



**Groundwater Sample Results,
Combined Level 2 and Level 4 Laboratory Report,
Electronic Data Deliverable, Data Validation Report,
and the Sample Location Report, SDG 320-41846-1**

*Naval Air Station Willow Grove
Willow Grove, Pennsylvania*

August 2019

N00158_000785
WILLOW_GROVE_NAS
SSIC 5000-33c

**LABORATORY DATA PACKAGE, 320-41846-1, NAWC WARMINSTER NAS
WILLOW GROVE PA**

08/21/2018
TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

ANALYTICAL REPORT

Job Number: 320-41846-1

Job Description: Warminster: PFAS, NAS JRB Willow Grove

For:
Tetra Tech, Inc.
234 Mall Boulevard
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Attention: Andy Frebowitz



Approved for release.
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Project Manager I
8/21/2018 4:44 PM

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Definitions/Glossary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-41846-1

Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Qualifiers

LCMS

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

Glossary

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

Job Narrative
320-41846-1

Receipt

The samples were received on 8/7/2018 9:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.7° C.

LCMS

Method(s) 537: The first level standard from the initial calibration curve is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5amu; therefore, detection of the analyte serves as verification that the assigned mass is within +/- 0.5amu of the true value, which meets the DoD/DOE QSM tune criterion.

Method(s) 537: Internal standard (ISTD) response for the following samples was outside control limits: WGNA-080618-RW-0413 (320-41846-3) and WGNA-080618-FRB-0533 (320-41846-6). The samples were re-analyzed with concurring results, and the both sets of data have been reported.

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

Organic Prep

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 320-240201.
537-Water

Method(s) 537: The following sample: NAWC-080618-RW-272 (320-41846-11) in preparation batch 320-240201 was observed to be a yellow color after brought to final volume.

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

Detection Summary

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-41846-1

Client Sample ID: WGNA-080618-RW-0386

Lab Sample ID: 320-41846-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	40		36	6.1	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	22		18	2.5	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	18	J	27	4.9	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.9	J	9.0	1.7	ng/L	1		537	Total/NA
Perfluorobutanesulfonic acid (PFBS)	14	J	81	14	ng/L	1		537	Total/NA

Client Sample ID: WGNA-080618-FRB-0386

Lab Sample ID: 320-41846-2

No Detections.

Client Sample ID: WGNA-080618-RW-0413

Lab Sample ID: 320-41846-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	21	J	38	6.4	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	23	M	19	2.6	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.8	J	28	5.2	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.7	J	9.4	1.8	ng/L	1		537	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RA	21	J	38	6.4	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA) - RA	22		19	2.6	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - RA	6.9	J	28	5.2	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA) - RA	6.6	J	9.4	1.8	ng/L	1		537	Total/NA

Client Sample ID: WGNA-080618-FRB-0413

Lab Sample ID: 320-41846-4

No Detections.

Client Sample ID: WGNA-080618-RW-0533

Lab Sample ID: 320-41846-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	21	J	37	6.4	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	21		19	2.6	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	8.7	J	28	5.1	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.9	J	9.3	1.8	ng/L	1		537	Total/NA

Client Sample ID: WGNA-080618-FRB-0533

Lab Sample ID: 320-41846-6

No Detections.

Client Sample ID: WGNA-080618-RW-4024

Lab Sample ID: 320-41846-7

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	24	J	37	6.4	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	14	J	19	2.6	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.5	J	28	5.1	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.8	J	9.3	1.8	ng/L	1		537	Total/NA

Client Sample ID: WGNA-080618-FRB-4024

Lab Sample ID: 320-41846-8

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Detection Summary

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-41846-1

Client Sample ID: NAWC-080618-RW-032

Lab Sample ID: 320-41846-9

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	19	J	38	6.5	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	15	J	19	2.7	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	11	J	29	5.2	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	5.4	J	9.5	1.8	ng/L	1		537	Total/NA

Client Sample ID: NAWC-080618-FRB-032

Lab Sample ID: 320-41846-10

No Detections.

Client Sample ID: NAWC-080618-RW-272

Lab Sample ID: 320-41846-11

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	14	J	37	6.3	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	9.8	J	19	2.6	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.4	J M	9.3	1.8	ng/L	1		537	Total/NA

Client Sample ID: NAWC-080618-FRB-272

Lab Sample ID: 320-41846-12

No Detections.

Client Sample ID: WGNA-080618-DUP-43

Lab Sample ID: 320-41846-13

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	24	J	39	6.6	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	15	J	19	2.7	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.8	J	29	5.3	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.6	J	9.7	1.8	ng/L	1		537	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-41846-1

Client Sample ID: WGNA-080618-RW-0386

Date Collected: 08/06/18 10:10

Date Received: 08/07/18 09:35

Lab Sample ID: 320-41846-1

Matrix: Water

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	40		36	6.1	ng/L		08/16/18 08:12	08/19/18 01:30	1
Perfluorooctanoic acid (PFOA)	22		18	2.5	ng/L		08/16/18 08:12	08/19/18 01:30	1
Perfluorononanoic acid (PFNA)	18	U	22	7.2	ng/L		08/16/18 08:12	08/19/18 01:30	1
Perfluorohexanesulfonic acid (PFHxS)	18	J	27	4.9	ng/L		08/16/18 08:12	08/19/18 01:30	1
Perfluoroheptanoic acid (PFHpA)	3.9	J	9.0	1.7	ng/L		08/16/18 08:12	08/19/18 01:30	1
Perfluorobutanesulfonic acid (PFBS)	14	J	81	14	ng/L		08/16/18 08:12	08/19/18 01:30	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	96		70 - 130				08/16/18 08:12	08/19/18 01:30	1
13C2 PFDA	105		70 - 130				08/16/18 08:12	08/19/18 01:30	1

Client Sample ID: WGNA-080618-FRB-0386

Date Collected: 08/06/18 10:05

Date Received: 08/07/18 09:35

Lab Sample ID: 320-41846-2

Matrix: Water

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	U	39	6.6	ng/L		08/16/18 08:12	08/19/18 01:34	1
Perfluorooctanoic acid (PFOA)	7.7	U	19	2.7	ng/L		08/16/18 08:12	08/19/18 01:34	1
Perfluorononanoic acid (PFNA)	19	U	23	7.7	ng/L		08/16/18 08:12	08/19/18 01:34	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.3	ng/L		08/16/18 08:12	08/19/18 01:34	1
Perfluoroheptanoic acid (PFHpA)	3.9	U	9.7	1.8	ng/L		08/16/18 08:12	08/19/18 01:34	1
Perfluorobutanesulfonic acid (PFBS)	35	U	87	16	ng/L		08/16/18 08:12	08/19/18 01:34	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	95		70 - 130				08/16/18 08:12	08/19/18 01:34	1
13C2 PFDA	102		70 - 130				08/16/18 08:12	08/19/18 01:34	1

Client Sample ID: WGNA-080618-RW-0413

Date Collected: 08/06/18 10:40

Date Received: 08/07/18 09:35

Lab Sample ID: 320-41846-3

Matrix: Water

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	21	J	38	6.4	ng/L		08/16/18 08:12	08/19/18 01:39	1
Perfluorooctanoic acid (PFOA)	23	M	19	2.6	ng/L		08/16/18 08:12	08/19/18 01:39	1
Perfluorononanoic acid (PFNA)	19	U	23	7.5	ng/L		08/16/18 08:12	08/19/18 01:39	1
Perfluorohexanesulfonic acid (PFHxS)	6.8	J	28	5.2	ng/L		08/16/18 08:12	08/19/18 01:39	1
Perfluoroheptanoic acid (PFHpA)	6.7	J	9.4	1.8	ng/L		08/16/18 08:12	08/19/18 01:39	1
Perfluorobutanesulfonic acid (PFBS)	34	U	85	15	ng/L		08/16/18 08:12	08/19/18 01:39	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	99		70 - 130				08/16/18 08:12	08/19/18 01:39	1
13C2 PFDA	106		70 - 130				08/16/18 08:12	08/19/18 01:39	1

TestAmerica Sacramento

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-41846-1

Client Sample ID: WGNA-080618-RW-0413

Lab Sample ID: 320-41846-3

Date Collected: 08/06/18 10:40

Matrix: Water

Date Received: 08/07/18 09:35

Method: 537 - Perfluorinated Alkyl Acids (LC/MS) - RA

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	21	J	38	6.4	ng/L		08/16/18 08:12	08/20/18 16:38	1
Perfluorooctanoic acid (PFOA)	22		19	2.6	ng/L		08/16/18 08:12	08/20/18 16:38	1
Perfluorononanoic acid (PFNA)	19	U	23	7.5	ng/L		08/16/18 08:12	08/20/18 16:38	1
Perfluorohexanesulfonic acid (PFHxS)	6.9	J	28	5.2	ng/L		08/16/18 08:12	08/20/18 16:38	1
Perfluoroheptanoic acid (PFHpA)	6.6	J	9.4	1.8	ng/L		08/16/18 08:12	08/20/18 16:38	1
Perfluorobutanesulfonic acid (PFBS)	34	U	85	15	ng/L		08/16/18 08:12	08/20/18 16:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	97		70 - 130				08/16/18 08:12	08/20/18 16:38	1
13C2 PFDA	103		70 - 130				08/16/18 08:12	08/20/18 16:38	1

Client Sample ID: WGNA-080618-FRB-0413

Lab Sample ID: 320-41846-4

Date Collected: 08/06/18 10:35

Matrix: Water

Date Received: 08/07/18 09:35

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	U	38	6.4	ng/L		08/16/18 08:12	08/19/18 01:44	1
Perfluorooctanoic acid (PFOA)	7.6	U	19	2.6	ng/L		08/16/18 08:12	08/19/18 01:44	1
Perfluorononanoic acid (PFNA)	19	U	23	7.6	ng/L		08/16/18 08:12	08/19/18 01:44	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	28	5.2	ng/L		08/16/18 08:12	08/19/18 01:44	1
Perfluoroheptanoic acid (PFHpA)	3.8	U	9.4	1.8	ng/L		08/16/18 08:12	08/19/18 01:44	1
Perfluorobutanesulfonic acid (PFBS)	34	U	85	15	ng/L		08/16/18 08:12	08/19/18 01:44	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	102		70 - 130				08/16/18 08:12	08/19/18 01:44	1
13C2 PFDA	105		70 - 130				08/16/18 08:12	08/19/18 01:44	1

Client Sample ID: WGNA-080618-RW-0533

Lab Sample ID: 320-41846-5

Date Collected: 08/06/18 11:10

Matrix: Water

Date Received: 08/07/18 09:35

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	21	J	37	6.4	ng/L		08/16/18 08:12	08/19/18 01:48	1
Perfluorooctanoic acid (PFOA)	21		19	2.6	ng/L		08/16/18 08:12	08/19/18 01:48	1
Perfluorononanoic acid (PFNA)	19	U	22	7.5	ng/L		08/16/18 08:12	08/19/18 01:48	1
Perfluorohexanesulfonic acid (PFHxS)	8.7	J	28	5.1	ng/L		08/16/18 08:12	08/19/18 01:48	1
Perfluoroheptanoic acid (PFHpA)	3.9	J	9.3	1.8	ng/L		08/16/18 08:12	08/19/18 01:48	1
Perfluorobutanesulfonic acid (PFBS)	34	U	84	15	ng/L		08/16/18 08:12	08/19/18 01:48	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	99		70 - 130				08/16/18 08:12	08/19/18 01:48	1
13C2 PFDA	100		70 - 130				08/16/18 08:12	08/19/18 01:48	1

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-41846-1

Client Sample ID: WGNA-080618-FRB-0533

Lab Sample ID: 320-41846-6

Date Collected: 08/06/18 11:05

Matrix: Water

Date Received: 08/07/18 09:35

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	U	38	6.5	ng/L		08/16/18 08:12	08/19/18 01:53	1
Perfluorooctanoic acid (PFOA)	7.7	U	19	2.7	ng/L		08/16/18 08:12	08/19/18 01:53	1
Perfluorononanoic acid (PFNA)	19	U	23	7.7	ng/L		08/16/18 08:12	08/19/18 01:53	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.3	ng/L		08/16/18 08:12	08/19/18 01:53	1
Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	1.8	ng/L		08/16/18 08:12	08/19/18 01:53	1
Perfluorobutanesulfonic acid (PFBS)	35	U	86	15	ng/L		08/16/18 08:12	08/19/18 01:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	100		70 - 130	08/16/18 08:12	08/19/18 01:53	1
13C2 PFDA	107		70 - 130	08/16/18 08:12	08/19/18 01:53	1

Method: 537 - Perfluorinated Alkyl Acids (LC/MS) - RA

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	U	38	6.5	ng/L		08/16/18 08:12	08/20/18 16:43	1
Perfluorooctanoic acid (PFOA)	7.7	U	19	2.7	ng/L		08/16/18 08:12	08/20/18 16:43	1
Perfluorononanoic acid (PFNA)	19	U	23	7.7	ng/L		08/16/18 08:12	08/20/18 16:43	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.3	ng/L		08/16/18 08:12	08/20/18 16:43	1
Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	1.8	ng/L		08/16/18 08:12	08/20/18 16:43	1
Perfluorobutanesulfonic acid (PFBS)	35	U	86	15	ng/L		08/16/18 08:12	08/20/18 16:43	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	100		70 - 130	08/16/18 08:12	08/20/18 16:43	1
13C2 PFDA	110		70 - 130	08/16/18 08:12	08/20/18 16:43	1

Client Sample ID: WGNA-080618-RW-4024

Lab Sample ID: 320-41846-7

Date Collected: 08/06/18 11:40

Matrix: Water

Date Received: 08/07/18 09:35

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	24	J	37	6.4	ng/L		08/16/18 08:12	08/19/18 01:58	1
Perfluorooctanoic acid (PFOA)	14	J	19	2.6	ng/L		08/16/18 08:12	08/19/18 01:58	1
Perfluorononanoic acid (PFNA)	19	U	22	7.5	ng/L		08/16/18 08:12	08/19/18 01:58	1
Perfluorohexanesulfonic acid (PFHxS)	6.5	J	28	5.1	ng/L		08/16/18 08:12	08/19/18 01:58	1
Perfluoroheptanoic acid (PFHpA)	4.8	J	9.3	1.8	ng/L		08/16/18 08:12	08/19/18 01:58	1
Perfluorobutanesulfonic acid (PFBS)	34	U	84	15	ng/L		08/16/18 08:12	08/19/18 01:58	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	95		70 - 130	08/16/18 08:12	08/19/18 01:58	1
13C2 PFDA	104		70 - 130	08/16/18 08:12	08/19/18 01:58	1

Client Sample ID: WGNA-080618-FRB-4024

Lab Sample ID: 320-41846-8

Date Collected: 08/06/18 11:35

Matrix: Water

Date Received: 08/07/18 09:35

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	39	6.6	ng/L		08/16/18 08:12	08/19/18 02:12	1
Perfluorooctanoic acid (PFOA)	7.8	U	20	2.7	ng/L		08/16/18 08:12	08/19/18 02:12	1

TestAmerica Sacramento

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-41846-1

Client Sample ID: WGNA-080618-FRB-4024

Lab Sample ID: 320-41846-8

Date Collected: 08/06/18 11:35

Matrix: Water

Date Received: 08/07/18 09:35

Method: 537 - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	20	U	23	7.8	ng/L		08/16/18 08:12	08/19/18 02:12	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.4	ng/L		08/16/18 08:12	08/19/18 02:12	1
Perfluoroheptanoic acid (PFHpA)	3.9	U	9.8	1.9	ng/L		08/16/18 08:12	08/19/18 02:12	1
Perfluorobutanesulfonic acid (PFBS)	35	U	88	16	ng/L		08/16/18 08:12	08/19/18 02:12	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	101		70 - 130	08/16/18 08:12	08/19/18 02:12	1
13C2 PFDA	108		70 - 130	08/16/18 08:12	08/19/18 02:12	1

Client Sample ID: NAWC-080618-RW-032

Lab Sample ID: 320-41846-9

Date Collected: 08/06/18 12:40

Matrix: Water

Date Received: 08/07/18 09:35

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	19	J	38	6.5	ng/L		08/16/18 08:12	08/19/18 02:16	1
Perfluorooctanoic acid (PFOA)	15	J	19	2.7	ng/L		08/16/18 08:12	08/19/18 02:16	1
Perfluorononanoic acid (PFNA)	19	U	23	7.6	ng/L		08/16/18 08:12	08/19/18 02:16	1
Perfluorohexanesulfonic acid (PFHxS)	11	J	29	5.2	ng/L		08/16/18 08:12	08/19/18 02:16	1
Perfluoroheptanoic acid (PFHpA)	5.4	J	9.5	1.8	ng/L		08/16/18 08:12	08/19/18 02:16	1
Perfluorobutanesulfonic acid (PFBS)	34	U	86	15	ng/L		08/16/18 08:12	08/19/18 02:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	79		70 - 130	08/16/18 08:12	08/19/18 02:16	1
13C2 PFDA	102		70 - 130	08/16/18 08:12	08/19/18 02:16	1

Client Sample ID: NAWC-080618-FRB-032

Lab Sample ID: 320-41846-10

Date Collected: 08/06/18 12:35

Matrix: Water

Date Received: 08/07/18 09:35

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	39	6.6	ng/L		08/16/18 08:12	08/19/18 02:21	1
Perfluorooctanoic acid (PFOA)	7.8	U	20	2.7	ng/L		08/16/18 08:12	08/19/18 02:21	1
Perfluorononanoic acid (PFNA)	20	U	23	7.8	ng/L		08/16/18 08:12	08/19/18 02:21	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.4	ng/L		08/16/18 08:12	08/19/18 02:21	1
Perfluoroheptanoic acid (PFHpA)	3.9	U	9.8	1.9	ng/L		08/16/18 08:12	08/19/18 02:21	1
Perfluorobutanesulfonic acid (PFBS)	35	U	88	16	ng/L		08/16/18 08:12	08/19/18 02:21	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	97		70 - 130	08/16/18 08:12	08/19/18 02:21	1
13C2 PFDA	99		70 - 130	08/16/18 08:12	08/19/18 02:21	1

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-41846-1

Client Sample ID: NAWC-080618-RW-272

Lab Sample ID: 320-41846-11

Date Collected: 08/06/18 14:10

Matrix: Water

Date Received: 08/07/18 09:35

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	14	J	37	6.3	ng/L	—	08/16/18 08:12	08/19/18 02:26	1
Perfluorooctanoic acid (PFOA)	9.8	J	19	2.6	ng/L	—	08/16/18 08:12	08/19/18 02:26	1
Perfluorononanoic acid (PFNA)	19	U	22	7.4	ng/L	—	08/16/18 08:12	08/19/18 02:26	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	28	5.1	ng/L	—	08/16/18 08:12	08/19/18 02:26	1
Perfluoroheptanoic acid (PFHpA)	2.4	J M	9.3	1.8	ng/L	—	08/16/18 08:12	08/19/18 02:26	1
Perfluorobutanesulfonic acid (PFBS)	33	U	84	15	ng/L	—	08/16/18 08:12	08/19/18 02:26	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	92		70 - 130	08/16/18 08:12	08/19/18 02:26	1
13C2 PFDA	103		70 - 130	08/16/18 08:12	08/19/18 02:26	1

Client Sample ID: NAWC-080618-FRB-272

Lab Sample ID: 320-41846-12

Date Collected: 08/06/18 14:05

Matrix: Water

Date Received: 08/07/18 09:35

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	U	39	6.6	ng/L	—	08/16/18 08:12	08/19/18 02:30	1
Perfluorooctanoic acid (PFOA)	7.7	U	19	2.7	ng/L	—	08/16/18 08:12	08/19/18 02:30	1
Perfluorononanoic acid (PFNA)	19	U	23	7.7	ng/L	—	08/16/18 08:12	08/19/18 02:30	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.3	ng/L	—	08/16/18 08:12	08/19/18 02:30	1
Perfluoroheptanoic acid (PFHpA)	3.9	U	9.6	1.8	ng/L	—	08/16/18 08:12	08/19/18 02:30	1
Perfluorobutanesulfonic acid (PFBS)	35	U	87	16	ng/L	—	08/16/18 08:12	08/19/18 02:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	94		70 - 130	08/16/18 08:12	08/19/18 02:30	1
13C2 PFDA	101		70 - 130	08/16/18 08:12	08/19/18 02:30	1

Client Sample ID: WGNA-080618-DUP-43

Lab Sample ID: 320-41846-13

Date Collected: 08/06/18 07:00

Matrix: Water

Date Received: 08/07/18 09:35

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	24	J	39	6.6	ng/L	—	08/16/18 08:12	08/19/18 02:35	1
Perfluorooctanoic acid (PFOA)	15	J	19	2.7	ng/L	—	08/16/18 08:12	08/19/18 02:35	1
Perfluorononanoic acid (PFNA)	19	U	23	7.7	ng/L	—	08/16/18 08:12	08/19/18 02:35	1
Perfluorohexanesulfonic acid (PFHxS)	6.8	J	29	5.3	ng/L	—	08/16/18 08:12	08/19/18 02:35	1
Perfluoroheptanoic acid (PFHpA)	4.6	J	9.7	1.8	ng/L	—	08/16/18 08:12	08/19/18 02:35	1
Perfluorobutanesulfonic acid (PFBS)	35	U	87	16	ng/L	—	08/16/18 08:12	08/19/18 02:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	101		70 - 130	08/16/18 08:12	08/19/18 02:35	1
13C2 PFDA	111		70 - 130	08/16/18 08:12	08/19/18 02:35	1

Default Detection Limits

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-41846-1

Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Prep: 537

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	90	16	ng/L	537
Perfluoroheptanoic acid (PFHpA)	10	1.9	ng/L	537
Perfluorohexanesulfonic acid (PFHxS)	30	5.5	ng/L	537
Perfluorononanoic acid (PFNA)	24	8.0	ng/L	537
Perfluorooctanesulfonic acid (PFOS)	40	6.8	ng/L	537
Perfluorooctanoic acid (PFOA)	20	2.8	ng/L	537

Surrogate Summary

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-41846-1

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)					
Lab Sample ID	Client Sample ID	PFHxA	PFDA				
		(70-130)	(70-130)				
320-41846-1	WGNA-080618-RW-0386	96	105				
320-41846-2	WGNA-080618-FRB-0386	95	102				
320-41846-3	WGNA-080618-RW-0413	99	106				
320-41846-3 - RA	WGNA-080618-RW-0413	97	103				
320-41846-4	WGNA-080618-FRB-0413	102	105				
320-41846-5	WGNA-080618-RW-0533	99	100				
320-41846-6	WGNA-080618-FRB-0533	100	107				
320-41846-6 - RA	WGNA-080618-FRB-0533	100	110				
320-41846-7	WGNA-080618-RW-4024	95	104				
320-41846-8	WGNA-080618-FRB-4024	101	108				
320-41846-9	NAWC-080618-RW-032	79	102				
320-41846-10	NAWC-080618-FRB-032	97	99				
320-41846-11	NAWC-080618-RW-272	92	103				
320-41846-12	NAWC-080618-FRB-272	94	101				
320-41846-13	WGNA-080618-DUP-43	101	111				
LCS 320-240201/2-A	Lab Control Sample	106	109				
LCSD 320-240201/3-A	Lab Control Sample Dup	92	110				
MB 320-240201/1-A	Method Blank	98	105				

Surrogate Legend

PFHxA = 13C2 PFHxA

PFDA = 13C2 PFDA

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-41846-1

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Lab Sample ID: MB 320-240201/1-A

Matrix: Water

Analysis Batch: 240731

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 240201

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		08/16/18 08:12	08/19/18 01:16	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		08/16/18 08:12	08/19/18 01:16	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		08/16/18 08:12	08/19/18 01:16	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		08/16/18 08:12	08/19/18 01:16	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		08/16/18 08:12	08/19/18 01:16	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		08/16/18 08:12	08/19/18 01:16	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	98		70 - 130	08/16/18 08:12	08/19/18 01:16	1
13C2 PFDA	105		70 - 130	08/16/18 08:12	08/19/18 01:16	1

Lab Sample ID: LCS 320-240201/2-A

Matrix: Water

Analysis Batch: 240731

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 240201

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	220	236		ng/L		107	70 - 130
Perfluorooctanoic acid (PFOA)	110	115		ng/L		105	70 - 130
Perfluorononanoic acid (PFNA)	110	115		ng/L		105	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	168	180		ng/L		107	70 - 130
Perfluoroheptanoic acid (PFHpA)	54.0	59.5		ng/L		110	70 - 130
Perfluorobutanesulfonic acid (PFBS)	500	467		ng/L		93	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
13C2 PFHxA	106		70 - 130
13C2 PFDA	109		70 - 130

Lab Sample ID: LCSD 320-240201/3-A

Matrix: Water

Analysis Batch: 240731

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 240201

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)	220	236		ng/L		108	70 - 130	0	30
Perfluorooctanoic acid (PFOA)	110	112		ng/L		101	70 - 130	3	30
Perfluorononanoic acid (PFNA)	110	112		ng/L		102	70 - 130	3	30
Perfluorohexanesulfonic acid (PFHxS)	168	180		ng/L		107	70 - 130	0	30
Perfluoroheptanoic acid (PFHpA)	54.0	54.9		ng/L		102	70 - 130	8	30
Perfluorobutanesulfonic acid (PFBS)	500	404		ng/L		81	70 - 130	14	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
13C2 PFHxA	92		70 - 130
13C2 PFDA	110		70 - 130

TestAmerica Sacramento

QC Association Summary

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-41846-1

LCMS

Prep Batch: 240201

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41846-1	WGNA-080618-RW-0386	Total/NA	Water	537	
320-41846-2	WGNA-080618-FRB-0386	Total/NA	Water	537	
320-41846-3 - RA	WGNA-080618-RW-0413	Total/NA	Water	537	
320-41846-3	WGNA-080618-RW-0413	Total/NA	Water	537	
320-41846-4	WGNA-080618-FRB-0413	Total/NA	Water	537	
320-41846-5	WGNA-080618-RW-0533	Total/NA	Water	537	
320-41846-6 - RA	WGNA-080618-FRB-0533	Total/NA	Water	537	
320-41846-6	WGNA-080618-FRB-0533	Total/NA	Water	537	
320-41846-7	WGNA-080618-RW-4024	Total/NA	Water	537	
320-41846-8	WGNA-080618-FRB-4024	Total/NA	Water	537	
320-41846-9	NAWC-080618-RW-032	Total/NA	Water	537	
320-41846-10	NAWC-080618-FRB-032	Total/NA	Water	537	
320-41846-11	NAWC-080618-RW-272	Total/NA	Water	537	
320-41846-12	NAWC-080618-FRB-272	Total/NA	Water	537	
320-41846-13	WGNA-080618-DUP-43	Total/NA	Water	537	
MB 320-240201/1-A	Method Blank	Total/NA	Water	537	
LCS 320-240201/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 320-240201/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 240731

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41846-1	WGNA-080618-RW-0386	Total/NA	Water	537	240201
320-41846-2	WGNA-080618-FRB-0386	Total/NA	Water	537	240201
320-41846-3	WGNA-080618-RW-0413	Total/NA	Water	537	240201
320-41846-4	WGNA-080618-FRB-0413	Total/NA	Water	537	240201
320-41846-5	WGNA-080618-RW-0533	Total/NA	Water	537	240201
320-41846-6	WGNA-080618-FRB-0533	Total/NA	Water	537	240201
320-41846-7	WGNA-080618-RW-4024	Total/NA	Water	537	240201
MB 320-240201/1-A	Method Blank	Total/NA	Water	537	240201
LCS 320-240201/2-A	Lab Control Sample	Total/NA	Water	537	240201
LCSD 320-240201/3-A	Lab Control Sample Dup	Total/NA	Water	537	240201

Analysis Batch: 240733

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41846-8	WGNA-080618-FRB-4024	Total/NA	Water	537	240201
320-41846-9	NAWC-080618-RW-032	Total/NA	Water	537	240201
320-41846-10	NAWC-080618-FRB-032	Total/NA	Water	537	240201
320-41846-11	NAWC-080618-RW-272	Total/NA	Water	537	240201
320-41846-12	NAWC-080618-FRB-272	Total/NA	Water	537	240201
320-41846-13	WGNA-080618-DUP-43	Total/NA	Water	537	240201

Analysis Batch: 240968

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41846-3 - RA	WGNA-080618-RW-0413	Total/NA	Water	537	240201
320-41846-6 - RA	WGNA-080618-FRB-0533	Total/NA	Water	537	240201

Lab Chronicle

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-41846-1

Client Sample ID: WGNA-080618-RW-0386

Date Collected: 08/06/18 10:10

Date Received: 08/07/18 09:35

Lab Sample ID: 320-41846-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			240201	08/16/18 08:12	SK	TAL SAC
Total/NA	Analysis	537		1	240731	08/19/18 01:30	JRB	TAL SAC

Client Sample ID: WGNA-080618-FRB-0386

Date Collected: 08/06/18 10:05

Date Received: 08/07/18 09:35

Lab Sample ID: 320-41846-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			240201	08/16/18 08:12	SK	TAL SAC
Total/NA	Analysis	537		1	240731	08/19/18 01:34	JRB	TAL SAC

Client Sample ID: WGNA-080618-RW-0413

Date Collected: 08/06/18 10:40

Date Received: 08/07/18 09:35

Lab Sample ID: 320-41846-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			240201	08/16/18 08:12	SK	TAL SAC
Total/NA	Analysis	537		1	240731	08/19/18 01:39	JRB	TAL SAC
Total/NA	Prep	537	RA		240201	08/16/18 08:12	SK	TAL SAC
Total/NA	Analysis	537	RA	1	240968	08/20/18 16:38	JRB	TAL SAC

Client Sample ID: WGNA-080618-FRB-0413

Date Collected: 08/06/18 10:35

Date Received: 08/07/18 09:35

Lab Sample ID: 320-41846-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			240201	08/16/18 08:12	SK	TAL SAC
Total/NA	Analysis	537		1	240731	08/19/18 01:44	JRB	TAL SAC

Client Sample ID: WGNA-080618-RW-0533

Date Collected: 08/06/18 11:10

Date Received: 08/07/18 09:35

Lab Sample ID: 320-41846-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			240201	08/16/18 08:12	SK	TAL SAC
Total/NA	Analysis	537		1	240731	08/19/18 01:48	JRB	TAL SAC

Lab Chronicle

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-41846-1

Client Sample ID: WGNA-080618-FRB-0533

Lab Sample ID: 320-41846-6

Date Collected: 08/06/18 11:05

Matrix: Water

Date Received: 08/07/18 09:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			240201	08/16/18 08:12	SK	TAL SAC
Total/NA	Analysis	537		1	240731	08/19/18 01:53	JRB	TAL SAC
Total/NA	Prep	537	RA		240201	08/16/18 08:12	SK	TAL SAC
Total/NA	Analysis	537	RA	1	240968	08/20/18 16:43	JRB	TAL SAC

Client Sample ID: WGNA-080618-RW-4024

Lab Sample ID: 320-41846-7

Date Collected: 08/06/18 11:40

Matrix: Water

Date Received: 08/07/18 09:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			240201	08/16/18 08:12	SK	TAL SAC
Total/NA	Analysis	537		1	240731	08/19/18 01:58	JRB	TAL SAC

Client Sample ID: WGNA-080618-FRB-4024

Lab Sample ID: 320-41846-8

Date Collected: 08/06/18 11:35

Matrix: Water

Date Received: 08/07/18 09:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			240201	08/16/18 08:12	SK	TAL SAC
Total/NA	Analysis	537		1	240733	08/19/18 02:12	JRB	TAL SAC

Client Sample ID: NAWC-080618-RW-032

Lab Sample ID: 320-41846-9

Date Collected: 08/06/18 12:40

Matrix: Water

Date Received: 08/07/18 09:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			240201	08/16/18 08:12	SK	TAL SAC
Total/NA	Analysis	537		1	240733	08/19/18 02:16	JRB	TAL SAC

Client Sample ID: NAWC-080618-FRB-032

Lab Sample ID: 320-41846-10

Date Collected: 08/06/18 12:35

Matrix: Water

Date Received: 08/07/18 09:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			240201	08/16/18 08:12	SK	TAL SAC
Total/NA	Analysis	537		1	240733	08/19/18 02:21	JRB	TAL SAC

Client Sample ID: NAWC-080618-RW-272

Lab Sample ID: 320-41846-11

Date Collected: 08/06/18 14:10

Matrix: Water

Date Received: 08/07/18 09:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			240201	08/16/18 08:12	SK	TAL SAC

TestAmerica Sacramento

Lab Chronicle

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-41846-1

Client Sample ID: NAWC-080618-RW-272

Date Collected: 08/06/18 14:10

Date Received: 08/07/18 09:35

Lab Sample ID: 320-41846-11

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	537		1	240733	08/19/18 02:26	JRB	TAL SAC

Client Sample ID: NAWC-080618-FRB-272

Date Collected: 08/06/18 14:05

Date Received: 08/07/18 09:35

Lab Sample ID: 320-41846-12

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			240201	08/16/18 08:12	SK	TAL SAC
Total/NA	Analysis	537		1	240733	08/19/18 02:30	JRB	TAL SAC

Client Sample ID: WGNA-080618-DUP-43

Date Collected: 08/06/18 07:00

Date Received: 08/07/18 09:35

Lab Sample ID: 320-41846-13

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			240201	08/16/18 08:12	SK	TAL SAC
Total/NA	Analysis	537		1	240733	08/19/18 02:35	JRB	TAL SAC

Laboratory References:

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

Accreditation/Certification Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-41846-1

Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
ANAB	DoD ELAP		L2468	01-20-21
Arizona	State Program	9	AZ0708	08-11-19
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-19
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-19
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Kansas	NELAP	7	E-10375	10-31-18
Louisiana	NELAP	6	30612	06-30-19
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-19
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-19
New York	NELAP	2	11666	03-31-19
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-19
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-19
USDA	Federal		P330-18-00239	01-17-21
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-19
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-19
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

Method Summary

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-41846-1

Method	Method Description	Protocol	Laboratory
537	Perfluorinated Alkyl Acids (LC/MS)	EPA	TAL SAC
537	Extraction of Perfluorinated Alkyl Acids	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-41846-1

Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-41846-1	WGNA-080618-RW-0386	Water	08/06/18 10:10	08/07/18 09:35
320-41846-2	WGNA-080618-FRB-0386	Water	08/06/18 10:05	08/07/18 09:35
320-41846-3	WGNA-080618-RW-0413	Water	08/06/18 10:40	08/07/18 09:35
320-41846-4	WGNA-080618-FRB-0413	Water	08/06/18 10:35	08/07/18 09:35
320-41846-5	WGNA-080618-RW-0533	Water	08/06/18 11:10	08/07/18 09:35
320-41846-6	WGNA-080618-FRB-0533	Water	08/06/18 11:05	08/07/18 09:35
320-41846-7	WGNA-080618-RW-4024	Water	08/06/18 11:40	08/07/18 09:35
320-41846-8	WGNA-080618-FRB-4024	Water	08/06/18 11:35	08/07/18 09:35
320-41846-9	NAWC-080618-RW-032	Water	08/06/18 12:40	08/07/18 09:35
320-41846-10	NAWC-080618-FRB-032	Water	08/06/18 12:35	08/07/18 09:35
320-41846-11	NAWC-080618-RW-272	Water	08/06/18 14:10	08/07/18 09:35
320-41846-12	NAWC-080618-FRB-272	Water	08/06/18 14:05	08/07/18 09:35
320-41846-13	WGNA-080618-DUP-43	Water	08/06/18 07:00	08/07/18 09:35

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 240166Lab Sample ID: IC 320-240166/2 Client Sample ID: _____Date Analyzed: 08/15/18 18:21 Lab File ID: 2018.08.15_537CURVE_003.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	1.65	Baseline	roycea	08/15/18 18:53

Lab Sample ID: CCVL 320-240166/9 Client Sample ID: _____Date Analyzed: 08/15/18 18:53 Lab File ID: 2018.08.15_537CURVE_010.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	1.65	Baseline	roycea	08/15/18 19:08

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 240731Lab Sample ID: 320-41846-3 Client Sample ID: WGNA-080618-RW-0413Date Analyzed: 08/19/18 01:39 Lab File ID: 2018.08.18_537A_033.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	1.84	Incomplete Integration	barnettj	08/20/18 10:44

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 240733Lab Sample ID: 320-41846-11 Client Sample ID: NAWC-080618-RW-272Date Analyzed: 08/19/18 02:26 Lab File ID: 2018.08.18_537A_043.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	1.65	Missed Peak	barnettj	08/20/18 10:46

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41846-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-HSP_00029	10/06/18	04/06/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid (PFBS)	1250.86 ng/mL
					LCPFHpA_00009	81 uL	Perfluoroheptanoic acid (PFHpA)	135 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluorohexane Sulfonate	420.117 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	420.117 ng/mL
					LCPFNA_00009	165 uL	Perfluorononanoic acid (PFNA)	275 ng/mL
					LCPFOA_00010	165 uL	Perfluorooctanoic acid (PFOA)	275 ng/mL
					LCPFOS-br_00005	355 uL	Perfluorooctanesulfonic acid (PFOS)	549.067 ng/mL
.LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexane Sulfonate	45.5 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
.LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
.LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LC537-ICV_00032	08/15/18	06/23/18	MeOH/H2O, Lot 197626	10 mL	LC537-IS_00074	1000 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
.LC537-IS_00074	12/16/18	06/16/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
LC537-ICV_00032	08/15/18	06/23/18	MeOH/H2O, Lot 197626	10 mL	LC537-SU_00072	1000 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
					LC537ICIM2_00001	400 uL	Perfluorobutanesulfonic acid (PFBS)	100.092 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	20.1619 ng/mL
							Perfluorononanoic acid (PFNA)	20.1641 ng/mL
							Perfluorooctanoic acid (PFOA)	20.167 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	20.1702 ng/mL
.LC537-SU_00072	12/16/18	06/16/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LC537ICIM2_00001	08/15/18	02/15/18	Methanol, Lot 090285	10 mL	LC537ICIM_00020	0.5 mL	Perfluorobutanesulfonic acid (PFBS)	2.5023 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.25 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41846-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	0.504047 ug/mL
							Perfluorononanoic acid (PFNA)	0.504103 ug/mL
							Perfluorooctanoic acid (PFOA)	0.504176 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.504255 ug/mL
..LC537ICIM_00020	08/15/18	02/15/18	Methanol, Lot 090285	25 mL	LC537-PFBS2_00009	0.625 mL	Perfluorobutanesulfonic acid (PFBS)	50.0459 ug/mL
					LC537-PFHpA2_00012	0.0625 mL	Perfluoroheptanoic acid (PFHpA)	5 ug/mL
					LC537-PFHxS2_00009	0.126 mL	Perfluorohexanesulfonic acid (PFHxS)	10.0809 ug/mL
					LC537-PFNA2_00010	0.126 mL	Perfluorononanoic acid (PFNA)	10.0821 ug/mL
					LC537-PFOA2_00011	0.126 mL	Perfluorooctanoic acid (PFOA)	10.0835 ug/mL
					LC537-PFOS2_00011	0.126 mL	Perfluorooctanesulfonic acid (PFOS)	10.0851 ug/mL
...LC537-PFBS2_00009	08/15/18	02/15/18	Methanol, Lot 090285	17.1 mL	LC537_PFBS2_00002	0.0343 g	Perfluorobutanesulfonic acid (PFBS)	2001.84 ug/mL
....LC537_PFBS2_00002	09/08/22	Santa Cruz Biotechnology, Lot F0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	0.998 g/g
...LC537-PFHpA2_00012	08/15/18	02/15/18	Methanol, Lot 09092	23.95 mL	LC537_PFHpA2_00002	0.0479 g	Perfluoroheptanoic acid (PFHpA)	2000 ug/mL
....LC537_PFHpA2_00002	06/13/22	Afla Aesar, Lot 10200390			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	1 g/g
...LC537-PFHxS2_00009	08/15/18	02/15/18	Methanol, Lot 090285	25.87 mL	LC537_PFHxS2_00002	0.0569 g	Perfluorohexanesulfonic acid (PFHxS)	2000.19 ug/mL
....LC537_PFHxS2_00002	06/08/22	Santa Cruz Biotechnology, Lot G2516			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA2_00010	08/15/18	02/15/18	Methanol, Lot 090285	16.58 mL	LC537 PFNA2_00002	0.0333 g	Perfluorononanoic acid (PFNA)	2000.41 ug/mL
....LC537 PFNA2_00002	06/14/22	Aldrich, Lot MKCC0699			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.996 g/g
...LC537-PFOA2_00011	08/15/18	02/15/18	Methanol, Lot 090285	22.96 mL	LC537 PFOA2_00002	0.0464 g	Perfluorooctanoic acid (PFOA)	2000.7 ug/mL
....LC537 PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.99 g/g
...LC537-PFOS2_00011	08/15/18	02/15/18	Methanol, Lot 090285	14.71 mL	LC537_PFOS2_00002	0.0378 g	Perfluorooctanesulfonic acid (PFOS)	2001.01 ug/mL
....LC537_PFOS2_00002	06/14/22	Sigma, Lot BCBQ0108V			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.7787 g/g
LC537-IS_00080	02/02/19	08/15/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
.LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
LC537-L1_00022	09/30/18	04/02/18	MeOH/H2O, Lot 090285	5 mL	LC537-IS_00065	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-MSP_00033	60 uL	Perfluorobutanesulfonic acid (PFBS)	8.99912 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.96 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41846-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	3.003 ng/mL
							Perfluorononanoic acid (PFNA)	1.98 ng/mL
							Perfluorooctanoic acid (PFOA)	1.98 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	3.95328 ng/mL
					LC537-SU_00064	500 uL	13C2 PFDA	10 ng/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-MSP_00033	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	509 uL	Perfluorobutanesulfonic acid (PFBS)	749.927 ng/mL
					LCPFHpA_00009	48 uL	Perfluoroheptanoic acid (PFHpA)	80 ng/mL
					LCPFHxS-br_00005	165 uL	Perfluorohexanesulfonic acid (PFHxS)	250.25 ng/mL
					LCPFNA_00009	99 uL	Perfluorononanoic acid (PFNA)	165 ng/mL
					LCPFOA_00010	99 uL	Perfluorooctanoic acid (PFOA)	165 ng/mL
					LCPFOS-br_00005	213 uL	Perfluorooctanesulfonic acid (PFOS)	329.44 ng/mL
					..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116	
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFHxA	0.1 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFDA	50 ug/mL
LC537-L2_00022	09/30/18	04/02/18	MeOH/H2O, Lot 090285	20 mL	LC537-HSP_00028	320 uL	Perfluorobutanesulfonic acid (PFBS)	20.0138 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.16 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	6.72187 ng/mL
							Perfluorononanoic acid (PFNA)	4.4 ng/mL
							Perfluorooctanoic acid (PFOA)	4.4 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	8.78507 ng/mL
							LC537-IS_00065	2 mL
					LC537-SU_00064	2 mL	13C4 PFOS	28.68 ng/mL
							13C2 PFDA	10 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41846-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00028	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid (PFBS)	1250.86 ng/mL
					LCPFHpA_00009	81 uL	Perfluoroheptanoic acid (PFHpA)	135 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid (PFHxS)	420.117 ng/mL
					LCPFNA_00009	165 uL	Perfluorononanoic acid (PFNA)	275 ng/mL
					LCPFOA_00010	165 uL	Perfluorooctanoic acid (PFOA)	275 ng/mL
					LCPFOS-br_00005	355 uL	Perfluorooctanesulfonic acid (PFOS)	549.067 ng/mL
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L3_00025	09/30/18	04/02/18	MeOH/H2O, Lot 090285	20 mL	LC537-HSP_00028	720 uL	Perfluorobutanesulfonic acid (PFBS)	45.031 ng/mL
							Perfluoroheptanoic acid (PFHpA)	4.86 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	15.1242 ng/mL
							Perfluorononanoic acid (PFNA)	9.9 ng/mL
							Perfluorooctanoic acid (PFOA)	9.9 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	19.7664 ng/mL
					LC537-IS_00065	2 mL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
LC537-SU_00064	2 mL	13C2 PFDA	10 ng/mL					
		13C2 PFHxA	10 ng/mL					
.LC537-HSP_00028	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid (PFBS)	1250.86 ng/mL
					LCPFHpA_00009	81 uL	Perfluoroheptanoic acid (PFHpA)	135 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid (PFHxS)	420.117 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41846-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFNA_00009	165 uL	Perfluorononanoic acid (PFNA)	275 ng/mL
					LCPFOA_00010	165 uL	Perfluorooctanoic acid (PFOA)	275 ng/mL
					LCPFOS-br_00005	355 uL	Perfluorooctanesulfonic acid (PFOS)	549.067 ng/mL
..LCPFBSA_00002	12/02/21		Wellington Laboratories, Lot LPFBS1116		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFHpa_00009	12/02/21		Wellington Laboratories, Lot PFHpA1216		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00005	01/04/22		Wellington Laboratories, Lot brPFHxSK0117		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22		Wellington Laboratories, Lot PFNA0717		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00010	09/27/22		Wellington Laboratories, Lot PFOA0917		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00005	01/12/22		Wellington Laboratories, Lot brPFOSK0117		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00010	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00024	05/19/22		Wellington Laboratories, Lot MPFOS517		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21		Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L4_00022	09/30/18	04/02/18	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00028	360 uL	Perfluorobutanesulfonic acid (PFBS)	90.0619 ng/mL
							Perfluoroheptanoic acid (PFHpA)	9.72 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	30.2484 ng/mL
							Perfluorononanoic acid (PFNA)	19.8 ng/mL
							Perfluorooctanoic acid (PFOA)	19.8 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	39.5328 ng/mL
					LC537-IS_00065	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00064	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00028	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid (PFBS)	1250.86 ng/mL
					LCPFHpa_00009	81 uL	Perfluoroheptanoic acid (PFHpA)	135 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid (PFHxS)	420.117 ng/mL
					LCPFNA_00009	165 uL	Perfluorononanoic acid (PFNA)	275 ng/mL
					LCPFOA_00010	165 uL	Perfluorooctanoic acid (PFOA)	275 ng/mL
					LCPFOS-br_00005	355 uL	Perfluorooctanesulfonic acid (PFOS)	549.067 ng/mL
..LCPFBSA_00002	12/02/21		Wellington Laboratories, Lot LPFBS1116		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA 00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA 00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA 00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS 00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA 00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS 00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFDA 00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA 00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA 00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA 00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L5_00026	09/30/18	04/02/18	MeOH/H2O, Lot 090285	20 mL	LC537-HSP_00028	2160 uL	Perfluorobutanesulfonic acid (PFBS)	135.093 ng/mL
							Perfluoroheptanoic acid (PFHpA)	14.58 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.3726 ng/mL
							Perfluorononanoic acid (PFNA)	29.7 ng/mL
							Perfluorooctanoic acid (PFOA)	29.7 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	59.2992 ng/mL
					LC537-IS_00065	2 mL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00064	2 mL	13C2 PFDA	10 ng/mL
		13C2 PFHxA	10 ng/mL					
.LC537-HSP_00028	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid (PFBS)	1250.86 ng/mL
					LCPFHpA_00009	81 uL	Perfluoroheptanoic acid (PFHpA)	135 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid (PFHxS)	420.117 ng/mL
					LCPFNA 00009	165 uL	Perfluorononanoic acid (PFNA)	275 ng/mL
					LCPFOA 00010	165 uL	Perfluorooctanoic acid (PFOA)	275 ng/mL
					LCPFOS-br_00005	355 uL	Perfluorooctanesulfonic acid (PFOS)	549.067 ng/mL
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA 00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA 00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41846-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA 00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS 00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA 00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS 00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFDA 00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA 00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA 00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA 00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L6_00022	09/30/18	04/02/18	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00028	720 uL	Perfluorobutanesulfonic acid (PFBS)	180.124 ng/mL
							Perfluoroheptanoic acid (PFHpA)	19.44 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	60.4968 ng/mL
							Perfluorononanoic acid (PFNA)	39.6 ng/mL
							Perfluorooctanoic acid (PFOA)	39.6 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	79.0656 ng/mL
					LC537-IS_00065	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00064	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00028	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid (PFBS)	1250.86 ng/mL
					LCPFHpA_00009	81 uL	Perfluoroheptanoic acid (PFHpA)	135 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid (PFHxS)	420.117 ng/mL
					LCPFNA_00009	165 uL	Perfluorononanoic acid (PFNA)	275 ng/mL
					LCPFOA_00010	165 uL	Perfluorooctanoic acid (PFOA)	275 ng/mL
					LCPFOS-br_00005	355 uL	Perfluorooctanesulfonic acid (PFOS)	549.067 ng/mL
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA 00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS 00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA 00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS 00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFDA 00012	60 uL	13C2 PFDA	0.1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1

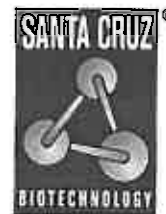
SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL		
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL		
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL		
LC537-SU_00074	01/05/19	07/16/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL		
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL		
.LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL		
.LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL		

Reagent

LC537_PFB2_00002

P: 6.8.17 SW



CERTIFICATE OF ANALYSIS

The Power to Question

Catalog Number: sc-236187
Lot Number: F0917
Product Name: Nonafluorobutane-1-sulfonic acid
CAS Number: 375-73-5
Molecular Formula: $C_4HF_9O_3S$
Molecular Weight: 300.10

Test	Specification	Result
Appearance	Colorless liquid	Complies
Identification (^{19}F -NMR)	Conforms to structure	Complies
Purity (Sodium Hydroxide Titration)	$\geq 97\%$	101.3%
Infrared Spectrum	Conforms to structure	Complies

Reagent

LC537_PFHpA2_00002

Certificate of analysis

R: 6.13.17 SW

PFHe A

Product No.: A12092
Product: Perfluoroheptanoic acid, 98+%
Lot No.: 10200390

Appearance: White fused solid
Water Content (Karl-Fischer): 0.30%
Melting Point: 32.0-34.3°C
Assay (Aqueous acid-base titration): 99.7%
Identification (FTIR): Conforms

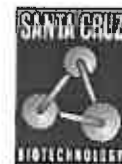
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Reagent

LC537_PFHxS2_00002



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CERTIFICATE OF ANALYSIS

Catalog Number: sc-237289
 Lot Number: G2516
 Product Name: Tridecafluorohexane-1-sulfonic acid potassium salt
 CAS Number: 3871-99-6
 Molecular Formula: $C_6F_{13}KO_3S$
 Molecular Weight: 438.20

Test	Specification	Result
Appearance	White to faint beige powder or crystals	White powder
Identification (Infrared Spectrum)	Consistent with structure	Complies
Purity (Titration, Ion Exchange)	$\geq 98.0\%$	100.4%

PFH_xS-K

$C_6F_{13}SO_3K$ 438.201

$C_6F_{13}SO_3H$ 400.111

$$MW \text{ correction} = \frac{400.11}{438.201} = 0.91307 \quad \frac{PFH_xS}{\text{cas\# 355-46-4}}$$

$$\text{Purity} \div MW \text{ correction} = 90.9\%$$

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Reagent

LC537_PFNA2_00002

17.6.14.17 SW

3050 Spruce Street, Saint Louis, MO 63103, USA

Website: www.sigmaaldrich.com

Email USA: techserv@sial.com

Outside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name:

Perfluorononanoic acid - 97%

Product Number:

394459

Batch Number:

MKCC0699

Brand:

ALDRICH

CAS Number:

375-95-1

MDL Number:

MFCD00039605

Formula:

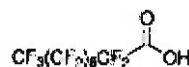
C₉H₁₇O₂

Formula Weight:

464.08 g/mol

Quality Release Date:

07 DEC 2016



Test	Specification	Result
Appearance (Color)	White to Off-White	White
Appearance (Form)	Powder or Crystals or Crystalline Chunk(s) or Granule or Flakes or Solid	Powder
Infrared Spectrum	Conforms to Structure	Conforms
GC (area %)	> 96.5 %	98.2 %

Michael Grady, Manager
Quality Control
Milwaukee, WI US

PFNA

Sigma-Aldrich warrants, that at the time of the quality release or subsequent retest date this product conformed to the information contained in this publication. The current Specification sheet may be available at Sigma-Aldrich.com. For further inquiries, please contact Technical Service. Purchaser must determine the suitability of the product for its particular use. See reverse side of invoice or packing slip for additional terms and conditions of sale.

Reagent

LC537_PFOA2_00002

Certificate of analysis

P: 6/9/17 SW

Product No.: L08862
Product: Perfluorooctanoic acid, 95%
Lot No.: 10199078

PFOA

Appearance: White powder
Water Content (Karl-Fischer): 1.30%
Melting Point: 47.6-54.0°C
Assay (Aqueous acid-base titration): 98.4%
Assay (GC Silyl Deriv): 97.2%

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ThermoFisher
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Reagent

LC537_PFOS2_00002

V: 6.14.17 SKV

SIGMA-ALDRICH

3050 Spruce Street, Saint Louis, MO 63103 USA
Email USA: techserv@sial.com Outside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name: HEPTADEC AFLUORO OCTANESULFONIC ACID TETRAETHYLAMMONIUM SALT
98 %
Product Number: 365289
Batch Number: BCBQ0108V
Brand: Aldrich
CAS Number: 56773-42-3
Formula: $\text{CF}_3(\text{CF}_2)_6\text{CF}_2\text{SO}_3\text{N}(\text{C}_2\text{H}_5)_4$
Formula Weight: 629.37
Quality Release Date: 11 JUN 2015

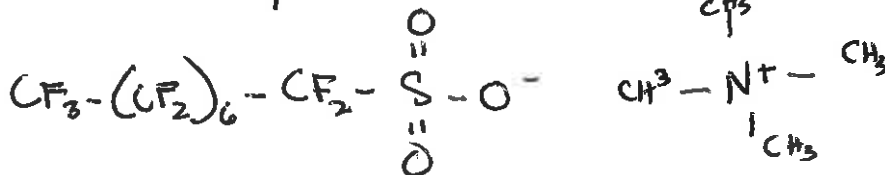
TEST	SPECIFICATION	RESULT
APPEARANCE (COLOR)	WHITE TO OFF WHITE	OFF-WHITE
APPEARANCE (FORM)	POWDER OR POWDER WITH CHUNK(S)	POWDER
CARBON CONTENT	29.77 % - 31.29 %	29.97 %
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS

Claudia Geitner

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

$$\text{MW correction: } \frac{500.125}{629.37} = 0.7946$$

$$\text{Purity \& mw correction} = 77.87\%$$



$$\begin{array}{r} \text{C}_8\text{F}_{17}\text{SO}_3^+\text{H} \\ \text{C} = 12.011 \quad 96.088 \\ \text{F} = 18.998 \quad 322.966 \\ \text{S} = 32.066 \quad 32.066 \\ \text{O} = 16.999 \quad 47.997 \\ \text{H} = 1.008 \quad 1.008 \\ \text{N} = 14.007 \quad - \\ \hline 500.125 \end{array}$$

$$\begin{array}{r} \text{C}_8\text{H}_{20}\text{N} \\ 96.088 \\ - \\ - \\ - \\ 20.460 \\ 14.007 \\ \hline 130.255 \end{array}$$

Reagent

LCM2PFOA_00010



WELLINGTON LABORATORIES

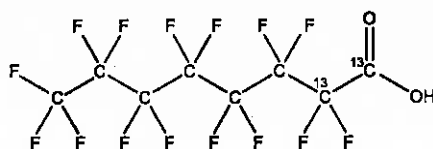
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: M2PFOA0216

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₂¹²C₈HF₁₆O₂
CONCENTRATION: 50 ± 2.5 µg/ml

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

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

ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 02/24/2016
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

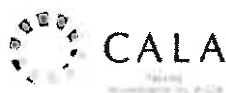
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

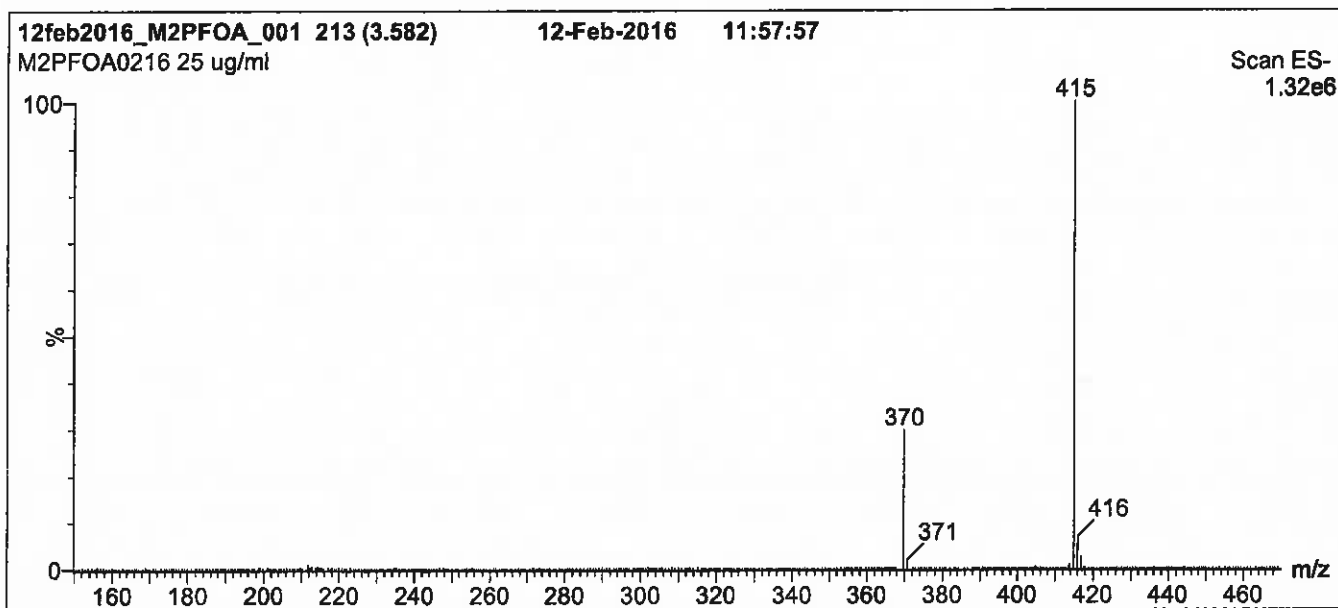
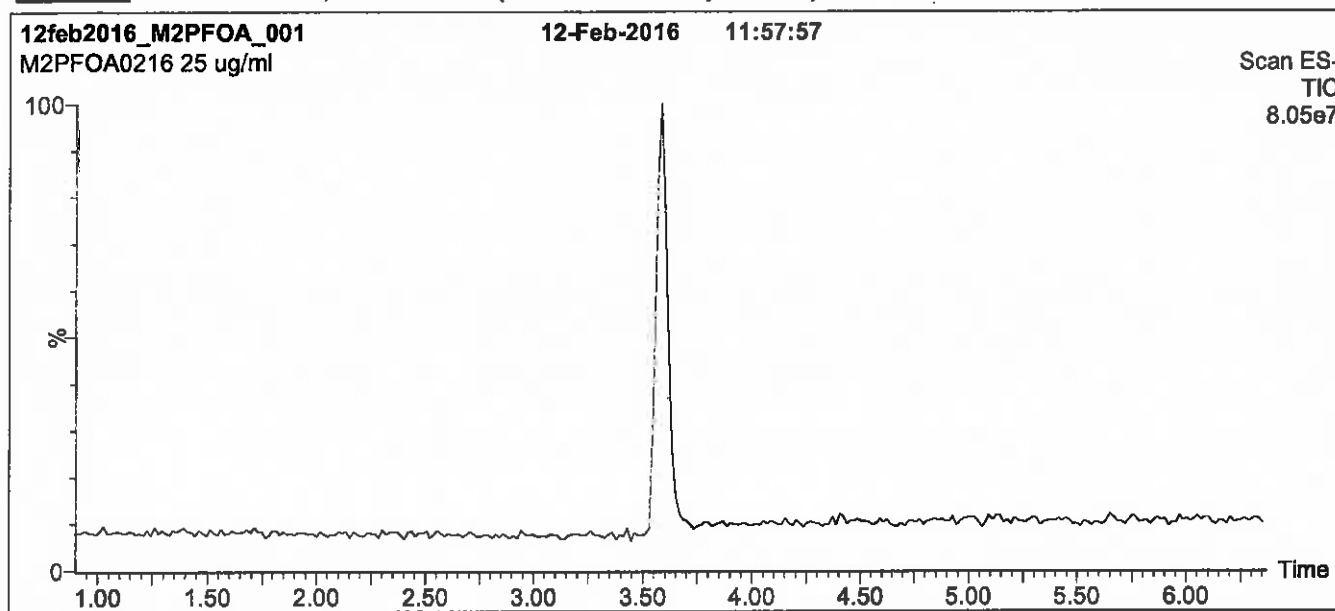
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

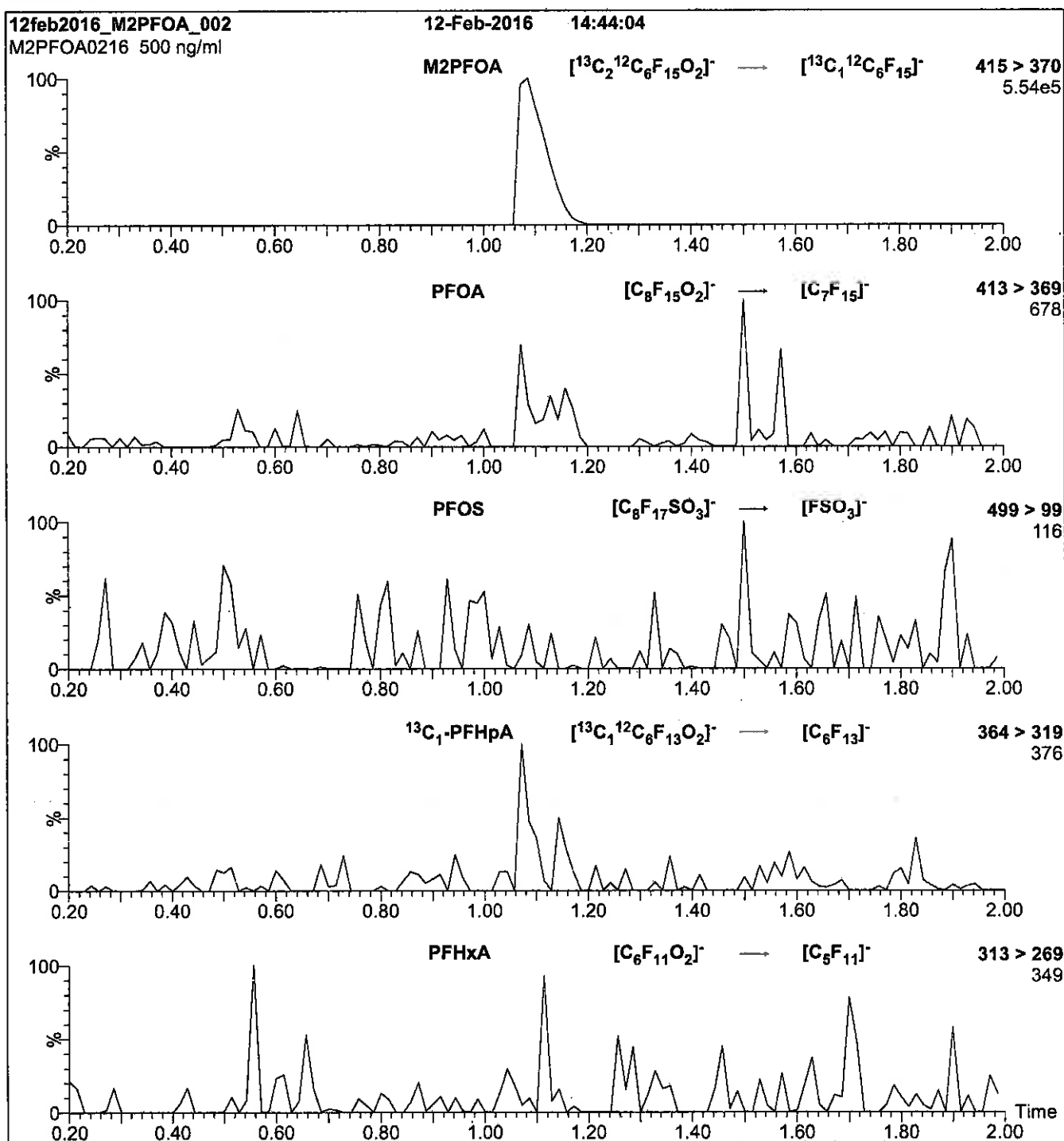
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% MeOH / 20% H_2O

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

MS Parameters

Collision Gas (mbar) = $3.39\text{e-}3$
Collision Energy (eV) = 10

Reagent

LCMPFDA_00012

R: SBC 12/21/16



814255

ID: LCMFDA_00012

Exp: 09/30/21 Prod: SBC

13C2-Perfluorodecanoic acid



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFDA

COMPOUND:

Perfluoro-n-[1,2-¹³C₂]decanoic acid

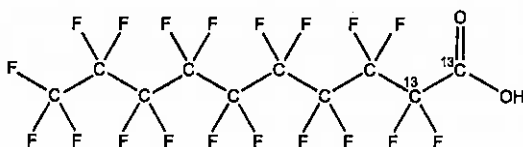
LOT NUMBER:

MPFDA0916

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₈H₁₈O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

516.07

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

(1,2-¹³C₂)

LAST TESTED: (mm/dd/yyyy)

09/30/2016

EXPIRY DATE: (mm/dd/yyyy)

09/30/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 10/07/2016

(mm/dd/yyyy)

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

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

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

EXPIRY DATE / PERIOD OF VALIDITY:

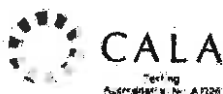
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

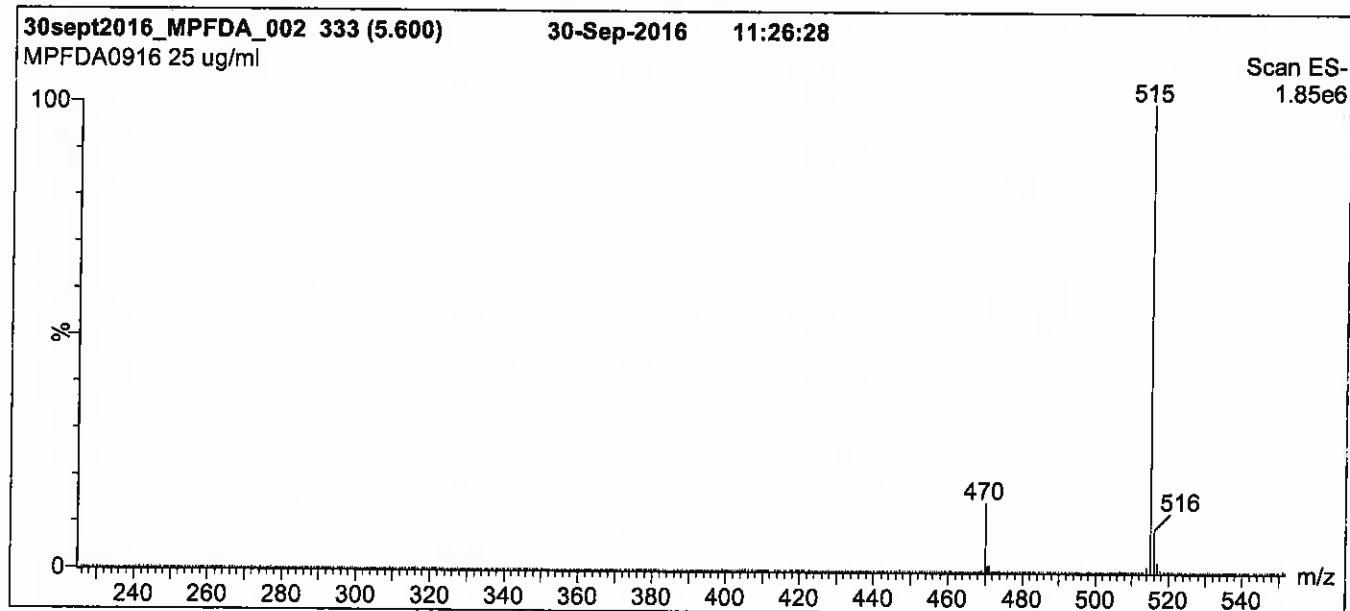
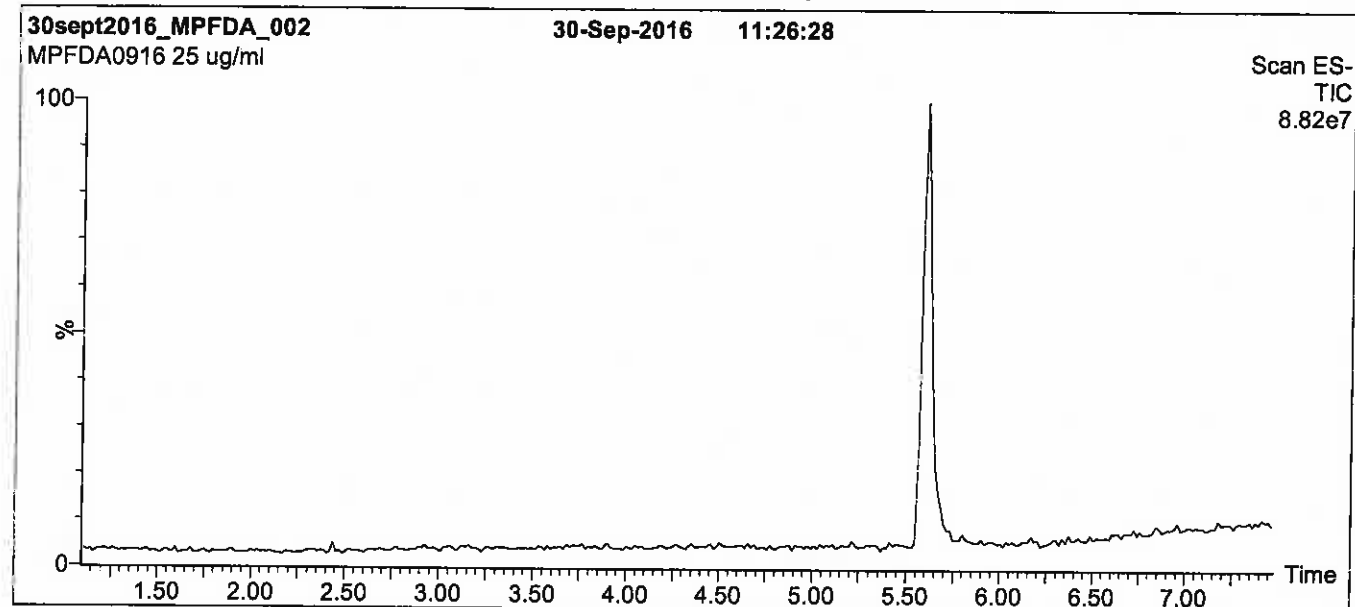
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

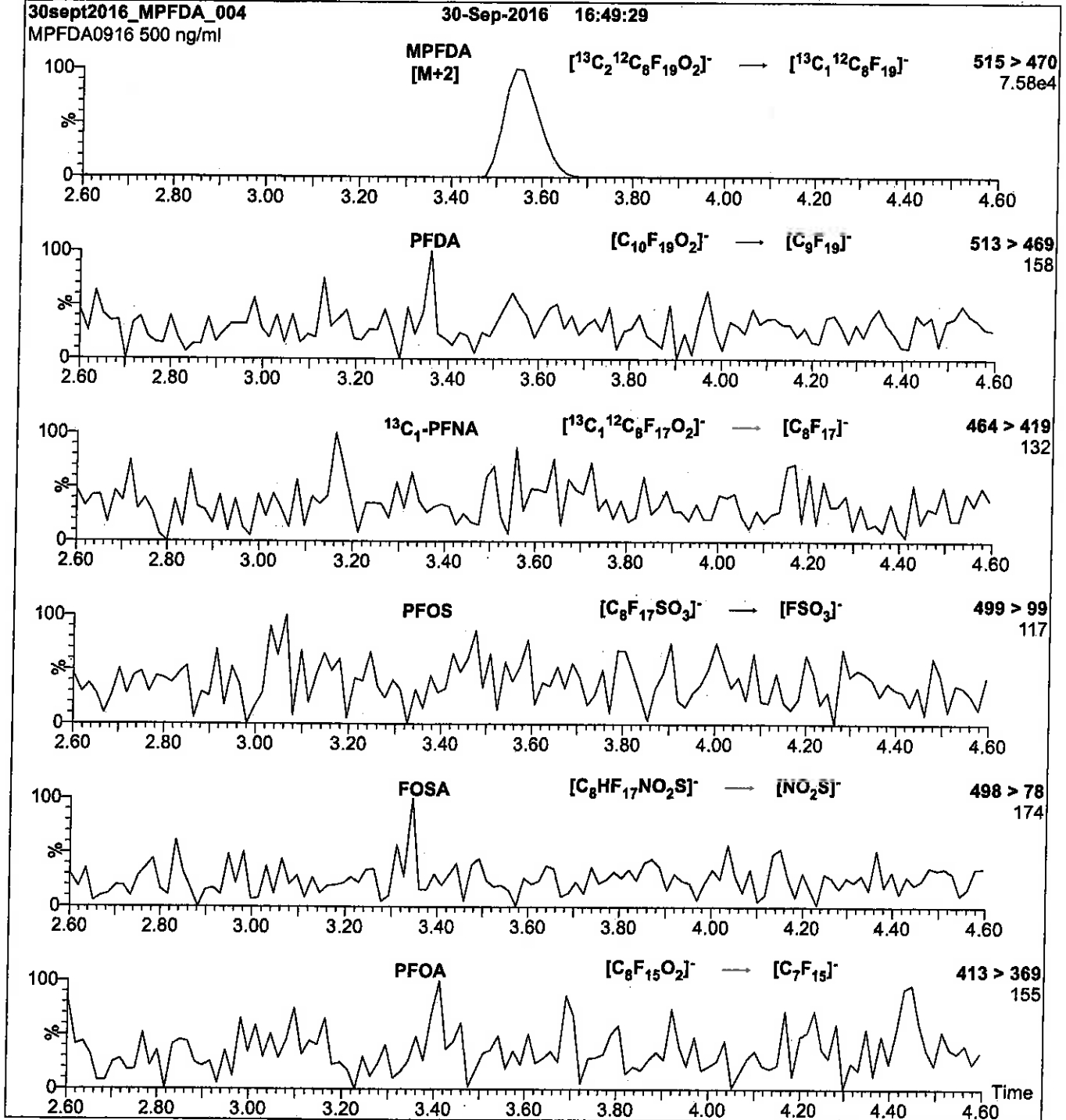
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFHxA_00015



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFHxA

LOT NUMBER:

MPFHxA1116

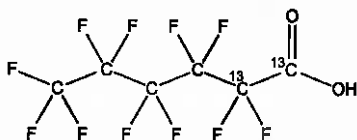
COMPOUND:

Perfluoro-n-[1,2-¹³C₂]hexanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₄HF₁₁O₂

MOLECULAR WEIGHT:

316.04

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99%¹³C

(1,2-¹³C₂)

LAST TESTED: (mm/dd/yyyy)

11/22/2016

EXPIRY DATE: (mm/dd/yyyy)

11/22/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/13/2016

(mm/dd/yyyy)

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

INTENDED USE:

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EXPIRY DATE / PERIOD OF VALIDITY:

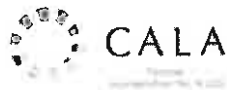
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LIMITED WARRANTY:

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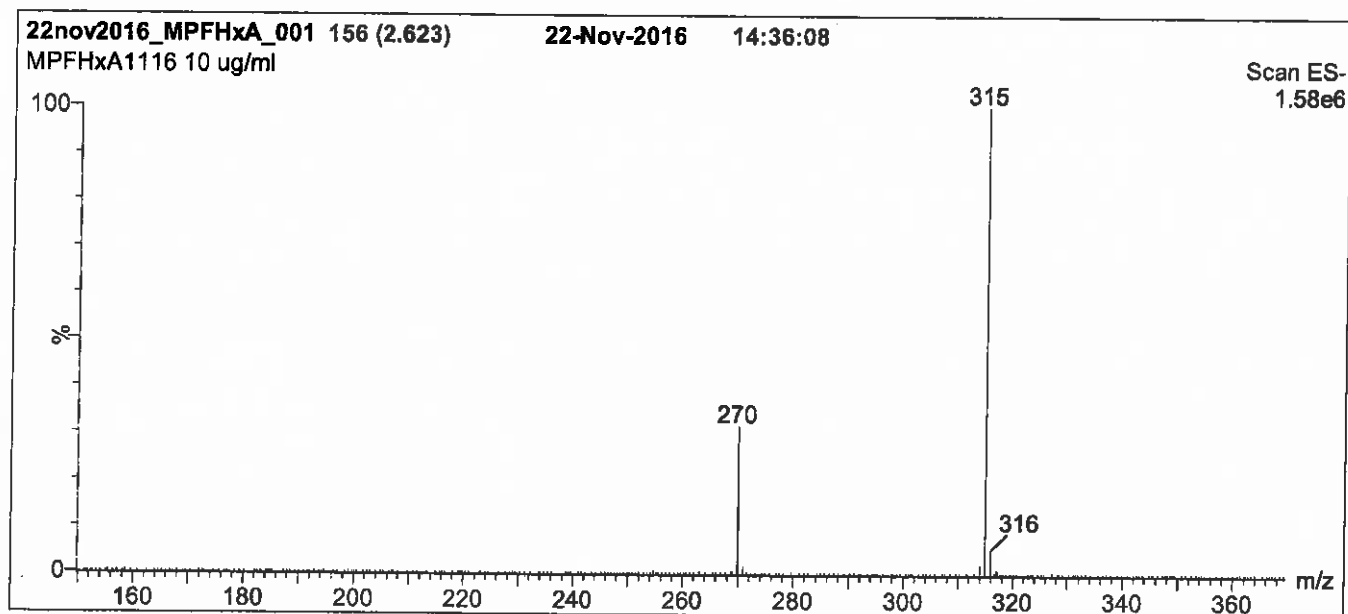
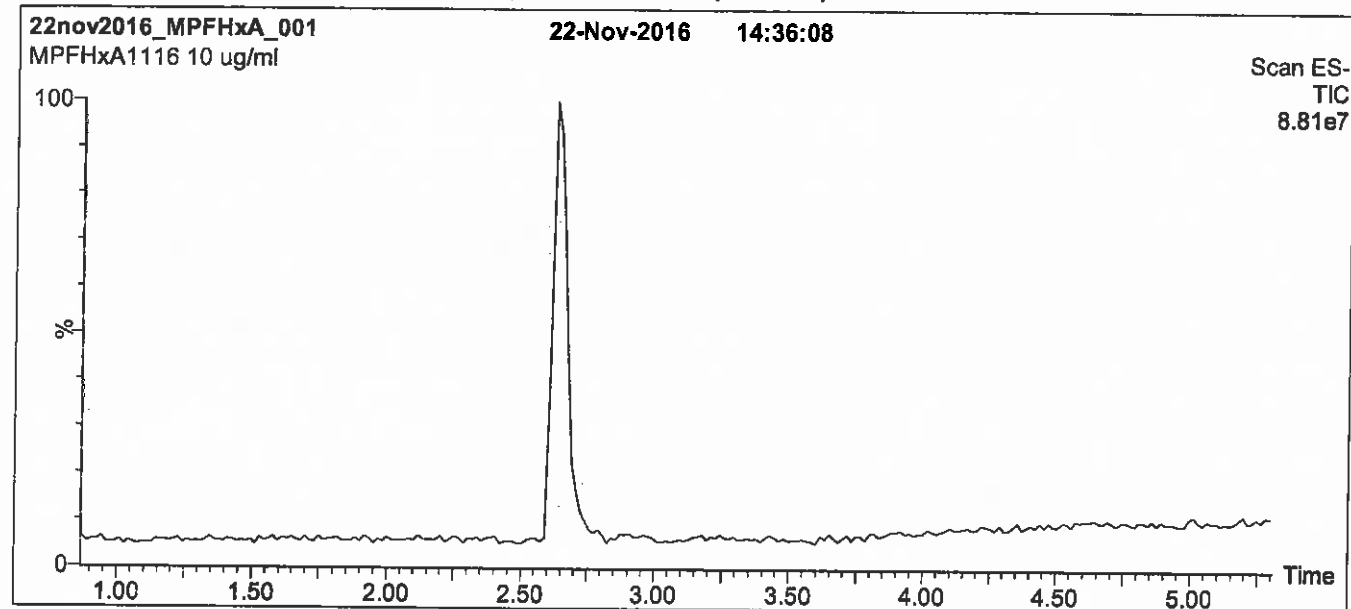
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

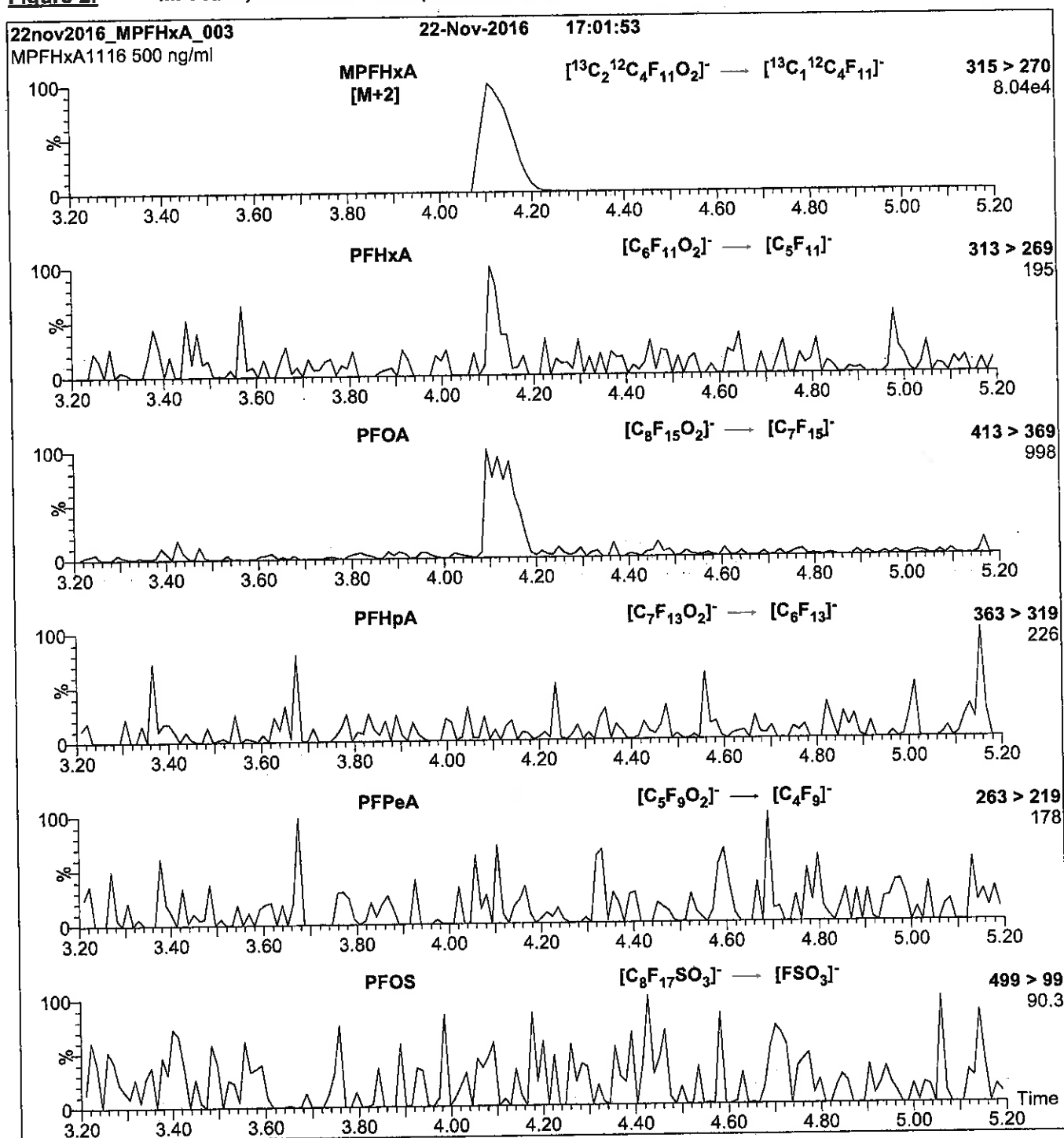
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% 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) = 10

Reagent

LCMPFOS_00024

r: 8/2/17 SKJ

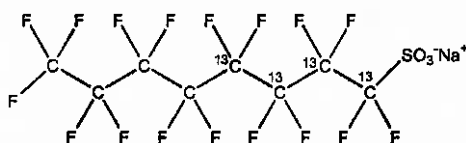


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0517
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)	05/19/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/19/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.8% Sodium perfluoro-1-[1,2,3-¹³C₃]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim, General Manager

Date: 05/30/2017
(mm/dd/yyyy)

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

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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.

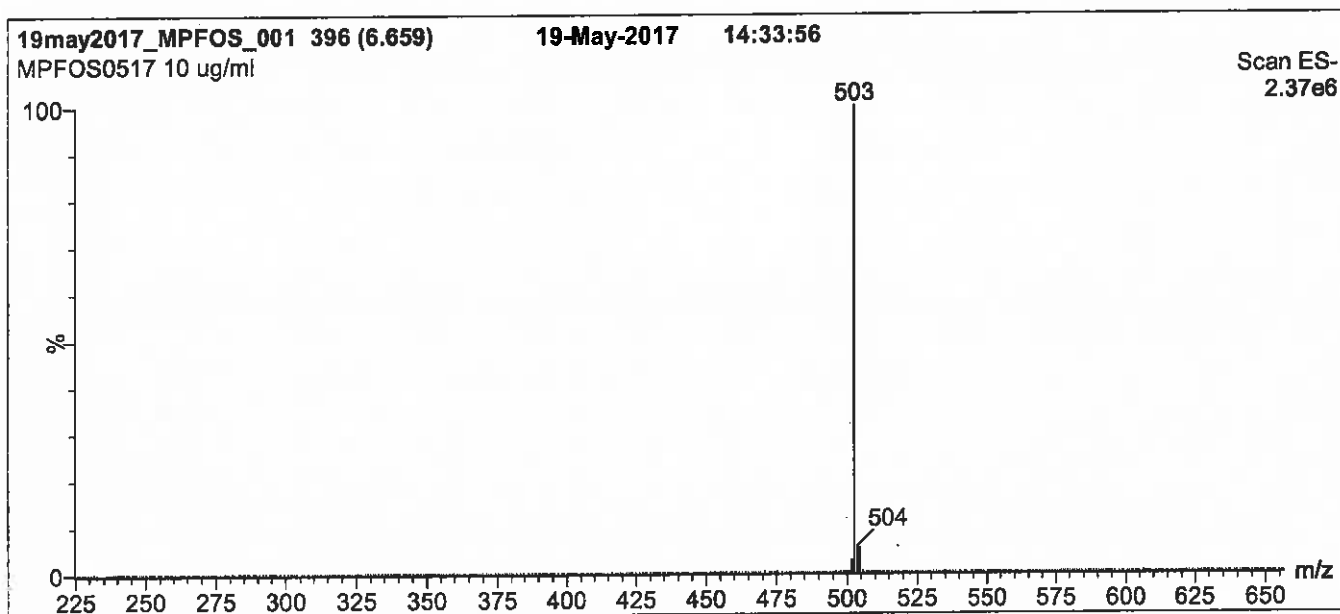
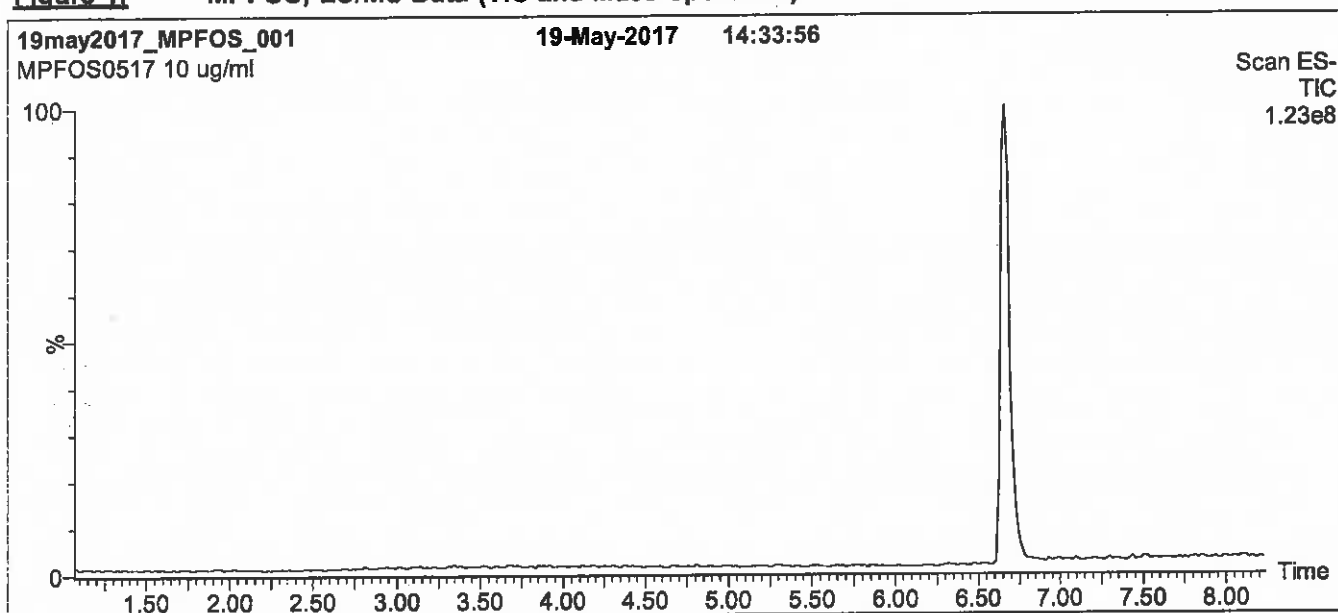
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

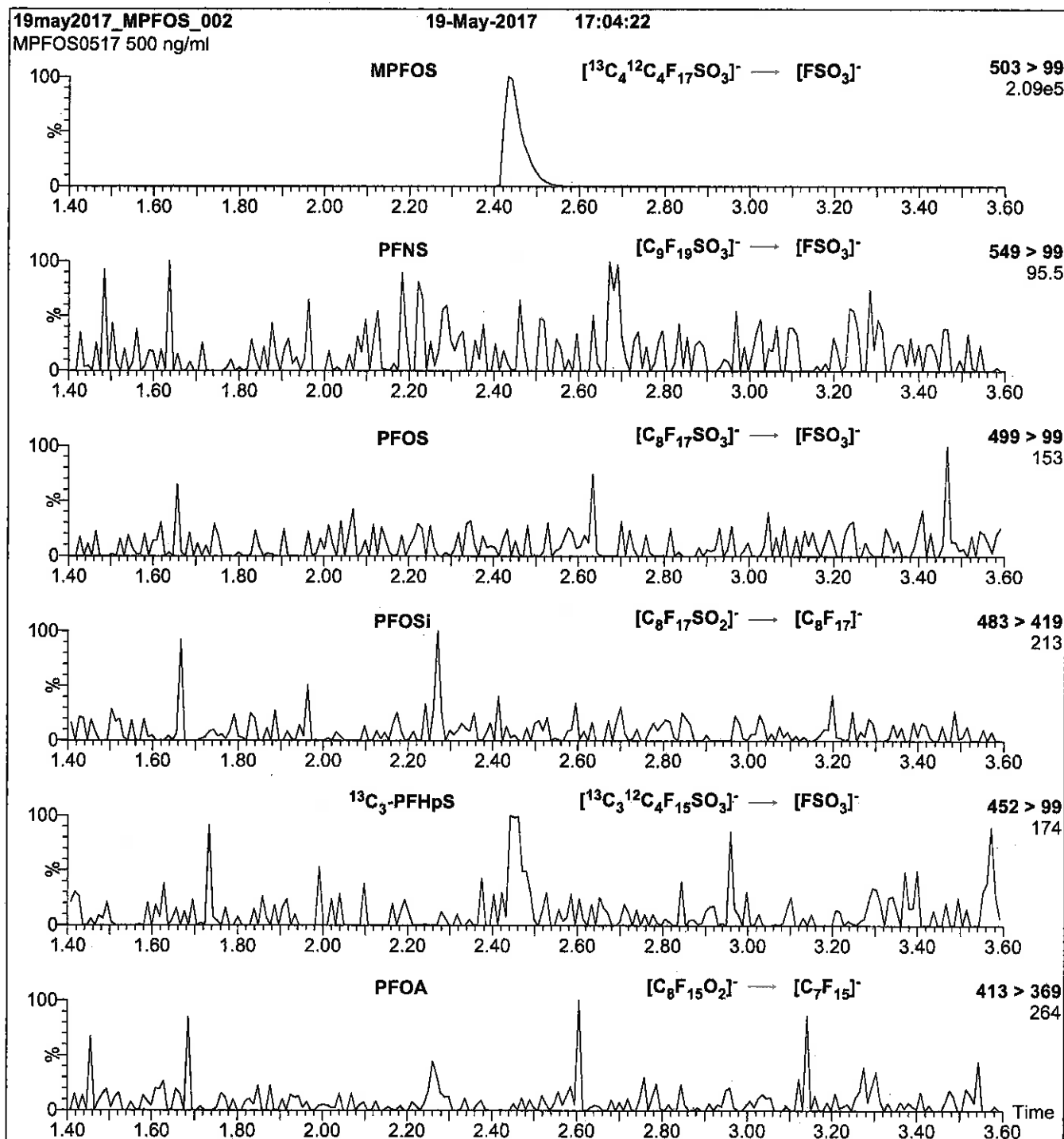
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 40

Reagent

LCPFBSA_00002

n: 4/2/17 SKW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFBS

LOT NUMBER:

LPFBS1116

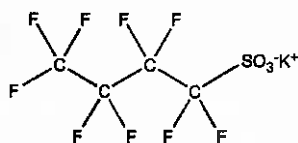
COMPOUND:

Potassium perfluoro-1-butanesulfonate

STRUCTURE:

CAS #:

29420-49-3



MOLECULAR FORMULA:

C₄F₉SO₃K

MOLECULAR WEIGHT:

338.19

CONCENTRATION:

50.0 ± 2.5 µg/ml (K salt)

SOLVENT(S):

Methanol

44.2 ± 2.2 µg/ml (PFBS anion)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/02/2016

EXPIRY DATE: (mm/dd/yyyy)

12/02/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/05/2016

(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

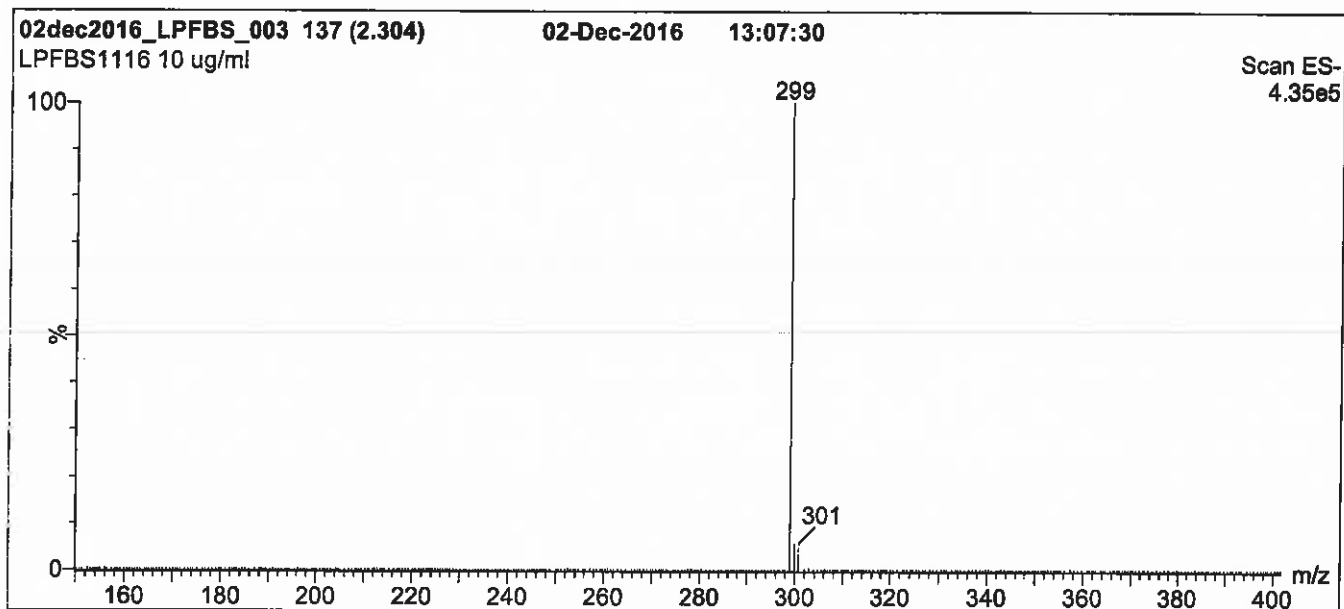
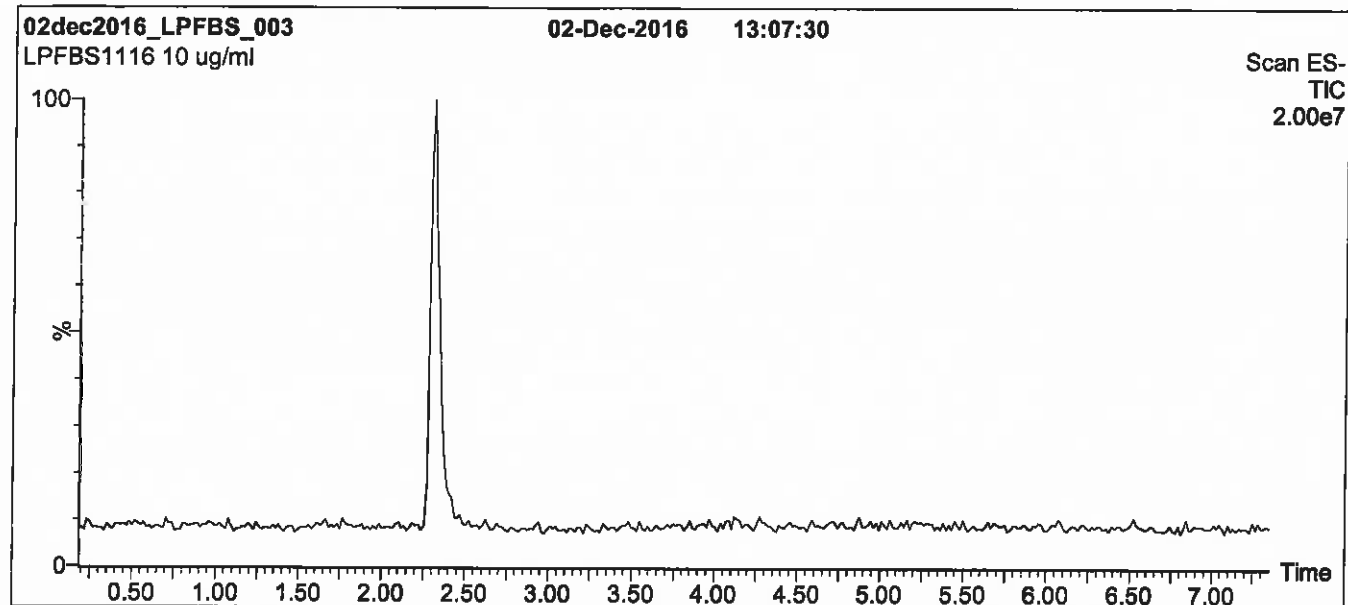
QUALITY MANAGEMENT:

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



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Figure 1: 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 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

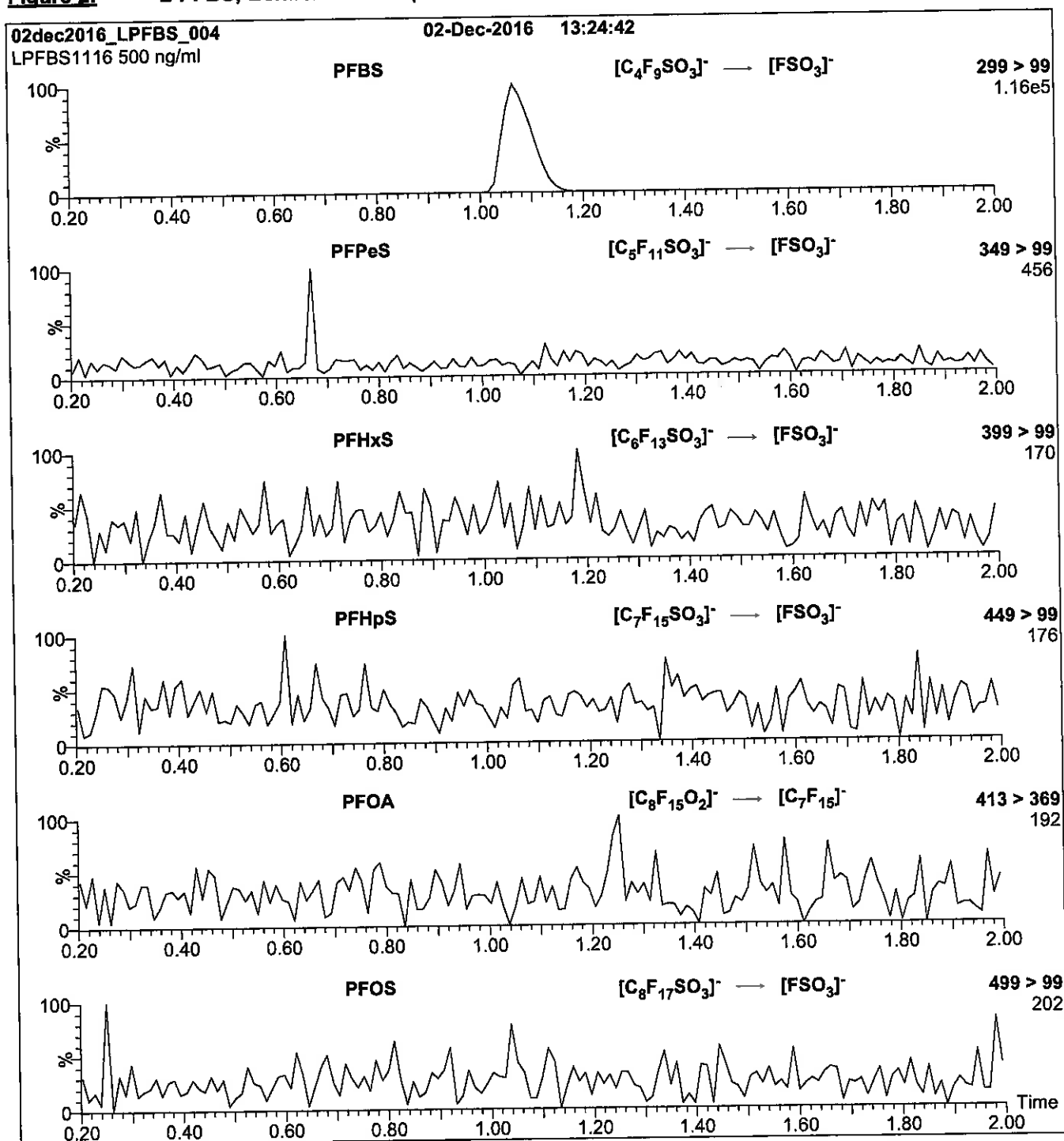
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

Figure 2: 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) = 3.28e-3
Collision Energy (eV) = 25

Reagent

LCPFHpA_00009

P: 9/21/17 SKJ



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFHpA

LOT NUMBER:

PFHpA1216

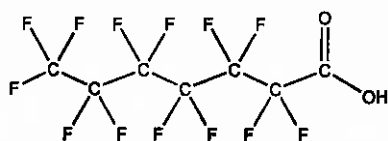
COMPOUND:

Perfluoro-n-heptanoic acid

STRUCTURE:

CAS #:

375-85-9



MOLECULAR FORMULA:

$C_7H_{13}O_2$

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)

12/02/2016

EXPIRY DATE: (mm/dd/yyyy)

12/02/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/12/2016

(mm/dd/yyyy)

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

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

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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:

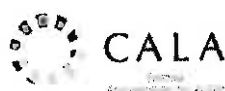
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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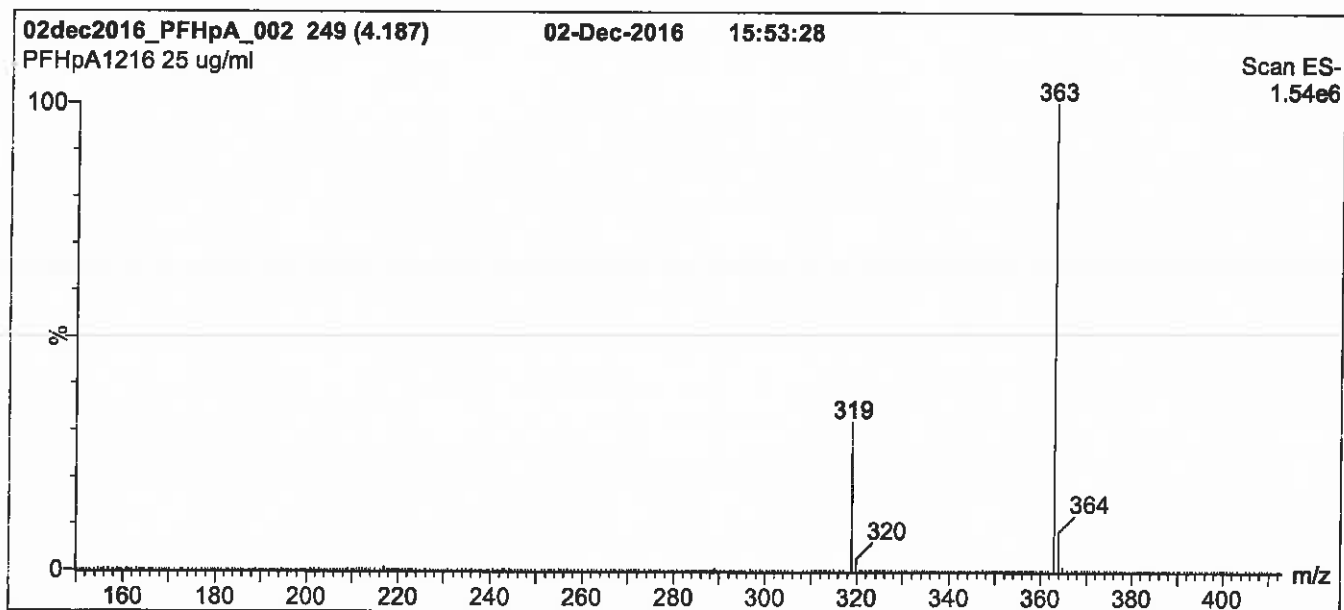
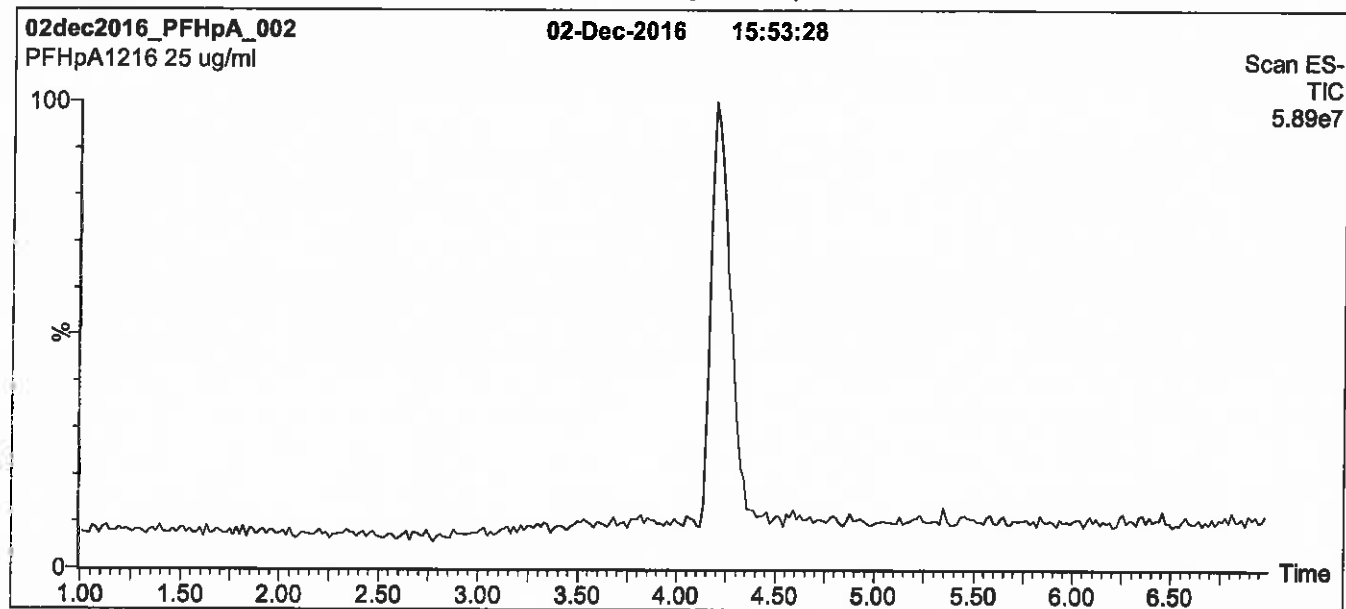
QUALITY MANAGEMENT:

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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: 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

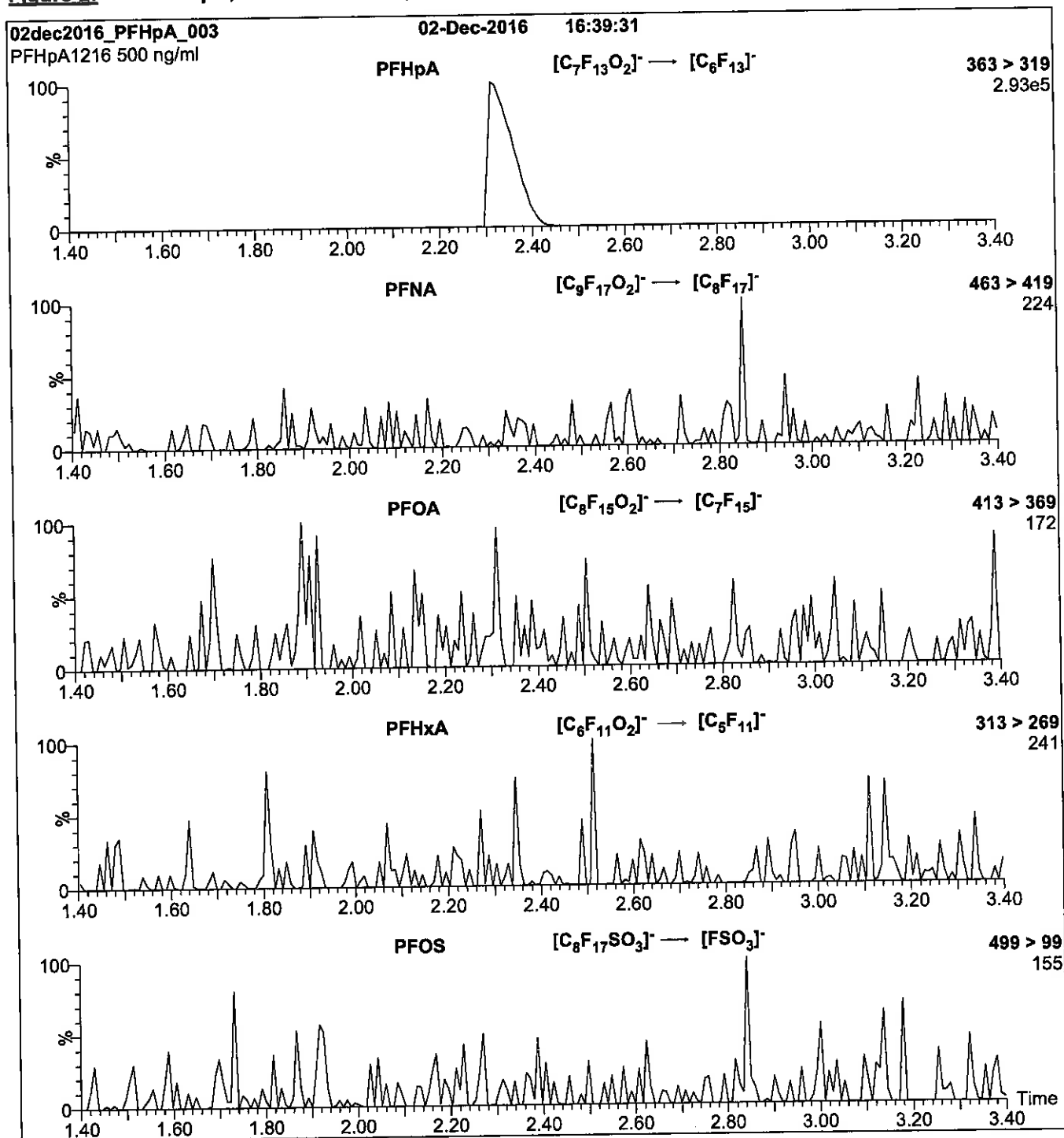
Flow: 300 μ l/min

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: 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

LCPFHxS-br_00005



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE: br-PFHxSK
LOT NUMBER: brPFHxSK0117
CONCENTRATION: 50.0 ± 2.5 µg/ml (total potassium salt)
 45.5 ± 2.3 µg/ml (total PFHxS anion)
SOLVENT(S): Methanol
DATE PREPARED: (mm/dd/yyyy) 01/03/2017
LAST TESTED: (mm/dd/yyyy) 01/04/2017
EXPIRY DATE: (mm/dd/yyyy) 01/04/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorohexanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ¹⁹F-NMR
 Figure 1: LC/MS Data (TIC and Mass Spectrum)
 Figure 2: LC/MS Data (SIR)
 Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% of perfluoro-1-pentanesulfonate and ~ 0.2% of perfluoro-1-octanesulfonate.
- CAS#: 3871-99-6 (for linear isomer; potassium salt).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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 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:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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

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

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

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

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

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

TRACEABILITY:

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:

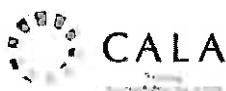
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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	$\text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$\text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{C}(\text{CF}_3)\text{SO}_3^-\text{K}^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$\text{CF}_3\text{CF}_2\text{C}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$\text{CF}_3\text{CF}_2\text{C}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$\text{CF}_3\text{C}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$\text{CF}_3\text{C}(\text{CF}_3)_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$	0.2
7	Other Unidentified Isomers		0.5

* Percent of total perfluorohexanesulfonate isomers only.
** Systematic Name: Potassium perfluorohexane-2-sulfonate.

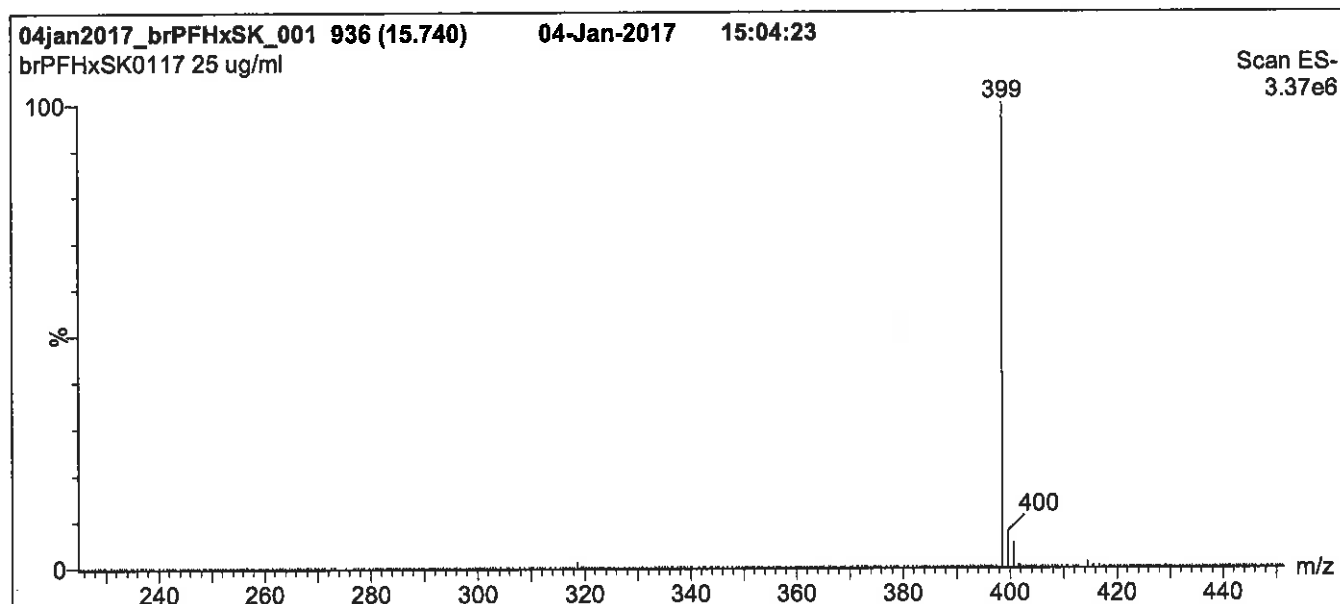
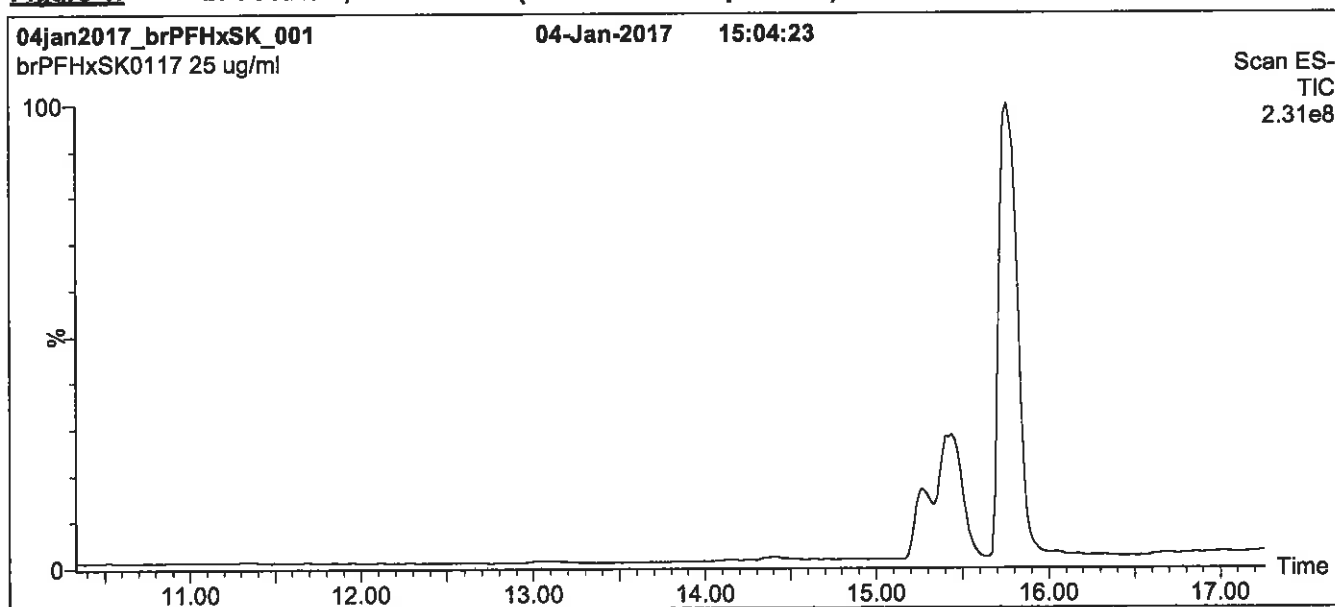
Certified By:


B.G. Chittim

Date: 01/20/2017

(mm/dd/yyyy)

Figure 1: br-PFHxSK; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient

Start: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 20 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)

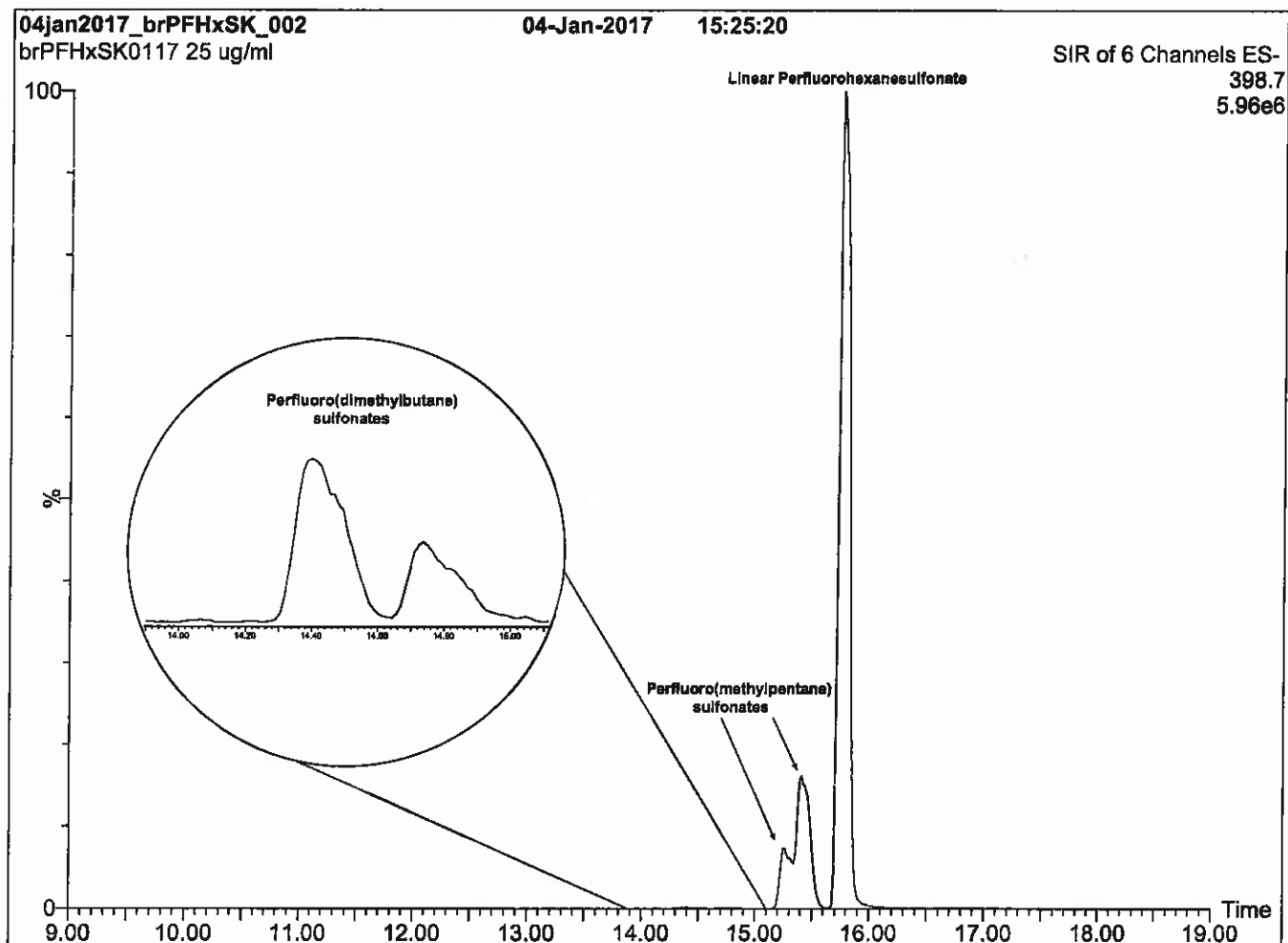
Capillary Voltage (kV) = 3.00

Cone Voltage (V) = 50.00

Cone Gas Flow (l/hr) = 60

Desolvation Gas Flow (l/hr) = 750

Figure 2: br-PFHxSK; LC/MS Data (SIR)



Conditions for Figure 2:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 20 min

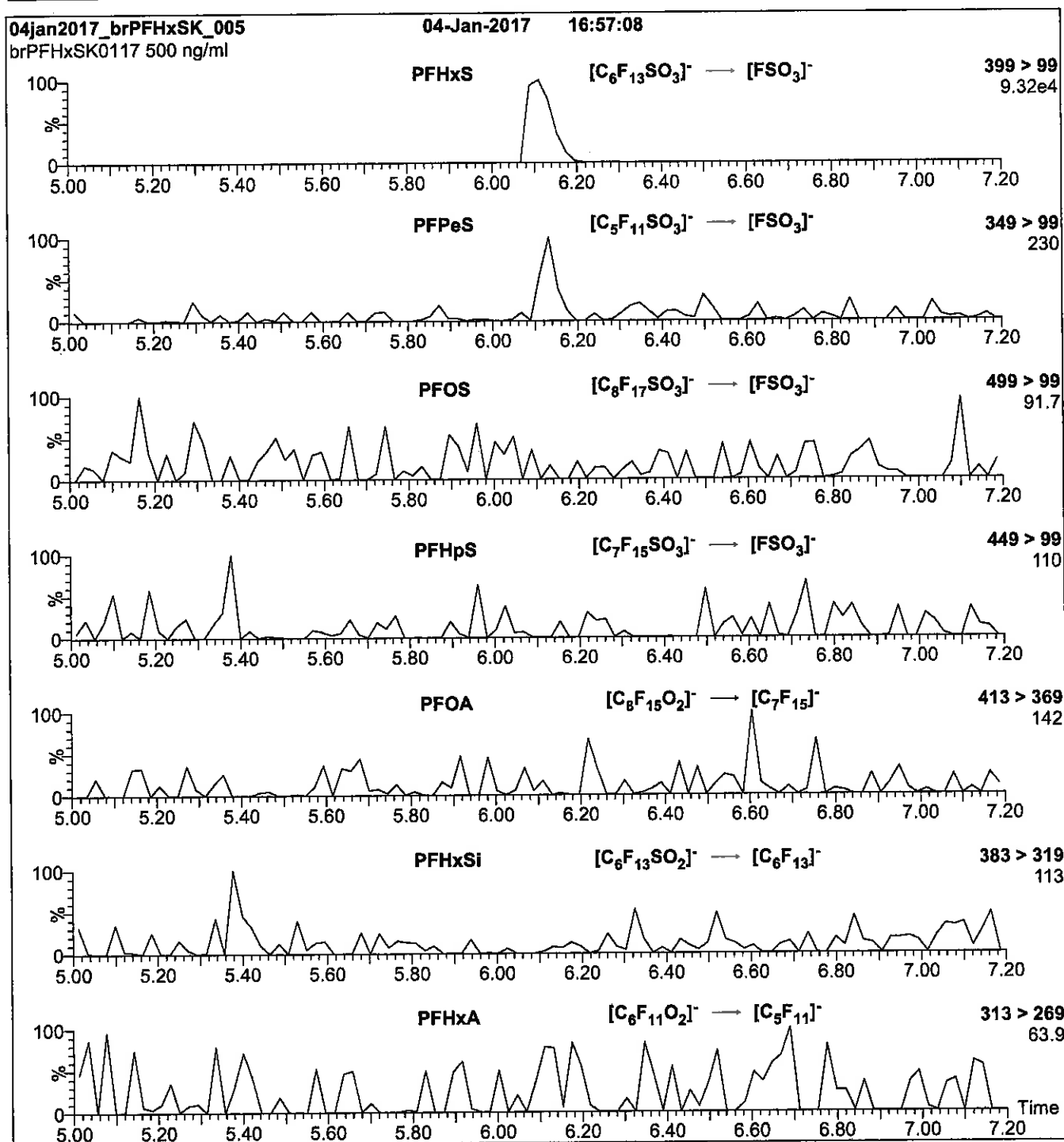
Flow: 300 μ l/min

MS Parameters

Experiment: SIR (6 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = variable (15-62)
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 3: br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 3:

Injection: Direct loop injection
10 μ l (500 ng/ml br-PFHxSK)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFNA_00009

r: 9/21/17 skv



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFNA

LOT NUMBER:

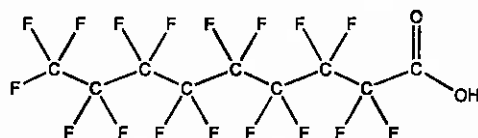
PFNA0717

COMPOUND:

Perfluoro-n-nonanoic acid

STRUCTURE:**CAS #:**

375-95-1

**MOLECULAR FORMULA:** $C_9H_{17}O_2$ **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)

07/20/2017

EXPIRY DATE: (mm/dd/yyyy)

07/20/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA), < 0.1% of perfluoro-n-heptanoic acid (PFHpA), and < 0.1% of perfluoro-n-undecanoic acid (PFUdA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**Certified By:**
B.G. Chittim, General Manager**Date:** 07/24/2017

(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

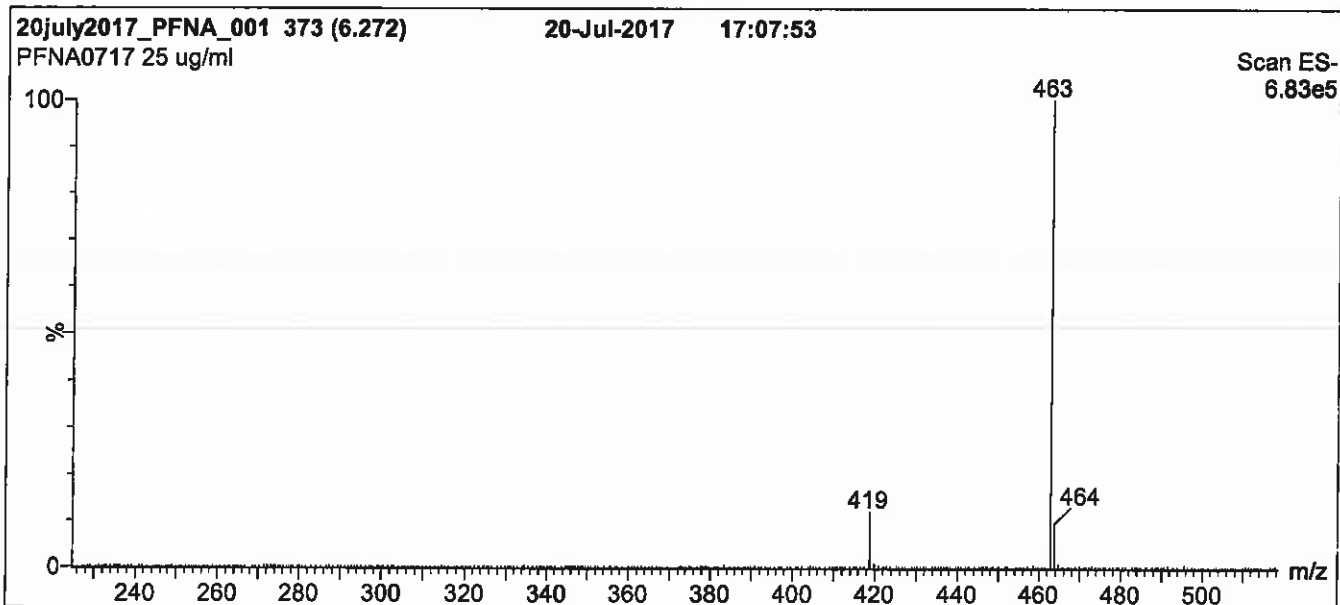
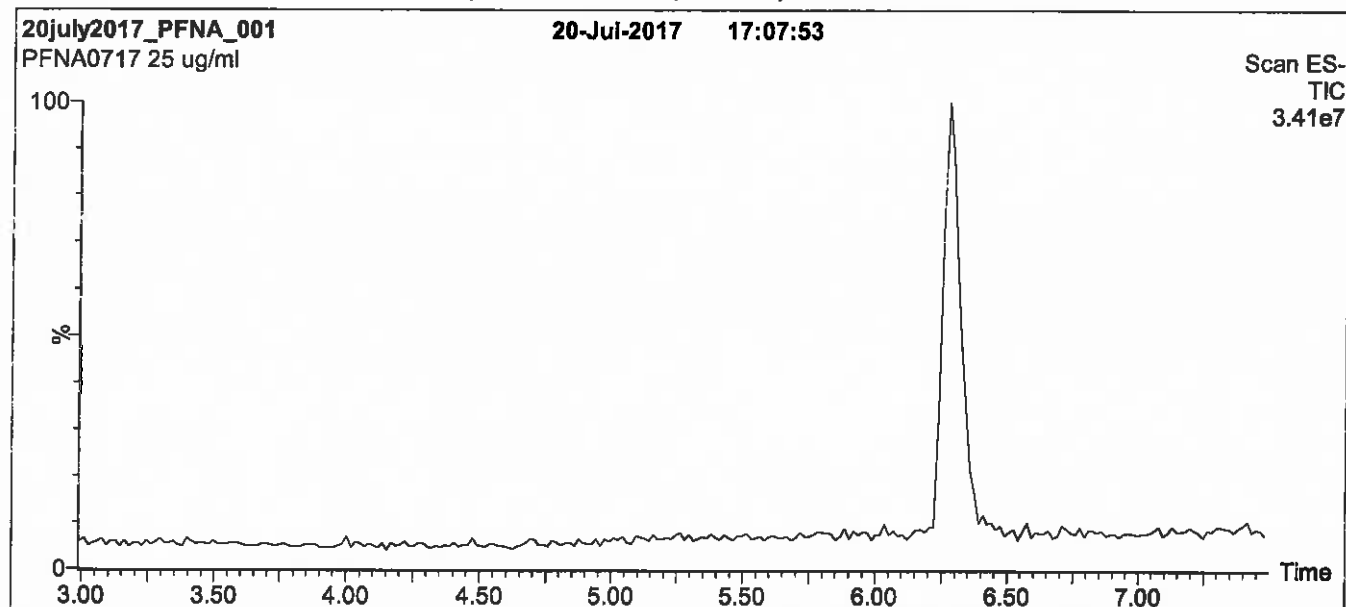
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient

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

Hold for 1 min. Ramp to 90% organic over 7 min and hold
for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)

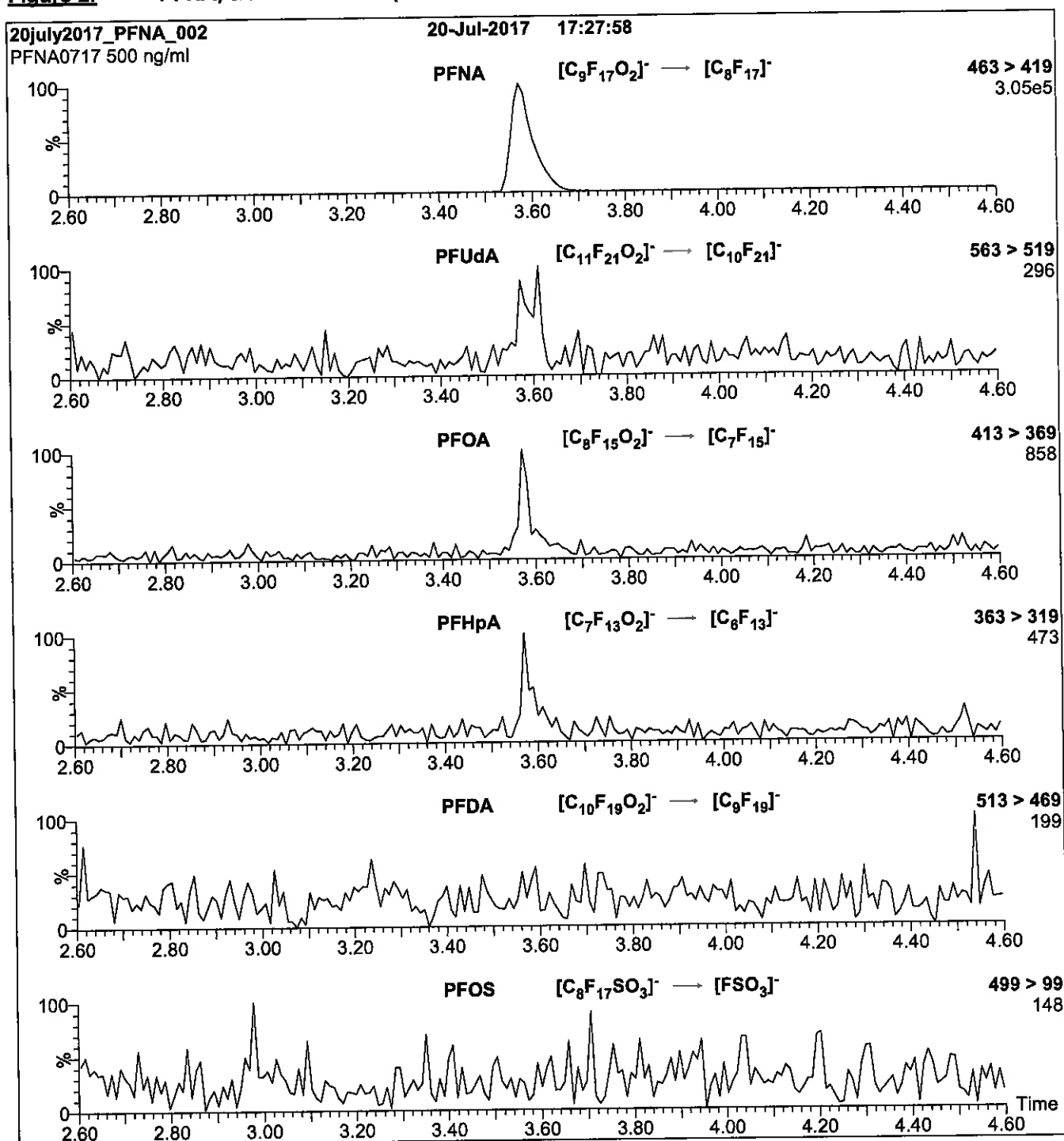
Capillary Voltage (kV) = 2.00

Cone Voltage (V) = 15.00

Cone Gas Flow (l/hr) = 50

Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 11

Reagent

LCPFOA_00010

P: 10/2017 SKV



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFOA

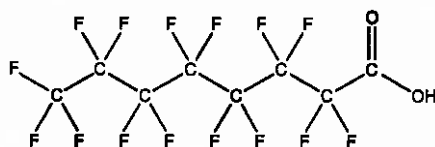
LOT NUMBER: PFOA0917

COMPOUND:

Perfluoro-n-octanoic acid

STRUCTURE:

CAS #: 335-67-1



MOLECULAR FORMULA:

$C_8H_{15}O_2$

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)

09/27/2017

EXPIRY DATE: (mm/dd/yyyy)

09/27/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:


B.G. Chittim, General Manager

Date: 09/28/2017

(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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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 calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

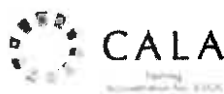
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

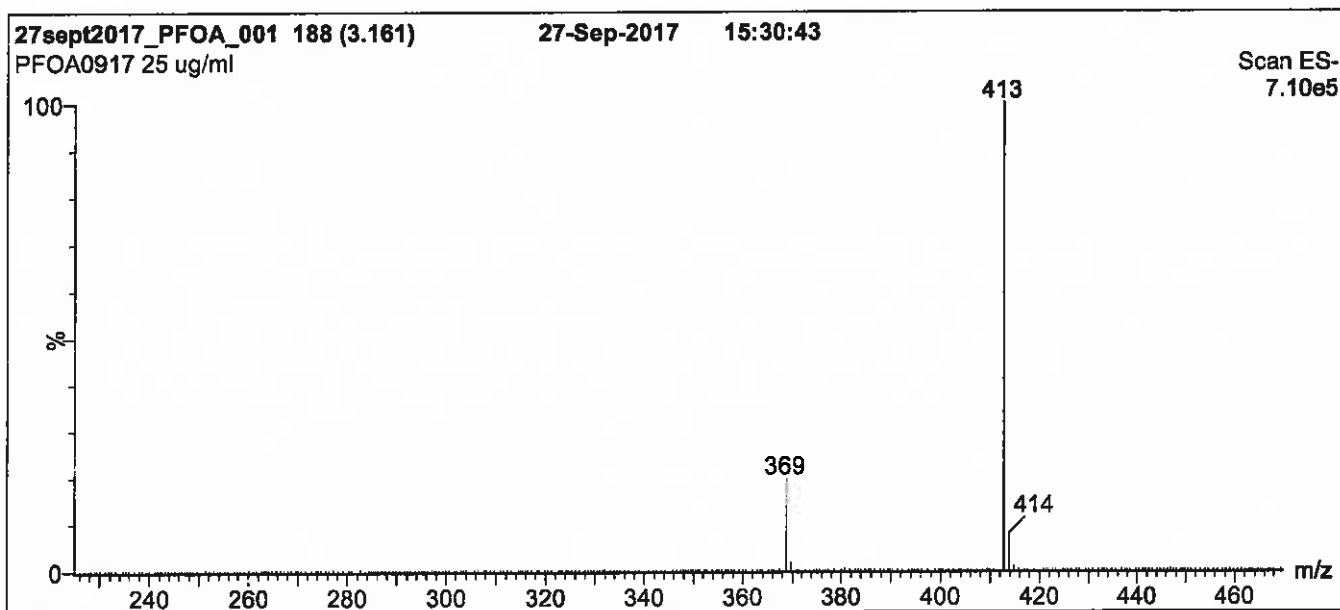
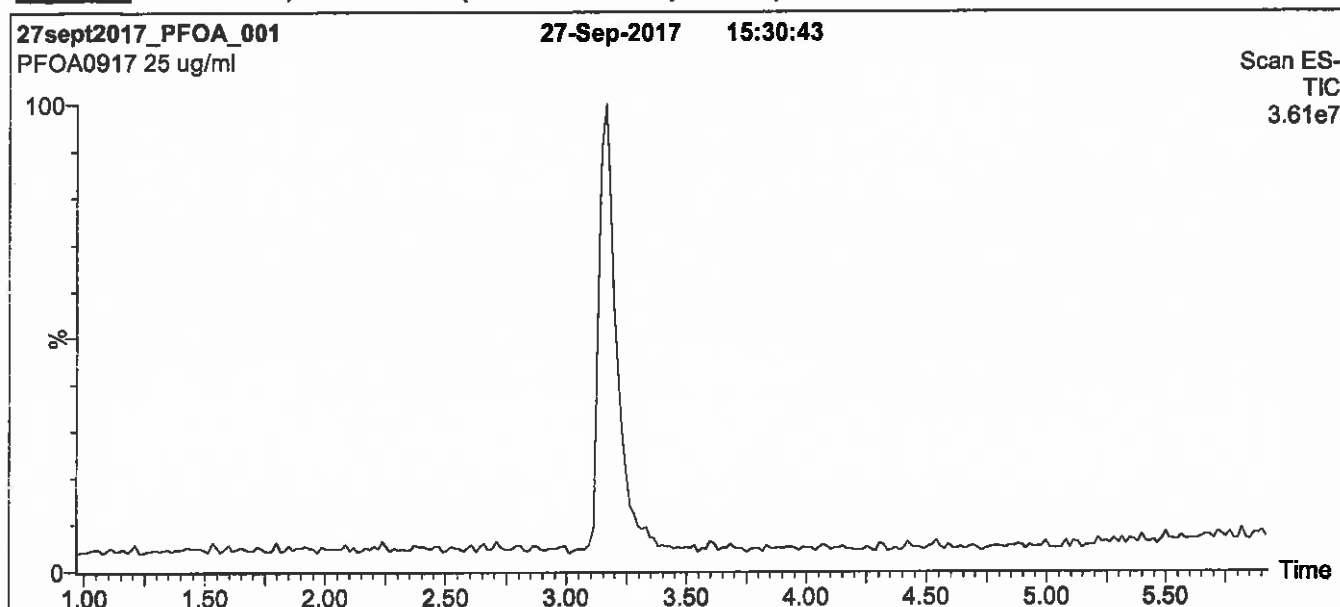
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

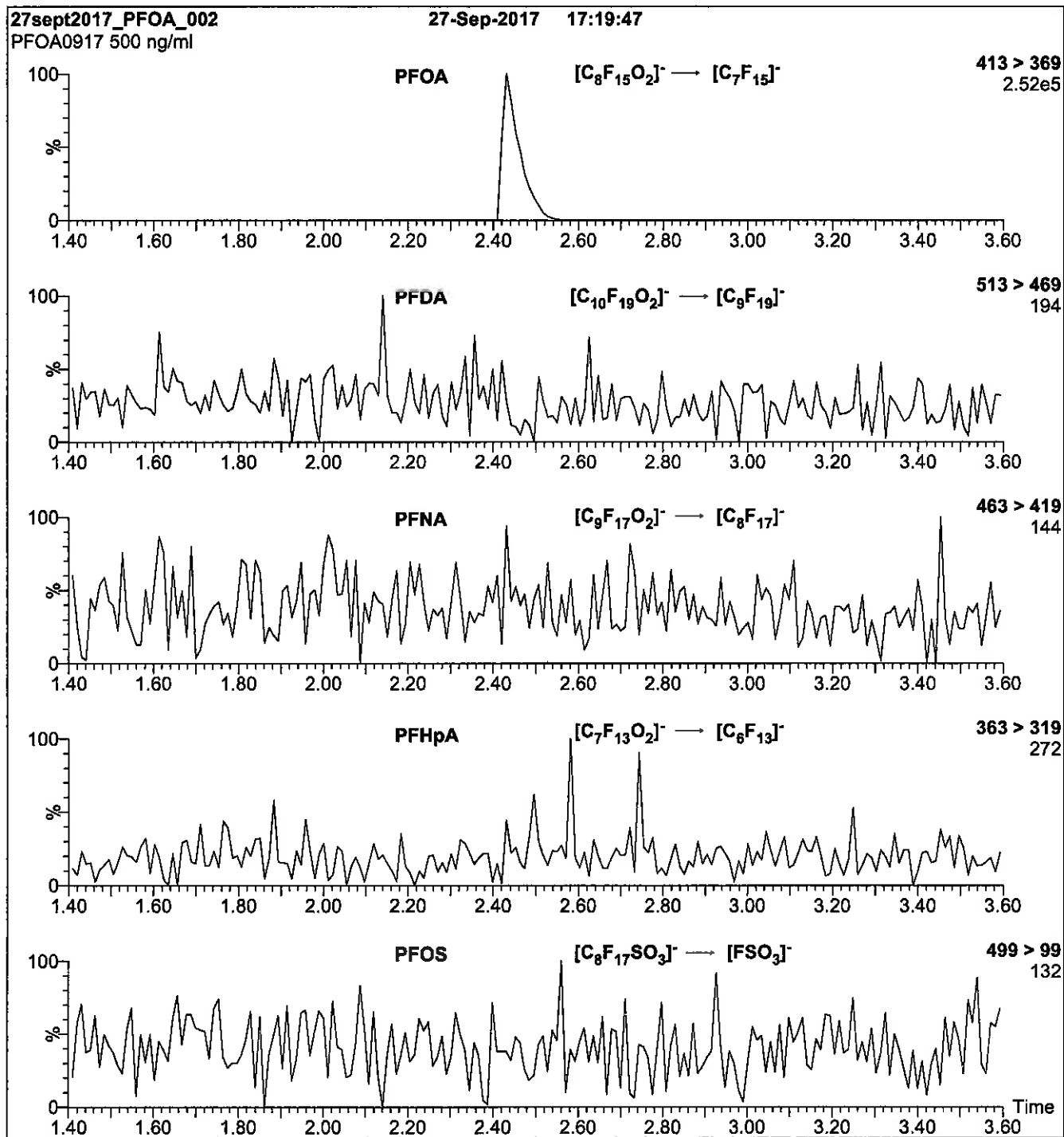
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 11

Reagent

LCPFOS-br_00005

P: 10/20/17 SKV



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE: br-PFOSK
LOT NUMBER: brPFOSK0117
CONCENTRATION: 50 ± 2.5 µg/ml (total potassium salt)
46.4 ± 2.3 µg/ml (total PFOS anion)
SOLVENT(S): Methanol
DATE PREPARED: (mm/dd/yyyy) 01/09/2017
LAST TESTED: (mm/dd/yyyy) 01/12/2017
EXPIRY DATE: (mm/dd/yyyy) 01/12/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorooctanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ¹⁹F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

INTENDED USE:

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

HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

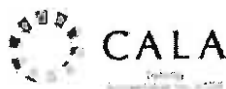
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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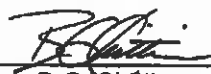
Table A: br-PFOSK; Isomeric Components and Percent Composition (by ¹⁹F-NMR)*

Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-octanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₃ SO ₃ ⁻ K ⁺	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF(CF ₃)SO ₃ ⁻ K ⁺	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF(CF ₃)CF ₂ SO ₃ ⁻ K ⁺	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF(CF ₃)CF ₂ CF ₂ SO ₃ ⁻ K ⁺	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF(CF ₃)CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF(CF ₃)CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF(CF ₃)CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₂ CF(CF ₃)CF ₂ CF ₂ SO ₃ ⁻ K ⁺	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF(CF ₃)CF(CF ₃)CF ₂ CF ₂ SO ₃ ⁻ K ⁺	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF(CF ₃)CF ₂ CF(CF ₃)CF ₂ SO ₃ ⁻ K ⁺	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.

** Systematic Name: Potassium perfluorooctane-2-sulfonate.

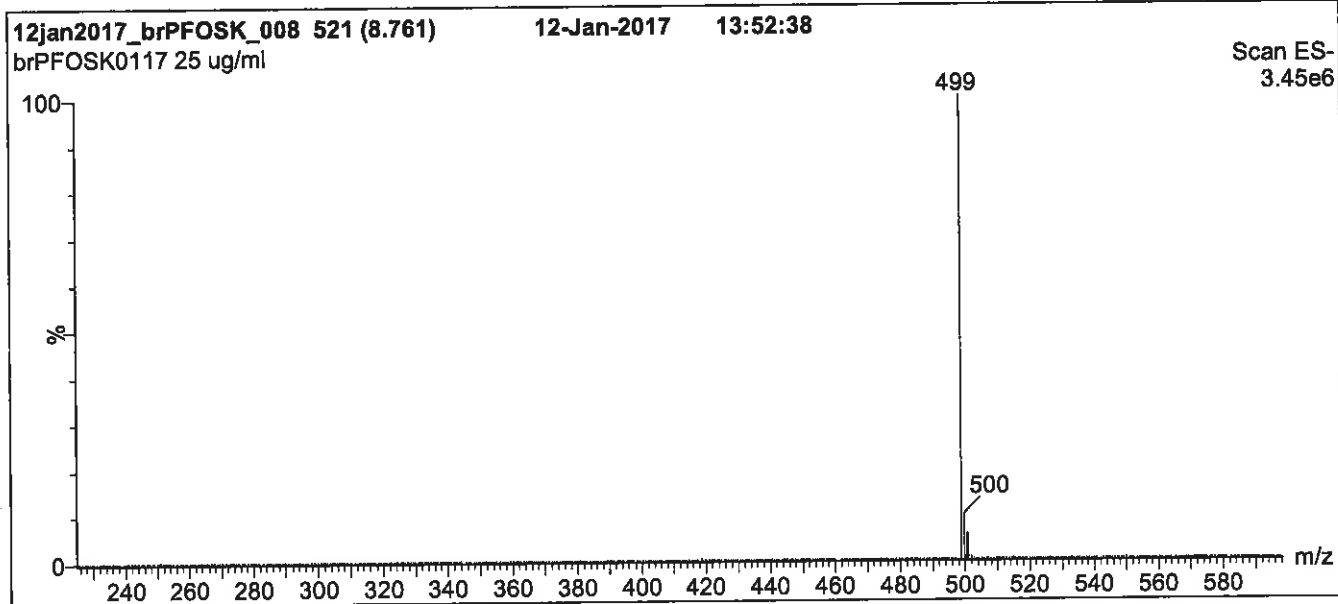
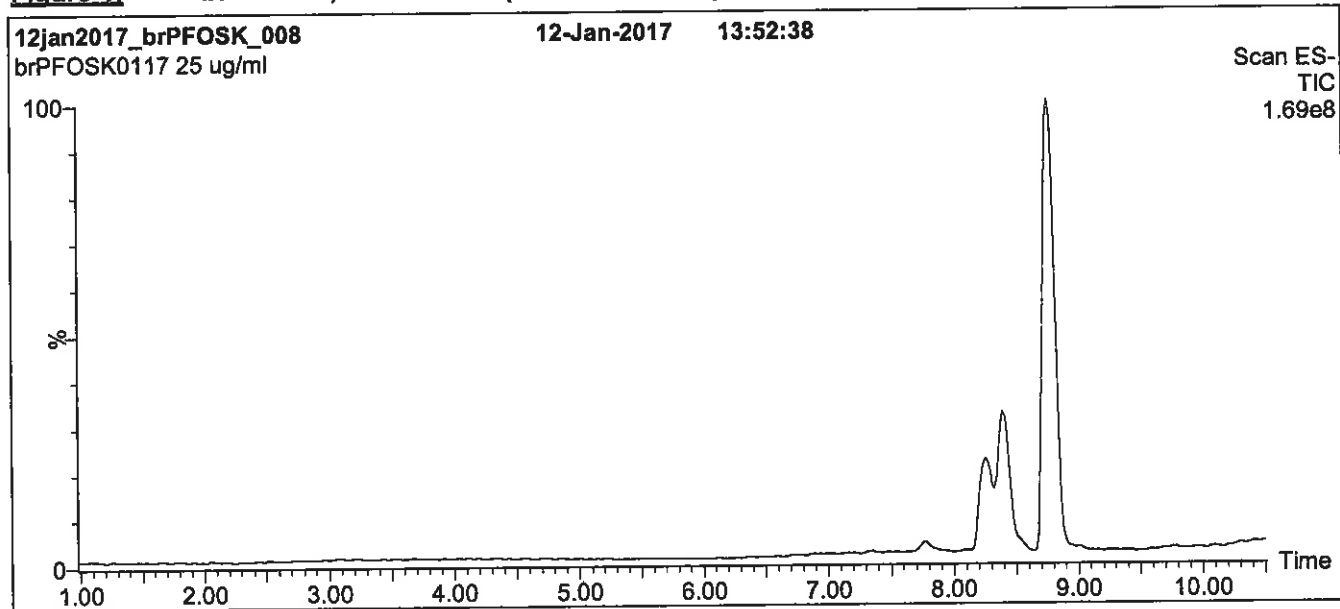
Certified By:


B.G. Chittim

Date: 01/20/2017

(mm/dd/yyyy)

Figure 1: br-PFOSK; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

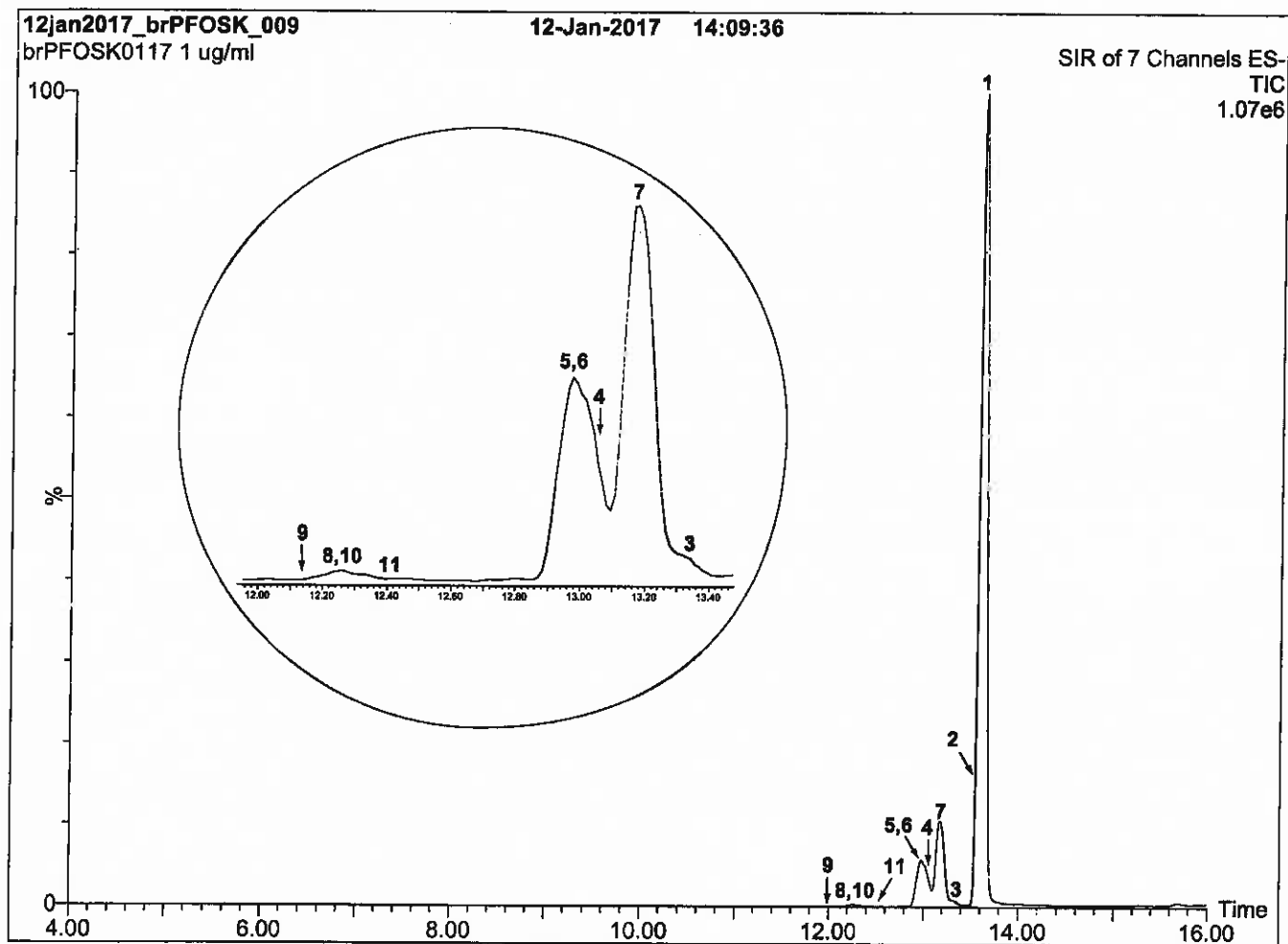
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

Figure 2: br-PFOSK; LC/MS Data (SIR)



Conditions for Figure 2:

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

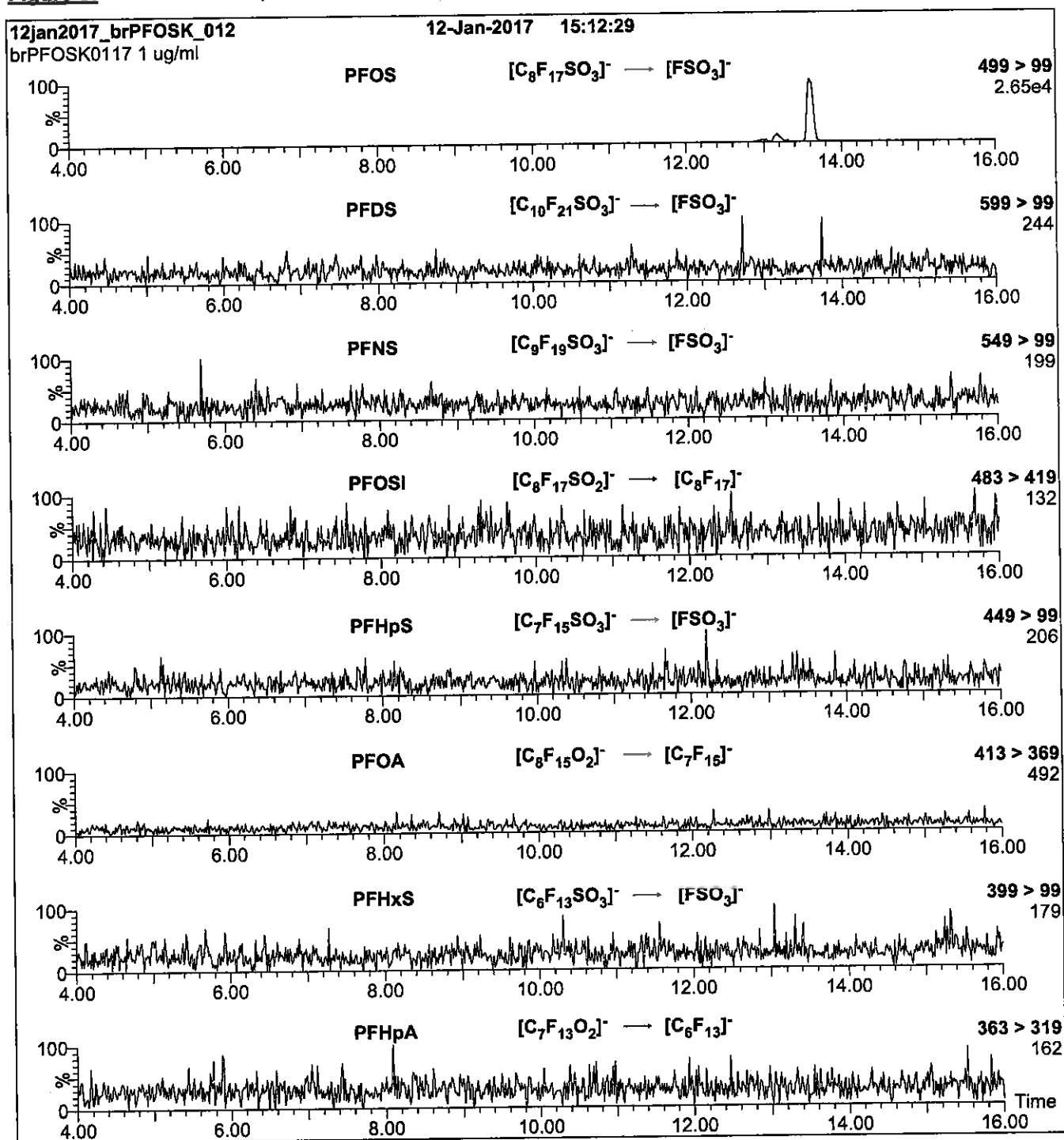
Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈ (1.7 μ m, 2.1 x 100 mm)
Injection: 1.0 μ g/ml of br-PFOSK
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H₂O (both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min
Flow: 300 μ l/min

MS Conditions:

SIR (ES)
Source = 110 °C
Desolvation = 325 °C
Cone Voltage = 60V

Figure 3: br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-3

Collision Energy (eV) = 11-50 (variable)

Method 537 DOD

Perfluorinated Alkyl Acids (LC/MS)
by Method 537 DOD

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1

SDG No.: _____

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WGNA-080618-RW-038 6	320-41846-1	96	105
WGNA-080618-FRB-03 86	320-41846-2	95	102
WGNA-080618-RW-041 3	320-41846-3	99	106
WGNA-080618-RW-041 3 RA	320-41846-3 RA	97	103
WGNA-080618-FRB-04 13	320-41846-4	102	105
WGNA-080618-RW-053 3	320-41846-5	99	100
WGNA-080618-FRB-05 33	320-41846-6	100	107
WGNA-080618-FRB-05 33 RA	320-41846-6 RA	100	110
WGNA-080618-RW-402 4	320-41846-7	95	104
WGNA-080618-FRB-40 24	320-41846-8	101	108
NAWC-080618-RW-032	320-41846-9	79	102
NAWC-080618-FRB-03 2	320-41846-10	97	99
NAWC-080618-RW-272	320-41846-11	92	103
NAWC-080618-FRB-27 2	320-41846-12	94	101
WGNA-080618-DUP-43	320-41846-13	101	111
	MB 320-240201/1-A	98	105
	LCS 320-240201/2-A	106	109
	LCSD 320-240201/3-A	92	110

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA

QC LIMITS
70-130
70-130

Column to be used to flag recovery values

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.08.18_537A_029.d
 Lab ID: LCS 320-240201/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	220	236	107	70-130	
Perfluorooctanoic acid (PFOA)	110	115	105	70-130	
Perfluorononanoic acid (PFNA)	110	115	105	70-130	
Perfluorohexanesulfonic acid (PFHxS)	168	180	107	70-130	
Perfluoroheptanoic acid (PFHpA)	54.0	59.5	110	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	467	93	70-130	

Column to be used to flag recovery and RPD values

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.08.18_537A_030.d
 Lab ID: LCSD 320-240201/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	220	236	108	0	30	70-130	
Perfluorooctanoic acid (PFOA)	110	112	101	3	30	70-130	
Perfluorononanoic acid (PFNA)	110	112	102	3	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	168	180	107	0	30	70-130	
Perfluoroheptanoic acid (PFHpA)	54.0	54.9	102	8	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	404	81	14	30	70-130	

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab File ID: 2018.08.18_537A_028.d Lab Sample ID: MB 320-240201/1-A
 Matrix: Water Date Extracted: 08/16/2018 08:12
 Instrument ID: A8_N Date Analyzed: 08/19/2018 01:16
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-240201/2-A	2018.08.18_537A_029.d	08/19/2018 01:20
	LCSD 320-240201/3-A	2018.08.18_537A_030.d	08/19/2018 01:25
WGNA-080618-RW-0386	320-41846-1	2018.08.18_537A_031.d	08/19/2018 01:30
WGNA-080618-FRB-0386	320-41846-2	2018.08.18_537A_032.d	08/19/2018 01:34
WGNA-080618-RW-0413	320-41846-3	2018.08.18_537A_033.d	08/19/2018 01:39
WGNA-080618-FRB-0413	320-41846-4	2018.08.18_537A_034.d	08/19/2018 01:44
WGNA-080618-RW-0533	320-41846-5	2018.08.18_537A_035.d	08/19/2018 01:48
WGNA-080618-FRB-0533	320-41846-6	2018.08.18_537A_036.d	08/19/2018 01:53
WGNA-080618-RW-4024	320-41846-7	2018.08.18_537A_037.d	08/19/2018 01:58
WGNA-080618-FRB-4024	320-41846-8	2018.08.18_537A_040.d	08/19/2018 02:12
NAWC-080618-RW-032	320-41846-9	2018.08.18_537A_041.d	08/19/2018 02:16
NAWC-080618-FRB-032	320-41846-10	2018.08.18_537A_042.d	08/19/2018 02:21
NAWC-080618-RW-272	320-41846-11	2018.08.18_537A_043.d	08/19/2018 02:26
NAWC-080618-FRB-272	320-41846-12	2018.08.18_537A_044.d	08/19/2018 02:30
WGNA-080618-DUP-43	320-41846-13	2018.08.18_537A_045.d	08/19/2018 02:35
WGNA-080618-RW-0413 RA	320-41846-3 RA	2018.08.20_537A_007.d	08/20/2018 16:38
WGNA-080618-FRB-0533 RA	320-41846-6 RA	2018.08.20_537A_008.d	08/20/2018 16:43

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Instrument ID: A8_N Calibration Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 08/15/2018 18:44
 Calibration ID: 40641

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		999840	1.85	2469394	2.11		
UPPER LIMIT		1499760	2.35	3704091	2.61		
LOWER LIMIT		499920	1.35	1234697	1.61		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 320-240166/9		1006603	1.84	2388436	2.10		
ICV 320-240166/11		1022273	1.84	2551643	2.10		
CCVL 320-240726/1		1133505	1.85	2726575	2.11		
CCV 320-240731/24 CCVIS		993768	1.84	2515780	2.09		
MB 320-240201/1-A		1045030	1.84	2549261	2.09		
LCS 320-240201/2-A		1136401	1.84	2944707	2.09		
LCSD 320-240201/3-A		1253302	1.84	3176488	2.09		
320-41846-1	WGNA-080618-RW-0386	1183795	1.84	2982852	2.09		
320-41846-2	WGNA-080618-FRB-0386	1095539	1.84	2690154	2.09		
320-41846-3	WGNA-080618-RW-0413	1527332Q	1.84	3844702Q	2.09		
320-41846-4	WGNA-080618-FRB-0413	1215966	1.84	2999791	2.09		
320-41846-5	WGNA-080618-RW-0533	1169587	1.84	2901574	2.09		
320-41846-6	WGNA-080618-FRB-0533	1782008Q	1.84	4358112Q	2.09		
320-41846-7	WGNA-080618-RW-4024	1117019	1.84	2750630	2.09		
CCV 320-240731/36 CCVIS		1017295	1.84	2573081	2.09		
CCV 320-240733/36 CCVIS		1017295	1.84	2573081	2.09		
320-41846-8	WGNA-080618-FRB-4024	1134575	1.84	2791314	2.09		
320-41846-9	NAWC-080618-RW-032	1183711	1.83	2913857	2.09		
320-41846-10	NAWC-080618-FRB-032	1171838	1.84	2887738	2.09		
320-41846-11	NAWC-080618-RW-272	1176201	1.84	2878024	2.09		
320-41846-12	NAWC-080618-FRB-272	1246847	1.84	2945506	2.09		
320-41846-13	WGNA-080618-DUP-43	1108290	1.84	2766230	2.09		
CCV 320-240733/44 CCVIS		1023857	1.83	2550677	2.09		
CCVL 320-240968/1		1080920	1.86	2508240	2.11		
CCV 320-240968/2 CCVIS		1030793	1.86	2439962	2.11		
320-41846-3 RA	WGNA-080618-RW-0413 RA	1436509	1.85	3491415	2.11		
320-41846-6 RA	WGNA-080618-FRB-0533 RA	1578837Q	1.85	3922335Q	2.11		

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 50%-150% of internal standard area

RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Instrument ID: A8_N Calibration Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3 (mm) Calibration End Date: 08/15/2018 18:44
 Calibration ID: 40641

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT	999840	1.85	2469394	2.11		
UPPER LIMIT	1499760	2.35	3704091	2.61		
LOWER LIMIT	499920	1.35	1234697	1.61		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCV 320-240968/10 CCVIS		997051 1.85	2521958 2.10			

13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS

Area Limit = 50%-150% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Sample No.: CCV 320-240731/24 Date Analyzed: 08/19/2018 01:06
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.18_537A_026 Heated Purge: (Y/N) N
 Calibration ID: 40641

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		993768	1.84	2515780	2.09		
UPPER LIMIT		1391275	2.34	3522092	2.59		
LOWER LIMIT		695638	1.34	1761046	1.59		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-240201/1-A		1045030	1.84	2549261	2.09		
LCS 320-240201/2-A		1136401	1.84	2944707	2.09		
LCSD 320-240201/3-A		1253302	1.84	3176488	2.09		
320-41846-1	WGNA-080618-RW-0386	1183795	1.84	2982852	2.09		
320-41846-2	WGNA-080618-FRB-0386	1095539	1.84	2690154	2.09		
320-41846-3	WGNA-080618-RW-0413	1527332Q	1.84	3844702Q	2.09		
320-41846-4	WGNA-080618-FRB-0413	1215966	1.84	2999791	2.09		
320-41846-5	WGNA-080618-RW-0533	1169587	1.84	2901574	2.09		
320-41846-6	WGNA-080618-FRB-0533	1782008Q	1.84	4358112Q	2.09		
320-41846-7	WGNA-080618-RW-4024	1117019	1.84	2750630	2.09		

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area

RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Sample No.: CCV 320-240731/36 Date Analyzed: 08/19/2018 02:02
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.18_537A_038 Heated Purge: (Y/N) N
 Calibration ID: 40641

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1017295	1.84	2573081	2.09		
UPPER LIMIT		1424213	2.34	3602313	2.59		
LOWER LIMIT		712107	1.34	1801157	1.59		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-240201/1-A		1045030	1.84	2549261	2.09		
LCS 320-240201/2-A		1136401	1.84	2944707	2.09		
LCSD 320-240201/3-A		1253302	1.84	3176488	2.09		
320-41846-1	WGNA-080618-RW-0386	1183795	1.84	2982852	2.09		
320-41846-2	WGNA-080618-FRB-0386	1095539	1.84	2690154	2.09		
320-41846-3	WGNA-080618-RW-0413	1527332Q	1.84	3844702Q	2.09		
320-41846-4	WGNA-080618-FRB-0413	1215966	1.84	2999791	2.09		
320-41846-5	WGNA-080618-RW-0533	1169587	1.84	2901574	2.09		
320-41846-6	WGNA-080618-FRB-0533	1782008Q	1.84	4358112Q	2.09		
320-41846-7	WGNA-080618-RW-4024	1117019	1.84	2750630	2.09		

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area

RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Sample No.: CCV 320-240733/36 Date Analyzed: 08/19/2018 02:02
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.18_537A_038 Heated Purge: (Y/N) N
 Calibration ID: 40641

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	1017295	1.84	2573081	2.09		
UPPER LIMIT	1424213	2.34	3602313	2.59		
LOWER LIMIT	712107	1.34	1801157	1.59		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-41846-8	WGNA-080618-FRB-4024	1134575	1.84	2791314	2.09	
320-41846-9	NAWC-080618-RW-032	1183711	1.83	2913857	2.09	
320-41846-10	NAWC-080618-FRB-032	1171838	1.84	2887738	2.09	
320-41846-11	NAWC-080618-RW-272	1176201	1.84	2878024	2.09	
320-41846-12	NAWC-080618-FRB-272	1246847	1.84	2945506	2.09	
320-41846-13	WGNA-080618-DUP-43	1108290	1.84	2766230	2.09	

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area

RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Sample No.: CCV 320-240733/44 Date Analyzed: 08/19/2018 02:40
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.18_537A_046 Heated Purge: (Y/N) N
 Calibration ID: 40641

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	1023857	1.83	2550677	2.09		
UPPER LIMIT	1433400	2.33	3570948	2.59		
LOWER LIMIT	716700	1.33	1785474	1.59		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-41846-8	WGNA-080618-FRB-4024	1134575	1.84	2791314	2.09	
320-41846-9	NAWC-080618-RW-032	1183711	1.83	2913857	2.09	
320-41846-10	NAWC-080618-FRB-032	1171838	1.84	2887738	2.09	
320-41846-11	NAWC-080618-RW-272	1176201	1.84	2878024	2.09	
320-41846-12	NAWC-080618-FRB-272	1246847	1.84	2945506	2.09	
320-41846-13	WGNA-080618-DUP-43	1108290	1.84	2766230	2.09	

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area

RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Sample No.: CCV 320-240968/2 Date Analyzed: 08/20/2018 16:24
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.20_537A_004 Heated Purge: (Y/N) N
 Calibration ID: 40641

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	1030793	1.86	2439962	2.11		
UPPER LIMIT	1443110	2.36	3415947	2.61		
LOWER LIMIT	721555	1.36	1707973	1.61		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-41846-3 RA	WGNA-080618-RW-0413 RA	1436509	1.85	3491415	2.11	
320-41846-6 RA	WGNA-080618-FRB-0533 RA	1578837Q	1.85	3922335Q	2.11	

13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Sample No.: CCV 320-240968/10 Date Analyzed: 08/20/2018 17:01
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.20_537A_012 Heated Purge: (Y/N) N
 Calibration ID: 40641

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	997051	1.85	2521958	2.10		
UPPER LIMIT	1395871	2.35	3530741	2.60		
LOWER LIMIT	697936	1.35	1765371	1.60		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-41846-3 RA	WGNA-080618-RW-0413 RA	1436509	1.85	3491415	2.11	
320-41846-6 RA	WGNA-080618-FRB-0533 RA	1578837Q	1.85	3922335Q	2.11	

13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-RW-0386</u>	Lab Sample ID: <u>320-41846-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_031.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 10:10</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>278.4 (mL)</u>	Date Analyzed: <u>08/19/2018 01:30</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240731</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	40		36	14	6.1
335-67-1	Perfluorooctanoic acid (PFOA)	22		18	7.2	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	18	J	27	11	4.9
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	J	9.0	3.6	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	14	J	81	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	105		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_031.d
 Lims ID: 320-41846-A-1-A
 Client ID: WGNA-080618-RW-0386
 Sample Type: Client
 Inject. Date: 19-Aug-2018 01:30:01 ALS Bottle#: 21 Worklist Smp#: 29
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41846-a-1-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK026

First Level Reviewer: barnettj

Date: 20-Aug-2018 10:43:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	461432	3.88		722	
298.90 > 99.00	1.381	1.381	0.0	1.000	312922		1.47(0.00-0.00)	522	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.502	0.0	1.000	1179852	9.59		9923	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.654	1.646	0.008	1.000	134435	1.07		21.2	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.654	1.646	0.008	1.000	867616	5.04		376	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.836	0.0		1183795	10.0		9647	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.844	1.836	0.008	1.000	773966	6.00		73.6	
413.00 > 169.00	1.844	1.836	0.008	1.000	473161		1.64(0.00-0.00)	782	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.094	0.0		2982852	28.7		3202	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.094	2.109	-0.015	1.000	1255342	11.2		674	
499.00 > 99.00	2.094	2.109	-0.015	1.000	241948		5.19(0.00-0.00)	219	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	985246	10.5		7107	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_031.d

Injection Date: 19-Aug-2018 01:30:01

Instrument ID: A8_N

Lims ID: 320-41846-A-1-A

Lab Sample ID: 320-41846-1

Client ID: WGNA-080618-RW-0386

Operator ID: SACINSTLCMS01

ALS Bottle#: 21

Worklist Smp#: 29

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

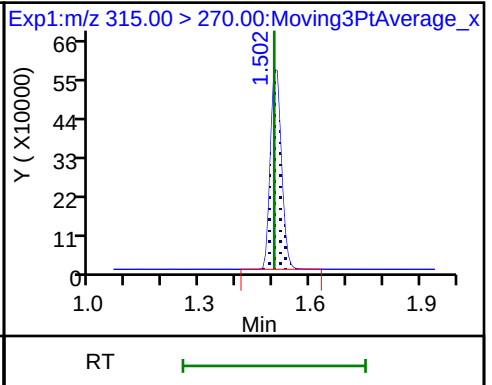
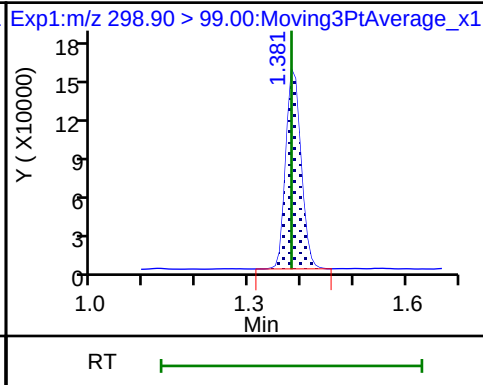
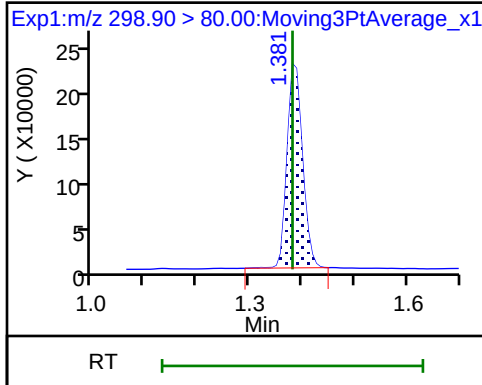
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

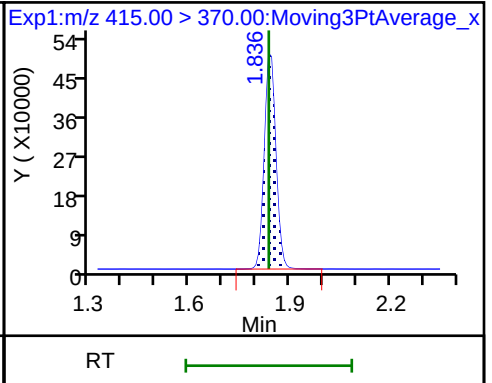
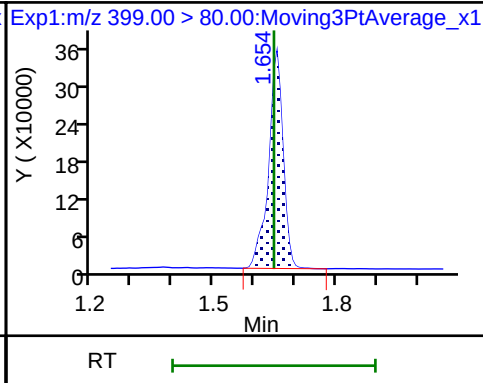
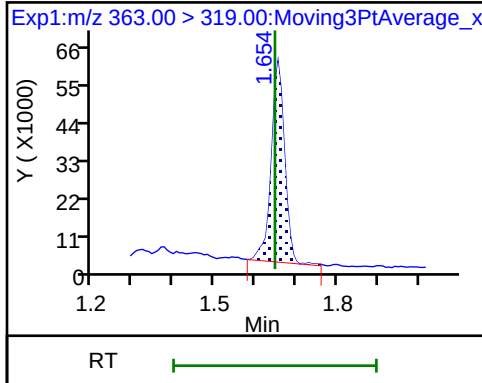
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

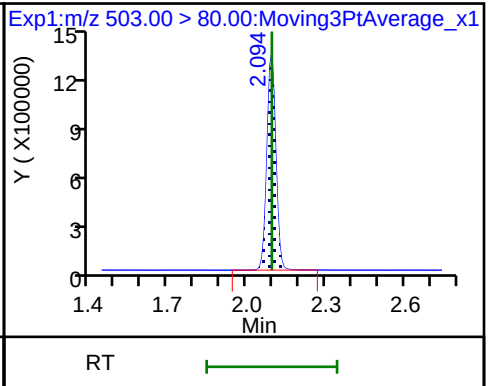
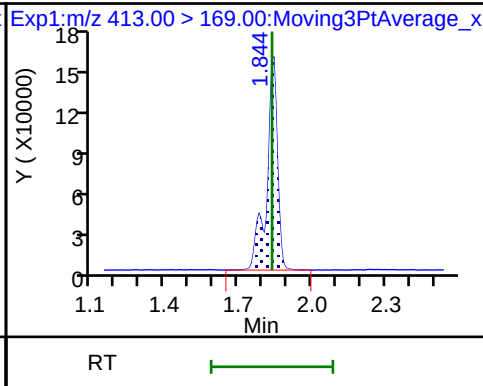
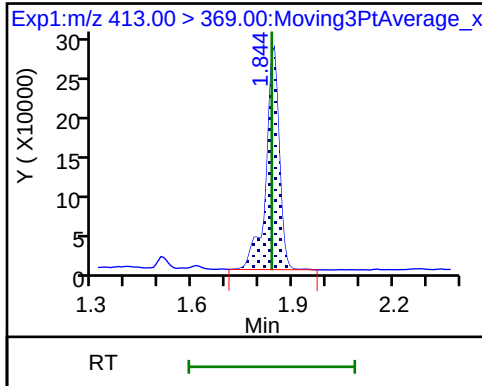
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

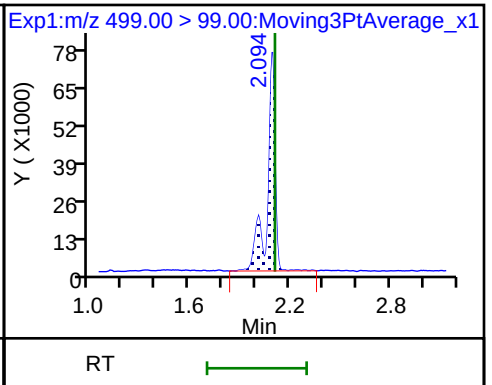
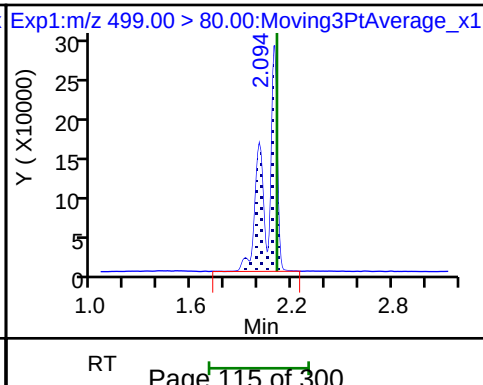
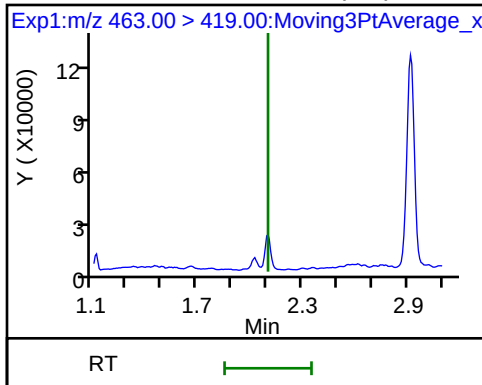
* 7 13C4 PFOS



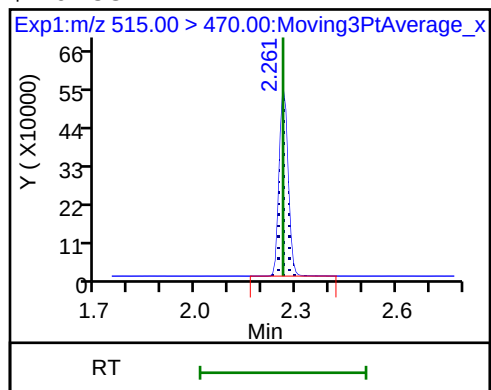
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_031.d
Lims ID: 320-41846-A-1-A
Client ID: WGNA-080618-RW-0386
Sample Type: Client
Inject. Date: 19-Aug-2018 01:30:01 ALS Bottle#: 21 Worklist Smp#: 29
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41846-a-1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
Column 1 : Det: EXP1
Process Host: XAWRK026

First Level Reviewer: barnettj

Date: 20-Aug-2018 10:43:45

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.59	95.89
\$ 10 13C2 PFDA	10.0	10.5	105.07

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-FRB-0386</u>	Lab Sample ID: <u>320-41846-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_032.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 10:05</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>258.6(mL)</u>	Date Analyzed: <u>08/19/2018 01:34</u>
Con. Extract Vol.: <u>1.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240731</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	7.7	U	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.7	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	102		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_032.d
 Lims ID: 320-41846-B-2-A
 Client ID: WGNA-080618-FRB-0386
 Sample Type: Client
 Inject. Date: 19-Aug-2018 01:34:42 ALS Bottle#: 22 Worklist Smp#: 30
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41846-b-2-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.502	0.0	1.000	1076884	9.46		9900	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.836	0.0		1095539	10.0		9455	
* 7 13C4 PFOS									
503.00 > 80.00	2.086	2.094	-0.008		2690154	28.7		6282	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	881610	10.2		6269	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_032.d

Injection Date: 19-Aug-2018 01:34:42

Instrument ID: A8_N

Lims ID: 320-41846-B-2-A

Lab Sample ID: 320-41846-2

Client ID: WGNA-080618-FRB-0386

Operator ID: SACINSTLCMS01

ALS Bottle#: 22

Worklist Smp#: 30

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

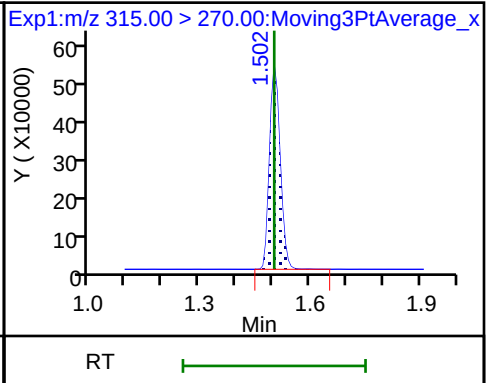
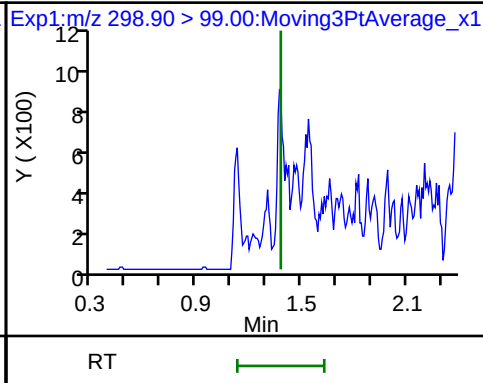
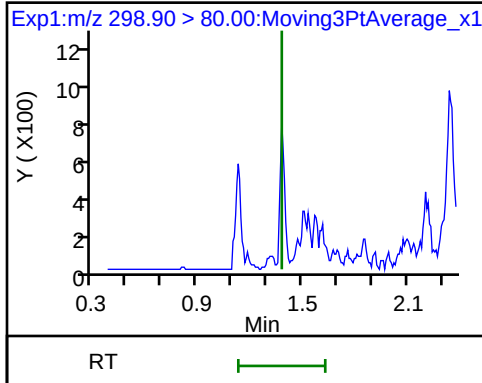
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

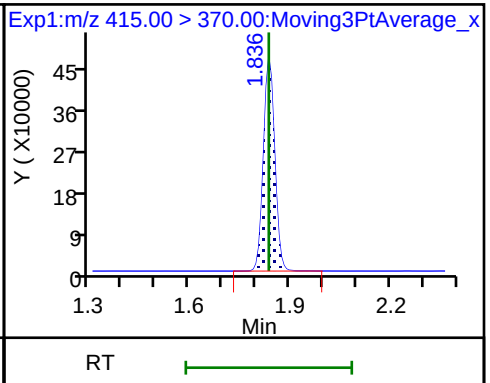
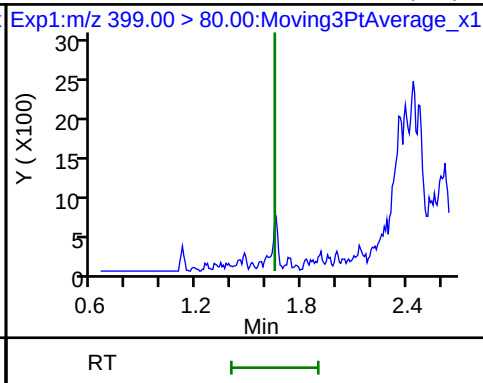
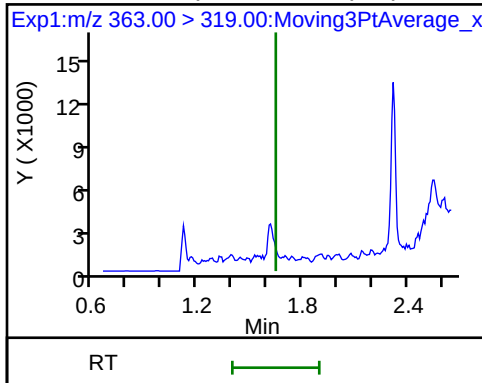
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid (ND)

3 Perfluorohexanesulfonic acid (ND)

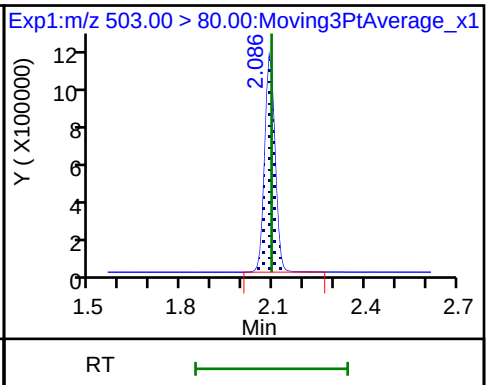
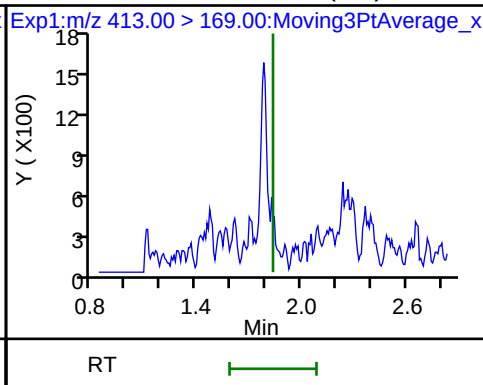
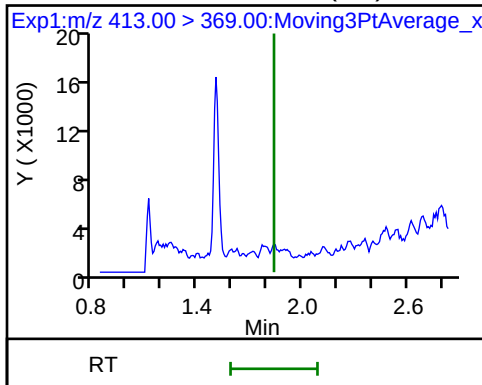
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

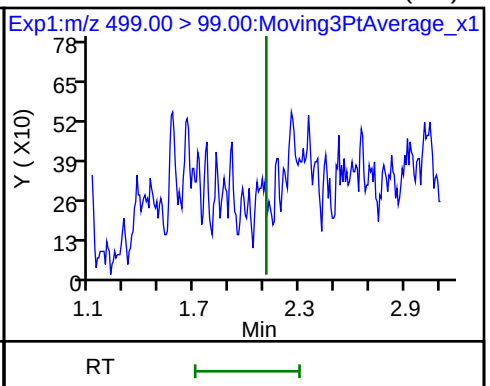
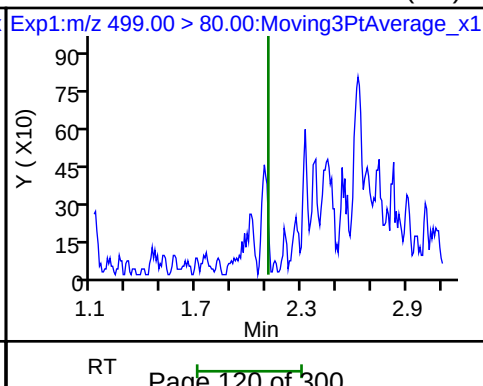
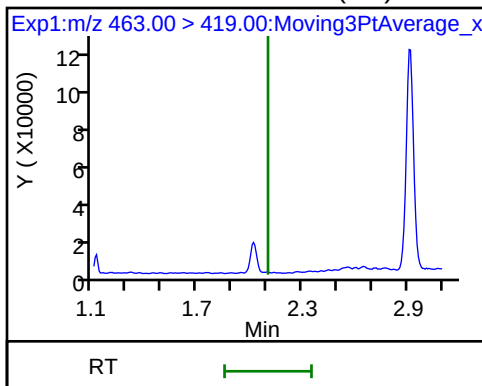
* 7 13C4 PFOS



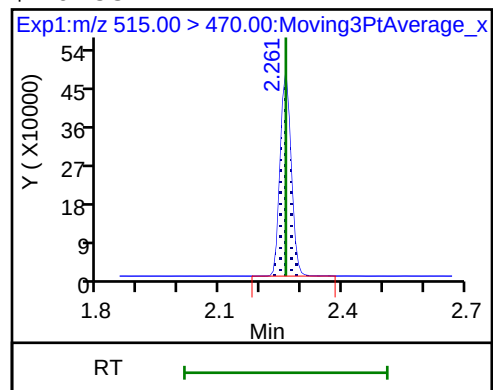
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_032.d
Lims ID: 320-41846-B-2-A
Client ID: WGNA-080618-FRB-0386
Sample Type: Client
Inject. Date: 19-Aug-2018 01:34:42 ALS Bottle#: 22 Worklist Smp#: 30
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41846-b-2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 :

Det: EXP1

Process Host: XAWRK026

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.46	94.57
\$ 10 13C2 PFDA	10.0	10.2	101.59

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1

SDG No.: _____

Client Sample ID: WGNA-080618-RW-0413 Lab Sample ID: 320-41846-3

Matrix: Water Lab File ID: 2018.08.18_537A_033.d

Analysis Method: 537 Date Collected: 08/06/2018 10:40

Extraction Method: 537 Date Extracted: 08/16/2018 08:12

Sample wt/vol: 266.1(mL) Date Analyzed: 08/19/2018 01:39

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: _____ GPC Cleanup: (Y/N) N

Analysis Batch No.: 240731 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J	38	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	23	M	19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.8	J	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.7	J	9.4	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	99		70-130
STL00996	13C2 PFDA	106		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_033.d
 Lims ID: 320-41846-A-3-A
 Client ID: WGNA-080618-RW-0413
 Sample Type: Client
 Inject. Date: 19-Aug-2018 01:39:22 ALS Bottle#: 23 Worklist Smp#: 31
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41846-a-3-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK026

First Level Reviewer: barnettj

Date: 20-Aug-2018 10:44:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	380153	2.48		321	
298.90 > 99.00	1.381	1.381	0.0	1.000	245917		1.55(0.00-0.00)	357	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.502	0.0	1.000	1565711	9.86		11750	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.654	1.646	0.008	1.000	287582	1.78		36.5	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.654	1.646	0.008	1.000	402393	1.81		142	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.836	0.0		1527332	10.0		11105	S
5 Perfluorooctanoic acid									
413.00 > 369.00	1.844	1.836	0.008	1.000	999732	6.01		98.1	M
413.00 > 169.00	1.836	1.836	0.0	0.996	576351		1.73(0.00-0.00)	971	M
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.094	0.0		3844702	28.7		3164	S
9 Perfluorononanoic acid									
463.00 > 419.00	2.102	2.102	0.0	1.000	77512	0.6157		6.4	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.094	2.109	-0.015	1.000	807588	5.58		305	
499.00 > 99.00	2.094	2.109	-0.015	1.000	139534		5.79(0.00-0.00)	122	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	1280502	10.6		8560	

QC Flag Legend

Processing Flags

s - Failed ISTD Recovery Test

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_033.d

Injection Date: 19-Aug-2018 01:39:22

Instrument ID: A8_N

Lims ID: 320-41846-A-3-A

Lab Sample ID: 320-41846-3

Client ID: WGNA-080618-RW-0413

Operator ID: SACINSTLCMS01

ALS Bottle#: 23

Worklist Smp#: 31

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

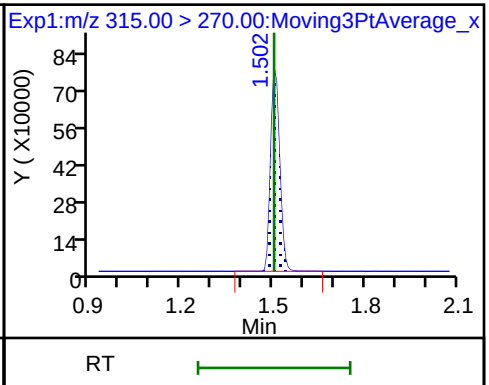
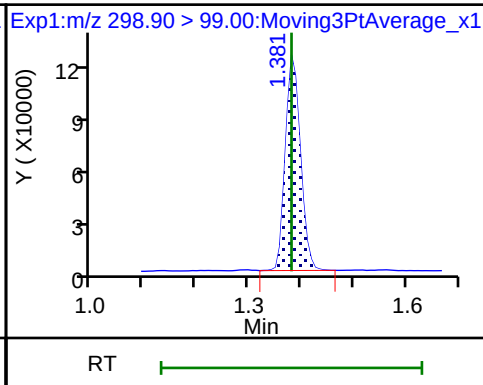
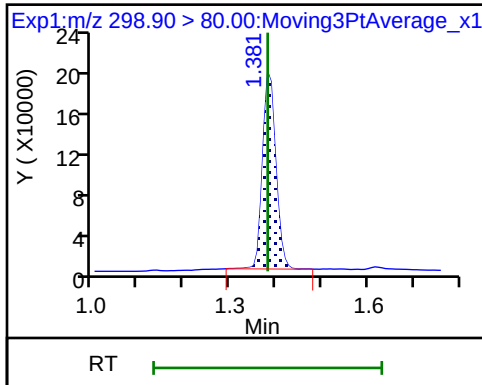
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

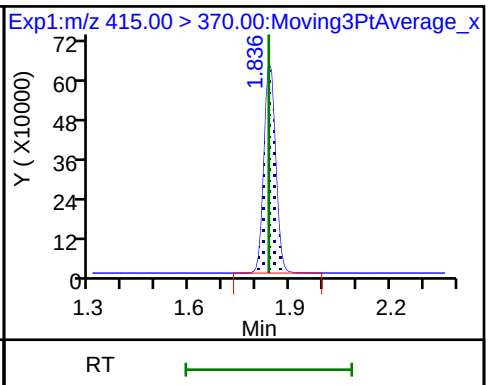
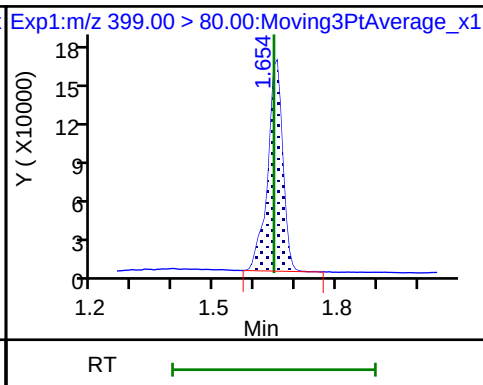
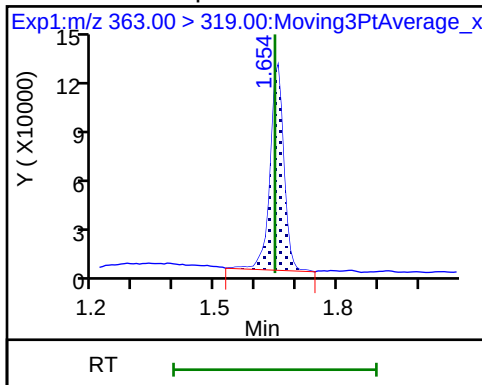
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

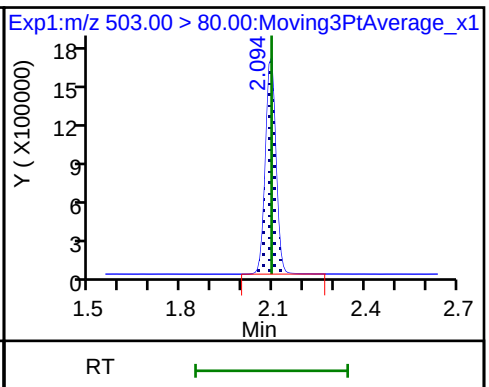
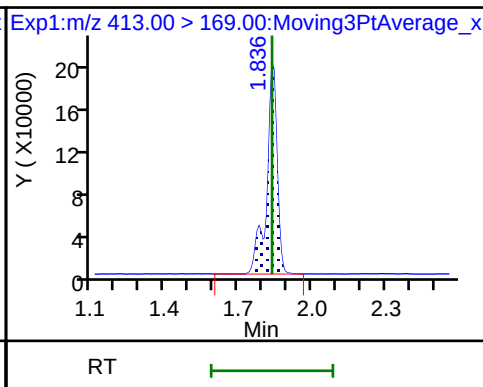
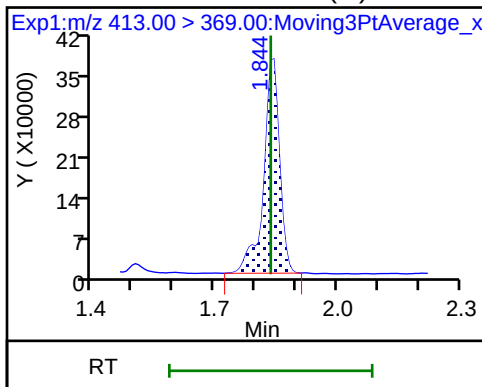
* 6 13C2-PFOA



5 Perfluorooctanoic acid (M)

5 Perfluorooctanoic acid

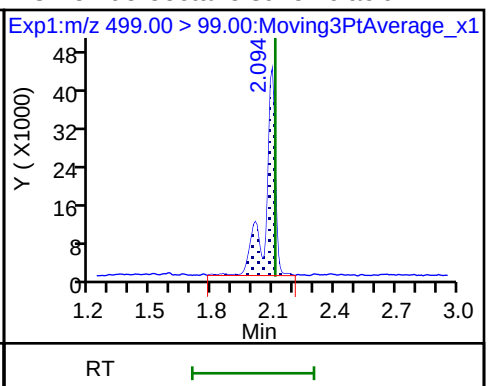
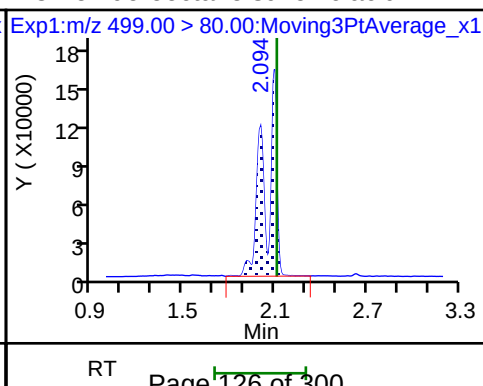
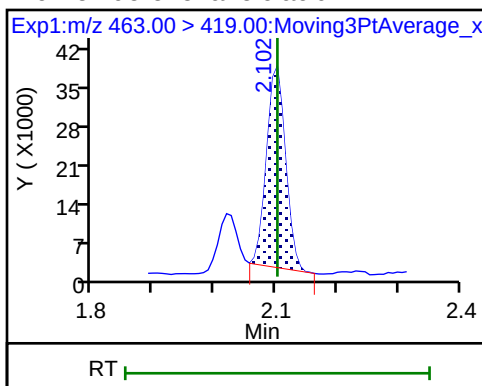
* 7 13C4 PFOS



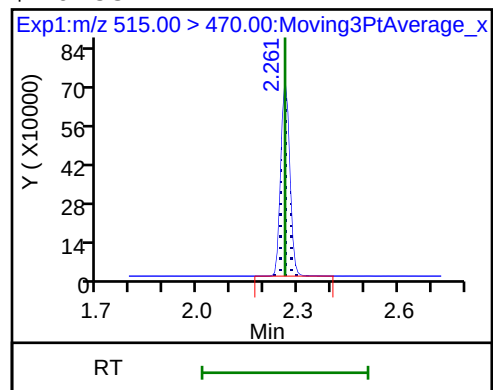
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_033.d
Lims ID: 320-41846-A-3-A
Client ID: WGNA-080618-RW-0413
Sample Type: Client
Inject. Date: 19-Aug-2018 01:39:22 ALS Bottle#: 23 Worklist Smp#: 31
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41846-a-3-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
Column 1 : Det: EXP1
Process Host: XAWRK026

First Level Reviewer: barnettj

Date: 20-Aug-2018 10:44:40

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.86	98.63
\$ 10 13C2 PFDA	10.0	10.6	105.84

TestAmerica Sacramento

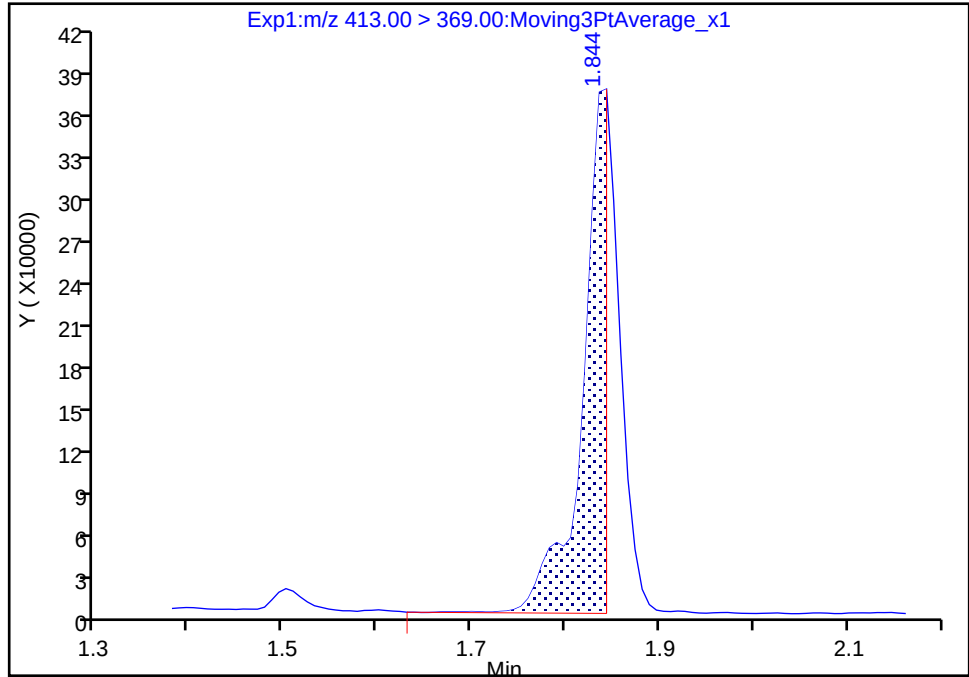
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_033.d				
Injection Date:	19-Aug-2018 01:39:22	Instrument ID:	A8_N		
Lims ID:	320-41846-A-3-A	Lab Sample ID:	320-41846-3		
Client ID:	WGNA-080618-RW-0413				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	23	Worklist Smp#:	31
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector:	EXP1		

5 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

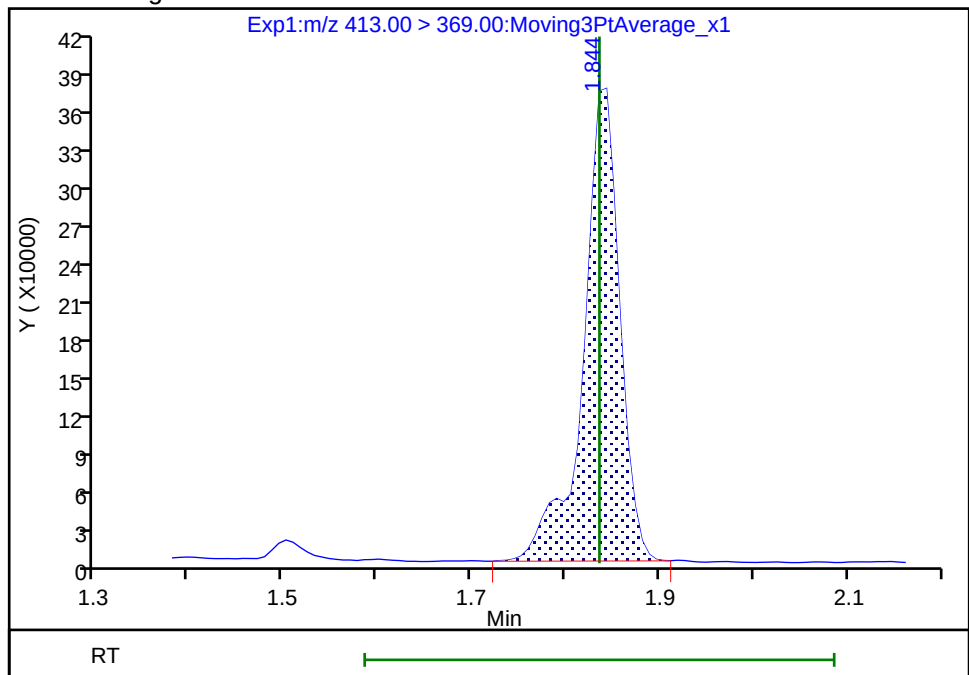
RT: 1.84
Area: 631543
Amount: 3.795104
Amount Units: ng/ml

Processing Integration Results



RT: 1.84
Area: 999732
Amount: 6.007646
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 20-Aug-2018 10:44:12

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-RW-0413 RA</u>	Lab Sample ID: <u>320-41846-3 RA</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.20_537A_007.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 10:40</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>266.1(mL)</u>	Date Analyzed: <u>08/20/2018 16:38</u>
Con. Extract Vol.: <u>1.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240968</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J	38	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	22		19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.9	J	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.6	J	9.4	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	103		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180820-62982.b\2018.08.20_537A_007.d
 Lims ID: 320-41846-A-3-A
 Client ID: WGNA-080618-RW-0413
 Sample Type: Client
 Inject. Date: 20-Aug-2018 16:38:20 ALS Bottle#: 2 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41846-a-3-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180820-62982.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2018 10:01:04 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK026

First Level Reviewer: barnettj

Date: 21-Aug-2018 09:59:25

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.388	1.388	0.0	1.000	337968	2.43		289	
298.90 > 99.00	1.388	1.388	0.0	1.000	231102		1.46(0.00-0.00)	335	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.510	1.510	0.0	1.000	1452701	9.73		13068	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.654	1.662	-0.008	1.000	265383	1.75		32.8	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.662	1.662	0.0	1.000	370903	1.84		136	
* 6 13C2-PFOA									
415.00 > 370.00	1.851	1.859	-0.008		1436509	10.0		9933	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.851	1.859	-0.008	1.000	913054	5.83		88.1	
413.00 > 169.00	1.851	1.859	-0.008	1.000	540338		1.69(0.00-0.00)	799	
* 7 13C4 PFOS									
503.00 > 80.00	2.109	2.109	0.0		3491415	28.7		3086	S
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.109	2.109	0.0	1.000	723347	5.50		304	
499.00 > 99.00	2.109	2.109	0.0	1.000	124948		5.79(0.00-0.00)	109	
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.117	0.0	1.000	71265	0.6018		6.3	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.269	0.0	1.000	1172394	10.3		6985	

QC Flag Legend

Processing Flags

s - Failed ISTD Recovery Test

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180820-62982.b\2018.08.20_537A_007.d

Injection Date: 20-Aug-2018 16:38:20

Instrument ID: A8_N

Lims ID: 320-41846-A-3-A

Lab Sample ID: 320-41846-3

Client ID: WGNA-080618-RW-0413

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

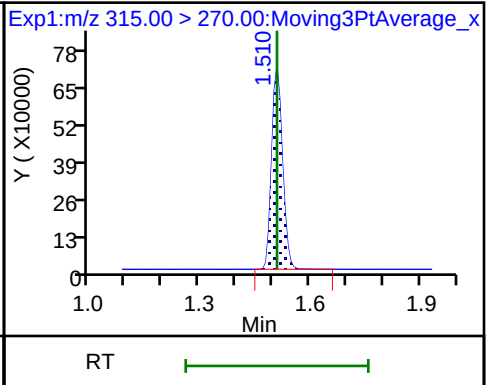
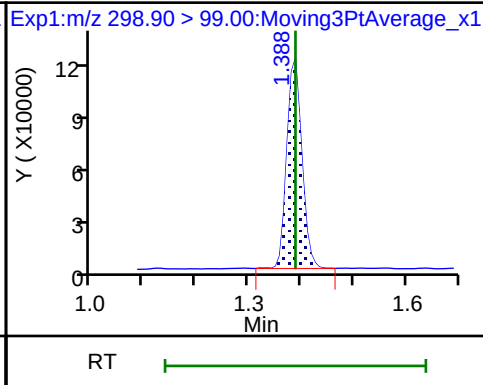
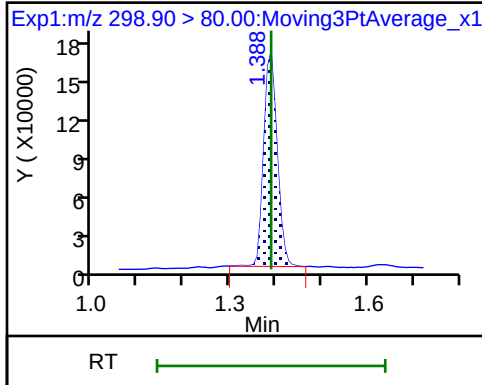
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

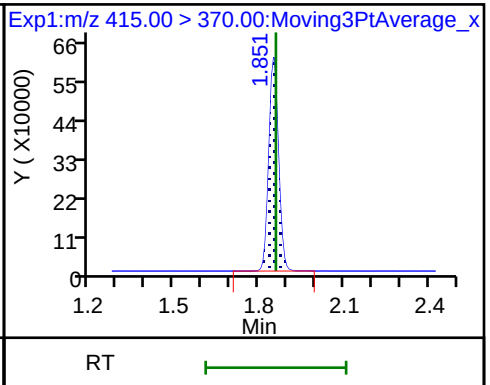
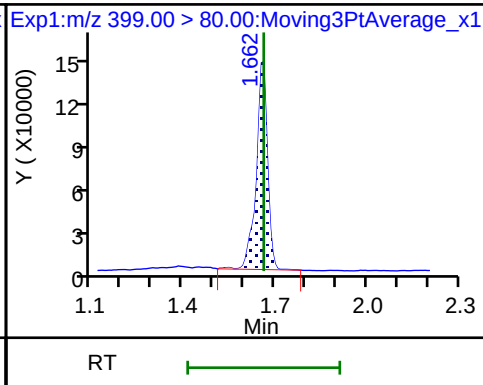
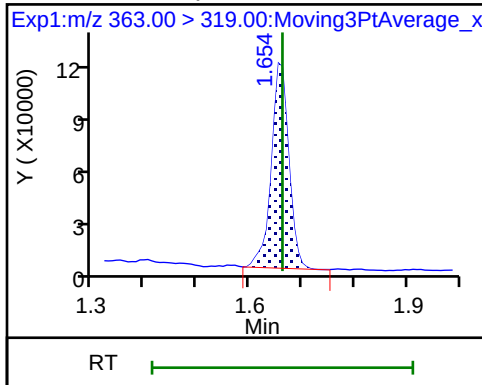
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

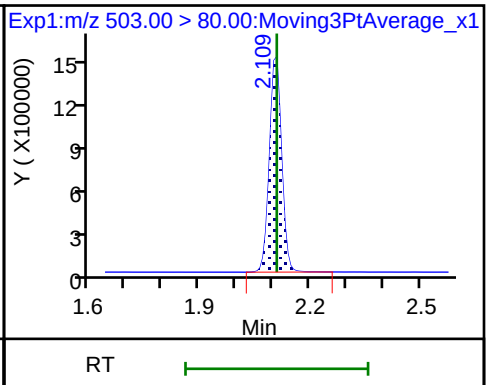
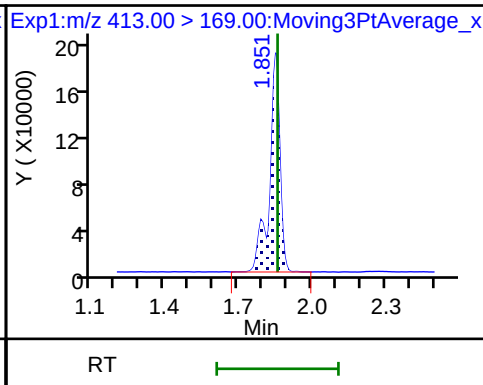
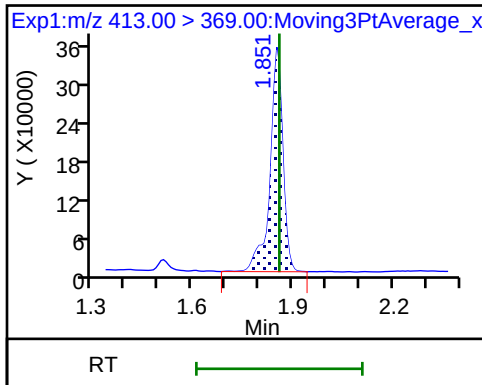
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

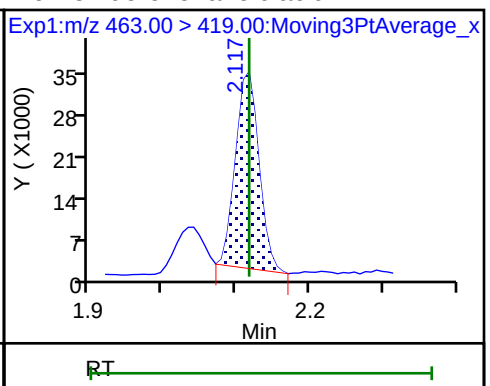
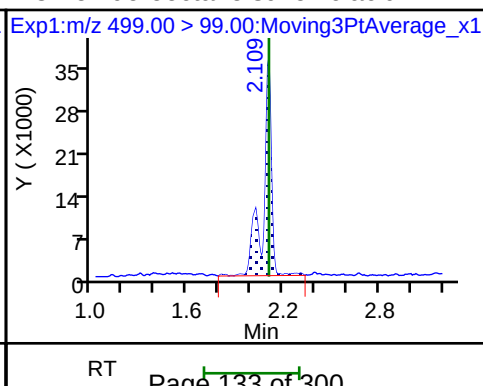
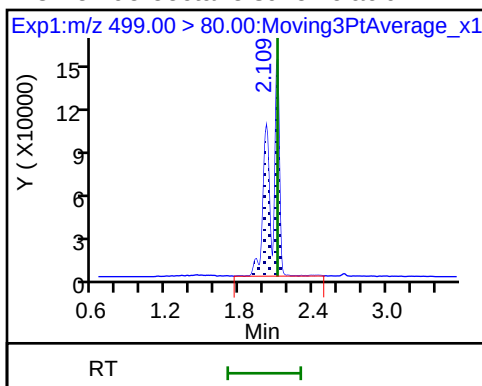
* 7 13C4 PFOS



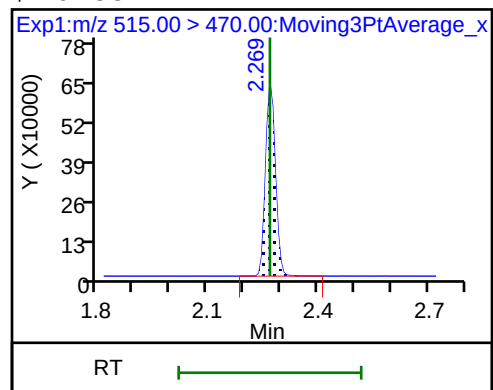
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180820-62982.b\2018.08.20_537A_007.d
Lims ID: 320-41846-A-3-A
Client ID: WGNA-080618-RW-0413
Sample Type: Client
Inject. Date: 20-Aug-2018 16:38:20 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41846-a-3-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180820-62982.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 21-Aug-2018 10:01:04 Calib Date: 15-Aug-2018 18:44:32
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
Column 1 : Det: EXP1
Process Host: XAWRK026

First Level Reviewer: barnettj

Date: 21-Aug-2018 09:59:25

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.73	97.29
\$ 10 13C2 PFDA	10.0	10.3	103.03

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: WGNA-080618-FRB-0413 Lab Sample ID: 320-41846-4
 Matrix: Water Lab File ID: 2018.08.18_537A_034.d
 Analysis Method: 537 Date Collected: 08/06/2018 10:35
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 264.9(mL) Date Analyzed: 08/19/2018 01:44
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240731 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	38	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	7.6	U	19	7.6	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.4	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	105		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_034.d
 Lims ID: 320-41846-A-4-A
 Client ID: WGNA-080618-FRB-0413
 Sample Type: Client
 Inject. Date: 19-Aug-2018 01:44:03 ALS Bottle#: 24 Worklist Smp#: 32
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41846-a-4-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.502	0.0	1.000	1294760	10.2		11462	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.836	0.0		1215966	10.0		10313	
* 7 13C4 PFOS									
503.00 > 80.00	2.086	2.094	-0.008		2999791	28.7		5391	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	1014147	10.5		6748	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_034.d

Injection Date: 19-Aug-2018 01:44:03

Instrument ID: A8_N

Lims ID: 320-41846-A-4-A

Lab Sample ID: 320-41846-4

Client ID: WGNA-080618-FRB-0413

Operator ID: SACINSTLCMS01

ALS Bottle#: 24

Worklist Smp#: 32

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

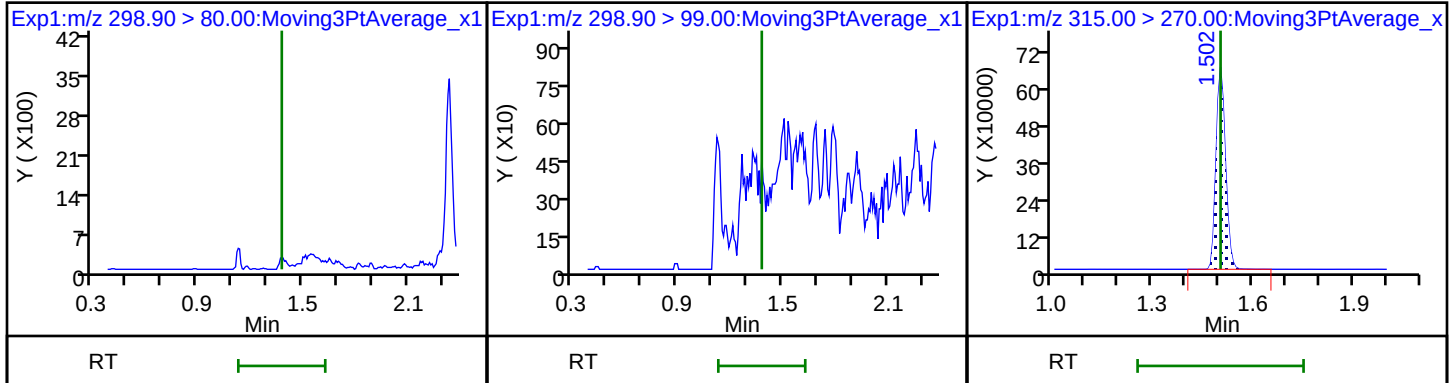
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

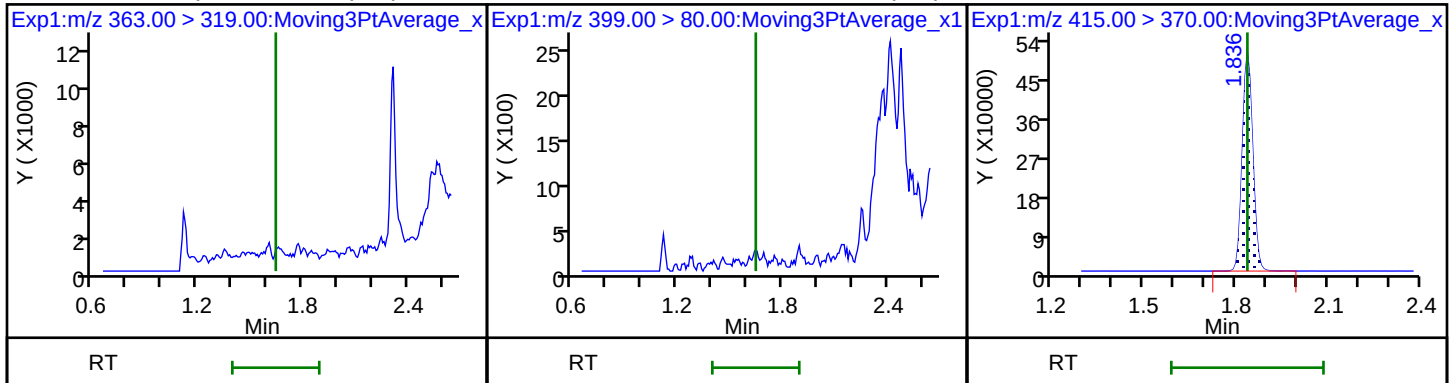
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid (ND)

3 Perfluorohexanesulfonic acid (ND)

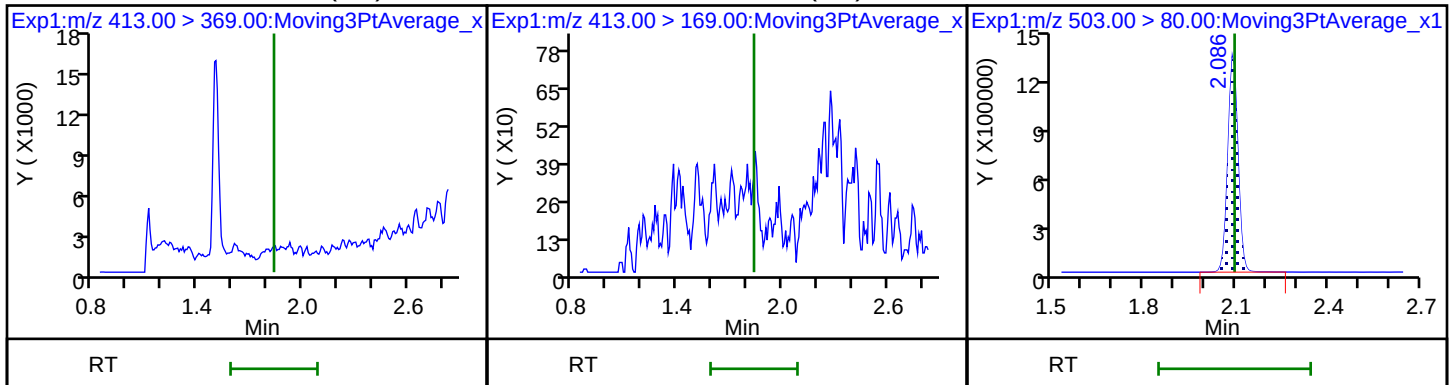
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

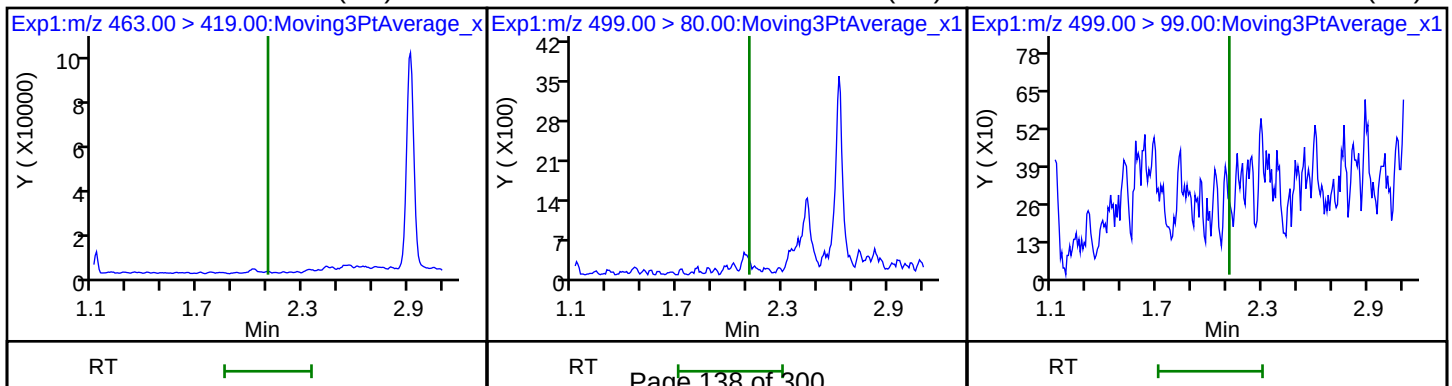
* 7 13C4 PFOS



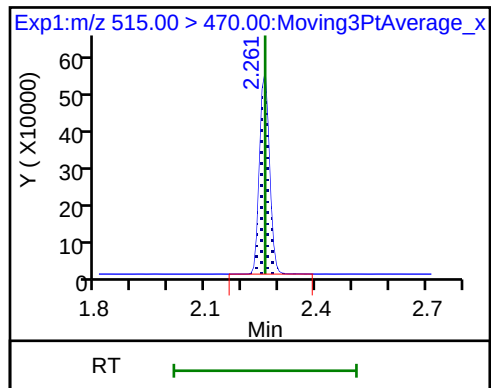
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_034.d
Lims ID: 320-41846-A-4-A
Client ID: WGNA-080618-FRB-0413
Sample Type: Client
Inject. Date: 19-Aug-2018 01:44:03 ALS Bottle#: 24 Worklist Smp#: 32
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41846-a-4-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 :

Det: EXP1

Process Host: XAWRK026

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.2	102.44
\$ 10 13C2 PFDA	10.0	10.5	105.29

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-RW-0533</u>	Lab Sample ID: <u>320-41846-5</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_035.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 11:10</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>267.7(mL)</u>	Date Analyzed: <u>08/19/2018 01:48</u>
Con. Extract Vol.: <u>1.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240731</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J	37	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	21		19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	22	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	8.7	J	28	11	5.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	J	9.3	3.7	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	84	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	99		70-130
STL00996	13C2 PFDA	100		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_035.d
 Lims ID: 320-41846-A-5-A
 Client ID: WGNA-080618-RW-0533
 Sample Type: Client
 Inject. Date: 19-Aug-2018 01:48:44 ALS Bottle#: 25 Worklist Smp#: 33
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41846-a-5-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK026

First Level Reviewer: barnettj

Date: 20-Aug-2018 10:45:07

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.388	1.381	0.007	1.000	228035	1.97		297	
298.90 > 99.00	1.388	1.381	0.007	1.000	150629		1.51(0.00-0.00)	253	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.510	1.502	0.008	1.000	1198446	9.86		10317	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.654	1.646	0.008	1.000	127812	1.03		18.9	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.654	1.646	0.008	1.000	392345	2.34		145	
* 6 13C2-PFOA									
415.00 > 370.00	1.844	1.836	0.008		1169587	10.0		8684	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.844	1.836	0.008	1.000	710597	5.58		66.9	
413.00 > 169.00	1.844	1.836	0.008	1.000	422415		1.68(0.00-0.00)	773	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.094	0.0		2901574	28.7		3154	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.094	2.109	-0.015	1.000	617716	5.65		276	
499.00 > 99.00	2.094	2.109	-0.015	1.000	112448		5.49(0.00-0.00)	93.4	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	927772	10.0		6329	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_035.d

Injection Date: 19-Aug-2018 01:48:44

Instrument ID: A8_N

Lims ID: 320-41846-A-5-A

Lab Sample ID: 320-41846-5

Client ID: WGNA-080618-RW-0533

Operator ID: SACINSTLCMS01

ALS Bottle#: 25

Worklist Smp#: 33

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

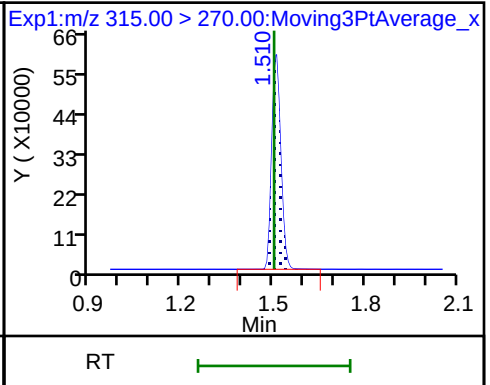
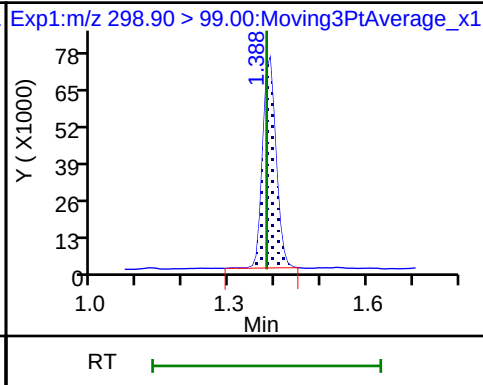
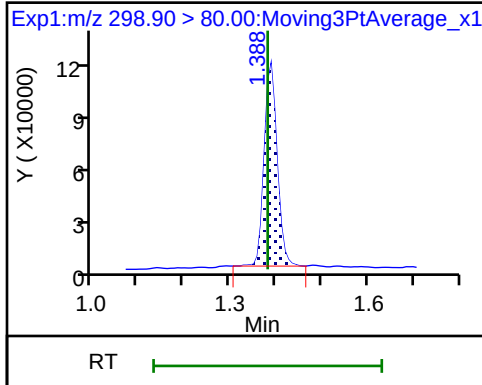
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

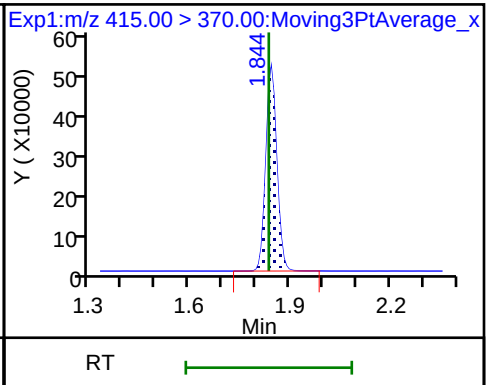
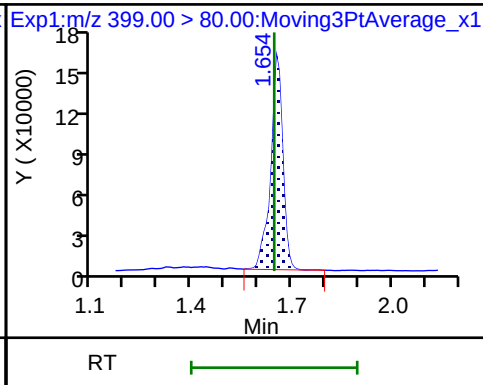
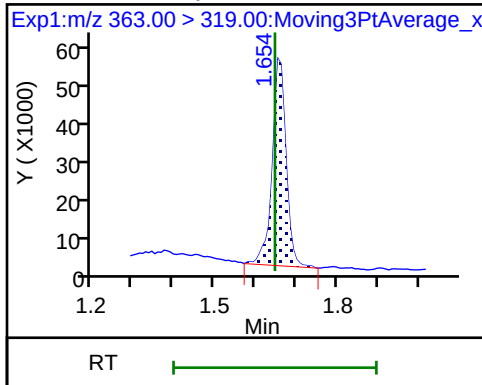
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

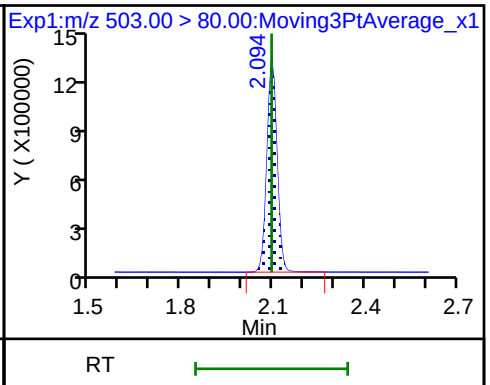
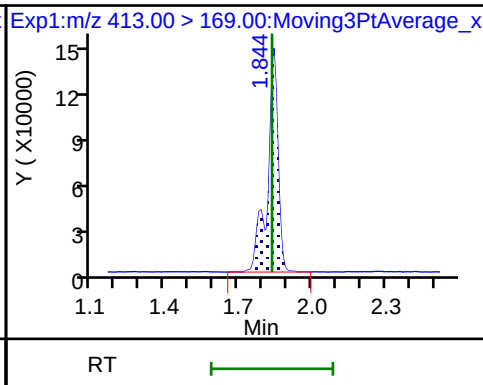
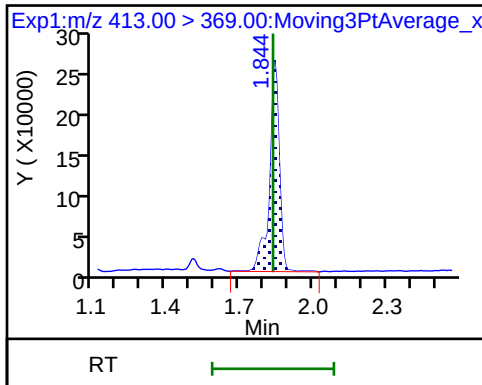
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

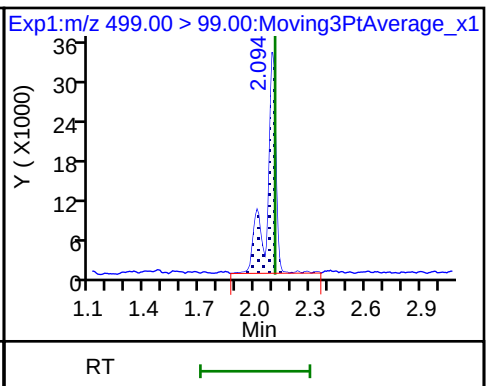
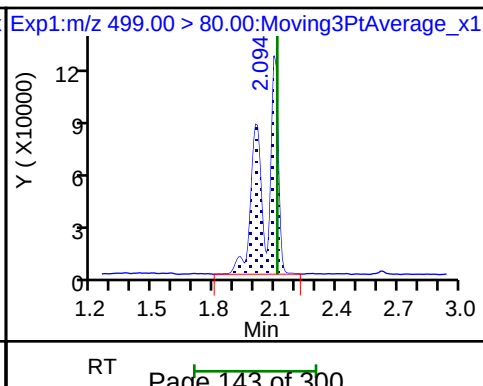
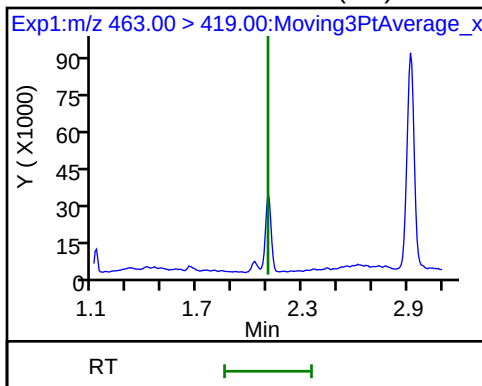
* 7 13C4 PFOS



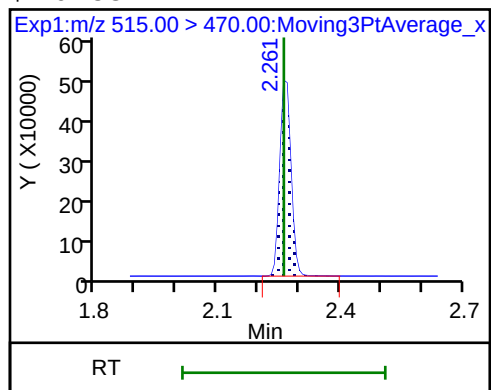
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_035.d
Lims ID: 320-41846-A-5-A
Client ID: WGNA-080618-RW-0533
Sample Type: Client
Inject. Date: 19-Aug-2018 01:48:44 ALS Bottle#: 25 Worklist Smp#: 33
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41846-a-5-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
Column 1 : Det: EXP1
Process Host: XAWRK026

First Level Reviewer: barnettj

Date: 20-Aug-2018 10:45:07

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.86	98.58
\$ 10 13C2 PFDA	10.0	10.0	100.14

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-FRB-0533</u>	Lab Sample ID: <u>320-41846-6</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_036.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 11:05</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>260.8 (mL)</u>	Date Analyzed: <u>08/19/2018 01:53</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240731</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	7.7	U	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	86	35	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	107		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_036.d
 Lims ID: 320-41846-A-6-A
 Client ID: WGNA-080618-FRB-0533
 Sample Type: Client
 Inject. Date: 19-Aug-2018 01:53:24 ALS Bottle#: 26 Worklist Smp#: 34
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41846-a-6-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.502	0.0	1.000	1851912	10.0		15018	
* 6 13C2-PFOA									s
415.00 > 370.00	1.844	1.836	0.008		1782008	10.0		11350	
* 7 13C4 PFOS									s
503.00 > 80.00	2.094	2.094	0.0		4358112	28.7		7739	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	1510689	10.7		10604	

QC Flag Legend

Processing Flags

s - Failed ISTD Recovery Test

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_036.d

Injection Date: 19-Aug-2018 01:53:24

Instrument ID: A8_N

Lims ID: 320-41846-A-6-A

Lab Sample ID: 320-41846-6

Client ID: WGNA-080618-FRB-0533

Operator ID: SACINSTLCMS01

ALS Bottle#: 26

Worklist Smp#: 34

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

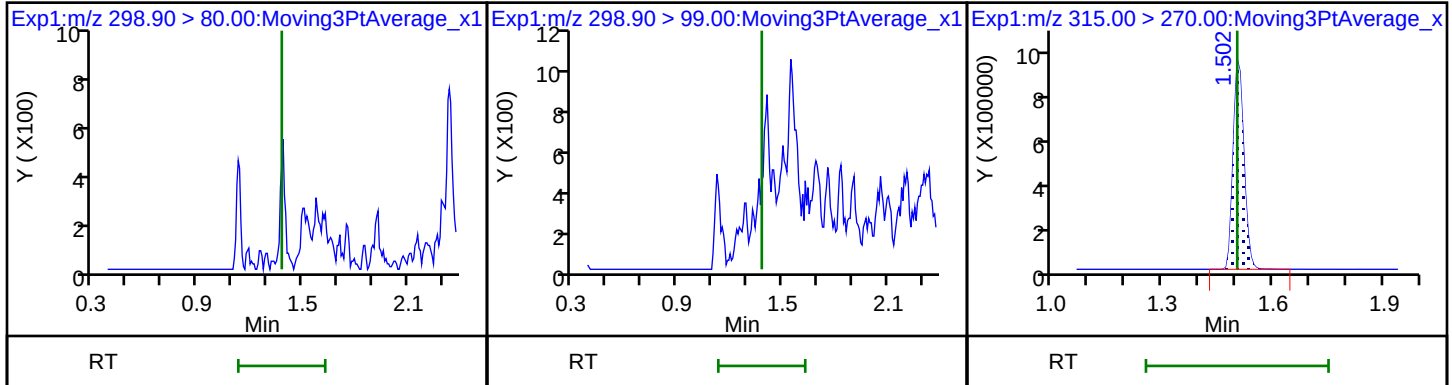
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

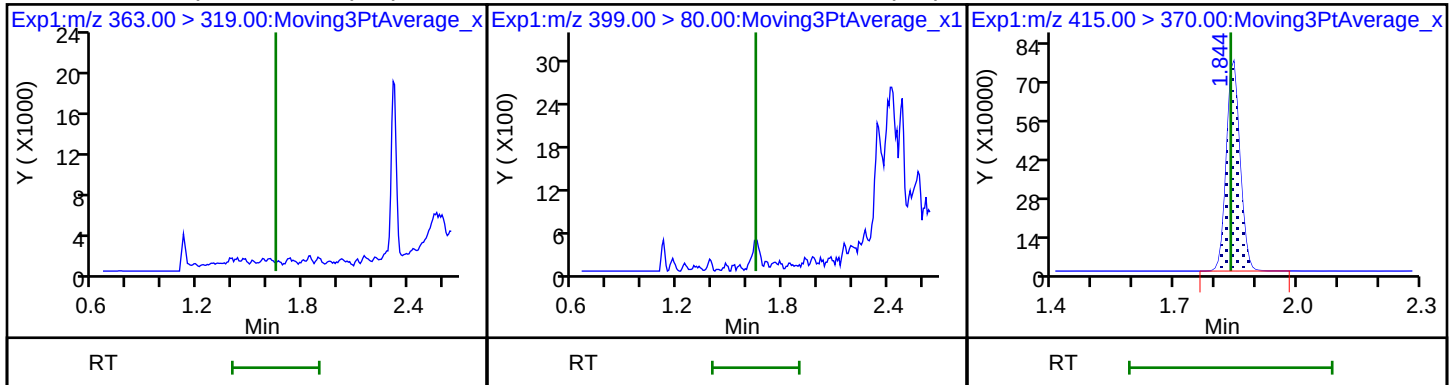
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid (ND)

3 Perfluorohexanesulfonic acid (ND)

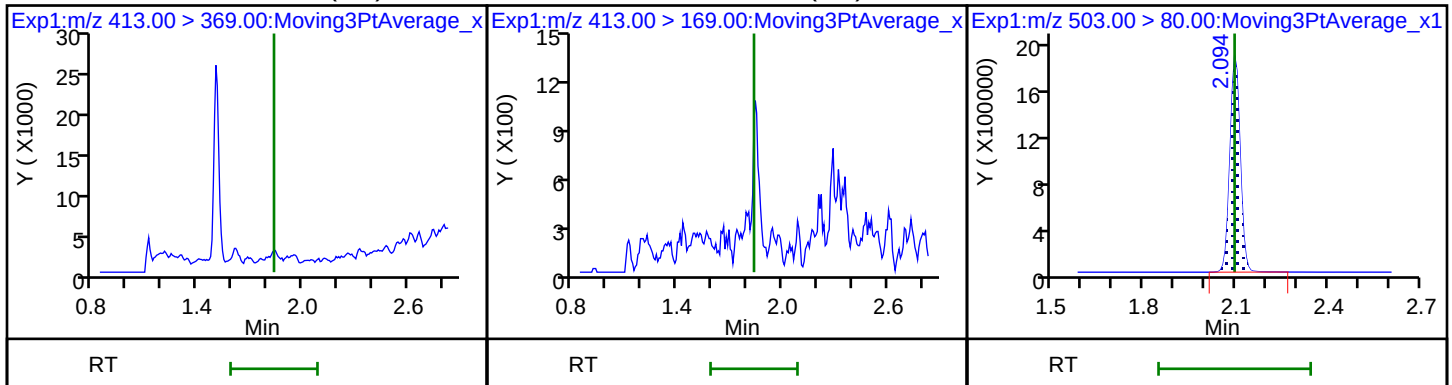
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

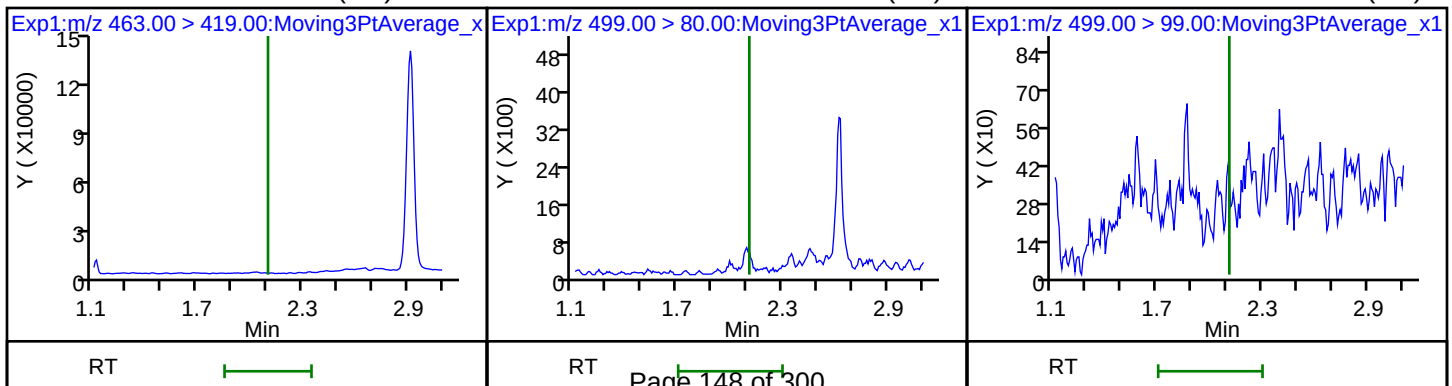
* 7 13C4 PFOS



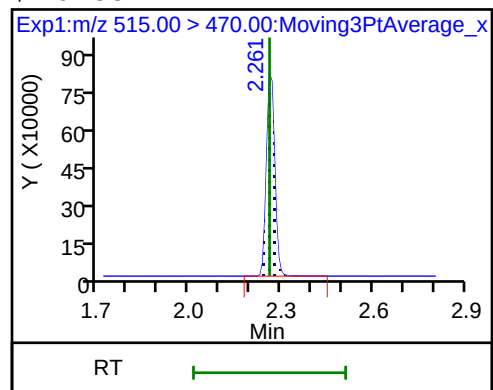
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_036.d
Lims ID: 320-41846-A-6-A
Client ID: WGNA-080618-FRB-0533
Sample Type: Client
Inject. Date: 19-Aug-2018 01:53:24 ALS Bottle#: 26 Worklist Smp#: 34
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41846-a-6-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 :

Det: EXP1

Process Host: XAWRK026

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.0	99.98
\$ 10 13C2 PFDA	10.0	10.7	107.02

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-FRB-0533 RA</u>	Lab Sample ID: <u>320-41846-6 RA</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.20_537A_008.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 11:05</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>260.8 (mL)</u>	Date Analyzed: <u>08/20/2018 16:43</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240968</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	<i>Perfluorooctanesulfonic acid (PFOS)</i>	15	U	38	15	6.5
335-67-1	<i>Perfluorooctanoic acid (PFOA)</i>	7.7	U	19	7.7	2.7
375-95-1	<i>Perfluorononanoic acid (PFNA)</i>	19	U	23	19	7.7
355-46-4	<i>Perfluorohexanesulfonic acid (PFHxS)</i>	12	U	29	12	5.3
375-85-9	<i>Perfluoroheptanoic acid (PFHpA)</i>	3.8	U	9.6	3.8	1.8
375-73-5	<i>Perfluorobutanesulfonic acid (PFBS)</i>	35	U	86	35	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	110		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180820-62982.b\2018.08.20_537A_008.d
 Lims ID: 320-41846-A-6-A
 Client ID: WGNA-080618-FRB-0533
 Sample Type: Client
 Inject. Date: 20-Aug-2018 16:43:00 ALS Bottle#: 3 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41846-a-6-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180820-62982.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2018 10:01:04 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.510	1.510	0.0	1.000	1644393	10.0		12151	
* 6 13C2-PFOA									s
415.00 > 370.00	1.851	1.859	-0.008		1578837	10.0		11328	
* 7 13C4 PFOS									s
503.00 > 80.00	2.109	2.109	0.0		3922335	28.7		7165	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.269	0.0	1.000	1375667	11.0		8880	

QC Flag Legend

Processing Flags

s - Failed ISTD Recovery Test

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180820-62982.b\2018.08.20_537A_008.d

Injection Date: 20-Aug-2018 16:43:00

Instrument ID: A8_N

Lims ID: 320-41846-A-6-A

Lab Sample ID: 320-41846-6

Client ID: WGNA-080618-FRB-0533

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

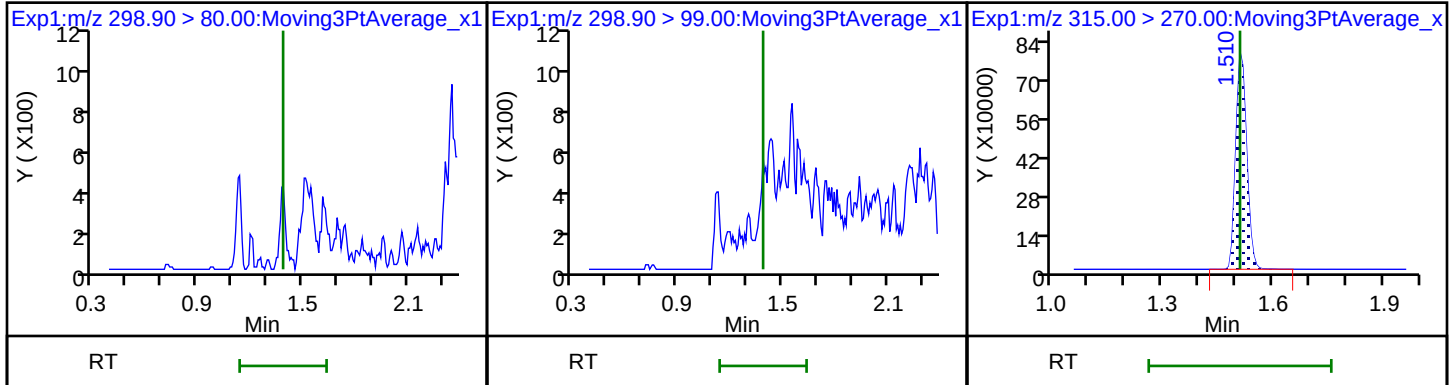
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

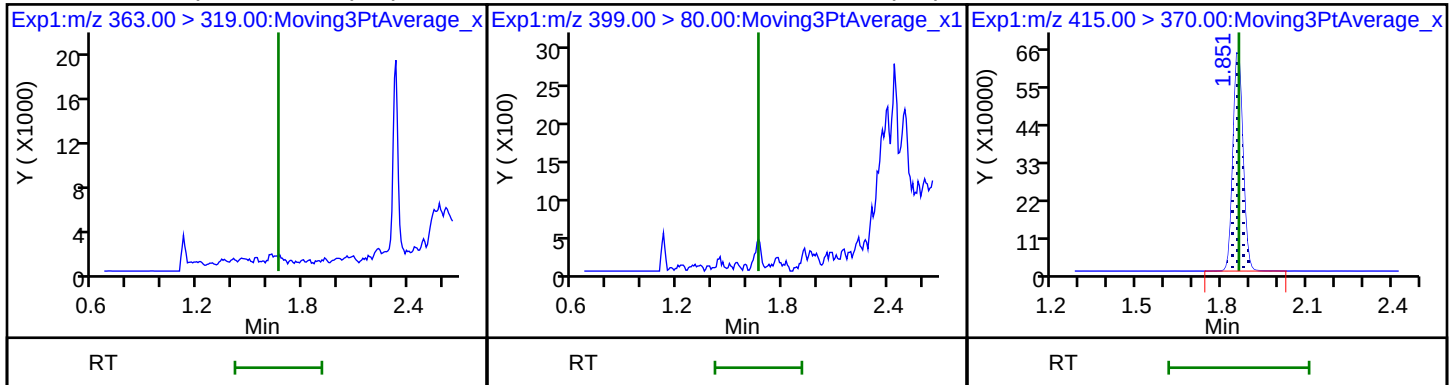
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid (ND)

3 Perfluorohexanesulfonic acid (ND)

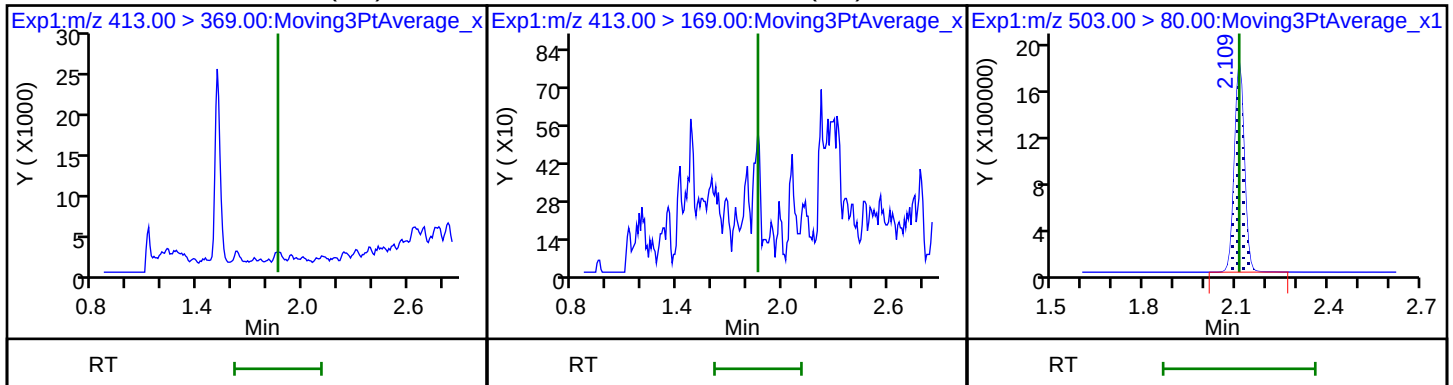
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

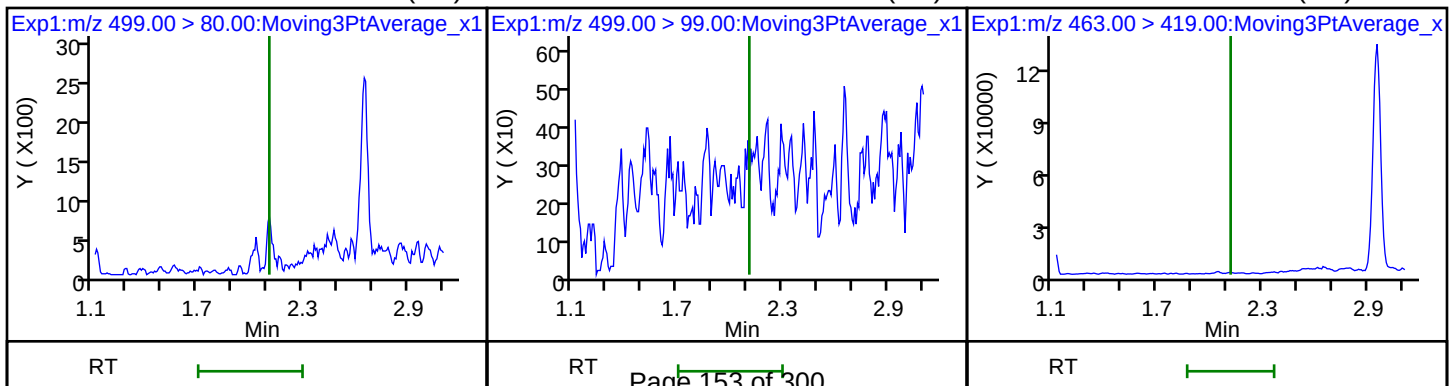
* 7 13C4 PFOS



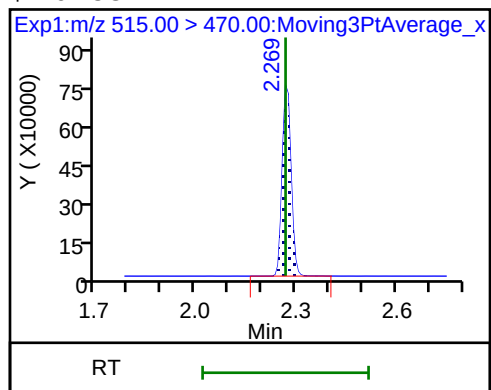
8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180820-62982.b\2018.08.20_537A_008.d
Lims ID: 320-41846-A-6-A
Client ID: WGNA-080618-FRB-0533
Sample Type: Client
Inject. Date: 20-Aug-2018 16:43:00 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41846-a-6-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180820-62982.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 21-Aug-2018 10:01:04 Calib Date: 15-Aug-2018 18:44:32
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.0	100.20
\$ 10 13C2 PFDA	10.0	11.0	110.00

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-RW-4024</u>	Lab Sample ID: <u>320-41846-7</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_037.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 11:40</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>267.6(mL)</u>	Date Analyzed: <u>08/19/2018 01:58</u>
Con. Extract Vol.: <u>1.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240731</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	24	J	37	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	14	J	19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	22	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.5	J	28	11	5.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.8	J	9.3	3.7	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	84	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	104		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_037.d
 Lims ID: 320-41846-A-7-A
 Client ID: WGNA-080618-RW-4024
 Sample Type: Client
 Inject. Date: 19-Aug-2018 01:58:04 ALS Bottle#: 27 Worklist Smp#: 35
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41846-a-7-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK026

First Level Reviewer: barnettj

Date: 20-Aug-2018 10:45:47

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	163504	1.49		105	
298.90 > 99.00	1.381	1.381	0.0	1.000	107570		1.52(0.00-0.00)	166	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.502	0.0	1.000	1108028	9.54		8415	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.646	1.646	0.0	1.000	151213	1.28		17.6	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.654	1.646	0.008	1.000	278178	1.75		74.2	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.836	0.0		1117019	10.0		8816	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.836	1.836	0.0	1.000	464751	3.82		40.4	
413.00 > 169.00	1.836	1.836	0.0	1.000	283904		1.64(0.00-0.00)	475	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.094	0.0		2750630	28.7		1798	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.094	2.109	-0.015	1.000	671706	6.48		176	
499.00 > 99.00	2.094	2.109	-0.015	1.000	108344		6.20(0.00-0.00)	73.4	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	916346	10.4		5540	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_037.d

Injection Date: 19-Aug-2018 01:58:04

Instrument ID: A8_N

Lims ID: 320-41846-A-7-A

Lab Sample ID: 320-41846-7

Client ID: WGNA-080618-RW-4024

Operator ID: SACINSTLCMS01

ALS Bottle#: 27

Worklist Smp#: 35

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

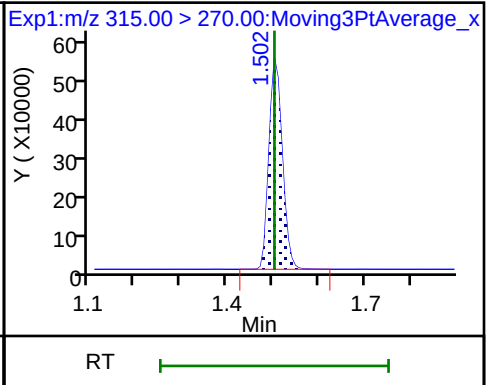
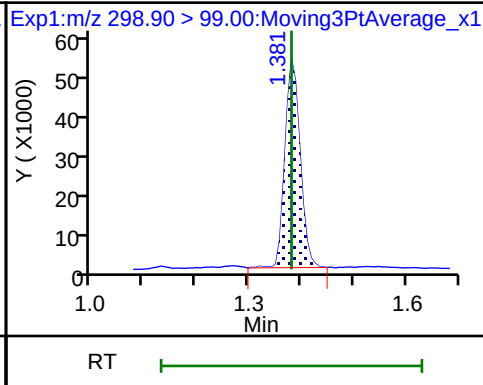
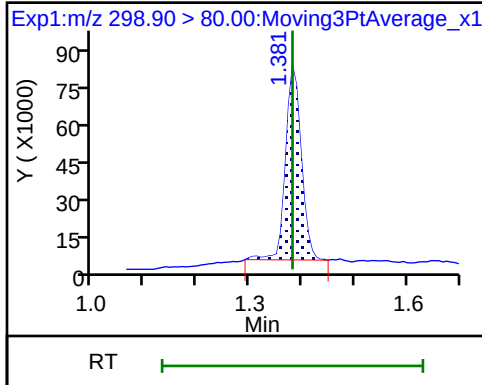
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

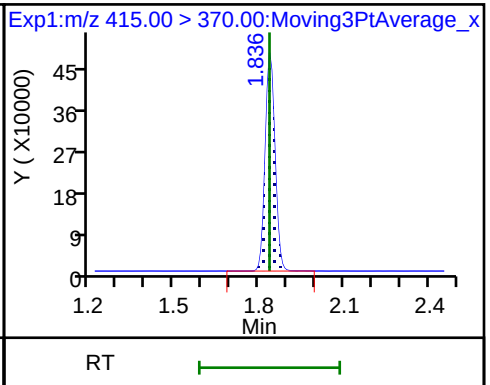
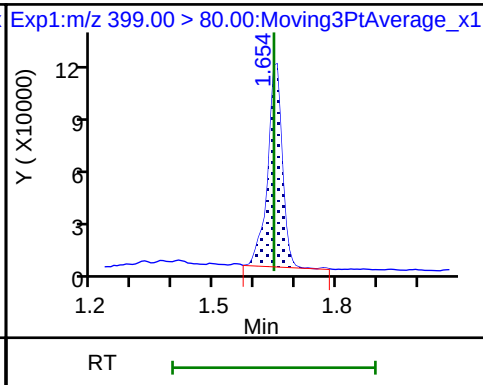
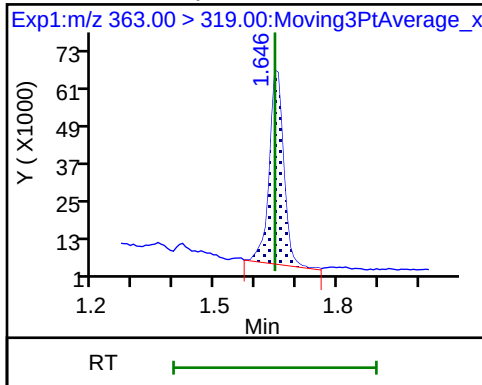
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

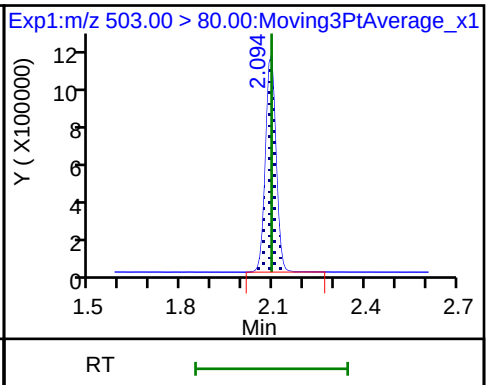
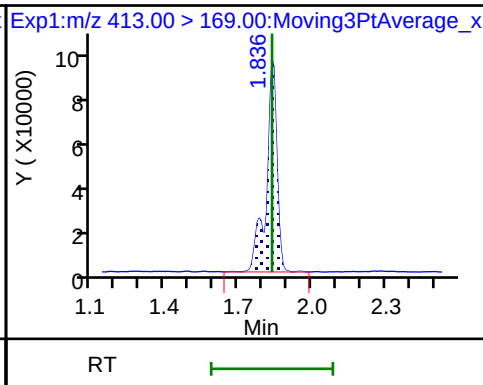
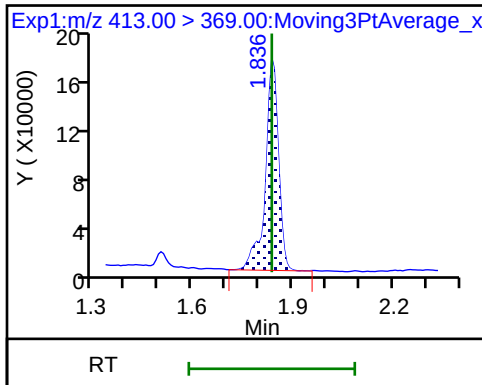
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

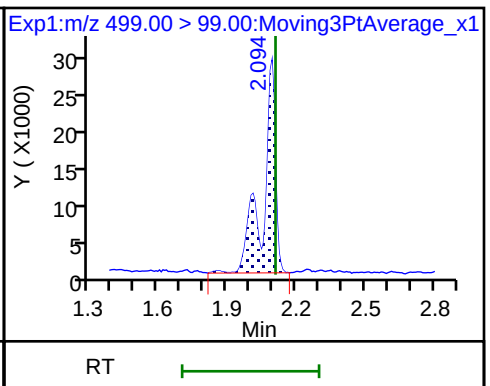
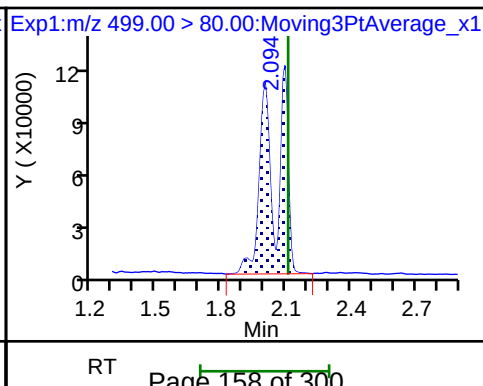
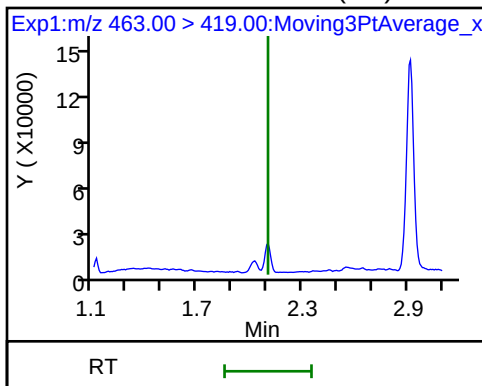
* 7 13C4 PFOS



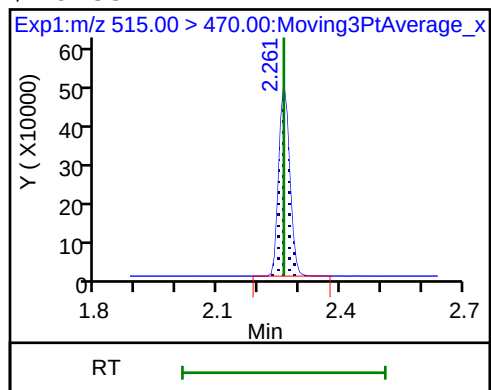
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_037.d
Lims ID: 320-41846-A-7-A
Client ID: WGNA-080618-RW-4024
Sample Type: Client
Inject. Date: 19-Aug-2018 01:58:04 ALS Bottle#: 27 Worklist Smp#: 35
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41846-a-7-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
Column 1 : Det: EXP1
Process Host: XAWRK026

First Level Reviewer: barnettj

Date: 20-Aug-2018 10:45:47

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.54	95.43
\$ 10 13C2 PFDA	10.0	10.4	103.56

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-FRB-4024</u>	Lab Sample ID: <u>320-41846-8</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_040.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 11:35</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>256.1 (mL)</u>	Date Analyzed: <u>08/19/2018 02:12</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240733</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	7.8	U	20	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	20	U	23	20	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.8	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	108		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_040.d
 Lims ID: 320-41846-A-8-A
 Client ID: WGNA-080618-FRB-4024
 Sample Type: Client
 Inject. Date: 19-Aug-2018 02:12:04 ALS Bottle#: 28 Worklist Smp#: 38
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41846-a-8-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:48:44 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.510	-0.008	1.000	1194698	10.1		12171	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.836	0.0		1134575	10.0		7558	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.086	0.008		2791314	28.7		6098	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	967282	10.8		6433	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_040.d

Injection Date: 19-Aug-2018 02:12:04

Instrument ID: A8_N

Lims ID: 320-41846-A-8-A

Lab Sample ID: 320-41846-8

Client ID: WGNA-080618-FRB-4024

Operator ID: SACINSTLCMS01

ALS Bottle#: 28

Worklist Smp#: 38

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

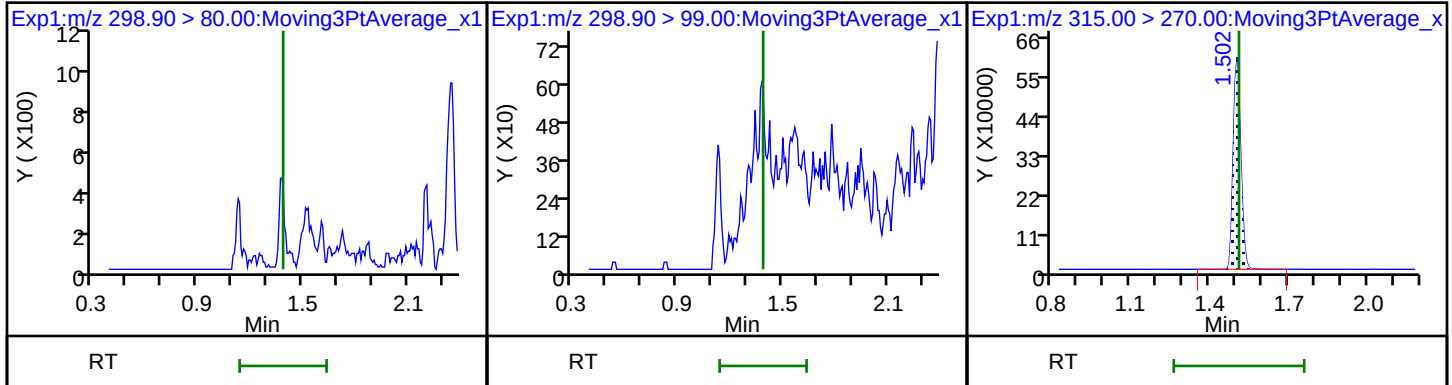
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

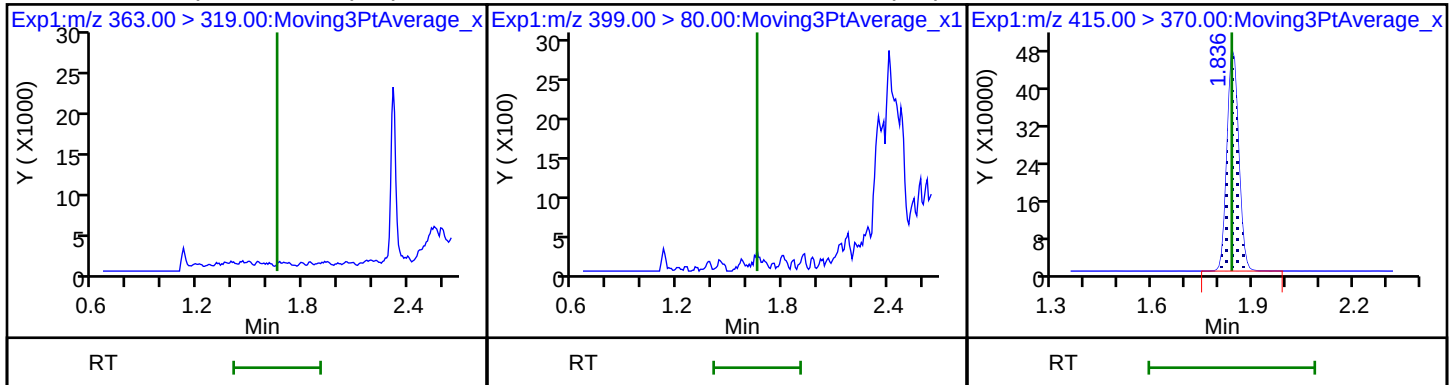
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid (ND)

3 Perfluorohexanesulfonic acid (ND)

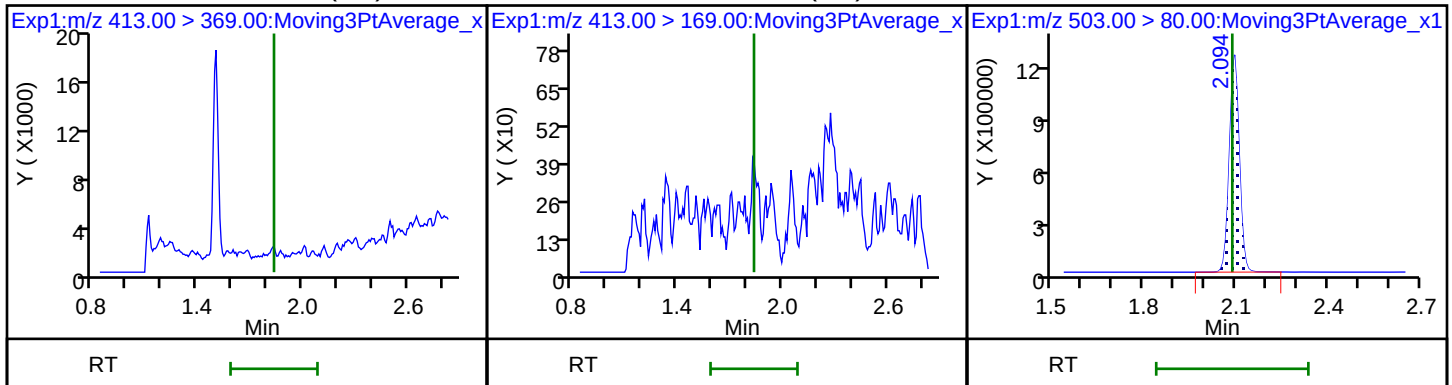
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

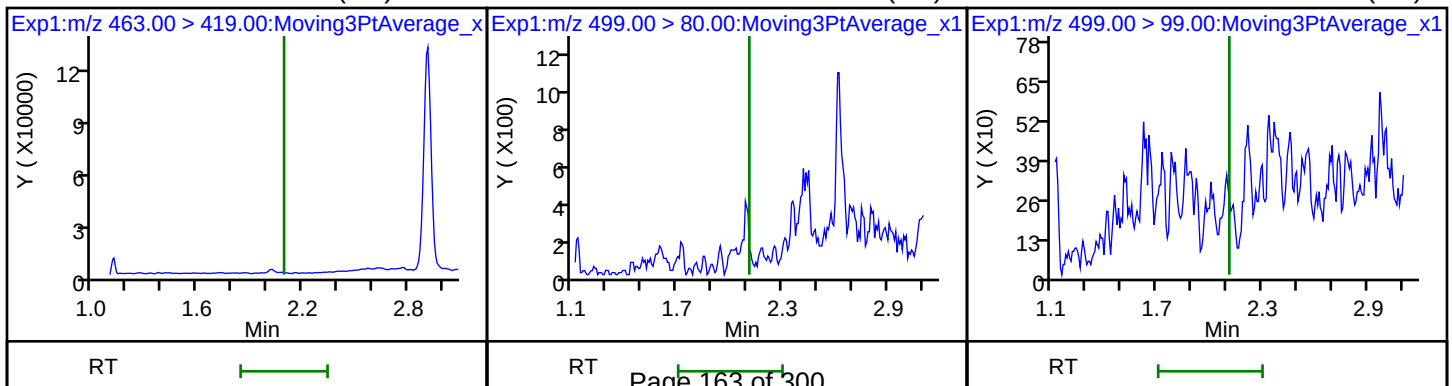
* 7 13C4 PFOS



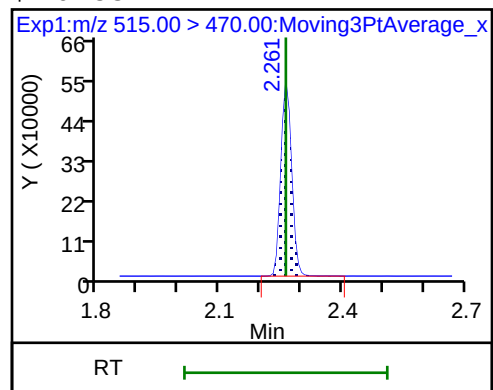
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_040.d
Lims ID: 320-41846-A-8-A
Client ID: WGNA-080618-FRB-4024
Sample Type: Client
Inject. Date: 19-Aug-2018 02:12:04 ALS Bottle#: 28 Worklist Smp#: 38
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41846-a-8-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 20-Aug-2018 10:48:44 Calib Date: 15-Aug-2018 18:44:32
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.1	101.31
\$ 10 13C2 PFDA	10.0	10.8	107.63

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-080618-RW-032</u>	Lab Sample ID: <u>320-41846-9</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_041.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 12:40</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>262 (mL)</u>	Date Analyzed: <u>08/19/2018 02:16</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240733</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	15	J	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	J	29	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.4	J	9.5	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	86	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	79		70-130
STL00996	13C2 PFDA	102		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_041.d
 Lims ID: 320-41846-A-9-A
 Client ID: NAWC-080618-RW-032
 Sample Type: Client
 Inject. Date: 19-Aug-2018 02:16:45 ALS Bottle#: 29 Worklist Smp#: 39
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41846-a-9-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:48:44 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK026

First Level Reviewer: barnettj

Date: 20-Aug-2018 10:46:25

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.388	-0.007	1.000	246198	2.12		365	
298.90 > 99.00	1.381	1.388	-0.007	1.000	166125		1.48(0.00-0.00)	300	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.510	-0.008	1.000	968167	7.87		8593	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.646	1.654	-0.008	1.000	178291	1.42		28.5	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.646	1.654	-0.008	1.000	496490	2.95		254	
* 6 13C2-PFOA									
415.00 > 370.00	1.828	1.836	-0.008		1183711	10.0		10049	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.836	1.836	0.0	1.000	507006	3.93		57.7	
413.00 > 169.00	1.828	1.836	-0.008	0.996	302781		1.67(0.00-0.00)	533	
* 7 13C4 PFOS									
503.00 > 80.00	2.086	2.086	0.0		2913857	28.7		3598	
9 Perfluorononanoic acid									
463.00 > 419.00	2.094	2.094	0.0	1.000	54842	0.5620		4.3	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.086	2.109	-0.023	1.000	543841	4.95		395	
499.00 > 99.00	2.086	2.109	-0.023	1.000	111170		4.89(0.00-0.00)	111	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.253	2.261	-0.008	1.000	952981	10.2		6968	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_041.d

Injection Date: 19-Aug-2018 02:16:45

Instrument ID: A8_N

Lims ID: 320-41846-A-9-A

Lab Sample ID: 320-41846-9

Client ID: NAWC-080618-RW-032

Operator ID: SACINSTLCMS01

ALS Bottle#: 29

Worklist Smp#: 39

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

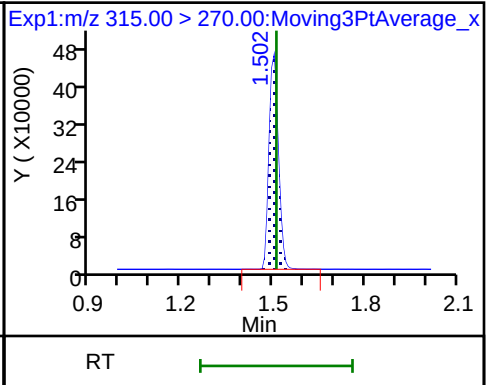
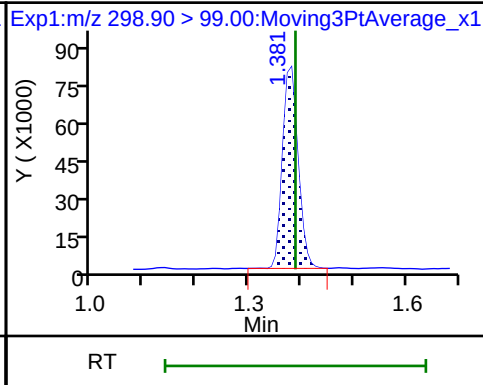
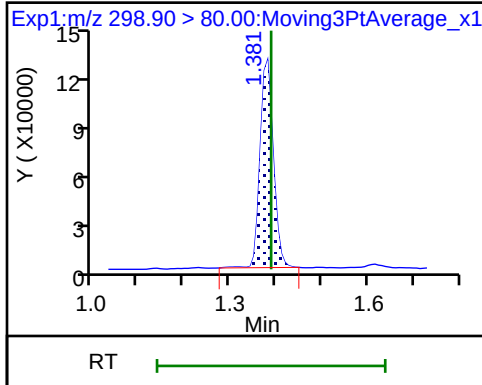
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

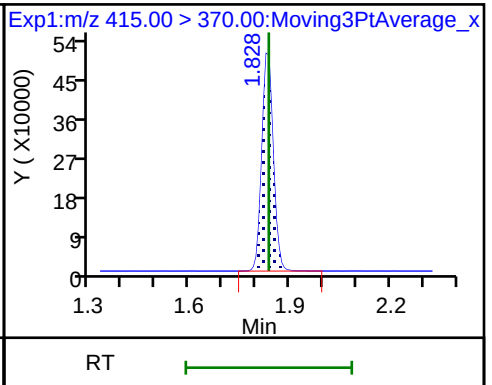
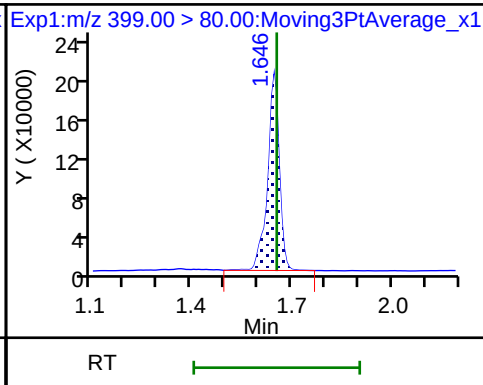
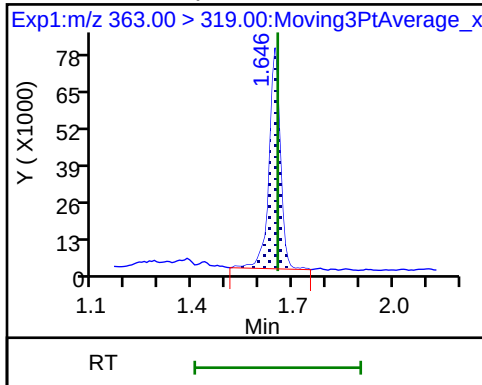
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

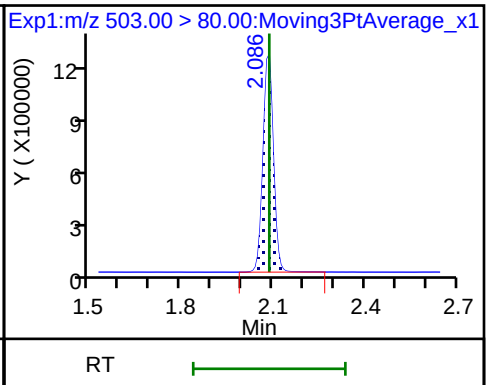
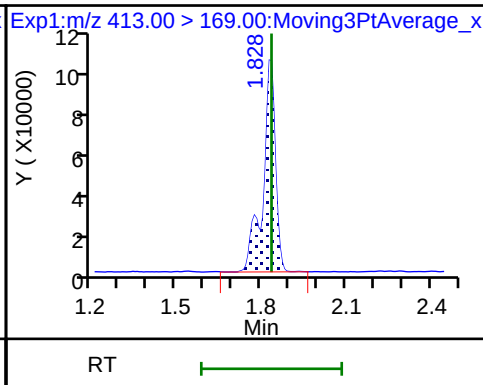
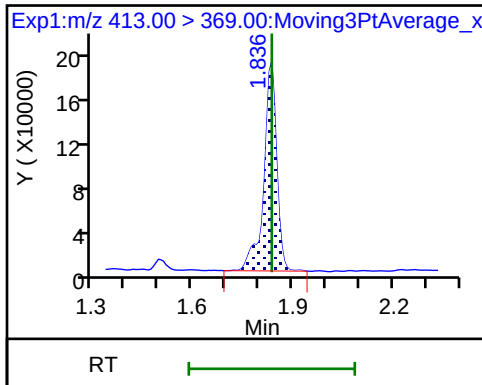
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

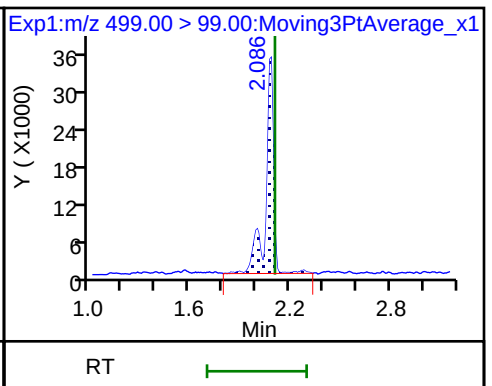
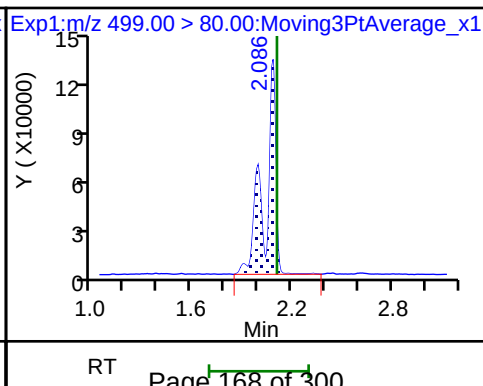
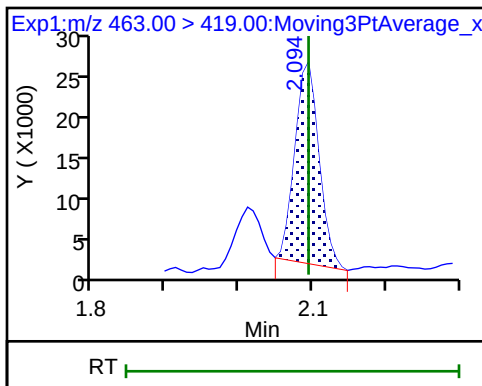
* 7 13C4 PFOS



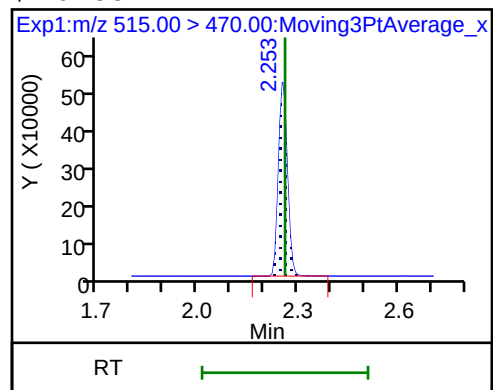
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_041.d
Lims ID: 320-41846-A-9-A
Client ID: NAWC-080618-RW-032
Sample Type: Client
Inject. Date: 19-Aug-2018 02:16:45 ALS Bottle#: 29 Worklist Smp#: 39
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41846-a-9-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 20-Aug-2018 10:48:44 Calib Date: 15-Aug-2018 18:44:32
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
Column 1 : Det: EXP1
Process Host: XAWRK026

First Level Reviewer: barnettj

Date: 20-Aug-2018 10:46:25

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	7.87	78.69
\$ 10 13C2 PFDA	10.0	10.2	101.64

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-080618-FRB-032</u>	Lab Sample ID: <u>320-41846-10</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_042.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 12:35</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>255.8 (mL)</u>	Date Analyzed: <u>08/19/2018 02:21</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240733</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	7.8	U	20	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	20	U	23	20	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.8	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	99		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_042.d
 Lims ID: 320-41846-A-10-A
 Client ID: NAWC-080618-FRB-032
 Sample Type: Client
 Inject. Date: 19-Aug-2018 02:21:26 ALS Bottle#: 30 Worklist Smp#: 40
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41846-a-10-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:48:44 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.510	1.510	0.0	1.000	1180387	9.69		11392	
* 6 13C2-PFOA									
415.00 > 370.00	1.844	1.836	0.008		1171838	10.0		9595	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.086	0.008		2887738	28.7		7032	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	920108	9.91		6594	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_042.d

Injection Date: 19-Aug-2018 02:21:26

Instrument ID: A8_N

Lims ID: 320-41846-A-10-A

Lab Sample ID: 320-41846-10

Client ID: NAWC-080618-FRB-032

Operator ID: SACINSTLCMS01

ALS Bottle#: 30

Worklist Smp#: 40

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

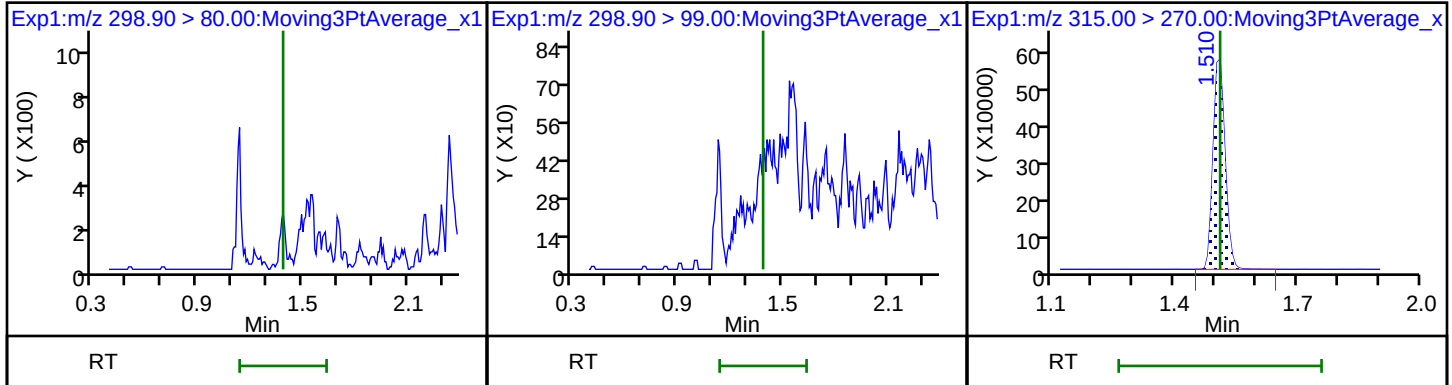
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

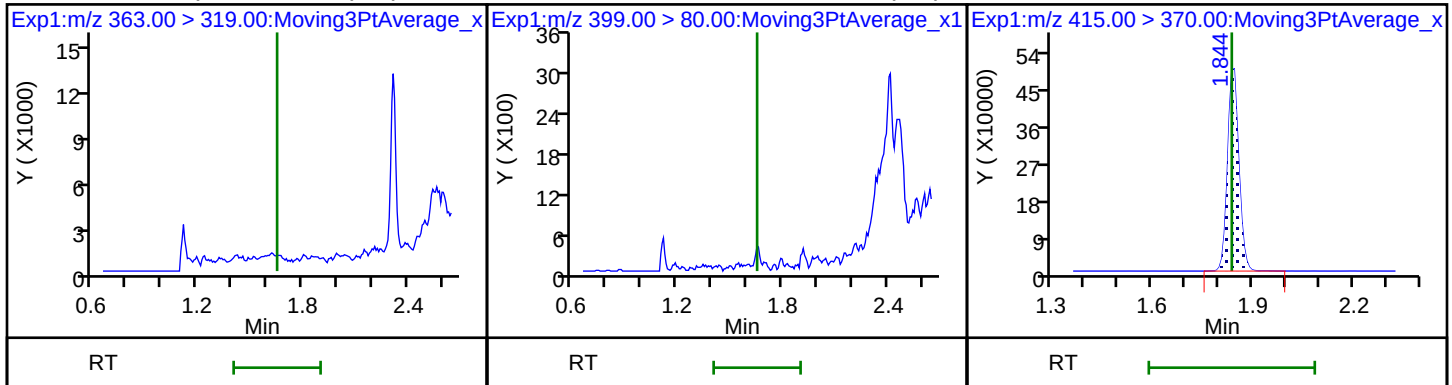
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid (ND)

3 Perfluorohexanesulfonic acid (ND)

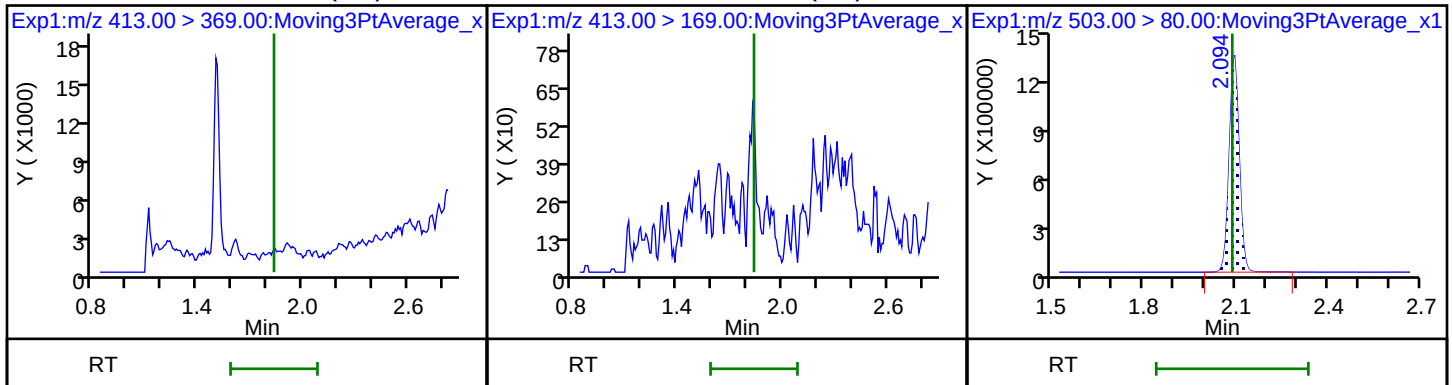
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

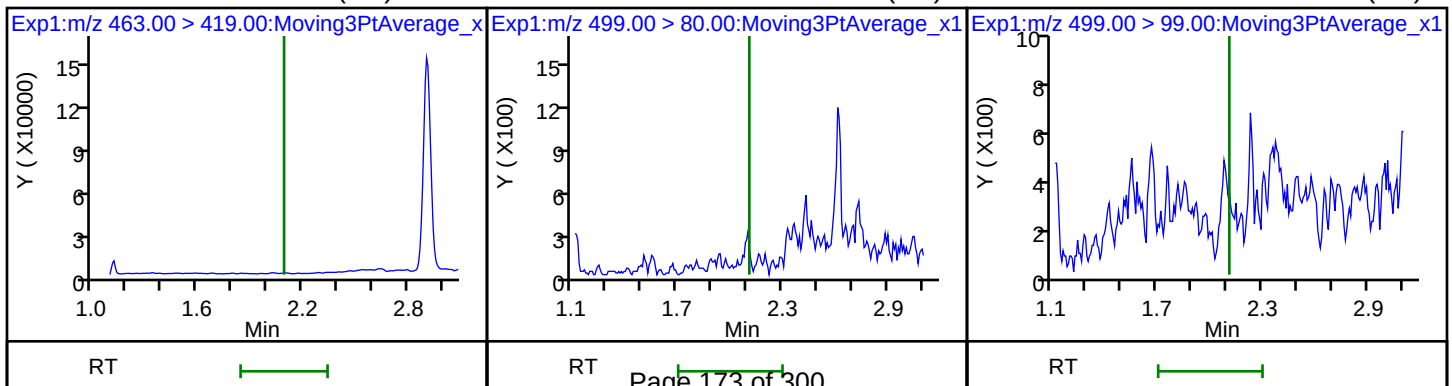
* 7 13C4 PFOS



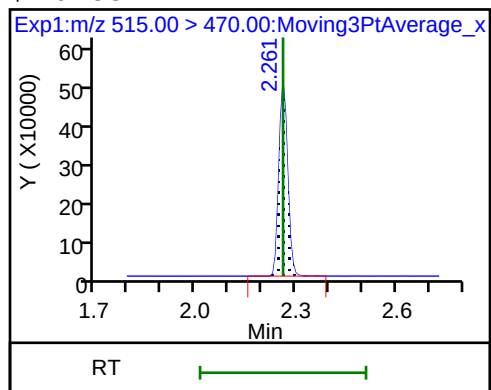
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_042.d
Lims ID: 320-41846-A-10-A
Client ID: NAWC-080618-FRB-032
Sample Type: Client
Inject. Date: 19-Aug-2018 02:21:26 ALS Bottle#: 30 Worklist Smp#: 40
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41846-a-10-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 20-Aug-2018 10:48:44 Calib Date: 15-Aug-2018 18:44:32
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 :

Det: EXP1

Process Host: XAWRK026

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.69	96.91
\$ 10 13C2 PFDA	10.0	9.91	99.12

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1

SDG No.: _____

Client Sample ID: NAWC-080618-RW-272 Lab Sample ID: 320-41846-11

Matrix: Water Lab File ID: 2018.08.18_537A_043.d

Analysis Method: 537 Date Collected: 08/06/2018 14:10

Extraction Method: 537 Date Extracted: 08/16/2018 08:12

Sample wt/vol: 269.4 (mL) Date Analyzed: 08/19/2018 02:26

Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1

Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)

% Moisture: _____ GPC Cleanup: (Y/N) N

Analysis Batch No.: 240733 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	J	37	15	6.3
335-67-1	Perfluorooctanoic acid (PFOA)	9.8	J	19	7.4	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	22	19	7.4
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.4	J M	9.3	3.7	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33	U	84	33	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	92		70-130
STL00996	13C2 PFDA	103		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_043.d
 Lims ID: 320-41846-A-11-A
 Client ID: NAWC-080618-RW-272
 Sample Type: Client
 Inject. Date: 19-Aug-2018 02:26:06 ALS Bottle#: 31 Worklist Smp#: 41
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41846-a-11-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:48:44 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK026

First Level Reviewer: barnettj

Date: 20-Aug-2018 10:47:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.388	-0.007	1.000	127180	1.11		165	
298.90 > 99.00	1.381	1.388	-0.007	1.000	80097		1.59(0.00-0.00)	137	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.510	-0.008	1.000	1129642	9.24		10467	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.654	1.654	0.0	1.000	80223	0.6450		13.7	M
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.654	1.654	0.0	1.000	212850	1.28		92.7	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.836	0.0		1176201	10.0		8390	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.844	1.836	0.008	1.000	337429	2.63		33.2	
413.00 > 169.00	1.836	1.836	0.0	0.996	194835		1.73(0.00-0.00)	325	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.086	0.008		2878024	28.7		3190	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.094	2.109	-0.015	1.000	400370	3.69		254	
499.00 > 99.00	2.094	2.109	-0.015	1.000	88502		4.52(0.00-0.00)	85.5	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	958520	10.3		6596	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_043.d

Injection Date: 19-Aug-2018 02:26:06

Instrument ID: A8_N

Lims ID: 320-41846-A-11-A

Lab Sample ID: 320-41846-11

Client ID: NAWC-080618-RW-272

Operator ID: SACINSTLCMS01

ALS Bottle#: 31

Worklist Smp#: 41

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

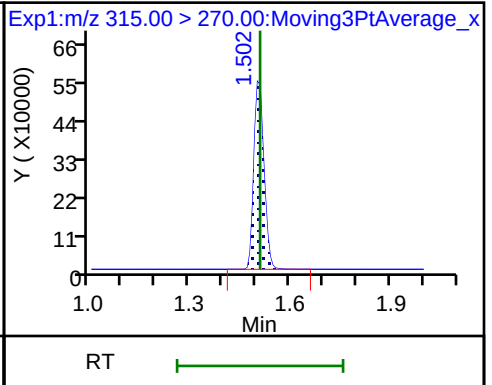
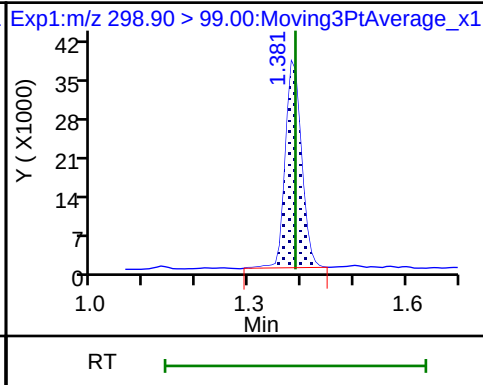
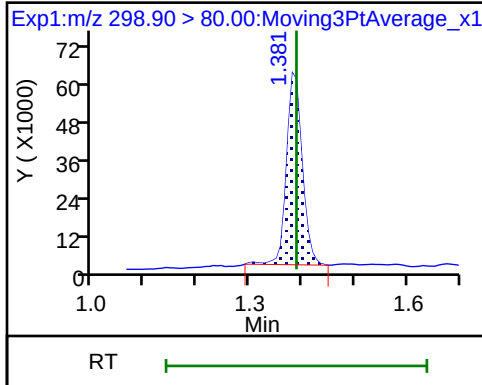
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

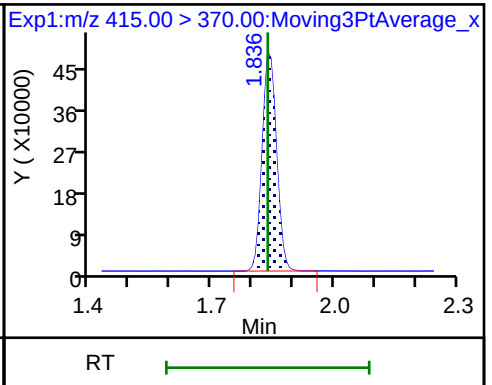
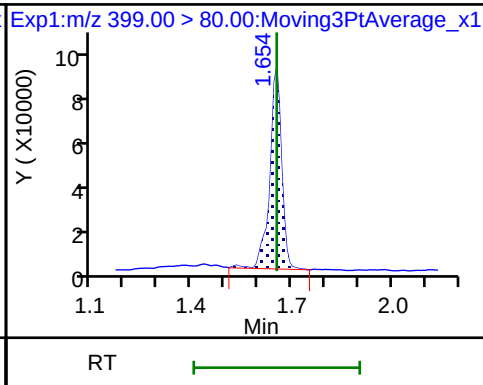
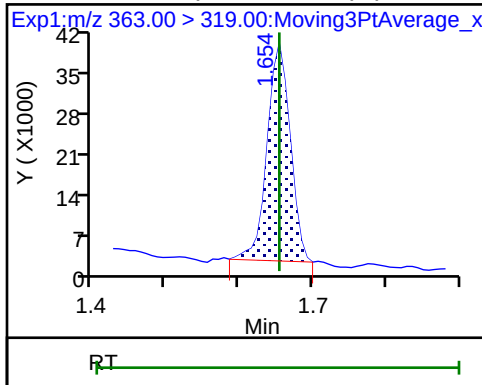
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid (M)

3 Perfluorohexanesulfonic acid

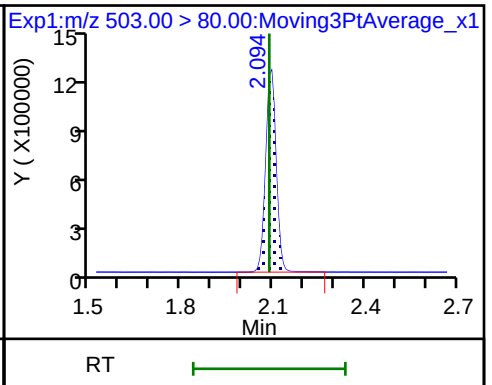
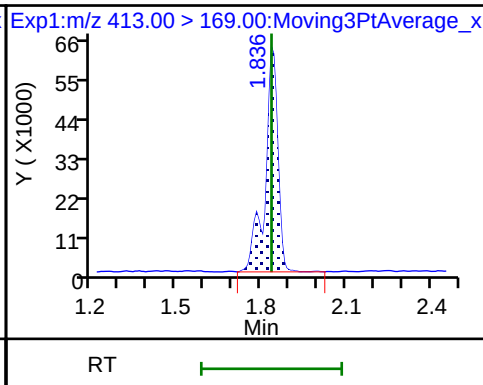
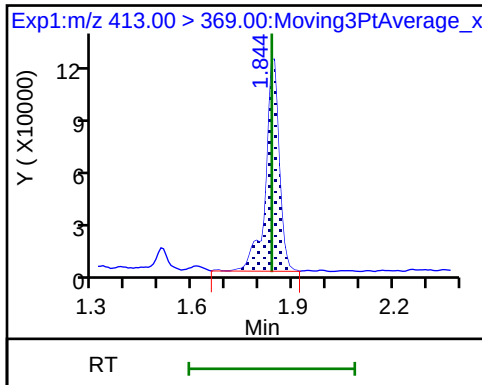
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

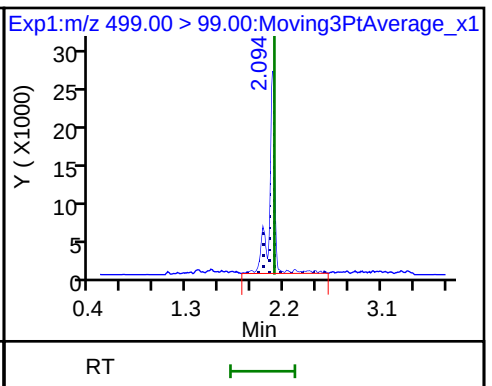
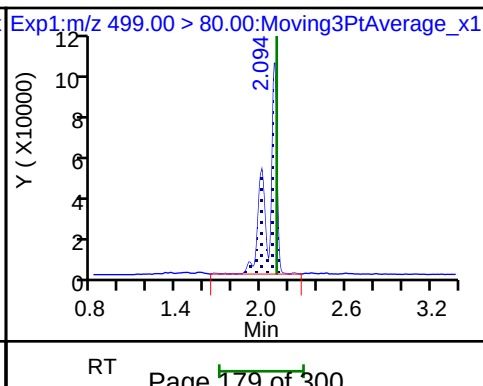
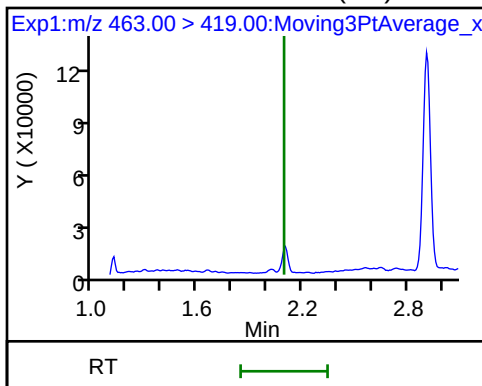
* 7 13C4 PFOS



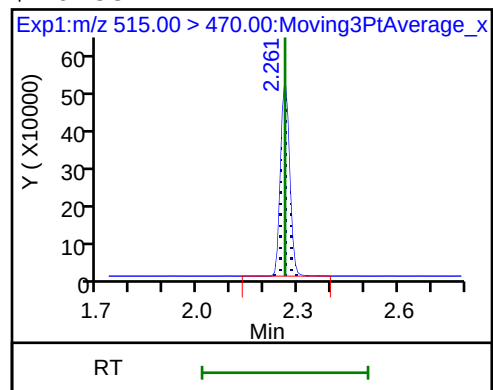
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_043.d
Lims ID: 320-41846-A-11-A
Client ID: NAWC-080618-RW-272
Sample Type: Client
Inject. Date: 19-Aug-2018 02:26:06 ALS Bottle#: 31 Worklist Smp#: 41
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41846-a-11-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 20-Aug-2018 10:48:44 Calib Date: 15-Aug-2018 18:44:32
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
Column 1 : Det: EXP1
Process Host: XAWRK026

First Level Reviewer: barnettj

Date: 20-Aug-2018 10:47:10

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.24	92.40
\$ 10 13C2 PFDA	10.0	10.3	102.88

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_043.d				
Injection Date:	19-Aug-2018 02:26:06	Instrument ID:	A8_N		
Lims ID:	320-41846-A-11-A	Lab Sample ID:	320-41846-11		
Client ID:	NAWC-080618-RW-272				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	31	Worklist Smp#:	41
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

Signal: 1

Not Detected
Expected RT: 1.65

Exp1:m/z 363.00 > 319.00:Moving3PtAverage_x1

The chromatogram displays a single, sharp, and prominent peak at a retention time of approximately 1.65 minutes. The y-axis, labeled 'Y (X1000)', ranges from 0 to 42 with major tick marks every 3 units. The x-axis, labeled 'Min', ranges from 1.3 to 2.0 with major tick marks every 0.1 units. The peak reaches a maximum height of approximately 40.5 units. The baseline is relatively flat with minor fluctuations, starting around 5 units at 1.3 minutes and ending around 1 unit at 2.0 minutes.

Time (Min)	Y (X1000)
1.3	5.0
1.4	4.5
1.5	3.0
1.6	4.0
1.65	40.5
1.7	2.5
1.8	1.5
1.9	1.0
2.0	1.0

RT: 1.65
Area: 80223
Amount: 0.644959
Amount Units: ng/ml

Exp1:m/z 363.00 > 319.00:Moving3PtAverage_x1

Y (X1000)

RT

1.654

Min

Reviewer: barnettj, 20-Aug-2018 10:46:57
Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-080618-FRB-272</u>	Lab Sample ID: <u>320-41846-12</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_044.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 14:05</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>259.4 (mL)</u>	Date Analyzed: <u>08/19/2018 02:30</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240733</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	7.7	U	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.6	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	94		70-130
STL00996	13C2 PFDA	101		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_044.d
 Lims ID: 320-41846-A-12-A
 Client ID: NAWC-080618-FRB-272
 Sample Type: Client
 Inject. Date: 19-Aug-2018 02:30:46 ALS Bottle#: 32 Worklist Smp#: 42
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41846-a-12-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:48:44 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.510	-0.008	1.000	1212564	9.36		13327	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.836	0.0		1246847	10.0		10045	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.086	0.008		2945506	28.7		6248	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	993765	10.1		6728	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_044.d

Injection Date: 19-Aug-2018 02:30:46

Instrument ID: A8_N

Lims ID: 320-41846-A-12-A

Lab Sample ID: 320-41846-12

Client ID: NAWC-080618-FRB-272

Operator ID: SACINSTLCMS01

ALS Bottle#: 32

Worklist Smp#: 42

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

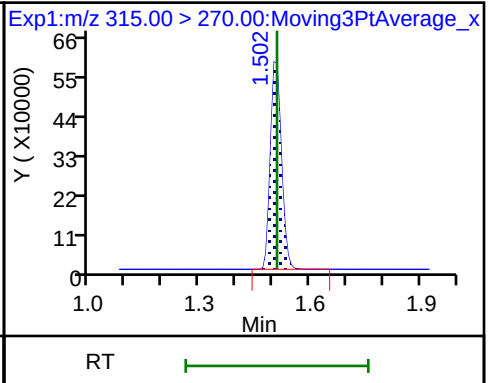
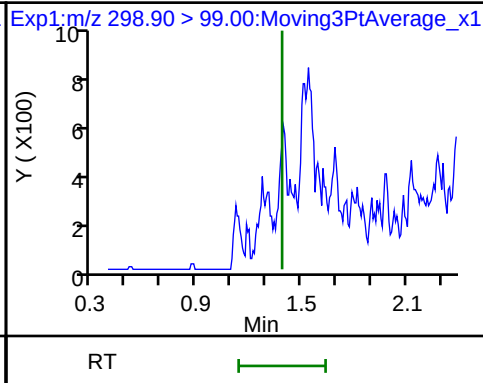
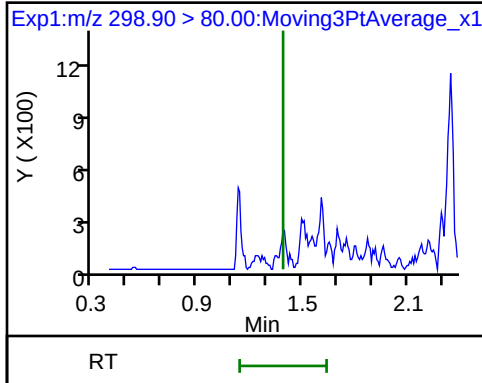
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

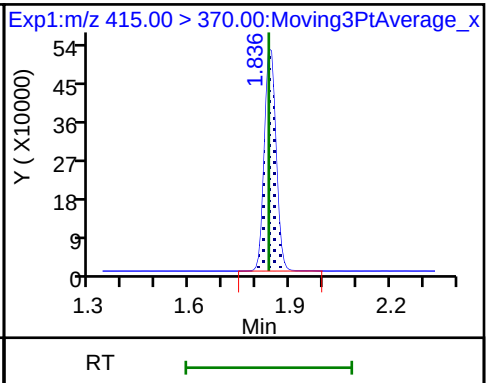
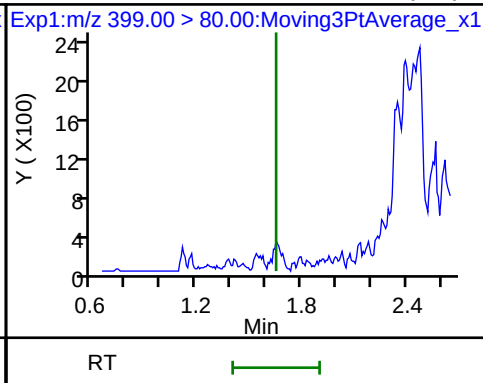
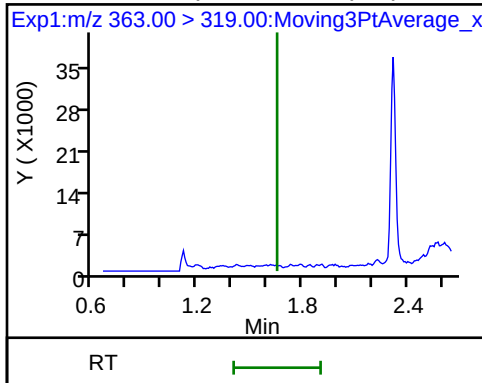
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid (ND)

3 Perfluorohexanesulfonic acid (ND)

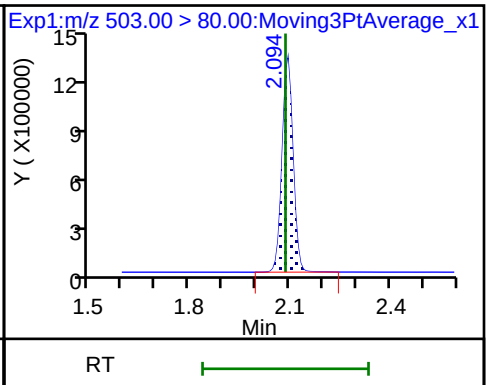
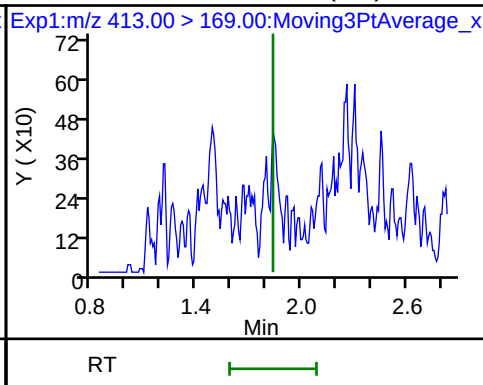
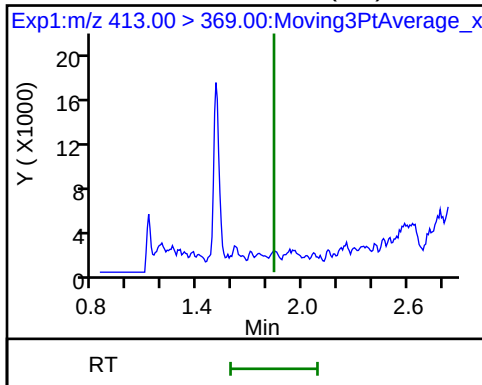
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

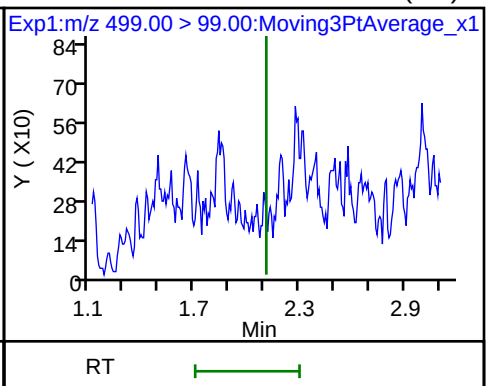
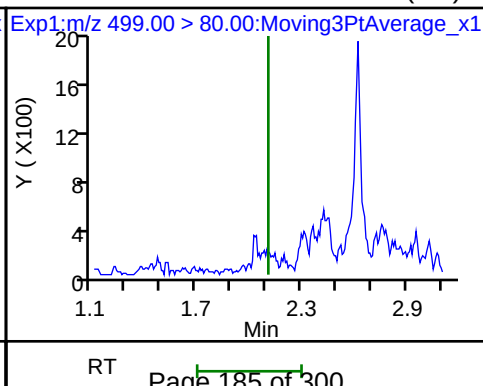
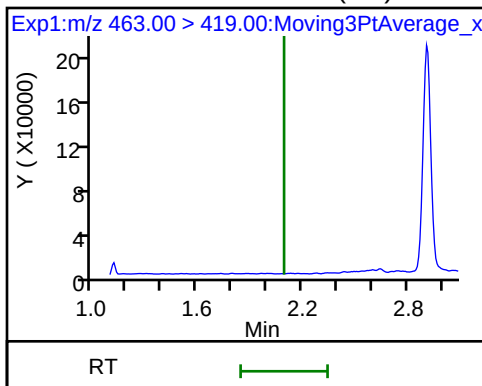
* 7 13C4 PFOS



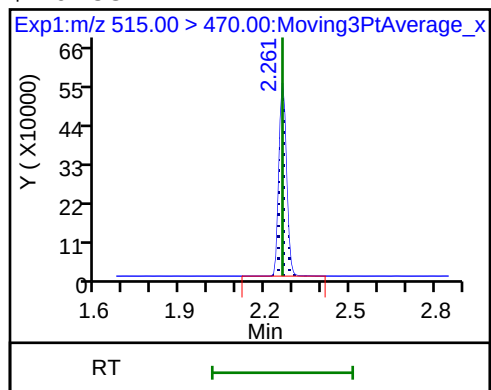
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_044.d
Lims ID: 320-41846-A-12-A
Client ID: NAWC-080618-FRB-272
Sample Type: Client
Inject. Date: 19-Aug-2018 02:30:46 ALS Bottle#: 32 Worklist Smp#: 42
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41846-a-12-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 20-Aug-2018 10:48:44 Calib Date: 15-Aug-2018 18:44:32
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.36	93.56
\$ 10 13C2 PFDA	10.0	10.1	100.62

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: WGNA-080618-DUP-43 Lab Sample ID: 320-41846-13
 Matrix: Water Lab File ID: 2018.08.18_537A_045.d
 Analysis Method: 537 Date Collected: 08/06/2018 07:00
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 258.7(mL) Date Analyzed: 08/19/2018 02:35
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240733 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	24	J	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	15	J	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.8	J	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.6	J	9.7	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	111		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_045.d
 Lims ID: 320-41846-A-13-A
 Client ID: WGNA-080618-DUP-43
 Sample Type: Client
 Inject. Date: 19-Aug-2018 02:35:27 ALS Bottle#: 33 Worklist Smp#: 43
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41846-a-13-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:48:44 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK026

First Level Reviewer: barnettj

Date: 20-Aug-2018 10:47:49

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.388	-0.007	1.000	165252	1.50		109	
298.90 > 99.00	1.381	1.388	-0.007	1.000	99680		1.66(0.00-0.00)	158	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.510	-0.008	1.000	1158630	10.1		11568	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.646	1.654	-0.008	1.000	140239	1.20		18.0	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.646	1.654	-0.008	1.000	281615	1.76		77.7	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.836	0.0		1108290	10.0		6679	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.836	1.836	0.0	1.000	480015	3.98		40.2	
413.00 > 169.00	1.836	1.836	0.0	1.000	273506		1.76(0.00-0.00)	472	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.086	0.008		2766230	28.7		1804	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.094	2.109	-0.015	1.000	659874	6.33		176	
499.00 > 99.00	2.094	2.109	-0.015	1.000	115921		5.69(0.00-0.00)	79.3	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	975127	11.1		6540	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_045.d

Injection Date: 19-Aug-2018 02:35:27

Instrument ID: A8_N

Lims ID: 320-41846-A-13-A

Lab Sample ID: 320-41846-13

Client ID: WGNA-080618-DUP-43

Operator ID: SACINSTLCMS01

ALS Bottle#: 33

Worklist Smp#: 43

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

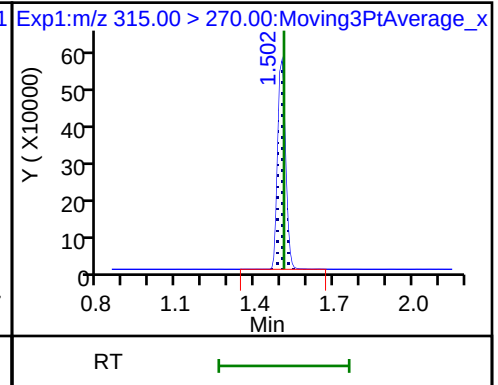
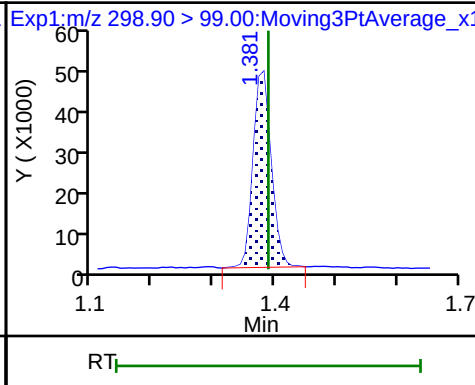
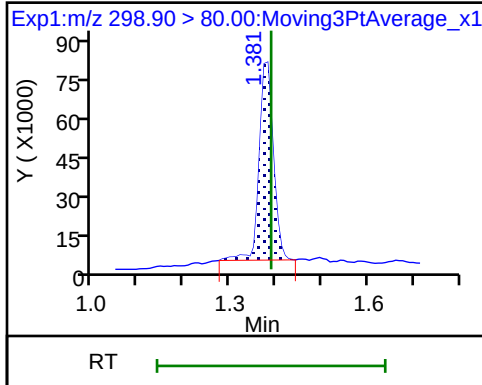
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

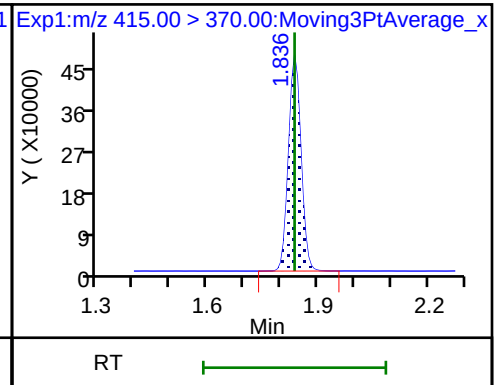
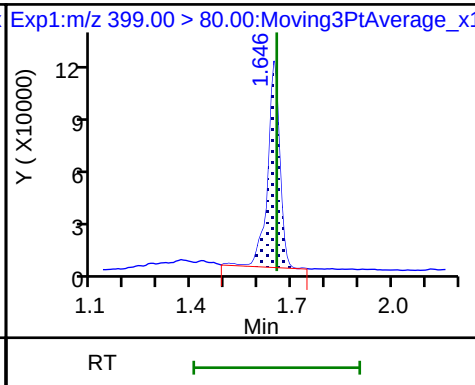
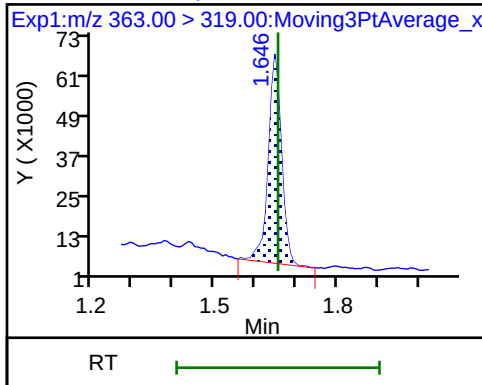
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

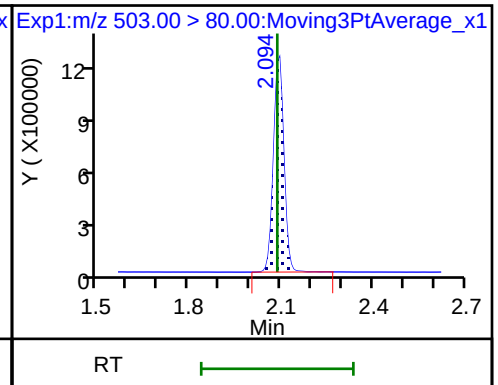
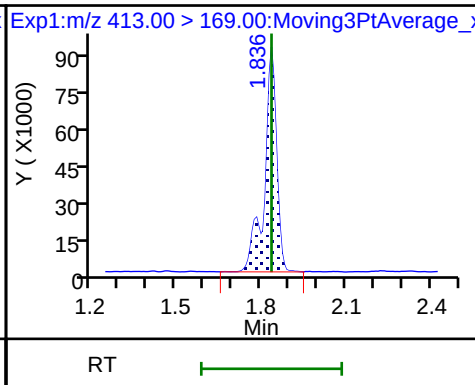
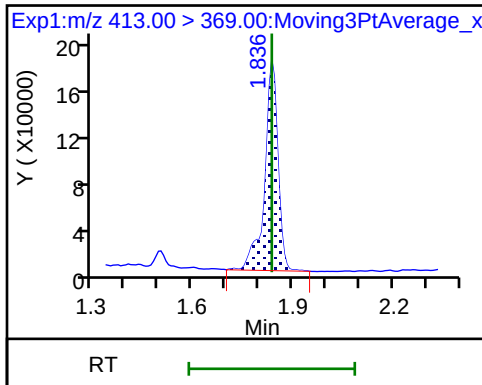
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

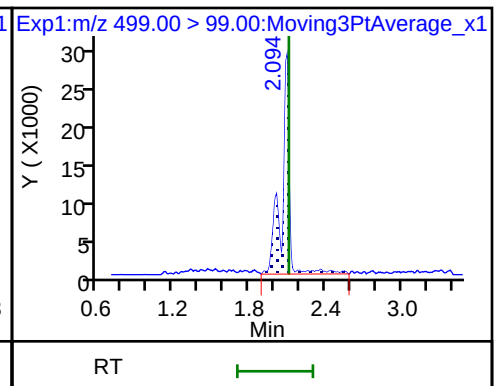
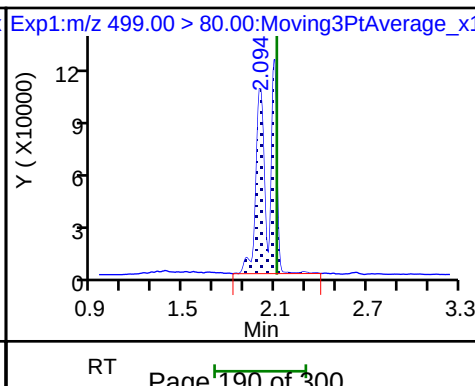
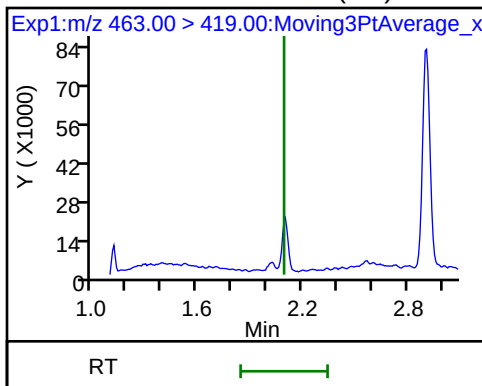
* 7 13C4 PFOS



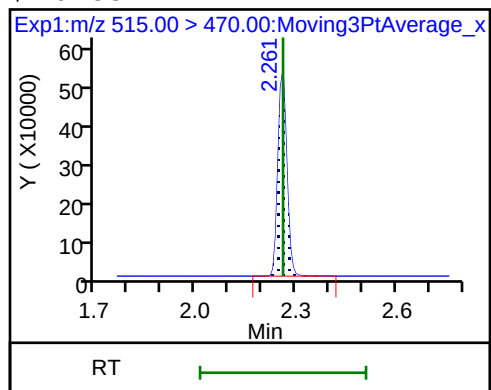
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_045.d
Lims ID: 320-41846-A-13-A
Client ID: WGNA-080618-DUP-43
Sample Type: Client
Inject. Date: 19-Aug-2018 02:35:27 ALS Bottle#: 33 Worklist Smp#: 43
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41846-a-13-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 20-Aug-2018 10:48:44 Calib Date: 15-Aug-2018 18:44:32
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
Column 1 : Det: EXP1
Process Host: XAWRK026

First Level Reviewer: barnettj

Date: 20-Aug-2018 10:47:49

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.1	100.58
\$ 10 13C2 PFDA	10.0	11.1	111.07

FORM VI
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1 Analy Batch No.: 240166

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/15/2018 18:21 Calibration End Date: 08/15/2018 18:44 Calibration ID: 40641

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-240166/2	2018.08.15_537CURVE_003.d
Level 2	IC 320-240166/3	2018.08.15_537CURVE_004.d
Level 3	IC 320-240166/4	2018.08.15_537CURVE_005.d
Level 4	IC 320-240166/5	2018.08.15_537CURVE_006.d
Level 5	IC 320-240166/6	2018.08.15_537CURVE_007.d
Level 6	IC 320-240166/7	2018.08.15_537CURVE_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid (PFBS)	1.2479 0.9705	1.1886	1.2616	1.1091	1.0906	Ave		1.1447				9.6		30.0			
Perfluoroheptanoic acid (PFHpA)	1.0855 1.0407	1.0364	1.0489	1.0876	1.0460	Ave		1.0575				2.2		30.0			
Perfluorohexanesulfonic acid (PFHxS)	1.6492 1.6115	1.6167	1.6890	1.6380	1.7330	Ave		1.6562				2.8		30.0			
Perfluorooctanoic acid (PFOA)	1.0954 1.0842	1.0529	1.0915	1.1075	1.1058	Ave		1.0895				1.8		30.0			
Perfluorooctanesulfonic acid (PFOS)	1.0830 1.0982	1.0386	1.0683	1.0853	1.1084	Ave		1.0803				2.3		30.0			
Perfluorononanoic acid (PFNA)	0.8630 0.8350	0.7990	0.7881	0.8431	0.8177	Ave		0.8243				3.4		30.0			
13C2 PFHxA	1.0723 1.0545	1.0111	1.0024	1.0515	1.0447	Ave		1.0394				2.6		30.0			
13C2 PFDA	0.7972 0.7976	0.7443	0.7670	0.8351	0.8115	Ave		0.7921				4.1		30.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1 Analy Batch No.: 240166

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/15/2018 18:21 Calibration End Date: 08/15/2018 18:44 Calibration ID: 40641

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-240166/2	2018.08.15_537CURVE_003.d
Level 2	IC 320-240166/3	2018.08.15_537CURVE_004.d
Level 3	IC 320-240166/4	2018.08.15_537CURVE_005.d
Level 4	IC 320-240166/5	2018.08.15_537CURVE_006.d
Level 5	IC 320-240166/6	2018.08.15_537CURVE_007.d
Level 6	IC 320-240166/7	2018.08.15_537CURVE_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	Ave	998954 15136483	2070355	4549188	9386038	11785636	9.00 180	20.0	45.0	90.1	135
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	106948 1986691	233189	488515	1105731	1440874	0.960 19.4	2.16	4.86	9.72	14.6
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	440547 8441814	945775	2045536	4655795	6289862	3.00 60.5	6.72	15.1	30.2	45.4
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	222587 4216218	482587	1035552	2293687	3102767	1.98 39.6	4.40	9.90	19.8	29.7
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	380845 7518443	794113	1690983	4031609	5257770	3.95 79.1	8.79	19.8	39.5	59.3
Perfluorononanoic acid (PFNA)	13PF OA	Ave	175370 3246932	366204	747749	1746006	2294540	1.98 39.6	4.40	9.90	19.8	29.7
13C2 PFHxA	13PF OA	Ave	1100508 1035478	1053216	960623	1099800	987004	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	818198 783206	775306	735076	873467	766710	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD

FORM VI
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1 Analy Batch No.: 240166

SDG No.: _____

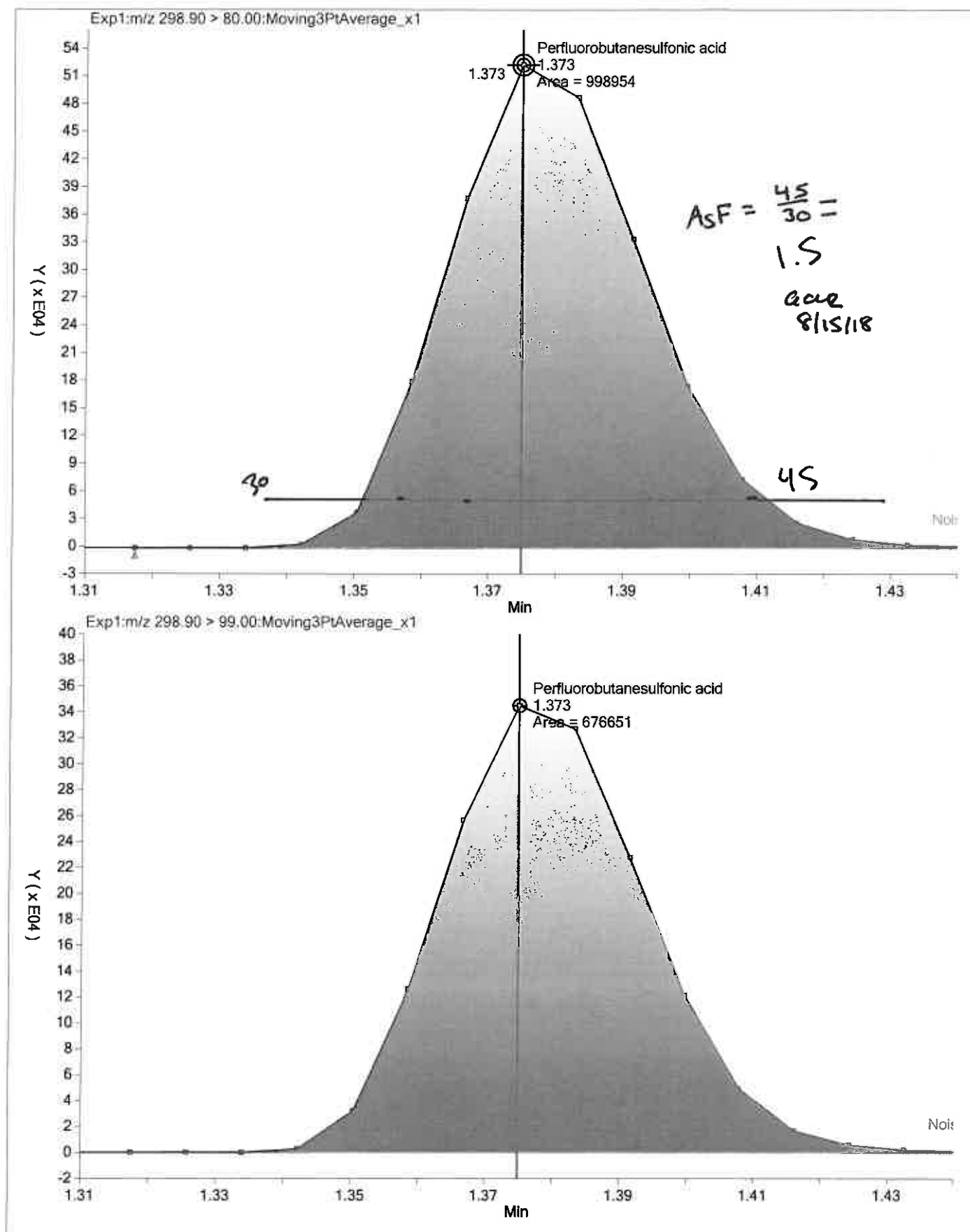
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

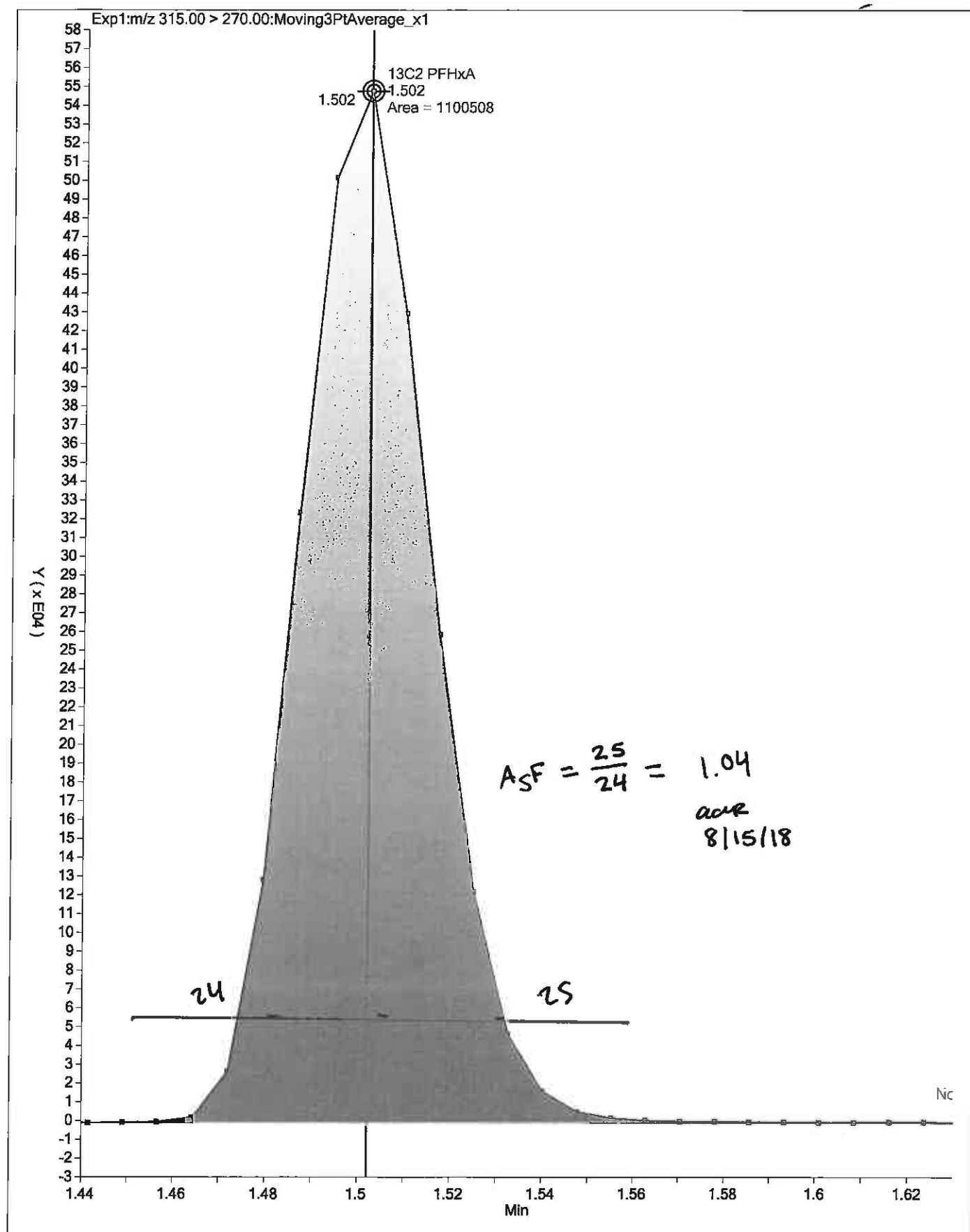
Calibration Start Date: 08/15/2018 18:21 Calibration End Date: 08/15/2018 18:44 Calibration ID: 40641

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-240166/2	2018.08.15_537CURVE_003.d
Level 2	IC 320-240166/3	2018.08.15_537CURVE_004.d
Level 3	IC 320-240166/4	2018.08.15_537CURVE_005.d
Level 4	IC 320-240166/5	2018.08.15_537CURVE_006.d
Level 5	IC 320-240166/6	2018.08.15_537CURVE_007.d
Level 6	IC 320-240166/7	2018.08.15_537CURVE_008.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid (PFBS)	9.0	3.8	10.2	-3.1	-4.7	-15.2	50	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	2.6	-2.0	-0.8	2.8	-1.1	-1.6	50	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	-0.4	-2.4	2.0	-1.1	4.6	-2.7	50	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	0.5	-3.4	0.2	1.7	1.5	-0.5	50	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	0.2	-3.9	-1.1	0.5	2.6	1.7	50	30	30	30	30	30
Perfluorononanoic acid (PFNA)	4.7	-3.1	-4.4	2.3	-0.8	1.3	50	30	30	30	30	30
13C2 PFHxA	3.2	-2.7	-3.6	1.2	0.5	1.4	30	30	30	30	30	30
13C2 PFDA	0.6	-6.0	-3.2	5.4	2.4	0.7	30	30	30	30	30	30





TestAmerica Laboratories
Istd/Surrogate Recovery Report

Worklist Name: 15AUG2018_537_ICAL

Worklist Num: 62769

Instrument: A8_N

Method: 537_A8_N

Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b

Limit Group: LC 537 ICAI

Analysis Type: SemiVOA

Inj Volume: 2.00

Inj Vol Units: ul

Lims Batch: 240166

CCV IS Mode: Select Ical Level, Cal Level: 3

Non-Cal IS Mode: Last Cal Sample

\$ 2 13C2 PFHxA

\$ 10 13C2 PFDA

Lab ID	Inj Date	\$ 2	\$ 10	* 6 13C2-PFOA	* 7 13C4 PFOS
#1 RB	IS Std			1167019 1.78	2601656 2.01
15-Aug-2018 18:16:30				1133890 97.2	2646770 101.7
#2 IC L1	IS Std				
15-Aug-2018 18:21:09		1.50	2.27	1026304> 100.0*	2551191> 100.0*
#3 IC L2		1.50	2.28	1041660> 101.5*	2496049> 97.8*
15-Aug-2018 18:25:50		97.28	93.96		
#4 IC L3		1.51	2.27	958352> 93.4*	2296598> 90.0*
15-Aug-2018 18:30:31		96.91	97.60		
#5 IC L4		1.50	2.28	1045953> 101.9*	2694948> 105.6*
15-Aug-2018 18:35:11		101.20	105.40		
#6 IC L5		1.51	2.27	944777> 92.1*	2294155> 89.9*
15-Aug-2018 18:39:51		100.50	102.40		
#7 IC L6		1.50	2.27	981996> 95.7*	2483425> 97.3*
15-Aug-2018 18:44:32		101.40	100.70		
IS Std				958352 1.85	2296598 2.11
#8 RB				1059425 110.5	2535393 110.4
15-Aug-2018 18:49:12				1045953 1.85	2694948 2.11
IS Std					
#9 CCVL		1.50	2.27	1006603 96.2	2388436 88.6
15-Aug-2018 18:53:52		96.45	96.68		
IS Std				1006603 1.84	2388436 2.10
#10 ICB				1042675 103.6	2354282 98.6
15-Aug-2018 18:58:33				1045953 1.85	2694948 2.11
IS Std					
#11 ICV		1.50	2.26	1022273 97.7	2551643 94.7
15-Aug-2018 19:03:12		98.30	100.40		

13C2 PFOA

$$RPD = \frac{1045953 - 944777}{\left(\frac{1045953 + 944777}{2} \right)} \times 100 = 10.2\%$$

13C4 PFOS

$$RPD = \frac{2694948 - 2294155}{\left(\frac{2694948 + 2294155}{2} \right)} \times 100 = 16.1\%$$

accr
8/16/18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_003.d
 Lims ID: IC L1
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 15-Aug-2018 18:21:09 ALS Bottle#: 1 Worklist Smp#: 2
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L1_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2018 08:51:49 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK001

First Level Reviewer: roycea

Date: 15-Aug-2018 18:54:20

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.373	1.381	-0.008	1.000	998954	9.81		2568	
298.90 > 99.00	1.373	1.381	-0.008	1.000	676651		1.48(0.00-0.00)	998	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.505	-0.003	1.000	1100508	10.3		9954	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.654	1.654	0.0	1.000	106948	0.9854		20.4	M
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.654	1.654	0.0	1.000	440547	2.99		282	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.851	1.850	0.001	1.000	222587	1.99		30.5	
413.00 > 169.00	1.851	1.850	0.001	1.000	121100		1.84(0.00-0.00)	269	
* 6 13C2-PFOA									
415.00 > 370.00	1.851	1.850	0.001		1026304	10.0		6456	
* 7 13C4 PFOS									
503.00 > 80.00	2.109	2.108	0.001		2551191	28.7		5861	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.109	2.109	0.0	1.000	380845	3.96		606	
499.00 > 99.00	2.109	2.109	0.0	1.000	83364		4.57(0.00-0.00)	134	
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.116	0.001	1.000	175370	2.07		29.0	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.271	-0.003	1.000	818198	10.1		6270	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L1_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_003.d

Injection Date: 15-Aug-2018 18:21:09

Instrument ID: A8_N

Lims ID: IC L1

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 1

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

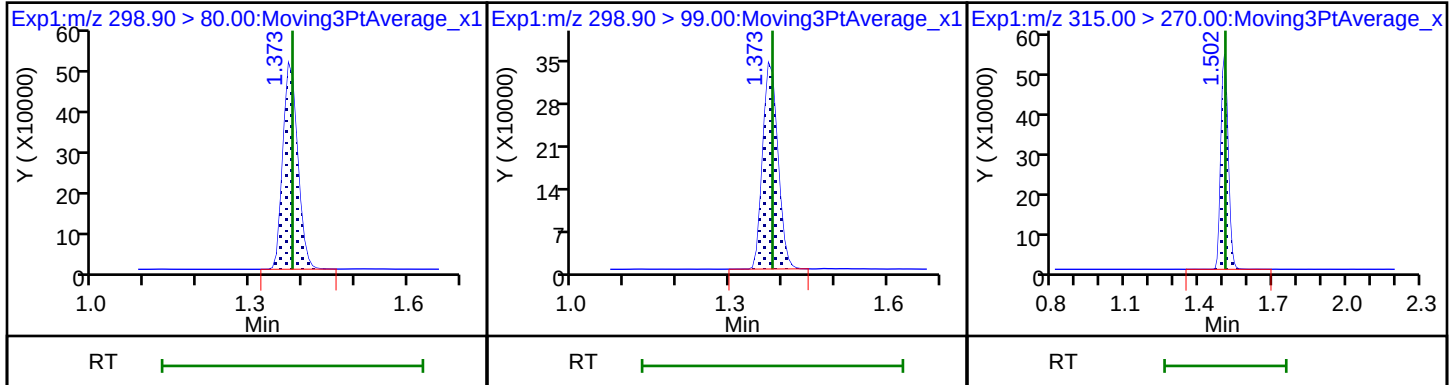
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

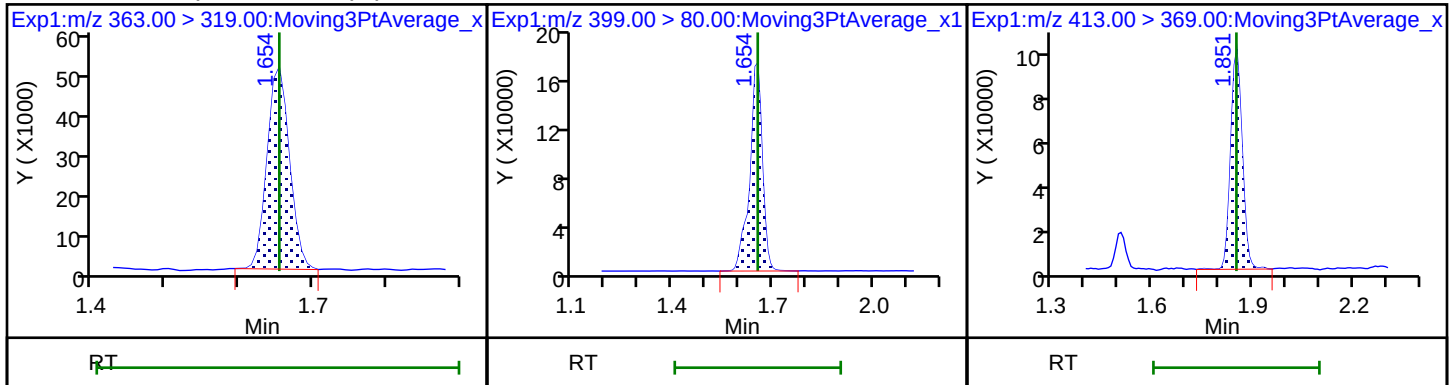
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid (M)

3 Perfluorohexanesulfonic acid

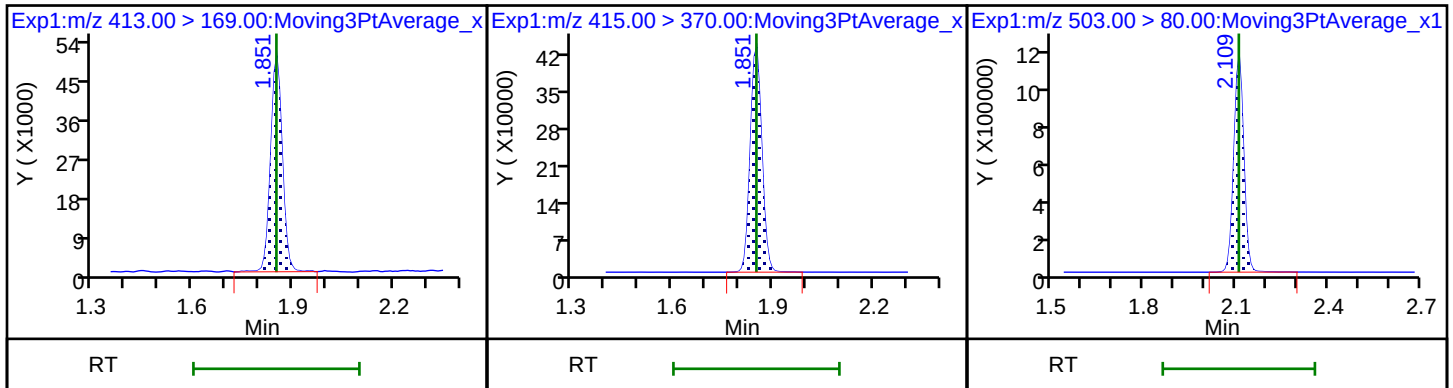
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

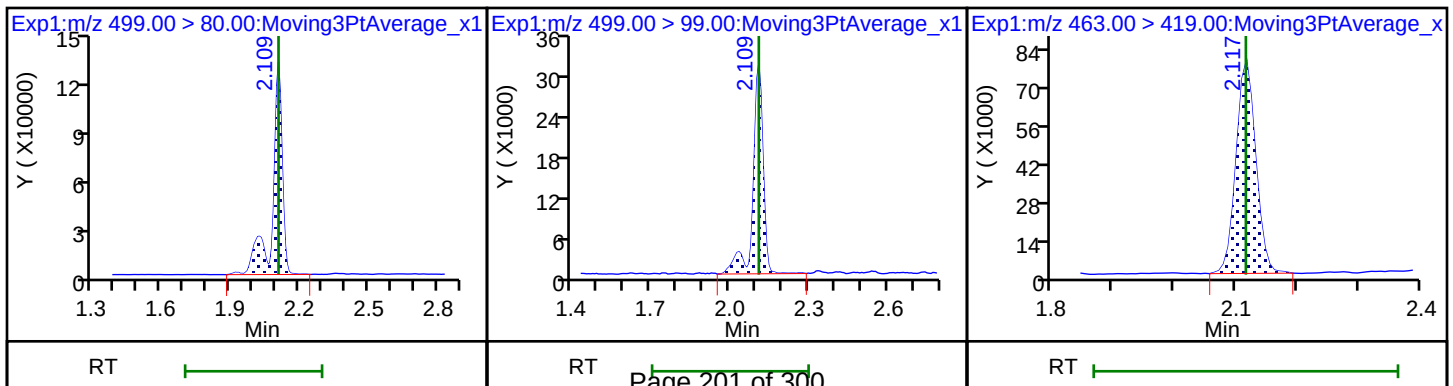
* 7 13C4 PFOS



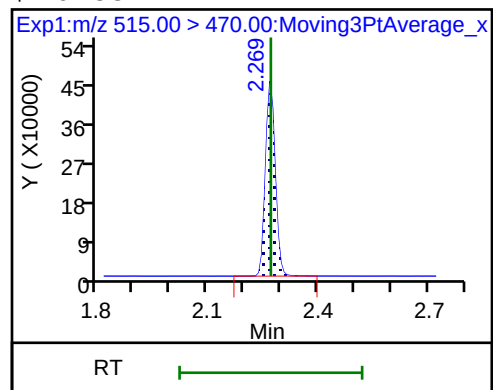
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

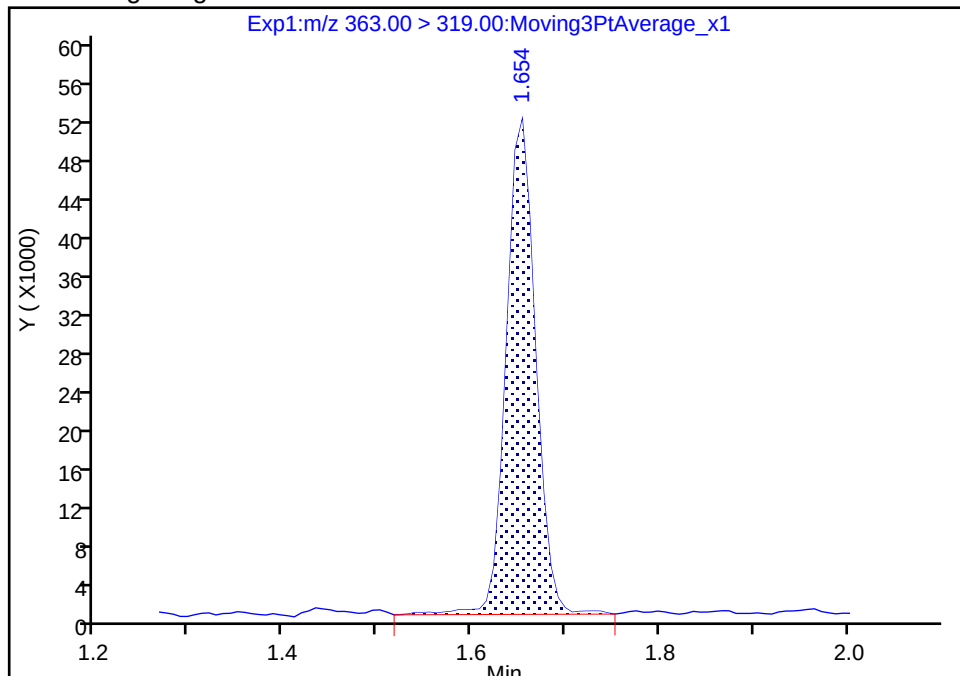
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_003.d
Injection Date: 15-Aug-2018 18:21:09 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

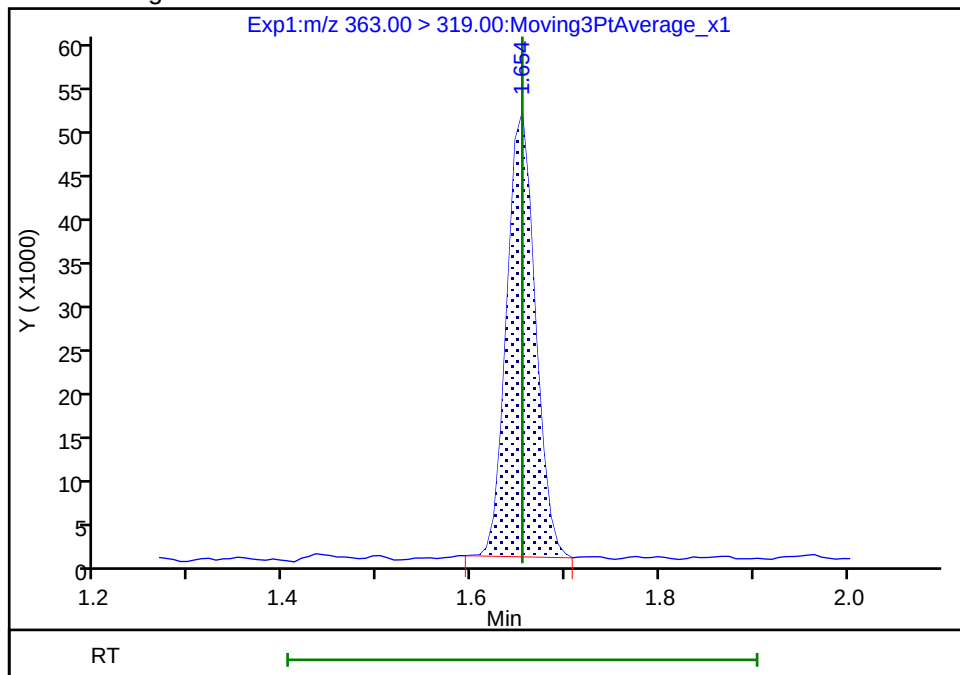
RT: 1.65
Area: 110830
Amount: 1.021059
Amount Units: ng/ml

Processing Integration Results



RT: 1.65
Area: 106948
Amount: 0.985398
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 15-Aug-2018 18:53:50
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 203 of 300

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_004.d
 Lims ID: IC L2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 15-Aug-2018 18:25:50 ALS Bottle#: 2 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L2_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2018 08:51:51 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK001

First Level Reviewer: roycea

Date: 15-Aug-2018 18:54:32

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	2070355	20.8		4725	
298.90 > 99.00	1.381	1.381	0.0	1.000	1435059		1.44(0.00-0.00)	2152	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.505	-0.003	1.000	1053216	9.73		8501	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.654	1.654	0.0	1.000	233189	2.12		44.5	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.654	1.654	0.0	1.000	945775	6.56		643	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.851	1.850	0.001	1.000	482587	4.25		66.7	
413.00 > 169.00	1.851	1.850	0.001	1.000	253282		1.91(0.00-0.00)	550	
* 6 13C2-PFOA									
415.00 > 370.00	1.851	1.850	0.001		1041660	10.0		6420	
* 7 13C4 PFOS									
503.00 > 80.00	2.109	2.108	0.001		2496049	28.7		4617	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.109	2.109	0.0	1.000	794113	8.45		1241	
499.00 > 99.00	2.109	2.109	0.0	1.000	177724		4.47(0.00-0.00)	300	
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.116	0.001	1.000	366204	4.26		60.0	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.276	2.271	0.005	1.000	775306	9.40		5522	

Reagents:

LC537-L2_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_004.d

Injection Date: 15-Aug-2018 18:25:50

Instrument ID: A8_N

Lims ID: IC L2

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

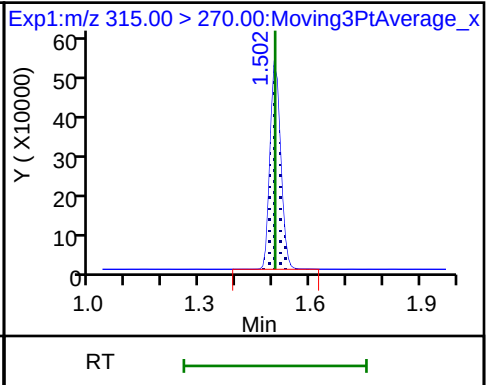
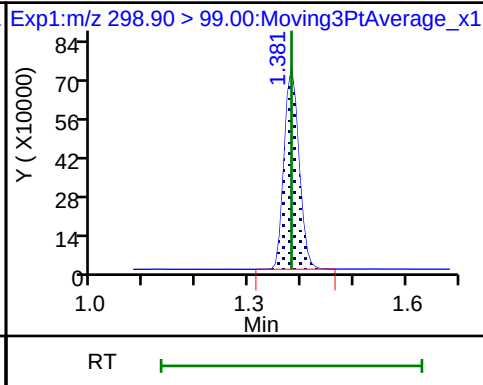
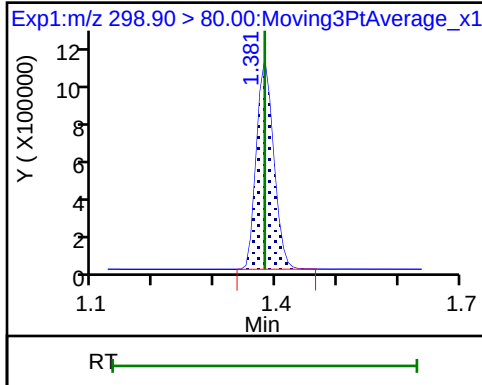
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

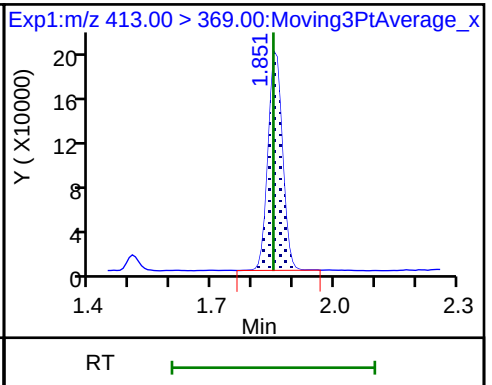
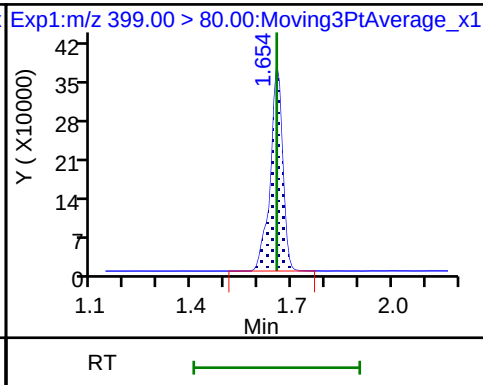
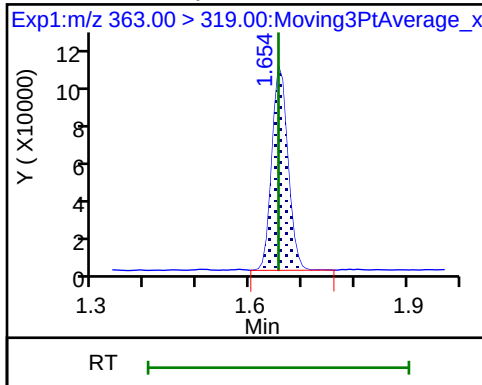
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

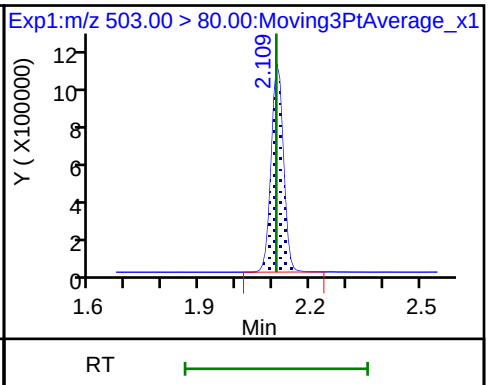
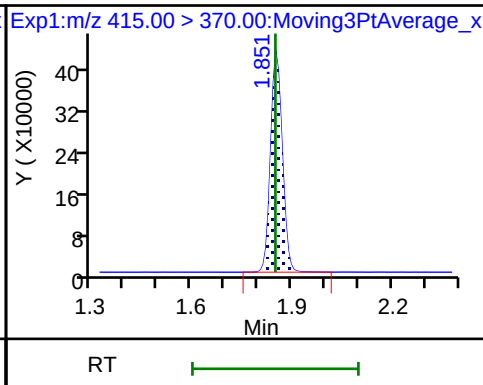
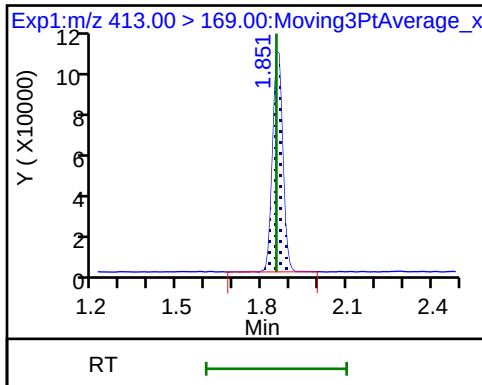
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

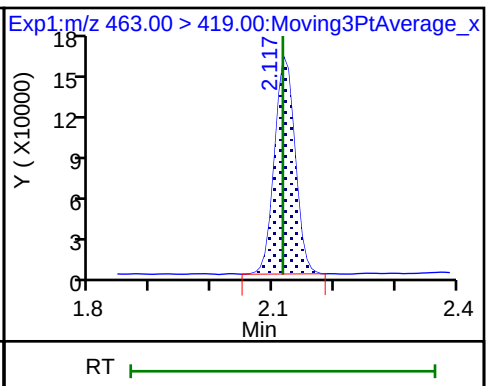
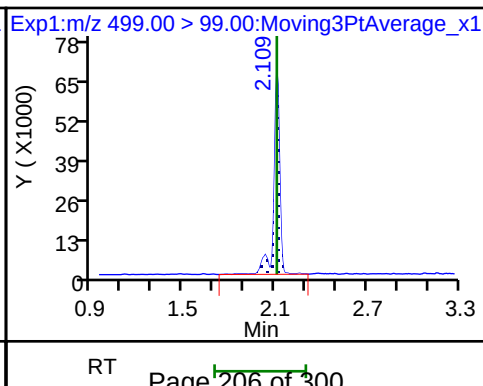
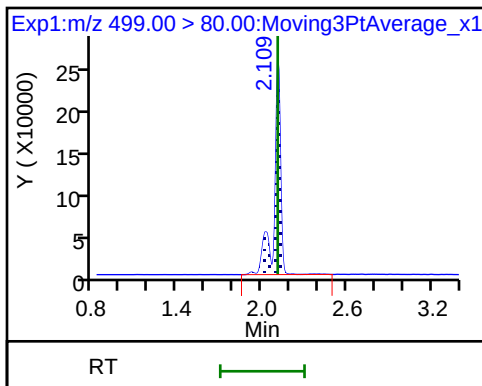
* 7 13C4 PFOS



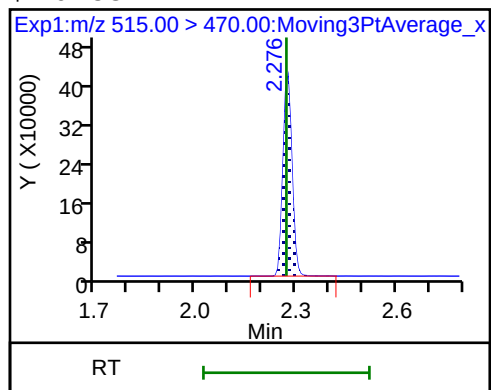
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_005.d
 Lims ID: IC L3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 15-Aug-2018 18:30:31 ALS Bottle#: 3 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L3_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2018 08:51:52 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK001

First Level Reviewer: roycea

Date: 15-Aug-2018 18:54:46

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	4549188	49.6		9553	
298.90 > 99.00	1.381	1.381	0.0	1.000	3023433		1.50(0.00-0.00)	4386	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.510	1.505	0.005	1.000	960623	9.64		8278	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.654	1.654	0.0	1.000	488515	4.82		90.9	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.654	1.654	0.0	1.000	2045536	15.4		1357	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.851	1.850	0.001	1.000	1035552	9.92		136	
413.00 > 169.00	1.851	1.850	0.001	1.000	542050		1.91(0.00-0.00)	1191	
* 6 13C2-PFOA									
415.00 > 370.00	1.851	1.850	0.001		958352	10.0		6793	
* 7 13C4 PFOS									
503.00 > 80.00	2.109	2.108	0.001		2296598	28.7		5075	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.109	2.109	0.0	1.000	1690983	19.5		2539	
499.00 > 99.00	2.109	2.109	0.0	1.000	384764		4.39(0.00-0.00)	662	
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.116	0.001	1.000	747749	9.47		118	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.271	-0.003	1.000	735076	9.68		5283	

Reagents:

LC537-L3_00025

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_005.d

Injection Date: 15-Aug-2018 18:30:31

Instrument ID: A8_N

Lims ID: IC L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

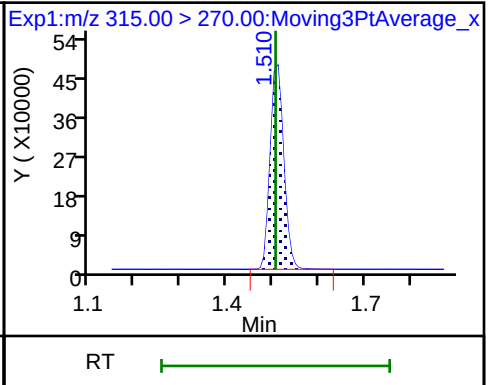
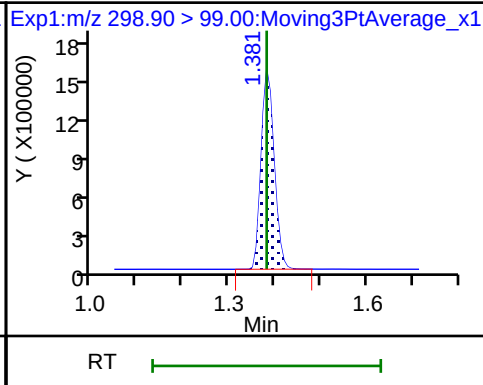
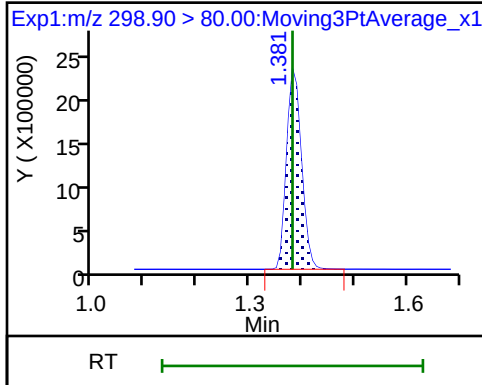
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

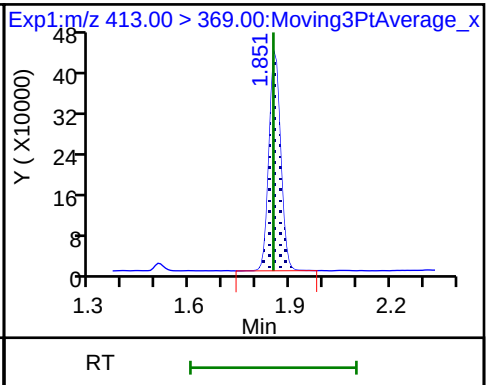
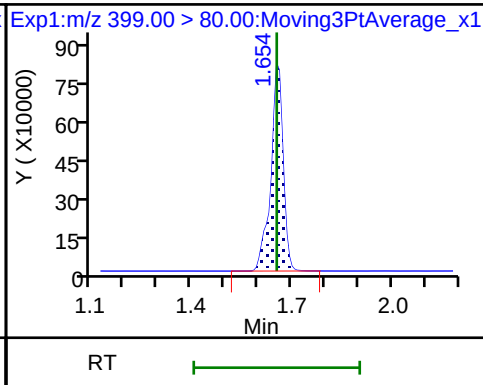
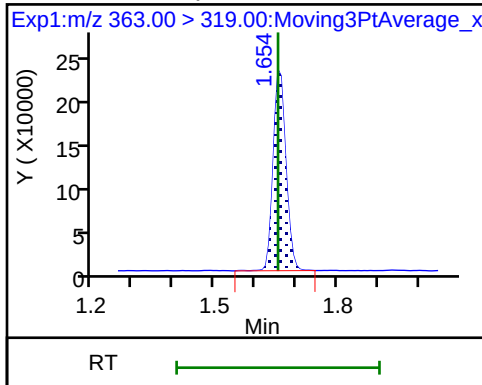
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

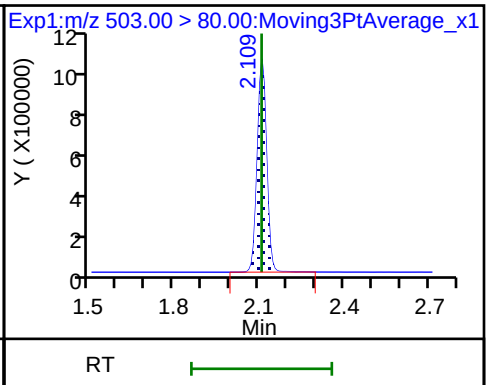
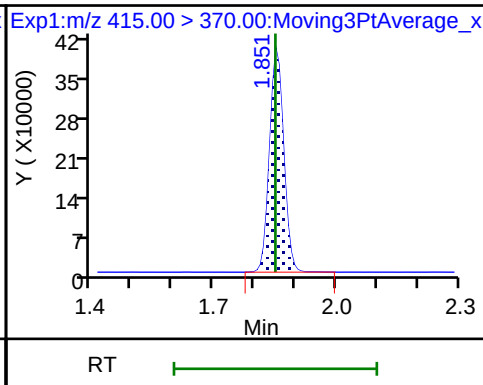
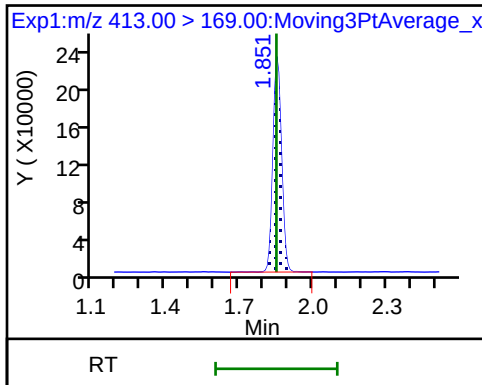
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

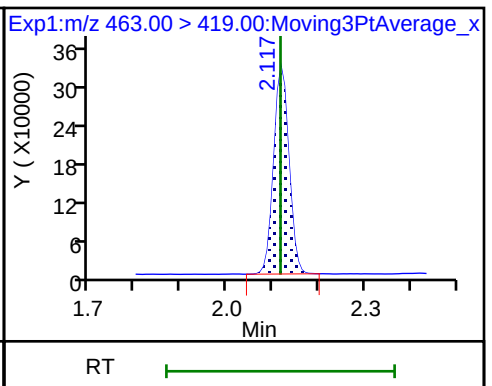
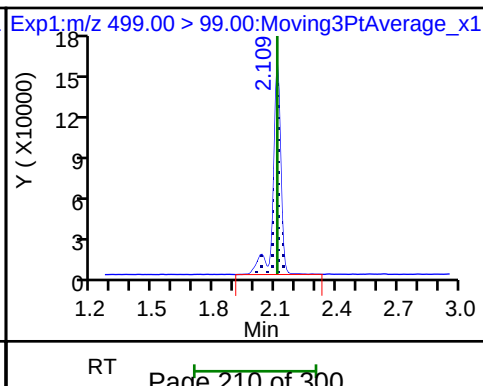
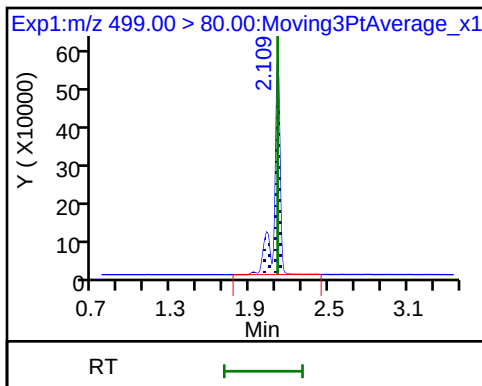
* 7 13C4 PFOS



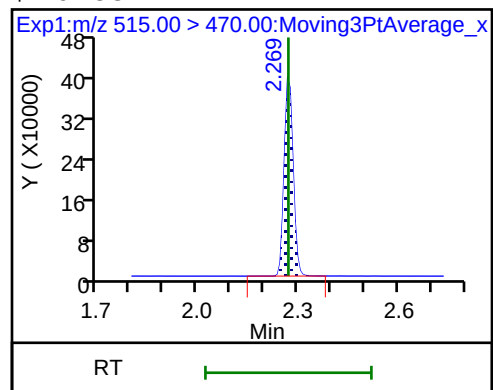
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_006.d
 Lims ID: IC L4
 Client ID:
 Sample Type: ICISAV Calib Level: 4
 Inject. Date: 15-Aug-2018 18:35:11 ALS Bottle#: 4 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L4_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2018 08:51:53 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK001

First Level Reviewer: roycea

Date: 16-Aug-2018 08:51:32

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	9386038	87.3		13589	
298.90 > 99.00	1.381	1.381	0.0	1.000	6689135		1.40(0.00-0.00)	8057	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.505	-0.003	1.000	1099800	10.1		8908	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.654	1.654	0.0	1.000	1105731	10.0		214	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.654	1.654	0.0	1.000	4655795	29.9		2833	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.851	1.850	0.001	1.000	2293687	20.1		314	
413.00 > 169.00	1.851	1.850	0.001	1.000	1177353		1.95(0.00-0.00)	2593	
* 6 13C2-PFOA									
415.00 > 370.00	1.851	1.850	0.001		1045953	10.0		8611	
* 7 13C4 PFOS									
503.00 > 80.00	2.109	2.108	0.001		2694948	28.7		5789	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.109	2.109	0.0	1.000	4031609	39.7		5452	
499.00 > 99.00	2.109	2.109	0.0	1.000	879709		4.58(0.00-0.00)	1346	
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.116	0.001	1.000	1746006	20.3		261	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.276	2.271	0.005	1.000	873467	10.5		5675	

Reagents:

LC537-L4_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_006.d

Injection Date: 15-Aug-2018 18:35:11

Instrument ID: A8_N

Lims ID: IC L4

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 4

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

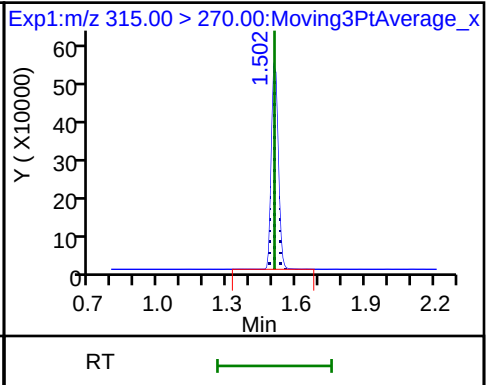
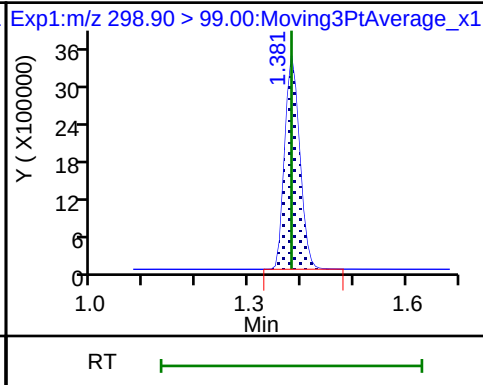
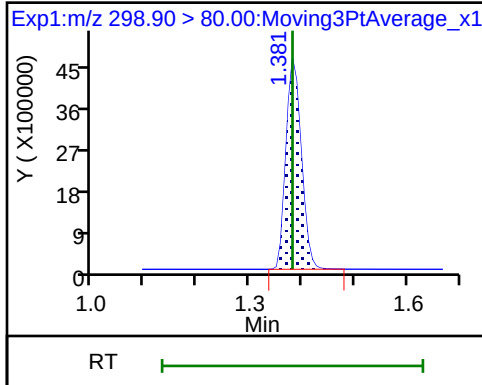
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

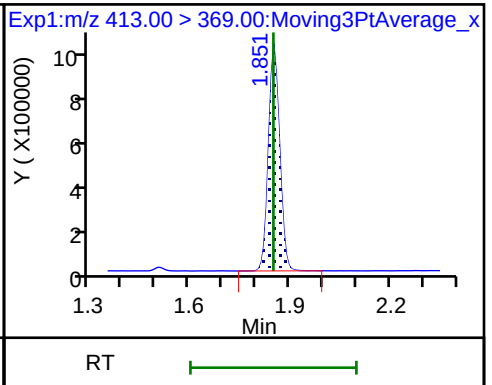
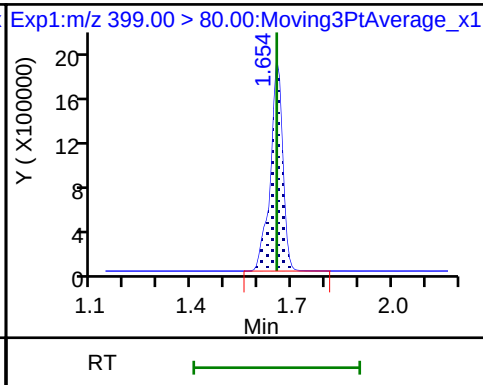
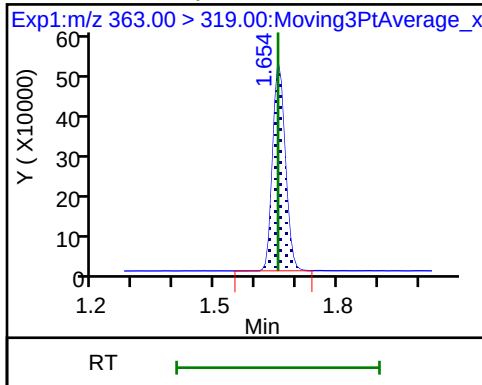
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

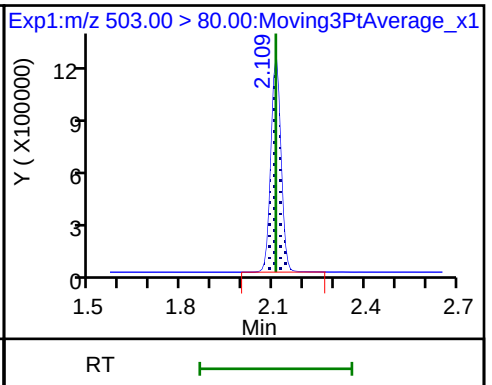
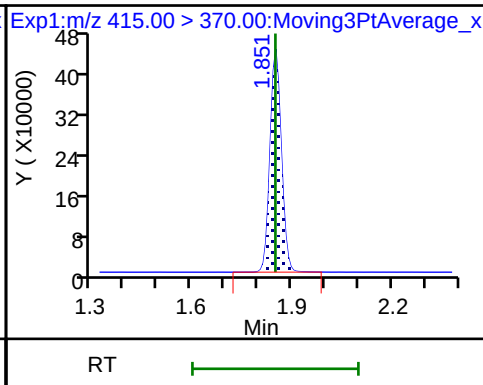
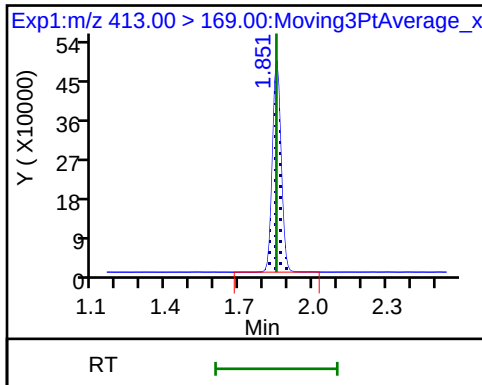
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

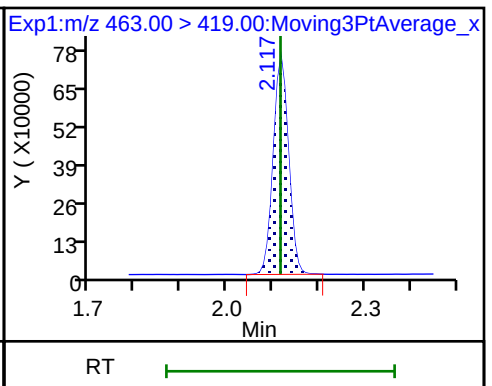
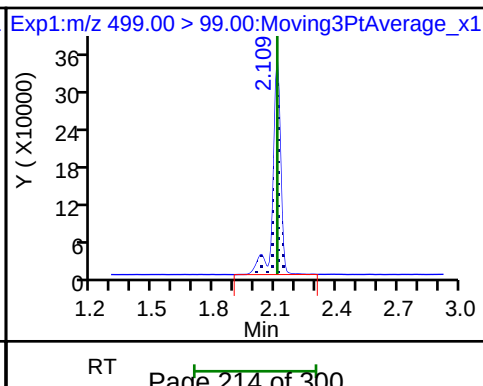
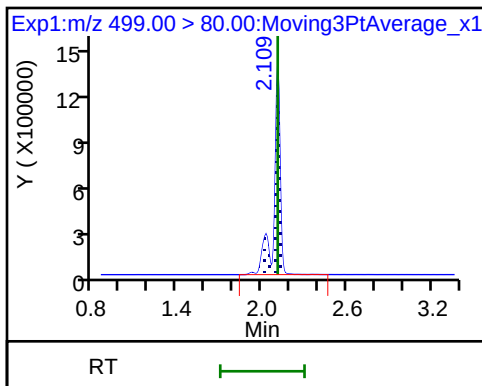
* 7 13C4 PFOS



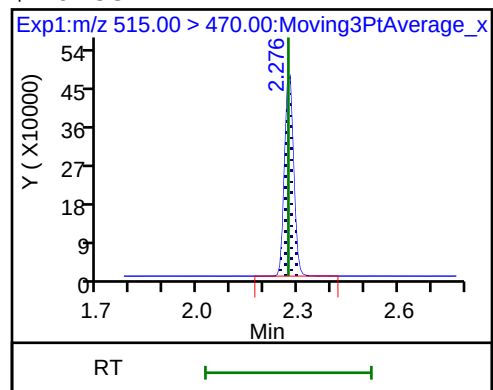
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_007.d
 Lims ID: IC L5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 15-Aug-2018 18:39:51 ALS Bottle#: 5 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L5_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2018 08:51:48 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK001

First Level Reviewer: roycea

Date: 15-Aug-2018 18:55:29

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.388	1.381	0.007	1.000	11785636	128.7		14701	
298.90 > 99.00	1.388	1.381	0.007	1.000	8762661		1.34(0.00-0.00)	9668	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.510	1.505	0.005	1.000	987004	10.1		9370	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.654	1.654	0.0	1.000	6289862	47.5		3399	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.654	1.654	0.0	1.000	1440874	14.4		257	
* 6 13C2-PFOA									
415.00 > 370.00	1.851	1.850	0.001		944777	10.0		7532	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.851	1.850	0.001	1.000	3102767	30.1		420	
413.00 > 169.00	1.851	1.850	0.001	1.000	1613623		1.92(0.00-0.00)	3725	
* 7 13C4 PFOS									
503.00 > 80.00	2.109	2.108	0.001		2294155	28.7		5009	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.109	2.109	0.0	1.000	5257770	60.8		6360	
499.00 > 99.00	2.109	2.109	0.0	1.000	1128903		4.66(0.00-0.00)	1721	
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.116	0.001	1.000	2294540	29.5		331	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.271	-0.003	1.000	766710	10.2		5627	

Reagents:

LC537-L5_00026

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_007.d

Injection Date: 15-Aug-2018 18:39:51

Instrument ID: A8_N

Lims ID: IC L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

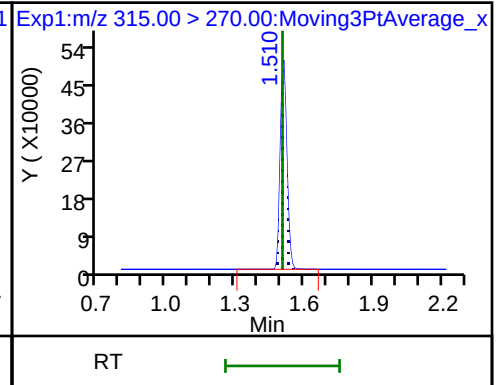
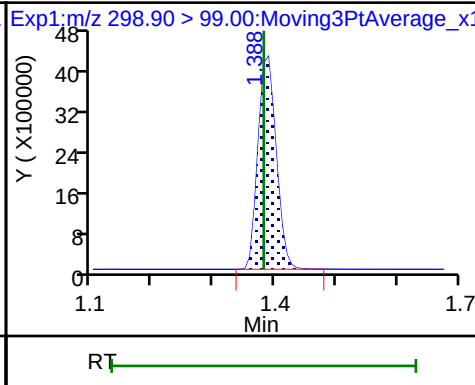
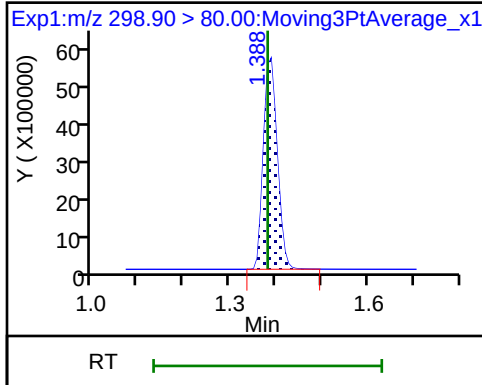
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

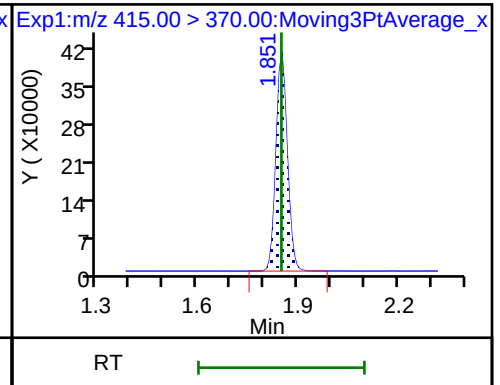
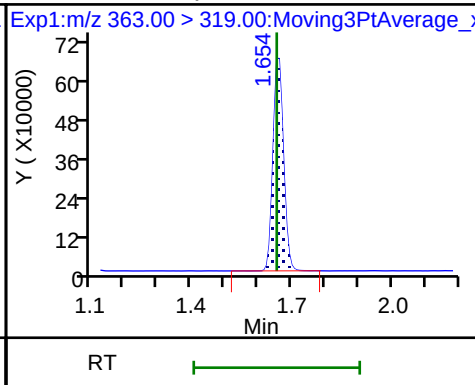
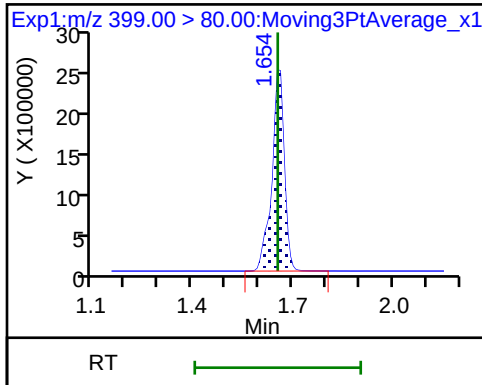
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

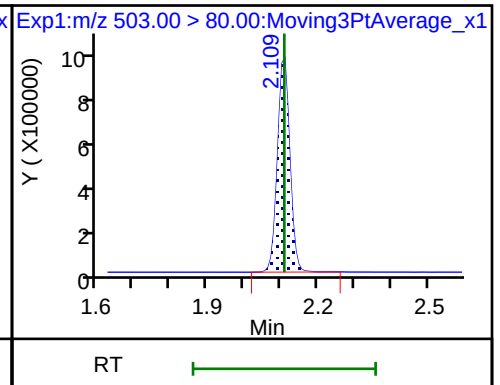
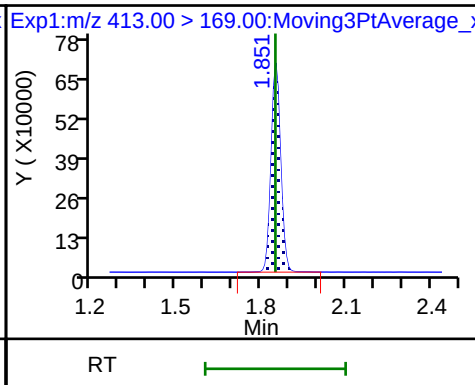
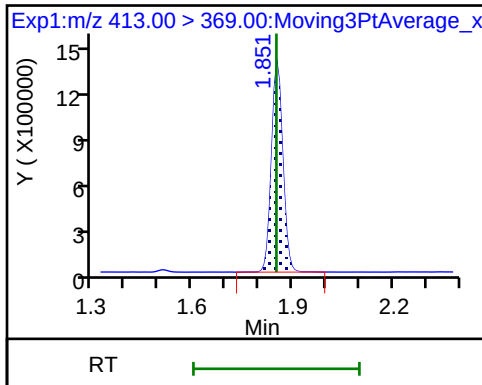
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

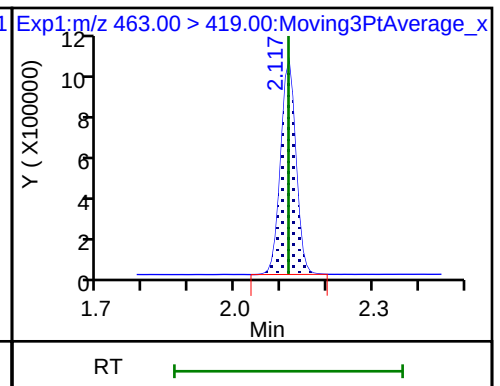
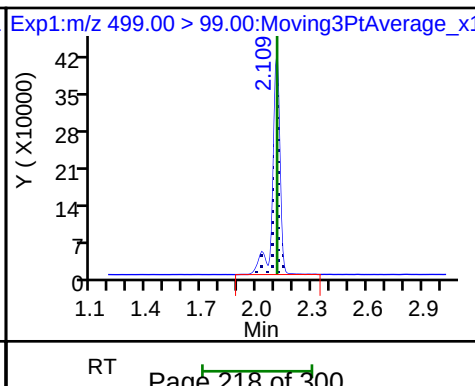
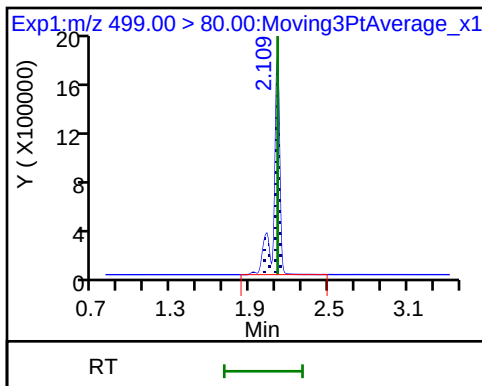
* 7 13C4 PFOS



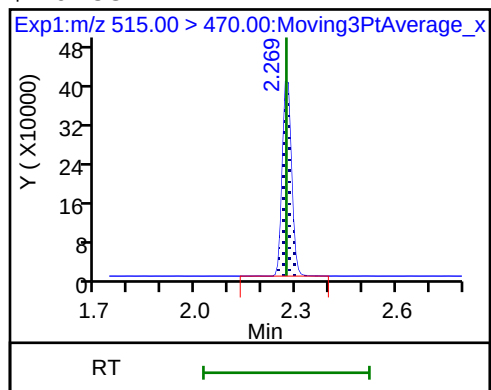
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
 Lims ID: IC L6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 15-Aug-2018 18:44:32 ALS Bottle#: 6 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L6_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2018 08:51:54 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK001

First Level Reviewer: roycea

Date: 15-Aug-2018 18:55:42

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	15136483	152.7		15082	
298.90 > 99.00	1.381	1.381	0.0	1.000	11077712		1.37(0.00-0.00)	11444	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.505	-0.003	1.000	1035478	10.1		10037	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.654	1.654	0.0	1.000	1986691	19.1		353	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.654	1.654	0.0	1.000	8441814	58.9		4544	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.844	1.850	-0.006	1.000	4216218	39.4		560	
413.00 > 169.00	1.844	1.850	-0.006	1.000	2187034		1.93(0.00-0.00)	4711	
* 6 13C2-PFOA									
415.00 > 370.00	1.844	1.850	-0.006		981996	10.0		8690	
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.108	-0.006		2483425	28.7		5512	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.102	2.109	-0.007	1.000	7518443	80.4		8718	
499.00 > 99.00	2.102	2.109	-0.007	1.000	1595089		4.71(0.00-0.00)	2315	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.116	-0.007	1.000	3246932	40.1		449	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.271	-0.003	1.000	783206	10.1		6018	

Reagents:

LC537-L6_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Injection Date: 15-Aug-2018 18:44:32

Instrument ID: A8_N

Lims ID: IC L6

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 6

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

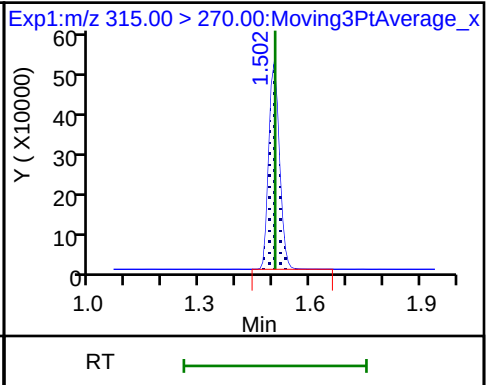
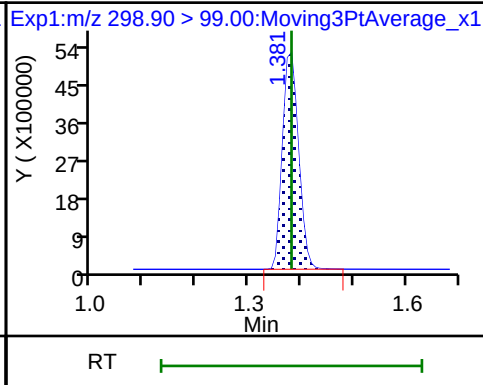
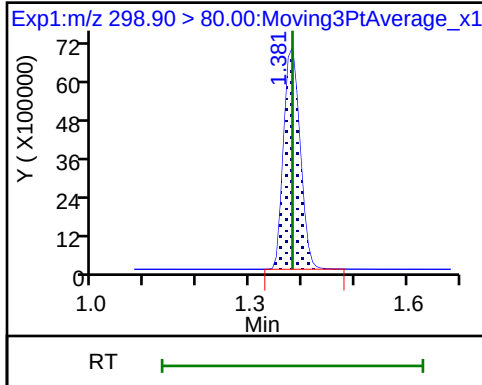
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

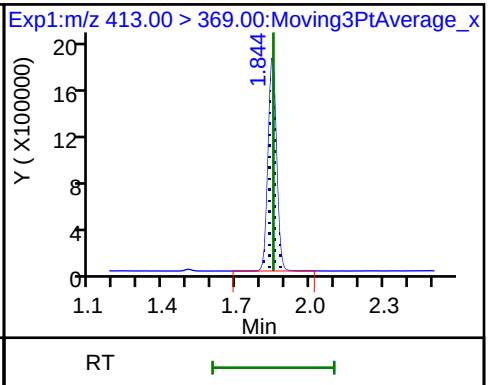
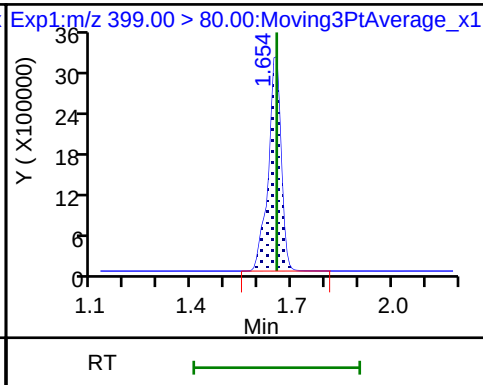
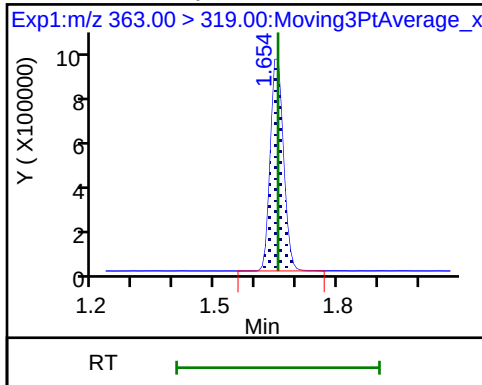
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

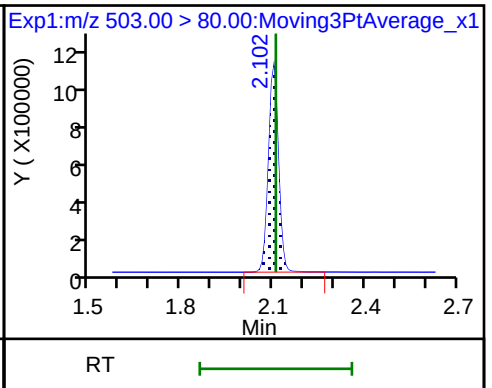
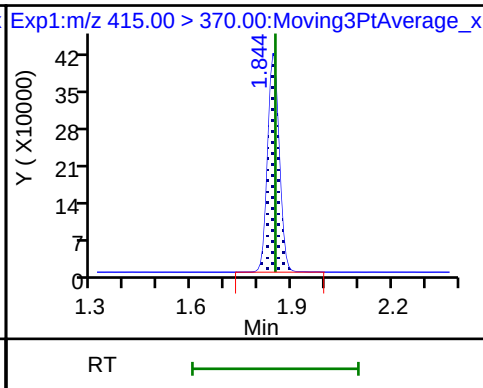
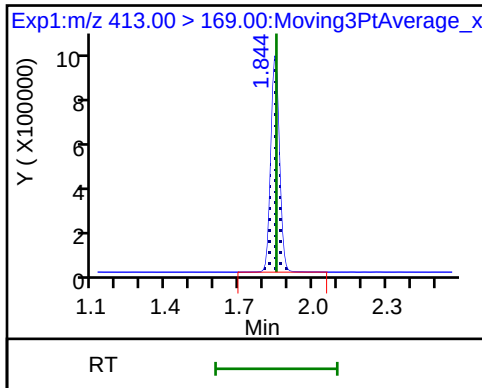
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

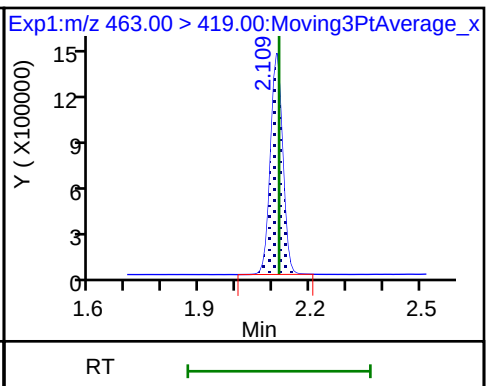
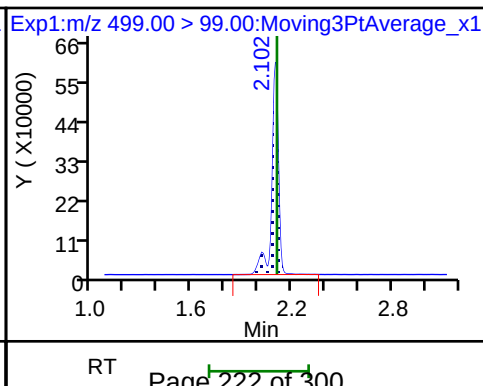
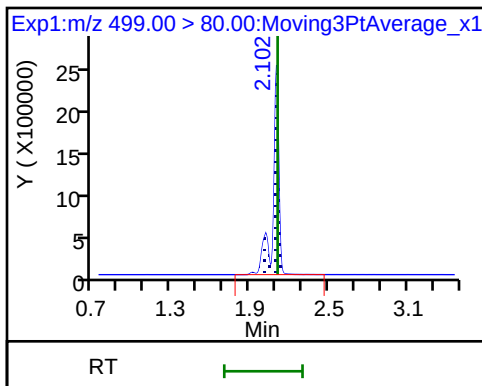
* 7 13C4 PFOS



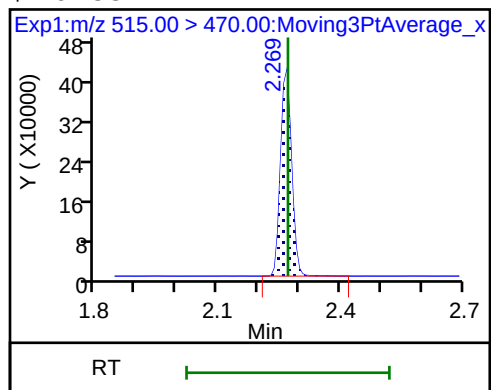
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



Calibration

/ Perfluorobutanesulfonic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: ISTD
Response Base: AREA
RF Rounding: 0

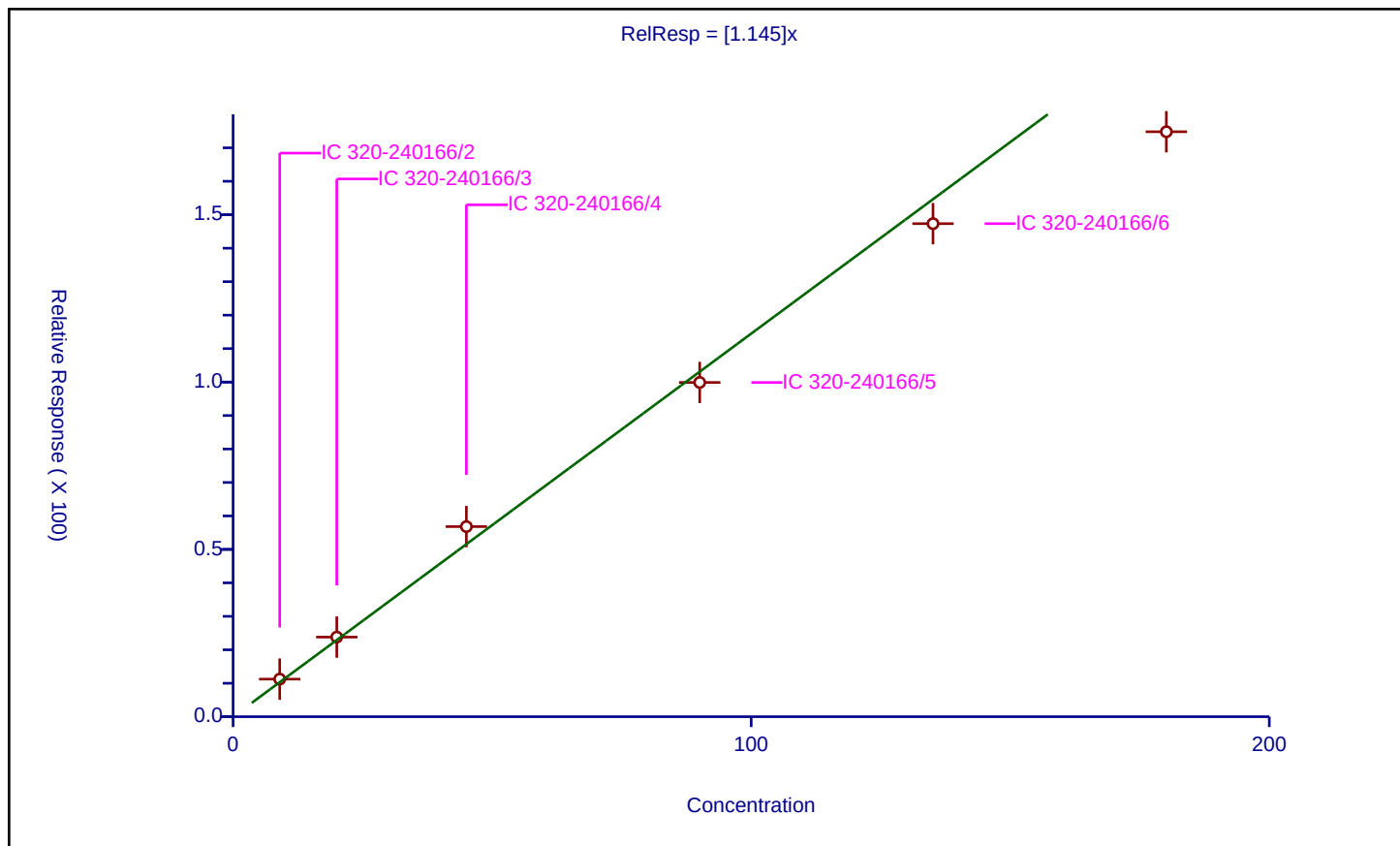
Curve Coefficients

Intercept: 0
Slope: 1.145

Error Coefficients

Standard Error: 9820000
Relative Standard Error: 9.6
Correlation Coefficient: 0.987
Coefficient of Determination (Adjusted): 0.984

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-240166/2	8.99912	11.230049	28.68	2551191.0	1.247905	Y
2	IC 320-240166/3	20.01376	23.788708	28.68	2496049.0	1.188618	Y
3	IC 320-240166/4	45.03096	56.810426	28.68	2296598.0	1.261586	Y
4	IC 320-240166/5	90.06192	99.887482	28.68	2694948.0	1.109098	Y
5	IC 320-240166/6	135.09288	147.336183	28.68	2294155.0	1.090629	Y
6	IC 320-240166/7	180.12384	174.804688	28.68	2483425.0	0.970469	Y



Calibration

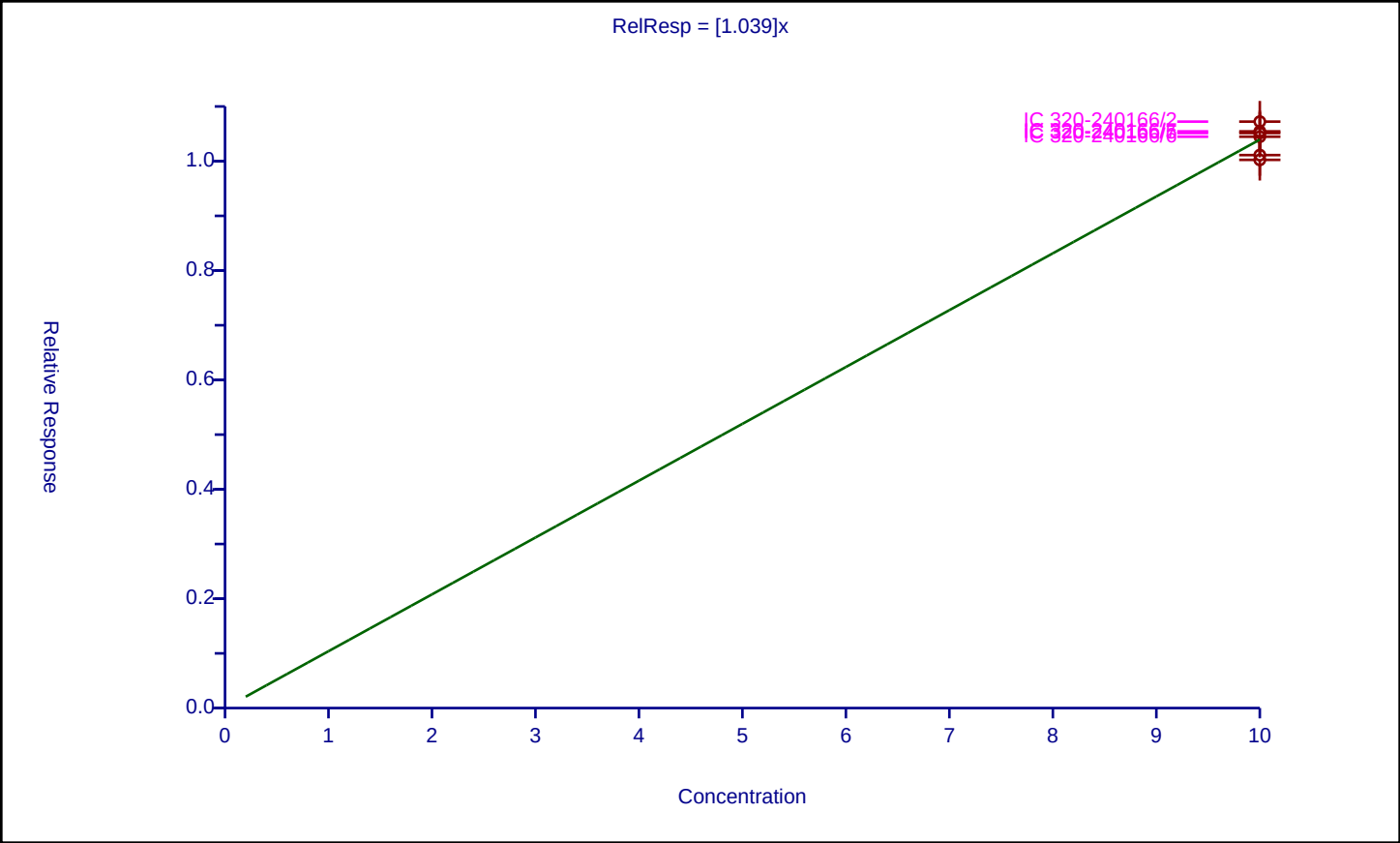
/ 13C2 PFHxA

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: ISTD
Response Base: AREA
RF Rounding: 0

Curve Coefficients	
Intercept:	0
Slope:	1.039

Error Coefficients	
Standard Error:	1140000
Relative Standard Error:	2.6
Correlation Coefficient:	NA
Coefficient of Determination (Adjusted):	0.000000000000000111

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-240166/2	10.0	10.723022	10.0	1026304.0	1.072302	Y
2	IC 320-240166/3	10.0	10.110938	10.0	1041660.0	1.011094	Y
3	IC 320-240166/4	10.0	10.023697	10.0	958352.0	1.00237	Y
4	IC 320-240166/5	10.0	10.514813	10.0	1045953.0	1.051481	Y
5	IC 320-240166/6	10.0	10.446952	10.0	944777.0	1.044695	Y
6	IC 320-240166/7	10.0	10.544625	10.0	981996.0	1.054463	Y



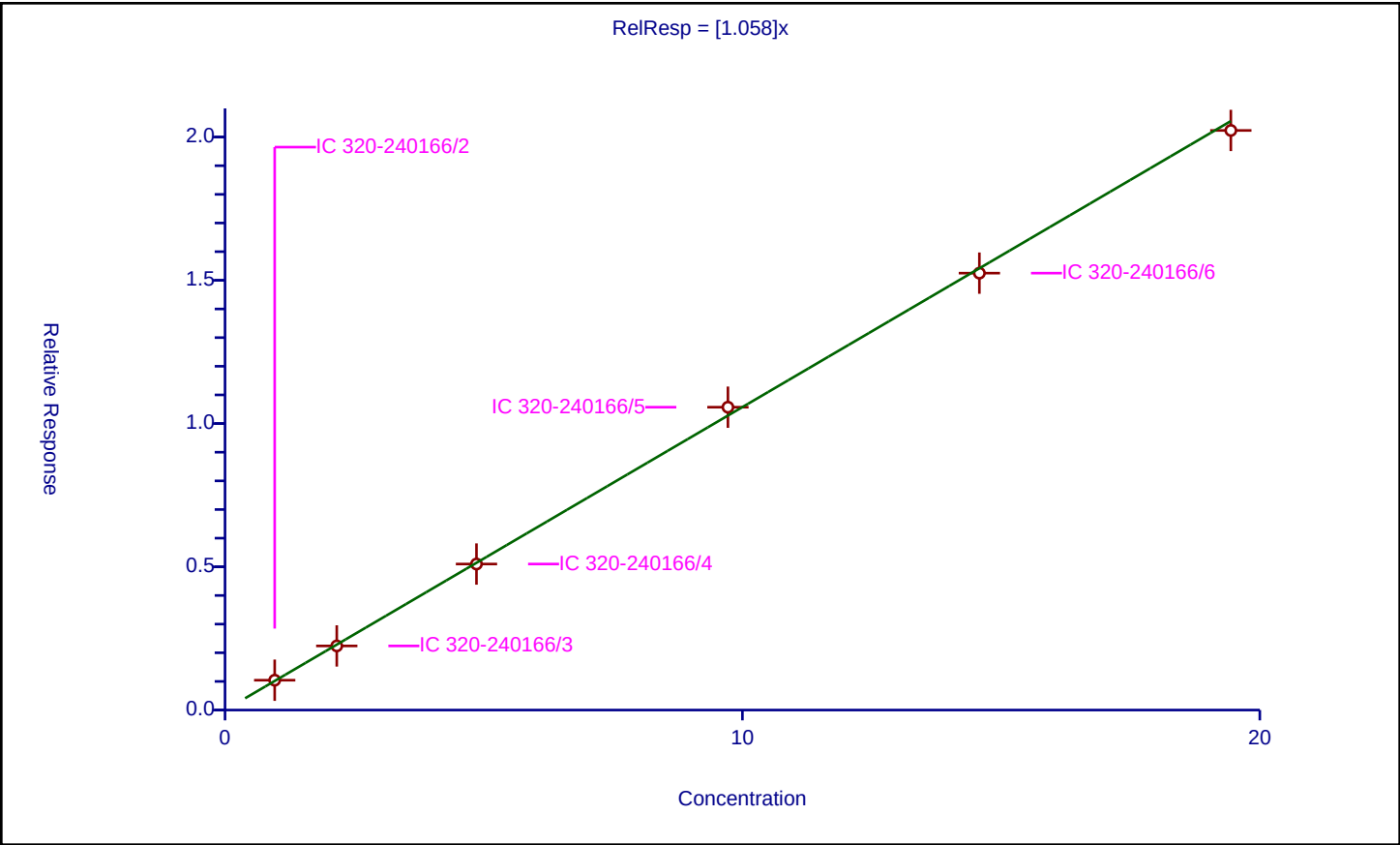
Calibration

/ Perfluoroheptanoic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: ISTD
Response Base: AREA
RF Rounding: 0

Curve Coefficients	
Intercept:	0
Slope:	1.058
Error Coefficients	
Standard Error:	1230000
Relative Standard Error:	2.2
Correlation Coefficient:	0.995
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-240166/2	0.96	1.042069	10.0	1026304.0	1.085489	Y
2	IC 320-240166/3	2.16	2.238629	10.0	1041660.0	1.036402	Y
3	IC 320-240166/4	4.86	5.097449	10.0	958352.0	1.048858	Y
4	IC 320-240166/5	9.72	10.571517	10.0	1045953.0	1.087605	Y
5	IC 320-240166/6	14.58	15.250943	10.0	944777.0	1.046018	Y
6	IC 320-240166/7	19.44	20.231152	10.0	981996.0	1.040697	Y



Calibration

/ Perfluorohexanesulfonic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: ISTD
Response Base: AREA
RF Rounding: 0

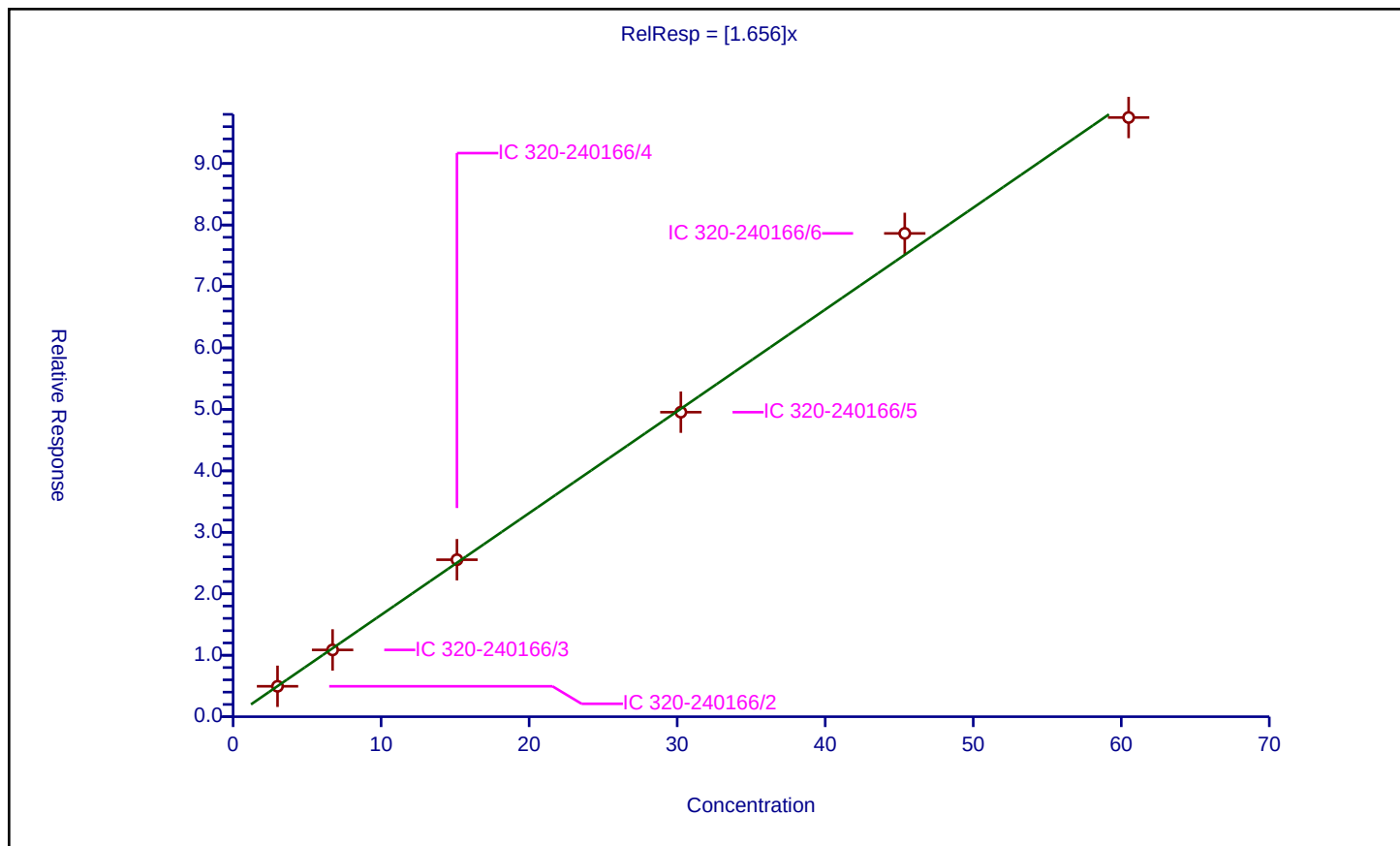
Curve Coefficients

Intercept: 0
Slope: 1.656

Error Coefficients

Standard Error: 5250000
Relative Standard Error: 2.8
Correlation Coefficient: 0.997
Coefficient of Determination (Adjusted): 0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-240166/2	3.003	4.952545	28.68	2551191.0	1.649199	Y
2	IC 320-240166/3	6.721867	10.867105	28.68	2496049.0	1.61668	Y
3	IC 320-240166/4	15.1242	25.544729	28.68	2296598.0	1.688997	Y
4	IC 320-240166/5	30.2484	49.547598	28.68	2694948.0	1.638024	Y
5	IC 320-240166/6	45.3726	78.631671	28.68	2294155.0	1.733021	Y
6	IC 320-240166/7	60.4968	97.490855	28.68	2483425.0	1.611504	Y



Calibration

/ Perfluorooctanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: ISTD
 Response Base: AREA
 RF Rounding: 0

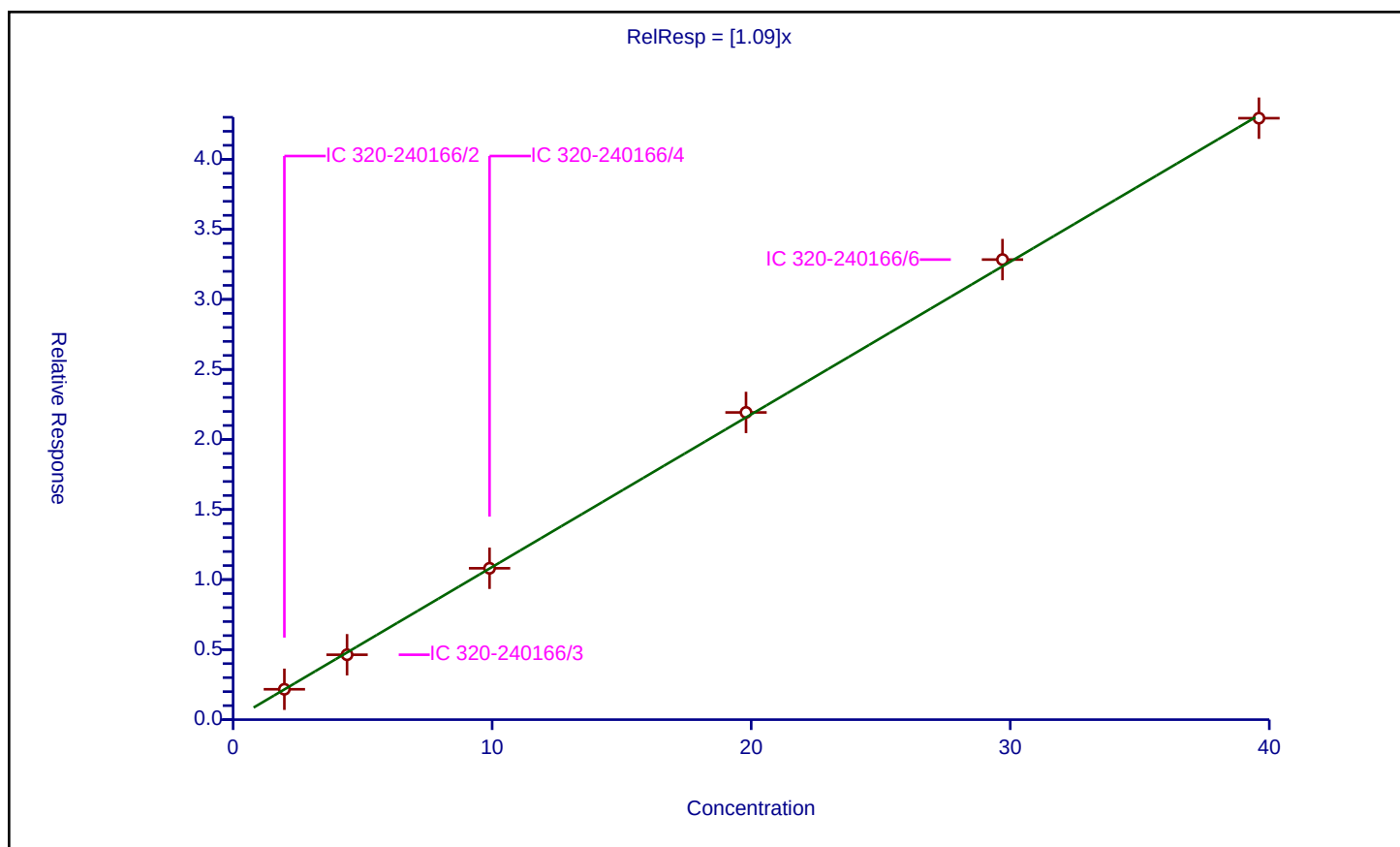
Curve Coefficients

Intercept: 0
 Slope: 1.09

Error Coefficients

Standard Error: 2610000
 Relative Standard Error: 1.8
 Correlation Coefficient: 0.997
 Coefficient of Determination (Adjusted): 0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-240166/2	1.98	2.168821	10.0	1026304.0	1.095364	Y
2	IC 320-240166/3	4.4	4.632865	10.0	1041660.0	1.052924	Y
3	IC 320-240166/4	9.9	10.80555	10.0	958352.0	1.09147	Y
4	IC 320-240166/5	19.8	21.929159	10.0	1045953.0	1.107533	Y
5	IC 320-240166/6	29.7	32.841263	10.0	944777.0	1.105766	Y
6	IC 320-240166/7	39.6	42.935185	10.0	981996.0	1.084222	Y



Calibration

/ Perfluorooctane sulfonic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: ISTD
 Response Base: AREA
 RF Rounding: 0

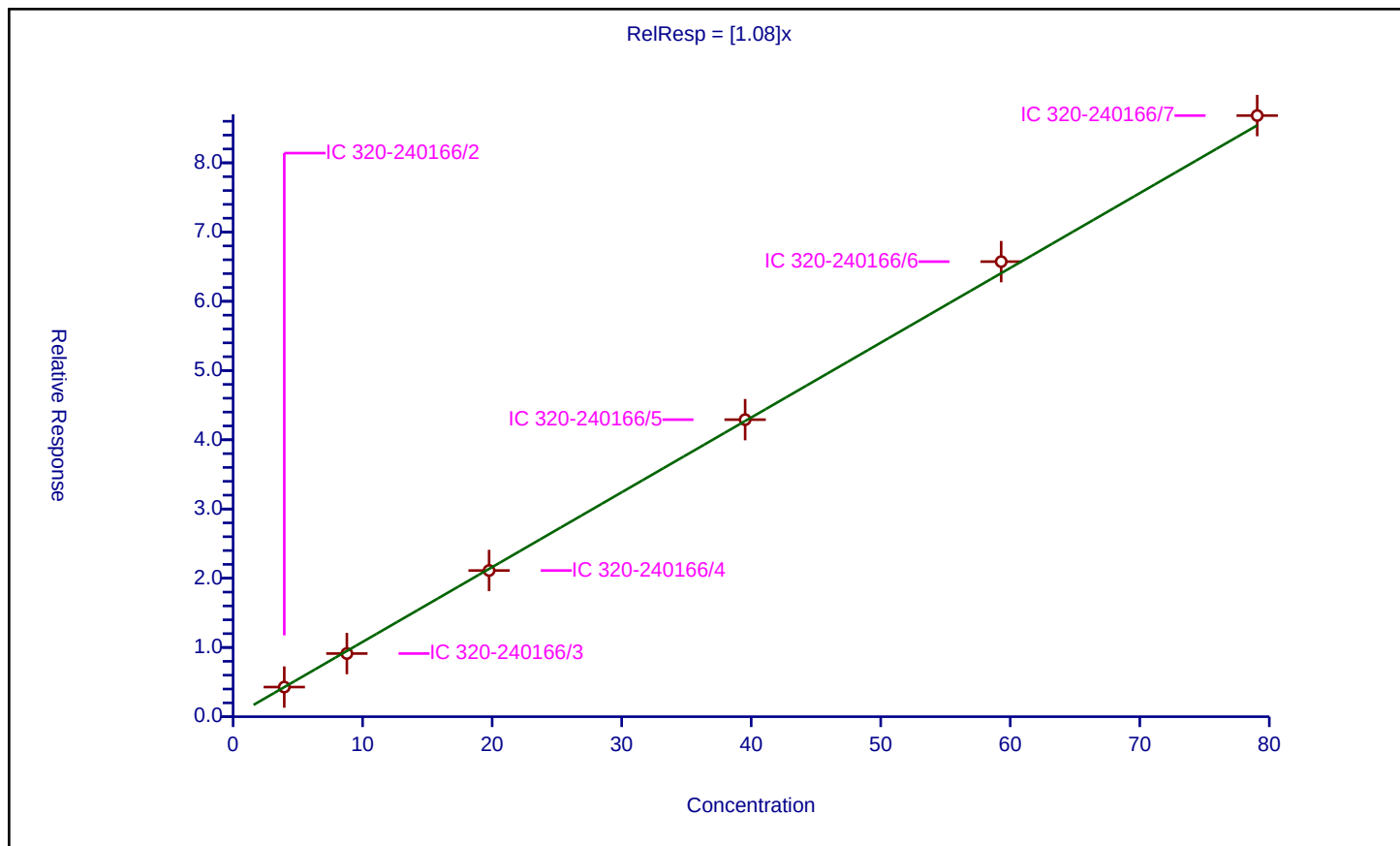
Curve Coefficients

Intercept: 0
 Slope: 1.08

Error Coefficients

Standard Error: 4560000
 Relative Standard Error: 2.3
 Correlation Coefficient: 0.994
 Coefficient of Determination (Adjusted): 0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-240166/2	3.95328	4.281386	28.68	2551191.0	1.082996	Y
2	IC 320-240166/3	8.785067	9.124485	28.68	2496049.0	1.038636	Y
3	IC 320-240166/4	19.7664	21.117058	28.68	2296598.0	1.068331	Y
4	IC 320-240166/5	39.5328	42.904927	28.68	2694948.0	1.085299	Y
5	IC 320-240166/6	59.2992	65.729144	28.68	2294155.0	1.108432	Y
6	IC 320-240166/7	79.0656	86.827243	28.68	2483425.0	1.098167	Y



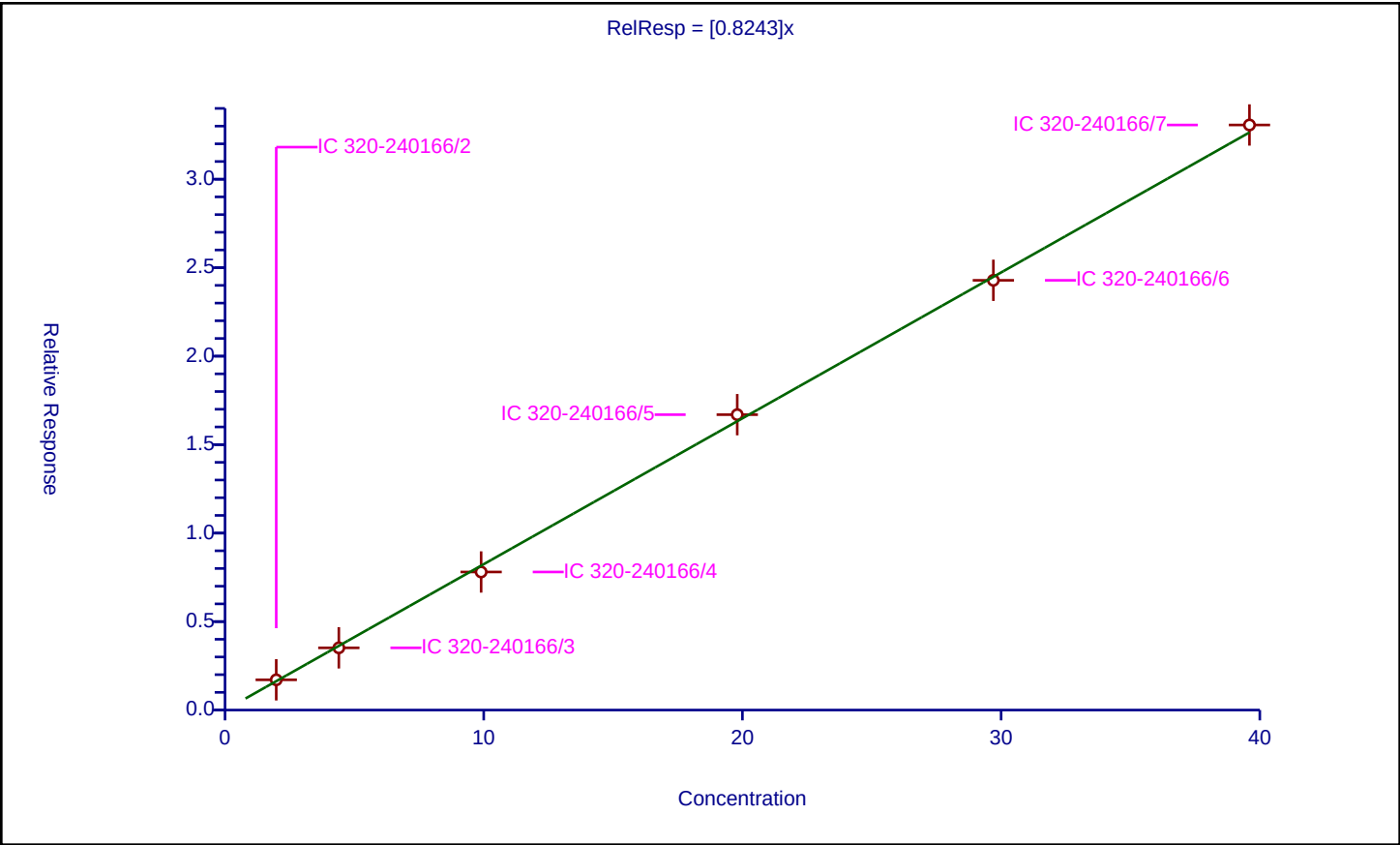
Calibration

/ Perfluorononanoic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: ISTD
Response Base: AREA
RF Rounding: 0

Curve Coefficients	
Intercept:	0
Slope:	0.8243
Error Coefficients	
Standard Error:	1980000
Relative Standard Error:	3.4
Correlation Coefficient:	0.995
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-240166/2	1.98	1.708753	10.0	1026304.0	0.863007	Y
2	IC 320-240166/3	4.4	3.515581	10.0	1041660.0	0.798996	Y
3	IC 320-240166/4	9.9	7.802446	10.0	958352.0	0.788126	Y
4	IC 320-240166/5	19.8	16.692968	10.0	1045953.0	0.843079	Y
5	IC 320-240166/6	29.7	24.286578	10.0	944777.0	0.81773	Y
6	IC 320-240166/7	39.6	33.064615	10.0	981996.0	0.834965	Y



Calibration

/ 13C2 PFDA

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: ISTD
 Response Base: AREA
 RF Rounding: 0

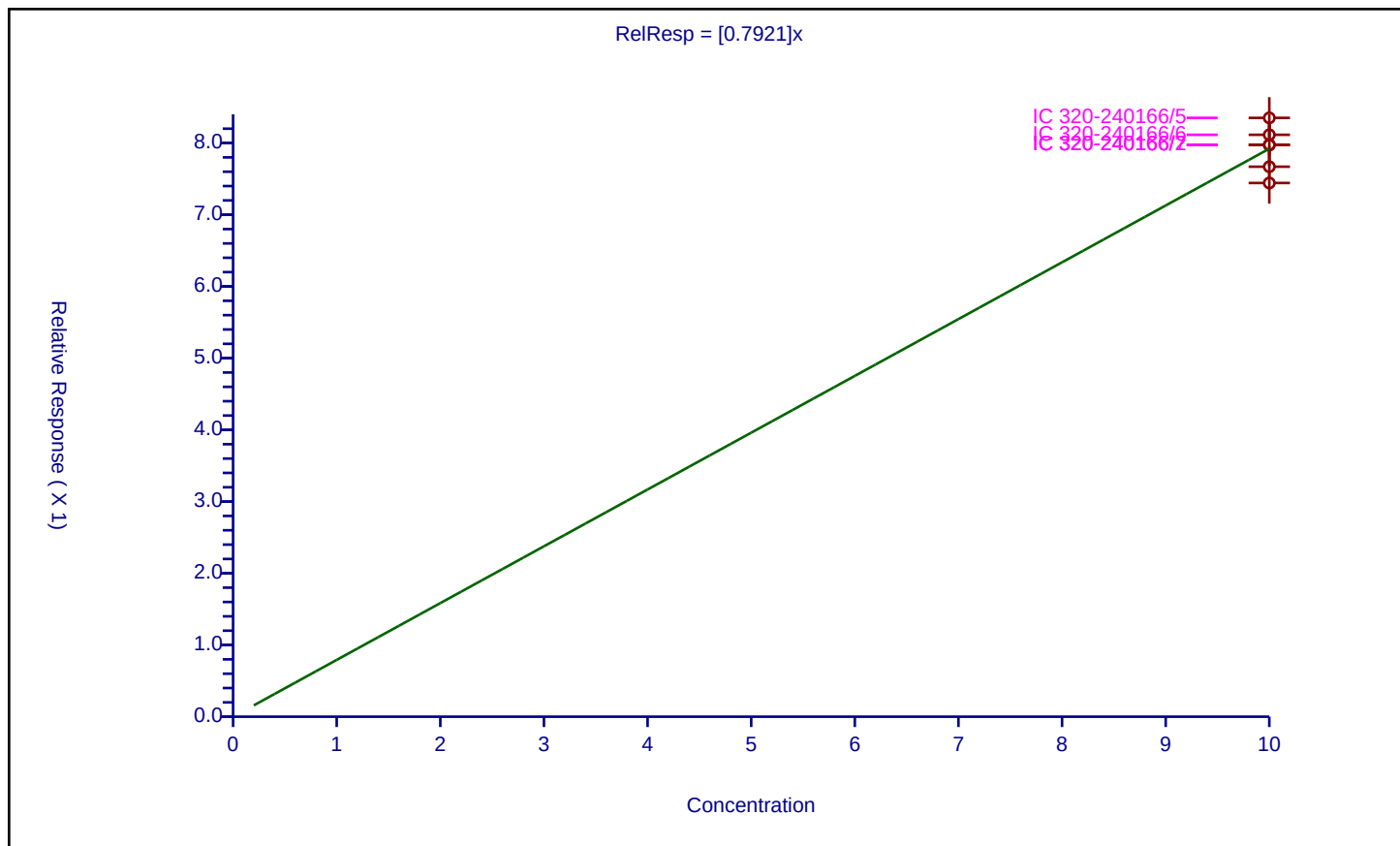
Curve Coefficients

Intercept: 0
 Slope: 0.7921

Error Coefficients

Standard Error: 869000
 Relative Standard Error: 4.1
 Correlation Coefficient: NA
 Coefficient of Determination (Adjusted): 0

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-240166/2	10.0	7.972277	10.0	1026304.0	0.797228	Y
2	IC 320-240166/3	10.0	7.442985	10.0	1041660.0	0.744299	Y
3	IC 320-240166/4	10.0	7.670209	10.0	958352.0	0.767021	Y
4	IC 320-240166/5	10.0	8.35092	10.0	1045953.0	0.835092	Y
5	IC 320-240166/6	10.0	8.115248	10.0	944777.0	0.811525	Y
6	IC 320-240166/7	10.0	7.975654	10.0	981996.0	0.797565	Y



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-240166/9 Calibration Date: 08/15/2018 18:53
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.15_537CURVE_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.167		20.4	20.0	2.0	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	1.033		2.11	2.16	-2.4	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.611		6.54	6.72	-2.7	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.020		4.12	4.40	-6.4	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	1.039		8.45	8.79	-3.8	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.8023		4.28	4.40	-2.7	50.0
13C2 PFHxA	Ave	1.039	1.002		9.64	10.0	-3.6	30.0
13C2 PFDA	Ave	0.7921	0.7658		9.67	10.0	-3.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_010.d
 Lims ID: CCVL
 Client ID:
 Sample Type: CCVL
 Inject. Date: 15-Aug-2018 18:53:52 ALS Bottle#: 2 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L2
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2018 08:40:39 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK001

First Level Reviewer: roycea

Date: 15-Aug-2018 19:08:57

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	1945320	20.4		4245	
298.90 > 99.00	1.381	1.381	0.0	1.000	1331599		1.46(0.00-0.00)	1955	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.505	-0.003	1.000	1009111	9.64		8281	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.654	1.654	0.0	1.000	901941	6.54		565	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.654	1.654	0.0	1.000	224502	2.11		42.5	M
* 6 13C2-PFOA									
415.00 > 370.00	1.844	1.850	-0.006		1006603	10.0		8231	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.844	1.850	-0.006	1.000	451556	4.12		60.4	
413.00 > 169.00	1.844	1.850	-0.006	1.000	246955		1.83(0.00-0.00)	568	
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.108	-0.006		2388436	28.7		5214	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.102	2.109	-0.007	1.000	760165	8.45		1715	
499.00 > 99.00	2.102	2.109	-0.007	1.000	165858		4.58(0.00-0.00)	275	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.116	-0.007	1.000	355358	4.28		52.6	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.271	-0.003	1.000	770892	9.67		5141	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_010.d

Injection Date: 15-Aug-2018 18:53:52

Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

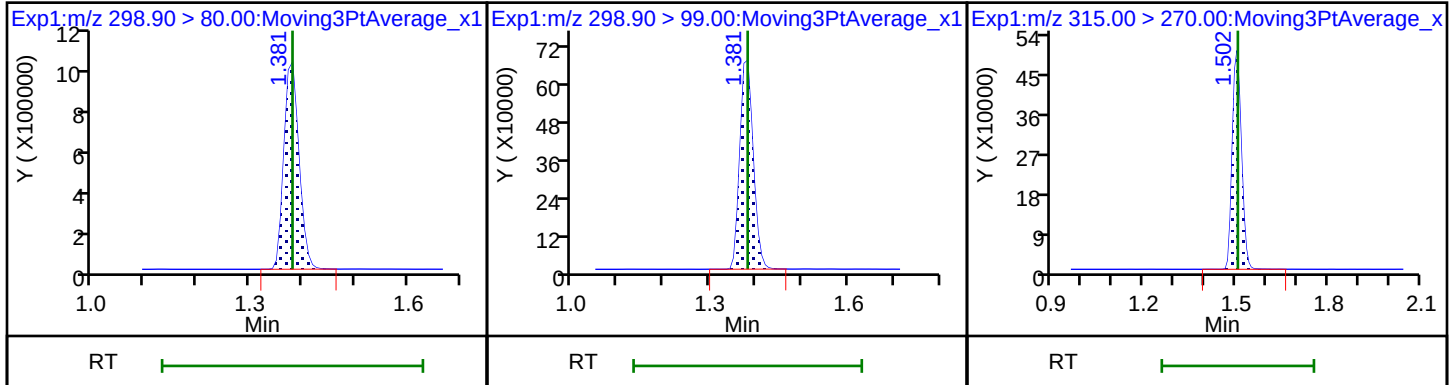
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

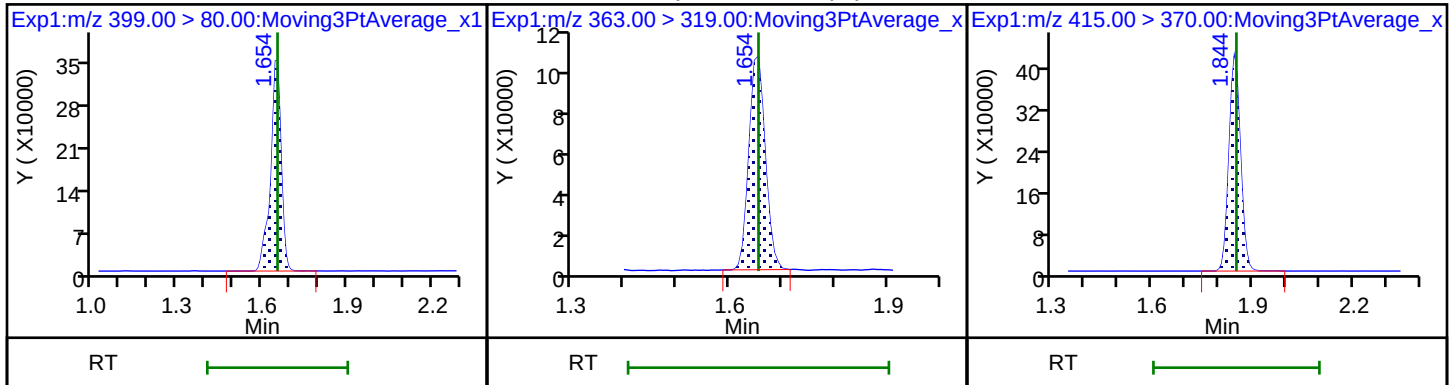
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid (M)

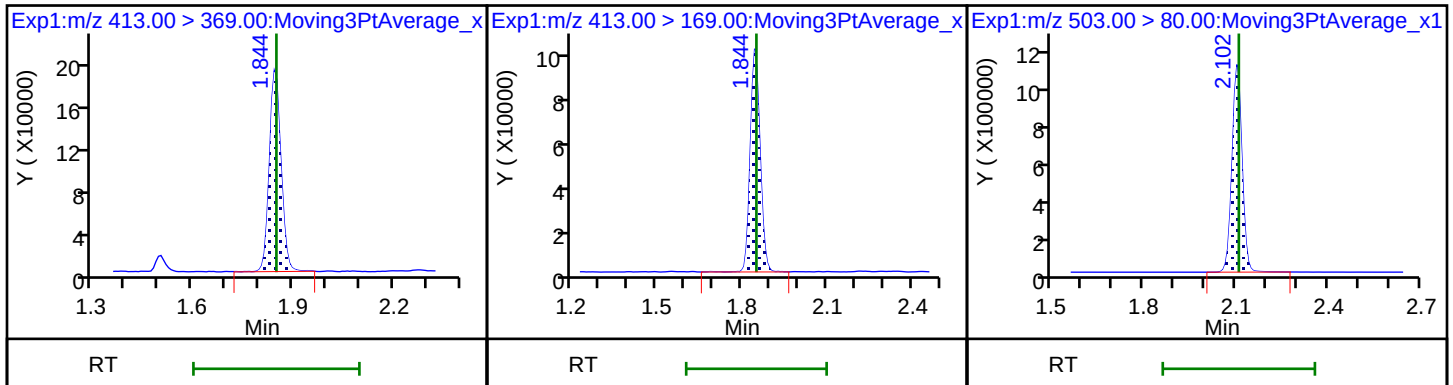
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

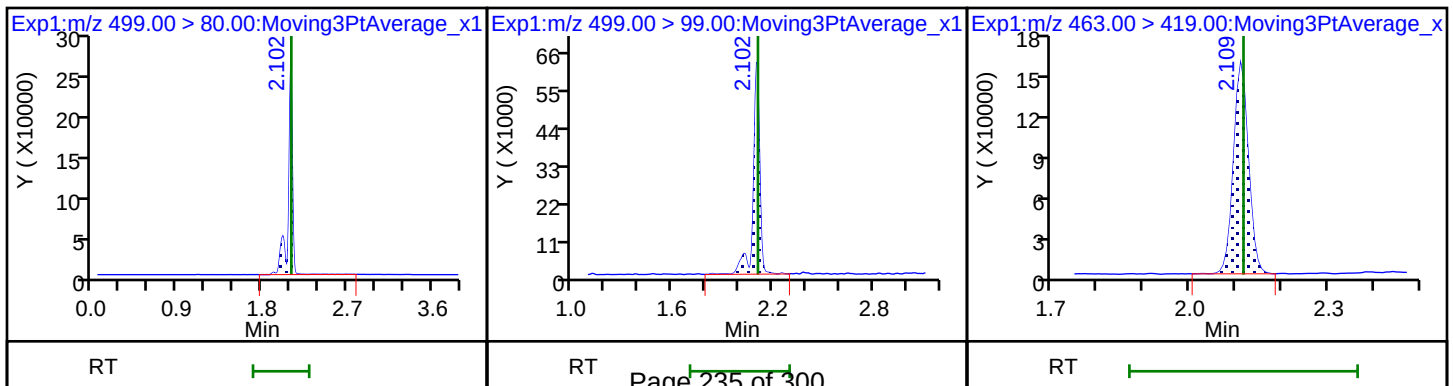
* 7 13C4 PFOS



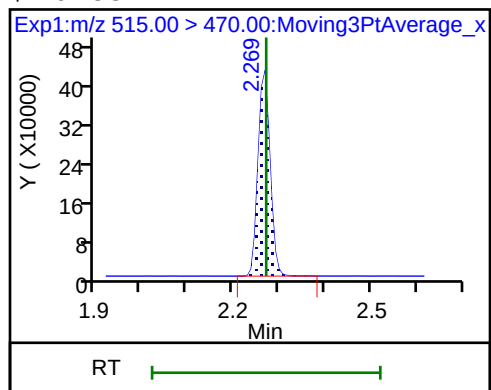
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

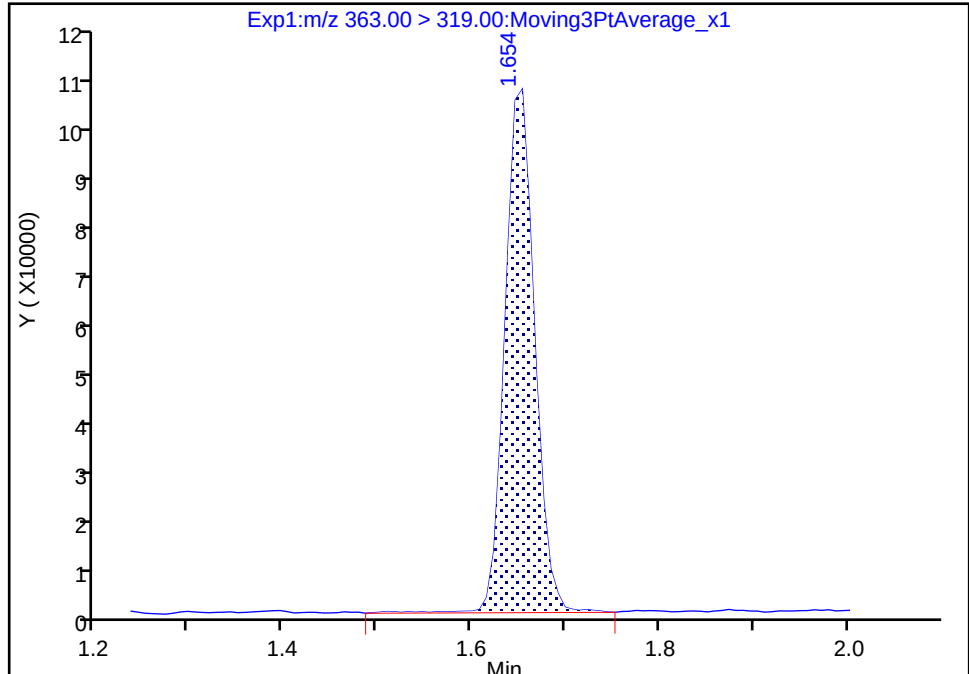
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_010.d
Injection Date: 15-Aug-2018 18:53:52 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

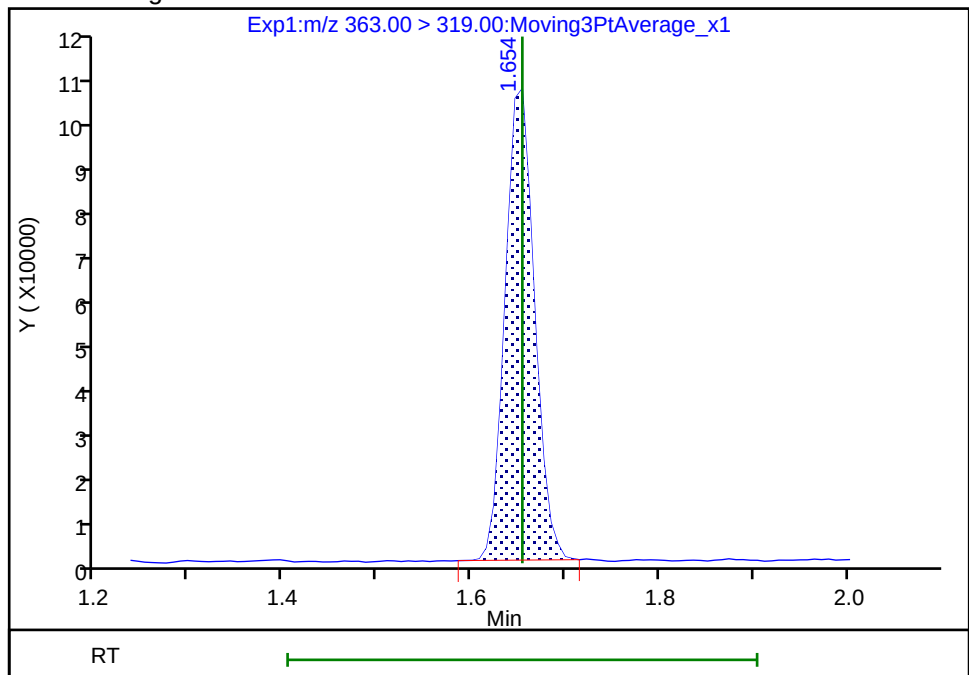
RT: 1.65
Area: 229068
Amount: 2.151895
Amount Units: ng/ml

Processing Integration Results



RT: 1.65
Area: 224502
Amount: 2.109002
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 15-Aug-2018 19:08:41
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 237 of 300

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: ICV 320-240166/11 Calibration Date: 08/15/2018 19:03
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.15_537CURVE_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.005		87.9	100	-12.2	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	0.9536		9.02	10.0	-9.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.530		18.6	20.2	-7.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	0.8802		16.3	20.2	-19.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	0.9603		17.9	20.2	-11.1	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.7757		19.0	20.2	-5.9	30.0
13C2 PFHxA	Ave	1.039	1.022		9.83	10.0	-1.7	30.0
13C2 PFDA	Ave	0.7921	0.7952		10.0	10.0	0.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_012.d
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 15-Aug-2018 19:03:12 ALS Bottle#: 7 Worklist Smp#: 11
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2018 08:40:40 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK001

First Level Reviewer: roycea

Date: 15-Aug-2018 19:11:27

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	8951923	87.9		13197	
298.90 > 99.00	1.373	1.381	-0.008	0.995	6353811		1.41(0.00-0.00)	8112	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.505	-0.003	1.000	1044443	9.83		9288	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.646	1.654	-0.008	1.000	2744582	18.6		1806	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.646	1.654	-0.008	1.000	974881	9.02		176	
* 6 13C2-PFOA									
415.00 > 370.00	1.844	1.850	-0.006		1022273	10.0		7889	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.844	1.850	-0.006	1.000	1814661	16.3		244	
413.00 > 169.00	1.844	1.850	-0.006	1.000	963434		1.88(0.00-0.00)	2245	
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.108	-0.006		2551643	28.7		5068	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.102	2.109	-0.007	1.000	1723342	17.9		2659	
499.00 > 99.00	2.102	2.109	-0.007	1.000	346840		4.97(0.00-0.00)	526	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.116	-0.007	1.000	1598983	19.0		227	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.271	-0.010	1.000	812885	10.0		5447	

Reagents:

LC537-ICV_00032

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_012.d

Injection Date: 15-Aug-2018 19:03:12

Instrument ID: A8_N

Lims ID: ICV

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 7

Worklist Smp#: 11

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

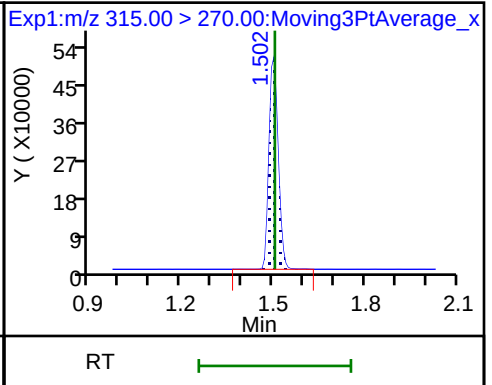
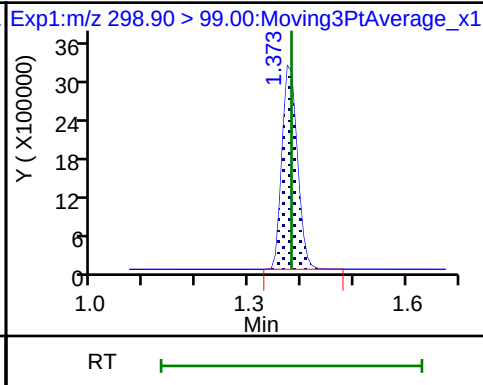
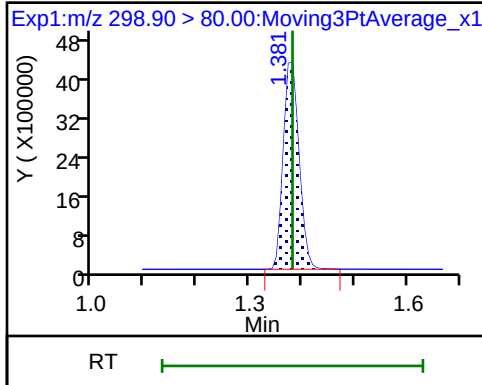
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

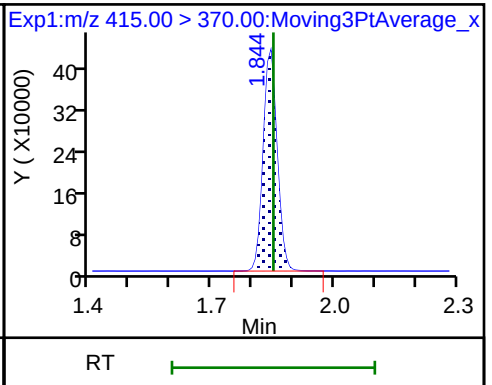
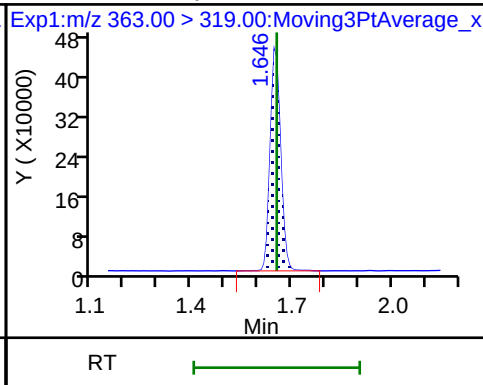
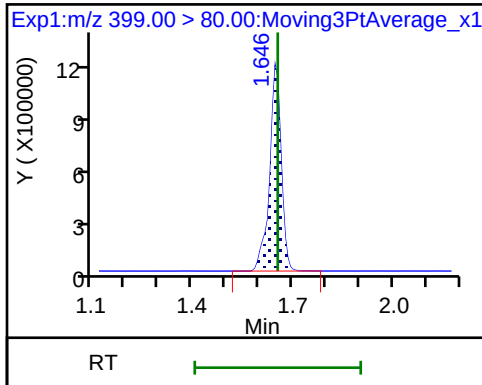
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

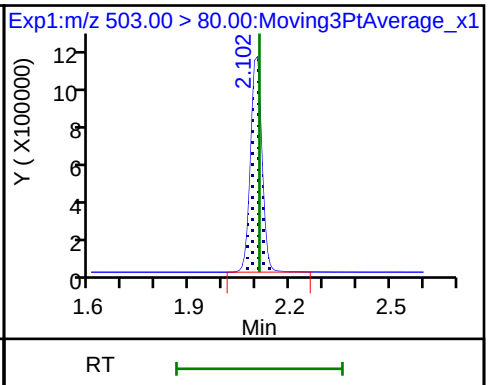
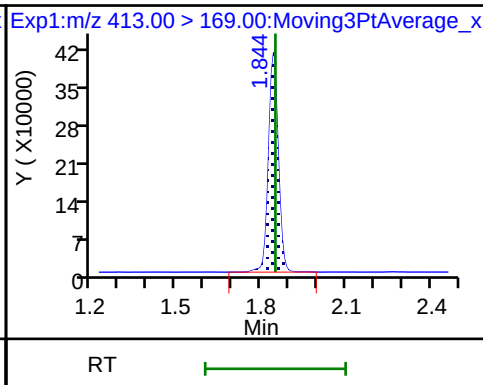
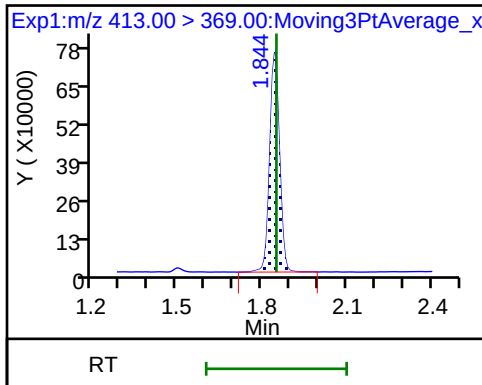
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

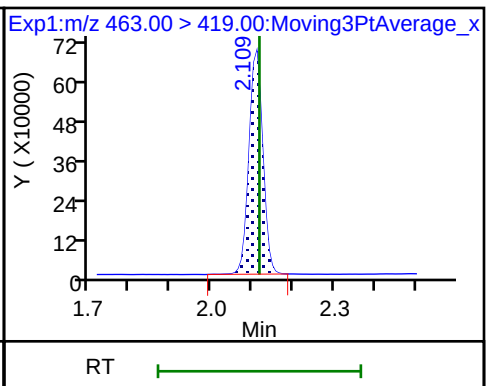
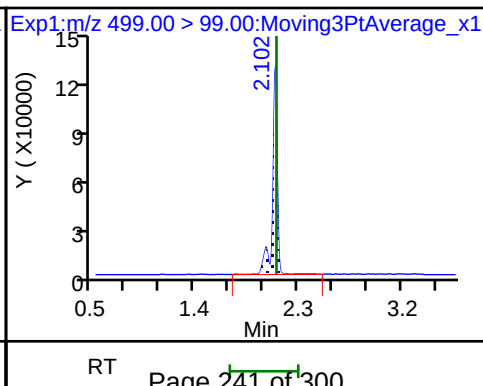
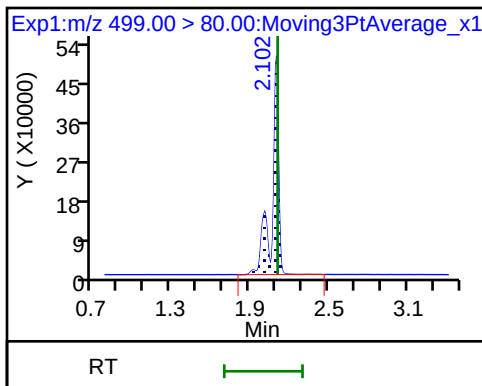
* 7 13C4 PFOS



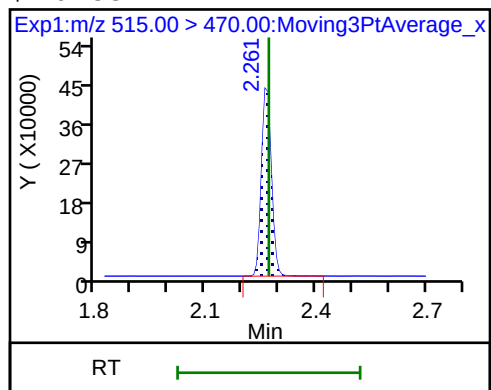
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-240726/1 Calibration Date: 08/18/2018 23:19
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.18_537A_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.214		21.2	20.0	6.1	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	1.019		2.08	2.16	-3.6	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.652		6.70	6.72	-0.3	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.030		4.16	4.40	-5.5	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	1.048		8.53	8.79	-2.9	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.7851		4.19	4.40	-4.8	50.0
13C2 PFHxA	Ave	1.039	1.020		9.81	10.0	-1.9	30.0
13C2 PFDA	Ave	0.7921	0.7561		9.55	10.0	-4.5	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_003.d
 Lims ID: CCVL
 Client ID:
 Sample Type: CCVL
 Inject. Date: 18-Aug-2018 23:19:02 ALS Bottle#: 2 Worklist Smp#: 1
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCVL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:22:56 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.388	1.388	0.0	1.000	2310275	21.2		8832	
298.90 > 99.00	1.388	1.388	0.0	1.000	1599701		1.44(0.00-0.00)	2397	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.510	1.510	0.0	1.000	1156137	9.81		8513	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.662	1.654	0.008	1.000	249503	2.08		61.5	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.662	1.654	0.008	1.000	1055551	6.70		1000	
* 6 13C2-PFOA									
415.00 > 370.00	1.851	1.836	0.015		1133505	10.0		8199	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.851	1.836	0.015	1.000	513534	4.16		73.1	
413.00 > 169.00	1.851	1.836	0.015	1.000	272142		1.89(0.00-0.00)	538	
* 7 13C4 PFOS									
503.00 > 80.00	2.109	2.086	0.023		2726575	28.7		3648	
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.094	0.023	1.000	391551	4.19		59.3	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.109	2.109	0.0	1.000	875645	8.53		1604	
499.00 > 99.00	2.109	2.109	0.0	1.000	203600		4.30(0.00-0.00)	291	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.261	0.007	1.000	857036	9.55		5720	

Reagents:

LC537-L2_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_003.d

Injection Date: 18-Aug-2018 23:19:02

Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

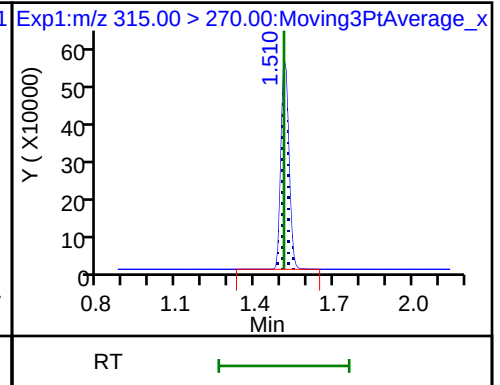
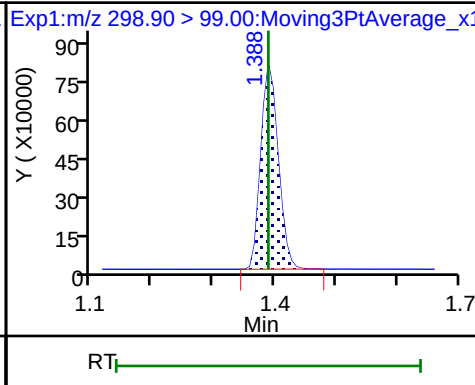
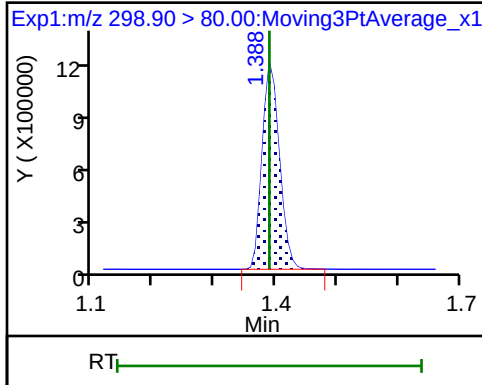
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

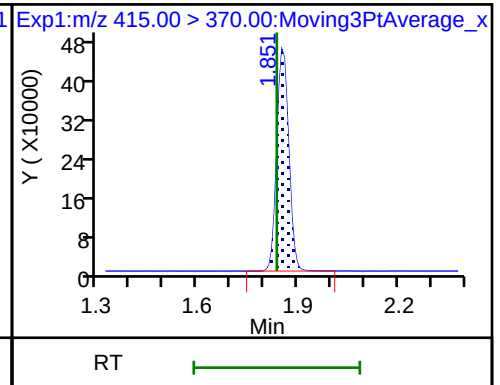
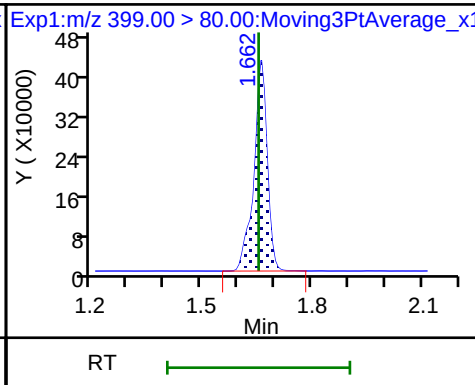
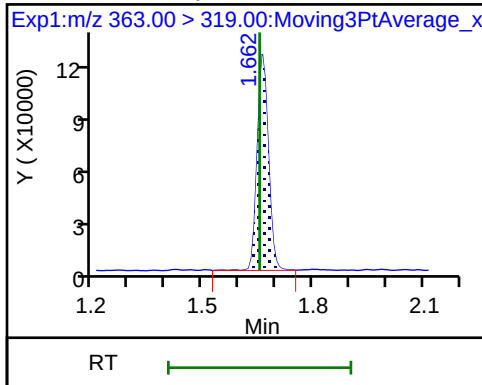
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

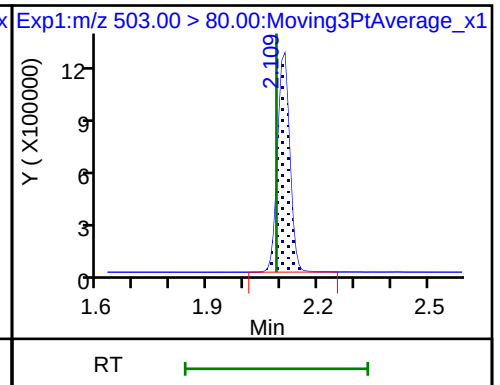
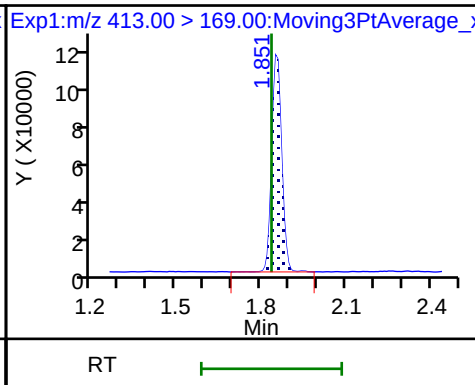
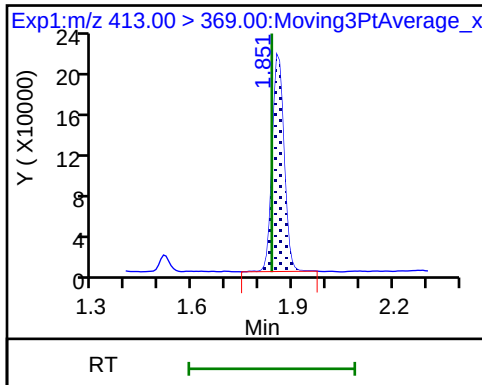
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

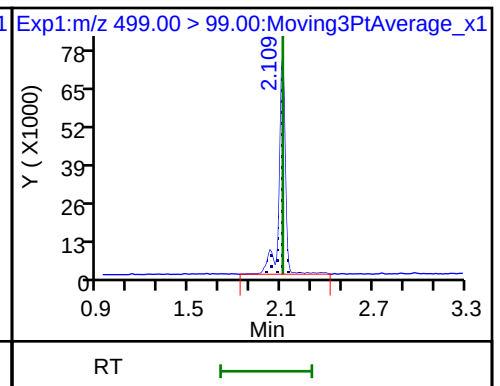
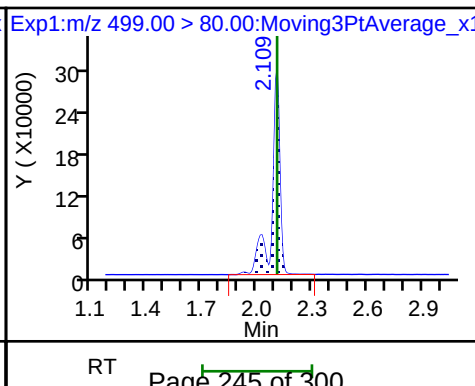
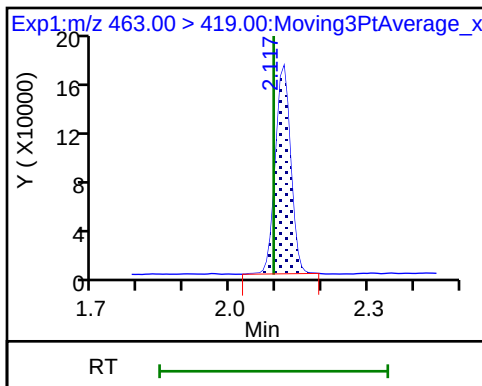
* 7 13C4 PFOS



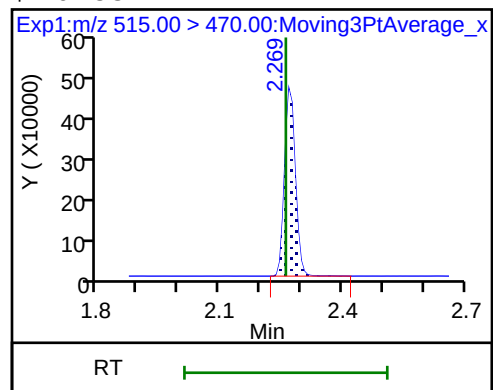
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: CCV 320-240731/24 Calibration Date: 08/19/2018 01:06
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.18_537A_026.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.282		50.4	45.0	12.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	1.069		4.91	4.86	1.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.724		15.7	15.1	4.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.093		9.93	9.90	0.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	1.055		19.3	19.8	-2.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.8255		9.91	9.90	0.1	30.0
13C2 PFHxA	Ave	1.039	1.051		10.1	10.0	1.1	30.0
13C2 PFDA	Ave	0.7921	0.7667		9.68	10.0	-3.2	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_026.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 19-Aug-2018 01:06:39 ALS Bottle#: 3 Worklist Smp#: 24
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L3
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:23:39 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	5062959	50.4		14580	
298.90 > 99.00	1.381	1.381	0.0	1.000	3418084		1.48(0.00-0.00)	5142	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.502	0.0	1.000	1044063	10.1		10322	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.646	1.646	0.0	1.000	516070	4.91		115	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.646	1.646	0.0	1.000	2287696	15.7		1602	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.836	0.0		993768	10.0		8231	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.836	1.836	0.0	1.000	1075354	9.93		147	
413.00 > 169.00	1.836	1.836	0.0	1.000	562316		1.91(0.00-0.00)	1237	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.094	0.0		2515780	28.7		5484	
9 Perfluorononanoic acid									
463.00 > 419.00	2.102	2.102	0.0	1.000	812169	9.91		101	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.094	2.109	-0.015	1.000	1829288	19.3		3382	
499.00 > 99.00	2.094	2.109	-0.015	1.000	396419		4.61(0.00-0.00)	531	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	761913	9.68		5478	

Reagents:

LC537-L3_00025

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_026.d

Injection Date: 19-Aug-2018 01:06:39

Instrument ID: A8_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 24

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

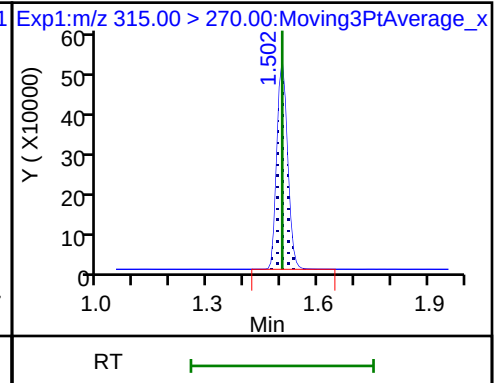
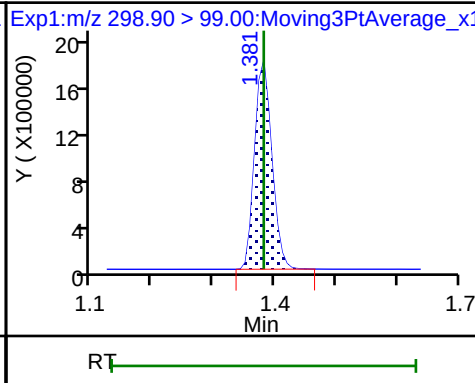
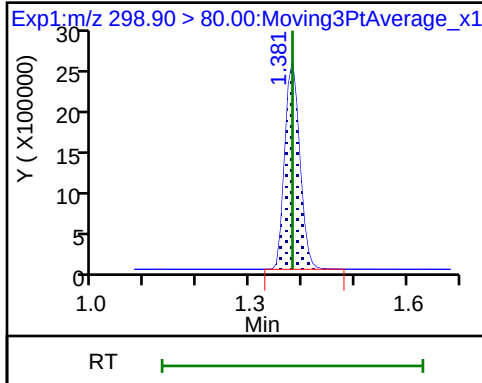
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

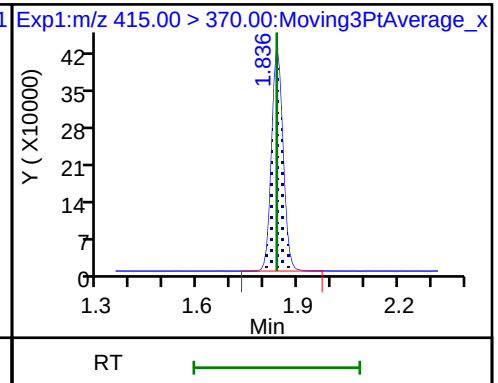
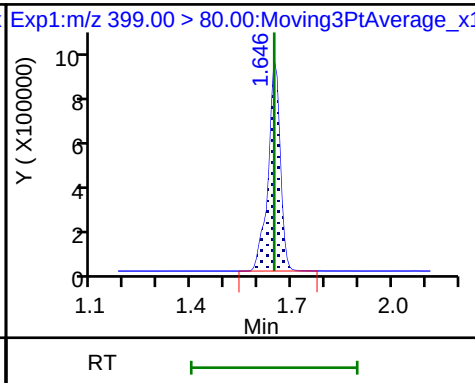
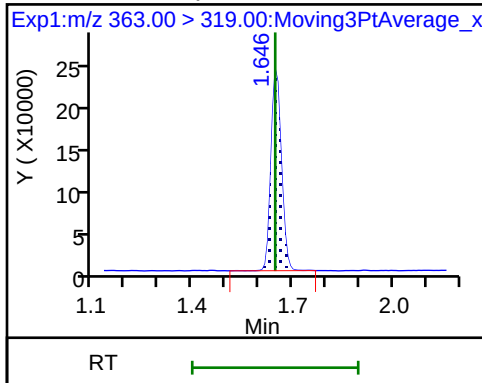
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

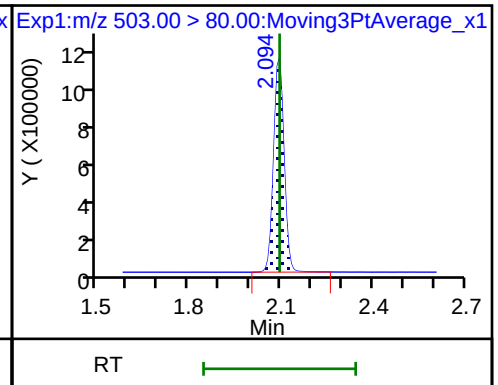
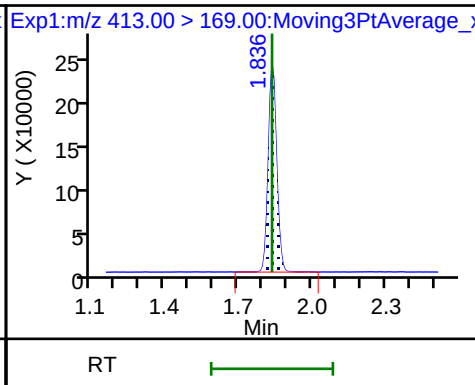
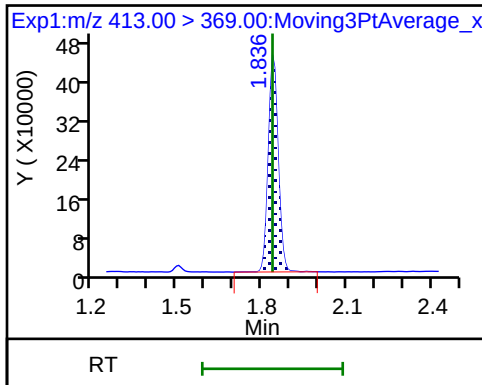
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

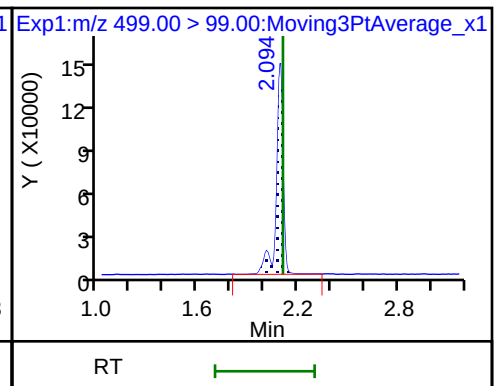
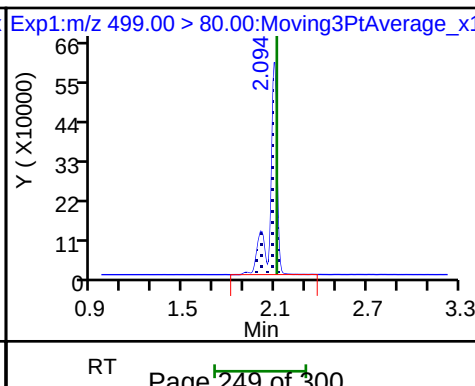
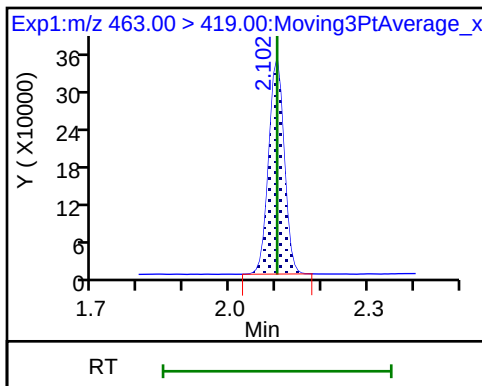
* 7 13C4 PFOS



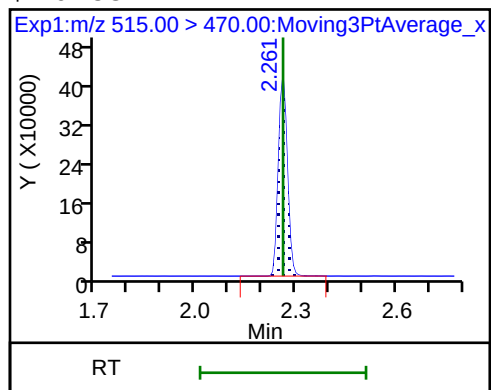
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: CCV 320-240731/36 Calibration Date: 08/19/2018 02:02
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.18_537A_038.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.076		127	135	-6.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	1.058		14.6	14.6	0.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.722		47.2	45.4	4.0	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.100		30.0	29.7	0.9	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	1.103		60.6	59.3	2.1	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.8116		29.2	29.7	-1.5	30.0
13C2 PFHxA	Ave	1.039	1.047		10.1	10.0	0.8	30.0
13C2 PFDA	Ave	0.7921	0.7572		9.56	10.0	-4.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: CCV 320-240733/36 Calibration Date: 08/19/2018 02:02
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.18_537A_038.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.076		127	135	-6.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	1.058		14.6	14.6	0.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.722		47.2	45.4	4.0	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.100		30.0	29.7	0.9	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	1.103		60.6	59.3	2.1	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.8116		29.2	29.7	-1.5	30.0
13C2 PFHxA	Ave	1.039	1.047		10.1	10.0	0.8	30.0
13C2 PFDA	Ave	0.7921	0.7572		9.56	10.0	-4.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_038.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 19-Aug-2018 02:02:44 ALS Bottle#: 5 Worklist Smp#: 36
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:48:44 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.388	1.388	0.0	1.000	13040959	127.0		21122	
298.90 > 99.00	1.388	1.388	0.0	1.000	9522888		1.37(0.00-0.00)	10887	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.510	1.510	0.0	1.000	1065318	10.1		10809	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.654	1.654	0.0	1.000	1568745	14.6		370	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.654	1.654	0.0	1.000	7009092	47.2		4292	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.836	0.0		1017295	10.0		8420	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.836	1.836	0.0	1.000	3322467	30.0		453	
413.00 > 169.00	1.836	1.836	0.0	1.000	1784740		1.86(0.00-0.00)	3864	
* 7 13C4 PFOS									
503.00 > 80.00	2.086	2.086	0.0		2573081	28.7		5179	
9 Perfluorononanoic acid									
463.00 > 419.00	2.094	2.094	0.0	1.000	2452189	29.2		300	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.086	2.109	-0.023	1.000	5869037	60.6		7961	
499.00 > 99.00	2.086	2.109	-0.023	1.000	1259534		4.66(0.00-0.00)	1509	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	770246	9.56		5133	

Reagents:

LC537-L5_00026

Amount Added: 1.00

Units: mL

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_038.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 19-Aug-2018 02:02:44 ALS Bottle#: 5 Worklist Smp#: 36
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:48:44 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.388	1.388	0.0	1.000	13040959	127.0		21122	
298.90 > 99.00	1.388	1.388	0.0	1.000	9522888		1.37(0.00-0.00)	10887	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.510	1.510	0.0	1.000	1065318	10.1		10809	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.654	1.654	0.0	1.000	1568745	14.6		370	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.654	1.654	0.0	1.000	7009092	47.2		4292	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.836	0.0		1017295	10.0		8420	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.836	1.836	0.0	1.000	3322467	30.0		453	
413.00 > 169.00	1.836	1.836	0.0	1.000	1784740		1.86(0.00-0.00)	3864	
* 7 13C4 PFOS									
503.00 > 80.00	2.086	2.086	0.0		2573081	28.7		5179	
9 Perfluorononanoic acid									
463.00 > 419.00	2.094	2.094	0.0	1.000	2452189	29.2		300	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.086	2.109	-0.023	1.000	5869037	60.6		7961	
499.00 > 99.00	2.086	2.109	-0.023	1.000	1259534		4.66(0.00-0.00)	1509	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	770246	9.56		5133	

Reagents:

LC537-L5_00026

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_038.d

Injection Date: 19-Aug-2018 02:02:44

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 36

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

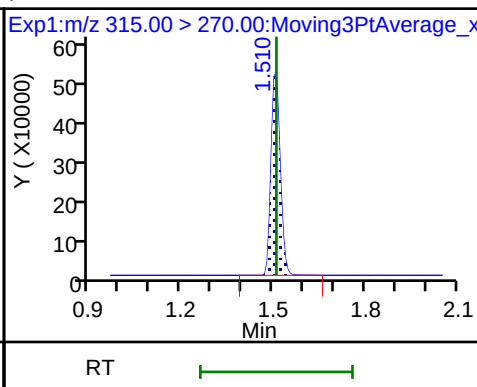
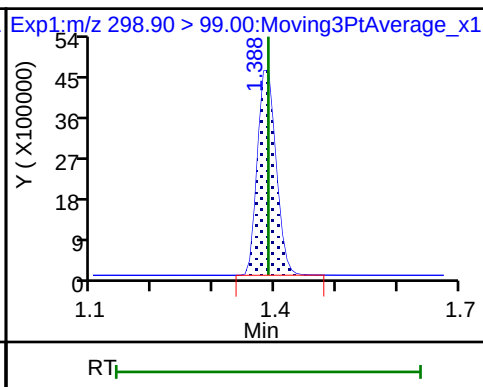
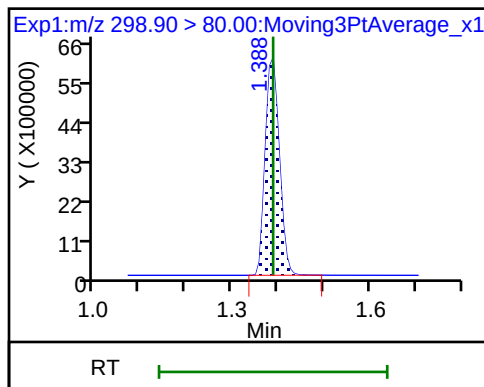
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

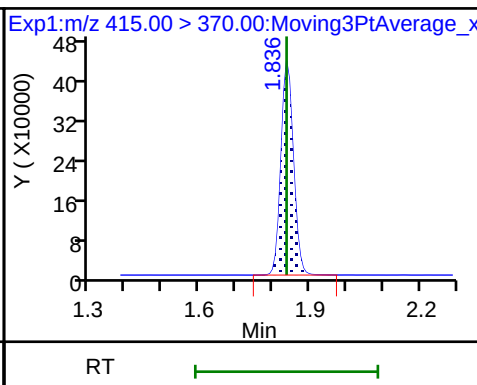
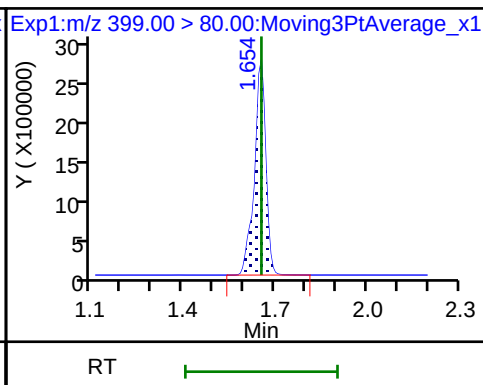
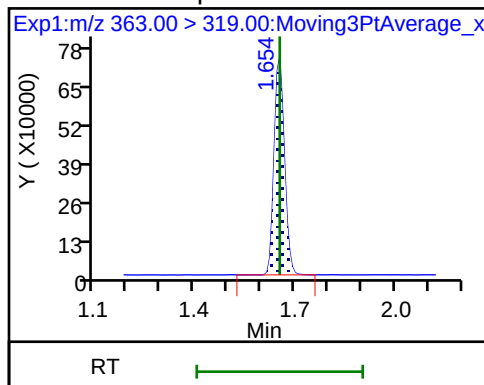
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

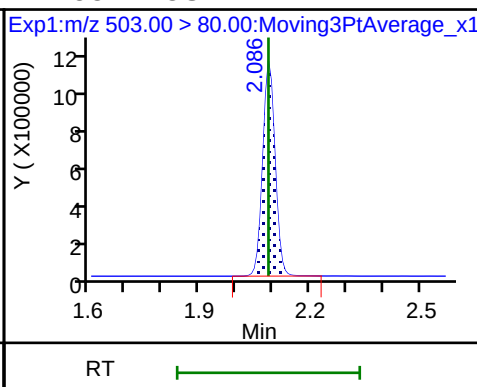
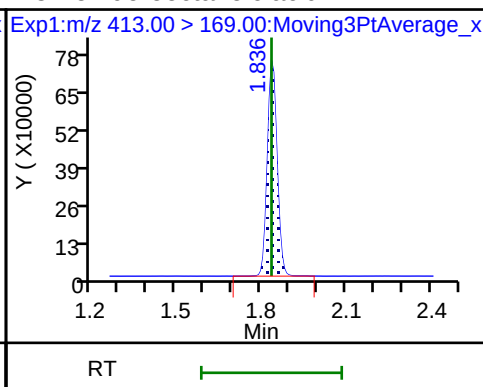
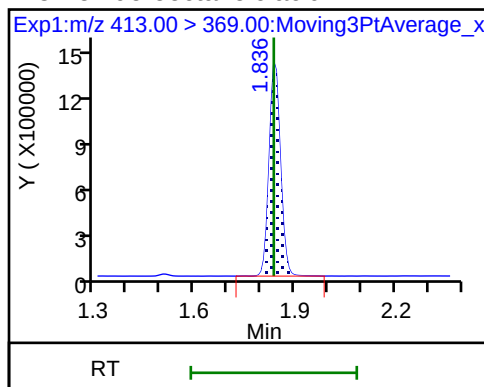
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

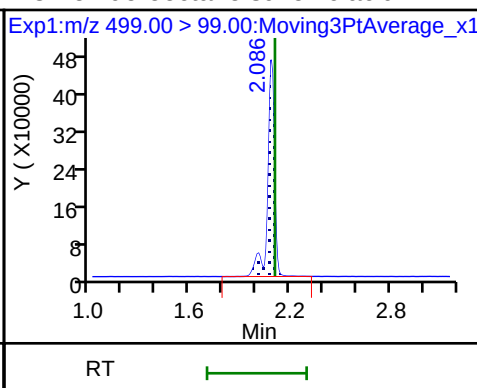
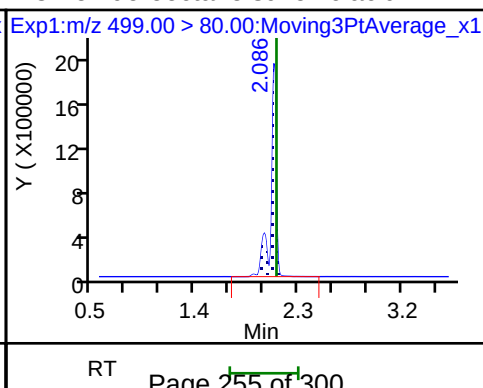
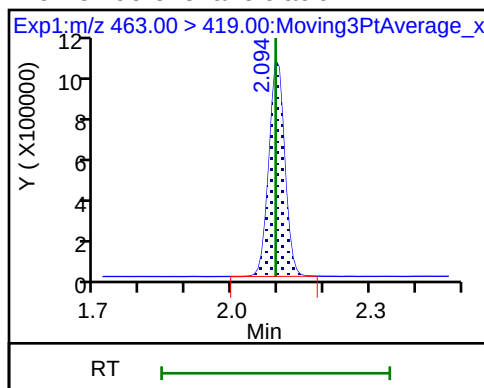
* 7 13C4 PFOS



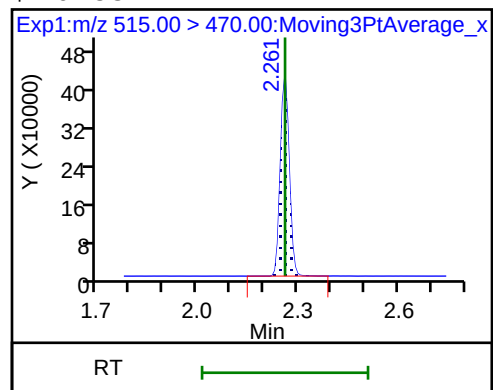
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_038.d

Injection Date: 19-Aug-2018 02:02:44

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 36

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

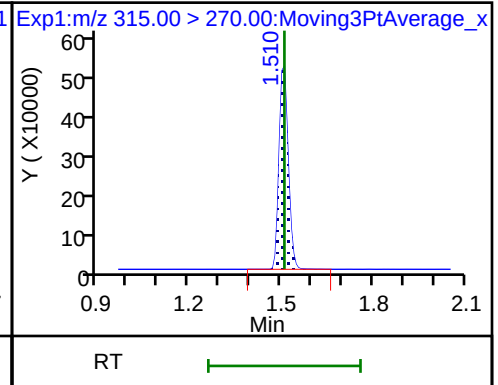
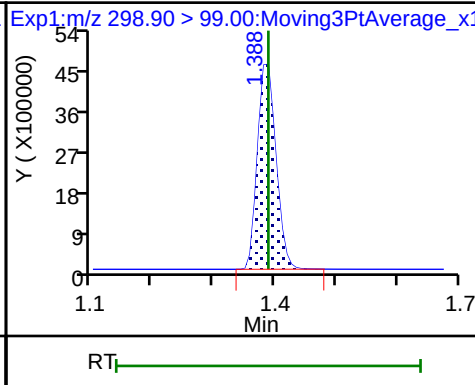
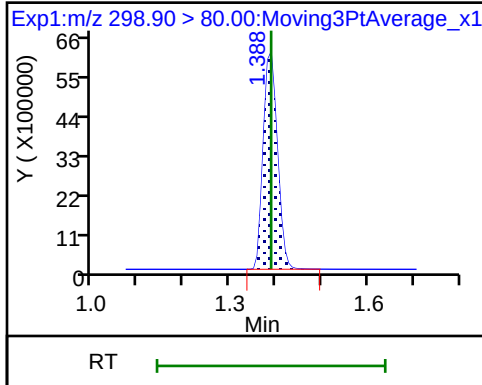
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

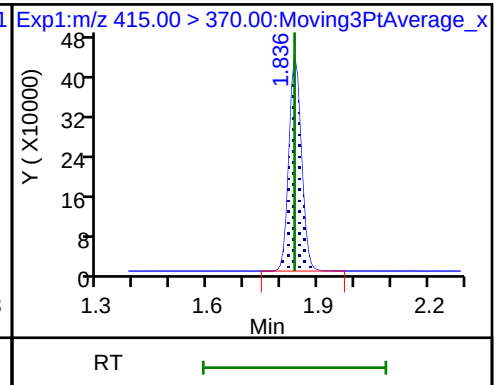
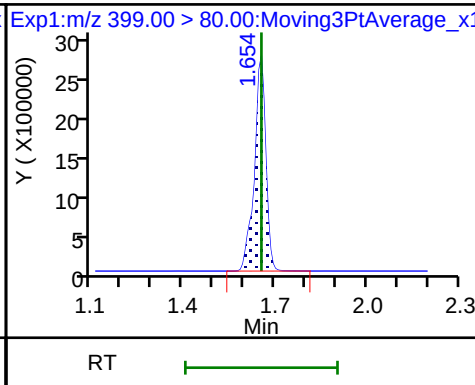
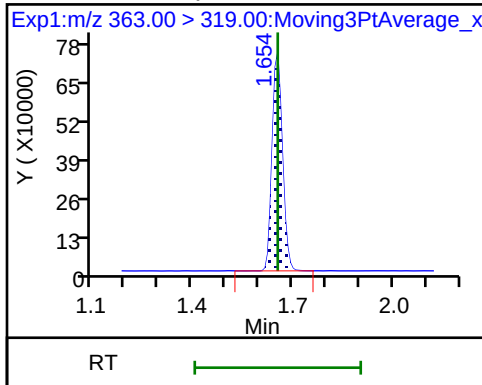
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

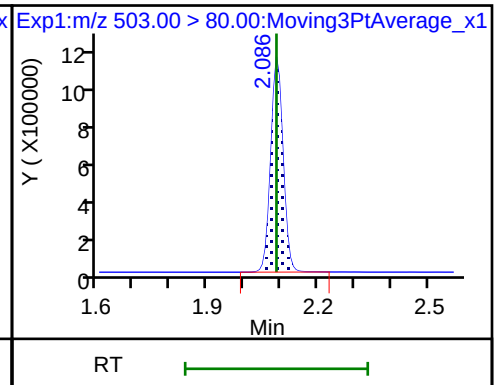
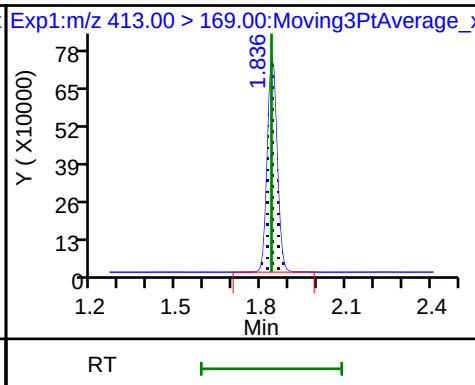
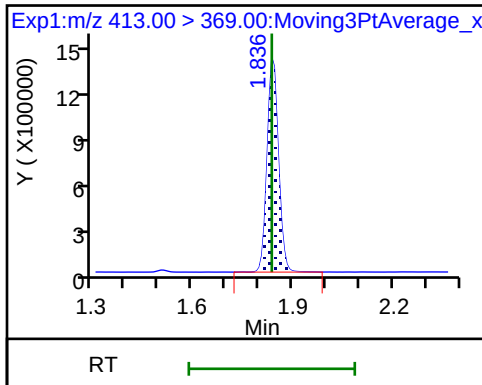
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

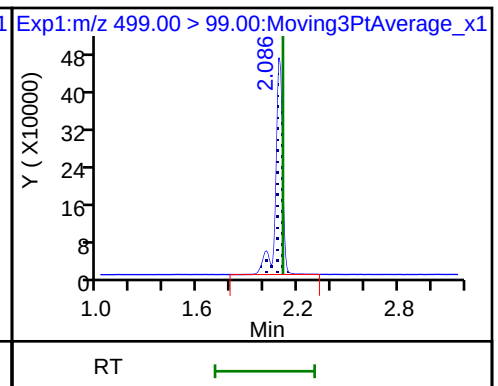
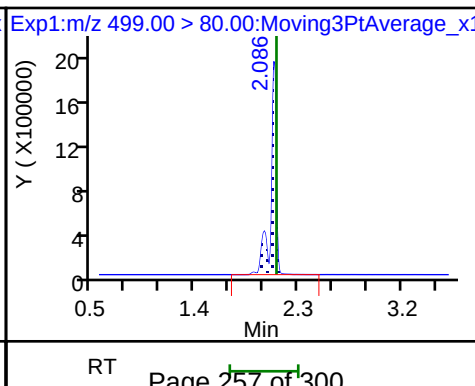
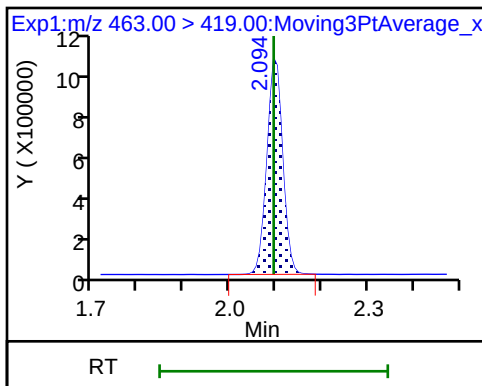
* 7 13C4 PFOS



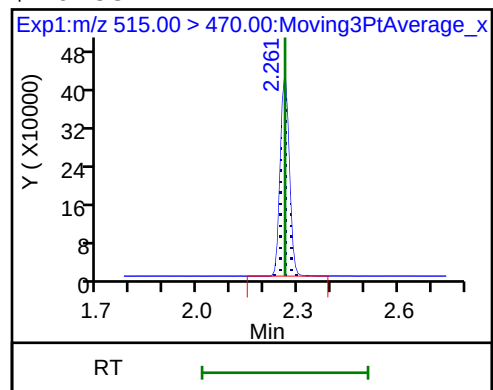
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: CCV 320-240733/44 Calibration Date: 08/19/2018 02:40
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.18_537A_046.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.227		48.3	45.0	7.2	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	1.051		4.83	4.86	-0.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.656		15.1	15.1	-0.0	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.049		9.53	9.90	-3.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	1.043		19.1	19.8	-3.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.8100		9.73	9.90	-1.7	30.0
13C2 PFHxA	Ave	1.039	1.044		10.0	10.0	0.5	30.0
13C2 PFDA	Ave	0.7921	0.7517		9.49	10.0	-5.1	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_046.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 19-Aug-2018 02:40:07 ALS Bottle#: 3 Worklist Smp#: 44
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L3
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:49:05 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.373	1.373	0.0	1.000	4914455	48.3		13613	
298.90 > 99.00	1.373	1.373	0.0	1.000	3459290		1.42(0.00-0.00)	5799	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.495	0.0	1.000	1069112	10.0		10856	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.646	1.646	0.0	1.000	523027	4.83		124	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.646	1.646	0.0	1.000	2226789	15.1		1496	
* 6 13C2-PFOA									
415.00 > 370.00	1.828	1.828	0.0		1023857	10.0		8695	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.836	1.836	0.0	1.000	1063278	9.53		146	
413.00 > 169.00	1.828	1.836	-0.008	0.996	567559		1.87(0.00-0.00)	1353	
* 7 13C4 PFOS									
503.00 > 80.00	2.086	2.086	0.0		2550677	28.7		5582	
9 Perfluorononanoic acid									
463.00 > 419.00	2.094	2.094	0.0	1.000	821037	9.73		102	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.086	2.109	-0.023	1.000	1833664	19.1		3477	
499.00 > 99.00	2.086	2.109	-0.023	1.000	404450		4.53(0.00-0.00)	537	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.253	2.253	0.0	1.000	769617	9.49		5563	

Reagents:

LC537-L3_00025

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_046.d

Injection Date: 19-Aug-2018 02:40:07

Instrument ID: A8_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 44

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

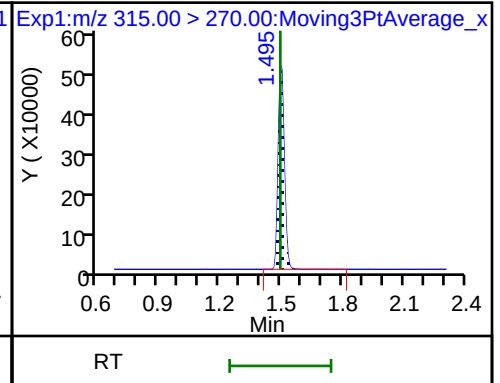
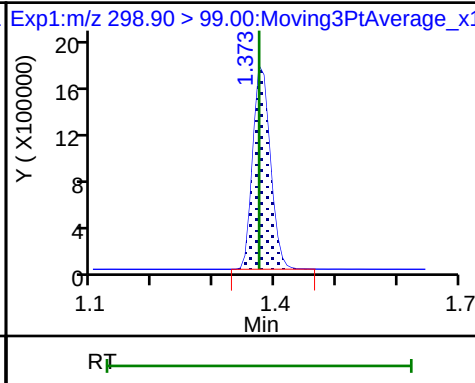
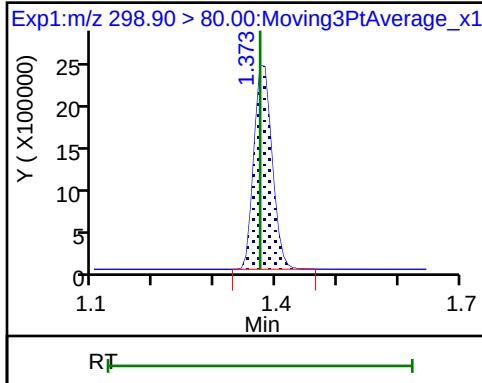
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

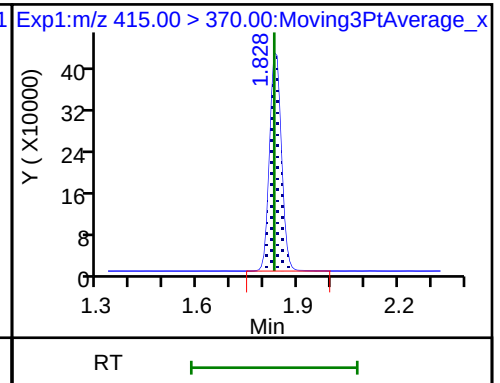
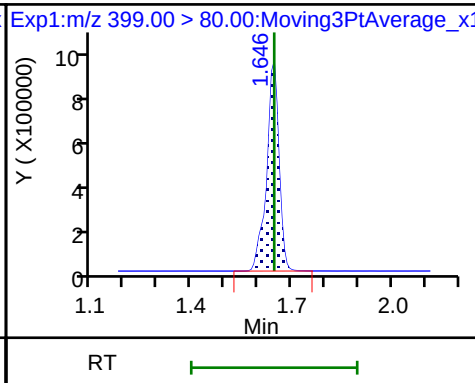
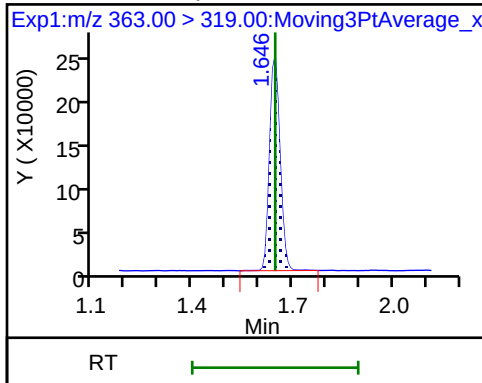
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

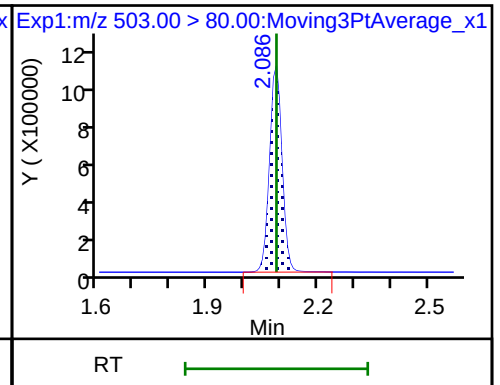
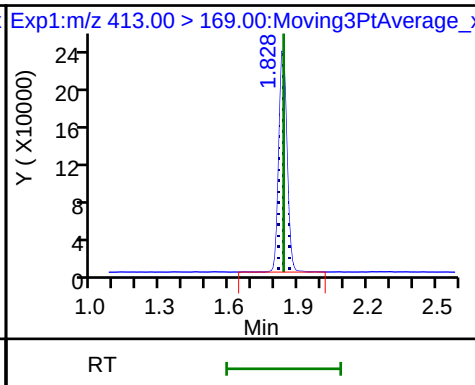
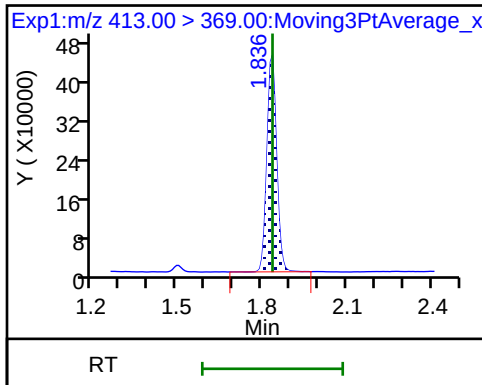
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

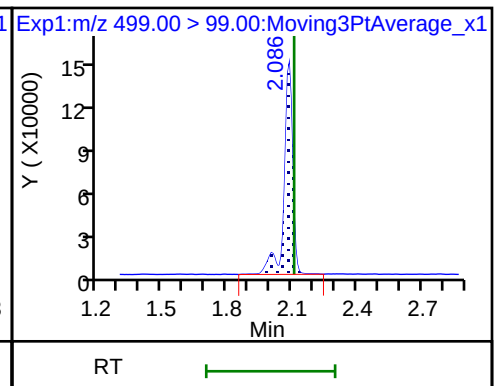
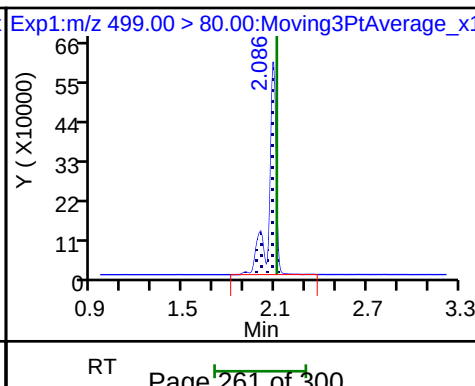
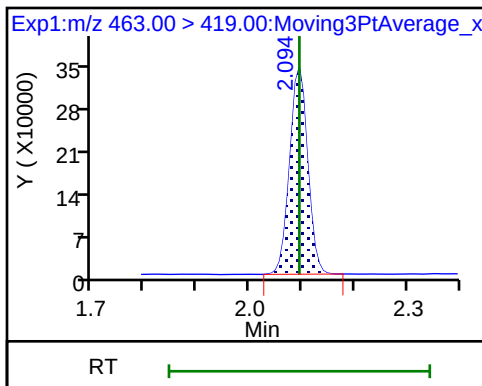
* 7 13C4 PFOS



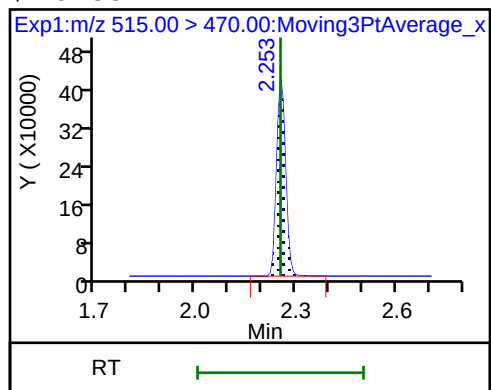
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-240968/1 Calibration Date: 08/20/2018 16:19
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.20_537A_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.194		20.9	20.0	4.3	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	0.9846		2.01	2.16	-6.9	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.592		6.46	6.72	-3.9	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.015		4.10	4.40	-6.9	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	1.035		8.42	8.79	-4.2	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.7441		3.97	4.40	-9.7	50.0
13C2 PFHxA	Ave	1.039	0.9672		9.31	10.0	-6.9	30.0
13C2 PFDA	Ave	0.7921	0.7090		8.95	10.0	-10.5	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180820-62982.b\2018.08.20_537A_003.d
 Lims ID: CCVL
 Client ID:
 Sample Type: CCVL
 Inject. Date: 20-Aug-2018 16:19:37 ALS Bottle#: 2 Worklist Smp#: 1
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCVL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180820-62982.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2018 10:01:01 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	2090256	20.9		6375	
298.90 > 99.00	1.381	1.381	0.0	1.000	1473779		1.42(0.00-0.00)	2246	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.510	1.502	0.008	1.000	1045461	9.31		8820	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.662	1.654	0.008	1.000	229893	2.01		49.1	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.662	1.654	0.008	1.000	935799	6.46		649	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.844	0.015		1080920	10.0		8541	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.844	0.015	1.000	482683	4.10		60.2	
413.00 > 169.00	1.859	1.844	0.015	1.000	264630		1.82(0.00-0.00)	518	
* 7 13C4 PFOS									
503.00 > 80.00	2.109	2.094	0.015		2508240	28.7		5202	
9 Perfluorononanoic acid									
463.00 > 419.00	2.124	2.102	0.022	1.000	353896	3.97		54.3	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.117	2.109	0.008	1.000	795391	8.42		1527	
499.00 > 99.00	2.109	2.109	0.0	0.996	172131		4.62(0.00-0.00)	251	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.261	0.007	1.000	766318	8.95		5120	

Reagents:

LC537-L2_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180820-62982.b\2018.08.20_537A_003.d

Injection Date: 20-Aug-2018 16:19:37

Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

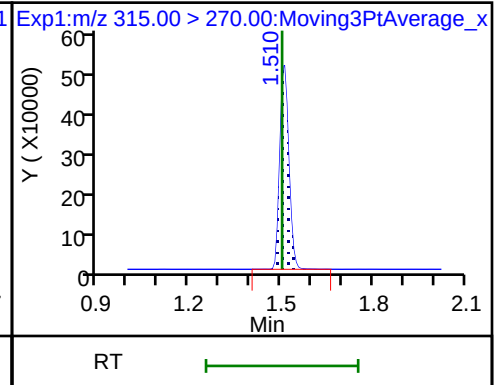
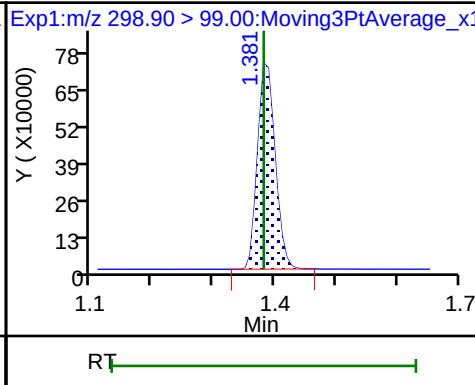
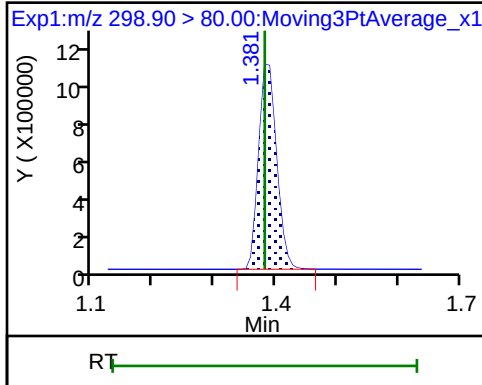
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

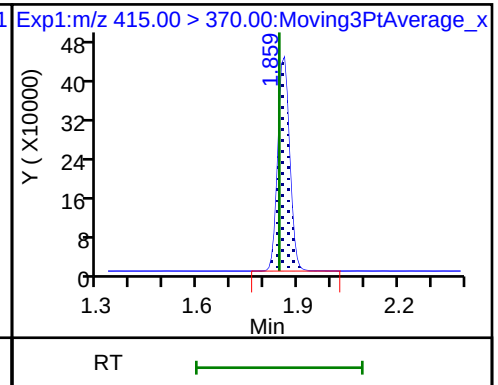
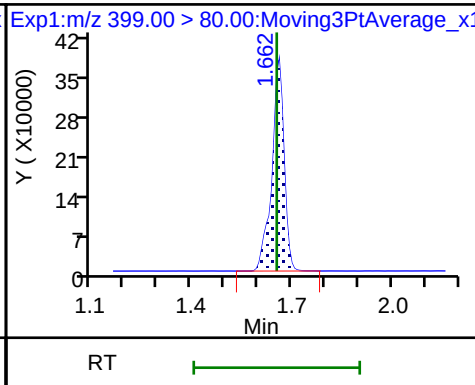
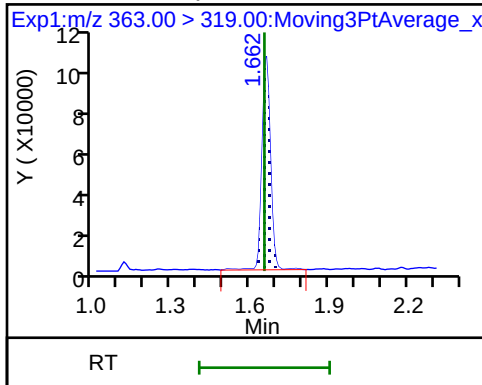
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

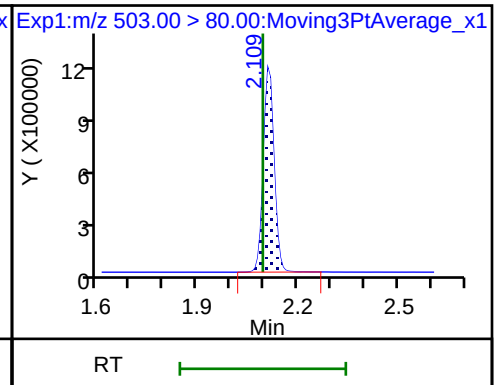
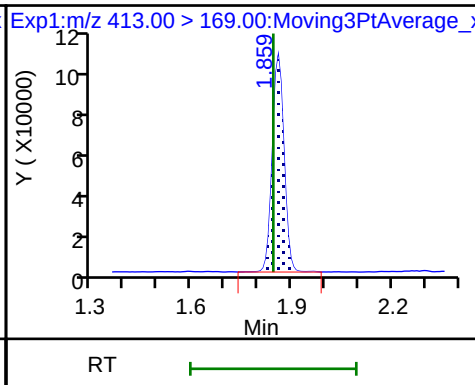
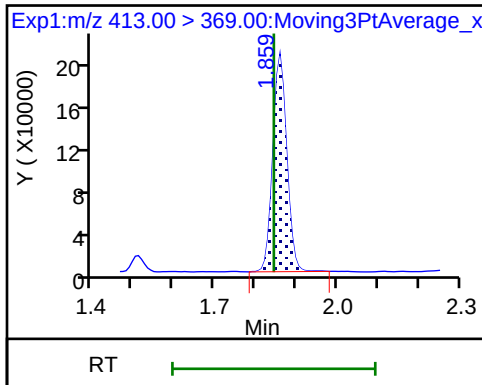
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

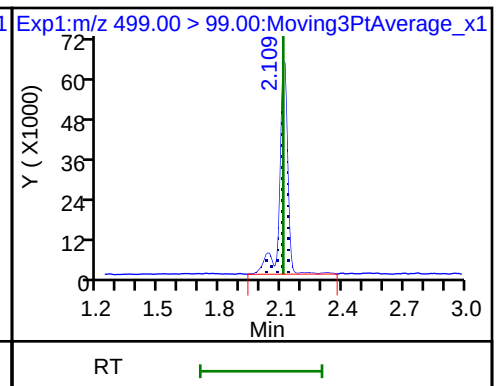
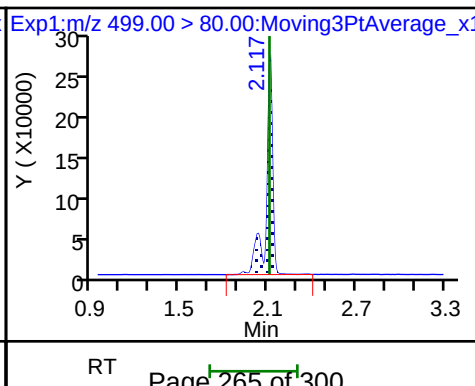
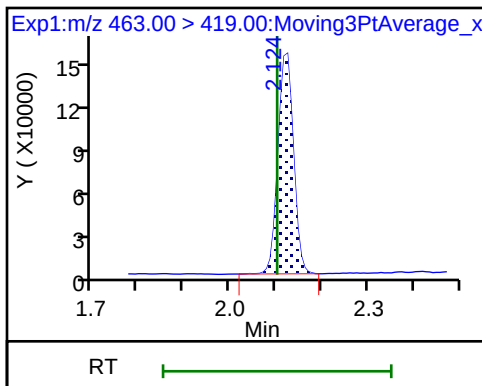
* 7 13C4 PFOS



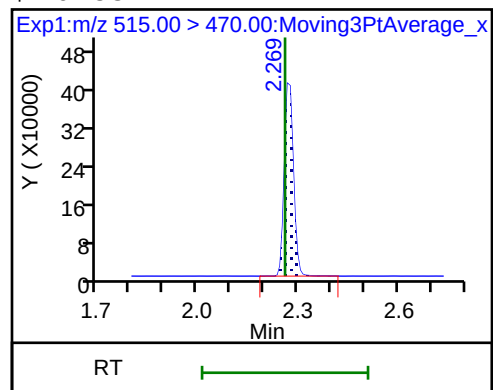
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: CCV 320-240968/2 Calibration Date: 08/20/2018 16:24
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.20_537A_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.280		50.4	45.0	11.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	1.056		4.85	4.86	-0.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.718		15.7	15.1	3.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.095		9.95	9.90	0.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	1.097		20.1	19.8	1.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.8054		9.67	9.90	-2.3	30.0
13C2 PFHxA	Ave	1.039	1.057		10.2	10.0	1.7	30.0
13C2 PFDA	Ave	0.7921	0.7464		9.42	10.0	-5.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180820-62982.b\2018.08.20_537A_004.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 20-Aug-2018 16:24:17 ALS Bottle#: 3 Worklist Smp#: 2
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L3
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180820-62982.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2018 10:01:04 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.388	1.388	0.0	1.000	4903952	50.4		12113	
298.90 > 99.00	1.381	1.388	-0.007	0.995	3409223		1.44(0.00-0.00)	4411	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.510	1.510	0.0	1.000	1089215	10.2		11175	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.662	1.662	0.0	1.000	529021	4.85		128	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.662	1.662	0.0	1.000	2210222	15.7		1348	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.859	0.0		1030793	10.0		8135	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.859	0.0	1.000	1117445	9.95		140	
413.00 > 169.00	1.859	1.859	0.0	1.000	589653		1.90(0.00-0.00)	1138	
* 7 13C4 PFOS									
503.00 > 80.00	2.109	2.109	0.0		2439962	28.7		5329	
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.117	0.0	1.000	821928	9.67		123	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.109	2.109	0.0	1.000	1845267	20.1		2931	
499.00 > 99.00	2.109	2.109	0.0	1.000	394835		4.67(0.00-0.00)	671	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.269	0.0	1.000	769363	9.42		5089	

Reagents:

LC537-L3_00025

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180820-62982.b\2018.08.20_537A_004.d

Injection Date: 20-Aug-2018 16:24:17

Instrument ID: A8_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

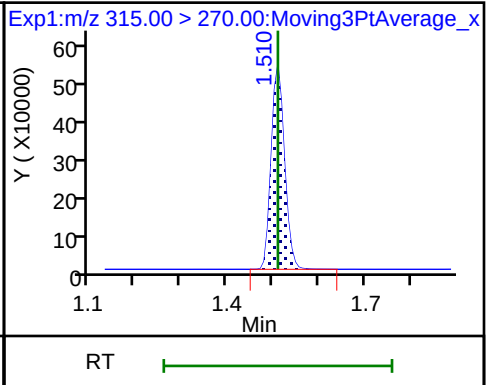
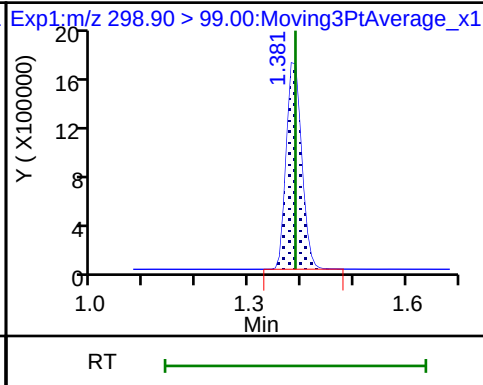
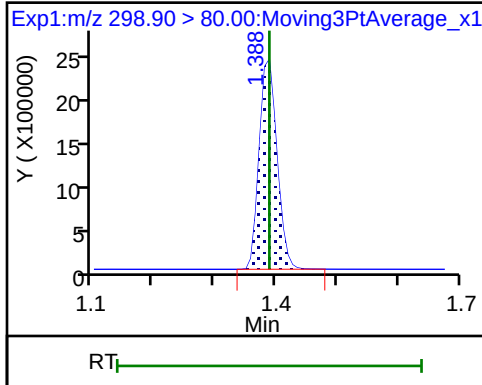
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

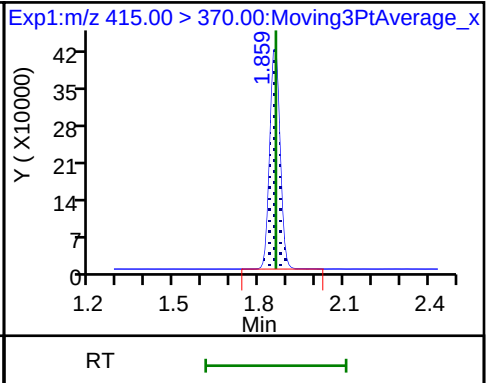
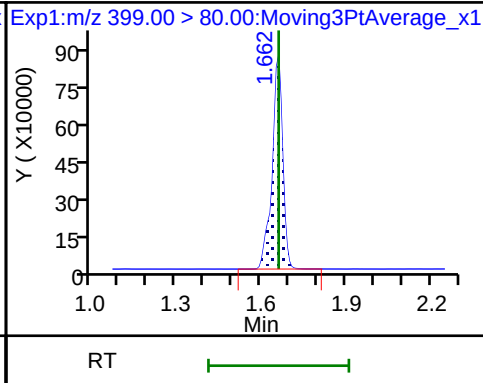
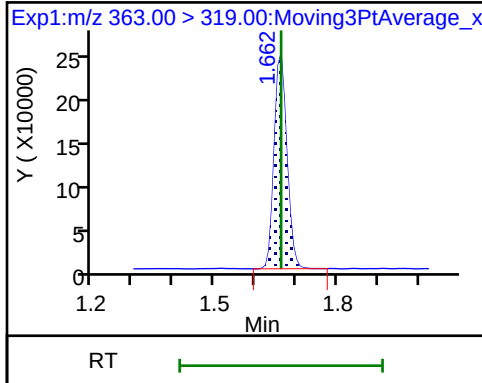
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

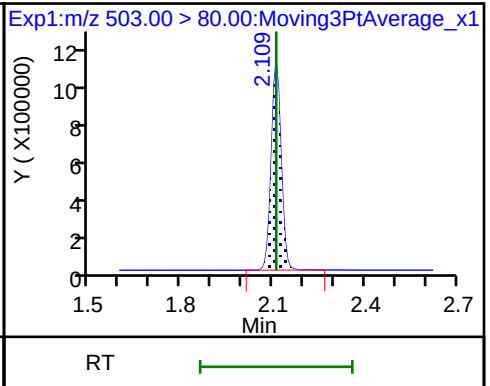
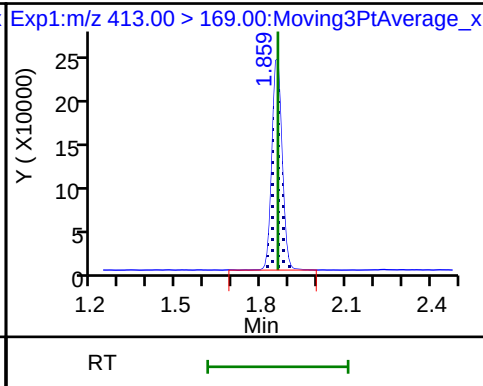
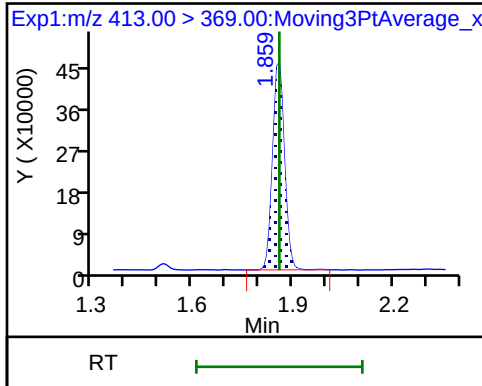
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

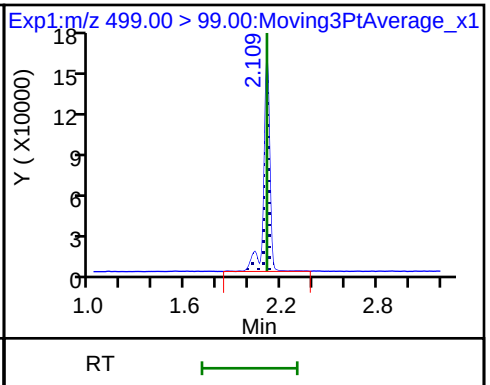
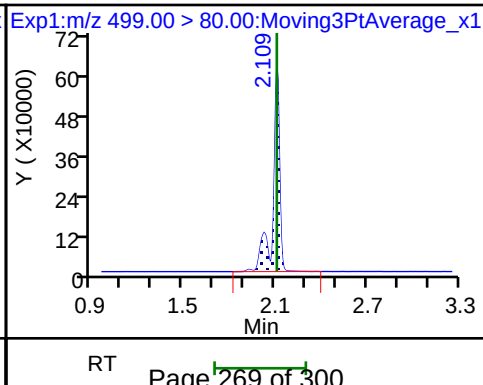
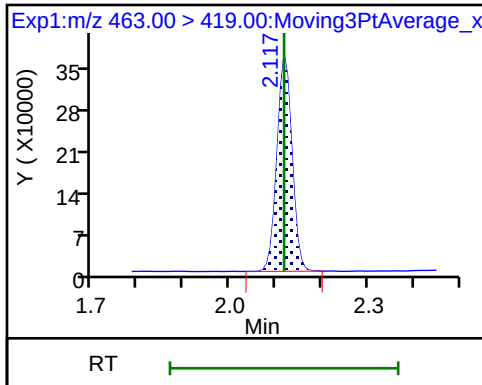
* 7 13C4 PFOS



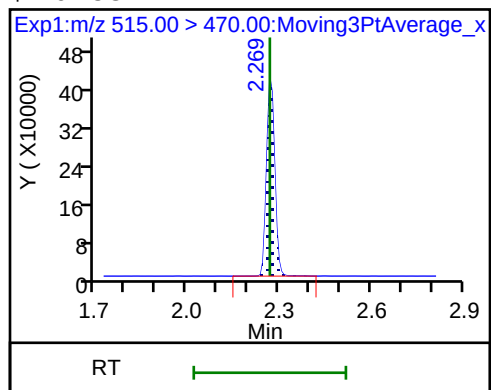
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: CCV 320-240968/10 Calibration Date: 08/20/2018 17:01
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.20_537A_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.065		126	135	-7.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	1.042		14.4	14.6	-1.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.682		46.1	45.4	1.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.089		29.7	29.7	-0.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	1.067		58.6	59.3	-1.2	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.8058		29.0	29.7	-2.3	30.0
13C2 PFHxA	Ave	1.039	1.071		10.3	10.0	3.0	30.0
13C2 PFDA	Ave	0.7921	0.7778		9.82	10.0	-1.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180820-62982.b\2018.08.20_537A_012.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 20-Aug-2018 17:01:41 ALS Bottle#: 5 Worklist Smp#: 10
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub9
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180820-62982.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2018 10:01:20 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.388	1.388	0.0	1.000	12648030	125.7		17497	
298.90 > 99.00	1.388	1.388	0.0	1.000	9329261		1.36(0.00-0.00)	10462	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.510	1.510	0.0	1.000	1067810	10.3		10579	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.662	1.662	0.0	1.000	1514439	14.4		347	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.662	1.662	0.0	1.000	6710504	46.1		3744	
* 6 13C2-PFOA									
415.00 > 370.00	1.851	1.851	0.0		997051	10.0		8513	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.851	1.851	0.0	1.000	3223392	29.7		397	
413.00 > 169.00	1.851	1.851	0.0	1.000	1724644		1.87(0.00-0.00)	3350	
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.102	0.0		2521958	28.7		5859	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.109	2.109	0.0	1.000	5565225	58.6		7570	
499.00 > 99.00	2.109	2.109	0.0	1.000	1218417		4.57(0.00-0.00)	1610	
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.117	0.0	1.000	2386022	29.0		333	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.269	0.0	1.000	775460	9.82		4914	

Reagents:

LC537-L5_00026

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180820-62982.b\2018.08.20_537A_012.d

Injection Date: 20-Aug-2018 17:01:41

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 10

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

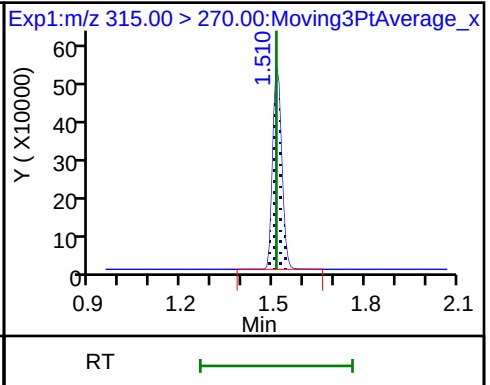
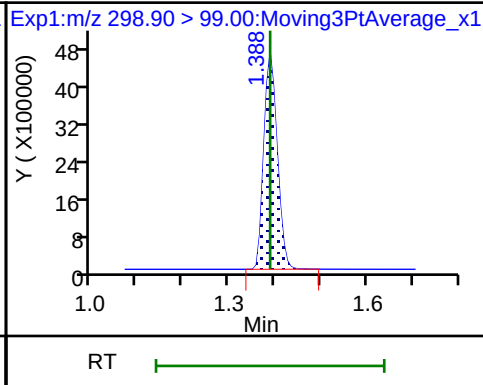
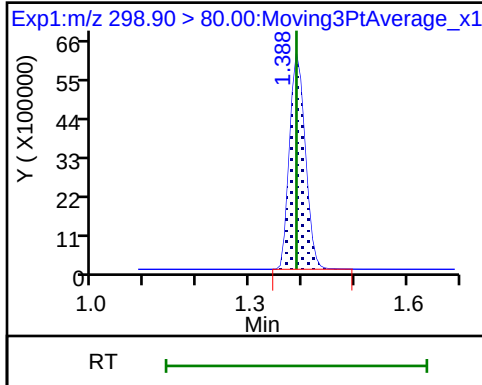
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

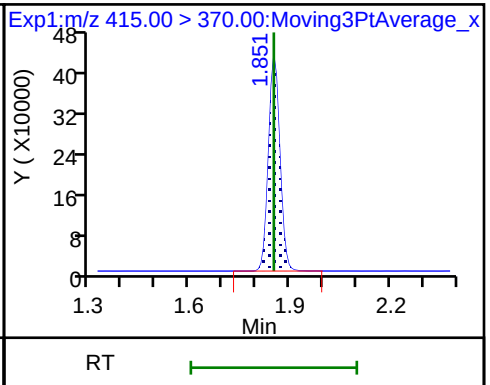
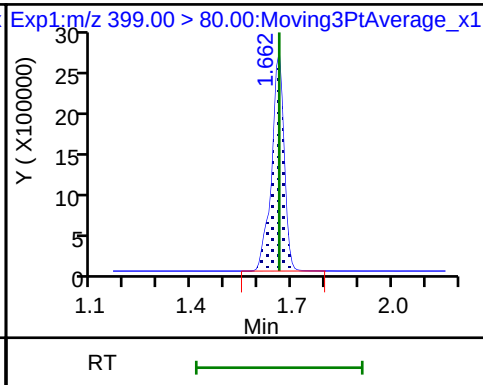
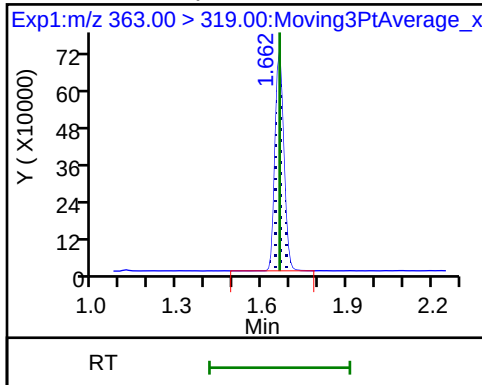
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

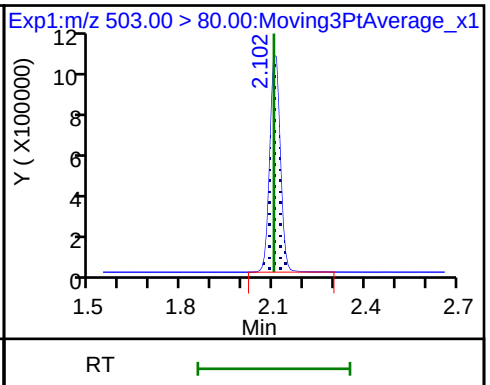
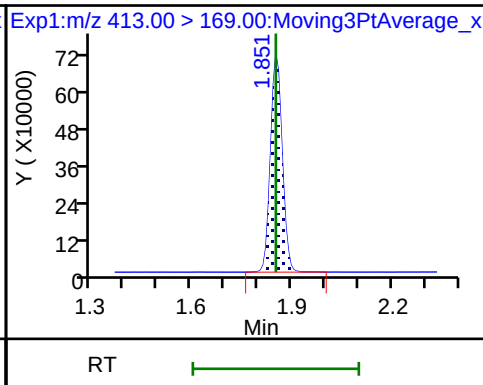
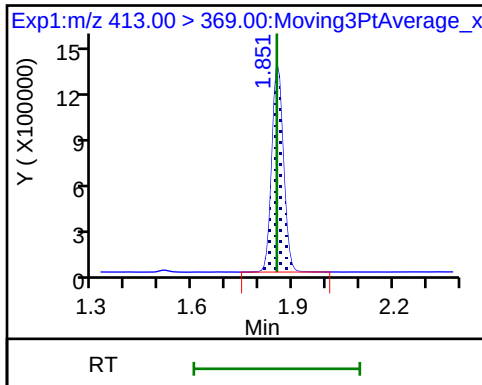
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

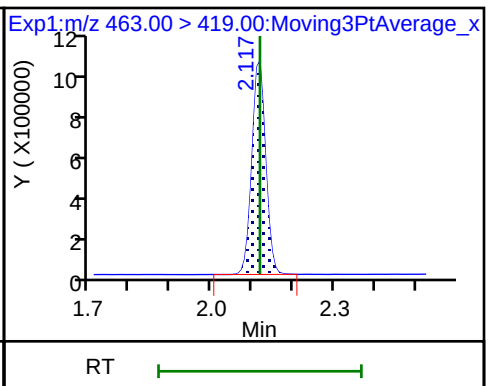
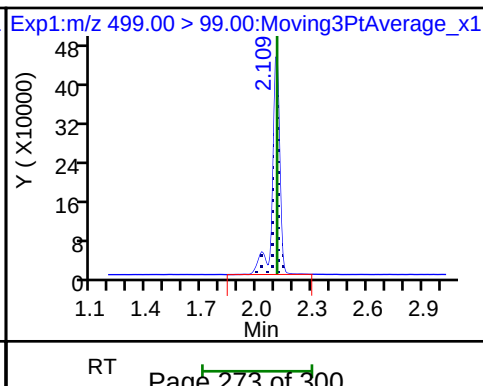
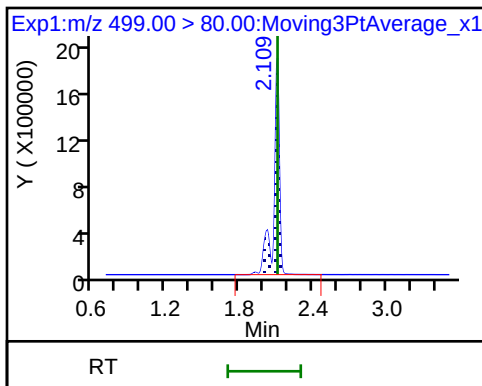
* 7 13C4 PFOS



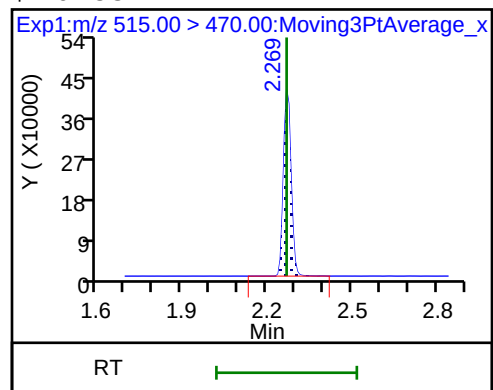
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-240201/1-A
 Matrix: Water Lab File ID: 2018.08.18_537A_028.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 250 (mL) Date Analyzed: 08/19/2018 01:16
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240731 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	8.0	U	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	105		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_028.d
 Lims ID: MB 320-240201/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 19-Aug-2018 01:16:01 ALS Bottle#: 18 Worklist Smp#: 26
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-240201/1-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.502	0.0	1.000	1059124	9.75		9595	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.836	0.0		1045030	10.0		8018	
* 7 13C4 PFOS									
503.00 > 80.00	2.086	2.094	-0.008		2549261	28.7		4949	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	867790	10.5		6782	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_028.d

Injection Date: 19-Aug-2018 01:16:01

Instrument ID: A8_N

Lims ID: MB 320-240201/1-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 18

Worklist Smp#: 26

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

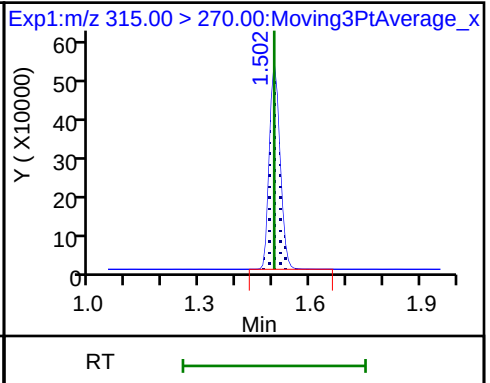
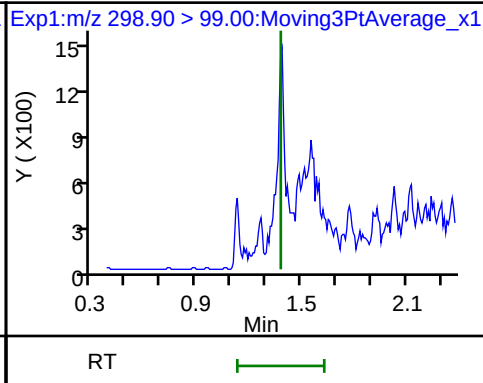
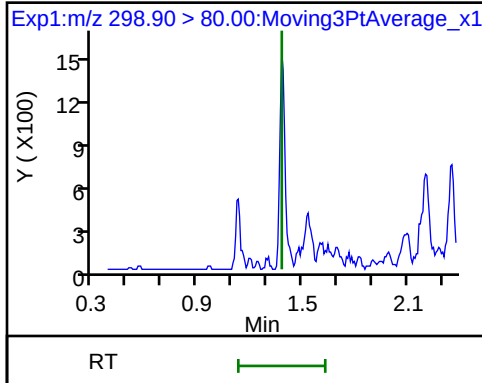
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

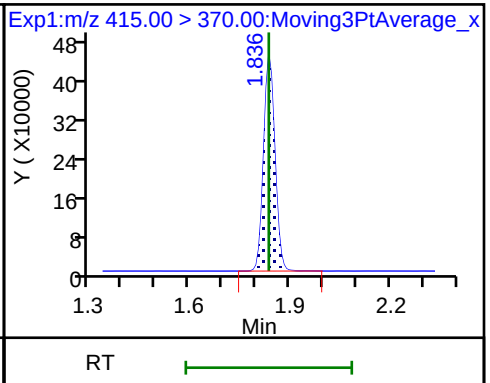
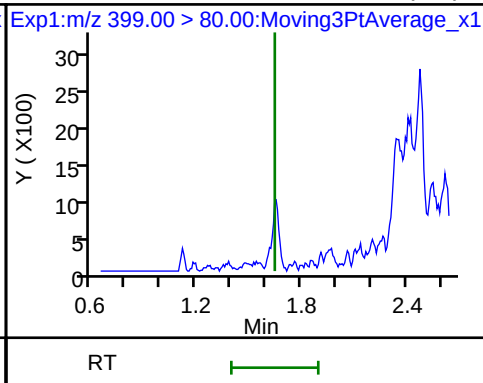
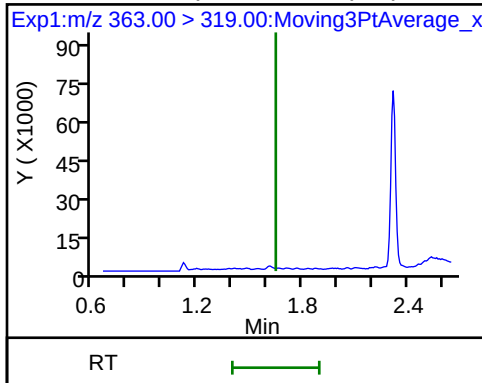
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid (ND)

3 Perfluorohexanesulfonic acid (ND)

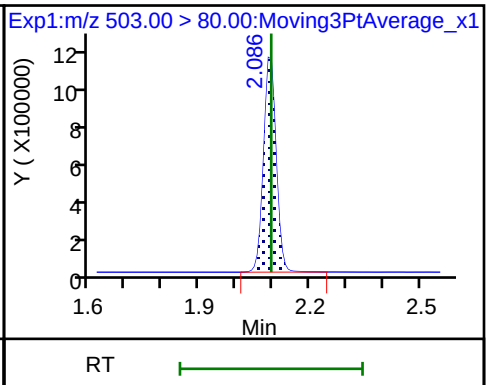
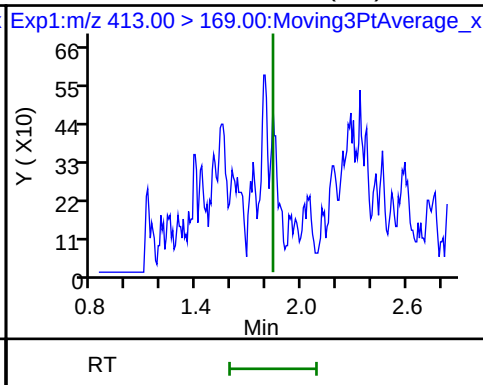
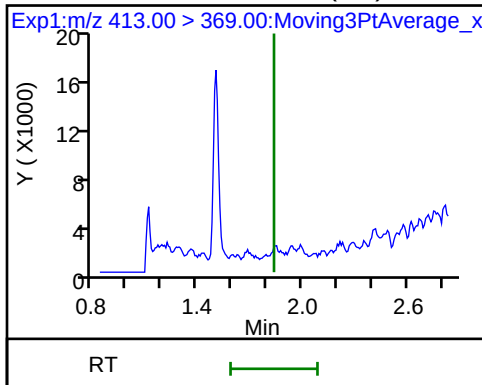
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

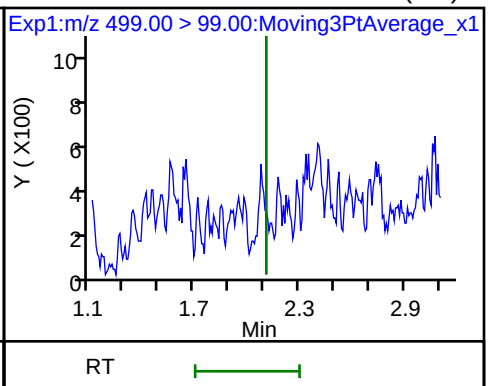
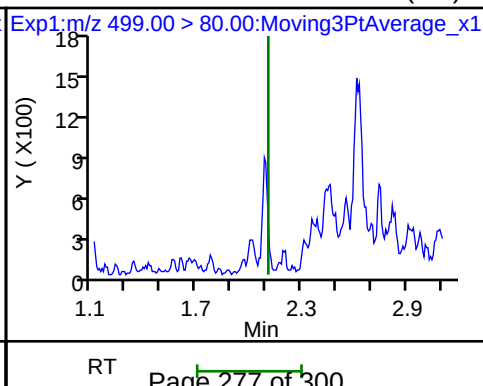
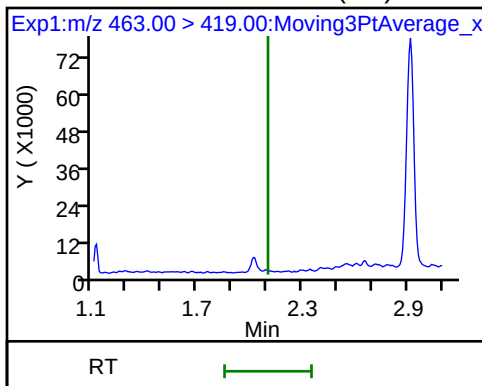
* 7 13C4 PFOS



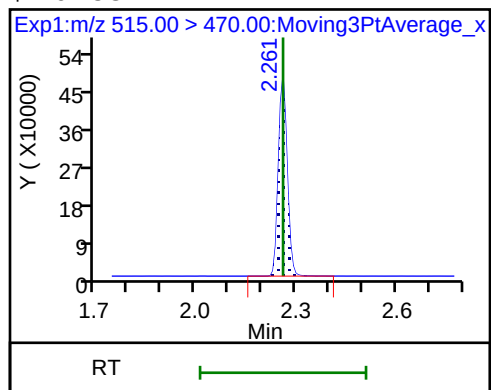
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_028.d
Lims ID: MB 320-240201/1-A
Client ID:
Sample Type: MB
Inject. Date: 19-Aug-2018 01:16:01 ALS Bottle#: 18 Worklist Smp#: 26
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-240201/1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
Column 1 : Det: EXP1
Process Host: XAWRK026

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.75	97.51
\$ 10 13C2 PFDA	10.0	10.5	104.83

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 320-240201/2-A
 Matrix: Water Lab File ID: 2018.08.18_537A_029.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 250 (mL) Date Analyzed: 08/19/2018 01:20
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240731 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	236		40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	115		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	115		24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	180		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	59.5		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	467		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	106		70-130
STL00996	13C2 PFDA	109		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_029.d
 Lims ID: LCS 320-240201/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 19-Aug-2018 01:20:40 ALS Bottle#: 19 Worklist Smp#: 27
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-240201/2-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	13725265	116.8		19087	
298.90 > 99.00	1.381	1.381	0.0	1.000	9793604		1.40(0.00-0.00)	10507	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.502	0.0	1.000	1246440	10.6		11022	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.654	1.646	0.008	1.000	1787020	14.9		369	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.654	1.646	0.008	1.000	7672463	45.1		4621	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.836	0.0		1136401	10.0		9534	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.836	1.836	0.0	1.000	3572087	28.8		490	
413.00 > 169.00	1.836	1.836	0.0	1.000	1912346		1.87(0.00-0.00)	3505	
* 7 13C4 PFOS									
503.00 > 80.00	2.086	2.094	-0.008		2944707	28.7		5551	
9 Perfluorononanoic acid									
463.00 > 419.00	2.102	2.102	0.0	1.000	2704017	28.9		187	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.094	2.109	-0.015	1.000	6542865	59.0		7594	
499.00 > 99.00	2.094	2.109	-0.015	1.000	1435512		4.56(0.00-0.00)	1796	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	979136	10.9		6745	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_029.d

Injection Date: 19-Aug-2018 01:20:40

Instrument ID: A8_N

Lims ID: LCS 320-240201/2-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 19

Worklist Smp#: 27

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

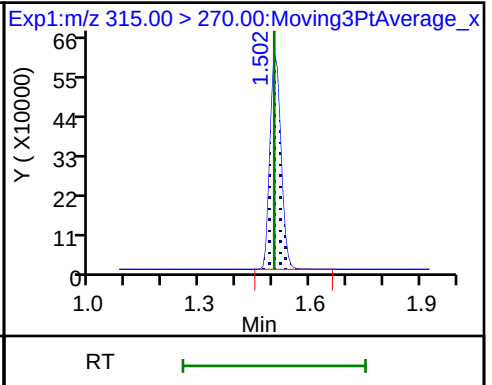
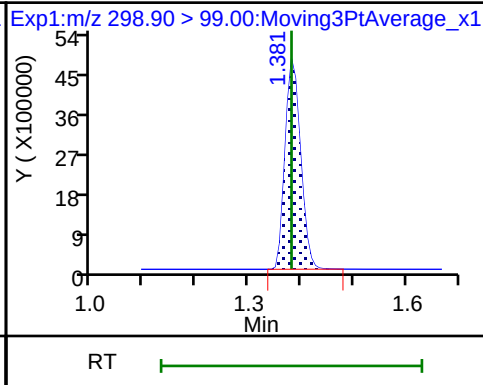
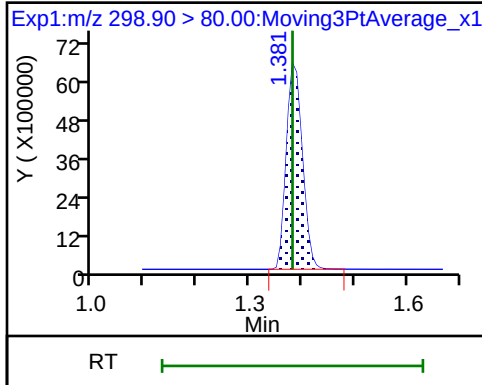
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

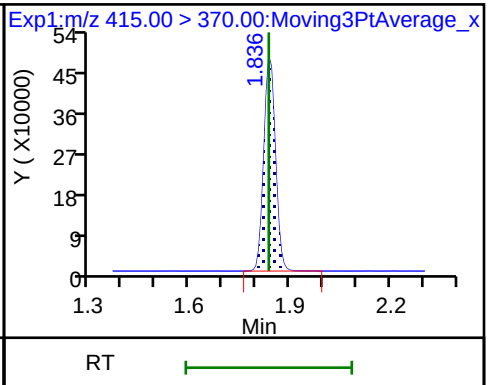
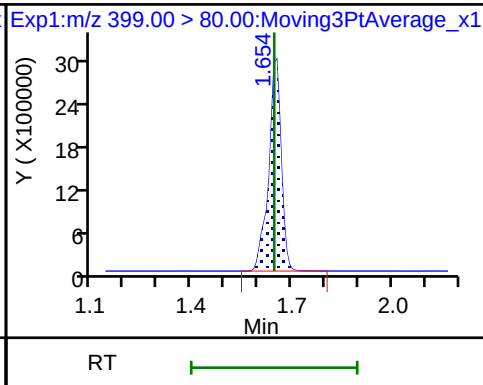
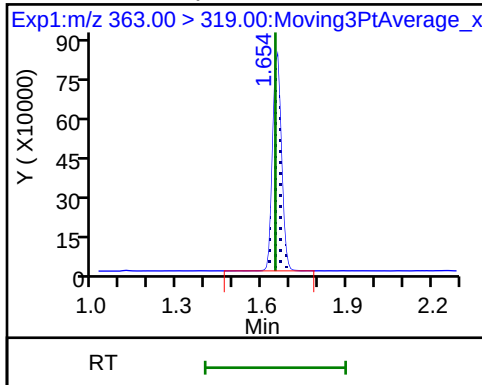
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

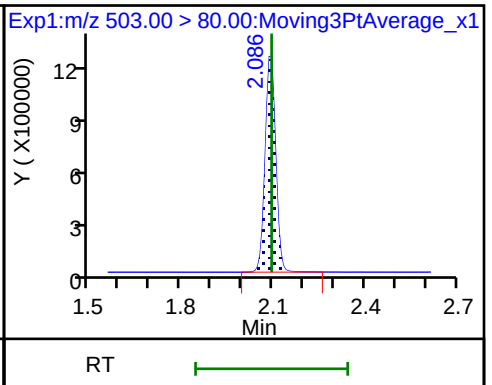
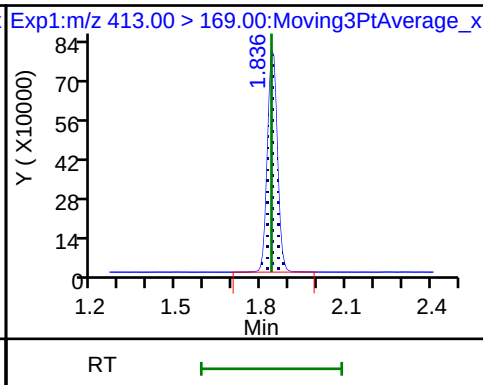
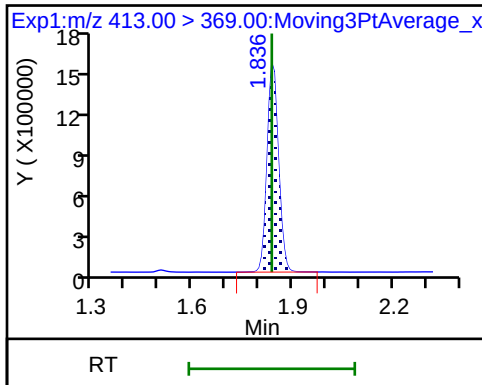
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

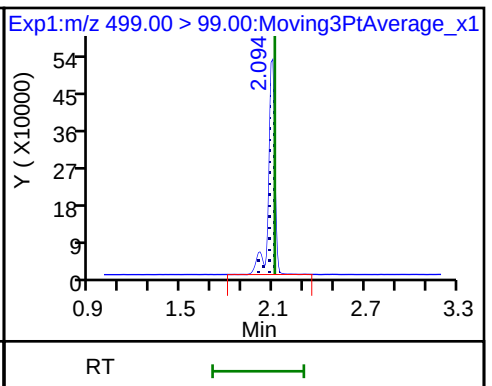
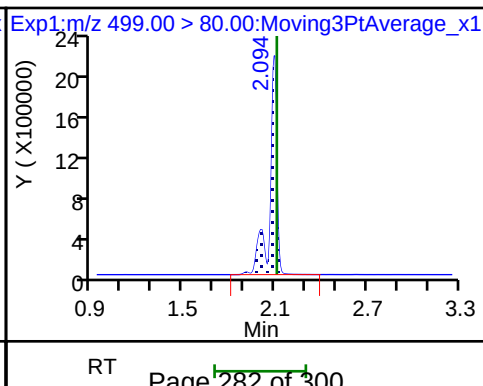
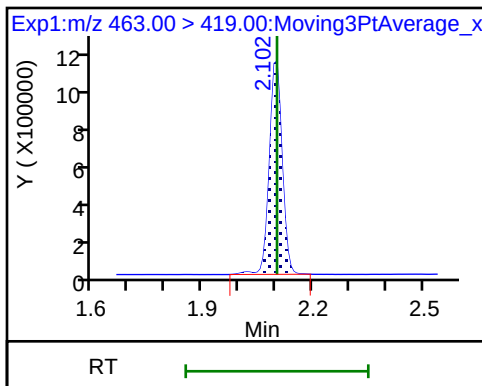
* 7 13C4 PFOS



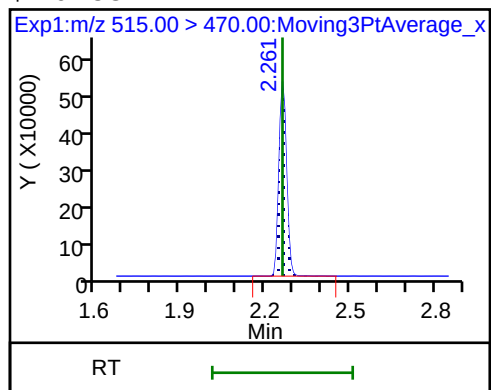
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_029.d
Lims ID: LCS 320-240201/2-A
Client ID:
Sample Type: LCS
Inject. Date: 19-Aug-2018 01:20:40 ALS Bottle#: 19 Worklist Smp#: 27
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-240201/2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
Column 1 : Det: EXP1
Process Host: XAWRK026

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.6	105.53
\$ 10 13C2 PFDA	10.0	10.9	108.77

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCSD 320-240201/3-A
 Matrix: Water Lab File ID: 2018.08.18_537A_030.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 250 (mL) Date Analyzed: 08/19/2018 01:25
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240731 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	236		40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	112		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	112		24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	180		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	54.9		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	404		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	92		70-130
STL00996	13C2 PFDA	110		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_030.d
 Lims ID: LCSD 320-240201/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 19-Aug-2018 01:25:21 ALS Bottle#: 20 Worklist Smp#: 28
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcsd 320-240201/3-h
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.381	0.0	1.000	12812359	101.1		20177	
298.90 > 99.00	1.381	1.381	0.0	1.000	9323977		1.37(0.00-0.00)	10305	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.502	1.502	0.0	1.000	1202000	9.23		10445	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.654	1.646	0.008	1.000	1817552	13.7		396	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.654	1.646	0.008	1.000	8247254	45.0		5418	
* 6 13C2-PFOA									
415.00 > 370.00	1.836	1.836	0.0		1253302	10.0		8468	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.844	1.836	0.008	1.000	3810980	27.9		544	
413.00 > 169.00	1.836	1.836	0.0	0.996	2035269		1.87(0.00-0.00)	4106	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.094	0.0		3176488	28.7		6788	
9 Perfluorononanoic acid									
463.00 > 419.00	2.102	2.102	0.0	1.000	2887392	27.9		173	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.094	2.109	-0.015	1.000	7071529	59.1		9372	
499.00 > 99.00	2.094	2.109	-0.015	1.000	1568524		4.51(0.00-0.00)	1911	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.261	0.0	1.000	1093443	11.0		7462	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_030.d

Injection Date: 19-Aug-2018 01:25:21

Instrument ID: A8_N

Lims ID: LCSD 320-240201/3-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 20

Worklist Smp#: 28

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

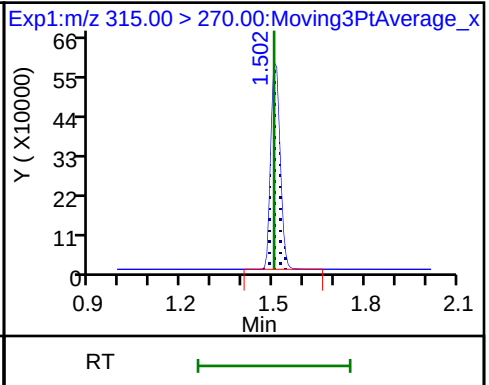
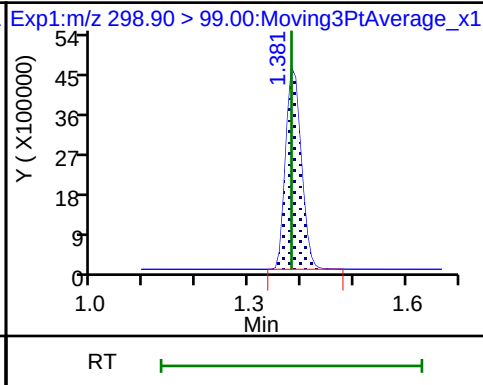
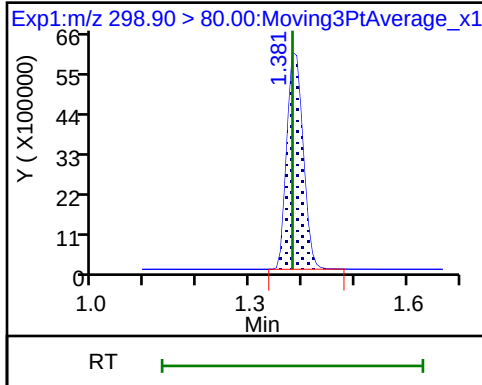
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

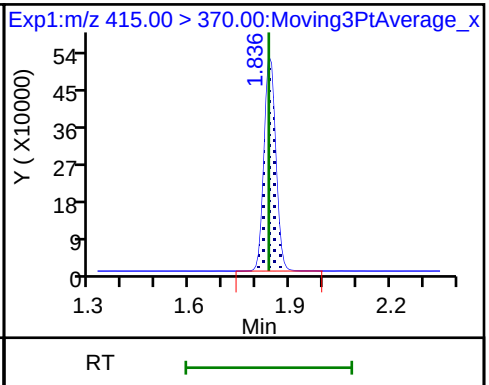
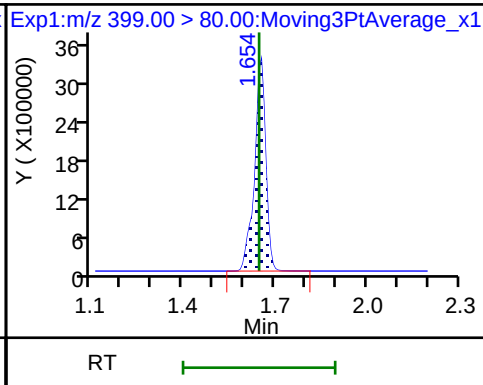
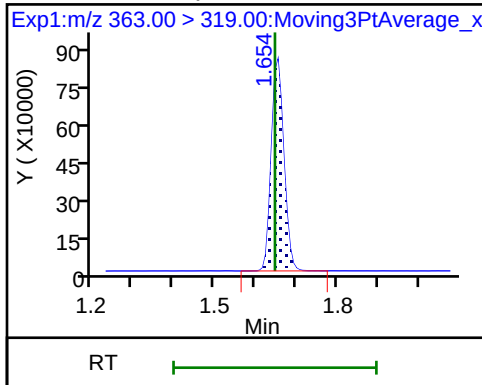
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

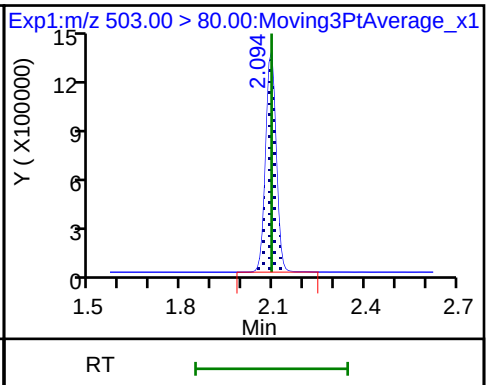
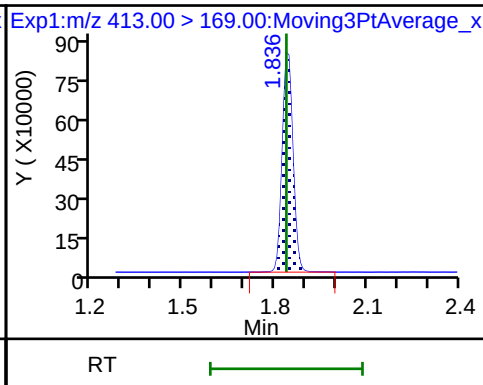
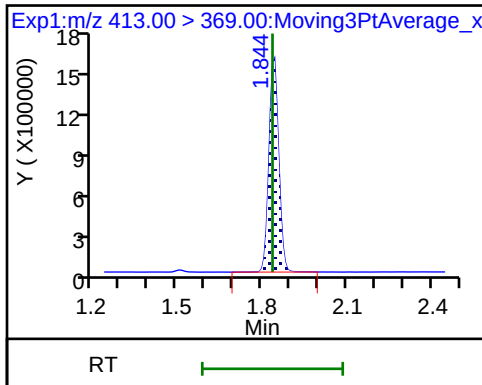
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

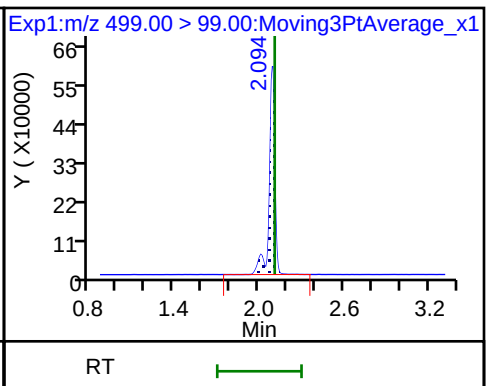
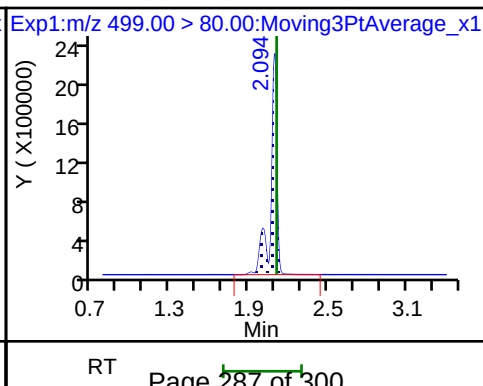
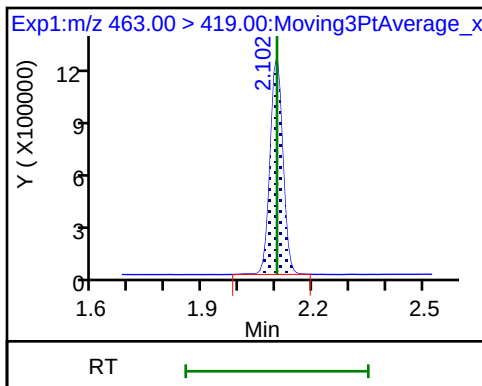
* 7 13C4 PFOS



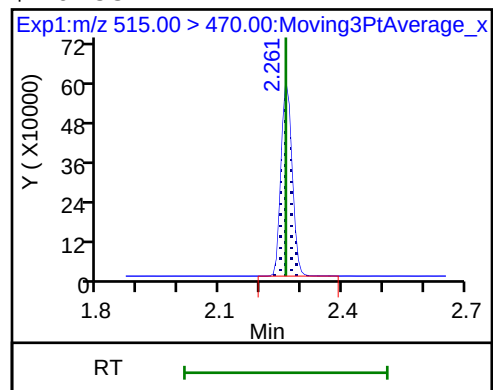
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\2018.08.18_537A_030.d
Lims ID: LCSD 320-240201/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 19-Aug-2018 01:25:21 ALS Bottle#: 20 Worklist Smp#: 28
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-240201/3-h
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20180818-62926.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 20-Aug-2018 10:47:10 Calib Date: 15-Aug-2018 18:44:32
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180815-62769.b\2018.08.15_537CURVE_008.d
Column 1 : Det: EXP1
Process Host: XAWRK026

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.23	92.27
\$ 10 13C2 PFDA	10.0	11.0	110.14

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-41846-1

SDG No.: _____

Instrument ID: A8_NStart Date: 08/15/2018 18:21Analysis Batch Number: 240166End Date: 08/15/2018 19:03

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-240166/2		08/15/2018 18:21	1	2018.08.15_537C URVE 003.d	GeminiC18 3x100 3(mm)
IC 320-240166/3		08/15/2018 18:25	1	2018.08.15_537C URVE 004.d	GeminiC18 3x100 3(mm)
IC 320-240166/4		08/15/2018 18:30	1	2018.08.15_537C URVE 005.d	GeminiC18 3x100 3(mm)
IC 320-240166/5 ICISAV		08/15/2018 18:35	1	2018.08.15_537C URVE 006.d	GeminiC18 3x100 3(mm)
IC 320-240166/6		08/15/2018 18:39	1	2018.08.15_537C URVE 007.d	GeminiC18 3x100 3(mm)
IC 320-240166/7		08/15/2018 18:44	1	2018.08.15_537C URVE 008.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/15/2018 18:49	1		GeminiC18 3x100 3(mm)
CCVL 320-240166/9		08/15/2018 18:53	1	2018.08.15_537C URVE 010.d	GeminiC18 3x100 3(mm)
ICB 320-240166/10		08/15/2018 18:58	1		GeminiC18 3x100 3(mm)
ICV 320-240166/11		08/15/2018 19:03	1	2018.08.15_537C URVE 012.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-41846-1

SDG No.: _____

Instrument ID: A8_NStart Date: 08/18/2018 23:19Analysis Batch Number: 240726End Date: 08/19/2018 00:19

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-240726/1		08/18/2018 23:19	1	2018.08.18_537A 003.d	GeminiC18 3x100 3(mm)
CCV 320-240726/2 CCVIS		08/18/2018 23:23	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/18/2018 23:28	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/18/2018 23:33	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/18/2018 23:37	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/18/2018 23:42	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/18/2018 23:47	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/18/2018 23:51	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/18/2018 23:56	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/19/2018 00:01	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/19/2018 00:05	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/19/2018 00:10	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/19/2018 00:15	1		GeminiC18 3x100 3(mm)
CCV 320-240726/14 CCVIS		08/19/2018 00:19	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-41846-1

SDG No.: _____

Instrument ID: A8_NStart Date: 08/19/2018 01:06Analysis Batch Number: 240731End Date: 08/19/2018 02:02

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-240731/24 CCVIS		08/19/2018 01:06	1	2018.08.18_537A 026.d	GeminiC18 3x100 3(mm)
MB 320-240201/1-A		08/19/2018 01:16	1	2018.08.18_537A 028.d	GeminiC18 3x100 3(mm)
LCS 320-240201/2-A		08/19/2018 01:20	1	2018.08.18_537A 029.d	GeminiC18 3x100 3(mm)
LCSD 320-240201/3-A		08/19/2018 01:25	1	2018.08.18_537A 030.d	GeminiC18 3x100 3(mm)
320-41846-1		08/19/2018 01:30	1	2018.08.18_537A 031.d	GeminiC18 3x100 3(mm)
320-41846-2		08/19/2018 01:34	1	2018.08.18_537A 032.d	GeminiC18 3x100 3(mm)
320-41846-3		08/19/2018 01:39	1	2018.08.18_537A 033.d	GeminiC18 3x100 3(mm)
320-41846-4		08/19/2018 01:44	1	2018.08.18_537A 034.d	GeminiC18 3x100 3(mm)
320-41846-5		08/19/2018 01:48	1	2018.08.18_537A 035.d	GeminiC18 3x100 3(mm)
320-41846-6		08/19/2018 01:53	1	2018.08.18_537A 036.d	GeminiC18 3x100 3(mm)
320-41846-7		08/19/2018 01:58	1	2018.08.18_537A 037.d	GeminiC18 3x100 3(mm)
CCV 320-240731/36 CCVIS		08/19/2018 02:02	1	2018.08.18_537A 038.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/19/2018 02:02Analysis Batch Number: 240733 End Date: 08/19/2018 02:40

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-240733/36 CCVIS		08/19/2018 02:02	1	2018.08.18_537A 038.d	GeminiC18 3x100 3(mm)
320-41846-8		08/19/2018 02:12	1	2018.08.18_537A 040.d	GeminiC18 3x100 3(mm)
320-41846-9		08/19/2018 02:16	1	2018.08.18_537A 041.d	GeminiC18 3x100 3(mm)
320-41846-10		08/19/2018 02:21	1	2018.08.18_537A 042.d	GeminiC18 3x100 3(mm)
320-41846-11		08/19/2018 02:26	1	2018.08.18_537A 043.d	GeminiC18 3x100 3(mm)
320-41846-12		08/19/2018 02:30	1	2018.08.18_537A 044.d	GeminiC18 3x100 3(mm)
320-41846-13		08/19/2018 02:35	1	2018.08.18_537A 045.d	GeminiC18 3x100 3(mm)
CCV 320-240733/44 CCVIS		08/19/2018 02:40	1	2018.08.18_537A 046.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/20/2018 16:19Analysis Batch Number: 240968 End Date: 08/20/2018 17:01

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-240968/1		08/20/2018 16:19	1	2018.08.20_537A 003.d	GeminiC18 3x100 3(mm)
CCV 320-240968/2 CCVIS		08/20/2018 16:24	1	2018.08.20_537A 004.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/20/2018 16:28	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/20/2018 16:33	10		GeminiC18 3x100 3(mm)
320-41846-3 RA		08/20/2018 16:38	1	2018.08.20_537A 007.d	GeminiC18 3x100 3(mm)
320-41846-6 RA		08/20/2018 16:43	1	2018.08.20_537A 008.d	GeminiC18 3x100 3(mm)
CCV 320-240968/10 CCVIS		08/20/2018 17:01	1	2018.08.20_537A 012.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1

SDG No.: _____

Batch Number: 240201 Batch Start Date: 08/16/18 08:12 Batch Analyst: Kouchari, ShamiranBatch Method: 537 Batch End Date: 08/17/18 16:20

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-HSP 00029
MB 320-240201/1		537, 537				250 mL	1.00 mL	7 SU	
LCS 320-240201/2		537, 537				250 mL	1.00 mL	7 SU	100 uL
LCSD 320-240201/3		537, 537				250 mL	1.00 mL	7 SU	100 uL
320-41846-A-1	WGNA-080618-RW-0386	537, 537	T	317.75 g	39.35 g	278.4 mL	1.00 mL	7 SU	
320-41846-B-2	WGNA-080618-FRB-0386	537, 537	T	287.28 g	28.72 g	258.6 mL	1.00 mL	7 SU	
320-41846-A-3	WGNA-080618-RW-0413	537, 537	T	294.84 g	28.75 g	266.1 mL	1.00 mL	7 SU	
320-41846-A-4	WGNA-080618-FRB-0413	537, 537	T	294.28 g	29.37 g	264.9 mL	1.00 mL	7 SU	
320-41846-A-5	WGNA-080618-RW-0533	537, 537	T	306.96 g	39.29 g	267.7 mL	1.00 mL	7 SU	
320-41846-A-6	WGNA-080618-FRB-0533	537, 537	T	291.54 g	30.76 g	260.8 mL	1.00 mL	7 SU	
320-41846-A-7	WGNA-080618-RW-4024	537, 537	T	296.74 g	29.12 g	267.6 mL	1.00 mL	7 SU	
320-41846-A-8	WGNA-080618-FRB-4024	537, 537	T	285.05 g	29.00 g	256.1 mL	1.00 mL	7 SU	
320-41846-A-9	NAWC-080618-RW-032	537, 537	T	291.28 g	29.29 g	262 mL	1.00 mL	7 SU	
320-41846-A-10	NAWC-080618-FRB-032	537, 537	T	284.58 g	28.78 g	255.8 mL	1.00 mL	7 SU	
320-41846-A-11	NAWC-080618-RW-272	537, 537	T	308.45 g	39.10 g	269.4 mL	1.00 mL	7 SU	
320-41846-A-12	NAWC-080618-FRB-272	537, 537	T	288.02 g	28.64 g	259.4 mL	1.00 mL	7 SU	
320-41846-A-13	WGNA-080618-DUP-43	537, 537	T	287.59 g	28.89 g	258.7 mL	1.00 mL	7 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00080	LC537-SU 00074	AnalysisComment			
MB 320-240201/1		537, 537		100 uL	100 uL	Chlorine, ND			
LCS 320-240201/2		537, 537		100 uL	100 uL	Chlorine, ND			
LCSD 320-240201/3		537, 537		100 uL	100 uL	Chlorine, ND			
320-41846-A-1	WGNA-080618-RW-0386	537, 537	T	100 uL	100 uL	Chlorine, ND			

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.: 320-41846-1

SDG No.: _____

Batch Number: 240201 Batch Start Date: 08/16/18 08:12 Batch Analyst: Kouchari, ShamiranBatch Method: 537 Batch End Date: 08/17/18 16:20

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00080	LC537-SU 00074	AnalysisComment			
320-41846-B-2	WGNA-080618-FRB-0386	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-3	WGNA-080618-RW-0413	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-4	WGNA-080618-FRB-0413	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-5	WGNA-080618-RW-0533	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-6	WGNA-080618-FRB-0533	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-7	WGNA-080618-RW-4024	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-8	WGNA-080618-FRB-4024	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-9	NAWC-080618-RW-032	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-10	NAWC-080618-FRB-032	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-11	NAWC-080618-RW-272	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-12	NAWC-080618-FRB-272	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-13	WGNA-080618-DUP-43	537, 537	T	100 uL	100 uL	Chlorine, ND			

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.: 320-41846-1

SDG No.: _____

Batch Number: 240201 Batch Start Date: 08/16/18 08:12 Batch Analyst: Kouchari, ShamiranBatch Method: 537 Batch End Date: 08/17/18 16:20

Batch Notes	
Analyst ID - Aliquot Step	SKD
Batch Comment	Client labels match TA label, SKD 08/16/18
Analyst ID - Concentration	SKD
Analyst ID - Final Volume Step	SKD
Internal Standard ID#	1334015
Manifold ID	4, A
Methanol ID	1328635
pH Indicator ID	0818
Pipette ID	R40536G, I46162G
Analyst ID - IS Reagent Drop	SKD
Analyst ID - IS Reagent Drop Witness	MNV
Analyst ID - SU Reagent Drop	SKD
Analyst ID - SU Reagent Drop Witness	HJA
Analyst ID - TA Reagent Drop	SKD
Analyst ID - TA Reagent Drop Witness	HJA
SPE Cartridge Lot ID	6390138-06
Trizma ID	SLBR5241V
Reagent Water ID	08/13/18, 08/16/18

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.

Shipping and Receiving Documents

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-41846-1

Login Number: 41846

List Source: TestAmerica Sacramento

List Number: 1

Creator: Turpen, Troy

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

"WGNA-080618-RW-0386","537","RES","320-41846-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","40","ng/L","","6.1","DL","","TRG","","","36","LOQ","YES","-99","","278.4","1.00","14",""

"WGNA-080618-RW-0386","537","RES","320-41846-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","22","ng/L","","2.5","DL","","TRG","","","18","LOQ","YES","-99","","278.4","1.00","7.2",""

"WGNA-080618-RW-0386","537","RES","320-41846-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","18","ng/L","J","4.9","DL","","TRG","","","27","LOQ","YES","-99","","278.4","1.00","11",""

"WGNA-080618-RW-0386","537","RES","320-41846-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","14","ng/L","J","14","DL","","TRG","","","81","LOQ","YES","-99","","278.4","1.00","32",""

"WGNA-080618-RW-0386","537","RES","320-41846-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.9","ng/L","J","1.7","DL","","TRG","","","9.0","LOQ","YES","-99","","278.4","1.00","3.6",""

"WGNA-080618-RW-0386","537","RES","320-41846-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","18","ng/L","U","7.2","DL","","TRG","","","22","LOQ","YES","-99","","278.4","1.00","18",""

"WGNA-080618-RW-0386","537","RES","320-41846-1","TALSAC","STL00993","13C2 PFHxA","34","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","35.9","","278.4","1.00","0",""

"WGNA-080618-RW-0386","537","RES","320-41846-1","TALSAC","STL00996","13C2 PFDA","38","ng/L","","-99","DL","","SURR","105","","-99","LOQ","YES","35.9","","278.4","1.00","0",""

"NAWC-080618-FRB-032","537","RES","320-41846-10","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.6","DL","","TRG","","","39","LOQ","YES","-99","","255.8","1.00","16",""

"NAWC-080618-FRB-032","537","RES","320-41846-10","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.8","ng/L","U","2.7","DL","","TRG","","","20","LOQ","YES","-99","","255.8","1.00","7.8",""

"NAWC-080618-FRB-032","537","RES","320-41846-10","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.4","DL","","TRG","","","29","LOQ","YES","-99","","255.8","1.00","12",""

"NAWC-080618-FRB-032","537","RES","320-41846-10","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35","ng/L","U","16","DL","","TRG","","","88","LOQ","YES","-99","","255.8","1.00","35",""

"NAWC-080618-FRB-032","537","RES","320-41846-10","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.9","ng/L","U","1.9","DL","","TRG","","","9.8","LOQ","YES","-99","","255.8","1.00","3.9",""

"NAWC-080618-FRB-032","537","RES","320-41846-10","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","7.8","DL","","TRG","","","23","LOQ","YES","-99","","255.8","1.00","20",""

"NAWC-080618-FRB-032","537","RES","320-41846-10","TALSAC","STL00993","13C2 PFHxA","38","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","39.1","","255.8","1.00","0",""

"NAWC-080618-FRB-032","537","RES","320-41846-10","TALSAC","STL00996","13C2 PFDA","39","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","39.1","","255.8","1.00","0",""

"NAWC-080618-RW-272","537","RES","320-41846-11","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","14","ng/L","J","6.3","DL","","TRG","","","37","LOQ","YES","-99","","269.4","1.00","15",""

"NAWC-080618-RW-272","537","RES","320-41846-11","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","9.8","ng/L","J","2.6","DL","","TRG","","","19","LOQ","YES","-99","","269.4","1.00","7.4",""

"NAWC-080618-RW-272","537","RES","320-41846-11","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","11","ng/L","U","5.1","DL","","TRG","","","28","LOQ","YES","-99","","269.4","1.00","11",""

"NAWC-080618-RW-272","537","RES","320-41846-11","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","33","ng/L","U","15","DL","","TRG","","","84","LOQ","YES","-99","","269.4","1.00","33",""

"NAWC-080618-RW-272","537","RES","320-41846-11","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","2.4","ng/L","J M","1.8","DL","","TRG","","","9.3","LOQ","YES","-99","","269.4","1.00","3.7",""

"NAWC-080618-RW-272","537","RES","320-41846-11","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","19","ng/L","U","7.4","DL","","TRG","","","22","LOQ","YES","-99","","269.4","1.00","19",""

"NAWC-080618-RW-272","537","RES","320-41846-11","TALSAC","STL00993","13C2 PFHxA","34","ng/L","","-99","DL","","SURR","92","","-99","LOQ","YES","37.1","","269.4","1.00","0",""

"NAWC-080618-RW-272","537","RES","320-41846-11","TALSAC","STL00996","13C2 PFDA","38","ng/L","","-99","DL","","SURR","103","","-99","LOQ","YES","37.1","","269.4","1.00","0",""

"NAWC-080618-FRB-272","537","RES","320-41846-12","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","15","ng/L","U","6.6","DL","","TRG","","","39","LOQ","YES","-99","","259.4","1.00","15",""

"NAWC-080618-FRB-272","537","RES","320-41846-12","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.7","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES","-99","","259.4","1.00","7.7",""

"NAWC-080618-FRB-272","537","RES","320-41846-12","TALSAC","355-46-4","Perfluorohexanesulfonic acid

(PFHxS)","12","ng/L","U","5.3","DL","","","TRG","","","29","LOQ","YES",-99","","259.4","1.00","12","","
"NAWC-080618-FRB-272","537","RES","320-41846-12","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","35","ng/L","U","16","DL","","","TRG","","","87","LOQ","YES",-99","","259.4","1.00","35","","
"NAWC-080618-FRB-272","537","RES","320-41846-12","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.9","ng/L","U","1.8","DL","","","TRG","","","9.6","LOQ","YES",-99","","259.4","1.00","3.9","","
"NAWC-080618-FRB-272","537","RES","320-41846-12","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","19","ng/L","U","7.7","DL","","","TRG","","","23","LOQ","YES",-99","","259.4","1.00","19","","
"NAWC-080618-FRB-272","537","RES","320-41846-12","TALSAC","STL00993","13C2
PFHxA","36","ng/L","","","-99","DL","","","SURR","94","","","-99","LOQ","YES","38.6","","259.4","1.00","0","","
"NAWC-080618-FRB-272","537","RES","320-41846-12","TALSAC","STL00996","13C2
PFDA","39","ng/L","","","-99","DL","","","SURR","101","","","-99","LOQ","YES","38.6","","259.4","1.00","0","","
"WGNA-080618-DUP-43","537","RES","320-41846-13","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","24","ng/L","J","6.6","DL","","","TRG","","","39","LOQ","YES",-99","","258.7","1.00","15","","
"WGNA-080618-DUP-43","537","RES","320-41846-13","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","15","ng/L","J","2.7","DL","","","TRG","","","19","LOQ","YES",-99","","258.7","1.00","7.7","","
"WGNA-080618-DUP-43","537","RES","320-41846-13","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","6.8","ng/L","J","5.3","DL","","","TRG","","","29","LOQ","YES",-99","","258.7","1.00","12","","
"WGNA-080618-DUP-43","537","RES","320-41846-13","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","35","ng/L","U","16","DL","","","TRG","","","87","LOQ","YES",-99","","258.7","1.00","35","","
"WGNA-080618-DUP-43","537","RES","320-41846-13","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.6","ng/L","J","1.8","DL","","","TRG","","","9.7","LOQ","YES",-99","","258.7","1.00","3.9","","
"WGNA-080618-DUP-43","537","RES","320-41846-13","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","19","ng/L","U","7.7","DL","","","TRG","","","23","LOQ","YES",-99","","258.7","1.00","19","","
"WGNA-080618-DUP-43","537","RES","320-41846-13","TALSAC","STL00993","13C2
PFHxA","39","ng/L","","","-99","DL","","","SURR","101","","","-99","LOQ","YES","38.7","","258.7","1.00","0","","
"WGNA-080618-DUP-43","537","RES","320-41846-13","TALSAC","STL00996","13C2
PFDA","43","ng/L","","","-99","DL","","","SURR","111","","","-99","LOQ","YES","38.7","","258.7","1.00","0","","
"WGNA-080618-FRB-0386","537","RES","320-41846-2","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","15","ng/L","U","6.6","DL","","","TRG","","","39","LOQ","YES",-99","","258.6","1.00","15","","
"WGNA-080618-FRB-0386","537","RES","320-41846-2","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","7.7","ng/L","U","2.7","DL","","","TRG","","","19","LOQ","YES",-99","","258.6","1.00","7.7","","
"WGNA-080618-FRB-0386","537","RES","320-41846-2","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.3","DL","","","TRG","","","29","LOQ","YES",-99","","258.6","1.00","12","","
"WGNA-080618-FRB-0386","537","RES","320-41846-2","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","35","ng/L","U","16","DL","","","TRG","","","87","LOQ","YES",-99","","258.6","1.00","35","","
"WGNA-080618-FRB-0386","537","RES","320-41846-2","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.9","ng/L","U","1.8","DL","","","TRG","","","9.7","LOQ","YES",-99","","258.6","1.00","3.9","","
"WGNA-080618-FRB-0386","537","RES","320-41846-2","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","19","ng/L","U","7.7","DL","","","TRG","","","23","LOQ","YES",-99","","258.6","1.00","19","","
"WGNA-080618-FRB-0386","537","RES","320-41846-2","TALSAC","STL00993","13C2
PFHxA","37","ng/L","","","-99","DL","","","SURR","95","","","-99","LOQ","YES","38.7","","258.6","1.00","0","","
"WGNA-080618-FRB-0386","537","RES","320-41846-2","TALSAC","STL00996","13C2
PFDA","39","ng/L","","","-99","DL","","","SURR","102","","","-99","LOQ","YES","38.7","","258.6","1.00","0","","
"WGNA-080618-RW-0413","537","RE","320-41846-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","21","ng/L","J","6.4","DL","","","TRG","","","38","LOQ","NO",-99","","266.1","1.00","15","","
"WGNA-080618-RW-0413","537","RE","320-41846-3","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","22","ng/L","","","2.6","DL","","","TRG","","","19","LOQ","NO",-99","","266.1","1.00","7.5","","
"WGNA-080618-RW-0413","537","RE","320-41846-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","6.9","ng/L","J","5.2","DL","","","TRG","","","28","LOQ","NO",-99","","266.1","1.00","11","","
"WGNA-080618-RW-0413","537","RE","320-41846-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","34","ng/L","U","15","DL","","","TRG","","","85","LOQ","NO",-99","","266.1","1.00","34","","
"WGNA-080618-RW-0413","537","RE","320-41846-3","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","6.6","ng/L","J","1.8","DL","","","TRG","","","9.4","LOQ","NO",-99","","266.1","1.00","3.8","","
"WGNA-080618-RW-0413","537","RE","320-41846-3","TALSAC","375-95-1","Perfluorononanoic acid

(PFNA),"19","ng/L","U","7.5","DL","","","TRG","","","23","LOQ","NO","-99","","266.1","1.00","19","","
"WGNA-080618-RW-0413","537","RE","320-41846-3","TALSAC","STL00993","13C2
PFHxA","37","ng/L","","","-99","DL","","","SURRE","97","","","-99","LOQ","NO","37.6","","266.1","1.00","0","","
"WGNA-080618-RW-0413","537","RE","320-41846-3","TALSAC","STL00996","13C2
PFDA","39","ng/L","","","-99","DL","","","SURRE","103","","","-99","LOQ","NO","37.6","","266.1","1.00","0","","
"WGNA-080618-RW-0413","537","RES","320-41846-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","21","ng/L","J","6.4","DL","","","TRG","","","38","LOQ","YES","-99","","266.1","1.00","15","","
"WGNA-080618-RW-0413","537","RES","320-41846-3","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","23","ng/L","M","2.6","DL","","","TRG","","","19","LOQ","YES","-99","","266.1","1.00","7.5","","
"WGNA-080618-RW-0413","537","RES","320-41846-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","6.8","ng/L","J","5.2","DL","","","TRG","","","28","LOQ","YES","-99","","266.1","1.00","11","","
"WGNA-080618-RW-0413","537","RES","320-41846-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","34","ng/L","U","15","DL","","","TRG","","","85","LOQ","YES","-99","","266.1","1.00","34","","
"WGNA-080618-RW-0413","537","RES","320-41846-3","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","6.7","ng/L","J","1.8","DL","","","TRG","","","9.4","LOQ","YES","-99","","266.1","1.00","3.8","","
"WGNA-080618-RW-0413","537","RES","320-41846-3","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","19","ng/L","U","7.5","DL","","","TRG","","","23","LOQ","YES","-99","","266.1","1.00","19","","
"WGNA-080618-RW-0413","537","RES","320-41846-3","TALSAC","STL00993","13C2
PFHxA","37","ng/L","","","-99","DL","","","SURRE","99","","","-99","LOQ","YES","37.6","","266.1","1.00","0","","
"WGNA-080618-RW-0413","537","RES","320-41846-3","TALSAC","STL00996","13C2
PFDA","40","ng/L","","","-99","DL","","","SURRE","106","","","-99","LOQ","YES","37.6","","266.1","1.00","0","","
"WGNA-080618-FRB-0413","537","RES","320-41846-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","15","ng/L","U","6.4","DL","","","TRG","","","38","LOQ","YES","-99","","264.9","1.00","15","","
"WGNA-080618-FRB-0413","537","RES","320-41846-4","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","7.6","ng/L","U","2.6","DL","","","TRG","","","19","LOQ","YES","-99","","264.9","1.00","7.6","","
"WGNA-080618-FRB-0413","537","RES","320-41846-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","11","ng/L","U","5.2","DL","","","TRG","","","28","LOQ","YES","-99","","264.9","1.00","11","","
"WGNA-080618-FRB-0413","537","RES","320-41846-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","34","ng/L","U","15","DL","","","TRG","","","85","LOQ","YES","-99","","264.9","1.00","34","","
"WGNA-080618-FRB-0413","537","RES","320-41846-4","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.8","ng/L","U","1.8","DL","","","TRG","","","9.4","LOQ","YES","-99","","264.9","1.00","3.8","","
"WGNA-080618-FRB-0413","537","RES","320-41846-4","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","19","ng/L","U","7.6","DL","","","TRG","","","23","LOQ","YES","-99","","264.9","1.00","19","","
"WGNA-080618-FRB-0413","537","RES","320-41846-4","TALSAC","STL00993","13C2
PFHxA","39","ng/L","","","-99","DL","","","SURRE","102","","","-99","LOQ","YES","37.8","","264.9","1.00","0","","
"WGNA-080618-FRB-0413","537","RES","320-41846-4","TALSAC","STL00996","13C2
PFDA","40","ng/L","","","-99","DL","","","SURRE","105","","","-99","LOQ","YES","37.8","","264.9","1.00","0","","
"WGNA-080618-RW-0533","537","RES","320-41846-5","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","21","ng/L","J","6.4","DL","","","TRG","","","37","LOQ","YES","-99","","267.7","1.00","15","","
"WGNA-080618-RW-0533","537","RES","320-41846-5","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","21","ng/L","","","2.6","DL","","","TRG","","","19","LOQ","YES","-99","","267.7","1.00","7.5","","
"WGNA-080618-RW-0533","537","RES","320-41846-5","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","8.7","ng/L","J","5.1","DL","","","TRG","","","28","LOQ","YES","-99","","267.7","1.00","11","","
"WGNA-080618-RW-0533","537","RES","320-41846-5","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","34","ng/L","U","15","DL","","","TRG","","","84","LOQ","YES","-99","","267.7","1.00","34","","
"WGNA-080618-RW-0533","537","RES","320-41846-5","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.9","ng/L","J","1.8","DL","","","TRG","","","9.3","LOQ","YES","-99","","267.7","1.00","3.7","","
"WGNA-080618-RW-0533","537","RES","320-41846-5","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","19","ng/L","U","7.5","DL","","","TRG","","","22","LOQ","YES","-99","","267.7","1.00","19","","
"WGNA-080618-RW-0533","537","RES","320-41846-5","TALSAC","STL00993","13C2
PFHxA","37","ng/L","","","-99","DL","","","SURRE","99","","","-99","LOQ","YES","37.4","","267.7","1.00","0","","
"WGNA-080618-RW-0533","537","RES","320-41846-5","TALSAC","STL00996","13C2
PFDA","37","ng/L","","","-99","DL","","","SURRE","100","","","-99","LOQ","YES","37.4","","267.7","1.00","0","","
"WGNA-080618-FRB-0533","537","RE","320-41846-6","TALSAC","1763-23-1","Perfluorooctanesulfonic acid

(PFOS),"15","ng/L","U","6.5","DL","","TRG","","","38","LOQ","NO",-99","","260.8","1.00","15",""
"WGNA-080618-FRB-0533","537","RE","320-41846-6","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"7.7","ng/L","U","2.7","DL","","TRG","","","19","LOQ","NO",-99","","260.8","1.00","7.7",""
"WGNA-080618-FRB-0533","537","RE","320-41846-6","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"12","ng/L","U","5.3","DL","","TRG","","","29","LOQ","NO",-99","","260.8","1.00","12",""
"WGNA-080618-FRB-0533","537","RE","320-41846-6","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"35","ng/L","U","15","DL","","TRG","","","86","LOQ","NO",-99","","260.8","1.00","35",""
"WGNA-080618-FRB-0533","537","RE","320-41846-6","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"3.8","ng/L","U","1.8","DL","","TRG","","","9.6","LOQ","NO",-99","","260.8","1.00","3.8",""
"WGNA-080618-FRB-0533","537","RE","320-41846-6","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"19","ng/L","U","7.7","DL","","TRG","","","23","LOQ","NO",-99","","260.8","1.00","19",""
"WGNA-080618-FRB-0533","537","RE","320-41846-6","TALSAC","STL00993","13C2
PFHxA","38","ng/L","","-99","DL","","SURR","100","","-99","LOQ","NO","38.3","","260.8","1.00","0",""
"WGNA-080618-FRB-0533","537","RE","320-41846-6","TALSAC","STL00996","13C2
PFDA","42","ng/L","","-99","DL","","SURR","110","","-99","LOQ","NO","38.3","","260.8","1.00","0",""
"WGNA-080618-FRB-0533","537","RES","320-41846-6","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"15","ng/L","U","6.5","DL","","TRG","","","38","LOQ","YES",-99","","260.8","1.00","15",""
"WGNA-080618-FRB-0533","537","RES","320-41846-6","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"7.7","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES",-99","","260.8","1.00","7.7",""
"WGNA-080618-FRB-0533","537","RES","320-41846-6","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"12","ng/L","U","5.3","DL","","TRG","","","29","LOQ","YES",-99","","260.8","1.00","12",""
"WGNA-080618-FRB-0533","537","RES","320-41846-6","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"35","ng/L","U","15","DL","","TRG","","","86","LOQ","YES",-99","","260.8","1.00","35",""
"WGNA-080618-FRB-0533","537","RES","320-41846-6","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"3.8","ng/L","U","1.8","DL","","TRG","","","9.6","LOQ","YES",-99","","260.8","1.00","3.8",""
"WGNA-080618-FRB-0533","537","RES","320-41846-6","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"19","ng/L","U","7.7","DL","","TRG","","","23","LOQ","YES",-99","","260.8","1.00","19",""
"WGNA-080618-FRB-0533","537","RES","320-41846-6","TALSAC","STL00993","13C2
PFHxA","38","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","38.3","","260.8","1.00","0",""
"WGNA-080618-FRB-0533","537","RES","320-41846-6","TALSAC","STL00996","13C2
PFDA","41","ng/L","","-99","DL","","SURR","107","","-99","LOQ","YES","38.3","","260.8","1.00","0",""
"WGNA-080618-RW-4024","537","RES","320-41846-7","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"24","ng/L","J","6.4","DL","","TRG","","","37","LOQ","YES",-99","","267.6","1.00","15",""
"WGNA-080618-RW-4024","537","RES","320-41846-7","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"14","ng/L","J","2.6","DL","","TRG","","","19","LOQ","YES",-99","","267.6","1.00","7.5",""
"WGNA-080618-RW-4024","537","RES","320-41846-7","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"6.5","ng/L","J","5.1","DL","","TRG","","","28","LOQ","YES",-99","","267.6","1.00","11",""
"WGNA-080618-RW-4024","537","RES","320-41846-7","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"34","ng/L","U","15","DL","","TRG","","","84","LOQ","YES",-99","","267.6","1.00","34",""
"WGNA-080618-RW-4024","537","RES","320-41846-7","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"4.8","ng/L","J","1.8","DL","","TRG","","","9.3","LOQ","YES",-99","","267.6","1.00","3.7",""
"WGNA-080618-RW-4024","537","RES","320-41846-7","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"19","ng/L","U","7.5","DL","","TRG","","","22","LOQ","YES",-99","","267.6","1.00","19",""
"WGNA-080618-RW-4024","537","RES","320-41846-7","TALSAC","STL00993","13C2
PFHxA","36","ng/L","","-99","DL","","SURR","95","","-99","LOQ","YES","37.4","","267.6","1.00","0",""
"WGNA-080618-RW-4024","537","RES","320-41846-7","TALSAC","STL00996","13C2
PFDA","39","ng/L","","-99","DL","","SURR","104","","-99","LOQ","YES","37.4","","267.6","1.00","0",""
"WGNA-080618-FRB-4024","537","RES","320-41846-8","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"16","ng/L","U","6.6","DL","","TRG","","","39","LOQ","YES",-99","","256.1","1.00","16",""
"WGNA-080618-FRB-4024","537","RES","320-41846-8","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"7.8","ng/L","U","2.7","DL","","TRG","","","20","LOQ","YES",-99","","256.1","1.00","7.8",""
"WGNA-080618-FRB-4024","537","RES","320-41846-8","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"12","ng/L","U","5.4","DL","","TRG","","","29","LOQ","YES",-99","","256.1","1.00","12",""
"WGNA-080618-FRB-4024","537","RES","320-41846-8","TALSAC","375-73-5","Perfluorobutanesulfonic acid

(PFBS)","35","ng/L","U","16","DL","","","TRG","","","88","LOQ","YES","-99","","","256.1","1.00","35","","
"WGNA-080618-FRB-4024","537","RES","320-41846-8","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.9","ng/L","U","1.9","DL","","","TRG","","","9.8","LOQ","YES","-99","","","256.1","1.00","3.9","","
"WGNA-080618-FRB-4024","537","RES","320-41846-8","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","7.8","DL","","","TRG","","","23","LOQ","YES","-99","","","256.1","1.00","20","","
"WGNA-080618-FRB-4024","537","RES","320-41846-8","TALSAC","STL00993","13C2
PFHxA","40","ng/L","","","-99","DL","","","SURR","101","","","-99","LOQ","YES","39.0","","","256.1","1.00","0","","
"WGNA-080618-FRB-4024","537","RES","320-41846-8","TALSAC","STL00996","13C2
PFDA","42","ng/L","","","-99","DL","","","SURR","108","","","-99","LOQ","YES","39.0","","","256.1","1.00","0","","
"NAWC-080618-RW-032","537","RES","320-41846-9","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","19","ng/L","J","6.5","DL","","","TRG","","","38","LOQ","YES","-99","","","262","1.00","15","","
"NAWC-080618-RW-032","537","RES","320-41846-9","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","15","ng/L","J","2.7","DL","","","TRG","","","19","LOQ","YES","-99","","","262","1.00","7.6","","
"NAWC-080618-RW-032","537","RES","320-41846-9","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","11","ng/L","J","5.2","DL","","","TRG","","","29","LOQ","YES","-99","","","262","1.00","11","","
"NAWC-080618-RW-032","537","RES","320-41846-9","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","34","ng/L","U","15","DL","","","TRG","","","86","LOQ","YES","-99","","","262","1.00","34","","
"NAWC-080618-RW-032","537","RES","320-41846-9","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","5.4","ng/L","J","1.8","DL","","","TRG","","","9.5","LOQ","YES","-99","","","262","1.00","3.8","","
"NAWC-080618-RW-032","537","RES","320-41846-9","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","19","ng/L","U","7.6","DL","","","TRG","","","23","LOQ","YES","-99","","","262","1.00","19","","
"NAWC-080618-RW-032","537","RES","320-41846-9","TALSAC","STL00993","13C2
PFHxA","30","ng/L","","","-99","DL","","","SURR","79","","","-99","LOQ","YES","38.2","","","262","1.00","0","","
"NAWC-080618-RW-032","537","RES","320-41846-9","TALSAC","STL00996","13C2
PFDA","39","ng/L","","","-99","DL","","","SURR","102","","","-99","LOQ","YES","38.2","","","262","1.00","0","","
"LCS 320-240201/2-A","537","RES","LCS 320-240201/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","236","ng/L","","","6.8","DL","","","SPK","107","","","40","LOQ","YES","220","","","250","1.00","16","","
"LCS 320-240201/2-A","537","RES","LCS 320-240201/2-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","115","ng/L","","","2.8","DL","","","SPK","105","","","20","LOQ","YES","110","","","250","1.00","8.0","","
"LCS 320-240201/2-A","537","RES","LCS 320-240201/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","180","ng/L","","","5.5","DL","","","SPK","107","","","30","LOQ","YES","168","","","250","1.00","12","","
"LCS 320-240201/2-A","537","RES","LCS 320-240201/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","467","ng/L","","","16","DL","","","SPK","93","","","90","LOQ","YES","500","","","250","1.00","36","","
"LCS 320-240201/2-A","537","RES","LCS 320-240201/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","59.5","ng/L","","","1.9","DL","","","SPK","110","","","10","LOQ","YES","54.0","","","250","1.00","4.0","","
"LCS 320-240201/2-A","537","RES","LCS 320-240201/2-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","115","ng/L","","","8.0","DL","","","SPK","105","","","24","LOQ","YES","110","","","250","1.00","20","","
"LCS 320-240201/2-A","537","RES","LCS 320-240201/2-A","TALSAC","STL00993","13C2
PFHxA","42.2","ng/L","","","-99","DL","","","SURR","106","","","-99","LOQ","YES","40.0","","","250","1.00","0","","
"LCS 320-240201/2-A","537","RES","LCS 320-240201/2-A","TALSAC","STL00996","13C2
PFDA","43.5","ng/L","","","-99","DL","","","SURR","109","","","-99","LOQ","YES","40.0","","","250","1.00","0","","
"LCSD 320-240201/3-A","537","RES","LCSD 320-240201/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic
acid (PFOS)","236","ng/L","","","6.8","DL","","","SPK","108","0","40","LOQ","YES","220","LCS 320-240201/2-
A","250","1.00","16","","
"LCSD 320-240201/3-A","537","RES","LCSD 320-240201/3-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","112","ng/L","","","2.8","DL","","","SPK","101","3","20","LOQ","YES","110","LCS 320-240201/2-
A","250","1.00","8.0","","
"LCSD 320-240201/3-A","537","RES","LCSD 320-240201/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic
acid (PFHxS)","180","ng/L","","","5.5","DL","","","SPK","107","0","30","LOQ","YES","168","LCS 320-240201/2-
A","250","1.00","12","","
"LCSD 320-240201/3-A","537","RES","LCSD 320-240201/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","404","ng/L","","","16","DL","","","SPK","81","14","90","LOQ","YES","500","LCS 320-240201/2-
A","250","1.00","36","","
"LCSD 320-240201/3-A","537","RES","LCSD 320-240201/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid

(PFHpA),"54.9","ng/L","","1.9","DL","","SPK","102","8","10","LOQ","YES","54.0","LCS 320-240201/2-A","250","1.00","4.0",""
"LCSD 320-240201/3-A","537","RES","LCSD 320-240201/3-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","112","ng/L","","8.0","DL","","SPK","102","3","24","LOQ","YES","110","LCS 320-240201/2-A","250","1.00","20",""
"LCSD 320-240201/3-A","537","RES","LCSD 320-240201/3-A","TALSAC","STL00993","13C2 PFHxA","36.9","ng/L","","-99","DL","","SURR","92","","-99","LOQ","YES","40.0","LCS 320-240201/2-A","250","1.00","0",""
"LCSD 320-240201/3-A","537","RES","LCSD 320-240201/3-A","TALSAC","STL00996","13C2 PFDA","44.1","ng/L","","-99","DL","","SURR","110","","-99","LOQ","YES","40.0","LCS 320-240201/2-A","250","1.00","0",""
"MB 320-240201/1-A","537","RES","MB 320-240201/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","250","1.00","16",""
"MB 320-240201/1-A","537","RES","MB 320-240201/1-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","250","1.00","8.0",""
"MB 320-240201/1-A","537","RES","MB 320-240201/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","250","1.00","12",""
"MB 320-240201/1-A","537","RES","MB 320-240201/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250","1.00","36",""
"MB 320-240201/1-A","537","RES","MB 320-240201/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","250","1.00","4.0",""
"MB 320-240201/1-A","537","RES","MB 320-240201/1-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","250","1.00","20",""
"MB 320-240201/1-A","537","RES","MB 320-240201/1-A","TALSAC","STL00993","13C2 PFHxA","39.0","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","40.0","","250","1.00","0",""
"MB 320-240201/1-A","537","RES","MB 320-240201/1-A","TALSAC","STL00996","13C2 PFDA","41.9","ng/L","","-99","DL","","SURR","105","","-99","LOQ","YES","40.0","","250","1.00","0",""
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"Unknown","Unknown","WGNA-080618-DUP-43","08/06/2018 07:00","AQ","320-41846-13","FD","","1.70","537","METHOD","RES","08/16/2018 08:12","08/19/2018 02:35","TALSAC","COA","WET","NA","1","NA","NA","","100","320-240201","320-240201","NA","320-240733","320-41846-1","08/07/2018 09:35","08/08/2018 10:55",""
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"Unknown","Unknown","WGNA-080618-RW-0413","08/06/2018 10:40","AQ","320-41846-3","NM","","1.70","537","METHOD","RES","08/16/2018 08:12","08/19/2018 01:39","TALSAC","COA","WET","NA","1","NA","NA","","100","320-240201","320-240201","NA","320-

240731","320-41846-1","08/07/2018 09:35","08/08/2018 10:55",""
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3","NM","","1.70","537","METHOD","RE","08/16/2018 08:12","08/20/2018
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240968","320-41846-1","08/07/2018 09:35","08/08/2018 10:55",""
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4","FB","","1.70","537","METHOD","RES","08/16/2018 08:12","08/19/2018
01:44","TALSAC","COA","WET","NA","1","NA","NA","","100","320-240201","320-240201","NA","320-
240731","320-41846-1","08/07/2018 09:35","08/08/2018 10:55",""
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01:48","TALSAC","COA","WET","NA","1","NA","NA","","100","320-240201","320-240201","NA","320-
240731","320-41846-1","08/07/2018 09:35","08/08/2018 10:55",""
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6","FB","","1.70","537","METHOD","RES","08/16/2018 08:12","08/19/2018
01:53","TALSAC","COA","WET","NA","1","NA","NA","","100","320-240201","320-240201","NA","320-
240731","320-41846-1","08/07/2018 09:35","08/08/2018 10:55",""
"Unknown","Unknown","WGNA-080618-FRB-0533","08/06/2018 11:05","AQ","320-41846-
6","FB","","1.70","537","METHOD","RE","08/16/2018 08:12","08/20/2018
16:43","TALSAC","COA","WET","NA","1","NA","NA","","100","320-240201","320-240201","NA","320-
240968","320-41846-1","08/07/2018 09:35","08/08/2018 10:55",""
"Unknown","Unknown","WGNA-080618-RW-4024","08/06/2018 11:40","AQ","320-41846-
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01:58","TALSAC","COA","WET","NA","1","NA","NA","","100","320-240201","320-240201","NA","320-
240731","320-41846-1","08/07/2018 09:35","08/08/2018 10:55",""
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A","MB","","-99","537","METHOD","RES","08/16/2018 08:12","08/19/2018
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240731","320-41846-1","08/16/2018 08:12","08/08/2018 10:55",""



TO: A. FREBOWITZ **DATE:** OCTOBER 4, 2018
FROM: TERRI L. SOLOMON **COPIES:** DV FILE
SUBJECT: ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)
NAS JRB WILLOW GROVE
SAMPLE DELIVERY GROUP (SDG) 320-41846-1

SAMPLES: 6/Field Reagent Blank (FRB)
NAWC-080618-FRB-032 NAWC-080618-FRB-272
WGNA-080618-FRB-0386 WGNA-080618-FRB-0413
WGNA-080618-FRB-0533 WGNA-080618-FRB-4024

7/Drinking Water
NAWC-080618-RW-032 NAWC-080618-RW-272
WGNA-080618-DUP-43 WGNA-080618-RW-0386
WGNA-080618-RW-0413 WGNA-080618-RW-0533
WGNA-080618-RW-4024

Overview

The sample set for NAS JRB Willow Grove, SDG 320-41846-1, consisted of seven (7) drinking water samples and six (6) FRB samples. All samples were analyzed for select perfluorinated alkyl acids including pentadecafluorooctanoic acid (PFOA), perfluorobutane sulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA) and perfluorooctane sulfonic acid (PFOS). One (1) field duplicate pair, WGNA-080618-RW-4024 / WGNA-080618-DUP-43, was included in this SDG.

The samples were collected by Tetra Tech on August 6, 2018 and analyzed by Test America-Sacramento. All sample analyses were conducted in accordance with EPA Method 537 version 1.1 analytical and reporting protocols.

The data contained in this SDG was validated with regard to the following parameters: data completeness, holding times, mass calibration, mass spectral acquisition rate, tune check, instrument sensitivity check, initial/continuing calibrations, ion transitions, laboratory method/FRBs, surrogate spike recoveries, laboratory control sample / laboratory control sample duplicate results, injected internal standard areas and recoveries, field duplicate results, chromatographic resolution, analyte identification, analyte quantitation, and detection limits. Areas of concern are listed below.

Major

None.

Minor

Detected results reported below the limit of quantitation (LOQ) but above the detection limit (DL) were qualified as estimated (J).

The injected internal standard areas of sample WGNA-080618-RW-0413 for 13C2-PFOA and 13C4-PFOS were greater than the 150% quality control limit of the initial calibration. Additionally, the injected internal standard areas of sample WGNA-080618-RW-0413 for 13C2-PFOA and 13C4-PFOS were greater than the 140% quality control limit of the continuing calibration. The laboratory reanalyzed the sample with similar results for the continuing calibration areas. The initial calibration areas for the reanalysis were within the 50-150% quality control limits. The reanalysis results were used for validation. The detected results reported for

TO: A. FREBOWITZ
SDG: 320-41846-1

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the reanalysis of sample WGNA-080618-RW-0413 were qualified as estimated (J) as a result of high areas compared to the continuing calibration.

Notes

The injected internal standard areas of sample WGNA-080618-FRB-0533 for 13C2-PFOA and 13C4-PFOS were greater than the 150% quality control limit of the initial calibration. Additionally, the injected internal standard areas of sample WGNA-080618-FRB-0533 for 13C2-PFOA and 13C4-PFOS were greater than the 140% quality control limit of the continuing calibration. The laboratory reanalyzed the sample with similar results for the initial and continuing calibration areas. The original results were used for validation. No validation actions were required as all sample results were nondetects.

Samples with detections and their associated FRBs are summarized below. No detected results were present in the FRBs.

<u>Sample</u>	<u>Associated FRB</u>
NAWC-080618-RW-032	NAWC-080618-FRB-032
NAWC-080618-RW-272	NAWC-080618-FRB-272
WGNA-080618-DUP-43	WGNA-080618-FRB-4024
WGNA-080618-RW-0386	WGNA-080618-FRB-0386
WGNA-080618-RW-0413	WGNA-080618-FRB-0413
WGNA-080618-RW-0533	WGNA-080618-FRB-0533
WGNA-080618-RW-4024	WGNA-080618-FRB-4024

Non-detected results were reported to the Limit of Detection (LOD).

The buffering agent Trizma was added to all drinking water samples.

Executive Summary

Laboratory Performance: Two injected internal standards area responses were above the upper quality control limits in two samples.

Other Factors Affecting Data Quality: Results below the RL were estimated.

The data for these analyses were reviewed with reference to the Environmental Protection Agency document EPA/600/R-08/092, Method 537, "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)", (September 2009), US EPA National Functional Guidelines for Organic Data Review (January 2017), and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (July 2013) as applicable. The text of this report has been formulated to address only those areas affecting data quality.

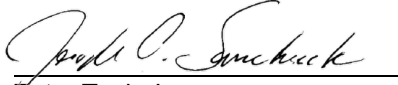


Tetra Tech, Inc.
Terri L. Solomon
Chemist/Data Validator

for

TO: A. FREBOWITZ
SDG: 320-41846-1

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Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:

Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted detection limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
NJ	The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team, but exclusion of the data is recommended.

Appendix A

Qualified Analytical Results

Qualifier Codes:

- A = Lab Blank Contamination
- B = Field Blank Contamination
- C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
- C01 = GC/MS Tuning Noncompliance
- D = MS/MSD Recovery Noncompliance
- E = LCS/LCSD Recovery Noncompliance
- F = Lab Duplicate Imprecision
- G = Field Duplicate Imprecision
- H = Holding Time Exceedance
- I = ICP Serial Dilution Noncompliance
- J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
- K = ICP Interference - includes ICS % R Noncompliance
- L = Instrument Calibration Range Exceedance
- M = Sample Preservation Noncompliance
- N = Internal Standard Noncompliance
- N01 = Internal Standard Recovery Noncompliance Dioxins
- N02 = Recovery Standard Noncompliance Dioxins
- N03 = Clean-up Standard Noncompliance Dioxins
- O = Poor Instrument Performance (i.e., base-time drifting)
- P = Uncertainty near detection limit ($< 2 \times \text{IDL}$ for inorganics and $< \text{CRQL}$ for organics)
- Q = Other problems (can encompass a number of issues; i.e. chromatography, interferences, etc.)
- R = Surrogates Recovery Noncompliance
- S = Pesticide/PCB Resolution
- T = % Breakdown Noncompliance for DDT and Endrin
- U = RPD between columns/detectors $> 40\%$ for positive results determined via GC/HPLC
- V = Non-linear calibrations; correlation coefficient $r < 0.995$
- W = EMPC result
- X = Signal to noise response drop
- Y = Percent solids $< 30\%$
- Z = Uncertainty at 2 standard deviations is greater than sample activity
- Z1 = Tentatively Identified Compound considered presumptively present
- Z2 = Tentatively Identified Compound column bleed
- Z3 = Tentatively Identified Compound aldol condensate
- Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
- Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04 SDG: 320-41846-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	NAWC-080618-FRB-032			NAWC-080618-FRB-272			NAWC-080618-RW-032			NAWC-080618-RW-272		
	LAB_ID	320-41846-10			320-41846-12			320-41846-9			320-41846-11		
	SAMP_DATE	8/6/2018			8/6/2018			8/6/2018			8/6/2018		
	QC_TYPE	FB			FB			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID (PFOA)		7.8	U		7.7	U		15	J	P	9.8	J	P
PERFLUOROBUTANESULFONIC ACID (PFBS)		35	U		35	U		34	U		33	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		3.9	U		3.9	U		5.4	J	P	2.4	J	P
PERFLUOROHXANESULFONIC ACID (PFHXS)		12	U		12	U		11	J	P	11	U	
PERFLUORONONANOIC ACID (PFNA)		20	U		19	U		19	U		19	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		16	U		15	U		19	J	P	14	J	P

PROJ_NO: 08005-WE04 SDG: 320-41846-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	WGNA-080618-DUP-43			WGNA-080618-FRB-0386			WGNA-080618-FRB-0413			WGNA-080618-FRB-0533		
	LAB_ID	320-41846-13			320-41846-2			320-41846-4			320-41846-6		
	SAMP_DATE	8/6/2018			8/6/2018			8/6/2018			8/6/2018		
	QC_TYPE	FD			FB			FB			FB		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF	WGNA-080618-RW-4024											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID (PFOA)		15	J	P	7.7	U		7.6	U		7.7	U	
PERFLUOROBUTANESULFONIC ACID (PFBS)		35	U		35	U		34	U		35	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		4.6	J	P	3.9	U		3.8	U		3.8	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		6.8	J	P	12	U		11	U		12	U	
PERFLUORONONANOIC ACID (PFNA)		19	U		19	U		19	U		19	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		24	J	P	15	U		15	U		15	U	

PROJ_NO: 08005-WE04 SDG: 320-41846-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	WGNA-080618-FRB-4024			WGNA-080618-RW-0386			WGNA-080618-RW-0413-RE			WGNA-080618-RW-0533		
	LAB_ID	320-41846-8			320-41846-1			320-41846-3			320-41846-5		
	SAMP_DATE	8/6/2018			8/6/2018			8/6/2018			8/6/2018		
	QC_TYPE	FB			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID (PFOA)		7.8	U		22			22	J	N	21		
PERFLUOROBUTANESULFONIC ACID (PFBS)		35	U		14	J	P	34	U		34	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		3.9	U		3.9	J	P	6.6	J	NP	3.9	J	P
PERFLUOROHXANESULFONIC ACID (PFHXS)		12	U		18	J	P	6.9	J	NP	8.7	J	P
PERFLUORONONANOIC ACID (PFNA)		20	U		18	U		19	U		19	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		16	U		40			21	J	NP	21	J	P

PROJ_NO: 08005-WE04 SDG: 320-41846-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	WGNA-080618-RW-4024		
	LAB_ID	320-41846-7		
	SAMP_DATE	8/6/2018		
	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID (PFOA)		14	J	P
PERFLUOROBUTANESULFONIC ACID (PFBS)		34	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		4.8	J	P
PERFLUOROHEXANESULFONIC ACID (PFHXS)		6.5	J	P
PERFLUORONONANOIC ACID (PFNA)		19	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		24	J	P

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: WGNA-080618-RW-0386 Lab Sample ID: 320-41846-1
 Matrix: Water Lab File ID: 2018.08.18_537A_031.d
 Analysis Method: 537 Date Collected: 08/06/2018 10:10
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 278.4 (mL) Date Analyzed: 08/19/2018 01:30
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240731 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	40		36	14	6.1
335-67-1	Perfluorooctanoic acid (PFOA)	22		18	7.2	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	18	J	27	11	4.9
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	J	9.0	3.6	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	14	J	81	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	105		70-130

Mari L. Salmeron
10/02/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-FRB-0386</u>	Lab Sample ID: <u>320-41846-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_032.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 10:05</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>258.6(mL)</u>	Date Analyzed: <u>08/19/2018 01:34</u>
Con. Extract Vol.: <u>1.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240731</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	7.7	U	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.7	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	102		70-130

Mari L. Salomon
10/02/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET
DO NOT USE

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: WGNA-080618-RW-0413 Lab Sample ID: 320-41846-3
 Matrix: Water Lab File ID: 2018.08.18_537A_033.d
 Analysis Method: 537 Date Collected: 08/06/2018 10:40
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 266.1 (mL) Date Analyzed: 08/19/2018 01:39
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240731 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J	38	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	23	~~M~~	19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.8	J	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.7	J	9.4	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	99		70-130
STL00996	13C2 PFDA	106		70-130

Wani L. Salaman
10/02/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-RW-0413 RA</u>	Lab Sample ID: <u>320-41846-3 RA</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.20_537A_007.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 10:40</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>266.1(mL)</u>	Date Analyzed: <u>08/20/2018 16:38</u>
Con. Extract Vol.: <u>1.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240968</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J	38	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	22	J	19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.9	J	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.6	J	9.4	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	103		70-130

Mari L. Salmeron
10/02/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: WGNA-080618-FRB-0413 Lab Sample ID: 320-41846-4
 Matrix: Water Lab File ID: 2018.08.18_537A_034.d
 Analysis Method: 537 Date Collected: 08/06/2018 10:35
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 264.9(mL) Date Analyzed: 08/19/2018 01:44
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240731 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	38	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	7.6	U	19	7.6	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.4	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	105		70-130

Ali L. Salem
10/02/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: WGNA-080618-RW-0533 Lab Sample ID: 320-41846-5
 Matrix: Water Lab File ID: 2018.08.18_537A_035.d
 Analysis Method: 537 Date Collected: 08/06/2018 11:10
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 267.7 (mL) Date Analyzed: 08/19/2018 01:48
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240731 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J	37	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	21		19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	22	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	8.7	J	28	11	5.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	J	9.3	3.7	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	84	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	99		70-130
STL00996	13C2 PFDA	100		70-130

Wesley L. Salomon
10/02/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: WGNA-080618-FRB-0533 Lab Sample ID: 320-41846-6
 Matrix: Water Lab File ID: 2018.08.18_537A_036.d
 Analysis Method: 537 Date Collected: 08/06/2018 11:05
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 260.8 (mL) Date Analyzed: 08/19/2018 01:53
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240731 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	7.7	U	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	86	35	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	107		70-130

Wesley L. Salomon
10/02/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET
DO NOT USE

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: WGNA-080618-FRB-0533 RA Lab Sample ID: 320-41846-6 RA
 Matrix: Water Lab File ID: 2018.08.20_537A_008.d
 Analysis Method: 537 Date Collected: 08/06/2018 11:05
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 260.8 (mL) Date Analyzed: 08/20/2018 16:43
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240968 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	7.7	U	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	86	35	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	110		70-130

Wesley L. Selman
10/02/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: WGNA-080618-RW-4024 Lab Sample ID: 320-41846-7
 Matrix: Water Lab File ID: 2018.08.18_537A_037.d
 Analysis Method: 537 Date Collected: 08/06/2018 11:40
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 267.6(mL) Date Analyzed: 08/19/2018 01:58
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240731 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	24	J	37	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	14	J	19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	22	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.5	J	28	11	5.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.8	J	9.3	3.7	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	84	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	104		70-130

Mari L. Salmeron
10/02/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-FRB-4024</u>	Lab Sample ID: <u>320-41846-8</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_040.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 11:35</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>256.1 (mL)</u>	Date Analyzed: <u>08/19/2018 02:12</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240733</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	7.8	U	20	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	20	U	23	20	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.8	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	108		70-130

Wesley L. Selman
10/02/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: NAWC-080618-RW-032 Lab Sample ID: 320-41846-9
 Matrix: Water Lab File ID: 2018.08.18_537A_041.d
 Analysis Method: 537 Date Collected: 08/06/2018 12:40
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 262 (mL) Date Analyzed: 08/19/2018 02:16
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240733 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	15	J	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	J	29	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.4	J	9.5	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	86	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	79		70-130
STL00996	13C2 PFDA	102		70-130

Wesley L. Salomon
10/02/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: NAWC-080618-FRB-032 Lab Sample ID: 320-41846-10
 Matrix: Water Lab File ID: 2018.08.18_537A_042.d
 Analysis Method: 537 Date Collected: 08/06/2018 12:35
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 255.8 (mL) Date Analyzed: 08/19/2018 02:21
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240733 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	7.8	U	20	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	20	U	23	20	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.8	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	99		70-130

Wesley L. Salomon
10/02/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: NAWC-080618-RW-272 Lab Sample ID: 320-41846-11
 Matrix: Water Lab File ID: 2018.08.18_537A_043.d
 Analysis Method: 537 Date Collected: 08/06/2018 14:10
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 269.4 (mL) Date Analyzed: 08/19/2018 02:26
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240733 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	J	37	15	6.3
335-67-1	Perfluorooctanoic acid (PFOA)	9.8	J	19	7.4	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	22	19	7.4
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.4	J ~~M~~	9.3	3.7	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33	U	84	33	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	92		70-130
STL00996	13C2 PFDA	103		70-130

Ali L. Selman
10/02/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: NAWC-080618-FRB-272 Lab Sample ID: 320-41846-12
 Matrix: Water Lab File ID: 2018.08.18_537A_044.d
 Analysis Method: 537 Date Collected: 08/06/2018 14:05
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 259.4 (mL) Date Analyzed: 08/19/2018 02:30
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240733 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	7.7	U	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.6	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	94		70-130
STL00996	13C2 PFDA	101		70-130

Ali L. Salem
10/02/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: WGNA-080618-DUP-43 Lab Sample ID: 320-41846-13
 Matrix: Water Lab File ID: 2018.08.18_537A_045.d
 Analysis Method: 537 Date Collected: 08/06/2018 07:00
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 258.7(mL) Date Analyzed: 08/19/2018 02:35
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240733 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	24	J	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	15	J	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.8	J	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.6	J	9.7	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	111		70-130

Wesley L. Salomon
10/02/2018

Appendix B

Results as Reported by the Laboratory

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-RW-0386</u>	Lab Sample ID: <u>320-41846-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_031.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 10:10</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>278.4 (mL)</u>	Date Analyzed: <u>08/19/2018 01:30</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240731</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	40		36	14	6.1
335-67-1	Perfluorooctanoic acid (PFOA)	22		18	7.2	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	18	J	27	11	4.9
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	J	9.0	3.6	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	14	J	81	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	105		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-FRB-0386</u>	Lab Sample ID: <u>320-41846-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_032.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 10:05</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>258.6(mL)</u>	Date Analyzed: <u>08/19/2018 01:34</u>
Con. Extract Vol.: <u>1.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240731</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	7.7	U	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.7	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	102		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: WGNA-080618-RW-0413 Lab Sample ID: 320-41846-3
 Matrix: Water Lab File ID: 2018.08.18_537A_033.d
 Analysis Method: 537 Date Collected: 08/06/2018 10:40
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 266.1 (mL) Date Analyzed: 08/19/2018 01:39
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240731 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J	38	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	23	M	19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.8	J	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.7	J	9.4	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	99		70-130
STL00996	13C2 PFDA	106		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-RW-0413 RA</u>	Lab Sample ID: <u>320-41846-3 RA</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.20_537A_007.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 10:40</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>266.1 (mL)</u>	Date Analyzed: <u>08/20/2018 16:38</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240968</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J	38	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	22		19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.9	J	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.6	J	9.4	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	103		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1

SDG No.: _____

Client Sample ID: WGNA-080618-FRB-0413 Lab Sample ID: 320-41846-4

Matrix: Water Lab File ID: 2018.08.18_537A_034.d

Analysis Method: 537 Date Collected: 08/06/2018 10:35

Extraction Method: 537 Date Extracted: 08/16/2018 08:12

Sample wt/vol: 264.9(mL) Date Analyzed: 08/19/2018 01:44

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: _____ GPC Cleanup: (Y/N) N

Analysis Batch No.: 240731 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	38	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	7.6	U	19	7.6	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.4	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	105		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-RW-0533</u>	Lab Sample ID: <u>320-41846-5</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_035.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 11:10</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>267.7 (mL)</u>	Date Analyzed: <u>08/19/2018 01:48</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240731</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J	37	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	21		19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	22	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	8.7	J	28	11	5.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	J	9.3	3.7	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	84	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	99		70-130
STL00996	13C2 PFDA	100		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-FRB-0533</u>	Lab Sample ID: <u>320-41846-6</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_036.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 11:05</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>260.8 (mL)</u>	Date Analyzed: <u>08/19/2018 01:53</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240731</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	7.7	U	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	86	35	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	107		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-FRB-0533 RA</u>	Lab Sample ID: <u>320-41846-6 RA</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.20_537A_008.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 11:05</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>260.8 (mL)</u>	Date Analyzed: <u>08/20/2018 16:43</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240968</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	<i>Perfluorooctanesulfonic acid (PFOS)</i>	15	U	38	15	6.5
335-67-1	<i>Perfluorooctanoic acid (PFOA)</i>	7.7	U	19	7.7	2.7
375-95-1	<i>Perfluorononanoic acid (PFNA)</i>	19	U	23	19	7.7
355-46-4	<i>Perfluorohexanesulfonic acid (PFHxS)</i>	12	U	29	12	5.3
375-85-9	<i>Perfluoroheptanoic acid (PFHpA)</i>	3.8	U	9.6	3.8	1.8
375-73-5	<i>Perfluorobutanesulfonic acid (PFBS)</i>	35	U	86	35	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	110		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-RW-4024</u>	Lab Sample ID: <u>320-41846-7</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_037.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 11:40</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>267.6(mL)</u>	Date Analyzed: <u>08/19/2018 01:58</u>
Con. Extract Vol.: <u>1.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240731</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	24	J	37	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	14	J	19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	22	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.5	J	28	11	5.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.8	J	9.3	3.7	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	84	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	104		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-FRB-4024</u>	Lab Sample ID: <u>320-41846-8</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_040.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 11:35</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>256.1 (mL)</u>	Date Analyzed: <u>08/19/2018 02:12</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240733</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	7.8	U	20	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	20	U	23	20	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.8	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	108		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-080618-RW-032</u>	Lab Sample ID: <u>320-41846-9</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_041.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 12:40</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>262 (mL)</u>	Date Analyzed: <u>08/19/2018 02:16</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240733</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	15	J	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	J	29	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.4	J	9.5	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	86	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	79		70-130
STL00996	13C2 PFDA	102		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>NAWC-080618-FRB-032</u>	Lab Sample ID: <u>320-41846-10</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_042.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 12:35</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>255.8 (mL)</u>	Date Analyzed: <u>08/19/2018 02:21</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240733</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	7.8	U	20	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	20	U	23	20	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.8	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	99		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: NAWC-080618-RW-272 Lab Sample ID: 320-41846-11
 Matrix: Water Lab File ID: 2018.08.18_537A_043.d
 Analysis Method: 537 Date Collected: 08/06/2018 14:10
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 269.4 (mL) Date Analyzed: 08/19/2018 02:26
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240733 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	J	37	15	6.3
335-67-1	Perfluorooctanoic acid (PFOA)	9.8	J	19	7.4	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	22	19	7.4
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.4	J M	9.3	3.7	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33	U	84	33	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	92		70-130
STL00996	13C2 PFDA	103		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: NAWC-080618-FRB-272 Lab Sample ID: 320-41846-12
 Matrix: Water Lab File ID: 2018.08.18_537A_044.d
 Analysis Method: 537 Date Collected: 08/06/2018 14:05
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 259.4 (mL) Date Analyzed: 08/19/2018 02:30
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240733 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	7.7	U	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.6	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	94		70-130
STL00996	13C2 PFDA	101		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41846-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-080618-DUP-43</u>	Lab Sample ID: <u>320-41846-13</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.18_537A_045.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/06/2018 07:00</u>
Extraction Method: <u>537</u>	Date Extracted: <u>08/16/2018 08:12</u>
Sample wt/vol: <u>258.7(mL)</u>	Date Analyzed: <u>08/19/2018 02:35</u>
Con. Extract Vol.: <u>1.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>240733</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	24	J	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	15	J	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.8	J	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.6	J	9.7	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	111		70-130

Appendix C

Support Documentation

ANALYTE	ORIGINAL	DUPLICATE		RL	RPD	RPD > 30% Aqueous	ORIGINAL SAMPLE	DUPLICATE	DIFFERENCE >2XRL
	WGNA-080618-RW-4024	WGNA-080618-DUP-43					CONC >2xRL	SAMPLE CONC >2xRL	
Perfluorooctanoic acid (PFOA)		14	15	19	6.90	FALSE	FALSE	FALSE	FALSE
Perfluoroheptanoic acid (PFHpA)		4.8	4.6	9.3	4.26	FALSE	FALSE	FALSE	FALSE
Perfluorohexanesulfonic acid (PFHxS)		6.5	6.8	28	4.51	FALSE	FALSE	FALSE	FALSE
Perfluorooctanesulfonic acid (PFOS)		24	24	37	0.00	FALSE	FALSE	FALSE	FALSE

880 Riverside Parkway
West Sacramento, CA 95605-1500
phone 916.373.5600 fax 303.467.7248

TestAmerica
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TestAmerica Laboratories, Inc.

Regulatory Program: ☒ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact		Project Manager: Andy Frebowitz		Site Contact: Mary Kay Bond		Date: 8/6/2018		COC No:	
TetraTech		Tel/Fax: 610.382.1170		Lab Contact: Dave Alltucker		Carrier: FedEx		1 of 1 COCs	
234 Mall Boulevard Suite 260		Analysis Turnaround Time		Filtered Sample (Y / N) Perform MS / MSD (Y / N) EPA 537 UCMR3				Sampler: Mary Kay Bond	
King of Prussia, PA 19406		☐ CALENDAR DAYS ☐ WORKING DAYS						For Lab Use Only:	
610-382-1174		TAT if different from Below 21						Walk-in Client:	
610-491-9688		☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day						Lab Sampling:	
Project Name: WE04								Job / SDG No.:	
Site: WE04									
P O # 1132358 (through EarthToxics)									
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.			Sample Specific Notes:
WGNA-080618-RW-0386	8/6/2018	10:10	G	DW	2	N N Y			
WGNA-080618-FRB-0386	8/6/2018	10:05	G	DW	2	N N Y			Field Reagent Blank
WGNA-080618-RW-0413	8/6/2018	10:40	G	DW	2	N N Y			
WGNA-080618-FRB-0413	8/6/2018	10:35	G	DW	2	N N Y			Field Reagent Blank
WGNA-080618-RW-0533	8/6/2018	11:10	G	DW	2	N N Y			
WGNA-080618-FRB-0533	8/6/2018	11:05	G	DW	2	N N Y			Field Reagent Blank
WGNA-080618-RW-4024	8/6/2018	11:40	G	DW	2	N N Y			
WGNA-080618-FRB-4024	8/6/2018	11:35	G	DW	2	N N Y			Field Reagent Blank
NAWC-080618-RW-032	8/6/2018	12:40	G	DW	2	N N Y			
NAWC-080618-FRB-032	8/6/2018	12:35	G	DW	2	N N Y			Field Reagent Blank
NAWC-080618-RW-272	8/6/2018	14:10	G	DW	2	N N Y			
NAWC-080618-FRB-272	8/6/2018	14:05	G	DW	2	N N Y			Field Reagent Blank
WGNA-080618-DUP-43	8/6/2018	07:00	G	DW	2	N N Y			Duplicate
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other: Trizma							6		
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.							Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)		
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown							☐ Return to Client ☒ Disposal by Lab ☐ Archive for _____ Months		
Fed Ex Tracking: 772904446550									
Custody Seals Intact: ☒ Yes ☐ No		Custody Seal No.:		Cooler Temp. (°C): Obs'd: 1.7 Corr'd: 1.7		Therm ID No.: AR-5			
Relinquished by: Mary Kay Bond		Company: Tetra Tech		Date/Time: 8/6/2018 16:00		Received by: [Signature]		Company: TA-SAC	
Relinquished by:		Company:		Date/Time:		Received by:		Company:	
Relinquished by:		Company:		Date/Time:		Received in Laboratory by:		Company:	

Form No. CA-C-WI-002, Rev. 4.11, dated 1/24/2017

320-41846 Chain of Custody

S:\WillowGrove PFOs Private Well\COCs TT\COC 2018.08.06

Job Narrative
320-41846-1

Receipt

The samples were received on 8/7/2018 9:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.7° C.

LCMS

Method(s) 537: The first level standard from the initial calibration curve is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5amu; therefore, detection of the analyte serves as verification that the assigned mass is within +/- 0.5amu of the true value, which meets the DoD/DOE QSM tune criterion.

Method(s) 537: Internal standard (ISTD) response for the following samples was outside control limits: WGNA-080618-RW-0413 (320-41846-3) and WGNA-080618-FRB-0533 (320-41846-6). The samples were re-analyzed with concurring results, and the both sets of data have been reported.

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

Organic Prep

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 320-240201.
537-Water

Method(s) 537: The following sample: NAWC-080618-RW-272 (320-41846-11) in preparation batch 320-240201 was observed to be a yellow color after brought to final volume.

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

Definitions/Glossary

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-41846-1

Qualifiers

LCMS

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

Glossary

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

Method Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-41846-1

Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Method	Method Description	Protocol	Laboratory
537	Perfluorinated Alkyl Acids (LC/MS)	EPA	TAL SAC
537	Extraction of Perfluorinated Alkyl Acids	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-41846-1

Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-41846-1	WGNA-080618-RW-0386	Water	08/06/18 10:10	08/07/18 09:35
320-41846-2	WGNA-080618-FRB-0386	Water	08/06/18 10:05	08/07/18 09:35
320-41846-3	WGNA-080618-RW-0413	Water	08/06/18 10:40	08/07/18 09:35
320-41846-4	WGNA-080618-FRB-0413	Water	08/06/18 10:35	08/07/18 09:35
320-41846-5	WGNA-080618-RW-0533	Water	08/06/18 11:10	08/07/18 09:35
320-41846-6	WGNA-080618-FRB-0533	Water	08/06/18 11:05	08/07/18 09:35
320-41846-7	WGNA-080618-RW-4024	Water	08/06/18 11:40	08/07/18 09:35
320-41846-8	WGNA-080618-FRB-4024	Water	08/06/18 11:35	08/07/18 09:35
320-41846-9	NAWC-080618-RW-032	Water	08/06/18 12:40	08/07/18 09:35
320-41846-10	NAWC-080618-FRB-032	Water	08/06/18 12:35	08/07/18 09:35
320-41846-11	NAWC-080618-RW-272	Water	08/06/18 14:10	08/07/18 09:35
320-41846-12	NAWC-080618-FRB-272	Water	08/06/18 14:05	08/07/18 09:35
320-41846-13	WGNA-080618-DUP-43	Water	08/06/18 07:00	08/07/18 09:35

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1

SDG No.: _____

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WGNA-080618-RW-038 6	320-41846-1	96	105
WGNA-080618-FRB-03 86	320-41846-2	95	102
WGNA-080618-RW-041 3	320-41846-3	99	106
WGNA-080618-RW-041 3 RA	320-41846-3 RA	97	103
WGNA-080618-FRB-04 13	320-41846-4	102	105
WGNA-080618-RW-053 3	320-41846-5	99	100
WGNA-080618-FRB-05 33	320-41846-6	100	107
WGNA-080618-FRB-05 33 RA	320-41846-6 RA	100	110
WGNA-080618-RW-402 4	320-41846-7	95	104
WGNA-080618-FRB-40 24	320-41846-8	101	108
NAWC-080618-RW-032	320-41846-9	79	102
NAWC-080618-FRB-03 2	320-41846-10	97	99
NAWC-080618-RW-272	320-41846-11	92	103
NAWC-080618-FRB-27 2	320-41846-12	94	101
WGNA-080618-DUP-43	320-41846-13	101	111
	MB 320-240201/1-A	98	105
	LCS 320-240201/2-A	106	109
	LCSD 320-240201/3-A	92	110

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA

QC LIMITS
70-130
70-130

Column to be used to flag recovery values

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.08.18_537A_029.d
 Lab ID: LCS 320-240201/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	220	236	107	70-130	
Perfluorooctanoic acid (PFOA)	110	115	105	70-130	
Perfluorononanoic acid (PFNA)	110	115	105	70-130	
Perfluorohexanesulfonic acid (PFHxS)	168	180	107	70-130	
Perfluoroheptanoic acid (PFHpA)	54.0	59.5	110	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	467	93	70-130	

Column to be used to flag recovery and RPD values

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.08.18_537A_030.d
 Lab ID: LCSD 320-240201/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	220	236	108	0	30	70-130	
Perfluorooctanoic acid (PFOA)	110	112	101	3	30	70-130	
Perfluorononanoic acid (PFNA)	110	112	102	3	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	168	180	107	0	30	70-130	
Perfluoroheptanoic acid (PFHpA)	54.0	54.9	102	8	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	404	81	14	30	70-130	

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab File ID: 2018.08.18_537A_028.d Lab Sample ID: MB 320-240201/1-A
 Matrix: Water Date Extracted: 08/16/2018 08:12
 Instrument ID: A8_N Date Analyzed: 08/19/2018 01:16
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-240201/2-A	2018.08.18_537A_029.d	08/19/2018 01:20
	LCSD 320-240201/3-A	2018.08.18_537A_030.d	08/19/2018 01:25
WGNA-080618-RW-0386	320-41846-1	2018.08.18_537A_031.d	08/19/2018 01:30
WGNA-080618-FRB-0386	320-41846-2	2018.08.18_537A_032.d	08/19/2018 01:34
WGNA-080618-RW-0413	320-41846-3	2018.08.18_537A_033.d	08/19/2018 01:39
WGNA-080618-FRB-0413	320-41846-4	2018.08.18_537A_034.d	08/19/2018 01:44
WGNA-080618-RW-0533	320-41846-5	2018.08.18_537A_035.d	08/19/2018 01:48
WGNA-080618-FRB-0533	320-41846-6	2018.08.18_537A_036.d	08/19/2018 01:53
WGNA-080618-RW-4024	320-41846-7	2018.08.18_537A_037.d	08/19/2018 01:58
WGNA-080618-FRB-4024	320-41846-8	2018.08.18_537A_040.d	08/19/2018 02:12
NAWC-080618-RW-032	320-41846-9	2018.08.18_537A_041.d	08/19/2018 02:16
NAWC-080618-FRB-032	320-41846-10	2018.08.18_537A_042.d	08/19/2018 02:21
NAWC-080618-RW-272	320-41846-11	2018.08.18_537A_043.d	08/19/2018 02:26
NAWC-080618-FRB-272	320-41846-12	2018.08.18_537A_044.d	08/19/2018 02:30
WGNA-080618-DUP-43	320-41846-13	2018.08.18_537A_045.d	08/19/2018 02:35
WGNA-080618-RW-0413 RA	320-41846-3 RA	2018.08.20_537A_007.d	08/20/2018 16:38
WGNA-080618-FRB-0533 RA	320-41846-6 RA	2018.08.20_537A_008.d	08/20/2018 16:43

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-240201/1-A
 Matrix: Water Lab File ID: 2018.08.18_537A_028.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 08/16/2018 08:12
 Sample wt/vol: 250 (mL) Date Analyzed: 08/19/2018 01:16
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 240731 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	8.0	U	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	105		70-130

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Instrument ID: A8_N Calibration Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 08/15/2018 18:44
 Calibration ID: 40641

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		999840	1.85	2469394	2.11		
UPPER LIMIT		1499760	2.35	3704091	2.61		
LOWER LIMIT		499920	1.35	1234697	1.61		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 320-240166/9		1006603	1.84	2388436	2.10		
ICV 320-240166/11		1022273	1.84	2551643	2.10		
CCVL 320-240726/1		1133505	1.85	2726575	2.11		
CCV 320-240731/24 CCVIS		993768	1.84	2515780	2.09		
MB 320-240201/1-A		1045030	1.84	2549261	2.09		
LCS 320-240201/2-A		1136401	1.84	2944707	2.09		
LCSD 320-240201/3-A		1253302	1.84	3176488	2.09		
320-41846-1	WGNA-080618-RW-0386	1183795	1.84	2982852	2.09		
320-41846-2	WGNA-080618-FRB-0386	1095539	1.84	2690154	2.09		
320-41846-3	WGNA-080618-RW-0413	1527332Q	1.84	3844702Q	2.09		
320-41846-4	WGNA-080618-FRB-0413	1215966	1.84	2999791	2.09		
320-41846-5	WGNA-080618-RW-0533	1169587	1.84	2901574	2.09		
320-41846-6	WGNA-080618-FRB-0533	1782008Q	1.84	4358112Q	2.09		
320-41846-7	WGNA-080618-RW-4024	1117019	1.84	2750630	2.09		
CCV 320-240731/36 CCVIS		1017295	1.84	2573081	2.09		
CCV 320-240733/36 CCVIS		1017295	1.84	2573081	2.09		
320-41846-8	WGNA-080618-FRB-4024	1134575	1.84	2791314	2.09		
320-41846-9	NAWC-080618-RW-032	1183711	1.83	2913857	2.09		
320-41846-10	NAWC-080618-FRB-032	1171838	1.84	2887738	2.09		
320-41846-11	NAWC-080618-RW-272	1176201	1.84	2878024	2.09		
320-41846-12	NAWC-080618-FRB-272	1246847	1.84	2945506	2.09		
320-41846-13	WGNA-080618-DUP-43	1108290	1.84	2766230	2.09		
CCV 320-240733/44 CCVIS		1023857	1.83	2550677	2.09		
CCVL 320-240968/1		1080920	1.86	2508240	2.11		
CCV 320-240968/2 CCVIS		1030793	1.86	2439962	2.11		
320-41846-3 RA	WGNA-080618-RW-0413 RA	1436509	1.85	3491415	2.11		
320-41846-6 RA	WGNA-080618-FRB-0533 RA	1578837Q	1.85	3922335Q	2.11		

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 50%-150% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Instrument ID: A8_N Calibration Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 08/15/2018 18:44
 Calibration ID: 40641

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT	999840	1.85	2469394	2.11		
UPPER LIMIT	1499760	2.35	3704091	2.61		
LOWER LIMIT	499920	1.35	1234697	1.61		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCV 320-240968/10 CCVIS		997051 1.85	2521958 2.10			

13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS

Area Limit = 50%-150% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Sample No.: CCV 320-240731/24 Date Analyzed: 08/19/2018 01:06
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.18_537A_026 Heated Purge: (Y/N) N
 Calibration ID: 40641

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		993768	1.84	2515780	2.09		
UPPER LIMIT		1391275	2.34	3522092	2.59		
LOWER LIMIT		695638	1.34	1761046	1.59		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-240201/1-A		1045030	1.84	2549261	2.09		
LCS 320-240201/2-A		1136401	1.84	2944707	2.09		
LCSD 320-240201/3-A		1253302	1.84	3176488	2.09		
320-41846-1	WGNA-080618-RW-0386	1183795	1.84	2982852	2.09		
320-41846-2	WGNA-080618-FRB-0386	1095539	1.84	2690154	2.09		
320-41846-3	WGNA-080618-RW-0413	1527332Q	1.84	3844702Q	2.09		
320-41846-4	WGNA-080618-FRB-0413	1215966	1.84	2999791	2.09		
320-41846-5	WGNA-080618-RW-0533	1169587	1.84	2901574	2.09		
320-41846-6	WGNA-080618-FRB-0533	1782008Q	1.84	4358112Q	2.09		
320-41846-7	WGNA-080618-RW-4024	1117019	1.84	2750630	2.09		

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area

RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Sample No.: CCV 320-240731/36 Date Analyzed: 08/19/2018 02:02
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.18_537A_038 Heated Purge: (Y/N) N
 Calibration ID: 40641

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1017295	1.84	2573081	2.09		
UPPER LIMIT		1424213	2.34	3602313	2.59		
LOWER LIMIT		712107	1.34	1801157	1.59		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-240201/1-A		1045030	1.84	2549261	2.09		
LCS 320-240201/2-A		1136401	1.84	2944707	2.09		
LCSD 320-240201/3-A		1253302	1.84	3176488	2.09		
320-41846-1	WGNA-080618-RW-0386	1183795	1.84	2982852	2.09		
320-41846-2	WGNA-080618-FRB-0386	1095539	1.84	2690154	2.09		
320-41846-3	WGNA-080618-RW-0413	1527332Q	1.84	3844702Q	2.09		
320-41846-4	WGNA-080618-FRB-0413	1215966	1.84	2999791	2.09		
320-41846-5	WGNA-080618-RW-0533	1169587	1.84	2901574	2.09		
320-41846-6	WGNA-080618-FRB-0533	1782008Q	1.84	4358112Q	2.09		
320-41846-7	WGNA-080618-RW-4024	1117019	1.84	2750630	2.09		

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area

RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Sample No.: CCV 320-240733/36 Date Analyzed: 08/19/2018 02:02
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.18_537A_038 Heated Purge: (Y/N) N
 Calibration ID: 40641

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	1017295	1.84	2573081	2.09		
UPPER LIMIT	1424213	2.34	3602313	2.59		
LOWER LIMIT	712107	1.34	1801157	1.59		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-41846-8	WGNA-080618-FRB-4024		1134575	1.84	2791314	2.09
320-41846-9	NAWC-080618-RW-032		1183711	1.83	2913857	2.09
320-41846-10	NAWC-080618-FRB-032		1171838	1.84	2887738	2.09
320-41846-11	NAWC-080618-RW-272		1176201	1.84	2878024	2.09
320-41846-12	NAWC-080618-FRB-272		1246847	1.84	2945506	2.09
320-41846-13	WGNA-080618-DUP-43		1108290	1.84	2766230	2.09

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area

RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Sample No.: CCV 320-240733/44 Date Analyzed: 08/19/2018 02:40
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.18_537A_046 Heated Purge: (Y/N) N
 Calibration ID: 40641

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1023857	1.83	2550677	2.09		
UPPER LIMIT		1433400	2.33	3570948	2.59		
LOWER LIMIT		716700	1.33	1785474	1.59		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-41846-8	WGNA-080618-FRB-4024	1134575	1.84	2791314	2.09		
320-41846-9	NAWC-080618-RW-032	1183711	1.83	2913857	2.09		
320-41846-10	NAWC-080618-FRB-032	1171838	1.84	2887738	2.09		
320-41846-11	NAWC-080618-RW-272	1176201	1.84	2878024	2.09		
320-41846-12	NAWC-080618-FRB-272	1246847	1.84	2945506	2.09		
320-41846-13	WGNA-080618-DUP-43	1108290	1.84	2766230	2.09		

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area

RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Sample No.: CCV 320-240968/2 Date Analyzed: 08/20/2018 16:24
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.20_537A_004 Heated Purge: (Y/N) N
 Calibration ID: 40641

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	1030793	1.86	2439962	2.11		
UPPER LIMIT	1443110	2.36	3415947	2.61		
LOWER LIMIT	721555	1.36	1707973	1.61		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-41846-3 RA	WGNA-080618-RW-0413 RA	1436509	1.85	3491415	2.11	
320-41846-6 RA	WGNA-080618-FRB-0533 RA	1578837Q	1.85	3922335Q	2.11	

13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Sample No.: CCV 320-240968/10 Date Analyzed: 08/20/2018 17:01
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.20_537A_012 Heated Purge: (Y/N) N
 Calibration ID: 40641

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		997051	1.85	2521958	2.10		
UPPER LIMIT		1395871	2.35	3530741	2.60		
LOWER LIMIT		697936	1.35	1765371	1.60		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-41846-3 RA	WGNA-080618-RW-0413 RA	1436509	1.85	3491415	2.11		
320-41846-6 RA	WGNA-080618-FRB-0533 RA	1578837Q	1.85	3922335Q	2.11		

13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VI
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1 Analy Batch No.: 240166

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/15/2018 18:21 Calibration End Date: 08/15/2018 18:44 Calibration ID: 40641

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-240166/2	2018.08.15_537CURVE_003.d
Level 2	IC 320-240166/3	2018.08.15_537CURVE_004.d
Level 3	IC 320-240166/4	2018.08.15_537CURVE_005.d
Level 4	IC 320-240166/5	2018.08.15_537CURVE_006.d
Level 5	IC 320-240166/6	2018.08.15_537CURVE_007.d
Level 6	IC 320-240166/7	2018.08.15_537CURVE_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid (PFBS)	1.2479 0.9705	1.1886	1.2616	1.1091	1.0906	Ave		1.1447				9.6		30.0			
Perfluoroheptanoic acid (PFHpA)	1.0855 1.0407	1.0364	1.0489	1.0876	1.0460	Ave		1.0575				2.2		30.0			
Perfluorohexanesulfonic acid (PFHxS)	1.6492 1.6115	1.6167	1.6890	1.6380	1.7330	Ave		1.6562				2.8		30.0			
Perfluorooctanoic acid (PFOA)	1.0954 1.0842	1.0529	1.0915	1.1075	1.1058	Ave		1.0895				1.8		30.0			
Perfluorooctanesulfonic acid (PFOS)	1.0830 1.0982	1.0386	1.0683	1.0853	1.1084	Ave		1.0803				2.3		30.0			
Perfluorononanoic acid (PFNA)	0.8630 0.8350	0.7990	0.7881	0.8431	0.8177	Ave		0.8243				3.4		30.0			
13C2 PFHxA	1.0723 1.0545	1.0111	1.0024	1.0515	1.0447	Ave		1.0394				2.6		30.0			
13C2 PFDA	0.7972 0.7976	0.7443	0.7670	0.8351	0.8115	Ave		0.7921				4.1		30.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1 Analy Batch No.: 240166

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/15/2018 18:21 Calibration End Date: 08/15/2018 18:44 Calibration ID: 40641

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-240166/2	2018.08.15_537CURVE_003.d
Level 2	IC 320-240166/3	2018.08.15_537CURVE_004.d
Level 3	IC 320-240166/4	2018.08.15_537CURVE_005.d
Level 4	IC 320-240166/5	2018.08.15_537CURVE_006.d
Level 5	IC 320-240166/6	2018.08.15_537CURVE_007.d
Level 6	IC 320-240166/7	2018.08.15_537CURVE_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	Ave	998954 15136483	2070355	4549188	9386038	11785636	9.00 180	20.0	45.0	90.1	135
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	106948 1986691	233189	488515	1105731	1440874	0.960 19.4	2.16	4.86	9.72	14.6
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	440547 8441814	945775	2045536	4655795	6289862	3.00 60.5	6.72	15.1	30.2	45.4
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	222587 4216218	482587	1035552	2293687	3102767	1.98 39.6	4.40	9.90	19.8	29.7
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	380845 7518443	794113	1690983	4031609	5257770	3.95 79.1	8.79	19.8	39.5	59.3
Perfluorononanoic acid (PFNA)	13PF OA	Ave	175370 3246932	366204	747749	1746006	2294540	1.98 39.6	4.40	9.90	19.8	29.7
13C2 PFHxA	13PF OA	Ave	1100508 1035478	1053216	960623	1099800	987004	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	818198 783206	775306	735076	873467	766710	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD

FORM VI
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1 Analy Batch No.: 240166

SDG No.: _____

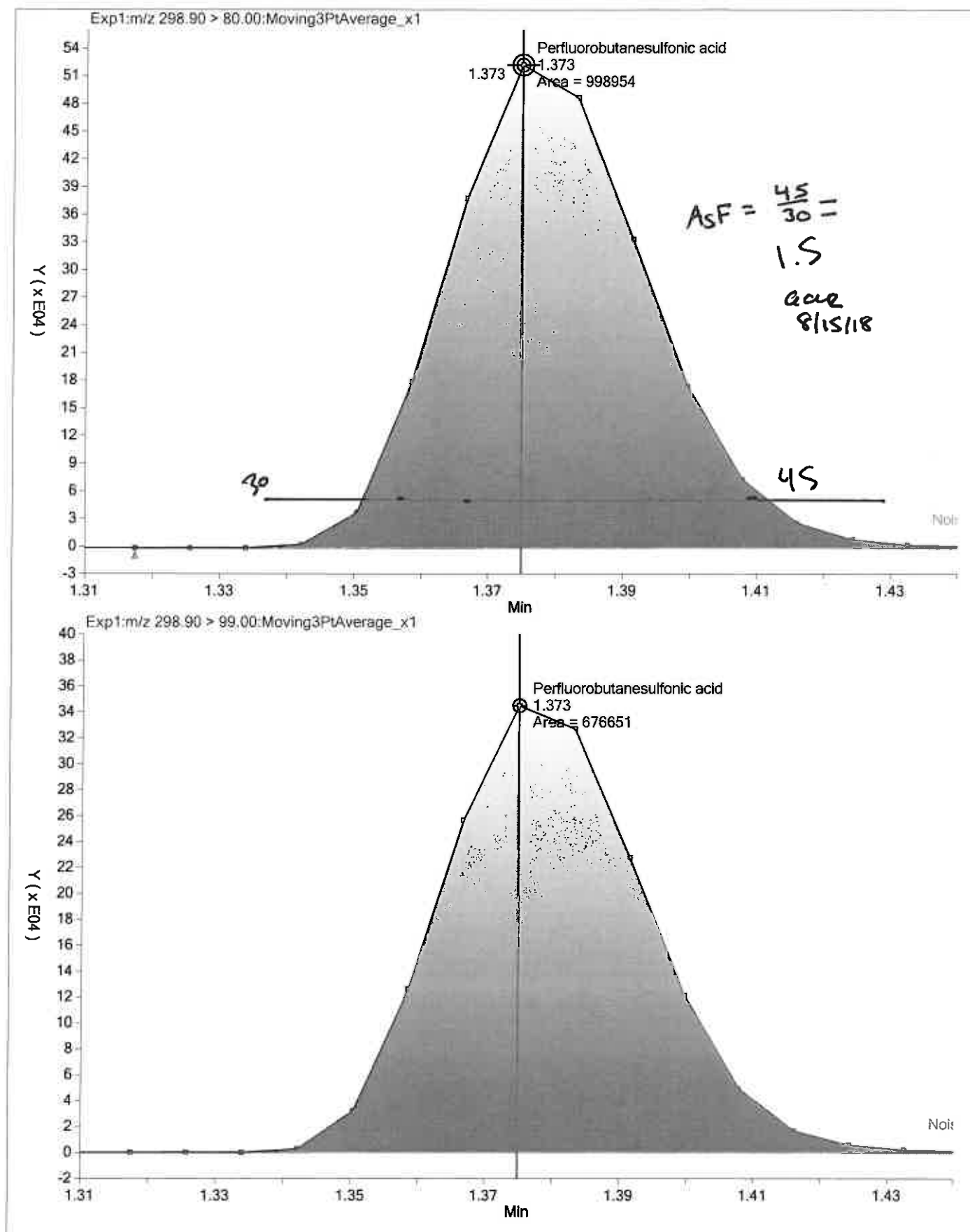
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

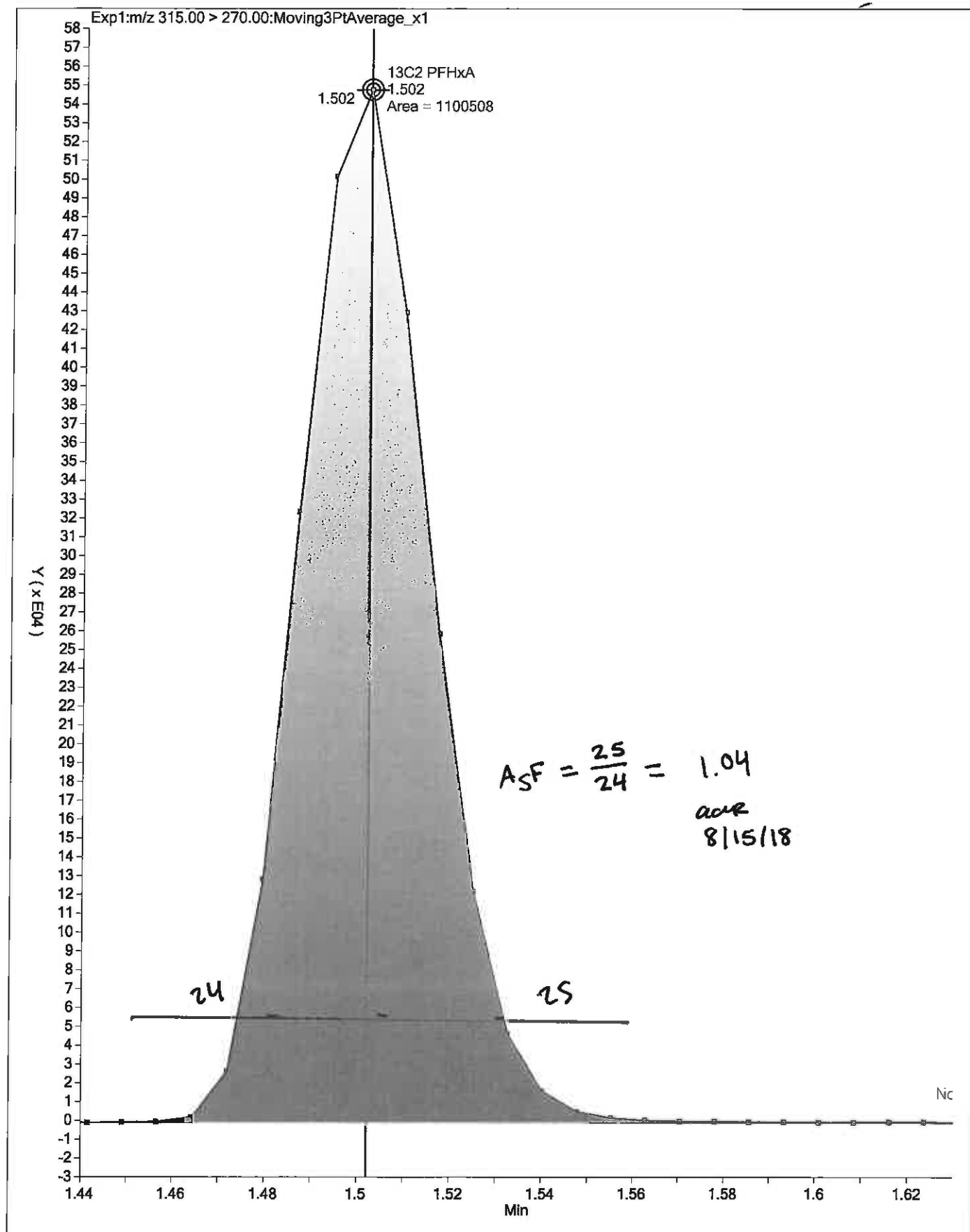
Calibration Start Date: 08/15/2018 18:21 Calibration End Date: 08/15/2018 18:44 Calibration ID: 40641

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-240166/2	2018.08.15_537CURVE_003.d
Level 2	IC 320-240166/3	2018.08.15_537CURVE_004.d
Level 3	IC 320-240166/4	2018.08.15_537CURVE_005.d
Level 4	IC 320-240166/5	2018.08.15_537CURVE_006.d
Level 5	IC 320-240166/6	2018.08.15_537CURVE_007.d
Level 6	IC 320-240166/7	2018.08.15_537CURVE_008.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid (PFBS)	9.0	3.8	10.2	-3.1	-4.7	-15.2	50	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	2.6	-2.0	-0.8	2.8	-1.1	-1.6	50	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	-0.4	-2.4	2.0	-1.1	4.6	-2.7	50	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	0.5	-3.4	0.2	1.7	1.5	-0.5	50	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	0.2	-3.9	-1.1	0.5	2.6	1.7	50	30	30	30	30	30
Perfluorononanoic acid (PFNA)	4.7	-3.1	-4.4	2.3	-0.8	1.3	50	30	30	30	30	30
13C2 PFHxA	3.2	-2.7	-3.6	1.2	0.5	1.4	30	30	30	30	30	30
13C2 PFDA	0.6	-6.0	-3.2	5.4	2.4	0.7	30	30	30	30	30	30





FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-240166/9 Calibration Date: 08/15/2018 18:53
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.15_537CURVE_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.167		20.4	20.0	2.0	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	1.033		2.11	2.16	-2.4	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.611		6.54	6.72	-2.7	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.020		4.12	4.40	-6.4	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	1.039		8.45	8.79	-3.8	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.8023		4.28	4.40	-2.7	50.0
13C2 PFHxA	Ave	1.039	1.002		9.64	10.0	-3.6	30.0
13C2 PFDA	Ave	0.7921	0.7658		9.67	10.0	-3.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: ICV 320-240166/11 Calibration Date: 08/15/2018 19:03
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.15_537CURVE_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.005		87.9	100	-12.2	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	0.9536		9.02	10.0	-9.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.530		18.6	20.2	-7.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	0.8802		16.3	20.2	-19.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	0.9603		17.9	20.2	-11.1	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.7757		19.0	20.2	-5.9	30.0
13C2 PFHxA	Ave	1.039	1.022		9.83	10.0	-1.7	30.0
13C2 PFDA	Ave	0.7921	0.7952		10.0	10.0	0.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-240726/1 Calibration Date: 08/18/2018 23:19
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.18_537A_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.214		21.2	20.0	6.1	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	1.019		2.08	2.16	-3.6	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.652		6.70	6.72	-0.3	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.030		4.16	4.40	-5.5	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	1.048		8.53	8.79	-2.9	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.7851		4.19	4.40	-4.8	50.0
13C2 PFHxA	Ave	1.039	1.020		9.81	10.0	-1.9	30.0
13C2 PFDA	Ave	0.7921	0.7561		9.55	10.0	-4.5	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: CCV 320-240731/24 Calibration Date: 08/19/2018 01:06
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.18_537A_026.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.282		50.4	45.0	12.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	1.069		4.91	4.86	1.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.724		15.7	15.1	4.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.093		9.93	9.90	0.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	1.055		19.3	19.8	-2.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.8255		9.91	9.90	0.1	30.0
13C2 PFHxA	Ave	1.039	1.051		10.1	10.0	1.1	30.0
13C2 PFDA	Ave	0.7921	0.7667		9.68	10.0	-3.2	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: CCV 320-240731/36 Calibration Date: 08/19/2018 02:02
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.18_537A_038.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.076		127	135	-6.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	1.058		14.6	14.6	0.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.722		47.2	45.4	4.0	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.100		30.0	29.7	0.9	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	1.103		60.6	59.3	2.1	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.8116		29.2	29.7	-1.5	30.0
13C2 PFHxA	Ave	1.039	1.047		10.1	10.0	0.8	30.0
13C2 PFDA	Ave	0.7921	0.7572		9.56	10.0	-4.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: CCV 320-240733/36 Calibration Date: 08/19/2018 02:02
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.18_537A_038.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.076		127	135	-6.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	1.058		14.6	14.6	0.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.722		47.2	45.4	4.0	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.100		30.0	29.7	0.9	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	1.103		60.6	59.3	2.1	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.8116		29.2	29.7	-1.5	30.0
13C2 PFHxA	Ave	1.039	1.047		10.1	10.0	0.8	30.0
13C2 PFDA	Ave	0.7921	0.7572		9.56	10.0	-4.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: CCV 320-240733/44 Calibration Date: 08/19/2018 02:40
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.18_537A_046.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.227		48.3	45.0	7.2	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	1.051		4.83	4.86	-0.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.656		15.1	15.1	-0.0	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.049		9.53	9.90	-3.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	1.043		19.1	19.8	-3.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.8100		9.73	9.90	-1.7	30.0
13C2 PFHxA	Ave	1.039	1.044		10.0	10.0	0.5	30.0
13C2 PFDA	Ave	0.7921	0.7517		9.49	10.0	-5.1	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-240968/1 Calibration Date: 08/20/2018 16:19
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.20_537A_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.194		20.9	20.0	4.3	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	0.9846		2.01	2.16	-6.9	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.592		6.46	6.72	-3.9	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.015		4.10	4.40	-6.9	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	1.035		8.42	8.79	-4.2	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.7441		3.97	4.40	-9.7	50.0
13C2 PFHxA	Ave	1.039	0.9672		9.31	10.0	-6.9	30.0
13C2 PFDA	Ave	0.7921	0.7090		8.95	10.0	-10.5	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: CCV 320-240968/2 Calibration Date: 08/20/2018 16:24
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.20_537A_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.280		50.4	45.0	11.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	1.056		4.85	4.86	-0.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.718		15.7	15.1	3.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.095		9.95	9.90	0.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	1.097		20.1	19.8	1.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.8054		9.67	9.90	-2.3	30.0
13C2 PFHxA	Ave	1.039	1.057		10.2	10.0	1.7	30.0
13C2 PFDA	Ave	0.7921	0.7464		9.42	10.0	-5.8	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1
 SDG No.: _____
 Lab Sample ID: CCV 320-240968/10 Calibration Date: 08/20/2018 17:01
 Instrument ID: A8_N Calib Start Date: 08/15/2018 18:21
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/15/2018 18:44
 Lab File ID: 2018.08.20_537A_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.145	1.065		126	135	-7.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.058	1.042		14.4	14.6	-1.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.656	1.682		46.1	45.4	1.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.089		29.7	29.7	-0.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.080	1.067		58.6	59.3	-1.2	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8243	0.8058		29.0	29.7	-2.3	30.0
13C2 PFHxA	Ave	1.039	1.071		10.3	10.0	3.0	30.0
13C2 PFDA	Ave	0.7921	0.7778		9.82	10.0	-1.8	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/15/2018 18:21

Analysis Batch Number: 240166 End Date: 08/15/2018 19:03

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-240166/2		08/15/2018 18:21	1	2018.08.15_537C URVE 003.d	GeminiC18 3x100 3(mm)
IC 320-240166/3		08/15/2018 18:25	1	2018.08.15_537C URVE 004.d	GeminiC18 3x100 3(mm)
IC 320-240166/4		08/15/2018 18:30	1	2018.08.15_537C URVE 005.d	GeminiC18 3x100 3(mm)
IC 320-240166/5 ICISAV		08/15/2018 18:35	1	2018.08.15_537C URVE 006.d	GeminiC18 3x100 3(mm)
IC 320-240166/6		08/15/2018 18:39	1	2018.08.15_537C URVE 007.d	GeminiC18 3x100 3(mm)
IC 320-240166/7		08/15/2018 18:44	1	2018.08.15_537C URVE 008.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/15/2018 18:49	1		GeminiC18 3x100 3(mm)
CCVL 320-240166/9		08/15/2018 18:53	1	2018.08.15_537C URVE 010.d	GeminiC18 3x100 3(mm)
ICB 320-240166/10		08/15/2018 18:58	1		GeminiC18 3x100 3(mm)
ICV 320-240166/11		08/15/2018 19:03	1	2018.08.15_537C URVE 012.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-41846-1

SDG No.: _____

Instrument ID: A8_NStart Date: 08/18/2018 23:19Analysis Batch Number: 240726End Date: 08/19/2018 00:19

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-240726/1		08/18/2018 23:19	1	2018.08.18_537A 003.d	GeminiC18 3x100 3(mm)
CCV 320-240726/2 CCVIS		08/18/2018 23:23	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/18/2018 23:28	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/18/2018 23:33	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/18/2018 23:37	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/18/2018 23:42	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/18/2018 23:47	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/18/2018 23:51	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/18/2018 23:56	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/19/2018 00:01	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/19/2018 00:05	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/19/2018 00:10	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/19/2018 00:15	1		GeminiC18 3x100 3(mm)
CCV 320-240726/14 CCVIS		08/19/2018 00:19	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-41846-1

SDG No.: _____

Instrument ID: A8_NStart Date: 08/19/2018 01:06Analysis Batch Number: 240731End Date: 08/19/2018 02:02

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-240731/24 CCVIS		08/19/2018 01:06	1	2018.08.18_537A 026.d	GeminiC18 3x100 3(mm)
MB 320-240201/1-A		08/19/2018 01:16	1	2018.08.18_537A 028.d	GeminiC18 3x100 3(mm)
LCS 320-240201/2-A		08/19/2018 01:20	1	2018.08.18_537A 029.d	GeminiC18 3x100 3(mm)
LCSD 320-240201/3-A		08/19/2018 01:25	1	2018.08.18_537A 030.d	GeminiC18 3x100 3(mm)
320-41846-1		08/19/2018 01:30	1	2018.08.18_537A 031.d	GeminiC18 3x100 3(mm)
320-41846-2		08/19/2018 01:34	1	2018.08.18_537A 032.d	GeminiC18 3x100 3(mm)
320-41846-3		08/19/2018 01:39	1	2018.08.18_537A 033.d	GeminiC18 3x100 3(mm)
320-41846-4		08/19/2018 01:44	1	2018.08.18_537A 034.d	GeminiC18 3x100 3(mm)
320-41846-5		08/19/2018 01:48	1	2018.08.18_537A 035.d	GeminiC18 3x100 3(mm)
320-41846-6		08/19/2018 01:53	1	2018.08.18_537A 036.d	GeminiC18 3x100 3(mm)
320-41846-7		08/19/2018 01:58	1	2018.08.18_537A 037.d	GeminiC18 3x100 3(mm)
CCV 320-240731/36 CCVIS		08/19/2018 02:02	1	2018.08.18_537A 038.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/19/2018 02:02Analysis Batch Number: 240733 End Date: 08/19/2018 02:40

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-240733/36 CCVIS		08/19/2018 02:02	1	2018.08.18_537A 038.d	GeminiC18 3x100 3(mm)
320-41846-8		08/19/2018 02:12	1	2018.08.18_537A 040.d	GeminiC18 3x100 3(mm)
320-41846-9		08/19/2018 02:16	1	2018.08.18_537A 041.d	GeminiC18 3x100 3(mm)
320-41846-10		08/19/2018 02:21	1	2018.08.18_537A 042.d	GeminiC18 3x100 3(mm)
320-41846-11		08/19/2018 02:26	1	2018.08.18_537A 043.d	GeminiC18 3x100 3(mm)
320-41846-12		08/19/2018 02:30	1	2018.08.18_537A 044.d	GeminiC18 3x100 3(mm)
320-41846-13		08/19/2018 02:35	1	2018.08.18_537A 045.d	GeminiC18 3x100 3(mm)
CCV 320-240733/44 CCVIS		08/19/2018 02:40	1	2018.08.18_537A 046.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/20/2018 16:19Analysis Batch Number: 240968 End Date: 08/20/2018 17:01

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-240968/1		08/20/2018 16:19	1	2018.08.20_537A 003.d	GeminiC18 3x100 3(mm)
CCV 320-240968/2 CCVIS		08/20/2018 16:24	1	2018.08.20_537A 004.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/20/2018 16:28	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/20/2018 16:33	10		GeminiC18 3x100 3(mm)
320-41846-3 RA		08/20/2018 16:38	1	2018.08.20_537A 007.d	GeminiC18 3x100 3(mm)
320-41846-6 RA		08/20/2018 16:43	1	2018.08.20_537A 008.d	GeminiC18 3x100 3(mm)
CCV 320-240968/10 CCVIS		08/20/2018 17:01	1	2018.08.20_537A 012.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41846-1

SDG No.: _____

Batch Number: 240201 Batch Start Date: 08/16/18 08:12 Batch Analyst: Kouchari, ShamiranBatch Method: 537 Batch End Date: 08/17/18 16:20

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-HSP 00029
MB 320-240201/1		537, 537				250 mL	1.00 mL	7 SU	
LCS 320-240201/2		537, 537				250 mL	1.00 mL	7 SU	100 uL
LCSD 320-240201/3		537, 537				250 mL	1.00 mL	7 SU	100 uL
320-41846-A-1	WGNA-080618-RW-0386	537, 537	T	317.75 g	39.35 g	278.4 mL	1.00 mL	7 SU	
320-41846-B-2	WGNA-080618-FRB-0386	537, 537	T	287.28 g	28.72 g	258.6 mL	1.00 mL	7 SU	
320-41846-A-3	WGNA-080618-RW-0413	537, 537	T	294.84 g	28.75 g	266.1 mL	1.00 mL	7 SU	
320-41846-A-4	WGNA-080618-FRB-0413	537, 537	T	294.28 g	29.37 g	264.9 mL	1.00 mL	7 SU	
320-41846-A-5	WGNA-080618-RW-0533	537, 537	T	306.96 g	39.29 g	267.7 mL	1.00 mL	7 SU	
320-41846-A-6	WGNA-080618-FRB-0533	537, 537	T	291.54 g	30.76 g	260.8 mL	1.00 mL	7 SU	
320-41846-A-7	WGNA-080618-RW-4024	537, 537	T	296.74 g	29.12 g	267.6 mL	1.00 mL	7 SU	
320-41846-A-8	WGNA-080618-FRB-4024	537, 537	T	285.05 g	29.00 g	256.1 mL	1.00 mL	7 SU	
320-41846-A-9	NAWC-080618-RW-032	537, 537	T	291.28 g	29.29 g	262 mL	1.00 mL	7 SU	
320-41846-A-10	NAWC-080618-FRB-032	537, 537	T	284.58 g	28.78 g	255.8 mL	1.00 mL	7 SU	
320-41846-A-11	NAWC-080618-RW-272	537, 537	T	308.45 g	39.10 g	269.4 mL	1.00 mL	7 SU	
320-41846-A-12	NAWC-080618-FRB-272	537, 537	T	288.02 g	28.64 g	259.4 mL	1.00 mL	7 SU	
320-41846-A-13	WGNA-080618-DUP-43	537, 537	T	287.59 g	28.89 g	258.7 mL	1.00 mL	7 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00080	LC537-SU 00074	AnalysisComment			
MB 320-240201/1		537, 537		100 uL	100 uL	Chlorine, ND			
LCS 320-240201/2		537, 537		100 uL	100 uL	Chlorine, ND			
LCSD 320-240201/3		537, 537		100 uL	100 uL	Chlorine, ND			
320-41846-A-1	WGNA-080618-RW-0386	537, 537	T	100 uL	100 uL	Chlorine, ND			

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.: 320-41846-1

SDG No.: _____

Batch Number: 240201 Batch Start Date: 08/16/18 08:12 Batch Analyst: Kouchari, ShamiranBatch Method: 537 Batch End Date: 08/17/18 16:20

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00080	LC537-SU 00074	AnalysisComment			
320-41846-B-2	WGNA-080618-FRB-0386	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-3	WGNA-080618-RW-0413	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-4	WGNA-080618-FRB-0413	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-5	WGNA-080618-RW-0533	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-6	WGNA-080618-FRB-0533	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-7	WGNA-080618-RW-4024	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-8	WGNA-080618-FRB-4024	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-9	NAWC-080618-RW-032	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-10	NAWC-080618-FRB-032	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-11	NAWC-080618-RW-272	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-12	NAWC-080618-FRB-272	537, 537	T	100 uL	100 uL	Chlorine, ND			
320-41846-A-13	WGNA-080618-DUP-43	537, 537	T	100 uL	100 uL	Chlorine, ND			

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.: 320-41846-1

SDG No.: _____

Batch Number: 240201 Batch Start Date: 08/16/18 08:12 Batch Analyst: Kouchari, ShamiranBatch Method: 537 Batch End Date: 08/17/18 16:20

Batch Notes	
Analyst ID - Aliquot Step	SKD
Batch Comment	Client labels match TA label, SKD 08/16/18
Analyst ID - Concentration	SKD
Analyst ID - Final Volume Step	SKD
Internal Standard ID#	1334015
Manifold ID	4, A
Methanol ID	1328635
pH Indicator ID	0818
Pipette ID	R40536G, I46162G
Analyst ID - IS Reagent Drop	SKD
Analyst ID - IS Reagent Drop Witness	MNV
Analyst ID - SU Reagent Drop	SKD
Analyst ID - SU Reagent Drop Witness	HJA
Analyst ID - TA Reagent Drop	SKD
Analyst ID - TA Reagent Drop Witness	HJA
SPE Cartridge Lot ID	6390138-06
Trizma ID	SLBR5241V
Reagent Water ID	08/13/18, 08/16/18

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.

PFAS Calibration Calculations:

Initial Calibration
Instrument A8_N

8/15/2018

PFOA

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	Reported RRF
1.98	222587	1026304	10	1.09536	1.0954
4.4	482587	1041660	10	1.05292	1.0529
9.9	1035552	958352	10	1.09147	1.0915
19.8	2293687	1045953	10	1.10753	1.1075
29.7	3102767	944777	10	1.10577	1.1058
39.6	4216218	981996	10	1.08422	1.0842
Average				1.08955	1.0895
Standard Deviation				0.0200	
RSD				0.0183	
%RSD				1.83275	1.8

Continuing Calibration
PFOA

08/19/2018 @ 1:06

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	%D	Reported RRF	Reported %D
9.9	1075354	993768	10	1.0930	0.3238101	1.093	0.3

Sample Identification
Compound

NAWC-080618-RW-0386
PFOA

Compound Area	773966	Average RRF	1.09
Internal Standard Amount (ng)	10	Sample Volume(ml)	278.4
Dilution Factor	1	Volume Extract (ml)	1
Internal Standard Area	1183795	Injection Volume (µl)	1

Concentration
Reported Result

21.5452 ng/L
22 ng/L

Surrogate PFHxA

Compound Area	1179852		
Internal Standard Amount (ng)	10		
Dilution Factor	1	Volume Extract (ml)	1
Internal Standard Area	1183795	Injection Volume (µl)	1
Average RRF	1.0394		
Concentration	9.5889		
Surrogate %R	95.89	Spike amount	10

LCS/LCSD %R

320-240201/2-A PFOA 104.55	Spike amount 110	LCS concentration 115	
			RPD 2.643172
320-240201/3-A PFOA 101.82	Spike amount 110	LCS concentration 112	

DODCMD_ID	INSTALLATION_ID	SDG	SITE_NAME	NORM_SITE_NAME	LOCATION_NAME	LOCATION_TYPE_DESC	COORD_X	COORD_Y	CONTRACT_ID	DO_CTO_NUMBER	CONTR_NAME	SAMPLE_NAME	SAMPLE_MATRIX_DESC	SAMPLE_TYPE_DESC	COLLECT_DATE	ANALYTICAL_METHOD	ANALYTICAL_METHOD_GRP_DESC
MID_ATLANTIC	WILLOW_GROVE_NAS	320-41846-1	OFFSITE_RW	SITE 00005	WGNA-RW-4024	Domestic well	2702640.265	321549.5809	N6247016D9008	WE04	TETRA TECH, INC.	WGNA-080618-RW-4024-D	Ground water	Field duplicate	6-Aug-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	WILLOW_GROVE_NAS	320-41846-1							N6247016D9008	WE04	TETRA TECH, INC.	WGNA-080618-FRB-0386	Water for QC samples	Field Reagent Blank	6-Aug-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	WILLOW_GROVE_NAS	320-41846-1	OFFSITE_RW	SITE 00005	WGNA-RW-4024	Domestic well	2702640.265	321549.5809	N6247016D9008	WE04	TETRA TECH, INC.	WGNA-080618-RW-4024	Ground water	Normal (Regular)	6-Aug-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	WILLOW_GROVE_NAS	320-41846-1							N6247016D9008	WE04	TETRA TECH, INC.	WGNA-080618-FRB-0533	Water for QC samples	Field Reagent Blank	6-Aug-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	WILLOW_GROVE_NAS	320-41846-1							N6247016D9008	WE04	TETRA TECH, INC.	WGNA-080618-FRB-0413	Water for QC samples	Field Reagent Blank	6-Aug-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	WILLOW_GROVE_NAS	320-41846-1	OFFSITE_RW	SITE 00005	WGNA-RW-0386	Domestic well	2687292.16	330732.2721	N6247016D9008	WE04	TETRA TECH, INC.	WGNA-080618-RW-0386	Ground water	Normal (Regular)	6-Aug-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	WILLOW_GROVE_NAS	320-41846-1	OFFSITE_RW	SITE 00005	WGNA-RW-0533	Domestic well	2697584.858	320233.0473	N6247016D9008	WE04	TETRA TECH, INC.	WGNA-080618-RW-0533	Ground water	Normal (Regular)	6-Aug-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	WILLOW_GROVE_NAS	320-41846-1	OFFSITE_RW	SITE 00005	WGNA-RW-0413	Domestic well	2698499.632	319585.5155	N6247016D9008	WE04	TETRA TECH, INC.	WGNA-080618-RW-0413	Ground water	Normal (Regular)	6-Aug-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	WILLOW_GROVE_NAS	320-41846-1							N6247016D9008	WE04	TETRA TECH, INC.	WGNA-080618-FRB-4024	Water for QC samples	Field Reagent Blank	6-Aug-18	537	Perfluoroalkyl Compounds