



Groundwater Sample Results, Level 2 Laboratory Report, Level 4 Laboratory Report, Electronic Data Deliverable, Data Validation Report, Sample Location Report, SDG J236511

*Bay Head Road Annex
NSWC Annapolis
Maryland*

December 2020

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Sacramento

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TestAmerica Job ID: 320-23651-1

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

For:

AECOM Technical Services Inc.

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Authorized for release by:

12/6/2016 4:31:17 PM

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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: 320-23651-1

Qualifiers

LCMS

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

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, 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/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23651-1

Job ID: 320-23651-1

Laboratory: TestAmerica Sacramento

Narrative

CASE NARRATIVE

Client: AECOM Technical Services Inc.

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

Report Number: 320-23651-1

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.

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

RECEIPT

The samples were received on 11/17/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.9 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.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-138841.

The following samples had an excessive amount of sediment in the sample containers. The aqueous portion of these samples was decanted to new bottles prior to spiking and the extraction.

DPT-16-20-GW-16-20 (320-23651-1), DPT-16-20-GW-26-30 (320-23651-4), DPT-16-34-GW-16-20 (320-23651-6), DPT-16-26-GW-18-22 (320-23651-7), DPT-16-26-GW-29-33 (320-23651-8), DPT-16-26-GW-29-33-DUP (320-23651-9), DPT-16-27-GW-18-22 (320-23651-10)

Case Narrative

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

TestAmerica Job ID: 320-23651-1

Job ID: 320-23651-1 (Continued)

Laboratory: TestAmerica Sacramento (Continued)

and DPT-16-27-GW-29-33 (320-23651-11)

Samples DPT-16-20-GW-16-20 (320-23651-1)[10X], DPT-16-20-GW-26-30 (320-23651-4)[100X] and DPT-16-34-GW-16-20 (320-23651-6)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

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

PERCENT SOLIDS

No 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: 320-23651-1

Client Sample ID: DPT-16-20-GW-16-20

Lab Sample ID: 320-23651-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.15	D	0.025	0.0074	ug/L	10		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.66	D M	0.040	0.013	ug/L	10		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.017	J D	0.025	0.0091	ug/L	10		537 (Modified)	Total/NA

Client Sample ID: DPT-16-20-SO-16-17

Lab Sample ID: 320-23651-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.46	J	0.61	0.12	ug/Kg	1	☼	537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	10		0.61	0.15	ug/Kg	1	☼	537 (Modified)	Total/NA

Client Sample ID: DPT-16-20-SO-16-17-DUP

Lab Sample ID: 320-23651-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.78		0.59	0.12	ug/Kg	1	☼	537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	20	M	0.59	0.15	ug/Kg	1	☼	537 (Modified)	Total/NA

Client Sample ID: DPT-16-20-GW-26-30

Lab Sample ID: 320-23651-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	1.0	D	0.25	0.074	ug/L	100		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	6.8	D	0.40	0.13	ug/L	100		537 (Modified)	Total/NA

Client Sample ID: DPT-SO-EB-111516

Lab Sample ID: 320-23651-5

No Detections.

Client Sample ID: DPT-16-34-GW-16-20

Lab Sample ID: 320-23651-6

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.40	D	0.025	0.0074	ug/L	10		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	1.6	D	0.039	0.013	ug/L	10		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.028	D	0.025	0.0090	ug/L	10		537 (Modified)	Total/NA

Client Sample ID: DPT-16-26-GW-18-22

Lab Sample ID: 320-23651-7

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.0073	M	0.0025	0.00073	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.038	M	0.0039	0.0013	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.0010	J	0.0025	0.00090	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-16-26-GW-29-33

Lab Sample ID: 320-23651-8

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.0050	M	0.0025	0.00075	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.080	M	0.0040	0.0013	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.0010	J M	0.0025	0.00091	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-16-26-GW-29-33-DUP

Lab Sample ID: 320-23651-9

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.0031	M	0.0025	0.00075	ug/L	1		537 (Modified)	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Detection Summary

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

TestAmerica Job ID: 320-23651-1

Client Sample ID: DPT-16-26-GW-29-33-DUP (Continued)

Lab Sample ID: 320-23651-9

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctane Sulfonate (PFOS)	0.053	M	0.0040	0.0013	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-16-27-GW-18-22

Lab Sample ID: 320-23651-10

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.0017	J M	0.0025	0.00075	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.026		0.0040	0.0013	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-16-27-GW-29-33

Lab Sample ID: 320-23651-11

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.0022	J M	0.0025	0.00074	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.015	M	0.0040	0.0013	ug/L	1		537 (Modified)	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-23651-1

Client Sample ID: DPT-16-20-GW-16-20

Date Collected: 11/15/16 10:30

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-1

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.15	D	0.025	0.0074	ug/L	—	11/21/16 13:47	12/02/16 18:59	10
Perfluorooctane Sulfonate (PFOS)	0.66	D M	0.040	0.013	ug/L	—	11/21/16 13:47	12/02/16 18:59	10
Perfluorobutanesulfonic acid (PFBS)	0.017	J D	0.025	0.0091	ug/L	—	11/21/16 13:47	12/02/16 18:59	10
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	98		25 - 150				11/21/16 13:47	12/02/16 18:59	10
13C4 PFOS	137		25 - 150				11/21/16 13:47	12/02/16 18:59	10
18O2 PFHxS	148		25 - 150				11/21/16 13:47	12/02/16 18:59	10

Client Sample ID: DPT-16-20-SO-16-17

Date Collected: 11/15/16 09:45

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-2

Matrix: Solid

Percent Solids: 80.6

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.46	J	0.61	0.12	ug/Kg	☼	11/28/16 11:03	12/02/16 15:14	1
Perfluorooctane Sulfonate (PFOS)	10		0.61	0.15	ug/Kg	☼	11/28/16 11:03	12/02/16 15:14	1
Perfluorobutanesulfonic acid (PFBS)	0.37	U	0.49	0.13	ug/Kg	☼	11/28/16 11:03	12/02/16 15:14	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	101		25 - 150				11/28/16 11:03	12/02/16 15:14	1
13C4 PFOS	78		25 - 150				11/28/16 11:03	12/02/16 15:14	1
18O2 PFHxS	99		25 - 150				11/28/16 11:03	12/02/16 15:14	1

Client Sample ID: DPT-16-20-SO-16-17-DUP

Date Collected: 11/15/16 09:45

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-3

Matrix: Solid

Percent Solids: 83.5

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.78		0.59	0.12	ug/Kg	☼	11/28/16 11:03	12/02/16 15:22	1
Perfluorooctane Sulfonate (PFOS)	20	M	0.59	0.15	ug/Kg	☼	11/28/16 11:03	12/02/16 15:22	1
Perfluorobutanesulfonic acid (PFBS)	0.36	U	0.47	0.12	ug/Kg	☼	11/28/16 11:03	12/02/16 15:22	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	111		25 - 150				11/28/16 11:03	12/02/16 15:22	1
13C4 PFOS	90		25 - 150				11/28/16 11:03	12/02/16 15:22	1
18O2 PFHxS	101		25 - 150				11/28/16 11:03	12/02/16 15:22	1

Client Sample ID: DPT-16-20-GW-26-30

Date Collected: 11/15/16 11:05

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-4

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	1.0	D	0.25	0.074	ug/L	—	11/21/16 13:47	12/02/16 18:52	100
Perfluorooctane Sulfonate (PFOS)	6.8	D	0.40	0.13	ug/L	—	11/21/16 13:47	12/02/16 18:52	100
Perfluorobutanesulfonic acid (PFBS)	0.20	U	0.25	0.091	ug/L	—	11/21/16 13:47	12/02/16 18:52	100
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	127		25 - 150				11/21/16 13:47	12/02/16 18:52	100
13C4 PFOS	120		25 - 150				11/21/16 13:47	12/02/16 18:52	100

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-23651-1

Client Sample ID: DPT-16-20-GW-26-30

Date Collected: 11/15/16 11:05

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-4

Matrix: Water

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
18O2 PFHxS	132		25 - 150	11/21/16 13:47	12/02/16 18:52	100

Client Sample ID: DPT-SO-EB-111516

Date Collected: 11/15/16 11:00

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-5

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0018	U	0.0022	0.00067	ug/L		11/21/16 13:47	12/02/16 19:37	1
Perfluorooctane Sulfonate (PFOS)	0.0027	U	0.0036	0.0011	ug/L		11/21/16 13:47	12/02/16 19:37	1
Perfluorobutanesulfonic acid (PFBS)	0.0018	U	0.0022	0.00083	ug/L		11/21/16 13:47	12/02/16 19:37	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	139		25 - 150				11/21/16 13:47	12/02/16 19:37	1
13C4 PFOS	121		25 - 150				11/21/16 13:47	12/02/16 19:37	1
18O2 PFHxS	126		25 - 150				11/21/16 13:47	12/02/16 19:37	1

Client Sample ID: DPT-16-34-GW-16-20

Date Collected: 11/15/16 12:00

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-6

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.40	D	0.025	0.0074	ug/L		11/21/16 13:47	12/02/16 19:07	10
Perfluorooctane Sulfonate (PFOS)	1.6	D	0.039	0.013	ug/L		11/21/16 13:47	12/02/16 19:07	10
Perfluorobutanesulfonic acid (PFBS)	0.028	D	0.025	0.0090	ug/L		11/21/16 13:47	12/02/16 19:07	10
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	90		25 - 150				11/21/16 13:47	12/02/16 19:07	10
13C4 PFOS	107		25 - 150				11/21/16 13:47	12/02/16 19:07	10
18O2 PFHxS	116		25 - 150				11/21/16 13:47	12/02/16 19:07	10

Client Sample ID: DPT-16-26-GW-18-22

Date Collected: 11/16/16 11:20

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-7

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0073	M	0.0025	0.00073	ug/L	-	11/21/16 13:47	12/02/16 20:22	1
Perfluorooctane Sulfonate (PFOS)	0.038	M	0.0039	0.0013	ug/L	-	11/21/16 13:47	12/02/16 20:22	1
Perfluorobutanesulfonic acid (PFBS)	0.0010	J	0.0025	0.00090	ug/L	-	11/21/16 13:47	12/02/16 20:22	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	85		25 - 150				11/21/16 13:47	12/02/16 20:22	1
13C4 PFOS	126		25 - 150				11/21/16 13:47	12/02/16 20:22	1
18O2 PFHxS	132		25 - 150				11/21/16 13:47	12/02/16 20:22	1

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-23651-1

Client Sample ID: DPT-16-26-GW-29-33

Date Collected: 11/16/16 12:00

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-8

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0050	M	0.0025	0.00075	ug/L	—	11/21/16 13:47	12/02/16 20:29	1
Perfluorooctane Sulfonate (PFOS)	0.080	M	0.0040	0.0013	ug/L	—	11/21/16 13:47	12/02/16 20:29	1
Perfluorobutanesulfonic acid (PFBS)	0.0010	J M	0.0025	0.00091	ug/L	—	11/21/16 13:47	12/02/16 20:29	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	97		25 - 150				11/21/16 13:47	12/02/16 20:29	1
13C4 PFOS	109		25 - 150				11/21/16 13:47	12/02/16 20:29	1
18O2 PFHxS	119		25 - 150				11/21/16 13:47	12/02/16 20:29	1

Client Sample ID: DPT-16-26-GW-29-33-DUP

Date Collected: 11/16/16 12:00

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-9

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0031	M	0.0025	0.00075	ug/L	—	11/21/16 13:47	12/02/16 20:37	1
Perfluorooctane Sulfonate (PFOS)	0.053	M	0.0040	0.0013	ug/L	—	11/21/16 13:47	12/02/16 20:37	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L	—	11/21/16 13:47	12/02/16 20:37	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	82		25 - 150				11/21/16 13:47	12/02/16 20:37	1
13C4 PFOS	116		25 - 150				11/21/16 13:47	12/02/16 20:37	1
18O2 PFHxS	116		25 - 150				11/21/16 13:47	12/02/16 20:37	1

Client Sample ID: DPT-16-27-GW-18-22

Date Collected: 11/16/16 13:20

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-10

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0017	J M	0.0025	0.00075	ug/L	—	11/21/16 13:47	12/02/16 20:14	1
Perfluorooctane Sulfonate (PFOS)	0.026	M	0.0040	0.0013	ug/L	—	11/21/16 13:47	12/02/16 20:14	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00091	ug/L	—	11/21/16 13:47	12/02/16 20:14	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	75		25 - 150				11/21/16 13:47	12/02/16 20:14	1
13C4 PFOS	111		25 - 150				11/21/16 13:47	12/02/16 20:14	1
18O2 PFHxS	112		25 - 150				11/21/16 13:47	12/02/16 20:14	1

Client Sample ID: DPT-16-27-GW-29-33

Date Collected: 11/16/16 14:00

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-11

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0022	J M	0.0025	0.00074	ug/L	—	11/21/16 13:47	12/02/16 20:44	1
Perfluorooctane Sulfonate (PFOS)	0.015	M	0.0040	0.0013	ug/L	—	11/21/16 13:47	12/02/16 20:44	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00091	ug/L	—	11/21/16 13:47	12/02/16 20:44	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	101		25 - 150				11/21/16 13:47	12/02/16 20:44	1
13C4 PFOS	130		25 - 150				11/21/16 13:47	12/02/16 20:44	1

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-23651-1

Client Sample ID: DPT-16-27-GW-29-33

Date Collected: 11/16/16 14:00

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-11

Matrix: Water

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

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
18O2 PFHxS	134		25 - 150

<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
11/21/16 13:47	12/02/16 20:44	1

Isotope Dilution Summary

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

TestAmerica Job ID: 320-23651-1

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Matrix: Solid

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	3C4 PFO ₂ (25-150)	3C4 PFO ₂ (25-150)	3O2 PFHx (25-150)
320-23651-2	DPT-16-20-SO-16-17	101	78	99
320-23651-3	DPT-16-20-SO-16-17-DUP	111	90	101
LCS 320-139627/2-A	Lab Control Sample	119	112	120
MB 320-139627/1-A	Method Blank	108	94	104

Surrogate Legend

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

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 ₂ (25-150)	3C4 PFO ₂ (25-150)	3O2 PFHx (25-150)
320-23651-1	DPT-16-20-GW-16-20	98	137	148
320-23651-4	DPT-16-20-GW-26-30	127	120	132
320-23651-5	DPT-SO-EB-111516	139	121	126
320-23651-6	DPT-16-34-GW-16-20	90	107	116
320-23651-7	DPT-16-26-GW-18-22	85	126	132
320-23651-8	DPT-16-26-GW-29-33	97	109	119
320-23651-9	DPT-16-26-GW-29-33-DUP	82	116	116
320-23651-10	DPT-16-27-GW-18-22	75	111	112
320-23651-11	DPT-16-27-GW-29-33	101	130	134
LCS 320-138841/2-A	Lab Control Sample	133	123	126
LCSD 320-138841/3-A	Lab Control Sample Dup	110	102	109
MB 320-138841/1-A	Method Blank	133	118	123

Surrogate Legend

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

QC Sample Results

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

TestAmerica Job ID: 320-23651-1

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-138841/1-A

Matrix: Water

Analysis Batch: 140532

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 138841

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		11/21/16 13:47	12/02/16 18:29	1
Perfluorooctane Sulfonate (PFOS)	0.0030	U	0.0040	0.0013	ug/L		11/21/16 13:47	12/02/16 18:29	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		11/21/16 13:47	12/02/16 18:29	1
Isotope Dilution	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	133		25 - 150				11/21/16 13:47	12/02/16 18:29	1
13C4 PFOS	118		25 - 150				11/21/16 13:47	12/02/16 18:29	1
18O2 PFHxS	123		25 - 150				11/21/16 13:47	12/02/16 18:29	1

Lab Sample ID: LCS 320-138841/2-A

Matrix: Water

Analysis Batch: 140532

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 138841

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanoic acid (PFOA)	0.0400	0.0373		ug/L		93	60 - 140
Perfluorooctane Sulfonate (PFOS)	0.0371	0.0328		ug/L		88	60 - 140
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0373		ug/L		106	50 - 150
Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits				
13C4 PFOA	133		25 - 150				
13C4 PFOS	123		25 - 150				
18O2 PFHxS	126		25 - 150				

Lab Sample ID: LCSD 320-138841/3-A

Matrix: Water

Analysis Batch: 140532

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 138841

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	0.0400	0.0407		ug/L		102	60 - 140	9	30
Perfluorooctane Sulfonate (PFOS)	0.0371	0.0390		ug/L		105	60 - 140	17	30
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0371		ug/L		105	50 - 150	1	30
Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits						
13C4 PFOA	110		25 - 150						
13C4 PFOS	102		25 - 150						
18O2 PFHxS	109		25 - 150						

Lab Sample ID: MB 320-139627/1-A

Matrix: Solid

Analysis Batch: 140429

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 139627

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.30	U	0.50	0.10	ug/Kg		11/28/16 11:03	12/02/16 14:59	1
Perfluorooctane Sulfonate (PFOS)	0.30	U	0.50	0.13	ug/Kg		11/28/16 11:03	12/02/16 14:59	1
Perfluorobutanesulfonic acid (PFBS)	0.30	U	0.40	0.10	ug/Kg		11/28/16 11:03	12/02/16 14:59	1

TestAmerica Sacramento

QC Sample Results

Client: AECOM Technical Services Inc.

TestAmerica Job ID: 320-23651-1

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

MB MB						
Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	108		25 - 150	11/28/16 11:03	12/02/16 14:59	1
13C4 PFOS	94		25 - 150	11/28/16 11:03	12/02/16 14:59	1
18O2 PFHxS	104		25 - 150	11/28/16 11:03	12/02/16 14:59	1

Lab Sample ID: LCS 320-139627/2-A

Matrix: Solid

Analysis Batch: 140429

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 139627

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanoic acid (PFOA)	4.00	4.25		ug/Kg		106	60 - 140
Perfluorooctane Sulfonate (PFOS)	3.71	3.66		ug/Kg		99	60 - 140
Perfluorobutanesulfonic acid (PFBS)	3.54	4.03		ug/Kg		114	50 - 150

LCS LCS			
Isotope Dilution	%Recovery	Qualifier	Limits
13C4 PFOA	119		25 - 150
13C4 PFOS	112		25 - 150
18O2 PFHxS	120		25 - 150

TestAmerica Sacramento

QC Association Summary

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

TestAmerica Job ID: 320-23651-1

LCMS

Prep Batch: 138841

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23651-1	DPT-16-20-GW-16-20	Total/NA	Water	3535	
320-23651-4	DPT-16-20-GW-26-30	Total/NA	Water	3535	
320-23651-5	DPT-SO-EB-111516	Total/NA	Water	3535	
320-23651-6	DPT-16-34-GW-16-20	Total/NA	Water	3535	
320-23651-7	DPT-16-26-GW-18-22	Total/NA	Water	3535	
320-23651-8	DPT-16-26-GW-29-33	Total/NA	Water	3535	
320-23651-9	DPT-16-26-GW-29-33-DUP	Total/NA	Water	3535	
320-23651-10	DPT-16-27-GW-18-22	Total/NA	Water	3535	
320-23651-11	DPT-16-27-GW-29-33	Total/NA	Water	3535	
MB 320-138841/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-138841/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-138841/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Prep Batch: 139627

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23651-2	DPT-16-20-SO-16-17	Total/NA	Solid	SHAKE	
320-23651-3	DPT-16-20-SO-16-17-DUP	Total/NA	Solid	SHAKE	
MB 320-139627/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-139627/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	

Analysis Batch: 140429

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23651-2	DPT-16-20-SO-16-17	Total/NA	Solid	537 (Modified)	139627
320-23651-3	DPT-16-20-SO-16-17-DUP	Total/NA	Solid	537 (Modified)	139627
MB 320-139627/1-A	Method Blank	Total/NA	Solid	537 (Modified)	139627
LCS 320-139627/2-A	Lab Control Sample	Total/NA	Solid	537 (Modified)	139627

Analysis Batch: 140532

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23651-1	DPT-16-20-GW-16-20	Total/NA	Water	537 (Modified)	138841
320-23651-4	DPT-16-20-GW-26-30	Total/NA	Water	537 (Modified)	138841
320-23651-5	DPT-SO-EB-111516	Total/NA	Water	537 (Modified)	138841
320-23651-6	DPT-16-34-GW-16-20	Total/NA	Water	537 (Modified)	138841
320-23651-7	DPT-16-26-GW-18-22	Total/NA	Water	537 (Modified)	138841
320-23651-8	DPT-16-26-GW-29-33	Total/NA	Water	537 (Modified)	138841
320-23651-9	DPT-16-26-GW-29-33-DUP	Total/NA	Water	537 (Modified)	138841
320-23651-10	DPT-16-27-GW-18-22	Total/NA	Water	537 (Modified)	138841
320-23651-11	DPT-16-27-GW-29-33	Total/NA	Water	537 (Modified)	138841
MB 320-138841/1-A	Method Blank	Total/NA	Water	537 (Modified)	138841
LCS 320-138841/2-A	Lab Control Sample	Total/NA	Water	537 (Modified)	138841
LCSD 320-138841/3-A	Lab Control Sample Dup	Total/NA	Water	537 (Modified)	138841

General Chemistry

Analysis Batch: 139136

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23651-2	DPT-16-20-SO-16-17	Total/NA	Solid	D 2216	
320-23651-3	DPT-16-20-SO-16-17-DUP	Total/NA	Solid	D 2216	

TestAmerica Sacramento

Lab Chronicle

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

TestAmerica Job ID: 320-23651-1

Client Sample ID: DPT-16-20-GW-16-20

Date Collected: 11/15/16 10:30

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			252.6 mL	0.5 mL	138841	11/21/16 13:47	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		10			140532	12/02/16 18:59	SBC	TAL SAC

Client Sample ID: DPT-16-20-SO-16-17

Date Collected: 11/15/16 09:45

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-2

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			139136	11/22/16 13:53	MY1	TAL SAC

Client Sample ID: DPT-16-20-SO-16-17

Date Collected: 11/15/16 09:45

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-2

Matrix: Solid

Percent Solids: 80.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.07 g	1.00 mL	139627	11/28/16 11:03	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)		1			140429	12/02/16 15:14	SBC	TAL SAC

Client Sample ID: DPT-16-20-SO-16-17-DUP

Date Collected: 11/15/16 09:45

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-3

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			139136	11/22/16 13:53	MY1	TAL SAC

Client Sample ID: DPT-16-20-SO-16-17-DUP

Date Collected: 11/15/16 09:45

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-3

Matrix: Solid

Percent Solids: 83.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.05 g	1.00 mL	139627	11/28/16 11:03	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)		1			140429	12/02/16 15:22	SBC	TAL SAC

Client Sample ID: DPT-16-20-GW-26-30

Date Collected: 11/15/16 11:05

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			251.5 mL	0.5 mL	138841	11/21/16 13:47	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		100			140532	12/02/16 18:52	SBC	TAL SAC

TestAmerica Sacramento

Lab Chronicle

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

TestAmerica Job ID: 320-23651-1

Client Sample ID: DPT-SO-EB-111516

Lab Sample ID: 320-23651-5

Date Collected: 11/15/16 11:00

Matrix: Water

Date Received: 11/17/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			278 mL	0.5 mL	138841	11/21/16 13:47	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		1			140532	12/02/16 19:37	SBC	TAL SAC

Client Sample ID: DPT-16-34-GW-16-20

Lab Sample ID: 320-23651-6

Date Collected: 11/15/16 12:00

Matrix: Water

Date Received: 11/17/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			254.2 mL	0.5 mL	138841	11/21/16 13:47	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		10			140532	12/02/16 19:07	SBC	TAL SAC

Client Sample ID: DPT-16-26-GW-18-22

Lab Sample ID: 320-23651-7

Date Collected: 11/16/16 11:20

Matrix: Water

Date Received: 11/17/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			255.1 mL	0.5 mL	138841	11/21/16 13:47	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		1			140532	12/02/16 20:22	SBC	TAL SAC

Client Sample ID: DPT-16-26-GW-29-33

Lab Sample ID: 320-23651-8

Date Collected: 11/16/16 12:00

Matrix: Water

Date Received: 11/17/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			250.9 mL	0.5 mL	138841	11/21/16 13:47	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		1			140532	12/02/16 20:29	SBC	TAL SAC

Client Sample ID: DPT-16-26-GW-29-33-DUP

Lab Sample ID: 320-23651-9

Date Collected: 11/16/16 12:00

Matrix: Water

Date Received: 11/17/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			249.3 mL	0.5 mL	138841	11/21/16 13:47	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		1			140532	12/02/16 20:37	SBC	TAL SAC

Client Sample ID: DPT-16-27-GW-18-22

Lab Sample ID: 320-23651-10

Date Collected: 11/16/16 13:20

Matrix: Water

Date Received: 11/17/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			250.9 mL	0.5 mL	138841	11/21/16 13:47	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		1			140532	12/02/16 20:14	SBC	TAL SAC

TestAmerica Sacramento

Lab Chronicle

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

TestAmerica Job ID: 320-23651-1

Client Sample ID: DPT-16-27-GW-29-33

Lab Sample ID: 320-23651-11

Date Collected: 11/16/16 14:00

Matrix: Water

Date Received: 11/17/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			251.3 mL	0.5 mL	138841	11/21/16 13:47	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		1			140532	12/02/16 20:44	SBC	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: 320-23651-1

Laboratory: TestAmerica Sacramento

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

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

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

Analysis Method	Prep Method	Matrix	Analyte
537 (Modified)	SHAKE	Solid	Perfluorooctane Sulfonate (PFOS)
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids

Method Summary

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

TestAmerica Job ID: 320-23651-1

Method	Method Description	Protocol	Laboratory
537 (Modified)	Perfluorinated Hydrocarbons	EPA	TAL SAC
D 2216	Percent Moisture	ASTM	TAL SAC

Protocol References:

ASTM = ASTM International

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.

TestAmerica Job ID: 320-23651-1

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

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-23651-1	DPT-16-20-GW-16-20	Water	11/15/16 10:30	11/17/16 09:40
320-23651-2	DPT-16-20-SO-16-17	Solid	11/15/16 09:45	11/17/16 09:40
320-23651-3	DPT-16-20-SO-16-17-DUP	Solid	11/15/16 09:45	11/17/16 09:40
320-23651-4	DPT-16-20-GW-26-30	Water	11/15/16 11:05	11/17/16 09:40
320-23651-5	DPT-SO-EB-111516	Water	11/15/16 11:00	11/17/16 09:40
320-23651-6	DPT-16-34-GW-16-20	Water	11/15/16 12:00	11/17/16 09:40
320-23651-7	DPT-16-26-GW-18-22	Water	11/16/16 11:20	11/17/16 09:40
320-23651-8	DPT-16-26-GW-29-33	Water	11/16/16 12:00	11/17/16 09:40
320-23651-9	DPT-16-26-GW-29-33-DUP	Water	11/16/16 12:00	11/17/16 09:40
320-23651-10	DPT-16-27-GW-18-22	Water	11/16/16 13:20	11/17/16 09:40
320-23651-11	DPT-16-27-GW-29-33	Water	11/16/16 14:00	11/17/16 09:40

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Temperature on Receipt _____

Drinking Water? Yes ☐ No ☒

Chain of Custody Record

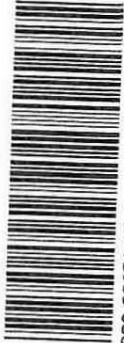
TAL-4124 (1007)

Client AECOM		Project Manager KURT VAN GELDER		Chain of Custody Number 299017	
Address 3101 WILSON BLVD		Telephone Number (Area Code)/Fax Number (703) 549-8728		Lab Number Page 1 of 1	
City ARLINGTON	State VA	Zip Code 22201	Site Contact MIKE GLINSKI	Analysis (Attach list if more space is needed)	
Project Name and Location (State) BAY HEAD ID ANNEX - ANNAPOLIS			Lab Contact JILL KELLMAN		
Contract/Purchase Order/Quote No.			Carrier/Waybill Number FEDEX		

Special Instructions/
Conditions of Receipt

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Air	Aqueous	Sed	Soil	Unpres	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	PF2	PF3	PF4
DPT-16-20-GW-16-20	11/15/16	1030		✓			2						✓	✓	✓
DPT-16-20-SO-16-17		0945			✓	✓	1						✓	✓	✓
DPT-16-20-SO-16-17-DUP		0945				✓	1						✓	✓	✓
DPT-16-20-GW-26-30		1105		✓			2						✓	✓	✓
DPT-SO-EB-111516		1100		✓			2						✓	✓	✓
DPT-16-34-GW-16-20		1200		✓			2						✓	✓	✓
DPT-16-26-GW-18-22	11/16/16	1120		✓	✓		2						✓	✓	✓
DPT-16-26-GW-29-33		1200		✓			2						✓	✓	✓
DPT-16-26-GW-29-33-DUP		1200		✓			2						✓	✓	✓
DPT-16-27-GW-18-22		1320		✓	✓		2						✓	✓	✓
DPT-16-27-GW-29-33		1400		✓	✓		2						✓	✓	✓

320-23651 Chain of Custody



Subsurface Soil EB

Subsurface soil TB



320-23651 Chain of Custody

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months
 (A fee may be assessed if samples are retained longer than 1 month)

QC Requirements (Specify)

Turn Around Time Required	☐ 24 Hours ☐ 48 Hours ☒ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____
1. Relinquished By	WJH Date 11/14/16 Time 1700
2. Relinquished By	TRANSFER TO FEDEX Date 11/17/16 Time 0940
3. Relinquished By	WJH Date 11/17/16 Time 0940

Comments

1.9

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 320-23651-1

Login Number: 23651

List Source: TestAmerica Sacramento

List Number: 1

Creator: Edman, Connor M

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

ANALYTICAL REPORT

Job Number: 320-23651-1

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
12/6/2016 4:39 PM

Jill Kellmann, Manager of Project Management
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4402
jill.kellmann@testamericainc.com
12/06/2016

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Definitions/Glossary

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

TestAmerica Job ID: 320-23651-1

Qualifiers

LCMS

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

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, 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: 320-23651-1

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.

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

RECEIPT

The samples were received on 11/17/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.9 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.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-138841.

The following samples had an excessive amount of sediment in the sample containers. The aqueous portion of these samples was decanted to new bottles prior to spiking and the extraction.

DPT-16-20-GW-16-20 (320-23651-1), DPT-16-20-GW-26-30 (320-23651-4), DPT-16-34-GW-16-20 (320-23651-6), DPT-16-26-GW-18-22 (320-23651-7), DPT-16-26-GW-29-33 (320-23651-8), DPT-16-26-GW-29-33-DUP (320-23651-9), DPT-16-27-GW-18-22 (320-23651-10) and DPT-16-27-GW-29-33 (320-23651-11)

Samples DPT-16-20-GW-16-20 (320-23651-1)[10X], DPT-16-20-GW-26-30 (320-23651-4)[100X] and DPT-16-34-GW-16-20 (320-23651-6)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

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

PERCENT SOLIDS

No 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: 320-23651-1

Client Sample ID: DPT-16-20-GW-16-20

Lab Sample ID: 320-23651-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.15	D	0.025	0.0074	ug/L	10		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.66	D M	0.040	0.013	ug/L	10		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.017	J D	0.025	0.0091	ug/L	10		537 (Modified)	Total/NA

Client Sample ID: DPT-16-20-SO-16-17

Lab Sample ID: 320-23651-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.46	J	0.61	0.12	ug/Kg	1	☼	537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	10		0.61	0.15	ug/Kg	1	☼	537 (Modified)	Total/NA

Client Sample ID: DPT-16-20-SO-16-17-DUP

Lab Sample ID: 320-23651-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.78		0.59	0.12	ug/Kg	1	☼	537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	20	M	0.59	0.15	ug/Kg	1	☼	537 (Modified)	Total/NA

Client Sample ID: DPT-16-20-GW-26-30

Lab Sample ID: 320-23651-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	1.0	D	0.25	0.074	ug/L	100		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	6.8	D	0.40	0.13	ug/L	100		537 (Modified)	Total/NA

Client Sample ID: DPT-SO-EB-111516

Lab Sample ID: 320-23651-5

No Detections.

Client Sample ID: DPT-16-34-GW-16-20

Lab Sample ID: 320-23651-6

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.40	D	0.025	0.0074	ug/L	10		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	1.6	D	0.039	0.013	ug/L	10		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.028	D	0.025	0.0090	ug/L	10		537 (Modified)	Total/NA

Client Sample ID: DPT-16-26-GW-18-22

Lab Sample ID: 320-23651-7

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.0073	M	0.0025	0.00073	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.038	M	0.0039	0.0013	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.0010	J	0.0025	0.00090	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-16-26-GW-29-33

Lab Sample ID: 320-23651-8

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.0050	M	0.0025	0.00075	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.080	M	0.0040	0.0013	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.0010	J M	0.0025	0.00091	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-16-26-GW-29-33-DUP

Lab Sample ID: 320-23651-9

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.0031	M	0.0025	0.00075	ug/L	1		537 (Modified)	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Detection Summary

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

TestAmerica Job ID: 320-23651-1

Client Sample ID: DPT-16-26-GW-29-33-DUP (Continued)

Lab Sample ID: 320-23651-9

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctane Sulfonate (PFOS)	0.053	M	0.0040	0.0013	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-16-27-GW-18-22

Lab Sample ID: 320-23651-10

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.0017	J M	0.0025	0.00075	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.026		0.0040	0.0013	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-16-27-GW-29-33

Lab Sample ID: 320-23651-11

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.0022	J M	0.0025	0.00074	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.015	M	0.0040	0.0013	ug/L	1		537 (Modified)	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-23651-1

Client Sample ID: DPT-16-20-GW-16-20

Date Collected: 11/15/16 10:30

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-1

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.15	D	0.025	0.0074	ug/L		11/21/16 13:47	12/02/16 18:59	10
Perfluorooctane Sulfonate (PFOS)	0.66	D M	0.040	0.013	ug/L		11/21/16 13:47	12/02/16 18:59	10
Perfluorobutanesulfonic acid (PFBS)	0.017	J D	0.025	0.0091	ug/L		11/21/16 13:47	12/02/16 18:59	10
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	98		25 - 150				11/21/16 13:47	12/02/16 18:59	10
13C4 PFOS	137		25 - 150				11/21/16 13:47	12/02/16 18:59	10
18O2 PFHxS	148		25 - 150				11/21/16 13:47	12/02/16 18:59	10

Client Sample ID: DPT-16-20-SO-16-17

Date Collected: 11/15/16 09:45

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-2

Matrix: Solid

Percent Solids: 80.6

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.46	J	0.61	0.12	ug/Kg	☼	11/28/16 11:03	12/02/16 15:14	1
Perfluorooctane Sulfonate (PFOS)	10		0.61	0.15	ug/Kg	☼	11/28/16 11:03	12/02/16 15:14	1
Perfluorobutanesulfonic acid (PFBS)	0.37	U	0.49	0.13	ug/Kg	☼	11/28/16 11:03	12/02/16 15:14	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	101		25 - 150				11/28/16 11:03	12/02/16 15:14	1
13C4 PFOS	78		25 - 150				11/28/16 11:03	12/02/16 15:14	1
18O2 PFHxS	99		25 - 150				11/28/16 11:03	12/02/16 15:14	1

Client Sample ID: DPT-16-20-SO-16-17-DUP

Date Collected: 11/15/16 09:45

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-3

Matrix: Solid

Percent Solids: 83.5

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.78		0.59	0.12	ug/Kg	☼	11/28/16 11:03	12/02/16 15:22	1
Perfluorooctane Sulfonate (PFOS)	20	M	0.59	0.15	ug/Kg	☼	11/28/16 11:03	12/02/16 15:22	1
Perfluorobutanesulfonic acid (PFBS)	0.36	U	0.47	0.12	ug/Kg	☼	11/28/16 11:03	12/02/16 15:22	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	111		25 - 150				11/28/16 11:03	12/02/16 15:22	1
13C4 PFOS	90		25 - 150				11/28/16 11:03	12/02/16 15:22	1
18O2 PFHxS	101		25 - 150				11/28/16 11:03	12/02/16 15:22	1

Client Sample ID: DPT-16-20-GW-26-30

Date Collected: 11/15/16 11:05

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-4

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	1.0	D	0.25	0.074	ug/L		11/21/16 13:47	12/02/16 18:52	100
Perfluorooctane Sulfonate (PFOS)	6.8	D	0.40	0.13	ug/L		11/21/16 13:47	12/02/16 18:52	100
Perfluorobutanesulfonic acid (PFBS)	0.20	U	0.25	0.091	ug/L		11/21/16 13:47	12/02/16 18:52	100
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	127		25 - 150				11/21/16 13:47	12/02/16 18:52	100
13C4 PFOS	120		25 - 150				11/21/16 13:47	12/02/16 18:52	100

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-23651-1

Client Sample ID: DPT-16-20-GW-26-30

Date Collected: 11/15/16 11:05

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-4

Matrix: Water

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
18O2 PFHxS	132		25 - 150	11/21/16 13:47	12/02/16 18:52	100

Client Sample ID: DPT-SO-EB-111516

Date Collected: 11/15/16 11:00

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-5

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0018	U	0.0022	0.00067	ug/L		11/21/16 13:47	12/02/16 19:37	1
Perfluorooctane Sulfonate (PFOS)	0.0027	U	0.0036	0.0011	ug/L		11/21/16 13:47	12/02/16 19:37	1
Perfluorobutanesulfonic acid (PFBS)	0.0018	U	0.0022	0.00083	ug/L		11/21/16 13:47	12/02/16 19:37	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	139		25 - 150				11/21/16 13:47	12/02/16 19:37	1
13C4 PFOS	121		25 - 150				11/21/16 13:47	12/02/16 19:37	1
18O2 PFHxS	126		25 - 150				11/21/16 13:47	12/02/16 19:37	1

Client Sample ID: DPT-16-34-GW-16-20

Date Collected: 11/15/16 12:00

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-6

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.40	D	0.025	0.0074	ug/L		11/21/16 13:47	12/02/16 19:07	10
Perfluorooctane Sulfonate (PFOS)	1.6	D	0.039	0.013	ug/L		11/21/16 13:47	12/02/16 19:07	10
Perfluorobutanesulfonic acid (PFBS)	0.028	D	0.025	0.0090	ug/L		11/21/16 13:47	12/02/16 19:07	10
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	90		25 - 150				11/21/16 13:47	12/02/16 19:07	10
13C4 PFOS	107		25 - 150				11/21/16 13:47	12/02/16 19:07	10
18O2 PFHxS	116		25 - 150				11/21/16 13:47	12/02/16 19:07	10

Client Sample ID: DPT-16-26-GW-18-22

Date Collected: 11/16/16 11:20

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-7

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0073	M	0.0025	0.00073	ug/L		11/21/16 13:47	12/02/16 20:22	1
Perfluorooctane Sulfonate (PFOS)	0.038	M	0.0039	0.0013	ug/L		11/21/16 13:47	12/02/16 20:22	1
Perfluorobutanesulfonic acid (PFBS)	0.0010	J	0.0025	0.00090	ug/L		11/21/16 13:47	12/02/16 20:22	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	85		25 - 150				11/21/16 13:47	12/02/16 20:22	1
13C4 PFOS	126		25 - 150				11/21/16 13:47	12/02/16 20:22	1
18O2 PFHxS	132		25 - 150				11/21/16 13:47	12/02/16 20:22	1

Client Sample Results

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

TestAmerica Job ID: 320-23651-1

Client Sample ID: DPT-16-26-GW-29-33

Date Collected: 11/16/16 12:00

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-8

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0050	M	0.0025	0.00075	ug/L	—	11/21/16 13:47	12/02/16 20:29	1
Perfluorooctane Sulfonate (PFOS)	0.080	M	0.0040	0.0013	ug/L	—	11/21/16 13:47	12/02/16 20:29	1
Perfluorobutanesulfonic acid (PFBS)	0.0010	J M	0.0025	0.00091	ug/L	—	11/21/16 13:47	12/02/16 20:29	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	97		25 - 150				11/21/16 13:47	12/02/16 20:29	1
13C4 PFOS	109		25 - 150				11/21/16 13:47	12/02/16 20:29	1
18O2 PFHxS	119		25 - 150				11/21/16 13:47	12/02/16 20:29	1

Client Sample ID: DPT-16-26-GW-29-33-DUP

Date Collected: 11/16/16 12:00

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-9

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0031	M	0.0025	0.00075	ug/L	—	11/21/16 13:47	12/02/16 20:37	1
Perfluorooctane Sulfonate (PFOS)	0.053	M	0.0040	0.0013	ug/L	—	11/21/16 13:47	12/02/16 20:37	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L	—	11/21/16 13:47	12/02/16 20:37	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	82		25 - 150				11/21/16 13:47	12/02/16 20:37	1
13C4 PFOS	116		25 - 150				11/21/16 13:47	12/02/16 20:37	1
18O2 PFHxS	116		25 - 150				11/21/16 13:47	12/02/16 20:37	1

Client Sample ID: DPT-16-27-GW-18-22

Date Collected: 11/16/16 13:20

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-10

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0017	J M	0.0025	0.00075	ug/L	—	11/21/16 13:47	12/02/16 20:14	1
Perfluorooctane Sulfonate (PFOS)	0.026	M	0.0040	0.0013	ug/L	—	11/21/16 13:47	12/02/16 20:14	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00091	ug/L	—	11/21/16 13:47	12/02/16 20:14	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	75		25 - 150				11/21/16 13:47	12/02/16 20:14	1
13C4 PFOS	111		25 - 150				11/21/16 13:47	12/02/16 20:14	1
18O2 PFHxS	112		25 - 150				11/21/16 13:47	12/02/16 20:14	1

Client Sample ID: DPT-16-27-GW-29-33

Date Collected: 11/16/16 14:00

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-11

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0022	J M	0.0025	0.00074	ug/L	—	11/21/16 13:47	12/02/16 20:44	1
Perfluorooctane Sulfonate (PFOS)	0.015	M	0.0040	0.0013	ug/L	—	11/21/16 13:47	12/02/16 20:44	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00091	ug/L	—	11/21/16 13:47	12/02/16 20:44	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	101		25 - 150				11/21/16 13:47	12/02/16 20:44	1
13C4 PFOS	130		25 - 150				11/21/16 13:47	12/02/16 20:44	1

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-23651-1

Client Sample ID: DPT-16-27-GW-29-33

Date Collected: 11/16/16 14:00

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-11

Matrix: Water

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

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
<i>¹⁸O₂ PFHxS</i>	<i>134</i>		<i>25 - 150</i>	<i>11/21/16 13:47</i>	<i>12/02/16 20:44</i>	<i>1</i>

Default Detection Limits

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

TestAmerica Job ID: 320-23651-1

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)

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Prep: SHAKE

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	0.40	0.10	ug/Kg	537 (Modified)
Perfluorooctane Sulfonate (PFOS)	0.50	0.13	ug/Kg	537 (Modified)
Perfluorooctanoic acid (PFOA)	0.50	0.10	ug/Kg	537 (Modified)

Isotope Dilution Summary

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

TestAmerica Job ID: 320-23651-1

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)		
		³ C4 PFO/ (25-150)	³ C4 PFO/ (25-150)	³ O2 PFHx (25-150)
320-23651-2	DPT-16-20-SO-16-17	101	78	99
320-23651-3	DPT-16-20-SO-16-17-DUP	111	90	101
LCS 320-139627/2-A	Lab Control Sample	119	112	120
MB 320-139627/1-A	Method Blank	108	94	104

Surrogate Legend

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

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)		
		³ C4 PFO/ (25-150)	³ C4 PFO/ (25-150)	³ O2 PFHx (25-150)
320-23651-1	DPT-16-20-GW-16-20	98	137	148
320-23651-4	DPT-16-20-GW-26-30	127	120	132
320-23651-5	DPT-SO-EB-111516	139	121	126
320-23651-6	DPT-16-34-GW-16-20	90	107	116
320-23651-7	DPT-16-26-GW-18-22	85	126	132
320-23651-8	DPT-16-26-GW-29-33	97	109	119
320-23651-9	DPT-16-26-GW-29-33-DUP	82	116	116
320-23651-10	DPT-16-27-GW-18-22	75	111	112
320-23651-11	DPT-16-27-GW-29-33	101	130	134
LCS 320-138841/2-A	Lab Control Sample	133	123	126
LCSD 320-138841/3-A	Lab Control Sample Dup	110	102	109
MB 320-138841/1-A	Method Blank	133	118	123

Surrogate Legend

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

QC Sample Results

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

TestAmerica Job ID: 320-23651-1

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-138841/1-A

Matrix: Water

Analysis Batch: 140532

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 138841

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		11/21/16 13:47	12/02/16 18:29	1
Perfluorooctane Sulfonate (PFOS)	0.0030	U	0.0040	0.0013	ug/L		11/21/16 13:47	12/02/16 18:29	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		11/21/16 13:47	12/02/16 18:29	1
Isotope Dilution	MB MB		Limits				Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier							
13C4 PFOA	133		25 - 150				11/21/16 13:47	12/02/16 18:29	1
13C4 PFOS	118		25 - 150				11/21/16 13:47	12/02/16 18:29	1
18O2 PFHxS	123		25 - 150				11/21/16 13:47	12/02/16 18:29	1

Lab Sample ID: LCS 320-138841/2-A

Matrix: Water

Analysis Batch: 140532

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 138841

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits	
Perfluorooctanoic acid (PFOA)	0.0400	0.0373		ug/L		93	60 - 140	
Perfluorooctane Sulfonate (PFOS)	0.0371	0.0328		ug/L		88	60 - 140	
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0373		ug/L		106	50 - 150	
Isotope Dilution	LCS LCS		Limits					
	%Recovery	Qualifier						
13C4 PFOA	133		25 - 150					
13C4 PFOS	123		25 - 150					
18O2 PFHxS	126		25 - 150					

Lab Sample ID: LCSD 320-138841/3-A

Matrix: Water

Analysis Batch: 140532

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 138841

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	0.0400	0.0407		ug/L		102	60 - 140	9	30
Perfluorooctane Sulfonate (PFOS)	0.0371	0.0390		ug/L		105	60 - 140	17	30
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0371		ug/L		105	50 - 150	1	30
Isotope Dilution	LCSD LCSD		Limits						
	%Recovery	Qualifier							
13C4 PFOA	110		25 - 150						
13C4 PFOS	102		25 - 150						
18O2 PFHxS	109		25 - 150						

Lab Sample ID: MB 320-139627/1-A

Matrix: Solid

Analysis Batch: 140429

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 139627

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorooctanoic acid (PFOA)	0.30	U	0.50	0.10	ug/Kg		11/28/16 11:03	12/02/16 14:59	1
Perfluorooctane Sulfonate (PFOS)	0.30	U	0.50	0.13	ug/Kg		11/28/16 11:03	12/02/16 14:59	1
Perfluorobutanesulfonic acid (PFBS)	0.30	U	0.40	0.10	ug/Kg		11/28/16 11:03	12/02/16 14:59	1

TestAmerica Sacramento

QC Sample Results

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

TestAmerica Job ID: 320-23651-1

	MB	MB				
Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	108		25 - 150	11/28/16 11:03	12/02/16 14:59	1
13C4 PFOS	94		25 - 150	11/28/16 11:03	12/02/16 14:59	1
18O2 PFHxS	104		25 - 150	11/28/16 11:03	12/02/16 14:59	1

Lab Sample ID: LCS 320-139627/2-A
Matrix: Solid
Analysis Batch: 140429

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 139627

<i>Analyte</i>	<i>Spike Added</i>	<i>LCS Result</i>	<i>LCS Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>Limits</i>
Perfluorooctanoic acid (PFOA)	4.00	4.25		ug/Kg		106	60 - 140
Perfluorooctane Sulfonate (PFOS)	3.71	3.66		ug/Kg		99	60 - 140
Perfluorobutanesulfonic acid (PFBS)	3.54	4.03		ug/Kg		114	50 - 150

<i>LCS LCS</i>					
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>		
13C4 PFOA	119		25 - 150		
13C4 PFOS	112		25 - 150		
18O2 PFHxS	120		25 - 150		

QC Association Summary

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

TestAmerica Job ID: 320-23651-1

LCMS

Prep Batch: 138841

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23651-1	DPT-16-20-GW-16-20	Total/NA	Water	3535	
320-23651-4	DPT-16-20-GW-26-30	Total/NA	Water	3535	
320-23651-5	DPT-SO-EB-111516	Total/NA	Water	3535	
320-23651-6	DPT-16-34-GW-16-20	Total/NA	Water	3535	
320-23651-7	DPT-16-26-GW-18-22	Total/NA	Water	3535	
320-23651-8	DPT-16-26-GW-29-33	Total/NA	Water	3535	
320-23651-9	DPT-16-26-GW-29-33-DUP	Total/NA	Water	3535	
320-23651-10	DPT-16-27-GW-18-22	Total/NA	Water	3535	
320-23651-11	DPT-16-27-GW-29-33	Total/NA	Water	3535	
MB 320-138841/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-138841/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-138841/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Prep Batch: 139627

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23651-2	DPT-16-20-SO-16-17	Total/NA	Solid	SHAKE	
320-23651-3	DPT-16-20-SO-16-17-DUP	Total/NA	Solid	SHAKE	
MB 320-139627/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-139627/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	

Analysis Batch: 140429

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23651-2	DPT-16-20-SO-16-17	Total/NA	Solid	537 (Modified)	139627
320-23651-3	DPT-16-20-SO-16-17-DUP	Total/NA	Solid	537 (Modified)	139627
MB 320-139627/1-A	Method Blank	Total/NA	Solid	537 (Modified)	139627
LCS 320-139627/2-A	Lab Control Sample	Total/NA	Solid	537 (Modified)	139627

Analysis Batch: 140532

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23651-1	DPT-16-20-GW-16-20	Total/NA	Water	537 (Modified)	138841
320-23651-4	DPT-16-20-GW-26-30	Total/NA	Water	537 (Modified)	138841
320-23651-5	DPT-SO-EB-111516	Total/NA	Water	537 (Modified)	138841
320-23651-6	DPT-16-34-GW-16-20	Total/NA	Water	537 (Modified)	138841
320-23651-7	DPT-16-26-GW-18-22	Total/NA	Water	537 (Modified)	138841
320-23651-8	DPT-16-26-GW-29-33	Total/NA	Water	537 (Modified)	138841
320-23651-9	DPT-16-26-GW-29-33-DUP	Total/NA	Water	537 (Modified)	138841
320-23651-10	DPT-16-27-GW-18-22	Total/NA	Water	537 (Modified)	138841
320-23651-11	DPT-16-27-GW-29-33	Total/NA	Water	537 (Modified)	138841
MB 320-138841/1-A	Method Blank	Total/NA	Water	537 (Modified)	138841
LCS 320-138841/2-A	Lab Control Sample	Total/NA	Water	537 (Modified)	138841
LCSD 320-138841/3-A	Lab Control Sample Dup	Total/NA	Water	537 (Modified)	138841

General Chemistry

Analysis Batch: 139136

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23651-2	DPT-16-20-SO-16-17	Total/NA	Solid	D 2216	
320-23651-3	DPT-16-20-SO-16-17-DUP	Total/NA	Solid	D 2216	

Lab Chronicle

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

TestAmerica Job ID: 320-23651-1

Client Sample ID: DPT-16-20-GW-16-20

Date Collected: 11/15/16 10:30

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			138841	11/21/16 13:47	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		10	140532	12/02/16 18:59	SBC	TAL SAC

Client Sample ID: DPT-16-20-SO-16-17

Date Collected: 11/15/16 09:45

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-2

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	139136	11/22/16 13:53	MY1	TAL SAC

Client Sample ID: DPT-16-20-SO-16-17

Date Collected: 11/15/16 09:45

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-2

Matrix: Solid

Percent Solids: 80.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			139627	11/28/16 11:03	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)		1	140429	12/02/16 15:14	SBC	TAL SAC

Client Sample ID: DPT-16-20-SO-16-17-DUP

Date Collected: 11/15/16 09:45

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-3

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	139136	11/22/16 13:53	MY1	TAL SAC

Client Sample ID: DPT-16-20-SO-16-17-DUP

Date Collected: 11/15/16 09:45

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-3

Matrix: Solid

Percent Solids: 83.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			139627	11/28/16 11:03	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)		1	140429	12/02/16 15:22	SBC	TAL SAC

Client Sample ID: DPT-16-20-GW-26-30

Date Collected: 11/15/16 11:05

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			138841	11/21/16 13:47	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		100	140532	12/02/16 18:52	SBC	TAL SAC

Lab Chronicle

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

TestAmerica Job ID: 320-23651-1

Client Sample ID: DPT-SO-EB-111516

Date Collected: 11/15/16 11:00

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			138841	11/21/16 13:47	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		1	140532	12/02/16 19:37	SBC	TAL SAC

Client Sample ID: DPT-16-34-GW-16-20

Date Collected: 11/15/16 12:00

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			138841	11/21/16 13:47	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		10	140532	12/02/16 19:07	SBC	TAL SAC

Client Sample ID: DPT-16-26-GW-18-22

Date Collected: 11/16/16 11:20

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			138841	11/21/16 13:47	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		1	140532	12/02/16 20:22	SBC	TAL SAC

Client Sample ID: DPT-16-26-GW-29-33

Date Collected: 11/16/16 12:00

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			138841	11/21/16 13:47	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		1	140532	12/02/16 20:29	SBC	TAL SAC

Client Sample ID: DPT-16-26-GW-29-33-DUP

Date Collected: 11/16/16 12:00

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-9

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			138841	11/21/16 13:47	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		1	140532	12/02/16 20:37	SBC	TAL SAC

Client Sample ID: DPT-16-27-GW-18-22

Date Collected: 11/16/16 13:20

Date Received: 11/17/16 09:40

Lab Sample ID: 320-23651-10

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			138841	11/21/16 13:47	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		1	140532	12/02/16 20:14	SBC	TAL SAC

TestAmerica Sacramento

Lab Chronicle

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

TestAmerica Job ID: 320-23651-1

Client Sample ID: DPT-16-27-GW-29-33

Lab Sample ID: 320-23651-11

Date Collected: 11/16/16 14:00

Matrix: Water

Date Received: 11/17/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			138841	11/21/16 13:47	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		1	140532	12/02/16 20:44	SBC	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: 320-23651-1

Laboratory: TestAmerica Sacramento

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

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

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

Analysis Method	Prep Method	Matrix	Analyte
537 (Modified)	SHAKE	Solid	Perfluorooctane Sulfonate (PFOS)
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids

Method Summary

Client: AECOM Technical Services Inc.

TestAmerica Job ID: 320-23651-1

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

Method	Method Description	Protocol	Laboratory
537 (Modified)	Perfluorinated Hydrocarbons	EPA	TAL SAC
D 2216	Percent Moisture	ASTM	TAL SAC

Protocol References:

ASTM = ASTM International

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.

TestAmerica Job ID: 320-23651-1

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

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-23651-1	DPT-16-20-GW-16-20	Water	11/15/16 10:30	11/17/16 09:40
320-23651-2	DPT-16-20-SO-16-17	Solid	11/15/16 09:45	11/17/16 09:40
320-23651-3	DPT-16-20-SO-16-17-DUP	Solid	11/15/16 09:45	11/17/16 09:40
320-23651-4	DPT-16-20-GW-26-30	Water	11/15/16 11:05	11/17/16 09:40
320-23651-5	DPT-SO-EB-111516	Water	11/15/16 11:00	11/17/16 09:40
320-23651-6	DPT-16-34-GW-16-20	Water	11/15/16 12:00	11/17/16 09:40
320-23651-7	DPT-16-26-GW-18-22	Water	11/16/16 11:20	11/17/16 09:40
320-23651-8	DPT-16-26-GW-29-33	Water	11/16/16 12:00	11/17/16 09:40
320-23651-9	DPT-16-26-GW-29-33-DUP	Water	11/16/16 12:00	11/17/16 09:40
320-23651-10	DPT-16-27-GW-18-22	Water	11/16/16 13:20	11/17/16 09:40
320-23651-11	DPT-16-27-GW-29-33	Water	11/16/16 14:00	11/17/16 09:40

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 140382Lab Sample ID: IC 320-140382/4 Client Sample ID: _____Date Analyzed: 12/02/16 10:29 Lab File ID: 02DEC2016A_004.d GC Column: Acquity ID: 2.1 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorotetradecanoic acid (PFTeA)	4.94	Incomplete Integration	chandrase nas	12/02/16 13:37

Lab Sample ID: IC 320-140382/5 Client Sample ID: _____Date Analyzed: 12/02/16 10:37 Lab File ID: 02DEC2016A_005.d GC Column: Acquity ID: 2.1 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane Sulfonate (PFOS)	3.38	Isomers	chandrase nas	12/02/16 13:38

Lab Sample ID: IC 320-140382/10 Client Sample ID: _____Date Analyzed: 12/02/16 11:14 Lab File ID: 02DEC2016A_010.d GC Column: Acquity ID: 2.1 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorotridecanoic Acid (PFTriA)	4.61	Incomplete Integration	chandrase nas	12/02/16 13:42

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 140429Lab Sample ID: 320-23651-3 Client Sample ID: DPT-16-20-SO-16-17-DUPDate Analyzed: 12/02/16 15:22 Lab File ID: 02DEC2016C_004.d GC Column: Acquity ID: 2.1 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane Sulfonate (PFOS)	3.27	Baseline	chandrase nas	12/04/16 18:18

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 140532Lab Sample ID: CCV 320-140532/2 Client Sample ID: _____Date Analyzed: 12/02/16 18:07 Lab File ID: 02DEC2016C_026.d GC Column: Acquity ID: 2.1 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.52	Baseline	chandrase nas	12/05/16 08:28

Lab Sample ID: 320-23651-1 Client Sample ID: DPT-16-20-GW-16-20Date Analyzed: 12/02/16 18:59 Lab File ID: 02DEC2016C_033.d GC Column: Acquity ID: 2.1 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane Sulfonate (PFOS)	3.26	Baseline	chandrase nas	12/05/16 08:33

Lab Sample ID: CCV 320-140532/16 Client Sample ID: _____Date Analyzed: 12/02/16 19:52 Lab File ID: 02DEC2016C_040.d GC Column: Acquity ID: 2.1 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.51	Baseline	chandrase nas	12/05/16 08:39
Perfluorooctanoic acid (PFOA)	2.87	Baseline	chandrase nas	12/05/16 08:39

Lab Sample ID: 320-23651-10 Client Sample ID: DPT-16-27-GW-18-22Date Analyzed: 12/02/16 20:14 Lab File ID: 02DEC2016C_043.d GC Column: Acquity ID: 2.1 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.87	Isomers	chandrase nas	12/05/16 08:41

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 140532Lab Sample ID: 320-23651-7 Client Sample ID: DPT-16-26-GW-18-22Date Analyzed: 12/02/16 20:22 Lab File ID: 02DEC2016C_044.d GC Column: Acquity ID: 2.1 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.88	Baseline	chandrase nas	12/05/16 08:42
Perfluorooctane Sulfonate (PFOS)	3.25	Baseline	chandrase nas	12/05/16 08:42

Lab Sample ID: 320-23651-8 Client Sample ID: DPT-16-26-GW-29-33Date Analyzed: 12/02/16 20:29 Lab File ID: 02DEC2016C_045.d GC Column: Acquity ID: 2.1 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.90	Baseline	chandrase nas	12/05/16 08:35
Perfluorooctanoic acid (PFOA)	2.87	Baseline	chandrase nas	12/05/16 08:35
Perfluorooctane Sulfonate (PFOS)	3.25	Baseline	chandrase nas	12/05/16 08:35

Lab Sample ID: 320-23651-9 Client Sample ID: DPT-16-26-GW-29-33-DUPDate Analyzed: 12/02/16 20:37 Lab File ID: 02DEC2016C_046.d GC Column: Acquity ID: 2.1 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.88	Baseline	chandrase nas	12/05/16 08:36
Perfluorooctane Sulfonate (PFOS)	3.25	Baseline	chandrase nas	12/05/16 08:36

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 140532Lab Sample ID: 320-23651-11 Client Sample ID: DPT-16-27-GW-29-33Date Analyzed: 12/02/16 20:44 Lab File ID: 02DEC2016C_047.d GC Column: Acquity ID: 2.1 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.88	Baseline	chandrase nas	12/05/16 08:37
Perfluorooctane Sulfonate (PFOS)	3.25	Baseline	chandrase nas	12/05/16 08:37

Lab Sample ID: CCV 320-140532/25 Client Sample ID: _____Date Analyzed: 12/02/16 20:59 Lab File ID: 02DEC2016C_049.d GC Column: Acquity ID: 2.1 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.53	Baseline	chandrase nas	12/05/16 08:43
Perfluorooctanoic acid (PFOA)	2.88	Baseline	chandrase nas	12/05/16 08:43

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23651-1

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
					LCM4PFHFA_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	1802_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
.LCM4PFHFA_00007	05/27/21	Wellington Laboratories, Lot M4PFHFA0516			(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)		1802_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
							1802_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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23651-1

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
					LCM4PFHFA_00006	1000 uL	13C4-PFHFA	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	1802 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
					(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFHxDA_00006	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM2PFTeDA_00006	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C4-PFHFA	50 ug/mL
..LCM4PFHFA_00006	05/22/20	Wellington Laboratories, Lot M4PFHFA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM5PFPEA_00007	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCM8FOSA_00010	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBA_00007	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDA_00010	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFDoA_00007	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxA_00011	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		1802 PFHxS	47.3 ug/mL
..LCMPFHxS_00007	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFNA_00007	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOA_00011	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFOS_00015	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
..LCMPFUDa_00008	10/31/19	Wellington Laboratories, Lot MPFUDa1014			(Purchased Reagent)			
.LCPFCSP_00057	02/01/17	08/03/16	Methanol, Lot 090285	10000 uL	LCPFCSP_00056	1000 uL	Perfluorobutyric acid	0.1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23651-1

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.: 320-23651-1

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
...LCPFTTrDA_00004	12/10/18		Wellington Laboratories, Lot PFTTrDA1213		(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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23651-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCMPFCSU_00044	12/28/16	06/28/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006	1000 uL	Perfluoroundecanoic acid	1 ng/mL
							13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00006	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHFA_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	1802 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
..LCM2PFHxDA_00006	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			LCMPFUDa_00008	1000 uL	13C2 PFUnA	1 ug/mL
					(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
					(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
					(Purchased Reagent)		13C4-PFHpA	50 ug/mL
					(Purchased Reagent)		13C5-PFPeA	50 ug/mL
					(Purchased Reagent)		13C8 FOSA	50 ug/mL
					(Purchased Reagent)		13C4 PFBA	50 ug/mL
					(Purchased Reagent)		13C2 PFDA	50 ug/mL
					(Purchased Reagent)		13C2 PFDoA	50 ug/mL
					(Purchased Reagent)		13C2 PFHxA	50 ug/mL
					(Purchased Reagent)		1802 PFHxS	47.3 ug/mL
					(Purchased Reagent)		13C5 PFNA	50 ug/mL
					(Purchased Reagent)		13C4 PFOA	50 ug/mL
					(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
					(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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23651-1

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.: 320-23651-1

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					
(Purchased Reagent)		13C2-PFHxDA	50 ug/mL					
..LCM2PFHxDA_00006	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112						

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23651-1

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
..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.: 320-23651-1

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
					LCMPFCSP_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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23651-1

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	1802 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)		1802 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.: 320-23651-1

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)		Perfluorododecanoic 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 PFTTrDA1213		(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUDa_00004	08/19/20		Wellington Laboratories, Lot PFUDa0815		(Purchased Reagent)		Perfluoroundecanoic acid	50 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
							1802 PFHxS	47.3 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23651-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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							
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
					LCM4PFHFA_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
..LCM4PFHFA_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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23651-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..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)		1802 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
					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 PFODA1115		(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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
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
							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
					LCM4PFHFA_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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23651-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					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)		1802 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
					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	
..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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23651-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..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-L7_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	2000 uL	Perfluorobutyric acid	400 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	353.6 ng/mL
							Perfluorodecanoic acid	400 ng/mL
							Perfluorododecanoic acid	400 ng/mL
							Perfluorodecane Sulfonic acid	385.6 ng/mL
							Perfluoroheptanoic acid	400 ng/mL
							Perfluoroheptanesulfonic Acid	380.8 ng/mL
							Perfluorohexanoic acid	400 ng/mL
							Perfluorohexadecanoic acid	400 ng/mL
							Perfluorohexanesulfonic acid	364 ng/mL
							Perfluorononanoic acid	400 ng/mL
							Perfluorooctanoic acid (PFOA)	400 ng/mL
							Perfluorooctadecanoic acid	400 ng/mL
							Perfluorooctane Sulfonate (PFOS)	371.2 ng/mL
							Perfluorooctane Sulfonamide	400 ng/mL
							Perfluoropentanoic acid	400 ng/mL
							Perfluorotetradecanoic acid	400 ng/mL
							Perfluorotridecanoic acid	400 ng/mL
							Perfluoroundecanoic acid	400 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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23651-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					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	1802 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)		1802 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
					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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23651-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..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
LCPPFC2-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
					LCPPFC2SP_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
							N-ethylperfluoro-1-octanesulfo namide	0.5 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ng/mL
							MeFOSA	0.5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ng/mL
.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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23651-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23651-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					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-octanesulfo namide	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-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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23651-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCN-MeFOSAA_00001	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
.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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23651-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (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
...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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

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	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
..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-octanesulfo namide	50 ug/mL
..LCN-EtFOSAA_00002	01/20/21		WELLINGTON, Lot NETFOSAA0116		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSA-M_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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23651-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPF2SP_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-octanesulfoamide	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
.LCPF2SP_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-octanesulfoamide	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-octanesulfoamide	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.: 320-23651-1

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-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-NMeFOSAA	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
.LCMPFC2SU_00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NMeFOSA-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-NMeFOSAA_00001	200 uL	d5-NMeFOSAA	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-NMeFOSA-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-NMeFOSAA_00001	05/08/20		WELLINGTON, Lot d5NetFOSAA0515		(Purchased Reagent)		d5-NMeFOSAA	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-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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23651-1

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-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-L7_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-NMeFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
					LCPFC2SP_00013	2000 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	379.2 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	383.2 ng/mL
							N-ethylperfluoro-1-octanesulfo namide	400 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	400 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-NMeFOSAA_00001	200 uL	d5-NMeFOSAA	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-NMeFOSAA_00001	05/08/20		WELLINGTON, Lot d5NMeFOSAA0515		(Purchased Reagent)		d5-NMeFOSAA	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-octanesulfo namide	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

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
LCPFIC_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
					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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					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
..LCM4PFHFA_00007	05/27/21	Wellington Laboratories, Lot M4PFHFA0516			(Purchased Reagent)		13C4-PFHFA	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
					LCPFHFA_00005	100 uL	Perfluoroheptanoic acid	0.5 ug/mL
					LCPFHFS_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
					LCPFOS-br_00002	100 uL	Perfluorooctane Sulfonate (PFOS)	0.464 ug/mL
					LCPFOSA_00006	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPFA_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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

SDG No.: _____

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

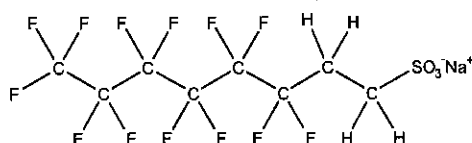
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S: 7h20/15 &v



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: $50.0 \pm 2.5 \mu\text{g/ml}$ (Na salt) **SOLVENT(S):** Methanol
 $47.4 \pm 2.4 \mu\text{g/ml}$ (6:2FTS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 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 $x_1, x_2, \dots, x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

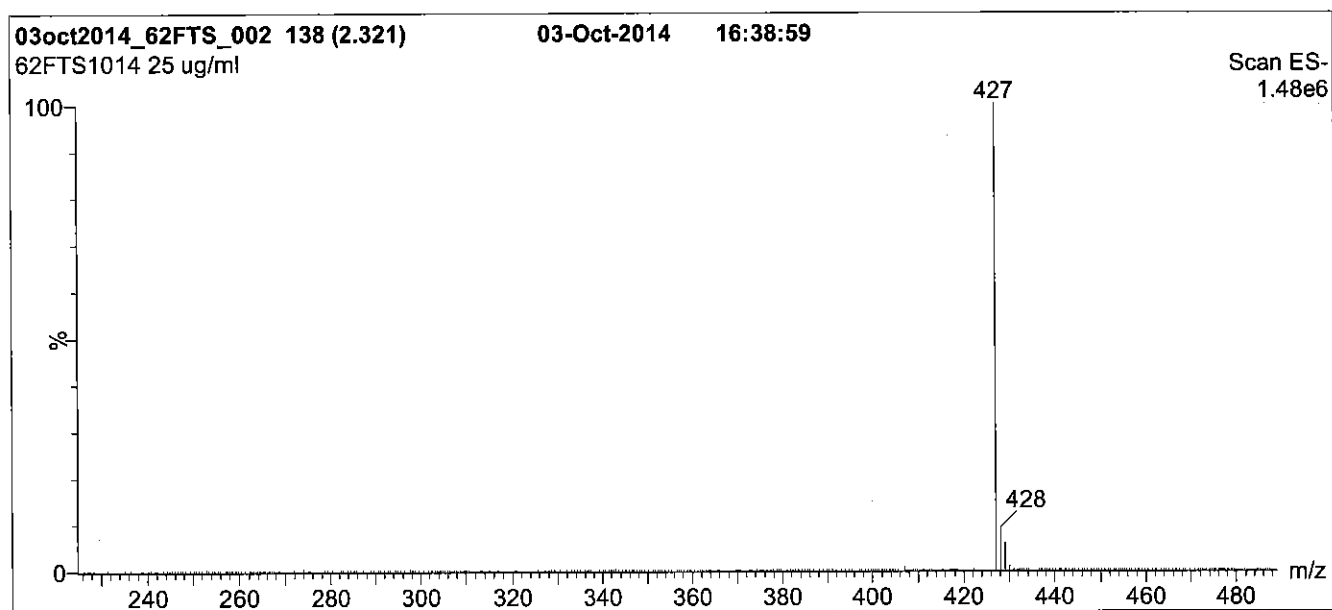
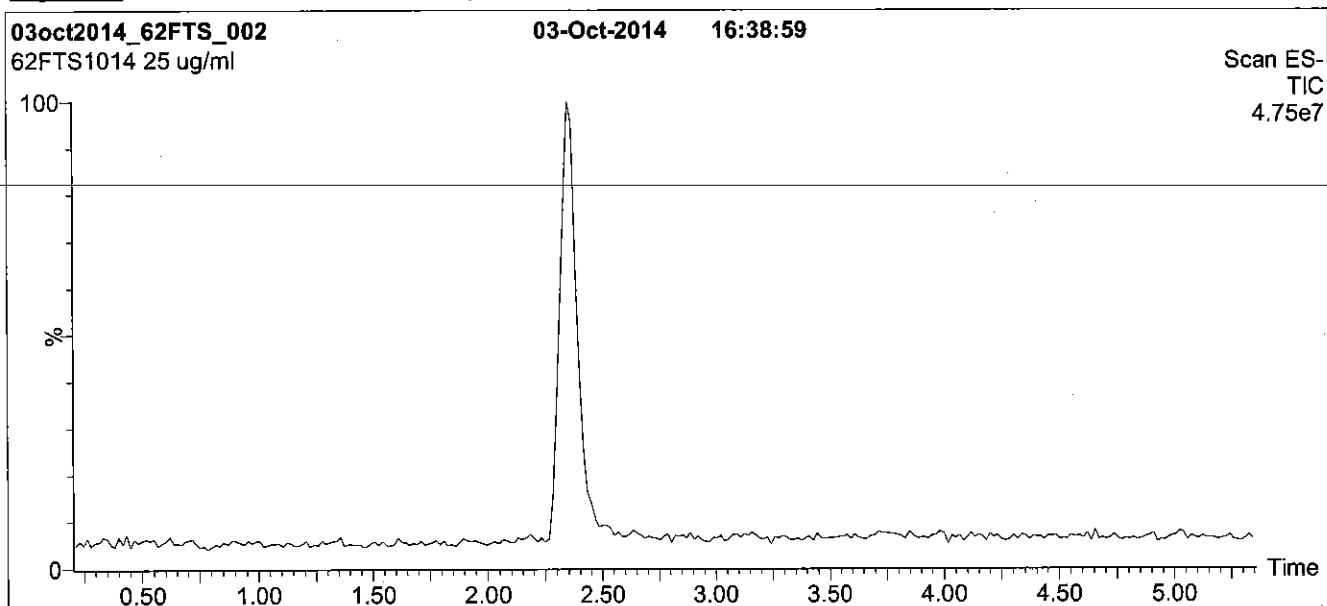
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

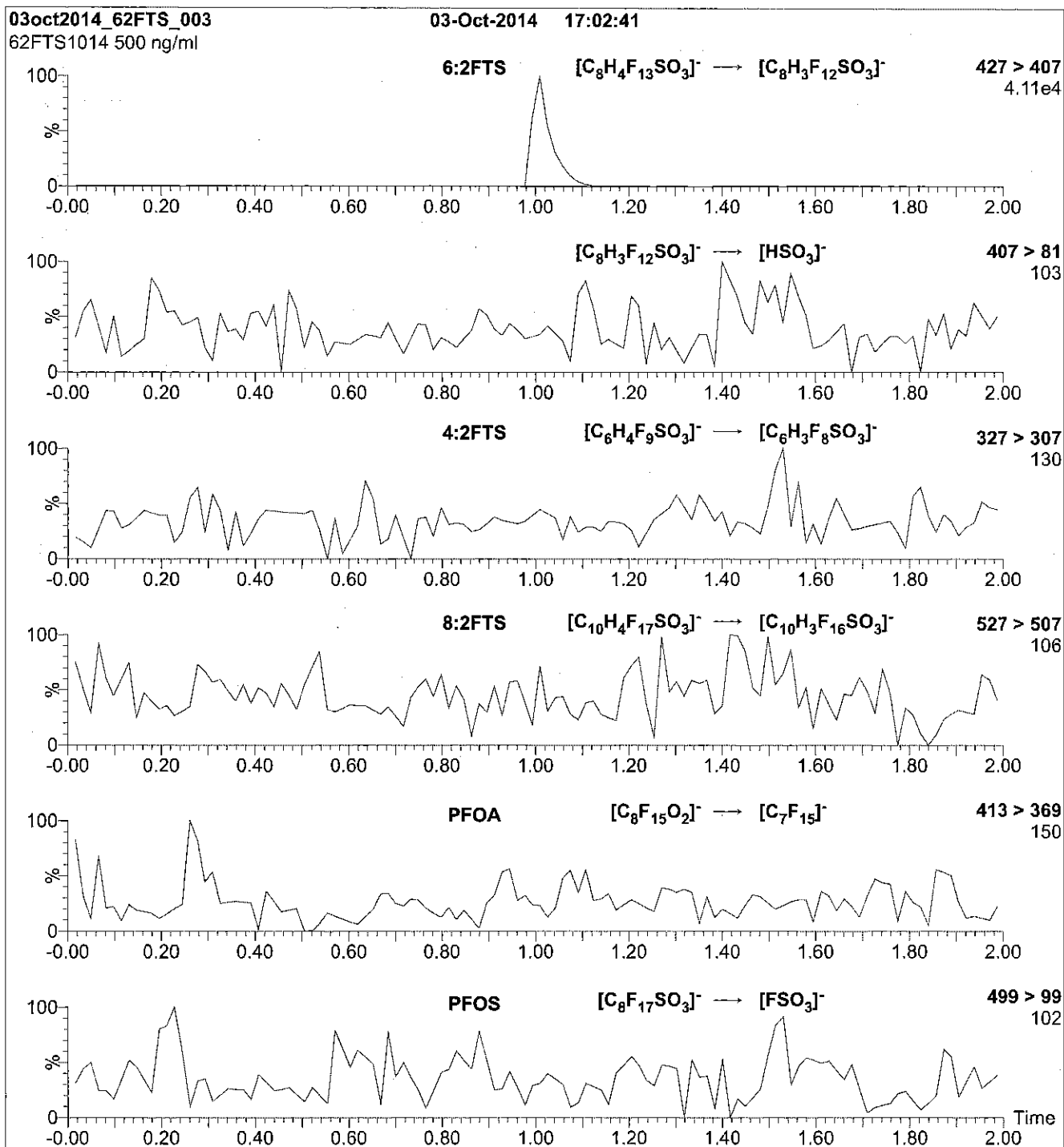
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LC6:2FTS_00002

R: 8/23/16 SBC



715544

ID: LC6:2FTS_00002

Exp: 06/25/21 Prod: SBC

6:2FTS



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

6:2FTS

LOT NUMBER:

62FTS0616

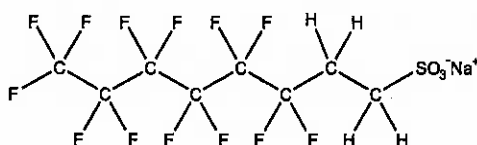
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

C₈H₄F₁₀SO₃Na

MOLECULAR WEIGHT:

450.15

CONCENTRATION:

50.0 ± 2.5 µg/ml (Na salt)
47.4 ± 2.4 µg/ml (6:2FTS anion)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

06/25/2016

EXPIRY DATE: (mm/dd/yyyy)

06/25/2021

RECOMMENDED STORAGE:

Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 06/29/2016

(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

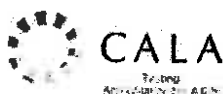
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

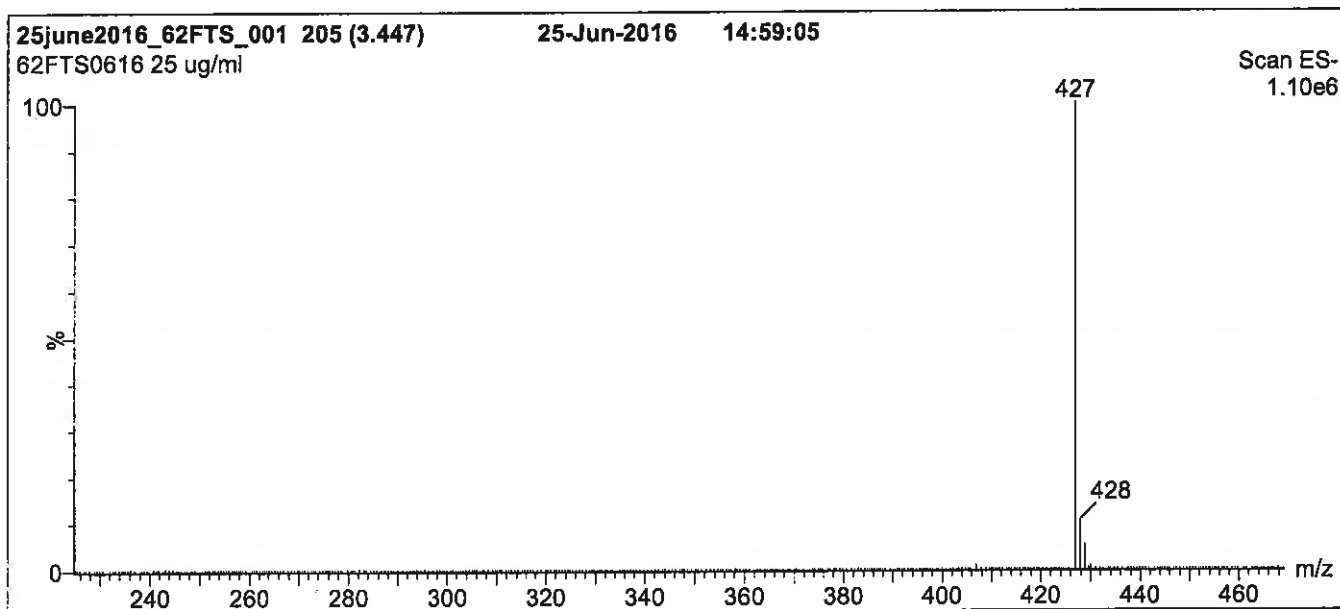
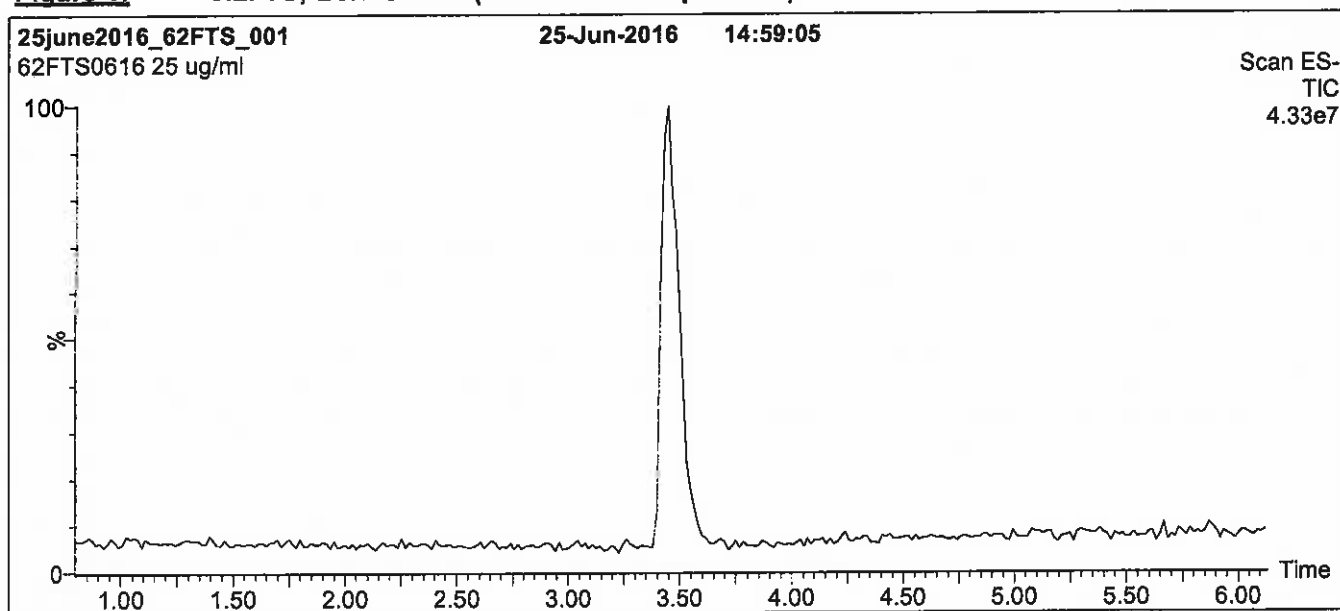
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

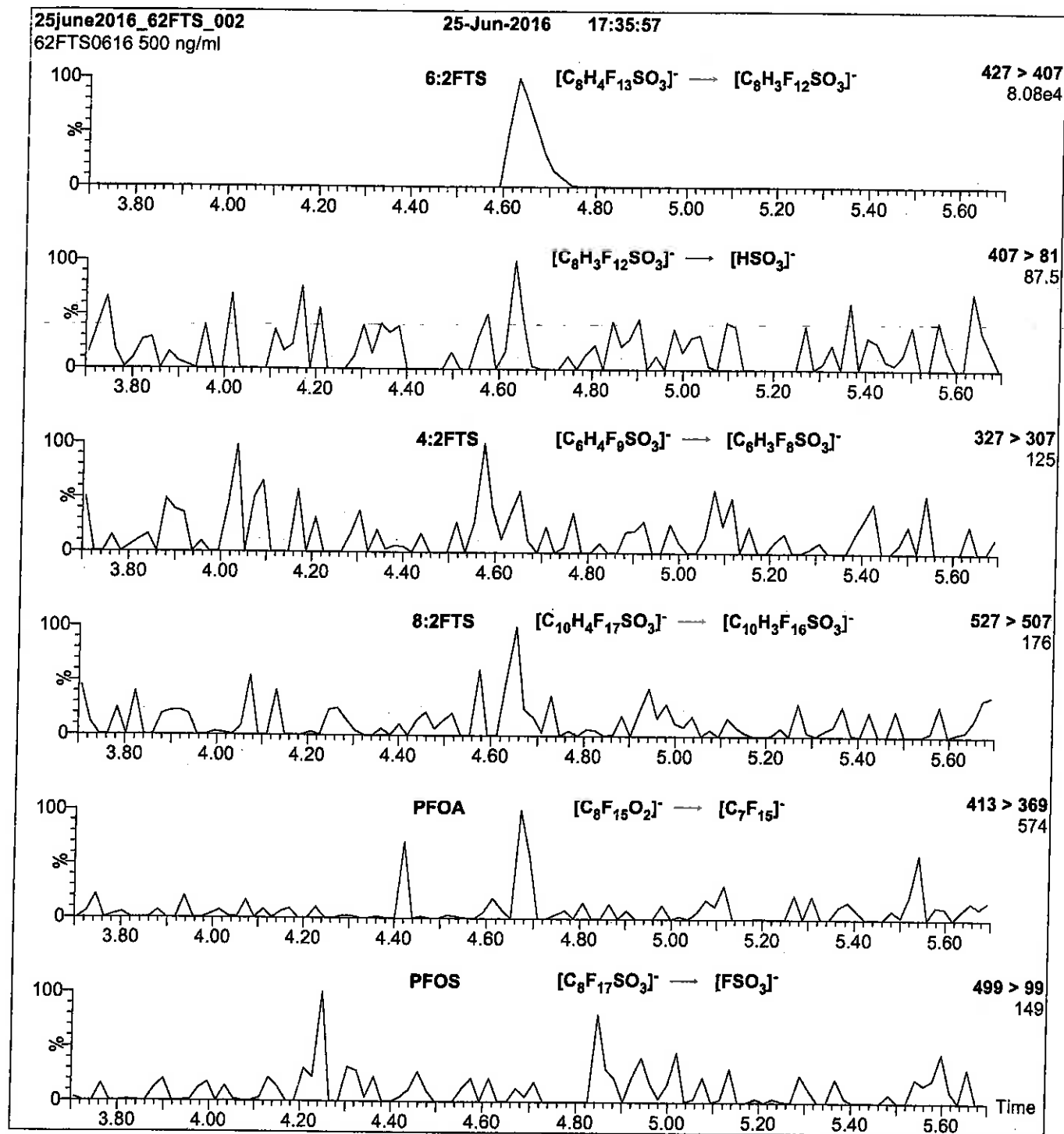
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LC8 : 2FTS_00001

r: 7/16/15 8V
S: 7/22/15 8V



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

8:2FTS

LOT NUMBER:

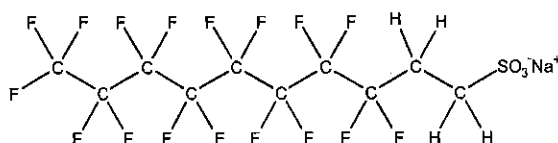
82FTS1014

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: $50.0 \pm 2.5 \mu\text{g/ml}$ (Na salt)
 $47.9 \pm 2.4 \mu\text{g/ml}$ (8:2FTS anion)**SOLVENT(S):**

Methanol

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:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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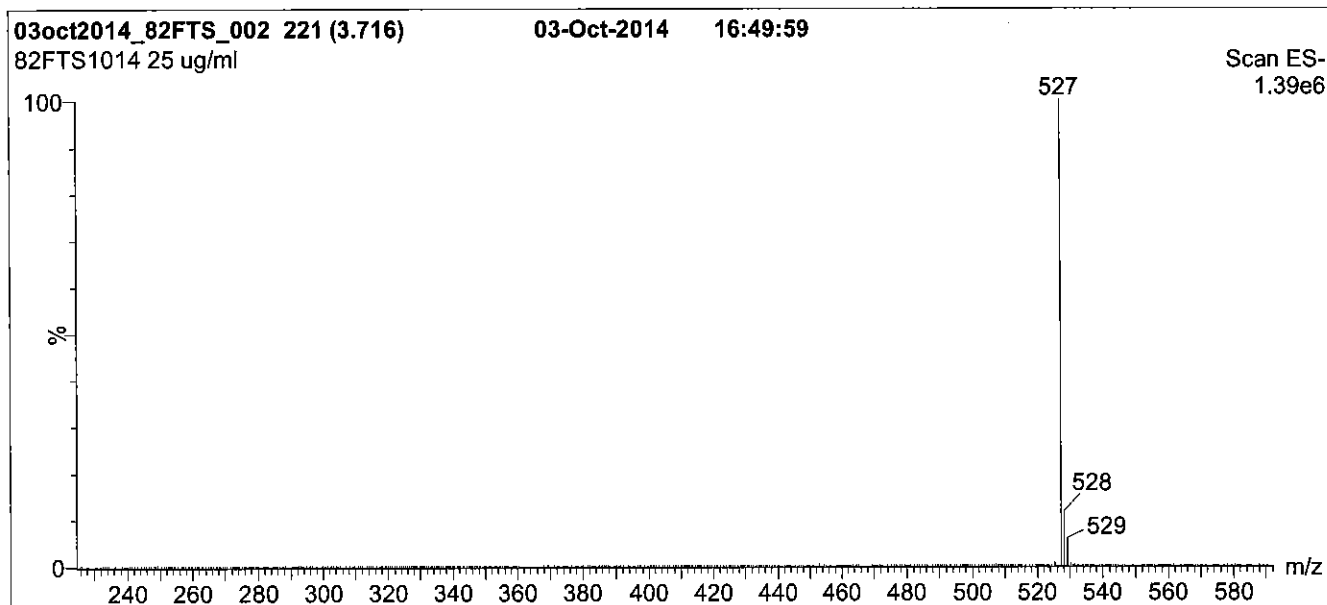
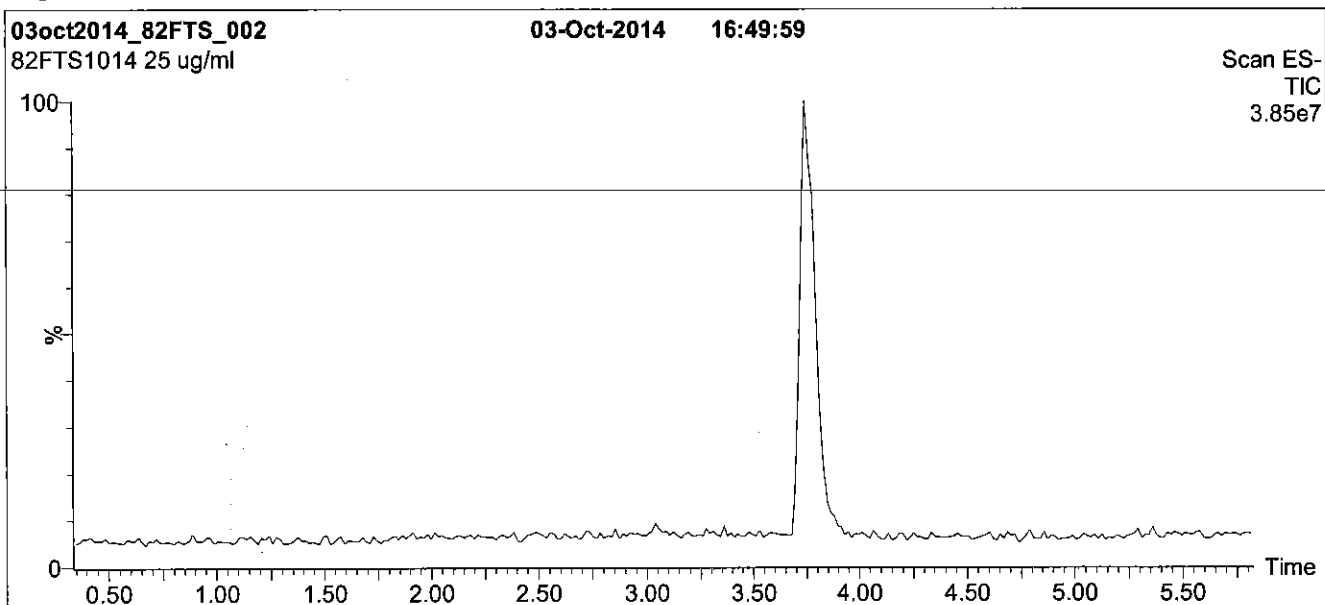
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

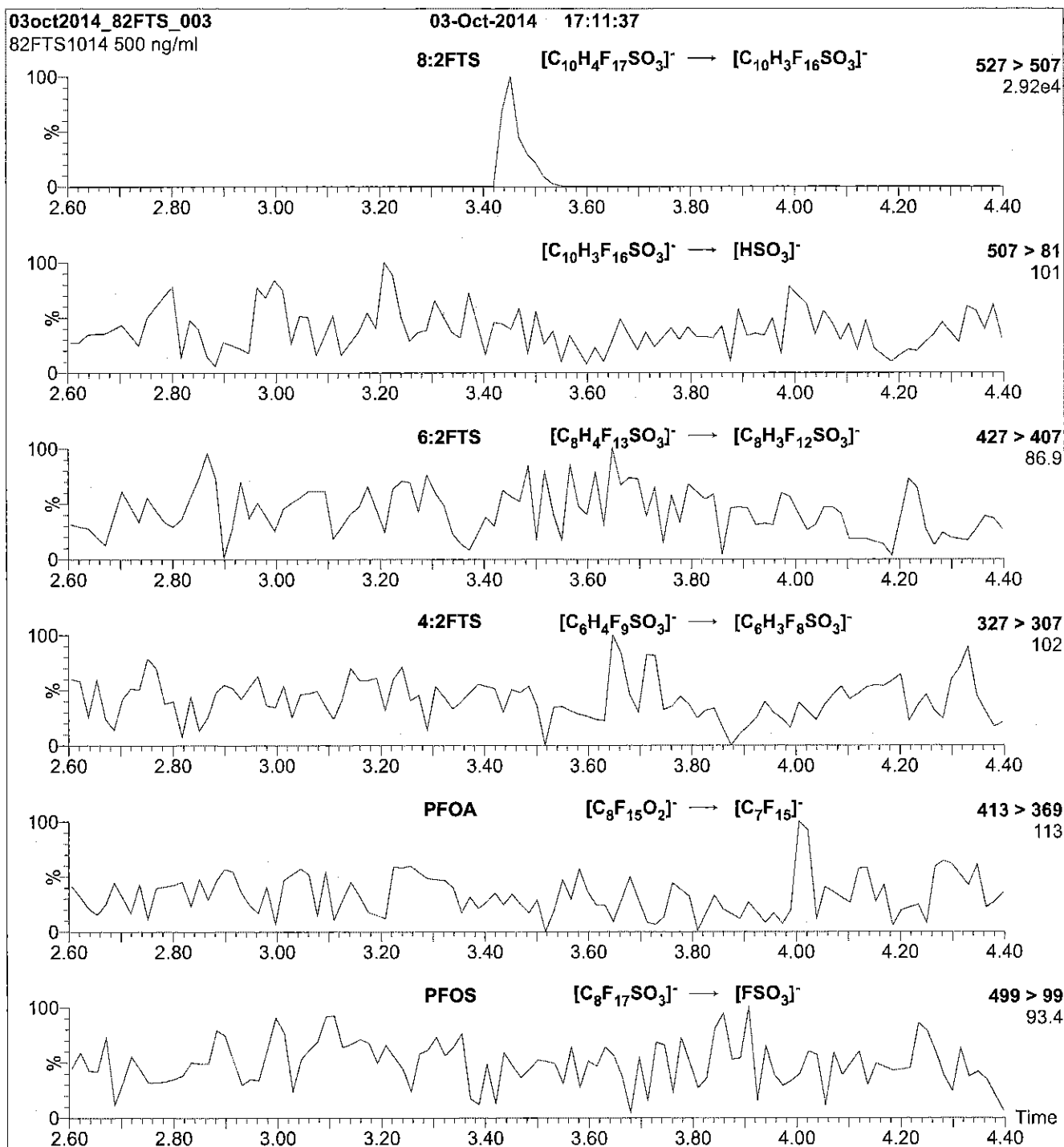
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LC8 : 2FTS_00002

R: 8/23/16 ~~8BC~~



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

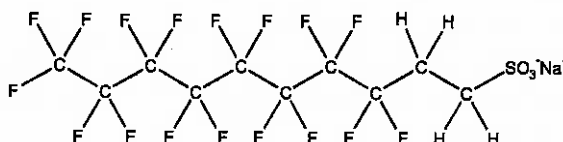


WELLINGTON LABORATORIES

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

INTENDED USE:

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HAZARDS:

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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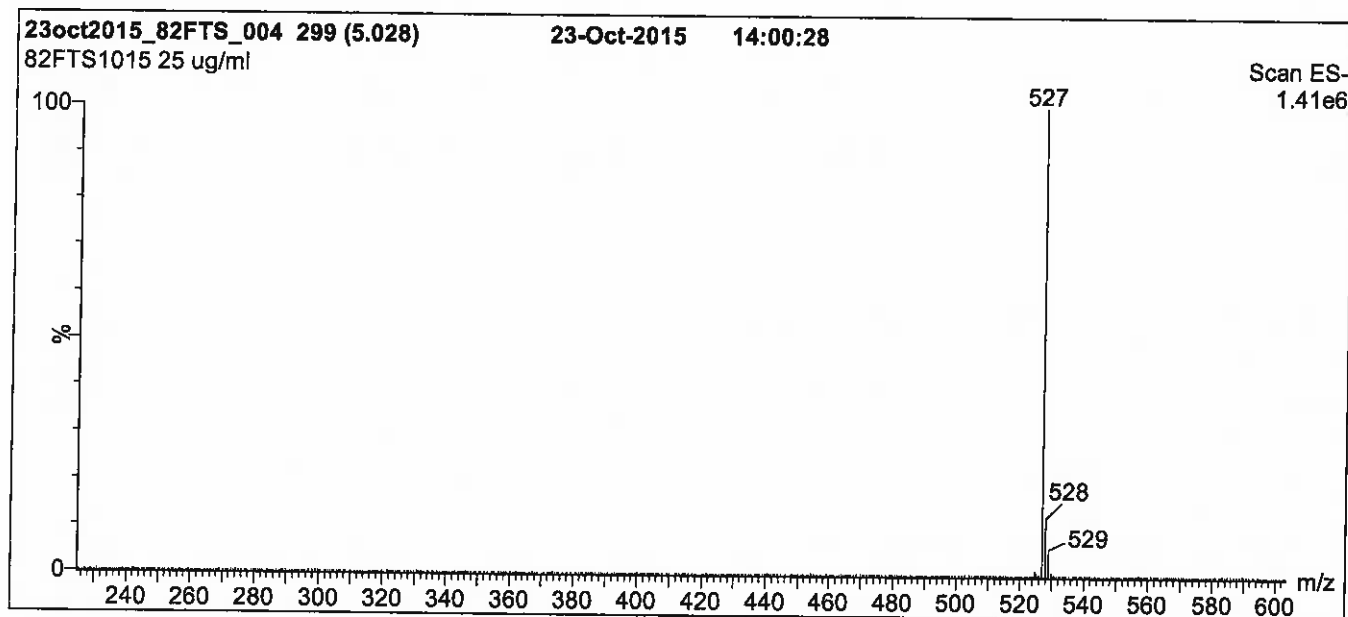
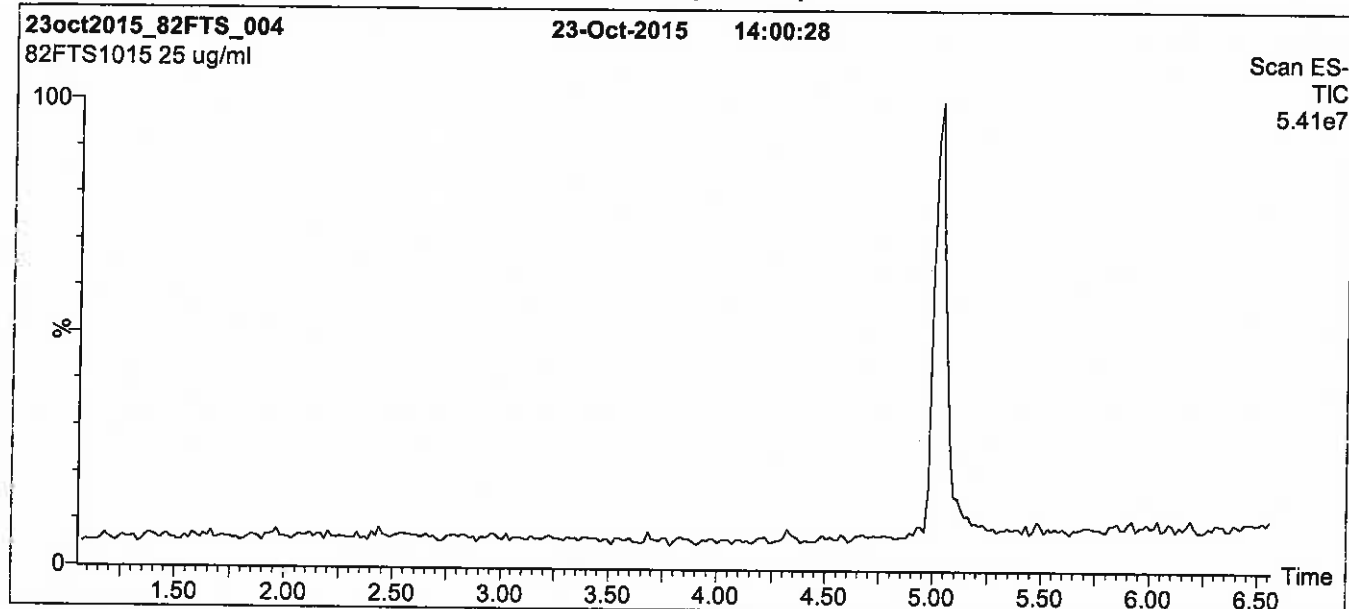
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

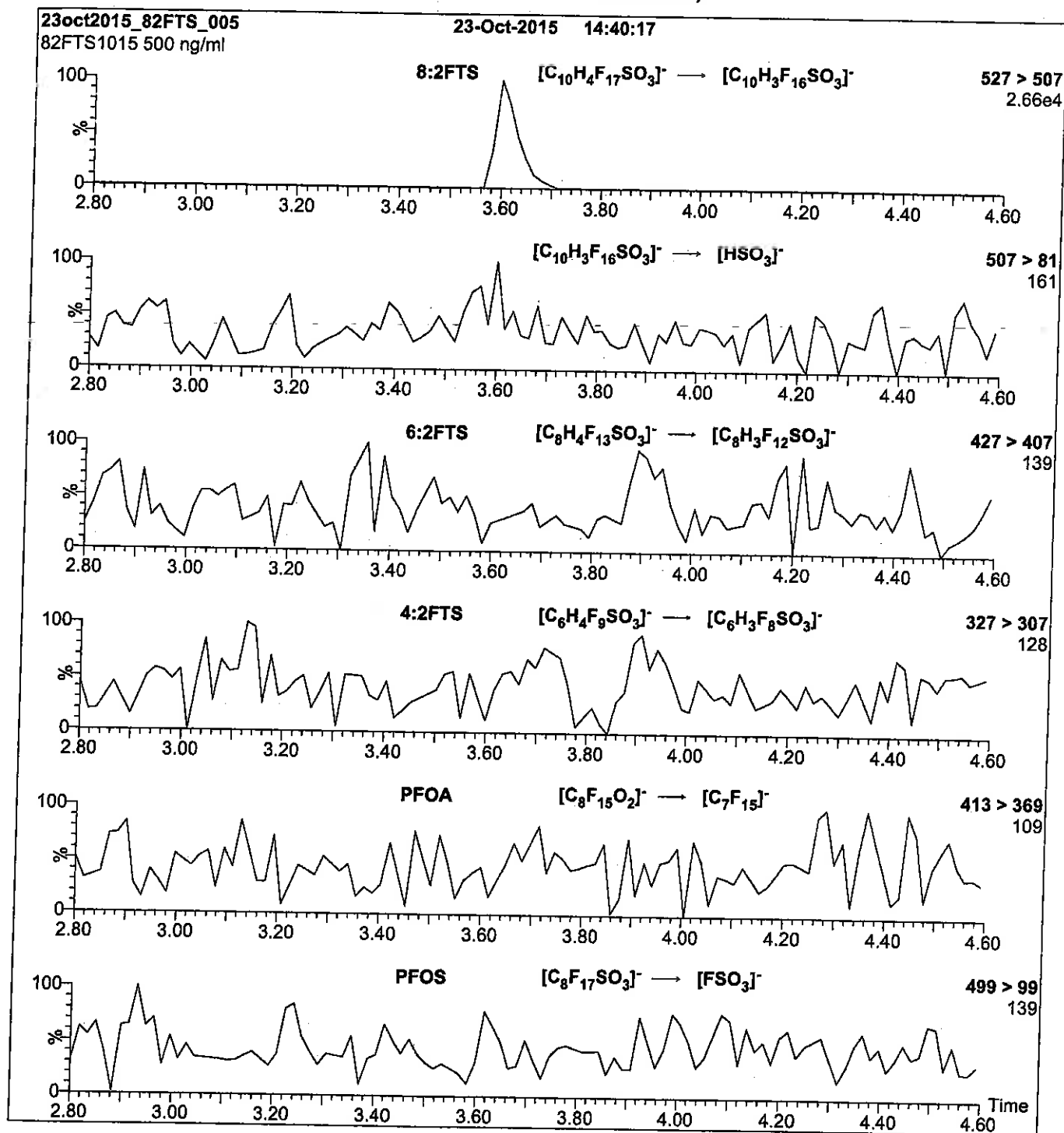
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min.
Return to Initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)
Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCd-NEtFOSA-M_00001

C: 7/16/15 8/



WELLINGTON LABORATORIES

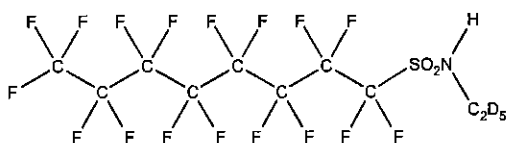
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d-N-EtFOSA-M
COMPOUND: N-ethyl-d₅-perfluoro-1-octanesulfonamide

LOT NUMBER: dNEtFOSA0314M

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: C₁₀D₆HF₁₇NO₂S
CONCENTRATION: 50 ± 2.5 µg/ml
CHEMICAL PURITY: >98%
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

MOLECULAR WEIGHT: 532.23
SOLVENT(S): Methanol
ISOTOPIC PURITY: ≥98% ²H₅

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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
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LIMITED WARRANTY:

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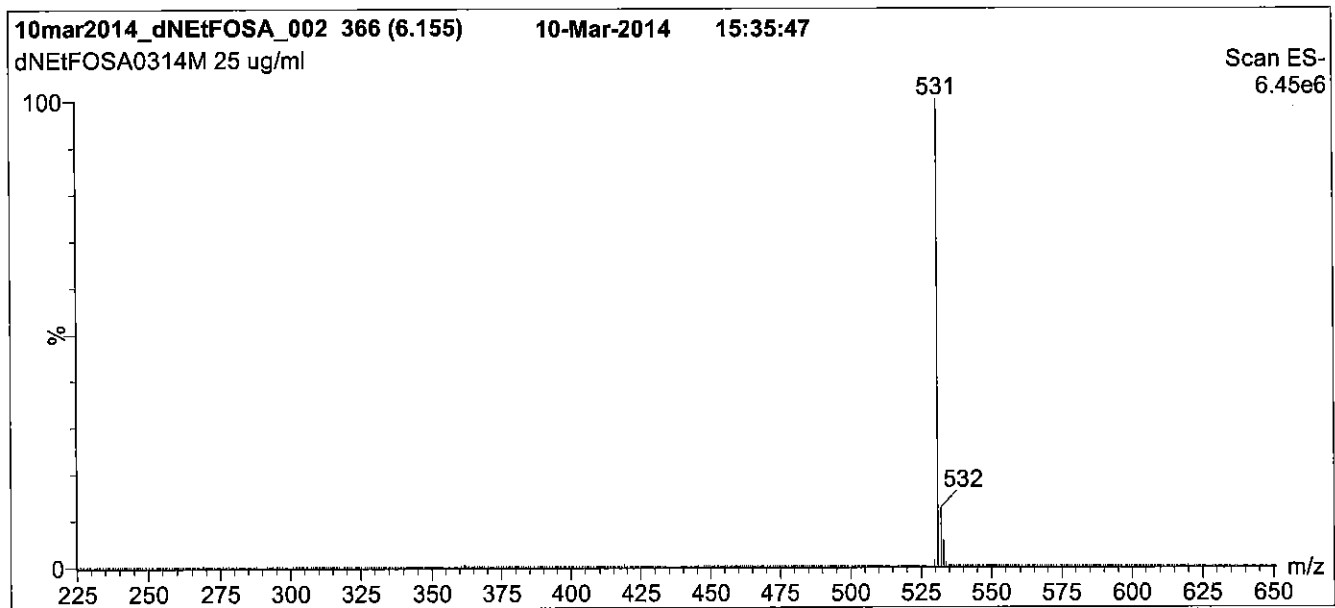
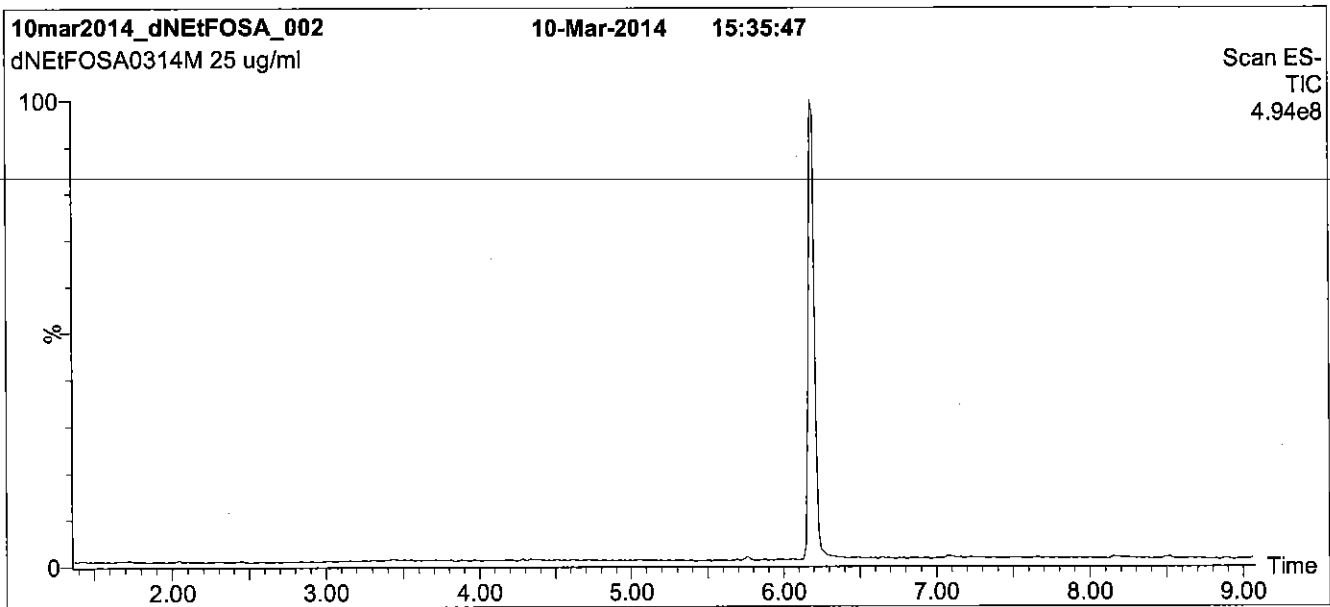
QUALITY MANAGEMENT:

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).



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

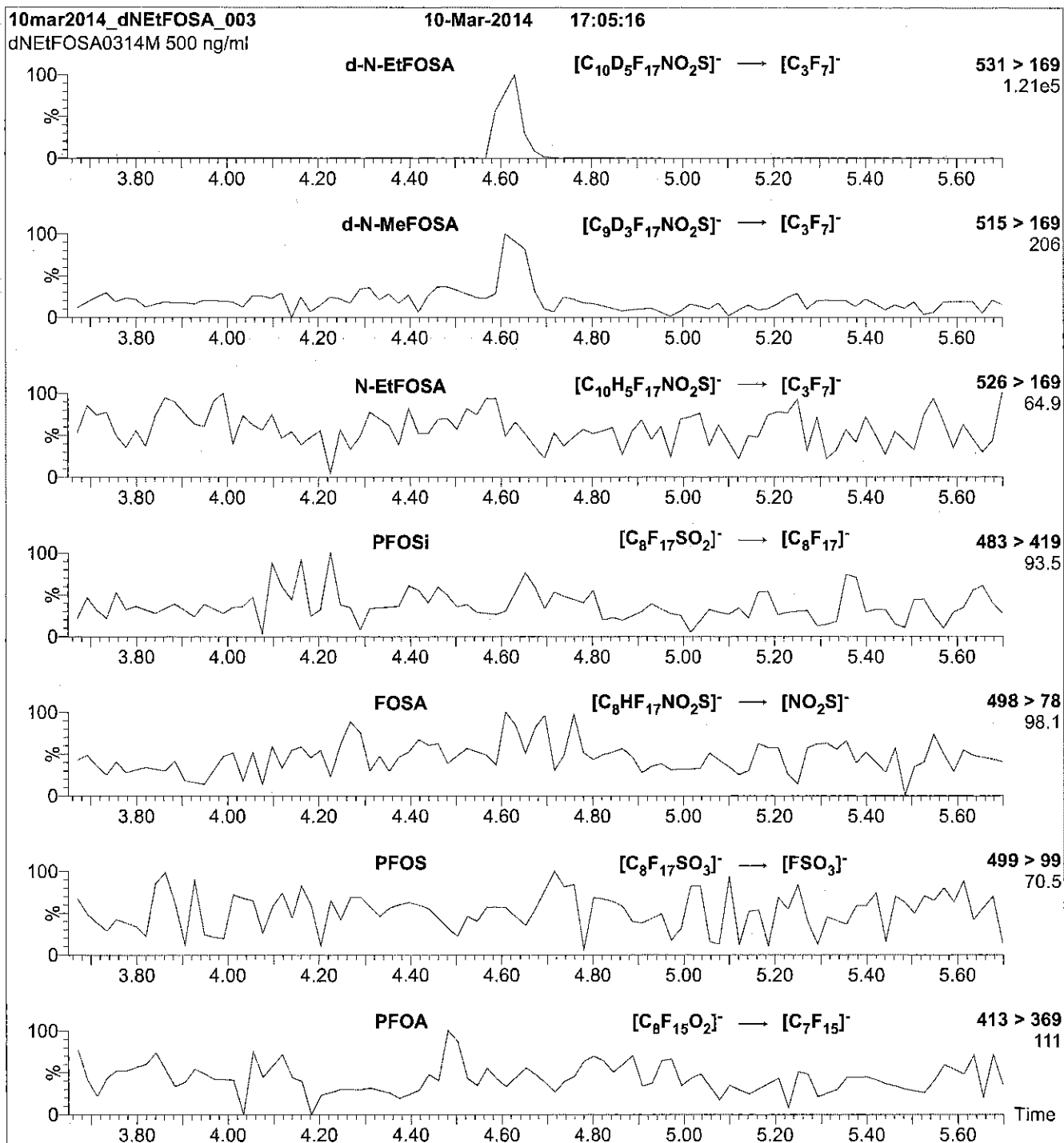
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 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 μ l (500 ng/ml d-N-EtFOSA-M)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCd-NEtFOSA-M_00002

R-7/6/16 CAN



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



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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

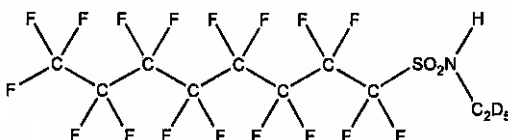
d-N-EtFOSA-M

LOT NUMBER:

dNEtFOSA0314M

COMPOUND:N-ethyl-d₅-perfluoro-1-octanesulfonamide**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**C₁₀D₅HF₁₇NO₂S**CONCENTRATION:**

50 ± 2.5 µg/ml

CHEMICAL PURITY:

>98%

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

MOLECULAR WEIGHT:

532.23

SOLVENT(S):

Methanol

ISOTOPIC PURITY:≥98% ²H₅**DOCUMENTATION/ DATA ATTACHED:**

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

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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:

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HOMOGENEITY:

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

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

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

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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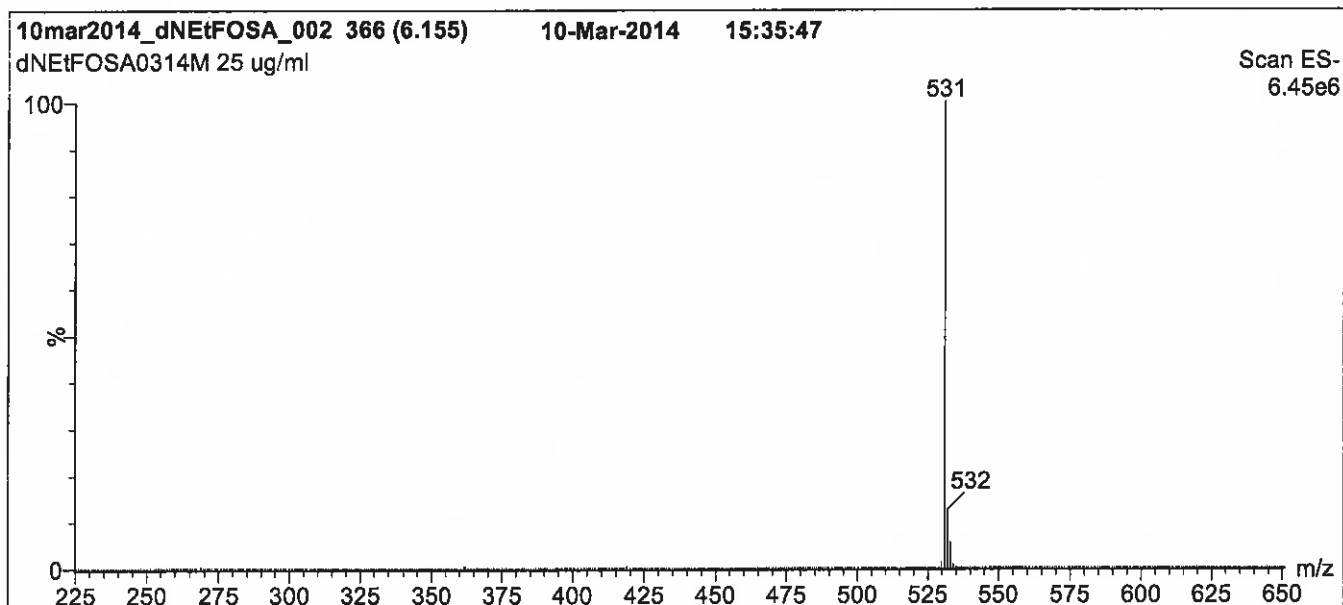
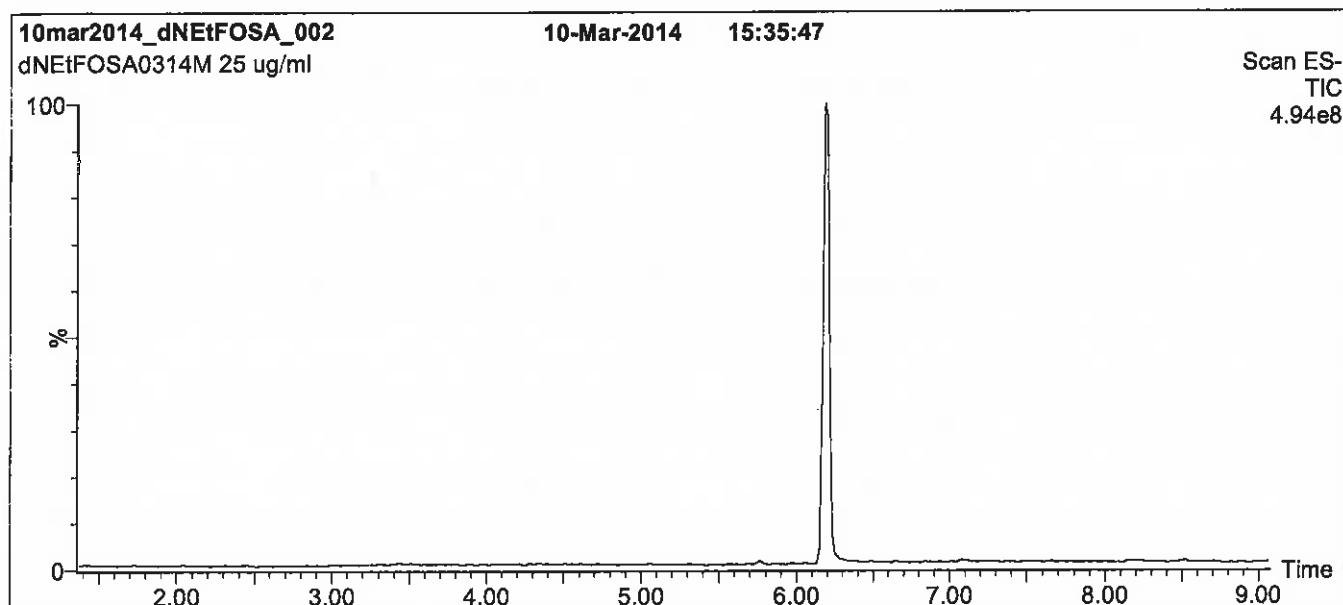
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

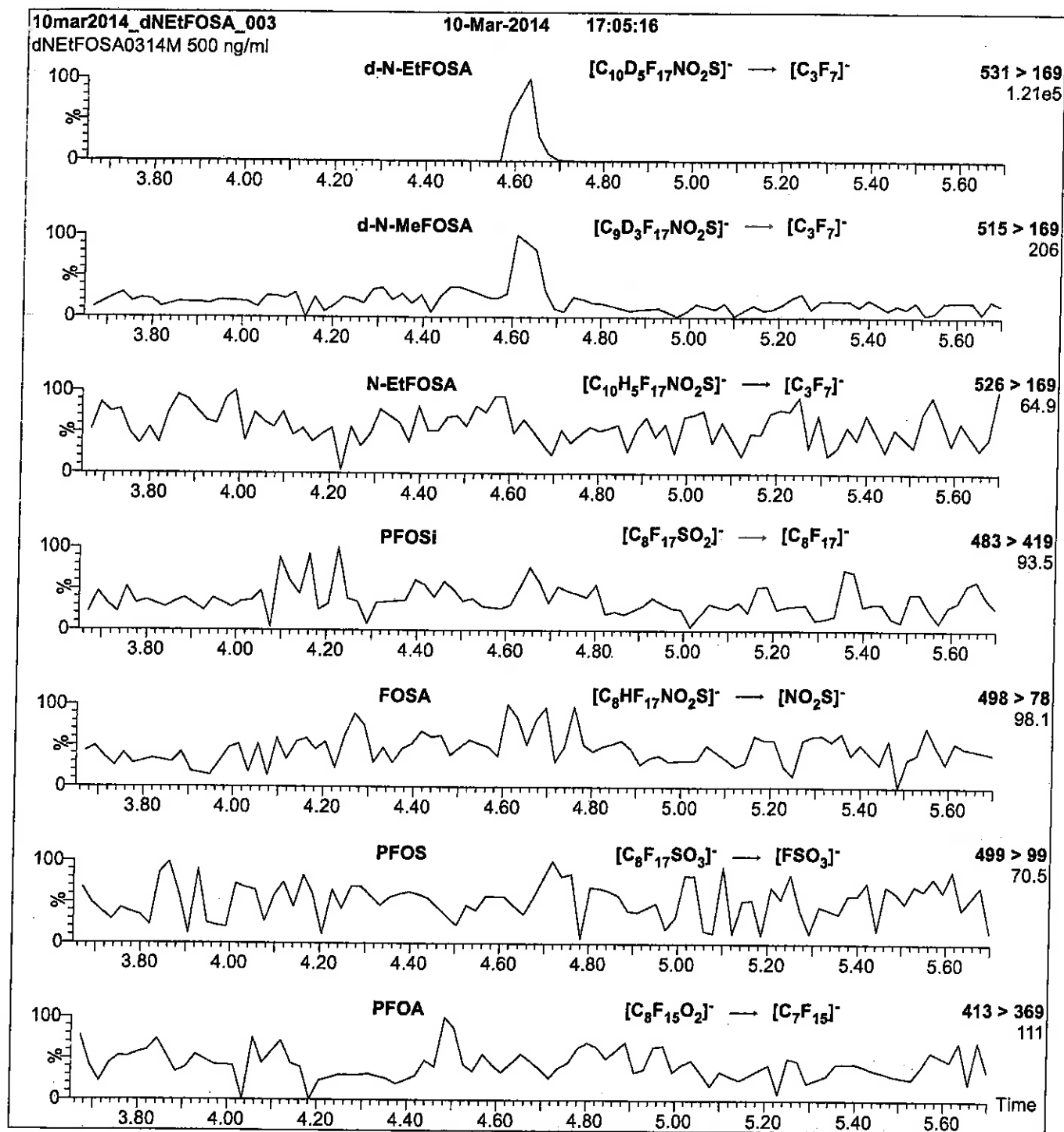
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 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 μ l (500 ng/ml d-N-EtFOSA-M)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCd-NMeFOSA-M_00001

r: 7/16/15 SKW



WELLINGTON LABORATORIES

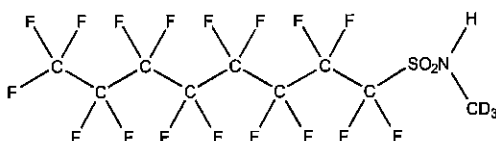
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: dNMeFOSA0114M

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: C₈D₃HF₁₇NO₂S
CONCENTRATION: 50 ± 2.5 µg/ml
CHEMICAL PURITY: >98%
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

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

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

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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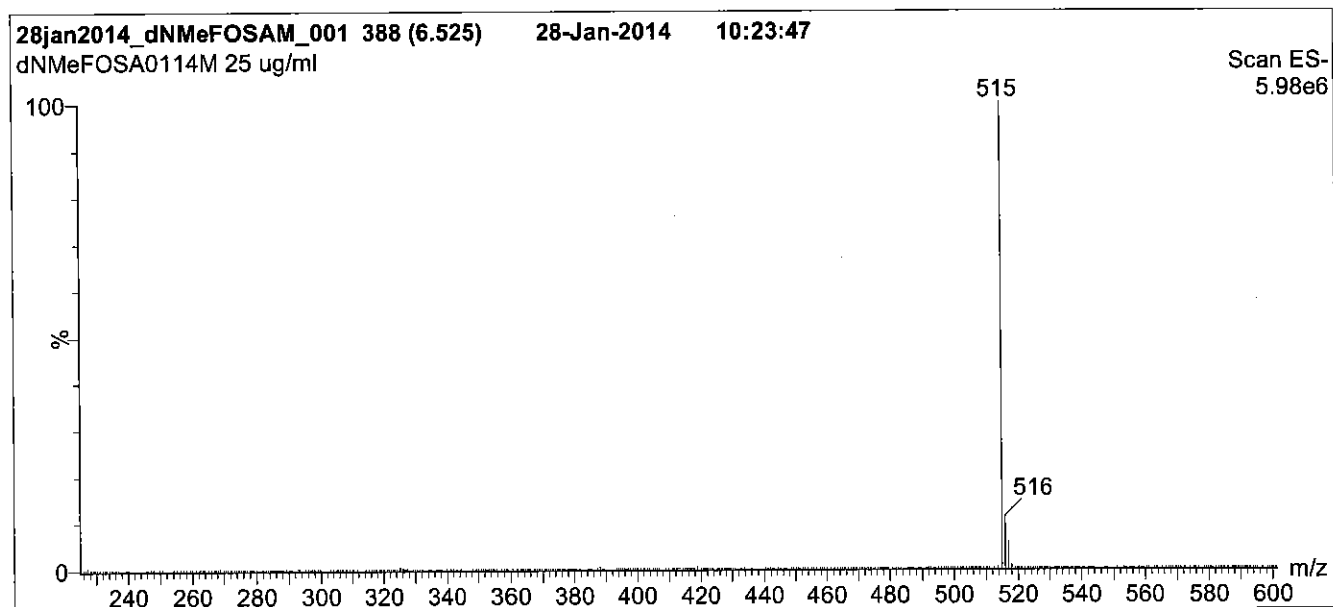
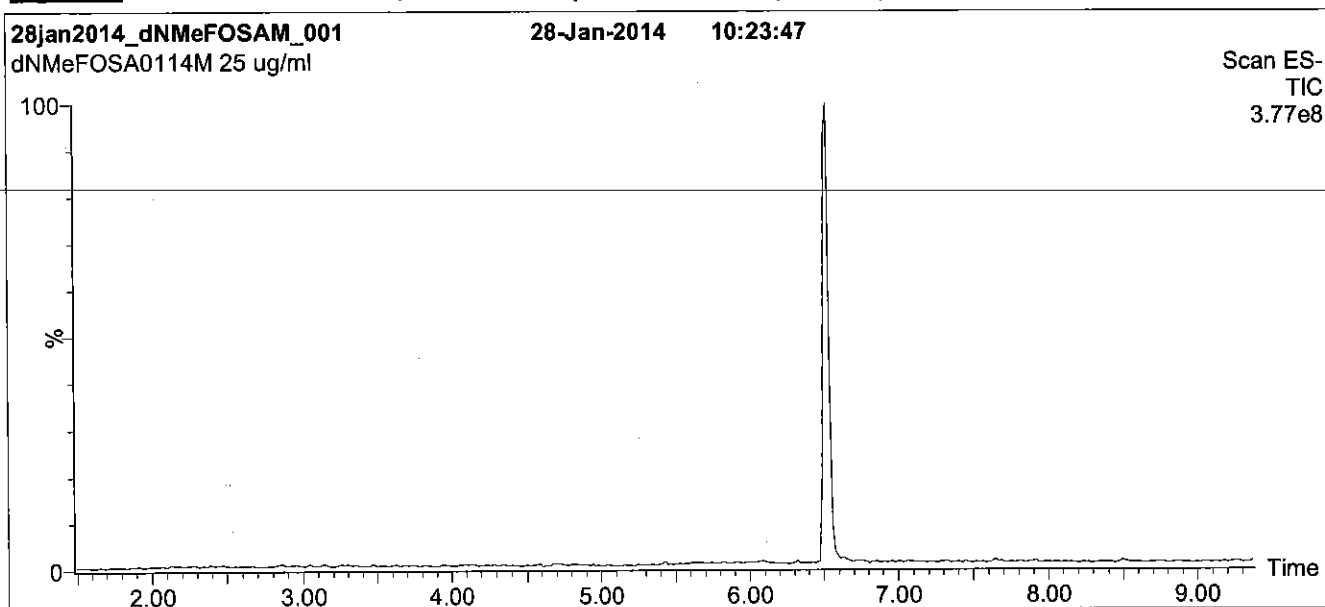
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

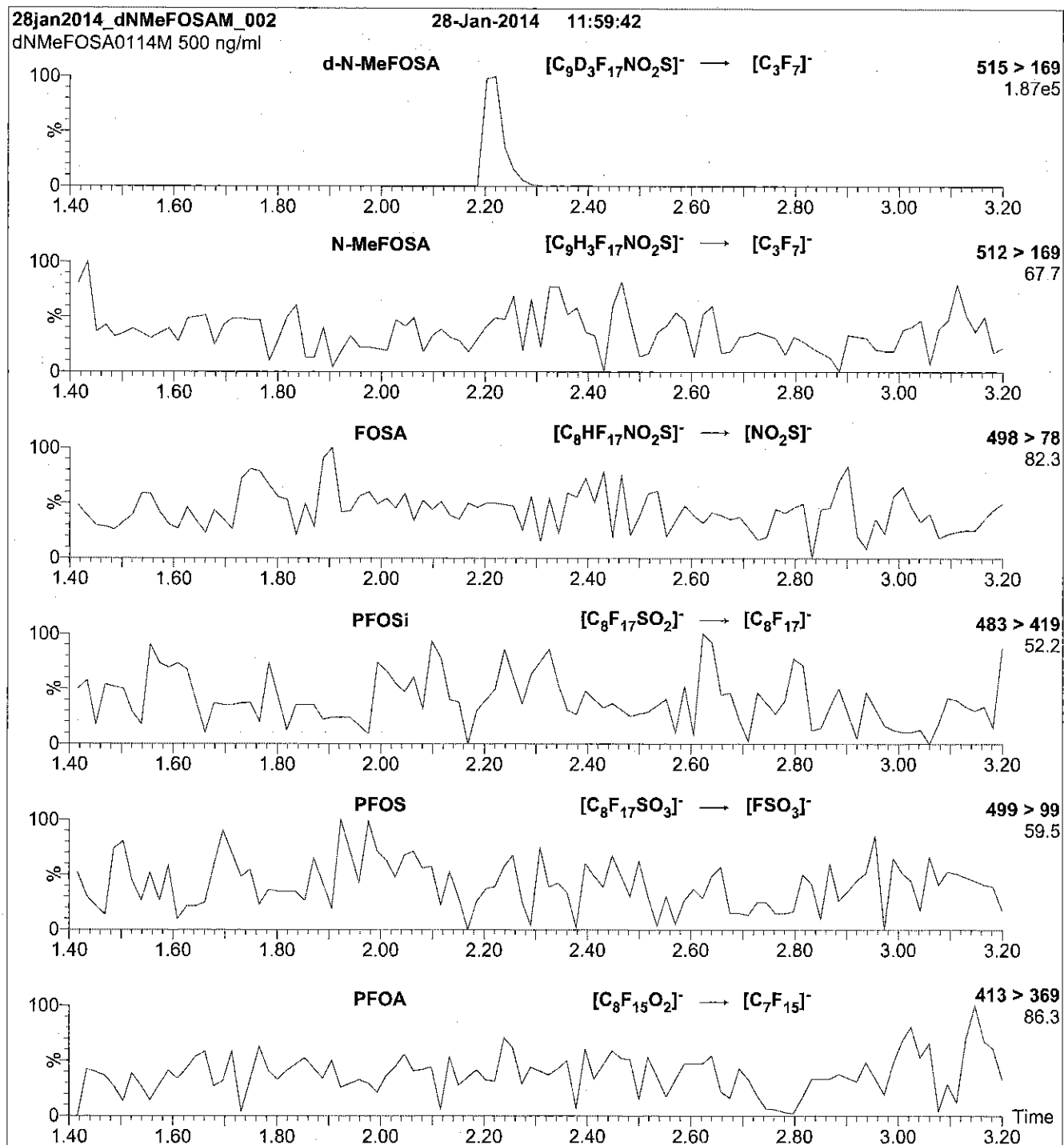
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCd-NMeFOSA-M_00002



671625

ID: LCd-NMeFOSA-M_00002

Exp: 06/13/21 Prep: CBW

d-N-MeFOSA-M



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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

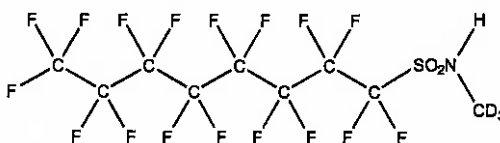
d-N-MeFOSA-M

LOT NUMBER:

dNMeFOSA0616M

COMPOUND:N-methyl-d₃-perfluoro-1-octanesulfonamide**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**C₈D₃HF₁₇NO₂S**CONCENTRATION:**

50 ± 2.5 µg/ml

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

06/10/2016

EXPIRY DATE: (mm/dd/yyyy)

06/10/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

MOLECULAR WEIGHT:

516.19

SOLVENT(S):

Methanol

ISOTOPIC PURITY:≥98% ²H₃**DOCUMENTATION/ DATA ATTACHED:**

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 06/16/2016

(mm/dd/yyyy)

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

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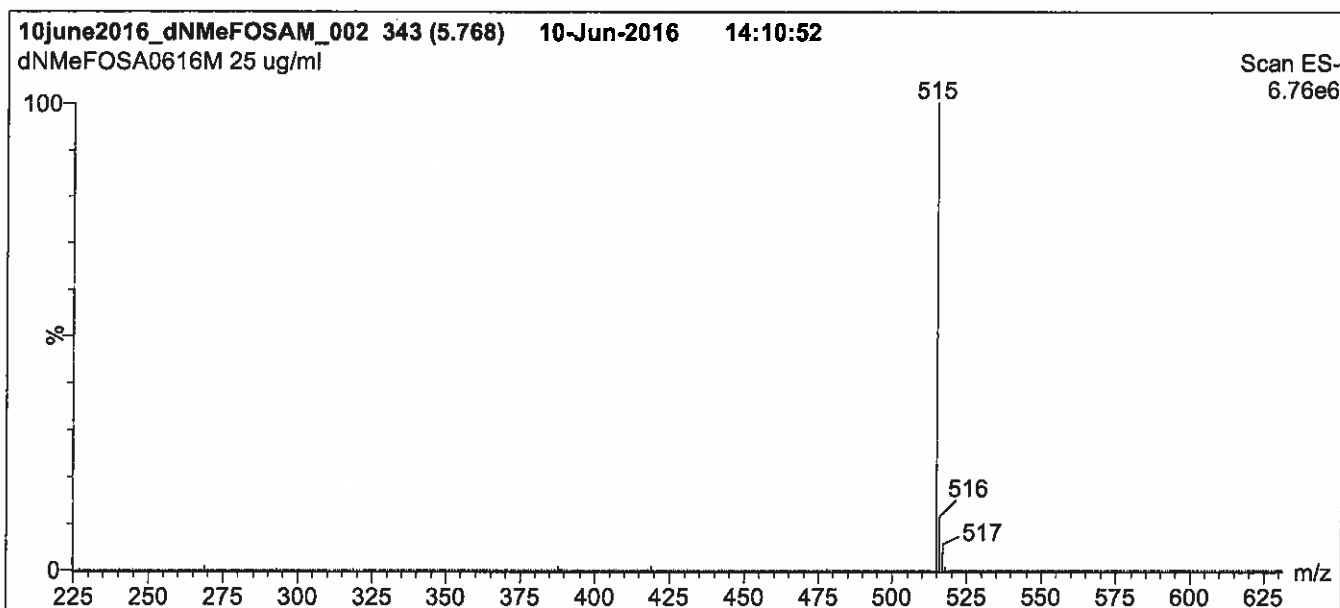
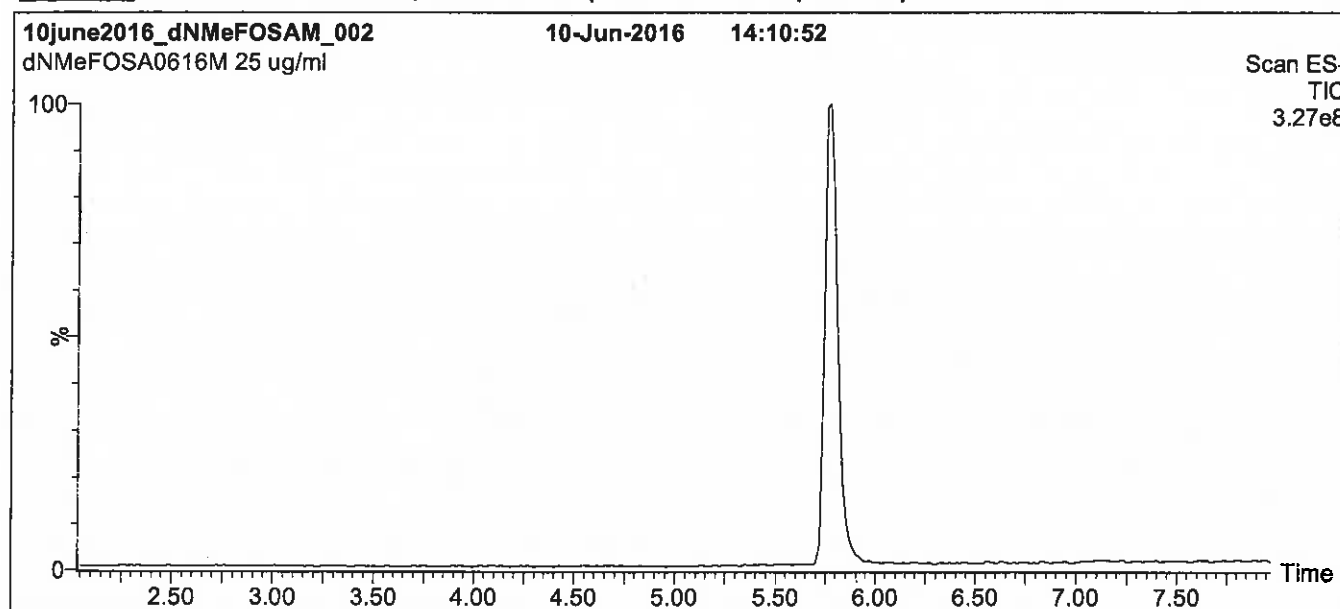
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

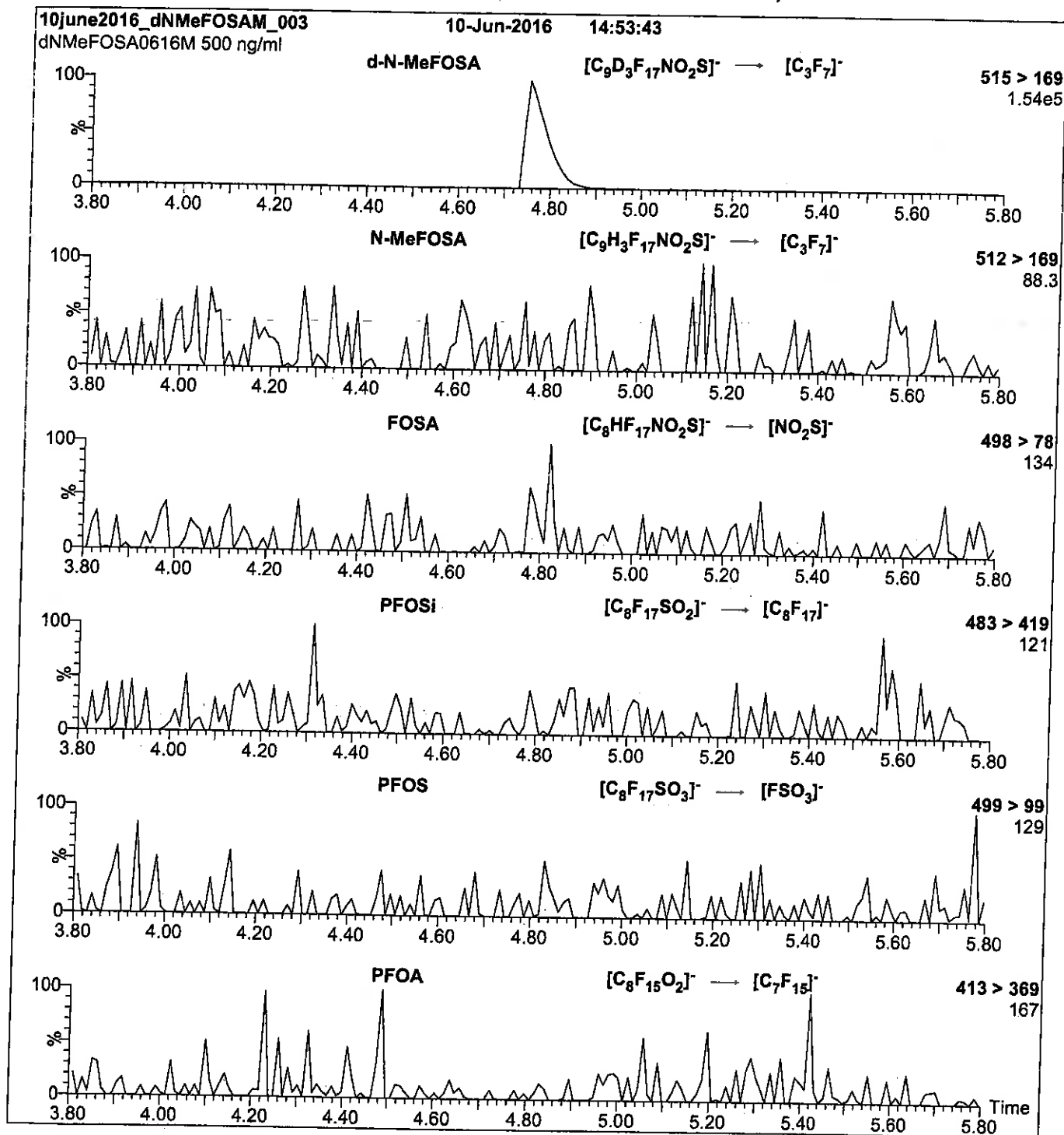
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

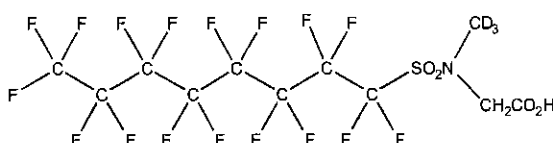
LCd3-NMeFOSAA_00001



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: C₁₁D₃H₃F₁₇NO₄S **MOLECULAR WEIGHT:** 574.23
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥98% ²H₃
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.

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

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

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

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

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LIMITED WARRANTY:

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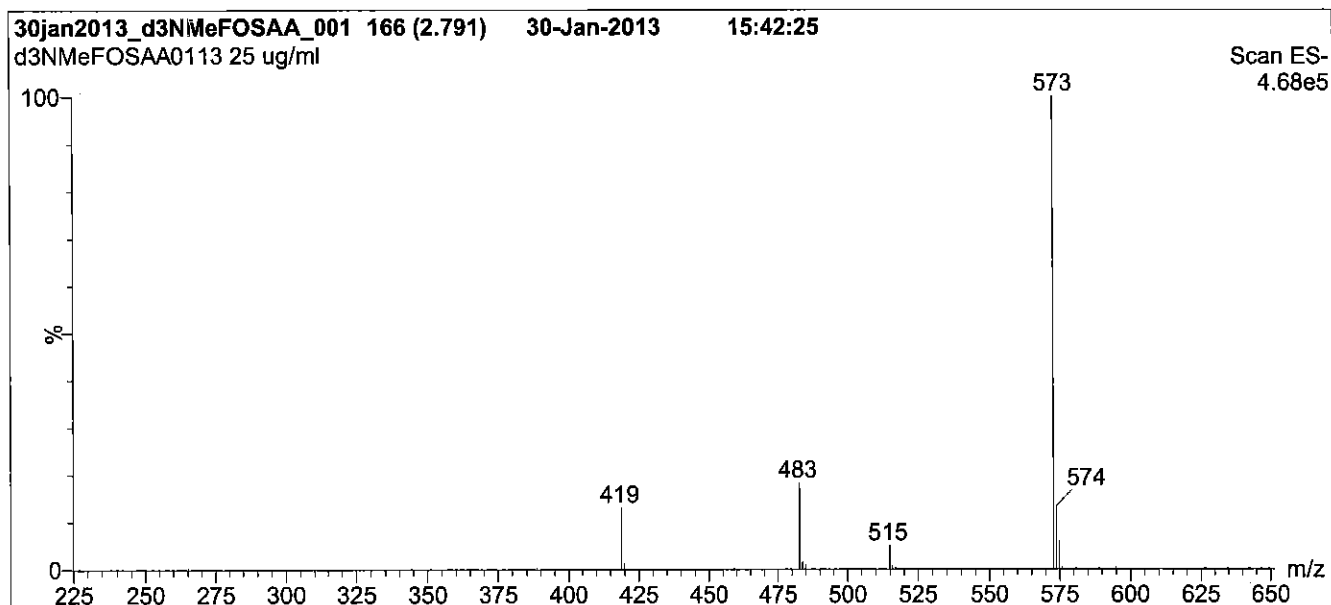
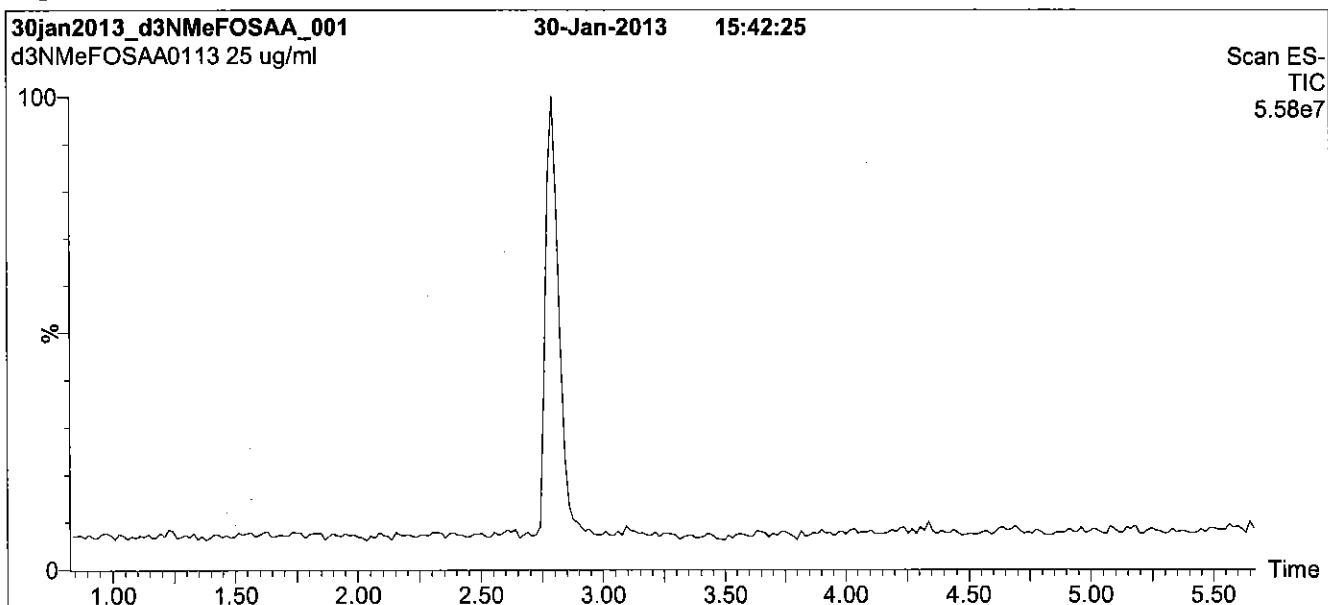
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

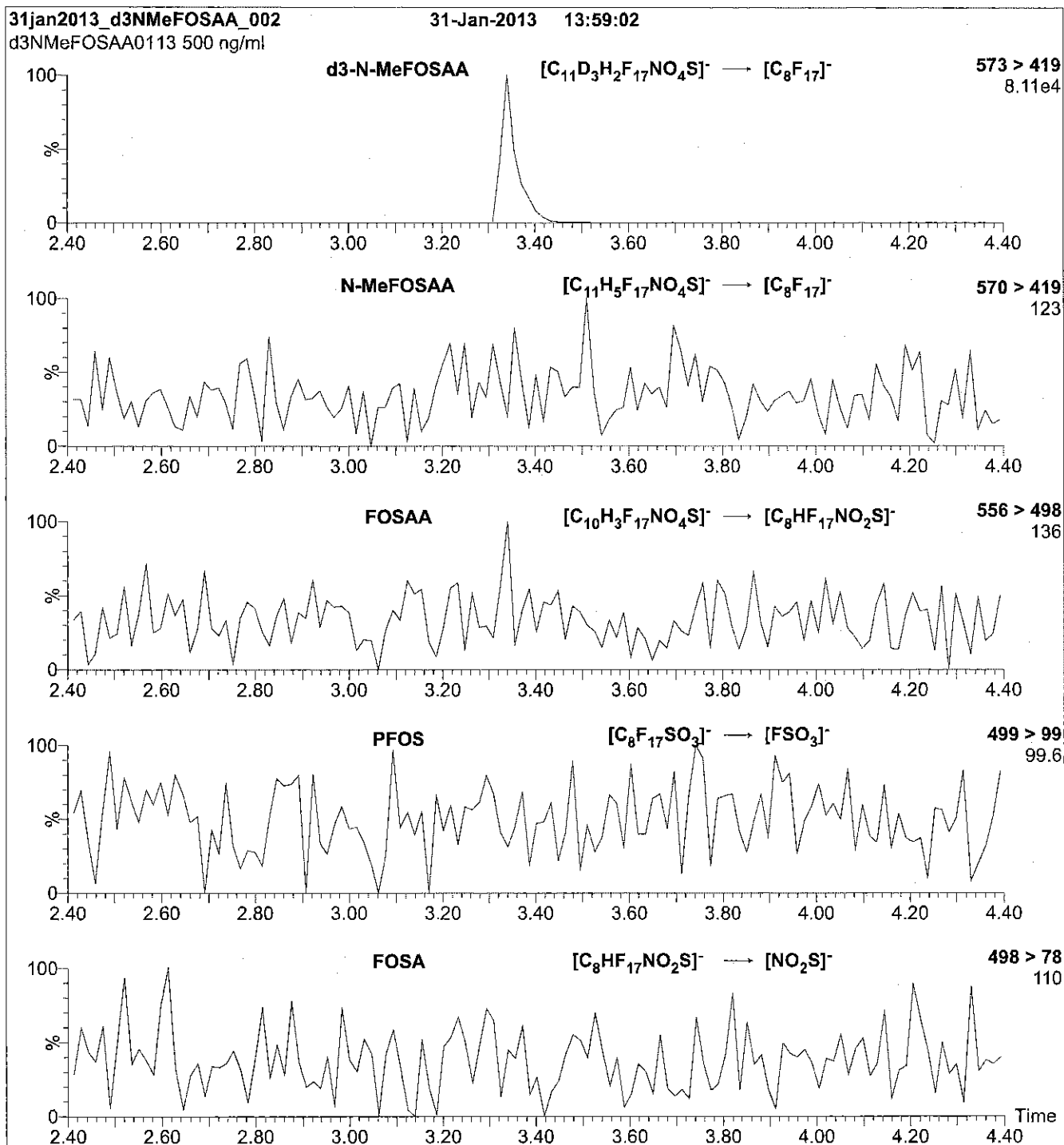
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCd3-NMeFOSAA_00002

R-7/6/16 CBW



671572

ID: LCd3-NMeFOSAA_00002

Exp: 01/2021 Prpd: CBW

d3-N-MeFOSAA

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

d3-N-MeFOSAA

LOT NUMBER:

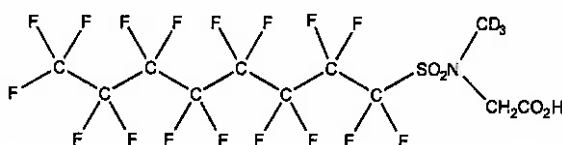
d3NMeFOSAA0116

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: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):**

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY: $\geq 98\% \text{ } ^2\text{H}_3$ **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

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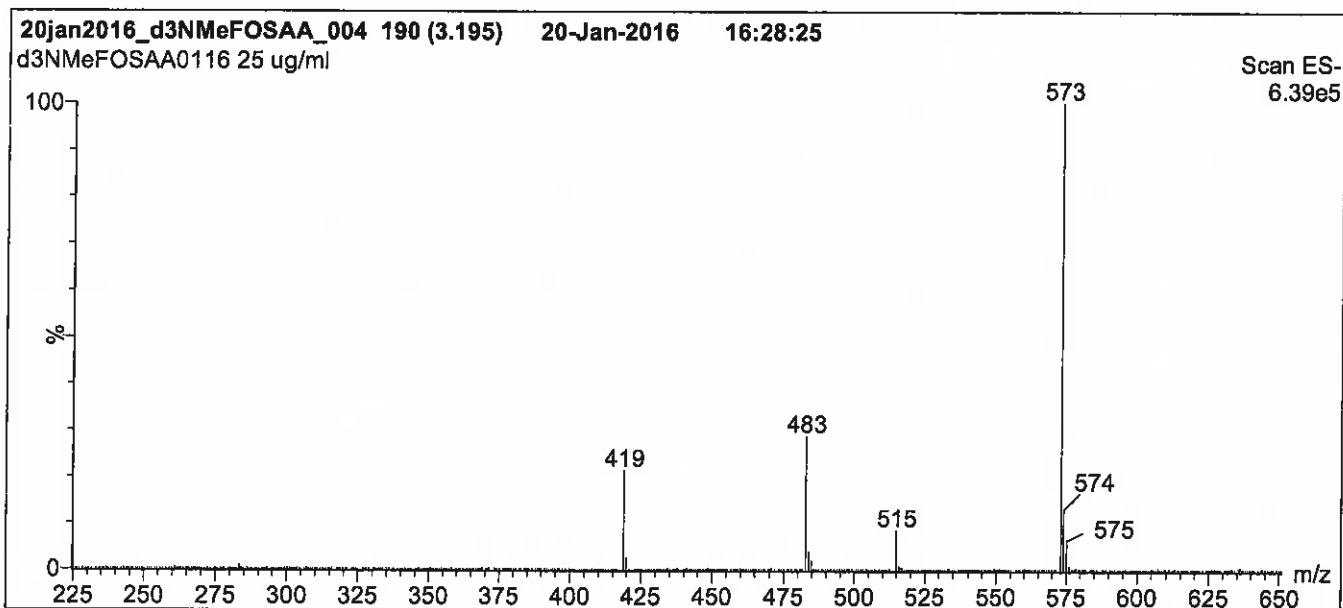
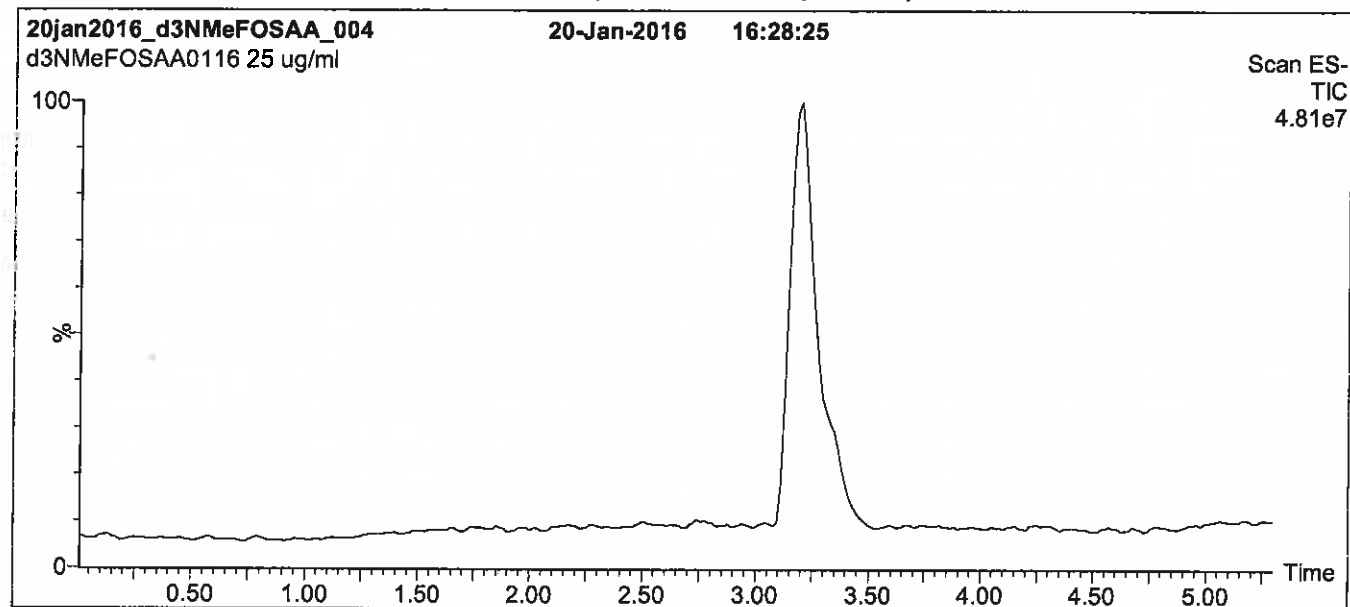
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

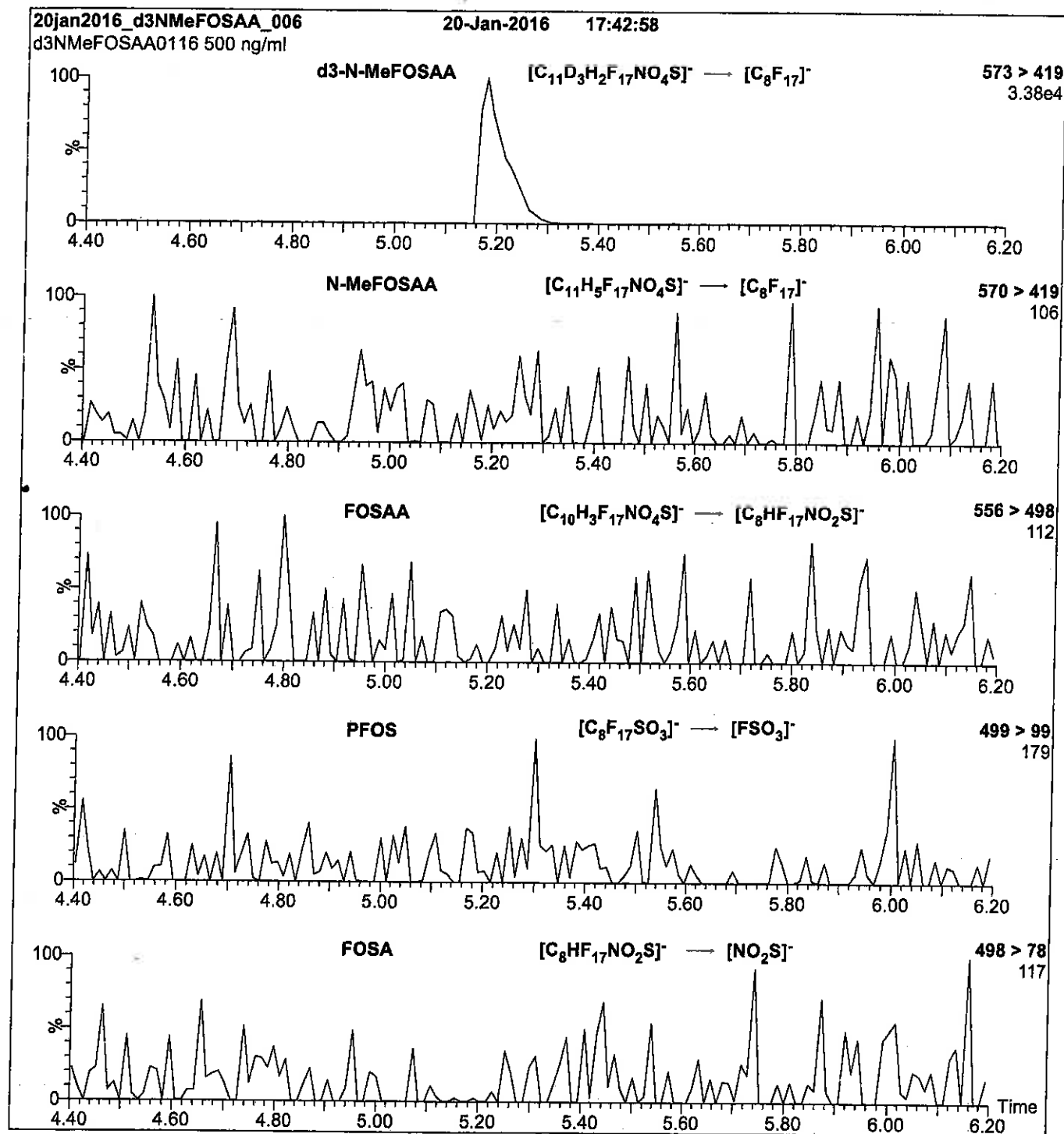
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

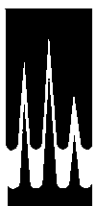
Flow: 300 μ l/min

MS Parameters

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

Reagent

LCd5-NEtFOSAA_00001

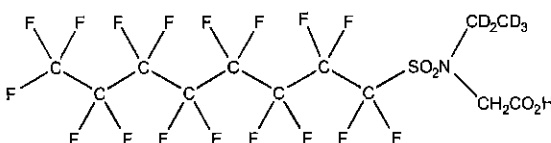


WELLINGTON LABORATORIES

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: $C_{12}D_5H_3F_{17}NO_4S$
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$

MOLECULAR WEIGHT: 590.27
SOLVENT(S): Methanol
 Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/08/2015
EXPIRY DATE: (mm/dd/yyyy) 05/08/2020
RECOMMENDED STORAGE: Refrigerate ampoule

ISOTOPIC PURITY: $\geq 98\% \text{ } ^2\text{H}_5$

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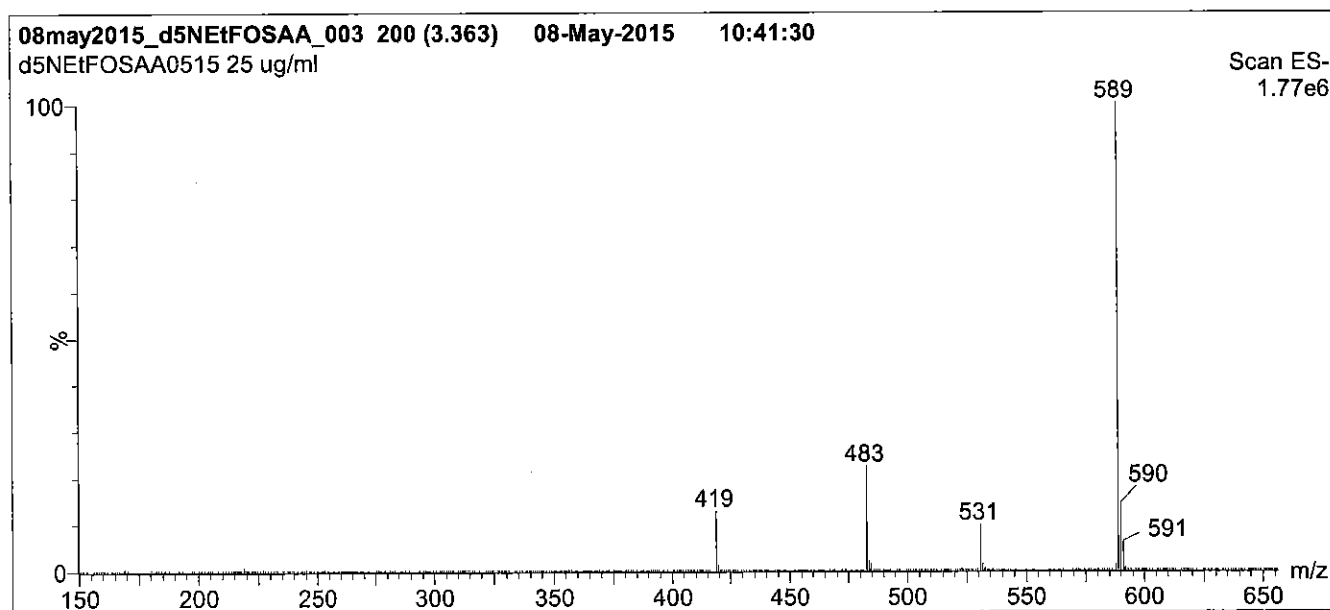
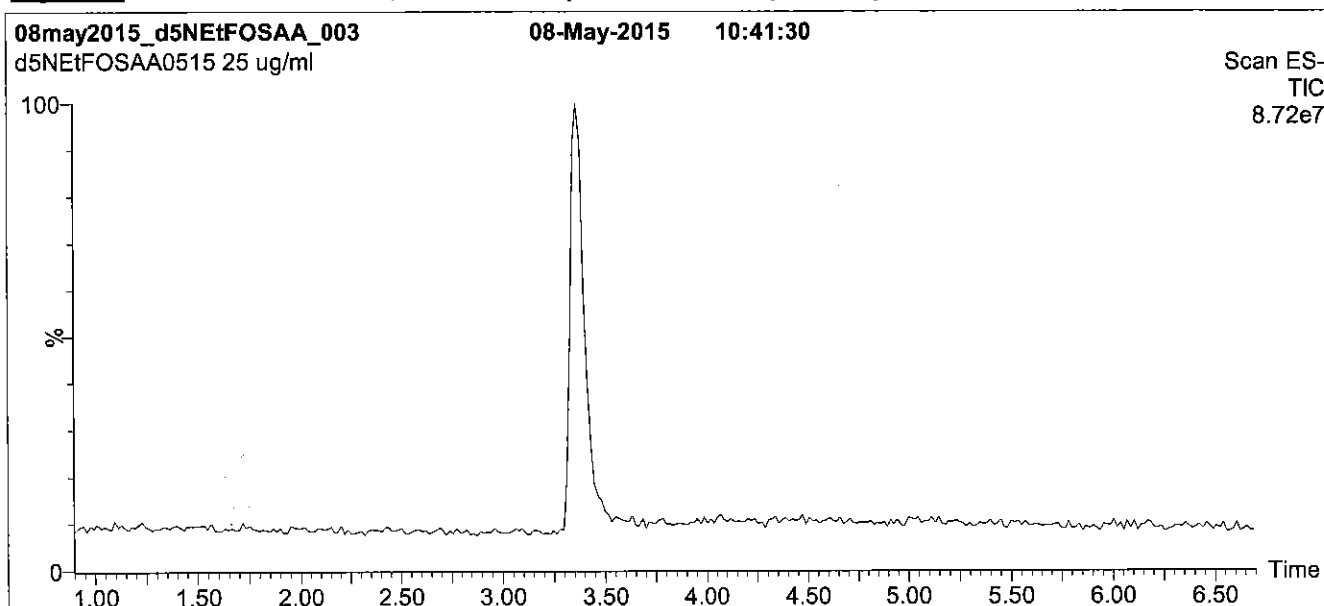
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Figure 1: d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient

Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

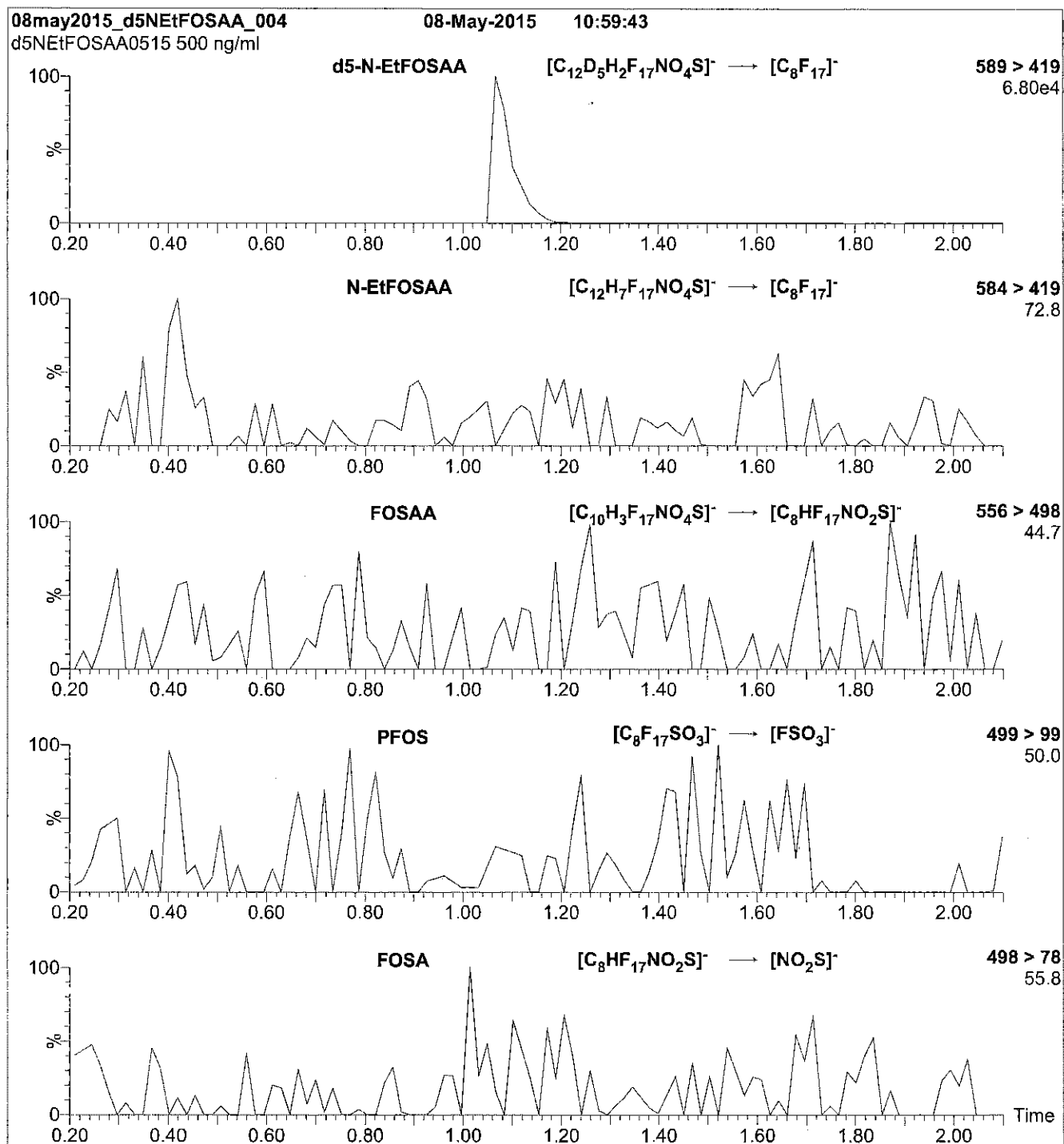
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCd5-NEtFOSAA_00002

R: 7/6/16 CBW



671603

ID: LCd5-NEtFOSAA_00002

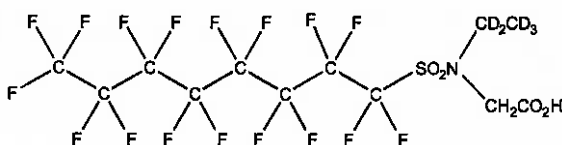
Exp: 12/07/20 Prep: CBW

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: C₁₂D₅H₃F₁₇NO₄S

CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 590.27

SOLVENT(S): Methanol

Water (<1%)

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥98% ²H₆

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

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

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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Certified By:

B.G. Chittim

Date: 12/07/2015

(mm/dd/yyyy)

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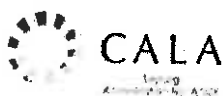
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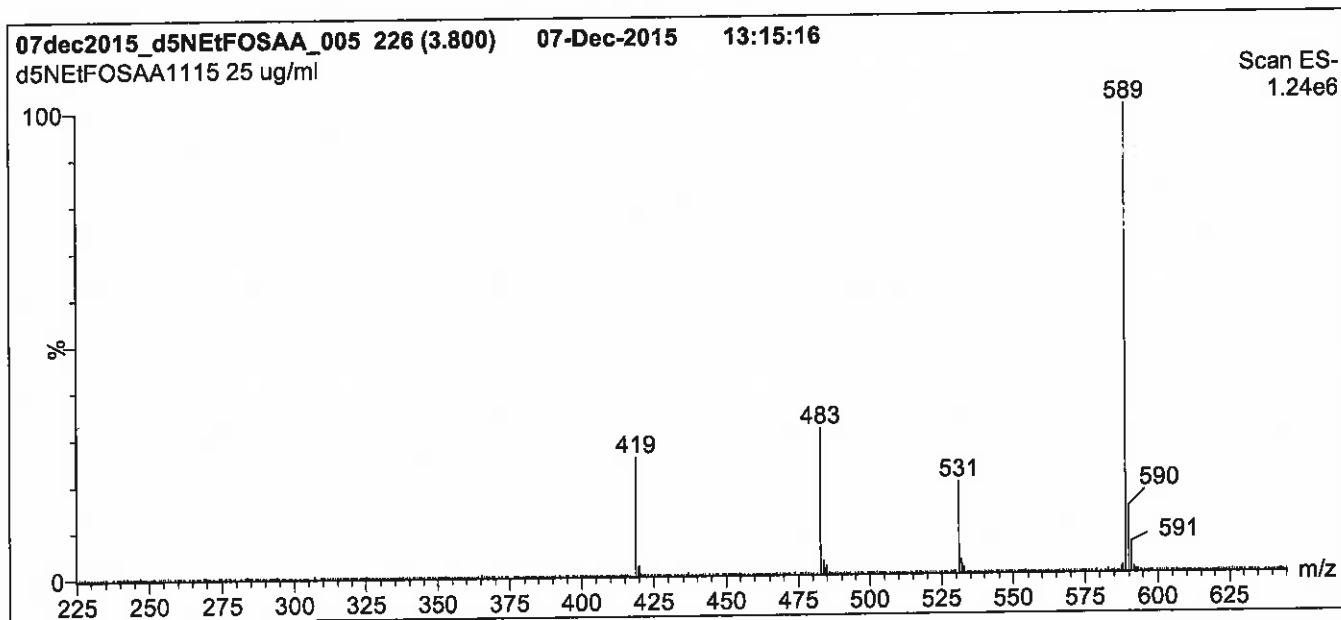
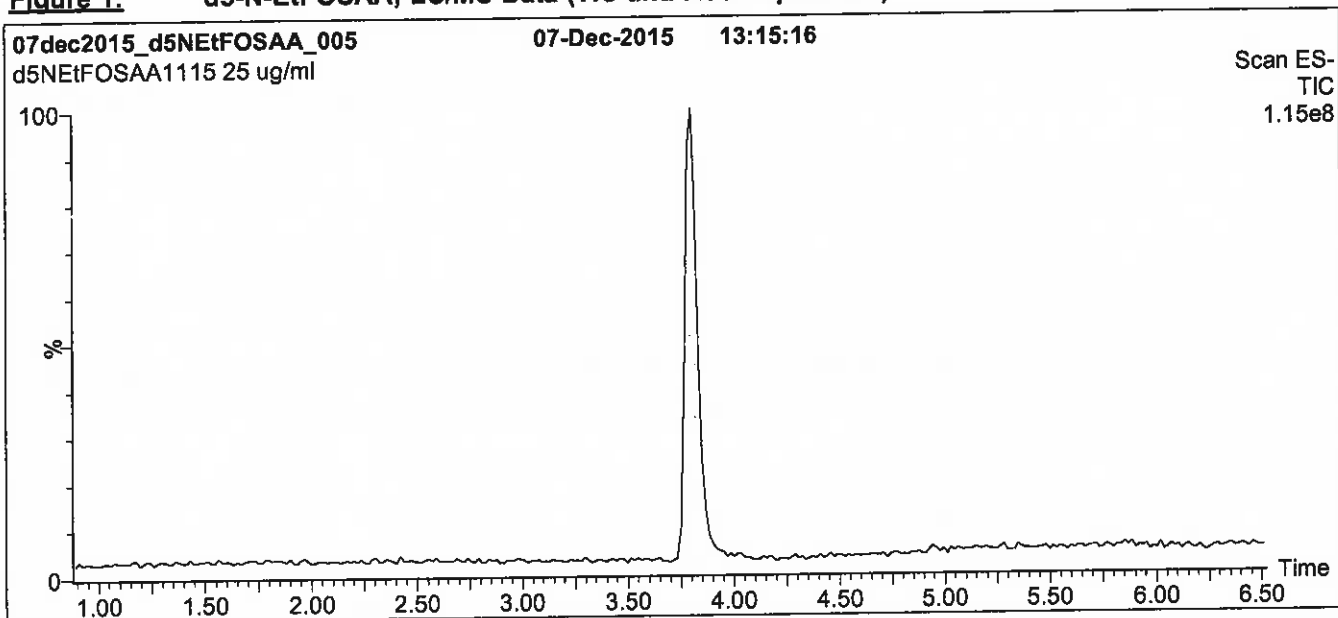
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MS: Micromass Quattro micro API MS

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1.7 μ m, 2.1 x 100 mm

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Ramp to 90% organic over 7 min and hold for 2 min.
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)

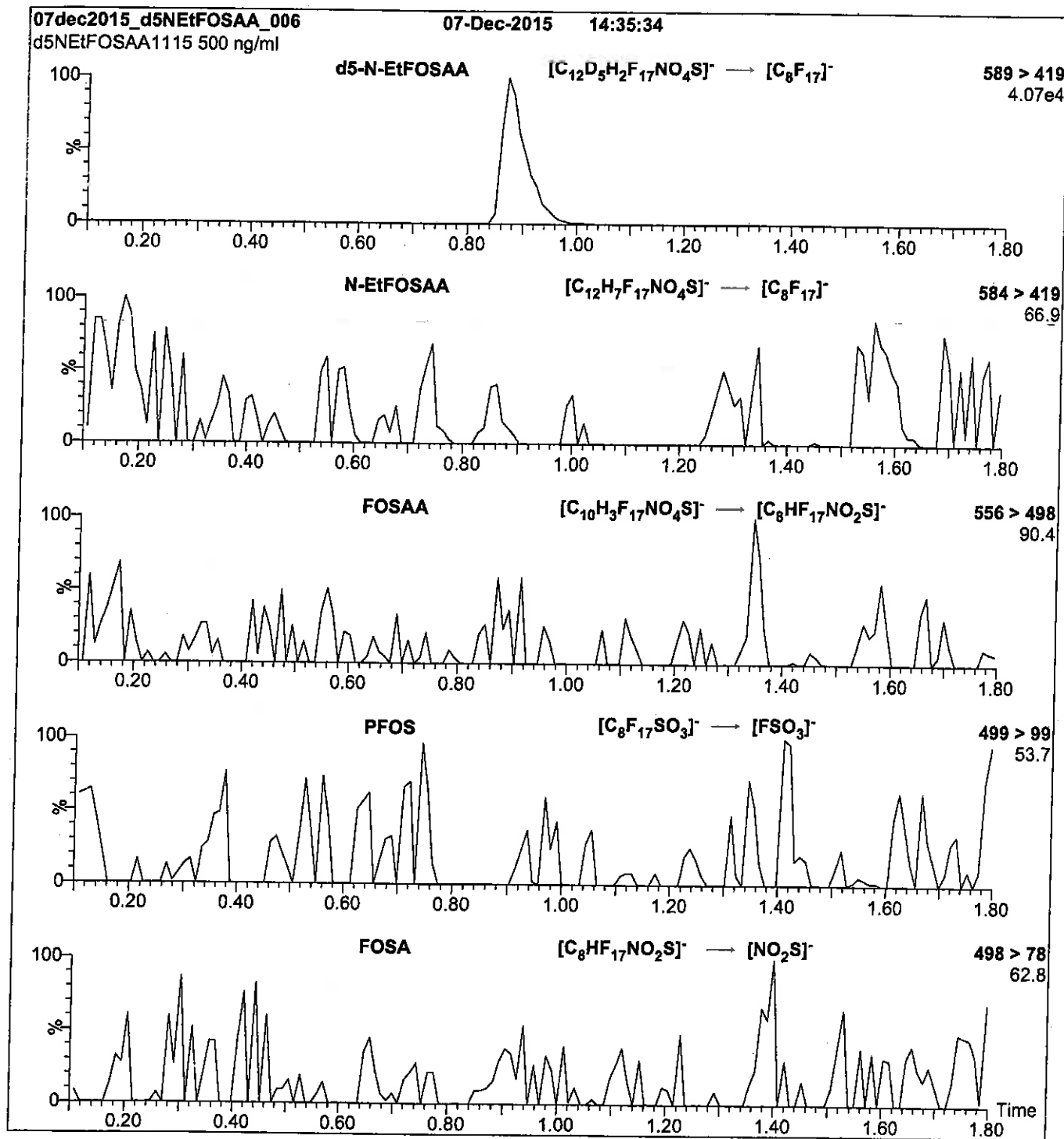
Capillary Voltage (kV) = 3.00

Cone Voltage (V) = 35.00

Cone Gas Flow (l/hr) = 50

Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

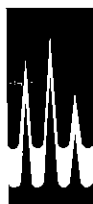
MS Parameters

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

Reagent

LCM2-6:FTS_00001

R. 7/16/15 SW
S. 7/20/15 SW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

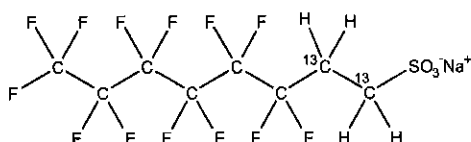
M2-6:2FTS

LOT NUMBER:

M262FTS0714

COMPOUND:Sodium 1H,1H,2H,2H-perfluoro-[1,2-¹³C₂]octane sulfonate**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**¹³C₂¹²C₆H₄F₁₃SO₃Na**CONCENTRATION:**50.0 ± 2.5 µg/ml (Na salt)
47.5 ± 2.4 µg/ml (M2-6:2FTS anion)**MOLECULAR WEIGHT:**

452.13

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:≥99% ¹³C
(1,2-¹³C₂)**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 ³⁴S (due to natural isotopic abundance) therefore both native 6:2FTS and M2-6:2FTS will produce signals in the m/z 429 to m/z 409 channel during SRM analysis. We recommend using the m/z 429 to m/z 81 transition to monitor for M2-6:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 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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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

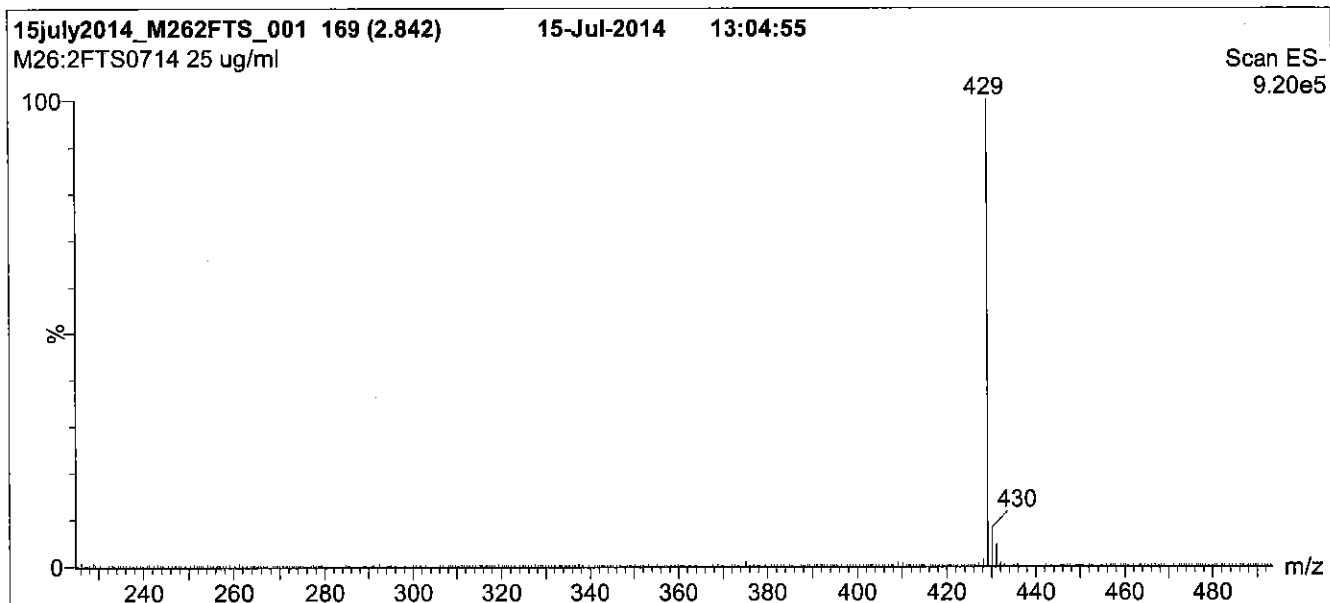
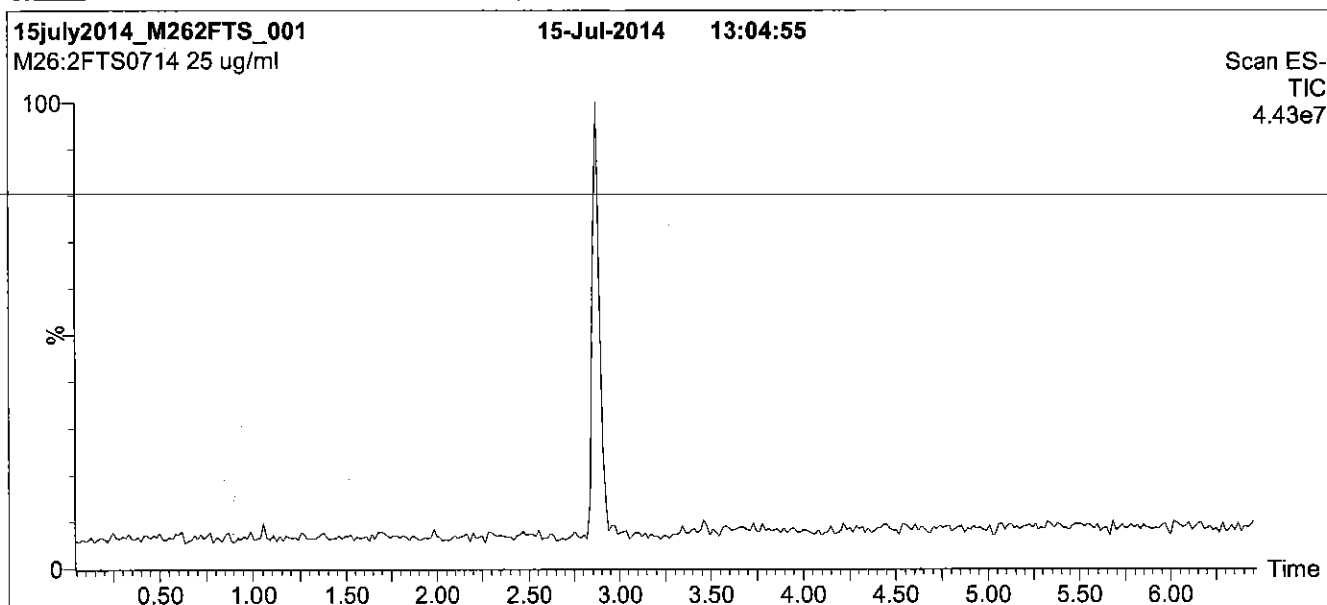
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

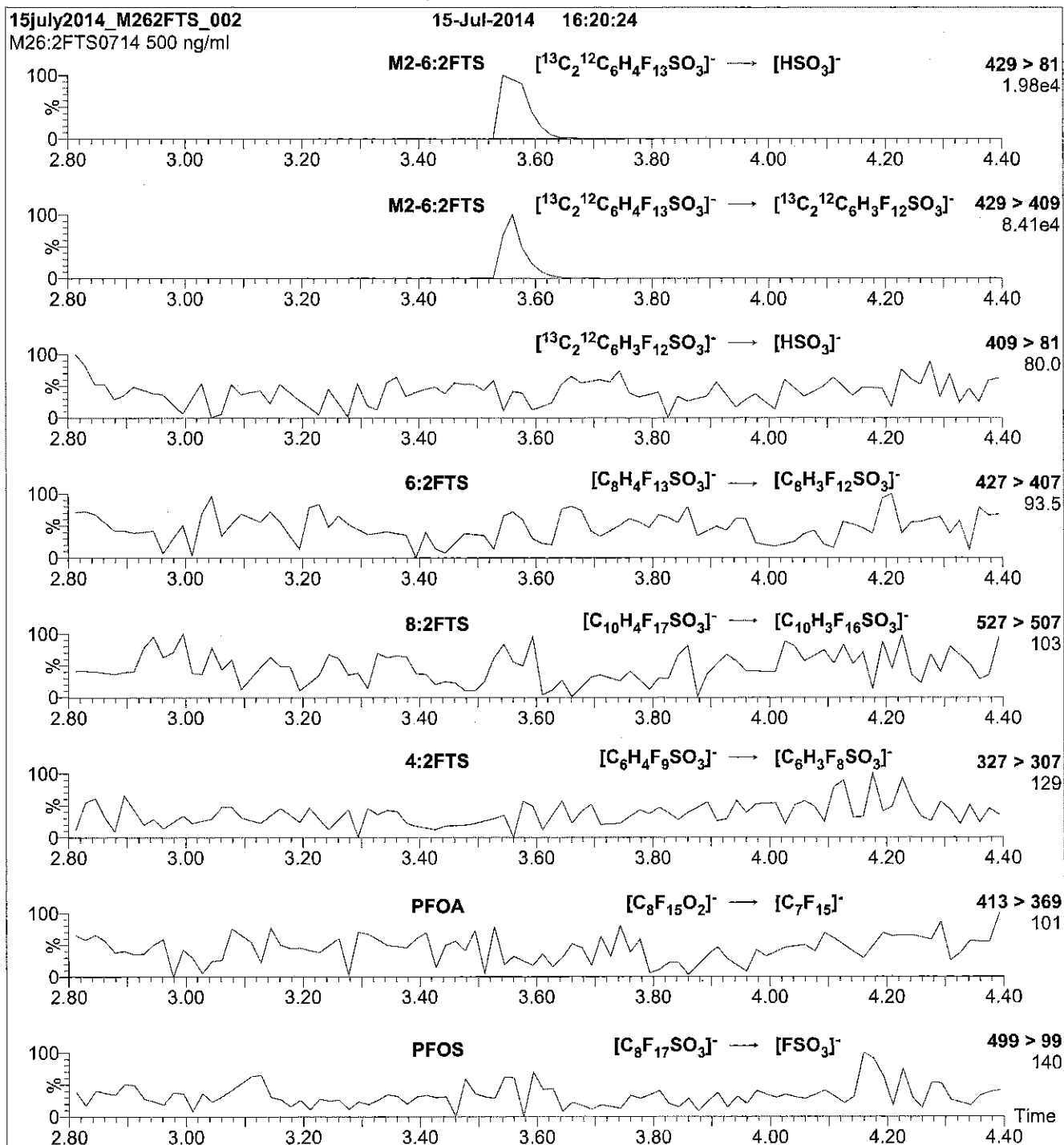
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCM2-6:FTS_00002

R: 7/6/16 CSW

671575
ID: LCM2-6:FTS_00002
Exp: 01/08/21 Prod: CSW
M2-6:2FTS

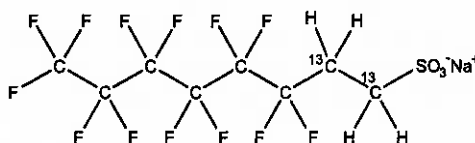


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-6:2FTS **LOT NUMBER:** M262FTS0116
COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-¹³C₂]octane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₆H₄F₁₃SO₃Na **MOLECULAR WEIGHT:** 452.13
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
47.5 ± 2.4 µg/ml (M2-6:2FTS anion)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
LAST TESTED: (mm/dd/yyyy) 01/08/2016 (1,2-¹³C₂)
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 6:2FTS contains 4.22% of ³⁴S (due to natural isotopic abundance) therefore both native 6:2FTS and M2-6:2FTS will produce signals in the m/z 429 to m/z 409 channel during SRM analysis. We recommend using the m/z 429 to m/z 81 transition to monitor for M2-6:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 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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SYNTHESIS / CHARACTERIZATION:

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EXPIRY DATE / PERIOD OF VALIDITY:

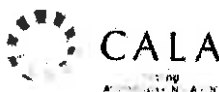
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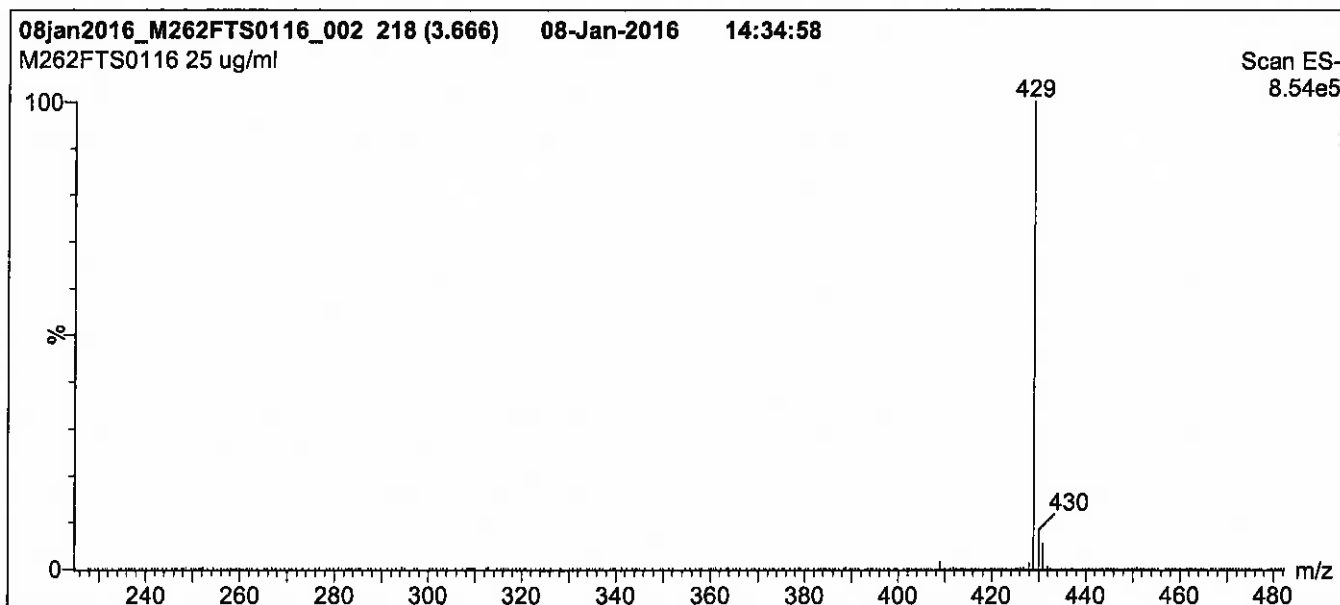
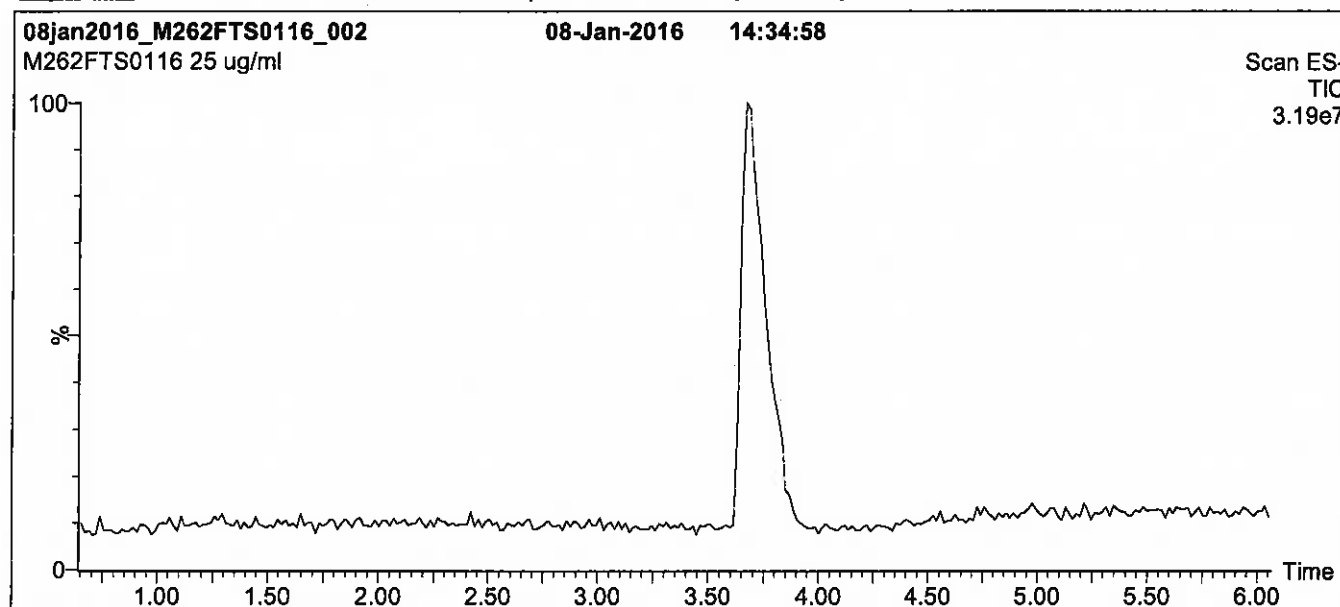
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

Time: 10 min

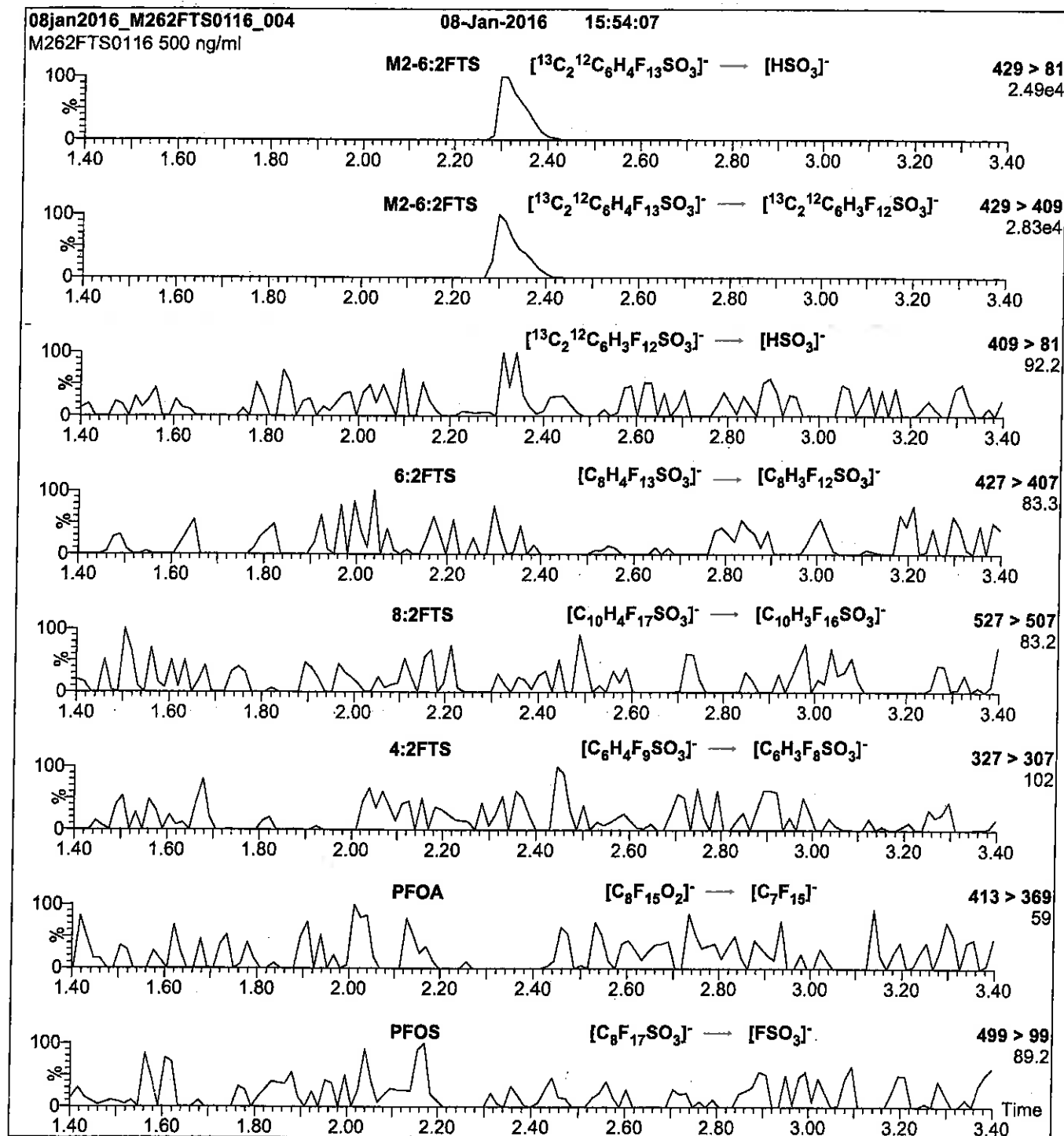
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCM2-8:2FTS_00001

r: 7/16/15 8/ ✓
8: 7/22/15 STV ✓

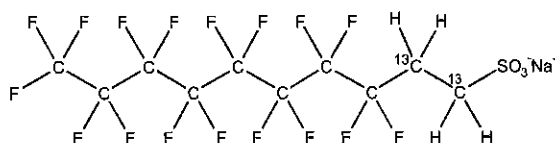


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0414
COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-¹³C₂]decane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₈H₄F₁₇SO₃Na **MOLECULAR WEIGHT:** 552.15
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
47.9 ± 2.4 µg/ml (M2-8:2FTS anion)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
LAST TESTED: (mm/dd/yyyy) 04/13/2014 (1,2-¹³C₂)
EXPIRY DATE: (mm/dd/yyyy) 04/13/2017
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 8:2FTS contains 4.22% of ³⁴S (due to natural isotopic abundance) therefore both native 8:2FTS and M2-8:2FTS will produce signals in the m/z 529 to m/z 509 channel during SRM analysis. We recommend using the m/z 529 to m/z 81 transition to monitor for M2-8:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

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Certified By:

B.G. Chittim

Date: 03/27/2015

(mm/dd/yyyy)

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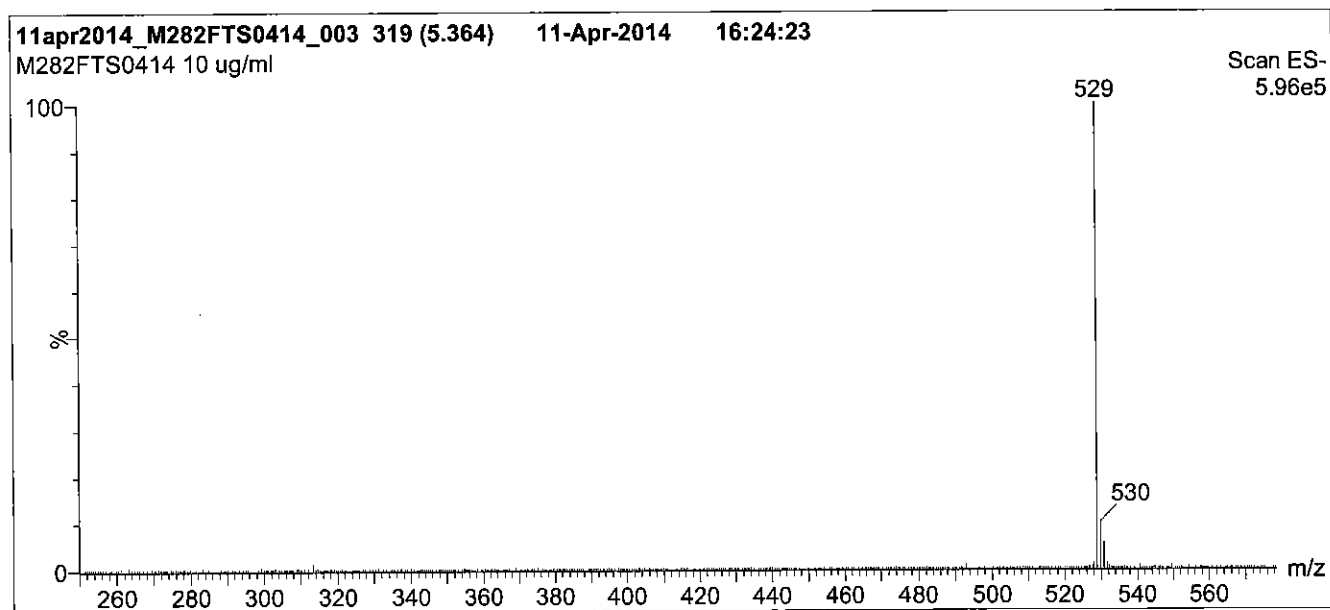
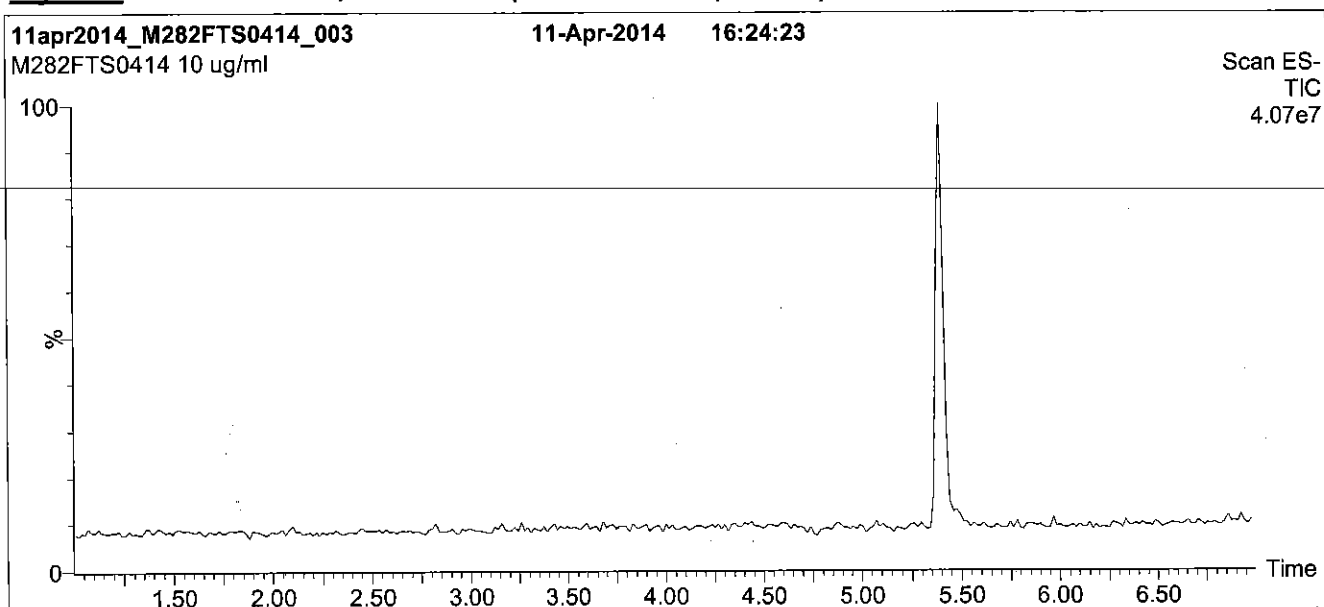
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Figure 1: M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

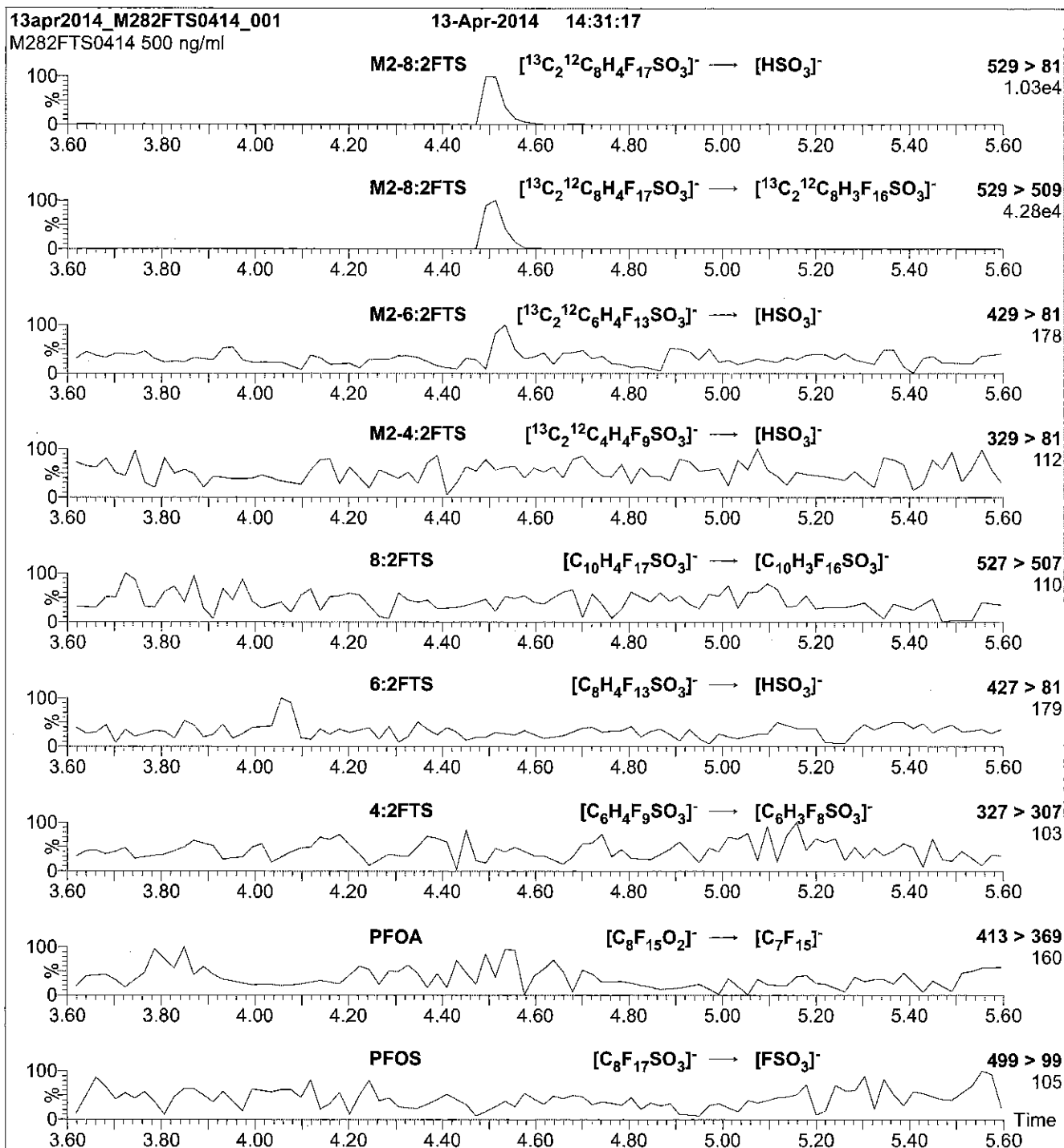
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCM2-8:2FTS_00002

R_s 7/6/16 *can*

671602

ID: LCM2-8:2FTS_00002

Exp: 01/08/21 Prod: CBW

M2-8:2FTS

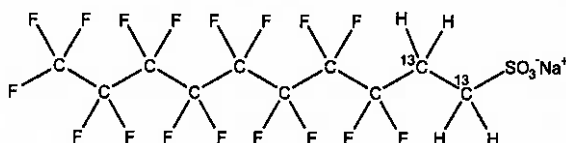


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0116
COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-¹³C₂]decane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}\text{C}_2^{12}\text{C}_8\text{H}_4\text{F}_{17}\text{SO}_3\text{Na}$	MOLECULAR WEIGHT:	552.15
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	SOLVENT(S):	Methanol
	47.9 ± 2.4 µg/ml (M2-8:2FTS anion)		
CHEMICAL PURITY:	>98%	ISOTOPIC PURITY:	≥99% ¹³ C
LAST TESTED: (mm/dd/yyyy)	01/08/2016		(1,2- ¹³ C ₂)
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 ³⁴S (due to natural isotopic abundance) therefore both native 8:2FTS and M2-8:2FTS will produce signals in the m/z 529 to m/z 509 channel during SRM analysis. We recommend using the m/z 529 to m/z 81 transition to monitor for M2-8:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

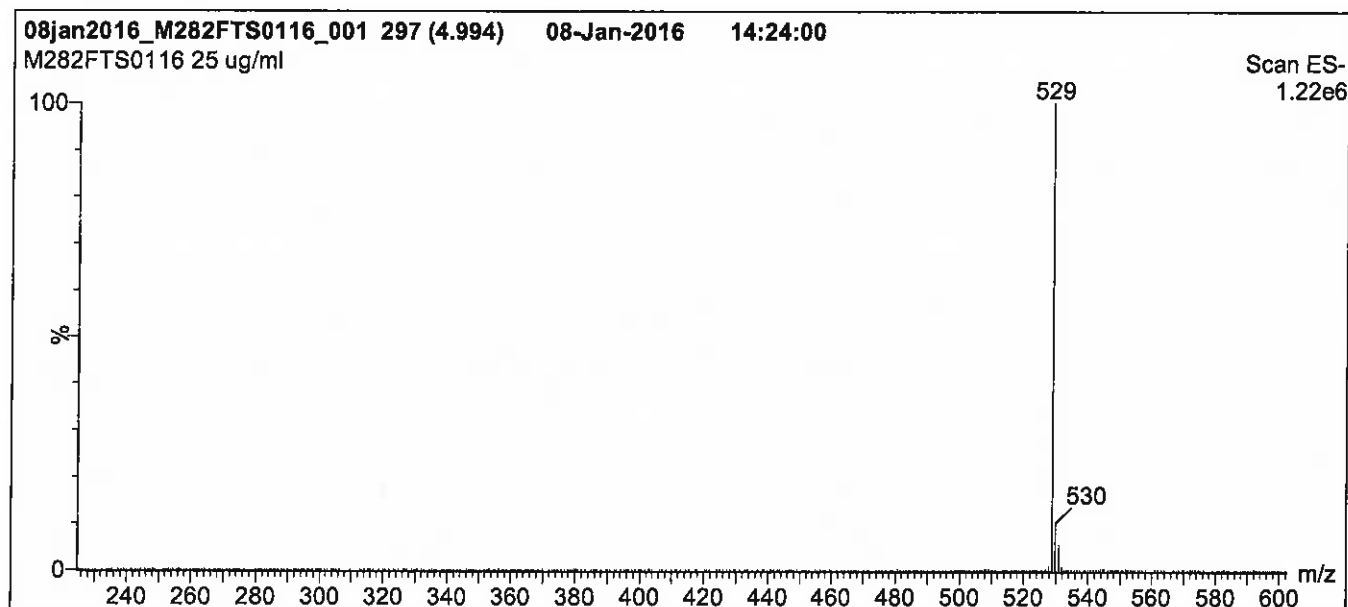
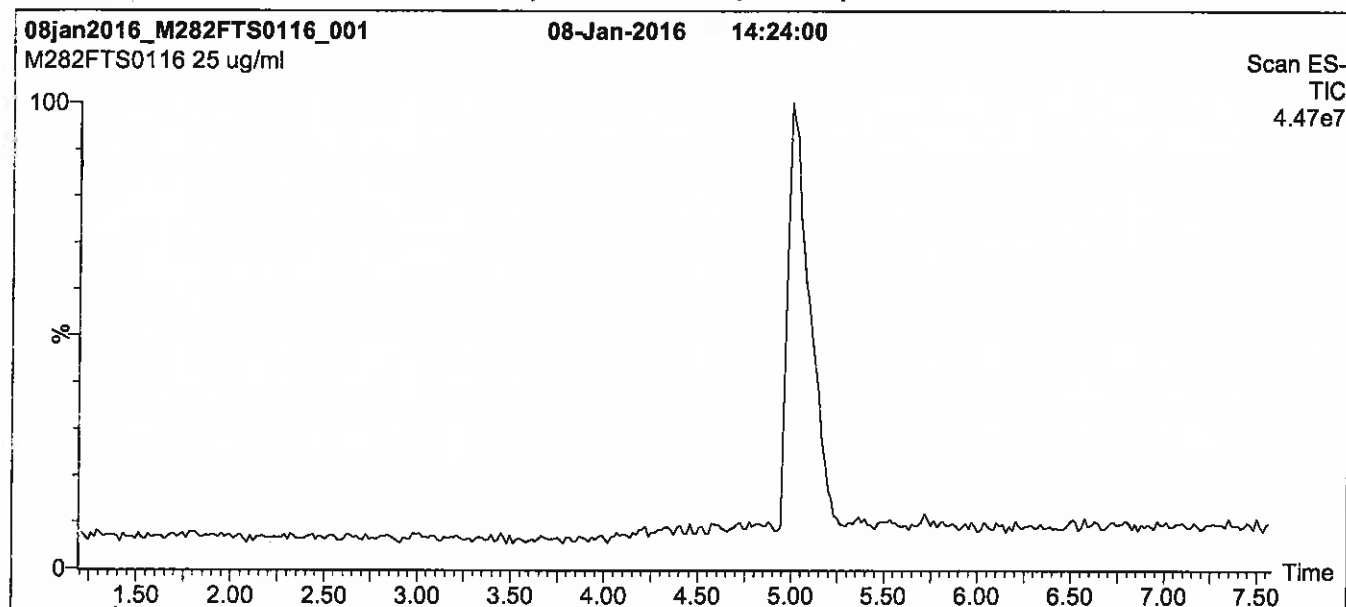
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

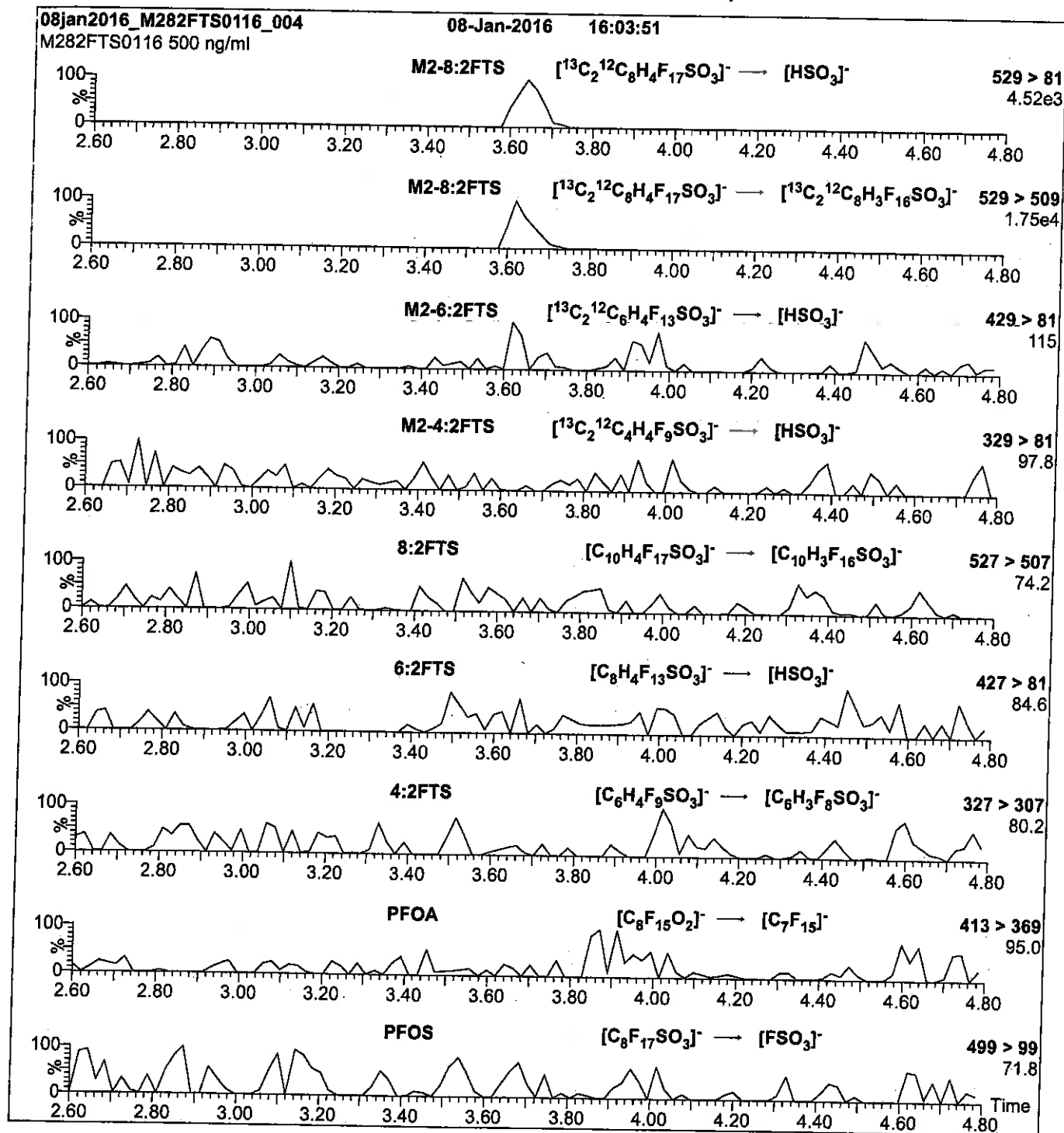
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

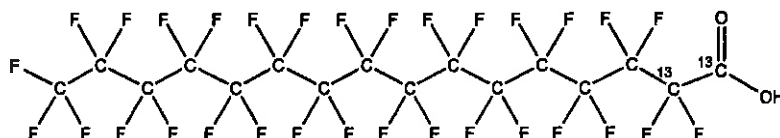
LCM2PFHxDA_00008

R: 8BC 9/22/16

739512
ID: LCM2PFHxDA_00008
Exp: 01/07/21 Prod: SBC
13C2-PFHxDA at 50ug/mLWELLINGTON
LABORATORIESCERTIFICATE OF ANALYSIS
DOCUMENTATION

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

STRUCTURE: **CAS #:** Not available



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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

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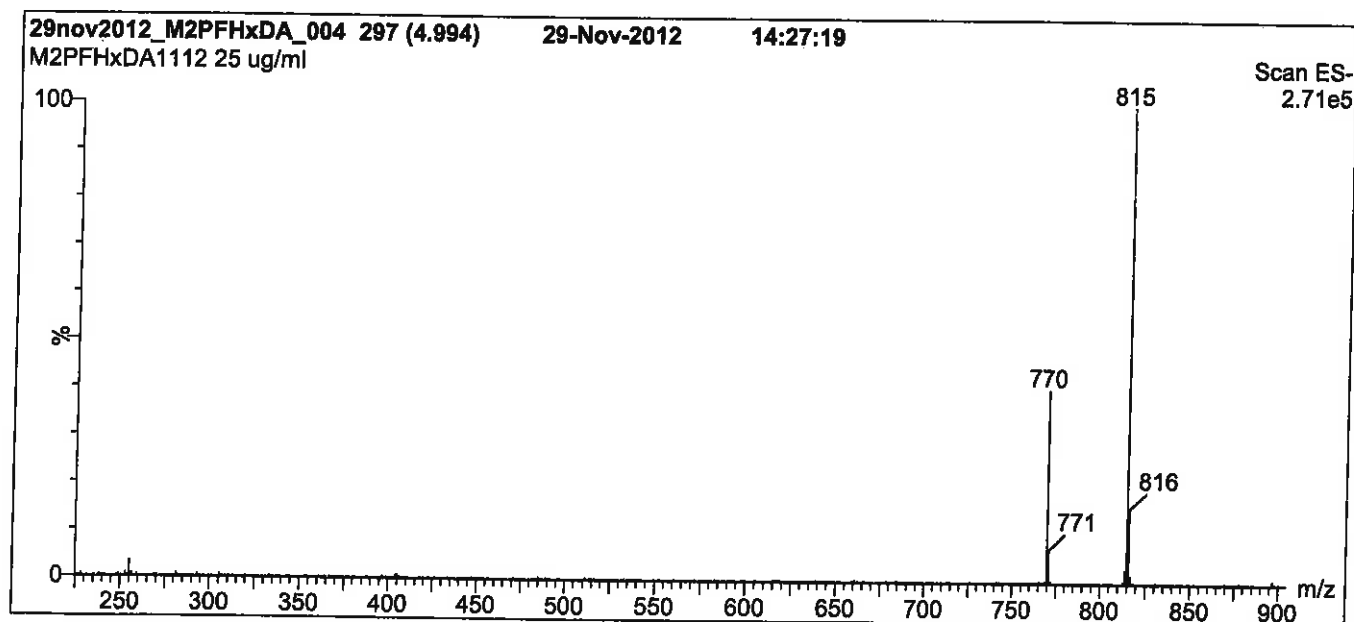
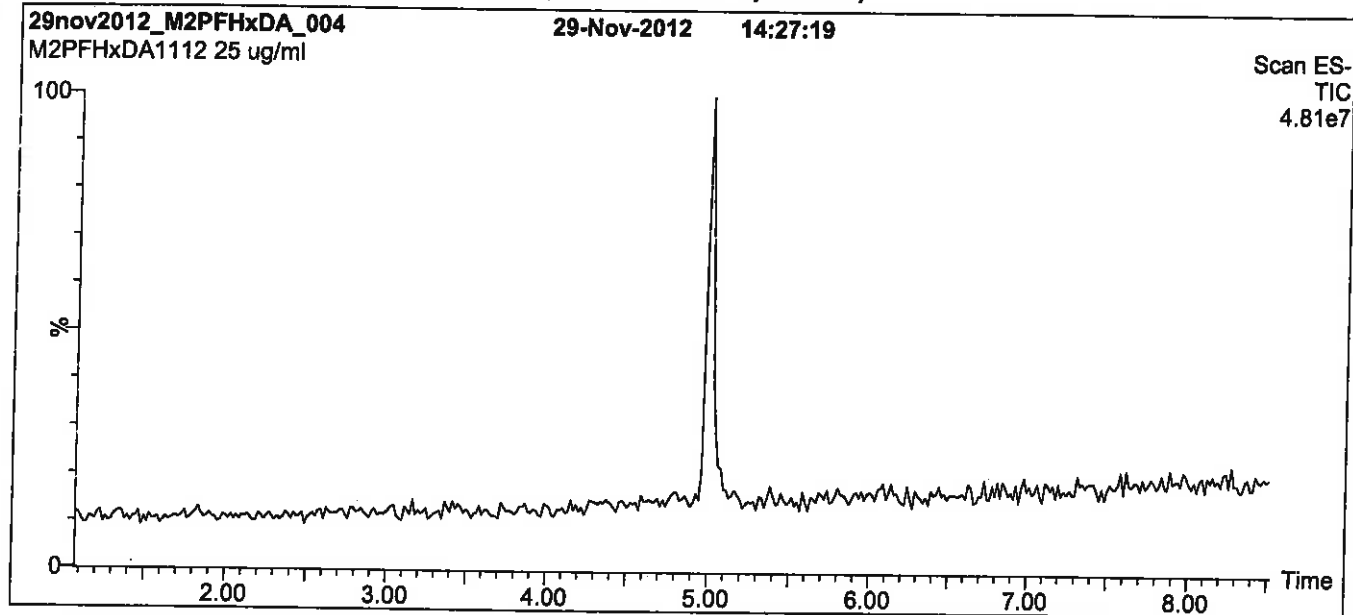
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

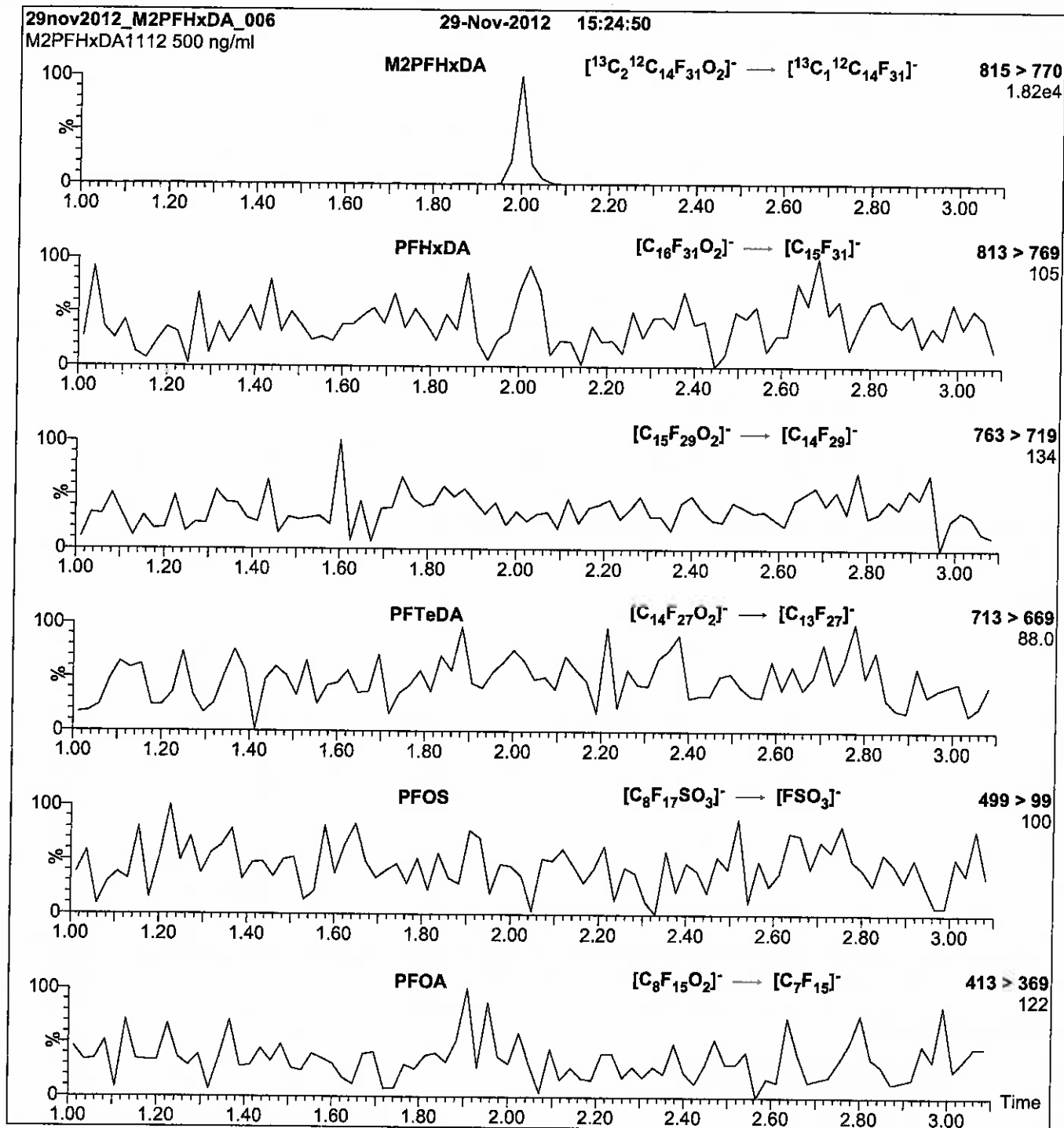
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 1200 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = $3.39\text{e-}3$
Collision Energy (eV) = 15

Reagent

LCM2PFTeDA_00007



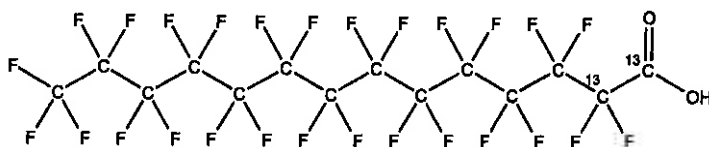
Scanned 10/14/16 R: 800 9/27/16
WELLINGTON
LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: ¹³C₂¹²C₁₂H₂₇O₂
CONCENTRATION: 50 ± 2.5 µg/ml
MOLECULAR WEIGHT: 716.10
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)
LAST TESTED: (mm/dd/yyyy) 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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EXPIRY DATE / PERIOD OF VALIDITY:

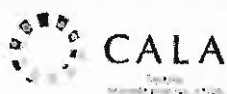
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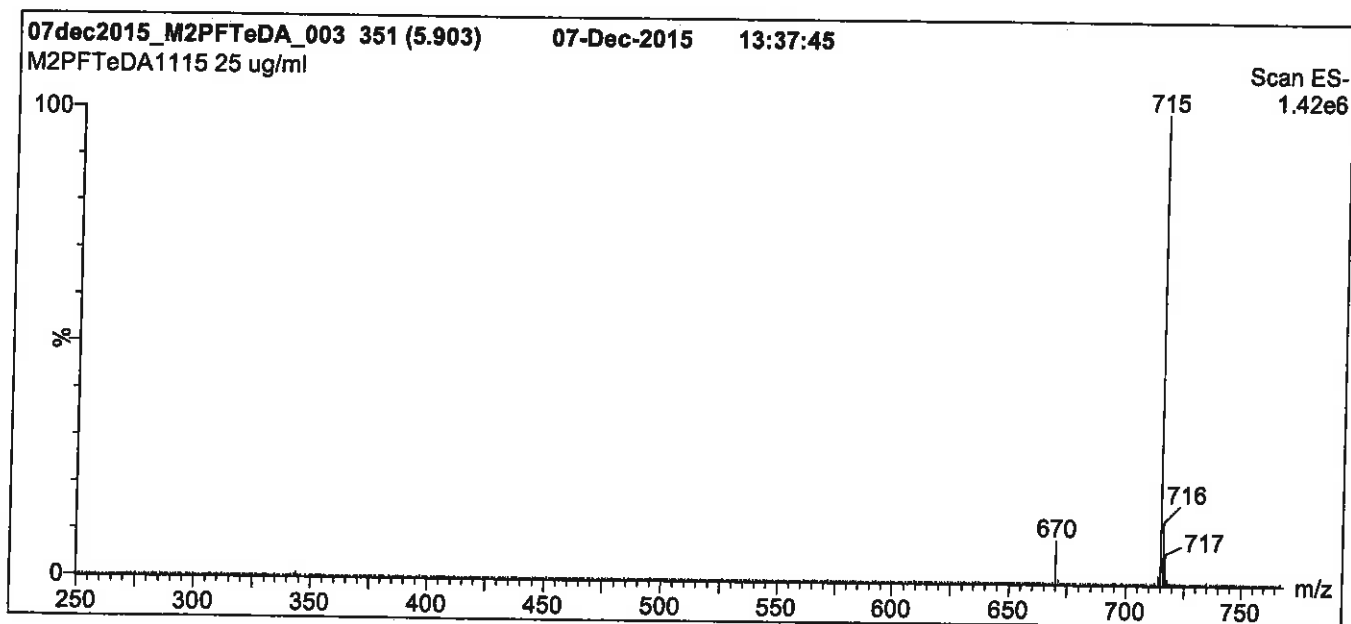
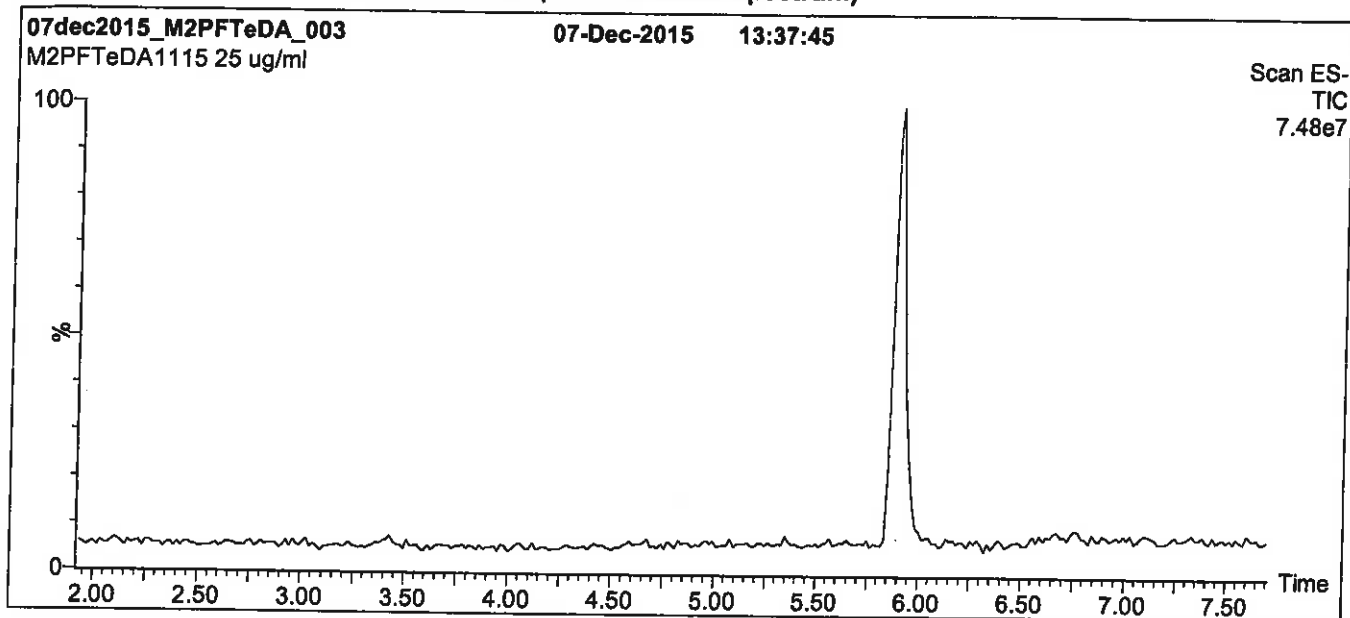
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Figure 1: M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

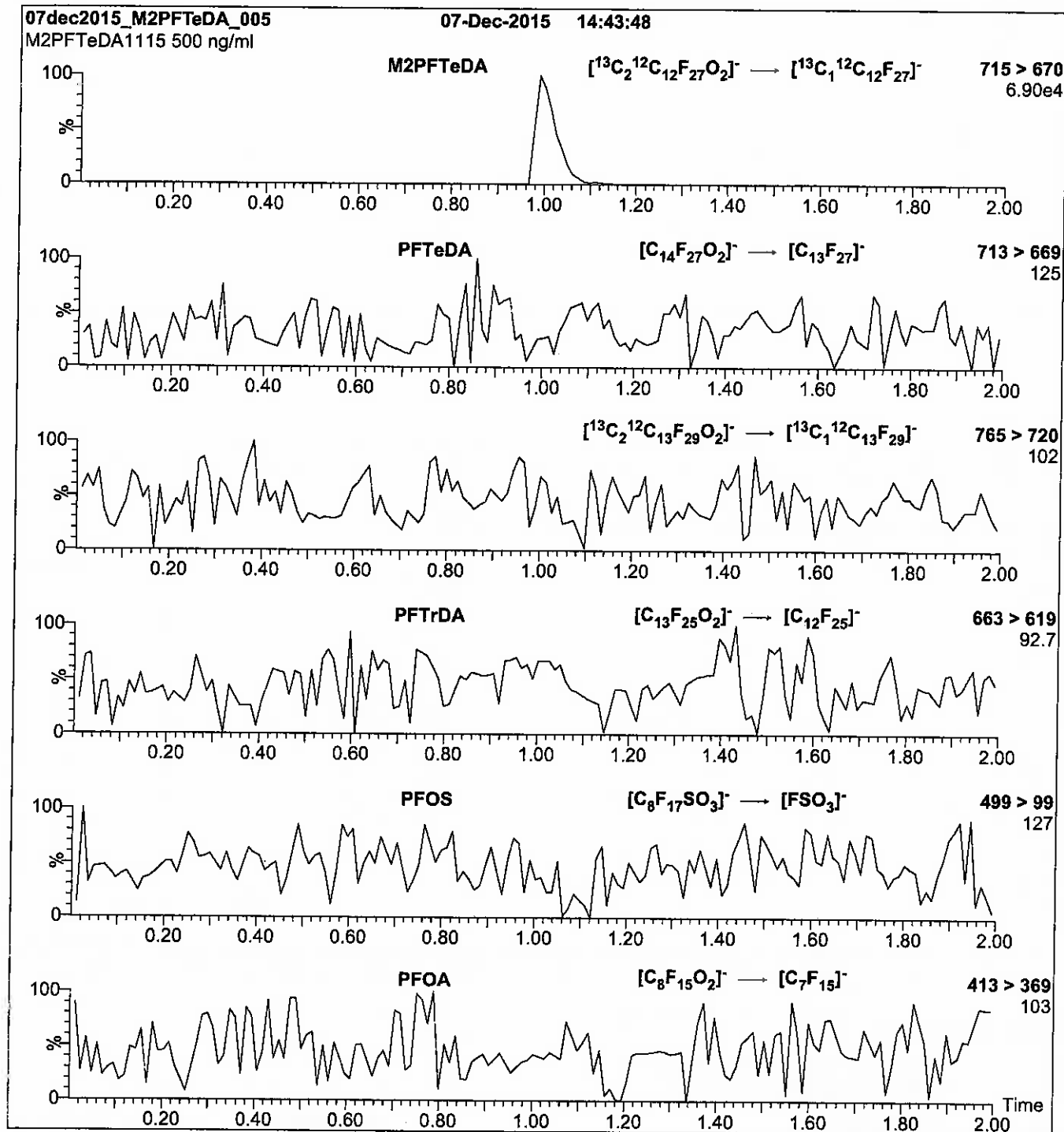
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = $3.28\text{e-}3$
 Collision Energy (eV) = 14

Reagent

LCM4PFHPA_00007

f: SBC 9/22/16

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



WELLINGTON
LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

Scanned 10/14/16 SK

PRODUCT CODE:

M4PFHpA

LOT NUMBER:

M4PFHpA0516

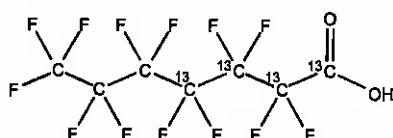
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₄¹²C₃HF₁₃O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

368.03

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99%¹³C

LAST TESTED: (mm/dd/yyyy)

05/27/2016

(1,2,3,4-¹³C₄)

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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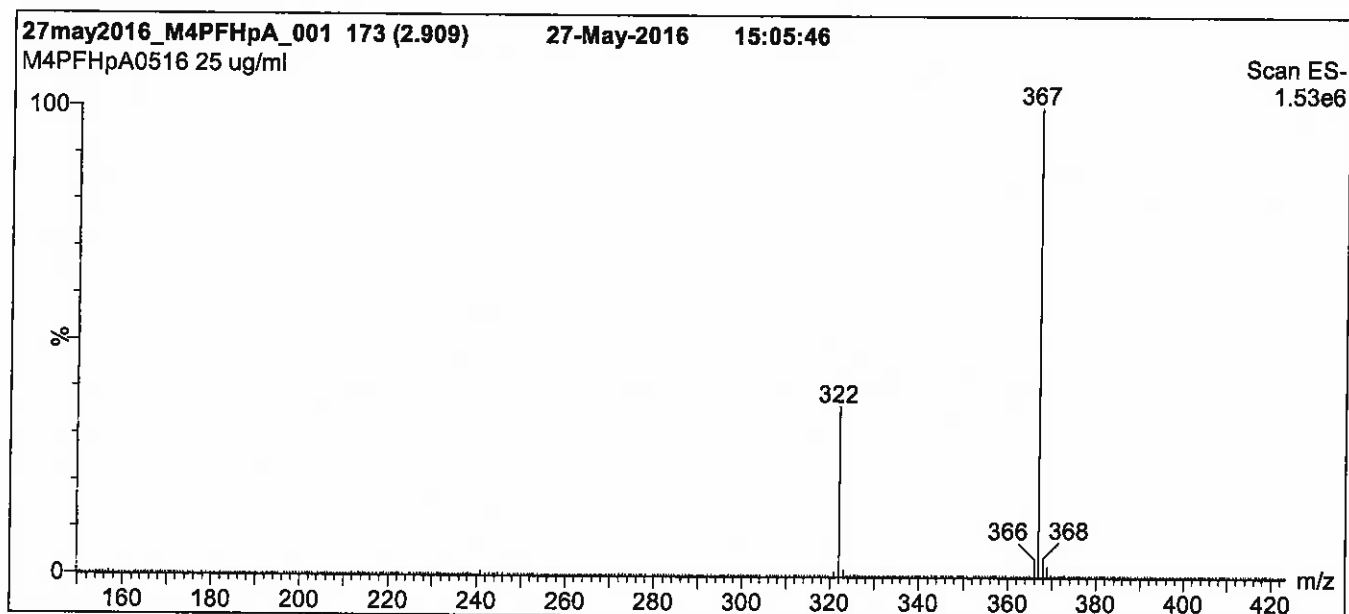
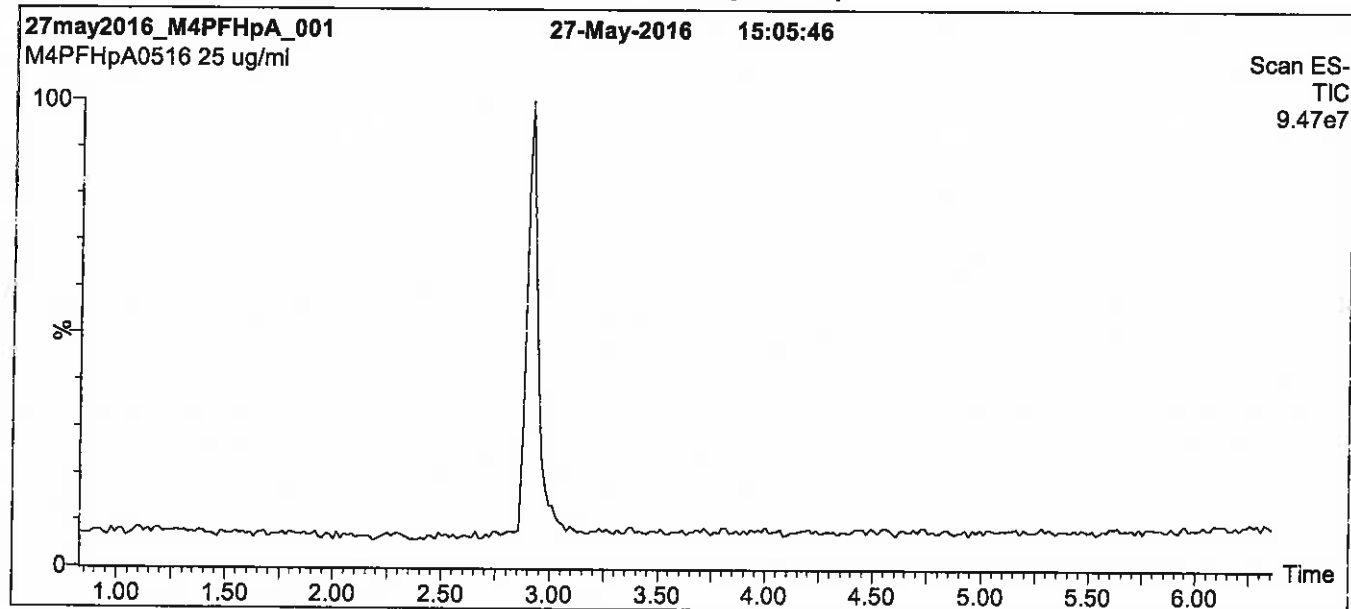
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

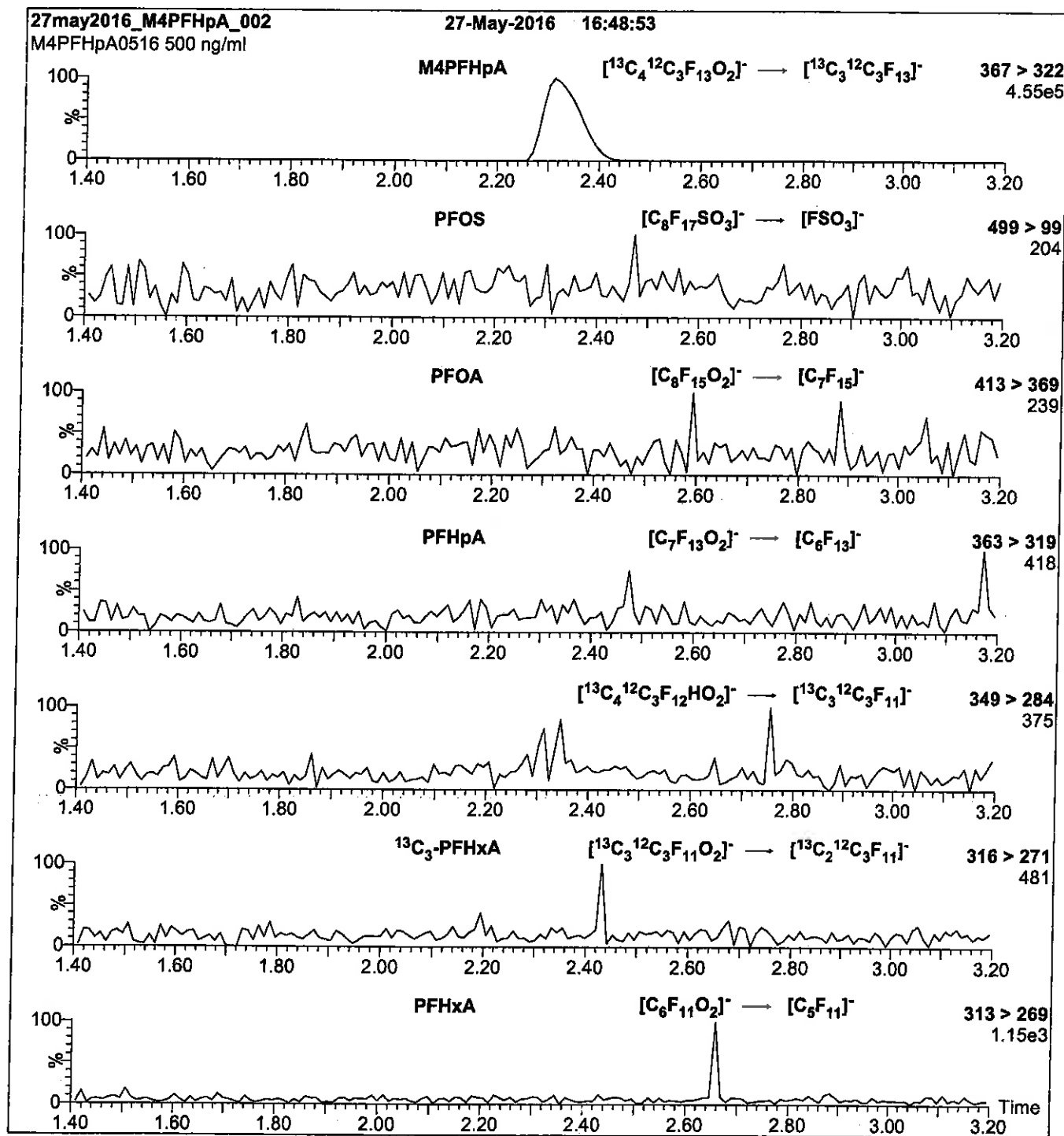
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCM5PFPEA_00008

R: 8BC 9/22/16



739590

ID: LCM5PFPEA_00008

Exp: 05/22/20 Prpt: SAC

¹³C5-Perfluoropentanoic a



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LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

Scanned 10/14/16 LR

PRODUCT CODE:

M5PFPeA

LOT NUMBER:

M5PFPeA0515

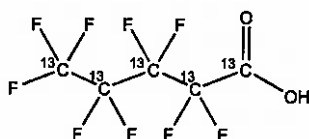
COMPOUND:

Perfluoro-n-[¹³C₅]pentanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₅HF₉O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

269.01

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C
(¹³C₅)

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:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

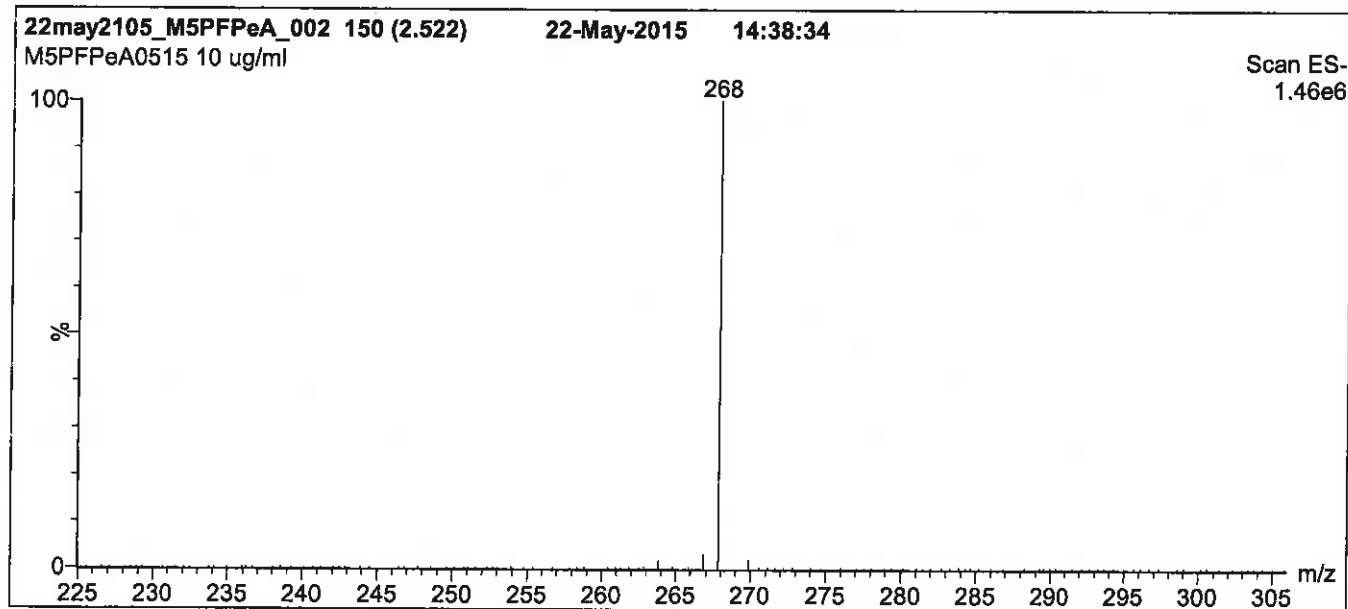
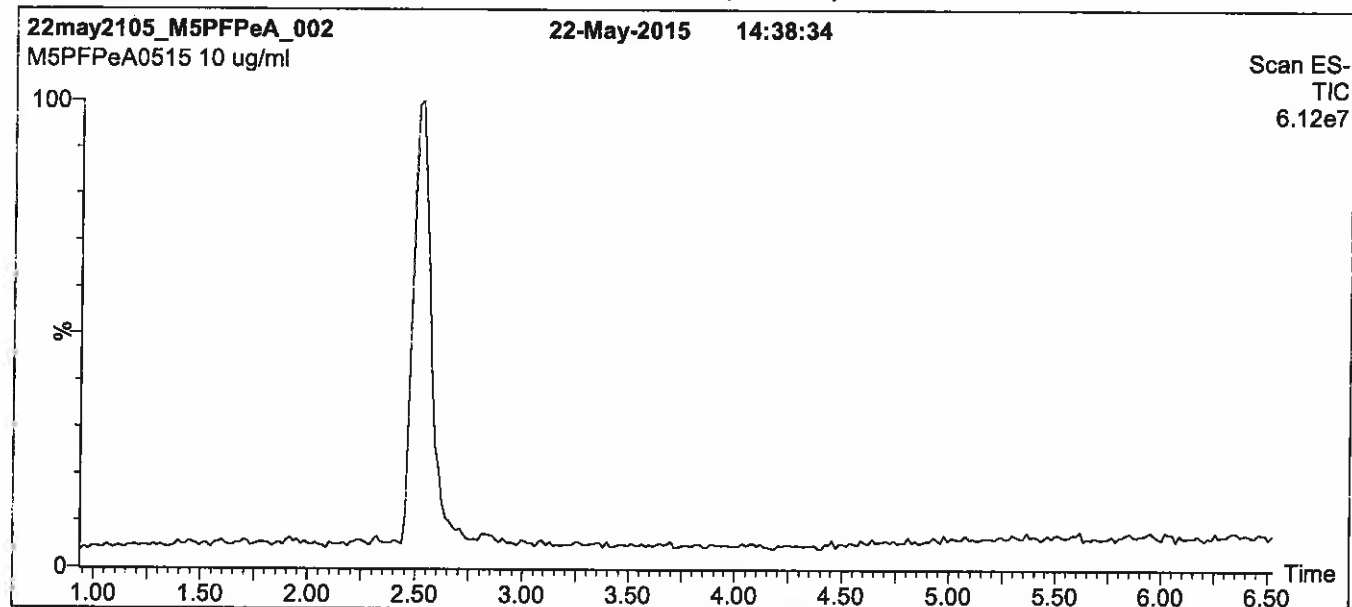
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

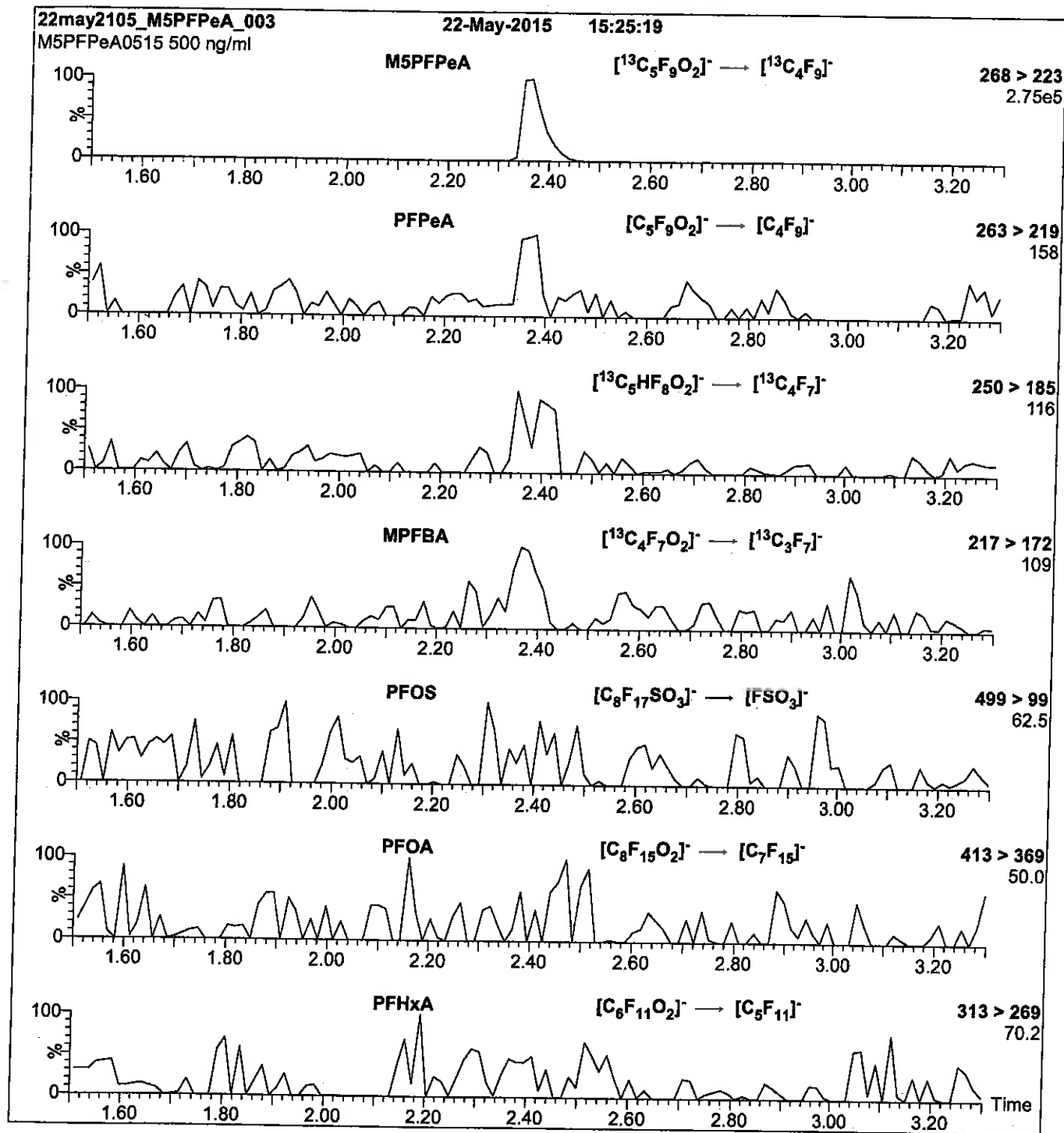
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = $3.35\text{e-}3$
Collision Energy (eV) = 9

Reagent

LCM8FOSA_00011



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION



739615

ID: LCM8FOSA_00011

Exp: 12/22/17 Prod: SBC
13C8-PerfluorooctanesulfoR: SBC 9/22/16
Scanned 10/14/16**PRODUCT CODE:**

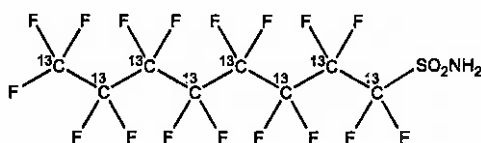
M8FOSA-I

LOT NUMBER:

M8FOSA1215I

COMPOUND:Perfluoro-1-[¹³C₈]octanesulfonamide**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**¹³C₈H₂F₁₇NO₂S**CONCENTRATION:**

50 ± 2.5 µg/ml

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/22/2015

EXPIRY DATE: (mm/dd/yyyy)

12/22/2017

RECOMMENDED STORAGE:

Refrigerate ampoule

MOLECULAR WEIGHT:

507.09

SOLVENT(S):

Isopropanol

ISOTOPIC PURITY:≥99% ¹³C
(¹³C₈)**DOCUMENTATION/ DATA ATTACHED:**

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

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 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

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:

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

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

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

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TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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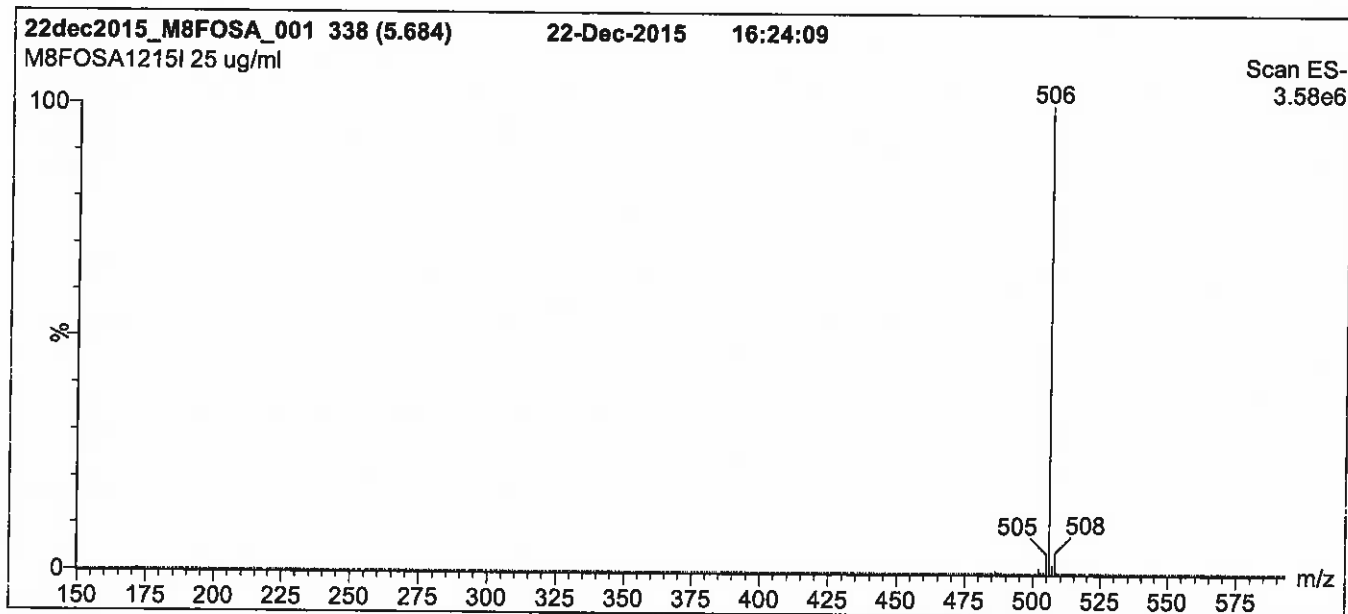
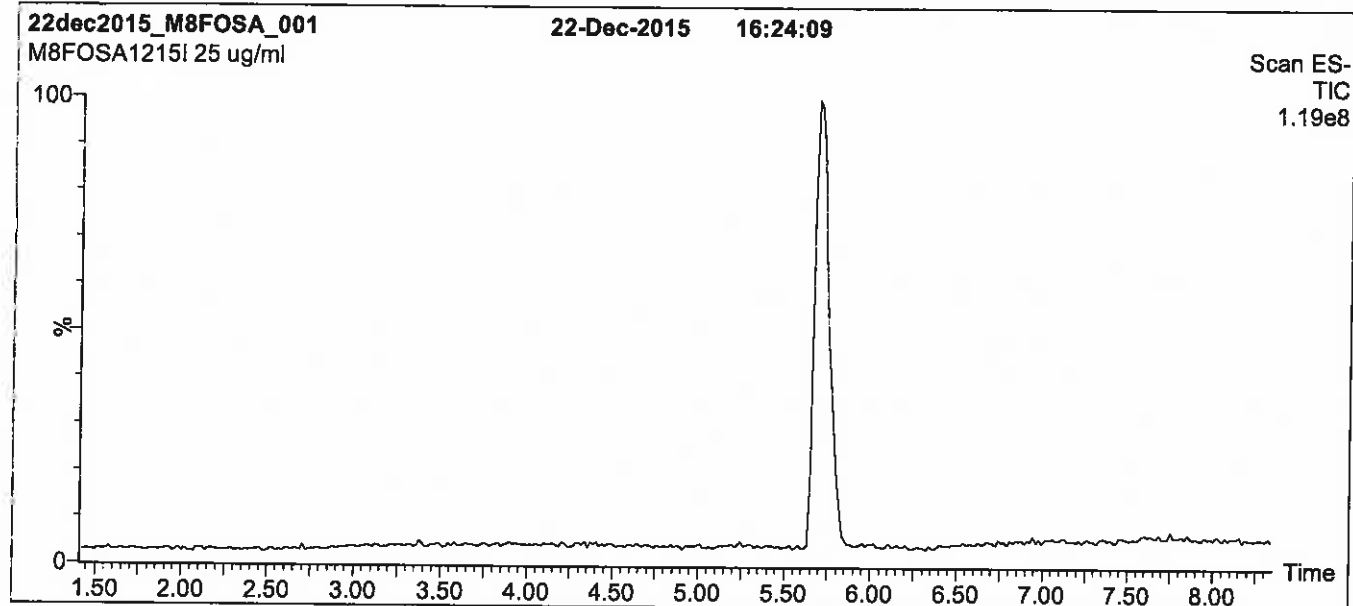
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

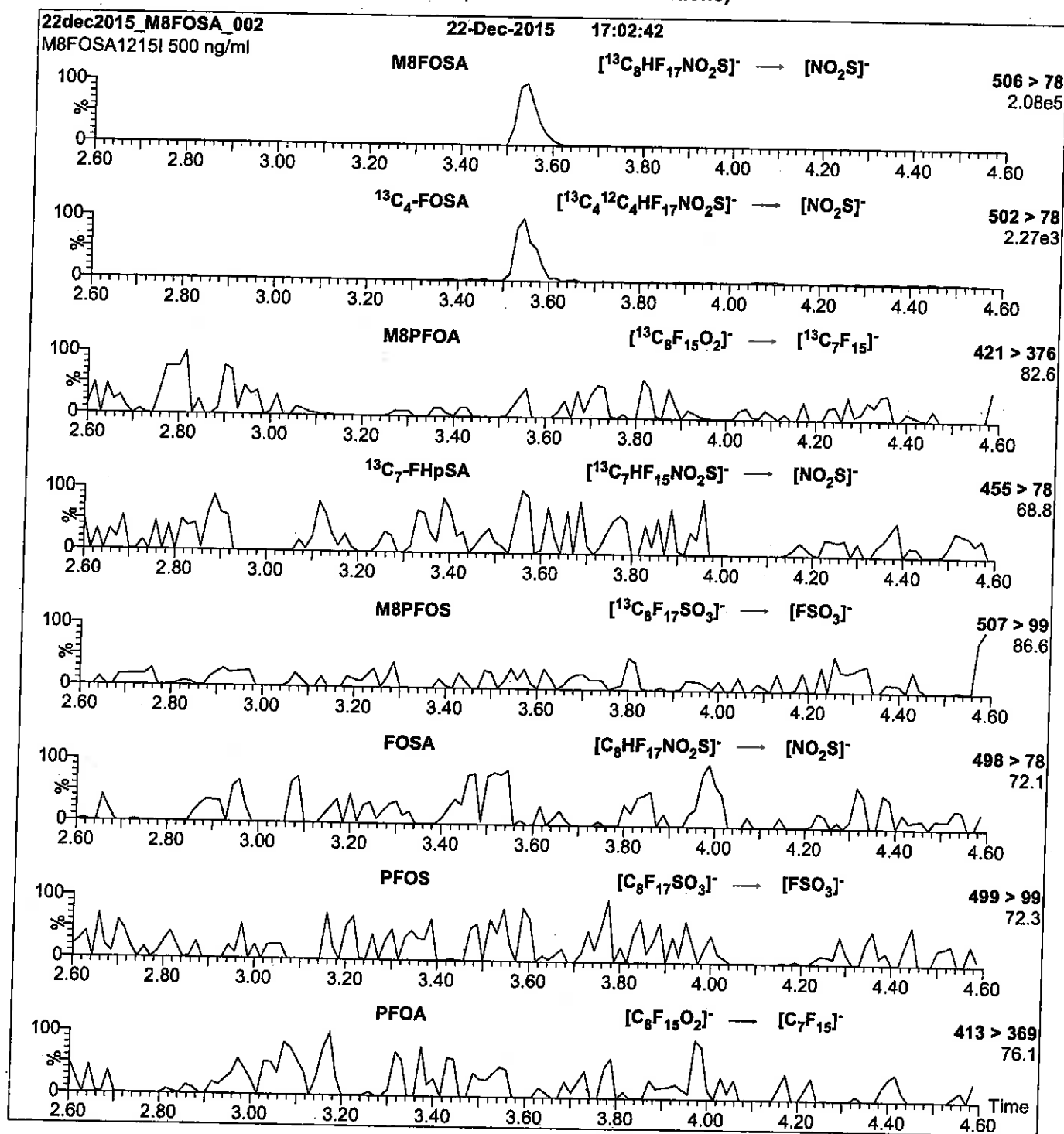
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCMPFBA_00008

R: 8BC 9/22/16



739593

ID: LCMFBA_00008

Exp: 05/24/21 Prod: SEC

13C4-Perfluorobutanoic ac



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16 SP

PRODUCT CODE:

MPFBA

LOT NUMBER:

MPFBA0516

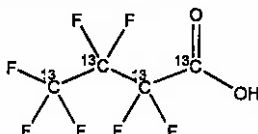
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₄HF₉O₂

MOLECULAR WEIGHT:

218.01

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99%¹³C

LAST TESTED: (mm/dd/yyyy)

05/24/2016

(1,2,3,4-¹³C₄)

EXPIRY DATE: (mm/dd/yyyy)

05/24/2021

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

INTENDED USE:

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

HAZARDS:

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HOMOGENEITY:

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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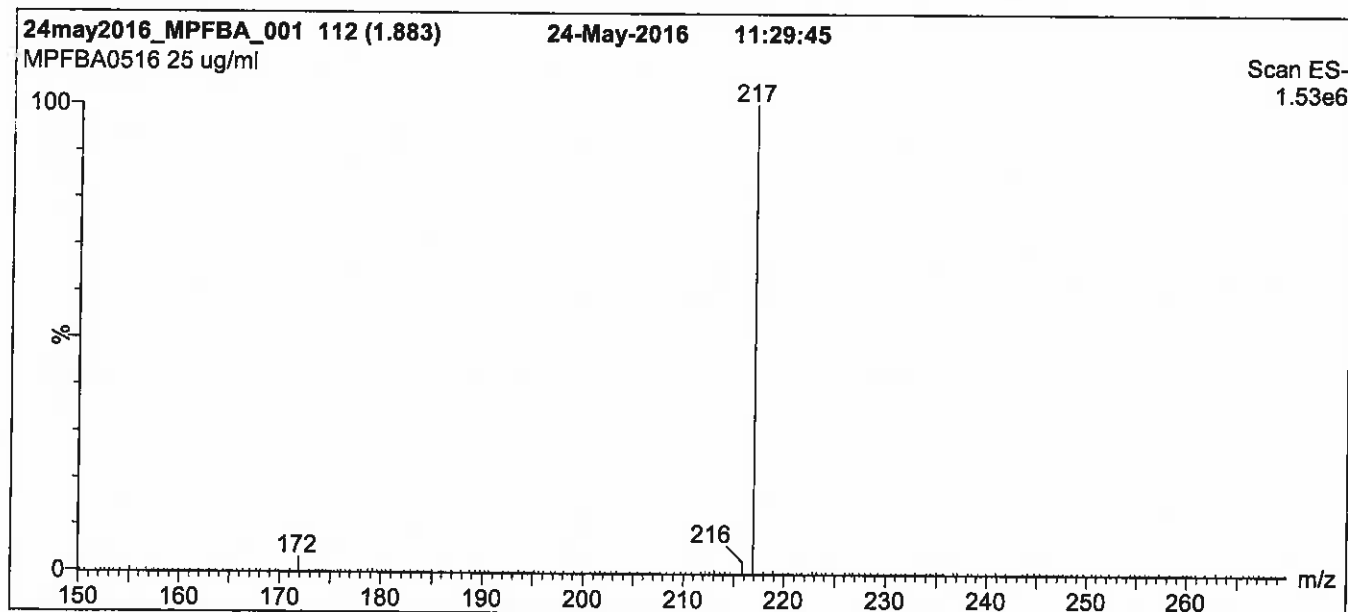
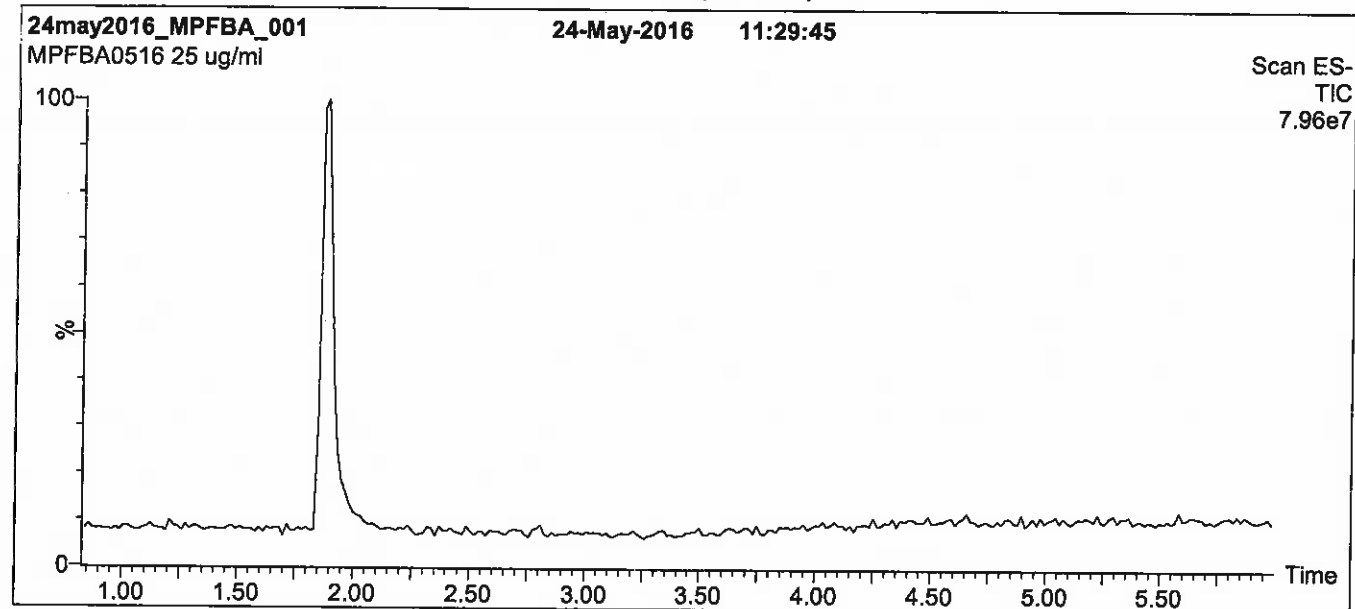
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

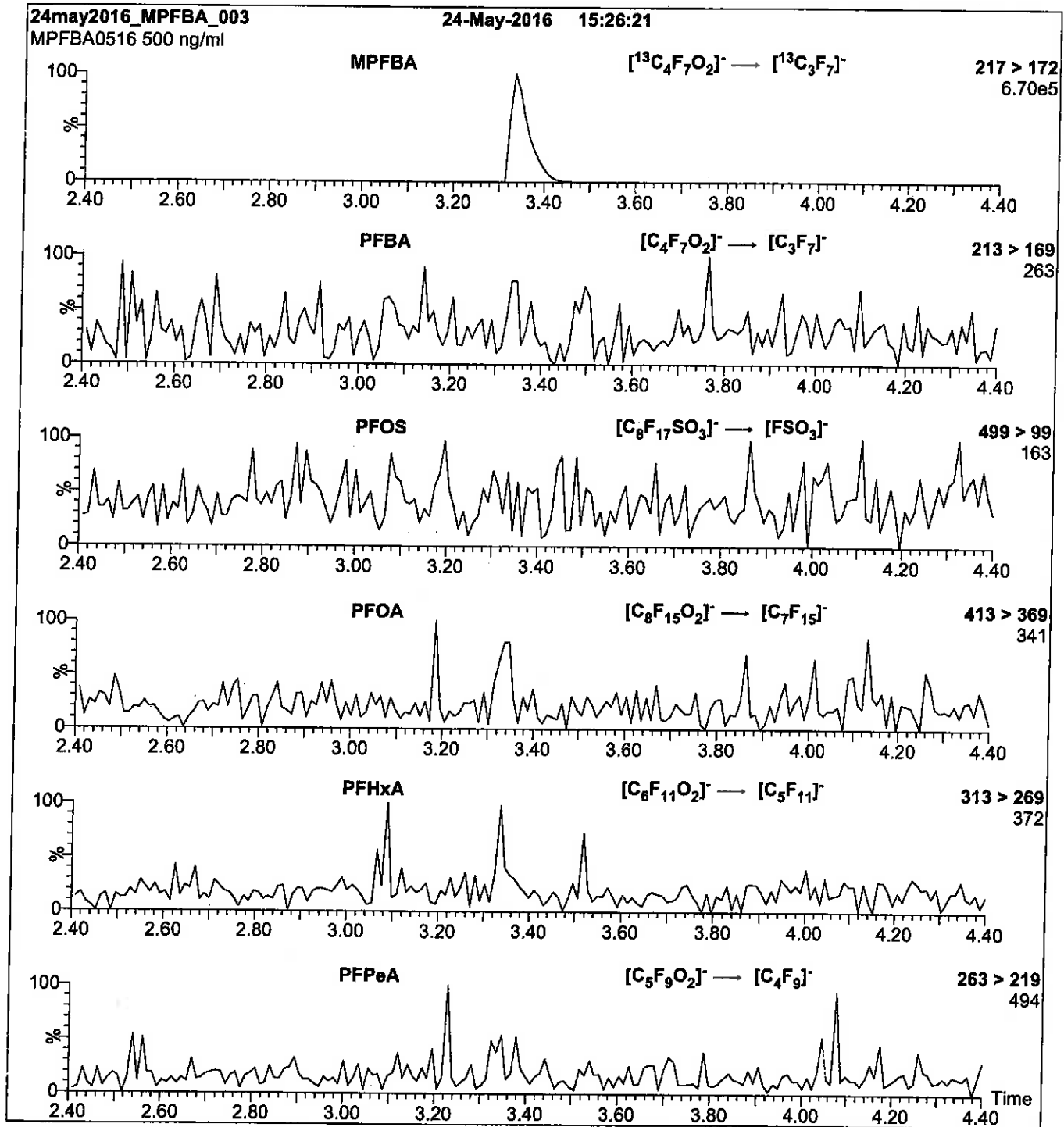
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = $3.50\text{e-}3$
Collision Energy (eV) = 10

Reagent

LCMPFDA_00011



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

CERTIFICATE OF ANALYSIS
DOCUMENTATION

739609
ID: LCMFDA_00011
Exp: 08/19/20 Prep: SBC
13C2-Perfluorodecanoic a

PRODUCT CODE:

MPFDA

LOT NUMBER:

MPFDA0815

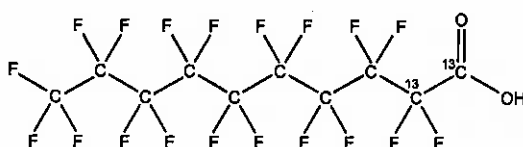
COMPOUND:

Perfluoro-n-[1,2-¹³C₂]decanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₈HF₁₈O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

516.07

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

LAST TESTED: (mm/dd/yyyy)

08/19/2015

(1,2-¹³C₂)

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 ¹³C₁-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 $x_1, x_2, \dots, x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

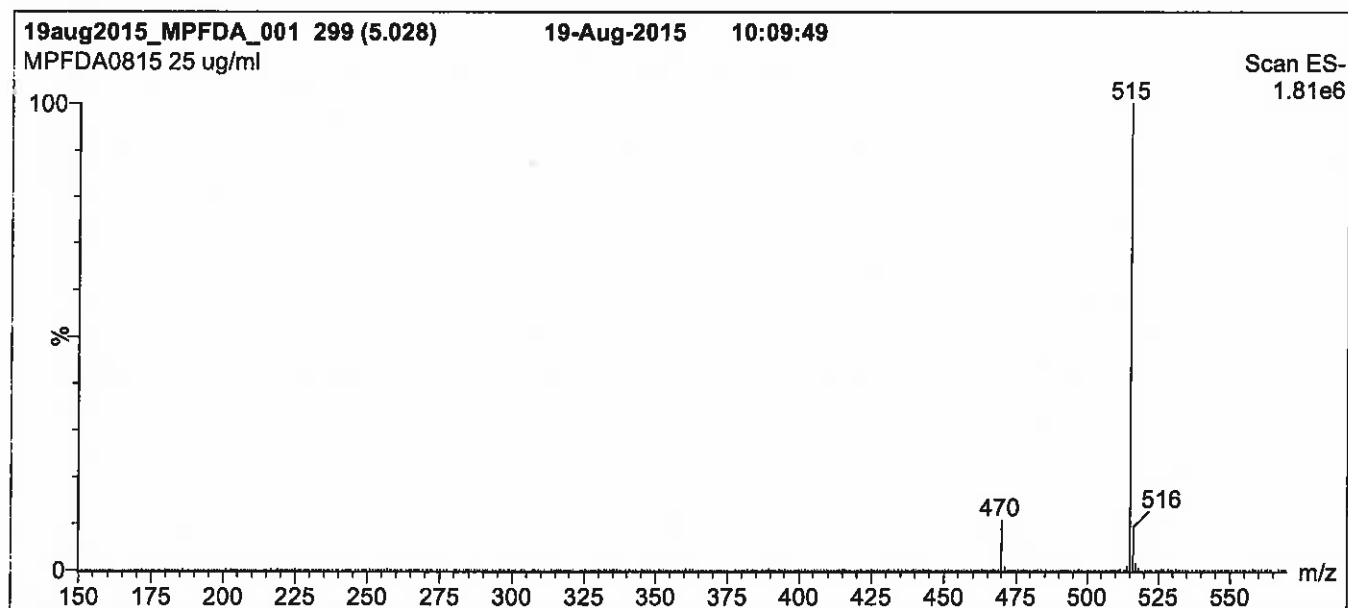
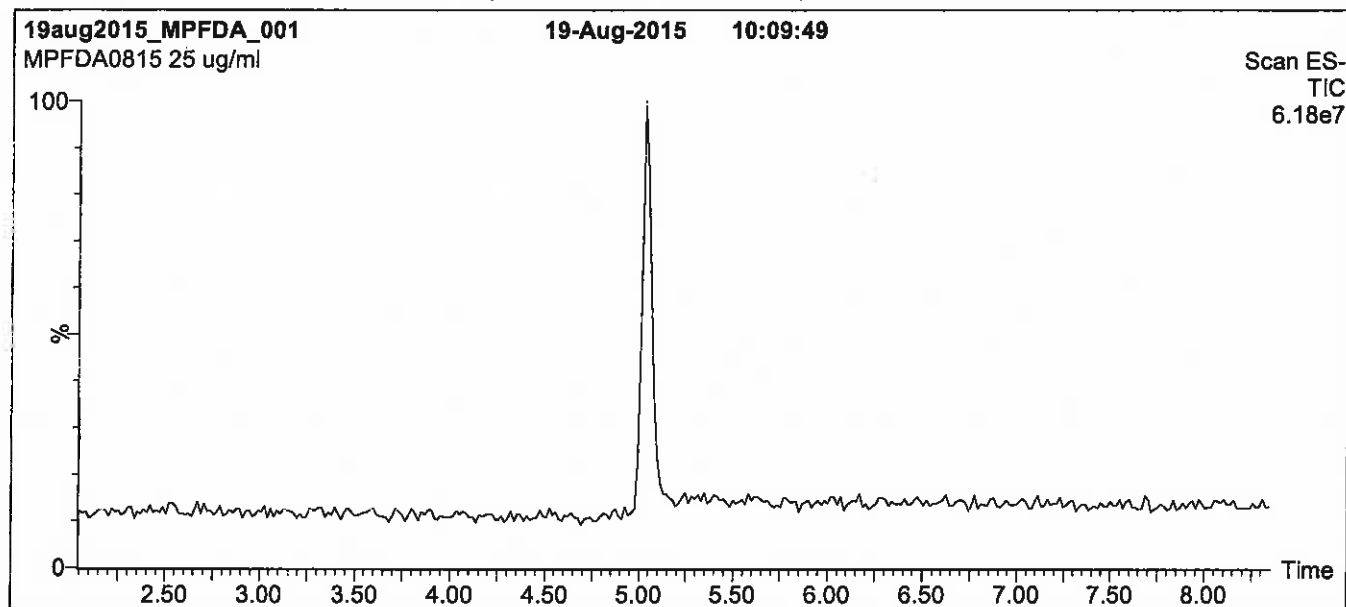
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

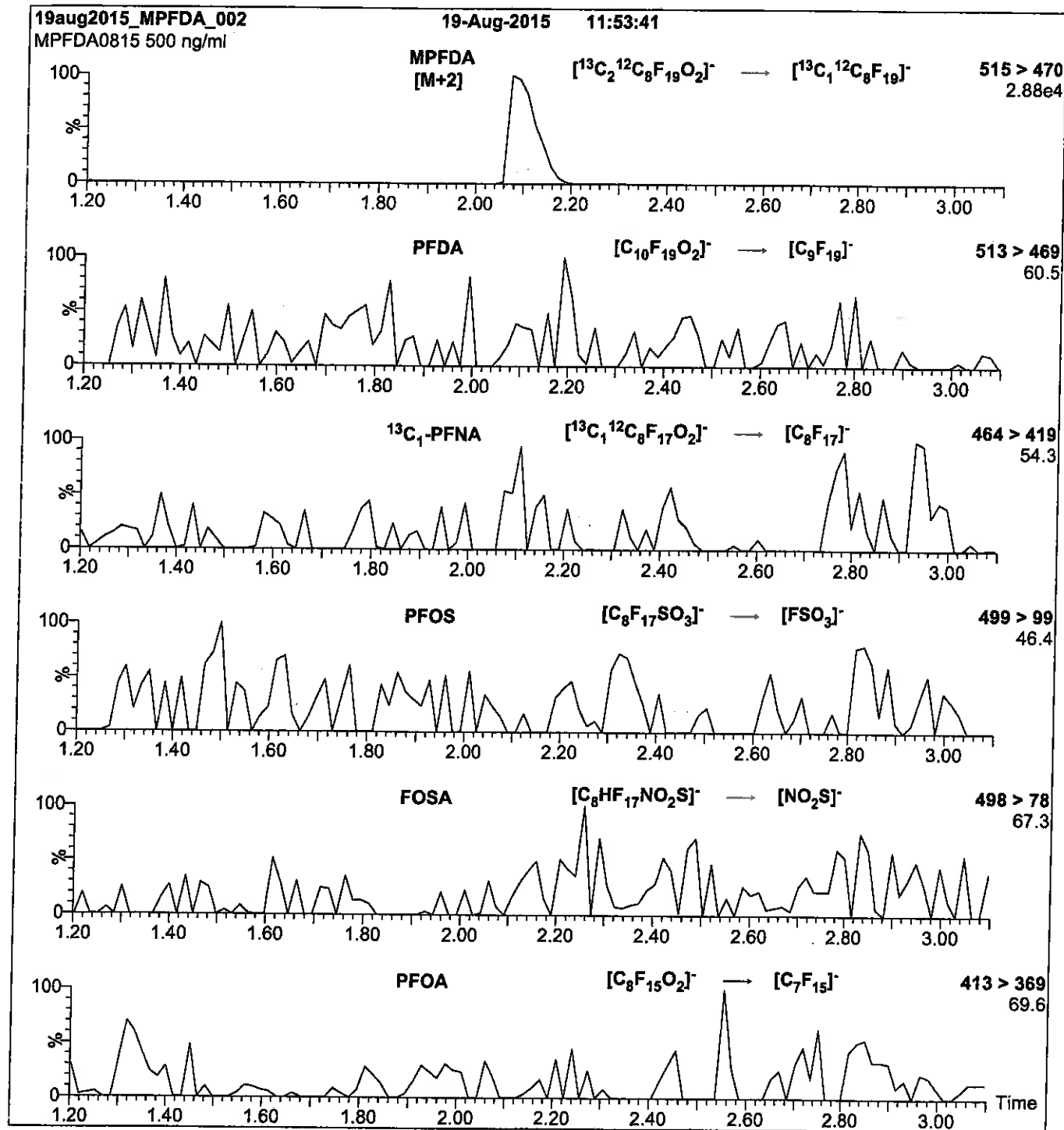
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 13

Reagent

LCMPFD_oA_00008

R: gbe 9/22/16



739598

ID: LCMFDoA_00008

Exp: 04/06/21 Prod: SBC

13C2-Perfluorododecanoic



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CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16 SR

PRODUCT CODE:

MPFDoA

LOT NUMBER:

MPFDoA0416

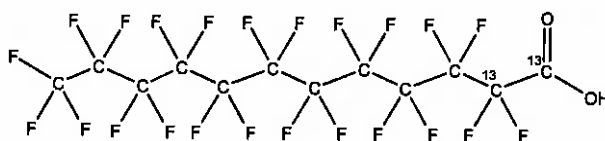
COMPOUND:

Perfluoro-n-[1,2-¹³C₂]dodecanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₁₀HF₂₃O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

616.08

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

(1,2-¹³C₂)

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.

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Certified By:

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Date: 04/15/2016

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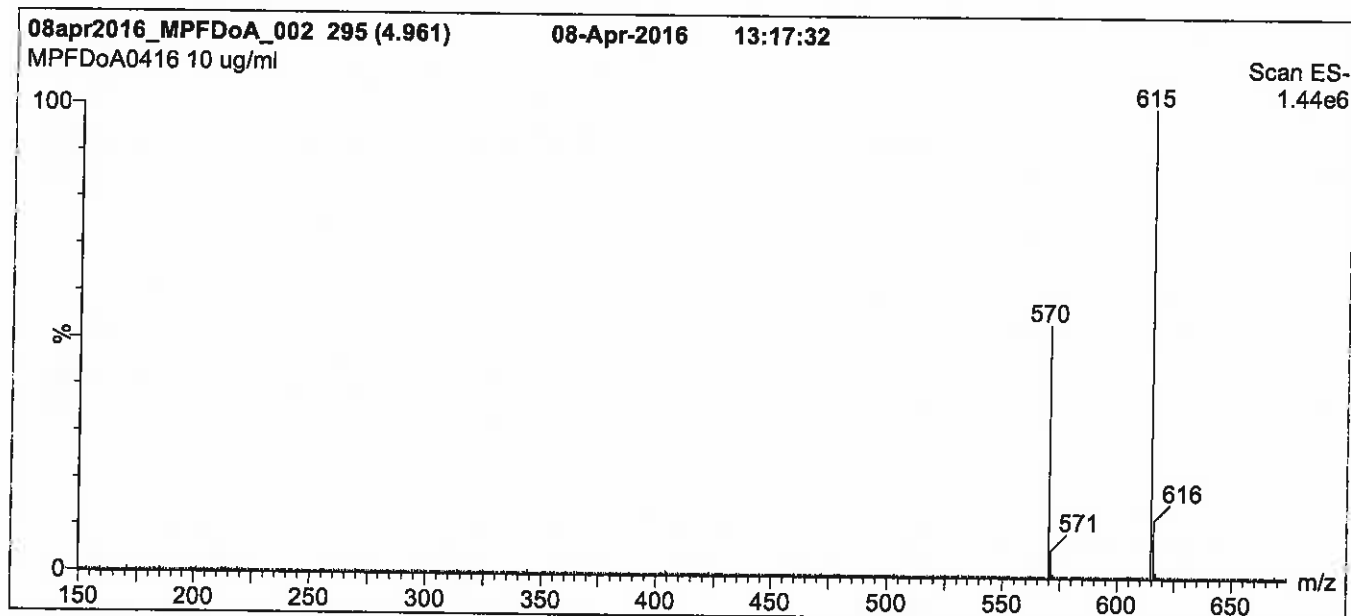
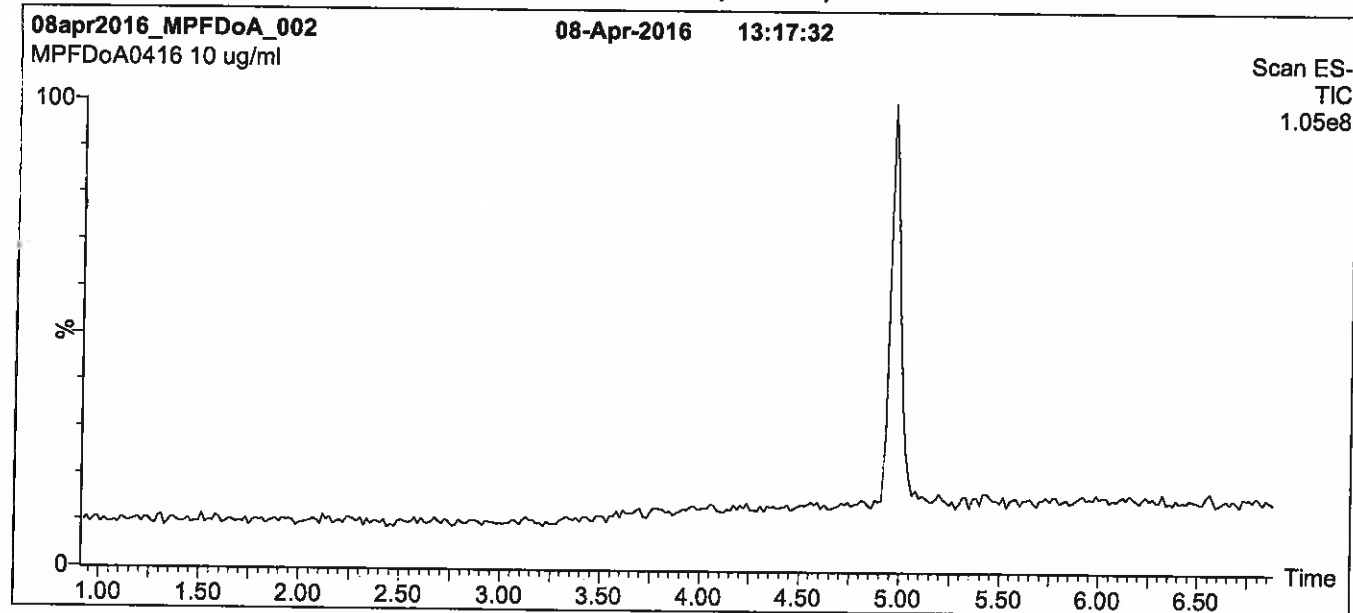
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Figure 1: MPFDoA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

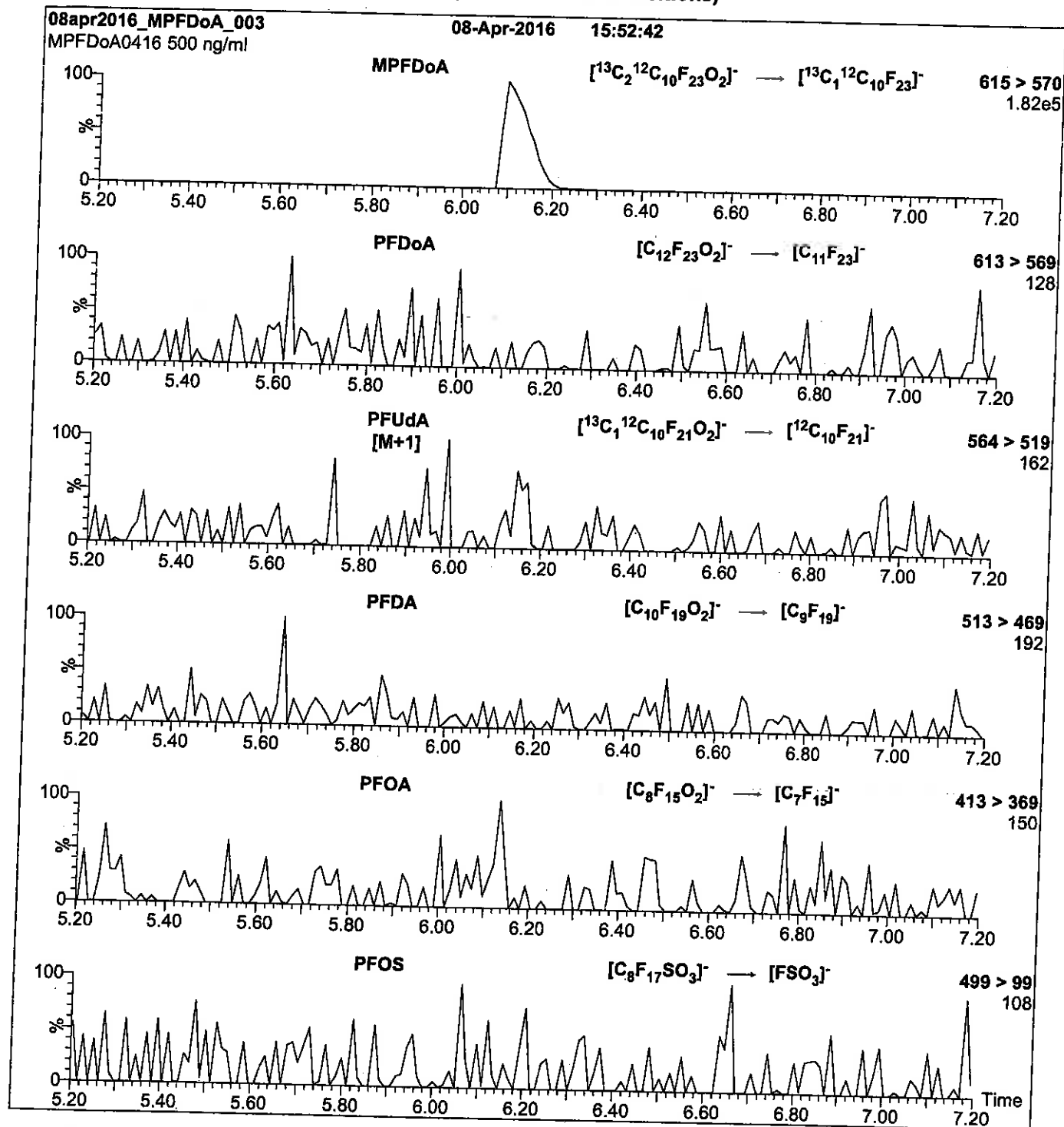
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCMPFHxA_00012

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

739612
ID: LCMFHX_A_00012
Exp: 04/08/21 Prep: SBC
13C2-Perfluorohexanoic ac



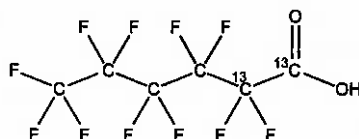
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFHxA0416

STRUCTURE: **CAS #:** Not available



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

MOLECULAR WEIGHT: 316.04
SOLVENT(S): Methanol
Water (<1%)
ISOTOPIC PURITY: ≥99%¹³C
(1,2-¹³C₂)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/08/2016
EXPIRY DATE: (mm/dd/yyyy) 04/08/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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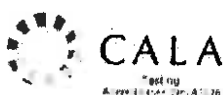
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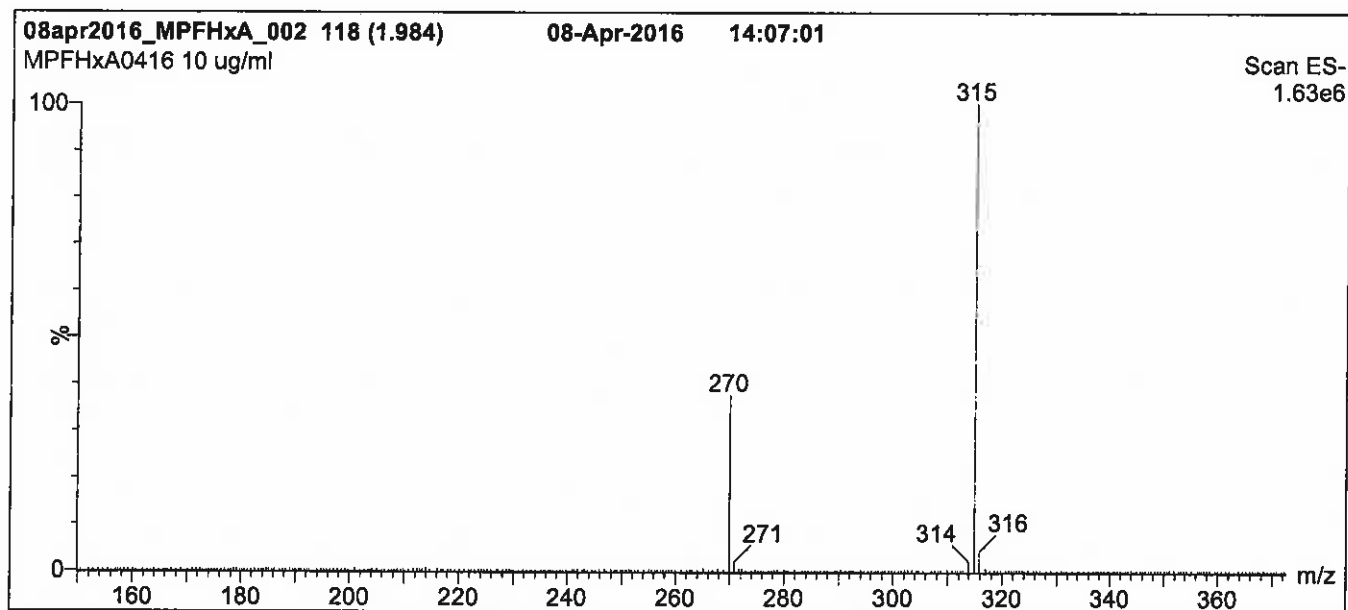
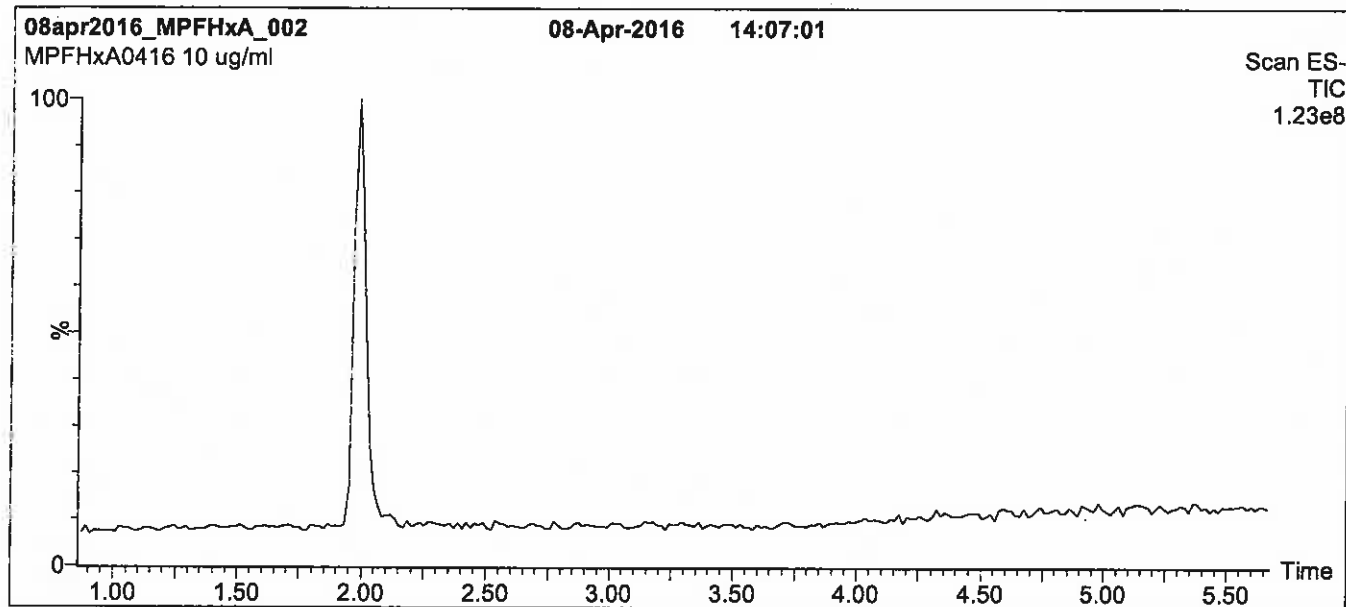
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Figure 1: MPFHxA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

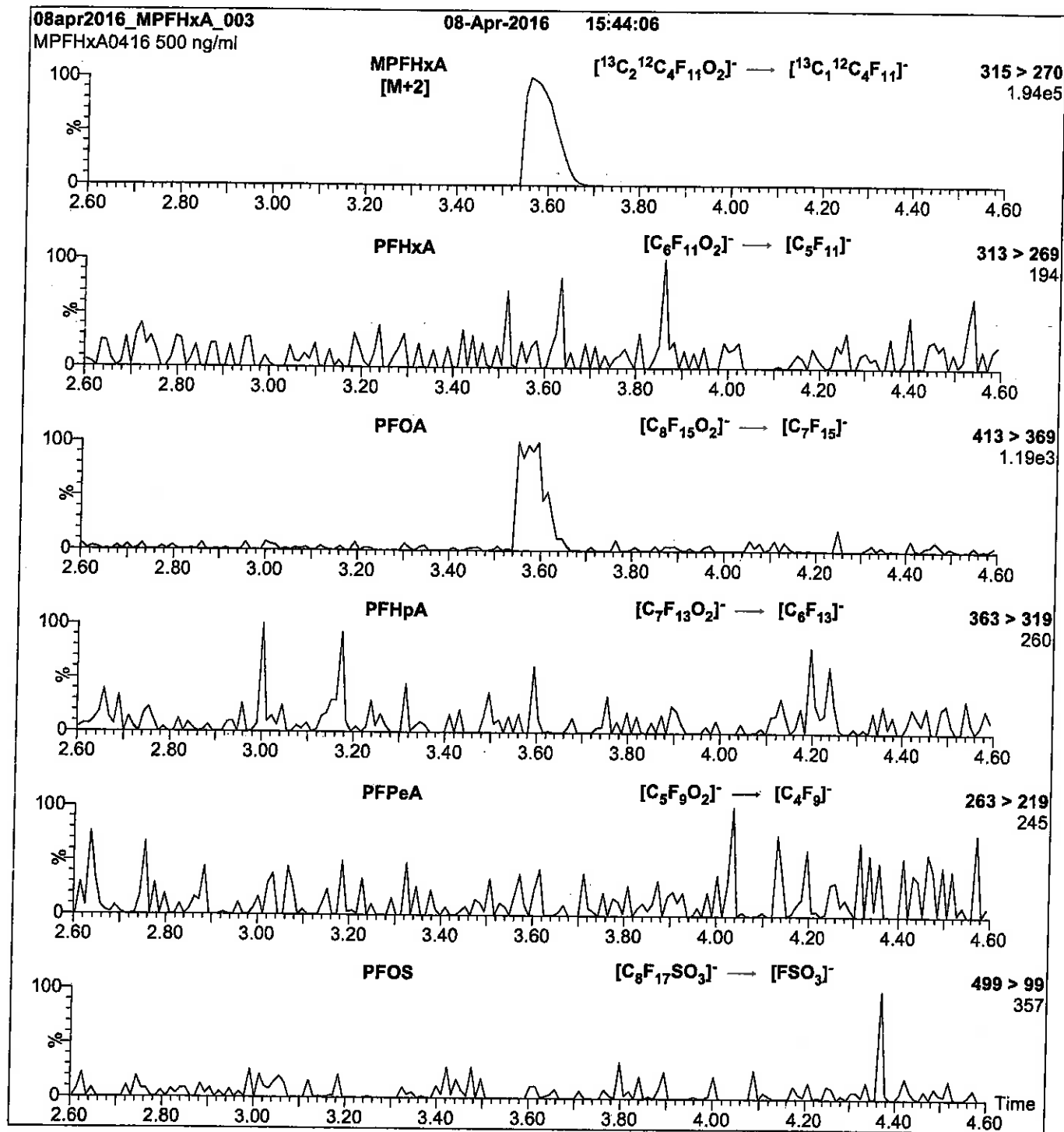
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCMPFHxS_00008

f: 8BC 9/22/16



739601

ID: LCMPFHxS_00008

Exp: 10/23/20 Prod: SBC

18O2-Perfluorohexanesulfo



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CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16 SK

PRODUCT CODE:

MPFHxS

LOT NUMBER:

MPFHxS1015

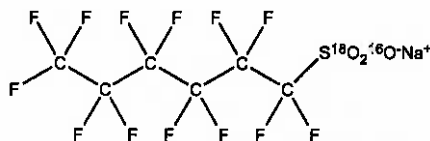
COMPOUND:

Sodium perfluoro-1-hexane[¹⁸O₂]sulfonate

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

C₆F₁₃S¹⁸O₂¹⁶ONa

MOLECULAR WEIGHT:

426.10

CONCENTRATION:

50.0 ± 2.5 µg/ml (Na salt)

SOLVENT(S):

Methanol

47.3 ± 2.4 µg/ml (MPFHxS anion)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

>94% (¹⁸O₂)

LAST TESTED: (mm/dd/yyyy)

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

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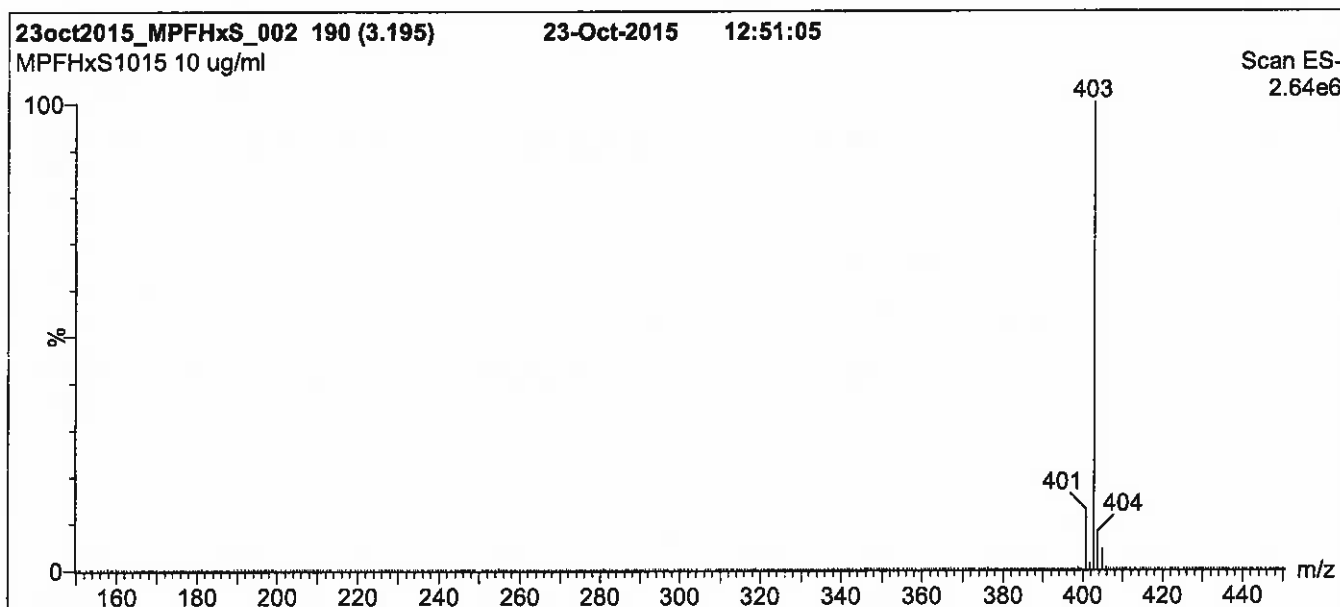
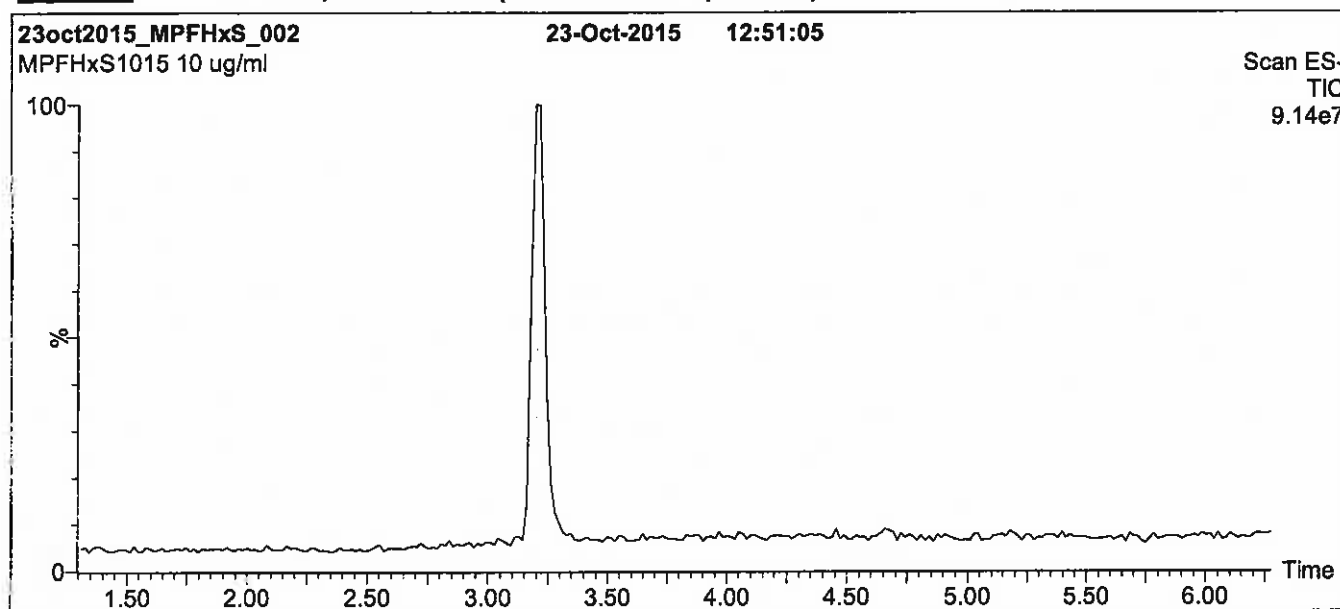
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

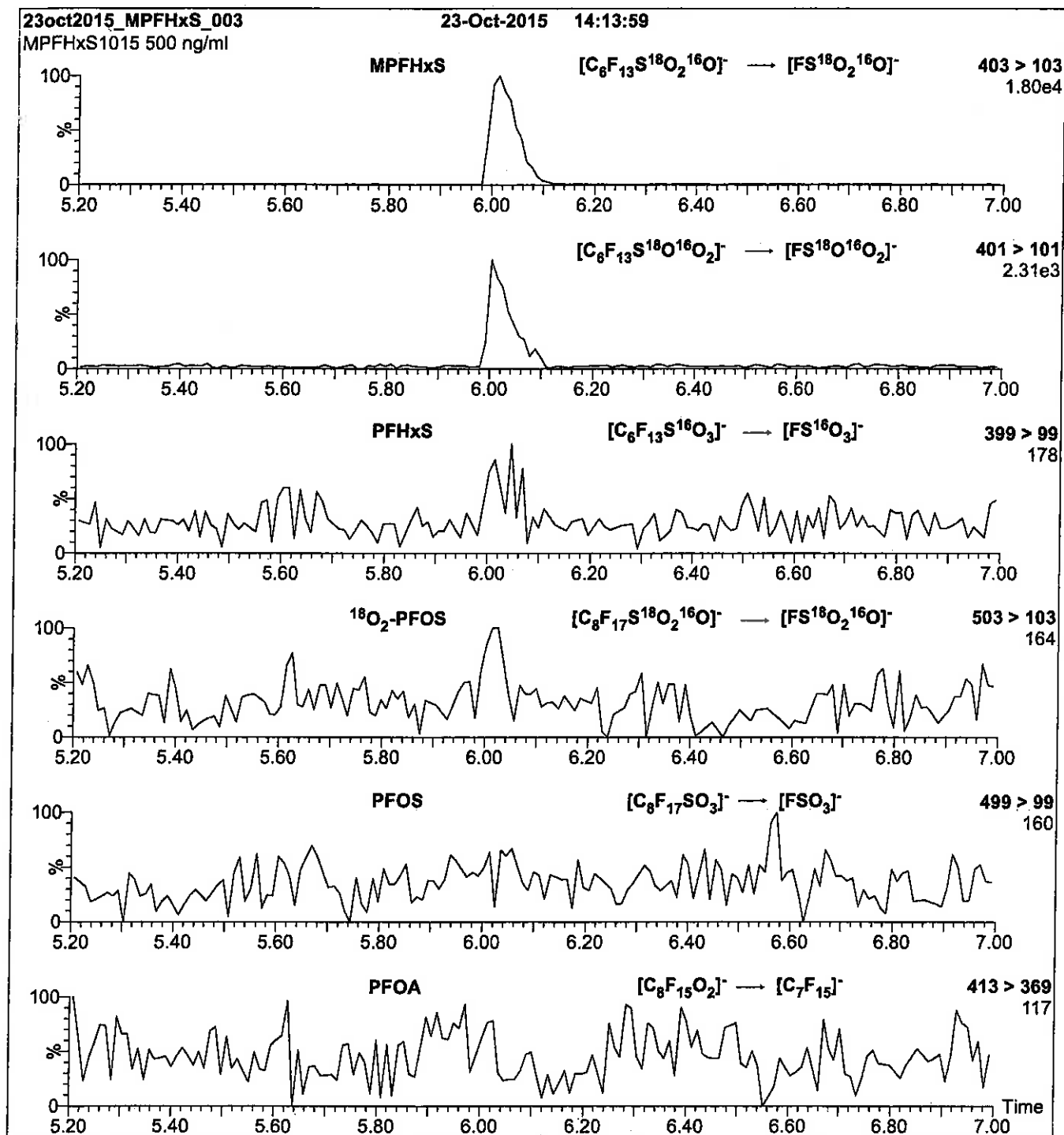
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFNA_00008

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



739637
ID: LCM:PFNA_00008
Exp: 04/13/19 Prod: SBC
13C5-Perfluorononanoic acid



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFNA

LOT NUMBER:

MPFNA0414

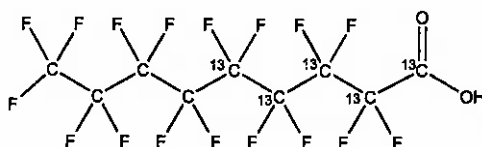
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₅¹²C₄HF₁₇O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

469.04

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99%¹³C

LAST TESTED: (mm/dd/yyyy)

04/13/2014

EXPIRY DATE: (mm/dd/yyyy)

04/13/2019

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

(1,2,3,4,5-¹³C₅)

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 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:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

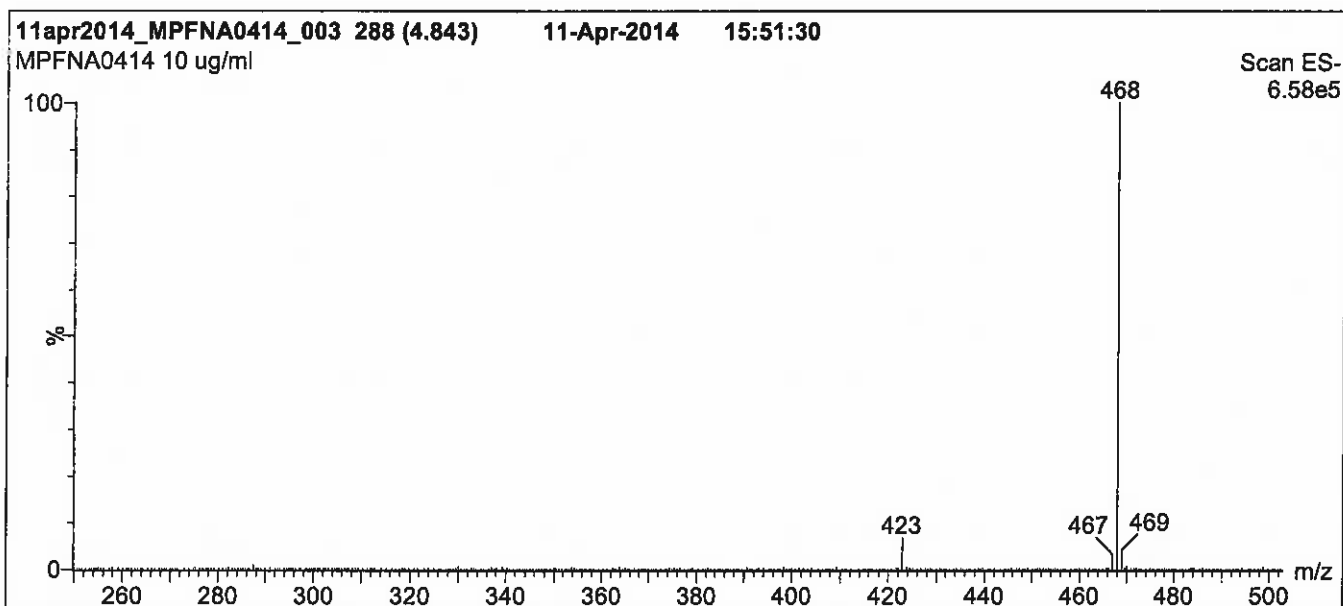
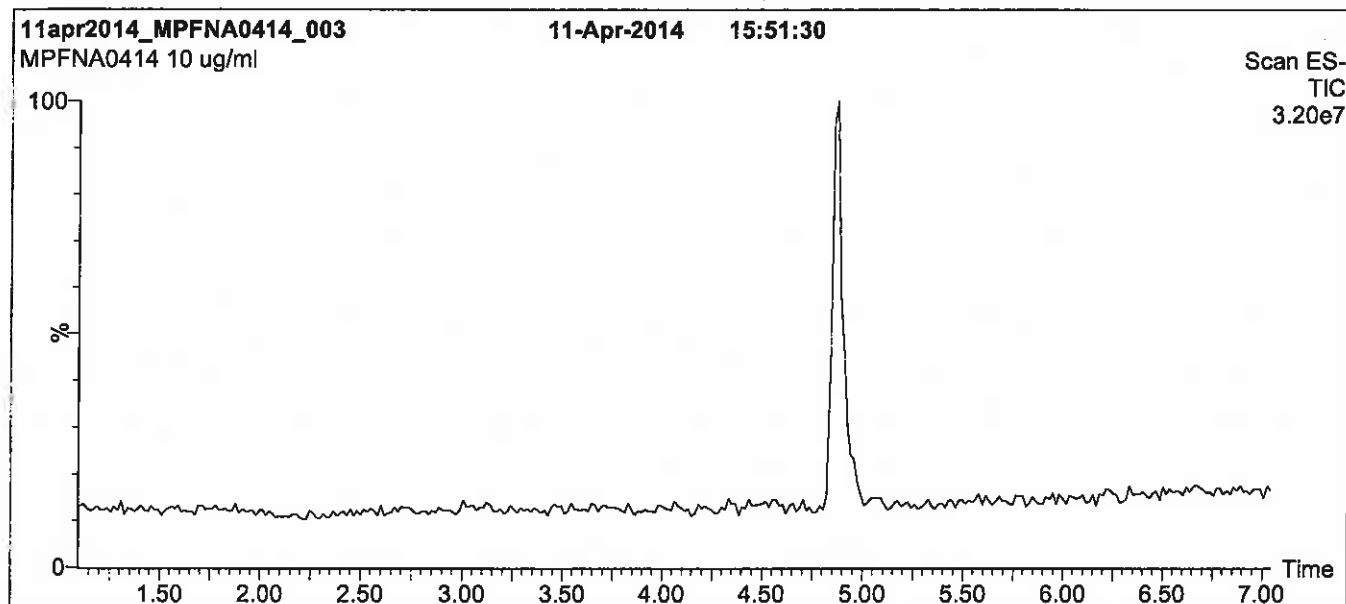
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

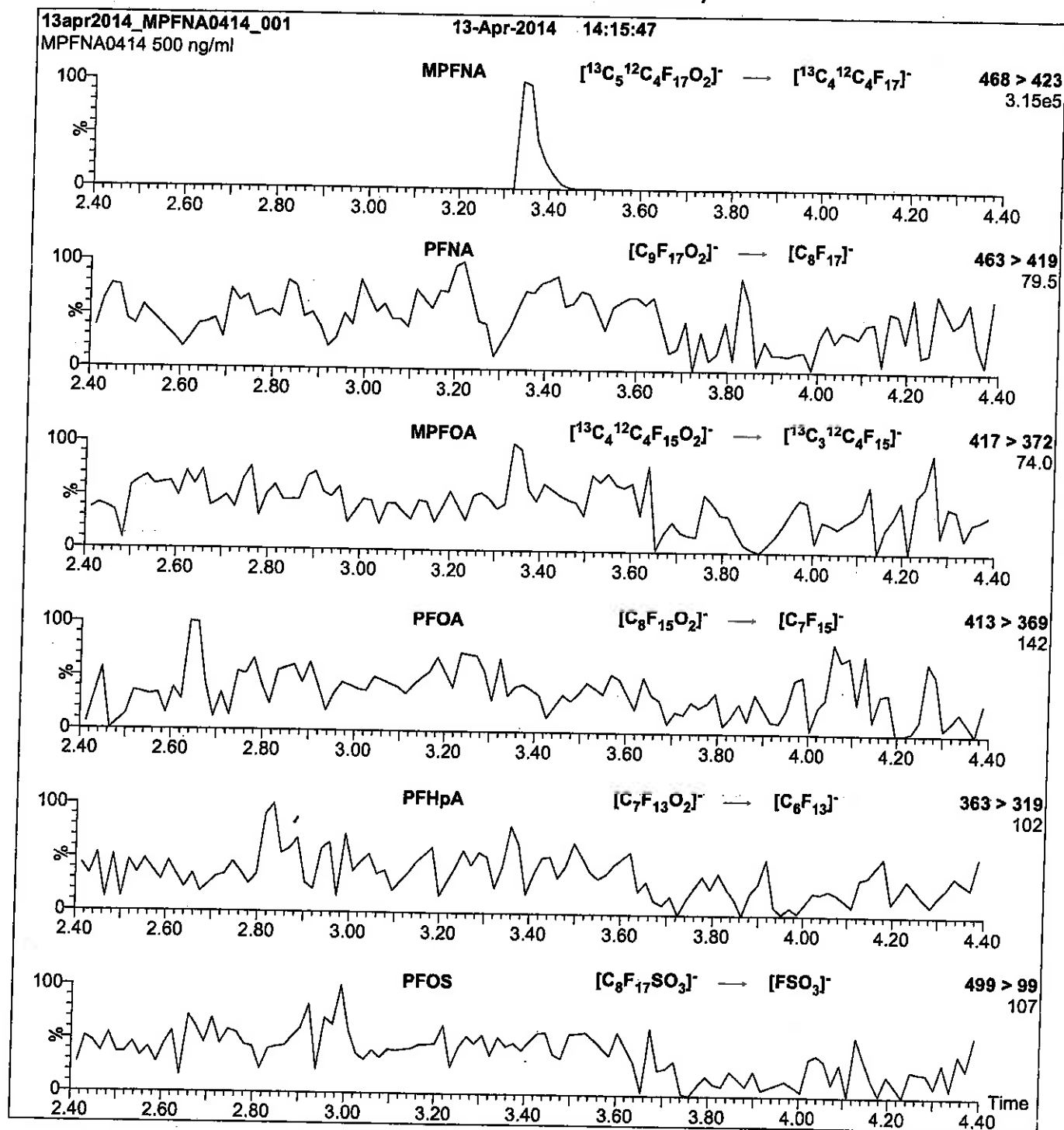
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCMPFOA_00012

R: SBC 9/22/16



738683

ID: LCMFOA_00012

Exp: 01/22/21 Prod: SBC
13C4-Perfluorooctanoic ac



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFOA

LOT NUMBER:

MPFOA0116

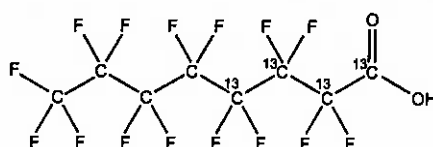
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₄¹²C₄HF₁₅O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

418.04

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

LAST TESTED: (mm/dd/yyyy)

01/22/2016

(1,2,3,4-¹³C₄)

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.
- 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

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:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

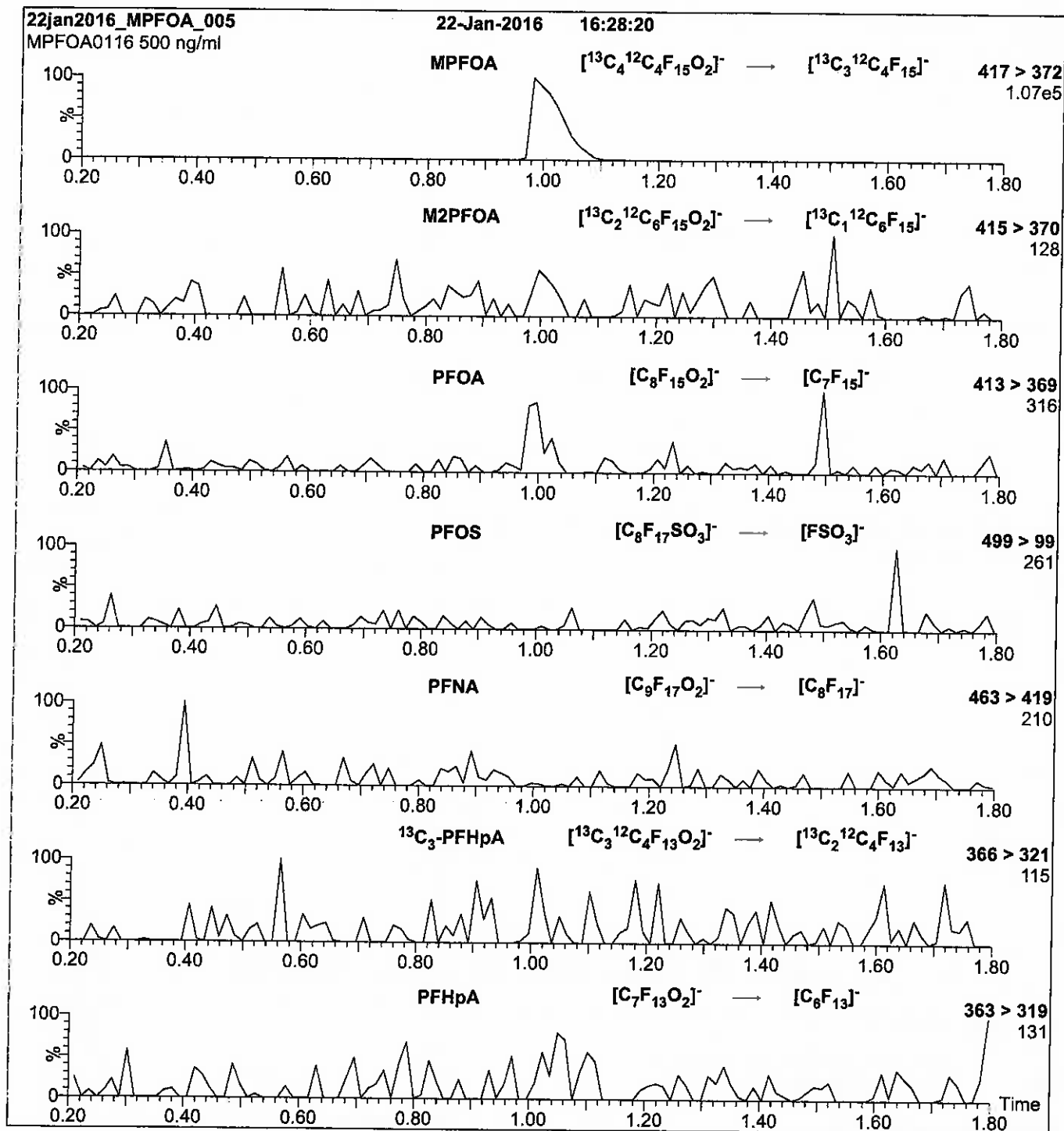
QUALITY MANAGEMENT:

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



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



Conditions for Figure 2:

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

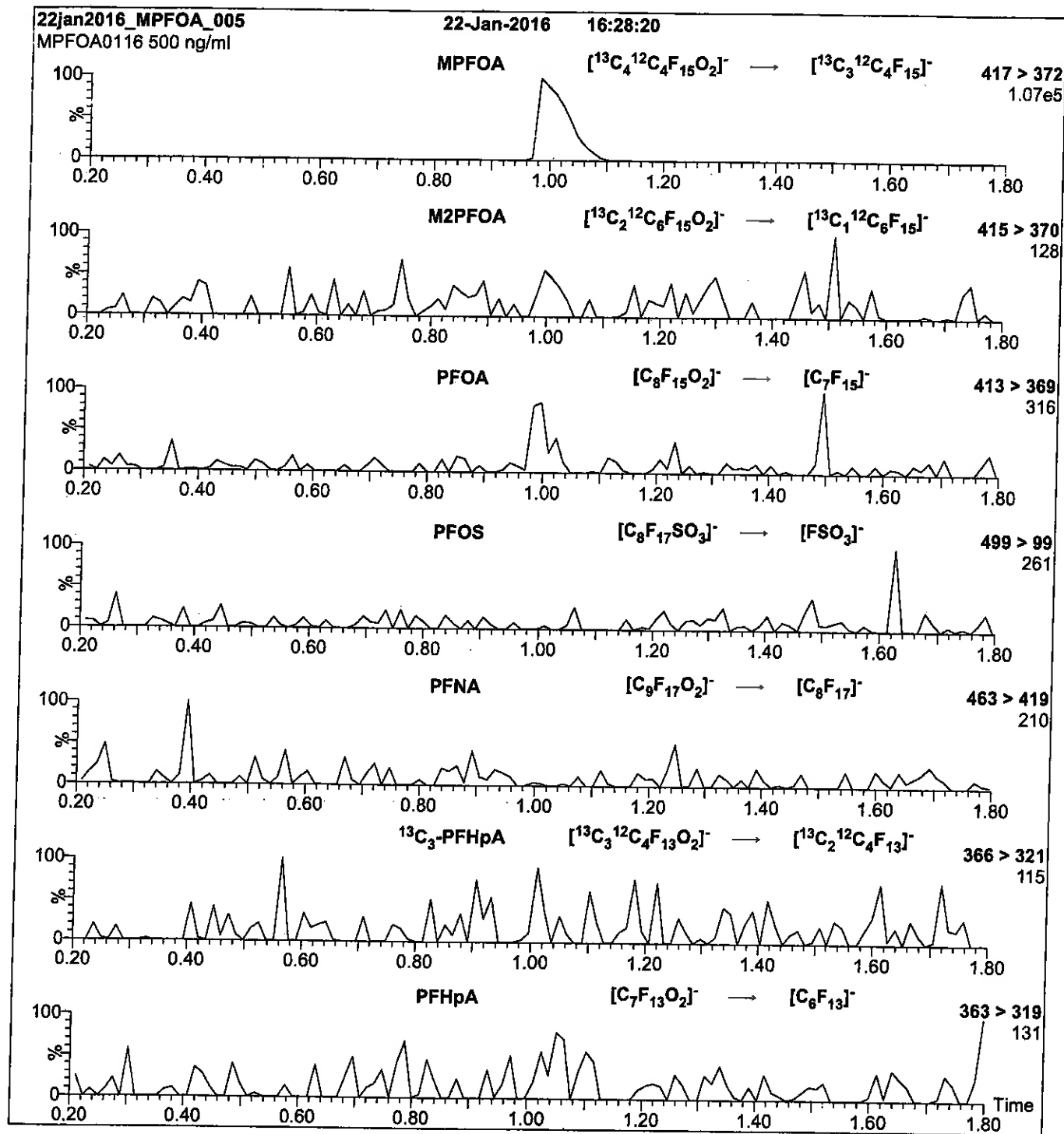
Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

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

MS Parameters

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

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

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

MS Parameters

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

Reagent

LCMPFOS_00017

R: 9/9/16 802

728309
ID: LCMFOS_00017
Exp: 08/03/21 Prod: SBC
13C4-Perfluorooctanesulfonate

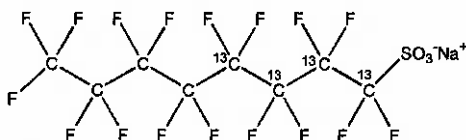


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0816
COMPOUND: Sodium perfluoro-1-[1,2,3,4-¹³C₄]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	¹³ C ₄ ¹² C ₄ F ₁₇ SO ₃ Na	MOLECULAR WEIGHT:	526.08
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	SOLVENT(S):	Methanol
CHEMICAL PURITY:	>98%	ISOTOPIC PURITY:	≥99% ¹³ C (1,2,3,4- ¹³ C ₄)
LAST TESTED: (mm/dd/yyyy)	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-[1,2,3-¹³C₃]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 $x_1, x_2, \dots, x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

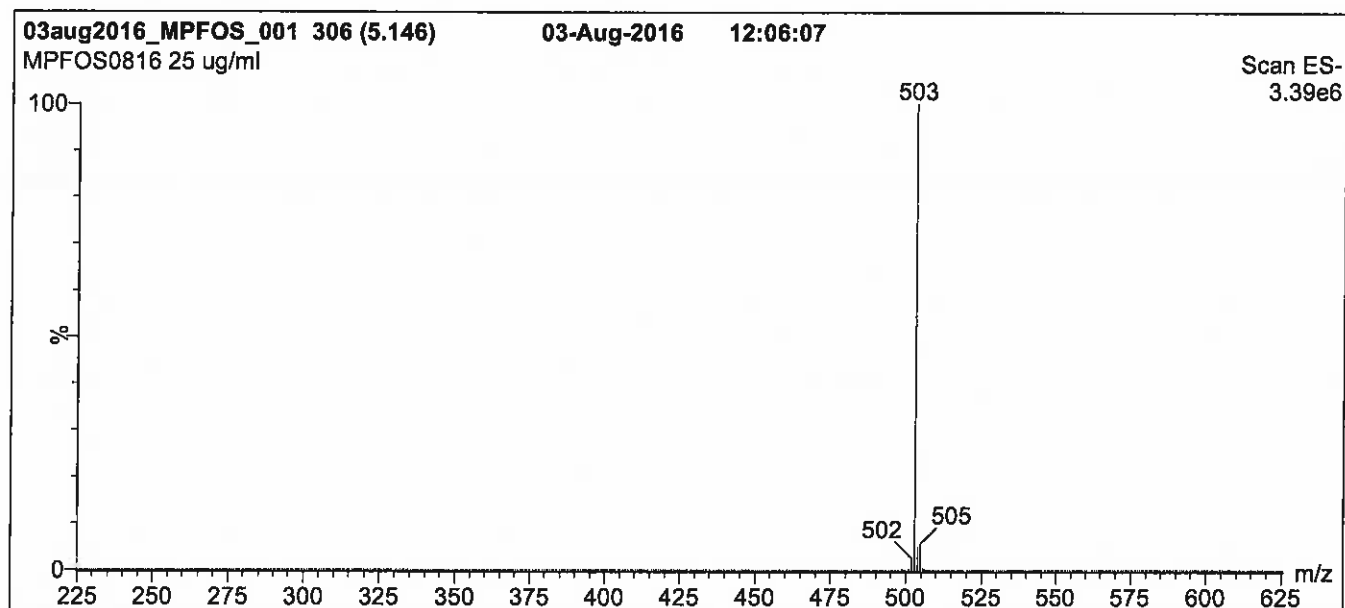
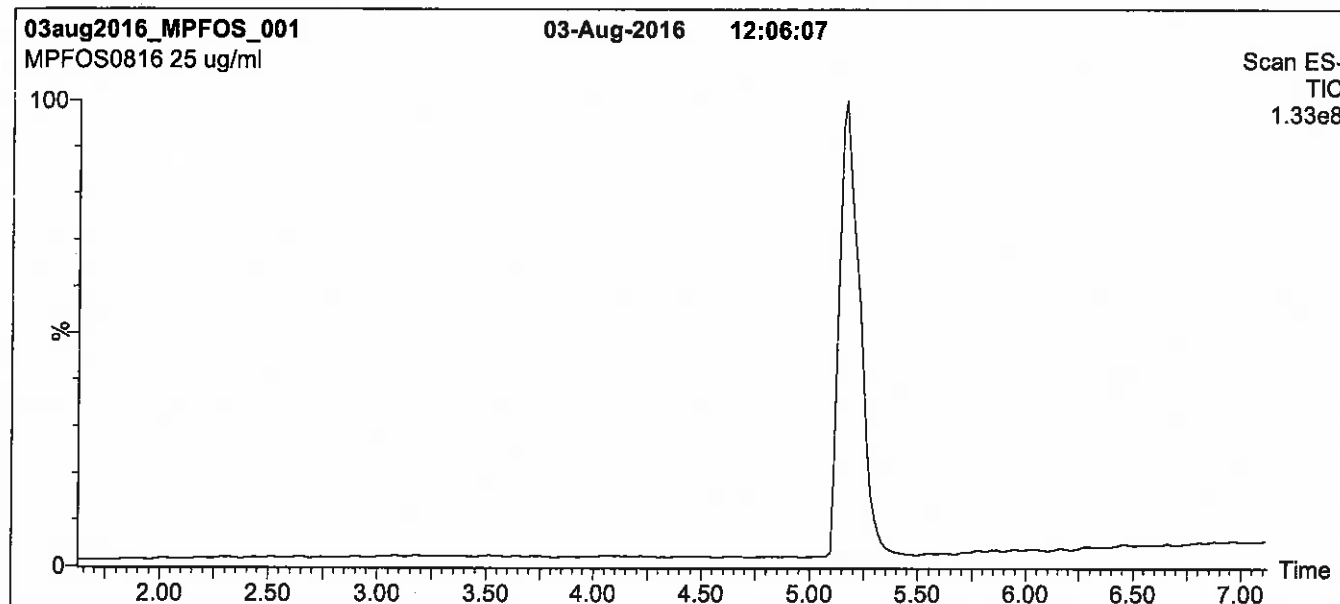
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

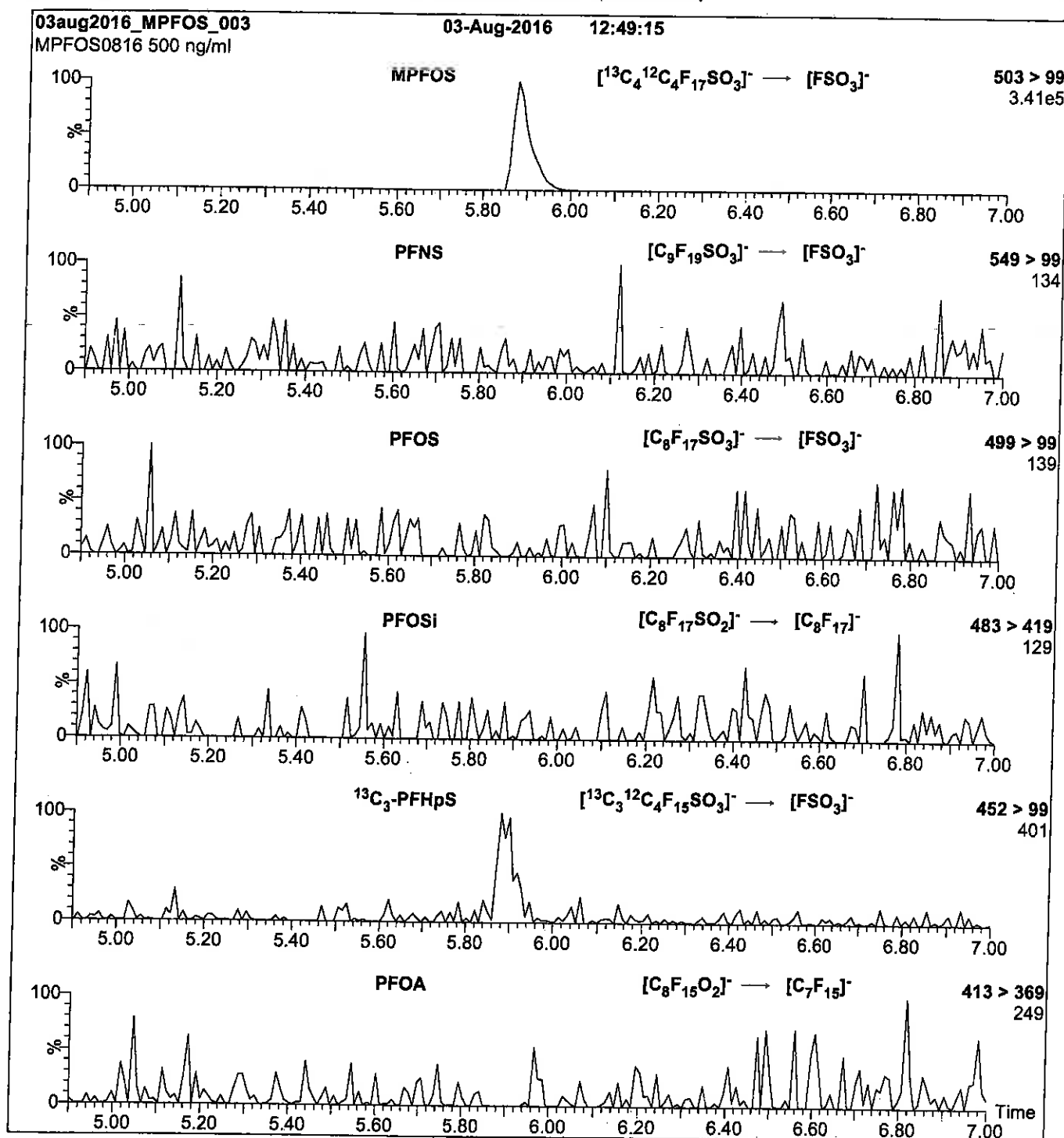
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 40

Reagent

LCMPFUdA_00009

R: SBC 9/22/16



739604

ID: LCMFUDa_00009

Exp: 02/12/21 Prod: SBC

¹³C2-Perfluoroundecanoic



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16 SK

PRODUCT CODE:

MPFUDa

LOT NUMBER:

MPFUDa0216

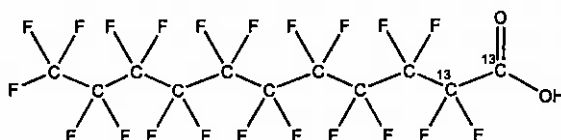
COMPOUND:

Perfluoro-n-[1,2-¹³C₂]undecanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₉HF₂₁O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

566.08

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

LAST TESTED: (mm/dd/yyyy)

02/12/2016

(1,2-¹³C₂)

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 1-¹³C₁-PFUDa (~1%; see Figure 2), 2-¹³C₁-PFUDa (~1%), and PFUDa (~0.2%; see Figure 2) are due to the isotopic purity of the ¹³C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 02/24/2016

(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

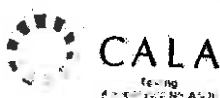
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

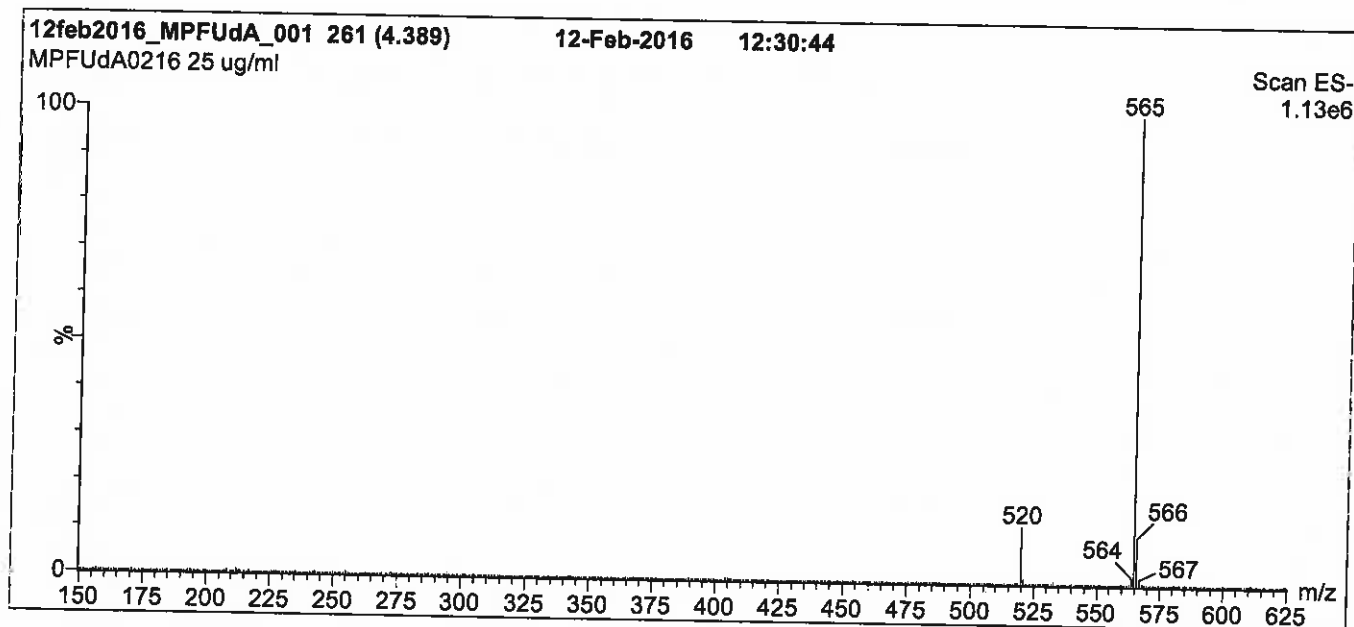
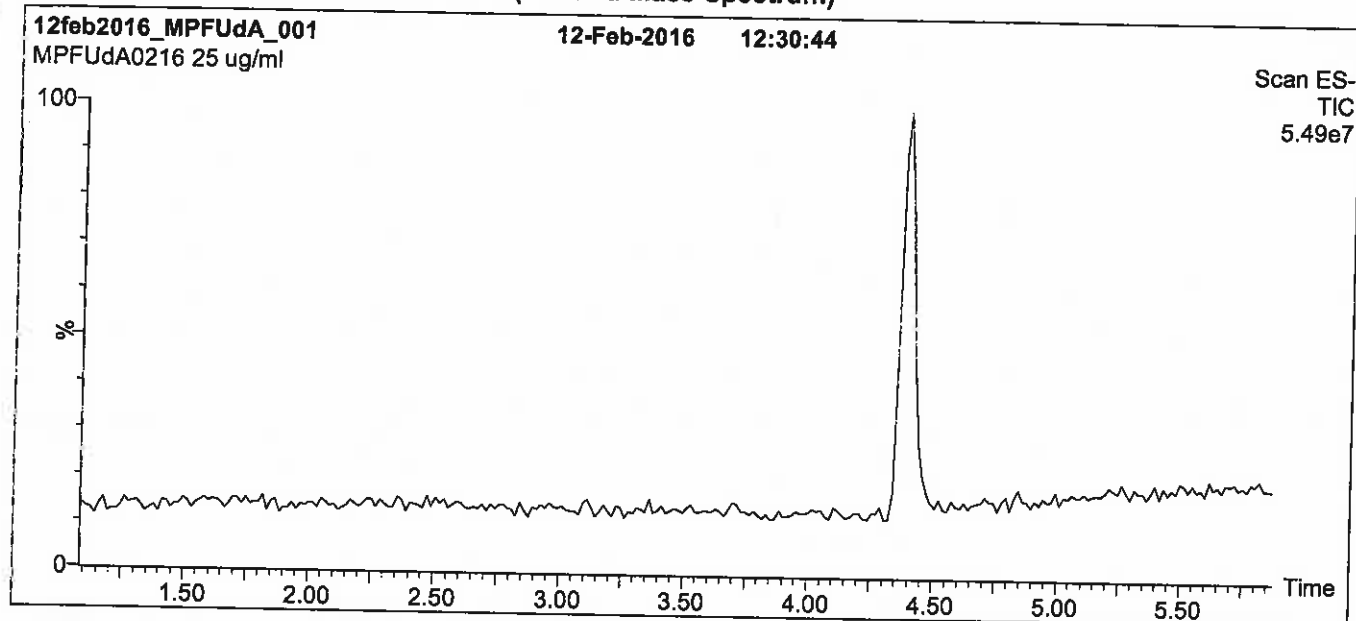
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

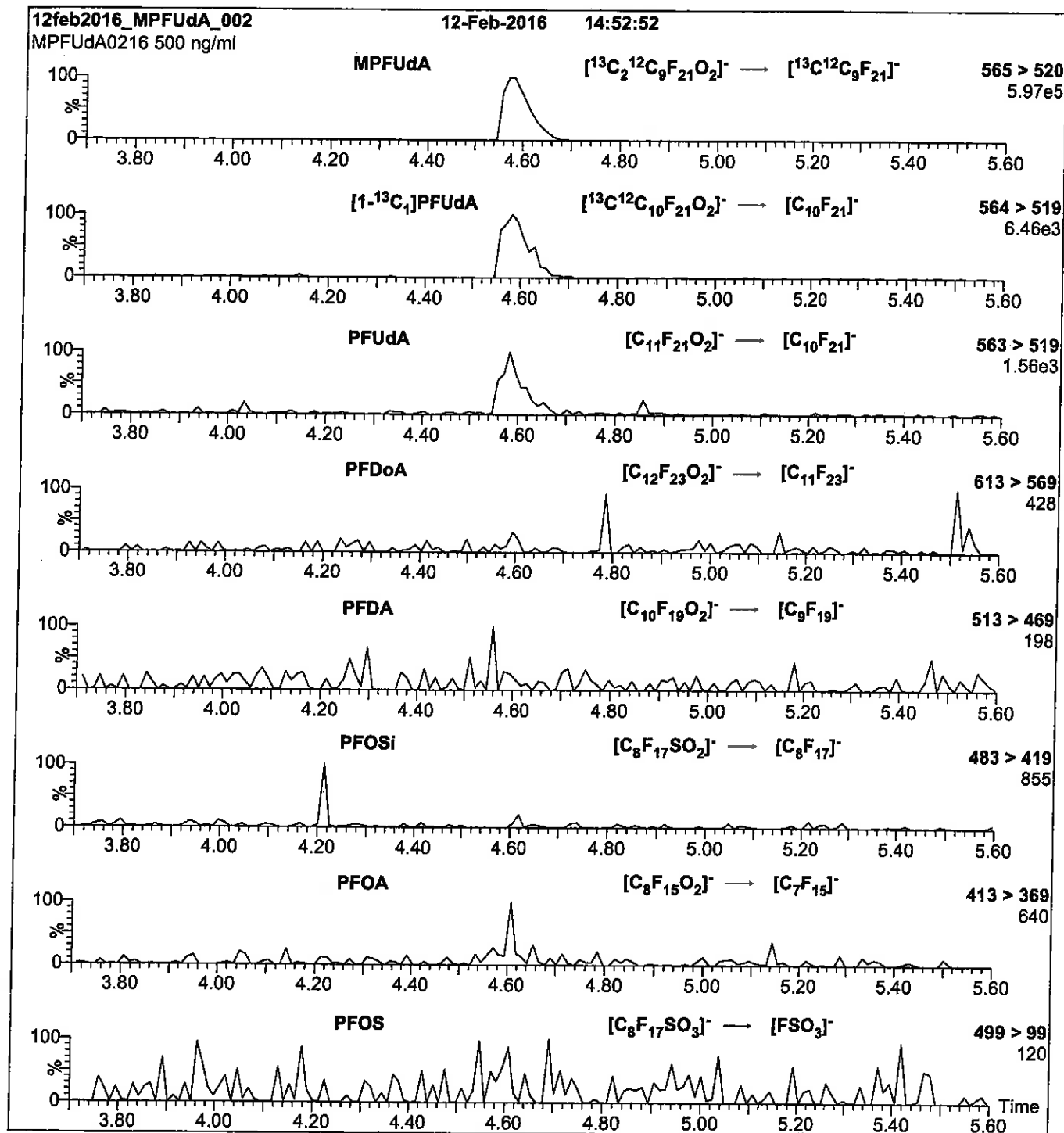
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% MeOH / 20% H_2O

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

MS Parameters

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

Reagent

LCN-EtFOSA-M_00002

P: 7/16/15 SW



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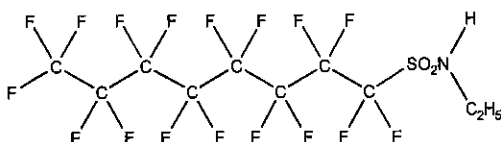
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-EtFOSA-M
COMPOUND: N-ethylperfluoro-1-octanesulfonamide

LOT NUMBER: NEtFOSA0714M

STRUCTURE:

CAS #: 4151-50-2



MOLECULAR FORMULA: $C_{10}H_6F_{17}NO_2S$
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$
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

MOLECULAR WEIGHT: 527.20
SOLVENT(S): Methanol

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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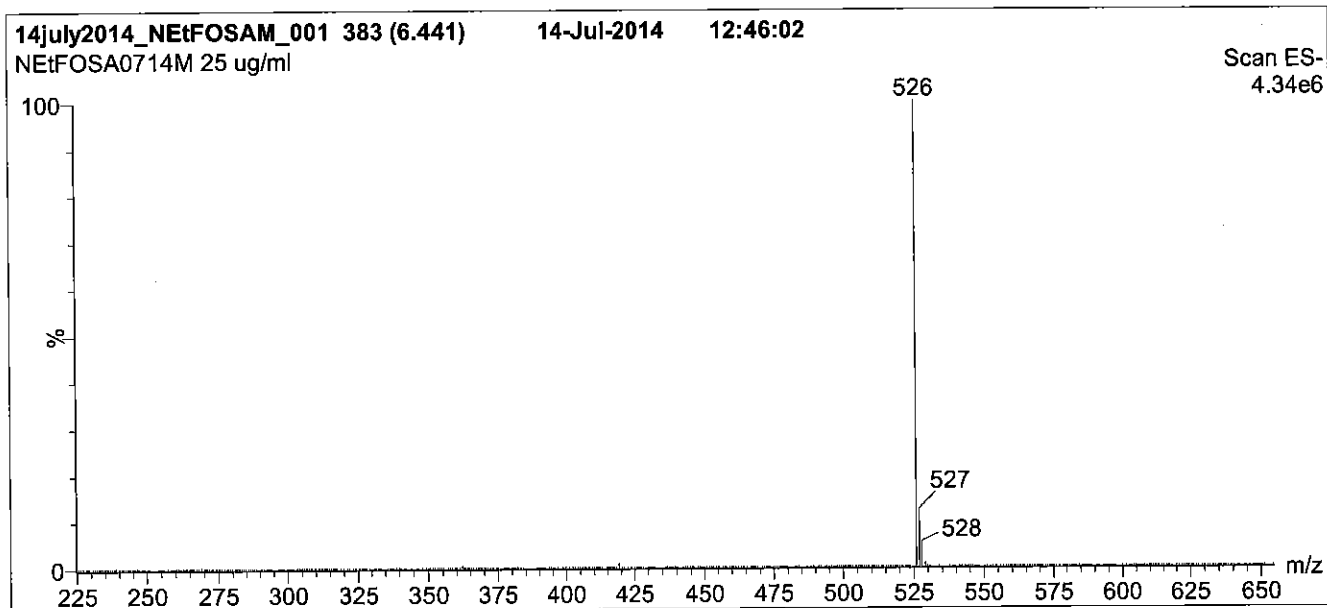
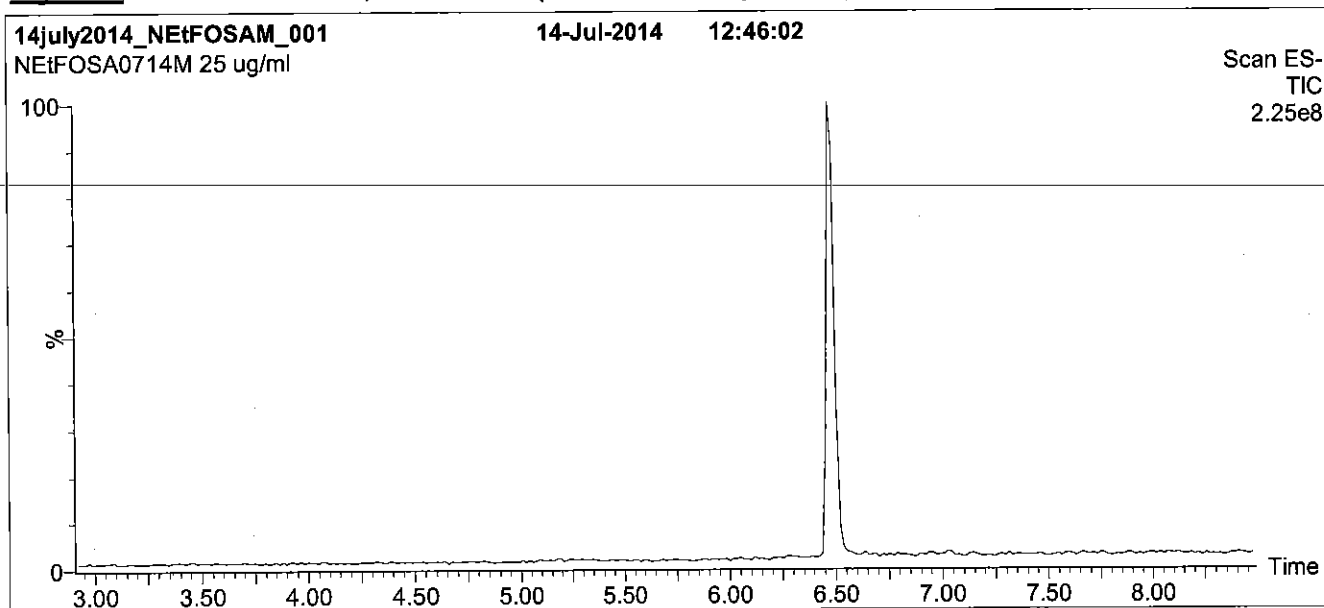
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

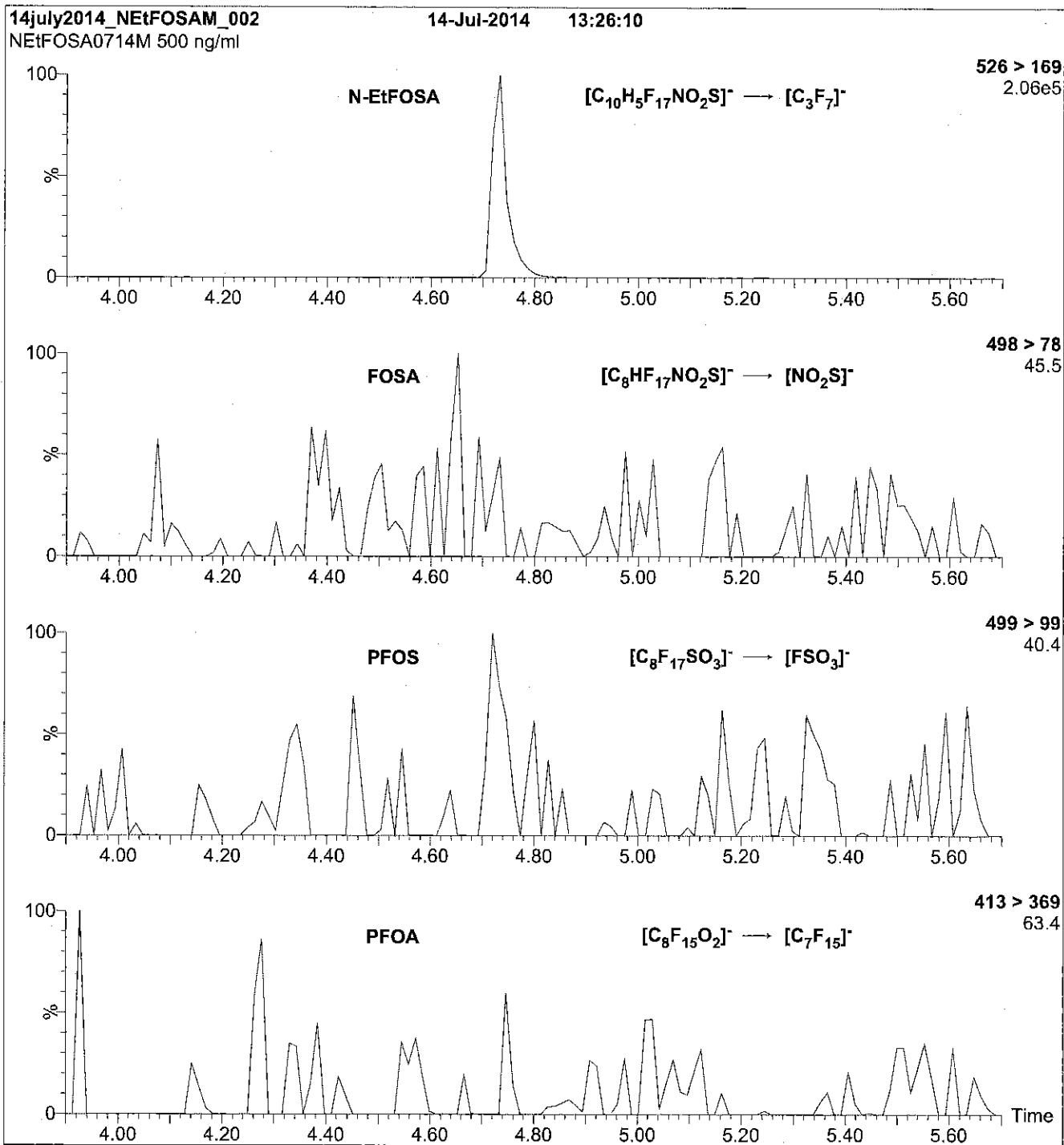
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 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 μ l (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 μ l/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 Prod: SBC
N-EtFOSA-M



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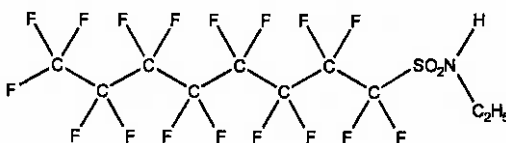
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-EtFOSA-M
COMPOUND: N-ethylperfluoro-1-octanesulfonamide

LOT NUMBER: NEtFOSA0516M

STRUCTURE:

CAS #: 4151-50-2



MOLECULAR FORMULA: $C_{10}H_8F_{17}NO_2S$
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/24/2016
EXPIRY DATE: (mm/dd/yyyy) 05/24/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 527.20
SOLVENT(S): Methanol

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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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SYNTHESIS / CHARACTERIZATION:

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LIMITED WARRANTY:

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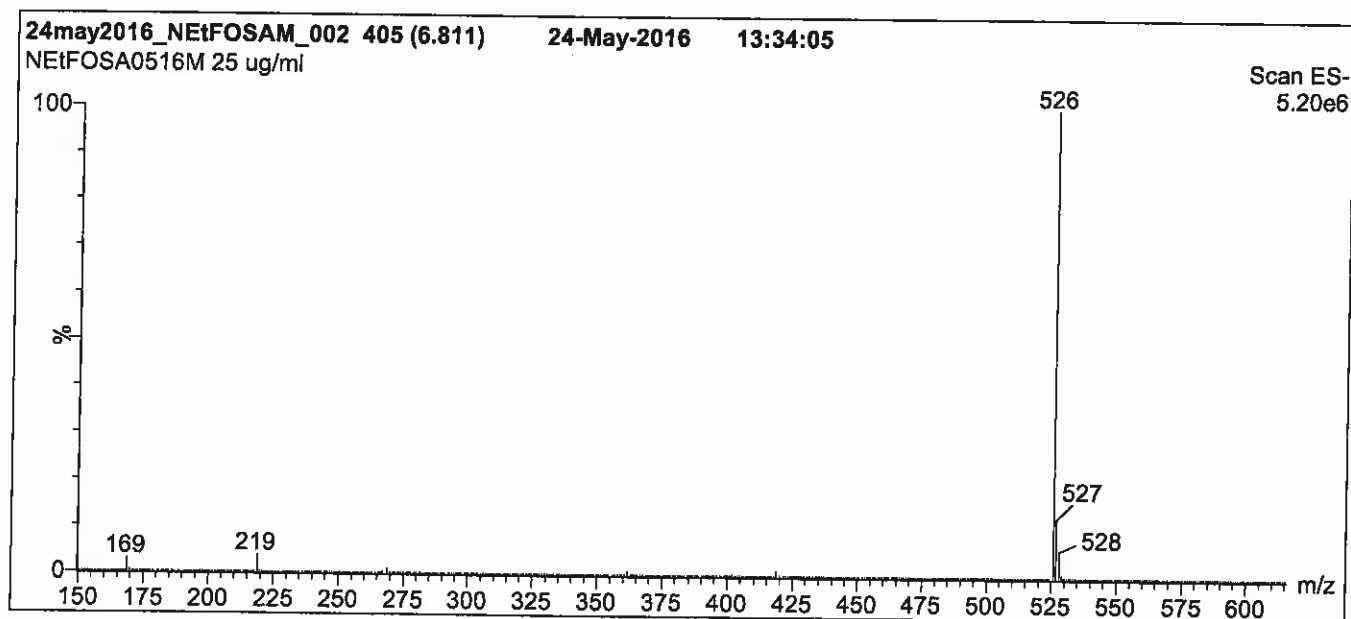
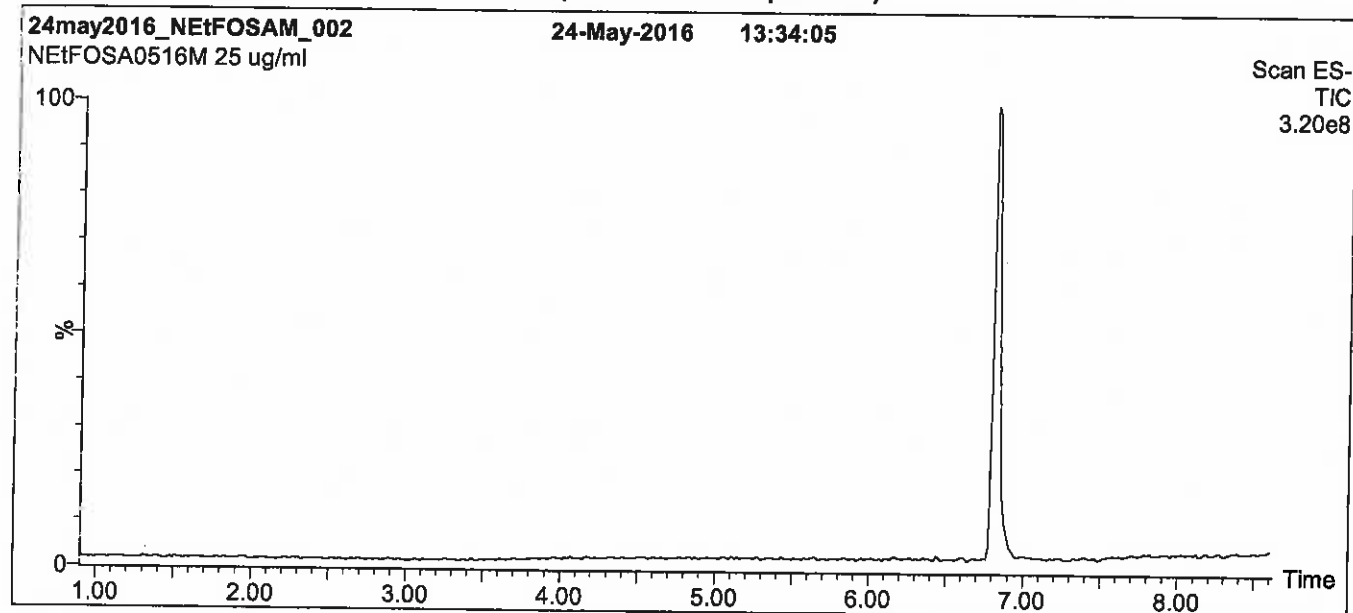
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

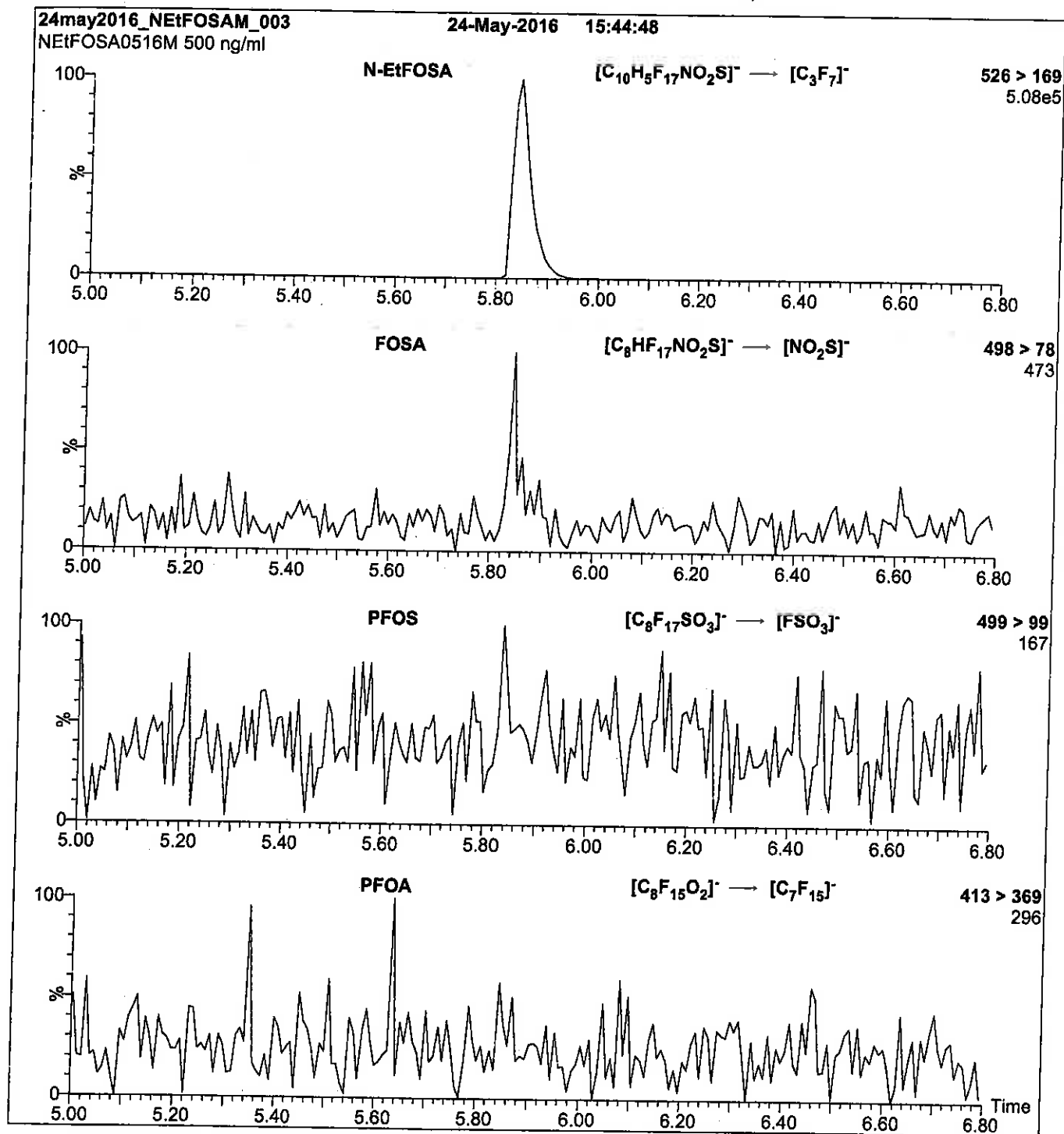
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (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 μ l/min

MS Parameters

Collision Gas (mbar) = $3.54e-3$
Collision Energy (eV) = 30

Reagent

LCN-EtFOSAA_00001

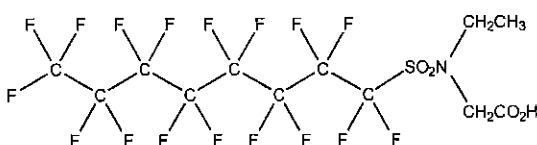


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CERTIFICATE OF ANALYSIS DOCUMENTATION

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: $50 \pm 2.5 \mu\text{g/ml}$ **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
 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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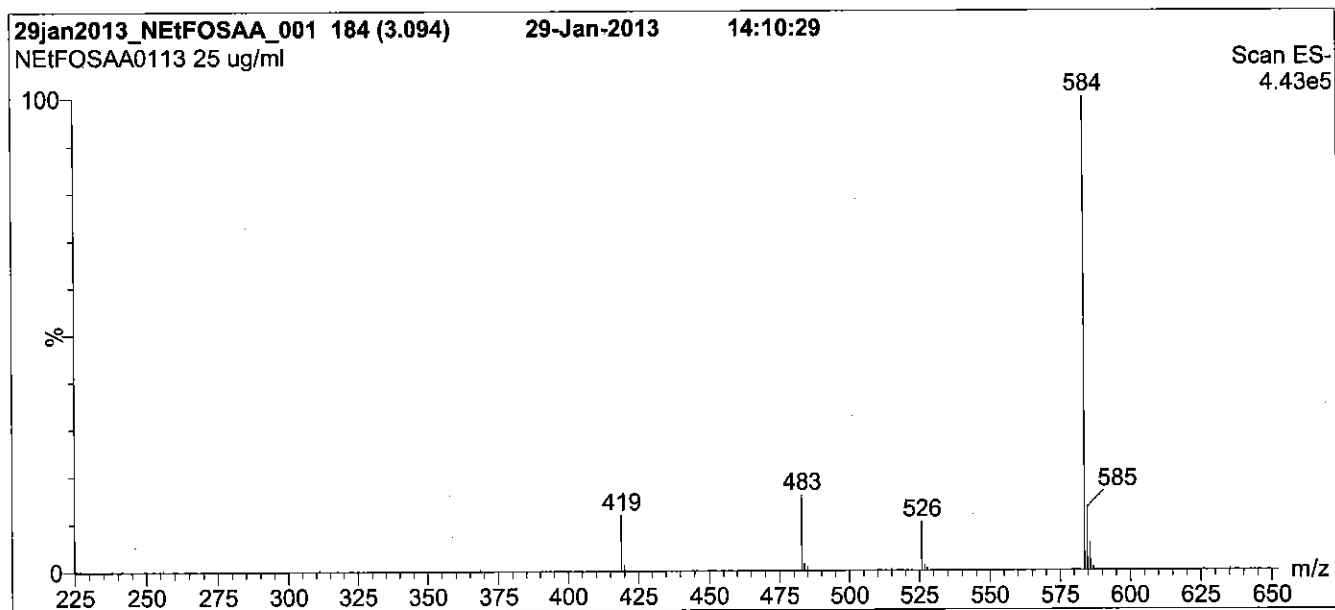
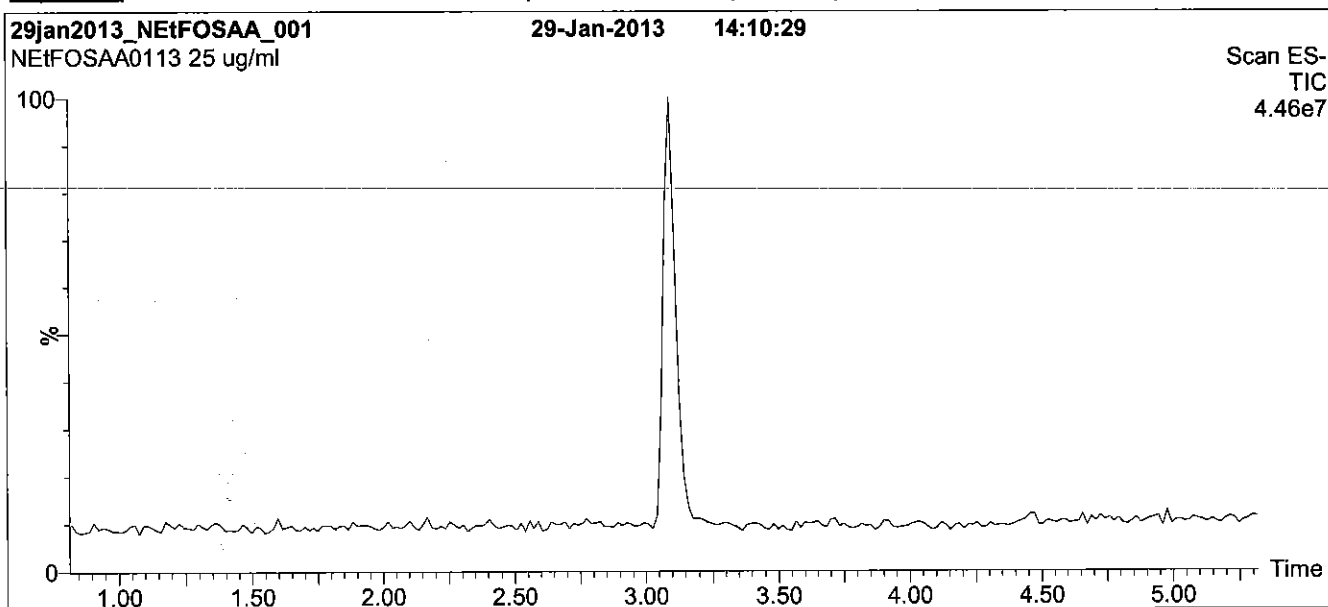
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

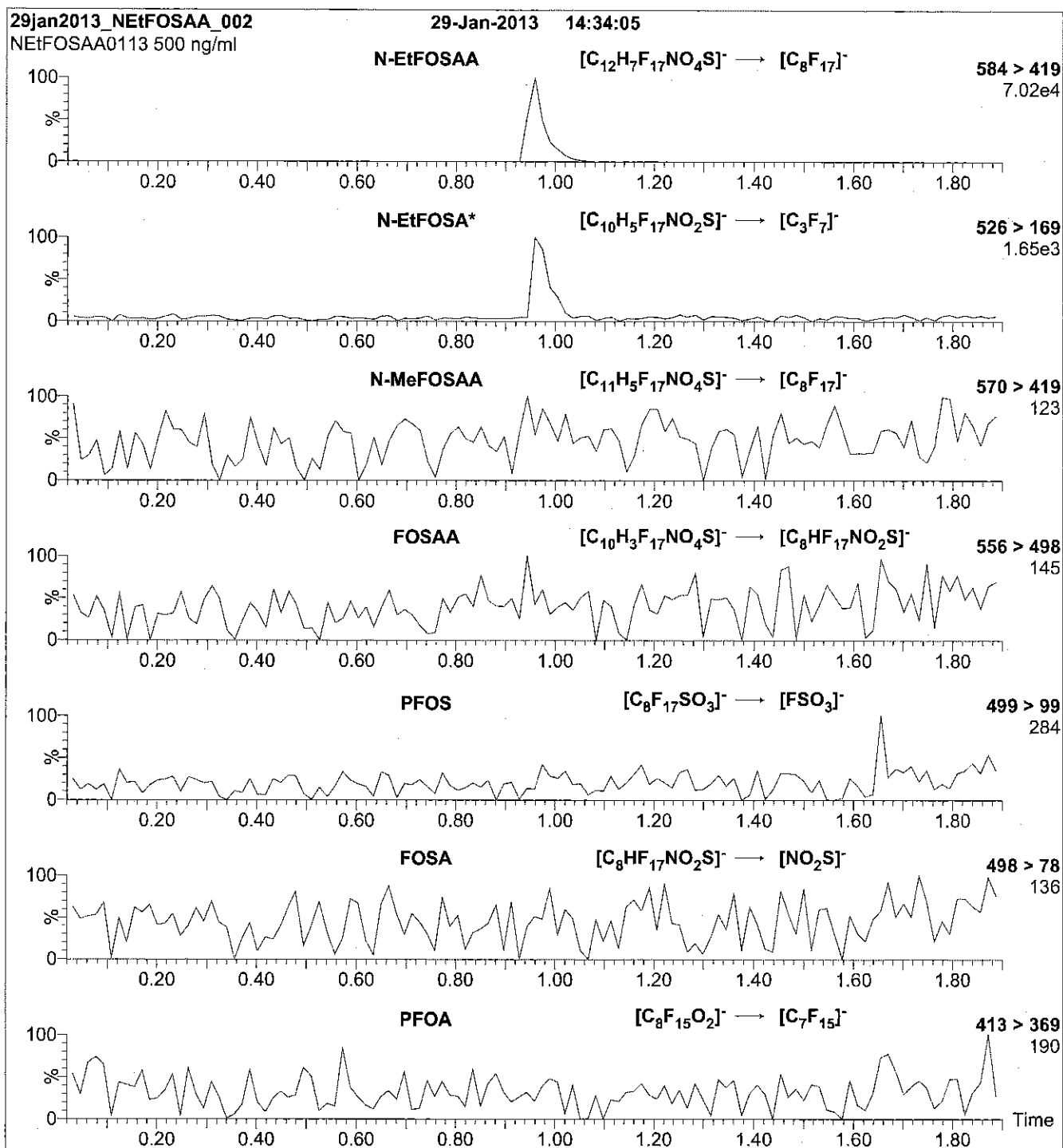
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Note: N-EtFOSA is formed by fragmentation of N-EtFOSAA.

Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCN-EtFOSAA_00002

R: 8/23/16 SBC



715561

ID: LCN-EtFOSAA_00002

Exp: 01/20/21 Prod: SBC

N-EtFOSAA



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

N-EtFOSAA

LOT NUMBER:

NEtFOSAA0116

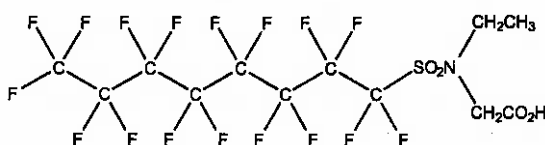
COMPOUND:

N-ethylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

CAS #:

2991-50-6



MOLECULAR FORMULA:

C₁₂H₈F₁₇NO₄S

MOLECULAR WEIGHT:

585.23

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/20/2016

EXPIRY DATE: (mm/dd/yyyy)

01/20/2021

RECOMMENDED STORAGE:

Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 01/21/2016

(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

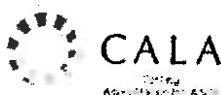
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

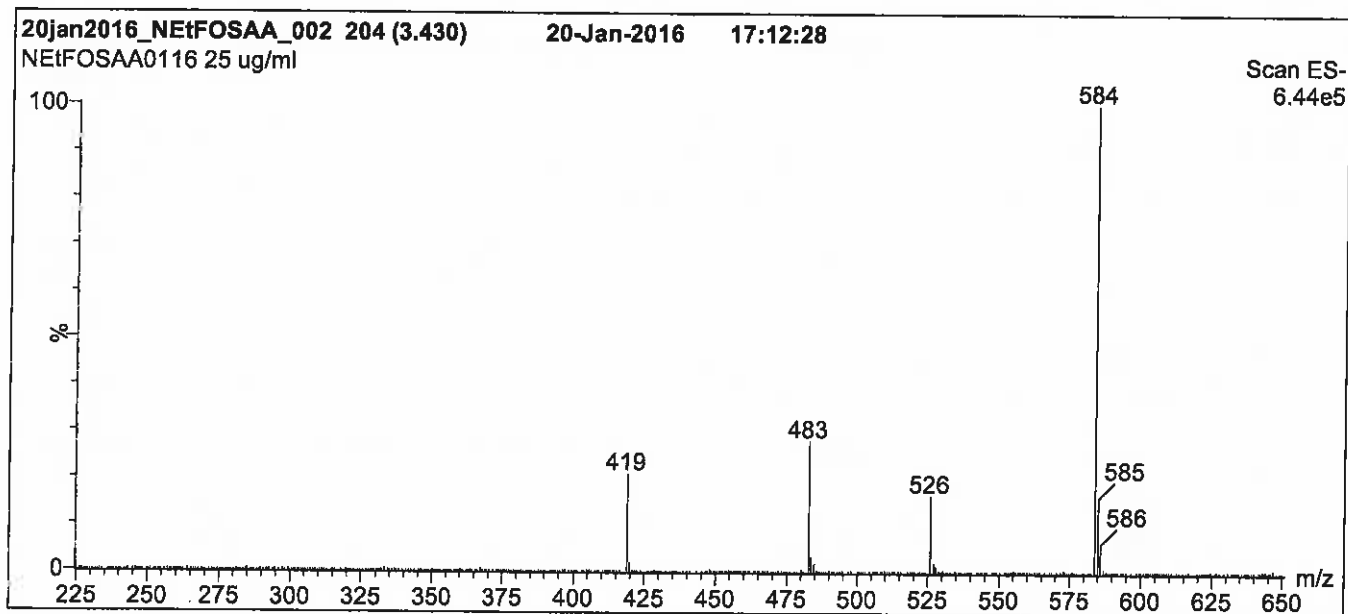
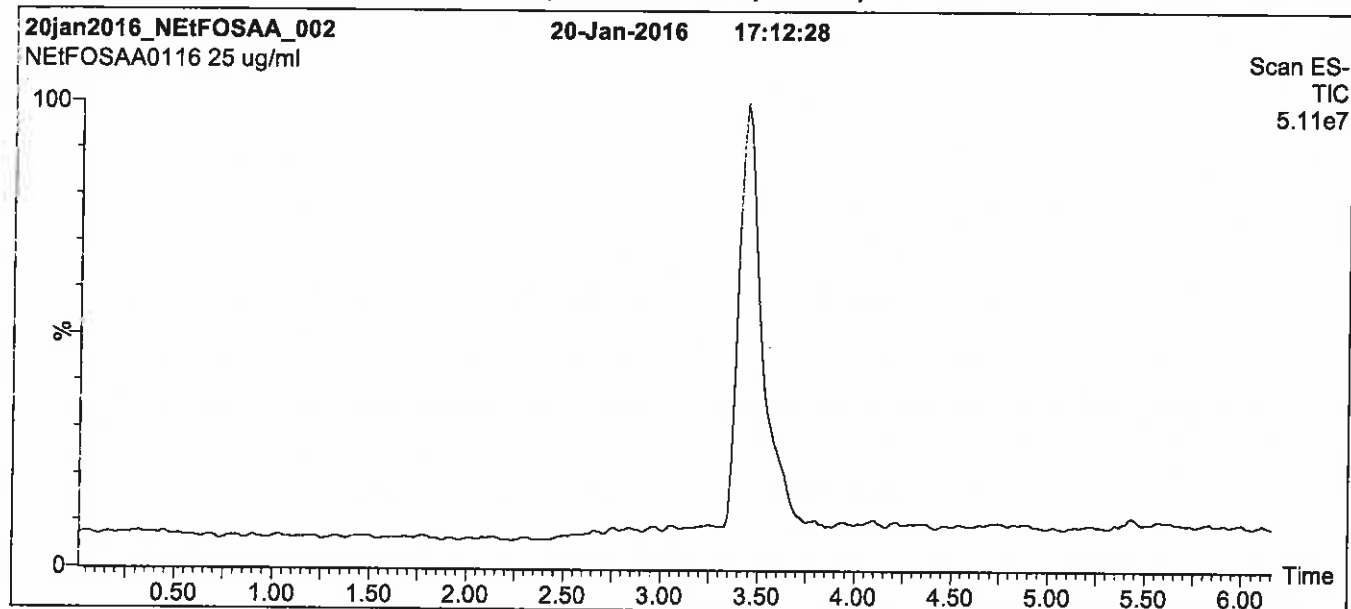
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

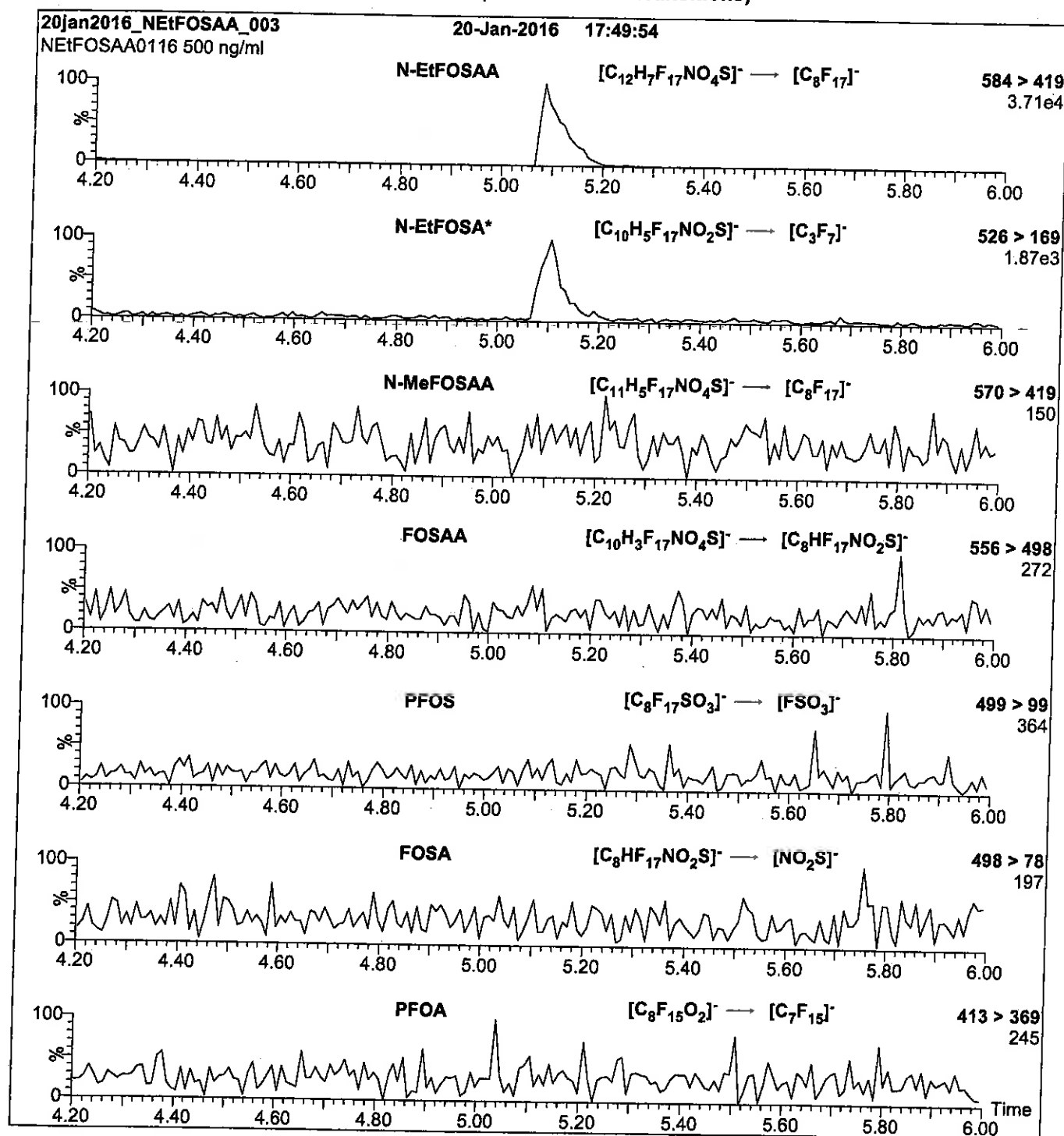
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Note: N-EtFOSA is formed by fragmentation of N-EtFOSAA.

Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCN-MeFOSA-M_00001

R: 7/16/15 SPW



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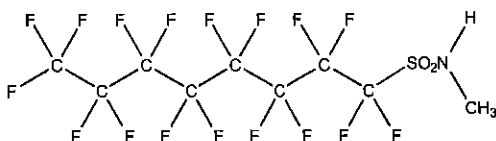
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-MeFOSA-M
COMPOUND: N-methylperfluoro-1-octanesulfonamide

LOT NUMBER: NMeFOSA0714M

STRUCTURE:

CAS #: 31506-32-8



MOLECULAR FORMULA: $C_9H_4F_{17}NO_2S$
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$
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

MOLECULAR WEIGHT: 513.17
SOLVENT(S): Methanol

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 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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HOMOGENEITY:

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UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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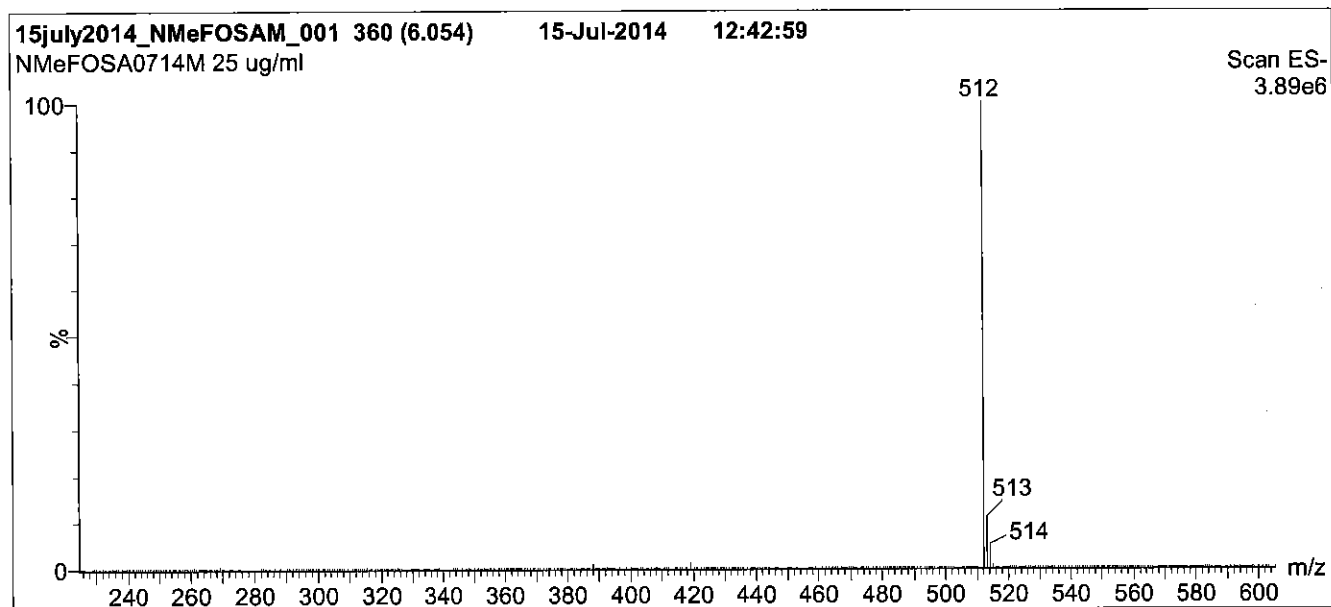
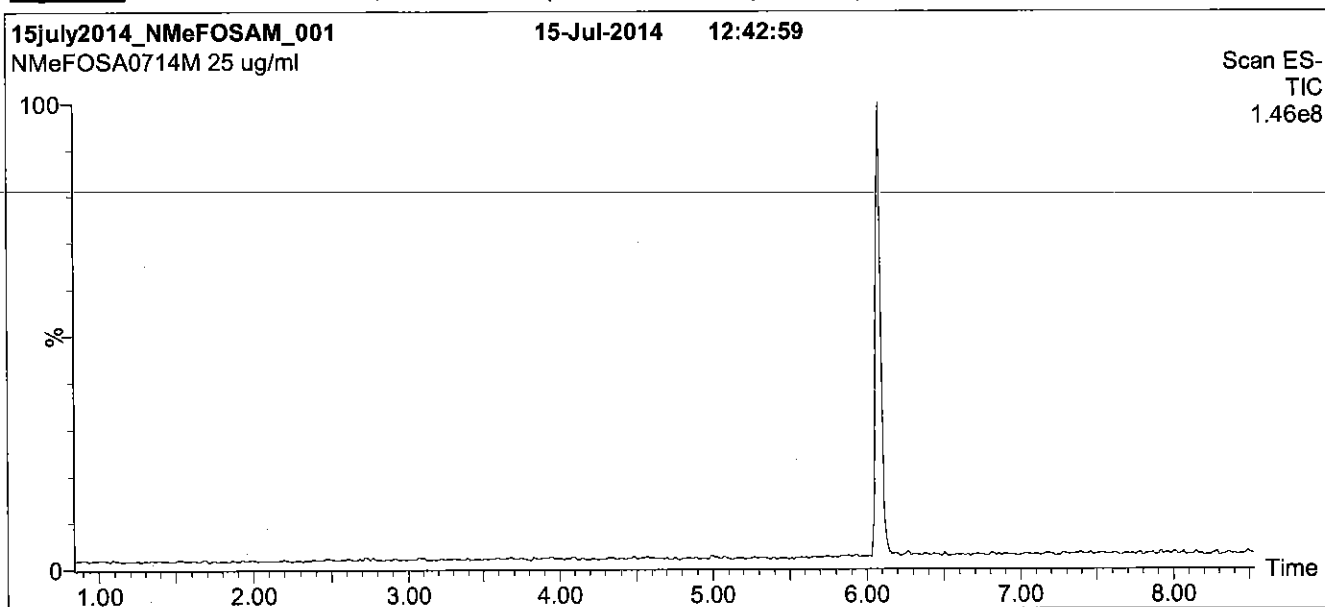
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

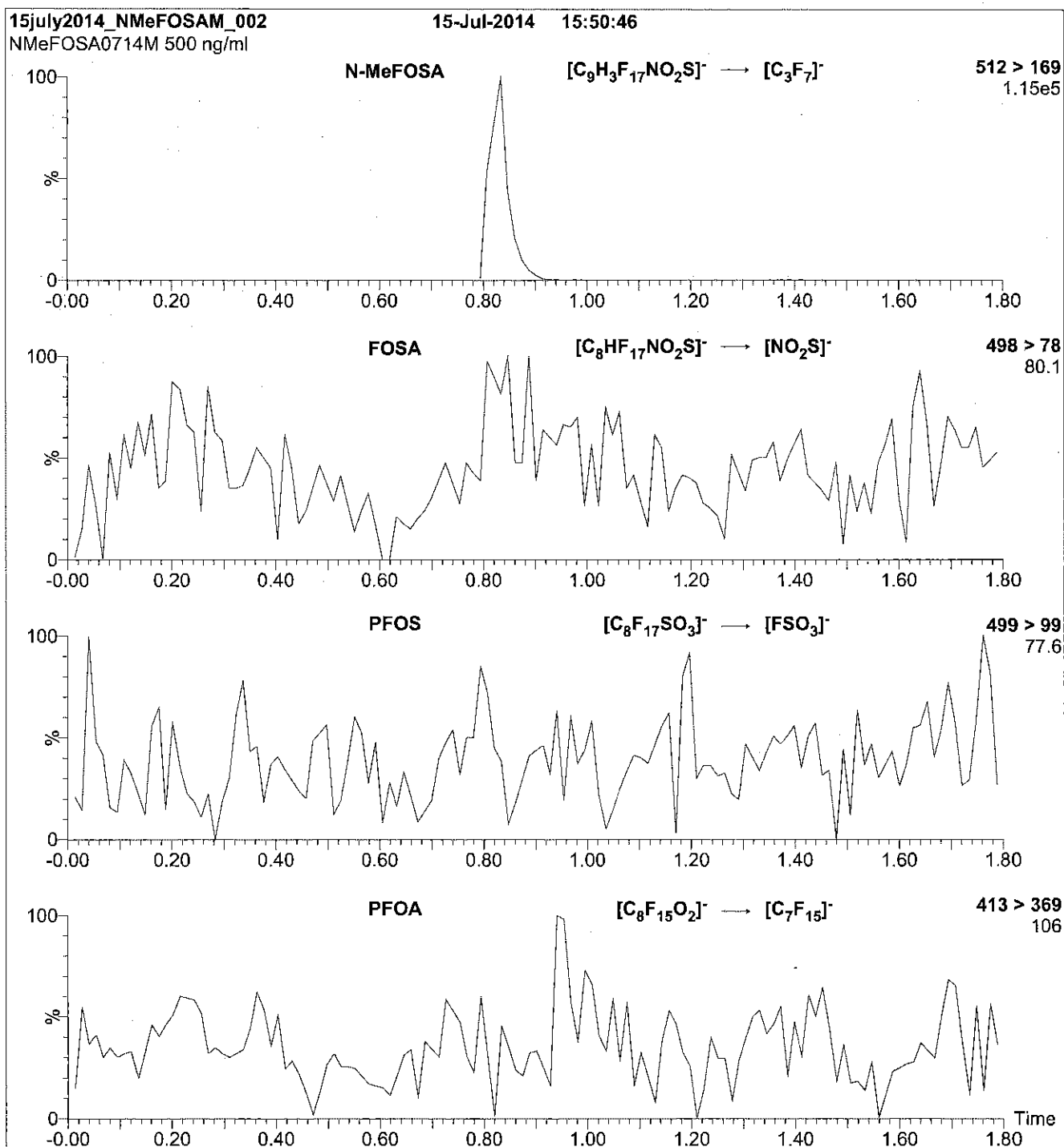
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 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 μ l (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 μ l/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 Prpt: SBC

N-MeFOSA-M



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

N-MeFOSA-M

LOT NUMBER:

NMeFOSA0516M

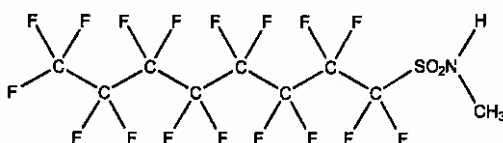
COMPOUND:

N-methylperfluoro-1-octanesulfonamide

STRUCTURE:

CAS #:

31506-32-8



MOLECULAR FORMULA:

C₈H₄F₁₇NO₂S

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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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.

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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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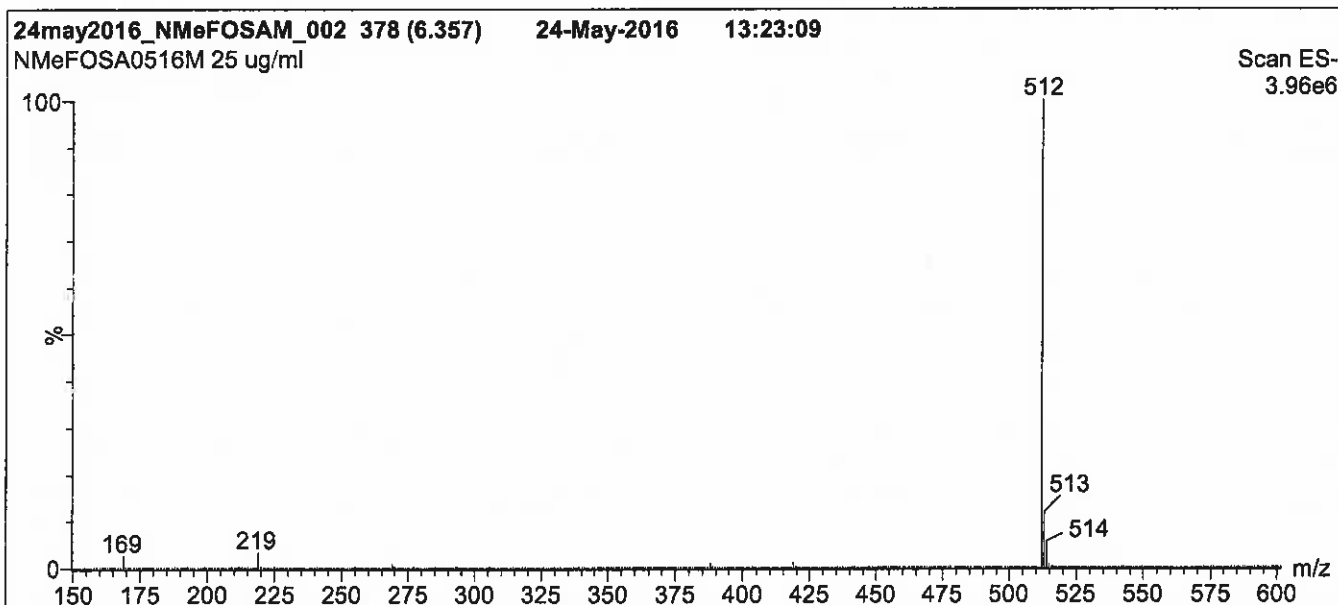
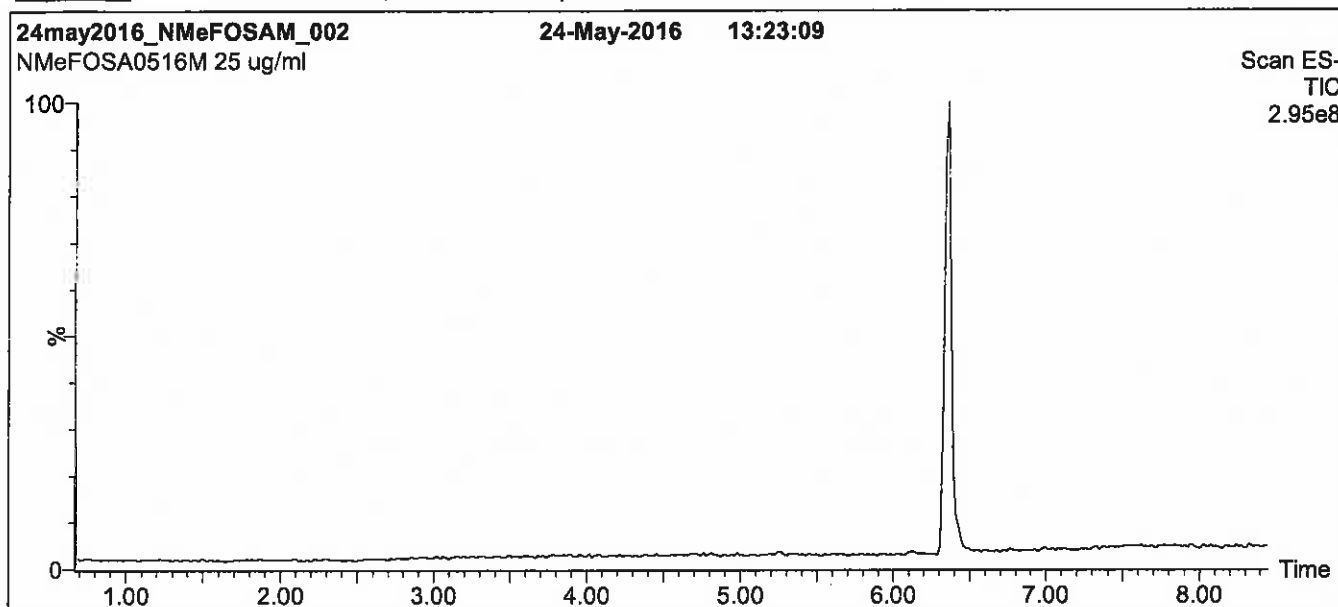
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

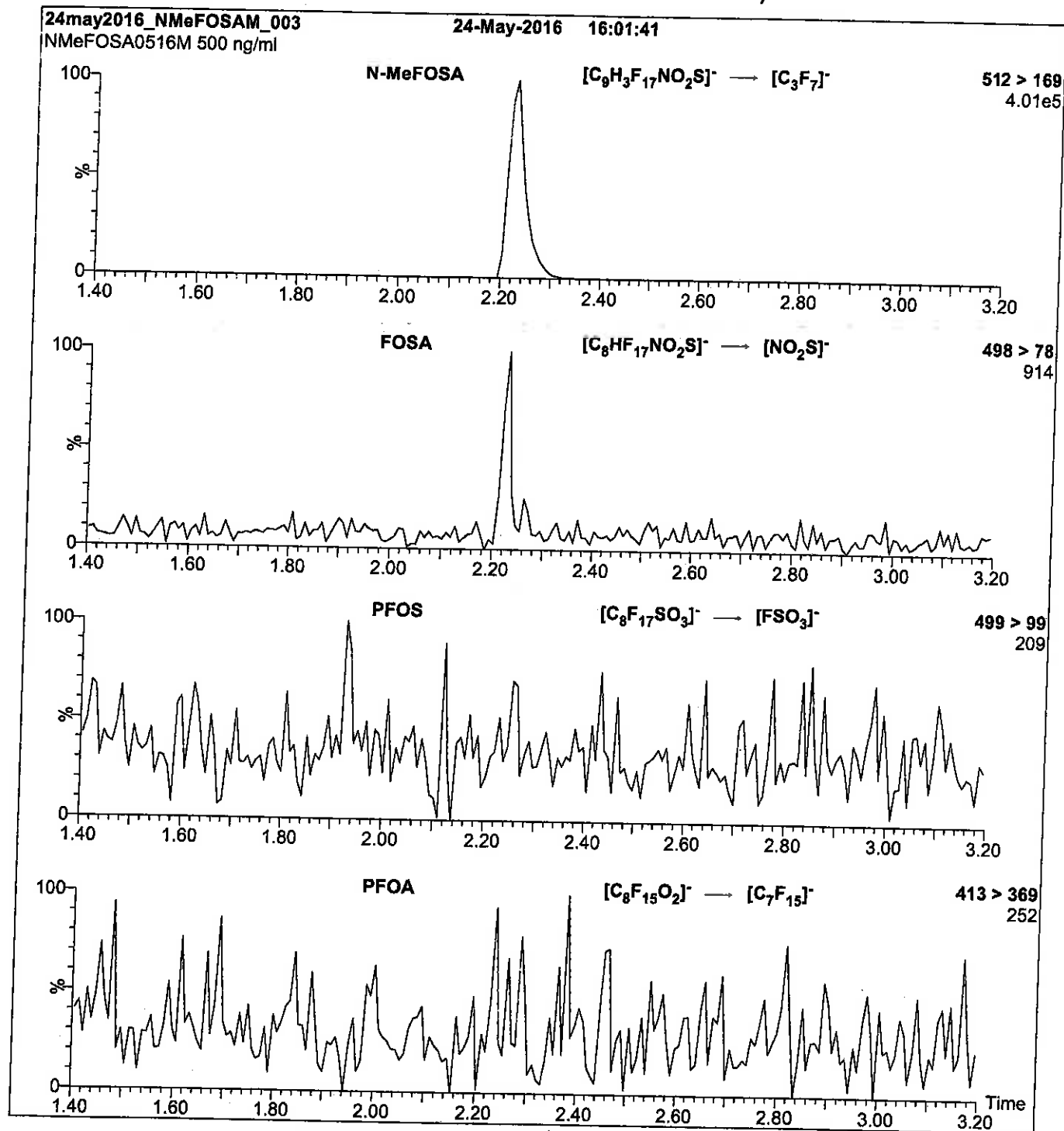
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 30

Reagent

LCN-MeFOSAA_00001

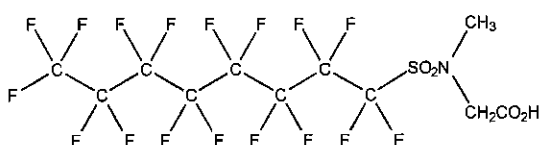


WELLINGTON LABORATORIES

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: $50 \pm 2.5 \mu\text{g/ml}$ **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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EXPIRY DATE / PERIOD OF VALIDITY:

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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.

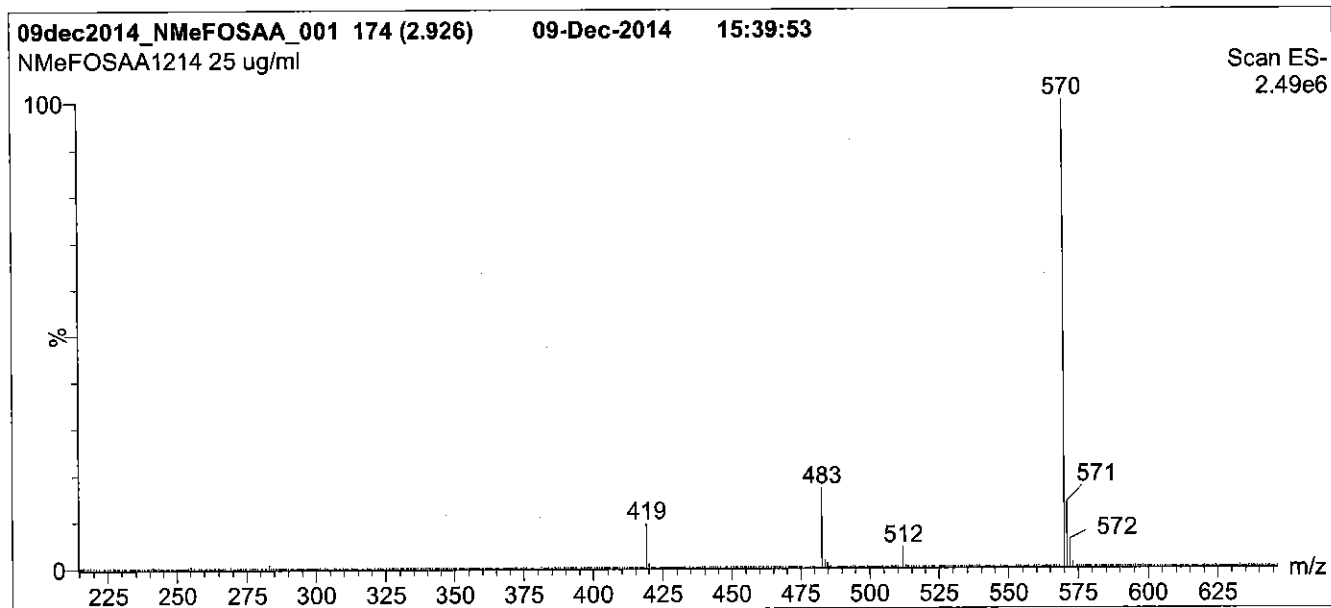
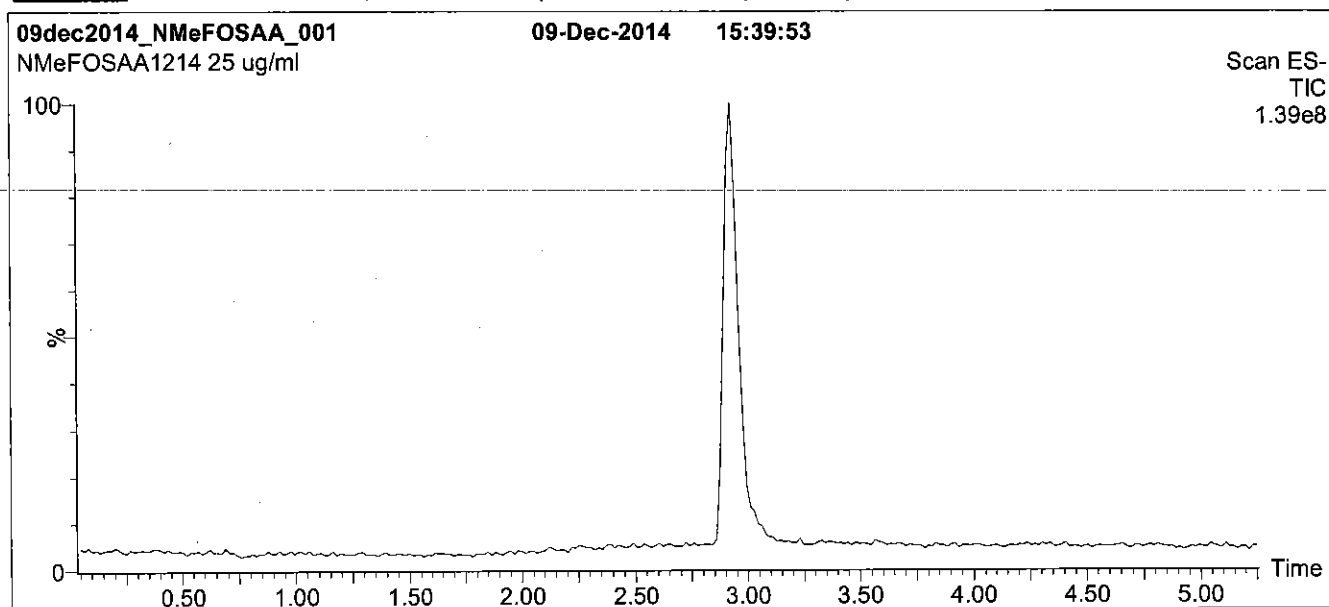
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

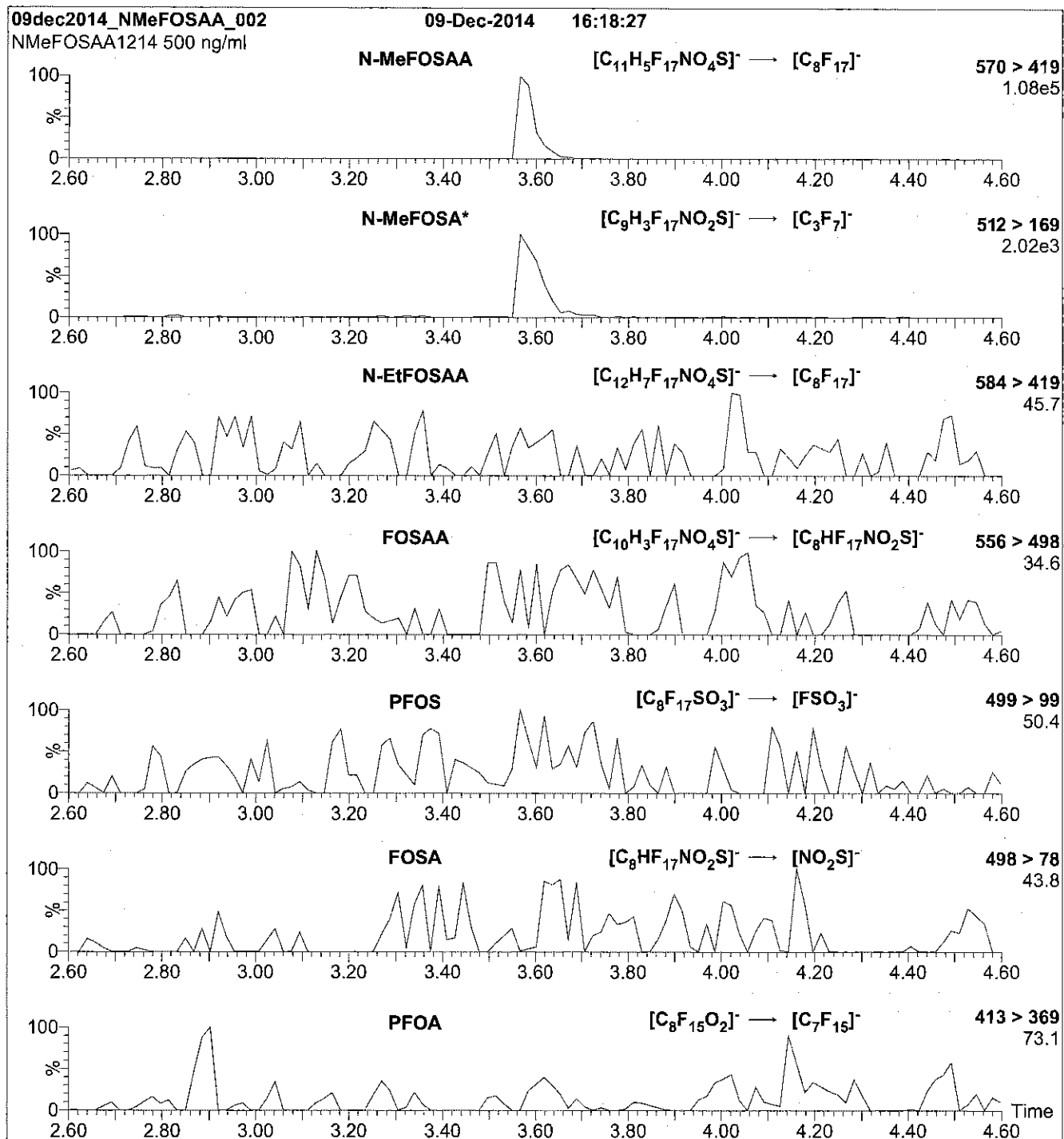
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 μ l (500 ng/ml N-MeFOSAA)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCN-MeFOSAA_00003

R: 8/23/16 SAE

715562
ID: LCN-MeFOSAA_00003
Exp: 01/20/21 Prod: SEC
N-MeFOSAA

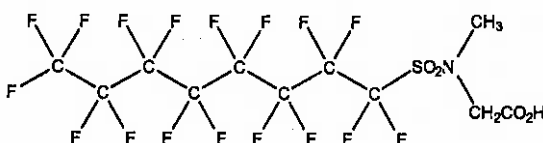


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-MeFOSAA **LOT NUMBER:** NMeFOSAA0116
COMPOUND: N-methylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** 2355-31-9



MOLECULAR FORMULA: $C_{11}H_8F_{17}NO_4S$ **MOLECULAR WEIGHT:** 571.21
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):** Methanol
Water (<1%)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/20/2016
EXPIRY DATE: (mm/dd/yyyy) 01/20/2021
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 01/21/2016
(mm/dd/yyyy)

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

INTENDED USE:

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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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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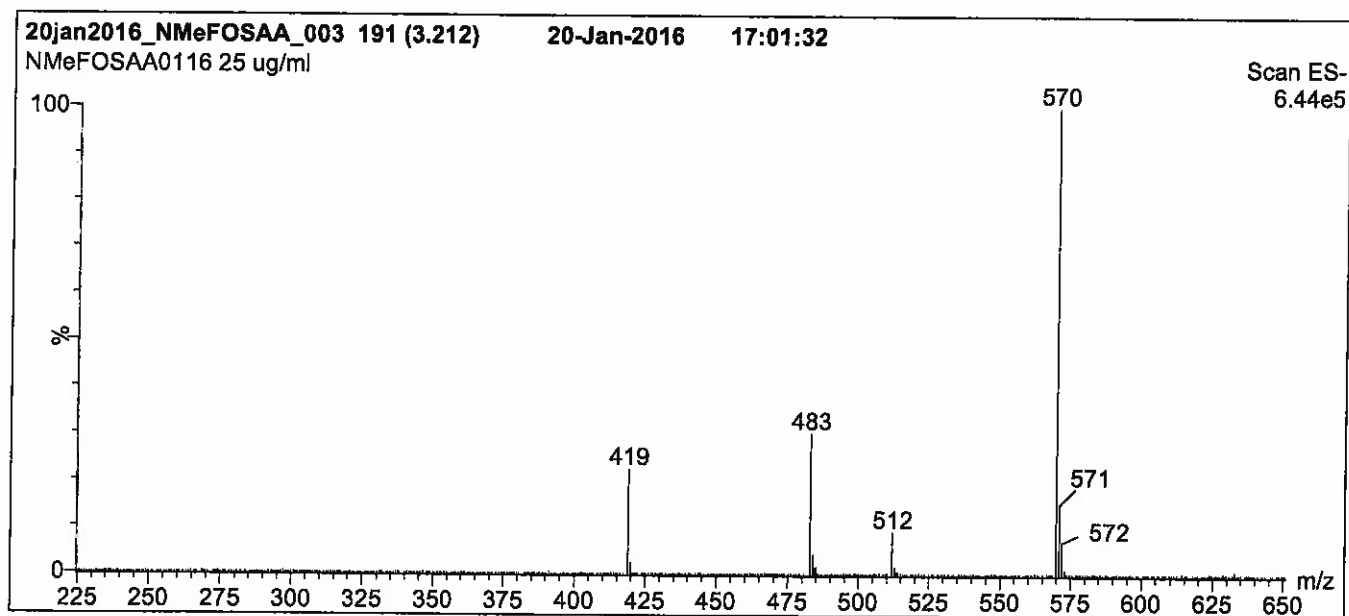
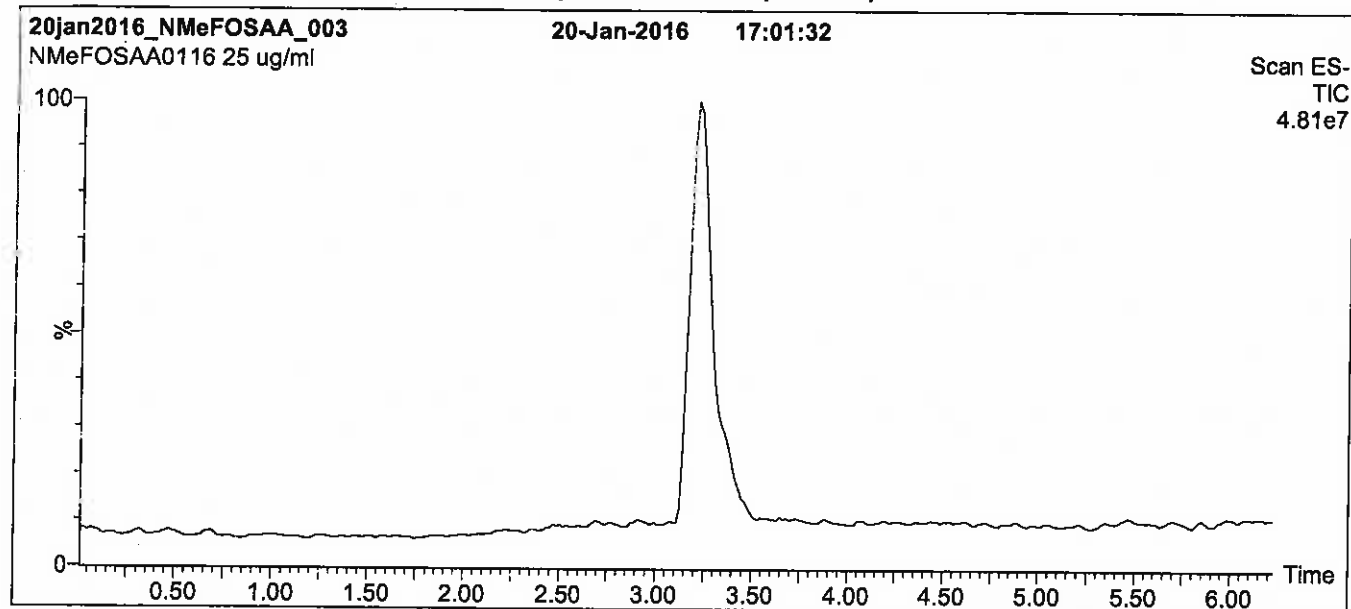
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

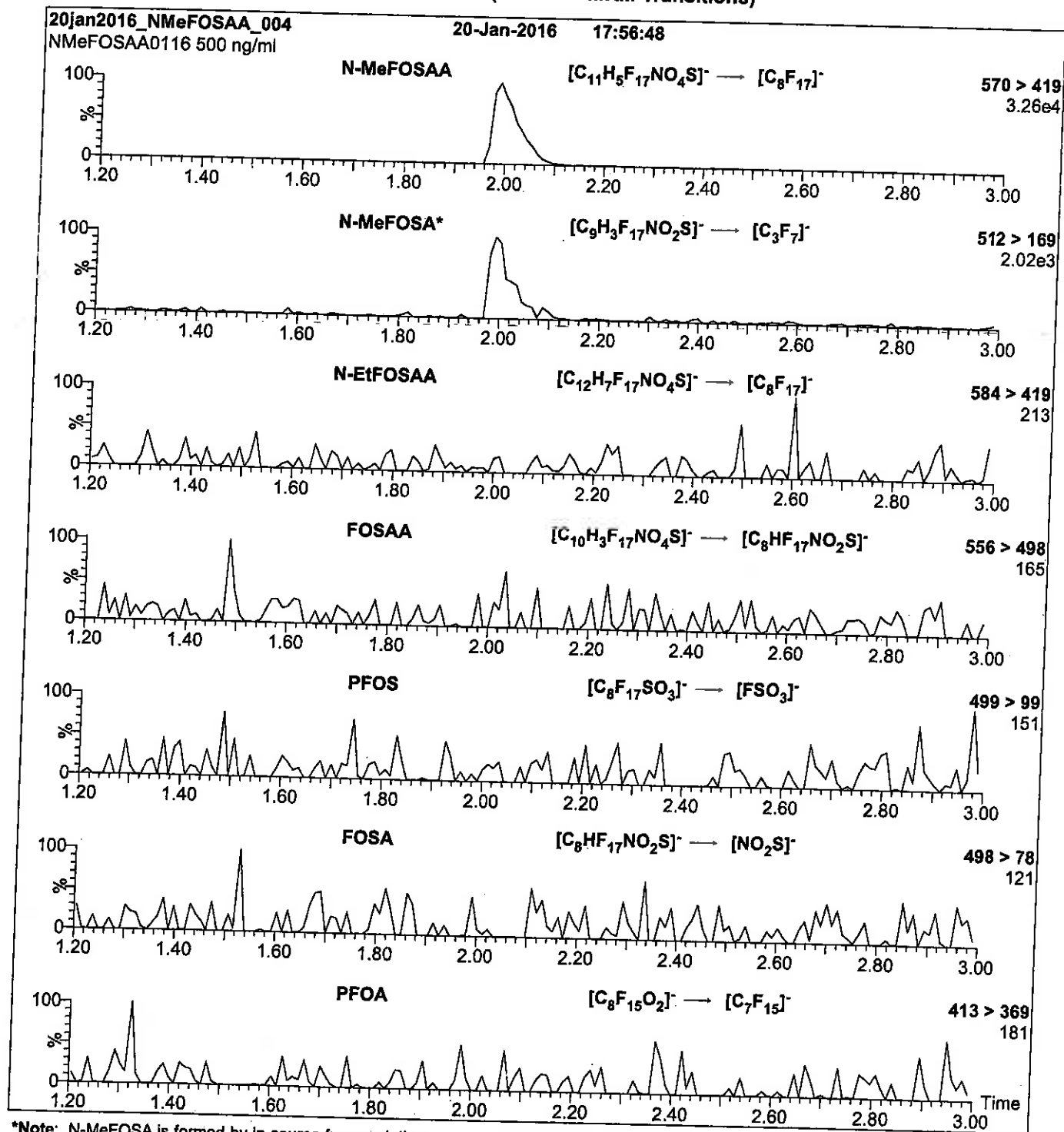
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



*Note: N-MeFOSA is formed by in-source fragmentation.

Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFACMXB_00007



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXB

**Solution/Mixture of Native
Perfluoroalkylcarboxylic Acids and
Native Perfluoroalkylsulfonates**

PRODUCT CODE: PFAC-MXB
LOT NUMBER: PFACMXB1115
SOLVENT(S): Methanol / Water (<1%)
DATE PREPARED: (mm/dd/yyyy) 11/04/2015
LAST TESTED: (mm/dd/yyyy) 11/06/2015
EXPIRY DATE: (mm/dd/yyyy) 11/06/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXB is a solution/mixture of thirteen native perfluoroalkylcarboxylic acids (C₄-C₁₄, C₁₆, and C₁₈) and four native perfluoroalkylsulfonates (C₄, C₆, C₈ and C₁₀). The full name, abbreviation and concentration for each of the components are given in Table A.

The individual perfluoroalkylcarboxylic acids and perfluoroalkylsulfonates all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
 Figure 1: LC/MS Data (SiR)
 Figure 2: LC/MS/MS Data (Selected MRM Transitions)
 Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.

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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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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Table A: PFAC-MXB; Components and Concentrations (ng/ml, $\pm$ 5% in Methanol / Water (<1%))

Name	Abbreviation	Concentration (ng/ml)	Peak Assignment In Figure 1	
Perfluoro-n-butanoic acid	PFBA	2000	A	
Perfluoro-n-pentanoic acid	PFPeA	2000	B	
Perfluoro-n-hexanoic acid	PFHxA	2000	D	
Perfluoro-n-heptanoic acid	PFHpA	2000	E	
Perfluoro-n-octanoic acid	PFOA	2000	G	
Perfluoro-n-nonanoic acid	PFNA	2000	H	
Perfluoro-n-decanoic acid	PFDA	2000	J	
Perfluoro-n-undecanoic acid	PFUdA	2000	K	
Perfluoro-n-dodecanoic acid	PFDoA	2000	M	
Perfluoro-n-tridecanoic acid	PFTrDA	2000	N	
Perfluoro-n-tetradecanoic acid	PFTeDA	2000	O	
Perfluoro-n-hexadecanoic acid	PFHxDA	2000	P	
Perfluoro-n-octadecanoic acid	PFODA	2000	Q	
Name	Abbreviation	Concentration (ng/ml)		Peak Assignment In Figure 1
		as the salt	as the anion	
Potassium perfluoro-1-buthanesulfonate	L-PFBS	2000	1770	C
Sodium perfluoro-1-hexanesulfonate	L-PFHxS	2000	1890	F
Sodium perfluoro-1-octanesulfonate	L-PFOS	2000	1910	I
Sodium perfluoro-1-decanesulfonate	L-PFDS	2000	1930	L

Certified By:

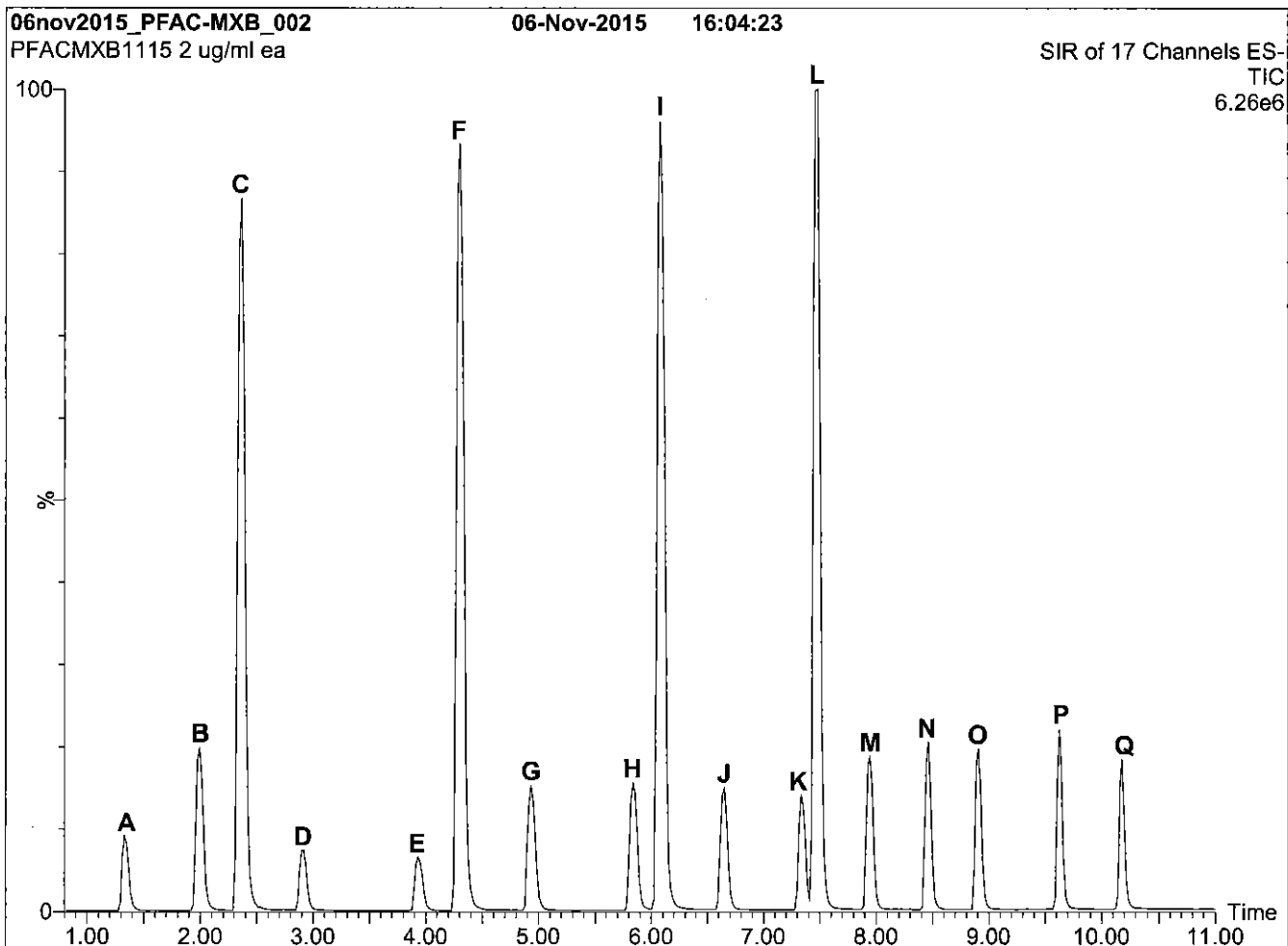

B.G. Chittim

Date:

11/11/2015

(mm/dd/yyyy)

Figure 1: PFAC-MXB; LC/MS Data (Total Ion Current Chromatogram; SIR)



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient

Start: 55% H₂O / 45% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 95% organic over 10 min and hold for 1 min
before returning to initial conditions in 0.5 min.

Time: 12 min

Flow: 300 μ l/min

MS Parameters

Experiment: SIR of 17 Channels

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = variable (10-70)
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: PFAC-MXB; LC/MS/MS Data (Selected MRM Transitions)

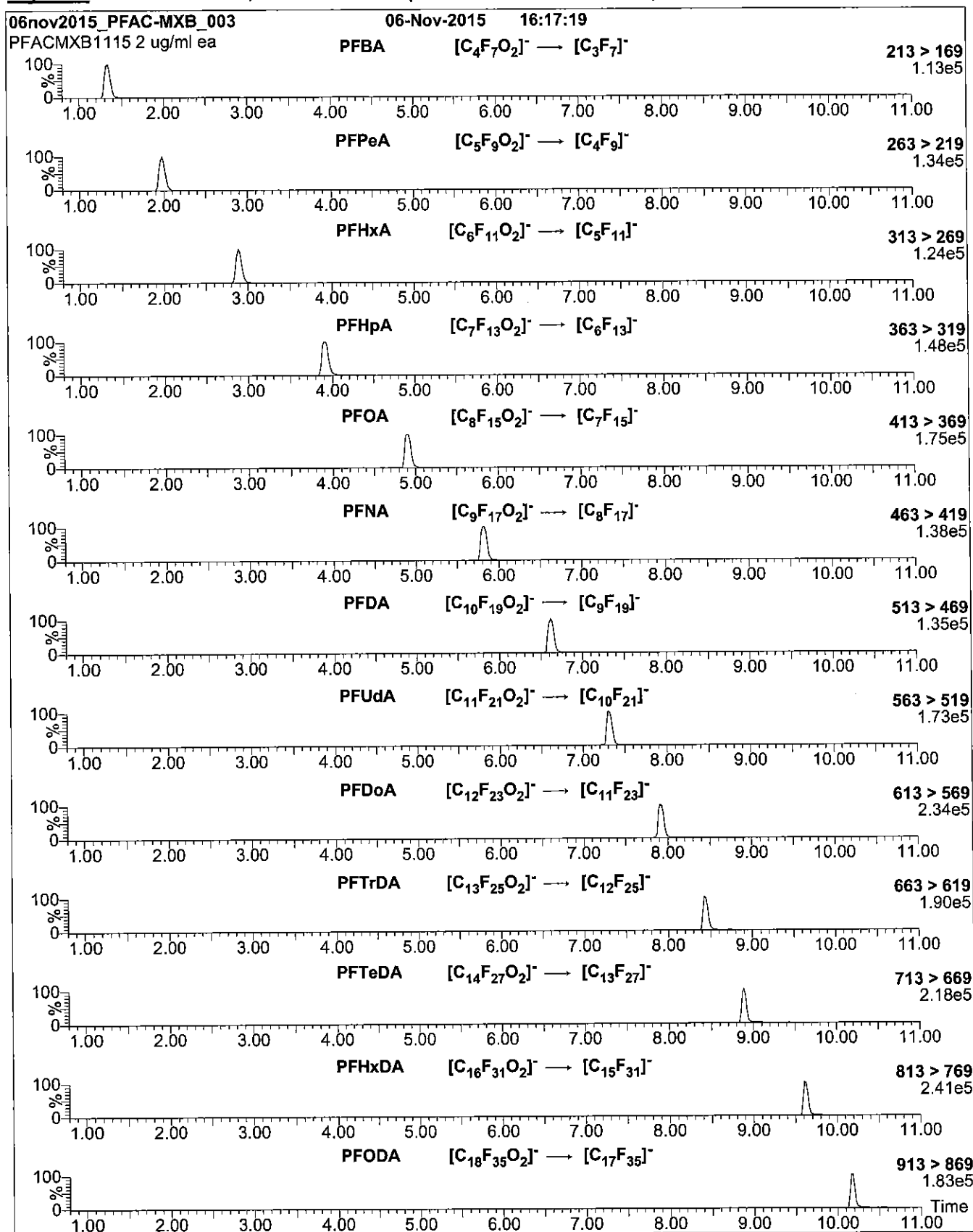
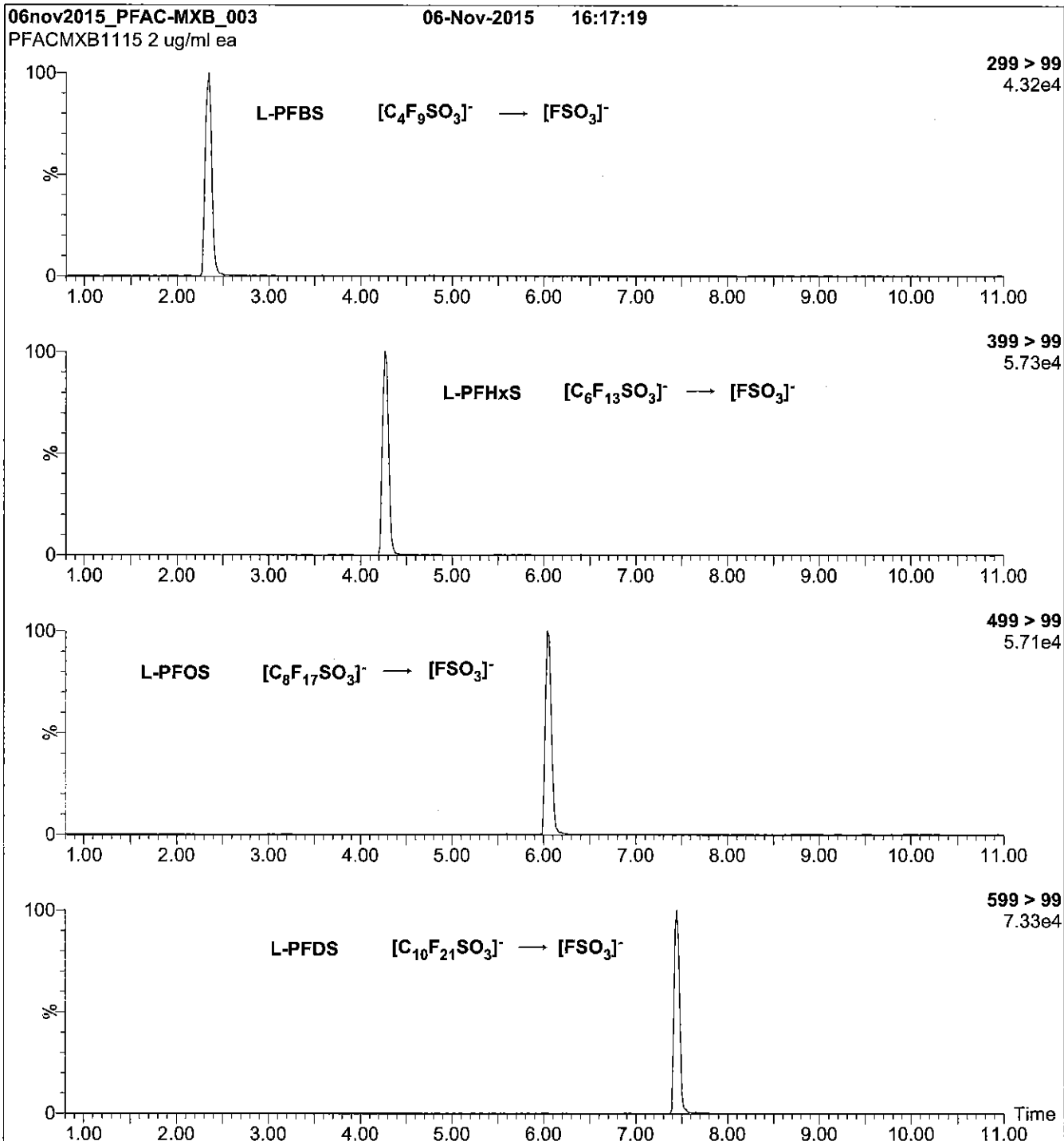


Figure 3: PFAC-MXB; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figures 2 and 3:

Injection: on-column (PFAC-MXB)

Mobile phase: Same as Figure 1

Flow: 300 μ /min

MS Parameters

Collision Gas (mbar) = 3.24e-3

Collision Energy (eV) = 8-50 (variable)

Reagent

LCPFBA_00004



587895

ID: LCPFBA_00004

Exp: 01/30/20 Prod: CBW

PF-n-butanoic acid

R: 2/25/16 CBW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFBA

LOT NUMBER:

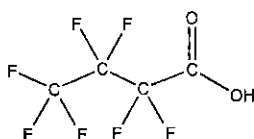
PFBA0115

COMPOUND:

Perfluoro-n-butanoic acid

STRUCTURE:**CAS #:**

375-22-4

**MOLECULAR FORMULA:** $C_4HF_7O_2$ **MOLECULAR WEIGHT:**

214.04

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **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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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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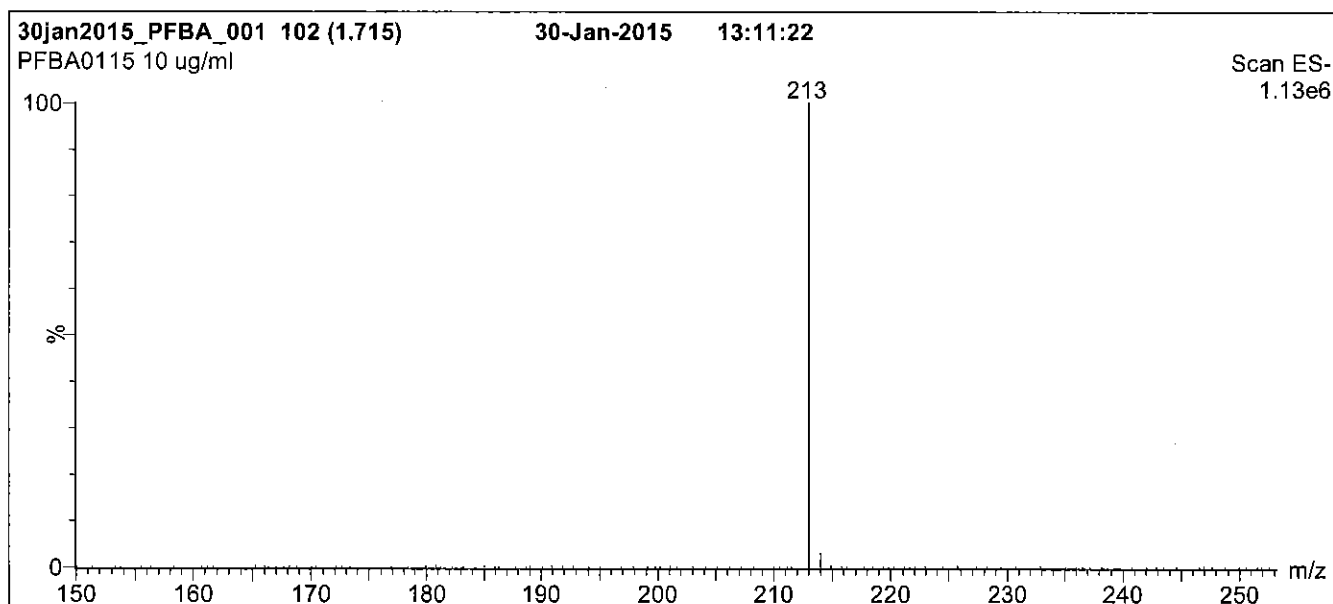
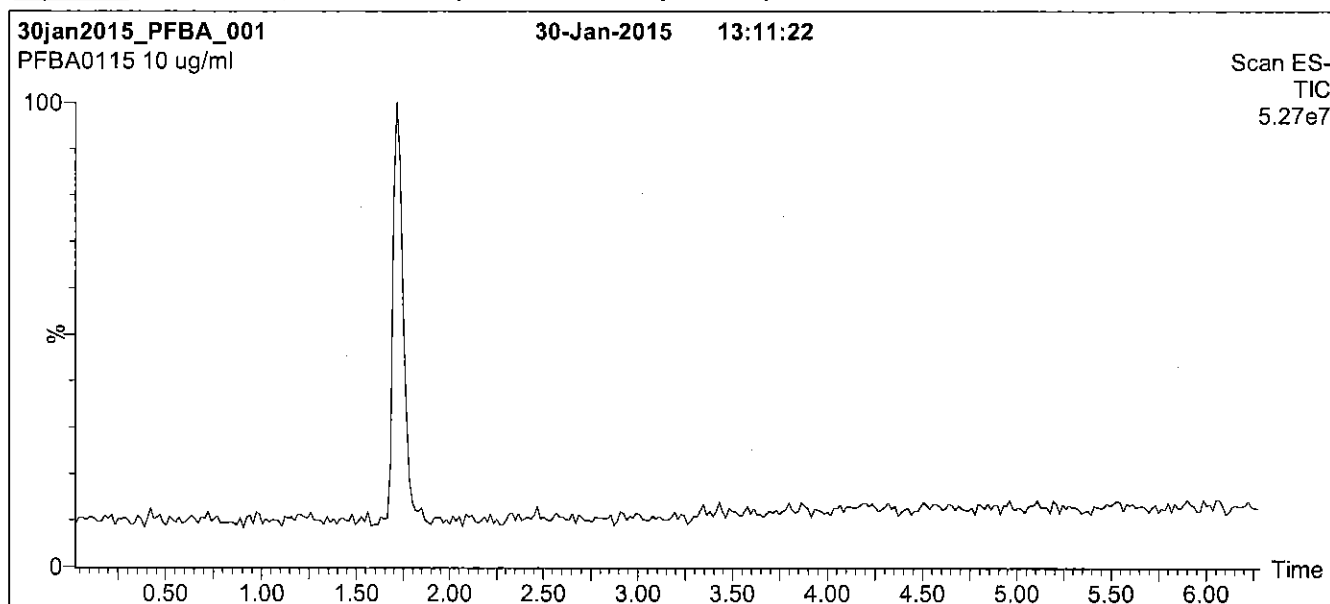
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

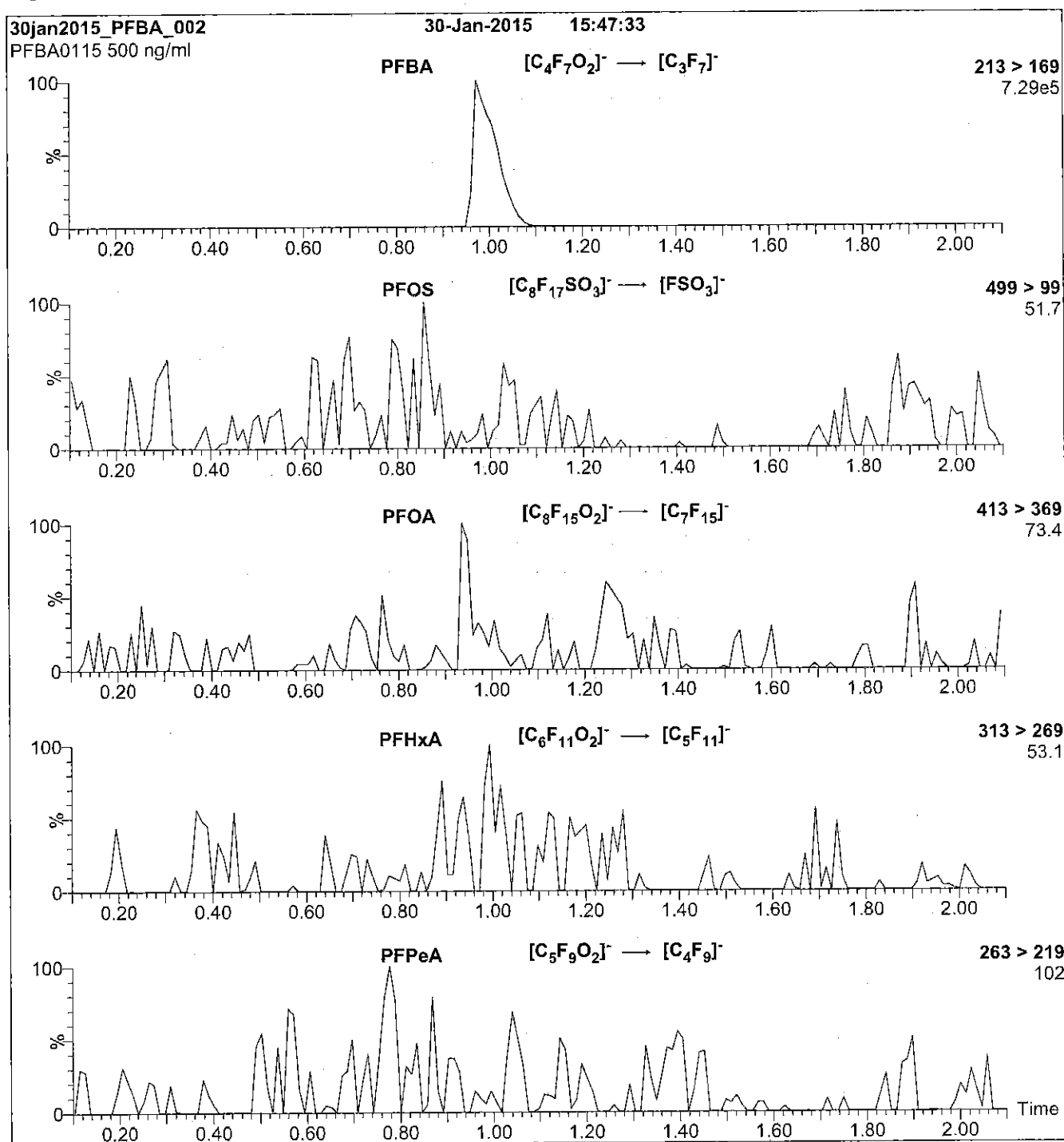
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 μ l (500 ng/ml PFBA)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFBA_00005

Scanned
10/16/14

R: SBC 9/13/16



730531
ID: LCPFBA_00005
Exp: 05/27/21 Ppd: SBC
PF-n-butanoic acid



730532
ID: LCPFBA_00006
Exp: 05/27/21 Ppd: SBC
PF-n-butanoic acid



WELLINGTON
LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:

PFBA

LOT NUMBER:

PFBA0516

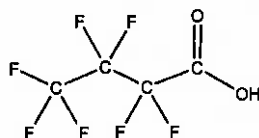
COMPOUND:

Perfluoro-n-butanoic acid

STRUCTURE:

CAS #:

375-22-4



MOLECULAR FORMULA:

C₄HF₇O₂

MOLECULAR WEIGHT:

214.04

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/27/2016

EXPIRY DATE: (mm/dd/yyyy)

05/27/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 05/31/2016

(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

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HOMOGENEITY:

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

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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

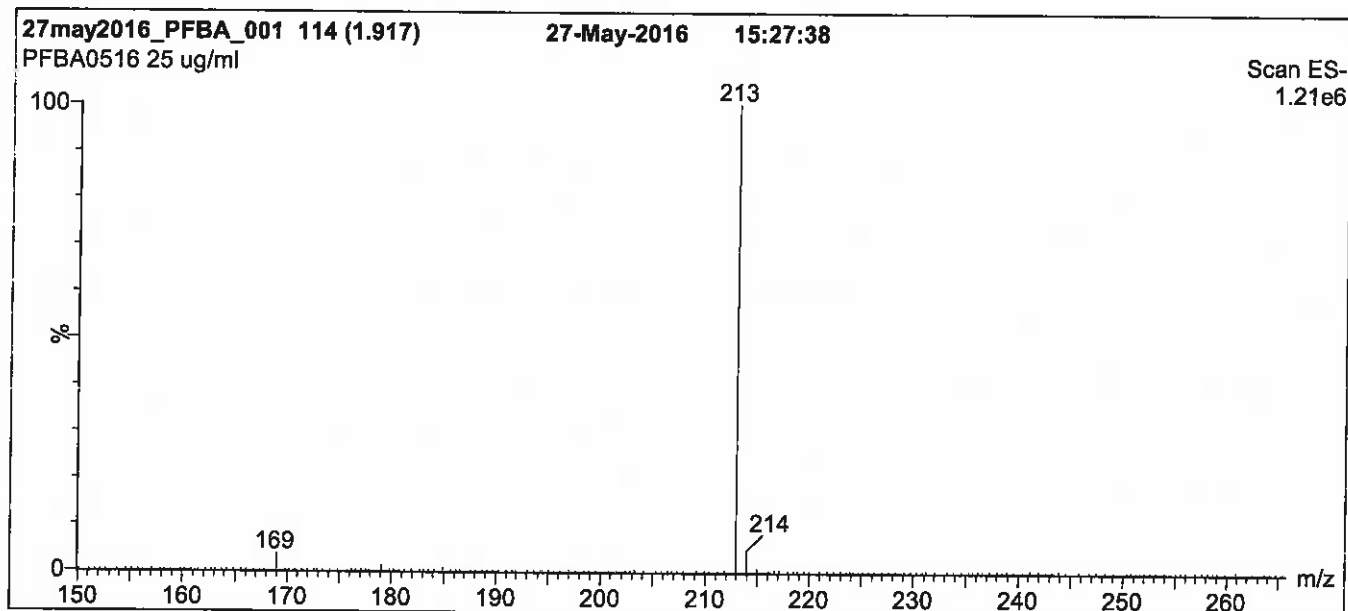
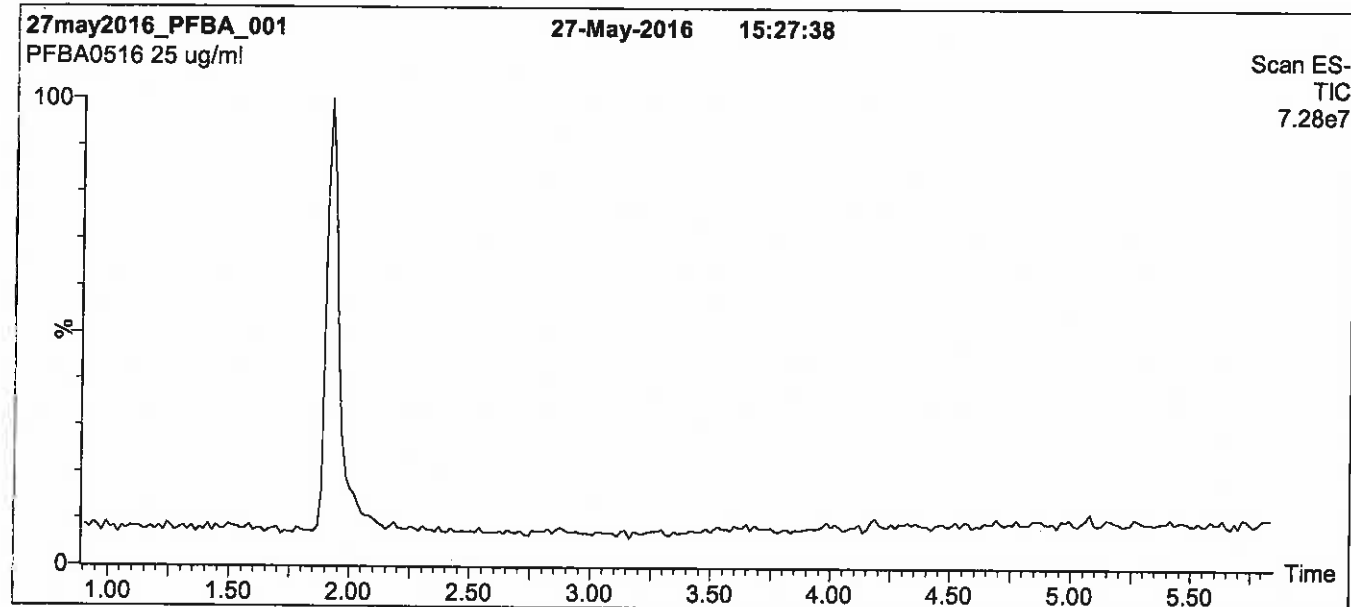
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

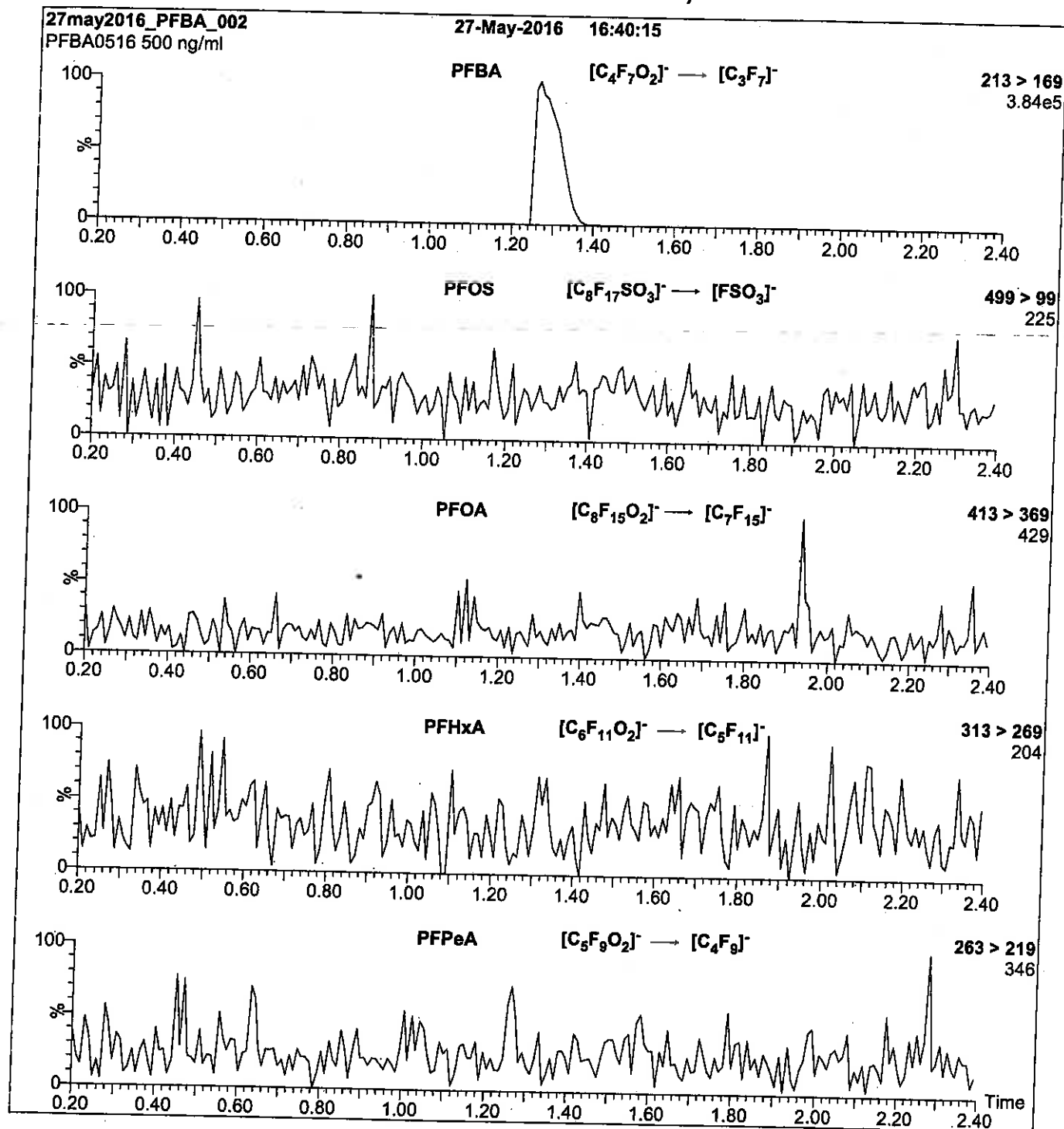
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.62e-3
Collision Energy (eV) = 10

Reagent

LCPFBS_00004



605236

ID: LCPFBFS_00004

Exp: 10/09/19 Prpd: CBW
PF-1-butanefulfonate K sa

Rec. 3/29/16 JRB ✓

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

L-PFBS

LOT NUMBER:

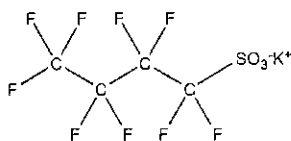
LPFBS1014

COMPOUND:

Potassium perfluoro-1-butanefulfonate

STRUCTURE:**CAS #:**

29420-49-3

**MOLECULAR FORMULA:** $C_4F_9SO_3K$ **MOLECULAR WEIGHT:**

338.19

CONCENTRATION: $50.0 \pm 2.5 \mu\text{g/ml}$ (K salt)**SOLVENT(S):**

Methanol

 $44.2 \pm 2.2 \mu\text{g/ml}$ (PFBS anion)**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.

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Certified By:

B.G. Chittim

Date: 04/02/2015

(mm/dd/yyyy)

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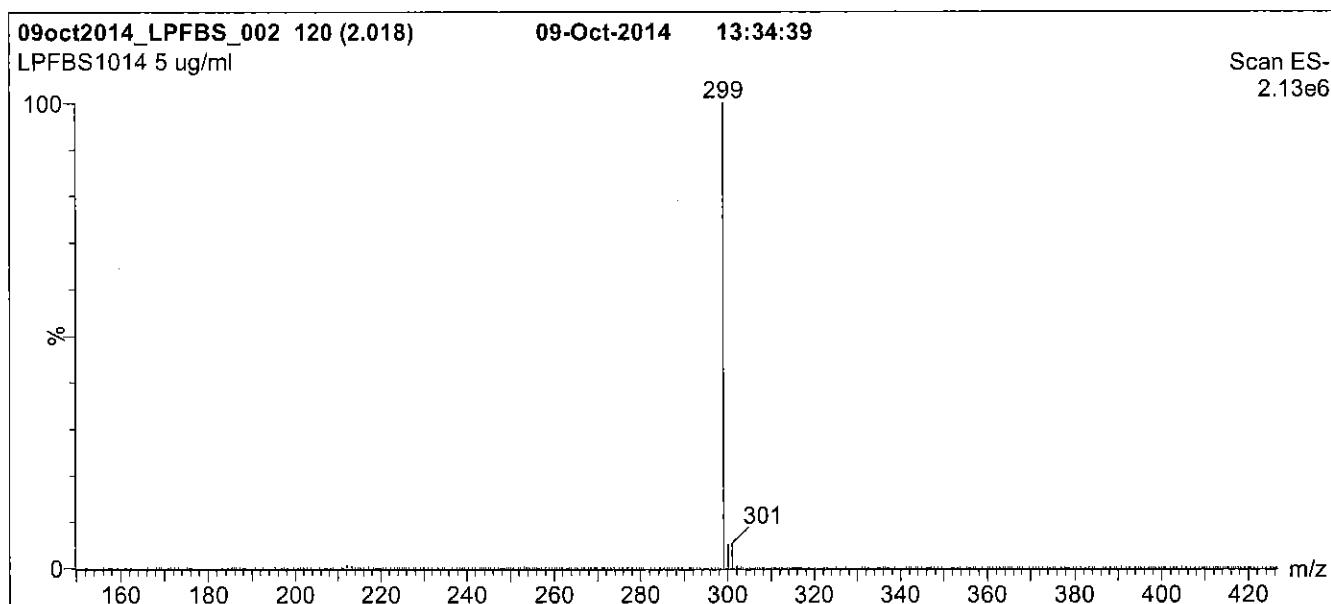
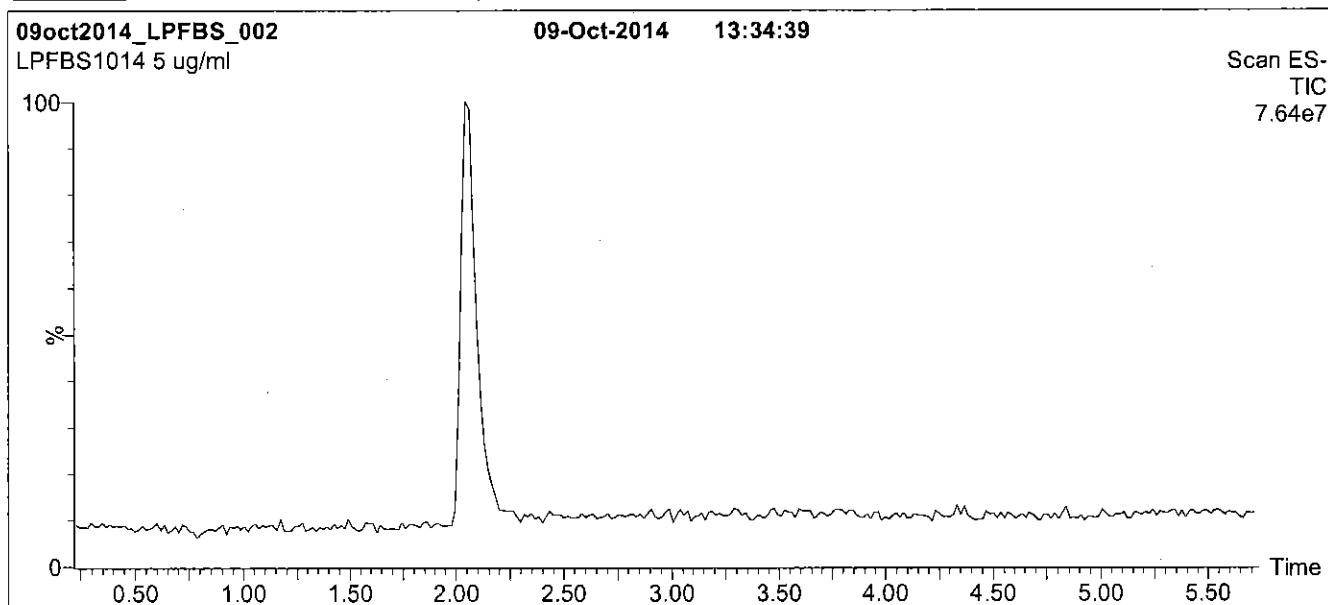
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

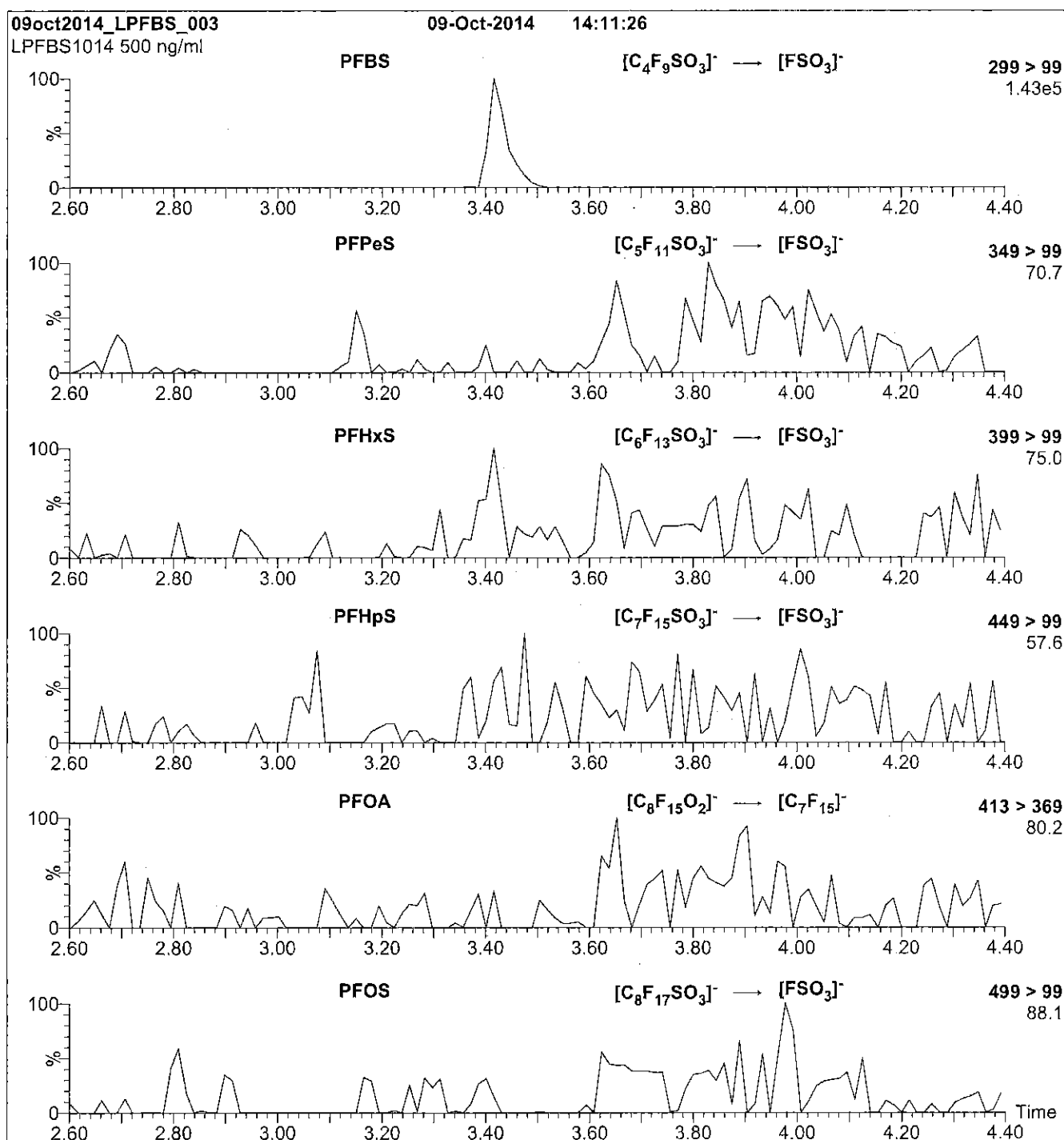
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 μ l (500 ng/ml L-PFBS)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFBS_00005

R: 9/9/16 gbx



728306

ID: LCM2-8:2FTS_00003

Exp: 01/08/21 Prod: SBC

M2-8:2FTS

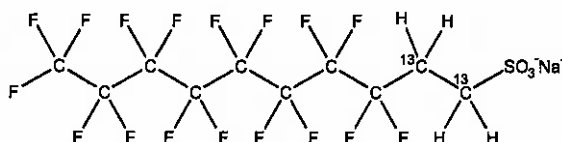


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0116
COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-¹³C₂]decane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₈H₄F₁₇SO₃Na **MOLECULAR WEIGHT:** 552.15
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
 47.9 ± 2.4 µg/ml (M2-8:2FTS anion)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
LAST TESTED: (mm/dd/yyyy) 01/08/2016 (1,2-¹³C₂)
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 ³⁴S (due to natural isotopic abundance) therefore both native 8:2FTS and M2-8:2FTS will produce signals in the m/z 529 to m/z 509 channel during SRM analysis. We recommend using the m/z 529 to m/z 81 transition to monitor for M2-8:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 01/18/2016

(mm/dd/yyyy)

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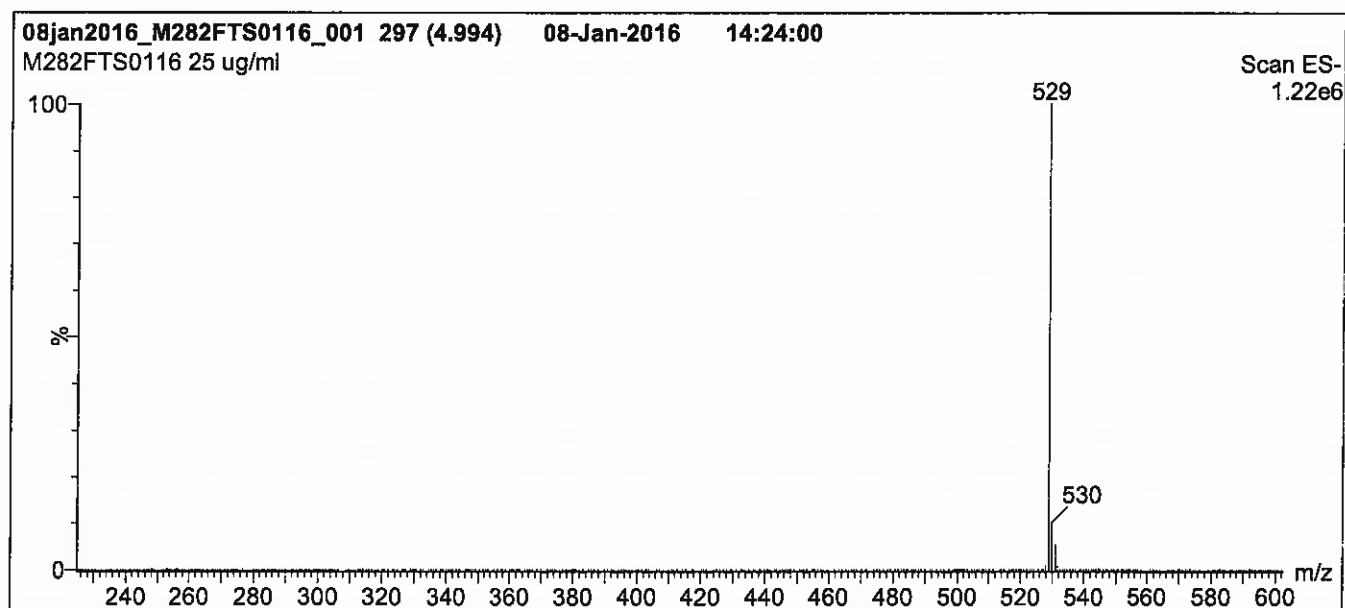
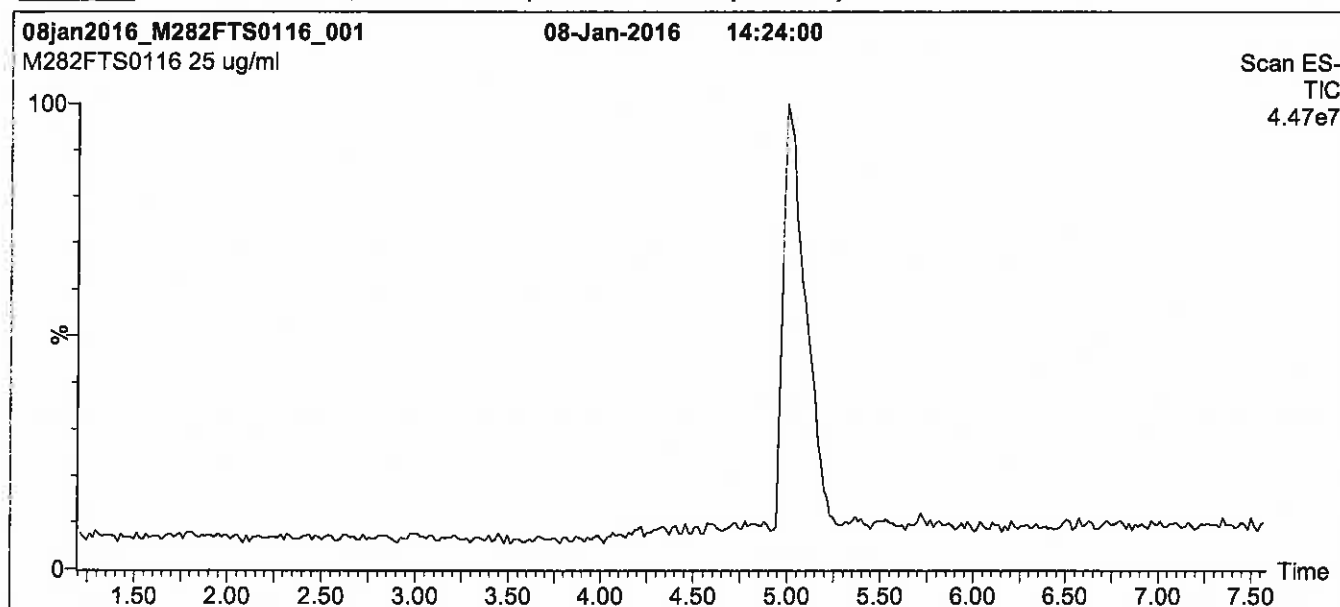
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Figure 1: M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

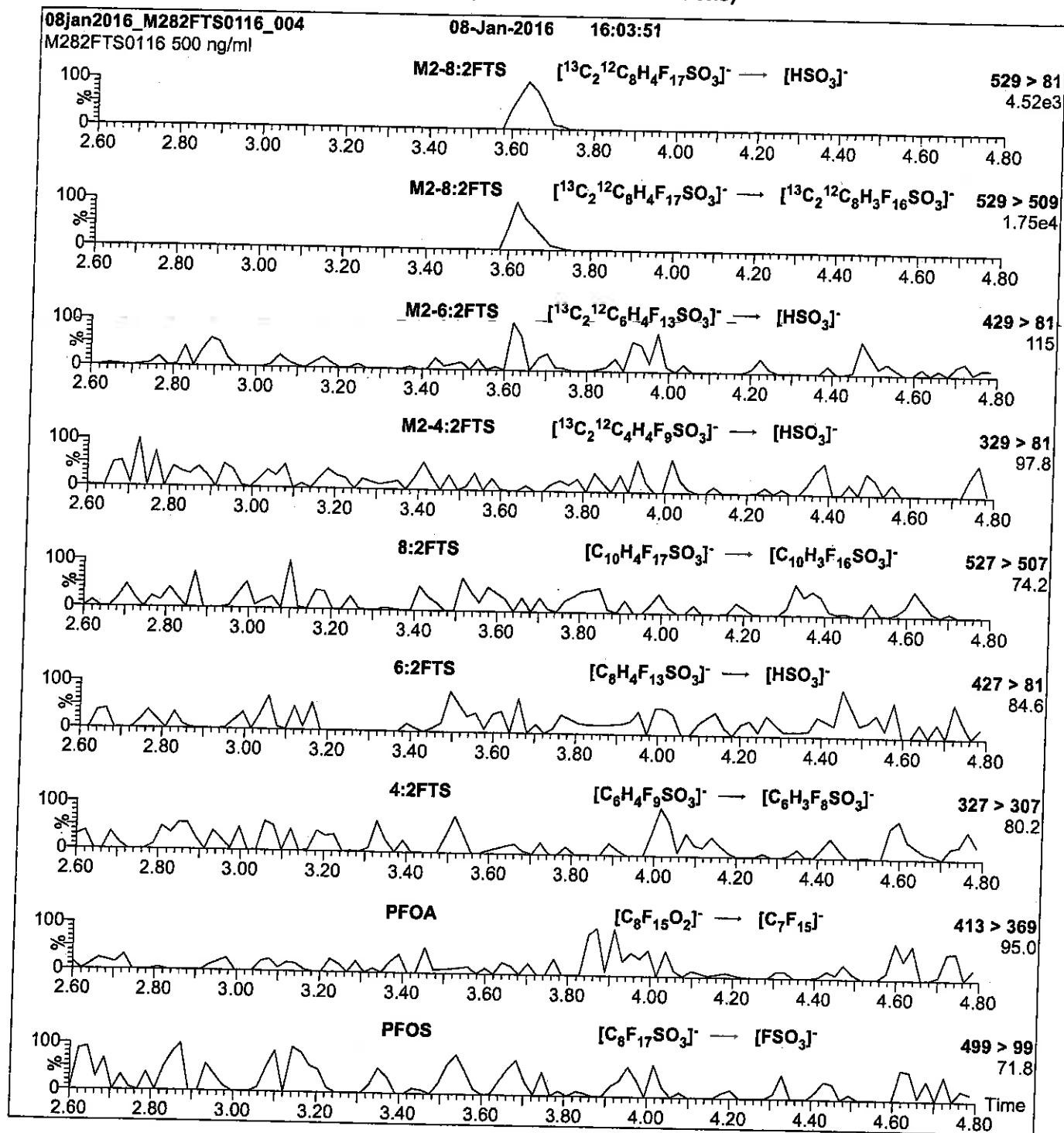
Time: 10 min
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

R: SBC 9/13/16



730511

ID: LCPFBFS_00005

Exp: 03/15/21 Pripd: SBC

PF-1-butanedisulfonate K sa



730512

ID: LCPFBFS_00006

Exp: 03/15/21 Pripd: SBC

PF-1-butanedisulfonate K sa



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFBS

COMPOUND:

Potassium perfluoro-1-butanedisulfonate

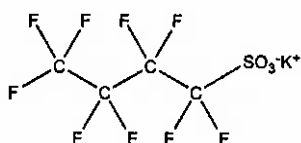
LOT NUMBER:

LPFBFS0316

STRUCTURE:

CAS #:

29420-49-3



MOLECULAR FORMULA:

C₄F₉SO₃K

CONCENTRATION:

50.0 ± 2.5 µg/ml (K salt)
44.2 ± 2.2 µg/ml (PFBS anion)

MOLECULAR WEIGHT:

338.19

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

03/15/2016

EXPIRY DATE: (mm/dd/yyyy)

03/15/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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Certified By:

B.G. Chittim

Date: 03/21/2016

(mm/dd/yyyy)

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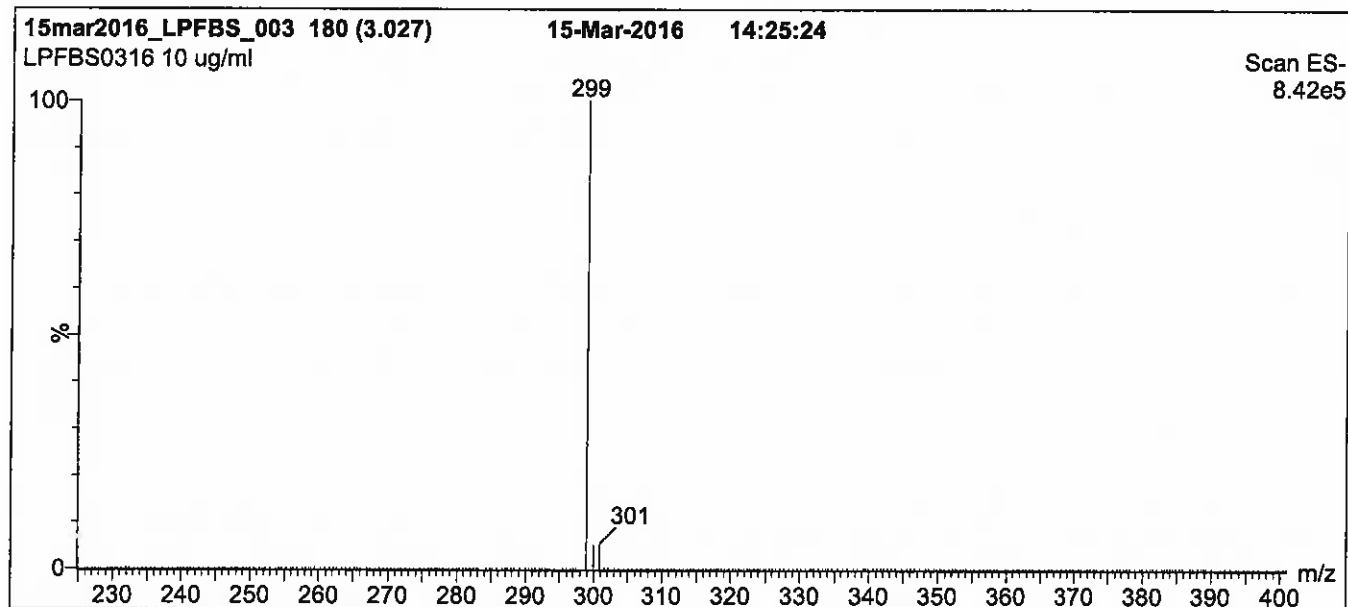
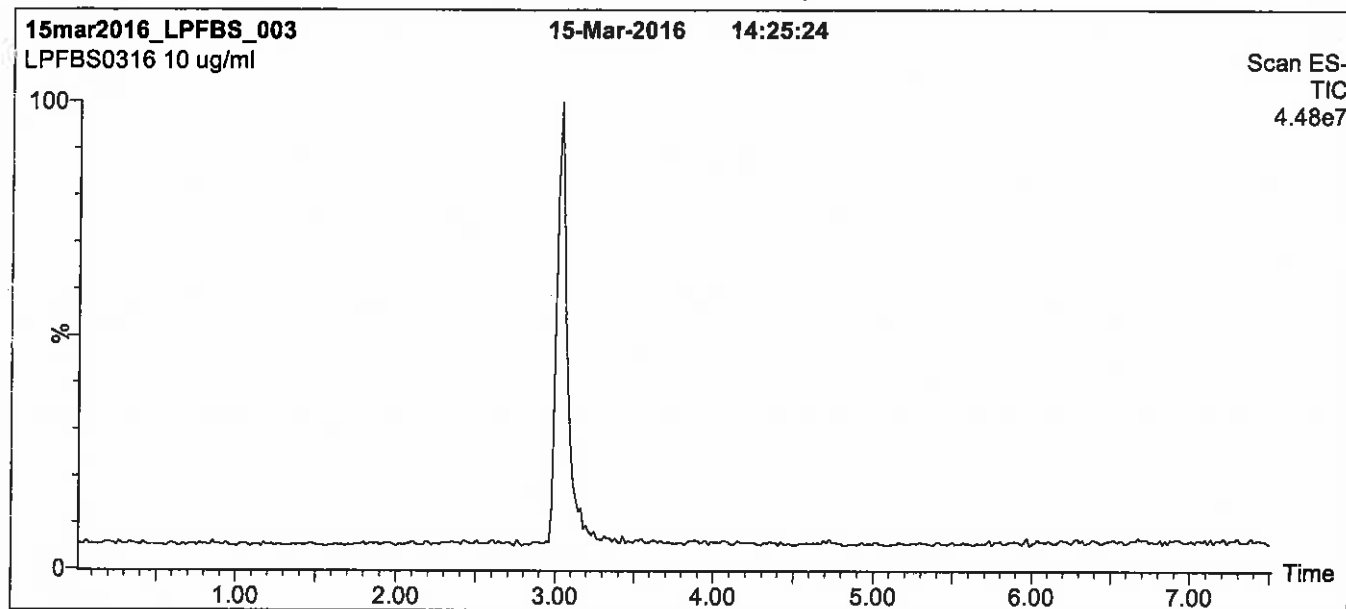
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient

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

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)

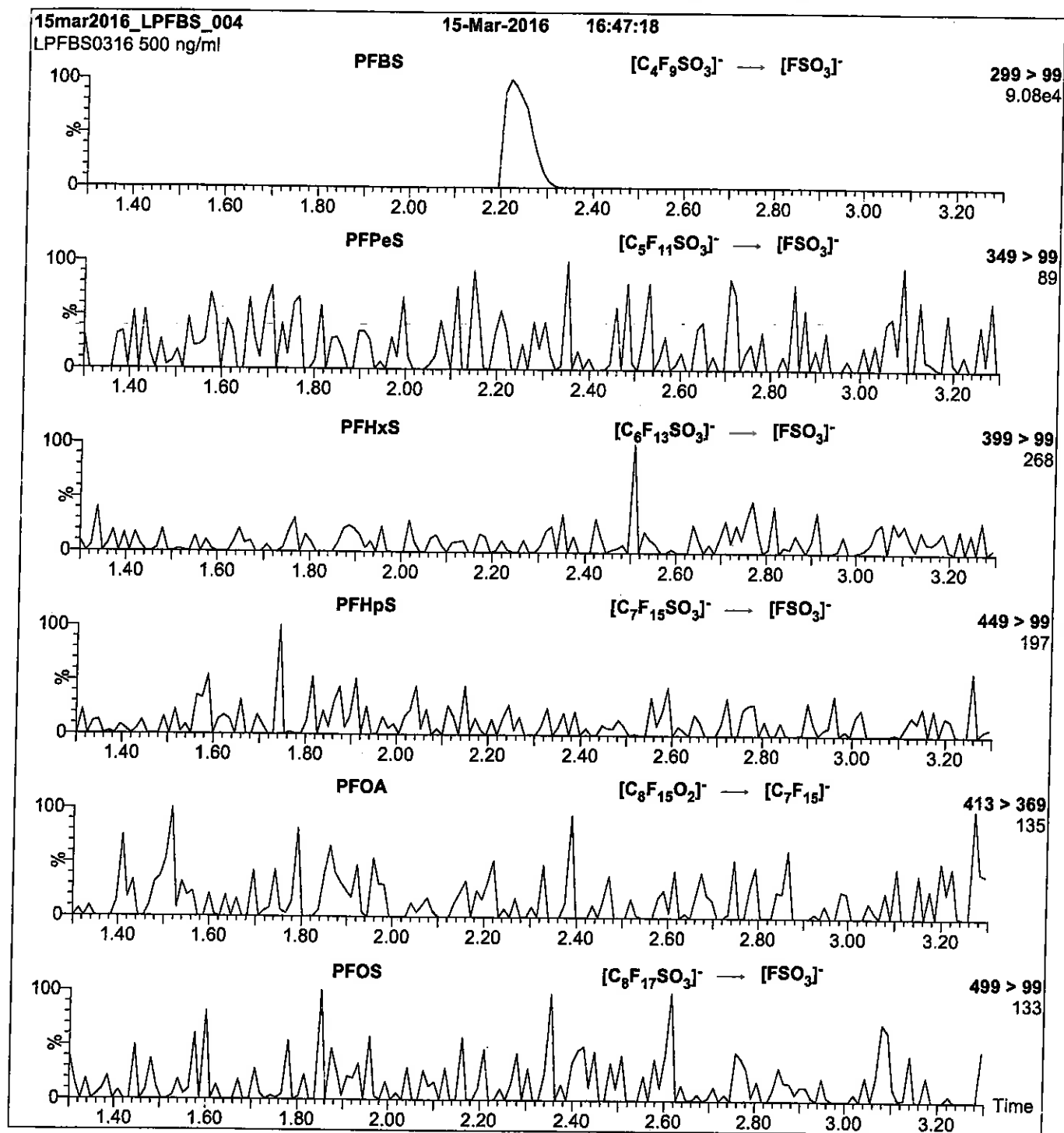
Capillary Voltage (kV) = 2.00

Cone Voltage (V) = 40.00

Cone Gas Flow (l/hr) = 50

Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml L-PFBS)

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 25

Reagent

LCPFDA_00005

R: 7/16/16 CBW



671576

ID: LCPFDA_00305

Exp: 07/02/20 Ppdt: CBW

PF-n-decanoic acid



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDA

LOT NUMBER:

PFDA0615

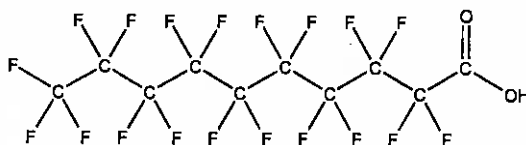
COMPOUND:

Perfluoro-n-decanoic acid

STRUCTURE:

CAS #:

335-76-2



MOLECULAR FORMULA:

$C_{10}H_{19}O_2$

MOLECULAR WEIGHT:

514.08

CONCENTRATION:

$50 \pm 2.5 \mu\text{g/ml}$

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.

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

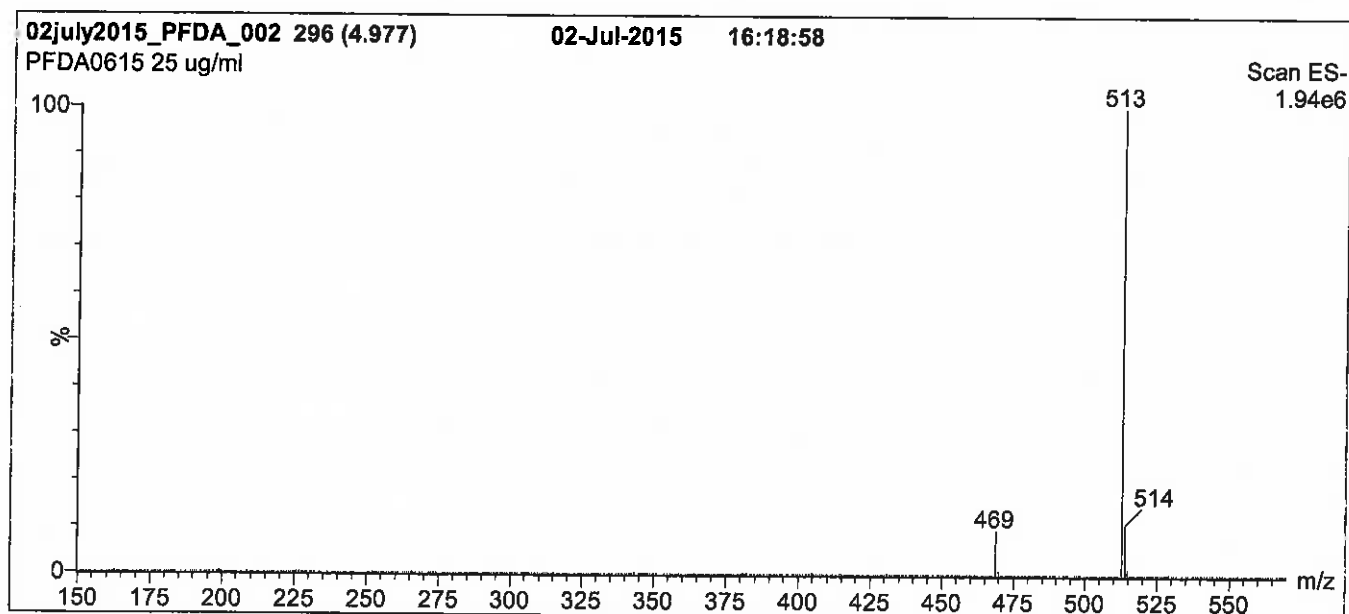
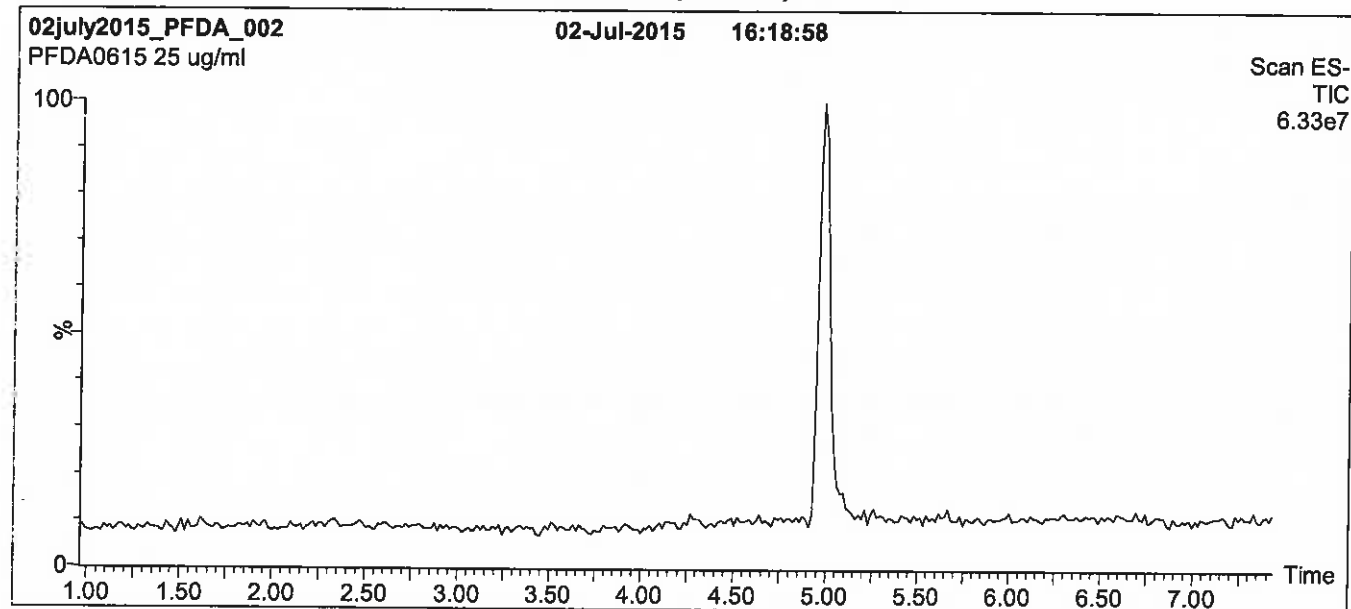
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

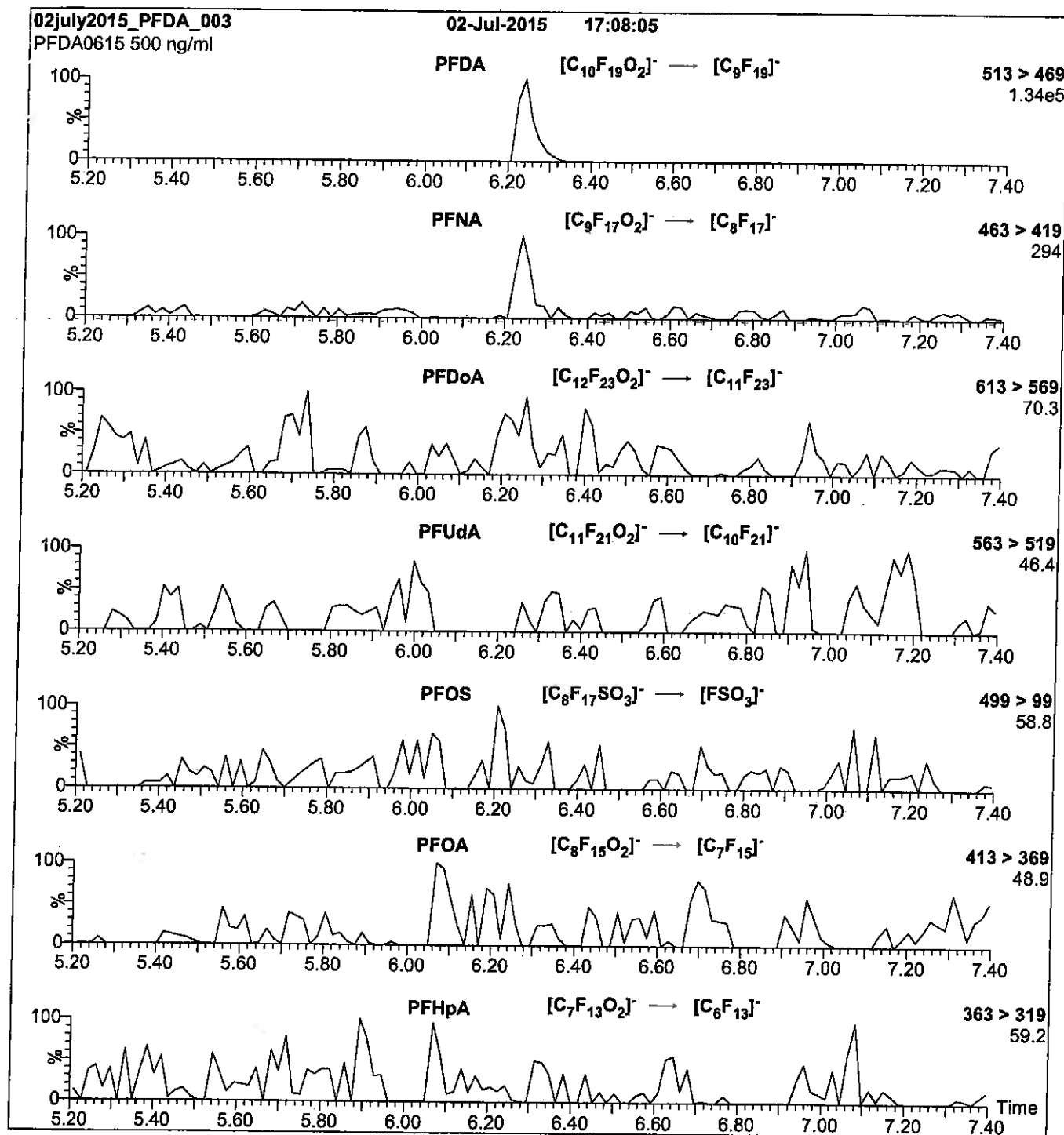
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.62e-3
Collision Energy (eV) = 13

Reagent

LCPFDoA_00005

R: 7/6/16 car

671601
ID: LCPFD0A_00005
Exp: 01/30/20 Pripd: CSW
PF-n-dodecanoic acid

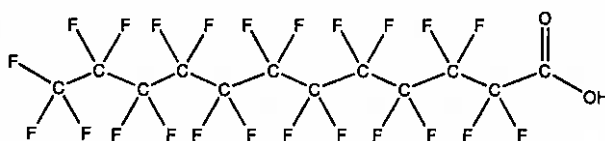


WELLINGTON
LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFD0A **LOT NUMBER:** PFD0A0115
COMPOUND: Perfluoro-n-dodecanoic acid

STRUCTURE: **CAS #:** 307-55-1



MOLECULAR FORMULA: $C_{12}H_{23}O_2$ **MOLECULAR WEIGHT:** 614.10
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):** Methanol
Water (<1%)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

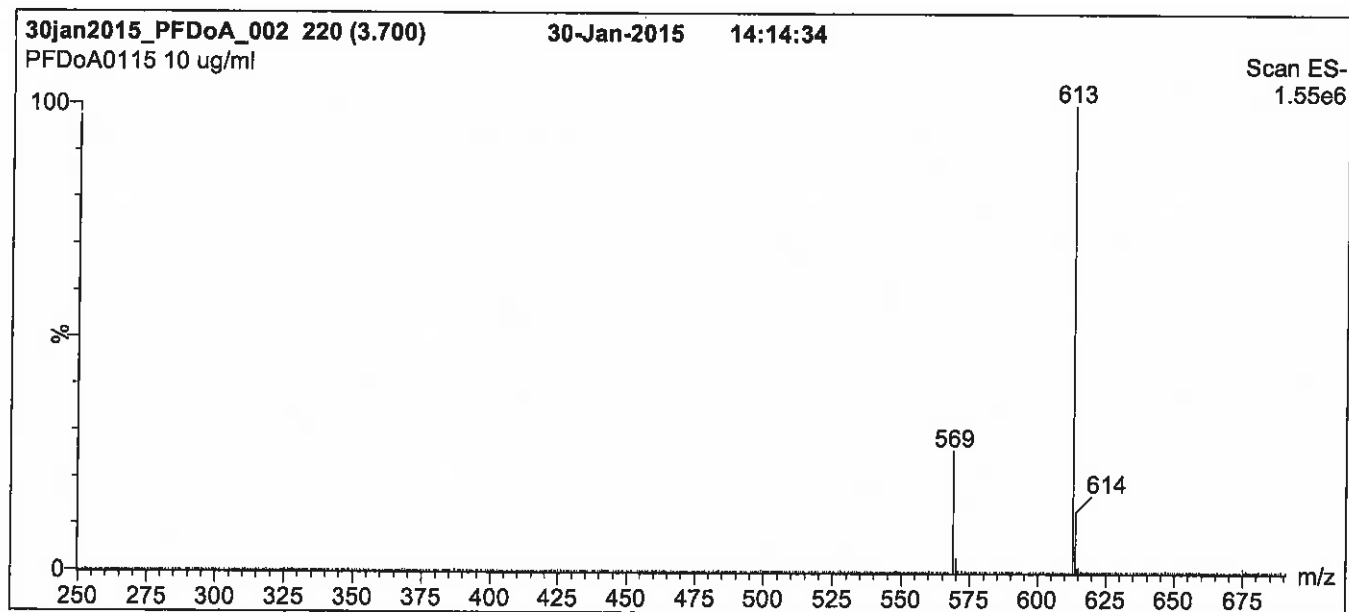
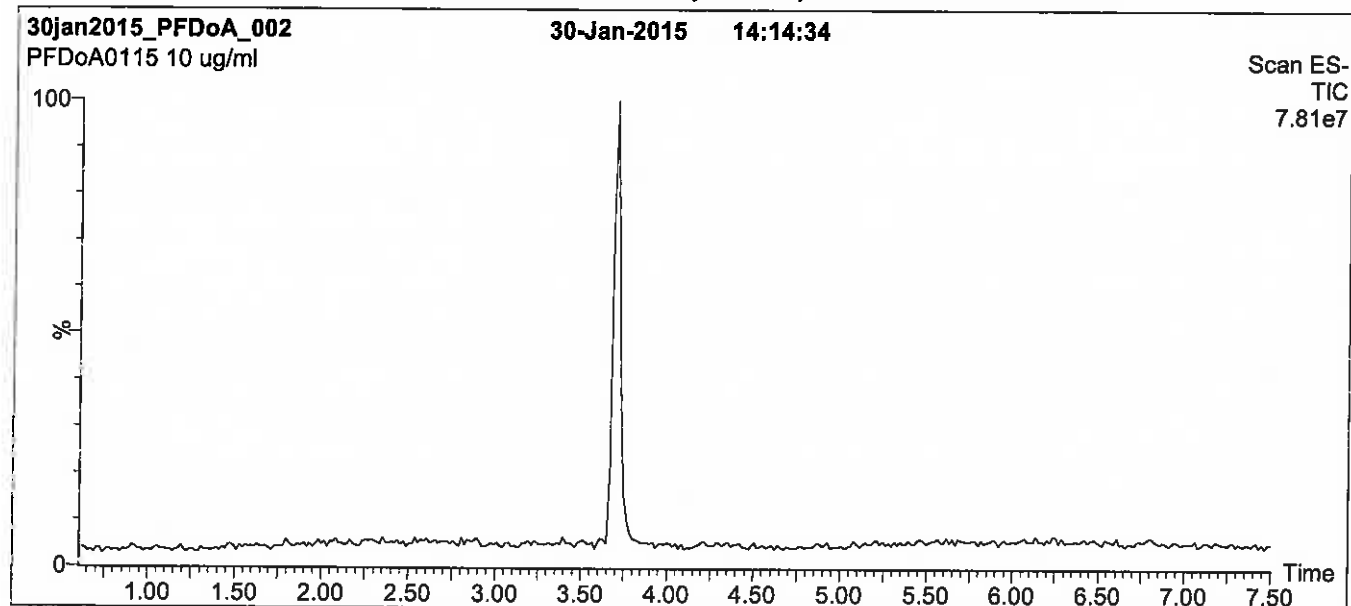
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

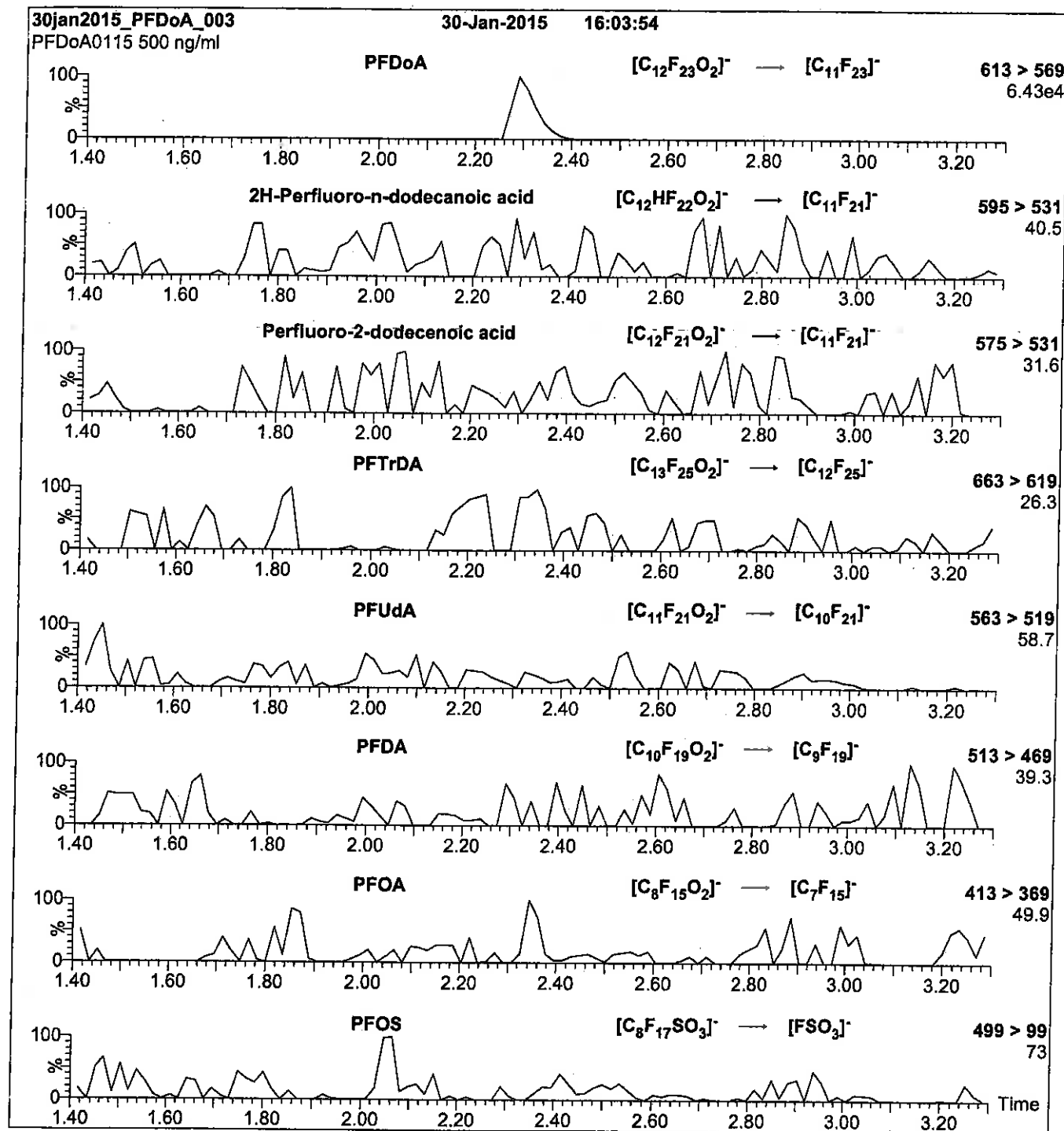
Flow: 300 μ l/min

MS Parameters

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



Conditions for Figure 2:

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

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 μ l/min

Reagent

LCPFDS_00005



605240

ID: LCPFDS_00005

Exp: 07/02/20 Prod: CBW

PF-1-decanesulfonate sodi

Rec. 3/29/16 JRB

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

L-PFDS

LOT NUMBER:

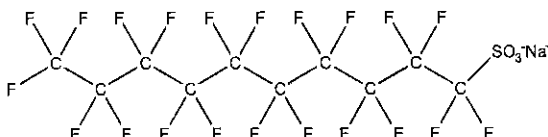
LPFDS0615

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)

SOLVENT(S):

Methanol

48.2 ± 2.4 µg/ml (PFDS anion)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

07/02/2015

EXPIRY DATE: (mm/dd/yyyy)

07/02/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.9% of sodium perfluoro-1-dodecanesulfonate (L-PFDoS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

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

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:

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

UNCERTAINTY:

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

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

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

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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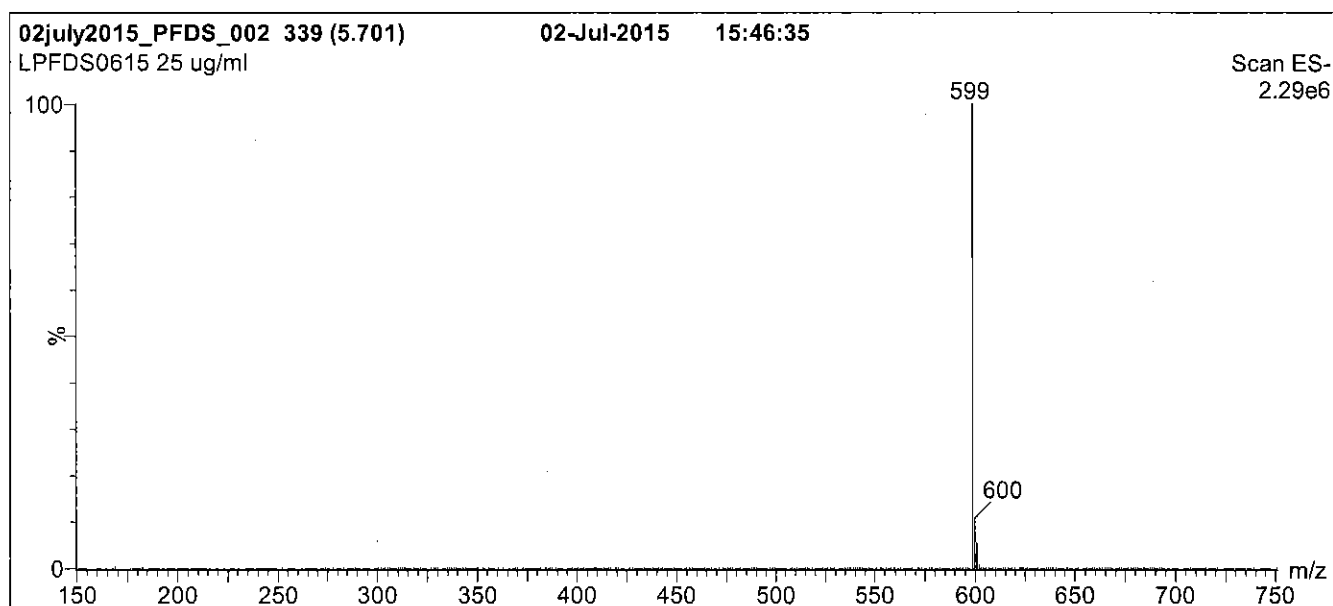
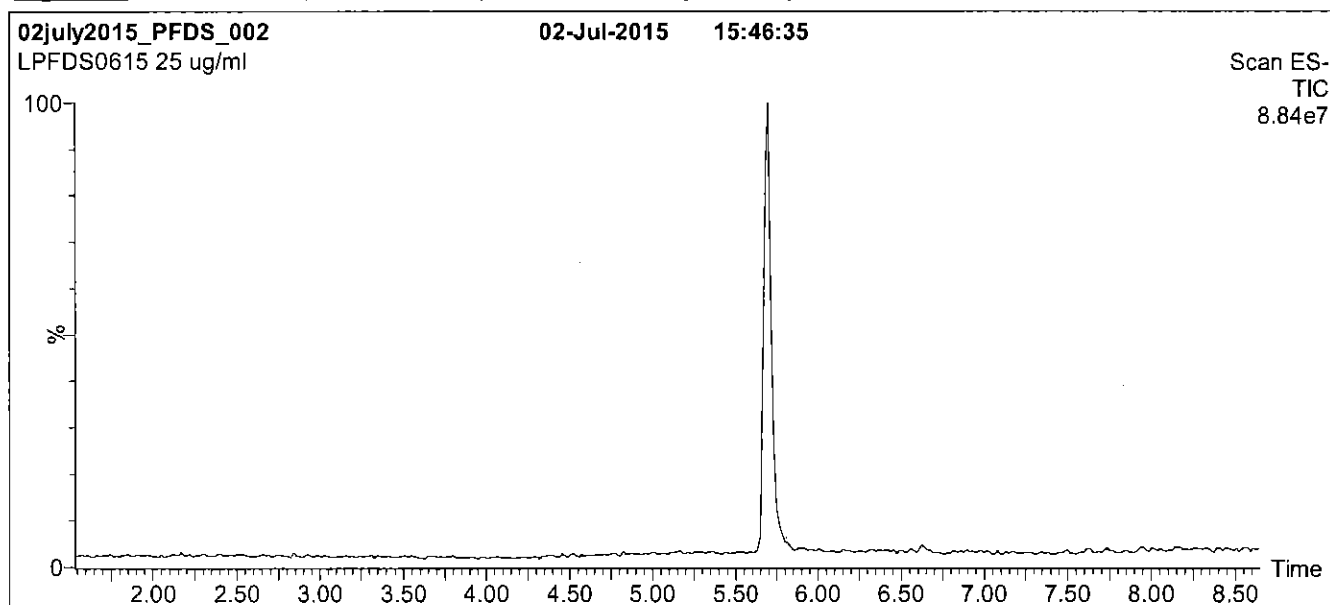
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

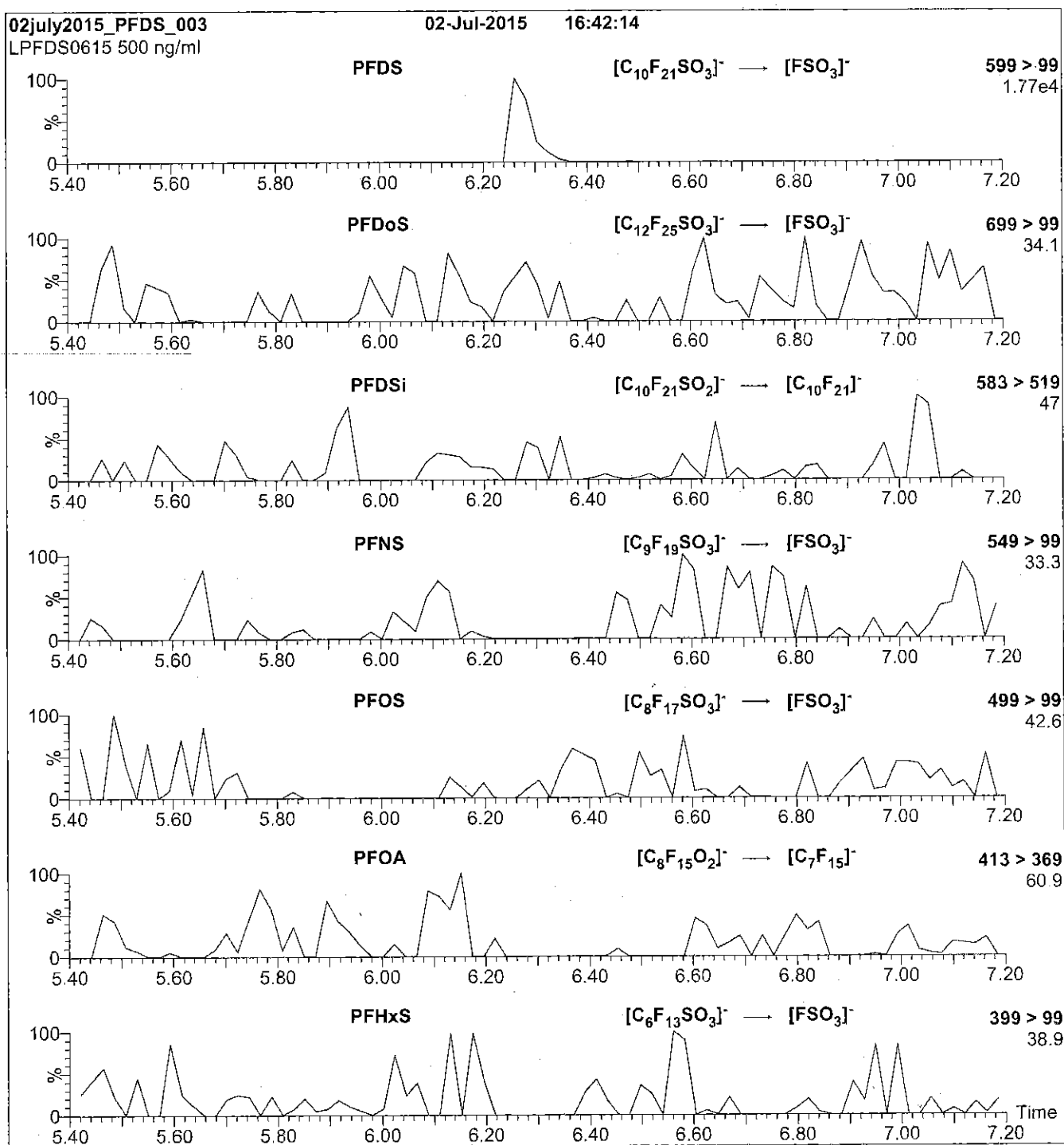
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 70.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml L-PFDS)

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 50

Reagent

LCPFHpA_00005



609639

ID: LCPFHpA_00005

Exp: 01/22/21 Prpd: CBW

PF-n-heptanoic acid

R: 4/7/16 CBW



WELLINGTON LABORATORIES

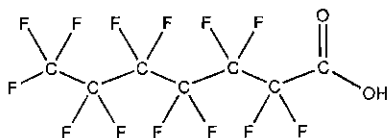
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFHpA

LOT NUMBER: PFHpA0116**COMPOUND:**

Perfluoro-n-heptanoic acid

STRUCTURE:**CAS #:** 375-85-9**MOLECULAR FORMULA:** $C_7H_{13}O_2$ **MOLECULAR WEIGHT:** 364.06**CONCENTRATION:** $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):**Methanol
Water (<1%)**CHEMICAL PURITY:**

>98%

LAST TESTED: (mm/dd/yyyy)

01/22/2016

EXPIRY DATE: (mm/dd/yyyy)

01/22/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 02/02/2016

(mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

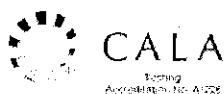
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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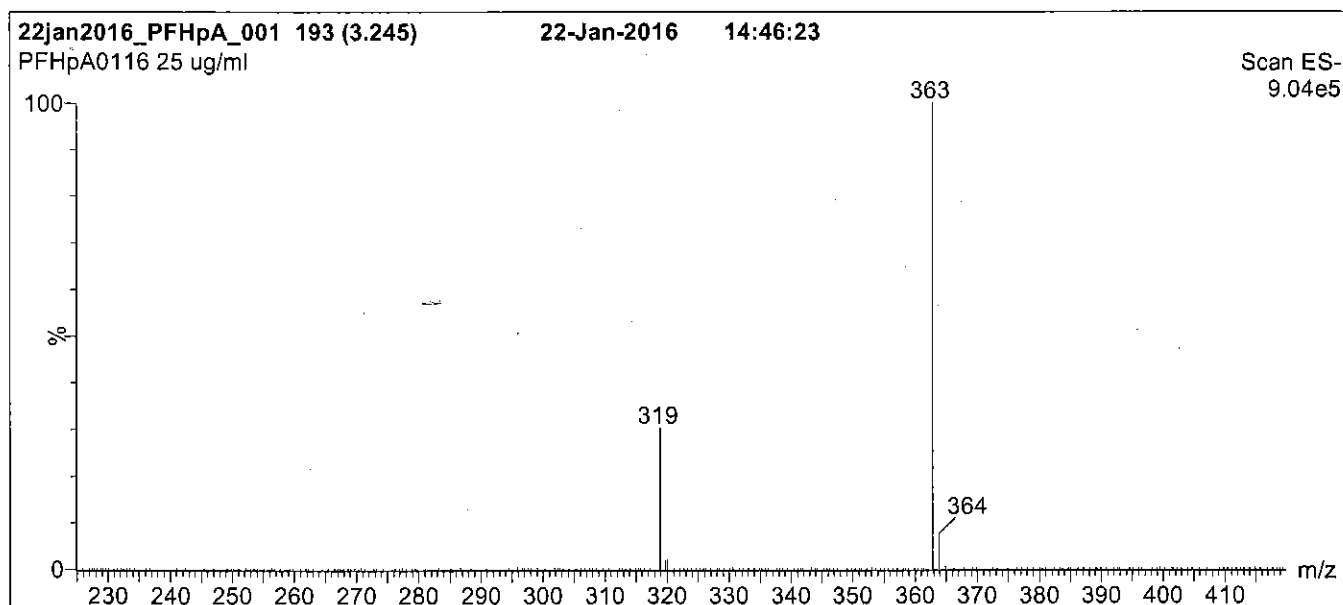
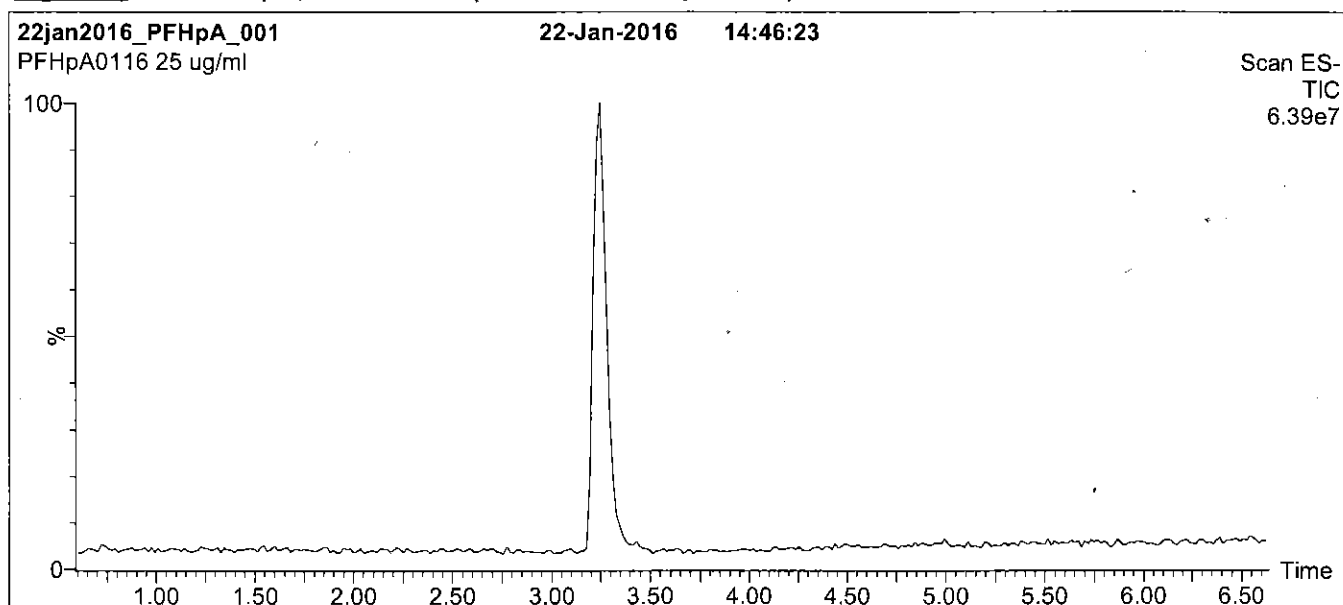
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

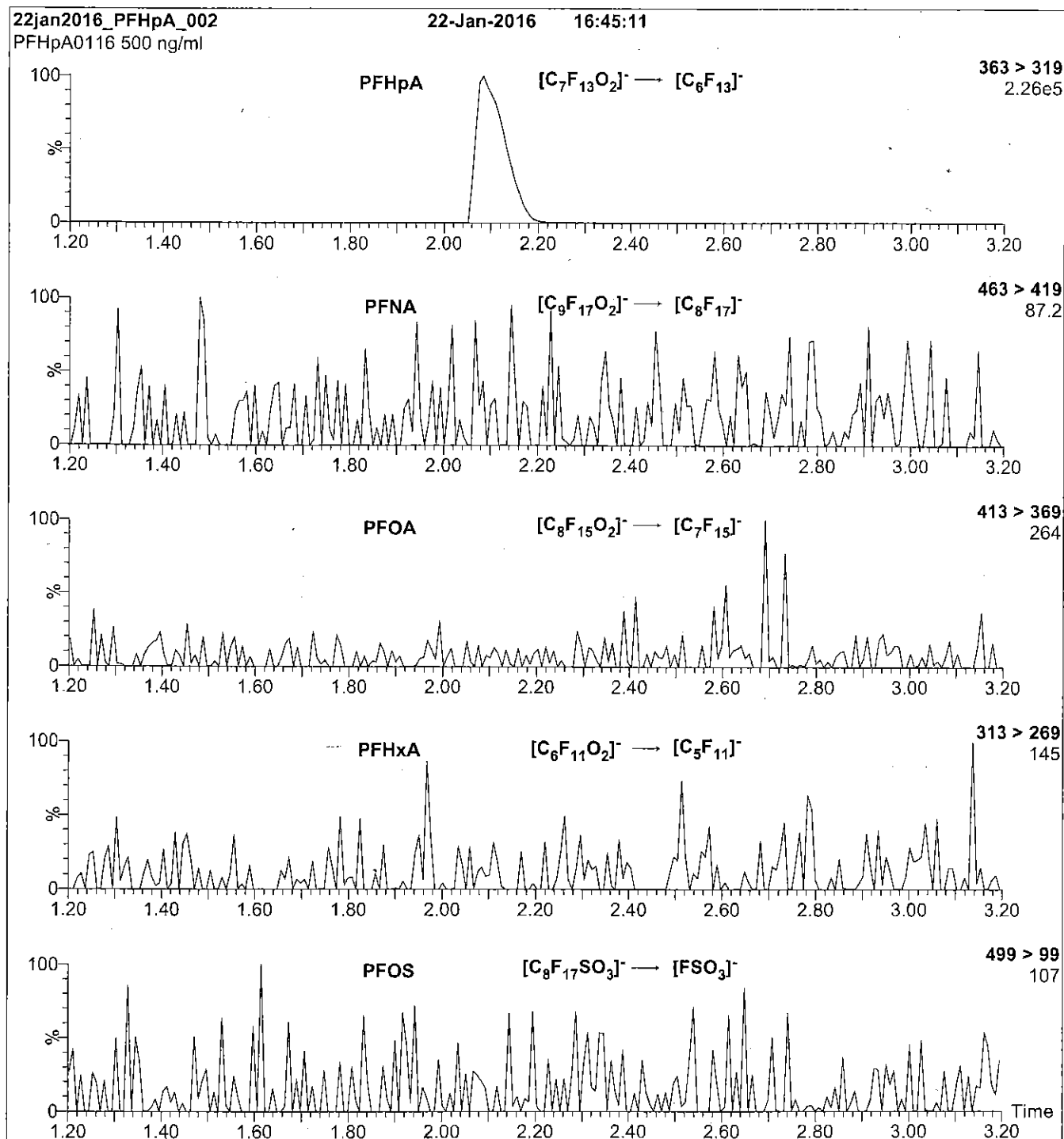
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 11

Reagent

LCPFHpS_00008



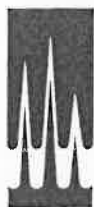
627751

ID: LCPFHPS_00008

Exp: 11/06/20 Pp: CBW

PFHpS at 47.6ug/mL

R: 5/10/16 CBW

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

L-PFHPS

LOT NUMBER:

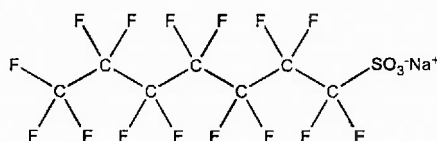
LPFHPS1115

COMPOUND:

Sodium perfluoro-1-heptanesulfonate

STRUCTURE:**CAS #:**

Not available

**MOLECULAR FORMULA:** $C_7F_{15}SO_3Na$ **MOLECULAR WEIGHT:**

472.10

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

Methanol

 $47.6 \pm 2.4 \mu\text{g/ml}$ (PFHpS anion)**CHEMICAL PURITY:**

>98%

LAST TESTED: (mm/dd/yyyy)

11/06/2015

EXPIRY DATE: (mm/dd/yyyy)

11/06/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: 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 ($C_8F_{13}SO_3Na$) 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

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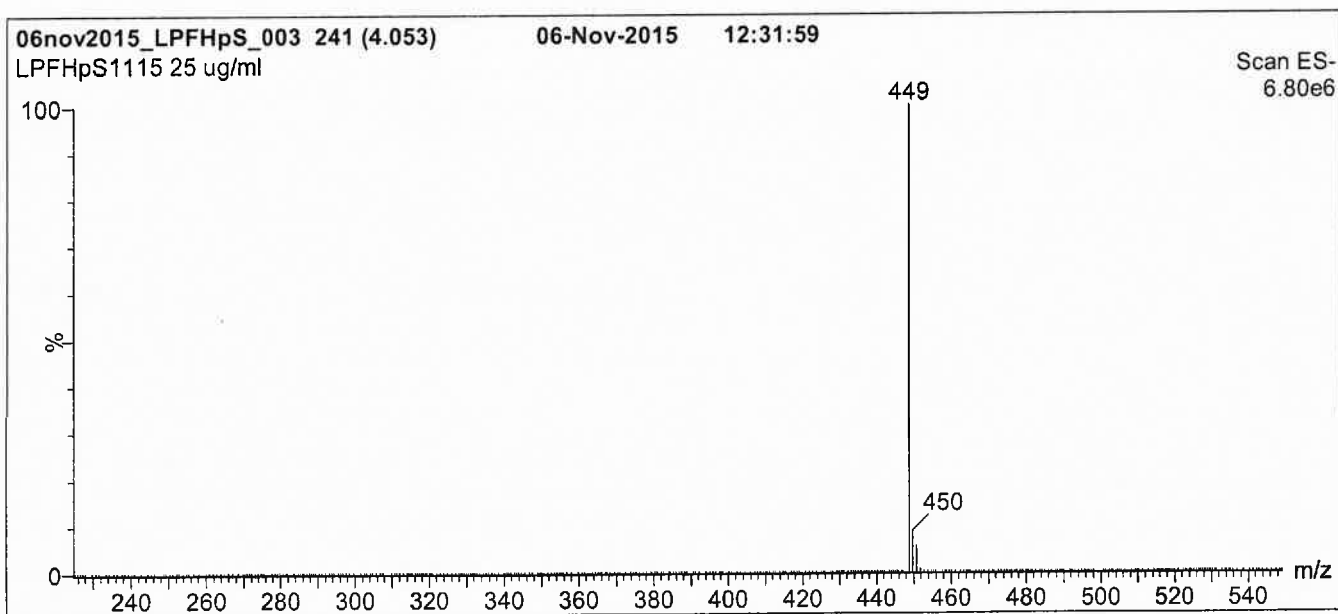
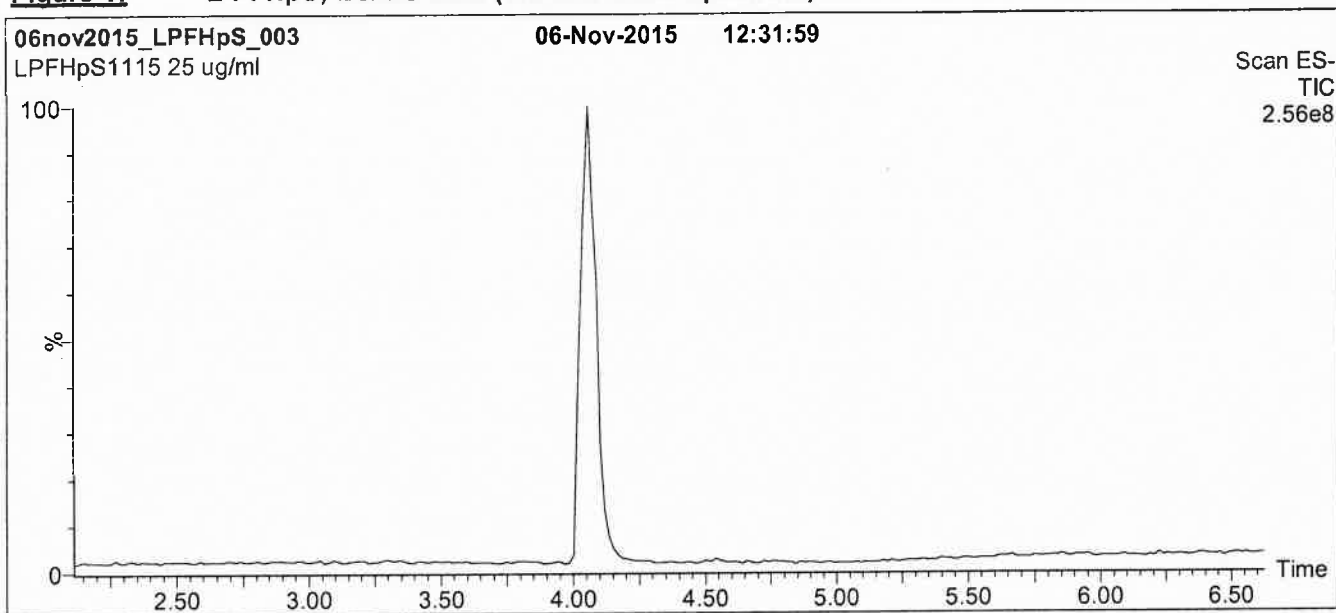
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

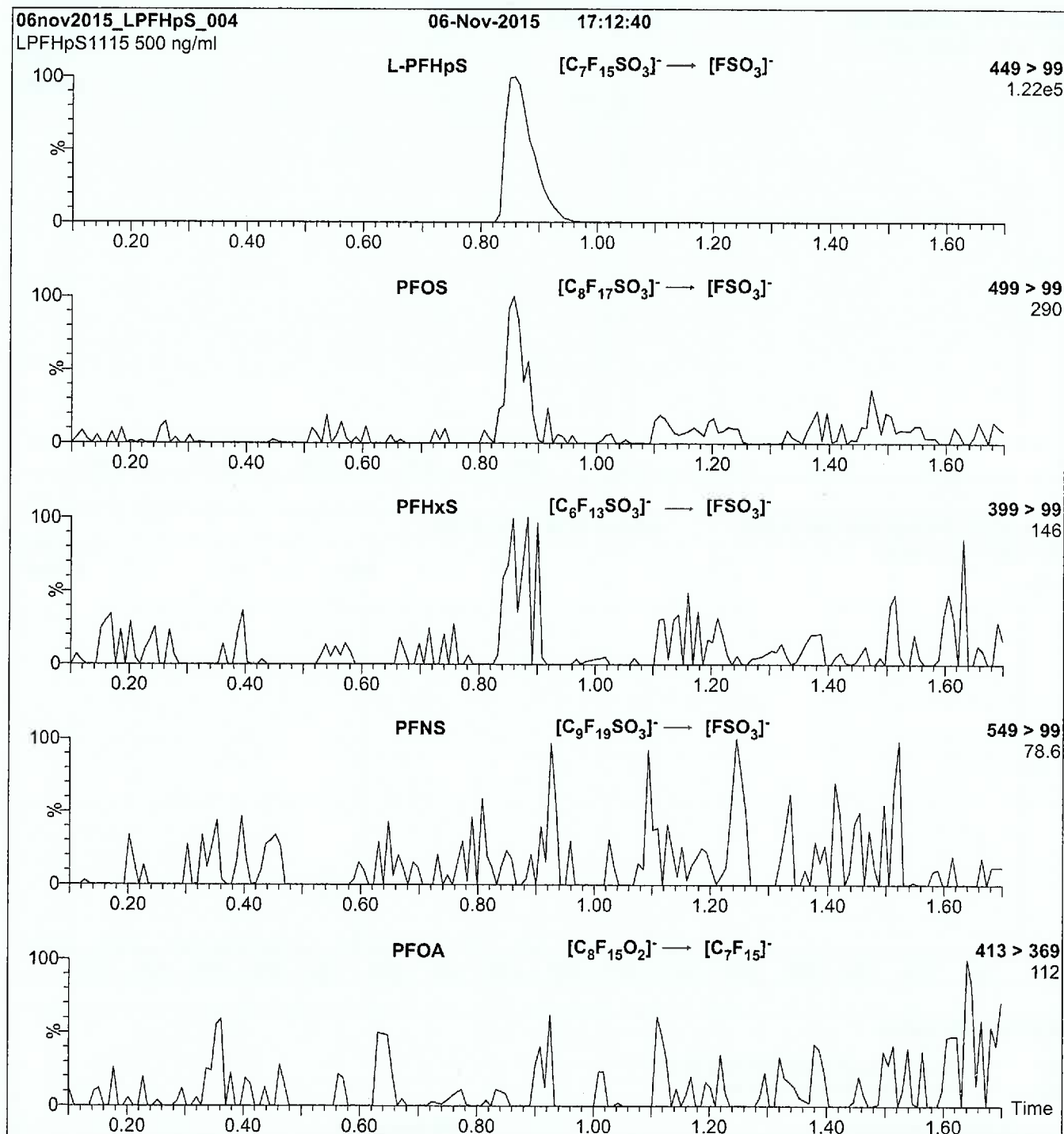
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml L-PFHpS)

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 35

Reagent

LCPFHpS_00009

Scanned
10/14/16 SP
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



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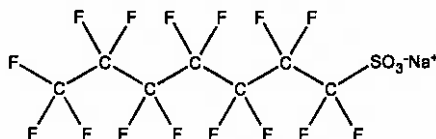
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: L-PFHPS
COMPOUND: Sodium perfluoro-1-heptanesulfonate

LOT NUMBER: LPFHPS1115

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $C_7F_{15}SO_3Na$
CONCENTRATION: $50.0 \pm 2.5 \mu g/mL$ (Na salt)
 $47.6 \pm 2.4 \mu g/mL$ (PFHpS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/06/2015
EXPIRY DATE: (mm/dd/yyyy) 11/06/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 472.10
SOLVENT(S): Methanol

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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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

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EXPIRY DATE / PERIOD OF VALIDITY:

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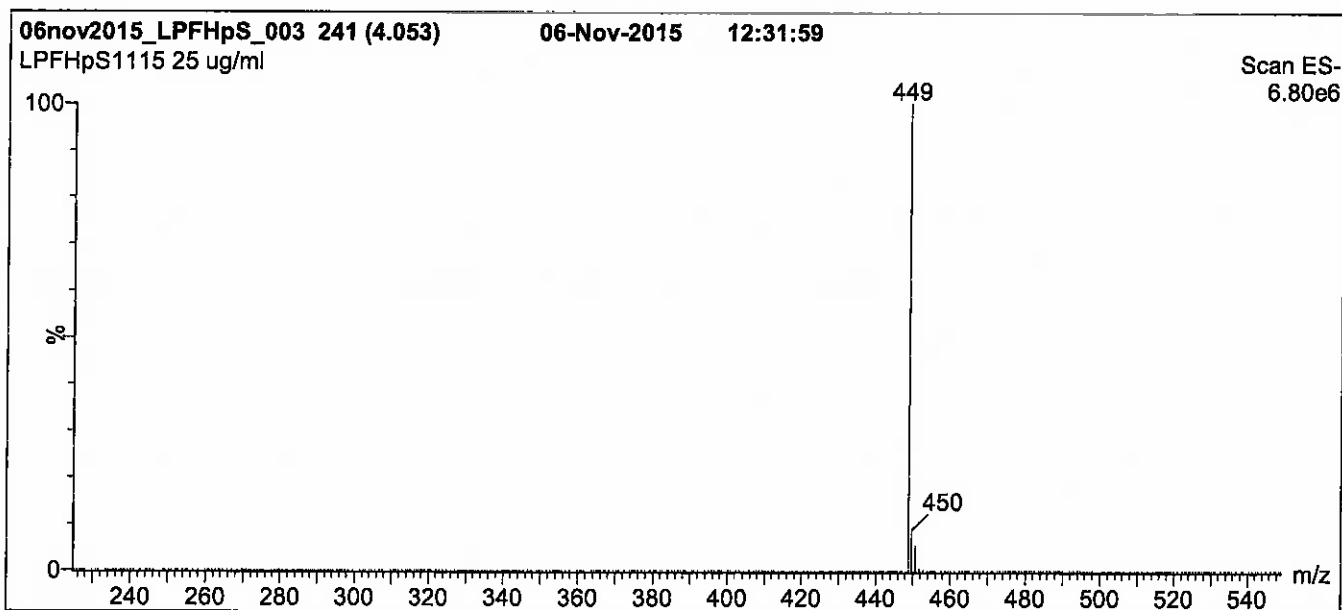
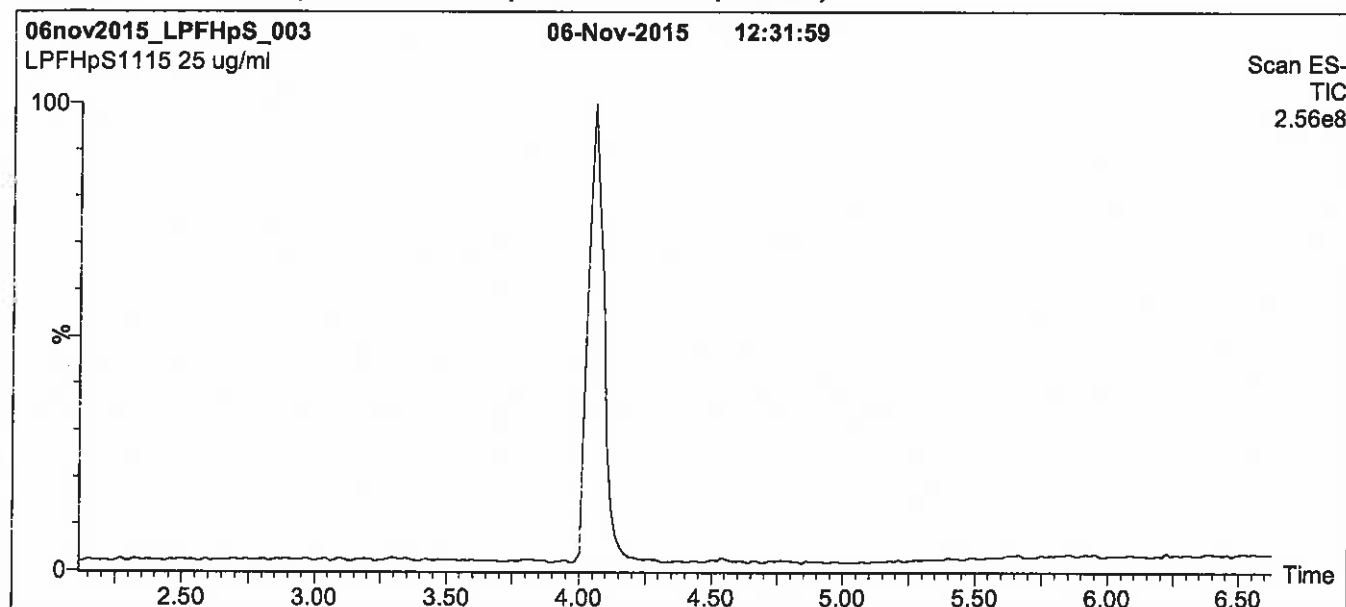
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

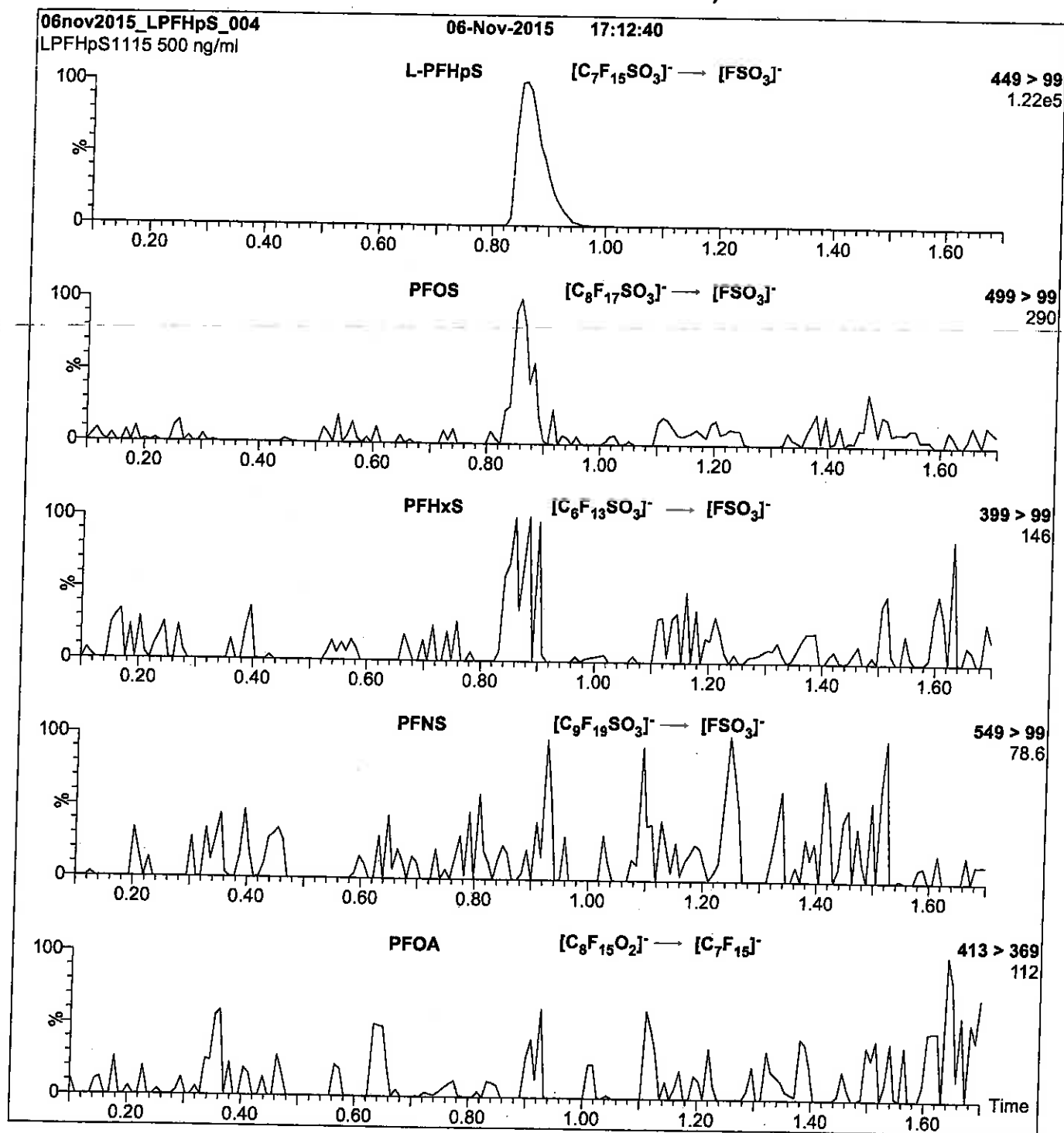
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml L-PFHpS)

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 35

Reagent

LCPFHxA_00004



609702

ID: LCPFHxA_00004

Exp: 12/22/20 Prod: CBW

PF-n-hexanoic acid

R: 4/7/16 CBW

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

PFHxA

LOT NUMBER:

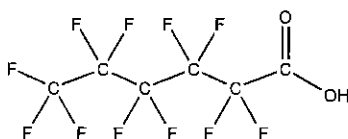
PFHxA1215

COMPOUND:

Perfluoro-n-hexanoic acid

STRUCTURE:**CAS #:**

307-24-4

**MOLECULAR FORMULA:** $C_6HF_{11}O_2$ **CONCENTRATION:** $50 \pm 2.5 \mu\text{g/ml}$ **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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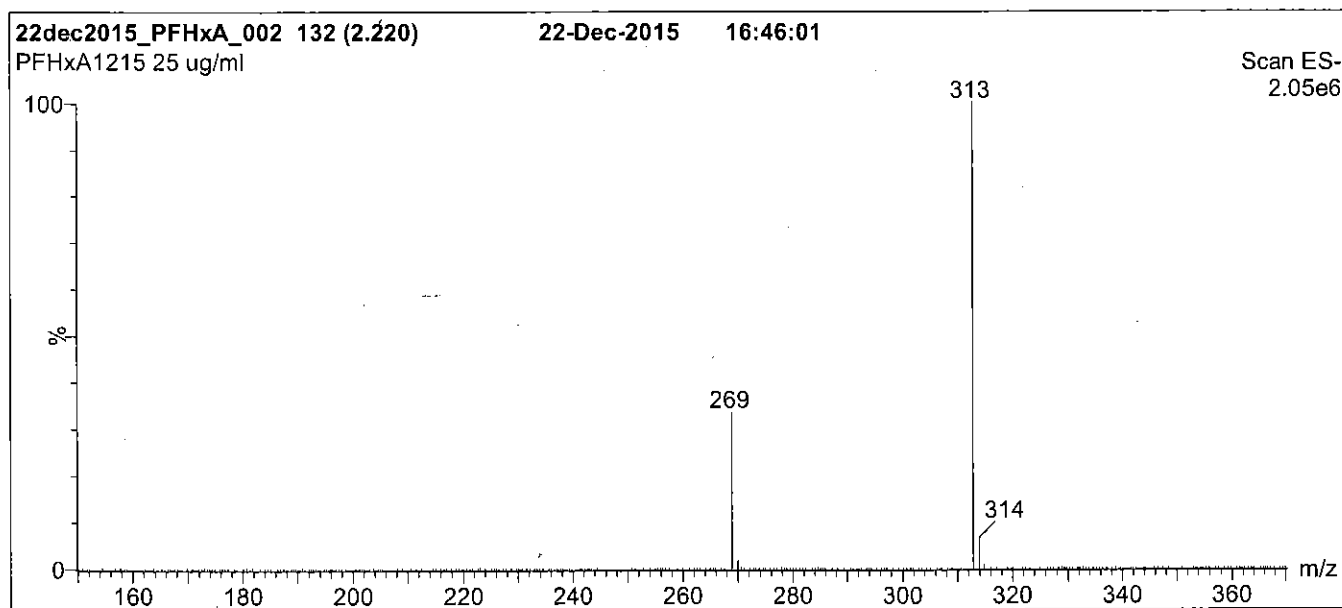
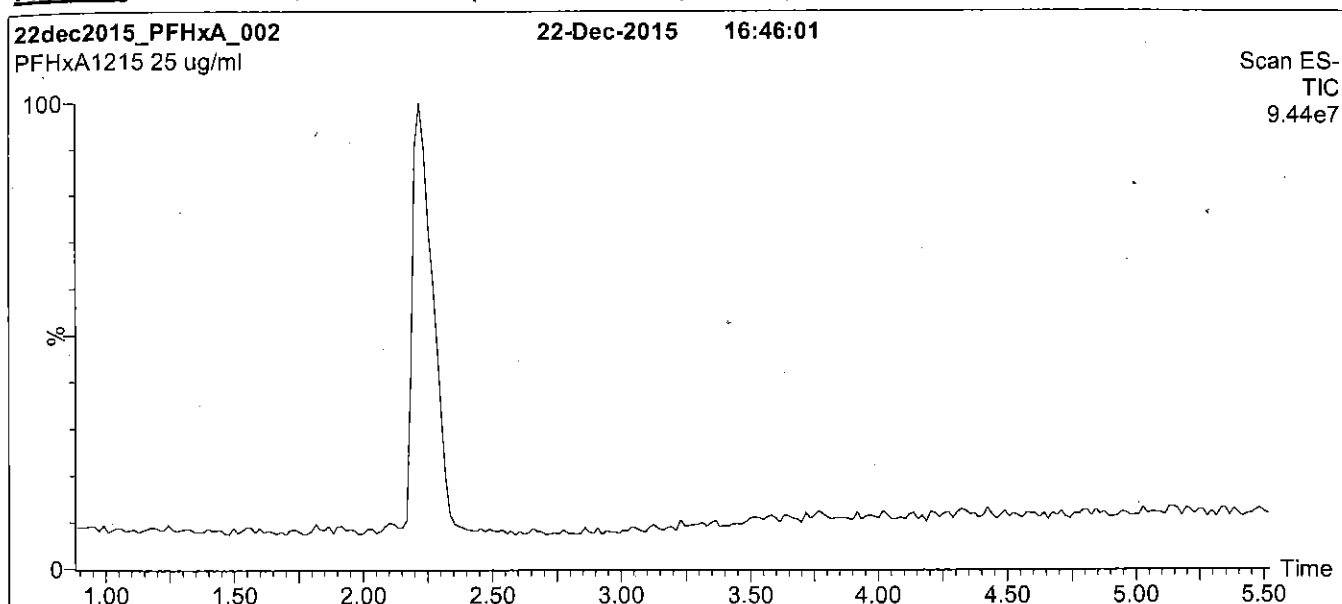
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Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

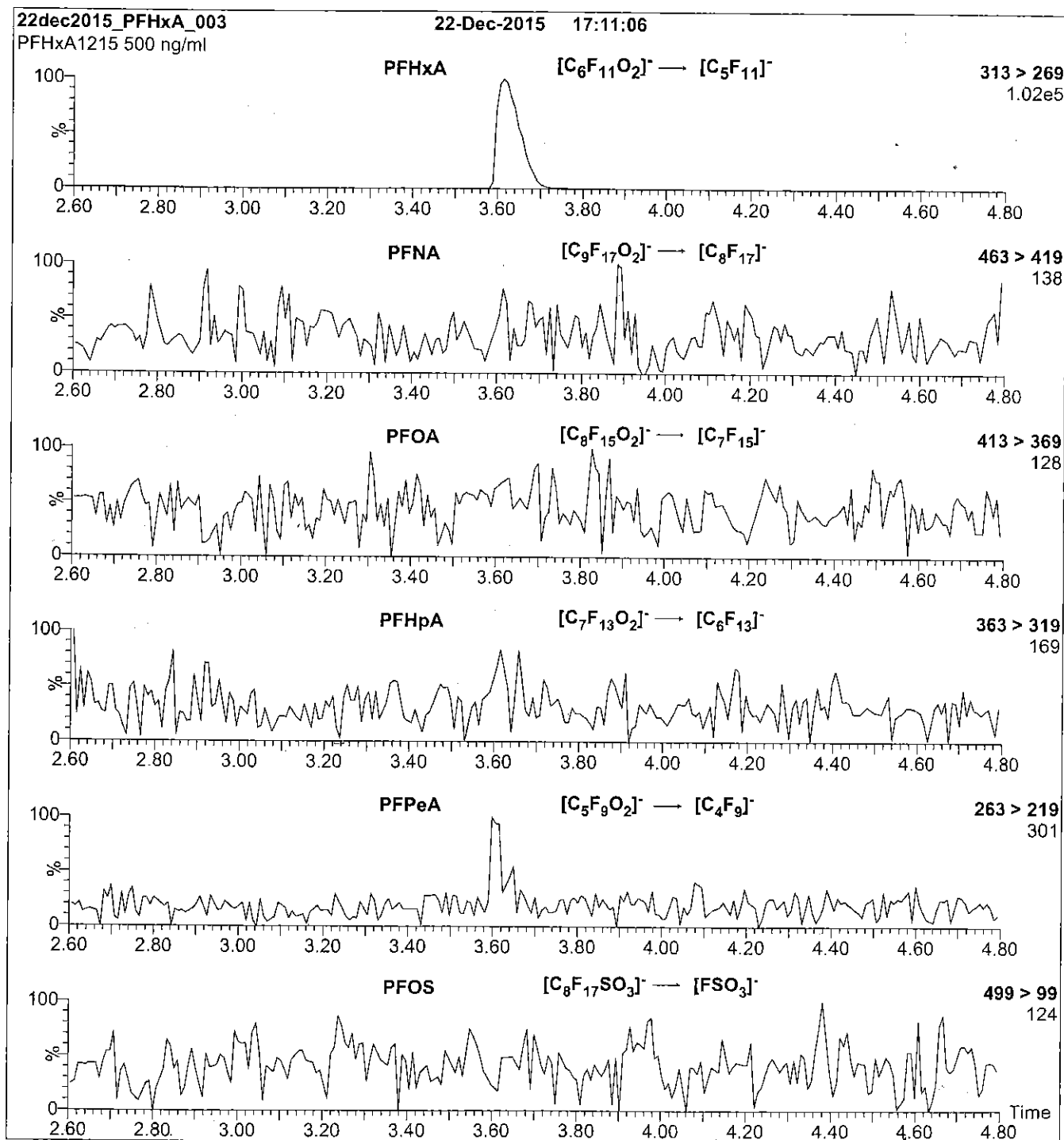
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 10

Reagent

LCPFHxDA_00006



WELLINGTON
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730630
ID: LCPFHxDA_00006
Exp: 05/25/21 Prpd: SBC
PFHxDA stock 50ug/mL

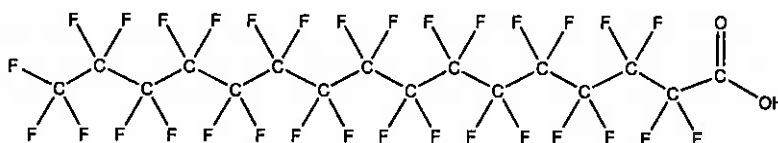


730631
ID: LCPFHxDA_00007
Exp: 05/25/21 Prpd: SBC
PFHxDA stock 50ug/mL

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHxDA **LOT NUMBER:** PFHxDA0516
COMPOUND: Perfluoro-n-hexadecanoic acid

STRUCTURE: **CAS #:** 67905-19-5



MOLECULAR FORMULA: $C_{16}H_{31}O_2$ **MOLECULAR WEIGHT:** 814.13
CONCENTRATION: $50 \pm 2.5 \mu\text{g/mL}$ **SOLVENT(S):** Methanol
Water (<1%)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/25/2016
EXPIRY DATE: (mm/dd/yyyy) 05/25/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.4% of PFODA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 05/27/2016
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

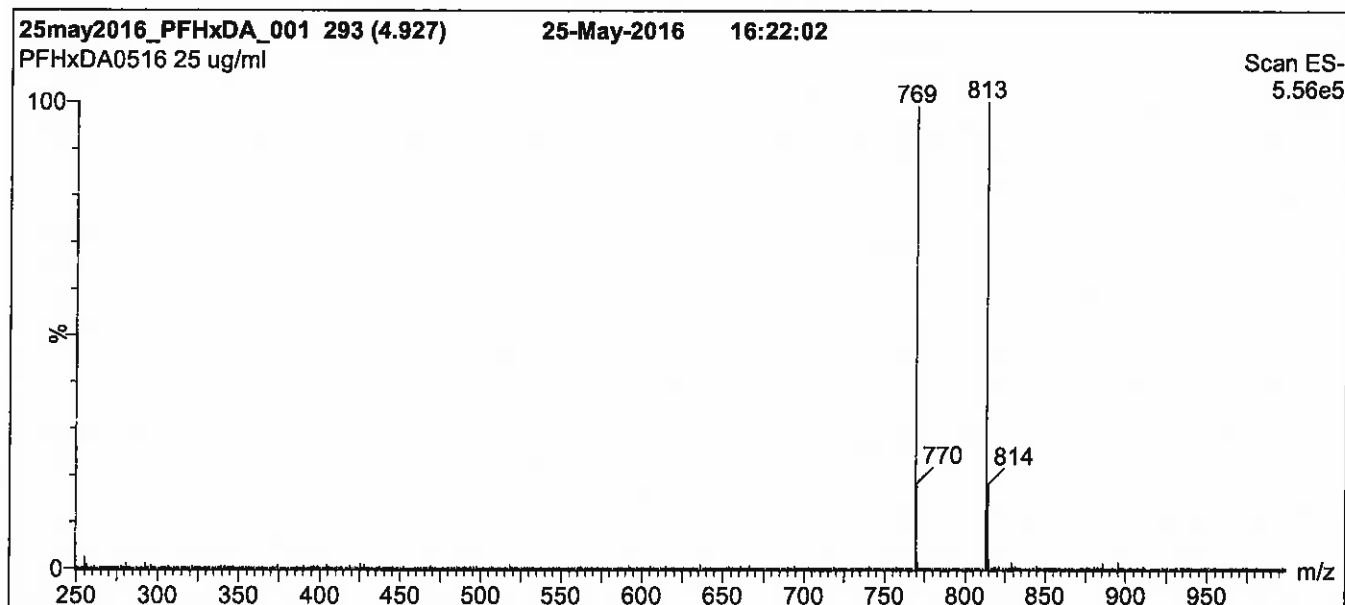
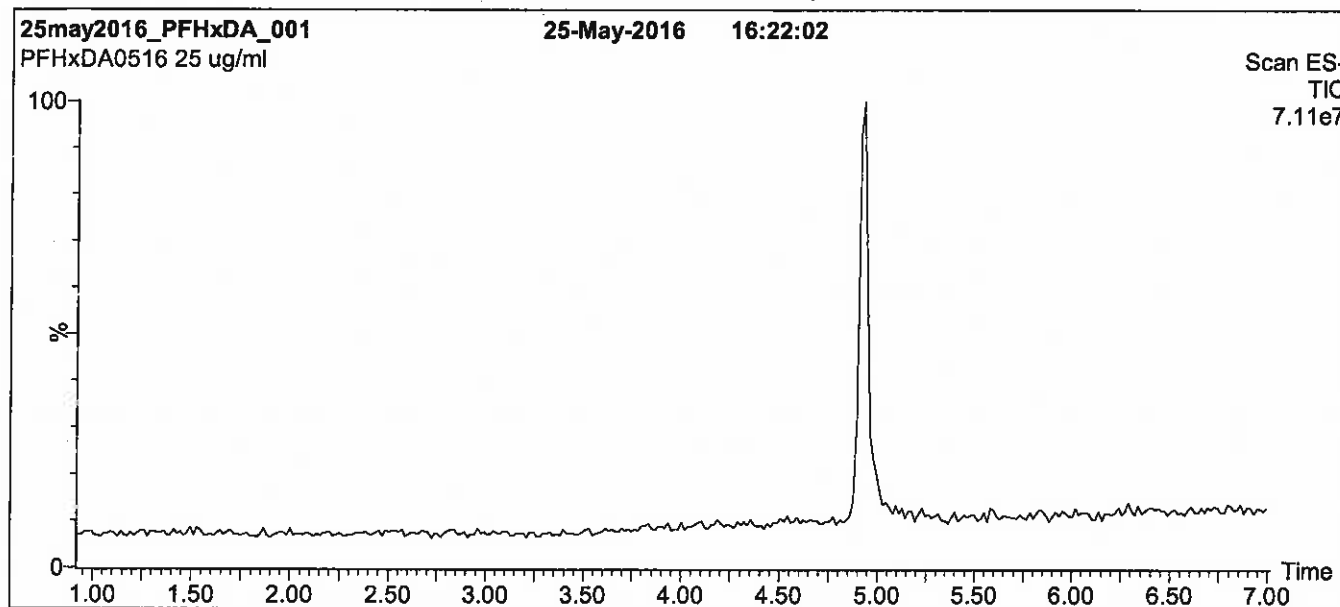
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 70% (80:20 MeOH:ACN) / 30% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 95% organic over 6 min and hold for 2.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

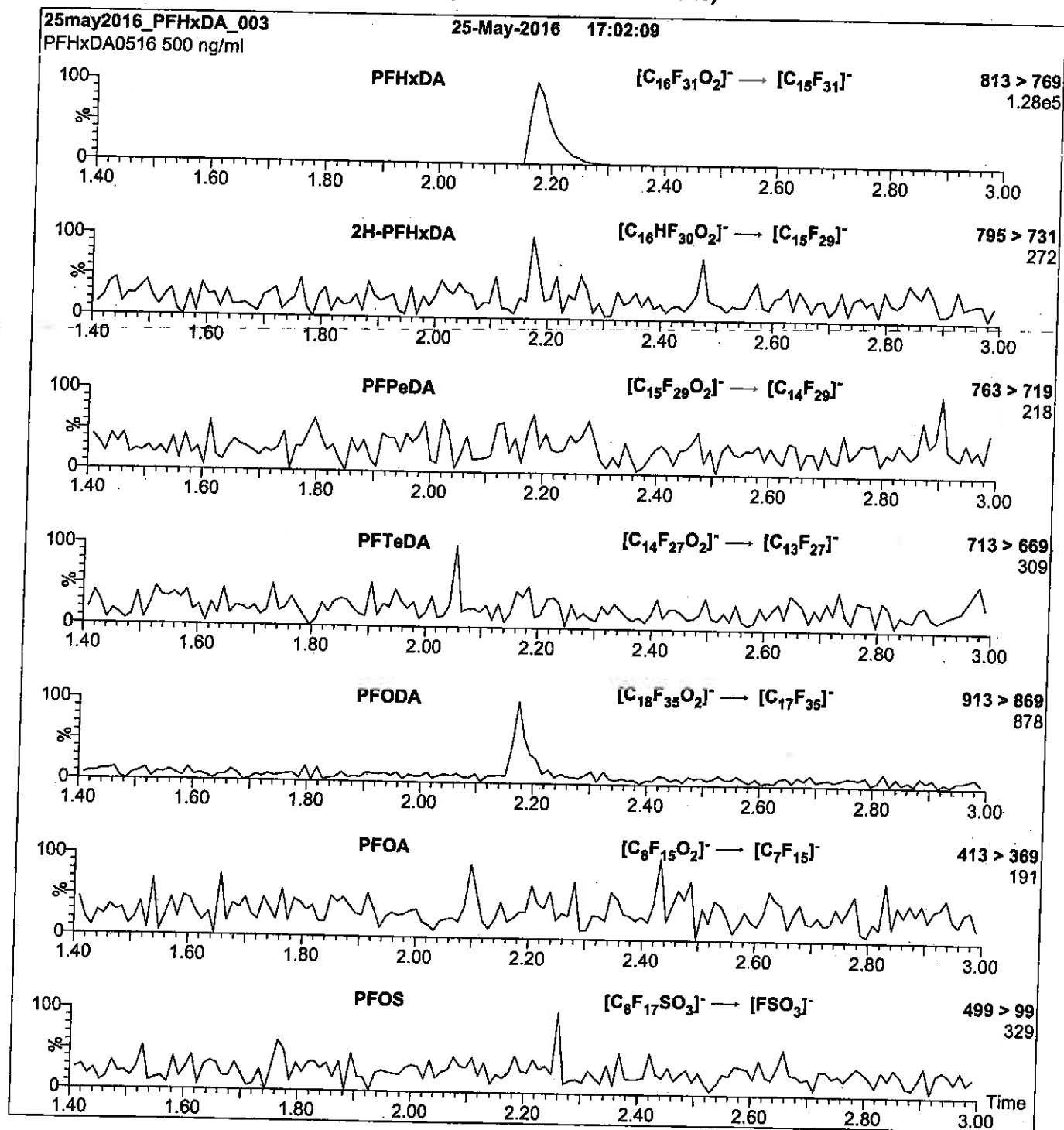
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 15

Reagent

LCPFHxS-br_00001



566007

ID: LCPFHxS-br_00001

Exp: 07/03/20 Ppdt: CBW

Potassium Perfluorohexane

P: 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 ¹⁹F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% of perfluoro-1-pentanesulfonate and ~ 0.2% of perfluoro-1-octanesulfonate.
- CAS#: 3871-99-6 (for linear isomer; potassium salt).

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

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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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 ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$ \begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array} $	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$ \begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array} $	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$ \begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array} $	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$ \begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array} $	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$ \begin{array}{c} \text{CF}_3 \\ \\ \text{CF}_3\text{CCF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array} $	0.2
7	Other Unidentified Isomers		0.5

* Percent of total perfluorohexanesulfonate isomers only.
 ** Systematic Name: Potassium perfluorohexane-2-sulfonate.

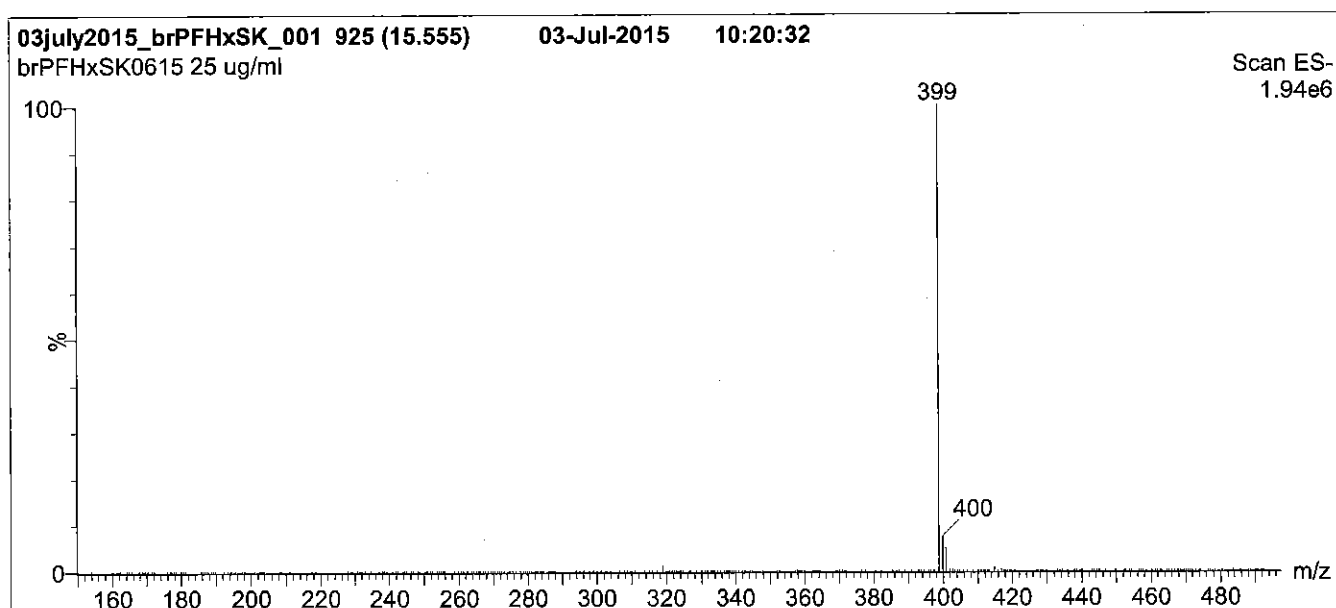
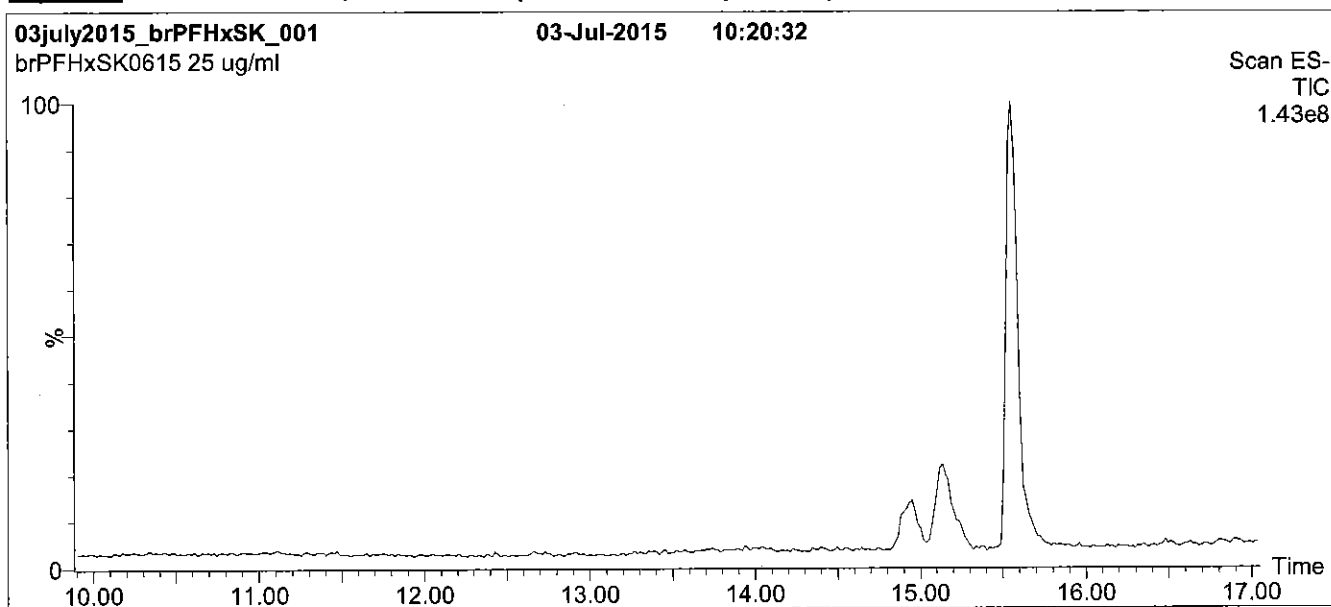
Certified By:

B.G. Chittim

Date: 07/15/2015

(mm/dd/yyyy)

Figure 1: br-PFHxSK; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient

Start: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 20 min

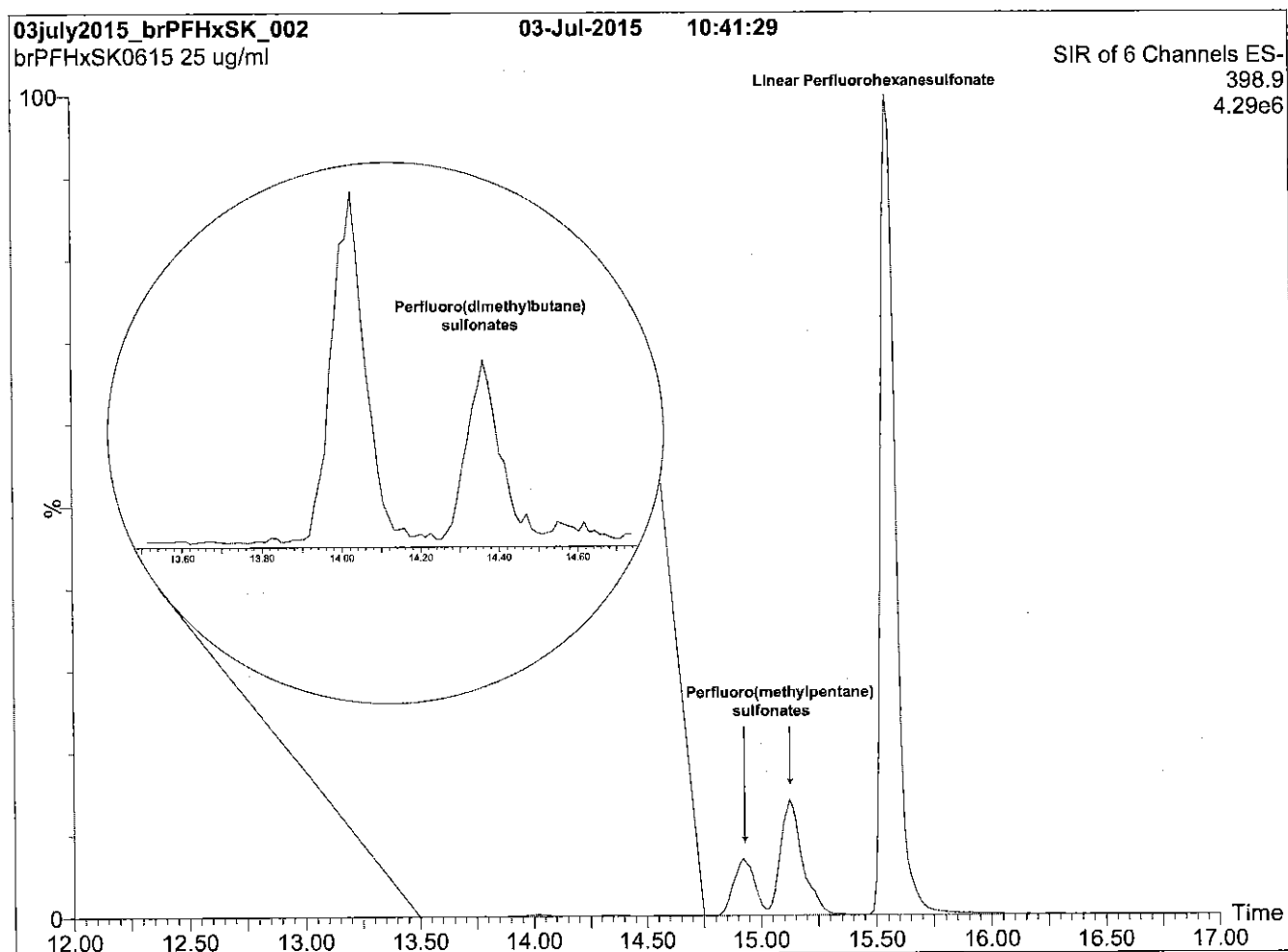
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

Figure 2: br-PFHxSK; LC/MS Data



Conditions for Figure 2:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 20 min

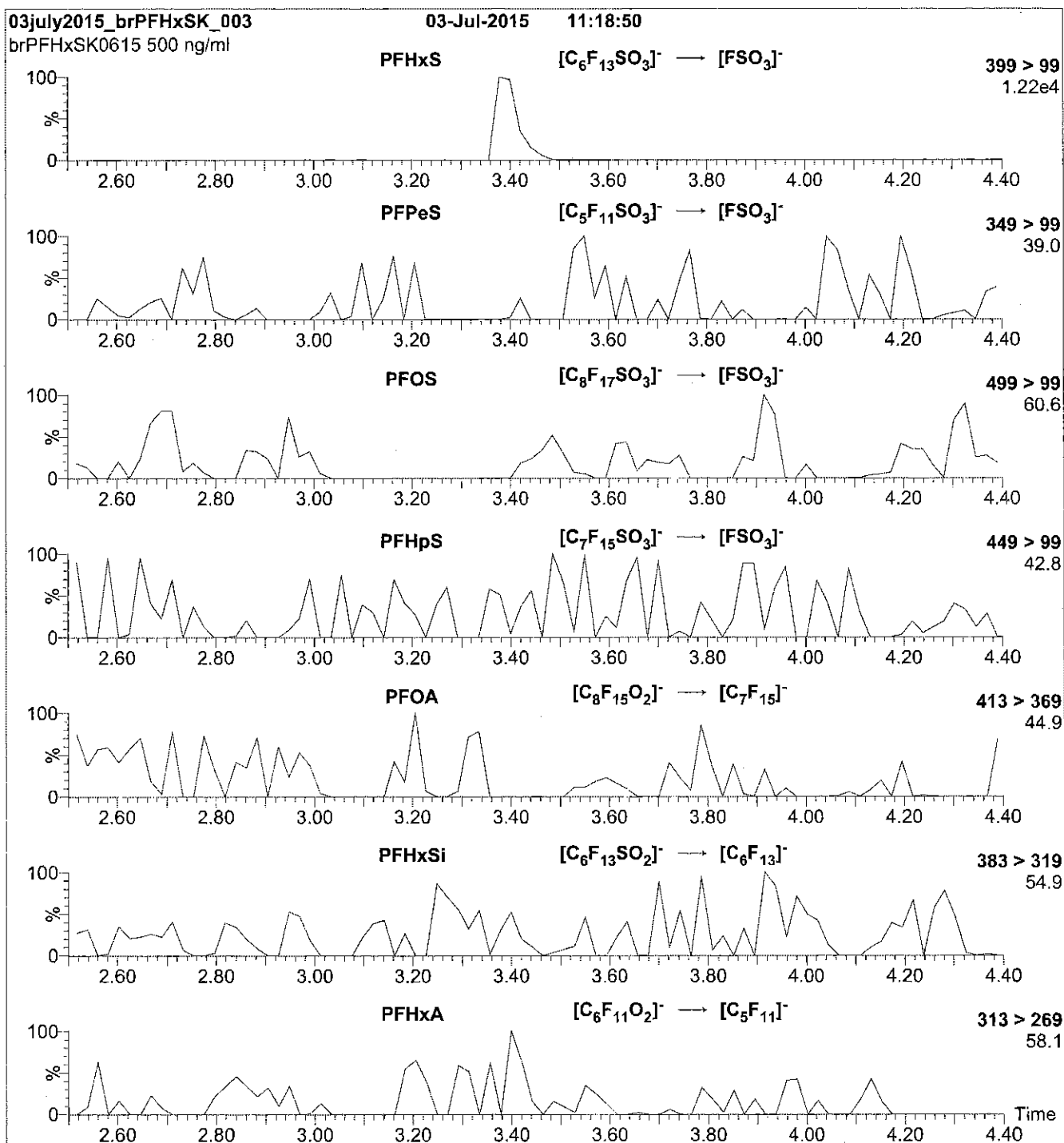
Flow: 300 μ l/min

MS Parameters

Experiment: SIR (6 channels)

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

Figure 3: br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 3:

Injection: Direct loop injection
10 μ l (500 ng/ml br-PFHxSK)

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 30

Reagent

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
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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 ¹⁹F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% of perfluoro-1-pentanesulfonate and ~ 0.2% of perfluoro-1-octanesulfonate.
- CAS#: 3871-99-6 (for linear isomer; potassium salt).

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

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QUALITY MANAGEMENT:

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

Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-hexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$\begin{array}{c} \text{CF}_3 \\ \\ \text{CF}_3\text{CCF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	0.2
7	Other Unidentified Isomers		0.5

* Percent of total perfluorohexanesulfonate isomers only.
** Systematic Name: Potassium perfluorohexane-2-sulfonate.

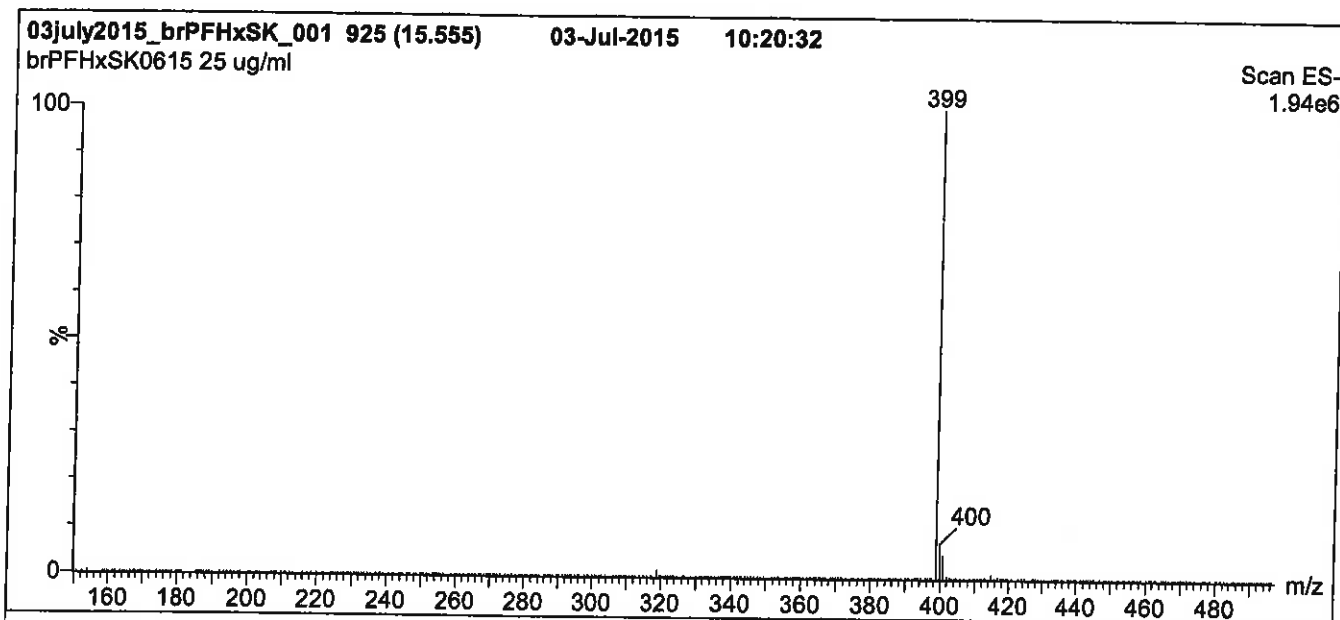
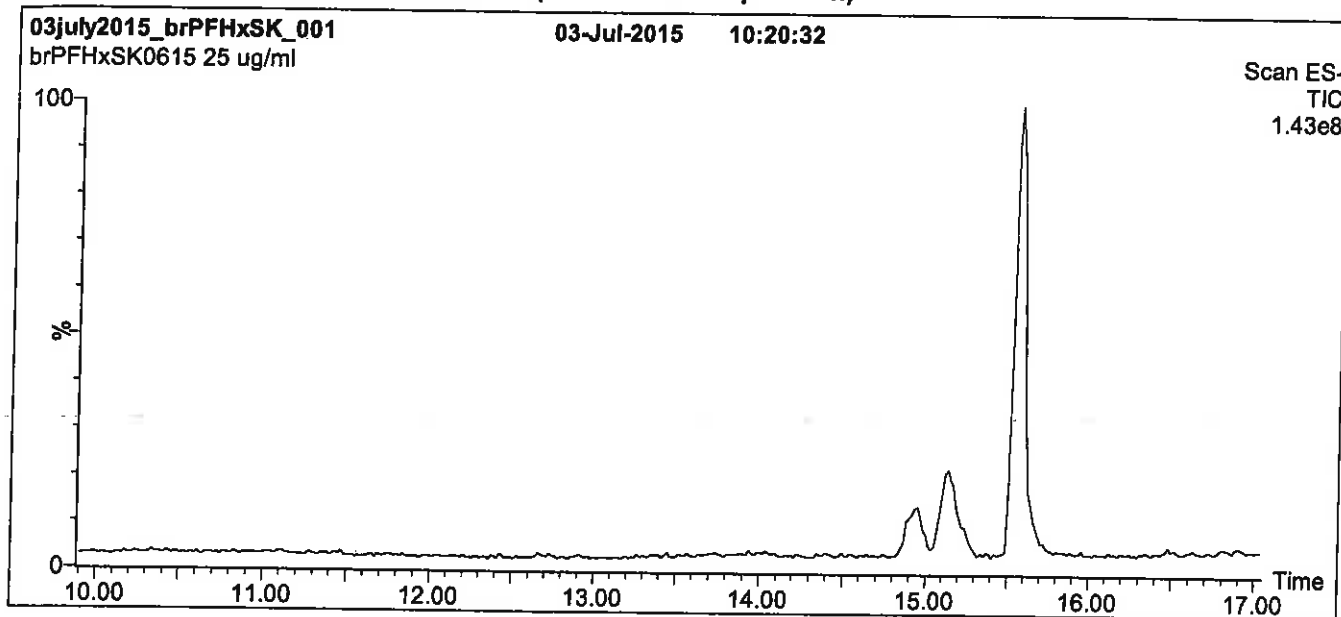
Certified By:


B.G. Chittim

Date: 07/15/2015

(mm/dd/yyyy)

Figure 1: br-PFHxSK; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 20 min

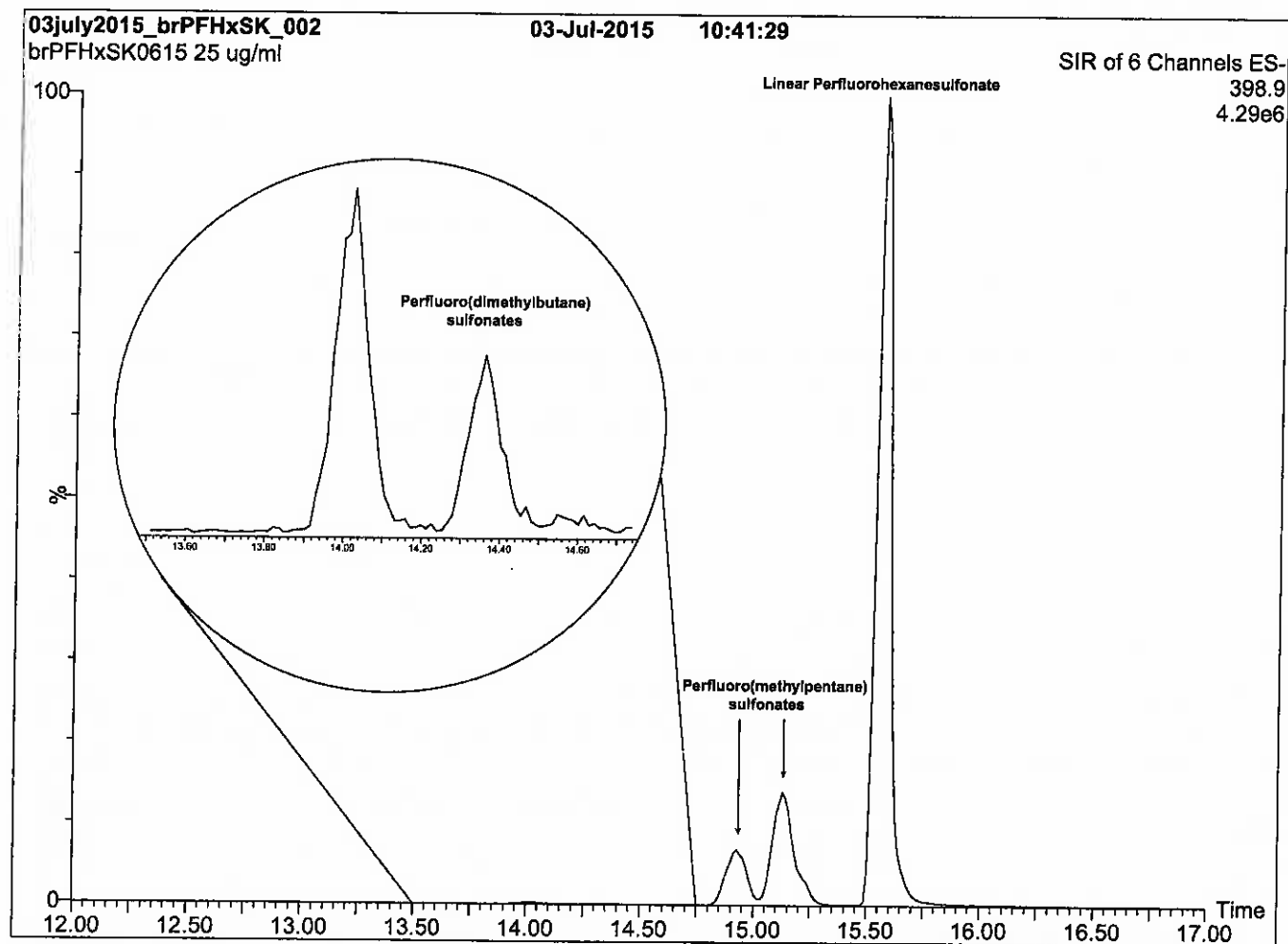
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

Figure 2: br-PFHxSK; LC/MS Data



Conditions for Figure 2:

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

Chromatographic Conditions

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

Mobile phase: Gradient

Start: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 20 min

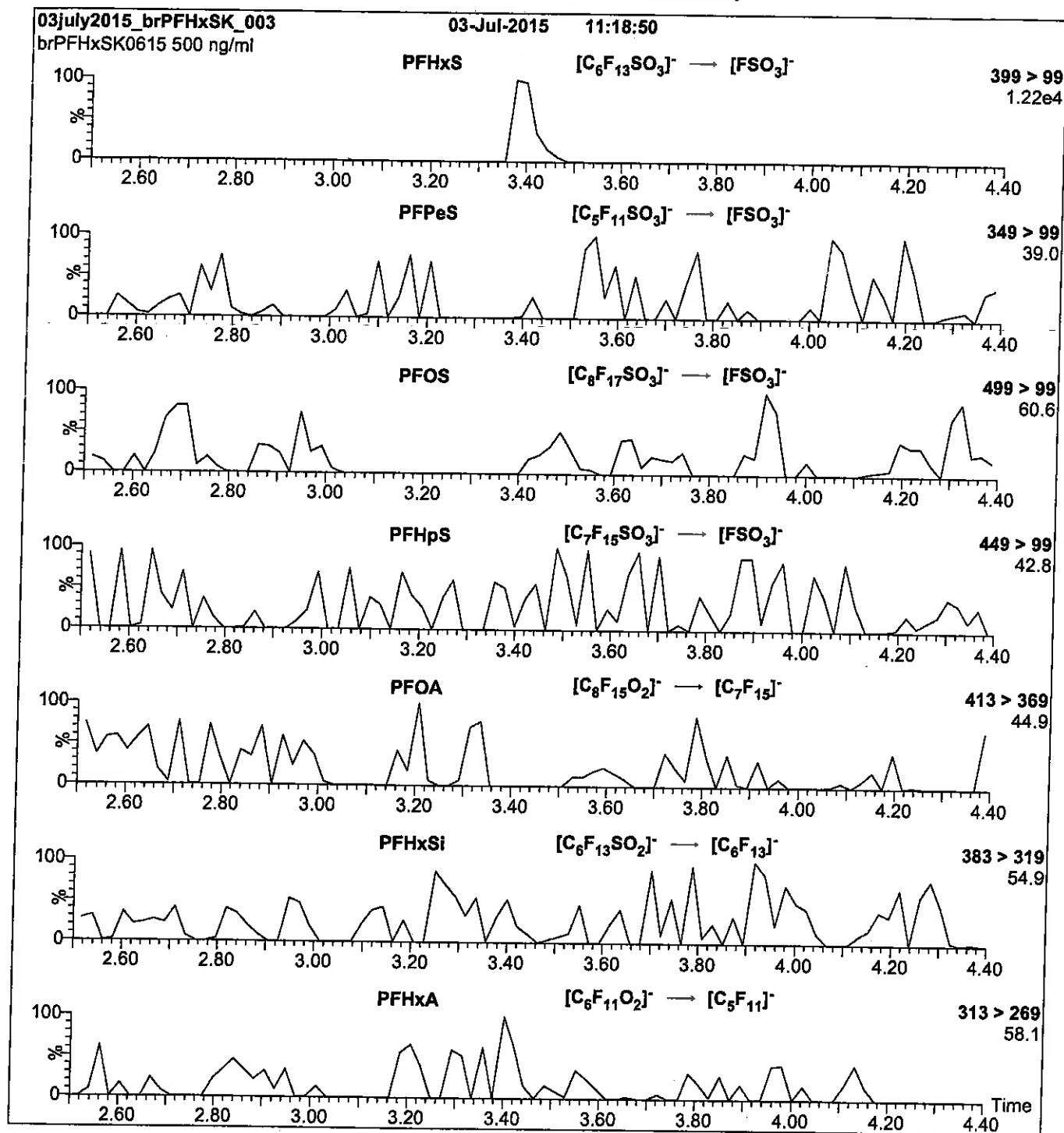
Flow: 300 μ l/min

MS Parameters

Experiment: SIR (6 channels)

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

Figure 3: br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 3:

Injection: Direct loop injection
10 μ l (500 ng/ml br-PFHxSK)

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 30

Reagent

LCPFNA_00005



609703

ID: LCPFNA_00005

Exp: 10/23/20 Prod: CBW

PF-n-nonanoic acid

R: 4/7/16 CBW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFNA

LOT NUMBER:

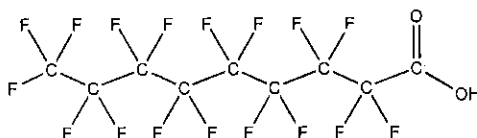
PFNA1015

COMPOUND:

Perfluoro-n-nonanoic acid

STRUCTURE:**CAS #:**

375-95-1

**MOLECULAR FORMULA:** $C_9H_{17}O_2$ **MOLECULAR WEIGHT:**

464.08

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):**

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/23/2015

EXPIRY DATE: (mm/dd/yyyy)

10/23/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

10/30/2015
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

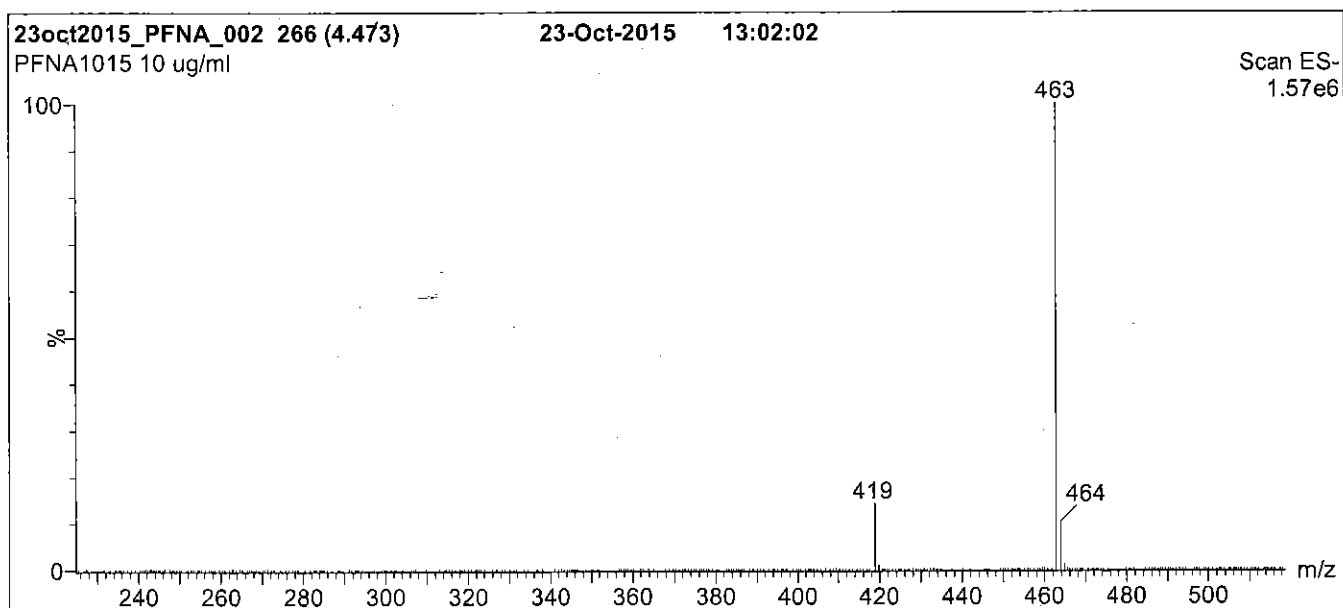
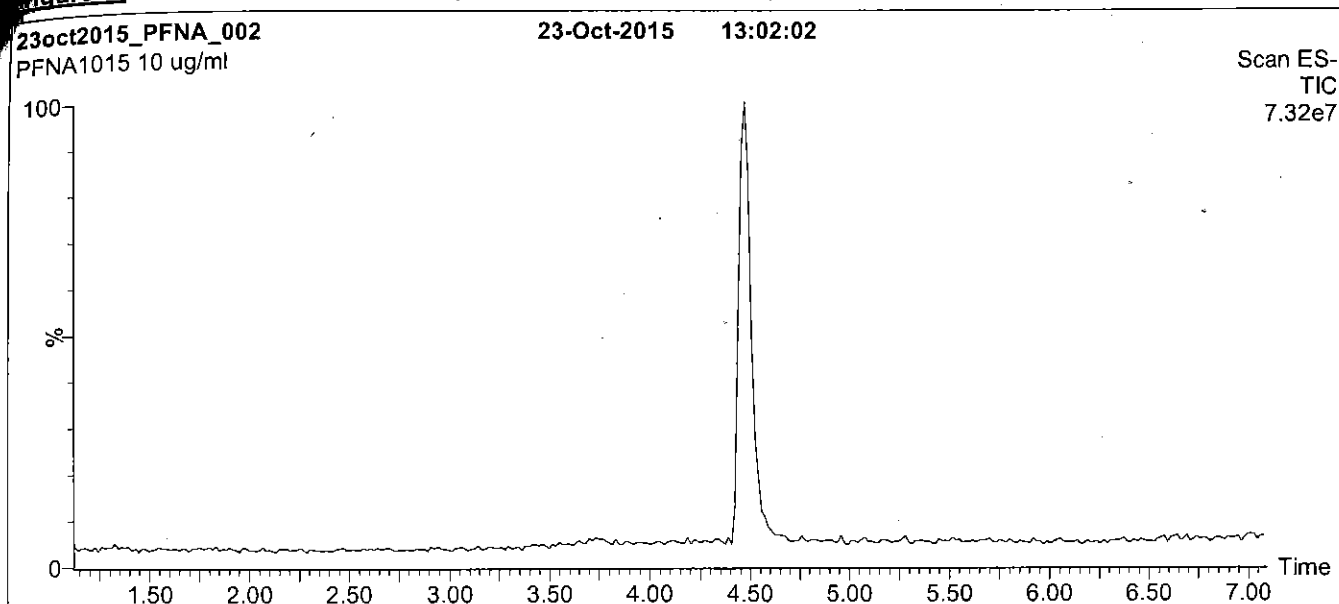
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

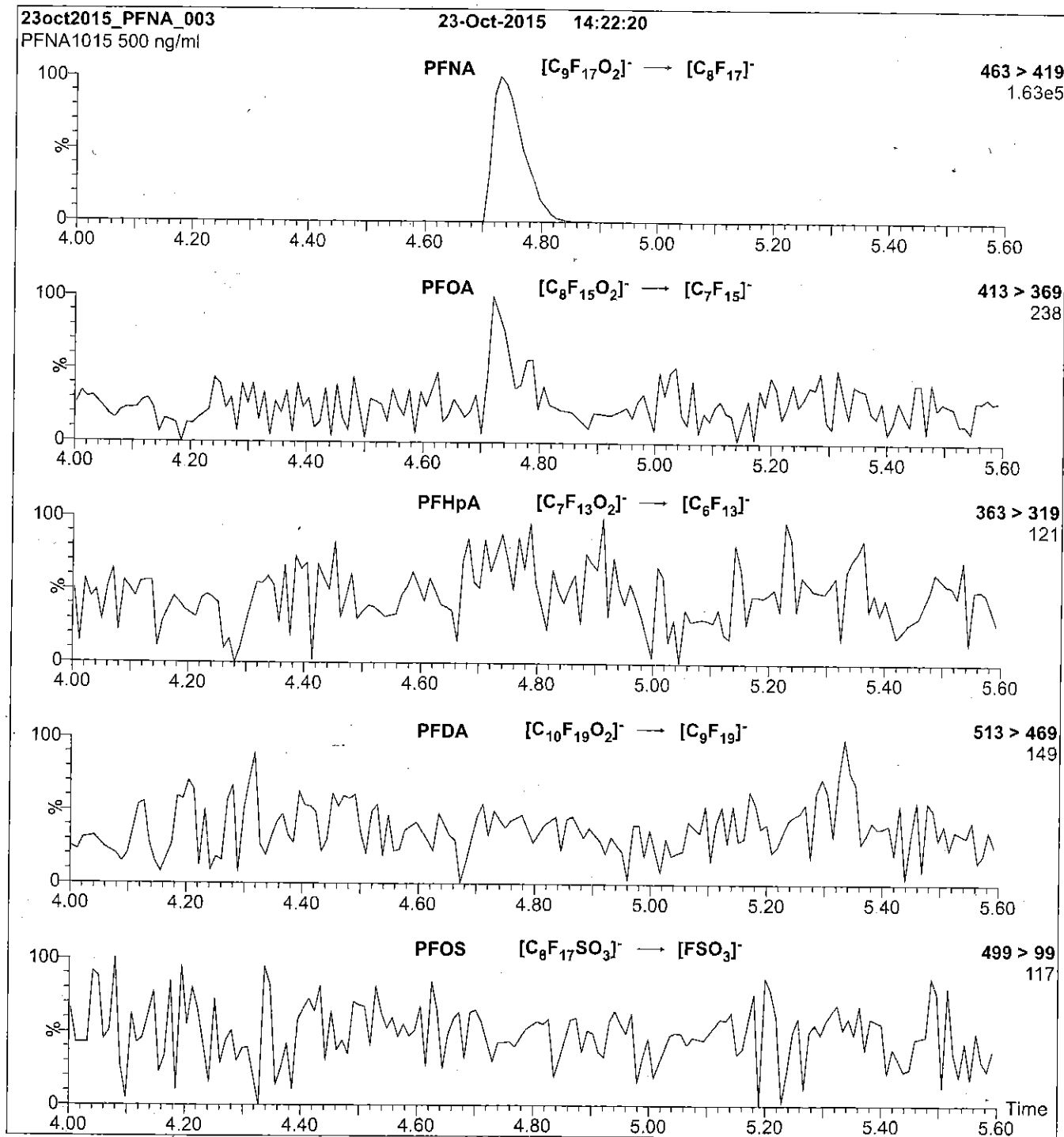
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCPFOA_00006

R-716/16CBW

671577
ID: LCPFOA_00006
Exp: 11/06/20 Prod: CBW
PF-n-octanoic acid**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PRODUCT CODE:**

PFOA

LOT NUMBER:

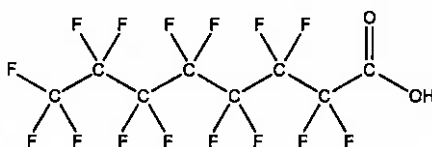
PFOA1115

COMPOUND:

Perfluoro-n-octanoic acid

STRUCTURE:**CAS #:**

335-67-1

**MOLECULAR FORMULA:** $C_8H_2F_{15}O_2$ **MOLECULAR WEIGHT:**

414.07

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):**

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

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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HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \dots, x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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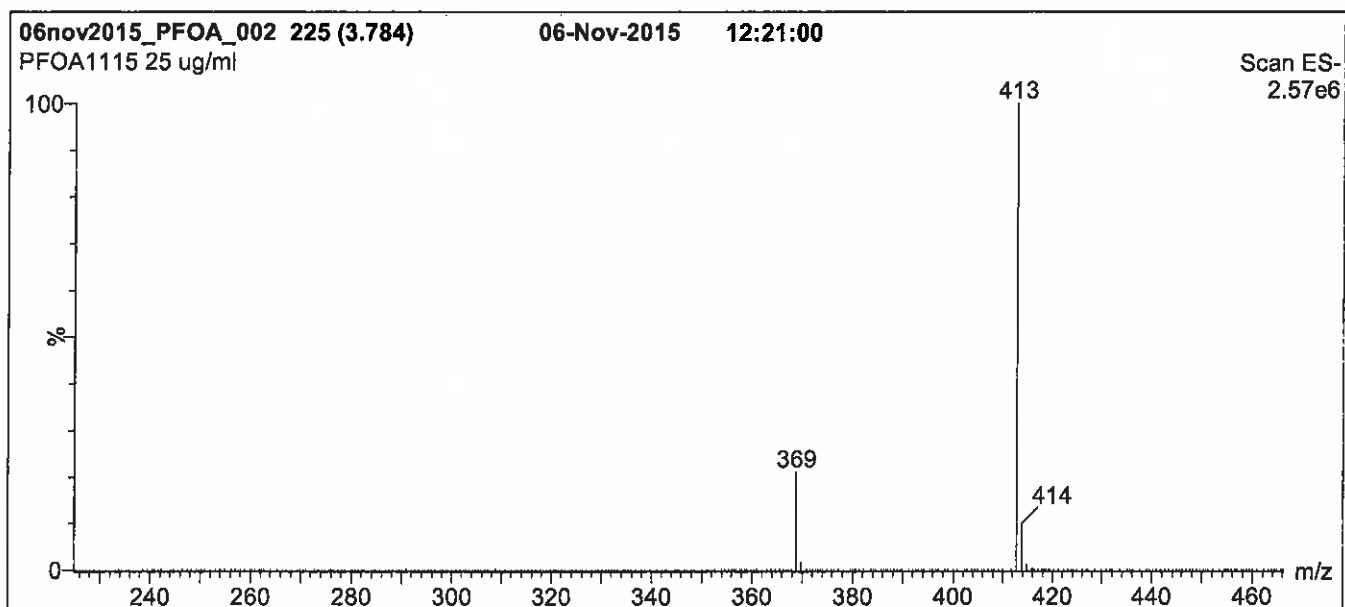
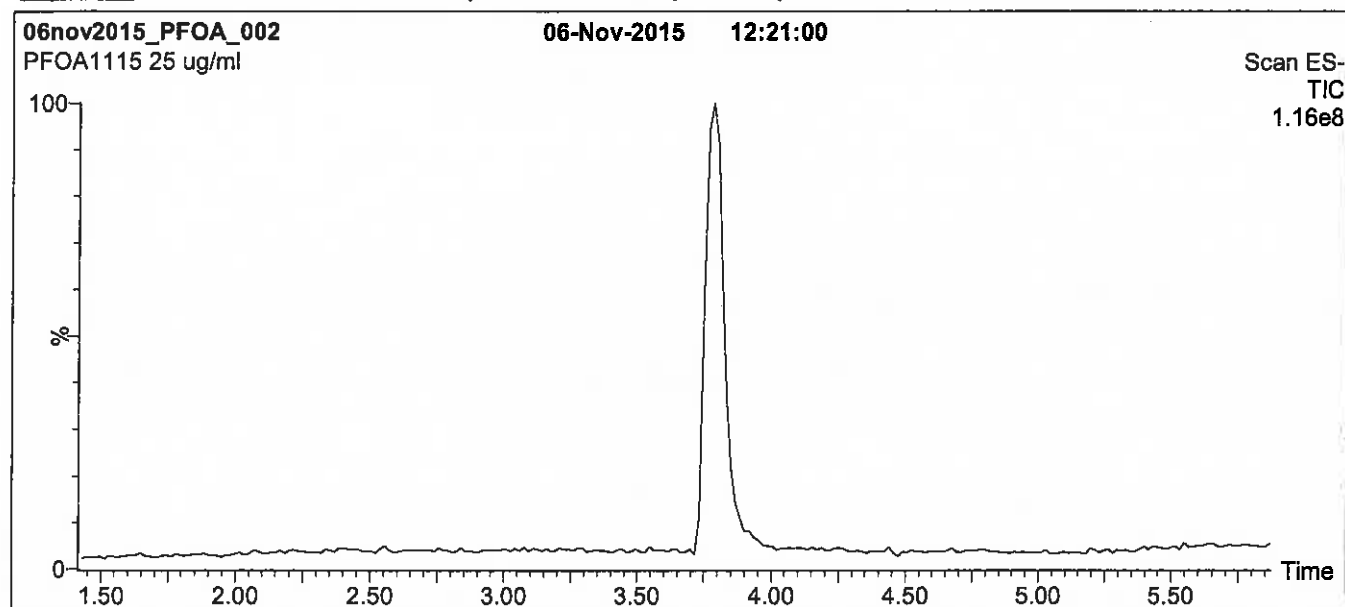
QUALITY MANAGEMENT:

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Figure 1: PFOA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

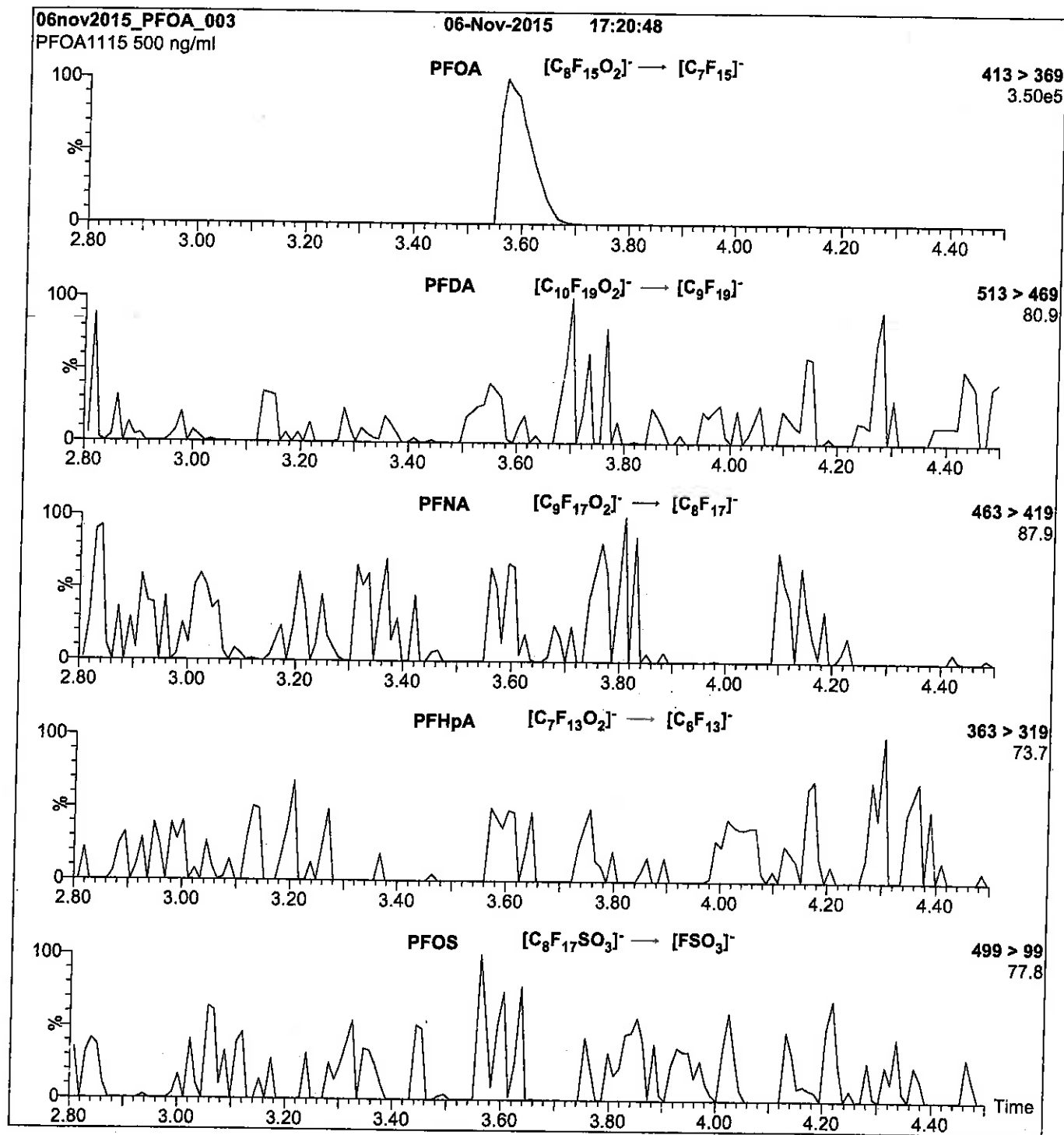
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: PFOA; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 10

Reagent

LCPFODA_00005



605234

ID: LCPFODA_00005

Exp: 01/30/20 Prod: CBW
PFODA stock 50ug/mL

Rec. 3/29/16 JRB

**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PRODUCT CODE:**

PFODA

LOT NUMBER:

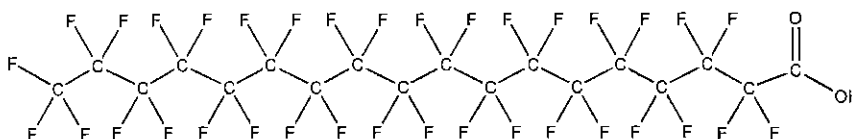
PFODA0115

COMPOUND:

Perfluoro-n-octadecanoic acid

STRUCTURE:**CAS #:**

16517-11-6

**MOLECULAR FORMULA:** $C_{18}H_{35}O_2$ **MOLECULAR WEIGHT:**

914.14

CONCENTRATION: $50 \pm 2.5 \mu\text{g/mL}$ **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:

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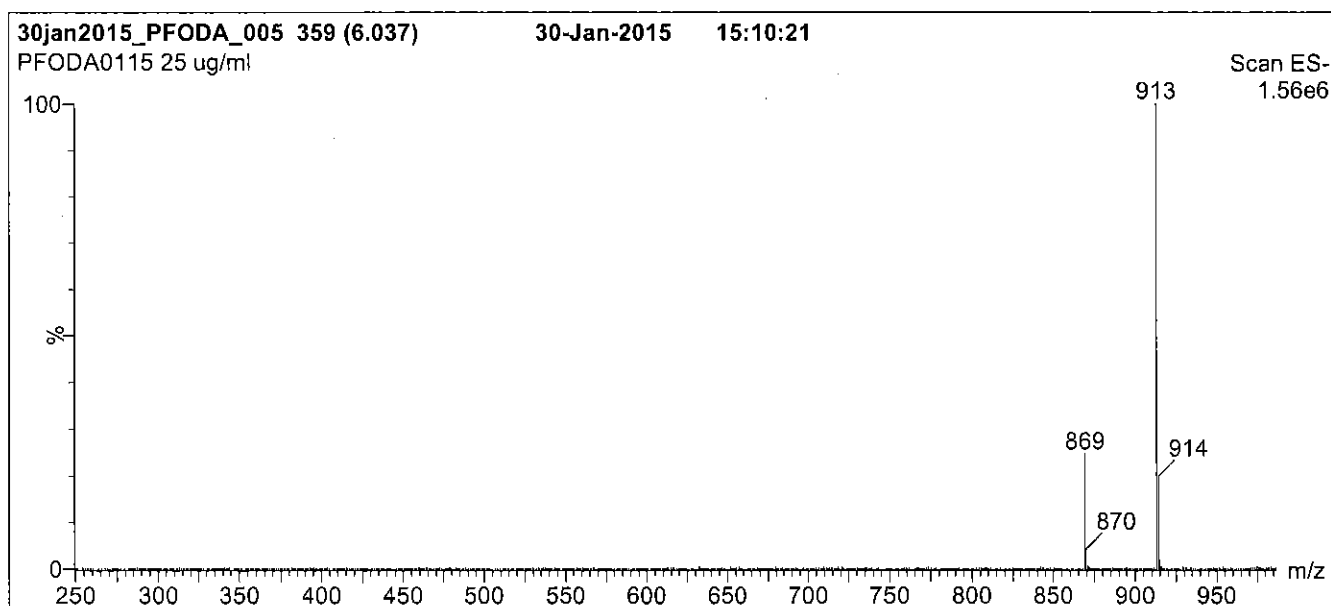
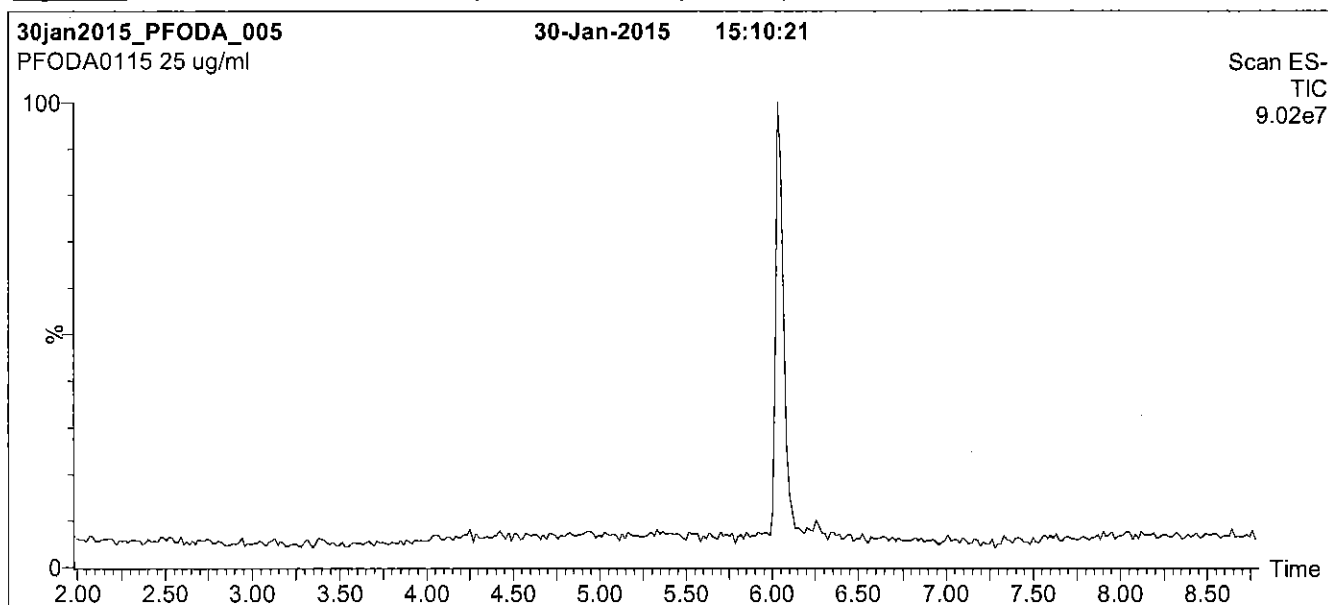
QUALITY MANAGEMENT:

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Figure 1: PFODA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

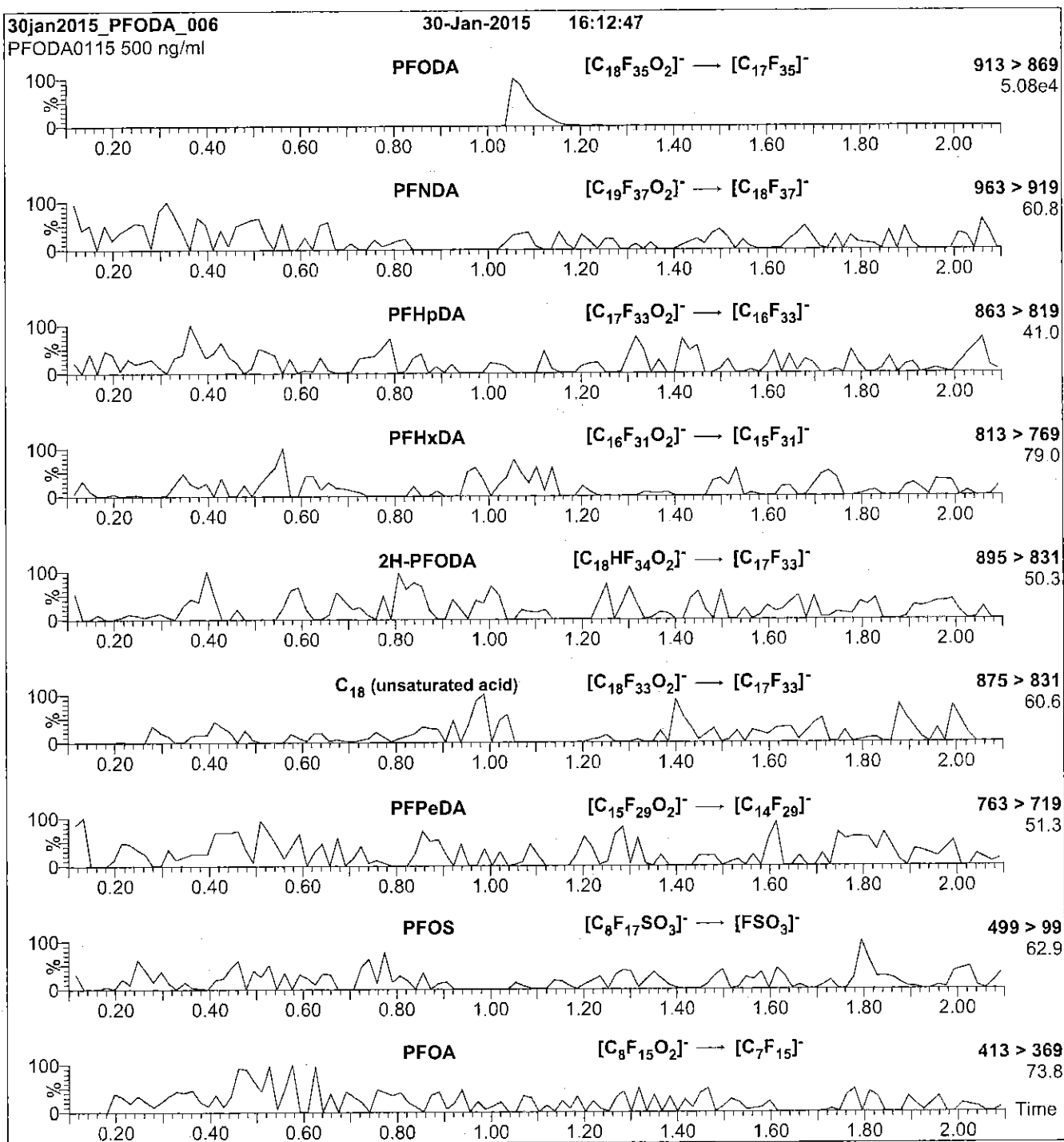
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 μ l (500 ng/ml PFODA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 15

Reagent

LCPFOS-br_00001



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 ¹⁹F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters

$x_1, x_2, \dots, x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to International interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Table A: br-PFOSK; Isomeric Components and Percent Composition (by ¹⁹F-NMR)*

Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-octanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K ⁺	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CFSO}_3\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}(\text{CF}_3)\text{SO}_3\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}(\text{CF}_3)\text{CF}_2\text{SO}_3\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{SO}_3\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$\begin{array}{c} \text{CF}_3 \\ \\ \text{CF}_3-\text{C}-\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$\begin{array}{c} \text{CF}_3 \\ \\ \text{CF}_3\text{CF}_2-\text{C}-\text{CF}_2\text{CF}_2\text{SO}_3\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$\begin{array}{c} \text{CF}_3-\text{CF}(\text{CF}_3)-\text{CF}(\text{CF}_3)-\text{CF}_2\text{CF}_2\text{SO}_3\text{K}^+ \end{array}$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$\begin{array}{c} \text{CF}_3-\text{CF}(\text{CF}_3)-\text{CF}_2-\text{CF}(\text{CF}_3)-\text{CF}_2\text{SO}_3\text{K}^+ \end{array}$	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.

** Systematic Name: Potassium perfluorooctane-2-sulfonate.

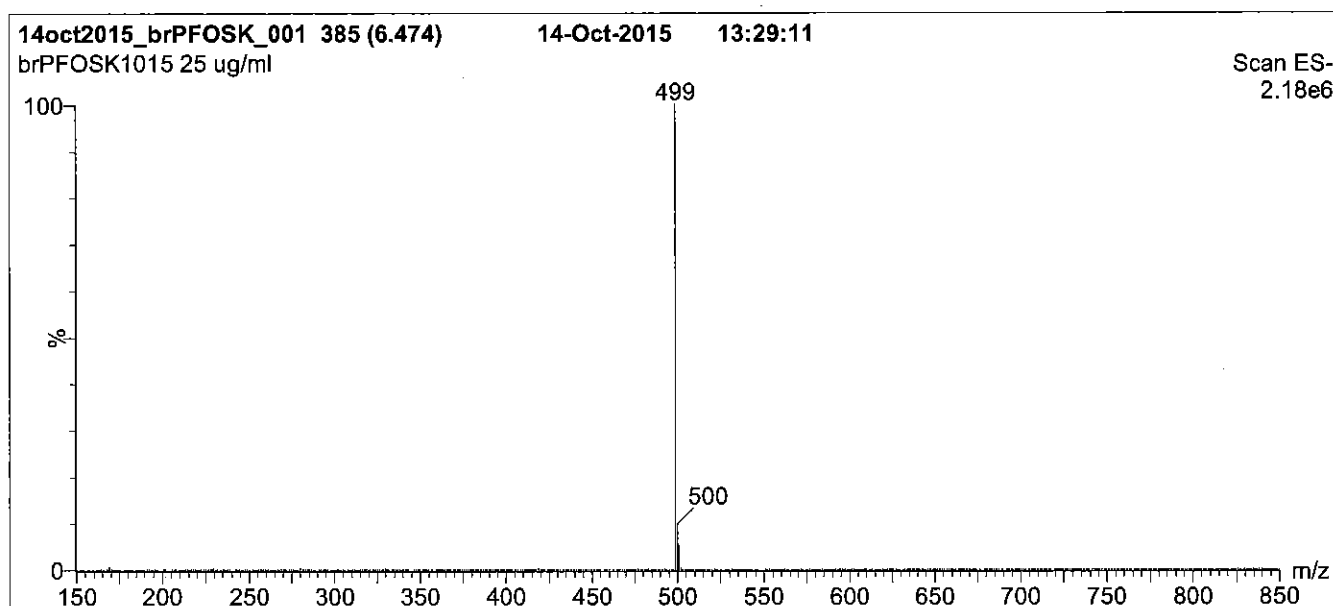
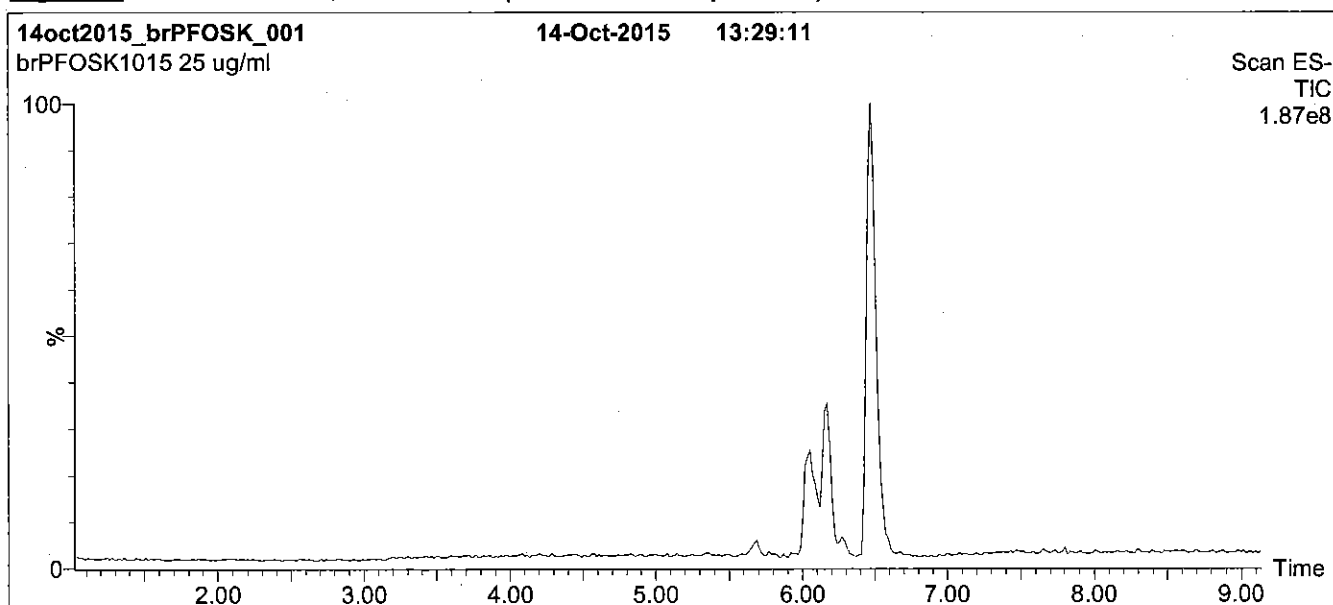
Certified By:


 B.G. Chittim

Date: 10/15/2015

(mm/dd/yyyy)

Figure 1: br-PFOSK; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

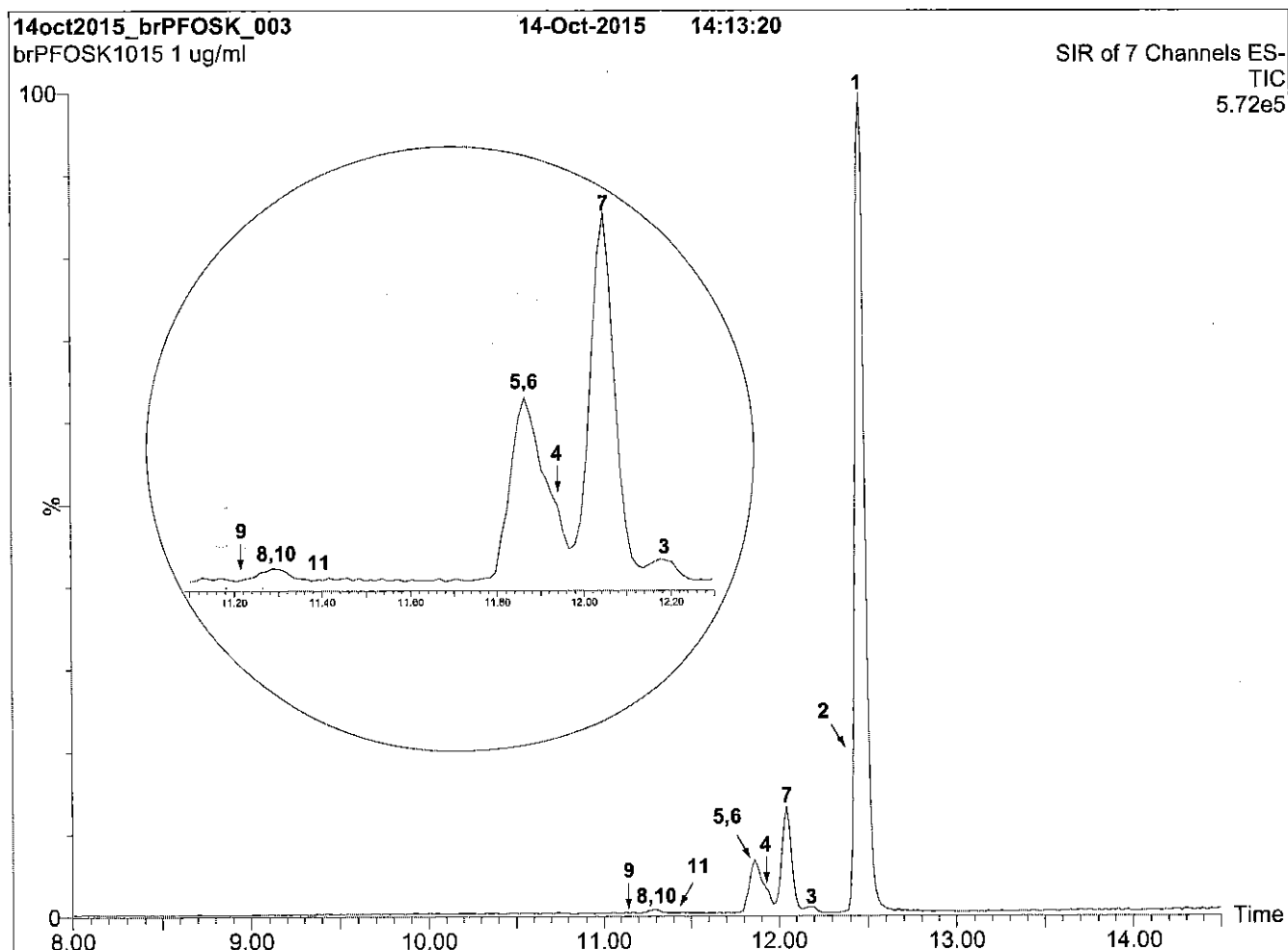
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: br-PFOSK; LC/MS Data (SIR)



Conditions for Figure 2:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

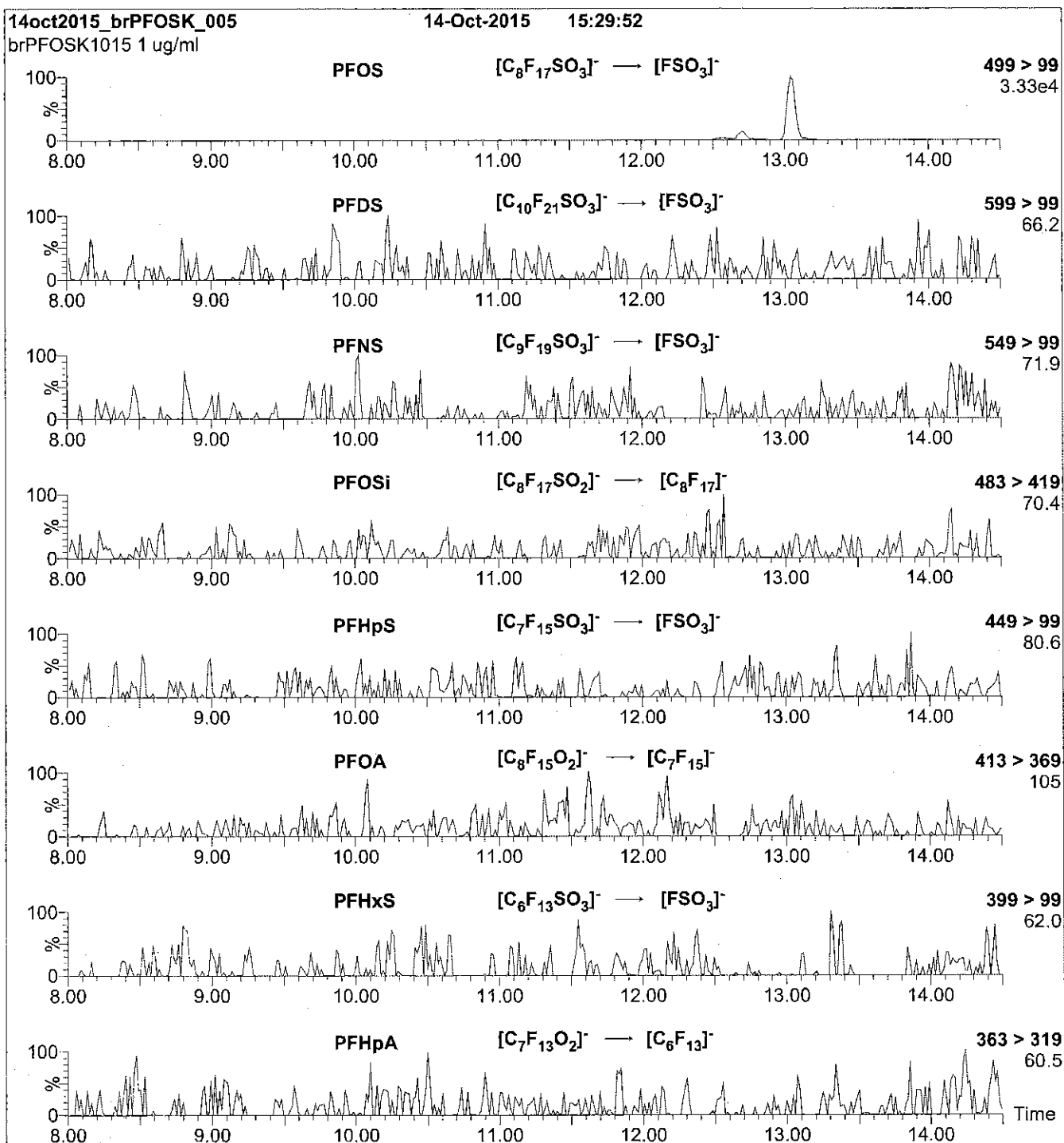
Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈ (1.7 μ m, 2.1 x 100 mm)
Injection: 1.0 μ g/ml of br-PFOSK
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H₂O (both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min
Flow: 300 μ l/min

MS Conditions:

SIR (ES)
Source = 110 $^{\circ}$ C
Desolvation = 325 $^{\circ}$ C
Cone Voltage = 60V

Figure 3: br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 μ l/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 Ppdt: SBC
Potassium Perfluorooctane



730516
ID: LCPFOS-br_00003
Exp: 10/14/20 Ppdt: 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 ¹⁹F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

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3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}(\text{SO}_3\text{K}^+)\text{CF}_2\text{CF}_3 \\ \\ \text{CF}_3 \end{array}$	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}(\text{SO}_3\text{K}^+)\text{CF}_2\text{CF}_2\text{CF}_3 \\ \\ \text{CF}_3 \end{array}$	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}(\text{SO}_3\text{K}^+)\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_3 \\ \\ \text{CF}_3 \end{array}$	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}(\text{SO}_3\text{K}^+)\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_3 \\ \\ \text{CF}_3 \end{array}$	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}(\text{SO}_3\text{K}^+)\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_3 \\ \\ \text{CF}_3 \end{array}$	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$\begin{array}{c} \text{CF}_3 \\ \\ \text{CF}_3-\text{C}-\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$\begin{array}{c} \text{CF}_3 \\ \\ \text{CF}_3\text{CF}_2-\text{C}-\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$\begin{array}{c} \text{CF}_3-\text{CF}(\text{CF}_3)-\text{CF}(\text{CF}_3)-\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3\text{K}^+ \end{array}$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$\begin{array}{c} \text{CF}_3-\text{CF}(\text{CF}_3)-\text{CF}_2-\text{CF}(\text{CF}_3)-\text{CF}_2\text{CF}_2\text{SO}_3\text{K}^+ \end{array}$	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

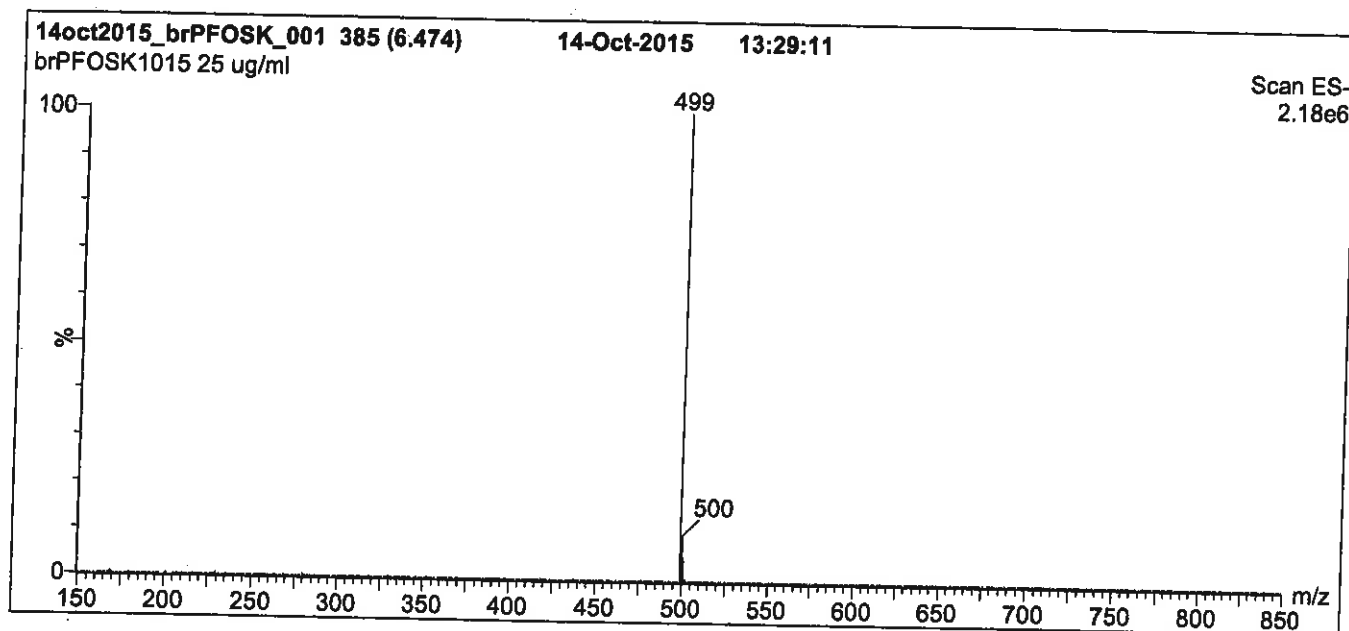
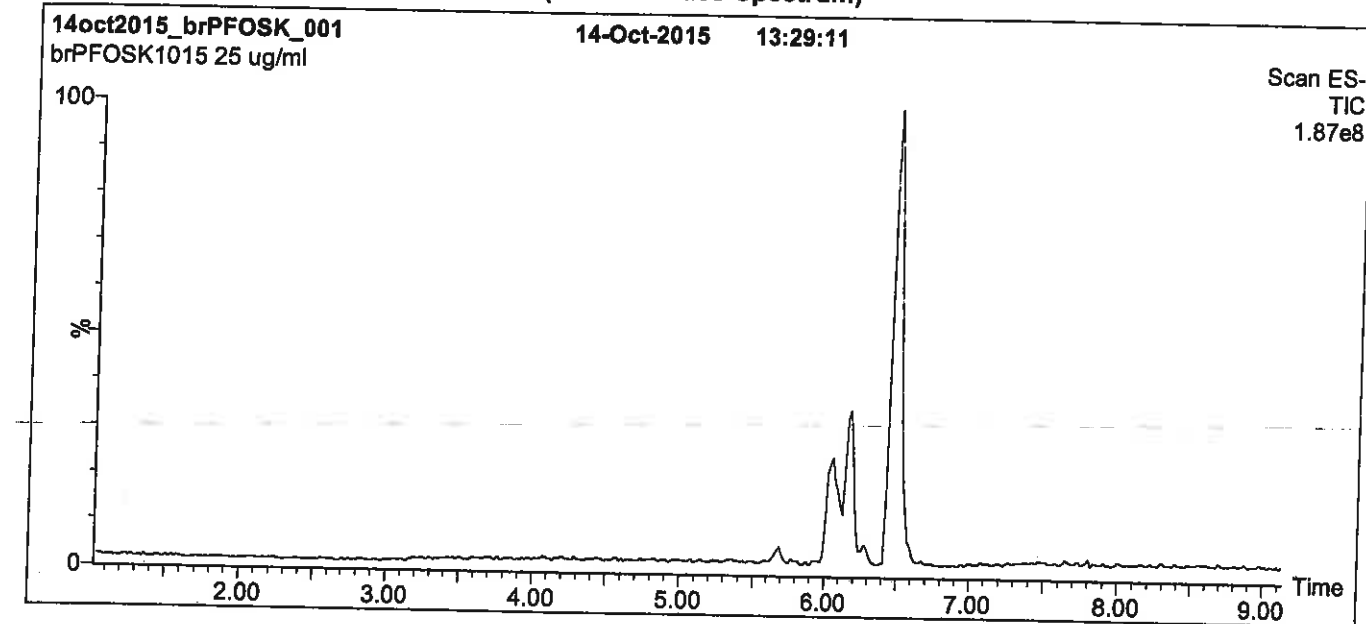
Certified By:


B.G. Chittim

Date: 10/15/2015

(mm/dd/yyyy)

Figure 1: br-PFOSK; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 45% (80:20 MeOH:ACN) / 55% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

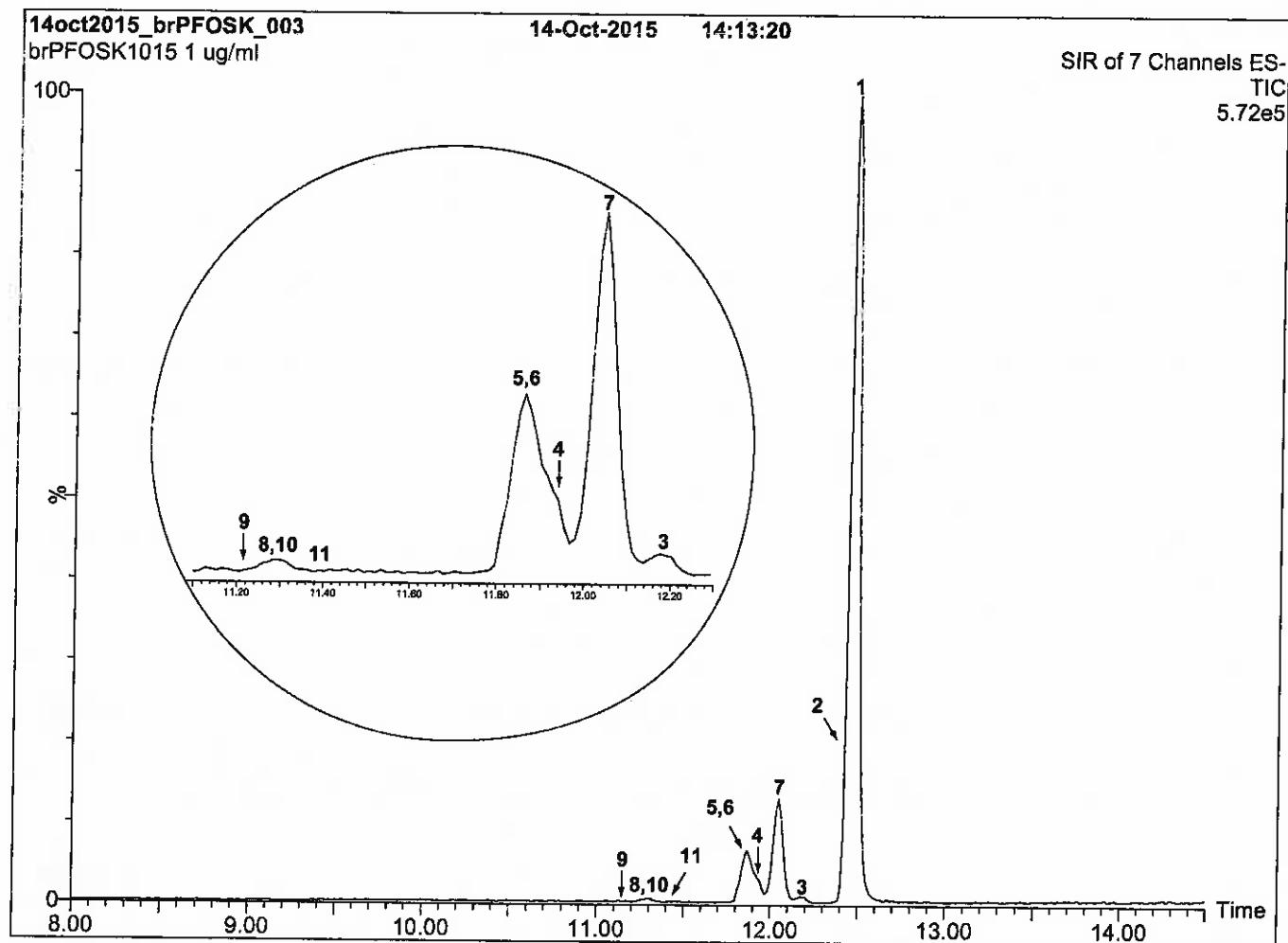
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: br-PFOSK; LC/MS Data (SIR)



Conditions for Figure 2:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

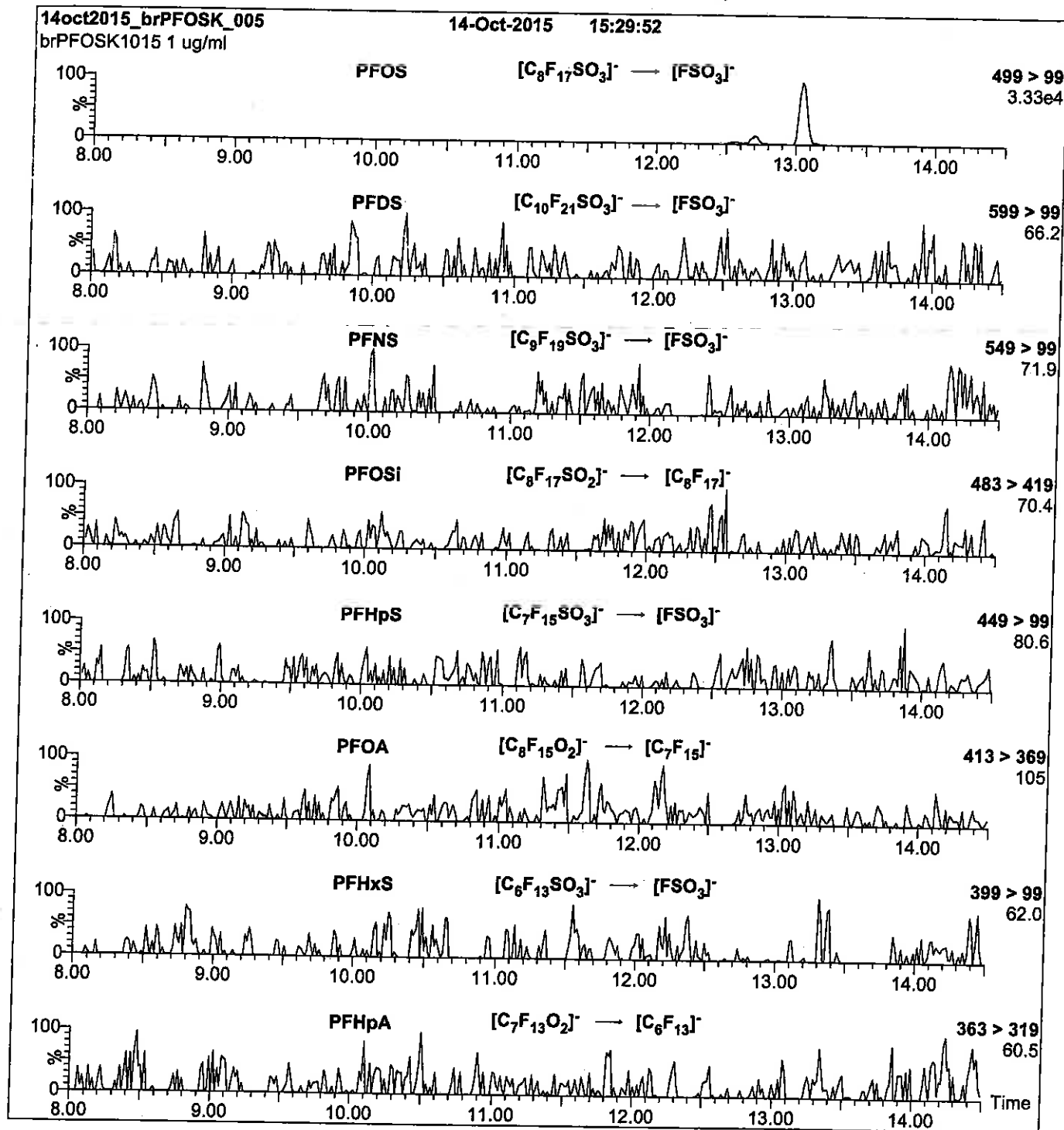
Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈ (1.7 μ m, 2.1 x 100 mm)
Injection: 1.0 μ g/ml of br-PFOSK
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H₂O (both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min
Flow: 300 μ l/min

MS Conditions:

SIR (ES)
Source = 110 $^{\circ}$ C
Desolvation = 325 $^{\circ}$ C
Cone Voltage = 60V

Figure 3: br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 μ /min

MS Parameters

Collision Gas (mbar) = 3.06e-3

Collision Energy (eV) = 11-50 (variable)

Reagent

LCPFOSA_00006



WELLINGTON LABORATORIES

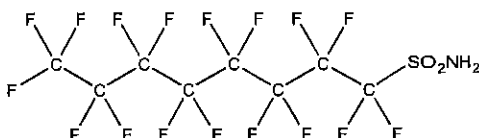
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FOSA-I
COMPOUND: Perfluoro-1-octanesulfonamide

LOT NUMBER: FOSA0815I

STRUCTURE:

CAS #: 754-91-6



MOLECULAR FORMULA: $C_8H_2F_{17}NO_2S$
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/02/2015
EXPIRY DATE: (mm/dd/yyyy) 09/02/2017
RECOMMENDED STORAGE: Refrigerate ampoule

MOLECULAR WEIGHT: 499.14
SOLVENT(S): Isopropanol

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Date: 09/11/2015
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LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

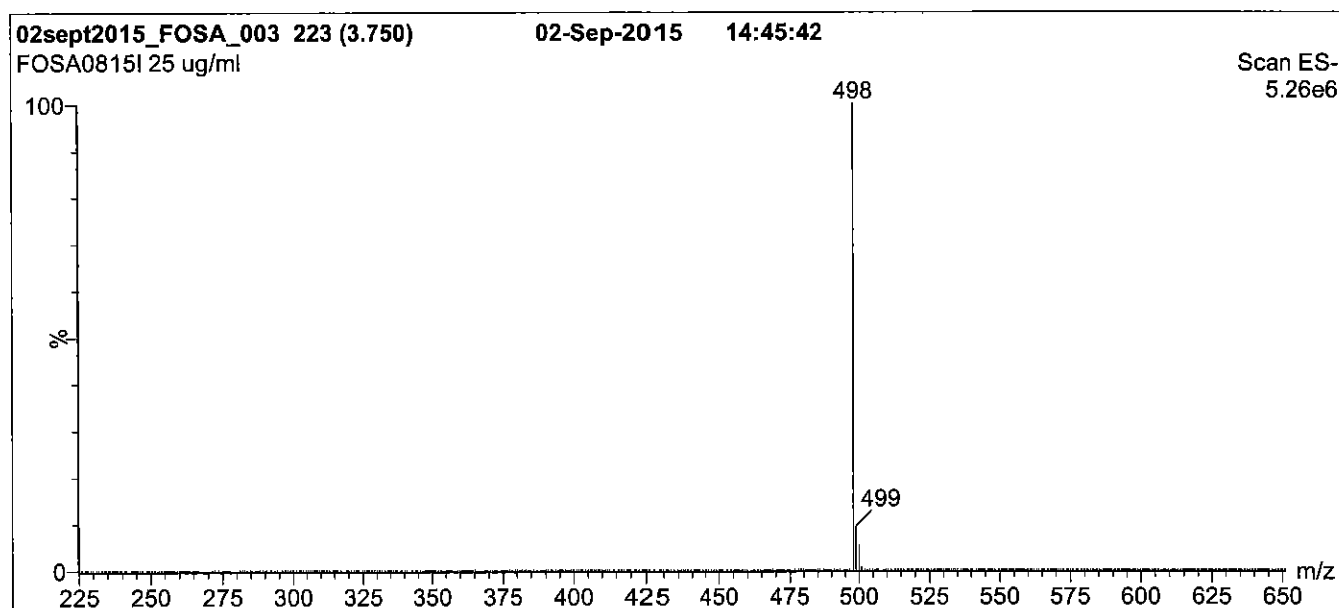
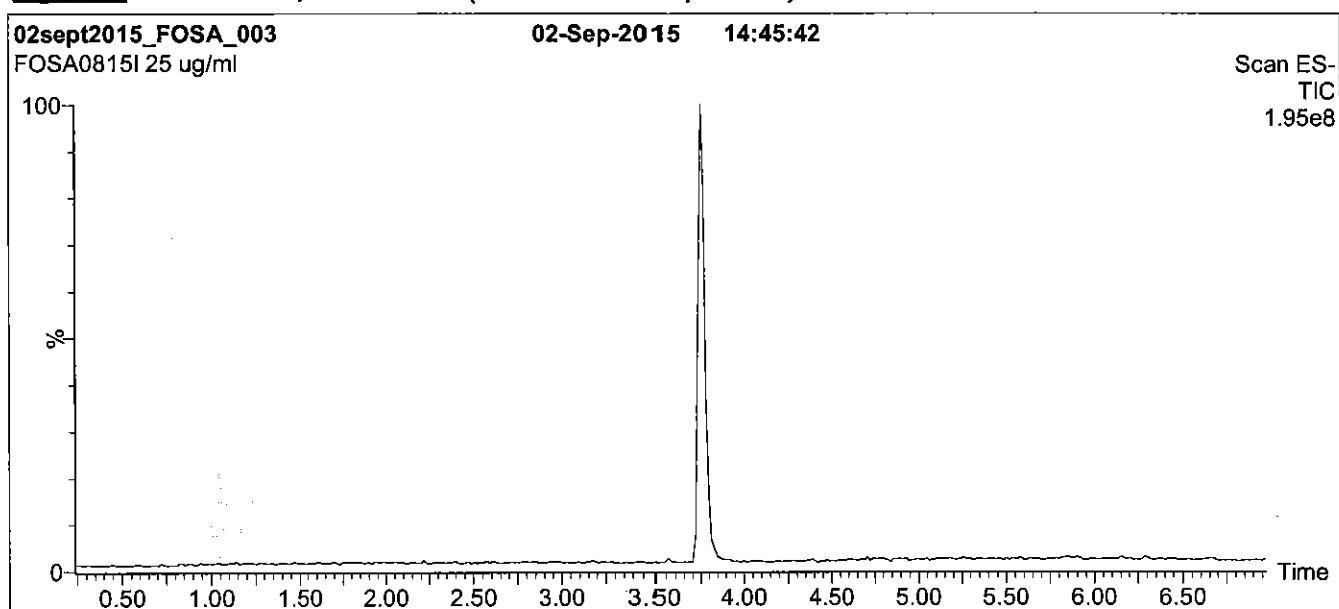
QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



****For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com****

Figure 1: FOSA-I; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

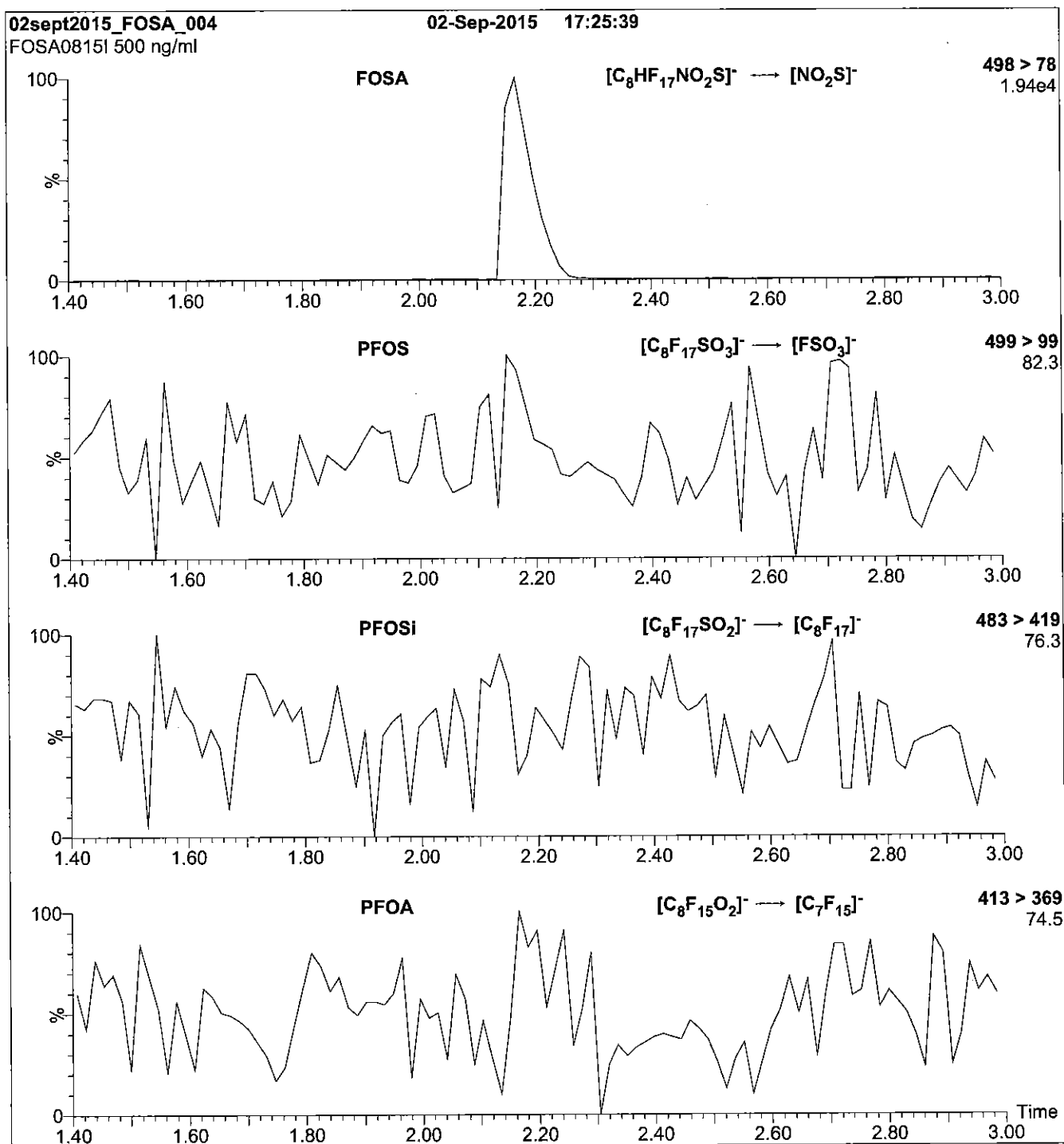
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: FOSA-I; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 30

Reagent

LCPFPeA_00005

R: 7/6/16 CBW



671579

ID: LCPFPeA_00005

Exp: 01/30/20 Prod: CBW

PF-n-pentanoic acid

**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PRODUCT CODE:**

PFPeA

LOT NUMBER:

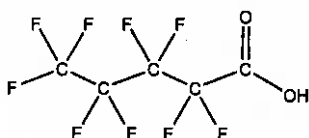
PFPeA0115

COMPOUND:

Perfluoro-n-pentanoic acid

STRUCTURE:**CAS #:**

2706-90-3

**MOLECULAR FORMULA:** $C_5H_9F_9O_2$ **MOLECULAR WEIGHT:**

264.05

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):**

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

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

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:

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The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \dots, x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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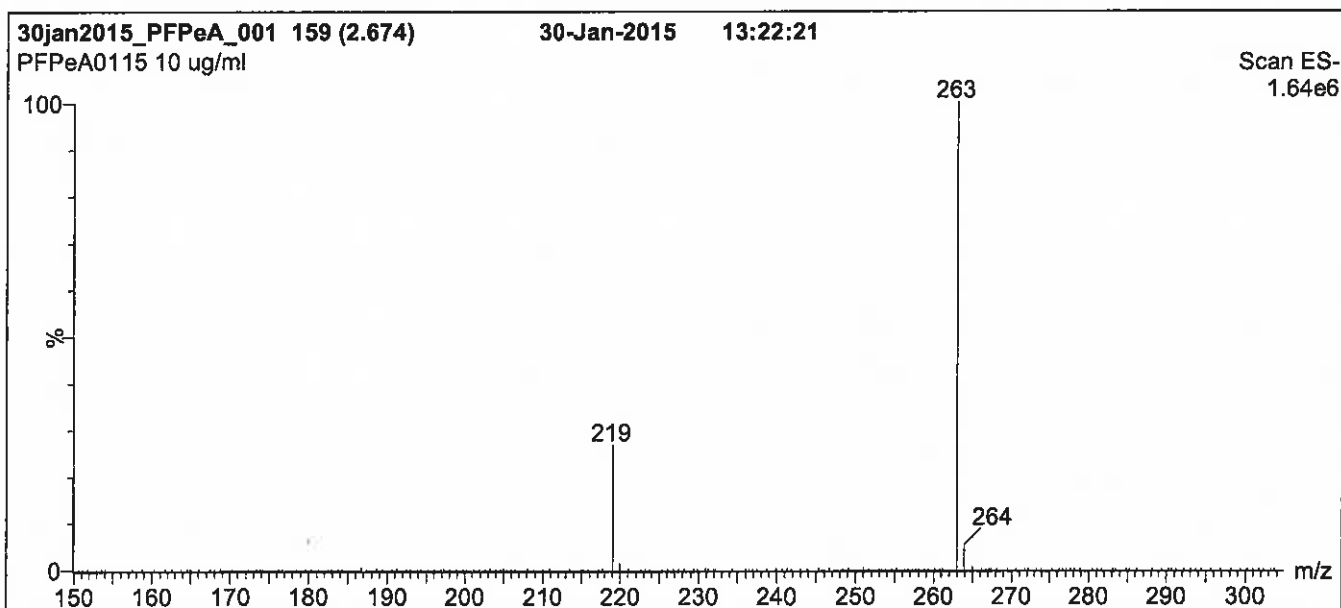
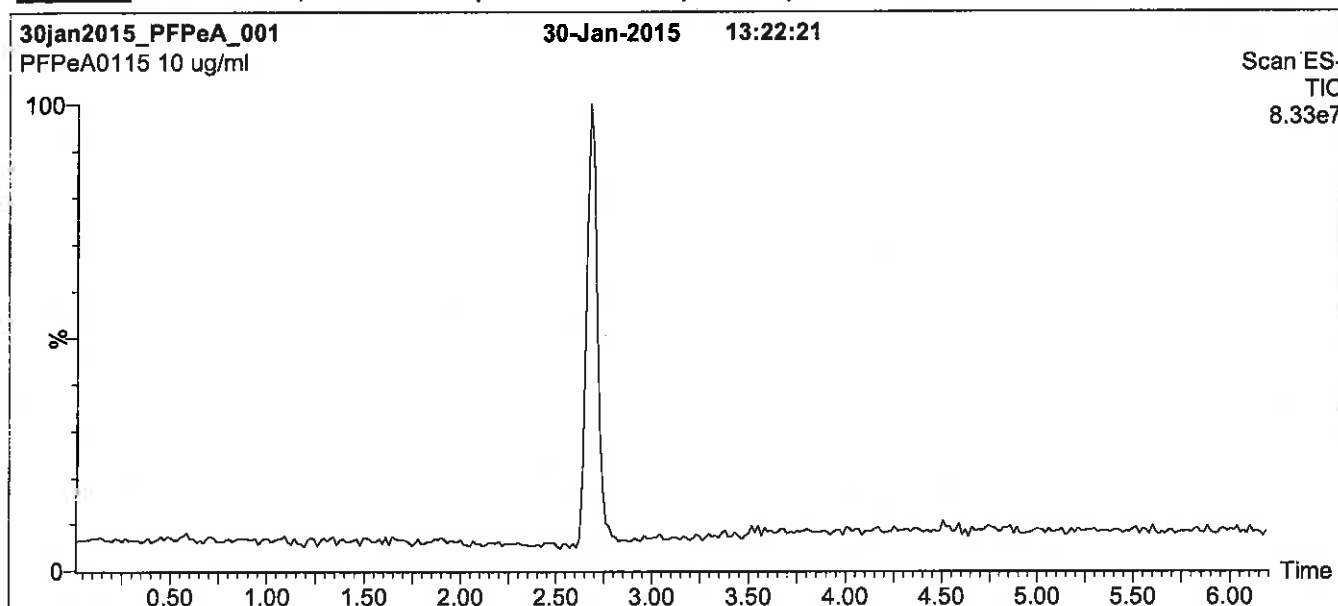
QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



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Figure 1: PFPeA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

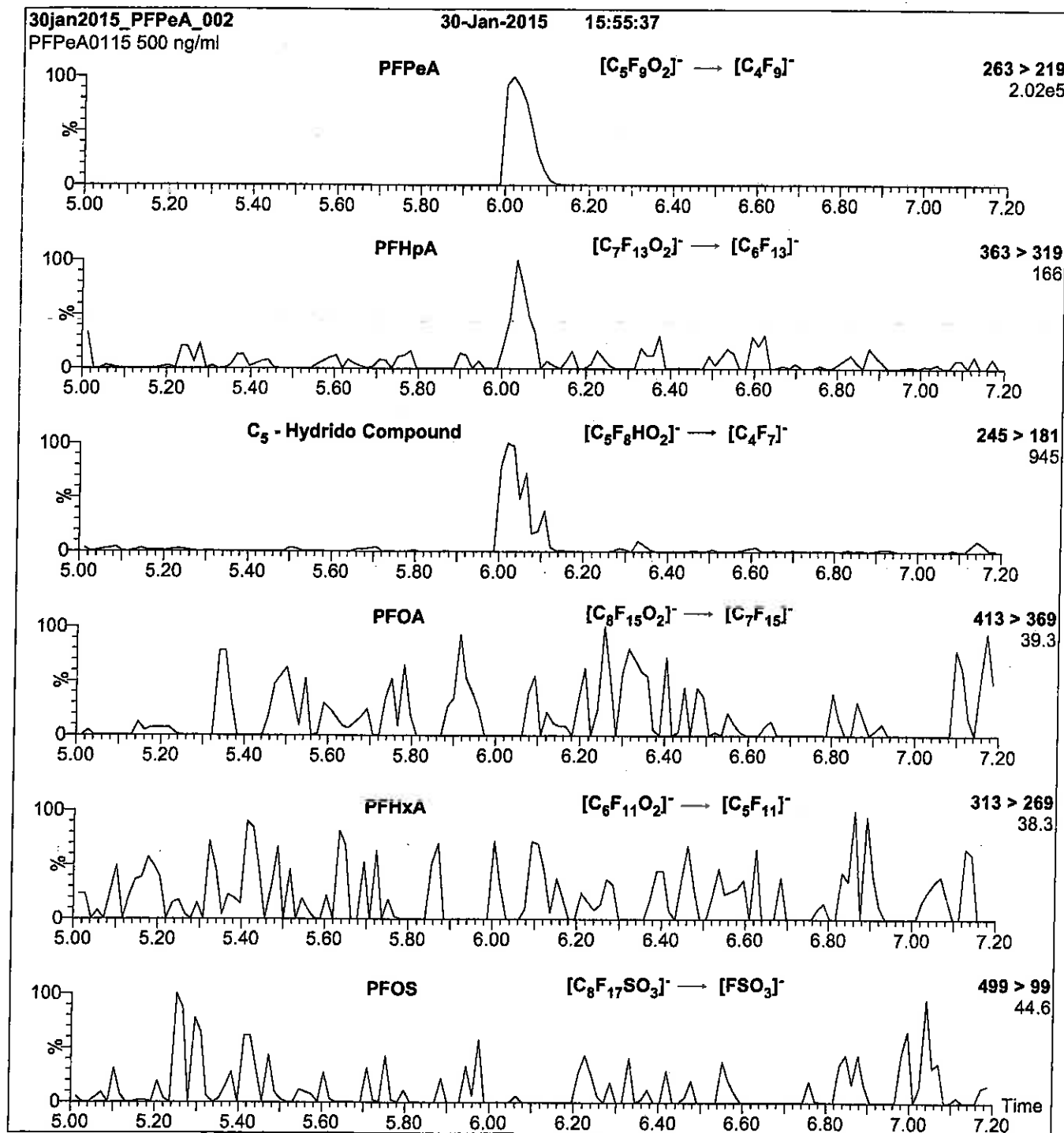
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: PFPeA; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 9

Reagent

LCPFTeDA_00004



609696

ID: LCPFTeDA_00004

Exp: 12/09/20 Pripd: CBW

PF-n-tetradecanoic acid

R: 4/7/16 CBW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFTeDA

LOT NUMBER:

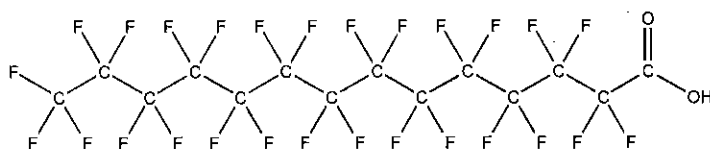
PFTeDA1215

COMPOUND:

Perfluoro-n-tetradecanoic acid

STRUCTURE:**CAS #:**

376-06-7

**MOLECULAR FORMULA:** $C_{14}H_{27}O_2$ **MOLECULAR WEIGHT:**

714.11

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):**

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

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 PFDa ($C_{12}H_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}H_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

12/09/2015
(mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \dots, x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

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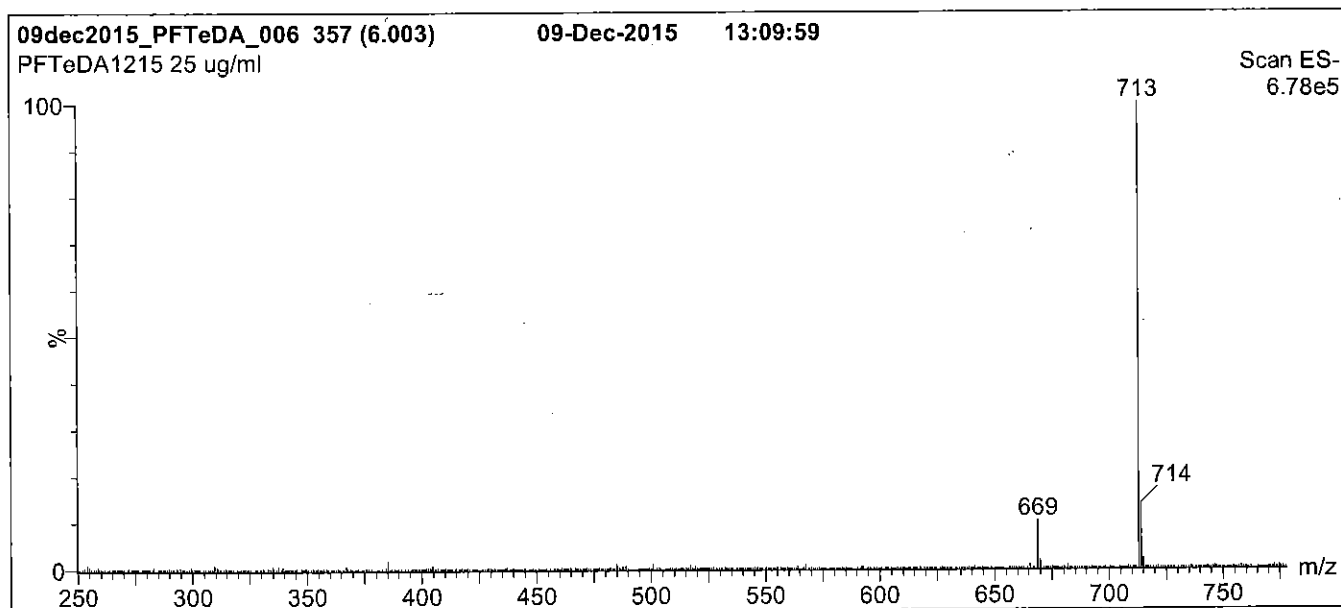
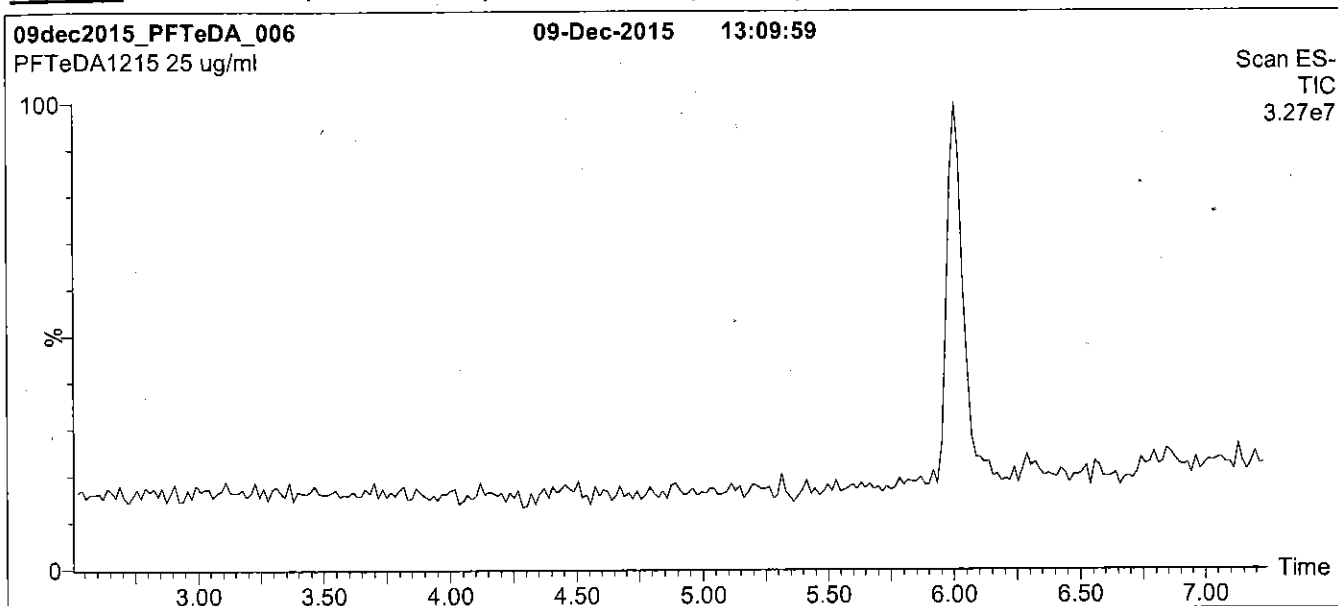
QUALITY MANAGEMENT:

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Figure 1: PFTeDA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

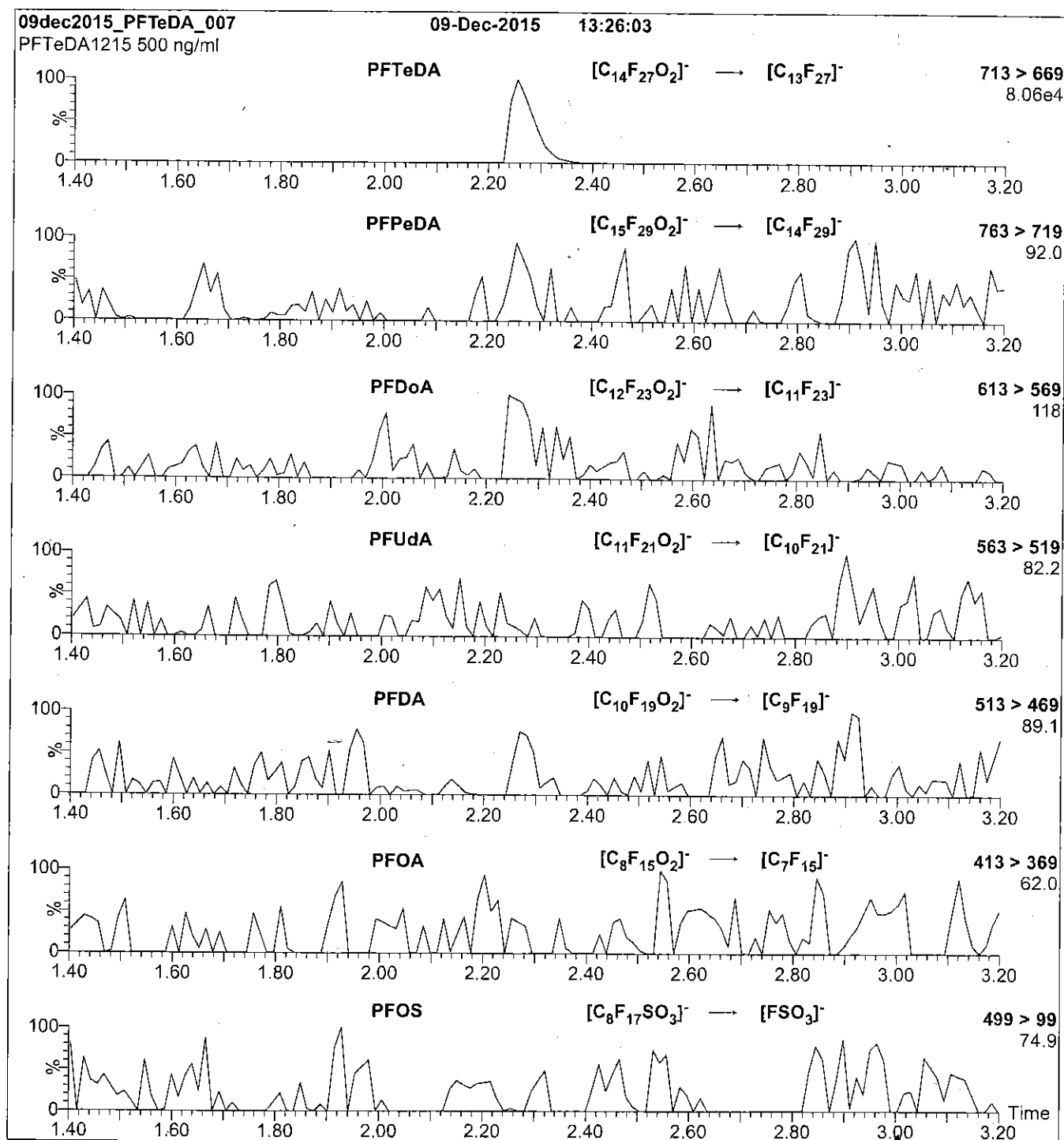
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: PFTeDA; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 14

Reagent

LCPFT_rDA_00004



R: 4/7/16 CBW

609697

ID: LCPFTTrDA_00004

Exp: 12/10/18 Prod: CBW

PF-n-tridecanoic acid



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFTTrDA

LOT NUMBER:

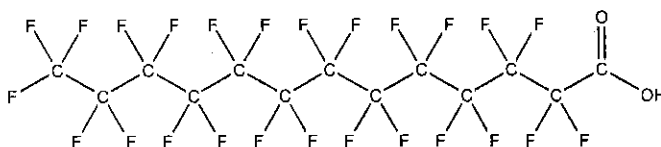
PFTTrDA1213

COMPOUND:

Perfluoro-n-tridecanoic acid

STRUCTURE:**CAS #:**

72629-94-8

**MOLECULAR FORMULA:** $C_{13}H_{25}O_2$ **MOLECULAR WEIGHT:**

664.11

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):**

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

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 ($C_{11}H_{21}O_2$); ~ 0.4% of PFDa ($C_{12}H_{23}O_2$), and ~ 0.1% of PFTeDa ($C_{14}H_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

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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where x is expressed as a relative standard uncertainty of the individual parameter.

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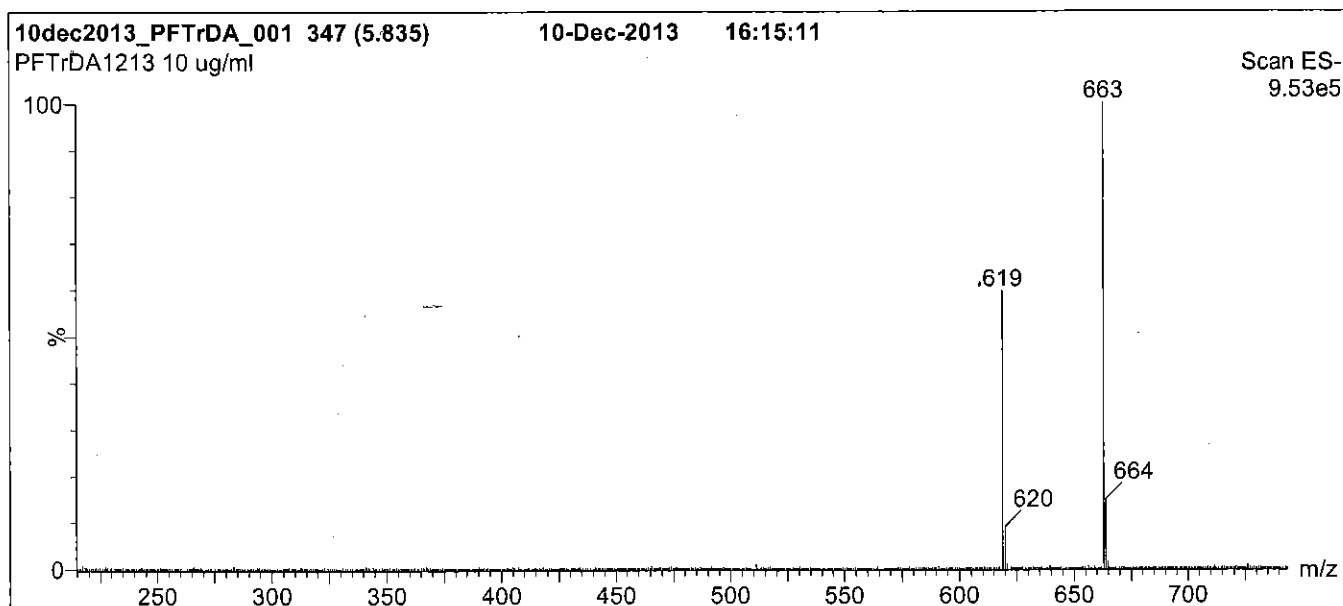
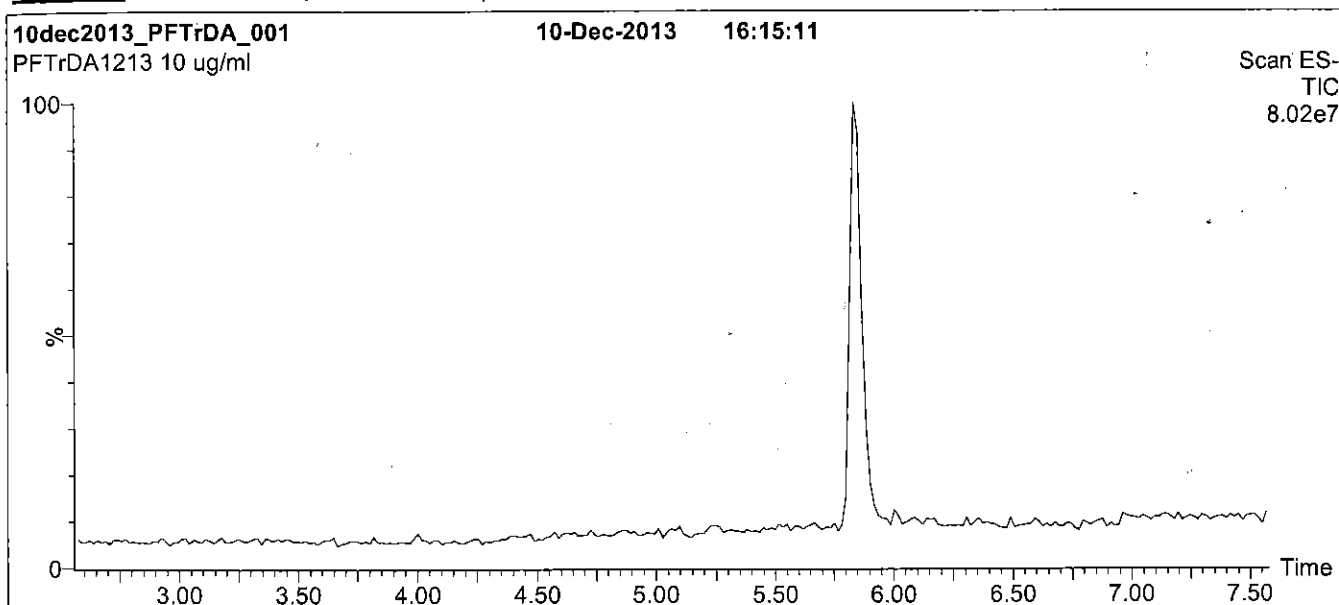
QUALITY MANAGEMENT:

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Figure 1: PFTrDA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

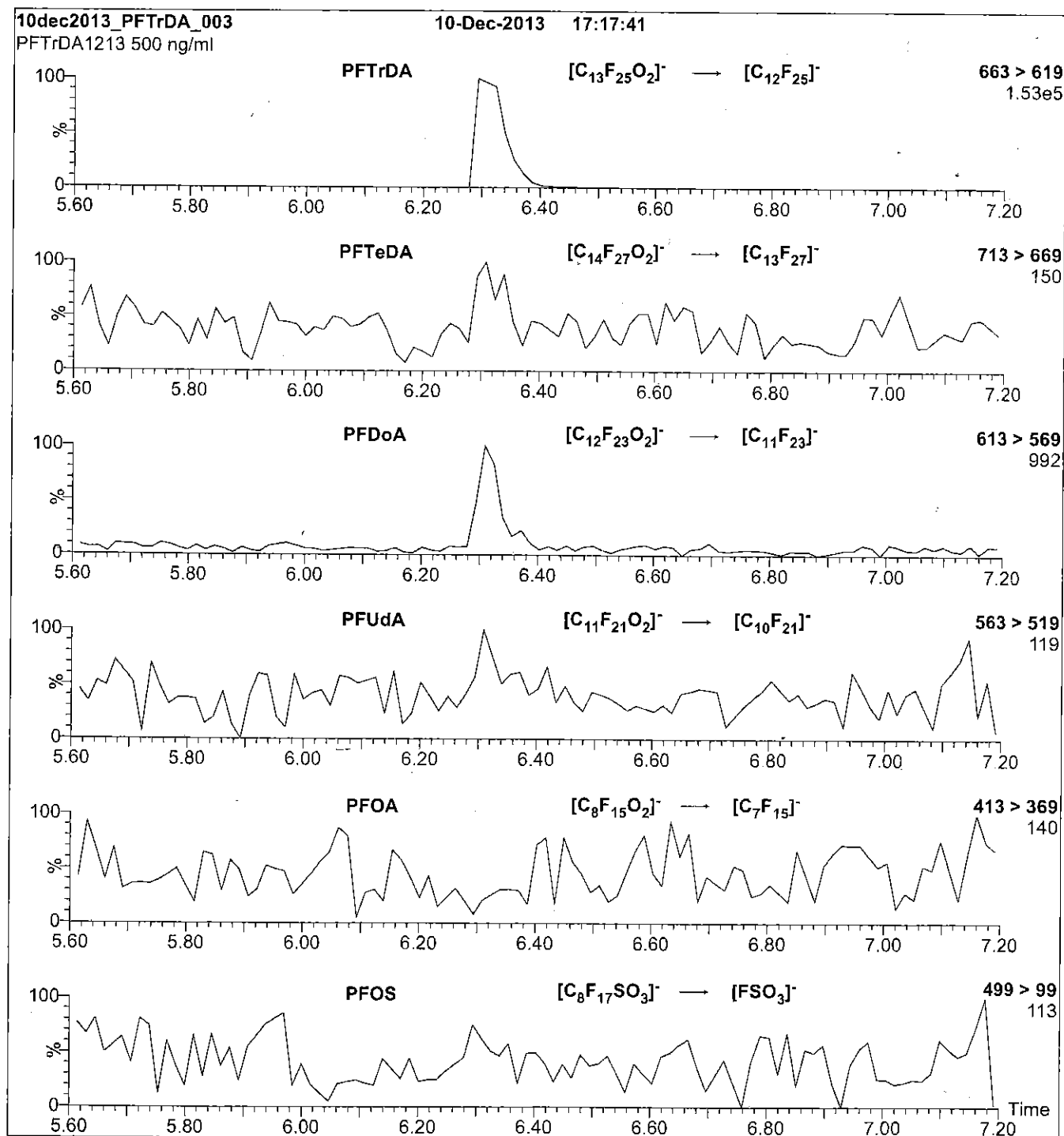
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 μ l (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 15

Reagent

LCPFUdA_00004



WELLINGTON LABORATORIES

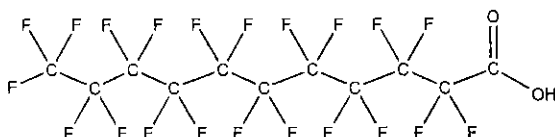
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFUdA
COMPOUND: Perfluoro-n-undecanoic acid

LOT NUMBER: PFUdA0815

STRUCTURE:

CAS #: 2058-94-8



MOLECULAR FORMULA: $C_{11}H_{21}O_2$
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$

MOLECULAR WEIGHT: 564.09
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 08/19/2015
EXPIRY DATE: (mm/dd/yyyy) 08/19/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 08/21/2015
(mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \dots, x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

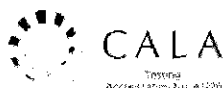
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

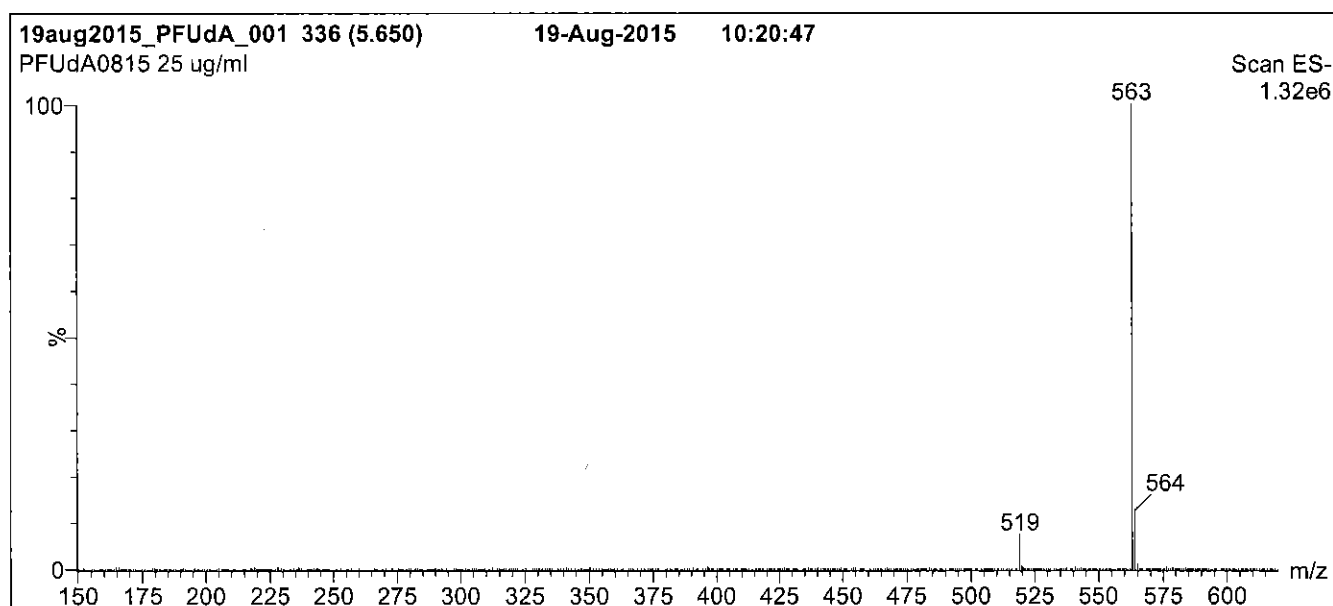
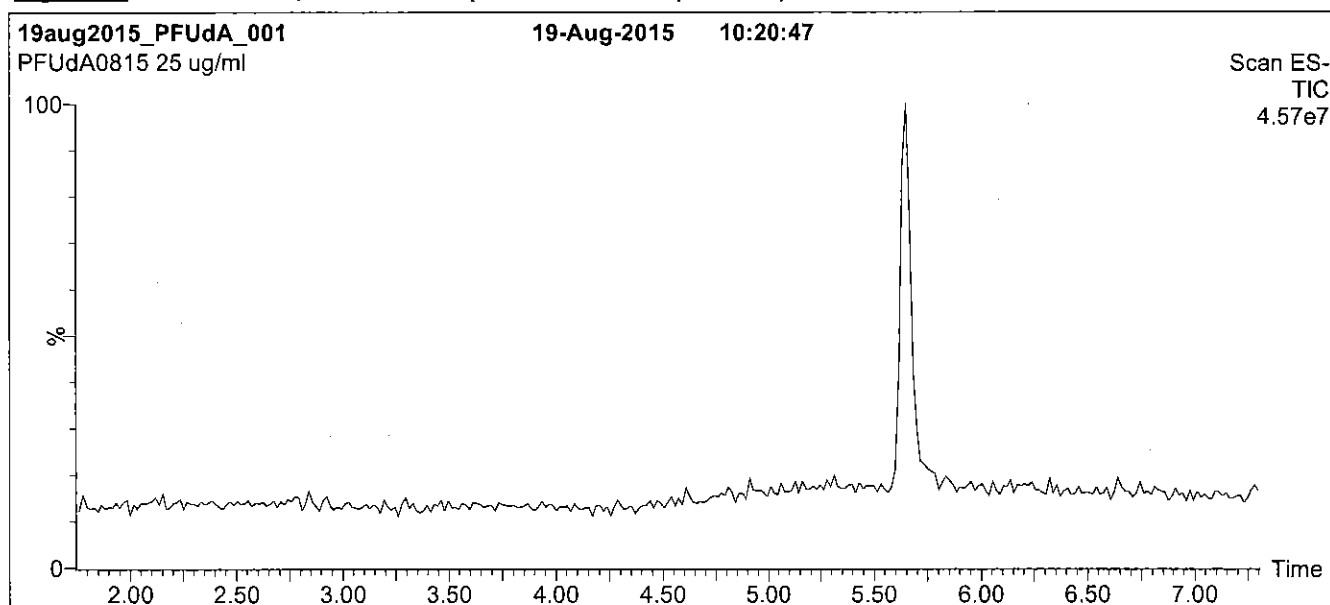
QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



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Figure 1: PFUdA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

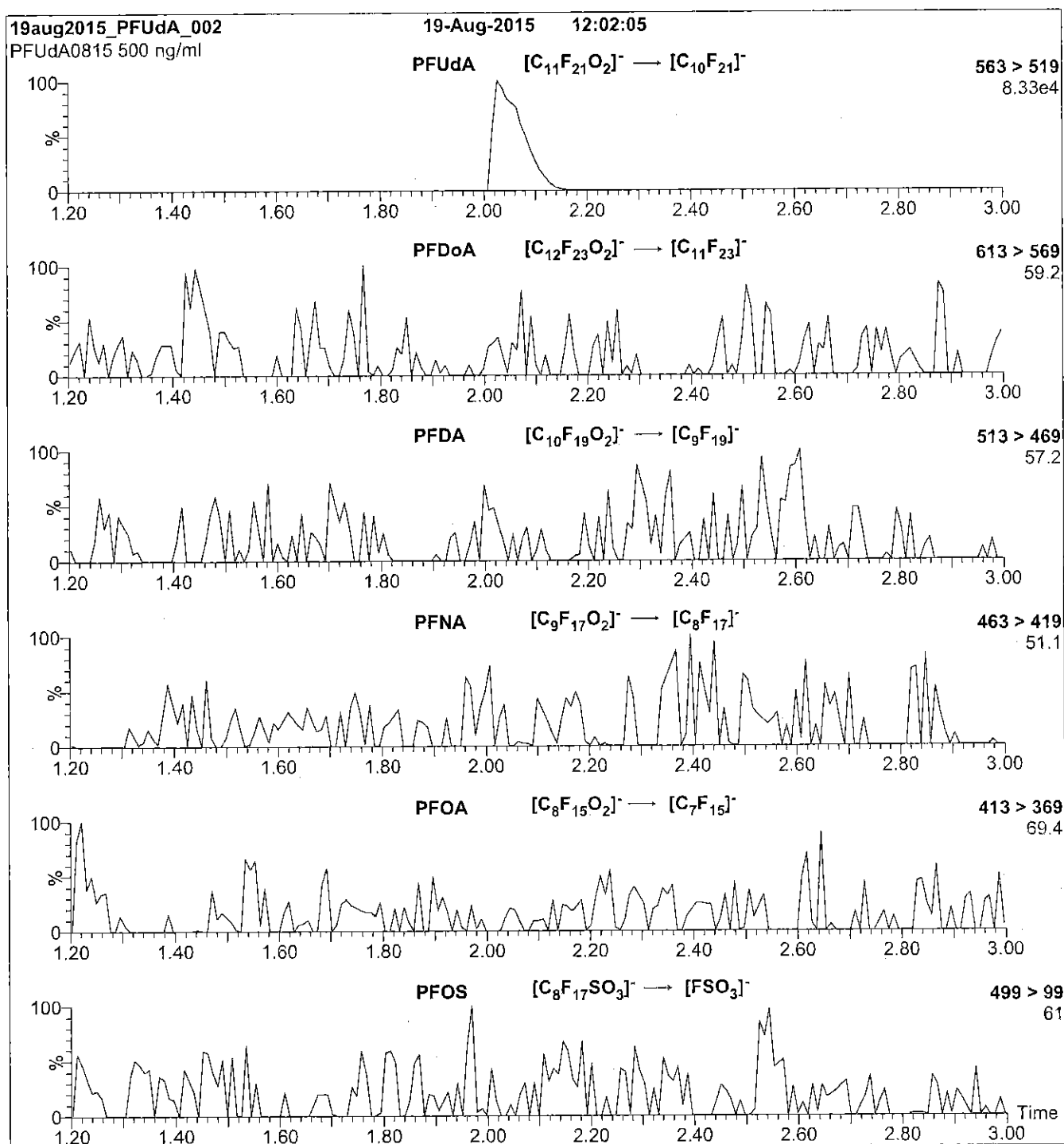
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

Figure 2: PFUdA; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/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

PRODUCT CODE:

PFUdA

LOT NUMBER:

PFUdA0815

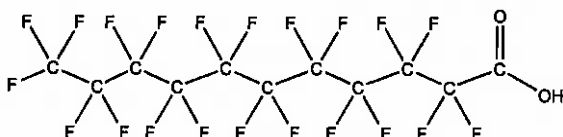
COMPOUND:

Perfluoro-n-undecanoic acid

STRUCTURE:

CAS #:

2058-94-8



MOLECULAR FORMULA:

$C_{11}HF_{21}O_2$

MOLECULAR WEIGHT:

564.09

CONCENTRATION:

$50 \pm 2.5 \mu\text{g/ml}$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

08/19/2015

EXPIRY DATE: (mm/dd/yyyy)

08/19/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 08/21/2015

(mm/dd/yyyy)

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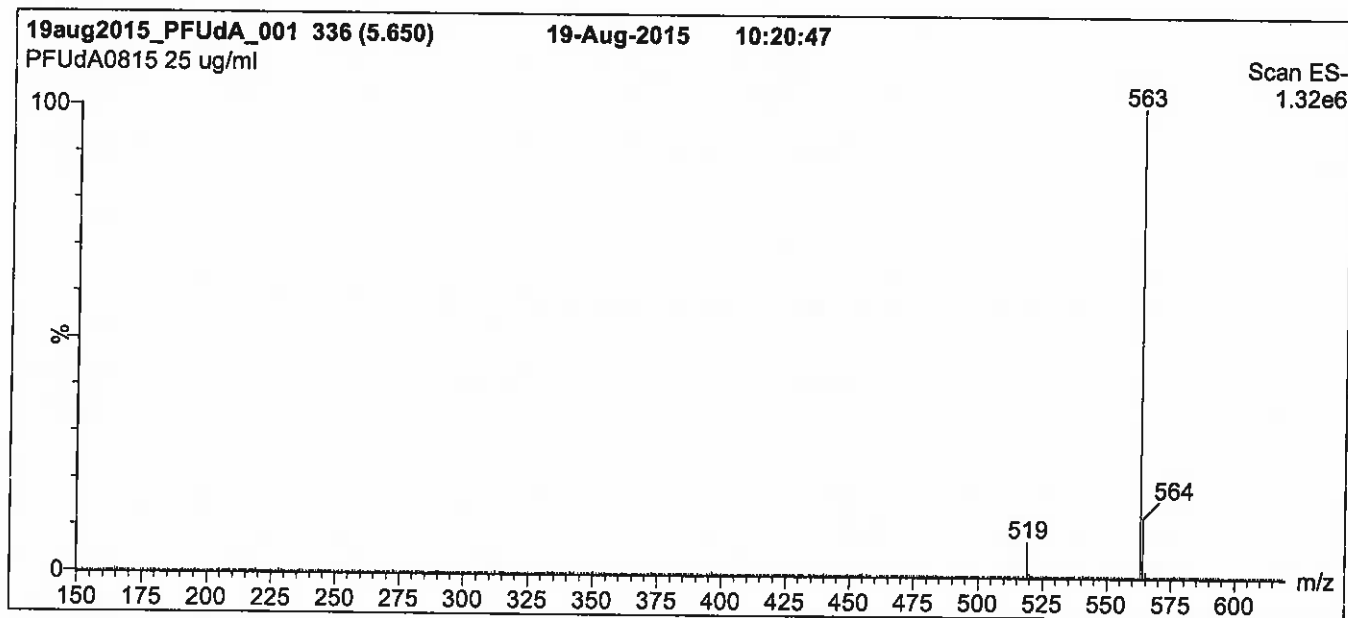
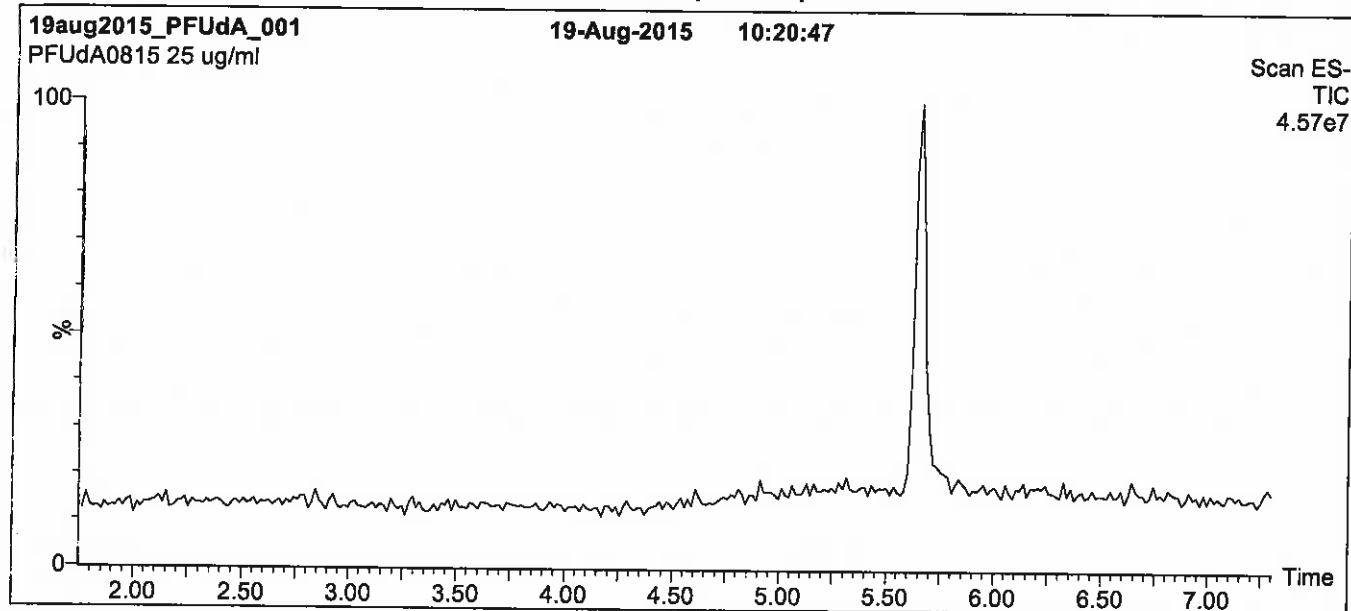
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Figure 1: PFUdA; LC/MS Data (TIC and Mass Spectrum)



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MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

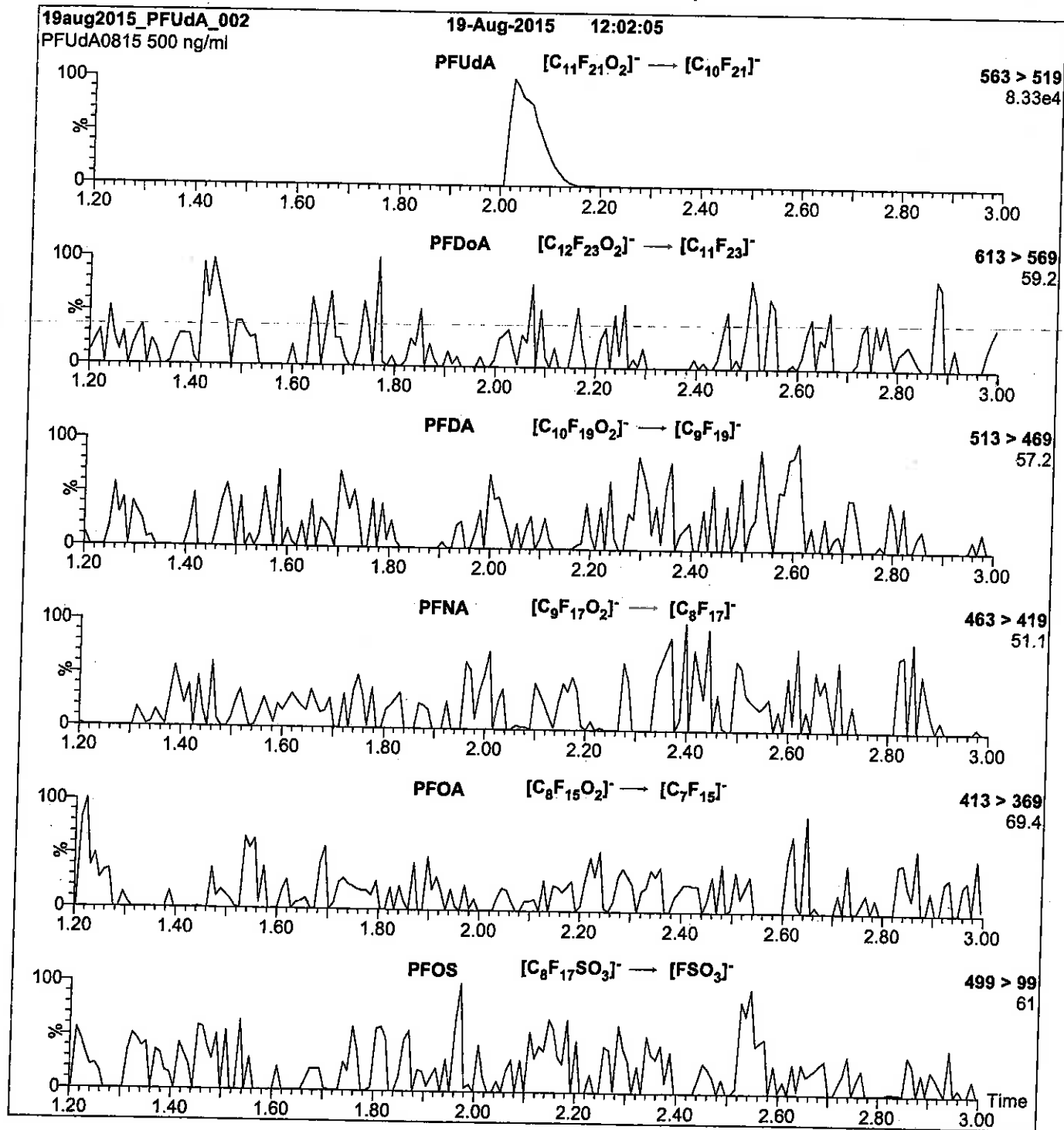
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

Figure 2: PFUdA; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 11

Method PFC DOD

Perfluronated Hydrocarbons (LC/MS)
by Method PFC_DOD

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

SDG No.: _____

Matrix: Solid Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFHxS #	PFOA #	PFOS #
DPT-16-20-SO-16-17	320-23651-2	99	101	78
DPT-16-20-SO-16-17 -DUP	320-23651-3	101	111	90
	MB 320-139627/1-A	104	108	94
	LCS 320-139627/2-A	120	119	112

PFHxS = 1802 PFHxS	QC LIMITS
PFOA = 13C4 PFOA	25-150
PFOS = 13C4 PFOS	25-150
	25-150

Column to be used to flag recovery values

FORM II 537 (Modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

SDG No.: _____

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFHxS #	PFOA #	PFOS #
DPT-16-20-GW-16-20	320-23651-1	148	98	137
DPT-16-20-GW-26-30	320-23651-4	132	127	120
DPT-SO-EB-111516	320-23651-5	126	139	121
DPT-16-34-GW-16-20	320-23651-6	116	90	107
DPT-16-26-GW-18-22	320-23651-7	132	85	126
DPT-16-26-GW-29-33	320-23651-8	119	97	109
DPT-16-26-GW-29-33 -DUP	320-23651-9	116	82	116
DPT-16-27-GW-18-22	320-23651-10	112	75	111
DPT-16-27-GW-29-33	320-23651-11	134	101	130
	MB 320-138841/1-A	123	133	118
	LCS 320-138841/2-A	126	133	123
	LCSD 320-138841/3-A	109	110	102

	<u>QC LIMITS</u>
PFHxS = 1802 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.: 320-23651-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 02DEC2016C_030.d
 Lab ID: LCS 320-138841/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	0.0400	0.0373	93	60-140	
Perfluorooctane Sulfonate (PFOS)	0.0371	0.0328	88	60-140	
13C4 PFOA	0.100	0.133	133	25-150	
13C4 PFOS	0.0956	0.118	123	25-150	
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0373	106	50-150	
18O2 PFHxS	0.0946	0.119	126	25-150	

Column to be used to flag recovery and RPD values
 FORM III 537 (Modified)

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1
SDG No.: _____
Matrix: Solid Level: Low Lab File ID: 02DEC2016C_002.d
Lab ID: LCS 320-139627/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	4.00	4.25	106	60-140	
Perfluorooctane Sulfonate (PFOS)	3.71	3.66	99	60-140	
13C4 PFOA	10.0	11.9	119	25-150	
13C4 PFOS	9.56	10.7	112	25-150	
Perfluorobutanesulfonic acid (PFBS)	3.54	4.03	114	50-150	
18O2 PFHxS	9.46	11.3	120	25-150	

Column to be used to flag recovery and RPD values
FORM III 537 (Modified)

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 02DEC2016C_031.d
 Lab ID: LCSD 320-138841/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanoic acid (PFOA)	0.0400	0.0407	102	9	30	60-140	
Perfluorooctane Sulfonate (PFOS)	0.0371	0.0390	105	17	30	60-140	
13C4 PFOA	0.100	0.110	110			25-150	
13C4 PFOS	0.0956	0.0976	102			25-150	
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0371	105	1	30	50-150	
18O2 PFHxS	0.0946	0.104	109			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.: 320-23651-1
 SDG No.: _____
 Lab File ID: 02DEC2016C_029.d Lab Sample ID: MB 320-138841/1-A
 Matrix: Water Date Extracted: 11/21/2016 13:47
 Instrument ID: A8_N Date Analyzed: 12/02/2016 18:29
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-138841/2-A	02DEC2016C_ 030.d	12/02/2016 18:37
	LCSD 320-138841/3-A	02DEC2016C_ 031.d	12/02/2016 18:44
DPT-16-20-GW-26-30	320-23651-4	02DEC2016C_ 032.d	12/02/2016 18:52
DPT-16-20-GW-16-20	320-23651-1	02DEC2016C_ 033.d	12/02/2016 18:59
DPT-16-34-GW-16-20	320-23651-6	02DEC2016C_ 034.d	12/02/2016 19:07
DPT-SO-EB-111516	320-23651-5	02DEC2016C_ 038.d	12/02/2016 19:37
DPT-16-27-GW-18-22	320-23651-10	02DEC2016C_ 043.d	12/02/2016 20:14
DPT-16-26-GW-18-22	320-23651-7	02DEC2016C_ 044.d	12/02/2016 20:22
DPT-16-26-GW-29-33	320-23651-8	02DEC2016C_ 045.d	12/02/2016 20:29
DPT-16-26-GW-29-33-DUP	320-23651-9	02DEC2016C_ 046.d	12/02/2016 20:37
DPT-16-27-GW-29-33	320-23651-11	02DEC2016C_ 047.d	12/02/2016 20:44

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1
SDG No.: _____
Lab File ID: 02DEC2016C_001.d Lab Sample ID: MB 320-139627/1-A
Matrix: Solid Date Extracted: 11/28/2016 11:03
Instrument ID: A8_N Date Analyzed: 12/02/2016 14:59
Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-139627/2-A	02DEC2016C_ 002.d	12/02/2016 15:07
DPT-16-20-SO-16-17	320-23651-2	02DEC2016C_ 003.d	12/02/2016 15:14
DPT-16-20-SO-16-17-DUP	320-23651-3	02DEC2016C_ 004.d	12/02/2016 15:22

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1
 SDG No.: _____
 Client Sample ID: DPT-16-20-GW-16-20 Lab Sample ID: 320-23651-1
 Matrix: Water Lab File ID: 02DEC2016C_033.d
 Analysis Method: 537 (Modified) Date Collected: 11/15/2016 10:30
 Extraction Method: 3535 Date Extracted: 11/21/2016 13:47
 Sample wt/vol: 252.6(mL) Date Analyzed: 12/02/2016 18:59
 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.: 140532 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.15	D	0.025	0.020	0.0074
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.66	D M	0.040	0.030	0.013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.017	J D	0.025	0.020	0.0091

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	98		25-150
STL00991	13C4 PFOS	137		25-150
STL00994	18O2 PFHxS	148		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_033.d
 Lims ID: 320-23651-A-1-A
 Client ID: DPT-16-20-GW-16-20
 Sample Type: Client
 Inject. Date: 02-Dec-2016 18:59:48 ALS Bottle#: 21 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 10.0000
 Sample Info: 320-23651-a-1-a 10X
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 08:33:26 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas

Date: 05-Dec-2016 08:33:26

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	1.897	1.897	0.0	1.000	635719	0.8829				
298.90 > 99.00	1.897	1.897	0.0	1.000	267125		2.38(0.00-0.00)			
D 10 18O2 PFHxS										
403.00 > 84.00	2.527	2.521	0.006		2110908	6.98		14.8	288973	
D 14 13C4 PFOA										
417.00 > 372.00	2.878	2.869	0.009		1072700	4.89		9.8	142611	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.878	2.877	0.001	1.000	1665282	7.61			32234	
413.00 > 169.00	2.878	2.877	0.001	1.000	1093387		1.52(0.90-1.10)		64346	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.259	3.250	0.009	1.000	12123303	33.2			318226	M
499.00 > 99.00	3.259	3.250	0.009	1.000	2680622		4.52(0.90-1.10)		187420	
D 17 13C4 PFOS										
503.00 > 80.00	3.251	3.250	0.001		1604387	6.56		13.7	90229	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_033.d

Injection Date: 02-Dec-2016 18:59:48

Instrument ID: A8_N

Lims ID: 320-23651-A-1-A

Lab Sample ID: 320-23651-1

Client ID: DPT-16-20-GW-16-20

Operator ID: A8-PC\A8

ALS Bottle#: 21

Worklist Smp#: 9

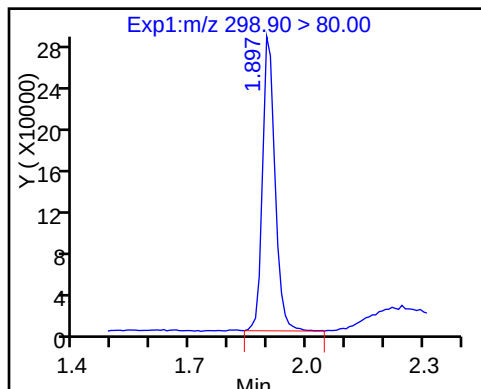
Injection Vol: 2.0 ul

Dil. Factor: 10.0000

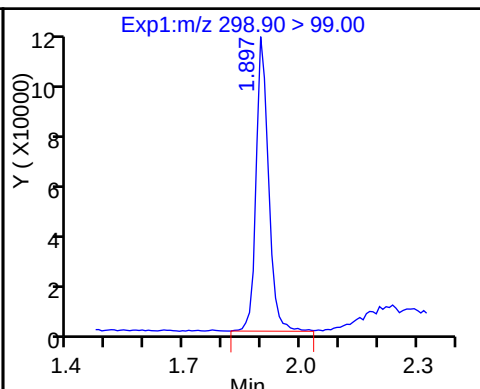
Method: A8_N

Limit Group: LC PFC_DOD ICAL

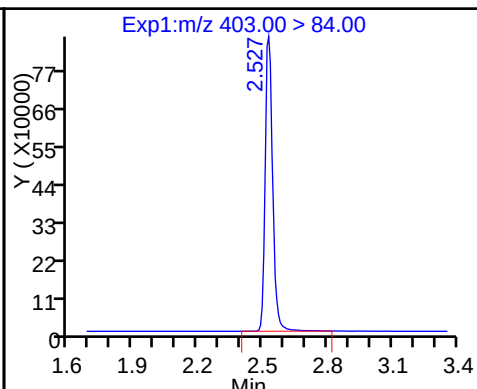
5 Perfluorobutanesulfonic acid



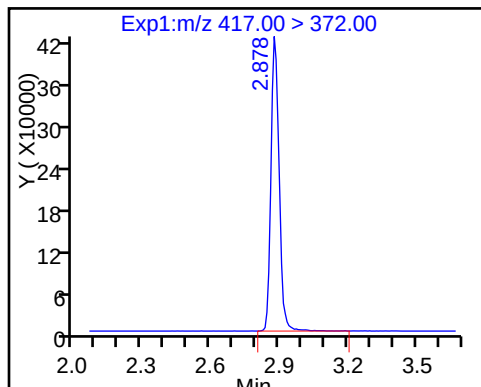
5 Perfluorobutanesulfonic acid



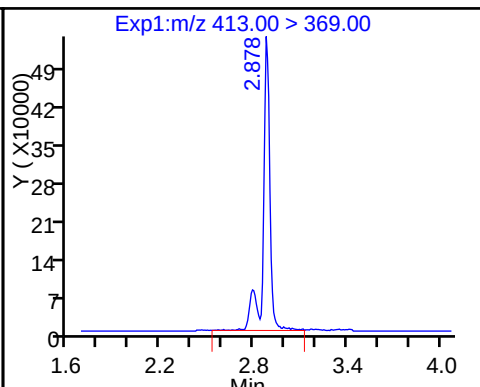
D 10 18O2 PFHxS



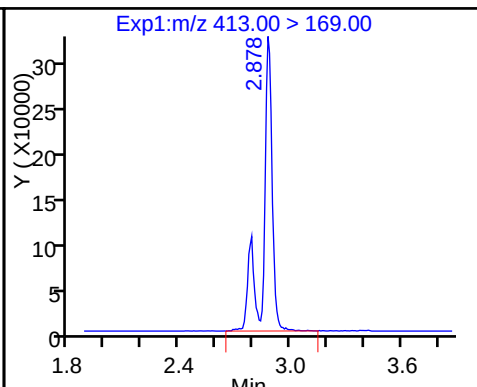
D 14 13C4 PFOA



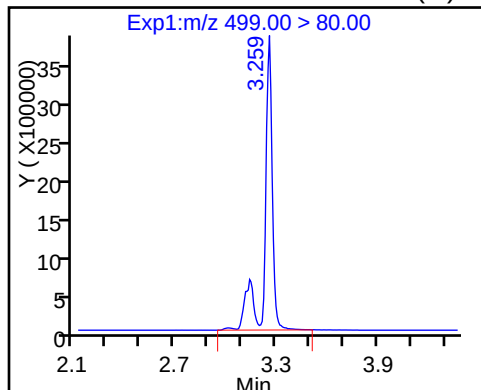
15 Perfluorooctanoic acid



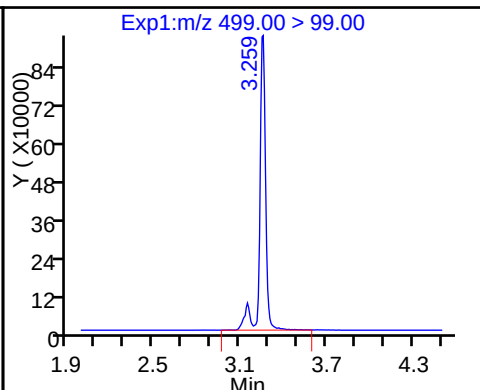
15 Perfluorooctanoic acid



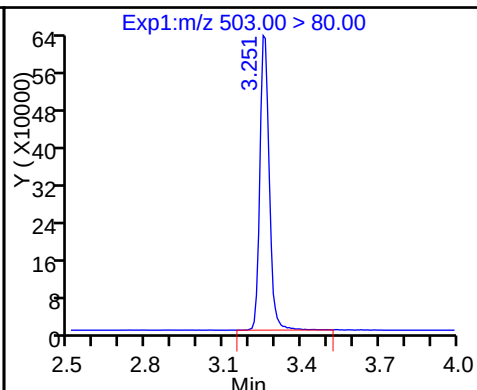
18 Perfluorooctane sulfonic acid (M)



18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS



TestAmerica Sacramento

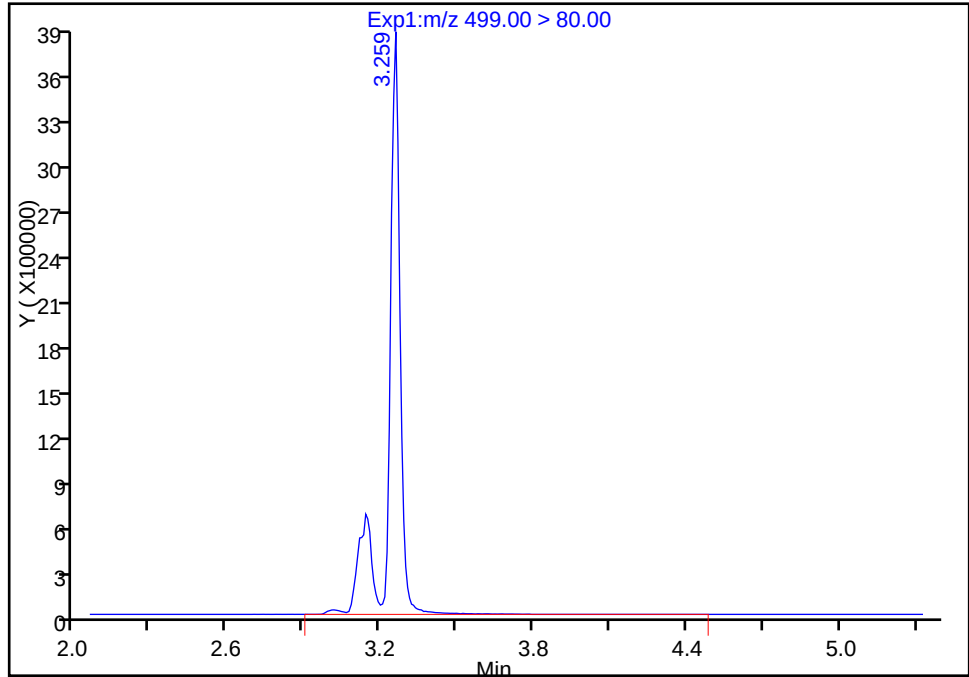
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_033.d				
Injection Date:	02-Dec-2016 18:59:48	Instrument ID:	A8_N		
Lims ID:	320-23651-A-1-A	Lab Sample ID:	320-23651-1		
Client ID:	DPT-16-20-GW-16-20				
Operator ID:	A8-PC\A8	ALS Bottle#:	21	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

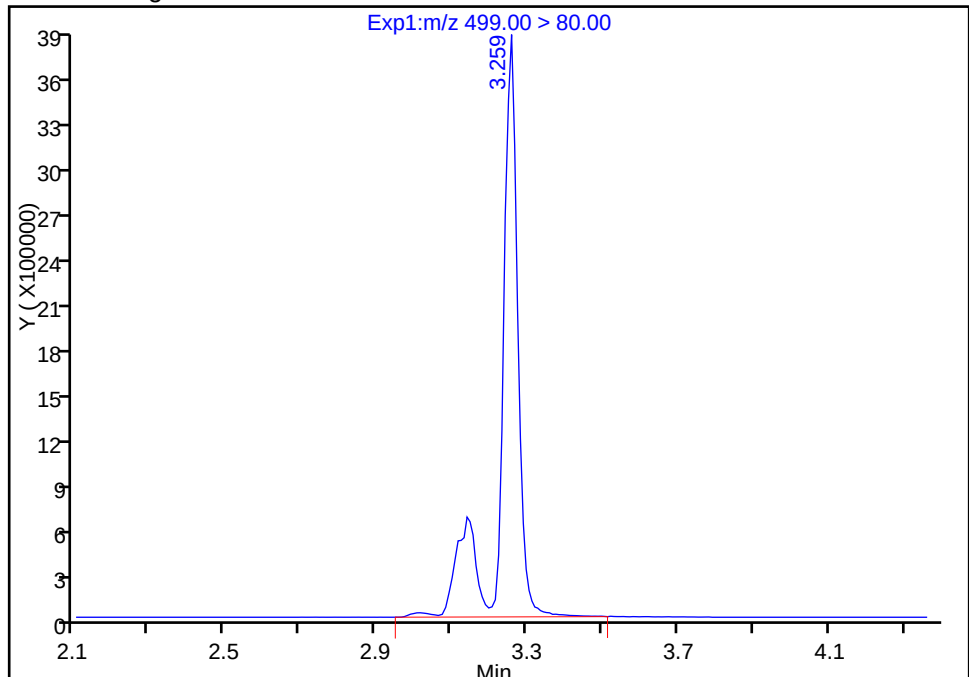
RT: 3.26
Area: 12243701
Amount: 33.547890
Amount Units: ng/ml

Processing Integration Results



RT: 3.26
Area: 12123303
Amount: 33.217998
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:33:26

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-23651-1</u>
SDG No.: _____	
Client Sample ID: <u>DPT-16-20-SO-16-17</u>	Lab Sample ID: <u>320-23651-2</u>
Matrix: <u>Solid</u>	Lab File ID: <u>02DEC2016C_003.d</u>
Analysis Method: <u>537 (Modified)</u>	Date Collected: <u>11/15/2016 09:45</u>
Extraction Method: <u>SHAKE</u>	Date Extracted: <u>11/28/2016 11:03</u>
Sample wt/vol: <u>5.07(g)</u>	Date Analyzed: <u>12/02/2016 15:14</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>Acquity</u> ID: <u>2.1 (mm)</u>
% Moisture: <u>19.4</u>	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>140429</u>	Units: <u>ug/Kg</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.46	J	0.61	0.37	0.12
1763-23-1	Perfluorooctane Sulfonate (PFOS)	10		0.61	0.37	0.15
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.37	U	0.49	0.37	0.13

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	101		25-150
STL00991	13C4 PFOS	78		25-150
STL00994	18O2 PFHxS	99		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37461.b\02DEC2016C_003.d
 Lims ID: 320-23651-A-2-A
 Client ID: DPT-16-20-SO-16-17
 Sample Type: Client
 Inject. Date: 02-Dec-2016 15:14:35 ALS Bottle#: 3 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-23651-a-2-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37461.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 04-Dec-2016 18:25:25 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d
 Column 1 : Det: EXP1
 Process Host: XAWRK025

First Level Reviewer: chandrasenas

Date: 04-Dec-2016 18:17:48

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	1.909	1.907	0.002	1.000	20190	0.0419				
298.90 > 99.00	1.909	1.907	0.002	1.000	12200		1.65(0.00-0.00)			
D 10 18O2 PFHxS										
403.00 > 84.00	2.535	2.534	0.001		14140025	46.8		98.8	680941	
D 14 13C4 PFOA										
417.00 > 372.00	2.895	2.886	0.009		11051650	50.4		101	709798	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.903	2.894	0.009	1.000	423855	1.88			6403	
413.00 > 169.00	2.895	2.894	0.001	0.997	258877		1.64(0.90-1.10)		17823	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.276	3.267	0.009	1.000	8730485	42.2			736104	
499.00 > 99.00	3.268	3.267	0.001	0.998	1987724		4.39(0.90-1.10)		46313	
D 17 13C4 PFOS										
503.00 > 80.00	3.268	3.267	0.001		9102434	37.2		77.8	445350	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37461.b\02DEC2016C_003.d

Injection Date: 02-Dec-2016 15:14:35

Instrument ID: A8_N

Lims ID: 320-23651-A-2-A

Lab Sample ID: 320-23651-2

Client ID: DPT-16-20-SO-16-17

Operator ID: A8-PC\A8

ALS Bottle#: 3

Worklist Smp#: 7

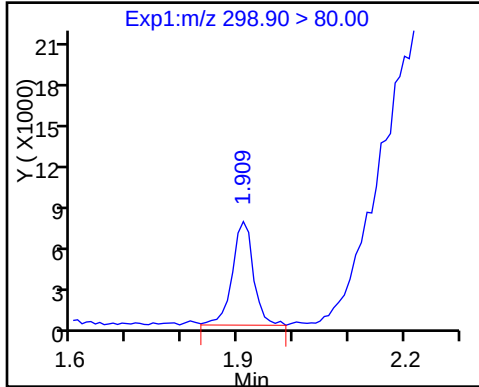
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

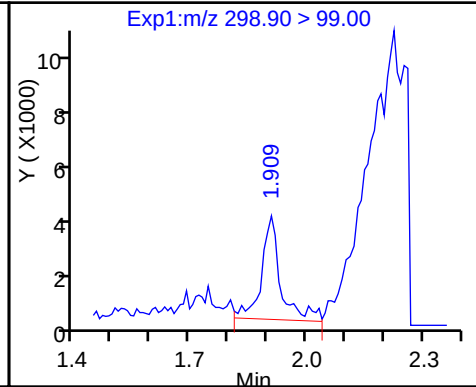
Method: A8_N

Limit Group: LC PFC_DOD ICAL

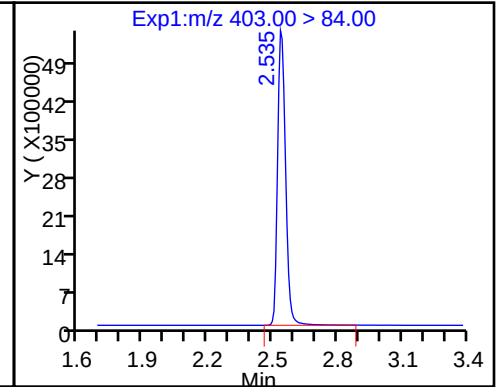
5 Perfluorobutanesulfonic acid



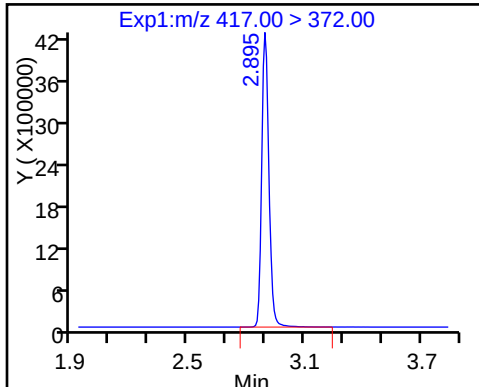
5 Perfluorobutanesulfonic acid



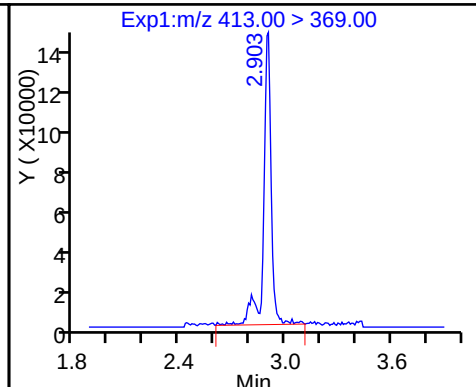
D 10 18O2 PFHxS



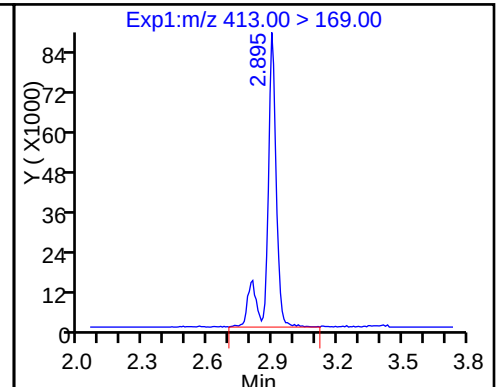
D 14 13C4 PFOA



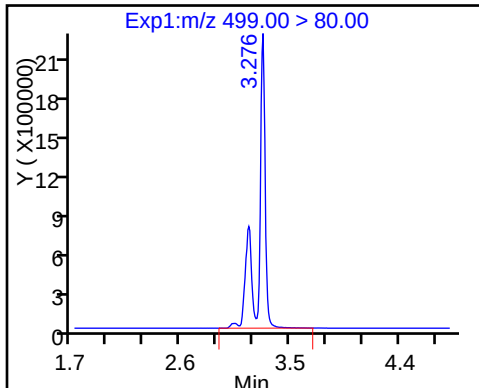
15 Perfluorooctanoic acid



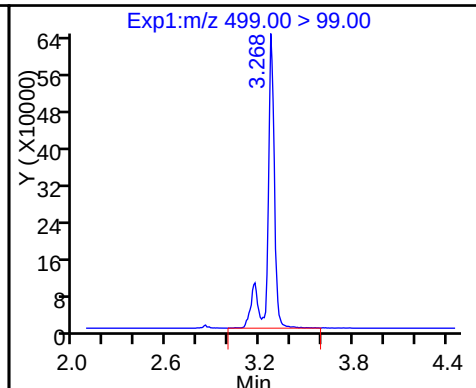
15 Perfluorooctanoic acid



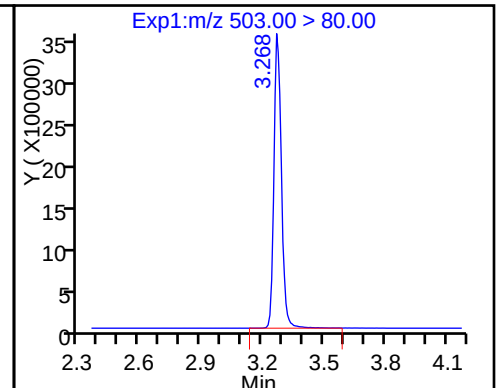
18 Perfluorooctane sulfonic acid



18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-23651-1</u>
SDG No.: _____	
Client Sample ID: <u>DPT-16-20-SO-16-17-DUP</u>	Lab Sample ID: <u>320-23651-3</u>
Matrix: <u>Solid</u>	Lab File ID: <u>02DEC2016C_004.d</u>
Analysis Method: <u>537 (Modified)</u>	Date Collected: <u>11/15/2016 09:45</u>
Extraction Method: <u>SHAKE</u>	Date Extracted: <u>11/28/2016 11:03</u>
Sample wt/vol: <u>5.05(g)</u>	Date Analyzed: <u>12/02/2016 15:22</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>Acquity</u> ID: <u>2.1 (mm)</u>
% Moisture: <u>16.5</u>	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>140429</u>	Units: <u>ug/Kg</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.78		0.59	0.36	0.12
1763-23-1	Perfluorooctane Sulfonate (PFOS)	20	M	0.59	0.36	0.15
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.36	U	0.47	0.36	0.12

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	111		25-150
STL00991	13C4 PFOS	90		25-150
STL00994	18O2 PFHxS	101		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37461.b\02DEC2016C_004.d
 Lims ID: 320-23651-A-3-A
 Client ID: DPT-16-20-SO-16-17-DUP
 Sample Type: Client
 Inject. Date: 02-Dec-2016 15:22:06 ALS Bottle#: 4 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-23651-a-3-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37461.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 04-Dec-2016 18:25:25 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d
 Column 1 : Det: EXP1
 Process Host: XAWRK025

First Level Reviewer: chandrasenas

Date: 04-Dec-2016 18:18:41

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	1.907	1.907	0.0	1.000	125000	0.2535				
298.90 > 99.00	1.907	1.907	0.0	1.000	58275		2.15(0.00-0.00)			
D 10 18O2 PFHxS										
403.00 > 84.00	2.532	2.534	-0.002		14453702	47.8		101	1103319	
D 14 13C4 PFOA										
417.00 > 372.00	2.890	2.886	0.004		12188789	55.6		111	777668	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.890	2.894	-0.004	1.000	819036	3.29			11961	
413.00 > 169.00	2.890	2.894	-0.004	1.000	499864		1.64(0.90-1.10)		24527	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.265	3.267	-0.002	1.000	19885913	83.0			360693	M
499.00 > 99.00	3.265	3.267	-0.002	1.000	4559843		4.36(0.90-1.10)		1457492	
D 17 13C4 PFOS										
503.00 > 80.00	3.265	3.267	-0.002		10527136	43.0		90.0	507560	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37461.b\02DEC2016C_004.d

Injection Date: 02-Dec-2016 15:22:06

Instrument ID: A8_N

Lims ID: 320-23651-A-3-A

Lab Sample ID: 320-23651-3

Client ID: DPT-16-20-SO-16-17-DUP

Operator ID: A8-PC\A8

ALS Bottle#: 4

Worklist Smp#: 8

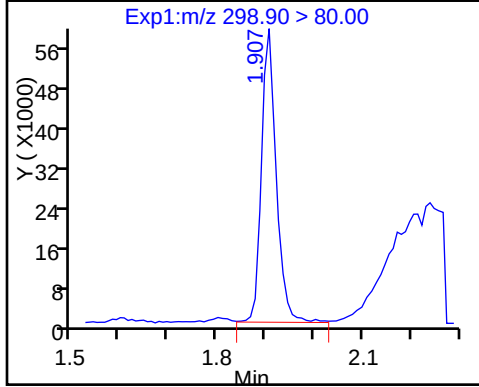
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

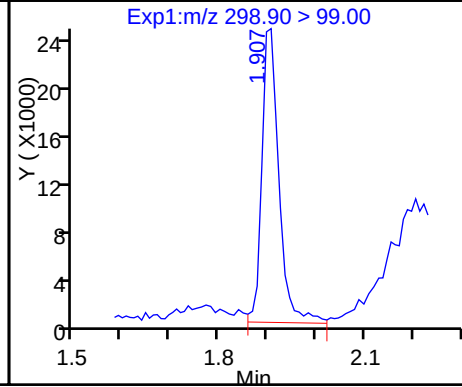
Method: A8_N

Limit Group: LC PFC_DOD ICAL

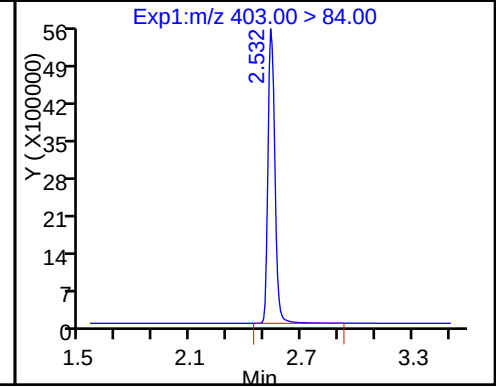
5 Perfluorobutanesulfonic acid



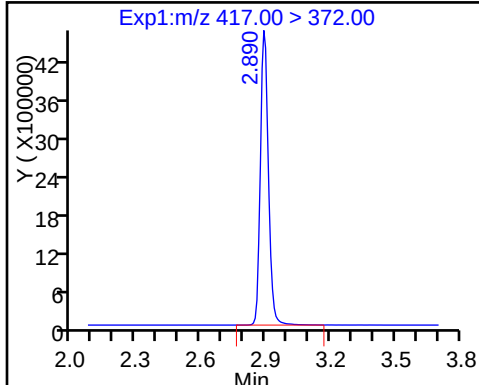
5 Perfluorobutanesulfonic acid



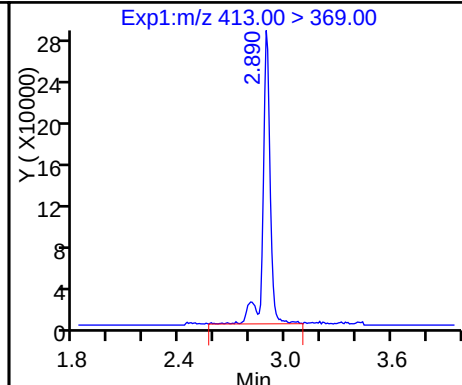
D 10 18O2 PFHxS



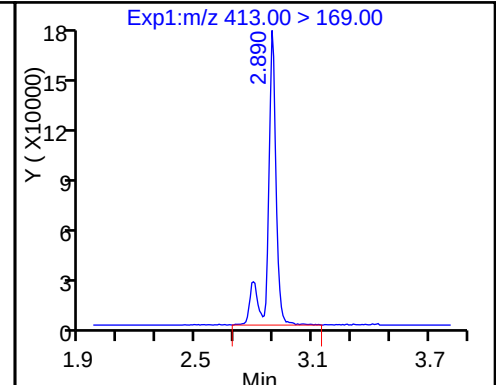
D 14 13C4 PFOA



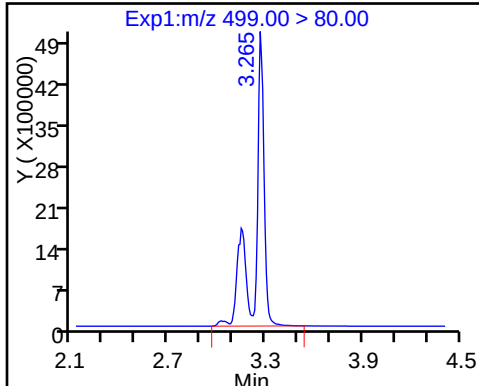
15 Perfluorooctanoic acid



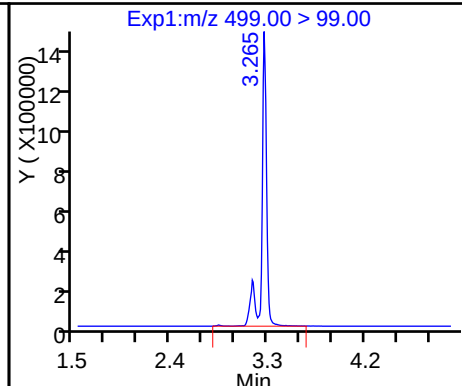
15 Perfluorooctanoic acid



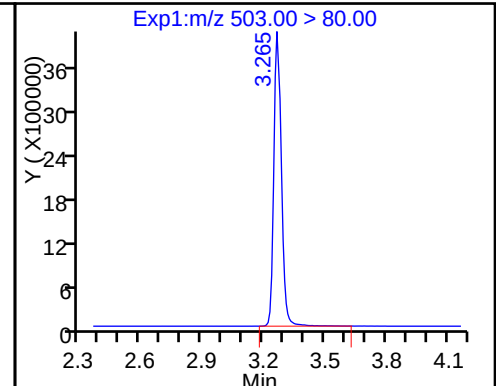
18 Perfluorooctane sulfonic acid (M)



18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS



TestAmerica Sacramento

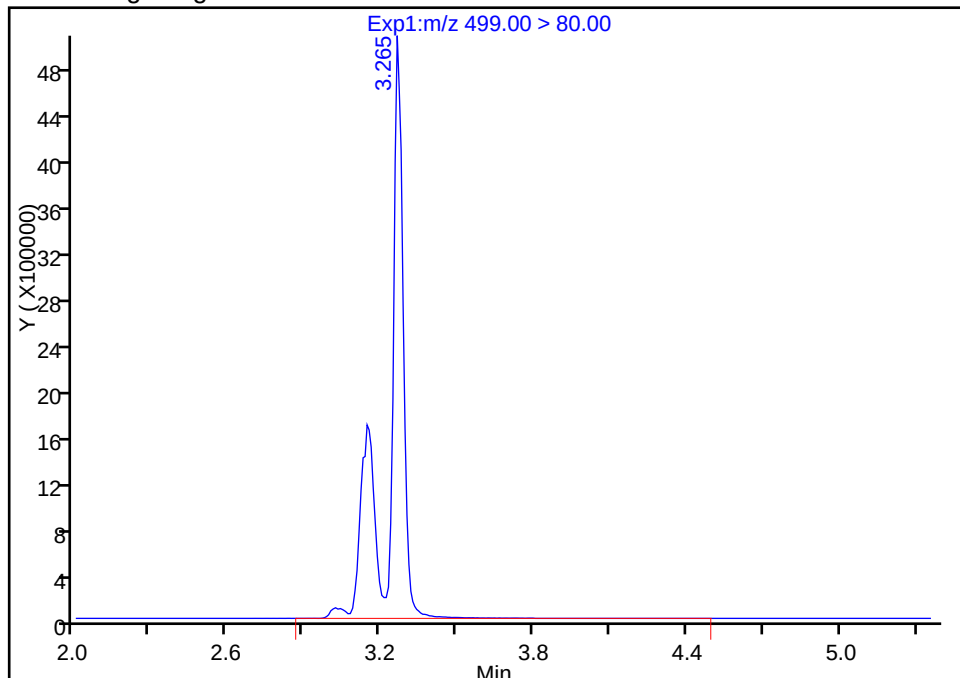
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161202-37461.b\02DEC2016C_004.d				
Injection Date:	02-Dec-2016 15:22:06	Instrument ID:	A8_N		
Lims ID:	320-23651-A-3-A	Lab Sample ID:	320-23651-3		
Client ID:	DPT-16-20-SO-16-17-DUP				
Operator ID:	A8-PC\A8	ALS Bottle#:	4	Worklist Smp#:	8
Injection Vol:	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

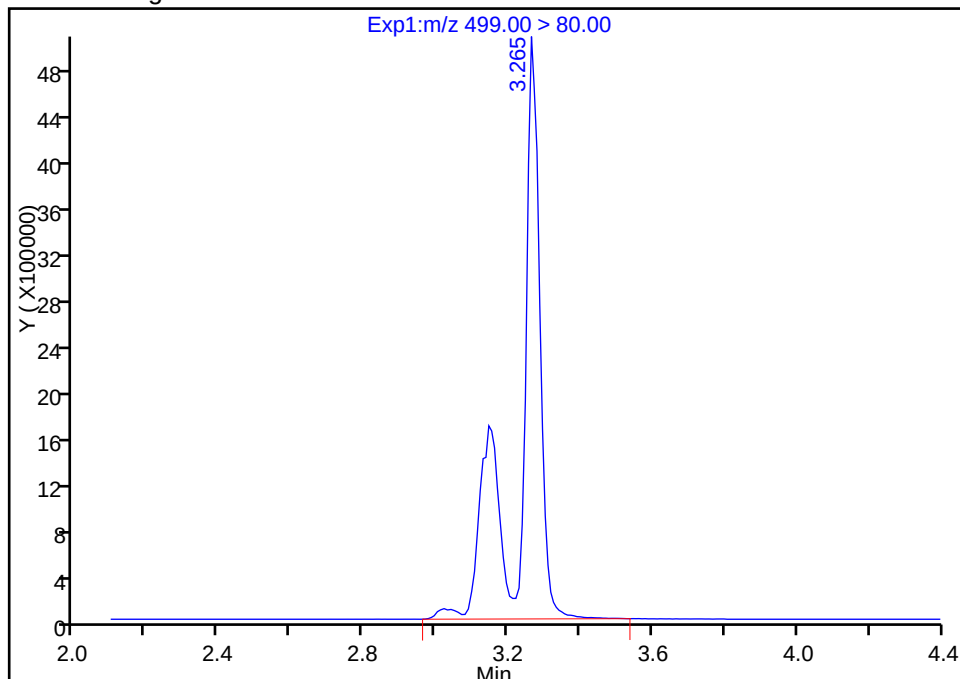
RT: 3.26
Area: 20024091
Amount: 83.618853
Amount Units: ng/ml

Processing Integration Results



RT: 3.26
Area: 19885913
Amount: 83.041833
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 04-Dec-2016 18:18:41

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1
 SDG No.: _____
 Client Sample ID: DPT-16-20-GW-26-30 Lab Sample ID: 320-23651-4
 Matrix: Water Lab File ID: 02DEC2016C_032.d
 Analysis Method: 537 (Modified) Date Collected: 11/15/2016 11:05
 Extraction Method: 3535 Date Extracted: 11/21/2016 13:47
 Sample wt/vol: 251.5 (mL) Date Analyzed: 12/02/2016 18:52
 Con. Extract Vol.: 0.5 (mL) Dilution Factor: 100
 Injection Volume: 2 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 140532 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	1.0	D	0.25	0.20	0.074
1763-23-1	Perfluorooctane Sulfonate (PFOS)	6.8	D	0.40	0.30	0.13
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.20	U	0.25	0.20	0.091

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	127		25-150
STL00991	13C4 PFOS	120		25-150
STL00994	18O2 PFHxS	132		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_032.d
 Lims ID: 320-23651-A-4-A
 Client ID: DPT-16-20-GW-26-30
 Sample Type: Client
 Inject. Date: 02-Dec-2016 18:52:17 ALS Bottle#: 20 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 100.0000
 Sample Info: 320-23651-a-4-a 100X
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 08:30:42 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas

Date: 05-Dec-2016 08:31:18

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	1.897	1.897	0.0	1.000	216584	0.3358				
298.90 > 99.00	1.897	1.897	0.0	1.000	86706		2.50(0.00-0.00)			
D 10 18O2 PFHxS										
403.00 > 84.00	2.521	2.521	0.0		189105	0.6252		1.3	19610	
D 14 13C4 PFOA										
417.00 > 372.00	2.870	2.869	0.001		139404	0.6354		1.3	25960	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.878	2.877	0.001	1.000	1447589	5.09			16152	
413.00 > 169.00	2.870	2.877	-0.007	0.997	969534		1.49(0.90-1.10)		32991	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.252	3.250	0.002	1.000	10975064	34.3			927887	
499.00 > 99.00	3.252	3.250	0.002	1.000	2572708		4.27(0.90-1.10)		964627	
D 17 13C4 PFOS										
503.00 > 80.00	3.244	3.250	-0.006		140462	0.5742		1.2	13892	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_032.d

Injection Date: 02-Dec-2016 18:52:17

Instrument ID: A8_N

Lims ID: 320-23651-A-4-A

Lab Sample ID: 320-23651-4

Client ID: DPT-16-20-GW-26-30

Operator ID: A8-PC\A8

ALS Bottle#: 20

Worklist Smp#: 8

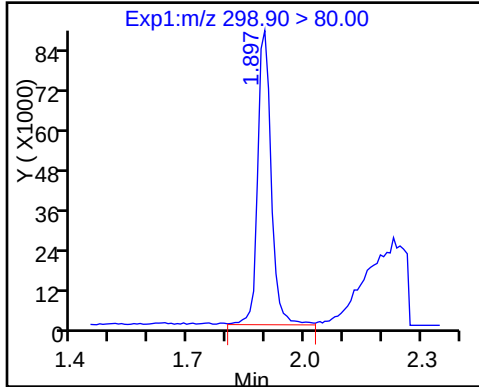
Injection Vol: 2.0 ul

Dil. Factor: 100.0000

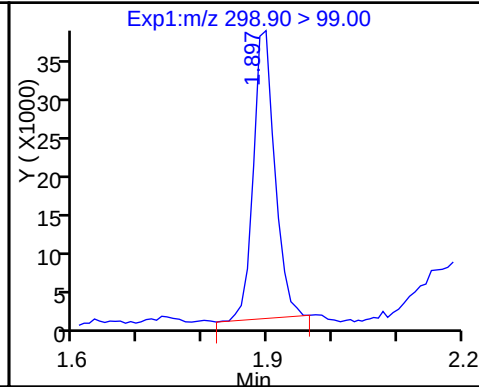
Method: A8_N

Limit Group: LC PFC_DOD ICAL

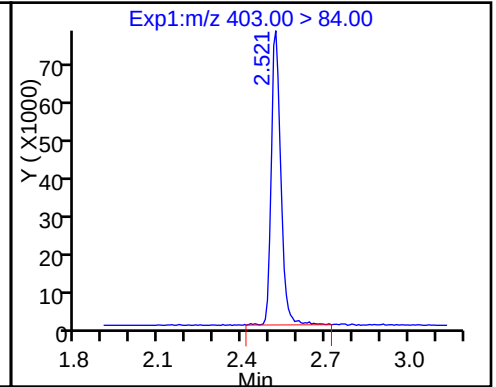
5 Perfluorobutanesulfonic acid



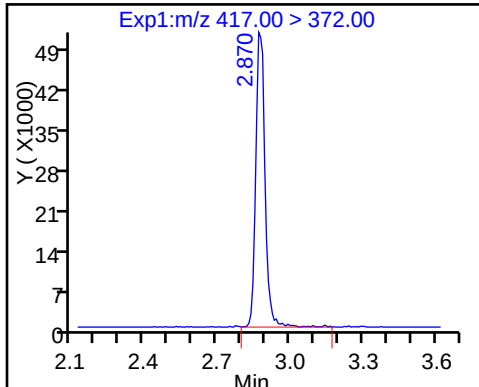
5 Perfluorobutanesulfonic acid



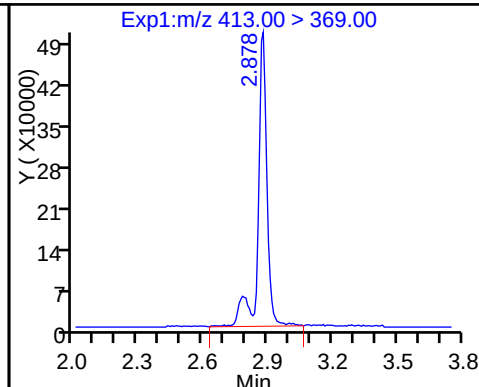
D 10 18O2 PFHxS



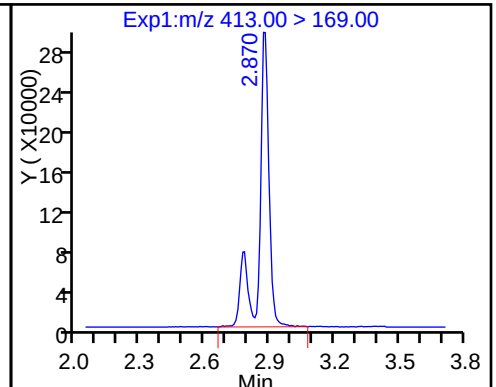
D 14 13C4 PFOA



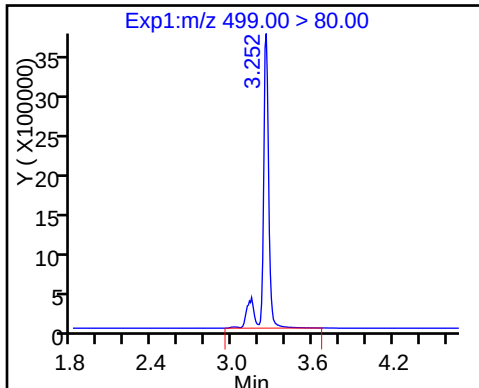
15 Perfluorooctanoic acid



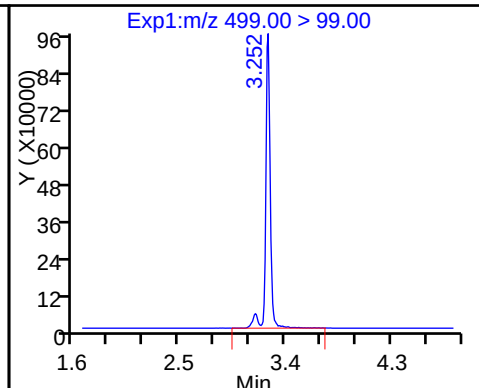
15 Perfluorooctanoic acid



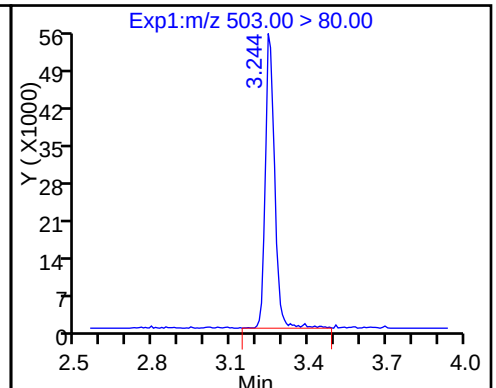
18 Perfluorooctane sulfonic acid



18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1
 SDG No.: _____
 Client Sample ID: DPT-SO-EB-111516 Lab Sample ID: 320-23651-5
 Matrix: Water Lab File ID: 02DEC2016C_038.d
 Analysis Method: 537 (Modified) Date Collected: 11/15/2016 11:00
 Extraction Method: 3535 Date Extracted: 11/21/2016 13:47
 Sample wt/vol: 278 (mL) Date Analyzed: 12/02/2016 19:37
 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.: 140532 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0018	U	0.0022	0.0018	0.00067
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.0027	U	0.0036	0.0027	0.0011
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0018	U	0.0022	0.0018	0.00083

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	139		25-150
STL00991	13C4 PFOS	121		25-150
STL00994	18O2 PFHxS	126		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_038.d
 Lims ID: 320-23651-A-5-A
 Client ID: DPT-SO-EB-111516
 Sample Type: Client
 Inject. Date: 02-Dec-2016 19:37:23 ALS Bottle#: 26 Worklist Smp#: 14
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-23651-a-5-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 08:37:36 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas

Date: 05-Dec-2016 08:37:51

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	1.897	1.897	0.0	1.000	16715	0.0273				
298.90 > 99.00	1.897	1.897	0.0	1.000	7246		2.31(0.00-0.00)			
D 10 18O2 PFHxS										
403.00 > 84.00	2.521	2.521	0.0		17956706	59.4		126	1753428	
D 14 13C4 PFOA										
417.00 > 372.00	2.870	2.869	0.001		15210546	69.3		139	536083	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.870	2.877	-0.007	1.000	75993	0.2448			651	
413.00 > 169.00	2.870	2.877	-0.007	1.000	27171		2.80(0.90-1.10)		1208	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.243	3.250	-0.007	1.000	44811	0.1396			1393	
499.00 > 99.00	3.250	3.250	0.0	1.002	0		0.00(0.90-1.10)			
D 17 13C4 PFOS										
503.00 > 80.00	3.243	3.250	-0.007		14107160	57.7		121	1074527	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_038.d

Injection Date: 02-Dec-2016 19:37:23

Instrument ID: A8_N

Lims ID: 320-23651-A-5-A

Lab Sample ID: 320-23651-5

Client ID: DPT-SO-EB-111516

Operator ID: A8-PC\A8

ALS Bottle#: 26

Worklist Smp#: 14

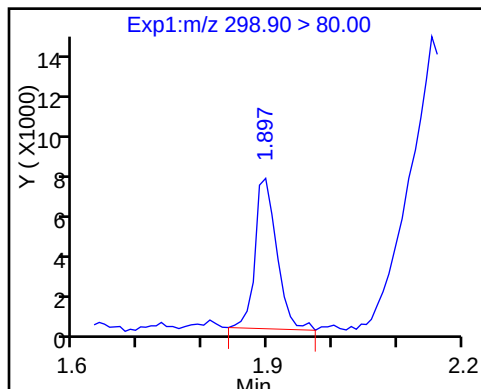
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

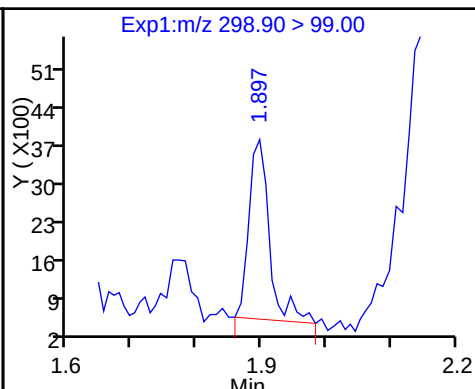
Method: A8_N

Limit Group: LC PFC_DOD ICAL

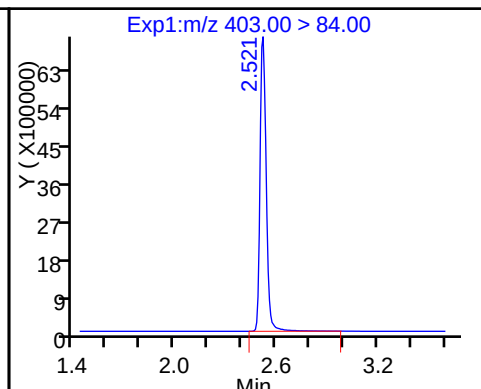
5 Perfluorobutanesulfonic acid



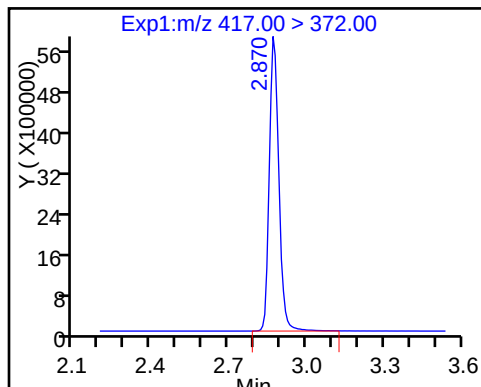
5 Perfluorobutanesulfonic acid



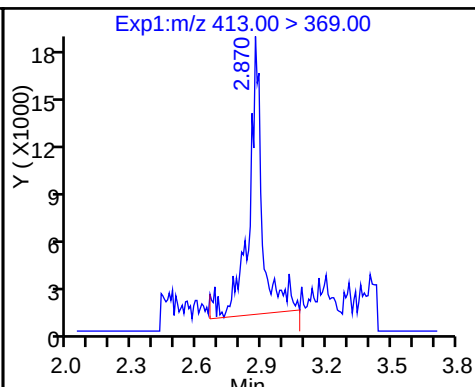
D 10 18O2 PFHxS



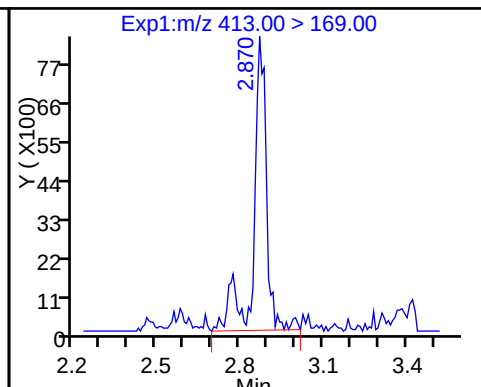
D 14 13C4 PFOA



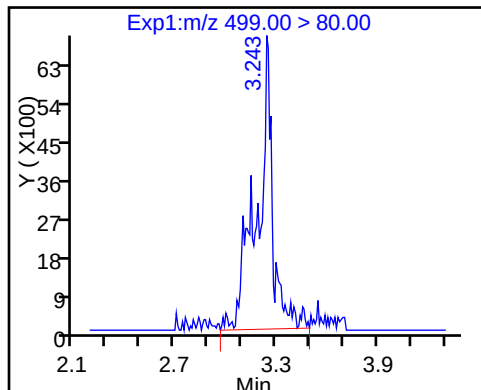
15 Perfluorooctanoic acid



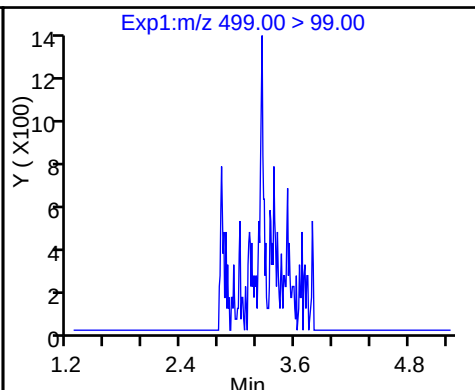
15 Perfluorooctanoic acid



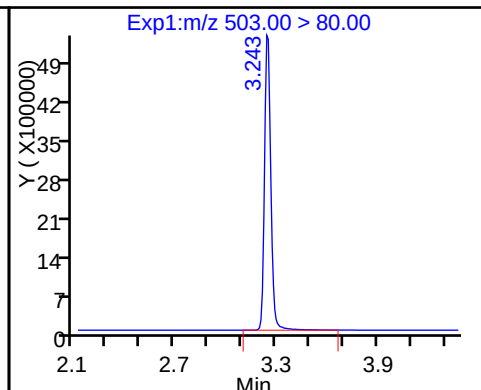
18 Perfluorooctane sulfonic acid



18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1
 SDG No.: _____
 Client Sample ID: DPT-16-34-GW-16-20 Lab Sample ID: 320-23651-6
 Matrix: Water Lab File ID: 02DEC2016C_034.d
 Analysis Method: 537 (Modified) Date Collected: 11/15/2016 12:00
 Extraction Method: 3535 Date Extracted: 11/21/2016 13:47
 Sample wt/vol: 254.2 (mL) Date Analyzed: 12/02/2016 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.: 140532 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.40	D	0.025	0.020	0.0074
1763-23-1	Perfluorooctane Sulfonate (PFOS)	1.6	D	0.039	0.030	0.013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.028	D	0.025	0.020	0.0090

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	90		25-150
STL00991	13C4 PFOS	107		25-150
STL00994	18O2 PFHxS	116		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_034.d
 Lims ID: 320-23651-A-6-A
 Client ID: DPT-16-34-GW-16-20
 Sample Type: Client
 Inject. Date: 02-Dec-2016 19:07:20 ALS Bottle#: 22 Worklist Smp#: 10
 Injection Vol: 2.0 ul Dil. Factor: 10.0000
 Sample Info: 320-23651-a-6-a 10X
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 08:33:26 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas

Date: 05-Dec-2016 08:33:44

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	1.896	1.897	-0.001	1.000	797566	1.41				
298.90 > 99.00	1.896	1.897	-0.001	1.000	355079		2.25(0.00-0.00)			
D 10 18O2 PFHxS										
403.00 > 84.00	2.519	2.521	-0.002		1662695	5.50		11.6	180952	
D 14 13C4 PFOA										
417.00 > 372.00	2.877	2.869	0.008		988570	4.51		9.0	136715	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.877	2.877	0.0	1.000	4057043	20.1			74621	
413.00 > 169.00	2.877	2.877	0.0	1.000	2696423		1.50(0.90-1.10)		119501	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.250	3.250	0.0	1.000	22609220	79.7			742040	
499.00 > 99.00	3.250	3.250	0.0	1.000	5101805		4.43(0.90-1.10)		355925	
D 17 13C4 PFOS										
503.00 > 80.00	3.250	3.250	0.0		1246546	5.10		10.7	55982	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_034.d

Injection Date: 02-Dec-2016 19:07:20

Instrument ID: A8_N

Lims ID: 320-23651-A-6-A

Lab Sample ID: 320-23651-6

Client ID: DPT-16-34-GW-16-20

Operator ID: A8-PC\A8

ALS Bottle#: 22

Worklist Smp#: 10

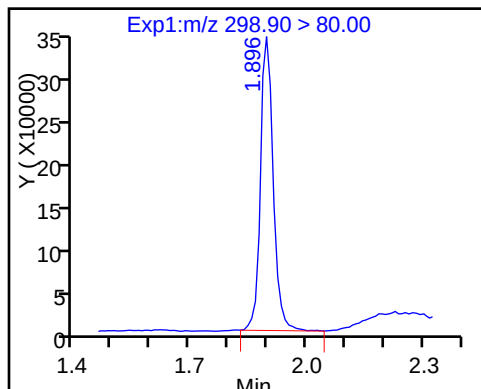
Injection Vol: 2.0 ul

Dil. Factor: 10.0000

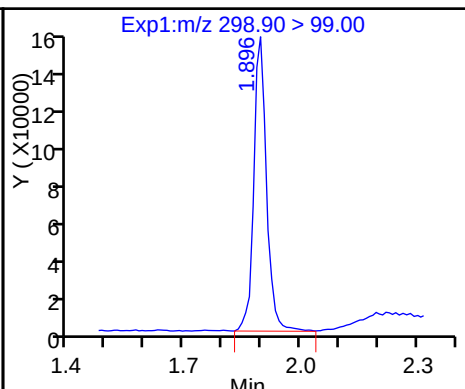
Method: A8_N

Limit Group: LC PFC_DOD ICAL

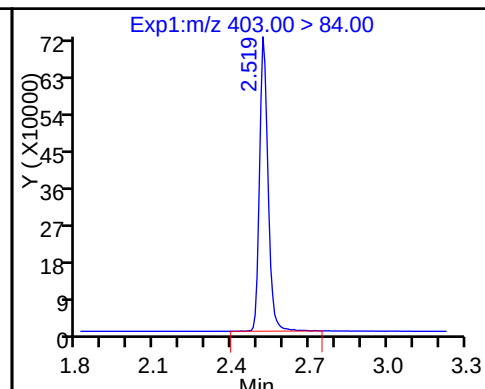
5 Perfluorobutanesulfonic acid



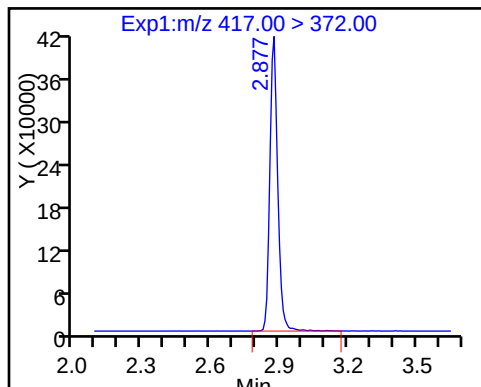
5 Perfluorobutanesulfonic acid



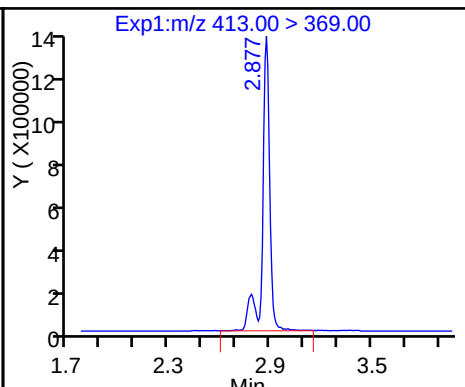
D 10 18O2 PFHxS



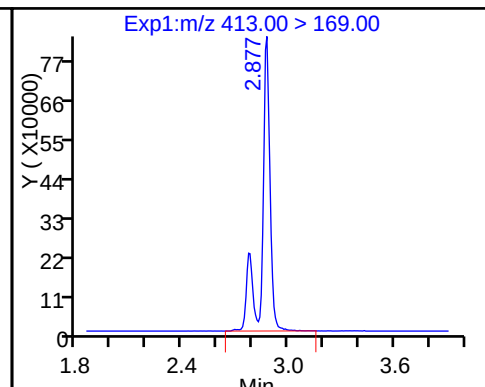
D 14 13C4 PFOA



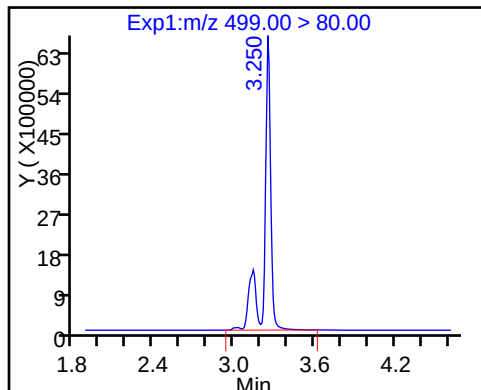
15 Perfluorooctanoic acid



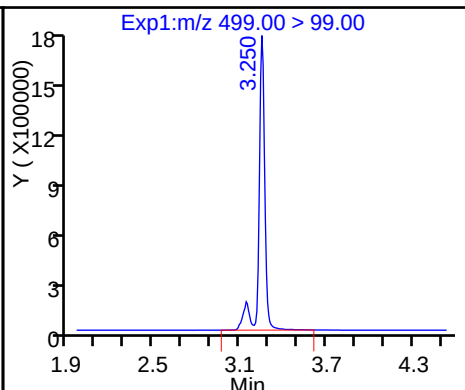
15 Perfluorooctanoic acid



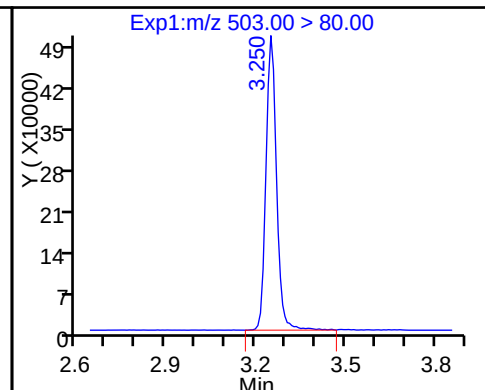
18 Perfluorooctane sulfonic acid



18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1
 SDG No.: _____
 Client Sample ID: DPT-16-26-GW-18-22 Lab Sample ID: 320-23651-7
 Matrix: Water Lab File ID: 02DEC2016C_044.d
 Analysis Method: 537 (Modified) Date Collected: 11/16/2016 11:20
 Extraction Method: 3535 Date Extracted: 11/21/2016 13:47
 Sample wt/vol: 255.1 (mL) Date Analyzed: 12/02/2016 20:22
 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.: 140532 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0073	M	0.0025	0.0020	0.00073
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.038	M	0.0039	0.0029	0.0013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0010	J	0.0025	0.0020	0.00090

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	85		25-150
STL00991	13C4 PFOS	126		25-150
STL00994	18O2 PFHxS	132		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_044.d
 Lims ID: 320-23651-A-7-A
 Client ID: DPT-16-26-GW-18-22
 Sample Type: Client
 Inject. Date: 02-Dec-2016 20:22:22 ALS Bottle#: 28 Worklist Smp#: 20
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-23651-a-7-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 08:42:38 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas

Date: 05-Dec-2016 08:42:38

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	1.897	1.897	0.0	1.000	331019	0.5131				
298.90 > 99.00	1.897	1.897	0.0	1.000	139293		2.38(0.00-0.00)			
D 10 18O2 PFHxS										
403.00 > 84.00	2.520	2.521	-0.001		18912889	62.5		132	1894182	
D 14 13C4 PFOA										
417.00 > 372.00	2.871	2.869	0.002		9379588	42.7		85.5	895841	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.879	2.877	0.002	1.000	708256	3.70			6165	M
413.00 > 169.00	2.879	2.877	0.002	1.000	443942		1.60(0.90-1.10)		14532	M
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.253	3.250	0.003	1.000	6448218	19.2			125448	M
499.00 > 99.00	3.244	3.250	-0.006	0.997	1330656		4.85(0.90-1.10)		37980	M
D 17 13C4 PFOS										
503.00 > 80.00	3.244	3.250	-0.006		14756038	60.3		126	364739	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_044.d

Injection Date: 02-Dec-2016 20:22:22

Instrument ID: A8_N

Lims ID: 320-23651-A-7-A

Lab Sample ID: 320-23651-7

Client ID: DPT-16-26-GW-18-22

Operator ID: A8-PC\A8

ALS Bottle#: 28

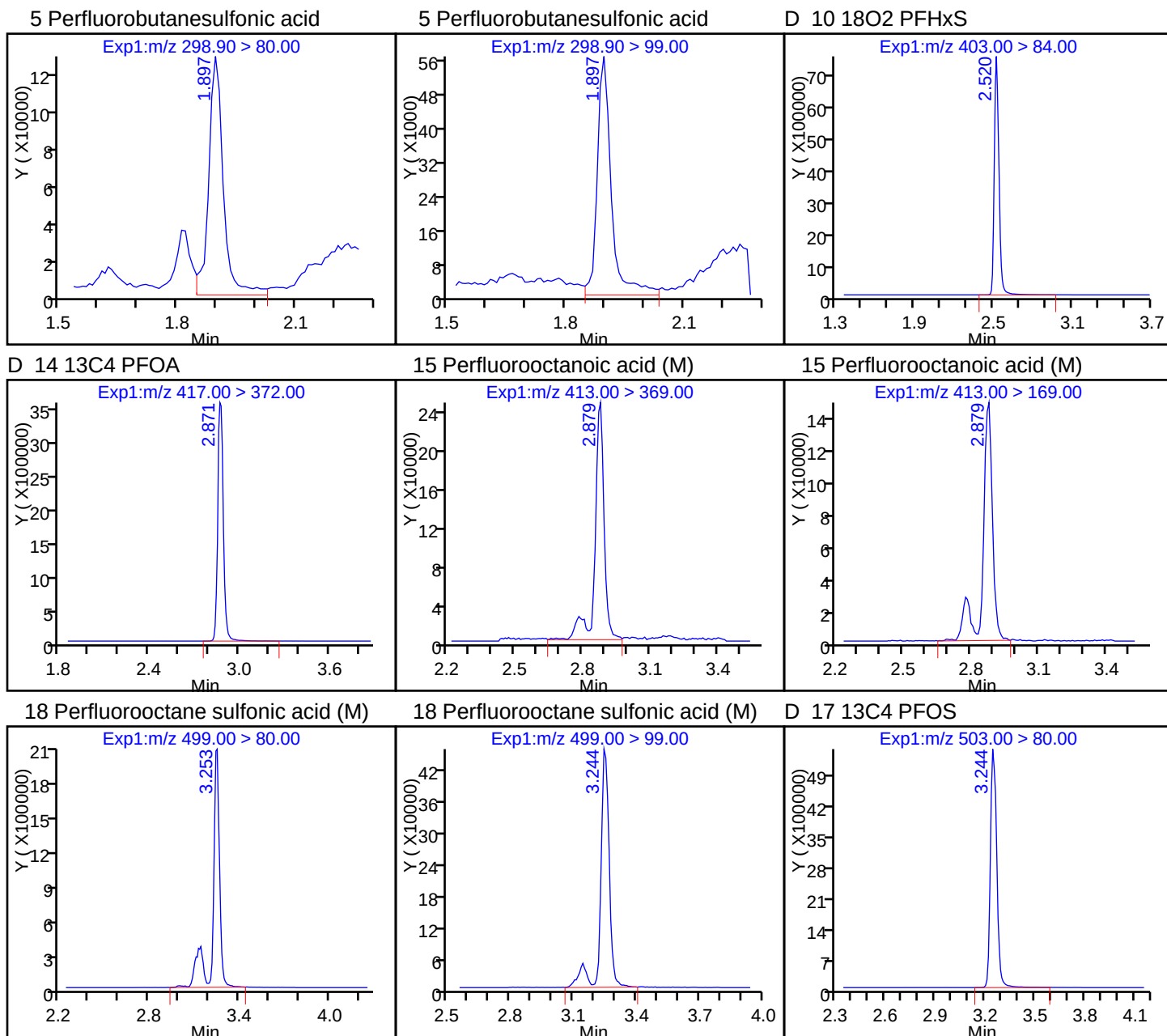
Worklist Smp#: 20

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: A8_N

Limit Group: LC PFC_DOD ICAL



TestAmerica Sacramento

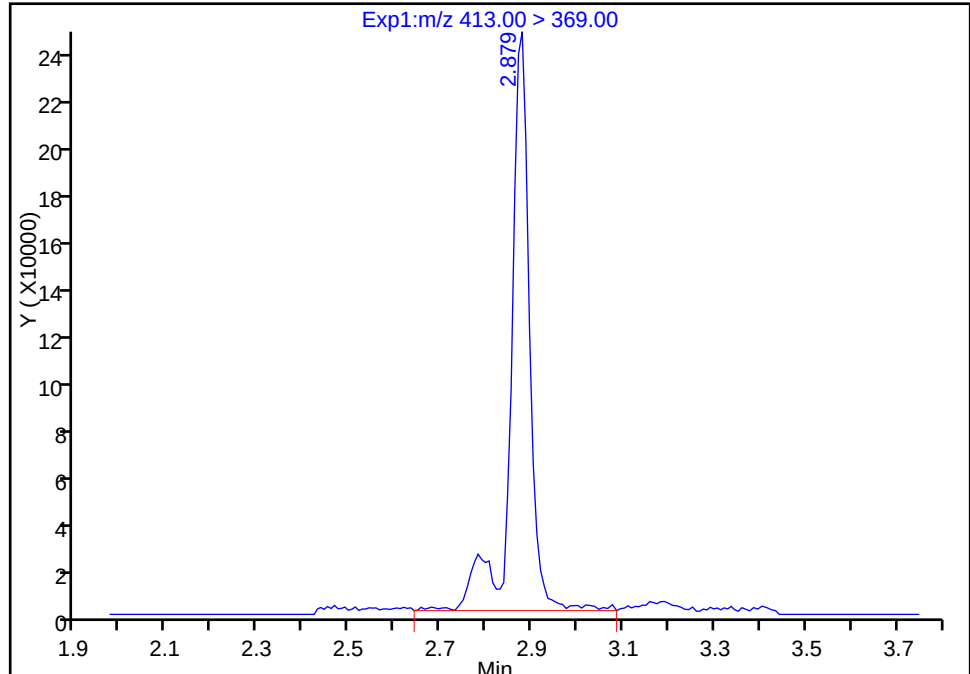
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_044.d				
Injection Date:	02-Dec-2016 20:22:22	Instrument ID:	A8_N		
Lims ID:	320-23651-A-7-A	Lab Sample ID:	320-23651-7		
Client ID:	DPT-16-26-GW-18-22				
Operator ID:	A8-PC\A8	ALS Bottle#:	28	Worklist Smp#:	20
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

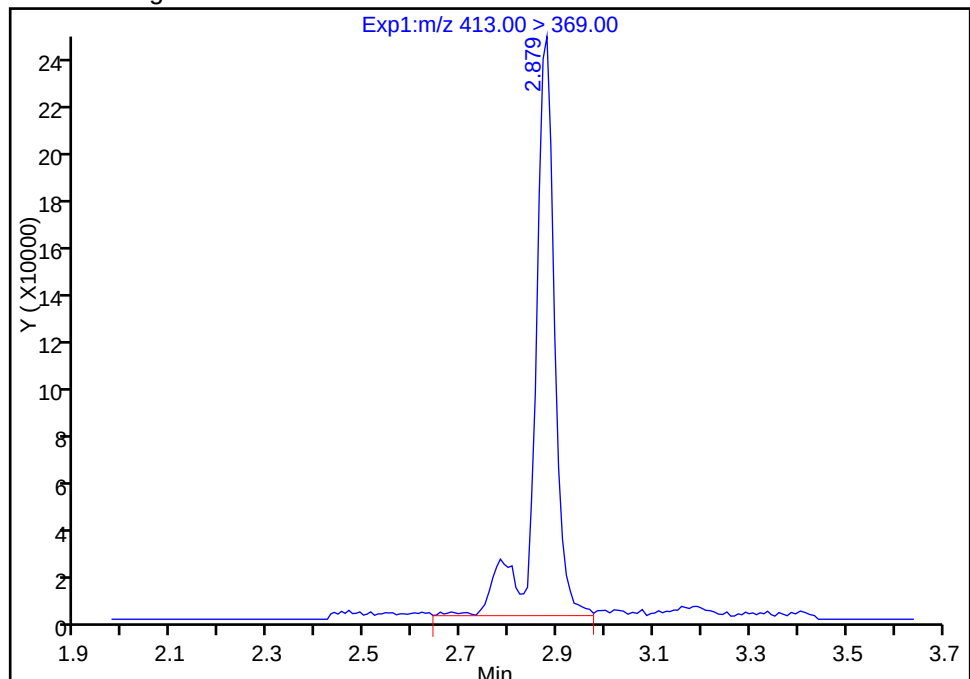
RT: 2.88
Area: 717790
Amount: 3.750185
Amount Units: ng/ml

Processing Integration Results



RT: 2.88
Area: 708256
Amount: 3.700373
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:42:38

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

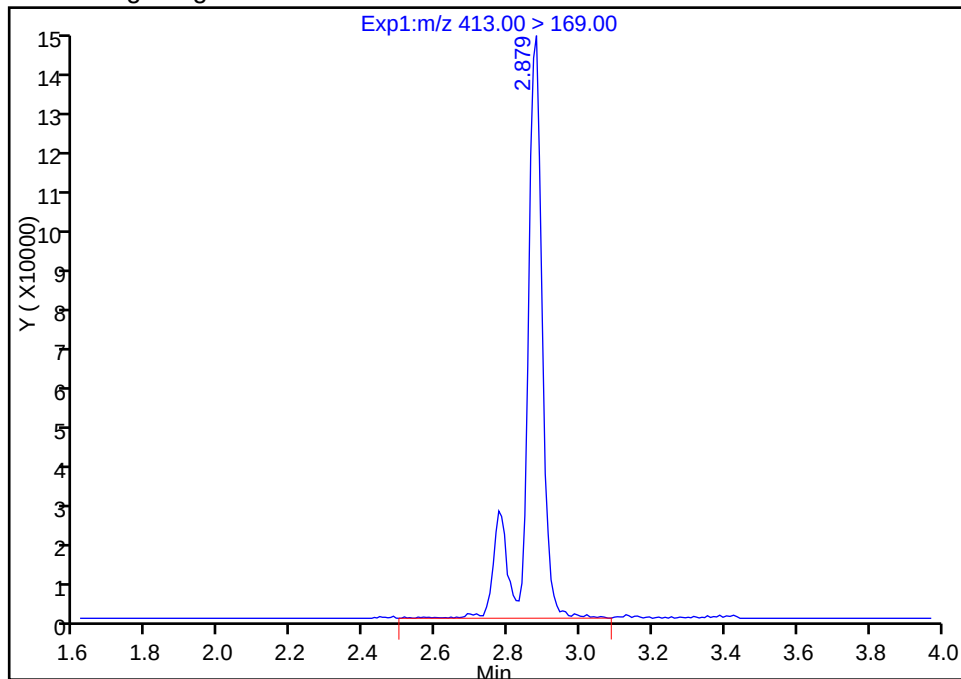
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_044.d				
Injection Date:	02-Dec-2016 20:22:22	Instrument ID:	A8_N		
Lims ID:	320-23651-A-7-A	Lab Sample ID:	320-23651-7		
Client ID:	DPT-16-26-GW-18-22				
Operator ID:	A8-PCVA8	ALS Bottle#:	28	Worklist Smp#:	20
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

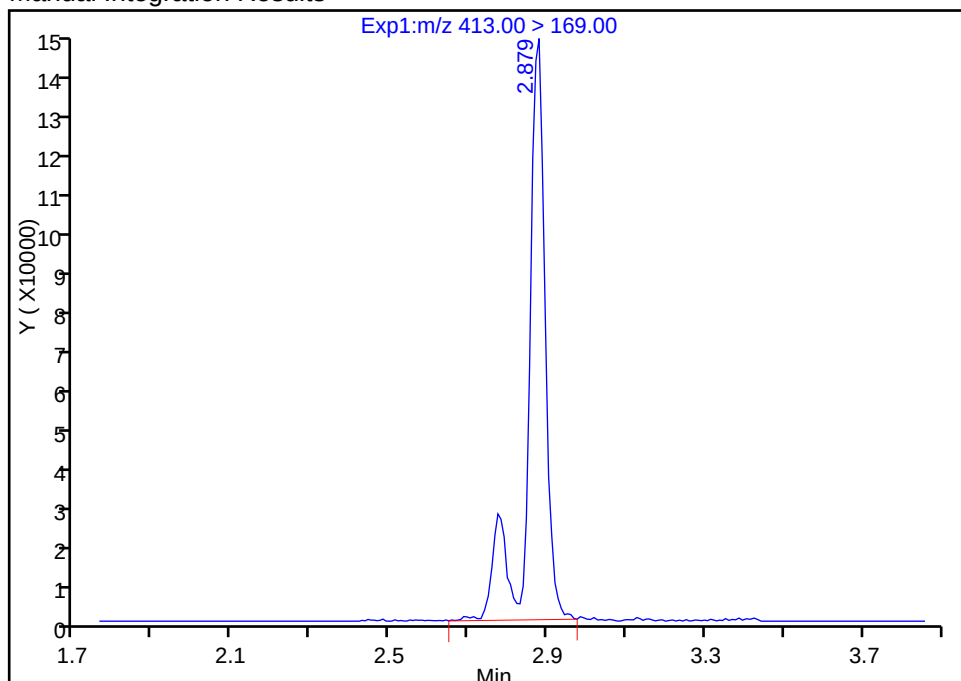
RT: 2.88
Area: 453307
Amount: 3.750185
Amount Units: ng/ml

Processing Integration Results



RT: 2.88
Area: 443942
Amount: 3.700373
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:42:38

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

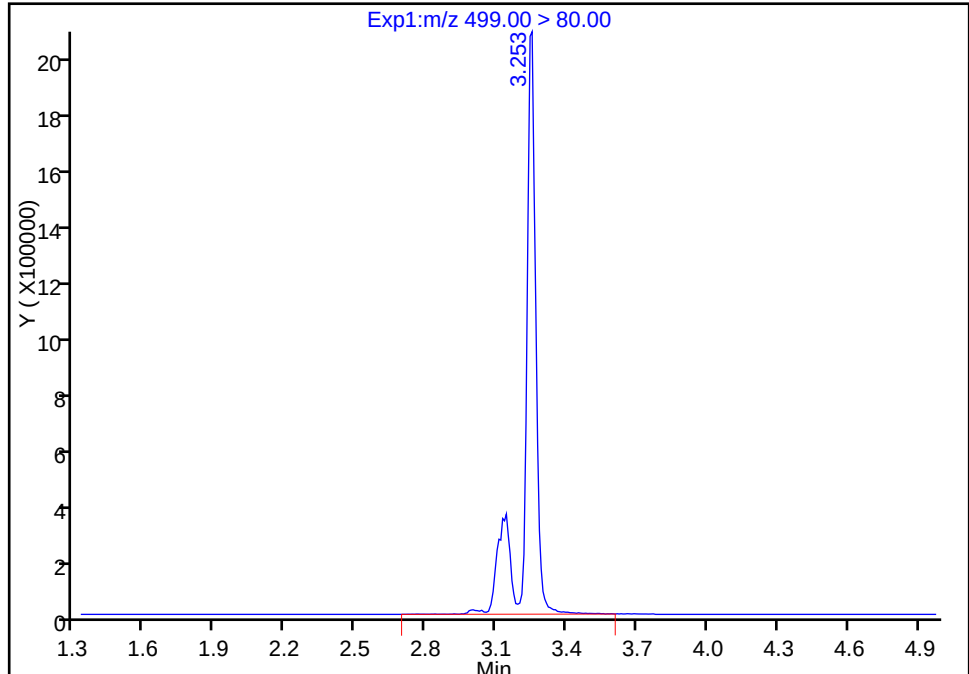
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_044.d				
Injection Date:	02-Dec-2016 20:22:22	Instrument ID:	A8_N		
Lims ID:	320-23651-A-7-A	Lab Sample ID:	320-23651-7		
Client ID:	DPT-16-26-GW-18-22				
Operator ID:	A8-PC\A8	ALS Bottle#:	28	Worklist Smp#:	20
Injection Vol:	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

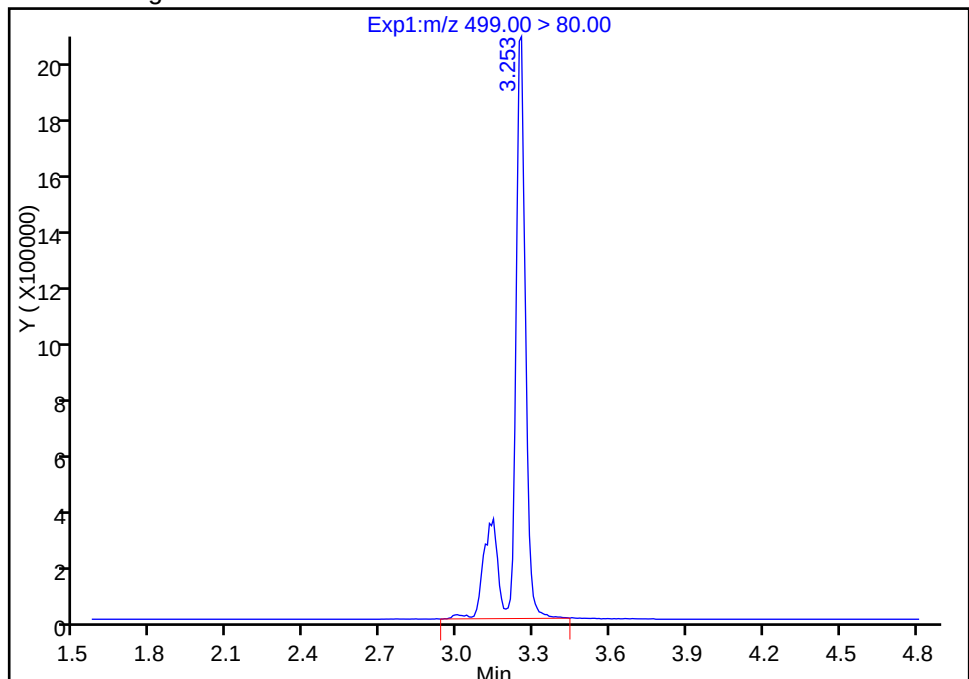
RT: 3.25
Area: 6524018
Amount: 19.436005
Amount Units: ng/ml

Processing Integration Results



RT: 3.25
Area: 6448218
Amount: 19.210186
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:42:38

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

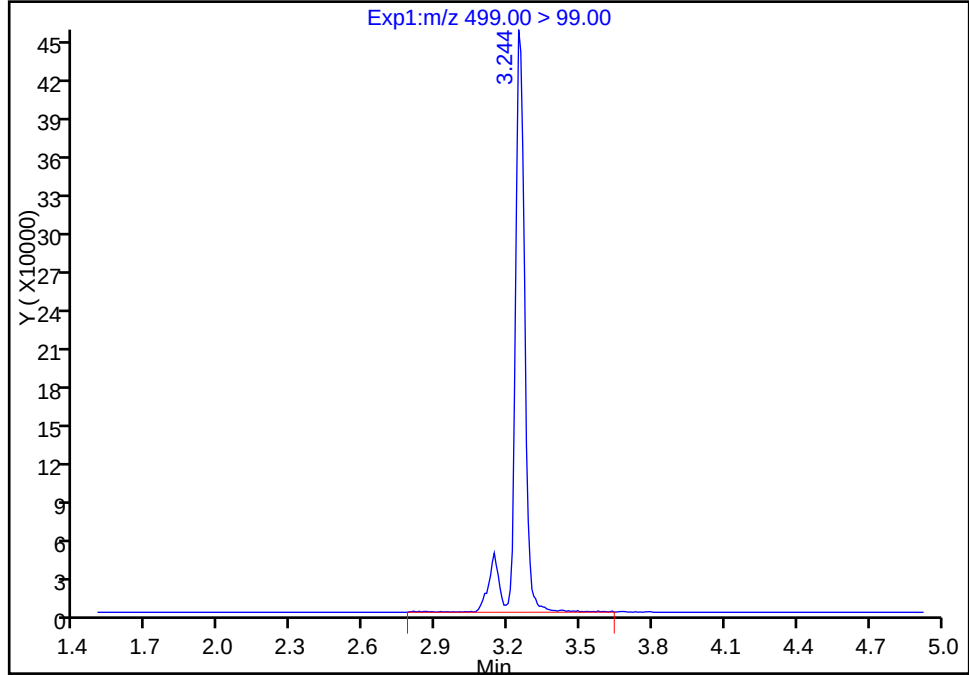
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_044.d
Injection Date: 02-Dec-2016 20:22:22 Instrument ID: A8_N
Lims ID: 320-23651-A-7-A Lab Sample ID: 320-23651-7
Client ID: DPT-16-26-GW-18-22
Operator ID: A8-PC\A8 ALS Bottle#: 28 Worklist Smp#: 20
Injection Vol: 2.0 ul Dil. 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

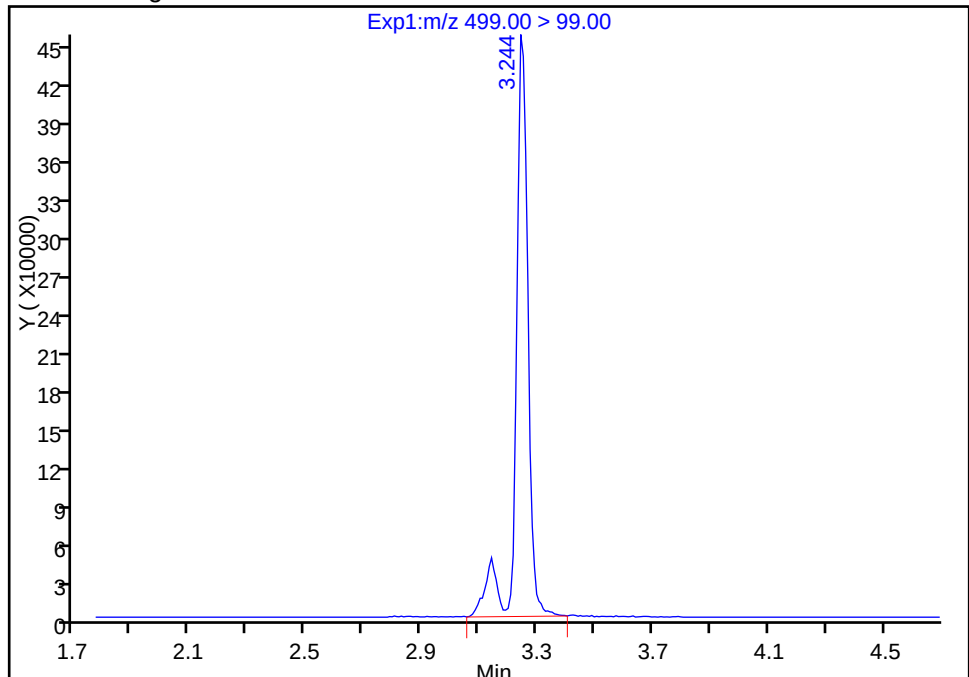
RT: 3.24
Area: 1357115
Amount: 19.436005
Amount Units: ng/ml

Processing Integration Results



RT: 3.24
Area: 1330656
Amount: 19.210186
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:42:38

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1
 SDG No.: _____
 Client Sample ID: DPT-16-26-GW-29-33 Lab Sample ID: 320-23651-8
 Matrix: Water Lab File ID: 02DEC2016C_045.d
 Analysis Method: 537 (Modified) Date Collected: 11/16/2016 12:00
 Extraction Method: 3535 Date Extracted: 11/21/2016 13:47
 Sample wt/vol: 250.9(mL) Date Analyzed: 12/02/2016 20:29
 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.: 140532 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0050	M	0.0025	0.0020	0.00075
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.080	M	0.0040	0.0030	0.0013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0010	J M	0.0025	0.0020	0.00091

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	97		25-150
STL00991	13C4 PFOS	109		25-150
STL00994	18O2 PFHxS	119		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_045.d
 Lims ID: 320-23651-A-8-A
 Client ID: DPT-16-26-GW-29-33
 Sample Type: Client
 Inject. Date: 02-Dec-2016 20:29:53 ALS Bottle#: 29 Worklist Smp#: 21
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-23651-a-8-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 08:35:39 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas

Date: 05-Dec-2016 08:35:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.897	1.897	0.0	1.000	295806	0.5114				M
298.90 > 99.00	1.897	1.897	0.0	1.000	117522		2.52(0.00-0.00)			M
D 10 18O2 PFHxS										
403.00 > 84.00	2.520	2.521	-0.001		16956485	56.1		119	444103	
D 14 13C4 PFOA										
417.00 > 372.00	2.870	2.869	0.001		10637461	48.5		97.0	694623	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.870	2.877	-0.007	1.000	545878	2.51			3107	M
413.00 > 169.00	2.870	2.877	-0.007	1.000	389937		1.40(0.90-1.10)		1609	M
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.252	3.250	0.002	1.000	11618628	39.9			127681	M
499.00 > 99.00	3.252	3.250	0.002	1.000	2570215		4.52(0.90-1.10)		30205	M
D 17 13C4 PFOS										
503.00 > 80.00	3.252	3.250	0.002		12791254	52.3		109	142733	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_045.d

Injection Date: 02-Dec-2016 20:29:53

Instrument ID: A8_N

Lims ID: 320-23651-A-8-A

Lab Sample ID:

Client ID: DPT-16-26-GW-29-33

Operator ID: A8-PC\A8

ALS Bottle#: 29

Worklist Smp#: 21

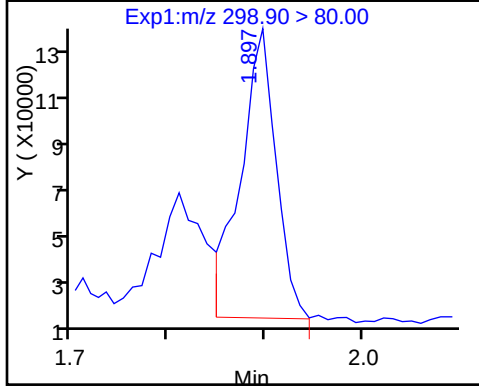
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

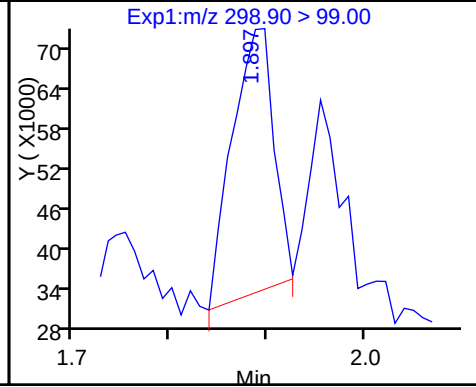
Method: A8_N

Limit Group: LC PFC_DOD ICAL

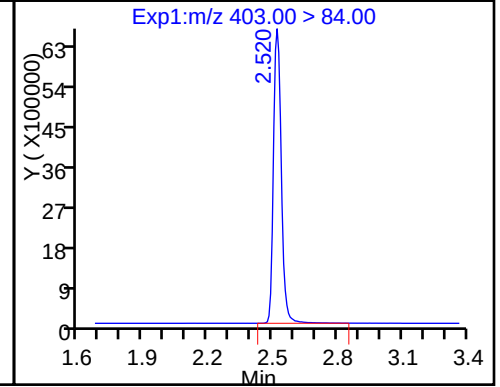
5 Perfluorobutanesulfonic acid (M)



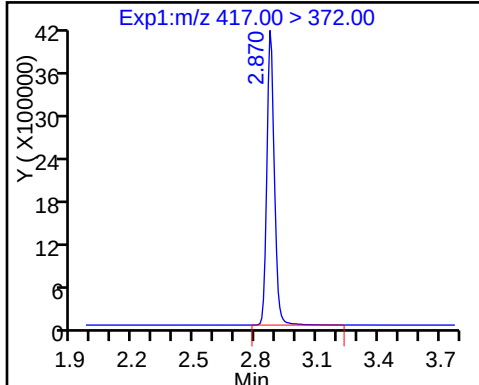
5 Perfluorobutanesulfonic acid (M)



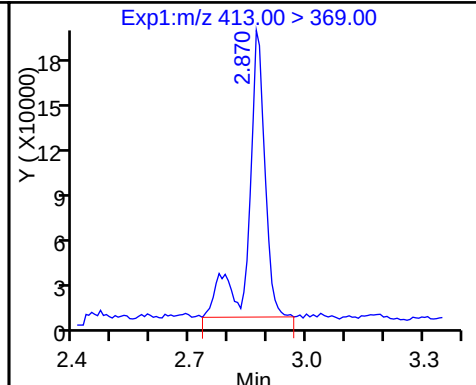
D 10 18O2 PFHxS



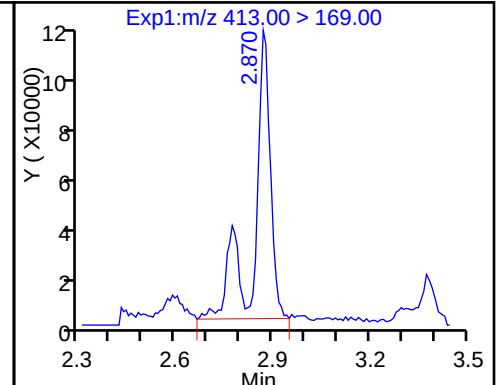
D 14 13C4 PFOA



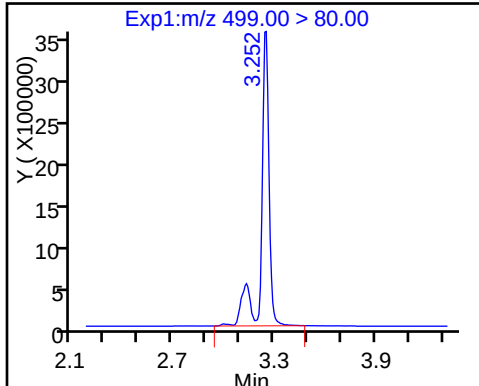
15 Perfluorooctanoic acid (M)



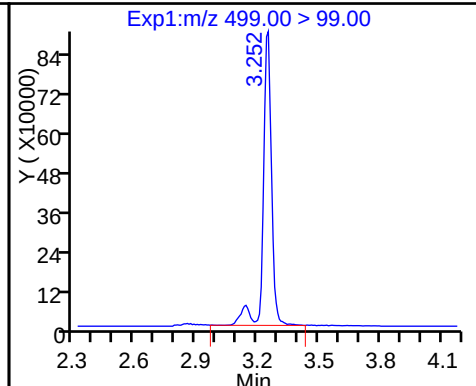
15 Perfluorooctanoic acid (M)



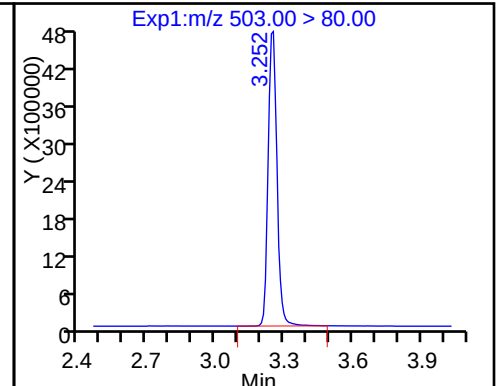
18 Perfluorooctane sulfonic acid (M)



18 Perfluorooctane sulfonic acid (M)



D 17 13C4 PFOS



TestAmerica Sacramento

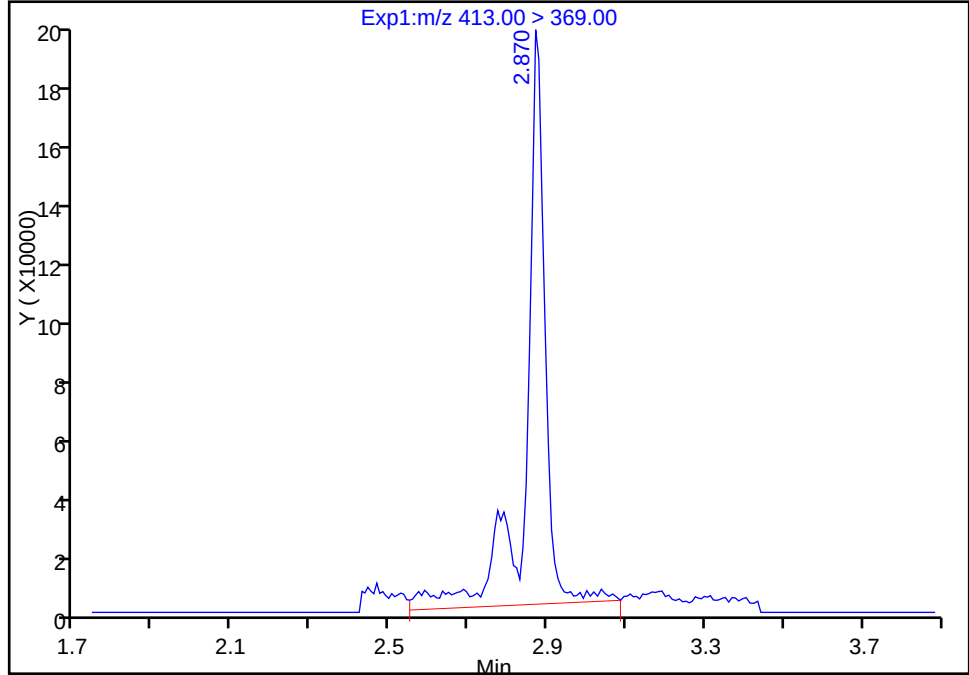
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_045.d		
Injection Date:	02-Dec-2016 20:29:53	Instrument ID:	A8_N
Lims ID:	320-23651-A-8-A	Lab Sample ID:	
Client ID:	DPT-16-26-GW-29-33		
Operator ID:	A8-PC\A8	ALS Bottle#:	29
Injection Vol:	2.0 ul	Dil. Factor:	1.0000
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL
Column:		Detector:	EXP1
		Worklist Smp#:	21

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

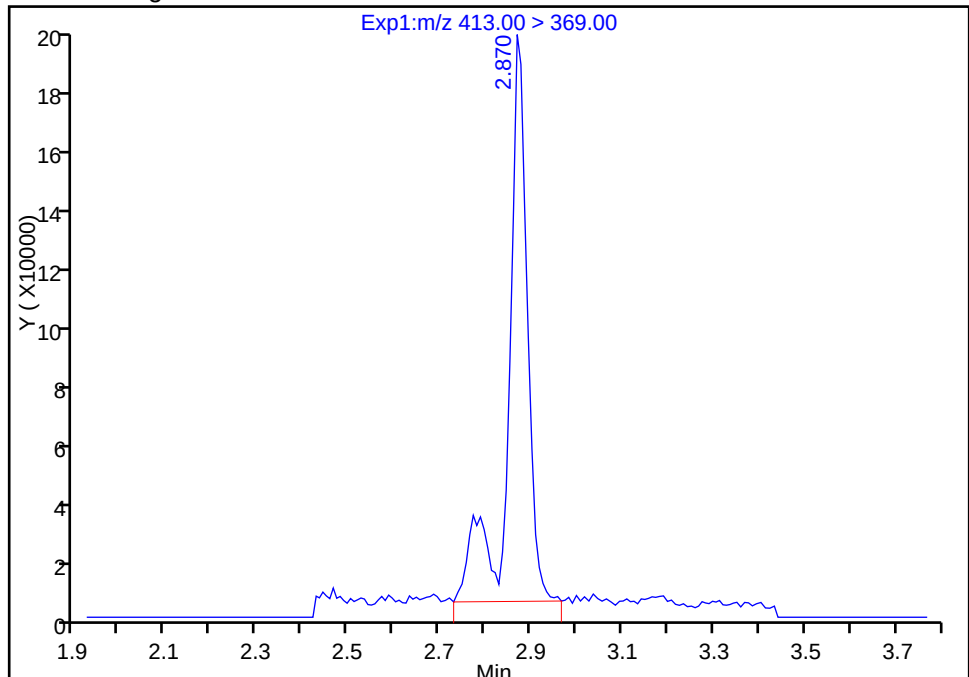
RT: 2.87
Area: 649501
Amount: 2.992133
Amount Units: ng/ml

Processing Integration Results



RT: 2.87
Area: 545878
Amount: 2.514760
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:35:39

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

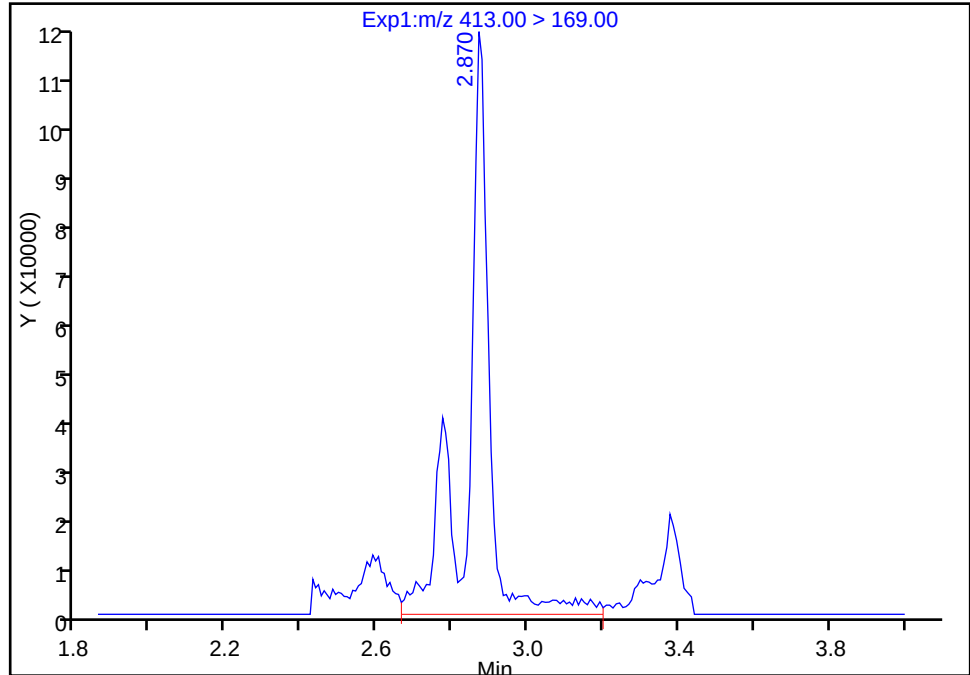
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_045.d
Injection Date: 02-Dec-2016 20:29:53 Instrument ID: A8_N
Lims ID: 320-23651-A-8-A Lab Sample ID:
Client ID: DPT-16-26-GW-29-33
Operator ID: A8-PCVA8 ALS Bottle#: 29 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

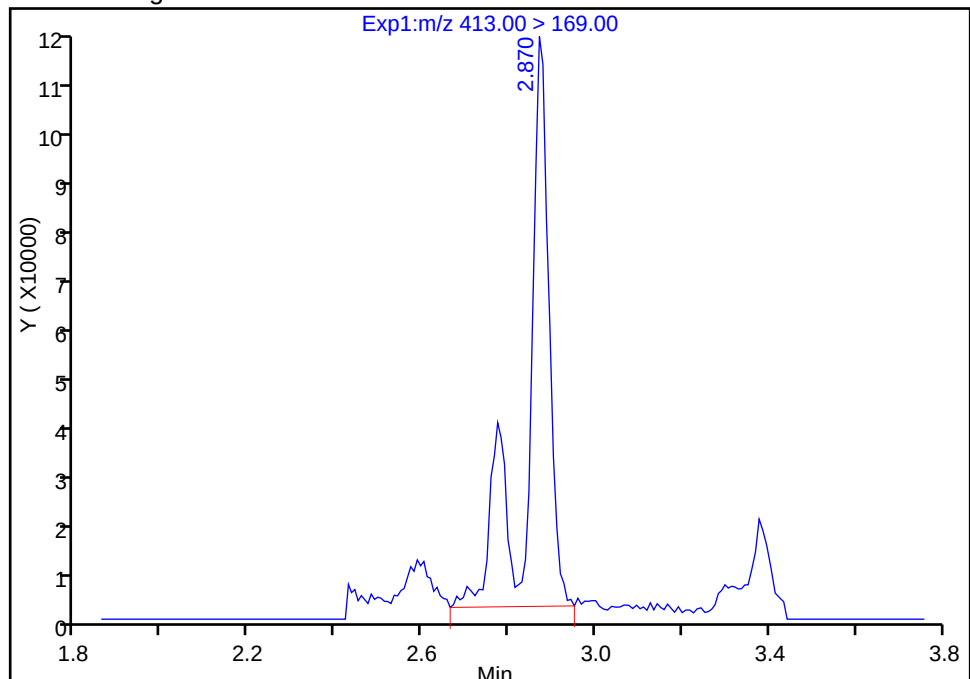
RT: 2.87
Area: 471128
Amount: 2.992133
Amount Units: ng/ml

Processing Integration Results



RT: 2.87
Area: 389937
Amount: 2.514760
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:35:39

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

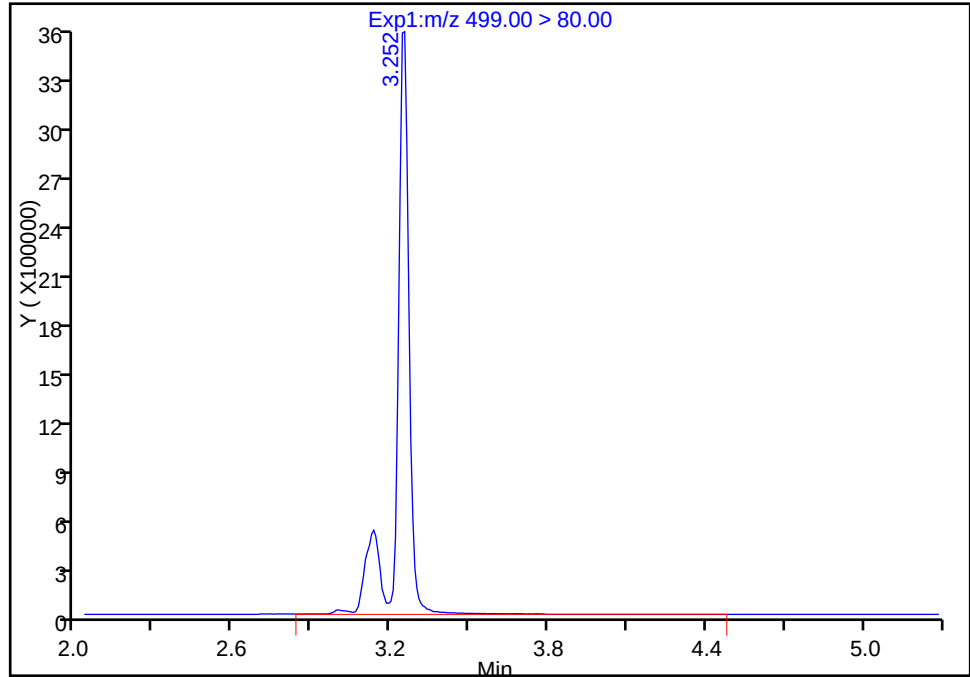
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_045.d		
Injection Date:	02-Dec-2016 20:29:53	Instrument ID:	A8_N
Lims ID:	320-23651-A-8-A	Lab Sample ID:	
Client ID:	DPT-16-26-GW-29-33		
Operator ID:	A8-PC\A8	ALS Bottle#:	29
Injection Vol:	2.0 ul	Dil. Factor:	1.0000
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL
Column:		Detector	EXP1
		Worklist Smp#:	21

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

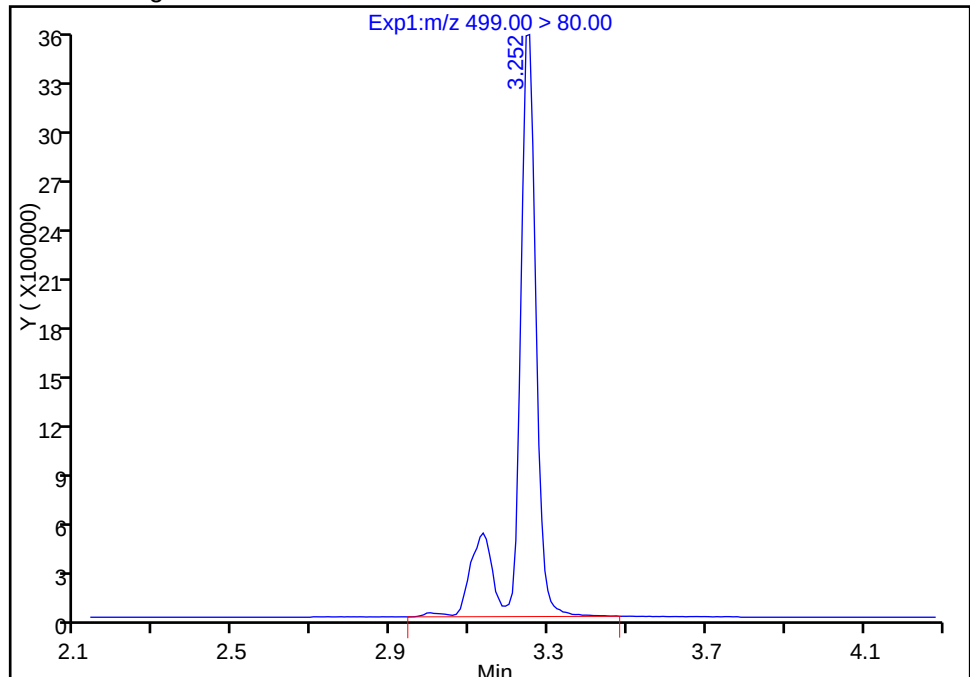
RT: 3.25
Area: 11839118
Amount: 40.688142
Amount Units: ng/ml

Processing Integration Results



RT: 3.25
Area: 11618628
Amount: 39.930372
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:35:39

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

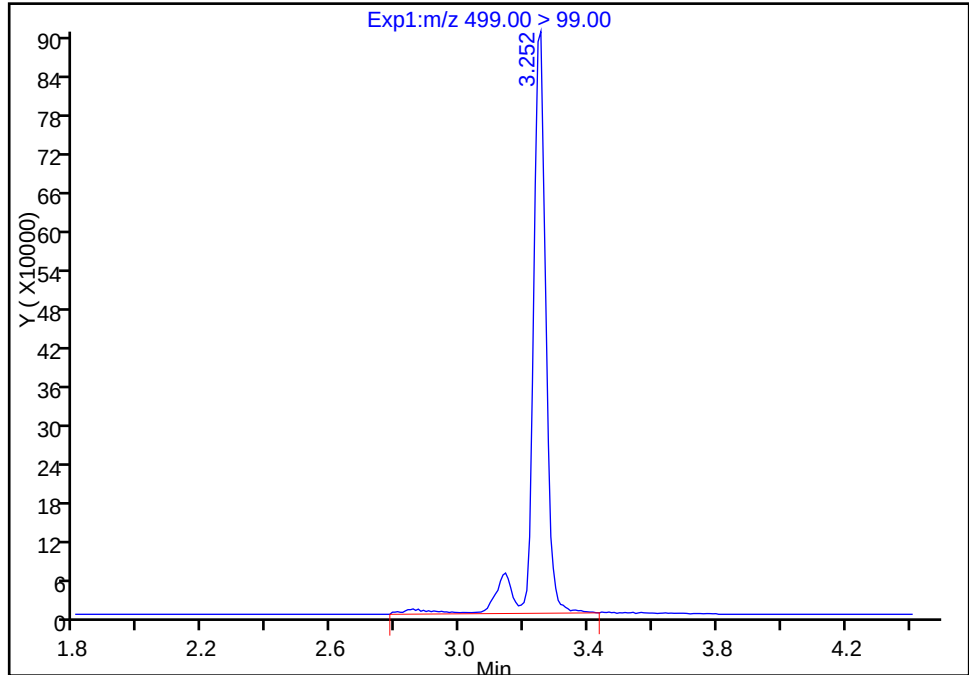
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_045.d
Injection Date: 02-Dec-2016 20:29:53 Instrument ID: A8_N
Lims ID: 320-23651-A-8-A Lab Sample ID:
Client ID: DPT-16-26-GW-29-33
Operator ID: A8-PCVA8 ALS Bottle#: 29 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

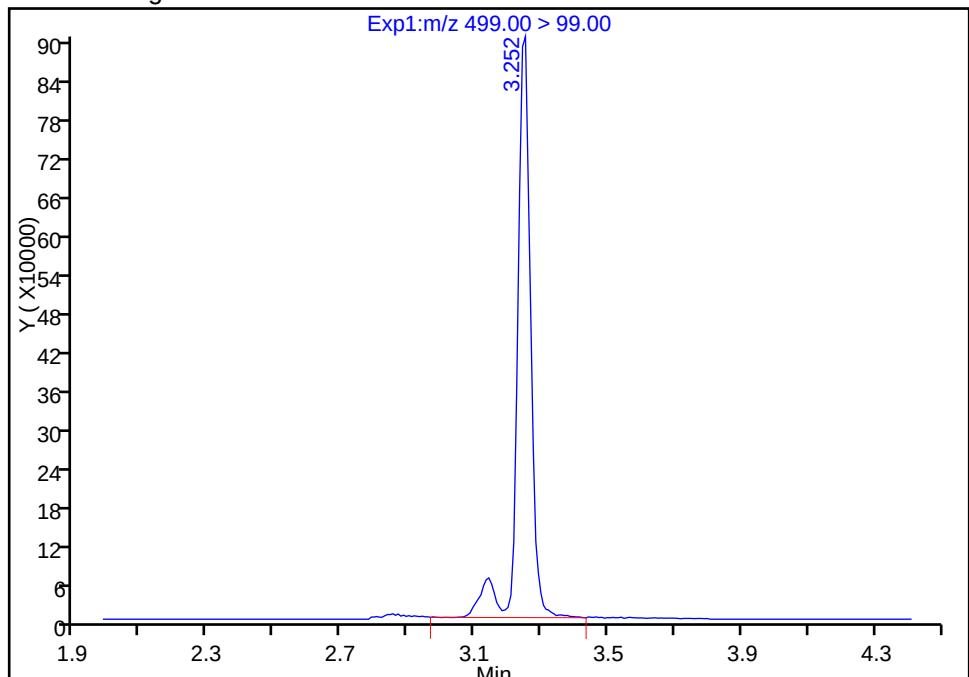
RT: 3.25
Area: 2651361
Amount: 40.688142
Amount Units: ng/ml

Processing Integration Results



RT: 3.25
Area: 2570215
Amount: 39.930372
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:35:39

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

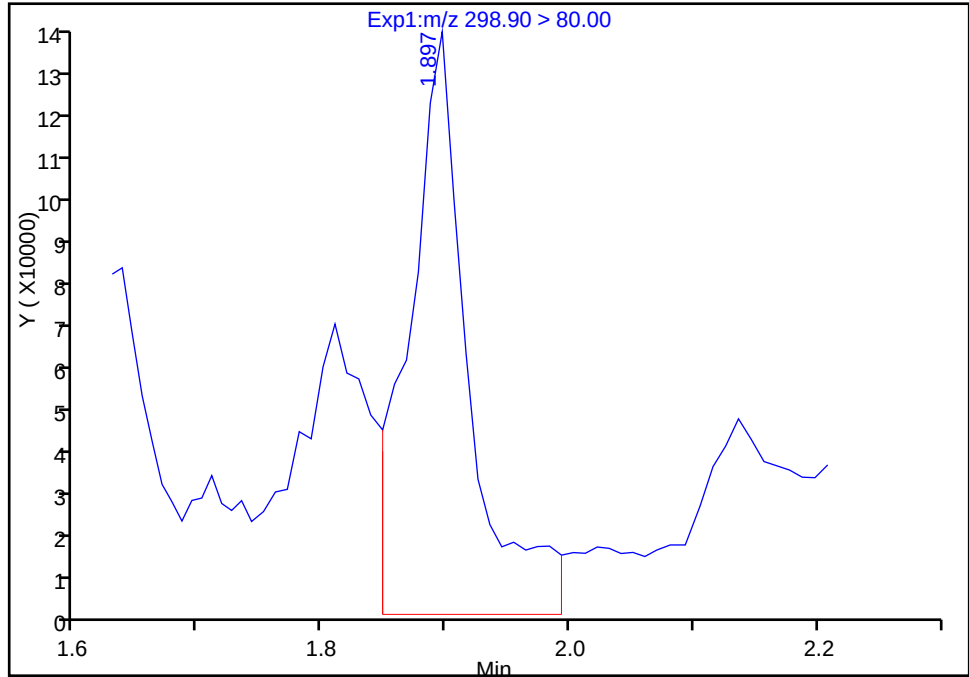
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_045.d		
Injection Date:	02-Dec-2016 20:29:53	Instrument ID:	A8_N
Lims ID:	320-23651-A-8-A	Lab Sample ID:	
Client ID:	DPT-16-26-GW-29-33		
Operator ID:	A8-PC\A8	ALS Bottle#:	29
Injection Vol:	2.0 ul	Dil. Factor:	1.0000
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL
Column:		Detector:	EXP1
		Worklist Smp#:	21

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

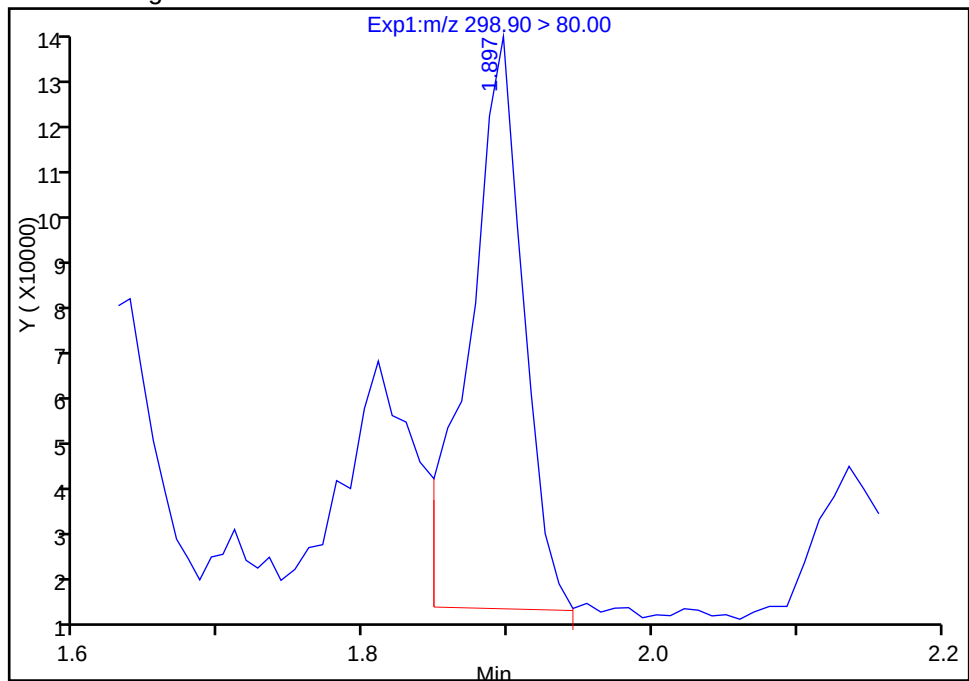
RT: 1.90
Area: 427155
Amount: 0.738493
Amount Units: ng/ml

Processing Integration Results



RT: 1.90
Area: 295806
Amount: 0.511408
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:35:39

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

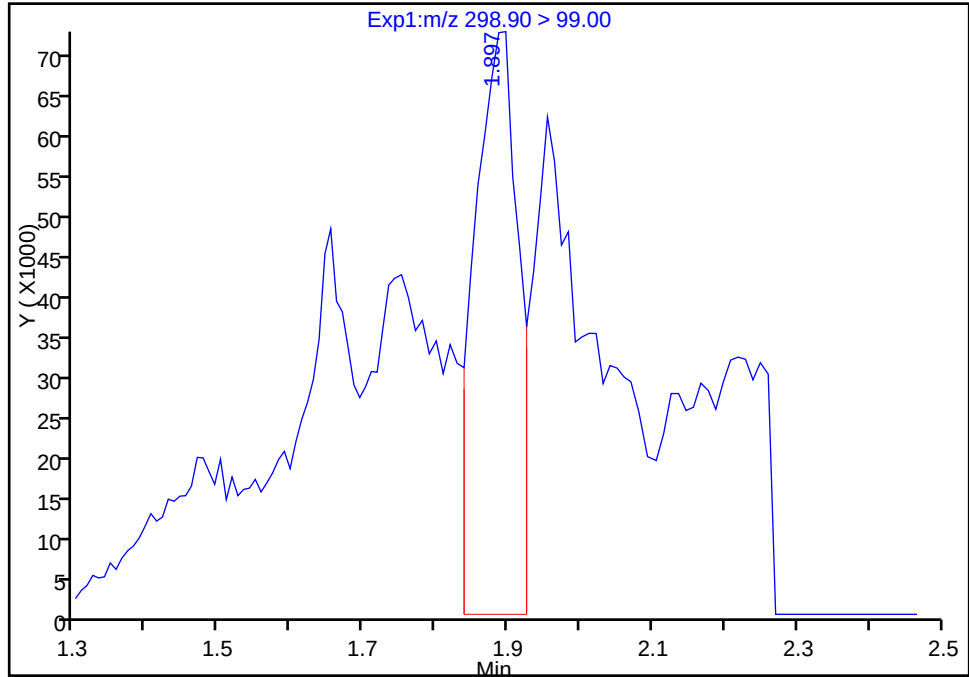
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_045.d
Injection Date: 02-Dec-2016 20:29:53 Instrument ID: A8_N
Lims ID: 320-23651-A-8-A Lab Sample ID:
Client ID: DPT-16-26-GW-29-33
Operator ID: A8-PCVA8 ALS Bottle#: 29 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

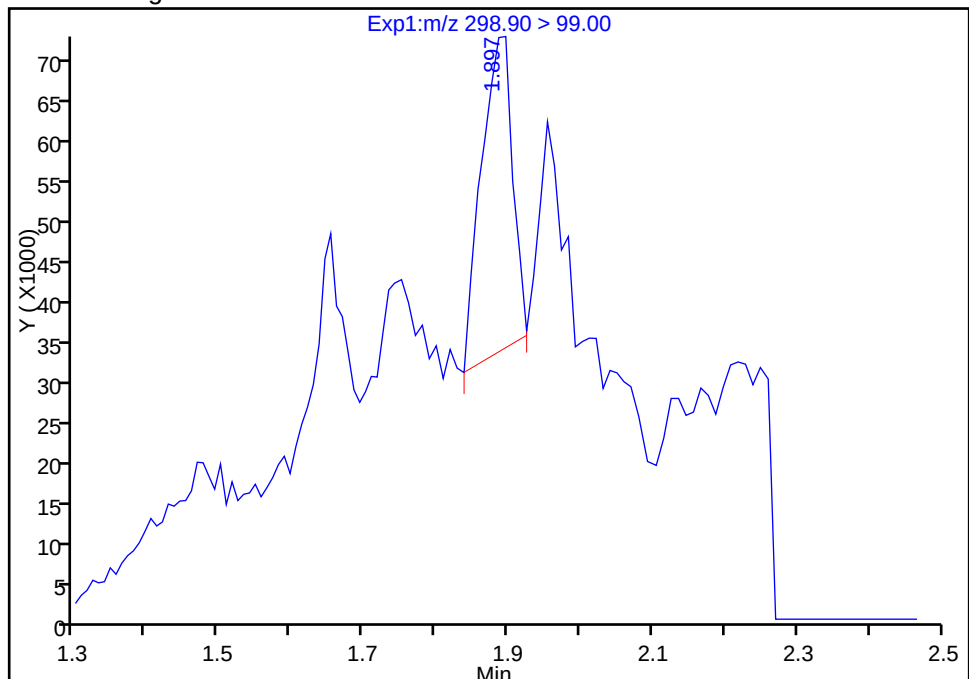
RT: 1.90
Area: 288828
Amount: 0.738493
Amount Units: ng/ml

Processing Integration Results



RT: 1.90
Area: 117522
Amount: 0.511408
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:35:39

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1
 SDG No.: _____
 Client Sample ID: DPT-16-26-GW-29-33-DUP Lab Sample ID: 320-23651-9
 Matrix: Water Lab File ID: 02DEC2016C_046.d
 Analysis Method: 537 (Modified) Date Collected: 11/16/2016 12:00
 Extraction Method: 3535 Date Extracted: 11/21/2016 13:47
 Sample wt/vol: 249.3 (mL) Date Analyzed: 12/02/2016 20:37
 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.: 140532 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0031	M	0.0025	0.0020	0.00075
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.053	M	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	82		25-150
STL00991	13C4 PFOS	116		25-150
STL00994	18O2 PFHxS	116		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_046.d
 Lims ID: 320-23651-A-9-A
 Client ID: DPT-16-26-GW-29-33-DUP
 Sample Type: Client
 Inject. Date: 02-Dec-2016 20:37:25 ALS Bottle#: 30 Worklist Smp#: 22
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-23651-a-9-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 08:44:22 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas

Date: 05-Dec-2016 08:36:51

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 1.896 1.897 -0.001 1.000 239729 0.4217
 298.90 > 99.00 1.887 1.897 -0.010 0.995 183446 1.31(0.00-0.00)
 D 10 18O2 PFHxS
 403.00 > 84.00 2.513 2.521 -0.008 16664263 55.1 116 591227
 D 14 13C4 PFOA
 417.00 > 372.00 2.878 2.869 0.009 9003131 41.0 82.1 558254
 15 Perfluorooctanoic acid M
 413.00 > 369.00 2.878 2.877 0.001 1.000 287574 1.57 1317 M
 413.00 > 169.00 2.870 2.877 -0.007 0.997 198322 1.45(0.90-1.10) 824 M
 18 Perfluorooctane sulfonic acid M
 499.00 > 80.00 3.252 3.250 0.002 1.000 8078344 26.2 129104 M
 499.00 > 99.00 3.252 3.250 0.002 1.000 1760381 4.59(0.90-1.10) 11587 M
 D 17 13C4 PFOS
 503.00 > 80.00 3.252 3.250 0.002 13546173 55.4 116 260316

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_046.d

Injection Date: 02-Dec-2016 20:37:25

Instrument ID: A8_N

Lims ID: 320-23651-A-9-A

Lab Sample ID:

Client ID: DPT-16-26-GW-29-33-DUP

Operator ID: A8-PC\A8

ALS Bottle#: 30

Worklist Smp#: 22

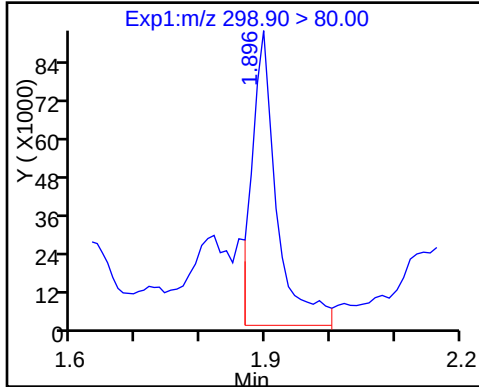
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

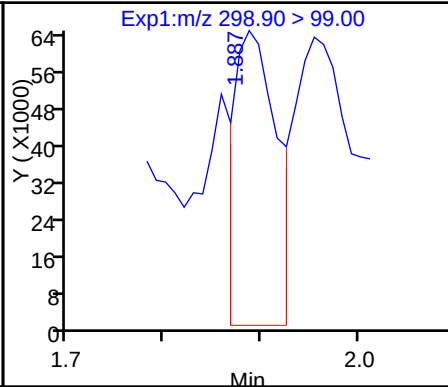
Method: A8_N

Limit Group: LC PFC_DOD ICAL

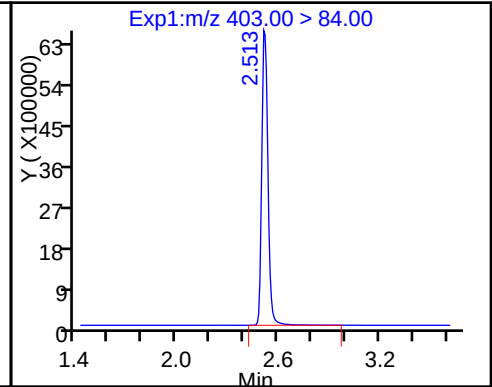
5 Perfluorobutanesulfonic acid



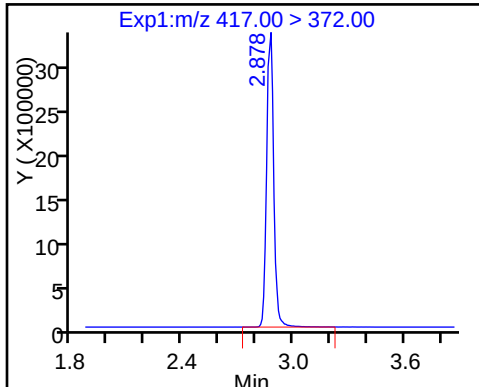
5 Perfluorobutanesulfonic acid



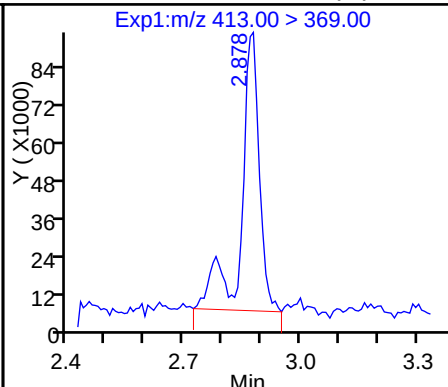
D 10 18O2 PFHxS



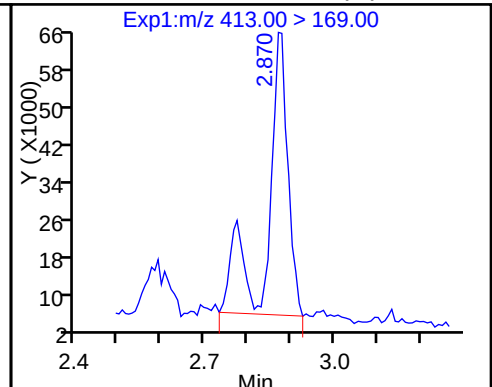
D 14 13C4 PFOA



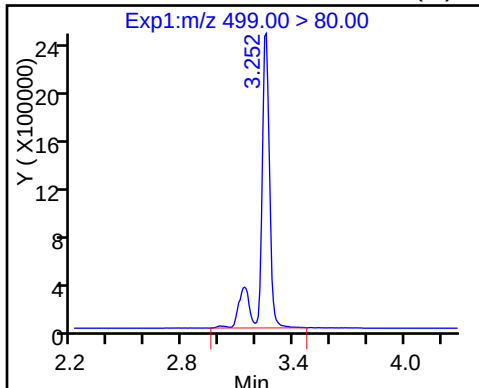
15 Perfluorooctanoic acid (M)



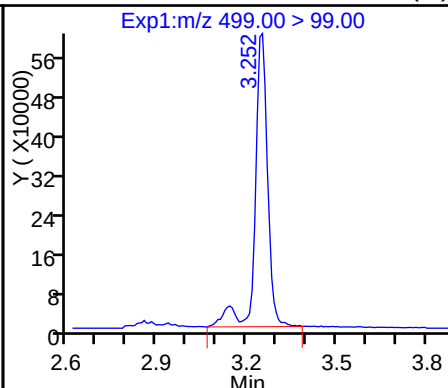
15 Perfluorooctanoic acid (M)



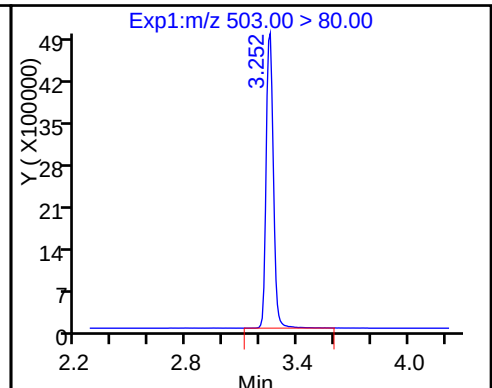
18 Perfluorooctane sulfonic acid (M)



18 Perfluorooctane sulfonic acid (M)



D 17 13C4 PFOS



TestAmerica Sacramento

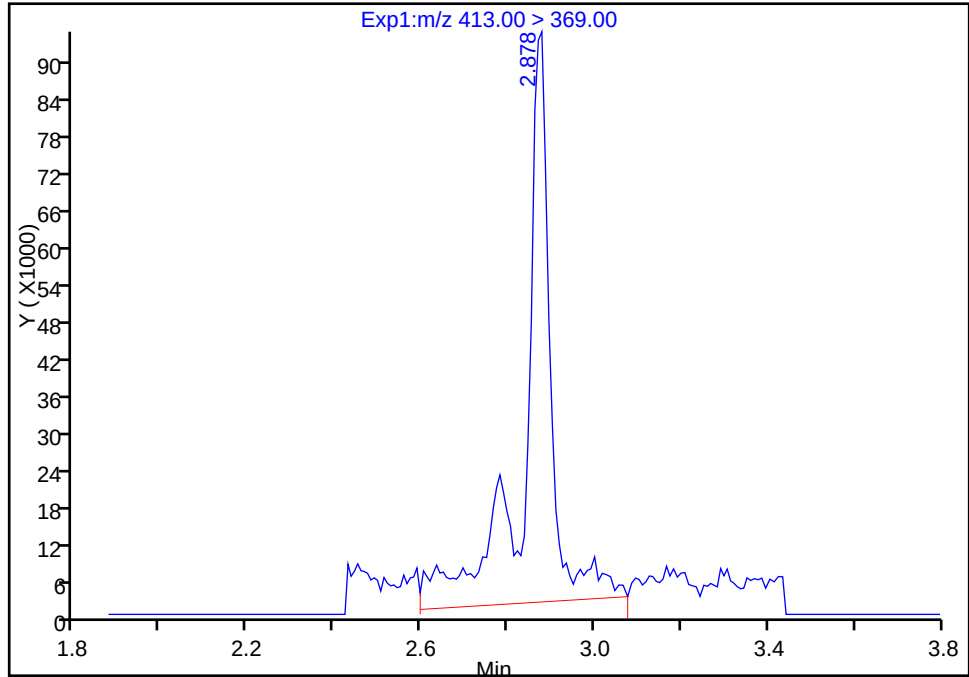
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_046.d
Injection Date: 02-Dec-2016 20:37:25 Instrument ID: A8_N
Lims ID: 320-23651-A-9-A Lab Sample ID:
Client ID: DPT-16-26-GW-29-33-DUP
Operator ID: A8-PC\A8 ALS Bottle#: 30 Worklist Smp#: 22
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

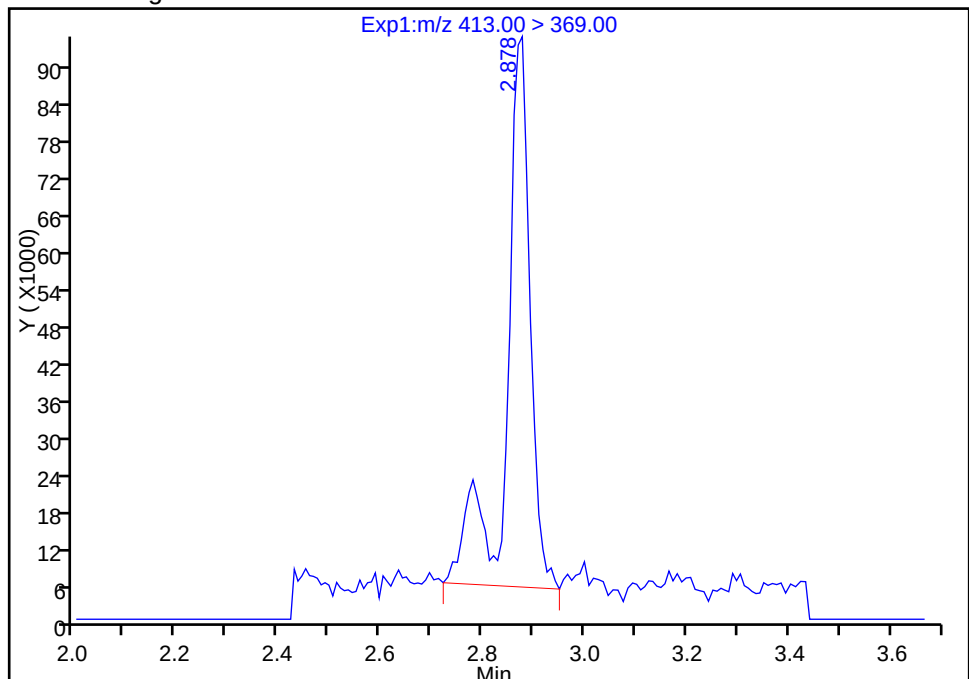
RT: 2.88
Area: 402701
Amount: 2.191937
Amount Units: ng/ml

Processing Integration Results



RT: 2.88
Area: 287574
Amount: 1.565291
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:36:51

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

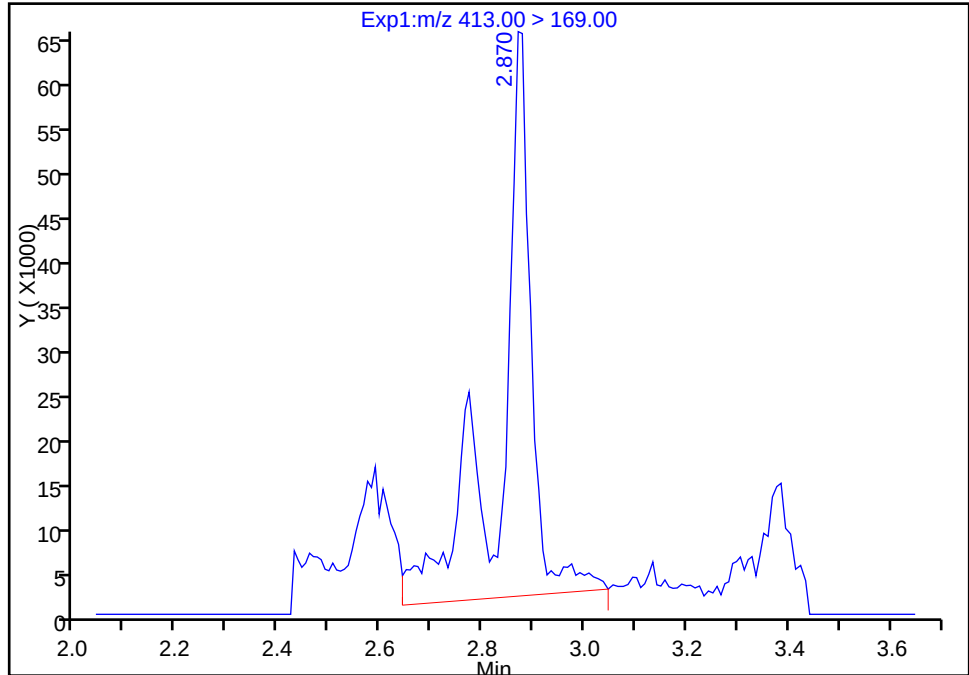
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_046.d
Injection Date: 02-Dec-2016 20:37:25 Instrument ID: A8_N
Lims ID: 320-23651-A-9-A Lab Sample ID:
Client ID: DPT-16-26-GW-29-33-DUP
Operator ID: A8-PCVA8 ALS Bottle#: 30 Worklist Smp#: 22
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

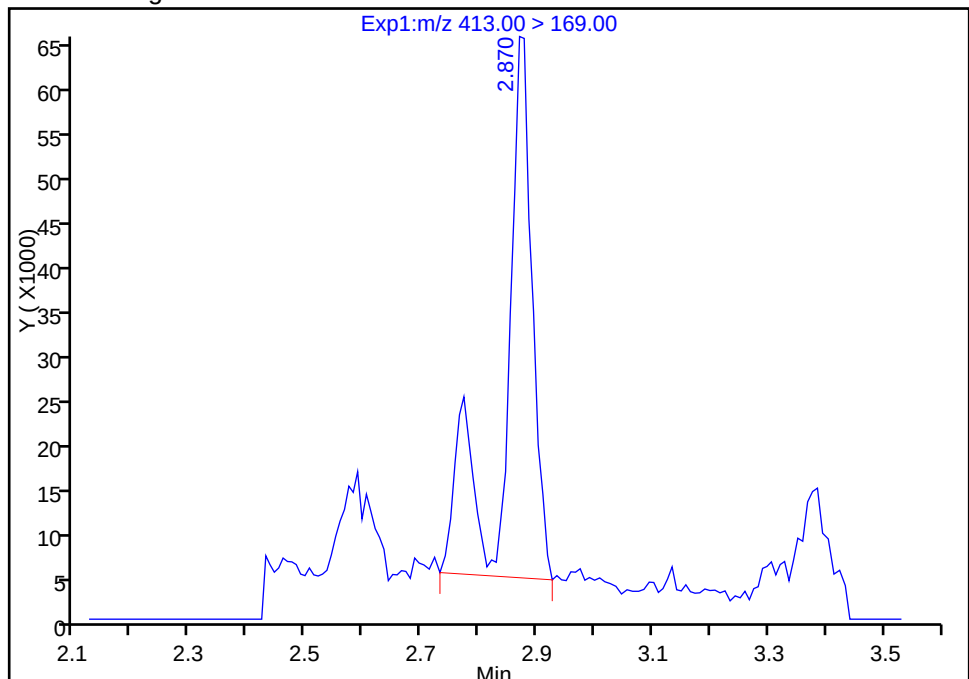
RT: 2.87
Area: 270947
Amount: 2.191937
Amount Units: ng/ml

Processing Integration Results



RT: 2.87
Area: 198322
Amount: 1.565291
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:36:51

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

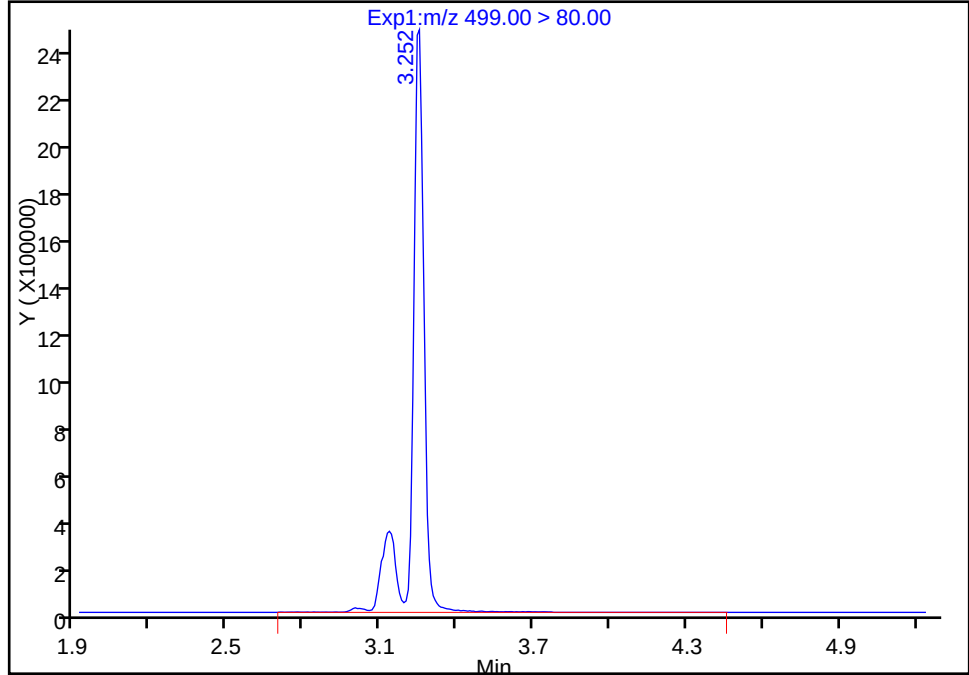
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_046.d
Injection Date: 02-Dec-2016 20:37:25 Instrument ID: A8_N
Lims ID: 320-23651-A-9-A Lab Sample ID:
Client ID: DPT-16-26-GW-29-33-DUP
Operator ID: A8-PC\A8 ALS Bottle#: 30 Worklist Smp#: 22
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

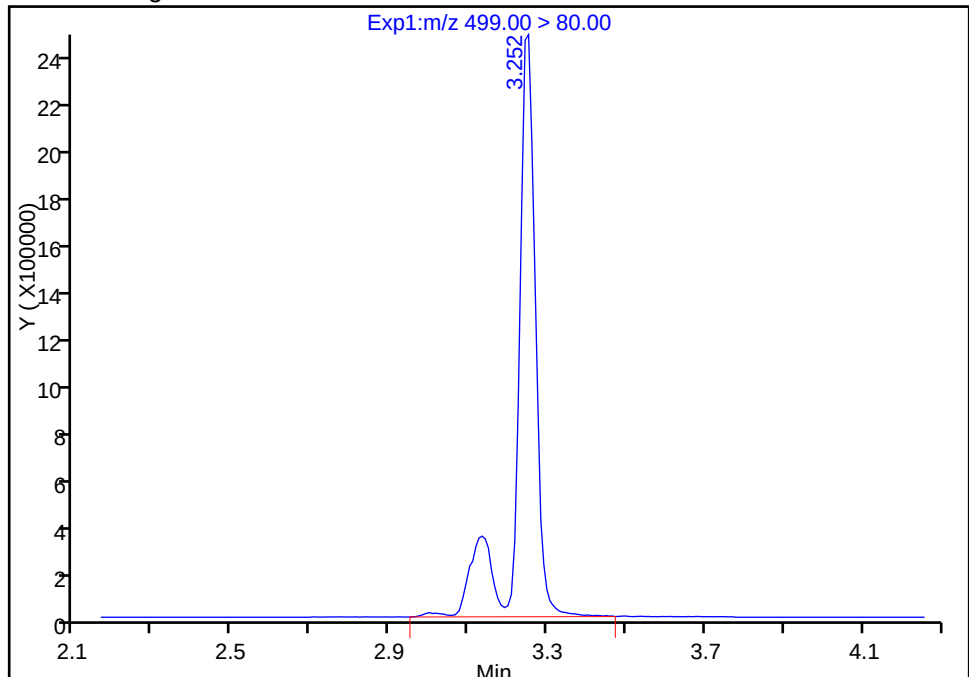
RT: 3.25
Area: 8208426
Amount: 26.638201
Amount Units: ng/ml

Processing Integration Results



RT: 3.25
Area: 8078344
Amount: 26.216056
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:36:51

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

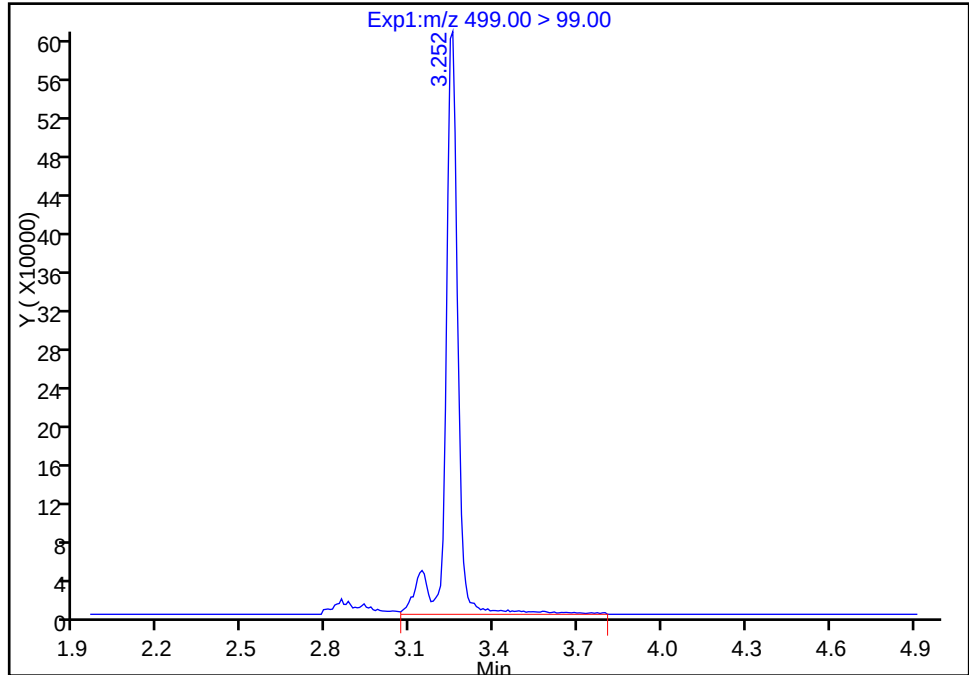
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_046.d
Injection Date: 02-Dec-2016 20:37:25 Instrument ID: A8_N
Lims ID: 320-23651-A-9-A Lab Sample ID:
Client ID: DPT-16-26-GW-29-33-DUP
Operator ID: A8-PCVA8 ALS Bottle#: 30 Worklist Smp#: 22
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

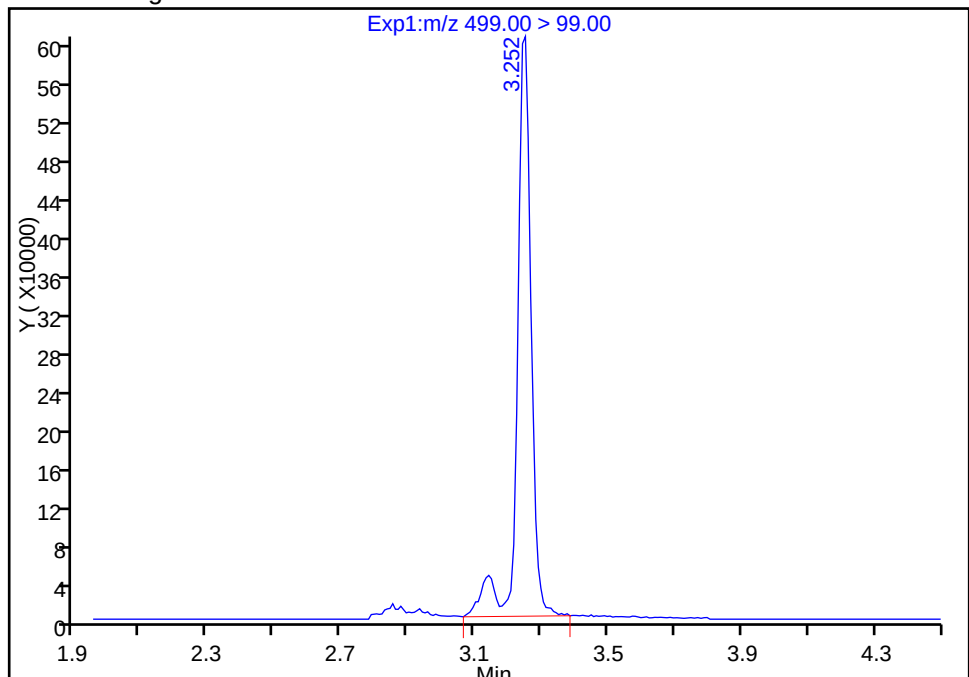
RT: 3.25
Area: 1876520
Amount: 26.638201
Amount Units: ng/ml

Processing Integration Results



RT: 3.25
Area: 1760381
Amount: 26.216056
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:36:51

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1
 SDG No.: _____
 Client Sample ID: DPT-16-27-GW-18-22 Lab Sample ID: 320-23651-10
 Matrix: Water Lab File ID: 02DEC2016C_043.d
 Analysis Method: 537 (Modified) Date Collected: 11/16/2016 13:20
 Extraction Method: 3535 Date Extracted: 11/21/2016 13:47
 Sample wt/vol: 250.9(mL) Date Analyzed: 12/02/2016 20:14
 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.: 140532 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0017	J M	0.0025	0.0020	0.00075
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.026		0.0040	0.0030	0.0013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.0020	0.00091

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	75		25-150
STL00991	13C4 PFOS	111		25-150
STL00994	18O2 PFHxS	112		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_043.d
 Lims ID: 320-23651-A-10-A
 Client ID: DPT-16-27-GW-18-22
 Sample Type: Client
 Inject. Date: 02-Dec-2016 20:14:52 ALS Bottle#: 27 Worklist Smp#: 19
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-23651-a-10-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 08:41:17 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas

Date: 05-Dec-2016 08:41:17

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	1.897	1.897	0.0	1.000	233714	0.4293				
298.90 > 99.00	1.887	1.897	-0.010	0.995	106564		2.19(0.00-0.00)			
D 10 18O2 PFHxS										
403.00 > 84.00	2.520	2.521	-0.001		15961095	52.8		112	786600	
D 14 13C4 PFOA										
417.00 > 372.00	2.870	2.869	0.001		8210465	37.4		74.8	629351	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.870	2.877	-0.007	1.000	139958	0.8354			657	M
413.00 > 169.00	2.878	2.877	0.001	1.003	95390		1.47(0.90-1.10)		434	M
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.243	3.250	-0.007	1.000	3858997	13.1			401882	
499.00 > 99.00	3.243	3.250	-0.007	1.000	903081		4.27(0.90-1.10)		6187	
D 17 13C4 PFOS										
503.00 > 80.00	3.243	3.250	-0.007		12983891	53.1		111	294132	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_043.d

Injection Date: 02-Dec-2016 20:14:52

Instrument ID: A8_N

Lims ID: 320-23651-A-10-A

Lab Sample ID: 320-23651-10

Client ID: DPT-16-27-GW-18-22

Operator ID: A8-PC\A8

ALS Bottle#: 27

Worklist Smp#: 19

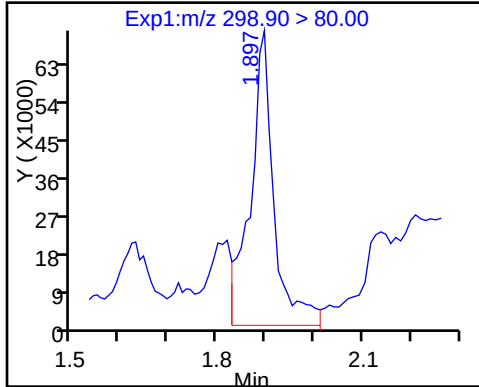
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

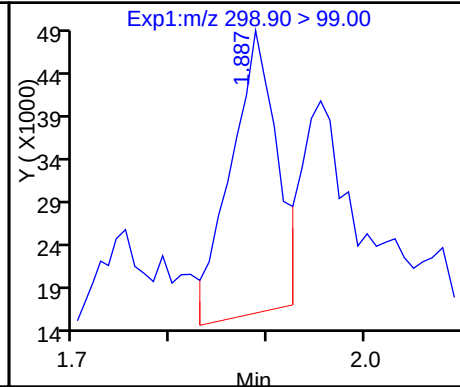
Method: A8_N

Limit Group: LC PFC_DOD ICAL

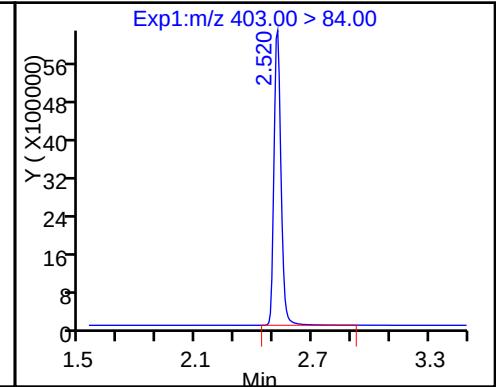
5 Perfluorobutanesulfonic acid



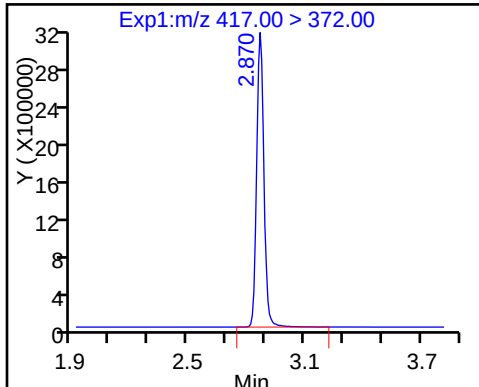
5 Perfluorobutanesulfonic acid



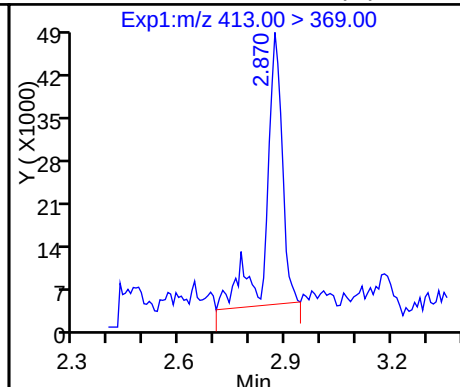
D 10 18O2 PFHxS



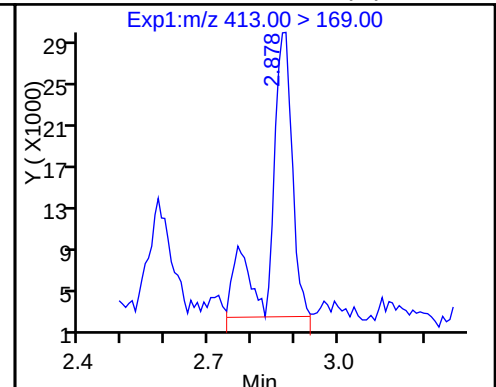
D 14 13C4 PFOA



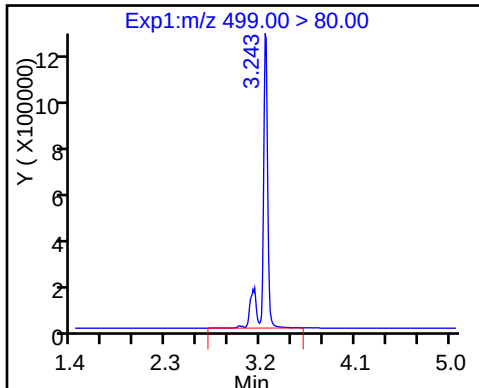
15 Perfluorooctanoic acid (M)



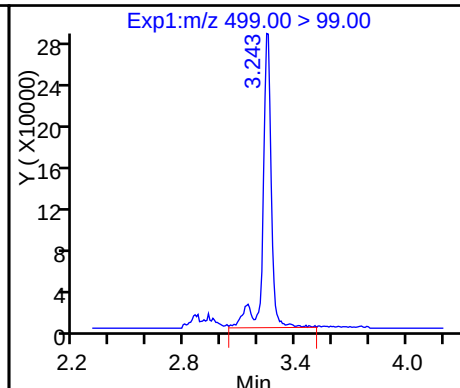
15 Perfluorooctanoic acid (M)



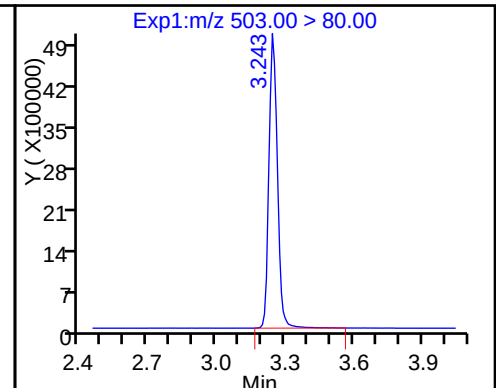
18 Perfluorooctane sulfonic acid



18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS



TestAmerica Sacramento

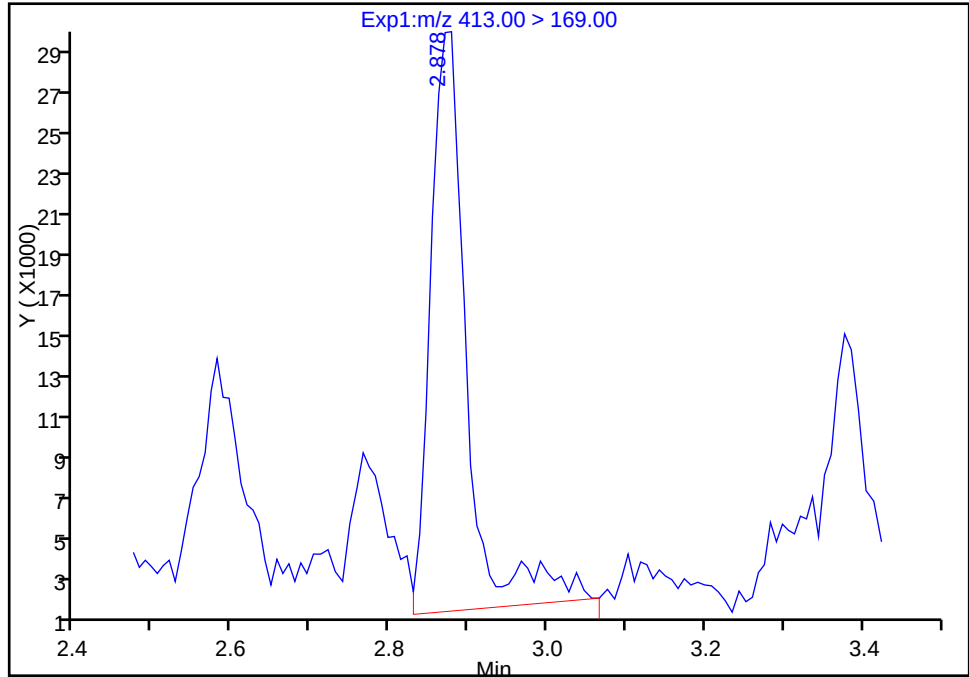
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_043.d		
Injection Date:	02-Dec-2016 20:14:52	Instrument ID:	A8_N
Lims ID:	320-23651-A-10-A	Lab Sample ID:	320-23651-10
Client ID:	DPT-16-27-GW-18-22		
Operator ID:	A8-PC\A8	ALS Bottle#:	27
Injection Vol:	2.0 ul	Dil. Factor:	1.0000
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL
Column:		Detector:	EXP1
		Worklist Smp#:	19

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

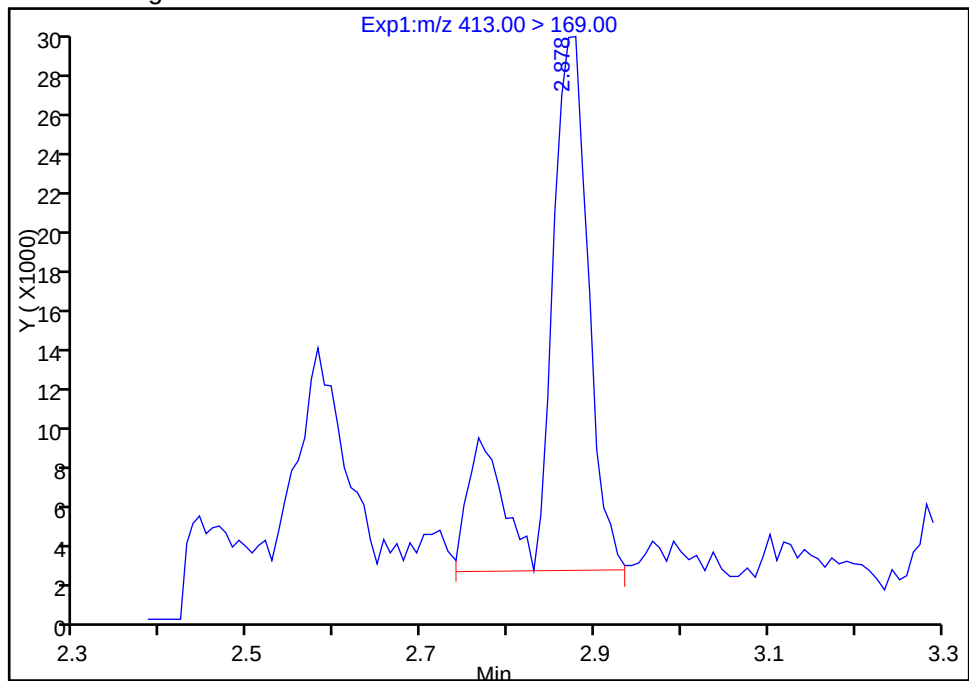
RT: 2.88
Area: 90275
Amount: 0.940374
Amount Units: ng/ml

Processing Integration Results



RT: 2.88
Area: 95390
Amount: 0.835351
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:41:17

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

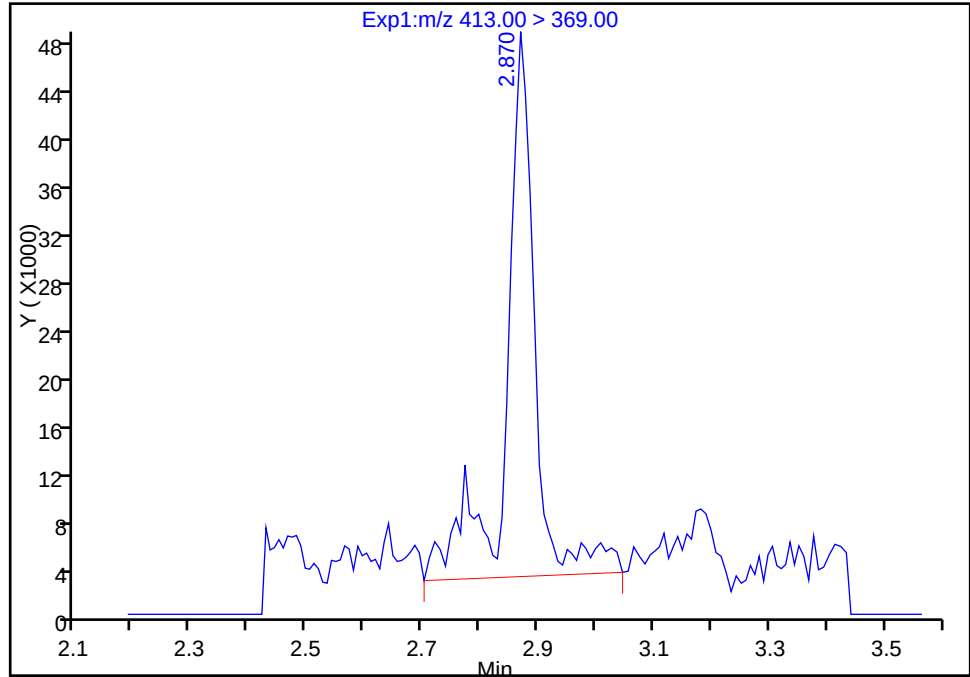
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_043.d
Injection Date: 02-Dec-2016 20:14:52 Instrument ID: A8_N
Lims ID: 320-23651-A-10-A Lab Sample ID: 320-23651-10
Client ID: DPT-16-27-GW-18-22
Operator ID: A8-PCVA8 ALS Bottle#: 27 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

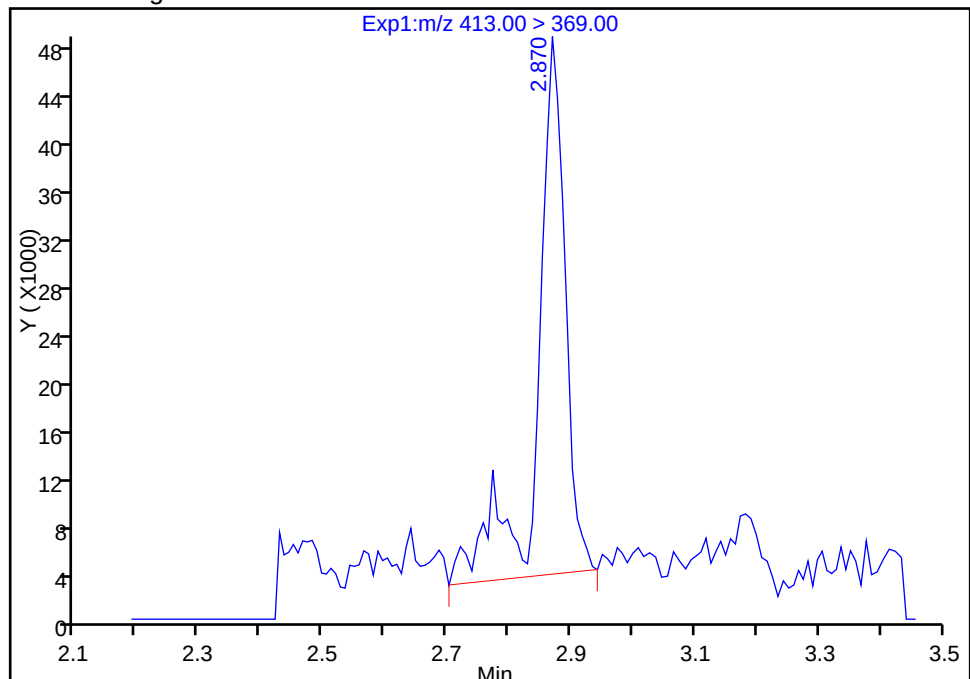
RT: 2.87
Area: 157554
Amount: 0.940374
Amount Units: ng/ml

Processing Integration Results



RT: 2.87
Area: 139958
Amount: 0.835351
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:41:17

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-23651-1</u>
SDG No.: _____	
Client Sample ID: <u>DPT-16-27-GW-29-33</u>	Lab Sample ID: <u>320-23651-11</u>
Matrix: <u>Water</u>	Lab File ID: <u>02DEC2016C_047.d</u>
Analysis Method: <u>537 (Modified)</u>	Date Collected: <u>11/16/2016 14:00</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>11/21/2016 13:47</u>
Sample wt/vol: <u>251.3 (mL)</u>	Date Analyzed: <u>12/02/2016 20:44</u>
Con. Extract Vol.: <u>0.5 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>Acquity</u> ID: <u>2.1 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>140532</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0022	J M	0.0025	0.0020	0.00074
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.015	M	0.0040	0.0030	0.0013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.0020	0.00091

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	101		25-150
STL00991	13C4 PFOS	130		25-150
STL00994	18O2 PFHxS	134		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_047.d
 Lims ID: 320-23651-A-11-A
 Client ID: DPT-16-27-GW-29-33
 Sample Type: Client
 Inject. Date: 02-Dec-2016 20:44:56 ALS Bottle#: 31 Worklist Smp#: 23
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-23651-a-11-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 08:37:36 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas

Date: 05-Dec-2016 08:37:36

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	1.900	1.897	0.003	1.000	158024	0.2409				
298.90 > 99.00	1.900	1.897	0.003	1.000	47587		3.32(0.00-0.00)			
D 10 18O2 PFHxS										
403.00 > 84.00	2.528	2.521	0.007		19229593	63.6		134	915484	
D 14 13C4 PFOA										
417.00 > 372.00	2.877	2.869	0.008		11059460	50.4		101	749007	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.877	2.877	0.0	1.000	249691	1.11			1385	M
413.00 > 169.00	2.877	2.877	0.0	1.000	173576		1.44(0.90-1.10)		9586	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.250	3.250	0.0	1.000	2544130	7.38			59853	M
499.00 > 99.00	3.250	3.250	0.0	1.000	507582		5.01(0.90-1.10)		21714	M
D 17 13C4 PFOS										
503.00 > 80.00	3.250	3.250	0.0		15150867	61.9		130	260951	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_047.d

Injection Date: 02-Dec-2016 20:44:56

Instrument ID: A8_N

Lims ID: 320-23651-A-11-A

Lab Sample ID:

Client ID: DPT-16-27-GW-29-33

Operator ID: A8-PC\A8

ALS Bottle#: 31

Worklist Smp#: 23

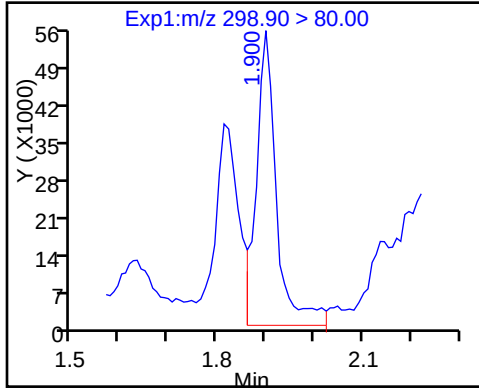
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

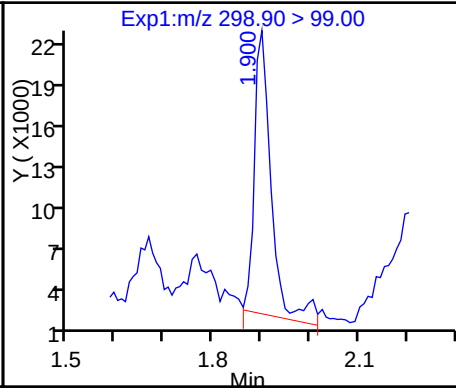
Method: A8_N

Limit Group: LC PFC_DOD ICAL

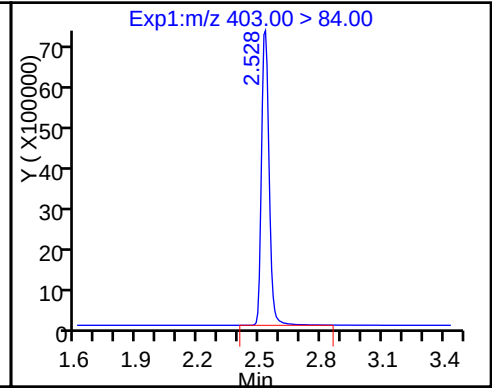
5 Perfluorobutanesulfonic acid



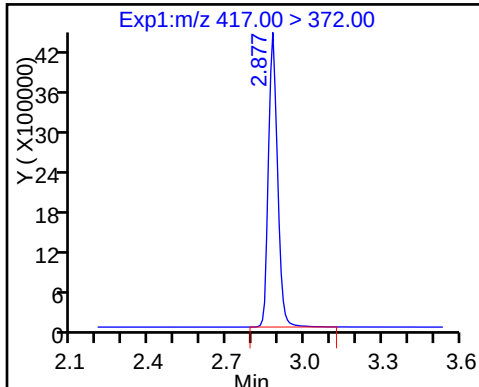
5 Perfluorobutanesulfonic acid



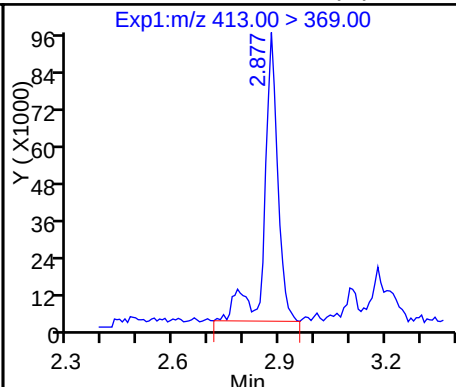
D 10 18O2 PFHxS



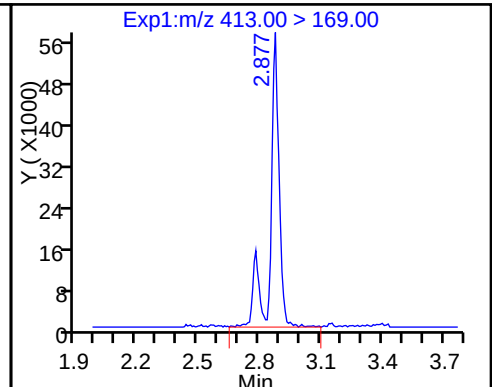
D 14 13C4 PFOA



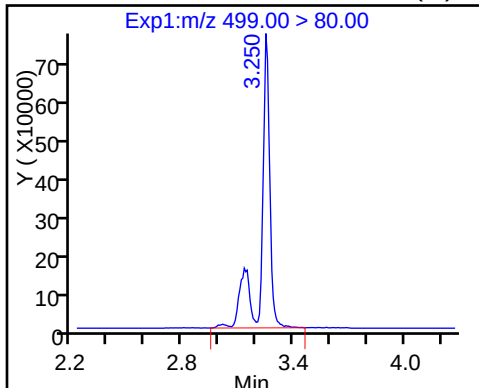
15 Perfluorooctanoic acid (M)



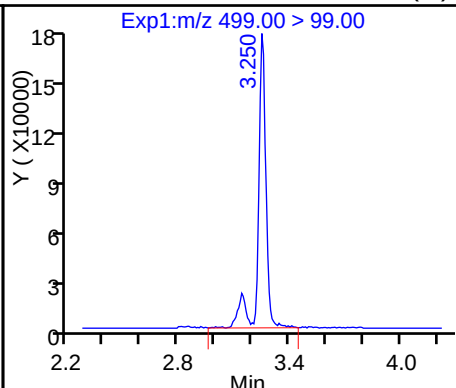
15 Perfluorooctanoic acid



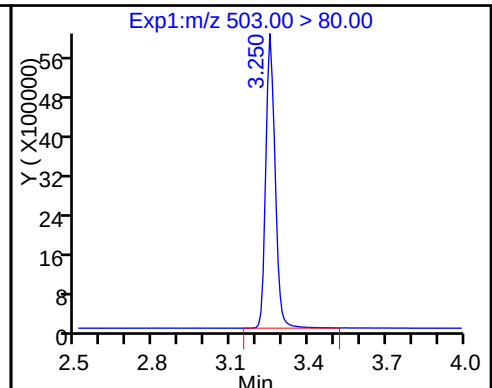
18 Perfluorooctane sulfonic acid (M)



18 Perfluorooctane sulfonic acid (M)



D 17 13C4 PFOS



TestAmerica Sacramento

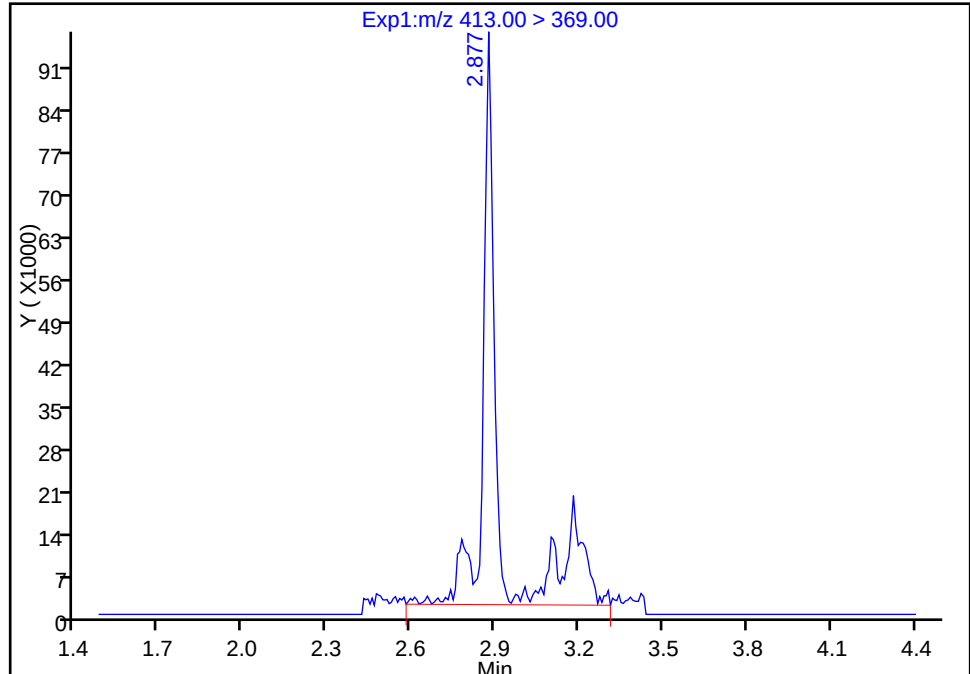
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_047.d
Injection Date: 02-Dec-2016 20:44:56 Instrument ID: A8_N
Lims ID: 320-23651-A-11-A Lab Sample ID:
Client ID: DPT-16-27-GW-29-33
Operator ID: A8-PC\A8 ALS Bottle#: 31 Worklist Smp#: 23
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

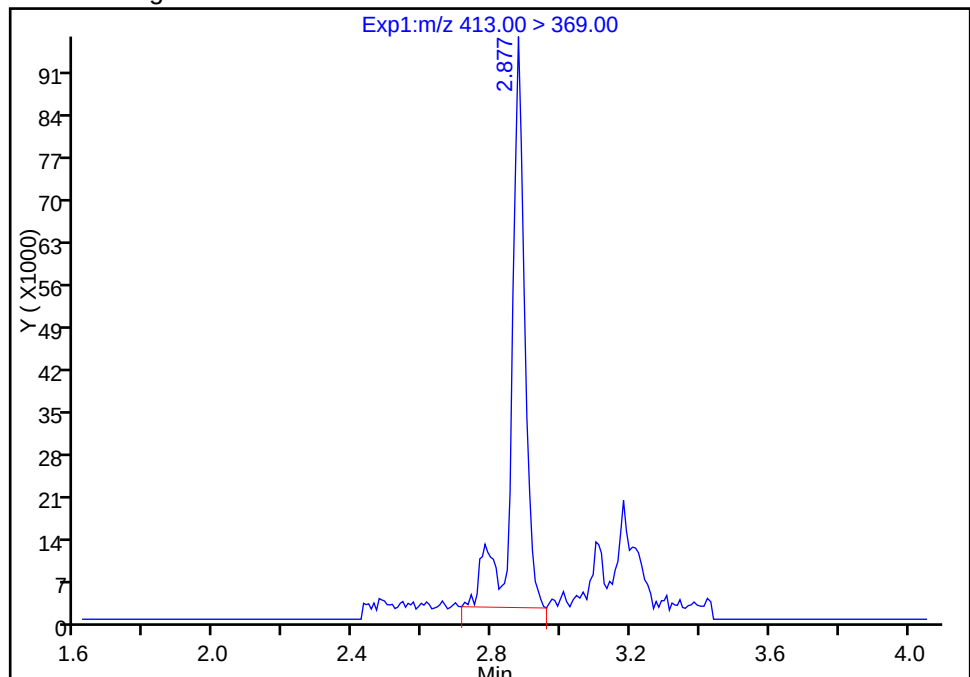
RT: 2.88
Area: 363241
Amount: 1.609533
Amount Units: ng/ml

Processing Integration Results



RT: 2.88
Area: 249691
Amount: 1.106389
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:37:36

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

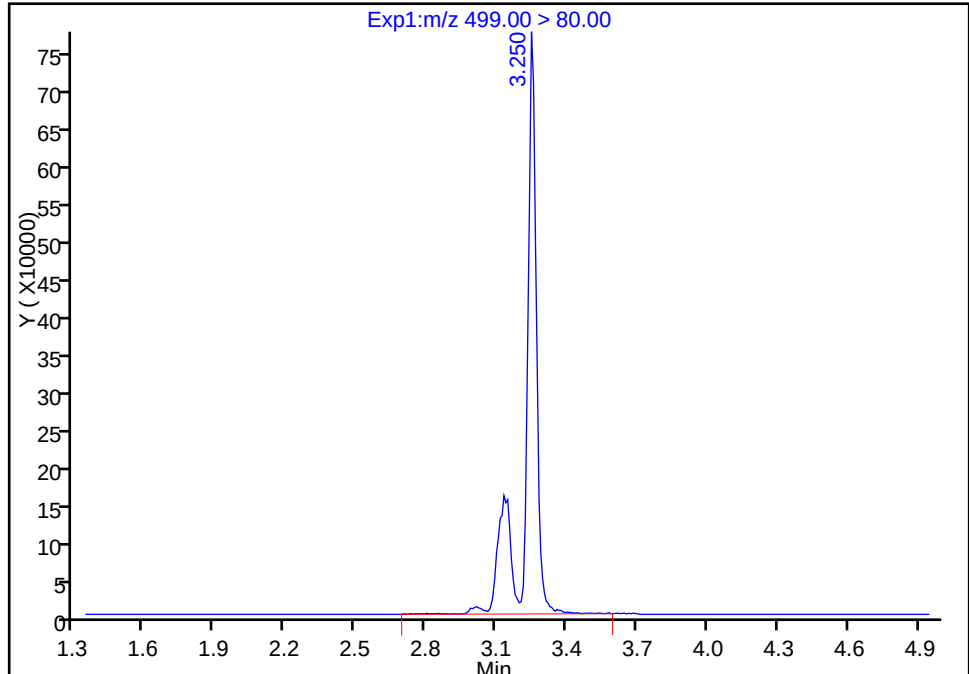
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_047.d
Injection Date: 02-Dec-2016 20:44:56 Instrument ID: A8_N
Lims ID: 320-23651-A-11-A Lab Sample ID:
Client ID: DPT-16-27-GW-29-33
Operator ID: A8-PC\A8 ALS Bottle#: 31 Worklist Smp#: 23
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

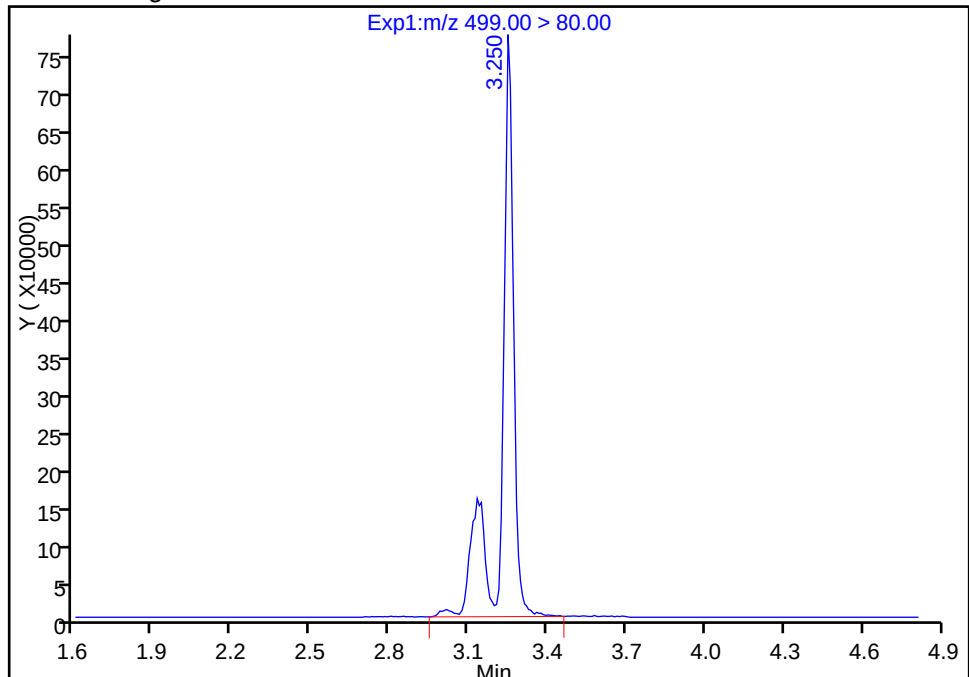
RT: 3.25
Area: 2566092
Amount: 7.445543
Amount Units: ng/ml

Processing Integration Results



RT: 3.25
Area: 2544130
Amount: 7.381820
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:37:36

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

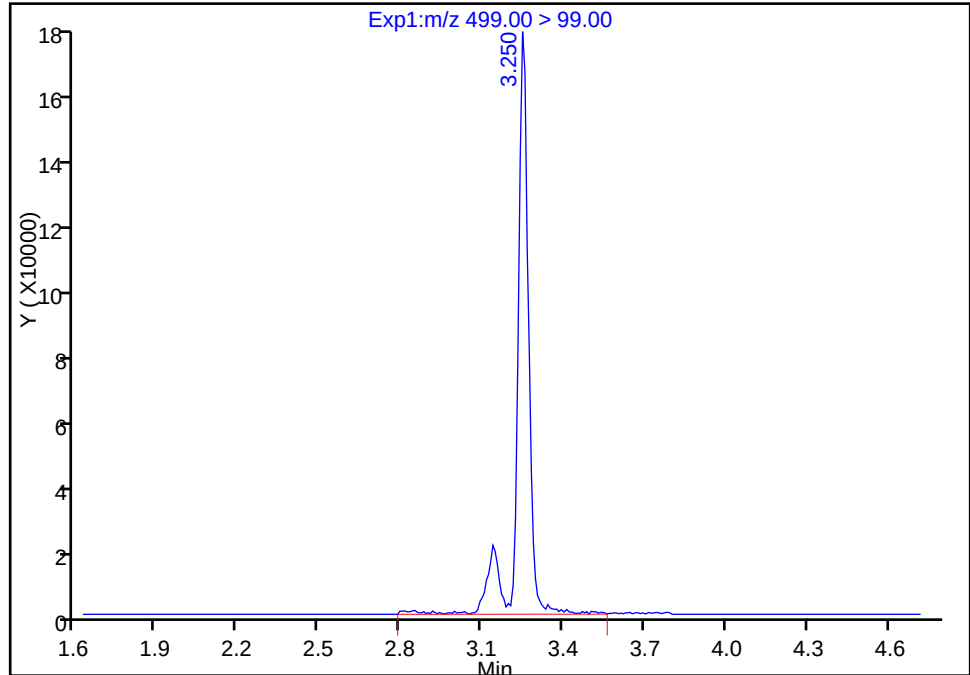
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_047.d
Injection Date: 02-Dec-2016 20:44:56 Instrument ID: A8_N
Lims ID: 320-23651-A-11-A Lab Sample ID:
Client ID: DPT-16-27-GW-29-33
Operator ID: A8-PCVA8 ALS Bottle#: 31 Worklist Smp#: 23
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

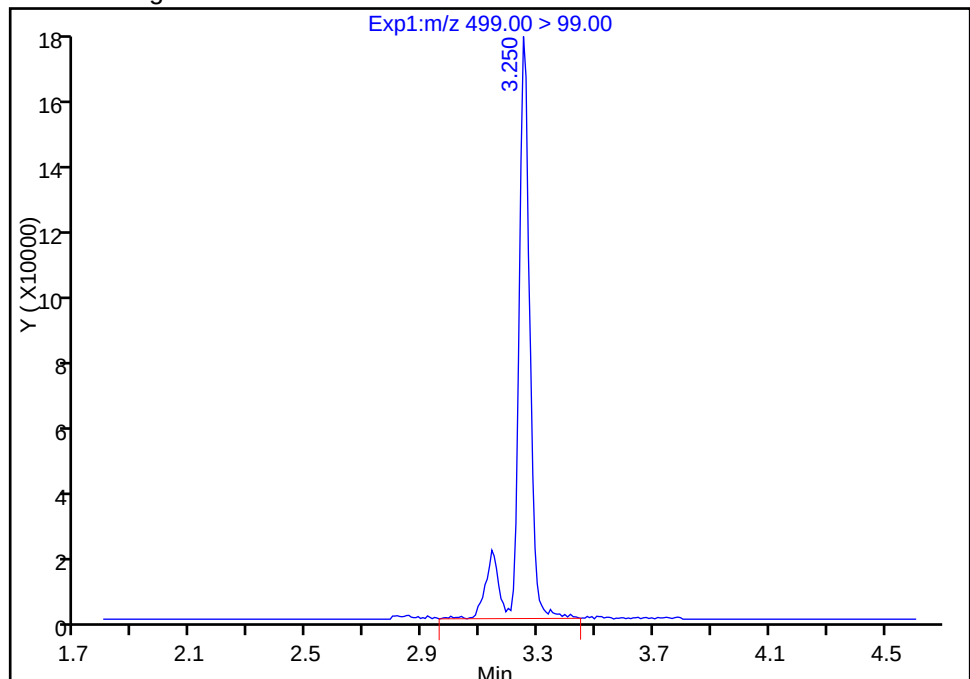
RT: 3.25
Area: 521766
Amount: 7.445543
Amount Units: ng/ml

Processing Integration Results



RT: 3.25
Area: 507582
Amount: 7.381820
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:37:36

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1 Analy Batch No.: 140382

SDG No.: _____

Instrument ID: A8_N GC Column: Acquity ID: 2.1 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/02/2016 10:29 Calibration End Date: 12/02/2016 12:29 Calibration ID: 26849

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-140382/4	02DEC2016A_004.d
Level 2	IC 320-140382/14	02DEC2016A_014.d
Level 3	IC 320-140382/5	02DEC2016A_005.d
Level 4	IC 320-140382/15	02DEC2016A_015.d
Level 5	IC 320-140382/6	02DEC2016A_006.d
Level 6	IC 320-140382/16	02DEC2016A_016.d
Level 7	IC 320-140382/7	02DEC2016A_007.d
Level 8	IC 320-140382/17	02DEC2016A_017.d
Level 9	IC 320-140382/8	02DEC2016A_008.d
Level 10	IC 320-140382/18	02DEC2016A_018.d
Level 11	IC 320-140382/9	02DEC2016A_009.d
Level 12	IC 320-140382/19	02DEC2016A_019.d
Level 13	IC 320-140382/10	02DEC2016A_010.d
Level 14	IC 320-140382/20	02DEC2016A_020.d

ANALYTE	LVL 1 LVL 11	LVL 2 LVL 12	LVL 3 LVL 13	LVL 4 LVL 14	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	1.630 1.610		1.622 ++++		1.622		1.614		1.614		1.367 - 1.867	1.619
Perfluoropentanoic acid (PFPeA)	1.944 1.910		1.916 ++++		1.926		1.916		1.916		1.670 - 2.170	1.921
Perfluorobutanesulfonic acid (PFBS)	1.983 1.949		1.964 ++++		1.964		1.954		1.945		1.781 - 2.141	1.960
Perfluorohexanoic acid (PFHxA)	2.281 2.225		2.239 ++++		2.247		2.239		2.226		1.991 - 2.491	2.243
Perfluoroheptanoic acid (PFHpA)	2.648 2.578		2.604 ++++		2.600		2.593		2.593		2.350 - 2.850	2.603
Perfluorohexanesulfonic acid (PFHxS)	++++ 2.601		2.619 2.598		2.616		2.608		2.608		2.365 - 2.865	2.608
6:2FTS		++++ 2.904		2.920 ++++		2.910		2.914		2.919	2.663 - 3.163	2.913
Perfluorooctanoic acid (PFOA)	++++ 2.958		2.993 2.967		2.981		2.982		2.972		2.734 - 3.234	2.976
Perfluoroheptanesulfonic Acid (PFHpS)	3.032 2.966		2.993 ++++		2.989		2.982		2.972		2.736 - 3.236	2.989
Perfluorooctane Sulfonate (PFOS)	++++ 3.340		3.380 3.345		3.366		3.362		3.352		3.116 - 3.616	3.358
Perfluorononanoic acid (PFNA)	3.416 3.348		3.380 ++++		3.383		3.371		3.361		3.123 - 3.623	3.377
Perfluorooctane Sulfonamide (FOSA)	3.686 3.643		3.657 ++++		3.652		3.648		3.648		3.406 - 3.906	3.656
8:2FTS		3.668 3.667		3.684 ++++		3.673		3.678		3.674	3.424 - 3.924	3.674

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1 Analy Batch No.: 140382

SDG No.: _____

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/02/2016 10:29 Calibration End Date: 12/02/2016 12:29 Calibration ID: 26849

ANALYTE	LVL 1 LVL 11	LVL 2 LVL 12	LVL 3 LVL 13	LVL 4 LVL 14	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
Perfluorodecanoic acid (PFDA)	3.786 3.721		3.746 ++++		3.740		3.738		3.727		3.488 - 3.988	3.743
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		3.851 3.832		3.857 3.849		3.847		3.843		3.847	3.597 - 4.097	3.847
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		4.020 4.009		4.026 4.018		4.015		4.011		4.016	3.766 - 4.266	4.016
Perfluorodecanesulfonic acid (PFDS)	4.096 4.028		4.061 4.028		4.046		4.048		4.039		3.799 - 4.299	4.049
Perfluoroundecanoic acid (PFUnA)	4.120 4.054		4.086 ++++		4.071		4.065		4.056		3.821 - 4.321	4.075
MeFOSA		4.115 4.102		4.114 4.118		4.104		4.112		4.108	3.860 - 4.360	4.110
N-EtFOSA-M		4.293 4.296		4.301 4.309		4.297		4.302		4.295	4.049 - 4.549	4.299
Perfluorododecanoic acid (PFDoA)	4.420 4.343		4.381 ++++		4.376		4.365		4.354		4.120 - 4.620	4.373
Perfluorotridecanoic Acid (PFTriA)	4.681 4.613		4.653 ++++		4.637		4.631		4.629		4.386 - 4.886	4.641
Perfluorotetradecanoic acid (PFTeA)	4.935 4.864		4.893 ++++		4.888		4.883		4.867		4.634 - 5.134	4.888
Perfluoro-n-hexadecanoic acid (PFHxDA)	5.370 5.290		5.334 ++++		5.326		5.315		5.306		5.070 - 5.570	5.324
Perfluoro-n-octadecanoic acid (PFODA)	5.784 5.688		5.738 5.682		5.726		5.717		5.702		5.470 - 5.970	5.720
13C4 PFBA	1.630 1.602		1.614 1.609		1.622		1.614		1.614		1.365 - 1.865	1.615
13C5-PFPeA	1.944 1.910		1.916 ++++		1.916		1.916		1.916		1.668 - 2.168	1.920
13C2 PFHxA	2.281 2.225		2.239 ++++		2.239		2.231		2.226		1.989 - 2.489	2.240
13C4-PFHpA	2.641 2.578		2.604 ++++		2.600		2.593		2.593		2.349 - 2.849	2.602
18O2 PFHxS	2.656 2.594		2.619 2.598		2.616		2.608		2.608		2.364 - 2.864	2.614
M2-6:2FTS		2.925 2.912		2.912 2.917		2.918		2.906		2.911	2.665 - 3.165	2.914
13C4 PFOA	3.032 2.966		2.993 2.958		2.989		2.974		2.972		2.734 - 3.234	2.983
13C4 PFOS	3.416 3.340		3.371 3.345		3.366		3.362		3.352		3.115 - 3.615	3.365
13C5 PFNA	3.425 3.355		3.380 ++++		3.375		3.371		3.361		3.124 - 3.624	3.378
13C8 FOSA	3.686 3.634		3.648 ++++		3.652		3.648		3.648		3.401 - 3.901	3.653

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1 Analy Batch No.: 140382

SDG No.: _____

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/02/2016 10:29 Calibration End Date: 12/02/2016 12:29 Calibration ID: 26849

ANALYTE	LVL 1 LVL 11	LVL 2 LVL 12	LVL 3 LVL 13	LVL 4 LVL 14	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
M2-8:2FTS		3.678 3.667		3.684 3.676		3.673		3.678		3.674	3.426 - 3.926	3.676
13C2 PFDA	3.786 3.710		3.746 ++++		3.740		3.738		3.727		3.488 - 3.988	3.741
d3-NMeFOSAA		3.843 3.824		3.848 3.841		3.838		3.843		3.839	3.589 - 4.089	3.839
d5-NEtFOSAA		4.011 4.000		4.017 4.009		4.006		4.011		4.007	3.759 - 4.259	4.009
13C2 PFUnA	4.120 4.045		4.078 ++++		4.079		4.065		4.056		3.820 - 4.320	4.074
d-N-MeFOSA-M		4.108 4.102		4.106 4.110		4.104		4.104		4.100	3.855 - 4.355	4.105
d-N-EtFOSA-M		4.293 4.286		4.292 4.299		4.287		4.293		4.285	4.040 - 4.540	4.291
13C2 PFDoA	4.420 4.343		4.381 ++++		4.376		4.365		4.354		4.120 - 4.620	4.373
13C2-PFTeDA	4.935 4.855		4.893 4.860		4.880		4.883		4.867		4.632 - 5.132	4.882
13C2-PFHxDA	5.370 5.290		5.334 5.300		5.326		5.315		5.306		5.070 - 5.570	5.320

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1 Analy Batch No.: 140382

SDG No.: _____

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/02/2016 10:29 Calibration End Date: 12/02/2016 12:29 Calibration ID: 26849

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-140382/4	02DEC2016A_004.d
Level 2	IC 320-140382/14	02DEC2016A_014.d
Level 3	IC 320-140382/5	02DEC2016A_005.d
Level 4	IC 320-140382/15	02DEC2016A_015.d
Level 5	IC 320-140382/6	02DEC2016A_006.d
Level 6	IC 320-140382/16	02DEC2016A_016.d
Level 7	IC 320-140382/7	02DEC2016A_007.d
Level 8	IC 320-140382/17	02DEC2016A_017.d
Level 9	IC 320-140382/8	02DEC2016A_008.d
Level 10	IC 320-140382/18	02DEC2016A_018.d
Level 11	IC 320-140382/9	02DEC2016A_009.d
Level 12	IC 320-140382/19	02DEC2016A_019.d
Level 13	IC 320-140382/10	02DEC2016A_010.d
Level 14	IC 320-140382/20	02DEC2016A_020.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 13	LVL 2 LVL 6 LVL 10 LVL 14	LVL 3 LVL 7 LVL 11	LVL 4 LVL 8 LVL 12		B	M1	M2								
13C4 PFBA	315621 417432 329797 296657		338632 378720 305244		Ave		340300.229				12.7		50.0			
13C5-PFPeA	252783 331097 252000 ++++		264694 302516 218073		Ave		270193.930				14.9		50.0			
13C2 PFHxA	230991 294886 230866 ++++		246623 269968 205545		Ave		246479.820				12.9		50.0			
13C4-PFHpA	202776 256831 196027 ++++		215578 228495 163352		Ave		210510.050				15.0		50.0			
18O2 PFHxS	293951 366456 304899 239385		310687 347463 254328		Ave		302452.643				15.1		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.: 320-23651-1 Analy Batch No.: 140382

SDG No.: _____

Instrument ID: A8_N GC Column: Acquity ID: 2.1 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/02/2016 10:29 Calibration End Date: 12/02/2016 12:29 Calibration ID: 26849

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 13	LVL 2 LVL 6 LVL 10 LVL 14	LVL 3 LVL 7 LVL 11	LVL 4 LVL 8 LVL 12		B	M1	M2								
M2-6:2FTS		124739 140185 117602 164705		120558 166448 140694	Ave		139275.699				14.4		50.0			
13C4 PFOA	223843 294113 211325 144514		246973 252700 162409		Ave		219410.943				23.8		50.0			
13C4 PFOS	227748 298992 246737 190884		263387 280702 203865		Ave		244616.441				16.2		50.0			
13C5 PFNA	167208 216529 165500 ++++		188629 194611 136179		Ave		178109.173				15.7		50.0			
13C8 FOSA	366949 471533 404926 ++++		431176 451020 359915		Ave		414252.957				10.9		50.0			
M2-8:2FTS		117628 124671 122166 166617		108840 154273 140315	Ave		133501.446				15.7		50.0			
13C2 PFDA	151221 196057 159286 ++++		168367 182254 139218		Ave		166066.990				12.5		50.0			
d3-NMeFOSAA		77601 82804 68846 79183		72124 99067 80331	Ave		79993.7857				12.1		50.0			
d5-NETfOSAA		89291 89787 77393 89956		82682 104841 89500	Ave		89064.1286				9.5		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.: 320-23651-1 Analy Batch No.: 140382

SDG No.: _____

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/02/2016 10:29 Calibration End Date: 12/02/2016 12:29 Calibration ID: 26849

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 13	LVL 2 LVL 6 LVL 10 LVL 14	LVL 3 LVL 7 LVL 11	LVL 4 LVL 8 LVL 12		B	M1	M2								
13C2 PFUnA	122340 154918 114588 ++++		133394 138267 91167		Ave		125779.243				17.4		50.0			
d-N-MeFOSA-M		93620 107246 99342 124175		103638 117800 98551	Ave		106338.894				10.4		50.0			
d-N-EtFOSA-M		86581 104104 97144 118377		100979 112224 93938	Ave		101906.806				10.6		50.0			
13C2 PFDoA	108677 140992 109985 ++++		119003 126396 96377		Ave		116904.873				13.3		50.0			
13C2-PFTeDA	221880 299085 231293 207930		259139 271923 202045		Ave		241899.200				14.8		50.0			
13C2-PFHxDA	113226 160713 124217 120034		135127 148580 110713		Ave		130372.880				14.3		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.: 320-23651-1 Analy Batch No.: 140382

SDG No.: _____

Instrument ID: A8_N GC Column: Acquity ID: 2.1 (mm) Heated Purge: (Y/N) NCalibration Start Date: 12/02/2016 10:29 Calibration End Date: 12/02/2016 12:29 Calibration ID: 26849

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6 LVL 11	LVL 7 LVL 12	LVL 8 LVL 13	LVL 9 LVL 14	LVL 10												
Perfluorobutanoic acid (PFBA)	287036 219376	371759	298633 ++++	294183	387562	AveID		0.8853				10.0		35.0			
Perfluoropentanoic acid (PFPeA)	321460 171488	327954	290628 ++++	249486	336046	AveID		1.0408				15.3		35.0			
Perfluorobutanesulfonic acid (PFBS)	481176 291824	642971	500216 ++++	491581	668327	AveID		1.6135				15.6		50.0			
Perfluorohexanoic acid (PFHxA)	235306 166899	274051	236370 ++++	217418	291709	AveID		0.9559				8.0		35.0			
Perfluoroheptanoic acid (PFHpA)	233630 146715	250282	216223 ++++	204959	259601	AveID		1.0342				8.4		35.0			
Perfluorohexanesulfonic acid (PFHxS)	++++ 251770	380131	376003 213929	323081	406797	AveID		1.0596				10.2		35.0			
6:2FTS	103949	++++ 105654	93245 152954	++++	118849	AveID		0.8391				14.3		35.0			
Perfluorooctanoic acid (PFOA)	++++ 148950	280154	290666 118726	218968	312182	AveID		1.0203				12.7		35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	277206 199679	364908	299283 ++++	279830	372775	AveID		1.1690				9.7		50.0			
Perfluorooctane Sulfonate (PFOS)	++++ 225419	309544	275533 216190	265826	316788	AveID		1.0873				3.0		35.0			
Perfluorononanoic acid (PFNA)	170148 126022	200322	184877 ++++	164187	217102	AveID		0.9912				3.7		35.0			
Perfluorooctane Sulfonamide (FOSA)	360690 255544	468609	403791 ++++	379917	474054	AveID		0.9353				12.5		35.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

CURVE EVALUATION

Lab Name: TestAmerica SacramentoJob No.: 320-23651-1Analy Batch No.: 140382

SDG No.: _____

Instrument ID: A8_NGC Column: AcquityID: 2.1(mm)Heated Purge: (Y/N) NCalibration Start Date: 12/02/2016 10:29Calibration End Date: 12/02/2016 12:29Calibration ID: 26849

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6 LVL 11	LVL 7 LVL 12	LVL 8 LVL 13	LVL 9 LVL 14	LVL 10												
8:2FTS	90169	91935 101586	146110	98719 +++++	120115	AveID		0.8444				13.7		35.0			
Perfluorodecanoic acid (PFDA)	155778 128074	183568	159778 +++++	151623	187771	AveID		0.9693				4.2		35.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	57976	61790 68867	91493	59295 71812	73940	AveID		0.8686				13.5		35.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	56792	60032 70327	94072	56004 70891	70934	AveID		0.7671				14.6		35.0			
Perfluorodecanesulfonic acid (PFDS)	138425 126426	189172	156537 107269	162158	201706	AveID		0.6271				6.9		50.0			
Perfluoroundecanoic acid (PFUnA)	152116 89994	145410	148792 +++++	111549	152861	AveID		1.0596				9.9		35.0			
MeFOSA	72052	74554 79073	106455	73327 89254	96734	AveID		0.7963				13.8		35.0			
N-EtFOSA-M	73147	71070 82751	109355	78846 88734	100899	AveID		0.8497				14.4		35.0			
Perfluorododecanoic acid (PFDoA)	109058 88491	122257	109023 +++++	101710	133861	AveID		0.9465				3.6		35.0			
Perfluorotridecanoic Acid (PFTriA)	109674 92748	141902	126175 +++++	114082	147998	AveID		1.0402				5.1		50.0			
Perfluorotetradecanoic acid (PFTeA)	228612 159620	259265	237250 +++++	206027	270118	AveID		1.9323				8.3		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	267566 93727	142551	218894 +++++	113089	160135	L1ID	0.8109	0.9850							0.9990		0.9900
Perfluoro-n-octadecanoic acid (PFODA)	80380 68360	72886	118037 77747	107852	105867	AveID		0.7863				19.0		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.: 320-23651-1 Analy Batch No.: 140382

SDG No.: _____

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/02/2016 10:29 Calibration End Date: 12/02/2016 12:29 Calibration ID: 26849

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-140382/4	02DEC2016A_004.d
Level 2	IC 320-140382/14	02DEC2016A_014.d
Level 3	IC 320-140382/5	02DEC2016A_005.d
Level 4	IC 320-140382/15	02DEC2016A_015.d
Level 5	IC 320-140382/6	02DEC2016A_006.d
Level 6	IC 320-140382/16	02DEC2016A_016.d
Level 7	IC 320-140382/7	02DEC2016A_007.d
Level 8	IC 320-140382/17	02DEC2016A_017.d
Level 9	IC 320-140382/8	02DEC2016A_008.d
Level 10	IC 320-140382/18	02DEC2016A_018.d
Level 11	IC 320-140382/9	02DEC2016A_009.d
Level 12	IC 320-140382/19	02DEC2016A_019.d
Level 13	IC 320-140382/10	02DEC2016A_010.d
Level 14	IC 320-140382/20	02DEC2016A_020.d

ANALYTE	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
		LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
		LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10
		LVL 11	LVL 12	LVL 13	LVL 14		LVL 11	LVL 12	LVL 13	LVL 14	
13C4 PFBA	Ave	15781027	18935985	16931601	16489860	20871580	50.0	50.0	50.0	50.0	50.0
		15262180		14832847			50.0		50.0		
13C5-PFPeA	Ave	12639170	15125796	13234715	12600012	16554836	50.0	50.0	50.0	50.0	50.0
		10903650		+++++			50.0		+++++		
13C2 PFHxA	Ave	11549542	13498378	12331127	11543313	14744313	50.0	50.0	50.0	50.0	50.0
		10277273		+++++			50.0		+++++		
13C4-PFHpA	Ave	10138817	11424765	10778897	9801352	12841573	50.0	50.0	50.0	50.0	50.0
		8167611		+++++			50.0		+++++		
18O2 PFHxS	Ave	13903865	16435009	14695505	14421709	17333346	47.3	47.3	47.3	47.3	47.3
		12029706		11322930			47.3		47.3		
M2-6:2FTS	Ave	5925112	6682949	5726516	5586093		47.5	47.5	47.5	47.5	47.5
		6658764		7906261			47.5		47.5		47.5
13C4 PFOA	Ave	11192131	12634984	12348635	10566267	14705649	50.0	50.0	50.0	50.0	50.0
		8120442		7225722			50.0		50.0		

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1 Analy Batch No.: 140382

SDG No.: _____

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/02/2016 10:29 Calibration End Date: 12/02/2016 12:29 Calibration ID: 26849

ANALYTE	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
		LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8 LVL 13	LVL 4 LVL 9 LVL 14	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8 LVL 13	LVL 4 LVL 9 LVL 14	LVL 5 LVL 10
13C4 PFOS	Ave	10886366 9744748	13417569	12589922 9124233	11794026	14291797	47.8 47.8	47.8	47.8 47.8	47.8	47.8
13C5 PFNA	Ave	8360391 6808930	9730546	9431435 +++++	8274989	10826461	50.0 50.0	50.0	50.0 +++++	50.0	50.0
13C8 FOSA	Ave	18347473 17995728	22550983	21558794 +++++	20246280	23576629	50.0 50.0	50.0	50.0 +++++	50.0	50.0
M2-8:2FTS	Ave	5971752	5634375 6721067	7389674	5213436 7980965	5851766	47.9 47.9	47.9	47.9 47.9	47.9	47.9
13C2 PFDA	Ave	7561029 6960897	9112679	8418346 +++++	7964307	9802839	50.0 50.0	50.0	50.0 +++++	50.0	50.0
d3-NMeFOSAA	Ave	4140205	3880040 4016571	4953346	3606216 3959155	3442292	50.0 50.0	50.0	50.0 50.0	50.0	50.0
d5-NEtFOSAA	Ave	4489327	4464530 4474975	5242030	4134123 4497788	3869672	50.0 50.0	50.0	50.0 50.0	50.0	50.0
13C2 PFUnA	Ave	6117015 4558330	6913372	6669716 +++++	5729423	7745917	50.0 50.0	50.0	50.0 +++++	50.0	50.0
d-N-MeFOSA-M	Ave	5362314	4681022 4927555	5889991	5181881 6208758	4967092	50.0 50.0	50.0	50.0 50.0	50.0	50.0
d-N-EtFOSA-M	Ave	5205212	4329074 4696896	5611197	5048951 5918873	4857179	50.0 50.0	50.0	50.0 50.0	50.0	50.0
13C2 PFDoA	Ave	5433841 4818858	6319787	5950161 +++++	5499233	7049582	50.0 50.0	50.0	50.0 +++++	50.0	50.0
13C2-PFTeDA	Ave	11093975	13596161	12956938	11564641	14954236	50.0 50.0	50.0	50.0 50.0	50.0	50.0
13C2-PFHxDA	Ave	5661315 5535655	7428976	6756331 6001714	6210852	8035665	50.0 50.0	50.0	50.0 50.0	50.0	50.0

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1 Analy Batch No.: 140382
SDG No.: _____
Instrument ID: A8_N GC Column: Acquity ID: 2.1 (mm) Heated Purge: (Y/N) N
Calibration Start Date: 12/02/2016 10:29 Calibration End Date: 12/02/2016 12:29 Calibration ID: 26849

Curve Type Legend:

Ave = Average

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1 Analy Batch No.: 140382

SDG No.: _____

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) NCalibration Start Date: 12/02/2016 10:29 Calibration End Date: 12/02/2016 12:29 Calibration ID: 26849

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-140382/4	02DEC2016A_004.d
Level 2	IC 320-140382/14	02DEC2016A_014.d
Level 3	IC 320-140382/5	02DEC2016A_005.d
Level 4	IC 320-140382/15	02DEC2016A_015.d
Level 5	IC 320-140382/6	02DEC2016A_006.d
Level 6	IC 320-140382/16	02DEC2016A_016.d
Level 7	IC 320-140382/7	02DEC2016A_007.d
Level 8	IC 320-140382/17	02DEC2016A_017.d
Level 9	IC 320-140382/8	02DEC2016A_008.d
Level 10	IC 320-140382/18	02DEC2016A_018.d
Level 11	IC 320-140382/9	02DEC2016A_009.d
Level 12	IC 320-140382/19	02DEC2016A_019.d
Level 13	IC 320-140382/10	02DEC2016A_010.d
Level 14	IC 320-140382/20	02DEC2016A_020.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10
			LVL 11	LVL 12	LVL 13	LVL 14		LVL 11	LVL 12	LVL 13	LVL 14	
Perfluorobutanoic acid (PFBA)		AveID	143518	7435187	298633	14709131	1937809	0.500	20.0	1.00	50.0	5.00
			43875101		+++++			200		+++++		
Perfluoropentanoic acid (PFPeA)		AveID	160730	6559082	290628	12474289	1680231	0.500	20.0	1.00	50.0	5.00
			34297516		+++++			200		+++++		
Perfluorobutanesulfonic acid (PFBS)		AveID	212680	11367724	442191	21727893	2954006	0.442	17.7	0.884	44.2	4.42
			51594571		+++++			177		+++++		
Perfluorohexanoic acid (PFHxA)		AveID	117653	5481010	236370	10870881	1458544	0.500	20.0	1.00	50.0	5.00
			33379792		+++++			200		+++++		
Perfluoroheptanoic acid (PFHpA)		AveID	116815	5005633	216223	10247953	1298003	0.500	20.0	1.00	50.0	5.00
			29343029		+++++			200		+++++		
Perfluorohexanesulfonic acid (PFHxS)		AveID	+++++	6918390	342163	14700167	1850926	+++++	18.2	0.910	45.5	4.55
			45822208		77870104			182		364		
6:2FTS		AveID	492719	+++++	2900008	88396	5633441	4.74	+++++	19.0	0.948	47.4
				20031946		+++++			190		+++++	

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica SacramentoJob No.: 320-23651-1Analy Batch No.: 140382

SDG No.: _____

Instrument ID: A8_NGC Column: AcquityID: 2.1(mm)Heated Purge: (Y/N) NCalibration Start Date: 12/02/2016 10:29Calibration End Date: 12/02/2016 12:29Calibration ID: 26849

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 13	LVL 4 LVL 9 LVL 14	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8 LVL 13	LVL 4 LVL 9 LVL 14	LVL 5 LVL 10
Perfluorooctanoic acid (PFOA)		AveID	+++++	5603089	290666	10948383	1560911	+++++	20.0	1.00	50.0	5.00
			29789966		47490545			200		400		
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	131950	6947857	284917	13319919	1774408	0.476	19.0	0.952	47.6	4.76
			38018954		+++++			190		+++++		
Perfluorooctane Sulfonate (PFOS)		AveID	+++++	5745134	255695	12334342	1469896	+++++	18.6	0.928	46.4	4.64
			41837729		80249842			186		371		
Perfluorononanoic acid (PFNA)		AveID	85074	4006430	184877	8209339	1085508	0.500	20.0	1.00	50.0	5.00
			25204338		+++++			200		+++++		
Perfluorooctane Sulfonamide (FOSA)		AveID	180345	9372172	403791	18995833	2370271	0.500	20.0	1.00	50.0	5.00
			51108754		+++++			200		+++++		
8:2FTS		AveID	431909	44037	2799477	94573	5753486	4.79	0.479	19.2	0.958	47.9
				19463965		+++++			192		+++++	
Perfluorodecanoic acid (PFDA)		AveID	77889	3671358	159778	7581125	938853	0.500	20.0	1.00	50.0	5.00
			25614867		+++++			200		+++++		
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	289882	30895	1829869	59295	3696988	5.00	0.500	20.0	1.00	50.0
			13773335			28724886		200		400		
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	283960	30016	1881436	56004	3546696	5.00	0.500	20.0	1.00	50.0
			14065497			28356327		200		400		
Perfluorodecanesulfonic acid (PFDS)		AveID	66721	3647236	150902	7816007	972225	0.482	19.3	0.964	48.2	4.82
			24374906		41362935			193		386		
Perfluoroundecanoic acid (PFUnA)		AveID	76058	2908196	148792	5577456	764307	0.500	20.0	1.00	50.0	5.00
			17998762		+++++			200		+++++		
MeFOSA		AveID	360259	37277	2129108	73327	4836683	5.00	0.500	20.0	1.00	50.0
			15814534			35701676		200		400		
N-EtFOSA-M		AveID	365734	35535	2187091	78846	5044937	5.00	0.500	20.0	1.00	50.0
			16550291			35493503			200		400	

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1 Analy Batch No.: 140382

SDG No.: _____

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) NCalibration Start Date: 12/02/2016 10:29 Calibration End Date: 12/02/2016 12:29 Calibration ID: 26849

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10
			LVL 11	LVL 12	LVL 13	LVL 14		LVL 11	LVL 12	LVL 13	LVL 14	
Perfluorododecanoic acid (PFDoA)		AveID	54529	2445148	109023	5085511	669306	0.500	20.0	1.00	50.0	5.00
			17698276		+++++			200		+++++		
Perfluorotridecanoic Acid (PFTriA)		AveID	54837	2838032	126175	5704096	739992	0.500	20.0	1.00	50.0	5.00
			18549592		+++++			200		+++++		
Perfluorotetradecanoic acid (PFTeA)		AveID	114306	5185293	237250	10301361	1350591	0.500	20.0	1.00	50.0	5.00
			31923969		+++++			200		+++++		
Perfluoro-n-hexadecanoic acid (PFHxDA)		L1ID	133783	2851018	218894	5654463	800676	0.500	20.0	1.00	50.0	5.00
			18745470		+++++			200		+++++		
Perfluoro-n-octadecanoic acid (PFODA)		AveID	40190	1457725	118037	5392609	529337	0.500	20.0	1.00	50.0	5.00
			13671969		31098706			200		400		

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\20161202-37450.b\02DEC2016A_004.d
 Lims ID: IC L1
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 02-Dec-2016 10:29:38 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\20161202-37450.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Dec-2016 14:51:29 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas

Date: 02-Dec-2016 13:37:48

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	1.630	1.615	0.015		15781027	46.4		92.7	1736709	
1 Perfluorobutyric acid										
212.90 > 169.00	1.630	1.617	0.013	1.000	143518	0.5136		103	1140	
D 4 13C5-PFPeA										
267.90 > 223.00	1.944	1.918	0.026		12639170	46.8		93.6	942300	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.944	1.920	0.024	1.000	160730	0.6109		122	1551	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.983	1.961	0.022	1.000	212680	0.4484		101		
298.90 > 99.00	1.983	1.961	0.022	1.000	94809		2.24(0.00-0.00)	101		
D 6 13C2 PFHxA										
315.00 > 270.00	2.281	2.239	0.042		11549542	46.9		93.7	865664	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.281	2.241	0.040	1.000	117653	0.5329		107	3266	
D 11 13C4-PFHpA										
367.00 > 322.00	2.641	2.599	0.042		10138817	48.2		96.3	926585	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.648	2.600	0.048	1.000	116815	0.5570		111	2490	
D 10 18O2 PFHxS										
403.00 > 84.00	2.656	2.614	0.042		13903865	46.0		97.2	1297944	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.656	2.615	0.041	1.000	196748	0.6317		139		
15 Perfluorooctanoic acid										
413.00 > 369.00	3.032	2.984	0.048	1.000	158739	0.6950		139	1573	
413.00 > 169.00	3.032	2.984	0.048	1.000	89616		1.77(0.90-1.10)	139	8158	
D 14 13C4 PFOA										
417.00 > 372.00	3.032	2.984	0.048		11192131	51.0		102	1037140	

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	3.032	2.986	0.046	1.000	131950	0.4956		104		
D 17 13C4 PFOS										
503.00 > 80.00	3.416	3.365	0.051		10886366	44.5		93.1	481501	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.416	3.366	0.050	1.000	120361	0.4860		105	16520	
499.00 > 99.00	3.425	3.366	0.059	1.003	28366		4.24(0.90-1.10)	105	2029	
20 Perfluorononanoic acid										
463.00 > 419.00	3.416	3.373	0.043	1.000	85074	0.5133		103	1441	
D 19 13C5 PFNA										
468.00 > 423.00	3.425	3.374	0.051		8360391	46.9		93.9	601596	
D 21 13C8 FOSA										
506.00 > 78.00	3.686	3.651	0.035		18347473	44.3		88.6	659525	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.686	3.656	0.030	1.000	180345	0.5254		105	13418	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.786	3.738	0.048	1.000	77889	0.5314		106	2050	
D 23 13C2 PFDA										
515.00 > 470.00	3.786	3.738	0.048		7561029	45.5		91.1	167715	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	4.096	4.049	0.047	1.000	66721	0.4671		96.9		
D 27 13C2 PFUnA										
565.00 > 520.00	4.120	4.070	0.050		6117015	48.6		97.3	398481	
28 Perfluoroundecanoic acid										
563.00 > 519.00	4.120	4.071	0.049	1.000	76058	0.5867		117	2233	
D 30 13C2 PFDaA										
615.00 > 570.00	4.420	4.370	0.050		5433841	46.5		93.0	245704	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.420	4.370	0.050	1.000	54529	0.5301		106	74.3	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.681	4.636	0.045	1.000	54837	0.4851		97.0	81.1	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.935	4.882	0.053		11093975	45.9		91.7	599425	
33 Perfluorotetradecanoic acid										M
712.50 > 668.90	4.935	4.884	0.051	1.000	114306	0.5443		109	74.0	
713.00 > 169.00	4.918	4.884	0.034	0.997	21224		5.39(0.00-0.00)	109	2088	M
D 34 13C2-PFHxDA										
815.00 > 770.00	5.370	5.320	0.050		5661315	43.4		86.8	129845	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.370	5.320	0.050	1.000	133783	0.4265		85.3	239	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.784	5.720	0.064	1.000	40190	0.4703		94.1	105	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L1_00021

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_004.d

Injection Date: 02-Dec-2016 10:29:38

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

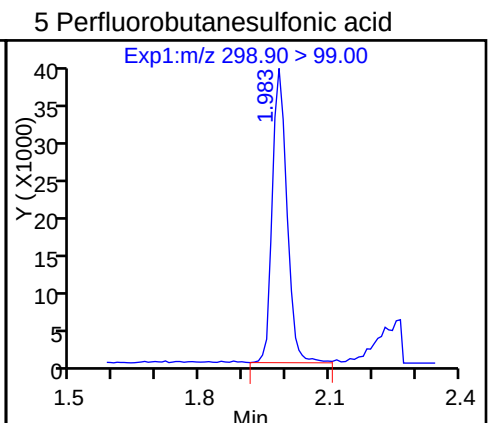
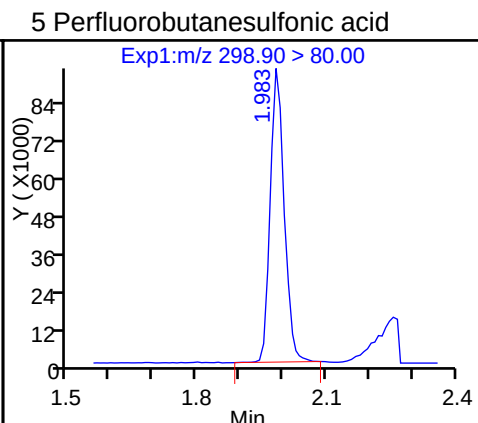
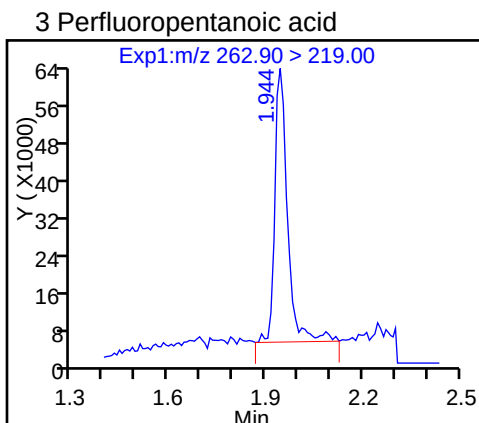
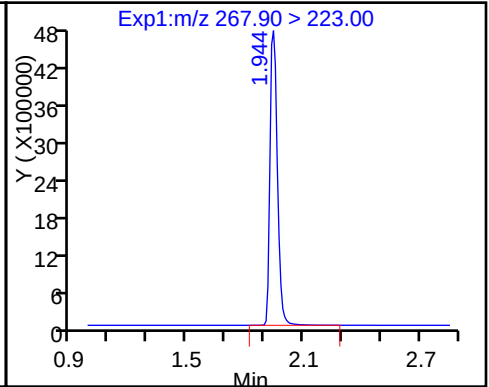
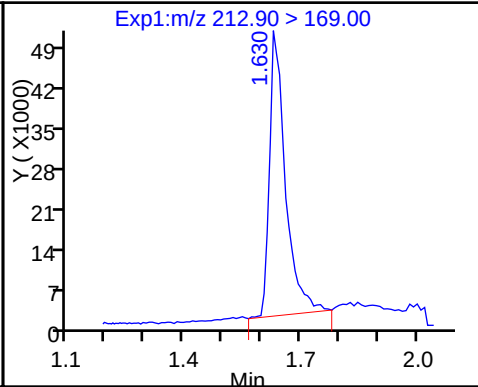
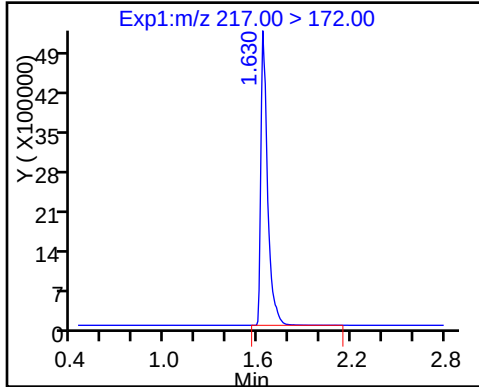
Limit Group:

LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

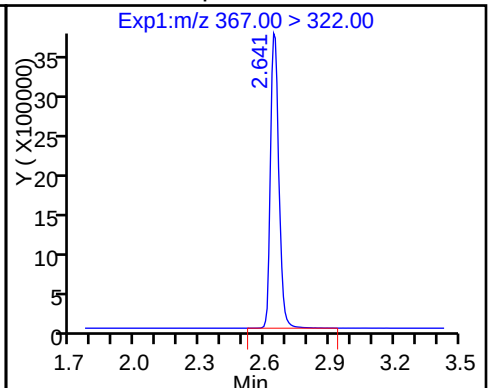
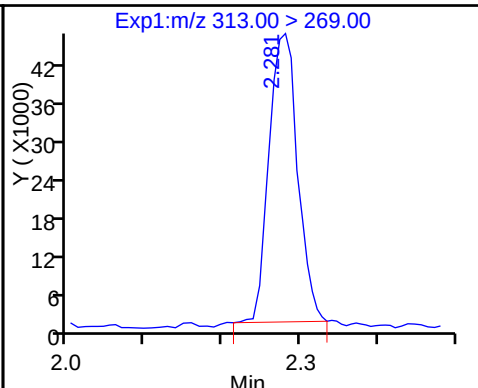
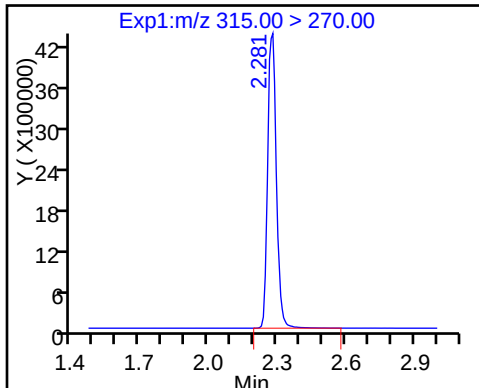
D 4 13C5-PFPeA



D 6 13C2 PFHxA

7 Perfluorohexanoic acid

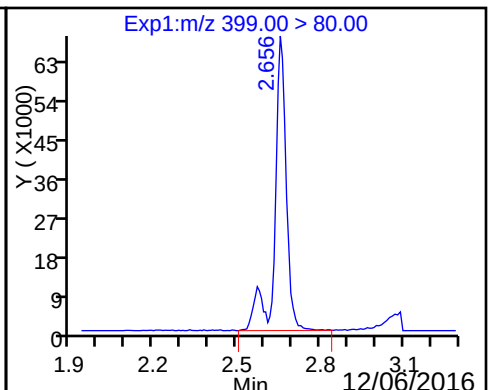
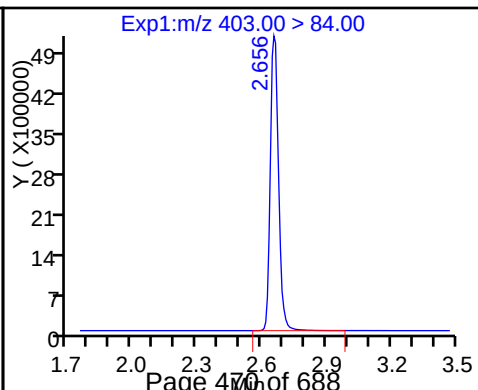
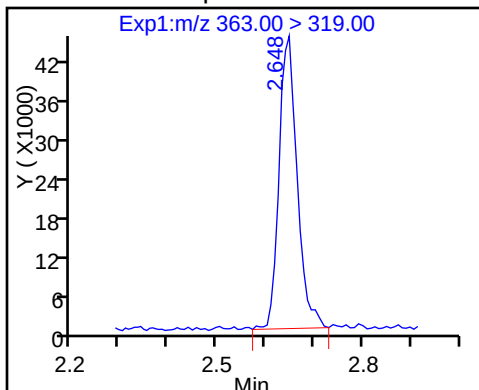
D 11 13C4-PFHpA

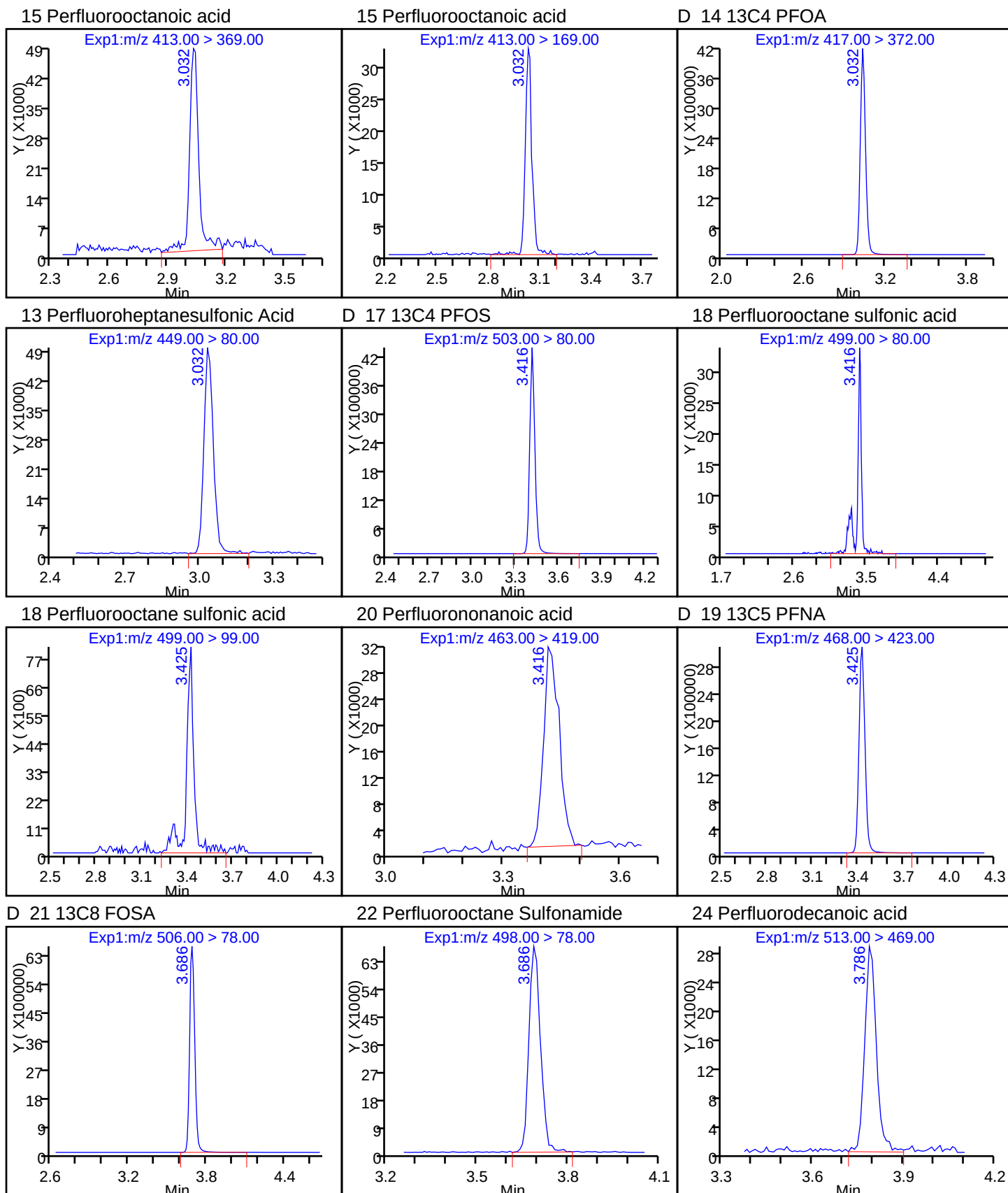


12 Perfluoroheptanoic acid

D 10 18O2 PFHxS

9 Perfluorohexanesulfonic acid

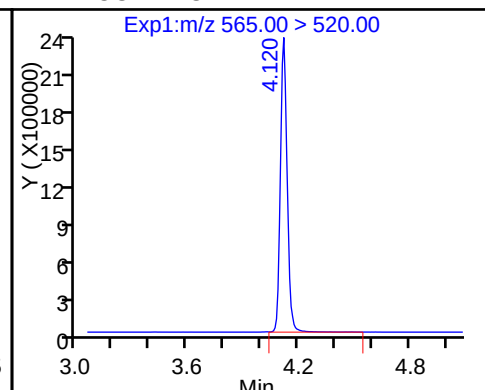
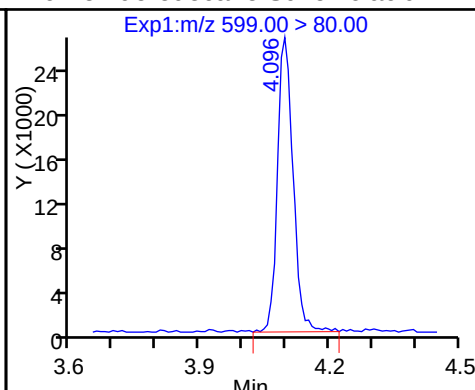
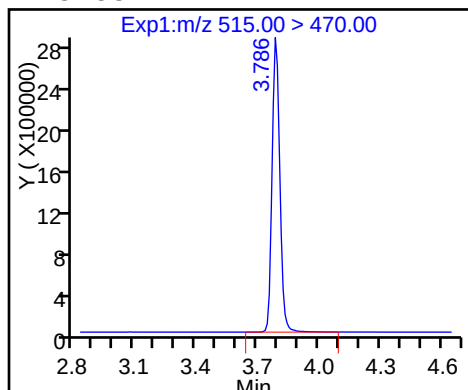




D 23 13C2 PFDA

26 Perfluorodecane Sulfonic acid

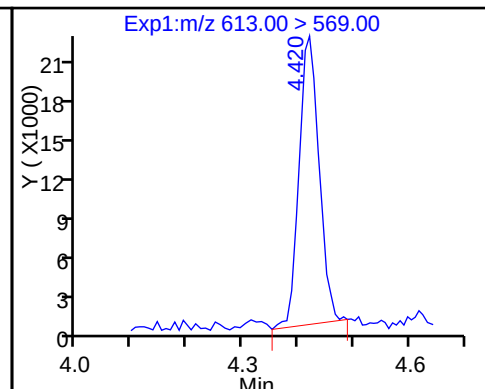
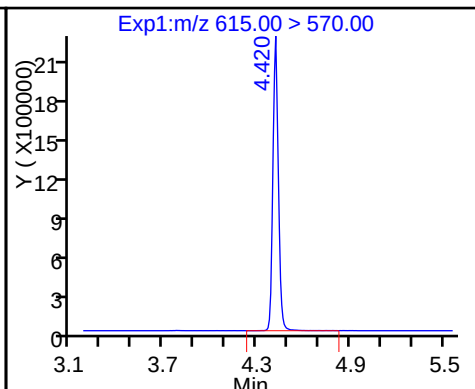
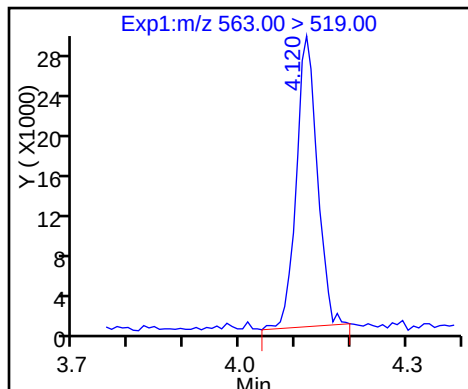
D 27 13C2 PFUnA



28 Perfluoroundecanoic acid

D 30 13C2 PFDaA

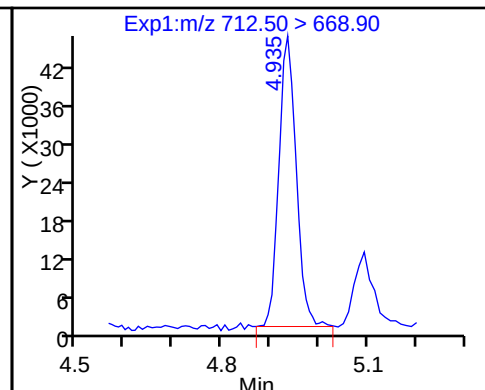
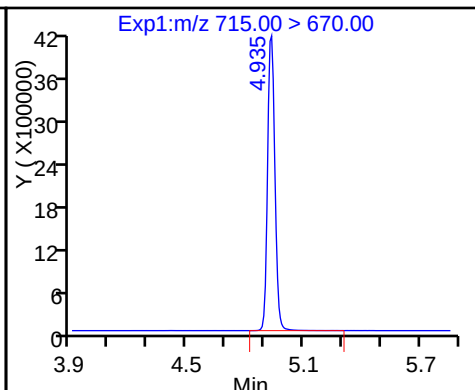
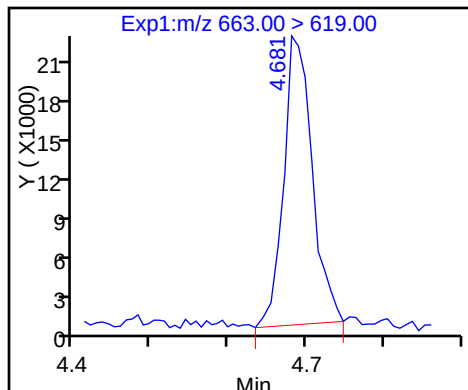
29 Perfluorododecanoic acid



31 Perfluorotridecanoic acid

D 32 13C2-PFTeDA

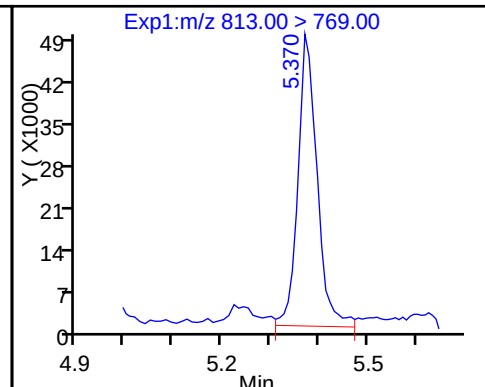
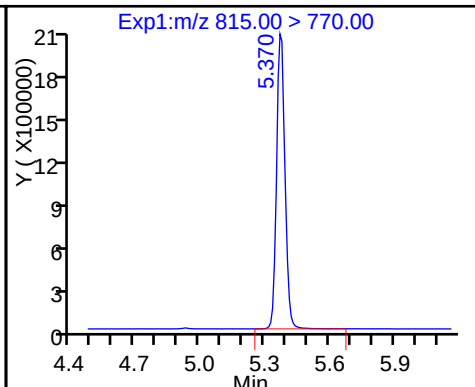
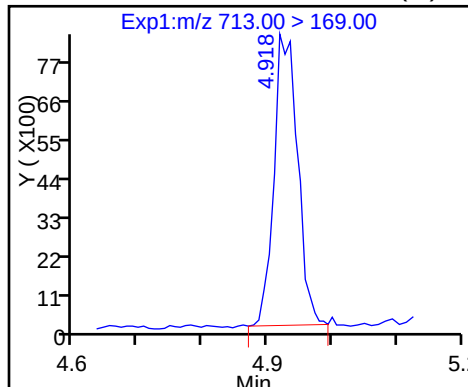
33 Perfluorotetradecanoic acid



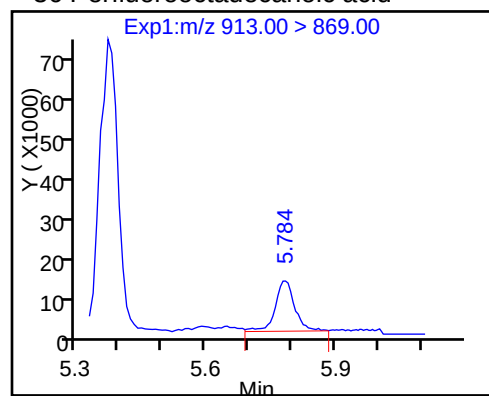
33 Perfluorotetradecanoic acid (M)

D 34 13C2-PFHxDA

35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento

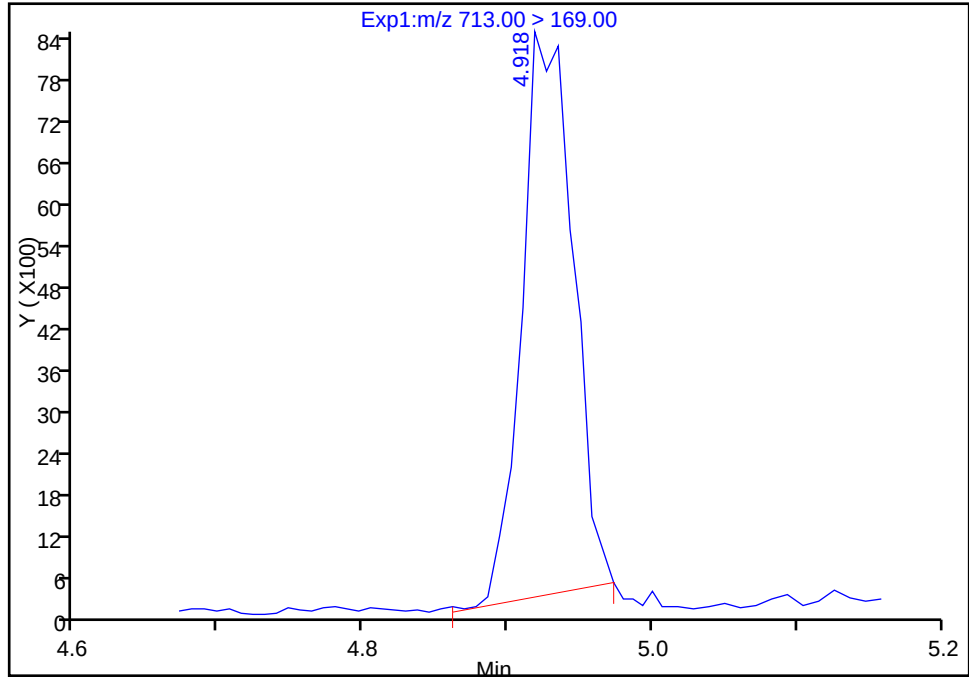
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Injection Date: 02-Dec-2016 10:29:38 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

33 Perfluorotetradecanoic acid, CAS: 376-06-7

Signal: 2

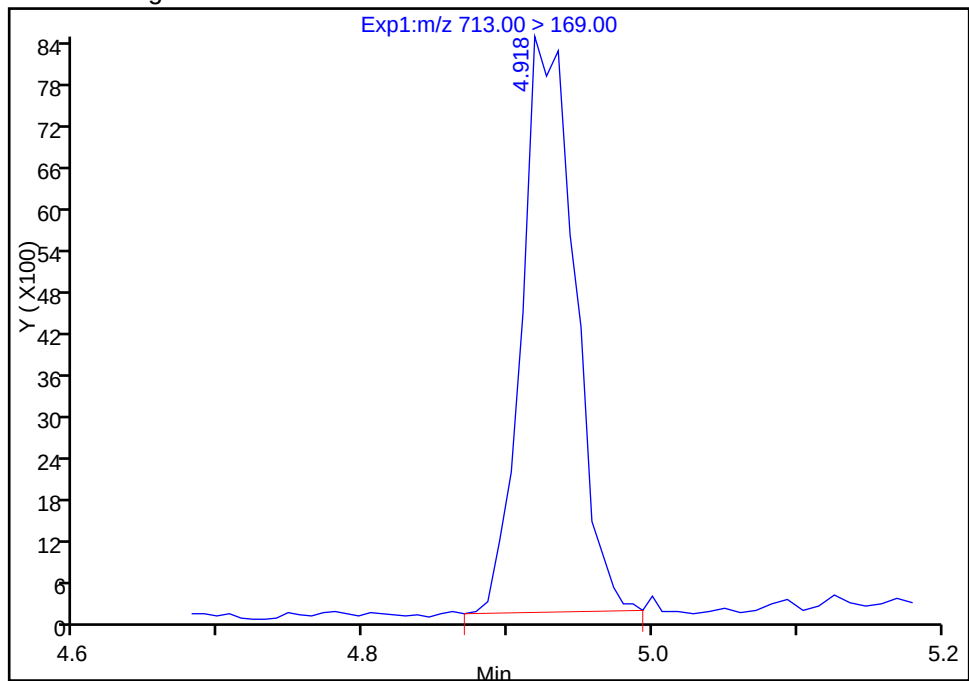
RT: 4.92
Area: 20090
Amount: 0.574454
Amount Units: ng/ml

Processing Integration Results



RT: 4.92
Area: 21224
Amount: 0.544327
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 02-Dec-2016 13:37:48

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_005.d
 Lims ID: IC L2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 02-Dec-2016 10:37:07 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\20161202-37450.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Dec-2016 14:51:31 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas

Date: 02-Dec-2016 13:38:35

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	1.614	1.615	-0.001		16931601	49.8		99.5	861260	
1 Perfluorobutyric acid										
212.90 > 169.00	1.622	1.617	0.005	1.000	298633	1.00		99.6	2205	
D 4 13C5-PFPeA										
267.90 > 223.00	1.916	1.918	-0.002		13234715	49.0		98.0	1668802	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.916	1.920	-0.004	1.000	290628	1.05		105	2905	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.964	1.961	0.003	1.000	442191	0.8821		99.8		
298.90 > 99.00	1.954	1.961	-0.007	0.995	183888		2.40(0.00-0.00)	99.8		
D 6 13C2 PFHxA										
315.00 > 270.00	2.239	2.239	0.0		12331127	50.0		100	1160245	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.239	2.241	-0.002	1.000	236370	1.00		100	7007	
D 11 13C4-PFHpA										
367.00 > 322.00	2.604	2.599	0.005		10778897	51.2		102	1033732	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.604	2.600	0.004	1.000	216223	0.9699		97.0	3288	
D 10 18O2 PFHxS										
403.00 > 84.00	2.619	2.614	0.005		14695505	48.6		103	816827	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.619	2.615	0.004	1.000	342163	1.04		114		
15 Perfluorooctanoic acid										
413.00 > 369.00	2.993	2.984	0.009	1.000	290666	1.15		115	3791	
413.00 > 169.00	2.993	2.984	0.009	1.000	166261		1.75(0.90-1.10)	115	12537	

D 14 13C4 PFOA

417.00 > 372.00 2.993 2.984 0.009 12348635 56.3 113 1464087
 Page 475 of 688 12/06/2016

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	2.993	2.986	0.007	1.000	284917	0.9254		97.2		
D 17 13C4 PFOS										
503.00 > 80.00	3.371	3.365	0.006		12589922	51.5		108	793078	
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.380	3.366	0.014	1.000	255695	0.8928		96.2	33794	
499.00 > 99.00	3.371	3.366	0.005	0.997	58595		4.36(0.90-1.10)	96.2	6167	M
20 Perfluorononanoic acid										
463.00 > 419.00	3.380	3.373	0.007	1.000	184877	0.9888		98.9	3375	
D 19 13C5 PFNA										
468.00 > 423.00	3.380	3.374	0.006		9431435	53.0		106	1129875	
D 21 13C8 FOSA										
506.00 > 78.00	3.648	3.651	-0.003		21558794	52.0		104	974406	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.657	3.656	0.001	1.000	403791	1.00		100	30165	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.746	3.738	0.008	1.000	159778	0.9790		97.9	5715	
D 23 13C2 PFDA										
515.00 > 470.00	3.746	3.738	0.008		8418346	50.7		101	248297	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	4.061	4.049	0.012	1.000	150902	0.9136		94.8		
D 27 13C2 PFUnA										
565.00 > 520.00	4.078	4.070	0.008		6669716	53.0		106	287118	
28 Perfluoroundecanoic acid										
563.00 > 519.00	4.086	4.071	0.015	1.000	148792	1.05		105	3690	
D 30 13C2 PFDaA										
615.00 > 570.00	4.381	4.370	0.011		5950161	50.9		102	144810	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.381	4.370	0.011	1.000	109023	0.9679		96.8	130	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.653	4.636	0.017	1.000	126175	1.02		102	142	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.893	4.882	0.011		12956938	53.6		107	632063	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.893	4.884	0.009	1.000	237250	1.03		103	104	
713.00 > 169.00	4.885	4.884	0.001	0.998	41035		5.78(0.00-0.00)	103	4184	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.334	5.320	0.014		6756331	51.8		104	147007	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.334	5.320	0.014	1.000	218894	1.04		104	287	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.738	5.720	0.018	1.000	118037	1.26		126	233	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L2_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_005.d

Injection Date: 02-Dec-2016 10:37:07

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

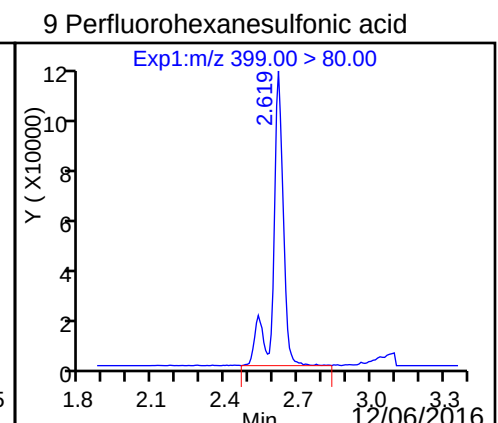
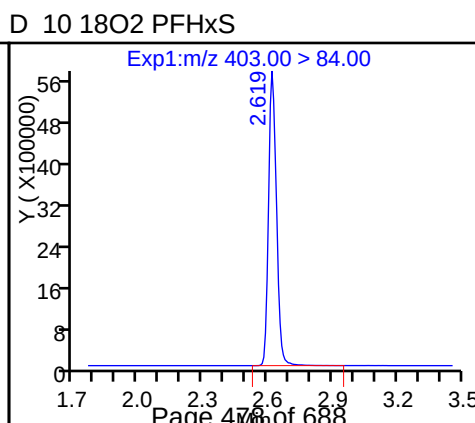
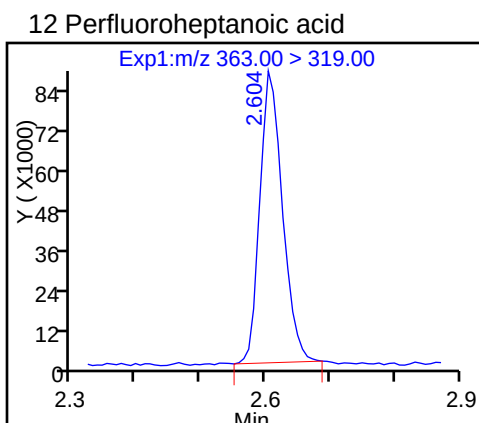
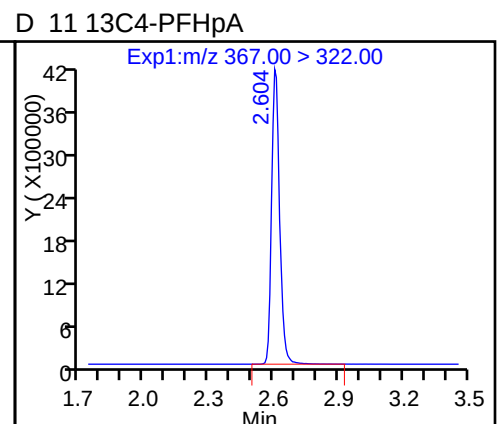
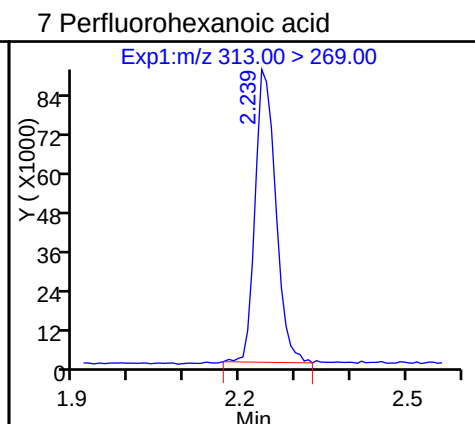
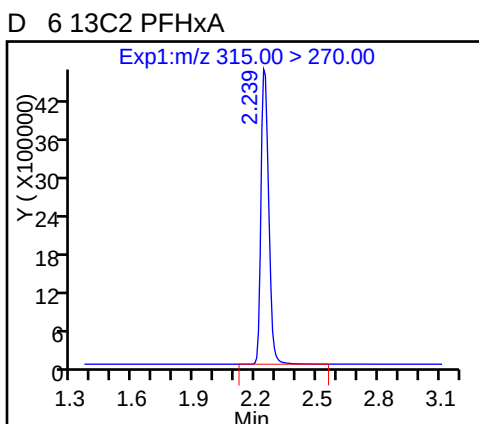
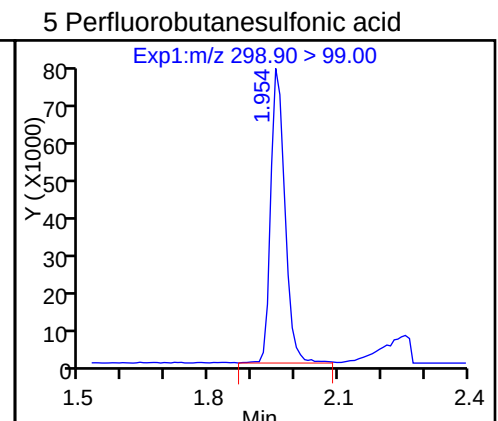
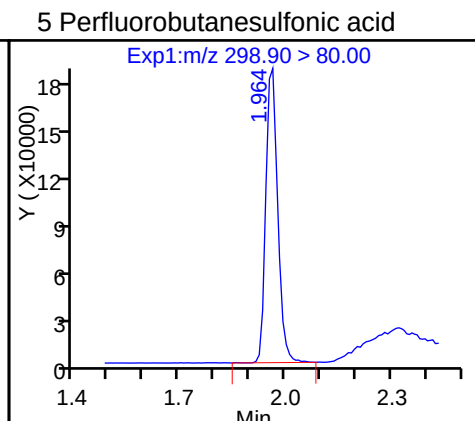
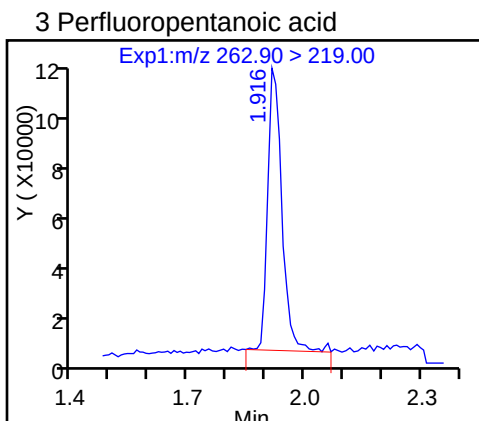
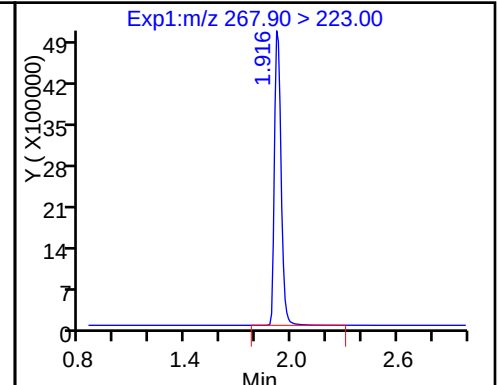
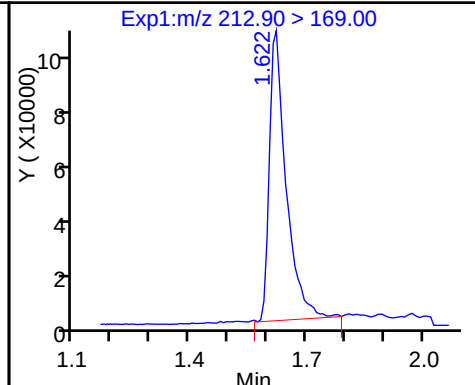
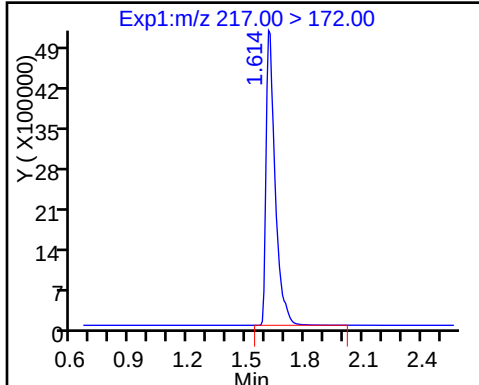
Method: A8_N

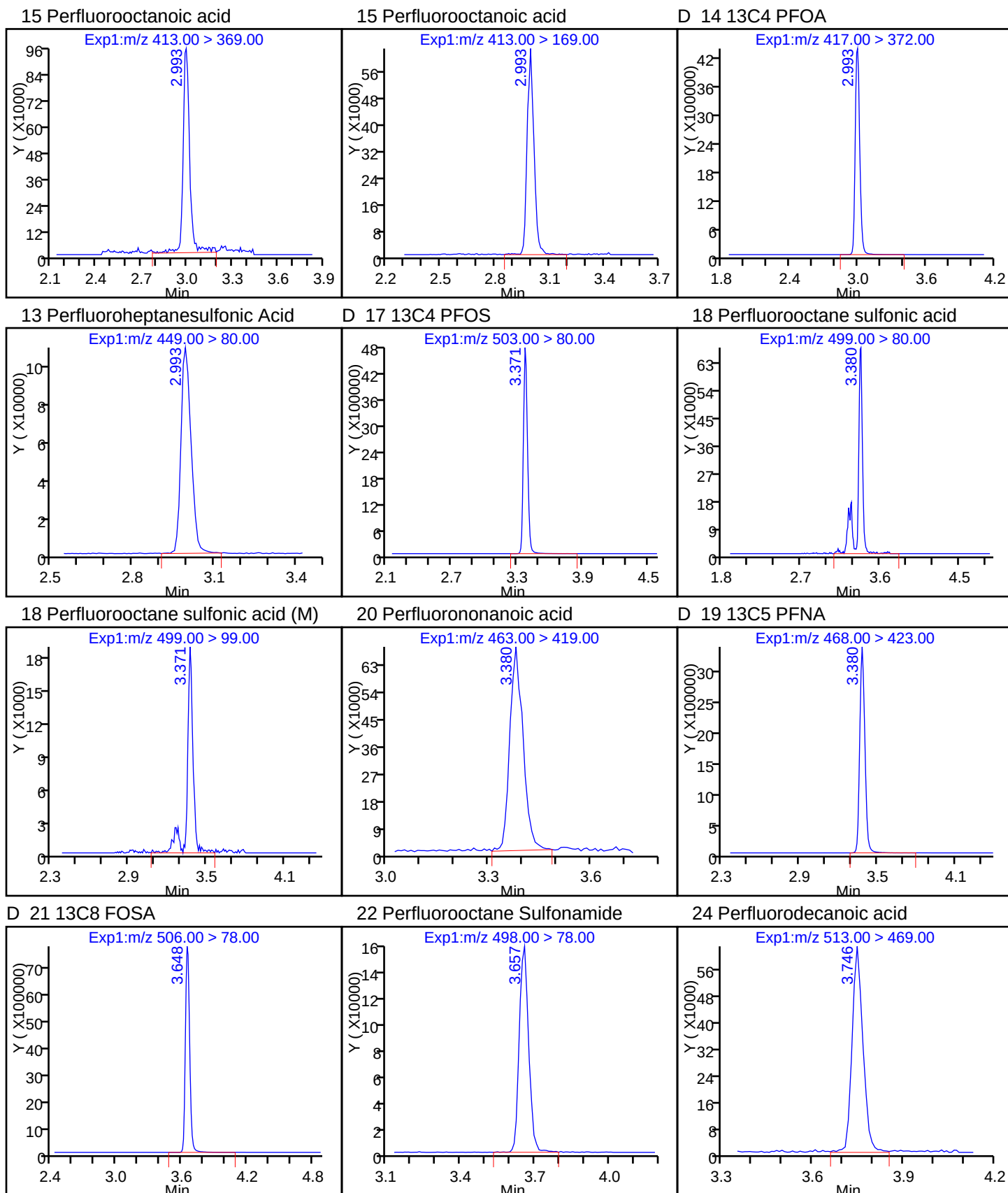
Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

D 4 13C5-PFPeA

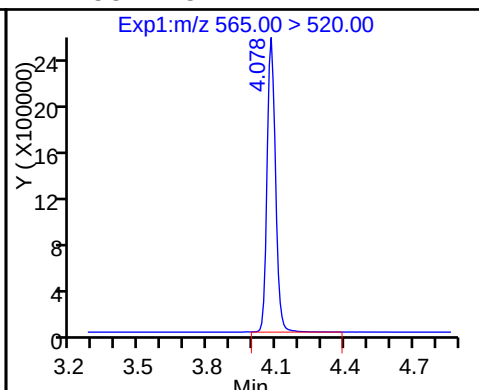
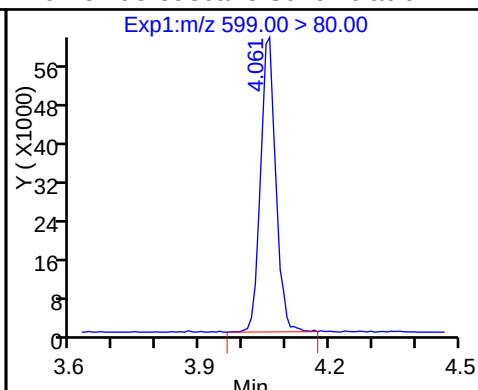
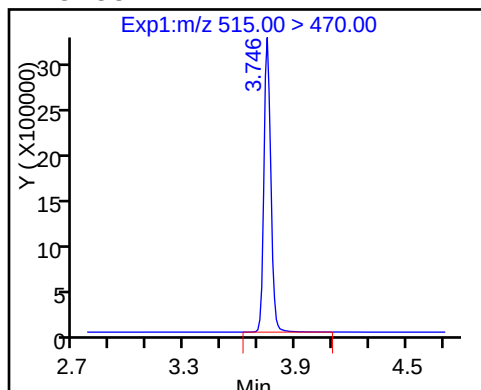




D 23 13C2 PFDA

26 Perfluorodecane Sulfonic acid

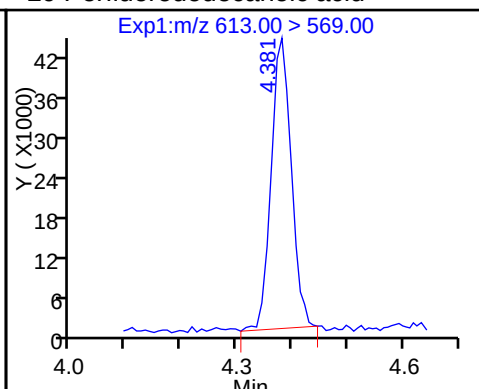
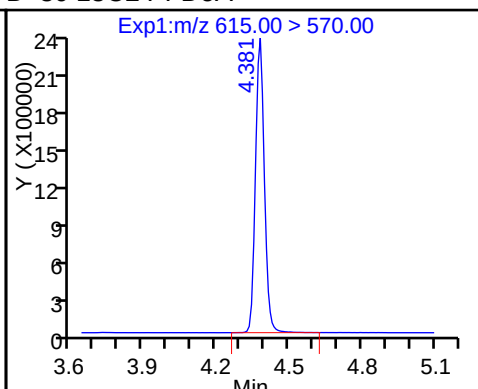
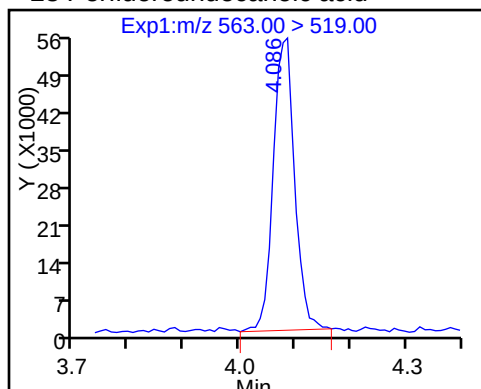
D 27 13C2 PFUnA



28 Perfluoroundecanoic acid

D 30 13C2 PFDaA

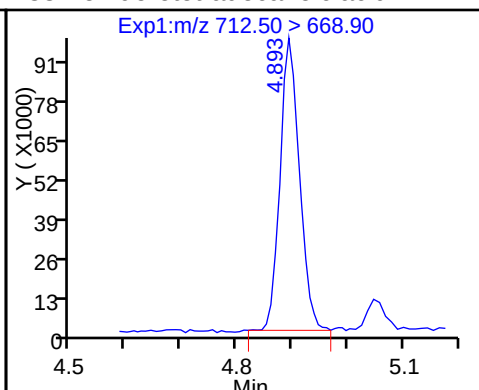
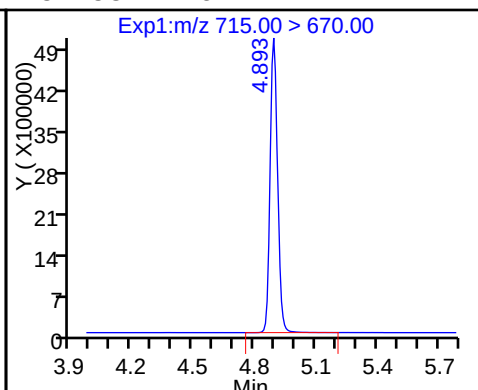
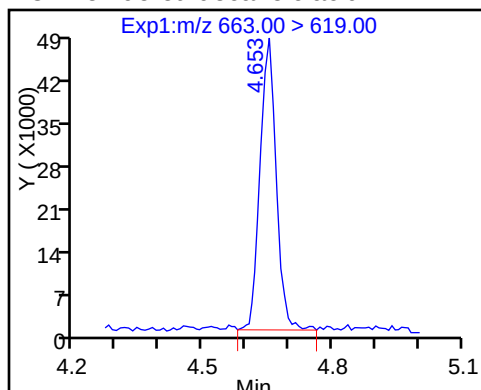
29 Perfluorododecanoic acid



31 Perfluorotridecanoic acid

D 32 13C2-PFTeDA

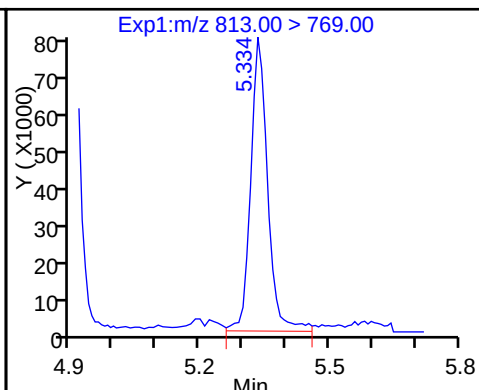
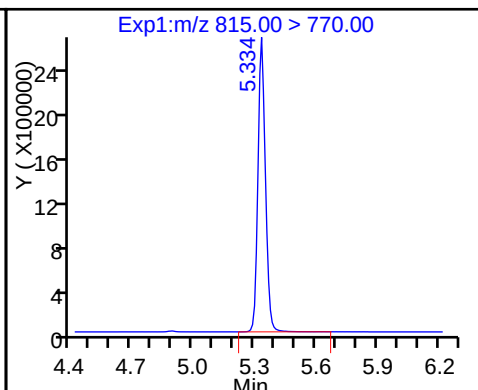
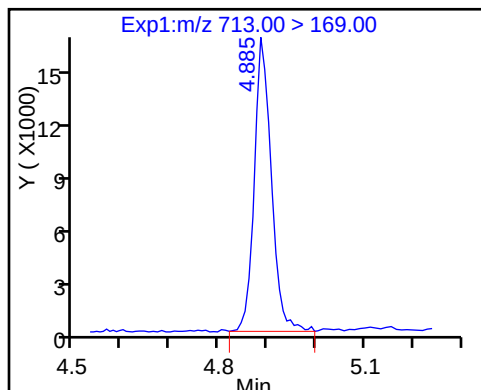
33 Perfluorotetradecanoic acid



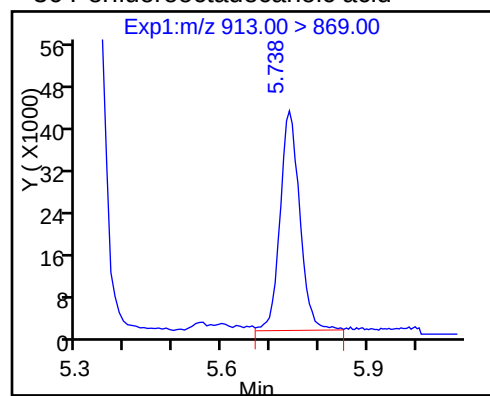
33 Perfluorotetradecanoic acid

D 34 13C2-PFHxDA

35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento

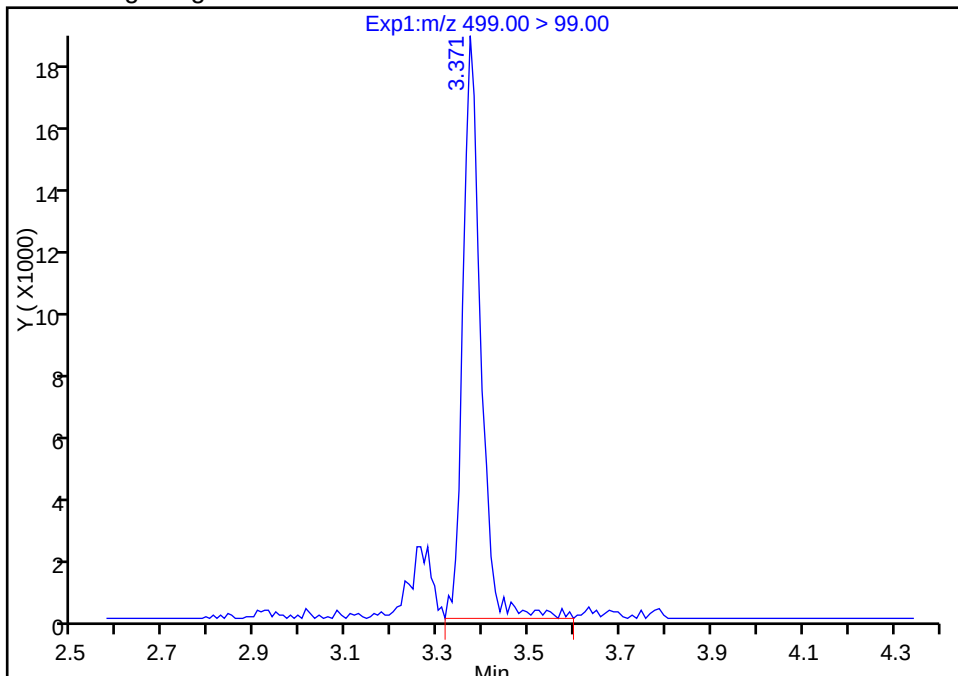
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_005.d
Injection Date: 02-Dec-2016 10:37:07 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

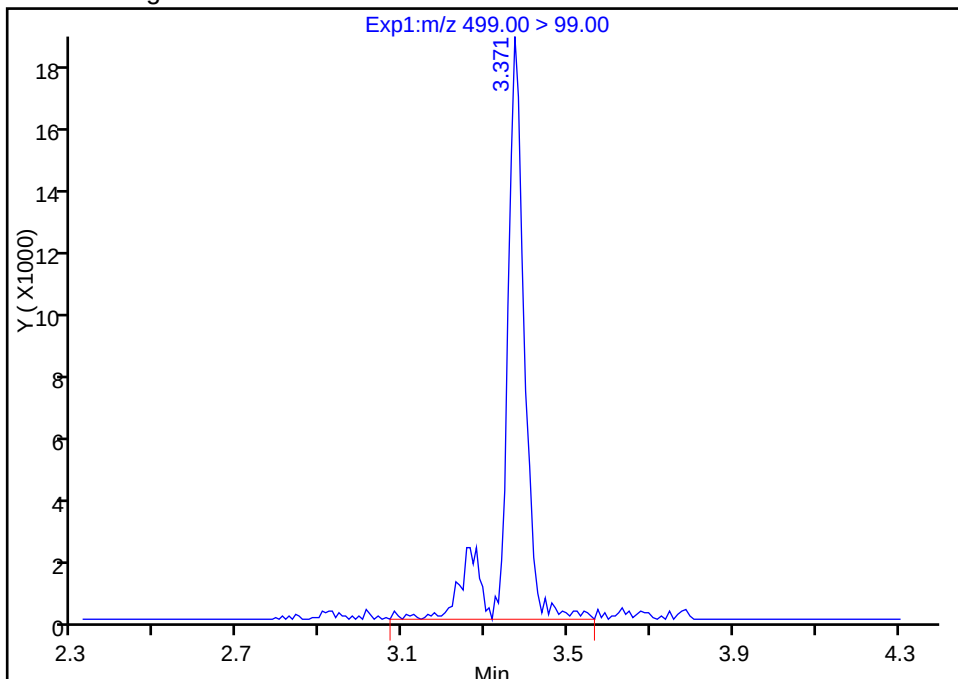
RT: 3.37
Area: 50423
Amount: 0.892814
Amount Units: ng/ml

Processing Integration Results



RT: 3.37
Area: 58595
Amount: 0.892814
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 02-Dec-2016 13:38:35

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_006.d
 Lims ID: IC L3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 02-Dec-2016 10:44:37 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\20161202-37450.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Dec-2016 14:51:32 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas

Date: 02-Dec-2016 13:38:56

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	1.622	1.615	0.007		20871580	61.3		123	1270902	
1 Perfluorobutyric acid										
212.90 > 169.00	1.622	1.617	0.005	1.000	1937809	5.24		105	16704	
D 4 13C5-PFPeA										
267.90 > 223.00	1.916	1.918	-0.002		16554836	61.3		123	1251857	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.926	1.920	0.006	1.000	1680231	4.88		97.5	18184	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.964	1.961	0.003	1.000	2954006	5.00		113		
298.90 > 99.00	1.955	1.961	-0.007	0.995	1239873		2.38(0.00-0.00)	113		
D 6 13C2 PFHxA										
315.00 > 270.00	2.239	2.239	-0.001		14744313	59.8		120	1821555	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.247	2.241	0.006	1.000	1458544	5.17		103	41938	
D 11 13C4-PFHpA										
367.00 > 322.00	2.600	2.599	0.001		12841573	61.0		122	826915	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.600	2.600	0.0	1.000	1298003	4.89		97.7	25441	
D 10 18O2 PFHxS										
403.00 > 84.00	2.616	2.614	0.002		17333346	57.3		121	1088243	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.616	2.615	0.001	1.000	1850926	4.77		105		
15 Perfluorooctanoic acid										
413.00 > 369.00	2.981	2.984	-0.003	1.000	1560911	5.20		104	22497	
413.00 > 169.00	2.989	2.984	0.005	1.003	958311		1.63(0.90-1.10)	104	88434	

D 14 13C4 PFOA

417.00 > 372.00 2.989 2.984 0.005 14705649 67.0

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	2.989	2.986	0.003	1.000	1774408	5.08		107		
D 17 13C4 PFOS										
503.00 > 80.00	3.366	3.365	0.001		14291797	58.4		122	925059	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.366	3.366	0.0	1.000	1469896	4.52		97.4	134789	
499.00 > 99.00	3.366	3.366	0.0	1.000	312360		4.71(0.90-1.10)	97.4	26246	
20 Perfluorononanoic acid										
463.00 > 419.00	3.383	3.373	0.010	1.000	1085508	5.06		101	19854	
D 19 13C5 PFNA										
468.00 > 423.00	3.375	3.374	0.001		10826461	60.8		122	367418	
D 21 13C8 FOSA										
506.00 > 78.00	3.652	3.651	0.001		23576629	56.9		114	722968	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.652	3.656	-0.004	1.000	2370271	5.37		107	305013	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.740	3.738	0.002	1.000	938853	4.94		98.8	39325	
D 23 13C2 PFDA										
515.00 > 470.00	3.740	3.738	0.002		9802839	59.0		118	248176	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	4.046	4.049	-0.003	1.000	972225	5.18		108		
D 27 13C2 PFUnA										
565.00 > 520.00	4.079	4.070	0.009		7745917	61.6		123	312996	
28 Perfluoroundecanoic acid										
563.00 > 519.00	4.071	4.071	0.0	1.000	764307	4.66		93.1	21162	
D 30 13C2 PFDaA										
615.00 > 570.00	4.376	4.370	0.006		7049582	60.3		121	194268	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.376	4.370	0.006	1.000	669306	5.02		100	638	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.637	4.636	0.001	1.000	739992	5.05		101	761	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.880	4.882	-0.002		14954236	61.8		124	563118	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.888	4.884	0.004	1.000	1350591	4.96		99.1	554	
713.00 > 169.00	4.880	4.884	-0.004	0.998	220454		6.13(0.00-0.00)	99.1	17882	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.326	5.320	0.006		8035665	61.6		123	159038	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.326	5.320	0.006	1.000	800676	4.94		98.8	999	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.726	5.720	0.006	1.000	529337	4.77		95.5	857	

Reagents:

LCPFC-L3_00019

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_006.d

Injection Date: 02-Dec-2016 10:44:37

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

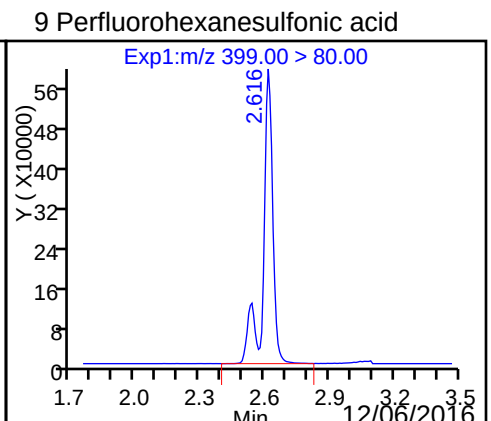
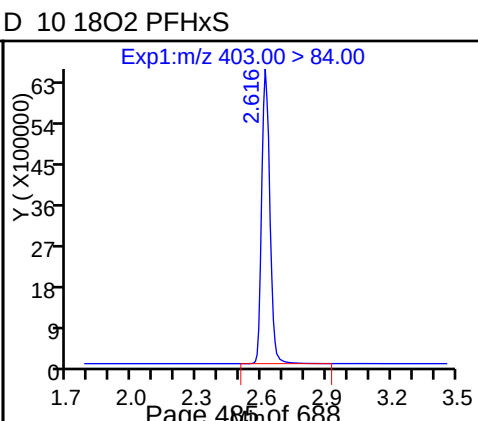
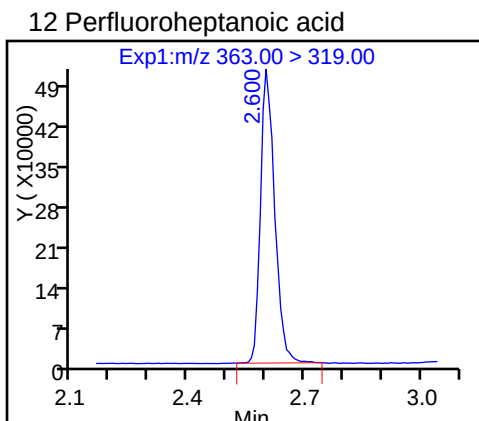
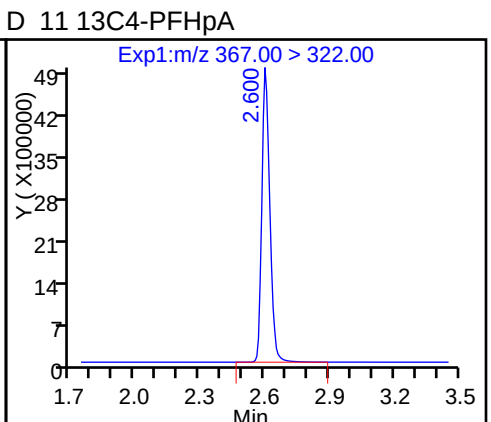
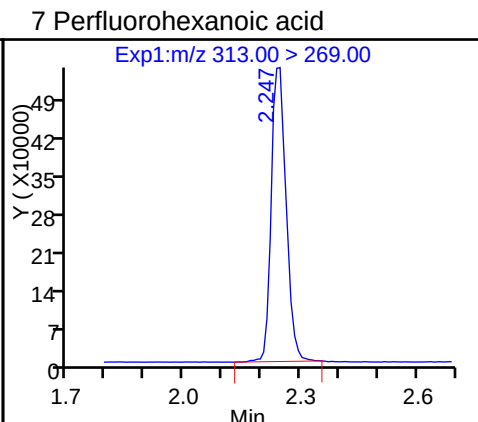
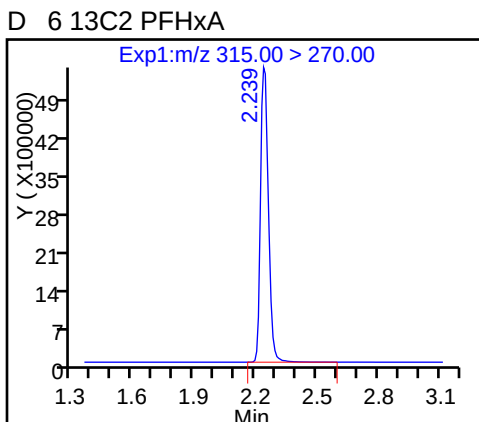
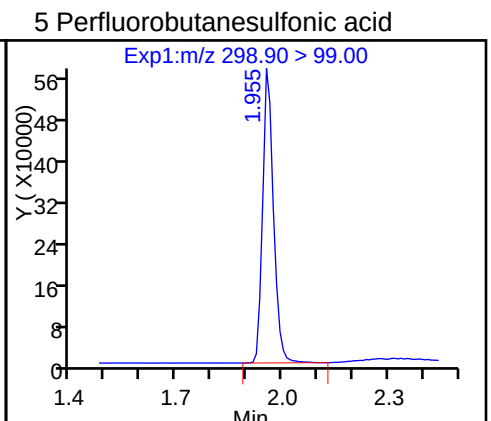
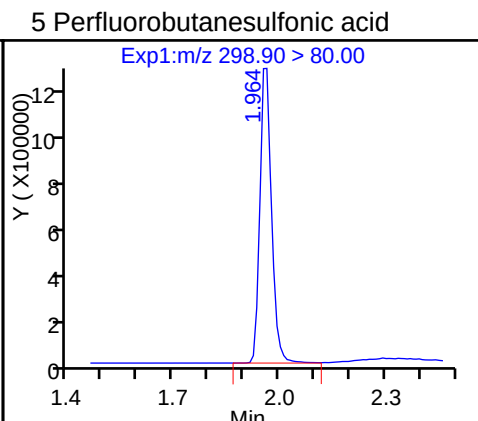
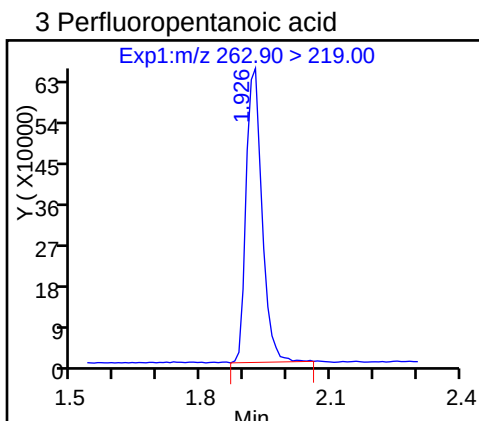
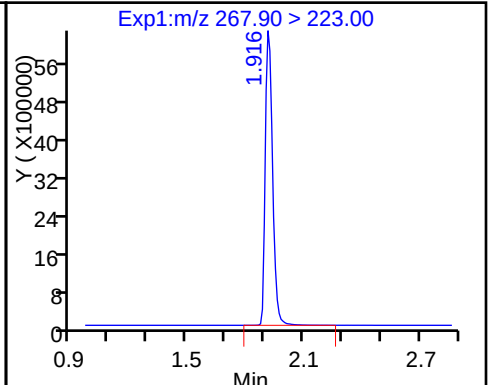
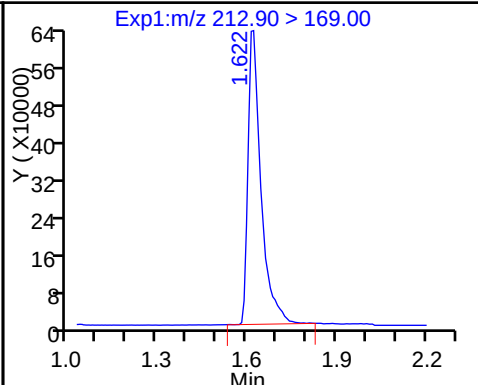
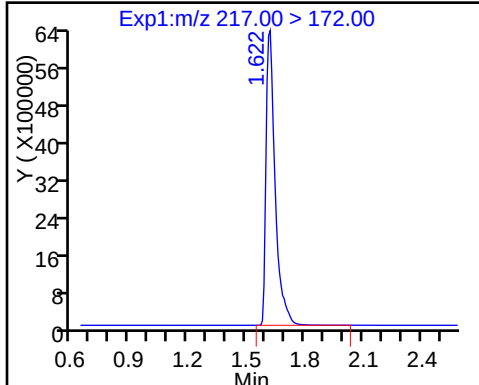
Method: A8_N

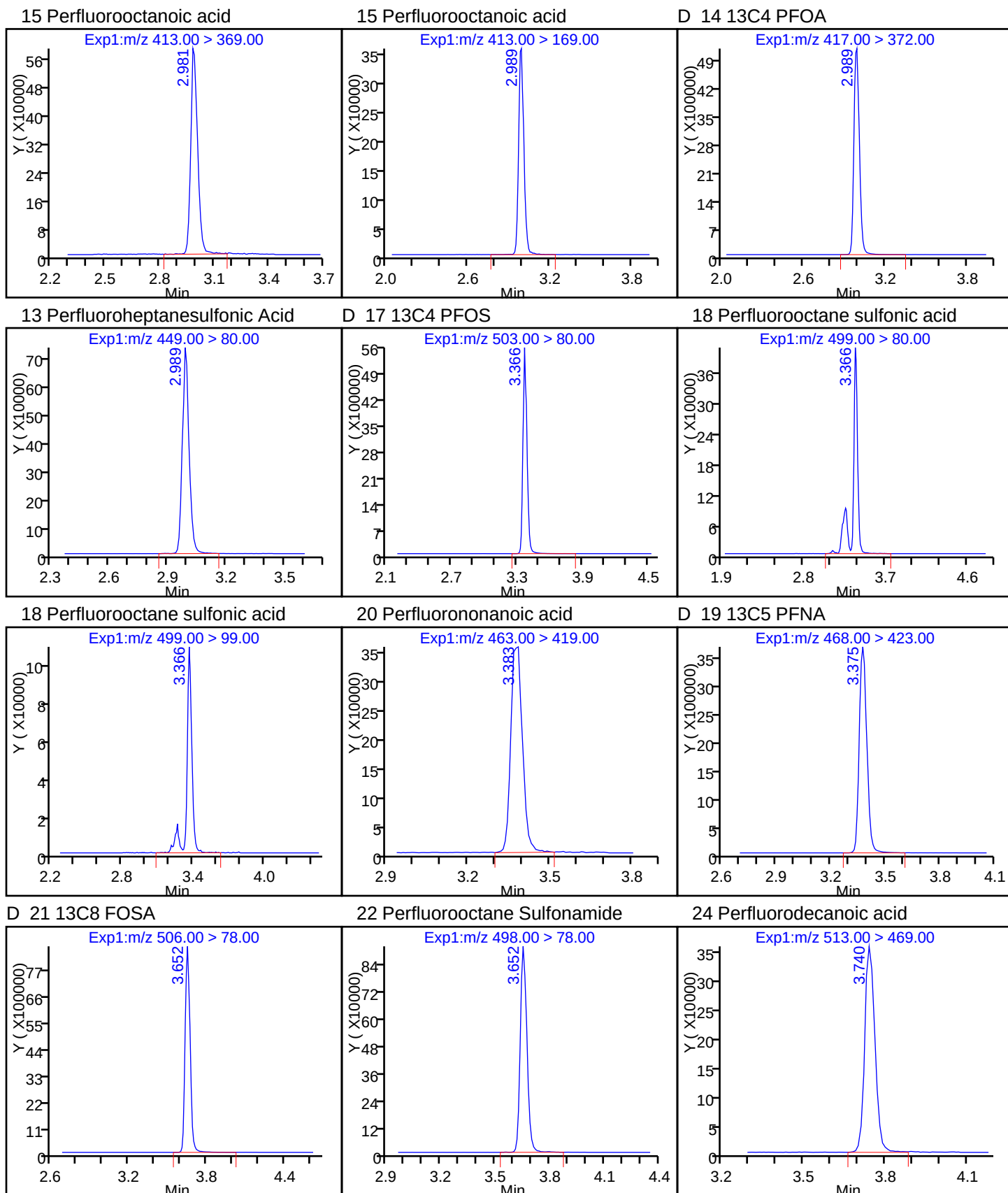
Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

D 4 13C5-PFPeA

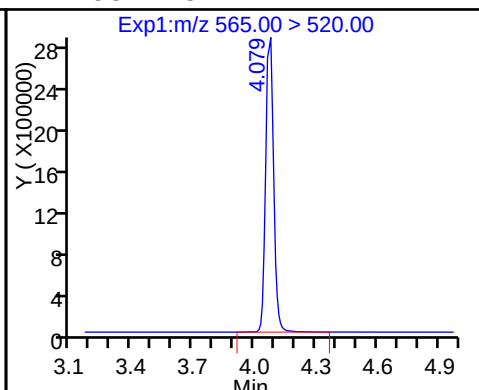
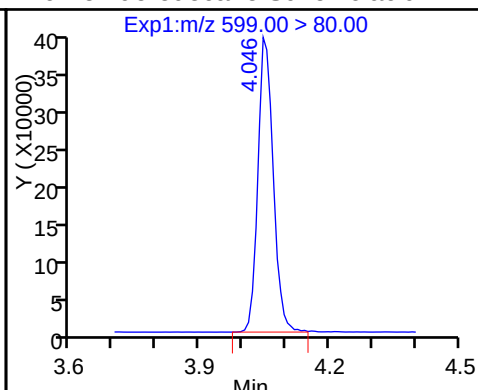
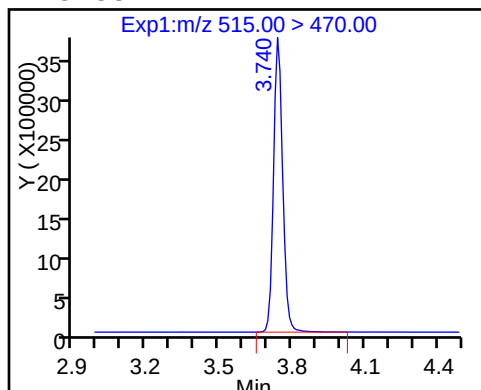




D 23 13C2 PFDA

26 Perfluorodecane Sulfonic acid

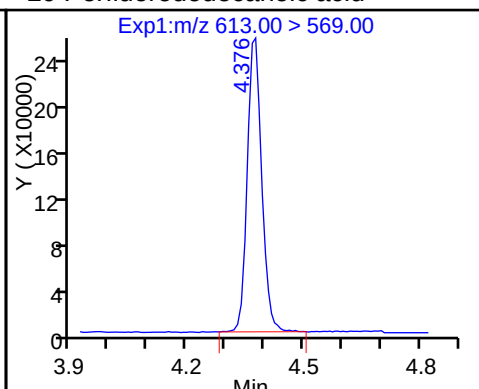
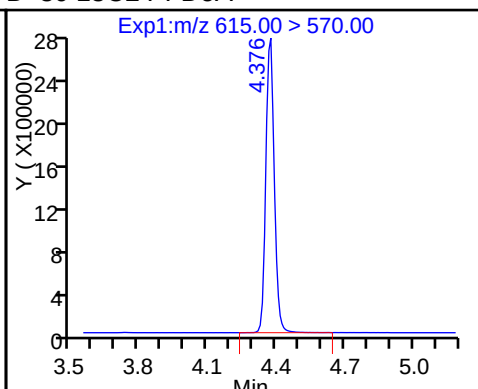
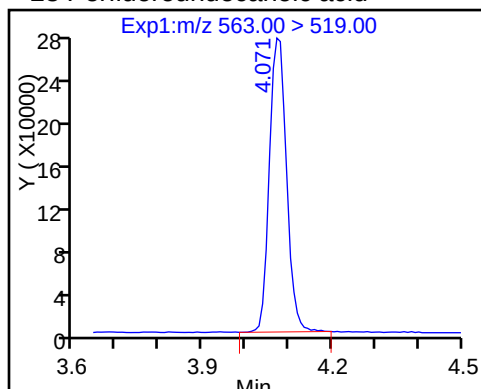
D 27 13C2 PFUnA



28 Perfluoroundecanoic acid

D 30 13C2 PFDaA

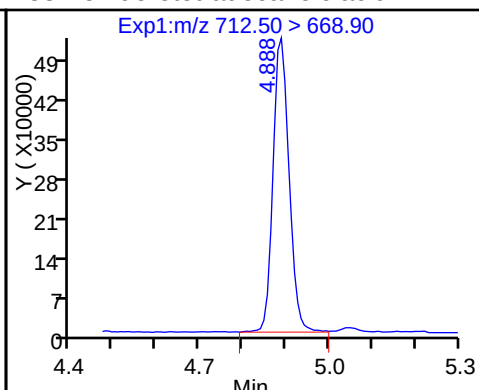
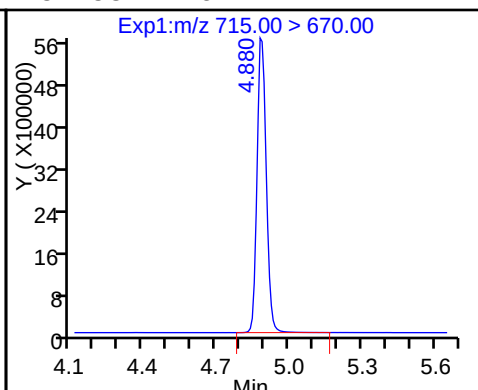
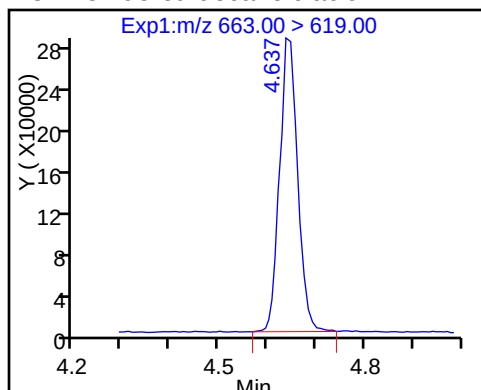
29 Perfluorododecanoic acid



31 Perfluorotridecanoic acid

D 32 13C2-PFTeDA

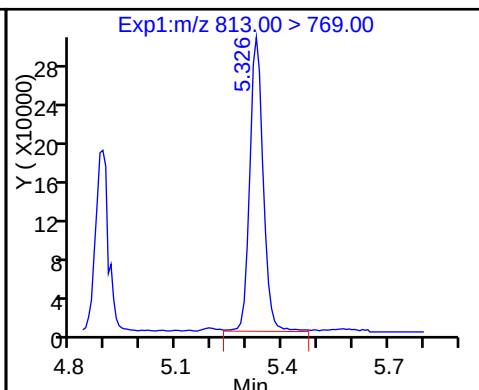
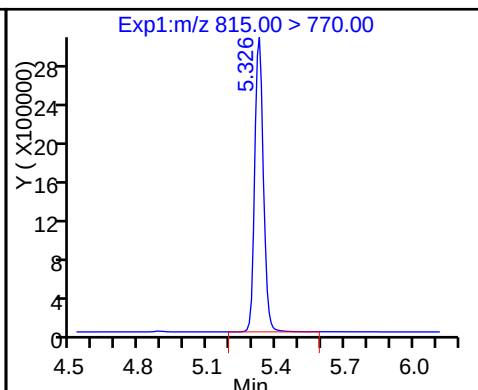
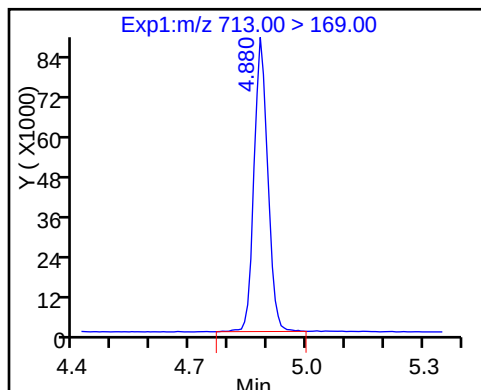
33 Perfluorotetradecanoic acid



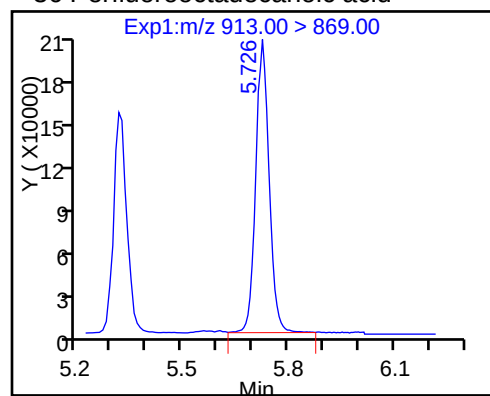
33 Perfluorotetradecanoic acid

D 34 13C2-PFHxDA

35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_007.d
 Lims ID: IC L4
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 02-Dec-2016 10:52:06 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\20161202-37450.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Dec-2016 14:51:34 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas

Date: 02-Dec-2016 13:36:08

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	1.614	1.615	-0.001		18935985	55.6		111	1406021	
1 Perfluorobutyric acid										
212.90 > 169.00	1.614	1.617	-0.003	1.000	7435187	22.2		111	60389	
D 4 13C5-PFPeA										
267.90 > 223.00	1.916	1.918	-0.002		15125796	56.0		112	1182515	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.916	1.920	-0.004	1.000	6559082	20.8		104	50558	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.954	1.961	-0.007	1.000	11367724	20.3		115		
298.90 > 99.00	1.954	1.961	-0.007	1.000	4784706		2.38(0.00-0.00)	115		
D 6 13C2 PFHxA										
315.00 > 270.00	2.231	2.239	-0.008		13498378	54.8		110	1276286	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.239	2.241	-0.002	1.000	5481010	21.2		106	245929	
D 11 13C4-PFHpA										
367.00 > 322.00	2.593	2.599	-0.006		11424765	54.3		109	4354289	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.593	2.600	-0.007	1.000	5005633	21.2		106	82737	
D 10 18O2 PFHxS										
403.00 > 84.00	2.608	2.614	-0.006		16435009	54.3		115	2029890	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.608	2.615	-0.007	1.000	6918390	18.8		103		
15 Perfluorooctanoic acid										
413.00 > 369.00	2.982	2.984	-0.002	1.000	5603089	21.7		109	76131	
413.00 > 169.00	2.974	2.984	-0.010	0.997	3413139		1.64(0.90-1.10)	109	244664	
D 14 13C4 PFOA										
417.00 > 372.00	2.974	2.984	-0.010		12634984	57.6		115	1129431	

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	2.982	2.986	-0.004	1.000	6947857	21.2	111		
D 17 13C4 PFOS	503.00 > 80.00	3.362	3.365	-0.003		13417569	54.9	115	370037	
18 Perfluorooctane sulfonic acid	499.00 > 80.00	3.362	3.366	-0.004	1.000	5745134	18.8	101	258473	
499.00 > 99.00	3.362	3.366	-0.004	1.000	1279643		4.49(0.90-1.10)	101	205142	
20 Perfluorononanoic acid	463.00 > 419.00	3.371	3.373	-0.002	1.000	4006430	20.8	104	50680	
D 19 13C5 PFNA	468.00 > 423.00	3.371	3.374	-0.003		9730546	54.6	109	1069619	
D 21 13C8 FOSA	506.00 > 78.00	3.648	3.651	-0.003		22550983	54.4	109	565745	
22 Perfluorooctane Sulfonamide	498.00 > 78.00	3.648	3.656	-0.008	1.000	9372172	22.2	111	355431	
24 Perfluorodecanoic acid	513.00 > 469.00	3.738	3.738	0.0	1.000	3671358	20.8	104	97996	
D 23 13C2 PFDA	515.00 > 470.00	3.738	3.738	0.0		9112679	54.9	110	235961	
26 Perfluorodecane Sulfonic acid	599.00 > 80.00	4.048	4.049	-0.001	1.000	3647236	20.7	107		
D 27 13C2 PFUnA	565.00 > 520.00	4.065	4.070	-0.005		6913372	55.0	110	380701	
28 Perfluoroundecanoic acid	563.00 > 519.00	4.065	4.071	-0.006	1.000	2908196	19.8	99.2	75091	
D 30 13C2 PFDaA	615.00 > 570.00	4.365	4.370	-0.005		6319787	54.1	108	160074	
29 Perfluorododecanoic acid	613.00 > 569.00	4.365	4.370	-0.005	1.000	2445148	20.4	102	2507	
31 Perfluorotridecanoic acid	663.00 > 619.00	4.631	4.636	-0.005	1.000	2838032	21.6	108	3011	
D 32 13C2-PFTeDA	715.00 > 670.00	4.883	4.882	0.001		13596161	56.2	112	754431	
33 Perfluorotetradecanoic acid	712.50 > 668.90	4.883	4.884	-0.001	1.000	5185293	21.2	106	2202	
713.00 > 169.00	4.875	4.884	-0.009	0.998	789160		6.57(0.00-0.00)	106	63701	
D 34 13C2-PFHxDA	815.00 > 770.00	5.315	5.320	-0.005		7428976	57.0	114	148527	
35 Perfluorohexadecanoic acid	813.00 > 769.00	5.315	5.320	-0.005	1.000	2851018	22.1	110	3329	
36 Perfluorooctadecanoic acid	913.00 > 869.00	5.717	5.720	-0.003	1.000	1457725	14.7	73.3	2373	

Reagents:

LCPFC-L4_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_007.d

Injection Date: 02-Dec-2016 10:52:06

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

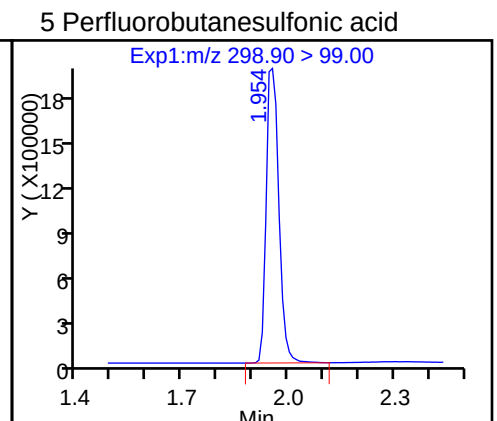
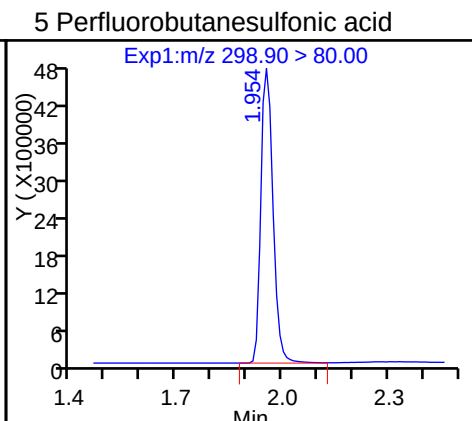
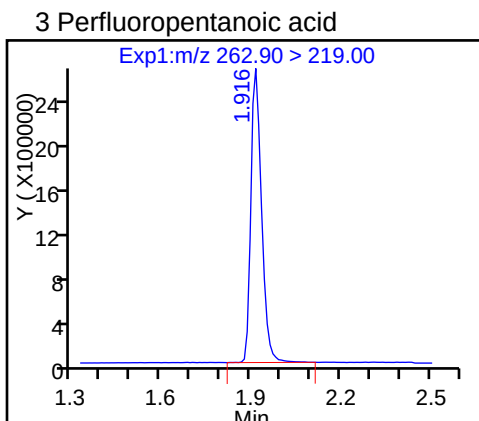
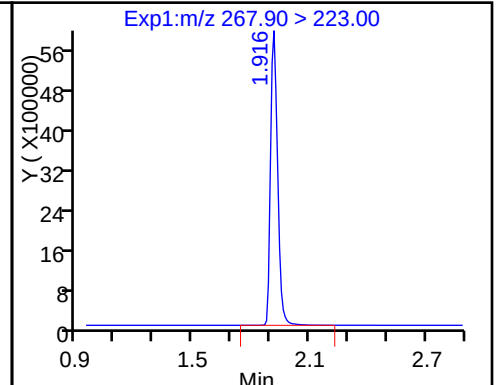
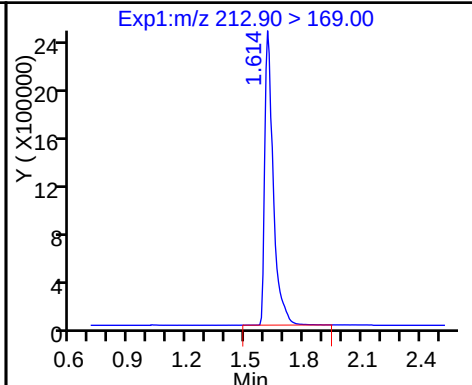
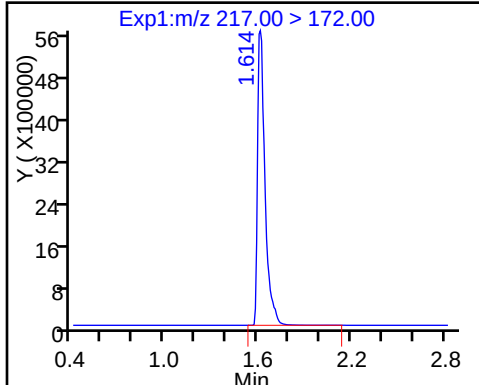
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

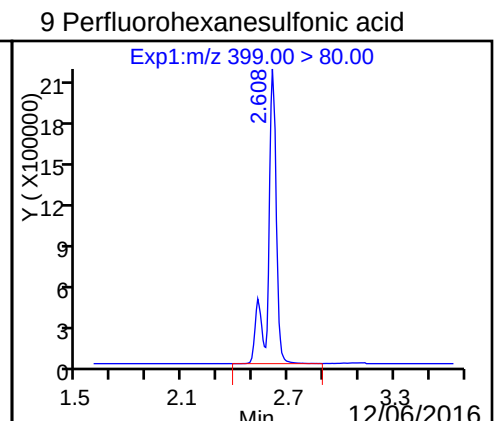
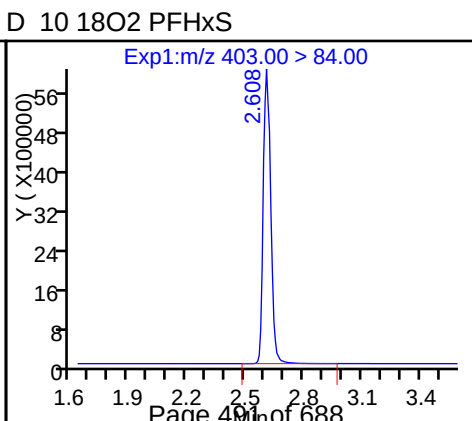
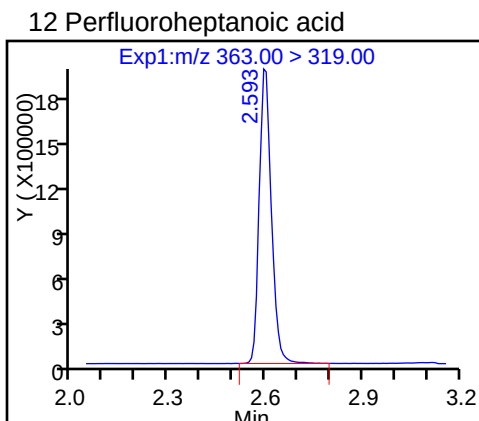
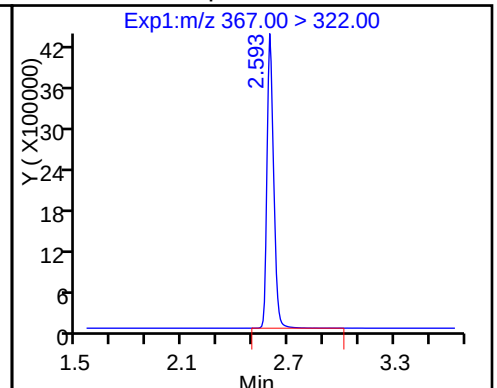
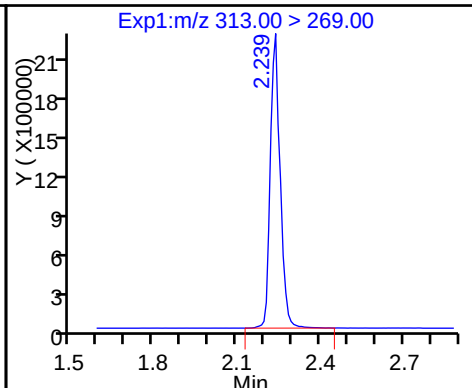
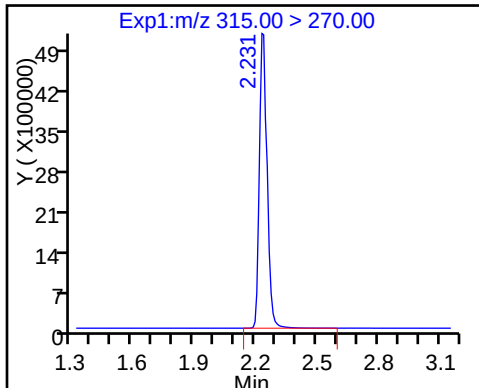
D 4 13C5-PFPeA

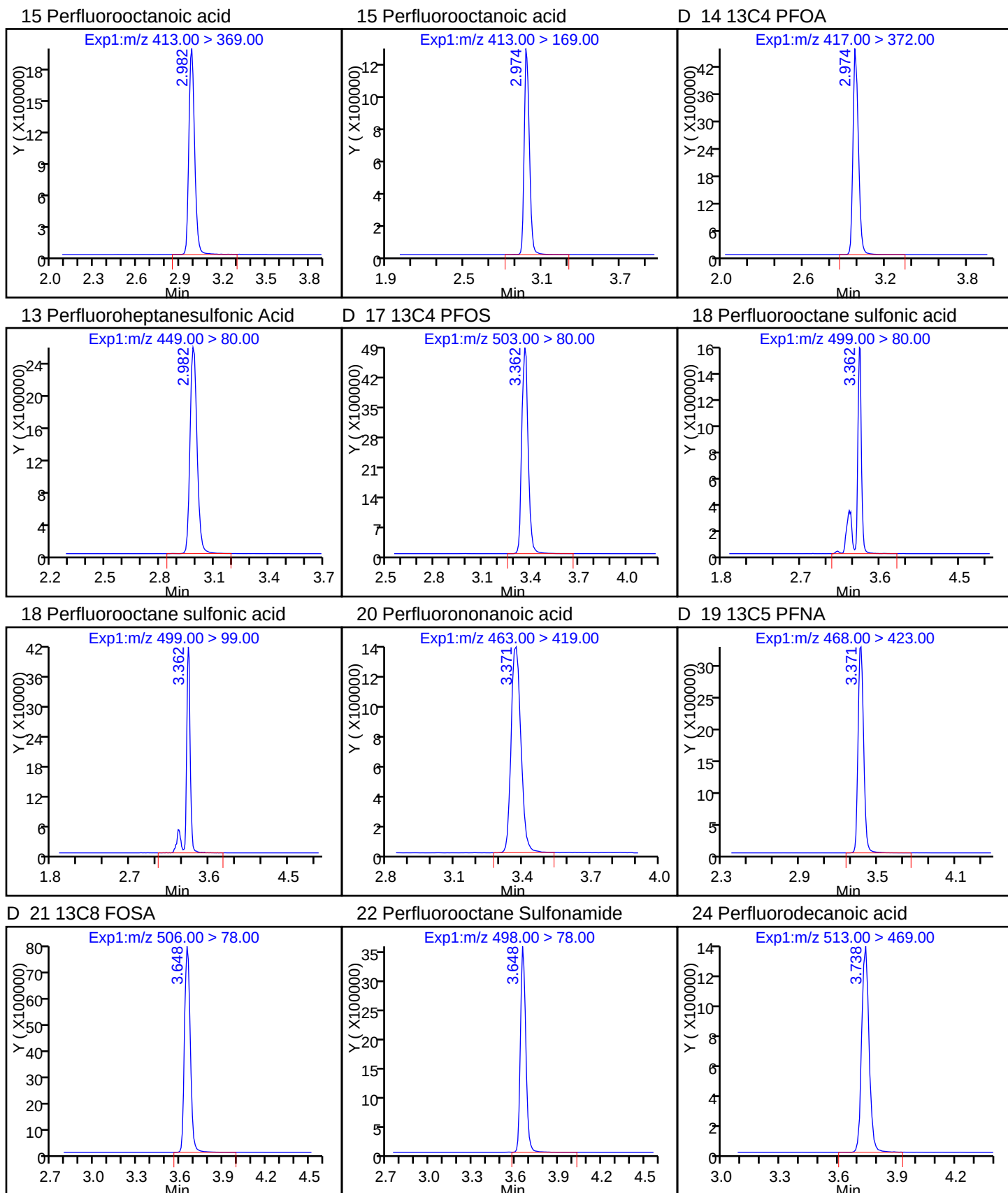


D 6 13C2 PFHxA

7 Perfluorohexanoic acid

D 11 13C4-PFHpA

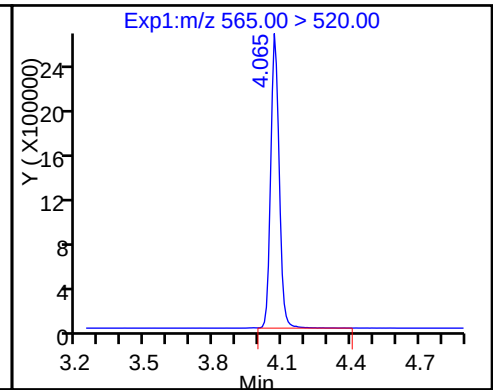
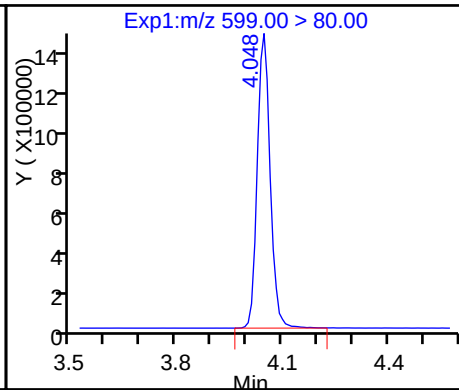
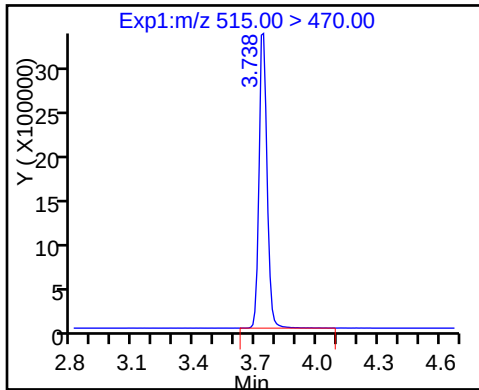




D 23 13C2 PFDA

26 Perfluorodecane Sulfonic acid

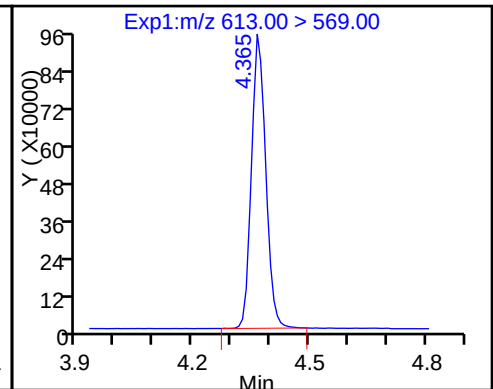
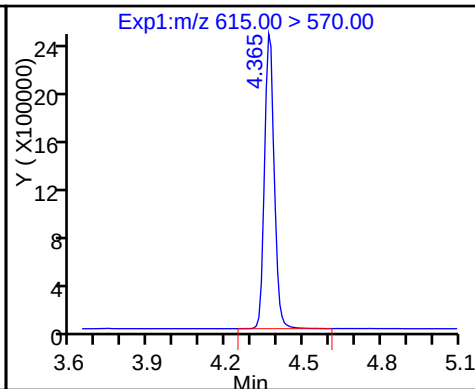
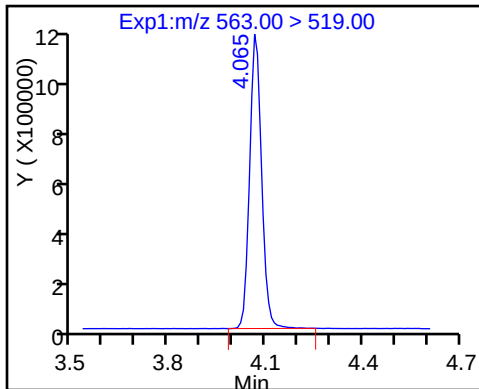
D 27 13C2 PFUnA



28 Perfluoroundecanoic acid

D 30 13C2 PFDaA

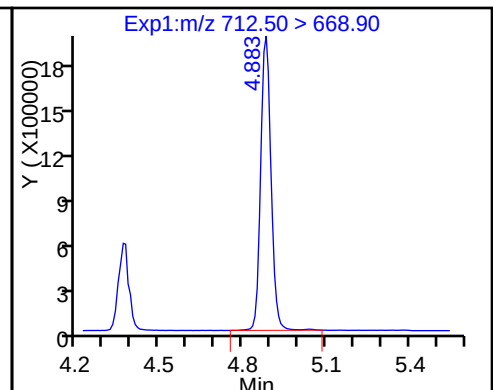
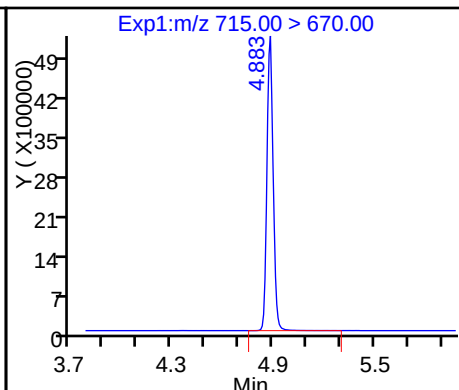
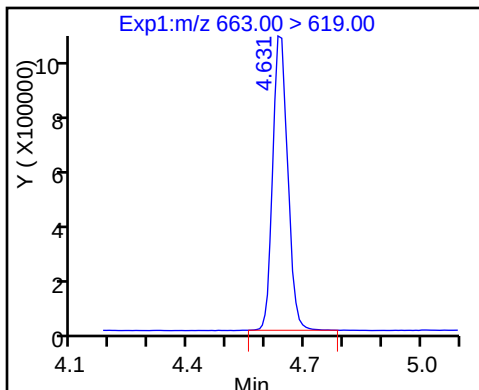
29 Perfluorododecanoic acid



31 Perfluorotridecanoic acid

D 32 13C2-PFTeDA

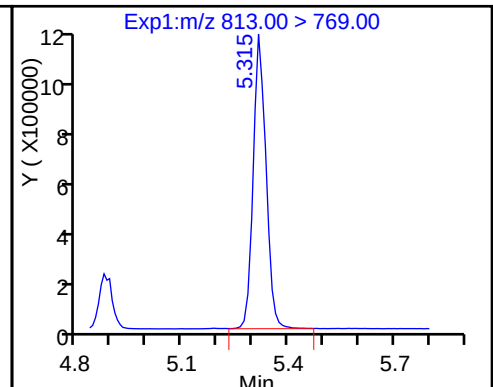
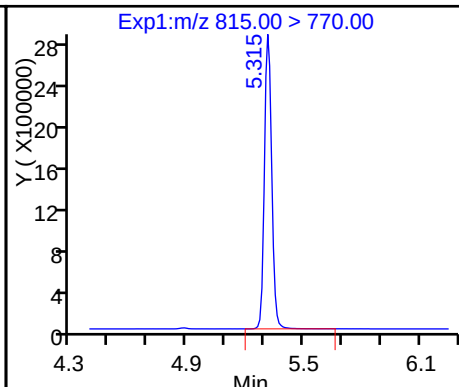
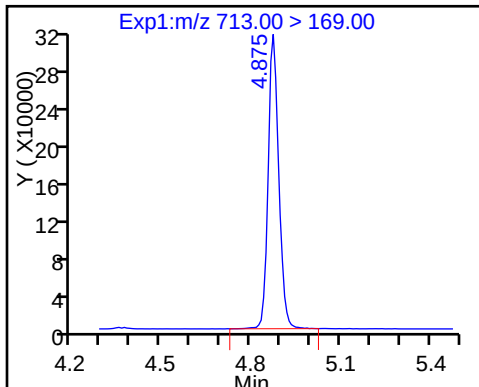
33 Perfluorotetradecanoic acid



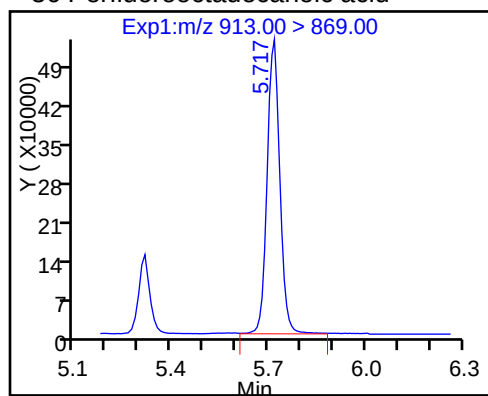
33 Perfluorotetradecanoic acid

D 34 13C2-PFHxDA

35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_008.d
 Lims ID: IC L5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 02-Dec-2016 10:59:32 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\20161202-37450.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Dec-2016 14:51:36 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas

Date: 02-Dec-2016 13:39:38

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	1.614	1.615	-0.001		16489860	48.5		96.9	1638772	
1 Perfluorobutyric acid										
212.90 > 169.00	1.614	1.617	-0.003	1.000	14709131	50.4		101	160438	
D 4 13C5-PFPeA										
267.90 > 223.00	1.916	1.918	-0.002		12600012	46.6		93.3	943576	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.916	1.920	-0.004	1.000	12474289	47.6		95.1	93266	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.945	1.961	-0.016	1.000	21727893	44.2		99.9		
298.90 > 99.00	1.945	1.961	-0.016	1.000	10461832		2.08(0.00-0.00)	99.9		
D 6 13C2 PFHxA										
315.00 > 270.00	2.226	2.239	-0.013		11543313	46.8		93.7	1429849	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.226	2.241	-0.015	1.000	10870881	49.3		98.5	324820	
D 11 13C4-PFHpA										
367.00 > 322.00	2.593	2.599	-0.006		9801352	46.6		93.1	1194438	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.593	2.600	-0.007	1.000	10247953	50.6		101	131961	
D 10 18O2 PFHxS										
403.00 > 84.00	2.608	2.614	-0.006		14421709	47.7		101	804399	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.608	2.615	-0.007	1.000	14700167	45.5		100		
15 Perfluorooctanoic acid										
413.00 > 369.00	2.972	2.984	-0.012	1.000	10948383	50.8		102	135691	
413.00 > 169.00	2.972	2.984	-0.012	1.000	6763939		1.62(0.90-1.10)	102	350881	
D 14 13C4 PFOA										
417.00 > 372.00	2.972	2.984	-0.012		10566267	48.2		96.3	1210292	

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	2.972	2.986	-0.014	1.000	13319919	46.2	97.0		
D 17 13C4 PFOS	503.00 > 80.00	3.352	3.365	-0.013		11794026	48.2	101	334101	
18 Perfluorooctane sulfonic acid	499.00 > 80.00	3.352	3.366	-0.014	1.000	12334342	46.0	99.1	3198173	
	499.00 > 99.00	3.352	3.366	-0.014	1.000	2699806	4.57(0.90-1.10)	99.1	276987	
20 Perfluorononanoic acid	463.00 > 419.00	3.361	3.373	-0.012	1.000	8209339	50.0	100	106298	
D 19 13C5 PFNA	468.00 > 423.00	3.361	3.374	-0.013		8274989	46.5	92.9	464531	
D 21 13C8 FOSA	506.00 > 78.00	3.648	3.651	-0.003		20246280	48.9	97.7	412589	
22 Perfluorooctane Sulfonamide	498.00 > 78.00	3.648	3.656	-0.008	1.000	18995833	50.2	100	525604	
24 Perfluorodecanoic acid	513.00 > 469.00	3.727	3.738	-0.011	1.000	7581125	49.1	98.2	195732	
D 23 13C2 PFDA	515.00 > 470.00	3.727	3.738	-0.011		7964307	48.0	95.9	183252	
26 Perfluorodecane Sulfonic acid	599.00 > 80.00	4.039	4.049	-0.010	1.000	7816007	50.5	105		
D 27 13C2 PFUnA	565.00 > 520.00	4.056	4.070	-0.014		5729423	45.6	91.1	366101	
28 Perfluoroundecanoic acid	563.00 > 519.00	4.056	4.071	-0.015	1.000	5577456	45.9	91.9	89442	
D 30 13C2 PFDaA	615.00 > 570.00	4.354	4.370	-0.016		5499233	47.0	94.1	178583	
29 Perfluorododecanoic acid	613.00 > 569.00	4.354	4.370	-0.016	1.000	5085511	48.8	97.7	5770	
31 Perfluorotridecanoic acid	663.00 > 619.00	4.629	4.636	-0.007	1.000	5704096	49.9	99.7	5914	
D 32 13C2-PFTeDA	715.00 > 670.00	4.867	4.882	-0.015		11564641	47.8	95.6	896262	
33 Perfluorotetradecanoic acid	712.50 > 668.90	4.867	4.884	-0.017	1.000	10301361	48.5	96.9	4268	
	713.00 > 169.00	4.867	4.884	-0.017	1.000	1659281	6.21(0.00-0.00)	96.9	129903	
D 34 13C2-PFHxDA	815.00 > 770.00	5.306	5.320	-0.014		6210852	47.6	95.3	147641	
35 Perfluorohexadecanoic acid	813.00 > 769.00	5.306	5.320	-0.014	1.000	5654463	51.4	103	6481	
36 Perfluorooctadecanoic acid	913.00 > 869.00	5.702	5.720	-0.018	1.000	5392609	62.4	125	9388	

Reagents:

LCPFC-L5_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_008.d

Injection Date: 02-Dec-2016 10:59:32

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

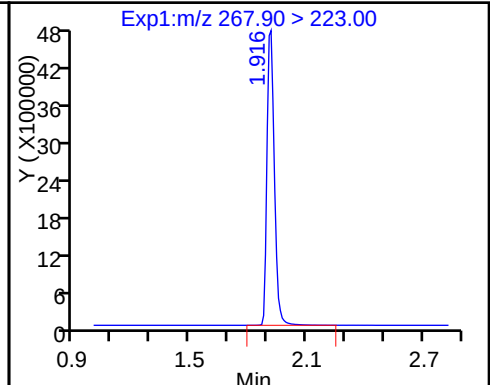
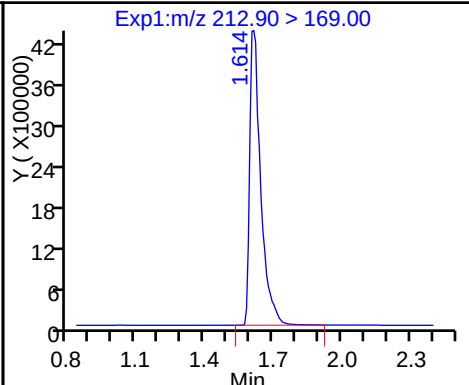
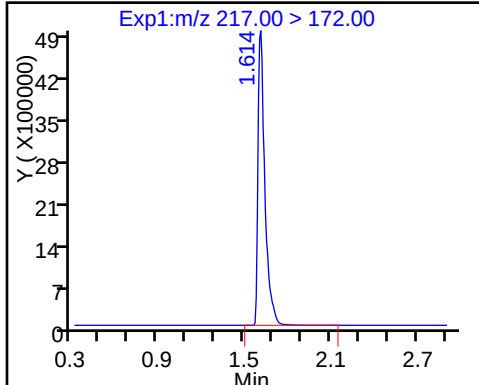
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

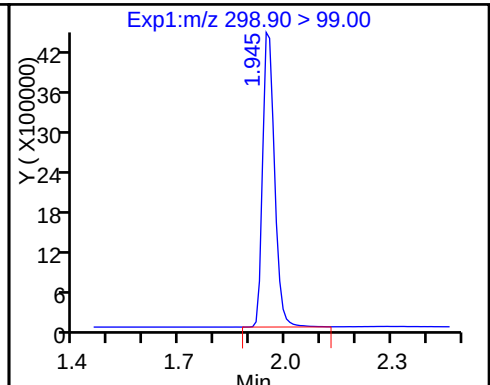
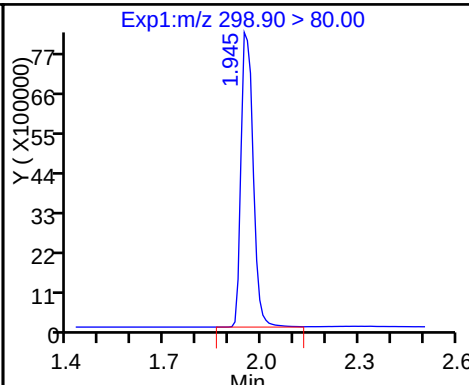
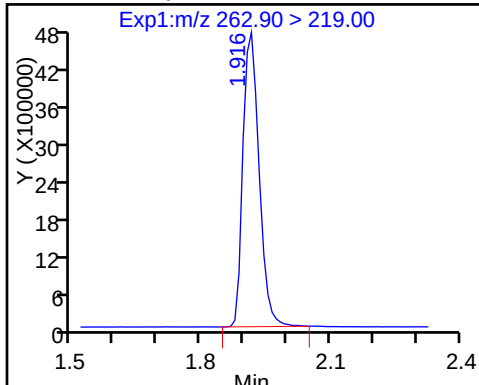
D 4 13C5-PFPeA



3 Perfluoropentanoic acid

5 Perfluorobutanesulfonic acid

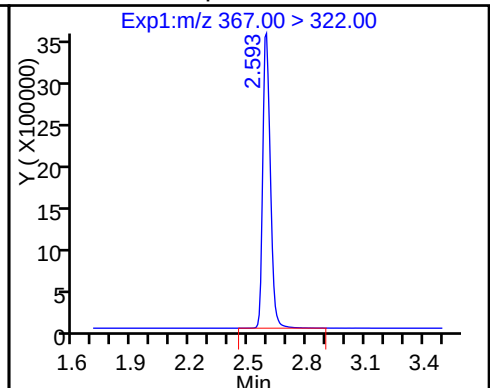
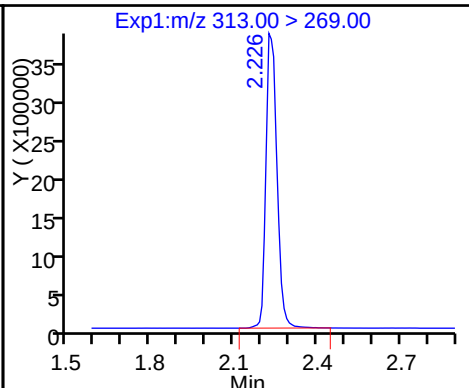
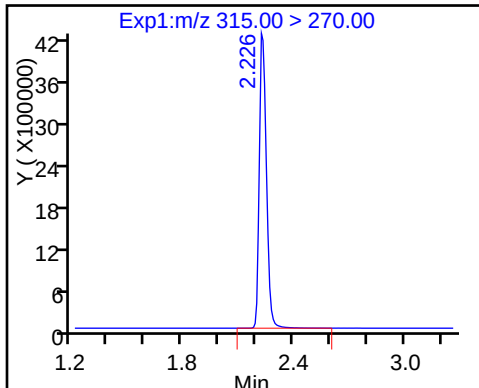
5 Perfluorobutanesulfonic acid



D 6 13C2 PFHxA

7 Perfluorohexanoic acid

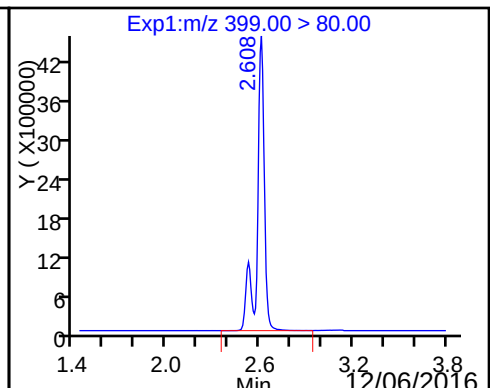
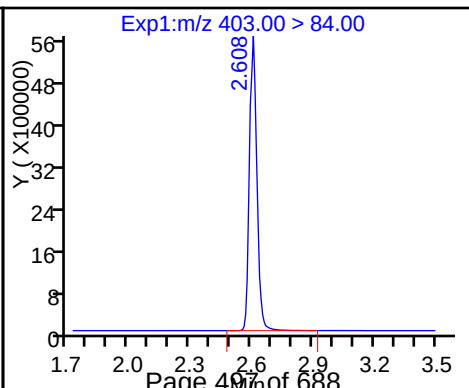
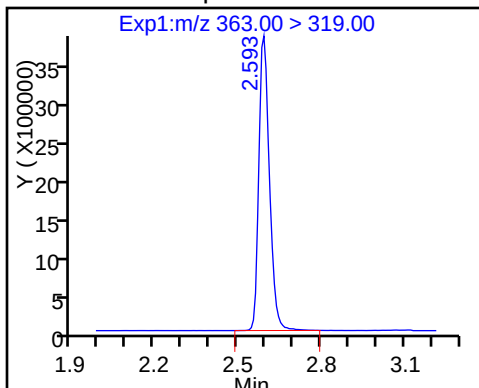
D 11 13C4-PFHpA

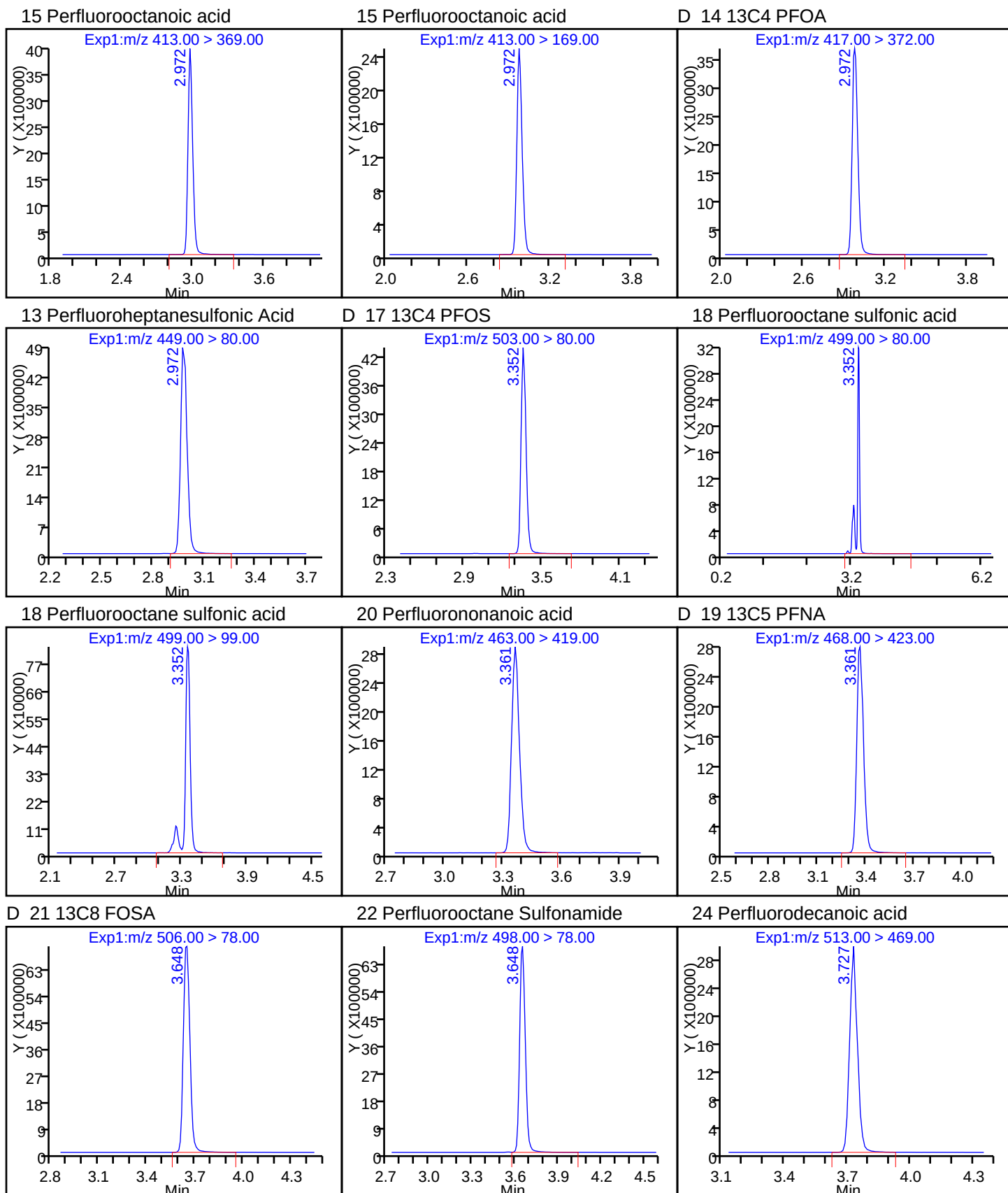


12 Perfluoroheptanoic acid

D 10 18O2 PFHxS

9 Perfluorohexanesulfonic acid

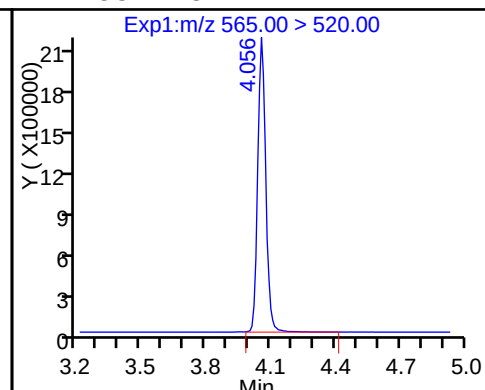
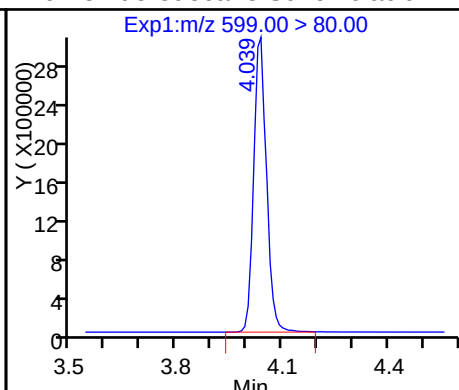
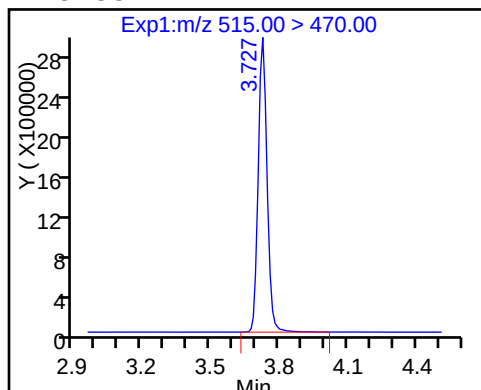




D 23 13C2 PFDA

26 Perfluorodecane Sulfonic acid

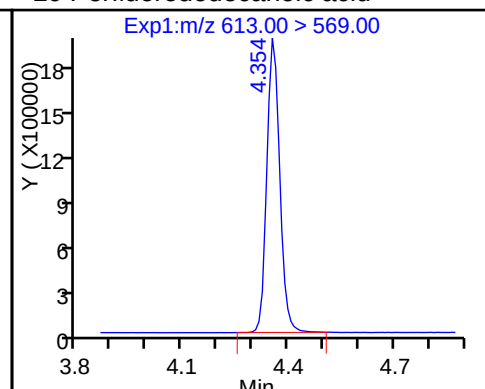
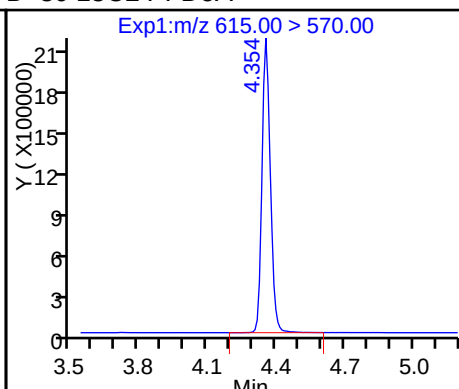
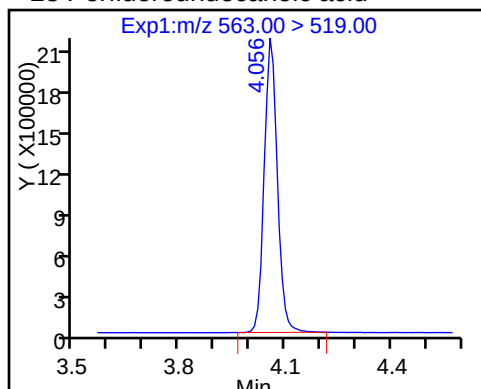
D 27 13C2 PFUnA



28 Perfluoroundecanoic acid

D 30 13C2 PFDaA

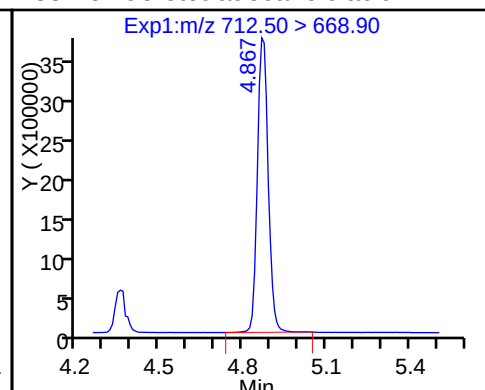
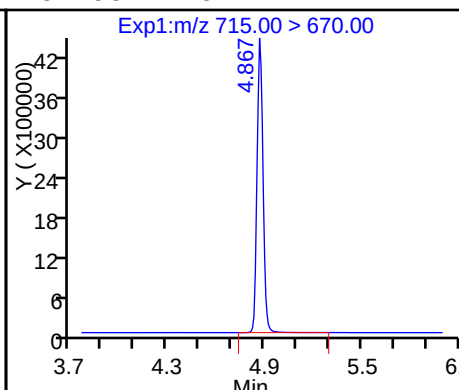
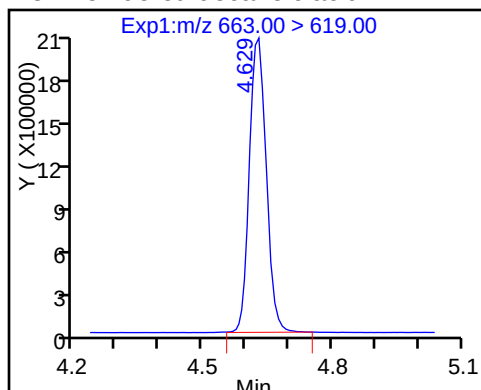
29 Perfluorododecanoic acid



31 Perfluorotridecanoic acid

D 32 13C2-PFTeDA

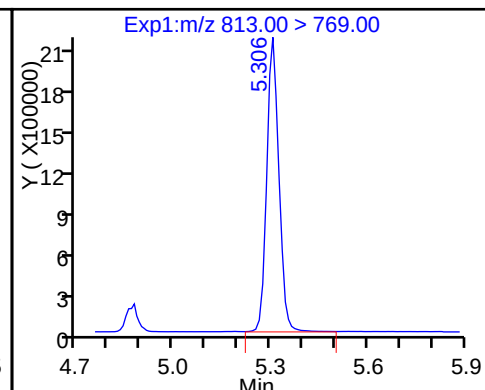
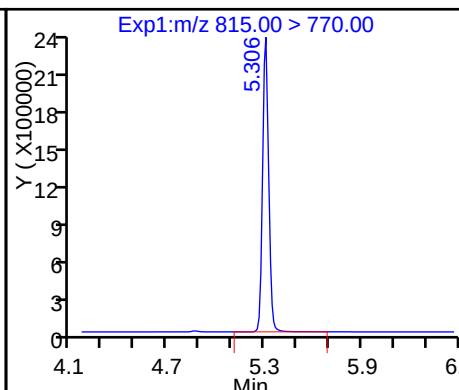
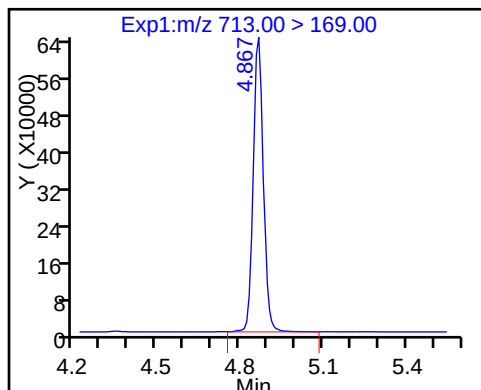
33 Perfluorotetradecanoic acid



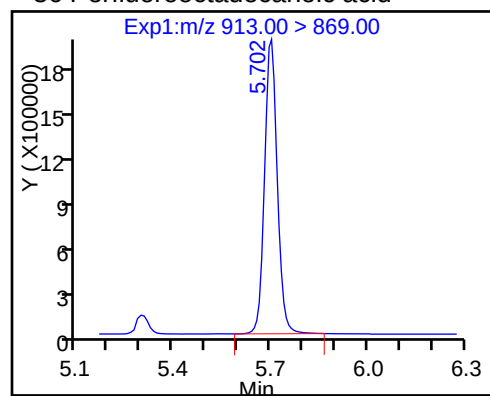
33 Perfluorotetradecanoic acid

D 34 13C2-PFHxDA

35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_009.d
 Lims ID: IC L6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 02-Dec-2016 11:07:02 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\20161202-37450.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Dec-2016 14:51:37 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas

Date: 02-Dec-2016 13:41:33

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	1.602	1.615	-0.013		15262180	44.8		89.7	765913	
1 Perfluorobutyric acid										
212.90 > 169.00	1.610	1.617	-0.007	1.000	43875101	162.4		81.2	412834	
D 4 13C5-PFPeA										
267.90 > 223.00	1.910	1.918	-0.008		10903650	40.4		80.7	1365253	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.910	1.920	-0.010	1.000	34297516	151.1		75.6	270259	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.949	1.961	-0.012	1.000	51594571	125.7		71.1		
298.90 > 99.00	1.939	1.961	-0.022	0.995	28882906		1.79(0.00-0.00)	71.1		
D 6 13C2 PFHxA										
315.00 > 270.00	2.225	2.239	-0.014		10277273	41.7		83.4	928195	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.225	2.241	-0.016	1.000	33379792	169.9		84.9	455453	
D 11 13C4-PFHpA										
367.00 > 322.00	2.578	2.599	-0.021		8167611	38.8		77.6	1010737	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.578	2.600	-0.022	1.000	29343029	173.7		86.8	246277	
D 10 18O2 PFHxS										
403.00 > 84.00	2.594	2.614	-0.020		12029706	39.8		84.1	822262	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.601	2.615	-0.014	1.000	45822208	170.0		93.4		
15 Perfluorooctanoic acid										
413.00 > 369.00	2.958	2.984	-0.026	1.000	29789966	179.8		89.9	348106	
413.00 > 169.00	2.966	2.984	-0.018	1.003	20146226		1.48(0.90-1.10)	89.9	805973	
D 14 13C4 PFOA										
417.00 > 372.00	2.966	2.984	-0.018		8120442	37.0		74.0	869612	

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	2.966	2.986	-0.020	1.000	38018954	159.5		83.8		
D 17 13C4 PFOS										
503.00 > 80.00	3.340	3.365	-0.025		9744748	39.8		83.3	81434	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.340	3.366	-0.026	1.000	41837729	188.7		102	8979223	
499.00 > 99.00	3.340	3.366	-0.026	1.000	9665788		4.33(0.90-1.10)	102	925115	
20 Perfluorononanoic acid										
463.00 > 419.00	3.348	3.373	-0.025	1.000	25204338	186.7		93.4	245903	
D 19 13C5 PFNA										
468.00 > 423.00	3.355	3.374	-0.019		6808930	38.2		76.5	557624	
D 21 13C8 FOSA										
506.00 > 78.00	3.634	3.651	-0.017		17995728	43.4		86.9	430609	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.643	3.656	-0.013	1.000	51108754	151.8		75.9	319115	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.721	3.738	-0.017	1.000	25614867	189.8		94.9	333805	
D 23 13C2 PFDA										
515.00 > 470.00	3.710	3.738	-0.028		6960897	41.9		83.8	168207	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	4.028	4.049	-0.021	1.000	24374906	190.6		98.9		
D 27 13C2 PFUnA										
565.00 > 520.00	4.045	4.070	-0.025		4558330	36.2		72.5	316100	
28 Perfluoroundecanoic acid										
563.00 > 519.00	4.054	4.071	-0.017	1.000	17998762	186.3		93.2	327205	
D 30 13C2 PFDaA										
615.00 > 570.00	4.343	4.370	-0.027		4818858	41.2		82.4	222562	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.343	4.370	-0.027	1.000	17698276	194.0		97.0	23046	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.613	4.636	-0.023	1.000	18549592	185.0		92.5	33008	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.855	4.882	-0.027		10102255	41.8		83.5	643461	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.864	4.884	-0.020	1.000	31923969	171.4		85.7	17512	
713.00 > 169.00	4.855	4.884	-0.029	0.998	6059732		5.27(0.00-0.00)	85.7	373056	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.290	5.320	-0.030		5535655	42.5		84.9	147627	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.290	5.320	-0.030	1.000	18745470	196.6		98.3	24259	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.688	5.720	-0.032	1.000	13671969	180.4		90.2	26246	

Reagents:

LCPFC-L6_00019

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_009.d

Injection Date: 02-Dec-2016 11:07:02

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

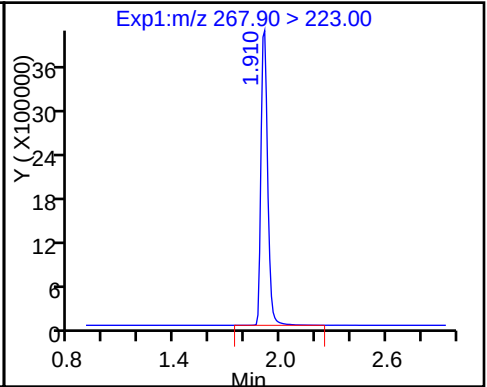
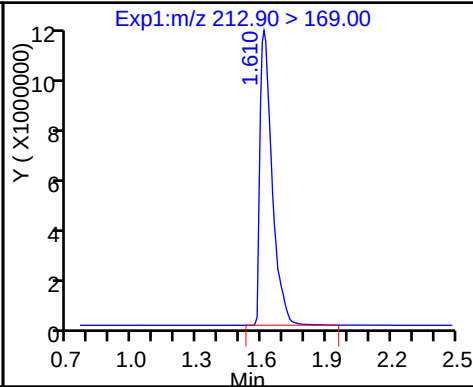
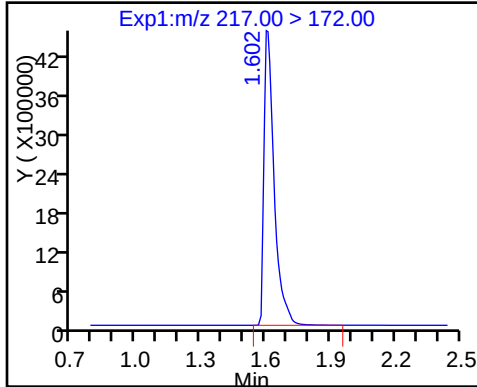
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

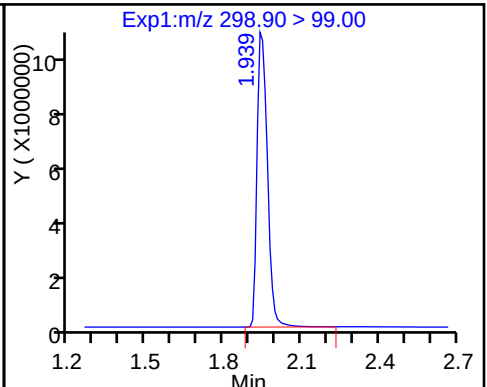
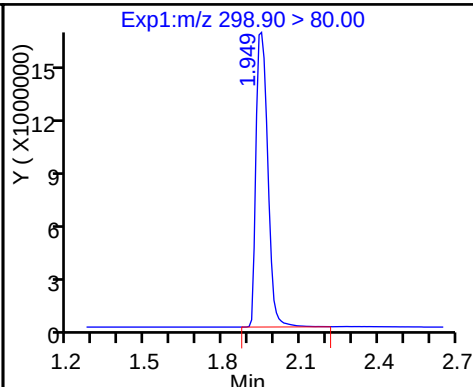
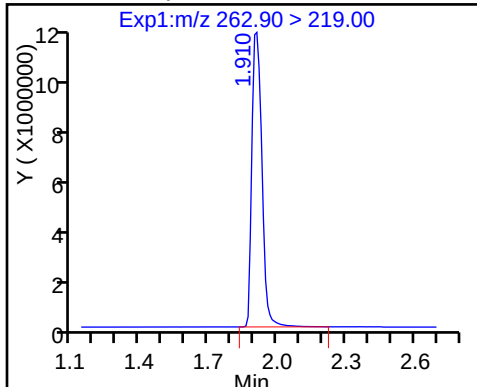
D 4 13C5-PFPeA



3 Perfluoropentanoic acid

5 Perfluorobutanesulfonic acid

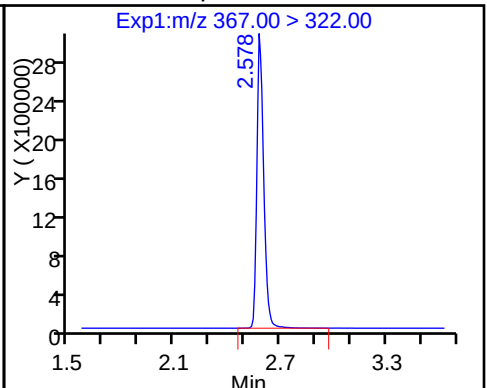
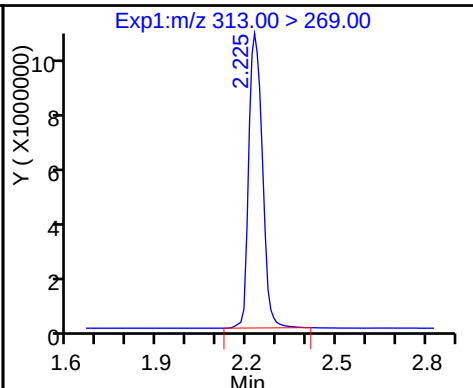
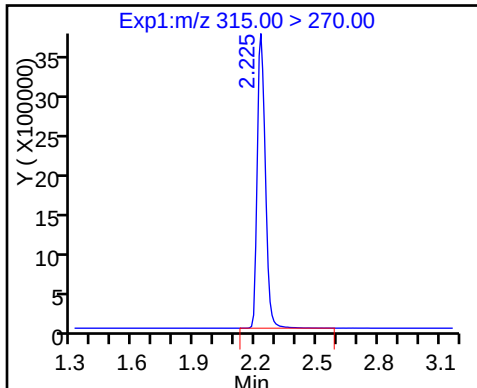
5 Perfluorobutanesulfonic acid



D 6 13C2 PFHxA

7 Perfluorohexanoic acid

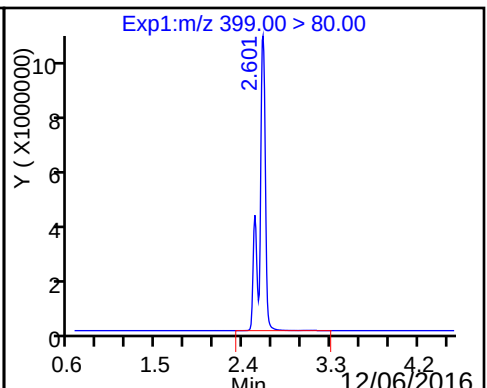
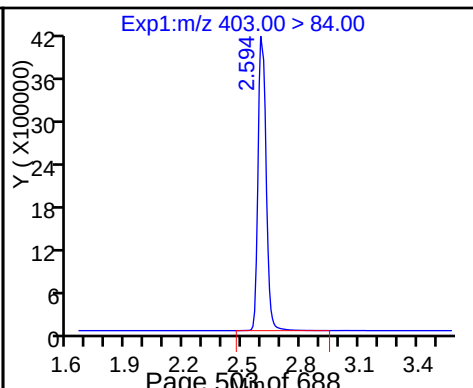
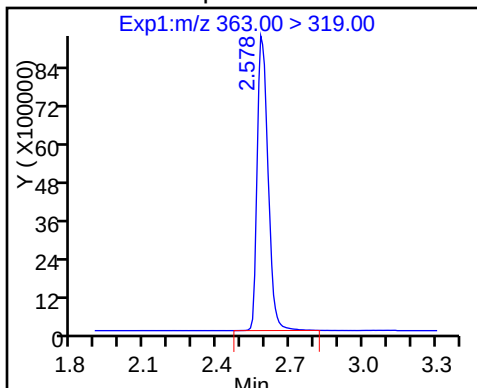
D 11 13C4-PFHpA

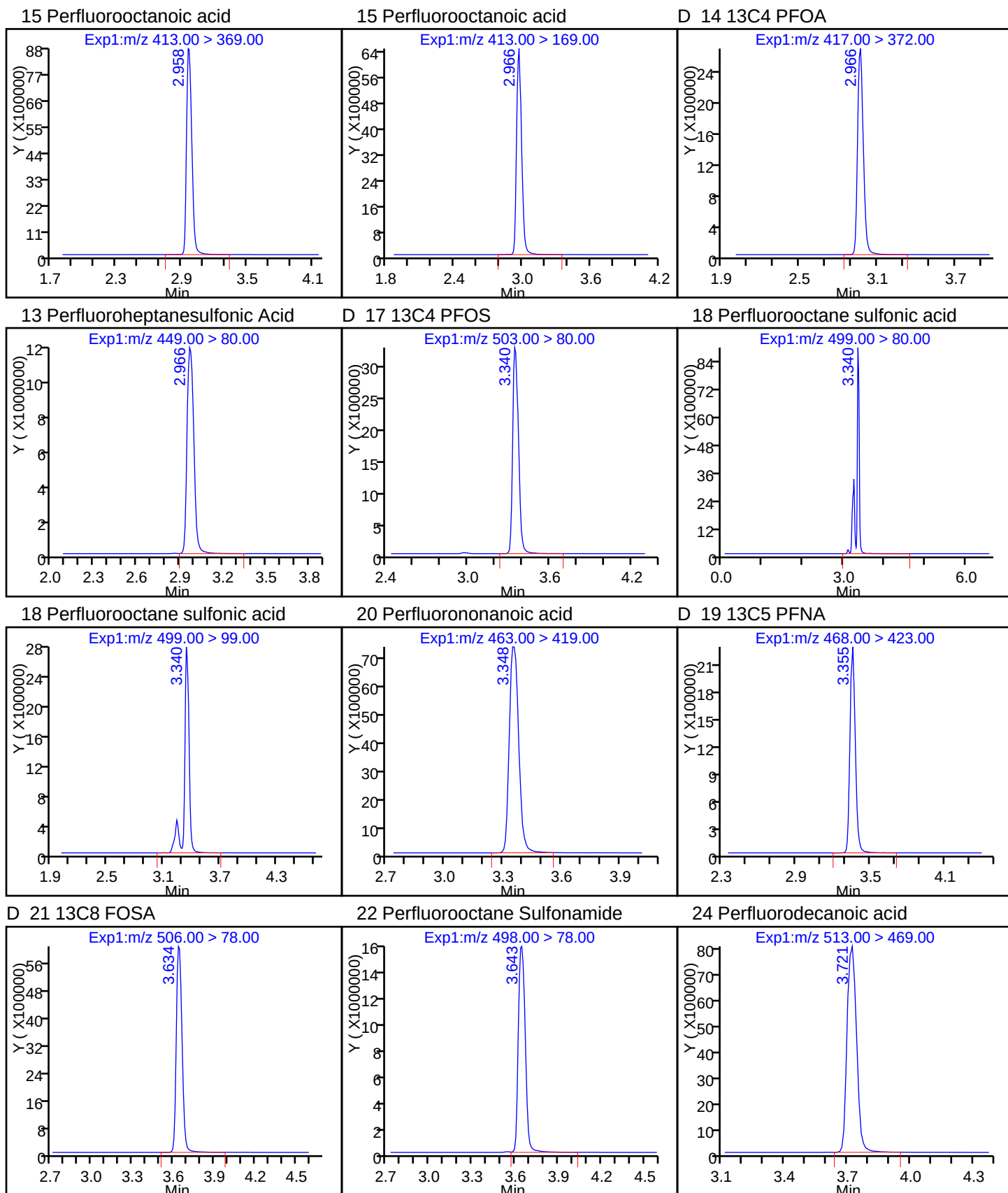


12 Perfluoroheptanoic acid

D 10 18O2 PFHxS

9 Perfluorohexanesulfonic acid

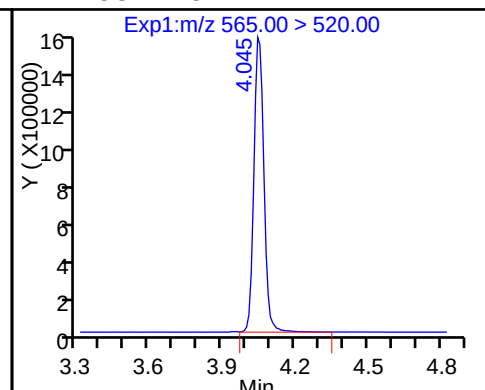
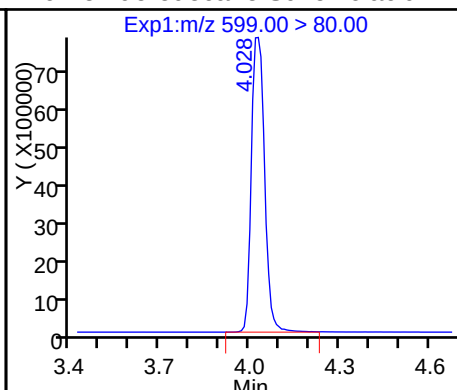
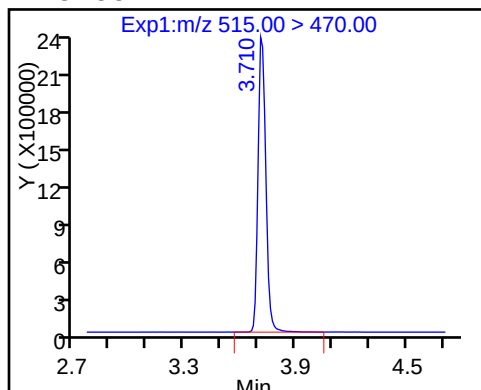




D 23 13C2 PFDA

26 Perfluorodecane Sulfonic acid

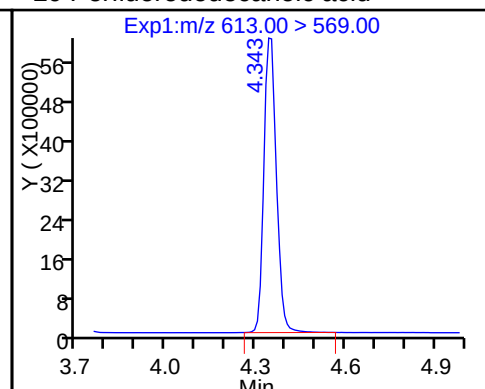
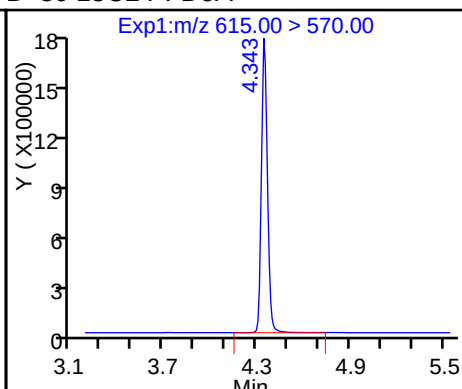
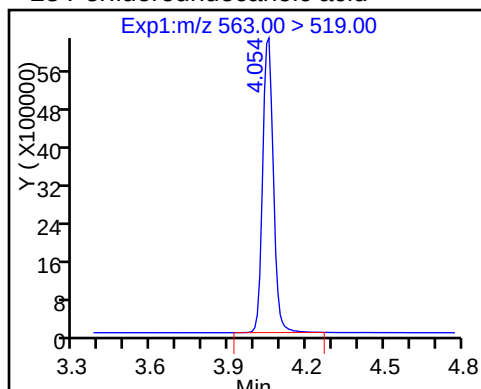
D 27 13C2 PFUnA



28 Perfluoroundecanoic acid

D 30 13C2 PFDaA

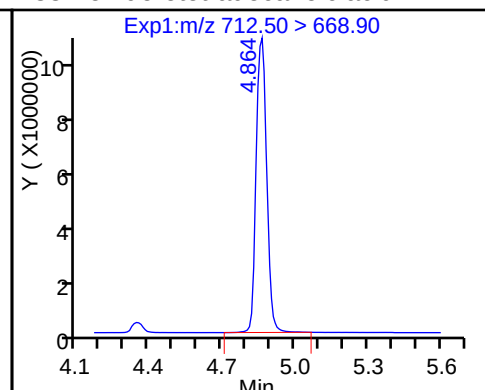
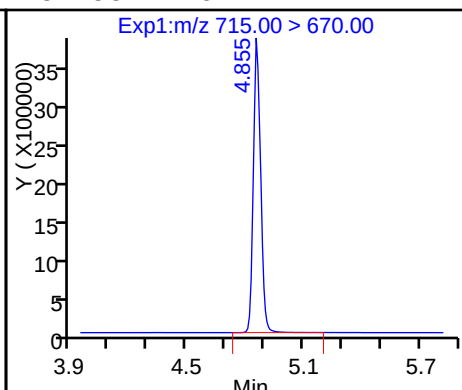
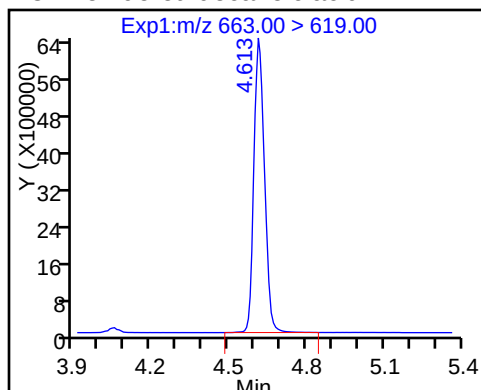
29 Perfluorododecanoic acid



31 Perfluorotridecanoic acid

D 32 13C2-PFTeDA

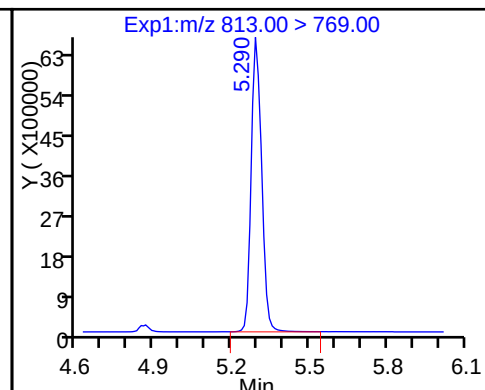
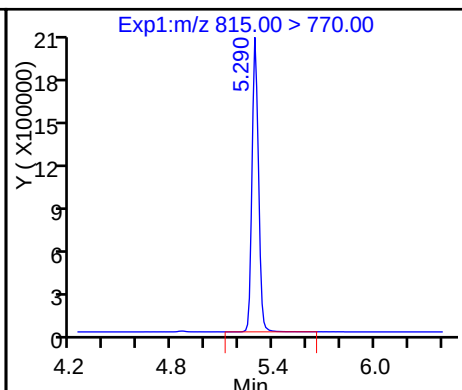
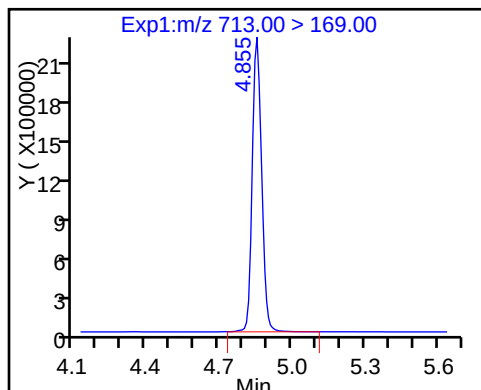
33 Perfluorotetradecanoic acid



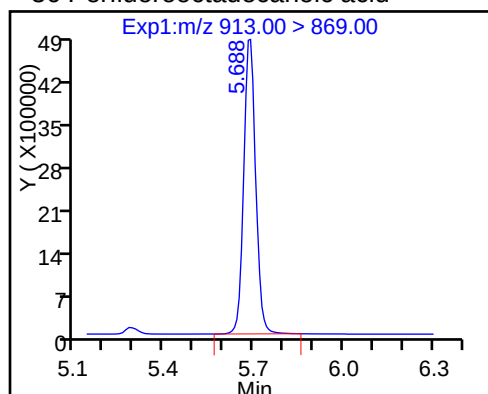
33 Perfluorotetradecanoic acid

D 34 13C2-PFHxDA

35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_010.d
 Lims ID: IC L7
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 02-Dec-2016 11:14:32 ALS Bottle#: 43 Worklist Smp#: 10
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L7_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\20161202-37450.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Dec-2016 14:51:39 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas

Date: 02-Dec-2016 13:42:13

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	1.609	1.615	-0.006		14832847	43.6		87.2	714054	
1 Perfluorobutyric acid										
212.90 > 169.00	1.609	1.617	-0.008	1.000	69781585	265.7		66.4	349641	
D 4 13C5-PFPeA										
267.90 > 223.00	1.910	1.918	-0.008		10386976	38.4		76.9	960901	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.910	1.920	-0.010	1.000	50360659	232.9		58.2	296264	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.968	1.961	0.007	1.000	41429650	107.3		30.3		
298.90 > 99.00	1.948	1.961	-0.013	0.990	44560969		0.93(0.00-0.00)	30.3		
D 6 13C2 PFHxA										
315.00 > 270.00	2.230	2.239	-0.009		9976646	40.5		81.0	859246	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.230	2.241	-0.011	1.000	51025463	267.5		66.9	759942	
D 11 13C4-PFHpA										
367.00 > 322.00	2.581	2.599	-0.019		7479568	35.5		71.1	874763	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.581	2.600	-0.020	1.000	45359019	293.2		73.3	320883	
D 10 18O2 PFHxS										
403.00 > 84.00	2.598	2.614	-0.016		11322930	37.4		79.1	1230464	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.598	2.615	-0.017	1.000	77870104	307.0		84.3		
15 Perfluorooctanoic acid										
413.00 > 369.00	2.967	2.984	-0.017	1.000	47490545	322.1		80.5	2406009	
413.00 > 169.00	2.967	2.984	-0.017	1.000	33779619		1.41(0.90-1.10)	80.5	3107357	
D 14 13C4 PFOA										
417.00 > 372.00	2.958	2.984	-0.026		7225722	32.9		65.9	438119	

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	2.967	2.986	-0.019	1.000	59371135	266.1		69.9		
D 17 13C4 PFOS										
503.00 > 80.00	3.345	3.365	-0.020		9124233	37.3		78.0	67315	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.345	3.366	-0.021	1.000	80249842	386.6		104	13058140	
499.00 > 99.00	3.345	3.366	-0.021	1.000	19443677		4.13(0.90-1.10)	104	690162	
20 Perfluorononanoic acid										
463.00 > 419.00	3.353	3.373	-0.020	1.000	41884345	335.5		83.9	392400	
D 19 13C5 PFNA										
468.00 > 423.00	3.353	3.374	-0.021		6297115	35.4		70.7	371230	
D 21 13C8 FOSA										
506.00 > 78.00	3.642	3.651	-0.009		18384094	44.4		88.8	592069	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.660	3.656	0.004	1.000	73164187	212.7		53.2	145203	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.709	3.738	-0.029	1.000	42979124	313.4		78.4	353734	
D 23 13C2 PFDA										
515.00 > 470.00	3.720	3.738	-0.018		7073000	42.6		85.2	160460	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	4.028	4.049	-0.021	1.000	41362935	345.5		89.6		
D 27 13C2 PFUnA										
565.00 > 520.00	4.045	4.070	-0.025		4373854	34.8		69.5	211760	
28 Perfluoroundecanoic acid										
563.00 > 519.00	4.045	4.071	-0.026	1.000	31200994	336.6		84.2	378305	
D 30 13C2 PFDaA										
615.00 > 570.00	4.353	4.370	-0.017		5148784	44.0		88.1	149077	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.353	4.370	-0.017	1.000	32927149	337.8		84.5	44886	
31 Perfluorotridecanoic acid										M
663.00 > 619.00	4.610	4.636	-0.026	1.000	34277350	320.0		80.0	59163	M
D 32 13C2-PFTeDA										
715.00 > 670.00	4.860	4.882	-0.022		10396514	43.0		86.0	969333	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.860	4.884	-0.024	1.000	50372831	253.2		63.3	26628	
713.00 > 169.00	4.851	4.884	-0.033	0.998	12426058		4.05(0.00-0.00)	63.3	473842	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.300	5.320	-0.020		6001714	46.0		92.1	121116	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.300	5.320	-0.020	1.000	35113710	345.4		86.3	34228	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.682	5.720	-0.038	1.000	31098706	384.1		96.0	54097	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L7_00019

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_010.d

Injection Date: 02-Dec-2016 11:14:32

Instrument ID: A8_N

Lims ID: IC L7

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 43

Worklist Smp#: 10

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

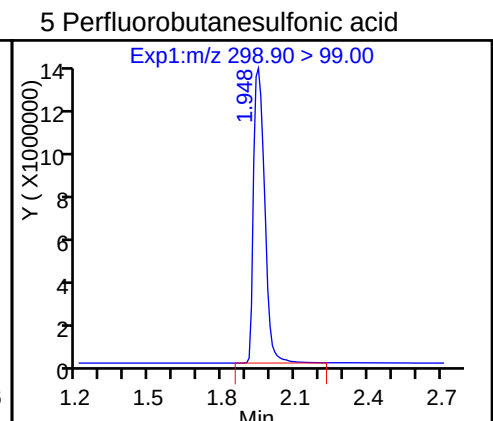
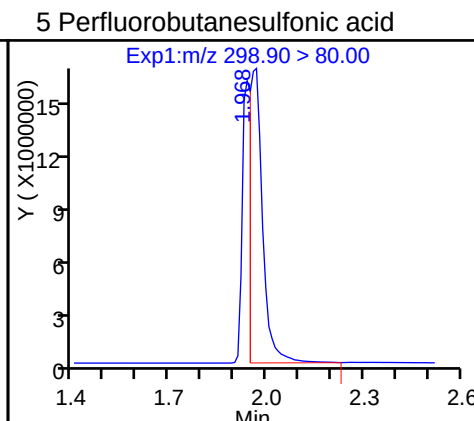
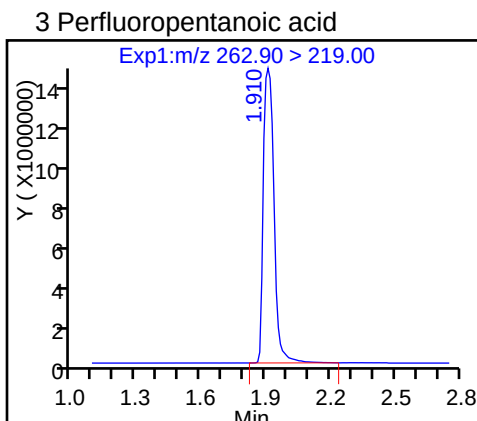
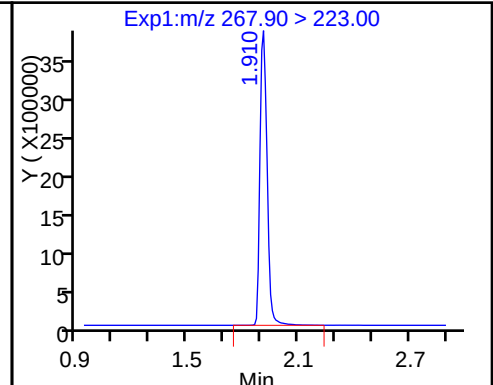
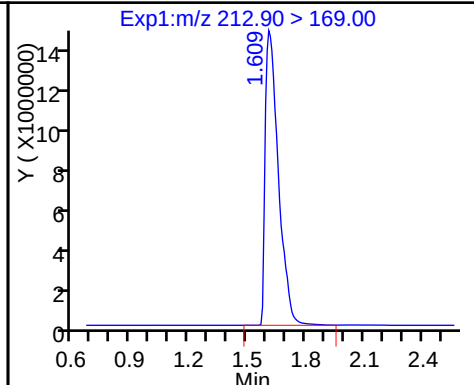
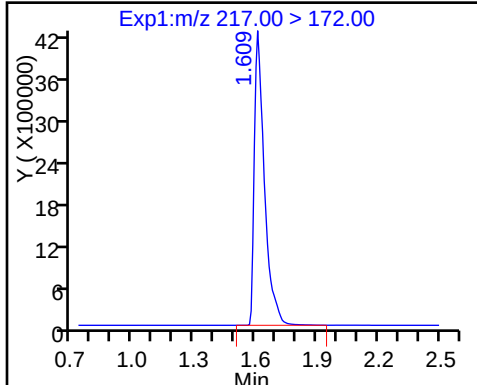
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

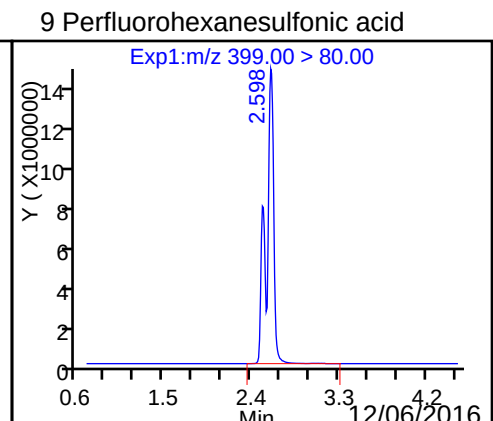
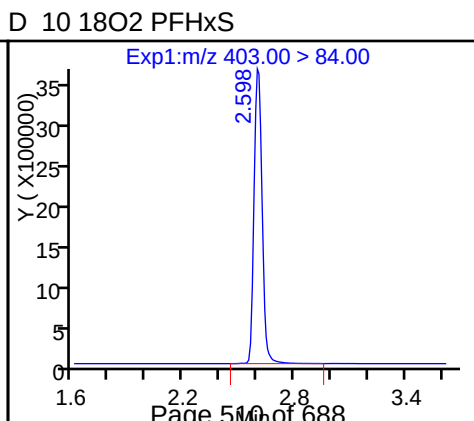
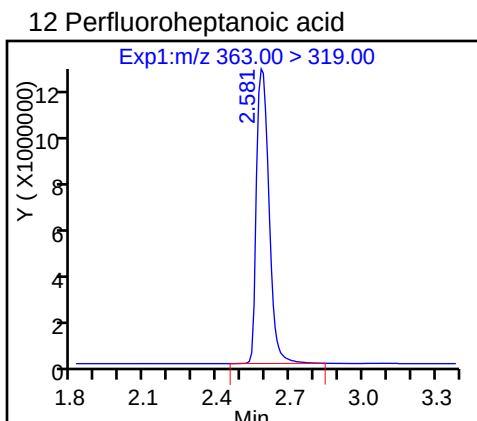
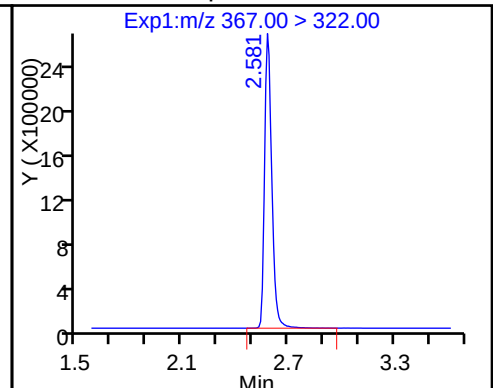
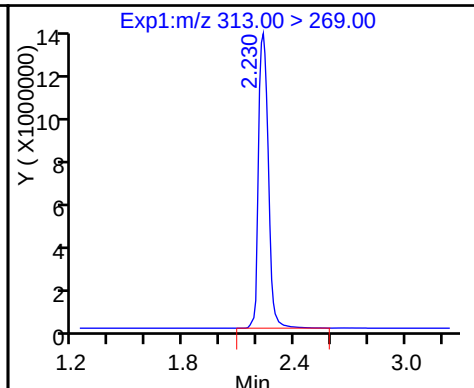
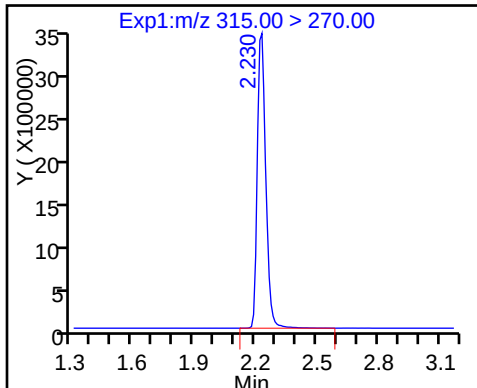
D 4 13C5-PFPeA

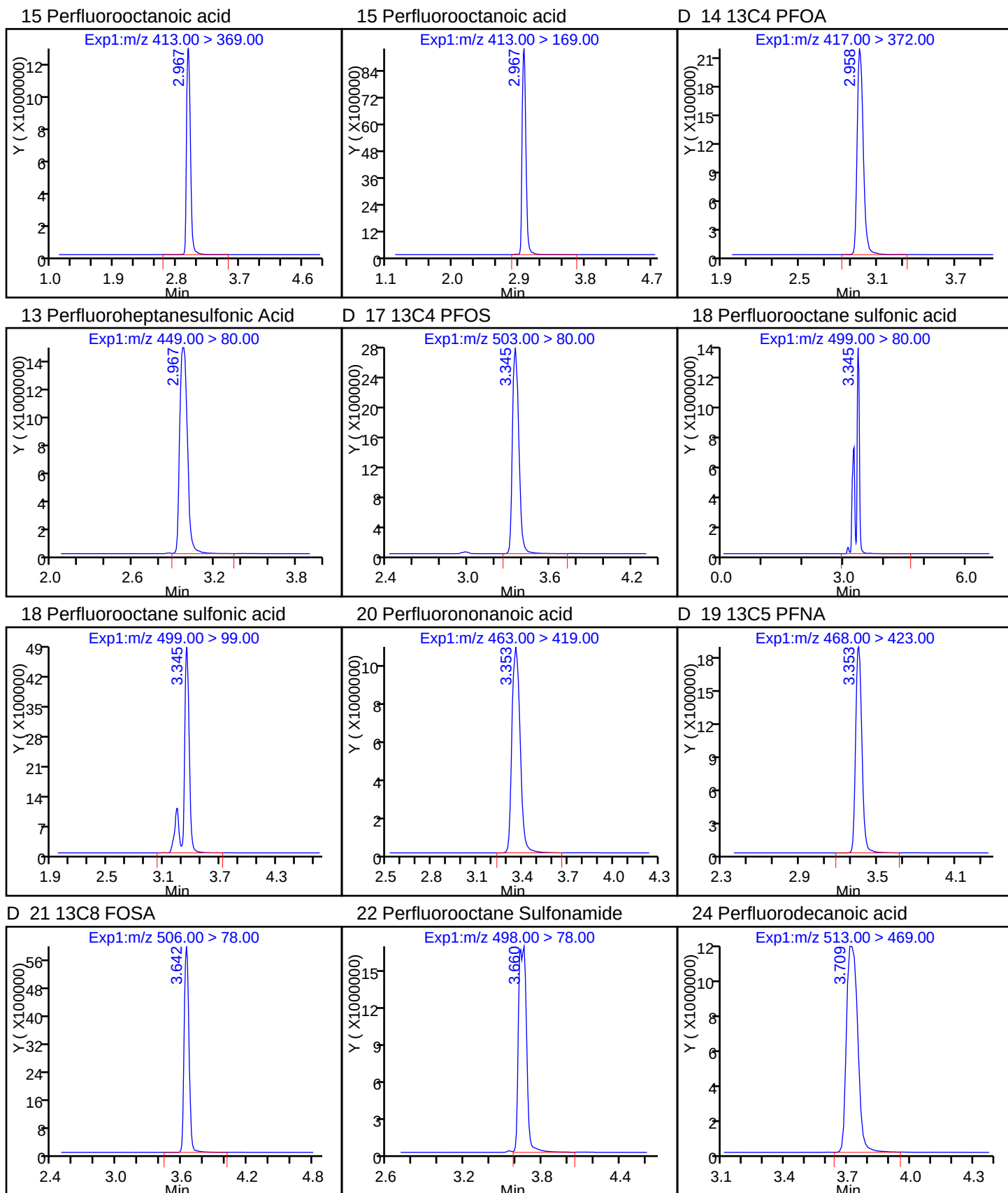


D 6 13C2 PFHxA

7 Perfluorohexanoic acid

D 11 13C4-PFHpA

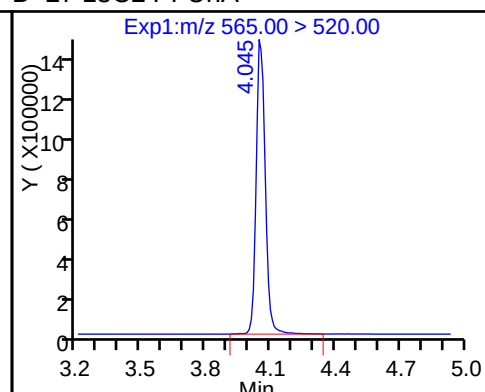
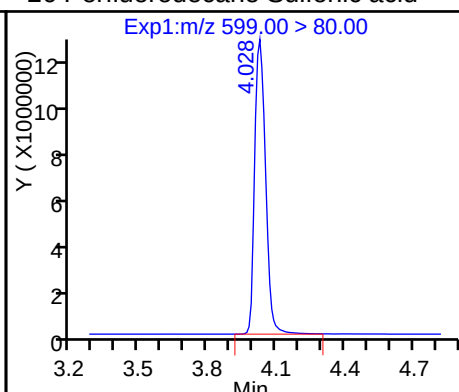
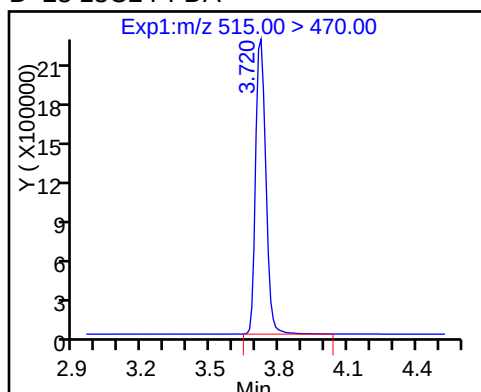




D 23 13C2 PFDA

26 Perfluorodecane Sulfonic acid

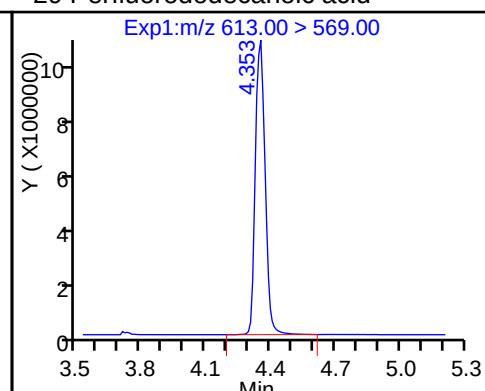
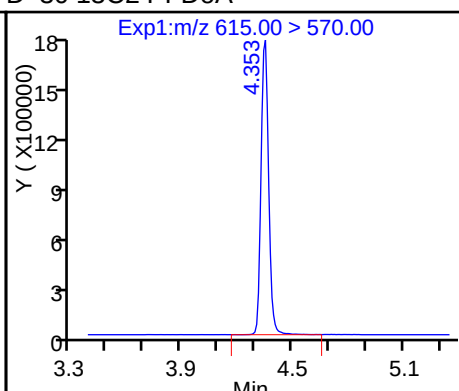
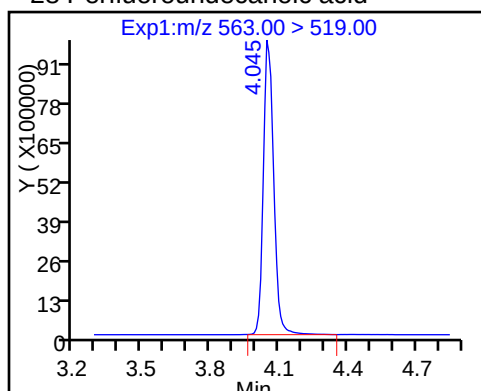
D 27 13C2 PFUnA



28 Perfluoroundecanoic acid

D 30 13C2 PFDaA

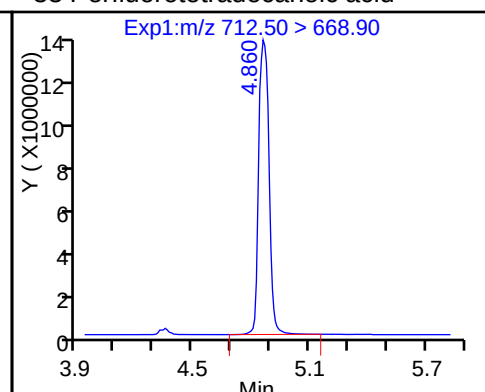
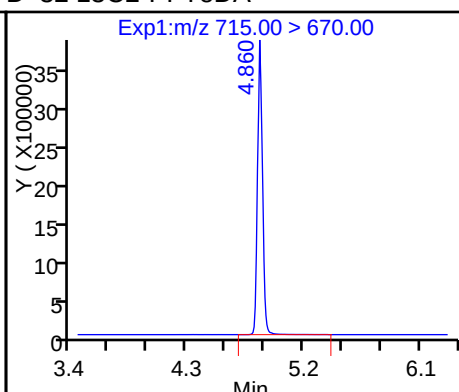
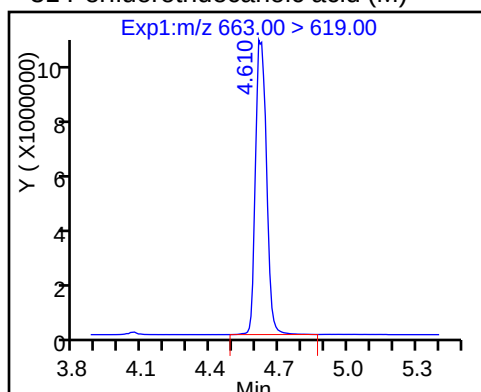
29 Perfluorododecanoic acid



31 Perfluorotridecanoic acid (M)

D 32 13C2-PFTeDA

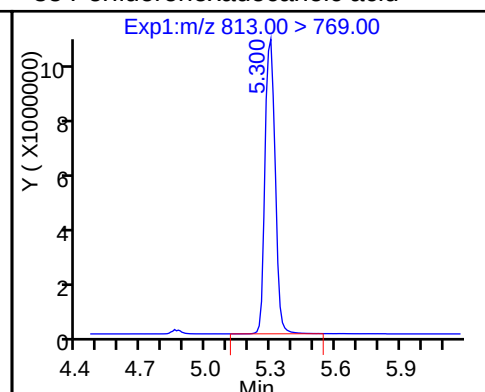
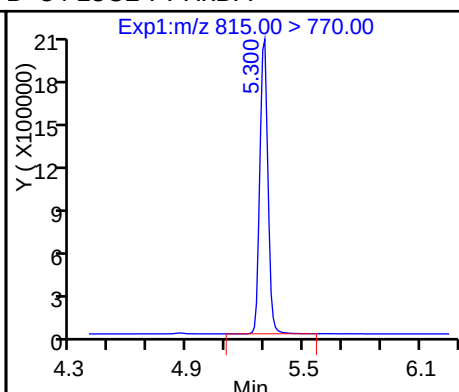
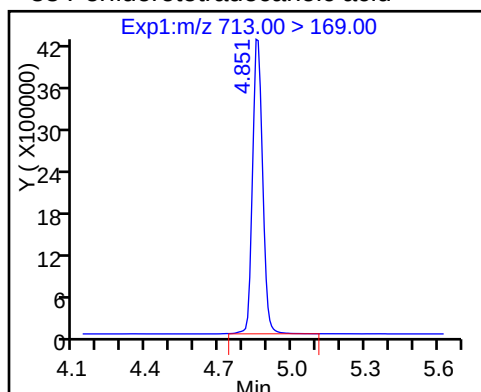
33 Perfluorotetradecanoic acid



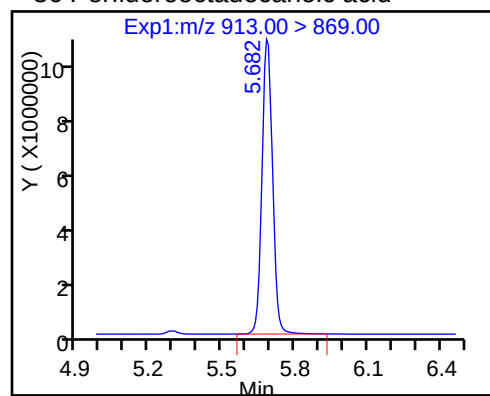
33 Perfluorotetradecanoic acid

D 34 13C2-PFHxDA

35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento

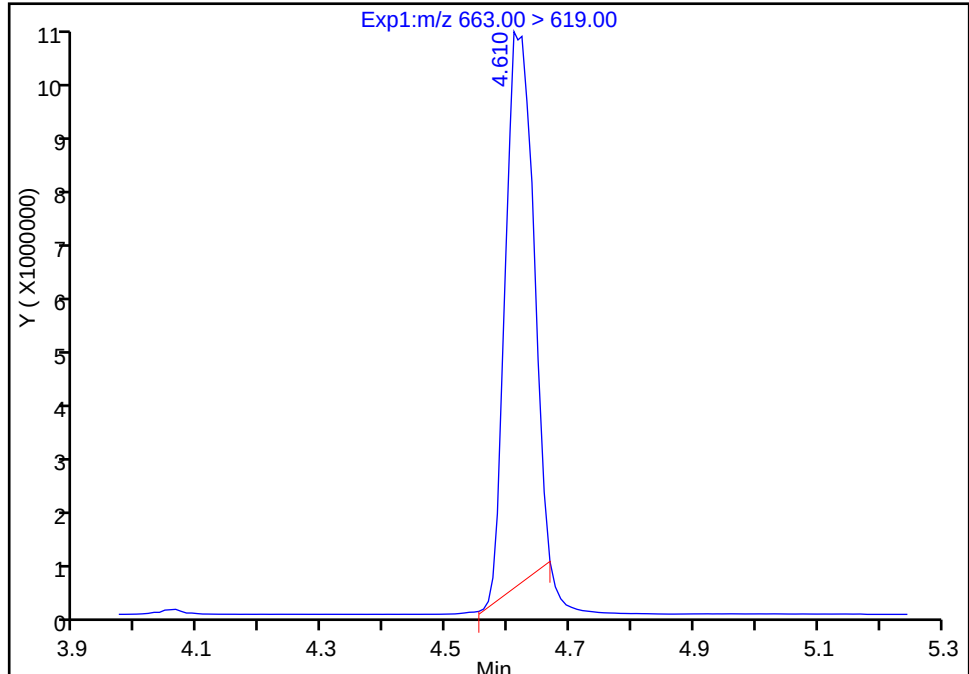
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_010.d
Injection Date: 02-Dec-2016 11:14:32 Instrument ID: A8_N
Lims ID: IC L7
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 43 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

31 Perfluorotridecanoic acid, CAS: 72629-94-8

Signal: 1

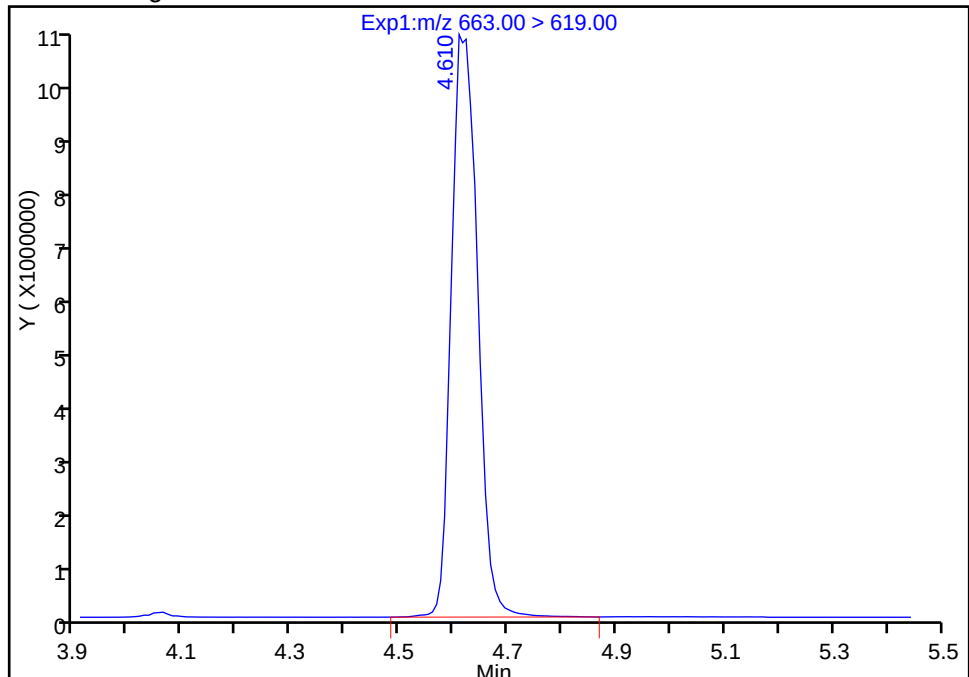
RT: 4.61
Area: 30068675
Amount: 293.1955
Amount Units: ng/ml

Processing Integration Results



RT: 4.61
Area: 34277350
Amount: 319.9934
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 02-Dec-2016 13:42:13

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_014.d
 Lims ID: IC L1 Add-on
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 02-Dec-2016 11:44:30 ALS Bottle#: 46 Worklist Smp#: 14
 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\20161202-37450.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Dec-2016 14:52:41 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas

Date: 02-Dec-2016 13:56:57

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	2.909	2.913	-0.004	1.000	51838	0.4953	104		
D 47 M2-6:2FTS	429.00 > 409.00	2.925	2.915	0.010		5925112	42.5	89.6		
43 Sodium 1H,1H,2H,2H-perfluorooctane	527.00 > 507.00	3.668	3.674	-0.006	0.997	44037	0.4434	92.6		
D 42 M2-8:2FTS	529.00 > 509.00	3.678	3.676	0.002		5634375	42.2	88.1		
D 45 d3-NMeFOSAA	573.00 > 419.00	3.843	3.839	0.004		3880040	48.5	97.0		
44 N-methyl perfluorooctane sulfonami	570.00 > 419.00	3.851	3.847	0.004	1.002	30895	0.4583	91.7		
D 46 d5-NEtFOSAA	589.00 > 419.00	4.011	4.009	0.002		4464530	50.1	100		
49 N-ethyl perfluorooctane sulfonamid	584.00 > 419.00	4.020	4.016	0.004	1.002	30016	0.4382	87.6		
D 52 d-N-MeFOSA-M	515.00 > 169.00	4.108	4.105	0.003		4681022	44.0	88.0		
54 MeFOSA	512.00 > 169.00	4.115	4.110	0.005	1.000	37277	0.5000	100		
D 51 d-N-EtFOSA-M	531.00 > 169.00	4.293	4.290	0.003		4329074	42.5	85.0		
53 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.293	4.299	-0.006	1.000	35535	0.4830	96.6		

Reagents:

LCPFC2-L1_00002

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_014.d

Injection Date: 02-Dec-2016 11:44:30

Instrument ID: A8_N

Lims ID: IC L1 Add-on

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 46

Worklist Smp#: 14

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

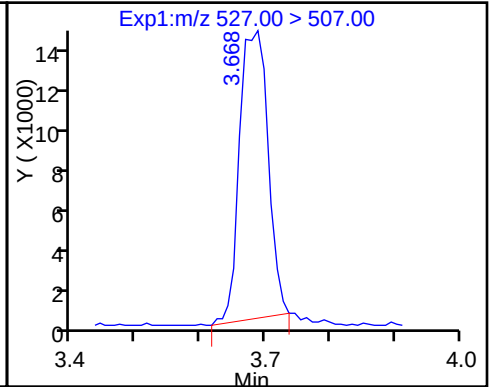
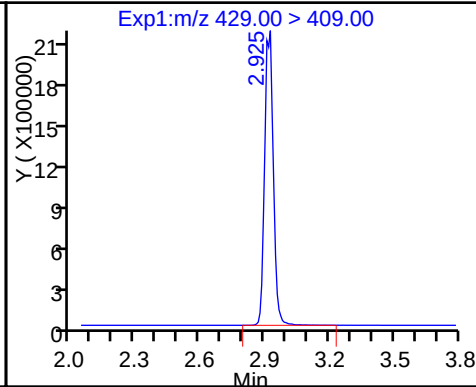
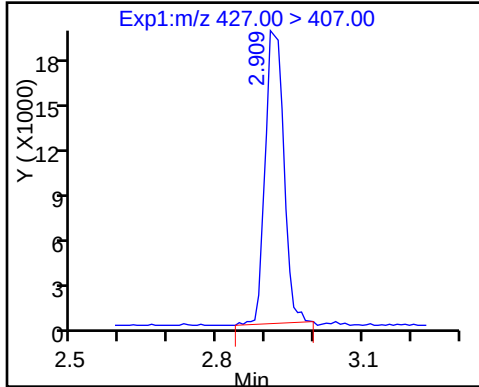
Method: A8_N

Limit Group: LC PFC_DOD ICAL

48 Sodium 1H,1H,2H,2H-perfluorooctane-1-sulfonate

D 47 M2-6:2FTS

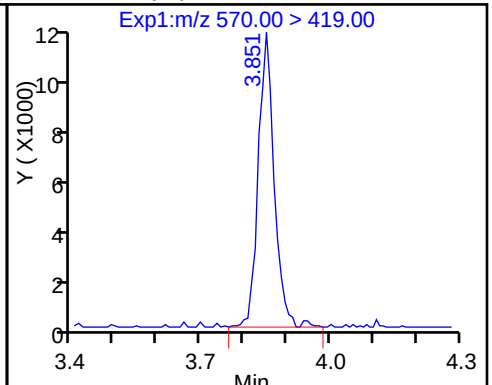
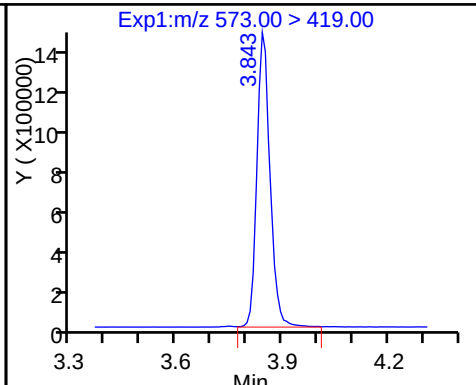
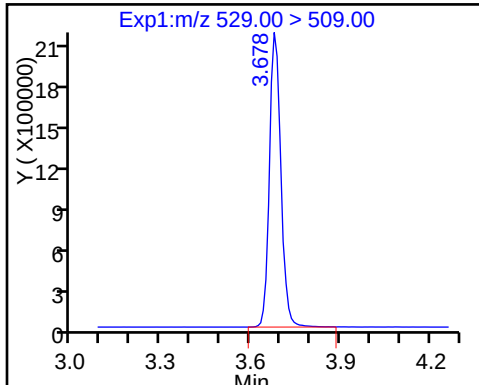
43 Sodium 1H,1H,2H,2H-perfluorooctane-1-sulfonate



D 42 M2-8:2FTS

D 45 d3-NMeFOSAA

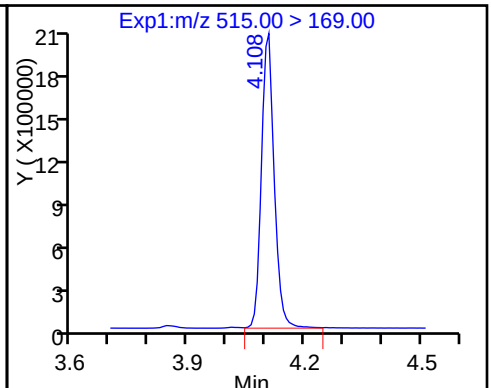
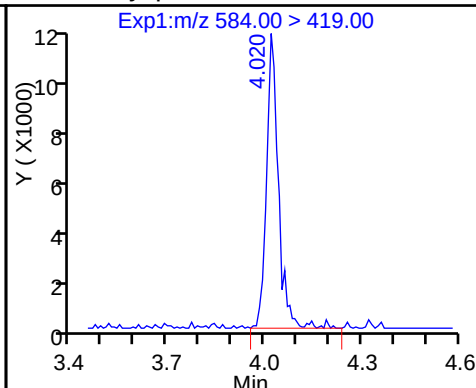
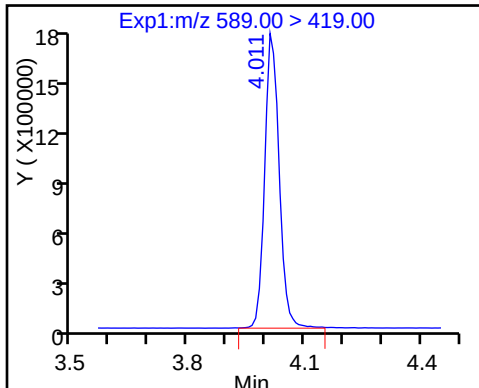
44 N-methyl perfluorooctane sulfonamide



D 46 d5-NEtFOSAA

49 N-ethyl perfluorooctane sulfonamide

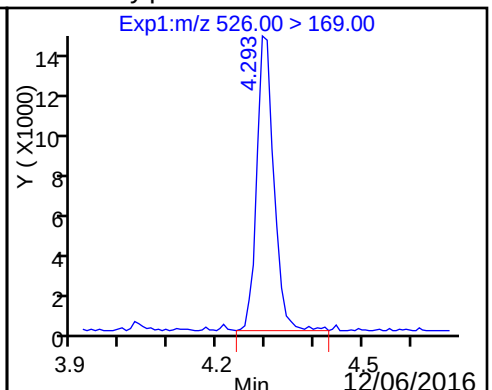
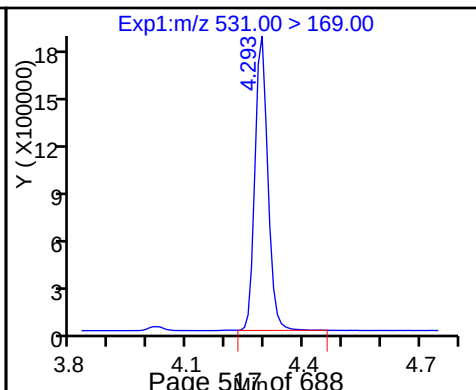
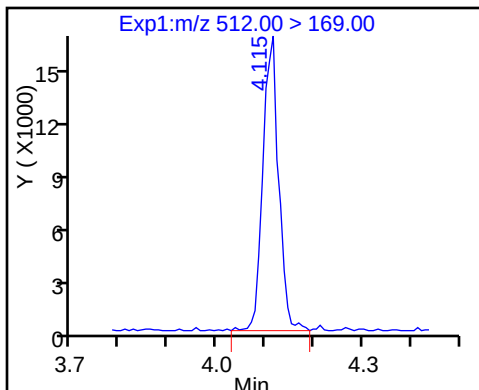
D 52 d-N-MeFOSA-M



54 MeFOSA

D 51 d-N-EtFOSA-M

53 N-ethylperfluoro-1-octanesulfonamide



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_015.d
 Lims ID: IC L2 Add-on
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 02-Dec-2016 11:52:00 ALS Bottle#: 47 Worklist Smp#: 15
 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\20161202-37450.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Dec-2016 14:52:42 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas

Date: 02-Dec-2016 13:57:07

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	2.920	2.913	0.007	1.000	88396	0.8738	92.2		
D 47 M2-6:2FTS	429.00 > 409.00	2.912	2.915	-0.003		5726516	41.1	86.6		
43 Sodium 1H,1H,2H,2H-perfluorooctane	527.00 > 507.00	3.684	3.674	0.010	1.000	94573	1.03	107		
D 42 M2-8:2FTS	529.00 > 509.00	3.684	3.676	0.008		5213436	39.1	81.5		
D 45 d3-NMeFOSAA	573.00 > 419.00	3.848	3.839	0.009		3606216	45.1	90.2		
44 N-methyl perfluorooctane sulfonami	570.00 > 419.00	3.857	3.847	0.010	1.002	59295	0.9465	94.6		
D 46 d5-NEtFOSAA	589.00 > 419.00	4.017	4.009	0.008		4134123	46.4	92.8		
49 N-ethyl perfluorooctane sulfonamid	584.00 > 419.00	4.026	4.016	0.010	1.002	56004	0.8830	88.3		
D 52 d-N-MeFOSA-M	515.00 > 169.00	4.106	4.105	0.001		5181881	48.7	97.5		
54 MeFOSA	512.00 > 169.00	4.114	4.110	0.004	1.000	73327	0.8885	88.8		
D 51 d-N-EtFOSA-M	531.00 > 169.00	4.292	4.290	0.002		5048951	49.5	99.1		
53 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.301	4.299	0.002	1.000	78846	0.9189	91.9		

Reagents:

LCPFC2-L2_00002

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_015.d

Injection Date: 02-Dec-2016 11:52:00

Instrument ID: A8_N

Lims ID: IC L2 Add-on

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 47

Worklist Smp#: 15

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

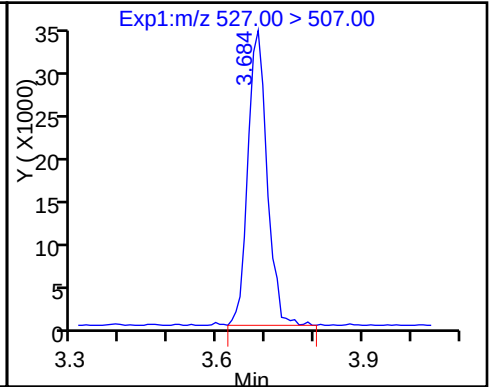
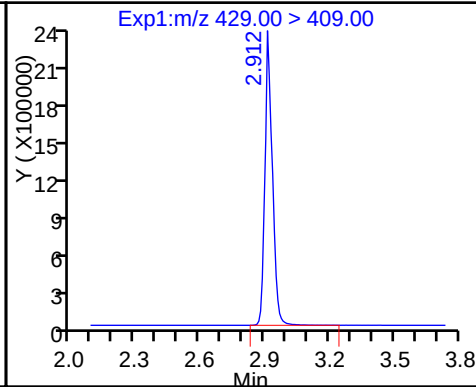
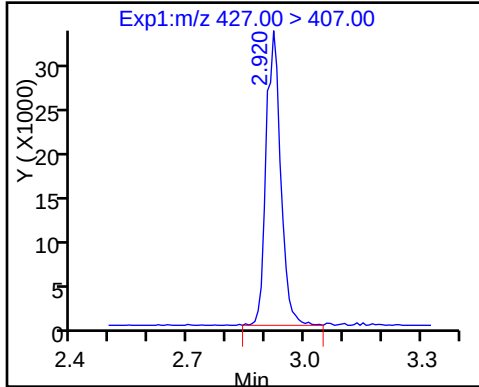
Method: A8_N

Limit Group: LC PFC_DOD ICAL

48 Sodium 1H,1H,2H,2H-perfluorooctane-1-sulfonate

D 47 M2-6:2FTS

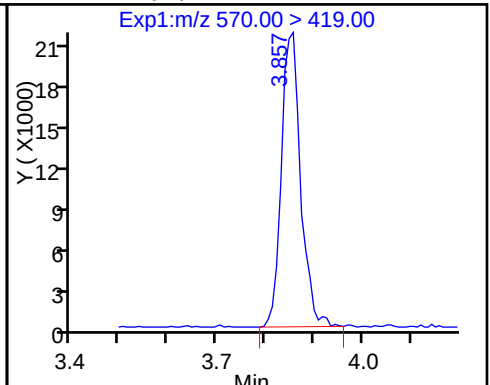
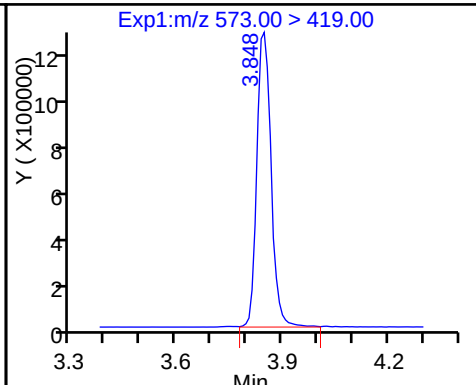
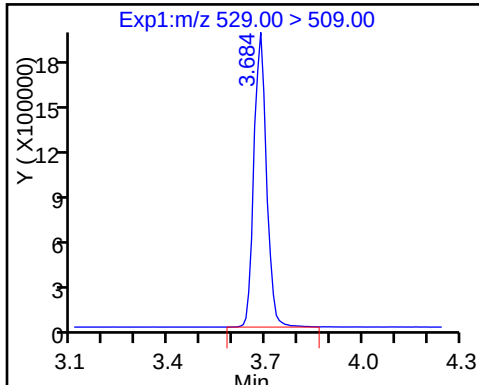
43 Sodium 1H,1H,2H,2H-perfluorooctane



D 42 M2-8:2FTS

D 45 d3-NMeFOSAA

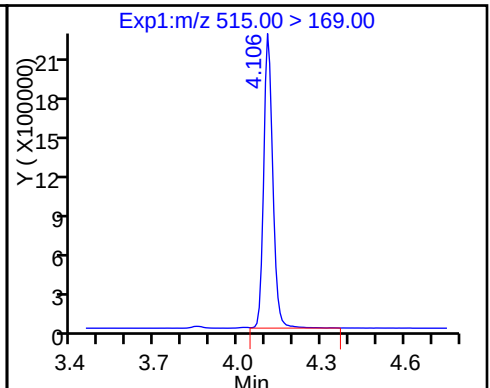
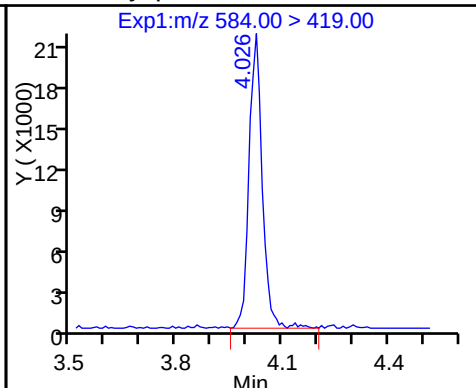
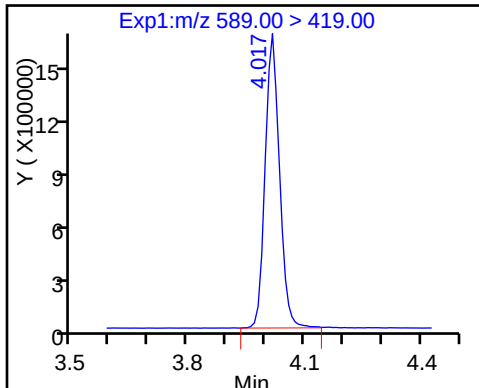
44 N-methyl perfluorooctane sulfonami



D 46 d5-NEtFOSAA

49 N-ethyl perfluorooctane sulfonamid

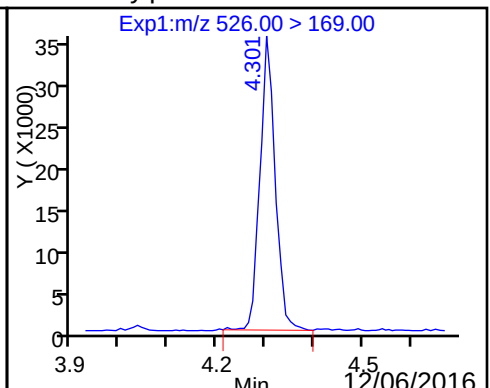
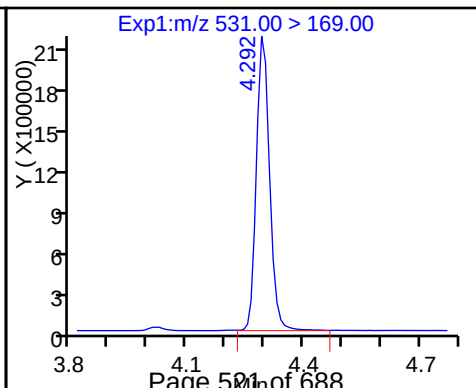
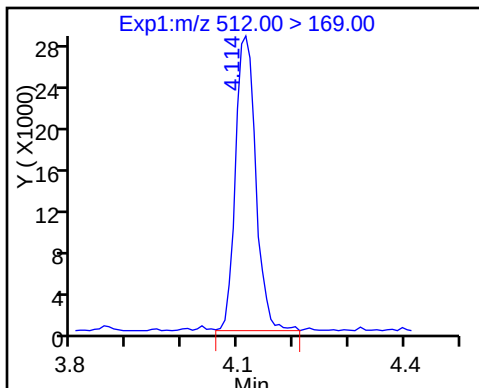
D 52 d-N-MeFOSA-M



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\20161202-37450.b\02DEC2016A_016.d
 Lims ID: IC L3 Add-on
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 02-Dec-2016 11:59:31 ALS Bottle#: 48 Worklist Smp#: 16
 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\20161202-37450.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Dec-2016 14:52:44 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas

Date: 02-Dec-2016 13:57:18

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	2.910	2.913	-0.003	1.000	492719	4.19	88.4		
D 47 M2-6:2FTS	429.00 > 409.00	2.918	2.915	0.003		6658764	47.8	101		
43 Sodium 1H,1H,2H,2H-perfluorooctane	527.00 > 507.00	3.673	3.674	-0.001	1.000	431909	4.10	85.7		
D 42 M2-8:2FTS	529.00 > 509.00	3.673	3.676	-0.003		5971752	44.7	93.4		
D 45 d3-NMeFOSAA	573.00 > 419.00	3.838	3.839	-0.001		4140205	51.8	104		
44 N-methyl perfluorooctane sulfonami	570.00 > 419.00	3.847	3.847	0.0	1.002	289882	4.03	80.6		
D 46 d5-NEtFOSAA	589.00 > 419.00	4.006	4.009	-0.003		4489327	50.4	101		
49 N-ethyl perfluorooctane sulfonamid	584.00 > 419.00	4.015	4.016	-0.001	1.002	283960	4.12	82.5		
D 52 d-N-MeFOSA-M	515.00 > 169.00	4.104	4.105	-0.001		5362314	50.4	101		
54 MeFOSA	512.00 > 169.00	4.104	4.110	-0.006	1.000	360259	4.22	84.4		
D 51 d-N-EtFOSA-M	531.00 > 169.00	4.287	4.290	-0.003		5205212	51.1	102		
53 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.297	4.299	-0.002	1.000	365734	4.13	82.7		

Reagents:

LCPFC2-L3_00002

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_016.d

Injection Date: 02-Dec-2016 11:59:31

Instrument ID: A8_N

Lims ID: IC L3 Add-on

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 48

Worklist Smp#: 16

Injection Vol: 2.0 ul

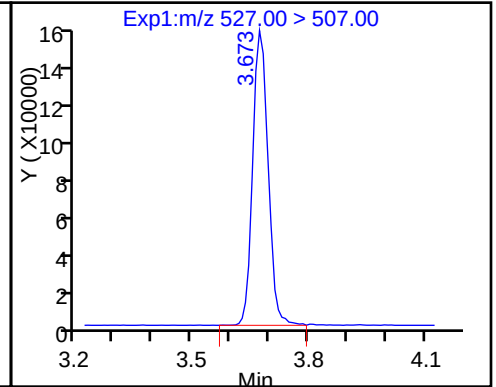
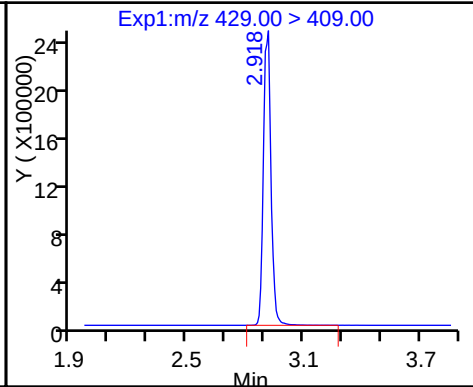
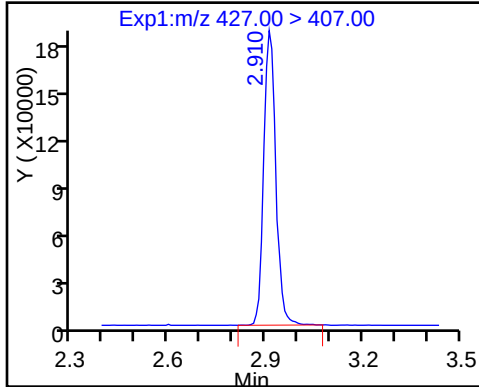
Dil. Factor: 1.0000

Method: A8_N

Limit Group: LC PFC_DOD ICAL

48 Sodium 1H,1H,2H,2H-perfluorooctane-1-sulfonate

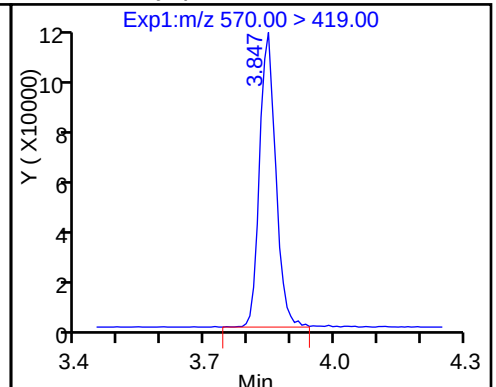
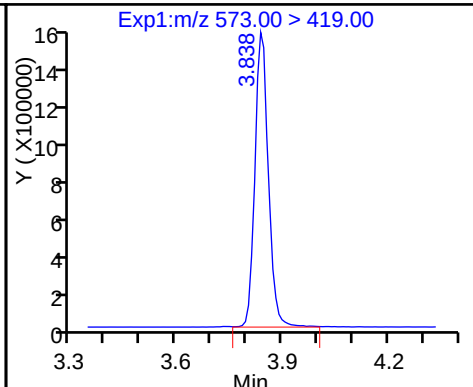
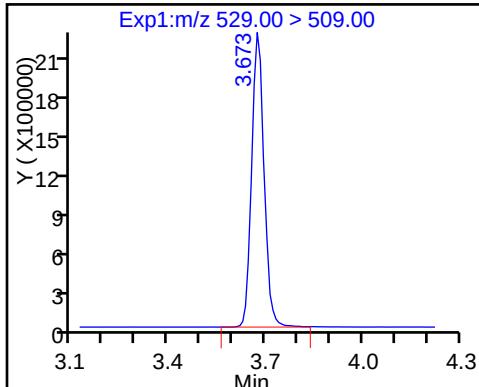
43 Sodium 1H,1H,2H,2H-perfluorooctane-1-sulfonate



D 42 M2-8:2FTS

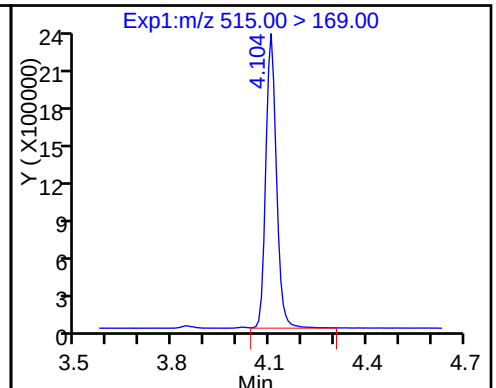
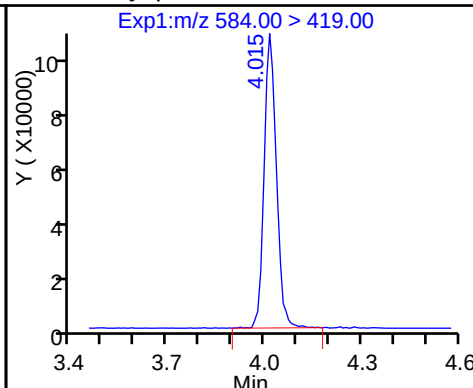
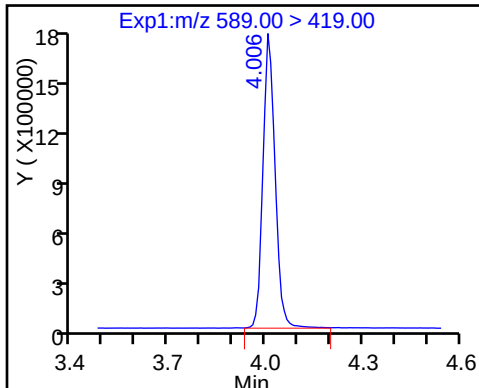
D 45 d3-NMeFOSAA

44 N-methyl perfluorooctane sulfonamide



D 46 d5-NEtFOSAA

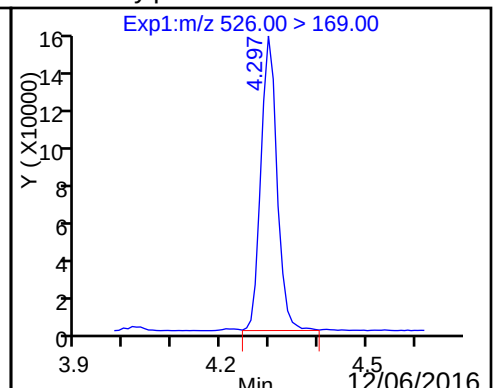
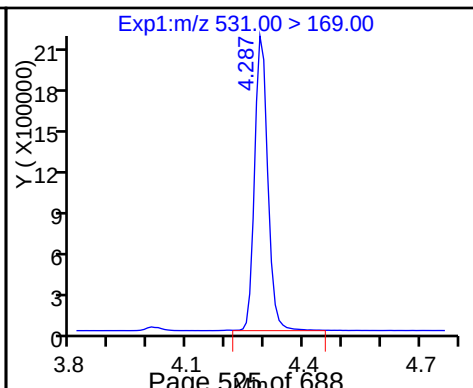
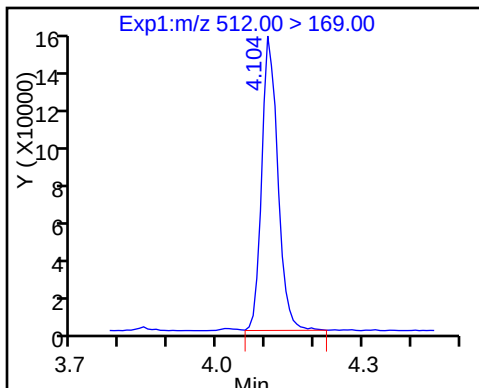
49 N-ethyl perfluorooctane sulfonamide D 52 d-N-MeFOSA-M



54 MeFOSA

D 51 d-N-EtFOSA-M

53 N-ethylperfluoro-1-octanesulfonamide



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_017.d
 Lims ID: IC L4 Add-on
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 02-Dec-2016 12:07:00 ALS Bottle#: 49 Worklist Smp#: 17
 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\20161202-37450.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Dec-2016 14:52:46 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas

Date: 02-Dec-2016 13:56:04

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	2.914	2.913	0.001	1.000	2900008	20.8	110		
D 47 M2-6:2FTS	429.00 > 409.00	2.906	2.915	-0.009		7906261	56.8	120		
43 Sodium 1H,1H,2H,2H-perfluorooctane	527.00 > 507.00	3.678	3.674	0.004	1.000	2799477	21.5	112		
D 42 M2-8:2FTS	529.00 > 509.00	3.678	3.676	0.002		7389674	55.4	116		
D 45 d3-NMeFOSAA	573.00 > 419.00	3.843	3.839	0.004		4953346	61.9	124		
44 N-methyl perfluorooctane sulfonami	570.00 > 419.00	3.843	3.847	-0.004	1.000	1829869	21.3	106		
D 46 d5-NEtFOSAA	589.00 > 419.00	4.011	4.009	0.002		5242030	58.9	118		
49 N-ethyl perfluorooctane sulfonamid	584.00 > 419.00	4.011	4.016	-0.005	1.000	1881436	23.4	117		
D 52 d-N-MeFOSA-M	515.00 > 169.00	4.104	4.105	-0.001		5889991	55.4	111		
54 MeFOSA	512.00 > 169.00	4.112	4.110	0.002	1.000	2129108	22.7	113		
D 51 d-N-EtFOSA-M	531.00 > 169.00	4.293	4.290	0.003		5611197	55.1	110		
53 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.302	4.299	0.003	1.000	2187091	22.9	115		

Reagents:

LCPFC2-L4_00003

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_017.d

Injection Date: 02-Dec-2016 12:07:00

Instrument ID: A8_N

Lims ID: IC L4 Add-on

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#:

49

Worklist Smp#: 17

Injection Vol: 2.0 ul

Dil. Factor:

1.0000

Method: A8_N

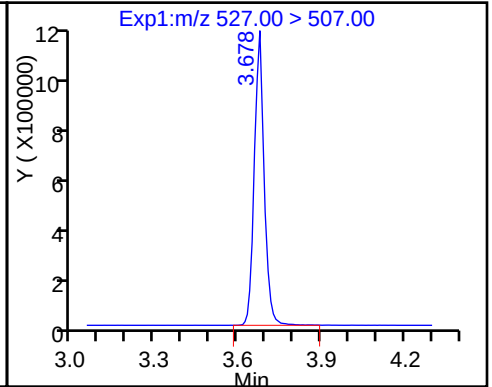
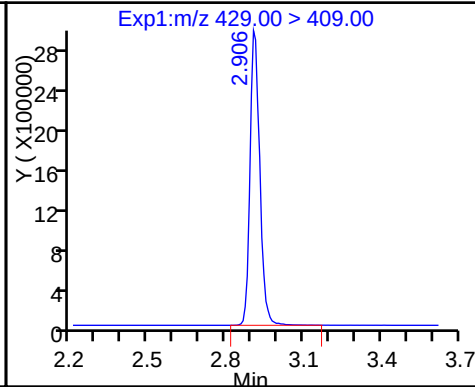
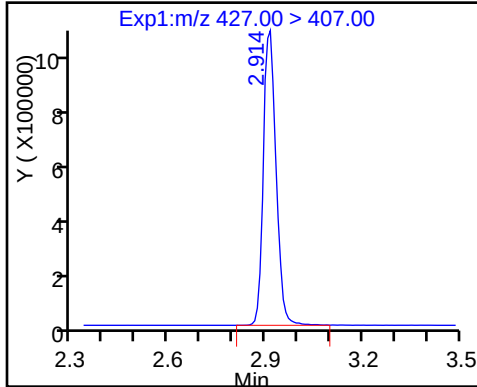
Limit Group:

LC PFC_DOD ICAL

48 Sodium 1H,1H,2H,2H-perfluorooctane

D 47 M2-6:2FTS

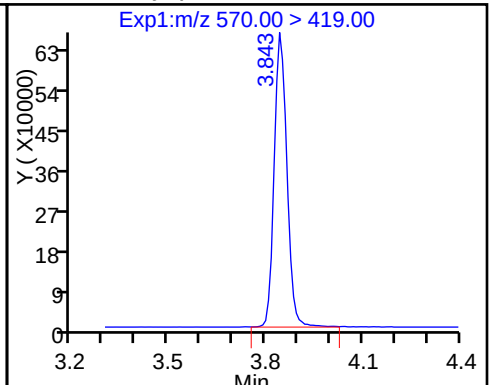
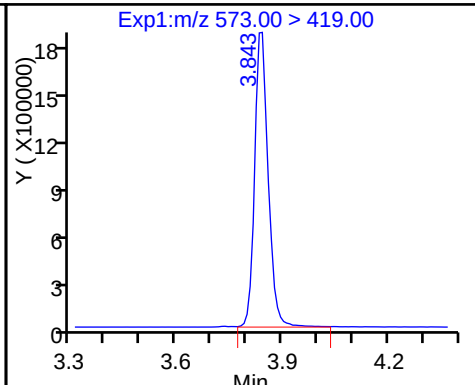
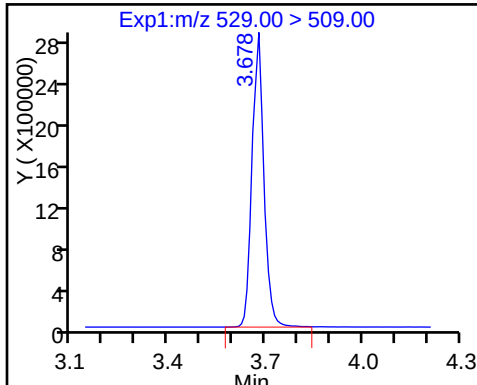
43 Sodium 1H,1H,2H,2H-perfluorooctane



D 42 M2-8:2FTS

D 45 d3-NMeFOSAA

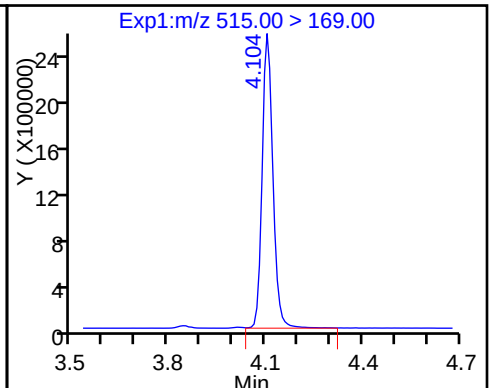
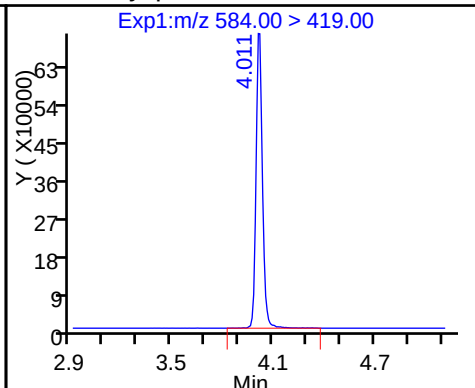
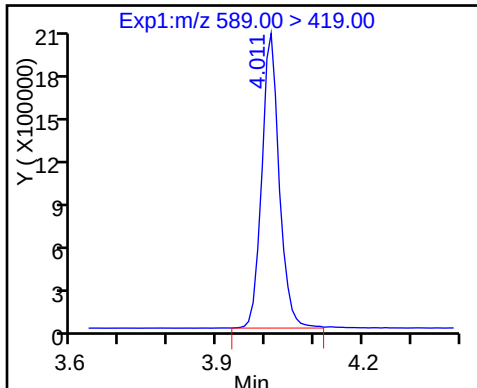
44 N-methyl perfluorooctane sulfonami



D 46 d5-NEtFOSAA

49 N-ethyl perfluorooctane sulfonamid

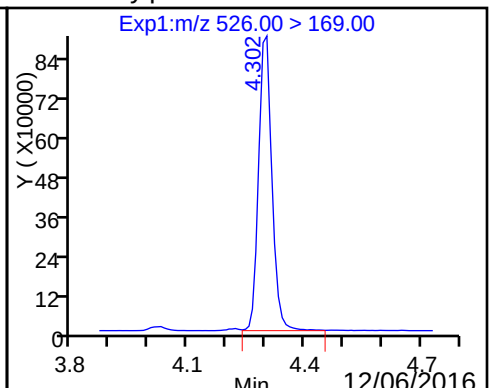
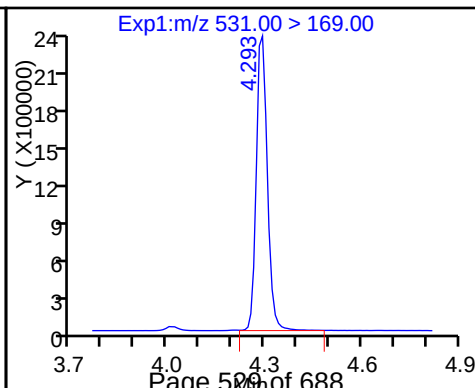
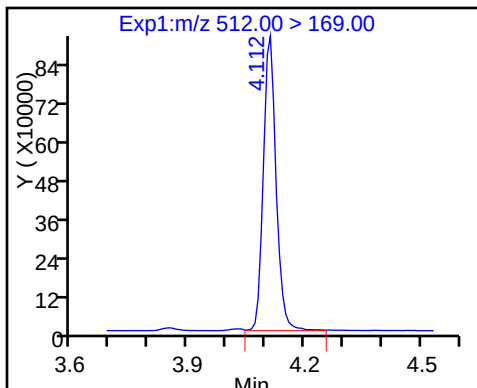
D 52 d-N-MeFOSA-M



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\20161202-37450.b\02DEC2016A_018.d
 Lims ID: IC L5 Add-on
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 02-Dec-2016 12:14:30 ALS Bottle#: 50 Worklist Smp#: 18
 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\20161202-37450.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Dec-2016 14:52:47 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas

Date: 02-Dec-2016 13:57:38

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	2.919	2.913	0.006	1.000	5633441	57.1	120		
D 47 M2-6:2FTS	429.00 > 409.00	2.911	2.915	-0.004		5586093	40.1	84.4		
43 Sodium 1H,1H,2H,2H-perfluorooctane	527.00 > 507.00	3.674	3.674	0.0	1.000	5753486	55.8	116		
D 42 M2-8:2FTS	529.00 > 509.00	3.674	3.676	-0.002		5851766	43.8	91.5		
D 45 d3-NMeFOSAA	573.00 > 419.00	3.839	3.839	0.0		3442292	43.0	86.1		
44 N-methyl perfluorooctane sulfonami	570.00 > 419.00	3.847	3.847	0.0	1.002	3696988	61.8	124		
D 46 d5-NEtFOSAA	589.00 > 419.00	4.007	4.009	-0.002		3869672	43.4	86.9		
49 N-ethyl perfluorooctane sulfonamid	584.00 > 419.00	4.016	4.016	0.0	1.002	3546696	59.7	119		
D 52 d-N-MeFOSA-M	515.00 > 169.00	4.100	4.105	-0.005		4967092	46.7	93.4		
54 MeFOSA	512.00 > 169.00	4.108	4.110	-0.002	1.000	4836683	61.1	122		
D 51 d-N-EtFOSA-M	531.00 > 169.00	4.285	4.290	-0.005		4857179	47.7	95.3		
53 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.295	4.299	-0.004	1.000	5044937	61.1	122		

Reagents:

LCPFC2-L5_00002

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_018.d

Injection Date: 02-Dec-2016 12:14:30

Instrument ID: A8_N

Lims ID: IC L5 Add-on

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#:

50

Worklist Smp#: 18

Injection Vol: 2.0 ul

Dil. Factor:

1.0000

Method: A8_N

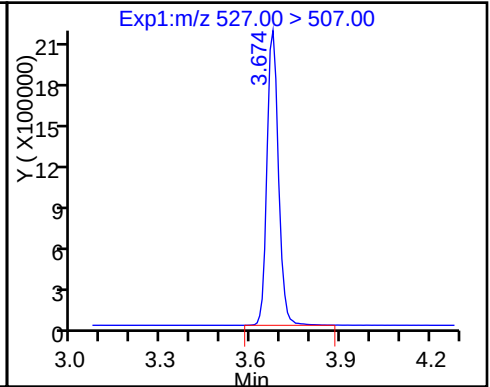
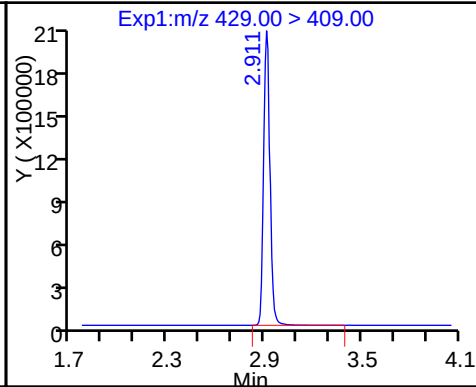
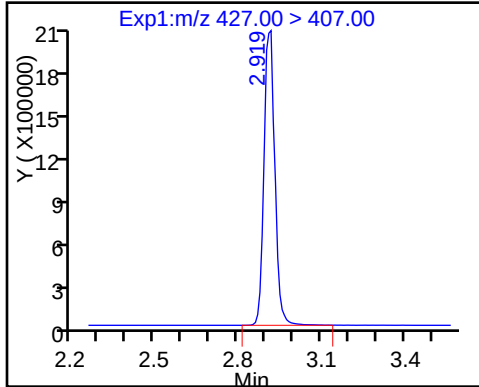
Limit Group:

LC PFC_DOD ICAL

48 Sodium 1H,1H,2H,2H-perfluorooctane-1-sulfonate

D 47 M2-6:2FTS

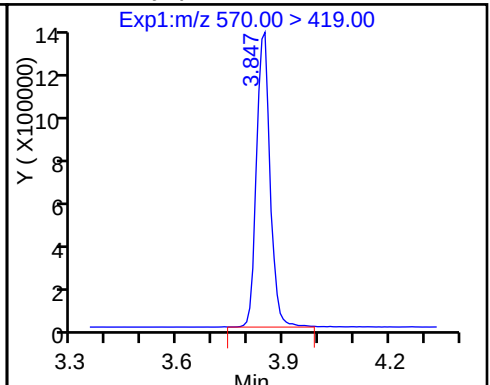
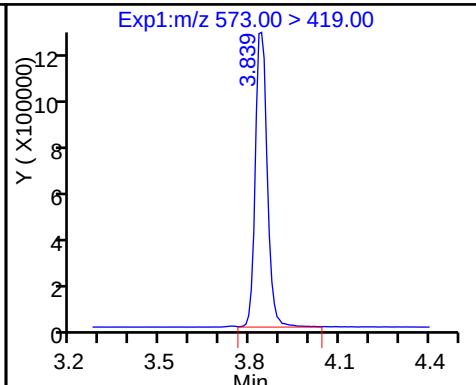
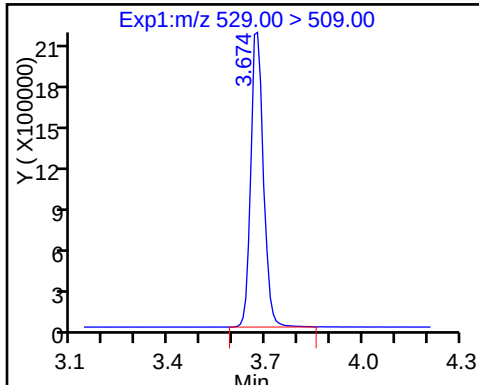
43 Sodium 1H,1H,2H,2H-perfluorooctane



D 42 M2-8:2FTS

D 45 d3-NMeFOSAA

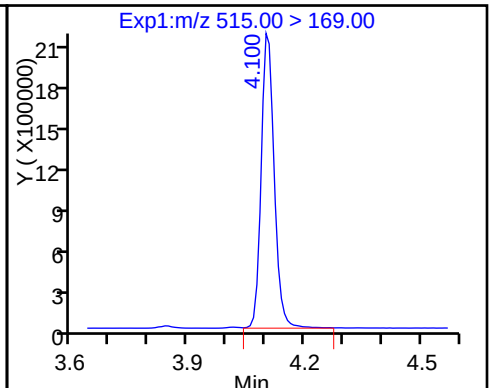
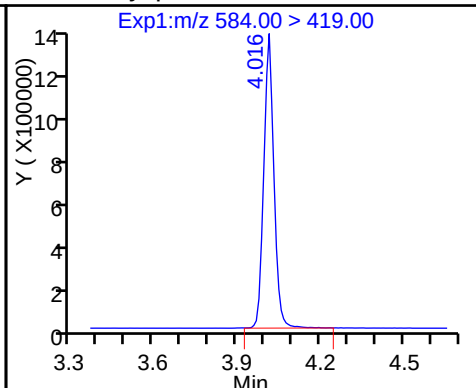
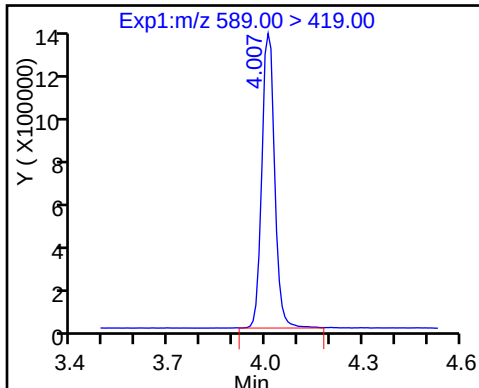
44 N-methyl perfluorooctane sulfonami



D 46 d5-NEtFOSAA

49 N-ethyl perfluorooctane sulfonamid

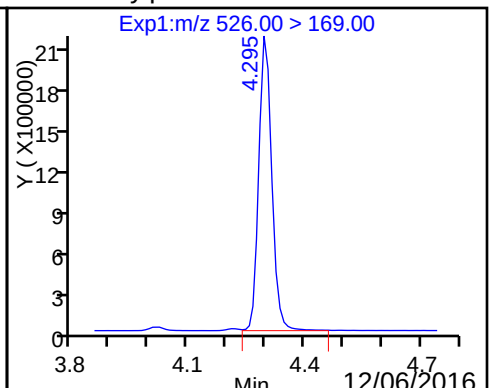
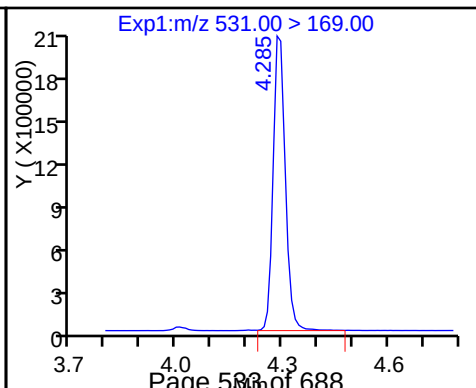
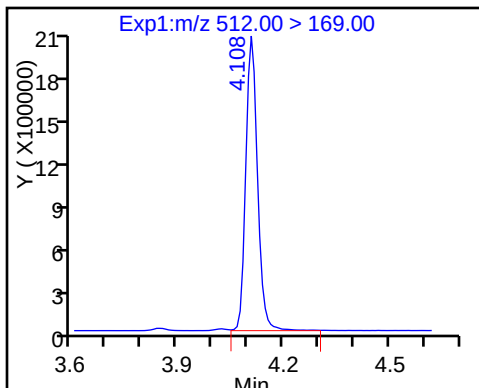
D 52 d-N-MeFOSA-M



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\20161202-37450.b\02DEC2016A_019.d
 Lims ID: IC L6 Add-on
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 02-Dec-2016 12:22:00 ALS Bottle#: 51 Worklist Smp#: 19
 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\20161202-37450.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Dec-2016 14:52:49 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas

Date: 02-Dec-2016 13:57:48

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	2.904	2.913	-0.009	1.000	20031946	169.7	89.5		
D 47 M2-6:2FTS	429.00 > 409.00	2.912	2.915	-0.003		6682949	48.0	101		
43 Sodium 1H,1H,2H,2H-perfluorooctane	527.00 > 507.00	3.667	3.674	-0.007	1.000	19463965	164.3	85.7		
D 42 M2-8:2FTS	529.00 > 509.00	3.667	3.676	-0.009		6721067	50.3	105		
D 45 d3-NMeFOSAA	573.00 > 419.00	3.824	3.839	-0.015		4016571	50.2	100		
44 N-methyl perfluorooctane sulfonami	570.00 > 419.00	3.832	3.847	-0.015	1.002	13773335	197.4	98.7		
D 46 d5-NEtFOSAA	589.00 > 419.00	4.000	4.009	-0.009		4474975	50.2	100		
49 N-ethyl perfluorooctane sulfonamid	584.00 > 419.00	4.009	4.016	-0.007	1.002	14065497	204.9	102		
D 52 d-N-MeFOSA-M	515.00 > 169.00	4.102	4.105	-0.003		4927555	46.3	92.7		
54 MeFOSA	512.00 > 169.00	4.102	4.110	-0.008	1.000	15814534	201.5	101		
D 51 d-N-EtFOSA-M	531.00 > 169.00	4.286	4.290	-0.004		4696896	46.1	92.2		
53 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.296	4.299	-0.003	1.000	16550291	207.3	104		

Reagents:

LCPFC2-L6_00002

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_019.d

Injection Date: 02-Dec-2016 12:22:00

Instrument ID: A8_N

Lims ID: IC L6 Add-on

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 51

Worklist Smp#: 19

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

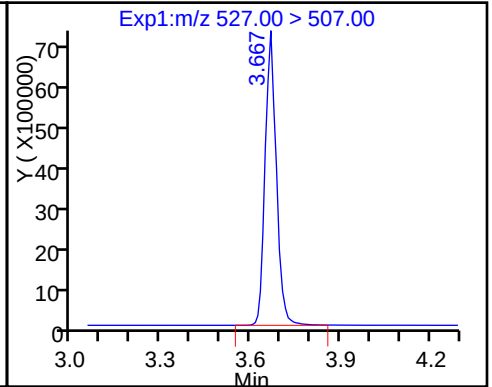
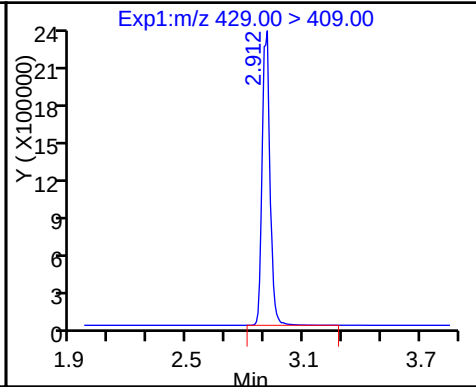
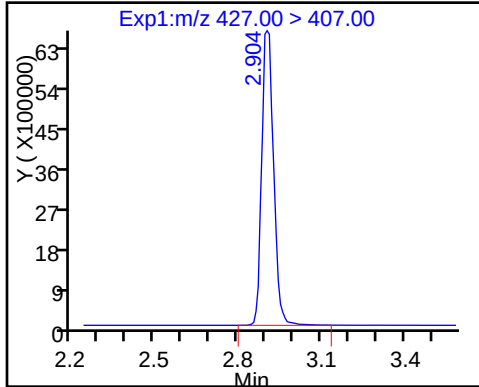
Method: A8_N

Limit Group: LC PFC_DOD ICAL

48 Sodium 1H,1H,2H,2H-perfluorooctane

D 47 M2-6:2FTS

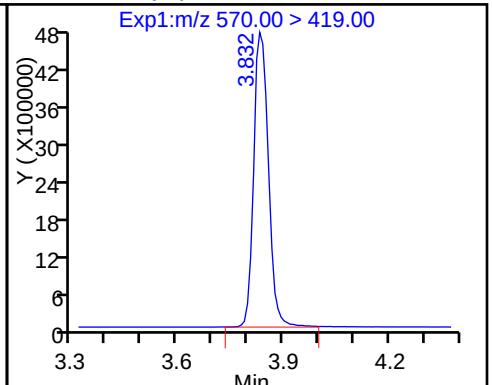
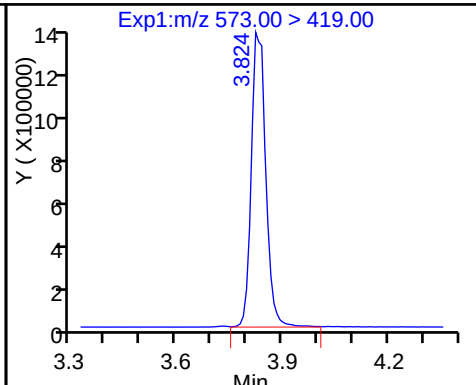
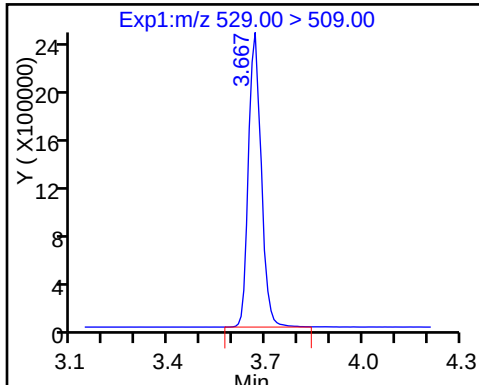
43 Sodium 1H,1H,2H,2H-perfluorooctane



D 42 M2-8:2FTS

D 45 d3-NMeFOSAA

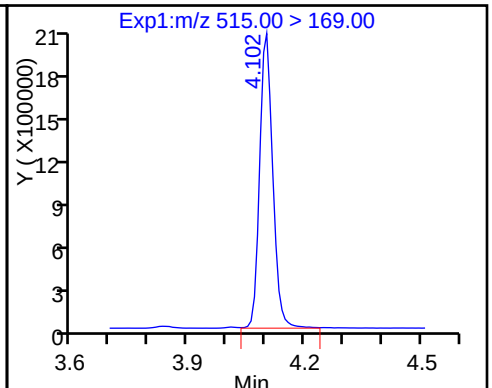
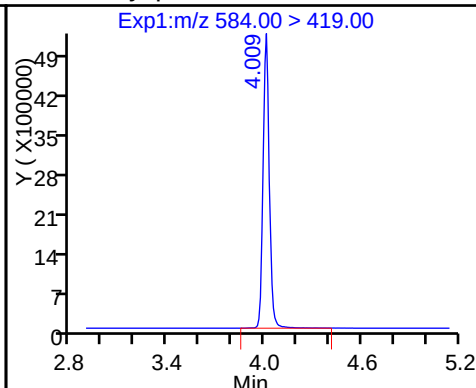
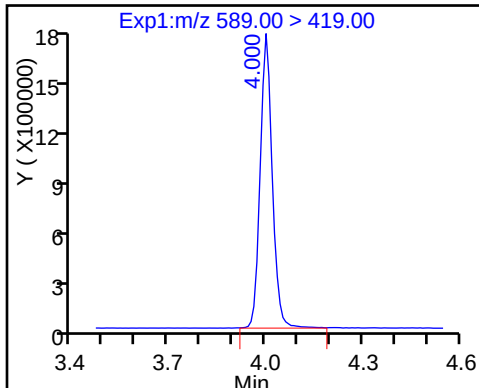
44 N-methyl perfluorooctane sulfonami



D 46 d5-NEtFOSAA

49 N-ethyl perfluorooctane sulfonamid

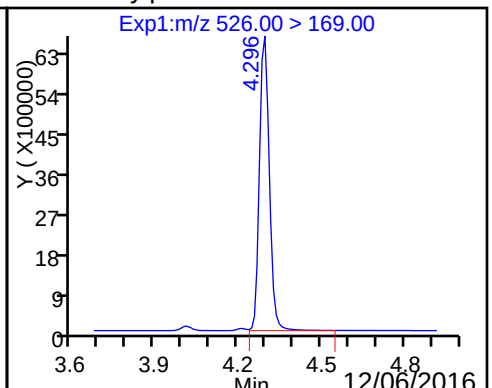
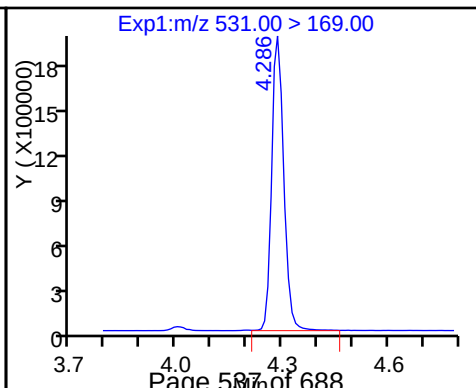
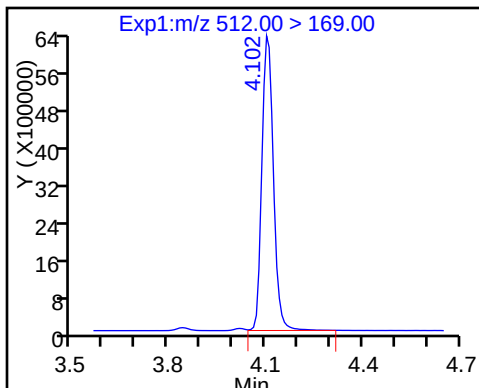
D 52 d-N-MeFOSA-M



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\20161202-37450.b\02DEC2016A_020.d
 Lims ID: IC L7 Add-on
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 02-Dec-2016 12:29:29 ALS Bottle#: 52 Worklist Smp#: 20
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L7 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\20161202-37450.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Dec-2016 14:52:50 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas

Date: 02-Dec-2016 13:58:03

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	2.917	2.913	0.004	1.000	37224925	269.4	71.0		
D 47 M2-6:2FTS	429.00 > 409.00	2.917	2.915	0.002		7823475	56.2	118		
43 Sodium 1H,1H,2H,2H-perfluorooctane	527.00 > 507.00	3.676	3.674	0.002	1.000	37119838	263.9	68.9		
D 42 M2-8:2FTS	529.00 > 509.00	3.676	3.676	0.0		7980965	59.8	125		
D 45 d3-NMeFOSAA	573.00 > 419.00	3.841	3.839	0.002		3959155	49.5	99.0		
44 N-methyl perfluorooctane sulfonami	570.00 > 419.00	3.849	3.847	0.002	1.002	28724886	417.6	104		
D 46 d5-NEtFOSAA	589.00 > 419.00	4.009	4.009	0.0		4497788	50.5	101		
49 N-ethyl perfluorooctane sulfonamid	584.00 > 419.00	4.018	4.016	0.002	1.002	28356327	410.9	103		
D 52 d-N-MeFOSA-M	515.00 > 169.00	4.110	4.105	0.005		6208758	58.4	117		
54 MeFOSA	512.00 > 169.00	4.118	4.110	0.008	1.000	35701676	361.0	90.3		
D 51 d-N-EtFOSA-M	531.00 > 169.00	4.299	4.290	0.009		5918873	58.1	116		
53 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.309	4.299	0.010	1.000	35493503	352.9	88.2		

Reagents:

LCPFC2-L7_00002

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Injection Date: 02-Dec-2016 12:29:29

Instrument ID: A8_N

Lims ID: IC L7 Add-on

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 52

Worklist Smp#: 20

Injection Vol: 2.0 ul

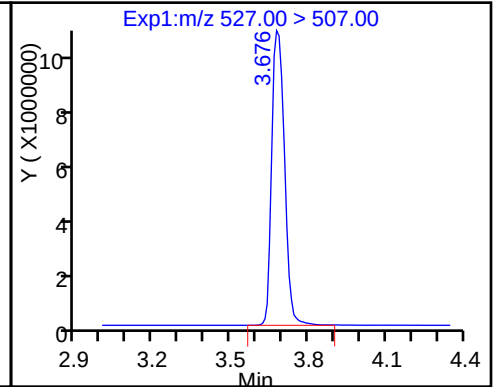
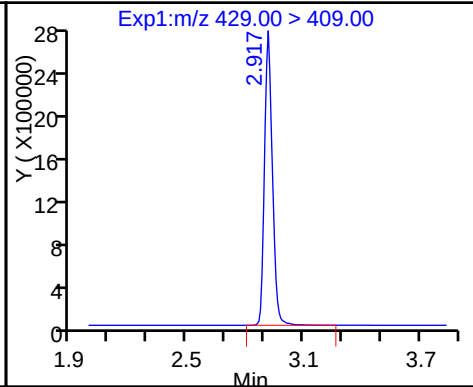
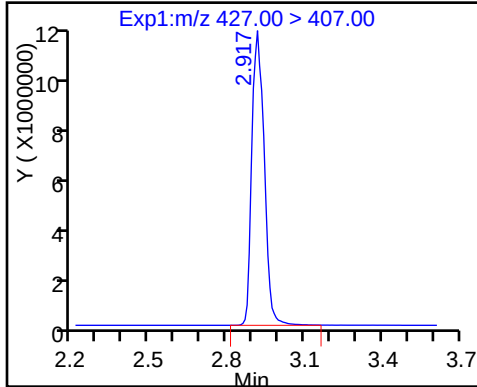
Dil. Factor: 1.0000

Method: A8_N

Limit Group: LC PFC_DOD ICAL

48 Sodium 1H,1H,2H,2H-perfluorooctane-1-sulfonate

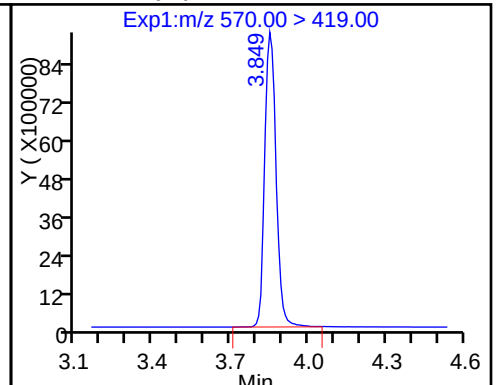
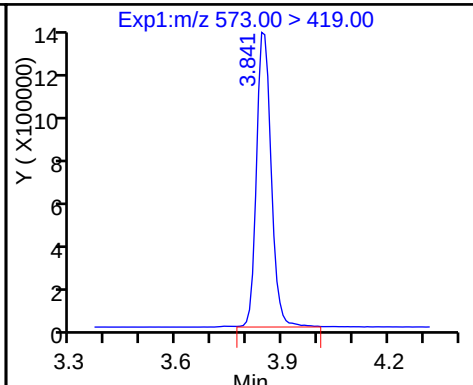
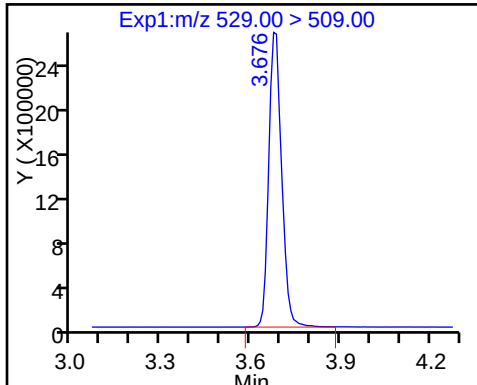
43 Sodium 1H,1H,2H,2H-perfluorooctane-1-sulfonate



D 42 M2-8:2FTS

D 45 d3-NMeFOSAA

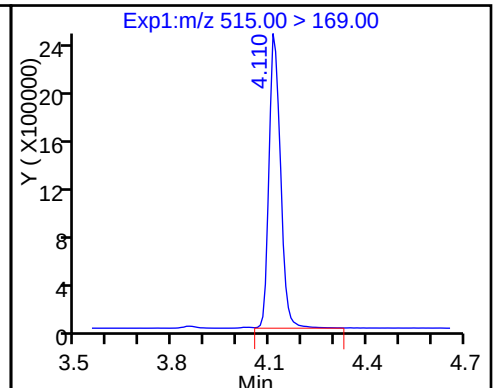
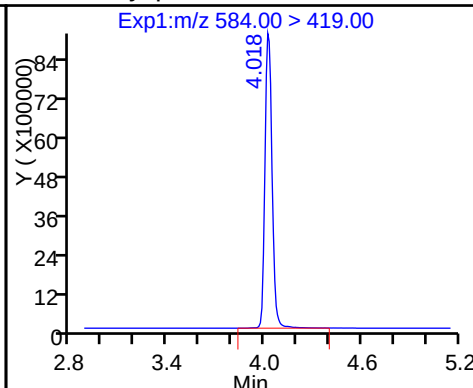
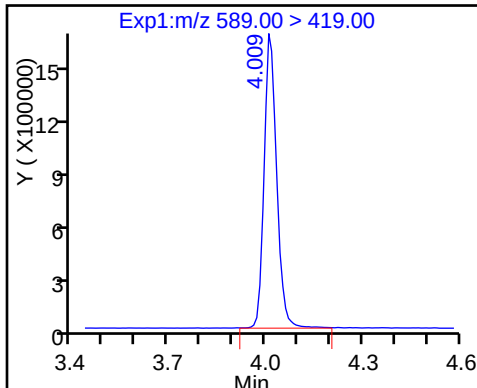
44 N-methyl perfluorooctane sulfonamide



D 46 d5-NEtFOSAA

49 N-ethyl perfluorooctane sulfonamide

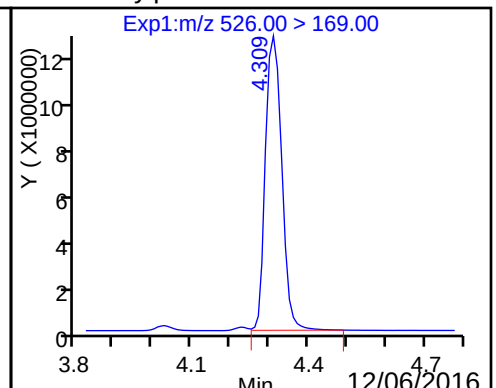
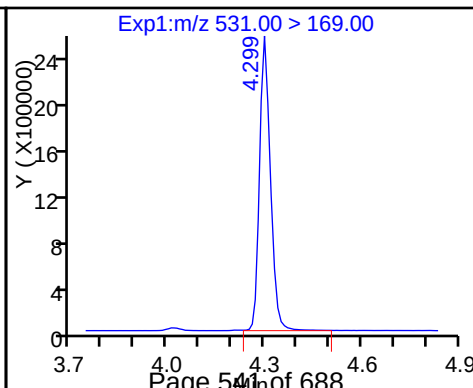
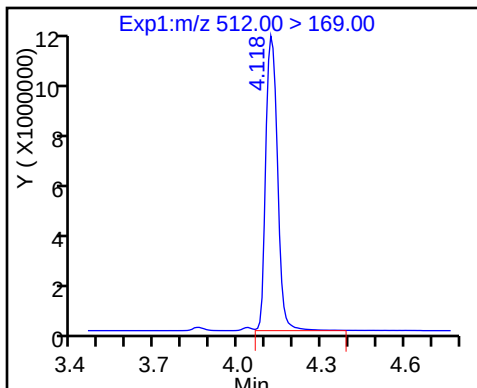
D 52 d-N-MeFOSA-M



54 MeFOSA

D 51 d-N-EtFOSA-M

53 N-ethylperfluoro-1-octanesulfonamide



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1
 SDG No.: _____
 Lab Sample ID: ICV 320-140382/12 Calibration Date: 12/02/2016 11:29
 Instrument ID: A8_N Calib Start Date: 12/02/2016 10:29
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/02/2016 12:29
 Lab File ID: 02DEC2016A_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8853	0.8586		48.5	50.0	-3.0	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.041	0.9596		46.1	50.0	-7.8	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.613	1.563		42.9	44.3	-3.1	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9559	0.9142		47.8	50.0	-4.4	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.034	0.9597		46.4	50.0	-7.2	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.060	0.9737		43.4	47.3	-8.1	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.020	0.9852		48.3	50.0	-3.4	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.169	1.153		47.0	47.6	-1.4	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.087	0.9062		39.8	47.8	-16.7	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9912	0.9578		48.3	50.0	-3.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9353	0.9322		49.8	50.0	-0.3	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9693	0.9099		46.9	50.0	-6.1	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6271	0.5941		45.7	48.3	-5.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.060	0.9368		44.2	50.0	-11.6	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9465	0.8975		47.4	50.0	-5.2	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.040	0.9223		44.3	50.0	-11.3	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.932	1.845		47.7	50.0	-4.5	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.014		50.7	50.0	1.3	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.7915	1.026		65.3	50.0	29.6*	25.0
13C4 PFBA	Ave	340300	315108		46.3	50.0	-7.4	50.0
13C5-PFPeA	Ave	270194	250588		46.4	50.0	-7.3	50.0
13C2 PFHxA	Ave	246480	226803		46.0	50.0	-8.0	50.0
13C4-PFHpA	Ave	210510	197868		47.0	50.0	-6.0	50.0
18O2 PFHxS	Ave	302453	298386		46.7	47.3	-1.3	50.0
13C4 PFOA	Ave	219411	208024		47.4	50.0	-5.2	50.0
13C4 PFOS	Ave	244616	241692		47.2	47.8	-1.2	50.0
13C5 PFNA	Ave	178109	162087		45.5	50.0	-9.0	50.0
13C8 FOSA	Ave	414253	389267		47.0	50.0	-6.0	50.0
13C2 PFDA	Ave	166067	160722		48.4	50.0	-3.2	50.0
13C2 PFUnA	Ave	125779	115580		45.9	50.0	-8.1	50.0
13C2 PFDoA	Ave	116905	110755		47.4	50.0	-5.3	50.0
13C2-PFTeA	Ave	241899	239157		49.4	50.0	-1.1	50.0
13C2-PFHxDA	Ave	130373	130244		50.0	50.0	-0.1	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_012.d
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 02-Dec-2016 11:29:31 ALS Bottle#: 44 Worklist Smp#: 12
 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\20161202-37450.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Dec-2016 16:10:33 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK025

First Level Reviewer: barnettj

Date: 02-Dec-2016 16:10:33

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	1.598	1.615	-0.017		15755416	46.3		92.6	1226463	
1 Perfluorobutyric acid										
212.90 > 169.00	1.606	1.617	-0.011	1.000	13527367	48.5			149480	
D 4 13C5-PFPeA										
267.90 > 223.00	1.897	1.918	-0.021		12529404	46.4		92.7	998019	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.897	1.920	-0.023	1.000	12023152	46.1			109623	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.936	1.961	-0.025	1.000	20638621	42.9				
298.90 > 99.00	1.936	1.961	-0.025	1.000	9604105		2.15(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.213	2.239	-0.026		11340128	46.0		92.0	872752	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.213	2.241	-0.028	1.000	10367089	47.8			388218	
D 11 13C4-PFHpA										
367.00 > 322.00	2.566	2.599	-0.033		9893393	47.0		94.0	1263133	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.573	2.600	-0.027	1.000	9494636	46.4			159398	
D 10 18O2 PFHxS										
403.00 > 84.00	2.589	2.614	-0.025		14113680	46.7		98.7	888579	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.589	2.615	-0.026	1.000	13727834	43.4				
15 Perfluorooctanoic acid										
413.00 > 369.00	2.951	2.984	-0.033	1.000	10247185	48.3			136835	
413.00 > 169.00	2.943	2.984	-0.041	0.997	6439506		1.59(0.90-1.10)		319423	
D 14 13C4 PFOA										
417.00 > 372.00	2.951	2.984	-0.033		10401182	47.4		94.8	602068	

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	2.960	2.986	-0.026	1.000	13266199	47.0			
D 17 13C4 PFOS	503.00 > 80.00	3.329	3.365	-0.036		11552855	47.2	98.8	248324	
18 Perfluorooctane sulfonic acid	499.00 > 80.00	3.329	3.366	-0.037	1.000	10458074	39.8		1887102	
	499.00 > 99.00	3.329	3.366	-0.037	1.000	2551302	4.10(0.90-1.10)		466085	
20 Perfluorononanoic acid	463.00 > 419.00	3.336	3.373	-0.037	1.000	7761968	48.3		97406	
D 19 13C5 PFNA	468.00 > 423.00	3.336	3.374	-0.038		8104346	45.5	91.0	462400	
D 21 13C8 FOSA	506.00 > 78.00	3.633	3.651	-0.018		19463355	47.0	94.0	341722	
22 Perfluorooctane Sulfonamide	498.00 > 78.00	3.633	3.656	-0.023	1.000	18143701	49.8		283379	
24 Perfluorodecanoic acid	513.00 > 469.00	3.698	3.738	-0.040	1.000	7312192	46.9		156765	
D 23 13C2 PFDA	515.00 > 470.00	3.698	3.738	-0.040		8036093	48.4	96.8	321643	
26 Perfluorodecane Sulfonic acid	599.00 > 80.00	4.010	4.049	-0.039	1.000	6928568	45.7			
D 27 13C2 PFUnA	565.00 > 520.00	4.029	4.070	-0.041		5778978	45.9	91.9	312840	
28 Perfluoroundecanoic acid	563.00 > 519.00	4.029	4.071	-0.042	1.000	5413472	44.2		130245	
D 30 13C2 PFDaA	615.00 > 570.00	4.330	4.370	-0.040		5537768	47.4	94.7	163474	
29 Perfluorododecanoic acid	613.00 > 569.00	4.330	4.370	-0.040	1.000	4970310	47.4		6635	
31 Perfluorotridecanoic acid	663.00 > 619.00	4.600	4.636	-0.036	1.000	5107276	44.3		7225	
D 32 13C2-PFTeDA	715.00 > 670.00	4.837	4.882	-0.045		11957860	49.4	98.9	638807	
33 Perfluorotetradecanoic acid	712.50 > 668.90	4.837	4.884	-0.047	1.000	10218574	47.7		5085	
	713.00 > 169.00	4.837	4.884	-0.047	1.000	1568084	6.52(0.00-0.00)		100324	
D 34 13C2-PFHxDA	815.00 > 770.00	5.274	5.320	-0.046		6512177	50.0	99.9	123170	
35 Perfluorohexadecanoic acid	813.00 > 769.00	5.274	5.320	-0.046	1.000	5617133	50.7		6502	
36 Perfluorooctadecanoic acid	913.00 > 869.00	5.664	5.720	-0.056	1.000	5682438	65.3		7600	

Reagents:

LCPFCIC_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_012.d

Injection Date: 02-Dec-2016 11:29:31

Instrument ID: A8_N

Lims ID: ICV

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 44

Worklist Smp#: 12

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

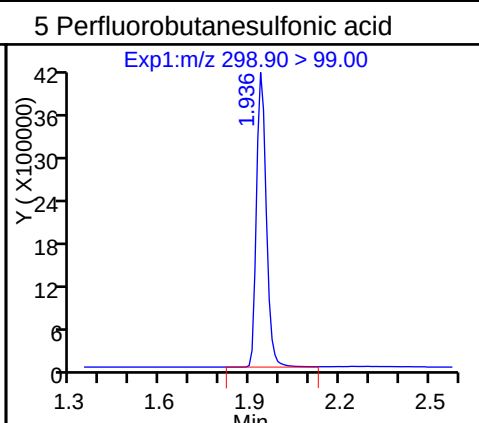
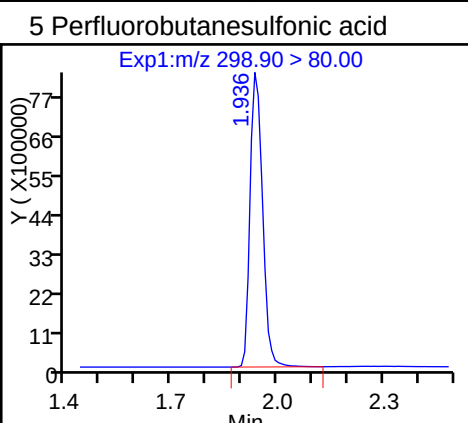
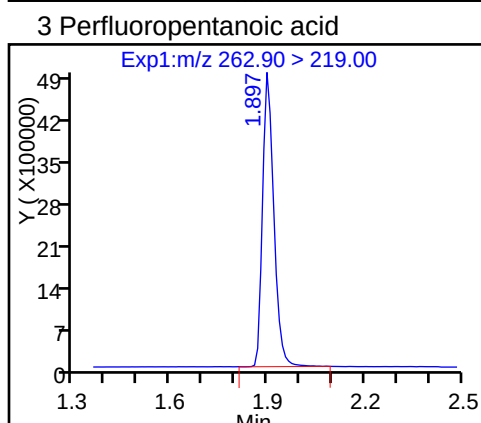
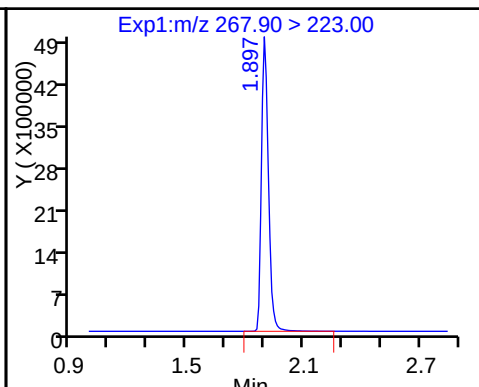
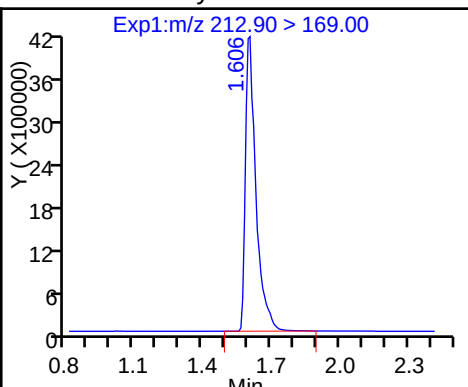
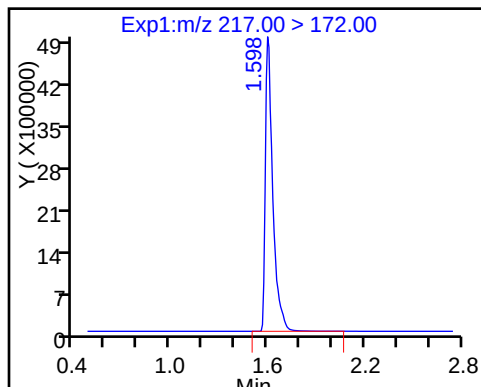
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

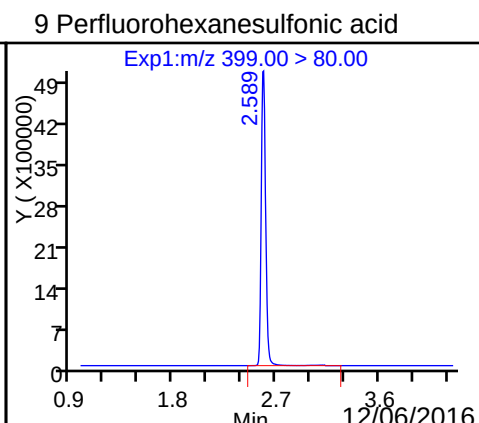
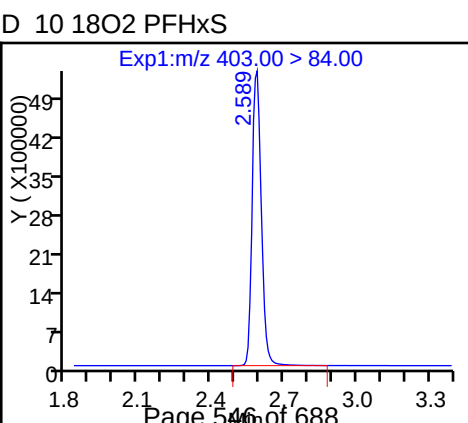
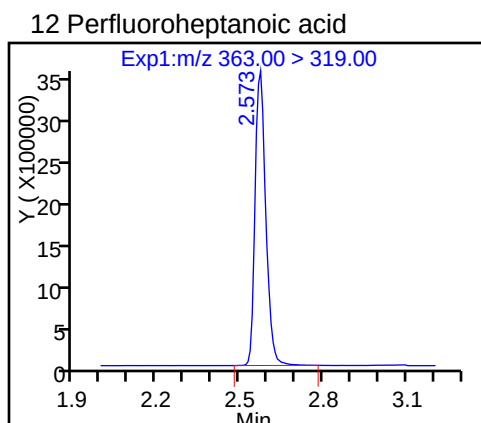
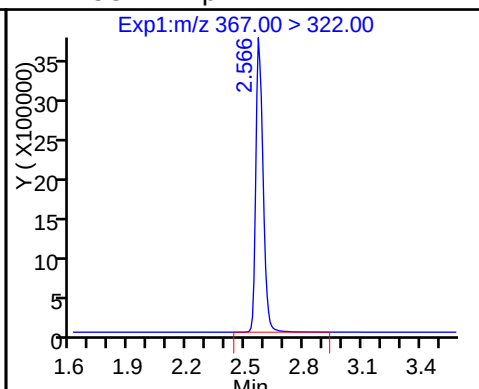
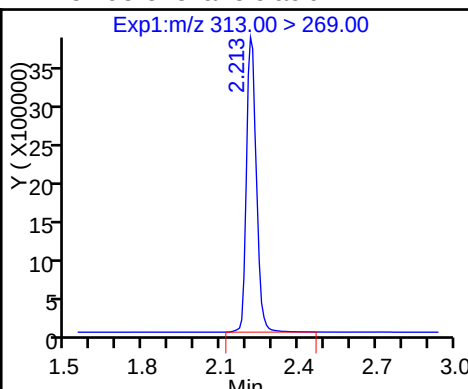
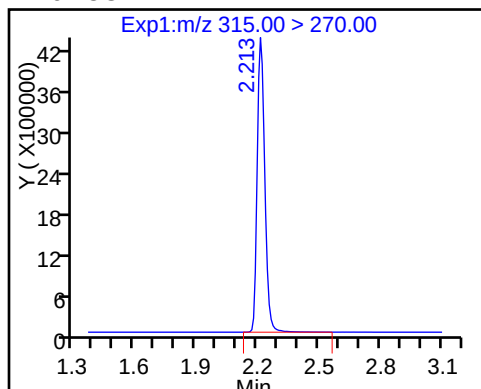
D 4 13C5-PFPeA

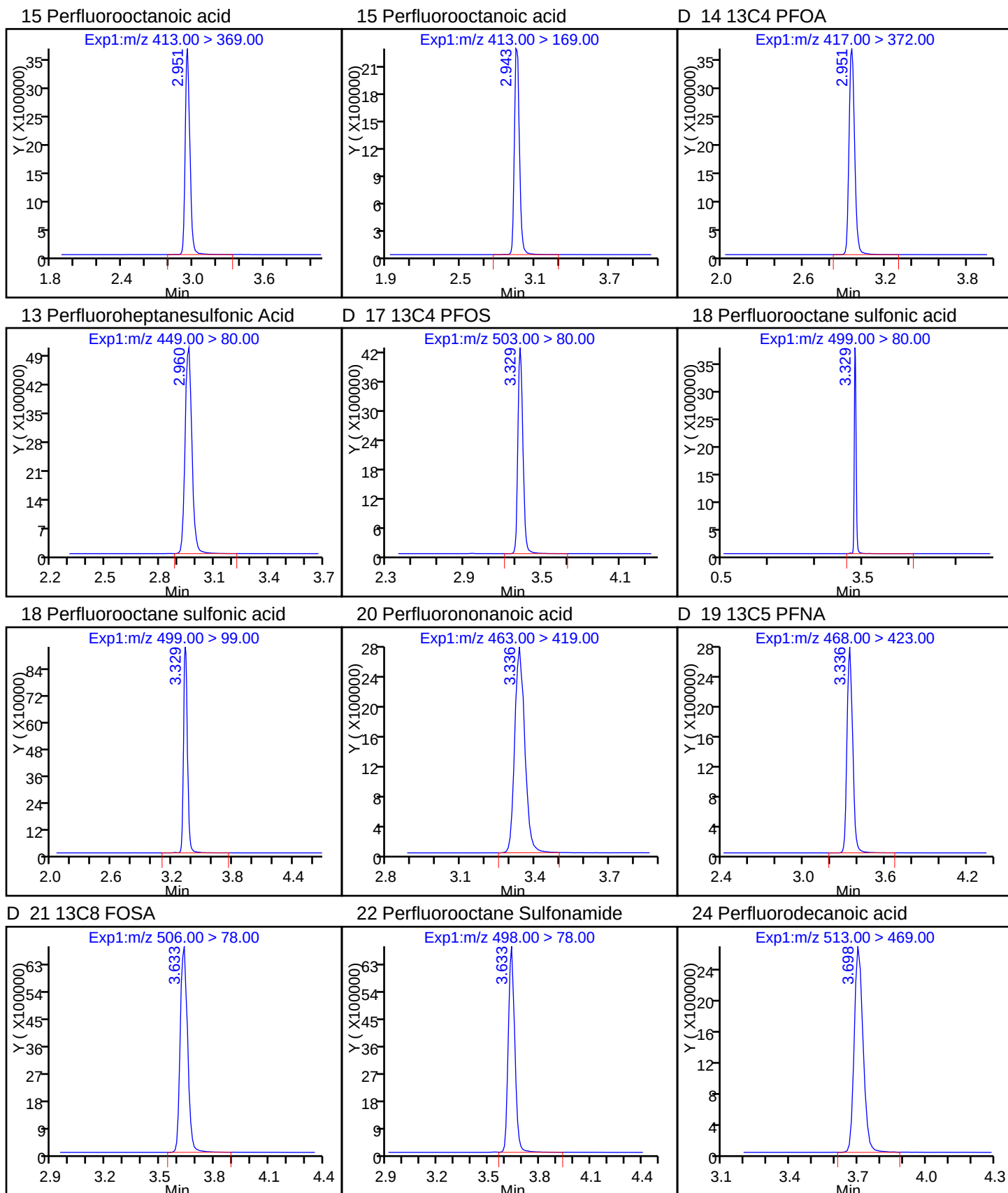


D 6 13C2 PFHxA

7 Perfluorohexanoic acid

D 11 13C4-PFHpA

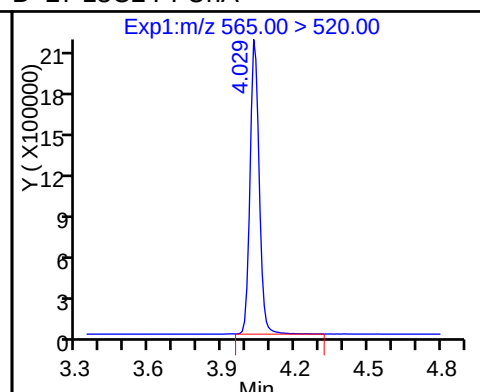
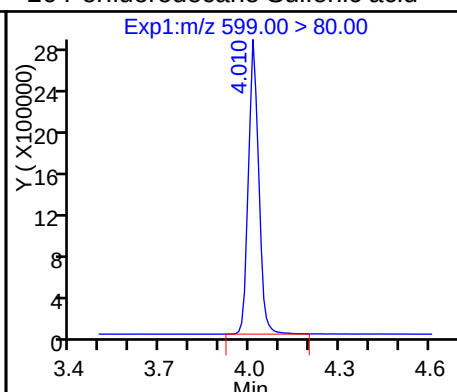
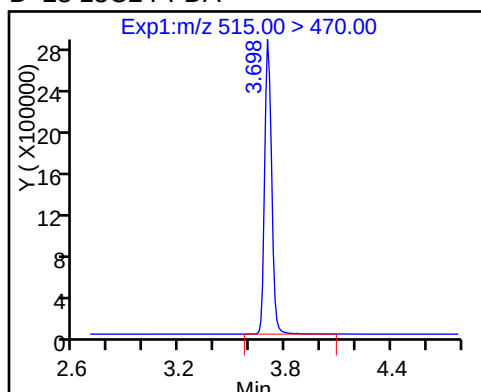




D 23 13C2 PFDA

26 Perfluorodecane Sulfonic acid

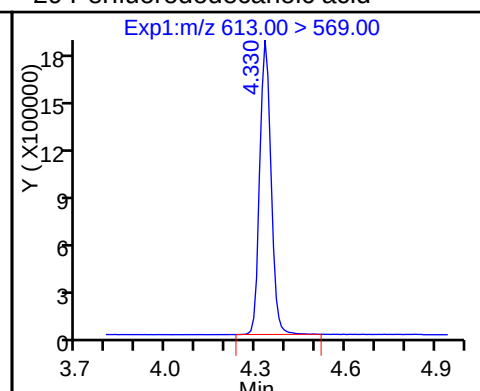
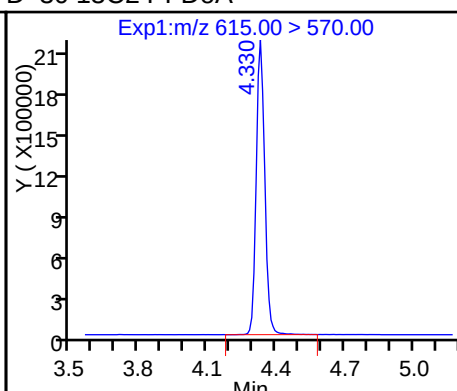
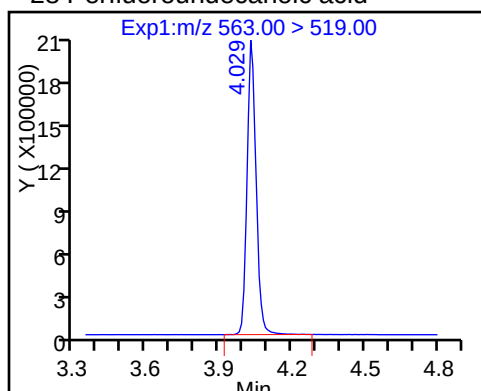
D 27 13C2 PFUnA



28 Perfluoroundecanoic acid

D 30 13C2 PFDaA

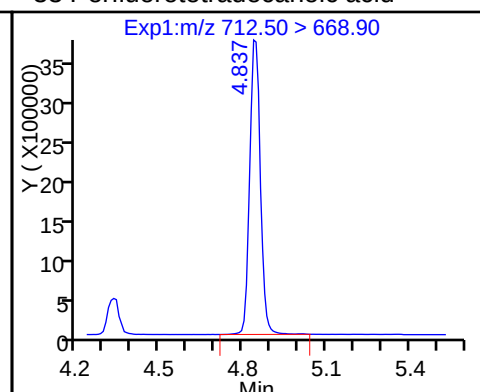
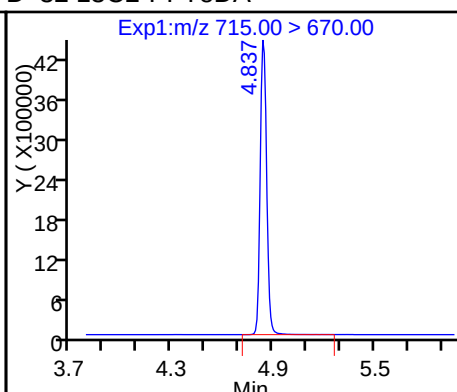
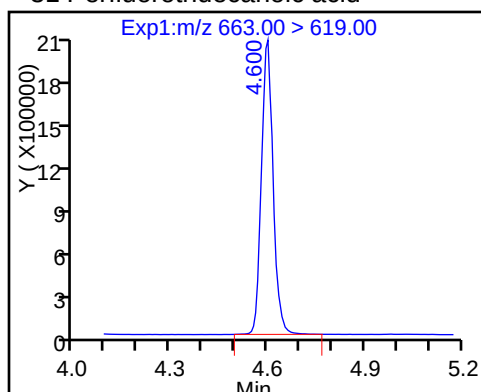
29 Perfluorododecanoic acid



31 Perfluorotridecanoic acid

D 32 13C2-PFTeDA

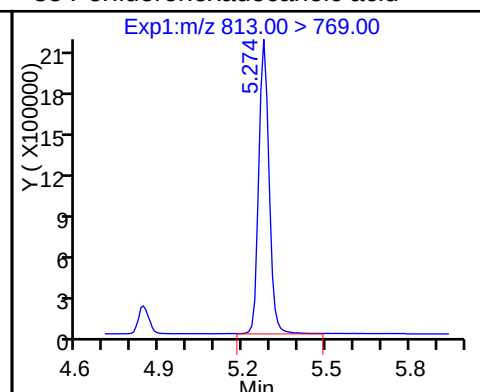
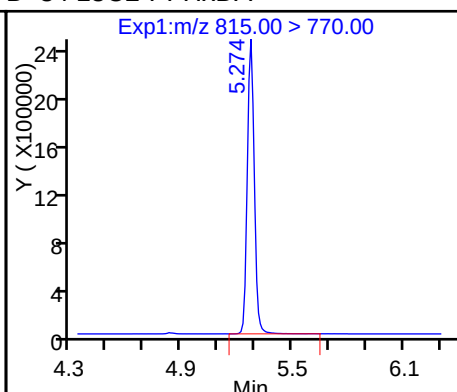
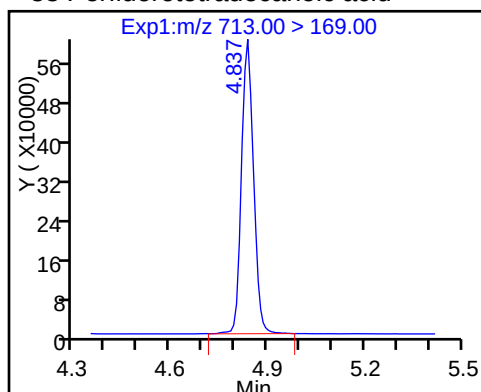
33 Perfluorotetradecanoic acid



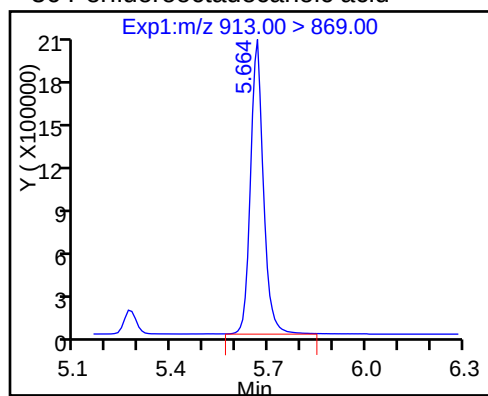
33 Perfluorotetradecanoic acid

D 34 13C2-PFHxDA

35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1
 SDG No.: _____
 Lab Sample ID: CCV 320-140429/2 Calibration Date: 12/02/2016 14:37
 Instrument ID: A8_N Calib Start Date: 12/02/2016 10:29
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/02/2016 12:29
 Lab File ID: 02DEC2016B_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	0.8853	0.8936		50.5	50.0	0.9	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.041	0.9928		47.7	50.0	-4.6	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.613	1.603		43.9	44.2	-0.6	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9559	0.9446		49.4	50.0	-1.2	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.034	1.038		50.2	50.0	0.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.060	1.067		45.8	45.5	0.7	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.020	1.035		50.7	50.0	1.5	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.169	1.172		47.7	47.6	0.2	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.087	1.084		46.3	46.4	-0.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9912	0.9755		49.2	50.0	-1.6	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9353	0.9066		48.5	50.0	-3.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9693	0.9463		48.8	50.0	-2.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6271	0.6643		51.1	48.2	5.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.060	0.9661		45.6	50.0	-8.8	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9465	0.9288		49.1	50.0	-1.9	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.040	0.9649		46.4	50.0	-7.2	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.932	1.864		48.2	50.0	-3.5	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9713		48.5	50.0	-3.0	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.7915	1.043		66.3	50.0	31.7*	25.0
13C4 PFBA	Ave	340300	339545		49.9	50.0	-0.2	50.0
13C5-PFPeA	Ave	270194	261302		48.4	50.0	-3.3	50.0
13C2 PFHxA	Ave	246480	229526		46.6	50.0	-6.9	50.0
13C4-PFHpA	Ave	210510	202011		48.0	50.0	-4.0	50.0
18O2 PFHxS	Ave	302453	317474		49.6	47.3	5.0	50.0
13C4 PFOA	Ave	219411	216146		49.3	50.0	-1.5	50.0
13C4 PFOS	Ave	244616	251364		49.1	47.8	2.8	50.0
13C5 PFNA	Ave	178109	169399		47.6	50.0	-4.9	50.0
13C8 FOSA	Ave	414253	402881		48.6	50.0	-2.7	50.0
13C2 PFDA	Ave	166067	161124		48.5	50.0	-3.0	50.0
13C2 PFUnA	Ave	125779	118770		47.2	50.0	-5.6	50.0
13C2 PFDoA	Ave	116905	109471		46.8	50.0	-6.4	50.0
13C2-PFTeDA	Ave	241899	223925		46.3	50.0	-7.4	50.0
13C2-PFHxDA	Ave	130373	118805		45.6	50.0	-8.9	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37461.b\02DEC2016B_014.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 02-Dec-2016 14:37:03 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\20161202-37461.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 04-Dec-2016 18:06:11 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK025

First Level Reviewer: chandrasenas

Date: 04-Dec-2016 18:06:11

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobutyric acid										
212.90 > 169.00	1.574	1.574	0.0	1.000	15171458	50.5		101	155330	
D 2 13C4 PFBA										
217.00 > 172.00	1.574	1.574	0.0		16977232	49.9		99.8	2771435	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.868	1.868	0.0	1.000	12970874	47.7		95.4	120574	
D 4 13C5-PFPeA										
267.90 > 223.00	1.868	1.868	0.0		13065075	48.4		96.7	2568563	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.907	1.907	0.0	1.000	22493915	43.9		99.4		
298.90 > 99.00	1.907	1.907	0.0	1.000	10590632		2.12(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.173	2.173	0.0	1.000	10840520	49.4		98.8	348131	
D 6 13C2 PFHxA										
315.00 > 270.00	2.173	2.173	0.0		11476282	46.6		93.1	919645	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.519	2.519	0.0	1.000	10487509	50.2		100	129458	
D 11 13C4-PFHpA										
367.00 > 322.00	2.519	2.519	0.0		10100555	48.0		96.0	962415	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.534	2.534	0.0	1.000	15406543	45.8		101		
D 10 18O2 PFHxS										
403.00 > 84.00	2.534	2.534	0.0		15016500	49.6		105	1172460	
D 14 13C4 PFOA										
417.00 > 372.00	2.886	2.886	0.0		10807294	49.3		98.5	772353	

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	2.894	0.0	1.000	11190759	50.7		101	205894	
413.00 > 169.00	2.894	2.894	0.0	1.000	6841143		1.64(0.90-1.10)		311496	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.902	2.902	0.0	1.000	14021365	47.7		100		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.267	3.267	0.0	1.000	12644938	46.3		99.7	53281	
499.00 > 99.00	3.267	3.267	0.0	1.000	2940349		4.30(0.90-1.10)		339746	
D 17 13C4 PFOS										
503.00 > 80.00	3.267	3.267	0.0		12015188	49.1		103	275554	
20 Perfluorononanoic acid										
463.00 > 419.00	3.275	3.275	0.0	1.000	8262291	49.2		98.4	153747	
D 19 13C5 PFNA										
468.00 > 423.00	3.275	3.275	0.0		8469930	47.6		95.1	605451	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.589	3.589	0.0	1.000	18261930	48.5		96.9	733539	
D 21 13C8 FOSA										
506.00 > 78.00	3.589	3.589	0.0		20144056	48.6		97.3	630987	
D 23 13C2 PFDA										
515.00 > 470.00	3.631	3.631	0.0		8056201	48.5		97.0	192938	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.631	3.631	0.0	1.000	7623608	48.8		97.6	194009	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.941	3.941	0.0	1.000	8048082	51.1		106		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.959	3.959	0.0	1.000	5737327	45.6		91.2	103207	
D 27 13C2 PFUnA										
565.00 > 520.00	3.967	3.967	0.0		5938511	47.2		94.4	310740	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.259	4.259	0.0	1.000	5083644	49.1		98.1	71841	
D 30 13C2 PFDaA										
615.00 > 570.00	4.259	4.259	0.0		5473570	46.8		93.6	186491	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.520	4.520	0.0	1.000	5281655	46.4		92.8	6905	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.772	4.772	0.0	1.000	10203271	48.2		96.5	4031	
713.00 > 169.00	4.763	4.772	-0.009	0.998	1624426		6.28(0.00-0.00)		120314	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.772	4.772	0.0		11196256	46.3		92.6	372028	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.184	5.184	0.0		5940244	45.6		91.1	99394	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.194	5.194	0.0	1.000	5316696	48.5		97.0	3968	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.562	5.562	0.0	1.000	5707122	66.3		133	7784	

Reagents:

LCPFC-L5_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37461.b\02DEC2016B_014.d

Injection Date: 02-Dec-2016 14:37:03

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 41

Worklist Smp#: 2

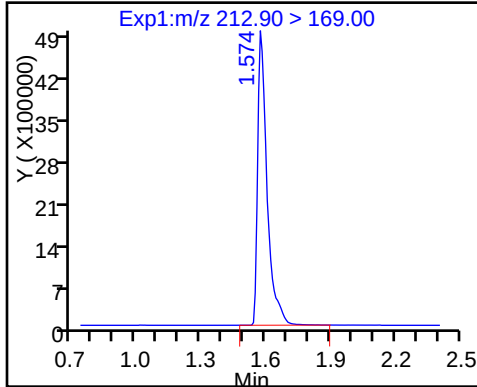
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

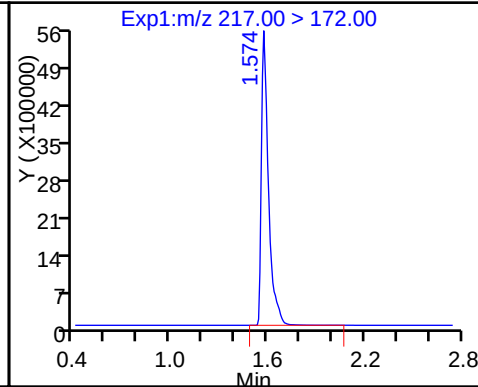
Method: A8_N

Limit Group: LC PFC_DOD ICAL

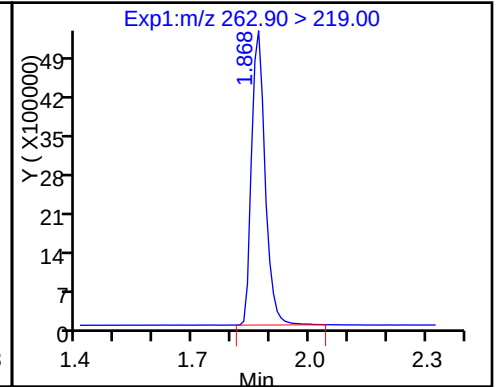
1 Perfluorobutyric acid



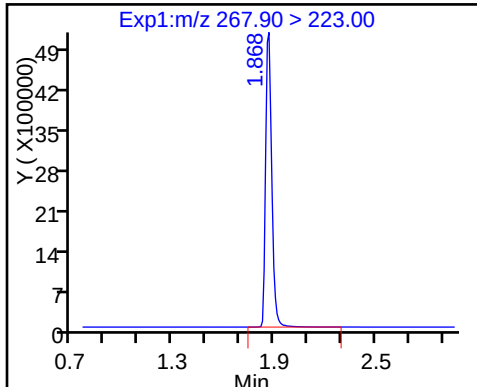
D 2 13C4 PFBA



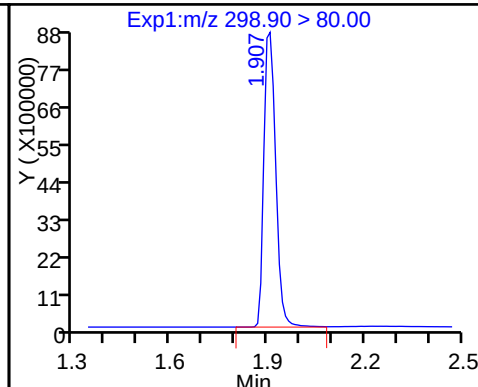
3 Perfluoropentanoic acid



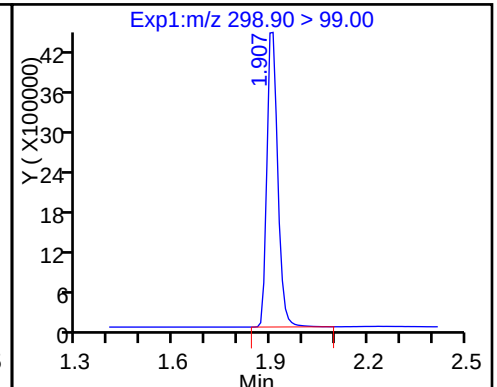
D 4 13C5-PFPeA



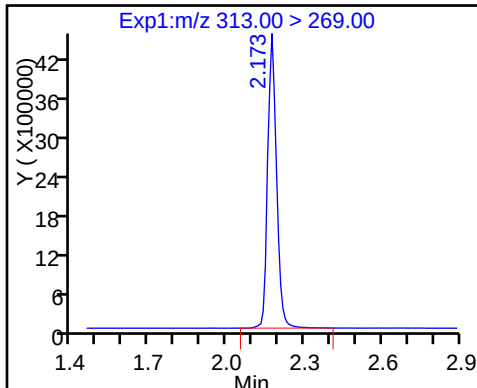
5 Perfluorobutanesulfonic acid



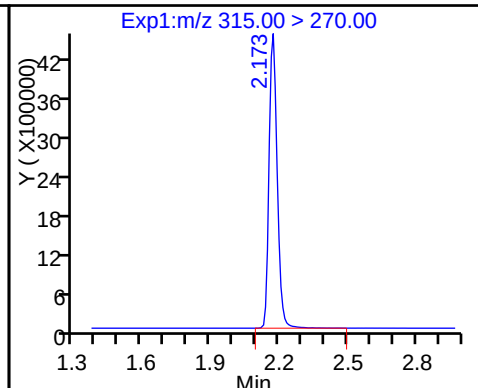
5 Perfluorobutanesulfonic acid



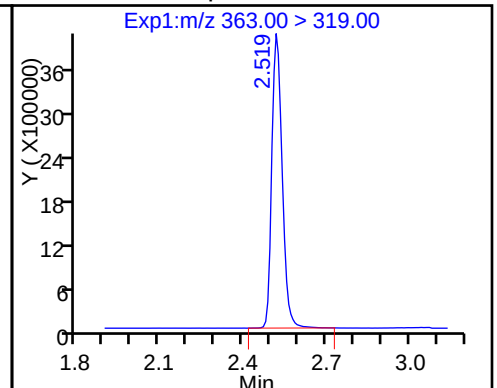
7 Perfluorohexanoic acid



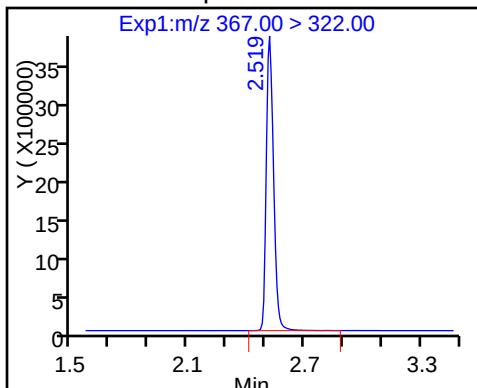
D 6 13C2 PFHxA



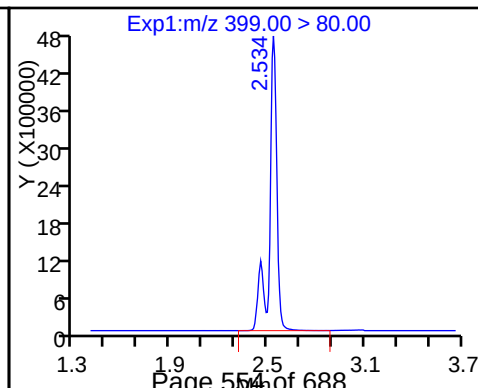
12 Perfluoroheptanoic acid



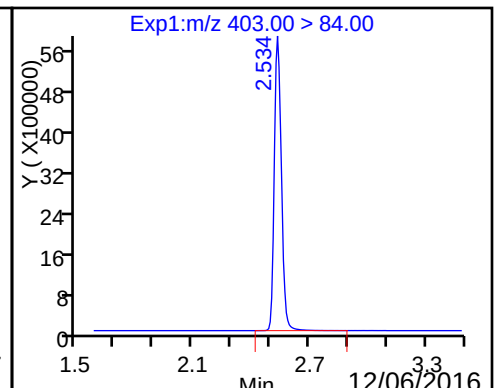
D 11 13C4-PFHpA



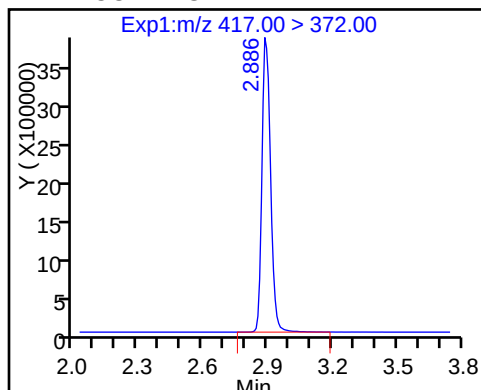
9 Perfluorohexanesulfonic acid



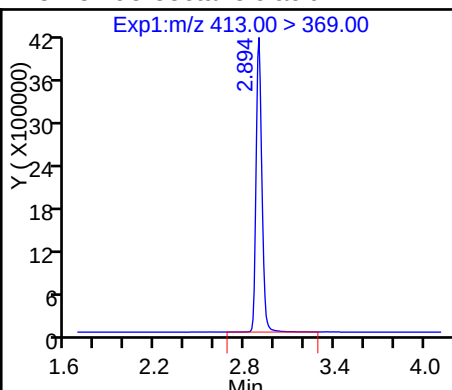
D 10 18O2 PFHxS



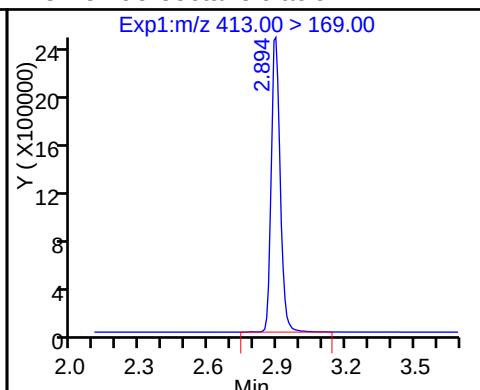
D 14 13C4 PFOA



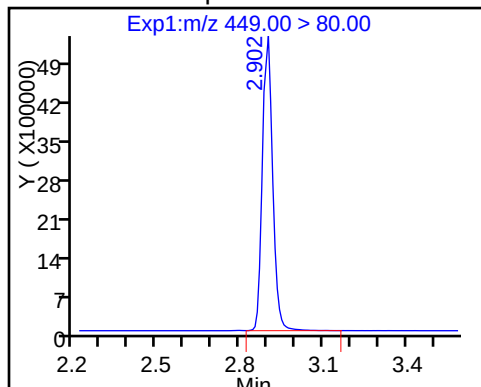
15 Perfluorooctanoic acid



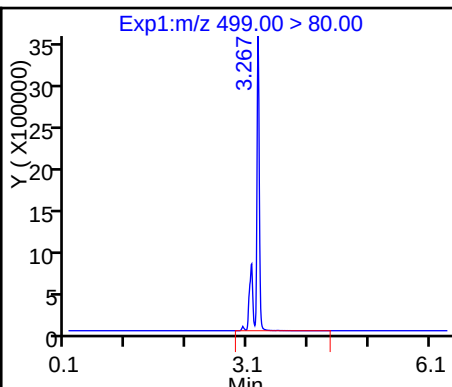
15 Perfluorooctanoic acid



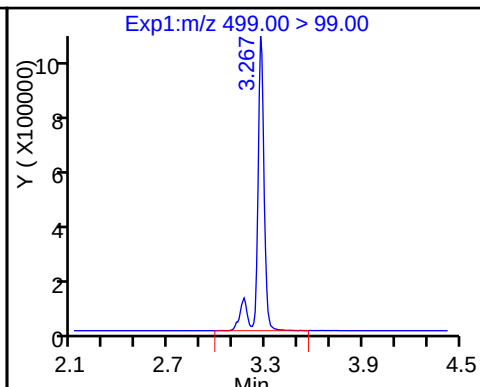
13 Perfluoroheptanesulfonic Acid



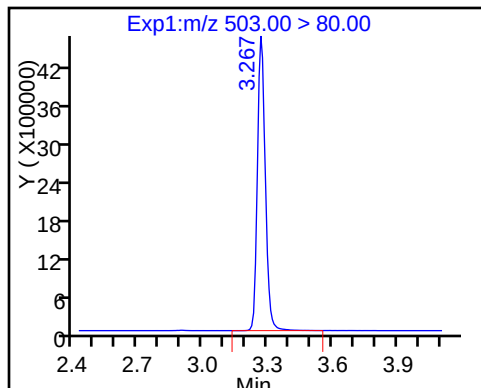
18 Perfluorooctane sulfonic acid



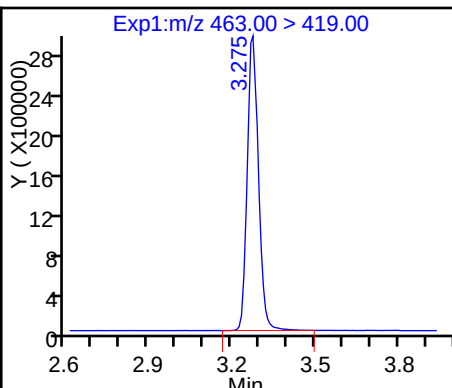
18 Perfluorooctane sulfonic acid



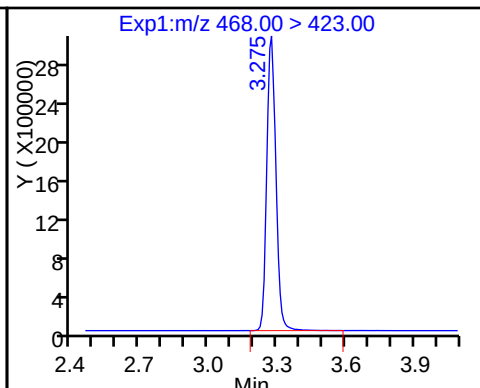
D 17 13C4 PFOS



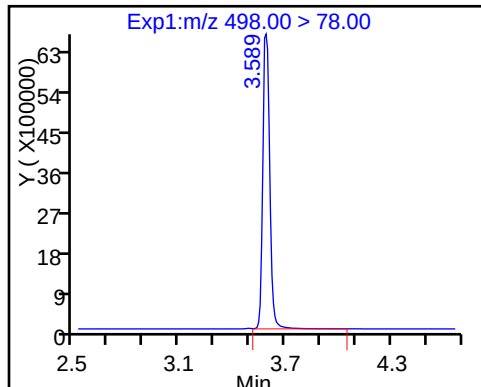
20 Perfluorononanoic acid



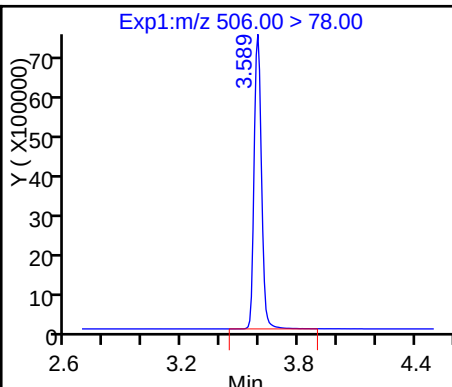
D 19 13C5 PFNA



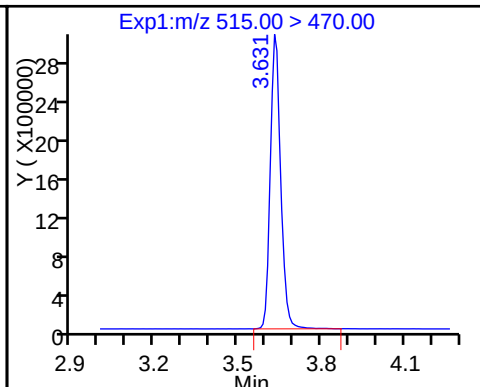
22 Perfluorooctane Sulfonamide

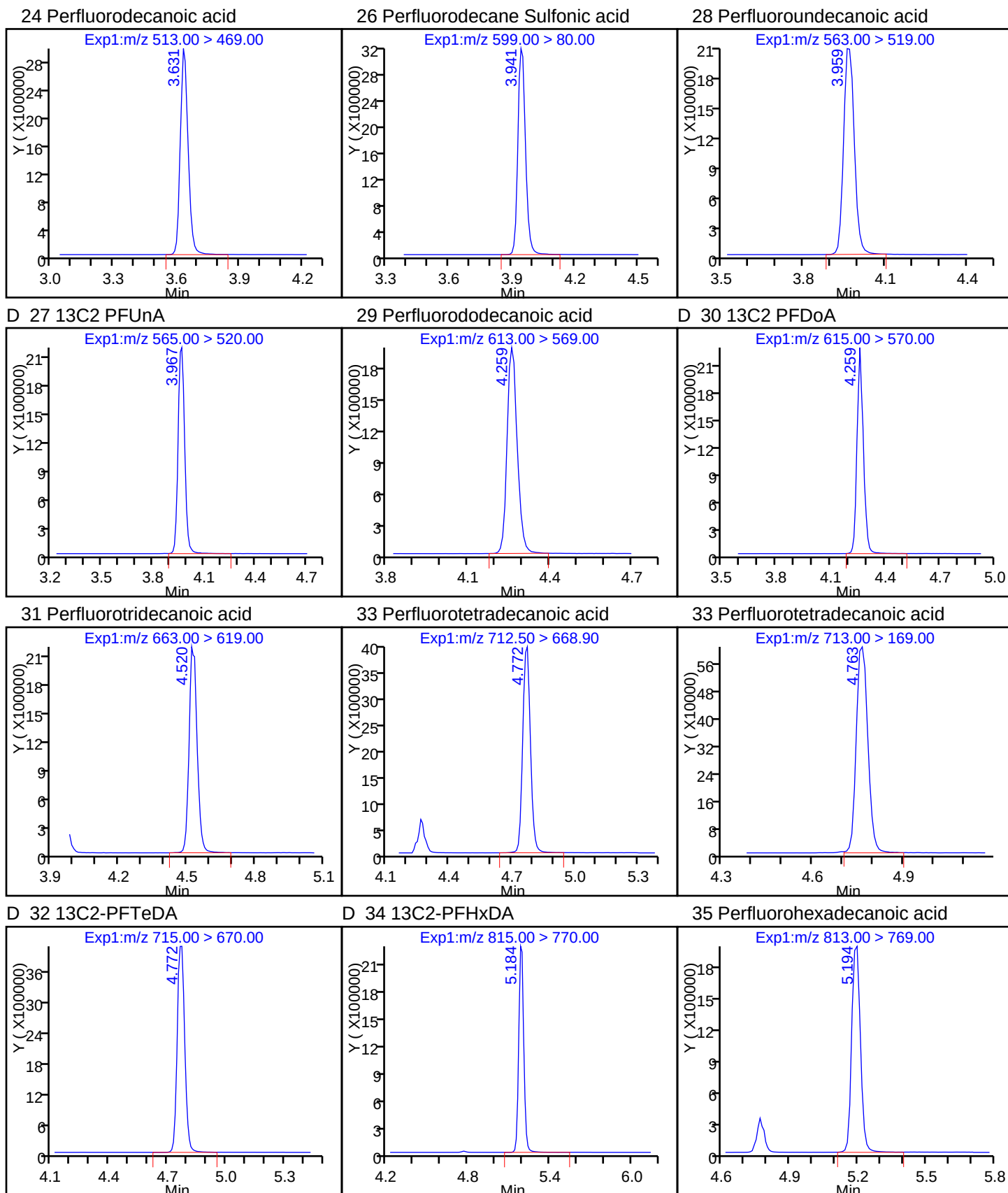


D 21 13C8 FOSA

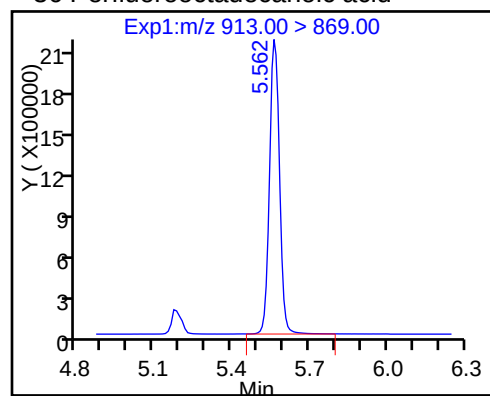


D 23 13C2 PFDA





36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

SDG No.: _____

Lab Sample ID: CCV 320-140429/16 Calibration Date: 12/02/2016 16:22

Instrument ID: A8_N Calib Start Date: 12/02/2016 10:29

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/02/2016 12:29

Lab File ID: 02DEC2016C_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8853	0.8804		49.7	50.0	-0.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.041	0.9809		47.1	50.0	-5.8	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.613	1.597		43.7	44.2	-1.0	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9559	0.9395		49.1	50.0	-1.7	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.034	1.019		49.3	50.0	-1.5	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.060	1.063		45.6	45.5	0.3	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.169	1.129		46.0	47.6	-3.4	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.020	1.019		49.9	50.0	-0.1	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.087	1.065		45.5	46.4	-2.0	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9912	0.996		50.2	50.0	0.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9353	0.9267		49.5	50.0	-0.9	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9693	0.9593		49.5	50.0	-1.0	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6271	0.6357		48.9	48.2	1.4	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.060	0.9840		46.4	50.0	-7.1	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9465	0.9295		49.1	50.0	-1.8	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.040	0.9397		45.2	50.0	-9.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.932	1.767		45.7	50.0	-8.6	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9637		48.1	50.0	-3.8	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.7915	1.054		67.0	50.0	33.2*	25.0
13C4 PFBA	Ave	340300	332191		48.8	50.0	-2.4	50.0
13C5-PFPeA	Ave	270194	252615		46.7	50.0	-6.5	50.0
13C2 PFHxA	Ave	246480	228018		46.3	50.0	-7.5	50.0
13C4-PFHpA	Ave	210510	196748		46.7	50.0	-6.5	50.0
18O2 PFHxS	Ave	302453	307137		48.0	47.3	1.5	50.0
13C4 PFOA	Ave	219411	211412		48.2	50.0	-3.6	50.0
13C4 PFOS	Ave	244616	252256		49.3	47.8	3.1	50.0
13C5 PFNA	Ave	178109	159978		44.9	50.0	-10.2	50.0
13C8 FOSA	Ave	414253	392650		47.4	50.0	-5.2	50.0
13C2 PFDA	Ave	166067	151711		45.7	50.0	-8.6	50.0
13C2 PFUnA	Ave	125779	110399		43.9	50.0	-12.2	50.0
13C2 PFDoA	Ave	116905	109030		46.6	50.0	-6.7	50.0
13C2-PFTeA	Ave	241899	217472		45.0	50.0	-10.1	50.0
13C2-PFHxDA	Ave	130373	114036		43.7	50.0	-12.5	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37461.b\02DEC2016C_012.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 02-Dec-2016 16:22:13 ALS Bottle#: 41 Worklist Smp#: 16
 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\20161202-37461.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 04-Dec-2016 18:06:22 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK025

First Level Reviewer: chandrasenas

Date: 04-Dec-2016 18:06:22

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobutyric acid										
212.90 > 169.00	1.574	1.574	0.0	1.000	14622963	49.7		99.4	136701	
D 2 13C4 PFBA										
217.00 > 172.00	1.574	1.574	0.0		16609540	48.8		97.6	1760564	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.859	1.868	-0.009	1.000	12389685	47.1		94.2	143388	
D 4 13C5-PFPeA										
267.90 > 223.00	1.859	1.868	-0.009		12630763	46.7		93.5	1231239	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.907	1.907	0.0	1.000	21678790	43.7		99.0		
298.90 > 99.00	1.897	1.907	-0.010	0.995	10208437		2.12(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.171	2.173	-0.003	1.000	10711219	49.1		98.3	288186	
D 6 13C2 PFHxA										
315.00 > 270.00	2.171	2.173	-0.003		11400916	46.3		92.5	2220908	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.516	2.519	-0.003	1.000	10025294	49.3		98.5	148580	
D 11 13C4-PFHpA										
367.00 > 322.00	2.516	2.519	-0.003		9837421	46.7		93.5	979084	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.532	2.534	-0.002	1.000	14850728	45.6		100		
D 10 18O2 PFHxS										
403.00 > 84.00	2.532	2.534	-0.002		14527568	48.0		102	761217	
D 14 13C4 PFOA										
417.00 > 372.00	2.890	2.886	0.004		10570593	48.2		96.4	786274	

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	2.890	2.894	-0.004	1.000	10770410	49.9		99.9	198921	
413.00 > 169.00	2.890	2.894	-0.004	1.000	6718323		1.60(0.90-1.10)		592810	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.890	2.902	-0.012	1.000	13560651	46.0		96.6		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.265	3.267	-0.002	1.000	12467043	45.5		98.0	3525927	
499.00 > 99.00	3.265	3.267	-0.002	1.000	2716230		4.59(0.90-1.10)		228232	
D 17 13C4 PFOS										
503.00 > 80.00	3.265	3.267	-0.002		12057843	49.3		103	232224	
20 Perfluorononanoic acid										
463.00 > 419.00	3.272	3.275	-0.003	1.000	7963240	50.2		100	144737	
D 19 13C5 PFNA										
468.00 > 423.00	3.265	3.275	-0.010		7998877	44.9		89.8	353617	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.587	3.589	-0.002	1.000	18194106	49.5		99.1	536694	
D 21 13C8 FOSA										
506.00 > 78.00	3.587	3.589	-0.002		19632521	47.4		94.8	564736	
D 23 13C2 PFDA										
515.00 > 470.00	3.629	3.631	-0.002		7585560	45.7		91.4	208800	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.629	3.631	-0.002	1.000	7277017	49.5		99.0	199518	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.938	3.941	-0.003	1.000	7729327	48.9		101		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.956	3.959	-0.003	1.000	5431519	46.4		92.9	112110	
D 27 13C2 PFUnA										
565.00 > 520.00	3.956	3.967	-0.011		5519927	43.9		87.8	528013	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.255	4.259	-0.004	1.000	5067396	49.1		98.2	77314	
D 30 13C2 PFDaA										
615.00 > 570.00	4.246	4.259	-0.013		5451503	46.6		93.3	157285	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.521	4.520	0.001	1.000	5122725	45.2		90.3	11584	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.757	4.772	-0.015	1.000	9633033	45.7		91.4	4134	
713.00 > 169.00	4.748	4.772	-0.024	0.998	1613548		5.97(0.00-0.00)		215079	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.757	4.772	-0.015		10873598	45.0		89.9	570141	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.173	5.184	-0.011		5701819	43.7		87.5	107923	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.184	5.194	-0.010	1.000	5253333	48.1		96.2	4932	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.545	5.562	-0.017	1.000	5747404	67.0		134	6736	

Reagents:

LCPFC-L5_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37461.b\02DEC2016C_012.d

Injection Date: 02-Dec-2016 16:22:13

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 41

Worklist Smp#: 16

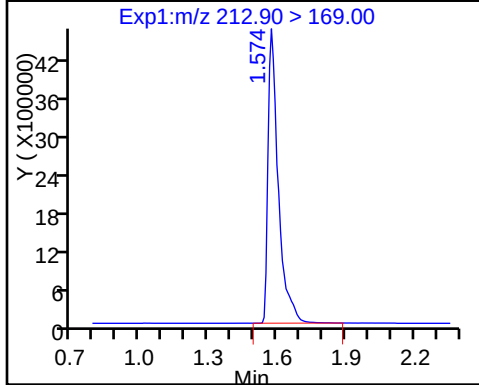
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

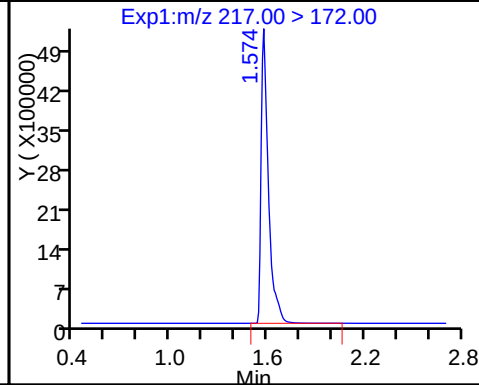
Method: A8_N

Limit Group: LC PFC_DOD ICAL

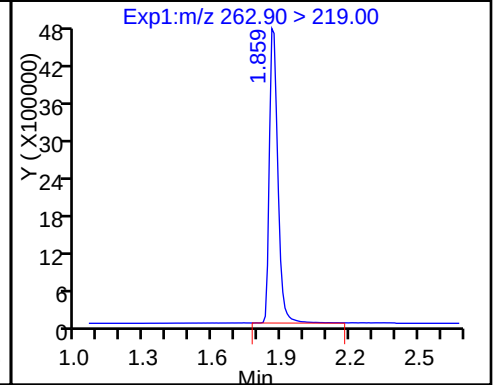
1 Perfluorobutyric acid



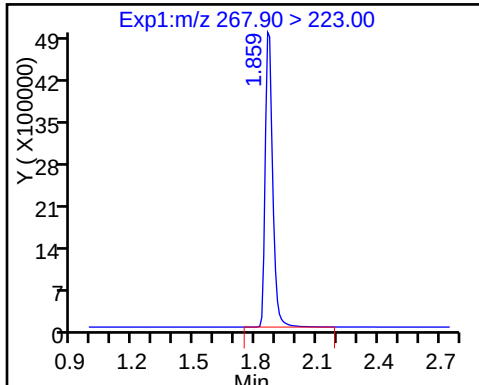
D 2 13C4 PFBA



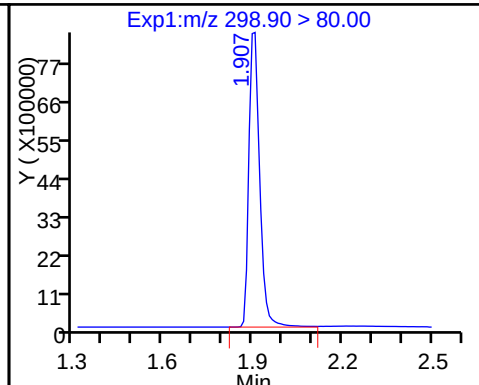
3 Perfluoropentanoic acid



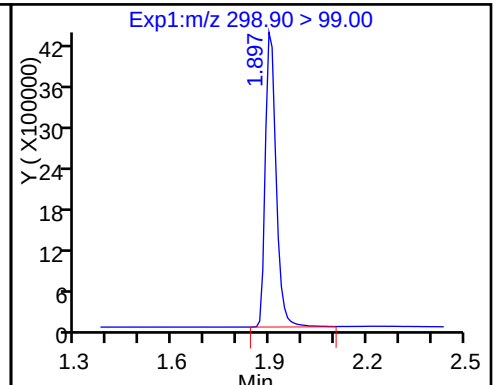
D 4 13C5-PFPeA



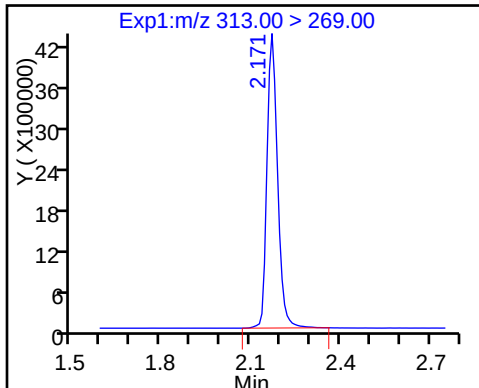
5 Perfluorobutanesulfonic acid



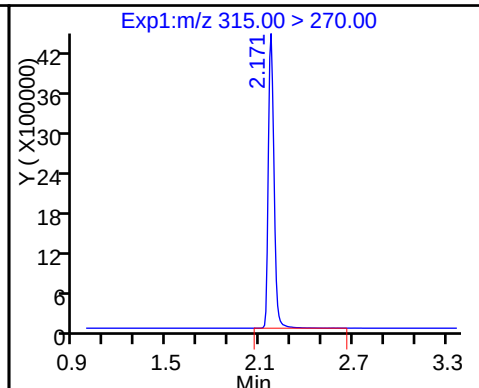
5 Perfluorobutanesulfonic acid



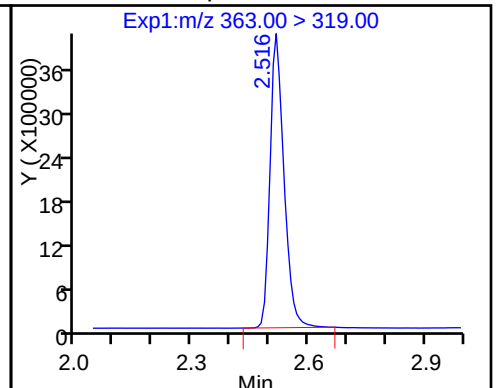
7 Perfluorohexanoic acid



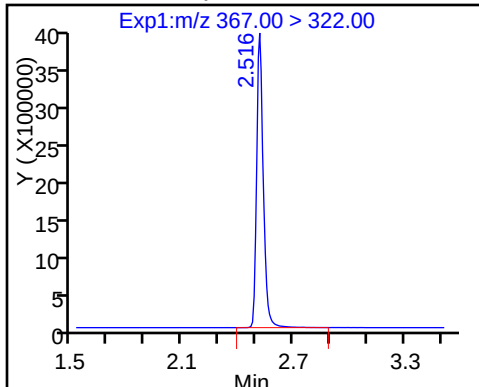
D 6 13C2 PFHxA



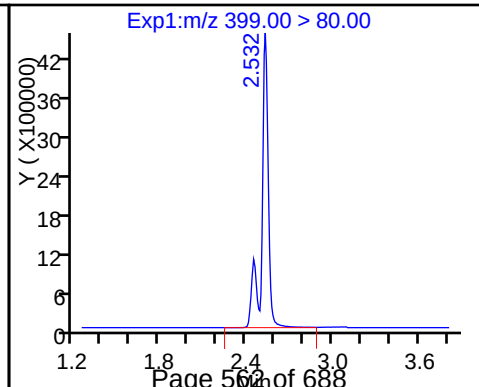
12 Perfluoroheptanoic acid



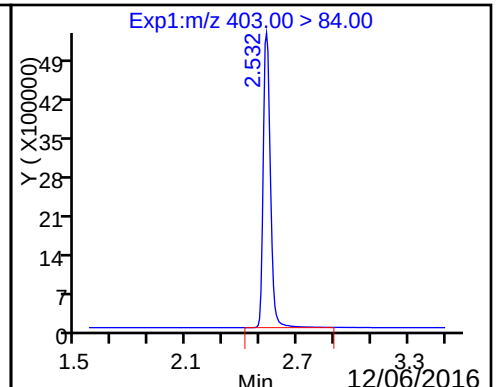
D 11 13C4-PFHpA



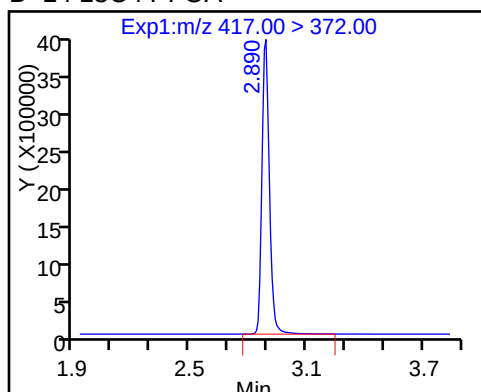
9 Perfluorohexanesulfonic acid



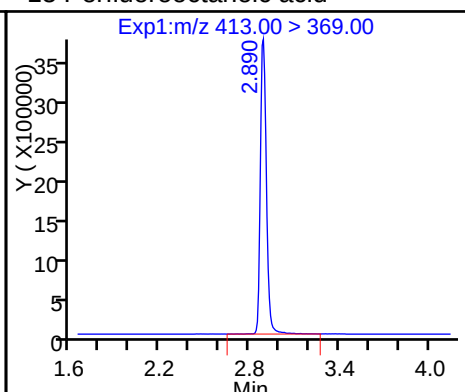
D 10 18O2 PFHxS



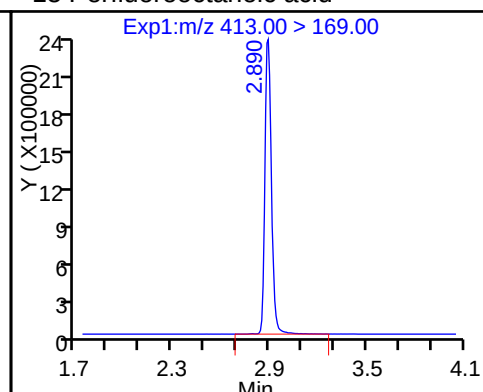
D 14 13C4 PFOA



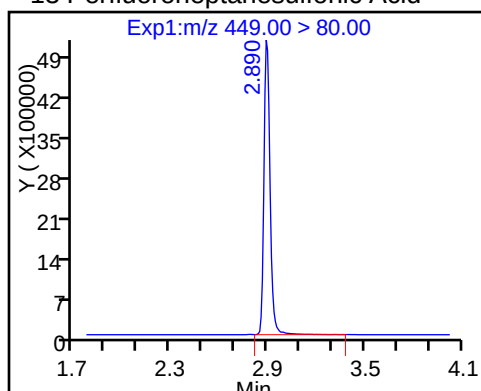
15 Perfluorooctanoic acid



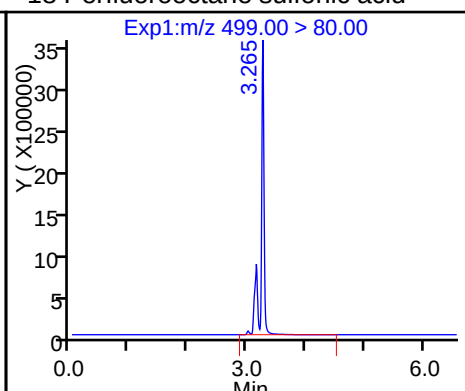
15 Perfluorooctanoic acid



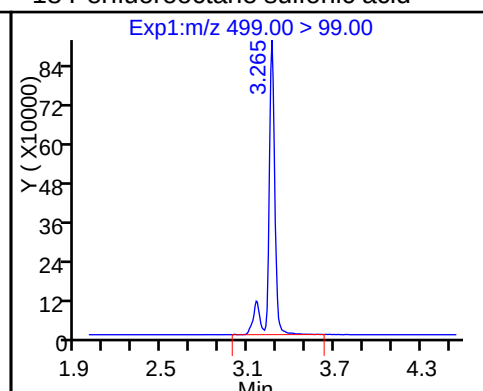
13 Perfluoroheptanesulfonic Acid



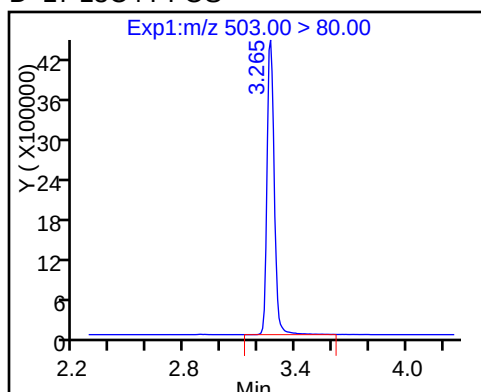
18 Perfluorooctane sulfonic acid



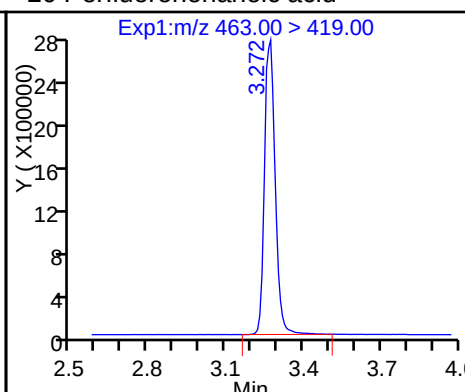
18 Perfluorooctane sulfonic acid



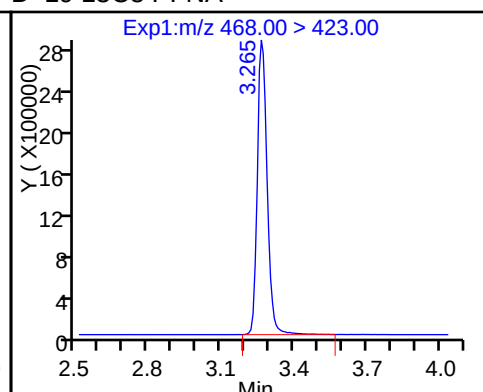
D 17 13C4 PFOS



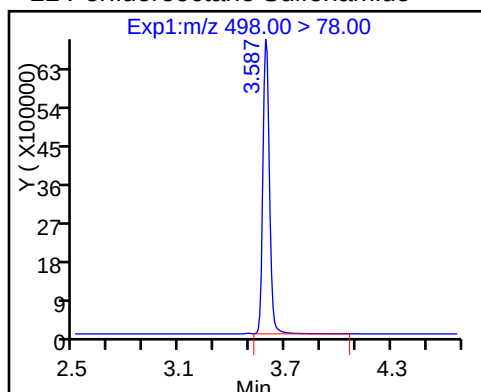
20 Perfluorononanoic acid



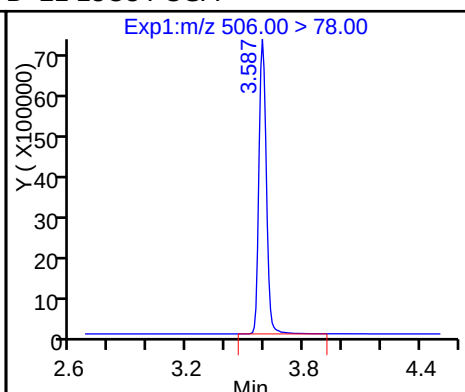
D 19 13C5 PFNA



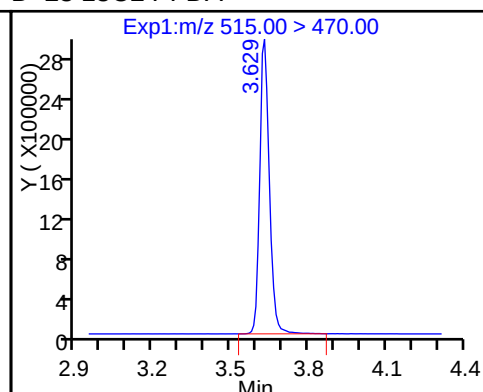
22 Perfluorooctane Sulfonamide



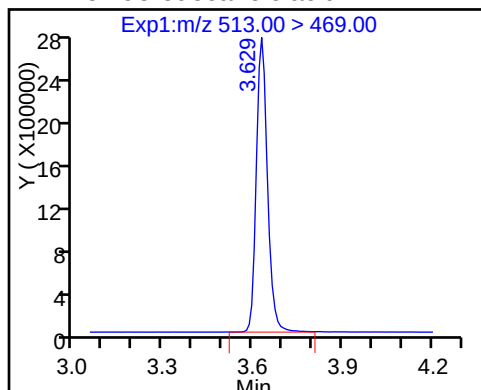
D 21 13C8 FOSA



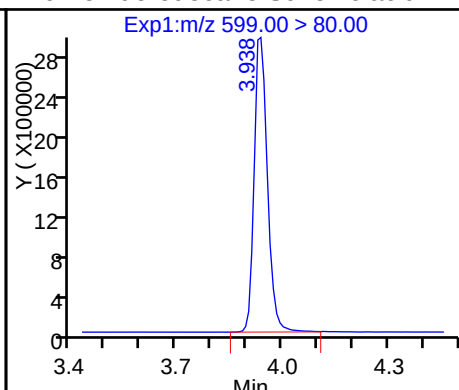
D 23 13C2 PFDA



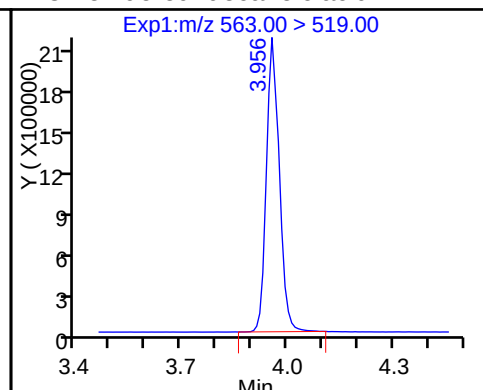
24 Perfluorodecanoic acid



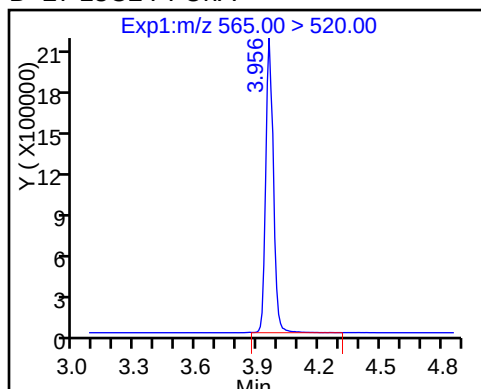
26 Perfluorodecane Sulfonic acid



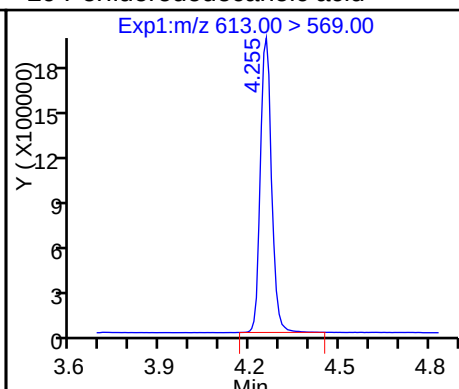
28 Perfluoroundecanoic acid



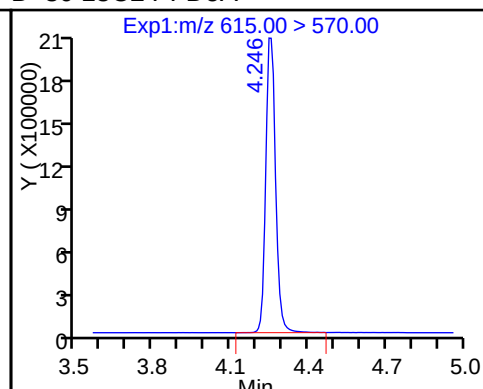
D 27 13C2 PFUnA



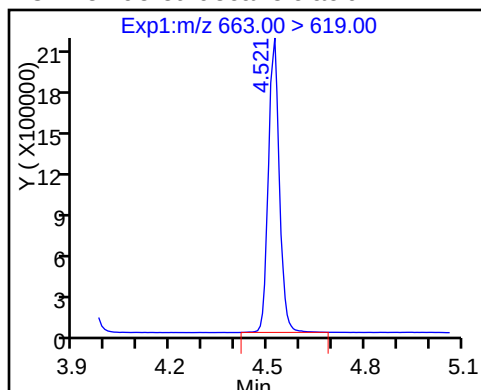
29 Perfluorododecanoic acid



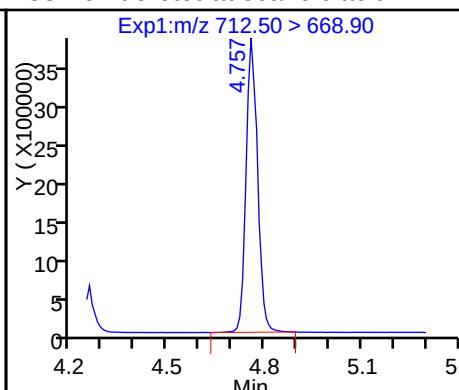
D 30 13C2 PFDaA



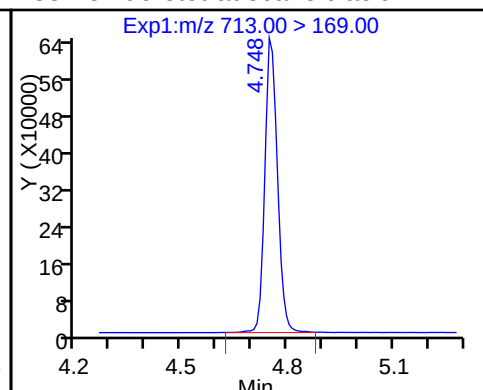
31 Perfluorotridecanoic acid



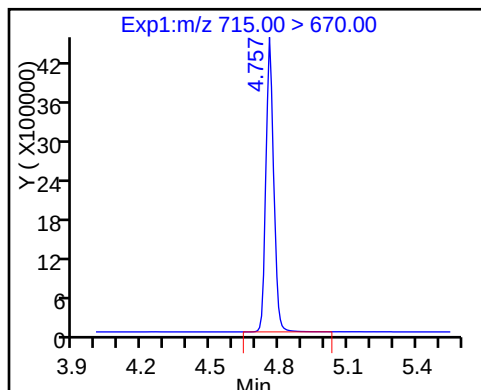
33 Perfluorotetradecanoic acid



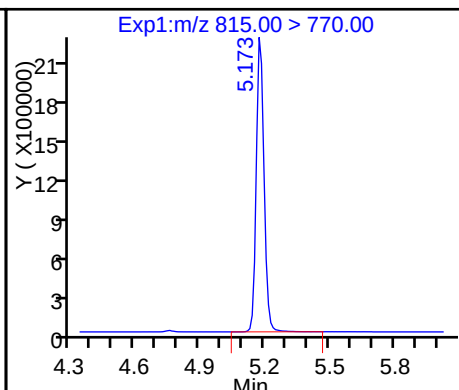
33 Perfluorotetradecanoic acid



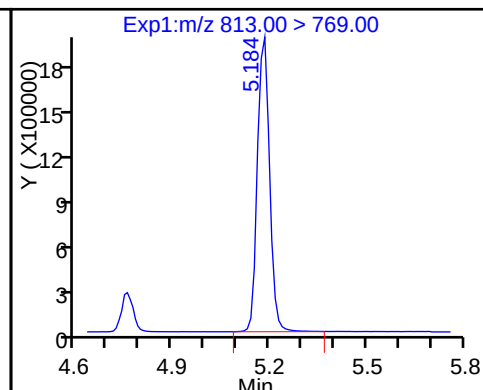
D 32 13C2-PFTeDA



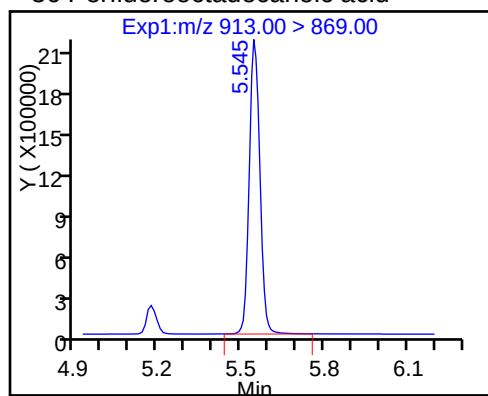
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

SDG No.: _____

Lab Sample ID: CCV 320-140532/2 Calibration Date: 12/02/2016 18:07

Instrument ID: A8_N Calib Start Date: 12/02/2016 10:29

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/02/2016 12:29

Lab File ID: 02DEC2016C_026.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8853	0.8941		50.5	50.0	1.0	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.041	0.9913		47.6	50.0	-4.8	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.613	1.540		42.2	44.2	-4.6	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9559	0.9532		49.9	50.0	-0.3	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.034	1.022		49.4	50.0	-1.2	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.060	1.034		44.4	45.5	-2.5	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.169	1.141		46.5	47.6	-2.4	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.020	1.044		51.1	50.0	2.3	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.087	1.056		45.1	46.4	-2.8	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9912	0.9827		49.6	50.0	-0.9	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9353	0.9387		50.2	50.0	0.4	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9693	0.9567		49.3	50.0	-1.3	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6271	0.6366		48.9	48.2	1.5	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.060	0.9581		45.2	50.0	-9.6	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9465	0.9102		48.1	50.0	-3.8	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.040	0.9293		44.7	50.0	-10.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.932	1.734		44.9	50.0	-10.3	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9800		48.9	50.0	-2.2	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.7915	0.9804		62.3	50.0	23.9	25.0
13C4 PFBA	Ave	340300	335285		49.3	50.0	-1.5	50.0
13C5-PFPeA	Ave	270194	255204		47.2	50.0	-5.5	50.0
13C2 PFHxA	Ave	246480	225525		45.7	50.0	-8.5	50.0
13C4-PFHpA	Ave	210510	197843		47.0	50.0	-6.0	50.0
18O2 PFHxS	Ave	302453	315965		49.4	47.3	4.5	50.0
13C4 PFOA	Ave	219411	207618		47.3	50.0	-5.4	50.0
13C4 PFOS	Ave	244616	247591		48.4	47.8	1.2	50.0
13C5 PFNA	Ave	178109	165241		46.4	50.0	-7.2	50.0
13C8 FOSA	Ave	414253	387042		46.7	50.0	-6.6	50.0
13C2 PFDA	Ave	166067	150854		45.4	50.0	-9.2	50.0
13C2 PFUnA	Ave	125779	115999		46.1	50.0	-7.8	50.0
13C2 PFDoA	Ave	116905	108756		46.5	50.0	-7.0	50.0
13C2-PFTeA	Ave	241899	217855		45.0	50.0	-9.9	50.0
13C2-PFHxDA	Ave	130373	115949		44.5	50.0	-11.1	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_026.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 02-Dec-2016 18:07:20 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\20161205-37485.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 08:28:53 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK020

First Level Reviewer: chandrasenas

Date: 05-Dec-2016 08:28:53

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	1.566	1.566	0.0		16764266	49.3		98.5	2786626	
1 Perfluorobutyric acid										
212.90 > 169.00	1.574	1.574	0.0	1.000	14989238	50.5		101	139081	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.858	1.858	0.0	1.000	12649007	47.6		95.2	115195	
D 4 13C5-PFPeA										
267.90 > 223.00	1.858	1.858	0.0		12760203	47.2		94.5	5053022	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.897	1.897	0.0	1.000	21505420	42.2		95.4		
298.90 > 99.00	1.897	1.897	0.0	1.000	10275563		2.09(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.159	2.159	0.0	1.000	10748380	49.9		99.7	349488	
D 6 13C2 PFHxA										
315.00 > 270.00	2.159	2.159	0.0		11276238	45.7		91.5	775727	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.505	2.505	0.0	1.000	10107993	49.4		98.8	119167	
D 11 13C4-PFHpA										
367.00 > 322.00	2.505	2.505	0.0		9892151	47.0		94.0	981087	
9 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.521	2.521	0.0	1.000	14859165	44.4		97.5		M
D 10 18O2 PFHxS										
403.00 > 84.00	2.521	2.521	0.0		14945133	49.4		104	811634	
D 14 13C4 PFOA										
417.00 > 372.00	2.869	2.869	0.0		10380923	47.3		94.6	742418	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.877	2.877	0.0	1.000	13446863	46.5		97.6		

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	2.877	2.877	0.0	1.000	10833776	51.1		102	183282	
413.00 > 169.00	2.877	2.877	0.0	1.000	6707904		1.62(0.90-1.10)		811767	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.250	3.250	0.0	1.000	12135669	45.1		97.2	693246	
499.00 > 99.00	3.250	3.250	0.0	1.000	2726799		4.45(0.90-1.10)		235524	
D 19 13C5 PFNA										
468.00 > 423.00	3.250	3.250	0.0		8262065	46.4		92.8	970540	
D 17 13C4 PFOS										
503.00 > 80.00	3.250	3.250	0.0		11834829	48.4		101	195105	
20 Perfluorononanoic acid										
463.00 > 419.00	3.259	3.259	0.0	1.000	8118852	49.6		99.1	122030	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.579	3.579	0.0	1.000	18165895	50.2		100	488711	
D 21 13C8 FOSA										
506.00 > 78.00	3.579	3.579	0.0		19352106	46.7		93.4	527848	
D 23 13C2 PFDA										
515.00 > 470.00	3.613	3.613	0.0		7542712	45.4		90.8	259624	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.613	3.613	0.0	1.000	7216176	49.3		98.7	196065	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.919	3.919	0.0	1.000	7597558	48.9		102		
D 27 13C2 PFUnA										
565.00 > 520.00	3.945	3.945	0.0		5799955	46.1		92.2	452477	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.945	3.945	0.0	1.000	5556795	45.2		90.4	142987	
D 30 13C2 PFDoA										
615.00 > 570.00	4.234	4.234	0.0		5437777	46.5		93.0	301721	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.242	4.242	0.0	1.000	4949541	48.1		96.2	85446	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.504	4.504	0.0	1.000	5053264	44.7		89.3	27708	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.741	4.741	0.0	1.000	9428219	44.9		89.7	4459	
713.00 > 169.00	4.732	4.741	-0.009	0.998	1571854		6.00(0.00-0.00)		158455	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.741	4.741	0.0		10892752	45.0		90.1	486481	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.160	5.160	0.0	1.000	5328892	48.9		97.8	4812	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.160	5.160	0.0		5797433	44.5		88.9	98891	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.525	5.525	0.0	1.000	5331300	62.3		125	6525	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L5_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_026.d

Injection Date: 02-Dec-2016 18:07:20

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

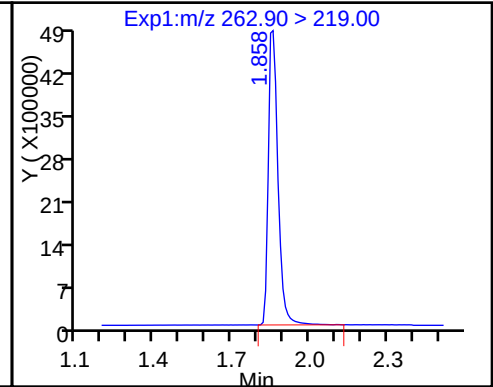
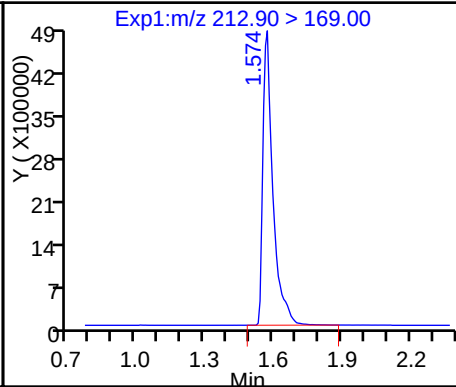
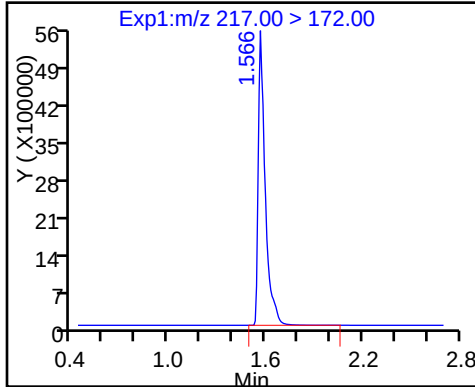
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

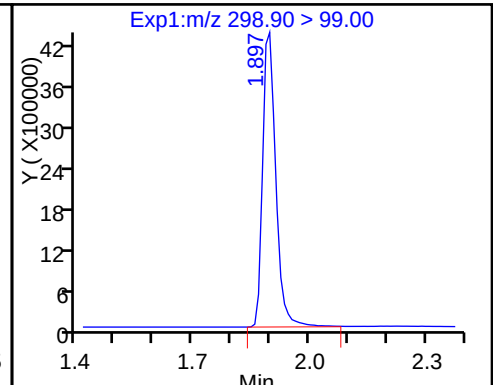
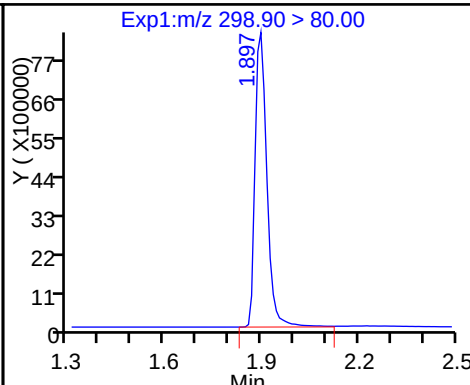
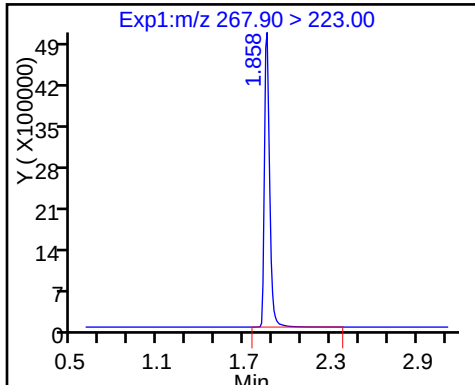
3 Perfluoropentanoic acid



D 4 13C5-PFPeA

5 Perfluorobutanesulfonic acid

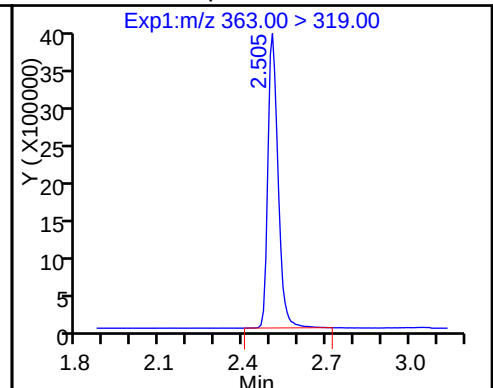
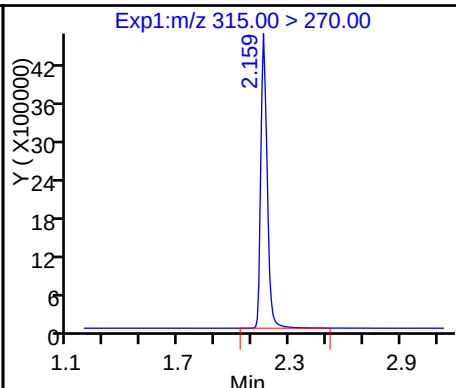
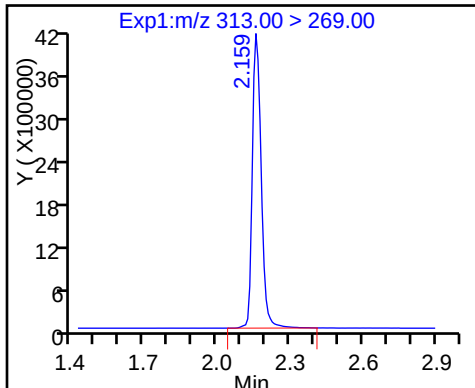
5 Perfluorobutanesulfonic acid



7 Perfluorohexanoic acid

D 6 13C2 PFHxA

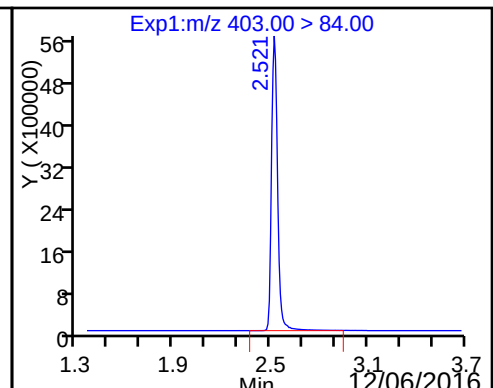
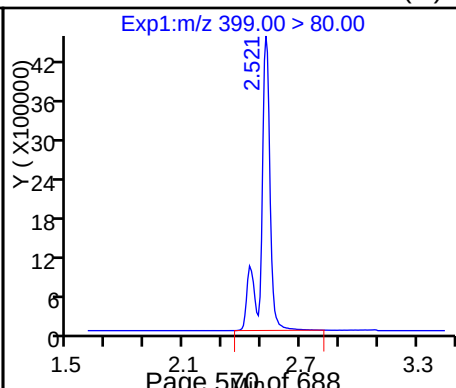
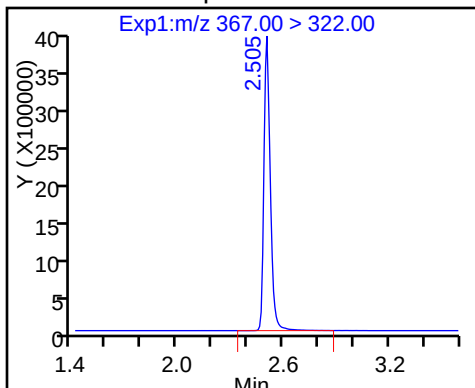
12 Perfluoroheptanoic acid



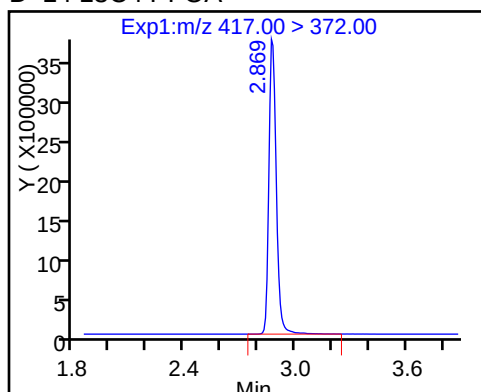
D 11 13C4-PFHpA

9 Perfluorohexanesulfonic acid (M)

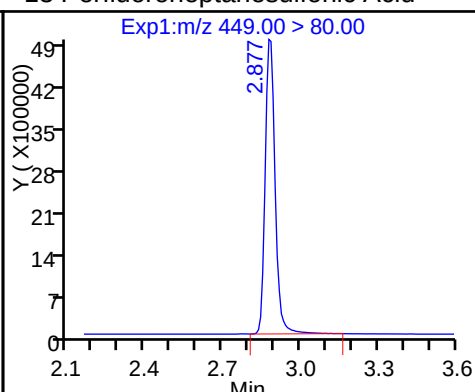
D 10 18O2 PFHxS



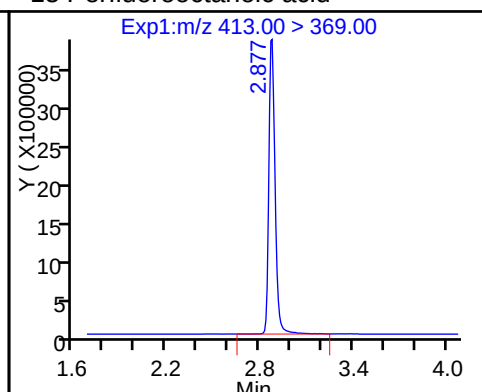
D 14 13C4 PFOA



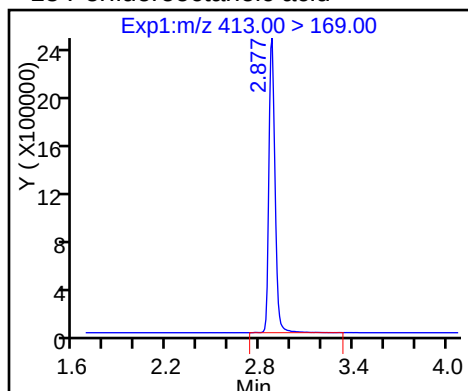
13 Perfluoroheptanesulfonic Acid



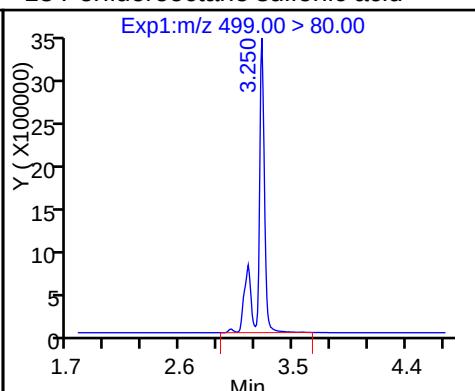
15 Perfluorooctanoic acid



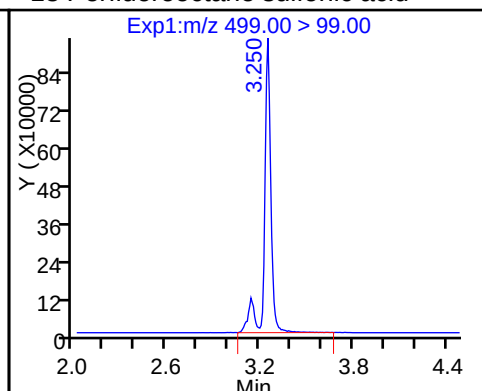
15 Perfluorooctanoic acid



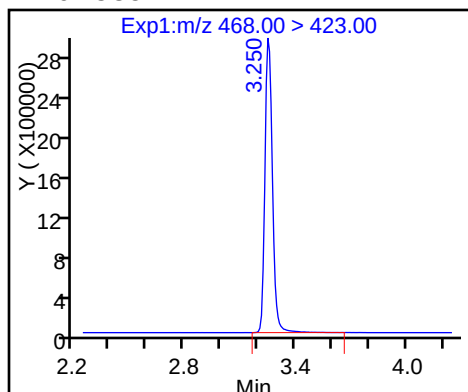
18 Perfluorooctane sulfonic acid



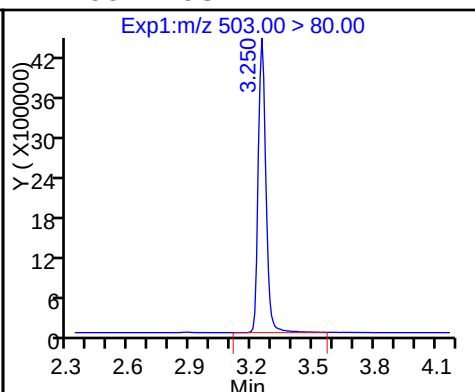
18 Perfluorooctane sulfonic acid



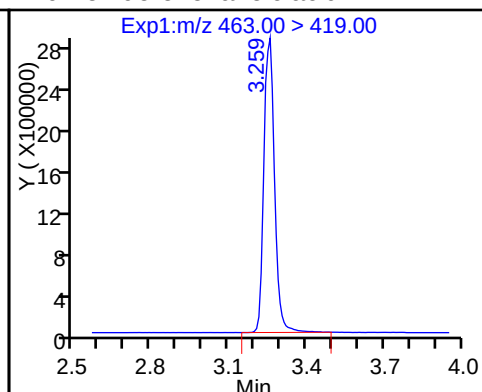
D 19 13C5 PFNA



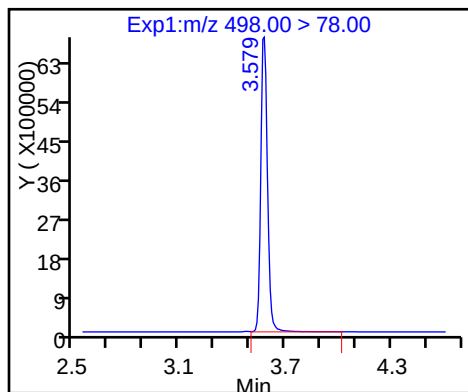
D 17 13C4 PFOS



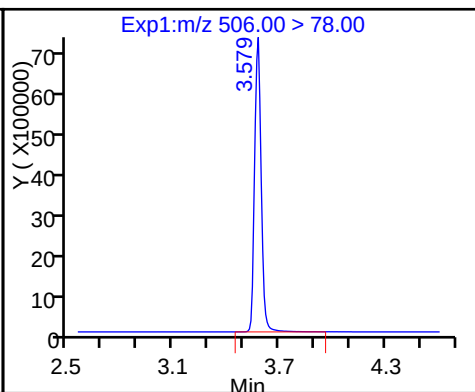
20 Perfluorononanoic acid



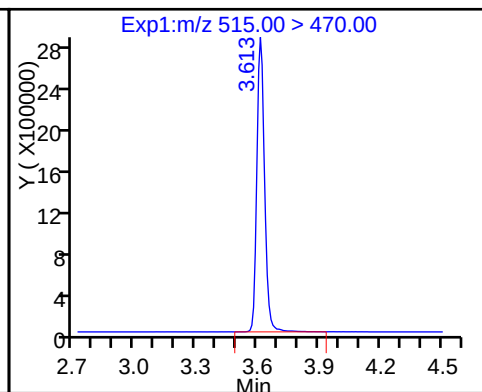
22 Perfluorooctane Sulfonamide

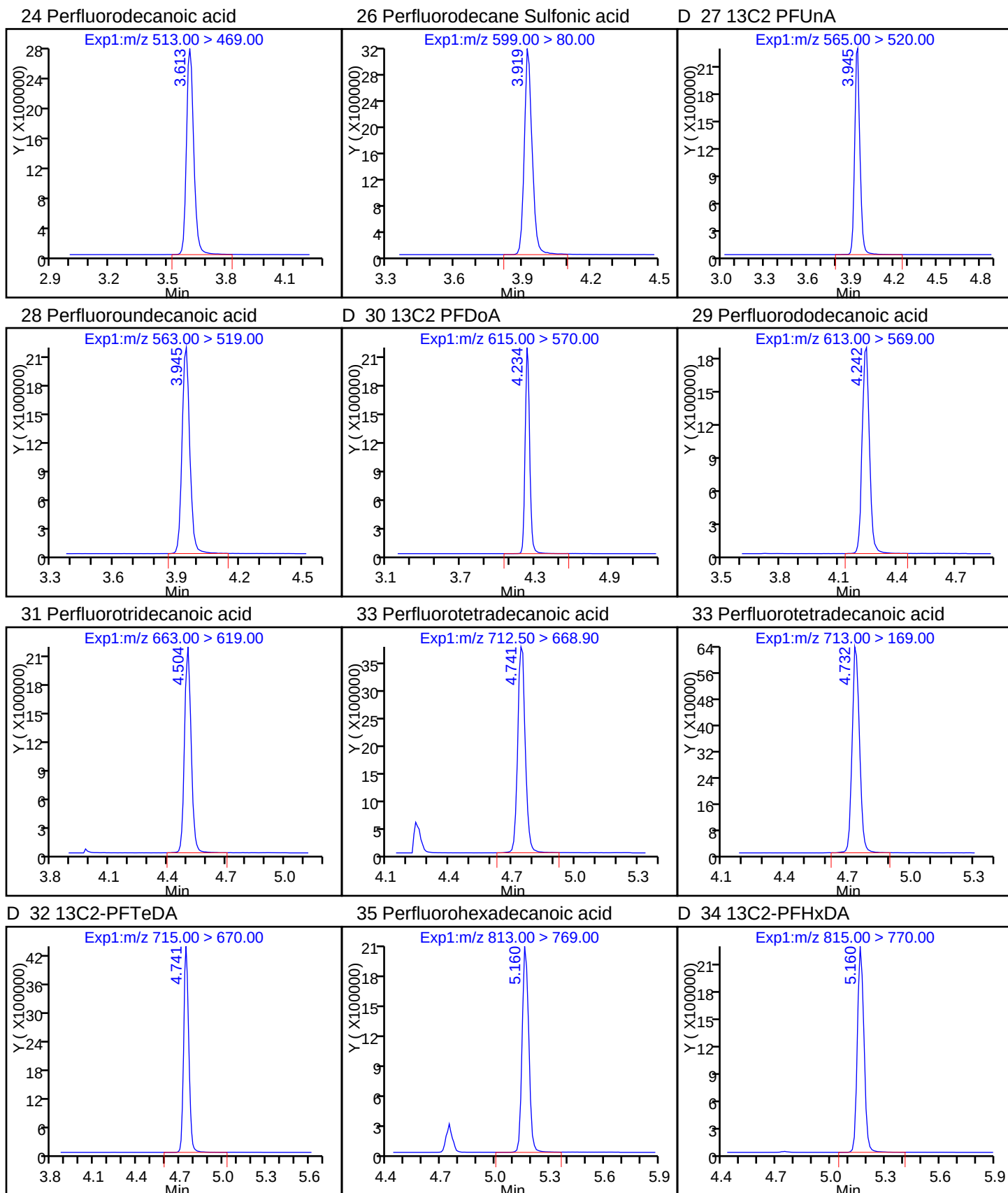


D 21 13C8 FOSA

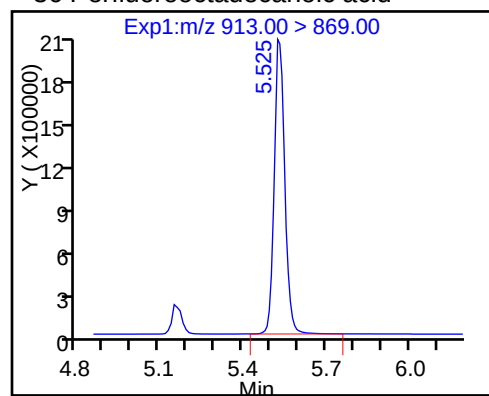


D 23 13C2 PFDA





36 Perfluorooctadecanoic acid



TestAmerica Sacramento

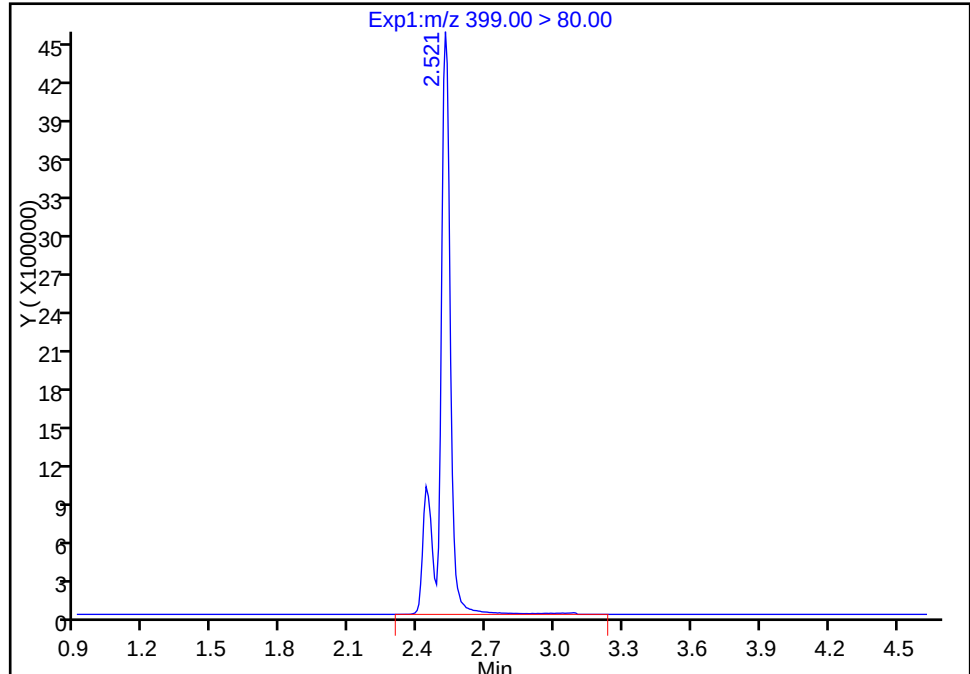
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_026.d
Injection Date: 02-Dec-2016 18:07:20 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

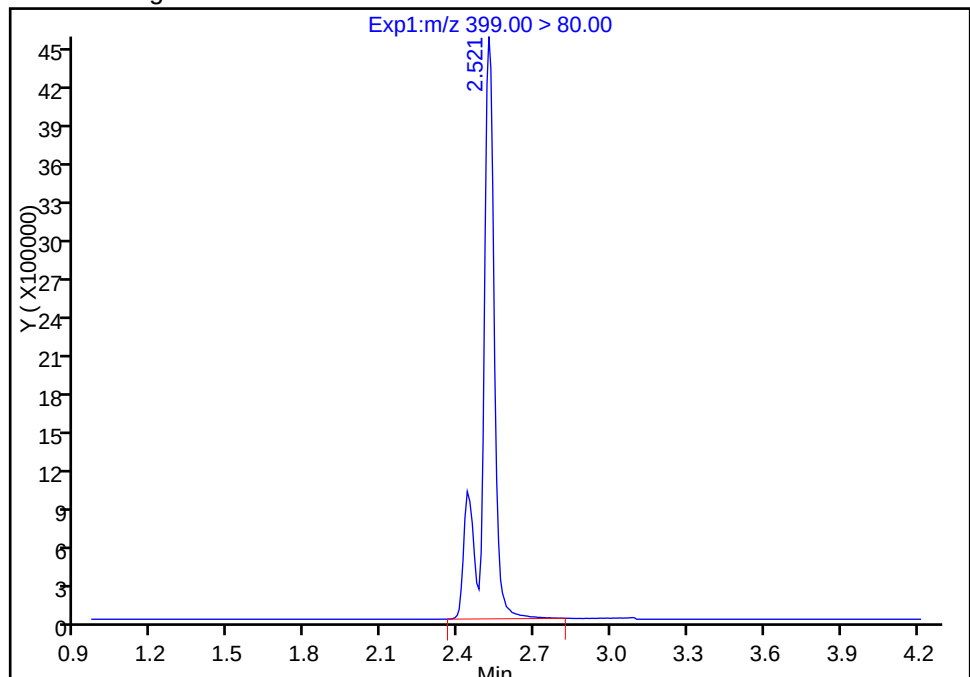
RT: 2.52
Area: 15104404
Amount: 45.115418
Amount Units: ng/ml

Processing Integration Results



RT: 2.52
Area: 14859165
Amount: 44.382913
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:28:53

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

SDG No.: _____

Lab Sample ID: CCV 320-140532/16 Calibration Date: 12/02/2016 19:52

Instrument ID: A8_N Calib Start Date: 12/02/2016 10:29

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/02/2016 12:29

Lab File ID: 02DEC2016C_040.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8853	0.8939		50.5	50.0	1.0	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.041	0.996		47.8	50.0	-4.3	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.613	1.610		44.1	44.2	-0.2	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9559	0.9365		49.0	50.0	-2.0	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.034	1.022		49.4	50.0	-1.2	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.060	1.046		44.9	45.5	-1.3	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.169	1.163		47.4	47.6	-0.5	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.020	1.013		49.6	50.0	-0.7	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.087	1.064		45.4	46.4	-2.1	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9912	0.9742		49.1	50.0	-1.7	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9353	0.9311		49.8	50.0	-0.5	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9693	0.9705		50.1	50.0	0.1	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6271	0.6291		48.3	48.2	0.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.060	0.9464		44.7	50.0	-10.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9465	0.9268		49.0	50.0	-2.1	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.040	0.9105		43.8	50.0	-12.5	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.932	1.641		42.5	50.0	-15.1	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9645		48.1	50.0	-3.7	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.7915	1.048		66.6	50.0	32.4*	25.0
13C4 PFBA	Ave	340300	336970		49.5	50.0	-1.0	50.0
13C5-PFPeA	Ave	270194	256270		47.4	50.0	-5.2	50.0
13C2 PFHxA	Ave	246480	231132		46.9	50.0	-6.2	50.0
13C4-PFHpA	Ave	210510	201137		47.8	50.0	-4.5	50.0
18O2 PFHxS	Ave	302453	301391		47.1	47.3	-0.4	50.0
13C4 PFOA	Ave	219411	213727		48.7	50.0	-2.6	50.0
13C4 PFOS	Ave	244616	241983		47.3	47.8	-1.1	50.0
13C5 PFNA	Ave	178109	163667		45.9	50.0	-8.1	50.0
13C8 FOSA	Ave	414253	383759		46.3	50.0	-7.4	50.0
13C2 PFDA	Ave	166067	149365		45.0	50.0	-10.1	50.0
13C2 PFUnA	Ave	125779	113945		45.3	50.0	-9.4	50.0
13C2 PFDoA	Ave	116905	111548		47.7	50.0	-4.6	50.0
13C2-PFTeA	Ave	241899	211592		43.7	50.0	-12.5	50.0
13C2-PFHxDA	Ave	130373	120579		46.2	50.0	-7.5	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_040.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 02-Dec-2016 19:52:23 ALS Bottle#: 41 Worklist Smp#: 16
 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\20161205-37485.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 08:39:01 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK020

First Level Reviewer: chandrasenas

Date: 05-Dec-2016 08:39:01

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	1.566	0.0		16848516	49.5		99.0	1291316	
1 Perfluorobutyric acid										
212.90 > 169.00	1.566	1.574	-0.008	1.000	15059981	50.5		101	157047	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.848	1.858	-0.010	1.000	12757968	47.8		95.7	129927	
D 4 13C5-PFPeA										
267.90 > 223.00	1.848	1.858	-0.010		12813518	47.4		94.8	1651903	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.887	1.897	-0.010	1.000	21451012	44.1		99.8		
298.90 > 99.00	1.887	1.897	-0.010	1.000	10244140		2.09(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.151	2.159	-0.008	1.000	10823000	49.0		98.0	284496	
D 6 13C2 PFHxA										
315.00 > 270.00	2.151	2.159	-0.008		11556614	46.9		93.8	645670	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.495	2.505	-0.010	1.000	10279218	49.4		98.8	118512	
D 11 13C4-PFHpA										
367.00 > 322.00	2.495	2.505	-0.010		10056830	47.8		95.5	3897605	
9 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.510	2.521	-0.011	1.000	14337924	44.9		98.7		M
D 10 18O2 PFHxS										
403.00 > 84.00	2.510	2.521	-0.011		14255807	47.1		99.6	489686	
D 14 13C4 PFOA										
417.00 > 372.00	2.868	2.869	-0.001		10686335	48.7		97.4	791217	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.868	2.877	-0.009	1.000	13394819	47.4		99.5		

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	2.868	2.877	-0.009	1.000	10823417	49.6		99.3	112713	M
413.00 > 169.00	2.859	2.877	-0.018	0.997	6726777		1.61(0.90-1.10)		303181	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.239	3.250	-0.011	1.000	11951293	45.4		97.9	679505	
499.00 > 99.00	3.239	3.250	-0.011	1.000	2632518		4.54(0.90-1.10)		306520	
D 19 13C5 PFNA										
468.00 > 423.00	3.239	3.250	-0.011		8183342	45.9		91.9	477738	
D 17 13C4 PFOS										
503.00 > 80.00	3.239	3.250	-0.011		11566790	47.3		98.9	335947	
20 Perfluorononanoic acid										
463.00 > 419.00	3.248	3.259	-0.011	1.000	7972332	49.1		98.3	107267	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.570	3.579	-0.009	1.000	17866352	49.8		99.5	436471	
D 21 13C8 FOSA										
506.00 > 78.00	3.570	3.579	-0.009		19187951	46.3		92.6	509143	
D 23 13C2 PFDA										
515.00 > 470.00	3.603	3.613	-0.010		7468241	45.0		89.9	275250	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.603	3.613	-0.010	1.000	7247569	50.1		100	203775	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.916	3.919	-0.003	1.000	7337126	48.3		100		
D 27 13C2 PFUnA										
565.00 > 520.00	3.925	3.945	-0.020		5697234	45.3		90.6	235919	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.934	3.945	-0.011	1.000	5391690	44.7		89.3	159786	
D 30 13C2 PFDoA										
615.00 > 570.00	4.229	4.234	-0.005		5577394	47.7		95.4	179728	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.229	4.242	-0.013	1.000	5169310	49.0		97.9	73655	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.493	4.504	-0.011	1.000	5078103	43.8		87.5	51579	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.736	4.741	-0.005	1.000	9154175	42.5		84.9	3673	
713.00 > 169.00	4.727	4.741	-0.014	0.998	1561436		5.86(0.00-0.00)		211467	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.736	4.741	-0.005		10579609	43.7		87.5	435951	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.155	5.160	-0.005	1.000	5379203	48.1		96.3	4747	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.155	5.160	-0.005		6028960	46.2		92.5	110632	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.521	5.525	-0.005	1.000	5843310	66.6		133	6759	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L5_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_040.d

Injection Date: 02-Dec-2016 19:52:23

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 41

Worklist Smp#: 16

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

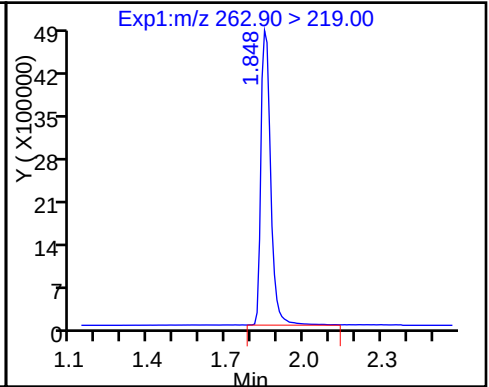
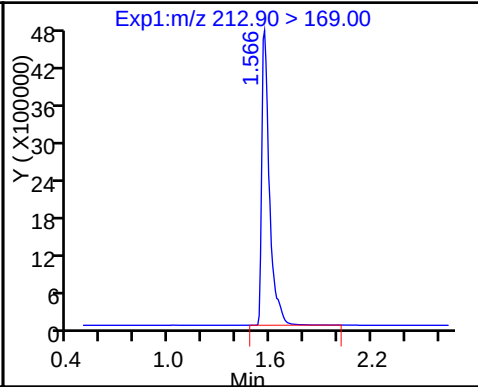
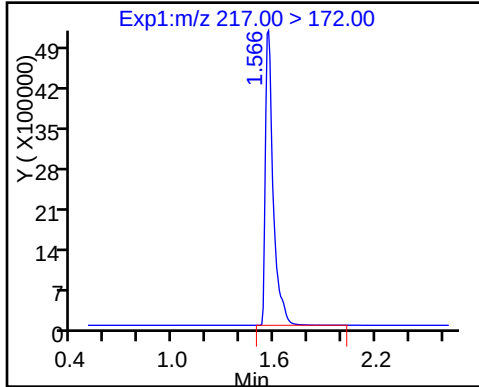
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

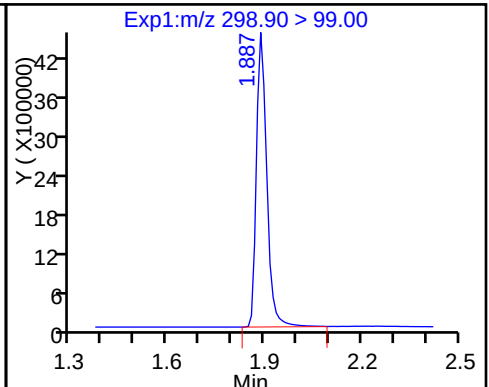
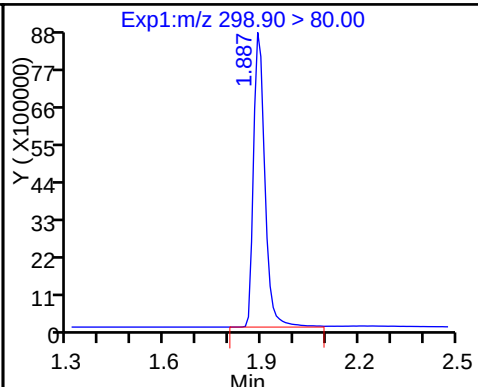
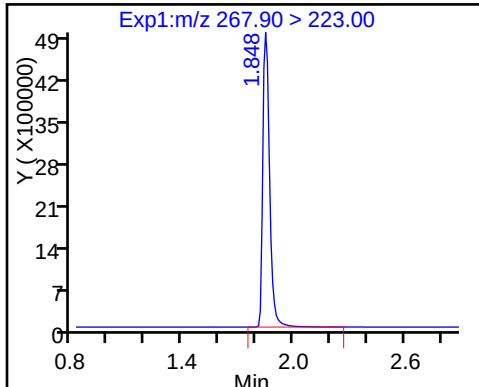
3 Perfluoropentanoic acid



D 4 13C5-PFPeA

5 Perfluorobutanesulfonic acid

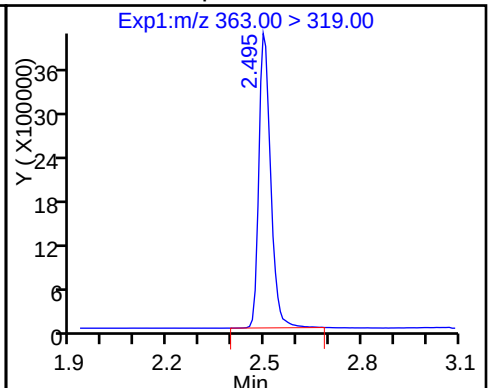
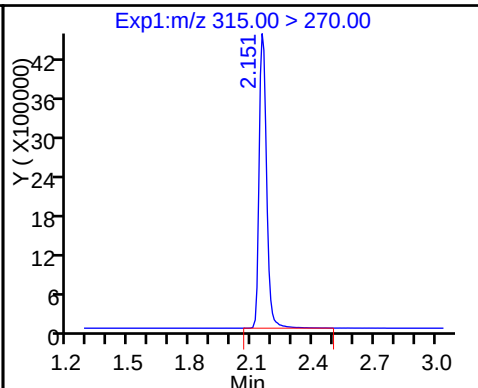
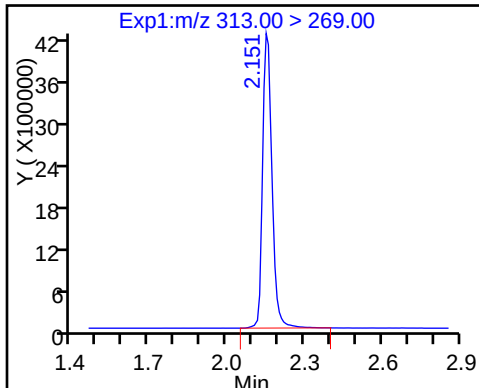
5 Perfluorobutanesulfonic acid



7 Perfluorohexanoic acid

D 6 13C2 PFHxA

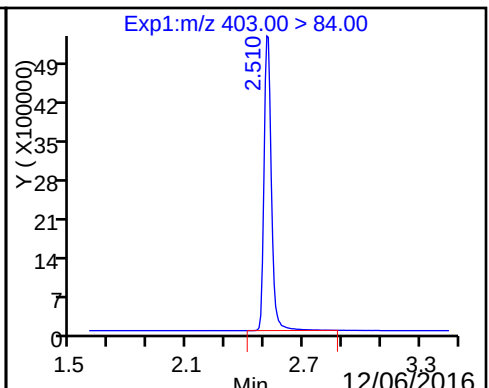
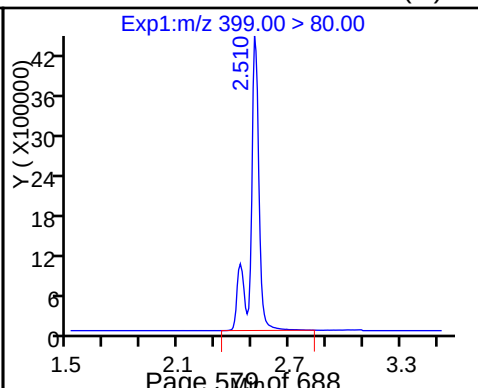
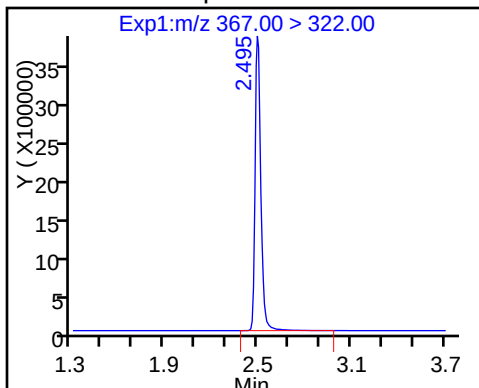
12 Perfluoroheptanoic acid



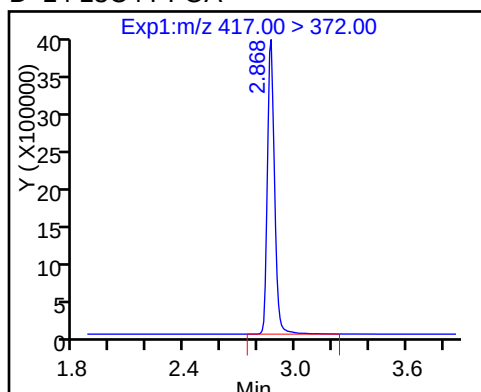
D 11 13C4-PFHpA

9 Perfluorohexanesulfonic acid (M)

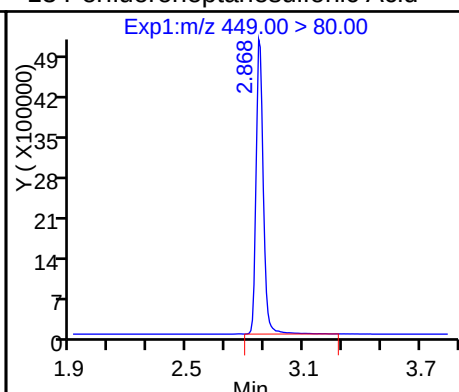
D 10 18O2 PFHxS



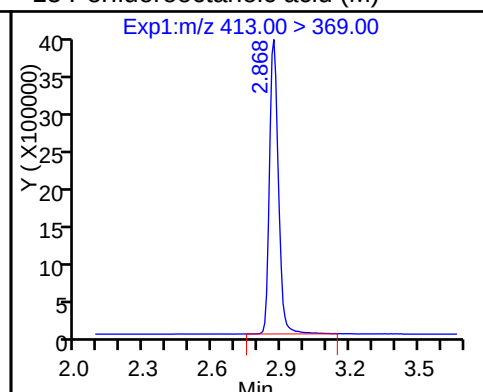
D 14 13C4 PFOA



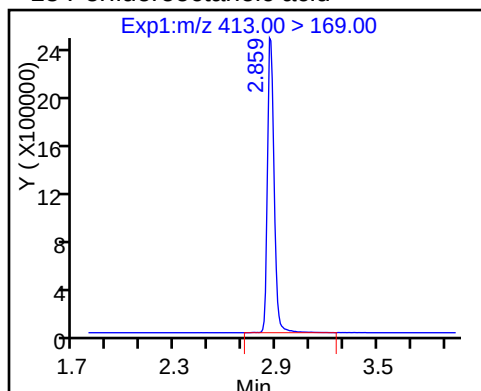
13 Perfluoroheptanesulfonic Acid



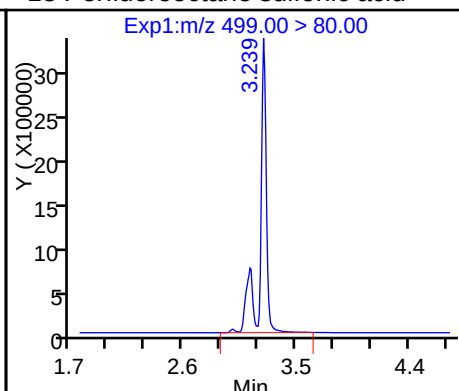
15 Perfluorooctanoic acid (M)



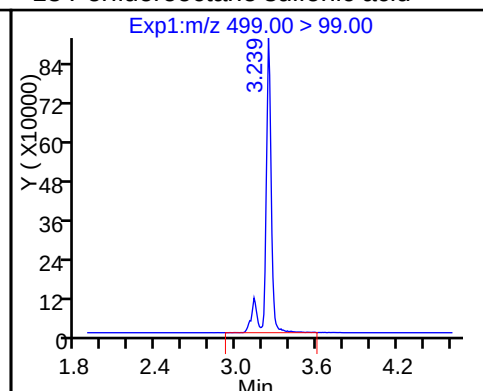
15 Perfluorooctanoic acid



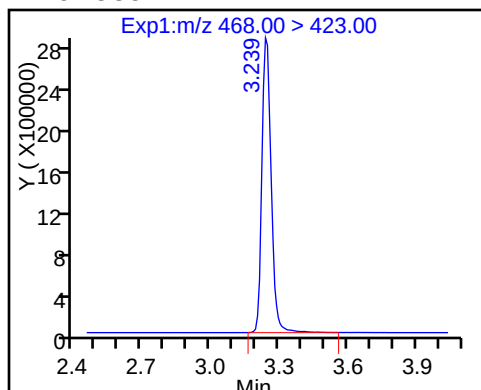
18 Perfluorooctane sulfonic acid



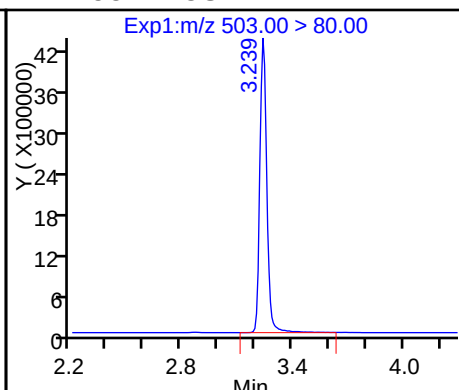
18 Perfluorooctane sulfonic acid



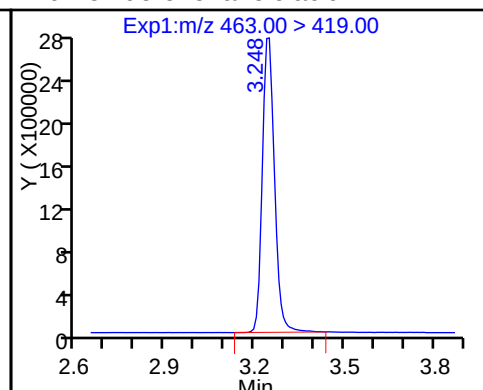
D 19 13C5 PFNA



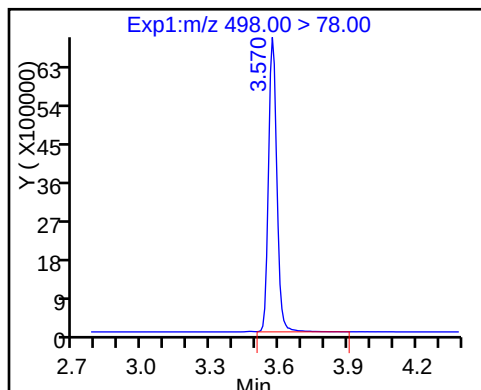
D 17 13C4 PFOS



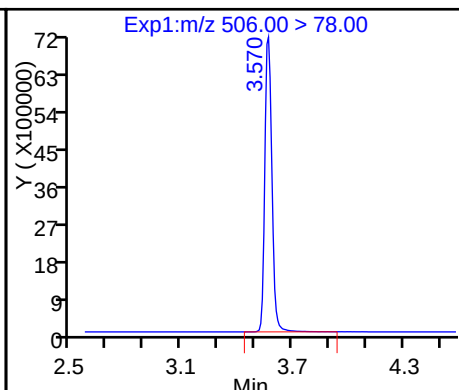
20 Perfluorononanoic acid



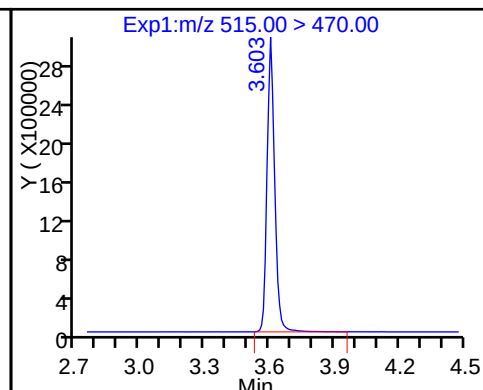
22 Perfluorooctane Sulfonamide

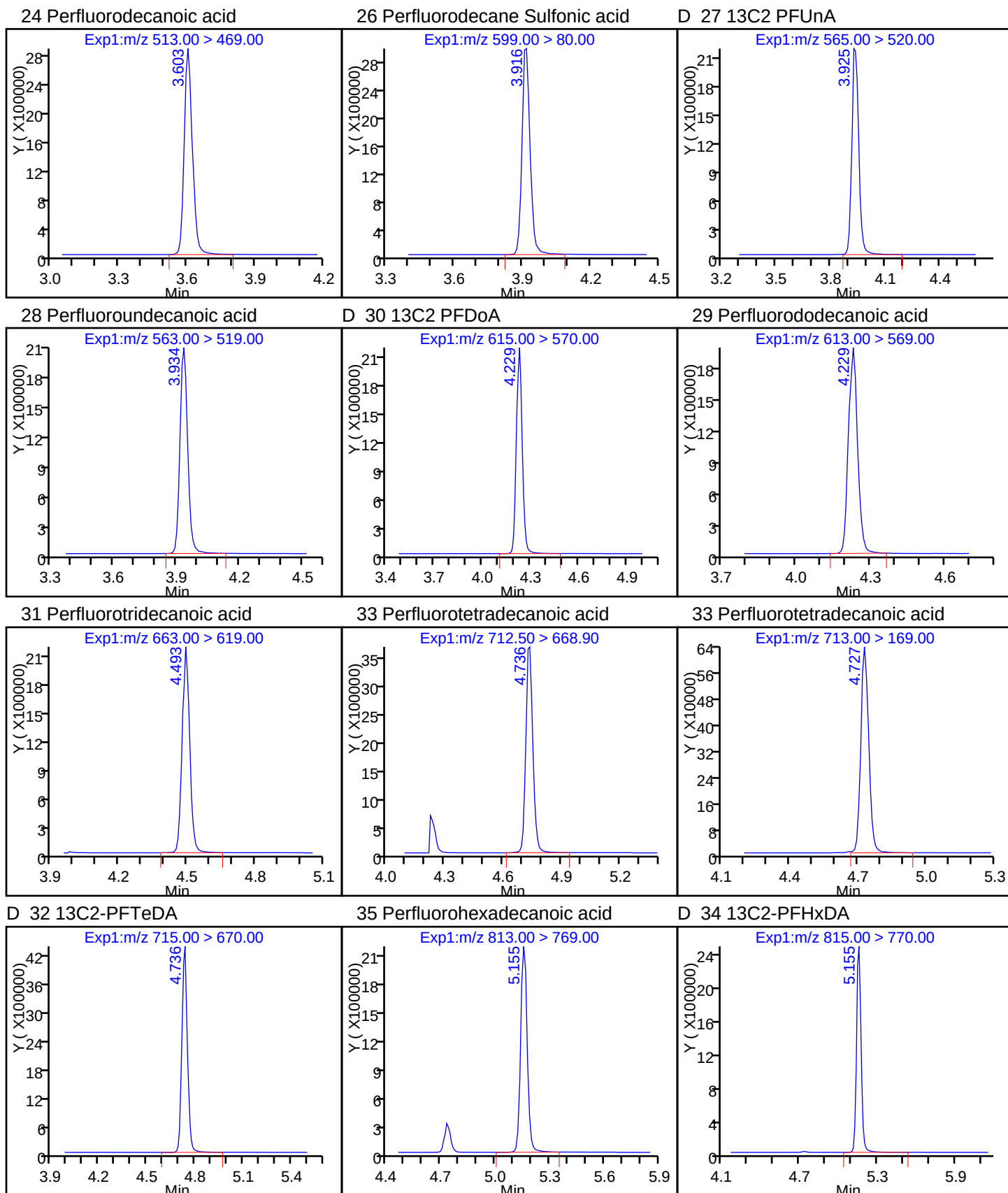


D 21 13C8 FOSA

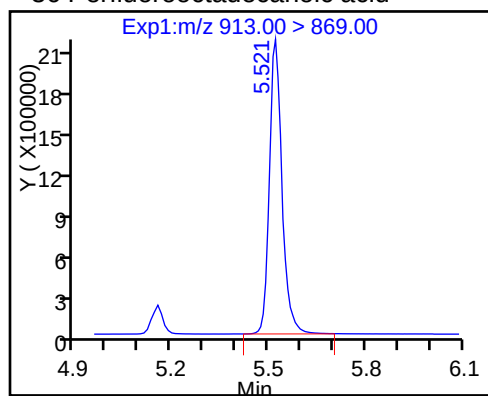


D 23 13C2 PFDA





36 Perfluorooctadecanoic acid



TestAmerica Sacramento

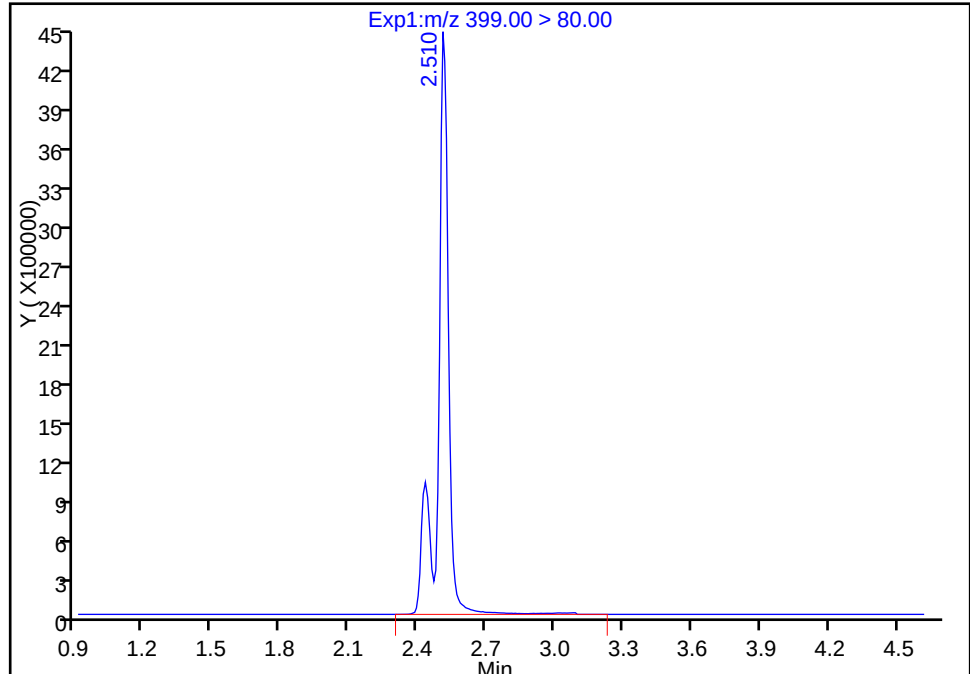
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_040.d
Injection Date: 02-Dec-2016 19:52:23 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

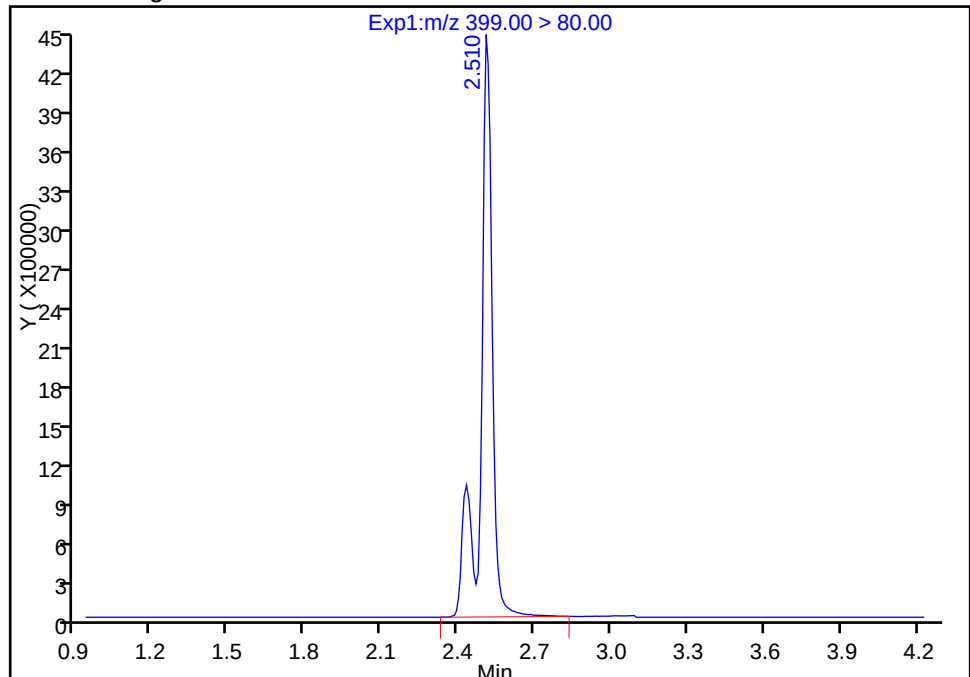
RT: 2.51
Area: 14567536
Amount: 45.615818
Amount Units: ng/ml

Processing Integration Results



RT: 2.51
Area: 14337924
Amount: 44.896827
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:39:01

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

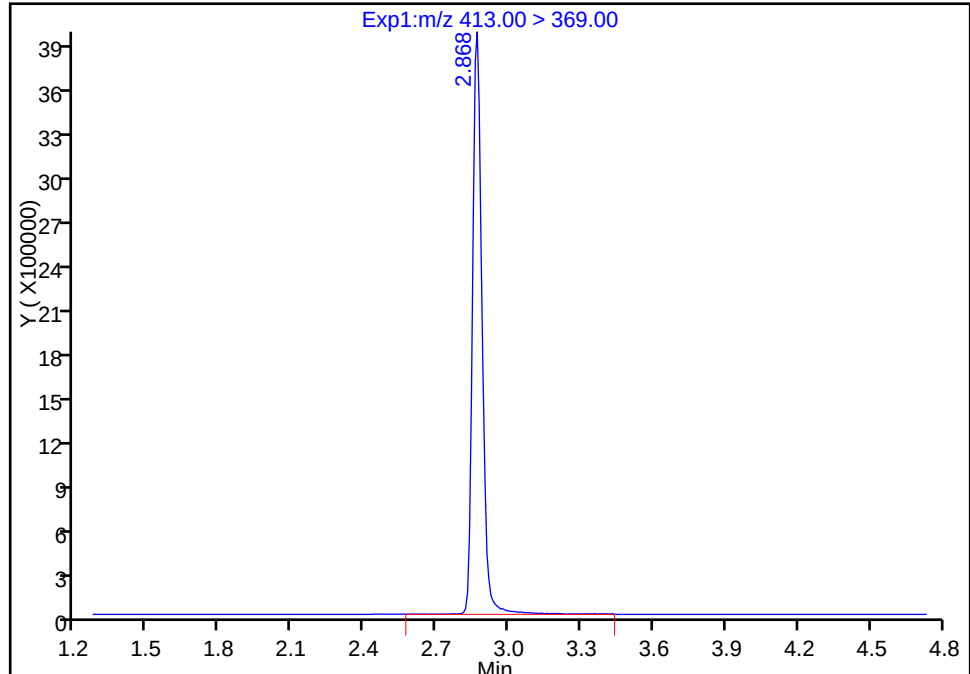
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Injection Date: 02-Dec-2016 19:52:23 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

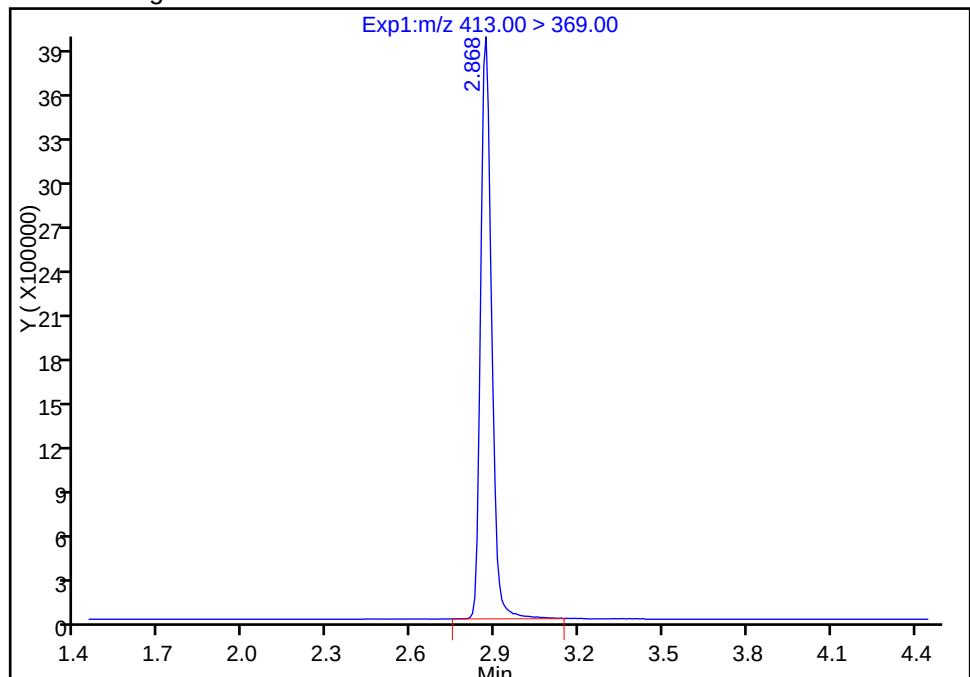
RT: 2.87
Area: 10958965
Amount: 50.255056
Amount Units: ng/ml

Processing Integration Results



RT: 2.87
Area: 10823417
Amount: 49.633467
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:39:01

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

SDG No.: _____

Lab Sample ID: CCV 320-140532/25 Calibration Date: 12/02/2016 20:59

Instrument ID: A8_N Calib Start Date: 12/02/2016 10:29

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/02/2016 12:29

Lab File ID: 02DEC2016C_049.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8853	0.8981		50.7	50.0	1.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.041	0.9910		47.6	50.0	-4.8	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.613	1.616		44.3	44.2	0.2	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9559	0.9573		50.1	50.0	0.1	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.034	1.029		49.7	50.0	-0.5	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.060	1.043		44.8	45.5	-1.6	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.020	1.029		50.4	50.0	0.8	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.169	1.161		47.3	47.6	-0.7	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9912	1.014		51.1	50.0	2.3	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.087	1.060		45.2	46.4	-2.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9353	0.9074		48.5	50.0	-3.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9693	0.9161		47.3	50.0	-5.5	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6271	0.6310		48.5	48.2	0.6	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.060	1.018		48.1	50.0	-3.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9465	0.9132		48.2	50.0	-3.5	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.040	0.9018		43.3	50.0	-13.3	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.932	1.710		44.3	50.0	-11.5	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9332		46.5	50.0	-6.9	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.7915	1.019		64.8	50.0	28.8*	25.0
13C4 PFBA	Ave	340300	333688		49.0	50.0	-1.9	50.0
13C5-PFPeA	Ave	270194	258811		47.9	50.0	-4.2	50.0
13C2 PFHxA	Ave	246480	226135		45.9	50.0	-8.3	50.0
13C4-PFHpA	Ave	210510	201111		47.8	50.0	-4.5	50.0
18O2 PFHxS	Ave	302453	304227		47.6	47.3	0.6	50.0
13C4 PFOA	Ave	219411	211695		48.2	50.0	-3.5	50.0
13C4 PFOS	Ave	244616	240257		46.9	47.8	-1.8	50.0
13C5 PFNA	Ave	178109	160540		45.1	50.0	-9.9	50.0
13C8 FOSA	Ave	414253	376900		45.5	50.0	-9.0	50.0
13C2 PFDA	Ave	166067	156441		47.1	50.0	-5.8	50.0
13C2 PFUnA	Ave	125779	110715		44.0	50.0	-12.0	50.0
13C2 PFDoA	Ave	116905	111230		47.6	50.0	-4.9	50.0
13C2-PFTeDA	Ave	241899	220112		45.5	50.0	-9.0	50.0
13C2-PFHxDA	Ave	130373	118057		45.3	50.0	-9.4	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_049.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 02-Dec-2016 20:59:57 ALS Bottle#: 41 Worklist Smp#: 25
 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\20161205-37485.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 08:43:44 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d

Column 1 : Det: EXP1

Process Host: XAWRK020

First Level Reviewer: chandrasenas

Date: 05-Dec-2016 08:43:44

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	1.566	0.008		16684387	49.0		98.1	1264865	
1 Perfluorobutyric acid										
212.90 > 169.00	1.574	1.574	0.0	1.000	14983624	50.7		101	140239	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.858	1.858	0.0	1.000	12823542	47.6		95.2	127470	
D 4 13C5-PFPeA										
267.90 > 223.00	1.858	1.858	0.0		12940573	47.9		95.8	820078	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.897	1.897	0.0	1.000	21732127	44.3		100		
298.90 > 99.00	1.897	1.897	0.0	1.000	10055092		2.16(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.162	2.159	0.003	1.000	10823491	50.1		100	329731	
D 6 13C2 PFHxA										
315.00 > 270.00	2.162	2.159	0.003		11306760	45.9		91.7	742168	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.511	2.505	0.006	1.000	10342094	49.7		99.5	111061	
D 11 13C4-PFHpA										
367.00 > 322.00	2.511	2.505	0.006		10055528	47.8		95.5	999222	
9 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.526	2.521	0.005	1.000	14433498	44.8		98.4		M
D 10 18O2 PFHxS										
403.00 > 84.00	2.526	2.521	0.005		14389953	47.6		101	1089390	
D 14 13C4 PFOA										
417.00 > 372.00	2.868	2.869	-0.001		10584735	48.2		96.5	760350	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.884	2.877	0.007	1.000	13275738	47.3		99.3		

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	2.876	2.877	-0.001	1.000	10891175	50.4		101	107737	M
413.00 > 169.00	2.876	2.877	-0.001	1.000	6713096		1.62(0.90-1.10)		512458	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.249	3.250	-0.001	1.000	11814032	45.2		97.5	825779	
499.00 > 99.00	3.249	3.250	-0.001	1.000	2619826		4.51(0.90-1.10)		298975	
D 19 13C5 PFNA										
468.00 > 423.00	3.258	3.250	0.008		8026990	45.1		90.1	732263	
D 17 13C4 PFOS										
503.00 > 80.00	3.249	3.250	-0.001		11484288	46.9		98.2	328684	
20 Perfluorononanoic acid										
463.00 > 419.00	3.249	3.259	-0.010	1.000	8138041	51.1		102	131108	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.579	3.579	0.0	1.000	17099534	48.5		97.0	327285	
D 21 13C8 FOSA										
506.00 > 78.00	3.579	3.579	0.0		18845010	45.5		91.0	580913	
D 23 13C2 PFDA										
515.00 > 470.00	3.613	3.613	0.0		7822074	47.1		94.2	251075	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.613	3.613	0.0	1.000	7165619	47.3		94.5	174542	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.920	3.919	0.001	1.000	7307334	48.5		101		
D 27 13C2 PFUnA										
565.00 > 520.00	3.946	3.945	0.001		5535734	44.0		88.0	252136	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.937	3.945	-0.008	1.000	5637139	48.1		96.1	122028	
D 30 13C2 PFDoA										
615.00 > 570.00	4.234	4.234	0.0		5561494	47.6		95.1	177737	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.234	4.242	-0.008	1.000	5078704	48.2		96.5	88846	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.503	4.504	-0.001	1.000	5015548	43.3		86.7	29434	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.740	4.741	-0.001	1.000	9512260	44.3		88.5	4412	
713.00 > 169.00	4.732	4.741	-0.009	0.998	1568765		6.06(0.00-0.00)		131629	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.740	4.741	-0.001		11005619	45.5		91.0	475237	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.159	5.160	-0.001	1.000	5189832	46.5		93.1	6005	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.159	5.160	-0.001		5902868	45.3		90.6	116762	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.524	5.525	-0.001	1.000	5669858	64.8		130	7837	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L5_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_049.d

Injection Date: 02-Dec-2016 20:59:57

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 41

Worklist Smp#: 25

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

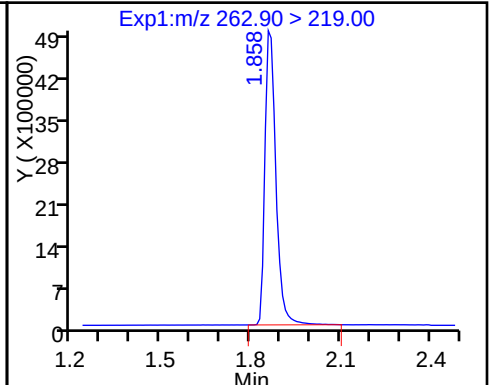
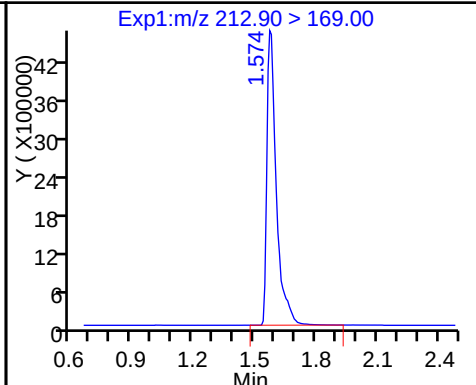
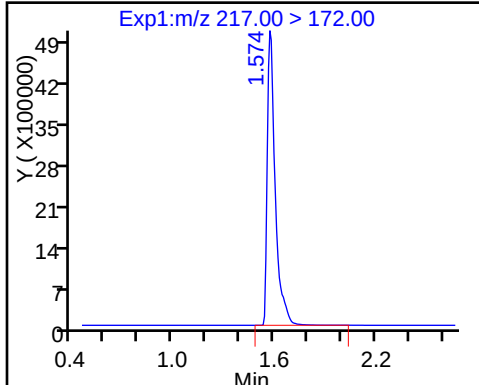
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

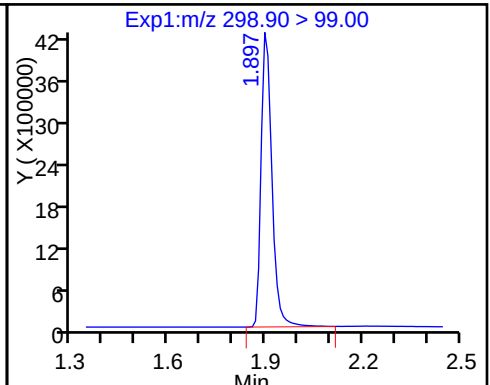
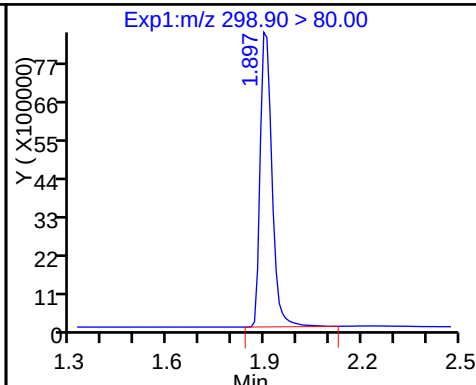
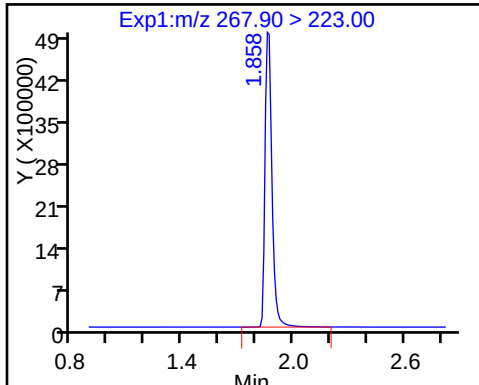
3 Perfluoropentanoic acid



D 4 13C5-PFPeA

5 Perfluorobutanesulfonic acid

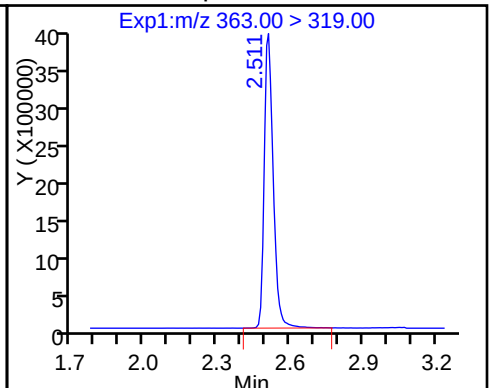
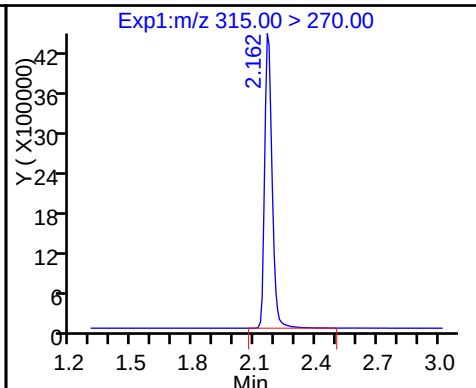
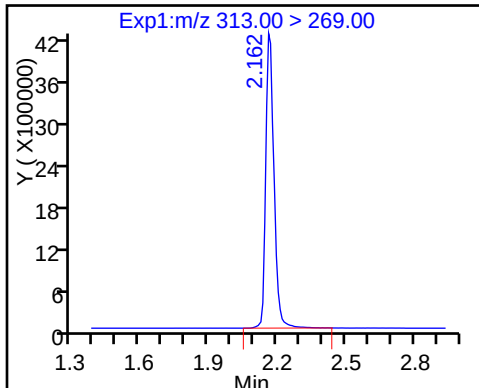
5 Perfluorobutanesulfonic acid



7 Perfluorohexanoic acid

D 6 13C2 PFHxA

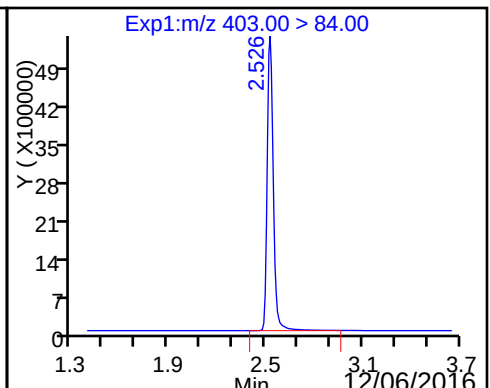
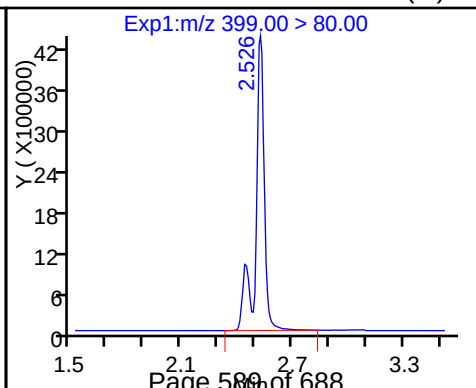
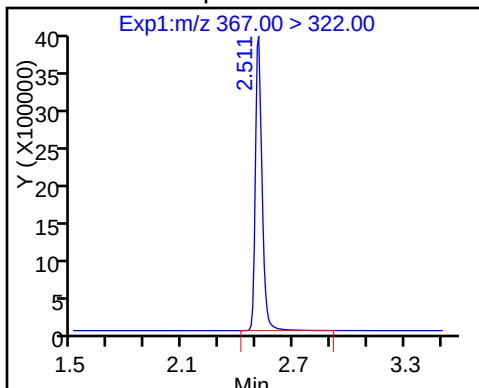
12 Perfluoroheptanoic acid



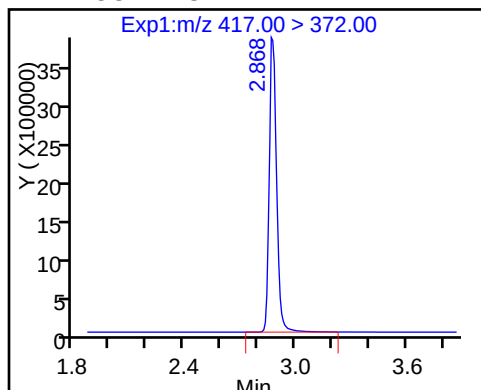
D 11 13C4-PFHpA

9 Perfluorohexanesulfonic acid (M)

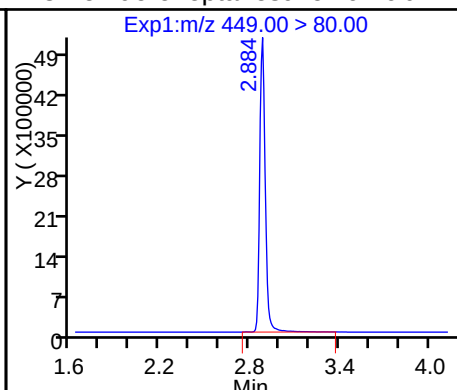
D 10 18O2 PFHxS



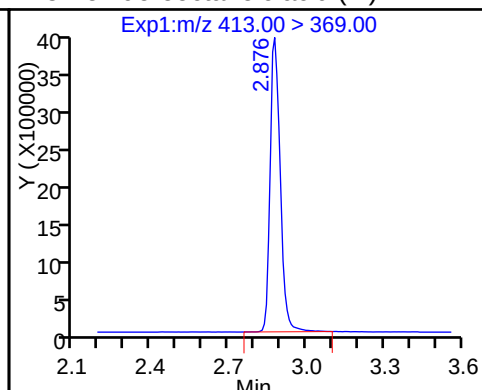
D 14 13C4 PFOA



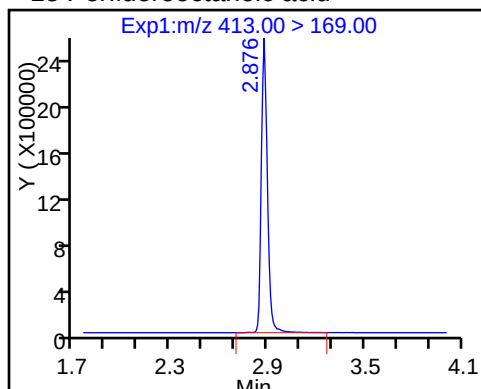
13 Perfluoroheptanesulfonic Acid



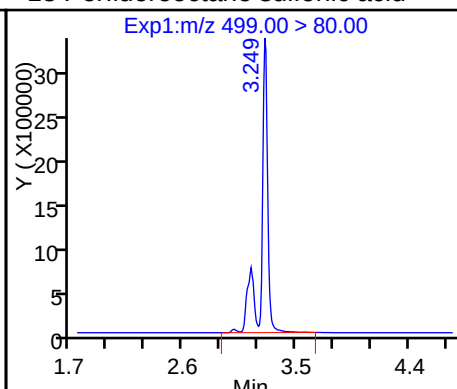
15 Perfluorooctanoic acid (M)



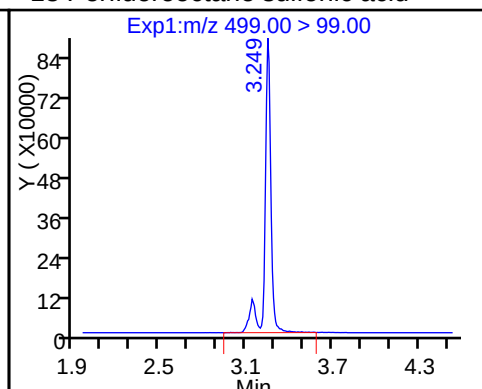
15 Perfluorooctanoic acid



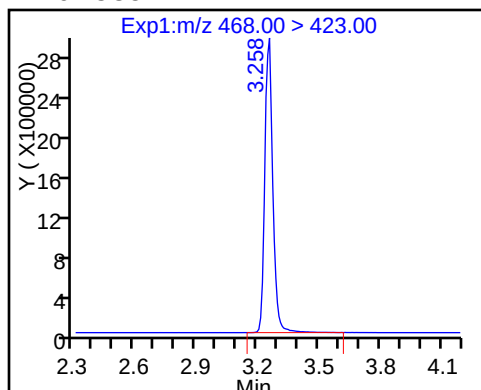
18 Perfluorooctane sulfonic acid



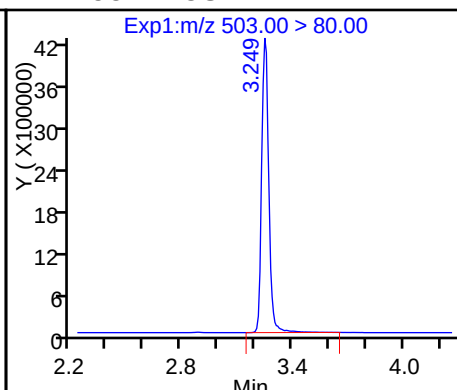
18 Perfluorooctane sulfonic acid



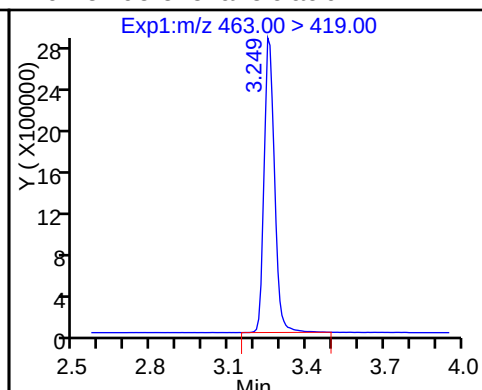
D 19 13C5 PFNA



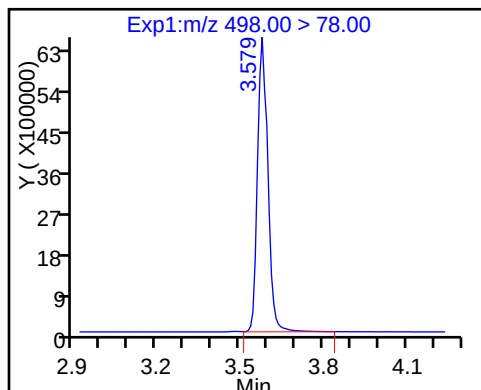
D 17 13C4 PFOS



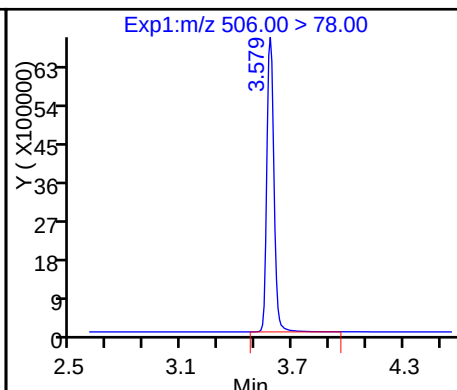
20 Perfluorononanoic acid



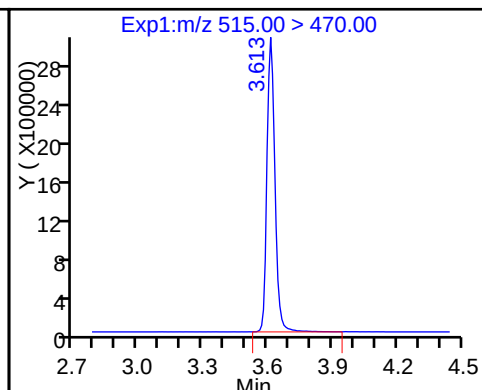
22 Perfluorooctane Sulfonamide

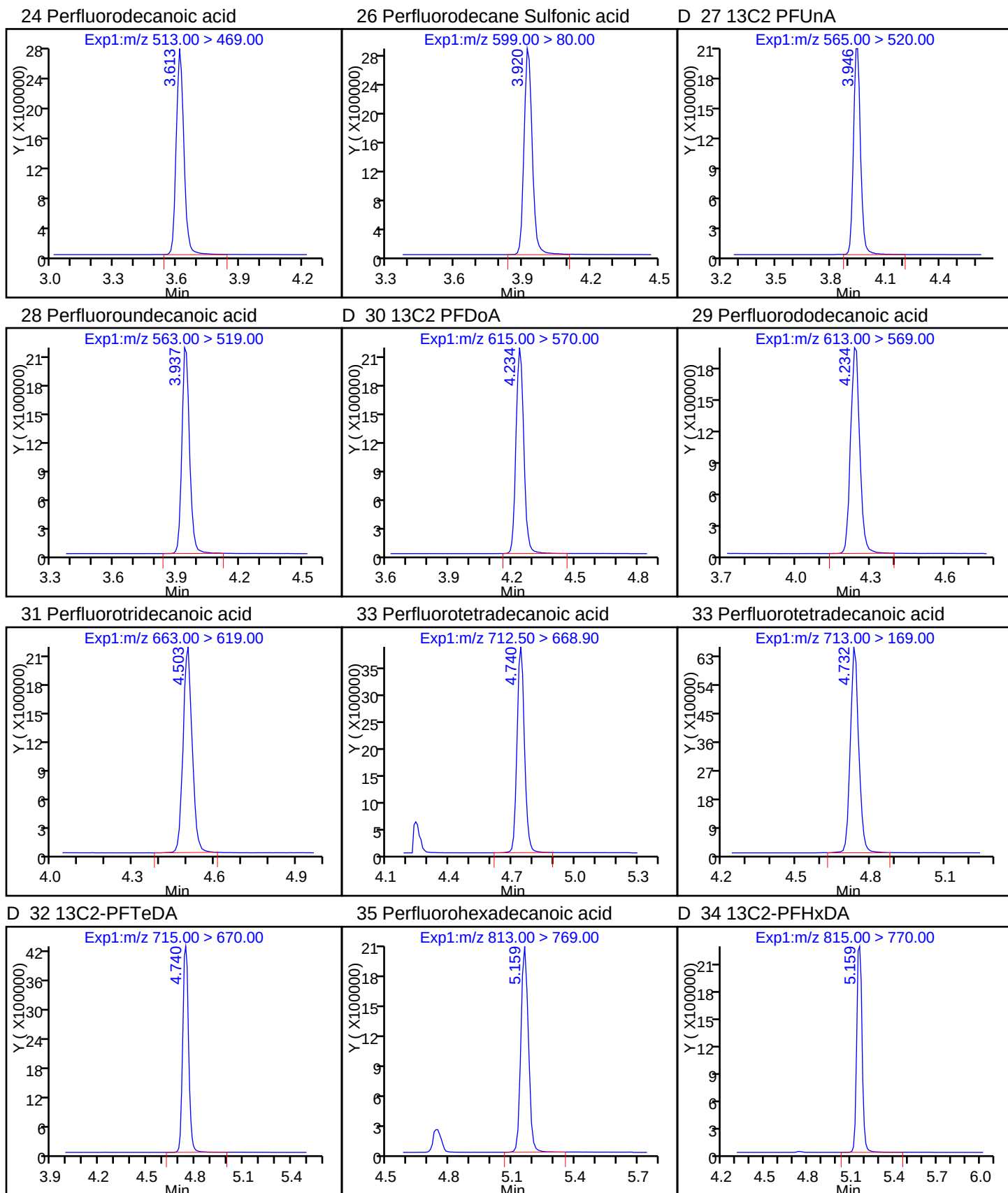


D 21 13C8 FOSA

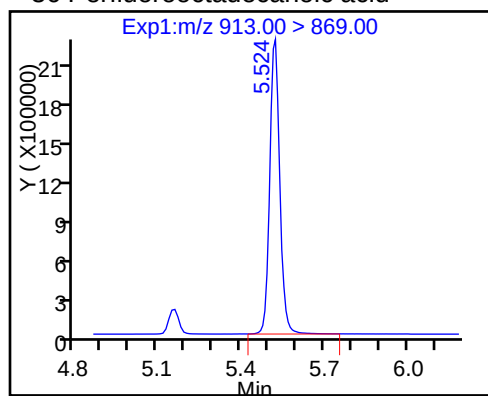


D 23 13C2 PFDA





36 Perfluorooctadecanoic acid



TestAmerica Sacramento

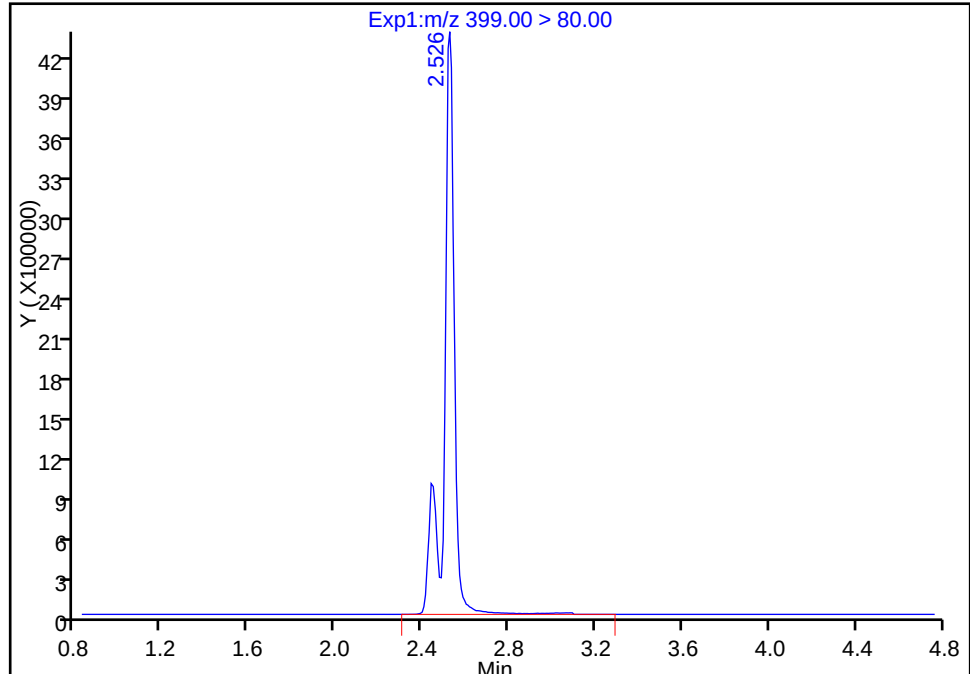
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Injection Date: 02-Dec-2016 20:59:57 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 25
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

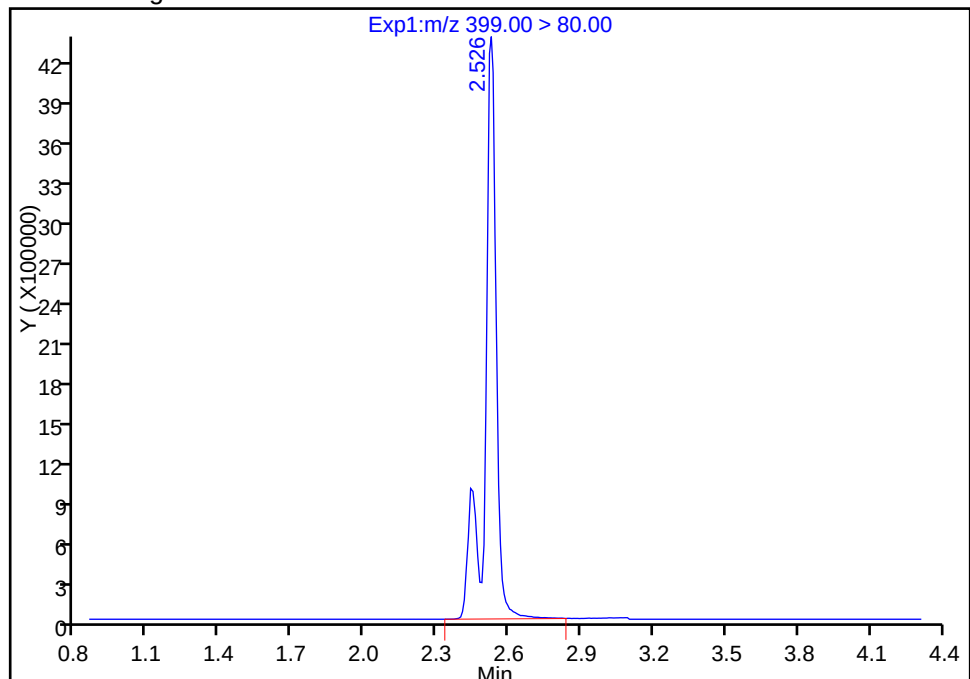
RT: 2.53
Area: 14645814
Amount: 45.433408
Amount Units: ng/ml

Processing Integration Results



RT: 2.53
Area: 14433498
Amount: 44.774774
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:43:44

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

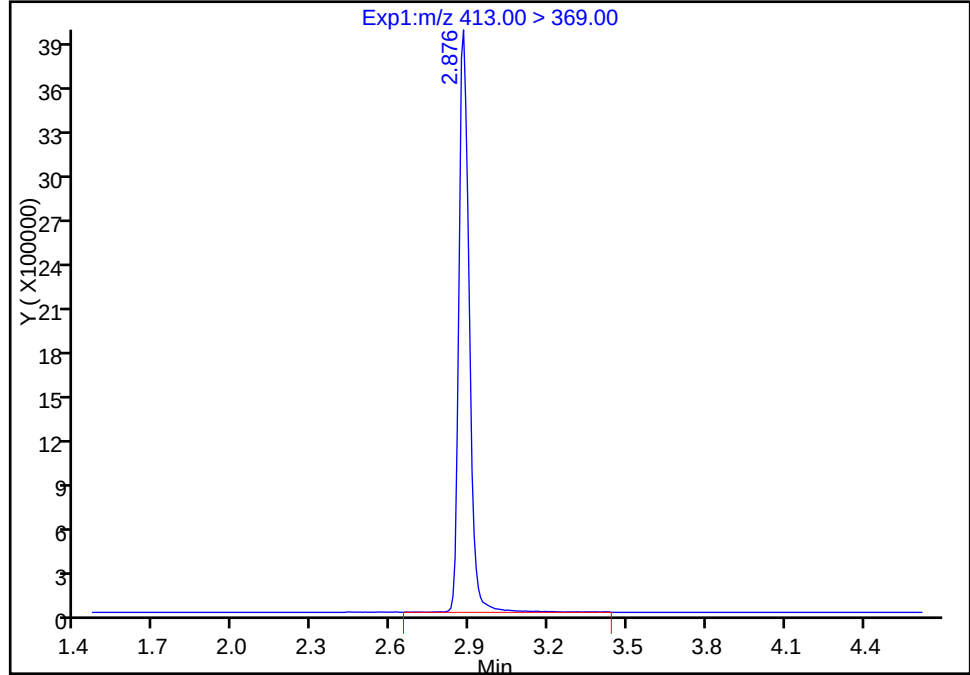
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Injection Date: 02-Dec-2016 20:59:57 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 25
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

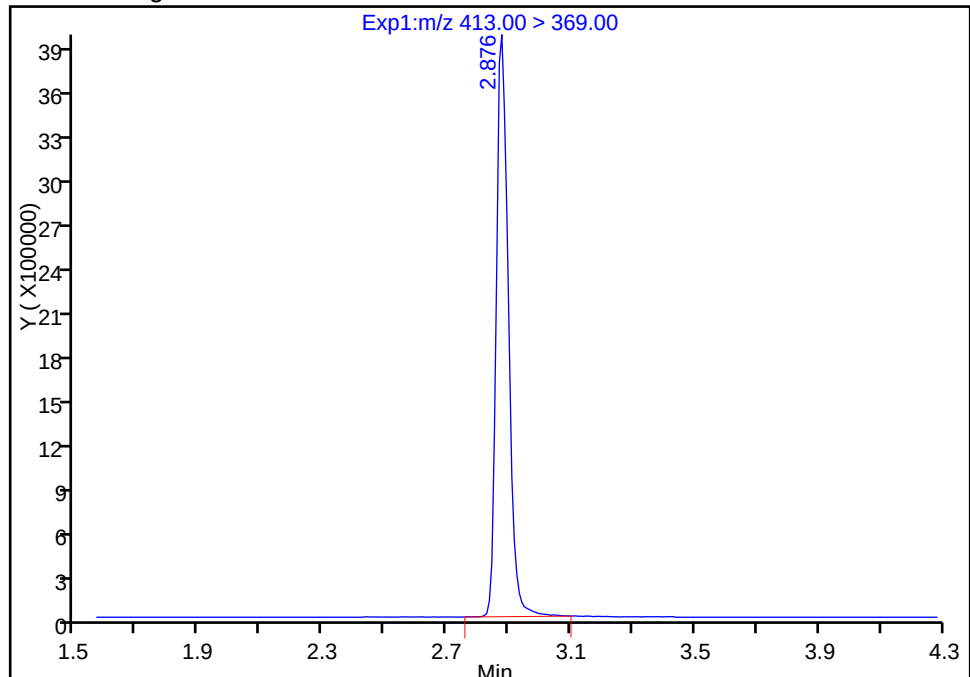
RT: 2.88
Area: 11078549
Amount: 51.291086
Amount Units: ng/ml

Processing Integration Results



RT: 2.88
Area: 10891175
Amount: 50.423589
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 08:43:44

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-138841/1-A
 Matrix: Water Lab File ID: 02DEC2016C_029.d
 Analysis Method: 537 (Modified) Date Collected: _____
 Extraction Method: 3535 Date Extracted: 11/21/2016 13:47
 Sample wt/vol: 250 (mL) Date Analyzed: 12/02/2016 18:29
 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.: 140532 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	133		25-150
STL00991	13C4 PFOS	118		25-150
STL00994	18O2 PFHxS	123		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_029.d
 Lims ID: MB 320-138841/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 02-Dec-2016 18:29:46 ALS Bottle#: 17 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-138841/1-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 08:29:29 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas

Date: 05-Dec-2016 08:29:50

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 1.566 1.566 0.0 20783420 61.1 122 1332108

1 Perfluorobutyric acid

212.90 > 169.00 1.574 1.574 0.0 1.000 94106 0.2557 463

3 Perfluoropentanoic acid

262.90 > 219.00 1.858 1.858 0.0 1.000 27451 0.0767 196

D 4 13C5-PFPeA

267.90 > 223.00 1.858 1.858 0.0 17186182 63.6 127 2207555

5 Perfluorobutanesulfonic acid

 298.90 > 80.00 1.896 1.897 -0.001 1.000 10409 0.0174
 298.90 > 99.00 1.896 1.897 -0.001 1.000 4493 2.32(0.00-0.00)

7 Perfluorohexanoic acid

313.00 > 269.00 2.169 2.159 0.010 1.000 12598 0.0467 292

D 6 13C2 PFHxA

315.00 > 270.00 2.160 2.159 0.001 14109435 57.2 114 787595

12 Perfluoroheptanoic acid

363.00 > 319.00 2.509 2.505 0.004 1.000 8031 0.0281 100

D 11 13C4-PFHpA

367.00 > 322.00 2.501 2.505 -0.004 13825912 65.7 131 1359526

9 Perfluorohexanesulfonic acid

399.00 > 80.00 2.524 2.521 0.003 1.000 70119 0.1782

D 10 18O2 PFHxS

403.00 > 84.00 2.516 2.521 -0.005 17569908 58.1 123 562513

48 Sodium 1H,1H,2H,2H-perfluorooctane

427.00 > 407.00 2.849 2.853 -0.004 1.000 9026 NR

D 47 M2-6:2FTS

429.00 > 409.00 2.841 2.853 -0.012 3759 0.0270 0.0

D 14 13C4 PFOA

417.00 > 372.00 2.873 2.869 0.004 14540538 66.3 133 927446 12/6/2016

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	2.882	2.877	0.005	1.000	57440	0.1936			321	
413.00 > 169.00	2.873	2.877	-0.004	0.997	19453		2.95(0.90-1.10)		833	
D 19 13C5 PFNA										
468.00 > 423.00	3.255	3.250	0.005		10679242	60.0		120	976576	
D 17 13C4 PFOS										
503.00 > 80.00	3.255	3.250	0.005		13838244	56.6		118	430480	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.576	3.579	-0.003	1.000	12955	0.0512			583	
D 21 13C8 FOSA										
506.00 > 78.00	3.576	3.579	-0.003		13536292	32.7		65.4	389347	
D 42 M2-8:2FTS										
529.00 > 509.00	3.593	3.604	-0.011		3895	0.0292		0.0		
D 23 13C2 PFDA										
515.00 > 470.00	3.610	3.613	-0.003		10330625	62.2		124	316029	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.610	3.613	-0.003	1.000	6747	0.0337			150	
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.771	3.768	0.003		15303	0.1913		0.0		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.771	3.777	-0.006	1.000	2418	NR				
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.920	3.919	0.001	1.000	1864	0.0103				
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.938	3.943	-0.005		21186	0.2379		0.0		
D 27 13C2 PFUnA										
565.00 > 520.00	3.938	3.945	-0.007		7927887	63.0		126	621855	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.946	3.945	0.001	1.000	19027	0.1132			428	
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.929	3.951	-0.022	0.998	4535	NR				
D 52 d-N-MeFOSA-M										
515.00 > 169.00	4.070	4.068	0.002		7288	0.0685		0.0		
54 MeFOSA										
512.00 > 169.00	4.070	4.077	-0.007	1.000	938	NR				
D 30 13C2 PFDaA										
615.00 > 570.00	4.234	4.234	0.0		6869220	58.8		118	187509	
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.259	4.257	0.002		7239	0.0710		0.0		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.259	4.266	-0.007	1.000	1223	NR				
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.742	4.741	0.001	1.000	124991	0.4708			58.7	
713.00 > 169.00	4.742	4.741	0.001	1.000	8666		14.42(0.00-0.00)		3794	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.742	4.741	0.001		18069469	74.7		149	812893	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.167	5.160	0.007	1.000	87802	0.1744			152	

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 5.156 5.160 -0.004 7226598 55.4 111 217189

36 Perfluorooctadecanoic acid

913.00 > 869.00 5.526 5.525 0.001 1.000 6912 0.0640 8.9

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_029.d

Injection Date: 02-Dec-2016 18:29:46

Instrument ID: A8_N

Lims ID: MB 320-138841/1-A

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 17

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

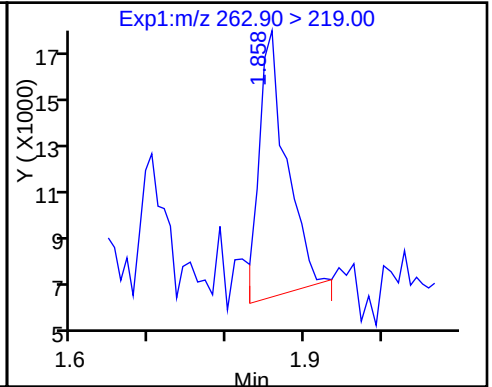
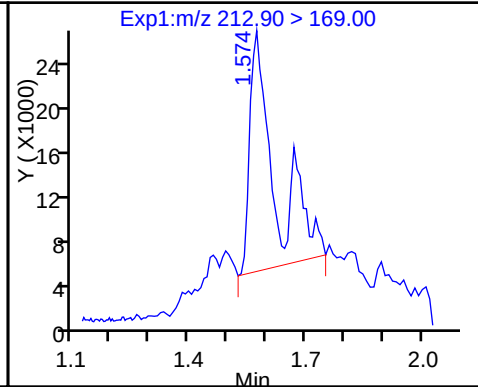
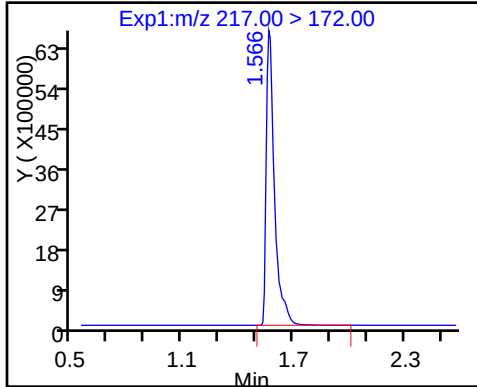
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

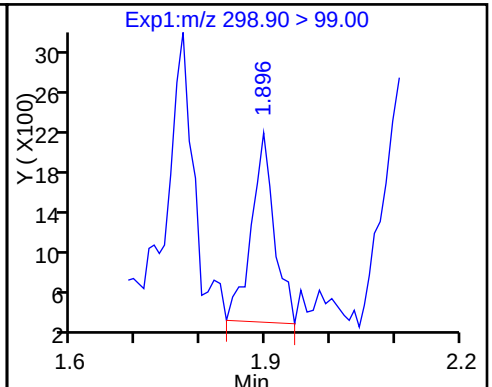
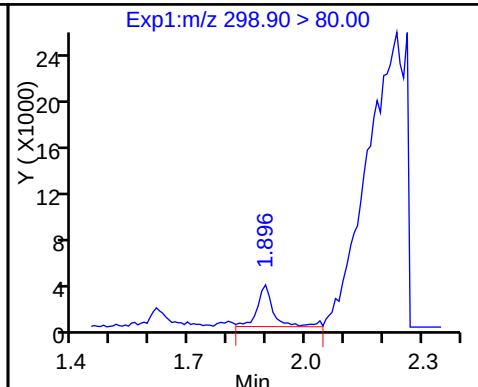
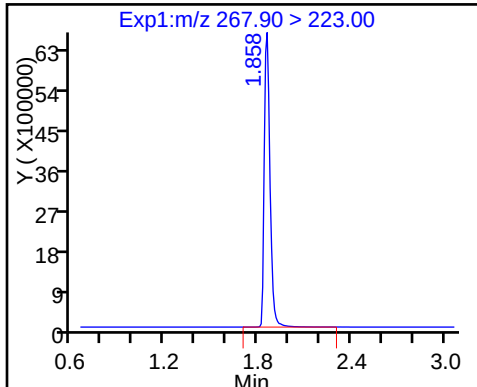
3 Perfluoropentanoic acid



D 4 13C5-PFPeA

5 Perfluorobutanesulfonic acid

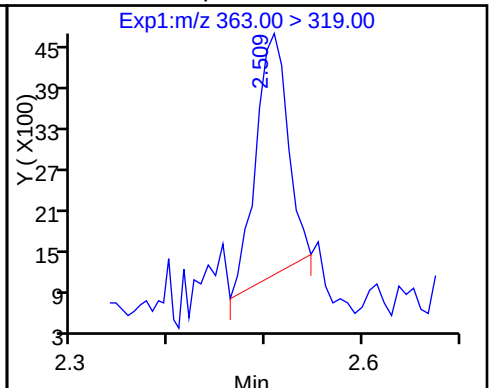
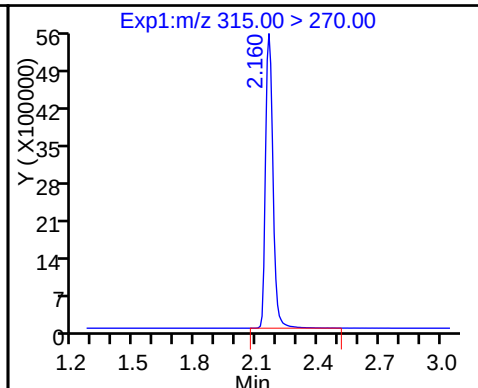
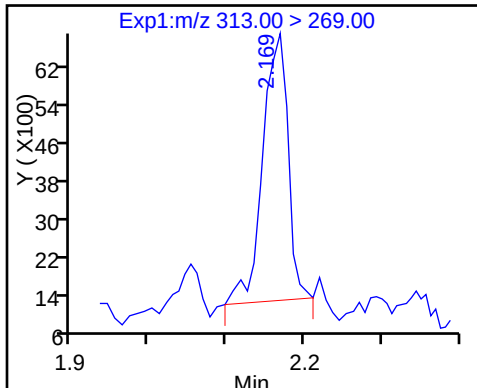
5 Perfluorobutanesulfonic acid



7 Perfluorohexanoic acid

D 6 13C2 PFHxA

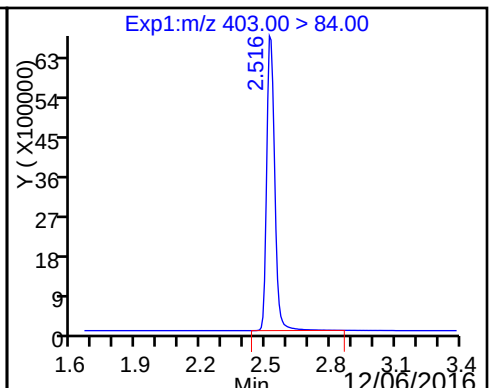
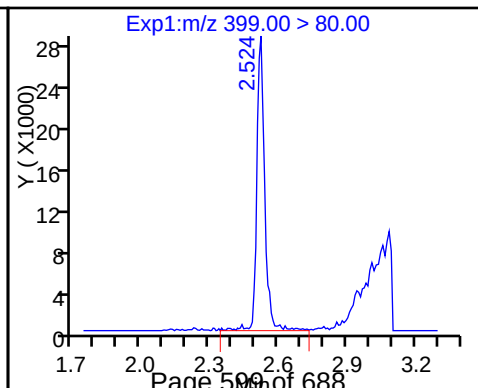
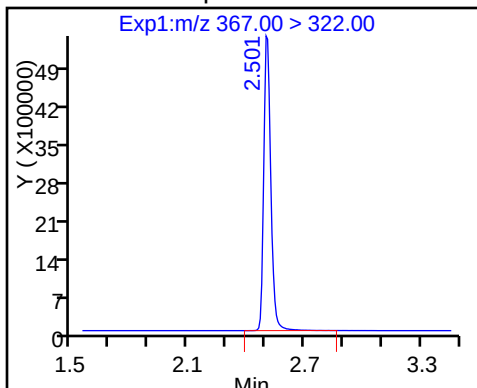
12 Perfluoroheptanoic acid



D 11 13C4-PFHpA

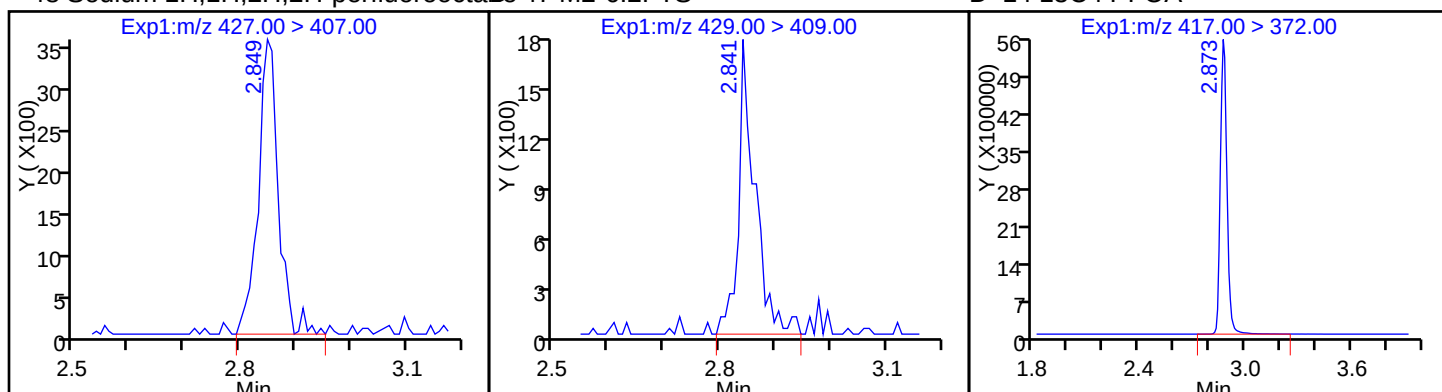
9 Perfluorohexanesulfonic acid

D 10 18O2 PFHxS



48 Sodium 1H,1H,2H,2H-perfluorooctadec-4

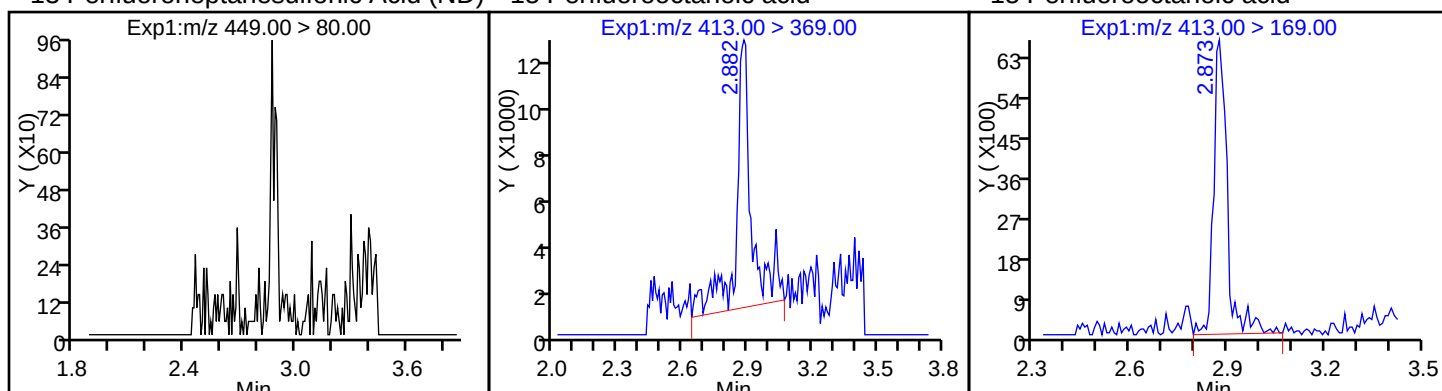
D 14 13C4 PFOA



13 Perfluoroheptanesulfonic Acid (ND)

15 Perfluorooctanoic acid

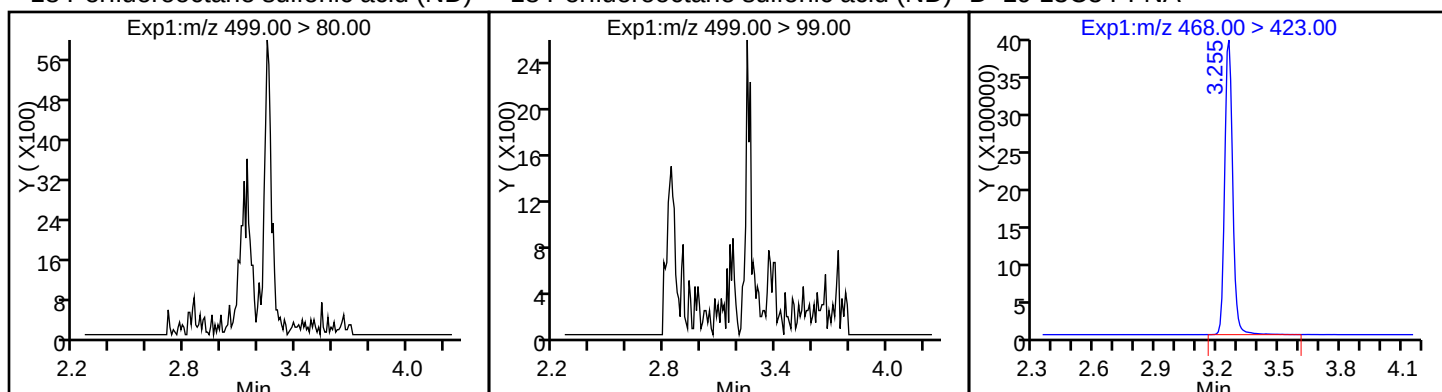
15 Perfluorooctanoic acid



18 Perfluorooctane sulfonic acid (ND)

18 Perfluorooctane sulfonic acid (ND)

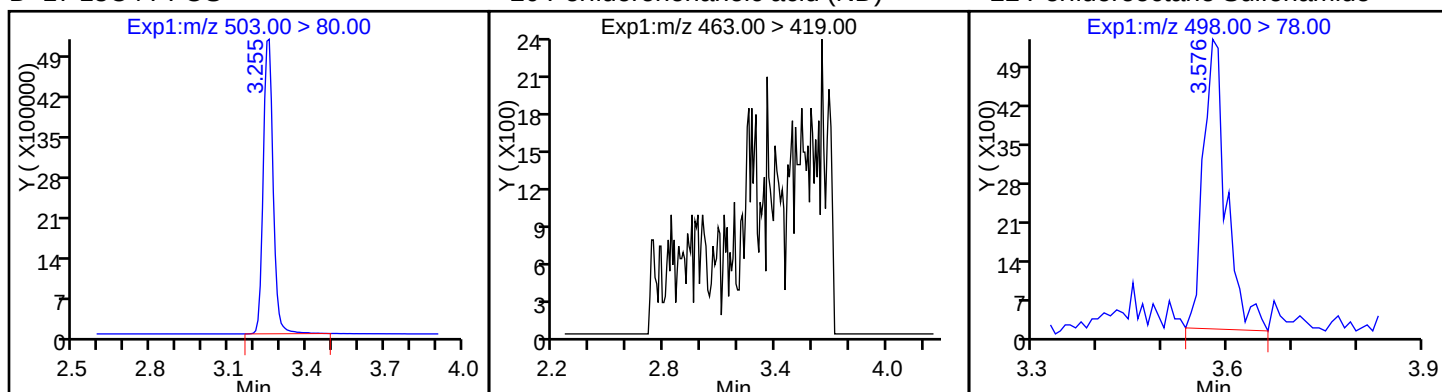
D 19 13C5 PFNA



D 17 13C4 PFOS

20 Perfluorononanoic acid (ND)

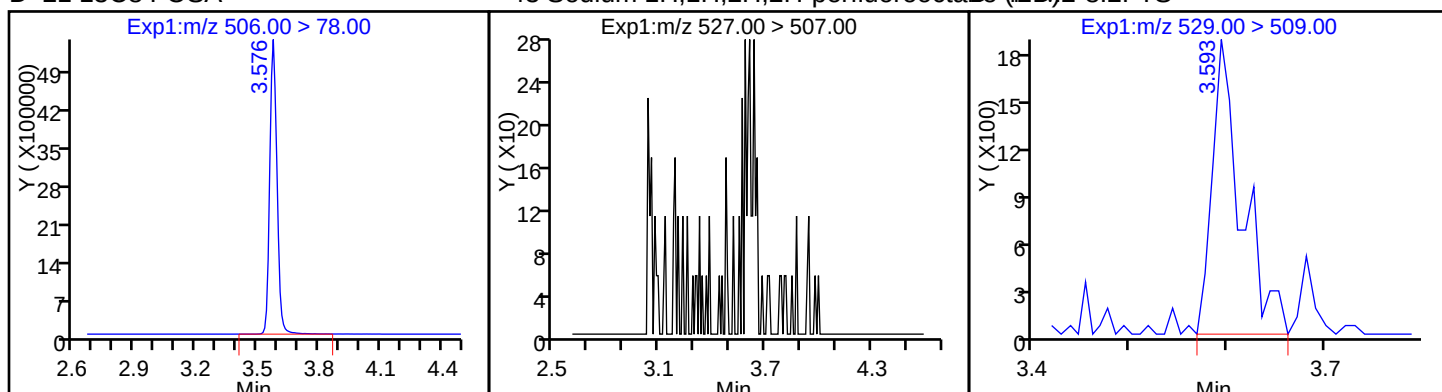
22 Perfluorooctane Sulfonamide



D 21 13C8 FOSA

43 Sodium 1H,1H,2H,2H-perfluorooctadecanoate

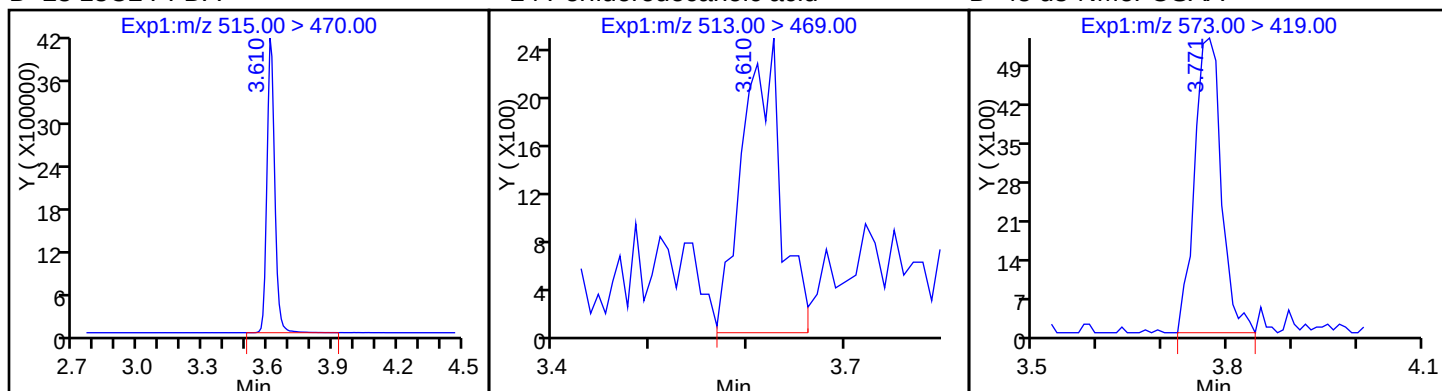
D 43 1H,1H,2H,2H-perfluorooctadecanoate



D 23 13C2 PFDA

24 Perfluorodecanoic acid

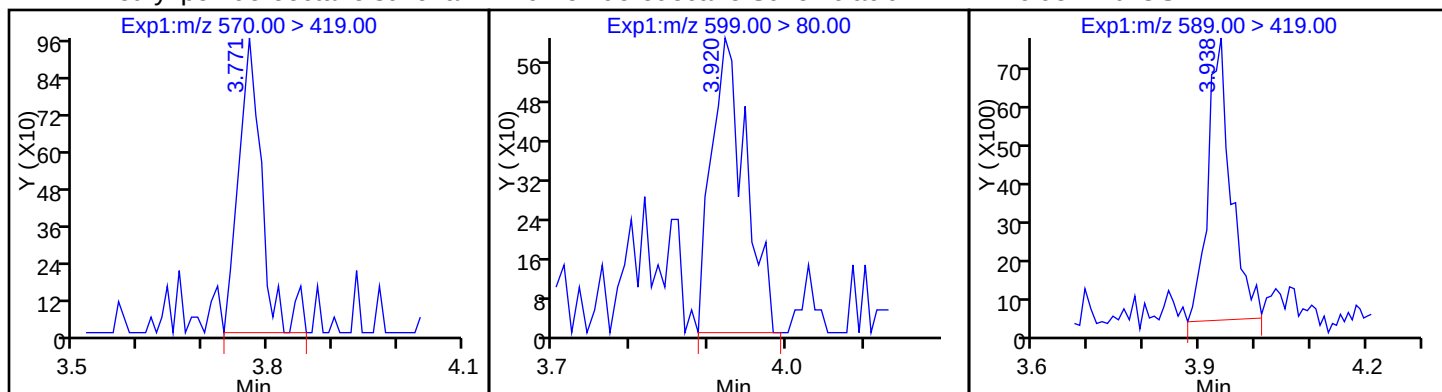
D 45 d3-NMeFOSAA



44 N-methyl perfluorooctane sulfonami

26 Perfluorodecane Sulfonic acid

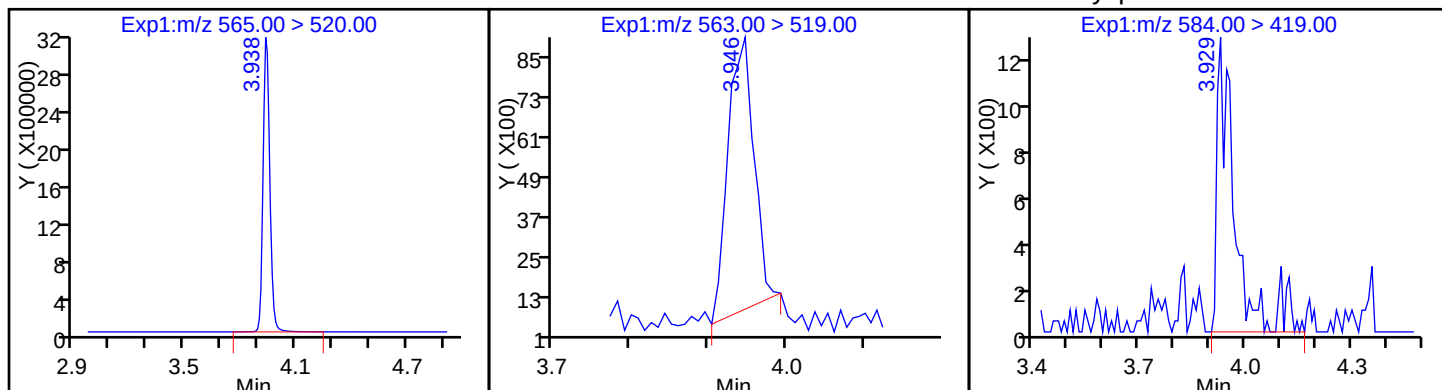
D 46 d5-NEtFOSAA



D 27 13C2 PFUnA

28 Perfluoroundecanoic acid

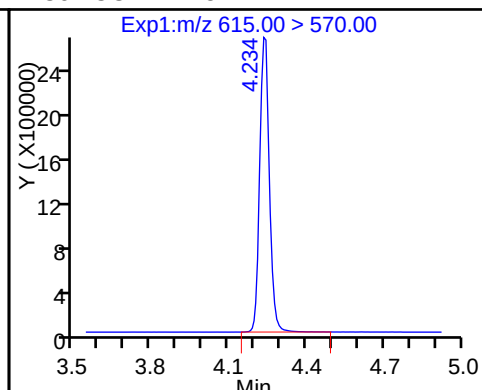
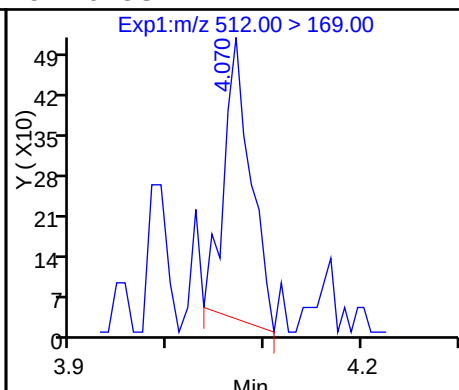
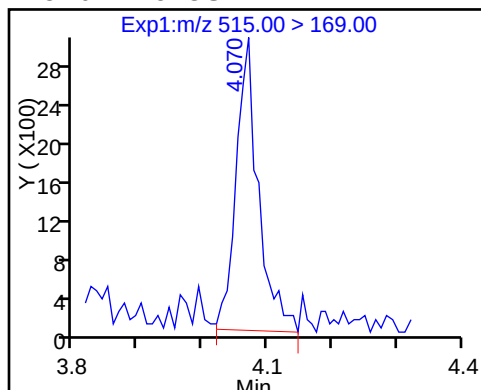
49 N-ethyl perfluorooctane sulfonamid



D 52 d-N-MeFOSA-M

54 MeFOSA

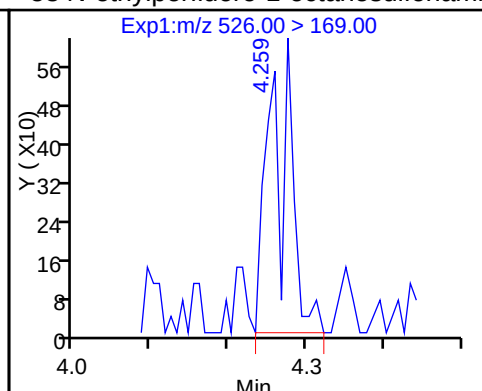
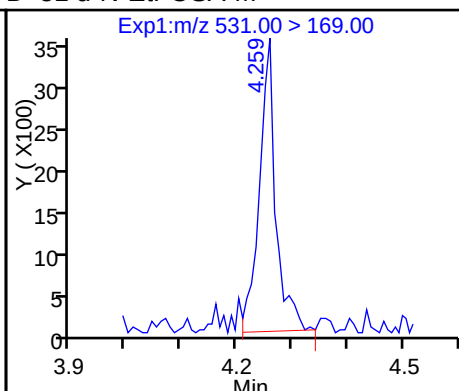
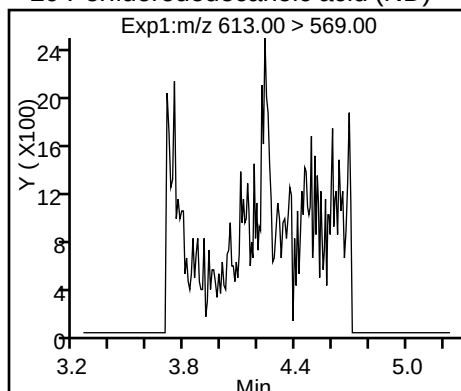
D 30 13C2 PFDaA



29 Perfluorododecanoic acid (ND)

D 51 d-N-EtFOSA-M

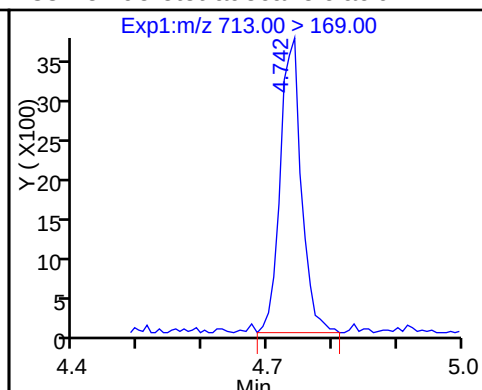
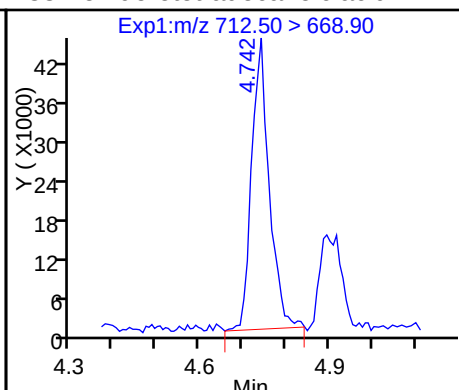
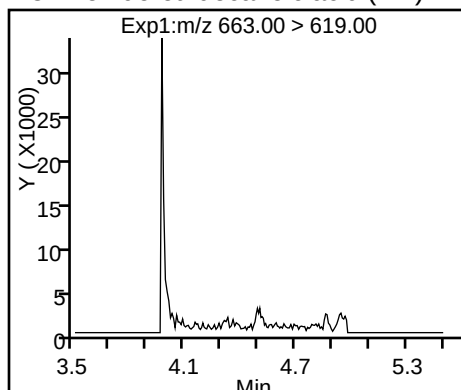
53 N-ethylperfluoro-1-octanesulfonami



31 Perfluorotridecanoic acid (ND)

33 Perfluorotetradecanoic acid

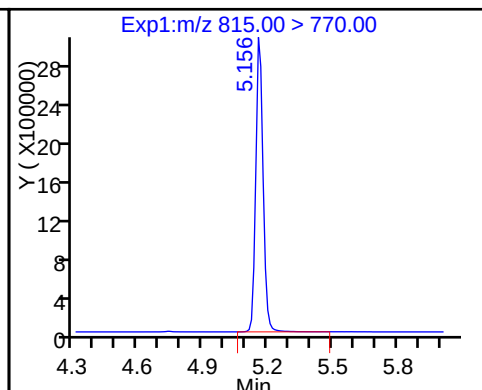
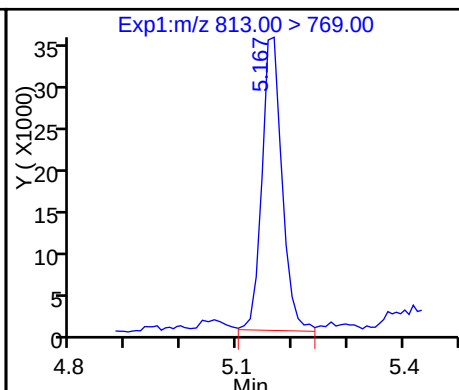
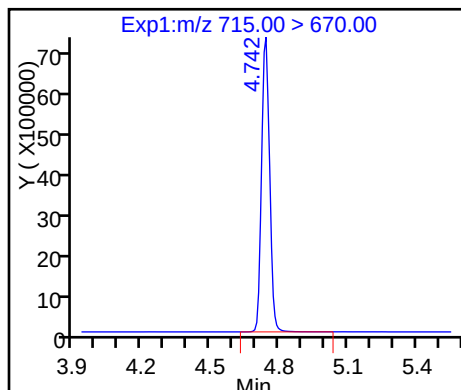
33 Perfluorotetradecanoic acid



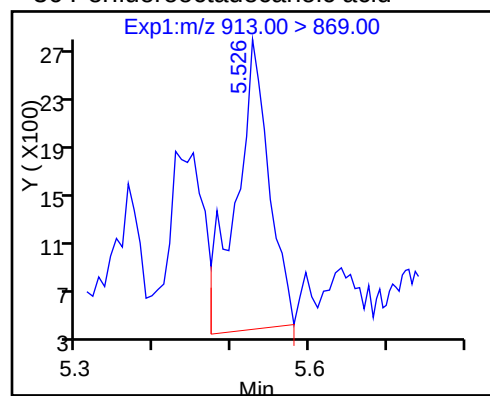
D 32 13C2-PFTeDA

35 Perfluorohexadecanoic acid

D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-139627/1-A
 Matrix: Solid Lab File ID: 02DEC2016C_001.d
 Analysis Method: 537 (Modified) Date Collected: _____
 Extraction Method: SHAKE Date Extracted: 11/28/2016 11:03
 Sample wt/vol: 5.00(g) Date Analyzed: 12/02/2016 14:59
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 140429 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.30	U	0.50	0.30	0.10
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.30	U	0.50	0.30	0.13
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.30	U	0.40	0.30	0.10

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	108		25-150
STL00991	13C4 PFOS	94		25-150
STL00994	18O2 PFHxS	104		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37461.b\02DEC2016C_001.d
 Lims ID: MB 320-139627/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 02-Dec-2016 14:59:32 ALS Bottle#: 1 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-139627/1-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37461.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 04-Dec-2016 18:16:35 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d
 Column 1 : Det: EXP1
 Process Host: XAWRK025

First Level Reviewer: chandrasenas

Date: 04-Dec-2016 18:16:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobutyric acid										
212.90 > 169.00	1.574	1.574	0.0	1.000	21795	0.0719			154	
D 2 13C4 PFBA										
217.00 > 172.00	1.574	1.574	0.0		17111077	50.3		101	1388607	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.868	1.868	0.0	1.000	23535	0.0847			149	
D 4 13C5-PFPeA										
267.90 > 223.00	1.858	1.868	-0.010		13340497	49.4		98.7	1043506	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.897	1.907	-0.010	1.000	5255	0.0103				
298.90 > 99.00	1.887	1.907	-0.020	0.995	2254		2.33(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.179	2.173	0.006	1.000	13669	0.0634			241	
D 6 13C2 PFHxA										
315.00 > 270.00	2.162	2.173	-0.011		11285724	45.8		91.6	435771	
D 11 13C4-PFHpA										
367.00 > 322.00	2.520	2.519	0.001		11132042	52.9		106	1111017	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.527	2.534	-0.007	1.000	54849	0.1642				
D 10 18O2 PFHxS										
403.00 > 84.00	2.535	2.534	0.001		14913821	49.3		104	737756	
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.862	2.870	-0.008	1.000	3757	NR				
D 47 M2-6:2FTS										
429.00 > 409.00	2.870	2.870	0.0		2973	0.0213		0.0		
D 14 13C4 PFOA										
417.00 > 372.00	2.886	2.886	0.0		11840544	54.0		108	891757	

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	2.894	0.008	1.000	58370	0.2416			382	
413.00 > 169.00	2.902	2.894	0.008	1.000	22471		2.60(0.90-1.10)		970	
D 17 13C4 PFOS										
503.00 > 80.00	3.268	3.267	0.001		11022180	45.1		94.3	717052	
D 19 13C5 PFNA										
468.00 > 423.00	3.268	3.275	-0.007		8809234	49.5		98.9	641246	
D 21 13C8 FOSA										
506.00 > 78.00	3.582	3.589	-0.007		12412970	30.0		59.9	447762	
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.632	3.624	0.008	1.005	1156	NR				
D 42 M2-8:2FTS										
529.00 > 509.00	3.616	3.624	-0.008		3435	0.0257		0.0		
D 23 13C2 PFDA										
515.00 > 470.00	3.632	3.631	0.001		7837443	47.2		94.4	389458	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.632	3.631	0.001	1.000	4782	0.0315			163	
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.787	3.790	-0.003		11498	0.1437		0.0		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.777	3.799	-0.022	0.997	2321	NR				
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.936	3.941	-0.005	1.000	808	0.005587				
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.953	3.955	-0.002		16818	0.1888		0.0		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.971	3.959	0.012	1.000	14456	0.1155			354	
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.953	3.963	-0.010	1.000	3184	NR				
D 27 13C2 PFUnA										
565.00 > 520.00	3.962	3.967	-0.005		5905793	47.0		93.9	315207	
D 52 d-N-MeFOSA-M										
515.00 > 169.00	4.052	4.079	-0.027		5561	0.0523		0.0		
54 MeFOSA										
512.00 > 169.00	4.085	4.087	-0.002	1.000	998	NR				
D 30 13C2 PFDaA										
615.00 > 570.00	4.251	4.259	-0.008		4628188	39.6		79.2	143761	
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.251	4.261	-0.010		6878	0.0675		0.0		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.285	4.271	0.014	1.000	842	NR				
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.743	4.772	-0.030	1.000	30983	0.1732			15.8	
713.00 > 169.00	4.759	4.772	-0.013	1.003	2876		10.77(0.00-0.00)		1371	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.759	4.772	-0.013		7246692	30.0		59.9	383039	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.178	5.184	-0.006		2329899	17.9		35.7	106732	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.178	5.194	-0.016	1.000	34261	-0.4475			71.7	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.566	5.562	0.004	1.000	2419	0.0332			11.2	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37461.b\02DEC2016C_001.d

Injection Date: 02-Dec-2016 14:59:32

Instrument ID: A8_N

Lims ID: MB 320-139627/1-A

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 1

Worklist Smp#: 5

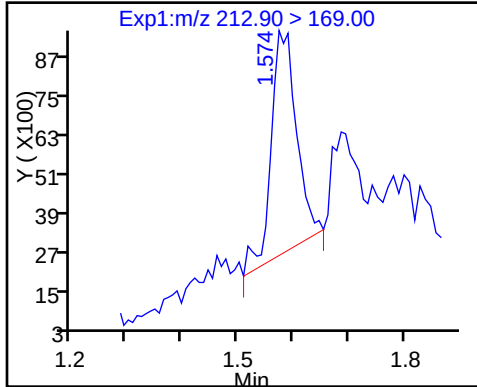
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

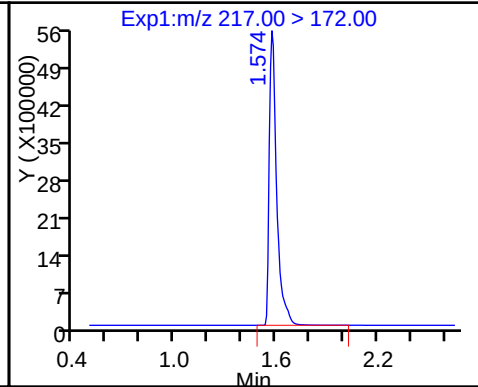
Method: A8_N

Limit Group: LC PFC_DOD ICAL

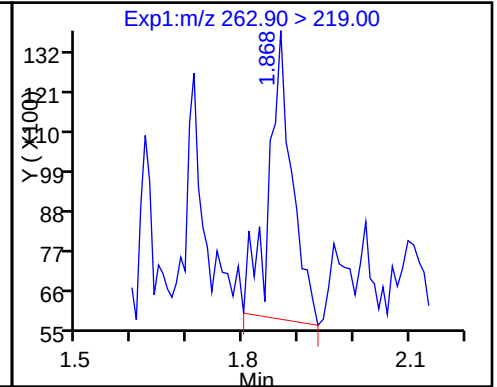
1 Perfluorobutyric acid



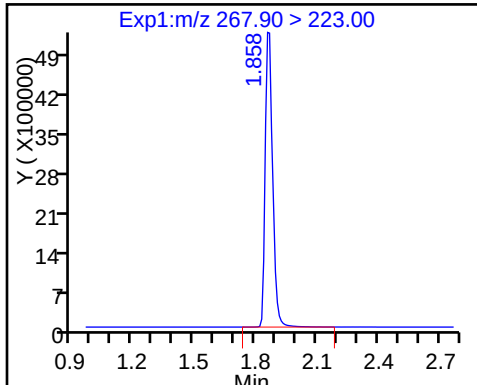
D 2 13C4 PFBA



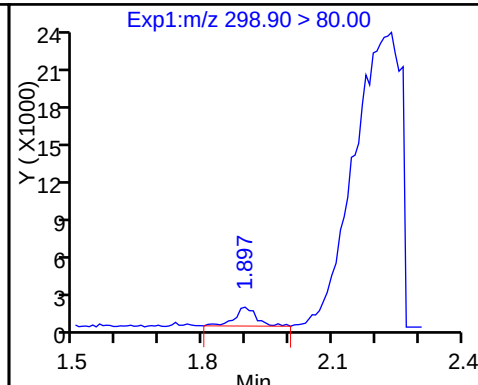
3 Perfluoropentanoic acid



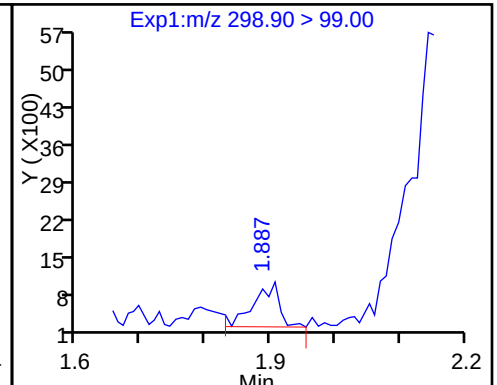
D 4 13C5-PFPeA



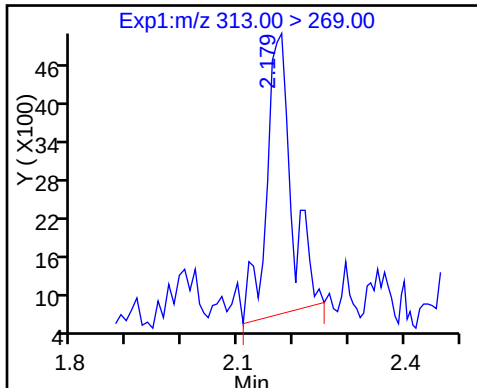
5 Perfluorobutanesulfonic acid



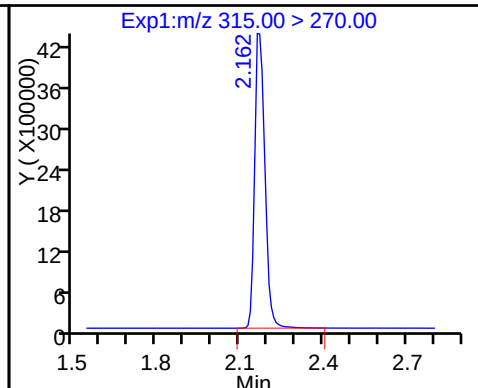
5 Perfluorobutanesulfonic acid



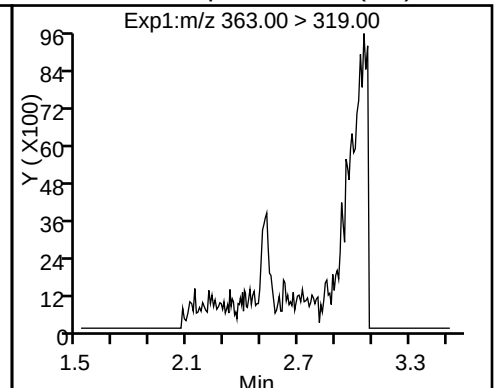
7 Perfluorohexanoic acid



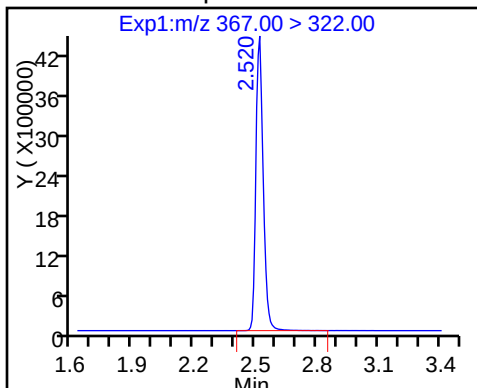
D 6 13C2 PFHxA



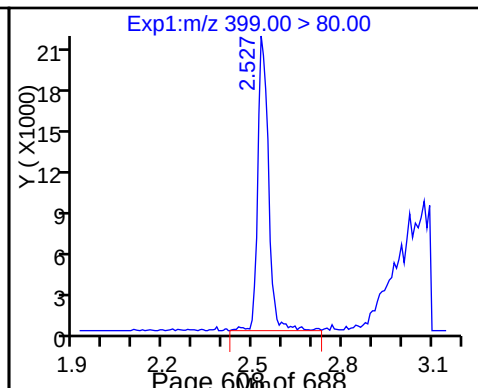
12 Perfluoroheptanoic acid (ND)



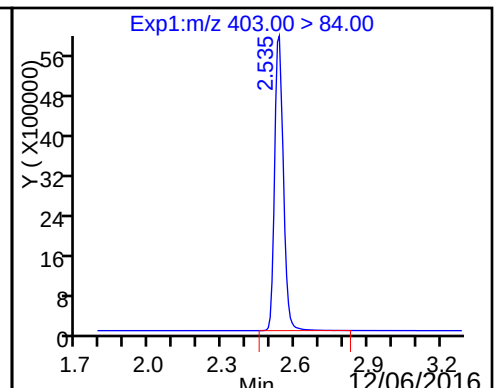
D 11 13C4-PFHpA



9 Perfluorohexanesulfonic acid

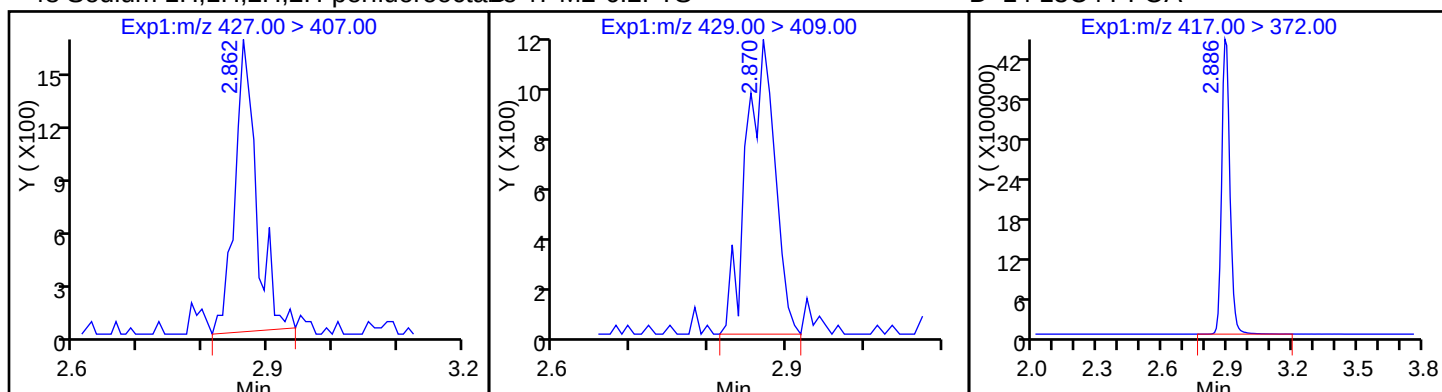


D 10 18O2 PFHxS



48 Sodium 1H,1H,2H,2H-perfluorooctadec-4

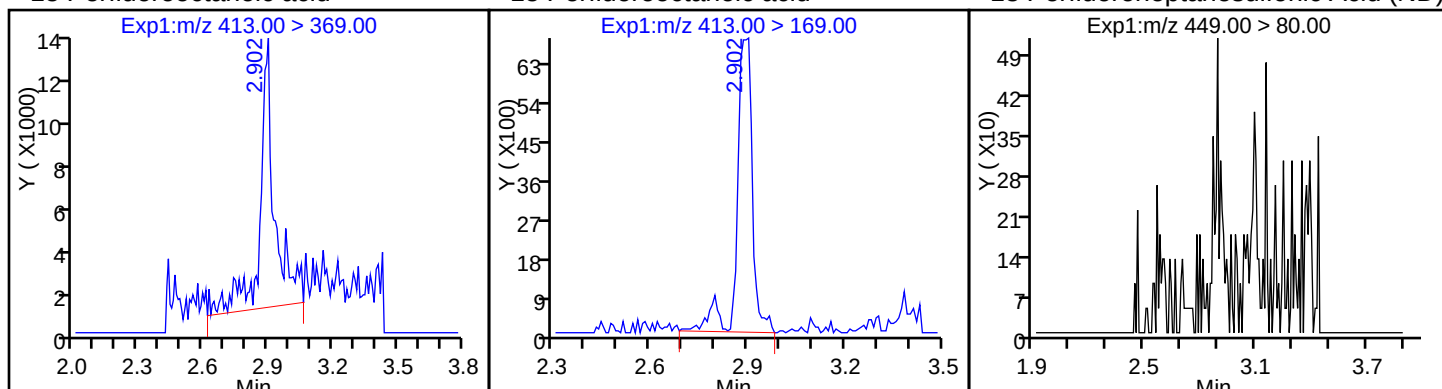
D 14 13C4 PFOA



15 Perfluorooctanoic acid

15 Perfluorooctanoic acid

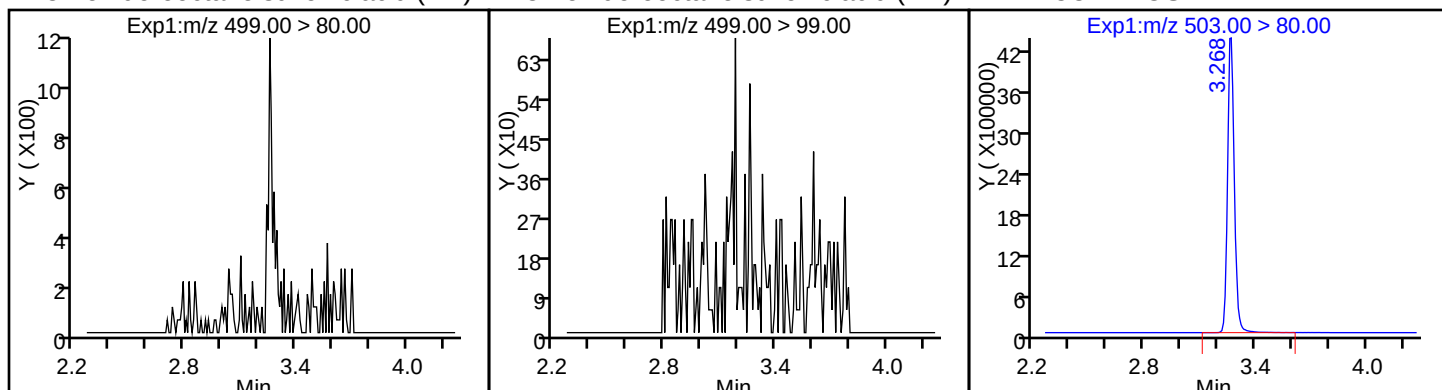
13 Perfluoroheptanesulfonic Acid (ND)



18 Perfluorooctane sulfonic acid (ND)

18 Perfluorooctane sulfonic acid (ND)

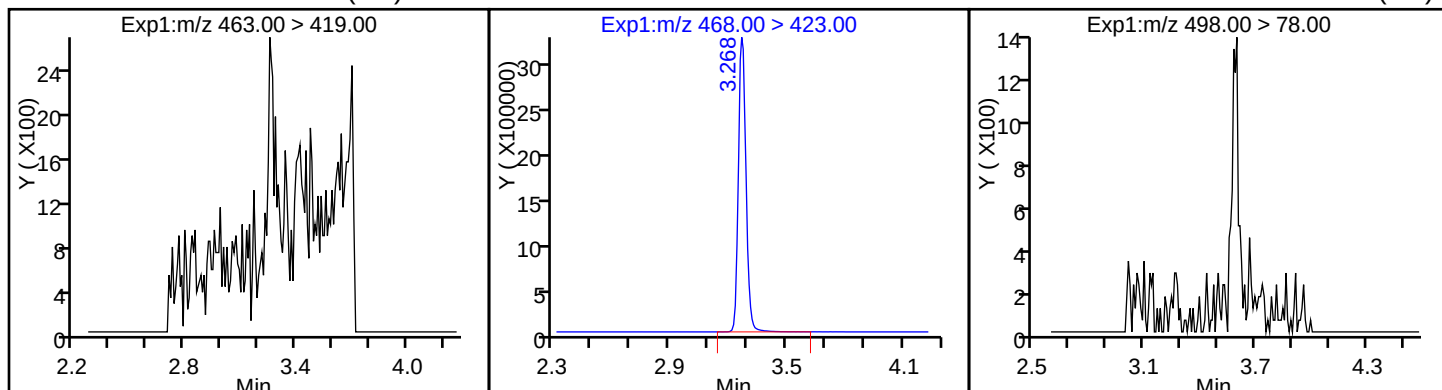
D 17 13C4 PFOS



20 Perfluorononanoic acid (ND)

D 19 13C5 PFNA

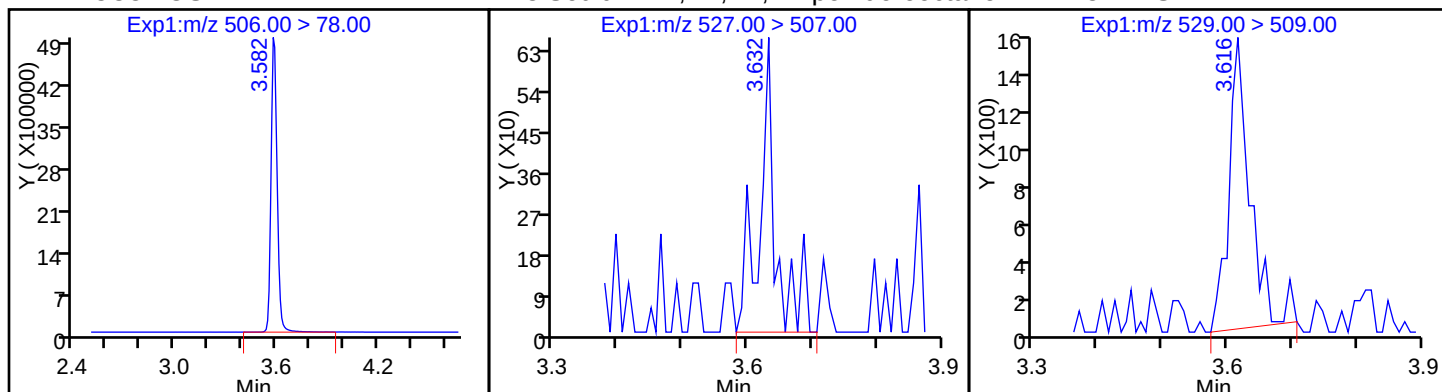
22 Perfluorooctane Sulfonamide (ND)



D 21 13C8 FOSA

43 Sodium 1H,1H,2H,2H-perfluorooctadecanoate

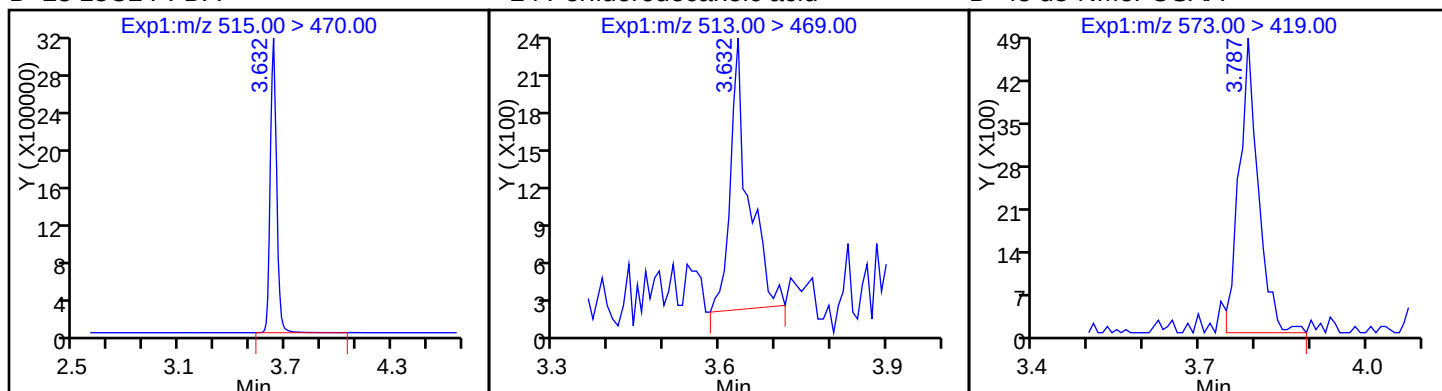
D 42 M2-8:2FTS



D 23 13C2 PFDA

24 Perfluorodecanoic acid

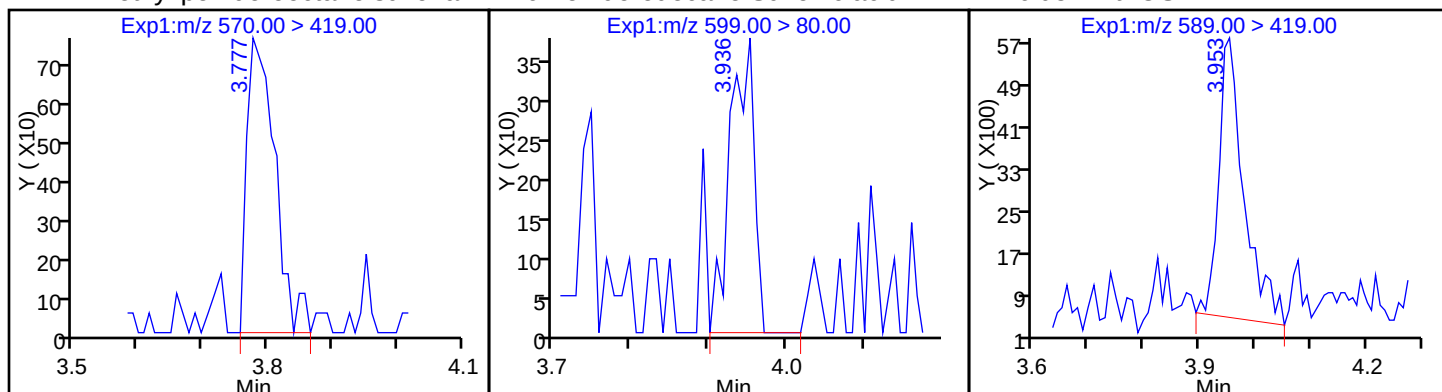
D 45 d3-NMeFOSAA



44 N-methyl perfluorooctane sulfonami

26 Perfluorodecane Sulfonic acid

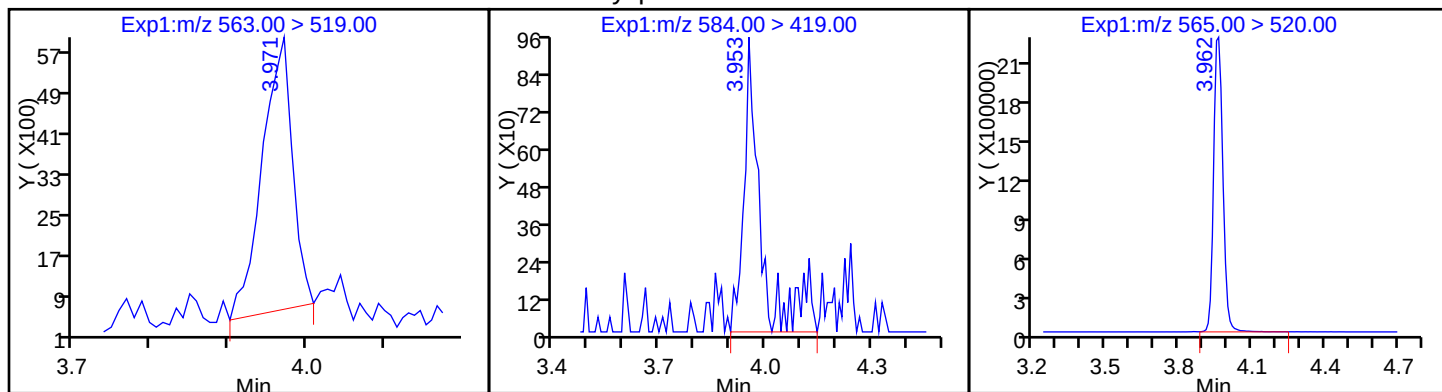
D 46 d5-NEtFOSAA



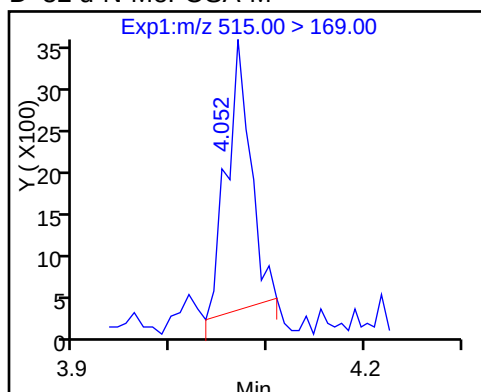
28 Perfluoroundecanoic acid

49 N-ethyl perfluorooctane sulfonamid

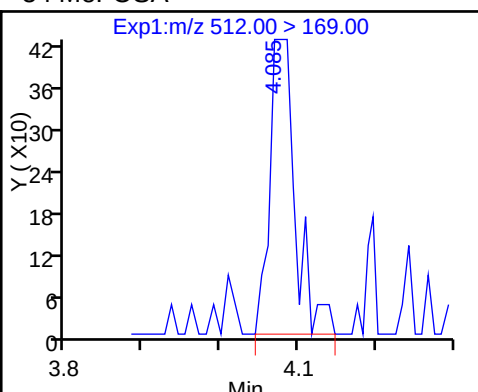
D 27 13C2 PFUnA



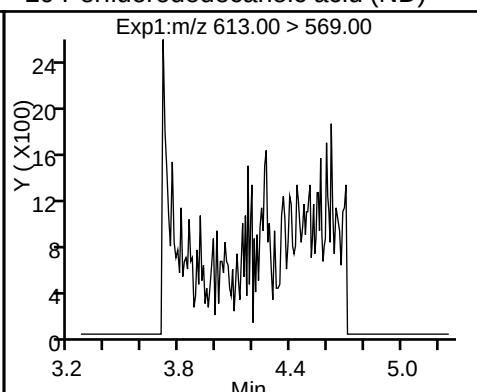
D 52 d-N-MeFOSA-M



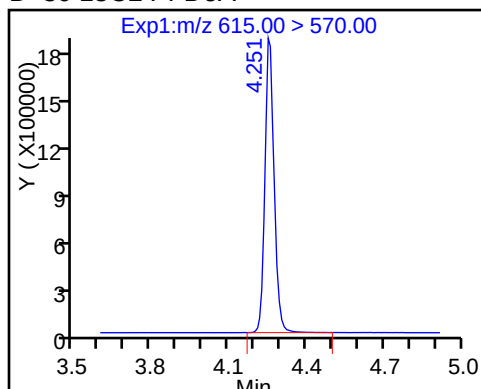
54 MeFOSA



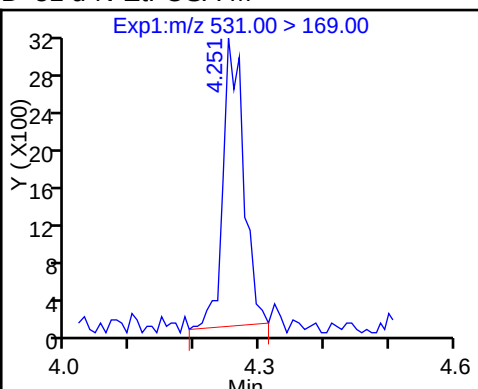
29 Perfluorododecanoic acid (ND)



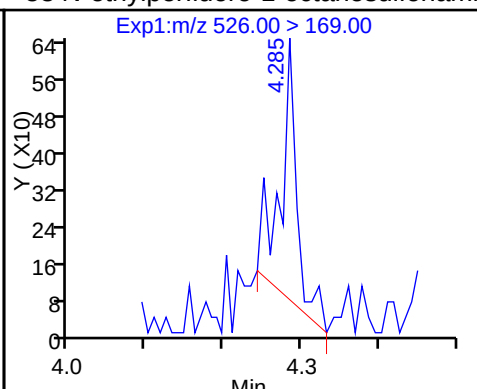
D 30 13C2 PFDaA



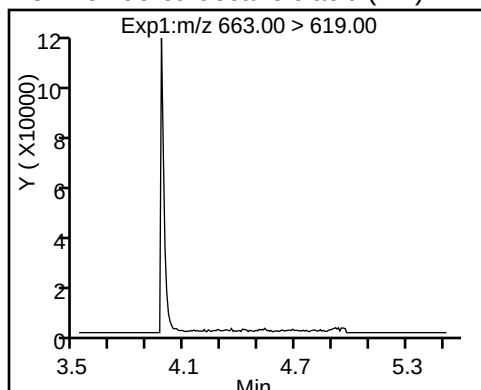
D 51 d-N-EtFOSA-M



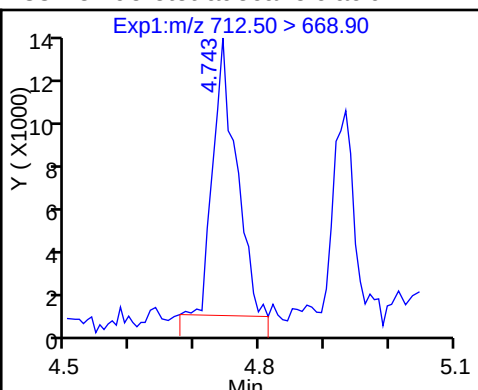
53 N-ethylperfluoro-1-octanesulfonami



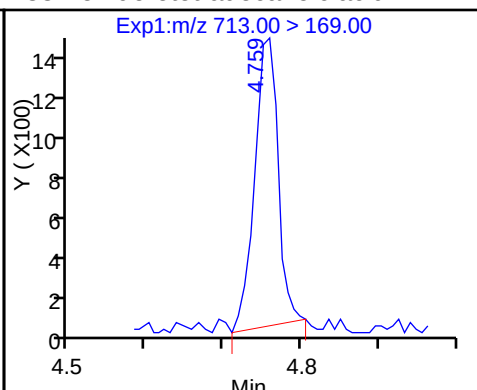
31 Perfluorotridecanoic acid (ND)



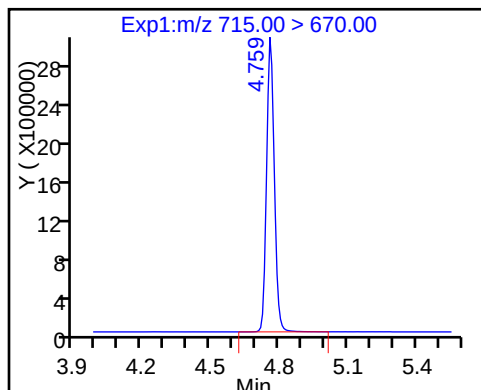
33 Perfluorotetradecanoic acid



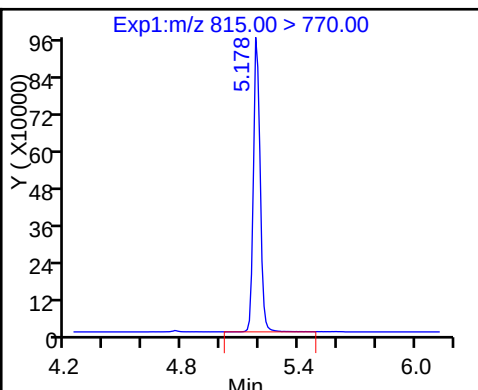
33 Perfluorotetradecanoic acid



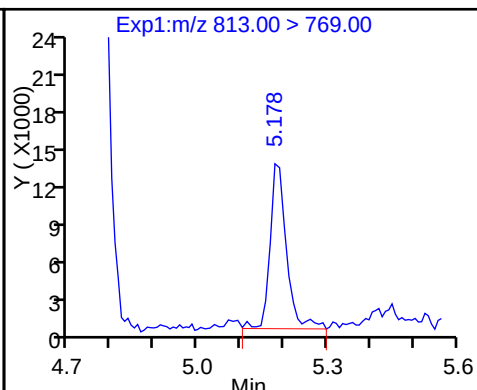
D 32 13C2-PFTeDA



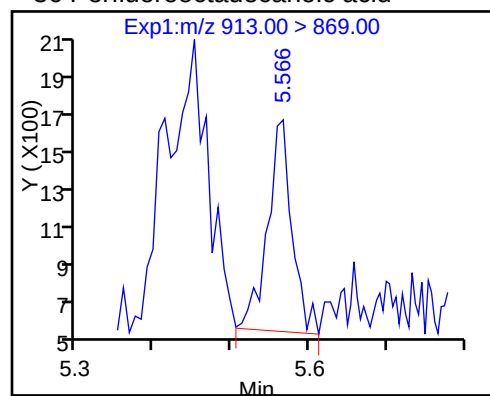
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 320-138841/2-A
 Matrix: Water Lab File ID: 02DEC2016C_030.d
 Analysis Method: 537 (Modified) Date Collected: _____
 Extraction Method: 3535 Date Extracted: 11/21/2016 13:47
 Sample wt/vol: 250 (mL) Date Analyzed: 12/02/2016 18:37
 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.: 140532 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0373		0.0025	0.0020	0.00075
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.0328		0.0040	0.0030	0.0013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0373		0.0025	0.0020	0.00092

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	133		25-150
STL00991	13C4 PFOS	123		25-150
STL00994	18O2 PFHxS	126		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_030.d
 Lims ID: LCS 320-138841/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 02-Dec-2016 18:37:16 ALS Bottle#: 18 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-138841/2-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 08:30:42 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas

Date: 05-Dec-2016 08:30:13

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	1.566	1.566	0.0		19956260	58.6		117	1234675	
1 Perfluorobutyric acid										
212.90 > 169.00	1.566	1.574	-0.008	1.000	6866539	19.4		97.2	51553	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.858	1.858	0.0	1.000	6573532	18.0		90.1	55603	
D 4 13C5-PFPeA										
267.90 > 223.00	1.858	1.858	0.0		17516427	64.8		130	1378939	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.897	1.897	0.0	1.000	11491087	18.7		106		
298.90 > 99.00	1.897	1.897	0.0	1.000	4929610		2.33(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.157	2.159	-0.002	1.000	5194493	18.7		93.3	119249	
D 6 13C2 PFHxA										
315.00 > 270.00	2.157	2.159	-0.002		14561074	59.1		118	648741	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.505	2.505	0.0	1.000	5253610	18.3		91.7	69423	
D 11 13C4-PFHpA										
367.00 > 322.00	2.505	2.505	0.0		13856646	65.8		132	880904	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.520	2.521	-0.001	1.000	6802242	16.8		92.4		
D 10 18O2 PFHxS										
403.00 > 84.00	2.520	2.521	-0.001		18049649	59.7		126	450653	
D 14 13C4 PFOA										
417.00 > 372.00	2.871	2.869	0.002		14593527	66.5		133	1090316	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.879	2.877	0.002	1.000	6305636	17.9		94.2		

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	2.871	2.877	-0.006	1.000	5558721	18.7		93.3	123868	
413.00 > 169.00	2.871	2.877	-0.006	1.000	3418372		1.63(0.90-1.10)		220513	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.253	3.250	0.003	1.000	5357214	16.4		88.3	508082	
499.00 > 99.00	3.253	3.250	0.003	1.000	1205589		4.44(0.90-1.10)		57711	
D 19 13C5 PFNA										
468.00 > 423.00	3.253	3.250	0.003		11225416	63.0		126	1388403	
D 17 13C4 PFOS										
503.00 > 80.00	3.253	3.250	0.003		14373323	58.8		123	687005	
20 Perfluorononanoic acid										
463.00 > 419.00	3.253	3.259	-0.006	1.000	3977471	17.9		89.4	70985	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.574	3.579	-0.005	1.000	6715790	19.4		97.0	167094	
D 21 13C8 FOSA										
506.00 > 78.00	3.574	3.579	-0.005		18504189	44.7		89.3	640733	
D 23 13C2 PFDA										
515.00 > 470.00	3.616	3.613	0.003		10471910	63.1		126	295500	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.608	3.613	-0.005	1.000	3610153	17.8		88.9	90054	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.921	3.919	0.002	1.000	3256128	17.3		89.6		
D 27 13C2 PFUnA										
565.00 > 520.00	3.938	3.945	-0.007		7748521	61.6		123	303975	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.938	3.945	-0.007	1.000	2539120	15.5		77.3	51336	
D 30 13C2 PFDoA										
615.00 > 570.00	4.234	4.234	0.0		6834267	58.5		117	235890	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.234	4.242	-0.008	1.000	2274597	17.6		87.9	47625	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.503	4.504	-0.001	1.000	2487350	17.5		87.5	15311	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.738	4.741	-0.003	1.000	6070176	23.0		115	2607	
713.00 > 169.00	4.730	4.741	-0.011	0.998	972173		6.24(0.00-0.00)		198877	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.738	4.741	-0.003		17804501	73.6		147	725929	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.166	5.160	0.006	1.000	1917987	13.4		67.1	3662	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.155	5.160	-0.005		6343518	48.7		97.3	207791	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.529	5.525	0.004	1.000	1668189	15.5		77.6	2394	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_030.d

Injection Date: 02-Dec-2016 18:37:16

Instrument ID: A8_N

Lims ID: LCS 320-138841/2-A

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 18

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

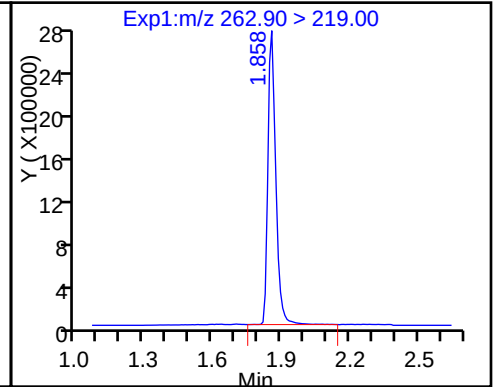
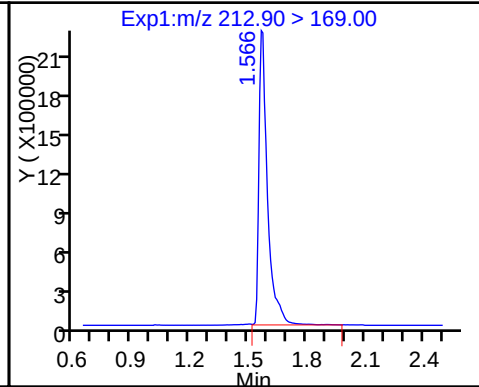
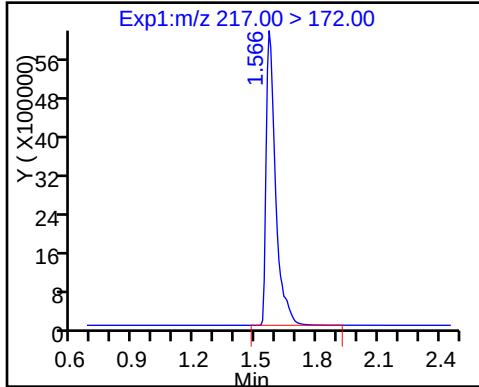
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

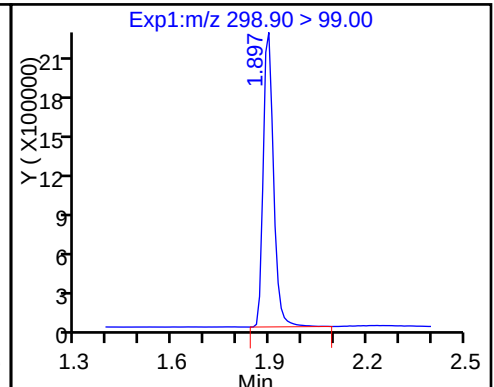
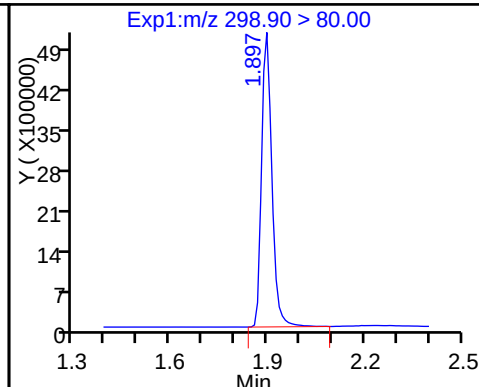
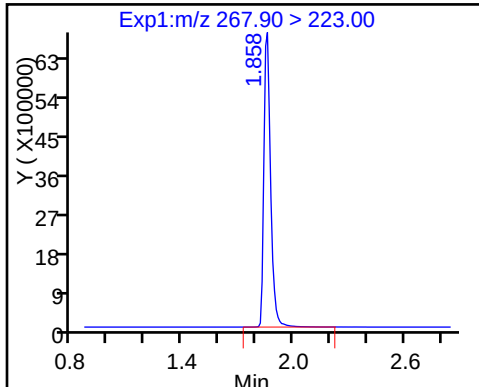
3 Perfluoropentanoic acid



D 4 13C5-PFPeA

5 Perfluorobutanesulfonic acid

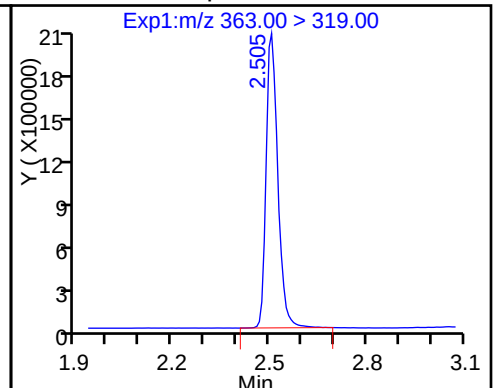
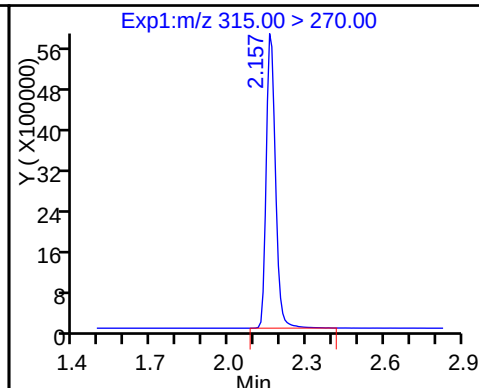
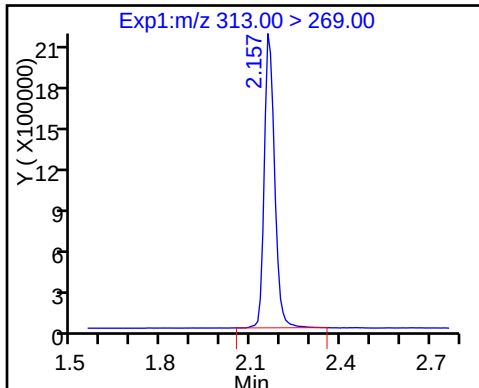
5 Perfluorobutanesulfonic acid



7 Perfluorohexanoic acid

D 6 13C2 PFHxA

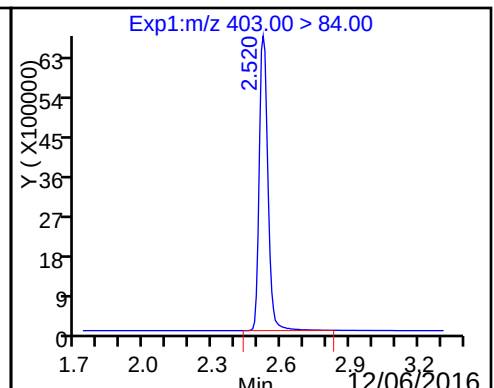
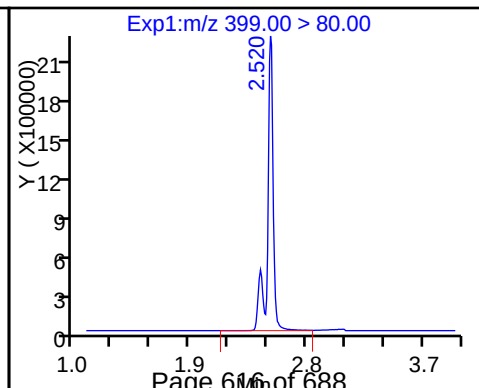
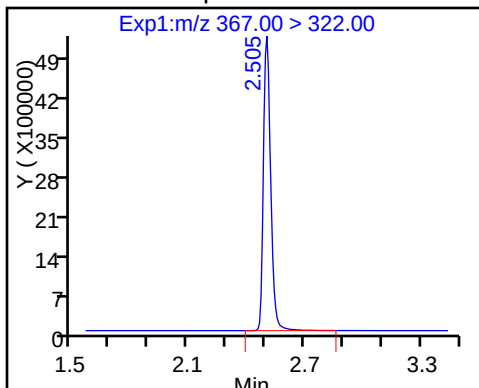
12 Perfluoroheptanoic acid



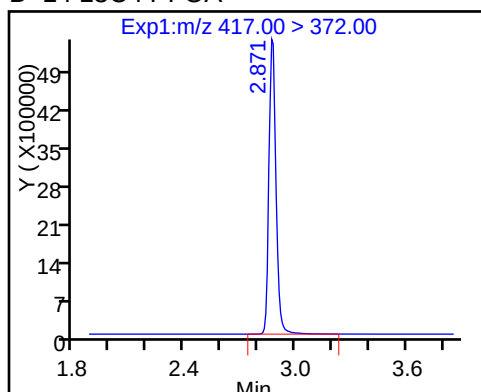
D 11 13C4-PFHpA

9 Perfluorohexanesulfonic acid

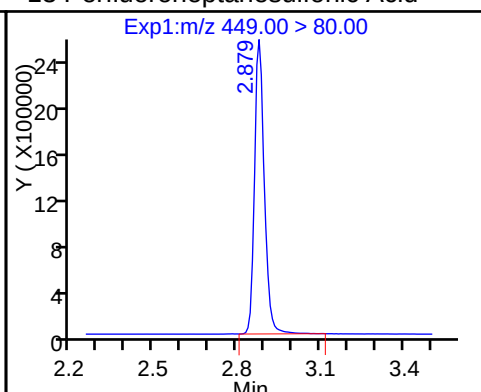
D 10 18O2 PFHxS



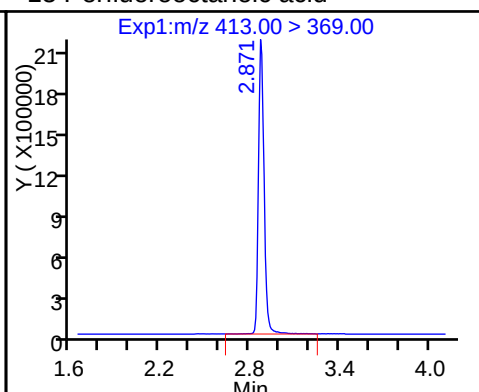
D 14 13C4 PFOA



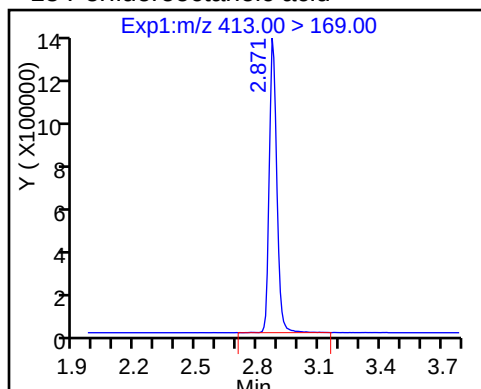
13 Perfluoroheptanesulfonic Acid



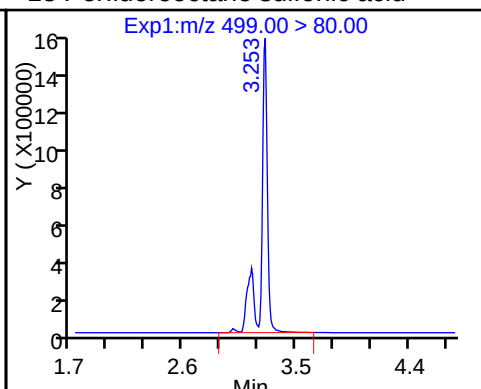
15 Perfluorooctanoic acid



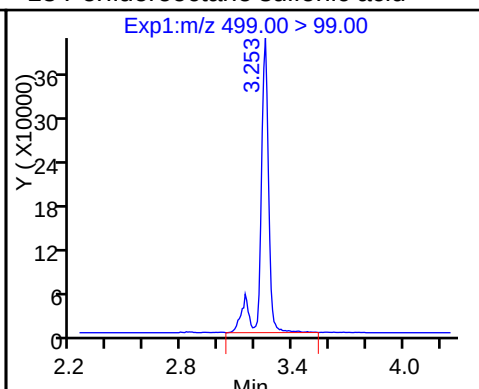
15 Perfluorooctanoic acid



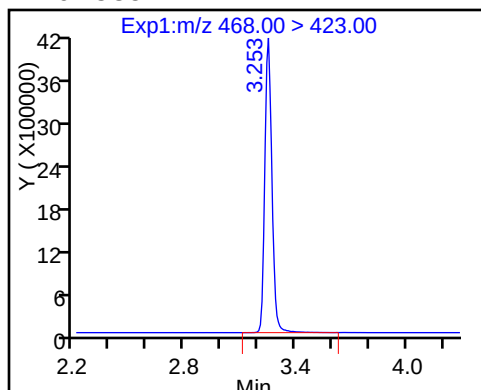
18 Perfluorooctane sulfonic acid



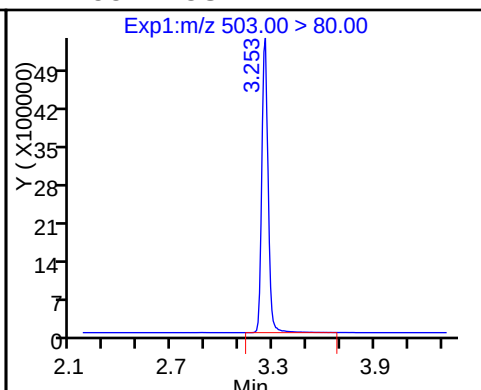
18 Perfluorooctane sulfonic acid



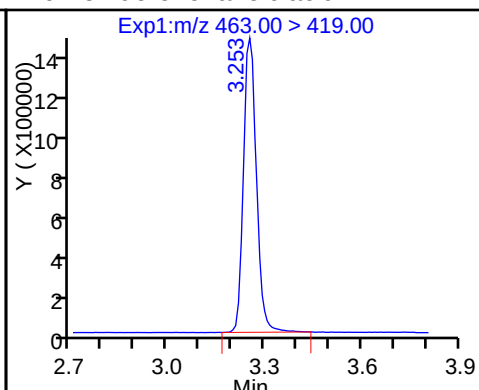
D 19 13C5 PFNA



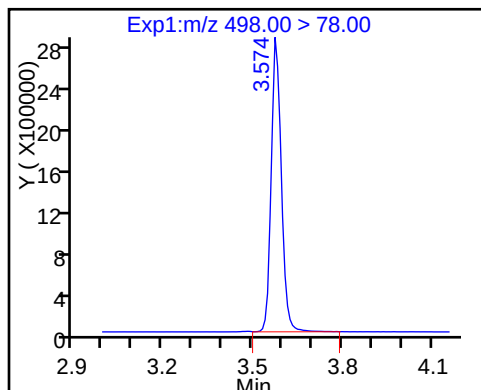
D 17 13C4 PFOS



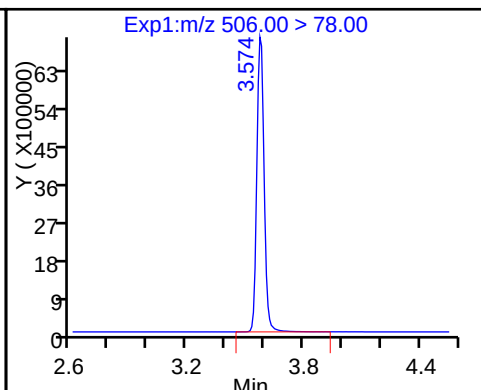
20 Perfluorononanoic acid



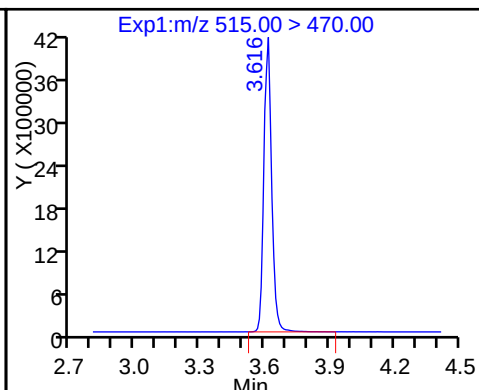
22 Perfluorooctane Sulfonamide



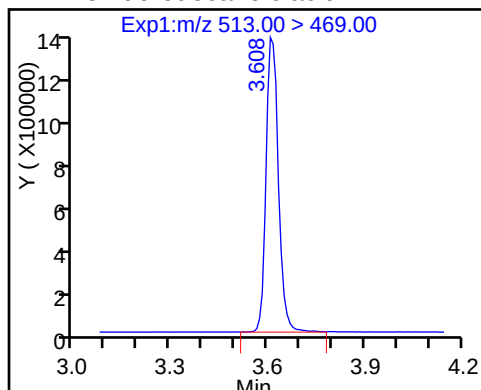
D 21 13C8 FOSA



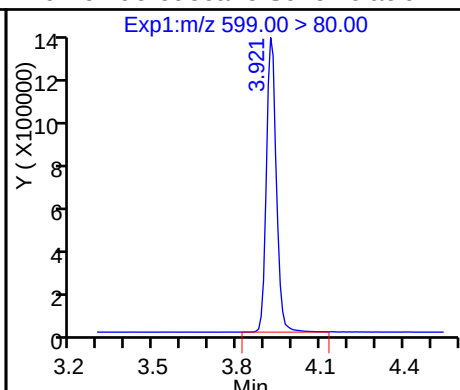
D 23 13C2 PFDA



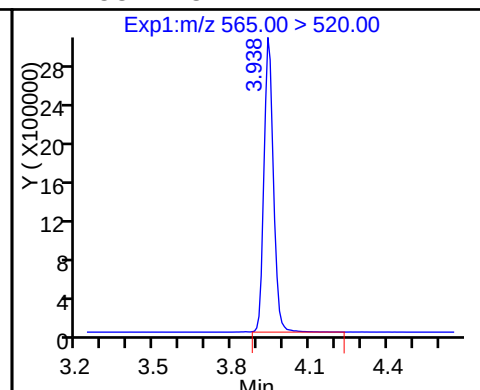
24 Perfluorodecanoic acid



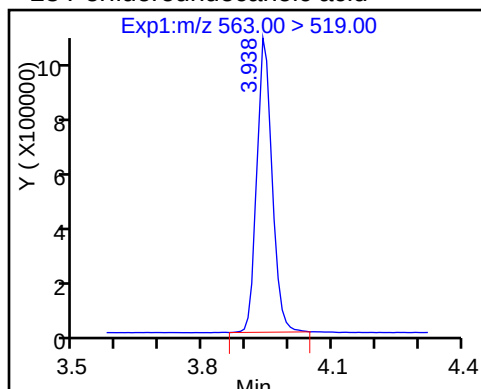
26 Perfluorodecane Sulfonic acid



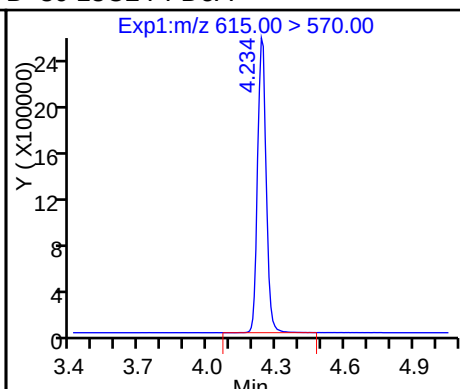
D 27 13C2 PFUnA



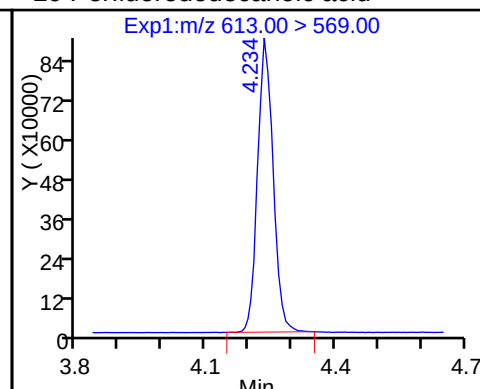
28 Perfluoroundecanoic acid



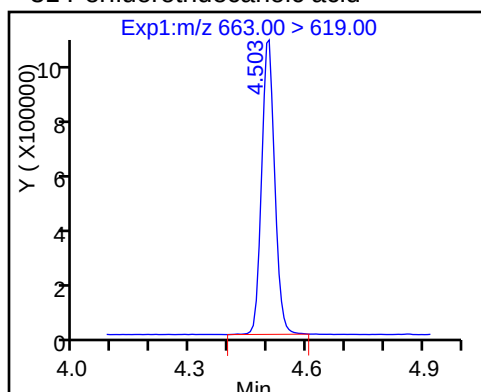
D 30 13C2 PFDaA



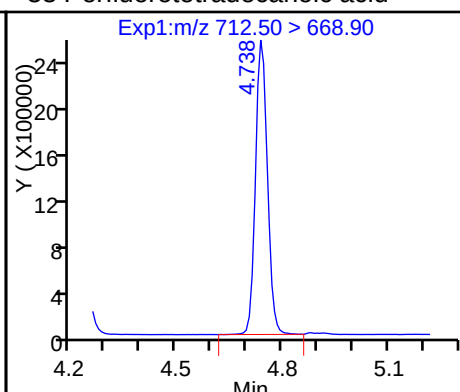
29 Perfluorododecanoic acid



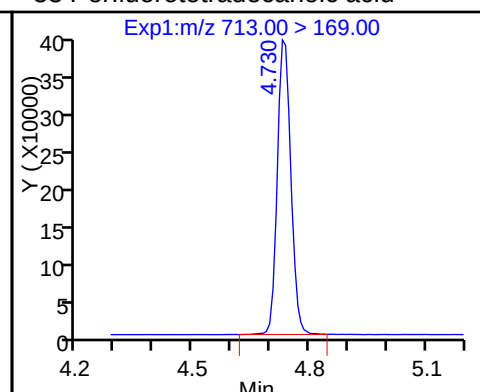
31 Perfluorotridecanoic acid



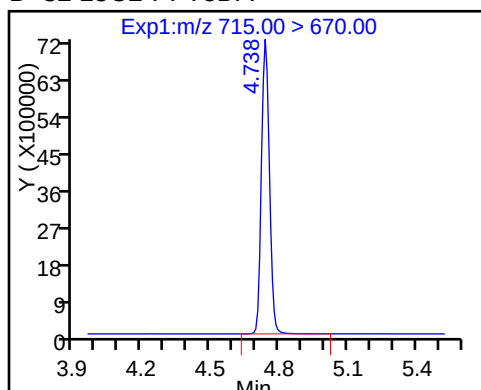
33 Perfluorotetradecanoic acid



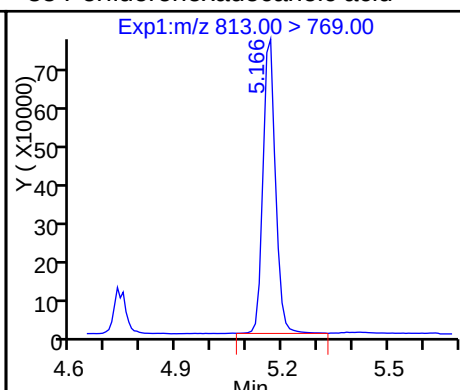
33 Perfluorotetradecanoic acid



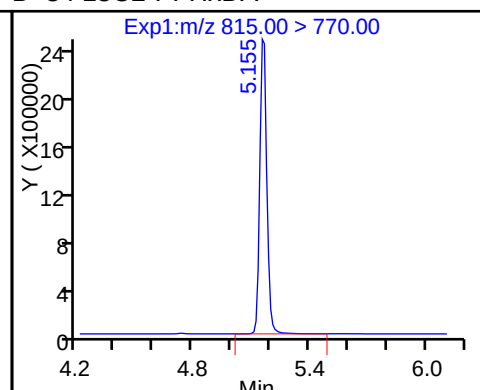
D 32 13C2-PFTeDA



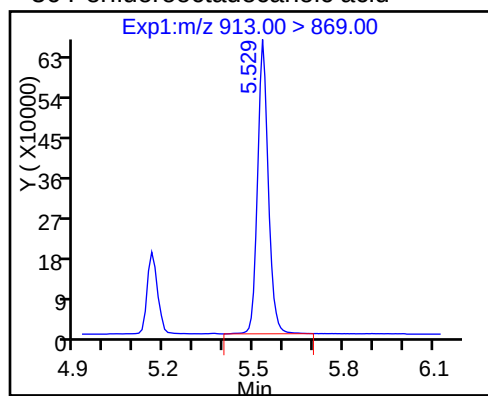
35 Perfluorohexadecanoic acid



D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 320-139627/2-A
 Matrix: Solid Lab File ID: 02DEC2016C_002.d
 Analysis Method: 537 (Modified) Date Collected: _____
 Extraction Method: SHAKE Date Extracted: 11/28/2016 11:03
 Sample wt/vol: 5.00(g) Date Analyzed: 12/02/2016 15:07
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 140429 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	4.25		0.50	0.30	0.10
1763-23-1	Perfluorooctane Sulfonate (PFOS)	3.66		0.50	0.30	0.13
375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.03		0.40	0.30	0.10

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	119		25-150
STL00991	13C4 PFOS	112		25-150
STL00994	18O2 PFHxS	120		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37461.b\02DEC2016C_002.d
 Lims ID: LCS 320-139627/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 02-Dec-2016 15:07:03 ALS Bottle#: 2 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-139627/2-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37461.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 04-Dec-2016 18:17:14 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d
 Column 1 : Det: EXP1
 Process Host: XAWRK025

First Level Reviewer: chandrasenas

Date: 04-Dec-2016 18:17:14

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobutyric acid										
212.90 > 169.00	1.582	1.574	0.008	1.000	7714134	21.3		106	70812	
D 2 13C4 PFBA										
217.00 > 172.00	1.574	1.574	0.0		20481402	60.2		120	1265290	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.868	1.868	0.0	1.000	6535777	19.3		96.7	62609	
D 4 13C5-PFPeA										
267.90 > 223.00	1.868	1.868	0.0		16242034	60.1		120	1094905	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.906	1.907	-0.001	1.000	11783909	20.1		114		
298.90 > 99.00	1.906	1.907	-0.001	1.000	5085170		2.32(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.179	2.173	0.006	1.000	5304421	20.8		104	102430	
D 6 13C2 PFHxA										
315.00 > 270.00	2.179	2.173	0.006		13349831	54.2		108	1044992	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.520	2.519	0.001	1.000	5325594	20.3		101	84952	
D 11 13C4-PFHpA										
367.00 > 322.00	2.520	2.519	0.001		12690645	60.3		121	811314	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.536	2.534	0.002	1.000	6956903	18.1		99.4		
D 10 18O2 PFHxS										
403.00 > 84.00	2.536	2.534	0.002		17161737	56.7		120	2215913	
D 14 13C4 PFOA										
417.00 > 372.00	2.895	2.886	0.009		13102595	59.7		119	818355	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.895	2.894	0.001	1.000	5685652	21.3		106	81058	
413.00 > 169.00	2.895	2.894	0.001	1.000	3320781		1.71(0.90-1.10)		187412	

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	2.903	2.902	0.001	1.000	6325837	19.8		104		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.269	3.267	0.002	1.000	5437362	18.3		98.5	1603544	
499.00 > 99.00	3.276	3.267	0.009	1.002	1198769		4.54(0.90-1.10)		67382	
D 17 13C4 PFOS										
503.00 > 80.00	3.269	3.267	0.002		13071743	53.4		112	495633	
20 Perfluorononanoic acid										
463.00 > 419.00	3.276	3.275	0.001	1.000	4107662	19.9		99.3	64639	
D 19 13C5 PFNA										
468.00 > 423.00	3.276	3.275	0.001		10430504	58.6		117	602616	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.591	3.589	0.002	1.000	6225860	20.9		104	196040	
D 21 13C8 FOSA										
506.00 > 78.00	3.591	3.589	0.002		15929131	38.5		76.9	599228	
D 23 13C2 PFDA										
515.00 > 470.00	3.633	3.631	0.002		9554899	57.5		115	328216	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.633	3.631	0.002	1.000	3686742	19.9		99.5	78094	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.943	3.941	0.002	1.000	2787512	16.3		84.3		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.969	3.959	0.010	1.000	2452827	17.5		87.3	60912	
D 27 13C2 PFUnA										
565.00 > 520.00	3.969	3.967	0.002		6630265	52.7		105	285640	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.260	4.259	0.001	1.000	1878687	19.1		95.7	31690	
D 30 13C2 PFDaA										
615.00 > 570.00	4.260	4.259	0.001		5187445	44.4		88.7	159341	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.530	4.520	0.010	1.000	1368885	12.7		63.4	2551	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.763	4.772	-0.009	1.000	2525010	12.6		63.0	1335	
713.00 > 169.00	4.763	4.772	-0.009	1.000	405389		6.23(0.00-0.00)		85374	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.763	4.772	-0.009		7044061	29.1		58.2	372548	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.186	5.184	0.002		2287334	17.5		35.1	108956	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.186	5.194	-0.008	1.000	788728	6.89		34.5	2778	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.569	5.562	0.007	1.000	812724	9.96		49.8	3215	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37461.b\02DEC2016C_002.d

Injection Date: 02-Dec-2016 15:07:03

Instrument ID: A8_N

Lims ID: LCS 320-139627/2-A

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 2

Worklist Smp#: 6

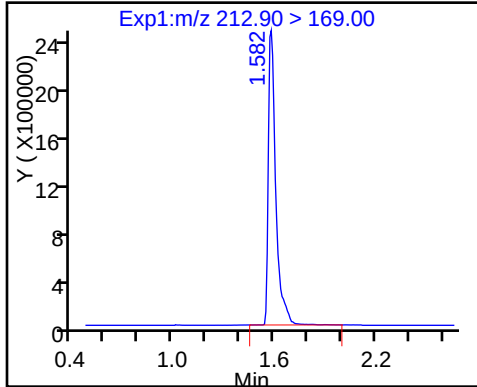
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

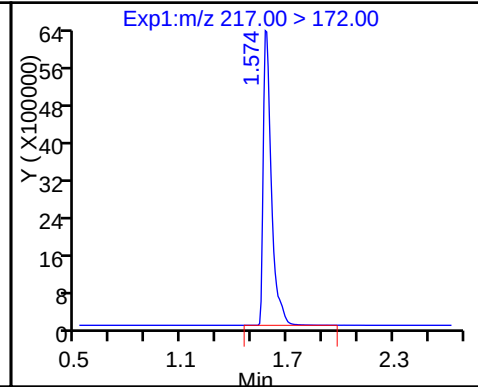
Method: A8_N

Limit Group: LC PFC_DOD ICAL

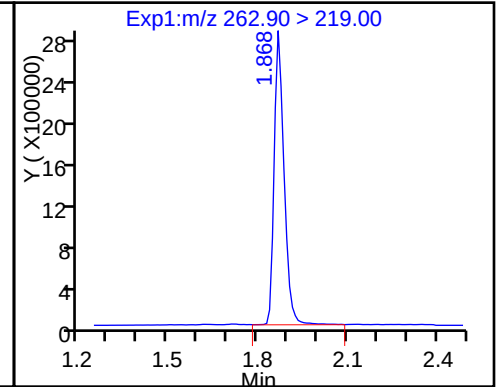
1 Perfluorobutyric acid



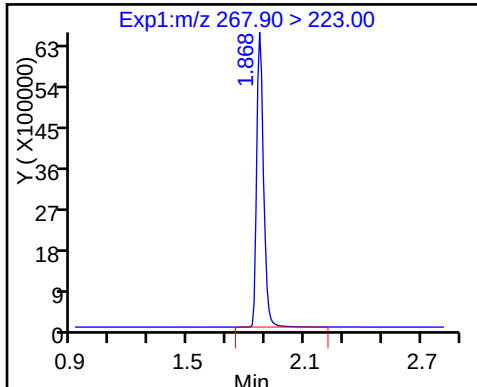
D 2 13C4 PFBA



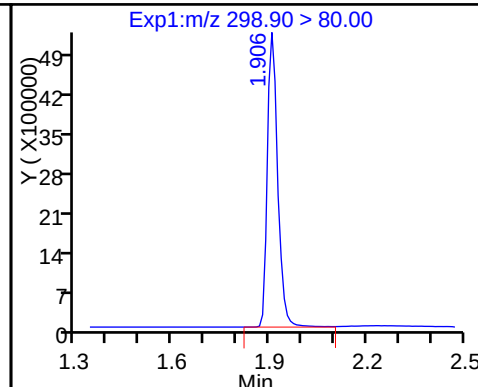
3 Perfluoropentanoic acid



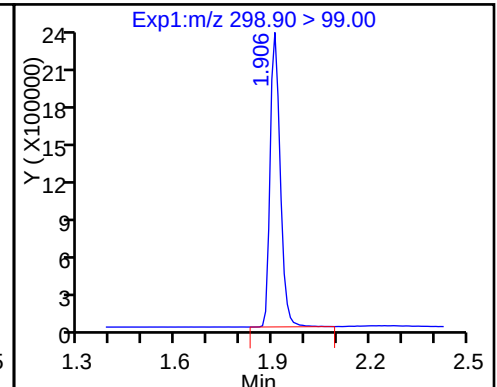
D 4 13C5-PFPeA



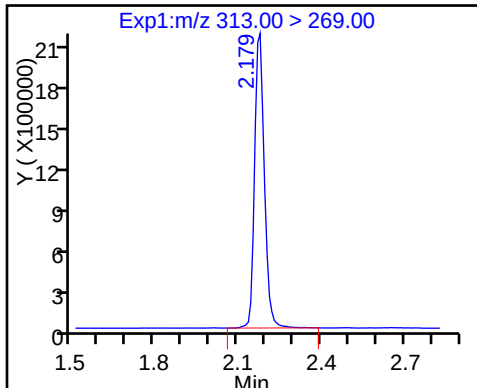
5 Perfluorobutanesulfonic acid



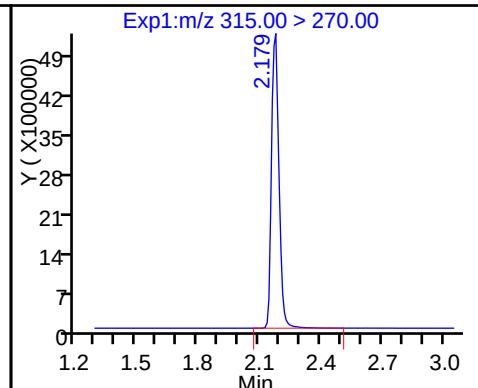
5 Perfluorobutanesulfonic acid



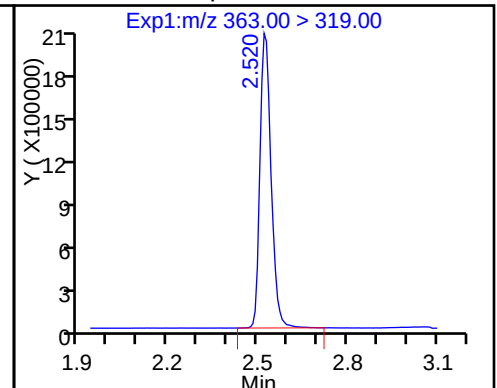
7 Perfluorohexanoic acid



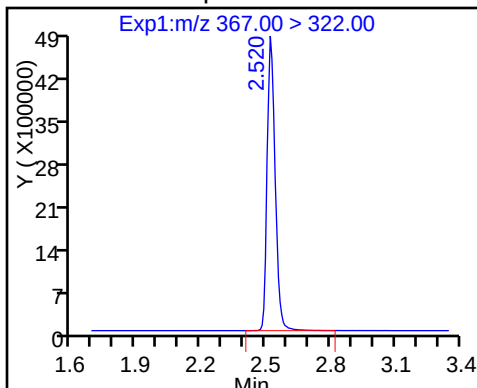
D 6 13C2 PFHxA



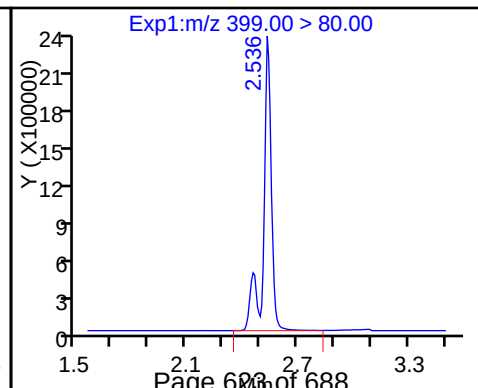
12 Perfluoroheptanoic acid



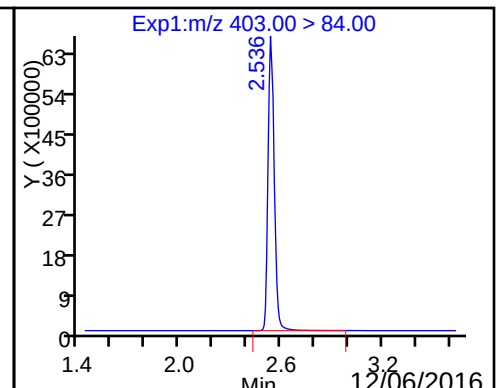
D 11 13C4-PFHpA



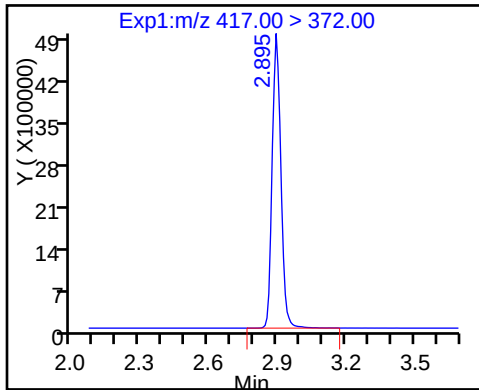
9 Perfluorohexanesulfonic acid



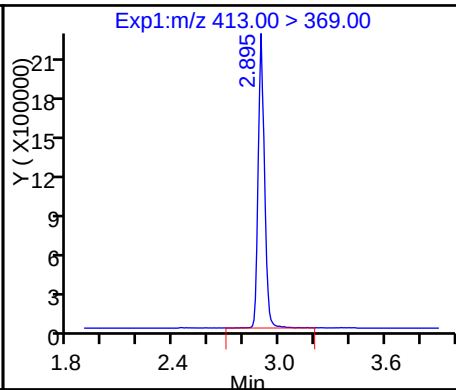
D 10 18O2 PFHxS



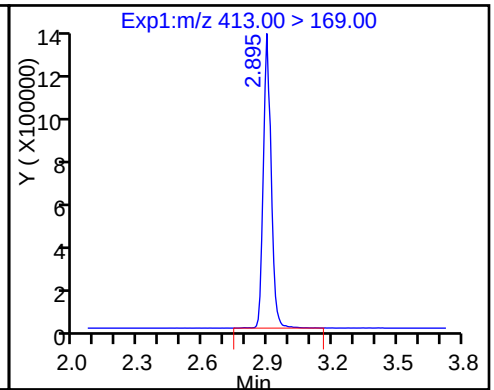
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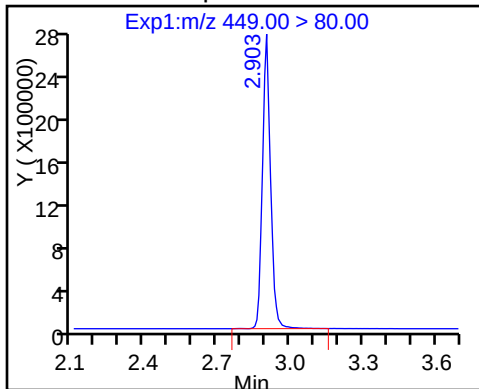
15 Perfluorooctanoic acid



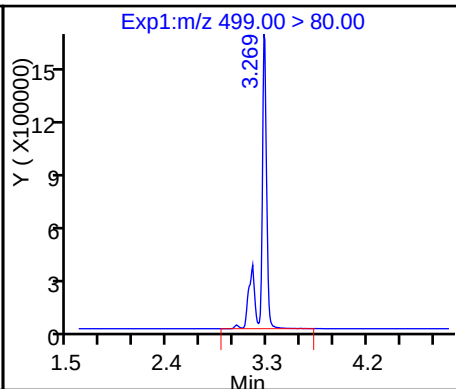
15 Perfluorooctanoic acid



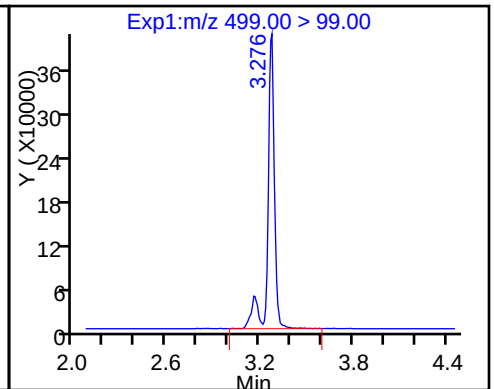
13 Perfluoroheptanesulfonic Acid



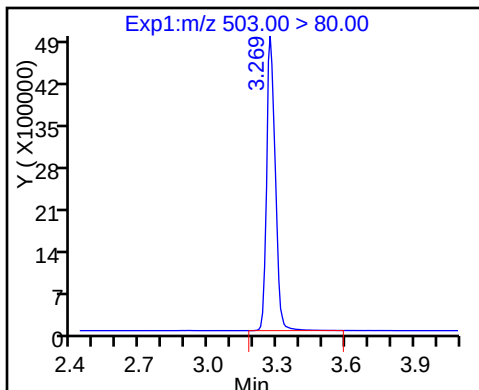
18 Perfluorooctane sulfonic acid



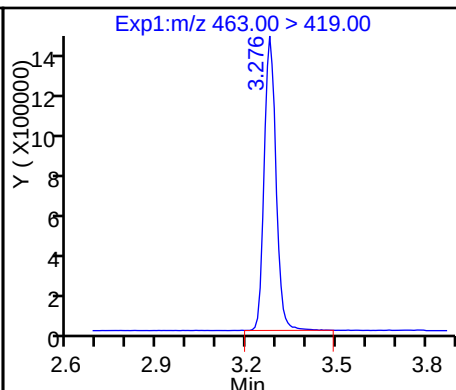
18 Perfluorooctane sulfonic acid



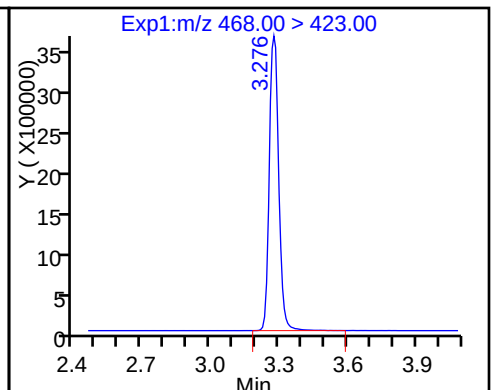
D 17 13C4 PFOS



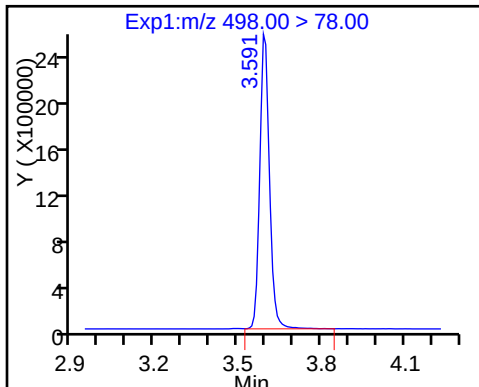
20 Perfluorononanoic acid



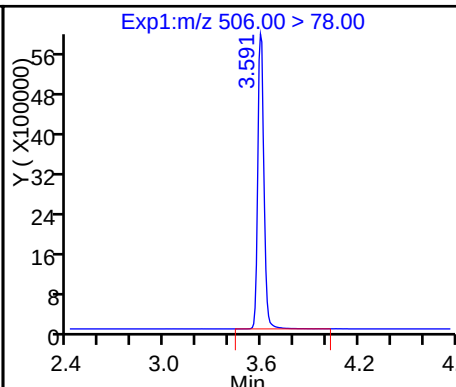
D 19 13C5 PFNA



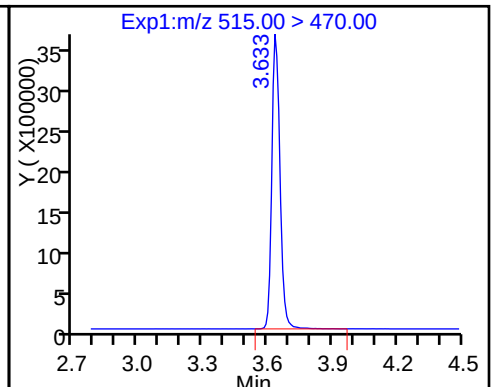
22 Perfluorooctane Sulfonamide

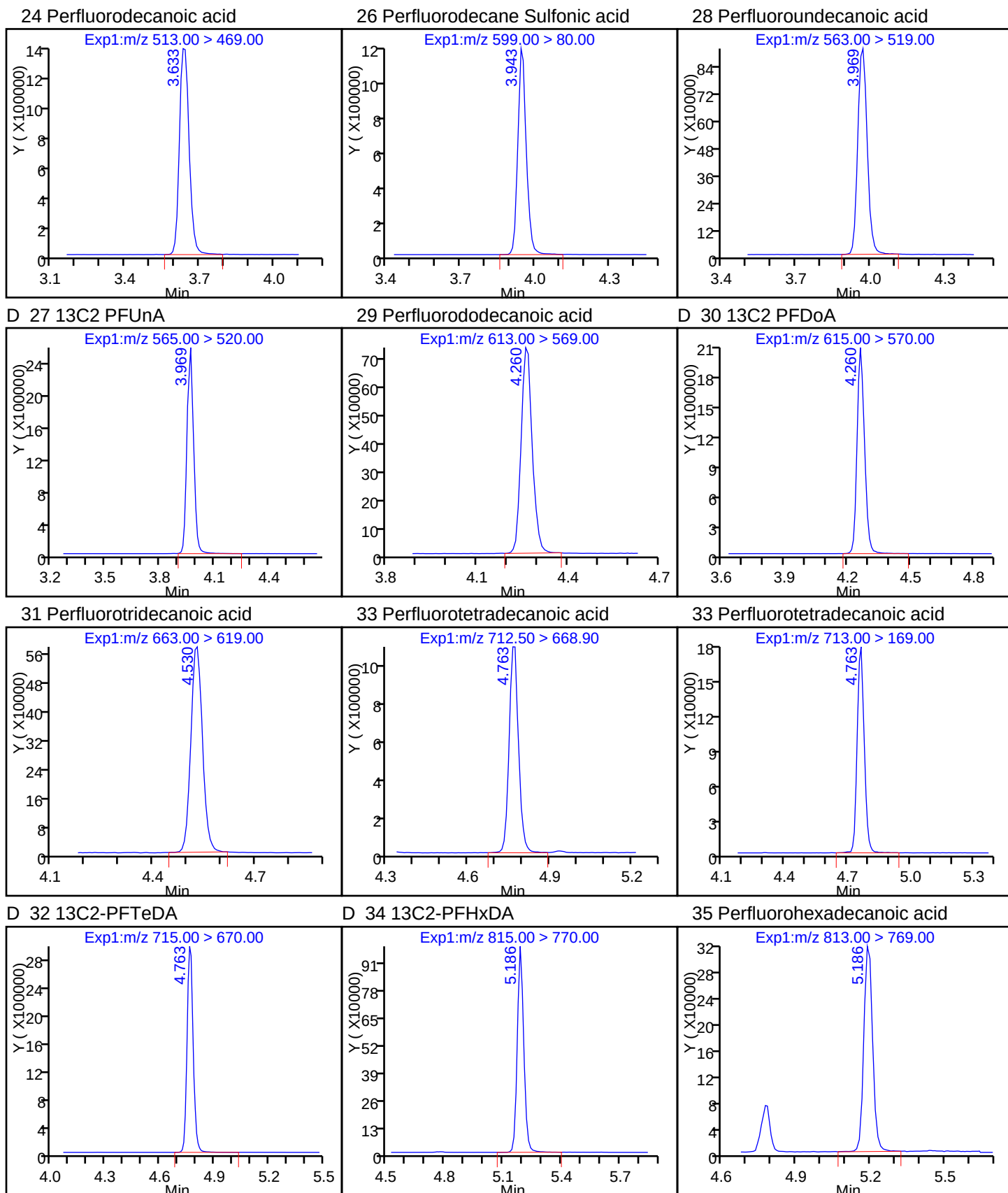


D 21 13C8 FOSA

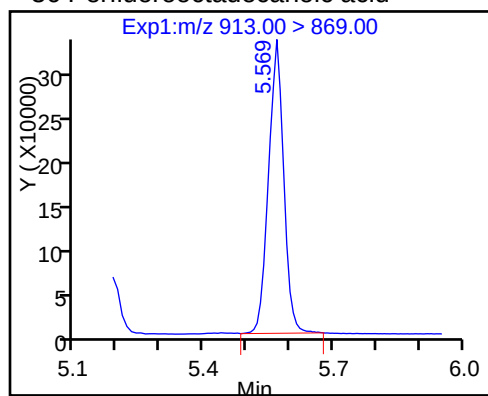


D 23 13C2 PFDA





36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCSD 320-138841/3-A
 Matrix: Water Lab File ID: 02DEC2016C_031.d
 Analysis Method: 537 (Modified) Date Collected: _____
 Extraction Method: 3535 Date Extracted: 11/21/2016 13:47
 Sample wt/vol: 250 (mL) Date Analyzed: 12/02/2016 18:44
 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.: 140532 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0407		0.0025	0.0020	0.00075
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.0390		0.0040	0.0030	0.0013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0371		0.0025	0.0020	0.00092

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	110		25-150
STL00991	13C4 PFOS	102		25-150
STL00994	18O2 PFHxS	109		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_031.d
 Lims ID: LCSD 320-138841/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 02-Dec-2016 18:44:46 ALS Bottle#: 19 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcsd 320-138841/3-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 08:30:42 Calib Date: 02-Dec-2016 12:29:29
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A_020.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas

Date: 05-Dec-2016 08:30:41

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	1.566	0.0		17900714	52.6		105	1100764	
1 Perfluorobutyric acid										
212.90 > 169.00	1.566	1.574	-0.008	1.000	6465201	20.4		102	53768	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.858	1.858	0.0	1.000	5699594	18.7		93.4	49416	
D 4 13C5-PFPeA										
267.90 > 223.00	1.858	1.858	0.0		14657462	54.2		108	2906527	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.897	1.897	0.0	1.000	9920236	18.6		105		
298.90 > 99.00	1.897	1.897	0.0	1.000	4232805		2.34(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.158	2.159	-0.001	1.000	4722174	19.5		97.4	138274	
D 6 13C2 PFHxA										
315.00 > 270.00	2.158	2.159	-0.001		12681011	51.4		103	1317788	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.499	2.505	-0.006	1.000	4667052	19.6		97.9	67992	
D 11 13C4-PFHpA										
367.00 > 322.00	2.507	2.505	0.002		11523295	54.7		109	884518	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.522	2.521	0.001	1.000	6247956	17.8		97.8		
D 10 18O2 PFHxS										
403.00 > 84.00	2.515	2.521	-0.006		15661922	51.8		109	1208738	
D 14 13C4 PFOA										
417.00 > 372.00	2.878	2.869	0.009		12070948	55.0		110	397174	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.878	2.877	0.001	1.000	5735894	19.6		103		

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	2.878	2.877	0.001	1.000	5013351	20.4		102	98824	
413.00 > 169.00	2.870	2.877	-0.007	0.997	3091851		1.62(0.90-1.10)		202504	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.244	3.250	-0.006	1.000	5295032	19.5		105	524421	
499.00 > 99.00	3.244	3.250	-0.006	1.000	1155930		4.58(0.90-1.10)		189074	
D 19 13C5 PFNA										
468.00 > 423.00	3.253	3.250	0.003		9366787	52.6		105	455519	
D 17 13C4 PFOS										
503.00 > 80.00	3.244	3.250	-0.006		11938571	48.8		102	732169	
20 Perfluorononanoic acid										
463.00 > 419.00	3.244	3.259	-0.015	1.000	3518477	18.9		94.7	61050	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.574	3.579	-0.005	1.000	5817776	20.5		103	169416	
D 21 13C8 FOSA										
506.00 > 78.00	3.574	3.579	-0.005		15167555	36.6		73.2	668253	
D 23 13C2 PFDA										
515.00 > 470.00	3.607	3.613	-0.006		8635540	52.0		104	278240	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.607	3.613	-0.006	1.000	3235195	19.3		96.6	79580	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.921	3.919	0.002	1.000	2983004	19.0		98.8		
D 27 13C2 PFUnA										
565.00 > 520.00	3.938	3.945	-0.007		6600082	52.5		105	671036	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.938	3.945	-0.007	1.000	2374391	17.0		84.9	75490	
D 30 13C2 PFDoA										
615.00 > 570.00	4.233	4.234	-0.001		6047604	51.7		103	199082	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.233	4.242	-0.009	1.000	2174813	19.0		95.0	42720	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.500	4.504	-0.004	1.000	2308964	18.4		91.8	15465	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.743	4.741	0.002	1.000	5528312	23.7		118	2679	
713.00 > 169.00	4.735	4.741	-0.007	0.998	900169		6.14(0.00-0.00)		129605	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.735	4.741	-0.007		15591250	64.5		129	1068337	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.156	5.160	-0.004	1.000	2051946	16.4		82.0	4835	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.156	5.160	-0.004		6092018	46.7		93.5	189987	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.521	5.525	-0.004	1.000	1870189	19.7		98.3	2392	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b\02DEC2016C_031.d

Injection Date: 02-Dec-2016 18:44:46

Instrument ID: A8_N

Lims ID: LCSD 320-138841/3-A

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 19

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

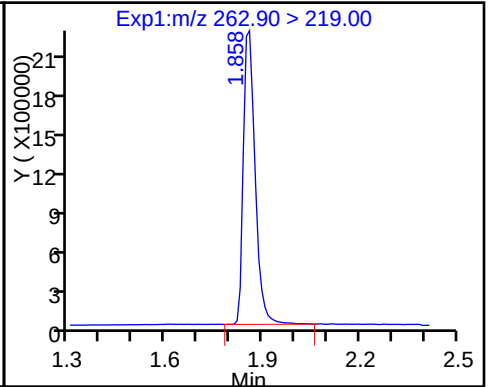
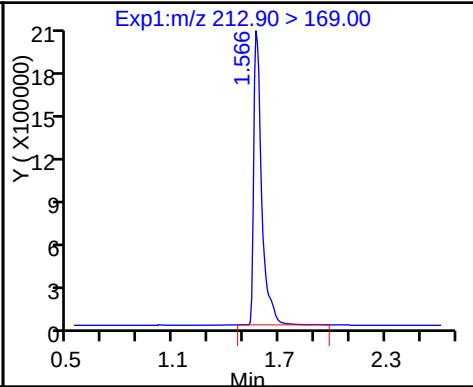
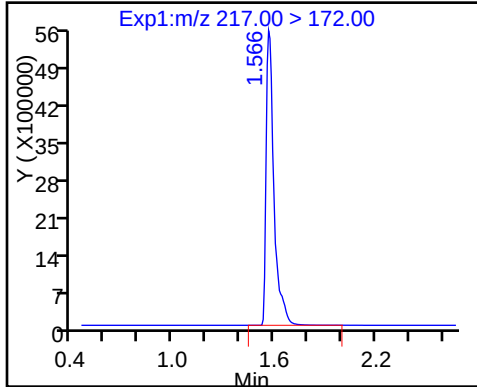
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

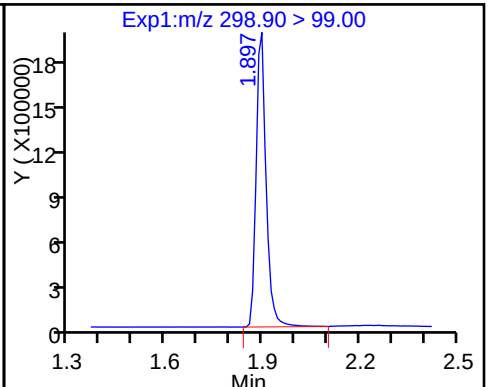
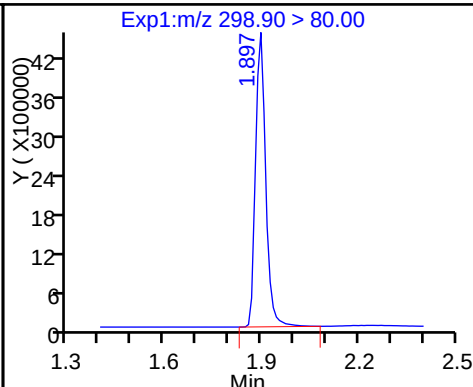
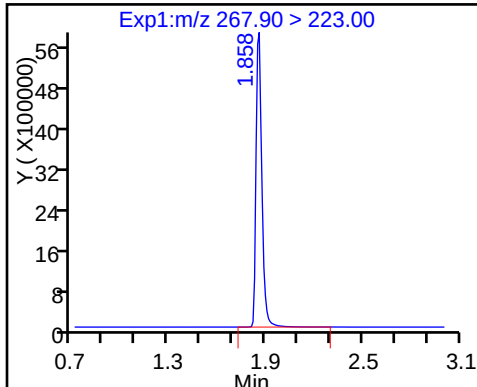
3 Perfluoropentanoic acid



D 4 13C5-PFPeA

5 Perfluorobutanesulfonic acid

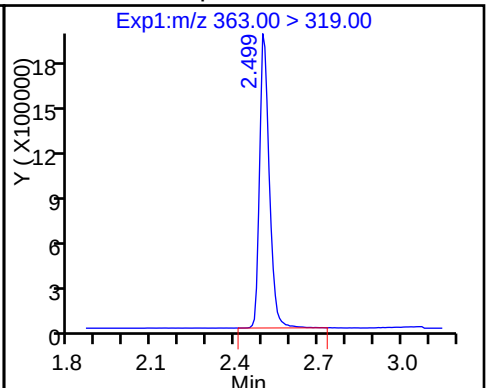
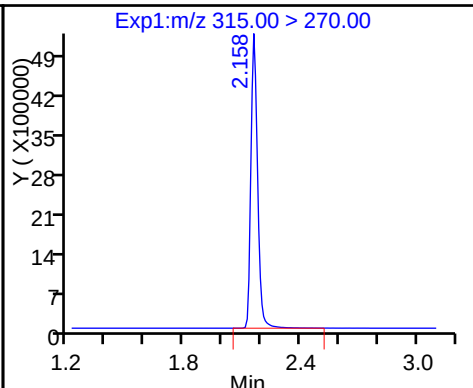
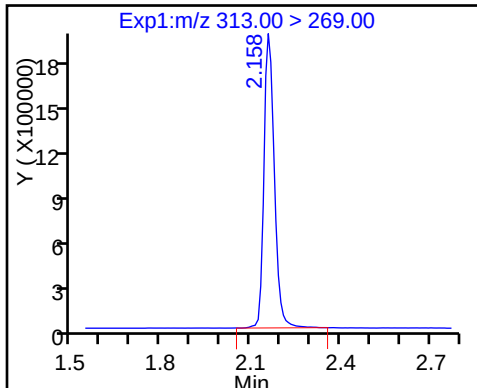
5 Perfluorobutanesulfonic acid



7 Perfluorohexanoic acid

D 6 13C2 PFHxA

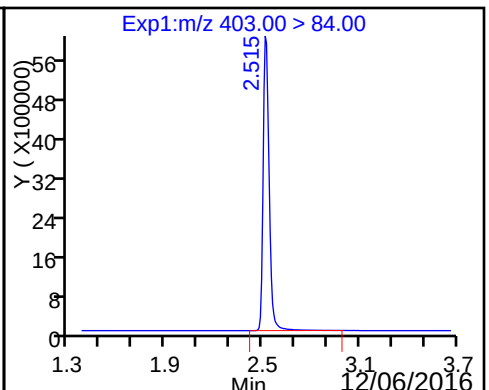
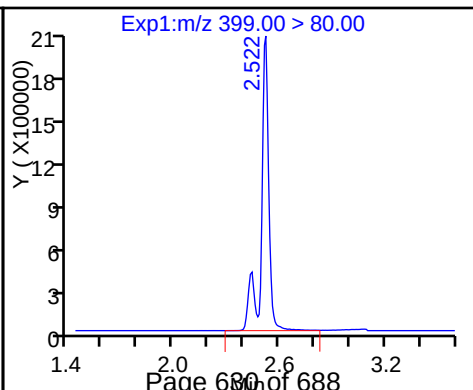
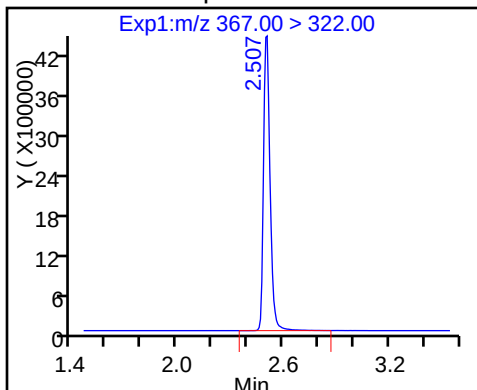
12 Perfluoroheptanoic acid



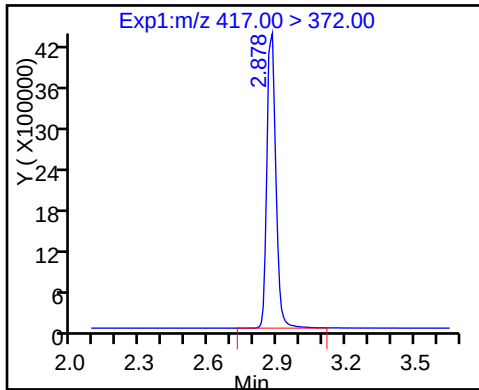
D 11 13C4-PFHpA

9 Perfluorohexanesulfonic acid

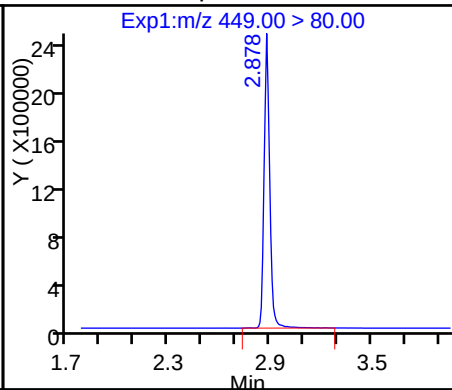
D 10 18O2 PFHxS



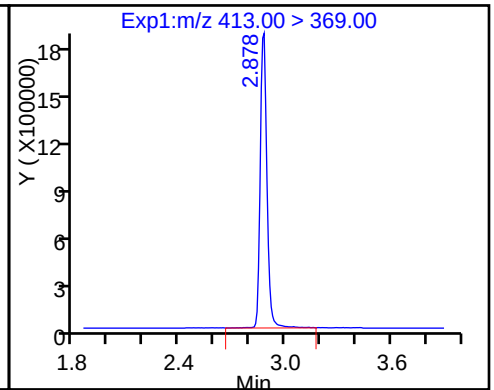
D 14 13C4 PFOA



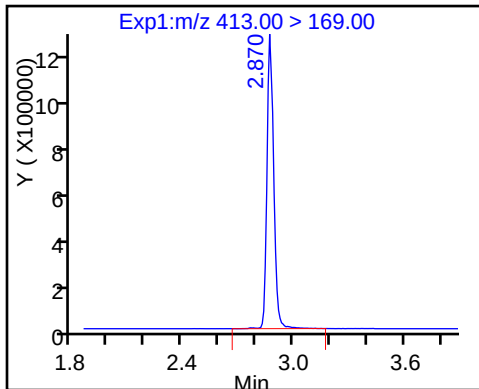
13 Perfluoroheptanesulfonic Acid



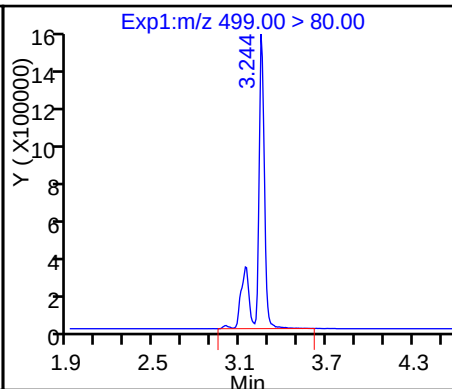
15 Perfluorooctanoic acid



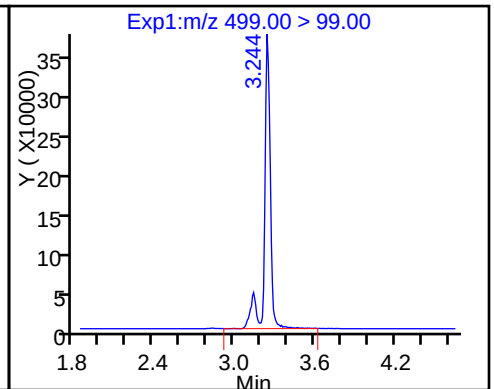
15 Perfluorooctanoic acid



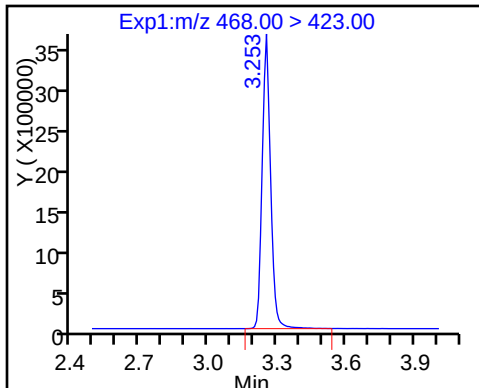
18 Perfluorooctane sulfonic acid



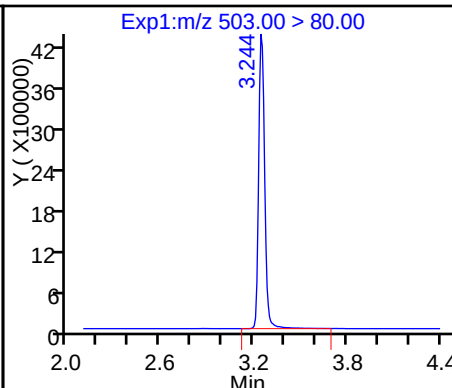
18 Perfluorooctane sulfonic acid



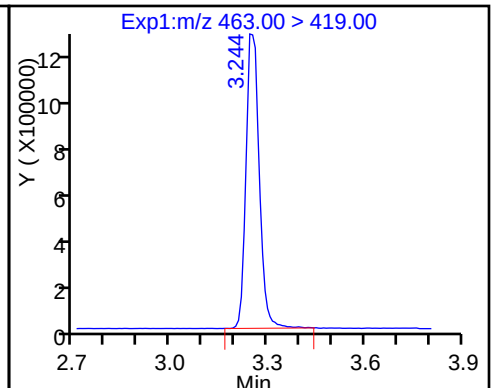
D 19 13C5 PFNA



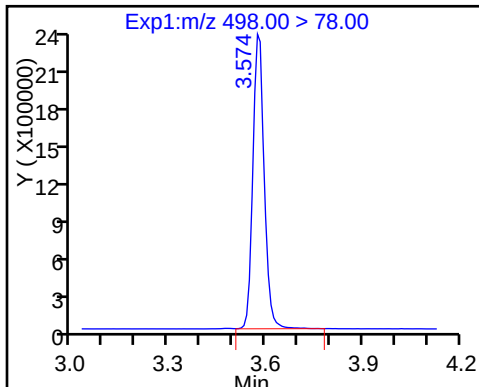
D 17 13C4 PFOS



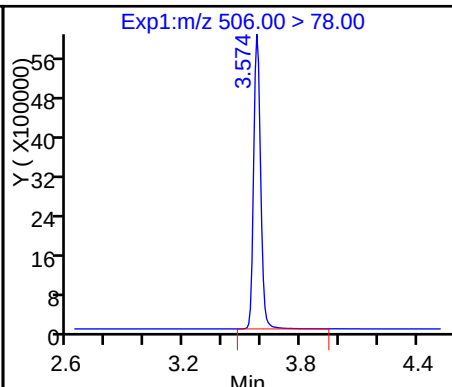
20 Perfluorononanoic acid



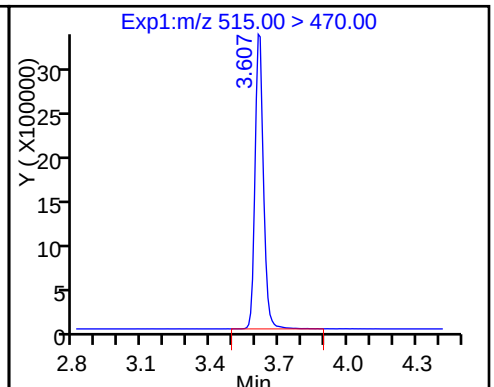
22 Perfluorooctane Sulfonamide

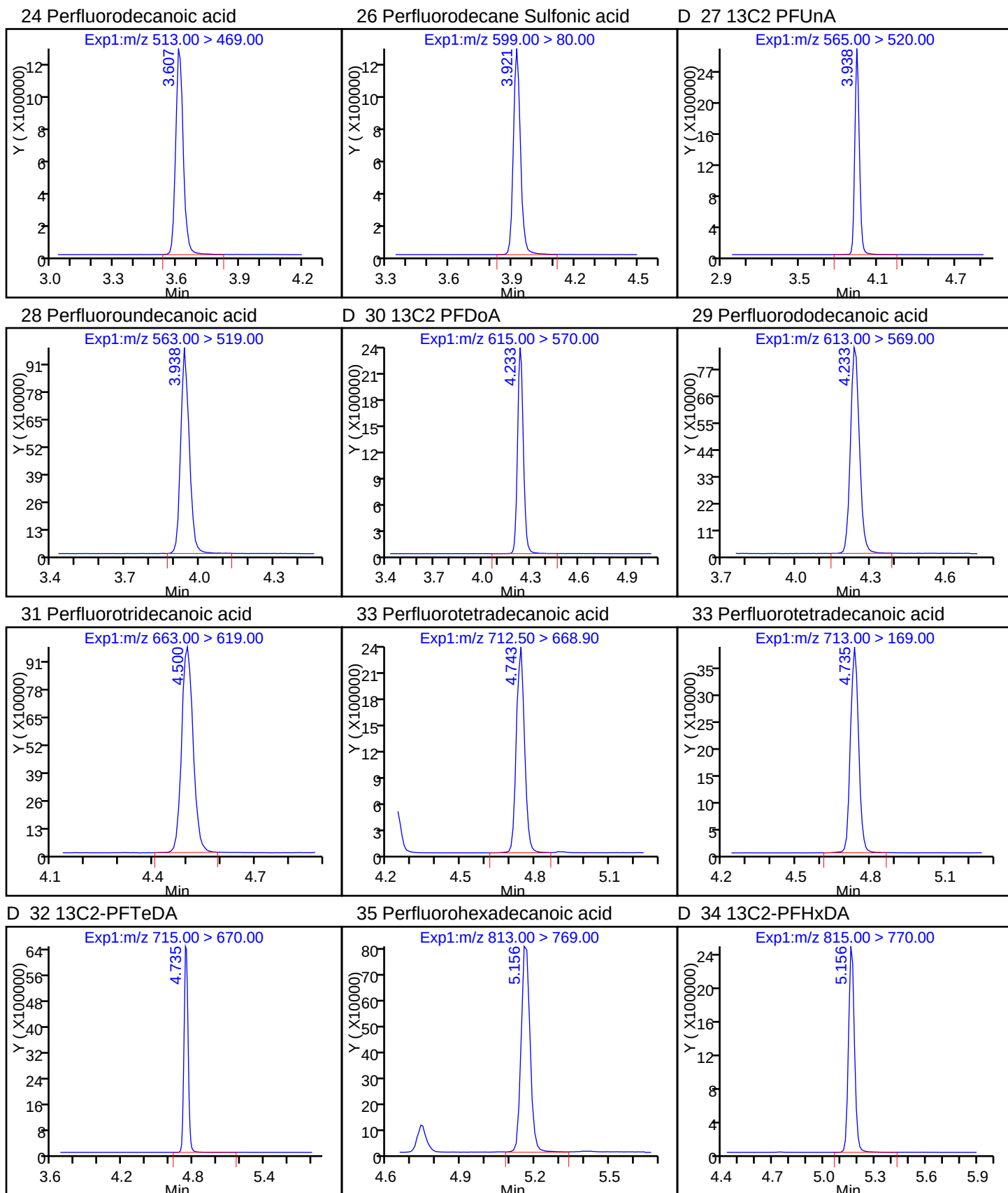


D 21 13C8 FOSA

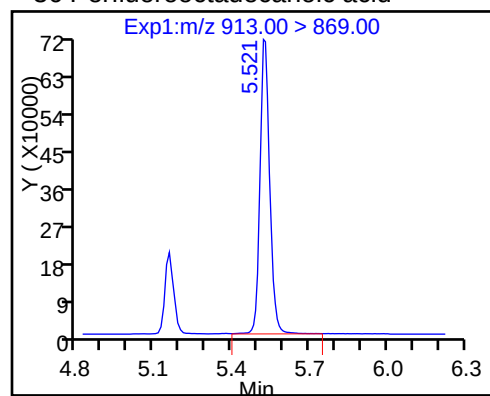


D 23 13C2 PFDA





36 Perfluorooctadecanoic acid



LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-23651-1

SDG No.: _____

Instrument ID: A8_NStart Date: 12/02/2016 10:06Analysis Batch Number: 140382End Date: 12/02/2016 14:22

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-140382/1 CCB		12/02/2016 10:06	1		Acquity 2.1 (mm)
RB 320-140382/2 CCB		12/02/2016 10:14	1		Acquity 2.1 (mm)
RB 320-140382/3 CCB		12/02/2016 10:22	1		Acquity 2.1 (mm)
IC 320-140382/4		12/02/2016 10:29	1	02DEC2016A_004.d	Acquity 2.1 (mm)
IC 320-140382/5		12/02/2016 10:37	1	02DEC2016A_005.d	Acquity 2.1 (mm)
IC 320-140382/6		12/02/2016 10:44	1	02DEC2016A_006.d	Acquity 2.1 (mm)
IC 320-140382/7		12/02/2016 10:52	1	02DEC2016A_007.d	Acquity 2.1 (mm)
IC 320-140382/8		12/02/2016 10:59	1	02DEC2016A_008.d	Acquity 2.1 (mm)
IC 320-140382/9		12/02/2016 11:07	1	02DEC2016A_009.d	Acquity 2.1 (mm)
IC 320-140382/10		12/02/2016 11:14	1	02DEC2016A_010.d	Acquity 2.1 (mm)
ICB 320-140382/11		12/02/2016 11:22	1		Acquity 2.1 (mm)
ICV 320-140382/12		12/02/2016 11:29	1	02DEC2016A_012.d	Acquity 2.1 (mm)
RB 320-140382/13 CCB		12/02/2016 11:37	1		Acquity 2.1 (mm)
IC 320-140382/14		12/02/2016 11:44	1	02DEC2016A_014.d	Acquity 2.1 (mm)
IC 320-140382/15		12/02/2016 11:52	1	02DEC2016A_015.d	Acquity 2.1 (mm)
IC 320-140382/16		12/02/2016 11:59	1	02DEC2016A_016.d	Acquity 2.1 (mm)
IC 320-140382/17		12/02/2016 12:07	1	02DEC2016A_017.d	Acquity 2.1 (mm)
IC 320-140382/18		12/02/2016 12:14	1	02DEC2016A_018.d	Acquity 2.1 (mm)
IC 320-140382/19		12/02/2016 12:22	1	02DEC2016A_019.d	Acquity 2.1 (mm)
IC 320-140382/20		12/02/2016 12:29	1	02DEC2016A_020.d	Acquity 2.1 (mm)
ICB 320-140382/21		12/02/2016 12:36	1		Acquity 2.1 (mm)
ICV 320-140382/22		12/02/2016 12:44	1		Acquity 2.1 (mm)
RB 320-140382/23 CCB		12/02/2016 12:51	1		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 12:59	100		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 13:06	100		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 13:14	100		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 13:22	10		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 13:29	10		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 13:37	10		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 13:44	10		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 13:52	10		Acquity 2.1 (mm)
RB 320-140382/32 CCB		12/02/2016 13:59	1		Acquity 2.1 (mm)
CCV 320-140382/33		12/02/2016 14:07	1		Acquity 2.1 (mm)
CCV 320-140382/34		12/02/2016 14:14	1		Acquity 2.1 (mm)
RB 320-140382/35 CCB		12/02/2016 14:22	1		Acquity 2.1 (mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-23651-1

SDG No.: _____

Instrument ID: A8_NStart Date: 12/02/2016 14:29Analysis Batch Number: 140429End Date: 12/02/2016 17:52

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-140429/1 CCB		12/02/2016 14:29	1		Acquity 2.1(mm)
CCV 320-140429/2		12/02/2016 14:37	1	02DEC2016B_014.d	Acquity 2.1(mm)
CCV 320-140429/3		12/02/2016 14:44	1		Acquity 2.1(mm)
RB 320-140429/4 CCB		12/02/2016 14:52	1		Acquity 2.1(mm)
MB 320-139627/1-A		12/02/2016 14:59	1	02DEC2016C_001.d	Acquity 2.1(mm)
LCS 320-139627/2-A		12/02/2016 15:07	1	02DEC2016C_002.d	Acquity 2.1(mm)
320-23651-2		12/02/2016 15:14	1	02DEC2016C_003.d	Acquity 2.1(mm)
320-23651-3		12/02/2016 15:22	1	02DEC2016C_004.d	Acquity 2.1(mm)
ZZZZZ		12/02/2016 15:29	1		Acquity 2.1(mm)
ZZZZZ		12/02/2016 15:37	1		Acquity 2.1(mm)
ZZZZZ		12/02/2016 15:44	1		Acquity 2.1(mm)
ZZZZZ		12/02/2016 15:52	1		Acquity 2.1(mm)
ZZZZZ		12/02/2016 15:59	1		Acquity 2.1(mm)
ZZZZZ		12/02/2016 16:07	1		Acquity 2.1(mm)
ZZZZZ		12/02/2016 16:14	10		Acquity 2.1(mm)
CCV 320-140429/16		12/02/2016 16:22	1	02DEC2016C_012.d	Acquity 2.1(mm)
CCV 320-140429/17		12/02/2016 16:29	1		Acquity 2.1(mm)
RB 320-140429/18 CCB		12/02/2016 16:37	1		Acquity 2.1(mm)
ZZZZZ		12/02/2016 16:44	1		Acquity 2.1(mm)
ZZZZZ		12/02/2016 16:52	1		Acquity 2.1(mm)
ZZZZZ		12/02/2016 16:59	1		Acquity 2.1(mm)
ZZZZZ		12/02/2016 17:07	1		Acquity 2.1(mm)
ZZZZZ		12/02/2016 17:14	1		Acquity 2.1(mm)
ZZZZZ		12/02/2016 17:22	1		Acquity 2.1(mm)
RB 320-140429/25 CCB		12/02/2016 17:29	1		Acquity 2.1(mm)
CCV 320-140429/26		12/02/2016 17:37	1		Acquity 2.1(mm)
CCV 320-140429/27		12/02/2016 17:44	1		Acquity 2.1(mm)
RB 320-140429/28 CCB		12/02/2016 17:52	1		Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-23651-1

SDG No.: _____

Instrument ID: A8_NStart Date: 12/02/2016 17:59Analysis Batch Number: 140532End Date: 12/02/2016 21:14

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-140532/1 CCB		12/02/2016 17:59	1		Acquity 2.1(mm)
CCV 320-140532/2		12/02/2016 18:07	1	02DEC2016C_026. d	Acquity 2.1(mm)
CCV 320-140532/3		12/02/2016 18:14	1		Acquity 2.1(mm)
RB 320-140532/4 CCB		12/02/2016 18:22	1		Acquity 2.1(mm)
MB 320-138841/1-A		12/02/2016 18:29	1	02DEC2016C_029. d	Acquity 2.1(mm)
LCS 320-138841/2-A		12/02/2016 18:37	1	02DEC2016C_030. d	Acquity 2.1(mm)
LCSD 320-138841/3-A		12/02/2016 18:44	1	02DEC2016C_031. d	Acquity 2.1(mm)
320-23651-4		12/02/2016 18:52	100	02DEC2016C_032. d	Acquity 2.1(mm)
320-23651-1		12/02/2016 18:59	10	02DEC2016C_033. d	Acquity 2.1(mm)
320-23651-6		12/02/2016 19:07	10	02DEC2016C_034. d	Acquity 2.1(mm)
ZZZZZ		12/02/2016 19:14	10		Acquity 2.1(mm)
ZZZZZ		12/02/2016 19:22	10		Acquity 2.1(mm)
ZZZZZ		12/02/2016 19:29	10		Acquity 2.1(mm)
320-23651-5		12/02/2016 19:37	1	02DEC2016C_038. d	Acquity 2.1(mm)
RB 320-140532/15 CCB		12/02/2016 19:44	1		Acquity 2.1(mm)
CCV 320-140532/16		12/02/2016 19:52	1	02DEC2016C_040. d	Acquity 2.1(mm)
CCV 320-140532/17		12/02/2016 19:59	1		Acquity 2.1(mm)
RB 320-140532/18 CCB		12/02/2016 20:07	1		Acquity 2.1(mm)
320-23651-10		12/02/2016 20:14	1	02DEC2016C_043. d	Acquity 2.1(mm)
320-23651-7		12/02/2016 20:22	1	02DEC2016C_044. d	Acquity 2.1(mm)
320-23651-8		12/02/2016 20:29	1	02DEC2016C_045. d	Acquity 2.1(mm)
320-23651-9		12/02/2016 20:37	1	02DEC2016C_046. d	Acquity 2.1(mm)
320-23651-11		12/02/2016 20:44	1	02DEC2016C_047. d	Acquity 2.1(mm)
RB 320-140532/24 CCB		12/02/2016 20:52	1		Acquity 2.1(mm)
CCV 320-140532/25		12/02/2016 20:59	1	02DEC2016C_049. d	Acquity 2.1(mm)
CCV 320-140532/26		12/02/2016 21:07	1		Acquity 2.1(mm)
RB 320-140532/27 CCB		12/02/2016 21:14	1		Acquity 2.1(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

SDG No.: _____

Batch Number: 138841 Batch Start Date: 11/21/16 13:47 Batch Analyst: Marchenko, Veronika PBatch Method: 3535 Batch End Date: 11/22/16 13:50

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00046	LCPFCSU 00070
MB 320-138841/1		3535, 537 (Modified)			26.75 g	250 mL	0.5 mL	25 uL	
LCS 320-138841/2		3535, 537 (Modified)			26.02 g	250 mL	0.5 mL	25 uL	20 uL
LCSD 320-138841/3		3535, 537 (Modified)			26.10 g	250 mL	0.5 mL	25 uL	20 uL
320-23651-A-1	DPT-16-20-GW-16-20	3535, 537 (Modified)	T	279.06 g	26.43 g	252.6 mL	0.5 mL	25 uL	
320-23651-A-4	DPT-16-20-GW-26-30	3535, 537 (Modified)	T	277.72 g	26.25 g	251.5 mL	0.5 mL	25 uL	
320-23651-A-5	DPT-SO-EB-111516	3535, 537 (Modified)	T	303.76 g	25.72 g	278 mL	0.5 mL	25 uL	
320-23651-A-6	DPT-16-34-GW-16-20	3535, 537 (Modified)	T	280.53 g	26.35 g	254.2 mL	0.5 mL	25 uL	
320-23651-A-7	DPT-16-26-GW-18-22	3535, 537 (Modified)	T	281.41 g	26.33 g	255.1 mL	0.5 mL	25 uL	
320-23651-A-8	DPT-16-26-GW-29-33	3535, 537 (Modified)	T	277.33 g	26.43 g	250.9 mL	0.5 mL	25 uL	
320-23651-A-9	DPT-16-26-GW-29-33-DUP	3535, 537 (Modified)	T	275.89 g	26.61 g	249.3 mL	0.5 mL	25 uL	
320-23651-A-10	DPT-16-27-GW-18-22	3535, 537 (Modified)	T	277.41 g	26.53 g	250.9 mL	0.5 mL	25 uL	
320-23651-A-11	DPT-16-27-GW-29-33	3535, 537 (Modified)	T	277.35 g	26.10 g	251.3 mL	0.5 mL	25 uL	

Lab Sample ID	Client Sample ID	Method Chain	Basis	AnalysisComment					
MB 320-138841/1		3535, 537 (Modified)							
LCS 320-138841/2		3535, 537 (Modified)							
LCSD 320-138841/3		3535, 537 (Modified)							
320-23651-A-1	DPT-16-20-GW-16-20	3535, 537 (Modified)	T	See NCM regarding these samples. Lots of sediment.					
320-23651-A-4	DPT-16-20-GW-26-30	3535, 537 (Modified)	T	See NCM regarding these samples. Lots of sediment.					
320-23651-A-5	DPT-SO-EB-111516	3535, 537 (Modified)	T						

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

537 (Modified)

Page 1 of 3

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

SDG No.: _____

Batch Number: 138841 Batch Start Date: 11/21/16 13:47 Batch Analyst: Marchenko, Veronika PBatch Method: 3535 Batch End Date: 11/22/16 13:50

Lab Sample ID	Client Sample ID	Method Chain	Basis	AnalysisComment					
320-23651-A-6	DPT-16-34-GW-16-20	3535, 537 (Modified)	T	See NCM regarding these samples. Lots of sediment.					
320-23651-A-7	DPT-16-26-GW-18-22	3535, 537 (Modified)	T	See NCM regarding these samples. Lots of sediment.					
320-23651-A-8	DPT-16-26-GW-29-33	3535, 537 (Modified)	T	See NCM regarding these samples. Lots of sediment.					
320-23651-A-9	DPT-16-26-GW-29-33-DUP	3535, 537 (Modified)	T	See NCM regarding these samples. Lots of sediment.					
320-23651-A-10	DPT-16-27-GW-18-22	3535, 537 (Modified)	T	See NCM regarding these samples. Lots of sediment.					
320-23651-A-11	DPT-16-27-GW-29-33	3535, 537 (Modified)	T	See NCM regarding these samples. Lots of sediment.					

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

537 (Modified)

Page 2 of 3

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

SDG No.: _____

Batch Number: 138841 Batch Start Date: 11/21/16 13:47 Batch Analyst: Marchenko, Veronika PBatch Method: 3535 Batch End Date: 11/22/16 13:50

Batch Notes	
Balance ID	QA-070
H2O ID	11/17/16
Hexane ID	0000146278
Manifold ID	7
Methanol ID	769612
Pipette ID	MD05306/MG05455
Analyst ID - Reagent Drop	VPM
Analyst ID - SU Reagent Drop	VPM
Analyst ID - SU Reagent Drop Witness	NSH
Solvent Lot #	776672
Solvent Name	3% NH4OH/MeOH
SOP Number	WS-LC-00025
SPE Cartridge Type	500 Mg Wax
Solid Phase Extraction Disk ID	00283612A

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.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

SDG No.: _____

Batch Number: 139627 Batch Start Date: 11/28/16 11:03 Batch Analyst: Arauz, Horacio JBatch Method: SHAKE Batch End Date: 11/30/16 16:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	LCMPFCSU 00046	LCPFCSP 00070		
MB 320-139627/1		SHAKE, 537 (Modified)		5.00 g	1.00 mL	50 uL			
LCS 320-139627/2		SHAKE, 537 (Modified)		5.00 g	1.00 mL	50 uL	40 uL		
320-23651-A-2	DPT-16-20-SO-16-17	SHAKE, 537 (Modified)	T	5.07 g	1.00 mL	50 uL			
320-23651-A-3	DPT-16-20-SO-16-17-DUP	SHAKE, 537 (Modified)	T	5.05 g	1.00 mL	50 uL			

Batch Notes	
Acetic Acid ID	429065
Balance ID	QA-070
Batch Comment	Pipette MD05306
Hexane ID	J.T.BAKER 0000146278
Manifold ID	5,9
Methanol ID	789824
Methanolic Potassium Hydroxide ID	757037
Millipore Water Dispense Date	11-29-16
Sodium Hydroxide ID	758321
Ammonium Hydroxide/MeOH ID	794501
Analyst ID - Reagent Drop Witness	NSH
Blank Sand Lot #	Fisher 156690
SPE Cartridge ID	016636277A
SPE Cartridge Type	WAX 150mg

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

HPLC/LCMS Data Review Checklist

Job Number(s): 23651; 23638

Work List ID(s): 37485; 37415

Extraction Batch: 138841; 139075
140221 SBC 12/5/16

Analysis Batch(es): 140532; 140221

Delivery Rank 4

Due Date: 11/21/16; 11/25/16

A. Calibration/Instrument Run QC	1 st Level	2 nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch# <u>140302; 137685</u>	✓	✓	
2. ICAL, CCV Frequency & Criteria met.	✓	✓	
• RF _{average} criteria appropriate for the method.	✓	✓	
• Linear Regression criteria appropriate if required ($r \geq 0.995$).	✓	✓	
• Quadratic fit criteria appropriate if required ($r^2 \geq 0.990$).			✓
• For Linear Regression and Quadratic fit – Does the y-intercept support ½ the reporting limit as described in CA-Q-S-005?	✓	✓	
• All curve points show calculated concentrations.	✓	✓	
3. Peaks correctly ID'd by data system.	✓	✓	
5. Tune check frequency & criteria met and Tune check report attached.	✓	✓	
B. QA/QC			
1. Are all QC samples properly linked in TALS?	✓	✓	
2. Method blank, LCS/LCSD and MS/SD frequencies met.	✓	✓	
3. LCS/LCSD and MB data are within control limits. If not, NCM is present.	✓	✓	
4. Are MS/MSD recoveries and RPD within control limits?	✓	✓	
5. Holding Times were met for prep and analytical.	✓	✓	
6. IS/Surrogate recoveries meet criteria or properly noted.	✓	✓	
C. Sample Analysis			
1. Was correct analysis performed and were project instructions followed?	✓	✓	
2. If required, are compounds within RT windows?	✓	✓	
3. If required, are positive hits confirmed and >40% RPD flagged?			✓
4. Manual Integrations reviewed and appropriate.	✓	✓	
5. All analytes correctly reported. (Primary, secondary, acceptable status)	✓	✓	
6. Correct reporting limits used. (based on client request, prep factors, and dilutions)	✓	✓	
D. Documentation			
1. Are all non-conformances documented/attached? NCM#	✓	✓	
2. Do results make sense (e.g. dilutions, etc.)?	✓	✓	
3. Have all flags been reviewed for appropriateness?	✓	✓	
4. For level 3 and 4 reports, have forms and raw data been reviewed?	✓	✓	
5. Was QC Checker run for this job?	✓	✓	

*Upon completion of this checklist, the reviewer must scan and attach the checklist to the TALS job.

1st Level (Analyst): [Signature]

Date: 12/5/16

2nd Level Reviewer: [Signature]

Date: 12/6/16

NCMs: 71898; 71946; 71948

TestAmerica Laboratories

Worklist QC Batch Report

Worklist Name: 29NOV2016B_PFC

Worklist Number: 37415

Instrument Name: A8_N

Chrom Method: A8_N

Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20161201-37415.b

QC Batching: Disabled

Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 140220	LC PFC ICAL Raw Batch: 140221	LC PFAS ICAL Raw Batch: 140222
# 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 MB 320-139075/1-A	IDA LOW NCM 71948	# 5 MB 320-139075/1-A	# 5 MB 320-139075/1-A
# 6 LCS 320-139075/2-A		# 6 LCS 320-139075/2-A	# 6 LCS 320-139075/2-A
# 7 320-23638-A-1-A		# 7 320-23638-A-1-A	# 7 320-23638-A-1-A
# 8 320-23638-A-2-A		# 8 320-23638-A-2-A	# 8 320-23638-A-2-A
# 9 320-23638-A-3-A		# 9 320-23638-A-3-A	# 9 320-23638-A-3-A
#10 320-23638-A-3-B DU	MS %R out, LCS PASS NCM 71946	#10 320-23638-A-3-B DU	#10 320-23638-A-3-B DU
#11 320-23638-A-3-C MS		#11 320-23638-A-3-C MS	#11 320-23638-A-3-C MS
#12 RB	#12 RB	#12 RB	#12 RB
#13 CCV L5	#13 CCV L5	#13 CCV L5	#13 CCV L5
#14 CCV L5 Add-on	#14 CCV L5 Add-on	#14 CCV L5 Add-on	#14 CCV L5 Add-on
#15 RB	#15 RB	#15 RB	#15 RB

ICV 137685
LCB

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 02DEC2016C_PFC

Worklist Number: 37485

Instrument Name: A8_N

Chrom Method: A8_N

Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37485.b

QC Batching: Disabled

Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 140532	LC PFC ICAL Raw Batch: 140533	LC PFAS ICAL Raw Batch: 140534
# 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 MB 320-138841/1-A	# 5 MB 320-138841/1-A		
# 6 LCS 320-138841/2-A	# 6 LCS 320-138841/2-A		
# 7 LCSD 320-138841/3-A	# 7 LCSD 320-138841/3-A		
# 8 320-23651-A-4-A	# 8 320-23651-A-4-A		
# 9 320-23651-A-1-A	# 9 320-23651-A-1-A		
# 10 320-23651-A-6-A	# 10 320-23651-A-6-A		
# 11 320-23651-A-8-A	# 11 320-23651-A-8-A	} 10x or not needed	
# 12 320-23651-A-9-A	# 12 320-23651-A-9-A		
# 13 320-23651-A-11-A	# 13 320-23651-A-11-A		
# 14 320-23651-A-5-A	# 14 320-23651-A-5-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
# 19 320-23651-A-10-A	# 19 320-23651-A-10-A		
# 20 320-23651-A-7-A	# 20 320-23651-A-7-A		
# 21 320-23651-A-8-A	# 21 320-23651-A-8-A		
# 22 320-23651-A-9-A	# 22 320-23651-A-9-A		
# 23 320-23651-A-11-A	# 23 320-23651-A-11-A		
# 24 RB	# 24 RB	# 24 RB	# 24 RB
# 25 CCV L5	# 25 CCV L5	# 25 CCV L5	# 25 CCV L5
# 26 CCV L5 Add-on	# 26 CCV L5 Add-on	# 26 CCV L5 Add-on	# 26 CCV L5 Add-on
# 27 RB	# 27 RB	# 27 RB	# 27 RB

1cv 140382
Tune NCM 71898

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-138841

Analyst: Marchenko, Veronika P

Method Code: 320-3535 IVWT-320

Batch Open: 11/21/2016 1:47:00PM

Batch End: 11/22/16 13:50

Solid-Phase Extraction (SPE)

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd Adj1 Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
MB-320-138841/1 N/A	N/A	26.75 g	250 mL 0.5 mL		N/A	N/A	N/A		
LCS-320-138841/2 N/A	N/A	26.02 g	250 mL 0.5 mL		N/A	N/A	N/A		
LCS-320-138841/3 N/A	N/A	26.10 g	250 mL 0.5 mL		N/A	N/A	N/A		
320-23651-A-1 (PFC_IDA_DOD5)	N/A (320-23651-1)	279.06 g	252.6 mL		11/21/16	16_Days	4	See NCM regarding these samples. Lots of sediment. <i>Screen 100x</i>	
320-23651-A-4 (PFC_IDA_DOD5)	N/A (320-23651-1)	277.72 g	251.5 mL		11/21/16	16_Days	4	See NCM regarding these samples. Lots of sediment. <i>100x</i>	
320-23651-A-5 (PFC_IDA_DOD5)	N/A (320-23651-1)	26.25 g	0.5 mL		11/21/16	16_Days	4	<i>1x</i> <i>100x</i>	
320-23651-A-6 (PFC_IDA_DOD5)	N/A (320-23651-1)	303.76 g	278 mL		11/21/16	16_Days	4	<i>1x</i> <i>100x</i>	
320-23651-A-7 (PFC_IDA_DOD5)	N/A (320-23651-1)	25.72 g	0.5 mL		11/21/16	16_Days	4	See NCM regarding these samples. Lots of sediment. <i>100x</i> <i>10x</i>	
320-23651-A-8 (PFC_IDA_DOD5)	N/A (320-23651-1)	280.53 g	254.2 mL		11/21/16	16_Days	4	See NCM regarding these samples. Lots of sediment. <i>100x</i> <i>1x</i>	
320-23651-A-9 (PFC_IDA_DOD5)	N/A (320-23651-1)	26.35 g	0.5 mL		11/21/16	16_Days	4	See NCM regarding these samples. Lots of sediment. <i>100x</i> <i>1x</i>	
320-23651-A-10 (PFC_IDA_DOD5)	N/A (320-23651-1)	281.41 g	255.1 mL		11/21/16	16_Days	4	See NCM regarding these samples. Lots of sediment. <i>100x</i> <i>1x</i>	
320-23651-A-11 (PFC_IDA_DOD5)	N/A (320-23651-1)	26.33 g	0.5 mL		11/21/16	16_Days	4	See NCM regarding these samples. Lots of sediment. <i>100x</i> <i>1x</i>	

A8 11/22/16
11/23/16

Due 12/8
A8 12/2/16

1

2

3

6

7

8

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-138841

Analyst: Marchenko, Veronika P

Batch Open: 11/21/2016 1:47:00PM

Method Code: 320-3535_IVWT-320

Batch End:

9	320-23651-A-8 (PFC_IDA_DOD5)	N/A (320-23651-1)	277.33 g 26.43 g	250.9 mL 0.5 mL				11/21/16	16_Days	4	See NCM regarding these samples. Lots of sediment.	 320-23651-A-8-A 100x, 1x
10	320-23651-A-9 (PFC_IDA_DOD5)	N/A (320-23651-1)	275.89 g 26.61 g	249.3 mL 0.5 mL				11/21/16	16_Days	4	See NCM regarding these samples. Lots of sediment.	 320-23651-A-9-A 100x, 1x
11	320-23651-A-10 (PFC_IDA_DOD5)	N/A (320-23651-1)	277.41 g 26.53 g	250.9 mL 0.5 mL				11/21/16	16_Days	4	See NCM regarding these samples. Lots of sediment.	 320-23651-A-10-A 1x
12	320-23651-A-11 (PFC_IDA_DOD5)	N/A (320-23651-1)	277.35 g 26.10 g	251.3 mL 0.5 mL				11/21/16	16_Days	4	See NCM regarding these samples. Lots of sediment.	 320-23651-A-11-A 100x, 1x

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-138841

Method Code: 320-3535_IVWT-320

Analyst: Marchenko, Veronika P

Batch Open: 11/21/2016 1:47:00PM

Batch End:

Batch Notes	
Manifold ID	7
Methanol ID	769612
Hexane ID	000146278
Sodium Hypochlorite ID	NA
First Start time	NA
First End time	NA
Balance ID	QA-070
SPE Cartridge Type	500mg WAX Cartridges
Solid Phase Extraction Disk ID	002836112A
H2O ID	11/17/16
Pipette ID	M005306 / M605455
Solvent Name	3% NH4OH / MeOH
Solvent Lot #	770672
Analyst ID - Reagent Drop	VPm
Analyst ID - SU Reagent Drop	VPm
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: 320-138841

Method Code: 320-3535_IVWT-320

Analyst: Marchenko, Veronika P

Batch Open: 11/21/2016 1:47:00PM

Batch End:

SOP Number	WS-CC-D0025
Batch Comment	

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-138841

Method Code: 320-3535_IVWT-320

Analyst: Marchenko, Veronika P

Batch Open: 11/21/2016 1:47:00PM

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-138841/1	LCMPFCSU_00046	25 uL	0.5 mL	PM 11/21/16	NSH 11-21-16
LCS 320-138841/2	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-138841/2	LCPFCSU_00070	20 uL	0.5 mL		
LCSD 320-138841/3	LCMPFCSU_00046	25 uL	0.5 mL		
LCSD 320-138841/3	LCPFCSU_00070	20 uL	0.5 mL		
320-23651-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-23651-A-4	LCMPFCSU_00046	25 uL	0.5 mL		
320-23651-A-5	LCMPFCSU_00046	25 uL	0.5 mL		
320-23651-A-6	LCMPFCSU_00046	25 uL	0.5 mL		
320-23651-A-7	LCMPFCSU_00046	25 uL	0.5 mL		
320-23651-A-8	LCMPFCSU_00046	25 uL	0.5 mL		
320-23651-A-9	LCMPFCSU_00046	25 uL	0.5 mL		
320-23651-A-10	LCMPFCSU_00046	25 uL	0.5 mL		
320-23651-A-11	LCMPFCSU_00046	25 uL	0.5 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-138841
Method Code: 320-3535_IVWT-320

Analyst: Marchenko, Veronika P

Batch Open: 11/21/2016 1:47:00PM

Batch End:

Reagent	Other Reagents:		Lot#:
	Amount/Units		

Preparation Batch Number(s): 138841 Test: PFC-IDA-DD105 (L)
Earliest Holding Time: 11/22/16

Sample List Tab	1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method	/	/
All necessary NCMs filed (including holding time)	/	/
Method/sample/login/QAS checked and correct	/	/
Worksheet Tab	1 st Level Reviewer	2 nd Level Reviewer
All samples properly preserved	NA	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 CI 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	1 st Level Reviewer	2 nd Level Reviewer
All necessary reagents not expired and entered into TALS	/	/
All spike amounts correct and added to necessary samples and QC	/	/
Batch Information	1 st Level Reviewer	2 nd Level Reviewer
Date and time accurate and entered into TALS correctly	/	/
All necessary 'batch information' complete and entered into TALS correctly	/	/

1st Level Reviewer: VPM

Date: 11/22/16

2nd Level Reviewer: NSH

Date: 11/22/16

Comments: _____

Job # 23651

Analyst Initials SBC

Date 11/23/16

[illegible]

8BC 11/23/16

Comments:

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Marchenko, Veronika P

Batch Number: 320-139075

Method Code: 320-3535_IWWT-320

Batch Open: 11/22/2016 11:38:00AM

Batch End: 11/23/16 16:20

Solid-Phase Extraction (SPE)

Due 12/5

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd Adj1 Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1 MB-320-139075/1 N/A	N/A		250 mL 0.5 mL		N/A	N/A	N/A		MB 320-139075-1-A
2 LCS-320-139075/2 N/A	N/A		250 mL 0.5 mL		N/A	N/A	N/A		LCS 320-139075-2-A
3 320-23638-A-1 (PFC_IDA)	N/A (320-23638-1)	301.91 g 27.35 g	274.6 mL 0.5 mL		11/25/16	12_Days	4		320-23638-A-1-A
4 320-23638-A-2 (PFC_IDA)	N/A (320-23638-1)	323.41 g 27.87 g	295.5 mL 0.5 mL		11/25/16	12_Days	4		320-23638-A-2-A
5 320-23638-A-3 (PFC_IDA)	N/A (320-23638-1)	315.80 g 27.46 g	288.3 mL 0.5 mL		11/25/16	12_Days	4		320-23638-A-3-A
6 320-23638-A-3-DU (PFC_IDA)	N/A (320-23638-1)	323.95 g 27.60 g	296.4 mL 0.5 mL		11/25/16	12_Days	4		320-23638-A-3-B DU
7 320-23638-A-3-MS (PFC_IDA)	N/A (320-23638-1)	327.58 g 27.22 g	300.4 mL 0.5 mL		11/25/16	12_Days	4		320-23638-A-3-C MS

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139075

Analyst: Marchenko, Veronika P

Batch Open: 11/22/2016 11:38:00AM

Method Code: 320-3535_IVWT-320

Batch End:

Batch Notes	
Manifold ID	7
Methanol ID	789828
Hexane ID	000146278
Sodium Hypochlorite ID	NA
First Start time	NA
First End time	NA
Balance ID	QA-070
SPE Cartridge Type	520 WAX mg cartridges
Solid Phase Extraction Disk ID	002836112A
H2O ID	11/17/16
Pipette ID	M005304 / M605455
Solvent Name	3% NH4OH/MeOH
Solvent Lot #	776672
Analyst ID - Reagent Drop	UPM
Analyst ID - SU Reagent Drop	UPM
Analyst ID - SU Reagent Drop Witness	FW
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: 320-139075

Method Code: 320-3535_IVWT-320

Analyst: Marchenko, Veronika P

Batch Open: 11/22/2016 11:38:00AM

Batch End:

SOP Number	WS-LC-00025
Batch Comment	

Comments

320-23638-A-1	Method Comments: DuPont QAS_LCSD req if No MS/DU per JOB_addon analytes needed
320-23638-A-2	Method Comments: DuPont QAS_LCSD req if No MS/DU per JOB_addon analytes needed
320-23638-A-3	Method Comments: DuPont QAS_LCSD req if No MS/DU per JOB_addon analytes needed
320-23638-A-3~DU	Method Comments: DuPont QAS_LCSD req if No MS/DU per JOB_addon analytes needed
320-23638-A-3~MS	Method Comments: DuPont QAS_LCSD req if No MS/DU per JOB_addon analytes needed

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Marchenko, Veronika P

Batch Open: 11/22/2016 11:38:00AM

Batch End:

Batch Number: 320-139075

Method Code: 320-3535_IVWT-320

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-139075/1	LCMPFC2SU_00010	25 uL	0.5 mL	upm 11/22/16	ERG 11/22/16
MB 320-139075/1	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-139075/2	LCMPFC2SU_00010	25 uL	0.5 mL		
LCS 320-139075/2	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-139075/2	LCPFC2SP_00016	20 uL	0.5 mL		
LCS 320-139075/2	LCPFCSP_00070	20 uL	0.5 mL		
320-23638-A-1	LCMPFC2SU_00010	25 uL	0.5 mL		
320-23638-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-23638-A-2	LCMPFC2SU_00010	25 uL	0.5 mL		
320-23638-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-23638-A-3	LCMPFC2SU_00010	25 uL	0.5 mL		
320-23638-A-3	LCMPFCSU_00046	25 uL	0.5 mL		
320-23638-A-3 DU	LCMPFC2SU_00010	25 uL	0.5 mL		
320-23638-A-3 DU	LCMPFCSU_00046	25 uL	0.5 mL		
320-23638-A-3 MS	LCMPFC2SU_00010	25 uL	0.5 mL		
320-23638-A-3 MS	LCMPFCSU_00046	25 uL	0.5 mL		
320-23638-A-3 MS	LCPFC2SP_00016	20 uL	0.5 mL		
320-23638-A-3 MS	LCPFCSP_00070	20 uL	0.5 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139075

Method Code: 320-3535_IVWT-320

Analyst: Marchenko, Veronika P

Batch Open: 11/22/2016 11:38:00AM

Batch End:

Reagent	Other Reagents:	
	Amount/Units	Lot#:

Preparation Batch Number(s): 139075

Test: PFC-IDA (L)

Earliest Holding Time: 11/22/16

Sample List Tab	1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method	<u>✓</u>	<u>✓</u>
All necessary NCMs filed (including holding time)	<u>NA</u>	<u>✓</u>
Method/sample/login/QAS checked and correct	<u>✓</u>	<u>✓</u>
Worksheet Tab	1 st Level Reviewer	2 nd Level Reviewer
All samples properly preserved	<u>NA</u>	<u>NA</u>
Weights in anticipated range and not targeted	<u>✓</u>	<u>✓</u>
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check)	<u>✓</u>	<u>✓</u>
The pH is transcribed correctly in TALS	<u>NA</u>	<u>NA</u>
All additional information transcribed into TALS is correct and raw data is attached	<u>✓</u>	<u>✓</u>
Comments are transcribed correctly in TALS	<u>✓</u>	<u>✓</u>
Reagents Tab	1 st Level Reviewer	2 nd Level Reviewer
All necessary reagents not expired and entered into TALS	<u>✓</u>	<u>✓</u>
All spike amounts correct and added to necessary samples and QC	<u>✓</u>	<u>✓</u>
Batch Information	1 st Level Reviewer	2 nd Level Reviewer
Date and time accurate and entered into TALS correctly	<u>✓</u>	<u>✓</u>
All necessary 'batch information' complete and entered into TALS correctly	<u>✓</u>	<u>✓</u>

1st Level Reviewer: VPM

Date: 11/23/16

2nd Level Reviewer: ERL

Date: 11/23/16

Comments: _____

HPLC/LCMS Data Review Checklist

Job Number(s): 23542; 23651; 23718; 23783 Work List ID(s): 37450; 37461
 Extraction Batch: 138217; 138291; 139627 Analysis Batch(es): 140382; 140429
 Delivery Rank: 4 Due Date: 11/19/16; 11/25/16

A. Calibration/Instrument Run QC	1 st Level	2 nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch# <u>140382;</u>	✓	✓	
2. ICAL, CCV Frequency & Criteria met.	✓	✓	
• RF _{average} criteria appropriate for the method.	✓	✓	
• Linear Regression criteria appropriate if required ($r \geq 0.995$).	✓	✓	
• Quadratic fit criteria appropriate if required ($r^2 \geq 0.990$).			✓
• For Linear Regression and Quadratic fit – Does the y-intercept support ½ the reporting limit as described in CA-Q-S-005?	✓	✓	
• All curve points show calculated concentrations.	✓	✓	
3. Peaks correctly ID'd by data system.	✓	✓	
5. Tune check frequency & criteria met and Tune check report attached.	✓	✓	
B. QA/QC			
1. Are all QC samples properly linked in TALS?	✓	✓	
2. Method blank, LCS/LCSD and MS/SD frequencies met.	✓	✓	
3. LCS/LCSD and MB data are within control limits. If not, NCM is present.	✓	✓	
4. Are MS/MSD recoveries and RPD within control limits?	✓	✓	
5. Holding Times were met for prep and analytical.	✓	✓	
6. IS/Surrogate recoveries meet criteria or properly noted.	✓	✓	
C. Sample Analysis			
1. Was correct analysis performed and were project instructions followed?	✓	✓	
2. If required, are compounds within RT windows?	✓	✓	
3. If required, are positive hits confirmed and >40% RPD flagged?			✓
4. Manual Integrations reviewed and appropriate.	✓	✓	
5. All analytes correctly reported. (Primary, secondary, acceptable status)	✓	✓	
6. Correct reporting limits used. (based on client request, prep factors, and dilutions)	✓	✓	
D. Documentation			
1. Are all non-conformances documented/attached? NCM# <u>71898; 71899</u>	✓	✓	
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: 12/4/16

2nd Level Reviewer: [Signature] Date: 12/5/16

NCMs: 71898; 71899; 71937; 71940

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 02DEC2016A_PFC

Worklist Number: 37450

Instrument Name: A8_N

Chrom Method: A8_N

Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b

QC Batching: Disabled

Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 140382	LC PFC ICAL Raw Batch: 140383	LC PFAS ICAL Raw Batch: 140384
# 1 RB	# 1 RB		
# 2 RB	# 2 RB		
# 3 RB	# 3 RB		
# 4 IC L1	# 4 IC L1	# 4 IC L1	# 4 IC L1
# 5 IC L2	# 5 IC L2	# 5 IC L2	# 5 IC L2
# 6 IC L3	# 6 IC L3	# 6 IC L3	# 6 IC L3
# 7 IC L4	# 7 IC L4	# 7 IC L4	# 7 IC L4
# 8 IC L5	# 8 IC L5	# 8 IC L5	# 8 IC L5
# 9 IC L6	# 9 IC L6	# 9 IC L6	# 9 IC L6
#10 IC L7	#10 IC L7	#10 IC L7	#10 IC L7
#11 ICB	#11 ICB	#11 ICB	#11 ICB
#12 ICV	#12 ICV <i>Tune NCM</i>	#12 ICV	
#13 RB	#13 RB <i>71898</i>	#13 RB	#13 RB
#14 IC L1 Add-on	#14 IC L1 Add-on	#14 IC L1 Add-on	#14 IC L1 Add-on
#15 IC L2 Add-on	#15 IC L2 Add-on	#15 IC L2 Add-on	#15 IC L2 Add-on
#16 IC L3 Add-on	#16 IC L3 Add-on	#16 IC L3 Add-on	#16 IC L3 Add-on
#17 IC L4 Add-on	#17 IC L4 Add-on	#17 IC L4 Add-on	#17 IC L4 Add-on
#18 IC L5 Add-on	#18 IC L5 Add-on	#18 IC L5 Add-on	#18 IC L5 Add-on
#19 IC L6 Add-on	#19 IC L6 Add-on	#19 IC L6 Add-on	#19 IC L6 Add-on
#20 IC L7 Add-on	#20 IC L7 Add-on	#20 IC L7 Add-on	#20 IC L7 Add-on
#21 ICB	#21 ICB	#21 ICB	#21 ICB
#22 ICV Add-on	#22 ICV Add-on	#22 ICV Add-on	
#23 RB	#23 RB	#23 RB	#23 RB
#24 320-23542-A-2-A	#24 320-23542-A-2-A		
#25 320-23542-A-2-B MS	#25 320-23542-A-2-B MS		
#26 320-23542-A-2-C MSD	#26 320-23542-A-2-C MSD		
#27 320-23542-A-1-A	#27 320-23542-A-1-A		
#28 320-23542-A-4-A	#28 320-23542-A-4-A <i>misinject</i>		
#29 320-23542-A-3-A	#29 320-23542-A-3-A		
#30 320-23542-A-3-B MS	#30 320-23542-A-3-B MS		
#31 320-23542-A-3-C MSD	#31 320-23542-A-3-C MSD		
#32 RB	#32 RB	#32 RB	#32 RB
#33 CCV L5	#33 CCV L5	#33 CCV L5	#33 CCV L5
#34 CCV L5 Add-on	#34 CCV L5 Add-on	#34 CCV L5 Add-on	#34 CCV L5 Add-on
#35 RB	#35 RB	#35 RB	#35 RB

MS/MSD high targets NCM 71899

TestAmerica Laboratories

Worklist QC Batch Report

Worklist Name: 02DEC2016B_PFC

Worklist Number: 37461

Instrument Name: A8_N

Chrom Method: A8_N

Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37461.b

QC Batching: Disabled

Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 140429	LC PFC ICAL Raw Batch: 140430	LC PFAS ICAL Raw Batch: 140431
# 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 MB 320-139627/1-A	# 5 MB 320-139627/1-A		
# 6 LCS 320-139627/2-A	# 6 LCS 320-139627/2-A		
# 7 320-23651-A-2-A	# 7 320-23651-A-2-A		
# 8 320-23651-A-3-A	# 8 320-23651-A-3-A		
# 9 320-23718-A-3-A	# 9 320-23718-A-3-A		
#10 320-23718-A-3-B MS	#10 320-23718-A-3-B MS		
#11 320-23718-A-3-C MSD	#11 320-23718-A-3-C MSD		
#12 320-23783-A-1-A	#12 320-23783-A-1-A		
#13 320-23783-A-2-A	#13 320-23783-A-2-A		
#14 320-23783-A-5-A	#14 320-23783-A-5-A E 10x PFOS E flag NCM 71937		
#15 320-23542-A-4-A	#15 320-23542-A-4-A		
#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
#19 320-23783-A-6-A	#19 320-23783-A-6-A		
#20 320-23783-A-7-A	#20 320-23783-A-7-A		
#21 320-23783-A-8-A	#21 320-23783-A-8-A		
#22 320-23783-A-9-A	#22 320-23783-A-9-A		
#23 320-23783-A-10-A	#23 320-23783-A-10-A		
#24 320-23783-A-11-A	#24 320-23783-A-11-A		
#25 RB	#25 RB	#25 RB	#25 RB
#26 CCV L5	#26 CCV L5	#26 CCV L5	#26 CCV L5
#27 CCV L5 Add-on	#27 CCV L5 Add-on	#27 CCV L5 Add-on	#27 CCV L5 Add-on
#28 RB	#28 RB	#28 RB	#28 RB

ICV 140382

Tune + SBC 12/4/16

Tune NCM 71998

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-138217

Method Code: 320-3535_IWWT-320

Analyst: Arauz, Horacio J

Batch Open: 11/17/2016 8:49:00AM

Batch End: 11/18/2016 2:20:00PM

AS 11/20/16
AS 12/2/16

Solid-Phase Extraction (SPE)

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmt FinAmt	PHs Adj1 Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1 MS-320-138217/1 N/A	N/A		250 mL 0.5 mL		N/A	N/A	N/A		
2 LCS-320-138217/2 N/A	N/A		250 mL 0.5 mL		N/A	N/A	N/A		
3 320-23542-A-1 (PFC_IDA_DOD5)	N/A (320-23542-1)	266.74 g 26.14 g	240.6 mL 0.5 mL		11/19/16	16_Days	4	10x PFOS ✓	
4 320-23542-A-2 (PFC_IDA_DOD5)	N/A (320-23542-1)	284.91 g 26.35 g	258.6 mL 0.5 mL		11/19/16	16_Days	4	100x PFOS ✓	
5 320-23542-A-2-MSD (PFC_IDA_DOD5)	N/A (320-23542-1)	277.51 g 26.23 g	251.3 mL 0.5 mL		11/19/16	16_Days	4		
6 320-23542-A-2-MSD (PFC_IDA_DOD5)	N/A (320-23542-1)	273.81 g 26.03 g	247.8 mL 0.5 mL		11/19/16	16_Days	4		
7 320-23542-A-4 (PFC_IDA_DOD5)	N/A (320-23542-1)	280.63 g 26.42 g	254.2 mL 0.5 mL		11/19/16	16_Days	4	10x PFOS PI ✓	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J

Batch Number: 320-138217

Method Code: 320-3535_IVWT-320

Batch Open: 11/17/2016 8:49:00AM

Batch End: 11-8-16 14:20

Solid-Phase Extraction (SPE)

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	IntAmt FinAmt	PHs Rcvd Adj1 Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1 MB-320-1382171 N/A	N/A		250 mL 0.5 mL		N/A	N/A	N/A		
2 LGS-320-1382172 N/A	N/A		250 mL 0.5 mL		N/A	N/A	N/A		
3 320-23542-A-1 (PFC_IDA_DOD5)	N/A (320-23542-1)	266.74 g			11/19/16	16_Days	4		
4 320-23542-A-2 (PFC_IDA_DOD5)	N/A (320-23542-1)	284.91 g	0.5 mL		11/19/16	16_Days	4		
5 320-23542-A-2-MS (PFC_IDA_DOD5)	N/A (320-23542-1)	277.51 g	0.5 mL		11/19/16	16_Days	4		
6 320-23542-A-2-MSD (PFC_IDA_DOD5)	N/A (320-23542-1)	273.81 g	0.5 mL		11/19/16	16_Days	4		
7 320-23542-A-4 (PFC_IDA_DOD5)	N/A (320-23542-1)	280.63 g	0.5 mL		11/19/16	16_Days	4		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J

Batch Open: 11/17/2016 8:49:00AM

Batch End:

Batch Number: 320-138217

Method Code: 320-3535_IVWT-320

Batch Notes

Manifold ID 5

Methanol ID 769617

Hexane ID 000146278

Sodium Hypochlorite ID NA

First Start time NA

First End time NA

Balanca ID QA-070

SPE Cartridge Type WAX 500mg

Solid Phase Extraction Disk ID 002836112A

H2O ID 11-14-16

Pipette ID MD05306

Solvent Name 0.3% NH4OH-Me

Solvent Lot # 776672

Analyst ID - Reagent Drop HJA

Analyst ID - SU Reagent Drop HJA

Analyst ID - SU Reagent Drop Witness NGK

Acid Name NA

Acid ID NA

Reagent ID NA

Reagent Lot Number NA

NaCl ID NA

Printed : 11/17/2016

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TestAmerica Sacramento

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-138217
Method Code: 320-3535_IWWT-320

Analyst: Arauz, Horacio J

Batch Open: 11/17/2016 8:49:00AM
Batch End:

SOP Number WS-LC-0025

Batch Comment 0.1N NaOH/H2O_00026

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J

Batch Number: 320-138217

Method Code: 320-3535_JVWT-320

Batch Open: 11/17/2016 8:49:00AM

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-138217/1	LCMPFCSU_00046	25 uL	0.5 mL	HSA 11-17-16	New 11-17-16
LCS 320-138217/2	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-138217/2	LCPFCSU_00066	20 uL	0.5 mL		
320-23542-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-23542-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-23542-A-2 MS	LCMPFCSU_00046	25 uL	0.5 mL		
320-23542-A-2 MS	LCPFCSU_00066	20 uL	0.5 mL		
320-23542-A-2 MSD	LCMPFCSU_00046	25 uL	0.5 mL		
320-23542-A-2 MSD	LCPFCSU_00066	20 uL	0.5 mL		
320-23542-A-4	LCMPFCSU_00046	25 uL	0.5 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J

Batch Open: 11/17/2016 8:49:00AM

Batch End:

Batch Number: 320-138217

Method Code: 320-3535_IWWT-320

Reagent	Other Reagents:	
	Amount/Units	Lot#:

**Sacramento
Preparation Data Review Checklist**

Preparation Batch Number(s): 320-138217 Test: PFC-L

Earliest Holding Time: 11-21-16

Sample List Tab	1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method	/	/
All necessary NCMs filed (including holding time)	/	/
Method/sample/login/QAS checked and correct	/	/
Worksheet Tab	1 st Level Reviewer	2 nd Level Reviewer
All samples properly preserved	NA	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 CI 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	1 st Level Reviewer	2 nd Level Reviewer
All necessary reagents not expired and entered into TALS	/	/
All spike amounts correct and added to necessary samples and QC	/	/
Batch Information	1 st Level Reviewer	2 nd Level Reviewer
Date and time accurate and entered into TALS correctly	/	/
All necessary 'batch information' complete and entered into TALS correctly	/	/

1st Level Reviewer: HSA

Date: 11-18-16

2nd Level Reviewer: VPM

Date: 11/18/16

Comments: _____

Job # 23542

Date 12/2/16

Comments:

Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-138291
Method Code: 320-Shake_Bath_14D-320

Analyst: Sharifi, Nooshin

Batch Open: 11/17/2016 12:46:00PM

Batch End: 11-18-16 13:18pm

Shake Extraction with Ultrasonic Bath Extraction

Input Sample Lab ID (Analytical Method)	SDG (Job #)	Initial Amount	Final Amount	Due Date	Analytical TAT	DIV Rank	Comments	Output Sample Lab ID
1 MB-320-138291/1 N/A	N/A	4.98 g	1.0 mL	N/A	N/A	N/A		
2 LCS-320-138291/2 N/A	N/A	5.03 g	1.0 mL	N/A	N/A	N/A		
3 320-23542-A-3 (PFC_IDA_DOD5)	N/A (320-23542-1)	5.05 g	1.0 mL	11/18/16	16_Days	4	10x PFCs ✓	
4 320-23542-A-3-MS (PFC_IDA_DOD5)	N/A (320-23542-1)	4.99 g	1.0 mL	11/18/16	16_Days	4	10x PFCs ✓	
5 320-23542-A-3-MSD (PFC_IDA_DOD5)	N/A (320-23542-1)	5.03 g	1.0 mL	11/18/16	16_Days	4	10x PFCs ✓	

Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-138291

Method Code: 320-Shake_Bath_14D-320

Analyst: Sharifi, Nooshin

Batch Open: 11/17/2016 12:46:00PM

Batch End:

Batch Notes

Balance ID QA-070

Blank Sand Lot # 156690

Filter ID NA

Millipore Water Dispense Date

Analyst ID - Reagent Drop Witness NSH

SPE Cartridge ID 016336091A

SPE Cartridge Type WAX150mg

Hexane ID 0000146278

Methanol ID 769617

Ammonium Hydroxide/MeOH ID 776672

Sodium Hydroxide ID 758321

Methanolic Potassium Hydroxide ID 757037

Manifold ID

Interference check solution ID NA

Acetic Acid ID 429065

Batch Comment Pipette ID: MD05306, MG05455

Comments

Printed : 11/17/2016

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TestAmerica Sacramento

Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-138291

Method Code: 320-Shake_Bath_14D-320

Analyst: Sharifi, Nooshin

Batch Open: 11/17/2016 12:46:00PM

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-138291/1	LCMPFCSU_00046	50 uL	1.0 mL	NSH 11-17-16	HSA 11-17-16
LCS 320-138291/2	LCMPFCSU_00046	50 uL	1.0 mL		
LCS 320-138291/2	LCPFCSU_00064	40 uL	1.0 mL		
320-23542-A-3	LCMPFCSU_00046	50 uL	1.0 mL		
320-23542-A-3 MS	LCMPFCSU_00046	50 uL	1.0 mL		
320-23542-A-3 MS	LCPFCSU_00064	40 uL	1.0 mL		
320-23542-A-3 MSD	LCMPFCSU_00046	50 uL	1.0 mL		
320-23542-A-3 MSD	LCPFCSU_00064	40 uL	1.0 mL		

Other Reagents:

Amount/Units

Lot#:

Printed : 11/17/2016

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TestAmerica Sacramento

Preparation Batch Number(s): 138291 Test: PFC-S
Earliest Holding Time: 11-28-16

Sample List Tab	1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method	/	/
All necessary NCMs filed (including holding time)	NA	NA
Method/sample/login/QAS checked and correct	/	/
Worksheet Tab	1 st Level Reviewer	2 nd 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 CI 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	1 st Level Reviewer	2 nd Level Reviewer
All necessary reagents not expired and entered into TALS	/	/
All spike amounts correct and added to necessary samples and QC	/	/
Batch Information	1 st Level Reviewer	2 nd Level Reviewer
Date and time accurate and entered into TALS correctly	/	/
All necessary 'batch information' complete and entered into TALS correctly	/	/

1st Level Reviewer: NSH Date: 11-19-16
2nd Level Reviewer: HSA Date: 11-19-16
Comments: _____

Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

AB 12/2/16

Batch Number: 320-139627

Analyst: Arauz, Horacio J

Method Code: 320-Shake_Bath_14D-320

Batch Open: 11/28/2016 11:03:00AM

Batch End: 11-30-16 16:30

Shake Extraction with Ultrasonic Bath Extraction

Input Sample Lab ID (Analytical Method)	SDG (Job #)	Initial Amount	Final Amount	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
MB-320-139627/1 N/A	N/A	5.00 g	1.00 mL	N/A	N/A	N/A		MB 320-139627/1-A
LCS-320-139627/2 N/A	N/A	5.00 g	1.00 mL	N/A	N/A	N/A		LCS 320-139627/2-A
320-23651-A-2 (PFC_IDA_DOD5)	(320-23651-1)	5.07 g	1.00 mL	11/21/16	16_Days	4		320-23651-A-2-A
320-23651-A-3 (PFC_IDA_DOD5)	(320-23651-1)	5.05 g	1.00 mL	11/21/16	16_Days	4		320-23651-A-3-A
320-23718-A-3 (PFC_IDA_DOD5)	(320-23718-1)	5.00 g	1.00 mL	11/25/16	16_Days	4		320-23718-A-3-A
320-23718-A-3-MS (PFC_IDA_DOD5)	(320-23718-1)	5.01 g	1.00 mL	11/25/16	16_Days	4		320-23718-A-3-B
320-23718-A-3-MSD (PFC_IDA_DOD5)	(320-23718-1)	5.08 g	1.00 mL	11/25/16	16_Days	4		320-23718-A-3-C
320-23783-A-1 (PFC_IDA_DOD5)	(320-23783-1)	5.01 g	1.00 mL	11/29/16	11_Day_Rush	4		320-23783-A-1-A
320-23783-A-2 (PFC_IDA_DOD5)	(320-23783-1)	5.07 g	1.00 mL	11/29/16	11_Day_Rush	4		320-23783-A-2-A
320-23783-A-5 (PFC_IDA_DOD5)	(320-23783-1)	5.02 g	1.00 mL	11/29/16	11_Day_Rush	4	10X PFOS 681.79	320-23783-A-5-A
320-23783-A-6 (PFC_IDA_DOD5)	(320-23783-1)	5.06 g	1.00 mL	11/29/16	11_Day_Rush	4		320-23783-A-6-A
320-23783-A-7 (PFC_IDA_DOD5)	(320-23783-1)	5.03 g	1.00 mL	11/29/16	11_Day_Rush	4		320-23783-A-7-A
320-23783-A-8 (PFC_IDA_DOD5)	(320-23783-1)	5.00 g	1.00 mL	11/29/16	11_Day_Rush	4		320-23783-A-8-A
320-23783-A-9 (PFC_IDA_DOD5)	(320-23783-1)	5.02 g	1.00 mL	11/29/16	11_Day_Rush	4		320-23783-A-9-A
320-23783-A-10 (PFC_IDA_DOD5)	(320-23783-1)	5.03 g	1.00 mL	11/29/16	11_Day_Rush	4		320-23783-A-10-A

Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139627

Analyst: Arauz, Horacio J

Batch Open: 11/28/2016 11:03:00AM

Method Code: 320-Shake_Bath_14D-320

Batch End:

320-23783-A-11 (PFC_IDA_DOD5)	N/A (320-23783-1)	5.05 g	1.00 mL	11/29/16	11_Day_Rush	4

16



Batch Notes

Balance ID QA-070

Blank Sand Lot # Fisher 156690

Filter ID NA

Millipore Water Dispense Date 11-29-16

Analyst ID - Reagent Drop Witness MSH

SPE Cartridge ID 016636277A

SPE Cartridge Type WAX 150mg

Hexane ID J.T.BAKER 0000146278

Methanol ID 789824

Ammonium Hydroxide/MeOH ID 794501

Sodium Hydroxide ID 758321

Methanolic Potassium Hydroxide ID 757037

Manifold ID 5,9

Interference check solution ID NA

Acetic Acid ID 429065

Batch Comment Pipette MD05306

Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139627

Method Code: 320-Shake_Bath_14D-320

Analyst: Arauz, Horacio J

Batch Open: 11/28/2016 11:03:00AM

Batch End:

Comments

Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J

Batch Open: 11/28/2016 11:03:00AM

Batch End:

Batch Number: 320-139627

Method Code: 320-Shake_Bath_14D-320

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-139627/1	LCMPFCSU_00046	50 uL	1.00 mL	HSA 11-28-16	NSH 11-28-16
LCS 320-139627/2	LCMPFCSU_00046	50 uL	1.00 mL		
LCS 320-139627/2	LCPFCSU_00070	40 uL	1.00 mL		
320-23651-A-2	LCMPFCSU_00046	50 uL	1.00 mL		
320-23651-A-3	LCMPFCSU_00046	50 uL	1.00 mL		
320-23718-A-3	LCMPFCSU_00046	50 uL	1.00 mL		
320-23718-A-3 MS	LCMPFCSU_00046	50 uL	1.00 mL		
320-23718-A-3 MS	LCPFCSU_00070	40 uL	1.00 mL		
320-23718-A-3 MSD	LCMPFCSU_00046	50 uL	1.00 mL		
320-23718-A-3 MSD	LCPFCSU_00070	40 uL	1.00 mL		
320-23783-A-1	LCMPFCSU_00046	50 uL	1.00 mL		
320-23783-A-2	LCMPFCSU_00046	50 uL	1.00 mL		
320-23783-A-5	LCMPFCSU_00046	50 uL	1.00 mL		
320-23783-A-6	LCMPFCSU_00046	50 uL	1.00 mL		
320-23783-A-7	LCMPFCSU_00046	50 uL	1.00 mL		
320-23783-A-8	LCMPFCSU_00046	50 uL	1.00 mL		
320-23783-A-9	LCMPFCSU_00046	50 uL	1.00 mL		
320-23783-A-10	LCMPFCSU_00046	50 uL	1.00 mL		

Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139627

Analyst: Arauz, Horacio J

Batch Open: 11/28/2016 11:03:00AM

Method Code: 320-Shake_Bath_14D-320

Batch End:

320-23783-A-11	LCMPFCSU_00046	50 uL	1.00 mL	HSA 11-28-16	NSH 11-28-16

Other Reagents:		
Reagent	Amount/Units	Lot#:

Preparation Batch Number(s): 320-139627 Test: PEC-IDA-0005

Earliest Holding Time: 11-29-16

Sample List Tab	1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method	/	/
All necessary NCMs filed (including holding time)	NA	NA
Method/sample/login/QAS checked and correct	/	/
Worksheet Tab	1 st Level Reviewer	2 nd 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 CI 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	1 st Level Reviewer	2 nd Level Reviewer
All necessary reagents not expired and entered into TALS	/	/
All spike amounts correct and added to necessary samples and QC	/	/
Batch Information	1 st Level Reviewer	2 nd Level Reviewer
Date and time accurate and entered into TALS correctly	/	/
All necessary 'batch information' complete and entered into TALS correctly	/	/

1st Level Reviewer: HSA

Date: 11-30-16

2nd Level Reviewer: VPM

Date: 11-30-16

Comments: _____

GENERAL CHEMISTRY

COVER PAGE
GENERAL CHEMISTRY

Lab Name: TestAmerica Sacramento Job Number: 320-23651-1

SDG No.: _____

Project: Former Bay Head Road Annex (RFP JU06-01)

Client Sample ID

DPT-16-20-SO-16-17

DPT-16-20-SO-16-17-DUP

Lab Sample ID

320-23651-2

320-23651-3

Comments:

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Sacramento

Job Number: 320-23651-1

SDG Number: _____

Matrix: Solid

Instrument ID: NOEQUIP

Method: D 2216

LOQ Date: 01/01/2012 08:18

Analyte	Wavelength/ Mass	LOQ (%)	
Percent Moisture		0.1	
Percent Solids		0.1	

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Sacramento

Job Number: 320-23651-1

SDG Number: _____

Matrix: Solid

Instrument ID: NOEQUIP

Method: D 2216

XRL Date: 01/01/2012 08:19

Analyte	Wavelength/ Mass	XRL (%)	
Percent Moisture		0.1	
Percent Solids		0.1	

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1
 SDG No.: _____
 Instrument ID: NOEQUIP Analysis Method: D 2216
 Start Date: 11/22/2016 13:53 End Date: 11/22/2016 13:53

Lab Sample Id	D/F	T y p e	Time	Analytes																									
				% S o l	M o i s t																								
ZZZZZZ			13:53																										
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ZZZZZZ			13:53																										
ZZZZZZ			13:53																										
320-23651-2	1	T	13:53	X	X																								
320-23651-3	1	T	13:53	X	X																								

Prep Types: _____
 T = Total/NA

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23651-1

SDG No.: _____

Batch Number: 139136 Batch Start Date: 11/22/16 13:53 Batch Analyst: Yang, MaiseeBatch Method: D 2216 Batch End Date: 11/23/16 10:20

Lab Sample ID	Client Sample ID	Method Chain	Basis	DISH#	DishWeight	SampleMassWet	SampleMassDry		
320-23651-A-2	DPT-16-20-SO-16-17	D 2216	T	19	2.02 g	9.33 g	7.91 g		
320-23651-A-3	DPT-16-20-SO-16-17-DUP	D 2216	T	20	1.03 g	7.98 g	6.83 g		

Batch Notes	
Balance ID	QA-068 No Unit
Date and Time Samples in Desiccator	11/23/16 @9:12
Date and Time Samples out of Desiccator	11/23/16 @10:20
Date samples were placed in the oven	11/22/16
Oven Temp In	110 Degrees C
Time samples were place in the oven	14:25
Date samples were removed from oven	11/23/16
Oven Temp Out	109 Degrees C
Time Samples were removed from oven	9:12
Oven ID	Soil Prep #2
Thermometer ID	151969607

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.

Preparation Batch Number(s): 139136 Test: % Moisture

Earliest Holding Time: N/A

320-23542; -23546; -23559; -23627; -23651

Sample List Tab		1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method		✓	✓
All necessary NCMs filed (including holding time)		✓	✓
Method/sample/login/QAS checked and correct		✓	✓
Worksheet Tab		1 st Level Reviewer	2 nd Level Reviewer
All samples properly preserved		✓	✓
Weights in anticipated range and not targeted		N/A	NA
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check)		✓	✓
The pH is transcribed correctly in TALS		N/A	NA
All additional information transcribed into TALS is correct and raw data is attached		N/A	NA
Comments are transcribed correctly in TALS		✓	✓
Reagents Tab		1 st Level Reviewer	2 nd Level Reviewer
All necessary reagents not expired and entered into TALS		✓	✓
All spike amounts correct and added to necessary samples and QC		N/A	NA
		N/A	NA
Batch Information		1 st Level Reviewer	2 nd Level Reviewer
Date and time accurate and entered into TALS correctly		✓	✓
All necessary 'batch information' complete and entered into TALS correctly		✓	✓

1st Level Reviewer: CTR

2nd Level Reviewer: MY

Comments: _____

Date: 11/25/16

Date: 11/28/16

Shipping and Receiving Documents

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Temperature on Receipt _____

Drinking Water? Yes ☐ No ☒

Chain of Custody Record

TAL-4124 (1007)

Client **AECOM** Project Manager **KURT VAN GELDER** Date **11/16/16** Chain of Custody Number **299017**
 Address **3101 WILSON BLVD** Telephone Number (Area Code)/Fax Number **(703) 549-0728** Lab Number **Page 1 of 1**
 City **ARLINGTON** State **VA** Zip Code **22201** Site Contact **MIKE G-LINSKI** Lab Contact **JILL KELLMAN** Analysis (Attach list if more space is needed)

Project Name and Location (State) **BAY HEAD RD ANNEX - ANNAPOLIS** Carrier/Waybill Number **FEDEX** Special Instructions/Conditions of Receipt

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix					Containers & Preservatives					Analysis
			Air	Aqueous	Sed	Soil	Unpres	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	
DPT-16-20-GW-16-20	11/15/16	1030	✓				2						PFBS
DPT-16-20-SO-16-17		0945		✓			1						PFBS
DPT-16-20-SO-16-17-DUP		0945		✓			1						PFBS
DPT-16-20-GW-26-30		1105	✓				2						PFBS
DPT-SO-EB-111516		1100	✓				2						PFBS
DPT-16-34-GW-16-20		1200	✓				2						PFBS
DPT-16-26-GW-18-22	11/16/16	1120	✓				2						PFBS
DPT-16-26-GW-29-33		1200	✓				2						PFBS
DPT-16-26-GW-29-33-DUP		1200	✓				2						PFBS
DPT-16-27-GW-18-22		1320	✓				2						PFBS
DPT-16-27-GW-29-33		1400	✓				2						PFBS

Subsurface Soil EB



320-23651 Chain of Custody

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☒ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify):
 1. Relinquished By **MSB** Date **11/14/16** Time **1700**
 2. Relinquished By **WJ** Date **11/17/16** Time **0940**
 3. Relinquished By _____ Date _____ Time _____

Comments

1.9

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

12/06/2016

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 320-23651-1

Login Number: 23651

List Source: TestAmerica Sacramento

List Number: 1

Creator: Edman, Connor M

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

"DPT-16-20-GW-16-20","537","12/02/16","18:59","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid (PFBS)","0.017","","TRG","Yes","Y","JD","Y","0.0091","0.025","0.025","UG_L","UG_L","","","0","","","0","","","","
","DPT-16-20-GW-16-20","537","12/02/16","18:59","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate (PFOS)","0.66","","TRG","Yes","Y","DM","Y","0.013","0.040","0.040","UG_L","UG_L","","","0","","","0","","","","
","DPT-16-20-GW-16-20","537","12/02/16","18:59","T","NA","Initial","335-67-1","Perfluorooctanoic acid (PFOA)","0.15","","TRG","Yes","Y","D","Y","0.0074","0.025","0.025","UG_L","UG_L","","","0","","","0","","","","
","DPT-16-20-GW-26-30","537","12/02/16","18:52","T","NA","Initial","335-67-1","Perfluorooctanoic acid (PFOA)","1.0","","TRG","Yes","Y","D","Y","0.074","0.25","0.25","UG_L","UG_L","","","0","","","0","","","","
","DPT-16-20-GW-26-30","537","12/02/16","18:52","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate (PFOS)","6.8","","TRG","Yes","Y","D","Y","0.13","0.40","0.40","UG_L","UG_L","","","0","","","0","","","","
","DPT-16-20-GW-26-30","537","12/02/16","18:52","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid (PFBS)","","","TRG","Yes","N","U","Y","0.091","0.25","0.25","UG_L","UG_L","","","0","","","0","","","","
","DPT-16-20-SO-16-17","537","12/02/16","15:14","T","NA","Initial","335-67-1","Perfluorooctanoic acid (PFOA)","0.46","","TRG","Yes","Y","J","Y","0.12","0.61","0.61","UG_KG","UG_KG","","","0","","","0","","","","
","DPT-16-20-SO-16-17","537","12/02/16","15:14","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate (PFOS)","10","","TRG","Yes","Y","","Y","0.15","0.61","0.61","UG_KG","UG_KG","","","0","","","0","","","","
","DPT-16-20-SO-16-17","537","12/02/16","15:14","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid (PFBS)","","","TRG","Yes","N","U","Y","0.13","0.49","0.49","UG_KG","UG_KG","","","0","","","0","","","","
","DPT-16-20-SO-16-17-DUP","537","12/02/16","15:22","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate (PFOS)","20","","TRG","Yes","Y","M","Y","0.15","0.59","0.59","UG_KG","UG_KG","","","0","","","0","","","","
","DPT-16-20-SO-16-17-DUP","537","12/02/16","15:22","T","NA","Initial","335-67-1","Perfluorooctanoic acid (PFOA)","0.78","","TRG","Yes","Y","","Y","0.12","0.59","0.59","UG_KG","UG_KG","","","0","","","0","","","","
","DPT-16-20-SO-16-17-DUP","537","12/02/16","15:22","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid (PFBS)","","","TRG","Yes","N","U","Y","0.12","0.47","0.47","UG_KG","UG_KG","","","0","","","0","","","","
","DPT-16-26-GW-18-22","537","12/02/16","20:22","T","NA","Initial","335-67-1","Perfluorooctanoic acid (PFOA)","0.0073","","TRG","Yes","Y","M","Y","0.00073","0.0025","0.0025","UG_L","UG_L","","","0","","","0","","","
","DPT-16-26-GW-18-22","537","12/02/16","20:22","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate (PFOS)","0.038","","TRG","Yes","Y","M","Y","0.0013","0.0039","0.0039","UG_L","UG_L","","","0","","","0","","","
","DPT-16-26-GW-18-22","537","12/02/16","20:22","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid (PFBS)","0.0010","","TRG","Yes","Y","J","Y","0.00090","0.0025","0.0025","UG_L","UG_L","","","0","","","0","","
","DPT-16-26-GW-29-33","537","12/02/16","20:29","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid (PFBS)","0.0010","","TRG","Yes","Y","JM","Y","0.00091","0.0025","0.0025","UG_L","UG_L","","","0","","","0","","
","DPT-16-26-GW-29-33","537","12/02/16","20:29","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate (PFOS)","0.080","","TRG","Yes","Y","M","Y","0.0013","0.0040","0.0040","UG_L","UG_L","","","0","","","0","","
","DPT-16-26-GW-29-33","537","12/02/16","20:29","T","NA","Initial","335-67-1","Perfluorooctanoic acid (PFOA)","0.0050","","TRG","Yes","Y","M","Y","0.00075","0.0025","0.0025","UG_L","UG_L","","","0","","","0","","

","93","0","","","","","","60","140","","","","","","","","",""
"LCS 320-139627/2-A","537","12/02/16","15:07","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","4.03","","SC","Yes","Y","","Y","0.10","0.40","0.40","UG_KG","UG_KG","","","0","3.54","4.03","114","0",
","","","50","150","","","","","",""
"LCS 320-139627/2-A","537","12/02/16","15:07","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","3.66","","SC","Yes","Y","","Y","0.13","0.50","0.50","UG_KG","UG_KG","","","0","3.71","3.66","99","0",
","","","60","140","","","","","",""
"LCS 320-139627/2-A","537","12/02/16","15:07","T","NA","Initial","335-67-1","Perfluorooctanoic acid
(PFOA)","4.25","","SC","Yes","Y","","Y","0.10","0.50","0.50","UG_KG","UG_KG","","","0","4.00","4.25","106","0",
","","","60","140","","","","","",""
"LCSD 320-138841/3-A","537","12/02/16","18:44","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","0.0371","","SC","Yes","Y","","Y","0.00092","0.0025","0.0025","UG_L","UG_L","","","0","","","0","0.03
54","0.0371","105","1","50","150","30","","","","",""
"LCSD 320-138841/3-A","537","12/02/16","18:44","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","0.0390","","SC","Yes","Y","","Y","0.0013","0.0040","0.0040","UG_L","UG_L","","","0","","","0","0.037
1","0.0390","105","17","60","140","30","","","","",""
"LCSD 320-138841/3-A","537","12/02/16","18:44","T","NA","Initial","335-67-1","Perfluorooctanoic acid
(PFOA)","0.0407","","SC","Yes","Y","","Y","0.00075","0.0025","0.0025","UG_L","UG_L","","","0","","","0","0.04
00","0.0407","102","9","60","140","30","","","","",""
"MB 320-138841/1-A","537","12/02/16","18:29","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","","","TRG","Yes","N","U","Y","0.00092","0.0025","0.0025","UG_L","UG_L","","","0","","","0","","","",""
","","","
"MB 320-138841/1-A","537","12/02/16","18:29","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","","","TRG","Yes","N","U","Y","0.0013","0.0040","0.0040","UG_L","UG_L","","","0","","","0","","","",""
","","","
"MB 320-138841/1-A","537","12/02/16","18:29","T","NA","Initial","335-67-1","Perfluorooctanoic acid
(PFOA)","","","TRG","Yes","N","U","Y","0.00075","0.0025","0.0025","UG_L","UG_L","","","0","","","0","","","",""
","","","
"MB 320-139627/1-A","537","12/02/16","14:59","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","","","TRG","Yes","N","U","Y","0.10","0.40","0.40","UG_KG","UG_KG","","","0","","","0","","","",""
","","","
"MB 320-139627/1-A","537","12/02/16","14:59","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","","","TRG","Yes","N","U","Y","0.13","0.50","0.50","UG_KG","UG_KG","","","0","","","0","","","",""
","","","
"MB 320-139627/1-A","537","12/02/16","14:59","T","NA","Initial","335-67-1","Perfluorooctanoic acid
(PFOA)","","","TRG","Yes","N","U","Y","0.10","0.50","0.50","UG_KG","UG_KG","","","0","","","0","","","",""
","","","



Resolution Consultants
250 Apollo Drive
Chelmsford, MA 01824

978.905.2100 tel
978.905.2101 fax

Data Validation Report

Project:	Former Bay Head Road Annex- Annapolis, MD	
Laboratory:	TestAmerica-West Sacramento, CA	
Job Number:	320-23651-1	
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	60444465-DM.DE	
Project Number:		
Prepared by:	Paula DiMattei/Resolution Consultants	Completed on: 12/08/16
Reviewed by:	Robert Kennedy/Resolution Consultants	Completed on: 12/19/16
File Name:	J23651-1_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 14-16, 2016.

Sample ID	Matrix/Sample Type
DPT-16-20-GW-16-20	Groundwater
DPT-16-20-GW-26-30	Groundwater
DPT-16-20-SO-16-17	Soil
DPT-16-20-SO-16-17-DUP	Field duplicate of DPT-16-20-SO-16-17
DPT-16-26-GW-18-22	Groundwater
DPT-16-26-GW-29-33	Groundwater
DPT-16-26-GW-29-33-DUP	Field duplicate of DPT-16-26-GW-29-33
DPT-16-27-GW-18-22	Groundwater
DPT-16-27-GW-29-33	Groundwater
DPT-16-34-GW-16-20	Groundwater
DPT-SO-EB-111516	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):

X	Data completeness (chain-of-custody (COC)/sample integrity
✓	Holding times/sample preservation
✓	Initial calibration/initial and continuing calibration verification
✓	Laboratory method blanks/equipment blanks
NA	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
X	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 (X) 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. Select data points were qualified as estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

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.

The laboratory noted in the case narrative that all groundwater samples were decanted to new bottles prior to spiking and extraction because of the presence of excessive amounts of sediment present in the sample bottles. In these cases, the sample bottles are not rinsed as required by the method. Consequently, professional judgment was applied to qualify the positive and nondetect results for all target compounds in

these samples as estimated (J-UJ) indicating a potential loss of target compounds that may have remained in the original sample bottle. Qualified sample results are presented in Table 1.

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 blanks or equipment blank associated with the samples in this data set.

MS/MSD Results

MS/MSD analyses were not performed on a sample from this data set. The data were not qualified on this basis.

LCS/LCSD Results

The LCS percent recoveries (%Rs) and relative percent differences (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 $\leq 2\times$ the LOQ [if results are less than five times the LOQ] for aqueous matrices. All field duplicate precision criteria were met with the following exceptions.

Compound	LOQ	DPT-16-20-SO-16-17 ($\mu\text{g/Kg}$)	DPT-16-20-SO-16-17-DUP ($\mu\text{g/Kg}$)	RPD
PFOS	0.61	10	20	67

Compound	LOQ	DPT-16-26-GW-29-33 ($\mu\text{g/L}$)	DPT-16-26-GW-29-33-DUP ($\mu\text{g/L}$)	RPD
PFOS	0.0040	0.080	0.053	41

Data qualification was as follows:

Actions: (Resolution Consultants professional judgment was used)

Criteria		Action	
		Detected	Nondetected
Sample and duplicate are nondetect results	RPD Not calculable (NC)	No	No qualification
Sample and duplicate results $\geq 5 \times \text{LOQ}$	RPD > 30 (aqueous and solids)	J	Not Applicable
Sample and duplicate results $< 5 \times \text{LOQ}$	Absolute difference $\leq 2 \times \text{LOQ}$ (aqueous and solids)	J	Not Applicable
If sample or duplicate result is $> 5 \times \text{LOQ}$ and the other is not detected	NC	J	UJ

Qualified sample results are shown in Table 1.

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.

It should be noted that the overall bias for a sample result is considered to be indeterminate in cases where the cumulative nonconformances do not show a consistent bias or in cases of the presence of a conflicting high and low bias.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Qualifier Codes and Explanations

Attachment B: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	LOD	LOQ	Units	Validation Qualifiers	Validation Reason
DPT-16-20-GW-16-20	WG	Perfluorooctanesulfonic Acid (PFOS)	0.66	0.030	0.040	µg/L	J-	si
DPT-16-20-GW-16-20	WG	Perfluorooctanoic Acid (PFOA)	0.15	0.020	0.025	µg/L	J-	si
DPT-16-20-GW-16-20	WG	Perfluorobutanesulfonic Acid (PFBS)	0.017	0.020	0.025	µg/L	J-	si
DPT-16-20-GW-26-30	WG	Perfluorooctanesulfonic Acid (PFOS)	6.8	0.30	0.40	µg/L	J-	si
DPT-16-20-GW-26-30	WG	Perfluorooctanoic Acid (PFOA)	1.0	0.20	0.25	µg/L	J-	si
DPT-16-20-GW-26-30	WG	Perfluorobutanesulfonic Acid (PFBS)		0.20	0.25	µg/L	UJ	si
DPT-16-20-SO-16-17	SO	Perfluorooctanesulfonic Acid (PFOS)	10	0.37	0.61	µg/Kg	J	fd
DPT-16-20-SO-16-17-DUP	SO	Perfluorooctanesulfonic Acid (PFOS)	20	0.36	0.59	µg/Kg	J	fd
DPT-16-26-GW-18-22	WG	Perfluorooctanesulfonic Acid (PFOS)	0.038	0.0029	0.0039	µg/L	J-	si
DPT-16-26-GW-18-22	WG	Perfluorooctanoic Acid (PFOA)	0.0073	0.0020	0.0025	µg/L	J-	si
DPT-16-26-GW-18-22	WG	Perfluorobutanesulfonic Acid (PFBS)	0.0010	0.0020	0.0025	µg/L	J-	si
DPT-16-26-GW-29-33	WG	Perfluorooctanesulfonic Acid (PFOS)	0.080	0.0030	0.0040	µg/L	J	fd,si
DPT-16-26-GW-29-33	WG	Perfluorooctanoic Acid (PFOA)	0.0050	0.0020	0.0025	µg/L	J-	si
DPT-16-26-GW-29-33	WG	Perfluorobutanesulfonic Acid (PFBS)	0.0010	0.0020	0.0025	µg/L	J-	si
DPT-16-26-GW-29-33-DUP	WG	Perfluorooctanesulfonic Acid (PFOS)	0.053	0.0030	0.0040	µg/L	J	fd,si
DPT-16-26-GW-29-33-DUP	WG	Perfluorooctanoic Acid (PFOA)	0.0031	0.0020	0.0025	µg/L	J-	si
DPT-16-26-GW-29-33-DUP	WG	Perfluorobutanesulfonic Acid (PFBS)		0.0020	0.0025	µg/L	UJ	si
DPT-16-27-GW-18-22	WG	Perfluorooctanesulfonic Acid (PFOS)	0.026	0.0030	0.0040	µg/L	J-	si
DPT-16-27-GW-18-22	WG	Perfluorooctanoic Acid (PFOA)	0.0017	0.0020	0.0025	µg/L	J-	si
DPT-16-27-GW-18-22	WG	Perfluorobutanesulfonic Acid (PFBS)		0.0020	0.0025	µg/L	UJ	si
DPT-16-27-GW-29-33	WG	Perfluorooctanesulfonic Acid (PFOS)	0.015	0.0030	0.0040	µg/L	J-	si
DPT-16-27-GW-29-33	WG	Perfluorooctanoic Acid (PFOA)	0.0022	0.0020	0.0025	µg/L	J-	si
DPT-16-27-GW-29-33	WG	Perfluorobutanesulfonic Acid (PFBS)		0.0020	0.0025	µg/L	UJ	si
DPT-16-34-GW-16-20	WG	Perfluorooctanesulfonic Acid (PFOS)	1.6	0.030	0.039	µg/L	J-	si
DPT-16-34-GW-16-20	WG	Perfluorooctanoic Acid (PFOA)	0.40	0.020	0.025	µg/L	J-	si
DPT-16-34-GW-16-20	WG	Perfluorobutanesulfonic Acid (PFBS)	0.028	0.020	0.025	µg/L	J-	si

Attachment A

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample and is potentially biased high.
J-	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample and is potentially biased low.
JN	The analyte was tentatively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Attachment B

Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
c	Calibration issue
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas
k	Estimated Maximum Possible Concentration (EMPC)
l	LCS or OPR recoveries
lc	Labeled compound recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
md	Matrix spike/matrix spike duplicate RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
r	Dual column RPD
q	Quantitation issue
s	Surrogate recovery
si	Sample integrity issue
su	Ion suppression
t	Temperature preservation issue
x	Percent solids
y	Serial dilution results
z	ICS results

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-16-20	Direct Push/Geoprobe	1474520	496301	DPT-16-20-GW-16-20	Ground water	11/15/2016	Perfluoroalkyl Compounds	320-23651-1
DAVID_TAYLOR_RC	SITE 00003	DPT-16-20	Direct Push/Geoprobe	1474520	496301	DPT-16-20-GW-26-30	Ground water	11/15/2016	Perfluoroalkyl Compounds	320-23651-1
DAVID_TAYLOR_RC	SITE 00003	DPT-16-26	Direct Push/Geoprobe	1473860	495960	DPT-16-26-GW-18-22	Ground water	11/16/2016	Perfluoroalkyl Compounds	320-23651-1
DAVID_TAYLOR_RC	SITE 00003	DPT-16-26	Direct Push/Geoprobe	1473860	495960	DPT-16-26-GW-29-33	Ground water	11/16/2016	Perfluoroalkyl Compounds	320-23651-1
DAVID_TAYLOR_RC	SITE 00003	DPT-16-26	Direct Push/Geoprobe	1473860	495960	DPT-16-26-GW-29-33-DUP	Ground water	11/16/2016	Perfluoroalkyl Compounds	320-23651-1
DAVID_TAYLOR_RC	SITE 00003	DPT-16-27	Direct Push/Geoprobe	1473930	495908	DPT-16-27-GW-18-22	Ground water	11/16/2016	Perfluoroalkyl Compounds	320-23651-1
DAVID_TAYLOR_RC	SITE 00003	DPT-16-27	Direct Push/Geoprobe	1473930	495908	DPT-16-27-GW-29-33	Ground water	11/16/2016	Perfluoroalkyl Compounds	320-23651-1
DAVID_TAYLOR_RC	SITE 00003	DPT-16-34	Direct Push/Geoprobe	1474530	496331	DPT-16-34-GW-16-20	Ground water	11/15/2016	Perfluoroalkyl Compounds	320-23651-1