



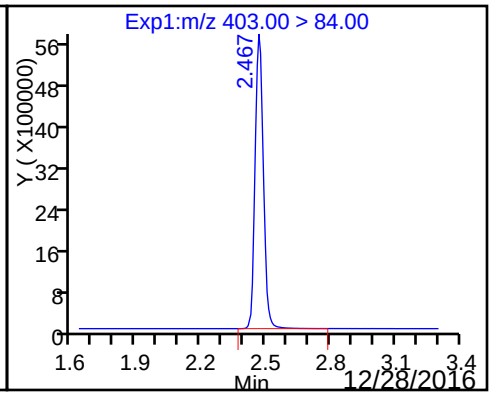
D 11 13C4-PFHpA



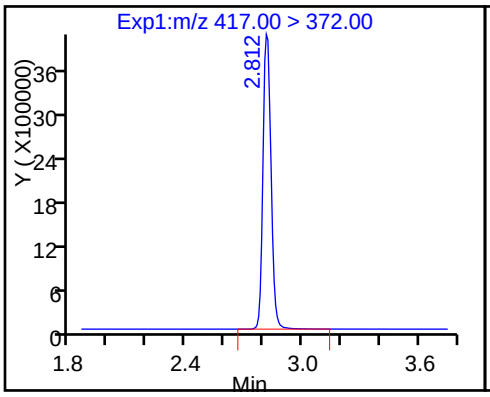
12 Perfluoroheptanoic acid



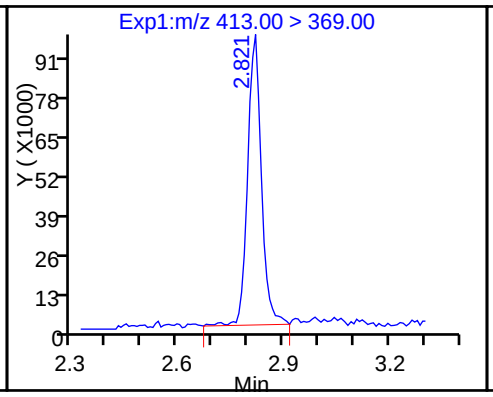
D 10 18O2 PFHxS



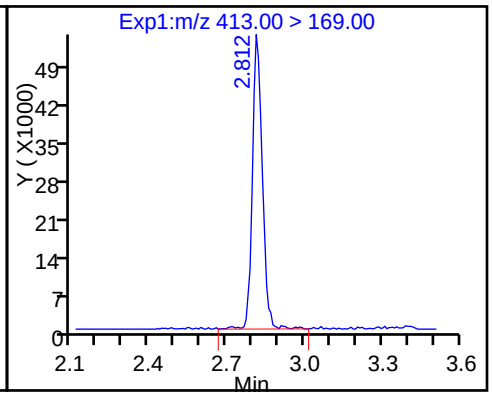
D 14 13C4 PFOA



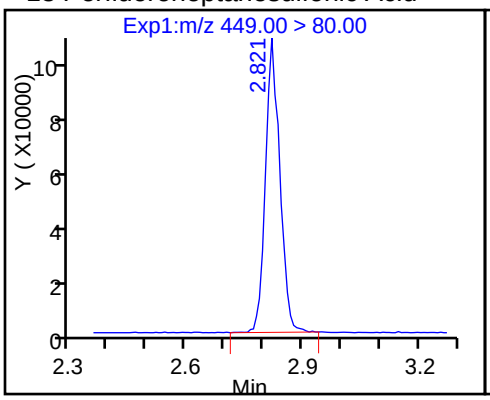
15 Perfluorooctanoic acid



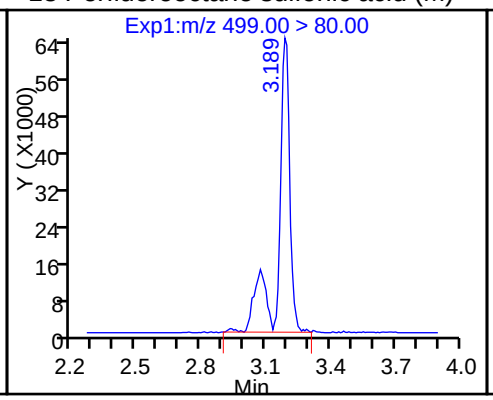
15 Perfluorooctanoic acid



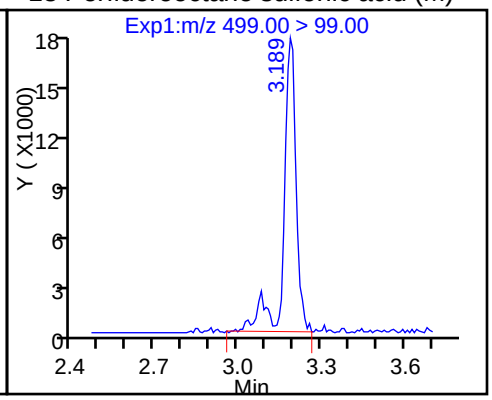
13 Perfluoroheptanesulfonic Acid



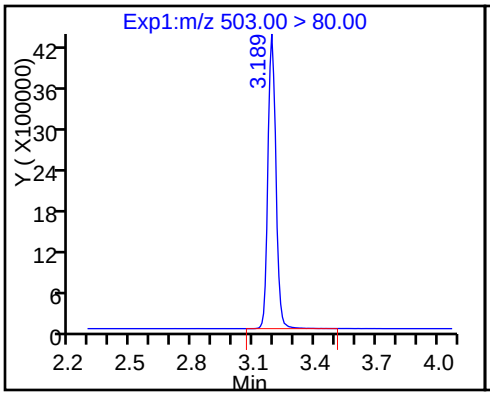
18 Perfluorooctane sulfonic acid (M)



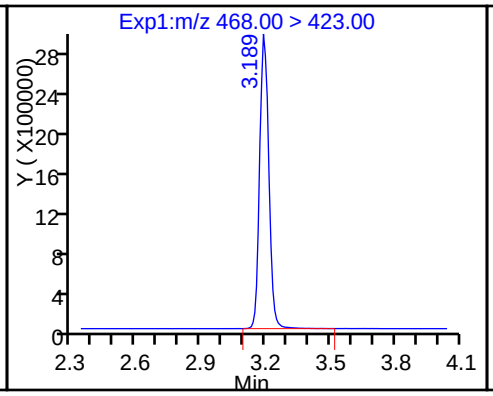
18 Perfluorooctane sulfonic acid (M)



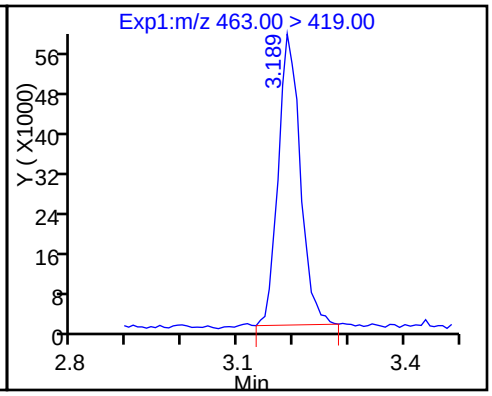
D 17 13C4 PFOS



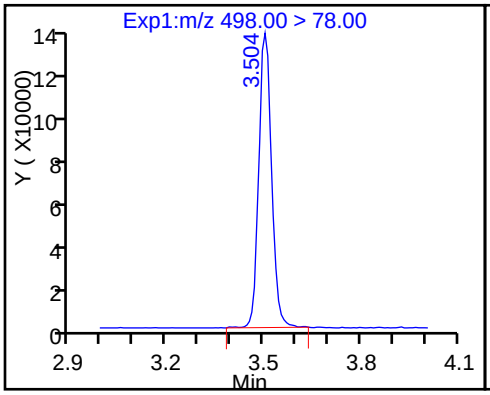
D 19 13C5 PFNA



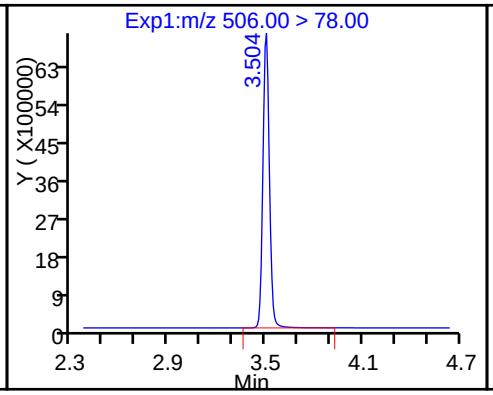
20 Perfluorononanoic acid



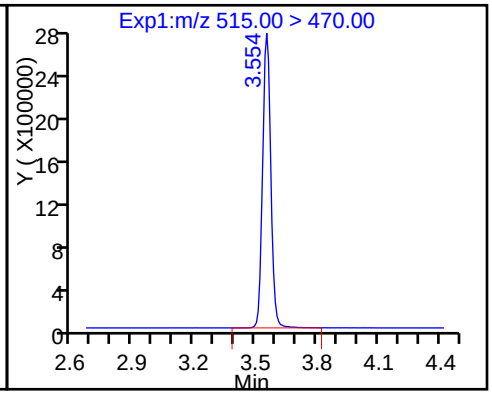
22 Perfluorooctane Sulfonamide



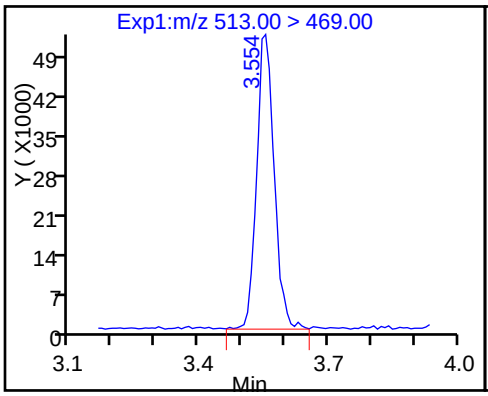
D 21 13C8 FOSA



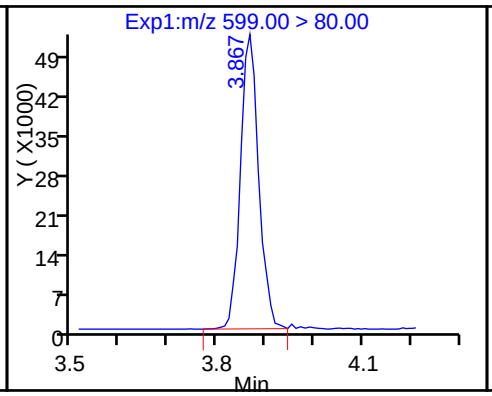
D 23 13C2 PFDA



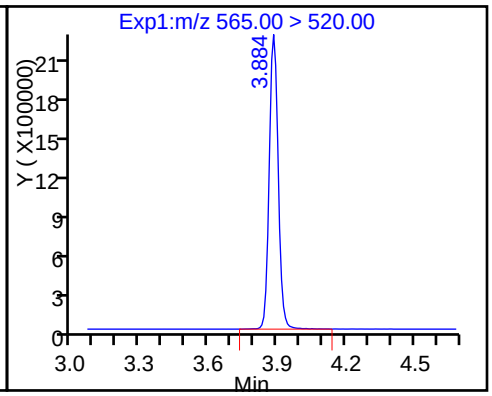
24 Perfluorodecanoic acid



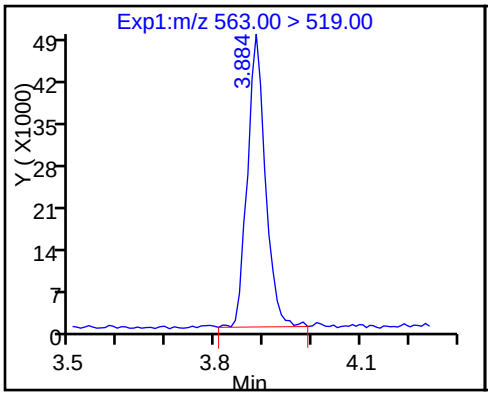
26 Perfluorodecane Sulfonic acid



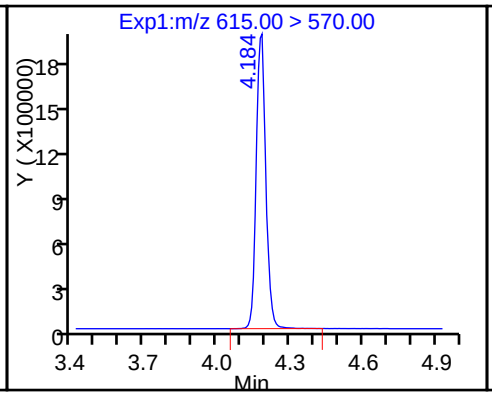
D 27 13C2 PFUnA



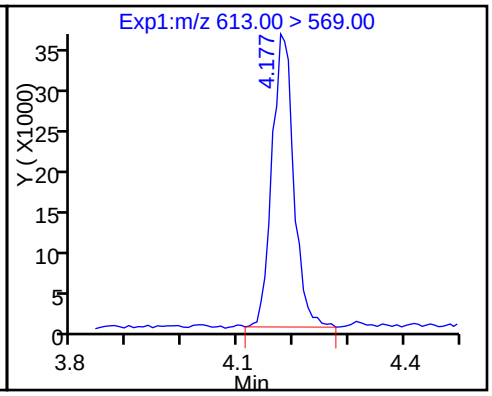
28 Perfluoroundecanoic acid



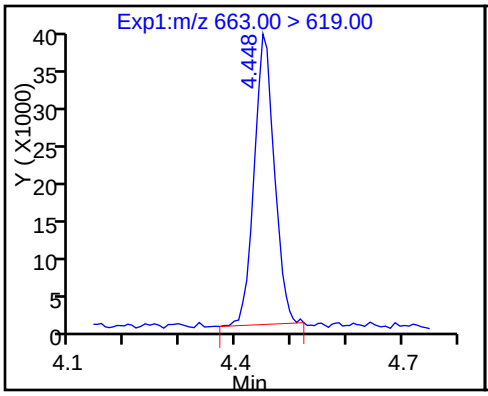
D 30 13C2 PFDoA



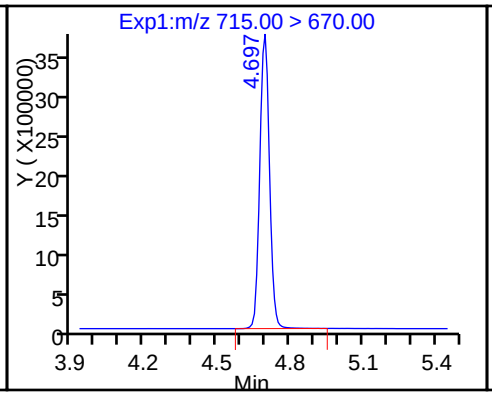
29 Perfluorododecanoic acid



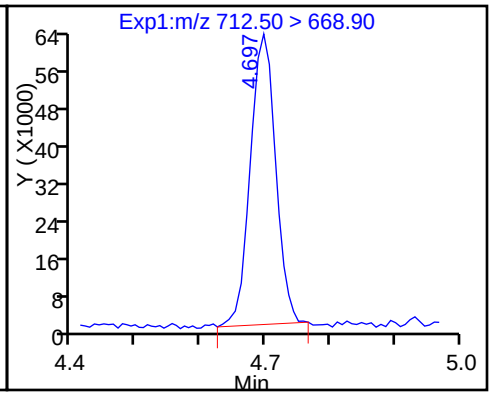
31 Perfluorotridecanoic acid



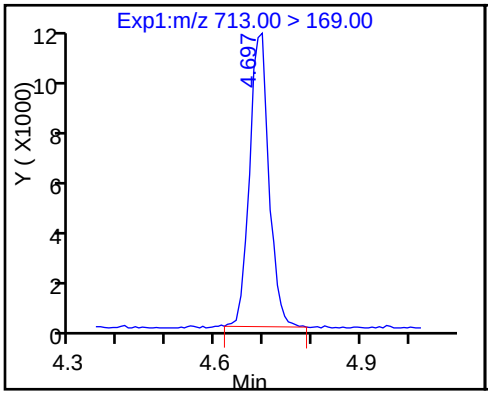
D 32 13C2-PFTeDA



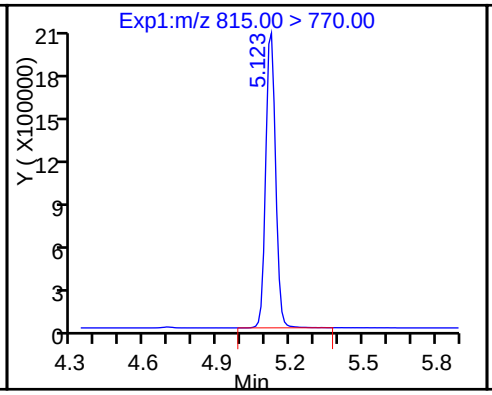
33 Perfluorotetradecanoic acid



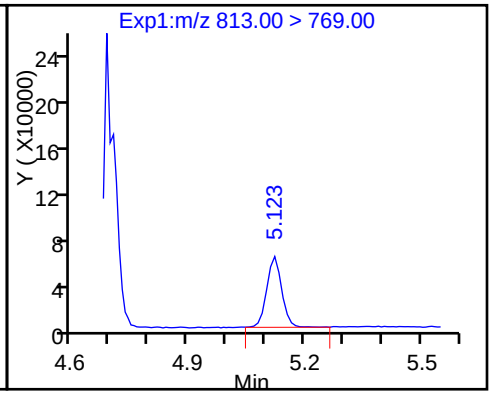
33 Perfluorotetradecanoic acid



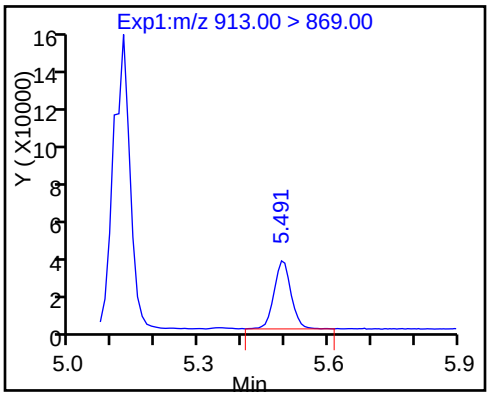
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

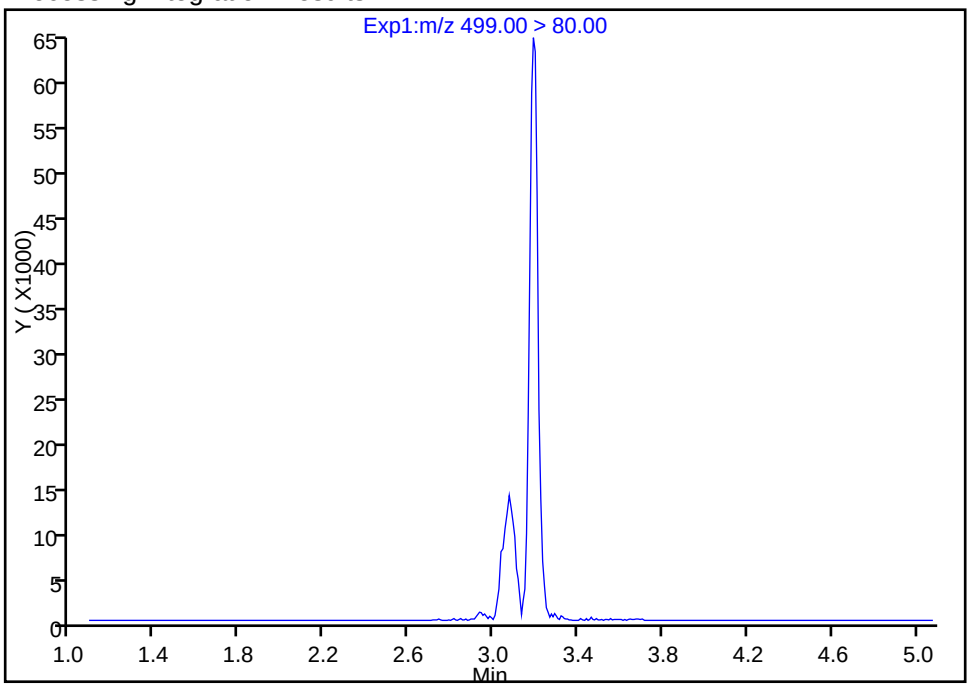
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_004.d				
Injection Date:	09-Dec-2016 11:21:19	Instrument ID:	A8_N		
Lims ID:	CCV L2				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	38	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

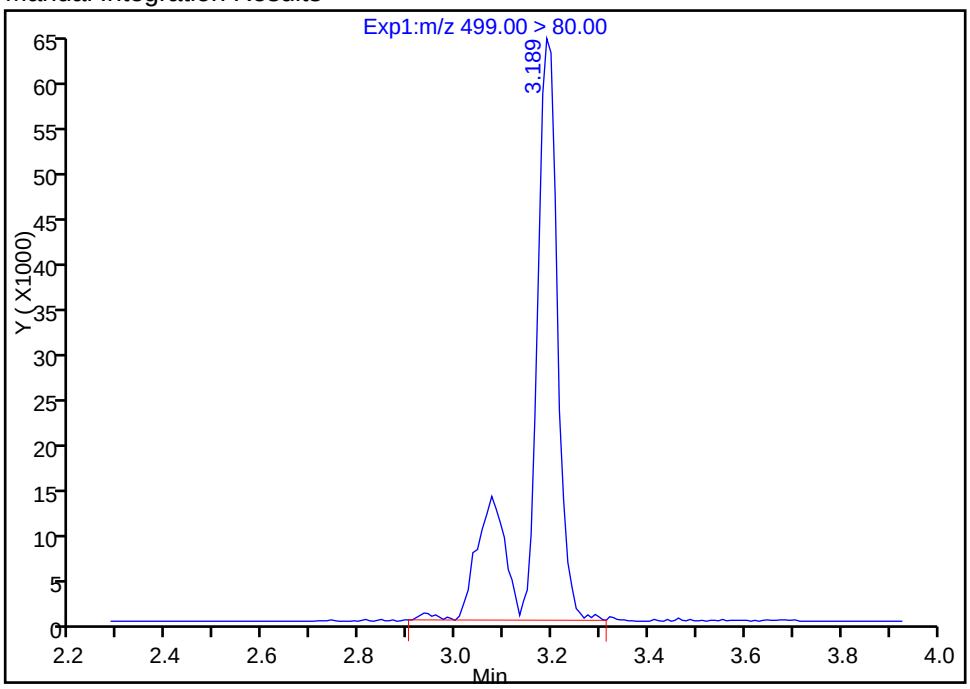
Processing Integration Results

Not Detected
Expected RT: 3.08



Manual Integration Results

RT: 3.19
Area: 241217
Amount: 0.887768
Amount Units: ng/ml



Reviewer: westendorfc, 09-Dec-2016 11:56:35
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

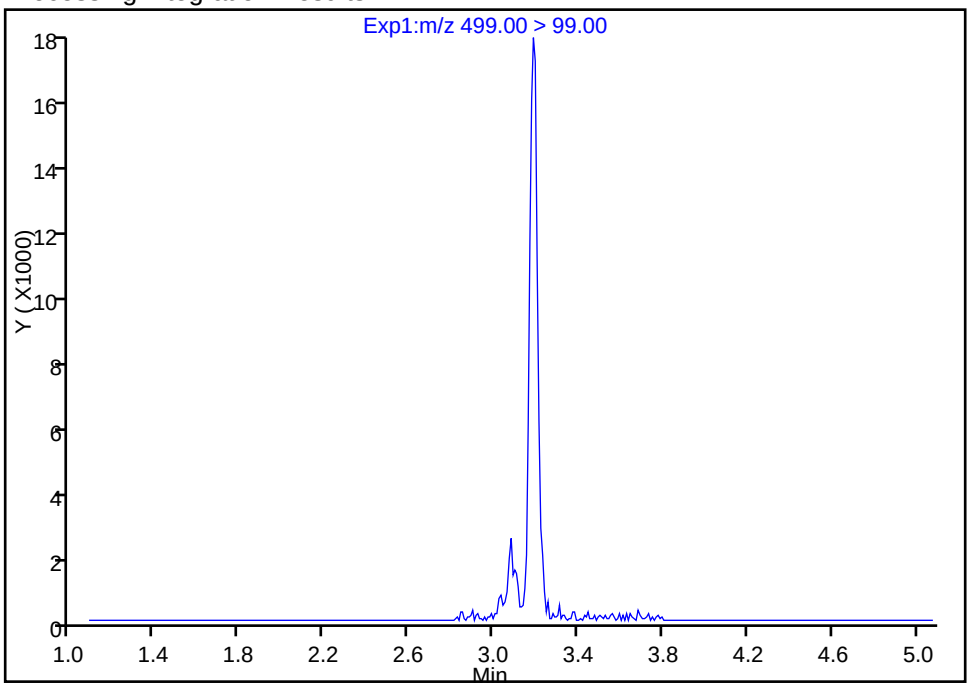
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_004.d				
Injection Date:	09-Dec-2016 11:21:19	Instrument ID:	A8_N		
Lims ID:	CCV L2				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	38	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

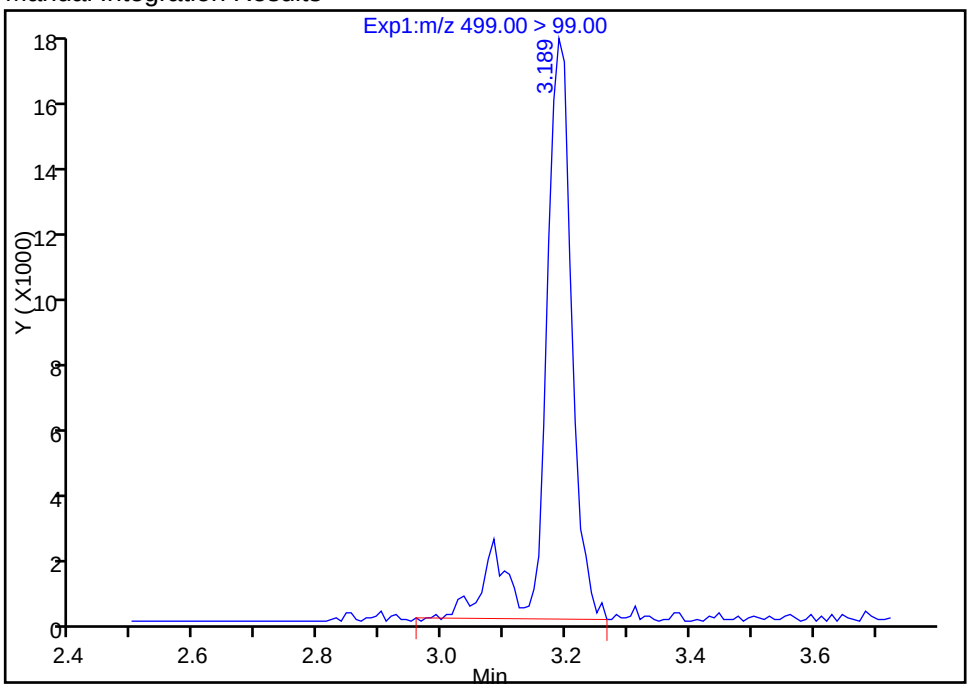
Processing Integration Results

Not Detected
Expected RT: 3.08



Manual Integration Results

RT: 3.19
Area: 55608
Amount: 0.887768
Amount Units: ng/ml



Reviewer: westendorfc, 09-Dec-2016 11:56:35
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Lab Sample ID: CCV 320-141453/34 Calibration Date: 12/09/2016 15:06

Instrument ID: A8_N Calib Start Date: 12/03/2016 13:48

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/03/2016 15:33

Lab File ID: 09DEC2016A_034.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8740	0.8663		49.6	50.0	-0.9	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.015	0.9779		48.2	50.0	-3.6	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.596	1.735		48.0	44.2	8.7	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9531	0.9293		48.7	50.0	-2.5	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.098	1.037		43.0	45.5	-5.5	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.027	0.996		48.5	50.0	-3.0	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.177	1.153		46.6	47.6	-2.0	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	1.020		47.6	50.0	-4.8	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.085	1.059		45.3	46.4	-2.4	25.0
Perfluorononanoic acid (PFNA)	AveID	0.996	1.005		50.5	50.0	0.9	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9341	0.9229		49.4	50.0	-1.2	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9605	0.9260		48.2	50.0	-3.6	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6398	0.5856		44.1	48.2	-8.5	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.066	1.001		47.0	50.0	-6.0	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9490	0.9255		48.8	50.0	-2.5	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9498	0.9487		49.9	50.0	-0.1	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.854	1.559		42.1	50.0	-15.9	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.028		51.0	50.0	2.0	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9929	1.002		50.5	50.0	0.9	25.0
13C4 PFBA	Ave	335829	303135		45.1	50.0	-9.7	50.0
13C5-PFPeA	Ave	264545	234093		44.2	50.0	-11.5	50.0
13C2 PFHxA	Ave	237486	214114		45.1	50.0	-9.8	50.0
13C4-PFHpA	Ave	207413	196131		47.3	50.0	-5.4	50.0
18O2 PFHxS	Ave	312342	263803		39.9	47.3	-15.5	50.0
13C4 PFOA	Ave	219258	192010		43.8	50.0	-12.4	50.0
13C4 PFOS	Ave	246009	218768		42.5	47.8	-11.1	50.0
13C5 PFNA	Ave	166415	145656		43.8	50.0	-12.5	50.0
13C8 FOSA	Ave	402279	337011		41.9	50.0	-16.2	50.0
13C2 PFDA	Ave	157817	133246		42.2	50.0	-15.6	50.0
13C2 PFUnA	Ave	118762	97965		41.2	50.0	-17.5	50.0
13C2 PFDoA	Ave	112084	92716		41.4	50.0	-17.3	50.0
13C2-PFTeDA	Ave	231173	186755		40.4	50.0	-19.2	50.0
13C2-PFHxDA	Ave	129725	103292		39.8	50.0	-20.4	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_034.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 09-Dec-2016 15:06:25 ALS Bottle#: 41 Worklist Smp#: 34
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 09-Dec-2016 16:30:20 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: westendorfc Date: 09-Dec-2016 16:28:55

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.537	1.537	0.0		15156753	45.1		90.3	1681012	
1 Perfluorobutyric acid										
212.90 > 169.00	1.545	1.545	0.0	1.000	13130841	49.6		99.1	87318	
D 4 13C5-PFPeA										
267.90 > 223.00	1.813	1.813	0.0		11704649	44.2		88.5	1492500	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.813	1.813	0.0	1.000	11446150	48.2		96.4	104021	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.852	1.852	0.0	1.000	20227894	48.0		109		
298.90 > 99.00	1.852	1.852	0.0	1.000	9425909		2.15(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.103	2.103	0.0		10705717	45.1		90.2	560949	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.103	2.103	0.0	1.000	9948398	48.7		97.5	258513	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.431	2.431	0.0	1.000	12443308	43.0		94.5		
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.438	2.438	0.0	1.000	9770270	48.5		97.0	92430	
D 11 13C4-PFHpA										
367.00 > 322.00	2.453	2.453	0.0		9806528	47.3		94.6	851672	
D 10 18O2 PFHxS										
403.00 > 84.00	2.460	2.460	0.0		12477863	39.9		84.5	902461	
D 14 13C4 PFOA										
417.00 > 372.00	2.805	2.805	0.0		9600499	43.8		87.6	527606	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.805	2.805	0.0	1.000	9796174	47.6		95.2	85264	
413.00 > 169.00	2.797	2.805	-0.008	0.997	5889483		1.66(0.90-1.10)		231220	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.805	2.805	0.0	1.000	12010110	46.6		98.0		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.150	3.150	0.0	1.000	10751304	45.3		97.6	305892	
499.00 > 99.00	3.174	3.150	0.024	1.008	2422794		4.44(0.90-1.10)		125828	
D 17 13C4 PFOS										
503.00 > 80.00	3.166	3.166	0.0		10457115	42.5		88.9	240187	
D 19 13C5 PFNA										
468.00 > 423.00	3.174	3.174	0.0		7282808	43.8		87.5	605811	
20 Perfluorononanoic acid										
463.00 > 419.00	3.174	3.174	0.0	1.000	7322389	50.5		101	126566	
D 21 13C8 FOSA										
506.00 > 78.00	3.489	3.489	0.0		16850565	41.9		83.8	1433280	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.498	3.498	0.0	1.000	15551872	49.4		98.8	1376520	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.531	3.531	0.0	1.000	6169505	48.2		96.4	170514	
D 23 13C2 PFDA										
515.00 > 470.00	3.531	3.531	0.0		6662288	42.2		84.4	350806	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.842	3.842	0.0	1.000	6174718	44.1		91.5		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.859	3.859	0.0	1.000	4904598	47.0		94.0	126092	
D 27 13C2 PFUnA										
565.00 > 520.00	3.859	3.859	0.0		4898271	41.2		82.5	436883	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.149	4.149	0.0	1.000	4290444	48.8		97.5	92024	
D 30 13C2 PFDoA										
615.00 > 570.00	4.156	4.156	0.0		4635811	41.4		82.7	173592	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.414	4.414	0.0	1.000	4397829	49.9		99.9	79958	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.664	4.664	0.0		9337760	40.4		80.8	701810	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.664	4.664	0.0	1.000	7228843	42.1		84.1	80280	
713.00 > 169.00	4.654	4.664	-0.010	0.998	1241774		5.82(0.00-0.00)		151751	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.081	5.081	0.0		5164593	39.8		79.6	181681	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.081	5.081	0.0	1.000	4765756	51.0		102	5833	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.444	5.444	0.0	1.000	4646394	50.5		101	6804	

Reagents:

LCPFC-L5_00020 Amount Added: 1.00 Units: mL

Report Date: 09-Dec-2016 16:30:21 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_034.d

Injection Date: 09-Dec-2016 15:06:25 Instrument ID: A8_N

Lims ID: CCV L5

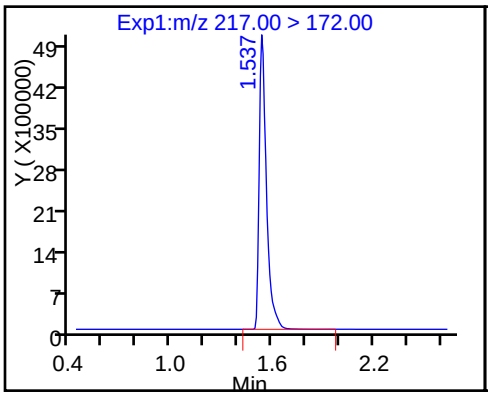
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 34

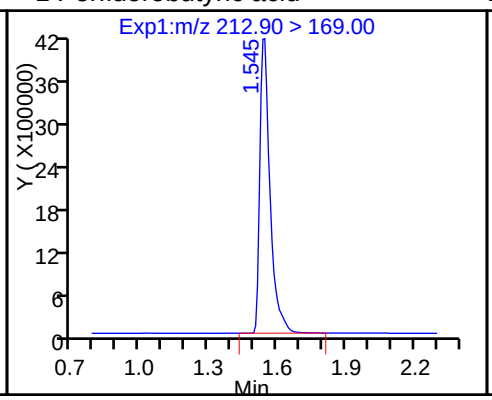
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

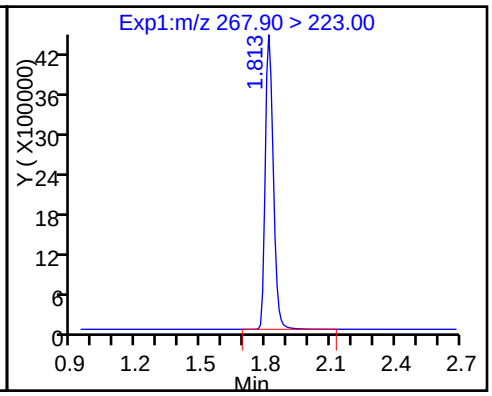
D 2 13C4 PFBA



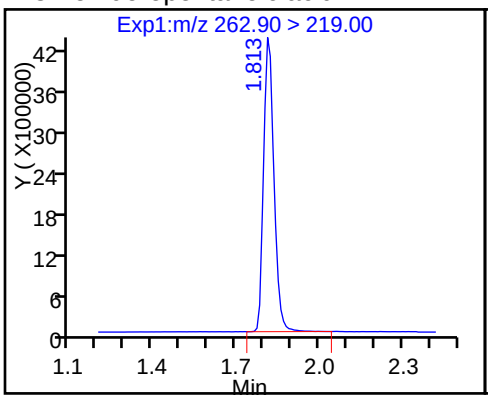
1 Perfluorobutyric acid



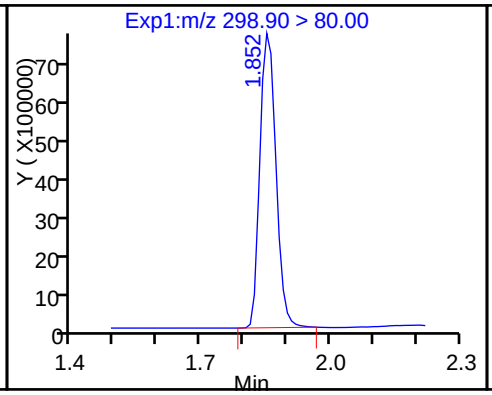
D 4 13C5-PFPeA



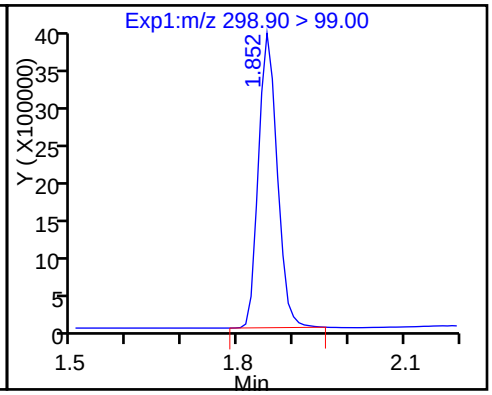
3 Perfluoropentanoic acid



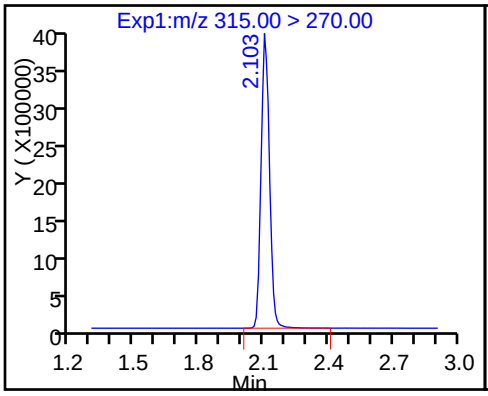
5 Perfluorobutanesulfonic acid



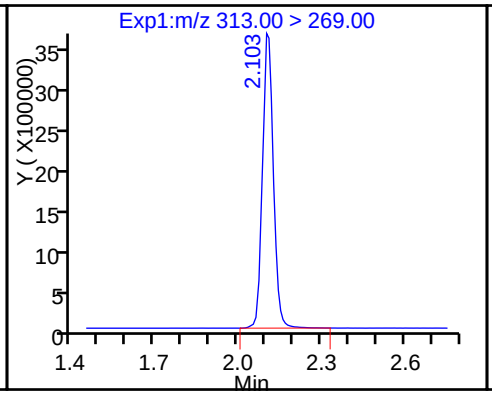
5 Perfluorobutanesulfonic acid



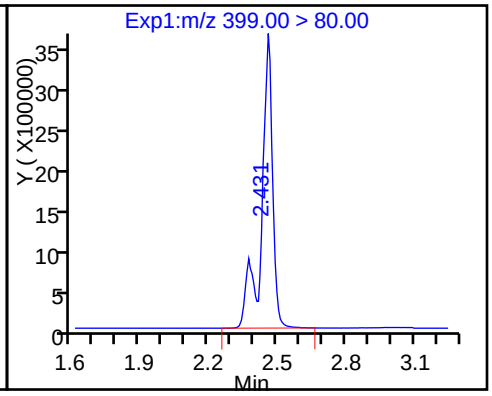
D 6 13C2 PFHxA



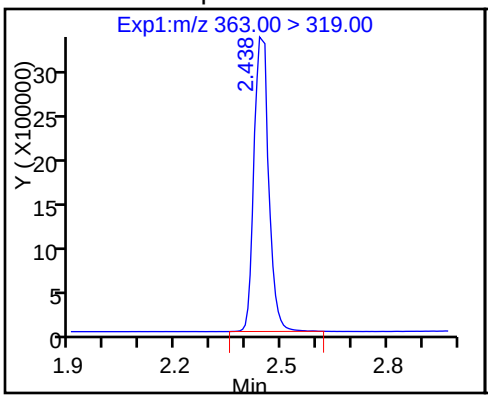
7 Perfluorohexanoic acid



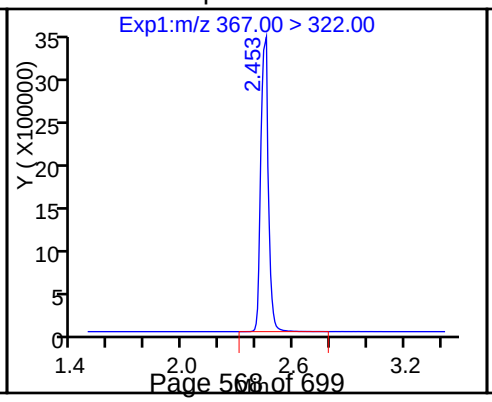
9 Perfluorohexanesulfonic acid



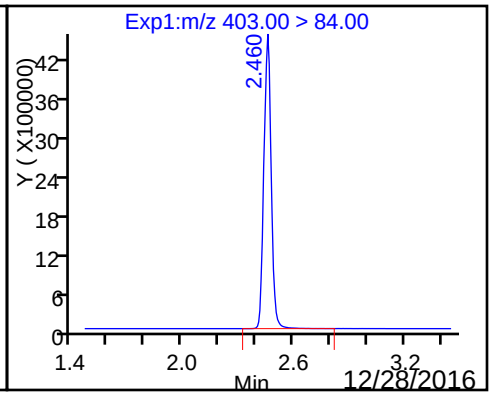
12 Perfluoroheptanoic acid



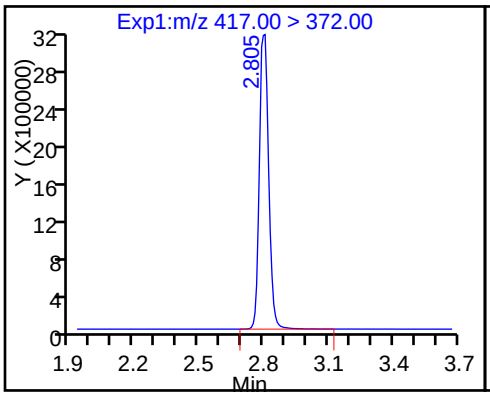
D 11 13C4-PFHpA



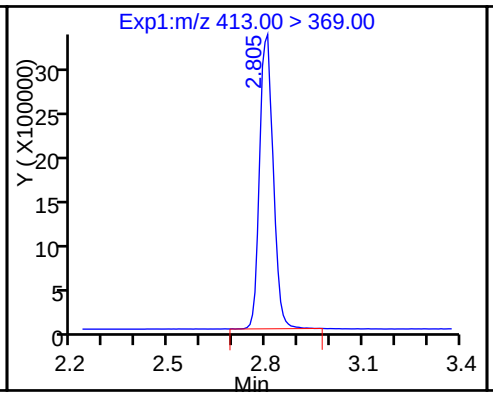
D 10 18O2 PFHxS



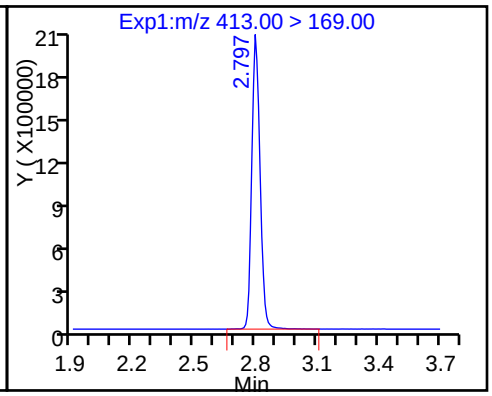
D 14 13C4 PFOA



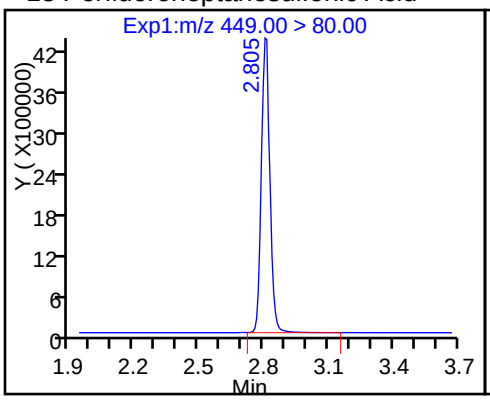
15 Perfluorooctanoic acid



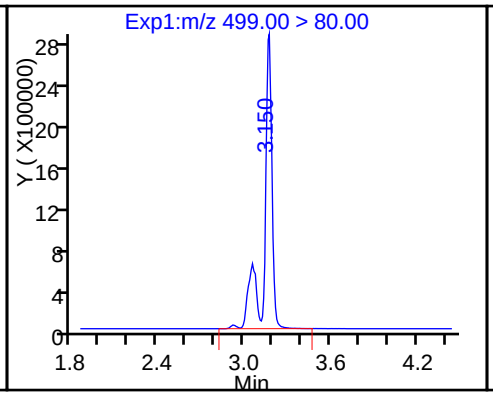
15 Perfluorooctanoic acid



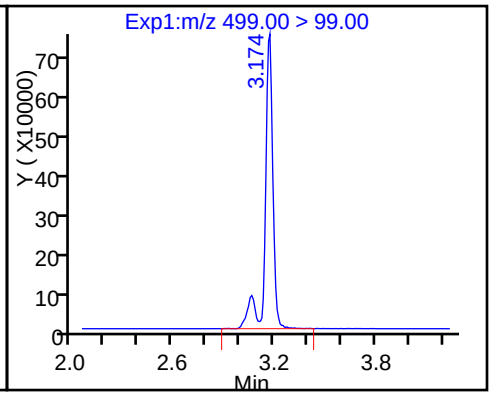
13 Perfluoroheptanesulfonic Acid



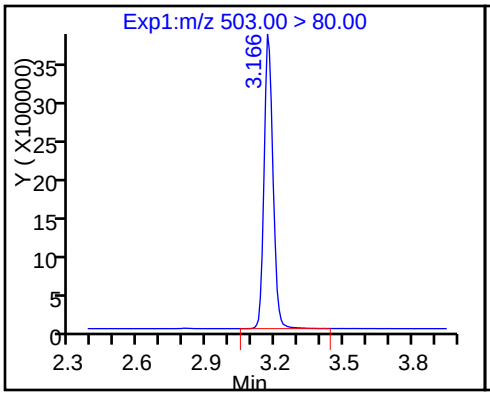
18 Perfluorooctane sulfonic acid



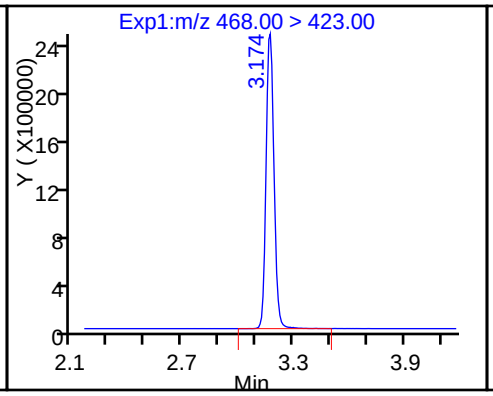
18 Perfluorooctane sulfonic acid



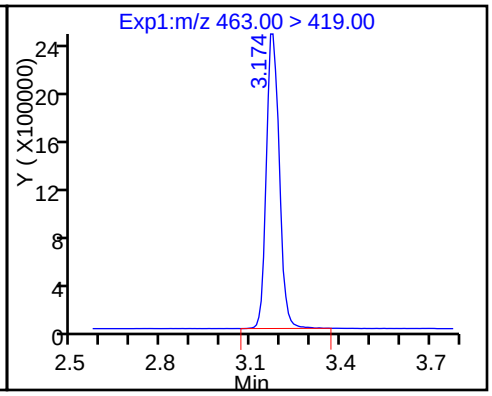
D 17 13C4 PFOS



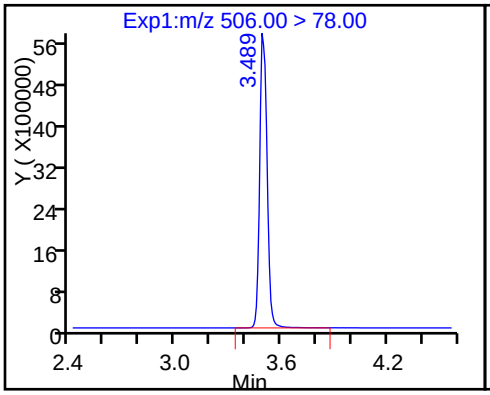
D 19 13C5 PFNA



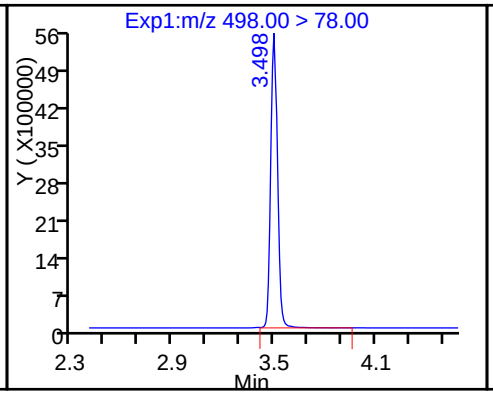
20 Perfluorononanoic acid



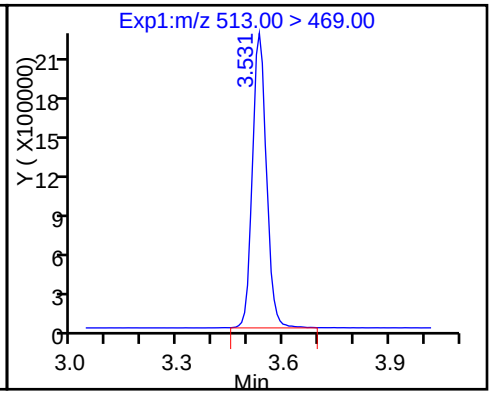
D 21 13C8 FOSA



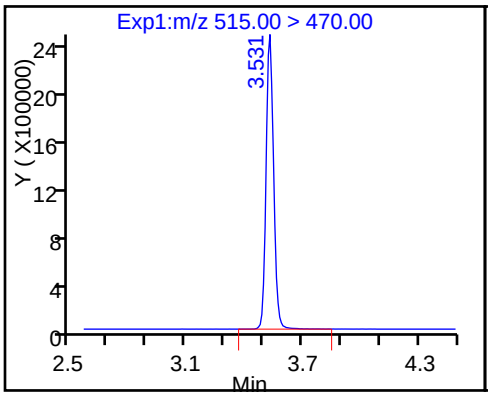
22 Perfluorooctane Sulfonamide



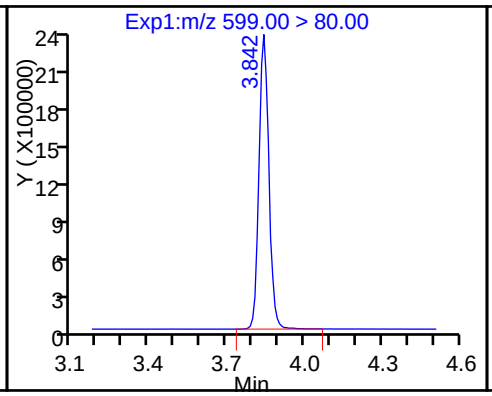
24 Perfluorodecanoic acid



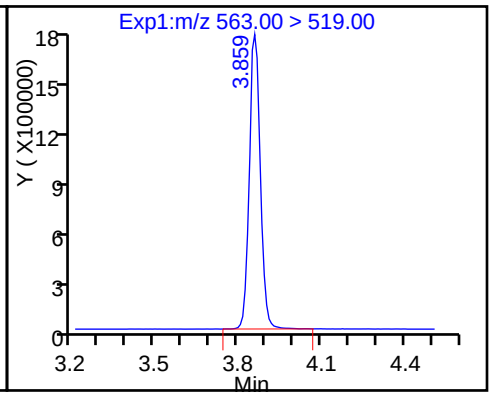
D 23 13C2 PFDA



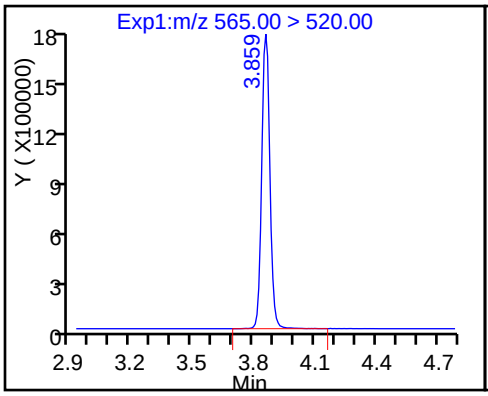
26 Perfluorodecane Sulfonic acid



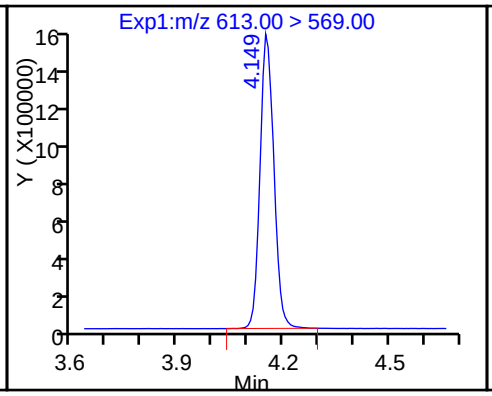
28 Perfluoroundecanoic acid



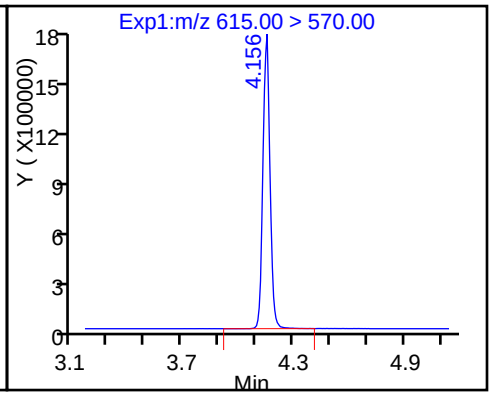
D 27 13C2 PFUnA



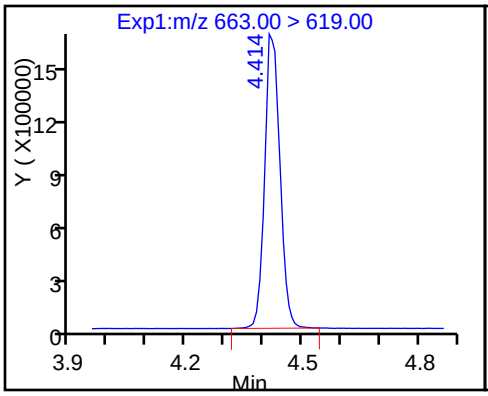
29 Perfluorododecanoic acid



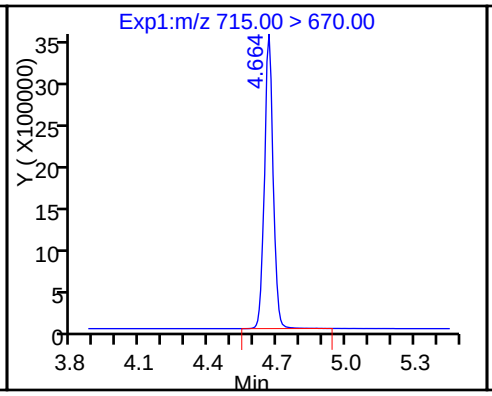
D 30 13C2 PFDoA



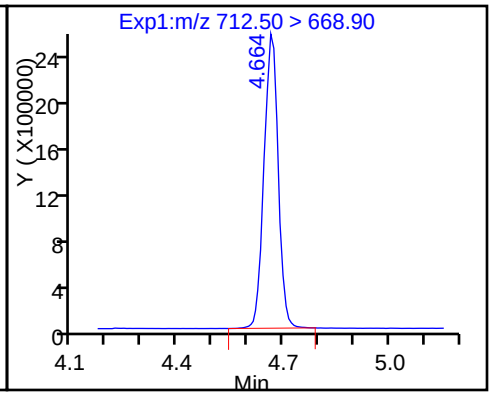
31 Perfluorotridecanoic acid



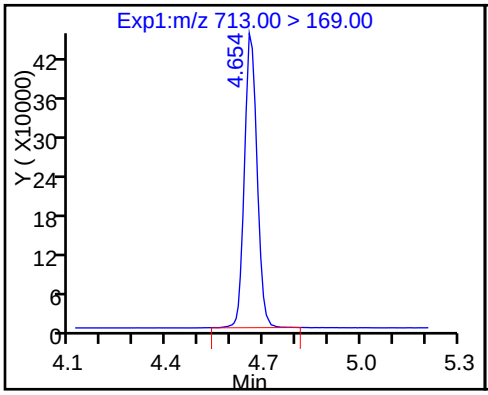
D 32 13C2-PFTeDA



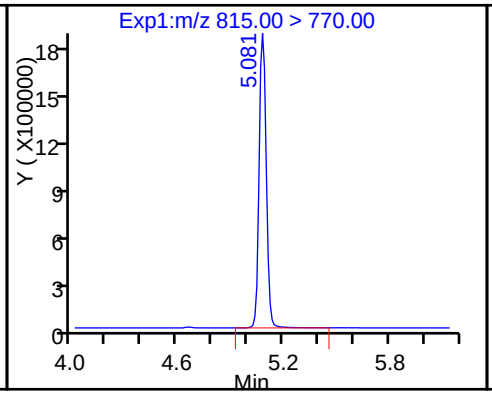
33 Perfluorotetradecanoic acid



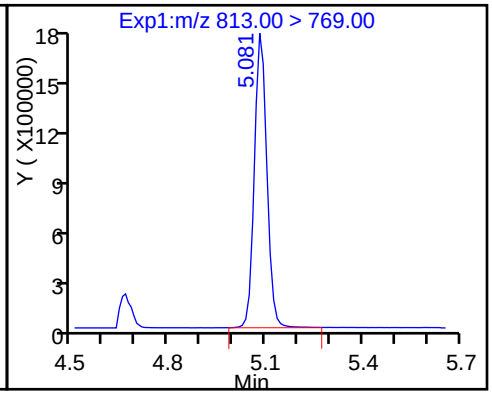
33 Perfluorotetradecanoic acid



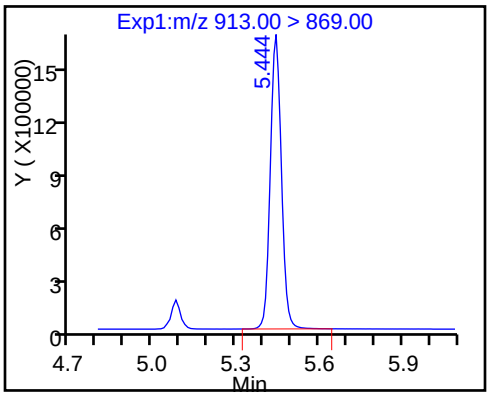
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Lab Sample ID: CCV 320-141453/50 Calibration Date: 12/09/2016 17:17

Instrument ID: A8_N Calib Start Date: 12/03/2016 13:48

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/03/2016 15:33

Lab File ID: 09DEC2016A_048.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8740	0.9495		21.7	20.0	8.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.015	1.084		21.4	20.0	6.8	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.596	1.726		19.1	17.7	8.1	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9531	1.023		21.5	20.0	7.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.098	1.094		18.1	18.2	-0.4	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.027	1.071		20.9	20.0	4.3	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	1.084		20.2	20.0	1.2	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.177	1.276		20.6	19.0	8.4	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.085	1.109		19.0	18.6	2.2	25.0
Perfluorononanoic acid (PFNA)	AveID	0.996	1.021		20.5	20.0	2.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9341	0.9843		21.1	20.0	5.4	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9605	1.001		20.8	20.0	4.2	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6398	0.6492		19.6	19.3	1.5	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.066	1.002		18.8	20.0	-6.0	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9490	0.9492		20.0	20.0	0.0	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9498	1.007		21.2	20.0	6.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.854	1.674		18.1	20.0	-9.7	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.063		20.6	20.0	3.2	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9929	0.8410		16.9	20.0	-15.3	25.0
13C4 PFBA	Ave	335829	339054		50.5	50.0	1.0	50.0
13C5-PFPeA	Ave	264545	269011		50.8	50.0	1.7	50.0
13C2 PFHxA	Ave	237486	250107		52.7	50.0	5.3	50.0
13C4-PFHpA	Ave	207413	223366		53.8	50.0	7.7	50.0
18O2 PFHxS	Ave	312342	331542		50.2	47.3	6.1	50.0
13C4 PFOA	Ave	219258	227963		52.0	50.0	4.0	50.0
13C4 PFOS	Ave	246009	251964		49.0	47.8	2.4	50.0
13C5 PFNA	Ave	166415	174348		52.4	50.0	4.8	50.0
13C8 FOSA	Ave	402279	398802		49.6	50.0	-0.9	50.0
13C2 PFDA	Ave	157817	156019		49.4	50.0	-1.1	50.0
13C2 PFUnA	Ave	118762	119052		50.1	50.0	0.2	50.0
13C2 PFDoA	Ave	112084	108419		48.4	50.0	-3.3	50.0
13C2-PFTeDA	Ave	231173	221095		47.8	50.0	-4.4	50.0
13C2-PFHxDA	Ave	129725	119140		45.9	50.0	-8.2	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_048.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 09-Dec-2016 17:17:15 ALS Bottle#: 40 Worklist Smp#: 50
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 11-Dec-2016 11:58:09 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: westendorfc Date: 11-Dec-2016 11:52:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.534	1.534	0.0		16952712	50.5		101	1816409	
1 Perfluorobutyric acid										
212.90 > 169.00	1.534	1.534	0.0	1.000	6438614	21.7		109	56057	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		13450556	50.8		102	1689419	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	5830492	21.4		107	47732	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.849	1.849	0.0	1.000	10115444	19.1		108		
298.90 > 99.00	1.849	1.849	0.0	1.000	4345692		2.33(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.105	2.105	0.0		12505346	52.7		105	554072	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.105	2.105	0.0	1.000	5118074	21.5		107	142428	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.382	2.382	0.0	1.000	6598234	18.1		99.6		
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.439	2.439	0.0	1.000	4786018	20.9		104	46836	
D 11 13C4-PFHpA										
367.00 > 322.00	2.446	2.446	0.0		11168305	53.8		108	758669	
D 10 18O2 PFHxS										
403.00 > 84.00	2.462	2.462	0.0		15681933	50.2		106	802810	
D 14 13C4 PFOA										
417.00 > 372.00	2.799	2.799	0.0		11398154	52.0		104	646244	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.799	2.799	0.0	1.000	4944009	20.2		101	39676	
413.00 > 169.00	2.799	2.799	0.0	1.000	2993434		1.65(0.90-1.10)		122946	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.807	2.807	0.0	1.000	6121896	20.6		108		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.057	3.057	0.0	1.000	5184496	19.0		102	54549	
499.00 > 99.00	3.175	3.057	0.118	1.038	1165736		4.45(0.90-1.10)		87883	
D 17 13C4 PFOS										
503.00 > 80.00	3.167	3.167	0.0		12043860	49.0		102	480145	
D 19 13C5 PFNA										
468.00 > 423.00	3.175	3.175	0.0		8717414	52.4		105	962972	
20 Perfluorononanoic acid										
463.00 > 419.00	3.175	3.175	0.0	1.000	3560346	20.5		102	52346	
D 21 13C8 FOSA										
506.00 > 78.00	3.499	3.499	0.0		19940101	49.6		99.1	6831527	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.499	3.499	0.0	1.000	7850863	21.1		105	256899	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.532	3.532	0.0	1.000	3121972	20.8		104	114250	
D 23 13C2 PFDA										
515.00 > 470.00	3.532	3.532	0.0		7800960	49.4		98.9	912193	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.843	3.843	0.0	1.000	3153497	19.6		101		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.861	3.861	0.0	1.000	2385520	18.8		94.0	74471	
D 27 13C2 PFUnA										
565.00 > 520.00	3.861	3.861	0.0		5952590	50.1		100	371307	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.156	4.156	0.0	1.000	2058325	20.0		100	40590	
D 30 13C2 PFDoA										
615.00 > 570.00	4.156	4.156	0.0		5420971	48.4		96.7	194606	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.421	4.421	0.0	1.000	2183684	21.2		106	43663	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.663	4.663	0.0		11054734	47.8		95.6	969526	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.663	4.663	0.0	1.000	3629964	18.1		90.3	33923	
713.00 > 169.00	4.663	4.663	0.0	1.000	616315		5.89(0.00-0.00)		115822	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.080	5.080	0.0		5956994	45.9		91.8	147305	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.080	5.080	0.0	1.000	2304157	20.6		103	2361	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.444	5.444	0.0	1.000	1823575	16.9		84.7	2560	

Reagents:

LCPFC-L4_00023 Amount Added: 1.00 Units: mL

Report Date: 11-Dec-2016 11:58:09 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_048.d

Injection Date: 09-Dec-2016 17:17:15 Instrument ID: A8_N

Lims ID: CCV L4

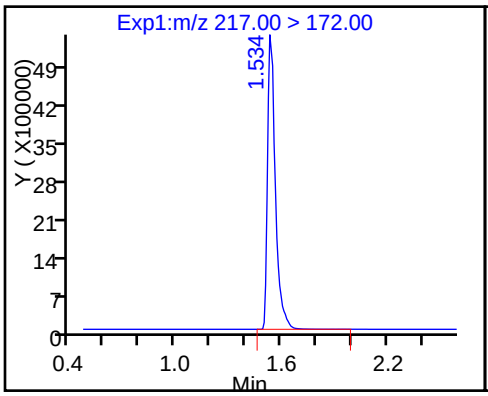
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 50

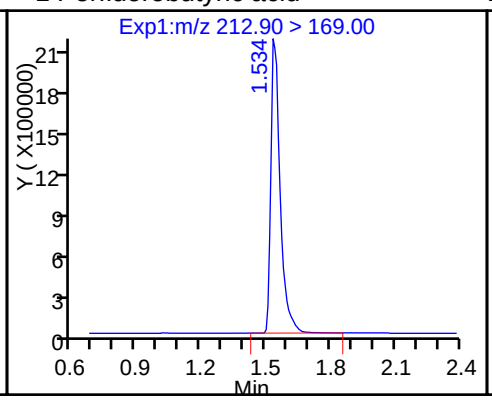
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

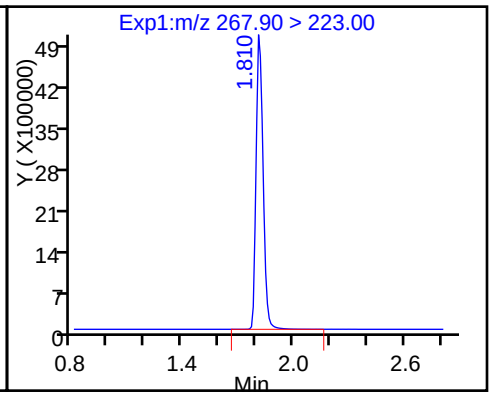
D 2 13C4 PFBA



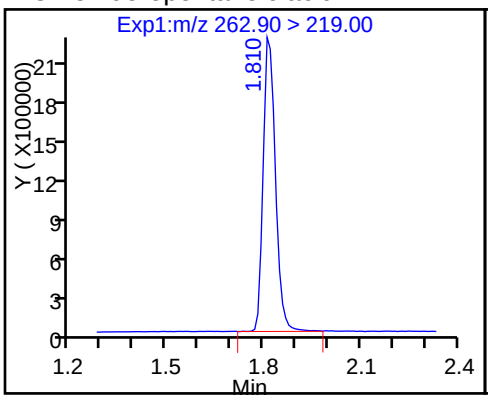
1 Perfluorobutyric acid



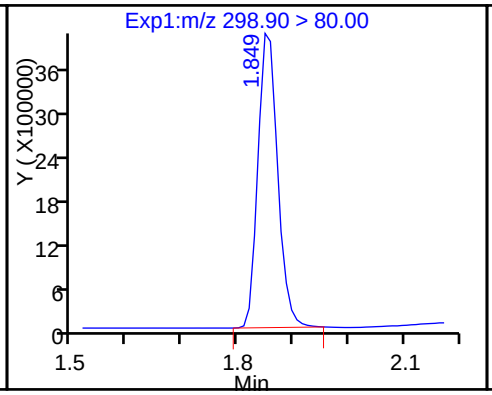
D 4 13C5-PFPeA



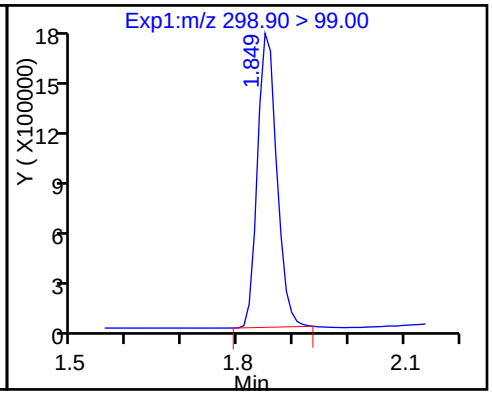
3 Perfluoropentanoic acid



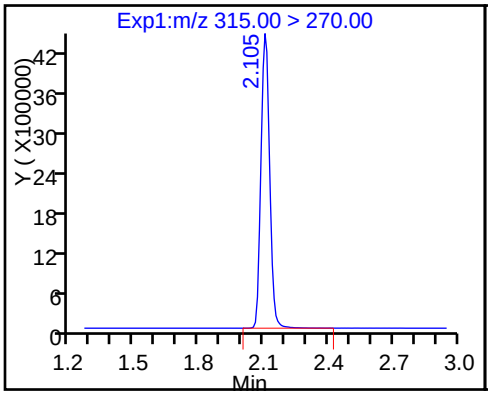
5 Perfluorobutanesulfonic acid



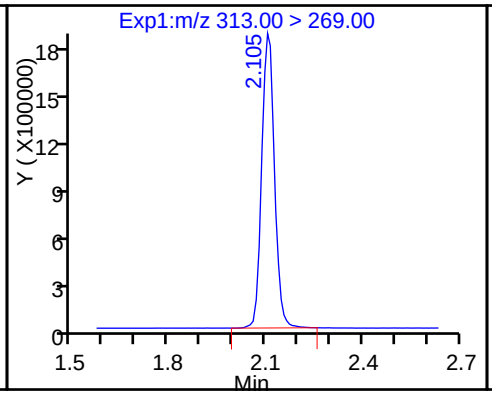
5 Perfluorobutanesulfonic acid



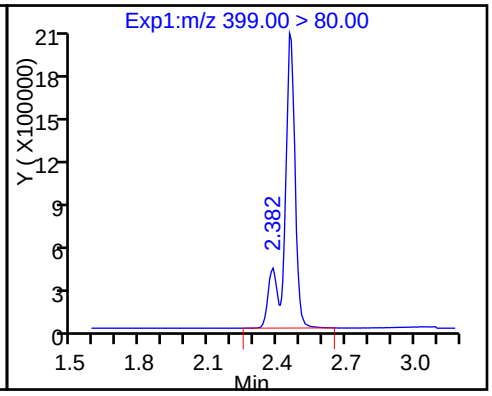
D 6 13C2 PFHxA



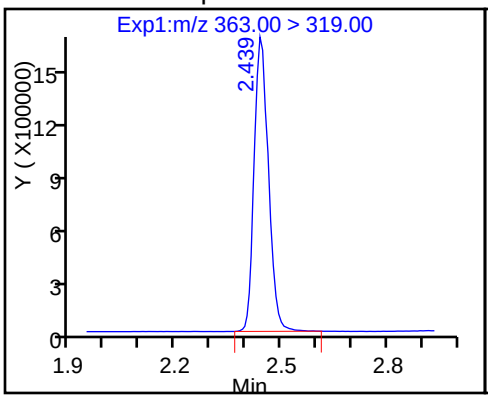
7 Perfluorohexanoic acid



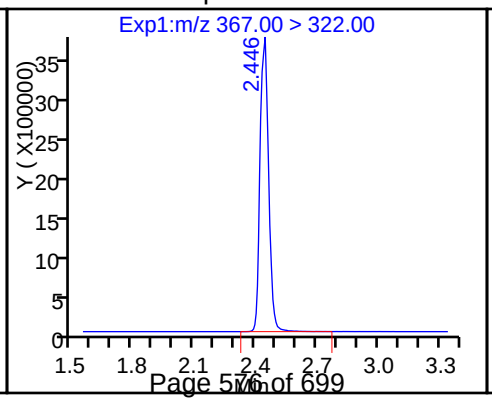
9 Perfluorohexanesulfonic acid



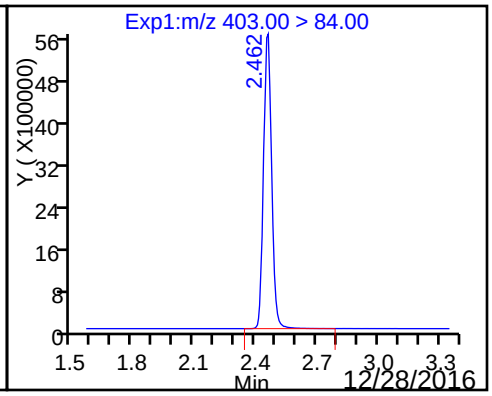
12 Perfluoroheptanoic acid



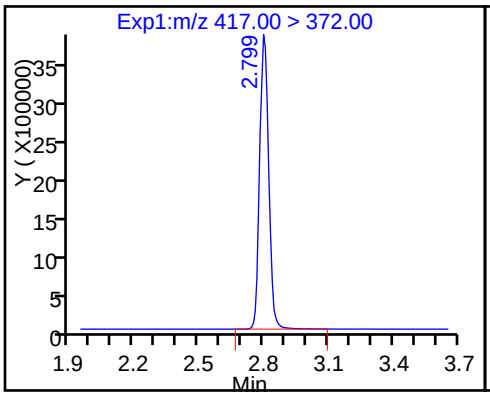
D 11 13C4-PFHpA



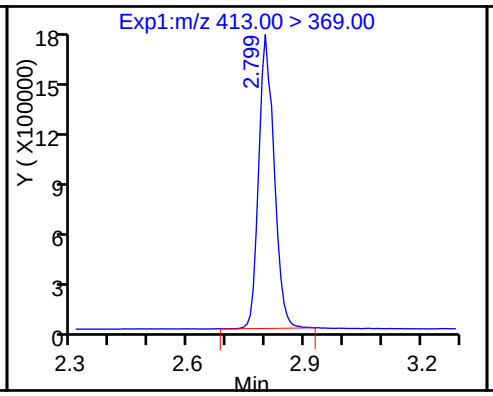
D 10 18O2 PFHxS



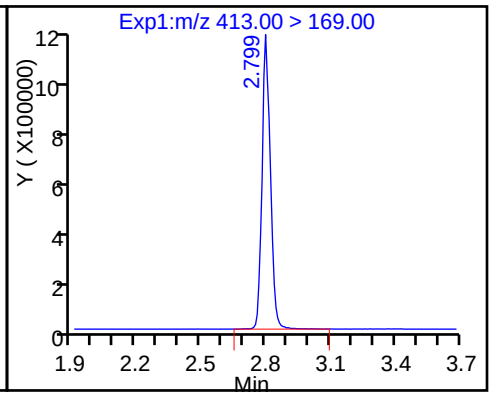
D 14 13C4 PFOA



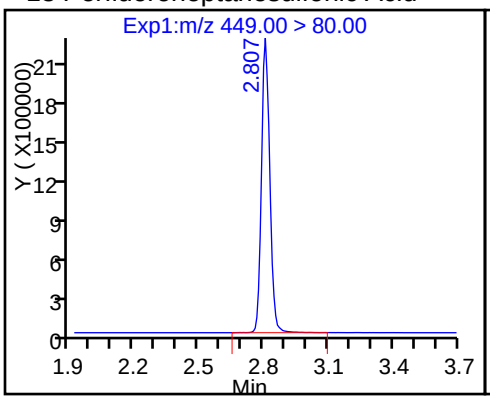
15 Perfluorooctanoic acid



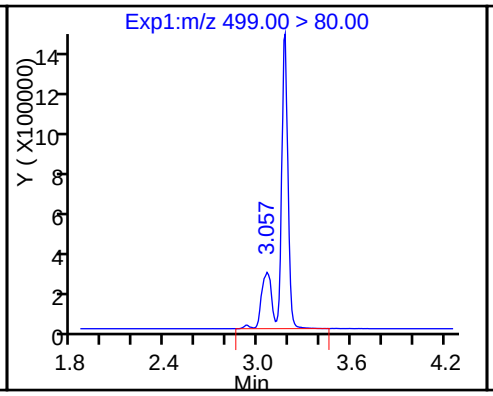
15 Perfluorooctanoic acid



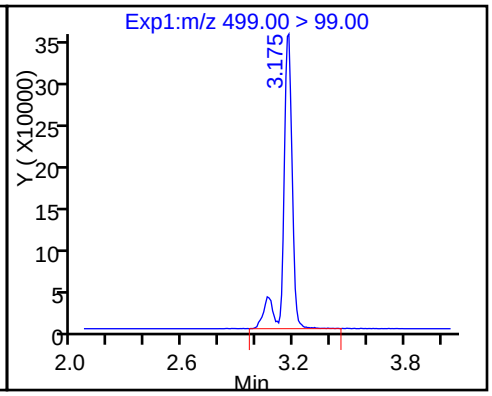
13 Perfluoroheptanesulfonic Acid



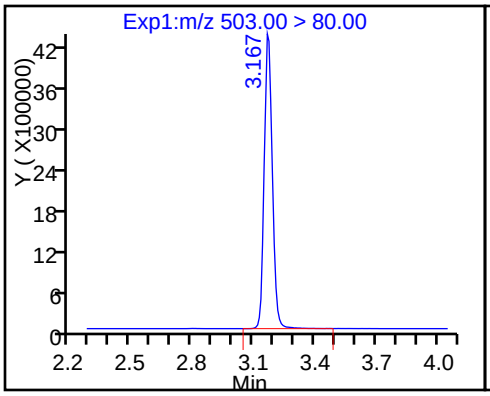
18 Perfluorooctane sulfonic acid



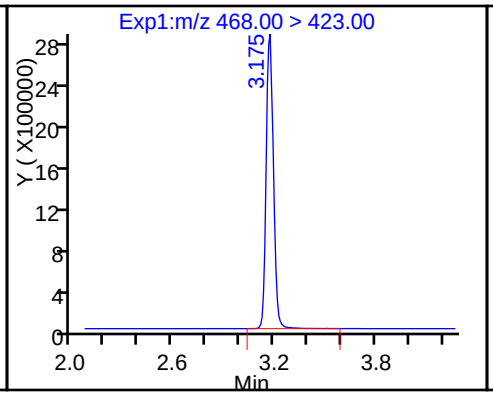
18 Perfluorooctane sulfonic acid



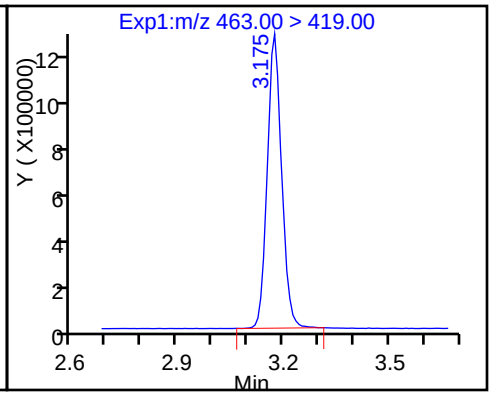
D 17 13C4 PFOS



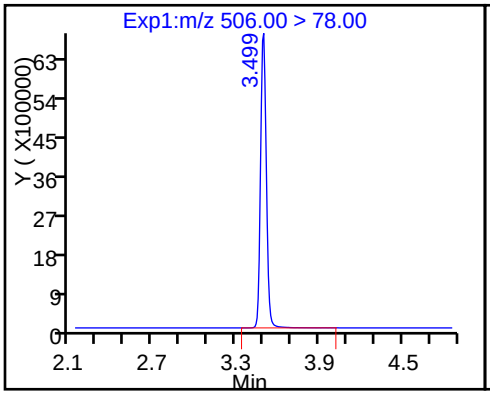
D 19 13C5 PFNA



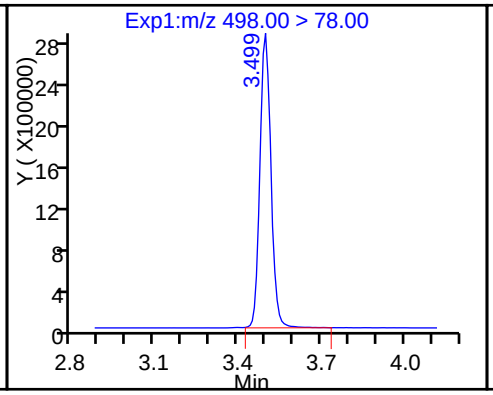
20 Perfluorononanoic acid



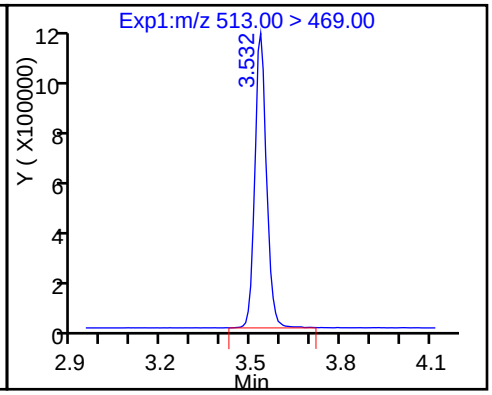
D 21 13C8 FOSA



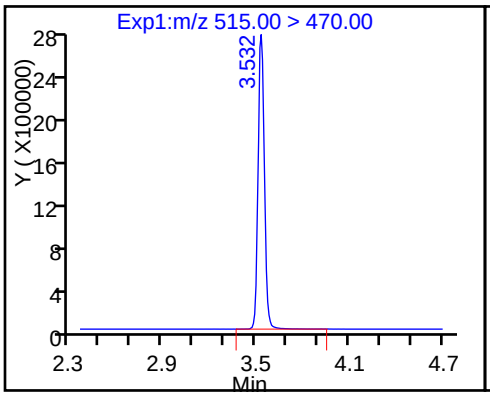
22 Perfluorooctane Sulfonamide



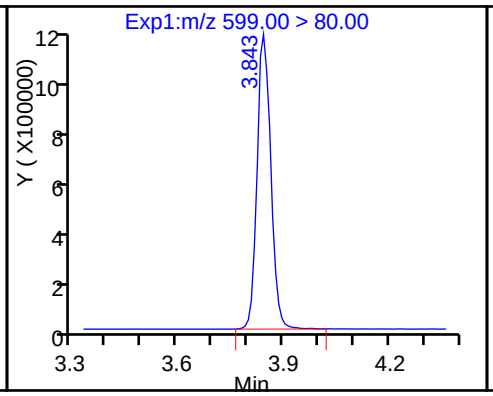
24 Perfluorodecanoic acid



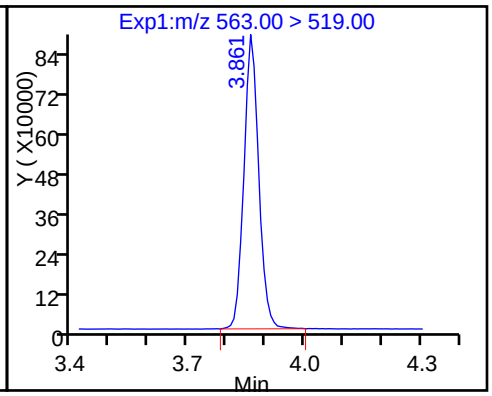
D 23 13C2 PFDA



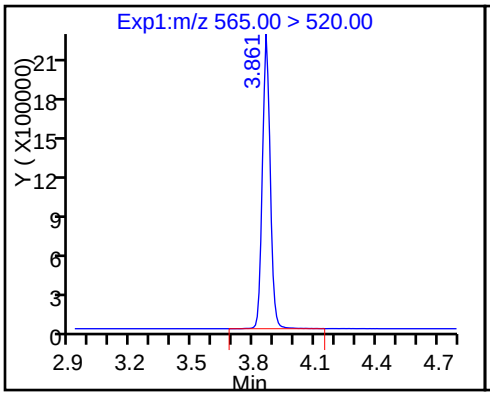
26 Perfluorodecane Sulfonic acid



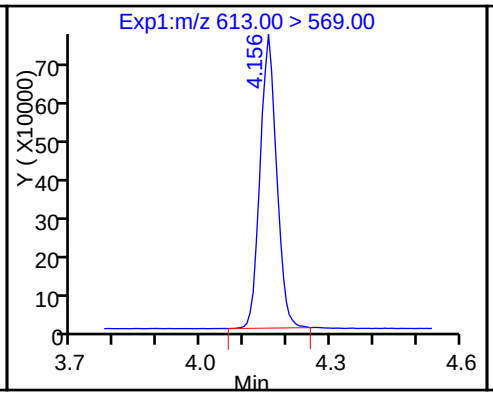
28 Perfluoroundecanoic acid



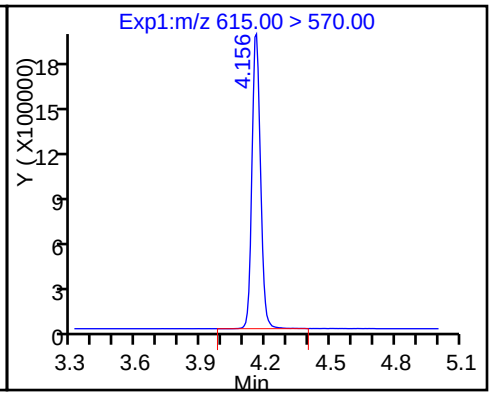
D 27 13C2 PFUnA



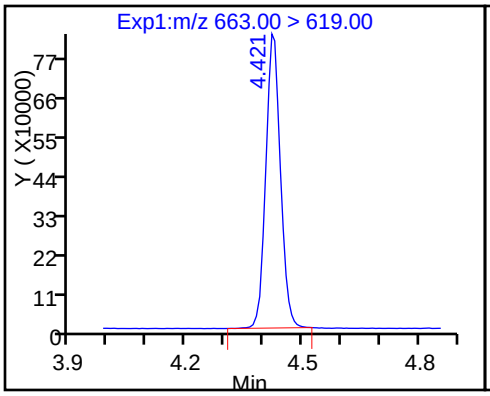
29 Perfluorododecanoic acid



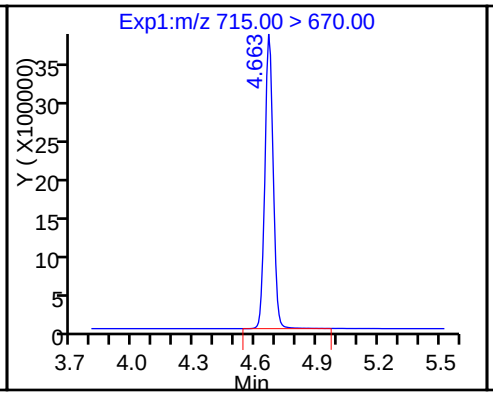
D 30 13C2 PFDoA



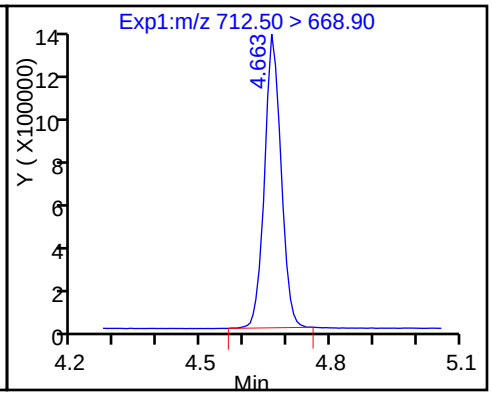
31 Perfluorotridecanoic acid



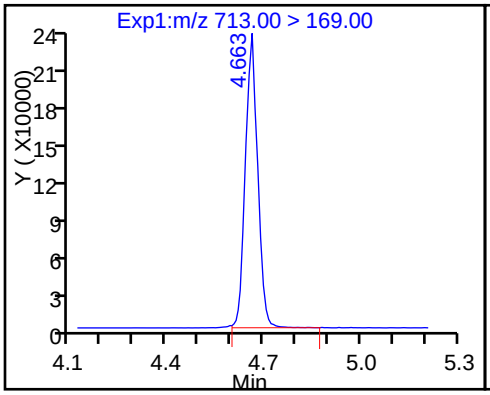
D 32 13C2-PFTeDA



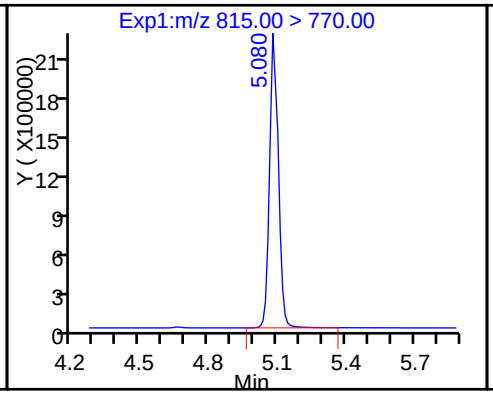
33 Perfluorotetradecanoic acid



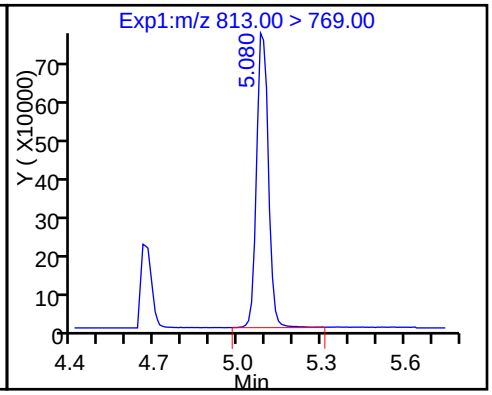
33 Perfluorotetradecanoic acid



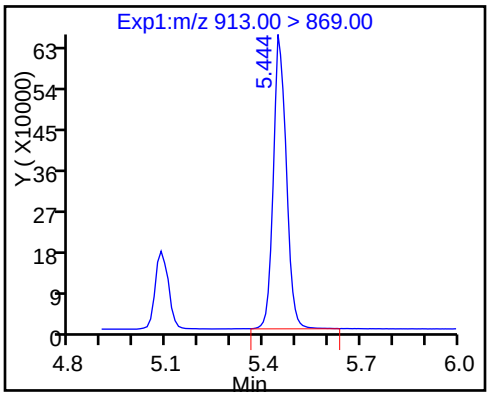
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Lab Sample ID: CCV 320-141453/59 Calibration Date: 12/09/2016 18:32

Instrument ID: A8_N Calib Start Date: 12/03/2016 13:48

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/03/2016 15:33

Lab File ID: 09DEC2016A_058.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8740	0.9657		22.1	20.0	10.5	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.015	1.069		21.1	20.0	5.3	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.596	1.782		19.7	17.7	11.7	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9531	1.010		21.2	20.0	6.0	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.098	1.113		18.5	18.2	1.4	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.027	1.056		20.6	20.0	2.8	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	1.087		20.3	20.0	1.4	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.177	1.259		20.4	19.0	6.9	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.085	1.102		18.9	18.6	1.6	25.0
Perfluorononanoic acid (PFNA)	AveID	0.996	1.071		21.5	20.0	7.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9341	1.035		22.2	20.0	10.8	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9605	1.036		21.6	20.0	7.9	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6398	0.6482		19.5	19.3	1.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.066	1.060		19.9	20.0	-0.5	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9490	1.002		21.1	20.0	5.6	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9498	1.029		21.7	20.0	8.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.854	1.763		19.0	20.0	-4.9	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.144		22.3	20.0	11.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9929	0.8739		17.6	20.0	-12.0	25.0
13C4 PFBA	Ave	335829	344607		51.3	50.0	2.6	50.0
13C5-PFPeA	Ave	264545	268800		50.8	50.0	1.6	50.0
13C2 PFHxA	Ave	237486	248796		52.4	50.0	4.8	50.0
13C4-PFHpA	Ave	207413	228753		55.1	50.0	10.3	50.0
18O2 PFHxS	Ave	312342	329612		49.9	47.3	5.5	50.0
13C4 PFOA	Ave	219258	237816		54.2	50.0	8.5	50.0
13C4 PFOS	Ave	246009	253381		49.2	47.8	3.0	50.0
13C5 PFNA	Ave	166415	172671		51.9	50.0	3.8	50.0
13C8 FOSA	Ave	402279	393228		48.9	50.0	-2.3	50.0
13C2 PFDA	Ave	157817	152841		48.4	50.0	-3.2	50.0
13C2 PFUnA	Ave	118762	115794		48.8	50.0	-2.5	50.0
13C2 PFDoA	Ave	112084	105449		47.0	50.0	-5.9	50.0
13C2-PFTeDA	Ave	231173	220691		47.7	50.0	-4.5	50.0
13C2-PFHxDA	Ave	129725	125540		48.4	50.0	-3.2	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_058.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 09-Dec-2016 18:32:16 ALS Bottle#: 40 Worklist Smp#: 59
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 11-Dec-2016 11:58:20 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: westendorfc Date: 11-Dec-2016 11:57:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.537	1.537	0.0		17230338	51.3		103	1133814	
1 Perfluorobutyric acid										
212.90 > 169.00	1.537	1.537	0.0	1.000	6655684	22.1		110	70098	
D 4 13C5-PFPeA										
267.90 > 223.00	1.813	1.813	0.0		13439981	50.8		102	1025948	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.813	1.813	0.0	1.000	5745502	21.1		105	65535	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.852	1.852	0.0	1.000	10386021	19.7		112		
298.90 > 99.00	1.852	1.852	0.0	1.000	4420134		2.35(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.099	2.099	0.0		12439786	52.4		105	634517	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.099	2.099	0.0	1.000	5026631	21.2		106	142343	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.377	2.377	0.0	1.000	6679439	18.5		101		
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.441	2.441	0.0	1.000	4832538	20.6		103	45716	
D 11 13C4-PFHpA										
367.00 > 322.00	2.433	2.433	0.0		11437631	55.1		110	778719	
D 10 18O2 PFHxS										
403.00 > 84.00	2.448	2.448	0.0		15590644	49.9		106	924361	
D 14 13C4 PFOA										
417.00 > 372.00	2.793	2.793	0.0		11890806	54.2		108	692751	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.793	2.793	0.0	1.000	5170893	20.3		101	46435	
413.00 > 169.00	2.793	2.793	0.0	1.000	3054411		1.69(0.90-1.10)		138249	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.801	2.801	0.0	1.000	6071689	20.4		107		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.051	3.051	0.0	1.000	5183928	18.9		102	50597	
499.00 > 99.00	3.161	3.051	0.110	1.036	1180272		4.39(0.90-1.10)		73710	
D 17 13C4 PFOS										
503.00 > 80.00	3.161	3.161	0.0		12111594	49.2		103	384748	
D 19 13C5 PFNA										
468.00 > 423.00	3.169	3.169	0.0		8633555	51.9		104	329266	
20 Perfluorononanoic acid										
463.00 > 419.00	3.169	3.169	0.0	1.000	3700160	21.5		108	64966	
D 21 13C8 FOSA										
506.00 > 78.00	3.493	3.493	0.0		19661389	48.9		97.7	956607	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.493	3.493	0.0	1.000	8142663	22.2		111	482684	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.526	3.526	0.0	1.000	3167950	21.6		108	95332	
D 23 13C2 PFDA										
515.00 > 470.00	3.526	3.526	0.0		7642030	48.4		96.8	438771	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.837	3.837	0.0	1.000	3166514	19.5		101		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.854	3.854	0.0	1.000	2455526	19.9		99.5	68406	
D 27 13C2 PFUnA										
565.00 > 520.00	3.854	3.854	0.0		5789687	48.8		97.5	363921	
29 Perfluorododecanoic acid										M
613.00 > 569.00	4.144	4.144	0.0	1.000	2113412	21.1		106	0.0	M
D 30 13C2 PFDoA										
615.00 > 570.00	4.151	4.151	0.0		5272445	47.0		94.1	142100	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.422	4.422	0.0	1.000	2170652	21.7		108	42455	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.657	4.657	0.0		11034528	47.7		95.5	764330	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.657	4.657	0.0	1.000	3718435	19.0		95.1	40985	
713.00 > 169.00	4.657	4.657	0.0	1.000	619799		6.00(0.00-0.00)		78152	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.082	5.082	0.0		6276979	48.4		96.8	154200	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.082	5.082	0.0	1.000	2412961	22.3		111	2541	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.446	5.446	0.0	1.000	1842987	17.6		88.0	2306	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L4_00023 Amount Added: 1.00 Units: mL

Report Date: 11-Dec-2016 11:58:21 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_058.d

Injection Date: 09-Dec-2016 18:32:16 Instrument ID: A8_N

Lims ID: CCV L4

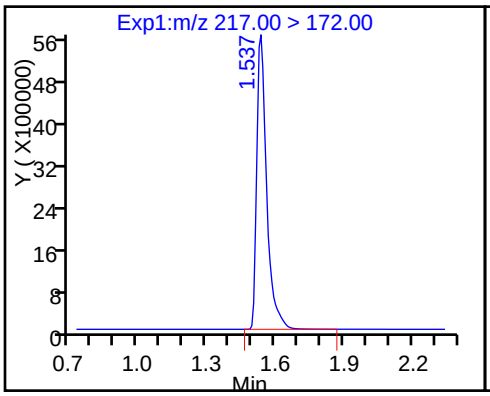
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 59

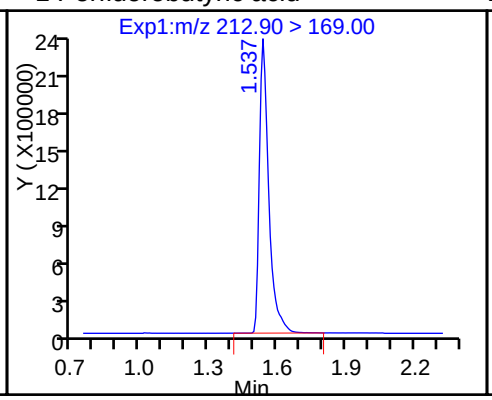
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

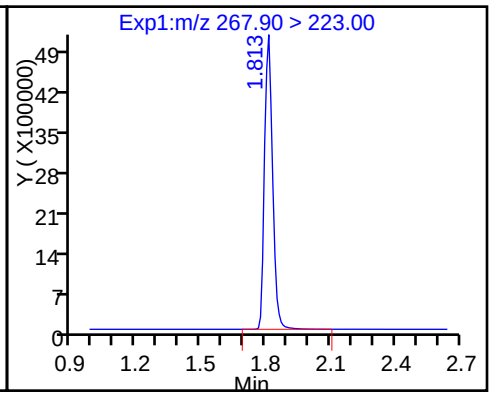
D 2 13C4 PFBA



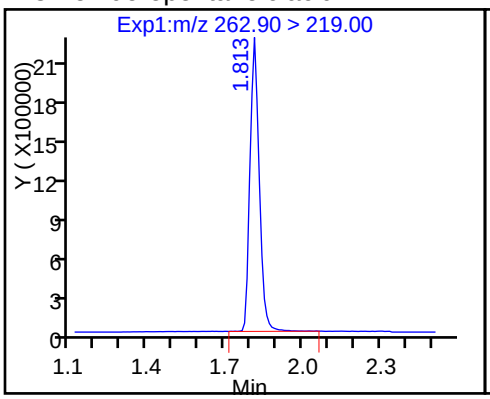
1 Perfluorobutyric acid



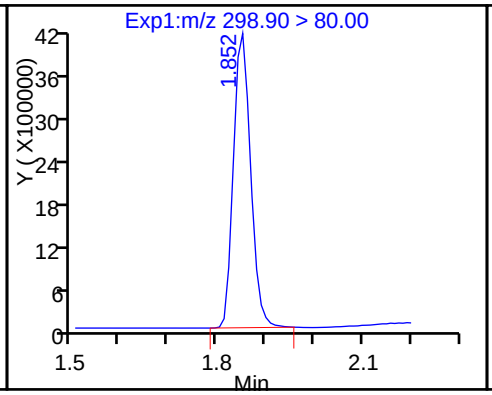
D 4 13C5-PFPeA



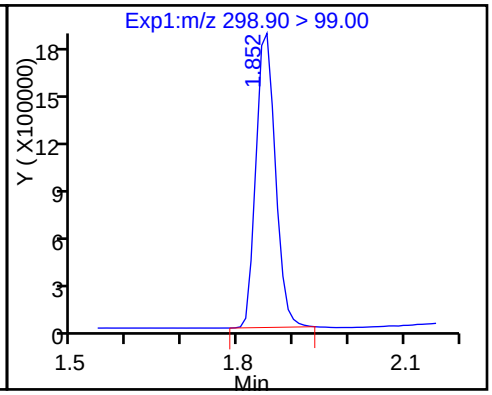
3 Perfluoropentanoic acid



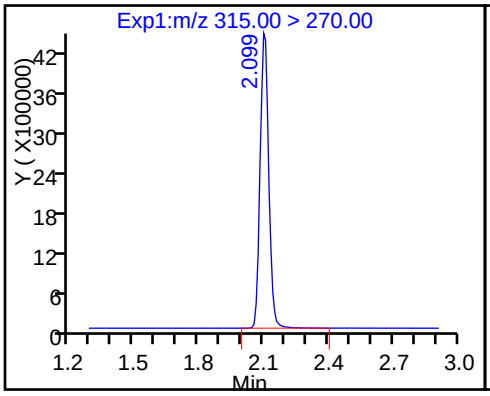
5 Perfluorobutanesulfonic acid



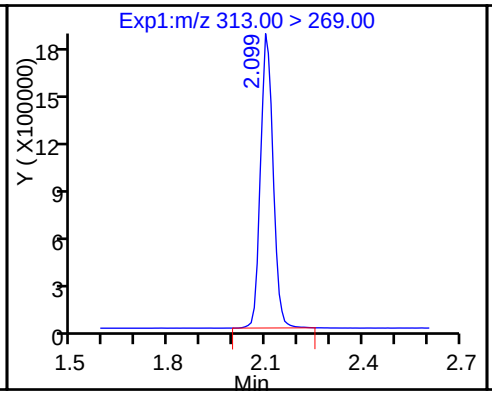
5 Perfluorobutanesulfonic acid



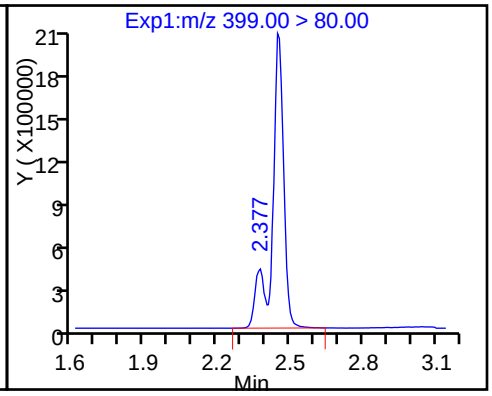
D 6 13C2 PFHxA



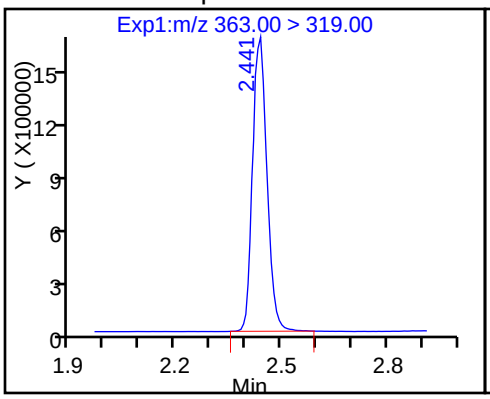
7 Perfluorohexanoic acid



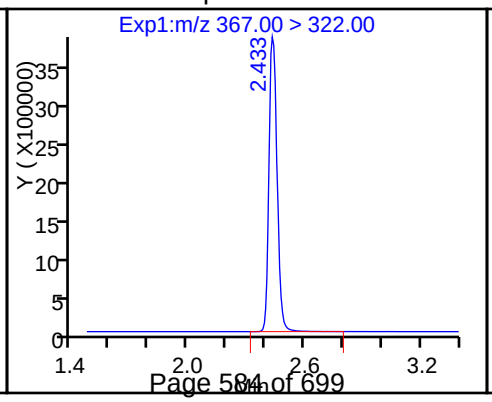
9 Perfluorohexanesulfonic acid



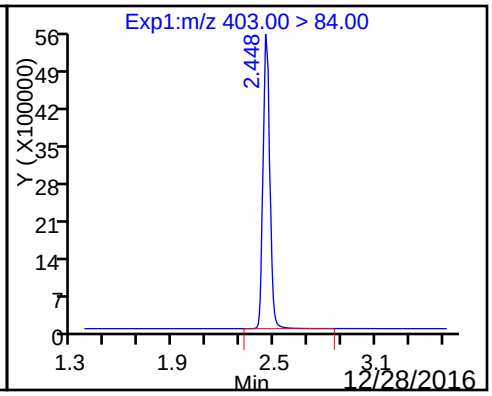
12 Perfluoroheptanoic acid



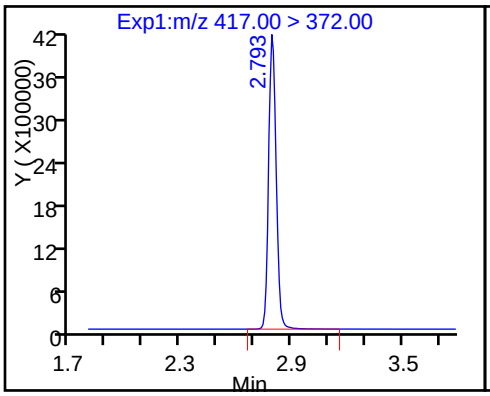
D 11 13C4-PFHpA



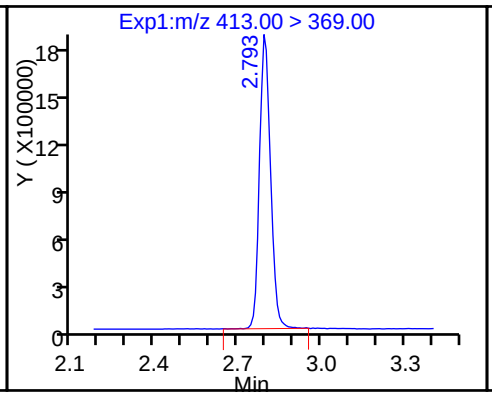
D 10 18O2 PFHxS



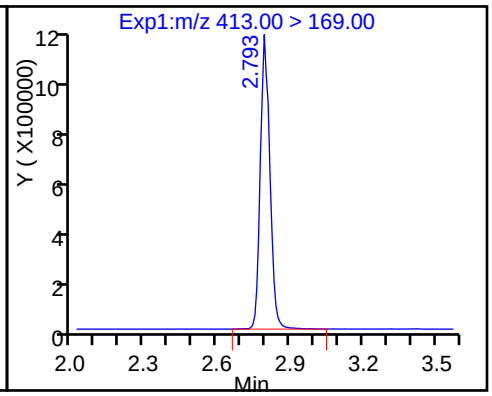
D 14 13C4 PFOA



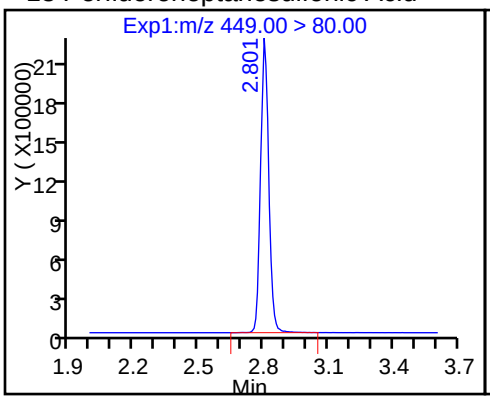
15 Perfluorooctanoic acid



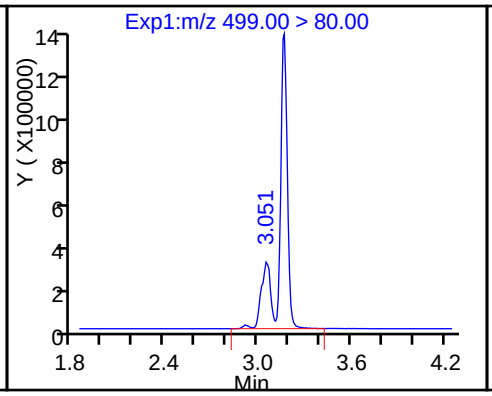
15 Perfluorooctanoic acid



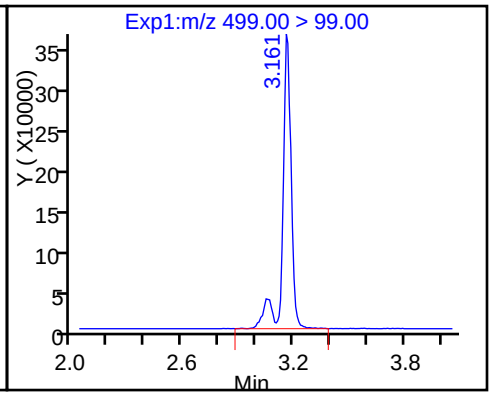
13 Perfluoroheptanesulfonic Acid



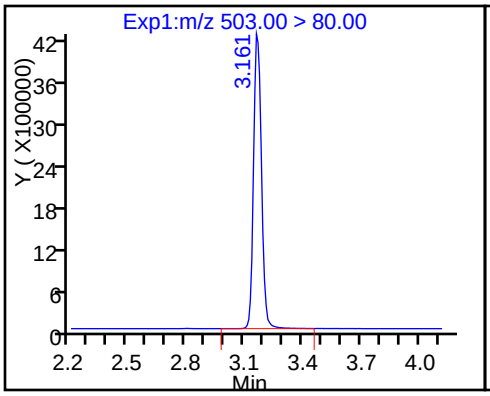
18 Perfluorooctane sulfonic acid



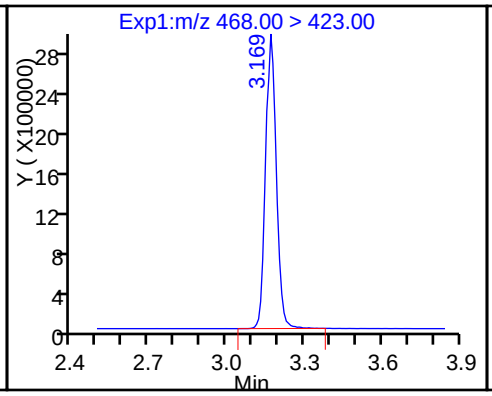
18 Perfluorooctane sulfonic acid



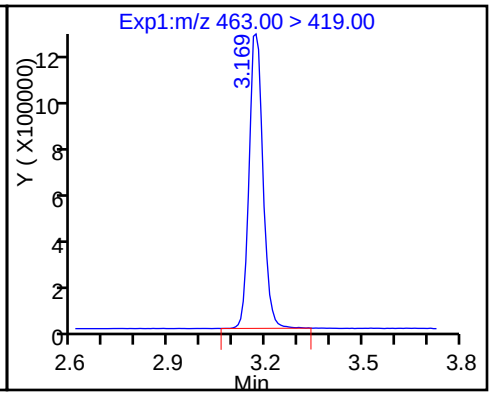
D 17 13C4 PFOS



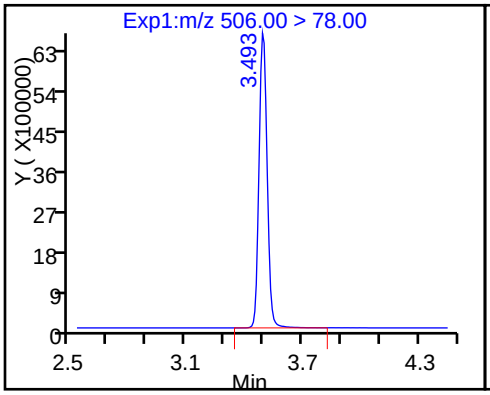
D 19 13C5 PFNA



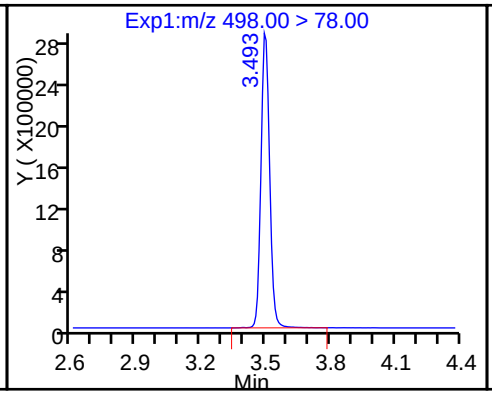
20 Perfluorononanoic acid



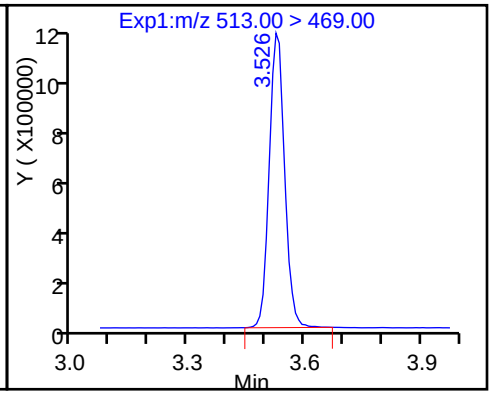
D 21 13C8 FOSA



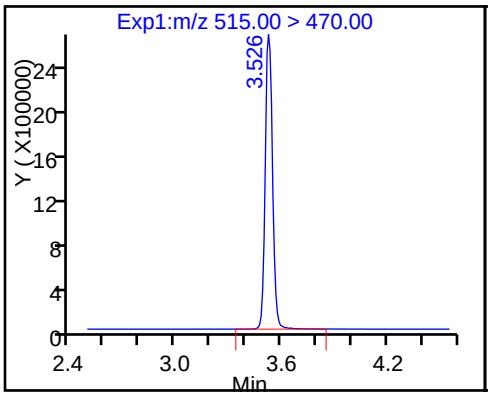
22 Perfluorooctane Sulfonamide



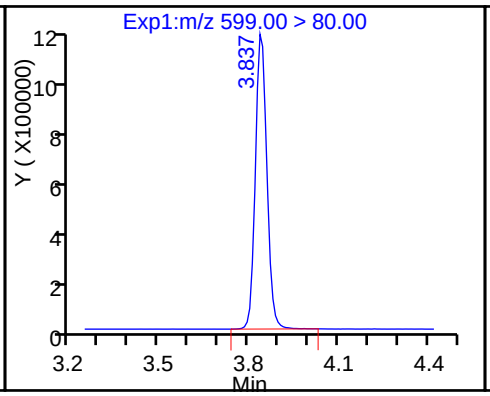
24 Perfluorodecanoic acid



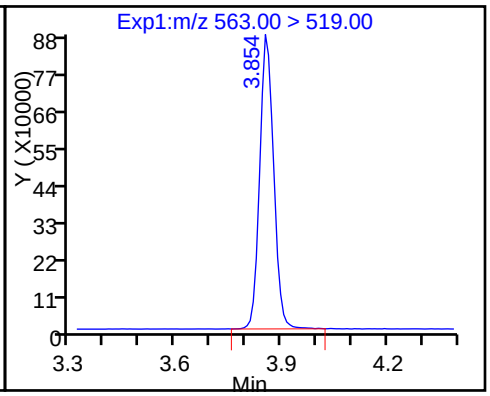
D 23 13C2 PFDA



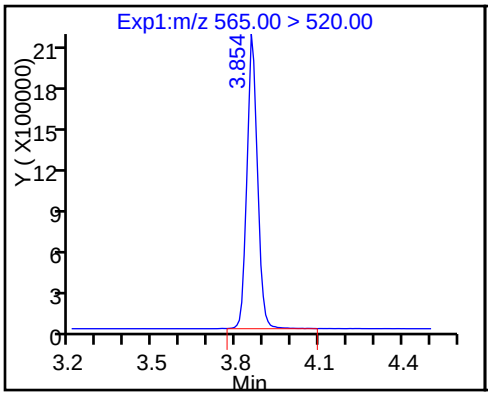
26 Perfluorodecane Sulfonic acid



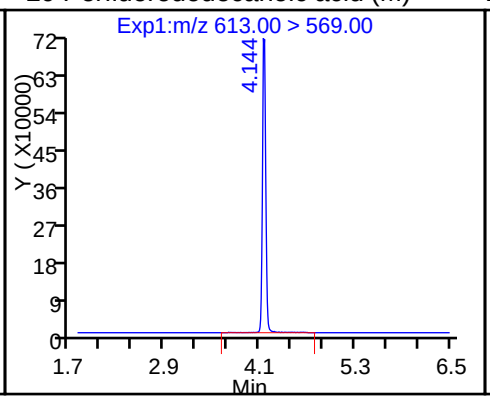
28 Perfluoroundecanoic acid



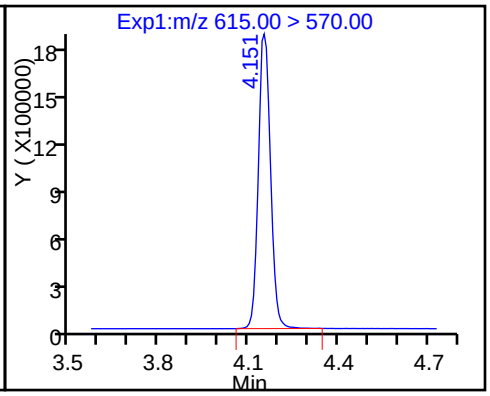
D 27 13C2 PFUnA



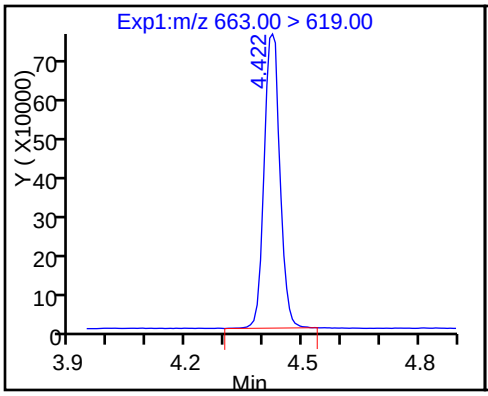
29 Perfluorododecanoic acid (M)



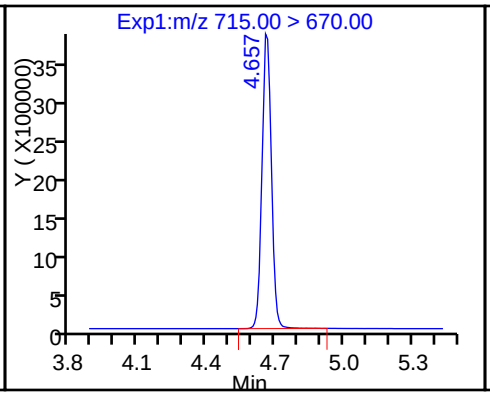
D 30 13C2 PFDoA



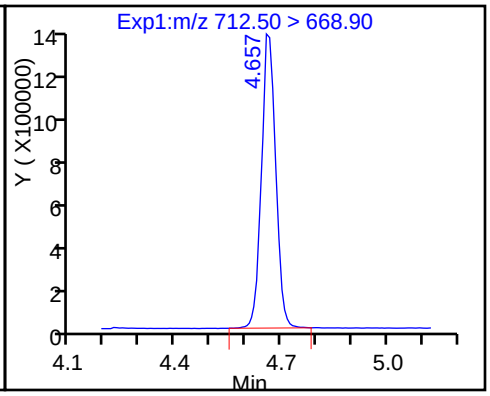
31 Perfluorotridecanoic acid



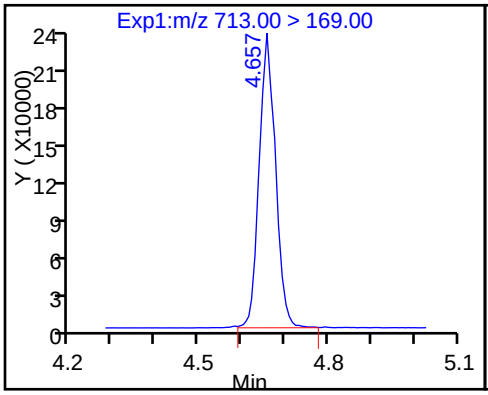
D 32 13C2-PFTeDA



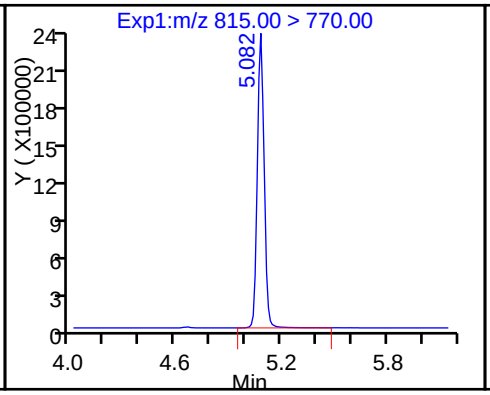
33 Perfluorotetradecanoic acid



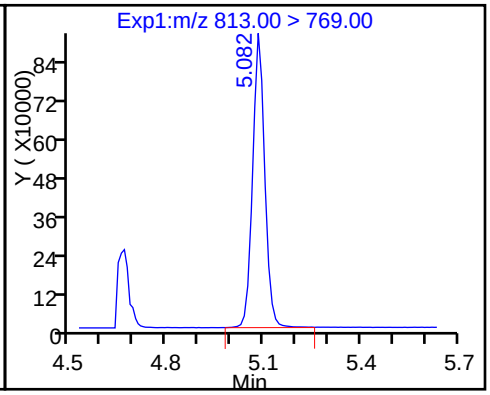
33 Perfluorotetradecanoic acid



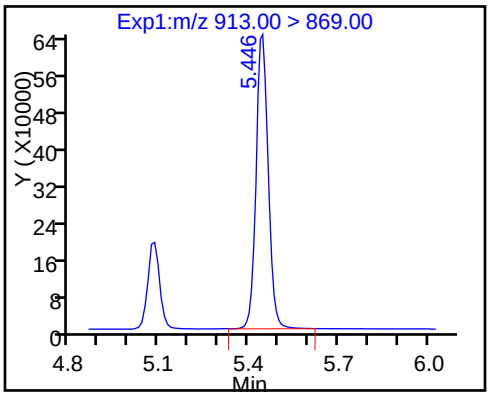
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

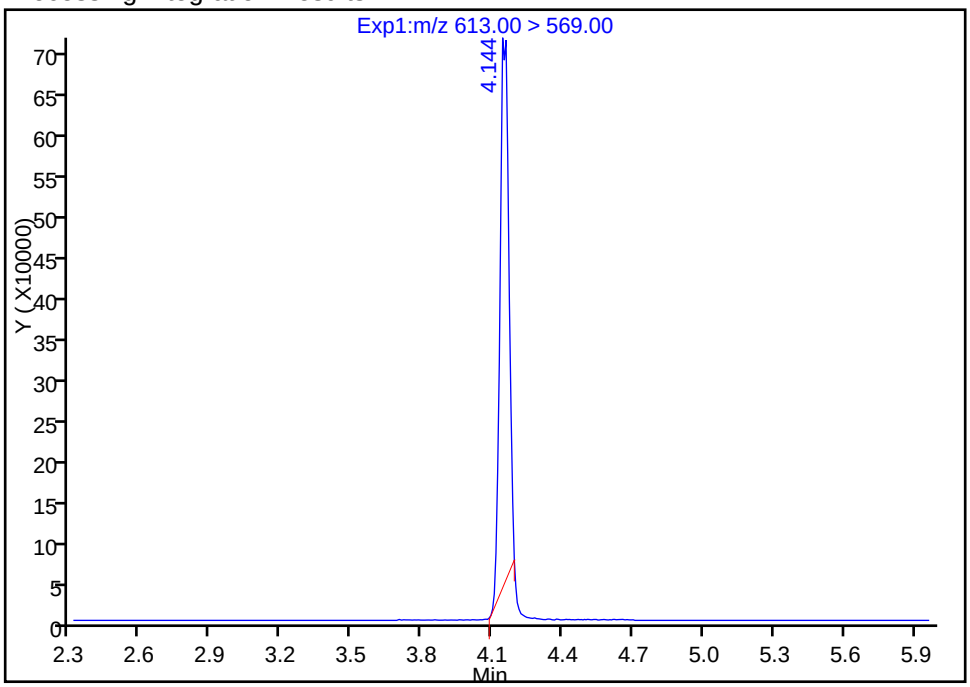
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_058.d				
Injection Date:	09-Dec-2016 18:32:16	Instrument ID:	A8_N		
Lims ID:	CCV L4				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	40	Worklist Smp#:	59
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

29 Perfluorododecanoic acid, CAS: 307-55-1

Signal: 1

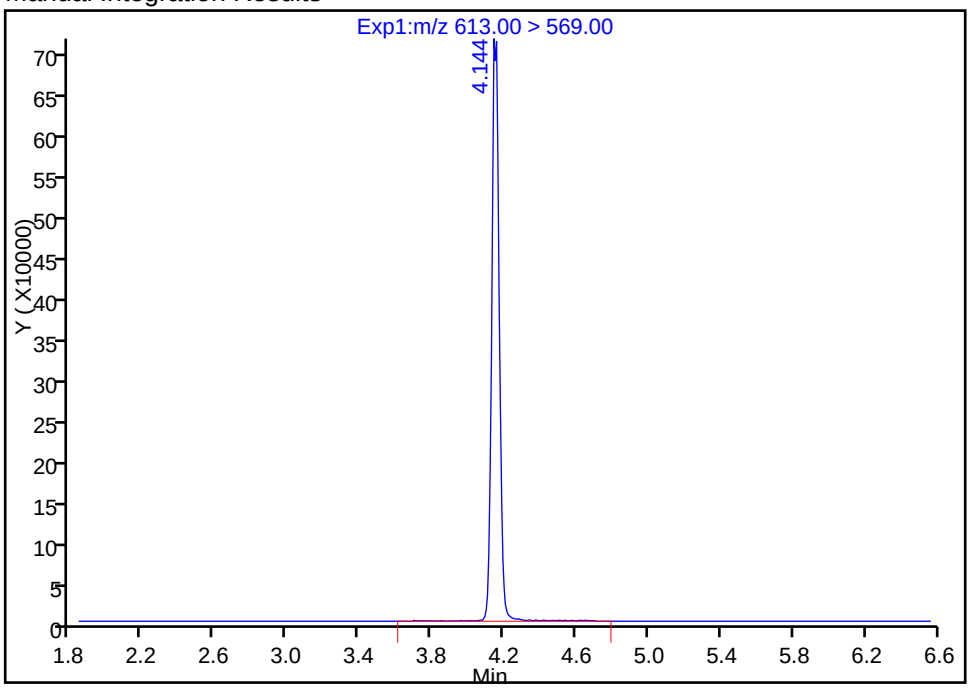
Processing Integration Results

RT: 4.14
Area: 1772063
Amount: 17.708035
Amount Units: ng/ml



Manual Integration Results

RT: 4.14
Area: 2113412
Amount: 21.119099
Amount Units: ng/ml



Reviewer: westendorfc, 11-Dec-2016 11:57:36

Audit Action: Manually Integrated Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Lab Sample ID: CCV 320-141834/2 Calibration Date: 12/12/2016 18:30

Instrument ID: A8_N Calib Start Date: 12/03/2016 13:48

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/03/2016 15:33

Lab File ID: 12DEC2016C_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8740	0.8833		50.5	50.0	1.1	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.015	0.999		49.2	50.0	-1.6	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.596	1.637		45.3	44.2	2.5	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9531	0.9379		49.2	50.0	-1.6	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.098	1.045		43.3	45.5	-4.8	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.027	1.014		49.4	50.0	-1.2	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	1.012		47.2	50.0	-5.6	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.177	1.223		49.4	47.6	3.9	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.085	1.097		46.9	46.4	1.1	25.0
Perfluorononanoic acid (PFNA)	AveID	0.996	0.996		50.0	50.0	-0.0	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9341	0.9409		50.4	50.0	0.7	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9605	0.9368		48.8	50.0	-2.5	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6398	0.6307		47.5	48.2	-1.4	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.066	0.9798		46.0	50.0	-8.1	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9490	0.9175		48.3	50.0	-3.3	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9498	0.9338		49.2	50.0	-1.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.854	1.740		46.9	50.0	-6.1	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.999		49.6	50.0	-0.9	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9929	0.9386		47.3	50.0	-5.5	25.0
13C4 PFBA	Ave	335829	315939		47.0	50.0	-5.9	50.0
13C5-PFPeA	Ave	264545	247336		46.7	50.0	-6.5	50.0
13C2 PFHxA	Ave	237486	238746		50.3	50.0	0.5	50.0
13C4-PFHpA	Ave	207413	200759		48.4	50.0	-3.2	50.0
18O2 PFHxS	Ave	312342	293119		44.4	47.3	-6.2	50.0
13C4 PFOA	Ave	219258	201293		45.9	50.0	-8.2	50.0
13C4 PFOS	Ave	246009	215761		41.9	47.8	-12.3	50.0
13C5 PFNA	Ave	166415	147102		44.2	50.0	-11.6	50.0
13C8 FOSA	Ave	402279	346527		43.1	50.0	-13.9	50.0
13C2 PFDA	Ave	157817	131138		41.5	50.0	-16.9	50.0
13C2 PFUnA	Ave	118762	95610		40.3	50.0	-19.5	50.0
13C2 PFDoA	Ave	112084	89351		39.9	50.0	-20.3	50.0
13C2-PFTeDA	Ave	231173	186630		40.4	50.0	-19.3	50.0
13C2-PFHxDA	Ave	129725	100067		38.6	50.0	-22.9	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_002.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 12-Dec-2016 18:30:16 ALS Bottle#: 41 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 14-Dec-2016 08:29:37 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: chandrasenas Date: 14-Dec-2016 08:20:53

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.534	1.534	0.0		15796955	47.0		94.1	1057996	
1 Perfluorobutyric acid										
212.90 > 169.00	1.534	1.534	0.0	1.000	13953620	50.5		101	131487	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		12366794	46.7		93.5	668942	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	12353232	49.2		98.4	105822	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.849	1.849	0.0	1.000	21203985	45.3		103		
298.90 > 99.00	1.849	1.849	0.0	1.000	9988319		2.12(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.098	2.098	0.0		11937306	50.3		101	698991	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.098	2.098	0.0	1.000	11195486	49.2		98.4	236828	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.424	2.424	0.0	1.000	13933751	43.3		95.2		
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.431	2.431	0.0	1.000	10182834	49.4		98.8	109350	
D 11 13C4-PFHpA										
367.00 > 322.00	2.431	2.431	0.0		10037949	48.4		96.8	706951	
D 10 18O2 PFHxS										
403.00 > 84.00	2.446	2.446	0.0		13864552	44.4		93.8	792408	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.791	2.791	0.0	1.000	10182430	47.2		94.4	108890	
413.00 > 169.00	2.791	2.791	0.0	1.000	6347337		1.60(0.90-1.10)		217501	
D 14 13C4 PFOA										
417.00 > 372.00	2.791	2.791	0.0		10064654	45.9		91.8	683399	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.799	2.799	0.0	1.000	12555619	49.4		104		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.135	3.135	0.0	1.000	10982856	46.9		101	88939	
499.00 > 99.00	3.057	3.135	-0.078	0.975	2439276		4.50(0.90-1.10)		21569	
D 19 13C5 PFNA										
468.00 > 423.00	3.159	3.159	0.0		7355107	44.2		88.4	603661	
D 17 13C4 PFOS										
503.00 > 80.00	3.159	3.159	0.0		10313358	41.9		87.7	259846	
20 Perfluorononanoic acid										
463.00 > 419.00	3.167	3.167	0.0	1.000	7324610	50.0		100.0	117530	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.490	3.490	0.0	1.000	16303082	50.4		101	408489	
D 21 13C8 FOSA										
506.00 > 78.00	3.490	3.490	0.0		17326334	43.1		86.1	733564	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.524	3.524	0.0	1.000	6142680	48.8		97.5	155293	
D 23 13C2 PFDA										
515.00 > 470.00	3.524	3.524	0.0		6556900	41.5		83.1	341444	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.835	3.835	0.0	1.000	6558630	47.5		98.6		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.853	3.853	0.0	1.000	4683875	46.0		91.9	87819	
D 27 13C2 PFUnA										
565.00 > 520.00	3.853	3.853	0.0		4780492	40.3		80.5	292962	
D 30 13C2 PFDoA										
615.00 > 570.00	4.143	4.143	0.0		4467572	39.9		79.7	152738	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.150	4.150	0.0	1.000	4099014	48.3		96.7	70870	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.414	4.414	0.0	1.000	4171685	49.2		98.3	72167	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.655	4.655	0.0	1.000	7774411	46.9		93.9	84116	
713.00 > 169.00	4.655	4.655	0.0	1.000	1227424		6.33(0.00-0.00)		108625	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.655	4.655	0.0		9331490	40.4		80.7	1081006	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.070	5.070	0.0	1.000	4463857	49.6		99.1	4720	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.070	5.070	0.0		5003339	38.6		77.1	119495	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.429	5.429	0.0	1.000	4193279	47.3		94.5	6479	

Reagents:

LCPFC-L5_00020 Amount Added: 1.00 Units: mL

Report Date: 14-Dec-2016 08:29:38 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_002.d

Injection Date: 12-Dec-2016 18:30:16 Instrument ID: A8_N

Lims ID: CCV L5

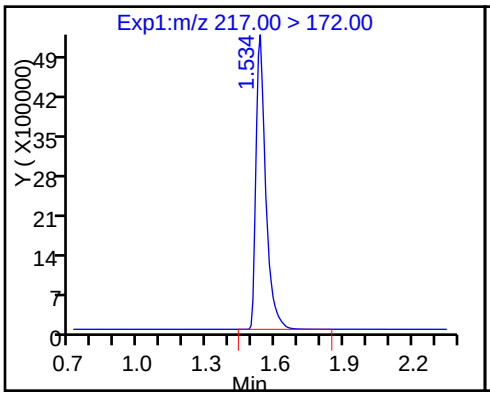
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 2

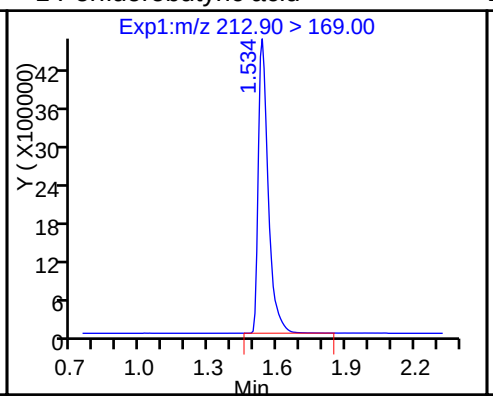
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

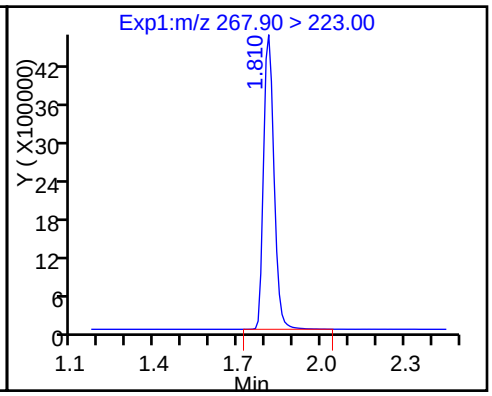
D 2 13C4 PFBA



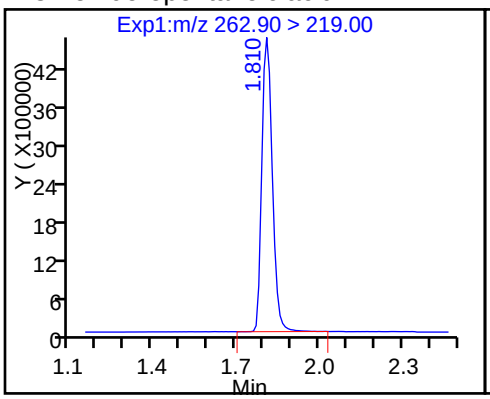
1 Perfluorobutyric acid



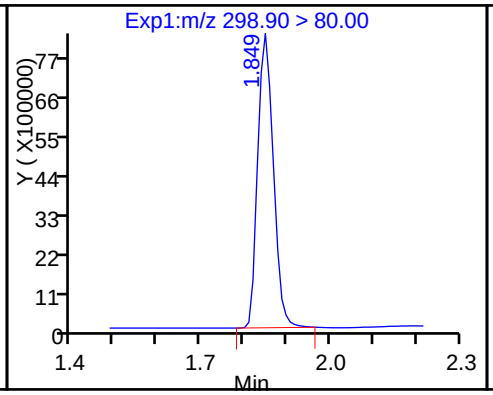
D 4 13C5-PFPeA



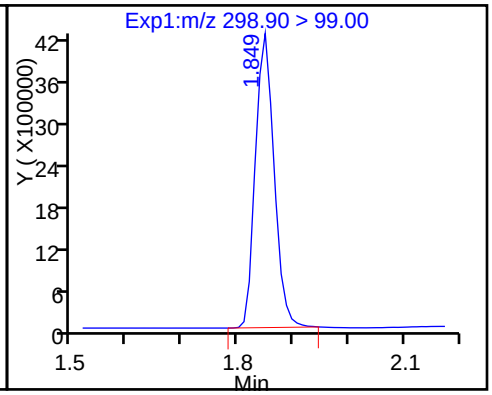
3 Perfluoropentanoic acid



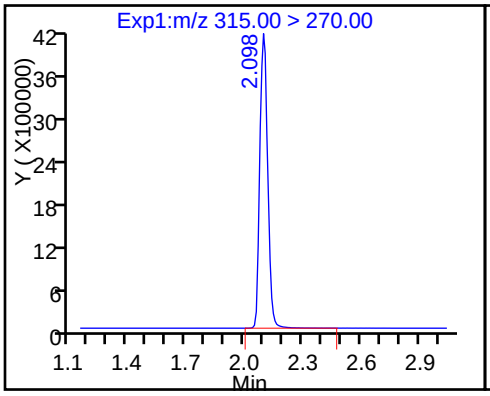
5 Perfluorobutanesulfonic acid



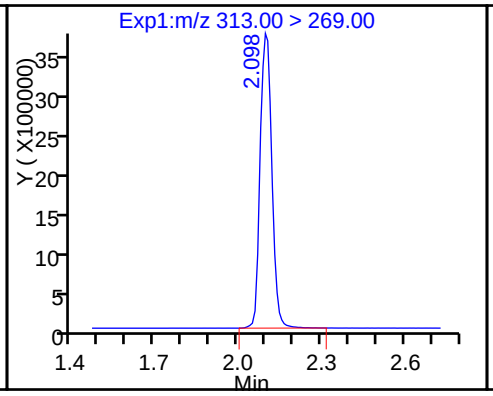
5 Perfluorobutanesulfonic acid



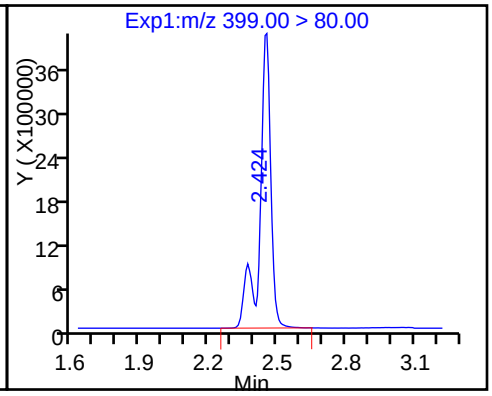
D 6 13C2 PFHxA



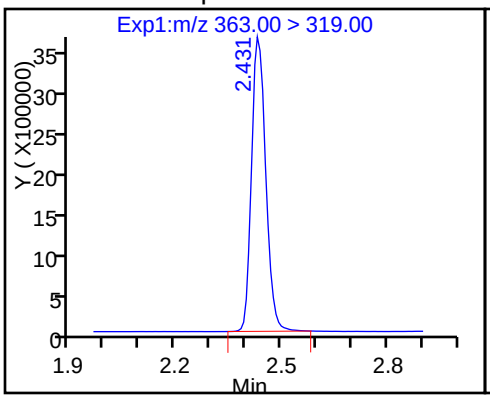
7 Perfluorohexanoic acid



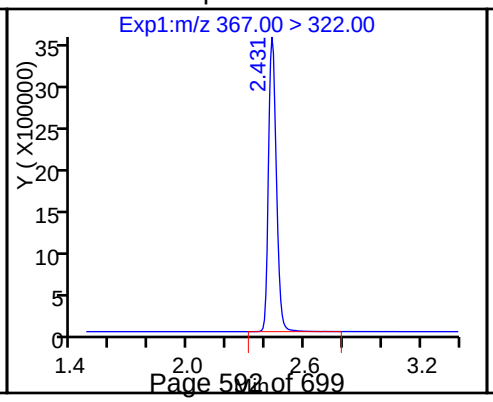
9 Perfluorohexanesulfonic acid



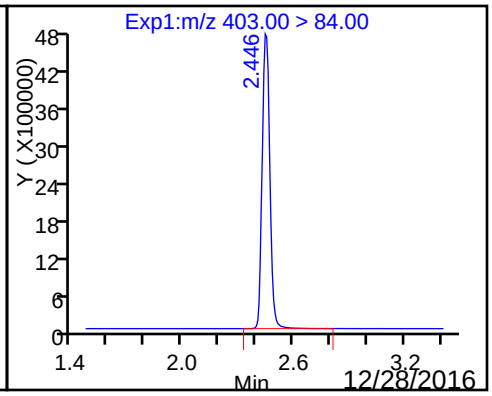
12 Perfluoroheptanoic acid



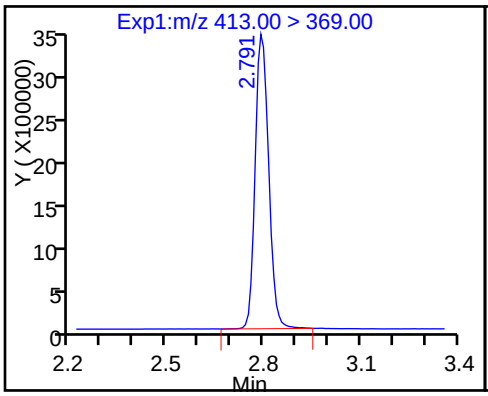
D 11 13C4-PFHpA



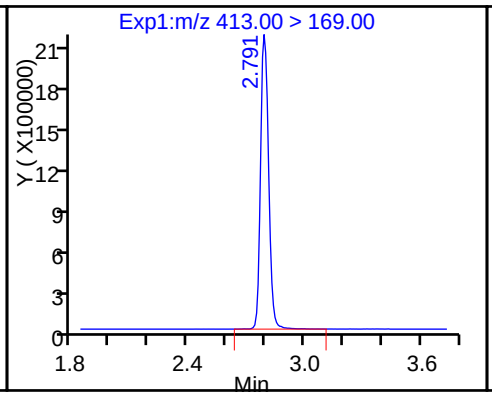
D 10 18O2 PFHxS



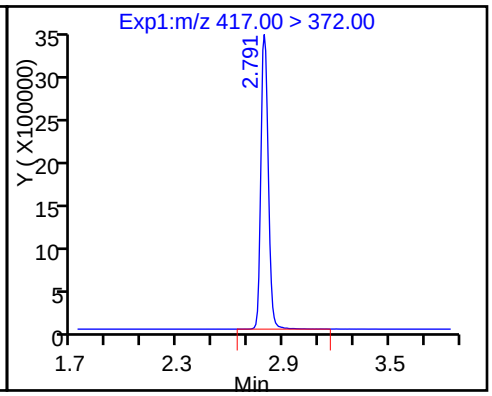
15 Perfluorooctanoic acid



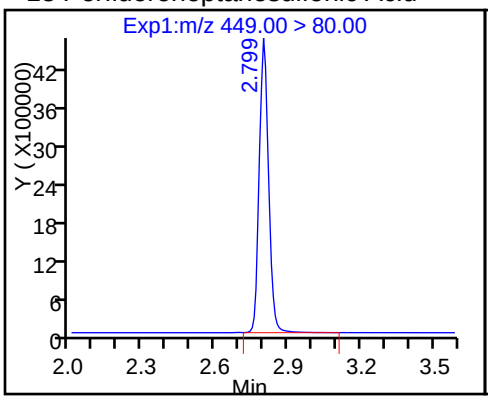
15 Perfluorooctanoic acid



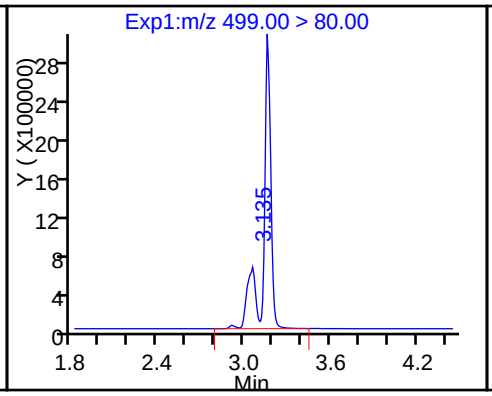
D 14 13C4 PFOA



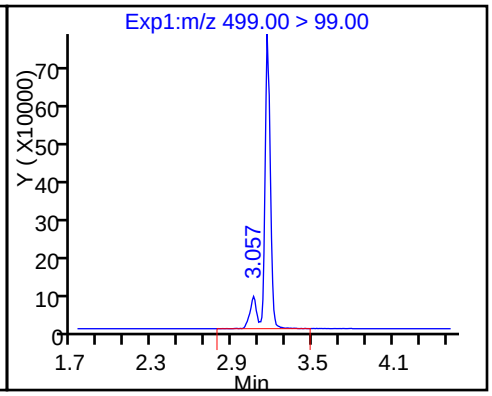
13 Perfluoroheptanesulfonic Acid



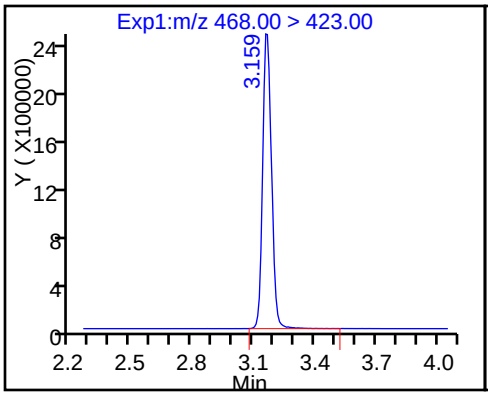
18 Perfluorooctane sulfonic acid



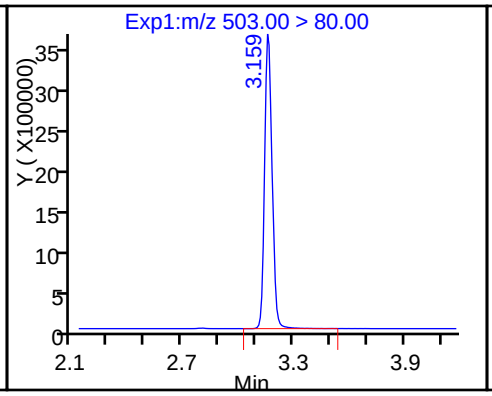
18 Perfluorooctane sulfonic acid



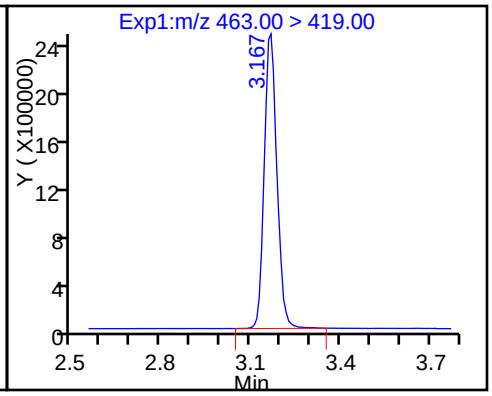
D 19 13C5 PFNA



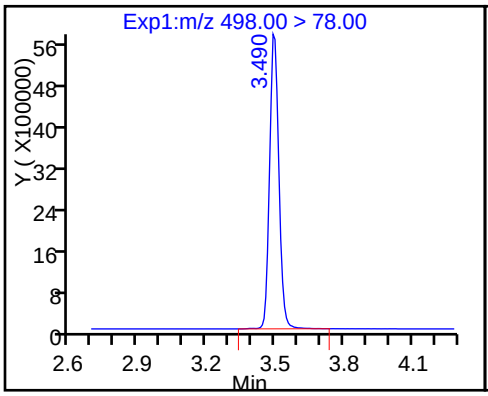
D 17 13C4 PFOS



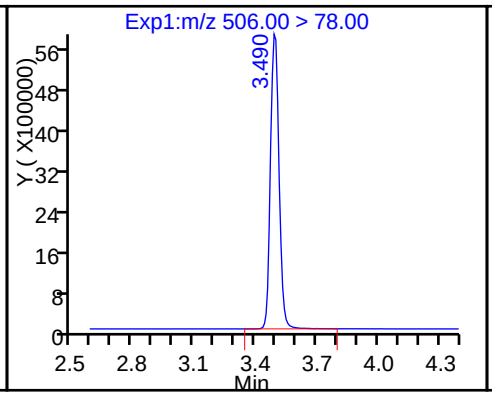
20 Perfluorononanoic acid



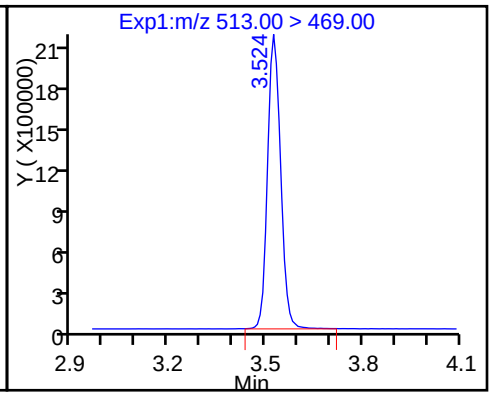
22 Perfluorooctane Sulfonamide



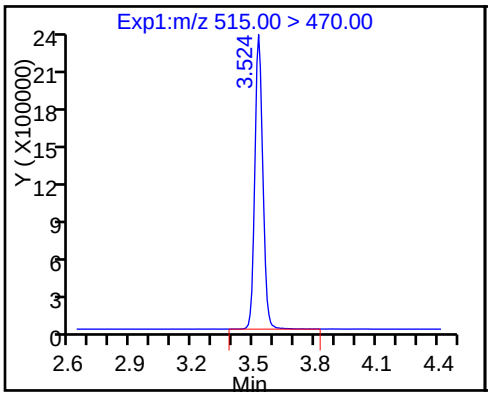
D 21 13C8 FOSA



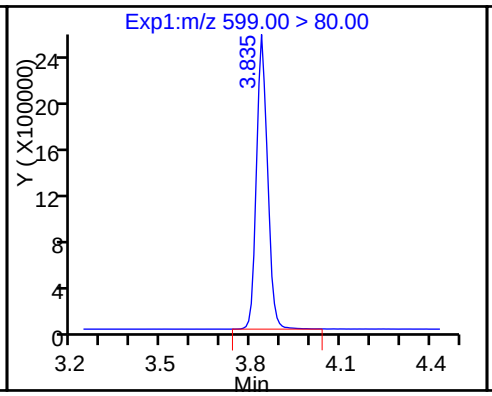
24 Perfluorodecanoic acid



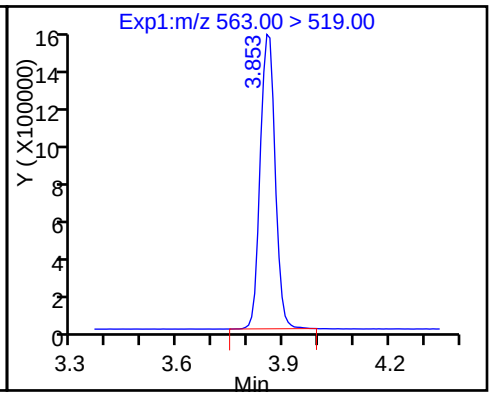
D 23 13C2 PFDA



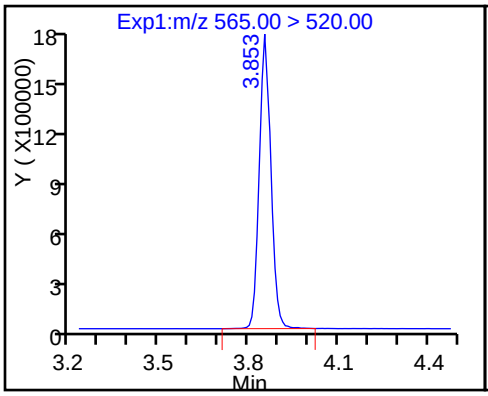
26 Perfluorodecane Sulfonic acid



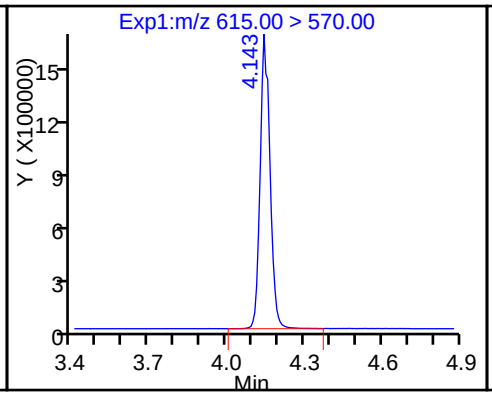
28 Perfluoroundecanoic acid



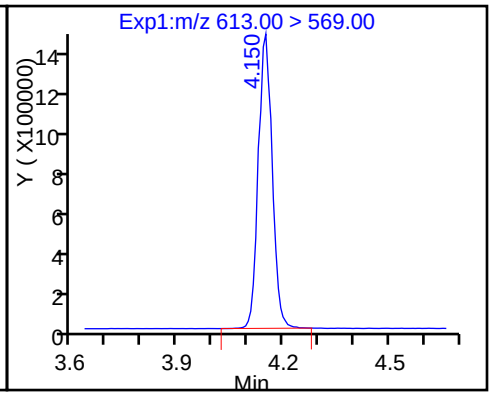
D 27 13C2 PFUnA



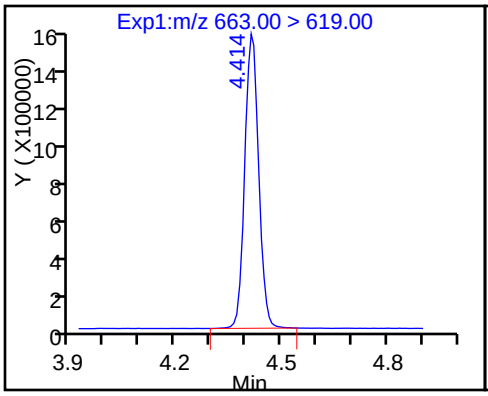
D 30 13C2 PFDoA



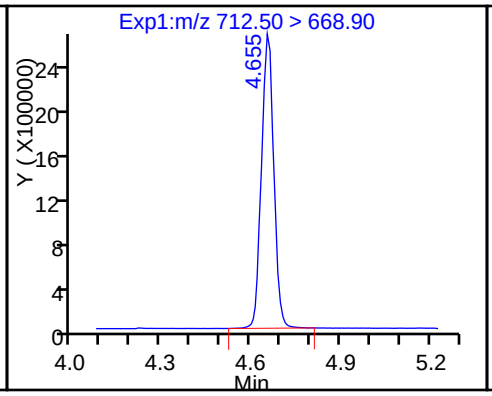
29 Perfluorododecanoic acid



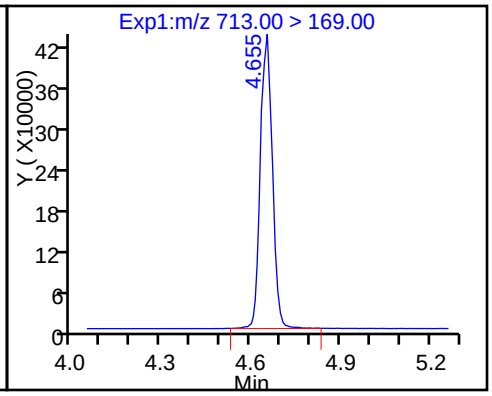
31 Perfluorotridecanoic acid



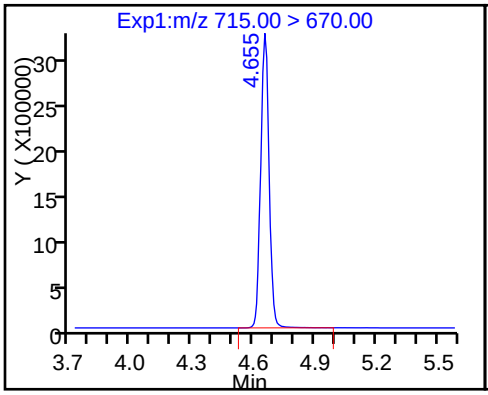
33 Perfluorotetradecanoic acid



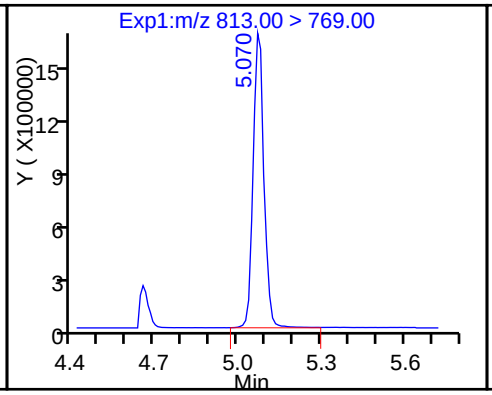
33 Perfluorotetradecanoic acid



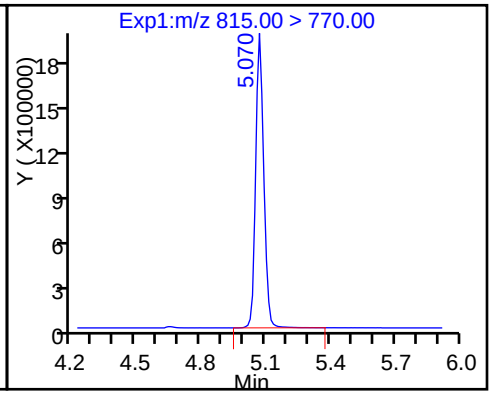
D 32 13C2-PFTeDA



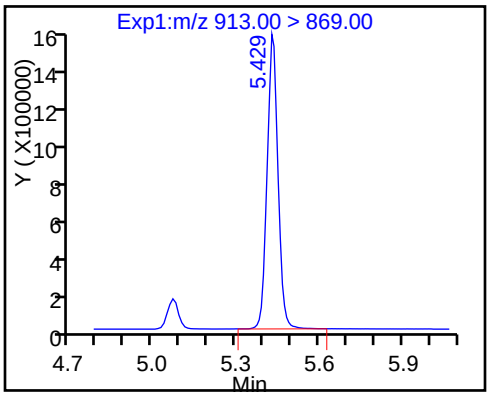
35 Perfluorohexadecanoic acid



D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Lab Sample ID: CCV 320-141834/14 Calibration Date: 12/12/2016 20:00

Instrument ID: A8_N Calib Start Date: 12/03/2016 13:48

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/03/2016 15:33

Lab File ID: 12DEC2016C_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8740	0.8884		50.8	50.0	1.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.015	1.009		49.7	50.0	-0.6	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.596	1.606		44.5	44.2	0.6	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9531	0.9525		50.0	50.0	-0.0	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.027	1.017		49.5	50.0	-1.0	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.098	1.039		43.1	45.5	-5.3	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	1.007		47.0	50.0	-6.1	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.177	1.204		48.7	47.6	2.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.996	0.9721		48.8	50.0	-2.4	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.085	1.059		45.3	46.4	-2.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9341	0.9337		50.0	50.0	-0.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9605	0.9486		49.4	50.0	-1.2	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6398	0.6240		47.0	48.2	-2.5	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.066	0.997		46.8	50.0	-6.5	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9490	0.9360		49.3	50.0	-1.4	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9498	0.9452		49.8	50.0	-0.5	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.854	1.702		45.9	50.0	-8.2	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.008		50.0	50.0	-0.0	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9929	0.9225		46.5	50.0	-7.1	25.0
13C4 PFBA	Ave	335829	317701		47.3	50.0	-5.4	50.0
13C5-PFPeA	Ave	264545	246893		46.7	50.0	-6.7	50.0
13C2 PFHxA	Ave	237486	241040		50.7	50.0	1.5	50.0
13C4-PFHpA	Ave	207413	200280		48.3	50.0	-3.4	50.0
18O2 PFHxS	Ave	312342	294419		44.6	47.3	-5.7	50.0
13C4 PFOA	Ave	219258	202029		46.1	50.0	-7.9	50.0
13C4 PFOS	Ave	246009	217443		42.2	47.8	-11.6	50.0
13C5 PFNA	Ave	166415	151236		45.4	50.0	-9.1	50.0
13C8 FOSA	Ave	402279	350929		43.6	50.0	-12.8	50.0
13C2 PFDA	Ave	157817	132430		42.0	50.0	-16.1	50.0
13C2 PFUnA	Ave	118762	95400		40.2	50.0	-19.7	50.0
13C2 PFDoA	Ave	112084	89930		40.1	50.0	-19.8	50.0
13C2-PFTeDA	Ave	231173	190416		41.2	50.0	-17.6	50.0
13C2-PFHxDA	Ave	129725	95385		36.8	50.0	-26.5	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_014.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 12-Dec-2016 20:00:12 ALS Bottle#: 41 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 14-Dec-2016 08:29:53 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: chandrasenas Date: 14-Dec-2016 08:29:11

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.525	1.534	-0.009		15885047	47.3		94.6	865013	
1 Perfluorobutyric acid										
212.90 > 169.00	1.525	1.534	-0.009	1.000	14112471	50.8		102	140487	
D 4 13C5-PFPeA										
267.90 > 223.00	1.800	1.810	-0.010		12344628	46.7		93.3	1227598	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.800	1.810	-0.010	1.000	12452162	49.7		99.4	148088	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.839	1.849	-0.010	1.000	20892957	44.5		101		
298.90 > 99.00	1.839	1.849	-0.010	1.000	9709338		2.15(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.093	2.098	-0.005		12051995	50.7		101	696690	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.093	2.098	-0.005	1.000	11479042	50.0		99.9	330746	
9 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.443	2.424	0.019	1.000	13922381	43.1		94.7		M
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.428	2.431	-0.003	1.000	10183050	49.5		99.0	102198	
D 11 13C4-PFHpA										
367.00 > 322.00	2.421	2.431	-0.010		10014022	48.3		96.6	498920	
D 10 18O2 PFHxS										
403.00 > 84.00	2.443	2.446	-0.003		13926013	44.6		94.3	812223	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.780	2.791	-0.011	1.000	10171333	47.0		93.9	82606	
413.00 > 169.00	2.780	2.791	-0.011	1.000	6285746		1.62(0.90-1.10)		203550	
D 14 13C4 PFOA										
417.00 > 372.00	2.780	2.791	-0.011		10101443	46.1		92.1	385301	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.788	2.799	-0.011	1.000	12459680	48.7		102		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.156	3.135	0.021	1.000	10685978	45.3		97.6	321561	
499.00 > 99.00	3.156	3.135	0.021	1.000	2334532		4.58(0.90-1.10)		106397	
D 19 13C5 PFNA										
468.00 > 423.00	3.156	3.159	-0.003		7561793	45.4		90.9	356105	
D 17 13C4 PFOS										
503.00 > 80.00	3.156	3.159	-0.003		10393779	42.2		88.4	205297	
20 Perfluorononanoic acid										
463.00 > 419.00	3.156	3.167	-0.011	1.000	7350683	48.8		97.6	94772	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.487	3.490	-0.003	1.000	16383427	50.0		100.0	410910	
D 21 13C8 FOSA										
506.00 > 78.00	3.487	3.490	-0.003		17546463	43.6		87.2	774134	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.520	3.524	-0.004	1.000	6281414	49.4		98.8	197838	
D 23 13C2 PFDA										
515.00 > 470.00	3.520	3.524	-0.004		6621493	42.0		83.9	349231	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.831	3.835	-0.004	1.000	6540042	47.0		97.5		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.848	3.853	-0.005	1.000	4754654	46.8		93.5	111570	
D 27 13C2 PFUnA										
565.00 > 520.00	3.848	3.853	-0.005		4769985	40.2		80.3	240620	
D 30 13C2 PFDoA										
615.00 > 570.00	4.140	4.143	-0.003		4496520	40.1		80.2	155453	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.140	4.150	-0.010	1.000	4208573	49.3		98.6	67886	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.411	4.414	-0.003	1.000	4250109	49.8		99.5	89566	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.642	4.655	-0.013	1.000	7653697	45.9		91.8	81105	
713.00 > 169.00	4.642	4.655	-0.013	1.000	1227121		6.24(0.00-0.00)		110278	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.642	4.655	-0.013		9520798	41.2		82.4	461277	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.068	5.070	-0.002	1.000	4531877	50.0		100	5013	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.068	5.070	-0.002		4769231	36.8		73.5	109780	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.421	5.429	-0.008	1.000	4148072	46.5		92.9	6309	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L5_00020 Amount Added: 1.00 Units: mL

Report Date: 14-Dec-2016 08:29:53 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_014.d

Injection Date: 12-Dec-2016 20:00:12 Instrument ID: A8_N

Lims ID: CCV L5

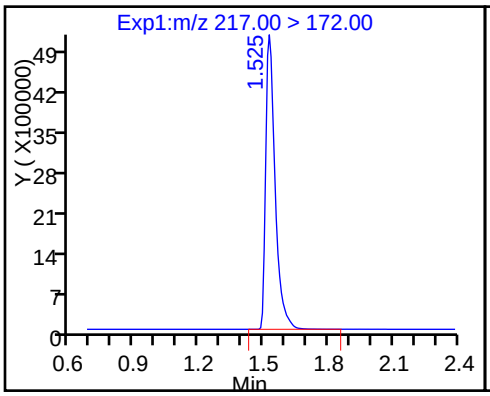
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 14

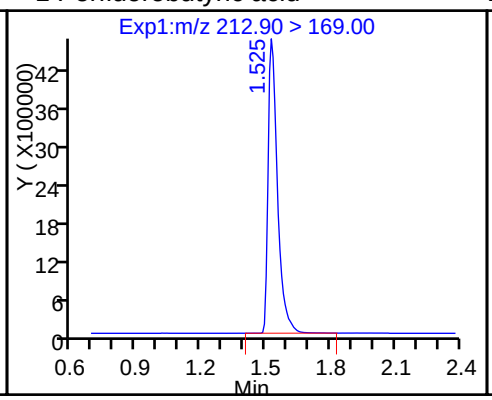
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

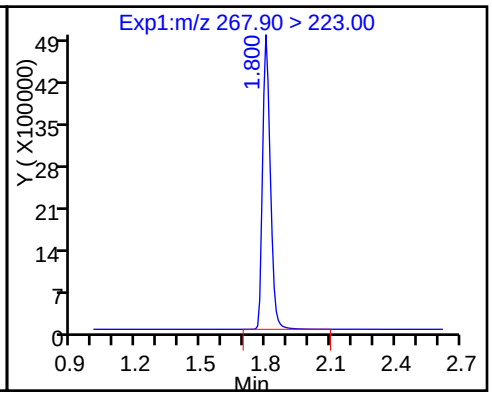
D 2 13C4 PFBA



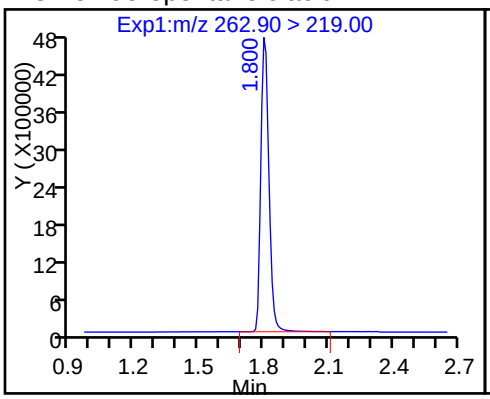
1 Perfluorobutyric acid



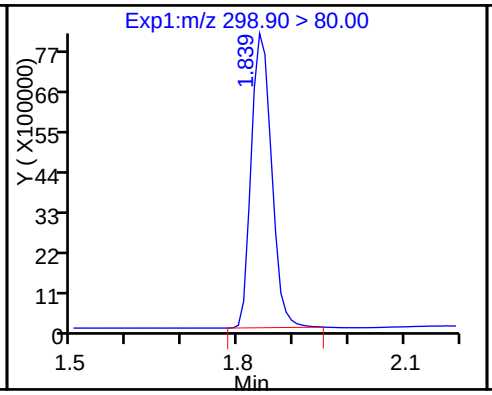
D 4 13C5-PFPeA



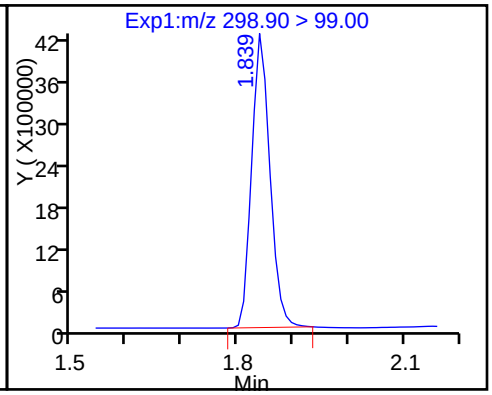
3 Perfluoropentanoic acid



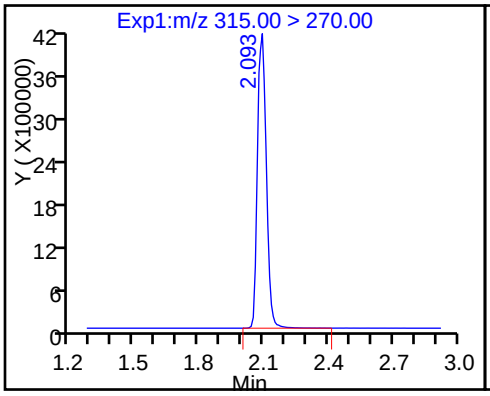
5 Perfluorobutanesulfonic acid



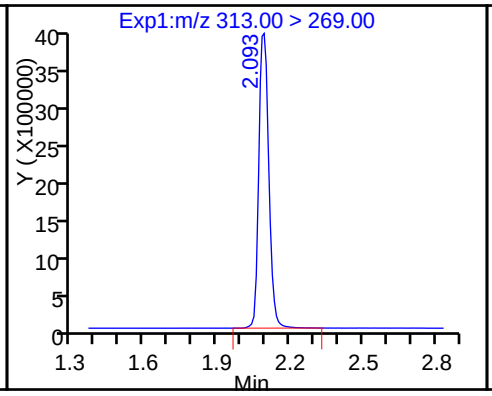
5 Perfluorobutanesulfonic acid



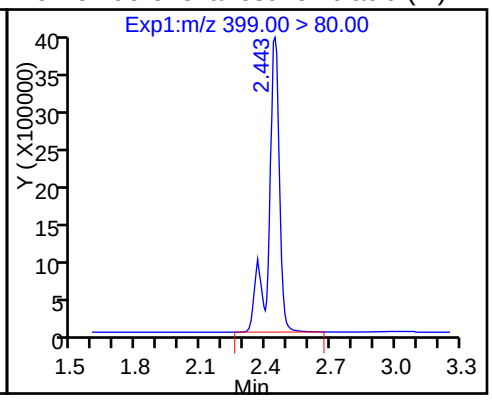
D 6 13C2 PFHxA



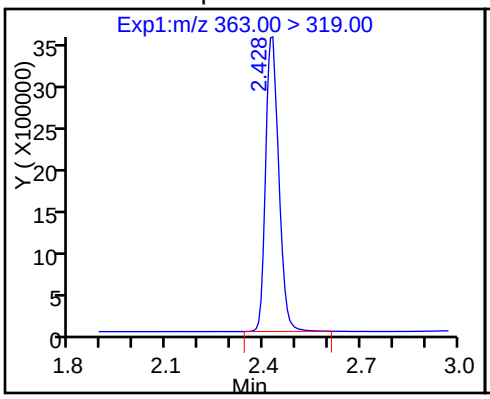
7 Perfluorohexanoic acid



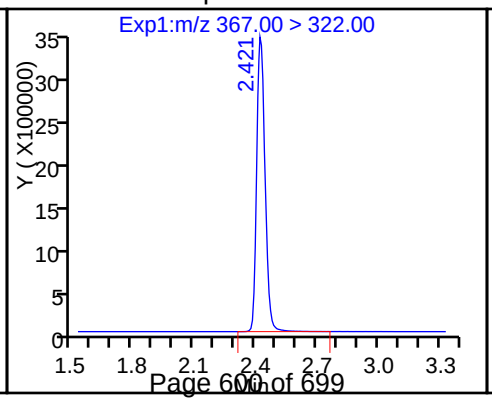
9 Perfluorohexanesulfonic acid (M)



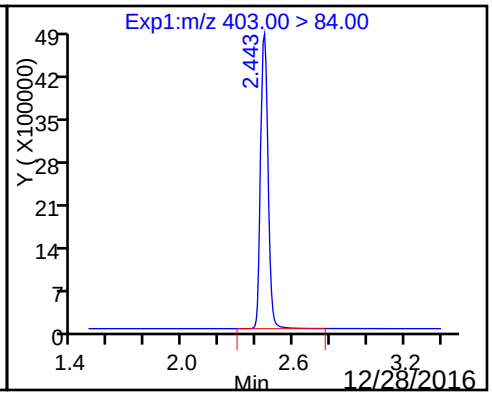
12 Perfluoroheptanoic acid



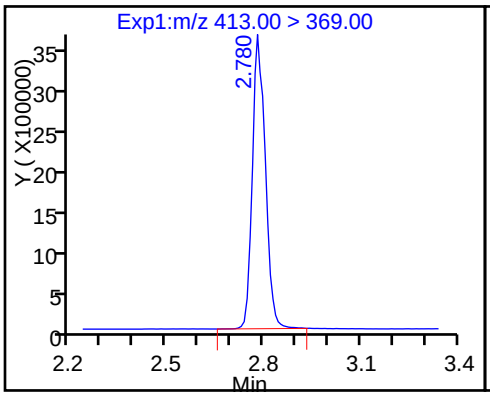
D 11 13C4-PFHpA



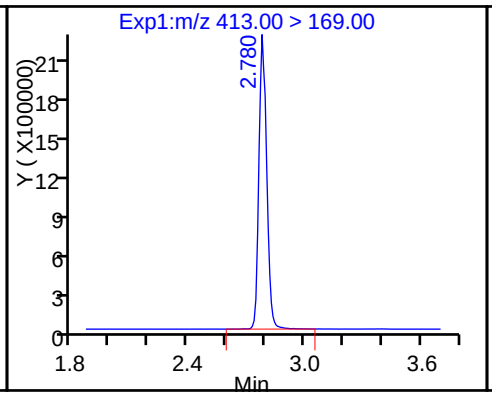
D 10 18O2 PFHxS



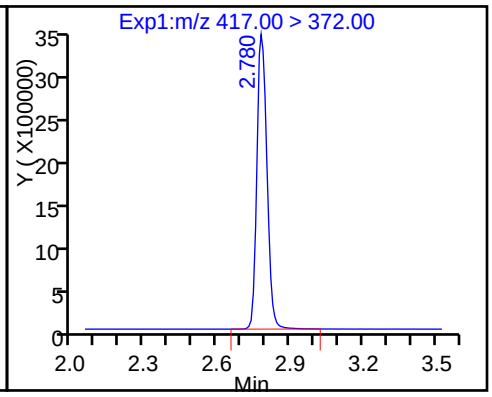
15 Perfluorooctanoic acid



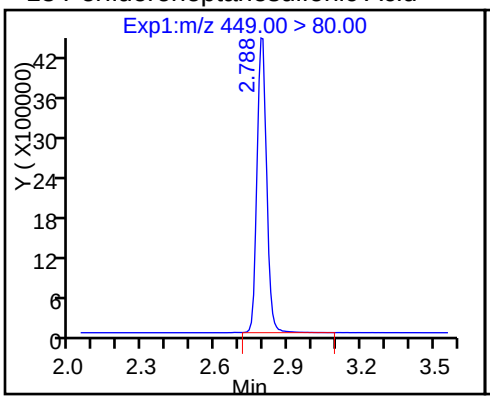
15 Perfluorooctanoic acid



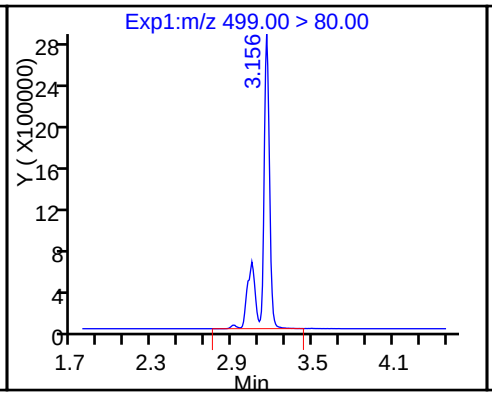
D 14 13C4 PFOA



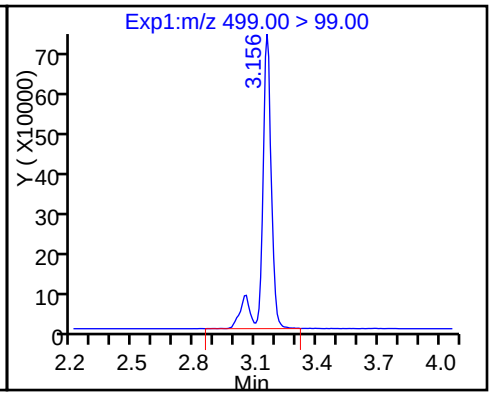
13 Perfluoroheptanesulfonic Acid



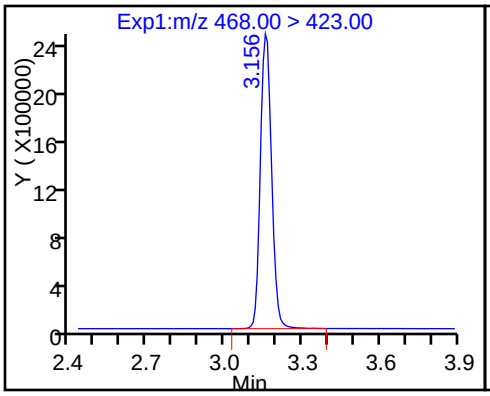
18 Perfluorooctane sulfonic acid



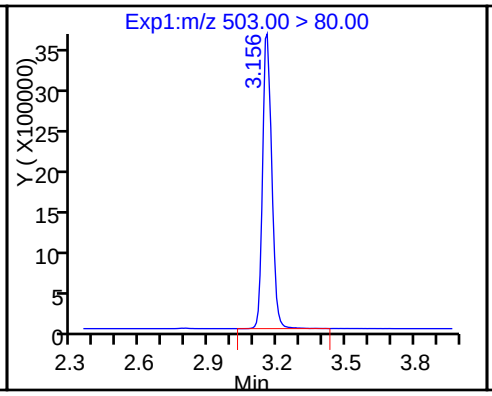
18 Perfluorooctane sulfonic acid



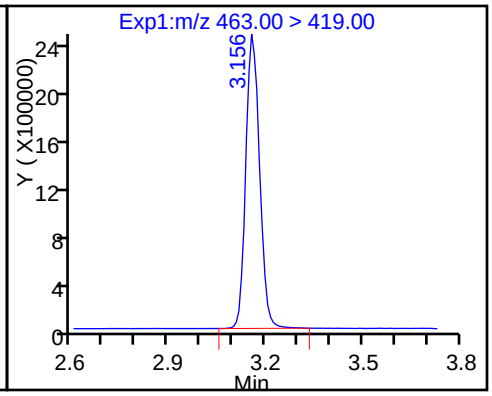
D 19 13C5 PFNA



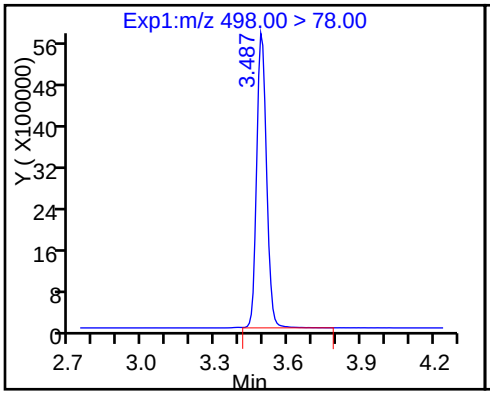
D 17 13C4 PFOS



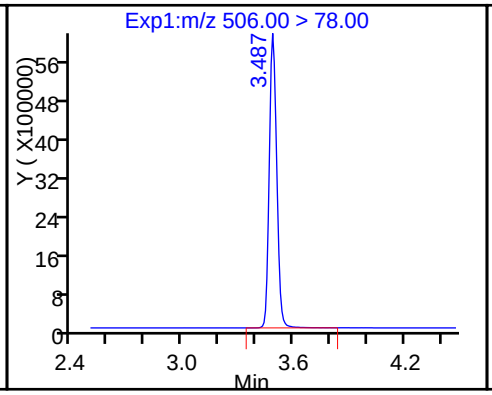
20 Perfluorononanoic acid



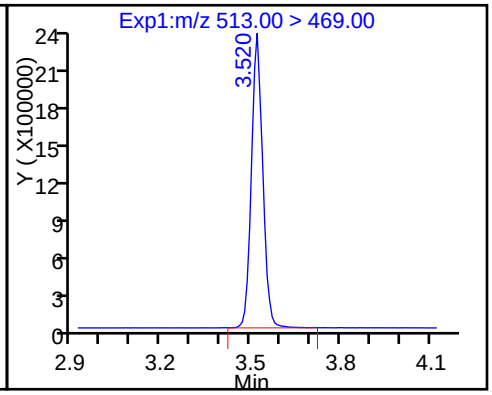
22 Perfluorooctane Sulfonamide



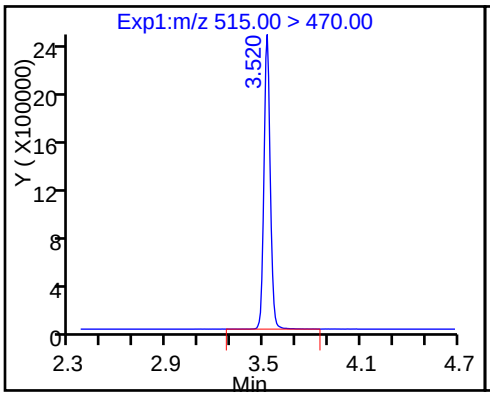
D 21 13C8 FOSA



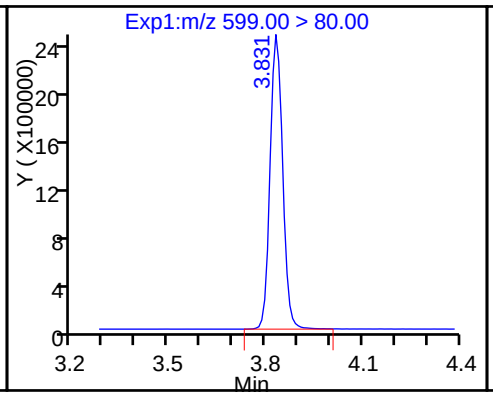
24 Perfluorodecanoic acid



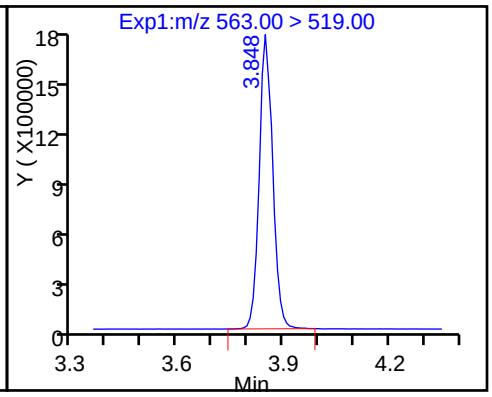
D 23 13C2 PFDA



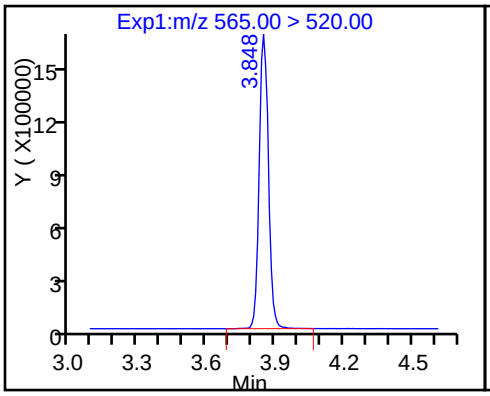
26 Perfluorodecane Sulfonic acid



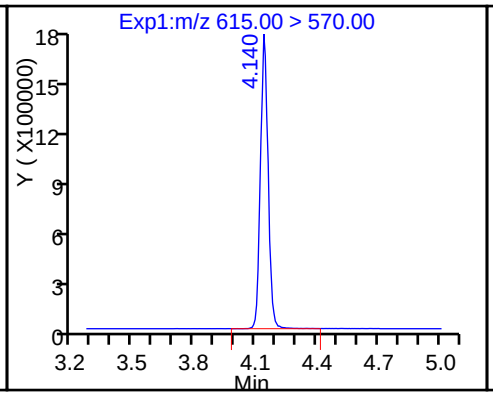
28 Perfluoroundecanoic acid



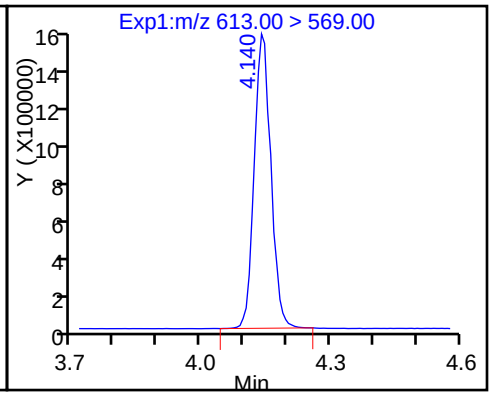
D 27 13C2 PFUnA



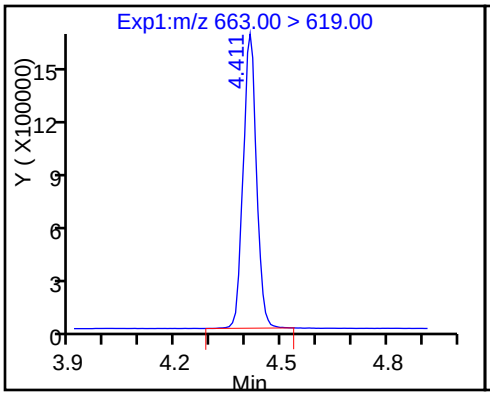
D 30 13C2 PFDoA



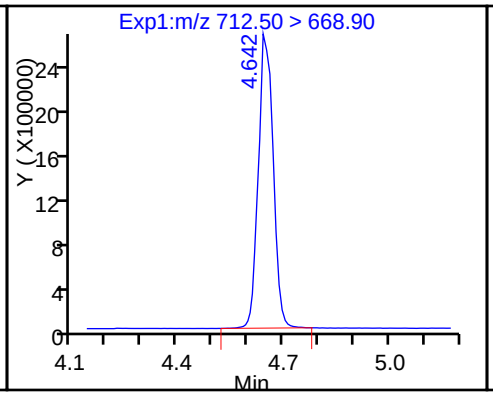
29 Perfluorododecanoic acid



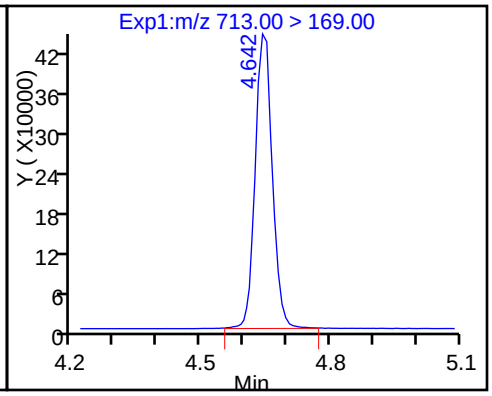
31 Perfluorotridecanoic acid



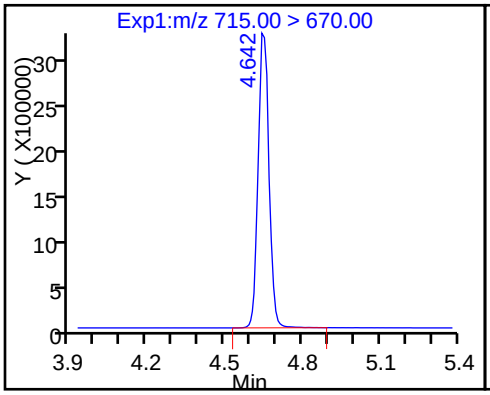
33 Perfluorotetradecanoic acid



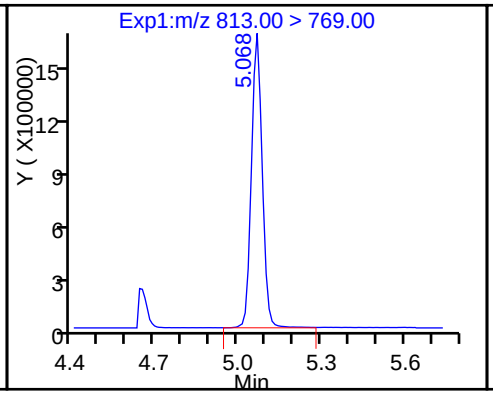
33 Perfluorotetradecanoic acid



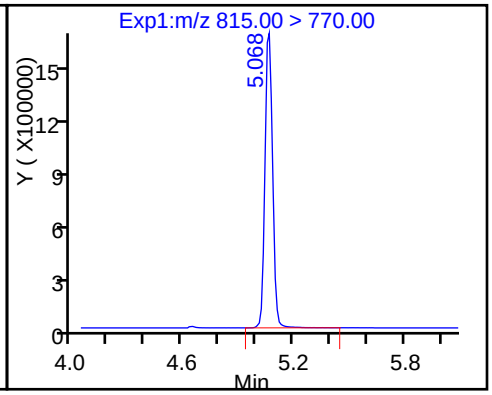
D 32 13C2-PFTeDA



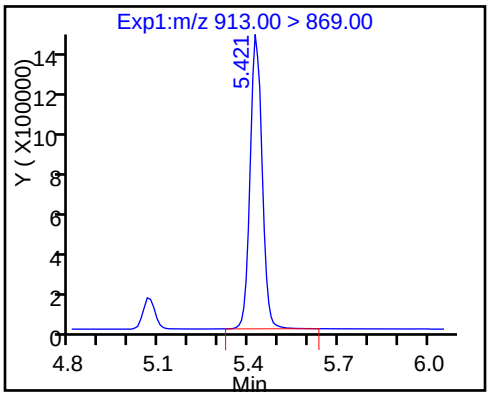
35 Perfluorohexadecanoic acid



D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

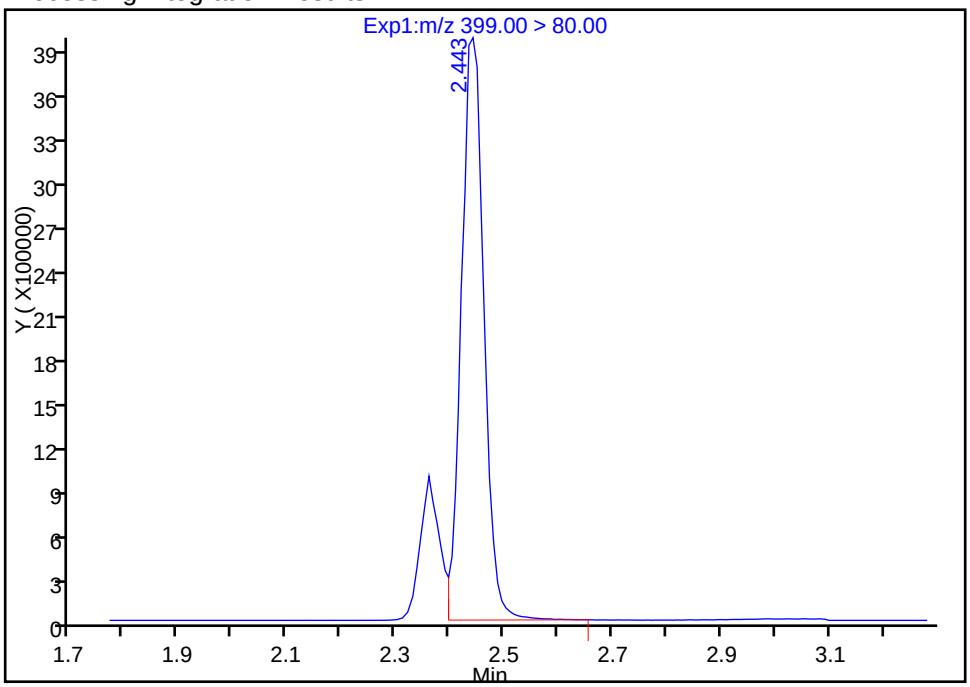
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_014.d				
Injection Date:	12-Dec-2016 20:00:12	Instrument ID:	A8_N		
Lims ID:	CCV L5				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	41	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

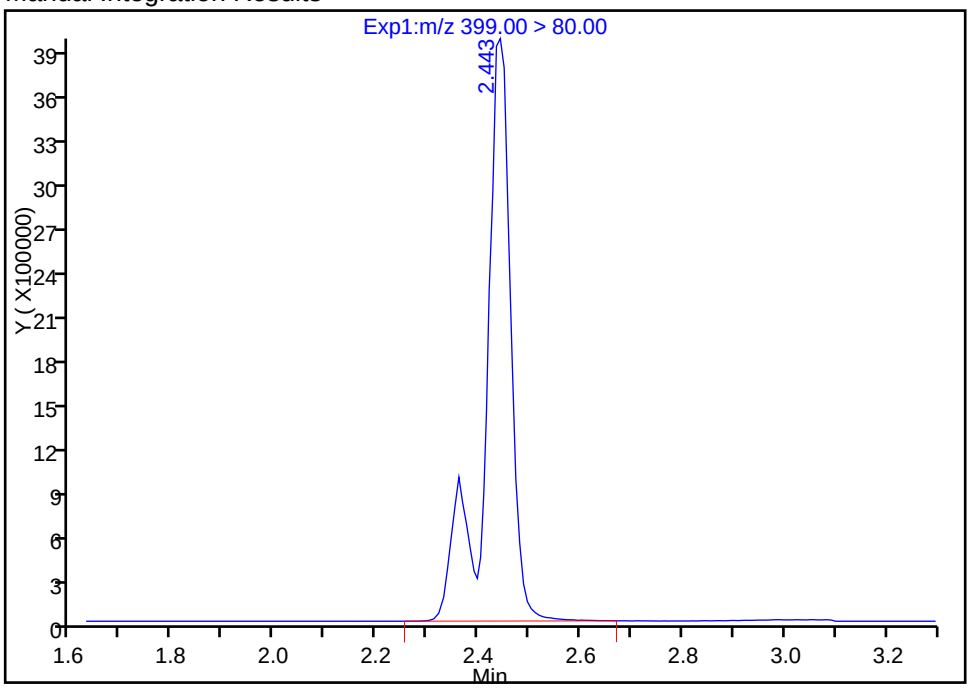
Processing Integration Results

RT: 2.44
Area: 11482501
Amount: 35.533239
Amount Units: ng/ml



Manual Integration Results

RT: 2.44
Area: 13922381
Amount: 43.083583
Amount Units: ng/ml



Reviewer: chandrasenas, 14-Dec-2016 08:29:11

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-23830-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 320-139917/1-A
Matrix: Water
Lab File ID: 09DEC2016A_037.d
Analysis Method: 537 (Modified)
Date Collected:
Extraction Method: 3535
Date Extracted: 11/29/2016 20:20
Sample wt/vol: 250.00(mL)
Date Analyzed: 12/09/2016 15:54
Con. Extract Vol.: 0.5(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: Acquity ID: 2.1(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 141453
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.0020	0.00075
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.0030	U	0.0040	0.0030	0.0013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.0020	0.00092

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	115		25-150
STL00991	13C4 PFOS	110		25-150
STL00994	18O2 PFHxS	115		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_037.d
Lims ID: MB 320-139917/1-A
Client ID:
Sample Type: MB
Inject. Date: 09-Dec-2016 15:54:30 ALS Bottle#: 21 Worklist Smp#: 37
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-139917/1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 11-Dec-2016 11:57:49 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: westendorfc Date: 11-Dec-2016 11:47:26

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.550	1.537	0.013		20528465	61.1		122	1081758	
1 Perfluorobutyric acid										
212.90 > 169.00	1.566	1.545	0.021	1.000	18225	0.0508			89.5	
D 4 13C5-PFPeA										
267.90 > 223.00	1.839	1.813	0.026		16376678	61.9		124	1052272	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.849	1.813	0.036	1.000	30365	0.0914			203	
D 6 13C2 PFHxA										
315.00 > 270.00	2.158	2.103	0.055		13234211	55.7		111	1614086	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.158	2.103	0.055	1.000	12042	0.0477			250	
D 11 13C4-PFHpA										
367.00 > 322.00	2.501	2.453	0.048		12458203	60.1		120	4651167	
D 10 18O2 PFHxS										
403.00 > 84.00	2.521	2.460	0.061		17017893	54.5		115	2100662	
D 47 M2-6:2FTS										
429.00 > 409.00	2.835	2.765	0.070		1226	0.0116		0.0		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.844	2.765	0.079	1.000	2254	NR				
D 14 13C4 PFOA										
417.00 > 372.00	2.872	2.805	0.067		12632500	57.6		115	1068655	
D 17 13C4 PFOS										
503.00 > 80.00	3.254	3.166	0.088		12883283	52.4		110	685119	
D 19 13C5 PFNA										
468.00 > 423.00	3.254	3.174	0.080		9277503	55.7		111	455958	
D 21 13C8 FOSA										
506.00 > 78.00	3.550	3.489	0.061		4152144	10.3		20.6	255587	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.592	3.519	0.073	1.000	384	NR				
24 Perfluorodecanoic acid										
513.00 > 469.00	3.459	3.531	-0.072	1.000	1320	0.007664			44.2	
D 23 13C2 PFDA										
515.00 > 470.00	3.617	3.531	0.086		8966156	56.8		114	620011	
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.699	3.683	0.016		219	0.003019		0.0		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.770	3.683	0.087	1.019	2355	NR				
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.789	3.842	-0.053	1.000	283	0.001641				
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.876	3.847	0.029		793	0.0100		0.0		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.946	3.856	0.090	1.018	3768	NR				
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.928	3.859	0.069	1.000	18863	0.1362			318	
D 27 13C2 PFUnA										
565.00 > 520.00	3.937	3.859	0.078		6497612	54.7		109	338697	
D 52 d-N-MeFOSA-M										
515.00 > 169.00	4.019	3.990	0.029		1100	0.0105		0.0		
54 MeFOSA										
512.00 > 169.00	3.798	3.999	-0.201	1.000	427	NR				
29 Perfluorododecanoic acid										
613.00 > 569.00	4.115	4.149	-0.034	1.000	2175	0.0177			52.4	
D 30 13C2 PFDoA										
615.00 > 570.00	4.232	4.156	0.076		6476831	57.8		116	175791	
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.188	4.175	0.013		604	0.006091		0.0		
D 32 13C2-PFTeDA										
715.00 > 670.00	4.739	4.664	0.075		13620532	58.9		118	365279	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.164	5.081	0.083		7932647	61.1		122	302060	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.099	5.081	0.018	1.000	6355	-0.7049			22.2	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.410	5.444	-0.034	1.000	9155	0.0712			26.0	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Report Date: 11-Dec-2016 11:57:58 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_037.d

Injection Date: 09-Dec-2016 15:54:30 Instrument ID: A8_N

Lims ID: MB 320-139917/1-A

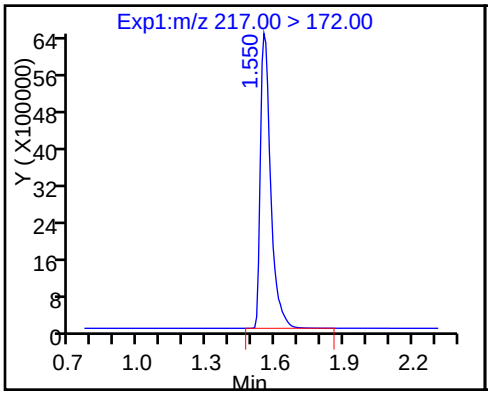
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 21 Worklist Smp#: 37

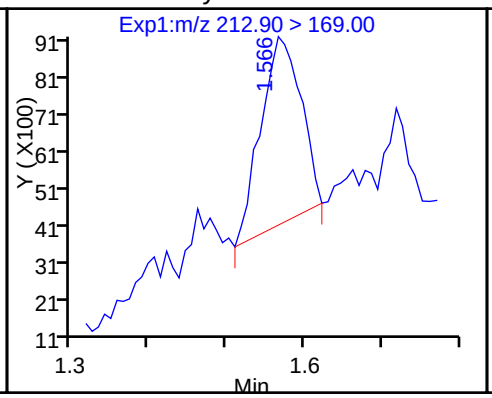
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

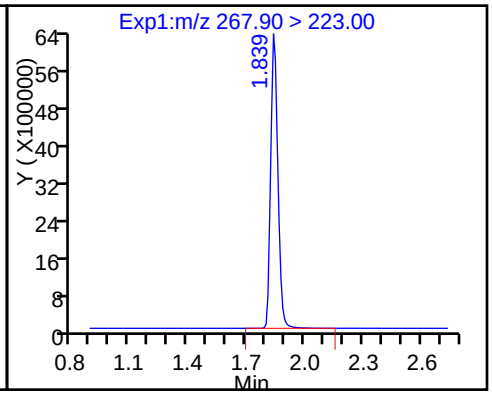
D 2 13C4 PFBA



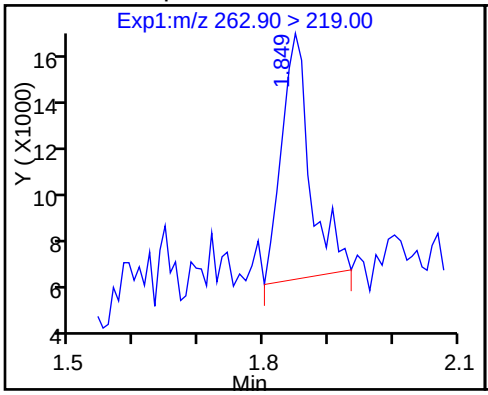
1 Perfluorobutyric acid



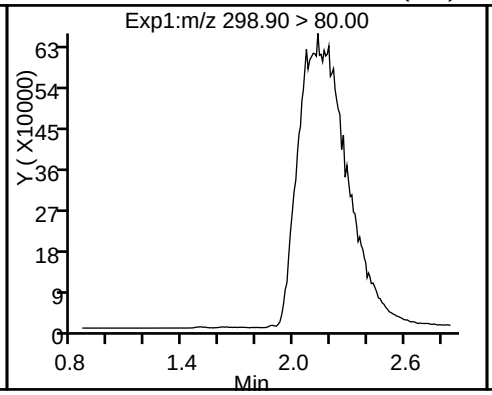
D 4 13C5-PFPeA



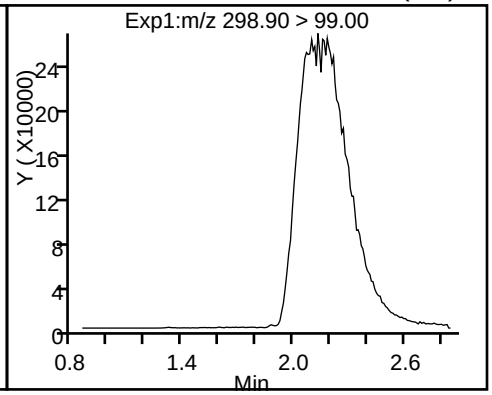
3 Perfluoropentanoic acid



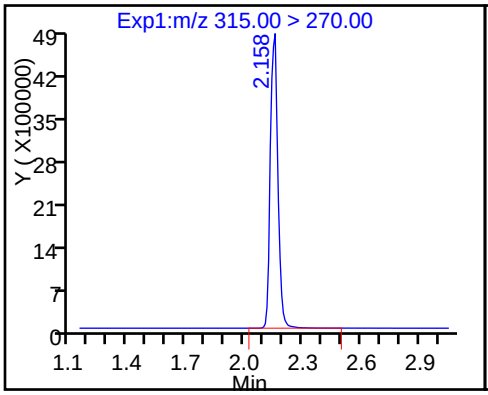
5 Perfluorobutanesulfonic acid (ND)



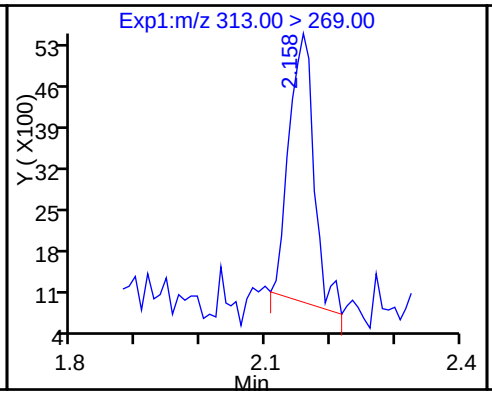
5 Perfluorobutanesulfonic acid (ND)



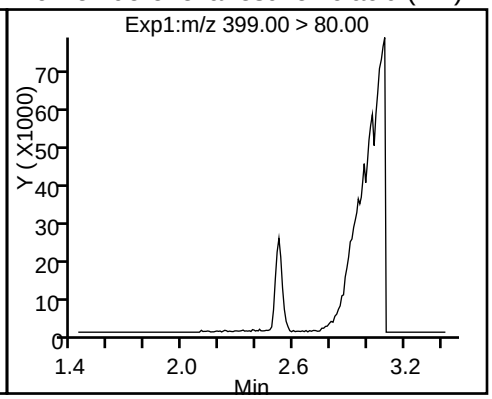
D 6 13C2 PFHxA



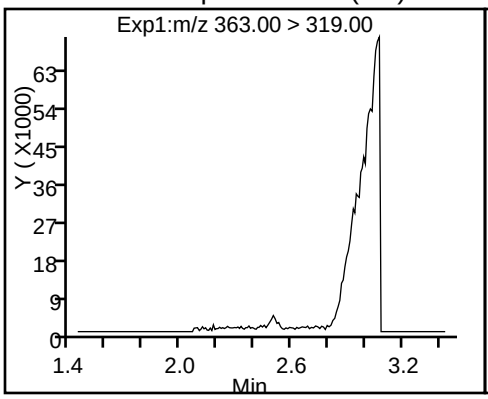
7 Perfluorohexanoic acid



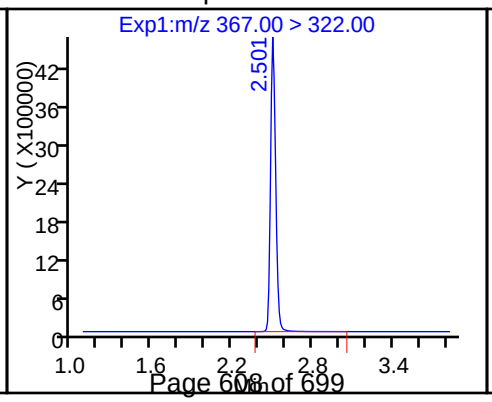
9 Perfluorohexanesulfonic acid (ND)



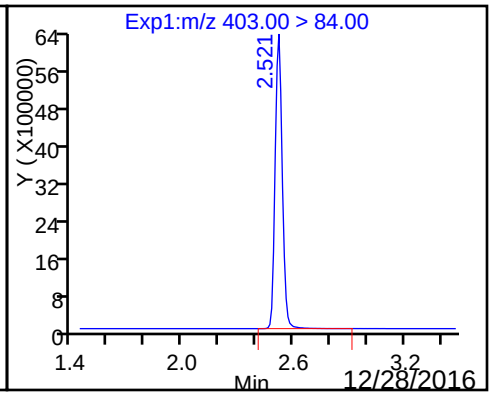
12 Perfluoroheptanoic acid (ND)



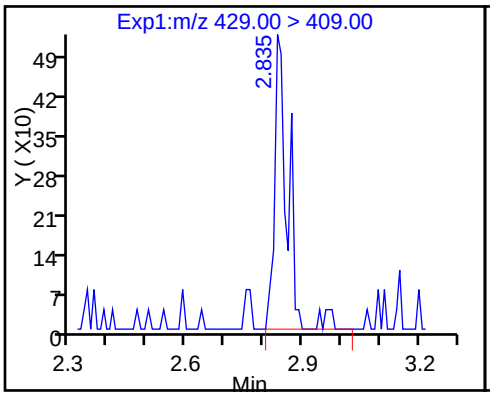
D 11 13C4-PFHpA



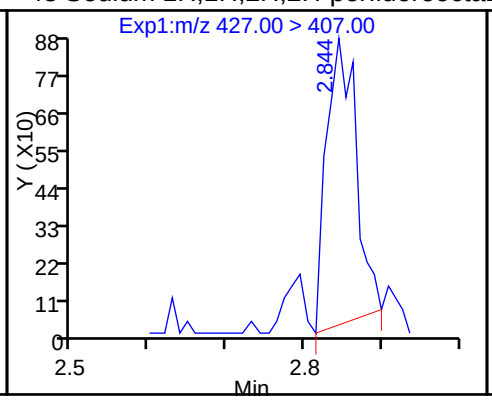
D 10 18O2 PFHxS



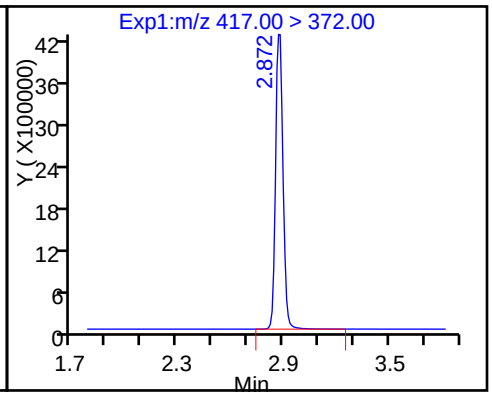
D 47 M2-6:2FTS



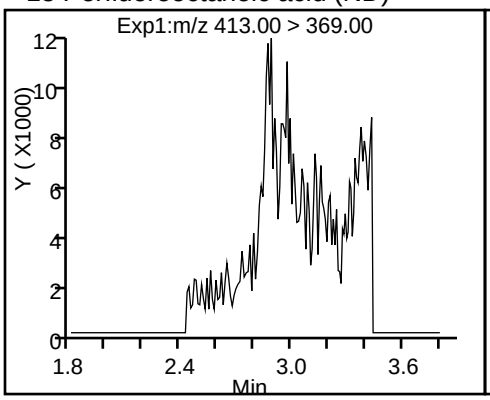
48 Sodium 1H,1H,2H,2H-perfluorooctane



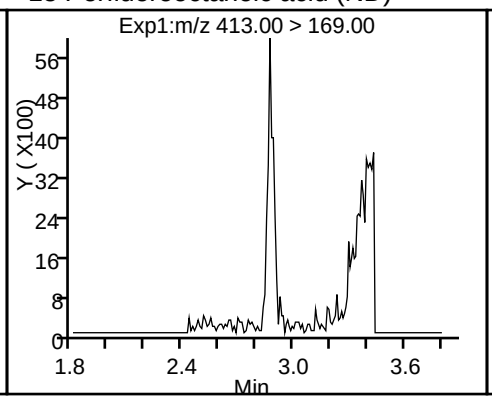
D 14 13C4 PFOA



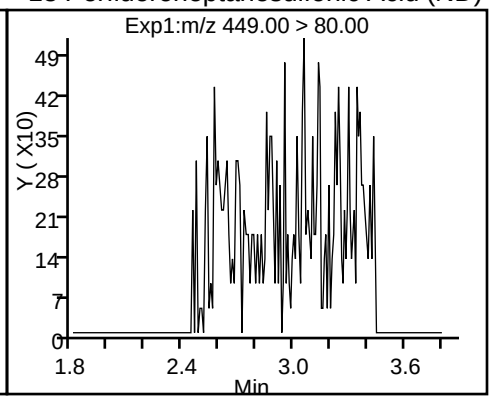
15 Perfluorooctanoic acid (ND)



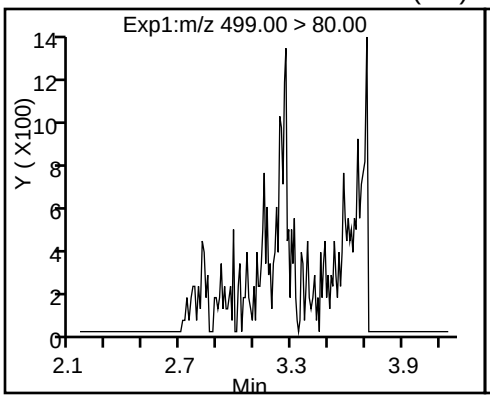
15 Perfluorooctanoic acid (ND)



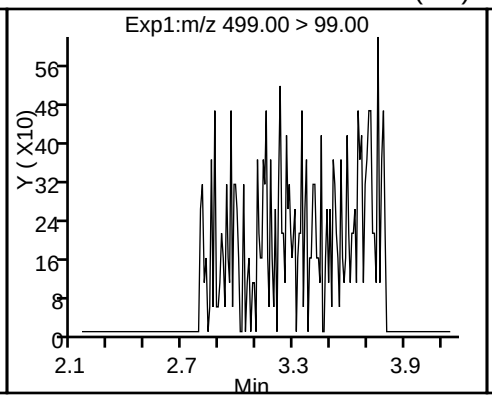
13 Perfluoroheptanesulfonic Acid (ND)



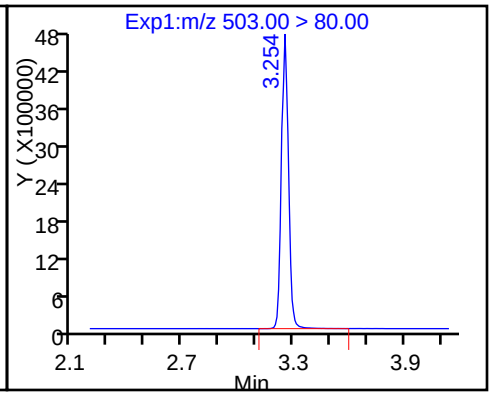
18 Perfluorooctane sulfonic acid (ND)



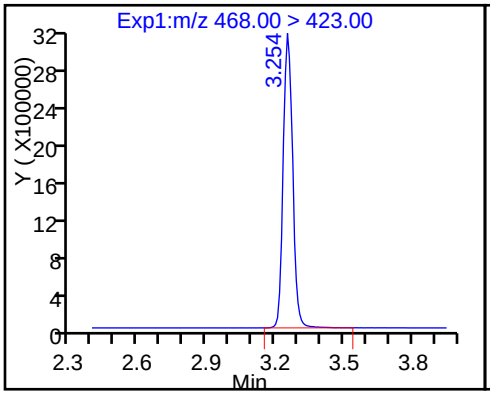
18 Perfluorooctane sulfonic acid (ND)



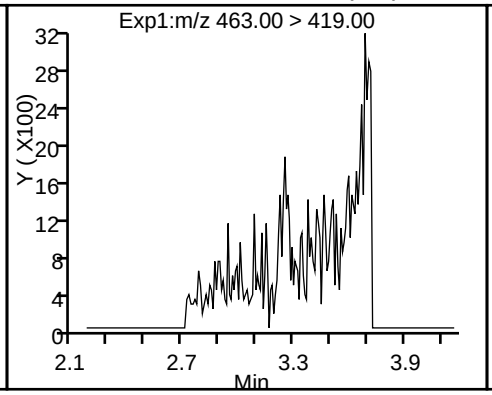
D 17 13C4 PFOS



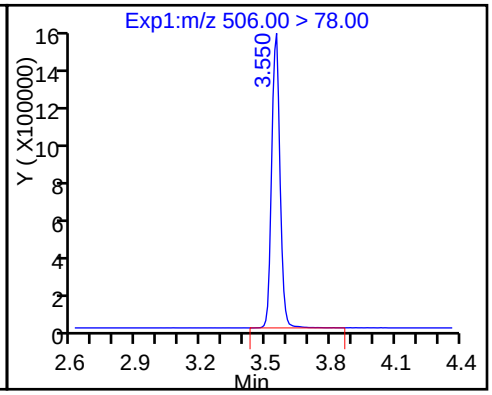
D 19 13C5 PFNA



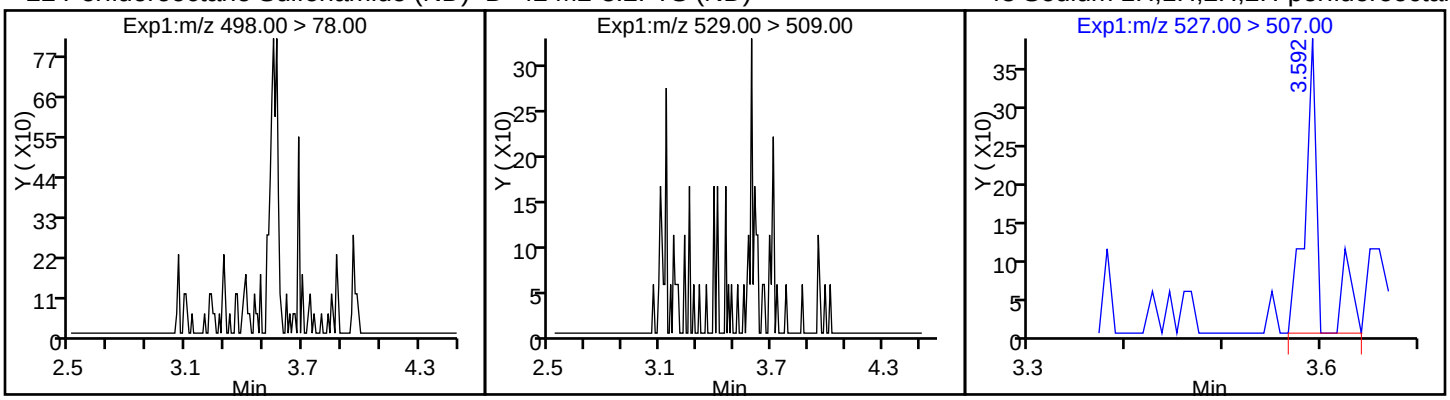
20 Perfluorononanoic acid (ND)



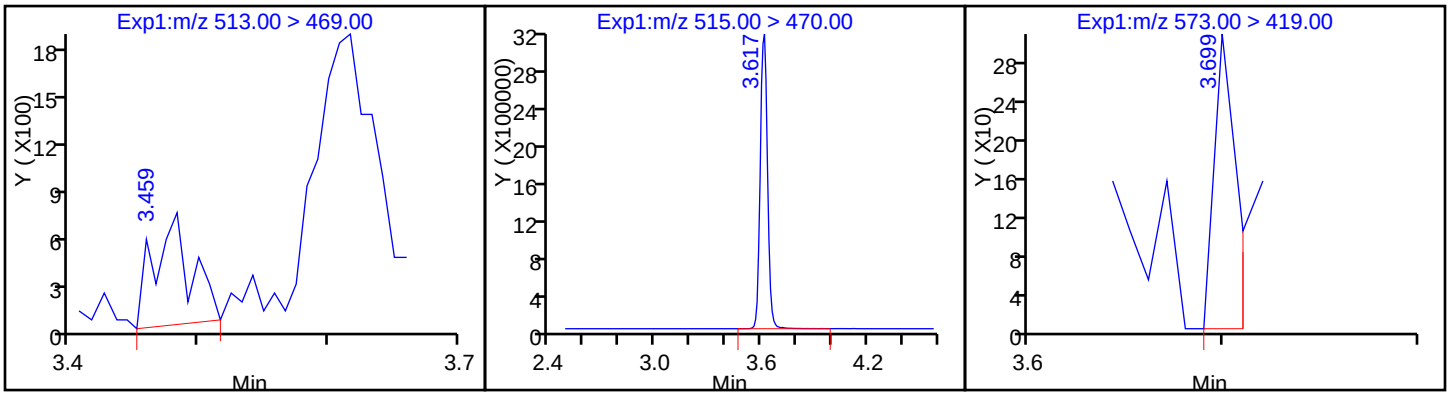
D 21 13C8 FOSA



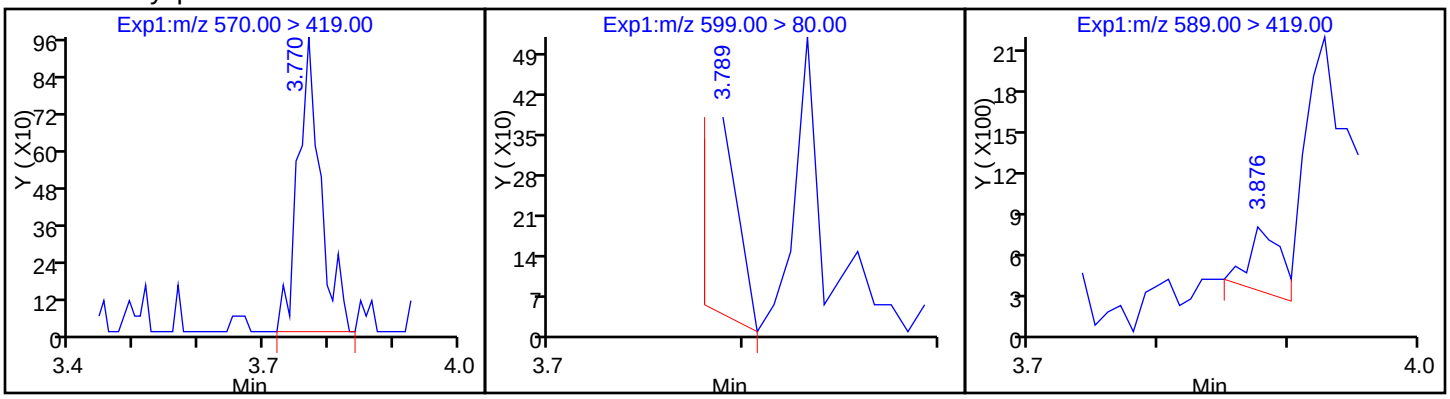
22 Perfluorooctane Sulfonamide (ND) D 42 M2-8:2FTS (ND) 43 Sodium 1H,1H,2H,2H-perfluorooctane



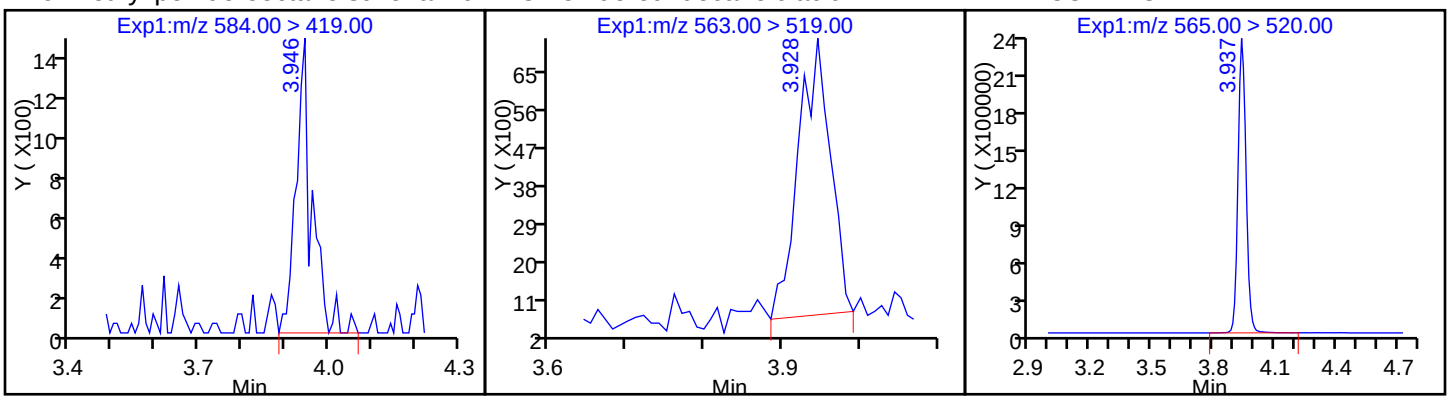
24 Perfluorodecanoic acid D 23 13C2 PFDA D 45 d3-NMeFOSAA



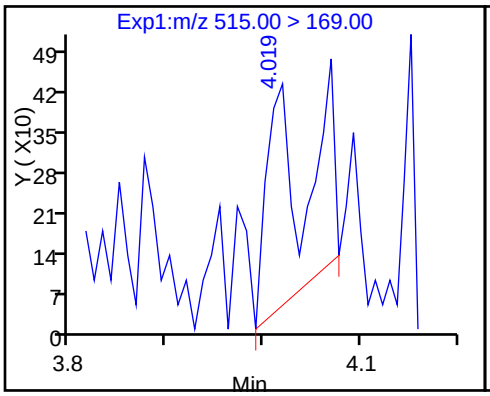
44 N-methyl perfluorooctane sulfonami 26 Perfluorodecane Sulfonic acid D 46 d5-NEtFOSAA



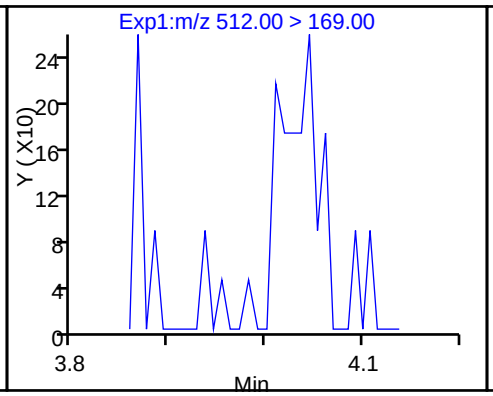
49 N-ethyl perfluorooctane sulfonamid 28 Perfluoroundecanoic acid D 27 13C2 PFUnA



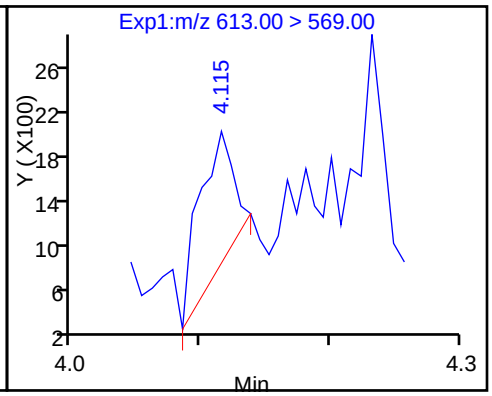
D 52 d-N-MeFOSA-M



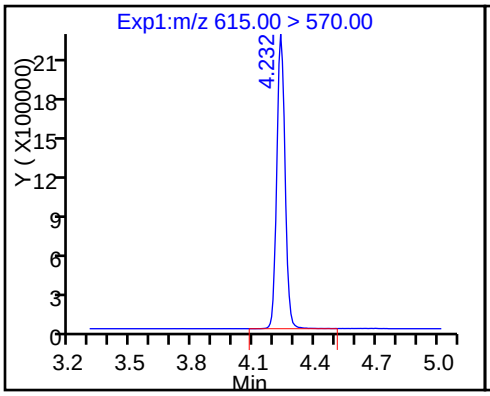
54 MeFOSA



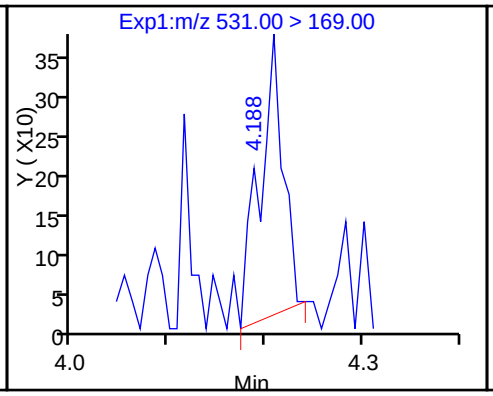
29 Perfluorododecanoic acid



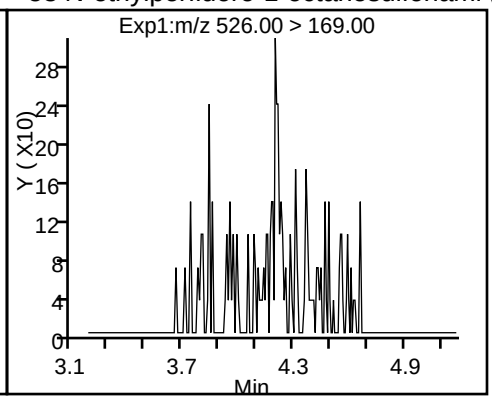
D 30 13C2 PFDoA



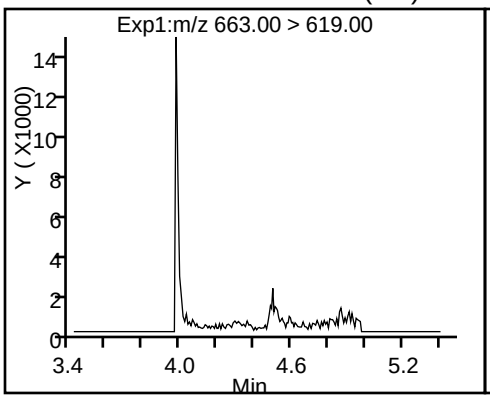
D 51 d-N-EtFOSA-M



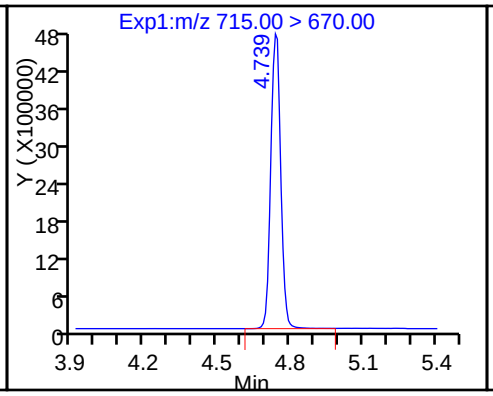
53 N-ethylperfluoro-1-octanesulfonami (ND)



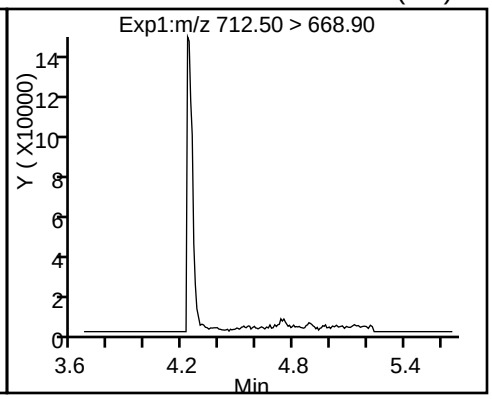
31 Perfluorotridecanoic acid (ND)



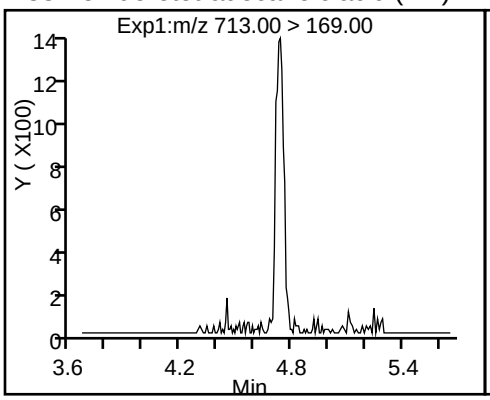
D 32 13C2-PFTeDA



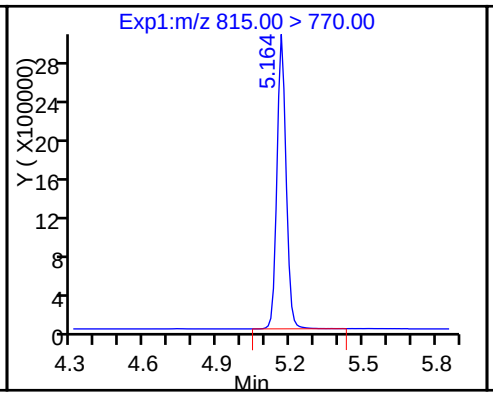
33 Perfluorotetradecanoic acid (ND)



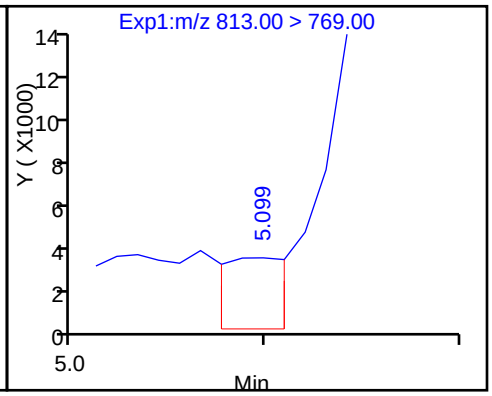
33 Perfluorotetradecanoic acid (ND)



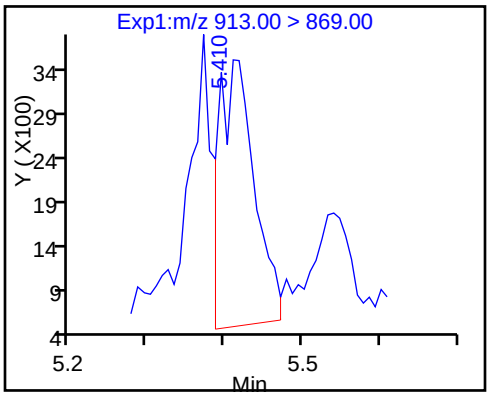
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-23830-1
SDG No.:
Client Sample ID:
Lab Sample ID: LCS 320-139917/2-A
Matrix: Water
Lab File ID: 09DEC2016A_038.d
Analysis Method: 537 (Modified)
Date Collected:
Extraction Method: 3535
Date Extracted: 11/29/2016 20:20
Sample wt/vol: 250.00(mL)
Date Analyzed: 12/09/2016 16:02
Con. Extract Vol.: 0.5(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: Acquity ID: 2.1(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 141453
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0345		0.0025	0.0020	0.00075
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.0334		0.0040	0.0030	0.0013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0366		0.0025	0.0020	0.00092

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	122		25-150
STL00991	13C4 PFOS	114		25-150
STL00994	18O2 PFHxS	116		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_038.d
Lims ID: LCS 320-139917/2-A
Client ID:
Sample Type: LCS
Inject. Date: 09-Dec-2016 16:02:04 ALS Bottle#: 22 Worklist Smp#: 38
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-139917/2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 11-Dec-2016 11:57:49 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: westendorfc Date: 11-Dec-2016 11:47:53

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.536	1.537	-0.001		19498525	58.1		116	909060	
1 Perfluorobutyric acid										
212.90 > 169.00	1.536	1.545	-0.009	1.000	6657567	19.5		97.7	68838	
D 4 13C5-PFPeA										
267.90 > 223.00	1.822	1.813	0.009		15748023	59.5		119	841002	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.822	1.813	0.009	1.000	6056758	18.9		94.7	43510	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.861	1.852	0.009	1.000	10607864	18.3		104		
298.90 > 99.00	1.861	1.852	0.009	1.000	4500653		2.36(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.119	2.103	0.016		13851528	58.3		117	841461	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.119	2.103	0.016	1.000	4923249	18.6		93.2	131831	
9 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.474	2.431	0.043	1.000	6487060	16.3		89.5		M
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.451	2.438	0.013	1.000	4882429	19.0		95.0	56234	
D 11 13C4-PFHpA										
367.00 > 322.00	2.458	2.453	0.005		12507176	60.3		121	740896	
D 10 18O2 PFHxS										
403.00 > 84.00	2.474	2.460	0.014		17170483	55.0		116	2059705	
D 14 13C4 PFOA										
417.00 > 372.00	2.821	2.805	0.016		13406970	61.1		122	957505	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.821	2.805	0.016	1.000	4953958	17.2		86.2	46735	
413.00 > 169.00	2.813	2.805	0.008	0.997	2969906		1.67(0.90-1.10)		132245	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.829	2.805	0.024	1.000	6007576	18.1		95.2		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.084	3.150	-0.066	1.000	5111555	16.7		90.1	59179	
499.00 > 99.00	3.190	3.150	0.040	1.034	1144309		4.47(0.90-1.10)		91841	
D 17 13C4 PFOS										
503.00 > 80.00	3.190	3.166	0.024		13464192	54.7		114	391598	
D 19 13C5 PFNA										
468.00 > 423.00	3.199	3.174	0.025		10017666	60.2		120	346626	
20 Perfluorononanoic acid										
463.00 > 419.00	3.190	3.174	0.016	1.000	3712345	18.6		93.0	68565	
D 21 13C8 FOSA										
506.00 > 78.00	3.506	3.489	0.017		3702459	9.20		18.4	222929	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.506	3.498	0.008	1.000	1331368	19.2		96.2	125757	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.556	3.531	0.025	1.000	3371972	18.9		94.4	110255	
D 23 13C2 PFDA										
515.00 > 470.00	3.556	3.531	0.025		9295267	58.9		118	360831	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.869	3.842	0.027	1.000	3061482	17.0		88.1		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.886	3.859	0.027	1.000	2396566	16.0		80.0	53524	
D 27 13C2 PFUnA										
565.00 > 520.00	3.886	3.859	0.027		7023443	59.1		118	331721	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.177	4.149	0.028	1.000	2219329	18.1		90.7	44041	
D 30 13C2 PFDoA										
615.00 > 570.00	4.177	4.156	0.021		6445871	57.5		115	263483	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.455	4.414	0.041	1.000	2521562	20.6		103	46138	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.696	4.664	0.032		14955777	64.7		129	917265	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.696	4.664	0.032	1.000	4465040	18.7		93.4	24511	
713.00 > 169.00	4.688	4.664	0.024	0.998	760204		5.87(0.00-0.00)		94745	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.123	5.081	0.042		7428139	57.3		115	321810	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.123	5.081	0.042	1.000	2361275	17.7		88.5	3701	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.499	5.444	0.055	1.000	2851270	22.3		111	4010	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 11-Dec-2016 11:57:59 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_038.d

Injection Date: 09-Dec-2016 16:02:04 Instrument ID: A8_N

Lims ID: LCS 320-139917/2-A

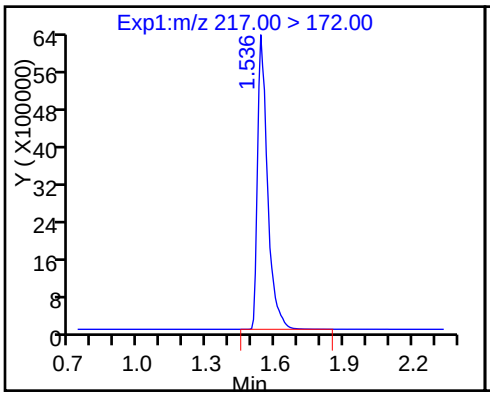
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 22 Worklist Smp#: 38

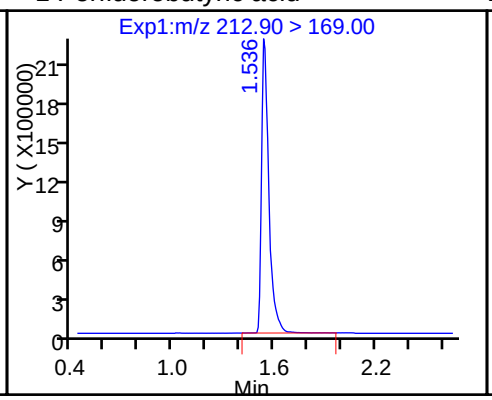
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

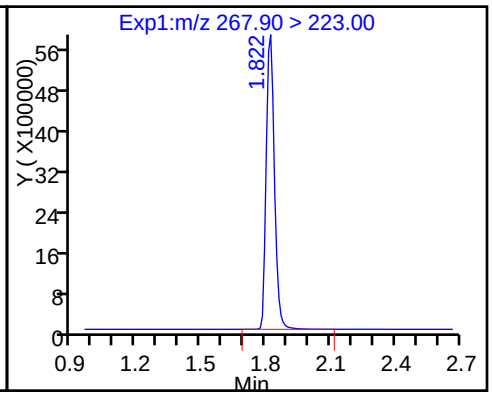
D 2 13C4 PFBA



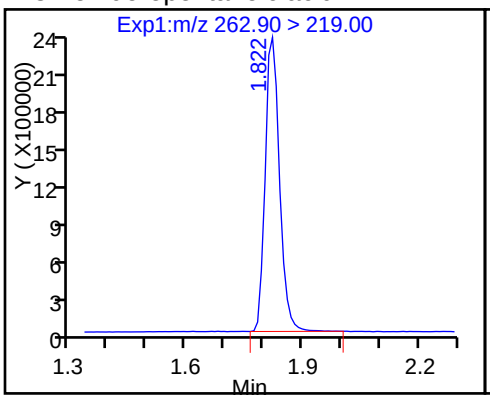
1 Perfluorobutyric acid



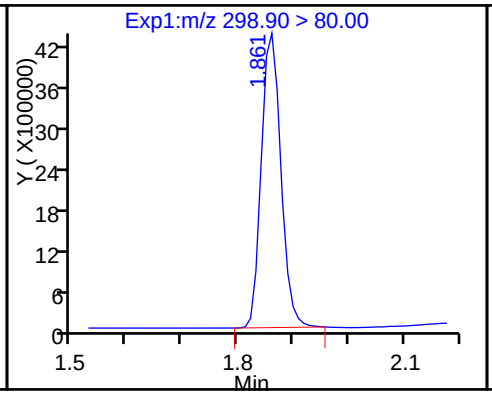
D 4 13C5-PFPeA



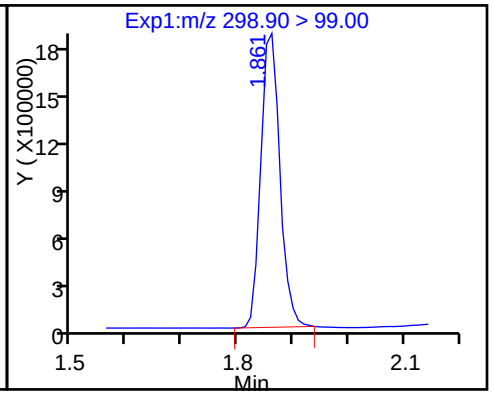
3 Perfluoropentanoic acid



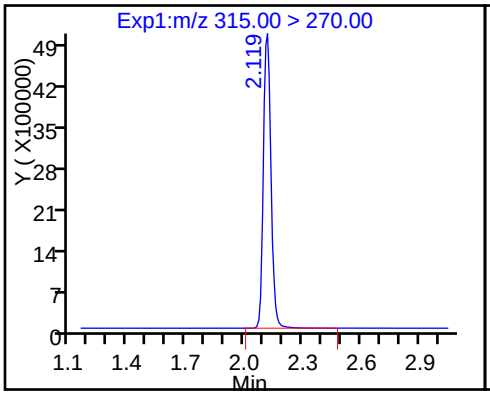
5 Perfluorobutanesulfonic acid



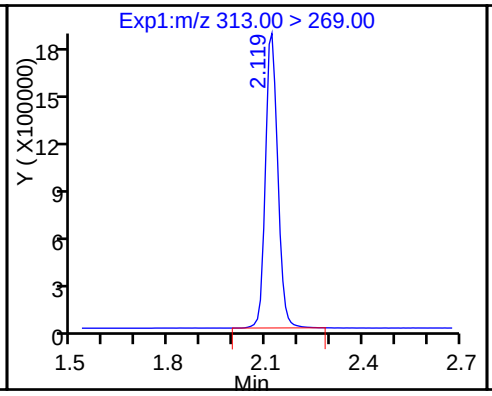
5 Perfluorobutanesulfonic acid



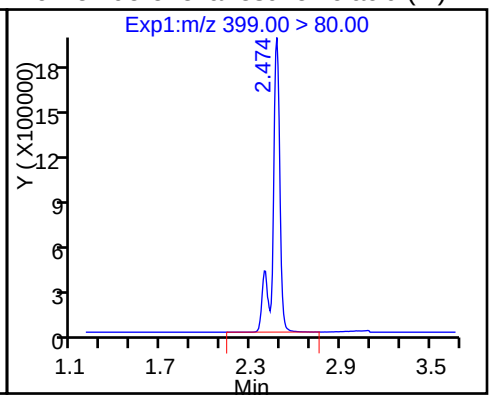
D 6 13C2 PFHxA



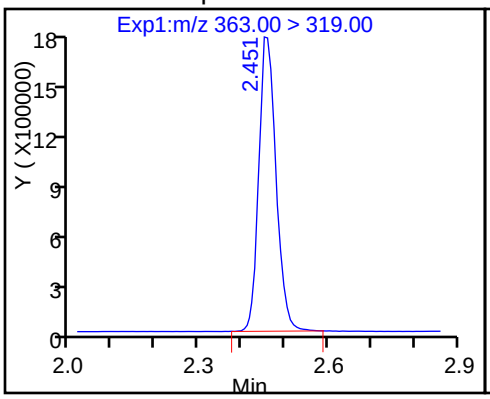
7 Perfluorohexanoic acid



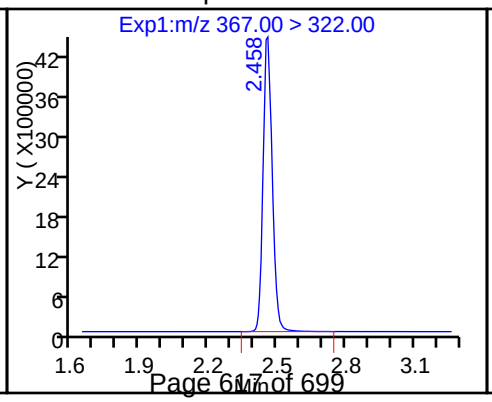
9 Perfluorohexanesulfonic acid (M)



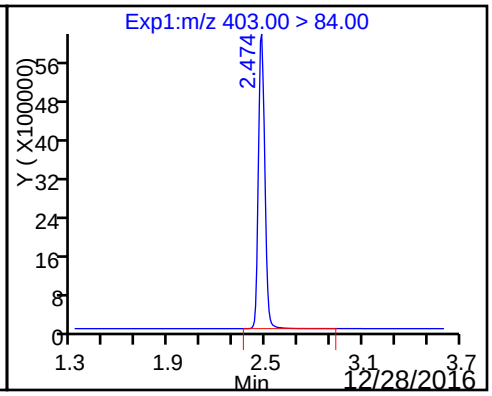
12 Perfluoroheptanoic acid



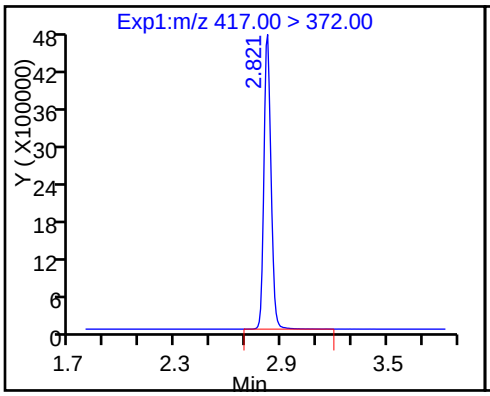
D 11 13C4-PFHpA



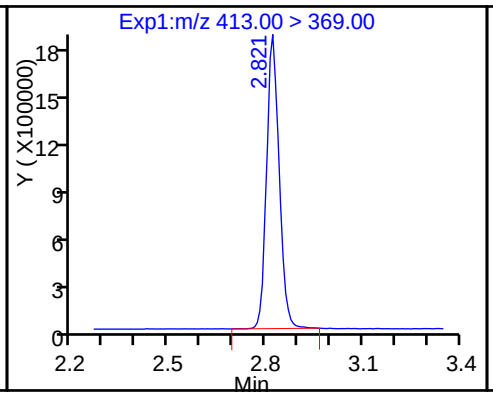
D 10 18O2 PFHxS



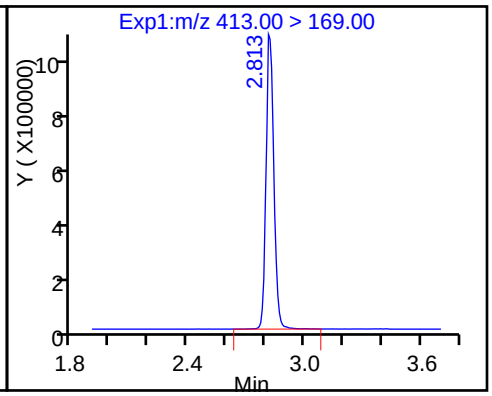
D 14 13C4 PFOA



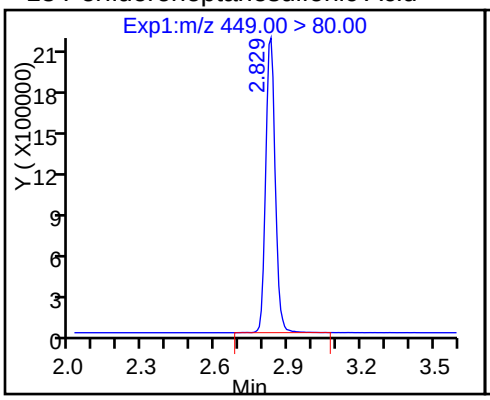
15 Perfluorooctanoic acid



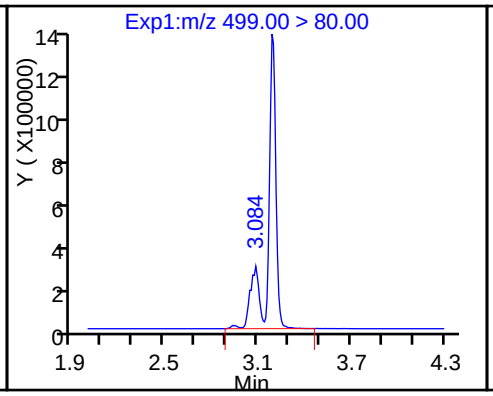
15 Perfluorooctanoic acid



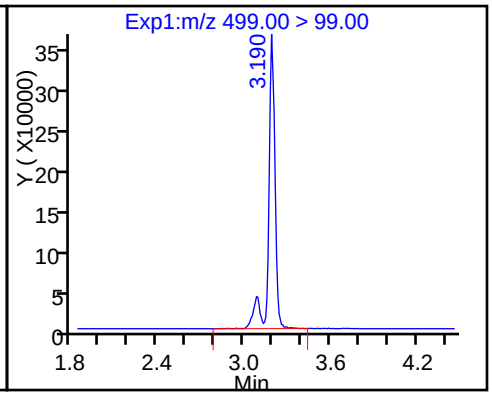
13 Perfluoroheptanesulfonic Acid



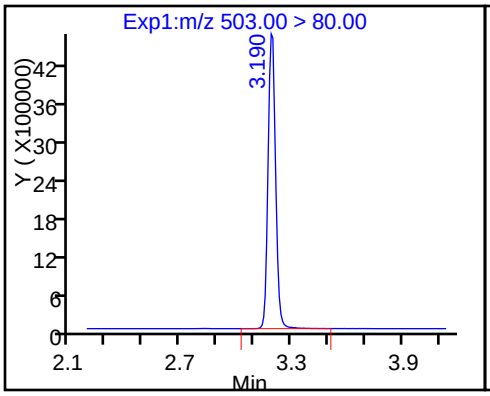
18 Perfluorooctane sulfonic acid



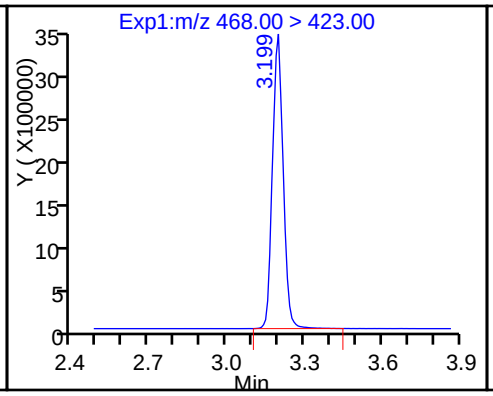
18 Perfluorooctane sulfonic acid



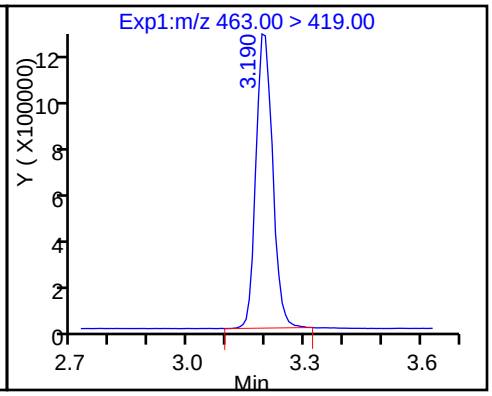
D 17 13C4 PFOS



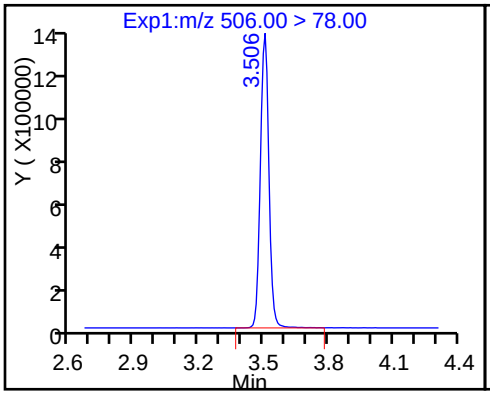
D 19 13C5 PFNA



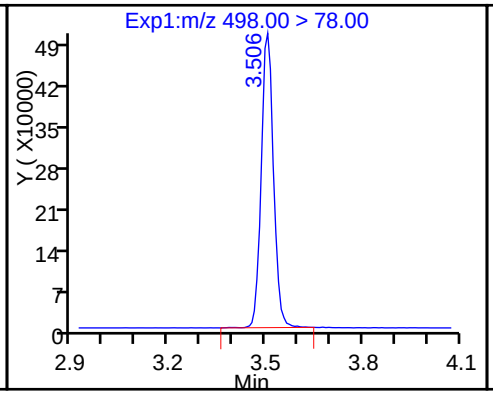
20 Perfluorononanoic acid



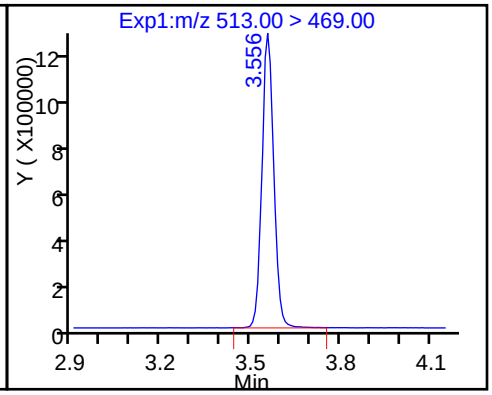
D 21 13C8 FOSA



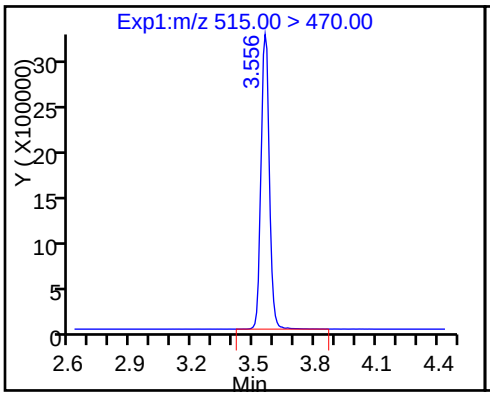
22 Perfluorooctane Sulfonamide



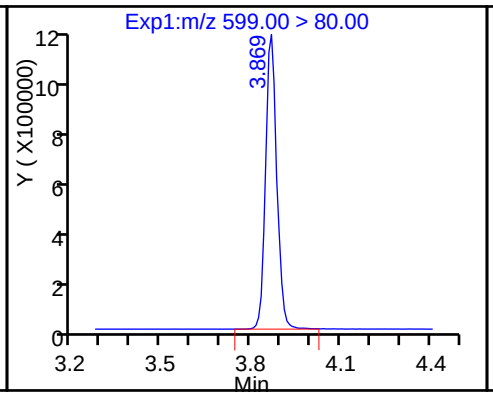
24 Perfluorodecanoic acid



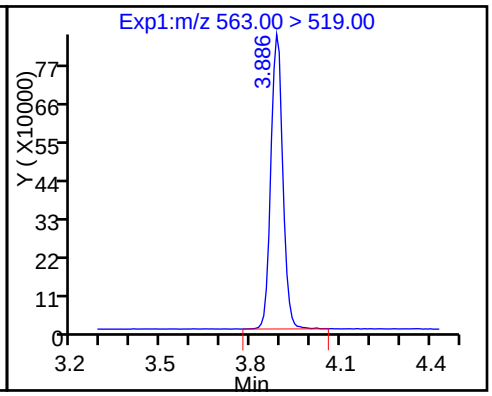
D 23 13C2 PFDA



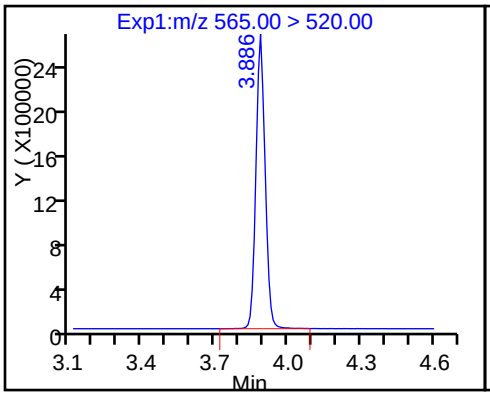
26 Perfluorodecane Sulfonic acid



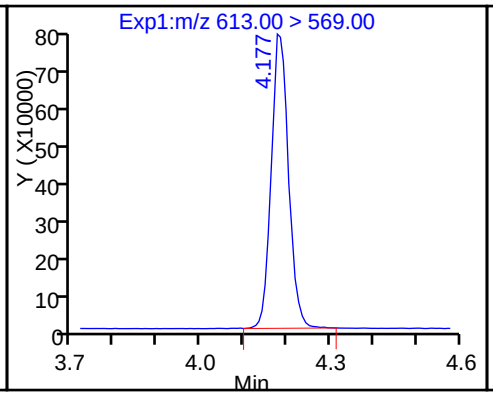
28 Perfluoroundecanoic acid



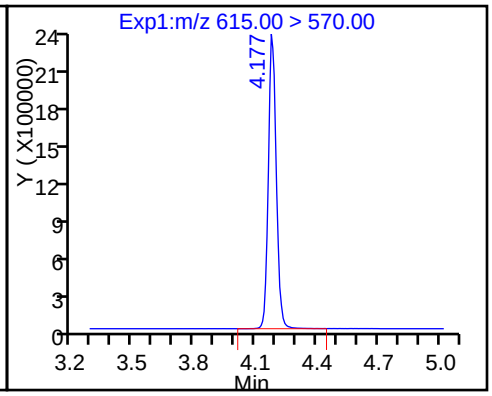
D 27 13C2 PFUnA



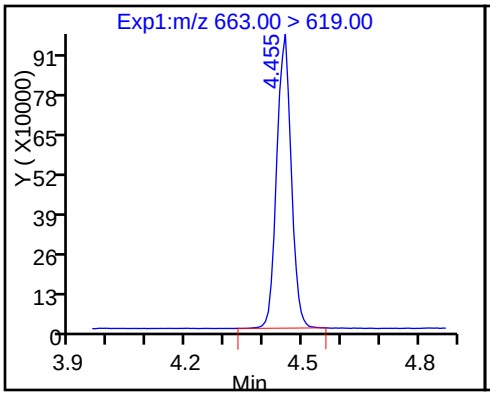
29 Perfluorododecanoic acid



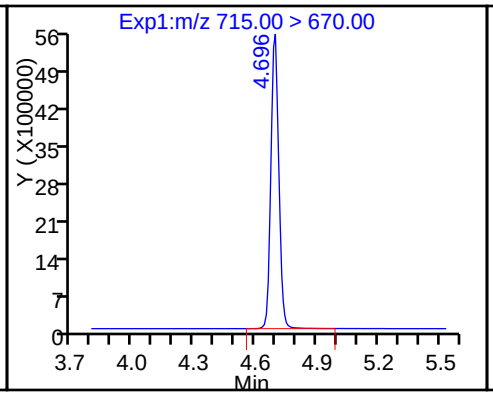
D 30 13C2 PFDoA



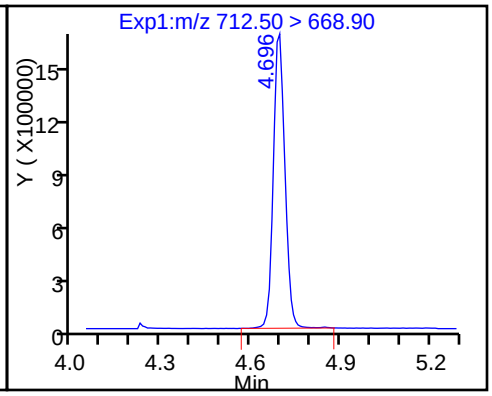
31 Perfluorotridecanoic acid



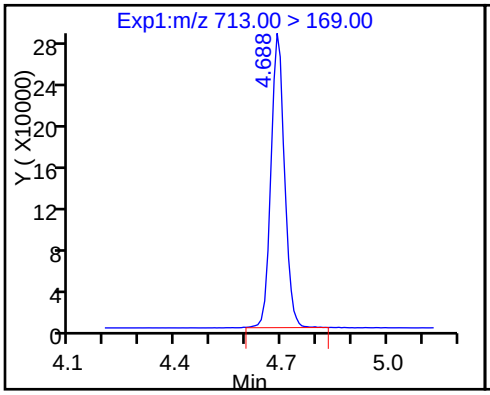
D 32 13C2-PFTeDA



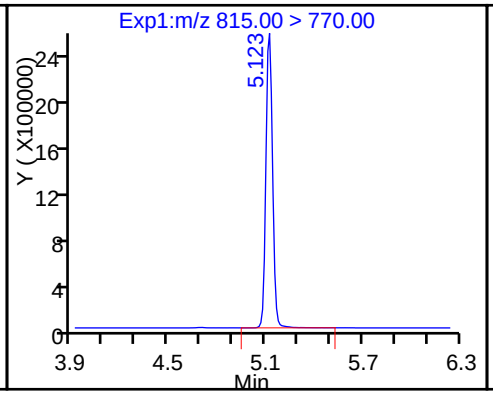
33 Perfluorotetradecanoic acid



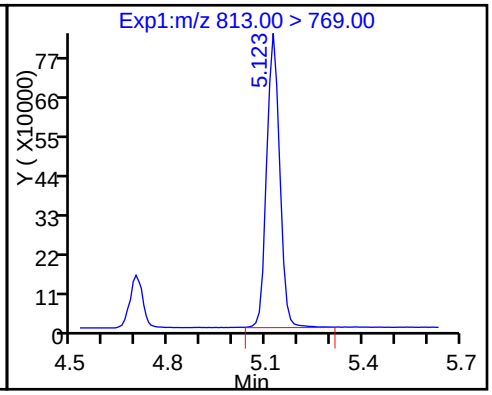
33 Perfluorotetradecanoic acid



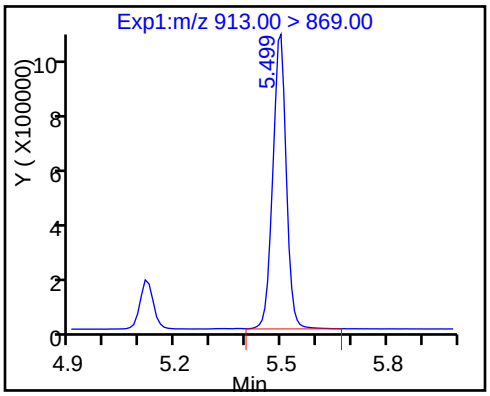
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23830-1

SDG No.:

Client Sample ID: DPT-16-18-GW-21-25 MS | Lab Sample ID: 320-23830-3 MS

Matrix: Water | Lab File ID: 09DEC2016A_042.d

Analysis Method: 537 (Modified) | Date Collected: 11/23/2016 11:40

Extraction Method: 3535 | Date Extracted: 11/29/2016 20:20

Sample wt/vol: 241.5(mL) | Date Analyzed: 12/09/2016 16:32

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 141453 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	*Perfluorooctanoic acid (PFOA)*	*0.667*	*E 4 M*	*0.0026*	0.0021	*0.00077*
1763-23-1	*Perfluorooctane Sulfonate (PFOS)*	*1.62*	*E 4*	*0.0041*	0.0031	*0.0013*
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.186	4	0.0026	0.0021	0.00095

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	70		25-150
STL00991	13C4 PFOS	69		25-150
STL00994	18O2 PFHxS	58		25-150

Report Date: 11-Dec-2016 11:58:03 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_042.d
Lims ID: 320-23830-A-3-B MS
Client ID: DPT-16-18-GW-21-25
Sample Type: MS
Inject. Date: 09-Dec-2016 16:32:14 ALS Bottle#: 26 Worklist Smp#: 42
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-23830-a-3-b ms
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 11-Dec-2016 11:57:49 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: westendorfc Date: 11-Dec-2016 11:50:33

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.529	1.537	-0.008		6488511	19.3		38.6	439394	
1 Perfluorobutyric acid										
212.90 > 169.00	1.537	1.545	-0.008	1.000	5834711	51.4		257	4872	
D 4 13C5-PFPeA										
267.90 > 223.00	1.813	1.813	0.0		10583165	40.0		80.0	317100	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.813	1.813	0.0	1.000	12199600	56.8		284	18021	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.842	1.852	-0.010	1.000	25877732	89.8		508		
298.90 > 99.00	1.842	1.852	-0.010	1.000	12180714		2.12(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.096	2.103	-0.007		9500658	40.0		80.0	525242	
7 Perfluorohexanoic acid										E
313.00 > 269.00	2.096	2.103	-0.007	1.000	39407228	217.6		1088	59570	E
9 Perfluorohexanesulfonic acid										EM
399.00 > 80.00	2.473	2.431	0.042	1.000	132179797	667.2		3666		EM
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.430	2.438	-0.008	1.000	5606350	46.4		232	9623	
D 11 13C4-PFHpA										
367.00 > 322.00	2.438	2.453	-0.015		5877015	28.3		56.7	481649	
D 10 18O2 PFHxS										
403.00 > 84.00	2.455	2.460	-0.005		8537533	27.3		57.8	416462	
D 47 M2-6:2FTS										
429.00 > 409.00	2.768	2.765	0.003		72006	0.6823		0.0		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.768	2.765	0.003	1.000	1322540	NR		0.0		
D 14 13C4 PFOA										
417.00 > 372.00	2.800	2.805	-0.005		7653648	34.9		69.8	411694	

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	2.800	2.805	-0.005	1.000	52825159	321.9		1610	636056	EM
413.00 > 169.00	2.800	2.805	-0.005	1.000	39378866		1.34(0.90-1.10)		514756	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.808	2.805	0.003	1.000	10239072	51.1		268		
18 Perfluorooctane sulfonic acid										E
499.00 > 80.00	3.050	3.150	-0.100	1.000	144879540	784.3		4226	320155	E
499.00 > 99.00	3.170	3.150	0.020	1.039	35551905		4.08(0.90-1.10)		824170	
D 17 13C4 PFOS										
503.00 > 80.00	3.170	3.166	0.004		8136697	33.1		69.2	74362	
D 19 13C5 PFNA										
468.00 > 423.00	3.178	3.174	0.004		3882380	23.3		46.7	117301	
20 Perfluorononanoic acid										
463.00 > 419.00	3.178	3.174	0.004	1.000	3976187	51.4		257	837	
D 21 13C8 FOSA										
506.00 > 78.00	3.486	3.489	-0.003		237275	0.5898		1.2	44216	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.494	3.498	-0.004	1.000	92495	20.9		104	6843	
D 42 M2-8:2FTS										
529.00 > 509.00	3.502	3.519	-0.017		2446	0.0252		0.0		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.528	3.519	0.009	1.007	44858	NR		0.0		
24 Perfluorodecanoic acid										
513.00 > 469.00	3.528	3.531	-0.003	1.000	1497484	20.5		103	11572	
D 23 13C2 PFDA										
515.00 > 470.00	3.536	3.531	0.005		3797713	24.1		48.1	266729	
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.664	3.683	-0.019		628	0.008659		0.0		
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.840	3.842	-0.002	1.000	2820980	25.9		134		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.875	3.847	0.028		1365	0.0171		0.0		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.875	3.856	0.019	1.000	1497	NR		0.0		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.866	3.859	0.007	1.000	832727	17.2		86.2	18236	
D 27 13C2 PFUnA										
565.00 > 520.00	3.866	3.859	0.007		2266663	19.1		38.2	268844	
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.990	3.990	0.0		2080	0.0198		0.0		
54 MeFOSA										
512.00 > 169.00	3.953	3.999	-0.046	1.000	390	NR		0.0		
29 Perfluorododecanoic acid										
613.00 > 569.00	4.160	4.149	0.011	1.000	866937	18.7		93.6	22182	
D 30 13C2 PFDoA										
615.00 > 570.00	4.160	4.156	0.004		2440781	21.8		43.6	151012	
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.233	4.175	0.058		214	0.002158		0.0		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.425	4.414	0.011	1.000	1136877	24.5		123	25383	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.670	4.664	0.006		9697699	41.9		83.9	1180668	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.670	4.664	0.006	1.000	3020927	33.4		167	45612	
713.00 > 169.00	4.661	4.664	-0.003	0.998	533234		5.67(0.00-0.00)		101891	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.090	5.081	0.009		6329869	48.8		97.6	374842	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.090	5.081	0.009	1.000	2183046	44.3		221	7397	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.459	5.444	0.015	1.000	2610818	53.9		269	3546	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 11-Dec-2016 11:58:03 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_042.d

Injection Date: 09-Dec-2016 16:32:14 Instrument ID: A8_N

Lims ID: 320-23830-A-3-B MS

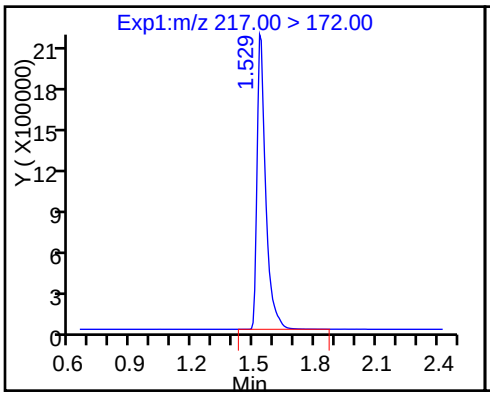
Client ID: DPT-16-18-GW-21-25

Operator ID: A8-PC\A8 ALS Bottle#: 26 Worklist Smp#: 42

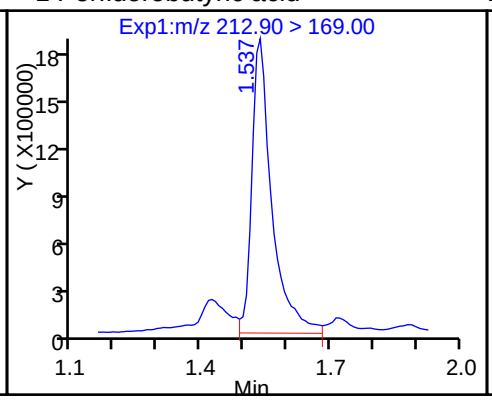
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

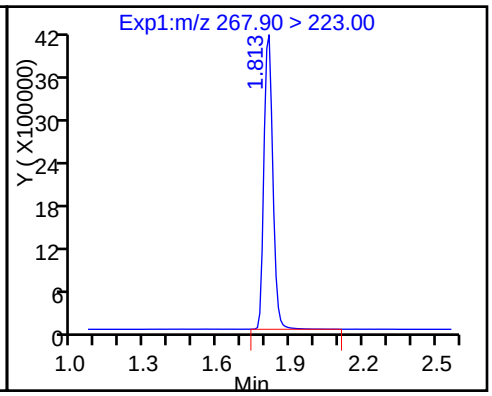
D 2 13C4 PFBA



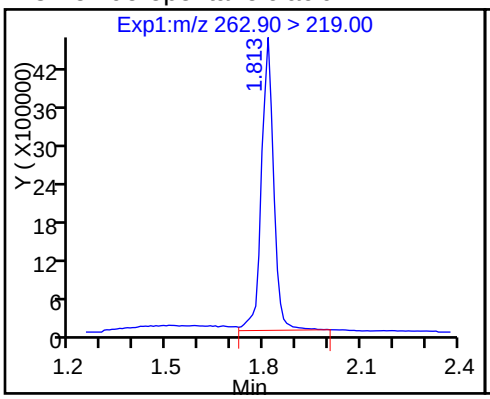
1 Perfluorobutyric acid



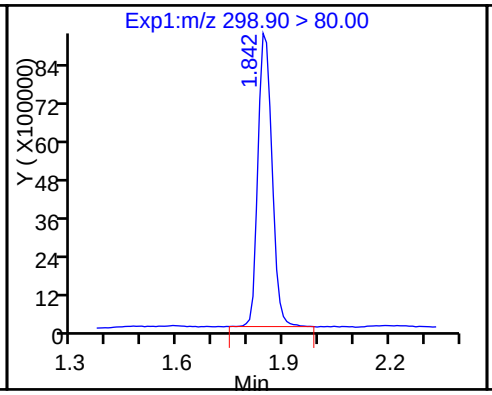
D 4 13C5-PFPeA



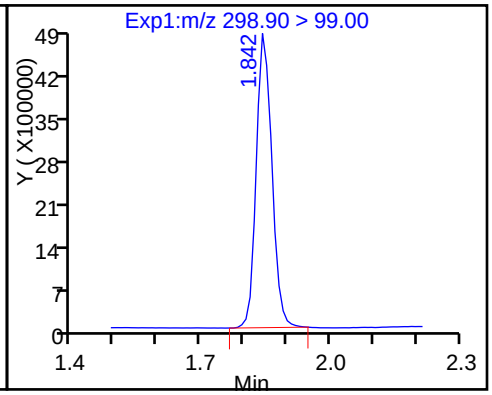
3 Perfluoropentanoic acid



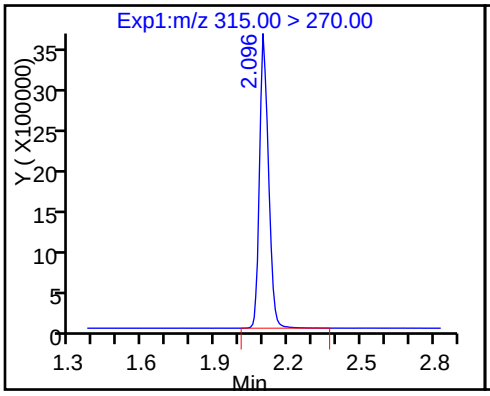
5 Perfluorobutanesulfonic acid



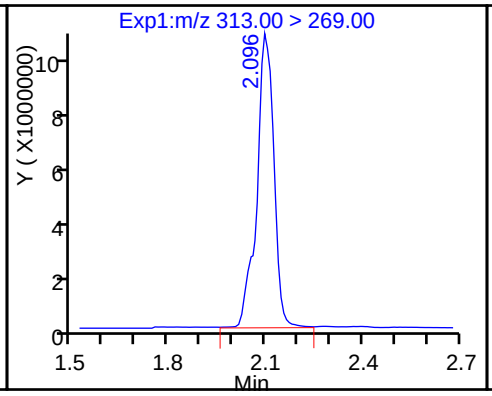
5 Perfluorobutanesulfonic acid



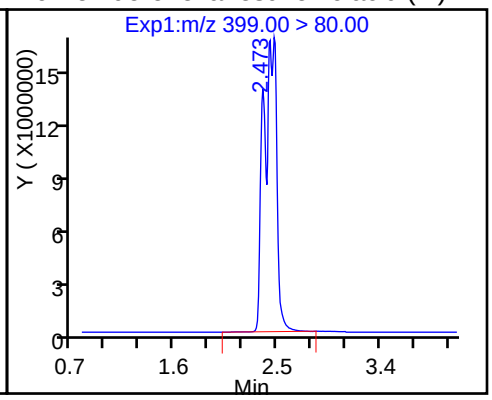
D 6 13C2 PFHxA



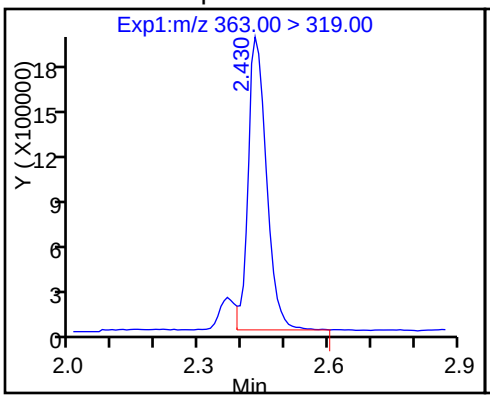
7 Perfluorohexanoic acid



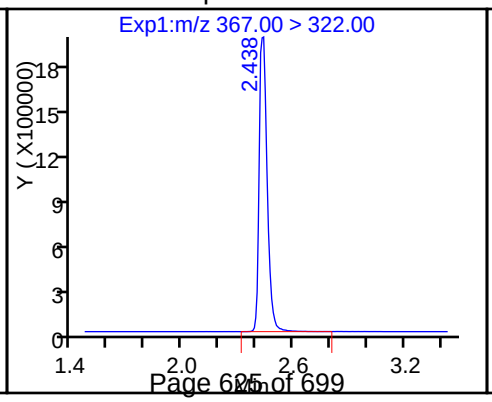
9 Perfluorohexanesulfonic acid (M)



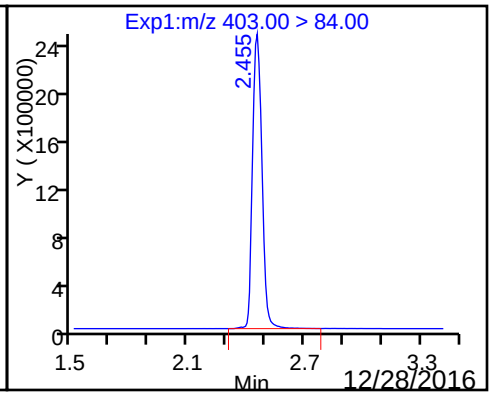
12 Perfluoroheptanoic acid



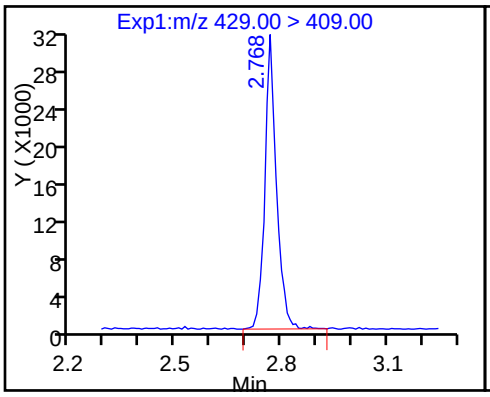
D 11 13C4-PFHpA



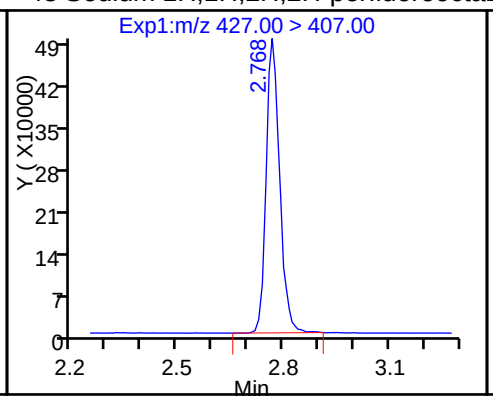
D 10 18O2 PFHxS



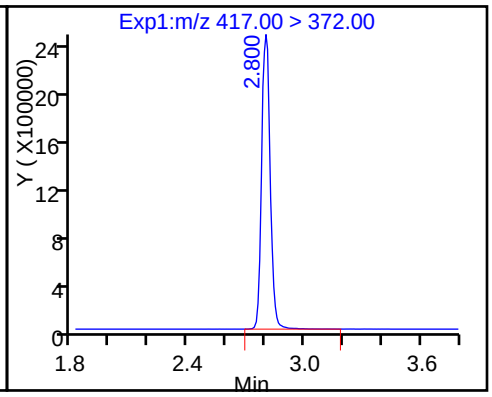
D 47 M2-6:2FTS



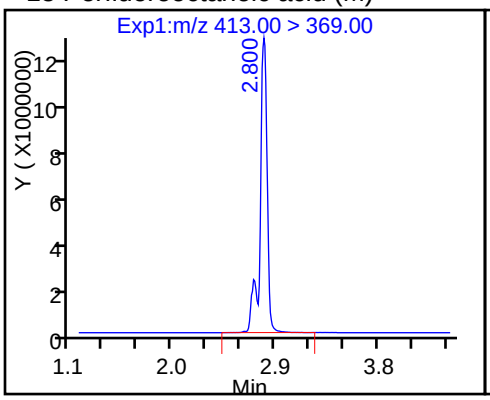
48 Sodium 1H,1H,2H,2H-perfluorooctane



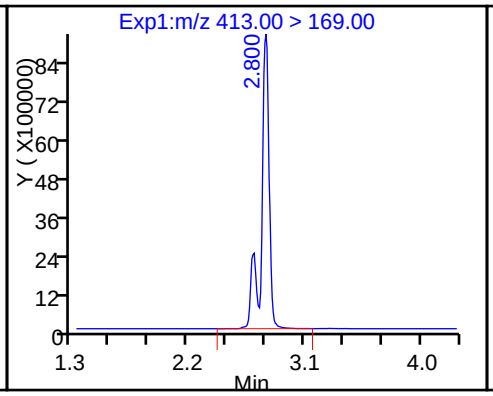
D 14 13C4 PFOA



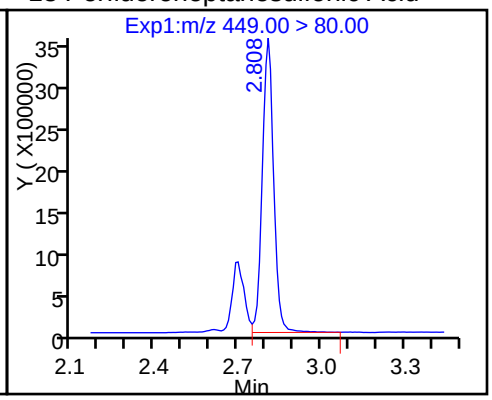
15 Perfluorooctanoic acid (M)



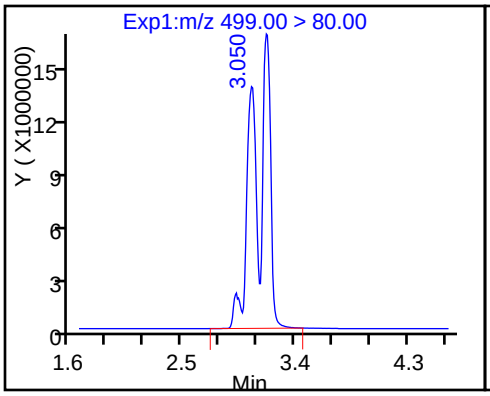
15 Perfluorooctanoic acid



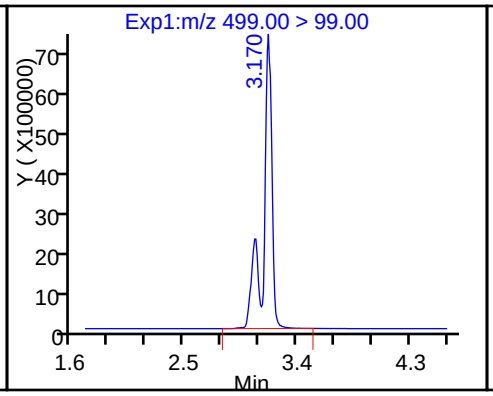
13 Perfluoroheptanesulfonic Acid



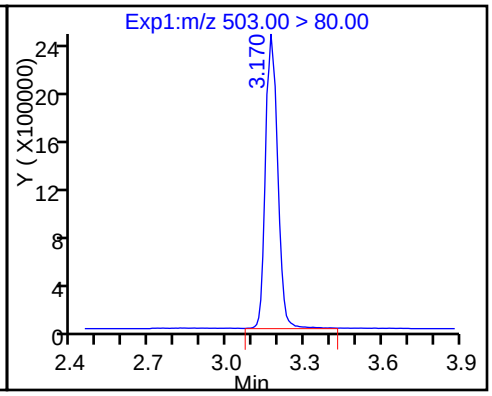
18 Perfluorooctane sulfonic acid



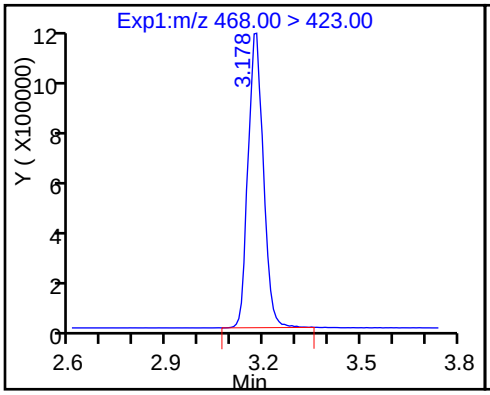
18 Perfluorooctane sulfonic acid



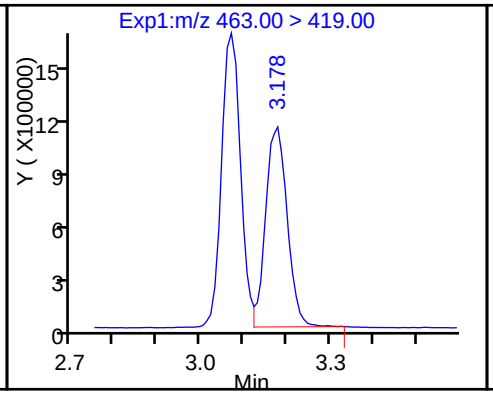
D 17 13C4 PFOS



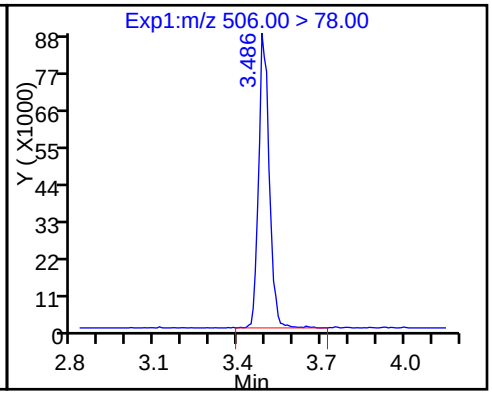
D 19 13C5 PFNA



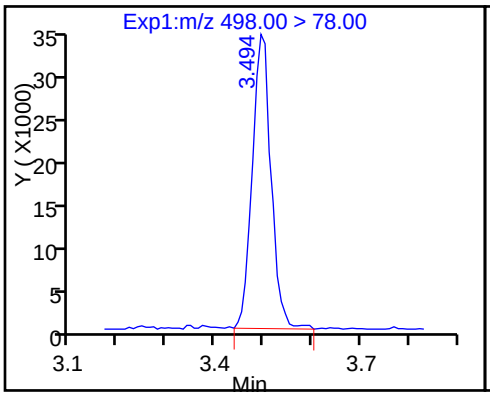
20 Perfluorononanoic acid



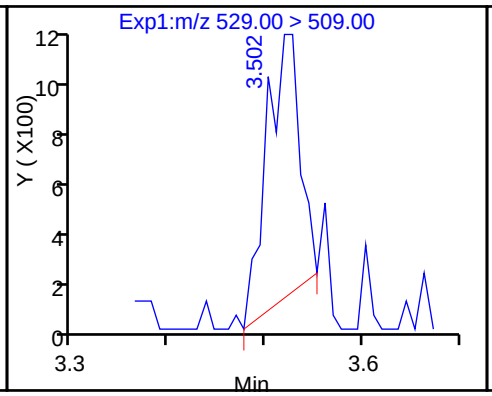
D 21 13C8 FOSA



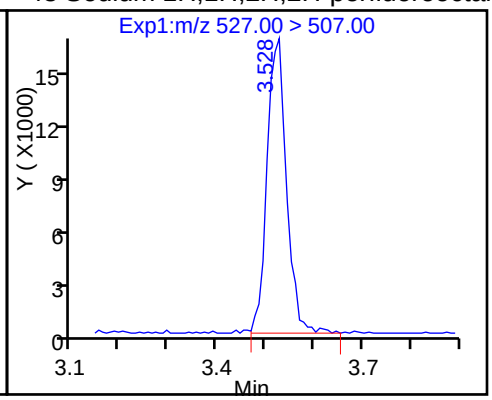
22 Perfluorooctane Sulfonamide



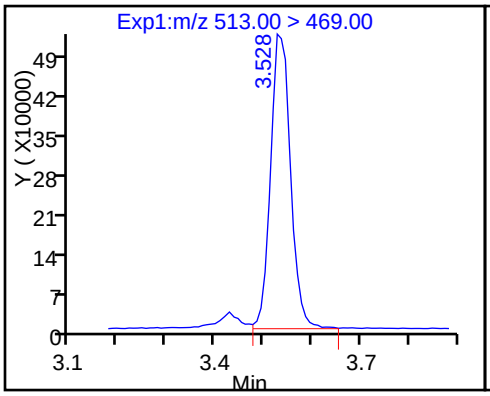
D 42 M2-8:2FTS



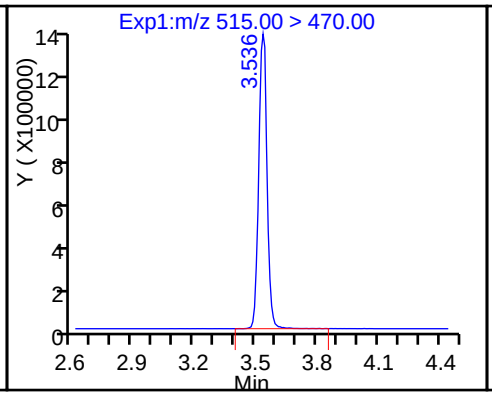
43 Sodium 1H,1H,2H,2H-perfluorooctane



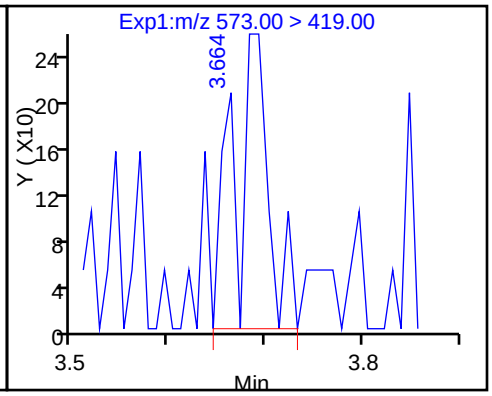
24 Perfluorodecanoic acid



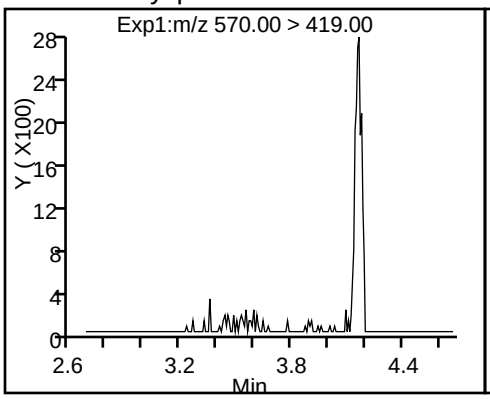
D 23 13C2 PFDA



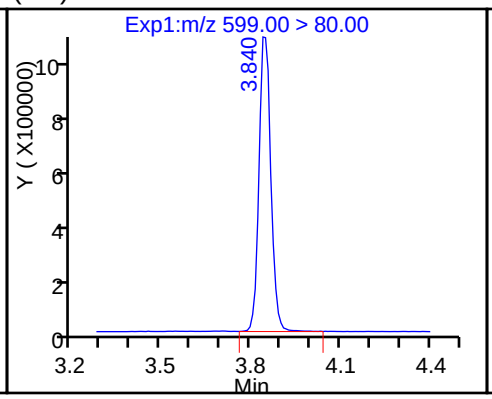
D 45 d3-NMeFOSAA



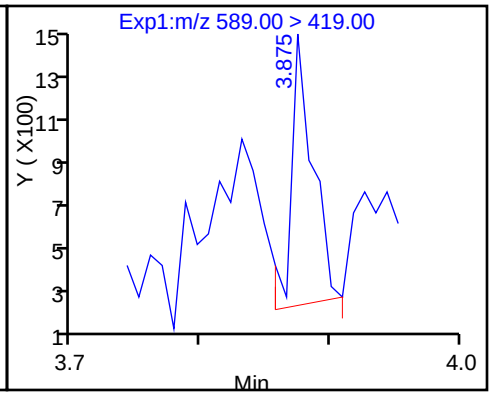
44 N-methyl perfluorooctane sulfonami (N)



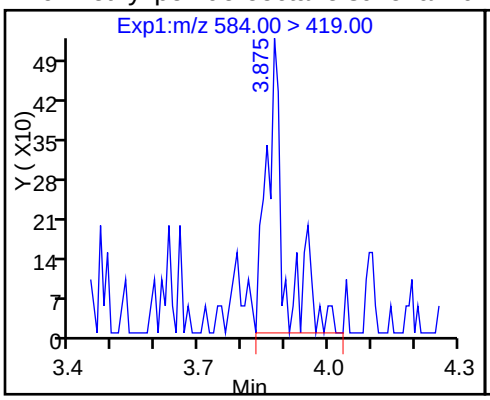
26 Perfluorodecane Sulfonic acid



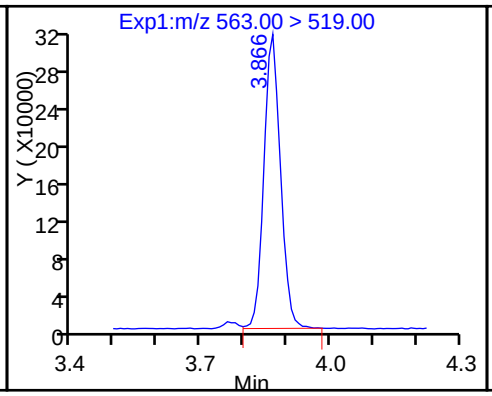
D 46 d5-NEtFOSAA



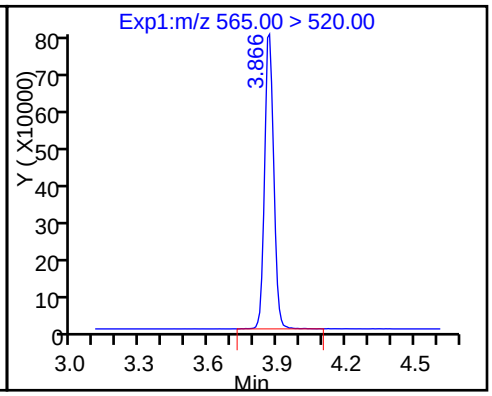
49 N-ethyl perfluorooctane sulfonamid



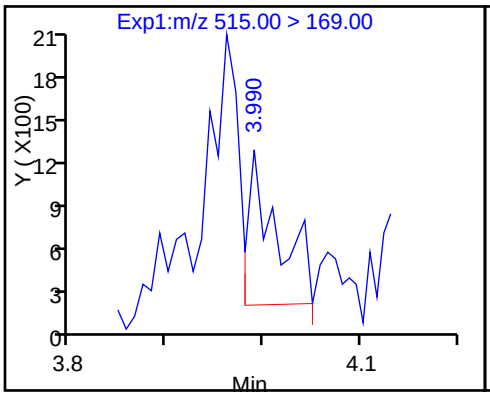
28 Perfluoroundecanoic acid



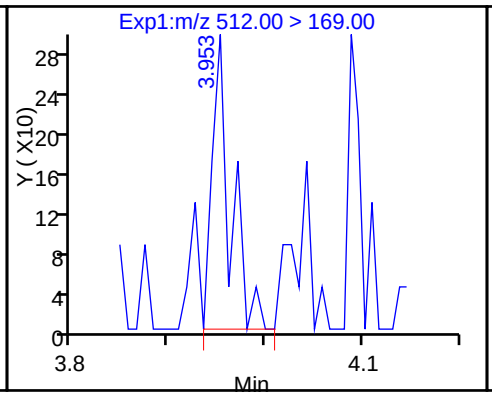
D 27 13C2 PFUnA



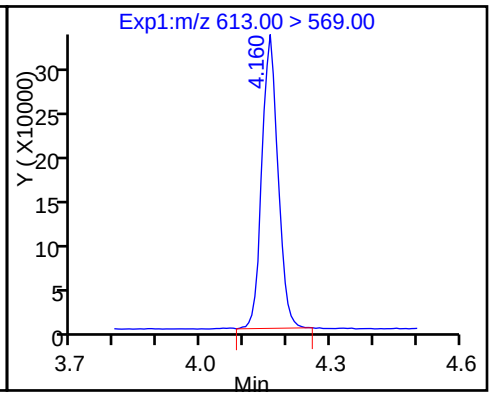
D 52 d-N-MeFOSA-M



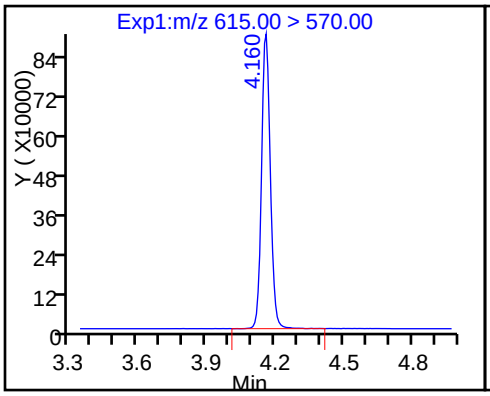
54 MeFOSA



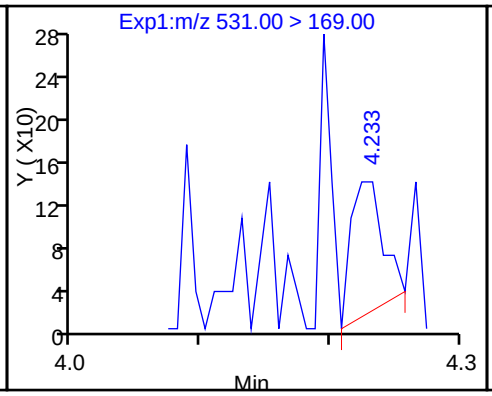
29 Perfluorododecanoic acid



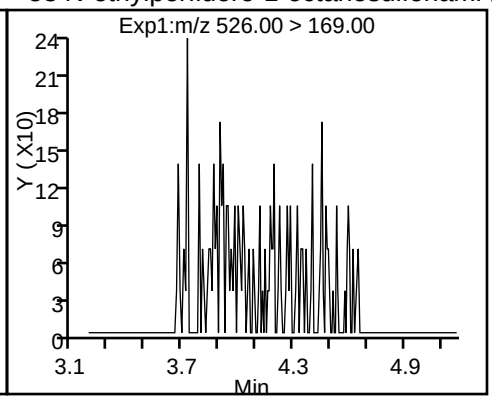
D 30 13C2 PFDoA



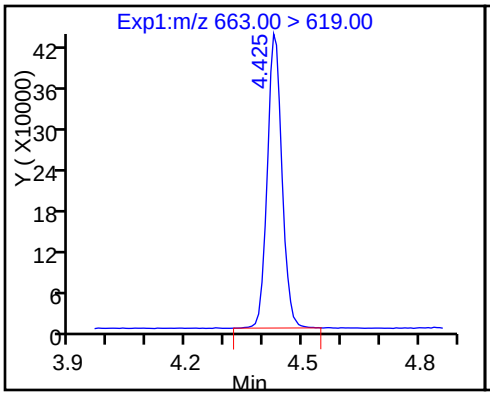
D 51 d-N-EtFOSA-M



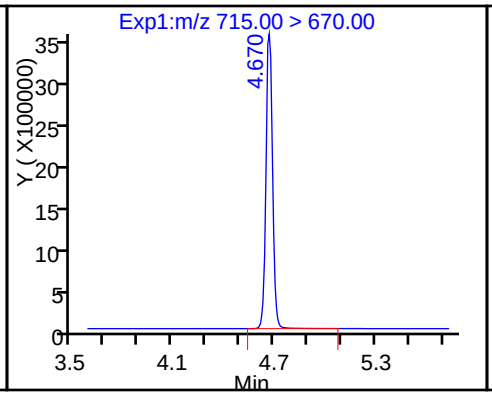
53 N-ethylperfluoro-1-octanesulfonami (ND)



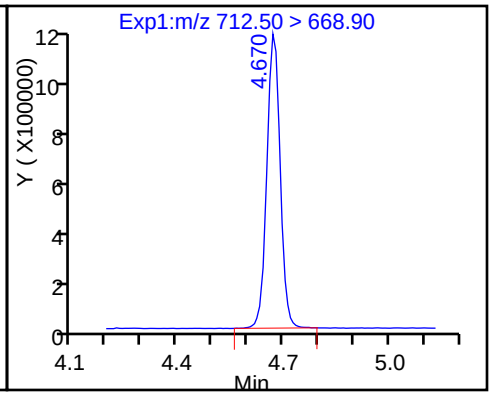
31 Perfluorotridecanoic acid



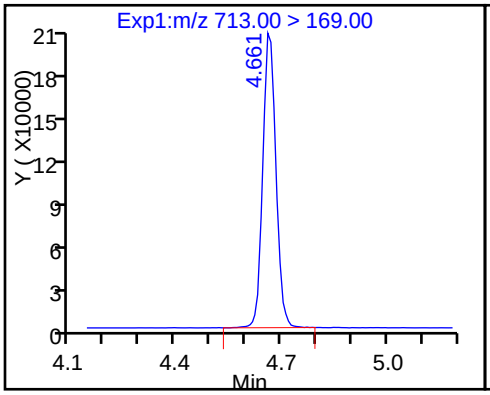
D 32 13C2-PFTeDA



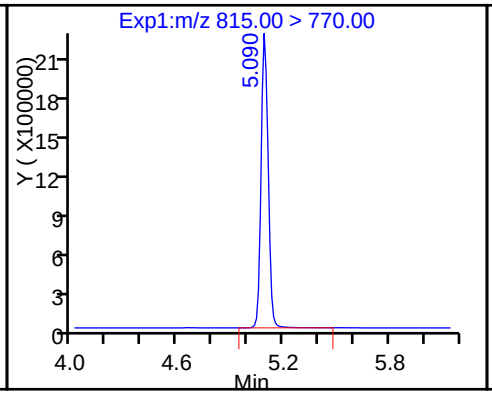
33 Perfluorotetradecanoic acid



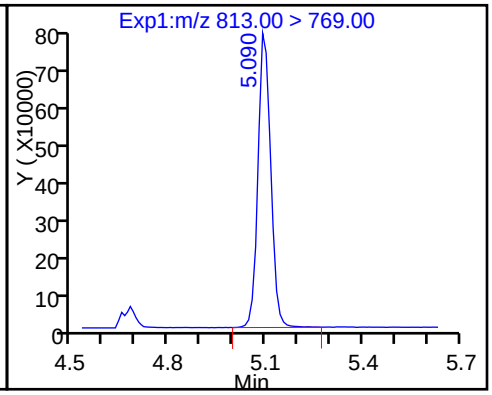
33 Perfluorotetradecanoic acid



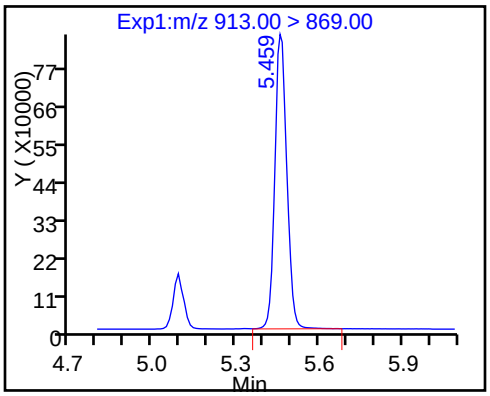
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

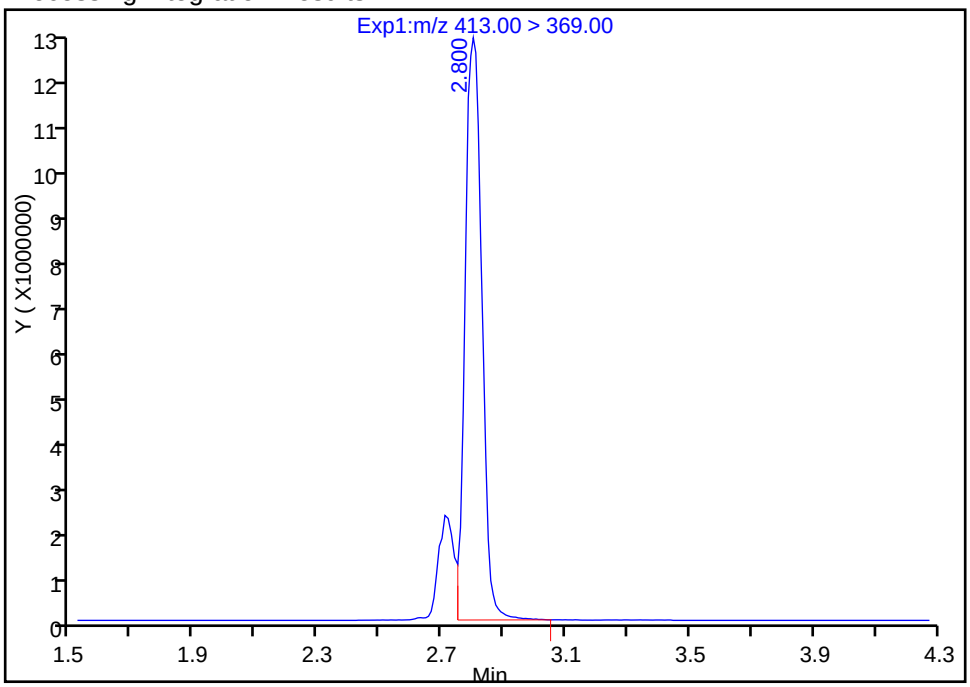
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_042.d				
Injection Date:	09-Dec-2016 16:32:14	Instrument ID:	A8_N		
Lims ID:	320-23830-A-3-B MS				
Client ID:	DPT-16-18-GW-21-25				
Operator ID:	A8-PC\A8	ALS Bottle#:	26	Worklist Smp#:	42
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

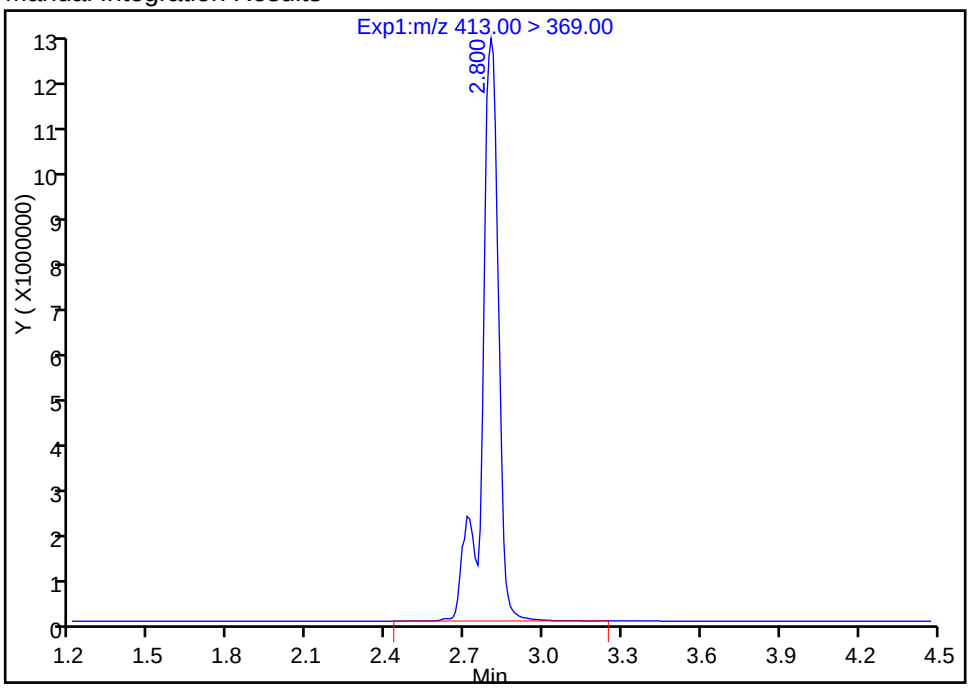
Processing Integration Results

RT: 2.80
Area: 45123422
Amount: 275.0066
Amount Units: ng/ml



Manual Integration Results

RT: 2.80
Area: 52825159
Amount: 321.9452
Amount Units: ng/ml



Reviewer: westendorfc, 11-Dec-2016 11:50:33

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23830-1

SDG No.:

Client Sample ID: DPT-16-18-GW-21-25 MS DL | Lab Sample ID: 320-23830-3 MS DL

Matrix: Water | Lab File ID: 12DEC2016C_008.d

Analysis Method: 537 (Modified) | Date Collected: 11/23/2016 11:40

Extraction Method: 3535 | Date Extracted: 11/29/2016 20:20

Sample wt/vol: 241.5(mL) | Date Analyzed: 12/12/2016 19:15

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 141834 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.882	D M 4	0.026	0.021	0.0077
1763-23-1	Perfluorooctane Sulfonate (PFOS)	1.98	D 4	0.041	0.031	0.013
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*0.149*	*D*	*0.026*	0.021	*0.0095*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	109		25-150
STL00991	13C4 PFOS	102		25-150
STL00994	18O2 PFHxS	107		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_008.d
Lims ID: 320-23830-A-3-B MS
Client ID: DPT-16-18-GW-21-25
Sample Type: MS
Inject. Date: 12-Dec-2016 19:15:15 ALS Bottle#: 49 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Sample Info: 320-23830-a-3-b ms 10X
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 14-Dec-2016 08:29:39 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: chandrasenas Date: 14-Dec-2016 08:23:15

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.526	1.534	-0.008		1445222	4.30		8.6	165452	
1 Perfluorobutyric acid										
212.90 > 169.00	1.526	1.534	-0.008	1.000	1304202	5.16		258	3885	
D 4 13C5-PFPeA										
267.90 > 223.00	1.801	1.810	-0.009		1551423	5.86		11.7	111071	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.801	1.810	-0.009	1.000	1840559	5.85		292	8149	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.839	1.849	-0.010	1.000	3847920	7.20		407		
298.90 > 99.00	1.839	1.849	-0.010	1.000	1572499		2.45(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.094	2.098	-0.004		1346117	5.67		11.3	136216	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.094	2.098	-0.004	1.000	6722536	26.2		1310	50848	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.415	2.424	-0.009	1.000	42581060	115.8		6362		
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.425	2.431	-0.006	1.000	906949	4.30		215	5220	
D 11 13C4-PFHpA										
367.00 > 322.00	2.425	2.431	-0.006		1025602	4.94		9.9	94797	
D 10 18O2 PFHxS										
403.00 > 84.00	2.440	2.446	-0.006		1584722	5.07		10.7	113590	
D 47 M2-6:2FTS										
429.00 > 409.00	2.759	2.758	0.001		12507	0.1185		0.0		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.759	2.766	-0.007	1.000	226447	NR		0.0		

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	2.790	2.791	-0.001	1.000	10867277	42.6		2130	73953	M
413.00 > 169.00	2.790	2.791	-0.001	1.000	6968499		1.56(0.90-1.10)		286184	
D 14 13C4 PFOA										
417.00 > 372.00	2.798	2.791	0.007		1189865	5.43		10.9	208091	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.790	2.799	-0.009	1.000	1183027	4.00		210		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.143	3.135	0.008	1.000	26130573	95.8		5163	231628	
499.00 > 99.00	3.159	3.135	0.024	1.005	5103970		5.12(0.90-1.10)		212985	
D 19 13C5 PFNA										
468.00 > 423.00	3.159	3.159	0.0		664546	3.99		8.0	54811	
D 17 13C4 PFOS										
503.00 > 80.00	3.159	3.159	0.0		1201126	4.88		10.2	29015	
20 Perfluorononanoic acid										
463.00 > 419.00	3.159	3.167	-0.008	1.000	658551	4.97		249	838	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.490	3.490	0.0	1.000	9766	2.08		104	1360	
D 21 13C8 FOSA										
506.00 > 78.00	3.498	3.490	0.008		25142	0.0625		0.1	2245	
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.507	3.509	-0.002	1.000	4844	NR		0.0		
D 42 M2-8:2FTS										
529.00 > 509.00	3.507	3.509	-0.002		520	0.005353		0.0		
24 Perfluorodecanoic acid										
513.00 > 469.00	3.524	3.524	0.0	1.000	143472	2.04		102	4012	
D 23 13C2 PFDA										
515.00 > 470.00	3.515	3.524	-0.009		365448	2.32		4.6	13106	
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.659	3.672	-0.013		1151	0.0159		0.0		
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.834	3.835	-0.001	1.000	263208	1.64		84.9		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.834	3.844	-0.010		2850	0.0358		0.0		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.843	3.853	-0.010	1.000	77281	1.68		84.0	1845	
D 27 13C2 PFUnA										
565.00 > 520.00	3.843	3.853	-0.010		215754	1.82		3.6	39575	
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.964	3.984	-0.020		940	0.008944		0.0		
D 30 13C2 PFDoA										
615.00 > 570.00	4.141	4.143	-0.002		221765	1.98		4.0	8683	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.148	4.150	-0.002	1.000	79726	1.89		94.7	1591	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.419	4.414	0.005	1.000	95049	2.26		113	2357	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.662	4.655	0.007	1.000	269466	3.28		164	2702	
713.00 > 169.00	4.653	4.655	-0.002	0.998	42854		6.29(0.00-0.00)		8209	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.653	4.655	-0.002		808794	3.50		7.0	100619	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.069	5.070	-0.001	1.000	206713	3.94		197	2030	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.069	5.070	-0.001		593302	4.57		9.1	56857	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.429	5.429	0.0	1.000	207438	4.71		236	2049	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Review Flags

M - Manually Integrated

Report Date: 14-Dec-2016 08:29:46 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_008.d

Injection Date: 12-Dec-2016 19:15:15 Instrument ID: A8_N

Lims ID: 320-23830-A-3-B MS

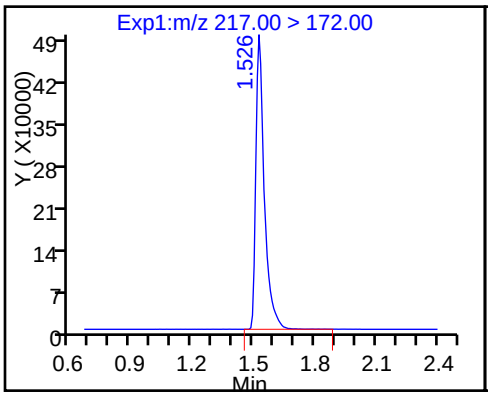
Client ID: DPT-16-18-GW-21-25

Operator ID: A8-PC\A8 ALS Bottle#: 49 Worklist Smp#: 8

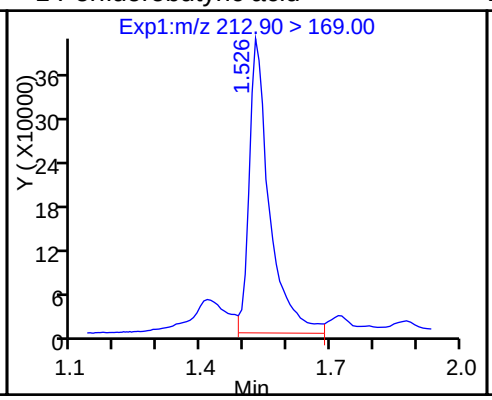
Injection Vol: 2.0 ul Dil. Factor: 10.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

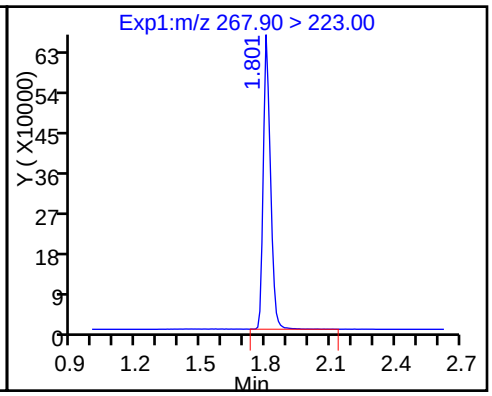
D 2 13C4 PFBA



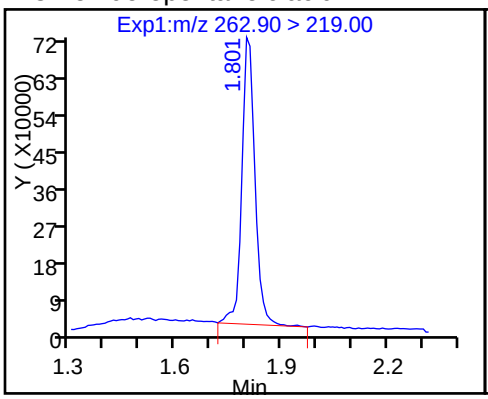
1 Perfluorobutyric acid



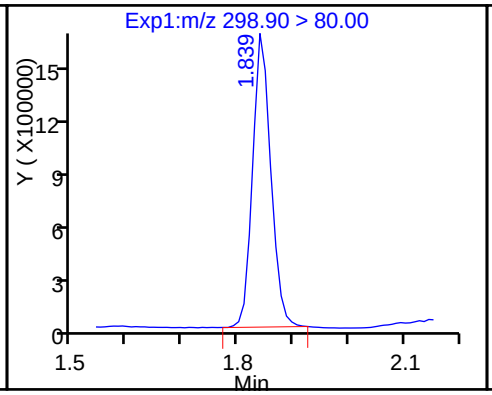
D 4 13C5-PFPeA



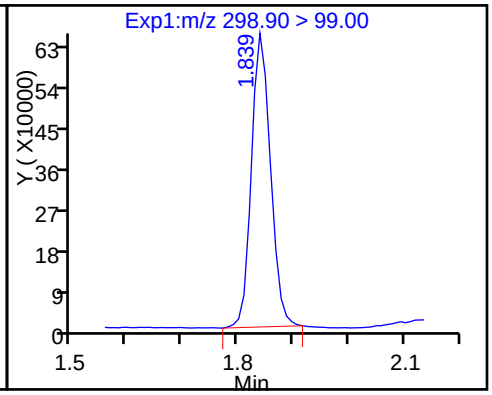
3 Perfluoropentanoic acid



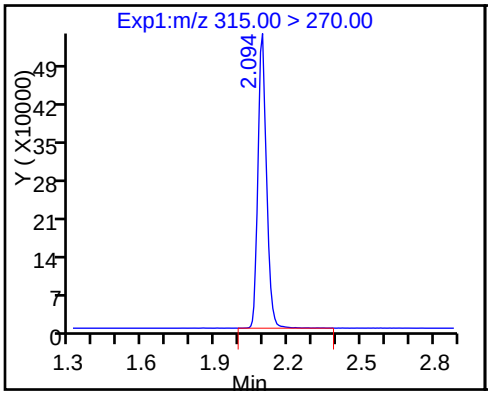
5 Perfluorobutanesulfonic acid



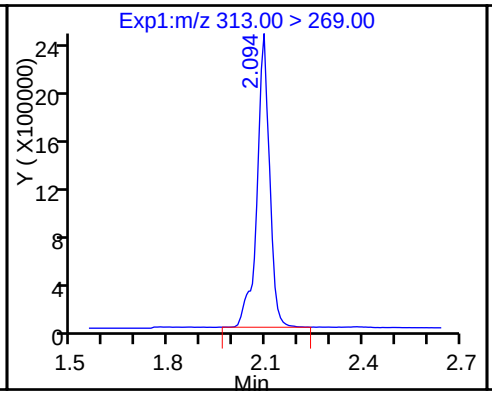
5 Perfluorobutanesulfonic acid



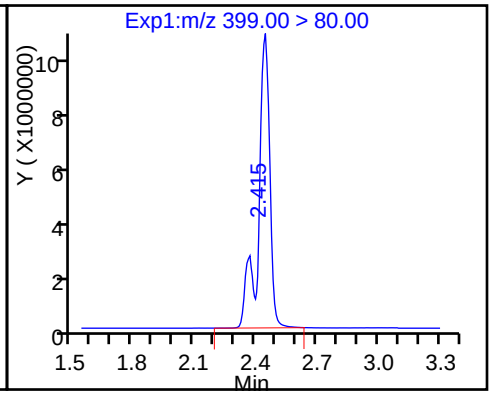
D 6 13C2 PFHxA



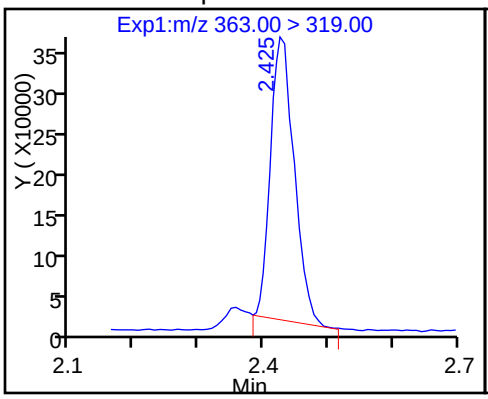
7 Perfluorohexanoic acid



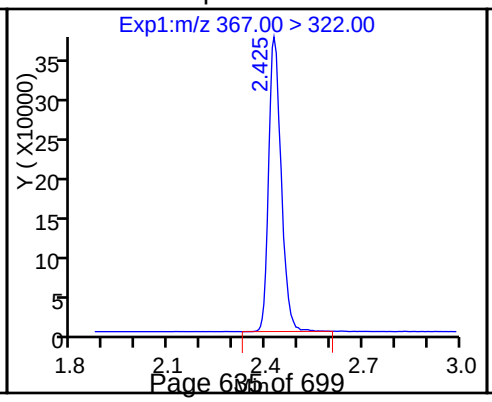
9 Perfluorohexanesulfonic acid



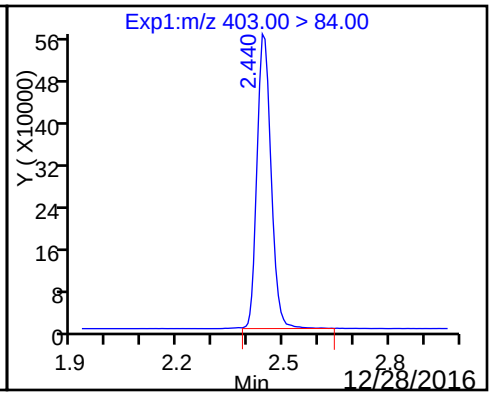
12 Perfluoroheptanoic acid



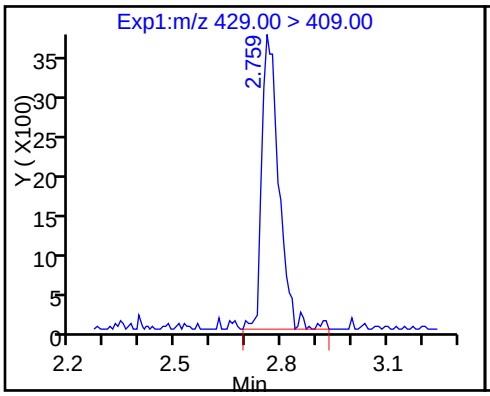
D 11 13C4-PFHpA



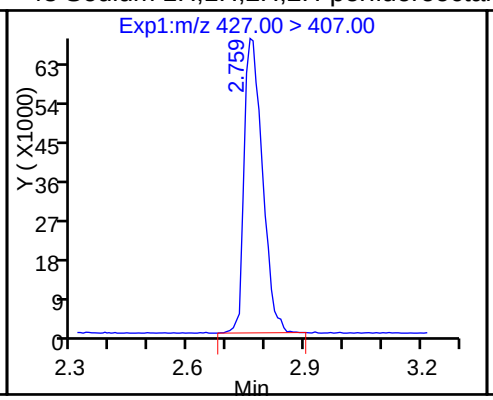
D 10 18O2 PFHxS



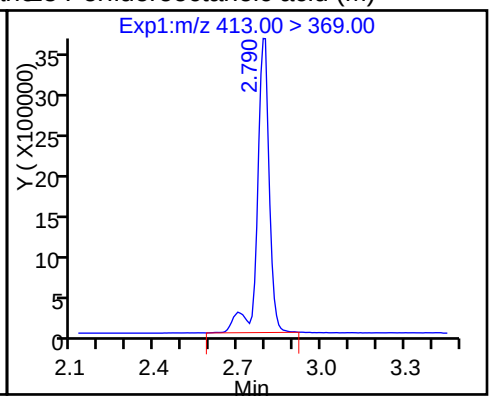
D 47 M2-6:2FTS



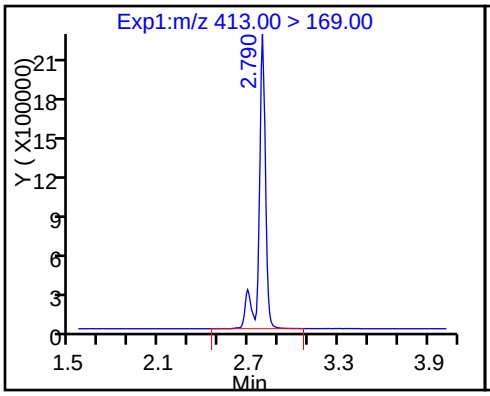
48 Sodium 1H,1H,2H,2H-perfluorooctane



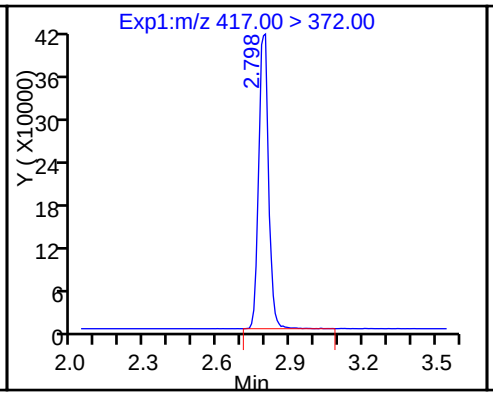
15 Perfluorooctanoic acid (M)



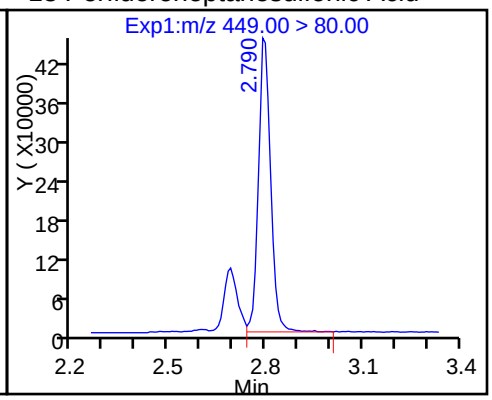
15 Perfluorooctanoic acid



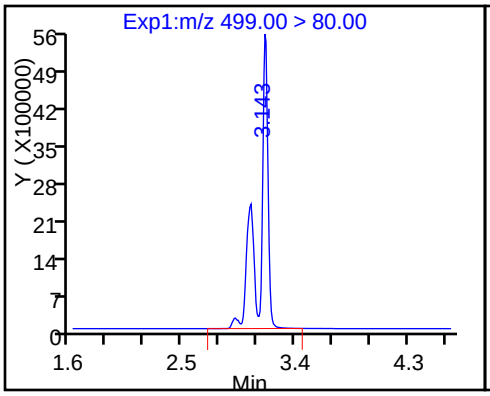
D 14 13C4 PFOA



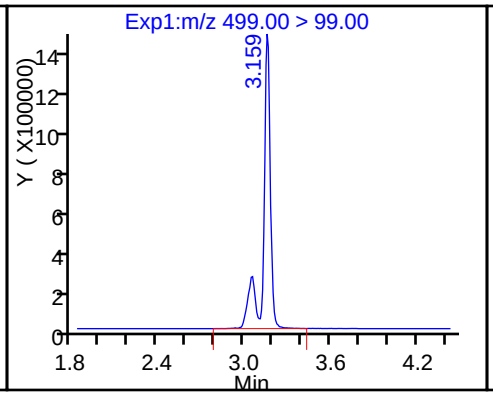
13 Perfluoroheptanesulfonic Acid



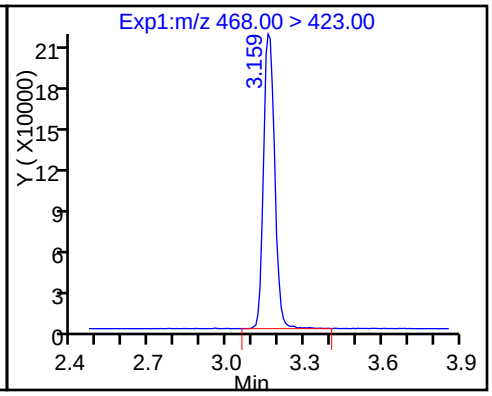
18 Perfluorooctane sulfonic acid



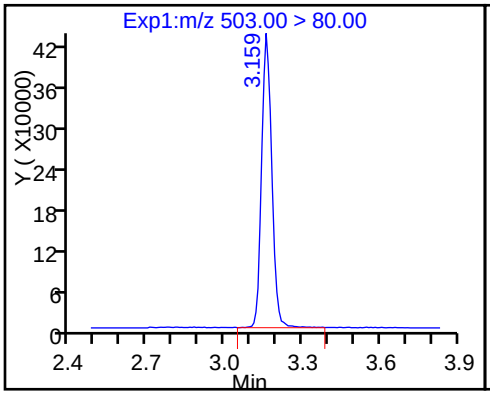
18 Perfluorooctane sulfonic acid



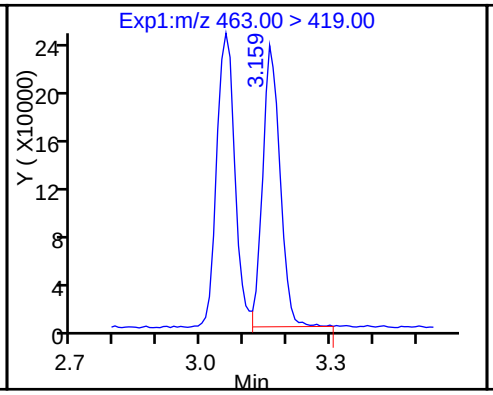
D 19 13C5 PFNA



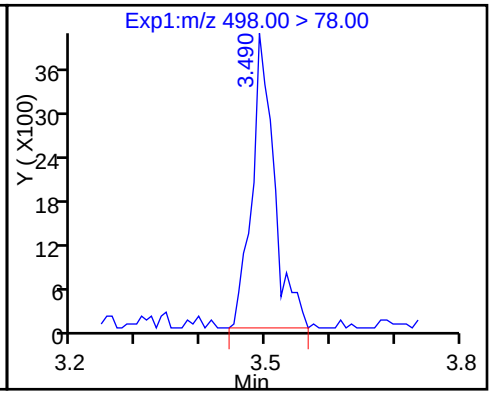
D 17 13C4 PFOS



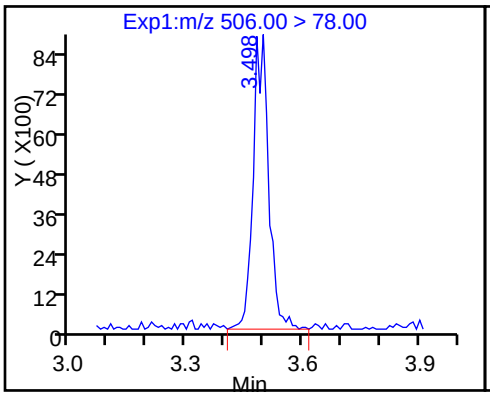
20 Perfluorononanoic acid



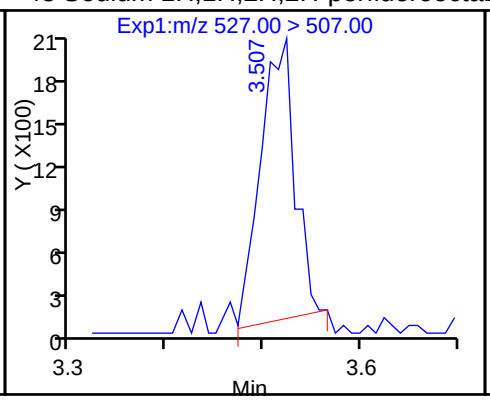
22 Perfluorooctane Sulfonamide



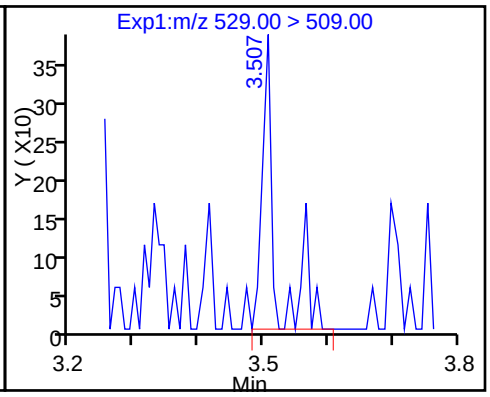
D 21 13C8 FOSA



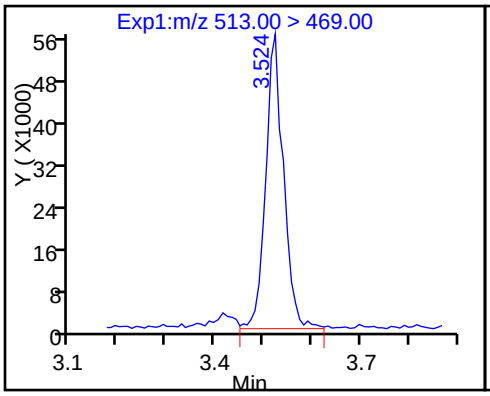
43 Sodium 1H,1H,2H,2H-perfluorooctane



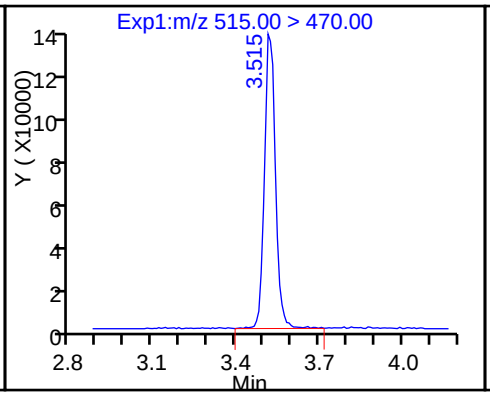
D 42 M2-8:2FTS



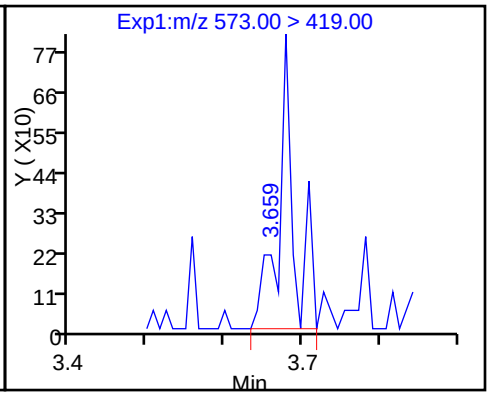
24 Perfluorodecanoic acid



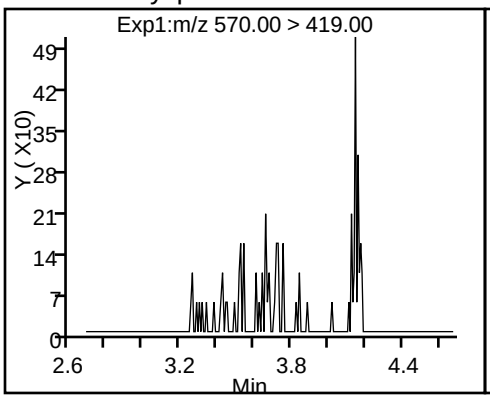
D 23 13C2 PFDA



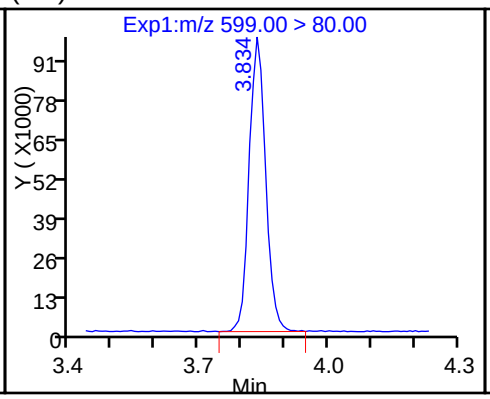
D 45 d3-NMeFOSAA



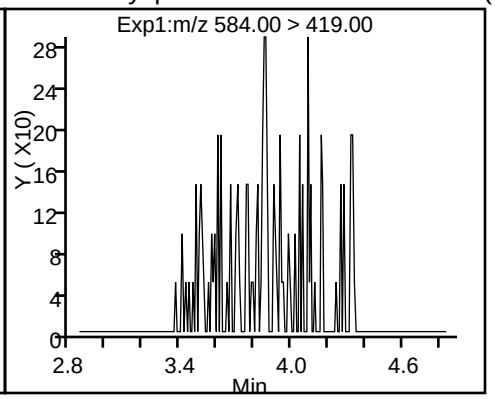
44 N-methyl perfluorooctane sulfonami (ND)



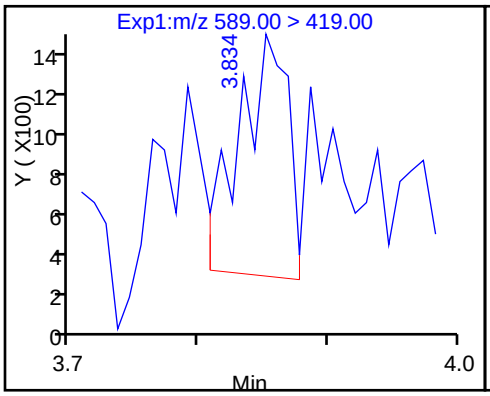
26 Perfluorodecane Sulfonic acid



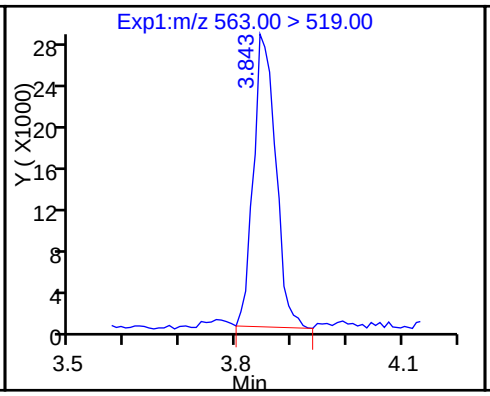
49 N-ethyl perfluorooctane sulfonamid (ND)



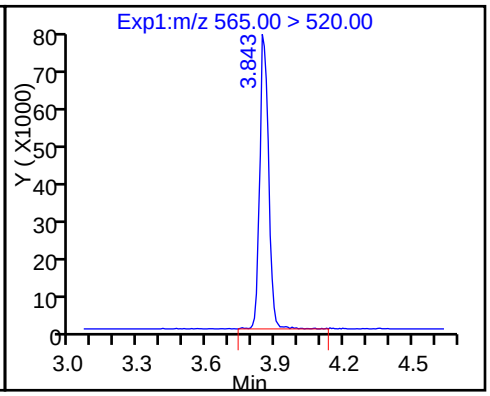
D 46 d5-NEtFOSAA



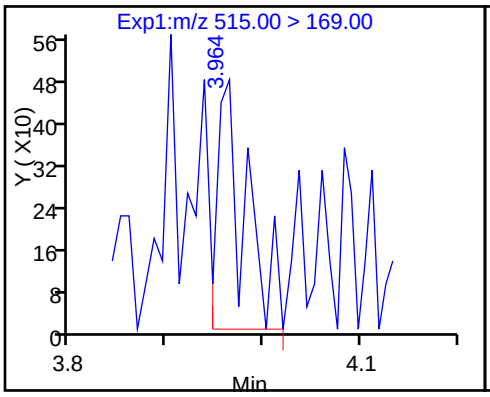
28 Perfluoroundecanoic acid



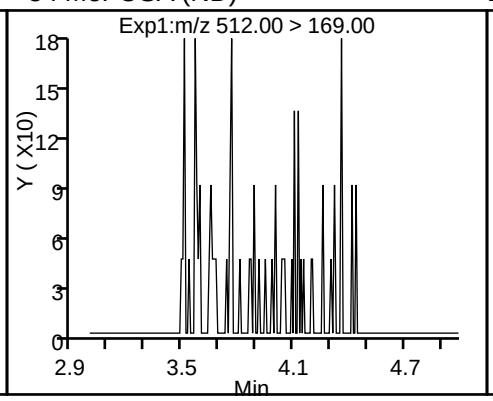
D 27 13C2 PFUnA



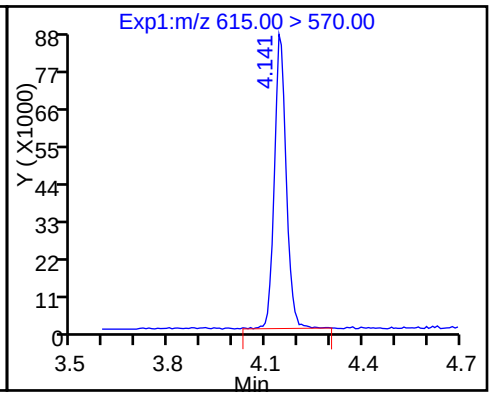
D 52 d-N-MeFOSA-M



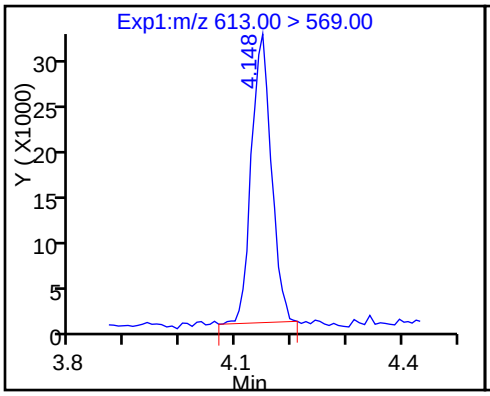
54 MeFOSA (ND)



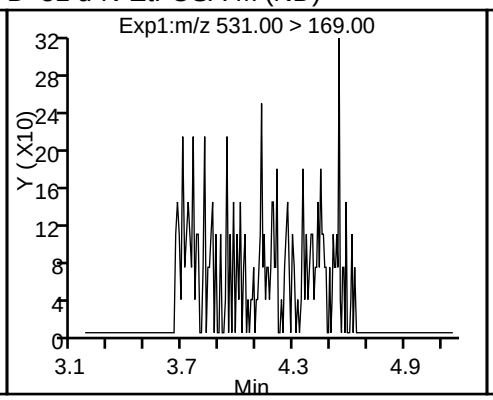
D 30 13C2 PFDoA



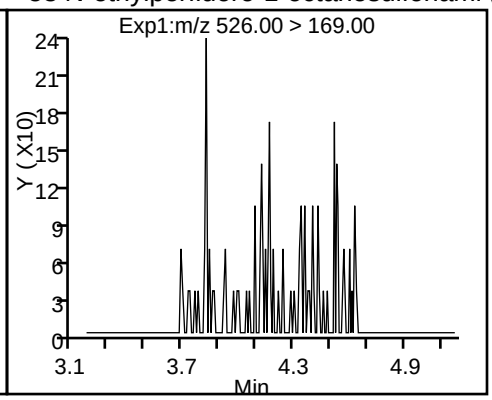
29 Perfluorododecanoic acid



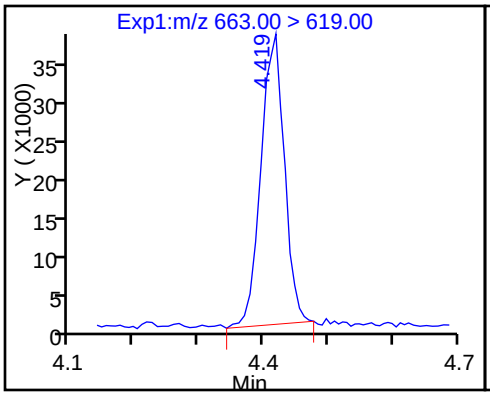
D 51 d-N-EtFOSA-M (ND)



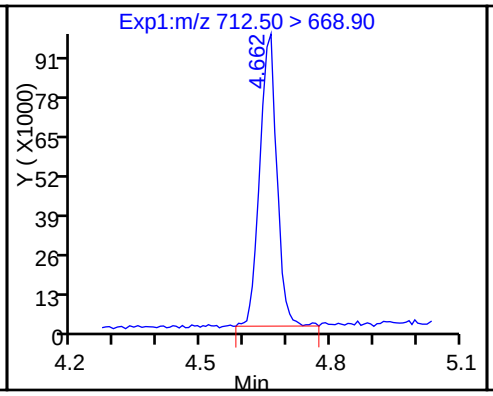
53 N-ethylperfluoro-1-octanesulfonami (ND)



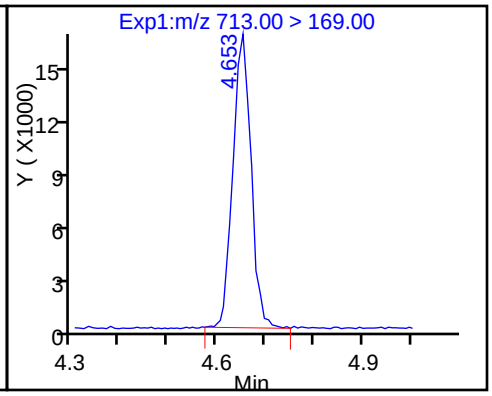
31 Perfluorotridecanoic acid



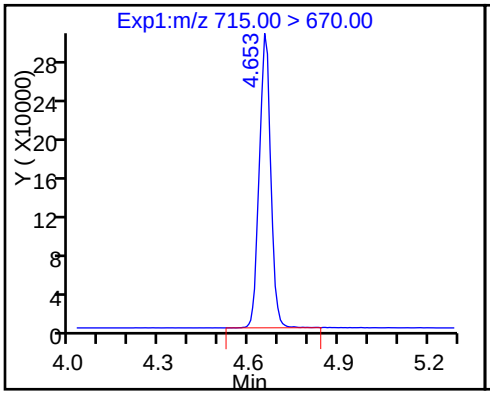
33 Perfluorotetradecanoic acid



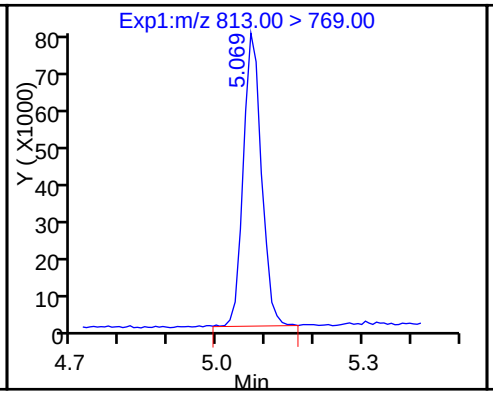
33 Perfluorotetradecanoic acid



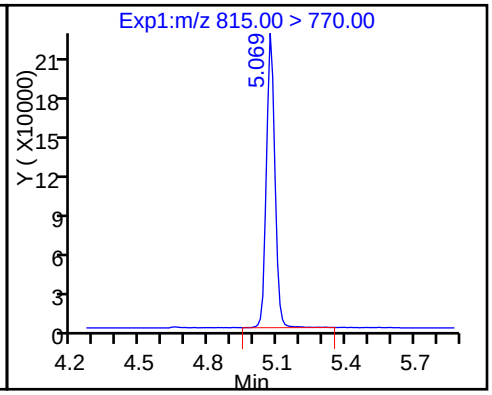
D 32 13C2-PFTeDA



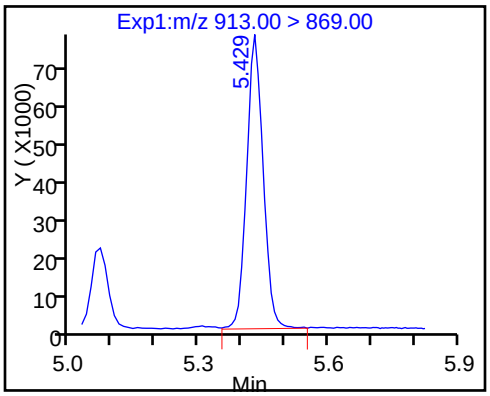
35 Perfluorohexadecanoic acid



D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

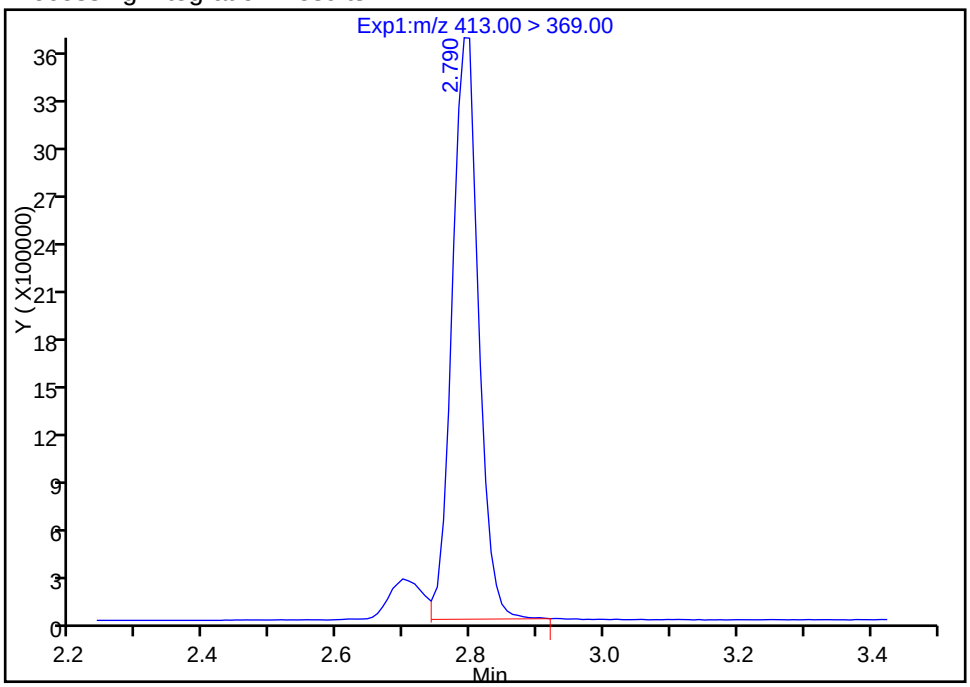
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_008.d				
Injection Date:	12-Dec-2016 19:15:15	Instrument ID:	A8_N		
Lims ID:	320-23830-A-3-B MS				
Client ID:	DPT-16-18-GW-21-25				
Operator ID:	A8-PC\A8	ALS Bottle#:	49	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

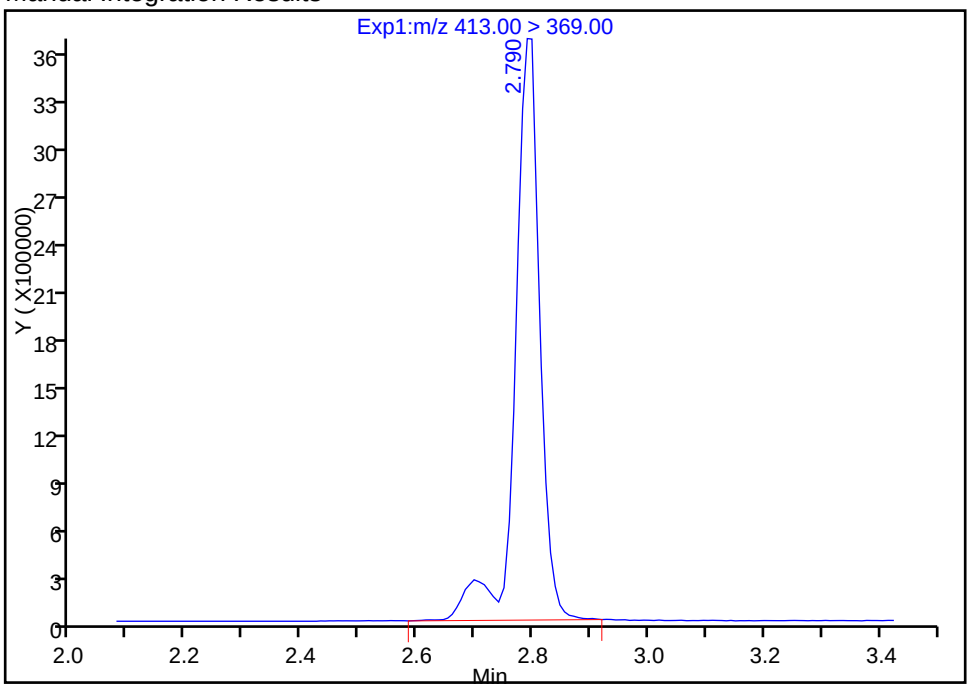
Processing Integration Results

RT: 2.79
Area: 9984286
Amount: 39.140732
Amount Units: ng/ml



Manual Integration Results

RT: 2.79
Area: 10867277
Amount: 42.602262
Amount Units: ng/ml



Reviewer: chandrasenas, 14-Dec-2016 08:23:15

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23830-1

SDG No.:

Client Sample ID: DPT-16-18-GW-21-25 MSD | Lab Sample ID: 320-23830-3 MSD

Matrix: Water | Lab File ID: 09DEC2016A_043.d

Analysis Method: 537 (Modified) | Date Collected: 11/23/2016 11:40

Extraction Method: 3535 | Date Extracted: 11/29/2016 20:20

Sample wt/vol: 224.4(mL) | Date Analyzed: 12/09/2016 16:39

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 141453 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	*Perfluorooctanoic acid (PFOA)*	*0.684*	*E 4 M*	*0.0028*	0.0022	*0.00083*
1763-23-1	*Perfluorooctane Sulfonate (PFOS)*	*1.56*	*E 4*	*0.0045*	0.0033	*0.0014*
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.184		0.0028	0.0022	0.0010

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	68		25-150
STL00991	13C4 PFOS	75		25-150
STL00994	18O2 PFHxS	61		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_043.d
Lims ID: 320-23830-A-3-C MSD
Client ID: DPT-16-18-GW-21-25
Sample Type: MSD
Inject. Date: 09-Dec-2016 16:39:45 ALS Bottle#: 27 Worklist Smp#: 43
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-23830-a-3-c msd
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 11-Dec-2016 11:57:49 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: westendorfc Date: 11-Dec-2016 11:51:13

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.533	1.537	-0.004		6647310	19.8		39.6	530311	
1 Perfluorobutyric acid										
212.90 > 169.00	1.533	1.545	-0.012	1.000	5617843	48.3		242	5017	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.813	-0.003		10282409	38.9		77.7	400147	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.813	-0.003	1.000	10931241	52.4		262	20256	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.848	1.852	-0.004	1.000	24941004	82.6		467		
298.90 > 99.00	1.848	1.852	-0.004	1.000	11595792		2.15(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.095	2.103	-0.008		9593478	40.4		80.8	595773	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.103	2.103	0.0	1.000	35967901	196.7		983	52065	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.372	2.431	-0.059	1.000	23635363	113.9		626		
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.427	2.438	-0.011	1.000	5331750	43.6		218	9458	
D 11 13C4-PFHpA										
367.00 > 322.00	2.427	2.453	-0.026		5953284	28.7		57.4	294073	
D 10 18O2 PFHxS										
403.00 > 84.00	2.453	2.460	-0.007		8945043	28.6		60.5	373923	
D 47 M2-6:2FTS										
429.00 > 409.00	2.767	2.765	0.002		66815	0.6331		0.0		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.767	2.765	0.002	1.000	1163533	NR		0.0		
D 14 13C4 PFOA										
417.00 > 372.00	2.798	2.805	-0.007		7481533	34.1		68.2	354188	

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	2.798	2.805	-0.007	1.000	49209188	306.8		1534	330546	EM
413.00 > 169.00	2.798	2.805	-0.007	1.000	36686712		1.34(0.90-1.10)		0.0	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.806	2.805	0.001	1.000	9892980	45.6		239		
18 Perfluorooctane sulfonic acid										E
499.00 > 80.00	3.047	3.150	-0.103	1.000	140258893	701.2		3778	352552	E
499.00 > 99.00	3.167	3.150	0.017	1.039	34393629		4.08(0.90-1.10)		646722	
D 17 13C4 PFOS										
503.00 > 80.00	3.167	3.166	0.001		8810976	35.8		74.9	71615	
D 19 13C5 PFNA										
468.00 > 423.00	3.175	3.174	0.001		3899689	23.4		46.9	277094	
20 Perfluorononanoic acid										
463.00 > 419.00	3.175	3.174	0.001	1.000	3726258	48.0		240	854	
D 21 13C8 FOSA										
506.00 > 78.00	3.490	3.489	0.001		331080	0.8230		1.6	42878	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.490	3.498	-0.008	1.000	123362	19.9		99.7	7418	
D 42 M2-8:2FTS										
529.00 > 509.00	3.284	3.519	-0.235		298	0.003068		0.0		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.515	3.519	-0.004	1.070	48282	NR		0.0		
24 Perfluorodecanoic acid										
513.00 > 469.00	3.532	3.531	0.001	1.000	1384205	20.4		102	16375	
D 23 13C2 PFDA										
515.00 > 470.00	3.532	3.531	0.001		3538309	22.4		44.8	186946	
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.583	3.683	-0.100		319	0.004398		0.0		
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.844	3.842	0.002	1.000	2941708	24.9		129		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.826	3.847	-0.021		2551	0.0320		0.0		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.861	3.859	0.002	1.000	834319	16.8		84.1	16714	
D 27 13C2 PFUnA										
565.00 > 520.00	3.861	3.859	0.002		2327146	19.6		39.2	286866	
D 52 d-N-MeFOSA-M										
515.00 > 169.00	4.003	3.990	0.013		1488	0.0142		0.0		
29 Perfluorododecanoic acid										
613.00 > 569.00	4.155	4.149	0.006	1.000	989427	19.3		96.3	24598	
D 30 13C2 PFDoA										
615.00 > 570.00	4.155	4.156	-0.001		2707877	24.2		48.3	127652	
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.119	4.175	-0.056		297	0.002995		0.0		
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.426	4.414	0.012	1.000	1451072	28.2		141	32433	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.670	4.664	0.006		11564070	50.0		100	636345	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.670	4.664	0.006	1.000	3569904	35.6		178	50003	
713.00 > 169.00	4.662	4.664	-0.002	0.998	627876		5.69(0.00-0.00)		81911	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.090	5.081	0.009		6057197	46.7		93.4	315459	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.090	5.081	0.009	1.000	2109085	38.5		192	6412	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.452	5.444	0.008	1.000	1496787	27.8		139	2405	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 11-Dec-2016 11:58:04 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_043.d

Injection Date: 09-Dec-2016 16:39:45 Instrument ID: A8_N

Lims ID: 320-23830-A-3-C MSD

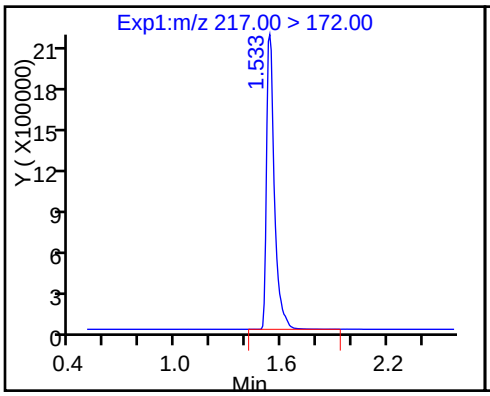
Client ID: DPT-16-18-GW-21-25

Operator ID: A8-PC\A8 ALS Bottle#: 27 Worklist Smp#: 43

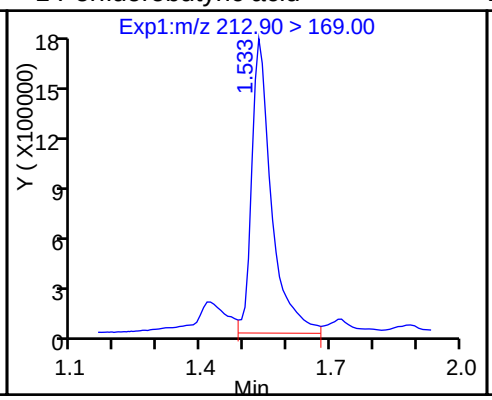
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

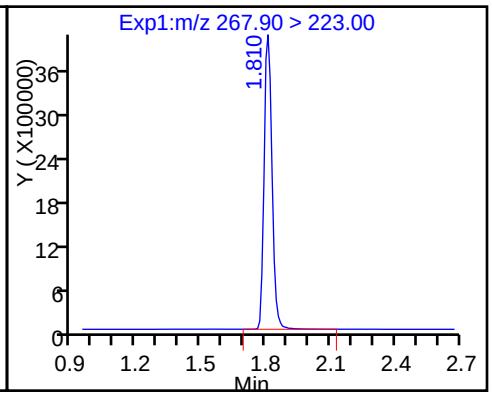
D 2 13C4 PFBA



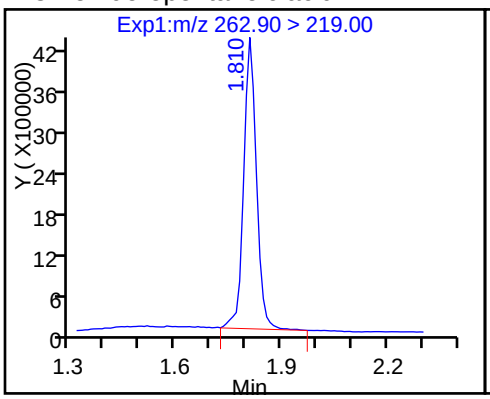
1 Perfluorobutyric acid



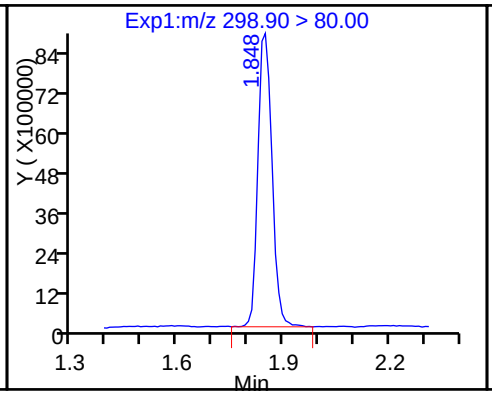
D 4 13C5-PFPeA



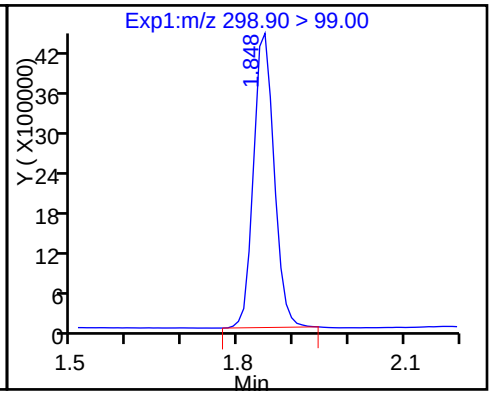
3 Perfluoropentanoic acid



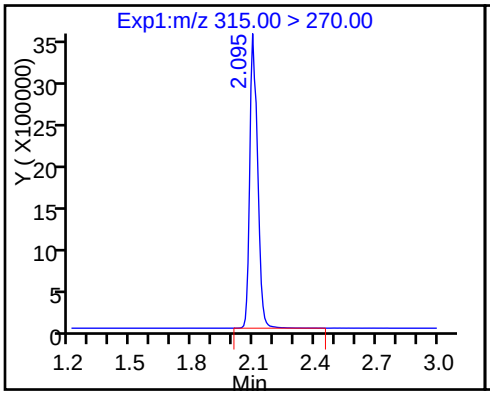
5 Perfluorobutanesulfonic acid



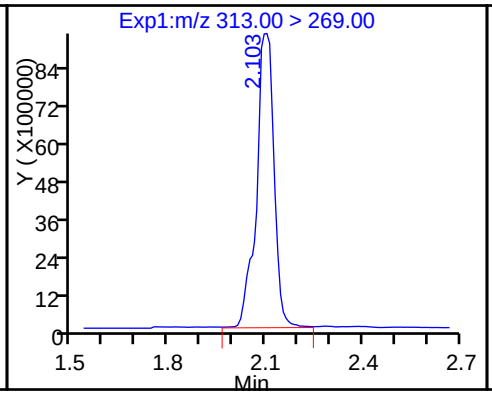
5 Perfluorobutanesulfonic acid



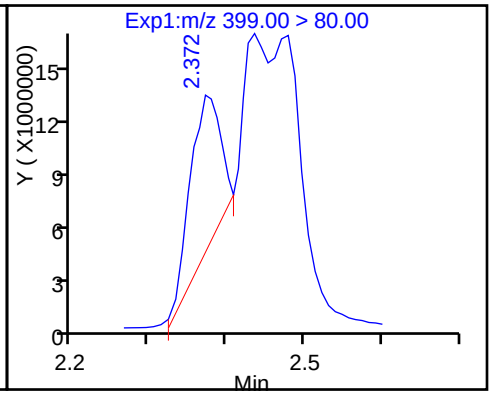
D 6 13C2 PFHxA



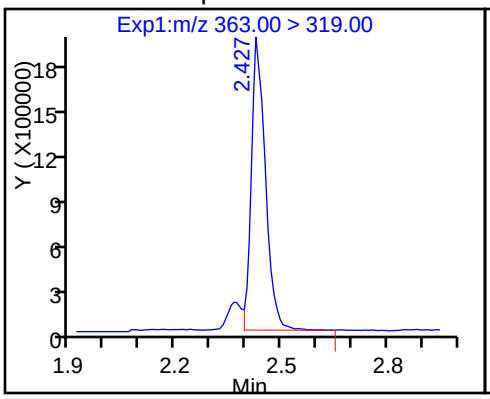
7 Perfluorohexanoic acid



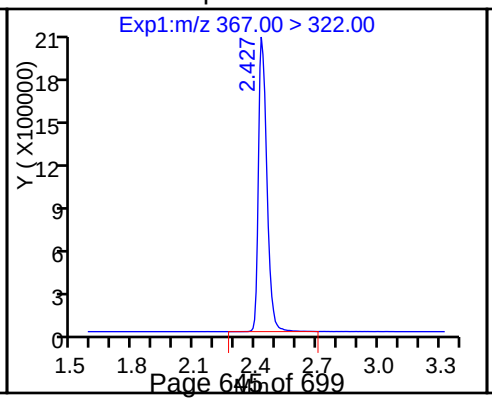
9 Perfluorohexanesulfonic acid



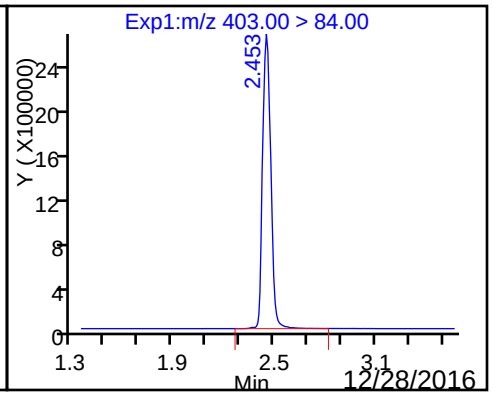
12 Perfluoroheptanoic acid



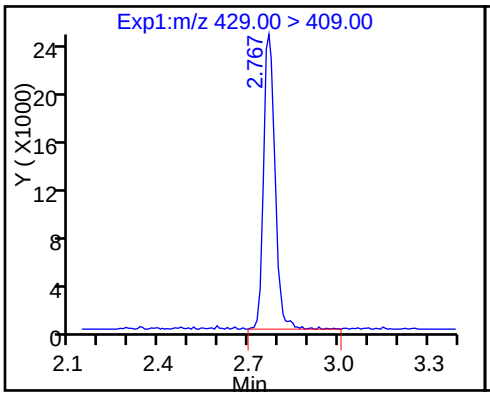
D 11 13C4-PFHpA



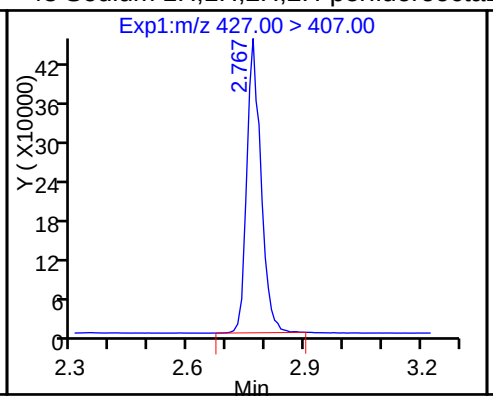
D 10 18O2 PFHxS



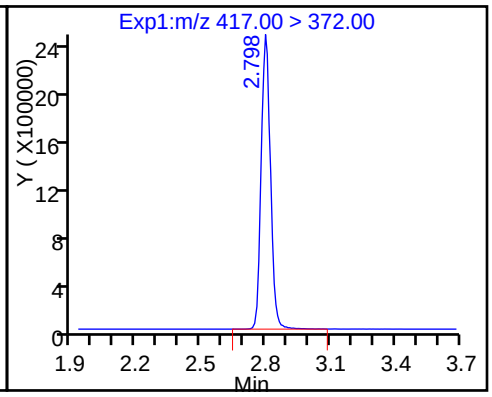
D 47 M2-6:2FTS



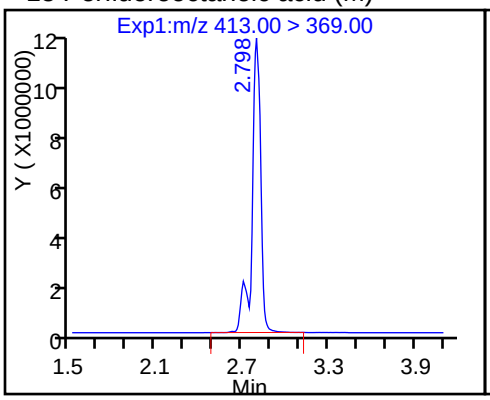
48 Sodium 1H,1H,2H,2H-perfluorooctane



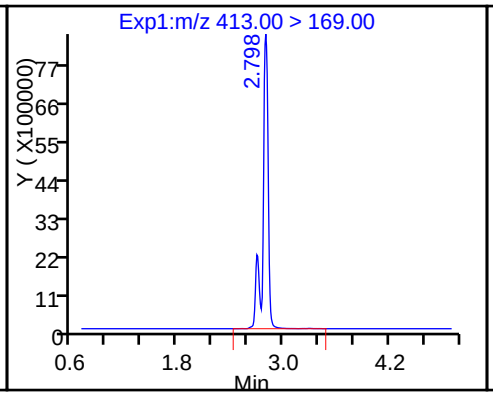
D 14 13C4 PFOA



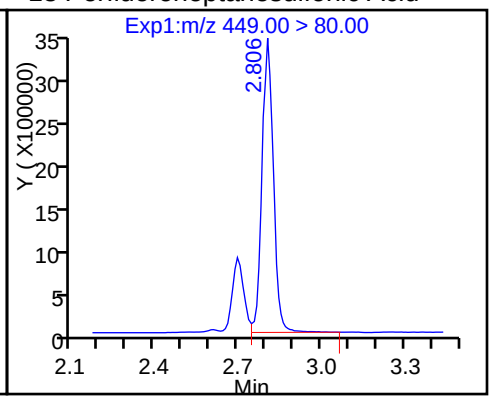
15 Perfluorooctanoic acid (M)



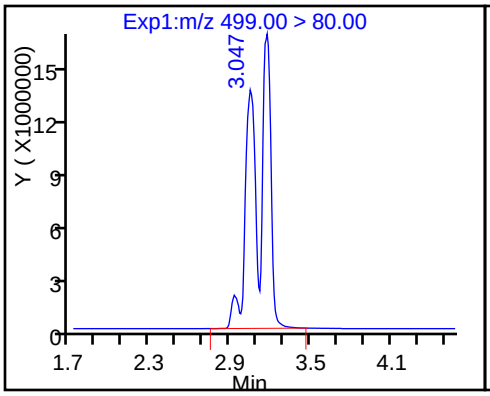
15 Perfluorooctanoic acid



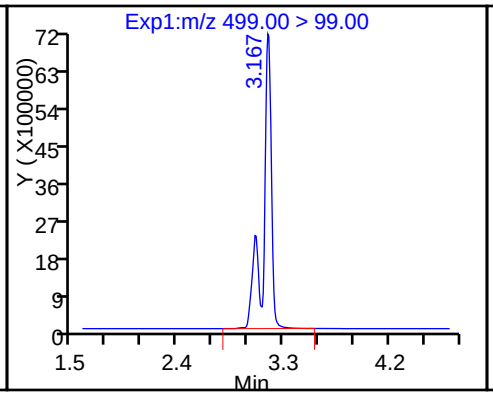
13 Perfluoroheptanesulfonic Acid



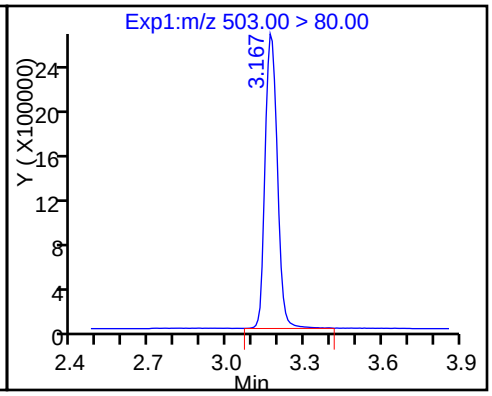
18 Perfluorooctane sulfonic acid



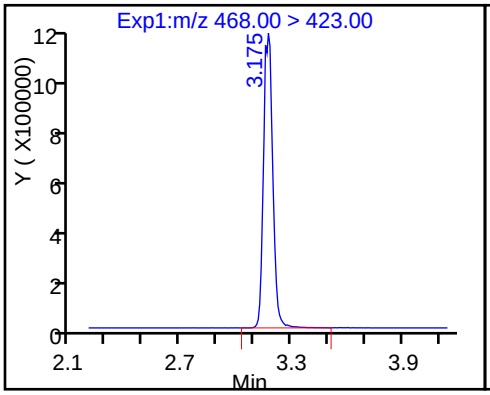
18 Perfluorooctane sulfonic acid



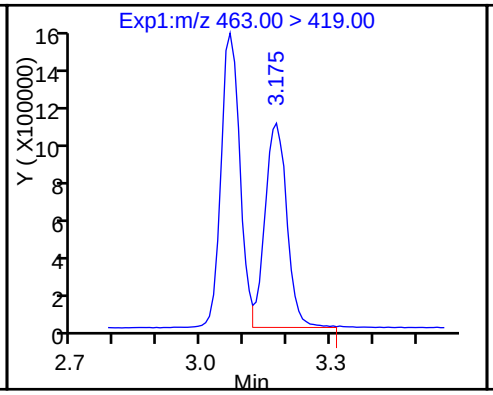
D 17 13C4 PFOS



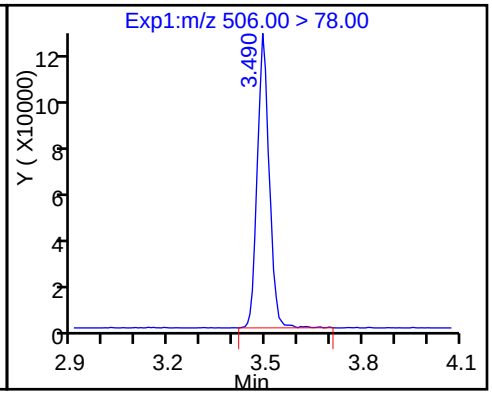
D 19 13C5 PFNA



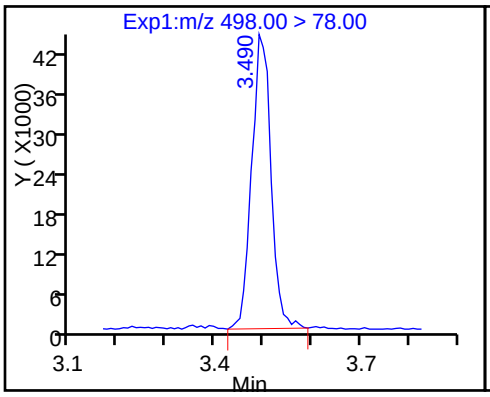
20 Perfluorononanoic acid



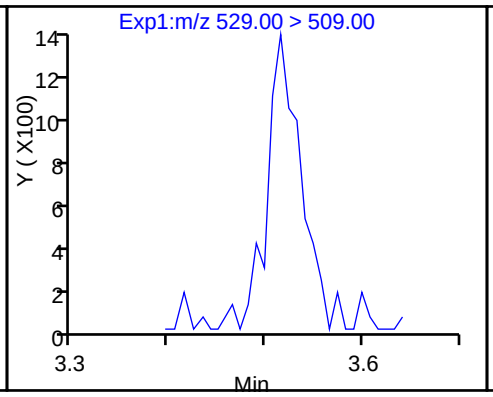
D 21 13C8 FOSA



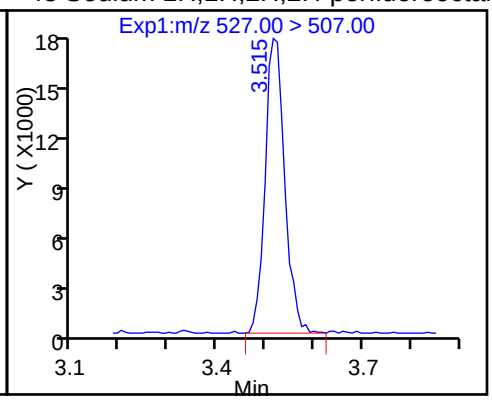
22 Perfluorooctane Sulfonamide



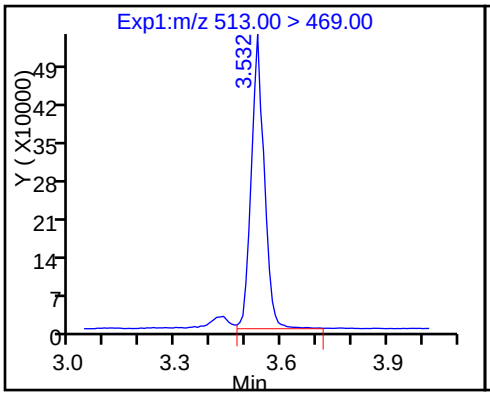
D 42 M2-8:2FTS



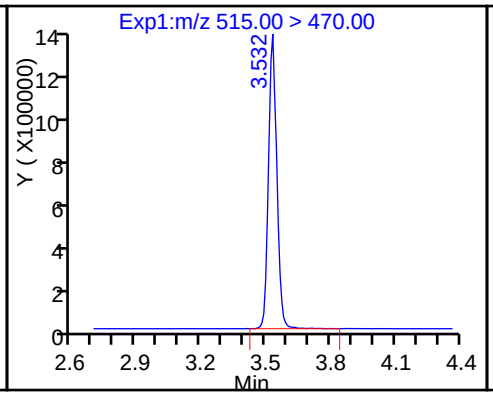
43 Sodium 1H,1H,2H,2H-perfluorooctane



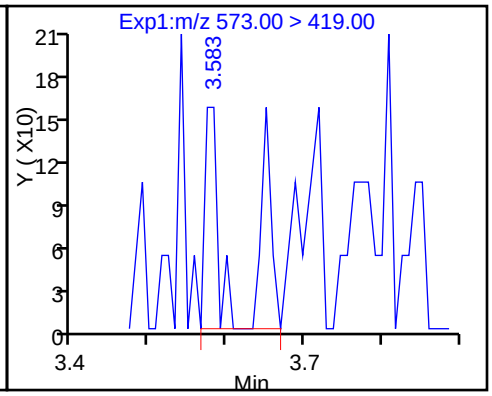
24 Perfluorodecanoic acid



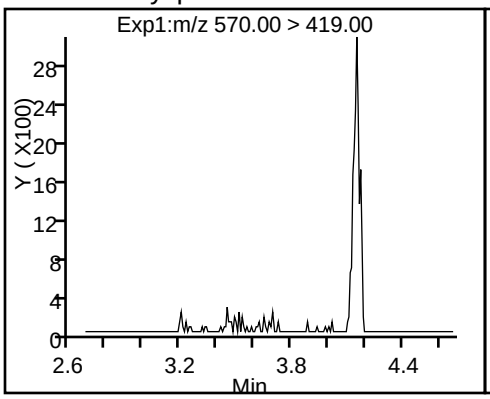
D 23 13C2 PFDA



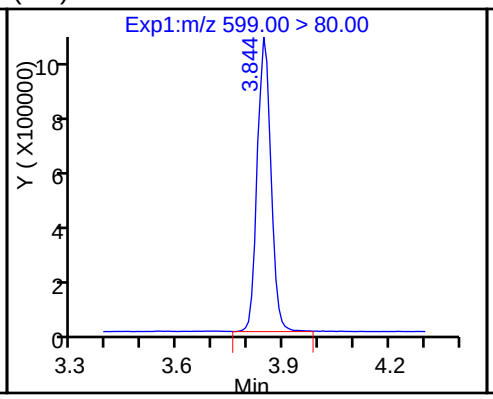
D 45 d3-NMeFOSAA



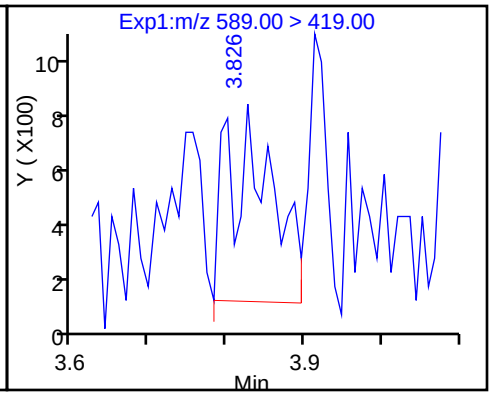
44 N-methyl perfluorooctane sulfonami (N)



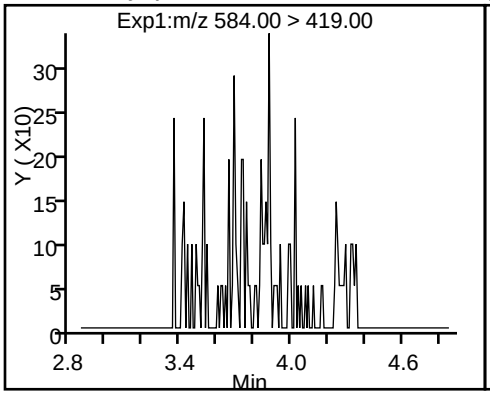
26 Perfluorodecane Sulfonic acid



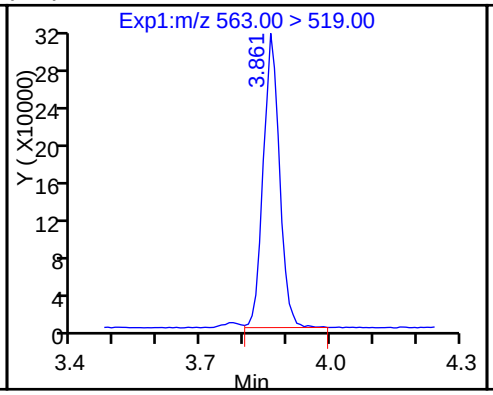
D 46 d5-NEtFOSAA



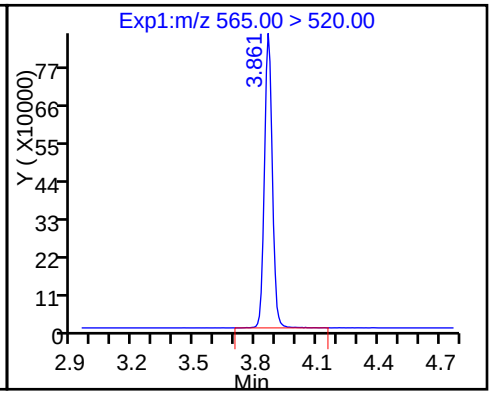
49 N-ethyl perfluorooctane sulfonamid (N)



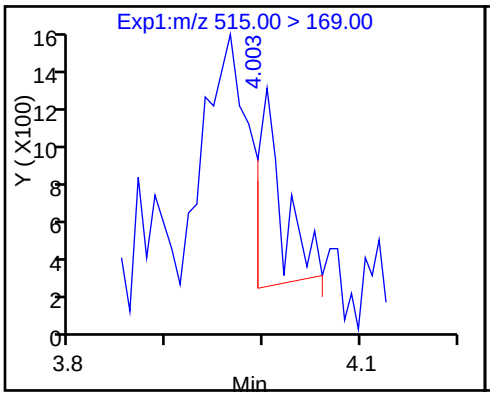
28 Perfluoroundecanoic acid



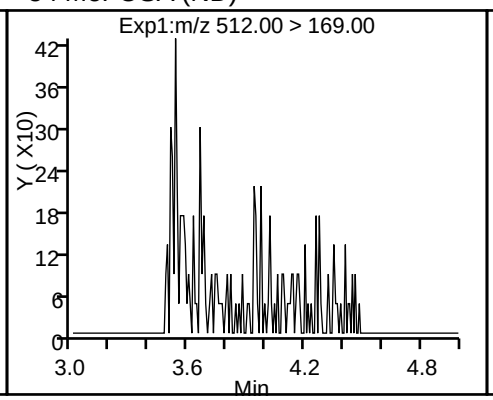
D 27 13C2 PFUnA



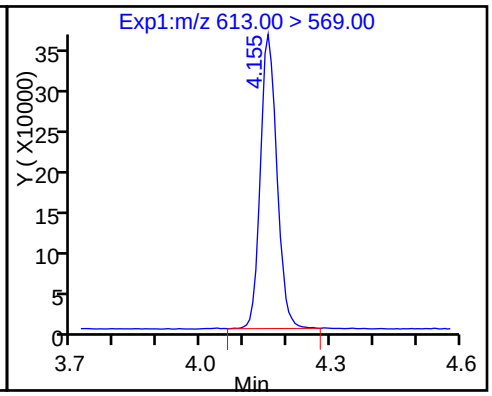
D 52 d-N-MeFOSA-M



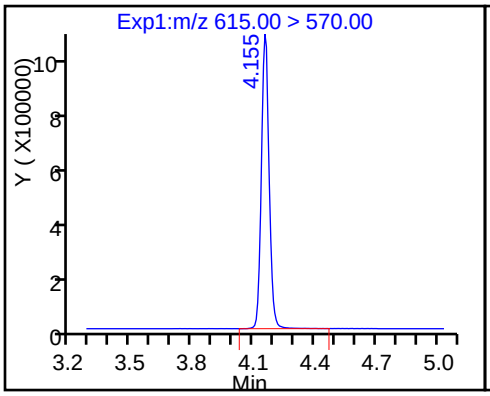
54 MeFOSA (ND)



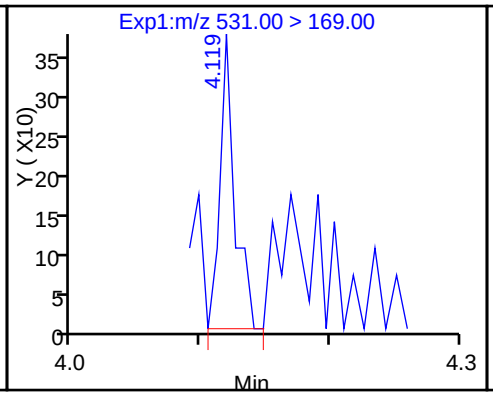
29 Perfluorododecanoic acid



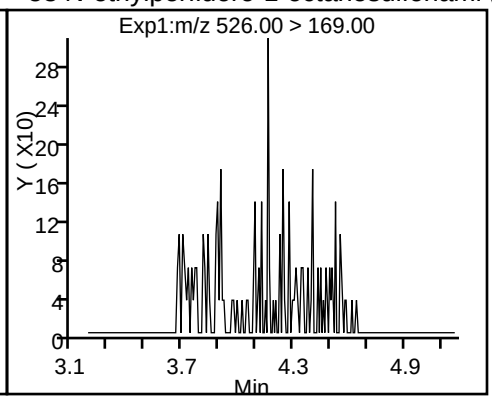
D 30 13C2 PFDoA



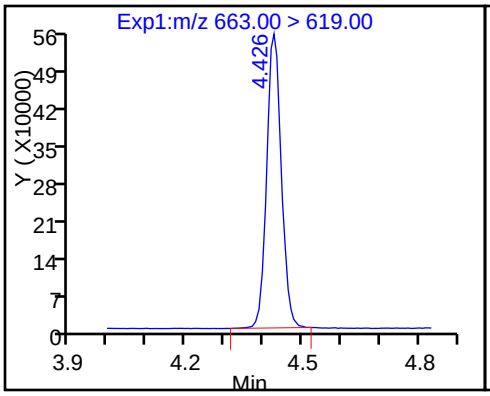
D 51 d-N-EtFOSA-M



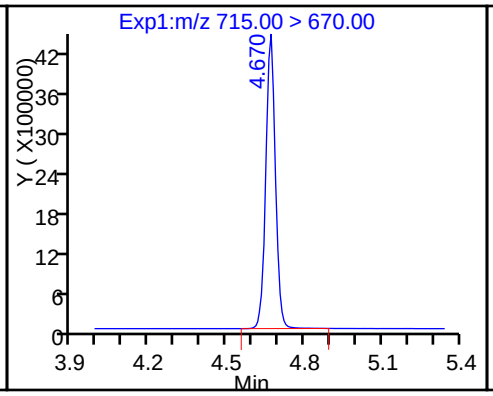
53 N-ethylperfluoro-1-octanesulfonami (ND)



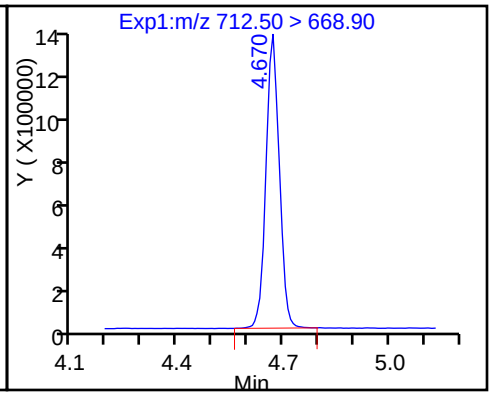
31 Perfluorotridecanoic acid



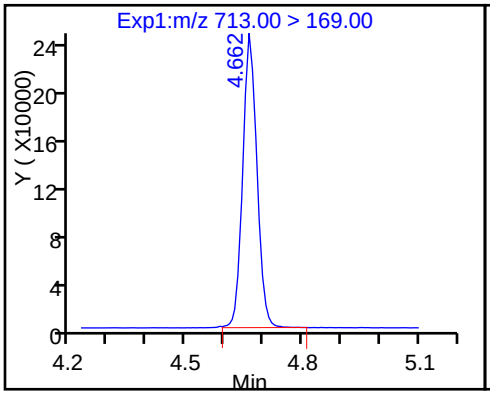
D 32 13C2-PFTeDA



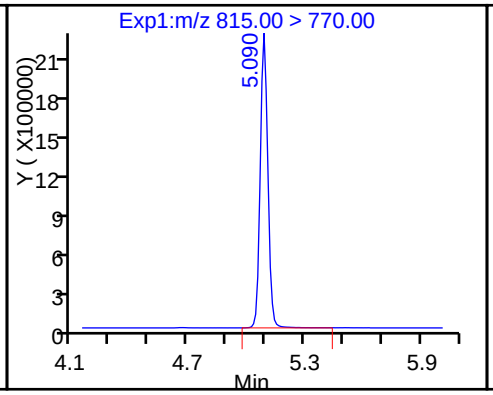
33 Perfluorotetradecanoic acid



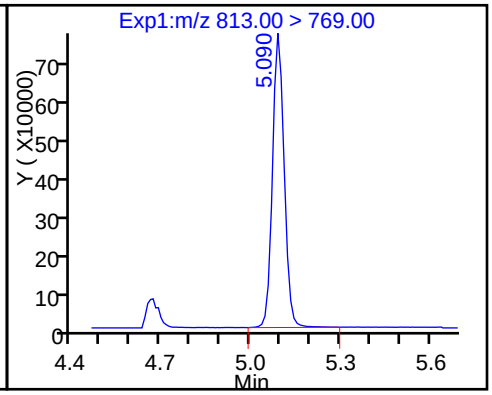
33 Perfluorotetradecanoic acid



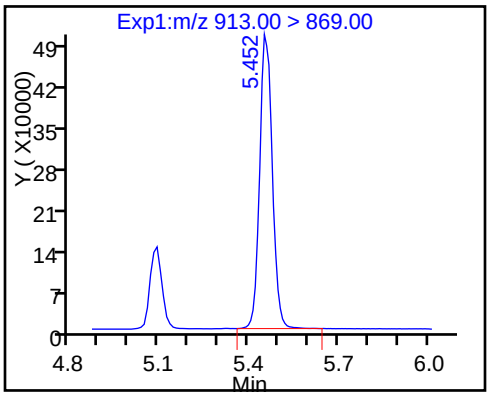
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

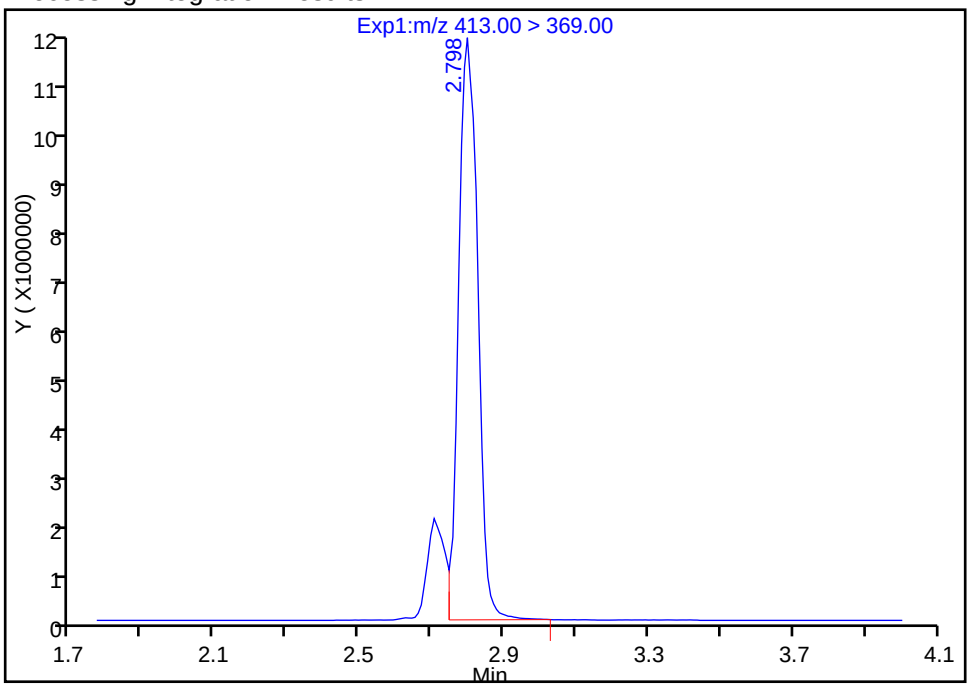
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b\09DEC2016A_043.d				
Injection Date:	09-Dec-2016 16:39:45	Instrument ID:	A8_N		
Lims ID:	320-23830-A-3-C MSD				
Client ID:	DPT-16-18-GW-21-25				
Operator ID:	A8-PC\A8	ALS Bottle#:	27	Worklist Smp#:	43
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

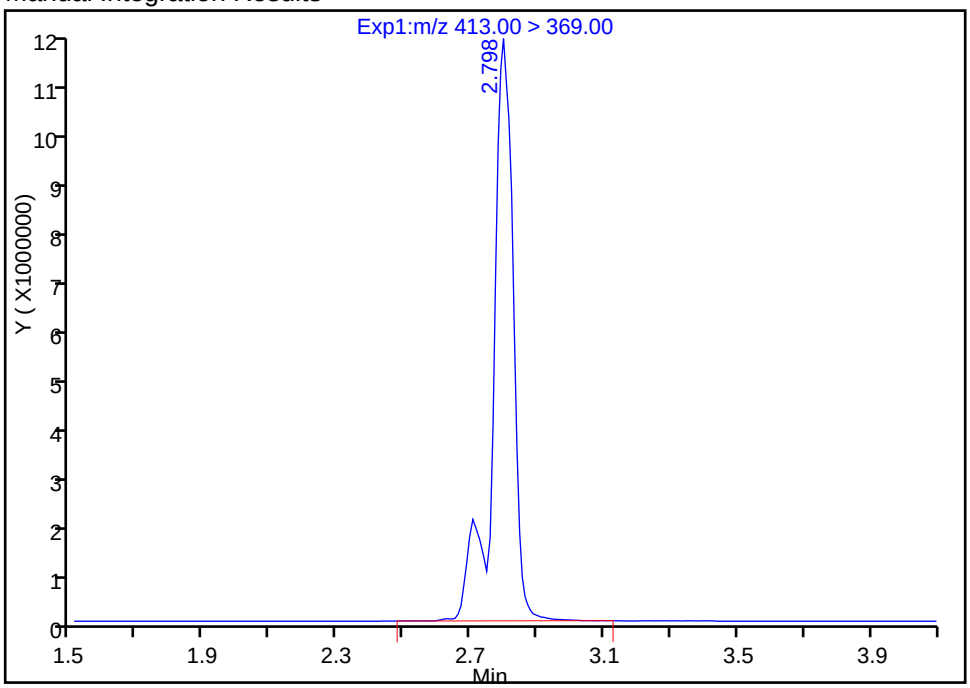
Processing Integration Results

RT: 2.80
Area: 42419227
Amount: 264.4733
Amount Units: ng/ml



Manual Integration Results

RT: 2.80
Area: 49209188
Amount: 306.8070
Amount Units: ng/ml



Reviewer: westendorfc, 11-Dec-2016 11:51:13

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23830-1

SDG No.:

Client Sample ID: DPT-16-18-GW-21-25 MSD DL | Lab Sample ID: 320-23830-3 MSD DL

Matrix: Water | Lab File ID: 12DEC2016C_009.d

Analysis Method: 537 (Modified) | Date Collected: 11/23/2016 11:40

Extraction Method: 3535 | Date Extracted: 11/29/2016 20:20

Sample wt/vol: 224.4(mL) | Date Analyzed: 12/12/2016 19:22

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 141834 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.857	D M 4	0.028	0.022	0.0083
1763-23-1	Perfluorooctane Sulfonate (PFOS)	1.89	D 4	0.045	0.033	0.014
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*0.148*	*D*	*0.028*	0.022	*0.010*

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	110		25-150
STL00991	13C4 PFOS	110		25-150
STL00994	18O2 PFHxS	113		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_009.d
Lims ID: 320-23830-A-3-C MSD
Client ID: DPT-16-18-GW-21-25
Sample Type: MSD
Inject. Date: 12-Dec-2016 19:22:46 ALS Bottle#: 50 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Sample Info: 320-23830-a-3-c msd 10X
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 14-Dec-2016 08:29:39 Calib Date: 03-Dec-2016 15:33:40
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK003

First Level Reviewer: chandrasenas Date: 14-Dec-2016 08:23:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.529	1.534	-0.005		1505759	4.48		9.0	165264	
1 Perfluorobutyric acid										
212.90 > 169.00	1.529	1.534	-0.005	1.000	1290947	4.90		245	4047	
D 4 13C5-PFPeA										
267.90 > 223.00	1.804	1.810	-0.006		1590535	6.01		12.0	131711	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.804	1.810	-0.006	1.000	1723389	5.34		267	7492	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.842	1.849	-0.007	1.000	3763910	6.65		376		
298.90 > 99.00	1.842	1.849	-0.007	1.000	1549774		2.43(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.092	2.098	-0.006		1334917	5.62		11.2	135138	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.092	2.098	-0.006	1.000	6026223	23.7		1184	53000	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.414	2.424	-0.010	1.000	40704048	104.6		5750		
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.432	2.431	0.001	1.000	864424	3.98		199	5811	
D 11 13C4-PFHpA										
367.00 > 322.00	2.425	2.431	-0.006		1058487	5.10		10.2	199598	
D 10 18O2 PFHxS										
403.00 > 84.00	2.447	2.446	0.001		1676279	5.37		11.3	198077	
D 47 M2-6:2FTS										
429.00 > 409.00	2.768	2.758	0.010		13054	0.1237		0.0		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.760	2.766	-0.006	1.000	216532	NR		0.0		

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	2.791	2.791	0.0	1.000	9986505	38.5		1924	76804	M
413.00 > 169.00	2.791	2.791	0.0	1.000	6506014		1.53(0.90-1.10)		293998	
D 14 13C4 PFOA										
417.00 > 372.00	2.791	2.791	0.0		1210631	5.52		11.0	92959	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.799	2.799	0.0	1.000	1156258	3.63		191		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.048	3.135	-0.087	1.000	24848903	84.6		4560	175022	
499.00 > 99.00	3.136	3.135	0.001	1.029	4800022		5.18(0.90-1.10)		83938	
D 19 13C5 PFNA										
468.00 > 423.00	3.167	3.159	0.008		656387	3.94		7.9	72874	
D 17 13C4 PFOS										
503.00 > 80.00	3.160	3.159	0.001		1293182	5.26		11.0	38412	
20 Perfluorononanoic acid										
463.00 > 419.00	3.160	3.167	-0.007	1.000	646431	4.94		247	1044	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.499	3.490	0.009	1.000	13189	2.08		104	1524	
D 21 13C8 FOSA										
506.00 > 78.00	3.499	3.490	0.009		33903	0.0843		0.2	6340	
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.508	3.509	-0.001	1.000	5054	NR		0.0		
24 Perfluorodecanoic acid										
513.00 > 469.00	3.524	3.524	0.0	1.000	141790	2.08		104	3071	
D 23 13C2 PFDA										
515.00 > 470.00	3.524	3.524	0.0		355497	2.25		4.5	12453	
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.661	3.672	-0.011		1121	0.0155		0.0		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.729	3.681	0.048	1.019	250	NR		0.0		
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.836	3.835	0.001	1.000	282560	1.63		84.7		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.827	3.844	-0.017		1959	0.0246		0.0		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.853	3.853	0.0	1.000	78560	1.75		87.5	1767	
D 27 13C2 PFUnA										
565.00 > 520.00	3.853	3.853	0.0		210662	1.77		3.5	41876	
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.957	3.984	-0.027		360	0.003425		0.0		
D 30 13C2 PFDoA										
615.00 > 570.00	4.141	4.143	-0.002		250572	2.24		4.5	9017	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.141	4.150	-0.009	1.000	93081	1.96		97.9	1865	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.411	4.414	-0.003	1.000	118972	2.50		125	2669	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.652	4.655	-0.003	1.000	328611	3.54		177	4154	
713.00 > 169.00	4.652	4.655	-0.003	1.000	52302		6.28(0.00-0.00)		9879	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.652	4.655	-0.003		960315	4.15		8.3	180922	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.068	5.070	-0.002	1.000	202633	3.32		166	1870	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.068	5.070	-0.002		577837	4.45		8.9	58223	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.428	5.429	-0.001	1.000	140244	2.82		141	1383	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Review Flags

M - Manually Integrated

Report Date: 14-Dec-2016 08:29:47 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_009.d

Injection Date: 12-Dec-2016 19:22:46 Instrument ID: A8_N

Lims ID: 320-23830-A-3-C MSD

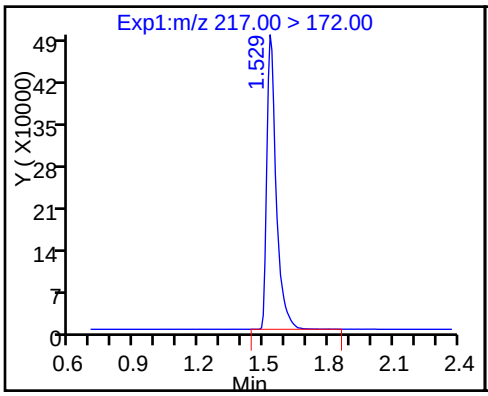
Client ID: DPT-16-18-GW-21-25

Operator ID: A8-PC\A8 ALS Bottle#: 50 Worklist Smp#: 9

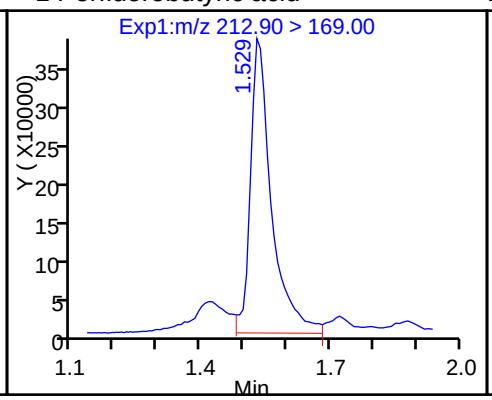
Injection Vol: 2.0 ul Dil. Factor: 10.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

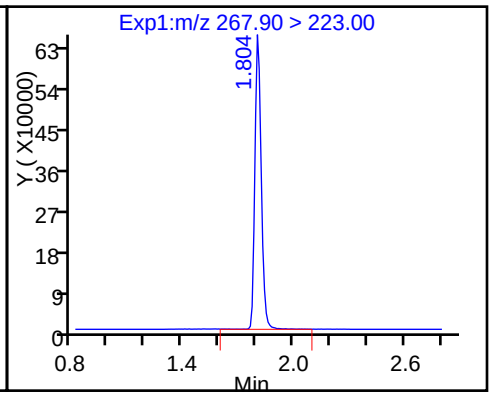
D 2 13C4 PFBA



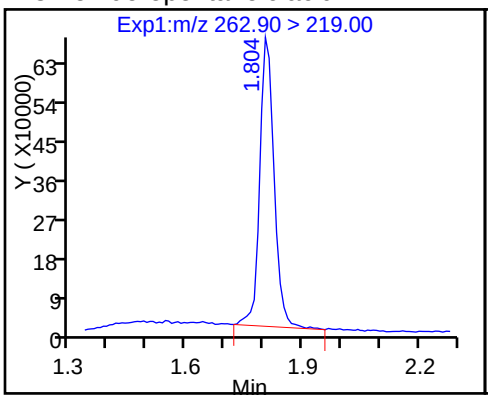
1 Perfluorobutyric acid



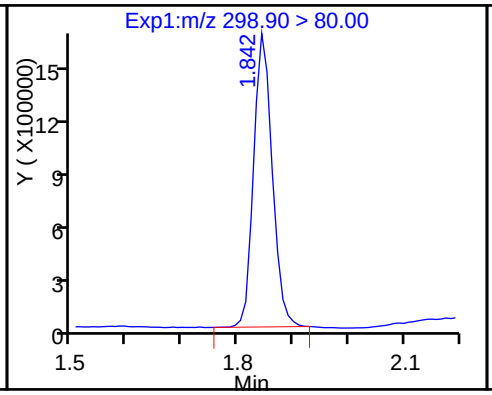
D 4 13C5-PFPeA



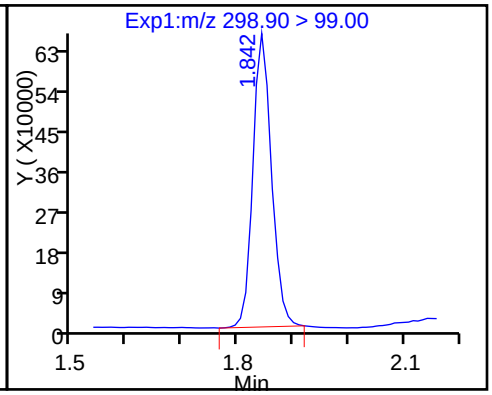
3 Perfluoropentanoic acid



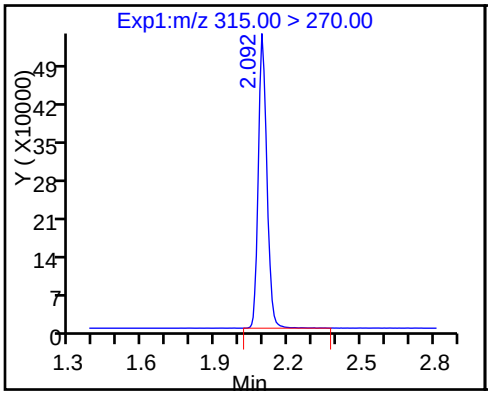
5 Perfluorobutanesulfonic acid



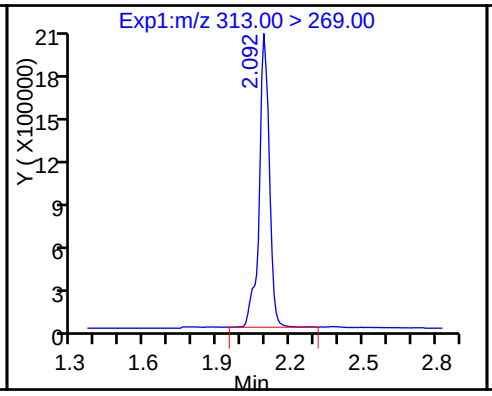
5 Perfluorobutanesulfonic acid



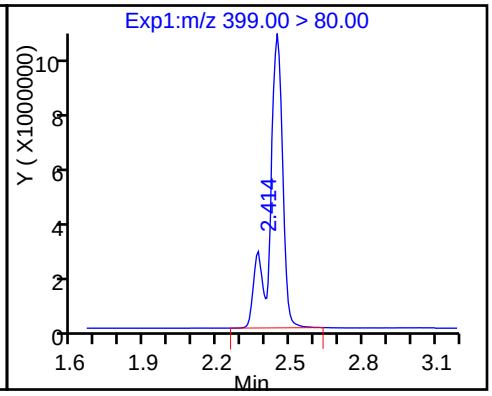
D 6 13C2 PFHxA



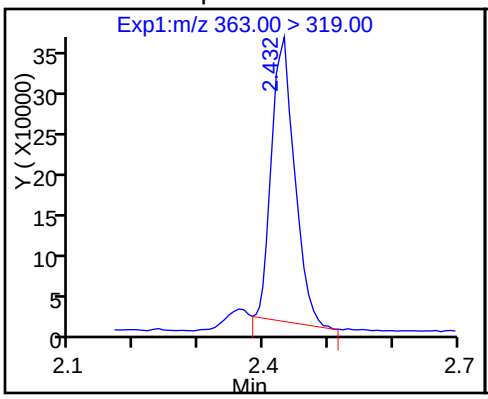
7 Perfluorohexanoic acid



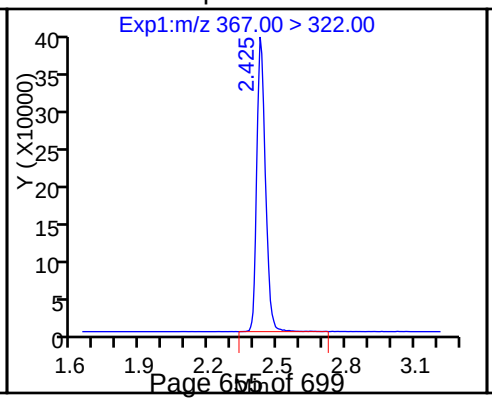
9 Perfluorohexanesulfonic acid



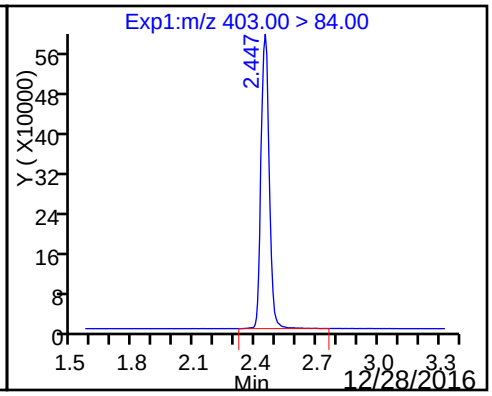
12 Perfluoroheptanoic acid



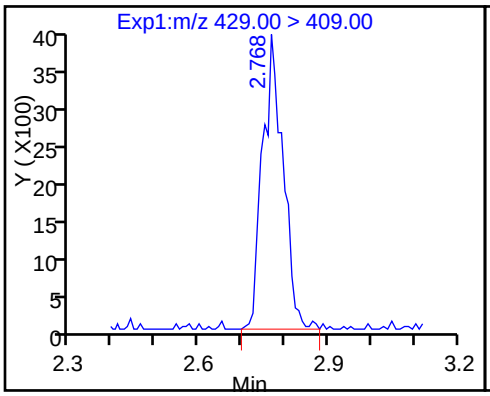
D 11 13C4-PFHpA



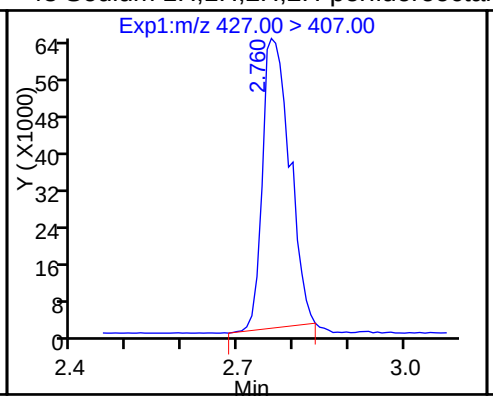
D 10 18O2 PFHxS



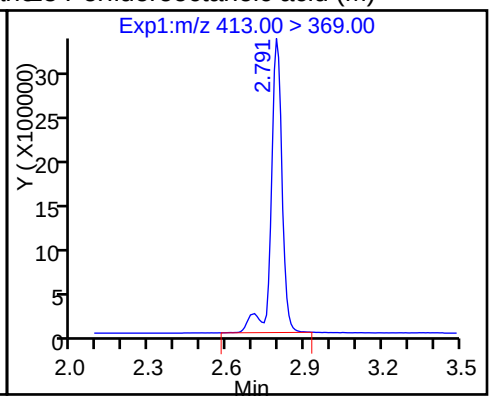
D 47 M2-6:2FTS



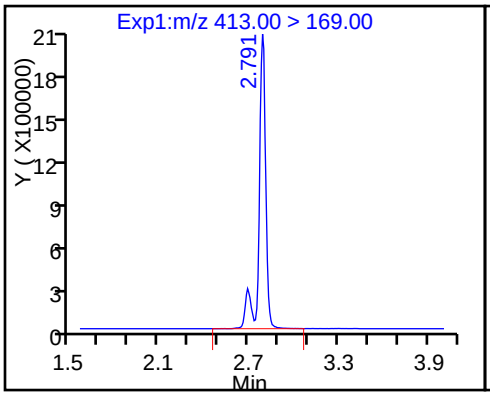
48 Sodium 1H,1H,2H,2H-perfluorooctane



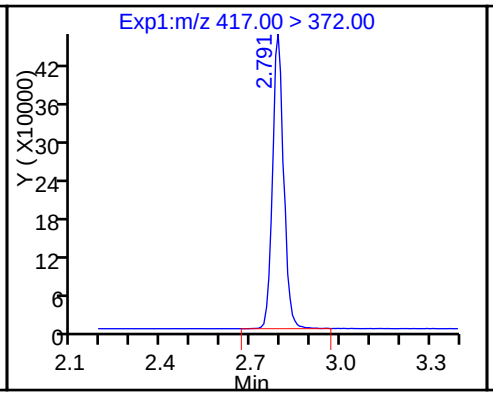
15 Perfluorooctanoic acid (M)



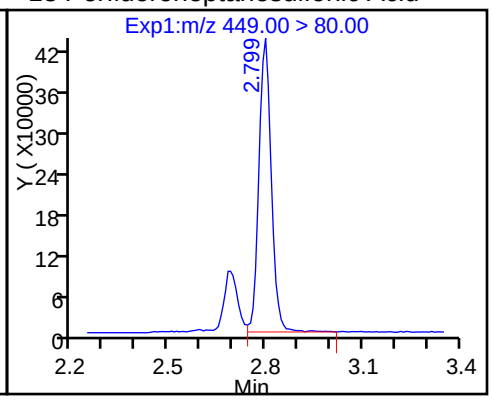
15 Perfluorooctanoic acid



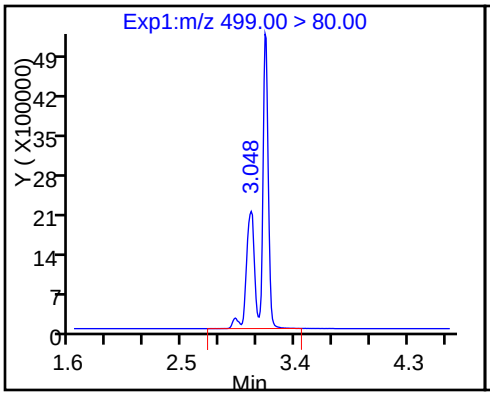
D 14 13C4 PFOA



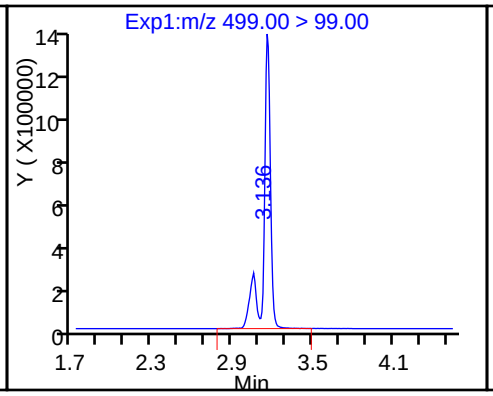
13 Perfluoroheptanesulfonic Acid



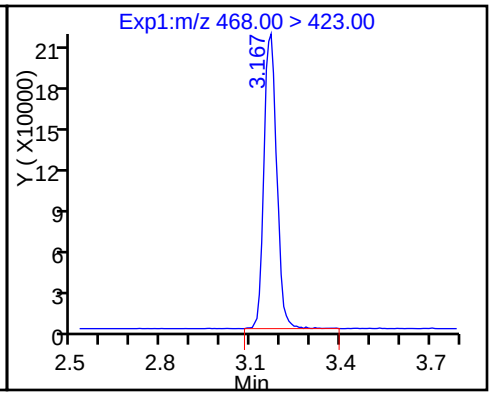
18 Perfluorooctane sulfonic acid



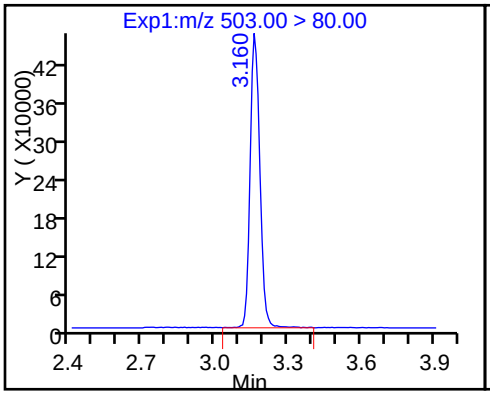
18 Perfluorooctane sulfonic acid



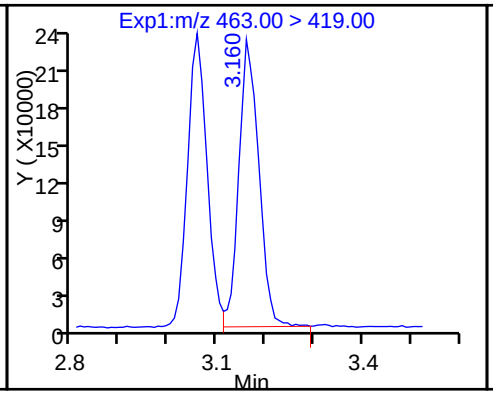
D 19 13C5 PFNA



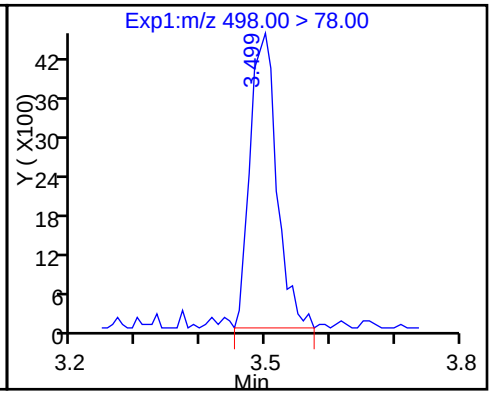
D 17 13C4 PFOS



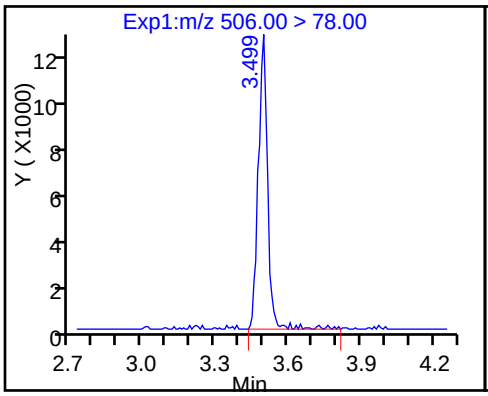
20 Perfluorononanoic acid



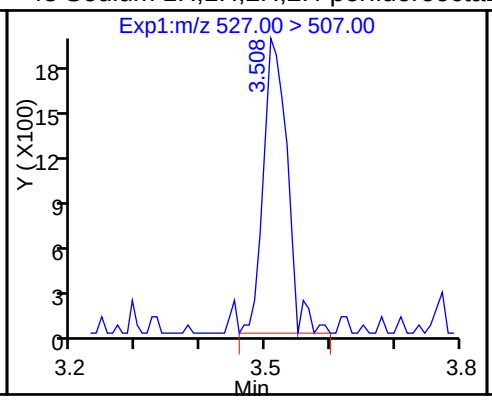
22 Perfluorooctane Sulfonamide



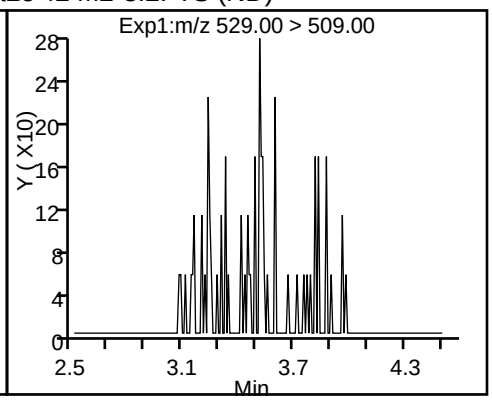
D 21 13C8 FOSA



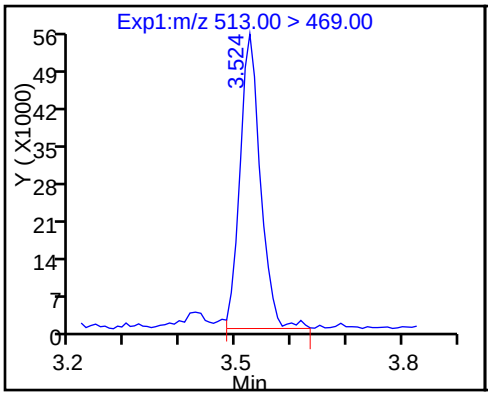
43 Sodium 1H,1H,2H,2H-perfluorooctane



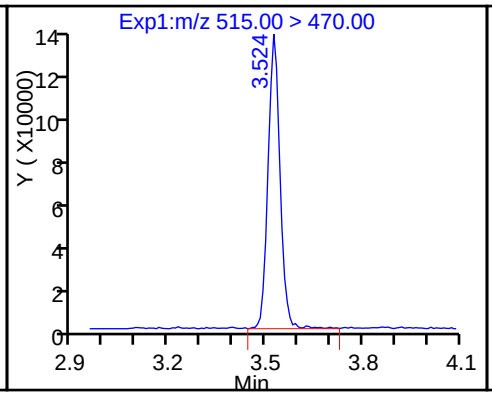
D 42 M2-8:2FTS (ND)



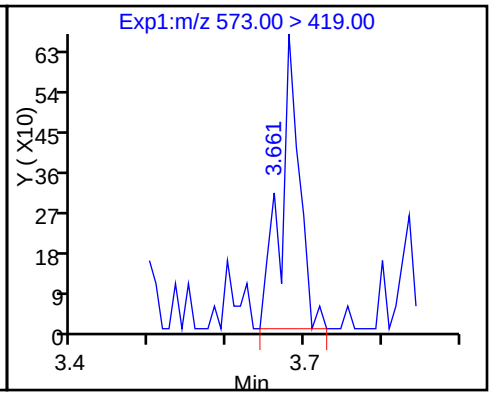
24 Perfluorodecanoic acid



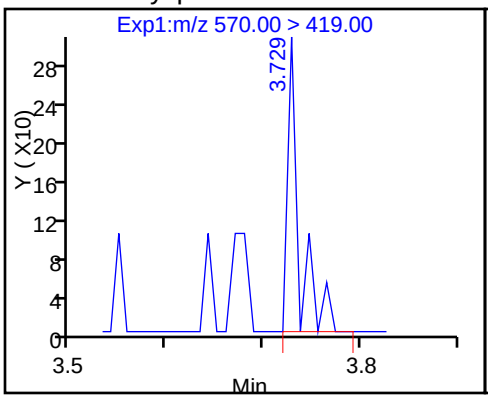
D 23 13C2 PFDA



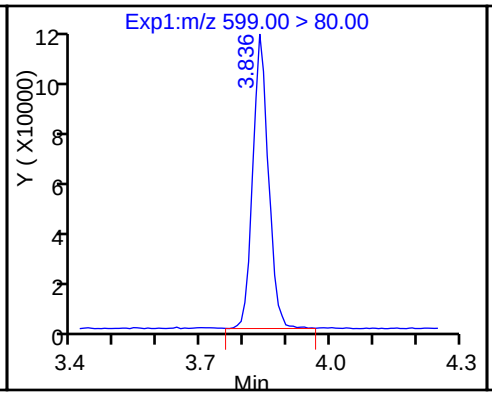
D 45 d3-NMeFOSAA



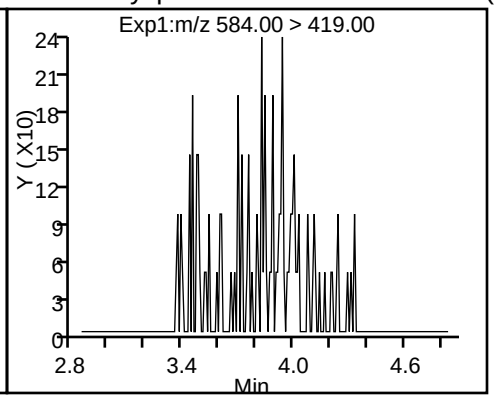
44 N-methyl perfluorooctane sulfonami



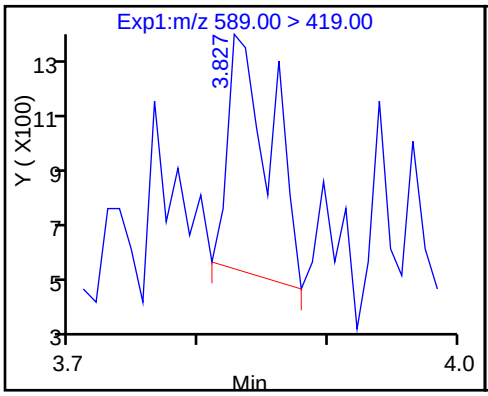
26 Perfluorodecane Sulfonic acid



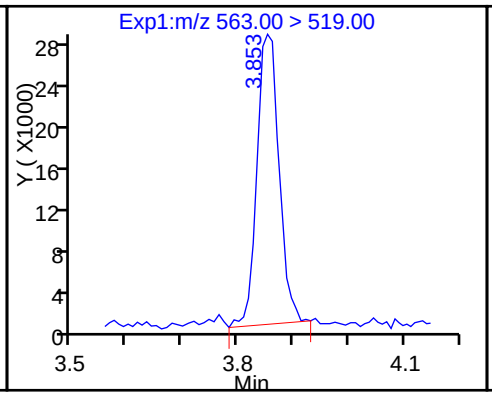
49 N-ethyl perfluorooctane sulfonamid (ND)



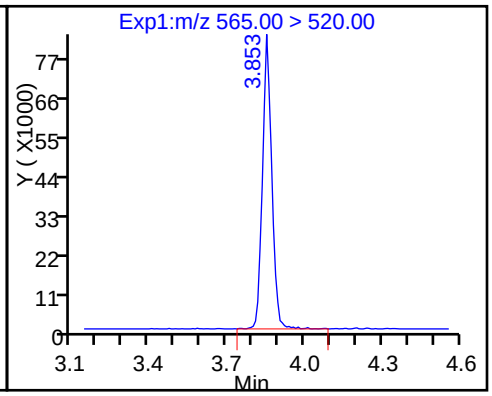
D 46 d5-NEtFOSAA



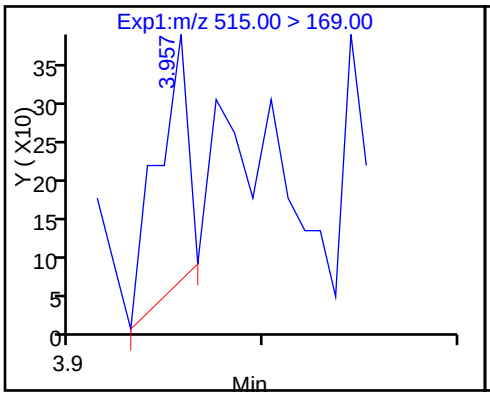
28 Perfluoroundecanoic acid



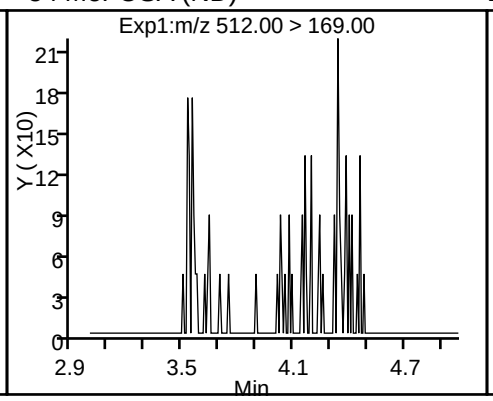
D 27 13C2 PFUnA



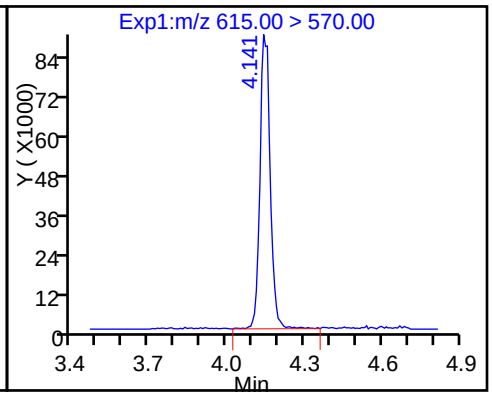
D 52 d-N-MeFOSA-M



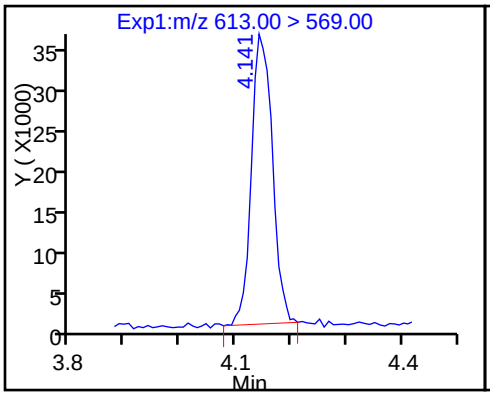
54 MeFOSA (ND)



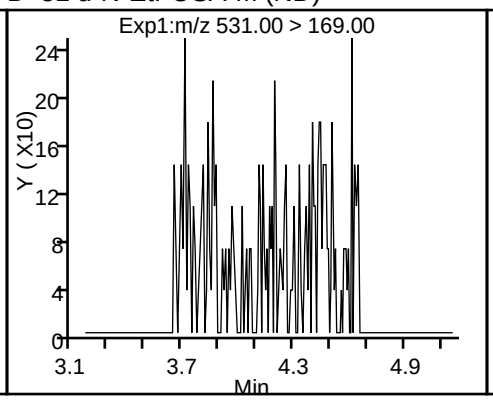
D 30 13C2 PFDoA



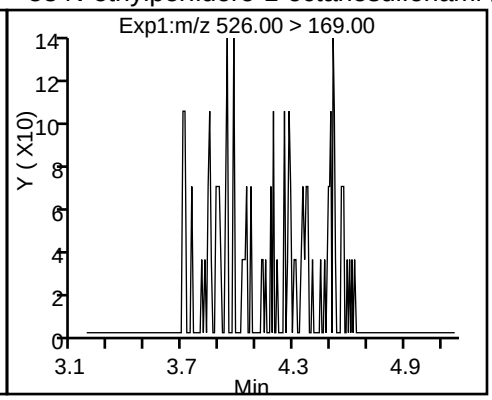
29 Perfluorododecanoic acid



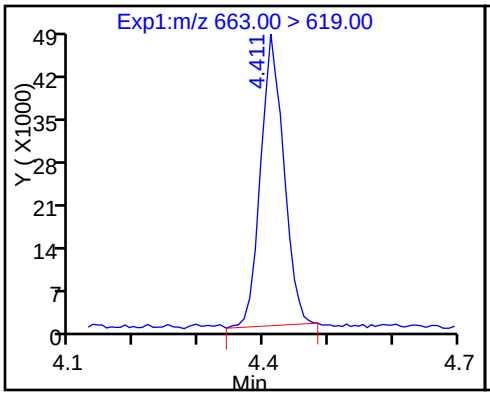
D 51 d-N-EtFOSA-M (ND)



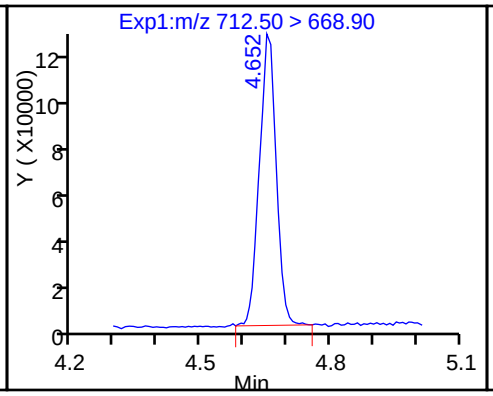
53 N-ethylperfluoro-1-octanesulfonami (ND)



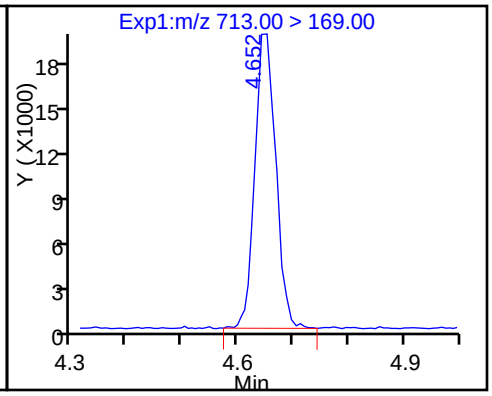
31 Perfluorotridecanoic acid



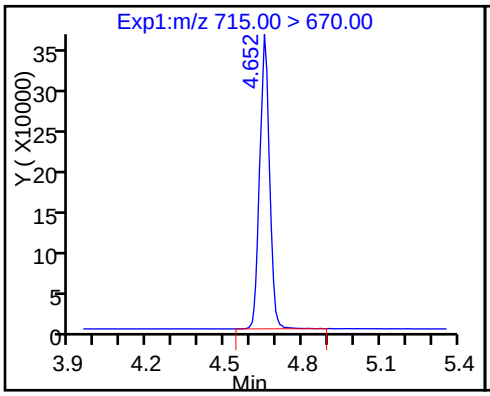
33 Perfluorotetradecanoic acid



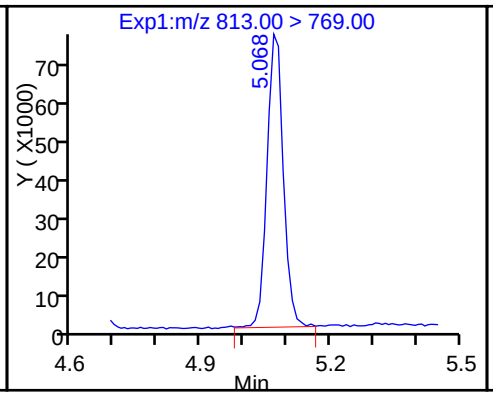
33 Perfluorotetradecanoic acid



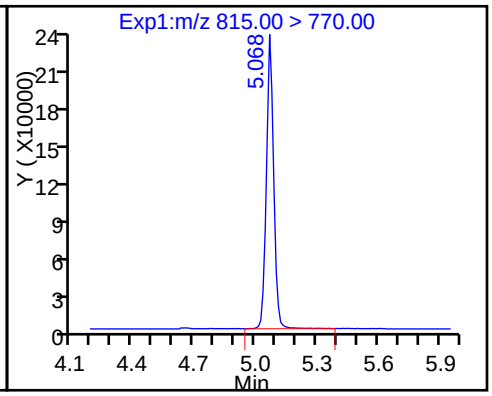
D 32 13C2-PFTeDA



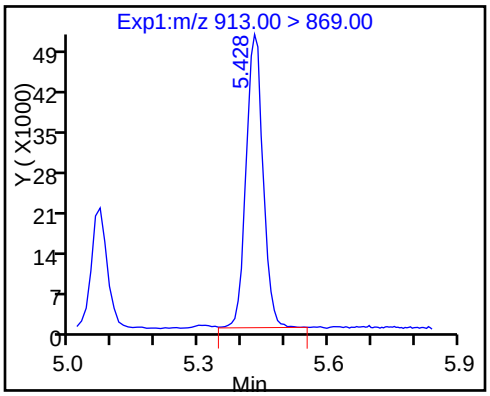
35 Perfluorohexadecanoic acid



D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

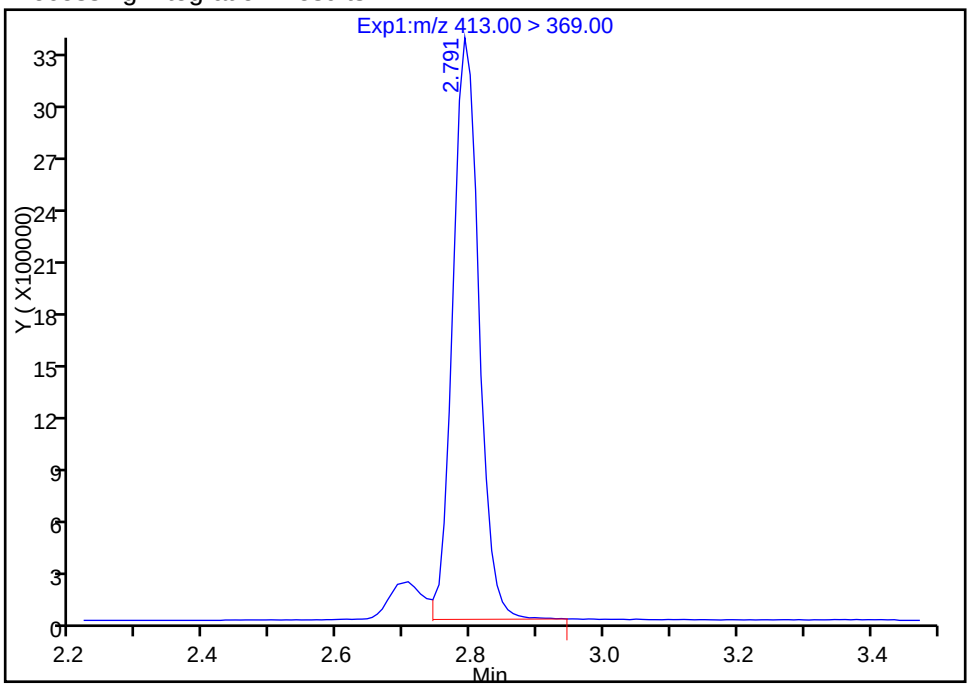
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b\12DEC2016C_009.d				
Injection Date:	12-Dec-2016 19:22:46	Instrument ID:	A8_N		
Lims ID:	320-23830-A-3-C MSD				
Client ID:	DPT-16-18-GW-21-25				
Operator ID:	A8-PC\A8	ALS Bottle#:	50	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

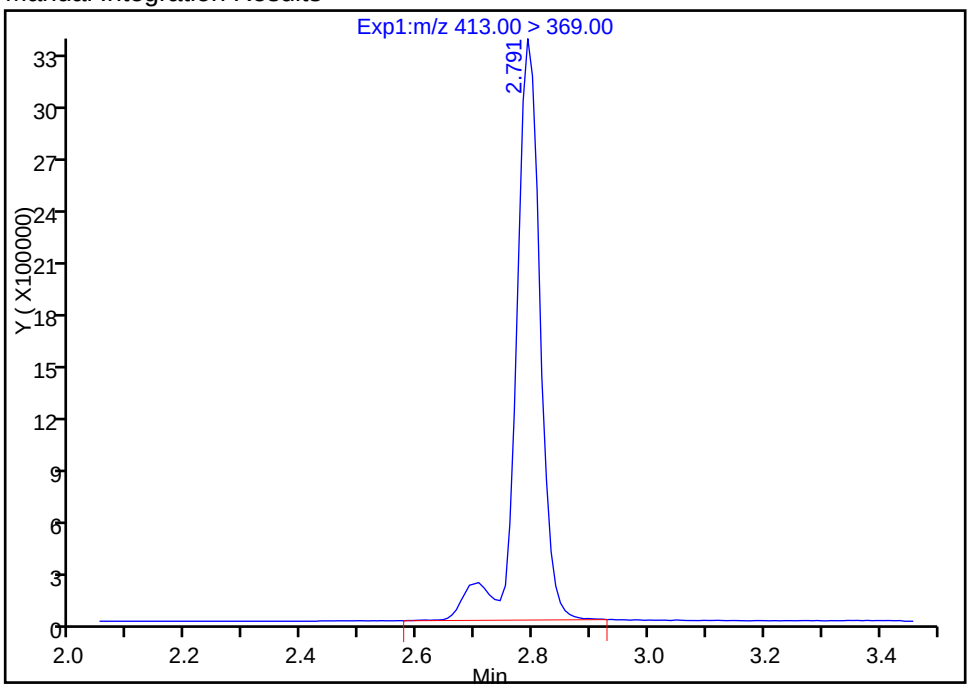
Processing Integration Results

RT: 2.79
Area: 9221396
Amount: 35.529942
Amount Units: ng/ml



Manual Integration Results

RT: 2.79
Area: 9986505
Amount: 38.477899
Amount Units: ng/ml



Reviewer: chandrasenas, 14-Dec-2016 08:23:36

Audit Action: Manually Integrated Audit Reason: Isomers

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Instrument ID: A8_N Start Date: 12/03/2016 13:26

Analysis Batch Number: 140564 End Date: 12/03/2016 18:33

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-140564/1 CCB		12/03/2016 13:26	1		Acquity 2.1(mm)
RB 320-140564/2 CCB		12/03/2016 13:33	1		Acquity 2.1(mm)
RB 320-140564/3 CCB		12/03/2016 13:41	1		Acquity 2.1(mm)
IC 320-140564/4		12/03/2016 13:48	1	03DEC2016A_004.d	Acquity 2.1(mm)
IC 320-140564/5		12/03/2016 13:56	1	03DEC2016A_005.d	Acquity 2.1(mm)
IC 320-140564/6		12/03/2016 14:03	1	03DEC2016A_006.d	Acquity 2.1(mm)
IC 320-140564/7		12/03/2016 14:11	1	03DEC2016A_007.d	Acquity 2.1(mm)
IC 320-140564/8		12/03/2016 14:18	1	03DEC2016A_008.d	Acquity 2.1(mm)
IC 320-140564/9		12/03/2016 14:26	1	03DEC2016A_009.d	Acquity 2.1(mm)
ICB 320-140564/10		12/03/2016 14:33	1		Acquity 2.1(mm)
ICV 320-140564/11		12/03/2016 14:41	1	03DEC2016A_011.d	Acquity 2.1(mm)
RB 320-140564/12 CCB		12/03/2016 14:48	1		Acquity 2.1(mm)
IC 320-140564/13		12/03/2016 14:56	1	03DEC2016A_013.d	Acquity 2.1(mm)
IC 320-140564/14		12/03/2016 15:03	1	03DEC2016A_014.d	Acquity 2.1(mm)
IC 320-140564/15		12/03/2016 15:11	1	03DEC2016A_015.d	Acquity 2.1(mm)
IC 320-140564/16		12/03/2016 15:18	1	03DEC2016A_016.d	Acquity 2.1(mm)
IC 320-140564/17		12/03/2016 15:26	1	03DEC2016A_017.d	Acquity 2.1(mm)
IC 320-140564/18		12/03/2016 15:33	1	03DEC2016A_018.d	Acquity 2.1(mm)
ICB 320-140564/19		12/03/2016 15:41	1		Acquity 2.1(mm)
ICV 320-140564/20		12/03/2016 15:48	1		Acquity 2.1(mm)
RB 320-140564/21 CCB		12/03/2016 15:56	1		Acquity 2.1(mm)
ZZZZZ		12/03/2016 16:03	1		Acquity 2.1(mm)
ZZZZZ		12/03/2016 16:11	1		Acquity 2.1(mm)
ZZZZZ		12/03/2016 16:18	1		Acquity 2.1(mm)
ZZZZZ		12/03/2016 16:26	1		Acquity 2.1(mm)
ZZZZZ		12/03/2016 16:33	1		Acquity 2.1(mm)
ZZZZZ		12/03/2016 16:41	1		Acquity 2.1(mm)
ZZZZZ		12/03/2016 16:48	1		Acquity 2.1(mm)
RB 320-140564/29 CCB		12/03/2016 16:56	1		Acquity 2.1(mm)
CCV 320-140564/30		12/03/2016 17:03	1		Acquity 2.1(mm)
CCV 320-140564/31		12/03/2016 17:11	1		Acquity 2.1(mm)
RB 320-140564/32 CCB		12/03/2016 17:18	1		Acquity 2.1(mm)
RB 320-140564/39 CCB		12/03/2016 18:11	1		Acquity 2.1(mm)
CCV 320-140564/40		12/03/2016 18:18	1		Acquity 2.1(mm)
CCV 320-140564/41		12/03/2016 18:26	1		Acquity 2.1(mm)
RB 320-140564/42 CCB		12/03/2016 18:33	1		Acquity 2.1(mm)

537 (Modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Instrument ID: A8_N Start Date: 12/08/2016 10:04

Analysis Batch Number: 141182 End Date: 12/08/2016 11:49

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-141182/3 CCB		12/08/2016 10:04	1		Acquity 2.1(mm)
RB 320-141182/4 CCB		12/08/2016 10:12	1		Acquity 2.1(mm)
CCV 320-141182/5 CCVL		12/08/2016 10:19	1	08DEC2016A_003.d	Acquity 2.1(mm)
CCV 320-141182/6 CCVL		12/08/2016 10:27	1		Acquity 2.1(mm)
CCV 320-141182/7		12/08/2016 10:34	1		Acquity 2.1(mm)
CCV 320-141182/8		12/08/2016 10:42	1		Acquity 2.1(mm)
RB 320-141182/9 CCB		12/08/2016 10:49	1		Acquity 2.1(mm)
RB 320-141182/14 CCB		12/08/2016 11:27	1		Acquity 2.1(mm)
CCV 320-141182/15		12/08/2016 11:34	1		Acquity 2.1(mm)
CCV 320-141182/16		12/08/2016 11:42	1		Acquity 2.1(mm)
RB 320-141182/17 CCB		12/08/2016 11:49	1		Acquity 2.1(mm)

537 (Modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Instrument ID: A8_N Start Date: 12/09/2016 11:06

Analysis Batch Number: 141453 End Date: 12/09/2016 18:47

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-141453/2 CCB		12/09/2016 11:06	1		Acquity 2.1(mm)
RB 320-141453/3 CCB		12/09/2016 11:13	1		Acquity 2.1(mm)
CCV 320-141453/4 CCVL		12/09/2016 11:21	1	09DEC2016A_004.d	Acquity 2.1(mm)
CCV 320-141453/5 CCVL		12/09/2016 11:28	1		Acquity 2.1(mm)
CCV 320-141453/6		12/09/2016 11:36	1		Acquity 2.1(mm)
CCV 320-141453/7		12/09/2016 11:43	1		Acquity 2.1(mm)
RB 320-141453/8 CCB		12/09/2016 11:51	1		Acquity 2.1(mm)
RB 320-141453/19 CCB		12/09/2016 13:13	1		Acquity 2.1(mm)
CCV 320-141453/20		12/09/2016 13:21	1		Acquity 2.1(mm)
CCV 320-141453/21		12/09/2016 13:28	1		Acquity 2.1(mm)
RB 320-141453/22 CCB		12/09/2016 13:36	1		Acquity 2.1(mm)
ZZZZZ		12/09/2016 13:43	20		Acquity 2.1(mm)
ZZZZZ		12/09/2016 13:51	20		Acquity 2.1(mm)
ZZZZZ		12/09/2016 13:58	20		Acquity 2.1(mm)
ZZZZZ		12/09/2016 14:06	5		Acquity 2.1(mm)
ZZZZZ		12/09/2016 14:13	5		Acquity 2.1(mm)
ZZZZZ		12/09/2016 14:21	5		Acquity 2.1(mm)
ZZZZZ		12/09/2016 14:28	5		Acquity 2.1(mm)
ZZZZZ		12/09/2016 14:36	5		Acquity 2.1(mm)
ZZZZZ		12/09/2016 14:43	5		Acquity 2.1(mm)
ZZZZZ		12/09/2016 14:51	1		Acquity 2.1(mm)
RB 320-141453/33 CCB		12/09/2016 14:58	1		Acquity 2.1(mm)
CCV 320-141453/34		12/09/2016 15:06	1	09DEC2016A_034.d	Acquity 2.1(mm)
CCV 320-141453/35		12/09/2016 15:13	1		Acquity 2.1(mm)
RB 320-141453/36 CCB		12/09/2016 15:21	1		Acquity 2.1(mm)
MB 320-139917/1-A		12/09/2016 15:54	1	09DEC2016A_037.d	Acquity 2.1(mm)
LCS 320-139917/2-A		12/09/2016 16:02	1	09DEC2016A_038.d	Acquity 2.1(mm)
320-23830-1		12/09/2016 16:09	1	09DEC2016A_039.d	Acquity 2.1(mm)
320-23830-2		12/09/2016 16:17	1	09DEC2016A_040.d	Acquity 2.1(mm)
320-23830-3		12/09/2016 16:24	1	09DEC2016A_041.d	Acquity 2.1(mm)
320-23830-3 MS		12/09/2016 16:32	1	09DEC2016A_042.d	Acquity 2.1(mm)
320-23830-3 MSD		12/09/2016 16:39	1	09DEC2016A_043.d	Acquity 2.1(mm)
320-23830-4		12/09/2016 16:47	1	09DEC2016A_044.d	Acquity 2.1(mm)
320-23830-5		12/09/2016 16:54	1	09DEC2016A_045.d	Acquity 2.1(mm)
320-23830-6		12/09/2016 17:02	1	09DEC2016A_046.d	Acquity 2.1(mm)
RB 320-141453/49 CCB		12/09/2016 17:09	1		Acquity 2.1(mm)
CCV 320-141453/50		12/09/2016 17:17	1	09DEC2016A_048.d	Acquity 2.1(mm)
CCV 320-141453/51		12/09/2016 17:24	1		Acquity 2.1(mm)
RB 320-141453/52 CCB		12/09/2016 17:32	1		Acquity 2.1(mm)

537 (Modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Instrument ID: A8_N Start Date: 12/09/2016 11:06

Analysis Batch Number: 141453 End Date: 12/09/2016 18:47

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
320-23830-7		12/09/2016 17:39	1	09DEC2016A_051.d	Acquity 2.1(mm)
320-23830-8		12/09/2016 17:47	1	09DEC2016A_052.d	Acquity 2.1(mm)
ZZZZZ		12/09/2016 17:54	20		Acquity 2.1(mm)
ZZZZZ		12/09/2016 18:02	20		Acquity 2.1(mm)
ZZZZZ		12/09/2016 18:09	20		Acquity 2.1(mm)
ZZZZZ		12/09/2016 18:17	1		Acquity 2.1(mm)
RB 320-141453/58 CCB		12/09/2016 18:24	1		Acquity 2.1(mm)
CCV 320-141453/59		12/09/2016 18:32	1	09DEC2016A_058.d	Acquity 2.1(mm)
CCV 320-141453/60		12/09/2016 18:39	1		Acquity 2.1(mm)
RB 320-141453/61 CCB		12/09/2016 18:47	1		Acquity 2.1(mm)

537 (Modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Instrument ID: A8_N Start Date: 12/12/2016 18:30

Analysis Batch Number: 141834 End Date: 12/12/2016 20:15

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-141834/2		12/12/2016 18:30	1	12DEC2016C_002.d	Acquity 2.1(mm)
CCV 320-141834/3		12/12/2016 18:37	1		Acquity 2.1(mm)
RB 320-141834/4 CCB		12/12/2016 18:45	1		Acquity 2.1(mm)
320-23830-1 DL		12/12/2016 18:52	10	12DEC2016C_005.d	Acquity 2.1(mm)
320-23830-2 DL		12/12/2016 19:00	10	12DEC2016C_006.d	Acquity 2.1(mm)
320-23830-3 DL		12/12/2016 19:07	10	12DEC2016C_007.d	Acquity 2.1(mm)
320-23830-3 MS DL		12/12/2016 19:15	10	12DEC2016C_008.d	Acquity 2.1(mm)
320-23830-3 MSD DL		12/12/2016 19:22	10	12DEC2016C_009.d	Acquity 2.1(mm)
320-23830-7 DL		12/12/2016 19:30	10	12DEC2016C_010.d	Acquity 2.1(mm)
ZZZZZ		12/12/2016 19:37	1		Acquity 2.1(mm)
ZZZZZ		12/12/2016 19:45	1		Acquity 2.1(mm)
RB 320-141834/13 CCB		12/12/2016 19:52	1		Acquity 2.1(mm)
CCV 320-141834/14		12/12/2016 20:00	1	12DEC2016C_014.d	Acquity 2.1(mm)
CCV 320-141834/15		12/12/2016 20:07	1		Acquity 2.1(mm)
RB 320-141834/16 CCB		12/12/2016 20:15	1		Acquity 2.1(mm)

537 (Modified)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Batch Number: 139917 Batch Start Date: 11/29/16 20:20 Batch Analyst: Reed, Jonathan E

Batch Method: 3535 Batch End Date: 11/30/16 10:51

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00046	LCPFCSP 00070
MB 320-139917/1		3535, 537 (Modified)				250.00 mL	0.5 mL	25 uL	
LCS 320-139917/2		3535, 537 (Modified)				250.00 mL	0.5 mL	25 uL	20 uL
320-23830-A-1	DPT-16-19-GW-21-25	3535, 537 (Modified)	T	274.82 g	25.91 g	248.9 mL	0.5 mL	25 uL	
320-23830-A-2	DPT-16-19-GW-31-35	3535, 537 (Modified)	T	280.78 g	26.22 g	254.6 mL	0.5 mL	25 uL	
320-23830-A-3	DPT-16-18-GW-21-25	3535, 537 (Modified)	T	267.87 g	26.38 g	241.5 mL	0.5 mL	25 uL	
320-23830-A-3 MS	DPT-16-18-GW-21-25	3535, 537 (Modified)	T	267.61 g	26.16 g	241.5 mL	0.5 mL	25 uL	20 uL
320-23830-A-3 MSD	DPT-16-18-GW-21-25	3535, 537 (Modified)	T	250.19 g	25.75 g	224.4 mL	0.5 mL	25 uL	20 uL
320-23830-A-4	DPT-16-18-GW-31-35	3535, 537 (Modified)	T	259.18 g	25.55 g	233.6 mL	0.5 mL	25 uL	
320-23830-A-5	DPT-16-18-GW-31-35-DUP	3535, 537 (Modified)	T	262.75 g	26.19 g	236.6 mL	0.5 mL	25 uL	
320-23830-A-6	DPT-GW-EB-112316	3535, 537 (Modified)	T	315.41 g	27.21 g	288.2 mL	0.5 mL	25 uL	
320-23830-A-7	DPT-16-23-GW-21-25	3535, 537 (Modified)	T	271.04 g	26.28 g	244.8 mL	0.5 mL	25 uL	
320-23830-B-8	DPT-16-23-GW-31-35	3535, 537 (Modified)	T	260.61 g	26.13 g	234.5 mL	0.5 mL	25 uL	

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23830-1

SDG No.:

Batch Number: 139917 Batch Start Date: 11/29/16 20:20 Batch Analyst: Reed, Jonathan E

Batch Method: 3535 Batch End Date: 11/30/16 10:51

Batch Notes	
Balance ID	QA-070
Batch Comment	0.1N NaOH/H2O: 794893
H2O ID	11/29/16
Hexane ID	0000146278
Manifold ID	1
Methanol ID	789820
Pipette ID	MD05306
Analyst ID - Reagent Drop	JER
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	NSH
Solvent Lot #	794501
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	002836112A

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

West Sacramento

HPLC/LCMS Data Review Checklist

12/15

Job Number(s): 23799, 23830

Work List ID(s): 37654, 37684

Extraction Batch: 139752, 139917

Analysis Batch(es): 141287, 141453, 141182(cor

Delivery Rank 4

Due Date: 11/30/16, 12/2/16

A. Calibration/Instrument Run QC	1st Level	2nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch# 140564	✓	✓	
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? 72627, 72636, 72657	✓	✓	
5. Holding Times were met for prep and analytical.	✓	✓	
6. IS/Surrogate recoveries meet criteria or properly noted. 72620, 72658	✓	✓	
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# 72617, 72656	✓	✓	
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: 12/12/16

2nd Level Reviewer: [signature] Date: 12/14/2016

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 08DEC2016B_PFC Worklist Number: 37654
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37654.b
QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 141287	LC PFC ICAL Raw Batch: 141288	LC PFAS ICAL Raw Batch: 141289
# 1 RB	# 1 RB	# 1 RB	# 1 RB
# 2 CCV L4	# 2 CCV L4	# 2 CCV L4	# 2 CCV L4
# 3 CCV L4 Add-on	# 3 CCV L4 Add-on	# 3 CCV L4 Add-on	# 3 CCV L4 Add-on
# 4 RB	# 4 RB	# 4 RB	# 4 RB
# 5 MB 320-139760/1-A		# 5 MB 320-139760/1-A	
# 6 LCS 320-139760/2-A		# 6 LCS 320-139760/2-A	
# 7 LCSD 320-139760/3-A		# 7 LCSD 320-139760/3-A	
# 8 320-23805-A-1-A		# 8 320-23805-A-1-A 10X	# 8 320-23805-A-1-A
# 9 320-23805-A-2-A		# 9 320-23805-A-2-A RA Carryover	# 9 320-23805-A-2-A
#10 320-23805-A-3-A		#10 320-23805-A-3-A 10X	#10 320-23805-A-3-A
#11 320-23805-A-4-A		#11 320-23805-A-4-A	#11 320-23805-A-4-A
#12 320-23805-A-5-A		#12 320-23805-A-5-A	#12 320-23805-A-5-A
#13 320-23805-A-6-A		#13 320-23805-A-6-A	#13 320-23805-A-6-A
#14 320-23805-A-7-A		#14 320-23805-A-7-A	#14 320-23805-A-7-A
#15 RB	#15 RB	#15 RB	#15 RB
#16 CCV L5	#16 CCV L5	#16 CCV L5	#16 CCV L5
#17 CCV L5 Add-on	#17 CCV L5 Add-on	#17 CCV L5 Add-on	#17 CCV L5 Add-on
#18 RB	#18 RB	#18 RB	#18 RB
#19 320-23805-A-8-A		#19 320-23805-A-8-A	#19 320-23805-A-8-A
#20 320-23805-A-9-A		#20 320-23805-A-9-A	#20 320-23805-A-9-A
#21 320-23805-A-10-A		#21 320-23805-A-10-A 100X, 10X	#21 320-23805-A-10-A
#22 320-23805-A-11-A		#22 320-23805-A-11-A RA Carryover	#22 320-23805-A-11-A
#23 320-23805-A-12-A		#23 320-23805-A-12-A	#23 320-23805-A-12-A
#24 320-23805-A-13-A		#24 320-23805-A-13-A 10X	#24 320-23805-A-13-A
#25 320-23805-A-14-A		#25 320-23805-A-14-A RA Carryover	#25 320-23805-A-14-A
#26 320-23805-A-15-A		#26 320-23805-A-15-A 10X	#26 320-23805-A-15-A
#27 320-23805-A-16-A		#27 320-23805-A-16-A	#27 320-23805-A-16-A
#28 320-23805-A-17-A		#28 320-23805-A-17-A 10X	#28 320-23805-A-17-A
#29 RB	#29 RB	#29 RB	#29 RB
#30 CCV L4	#30 CCV L4	#30 CCV L4	#30 CCV L4
#31 CCV L4 Add-on	#31 CCV L4 Add-on	#31 CCV L4 Add-on	#31 CCV L4 Add-on
#32 RB	#32 RB	#32 RB	#32 RB
#33 320-23805-A-18-A		#33 320-23805-A-18-A	#33 320-23805-A-18-A
#34 MB 320-139752/1-A	#34 MB 320-139752/1-A		
#35 LCS 320-139752/2-A	#35 LCS 320-139752/2-A		
#36 320-23799-A-1-A	#36 320-23799-A-1-A ~~10X~~ 20X		
#37 320-23799-A-2-A	#37 320-23799-A-2-A 20X		
#38 320-23799-A-3-A	#38 320-23799-A-3-A 20X		
#39 320-23799-A-4-A	#39 320-23799-A-4-A RA Carryover, ~~10X~~ 5X		
#40 320-23799-A-5-A	#40 320-23799-A-5-A 5X		
#41 320-23799-A-6-A	#41 320-23799-A-6-A 5X		
#42 320-23799-A-7-A	#42 320-23799-A-7-A 5X		
#43 RB	#43 RB	#43 RB	#43 RB
#44 CCV L5	#44 CCV L5	#44 CCV L5	#44 CCV L5
#45 CCV L5 Add-on	#45 CCV L5 Add-on	#45 CCV L5 Add-on	#45 CCV L5 Add-on
#46 RB	#46 RB	#46 RB	#46 RB
#47 320-23799-A-7-B MS	#47 320-23799-A-7-B MS 5X		
#48 320-23799-A-7-C MSD	#48 320-23799-A-7-C MSD 5X		
#49 MB 320-140132/1-A		#49 MB 320-140132/1-A	
#50 LCS 320-140132/2-A		#50 LCS 320-140132/2-A	
#51 320-23881-A-1-A		#51 320-23881-A-1-A	#51 320-23881-A-1-A
#52 320-23881-A-1-B DU		#52 320-23881-A-1-B DU	#52 320-23881-A-1-B DU
#53 320-23881-A-1-C MS		#53 320-23881-A-1-C MS	#53 320-23881-A-1-C MS
#54 320-23881-A-2-A		#54 320-23881-A-2-A	#54 320-23881-A-2-A
#55 320-23881-A-4-A		#55 320-23881-A-4-A	#55 320-23881-A-4-A

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 09DEC2016A_PFC Worklist Number: 37684
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20161209-37684.b
QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 141453	LC PFC ICAL Raw Batch: 141454	LC PFAS ICAL Raw Batch: 141455
# 1 RB	# 1 RB	# 1 RB	# 1 RB
# 2 RB	# 2 RB	# 2 RB	# 2 RB
# 3 RB	# 3 RB	# 3 RB	# 3 RB
# 4 CCV L2	# 4 CCV L2	# 4 CCV L2	# 4 CCV L2
# 5 CCV L2 Add-on	# 5 CCV L2 Add-on	# 5 CCV L2 Add-on	# 5 CCV L2 Add-on
# 6 CCV L5	# 6 CCV L5	# 6 CCV L5	# 6 CCV L5
# 7 CCV L5 Add-on	# 7 CCV L5 Add-on	# 7 CCV L5 Add-on	# 7 CCV L5 Add-on
# 8 RB	# 8 RB	# 8 RB	# 8 RB
# 9 320-23805-A-2-A		# 9 320-23805-A-2-A	# 9 320-23805-A-2-A
#10 320-23805-A-11-A		#10 320-23805-A-11-A	#10 320-23805-A-11-A
#11 320-23805-A-14-A		#11 320-23805-A-14-A	#11 320-23805-A-14-A
#12 320-23805-A-1-A		#12 320-23805-A-1-A	#12 320-23805-A-1-A
#13 320-23805-A-3-A		#13 320-23805-A-3-A	#13 320-23805-A-3-A
#14 320-23805-A-13-A		#14 320-23805-A-13-A	#14 320-23805-A-13-A
#15 320-23805-A-15-A		#15 320-23805-A-15-A	#15 320-23805-A-15-A
#16 320-23805-A-17-A		#16 320-23805-A-17-A	#16 320-23805-A-17-A
#17 320-23805-A-10-A		#17 320-23805-A-10-A	#17 320-23805-A-10-A
#18 320-23805-A-10-A		#18 320-23805-A-10-A	#18 320-23805-A-10-A
#19 RB	#19 RB	#19 RB	#19 RB
#20 CCV L4	#20 CCV L4	#20 CCV L4	#20 CCV L4
#21 CCV L4 Add-on	#21 CCV L4 Add-on	#21 CCV L4 Add-on	#21 CCV L4 Add-on
#22 RB	#22 RB	#22 RB	#22 RB
#23 320-23799-A-1-A	#23 320-23799-A-1-A		
#24 320-23799-A-2-A	#24 320-23799-A-2-A		
#25 320-23799-A-3-A	#25 320-23799-A-3-A		
#26 320-23799-A-5-A	#26 320-23799-A-5-A		
#27 320-23799-A-6-A	#27 320-23799-A-6-A		
#28 320-23799-A-7-A	#28 320-23799-A-7-A		
#29 320-23799-A-7-B MS	#29 320-23799-A-7-B MS		
#30 320-23799-A-7-C MSD	#30 320-23799-A-7-C MSD		
#31 320-23799-A-4-A	#31 320-23799-A-4-A		
#32 320-23799-A-4-A	#32 320-23799-A-4-A		
#33 RB	#33 RB	#33 RB	#33 RB
#34 CCV L5	#34 CCV L5	#34 CCV L5	#34 CCV L5
#35 CCV L5 Add-on	#35 CCV L5 Add-on	#35 CCV L5 Add-on	#35 CCV L5 Add-on
#36 RB	#36 RB	#36 RB	#36 RB
#37 MB 320-139917/1-A	#37 MB 320-139917/1-A		
#38 LCS 320-139917/2-A	#38 LCS 320-139917/2-A		
#39 320-23830-A-1-A	#39 320-23830-A-1-A E Flag, needs 10x		
#40 320-23830-A-2-A	#40 320-23830-A-2-A		
#41 320-23830-A-3-A	#41 320-23830-A-3-A		
#42 320-23830-A-3-B MS	#42 320-23830-A-3-B MS		
#43 320-23830-A-3-C MSD	#43 320-23830-A-3-C MSD		
#44 320-23830-A-4-A	#44 320-23830-A-4-A		
#45 320-23830-A-5-A	#45 320-23830-A-5-A		
#46 320-23830-A-6-A	#46 320-23830-A-6-A		
#49 RB	#49 RB	#49 RB	#49 RB
#50 CCV L4	#50 CCV L4	#50 CCV L4	#50 CCV L4
#51 CCV L4 Add-on	#51 CCV L4 Add-on	#51 CCV L4 Add-on	#51 CCV L4 Add-on
#52 RB	#52 RB	#52 RB	#52 RB
#47 320-23830-A-7-A	#47 320-23830-A-7-A E Flag Needs 10X		
#48 320-23830-B-8-A	#48 320-23830-B-8-A		
#54 320-23799-A-1-A	#54 320-23799-A-1-A Not needed		
#55 320-23799-A-2-A	#55 320-23799-A-2-A		
#56 320-23799-A-3-A	#56 320-23799-A-3-A		

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 141453	LC PFC ICAL Raw Batch: 141454	LC PFAS ICAL Raw Batch: 141455
#57 320-23799-A-4-A	#57 320-23799-A-4-A Not needed		
#58 RB	#58 RB	#58 RB	#58 RB
#59 CCV L4	#59 CCV L4	#59 CCV L4	#59 CCV L4
#60 CCV L4 Add-on	#60 CCV L4 Add-on	#60 CCV L4 Add-on	#60 CCV L4 Add-on
#61 RB	#61 RB	#61 RB	#61 RB

8

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139752

Method Code: 320-3535_IVWT-320

Analyst: Marchenko, Veronika P

Batch Open: 11/28/2016 5:11:00PM

Batch End: 11/29/2016 2:16:00PM

AS 12/8/16

DL AS 12/9/16

Solid-Phase Extraction (SPE)

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1	MB~320-139752/1 N/A	N/A	25.66 g	250 mL / 0.5 mL				N/A	N/A	N/A		MB 320-139752/1-A
2	LCS~320-139752/2 N/A	N/A	25.99 g	250 mL / 0.5 mL				N/A	N/A	N/A		LCS 320-139752/2-A
3	320-23799-A-1 (PFC_IDA_DOD5)	N/A (320-23799-1)	263.65 g / 25.94 g	237.7 mL / 0.5 mL				11/30/16	12_Days	4	See NCM regarding these samples, some of them are very dirty and they contain a lot of sediment, especially the 7MS. 20x	320-23799-A-1-A
4	320-23799-A-2 (PFC_IDA_DOD5)	N/A (320-23799-1)	263.38 g / 27.68 g	235.7 mL / 0.5 mL				11/30/16	12_Days	4	20x	320-23799-A-2-A
5	320-23799-A-3 (PFC_IDA_DOD5)	N/A (320-23799-1)	274.18 g / 27.78 g	246.4 mL / 0.5 mL				11/30/16	12_Days	4	20x	320-23799-A-3-A
6	320-23799-A-4 (PFC_IDA_DOD5)	N/A (320-23799-1)	274.10 g / 26.09 g	248 mL / 0.5 mL				11/30/16	12_Days	4	5x, RA Carryover	320-23799-A-4-A
7	320-23799-A-5 (PFC_IDA_DOD5)	N/A (320-23799-1)	274.47 g / 26.39 g	248.1 mL / 0.5 mL				11/30/16	12_Days	4	5x	320-23799-A-5-A
8	320-23799-A-6 (PFC_IDA_DOD5)	N/A (320-23799-1)	272.55 g / 27.30 g	245.3 mL / 0.5 mL				11/30/16	12_Days	4	5x	320-23799-A-6-A
9	320-23799-A-7 (PFC_IDA_DOD5)	N/A (320-23799-1)	271.17 g	245.1 mL				11/30/16	12_Days	4	5x	320-23799-A-7-A

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139752

Analyst: Marchenko, Veronika P

Batch Open: 11/28/2016 5:11:00PM

Method Code: 320-3535_IVWT-320

Batch End: 11/29/2016 2:16:00PM

			26.03 g	0.5 mL								
10	320-23799-A-7~MS (PFC_IDA_DOD5)	N/A (320-23799-1)	242.37 g	215.3 mL				11/30/16	12_Days	4	5x	320-23799-A-7-B MS
			27.12 g	0.5 mL								
11	320-23799-A-7~MSD (PFC_IDA_DOD5)	N/A (320-23799-1)	274.86 g	248.1 mL				11/30/16	12_Days	4	5x	320-23799-A-7-C MSD
			26.73 g	0.5 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139752

Method Code: 320-3535_IVWT-320

Analyst: Marchenko, Veronika P

Batch Open: 11/28/2016 5:11:00PM

Batch End:

Batch Notes

Manifold ID	1
Methanol ID	769613
Hexane ID	0000146278
Sodium Hypochlorite ID	NA
First Start time	NA
First End time	NA
Balance ID	QA-070
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	002836112A
H2O ID	11/28/16
Pipette ID	MD05306
Solvent Name	0.3% NH4OH/MeOH
Solvent Lot #	794501
Analyst ID - Reagent Drop	VPM
Analyst ID - SU Reagent Drop	VPM
Analyst ID - SU Reagent Drop Witness	KMK 11-28-16
Acid Name	NA
Acid ID	NA
Reagent ID	NA
Reagent Lot Number	NA
NaCl ID	NA

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139752

Analyst: Marchenko, Veronika P

Batch Open: 11/28/2016 5:11:00PM

Method Code: 320-3535_IVWT-320

Batch End:

SOP Number WS-LC-0025

Batch Comment 0.1N NaOH/H2O: 794892

Comments

320-23799-A-1	Method Comments:	Samples from AFB - use caution, screen sample, include extra spikes
320-23799-A-2	Method Comments:	Samples from AFB - use caution, screen sample, include extra spikes
320-23799-A-3	Method Comments:	Samples from AFB - use caution, screen sample, include extra spikes
320-23799-A-4	Method Comments:	Samples from AFB - use caution, screen sample, include extra spikes
320-23799-A-5	Method Comments:	Samples from AFB - use caution, screen sample, include extra spikes
320-23799-A-6	Method Comments:	Samples from AFB - use caution, screen sample, include extra spikes
320-23799-A-7	Method Comments:	Samples from AFB - use caution, screen sample, include extra spikes
320-23799-A-7~MS	Method Comments:	Samples from AFB - use caution, screen sample, include extra spikes
320-23799-A-7~MSD	Method Comments:	Samples from AFB - use caution, screen sample, include extra spikes

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139752

Method Code: 320-3535_IVWT-320

Analyst: Marchenko, Veronika P

Batch Open: 11/28/2016 5:11:00PM

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-139752/1	LCMPFC2SU_00010	25 uL	0.5 mL	VPM 11/28/16	KMK
MB 320-139752/1	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-139752/2	LCMPFC2SU_00010	25 uL	0.5 mL		
LCS 320-139752/2	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-139752/2	LCPFC2SP_00016	20 uL	0.5 mL		
LCS 320-139752/2	LCPFCSP_00070	20 uL	0.5 mL		
320-23799-A-1	LCMPFC2SU_00010	25 uL	0.5 mL		
320-23799-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-23799-A-2	LCMPFC2SU_00010	25 uL	0.5 mL		
320-23799-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-23799-A-3	LCMPFC2SU_00010	25 uL	0.5 mL		
320-23799-A-3	LCMPFCSU_00046	25 uL	0.5 mL		
320-23799-A-4	LCMPFC2SU_00010	25 uL	0.5 mL		
320-23799-A-4	LCMPFCSU_00046	25 uL	0.5 mL		
320-23799-A-5	LCMPFC2SU_00010	25 uL	0.5 mL		
320-23799-A-5	LCMPFCSU_00046	25 uL	0.5 mL		
320-23799-A-6	LCMPFC2SU_00010	25 uL	0.5 mL		
320-23799-A-6	LCMPFCSU_00046	25 uL	0.5 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139752

Analyst: Marchenko, Veronika P

Batch Open: 11/28/2016 5:11:00PM

Method Code: 320-3535_IVWT-320

Batch End:

320-23799-A-7	LCMPFC2SU_00010	25 uL	0.5 mL	VPM 11/28/16	KMK
320-23799-A-7	LCMPFCSU_00046	25 uL	0.5 mL		
320-23799-A-7 MS	LCMPFC2SU_00010	25 uL	0.5 mL		
320-23799-A-7 MS	LCMPFCSU_00046	25 uL	0.5 mL		
320-23799-A-7 MS	LCPFC2SP_00016	20 uL	0.5 mL		
320-23799-A-7 MS	LCPFCSP_00070	20 uL	0.5 mL		
320-23799-A-7 MSD	LCMPFC2SU_00010	25 uL	0.5 mL		
320-23799-A-7 MSD	LCMPFCSU_00046	25 uL	0.5 mL		
320-23799-A-7 MSD	LCPFC2SP_00016	20 uL	0.5 mL		
320-23799-A-7 MSD	LCPFCSP_00070	20 uL	0.5 mL		

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 139752 Test: PFC_IDA_DoD5 (L)

Earliest Holding Time: 11-29

Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Worksheet Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All samples properly preserved	NA	NA
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 Cl Check)	✓	✓
The pH is transcribed correctly in TALS	NA	NA
All additional information transcribed into TALS is correct and raw data is attached	✓	✓
Comments are transcribed correctly in TALS	✓	✓
Reagents Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and entered into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Batch Information	**1st Level Reviewer**	**2nd Level Reviewer**
Date and time accurate and entered into TALS correctly	✓	✓
All necessary 'batch information' complete and entered into TALS correctly	✓	✓

1st Level Reviewer: VPM Date: 11/29/16

2nd Level Reviewer: HJA Date: 11-29-16

Comments:

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Test America – Sacramento

Sample Dilution Record

Method ID PFC DoD **Job #** 23799

Analyst (Print Name) Gary Westendorf **Analyst Initials** GBW

Date 12/9/16

Sample#	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
23799-1	500	50	1000	20
-2		50	1000	20
-3		50	1000	20
-4		40	200	5
-5		40	200	5
-6		40	200	5
-7		40	200	5
-7 MS		40	200	5
-7 MSD		40	200	5

Comments:

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139917

Analyst: Reed, Jonathan E

Batch Open: 11/29/2016 8:20:00PM

Batch End: 11/30/16 10:51

Method Code: 320-3535_IVWT-320

AS 12/9/16
DL 12/11/16

Solid-Phase Extraction (SPE)

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-139917/1 N/A	N/A		250.00 mL / 0.5 mL				N/A	N/A	N/A		MB 320-139917/1-A
2	LCS~320-139917/2 N/A	N/A		250.00 mL / 0.5 mL				N/A	N/A	N/A		LCS 320-139917/2-A
3	320-23830-A-1 (PFC_IDA_DOD5)	N/A (320-23830-1)	274.82 g / 25.91 g	248.9 mL / 0.5 mL				12/2/16	16_Days	4	10X	320-23830-A-1-A
4	320-23830-A-2 (PFC_IDA_DOD5)	N/A (320-23830-1)	280.78 g / 26.22 g	254.6 mL / 0.5 mL				12/2/16	16_Days	4	10X	320-23830-A-2-A
5	320-23830-A-3 (PFC_IDA_DOD5)	N/A (320-23830-1)	267.87 g / 26.38 g	241.5 mL / 0.5 mL				12/2/16	16_Days	4	10X	320-23830-A-3-A
6	320-23830-A-3~MS (PFC_IDA_DOD5)	N/A (320-23830-1)	267.61 g / 26.16 g	241.5 mL / 0.5 mL				12/2/16	16_Days	4	10X	320-23830-A-3-B MS
7	320-23830-A-3~MSD (PFC_IDA_DOD5)	N/A (320-23830-1)	250.19 g / 25.75 g	224.4 mL / 0.5 mL				12/2/16	16_Days	4	10X	320-23830-A-3-C MSD
8	320-23830-A-4 (PFC_IDA_DOD5)	N/A (320-23830-1)	259.18 g / 25.55 g	233.6 mL / 0.5 mL				12/2/16	16_Days	4	RA	320-23830-A-4-A
9	320-23830-A-5 (PFC_IDA_DOD5)	N/A (320-23830-1)	262.75 g / 26.19 g	236.6 mL / 0.5 mL				12/2/16	16_Days	4		320-23830-A-5-A
10	320-23830-A-6 (PFC_IDA_DOD5)	N/A (320-23830-1)	315.41 g / 27.21 g	288.2 mL / 0.5 mL				12/2/16	16_Days	4		320-23830-A-6-A

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139917

Analyst: Reed, Jonathan E

Batch Open: 11/29/2016 8:20:00PM

Method Code: 320-3535_IVWT-320

Batch End:

11	320-23830-A-7 (PFC_IDA_DOD5)	N/A (320-23830-1)	271.04 g	244.8 mL				12/2/16	16_Days	4	10X	320-23830-A-7-A
			26.28 g	0.5 mL								
12	320-23830-B-8 (PFC_IDA_DOD5)	N/A (320-23830-1)	260.61 g	234.5 mL				12/2/16	16_Days	4	RA Sediment	320-23830-B-8-A
			26.13 g	0.5 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139917

Analyst: Reed, Jonathan E

Batch Open: 11/29/2016 8:20:00PM

Method Code: 320-3535_IVWT-320

Batch End:

Batch Notes

Manifold ID	1
Methanol ID	789820
Hexane ID	0000146278
Sodium Hypochlorite ID	NA
First Start time	NA
First End time	NA
Balance ID	QA-070
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	002836112A
H2O ID	11/29/16
Pipette ID	MD05306
Solvent Name	0.3% NH4OH/MeOH
Solvent Lot #	794501
Analyst ID - Reagent Drop	JER
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	NSH
Acid Name	NA
Acid ID	NA
Reagent ID	NA
Reagent Lot Number	NA
NaCl ID	NA

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139917

Analyst: Reed, Jonathan E

Batch Open: 11/29/2016 8:20:00PM

Method Code: 320-3535_IVWT-320

Batch End:

SOP Number	WS-LC-0025
Batch Comment	0.1N NaOH/H2O: 794893

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139917

Method Code: 320-3535_IVWT-320

Analyst: Reed, Jonathan E

Batch Open: 11/29/2016 8:20:00PM

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-139917/1	LCMPFCSU_00046	25 uL	0.5 mL	11/29/16	NSH 11-29-16
LCS 320-139917/2	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-139917/2	LCPFCSP_00070	20 uL	0.5 mL		
320-23830-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-23830-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-23830-A-3	LCMPFCSU_00046	25 uL	0.5 mL		
320-23830-A-3 MS	LCMPFCSU_00046	25 uL	0.5 mL		
320-23830-A-3 MS	LCPFCSP_00070	20 uL	0.5 mL		
320-23830-A-3 MSD	LCMPFCSU_00046	25 uL	0.5 mL		
320-23830-A-3 MSD	LCPFCSP_00070	20 uL	0.5 mL		
320-23830-A-4	LCMPFCSU_00046	25 uL	0.5 mL		
320-23830-A-5	LCMPFCSU_00046	25 uL	0.5 mL		
320-23830-A-6	LCMPFCSU_00046	25 uL	0.5 mL		
320-23830-A-7	LCMPFCSU_00046	25 uL	0.5 mL		
320-23830-B-8	LCMPFCSU_00046	25 uL	0.5 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139917

Analyst: Reed, Jonathan E

Batch Open: 11/29/2016 8:20:00PM

Method Code: 320-3535_IVWT-320

Batch End:

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 139917 Test: PFC-IDA-00D5

Earliest Holding Time: 11/30/16

Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	✓	✓
Method/sample/login/QAS checked and correct	✓	✓

Worksheet Tab	1st Level Reviewer	2nd Level Reviewer
All samples properly preserved	NA	NA
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 Cl Check)	✓	✓
The pH is transcribed correctly in TALS	NA	NA
All additional information transcribed into TALS is correct and raw data is attached	✓	✓
Comments are transcribed correctly in TALS	✓	✓

Reagents Tab	1st Level Reviewer	2nd Level Reviewer
All necessary reagents not expired and entered into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓

Batch Information	1st Level Reviewer	2nd Level Reviewer
Date and time accurate and entered into TALS correctly	✓	✓
All necessary 'batch information' complete and entered into TALS correctly	✓	✓

1st Level Reviewer: VPM Date: 11/30/16

2nd Level Reviewer: ERW Date: 11/30/16

Comments:

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

West Sacramento

HPLC/LCMS Data Review Checklist

Job Number(s): 23830

Work List ID(s): 37771

Extraction Batch: 139917

Analysis Batch(es): 141834

Delivery Rank 4

Due Date: 12/2/16

A. Calibration/Instrument Run QC	1st Level	2nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch# 140564	✓	✓	
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? SBC 12/14/16	✓		✓
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: 12/14/16

2nd Level Reviewer: [signature] Date: 12/14/2016

NCMs: 72841; 72842; 72659

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 12DEC2016C_PFC Worklist Number: 37771
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20161213-37771.b
QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 141834	LC PFC ICAL Raw Batch: 141835	LC PFAS ICAL Raw Batch: 141836
# 1 RB	# 1 RB	# 1 RB	# 1 RB
# 2 CCV L5	# 2 CCV L5	# 2 CCV L5	# 2 CCV L5
# 3 CCV L5 Add-on	# 3 CCV L5 Add-on	# 3 CCV L5 Add-on	# 3 CCV L5 Add-on
# 4 RB	# 4 RB	# 4 RB	# 4 RB
# 5 320-23830-A-1-A	# 5 320-23830-A-1-A		
# 6 320-23830-A-2-A	# 6 320-23830-A-2-A		
# 7 320-23830-A-3-A	# 7 320-23830-A-3-A		
# 8 320-23830-A-3-B MS	# 8 320-23830-A-3-B MS	high targets 72841	
# 9 320-23830-A-3-C MSD	# 9 320-23830-A-3-C MSD		
#10 320-23830-A-7-A	#10 320-23830-A-7-A		
#11 320-23830-A-4-A	#11 320-23830-A-4-A	Dilution NCM 72842	
#12 320-23830-B-8-A	#12 320-23830-B-8-A		
#13 RB	#13 RB	#13 RB	#13 RB
#14 CCV L4	#14 CCV L4	#14 CCV L4	#14 CCV L4
#15 CCV L4 Add-on	#15 CCV L4 Add-on	#15 CCV L4 Add-on	#15 CCV L4 Add-on
#16 RB	#16 RB	#16 RB	#16 RB

ICV 140564

Tune NCM 72659

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139917

Method Code: 320-3535_IVWT-320

Analyst: Reed, Jonathan E

Batch Open: 11/29/2016 8:20:00PM

Batch End: 11/30/16 10:51

AS 12/9/16
DL 12/11/16

Solid-Phase Extraction (SPE)

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1	MB~320-139917/1 N/A	N/A		250.00 mL				N/A	N/A	N/A		MB 320-139917/1-A
				0.5 mL								
2	LCS~320-139917/2 N/A	N/A		250.00 mL				N/A	N/A	N/A		LCS 320-139917/2-A
				0.5 mL								
3	320-23830-A-1 (PFC_IDA_DOD5)	N/A (320-23830-1)	274.82 g	248.9 mL				12/2/16	16_Days	4	10X	320-23830-A-1-A
			25.91 g	0.5 mL								
4	320-23830-A-2 (PFC_IDA_DOD5)	N/A (320-23830-1)	280.78 g	254.6 mL				12/2/16	16_Days	4	10X	320-23830-A-2-A
			26.22 g	0.5 mL								
5	320-23830-A-3 (PFC_IDA_DOD5)	N/A (320-23830-1)	267.87 g	241.5 mL				12/2/16	16_Days	4	10X	320-23830-A-3-A
			26.38 g	0.5 mL								
6	320-23830-A-3~MS (PFC_IDA_DOD5)	N/A (320-23830-1)	267.61 g	241.5 mL				12/2/16	16_Days	4	10X	320-23830-A-3-B MS
			26.16 g	0.5 mL								
7	320-23830-A-3~MSD (PFC_IDA_DOD5)	N/A (320-23830-1)	250.19 g	224.4 mL				12/2/16	16_Days	4	10X	320-23830-A-3-C MSD
			25.75 g	0.5 mL								
8	320-23830-A-4 (PFC_IDA_DOD5)	N/A (320-23830-1)	259.18 g	233.6 mL				12/2/16	16_Days	4	RA	320-23830-A-4-A
			25.55 g	0.5 mL								
9	320-23830-A-5 (PFC_IDA_DOD5)	N/A (320-23830-1)	262.75 g	236.6 mL				12/2/16	16_Days	4		320-23830-A-5-A
			26.19 g	0.5 mL								
10	320-23830-A-6 (PFC_IDA_DOD5)	N/A (320-23830-1)	315.41 g	288.2 mL				12/2/16	16_Days	4		320-23830-A-6-A
			27.21 g	0.5 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139917

Analyst: Reed, Jonathan E

Batch Open: 11/29/2016 8:20:00PM

Method Code: 320-3535_IVWT-320

Batch End:

11	320-23830-A-7 (PFC_IDA_DOD5)	N/A (320-23830-1)	271.04 g	244.8 mL				12/2/16	16_Days	4	10X	320-23830-A-7-A
			26.28 g	0.5 mL								
12	320-23830-B-8 (PFC_IDA_DOD5)	N/A (320-23830-1)	260.61 g	234.5 mL				12/2/16	16_Days	4	RA Sediment	320-23830-B-8-A
			26.13 g	0.5 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139917

Method Code: 320-3535_IVWT-320

Analyst: Reed, Jonathan E

Batch Open: 11/29/2016 8:20:00PM

Batch End:

Batch Notes

Manifold ID	1
Methanol ID	789820
Hexane ID	0000146278
Sodium Hypochlorite ID	NA
First Start time	NA
First End time	NA
Balance ID	QA-070
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	002836112A
H2O ID	11/29/16
Pipette ID	MD05306
Solvent Name	0.3% NH4OH/MeOH
Solvent Lot #	794501
Analyst ID - Reagent Drop	JER
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	NSH
Acid Name	NA
Acid ID	NA
Reagent ID	NA
Reagent Lot Number	NA
NaCl ID	NA

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139917

Analyst: Reed, Jonathan E

Batch Open: 11/29/2016 8:20:00PM

Method Code: 320-3535_IVWT-320

Batch End:

SOP Number WS-LC-0025

Batch Comment 0.1N NaOH/H2O: 794893

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139917

Method Code: 320-3535_IVWT-320

Analyst: Reed, Jonathan E

Batch Open: 11/29/2016 8:20:00PM

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-139917/1	LCMPFCSU_00046	25 uL	0.5 mL	11/29/16	NSH 11-29-16
LCS 320-139917/2	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-139917/2	LCPFCSP_00070	20 uL	0.5 mL		
320-23830-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-23830-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-23830-A-3	LCMPFCSU_00046	25 uL	0.5 mL		
320-23830-A-3 MS	LCMPFCSU_00046	25 uL	0.5 mL		
320-23830-A-3 MS	LCPFCSP_00070	20 uL	0.5 mL		
320-23830-A-3 MSD	LCMPFCSU_00046	25 uL	0.5 mL		
320-23830-A-3 MSD	LCPFCSP_00070	20 uL	0.5 mL		
320-23830-A-4	LCMPFCSU_00046	25 uL	0.5 mL		
320-23830-A-5	LCMPFCSU_00046	25 uL	0.5 mL		
320-23830-A-6	LCMPFCSU_00046	25 uL	0.5 mL		
320-23830-A-7	LCMPFCSU_00046	25 uL	0.5 mL		
320-23830-B-8	LCMPFCSU_00046	25 uL	0.5 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139917

Method Code: 320-3535_IVWT-320

Analyst: Reed, Jonathan E

Batch Open: 11/29/2016 8:20:00PM

Batch End:

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 139917 Test: PFC-IDA-00105

Earliest Holding Time: 11/30/16

Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Worksheet Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All samples properly preserved	NA	NA
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 Cl Check)	✓	✓
The pH is transcribed correctly in TALS	NA	NA
All additional information transcribed into TALS is correct and raw data is attached	✓	✓
Comments are transcribed correctly in TALS	✓	✓
Reagents Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and entered into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Batch Information	**1st Level Reviewer**	**2nd Level Reviewer**
Date and time accurate and entered into TALS correctly	✓	✓
All necessary 'batch information' complete and entered into TALS correctly	✓	✓

1st Level Reviewer: VPM Date: 11/30/16

2nd Level Reviewer: ERW Date: 11/30/16

Comments:

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Test America – Sacramento

Sample Dilution Record

Method ID PFC-IDA_DOD5 **Job #** 23830

Analyst (Print Name) Snyphana Chandrasena **Analyst Initials** SBC

Date 12/11/16

Sample#	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
1	500	100	1000	10X
2	↓	↓	↓	↓
3	↓	↓	↓	↓
MS	↓	↓	↓	↓
MSD	↓	↓	↓	↓
7	↓	↓	↓	↓

Comments:

Shipping and Receiving Documents

COC No. A 42927

~~158 Starlite Drive~~
~~Marietta, OH 45750~~

~~MICROBAC®~~

~~Phone: 740-373-4071~~
~~Toll Free: 800-373-4071~~

CHAIN-OF-CUSTODY RECORD

320-23830 Chain of Custody

Company Name: AECOM

Project Contact: KURT VAN GELDER

Contact Phone #:

Turn Around Requirements: 14 DAY

Location: Former Bay Head Rd Annapolis

Project ID: 60444465

Sampler (print): MIKE GLINSKI

Signature:

Program: ☐ CWA ☐ RCRA ☐ DOD ☐ AFCEE ☐ Other

ADDITIONAL REQUIREMENTS

Sample I.D. No.	Comp	Grab	Date	Time	Matrix*	NUMBER OF CONTAINERS	Hold	PFOA	PFOS	PFBS	TOTAL # (LAB USE)
DPT-16-19-GW-21-25			11/23/16	1015	GW	2		✓	✓	✓	
DPT-16-19-GW-31-35				1100	GW	2		✓	✓	✓	
DPT-16-18-GW-21-25				1140	GW	2		✓	✓	✓	
DPT-16-18-GW-21-25			MS	↓	↓	2		✓	✓	✓	
DPT-16-18-GW-21-25			MSD	↓	↓	2		✓	✓	✓	
DPT-16-18-GW-31-35				1220	GW	2		✓	✓	✓	
DPT-16-18-GW-31-35			DUP	1220	↓	2		✓	✓	✓	
DPT-GW-EB-112316				1315	↓	2		✓	✓	✓	
DPT-16-23-GW-21-25				1335	↓	2		✓	✓	✓	
DPT-16-23-GW-31-35				1400	↓	2		✓	✓	✓	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
	11/25/16	1700	TRANSFER TO PEDEX		11/25/16	1700	

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
				11/26/16	0900	2.4°C

*Water (W), Soil (S), Solid Waste (SD), Unknown (X)

Page 1 of 1

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 320-23830-1

Login Number: 23830
List Number: 1
Creator: Hytrek, Cheryl

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

"DPT-16-18-GW-21-25","537","12/09/16","16:24","T","NA","Initial","335-67-1","Perfluorooctanoic acid (PFOA)","0.69","","TRG","No","Y","EJM","Y","0.00077","0.0021","0.0026","UG_L","UG_L","","","0","","","","0","","","","","","","","","","","","","",""

"DPT-16-18-GW-21-25","537","12/09/16","16:24","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate (PFOS)","1.6","","TRG","No","Y","EJ","Y","0.0013","0.0031","0.0041","UG_L","UG_L","","","0","","","","0","","","","","","","","","","","","",""

"DPT-16-18-GW-21-25","537","12/09/16","16:24","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid (PFBS)","0.15","","TRG","Yes","Y","","Y","0.00095","0.0021","0.0026","UG_L","UG_L","","","0","","","","0","","","","","","","","","","","","","",""

"DPT-16-18-GW-21-25","537","12/12/16","19:07","T","NA","DILUTION1","375-73-5","Perfluorobutanesulfonic acid (PFBS)","0.11","","TRG","No","Y","D","Y","0.0095","0.021","0.026","UG_L","UG_L","","","0","","","","0","","","","","","","","","","","","","",""

"DPT-16-18-GW-21-25","537","12/12/16","19:07","T","NA","DILUTION1","1763-23-1","Perfluorooctane Sulfonate (PFOS)","2.0","","TRG","Yes","Y","DJ","Y","0.013","0.031","0.041","UG_L","UG_L","","","0","","","","0","","","","","","","","","","","","",""

"DPT-16-18-GW-21-25","537","12/12/16","19:07","T","NA","DILUTION1","335-67-1","Perfluorooctanoic acid (PFOA)","0.84","","TRG","Yes","Y","DMJ","Y","0.0077","0.021","0.026","UG_L","UG_L","","","0","","","","0","","","","","","","","","","","","","",""

"DPT-16-18-GW-31-35","537","12/09/16","16:47","T","NA","Initial","335-67-1","Perfluorooctanoic acid (PFOA)","0.24","","TRG","Yes","Y","M","Y","0.00080","0.0021","0.0027","UG_L","UG_L","","","0","","","","0","","","","","","","","","","","","","",""

"DPT-16-18-GW-31-35","537","12/09/16","16:47","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate (PFOS)","0.37","","TRG","Yes","Y","","Y","0.0014","0.0032","0.0043","UG_L","UG_L","","","0","","","","0","","","","","","","","","","","","",""

"DPT-16-18-GW-31-35","537","12/09/16","16:47","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid (PFBS)","0.057","","TRG","Yes","Y","","Y","0.00098","0.0021","0.0027","UG_L","UG_L","","","0","","","","0","","","","","","","","","","","","","",""

"DPT-16-18-GW-31-35-DUP","537","12/09/16","16:54","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid (PFBS)","0.060","","TRG","Yes","Y","","Y","0.00097","0.0021","0.0026","UG_L","UG_L","","","0","","","","0","","","","","","","","","","","","","",""

"DPT-16-18-GW-31-35-DUP","537","12/09/16","16:54","T","NA","Initial","335-67-1","Perfluorooctanoic acid (PFOA)","0.25","","TRG","Yes","Y","M","Y","0.00079","0.0021","0.0026","UG_L","UG_L","","","0","","","","0","","","","","","","","","","","","","",""

"DPT-16-18-GW-31-35-DUP","537","12/09/16","16:54","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate (PFOS)","0.38","","TRG","Yes","Y","","Y","0.0013","0.0032","0.0042","UG_L","UG_L","","","0","","","","0","","","","","","","","","","","","",""

"DPT-16-19-GW-21-25","537","12/09/16","16:09","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid (PFBS)","0.17","","TRG","Yes","Y","","Y","0.00092","0.0020","0.0025","UG_L","UG_L","","","0","","","","0","","","","","","","","","","","","","",""

"DPT-16-19-GW-21-25","537","12/09/16","16:09","T","NA","Initial","335-67-1","Perfluorooctanoic acid (PFOA)","0.34","","TRG","Yes","Y","M","Y","0.00075","0.0020","0.0025","UG_L","UG_L","","","0","","","","0","","","","","","","","","","","","","",""

"DPT-16-19-GW-21-25","537","12/09/16","16:09","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate (PFOS)","2.0","","TRG","No","Y","E","Y","0.0013","0.0030","0.0040","UG_L","UG_L","","","0","","","","0","","","","","","","","","","","","",""

"DPT-16-19-GW-21-25","537","12/12/16","18:52","T","NA","DILUTION1","335-67-1","Perfluorooctanoic acid (PFOA)","0.37","","TRG","No","Y","DM","Y","0.0075","0.020","0.025","UG_L","UG_L","","","0","","","","0","","","","","","","","","","","","","",""

"DPT-16-19-GW-21-25","537","12/12/16","18:52","T","NA","DILUTION1","1763-23-1","Perfluorooctane Sulfonate (PFOS)","2.6","","TRG","Yes","Y","D","Y","0.013","0.030","0.040","UG_L","UG_L","","","0","","","","0","","","","","","","","","","","","",""

"DPT-16-19-GW-21-25","537","12/12/16","18:52","T","NA","DILUTION1","375-73-5","Perfluorobutanesulfonic acid (PFBS)","0.13","","TRG","No","Y","D","Y","0.0092","0.020","0.025","UG_L","UG_L","","","0","","","","0","","","","","

",","","","","","","","","","","","","
"DPT-16-19-GW-31-35","537","12/09/16","16:17","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","0.33","","TRG","Yes","Y","","Y","0.00090","0.0020","0.0025","UG_L","UG_L","","","0","","","","0","","","
","","","","","","","","","","","","","
"DPT-16-19-GW-31-35","537","12/09/16","16:17","T","NA","Initial","335-67-1","Perfluorooctanoic acid
(PFOA)","0.71","","TRG","No","Y","EM","Y","0.00073","0.0020","0.0025","UG_L","UG_L","","","0","","","","0","",
"","","","","","","","","","","","","","
"DPT-16-19-GW-31-35","537","12/09/16","16:17","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","0.62","","TRG","No","Y","E","Y","0.0013","0.0029","0.0039","UG_L","UG_L","","","0","","","","0","","","
","","","","","","","","","","","","","
"DPT-16-19-GW-31-35","537","12/12/16","19:00","T","NA","DILUTION1","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","0.68","","TRG","Yes","Y","D","Y","0.013","0.029","0.039","UG_L","UG_L","","","0","","","","0","","","","
","","","","","","","","","","","","","
"DPT-16-19-GW-31-35","537","12/12/16","19:00","T","NA","DILUTION1","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","0.21","","TRG","No","Y","D","Y","0.0090","0.020","0.025","UG_L","UG_L","","","0","","","","0","","","","
","","","","","","","","","","","","","
"DPT-16-19-GW-31-35","537","12/12/16","19:00","T","NA","DILUTION1","335-67-1","Perfluorooctanoic acid
(PFOA)","0.93","","TRG","Yes","Y","DM","Y","0.0073","0.020","0.025","UG_L","UG_L","","","0","","","","0","","",
"","","","","","","","","","","","","","
"DPT-16-23-GW-21-25","537","12/09/16","17:39","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","0.83","","TRG","No","Y","E","Y","0.0013","0.0031","0.0041","UG_L","UG_L","","","0","","","","0","","","
","","","","","","","","","","","","","
"DPT-16-23-GW-21-25","537","12/09/16","17:39","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","0.32","","TRG","Yes","Y","","Y","0.00094","0.0020","0.0026","UG_L","UG_L","","","0","","","","0","","","
","","","","","","","","","","","","","
"DPT-16-23-GW-21-25","537","12/09/16","17:39","T","NA","Initial","335-67-1","Perfluorooctanoic acid
(PFOA)","0.66","","TRG","No","Y","EM","Y","0.00076","0.0020","0.0026","UG_L","UG_L","","","0","","","","0","",
"","","","","","","","","","","","","","
"DPT-16-23-GW-21-25","537","12/12/16","19:30","T","NA","DILUTION1","335-67-1","Perfluorooctanoic acid
(PFOA)","0.84","","TRG","Yes","Y","DM","Y","0.0076","0.020","0.026","UG_L","UG_L","","","0","","","","0","","",
"","","","","","","","","","","","","","
"DPT-16-23-GW-21-25","537","12/12/16","19:30","T","NA","DILUTION1","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","0.96","","TRG","Yes","Y","D","Y","0.013","0.031","0.041","UG_L","UG_L","","","0","","","","0","","","","
","","","","","","","","","","","","","
"DPT-16-23-GW-21-25","537","12/12/16","19:30","T","NA","DILUTION1","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","0.24","","TRG","No","Y","D","Y","0.0094","0.020","0.026","UG_L","UG_L","","","0","","","","0","","","","
","","","","","","","","","","","","","
"DPT-16-23-GW-31-35","537","12/09/16","17:47","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","0.27","","TRG","Yes","Y","","Y","0.0014","0.0032","0.0043","UG_L","UG_L","","","0","","","","0","","","",
"","","","","","","","","","","","","
"DPT-16-23-GW-31-35","537","12/09/16","17:47","T","NA","Initial","335-67-1","Perfluorooctanoic acid
(PFOA)","0.34","","TRG","Yes","Y","M","Y","0.00080","0.0021","0.0027","UG_L","UG_L","","","0","","","","0","","
","","","","","","","","","","","","","
"DPT-16-23-GW-31-35","537","12/09/16","17:47","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","0.11","","TRG","Yes","Y","","Y","0.00098","0.0021","0.0027","UG_L","UG_L","","","0","","","","0","","","
","","","","","","","","","","","","","
"DPT-GW-EB-112316","537","12/09/16","17:02","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","","","TRG","Yes","N","U","Y","0.00080","0.0017","0.0022","UG_L","UG_L","","","0","","","","0","","","
","","","","","","","","","","","","","
"DPT-GW-EB-112316","537","12/09/16","17:02","T","NA","Initial","335-67-1","Perfluorooctanoic acid
(PFOA)","","","TRG","Yes","N","U","Y","0.00065","0.0017","0.0022","UG_L","UG_L","","","0","","","","0","","","",
"","","","","","","","","","","","","
"DPT-GW-EB-112316","537","12/09/16","17:02","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","","","TRG","Yes","N","U","Y","0.0011","0.0026","0.0035","UG_L","UG_L","","","0","","","","0","","","","

,"","","","","","","","","","","","
"DPT-16-18-GW-21-25MS","537","12/09/16","16:32","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","1.62","","SC","No","Y","E4","Y","0.0013","0.0031","0.0041","UG_L","UG_L","","","1.6","0.0384","1.62","
0","0","","","","","60","140","","*","","","","","","","
"DPT-16-18-GW-21-25MS","537","12/09/16","16:32","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","0.186","","SC","Yes","Y","4","Y","0.00095","0.0021","0.0026","UG_L","UG_L","","","0.15","0.0366","0.18
6","96","0","","","","","50","150","","","","","","","","
"DPT-16-18-GW-21-25MS","537","12/09/16","16:32","T","NA","Initial","335-67-1","Perfluorooctanoic acid
(PFOA)","0.667","","SC","No","Y","E4M","Y","0.00077","0.0021","0.0026","UG_L","UG_L","","","0.69","0.0414","
0.667","0","0","","","","","60","140","","*","","","","","","
"DPT-16-18-GW-21-25MS","537","12/12/16","19:15","T","NA","DILUTION1","1763-23-1","Perfluorooctane
Sulfonate
(PFOS)","1.98","","SC","Yes","Y","D4","Y","0.013","0.031","0.041","UG_L","UG_L","","","2.0","0.0384","1.98","0",
"0","","","","","60","140","","*","","","","","","
"DPT-16-18-GW-21-25MS","537","12/12/16","19:15","T","NA","DILUTION1","335-67-1","Perfluorooctanoic acid
(PFOA)","0.882","","SC","Yes","Y","DM4","Y","0.0077","0.021","0.026","UG_L","UG_L","","","0.84","0.0414","0.8
82","108","0","","","","","60","140","","","","","","","
"DPT-16-18-GW-21-25MS","537","12/12/16","19:15","T","NA","DILUTION1","375-73-5","Perfluorobutanesulfonic
acid
(PFBS)","0.149","","SC","No","Y","D","Y","0.0095","0.021","0.026","UG_L","UG_L","","","0.11","0.0366","0.149","
119","0","","","","","50","150","","","","","","","","
"DPT-16-18-GW-21-25SD","537","12/09/16","16:39","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","0.184","","SC","Yes","Y","","Y","0.0010","0.0022","0.0028","UG_L","UG_L","","","0","","","","0.15","0.03
94","0.184","84","1","50","150","30","","","","","","","
"DPT-16-18-GW-21-25SD","537","12/09/16","16:39","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","1.56","","SC","No","Y","E4","Y","0.0014","0.0033","0.0045","UG_L","UG_L","","","0","","","","1.6","0.04
14","1.56","0","4","60","140","30","","*","","","","","
"DPT-16-18-GW-21-25SD","537","12/09/16","16:39","T","NA","Initial","335-67-1","Perfluorooctanoic acid
(PFOA)","0.684","","SC","No","Y","E4M","Y","0.00083","0.0022","0.0028","UG_L","UG_L","","","0","","","","0.69"
,"0.0446","0.684","0","3","60","140","30","","*","","","","","
"DPT-16-18-GW-21-25SD","537","12/12/16","19:22","T","NA","DILUTION1","335-67-1","Perfluorooctanoic acid
(PFOA)","0.857","","SC","Yes","Y","DM4","Y","0.0083","0.022","0.028","UG_L","UG_L","","","0","","","","0.84","0
.0446","0.857","45","3","60","140","30","","*","","","","","
"DPT-16-18-GW-21-25SD","537","12/12/16","19:22","T","NA","DILUTION1","375-73-5","Perfluorobutanesulfonic
acid
(PFBS)","0.148","","SC","No","Y","D","Y","0.010","0.022","0.028","UG_L","UG_L","","","0","","","","0.11","0.0394
","0.148","108","0","50","150","30","","","","","","","
"DPT-16-18-GW-21-25SD","537","12/12/16","19:22","T","NA","DILUTION1","1763-23-1","Perfluorooctane
Sulfonate
(PFOS)","1.89","","SC","Yes","Y","D4","Y","0.014","0.033","0.045","UG_L","UG_L","","","0","","","","2.0","0.0414
","1.89","0","5","60","140","30","","*","","","","","
"LCS 320-139917/2-A","537","12/09/16","16:02","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","0.0366","","SC","Yes","Y","","Y","0.00092","0.0020","0.0025","UG_L","UG_L","","","0","0.0354","0.0366
","104","0","","","","","50","150","","","","","","","","
"LCS 320-139917/2-A","537","12/09/16","16:02","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","0.0334","","SC","Yes","Y","","Y","0.0013","0.0030","0.0040","UG_L","UG_L","","","0","0.0371","0.0334",
"90","0","","","","","60","140","","","","","","","","
"LCS 320-139917/2-A","537","12/09/16","16:02","T","NA","Initial","335-67-1","Perfluorooctanoic acid
(PFOA)","0.0345","","SC","Yes","Y","","Y","0.00075","0.0020","0.0025","UG_L","UG_L","","","0","0.0400","0.0345
","86","0","","","","","60","140","","","","","","","","
"MB 320-139917/1-A","537","12/09/16","15:54","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","","","TRG","Yes","N","U","Y","0.00092","0.0020","0.0025","UG_L","UG_L","","","0","","","","0","","","","
","","","","","","","","","","","
"MB 320-139917/1-A","537","12/09/16","15:54","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate

(PFOS)","","","TRG","Yes","N","U","Y","0.0013","0.0030","0.0040","UG_L","UG_L","","","0","","","","0","","","","","","","","","","","","","","","","","
"MB 320-139917/1-A","537","12/09/16","15:54","T","NA","Initial","335-67-1","Perfluorooctanoic acid (PFOA)","","","TRG","Yes","N","U","Y","0.00075","0.0020","0.0025","UG_L","UG_L","","","0","","","","0","","","","","","","","","","","","","","","","","","

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Data Validation Report

Project:	Former Bay Head Road Annex- Annapolis, MD	
Laboratory:	TestAmerica-West Sacramento, CA	
Job Number:	320-23830-1	
Analyses/Method:	Perfluorinated Compounds (PFCs) in Water, Soils, Sediments and Tissues by Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS)/ Revision 1.4 (August 2015)	
Validation Level:	Limited	
Resolution Consultants Project Number:	60444465-DM.DE	
Prepared by:	Paula DiMattei/Resolution Consultants	Completed on: 12/28/16
Reviewed by:	Robert Kennedy /Resolution Consultants	Completed on: 12/28/16
File Name: J23830-1_PFC memo.docx		

SUMMARY

The samples listed below were collected by Resolution Consultants from the Former Bay Head Road Annex site in Annapolis, MD on November 23, 2016.

Sample ID	Matrix/Sample Type
DPT-16-18-GW-21-25	Groundwater
DPT-16-18-GW-31-35	Groundwater
DPT-16-18-GW-31-35-DUP	Field duplicate of DPT-16-18-GW-31-35
DPT-16-19-GW-21-25	Groundwater
DPT-16-19-GW-31-35	Groundwater
DPT-16-23-GW-21-25	Groundwater
DPT-16-23-GW-31-35	Groundwater
DPT-GW-EB-112316	Equipment blank

Data validation activities were conducted with reference to:

- TestAmerica-West Sacramento SOP: Perfluorinated Compounds (PFCs) in Water, Soils, Sediments and Tissues by Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS)/Revision 1.4 (August 2015);
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (September 2016);
- USEPA Contract Laboratory Program National Functional Guidelines for High Resolution Superfund Methods Data Review (April 2016)
- Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (DoD, July 2013); and
- the project-specific Sampling and Analysis Plan.

In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

The data were evaluated based on the following review elements (where applicable to the method):

✓ Data completeness (chain-of-custody (COC)/sample integrity
✓ Holding times/sample preservation
✓ Initial calibration/initial and continuing calibration verification
✓ Laboratory method blanks/equipment blanks
✓ Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
✓ Field duplicate results
✓ Labeled compound results
✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. An "NA" indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. Qualification of the data was not required on the basis of this data review.

RESULTS

Data Completeness (chain-of-custody (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Holding Times/Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Initial Calibration/Initial and Continuing Calibration Verification

Calibration data were reviewed for conformance with the QC acceptance criteria to ensure that:

- the initial calibration (ICAL) percent relative standard deviation (%RSD) or correlation coefficient (r) or coefficient of determination (r^2) method acceptance criteria were met;
- the initial calibration verification standard (ICV) percent recovery acceptance criteria were met; and
- the continuing calibration verification standard (CCV) frequency and method percent difference or percent drift (%D) criteria were met.

All QC acceptance criteria were met.

Laboratory Method Blanks/Equipment Blanks

Laboratory method blanks and equipment blanks are evaluated as to whether there are contaminants detected above the detection limit (DL). Target compounds were not detected in the laboratory method blank or the equipment blank associated with the samples in this data set.

MS/MSD Results

The MS/MSD percent recoveries (%Rs) and relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met or qualification of the data was not required.

LCS/LCSD Results

The LCS %Rs and RPDs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate Results

Field duplicate RPDs are reviewed for conformance with the RESCON QC acceptance limit of $\leq$ 30% [if results are greater than five times the limit of quantitation (LOQ)] and $\leq$ 2x the LOQ [if results are less than five times the LOQ] for aqueous and solid matrices. All field duplicate precision criteria were met.

Labeled Compound Results

The labeled compound results were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Sample Results/Reporting Issues

If applicable, compounds detected at concentrations less than the LOQ but greater than the DL are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

QUALIFICATION ACTIONS

Qualification of the data was not required on this basis of this data review.

INSTALLATION_ID	SITE_NAME	LOCATION_NAME	LOCATION_TYPE_DESC	COORD_X	COORD_Y	SAMPLE_NAME	SAMPLE_MATRIX_DESC	COLLECT_DATE	ANALYTICAL_METHOD_GRP_DESC	SDG
DAVID_TAYLOR_RC	SITE 00003	DPT-16-18	Direct Push/Geoprobe	1474610	496269	DPT-16-18-GW-21-25	Ground water	11/23/2016	Perfluoroalkyl Compounds	320-23830-1
DAVID_TAYLOR_RC	SITE 00003	DPT-16-18	Direct Push/Geoprobe	1474610	496269	DPT-16-18-GW-31-35	Ground water	11/23/2016	Perfluoroalkyl Compounds	320-23830-1
DAVID_TAYLOR_RC	SITE 00003	DPT-16-18	Direct Push/Geoprobe	1474610	496269	DPT-16-18-GW-31-35-DUP	Ground water	11/23/2016	Perfluoroalkyl Compounds	320-23830-1
DAVID_TAYLOR_RC	SITE 00003	DPT-16-19	Direct Push/Geoprobe	1474570	496282	DPT-16-19-GW-21-25	Ground water	11/23/2016	Perfluoroalkyl Compounds	320-23830-1
DAVID_TAYLOR_RC	SITE 00003	DPT-16-19	Direct Push/Geoprobe	1474570	496282	DPT-16-19-GW-31-35	Ground water	11/23/2016	Perfluoroalkyl Compounds	320-23830-1
DAVID_TAYLOR_RC	SITE 00003	DPT-16-23	Direct Push/Geoprobe	1474540	496236	DPT-16-23-GW-21-25	Ground water	11/23/2016	Perfluoroalkyl Compounds	320-23830-1
DAVID_TAYLOR_RC	SITE 00003	DPT-16-23	Direct Push/Geoprobe	1474540	496236	DPT-16-23-GW-31-35	Ground water	11/23/2016	Perfluoroalkyl Compounds	320-23830-1