



**Off-Base Drinking Water Sample Results,
Combined Level 2 and Level 4 Laboratory Report,
Electronic Data Deliverable, Data Validation Report,
and the Sample Location Figure, SDG 320-30576-1**

*Naval Air Station Willow Grove
Willow Grove, Pennsylvania*

August 2019

N00158_000747
WILLOW_GROVE_NAS
SSIC 5000-33c

**LABORATORY DATA PACKAGE, 320-30576-1, NAWC WARMINSTER NAS
WILLOW GROVE PA**

08/24/2017

TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

ANALYTICAL REPORT

Job Number: 320-30576-1

Job Description: Warminster: PFAS, NAS JRB Willow Grove

For:
Tetra Tech, Inc.
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King of Prussia, PA 19406
Attention: Andy Frebowitz



Approved for release.
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8/24/2017 4:03 PM

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Definitions/Glossary

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

TestAmerica Job ID: 320-30576-1

Qualifiers

LCMS

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
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
320-30576-1

Receipt

The samples were received on 8/10/2017 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.3° 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.

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 (MS/MSD) associated with preparation batch 320-179409.

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: 320-30576-1

Client Sample ID: NAWC-080917-RW-337A

Lab Sample ID: 320-30576-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	19	J M	39	6.7	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	15	J	20	2.8	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.8	J	9.9	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-080917-FRB-337A

Lab Sample ID: 320-30576-2

No Detections.

Client Sample ID: NAWC-080917-RW-337B

Lab Sample ID: 320-30576-3

No Detections.

Client Sample ID: WGNA-080917-RW-107A

Lab Sample ID: 320-30576-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	15	J M	39	6.6	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	13	J	20	2.7	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	12	J	29	5.4	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.6	J	9.8	1.9	ng/L	1		537	Total/NA

Client Sample ID: WGNA-080917-FRB-107A

Lab Sample ID: 320-30576-5

No Detections.

Client Sample ID: WGNA-080917-RW-107B

Lab Sample ID: 320-30576-6

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	15	J	39	6.6	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	13	J	19	2.7	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	12	J	29	5.3	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.8	J	9.7	1.8	ng/L	1		537	Total/NA

Client Sample ID: NAWC-080917-RW-320

Lab Sample ID: 320-30576-7

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	7.2	J	20	2.8	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.4	J M	10	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-080917-FRB-320

Lab Sample ID: 320-30576-8

No Detections.

Client Sample ID: WGNA-080917-RW-263

Lab Sample ID: 320-30576-9

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	18	J	39	6.6	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	17	J	19	2.7	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	9.1	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

Detection Summary

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

TestAmerica Job ID: 320-30576-1

Client Sample ID: WGNA-080917-FRB-263

Lab Sample ID: 320-30576-10

No Detections.

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: 320-30576-1

Client Sample ID: NAWC-080917-RW-337A

Lab Sample ID: 320-30576-1

Date Collected: 08/09/17 08:50

Matrix: Water

Date Received: 08/10/17 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	19	J M	39	6.7	ng/L		08/15/17 07:52	08/17/17 21:00	1
Perfluorooctanoic acid (PFOA)	15	J	20	2.8	ng/L		08/15/17 07:52	08/17/17 21:00	1
Perfluorononanoic acid (PFNA)	20	U	24	7.9	ng/L		08/15/17 07:52	08/17/17 21:00	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.4	ng/L		08/15/17 07:52	08/17/17 21:00	1
Perfluoroheptanoic acid (PFHpA)	4.8	J	9.9	1.9	ng/L		08/15/17 07:52	08/17/17 21:00	1
Perfluorobutanesulfonic acid (PFBS)	35	U	89	16	ng/L		08/15/17 07:52	08/17/17 21:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	83		70 - 130	08/15/17 07:52	08/17/17 21:00	1
13C2 PFDA	111		70 - 130	08/15/17 07:52	08/17/17 21:00	1

Client Sample ID: NAWC-080917-FRB-337A

Lab Sample ID: 320-30576-2

Date Collected: 08/09/17 08:45

Matrix: Water

Date Received: 08/10/17 09:50

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		08/15/17 07:52	08/17/17 21:04	1
Perfluorooctanoic acid (PFOA)	7.8	U	19	2.7	ng/L		08/15/17 07:52	08/17/17 21:04	1
Perfluorononanoic acid (PFNA)	19	U	23	7.8	ng/L		08/15/17 07:52	08/17/17 21:04	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.3	ng/L		08/15/17 07:52	08/17/17 21:04	1
Perfluoroheptanoic acid (PFHpA)	3.9	U	9.7	1.8	ng/L		08/15/17 07:52	08/17/17 21:04	1
Perfluorobutanesulfonic acid (PFBS)	35	U	87	16	ng/L		08/15/17 07:52	08/17/17 21:04	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	100		70 - 130	08/15/17 07:52	08/17/17 21:04	1
13C2 PFDA	108		70 - 130	08/15/17 07:52	08/17/17 21:04	1

Client Sample ID: NAWC-080917-RW-337B

Lab Sample ID: 320-30576-3

Date Collected: 08/09/17 08:55

Matrix: Water

Date Received: 08/10/17 09:50

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		08/15/17 07:52	08/17/17 21:09	1
Perfluorooctanoic acid (PFOA)	7.6	U	19	2.7	ng/L		08/15/17 07:52	08/17/17 21:09	1
Perfluorononanoic acid (PFNA)	19	U	23	7.6	ng/L		08/15/17 07:52	08/17/17 21:09	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	29	5.3	ng/L		08/15/17 07:52	08/17/17 21:09	1
Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	1.8	ng/L		08/15/17 07:52	08/17/17 21:09	1
Perfluorobutanesulfonic acid (PFBS)	34	U	86	15	ng/L		08/15/17 07:52	08/17/17 21:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	102		70 - 130	08/15/17 07:52	08/17/17 21:09	1
13C2 PFDA	113		70 - 130	08/15/17 07:52	08/17/17 21:09	1

Client Sample Results

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

TestAmerica Job ID: 320-30576-1

Client Sample ID: WGNA-080917-RW-107A

Lab Sample ID: 320-30576-4

Date Collected: 08/09/17 09:20

Matrix: Water

Date Received: 08/10/17 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	J M	39	6.6	ng/L	-	08/15/17 07:52	08/17/17 21:14	1
Perfluorooctanoic acid (PFOA)	13	J	20	2.7	ng/L	-	08/15/17 07:52	08/17/17 21:14	1
Perfluorononanoic acid (PFNA)	20	U	23	7.8	ng/L	-	08/15/17 07:52	08/17/17 21:14	1
Perfluorohexanesulfonic acid (PFHxS)	12	J	29	5.4	ng/L	-	08/15/17 07:52	08/17/17 21:14	1
Perfluoroheptanoic acid (PFHpA)	3.6	J	9.8	1.9	ng/L	-	08/15/17 07:52	08/17/17 21:14	1
Perfluorobutanesulfonic acid (PFBS)	35	U	88	16	ng/L	-	08/15/17 07:52	08/17/17 21:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	86		70 - 130				08/15/17 07:52	08/17/17 21:14	1
13C2 PFDA	104		70 - 130				08/15/17 07:52	08/17/17 21:14	1

Client Sample ID: WGNA-080917-FRB-107A

Lab Sample ID: 320-30576-5

Date Collected: 08/09/17 09:15

Matrix: Water

Date Received: 08/10/17 09:50

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	-	08/15/17 07:52	08/17/17 21:19	1
Perfluorooctanoic acid (PFOA)	7.8	U	19	2.7	ng/L	-	08/15/17 07:52	08/17/17 21:19	1
Perfluorononanoic acid (PFNA)	19	U	23	7.8	ng/L	-	08/15/17 07:52	08/17/17 21:19	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.3	ng/L	-	08/15/17 07:52	08/17/17 21:19	1
Perfluoroheptanoic acid (PFHpA)	3.9	U	9.7	1.8	ng/L	-	08/15/17 07:52	08/17/17 21:19	1
Perfluorobutanesulfonic acid (PFBS)	35	U	87	16	ng/L	-	08/15/17 07:52	08/17/17 21:19	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	98		70 - 130				08/15/17 07:52	08/17/17 21:19	1
13C2 PFDA	108		70 - 130				08/15/17 07:52	08/17/17 21:19	1

Client Sample ID: WGNA-080917-RW-107B

Lab Sample ID: 320-30576-6

Date Collected: 08/09/17 09:25

Matrix: Water

Date Received: 08/10/17 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	J	39	6.6	ng/L	-	08/15/17 07:52	08/17/17 21:23	1
Perfluorooctanoic acid (PFOA)	13	J	19	2.7	ng/L	-	08/15/17 07:52	08/17/17 21:23	1
Perfluorononanoic acid (PFNA)	19	U	23	7.7	ng/L	-	08/15/17 07:52	08/17/17 21:23	1
Perfluorohexanesulfonic acid (PFHxS)	12	J	29	5.3	ng/L	-	08/15/17 07:52	08/17/17 21:23	1
Perfluoroheptanoic acid (PFHpA)	3.8	J	9.7	1.8	ng/L	-	08/15/17 07:52	08/17/17 21:23	1
Perfluorobutanesulfonic acid (PFBS)	35	U	87	16	ng/L	-	08/15/17 07:52	08/17/17 21:23	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	89		70 - 130				08/15/17 07:52	08/17/17 21:23	1
13C2 PFDA	120		70 - 130				08/15/17 07:52	08/17/17 21:23	1

Client Sample Results

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

TestAmerica Job ID: 320-30576-1

Client Sample ID: NAWC-080917-RW-320

Lab Sample ID: 320-30576-7

Date Collected: 08/09/17 08:30

Matrix: Water

Date Received: 08/10/17 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		08/15/17 07:52	08/17/17 21:28	1
Perfluorooctanoic acid (PFOA)	7.2	J	20	2.8	ng/L		08/15/17 07:52	08/17/17 21:28	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		08/15/17 07:52	08/17/17 21:28	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		08/15/17 07:52	08/17/17 21:28	1
Perfluoroheptanoic acid (PFHpA)	2.4	J M	10	1.9	ng/L		08/15/17 07:52	08/17/17 21:28	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		08/15/17 07:52	08/17/17 21:28	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	90		70 - 130	08/15/17 07:52	08/17/17 21:28	1
13C2 PFDA	110		70 - 130	08/15/17 07:52	08/17/17 21:28	1

Client Sample ID: NAWC-080917-FRB-320

Lab Sample ID: 320-30576-8

Date Collected: 08/09/17 08:25

Matrix: Water

Date Received: 08/10/17 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	39	6.7	ng/L		08/15/17 07:52	08/17/17 21:42	1
Perfluorooctanoic acid (PFOA)	7.9	U	20	2.8	ng/L		08/15/17 07:52	08/17/17 21:42	1
Perfluorononanoic acid (PFNA)	20	U	24	7.9	ng/L		08/15/17 07:52	08/17/17 21:42	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.4	ng/L		08/15/17 07:52	08/17/17 21:42	1
Perfluoroheptanoic acid (PFHpA)	3.9	U	9.8	1.9	ng/L		08/15/17 07:52	08/17/17 21:42	1
Perfluorobutanesulfonic acid (PFBS)	35	U	89	16	ng/L		08/15/17 07:52	08/17/17 21:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	102		70 - 130	08/15/17 07:52	08/17/17 21:42	1
13C2 PFDA	113		70 - 130	08/15/17 07:52	08/17/17 21:42	1

Client Sample ID: WGNA-080917-RW-263

Lab Sample ID: 320-30576-9

Date Collected: 08/09/17 10:10

Matrix: Water

Date Received: 08/10/17 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	18	J	39	6.6	ng/L		08/15/17 07:52	08/17/17 21:47	1
Perfluorooctanoic acid (PFOA)	17	J	19	2.7	ng/L		08/15/17 07:52	08/17/17 21:47	1
Perfluorononanoic acid (PFNA)	19	U	23	7.8	ng/L		08/15/17 07:52	08/17/17 21:47	1
Perfluorohexanesulfonic acid (PFHxS)	9.1	J	29	5.3	ng/L		08/15/17 07:52	08/17/17 21:47	1
Perfluoroheptanoic acid (PFHpA)	4.6	J	9.7	1.8	ng/L		08/15/17 07:52	08/17/17 21:47	1
Perfluorobutanesulfonic acid (PFBS)	35	U	87	16	ng/L		08/15/17 07:52	08/17/17 21:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	89		70 - 130	08/15/17 07:52	08/17/17 21:47	1
13C2 PFDA	112		70 - 130	08/15/17 07:52	08/17/17 21:47	1

Client Sample Results

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

TestAmerica Job ID: 320-30576-1

Client Sample ID: WGNA-080917-FRB-263

Lab Sample ID: 320-30576-10

Date Collected: 08/09/17 10:05

Matrix: Water

Date Received: 08/10/17 09:50

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		08/15/17 07:52	08/17/17 21:52	1
Perfluorooctanoic acid (PFOA)	7.6	U	19	2.7	ng/L		08/15/17 07:52	08/17/17 21:52	1
Perfluorononanoic acid (PFNA)	19	U	23	7.6	ng/L		08/15/17 07:52	08/17/17 21:52	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	29	5.2	ng/L		08/15/17 07:52	08/17/17 21:52	1
Perfluoroheptanoic acid (PFHpA)	3.8	U	9.5	1.8	ng/L		08/15/17 07:52	08/17/17 21:52	1
Perfluorobutanesulfonic acid (PFBS)	34	U	86	15	ng/L		08/15/17 07:52	08/17/17 21:52	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
¹³ C2 PFHxA	104		70 - 130	08/15/17 07:52	08/17/17 21:52	1
¹³ C2 PFDA	115		70 - 130	08/15/17 07:52	08/17/17 21:52	1

Default Detection Limits

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

TestAmerica Job ID: 320-30576-1

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: 320-30576-1

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

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		3C2 PFHx (70-130)	3C2 PFDA (70-130)
320-30576-1	NAWC-080917-RW-337A	83	111
320-30576-2	NAWC-080917-FRB-337A	100	108
320-30576-3	NAWC-080917-RW-337B	102	113
320-30576-4	WGNA-080917-RW-107A	86	104
320-30576-5	WGNA-080917-FRB-107A	98	108
320-30576-6	WGNA-080917-RW-107B	89	120
320-30576-7	NAWC-080917-RW-320	90	110
320-30576-8	NAWC-080917-FRB-320	102	113
320-30576-9	WGNA-080917-RW-263	89	112
320-30576-10	WGNA-080917-FRB-263	104	115
LCS 320-179409/2-A	Lab Control Sample	101	109
LCSD 320-179409/3-A	Lab Control Sample Dup	100	113
MB 320-179409/1-A	Method Blank	97	112

Surrogate Legend

13C2 PFHxA = 13C2 PFHxA

13C2 PFDA = 13C2 PFDA

QC Sample Results

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

TestAmerica Job ID: 320-30576-1

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

Lab Sample ID: MB 320-179409/1-A
Matrix: Water
Analysis Batch: 180244

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 179409

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		08/15/17 07:52	08/17/17 20:45	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		08/15/17 07:52	08/17/17 20:45	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		08/15/17 07:52	08/17/17 20:45	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		08/15/17 07:52	08/17/17 20:45	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		08/15/17 07:52	08/17/17 20:45	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		08/15/17 07:52	08/17/17 20:45	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C2 PFHxA	97		70 - 130	08/15/17 07:52	08/17/17 20:45	1
13C2 PFDA	112		70 - 130	08/15/17 07:52	08/17/17 20:45	1

Lab Sample ID: LCS 320-179409/2-A
Matrix: Water
Analysis Batch: 180244

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 179409

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanoic acid (PFOA)	66.7	66.4		ng/L		100	70 - 130
Perfluorononanoic acid (PFNA)	66.7	59.3		ng/L		89	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	100	103		ng/L		103	70 - 130
Perfluoroheptanoic acid (PFHpA)	33.3	33.9		ng/L		102	70 - 130
Perfluorobutanesulfonic acid (PFBS)	300	319		ng/L		106	70 - 130

Surrogate	LCS	LCS	Limits
	%Recovery	Qualifier	
13C2 PFHxA	101		70 - 130
13C2 PFDA	109		70 - 130

Lab Sample ID: LCSD 320-179409/3-A
Matrix: Water
Analysis Batch: 180244

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 179409

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	
								RPD	Limit
Perfluorooctanesulfonic acid (PFOS)	133	135		ng/L		101	70 - 130	1	30
Perfluorooctanoic acid (PFOA)	66.7	67.7		ng/L		101	70 - 130	2	30
Perfluorononanoic acid (PFNA)	66.7	57.1		ng/L		86	70 - 130	4	30
Perfluorohexanesulfonic acid (PFHxS)	100	103		ng/L		103	70 - 130	0	30
Perfluoroheptanoic acid (PFHpA)	33.3	32.3		ng/L		97	70 - 130	5	30
Perfluorobutanesulfonic acid (PFBS)	300	320		ng/L		107	70 - 130	0	30

Surrogate	LCSD	LCSD	Limits
	%Recovery	Qualifier	
13C2 PFHxA	100		70 - 130
13C2 PFDA	113		70 - 130

TestAmerica Sacramento

QC Association Summary

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

TestAmerica Job ID: 320-30576-1

LCMS

Prep Batch: 179409

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-30576-1	NAWC-080917-RW-337A	Total/NA	Water	537	
320-30576-2	NAWC-080917-FRB-337A	Total/NA	Water	537	
320-30576-3	NAWC-080917-RW-337B	Total/NA	Water	537	
320-30576-4	WGNA-080917-RW-107A	Total/NA	Water	537	
320-30576-5	WGNA-080917-FRB-107A	Total/NA	Water	537	
320-30576-6	WGNA-080917-RW-107B	Total/NA	Water	537	
320-30576-7	NAWC-080917-RW-320	Total/NA	Water	537	
320-30576-8	NAWC-080917-FRB-320	Total/NA	Water	537	
320-30576-9	WGNA-080917-RW-263	Total/NA	Water	537	
320-30576-10	WGNA-080917-FRB-263	Total/NA	Water	537	
MB 320-179409/1-A	Method Blank	Total/NA	Water	537	
LCS 320-179409/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 320-179409/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 180244

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-30576-1	NAWC-080917-RW-337A	Total/NA	Water	537	179409
320-30576-2	NAWC-080917-FRB-337A	Total/NA	Water	537	179409
320-30576-3	NAWC-080917-RW-337B	Total/NA	Water	537	179409
320-30576-4	WGNA-080917-RW-107A	Total/NA	Water	537	179409
320-30576-5	WGNA-080917-FRB-107A	Total/NA	Water	537	179409
320-30576-6	WGNA-080917-RW-107B	Total/NA	Water	537	179409
320-30576-7	NAWC-080917-RW-320	Total/NA	Water	537	179409
MB 320-179409/1-A	Method Blank	Total/NA	Water	537	179409
LCS 320-179409/2-A	Lab Control Sample	Total/NA	Water	537	179409
LCSD 320-179409/3-A	Lab Control Sample Dup	Total/NA	Water	537	179409

Analysis Batch: 180245

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-30576-8	NAWC-080917-FRB-320	Total/NA	Water	537	179409
320-30576-9	WGNA-080917-RW-263	Total/NA	Water	537	179409
320-30576-10	WGNA-080917-FRB-263	Total/NA	Water	537	179409

Lab Chronicle

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

TestAmerica Job ID: 320-30576-1

Client Sample ID: NAWC-080917-RW-337A

Date Collected: 08/09/17 08:50

Date Received: 08/10/17 09:50

Lab Sample ID: 320-30576-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			179409	08/15/17 07:52	CCB	TAL SAC
Total/NA	Analysis	537		1	180244	08/17/17 21:00	JRB	TAL SAC

Client Sample ID: NAWC-080917-FRB-337A

Date Collected: 08/09/17 08:45

Date Received: 08/10/17 09:50

Lab Sample ID: 320-30576-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			179409	08/15/17 07:52	CCB	TAL SAC
Total/NA	Analysis	537		1	180244	08/17/17 21:04	JRB	TAL SAC

Client Sample ID: NAWC-080917-RW-337B

Date Collected: 08/09/17 08:55

Date Received: 08/10/17 09:50

Lab Sample ID: 320-30576-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			179409	08/15/17 07:52	CCB	TAL SAC
Total/NA	Analysis	537		1	180244	08/17/17 21:09	JRB	TAL SAC

Client Sample ID: WGNA-080917-RW-107A

Date Collected: 08/09/17 09:20

Date Received: 08/10/17 09:50

Lab Sample ID: 320-30576-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			179409	08/15/17 07:52	CCB	TAL SAC
Total/NA	Analysis	537		1	180244	08/17/17 21:14	JRB	TAL SAC

Client Sample ID: WGNA-080917-FRB-107A

Date Collected: 08/09/17 09:15

Date Received: 08/10/17 09:50

Lab Sample ID: 320-30576-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			179409	08/15/17 07:52	CCB	TAL SAC
Total/NA	Analysis	537		1	180244	08/17/17 21:19	JRB	TAL SAC

Client Sample ID: WGNA-080917-RW-107B

Date Collected: 08/09/17 09:25

Date Received: 08/10/17 09:50

Lab Sample ID: 320-30576-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			179409	08/15/17 07:52	CCB	TAL SAC
Total/NA	Analysis	537		1	180244	08/17/17 21:23	JRB	TAL SAC

TestAmerica Sacramento

Lab Chronicle

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

TestAmerica Job ID: 320-30576-1

Client Sample ID: NAWC-080917-RW-320

Date Collected: 08/09/17 08:30

Date Received: 08/10/17 09:50

Lab Sample ID: 320-30576-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			179409	08/15/17 07:52	CCB	TAL SAC
Total/NA	Analysis	537		1	180244	08/17/17 21:28	JRB	TAL SAC

Client Sample ID: NAWC-080917-FRB-320

Date Collected: 08/09/17 08:25

Date Received: 08/10/17 09:50

Lab Sample ID: 320-30576-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			179409	08/15/17 07:52	CCB	TAL SAC
Total/NA	Analysis	537		1	180245	08/17/17 21:42	JRB	TAL SAC

Client Sample ID: WGNA-080917-RW-263

Date Collected: 08/09/17 10:10

Date Received: 08/10/17 09:50

Lab Sample ID: 320-30576-9

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			179409	08/15/17 07:52	CCB	TAL SAC
Total/NA	Analysis	537		1	180245	08/17/17 21:47	JRB	TAL SAC

Client Sample ID: WGNA-080917-FRB-263

Date Collected: 08/09/17 10:05

Date Received: 08/10/17 09:50

Lab Sample ID: 320-30576-10

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			179409	08/15/17 07:52	CCB	TAL SAC
Total/NA	Analysis	537		1	180245	08/17/17 21:52	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.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-30576-1

Laboratory: TestAmerica Sacramento

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

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

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

Analysis Method	Prep Method	Matrix	Analyte
537	537	Water	Perfluorobutanesulfonic acid (PFBS)
537	537	Water	Perfluoroheptanoic acid (PFHpA)
537	537	Water	Perfluorohexanesulfonic acid (PFHxS)
537	537	Water	Perfluorononanoic acid (PFNA)
537	537	Water	Perfluorooctanesulfonic acid (PFOS)
537	537	Water	Perfluorooctanoic acid (PFOA)

Method Summary

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

TestAmerica Job ID: 320-30576-1

Method	Method Description	Protocol	Laboratory
537	Perfluorinated Alkyl Acids (LC/MS)	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: 320-30576-1

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

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-30576-1	NAWC-080917-RW-337A	Water	08/09/17 08:50	08/10/17 09:50
320-30576-2	NAWC-080917-FRB-337A	Water	08/09/17 08:45	08/10/17 09:50
320-30576-3	NAWC-080917-RW-337B	Water	08/09/17 08:55	08/10/17 09:50
320-30576-4	WGNA-080917-RW-107A	Water	08/09/17 09:20	08/10/17 09:50
320-30576-5	WGNA-080917-FRB-107A	Water	08/09/17 09:15	08/10/17 09:50
320-30576-6	WGNA-080917-RW-107B	Water	08/09/17 09:25	08/10/17 09:50
320-30576-7	NAWC-080917-RW-320	Water	08/09/17 08:30	08/10/17 09:50
320-30576-8	NAWC-080917-FRB-320	Water	08/09/17 08:25	08/10/17 09:50
320-30576-9	WGNA-080917-RW-263	Water	08/09/17 10:10	08/10/17 09:50
320-30576-10	WGNA-080917-FRB-263	Water	08/09/17 10:05	08/10/17 09:50

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 180236

Lab Sample ID: CCVL 320-180236/9 Client Sample ID: _____

Date Analyzed: 08/17/17 17:40 Lab File ID: 207.08.17_537A_011.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.17	Assign Peak	phomsophat	08/19/17 13:45

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 180244

Lab Sample ID: CCV 320-180244/1 CCVIS Client Sample ID: _____

Date Analyzed: 08/17/17 20:36 Lab File ID: 2017.08.17_537B_001.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.16	Missed Peak	barnettj	08/21/17 16:09

Lab Sample ID: LCS 320-179409/2-A Client Sample ID: _____

Date Analyzed: 08/17/17 20:50 Lab File ID: 2017.08.17_537B_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.16	Missed Peak	barnettj	08/21/17 16:11

Lab Sample ID: 320-30576-1 Client Sample ID: NAWC-080917-RW-337A

Date Analyzed: 08/17/17 21:00 Lab File ID: 2017.08.17_537B_006.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.16	Missed Peak	barnettj	08/21/17 16:12

Lab Sample ID: 320-30576-4 Client Sample ID: WGNA-080917-RW-107A

Date Analyzed: 08/17/17 21:14 Lab File ID: 2017.08.17_537B_009.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.16	Missed Peak	barnettj	08/21/17 16:13

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 180244

Lab Sample ID: 320-30576-7 Client Sample ID: NAWC-080917-RW-320

Date Analyzed: 08/17/17 21:28 Lab File ID: 2017.08.17_537B_012.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	1.71	Missed Peak	barnettj	08/21/17 16:14

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30576-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-ICV_00028	01/05/18	08/02/17	MeOH/H2O, Lot 067374	10 mL	LC537-IS_00045	1000 uL	13C2-PFOA	10 ng/mL
.LC537-IS_00045	01/05/18	07/05/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	28.68 ng/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	0.1 ug/mL
..LCMPFOS_00019	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	0.2868 ug/mL
LC537-ICV_00028	01/05/18	08/02/17	MeOH/H2O, Lot 067374	10 mL	LC537-SU_00046	1000 uL	13C2 PFDA	50 ug/mL
.LC537-SU_00046	01/05/18	07/05/17	Methanol, Lot 104453	30000 uL	LC537ICIM_00019	20 uL	13C2 PFHxA	47.8 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	10 ng/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	100.119 ng/mL
.LC537ICIM_00019	01/25/18	08/01/17	Methanol, Lot 090285	25 mL	LC537-PFBS2_00008	0.6 mL	Perfluorobutanesulfonic acid (PFBS)	9.99613 ng/mL
..LC537-PFBS2_00008	01/25/18	07/25/17	Methanol, Lot 090285	20 mL	LC537-PFHxA2_00011	0.061 mL	Perfluoroheptanoic acid (PFHpA)	20.0761 ng/mL
...LC537-PFHxA2_00011	09/08/22	Santa Cruz Biotechnology, Lot F0917			(Purchased Reagent)		13C2 PFDA	20.1272 ng/mL
..LC537-PFHxA2_00011	01/25/18	07/25/17	Methanol, Lot 09092	31 mL	LC537-PFHxS2_00008	0.122 mL	Perfluorohexanesulfonic acid (PFHxS)	20.4843 ng/mL
...LC537-PFHxS2_00008	06/13/22	Afla Aesar, Lot 10200390			(Purchased Reagent)		13C2 PFHxA	19.698 ng/mL
..LC537-PFHxS2_00008	01/25/18	07/25/17	Methanol, Lot 090285	21 mL	LC537-PFNA2_00009	0.126 mL	Perfluorononanoic acid (PFNA)	50 ug/mL
...LC537-PFNA2_00009	06/08/22	Santa Cruz Biotechnology, Lot G2516			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LC537-PFNA2_00009	01/25/18	07/25/17	Methanol, Lot 090285	21 mL	LC537-PFOA2_00010	0.122 mL	Perfluorooctanoic acid (PFOA)	50 ug/mL
...LC537-PFOA2_00010	06/14/22	Aldrich, Lot MKCC0699			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LC537-PFOA2_00010	01/25/18	08/01/17	Methanol, Lot 090285	20 mL	LC537-PFOS2_00010	0.124 mL	Perfluorooctanesulfonic acid (PFOS)	50 ug/mL
...LC537-PFOS2_00010	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
...LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LC537-PFNA2_00002	01/25/18	07/25/17	Methanol, Lot 090285	21 mL	LC537-PFOS2_00002	0.0418 g	Perfluorobutanesulfonic acid (PFBS)	50.0597 ug/mL
...LC537-PFOS2_00002	09/08/22	Santa Cruz Biotechnology, Lot F0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	4.99806 ug/mL
..LC537-PFHxA2_00011	01/25/18	07/25/17	Methanol, Lot 09092	31 mL	LC537-PFHxA2_00002	0.0635 g	Perfluoroheptanoic acid (PFHpA)	4.99806 ug/mL
...LC537-PFHxA2_00011	06/13/22	Afla Aesar, Lot 10200390			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	10.038 ug/mL
..LC537-PFHxS2_00008	01/25/18	07/25/17	Methanol, Lot 090285	21 mL	LC537-PFHxS2_00002	0.0475 g	Perfluorohexanesulfonic acid (PFHxS)	10.0636 ug/mL
...LC537-PFHxS2_00008	06/08/22	Santa Cruz Biotechnology, Lot G2516			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	10.2421 ug/mL
..LC537-PFNA2_00009	01/25/18	07/25/17	Methanol, Lot 090285	21 mL	LC537-PFOA2_00002	0.0421 g	Perfluorononanoic acid (PFNA)	9.849 ug/mL
...LC537-PFNA2_00009	06/14/22	Aldrich, Lot MKCC0699			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	2085.82 ug/mL
..LC537-PFOA2_00010	01/25/18	08/01/17	Methanol, Lot 090285	20 mL	LC537-PFOA2_00002	0.0424 g	Perfluorooctanoic acid (PFOA)	0.998 g/g
...LC537-PFOA2_00010	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	1 g/g
..LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	2056.98 ug/mL
...LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.9094 g/g
..LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.996 g/g
...LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	2098.8 ug/mL
..LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.99 g/g

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30576-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LC537-PFOS2_00010	01/25/18	08/01/17	Methanol, Lot 090285	22 mL	LC537_PFOS2_00002	0.0561 g	Perfluorooctanesulfonic acid (PFOS)	1985.68 ug/mL
...LC537_PFOS2_00002	06/14/22		Sigma, Lot BCBQ0108V		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.7787 g/g
LC537-IS_00047	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
LC537-L1_00020	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-MSP_00029	60 uL	Perfluorobutanesulfonic acid (PFBS)	9.0018 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1.00036 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	3.00103 ng/mL
							Perfluorononanoic acid (PFNA)	2.0006 ng/mL
							Perfluorooctanoic acid (PFOA)	2.00191 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.00146 ng/mL
					LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
..LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LC537-MSP_00029	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	166.7 uL	Perfluorobutanesulfonic acid (PFBS)	750.15 ng/mL
							Perfluoroheptanoic acid (PFHpA)	83.3637 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	250.086 ng/mL
							Perfluorononanoic acid (PFNA)	166.716 ng/mL
							Perfluorooctanoic acid (PFOA)	166.826 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	333.455 ng/mL
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30576-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
....LC537_PFBs_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
..LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537 PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537 PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537 PFOA_00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19		sigma alrich, Lot SZBE107XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFHxA_00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFDA	50 ug/mL
LC537-L2_00020	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	80 uL	Perfluorobutanesulfonic acid (PFBS)	20.0016 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.22277 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	6.66817 ng/mL
							Perfluorononanoic acid (PFNA)	4.44524 ng/mL
							Perfluorooctanoic acid (PFOA)	4.44816 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	8.89106 ng/mL
					LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
LC537-SU_00049	500 uL	13C4 PFOS	28.68 ng/mL					
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL
							Perfluorononanoic acid (PFNA)	277.827 ng/mL
Perfluorooctanoic acid (PFOA)	278.01 ng/mL							
Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL							
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30576-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537_PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537_PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537_PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	47.8 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L3_00023	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	180 uL	Perfluorobutanesulfonic acid (PFBS)	45.0036 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5.00122 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	15.0034 ng/mL
							Perfluorononanoic acid (PFNA)	10.0018 ng/mL
							Perfluorooctanoic acid (PFOA)	10.0084 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	20.0049 ng/mL
					LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30576-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	13C2 PFHxA	10 ng/mL		
							Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL		
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL		
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL		
							Perfluorononanoic acid (PFNA)	277.827 ng/mL		
Perfluorooctanoic acid (PFOA)	278.01 ng/mL									
Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL									
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL		
							LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
							LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
							LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
							LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
							LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL		
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g		
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL		
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g		
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL		
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g		
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537 PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL		
....LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g		
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537 PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL		
....LC537 PFOA_00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g		
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL		
....LC537_PFOS_00003	04/17/19		sigma alrich, Lot SZBE107XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g		
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL		
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL		
..LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL		
..LCMPFOS_00021	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL		
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL		
					LCMPFHxA_00013	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_00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFHxA	50 ug/mL		

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30576-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
LC537-L4_00020	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	360 uL	Perfluorobutanesulfonic acid (PFBS)	90.0072 ng/mL		
							Perfluoroheptanoic acid (PFHpA)	10.0024 ng/mL		
							Perfluorohexanesulfonic acid (PFHxS)	30.0067 ng/mL		
							Perfluorononanoic acid (PFNA)	20.0036 ng/mL		
							Perfluorooctanoic acid (PFOA)	20.0167 ng/mL		
					Perfluorooctanesulfonic acid (PFOS)	40.0098 ng/mL				
					LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL		
LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL							
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL		
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL		
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL		
							Perfluorononanoic acid (PFNA)	277.827 ng/mL		
							Perfluorooctanoic acid (PFOA)	278.01 ng/mL		
Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL									
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL		
							LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
							LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
							LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
							LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
							LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL		
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g		
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL		
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g		
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL		
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g		
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537 PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL		
....LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g		
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537 PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL		
....LC537_PFOA_00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g		

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30576-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA 00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS 00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA 00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS 00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA 00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA 00013	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 00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L5_00024	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	540 uL	Perfluorobutanesulfonic acid (PFBS)	135.011 ng/mL
							Perfluoroheptanoic acid (PFHpA)	15.0037 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.0101 ng/mL
							Perfluorononanoic acid (PFNA)	30.0053 ng/mL
							Perfluorooctanoic acid (PFOA)	30.0251 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	60.0146 ng/mL
					LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL
							Perfluorononanoic acid (PFNA)	277.827 ng/mL
							Perfluorooctanoic acid (PFOA)	278.01 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA 00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA 00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30576-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
....LC537_PFB_S_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
..LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537 PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
..LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537 PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537 PFOA_00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
..LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19		sigma alrich, Lot SZBE107XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
..LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	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 PFDA	50 ug/mL
..LCMPFHxA_00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L6_00020	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	720 uL	Perfluorobutanesulfonic acid (PFBS)	180.014 ng/mL
							Perfluoroheptanoic acid (PFHpA)	20.0049 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	60.0135 ng/mL
							Perfluorononanoic acid (PFNA)	40.0071 ng/mL
							Perfluorooctanoic acid (PFOA)	40.0334 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	80.0195 ng/mL
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
							13C2 PFDA	10 ng/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LC537-SU_00049	500 uL	13C2 PFHxA	10 ng/mL
							13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL
							Perfluorononanoic acid (PFNA)	277.827 ng/mL
							Perfluorooctanoic acid (PFOA)	278.01 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30576-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537 PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537 PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537 PFOA_00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19		sigma alrich, Lot SZBE107XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00013	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_00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-MSP_00026	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	166.7 uL	Perfluorobutane Sulfonate	750.15 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	750.15 ng/mL
							Perfluoroheptanoic acid (PFHpA)	83.3637 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	250.086 ng/mL
							Perfluorononanoic acid (PFNA)	166.716 ng/mL
							Perfluorooctanoic acid (PFOA)	166.826 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30576-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	333.455 ug/mL
.LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutane Sulfonate	90 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
..LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutane Sulfonate	2 mg/mL
							Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
...LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutane Sulfonate	1 g/g
							Perfluorobutanesulfonic acid (PFBS)	1 g/g
..LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
...LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
..LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
...LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
..LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537 PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
..LC537 PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
..LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537 PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
..LC537 PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
..LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
...LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
LC537-SU_00047	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00013	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_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL

Reagent

LC537_PFB_00002

#: 4/1/15 SPV

3050 Spruce Street, Saint Louis, MO 63103, USA

Website: www.sigmaaldrich.com

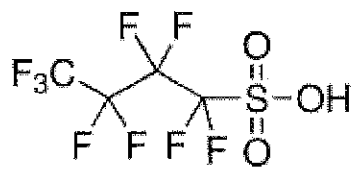
Email USA: techserv@sial.com

Outside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name:
Nonafluorobutane-1-sulfonic acid - 97%

Product Number: 562629
Batch Number: MKBP8842V
Brand: ALDRICH
CAS Number: 375-73-5
MDL Number: MFCD01320794
Formula: C4HF9O3S
Formula Weight: 300.10 g/mol
Storage Temperature: Store at 2 - 8 °C
Quality Release Date: 11 OCT 2013



PFBS

Test	Specification	Result
Appearance (Color)	Colorless	Colorless
Appearance (Form)	Liquid	Liquid
Infrared Spectrum	Conforms to Structure	Conforms
Fluorine NMR Spectrum	Conforms to Structure	Conforms
Purity (Titration by NaOH)	96.5 - 103.5 %	101.6 %

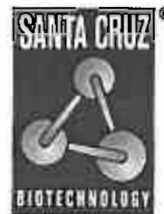
Jamie Gleason, Manager
Quality Control
Milwaukee, Wisconsin US

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_PFB2_00002

F: 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 (19F-NMR)	Conforms to structure	Complies
Purity (Sodium Hydroxide Titration)	$\geq 97\%$	101.3%
Infrared Spectrum	Conforms to structure	Complies

Reagent

LC537_PFHpA_00002

R: 4/1/15 4V

Certificate of Analysis

Product Name: PERFLUOROHEPTANOIC ACID
 99 %
Product Number: 342041
Batch Number: BCBM2579V
Brand: Aldrich
CAS Number: 375-85-9
Formula: $CF_3(CF_2)_5CO_2H$
Formula Weight: 364.06
Quality Release Date: 06 DEC 2013
Recommended Retest Date: OCT 2018

PFHpA

TEST	SPECIFICATION	RESULT
APPEARANCE (COLOR)	COLORLESS OR WHITE	WHITE
APPEARANCE (FORM)	LIQUID OR SOLID	SOLID
TITRATION	98.5 - 101.5 %	99.8 %
TITRATION (METHOD)	-	BACK TITRATION
PURITY (GC AREA %)	≥ 98.5 %	99.5 %
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS

Dr. Claudia Geitner
 Manager Quality Control
 Buchs, Switzerland

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Reagent

LC537_PFHpA2_00002

Certificate of analysis

r:6.13.17 SW

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

PFHe A

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_PFHxS_00002

r: 4/1/15 stw

Certificate of Analysis

Product Name: TRIDECAFLUOROHEXANE-1-SULFONIC ACID POTASSIUM SALT
 >= 98.0 % T

Product Number: 50929

Batch Number: BCBL3545V

Brand: Aldrich

CAS Number: 3871-99-6

Formula: C₆F₁₃KO₃S

Formula Weight: 438.20

Quality Release Date: 20 JUN 2013

PFH₁₃S-K

TEST	SPECIFICATION	RESULT
APPEARANCE (COLOR)	WHITE TO FAINT BEIGE	WHITE
APPEARANCE (FORM)	POWDER OR CRYSTALS	POWDER
TITRATION (ION EXCHANGE)	≥ 98.0 %	99.5 %
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

$$MW_{corr} = \frac{(k_{form}) - (k) + (H)}{438.20 (k_{form})} = \frac{(438.20 - 3910 + 101)}{438.20 (k_{form})} = 0.91307 \text{ (anion form)}$$

$$Purity = 90.94 \% \text{ w/m.w correction}$$

stw 4/1/15

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_PFHxS2_00002

n: 6-8-17 SKJ

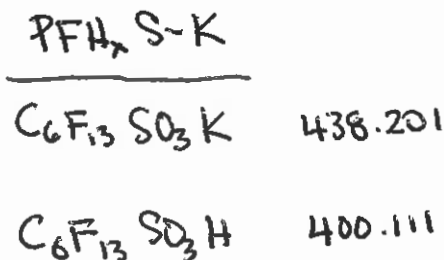


The Future of Science

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)	≥ 98.0%	100.4%



MW correction = $\frac{400.11}{438.201} = 0.91307$ PFH₁₃S
 CAS# 355-46-4

Purity $\frac{1}{9}$ MW correction = 90.9%

This document was produced electronically and is valid without a signature.

Reagent

LC537_PENA_00002

R: 4/1/15 SKV



Certificate of Analysis

Apr 2, 2015 (JST)

TOKYO CHEMICAL INDUSTRY CO.,LTD.
4-10-1 Nihonbashi-Honcho, Chuo-ku, Tokyo 103-0023 Japan

Chemical Name: Heptadecafluorononanoic Acid		
Product Number: H0843 CAS: 375-95-1	Lot: QN44F	

Tests	Results	Specifications
Purity(GC)	96.3 %	min. 95.0 %
Purity(Neutralization titration)	98.1 %	min. 95.0 %
Melting point	63.3 deg-C	62.0 to 67.0 deg-C

TCI Lot numbers are 4-5 characters in length.
Characters listed after the first 4-5 characters are control numbers for internal purpose only.

Customer service:

TCI AMERICA
Tel: +1-800-423-8616 / +1-503-283-1681
Fax: +1-888-520-1075 / +1-503-283-1987
E-mail: Sales-US@TCIchemicals.com

PFNA

Reagent

LC537_PFN2_00002

P: 6.14.17 SKW

3050 Spruce Street, Saint Louis, MO 63103, USA

Website: www.sigmaaldrich.com

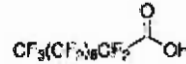
Email USA: techserv@sial.com

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: C9HF17O2
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_PFOA_00003

C: 11/30/16 SKV
PFA

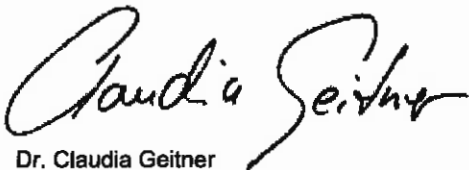
SIGMA-ALDRICH

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

Certificate of Analysis

Product Name: PENTADECAFLUOROOCCTANOIC ACID
analytical standard
Product Number: 33824
Batch Number: BCBS1198V
Brand: Sigma-Aldrich
CAS Number: 335-67-1
Formula: $\text{CF}_3(\text{CF}_2)_6\text{COOH}$
Formula Weight: 414.07
Expiration Date: OCT 2023
Quality Release Date: 12 MAY 2016

TEST	SPECIFICATION	RESULT
PURITY (HPLC AREA %)	≥ 98.0%	100.0%
IDENTIFICATION (LC-MS)	IDENTITY CONFORMS	CONFORMS



Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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: 6/21/17 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%

This document has been electronically generated and does not require a signature.

Order our products online www.alfa.com

ThermoFisher
SCIENTIFIC

Reagent

LC537_PFOs_00003

n: 11/30/16 SV
PFOS

SIGMA-ALDRICH

CERTIFICATE OF ANALYSIS

Sigma-Aldrich Laborchemikalien GmbH D-30918 Seelze
Telefon: +49 5137 8238-150

Seelze, 22.04.2014/524107/14/08646

Order-No.:

Customer-No.:

Order-Code:

Quantity:

Production Date: 17.Apr.2014

Expiry Date: 17.Apr.2019

Article/Product: 33829

Batch : SZBE107XV

Heptadecafluorooctanesulfonic acid potassium salt OEKANAL®

Reference Material (RM)

1. General Information

Formula: C₈F₁₇KO₃S

CAS-No.: [2795-39-3]

Usage : PFOS

Molar mass: 538.22 g/Mole

Recomm. storage temp.: roomtemp.

The estimated uncertainty of a single measurement of the assay can be expected to be 0.5 % relative (confidence level = 95%, n= 6) whereby the assay measurements are calculated by 100% minus found impurities.

2. Batch Analysis

Identity

Assay (LC-MS)

Date of Analysis

complying

98 %

22.Apr.2014

3. Advice and Remarks

- The expiry date is based on the current knowledge and holds only for proper storage conditions in the originally closed flasks/ packages.
- Whenever the container is opened for removal of aliquot portions of the substance, the person handling the substance must assure, that the integrity of the substance is maintained and proper records of all its handlings are kept. Special care has to be taken to avoid any contamination or adulteration of the substance.
- We herewith confirm that the delivery is effected according to the technical delivery conditions agreed.
- Particular properties of the products or the suitability for a particular area of application are not assured.
- We guarantee a proper quality within our General Conditions of Sales.

Sigma-Aldrich Laborchemikalien GmbH
Quality Management SA-LC

Reagent

LC537_PFOs2_00002

R: 6.14.17 SKV

Certificate of Analysis

Product Name: HEPTADECAFLUOROOCATANESULFONIC ACID TETRAETHYLAMMONIUM SALT
 98 %
Product Number: 365289
Batch Number: BCBQ0108V
Brand: Aldrich
CAS Number: 56773-42-3
Formula: $CF_3(CF_2)_6CF_2SO_3N(C_2H_5)_4$
Formula Weight: 629.37
Quality Release Date: 11 JUN 2015

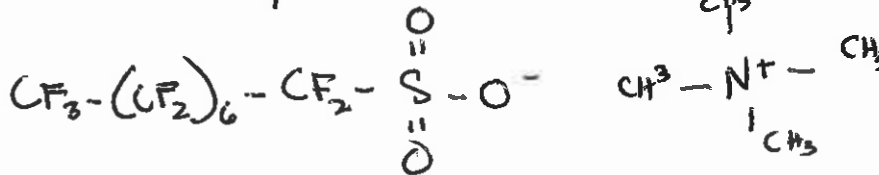
TEST	SPECIFICATION	RESULT
APPEARANCE (COLOR)	WHITE TO OFF WHITE	OFF-WHITE
APPEARANCE (FORM)	POWDER OR POWDER WITH CHUNK(S)	POWDER
CARBON CONTENT	29.77 % - 31.29 %	29.97 %
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS

Claudia Geitner

Dr. Claudia Geitner
 Manager Quality Control
 Buchs, Switzerland

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

Purity & MW correction = 77.37%



	$C_{17}F_{17}SO_3^+H$	$C_8H_{20}N$
C = 12.011	96.088	96.088
F = 18.998	322.966	—
S = 32.066	32.066	—
O = 16.999	47.997	20.60
H = 1.008	1.008	14.007
N = 14.007	—	—
	<hr/>	<hr/>
	500.125	130.255

Reagent

LCM2PFOA_00007

R: 5/11/17 SKV



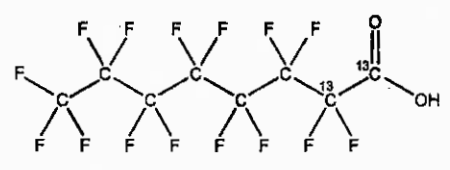
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: M2PFOA0216

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₆HF₁₆O₂
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:

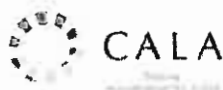
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

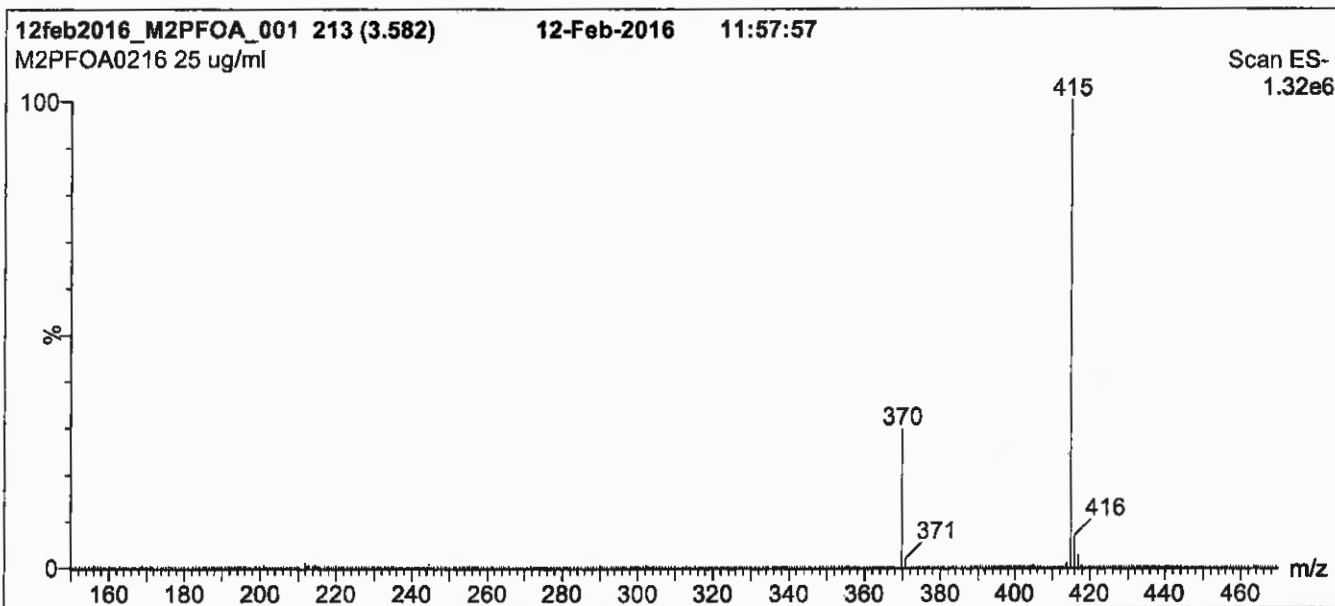
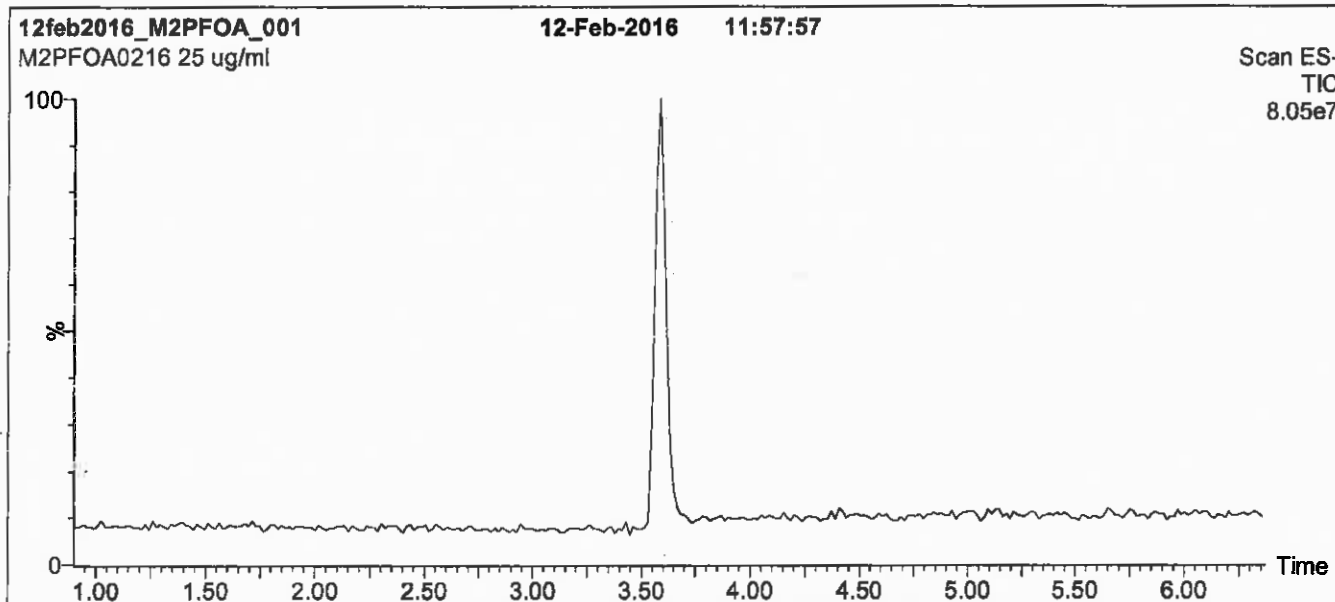
QUALITY MANAGEMENT:

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).



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: 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)

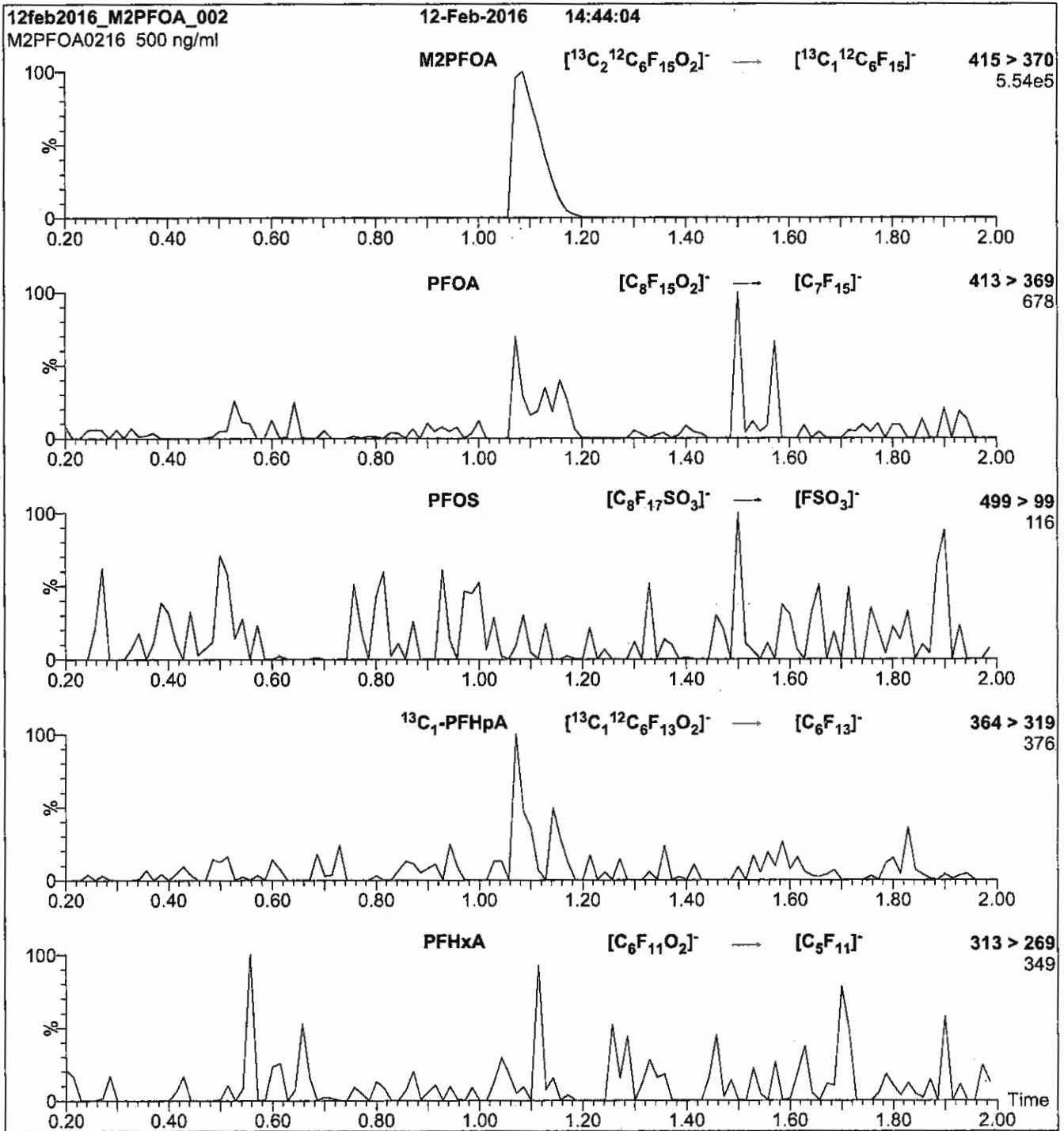
Capillary Voltage (kV) = 3.00

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% H₂O

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

MS Parameters

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

Reagent

LCMPFDA_00012

R: SBC 12/21/16



814255

ID: LCMPPFDA_00012

Exp: 09/30/21 Prpd: SBC

13C2-Perfluorodecanoic a

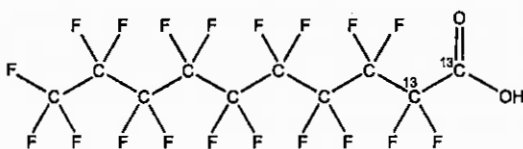


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDA **LOT NUMBER:** MPFDA0916
COMPOUND: Perfluoro-n-[1,2-¹³C₂]decanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₈HF₁₉O₂
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. Chríttim

Date: 10/07/2016
(mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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

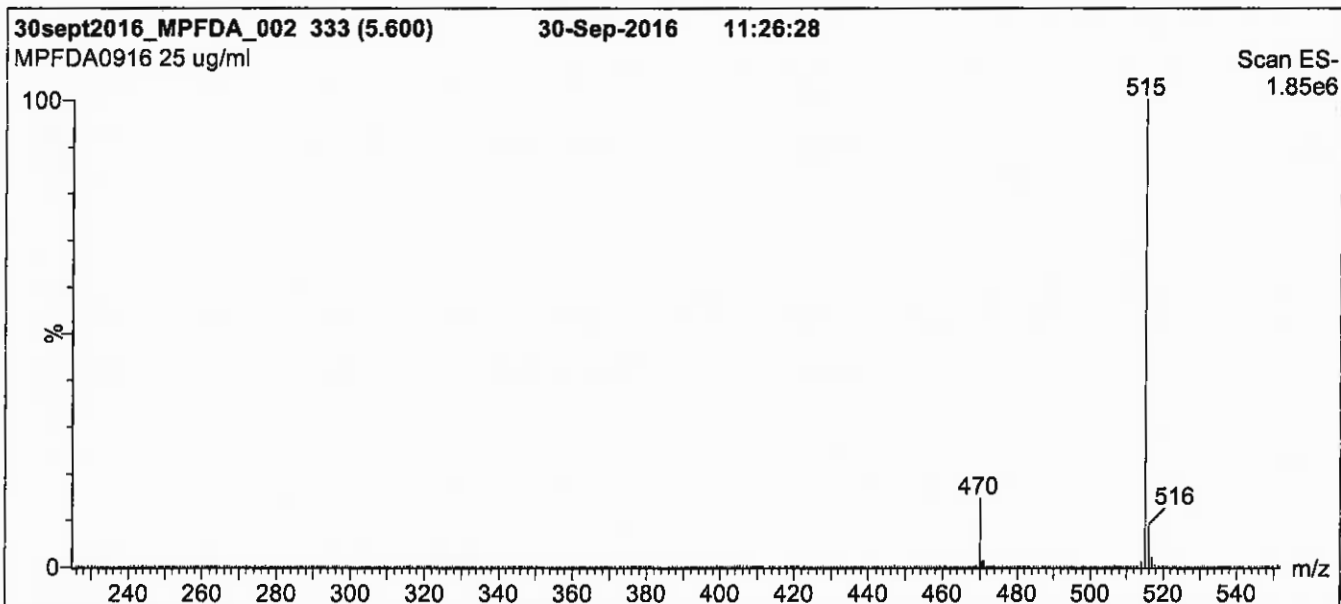
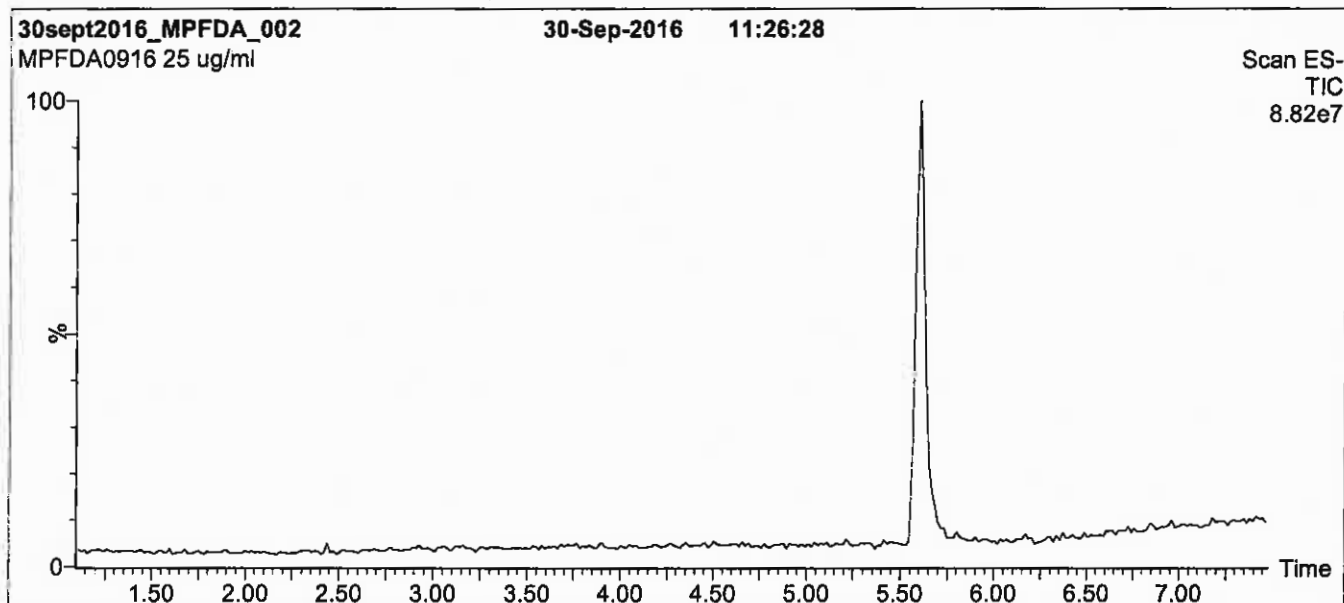
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Figure 1: MPFDA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

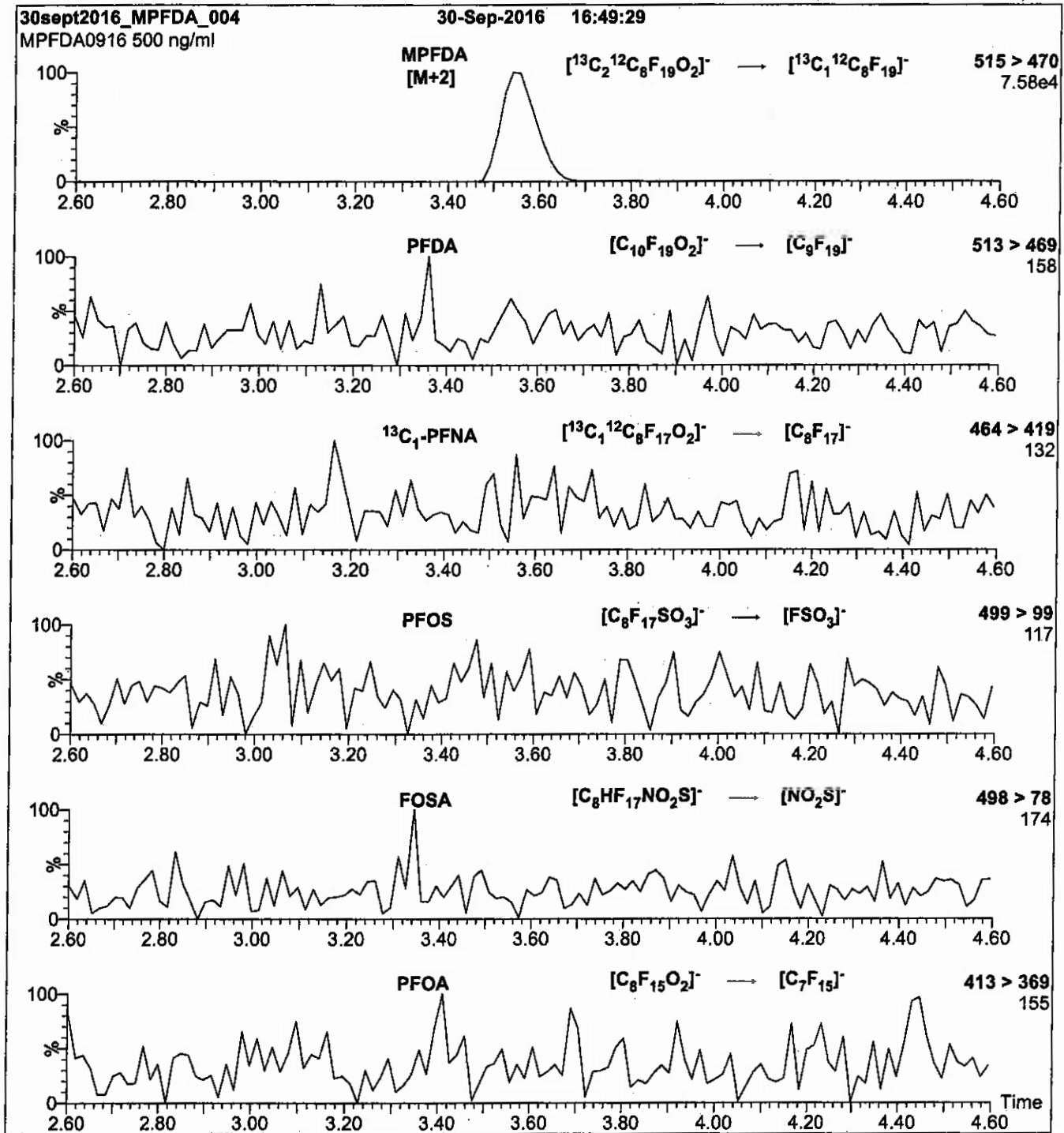
Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

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_00013

R: SBC 12/21/16



814258
ID: LCMPFHxA_00013
Exp: 04/08/21 Ppdt. SBC
13C2-Perfluorohexanoic ac



WELLINGTON LABORATORIES

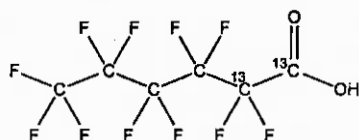
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFHxA0416

STRUCTURE:

CAS #: Not available



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

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

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99%¹³C
(1,2-¹³C₂)

LAST TESTED: (mm/dd/yyyy) 04/08/2016

EXPIRY DATE: (mm/dd/yyyy) 04/08/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:
B.G. Chittim

Date: 04/29/2016
(mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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UNCERTAINTY:

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

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.

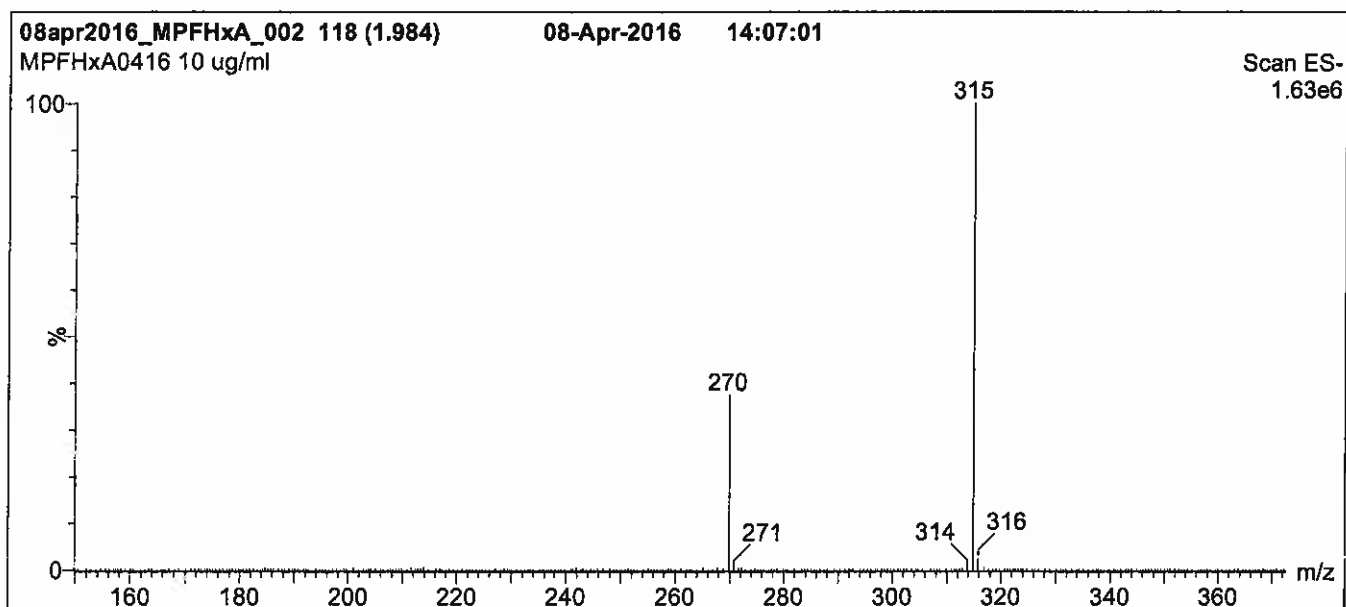
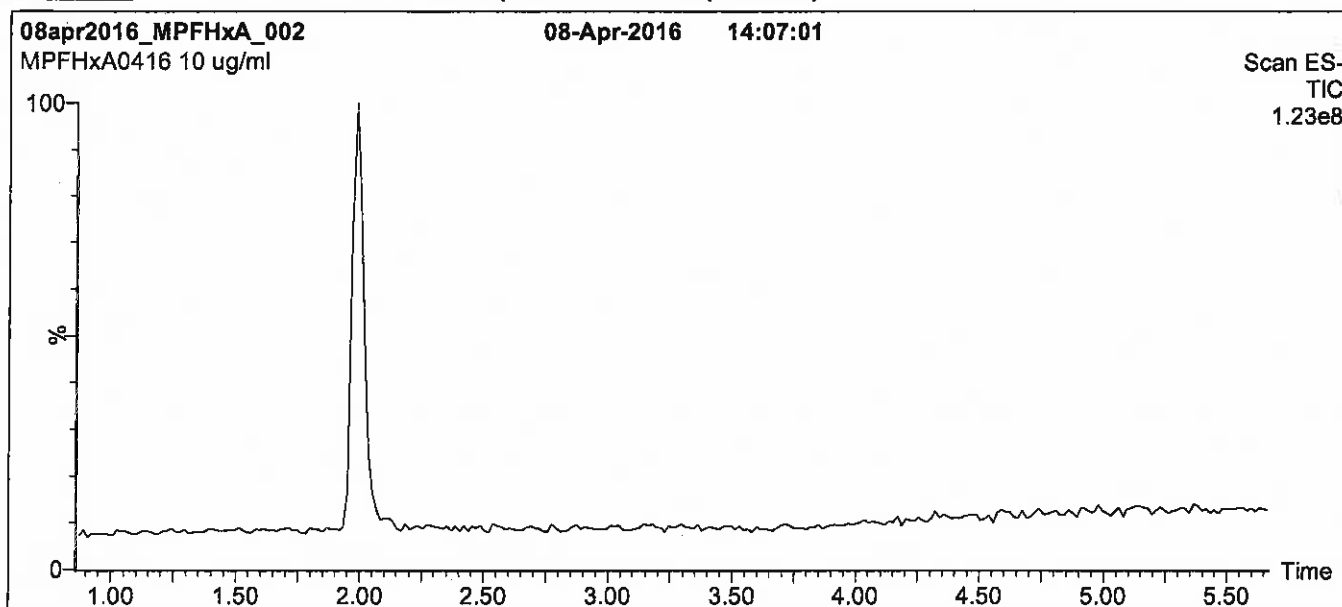
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

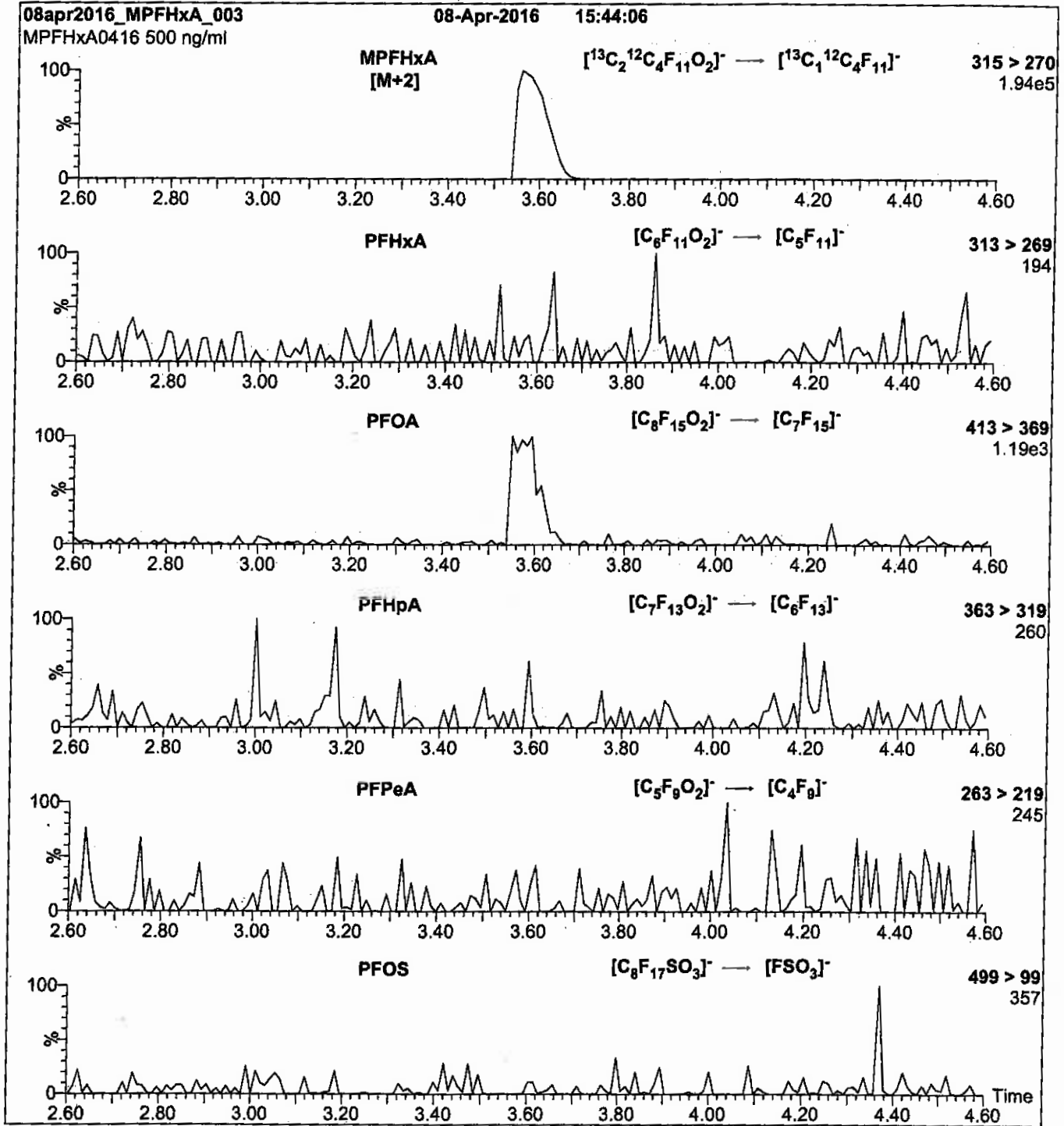
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFOS_00019

R: SBC 12/21/16



814253
ID: LCMPFOS_00019
Exp: 08/03/21 Ppfd: SBC
13C4-Perfluorooctanesulfo

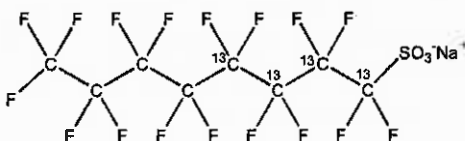


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₄¹²C₄F₁₇SO₃Na **MOLECULAR WEIGHT:** 526.08
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
47.8 ± 2.4 µg/ml (MPFOS anion)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
LAST TESTED: (mm/dd/yyyy) 08/03/2016 (1,2,3,4-¹³C₄)
EXPIRY DATE: (mm/dd/yyyy) 08/03/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place


DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim **Date:** 08/05/2016
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

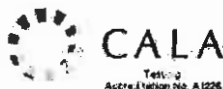
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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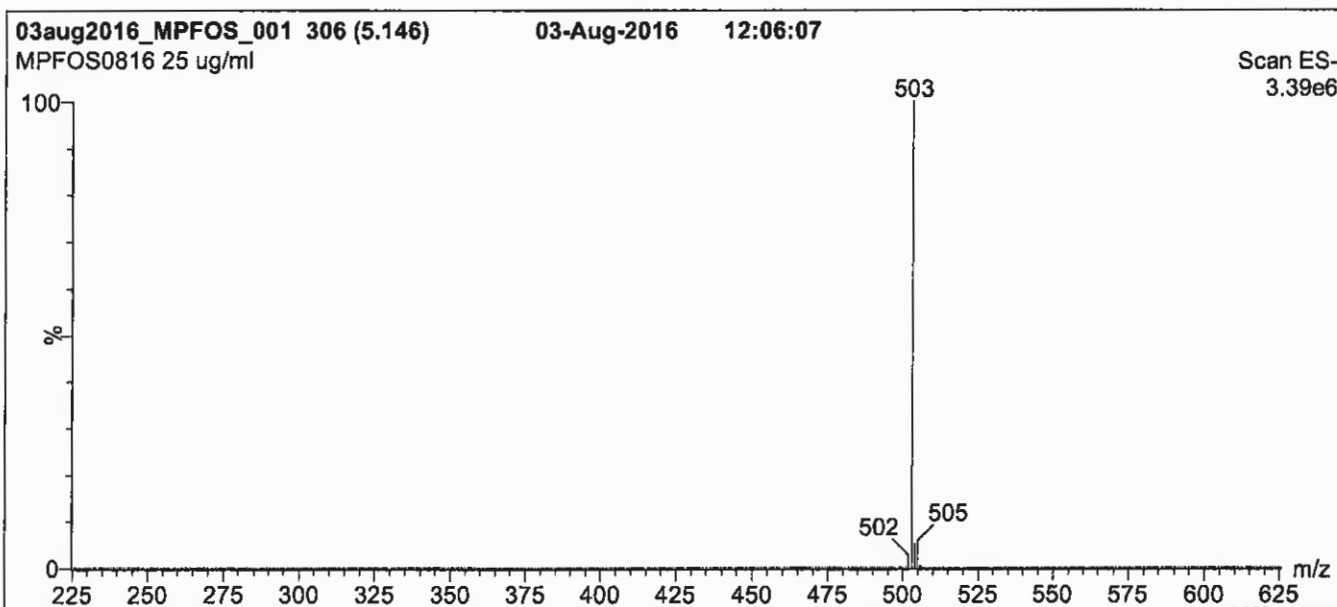
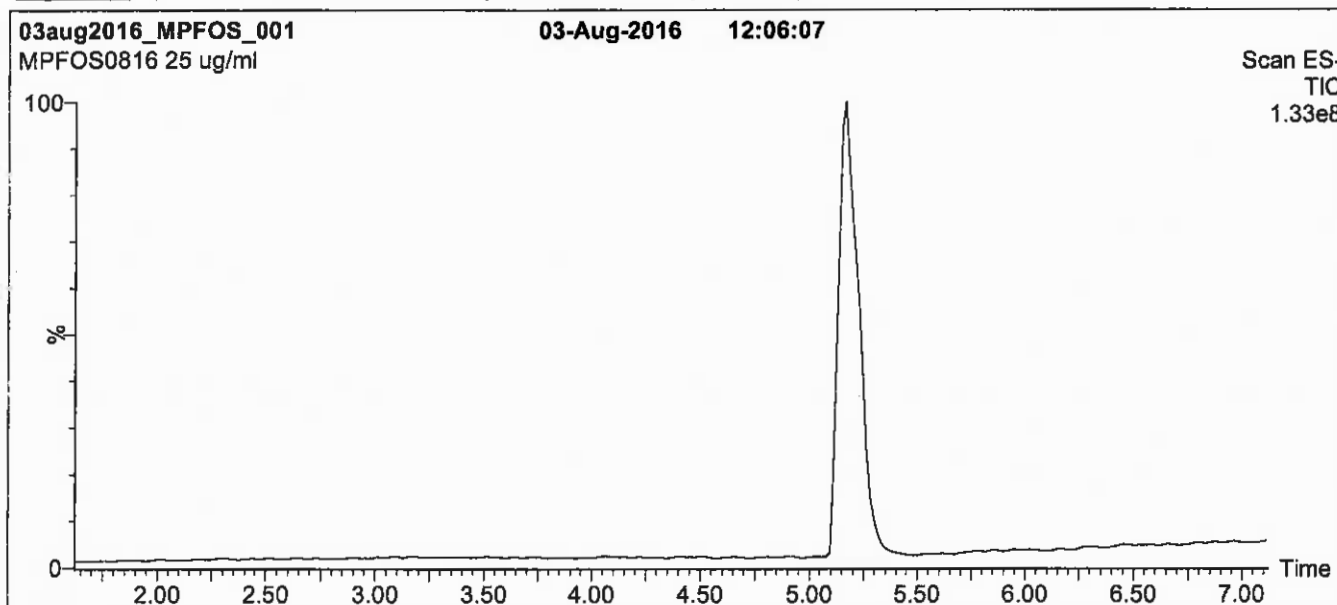
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

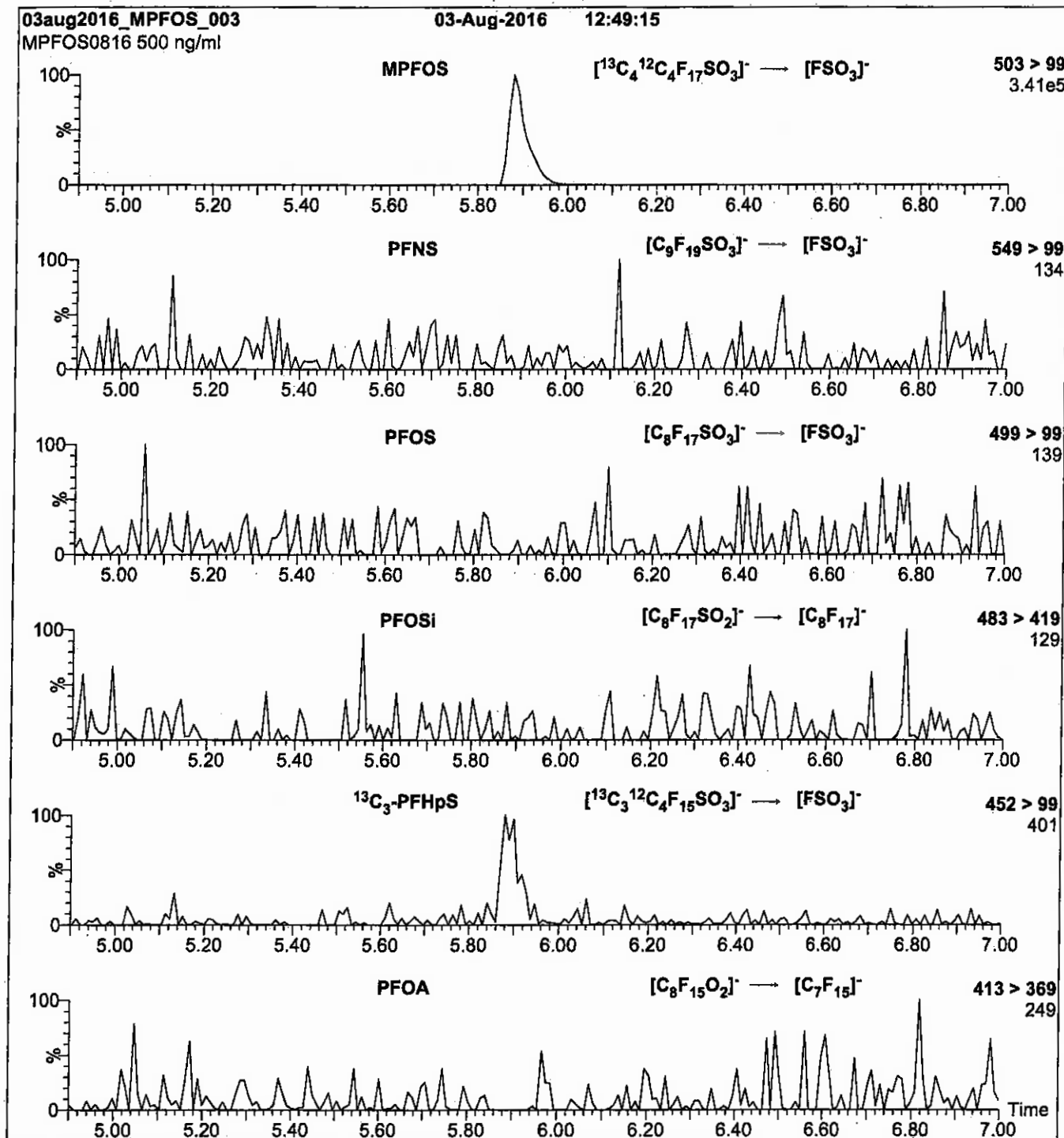
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCMPFOS_00021

r: 5/6/17 SKV

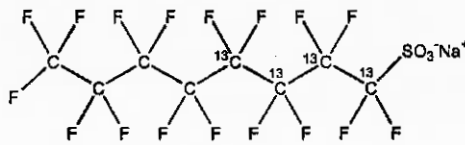


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	¹³ C ₄ ¹² C ₄ F ₁₇ SO ₃ Na	MOLECULAR WEIGHT:	526.08
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	SOLVENT(S):	Methanol
CHEMICAL PURITY:	>98%	ISOTOPIC PURITY:	≥99% ¹³ C (1,2,3,4- ¹³ C ₄)
LAST TESTED: (mm/dd/yyyy)	12/12/2016		
EXPIRY DATE: (mm/dd/yyyy)	12/12/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

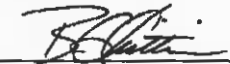
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- Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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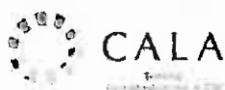
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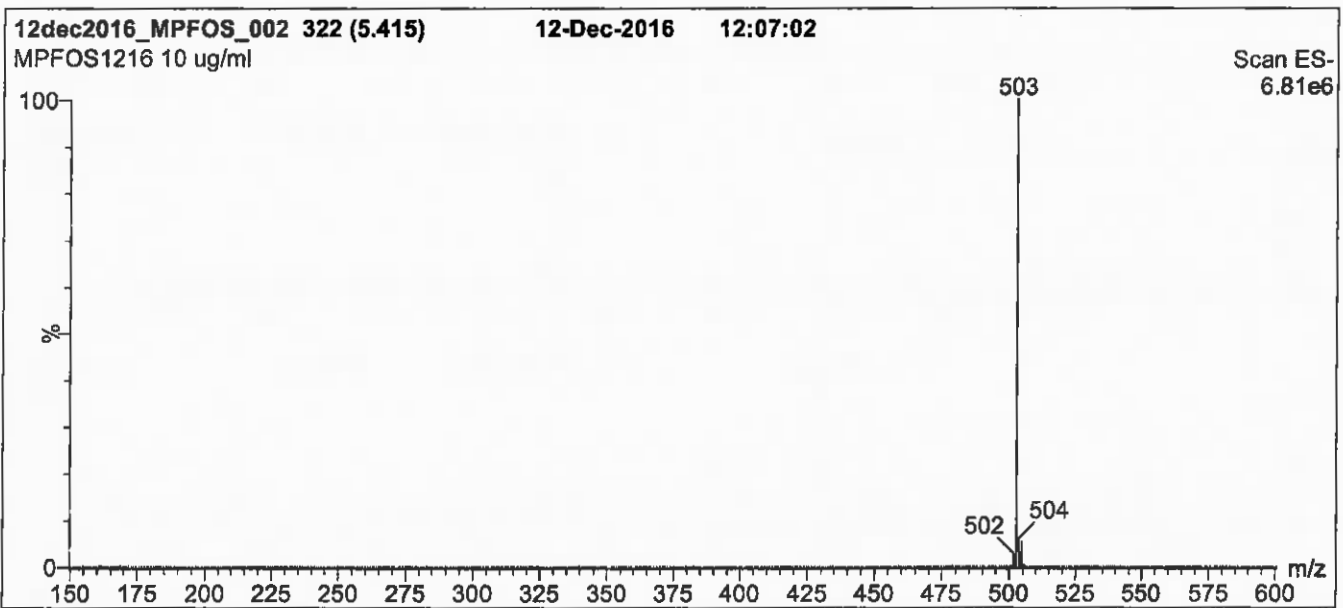
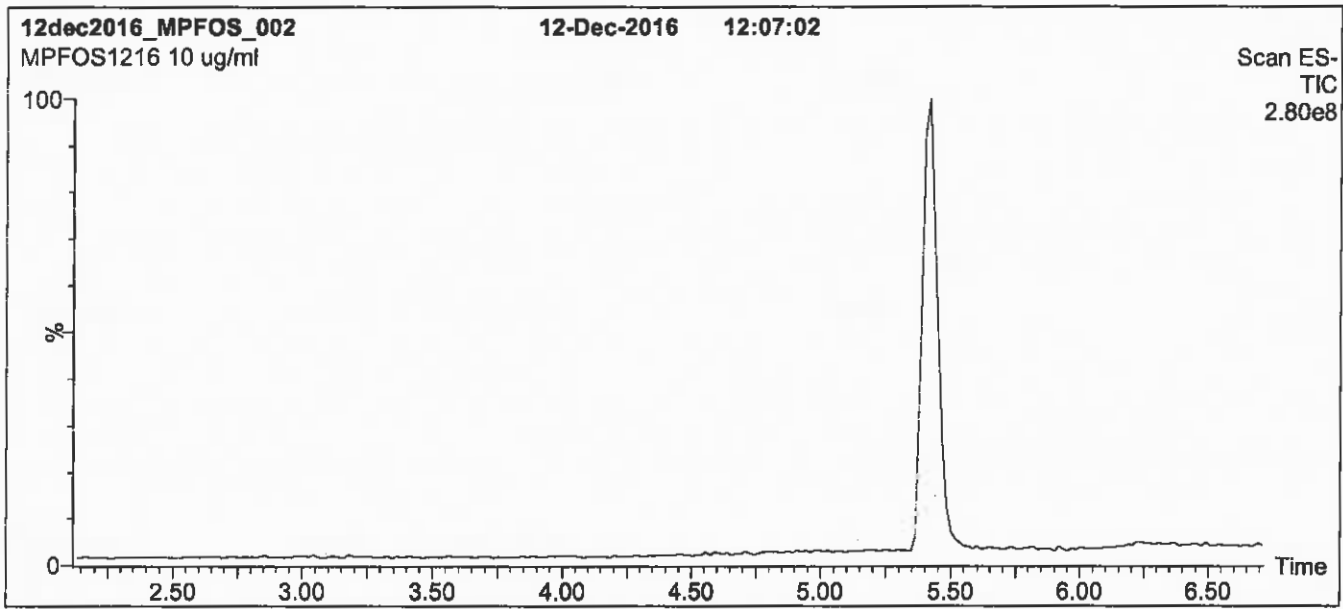
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Figure 1: MPFOS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

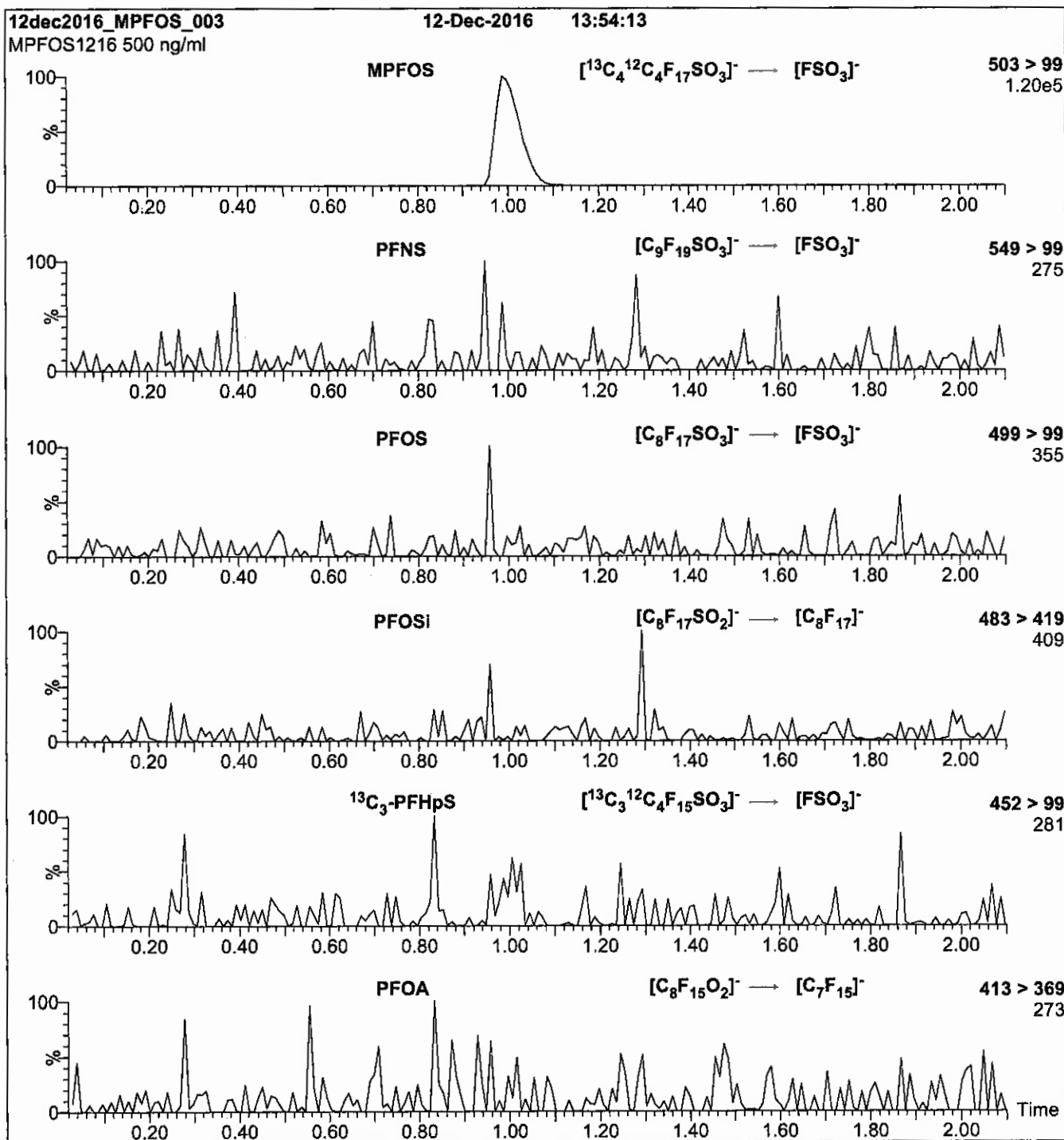
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 40

Method 537 DOD

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

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-30576-1

SDG No.: _____

Matrix: Water

Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-080917-RW-337 A	320-30576-1	83	111
NAWC-080917-FRB-33 7A	320-30576-2	100	108
NAWC-080917-RW-337 B	320-30576-3	102	113
WGNA-080917-RW-107 A	320-30576-4	86	104
WGNA-080917-FRB-10 7A	320-30576-5	98	108
WGNA-080917-RW-107 B	320-30576-6	89	120
NAWC-080917-RW-320	320-30576-7	90	110
NAWC-080917-FRB-32 0	320-30576-8	102	113
WGNA-080917-RW-263	320-30576-9	89	112
WGNA-080917-FRB-26 3	320-30576-10	104	115
	MB 320-179409/1-A	97	112
	LCS 320-179409/2-A	101	109
	LCSD 320-179409/3-A	100	113

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.: 320-30576-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2017.08.17_537B_004.d
 Lab ID: LCS 320-179409/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	133	134	101	70-130	M
Perfluorooctanoic acid (PFOA)	66.7	66.4	100	70-130	
Perfluorononanoic acid (PFNA)	66.7	59.3	89	70-130	
Perfluorohexanesulfonic acid (PFHxS)	100	103	103	70-130	
Perfluoroheptanoic acid (PFHpA)	33.3	33.9	102	70-130	
Perfluorobutanesulfonic acid (PFBS)	300	319	106	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.: 320-30576-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2017.08.17_537B_005.d
 Lab ID: LCSD 320-179409/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	133	135	101	1	30	70-130	
Perfluorooctanoic acid (PFOA)	66.7	67.7	101	2	30	70-130	
Perfluorononanoic acid (PFNA)	66.7	57.1	86	4	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	100	103	103	0	30	70-130	
Perfluoroheptanoic acid (PFHpA)	33.3	32.3	97	5	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	300	320	107	0	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.: 320-30576-1
 SDG No.: _____
 Lab File ID: 2017.08.17_537B_003.d Lab Sample ID: MB 320-179409/1-A
 Matrix: Water Date Extracted: 08/15/2017 07:52
 Instrument ID: A8_N Date Analyzed: 08/17/2017 20:45
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-179409/2-A	2017.08.17_537B 004.d	08/17/2017 20:50
	LCSD 320-179409/3-A	2017.08.17_537B 005.d	08/17/2017 20:55
NAWC-080917-RW-337A	320-30576-1	2017.08.17_537B 006.d	08/17/2017 21:00
NAWC-080917-FRB-337A	320-30576-2	2017.08.17_537B 007.d	08/17/2017 21:04
NAWC-080917-RW-337B	320-30576-3	2017.08.17_537B 008.d	08/17/2017 21:09
WGNA-080917-RW-107A	320-30576-4	2017.08.17_537B 009.d	08/17/2017 21:14
WGNA-080917-FRB-107A	320-30576-5	2017.08.17_537B 010.d	08/17/2017 21:19
WGNA-080917-RW-107B	320-30576-6	2017.08.17_537B 011.d	08/17/2017 21:23
NAWC-080917-RW-320	320-30576-7	2017.08.17_537B 012.d	08/17/2017 21:28
NAWC-080917-FRB-320	320-30576-8	2017.08.17_537B 015.d	08/17/2017 21:42
WGNA-080917-RW-263	320-30576-9	2017.08.17_537B 016.d	08/17/2017 21:47
WGNA-080917-FRB-263	320-30576-10	2017.08.17_537B 017.d	08/17/2017 21:52

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Instrument ID: A8_N Calibration Start Date: 08/17/2017 17:07
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 08/17/2017 17:30
 Calibration ID: 33656

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	1895140	1.93	5625431	2.18		
UPPER LIMIT	2842710	2.43	8438147	2.68		
LOWER LIMIT	947570	1.43	2812716	1.68		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCVL 320-180236/9		2135014	1.91	5637183	2.17	
ICV 320-180236/11		1977664	1.90	5748034	2.16	
CCV 320-180244/1 CCVIS		1891132	1.90	5441619	2.16	
MB 320-179409/1-A		2035487	1.90	5895955	2.16	
LCS 320-179409/2-A		1836687	1.90	5407681	2.16	
LCSD 320-179409/3-A		1987735	1.90	5721794	2.15	
320-30576-1	NAWC-080917-RW-337A	1947686	1.90	5750016	2.16	
320-30576-2	NAWC-080917-FRB-337A	1943952	1.89	5728648	2.15	
320-30576-3	NAWC-080917-RW-337B	2032921	1.89	5926034	2.15	
320-30576-4	WGNA-080917-RW-107A	1993349	1.90	5886801	2.16	
320-30576-5	WGNA-080917-FRB-107A	2077362	1.90	5864327	2.16	
320-30576-6	WGNA-080917-RW-107B	1983362	1.89	5976231	2.15	
320-30576-7	NAWC-080917-RW-320	1933732	1.90	5700370	2.16	
CCV 320-180244/13 CCVIS		1877700	1.89	5615534	2.15	
CCV 320-180245/13 CCVIS		1877700	1.89	5615534	2.15	
320-30576-8	NAWC-080917-FRB-320	1958634	1.90	5724980	2.16	
320-30576-9	WGNA-080917-RW-263	2053834	1.90	6030004	2.15	
320-30576-10	WGNA-080917-FRB-263	1856521	1.89	5734120	2.15	
CCV 320-180245/25 CCVIS		1814629	1.89	5386179	2.15	

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

Area Limit = 50%-150% of internal standard area
 RT Limit = ± 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.: 320-30576-1
 SDG No.: _____
 Sample No.: CCV 320-180244/1 Date Analyzed: 08/17/2017 20:36
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.08.17_537B_001 Heated Purge: (Y/N) N
 Calibration ID: 33656

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1891132	1.90	5441619	2.16		
UPPER LIMIT	2647585	2.40	7618267	2.66		
LOWER LIMIT	1323792	1.40	3809133	1.66		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-179409/1-A		2035487	1.90	5895955	2.16	
LCS 320-179409/2-A		1836687	1.90	5407681	2.16	
LCSD 320-179409/3-A		1987735	1.90	5721794	2.15	
320-30576-1	NAWC-080917-RW-337A	1947686	1.90	5750016	2.16	
320-30576-2	NAWC-080917-FRB-337A	1943952	1.89	5728648	2.15	
320-30576-3	NAWC-080917-RW-337B	2032921	1.89	5926034	2.15	
320-30576-4	WGNA-080917-RW-107A	1993349	1.90	5886801	2.16	
320-30576-5	WGNA-080917-FRB-107A	2077362	1.90	5864327	2.16	
320-30576-6	WGNA-080917-RW-107B	1983362	1.89	5976231	2.15	
320-30576-7	NAWC-080917-RW-320	1933732	1.90	5700370	2.16	

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

Area Limit = 70%-140% of internal standard area
 RT Limit = ± 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.: 320-30576-1
 SDG No.: _____
 Sample No.: CCV 320-180244/13 Date Analyzed: 08/17/2017 21:33
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.08.17_537B_013 Heated Purge: (Y/N) N
 Calibration ID: 33656

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1877700	1.89	5615534	2.15		
UPPER LIMIT	2628780	2.39	7861748	2.65		
LOWER LIMIT	1314390	1.39	3930874	1.65		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-179409/1-A		2035487	1.90	5895955	2.16	
LCS 320-179409/2-A		1836687	1.90	5407681	2.16	
LCSD 320-179409/3-A		1987735	1.90	5721794	2.15	
320-30576-1	NAWC-080917-RW-337A	1947686	1.90	5750016	2.16	
320-30576-2	NAWC-080917-FRB-337A	1943952	1.89	5728648	2.15	
320-30576-3	NAWC-080917-RW-337B	2032921	1.89	5926034	2.15	
320-30576-4	WGNA-080917-RW-107A	1993349	1.90	5886801	2.16	
320-30576-5	WGNA-080917-FRB-107A	2077362	1.90	5864327	2.16	
320-30576-6	WGNA-080917-RW-107B	1983362	1.89	5976231	2.15	
320-30576-7	NAWC-080917-RW-320	1933732	1.90	5700370	2.16	

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

Area Limit = 70%-140% of internal standard area
 RT Limit = ± 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.: 320-30576-1
 SDG No.: _____
 Sample No.: CCV 320-180245/13 Date Analyzed: 08/17/2017 21:33
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.08.17_537B_013 Heated Purge: (Y/N) N
 Calibration ID: 33656

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1877700	1.89	5615534	2.15		
UPPER LIMIT	2628780	2.39	7861748	2.65		
LOWER LIMIT	1314390	1.39	3930874	1.65		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-30576-8	NAWC-080917-FRB-320	1958634	1.90	5724980	2.16	
320-30576-9	WGNA-080917-RW-263	2053834	1.90	6030004	2.15	
320-30576-10	WGNA-080917-FRB-263	1856521	1.89	5734120	2.15	

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

Area Limit = 70%-140% of internal standard area
 RT Limit = ± 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.: 320-30576-1
 SDG No.: _____
 Sample No.: CCV 320-180245/25 Date Analyzed: 08/17/2017 22:30
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.08.17_537B_025 Heated Purge: (Y/N) N
 Calibration ID: 33656

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1814629	1.89	5386179	2.15		
UPPER LIMIT	2540481	2.39	7540651	2.65		
LOWER LIMIT	1270240	1.39	3770325	1.65		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-30576-8	NAWC-080917-FRB-320	1958634	1.90	5724980	2.16	
320-30576-9	WGNA-080917-RW-263	2053834	1.90	6030004	2.15	
320-30576-10	WGNA-080917-FRB-263	1856521	1.89	5734120	2.15	

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

Area Limit = 70%-140% of internal standard area
 RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: NAWC-080917-RW-337A Lab Sample ID: 320-30576-1
 Matrix: Water Lab File ID: 2017.08.17_537B_006.d
 Analysis Method: 537 Date Collected: 08/09/2017 08:50
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 253.8(mL) Date Analyzed: 08/17/2017 21:00
 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.: 180244 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J M	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	15	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.8	J	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	89	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	83		70-130
STL00996	13C2 PFDA	111		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_006.d
 Lims ID: 320-30576-A-1-A
 Client ID: NAWC-080917-RW-337A
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:00:03 ALS Bottle#: 22 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-1-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: barnettj Date: 21-Aug-2017 16:12:33

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.438	-0.012	1.000	292897	1.35		56.9	
298.90 > 99.00	1.426	1.438	-0.012	1.000	180247		1.62(0.00-0.00)	53.2	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.568	-0.013	1.000	1826387	8.26		7377	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.707	1.722	-0.015	1.000	225630	1.23		17.9	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.707	1.722	-0.015	1.000	322316	1.05		66.1	
* 6 13C2-PFOA									
415.00 > 370.00	1.897	1.928	-0.031		1947686	10.0		7365	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.897	1.928	-0.031	1.000	667119	3.73		28.6	
413.00 > 169.00	1.897	1.928	-0.031	1.000	385802		1.73(0.00-0.00)	502	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.155	2.147	0.008	1.000	890896	4.83		212	M
499.00 > 99.00	2.155	2.147	0.008	1.000	150257		5.93(0.00-0.00)	72.1	M
* 7 13C4 PFOS									
503.00 > 80.00	2.155	2.185	-0.030		5750016	28.7		2090	
9 Perfluorononanoic acid									
463.00 > 419.00	2.162	2.193	-0.031	1.000	66042	0.4742		2.3	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.342	-0.028	1.000	1413253	11.1		8558	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_006.d

Injection Date: 17-Aug-2017 21:00:03

Instrument ID: A8_N

Lims ID: 320-30576-A-1-A

Lab Sample ID: 320-30576-1

Client ID: NAWC-080917-RW-337A

Operator ID: SACINSTLCMS01

ALS Bottle#: 22

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

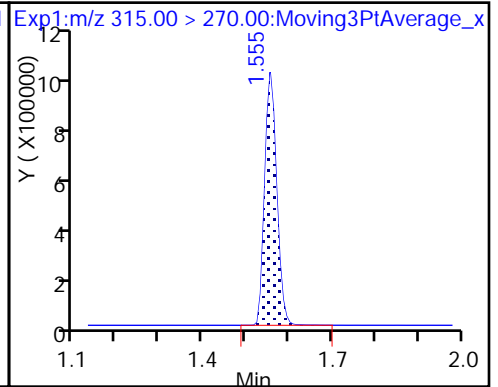
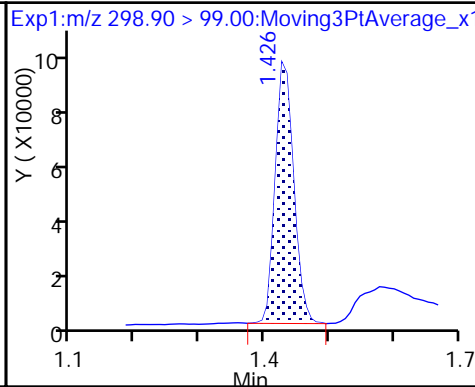
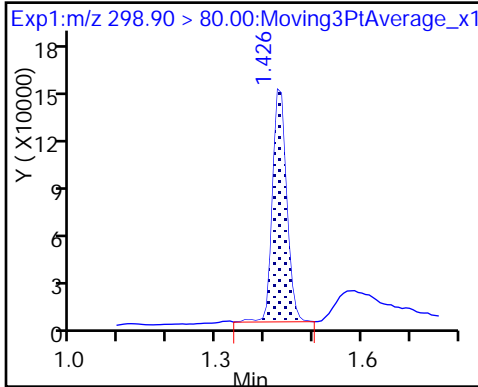
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

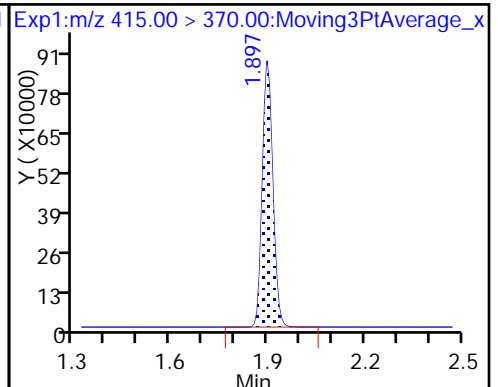
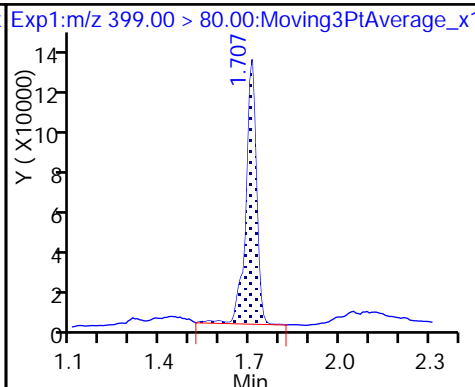
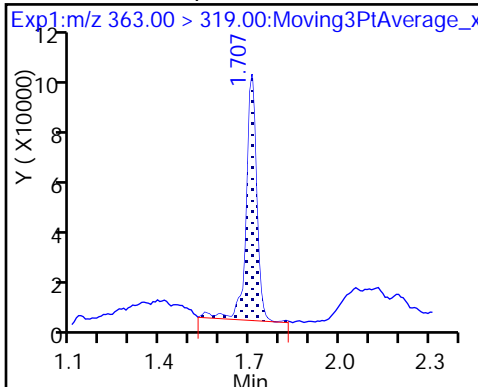
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

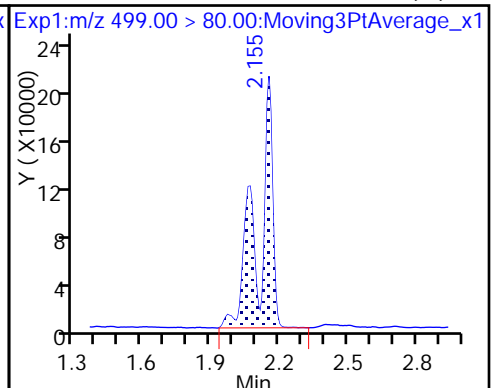
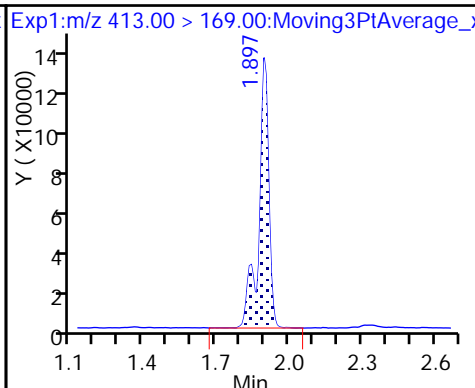
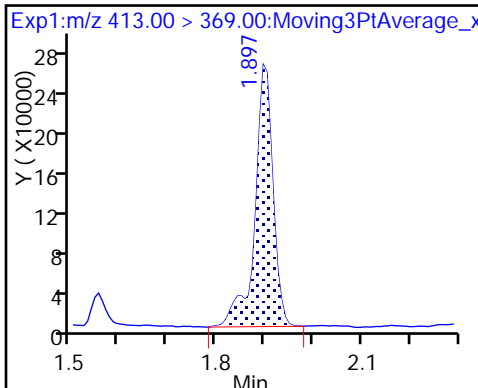
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

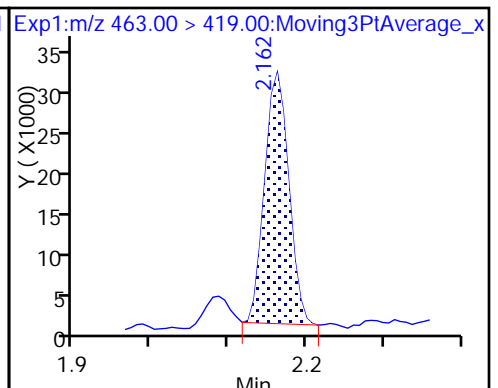
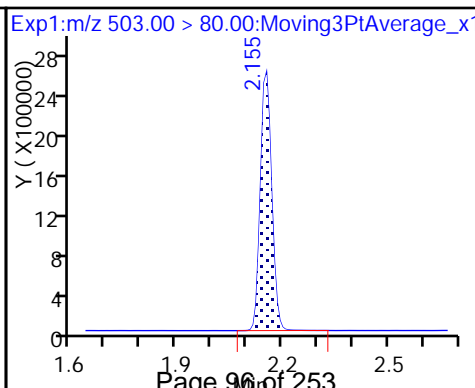
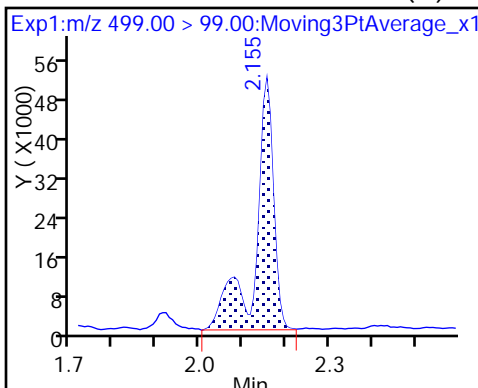
8 Perfluorooctane sulfonic acid (M)



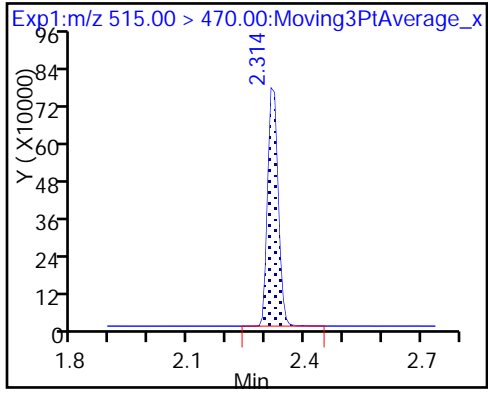
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_006.d
 Lims ID: 320-30576-A-1-A
 Client ID: NAWC-080917-RW-337A
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:00:03 ALS Bottle#: 22 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-1-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: barnettj Date: 21-Aug-2017 16:12:33

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.26	82.61
\$ 10 13C2 PFDA	10.0	11.1	111.09

TestAmerica Sacramento

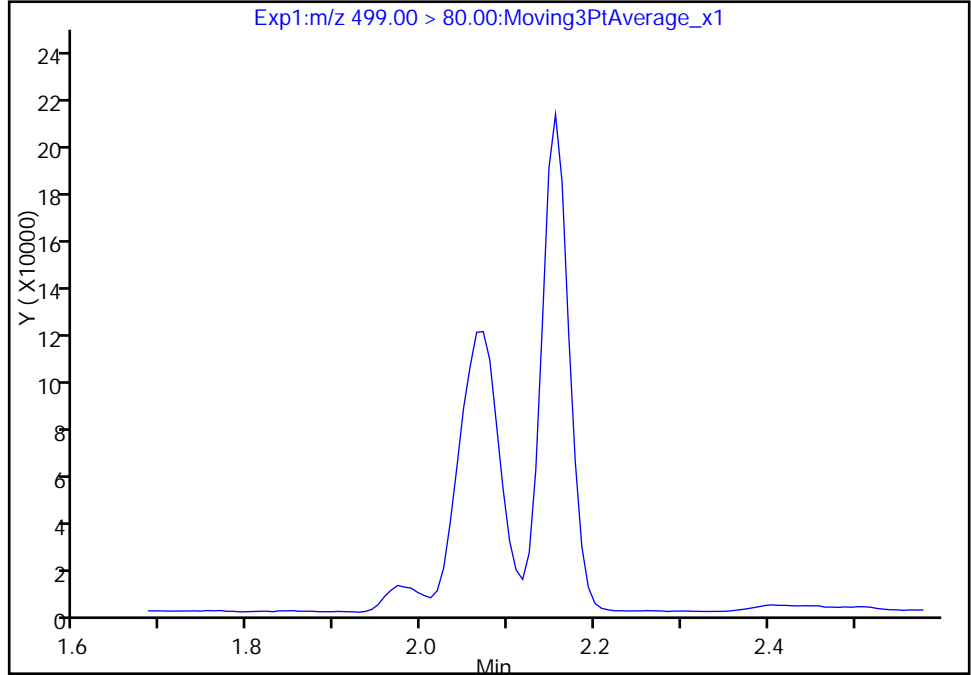
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Injection Date: 17-Aug-2017 21:00:03 Instrument ID: A8_N
Lims ID: 320-30576-A-1-A Lab Sample ID: 320-30576-1
Client ID: NAWC-080917-RW-337A
Operator ID: SACINSTLCMS01 ALS Bottle#: 22 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

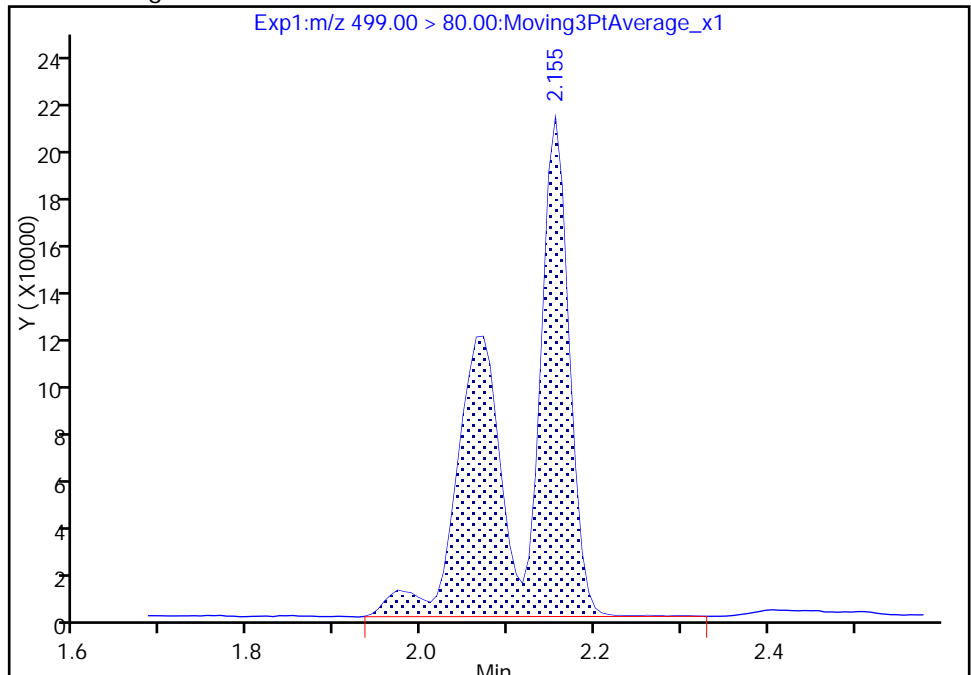
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 890896
Amount: 4.831329
Amount Units: ng/ml



Reviewer: barnettj, 21-Aug-2017 16:11:58
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

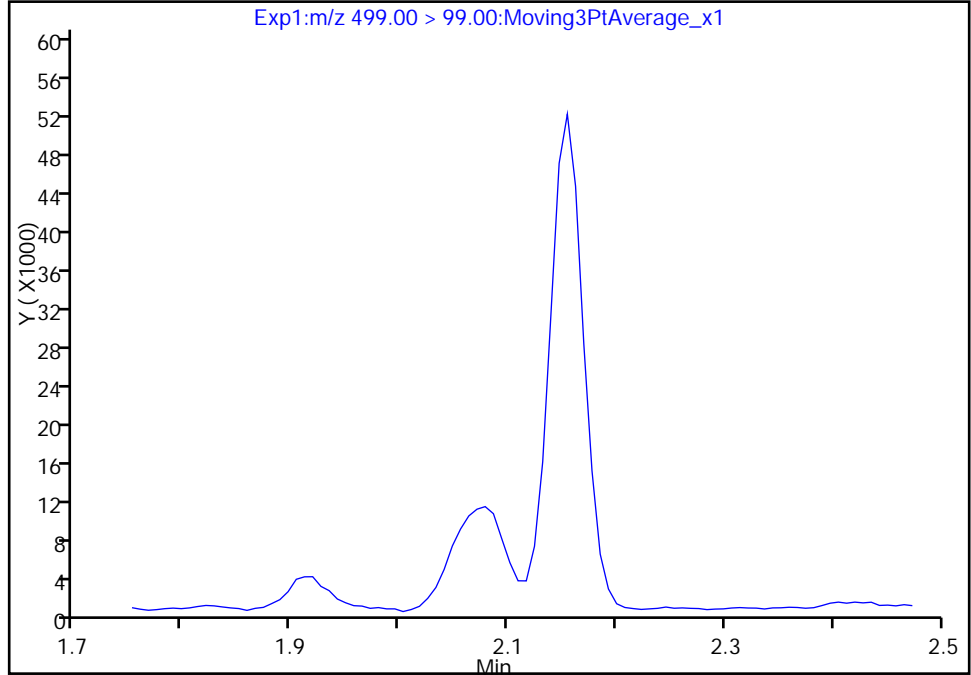
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Injection Date: 17-Aug-2017 21:00:03 Instrument ID: A8_N
Lims ID: 320-30576-A-1-A Lab Sample ID: 320-30576-1
Client ID: NAWC-080917-RW-337A
Operator ID: SACINSTLCMS01 ALS Bottle#: 22 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

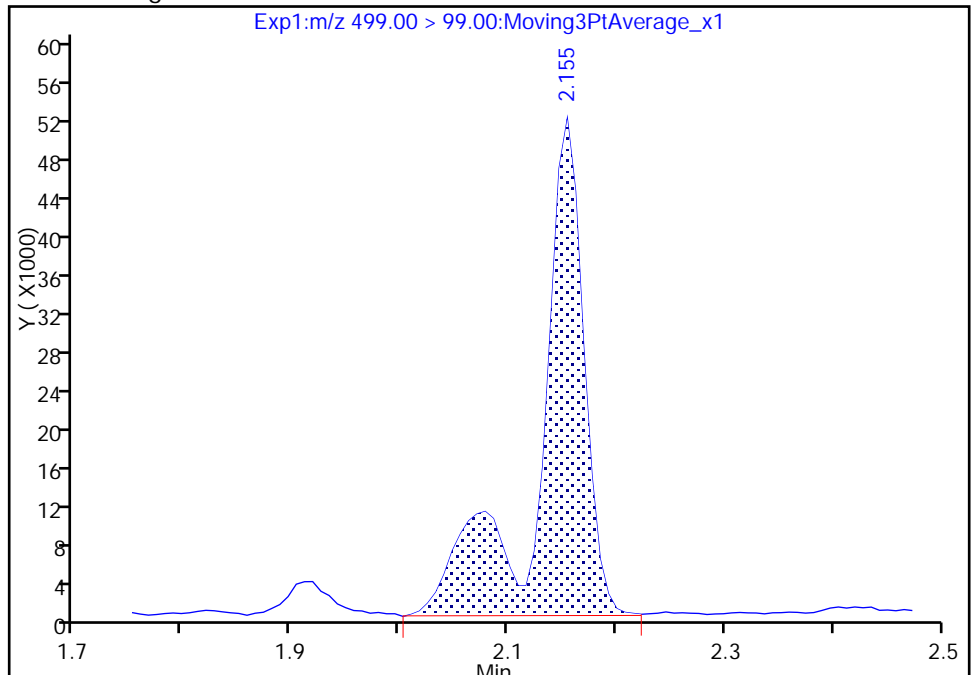
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 150257
Amount: 4.831329
Amount Units: ng/ml



Reviewer: barnettj, 21-Aug-2017 16:12:09

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

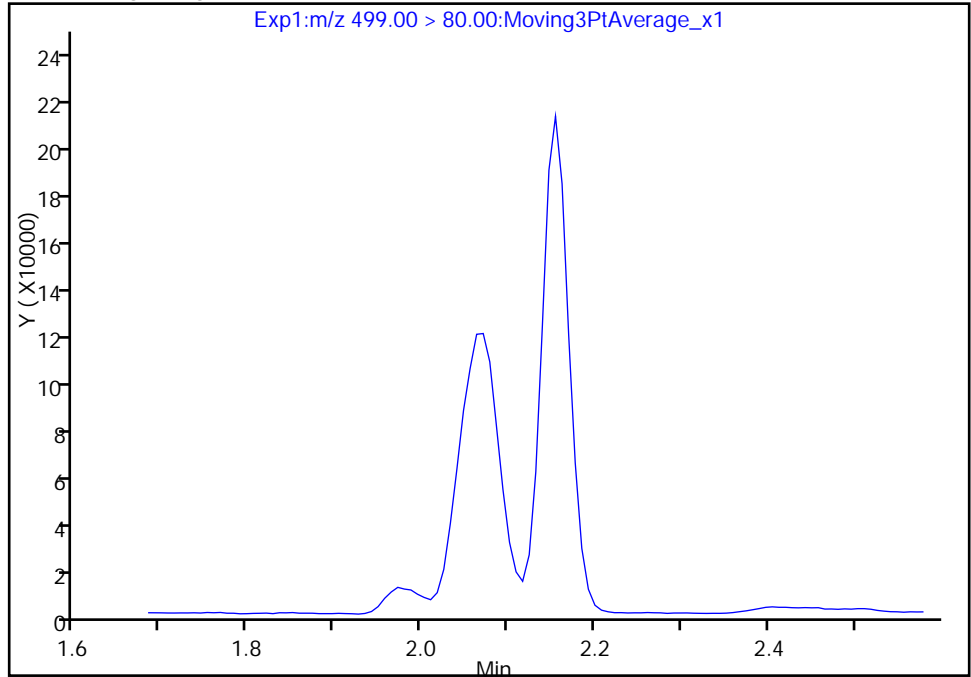
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Injection Date: 17-Aug-2017 21:00:03 Instrument ID: A8_N
Lims ID: 320-30576-A-1-A Lab Sample ID: 320-30576-1
Client ID: NAWC-080917-RW-337A
Operator ID: SACINSTLCMS01 ALS Bottle#: 22 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

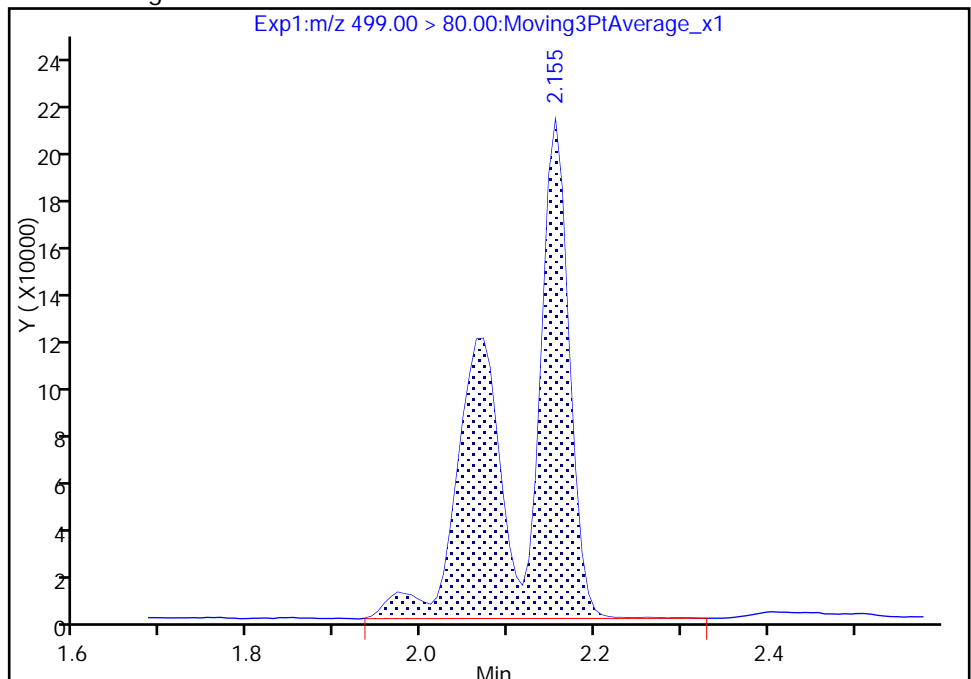
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 890896
Amount: 4.831329
Amount Units: ng/ml



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: NAWC-080917-FRB-337A Lab Sample ID: 320-30576-2
 Matrix: Water Lab File ID: 2017.08.17_537B_007.d
 Analysis Method: 537 Date Collected: 08/09/2017 08:45
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 257.7(mL) Date Analyzed: 08/17/2017 21:04
 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.: 180244 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	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
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	100		70-130
STL00996	13C2 PFDA	108		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_007.d
 Lims ID: 320-30576-A-2-A
 Client ID: NAWC-080917-FRB-337A
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:04:47 ALS Bottle#: 23 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-2-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK001

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.548	1.568	-0.020	1.000	2211904	10.0	8940	
* 6 13C2-PFOA	415.00 > 370.00	1.889	1.928	-0.039		1943952	10.0	6956	
* 7 13C4 PFOS	503.00 > 80.00	2.147	2.185	-0.038		5728648	28.7	2500	
\$ 10 13C2 PFDA	515.00 > 470.00	2.314	2.342	-0.028	1.000	1376396	10.8	8216	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_007.d

Injection Date: 17-Aug-2017 21:04:47

Instrument ID: A8_N

Lims ID: 320-30576-A-2-A

Lab Sample ID: 320-30576-2

Client ID: NAWC-080917-FRB-337A

Operator ID: SACINSTLCMS01

ALS Bottle#: 23

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

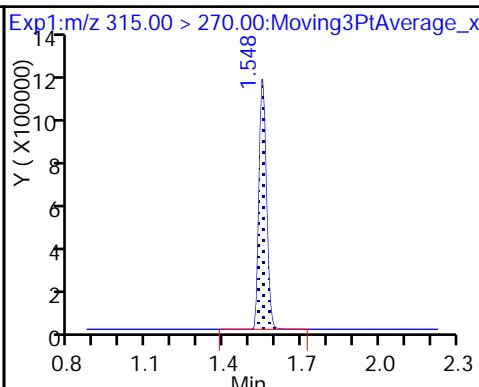
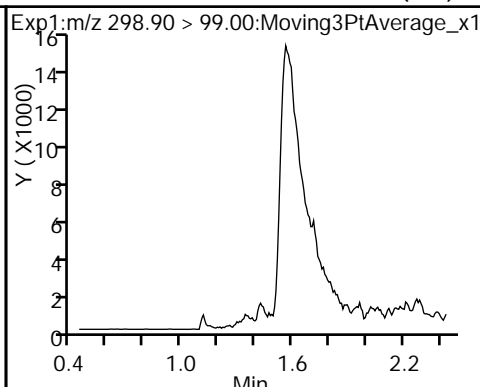
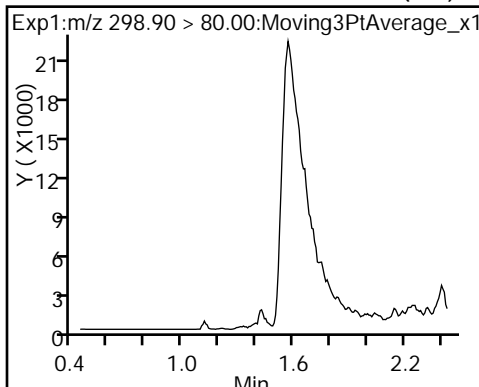
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

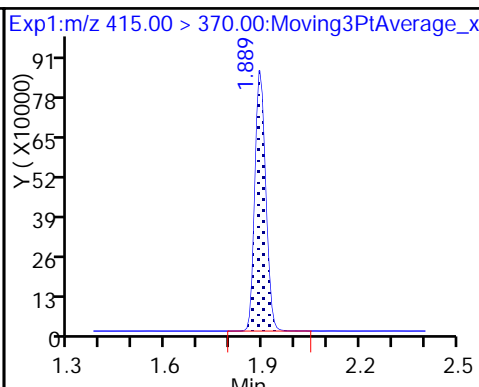
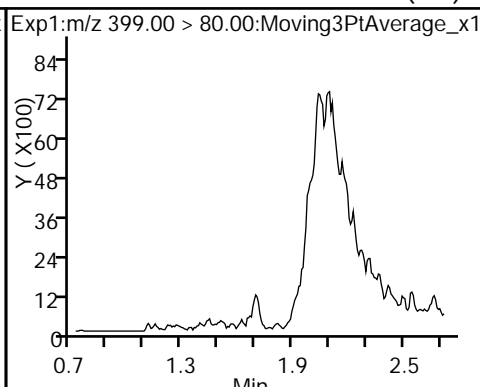
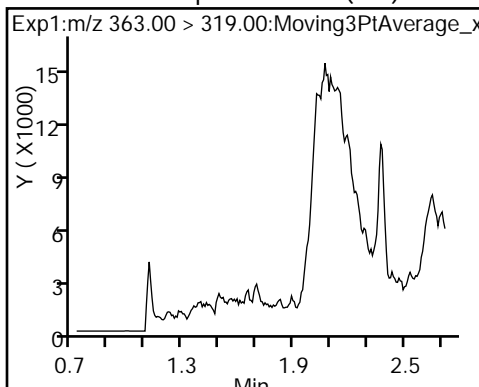
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid (ND)

3 Perfluorohexanesulfonic acid (ND)

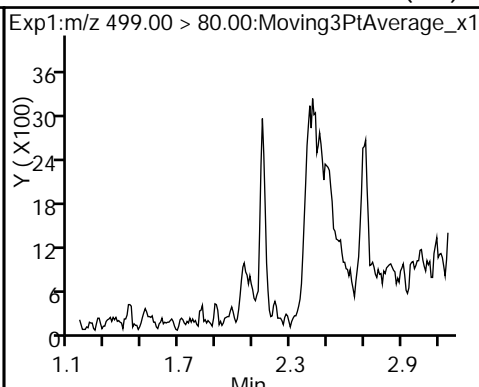
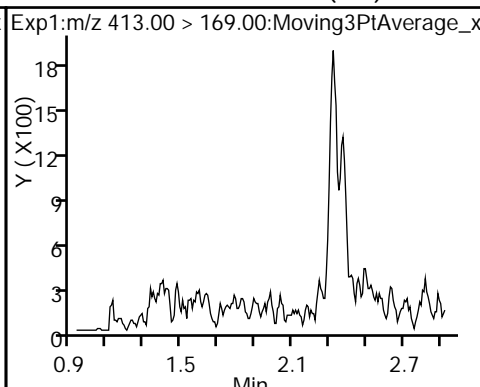
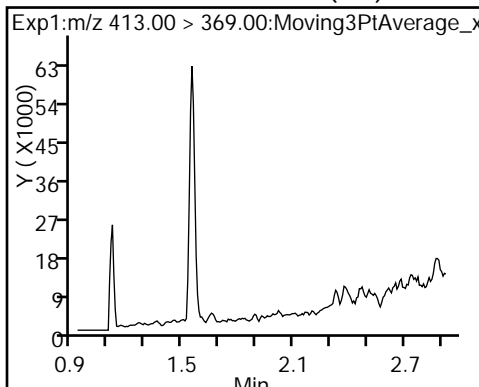
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

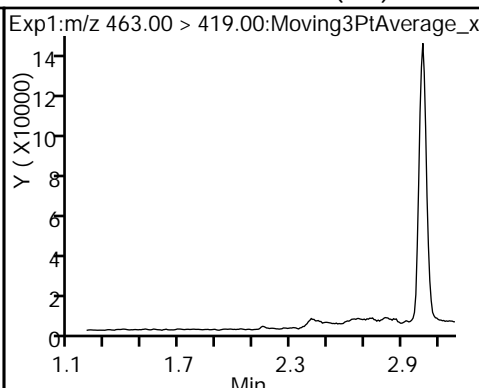
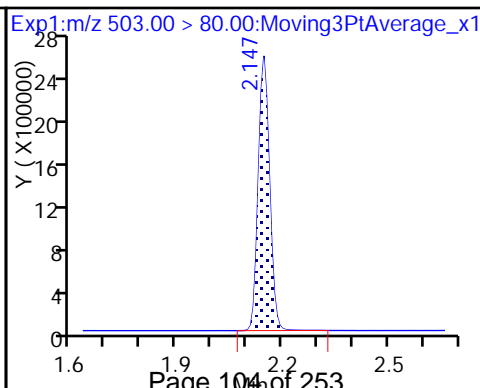
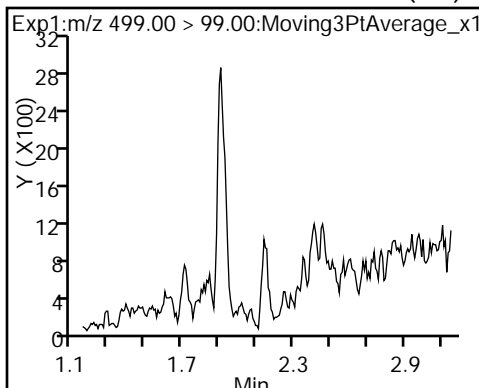
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

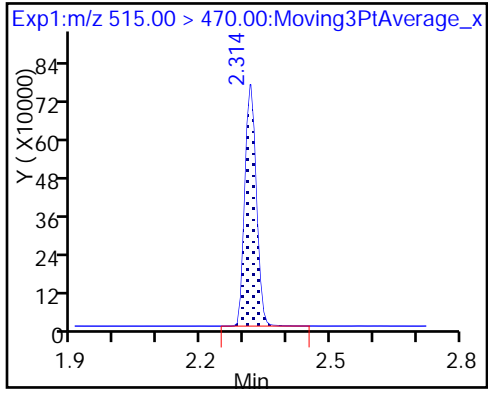


8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_007.d
 Lims ID: 320-30576-A-2-A
 Client ID: NAWC-080917-FRB-337A
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:04:47 ALS Bottle#: 23 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-2-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK001

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.0	100.24
\$ 10 13C2 PFDA	10.0	10.8	108.40

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: NAWC-080917-RW-337B Lab Sample ID: 320-30576-3
 Matrix: Water Lab File ID: 2017.08.17_537B_008.d
 Analysis Method: 537 Date Collected: 08/09/2017 08:55
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 261.6(mL) Date Analyzed: 08/17/2017 21:09
 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.: 180244 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)	7.6	U	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	29	11	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	86	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	113		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_008.d
 Lims ID: 320-30576-A-3-A
 Client ID: NAWC-080917-RW-337B
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:09:32 ALS Bottle#: 24 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-3-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK001

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.548	1.568	-0.020	1.000	2355208	10.2	9066	
* 6 13C2-PFOA	415.00 > 370.00	1.889	1.928	-0.039		2032921	10.0	7732	
* 7 13C4 PFOS	503.00 > 80.00	2.147	2.185	-0.038		5926034	28.7	2714	
\$ 10 13C2 PFDA	515.00 > 470.00	2.314	2.342	-0.028	1.000	1500703	11.3	9325	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_008.d

Injection Date: 17-Aug-2017 21:09:32

Instrument ID: A8_N

Lims ID: 320-30576-A-3-A

Lab Sample ID: 320-30576-3

Client ID: NAWC-080917-RW-337B

Operator ID: SACINSTLCMS01

ALS Bottle#: 24

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

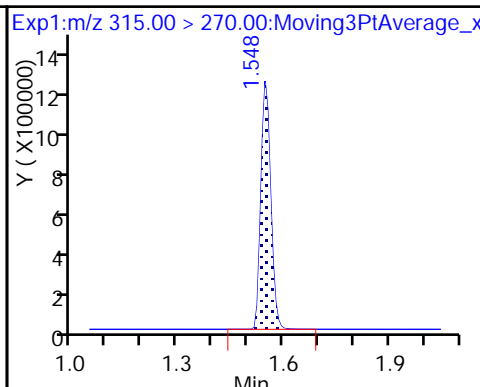
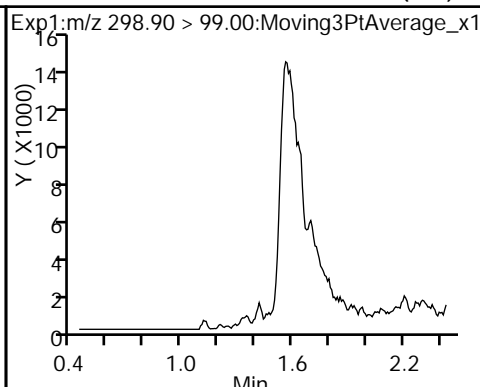
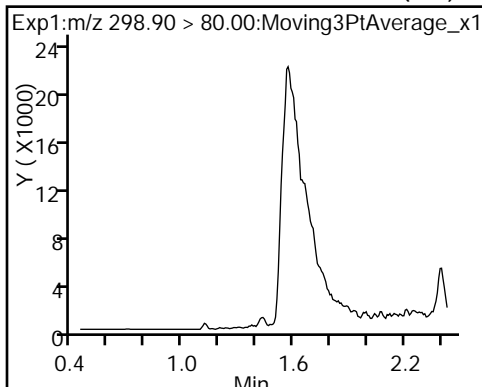
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

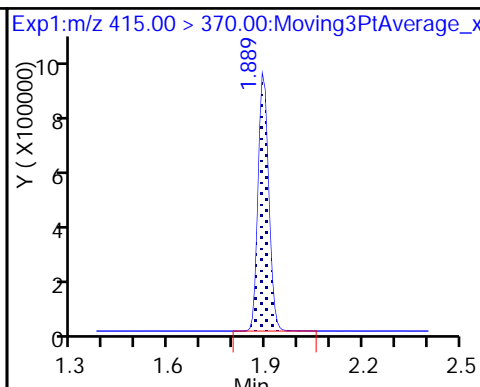
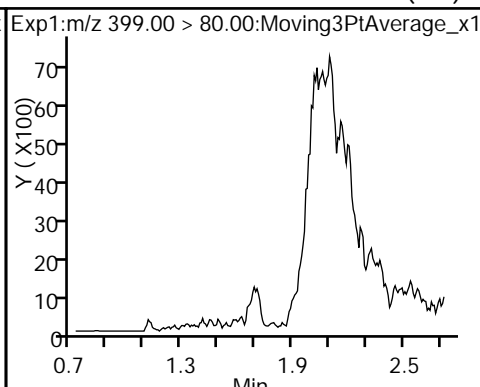
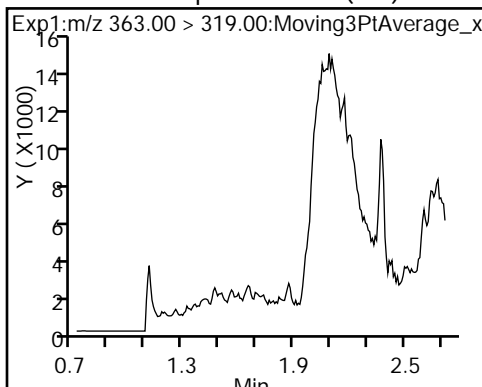
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid (ND)

3 Perfluorohexanesulfonic acid (ND)

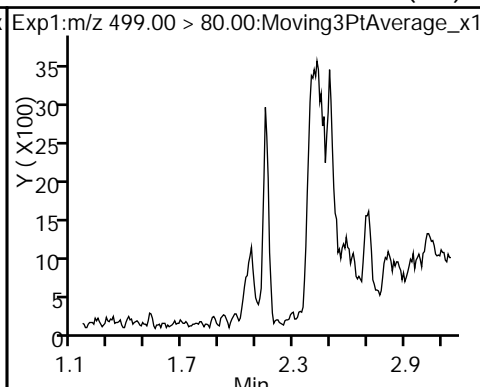
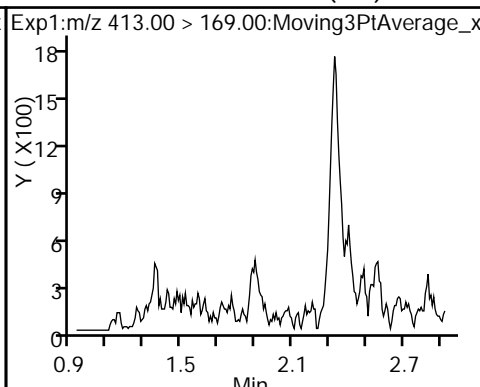
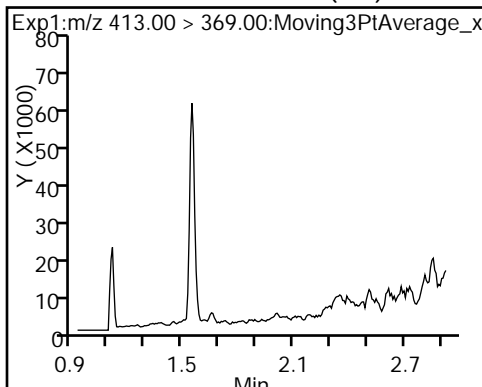
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

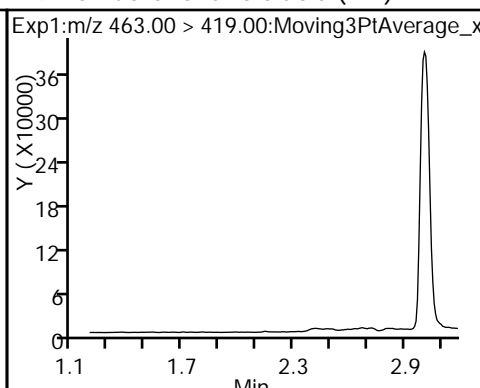
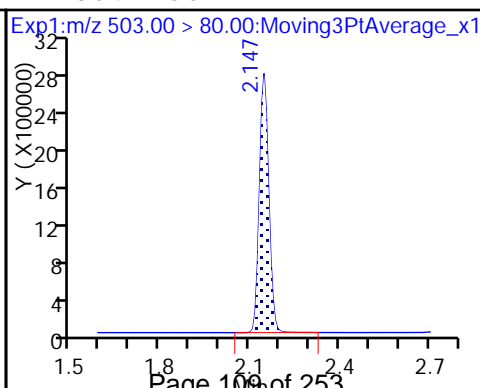
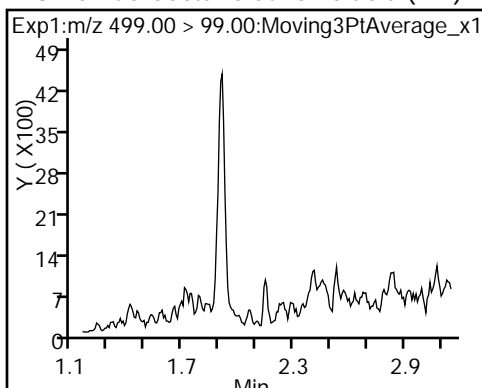
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

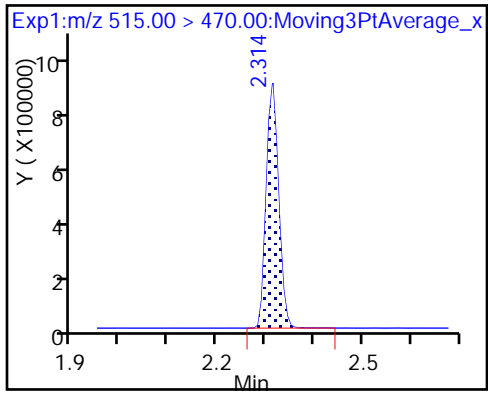


8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_008.d
 Lims ID: 320-30576-A-3-A
 Client ID: NAWC-080917-RW-337B
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:09:32 ALS Bottle#: 24 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-3-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK001

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.2	102.06
\$ 10 13C2 PFDA	10.0	11.3	113.02

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: WGNA-080917-RW-107A Lab Sample ID: 320-30576-4
 Matrix: Water Lab File ID: 2017.08.17_537B_009.d
 Analysis Method: 537 Date Collected: 08/09/2017 09:20
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 256.3(mL) Date Analyzed: 08/17/2017 21:14
 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.: 180244 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	J M	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	13	J	20	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	20	U	23	20	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	J	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.6	J	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	86		70-130
STL00996	13C2 PFDA	104		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_009.d
 Lims ID: 320-30576-A-4-A
 Client ID: WGNA-080917-RW-107A
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:14:17 ALS Bottle#: 25 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-4-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: barnettj Date: 21-Aug-2017 16:13:23

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.434	1.438	-0.004	1.000	355291	1.60		59.3	
298.90 > 99.00	1.434	1.438	-0.004	1.000	219935		1.62(0.00-0.00)	65.0	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.568	-0.013	1.000	1935051	8.55		8004	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.707	1.722	-0.015	1.000	174392	0.9293		13.5	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.707	1.722	-0.015	1.000	980662	3.11		184	
* 6 13C2-PFOA									
415.00 > 370.00	1.897	1.928	-0.031		1993349	10.0		6594	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.904	1.928	-0.024	1.000	613183	3.35		24.5	
413.00 > 169.00	1.897	1.928	-0.031	0.996	368423		1.66(0.00-0.00)	488	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.155	2.147	0.008	1.000	712085	3.77		110	M
499.00 > 99.00	2.155	2.147	0.008	1.000	124333		5.73(0.00-0.00)	59.5	M
* 7 13C4 PFOS									
503.00 > 80.00	2.155	2.185	-0.030		5886801	28.7		1785	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.322	2.342	-0.020	1.000	1353827	10.4		8286	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_009.d

Injection Date: 17-Aug-2017 21:14:17

Instrument ID: A8_N

Lims ID: 320-30576-A-4-A

Lab Sample ID: 320-30576-4

Client ID: WGNA-080917-RW-107A

Operator ID: SACINSTLCMS01

ALS Bottle#: 25

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

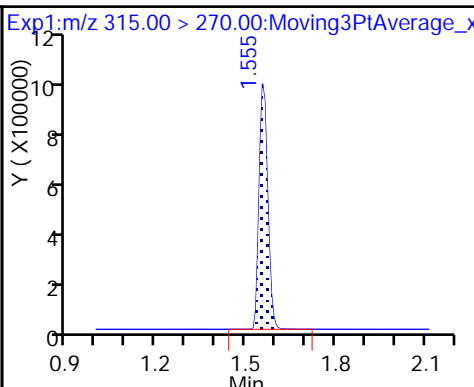
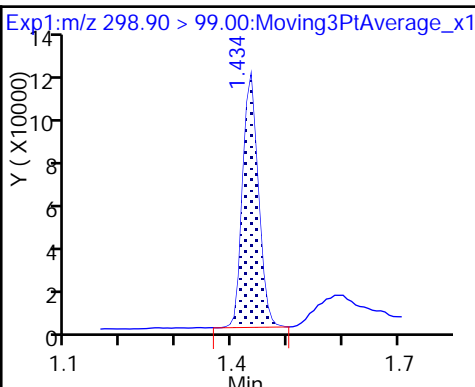
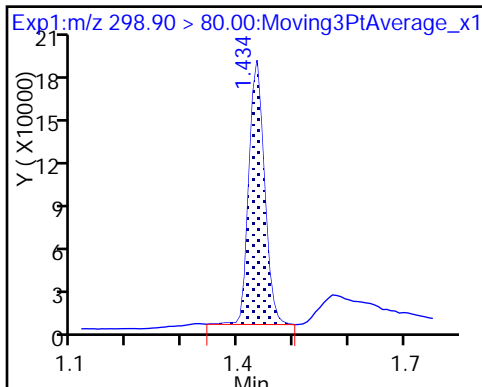
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

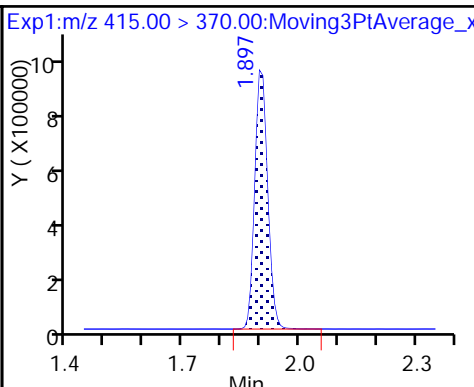
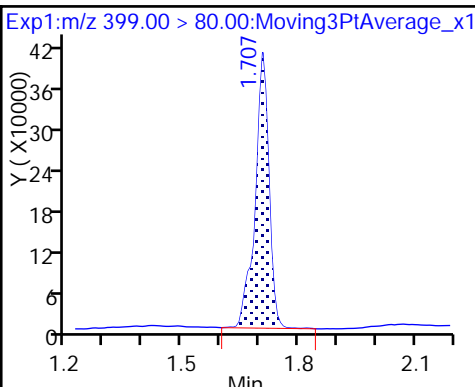
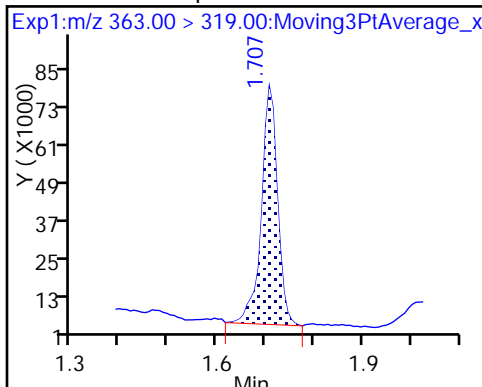
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

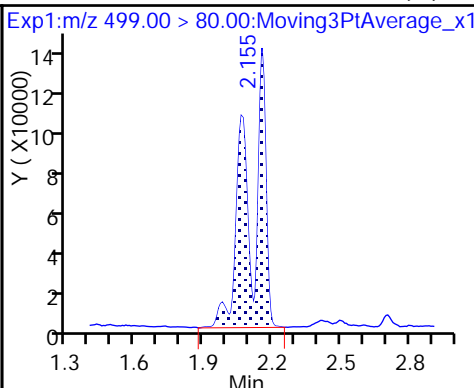
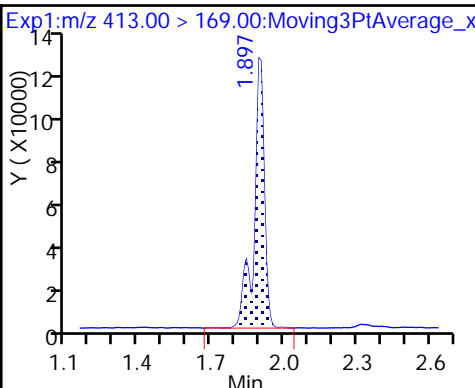
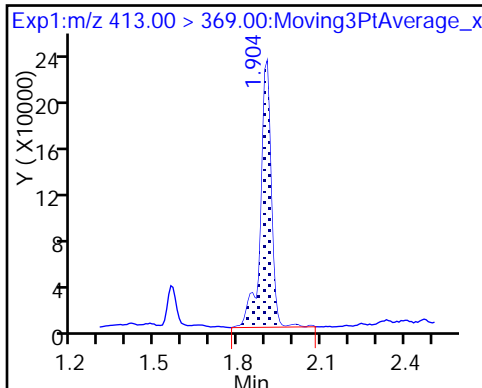
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

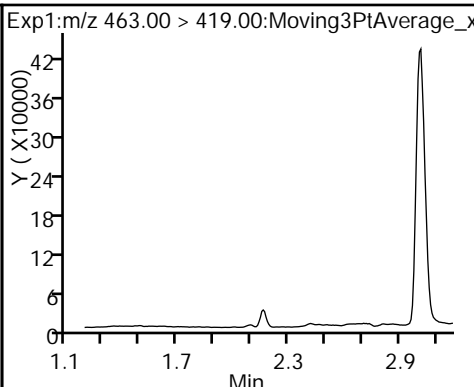
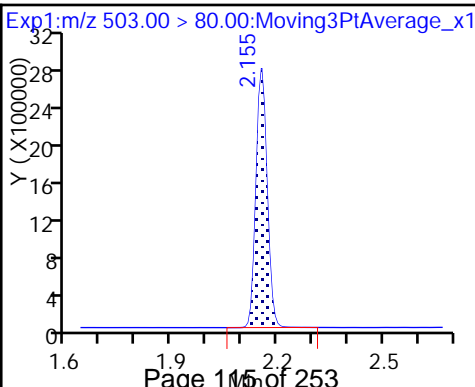
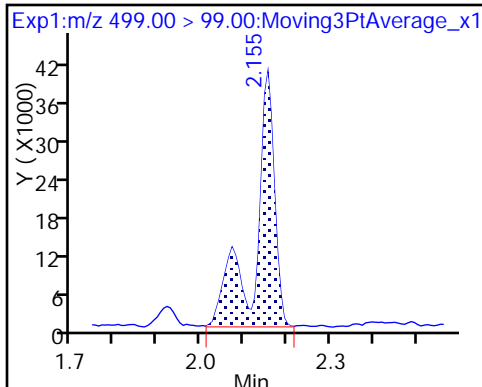
8 Perfluorooctane sulfonic acid (M)



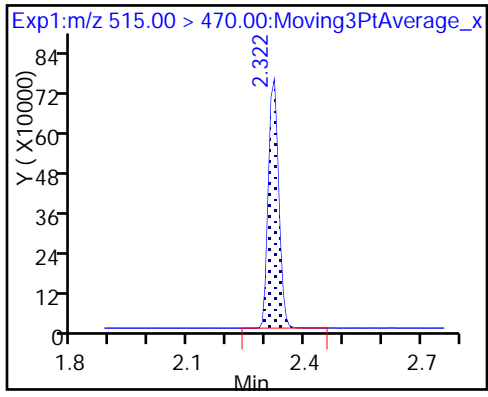
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_009.d
 Lims ID: 320-30576-A-4-A
 Client ID: WGNA-080917-RW-107A
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:14:17 ALS Bottle#: 25 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-4-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: barnettj Date: 21-Aug-2017 16:13:23

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.55	85.52
\$ 10 13C2 PFDA	10.0	10.4	103.98

TestAmerica Sacramento

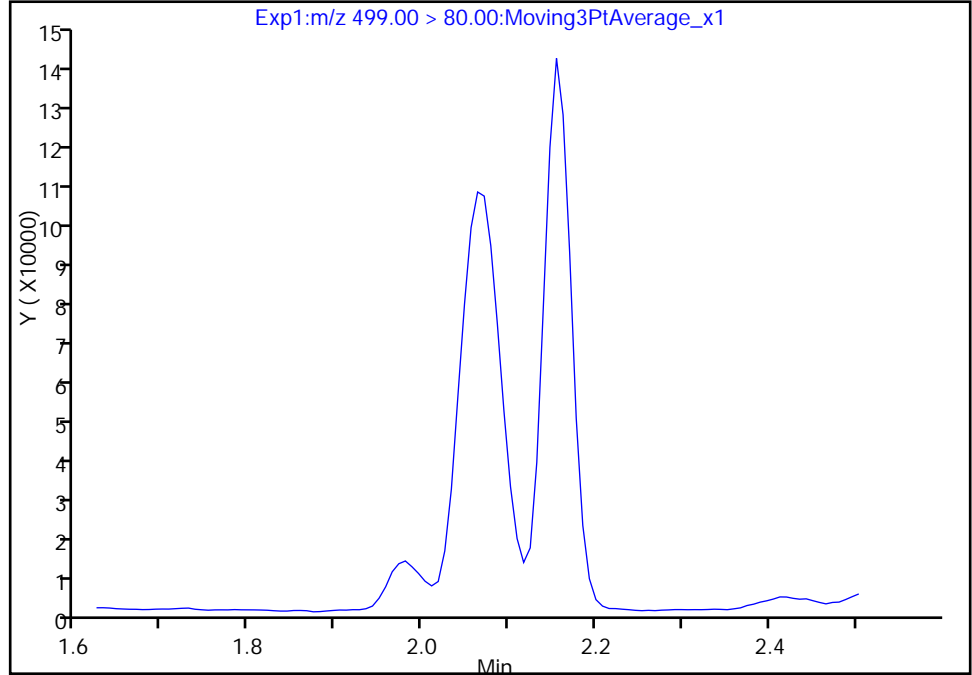
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Injection Date: 17-Aug-2017 21:14:17 Instrument ID: A8_N
Lims ID: 320-30576-A-4-A Lab Sample ID: 320-30576-4
Client ID: WGNA-080917-RW-107A
Operator ID: SACINSTLCMS01 ALS Bottle#: 25 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

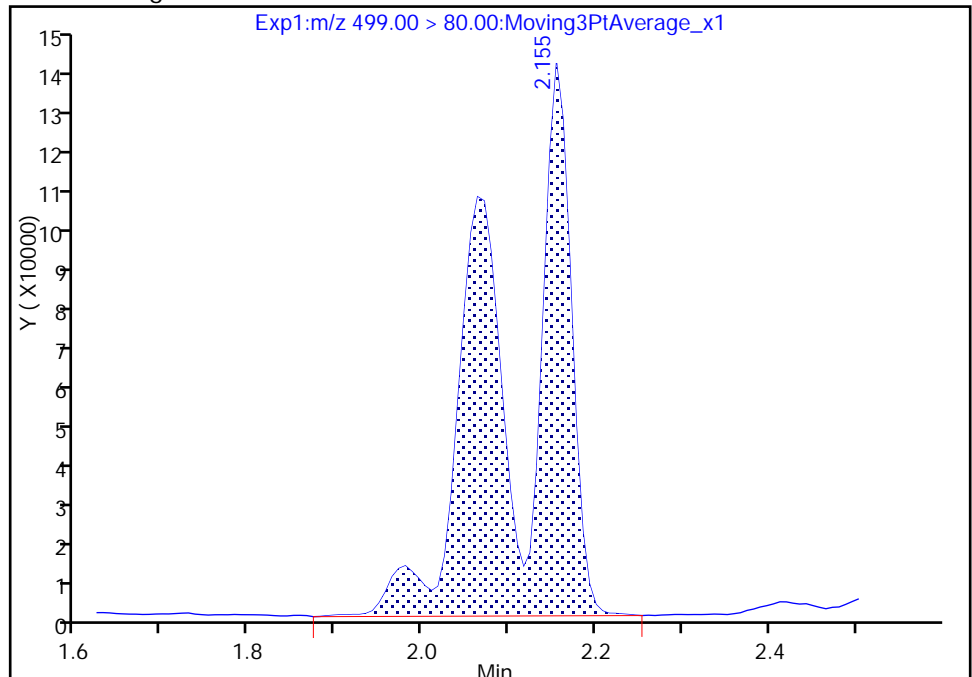
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 712085
Amount: 3.771908
Amount Units: ng/ml



Reviewer: barnettj, 21-Aug-2017 16:12:50
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

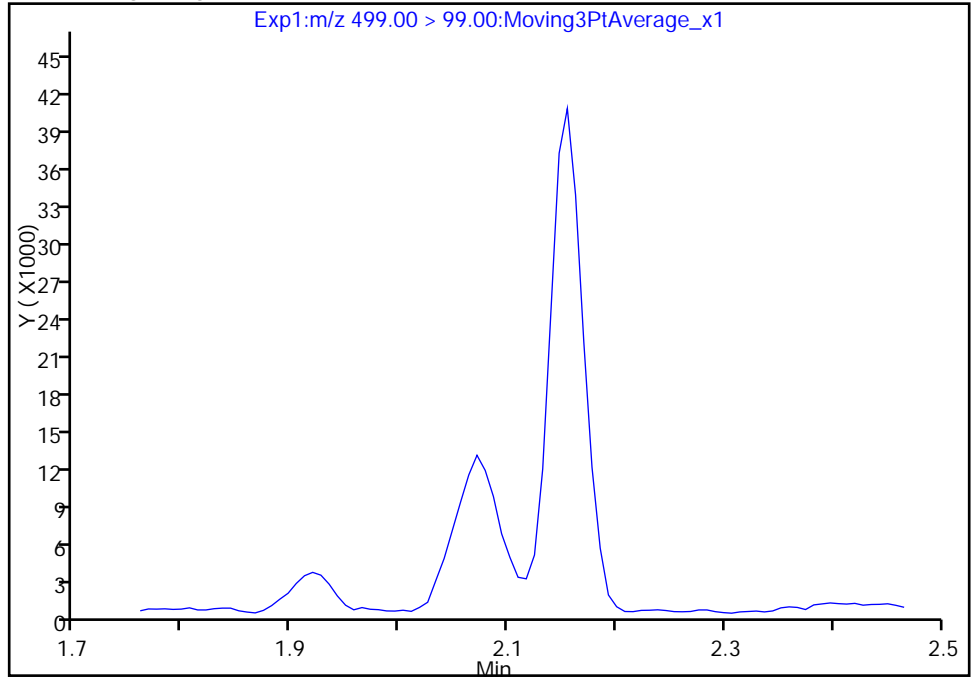
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Injection Date: 17-Aug-2017 21:14:17 Instrument ID: A8_N
Lims ID: 320-30576-A-4-A Lab Sample ID: 320-30576-4
Client ID: WGNA-080917-RW-107A
Operator ID: SACINSTLCMS01 ALS Bottle#: 25 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

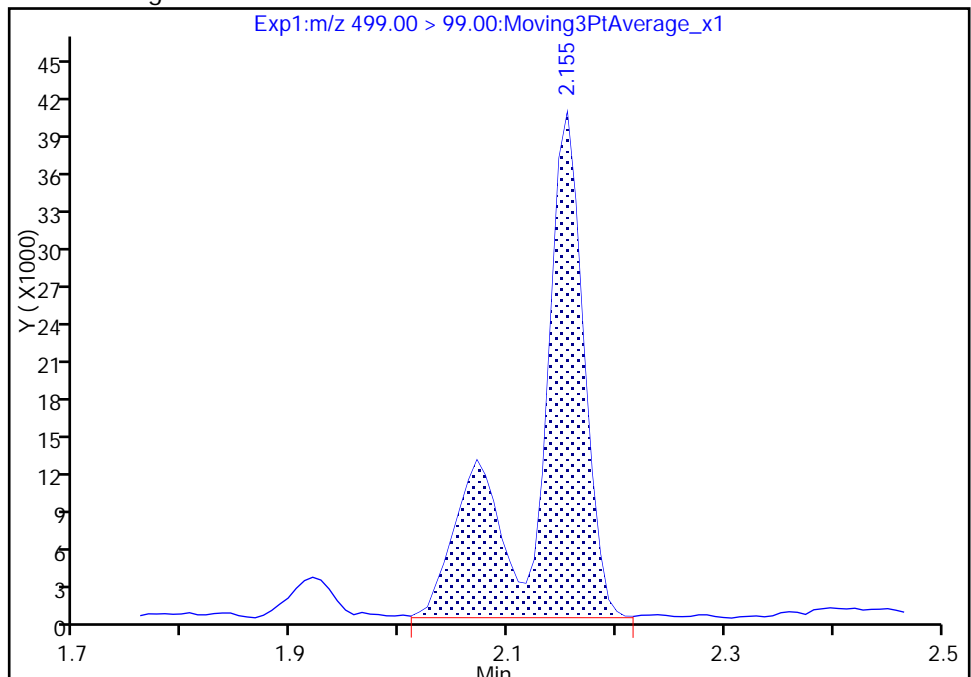
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 124333
Amount: 3.771908
Amount Units: ng/ml



Reviewer: barnettj, 21-Aug-2017 16:13:05

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

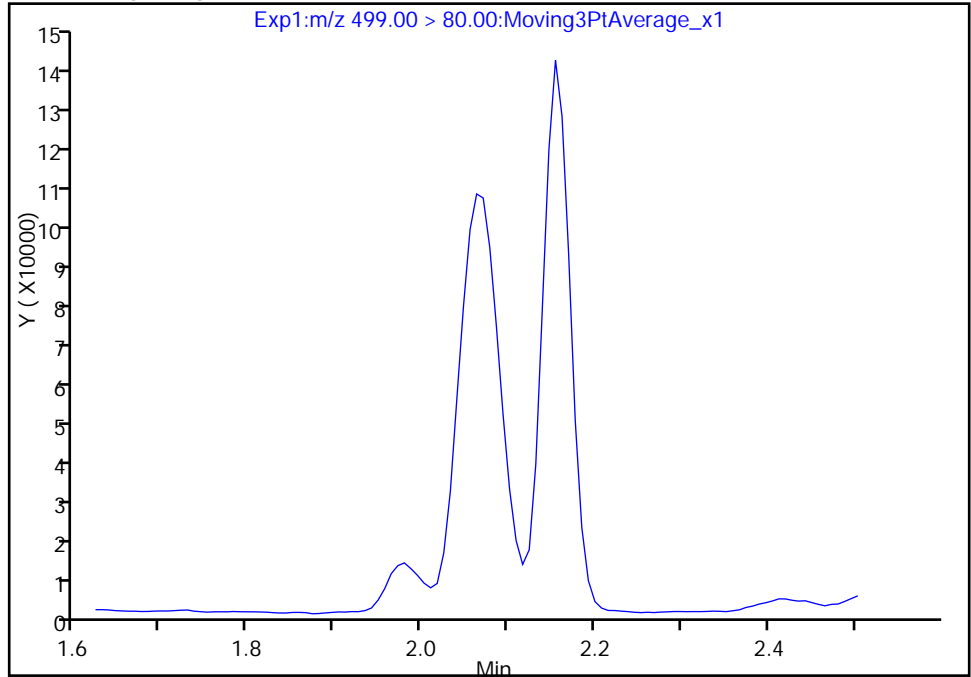
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Injection Date: 17-Aug-2017 21:14:17 Instrument ID: A8_N
Lims ID: 320-30576-A-4-A Lab Sample ID: 320-30576-4
Client ID: WGNA-080917-RW-107A
Operator ID: SACINSTLCMS01 ALS Bottle#: 25 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

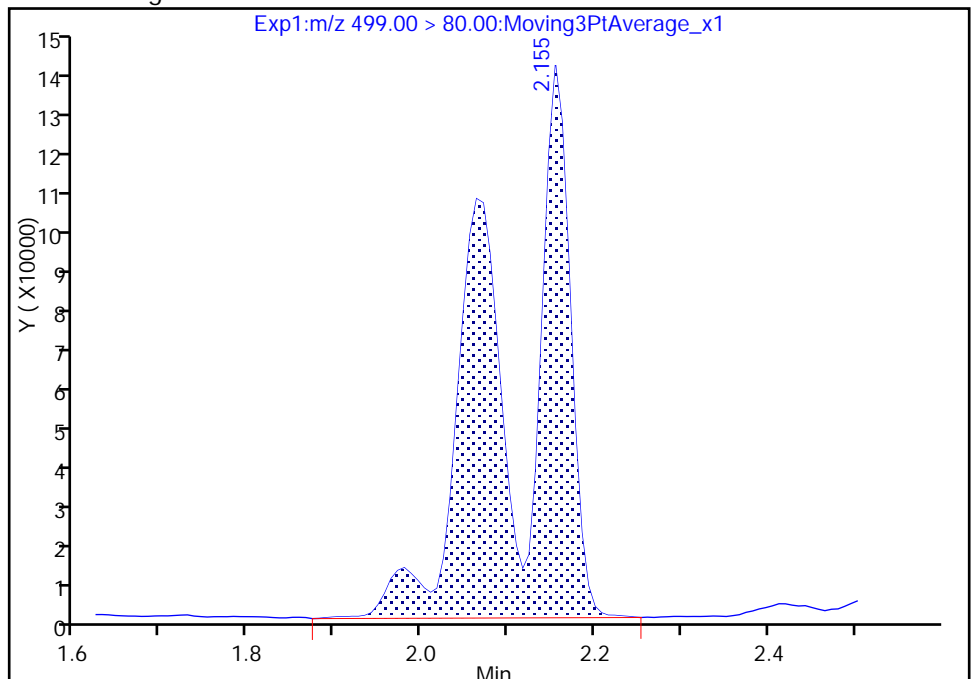
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 712085
Amount: 3.771908
Amount Units: ng/ml



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: WGNA-080917-FRB-107A Lab Sample ID: 320-30576-5
 Matrix: Water Lab File ID: 2017.08.17_537B_010.d
 Analysis Method: 537 Date Collected: 08/09/2017 09:15
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 257.4 (mL) Date Analyzed: 08/17/2017 21:19
 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.: 180244 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	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
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	98		70-130
STL00996	13C2 PFDA	108		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_010.d
 Lims ID: 320-30576-A-5-A
 Client ID: WGNA-080917-FRB-107A
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:19:02 ALS Bottle#: 26 Worklist Smp#: 10
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-5-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK001

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.555	1.568	-0.013	1.000	2303301	9.77	9254	
* 6 13C2-PFOA	415.00 > 370.00	1.897	1.928	-0.031		2077362	10.0	7583	
* 7 13C4 PFOS	503.00 > 80.00	2.155	2.185	-0.030		5864327	28.7	2315	
\$ 10 13C2 PFDA	515.00 > 470.00	2.322	2.342	-0.020	1.000	1469058	10.8	8482	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_010.d

Injection Date: 17-Aug-2017 21:19:02

Instrument ID: A8_N

Lims ID: 320-30576-A-5-A

Lab Sample ID: 320-30576-5

Client ID: WGNA-080917-FRB-107A

Operator ID: SACINSTLCMS01

ALS Bottle#: 26

Worklist Smp#: 10

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

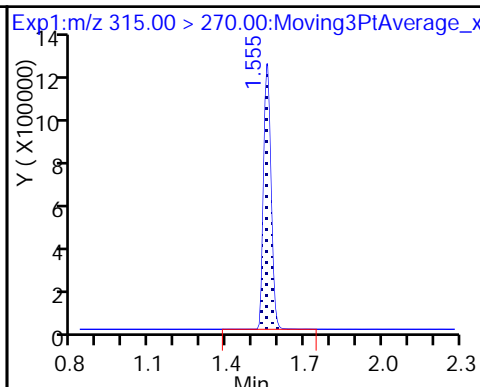
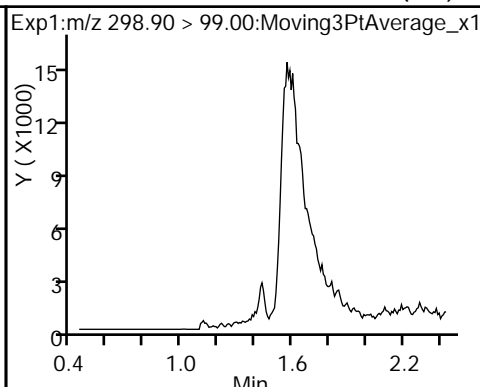
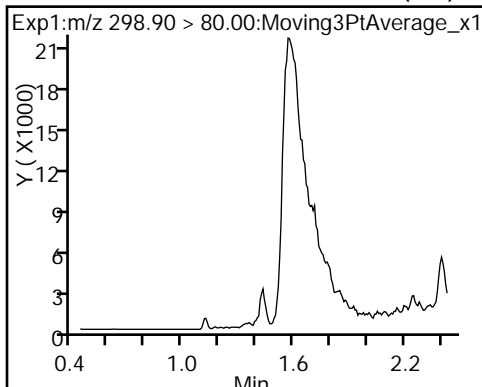
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

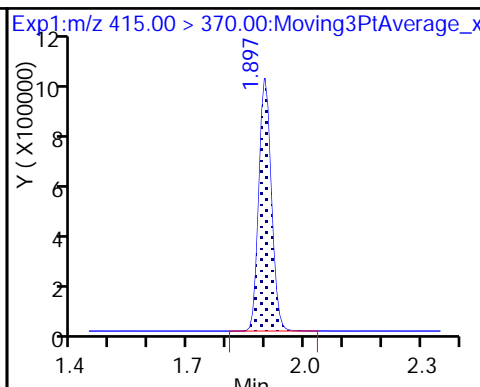
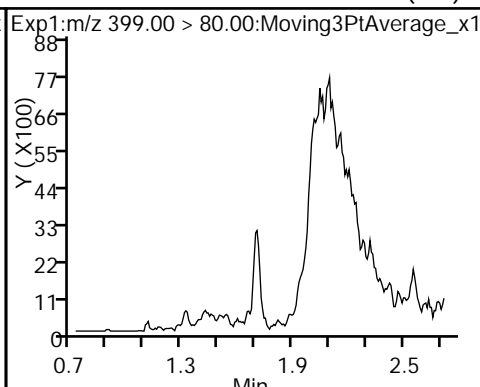
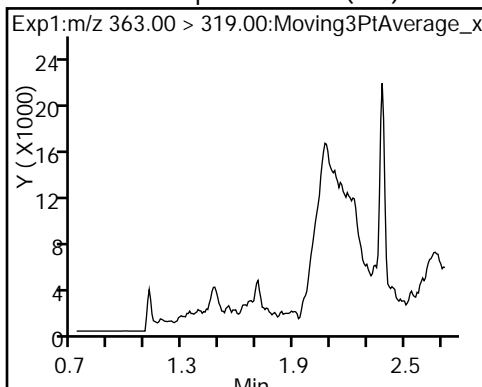
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid (ND)

3 Perfluorohexanesulfonic acid (ND)

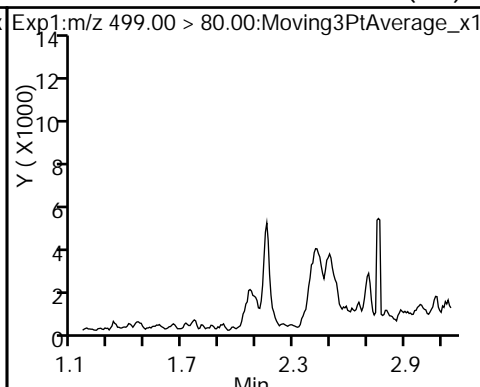
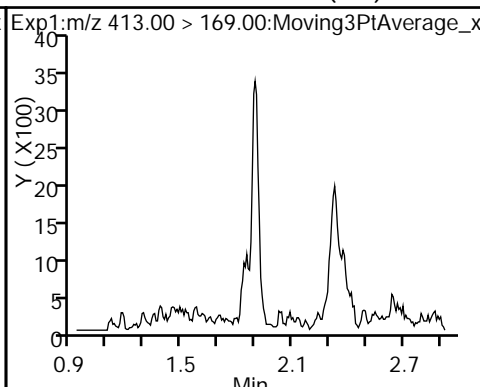
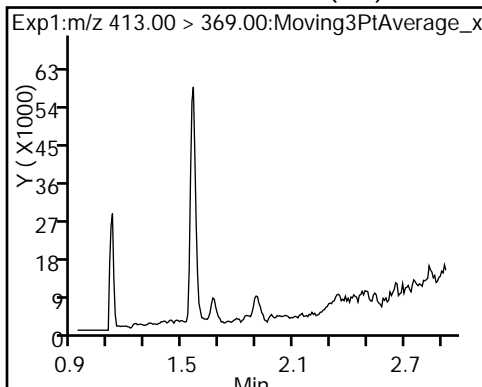
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

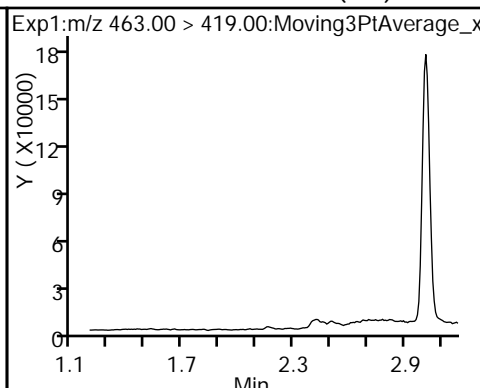
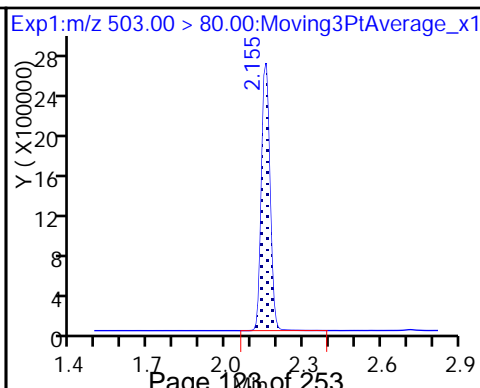
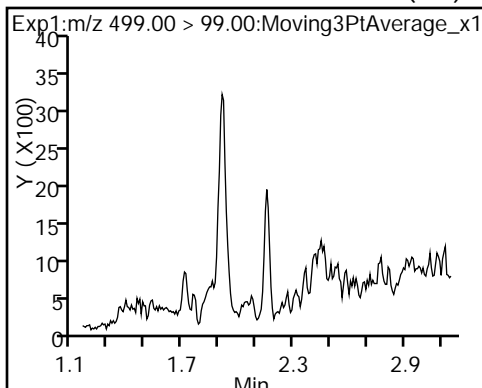
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

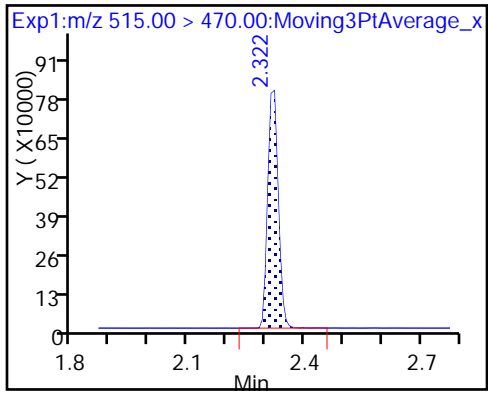


8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_010.d
 Lims ID: 320-30576-A-5-A
 Client ID: WGNA-080917-FRB-107A
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:19:02 ALS Bottle#: 26 Worklist Smp#: 10
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-5-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK001

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.77	97.68
\$ 10 13C2 PFDA	10.0	10.8	108.27

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: WGNA-080917-RW-107B Lab Sample ID: 320-30576-6
 Matrix: Water Lab File ID: 2017.08.17_537B_011.d
 Analysis Method: 537 Date Collected: 08/09/2017 09:25
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 258.5 (mL) Date Analyzed: 08/17/2017 21:23
 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.: 180244 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	J	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	13	J	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	J	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	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	89		70-130
STL00996	13C2 PFDA	120		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_011.d
 Lims ID: 320-30576-A-6-A
 Client ID: WGNA-080917-RW-107B
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:23:47 ALS Bottle#: 27 Worklist Smp#: 11
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-6-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: barnettj Date: 21-Aug-2017 16:13:51

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.438	-0.012	1.000	370607	1.65		66.5	
298.90 > 99.00	1.426	1.438	-0.012	1.000	233496		1.59(0.00-0.00)	66.5	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.548	1.568	-0.020	1.000	2014515	8.95		7229	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.699	1.722	-0.023	1.000	183256	0.9814		16.1	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.722	-0.023	1.000	1009532	3.15		185	
* 6 13C2-PFOA									
415.00 > 370.00	1.889	1.928	-0.039		1983362	10.0		7040	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.897	1.928	-0.031	1.000	599988	3.30		24.0	
413.00 > 169.00	1.897	1.928	-0.031	1.000	346005		1.73(0.00-0.00)	527	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.147	2.147	0.0	1.000	750678	3.92		145	
499.00 > 99.00	2.147	2.147	0.0	1.000	127779		5.87(0.00-0.00)	58.2	
* 7 13C4 PFOS									
503.00 > 80.00	2.147	2.185	-0.038		5976231	28.7		2037	
9 Perfluorononanoic acid									
463.00 > 419.00	2.155	2.193	-0.038	1.000	61366	0.4327		2.5	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.342	-0.028	1.000	1552792	12.0		9519	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_011.d

Injection Date: 17-Aug-2017 21:23:47

Instrument ID: A8_N

Lims ID: 320-30576-A-6-A

Lab Sample ID: 320-30576-6

Client ID: WGNA-080917-RW-107B

Operator ID: SACINSTLCMS01

ALS Bottle#: 27

Worklist Smp#: 11

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

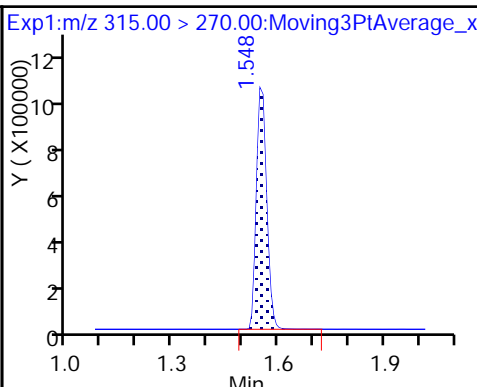
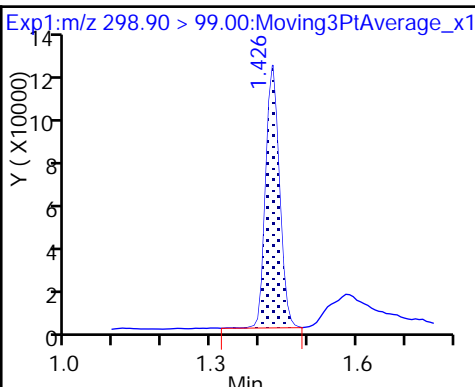
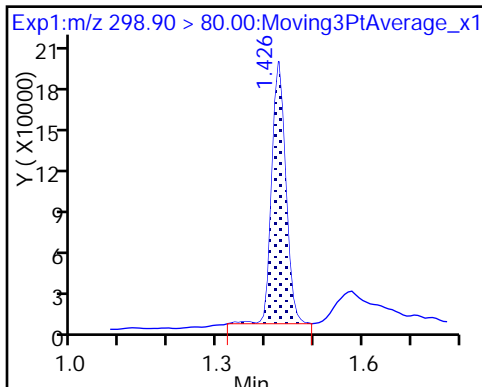
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

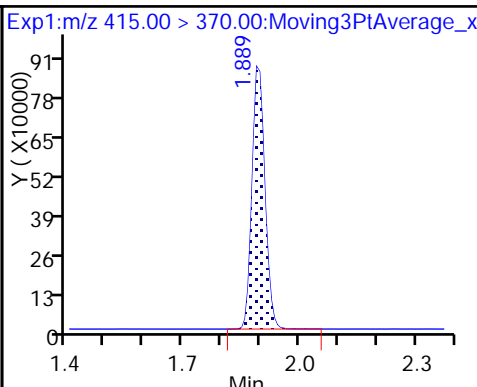
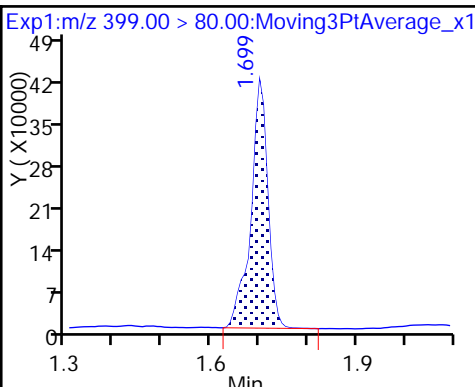
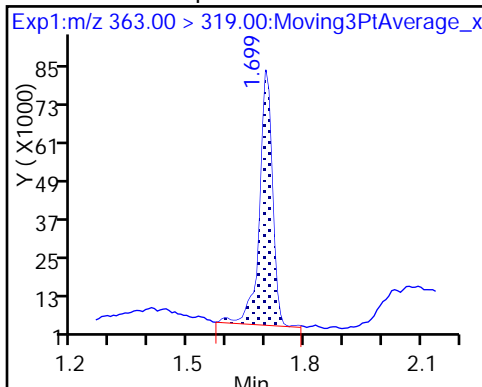
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

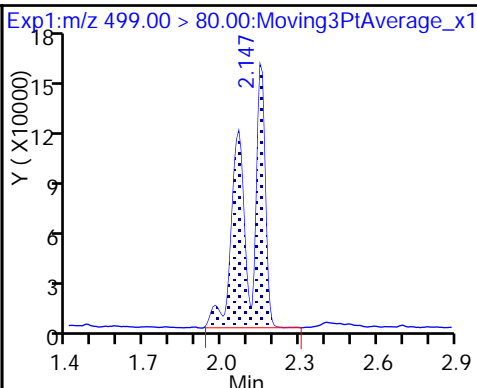
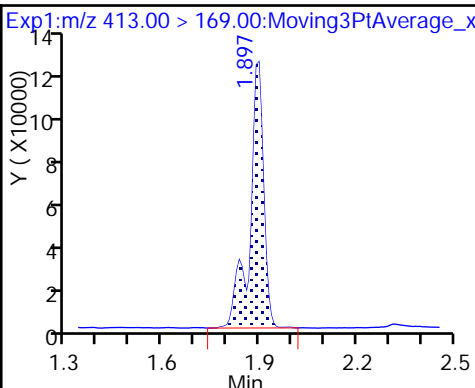
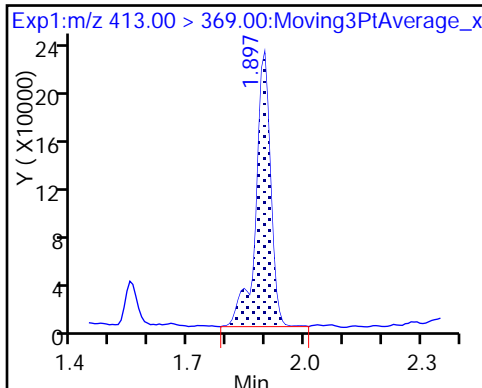
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

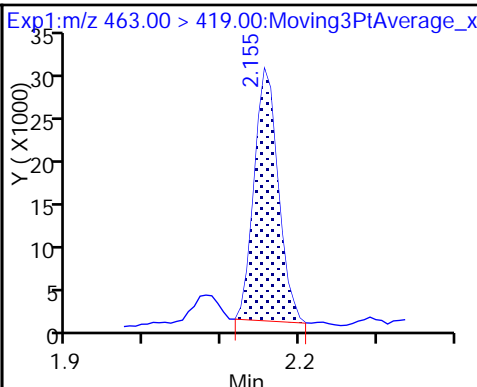
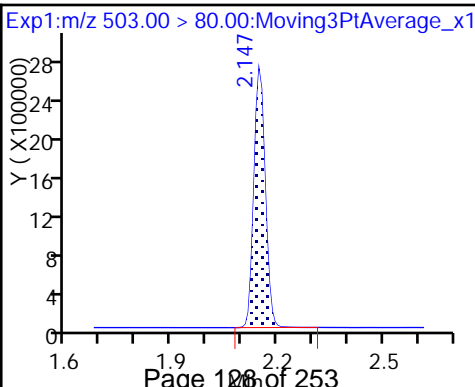
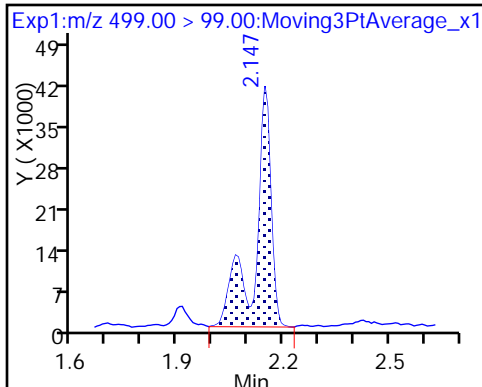
8 Perfluorooctane sulfonic acid



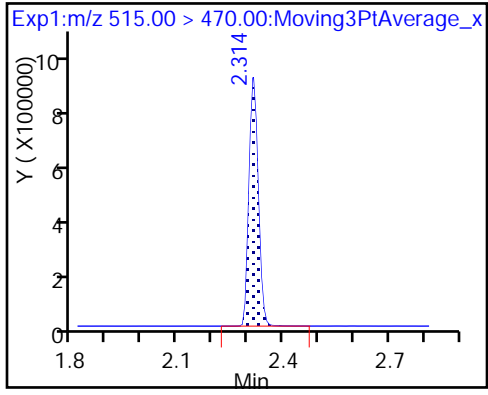
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_011.d
 Lims ID: 320-30576-A-6-A
 Client ID: WGNA-080917-RW-107B
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:23:47 ALS Bottle#: 27 Worklist Smp#: 11
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-6-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: barnettj Date: 21-Aug-2017 16:13:51

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.95	89.48
\$ 10 13C2 PFDA	10.0	12.0	119.86

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: NAWC-080917-RW-320 Lab Sample ID: 320-30576-7
 Matrix: Water Lab File ID: 2017.08.17_537B_012.d
 Analysis Method: 537 Date Collected: 08/09/2017 08:30
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 248.8 (mL) Date Analyzed: 08/17/2017 21:28
 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.: 180244 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)	7.2	J	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)	2.4	J M	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	90		70-130
STL00996	13C2 PFDA	110		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_012.d
 Lims ID: 320-30576-A-7-A
 Client ID: NAWC-080917-RW-320
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:28:30 ALS Bottle#: 28 Worklist Smp#: 12
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-7-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: barnettj Date: 21-Aug-2017 16:14:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.438	-0.012	1.000	92241	0.4286		14.8	
298.90 > 99.00	1.426	1.438	-0.012	1.000	55051		1.68(0.00-0.00)	17.0	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.568	-0.013	1.000	1966803	8.96		7731	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.707	1.722	-0.015	1.000	109786	0.6030		9.7	M
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.707	1.722	-0.015	1.000	131514	0.4301		22.2	
* 6 13C2-PFOA									
415.00 > 370.00	1.897	1.928	-0.031		1933732	10.0		7772	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.897	1.928	-0.031	1.000	318968	1.80		11.4	
413.00 > 169.00	1.897	1.928	-0.031	1.000	186161		1.71(0.00-0.00)	303	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.155	2.147	0.008	1.000	266844	1.46		50.4	
499.00 > 99.00	2.155	2.147	0.008	1.000	43574		6.12(0.00-0.00)	20.8	
* 7 13C4 PFOS									
503.00 > 80.00	2.155	2.185	-0.030		5700370	28.7		1803	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.322	2.342	-0.020	1.000	1389814	11.0		8353	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_012.d

Injection Date: 17-Aug-2017 21:28:30

Instrument ID: A8_N

Lims ID: 320-30576-A-7-A

Lab Sample ID: 320-30576-7

Client ID: NAWC-080917-RW-320

Operator ID: SACINSTLCMS01

ALS Bottle#: 28

Worklist Smp#: 12

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

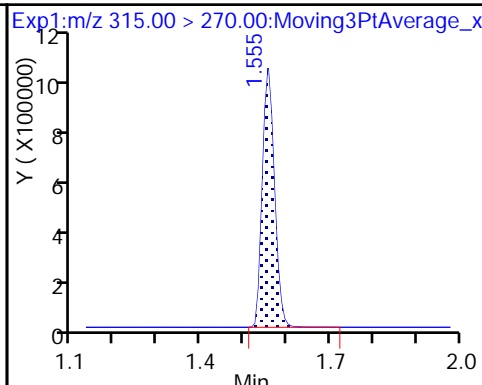
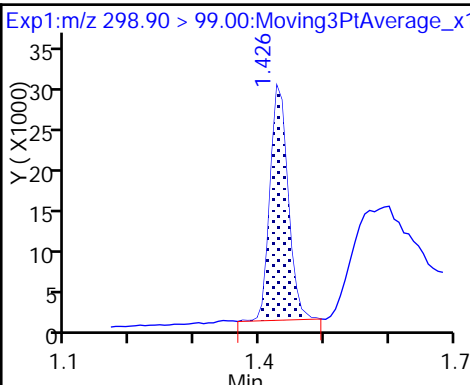
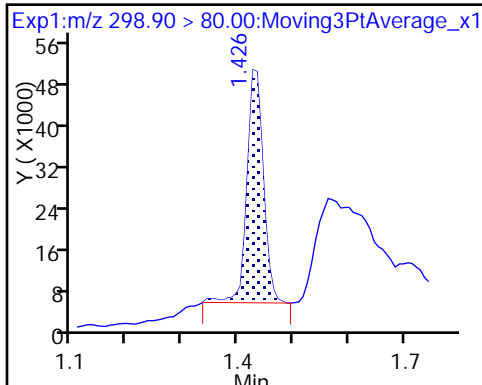
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

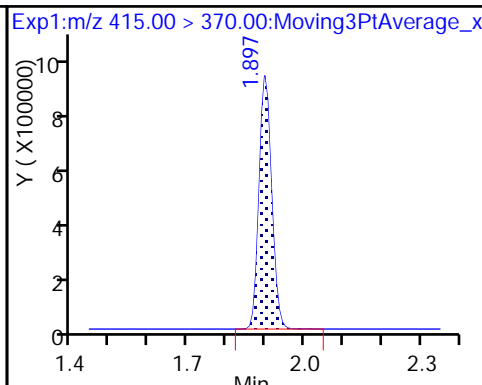
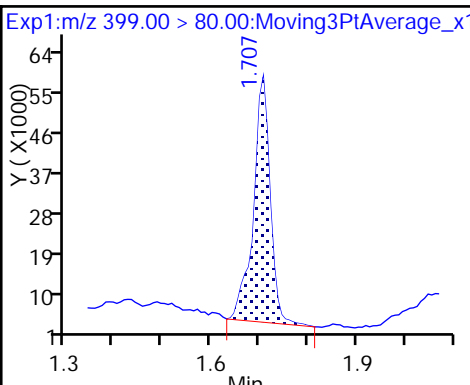
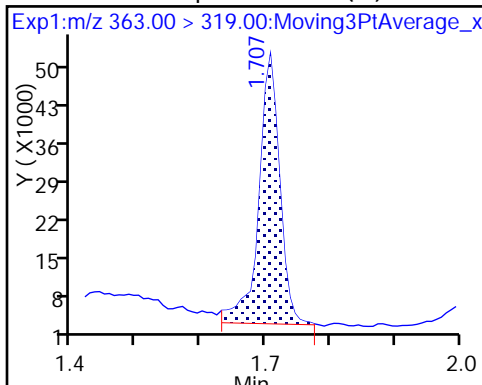
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid (M)

3 Perfluorohexanesulfonic acid

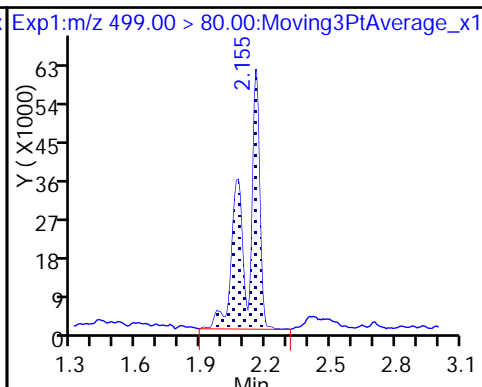
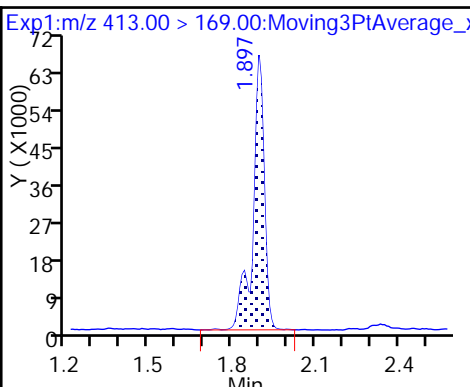
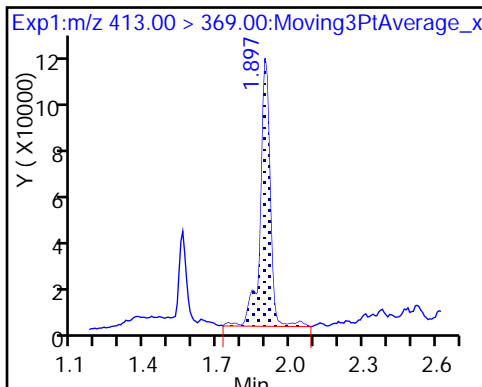
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

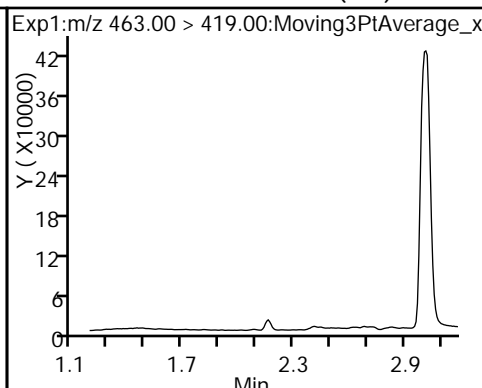
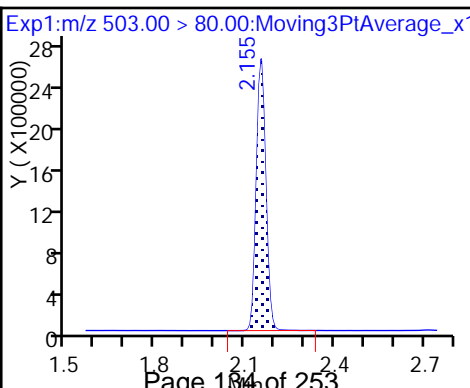
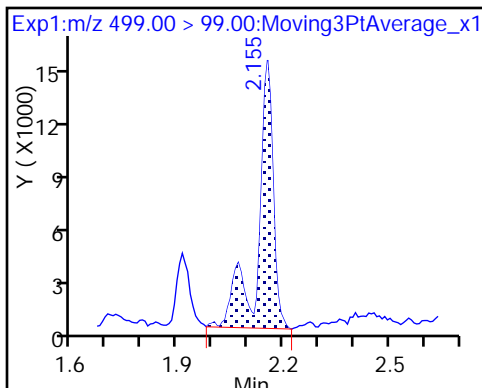
8 Perfluorooctane sulfonic acid



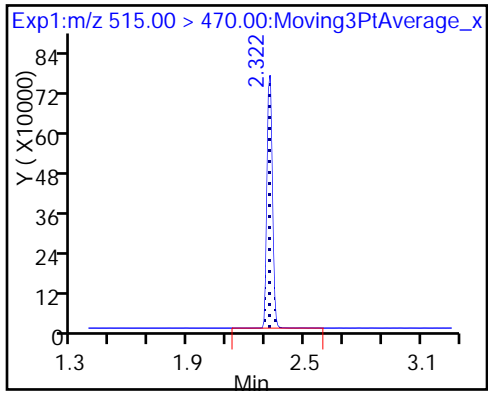
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_012.d
 Lims ID: 320-30576-A-7-A
 Client ID: NAWC-080917-RW-320
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:28:30 ALS Bottle#: 28 Worklist Smp#: 12
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-7-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: barnettj Date: 21-Aug-2017 16:14:39

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.96	89.60
\$ 10 13C2 PFDA	10.0	11.0	110.03

TestAmerica Sacramento

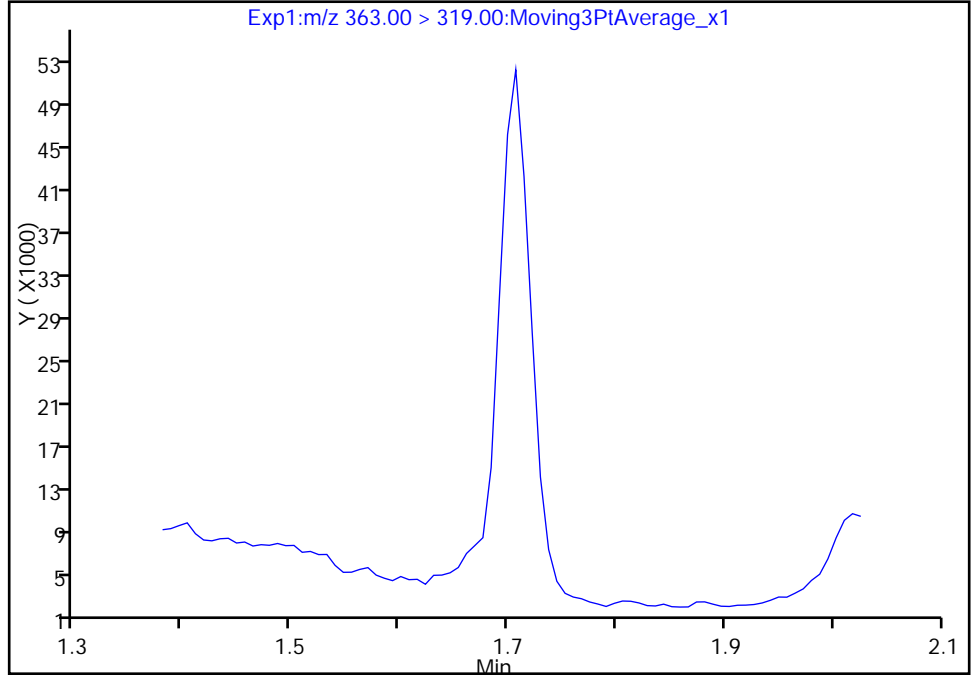
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_012.d
Injection Date: 17-Aug-2017 21:28:30 Instrument ID: A8_N
Lims ID: 320-30576-A-7-A Lab Sample ID: 320-30576-7
Client ID: NAWC-080917-RW-320
Operator ID: SACINSTLCMS01 ALS Bottle#: 28 Worklist Smp#: 12
Injection Vol: 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

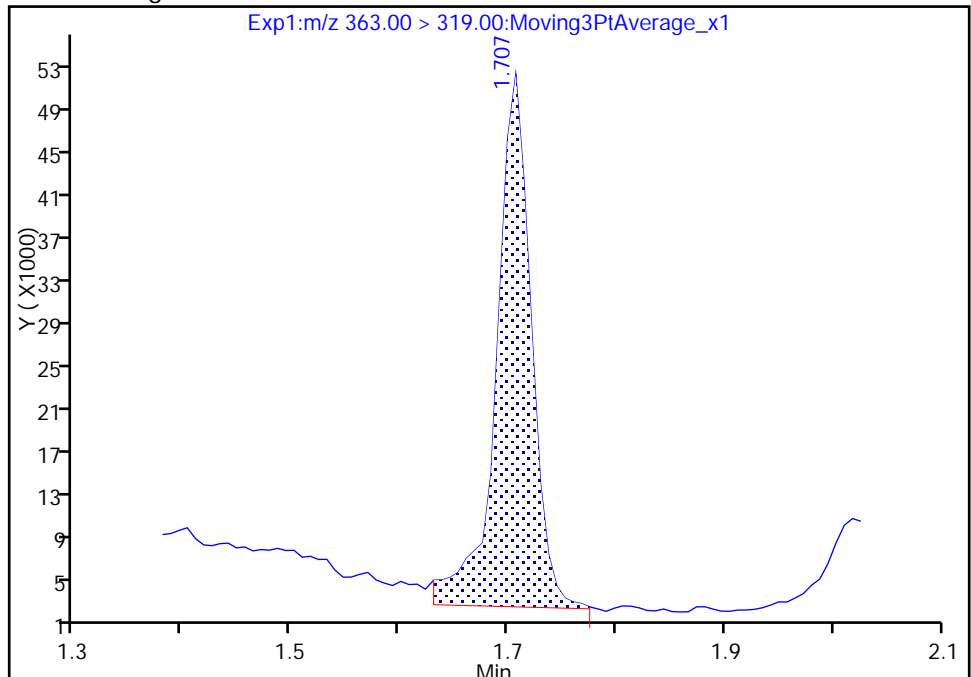
Not Detected
Expected RT: 1.72

Processing Integration Results



Manual Integration Results

RT: 1.71
Area: 109786
Amount: 0.603044
Amount Units: ng/ml



Reviewer: barnettj, 21-Aug-2017 16:14:16
Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: NAWC-080917-FRB-320 Lab Sample ID: 320-30576-8
 Matrix: Water Lab File ID: 2017.08.17_537B_015.d
 Analysis Method: 537 Date Collected: 08/09/2017 08:25
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 254(mL) Date Analyzed: 08/17/2017 21:42
 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.: 180245 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	7.9	U	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	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	89	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	113		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_015.d
 Lims ID: 320-30576-A-8-A
 Client ID: NAWC-080917-FRB-320
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:42:43 ALS Bottle#: 29 Worklist Smp#: 15
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-8-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:41 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK001

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.555	1.568	-0.013	1.000	2266830	10.2	9476	
* 6 13C2-PFOA	415.00 > 370.00	1.897	1.928	-0.031		1958634	10.0	7338	
* 7 13C4 PFOS	503.00 > 80.00	2.155	2.185	-0.030		5724980	28.7	2651	
\$ 10 13C2 PFDA	515.00 > 470.00	2.314	2.342	-0.028	1.000	1440923	11.3	8876	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_015.d

Injection Date: 17-Aug-2017 21:42:43

Instrument ID: A8_N

Lims ID: 320-30576-A-8-A

Lab Sample ID: 320-30576-8

Client ID: NAWC-080917-FRB-320

Operator ID: SACINSTLCMS01

ALS Bottle#: 29

Worklist Smp#: 15

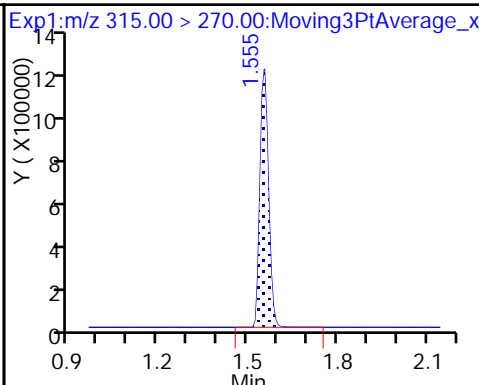
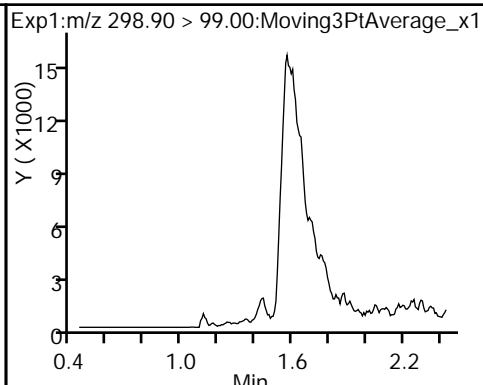
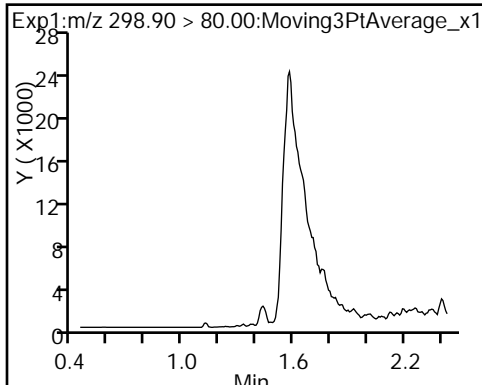
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

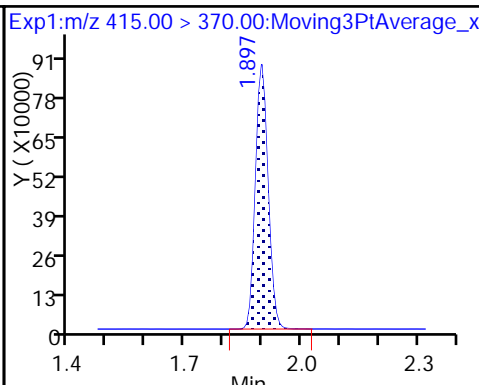
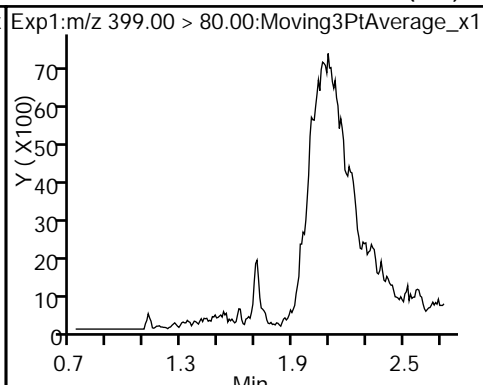
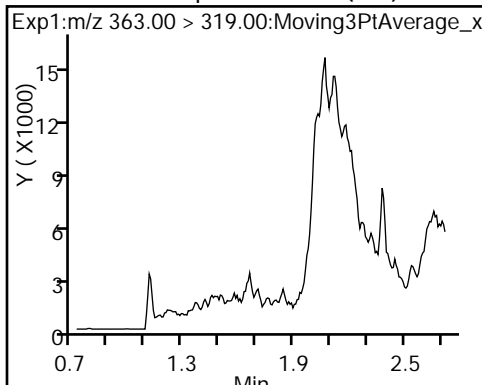
Method: 537_A8_N

Limit Group: LC 537 ICAL

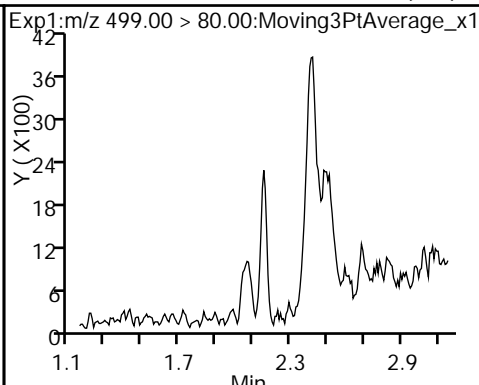
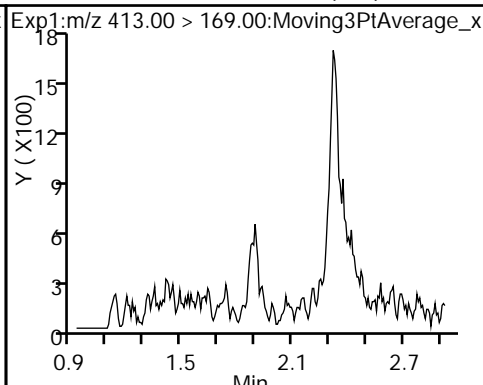
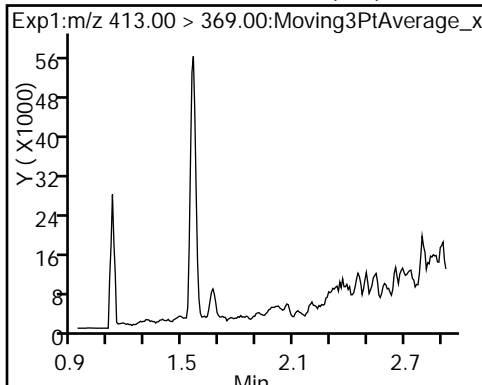
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



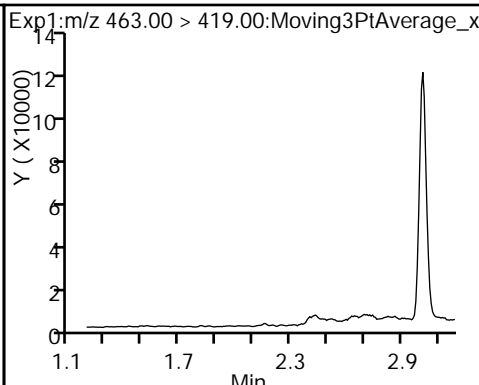
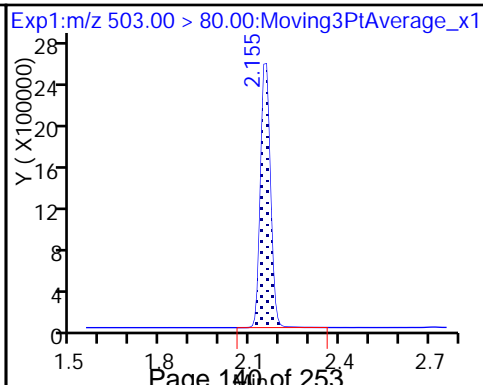
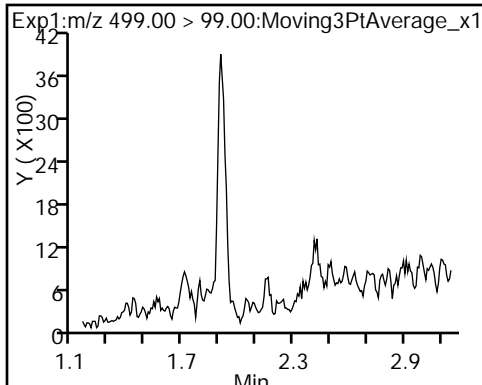
4 Perfluoroheptanoic acid (ND) 3 Perfluorohexanesulfonic acid (ND) * 6 13C2-PFOA



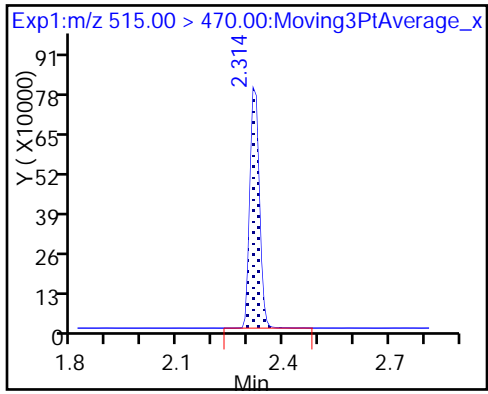
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) 8 Perfluorooctane sulfonic acid (ND)



8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS 9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_015.d
 Lims ID: 320-30576-A-8-A
 Client ID: NAWC-080917-FRB-320
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:42:43 ALS Bottle#: 29 Worklist Smp#: 15
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-8-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:41 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK001

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.2	101.96
\$ 10 13C2 PFDA	10.0	11.3	112.63

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: WGNA-080917-RW-263 Lab Sample ID: 320-30576-9
 Matrix: Water Lab File ID: 2017.08.17_537B_016.d
 Analysis Method: 537 Date Collected: 08/09/2017 10:10
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 257.4 (mL) Date Analyzed: 08/17/2017 21:47
 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.: 180245 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	18	J	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	17	J	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	9.1	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	89		70-130
STL00996	13C2 PFDA	112		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_016.d
 Lims ID: 320-30576-A-9-A
 Client ID: WGNA-080917-RW-263
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:47:28 ALS Bottle#: 30 Worklist Smp#: 16
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-9-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:41 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: barnettj Date: 21-Aug-2017 16:16:11

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.438	-0.012	1.000	667836	2.95		132	
298.90 > 99.00	1.426	1.438	-0.012	1.000	413081		1.62(0.00-0.00)	125	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.568	-0.013	1.000	2077120	8.91		7750	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.707	1.722	-0.015	1.000	229062	1.18		18.7	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.722	-0.023	1.000	755943	2.34		146	
* 6 13C2-PFOA									
415.00 > 370.00	1.897	1.928	-0.031		2053834	10.0		7808	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.897	1.928	-0.031	1.000	838145	4.45		31.8	
413.00 > 169.00	1.897	1.928	-0.031	1.000	508267		1.65(0.00-0.00)	660	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.064	2.147	-0.083	1.000	919191	4.75		168	
499.00 > 99.00	2.147	2.147	0.0	1.040	130396		7.05(0.00-0.00)	47.7	
* 7 13C4 PFOS									
503.00 > 80.00	2.147	2.185	-0.038		6030004	28.7		2195	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.342	-0.028	1.000	1499310	11.2		7962	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_016.d

Injection Date: 17-Aug-2017 21:47:28

Instrument ID: A8_N

Lims ID: 320-30576-A-9-A

Lab Sample ID: 320-30576-9

Client ID: WGNA-080917-RW-263

Operator ID: SACINSTLCMS01

ALS Bottle#: 30

Worklist Smp#: 16

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

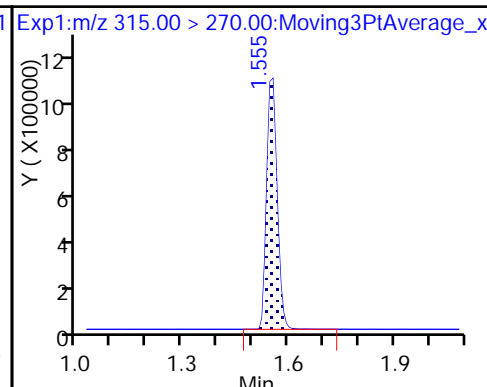
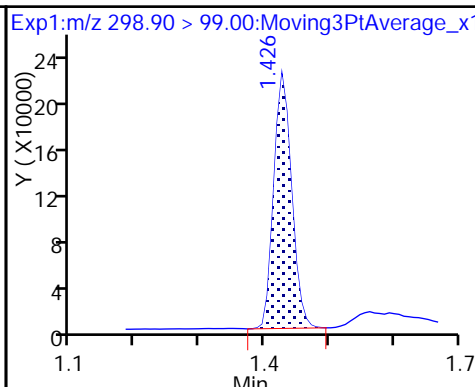
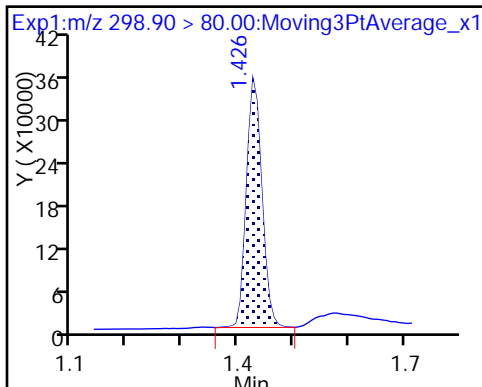
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

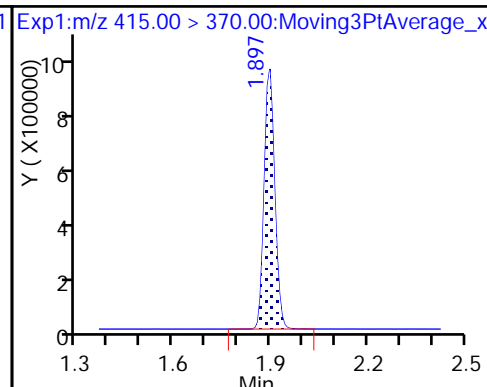
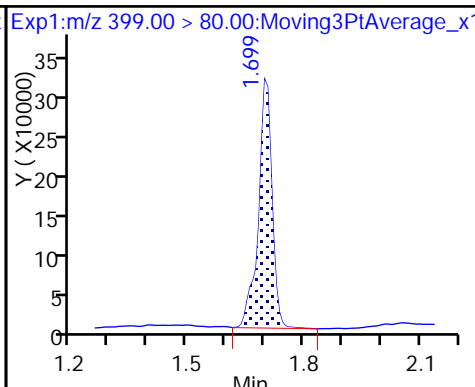
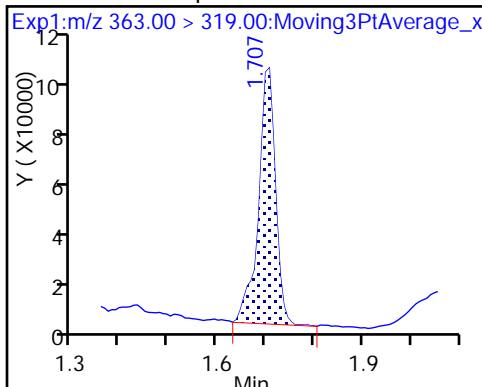
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

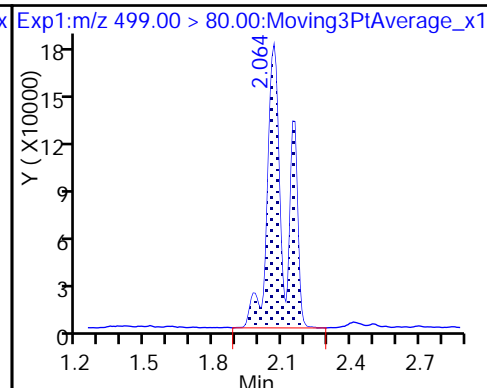
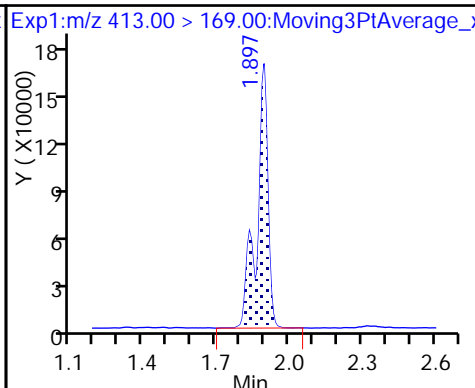
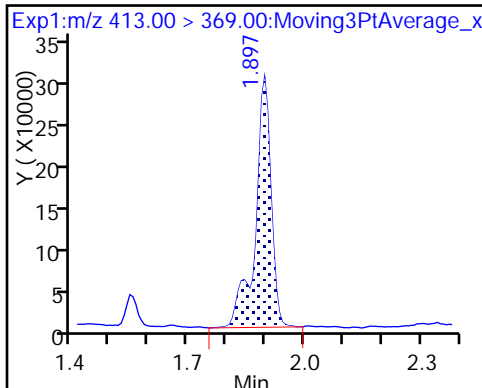
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

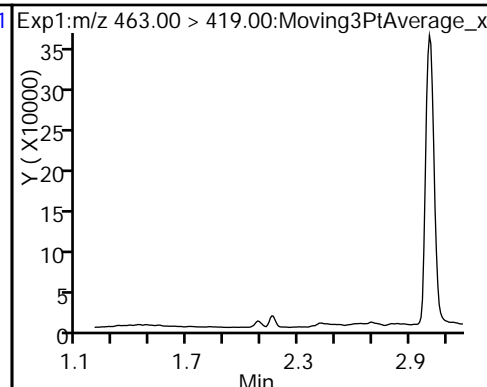
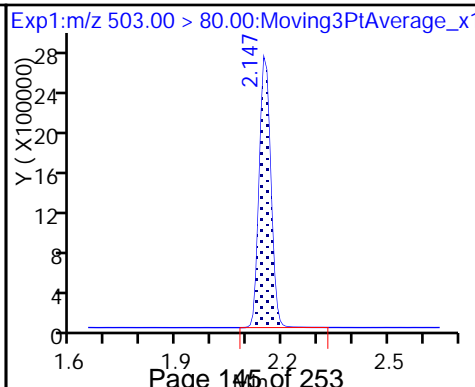
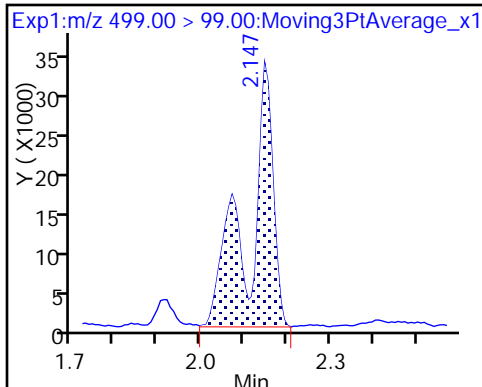
8 Perfluorooctane sulfonic acid



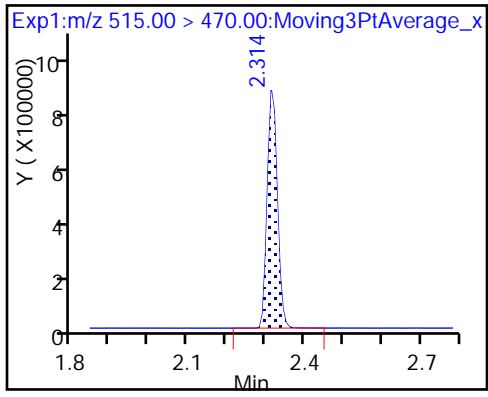
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_016.d
 Lims ID: 320-30576-A-9-A
 Client ID: WGNA-080917-RW-263
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:47:28 ALS Bottle#: 30 Worklist Smp#: 16
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-9-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:41 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: barnettj Date: 21-Aug-2017 16:16:11

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.91	89.09
\$ 10 13C2 PFDA	10.0	11.2	111.76

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: WGNA-080917-FRB-263 Lab Sample ID: 320-30576-10
 Matrix: Water Lab File ID: 2017.08.17_537B_017.d
 Analysis Method: 537 Date Collected: 08/09/2017 10:05
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 262.1(mL) Date Analyzed: 08/17/2017 21:52
 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.: 180245 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)	7.6	U	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	29	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	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	104		70-130
STL00996	13C2 PFDA	115		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_017.d
 Lims ID: 320-30576-A-10-A
 Client ID: WGNA-080917-FRB-263
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:52:13 ALS Bottle#: 31 Worklist Smp#: 17
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-10-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:41 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK001

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.548	1.568	-0.020	1.000	2197143	10.4	7986	
* 6 13C2-PFOA	415.00 > 370.00	1.889	1.928	-0.039		1856521	10.0	7003	
* 7 13C4 PFOS	503.00 > 80.00	2.147	2.185	-0.038		5734120	28.7	2705	
\$ 10 13C2 PFDA	515.00 > 470.00	2.314	2.342	-0.028	1.000	1395697	11.5	8938	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_017.d

Injection Date: 17-Aug-2017 21:52:13

Instrument ID: A8_N

Lims ID: 320-30576-A-10-A

Lab Sample ID: 320-30576-10

Client ID: WGNA-080917-FRB-263

Operator ID: SACINSTLCMS01

ALS Bottle#: 31

Worklist Smp#: 17

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

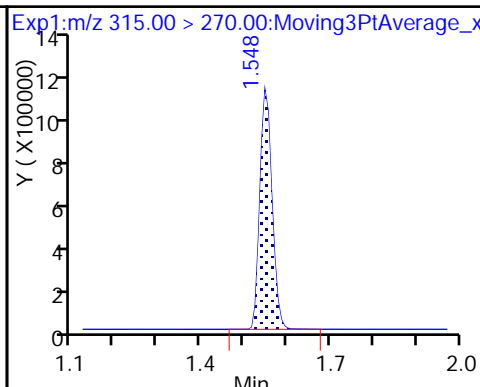
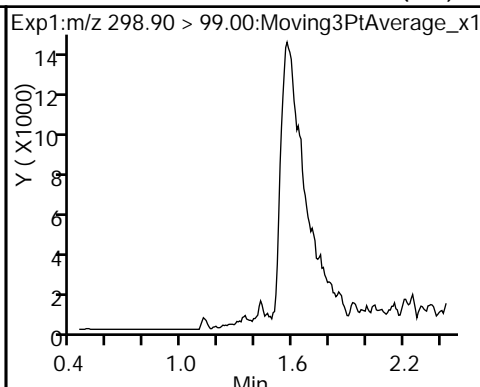
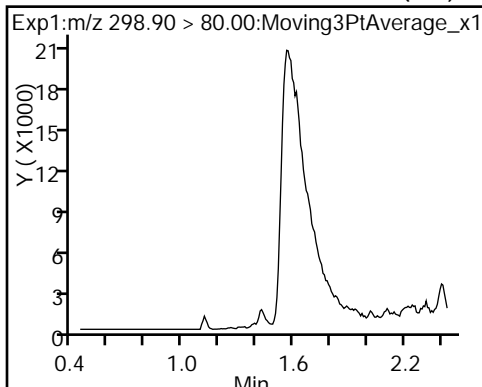
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

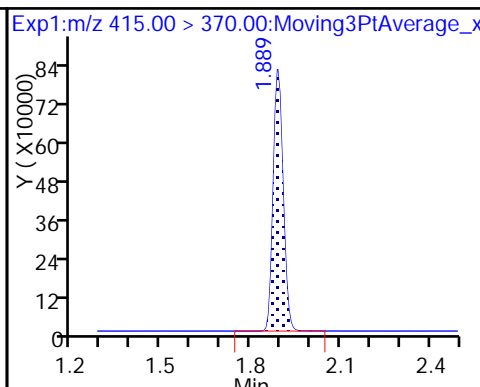
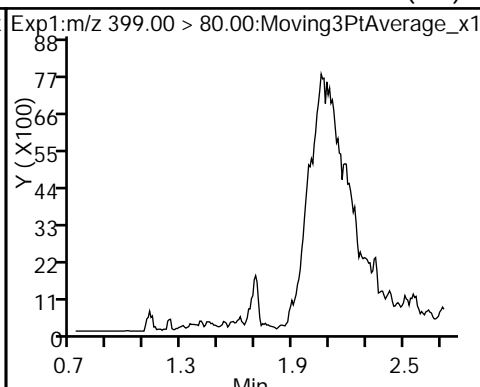
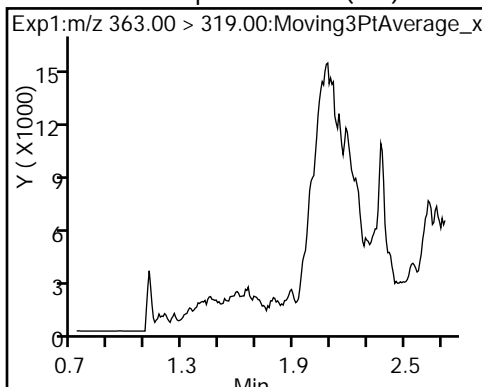
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid (ND)

3 Perfluorohexanesulfonic acid (ND)

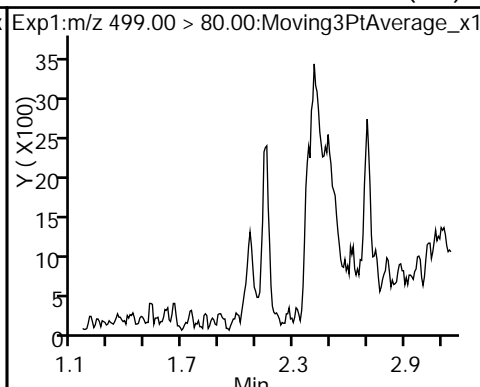
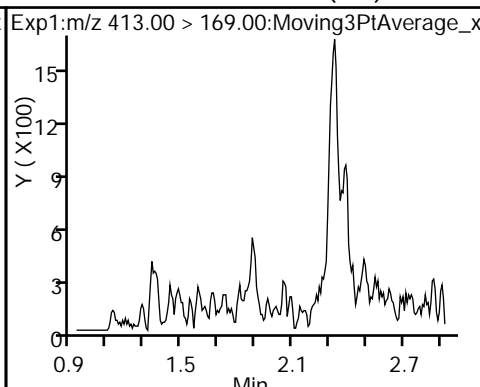
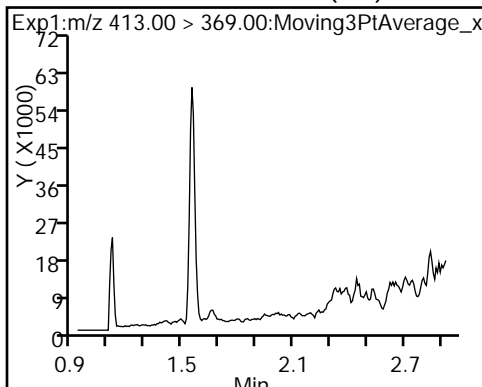
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

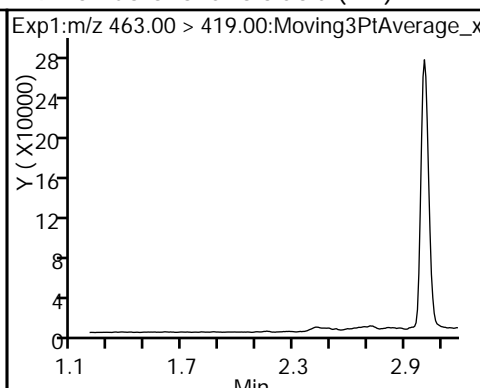
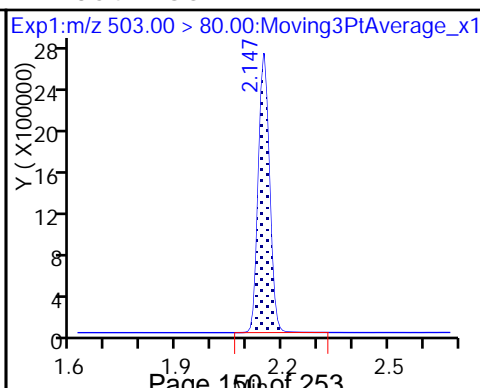
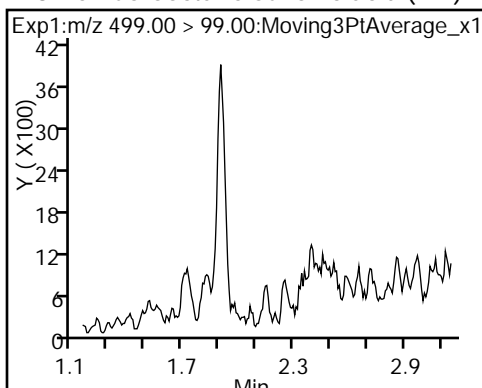
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

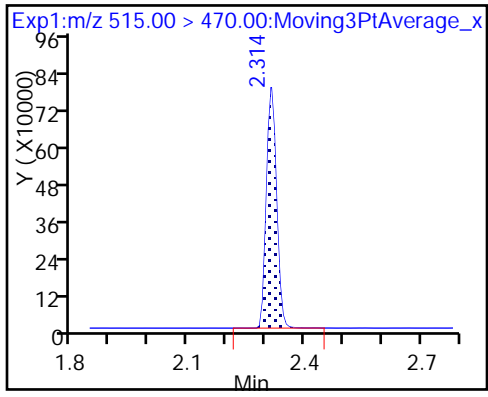


8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_017.d
 Lims ID: 320-30576-A-10-A
 Client ID: WGNA-080917-FRB-263
 Sample Type: Client
 Inject. Date: 17-Aug-2017 21:52:13 ALS Bottle#: 31 Worklist Smp#: 17
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30576-a-10-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:41 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK001

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.4	104.26
\$ 10 13C2 PFDA	10.0	11.5	115.09

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

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1 Analy Batch No.: 180236

SDG No.: _____

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

Calibration Start Date: 08/17/2017 17:07 Calibration End Date: 08/17/2017 17:30 Calibration ID: 33656

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-180236/2	207.08.17_537A_004.d
Level 2	IC 320-180236/3	207.08.17_537A_005.d
Level 3	IC 320-180236/4	207.08.17_537A_006.d
Level 4	IC 320-180236/5	207.08.17_537A_007.d
Level 5	IC 320-180236/6	207.08.17_537A_008.d
Level 6	IC 320-180236/7	207.08.17_537A_009.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)	1.0927 0.7332	1.1633	1.0611	0.8972	0.7853	QuaF		1.0837	-0.002008					0.9970			0.9600
Perfluoroheptanoic acid (PFHpA)	0.9281 0.8704	0.9794	1.0010	0.9614	0.9085	Ave		0.9415			5.1		30.0				
Perfluorohexanesulfonic acid (PFHxS)	1.4768 1.4556	1.6479	1.5869	1.5645	1.4984	Ave		1.5383			4.8		30.0				
Perfluorooctanoic acid (PFOA)	0.8906 0.9399	0.8695	0.9315	0.9671	0.9064	Ave		0.9175			3.9		30.0				
Perfluorooctanesulfonic acid (PFOS)	0.8621 0.9508	0.9259	0.8962	0.9469	0.9367	Ave		0.9198			3.7		30.0				
Perfluorononanoic acid (PFNA)	0.7073 0.6252	0.7733	0.7934	0.7465	0.6445	Ave		0.7150			9.6		30.0				
13C2 PFHxA	1.1263 1.0730	1.1534	1.1964	1.1363	1.1254	Ave		1.1351			3.6		30.0				
13C2 PFDA	0.7013 0.5669	0.6802	0.7263	0.6486	0.5957	Ave		0.6532			9.5		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.: 320-30576-1 Analy Batch No.: 180236

SDG No.: _____

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

Calibration Start Date: 08/17/2017 17:07 Calibration End Date: 08/17/2017 17:30 Calibration ID: 33656

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-180236/2	207.08.17_537A_004.d
Level 2	IC 320-180236/3	207.08.17_537A_005.d
Level 3	IC 320-180236/4	207.08.17_537A_006.d
Level 4	IC 320-180236/5	207.08.17_537A_007.d
Level 5	IC 320-180236/6	207.08.17_537A_008.d
Level 6	IC 320-180236/7	207.08.17_537A_009.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	QuaF	1989419 25626485	4448062	9376032	15897968	20788356	9.00 180	20.0	45.0	90.0	135
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	167400 3752250	379095	852234	1817435	2833966	1.00 20.0	2.22	5.00	10.0	15.0
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	896364 16959937	2100734	4674793	9242464	13223291	3.00 60.0	6.67	15.0	30.0	45.0
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	321453 8108947	673518	1587046	3658778	5658166	2.00 40.0	4.45	10.0	20.0	30.0
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	697706 14770994	1573826	3519979	7458706	11021657	4.00 80.0	8.89	20.0	40.0	60.0
Perfluorononanoic acid (PFNA)	13PF OA	Ave	255111 5389964	598613	1350886	2822430	4020876	2.00 40.0	4.45	10.0	20.0	30.0
13C2 PFHxA	13PF OA	Ave	2030599 2312284	2008624	2036663	2147570	2339905	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	1264490 1221662	1184489	1236464	1225880	1238610	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD
QuaF = Quadratic ISTD forced zero

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

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1 Analy Batch No.: 180236

SDG No.: _____

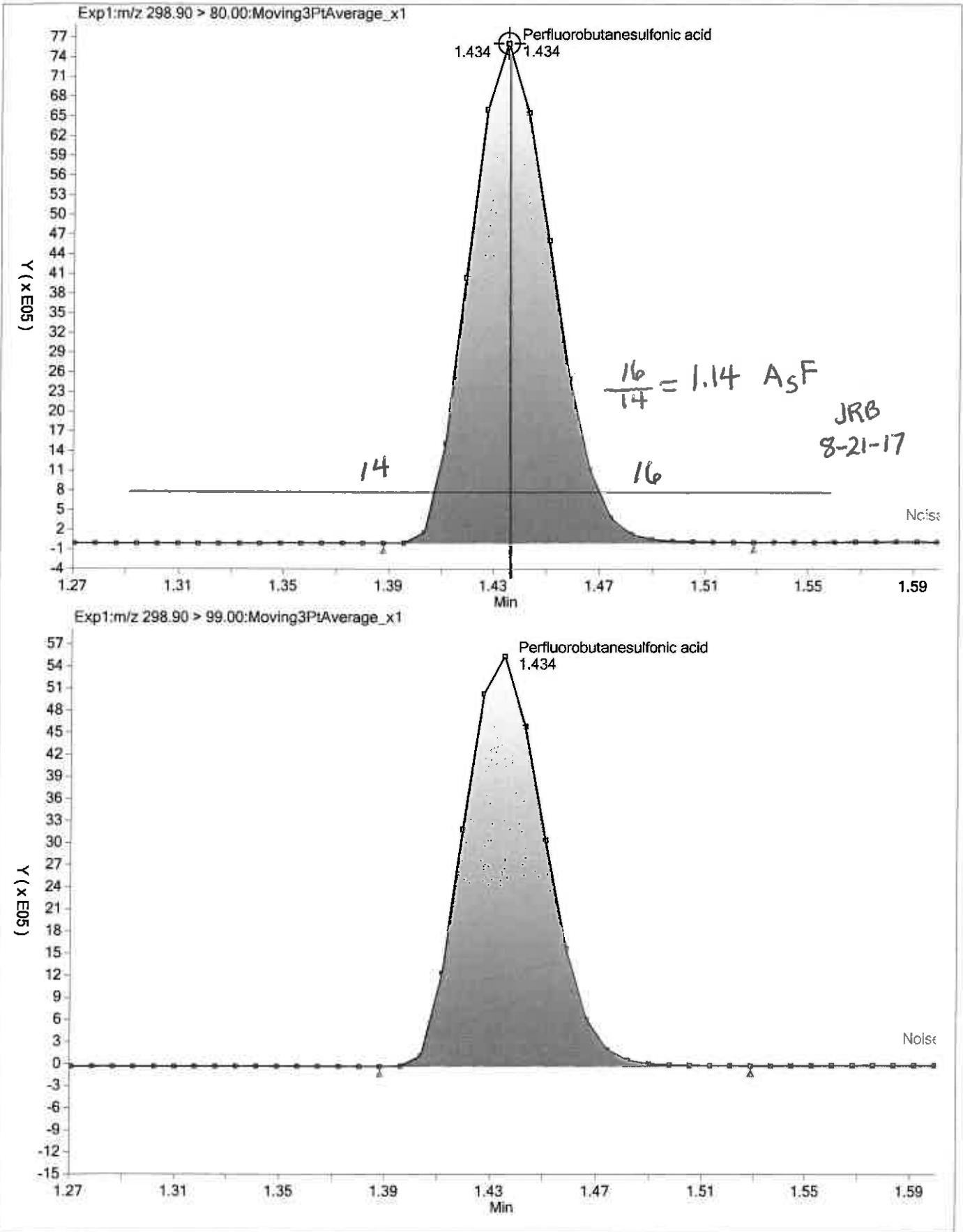
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

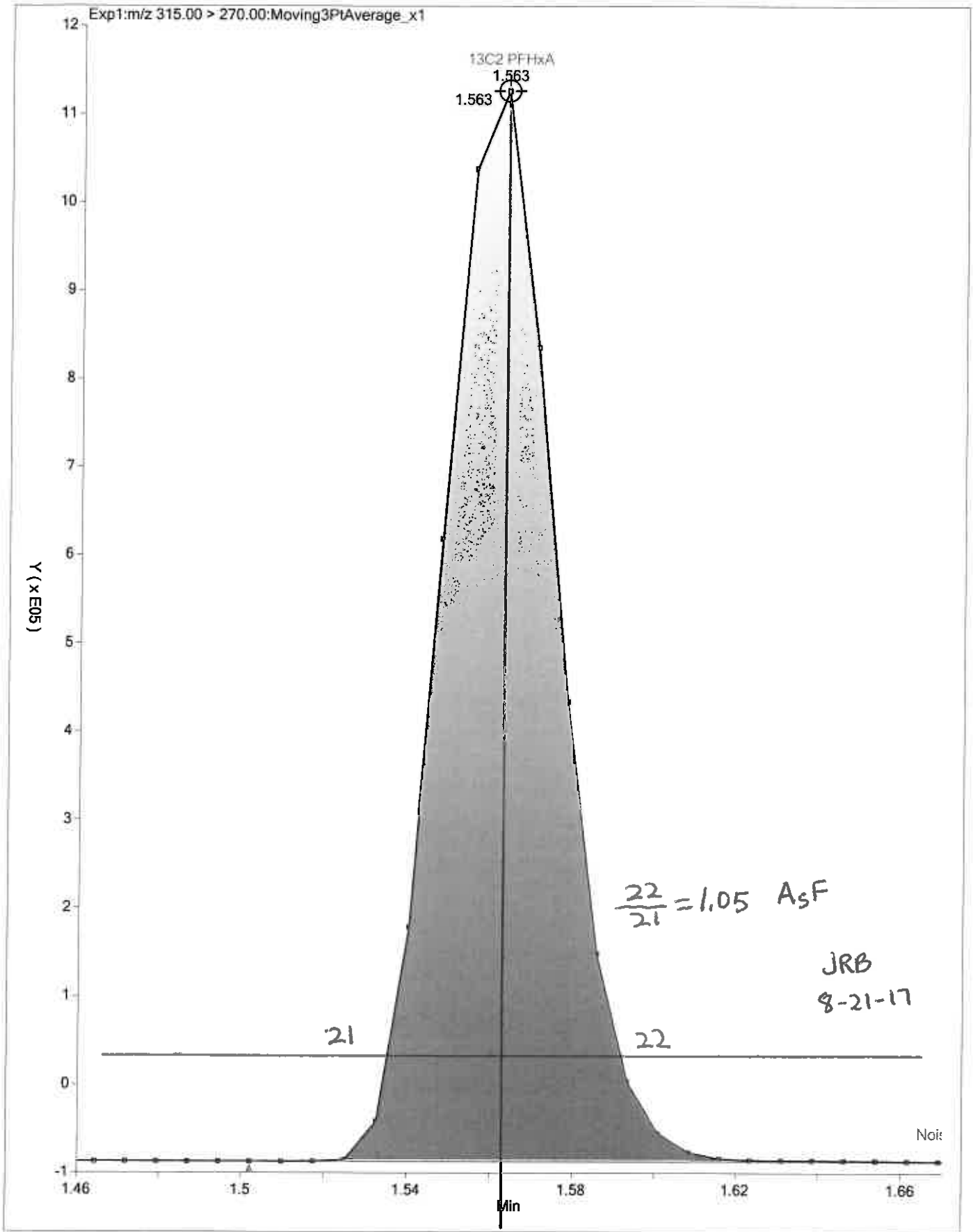
Calibration Start Date: 08/17/2017 17:07 Calibration End Date: 08/17/2017 17:30 Calibration ID: 33656

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-180236/2	207.08.17_537A_004.d
Level 2	IC 320-180236/3	207.08.17_537A_005.d
Level 3	IC 320-180236/4	207.08.17_537A_006.d
Level 4	IC 320-180236/5	207.08.17_537A_007.d
Level 5	IC 320-180236/6	207.08.17_537A_008.d
Level 6	IC 320-180236/7	207.08.17_537A_009.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)	2.6	12.0	7.6	-0.8	-4.9	3.1	50	50	50	50	50	50
Perfluoroheptanoic acid (PFHpA)	-1.4	4.0	6.3	2.1	-3.5	-7.6	50	50	50	50	50	50
Perfluorohexanesulfonic acid (PFHxS)	-4.0	7.1	3.2	1.7	-2.6	-5.4	50	50	50	50	50	50
Perfluorooctanoic acid (PFOA)	-2.9	-5.2	1.5	5.4	-1.2	2.4	50	50	50	50	50	50
Perfluorooctanesulfonic acid (PFOS)	-6.3	0.7	-2.6	3.0	1.8	3.4	50	50	50	50	50	50
Perfluorononanoic acid (PFNA)	-1.1	8.1	11.0	4.4	-9.9	-12.6	50	50	50	50	50	50
13C2 PFHxA	-0.8	1.6	5.4	0.1	-0.9	-5.5	30	30	30	30	30	30
13C2 PFDA	7.4	4.1	11.2	-0.7	-8.8	-13.2	30	30	30	30	30	30





TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_004.d
 Lims ID: IC L1
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 17-Aug-2017 17:07:15 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*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 10:10:39 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 19-Aug-2017 13:42:12

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.438	0.004	1.000	1989419	9.23		400	
298.90 > 99.00	1.442	1.438	0.004	1.000	1350551		1.47(0.00-0.00)	347	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.568	0.010	1.000	2030599	9.92		8904	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.737	1.722	0.015	1.000	896364	2.88		255	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.737	1.722	0.015	1.000	167400	0.9862		23.2	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.950	1.928	0.022	1.000	321453	1.94		37.6	
413.00 > 169.00	1.950	1.928	0.022	1.000	173092		1.86(0.00-0.00)	272	
* 6 13C2-PFOA									
415.00 > 370.00	1.950	1.928	0.022		1802946	10.0		7232	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.208	2.177	0.031	1.000	697706	3.75		192	
499.00 > 99.00	2.200	2.177	0.023	0.997	152215		4.58(0.00-0.00)	145	
* 7 13C4 PFOS									
503.00 > 80.00	2.200	2.185	0.015		5800695	28.7		2681	
9 Perfluorononanoic acid									
463.00 > 419.00	2.208	2.193	0.015	1.000	255111	1.98		19.9	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.352	2.342	0.010	1.000	1264490	10.7		7755	

Reagents:

LC537-L1_00020

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_004.d

Injection Date: 17-Aug-2017 17:07:15

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

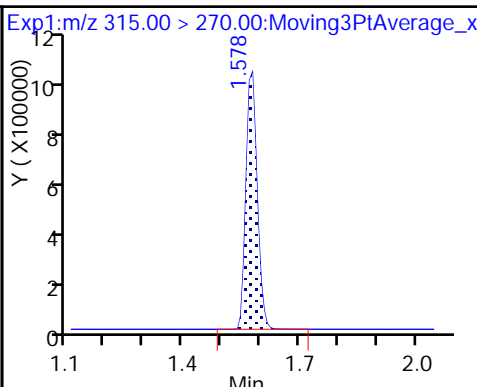
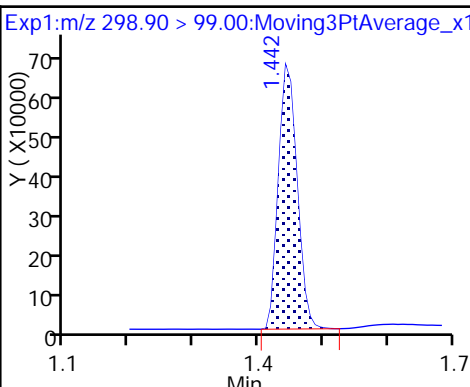
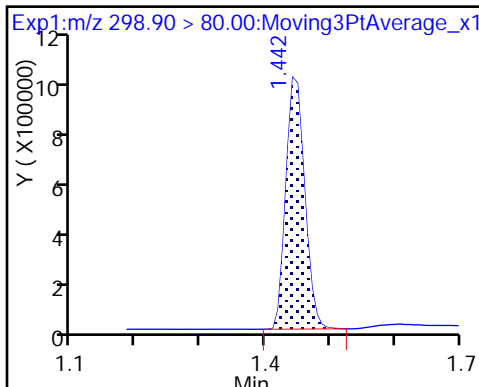
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

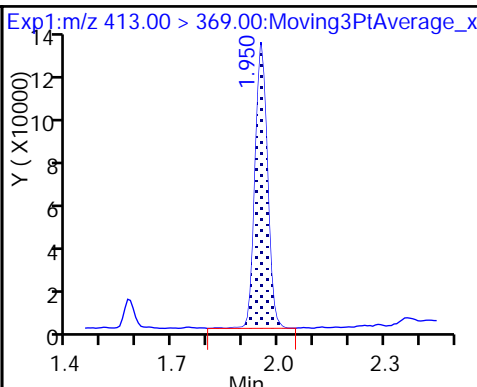
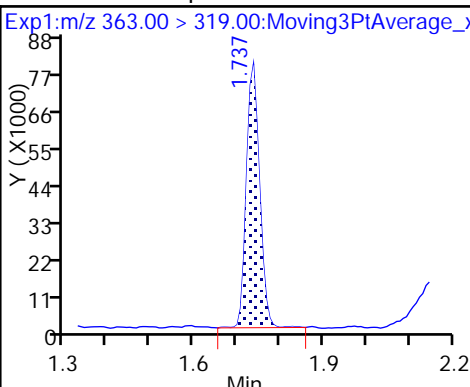
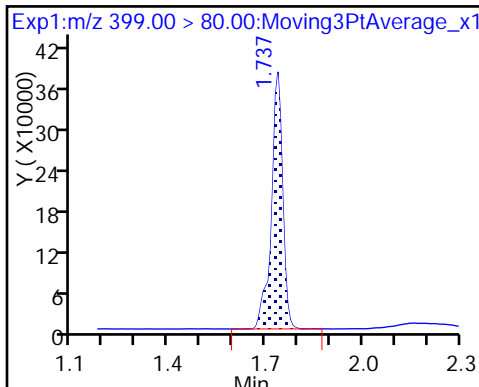
2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

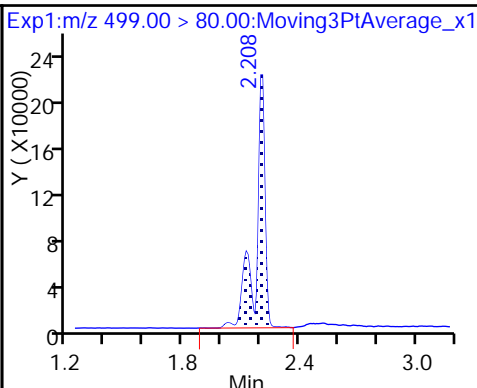
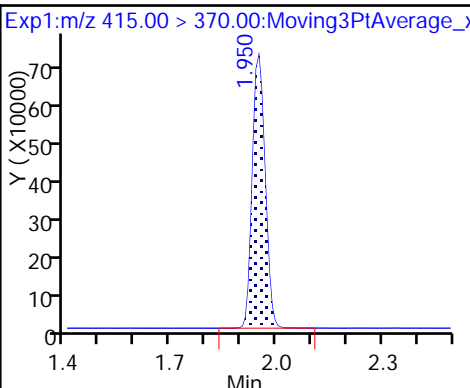
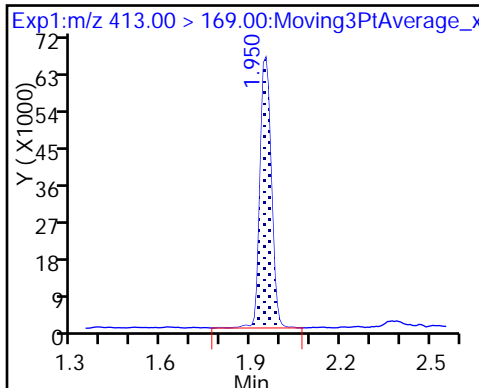
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

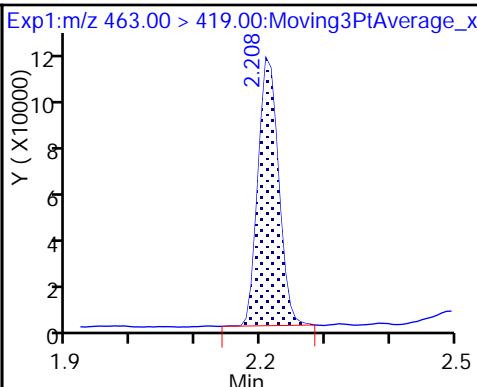
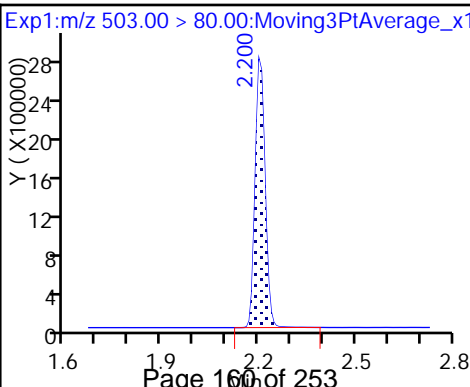
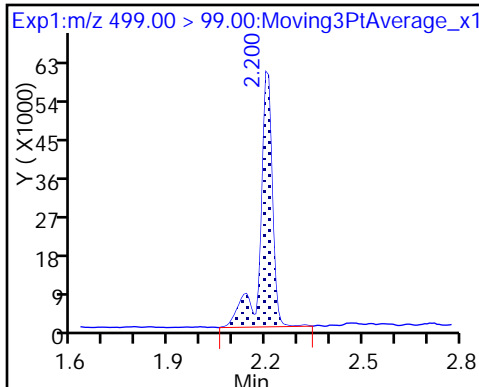
8 Perfluorooctane sulfonic acid



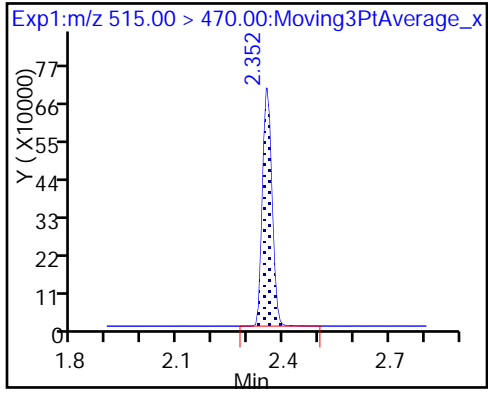
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_005.d
 Lims ID: IC L2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 17-Aug-2017 17:12:00 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*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 10:10:40 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 19-Aug-2017 13:42:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.449	1.438	0.011	1.000	4448062	22.4		935	
298.90 > 99.00	1.449	1.438	0.011	1.000	3039828		1.46(0.00-0.00)	790	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.568	0.010	1.000	2008624	10.2		9026	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.737	1.722	0.015	1.000	379095	2.31		50.7	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.737	1.722	0.015	1.000	2100734	7.14		621	
* 6 13C2-PFOA									
415.00 > 370.00	1.942	1.928	0.014		1741419	10.0		7925	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.942	1.928	0.014	1.000	673518	4.22		66.4	
413.00 > 169.00	1.942	1.928	0.014	1.000	351878		1.91(0.00-0.00)	543	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.200	2.177	0.023	1.000	1573826	8.95		525	
499.00 > 99.00	2.200	2.177	0.023	1.000	340165		4.63(0.00-0.00)	346	
* 7 13C4 PFOS									
503.00 > 80.00	2.200	2.185	0.015		5482857	28.7		2967	
9 Perfluorononanoic acid									
463.00 > 419.00	2.208	2.193	0.015	1.000	598613	4.81		63.2	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.352	2.342	0.010	1.000	1184489	10.4		8321	

Reagents:

LC537-L2_00020

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_005.d

Injection Date: 17-Aug-2017 17:12:00

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

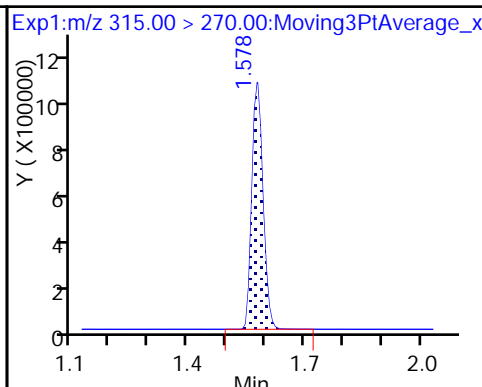
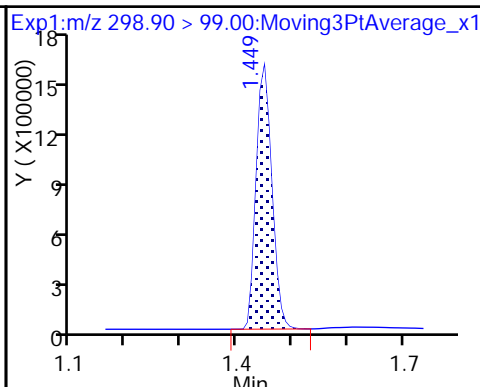
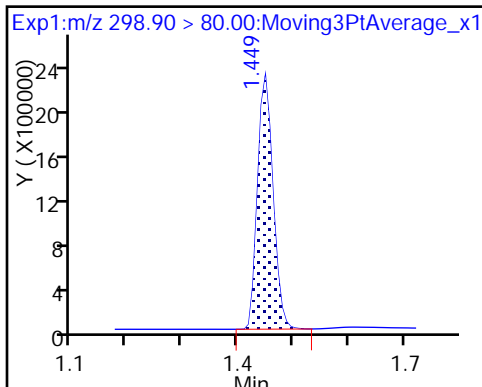
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

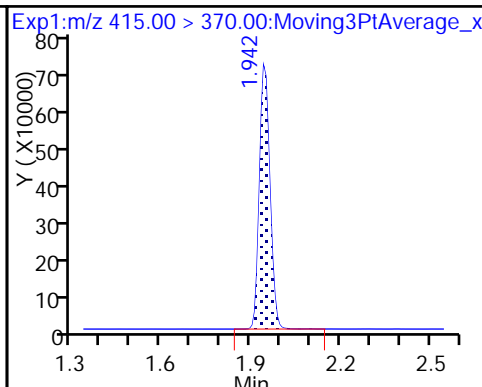
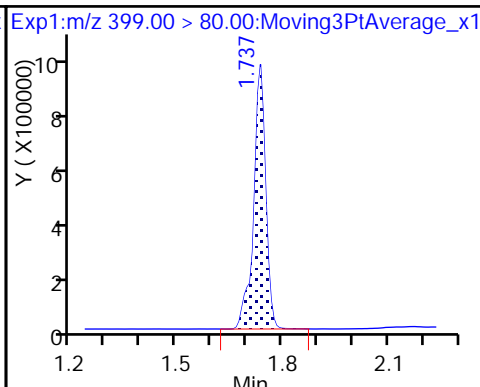
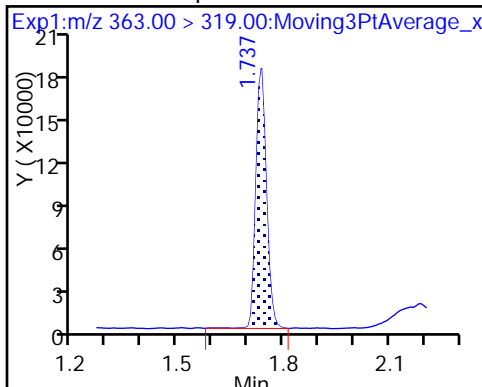
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

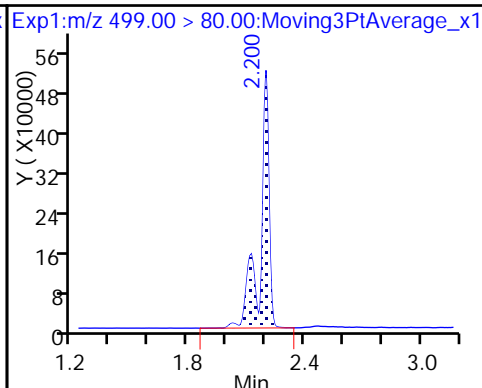
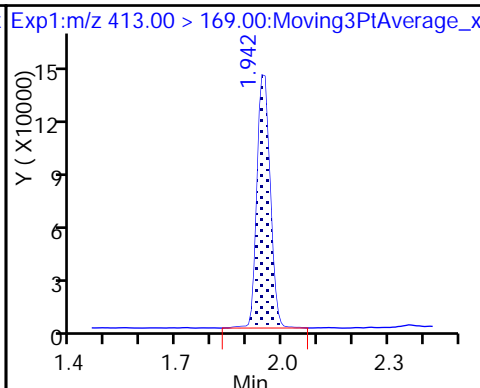
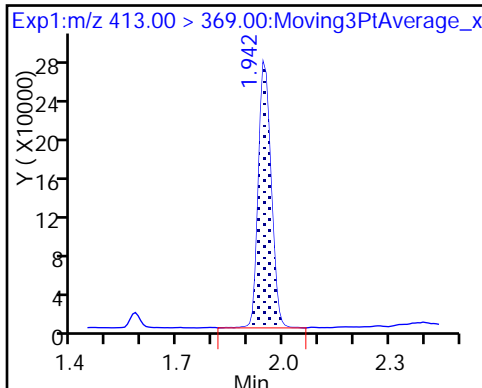
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

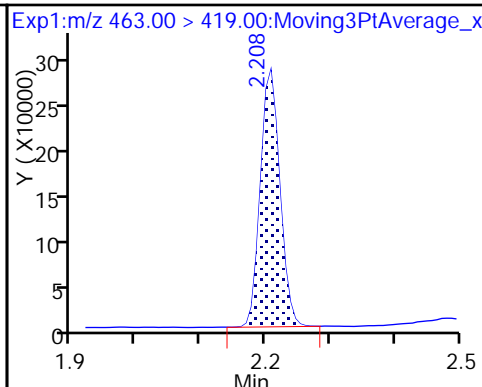
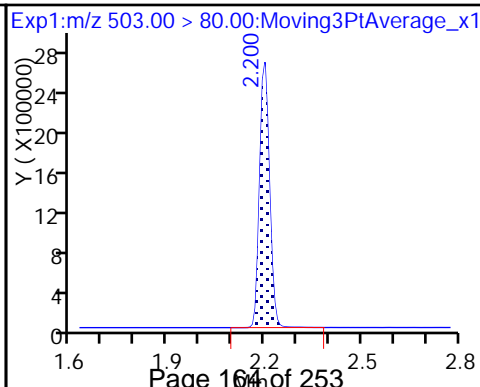
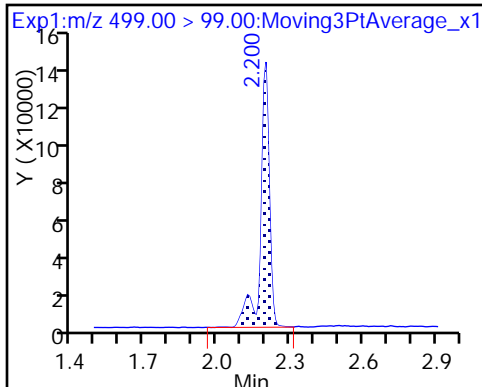
8 Perfluorooctane sulfonic acid



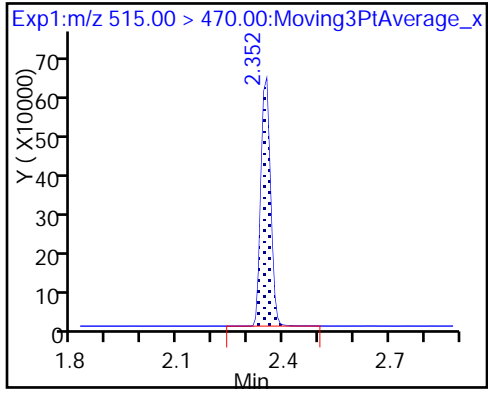
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_006.d
 Lims ID: IC L3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 17-Aug-2017 17:16:44 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*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 10:10:42 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 19-Aug-2017 13:42:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.434	1.438	-0.004	1.000	9376032	48.4		1742	
298.90 > 99.00	1.434	1.438	-0.004	1.000	6443436		1.46(0.00-0.00)	1548	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.563	1.568	-0.005	1.000	2036663	10.5		10368	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.715	1.722	-0.007	1.000	4674793	15.5		1277	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.715	1.722	-0.007	1.000	852234	5.32		109	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.920	1.928	-0.008	1.000	1587046	10.2		139	
413.00 > 169.00	1.920	1.928	-0.008	1.000	811042		1.96(0.00-0.00)	1273	
* 6 13C2-PFOA									
415.00 > 370.00	1.920	1.928	-0.008		1702319	10.0		7551	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.177	2.177	0.0	1.000	3519979	19.5		1141	
499.00 > 99.00	2.177	2.177	0.0	1.000	734381		4.79(0.00-0.00)	643	
* 7 13C4 PFOS									
503.00 > 80.00	2.177	2.185	-0.008		5631219	28.7		2814	
9 Perfluorononanoic acid									
463.00 > 419.00	2.185	2.193	-0.008	1.000	1350886	11.1		146	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.337	2.342	-0.005	1.000	1236464	11.1		7600	

Reagents:

LC537-L3_00023

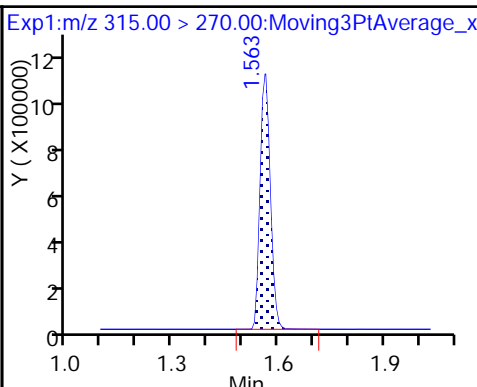
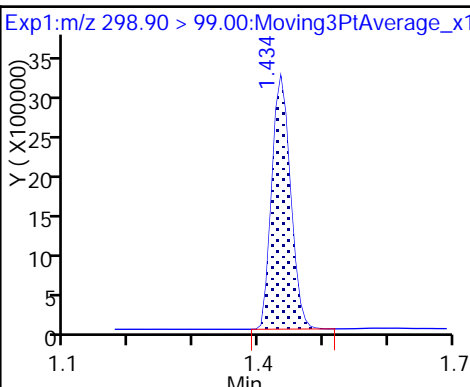
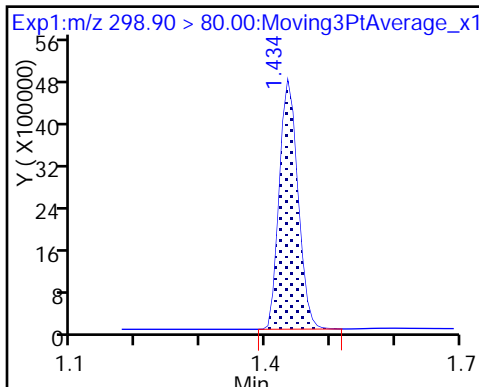
Amount Added: 1.00

Units: mL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

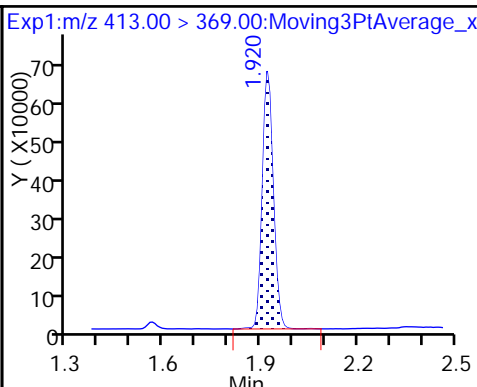
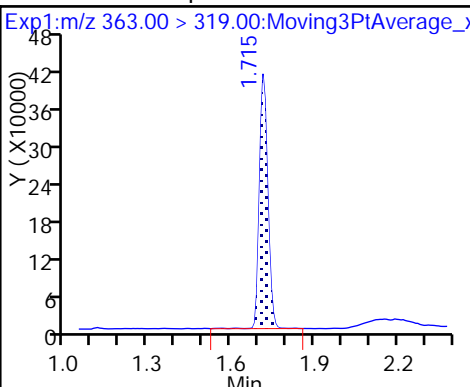
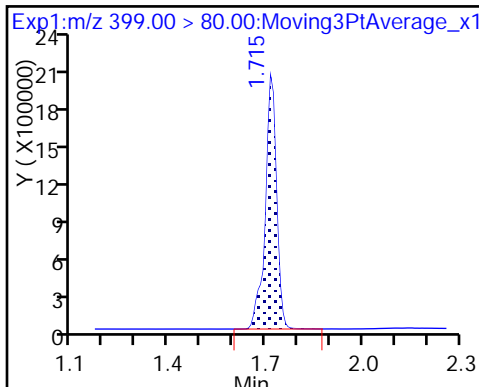
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

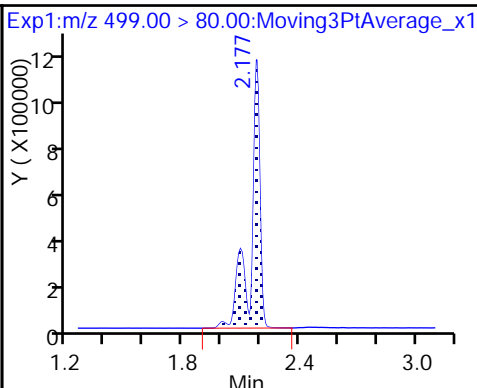
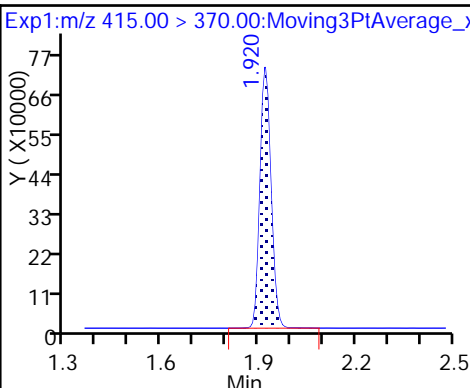
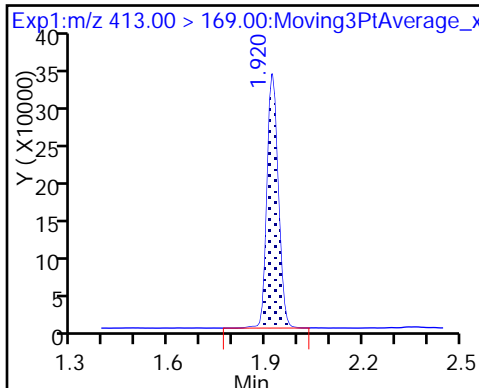
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

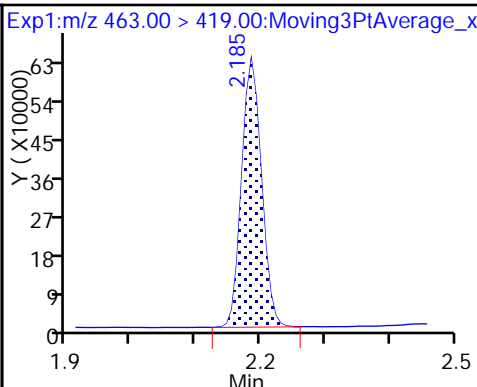
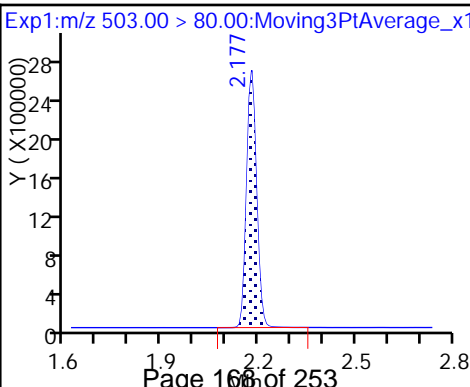
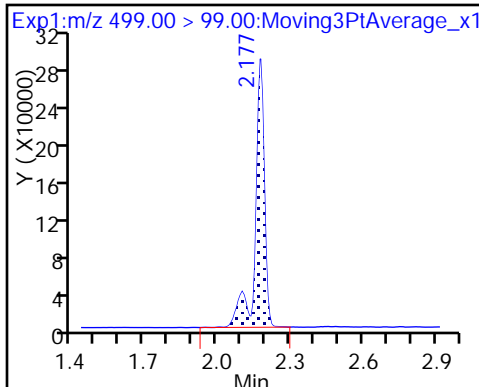
8 Perfluorooctane sulfonic acid



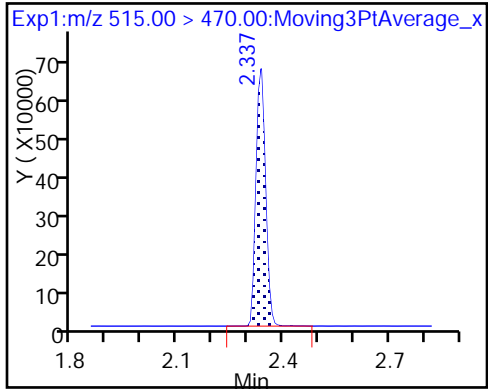
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_007.d
 Lims ID: IC L4
 Client ID:
 Sample Type: ICISAV Calib Level: 4
 Inject. Date: 17-Aug-2017 17:21:27 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*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 10:10:44 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: barnettj Date: 21-Aug-2017 10:10:28

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.434	1.438	-0.004	1.000	15897968	89.3		2489	
298.90 > 99.00	1.434	1.438	-0.004	1.000	11377248		1.40(0.00-0.00)	2453	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.563	1.568	-0.005	1.000	2147570	10.0		9863	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.715	1.722	-0.007	1.000	1817435	10.2		228	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.715	1.722	-0.007	1.000	9242464	30.5		2162	
* 6 13C2-PFOA									
415.00 > 370.00	1.920	1.928	-0.008		1890017	10.0		8600	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.920	1.928	-0.008	1.000	3658778	21.1		282	
413.00 > 169.00	1.920	1.928	-0.008	1.000	1830595		2.00(0.00-0.00)	2557	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.177	2.177	0.0	1.000	7458706	41.2		3723	
499.00 > 99.00	2.177	2.177	0.0	1.000	1548337		4.82(0.00-0.00)	1253	
* 7 13C4 PFOS									
503.00 > 80.00	2.177	2.185	-0.008		5646402	28.7		2860	
9 Perfluorononanoic acid									
463.00 > 419.00	2.185	2.193	-0.008	1.000	2822430	20.9		323	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.337	2.342	-0.005	1.000	1225880	9.93		8717	

Reagents:

LC537-L4_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_007.d

Injection Date: 17-Aug-2017 17:21:27

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

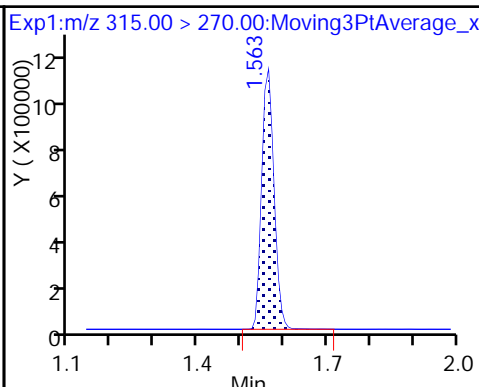
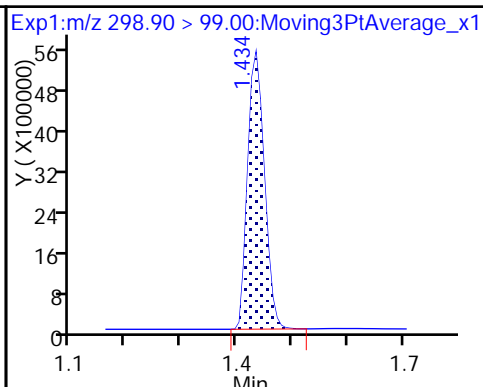
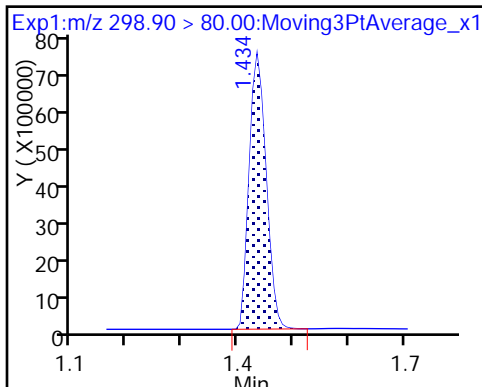
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

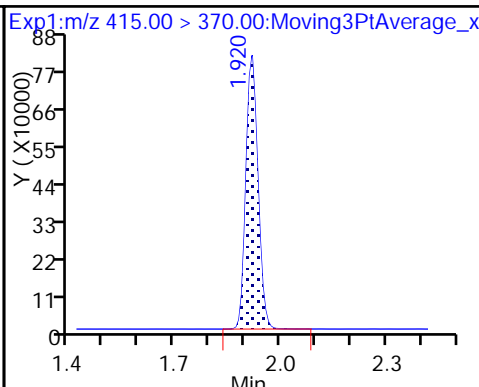
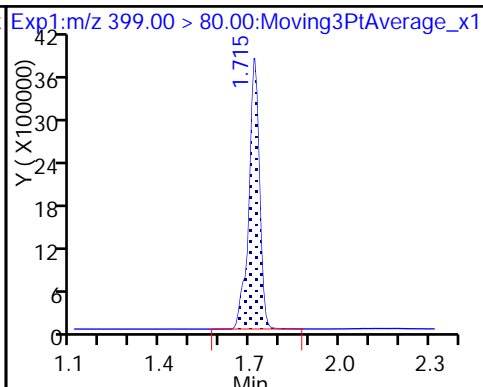
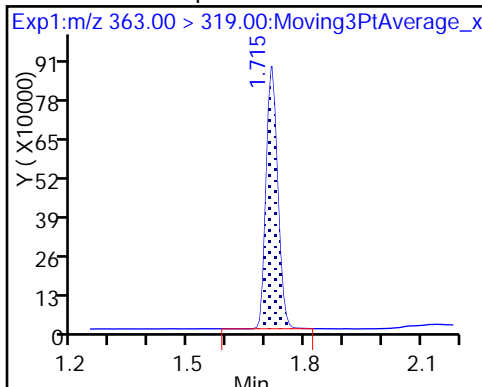
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

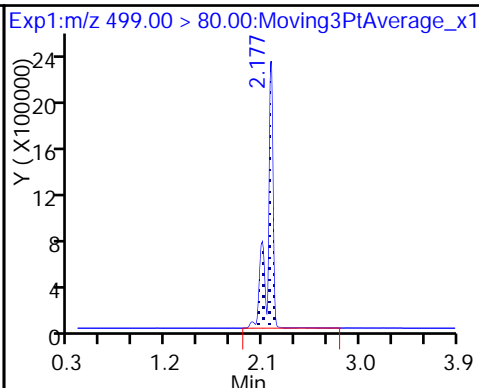
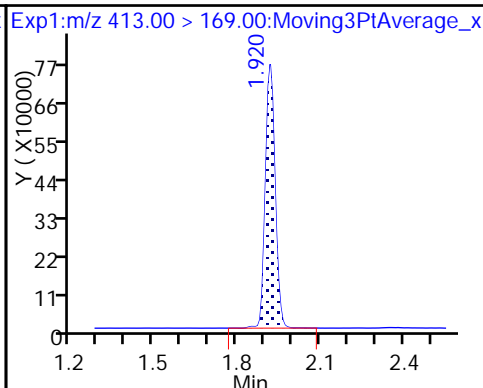
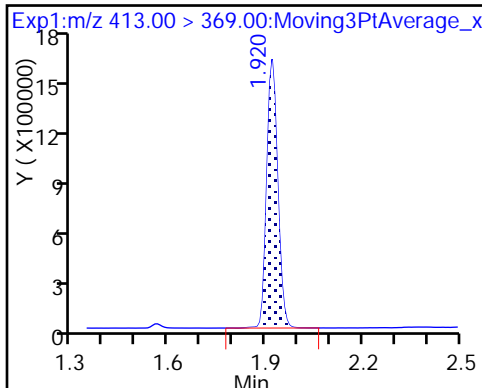
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

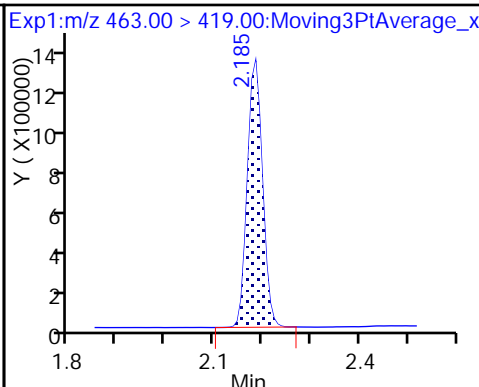
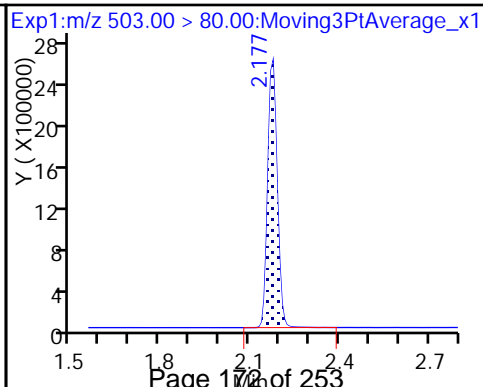
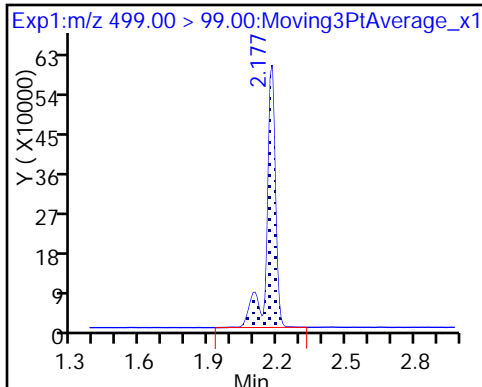
8 Perfluorooctane sulfonic acid



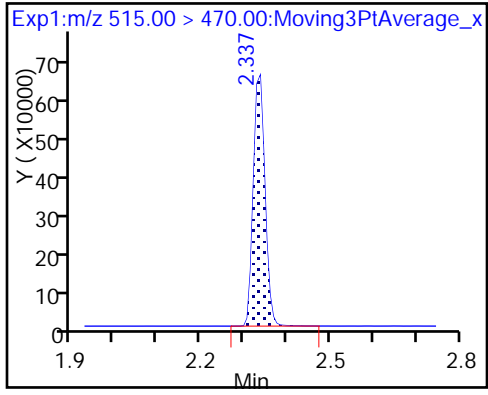
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_008.d
 Lims ID: IC L5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 17-Aug-2017 17:26:12 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*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 10:10:45 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 19-Aug-2017 13:43:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.434	1.438	-0.004	1.000	20788356	128.4		3029	
298.90 > 99.00	1.434	1.438	-0.004	1.000	15484251		1.34(0.00-0.00)	2979	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.563	1.568	-0.005	1.000	2339905	9.91		10949	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.715	1.722	-0.007	1.000	13223291	43.8		2949	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.715	1.722	-0.007	1.000	2833966	14.5		343	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.920	1.928	-0.008	1.000	5658166	29.7		404	
413.00 > 169.00	1.920	1.928	-0.008	1.000	3055610		1.85(0.00-0.00)	4022	
* 6 13C2-PFOA									
415.00 > 370.00	1.920	1.928	-0.008		2079120	10.0		9116	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.177	2.177	0.0	1.000	11021657	61.1		4955	
499.00 > 99.00	2.170	2.177	-0.007	0.997	2318380		4.75(0.00-0.00)	1730	
* 7 13C4 PFOS									
503.00 > 80.00	2.177	2.185	-0.008		5623095	28.7		2752	
9 Perfluorononanoic acid									
463.00 > 419.00	2.185	2.193	-0.008	1.000	4020876	27.0		485	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.337	2.342	-0.005	1.000	1238610	9.12		8347	

Reagents:

LC537-L5_00024

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_008.d

Injection Date: 17-Aug-2017 17:26:12

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

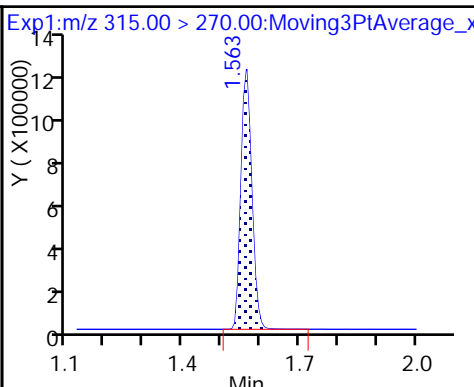
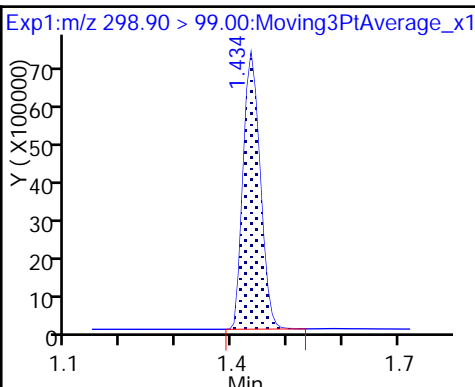
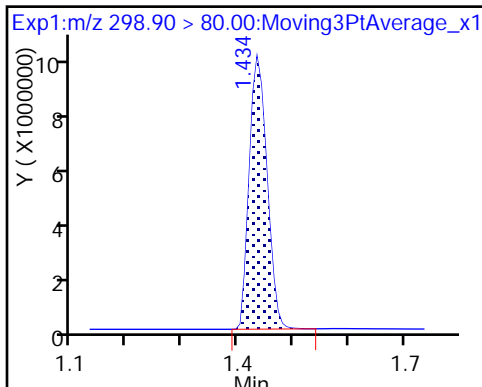
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

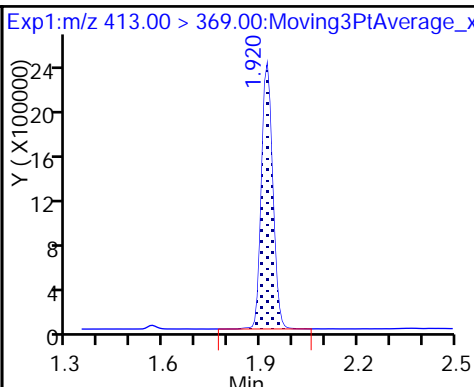
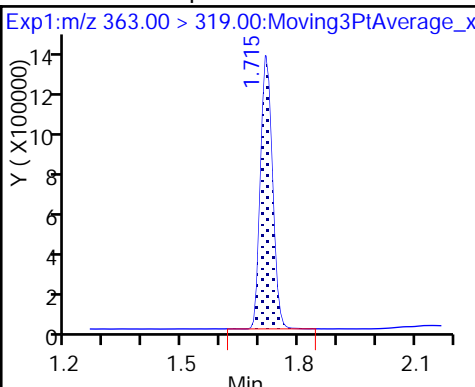
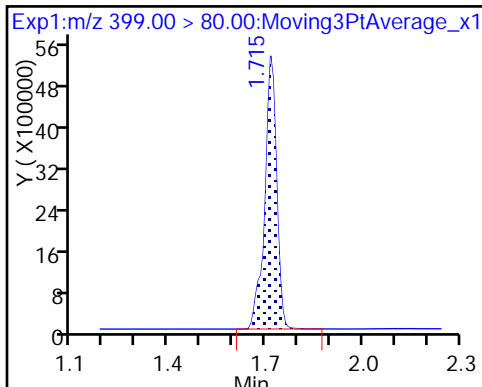
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

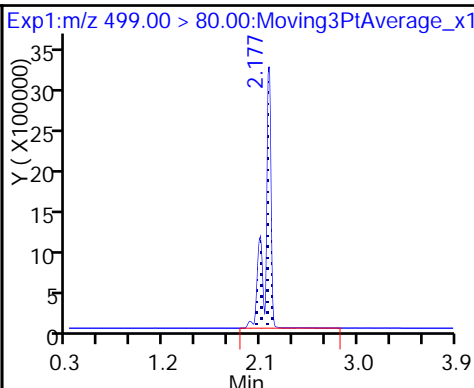
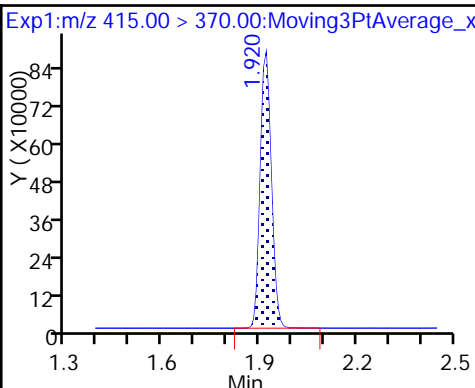
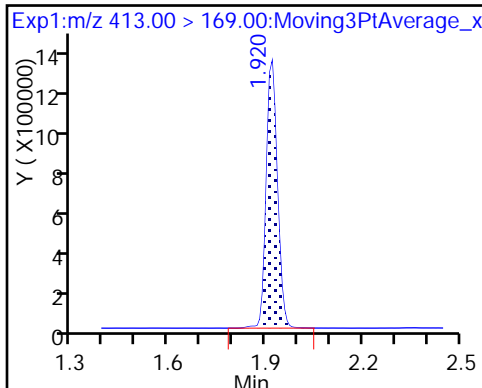
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

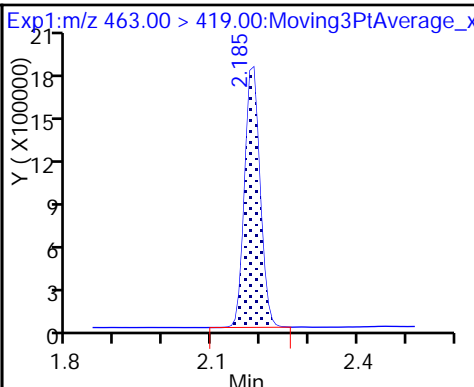
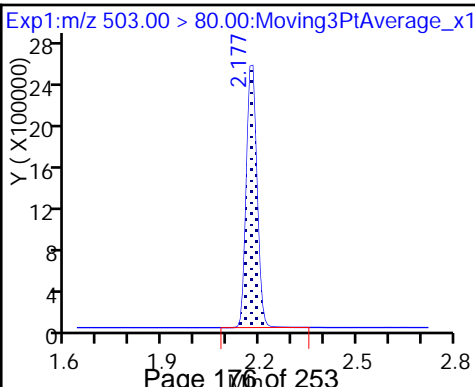
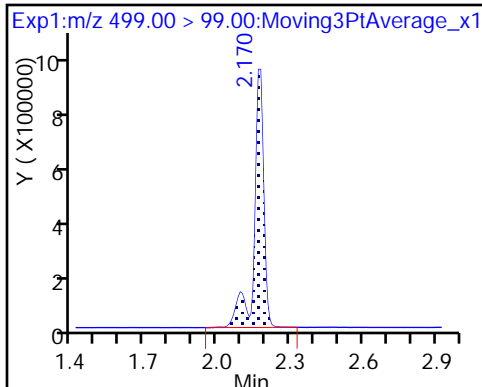
8 Perfluorooctane sulfonic acid



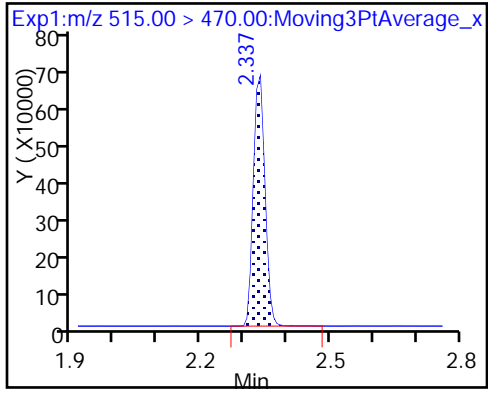
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Lims ID: IC L6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 17-Aug-2017 17:30:56 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*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 10:10:46 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 19-Aug-2017 13:43:22

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.434	1.438	-0.004	1.000	25626485	185.7		4359	
298.90 > 99.00	1.434	1.438	-0.004	1.000	18744630		1.37(0.00-0.00)	4242	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.563	1.568	-0.005	1.000	2312284	9.45		10080	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.715	1.722	-0.007	1.000	3752250	18.5		432	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.715	1.722	-0.007	1.000	16959937	56.8		3185	
* 6 13C2-PFOA									
415.00 > 370.00	1.920	1.928	-0.008		2155019	10.0		9574	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.920	1.928	-0.008	1.000	8108947	41.0		551	
413.00 > 169.00	1.920	1.928	-0.008	1.000	4149097		1.95(0.00-0.00)	4945	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.177	2.177	0.0	1.000	14770994	82.7		5185	
499.00 > 99.00	2.177	2.177	0.0	1.000	3187705		4.63(0.00-0.00)	2395	
* 7 13C4 PFOS									
503.00 > 80.00	2.177	2.185	-0.008		5568319	28.7		2691	
9 Perfluorononanoic acid									
463.00 > 419.00	2.185	2.193	-0.008	1.000	5389964	35.0		644	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.337	2.342	-0.005	1.000	1221662	8.68		9151	

Reagents:

LC537-L6_00020

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d

Injection Date: 17-Aug-2017 17:30:56

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

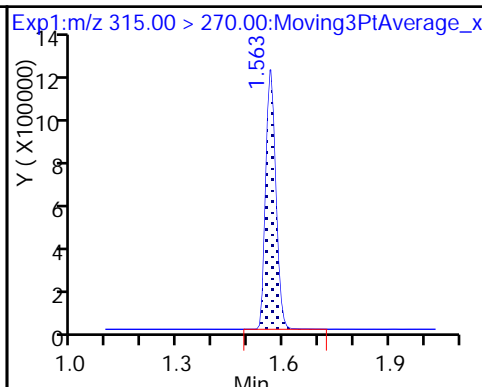
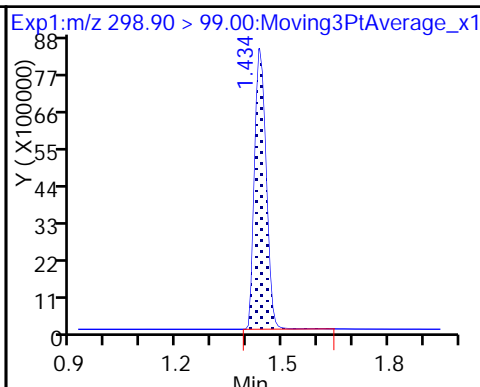
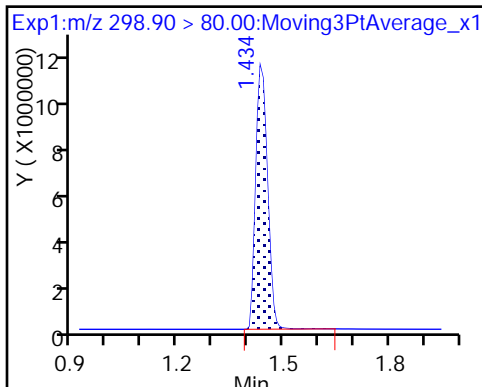
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

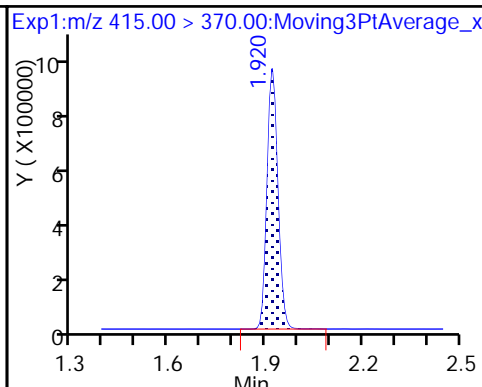
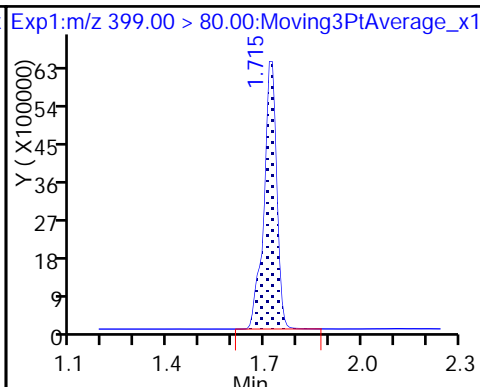
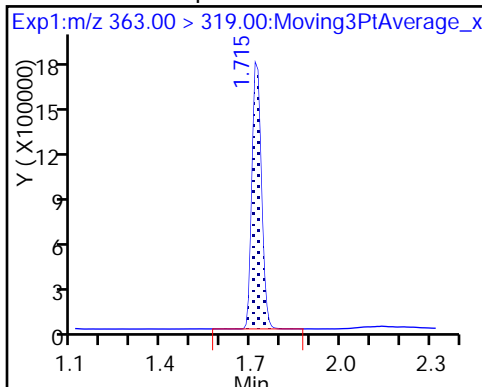
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

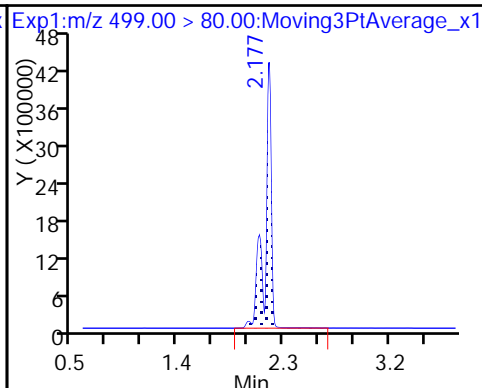
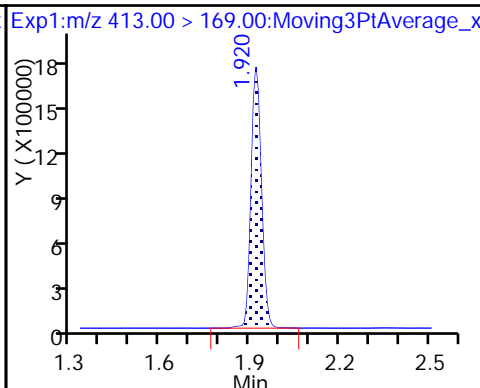
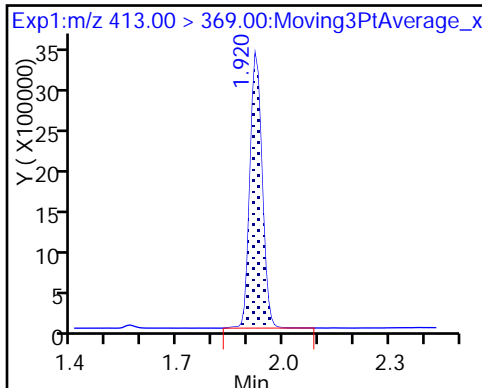
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

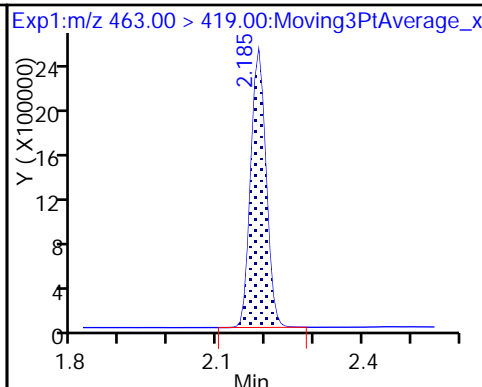
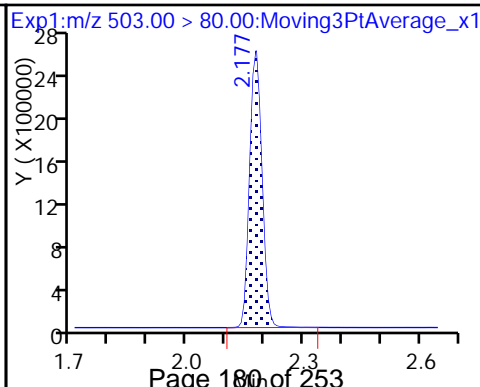
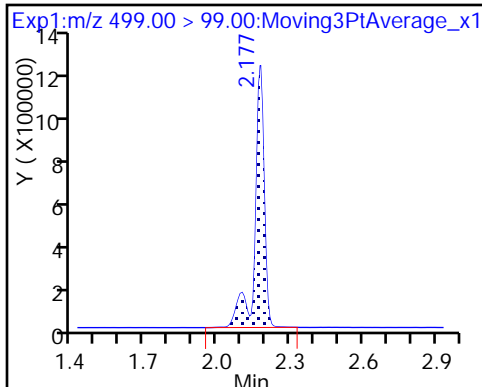
8 Perfluorooctane sulfonic acid



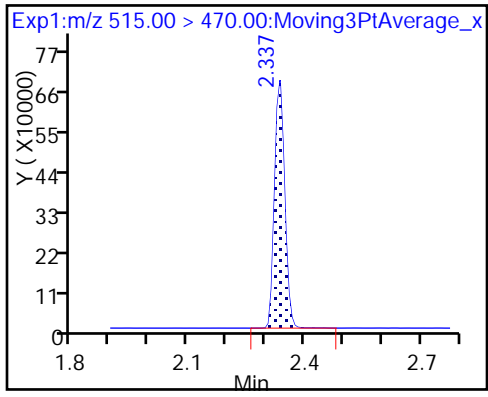
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-180236/9 Calibration Date: 08/17/2017 17:40
 Instrument ID: A8_N Calib Start Date: 08/17/2017 17:07
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/17/2017 17:30
 Lab File ID: 207.08.17_537A_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.202		23.2	20.0	15.9	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9415	0.9087		2.15	2.22	-3.5	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.538	1.602		6.94	6.67	4.1	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9175	0.8942		4.33	4.45	-2.5	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9198	0.9120		8.82	8.89	-0.8	50.0
Perfluorononanoic acid (PFNA)	Ave	0.7150	0.6150		3.82	4.45	-14.0	50.0
13C2 PFHxA	Ave	1.135	1.097		9.66	10.0	-3.4	30.0
13C2 PFDA	Ave	0.6532	0.5535		8.47	10.0	-15.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_011.d
 Lims ID: CCVL
 Client ID:
 Sample Type: CCVL
 Inject. Date: 17-Aug-2017 17:40:25 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*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 10:10:49 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 19-Aug-2017 13:45:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.434	1.438	-0.004	1.000	4727301	23.2		936	
298.90 > 99.00	1.434	1.438	-0.004	1.000	3102525		1.52(0.00-0.00)	808	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.568	-0.013	1.000	2341594	9.66		11304	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.715	1.722	-0.007	1.000	2099863	6.94		594	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.715	1.722	-0.007	1.000	431250	2.15		47.9	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.912	1.928	-0.016	1.000	849166	4.33		53.1	
413.00 > 169.00	1.912	1.928	-0.016	1.000	452734		1.88(0.00-0.00)	713	
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.928	-0.016		2135014	10.0		9556	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.170	2.177	-0.007	1.000	1593767	8.82		547	M
499.00 > 99.00	2.170	2.177	-0.007	1.000	337001		4.73(0.00-0.00)	273	M
* 7 13C4 PFOS									
503.00 > 80.00	2.170	2.185	-0.015		5637183	28.7		2779	
9 Perfluorononanoic acid									
463.00 > 419.00	2.177	2.193	-0.016	1.000	583704	3.82		73.2	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.329	2.342	-0.013	1.000	1181826	8.47		8470	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00020

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_011.d

Injection Date: 17-Aug-2017 17:40:25

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

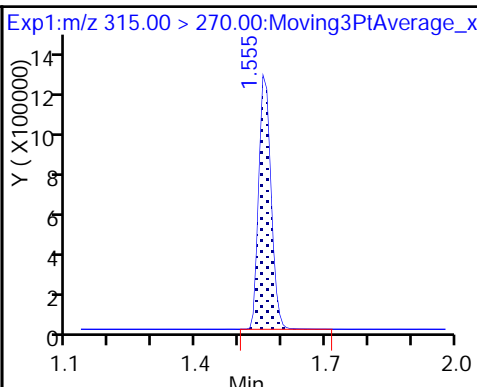
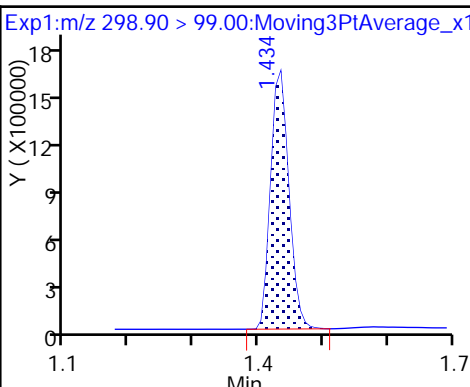
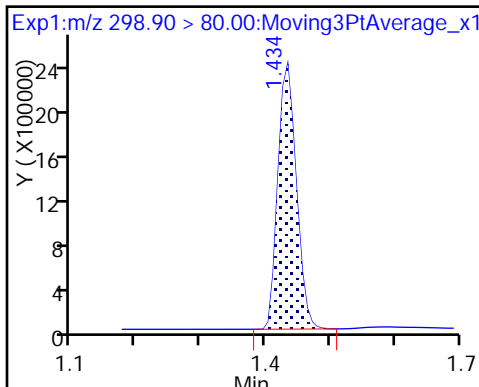
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

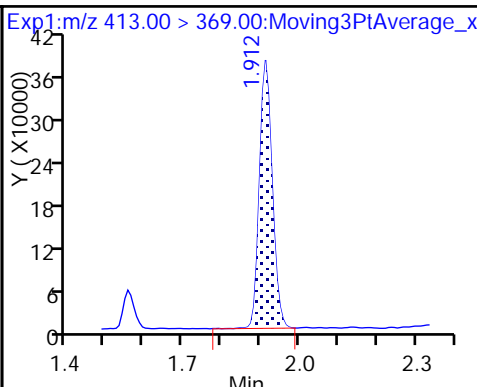
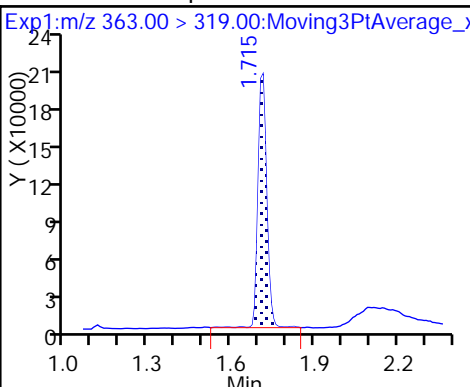
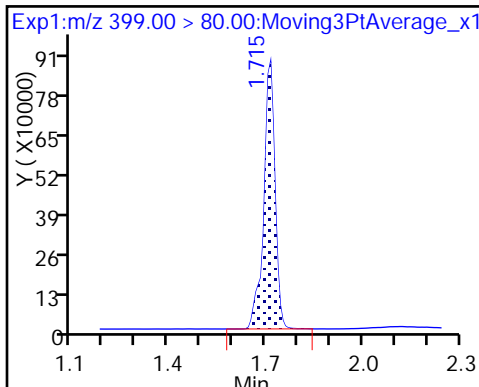
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

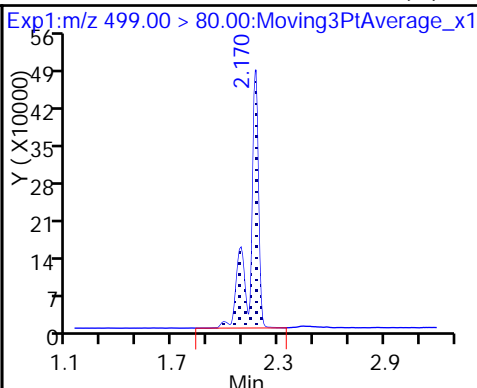
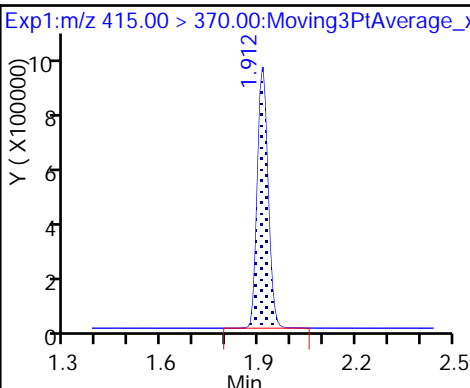
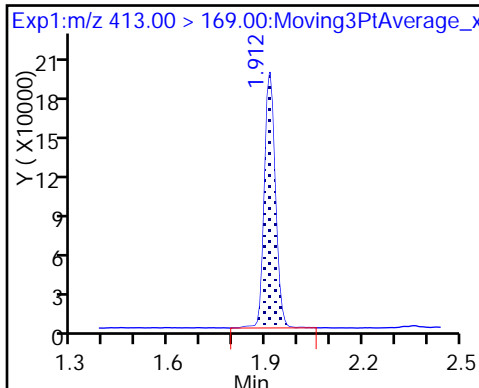
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

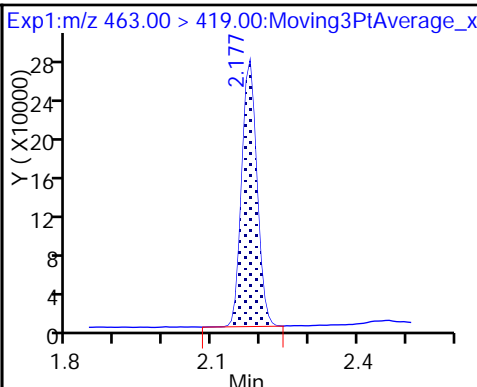
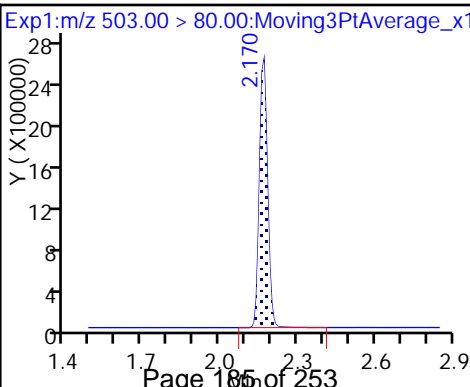
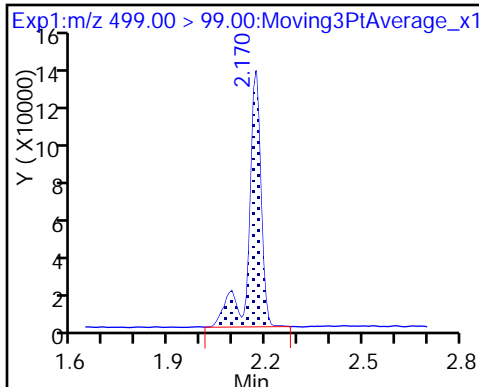
8 Perfluorooctane sulfonic acid (M)



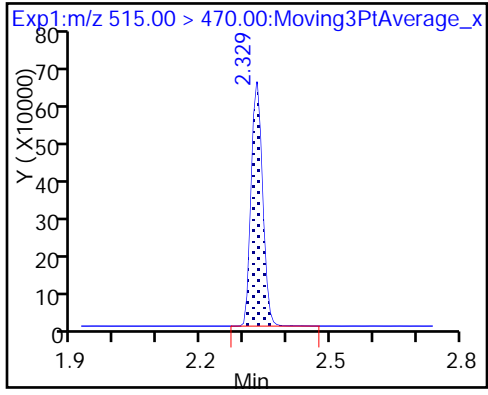
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

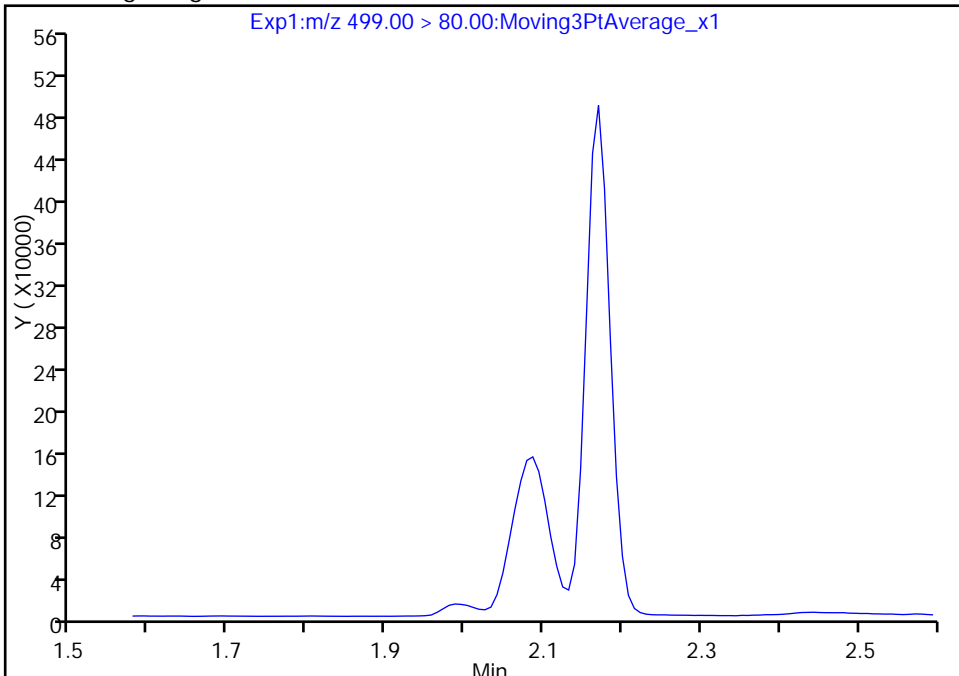
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_011.d
Injection Date: 17-Aug-2017 17:40:25 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

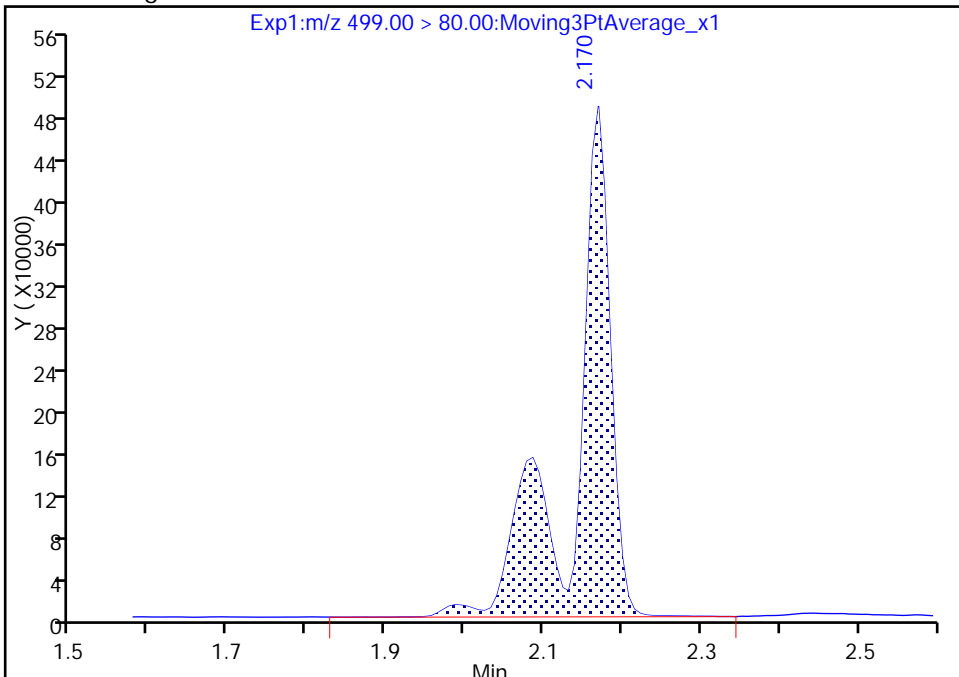
Not Detected
Expected RT: 2.18

Processing Integration Results



RT: 2.17
Area: 1593767
Amount: 8.815995
Amount Units: ng/ml

Manual Integration Results



Reviewer: phomsophat, 19-Aug-2017 13:45:01
Audit Action: Assigned Compound ID

Audit Reason: Assign Peak

TestAmerica Sacramento

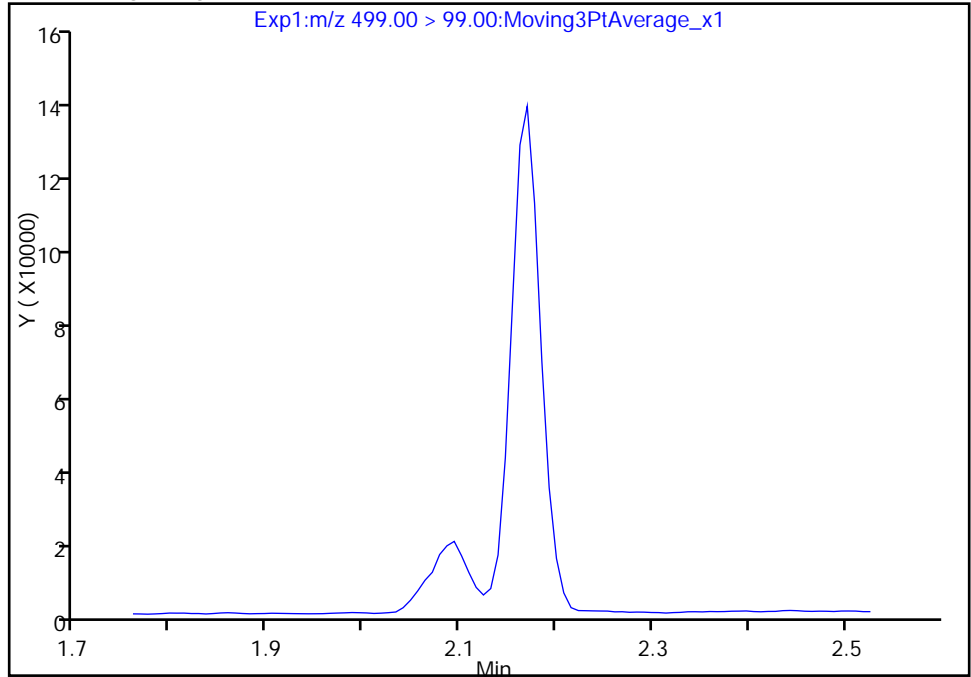
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Injection Date: 17-Aug-2017 17:40:25 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

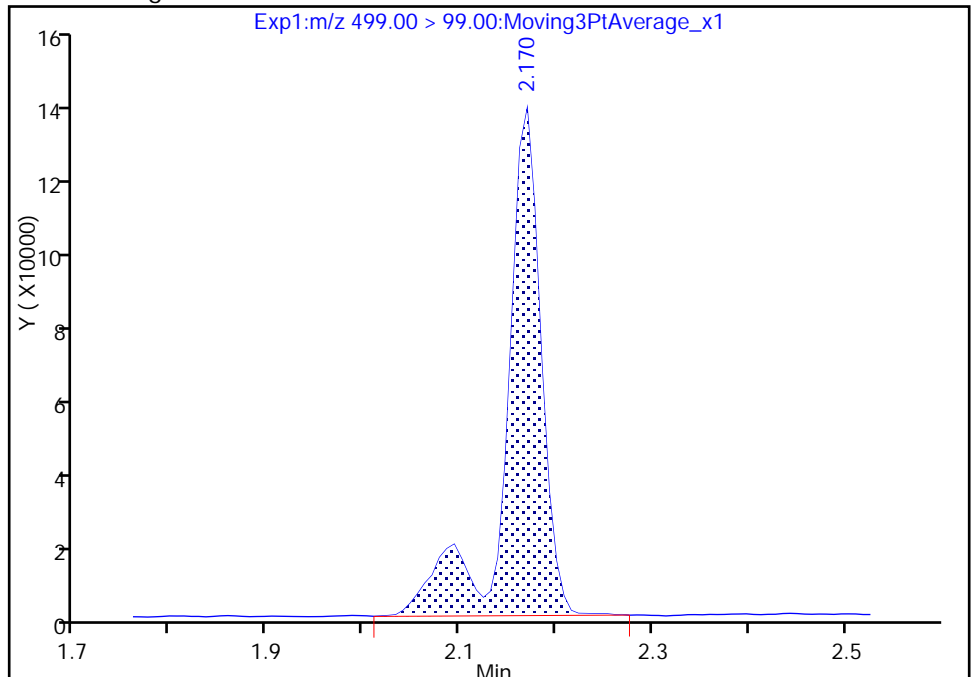
Not Detected
Expected RT: 2.18

Processing Integration Results



Manual Integration Results

RT: 2.17
Area: 337001
Amount: 8.815995
Amount Units: ng/ml



Reviewer: phomsophat, 19-Aug-2017 13:45:11

Audit Action: Manually Integrated

Audit Reason: Assign Peak

TestAmerica Sacramento

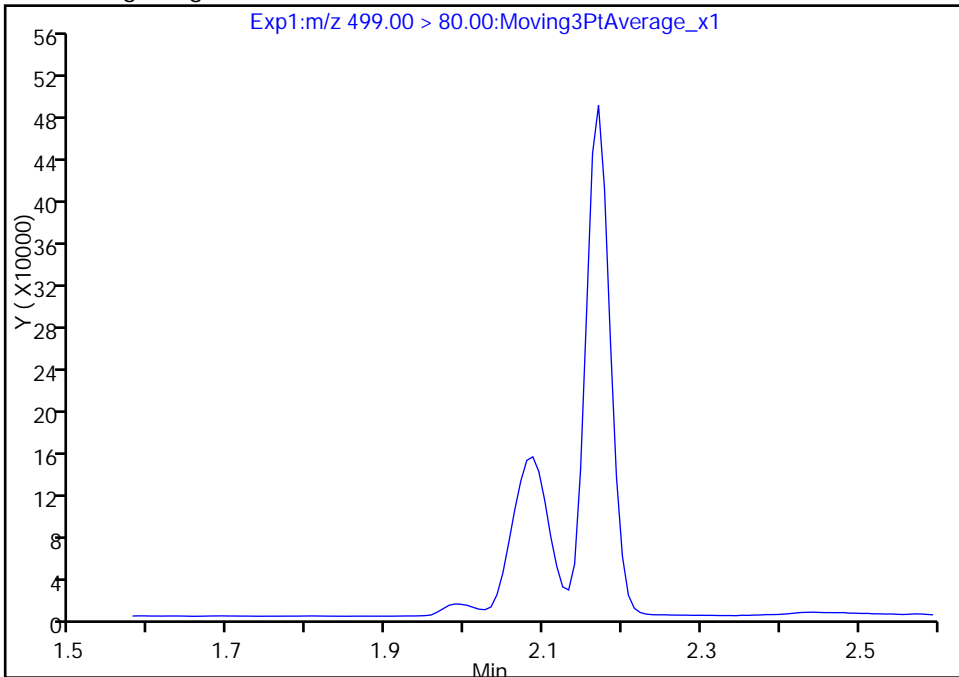
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Injection Date: 17-Aug-2017 17:40:25 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

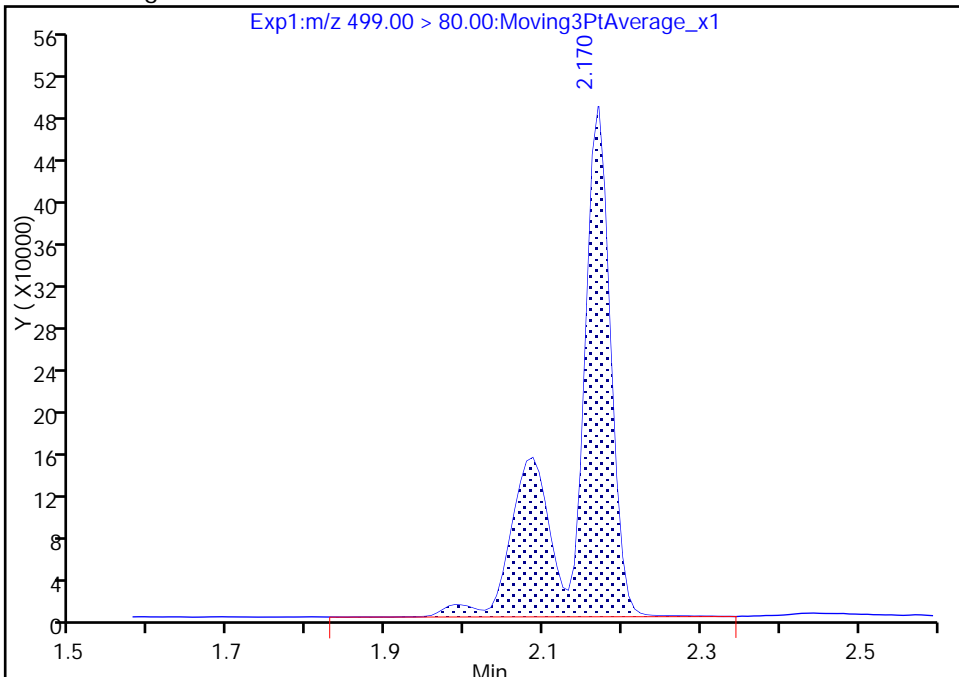
Not Detected
Expected RT: 2.18

Processing Integration Results



Manual Integration Results

RT: 2.17
Area: 1593767
Amount: 8.815995
Amount Units: ng/ml



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Lab Sample ID: ICV 320-180236/11 Calibration Date: 08/17/2017 17:49
 Instrument ID: A8_N Calib Start Date: 08/17/2017 17:07
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/17/2017 17:30
 Lab File ID: 207.08.17_537A_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.9477		110	100	9.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9415	0.9454		10.0	10.0	0.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.538	1.748		22.8	20.1	13.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9175	0.9757		21.8	20.5	6.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9198	1.118		23.9	19.7	21.5	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7150	0.7455		21.0	20.1	4.3	30.0
13C2 PFHxA	Ave	1.135	1.118		9.85	10.0	-1.5	30.0
13C2 PFDA	Ave	0.6532	0.5562		8.51	10.0	-14.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_013.d
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 17-Aug-2017 17:49:55 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\20170819-46875.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 10:10:52 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 19-Aug-2017 13:55:28

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.438	-0.012	1.000	19016696	110.0		2807	
298.90 > 99.00	1.426	1.438	-0.012	1.000	13787471		1.38(0.00-0.00)	2790	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.568	-0.013	1.000	2211762	9.85		10799	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.707	1.722	-0.015	1.000	7034445	22.8		1797	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.707	1.722	-0.015	1.000	1868976	10.0		216	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.904	1.928	-0.024	1.000	3952635	21.8		226	
413.00 > 169.00	1.904	1.928	-0.024	1.000	2077871		1.90(0.00-0.00)	3084	
* 6 13C2-PFOA									
415.00 > 370.00	1.904	1.928	-0.024		1977664	10.0		7784	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.162	2.177	-0.015	1.000	4412804	23.9		2058	
499.00 > 99.00	2.162	2.177	-0.015	1.000	673345		6.55(0.00-0.00)	193	
* 7 13C4 PFOS									
503.00 > 80.00	2.162	2.185	-0.023		5748034	28.7		2718	
9 Perfluorononanoic acid									
463.00 > 419.00	2.170	2.193	-0.023	1.000	2967510	21.0		415	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.322	2.342	-0.020	1.000	1099926	8.51		7550	

Reagents:

LC537-ICV_00028

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_013.d

Injection Date: 17-Aug-2017 17:49:55

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

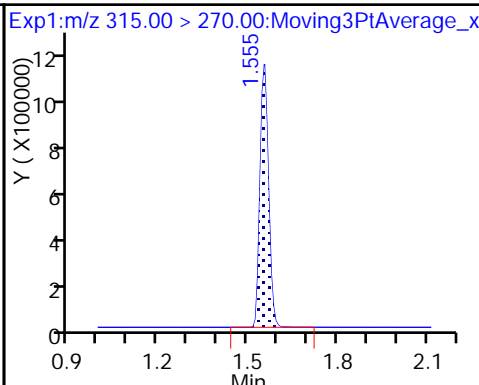
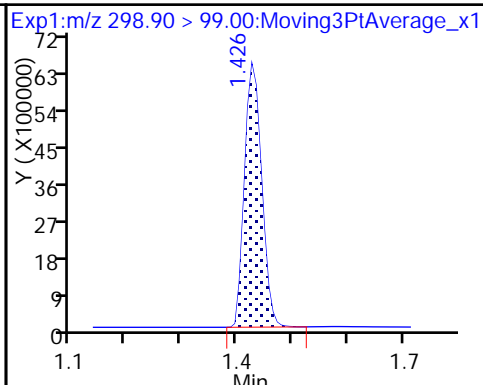
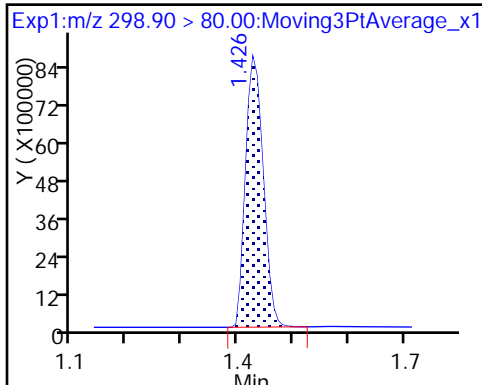
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

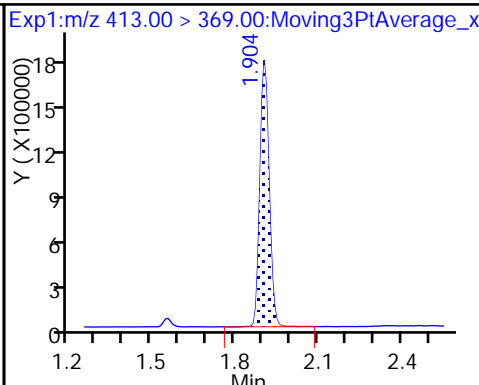
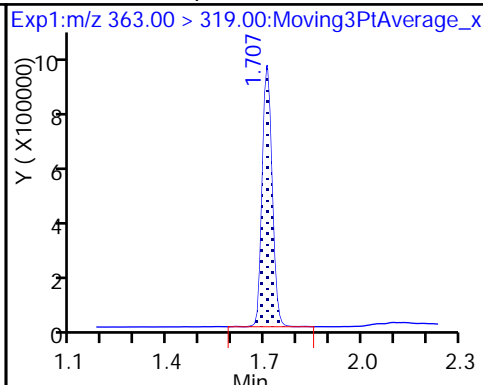
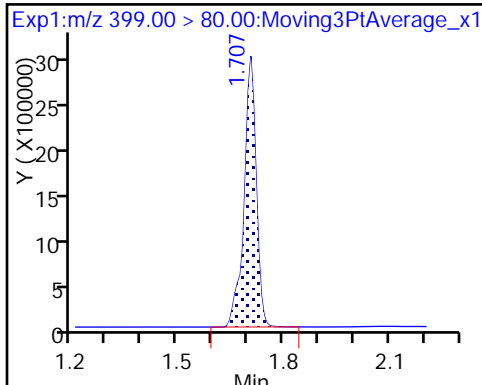
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

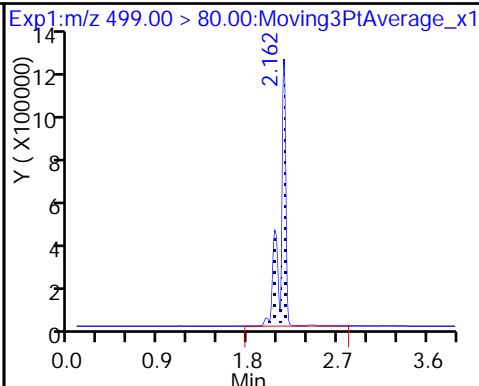
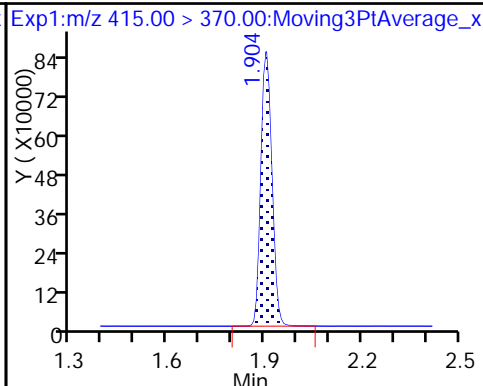
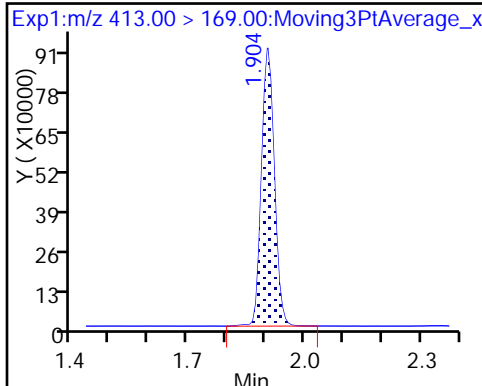
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

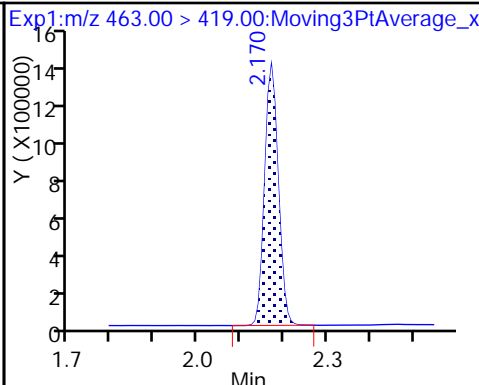
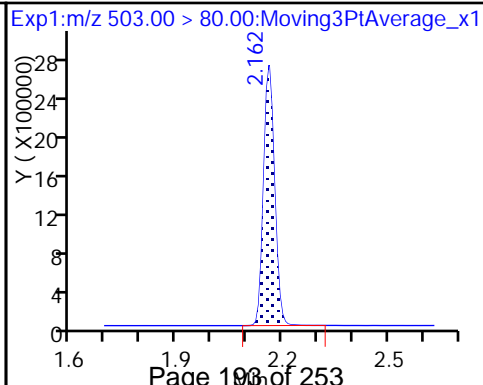
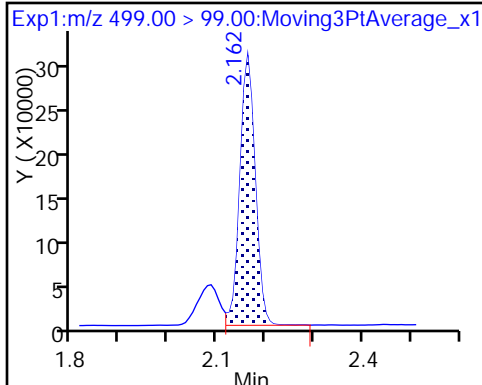
8 Perfluorooctane sulfonic acid



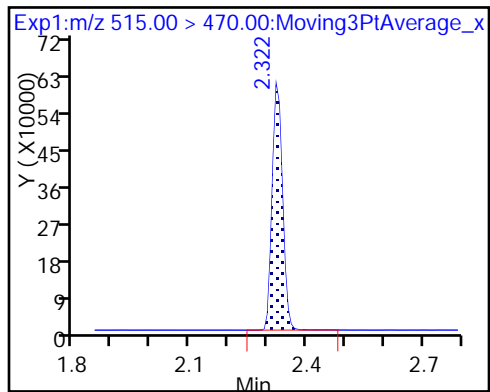
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Lab Sample ID: CCV 320-180244/1 Calibration Date: 08/17/2017 20:36
 Instrument ID: A8_N Calib Start Date: 08/17/2017 17:07
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/17/2017 17:30
 Lab File ID: 2017.08.17_537B_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.173		54.1	45.0	20.3	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9415	0.9423		5.01	5.00	0.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.538	1.652		16.1	15.0	7.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9175	0.8793		9.59	10.0	-4.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9198	0.9322		20.3	20.0	1.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7150	0.6068		8.49	10.0	-15.1	30.0
13C2 PFHxA	Ave	1.135	1.187		10.5	10.0	4.6	30.0
13C2 PFDA	Ave	0.6532	0.5885		9.01	10.0	-9.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_001.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 17-Aug-2017 20:36:18 ALS Bottle#: 3 Worklist Smp#: 1
 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*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: barnettj Date: 21-Aug-2017 16:10:02

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.434	1.438	-0.004	1.000	10012849	54.1		1791	
298.90 > 99.00	1.426	1.438	-0.012	0.995	6685811		1.50(0.00-0.00)	1656	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.568	-0.013	1.000	2245472	10.5		11109	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.707	1.722	-0.015	1.000	891249	5.01		107	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.707	1.722	-0.015	1.000	4703403	16.1		1354	
* 6 13C2-PFOA									
415.00 > 370.00	1.897	1.928	-0.031		1891132	10.0		7864	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.897	1.928	-0.031	1.000	1664160	9.59		72.7	
413.00 > 169.00	1.897	1.928	-0.031	1.000	864172		1.93(0.00-0.00)	1622	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.155	2.147	0.008	1.000	3538299	20.3		1906	M
499.00 > 99.00	2.155	2.147	0.008	1.000	716262		4.94(0.00-0.00)	516	M
* 7 13C4 PFOS									
503.00 > 80.00	2.155	2.185	-0.030		5441619	28.7		2657	
9 Perfluorononanoic acid									
463.00 > 419.00	2.162	2.193	-0.031	1.000	1147765	8.49		160	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.322	2.342	-0.020	1.000	1112939	9.01		7557	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00023

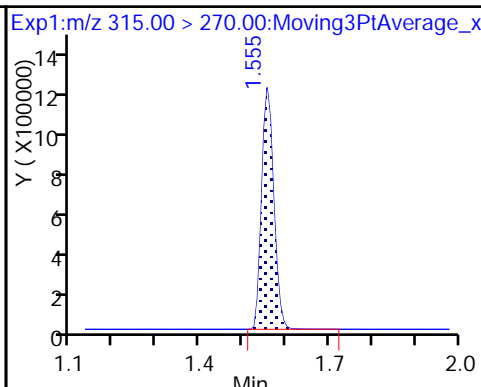
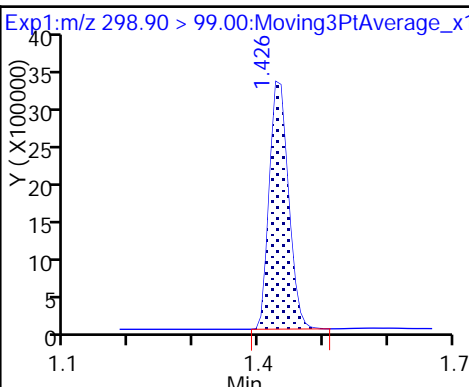
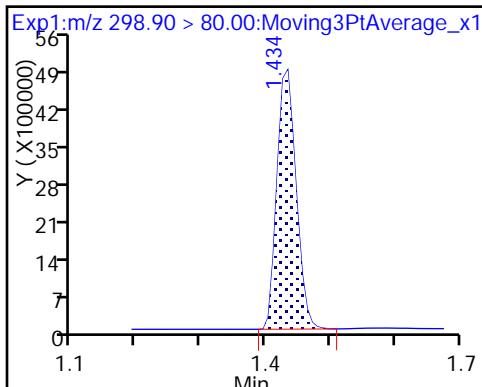
Amount Added: 1.00

Units: mL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

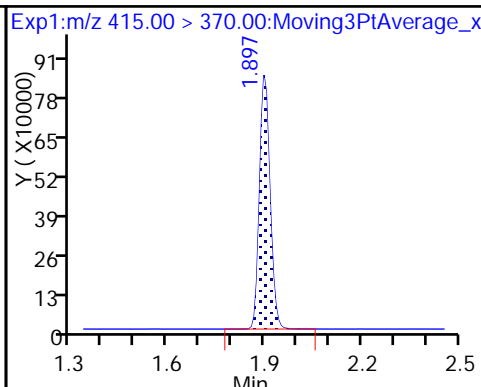
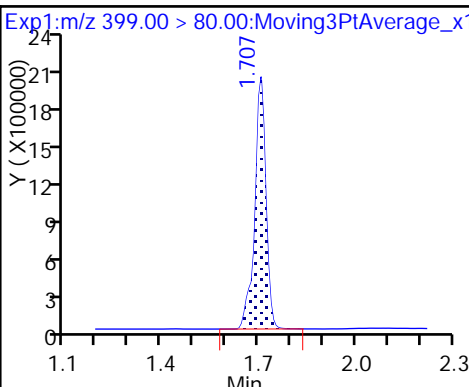
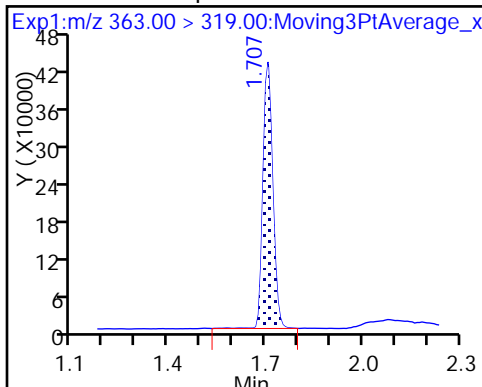
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

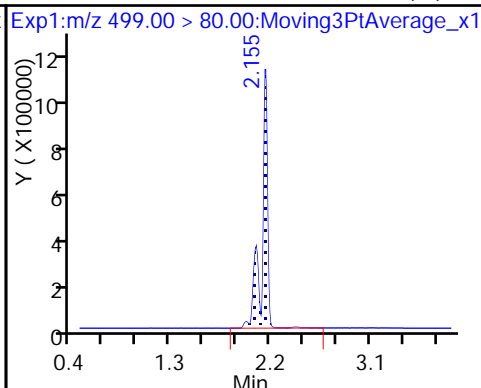
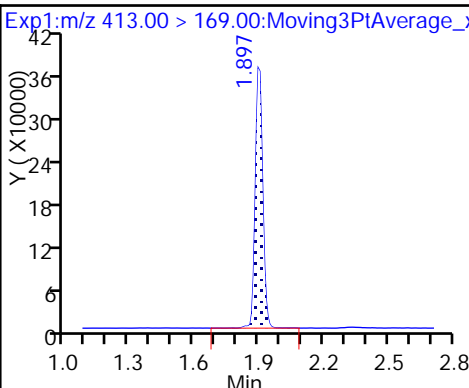
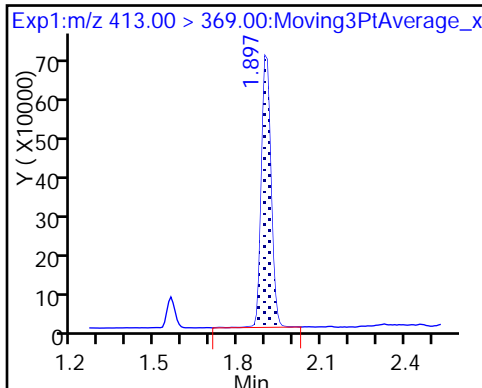
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

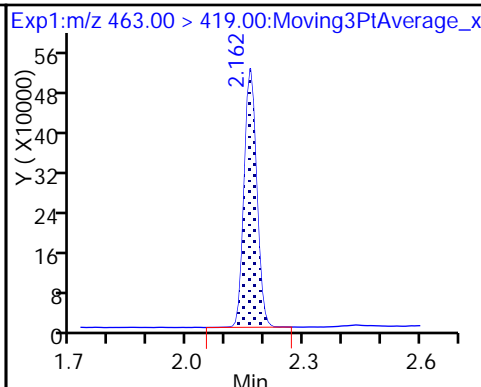
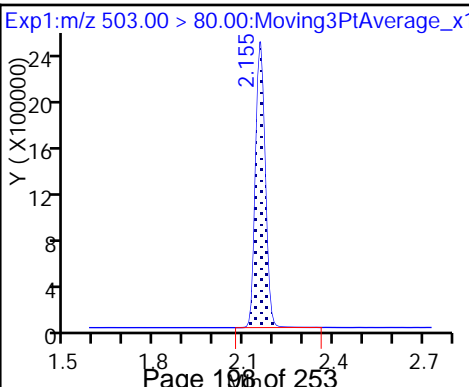
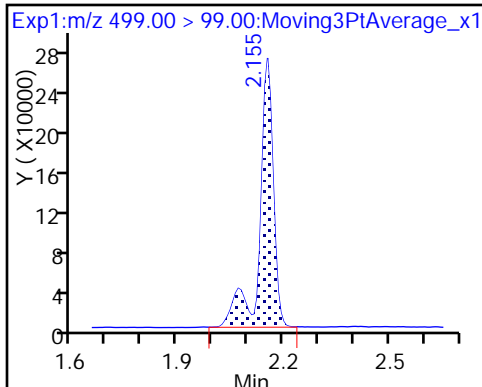
8 Perfluorooctane sulfonic acid (M)



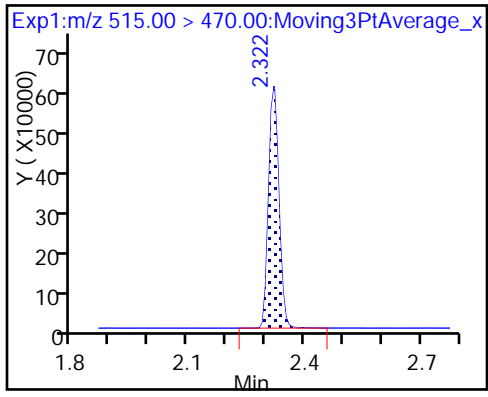
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

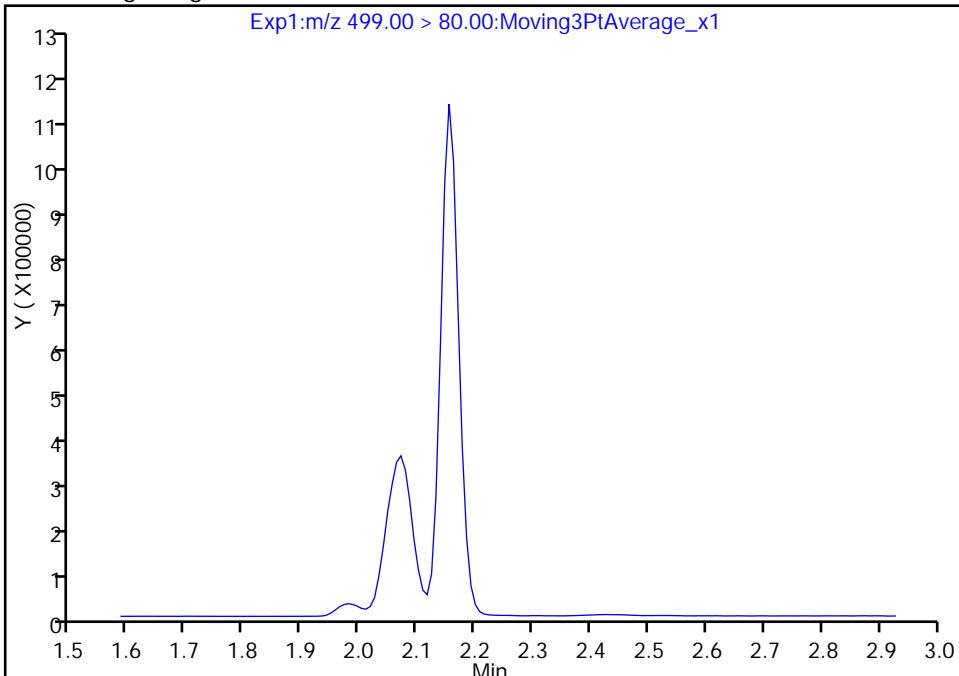
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_001.d
Injection Date: 17-Aug-2017 20:36:18 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

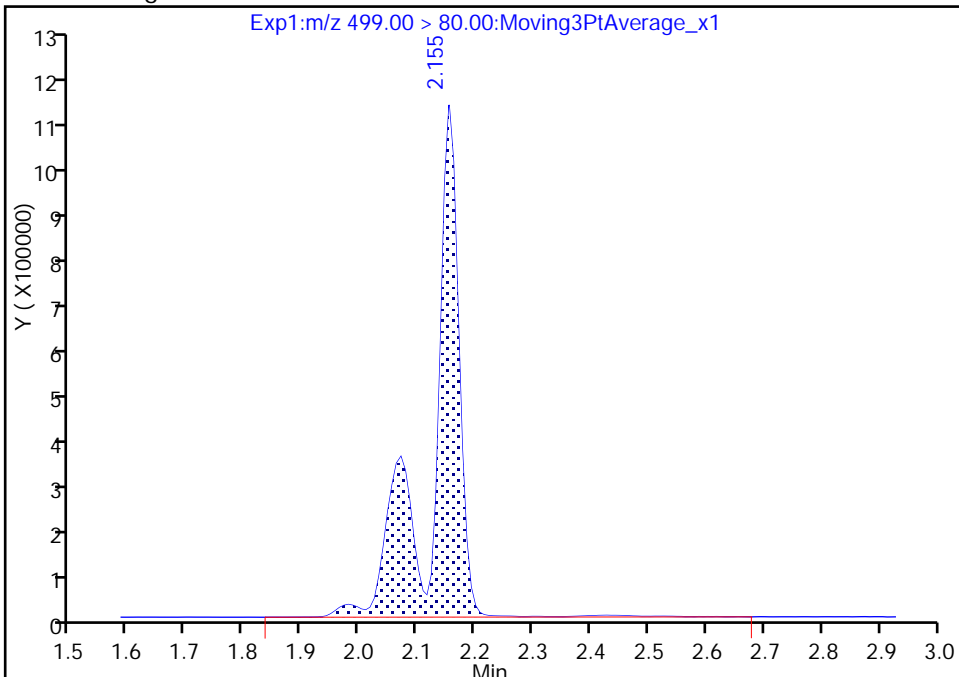
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 3538299
Amount: 20.275662
Amount Units: ng/ml



Reviewer: barnettj, 21-Aug-2017 16:09:37
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

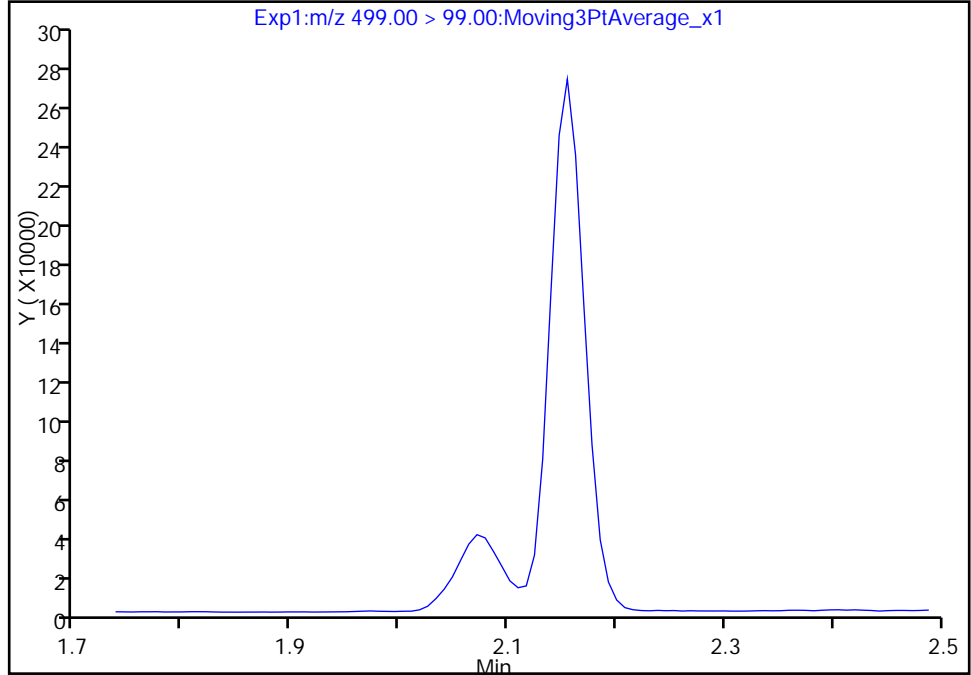
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_001.d
Injection Date: 17-Aug-2017 20:36:18 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

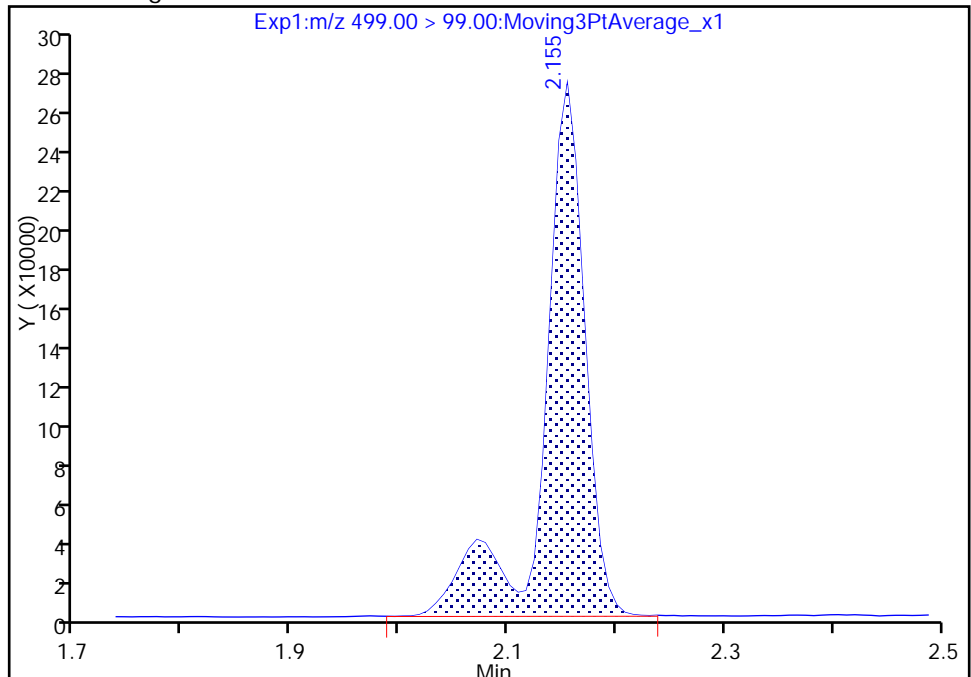
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 716262
Amount: 20.275662
Amount Units: ng/ml



Reviewer: barnettj, 21-Aug-2017 16:09:54

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

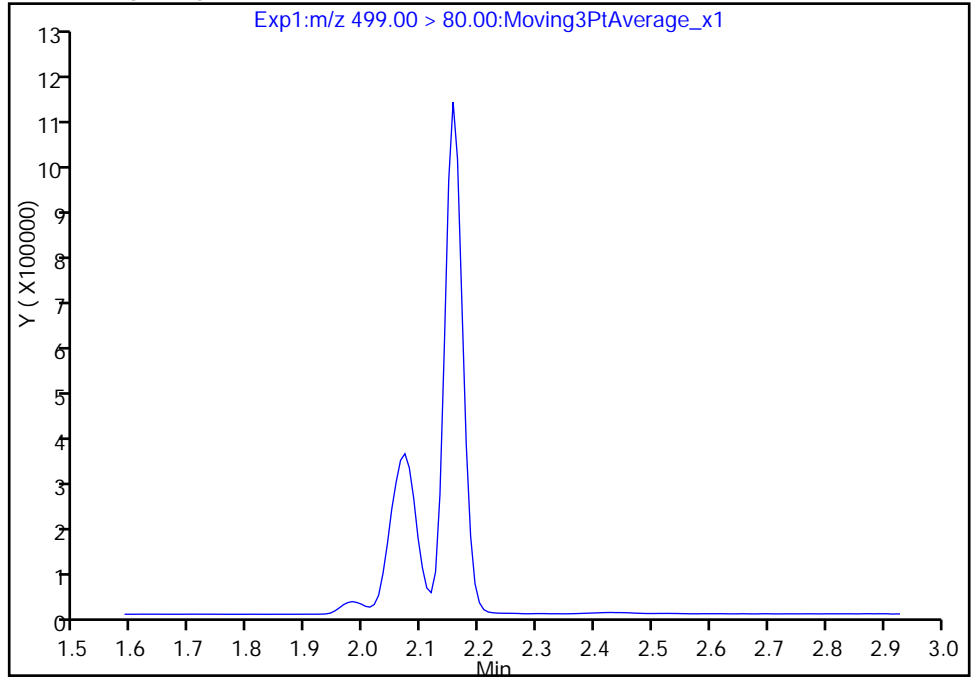
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Injection Date: 17-Aug-2017 20:36:18 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

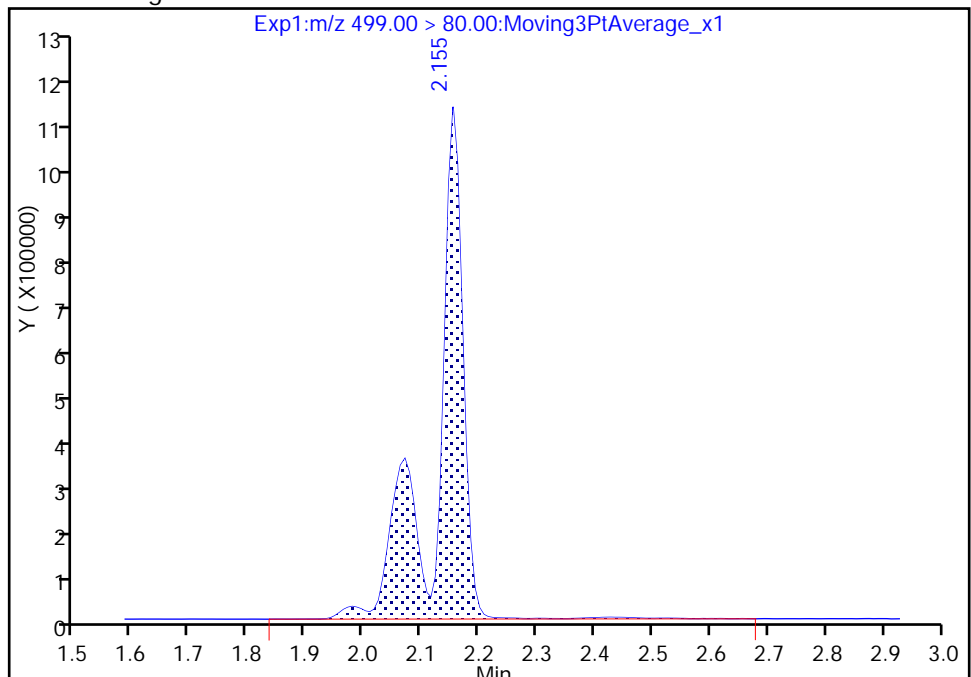
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 3538299
Amount: 20.275662
Amount Units: ng/ml



Reviewer: barnettj, 21-Aug-2017 16:09:54

Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Lab Sample ID: CCV 320-180244/13 Calibration Date: 08/17/2017 21:33
 Instrument ID: A8_N Calib Start Date: 08/17/2017 17:07
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/17/2017 17:30
 Lab File ID: 2017.08.17_537B_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.8319		140	135	3.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9415	0.9534		15.2	15.0	1.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.538	1.516		44.4	45.0	-1.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9175	0.9314		30.5	30.0	1.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9198	0.9550		62.3	60.0	3.8	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7150	0.6227		26.1	30.0	-12.9	30.0
13C2 PFHxA	Ave	1.135	1.224		10.8	10.0	7.8	30.0
13C2 PFDA	Ave	0.6532	0.6278		9.61	10.0	-3.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Lab Sample ID: CCV 320-180245/13 Calibration Date: 08/17/2017 21:33
 Instrument ID: A8_N Calib Start Date: 08/17/2017 17:07
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/17/2017 17:30
 Lab File ID: 2017.08.17_537B_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.8319		140	135	3.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9415	0.9534		15.2	15.0	1.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.538	1.516		44.4	45.0	-1.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9175	0.9314		30.5	30.0	1.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9198	0.9550		62.3	60.0	3.8	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7150	0.6227		26.1	30.0	-12.9	30.0
13C2 PFHxA	Ave	1.135	1.224		10.8	10.0	7.8	30.0
13C2 PFDA	Ave	0.6532	0.6278		9.61	10.0	-3.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_013.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 17-Aug-2017 21:33:16 ALS Bottle#: 5 Worklist Smp#: 13
 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*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:41 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: barnettj Date: 21-Aug-2017 16:10:15

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.438	-0.012	1.000	21990260	139.9		4281	
298.90 > 99.00	1.426	1.438	-0.012	1.000	16339580		1.35(0.00-0.00)	4588	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.548	1.568	-0.020	1.000	2298525	10.8		9096	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.699	1.722	-0.023	1.000	2686047	15.2		339	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.722	-0.023	1.000	13360827	44.4		2883	
* 6 13C2-PFOA									
415.00 > 370.00	1.889	1.928	-0.039		1877700	10.0		7032	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.889	1.928	-0.039	1.000	5251058	30.5		204	
413.00 > 169.00	1.897	1.928	-0.031	1.004	2806159		1.87(0.00-0.00)	4553	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.147	2.147	0.0	1.000	11221818	62.3		4039	
499.00 > 99.00	2.147	2.147	0.0	1.000	2376262		4.72(0.00-0.00)	1471	
* 7 13C4 PFOS									
503.00 > 80.00	2.147	2.185	-0.038		5615534	28.7		2976	
9 Perfluorononanoic acid									
463.00 > 419.00	2.155	2.193	-0.038	1.000	3508372	26.1		386	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.342	-0.028	1.000	1178744	9.61		6974	

Reagents:

LC537-L5_00024

Amount Added: 1.00

Units: mL

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_013.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 17-Aug-2017 21:33:16 ALS Bottle#: 5 Worklist Smp#: 13
 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*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:41 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: barnettj

Date: 21-Aug-2017 16:10:15

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.438	-0.012	1.000	21990260	139.9		4281	
298.90 > 99.00	1.426	1.438	-0.012	1.000	16339580		1.35(0.00-0.00)	4588	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.548	1.568	-0.020	1.000	2298525	10.8		9096	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.699	1.722	-0.023	1.000	2686047	15.2		339	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.722	-0.023	1.000	13360827	44.4		2883	
* 6 13C2-PFOA									
415.00 > 370.00	1.889	1.928	-0.039		1877700	10.0		7032	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.889	1.928	-0.039	1.000	5251058	30.5		204	
413.00 > 169.00	1.897	1.928	-0.031	1.004	2806159		1.87(0.00-0.00)	4553	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.147	2.147	0.0	1.000	11221818	62.3		4039	
499.00 > 99.00	2.147	2.147	0.0	1.000	2376262		4.72(0.00-0.00)	1471	
* 7 13C4 PFOS									
503.00 > 80.00	2.147	2.185	-0.038		5615534	28.7		2976	
9 Perfluorononanoic acid									
463.00 > 419.00	2.155	2.193	-0.038	1.000	3508372	26.1		386	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.342	-0.028	1.000	1178744	9.61		6974	

Reagents:

LC537-L5_00024

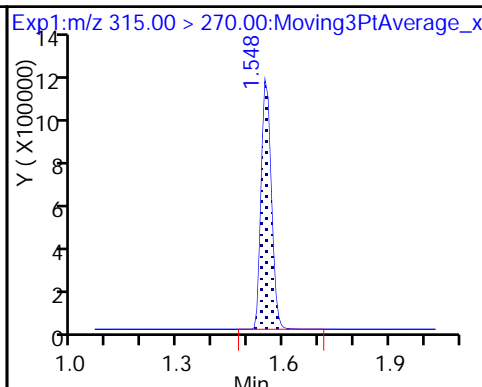
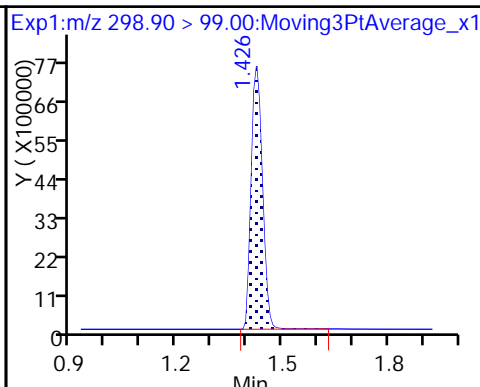
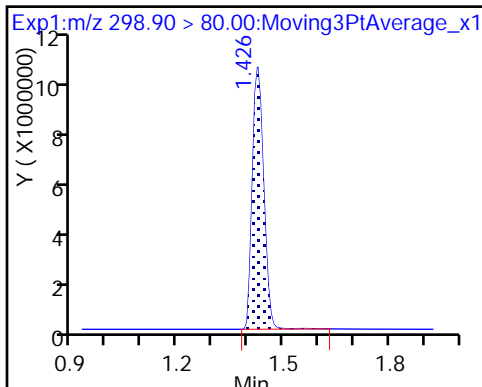
Amount Added: 1.00

Units: mL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

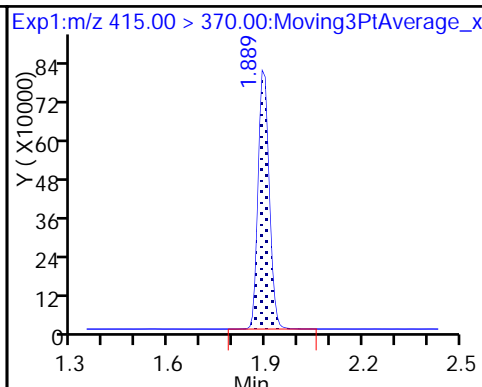
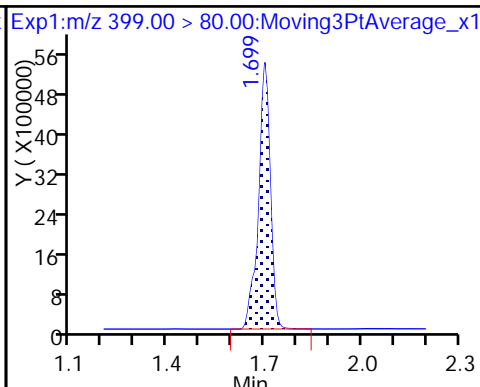
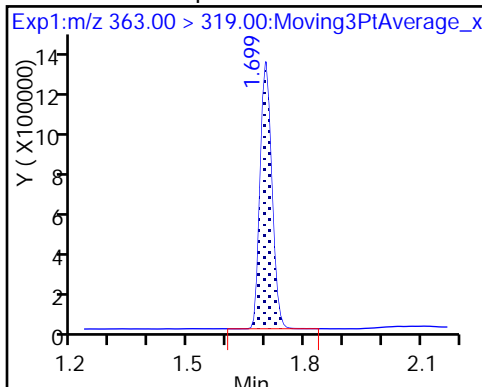
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4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

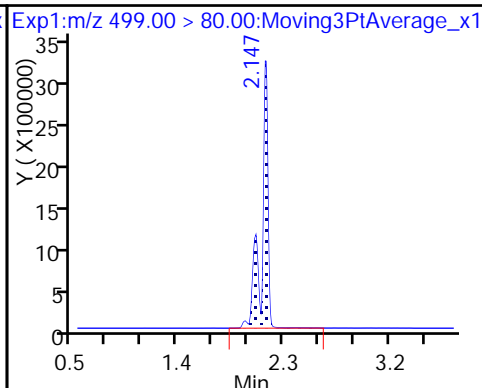
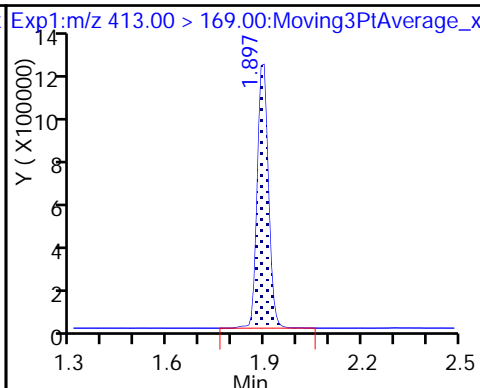
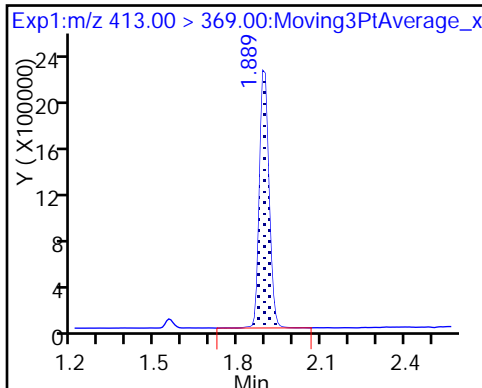
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

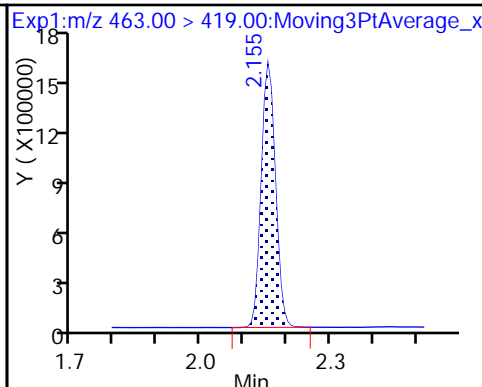
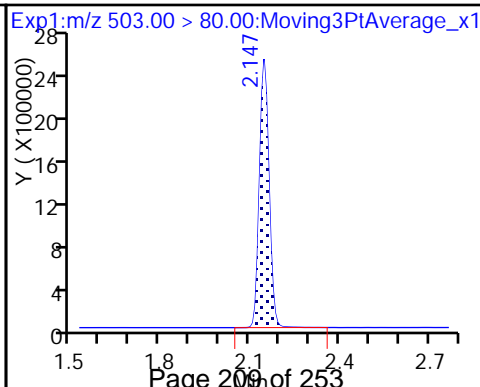
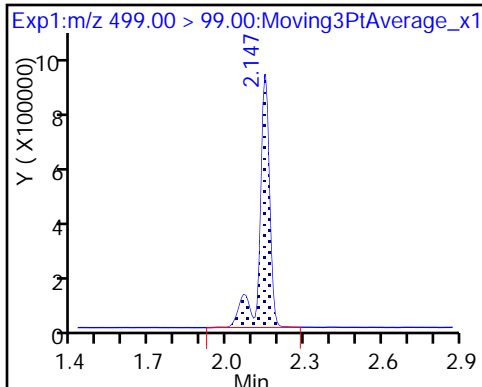
8 Perfluorooctane sulfonic acid



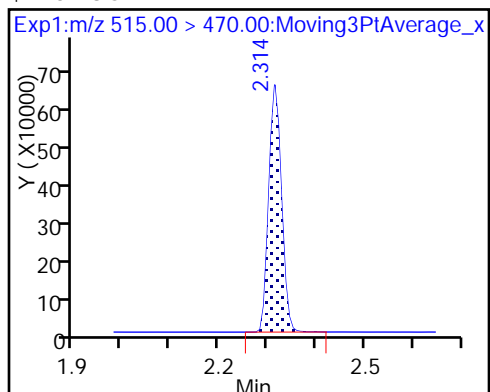
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



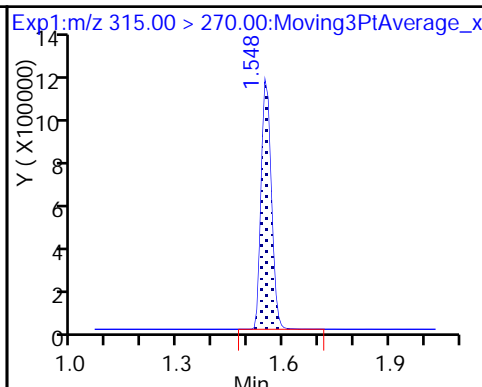
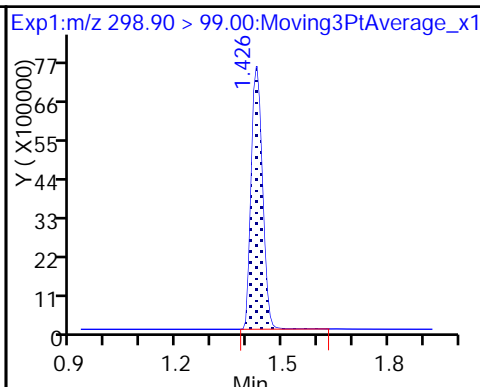
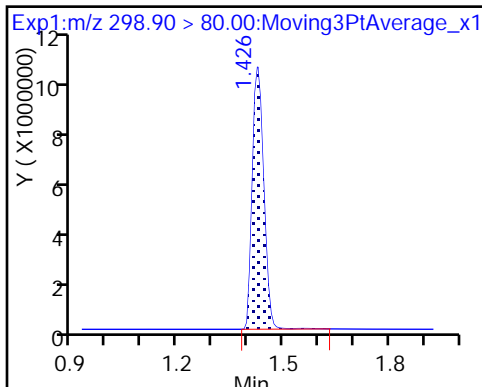
\$ 10 13C2 PFDA



1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

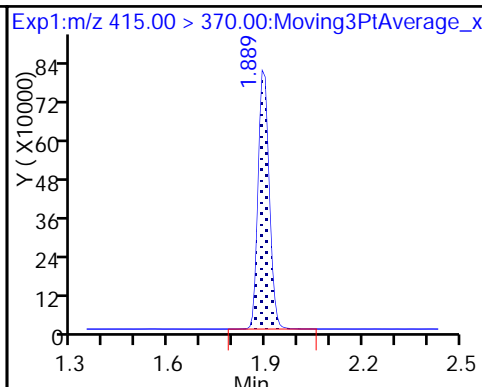
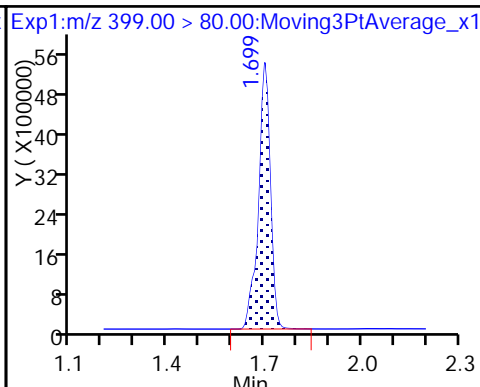
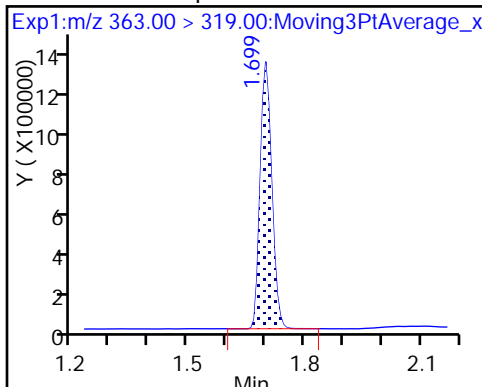
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

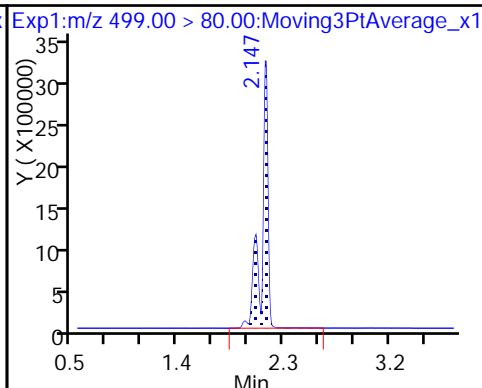
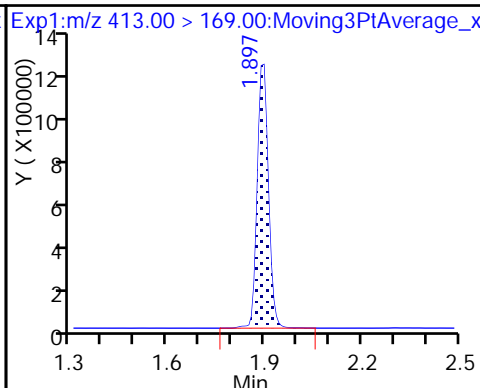
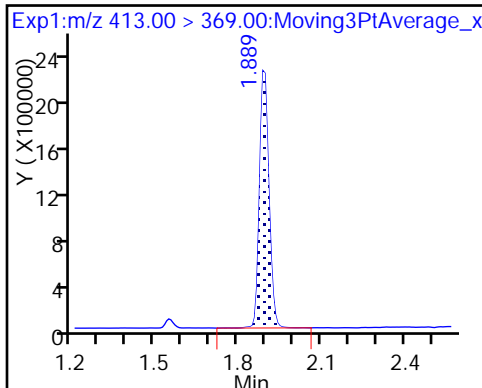
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

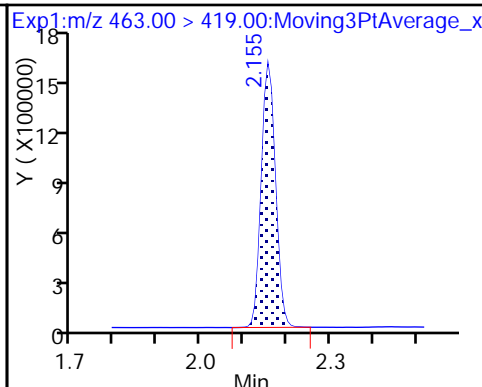
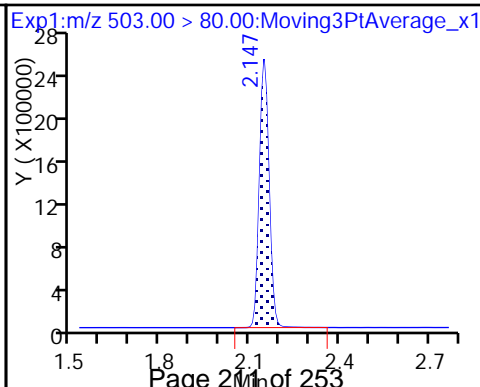
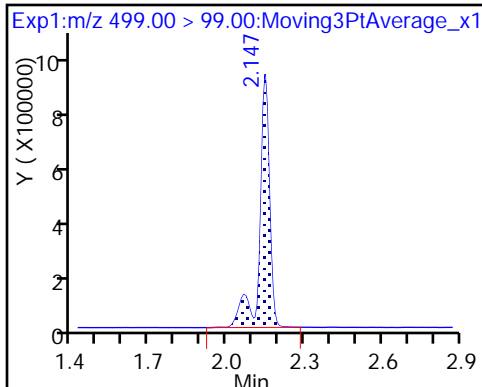
8 Perfluorooctane sulfonic acid



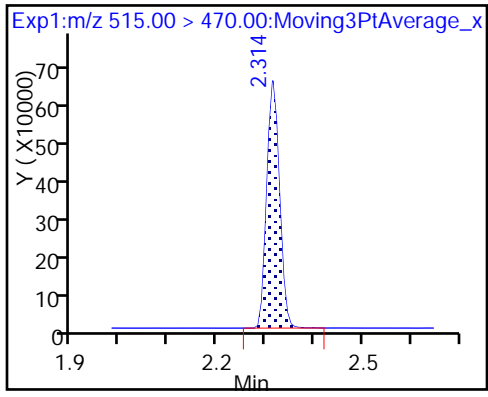
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Lab Sample ID: CCV 320-180245/25 Calibration Date: 08/17/2017 22:30
 Instrument ID: A8_N Calib Start Date: 08/17/2017 17:07
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/17/2017 17:30
 Lab File ID: 2017.08.17_537B_025.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.158		53.4	45.0	18.5	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9415	0.9634		5.12	5.00	2.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.538	1.695		16.5	15.0	10.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9175	0.8995		9.81	10.0	-2.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9198	0.9490		20.6	20.0	3.2	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7150	0.6350		8.88	10.0	-11.2	30.0
13C2 PFHxA	Ave	1.135	1.208		10.6	10.0	6.4	30.0
13C2 PFDA	Ave	0.6532	0.6271		9.60	10.0	-4.0	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_025.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 17-Aug-2017 22:30:15 ALS Bottle#: 3 Worklist Smp#: 25
 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*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:50 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 19-Aug-2017 13:55:47

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.438	-0.012	1.000	9784385	53.4		1811	
298.90 > 99.00	1.426	1.438	-0.012	1.000	6644865		1.47(0.00-0.00)	1803	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.548	1.568	-0.020	1.000	2191195	10.6		9940	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.699	1.722	-0.023	1.000	874343	5.12		103	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.722	-0.023	1.000	4774996	16.5		1412	
* 6 13C2-PFOA									
415.00 > 370.00	1.889	1.928	-0.039		1814629	10.0		7421	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.889	1.928	-0.039	1.000	1633694	9.81		71.1	
413.00 > 169.00	1.889	1.928	-0.039	1.000	875933		1.87(0.00-0.00)	1992	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.147	2.147	0.0	1.000	3565450	20.6		2017	
499.00 > 99.00	2.147	2.147	0.0	1.000	730899		4.88(0.00-0.00)	497	
* 7 13C4 PFOS									
503.00 > 80.00	2.147	2.185	-0.038		5386179	28.7		3022	
9 Perfluorononanoic acid									
463.00 > 419.00	2.155	2.193	-0.038	1.000	1152489	8.88		135	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.342	-0.028	1.000	1137879	9.60		6543	

Reagents:

LC537-L3_00023

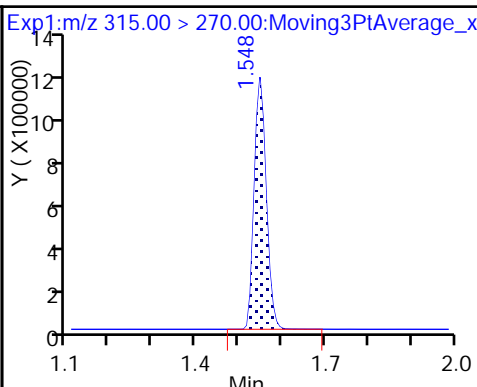
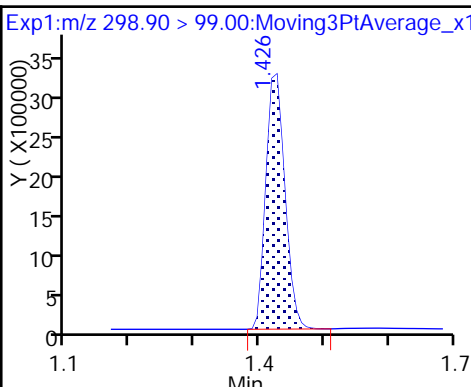
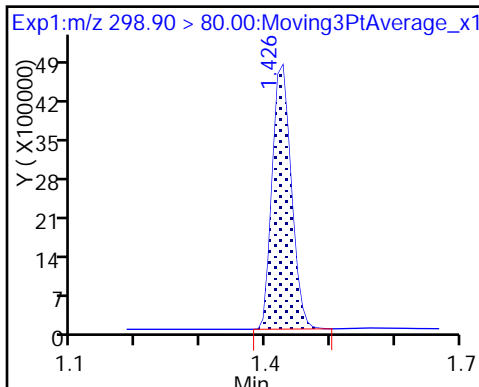
Amount Added: 1.00

Units: mL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

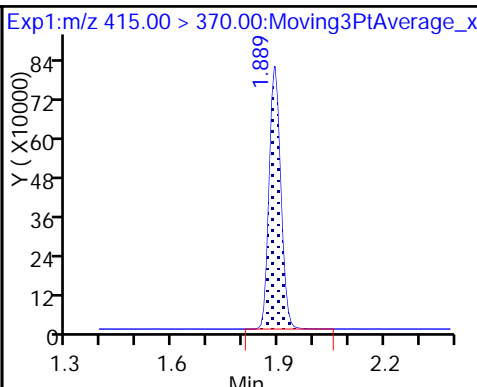
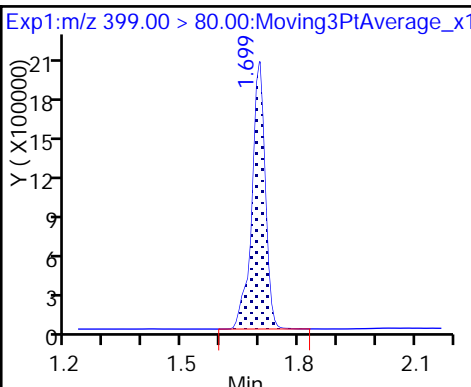
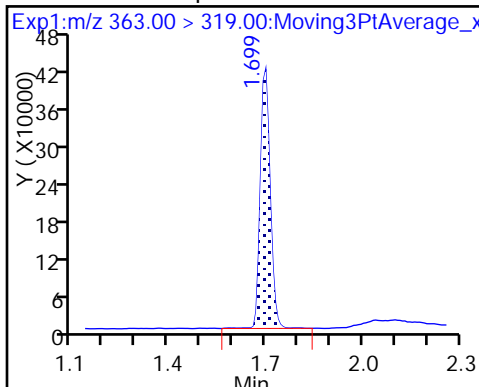
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

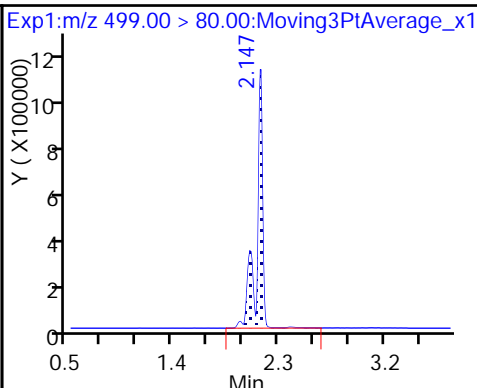
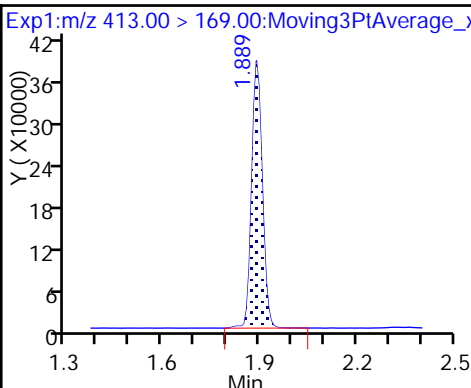
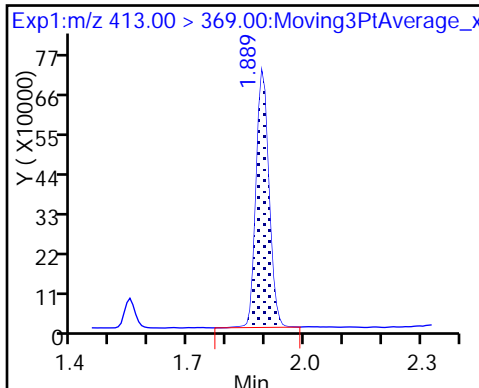
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

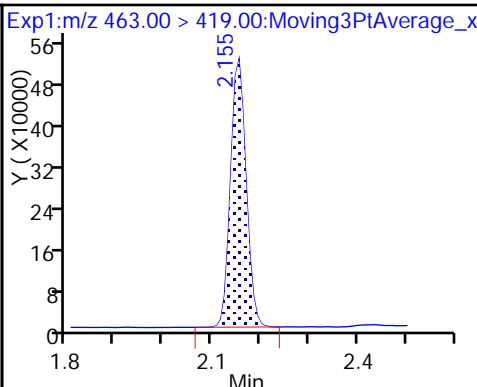
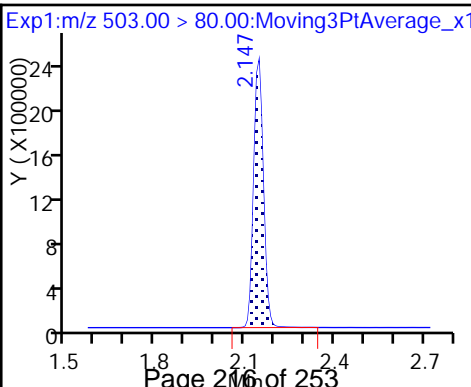
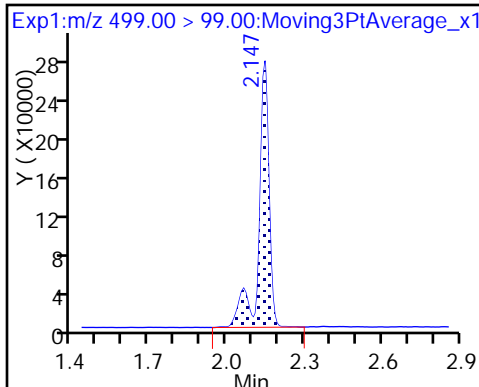
8 Perfluorooctane sulfonic acid



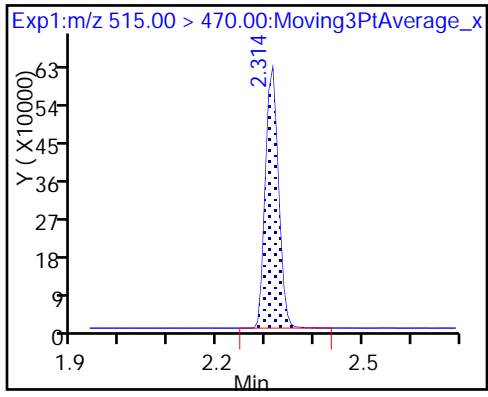
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-179409/1-A
 Matrix: Water Lab File ID: 2017.08.17_537B_003.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 250 (mL) Date Analyzed: 08/17/2017 20:45
 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.: 180244 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	97		70-130
STL00996	13C2 PFDA	112		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_003.d
 Lims ID: MB 320-179409/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 17-Aug-2017 20:45:47 ALS Bottle#: 19 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-179409/1-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK001

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.555	1.568	-0.013	1.000	2231765	9.66	9075	
* 6 13C2-PFOA	415.00 > 370.00	1.897	1.928	-0.031		2035487	10.0	7033	
* 7 13C4 PFOS	503.00 > 80.00	2.155	2.185	-0.030		5895955	28.7	2192	
\$ 10 13C2 PFDA	515.00 > 470.00	2.322	2.342	-0.020	1.000	1488351	11.2	9143	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_003.d

Injection Date: 17-Aug-2017 20:45:47

Instrument ID: A8_N

Lims ID: MB 320-179409/1-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 19

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

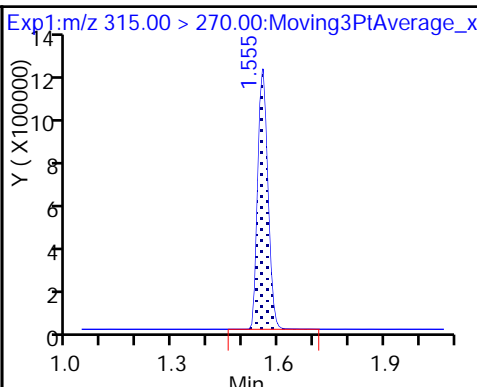
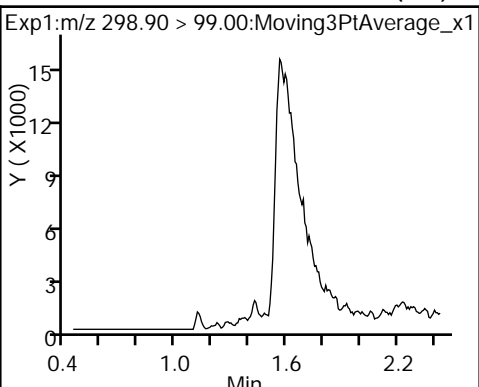
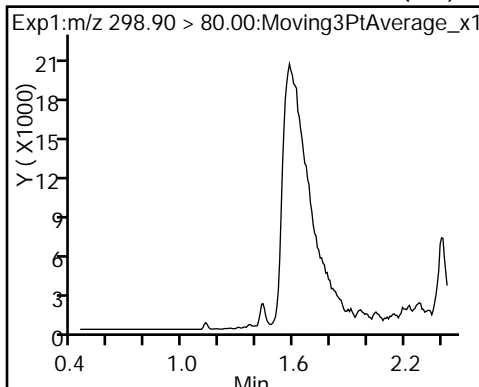
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

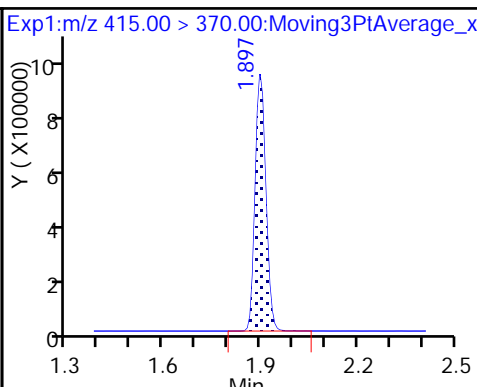
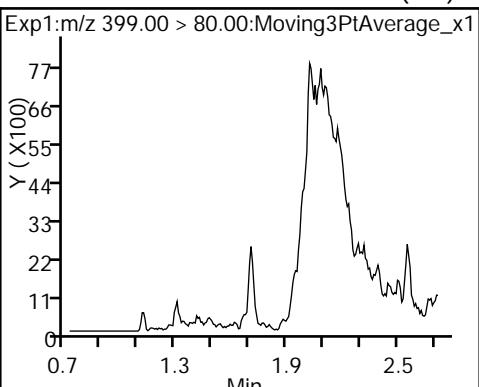
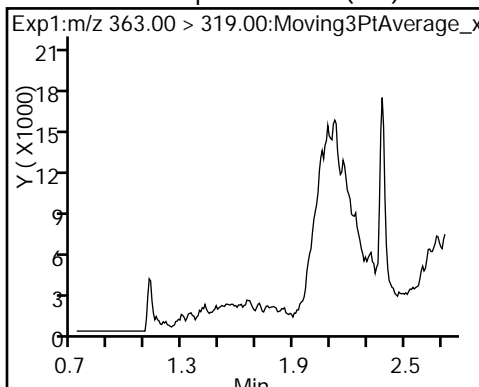
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid (ND)

3 Perfluorohexanesulfonic acid (ND)

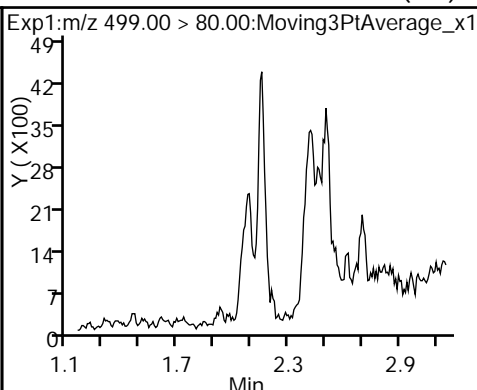
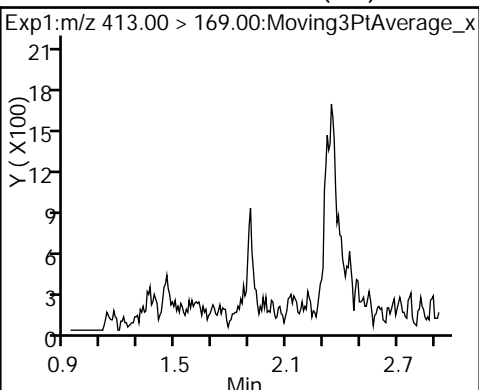
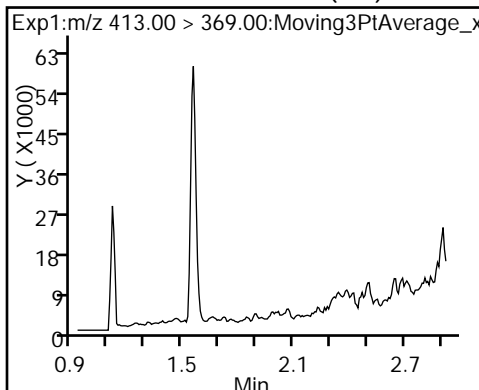
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

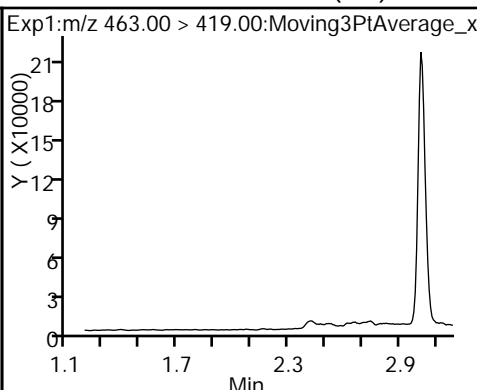
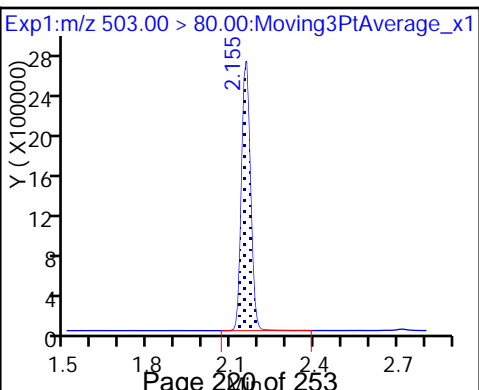
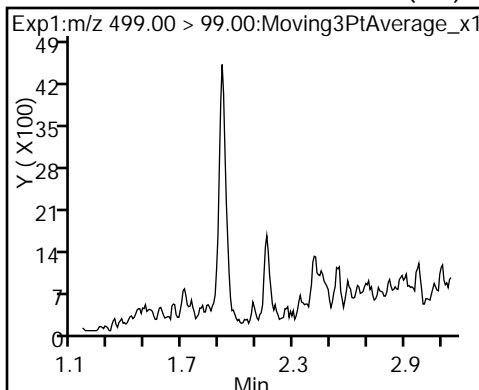
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

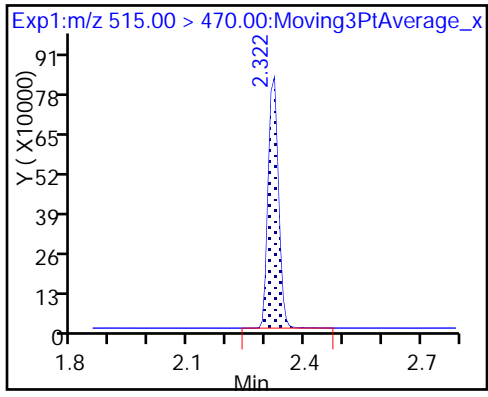


8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_003.d
 Lims ID: MB 320-179409/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 17-Aug-2017 20:45:47 ALS Bottle#: 19 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-179409/1-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK001

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.66	96.59
\$ 10 13C2 PFDA	10.0	11.2	111.94

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 320-179409/2-A
 Matrix: Water Lab File ID: 2017.08.17_537B_004.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 250 (mL) Date Analyzed: 08/17/2017 20:50
 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.: 180244 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	134	M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	66.4		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	59.3		24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	103		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	33.9		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	319		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	109		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_004.d
 Lims ID: LCS 320-179409/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 17-Aug-2017 20:50:33 ALS Bottle#: 20 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-179409/2-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: barnettj Date: 21-Aug-2017 16:11:27

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.438	-0.012	1.000	13898722	79.8		2257	
298.90 > 99.00	1.426	1.438	-0.012	1.000	9816702		1.42(0.00-0.00)	2194	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.568	-0.013	1.000	2108401	10.1		8334	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.707	1.722	-0.015	1.000	1464155	8.47		186	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.707	1.722	-0.015	1.000	7488689	25.8		1989	
* 6 13C2-PFOA									
415.00 > 370.00	1.897	1.928	-0.031		1836687	10.0		7258	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.897	1.928	-0.031	1.000	2798755	16.6		136	
413.00 > 169.00	1.897	1.928	-0.031	1.000	1498132		1.87(0.00-0.00)	2473	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.155	2.147	0.008	1.000	5813583	33.5		3009	M
499.00 > 99.00	2.155	2.147	0.008	1.000	1192338		4.88(0.00-0.00)	629	M
* 7 13C4 PFOS									
503.00 > 80.00	2.155	2.185	-0.030		5407681	28.7		2346	
9 Perfluorononanoic acid									
463.00 > 419.00	2.162	2.193	-0.031	1.000	1948393	14.8		113	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.322	2.342	-0.020	1.000	1302309	10.9		7623	

QC Flag Legend

Review Flags

M - Manually Integrated

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_004.d

Injection Date: 17-Aug-2017 20:50:33

Instrument ID: A8_N

Lims ID: LCS 320-179409/2-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 20

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

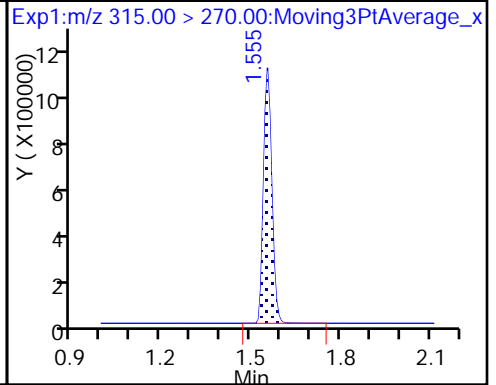
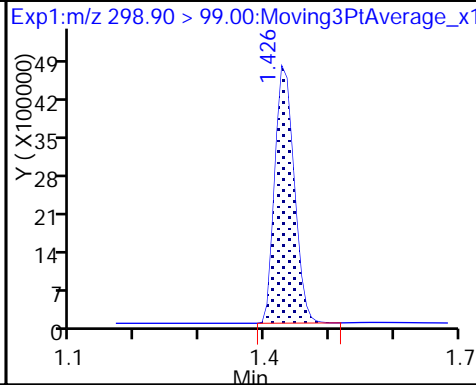
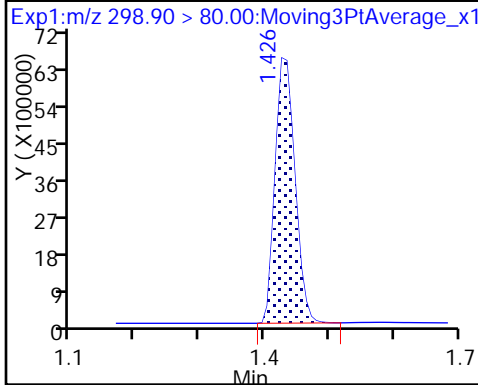
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

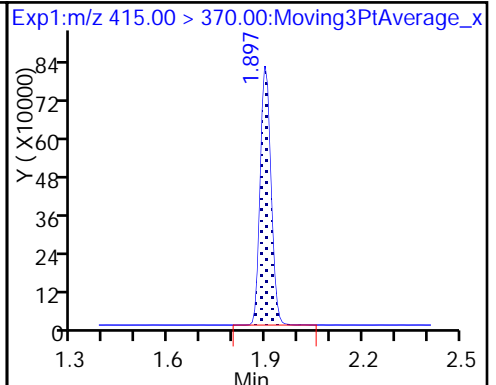
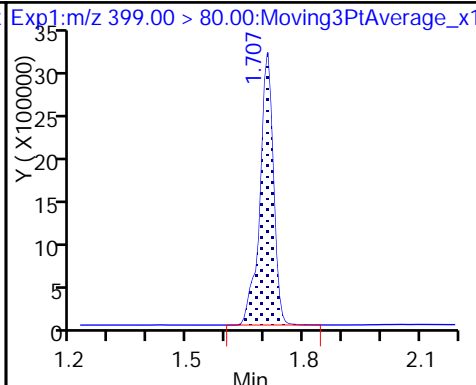
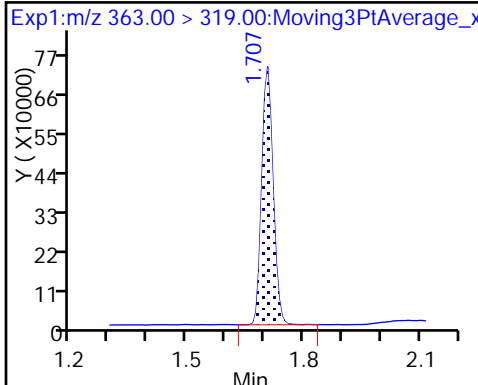
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

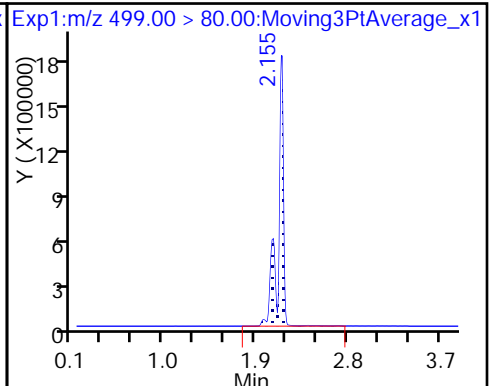
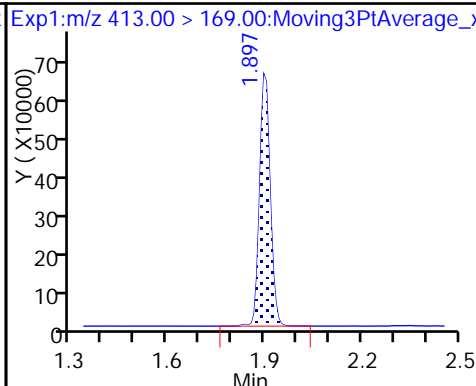
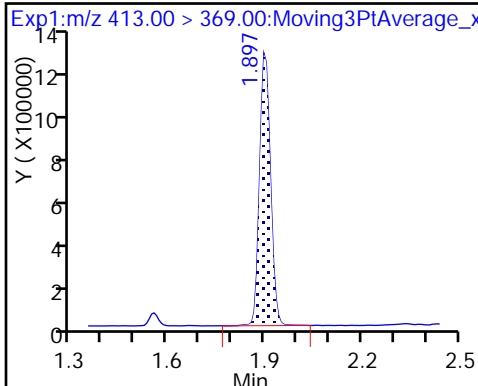
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

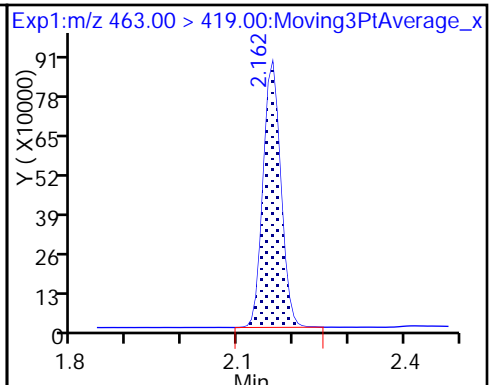
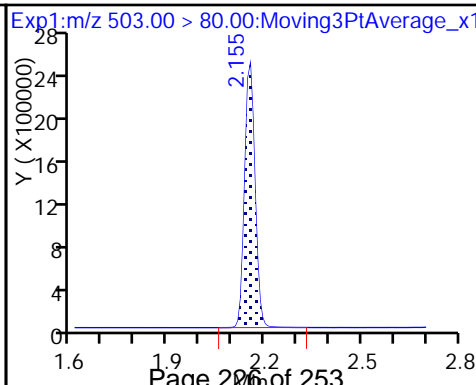
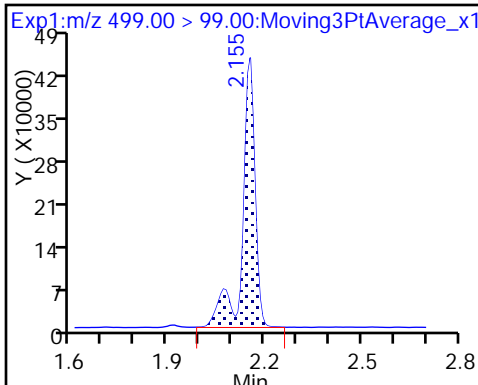
8 Perfluorooctane sulfonic acid (M)



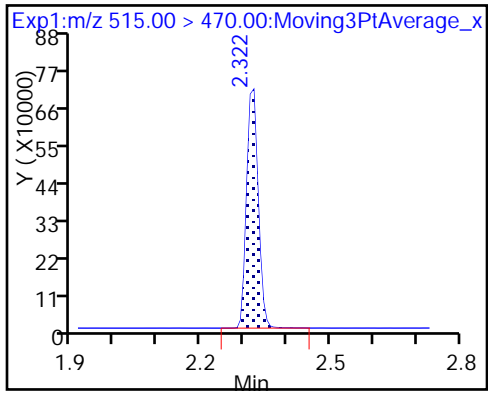
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_004.d
 Lims ID: LCS 320-179409/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 17-Aug-2017 20:50:33 ALS Bottle#: 20 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-179409/2-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: barnettj Date: 21-Aug-2017 16:11:27

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.1	101.13
\$ 10 13C2 PFDA	10.0	10.9	108.55

TestAmerica Sacramento

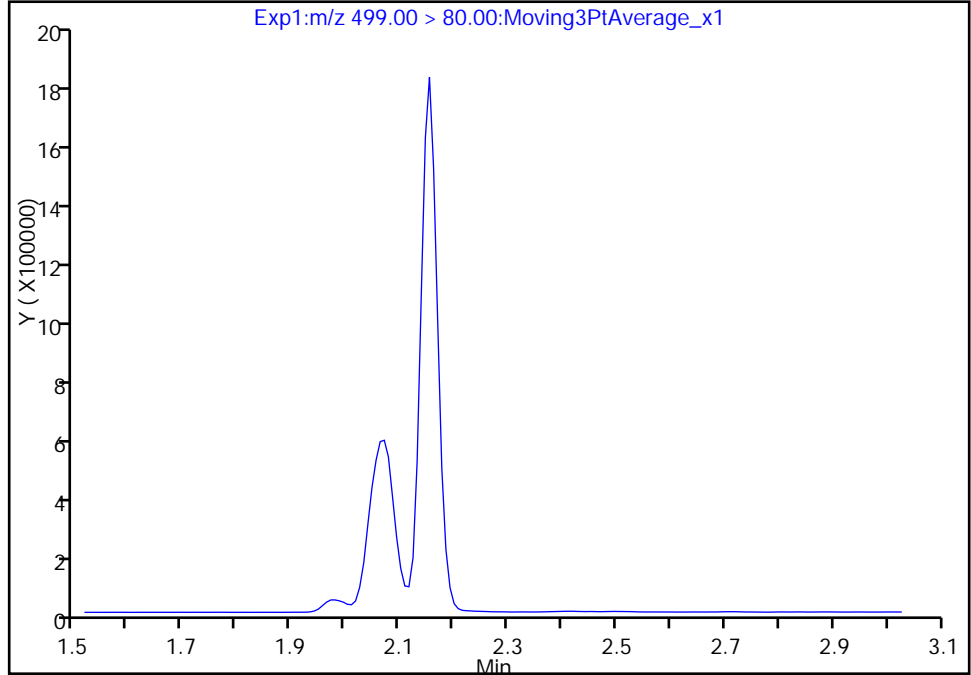
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Injection Date: 17-Aug-2017 20:50:33 Instrument ID: A8_N
Lims ID: LCS 320-179409/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

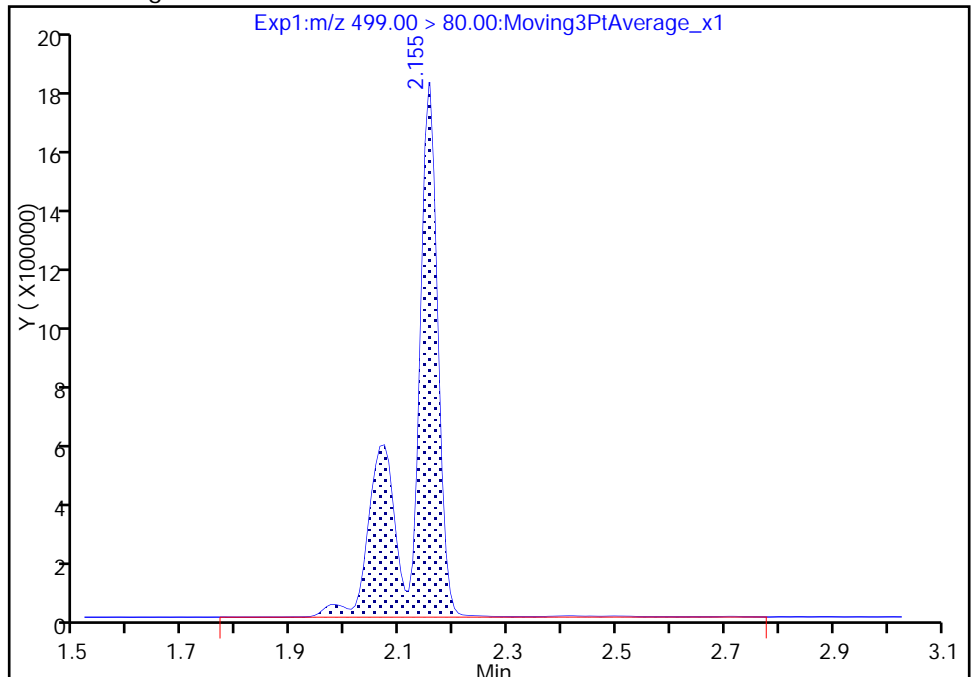
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 5813583
Amount: 33.522890
Amount Units: ng/ml



Reviewer: barnettj, 21-Aug-2017 16:10:55
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

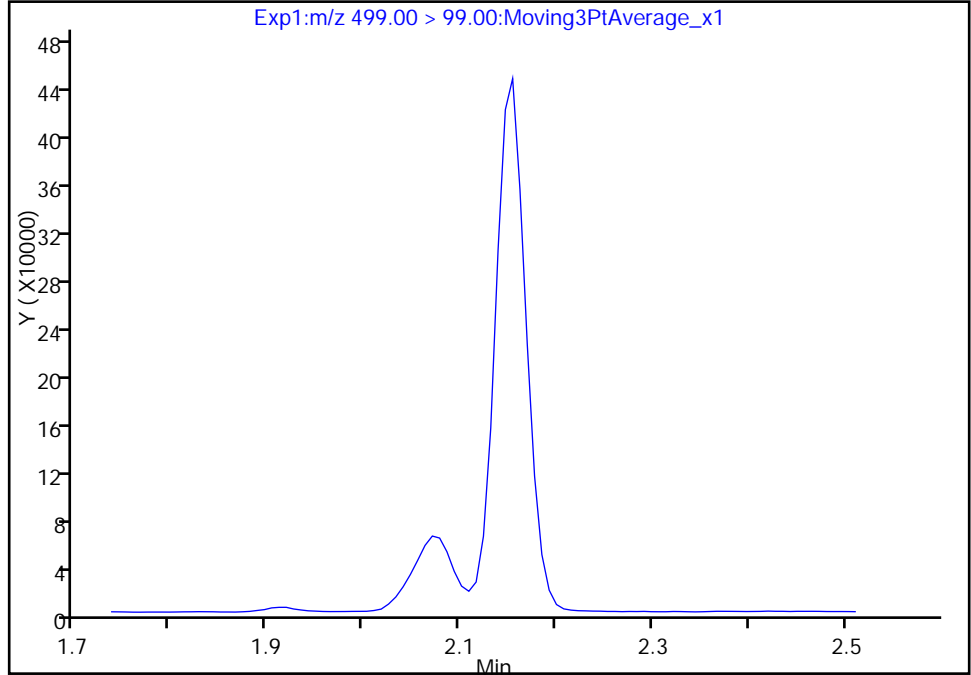
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_004.d
Injection Date: 17-Aug-2017 20:50:33 Instrument ID: A8_N
Lims ID: LCS 320-179409/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

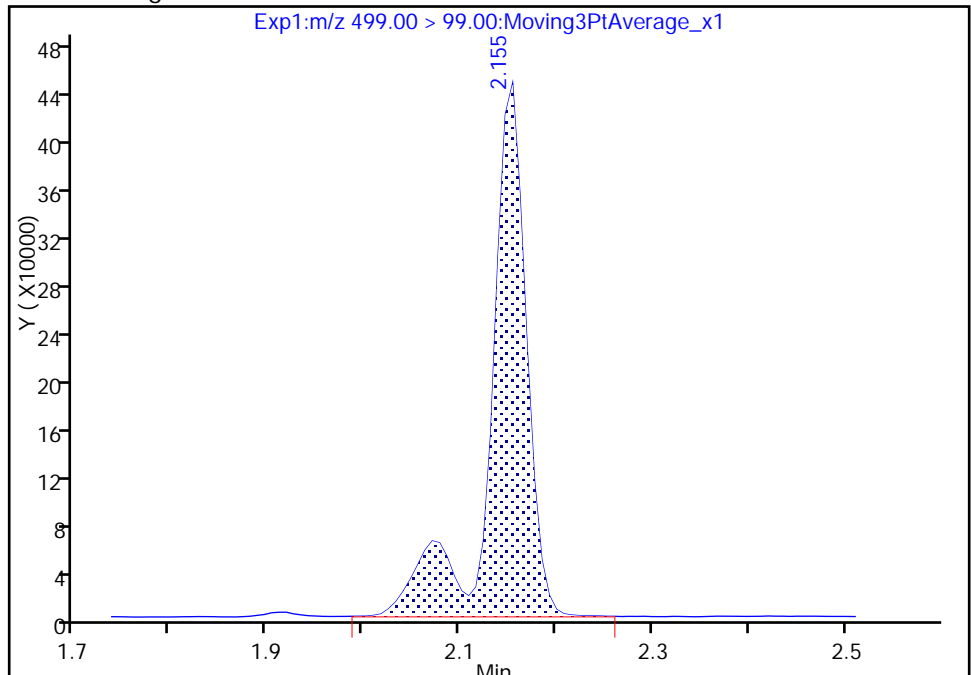
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 1192338
Amount: 33.522890
Amount Units: ng/ml



Reviewer: barnettj, 21-Aug-2017 16:11:08

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

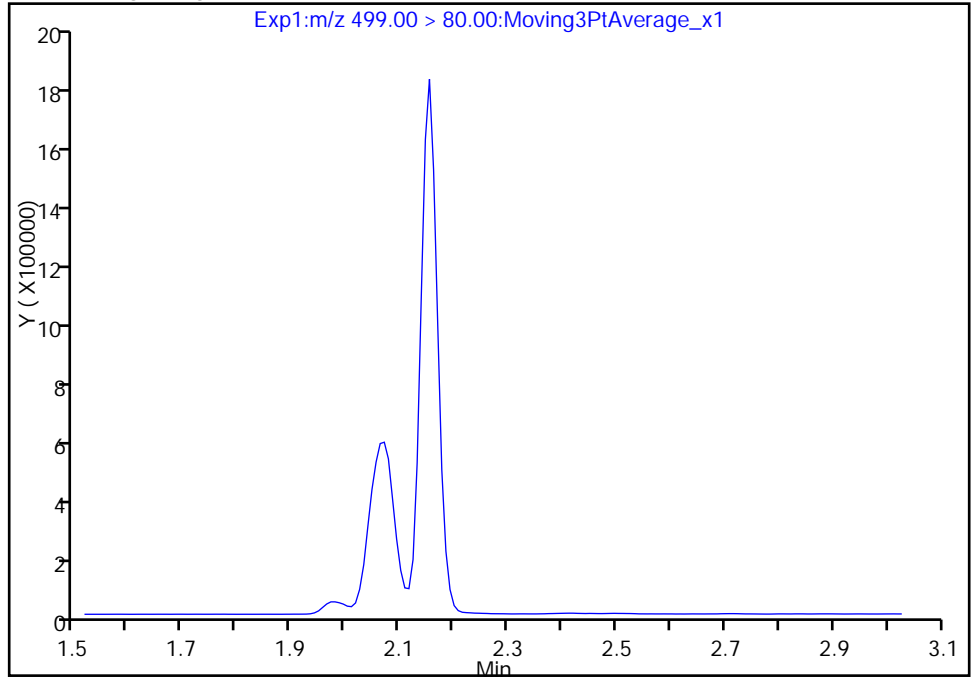
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Injection Date: 17-Aug-2017 20:50:33 Instrument ID: A8_N
Lims ID: LCS 320-179409/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

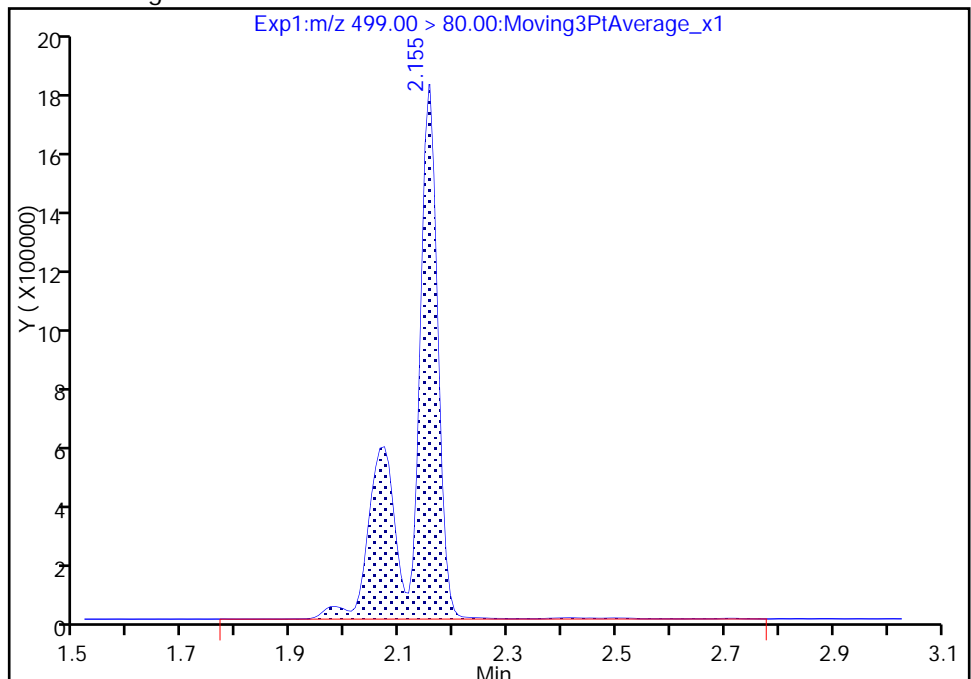
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 5813583
Amount: 33.522890
Amount Units: ng/ml



Reviewer: barnettj, 21-Aug-2017 16:11:08

Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCSD 320-179409/3-A
 Matrix: Water Lab File ID: 2017.08.17_537B_005.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 250 (mL) Date Analyzed: 08/17/2017 20:55
 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.: 180244 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	135		40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	67.7		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	57.1		24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	103		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	32.3		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	320		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	113		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_005.d
 Lims ID: LCSD 320-179409/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 17-Aug-2017 20:55:18 ALS Bottle#: 21 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcsd 320-179409/3-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: barnettj Date: 21-Aug-2017 16:11:50

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.438	-0.012	1.000	14734631	80.0		2203	
298.90 > 99.00	1.426	1.438	-0.012	1.000	10485635		1.41(0.00-0.00)	2453	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.555	1.568	-0.013	1.000	2253099	9.99		8124	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.699	1.722	-0.023	1.000	1509636	8.07		174	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.722	-0.023	1.000	7888042	25.7		1923	
* 6 13C2-PFOA									
415.00 > 370.00	1.897	1.928	-0.031		1987735	10.0		6735	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.897	1.928	-0.031	1.000	3086375	16.9		149	
413.00 > 169.00	1.897	1.928	-0.031	1.000	1616375		1.91(0.00-0.00)	2892	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.155	2.147	0.008	1.000	6199596	33.8		2500	
499.00 > 99.00	2.147	2.147	0.0	0.996	1275473		4.86(0.00-0.00)	668	
* 7 13C4 PFOS									
503.00 > 80.00	2.147	2.185	-0.038		5721794	28.7		2042	
9 Perfluorononanoic acid									
463.00 > 419.00	2.162	2.193	-0.031	1.000	2030609	14.3		115	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.342	-0.028	1.000	1472815	11.3		8214	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_005.d

Injection Date: 17-Aug-2017 20:55:18

Instrument ID: A8_N

Lims ID: LCSD 320-179409/3-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 21

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

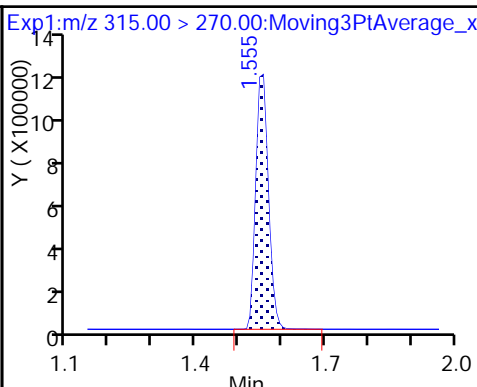
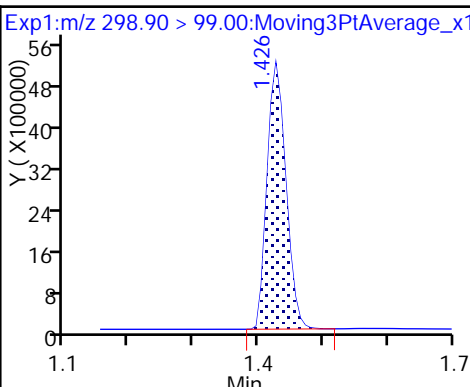
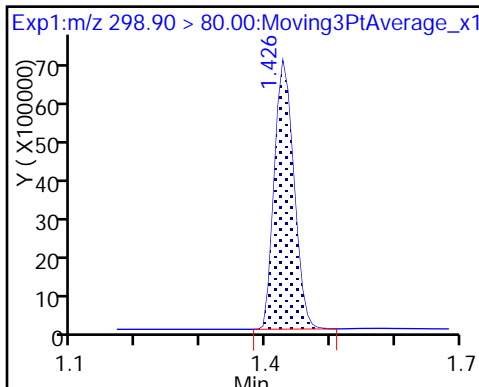
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

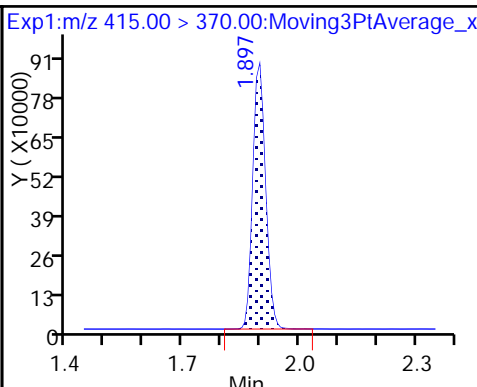
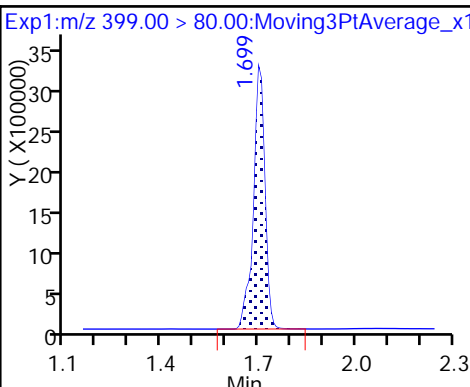
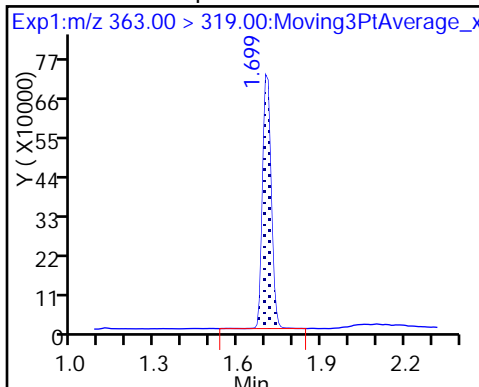
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

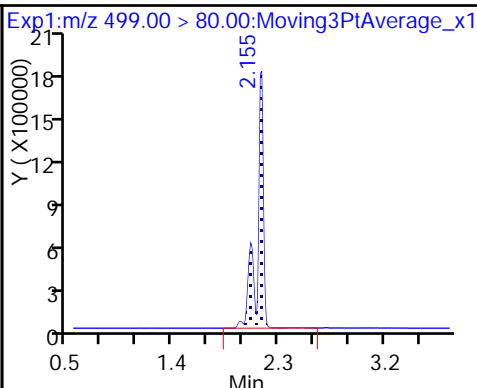
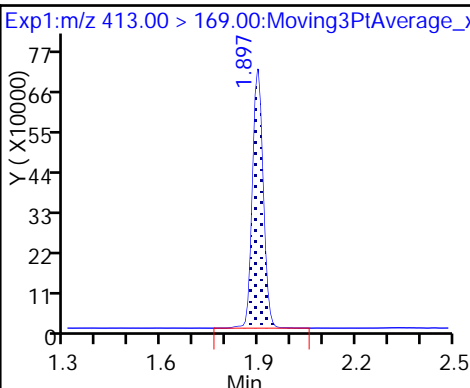
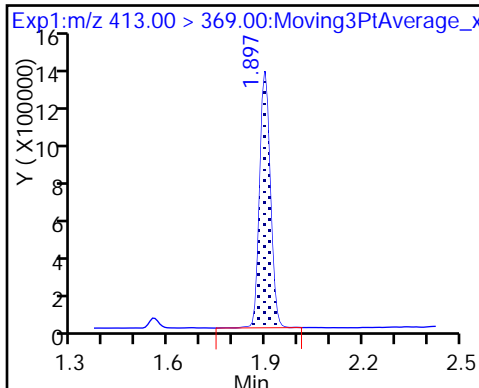
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

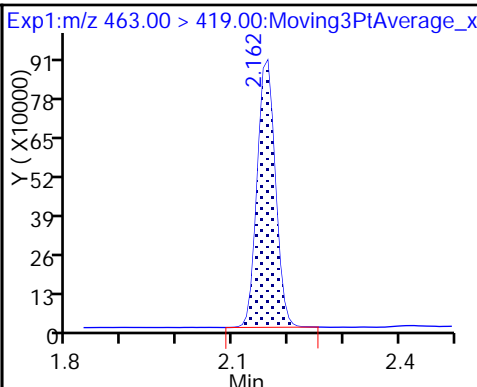
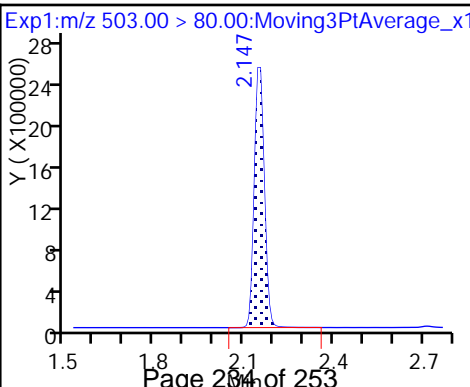
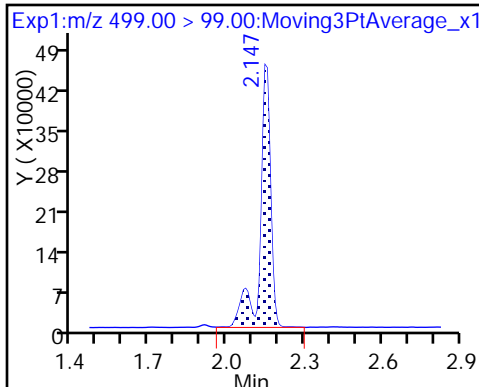
8 Perfluorooctane sulfonic acid



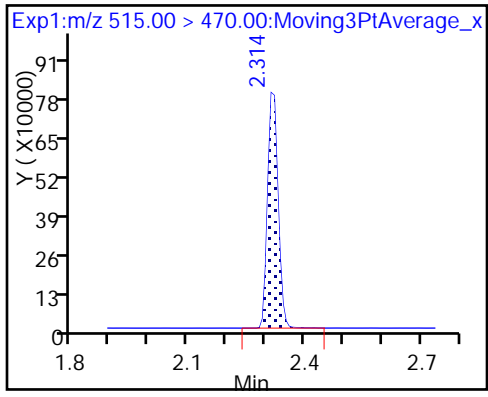
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\2017.08.17_537B_005.d
 Lims ID: LCSD 320-179409/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 17-Aug-2017 20:55:18 ALS Bottle#: 21 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcsd 320-179409/3-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 21-Aug-2017 16:18:32 Calib Date: 17-Aug-2017 17:30:56
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170819-46875.b\207.08.17_537A_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK001

First Level Reviewer: barnettj Date: 21-Aug-2017 16:11:50

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.99	99.86
\$ 10 13C2 PFDA	10.0	11.3	113.44

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/17/2017 17:07

Analysis Batch Number: 180236 End Date: 08/17/2017 17:49

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-180236/2		08/17/2017 17:07	1	207.08.17_537A_004.d	GeminiC18 3x100 3(mm)
IC 320-180236/3		08/17/2017 17:12	1	207.08.17_537A_005.d	GeminiC18 3x100 3(mm)
IC 320-180236/4		08/17/2017 17:16	1	207.08.17_537A_006.d	GeminiC18 3x100 3(mm)
IC 320-180236/5 ICISAV		08/17/2017 17:21	1	207.08.17_537A_007.d	GeminiC18 3x100 3(mm)
IC 320-180236/6		08/17/2017 17:26	1	207.08.17_537A_008.d	GeminiC18 3x100 3(mm)
IC 320-180236/7		08/17/2017 17:30	1	207.08.17_537A_009.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 17:35	1		GeminiC18 3x100 3(mm)
CCVL 320-180236/9		08/17/2017 17:40	1	207.08.17_537A_011.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 17:45	1		GeminiC18 3x100 3(mm)
ICV 320-180236/11		08/17/2017 17:49	1	207.08.17_537A_013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/17/2017 20:36

Analysis Batch Number: 180244 End Date: 08/17/2017 21:33

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-180244/1 CCVIS ZZZZZ		08/17/2017 20:36	1	2017.08.17_537B 001.d	GeminiC18 3x100 3(mm)
MB 320-179409/1-A		08/17/2017 20:45	1	2017.08.17_537B 003.d	GeminiC18 3x100 3(mm)
LCS 320-179409/2-A		08/17/2017 20:50	1	2017.08.17_537B 004.d	GeminiC18 3x100 3(mm)
LCSD 320-179409/3-A		08/17/2017 20:55	1	2017.08.17_537B 005.d	GeminiC18 3x100 3(mm)
320-30576-1		08/17/2017 21:00	1	2017.08.17_537B 006.d	GeminiC18 3x100 3(mm)
320-30576-2		08/17/2017 21:04	1	2017.08.17_537B 007.d	GeminiC18 3x100 3(mm)
320-30576-3		08/17/2017 21:09	1	2017.08.17_537B 008.d	GeminiC18 3x100 3(mm)
320-30576-4		08/17/2017 21:14	1	2017.08.17_537B 009.d	GeminiC18 3x100 3(mm)
320-30576-5		08/17/2017 21:19	1	2017.08.17_537B 010.d	GeminiC18 3x100 3(mm)
320-30576-6		08/17/2017 21:23	1	2017.08.17_537B 011.d	GeminiC18 3x100 3(mm)
320-30576-7		08/17/2017 21:28	1	2017.08.17_537B 012.d	GeminiC18 3x100 3(mm)
CCV 320-180244/13 CCVIS		08/17/2017 21:33	1	2017.08.17_537B 013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/17/2017 21:33

Analysis Batch Number: 180245 End Date: 08/17/2017 22:30

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-180245/13 CCVIS		08/17/2017 21:33	1	2017.08.17_537B 013.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 21:37	1		GeminiC18 3x100 3(mm)
320-30576-8		08/17/2017 21:42	1	2017.08.17_537B 015.d	GeminiC18 3x100 3(mm)
320-30576-9		08/17/2017 21:47	1	2017.08.17_537B 016.d	GeminiC18 3x100 3(mm)
320-30576-10		08/17/2017 21:52	1	2017.08.17_537B 017.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 21:56	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 22:01	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 22:06	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 22:11	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 22:15	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 22:20	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 22:25	1		GeminiC18 3x100 3(mm)
CCV 320-180245/25 CCVIS		08/17/2017 22:30	1	2017.08.17_537B 025.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1

SDG No.: _____

Batch Number: 179409 Batch Start Date: 08/15/17 07:52 Batch Analyst: Branscum, Cassie

Batch Method: 537 Batch End Date: 08/17/17 14:41

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00047
MB 320-179409/1		537, 537				250 mL	1.00 mL	7 SU	100 uL
LCS 320-179409/2		537, 537				250 mL	1.00 mL	7 SU	100 uL
LCSD 320-179409/3		537, 537				250 mL	1.00 mL	7 SU	100 uL
320-30576-A-1	NAWC-080917-RW-337A	537, 537	T	282.78 g	28.96 g	253.8 mL	1.00 mL	7 SU	100 uL
320-30576-A-2	NAWC-080917-FRB-337A	537, 537	T	285.79 g	28.11 g	257.7 mL	1.00 mL	7 SU	100 uL
320-30576-A-3	NAWC-080917-RW-337B	537, 537	T	290.40 g	28.82 g	261.6 mL	1.00 mL	7 SU	100 uL
320-30576-A-4	WGNA-080917-RW-107A	537, 537	T	286.31 g	30.04 g	256.3 mL	1.00 mL	7 SU	100 uL
320-30576-A-5	WGNA-080917-FRB-107A	537, 537	T	286.43 g	29.07 g	257.4 mL	1.00 mL	7 SU	100 uL
320-30576-A-6	WGNA-080917-RW-107B	537, 537	T	287.60 g	29.07 g	258.5 mL	1.00 mL	7 SU	100 uL
320-30576-A-7	NAWC-080917-RW-320	537, 537	T	277.50 g	28.74 g	248.8 mL	1.00 mL	7 SU	100 uL
320-30576-A-8	NAWC-080917-FRB-320	537, 537	T	282.63 g	28.67 g	254 mL	1.00 mL	7 SU	100 uL
320-30576-A-9	WGNA-080917-RW-263	537, 537	T	286.28 g	28.92 g	257.4 mL	1.00 mL	7 SU	100 uL
320-30576-A-10	WGNA-080917-FRB-263	537, 537	T	290.86 g	28.72 g	262.1 mL	1.00 mL	7 SU	100 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-MSP 00026	LC537-SU 00047	AnalysisComment			
MB 320-179409/1		537, 537			100 uL	ch nd			
LCS 320-179409/2		537, 537		100 uL	100 uL	ch nd			
LCSD 320-179409/3		537, 537		100 uL	100 uL	ch nd			
320-30576-A-1	NAWC-080917-RW-337A	537, 537	T		100 uL	ch nd			
320-30576-A-2	NAWC-080917-FRB-337A	537, 537	T		100 uL	ch nd			
320-30576-A-3	NAWC-080917-RW-337B	537, 537	T		100 uL	ch nd			
320-30576-A-4	WGNA-080917-RW-107A	537, 537	T		100 uL	ch 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.: 320-30576-1

SDG No.: _____

Batch Number: 179409 Batch Start Date: 08/15/17 07:52 Batch Analyst: Branscum, Cassie

Batch Method: 537 Batch End Date: 08/17/17 14:41

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-MSP 00026	LC537-SU 00047	AnalysisComment			
320-30576-A-5	WGNA-080917-FRB-107A	537, 537	T		100 uL	ch nd			
320-30576-A-6	WGNA-080917-RW-107B	537, 537	T		100 uL	ch nd			
320-30576-A-7	NAWC-080917-RW-320	537, 537	T		100 uL	ch nd			
320-30576-A-8	NAWC-080917-FRB-320	537, 537	T		100 uL	ch nd			
320-30576-A-9	WGNA-080917-RW-263	537, 537	T		100 uL	ch nd			
320-30576-A-10	WGNA-080917-FRB-263	537, 537	T		100 uL	ch nd			

Batch Notes	
Batch Comment	IS:1002957
Manifold ID	7,9
Methanol ID	1002843
Pipette ID	H14930F
Analyst ID - IS Reagent Drop	NSH
Analyst ID - IS Reagent Drop Witness	TQN
Analyst ID - SU Reagent Drop	CCB
Analyst ID - SU Reagent Drop Witness	HJA
Analyst ID - TA Reagent Drop	CCB
Analyst ID - TA Reagent Drop Witness	HJA
SPE Cartridge ID	6357081-03
Trizma ID	SLBR4303V
Reagent Water ID	8/6/17

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.

9/11

A8

Job No: 30576 Instrument ID & Date: 8-17-17 ICAL Batch: 180236
 Extraction Batch: 179409 Worklist #: 46878 TALS Batch: 180244, 180245

Review Items	-- Level 1 --			Level 2
	Yes	No	N/A	
Initial Calibration				
1. Is ICAL verified and locked in Chrom & TALS?	✓			✓
2. Is ICV properly linked in TALS?	✓			✓
Continuing Calibration				
1. Low-range CCV injected at start of analytical run? CCV injected after every 10 samples and at the end of the analytical run and alternated between Low-range, Mid-range and High-range?	✓			✓
2. If sequence was not after an ICAL was a low and mid range CCV injected at the start of the analytical run?			✓	
3. Native compounds and surrogates in control? Low-range within ±50% of true value Mid and High-range within ±30% of true value	✓			✓
4. Internal Standard areas in control? Areas ≥ 50% of average area of the ICAL and 70-140% of the most recent CCV.	✓			✓
Client Samples & QC Sample Results				
1. Were preparation and analysis done within holding times?	✓			✓
2. Are Chromatograms reviewed and spectra verified?	✓			✓
3. Are positive results within calibration range?	✓			✓
4. Dilutions due to target cpds? _____ Dilutions due to non-targets? _____			✓	✓
5. All target compounds in MB < 1/3 RL? (Requires NCM if "no.")	✓			✓
6. Are target constituents in LCS/LCSD within method control limits?	✓			✓
7. Internal Standard areas in control for all samples and QC reported? ±50% from the average area of the ICAL and 70-140% of the most recent CCV	✓			✓
8. Do results (e.g., dilutions/trip blanks) make sense?	✓			✓
9. Are MS/MSD recoveries and RPDs within method control limits?			✓	✓
10. Are all QC samples properly linked in TALS?	✓			✓
11. All manual integrations appropriate and completely documented?	✓			✓
12. Are nonconformances documented as NCMs?			✓	✓
13. Are all Chrom graphics uploaded?	✓			✓

1st Level Reviewer / Date: JRB 8-21-17 2nd Level Reviewer / Date: [Signature] 8/24/17

NCM # and Comments: _____

A8

Instrument ID & Date: 8-17-17 Worklist#: 46875

ICAL Batch: 180236, 180237 Calibration ID number: 33656, 33657

Review Items	-- Level 1 --			Level 2
	Yes	No	N/A	
Initial Calibration				
1. Mass calibration, as needed, verified by full scan of PFC stock standard. All PFC ions used for quantitation are within 0.3 m/z of true mass?	✓			✓
2. Responses increase with increasing concentration?	✓			✓
3. Fit used (circle): <u>Average</u> Linear (1/x ²)Linear <u>Quadratic</u> (6 points minimum)				
4. Meets fit criteria? Intercept ≤ 1/2 RL RSD ≤ 30% for Average R ² ≥ 0.990 for Linear R ² ≥ 0.990 for Quadratic NOTE: "Force through Zero" must be used and weighted if needed	✓			✓
5. If quadratic fit used the curve does not "bend over".	✓			✓
6. Feed calibration points into the calculated curve. Are points ≤MRL within ±50% of true value? Are points >MRL within ±30% of true value?	✓			✓
7. Any carryover from the high calibration point must be ≤ 1/3 RL	✓			✓
8. Asymmetry check meets criteria for the first two eluting peaks? (0.8 - 1.5).	✓			✓
9. Is the asymmetry check scanned and linked in TALS to the calibration point?	✓			✓
10. Is ICV (2 nd source) ± 30% of true value?	✓			✓
11. Is ICV (2 nd source) internal standards ±50% of average area of the ICAL?	✓			✓
12. ICAL locked in Chrom and uploaded to TALS?	✓			✓
13. ICAL locked in TALS and scanned?	✓			✓

1st Level Reviewer / Date: JRB 8-21-17

2nd Level Reviewer / Date: Murray 8/22/2017

NCM # and Comments: _____

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 17AUG2017_537B
Instrument Name: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20170819-46878.b
QC Batching: Enabled

Worklist Number: 46878
Chrom Method: 537_A8_N
Limit Group Batching: Enabled

QC Batch: 1	LC 537 ICAL Raw Batch: 180244
# 1 CCV L3	# 1 CCV L3
# 2 RB	# 2 RB
# 3 MB 320-179409/1-A	# 3 MB 320-179409/1-A
# 4 LCS 320-179409/2-A	# 4 LCS 320-179409/2-A
# 5 LCSD 320-179409/3-A	# 5 LCSD 320-179409/3-A
# 6 320-30576-A-1-A	# 6 320-30576-A-1-A
# 7 320-30576-A-2-A	# 7 320-30576-A-2-A
# 8 320-30576-A-3-A	# 8 320-30576-A-3-A
# 9 320-30576-A-4-A	# 9 320-30576-A-4-A
#10 320-30576-A-5-A	#10 320-30576-A-5-A
#11 320-30576-A-6-A	#11 320-30576-A-6-A
#12 320-30576-A-7-A	#12 320-30576-A-7-A
#13 CCV L5	#13 CCV L5

QC Batch: 2	LC 537 ICAL Raw Batch: 180245
#13 CCV L5	#13 CCV L5
#14 RB	#14 RB
#15 320-30576-A-8-A	#15 320-30576-A-8-A
#16 320-30576-A-9-A	#16 320-30576-A-9-A
#17 320-30576-A-10-A	#17 320-30576-A-10-A
#18 MB 320-179409/1-A	#18 MB 320-179409/1-A
#19 LCS 320-179409/2-A	#19 LCS 320-179409/2-A
#20 LCSD 320-179409/3-A	#20 LCSD 320-179409/3-A
#21 320-30576-A-1-A	#21 320-30576-A-1-A
#22 320-30576-A-2-A	#22 320-30576-A-2-A
#23 320-30576-A-3-A	#23 320-30576-A-3-A
#24 320-30576-A-4-A	#24 320-30576-A-4-A
#25 CCV L3	#25 CCV L3

Not needed

QC Batch: 3	LC 537 ICAL Raw Batch: 180246
#25 CCV L3	#25 CCV L3
#26 RB	#26 RB
#27 320-30576-A-5-A	#27 320-30576-A-5-A
#28 320-30576-A-6-A	#28 320-30576-A-6-A
#29 320-30576-A-7-A	#29 320-30576-A-7-A
#30 320-30576-A-8-A	#30 320-30576-A-8-A
#31 320-30576-A-9-A	#31 320-30576-A-9-A
#32 320-30576-A-10-A	#32 320-30576-A-10-A
#33 RB	#33 RB

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Aqueous Extraction Analysis Sheet

AG 8/17/17

(To Accompany Samples to Instruments)

Batch Number: 320-179409











Analyst: Branscum, Cassie

Batch Open: 8/15/2017 7:52:00AM

Method Code: 320-537_Prep-320

Batch End: 8/17/2017 2:41:00PM

Extraction of Perfluorinated Alkyl Acids

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	Rcvd	PHs Adj1	Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1 MB-320-179409/1 N/A	N/A		250 mL	7			N/A	N/A	N/A	ch nd	
			1.00 mL								
2 LCS-320-179409/2 N/A	N/A		250 mL	7			N/A	N/A	N/A	ch nd	
			1.00 mL								
3 LCSD-320-179409/3 N/A	N/A		250 mL	7			N/A	N/A	N/A	ch nd	
			1.00 mL								
4 320-30576-A-1 (537_DOD5)	N/A (320-30576-1)	282.78 g	253.8 mL	7			8/16/17	16_Days	4	ch nd	
		28.96 g	1.00 mL								
5 320-30576-A-2 (537_DOD5)	N/A (320-30576-1)	285.79 g	257.7 mL	7			8/16/17	16_Days	4	ch nd	
		28.11 g	1.00 mL								
6 320-30576-A-3 (537_DOD5)	N/A (320-30576-1)	290.40 g	261.6 mL	7			8/16/17	16_Days	4	ch nd	
		28.82 g	1.00 mL								
7 320-30576-A-4 (537_DOD5)	N/A (320-30576-1)	286.31 g	256.3 mL	7			8/16/17	16_Days	4	ch nd	
		30.04 g	1.00 mL								
8 320-30576-A-5 (537_DOD5)	N/A (320-30576-1)	286.43 g	257.4 mL	7			8/16/17	16_Days	4	ch nd	
		29.07 g	1.00 mL								
9 320-30576-A-6 (537_DOD5)	N/A (320-30576-1)	287.60 g	258.5 mL	7			8/16/17	16_Days	4	ch nd	
		29.07 g	1.00 mL								
10 320-30576-A-7 (537_DOD5)	N/A (320-30576-1)	277.50 g	248.8 mL	7			8/16/17	16_Days	4	ch nd	
		28.74 g	1.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)




Batch Number: 320-179409

Analyst: Branscum, Cassie

Batch Open: 8/15/2017 7:52:00AM

Method Code: 320-537_Prep-320

Batch End: 8/17/2017 2:41:00PM

11	320-30576-A-8 (537_DOD5)	N/A (320-30576-1)	282.63 g	254 mL	7			8/16/17	16_Days	4	ch nd	
			28.67 g	1.00 mL								
12	320-30576-A-9 (537_DOD5)	N/A (320-30576-1)	286.28 g	257.4 mL	7			8/16/17	16_Days	4	ch nd	
			28.92 g	1.00 mL								
13	320-30576-A-10 (537_DOD5)	N/A (320-30576-1)	290.86 g	262.1 mL	7			8/16/17	16_Days	4	ch nd	
			28.72 g	1.00 mL								

Batch Notes

Manifold ID 7,9

Trizma ID SLBR4303V

SPE Cartridge ID 6357081-03

Methanol ID 1002843

Reagent Water ID 8/6/17

Pipette ID H14930F

Analyst ID - TA Reagent Drop CCB

Analyst ID - TA Reagent Drop HJA

Witness

Analyst ID - SU Reagent Drop CCB

Analyst ID - SU Reagent Drop HJA

Witness

Analyst ID - IS Reagent Drop NSH

Analyst ID - IS Reagent Drop TQN

Witness

Batch Comment IS:1002957

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179409

Analyst: Branscum, Cassie

Batch Open: 8/15/2017 7:52:00AM

Method Code: 320-537_Prep-320

Batch End:

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179409

Analyst: Branscum, Cassie

Batch Open: 8/15/2017 7:52:00AM

Method Code: 320-537_Prep-320

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-179409/1	LC537-SU_00047	100 uL	1.00 mL	CCB 8-15-17	NSH 8/15/17
LCS 320-179409/2	LC537-MSP_00026	100 uL	1.00 mL		
LCS 320-179409/2	LC537-SU_00047	100 uL	1.00 mL		
LCSD 320-179409/3	LC537-MSP_00026	100 uL	1.00 mL		
LCSD 320-179409/3	LC537-SU_00047	100 uL	1.00 mL		
320-30576-A-1	LC537-SU_00047	100 uL	1.00 mL		
320-30576-A-2	LC537-SU_00047	100 uL	1.00 mL		
320-30576-A-3	LC537-SU_00047	100 uL	1.00 mL		
320-30576-A-4	LC537-SU_00047	100 uL	1.00 mL		
320-30576-A-5	LC537-SU_00047	100 uL	1.00 mL		
320-30576-A-6	LC537-SU_00047	100 uL	1.00 mL		
320-30576-A-7	LC537-SU_00047	100 uL	1.00 mL		
320-30576-A-8	LC537-SU_00047	100 uL	1.00 mL		
320-30576-A-9	LC537-SU_00047	100 uL	1.00 mL		
320-30576-A-10	LC537-SU_00047	100 uL	1.00 mL		

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179409

Analyst: Branscum, Cassie

Batch Open: 8/15/2017 7:52:00AM

Method Code: 320-537_Prep-320

Batch End:

Other Reagents:		
Reagent	Amount/Units	Lot#:

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Preparation Batch Number(s): 179409 Test: 537

Earliest Holding Time: 8-23-17

Sample List Tab		1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method		✓	✓
All necessary NCMs filed (including holding time)		✓	✓
Method/sample/login/QAS checked and correct		✓	✓
Worksheet Tab		1 st Level Reviewer	2 nd Level Reviewer
All samples properly preserved		✓	✓
Weights in anticipated range and not targeted		✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check)		✓	✓
The pH is transcribed correctly in TALS		✓	✓
All additional information transcribed into TALS is correct and raw data is attached		✓	✓
Comments are transcribed correctly in TALS		✓	✓
Reagents Tab		1 st Level Reviewer	2 nd Level Reviewer
All necessary reagents not expired and entered into TALS		✓	✓
All spike amounts correct and added to necessary samples and QC		✓	✓
Batch Information		1 st Level Reviewer	2 nd Level Reviewer
Date and time accurate and entered into TALS correctly		✓	✓
All necessary 'batch information' complete and entered into TALS correctly		✓	✓

1st Level Reviewer: TJA

Date: 08/17/17

2nd Level Reviewer: VPM

Date: 8/17/17

Comments: _____

Shipping and Receiving Documents

TestAmerica Sacramento
 880 Riverside Parkway
 West Sacramento, CA 95605-1500
 phone 916.373.5600 fax 303.467.7248

Chain of Custody Record

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: DW NPDES RCRA Other:

Client Contact	Project Manager: Andy Frebowitz	Site Contact: Mary Kay Bond	Date: 8/9/2017	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			Sampler: Mary Kay Bond
King of Prussia, PA 19406	<input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT if different from Below 21			For Lab Use Only:
610-382-1174	<input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day			Walk-in Client:
610-491-9688				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.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	EPA 537 UCMR3	Sample Specific Notes:
NAWC-080917-RW-337A	8/9/2017	08:50	G	DW	2	N	N	Y	
NAWC-080917-FRB-337A	8/9/2017	08:45	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-080917-RW-337B	8/9/2017	08:55	G	DW	2	N	N	Y	
WGNA-080917-RW-107A	8/9/2017	09:20	G	DW	2	N	N	Y	
WGNA-080917-FRB-107A	8/9/2017	09:15	G	BLK	2	N	N	Y	Field Reagent Blank
WGNA-080917-RW-107B	8/9/2017	09:25	G	DW	2	N	N	Y	
NAWC-080917-RW-320	8/9/2017	08:30	G	DW	2	N	N	Y	
NAWC-080917-FRB-320	8/9/2017	08:25	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-080917-RW-263	8/9/2017	10:10	G	DW	2	N	N	Y	
WGNA-080917-FRB-263	8/9/2017	10:05	G	DW	2	N	N	Y	Field Reagent Blank

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Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other: Trizma

Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Return to Client Disposal by Lab Archive for _____ Months

Fed Ex Tracking: 7449 6194 4281

Custody Seals Intact: Yes No

Custody Seal No.: _____ **Cooler Temp. (°C):** Obs'd: 4.3 **Corr'd:** _____ **Therm ID No.:** [Signature]

Relinquished by: Mary Kay Bond	Company: Tetra Tech	Date/Time: 8/9/2017 18:00	Received by: Brian Huang	Company: TAWS	Date/Time: 8/10/17 0950
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-30576-1

Login Number: 30576
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

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

"NAWC-080917-RW-337A","537","RES","320-30576-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","19","ng/L","J M","6.7","DL","","TRG","","","39","LOQ","YES","-99","","253.8","1.00","16",""
"NAWC-080917-RW-337A","537","RES","320-30576-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","15","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","253.8","1.00","7.9",""
"NAWC-080917-RW-337A","537","RES","320-30576-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.4","DL","","TRG","","","30","LOQ","YES","-99","","253.8","1.00","12",""
"NAWC-080917-RW-337A","537","RES","320-30576-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35","ng/L","U","16","DL","","TRG","","","89","LOQ","YES","-99","","253.8","1.00","35",""
"NAWC-080917-RW-337A","537","RES","320-30576-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","4.8","ng/L","J","1.9","DL","","TRG","","","9.9","LOQ","YES","-99","","253.8","1.00","3.9",""
"NAWC-080917-RW-337A","537","RES","320-30576-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","7.9","DL","","TRG","","","24","LOQ","YES","-99","","253.8","1.00","20",""
"NAWC-080917-RW-337A","537","RES","320-30576-1","TALSAC","STL00993","13C2 PFHxA","33","ng/L","","-99","DL","","SURR","83","","-99","LOQ","YES","39.4","","253.8","1.00","0",""
"NAWC-080917-RW-337A","537","RES","320-30576-1","TALSAC","STL00996","13C2 PFDA","44","ng/L","","-99","DL","","SURR","111","","-99","LOQ","YES","39.4","","253.8","1.00","0",""
"WGNA-080917-FRB-263","537","RES","320-30576-10","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","15","ng/L","U","6.5","DL","","TRG","","","38","LOQ","YES","-99","","262.1","1.00","15",""
"WGNA-080917-FRB-263","537","RES","320-30576-10","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.6","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES","-99","","262.1","1.00","7.6",""
"WGNA-080917-FRB-263","537","RES","320-30576-10","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","11","ng/L","U","5.2","DL","","TRG","","","29","LOQ","YES","-99","","262.1","1.00","11",""
"WGNA-080917-FRB-263","537","RES","320-30576-10","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","34","ng/L","U","15","DL","","TRG","","","86","LOQ","YES","-99","","262.1","1.00","34",""
"WGNA-080917-FRB-263","537","RES","320-30576-10","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.8","ng/L","U","1.8","DL","","TRG","","","9.5","LOQ","YES","-99","","262.1","1.00","3.8",""
"WGNA-080917-FRB-263","537","RES","320-30576-10","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","19","ng/L","U","7.6","DL","","TRG","","","23","LOQ","YES","-99","","262.1","1.00","19",""
"WGNA-080917-FRB-263","537","RES","320-30576-10","TALSAC","STL00993","13C2 PFHxA","40","ng/L","","-99","DL","","SURR","104","","-99","LOQ","YES","38.2","","262.1","1.00","0",""
"WGNA-080917-FRB-263","537","RES","320-30576-10","TALSAC","STL00996","13C2 PFDA","44","ng/L","","-99","DL","","SURR","115","","-99","LOQ","YES","38.2","","262.1","1.00","0",""
"NAWC-080917-FRB-337A","537","RES","320-30576-2","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.6","DL","","TRG","","","39","LOQ","YES","-99","","257.7","1.00","16",""
"NAWC-080917-FRB-337A","537","RES","320-30576-2","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.8","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES","-99","","257.7","1.00","7.8",""
"NAWC-080917-FRB-337A","537","RES","320-30576-2","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.3","DL","","TRG","","","29","LOQ","YES","-99","","257.7","1.00","12",""
"NAWC-080917-FRB-337A","537","RES","320-30576-2","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35","ng/L","U","16","DL","","TRG","","","87","LOQ","YES","-99","","257.7","1.00","35",""
"NAWC-080917-FRB-337A","537","RES","320-30576-2","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.9","ng/L","U","1.8","DL","","TRG","","","9.7","LOQ","YES","-99","","257.7","1.00","3.9",""
"NAWC-080917-FRB-337A","537","RES","320-30576-2","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","19","ng/L","U","7.8","DL","","TRG","","","23","LOQ","YES","-99","","257.7","1.00","19",""
"NAWC-080917-FRB-337A","537","RES","320-30576-2","TALSAC","STL00993","13C2 PFHxA","39","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","38.8","","257.7","1.00","0",""
"NAWC-080917-FRB-337A","537","RES","320-30576-2","TALSAC","STL00996","13C2 PFDA","42","ng/L","","-99","DL","","SURR","108","","-99","LOQ","YES","38.8","","257.7","1.00","0",""
"NAWC-080917-RW-337B","537","RES","320-30576-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","15","ng/L","U","6.5","DL","","TRG","","","38","LOQ","YES","-99","","261.6","1.00","15",""
"NAWC-080917-RW-337B","537","RES","320-30576-3","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.6","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES","-99","","261.6","1.00","7.6",""
"NAWC-080917-RW-337B","537","RES","320-30576-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid

(PFHxS),"11","ng/L","U","5.3","DL","","TRG","","","29","LOQ","YES","-99","","261.6","1.00","11",""
"NAWC-080917-RW-337B","537","RES","320-30576-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","34","ng/L","U","15","DL","","TRG","","","86","LOQ","YES","-99","","261.6","1.00","34",""
"NAWC-080917-RW-337B","537","RES","320-30576-3","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.8","ng/L","U","1.8","DL","","TRG","","","9.6","LOQ","YES","-99","","261.6","1.00","3.8",""
"NAWC-080917-RW-337B","537","RES","320-30576-3","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","19","ng/L","U","7.6","DL","","TRG","","","23","LOQ","YES","-99","","261.6","1.00","19",""
"NAWC-080917-RW-337B","537","RES","320-30576-3","TALSAC","STL00993","13C2
PFHxA","39","ng/L","","-99","DL","","SURR","102","","-99","LOQ","YES","38.2","","261.6","1.00","0",""
"NAWC-080917-RW-337B","537","RES","320-30576-3","TALSAC","STL00996","13C2
PFDA","43","ng/L","","-99","DL","","SURR","113","","-99","LOQ","YES","38.2","","261.6","1.00","0",""
"WGNA-080917-RW-107A","537","RES","320-30576-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","15","ng/L","J M","6.6","DL","","TRG","","","39","LOQ","YES","-99","","256.3","1.00","16",""
"WGNA-080917-RW-107A","537","RES","320-30576-4","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","13","ng/L","J","2.7","DL","","TRG","","","20","LOQ","YES","-99","","256.3","1.00","7.8",""
"WGNA-080917-RW-107A","537","RES","320-30576-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","J","5.4","DL","","TRG","","","29","LOQ","YES","-99","","256.3","1.00","12",""
"WGNA-080917-RW-107A","537","RES","320-30576-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","35","ng/L","U","16","DL","","TRG","","","88","LOQ","YES","-99","","256.3","1.00","35",""
"WGNA-080917-RW-107A","537","RES","320-30576-4","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.6","ng/L","J","1.9","DL","","TRG","","","9.8","LOQ","YES","-99","","256.3","1.00","3.9",""
"WGNA-080917-RW-107A","537","RES","320-30576-4","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","7.8","DL","","TRG","","","23","LOQ","YES","-99","","256.3","1.00","20",""
"WGNA-080917-RW-107A","537","RES","320-30576-4","TALSAC","STL00993","13C2
PFHxA","33","ng/L","","-99","DL","","SURR","86","","-99","LOQ","YES","39.0","","256.3","1.00","0",""
"WGNA-080917-RW-107A","537","RES","320-30576-4","TALSAC","STL00996","13C2
PFDA","41","ng/L","","-99","DL","","SURR","104","","-99","LOQ","YES","39.0","","256.3","1.00","0",""
"WGNA-080917-FRB-107A","537","RES","320-30576-5","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U","6.6","DL","","TRG","","","39","LOQ","YES","-99","","257.4","1.00","16",""
"WGNA-080917-FRB-107A","537","RES","320-30576-5","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","7.8","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES","-99","","257.4","1.00","7.8",""
"WGNA-080917-FRB-107A","537","RES","320-30576-5","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.3","DL","","TRG","","","29","LOQ","YES","-99","","257.4","1.00","12",""
"WGNA-080917-FRB-107A","537","RES","320-30576-5","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","35","ng/L","U","16","DL","","TRG","","","87","LOQ","YES","-99","","257.4","1.00","35",""
"WGNA-080917-FRB-107A","537","RES","320-30576-5","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.9","ng/L","U","1.8","DL","","TRG","","","9.7","LOQ","YES","-99","","257.4","1.00","3.9",""
"WGNA-080917-FRB-107A","537","RES","320-30576-5","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","19","ng/L","U","7.8","DL","","TRG","","","23","LOQ","YES","-99","","257.4","1.00","19",""
"WGNA-080917-FRB-107A","537","RES","320-30576-5","TALSAC","STL00993","13C2
PFHxA","38","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","38.9","","257.4","1.00","0",""
"WGNA-080917-FRB-107A","537","RES","320-30576-5","TALSAC","STL00996","13C2
PFDA","42","ng/L","","-99","DL","","SURR","108","","-99","LOQ","YES","38.9","","257.4","1.00","0",""
"WGNA-080917-RW-107B","537","RES","320-30576-6","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","15","ng/L","J","6.6","DL","","TRG","","","39","LOQ","YES","-99","","258.5","1.00","15",""
"WGNA-080917-RW-107B","537","RES","320-30576-6","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","13","ng/L","J","2.7","DL","","TRG","","","19","LOQ","YES","-99","","258.5","1.00","7.7",""
"WGNA-080917-RW-107B","537","RES","320-30576-6","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","J","5.3","DL","","TRG","","","29","LOQ","YES","-99","","258.5","1.00","12",""
"WGNA-080917-RW-107B","537","RES","320-30576-6","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","35","ng/L","U","16","DL","","TRG","","","87","LOQ","YES","-99","","258.5","1.00","35",""
"WGNA-080917-RW-107B","537","RES","320-30576-6","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.8","ng/L","J","1.8","DL","","TRG","","","9.7","LOQ","YES","-99","","258.5","1.00","3.9",""
"WGNA-080917-RW-107B","537","RES","320-30576-6","TALSAC","375-95-1","Perfluorononanoic acid

(PFNA),"19","ng/L","U","7.7","DL","","TRG","","","23","LOQ","YES","-99","","258.5","1.00","19","","
"WGNA-080917-RW-107B","537","RES","320-30576-6","TALSAC","STL00993","13C2
PFHxA","35","ng/L","","-99","DL","","SURR","89","","-99","LOQ","YES","38.7","","258.5","1.00","0","","
"WGNA-080917-RW-107B","537","RES","320-30576-6","TALSAC","STL00996","13C2
PFDA","46","ng/L","","-99","DL","","SURR","120","","-99","LOQ","YES","38.7","","258.5","1.00","0","","
"NAWC-080917-RW-320","537","RES","320-30576-7","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","248.8","1.00","16","","
"NAWC-080917-RW-320","537","RES","320-30576-7","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","7.2","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","248.8","1.00","8.0","","
"NAWC-080917-RW-320","537","RES","320-30576-7","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","248.8","1.00","12","","
"NAWC-080917-RW-320","537","RES","320-30576-7","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","248.8","1.00","36","","
"NAWC-080917-RW-320","537","RES","320-30576-7","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","2.4","ng/L","J M","1.9","DL","","TRG","","","10","LOQ","YES","-99","","248.8","1.00","4.0","","
"NAWC-080917-RW-320","537","RES","320-30576-7","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","248.8","1.00","20","","
"NAWC-080917-RW-320","537","RES","320-30576-7","TALSAC","STL00993","13C2
PFHxA","36","ng/L","","-99","DL","","SURR","90","","-99","LOQ","YES","40.2","","248.8","1.00","0","","
"NAWC-080917-RW-320","537","RES","320-30576-7","TALSAC","STL00996","13C2
PFDA","44","ng/L","","-99","DL","","SURR","110","","-99","LOQ","YES","40.2","","248.8","1.00","0","","
"NAWC-080917-FRB-320","537","RES","320-30576-8","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","16","ng/L","U","6.7","DL","","TRG","","","39","LOQ","YES","-99","","254","1.00","16","","
"NAWC-080917-FRB-320","537","RES","320-30576-8","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","7.9","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","254","1.00","7.9","","
"NAWC-080917-FRB-320","537","RES","320-30576-8","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.4","DL","","TRG","","","30","LOQ","YES","-99","","254","1.00","12","","
"NAWC-080917-FRB-320","537","RES","320-30576-8","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","35","ng/L","U","16","DL","","TRG","","","89","LOQ","YES","-99","","254","1.00","35","","
"NAWC-080917-FRB-320","537","RES","320-30576-8","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.9","ng/L","U","1.9","DL","","TRG","","","9.8","LOQ","YES","-99","","254","1.00","3.9","","
"NAWC-080917-FRB-320","537","RES","320-30576-8","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","7.9","DL","","TRG","","","24","LOQ","YES","-99","","254","1.00","20","","
"NAWC-080917-FRB-320","537","RES","320-30576-8","TALSAC","STL00993","13C2
PFHxA","40","ng/L","","-99","DL","","SURR","102","","-99","LOQ","YES","39.4","","254","1.00","0","","
"NAWC-080917-FRB-320","537","RES","320-30576-8","TALSAC","STL00996","13C2
PFDA","44","ng/L","","-99","DL","","SURR","113","","-99","LOQ","YES","39.4","","254","1.00","0","","
"WGNA-080917-RW-263","537","RES","320-30576-9","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","18","ng/L","J","6.6","DL","","TRG","","","39","LOQ","YES","-99","","257.4","1.00","16","","
"WGNA-080917-RW-263","537","RES","320-30576-9","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","17","ng/L","J","2.7","DL","","TRG","","","19","LOQ","YES","-99","","257.4","1.00","7.8","","
"WGNA-080917-RW-263","537","RES","320-30576-9","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","9.1","ng/L","J","5.3","DL","","TRG","","","29","LOQ","YES","-99","","257.4","1.00","12","","
"WGNA-080917-RW-263","537","RES","320-30576-9","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","35","ng/L","U","16","DL","","TRG","","","87","LOQ","YES","-99","","257.4","1.00","35","","
"WGNA-080917-RW-263","537","RES","320-30576-9","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.6","ng/L","J","1.8","DL","","TRG","","","9.7","LOQ","YES","-99","","257.4","1.00","3.9","","
"WGNA-080917-RW-263","537","RES","320-30576-9","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","19","ng/L","U","7.8","DL","","TRG","","","23","LOQ","YES","-99","","257.4","1.00","19","","
"WGNA-080917-RW-263","537","RES","320-30576-9","TALSAC","STL00993","13C2
PFHxA","35","ng/L","","-99","DL","","SURR","89","","-99","LOQ","YES","38.9","","257.4","1.00","0","","
"WGNA-080917-RW-263","537","RES","320-30576-9","TALSAC","STL00996","13C2
PFDA","43","ng/L","","-99","DL","","SURR","112","","-99","LOQ","YES","38.9","","257.4","1.00","0","","
"LCS 320-179409/2-A","537","RES","LCS 320-179409/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid

(PFOS),"134","ng/L","M","6.8","DL","","","SPK","101","","","40","LOQ","YES","133","","","250","1.00","16","","
"LCS 320-179409/2-A","537","RES","LCS 320-179409/2-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"66.4","ng/L","","","2.8","DL","","","SPK","100","","","20","LOQ","YES","66.7","","","250","1.00","8.0","","
"LCS 320-179409/2-A","537","RES","LCS 320-179409/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"103","ng/L","","","5.5","DL","","","SPK","103","","","30","LOQ","YES","100","","","250","1.00","12","","
"LCS 320-179409/2-A","537","RES","LCS 320-179409/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"319","ng/L","","","16","DL","","","SPK","106","","","90","LOQ","YES","300","","","250","1.00","36","","
"LCS 320-179409/2-A","537","RES","LCS 320-179409/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"33.9","ng/L","","","1.9","DL","","","SPK","102","","","10","LOQ","YES","33.3","","","250","1.00","4.0","","
"LCS 320-179409/2-A","537","RES","LCS 320-179409/2-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"59.3","ng/L","","","8.0","DL","","","SPK","89","","","24","LOQ","YES","66.7","","","250","1.00","20","","
"LCS 320-179409/2-A","537","RES","LCS 320-179409/2-A","TALSAC","STL00993","13C2
PFHxA","40.5","ng/L","","","-99","DL","","","SURR","101","","","-99","LOQ","YES","40.0","","","250","1.00","0","","
"LCS 320-179409/2-A","537","RES","LCS 320-179409/2-A","TALSAC","STL00996","13C2
PFDA","43.4","ng/L","","","-99","DL","","","SURR","109","","","-99","LOQ","YES","40.0","","","250","1.00","0","","
"LCSD 320-179409/3-A","537","RES","LCSD 320-179409/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic
acid (PFOS),"135","ng/L","","","6.8","DL","","","SPK","101","1","40","LOQ","YES","133","LCS 320-179409/2-
A","250","1.00","16","","
"LCSD 320-179409/3-A","537","RES","LCSD 320-179409/3-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"67.7","ng/L","","","2.8","DL","","","SPK","101","2","20","LOQ","YES","66.7","LCS 320-179409/2-
A","250","1.00","8.0","","
"LCSD 320-179409/3-A","537","RES","LCSD 320-179409/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic
acid (PFHxS),"103","ng/L","","","5.5","DL","","","SPK","103","0","30","LOQ","YES","100","LCS 320-179409/2-
A","250","1.00","12","","
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(PFBS),"320","ng/L","","","16","DL","","","SPK","107","0","90","LOQ","YES","300","LCS 320-179409/2-
A","250","1.00","36","","
"LCSD 320-179409/3-A","537","RES","LCSD 320-179409/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"32.3","ng/L","","","1.9","DL","","","SPK","97","5","10","LOQ","YES","33.3","LCS 320-179409/2-
A","250","1.00","4.0","","
"LCSD 320-179409/3-A","537","RES","LCSD 320-179409/3-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"57.1","ng/L","","","8.0","DL","","","SPK","86","4","24","LOQ","YES","66.7","LCS 320-179409/2-
A","250","1.00","20","","
"LCSD 320-179409/3-A","537","RES","LCSD 320-179409/3-A","TALSAC","STL00993","13C2
PFHxA","39.9","ng/L","","","-99","DL","","","SURR","100","","","-99","LOQ","YES","40.0","LCS 320-179409/2-
A","250","1.00","0","","
"LCSD 320-179409/3-A","537","RES","LCSD 320-179409/3-A","TALSAC","STL00996","13C2
PFDA","45.4","ng/L","","","-99","DL","","","SURR","113","","","-99","LOQ","YES","40.0","LCS 320-179409/2-
A","250","1.00","0","","
"MB 320-179409/1-A","537","RES","MB 320-179409/1-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 320-179409/1-A","537","RES","MB 320-179409/1-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 320-179409/1-A","537","RES","MB 320-179409/1-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 320-179409/1-A","537","RES","MB 320-179409/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"36","ng/L","U","16","DL","","","TRG","","","","90","LOQ","YES","-99","","","250","1.00","36","","
"MB 320-179409/1-A","537","RES","MB 320-179409/1-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 320-179409/1-A","537","RES","MB 320-179409/1-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 320-179409/1-A","537","RES","MB 320-179409/1-A","TALSAC","STL00993","13C2
PFHxA","38.6","ng/L","","","-99","DL","","","SURR","97","","","-99","LOQ","YES","40.0","","","250","1.00","0","","
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180244", "320-30576-1", "08/15/2017 07:52", "08/11/2017 16:30", ""



TO: A. FREBOWITZ **DATE:** SEPTEMBER 1, 2017
FROM: TERRI L. SOLOMON **COPIES:** DV FILE
SUBJECT: **ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)
 NAS JRB WILLOW GROVE
 SAMPLE DELIVERY GROUP (SDG) 320-30576-1**

SAMPLES: 4/Field Reagent Blank (FRB)
 NAWC-080917-FRB-320 NAWC-080917-FRB-337A
 WGNA-080917-FRB-107A WGNA-080917-FRB-263

6/Drinking Water
 NAWC-080917-RW-320 NAWC-080917-RW-337A
 NAWC-080917-RW-337B WGNA-080917-RW-107A
 WGNA-080917-RW-107B WGNA-080917-RW-263

Overview

The sample set for NAS JRB Willow Grove, SDG 320-30576-1, consisted of six (6) drinking water samples and four (4) 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). No field duplicate pairs were included in this SDG.

The samples were collected by Tetra Tech on August 9, 2017 and analyzed by TestAmerica-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, initial/continuing calibrations, laboratory method/FRBs, surrogate spike recoveries, laboratory control sample/laboratory control sample duplicate results, internal standard areas and recoveries, 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).

Notes

Samples with detections and their associated FRBs are summarized below. No detected results were present in any FRBs.

<u>Sample</u>	<u>Associated FRB</u>
NAWC-080917-RW-320	NAWC-080917-FRB-320
NAWC-080917-RW-337A	NAWC-080917-FRB-337A
NAWC-080917-RW-337B	NAWC-080917-FRB-337A

TO: A. FREBOWITZ
SDG: 320-30576-1

PAGE 2

WGNA-080917-RW-107A
WGNA-080917-RW-107B
WGNA-080917-RW-263

WGNA-080917-FRB-107A
WGNA-080917-FRB-107A
WGNA-080917-FRB-263

Non-detected results were reported to the Limit of Detection (LOD).

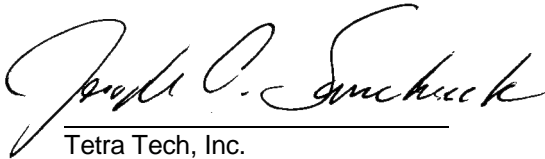
The buffering agent Trizma was added to all drinking water samples.

Executive Summary

Laboratory Performance: None.

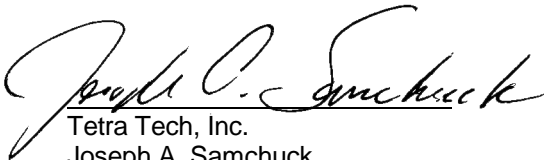
Other Factors Affecting Data Quality: Results below the RL were estimated.

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) and the US EPA National Functional Guidelines for Organic Data Review (January 2017) 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



Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:

- Appendix A – Qualified Analytical Results
- Appendix B – Results as Reported by the Laboratory
- Appendix C – Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted method detection limit for sample and method.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

Appendix A

Qualified 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 ($< 2 \times$ IDL for inorganics and $<$ CRQL for organics)
- Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
- R = Surrogates Recovery Noncompliance
- S = Pesticide/PCB Resolution
- T = % Breakdown Noncompliance for DDT and Endrin
- U = RPD between columns/detectors $>40\%$ for positive results determined via GC/HPLC
- V = Non-linear calibrations; correlation coefficient $r < 0.995$
- W = EMPC result
- X = Signal to noise response drop
- Y = Percent solids $<30\%$
- Z = Uncertainty at 2 standard deviations is greater than sample activity
- Z1 = Tentatively Identified Compound considered presumptively present
- Z2 = Tentatively Identified Compound column bleed
- Z3 = Tentatively Identified Compound aldol condensate
- Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
- Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04 SDG: 320-30576-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	NAWC-080917-FRB-320			NAWC-080917-FRB-337A			NAWC-080917-RW-320			NAWC-080917-RW-337A		
	LAB_ID	320-30576-8			320-30576-2			320-30576-7			320-30576-1		
	SAMP_DATE	8/9/2017			8/9/2017			8/9/2017			8/9/2017		
	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	7.9	U		7.8	U		7.2	J	P	15	J	P	
PERFLUOROBUTANESULFONIC ACID	35	U		35	U		36	U		35	U		
PERFLUOROHEPTANOIC ACID	3.9	U		3.9	U		2.4	J	P	4.8	J	P	
PERFLUOROHXANESULFONIC ACID	12	U		12	U		12	U		12	U		
PERFLUORONONANOIC ACID	20	U		19	U		20	U		20	U		
PERFLUOROOCTANE SULFONIC ACID	16	U		16	U		16	U		19	J	P	

PROJ_NO: 08005-WE04 SDG: 320-30576-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	NAWC-080917-RW-337B			WGNA-080917-FRB-107A			WGNA-080917-FRB-263			WGNA-080917-RW-107A		
	LAB_ID	320-30576-3			320-30576-5			320-30576-10			320-30576-4		
	SAMP_DATE	8/9/2017			8/9/2017			8/9/2017			8/9/2017		
	QC_TYPE	NM			FB			FB			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	7.6	U		7.8	U		7.6	U		13	J	P	
PERFLUOROBUTANESULFONIC ACID	34	U		35	U		34	U		35	U		
PERFLUOROHEPTANOIC ACID	3.8	U		3.9	U		3.8	U		3.6	J	P	
PERFLUOROHXANESULFONIC ACID	11	U		12	U		11	U		12	J	P	
PERFLUORONONANOIC ACID	19	U		19	U		19	U		20	U		
PERFLUOROOCTANE SULFONIC ACID	15	U		16	U		15	U		15	J	P	

PROJ_NO: 08005-WE04 SDG: 320-30576-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	WGNA-080917-RW-107B			WGNA-080917-RW-263		
	LAB_ID	320-30576-6			320-30576-9		
	SAMP_DATE	8/9/2017			8/9/2017		
	QC_TYPE	NM			NM		
	UNITS	NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
PENTADECAFLUOROOCTANOIC ACID	13	J	P	17	J	P	
PERFLUOROBUTANESULFONIC ACID	35	U		35	U		
PERFLUOROHEPTANOIC ACID	3.8	J	P	4.6	J	P	
PERFLUOROHEXANESULFONIC ACID	12	J	P	9.1	J	P	
PERFLUORONONANOIC ACID	19	U		19	U		
PERFLUOROOCTANE SULFONIC ACID	15	J	P	18	J	P	

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: NAWC-080917-RW-337A Lab Sample ID: 320-30576-1
 Matrix: Water Lab File ID: 2017.08.17_537B_006.d
 Analysis Method: 537 Date Collected: 08/09/2017 08:50
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 253.8(mL) Date Analyzed: 08/17/2017 21:00
 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.: 180244 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J-M	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	15	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.8	J	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	89	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	83		70-130
STL00996	13C2 PFDA	111		70-130

Ali L. Salaman
09/01/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: NAWC-080917-FRB-337A Lab Sample ID: 320-30576-2
 Matrix: Water Lab File ID: 2017.08.17_537B_007.d
 Analysis Method: 537 Date Collected: 08/09/2017 08:45
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 257.7(mL) Date Analyzed: 08/17/2017 21:04
 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.: 180244 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	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
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	100		70-130
STL00996	13C2 PFDA	108		70-130

Steve L. Salzman
09/01/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: NAWC-080917-RW-337B Lab Sample ID: 320-30576-3
 Matrix: Water Lab File ID: 2017.08.17_537B_008.d
 Analysis Method: 537 Date Collected: 08/09/2017 08:55
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 261.6(mL) Date Analyzed: 08/17/2017 21:09
 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.: 180244 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)	7.6	U	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	29	11	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	86	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	113		70-130

Wesley L. Selman
09/01/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: WGNA-080917-RW-107A Lab Sample ID: 320-30576-4
 Matrix: Water Lab File ID: 2017.08.17_537B_009.d
 Analysis Method: 537 Date Collected: 08/09/2017 09:20
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 256.3(mL) Date Analyzed: 08/17/2017 21:14
 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.: 180244 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	J M	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	13	J	20	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	20	U	23	20	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	J	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.6	J	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	86		70-130
STL00996	13C2 PFDA	104		70-130

Atqui L. Salaman
09/01/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: WGNA-080917-FRB-107A Lab Sample ID: 320-30576-5
 Matrix: Water Lab File ID: 2017.08.17_537B_010.d
 Analysis Method: 537 Date Collected: 08/09/2017 09:15
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 257.4 (mL) Date Analyzed: 08/17/2017 21:19
 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.: 180244 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	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
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	98		70-130
STL00996	13C2 PFDA	108		70-130

Amir L. Salaman

09/01/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: WGNA-080917-RW-107B Lab Sample ID: 320-30576-6
 Matrix: Water Lab File ID: 2017.08.17_537B_011.d
 Analysis Method: 537 Date Collected: 08/09/2017 09:25
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 258.5 (mL) Date Analyzed: 08/17/2017 21:23
 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.: 180244 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	J	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	13	J	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	J	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	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	89		70-130
STL00996	13C2 PFDA	120		70-130

Atari L. Selman
09/01/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: NAWC-080917-RW-320 Lab Sample ID: 320-30576-7
 Matrix: Water Lab File ID: 2017.08.17_537B_012.d
 Analysis Method: 537 Date Collected: 08/09/2017 08:30
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 248.8 (mL) Date Analyzed: 08/17/2017 21:28
 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.: 180244 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)	7.2	J	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)	2.4	J M	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	90		70-130
STL00996	13C2 PFDA	110		70-130

Heidi L. Selman

09/01/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: NAWC-080917-FRB-320 Lab Sample ID: 320-30576-8
 Matrix: Water Lab File ID: 2017.08.17_537B_015.d
 Analysis Method: 537 Date Collected: 08/09/2017 08:25
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 254(mL) Date Analyzed: 08/17/2017 21:42
 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.: 180245 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	7.9	U	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	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	89	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	113		70-130

Wesley L. Salzman
09/01/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: WGNA-080917-RW-263 Lab Sample ID: 320-30576-9
 Matrix: Water Lab File ID: 2017.08.17_537B_016.d
 Analysis Method: 537 Date Collected: 08/09/2017 10:10
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 257.4 (mL) Date Analyzed: 08/17/2017 21:47
 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.: 180245 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	18	J	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	17	J	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	9.1	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	89		70-130
STL00996	13C2 PFDA	112		70-130

Ami L. Salaman
09/01/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: WGNA-080917-FRB-263 Lab Sample ID: 320-30576-10
 Matrix: Water Lab File ID: 2017.08.17_537B_017.d
 Analysis Method: 537 Date Collected: 08/09/2017 10:05
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 262.1(mL) Date Analyzed: 08/17/2017 21:52
 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.: 180245 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)	7.6	U	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	29	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	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	104		70-130
STL00996	13C2 PFDA	115		70-130

Teri L. Salmeron
09/01/2017

Appendix B

Results as Reported by the Laboratory

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: NAWC-080917-RW-337A Lab Sample ID: 320-30576-1
 Matrix: Water Lab File ID: 2017.08.17_537B_006.d
 Analysis Method: 537 Date Collected: 08/09/2017 08:50
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 253.8(mL) Date Analyzed: 08/17/2017 21:00
 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.: 180244 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J M	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	15	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.8	J	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	89	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	83		70-130
STL00996	13C2 PFDA	111		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: NAWC-080917-FRB-337A Lab Sample ID: 320-30576-2
 Matrix: Water Lab File ID: 2017.08.17_537B_007.d
 Analysis Method: 537 Date Collected: 08/09/2017 08:45
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 257.7(mL) Date Analyzed: 08/17/2017 21:04
 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.: 180244 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	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
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	100		70-130
STL00996	13C2 PFDA	108		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: NAWC-080917-RW-337B Lab Sample ID: 320-30576-3
 Matrix: Water Lab File ID: 2017.08.17_537B_008.d
 Analysis Method: 537 Date Collected: 08/09/2017 08:55
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 261.6(mL) Date Analyzed: 08/17/2017 21:09
 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.: 180244 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)	7.6	U	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	29	11	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	86	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	113		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: WGNA-080917-RW-107A Lab Sample ID: 320-30576-4
 Matrix: Water Lab File ID: 2017.08.17_537B_009.d
 Analysis Method: 537 Date Collected: 08/09/2017 09:20
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 256.3(mL) Date Analyzed: 08/17/2017 21:14
 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.: 180244 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	J M	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	13	J	20	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	20	U	23	20	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	J	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.6	J	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	86		70-130
STL00996	13C2 PFDA	104		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: WGNA-080917-FRB-107A Lab Sample ID: 320-30576-5
 Matrix: Water Lab File ID: 2017.08.17_537B_010.d
 Analysis Method: 537 Date Collected: 08/09/2017 09:15
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 257.4 (mL) Date Analyzed: 08/17/2017 21:19
 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.: 180244 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	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
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	98		70-130
STL00996	13C2 PFDA	108		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: WGNA-080917-RW-107B Lab Sample ID: 320-30576-6
 Matrix: Water Lab File ID: 2017.08.17_537B_011.d
 Analysis Method: 537 Date Collected: 08/09/2017 09:25
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 258.5 (mL) Date Analyzed: 08/17/2017 21:23
 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.: 180244 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	J	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	13	J	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	J	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	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	89		70-130
STL00996	13C2 PFDA	120		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: NAWC-080917-RW-320 Lab Sample ID: 320-30576-7
 Matrix: Water Lab File ID: 2017.08.17_537B_012.d
 Analysis Method: 537 Date Collected: 08/09/2017 08:30
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 248.8 (mL) Date Analyzed: 08/17/2017 21:28
 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.: 180244 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)	7.2	J	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)	2.4	J M	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	90		70-130
STL00996	13C2 PFDA	110		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: NAWC-080917-FRB-320 Lab Sample ID: 320-30576-8
 Matrix: Water Lab File ID: 2017.08.17_537B_015.d
 Analysis Method: 537 Date Collected: 08/09/2017 08:25
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 254(mL) Date Analyzed: 08/17/2017 21:42
 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.: 180245 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	7.9	U	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	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	89	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	113		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: WGNA-080917-RW-263 Lab Sample ID: 320-30576-9
 Matrix: Water Lab File ID: 2017.08.17_537B_016.d
 Analysis Method: 537 Date Collected: 08/09/2017 10:10
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 257.4 (mL) Date Analyzed: 08/17/2017 21:47
 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.: 180245 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	18	J	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	17	J	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	9.1	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	89		70-130
STL00996	13C2 PFDA	112		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: WGNA-080917-FRB-263 Lab Sample ID: 320-30576-10
 Matrix: Water Lab File ID: 2017.08.17_537B_017.d
 Analysis Method: 537 Date Collected: 08/09/2017 10:05
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 262.1(mL) Date Analyzed: 08/17/2017 21:52
 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.: 180245 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)	7.6	U	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	29	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	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	104		70-130
STL00996	13C2 PFDA	115		70-130

Appendix C

Support Documentation


TestAmerica Sacramento
 880 Riverside Parkway
 West Sacramento, CA 95605-1500
 phone 916.373.5600 fax 303.467.7248

Chain of Custody Record

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: DW NPDES RCRA Other:

Client Contact		Project Manager: Andy Frebowitz		Site Contact: Mary Kay Bond		Date: 8/9/2017		COC No:		
TetraTech		Tel/Fax: 610.382.1170		Lab Contact: Dave Alltucker		Carrier: FedEx		1 of 1 COCs		
234 Mail Boulevard Suite 260		Analysis Turnaround Time		Filtered Sample (Y/N) Perform MS / MSD (Y/N) EPA 537 UCMR3		 320-30576 Chain of Custody		Sampler: Mary Kay Bond		
King of Prussia, PA 19406		<input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS						For Lab Use Only:		
610-382-1174		TAT if different from Below 21						Walk-in Client:		
610-491-9688		<input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 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.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	EPA 537 UCMR3	Sample Specific Notes:
NAWC-080917-RW-337A		8/9/2017	08:50	G	DW	2	N	N	Y	
NAWC-080917-FRB-337A		8/9/2017	08:45	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-080917-RW-337B		8/9/2017	08:55	G	DW	2	N	N	Y	
WGNA-080917-RW-107A		8/9/2017	09:20	G	DW	2	N	N	Y	
WGNA-080917-FRB-107A		8/9/2017	09:15	G	BLK	2	N	N	Y	Field Reagent Blank
WGNA-080917-RW-107B		8/9/2017	09:25	G	DW	2	N	N	Y	
NAWC-080917-RW-320		8/9/2017	08:30	G	DW	2	N	N	Y	
NAWC-080917-FRB-320		8/9/2017	08:25	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-080917-RW-263		8/9/2017	10:10	G	DW	2	N	N	Y	
WGNA-080917-FRB-263		8/9/2017	10:05	G	DW	2	N	N	Y	Field Reagent Blank
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other: Trizma										
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) <input type="checkbox"/> Return to Client <input type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months					
<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown										
Fed Ex Tracking: 7449 6194 4281										
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temp. (°C): Obs'd: 4.3 Corr'd: _____		Therm ID No.: <i>ALL</i>				
Relinquished by: <i>Mary Kay Bond</i>		Company: Tetra Tech		Date/Time: 8/9/2017 18:00		Received by: <i>Brian Huong</i>		Company: <i>TAWs</i>		Date/Time: 8/9/17 0950
Relinquished by:		Company:		Date/Time:		Received by:		Company:		Date/Time:
Relinquished by:		Company:		Date/Time:		Received in Laboratory by:		Company:		Date/Time:

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Job Narrative
320-30576-1

Receipt

The samples were received on 8/10/2017 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.3° 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.

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 (MS/MSD) associated with preparation batch 320-179409.

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

Method Summary

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

TestAmerica Job ID: 320-30576-1

Method	Method Description	Protocol	Laboratory
537	Perfluorinated Alkyl Acids (LC/MS)	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: 320-30576-1

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

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-30576-1	NAWC-080917-RW-337A	Water	08/09/17 08:50	08/10/17 09:50
320-30576-2	NAWC-080917-FRB-337A	Water	08/09/17 08:45	08/10/17 09:50
320-30576-3	NAWC-080917-RW-337B	Water	08/09/17 08:55	08/10/17 09:50
320-30576-4	WGNA-080917-RW-107A	Water	08/09/17 09:20	08/10/17 09:50
320-30576-5	WGNA-080917-FRB-107A	Water	08/09/17 09:15	08/10/17 09:50
320-30576-6	WGNA-080917-RW-107B	Water	08/09/17 09:25	08/10/17 09:50
320-30576-7	NAWC-080917-RW-320	Water	08/09/17 08:30	08/10/17 09:50
320-30576-8	NAWC-080917-FRB-320	Water	08/09/17 08:25	08/10/17 09:50
320-30576-9	WGNA-080917-RW-263	Water	08/09/17 10:10	08/10/17 09:50
320-30576-10	WGNA-080917-FRB-263	Water	08/09/17 10:05	08/10/17 09:50

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-30576-1

SDG No.: _____

Matrix: Water

Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-080917-RW-337 A	320-30576-1	83	111
NAWC-080917-FRB-33 7A	320-30576-2	100	108
NAWC-080917-RW-337 B	320-30576-3	102	113
WGNA-080917-RW-107 A	320-30576-4	86	104
WGNA-080917-FRB-10 7A	320-30576-5	98	108
WGNA-080917-RW-107 B	320-30576-6	89	120
NAWC-080917-RW-320	320-30576-7	90	110
NAWC-080917-FRB-32 0	320-30576-8	102	113
WGNA-080917-RW-263	320-30576-9	89	112
WGNA-080917-FRB-26 3	320-30576-10	104	115
	MB 320-179409/1-A	97	112
	LCS 320-179409/2-A	101	109
	LCSD 320-179409/3-A	100	113

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.: 320-30576-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2017.08.17_537B_004.d
 Lab ID: LCS 320-179409/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	133	134	101	70-130	M
Perfluorooctanoic acid (PFOA)	66.7	66.4	100	70-130	
Perfluorononanoic acid (PFNA)	66.7	59.3	89	70-130	
Perfluorohexanesulfonic acid (PFHxS)	100	103	103	70-130	
Perfluoroheptanoic acid (PFHpA)	33.3	33.9	102	70-130	
Perfluorobutanesulfonic acid (PFBS)	300	319	106	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.: 320-30576-1

SDG No.: _____

Matrix: Water Level: Low Lab File ID: 2017.08.17_537B_005.d

Lab ID: LCSD 320-179409/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	133	135	101	1	30	70-130	
Perfluorooctanoic acid (PFOA)	66.7	67.7	101	2	30	70-130	
Perfluorononanoic acid (PFNA)	66.7	57.1	86	4	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	100	103	103	0	30	70-130	
Perfluoroheptanoic acid (PFHpA)	33.3	32.3	97	5	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	300	320	107	0	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.: 320-30576-1
 SDG No.: _____
 Lab File ID: 2017.08.17_537B_003.d Lab Sample ID: MB 320-179409/1-A
 Matrix: Water Date Extracted: 08/15/2017 07:52
 Instrument ID: A8_N Date Analyzed: 08/17/2017 20:45
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-179409/2-A	2017.08.17_537B 004.d	08/17/2017 20:50
	LCSD 320-179409/3-A	2017.08.17_537B 005.d	08/17/2017 20:55
NAWC-080917-RW-337A	320-30576-1	2017.08.17_537B 006.d	08/17/2017 21:00
NAWC-080917-FRB-337A	320-30576-2	2017.08.17_537B 007.d	08/17/2017 21:04
NAWC-080917-RW-337B	320-30576-3	2017.08.17_537B 008.d	08/17/2017 21:09
WGNA-080917-RW-107A	320-30576-4	2017.08.17_537B 009.d	08/17/2017 21:14
WGNA-080917-FRB-107A	320-30576-5	2017.08.17_537B 010.d	08/17/2017 21:19
WGNA-080917-RW-107B	320-30576-6	2017.08.17_537B 011.d	08/17/2017 21:23
NAWC-080917-RW-320	320-30576-7	2017.08.17_537B 012.d	08/17/2017 21:28
NAWC-080917-FRB-320	320-30576-8	2017.08.17_537B 015.d	08/17/2017 21:42
WGNA-080917-RW-263	320-30576-9	2017.08.17_537B 016.d	08/17/2017 21:47
WGNA-080917-FRB-263	320-30576-10	2017.08.17_537B 017.d	08/17/2017 21:52

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-179409/1-A
 Matrix: Water Lab File ID: 2017.08.17_537B_003.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 08/15/2017 07:52
 Sample wt/vol: 250 (mL) Date Analyzed: 08/17/2017 20:45
 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.: 180244 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	97		70-130
STL00996	13C2 PFDA	112		70-130

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Instrument ID: A8_N Calibration Start Date: 08/17/2017 17:07
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 08/17/2017 17:30
 Calibration ID: 33656

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	1895140	1.93	5625431	2.18		
UPPER LIMIT	2842710	2.43	8438147	2.68		
LOWER LIMIT	947570	1.43	2812716	1.68		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCVL 320-180236/9		2135014	1.91	5637183	2.17	
ICV 320-180236/11		1977664	1.90	5748034	2.16	
CCV 320-180244/1 CCVIS		1891132	1.90	5441619	2.16	
MB 320-179409/1-A		2035487	1.90	5895955	2.16	
LCS 320-179409/2-A		1836687	1.90	5407681	2.16	
LCSD 320-179409/3-A		1987735	1.90	5721794	2.15	
320-30576-1	NAWC-080917-RW-337A	1947686	1.90	5750016	2.16	
320-30576-2	NAWC-080917-FRB-337A	1943952	1.89	5728648	2.15	
320-30576-3	NAWC-080917-RW-337B	2032921	1.89	5926034	2.15	
320-30576-4	WGNA-080917-RW-107A	1993349	1.90	5886801	2.16	
320-30576-5	WGNA-080917-FRB-107A	2077362	1.90	5864327	2.16	
320-30576-6	WGNA-080917-RW-107B	1983362	1.89	5976231	2.15	
320-30576-7	NAWC-080917-RW-320	1933732	1.90	5700370	2.16	
CCV 320-180244/13 CCVIS		1877700	1.89	5615534	2.15	
CCV 320-180245/13 CCVIS		1877700	1.89	5615534	2.15	
320-30576-8	NAWC-080917-FRB-320	1958634	1.90	5724980	2.16	
320-30576-9	WGNA-080917-RW-263	2053834	1.90	6030004	2.15	
320-30576-10	WGNA-080917-FRB-263	1856521	1.89	5734120	2.15	
CCV 320-180245/25 CCVIS		1814629	1.89	5386179	2.15	

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

Area Limit = 50%-150% of internal standard area
 RT Limit = ± 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.: 320-30576-1
 SDG No.: _____
 Sample No.: CCV 320-180244/1 Date Analyzed: 08/17/2017 20:36
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.08.17_537B_001 Heated Purge: (Y/N) N
 Calibration ID: 33656

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1891132	1.90	5441619	2.16		
UPPER LIMIT	2647585	2.40	7618267	2.66		
LOWER LIMIT	1323792	1.40	3809133	1.66		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-179409/1-A		2035487	1.90	5895955	2.16	
LCS 320-179409/2-A		1836687	1.90	5407681	2.16	
LCSD 320-179409/3-A		1987735	1.90	5721794	2.15	
320-30576-1	NAWC-080917-RW-337A	1947686	1.90	5750016	2.16	
320-30576-2	NAWC-080917-FRB-337A	1943952	1.89	5728648	2.15	
320-30576-3	NAWC-080917-RW-337B	2032921	1.89	5926034	2.15	
320-30576-4	WGNA-080917-RW-107A	1993349	1.90	5886801	2.16	
320-30576-5	WGNA-080917-FRB-107A	2077362	1.90	5864327	2.16	
320-30576-6	WGNA-080917-RW-107B	1983362	1.89	5976231	2.15	
320-30576-7	NAWC-080917-RW-320	1933732	1.90	5700370	2.16	

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

Area Limit = 70%-140% of internal standard area
 RT Limit = ± 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.: 320-30576-1
 SDG No.: _____
 Sample No.: CCV 320-180244/13 Date Analyzed: 08/17/2017 21:33
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.08.17_537B_013 Heated Purge: (Y/N) N
 Calibration ID: 33656

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1877700	1.89	5615534	2.15		
UPPER LIMIT	2628780	2.39	7861748	2.65		
LOWER LIMIT	1314390	1.39	3930874	1.65		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-179409/1-A		2035487	1.90	5895955	2.16	
LCS 320-179409/2-A		1836687	1.90	5407681	2.16	
LCSD 320-179409/3-A		1987735	1.90	5721794	2.15	
320-30576-1	NAWC-080917-RW-337A	1947686	1.90	5750016	2.16	
320-30576-2	NAWC-080917-FRB-337A	1943952	1.89	5728648	2.15	
320-30576-3	NAWC-080917-RW-337B	2032921	1.89	5926034	2.15	
320-30576-4	WGNA-080917-RW-107A	1993349	1.90	5886801	2.16	
320-30576-5	WGNA-080917-FRB-107A	2077362	1.90	5864327	2.16	
320-30576-6	WGNA-080917-RW-107B	1983362	1.89	5976231	2.15	
320-30576-7	NAWC-080917-RW-320	1933732	1.90	5700370	2.16	

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

Area Limit = 70%-140% of internal standard area
 RT Limit = ± 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.: 320-30576-1
 SDG No.: _____
 Sample No.: CCV 320-180245/13 Date Analyzed: 08/17/2017 21:33
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.08.17_537B_013 Heated Purge: (Y/N) N
 Calibration ID: 33656

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1877700	1.89	5615534	2.15		
UPPER LIMIT	2628780	2.39	7861748	2.65		
LOWER LIMIT	1314390	1.39	3930874	1.65		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-30576-8	NAWC-080917-FRB-320	1958634	1.90	5724980	2.16	
320-30576-9	WGNA-080917-RW-263	2053834	1.90	6030004	2.15	
320-30576-10	WGNA-080917-FRB-263	1856521	1.89	5734120	2.15	

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

Area Limit = 70%-140% of internal standard area
 RT Limit = ± 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.: 320-30576-1
 SDG No.: _____
 Sample No.: CCV 320-180245/25 Date Analyzed: 08/17/2017 22:30
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.08.17_537B_025 Heated Purge: (Y/N) N
 Calibration ID: 33656

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1814629	1.89	5386179	2.15		
UPPER LIMIT	2540481	2.39	7540651	2.65		
LOWER LIMIT	1270240	1.39	3770325	1.65		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-30576-8	NAWC-080917-FRB-320	1958634	1.90	5724980	2.16	
320-30576-9	WGNA-080917-RW-263	2053834	1.90	6030004	2.15	
320-30576-10	WGNA-080917-FRB-263	1856521	1.89	5734120	2.15	

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

Area Limit = 70%-140% of internal standard area
 RT Limit = ± 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.: 320-30576-1 Analy Batch No.: 180236

SDG No.: _____

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

Calibration Start Date: 08/17/2017 17:07 Calibration End Date: 08/17/2017 17:30 Calibration ID: 33656

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-180236/2	207.08.17_537A_004.d
Level 2	IC 320-180236/3	207.08.17_537A_005.d
Level 3	IC 320-180236/4	207.08.17_537A_006.d
Level 4	IC 320-180236/5	207.08.17_537A_007.d
Level 5	IC 320-180236/6	207.08.17_537A_008.d
Level 6	IC 320-180236/7	207.08.17_537A_009.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)	1.0927 0.7332	1.1633	1.0611	0.8972	0.7853	QuaF		1.0837	-0.002008					0.9970			0.9600
Perfluoroheptanoic acid (PFHpA)	0.9281 0.8704	0.9794	1.0010	0.9614	0.9085	Ave		0.9415			5.1		30.0				
Perfluorohexanesulfonic acid (PFHxS)	1.4768 1.4556	1.6479	1.5869	1.5645	1.4984	Ave		1.5383			4.8		30.0				
Perfluorooctanoic acid (PFOA)	0.8906 0.9399	0.8695	0.9315	0.9671	0.9064	Ave		0.9175			3.9		30.0				
Perfluorooctanesulfonic acid (PFOS)	0.8621 0.9508	0.9259	0.8962	0.9469	0.9367	Ave		0.9198			3.7		30.0				
Perfluorononanoic acid (PFNA)	0.7073 0.6252	0.7733	0.7934	0.7465	0.6445	Ave		0.7150			9.6		30.0				
13C2 PFHxA	1.1263 1.0730	1.1534	1.1964	1.1363	1.1254	Ave		1.1351			3.6		30.0				
13C2 PFDA	0.7013 0.5669	0.6802	0.7263	0.6486	0.5957	Ave		0.6532			9.5		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.: 320-30576-1 Analy Batch No.: 180236

SDG No.: _____

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

Calibration Start Date: 08/17/2017 17:07 Calibration End Date: 08/17/2017 17:30 Calibration ID: 33656

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-180236/2	207.08.17_537A_004.d
Level 2	IC 320-180236/3	207.08.17_537A_005.d
Level 3	IC 320-180236/4	207.08.17_537A_006.d
Level 4	IC 320-180236/5	207.08.17_537A_007.d
Level 5	IC 320-180236/6	207.08.17_537A_008.d
Level 6	IC 320-180236/7	207.08.17_537A_009.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	QuaF	1989419 25626485	4448062	9376032	15897968	20788356	9.00 180	20.0	45.0	90.0	135
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	167400 3752250	379095	852234	1817435	2833966	1.00 20.0	2.22	5.00	10.0	15.0
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	896364 16959937	2100734	4674793	9242464	13223291	3.00 60.0	6.67	15.0	30.0	45.0
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	321453 8108947	673518	1587046	3658778	5658166	2.00 40.0	4.45	10.0	20.0	30.0
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	697706 14770994	1573826	3519979	7458706	11021657	4.00 80.0	8.89	20.0	40.0	60.0
Perfluorononanoic acid (PFNA)	13PF OA	Ave	255111 5389964	598613	1350886	2822430	4020876	2.00 40.0	4.45	10.0	20.0	30.0
13C2 PFHxA	13PF OA	Ave	2030599 2312284	2008624	2036663	2147570	2339905	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	1264490 1221662	1184489	1236464	1225880	1238610	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD
QuaF = Quadratic ISTD forced zero

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

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1 Analy Batch No.: 180236

SDG No.: _____

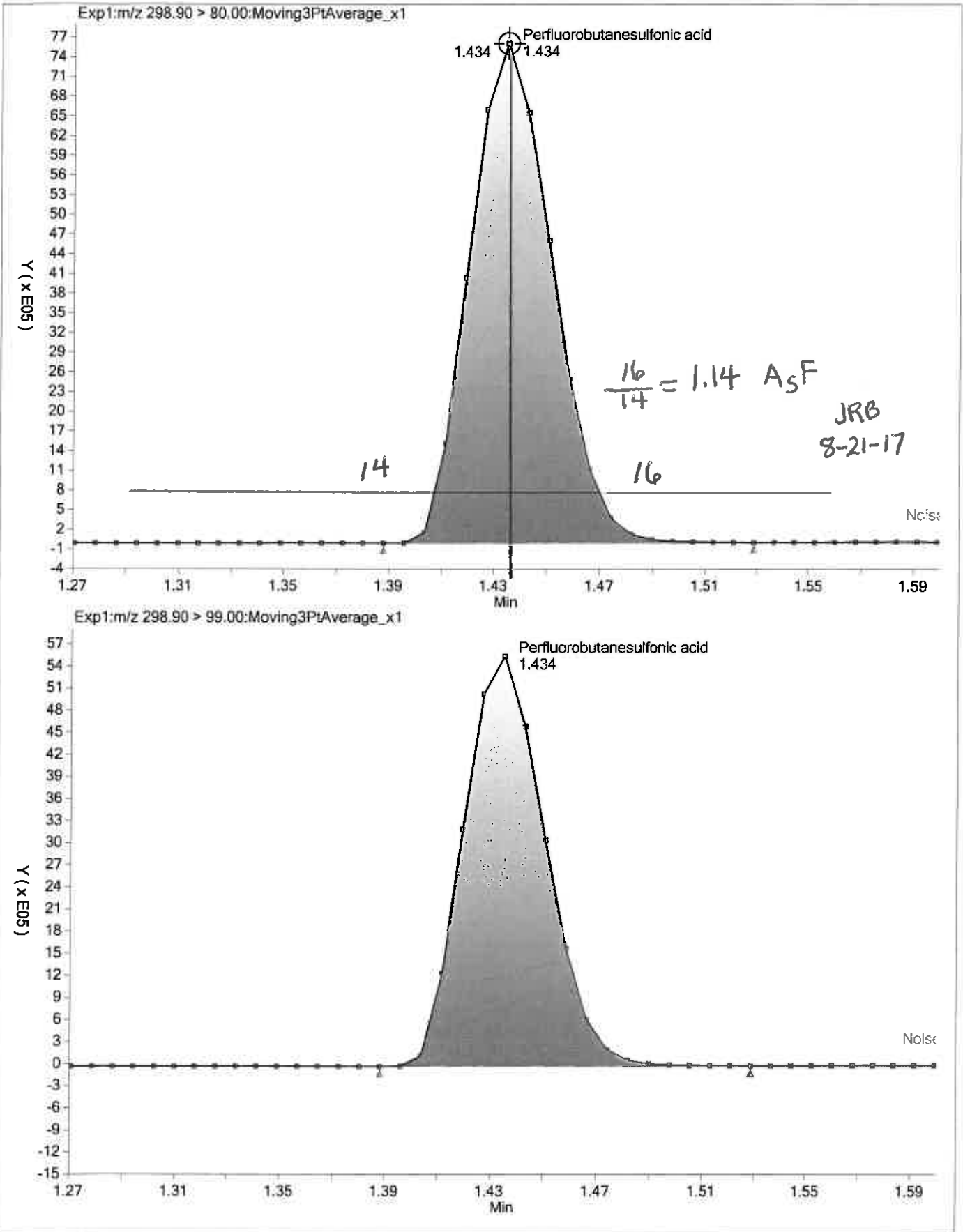
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

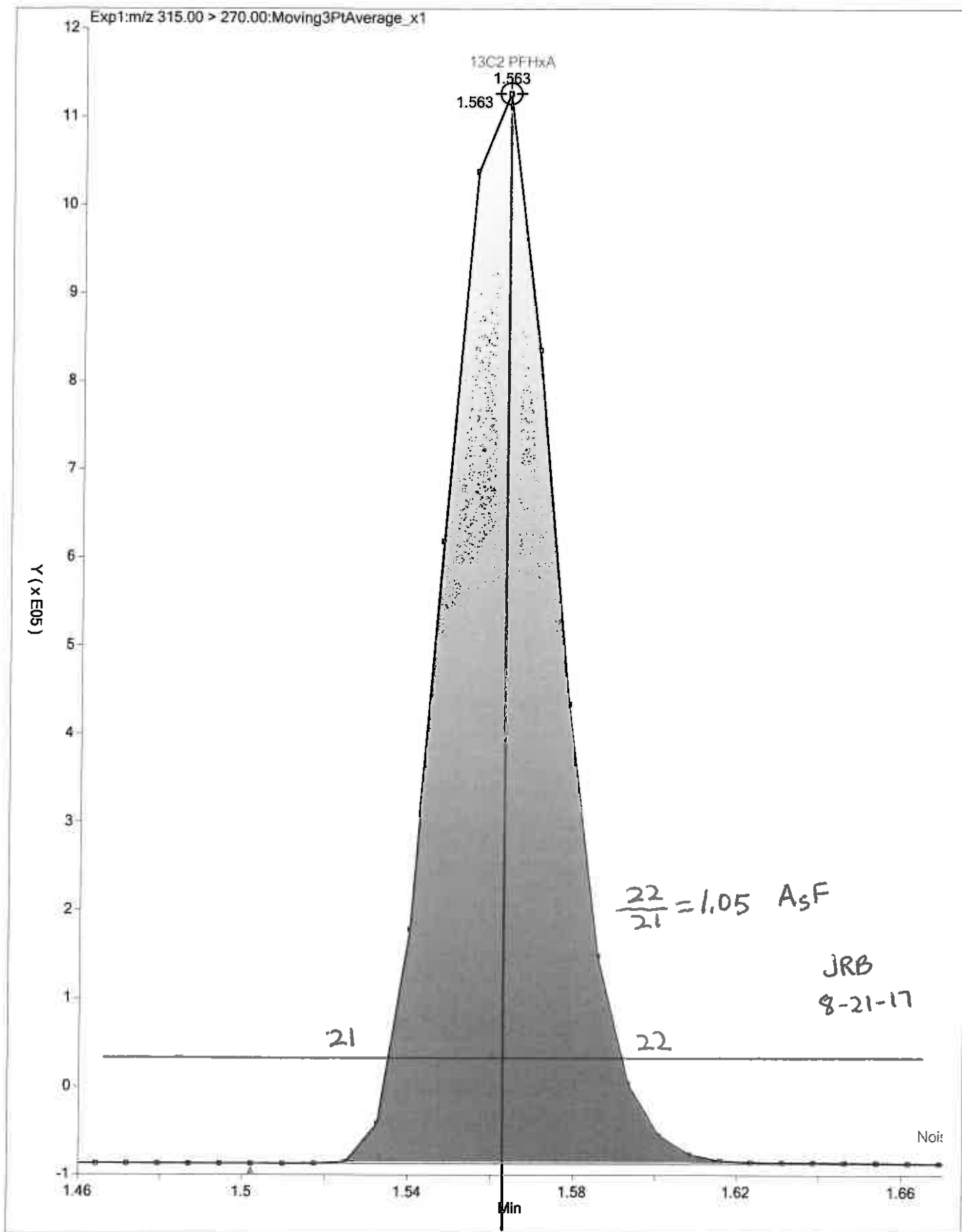
Calibration Start Date: 08/17/2017 17:07 Calibration End Date: 08/17/2017 17:30 Calibration ID: 33656

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-180236/2	207.08.17_537A_004.d
Level 2	IC 320-180236/3	207.08.17_537A_005.d
Level 3	IC 320-180236/4	207.08.17_537A_006.d
Level 4	IC 320-180236/5	207.08.17_537A_007.d
Level 5	IC 320-180236/6	207.08.17_537A_008.d
Level 6	IC 320-180236/7	207.08.17_537A_009.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)	2.6	12.0	7.6	-0.8	-4.9	3.1	50	50	50	50	50	50
Perfluoroheptanoic acid (PFHpA)	-1.4	4.0	6.3	2.1	-3.5	-7.6	50	50	50	50	50	50
Perfluorohexanesulfonic acid (PFHxS)	-4.0	7.1	3.2	1.7	-2.6	-5.4	50	50	50	50	50	50
Perfluorooctanoic acid (PFOA)	-2.9	-5.2	1.5	5.4	-1.2	2.4	50	50	50	50	50	50
Perfluorooctanesulfonic acid (PFOS)	-6.3	0.7	-2.6	3.0	1.8	3.4	50	50	50	50	50	50
Perfluorononanoic acid (PFNA)	-1.1	8.1	11.0	4.4	-9.9	-12.6	50	50	50	50	50	50
13C2 PFHxA	-0.8	1.6	5.4	0.1	-0.9	-5.5	30	30	30	30	30	30
13C2 PFDA	7.4	4.1	11.2	-0.7	-8.8	-13.2	30	30	30	30	30	30





FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-180236/9 Calibration Date: 08/17/2017 17:40
 Instrument ID: A8_N Calib Start Date: 08/17/2017 17:07
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/17/2017 17:30
 Lab File ID: 207.08.17_537A_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.202		23.2	20.0	15.9	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9415	0.9087		2.15	2.22	-3.5	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.538	1.602		6.94	6.67	4.1	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9175	0.8942		4.33	4.45	-2.5	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9198	0.9120		8.82	8.89	-0.8	50.0
Perfluorononanoic acid (PFNA)	Ave	0.7150	0.6150		3.82	4.45	-14.0	50.0
13C2 PFHxA	Ave	1.135	1.097		9.66	10.0	-3.4	30.0
13C2 PFDA	Ave	0.6532	0.5535		8.47	10.0	-15.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Lab Sample ID: ICV 320-180236/11 Calibration Date: 08/17/2017 17:49
 Instrument ID: A8_N Calib Start Date: 08/17/2017 17:07
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/17/2017 17:30
 Lab File ID: 207.08.17_537A_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.9477		110	100	9.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9415	0.9454		10.0	10.0	0.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.538	1.748		22.8	20.1	13.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9175	0.9757		21.8	20.5	6.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9198	1.118		23.9	19.7	21.5	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7150	0.7455		21.0	20.1	4.3	30.0
13C2 PFHxA	Ave	1.135	1.118		9.85	10.0	-1.5	30.0
13C2 PFDA	Ave	0.6532	0.5562		8.51	10.0	-14.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Lab Sample ID: CCV 320-180244/1 Calibration Date: 08/17/2017 20:36
 Instrument ID: A8_N Calib Start Date: 08/17/2017 17:07
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/17/2017 17:30
 Lab File ID: 2017.08.17_537B_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.173		54.1	45.0	20.3	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9415	0.9423		5.01	5.00	0.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.538	1.652		16.1	15.0	7.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9175	0.8793		9.59	10.0	-4.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9198	0.9322		20.3	20.0	1.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7150	0.6068		8.49	10.0	-15.1	30.0
13C2 PFHxA	Ave	1.135	1.187		10.5	10.0	4.6	30.0
13C2 PFDA	Ave	0.6532	0.5885		9.01	10.0	-9.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Lab Sample ID: CCV 320-180244/13 Calibration Date: 08/17/2017 21:33
 Instrument ID: A8_N Calib Start Date: 08/17/2017 17:07
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/17/2017 17:30
 Lab File ID: 2017.08.17_537B_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.8319		140	135	3.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9415	0.9534		15.2	15.0	1.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.538	1.516		44.4	45.0	-1.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9175	0.9314		30.5	30.0	1.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9198	0.9550		62.3	60.0	3.8	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7150	0.6227		26.1	30.0	-12.9	30.0
13C2 PFHxA	Ave	1.135	1.224		10.8	10.0	7.8	30.0
13C2 PFDA	Ave	0.6532	0.6278		9.61	10.0	-3.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Lab Sample ID: CCV 320-180245/13 Calibration Date: 08/17/2017 21:33
 Instrument ID: A8_N Calib Start Date: 08/17/2017 17:07
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/17/2017 17:30
 Lab File ID: 2017.08.17_537B_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.8319		140	135	3.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9415	0.9534		15.2	15.0	1.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.538	1.516		44.4	45.0	-1.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9175	0.9314		30.5	30.0	1.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9198	0.9550		62.3	60.0	3.8	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7150	0.6227		26.1	30.0	-12.9	30.0
13C2 PFHxA	Ave	1.135	1.224		10.8	10.0	7.8	30.0
13C2 PFDA	Ave	0.6532	0.6278		9.61	10.0	-3.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1
 SDG No.: _____
 Lab Sample ID: CCV 320-180245/25 Calibration Date: 08/17/2017 22:30
 Instrument ID: A8_N Calib Start Date: 08/17/2017 17:07
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/17/2017 17:30
 Lab File ID: 2017.08.17_537B_025.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.158		53.4	45.0	18.5	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9415	0.9634		5.12	5.00	2.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.538	1.695		16.5	15.0	10.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9175	0.8995		9.81	10.0	-2.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9198	0.9490		20.6	20.0	3.2	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7150	0.6350		8.88	10.0	-11.2	30.0
13C2 PFHxA	Ave	1.135	1.208		10.6	10.0	6.4	30.0
13C2 PFDA	Ave	0.6532	0.6271		9.60	10.0	-4.0	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/17/2017 17:07

Analysis Batch Number: 180236 End Date: 08/17/2017 17:49

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-180236/2		08/17/2017 17:07	1	207.08.17_537A_004.d	GeminiC18 3x100 3(mm)
IC 320-180236/3		08/17/2017 17:12	1	207.08.17_537A_005.d	GeminiC18 3x100 3(mm)
IC 320-180236/4		08/17/2017 17:16	1	207.08.17_537A_006.d	GeminiC18 3x100 3(mm)
IC 320-180236/5 ICISAV		08/17/2017 17:21	1	207.08.17_537A_007.d	GeminiC18 3x100 3(mm)
IC 320-180236/6		08/17/2017 17:26	1	207.08.17_537A_008.d	GeminiC18 3x100 3(mm)
IC 320-180236/7		08/17/2017 17:30	1	207.08.17_537A_009.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 17:35	1		GeminiC18 3x100 3(mm)
CCVL 320-180236/9		08/17/2017 17:40	1	207.08.17_537A_011.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 17:45	1		GeminiC18 3x100 3(mm)
ICV 320-180236/11		08/17/2017 17:49	1	207.08.17_537A_013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/17/2017 20:36

Analysis Batch Number: 180244 End Date: 08/17/2017 21:33

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-180244/1 CCVIS ZZZZZ		08/17/2017 20:36	1	2017.08.17_537B 001.d	GeminiC18 3x100 3(mm)
MB 320-179409/1-A		08/17/2017 20:45	1	2017.08.17_537B 003.d	GeminiC18 3x100 3(mm)
LCS 320-179409/2-A		08/17/2017 20:50	1	2017.08.17_537B 004.d	GeminiC18 3x100 3(mm)
LCSD 320-179409/3-A		08/17/2017 20:55	1	2017.08.17_537B 005.d	GeminiC18 3x100 3(mm)
320-30576-1		08/17/2017 21:00	1	2017.08.17_537B 006.d	GeminiC18 3x100 3(mm)
320-30576-2		08/17/2017 21:04	1	2017.08.17_537B 007.d	GeminiC18 3x100 3(mm)
320-30576-3		08/17/2017 21:09	1	2017.08.17_537B 008.d	GeminiC18 3x100 3(mm)
320-30576-4		08/17/2017 21:14	1	2017.08.17_537B 009.d	GeminiC18 3x100 3(mm)
320-30576-5		08/17/2017 21:19	1	2017.08.17_537B 010.d	GeminiC18 3x100 3(mm)
320-30576-6		08/17/2017 21:23	1	2017.08.17_537B 011.d	GeminiC18 3x100 3(mm)
320-30576-7		08/17/2017 21:28	1	2017.08.17_537B 012.d	GeminiC18 3x100 3(mm)
CCV 320-180244/13 CCVIS		08/17/2017 21:33	1	2017.08.17_537B 013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/17/2017 21:33

Analysis Batch Number: 180245 End Date: 08/17/2017 22:30

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-180245/13 CCVIS		08/17/2017 21:33	1	2017.08.17_537B 013.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 21:37	1		GeminiC18 3x100 3(mm)
320-30576-8		08/17/2017 21:42	1	2017.08.17_537B 015.d	GeminiC18 3x100 3(mm)
320-30576-9		08/17/2017 21:47	1	2017.08.17_537B 016.d	GeminiC18 3x100 3(mm)
320-30576-10		08/17/2017 21:52	1	2017.08.17_537B 017.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 21:56	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 22:01	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 22:06	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 22:11	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 22:15	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 22:20	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/17/2017 22:25	1		GeminiC18 3x100 3(mm)
CCV 320-180245/25 CCVIS		08/17/2017 22:30	1	2017.08.17_537B 025.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30576-1

SDG No.: _____

Batch Number: 179409 Batch Start Date: 08/15/17 07:52 Batch Analyst: Branscum, Cassie

Batch Method: 537 Batch End Date: 08/17/17 14:41

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00047
MB 320-179409/1		537, 537				250 mL	1.00 mL	7 SU	100 uL
LCS 320-179409/2		537, 537				250 mL	1.00 mL	7 SU	100 uL
LCSD 320-179409/3		537, 537				250 mL	1.00 mL	7 SU	100 uL
320-30576-A-1	NAWC-080917-RW-337A	537, 537	T	282.78 g	28.96 g	253.8 mL	1.00 mL	7 SU	100 uL
320-30576-A-2	NAWC-080917-FRB-337A	537, 537	T	285.79 g	28.11 g	257.7 mL	1.00 mL	7 SU	100 uL
320-30576-A-3	NAWC-080917-RW-337B	537, 537	T	290.40 g	28.82 g	261.6 mL	1.00 mL	7 SU	100 uL
320-30576-A-4	WGNA-080917-RW-107A	537, 537	T	286.31 g	30.04 g	256.3 mL	1.00 mL	7 SU	100 uL
320-30576-A-5	WGNA-080917-FRB-107A	537, 537	T	286.43 g	29.07 g	257.4 mL	1.00 mL	7 SU	100 uL
320-30576-A-6	WGNA-080917-RW-107B	537, 537	T	287.60 g	29.07 g	258.5 mL	1.00 mL	7 SU	100 uL
320-30576-A-7	NAWC-080917-RW-320	537, 537	T	277.50 g	28.74 g	248.8 mL	1.00 mL	7 SU	100 uL
320-30576-A-8	NAWC-080917-FRB-320	537, 537	T	282.63 g	28.67 g	254 mL	1.00 mL	7 SU	100 uL
320-30576-A-9	WGNA-080917-RW-263	537, 537	T	286.28 g	28.92 g	257.4 mL	1.00 mL	7 SU	100 uL
320-30576-A-10	WGNA-080917-FRB-263	537, 537	T	290.86 g	28.72 g	262.1 mL	1.00 mL	7 SU	100 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-MSP 00026	LC537-SU 00047	AnalysisComment			
MB 320-179409/1		537, 537			100 uL	ch nd			
LCS 320-179409/2		537, 537		100 uL	100 uL	ch nd			
LCSD 320-179409/3		537, 537		100 uL	100 uL	ch nd			
320-30576-A-1	NAWC-080917-RW-337A	537, 537	T		100 uL	ch nd			
320-30576-A-2	NAWC-080917-FRB-337A	537, 537	T		100 uL	ch nd			
320-30576-A-3	NAWC-080917-RW-337B	537, 537	T		100 uL	ch nd			
320-30576-A-4	WGNA-080917-RW-107A	537, 537	T		100 uL	ch 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.: 320-30576-1

SDG No.: _____

Batch Number: 179409 Batch Start Date: 08/15/17 07:52 Batch Analyst: Branscum, Cassie

Batch Method: 537 Batch End Date: 08/17/17 14:41

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-MSP 00026	LC537-SU 00047	AnalysisComment			
320-30576-A-5	WGNA-080917-FRB-107A	537, 537	T		100 uL	ch nd			
320-30576-A-6	WGNA-080917-RW-107B	537, 537	T		100 uL	ch nd			
320-30576-A-7	NAWC-080917-RW-320	537, 537	T		100 uL	ch nd			
320-30576-A-8	NAWC-080917-FRB-320	537, 537	T		100 uL	ch nd			
320-30576-A-9	WGNA-080917-RW-263	537, 537	T		100 uL	ch nd			
320-30576-A-10	WGNA-080917-FRB-263	537, 537	T		100 uL	ch nd			

Batch Notes	
Batch Comment	IS:1002957
Manifold ID	7,9
Methanol ID	1002843
Pipette ID	H14930F
Analyst ID - IS Reagent Drop	NSH
Analyst ID - IS Reagent Drop Witness	TQN
Analyst ID - SU Reagent Drop	CCB
Analyst ID - SU Reagent Drop Witness	HJA
Analyst ID - TA Reagent Drop	CCB
Analyst ID - TA Reagent Drop Witness	HJA
SPE Cartridge ID	6357081-03
Trizma ID	SLBR4303V
Reagent Water ID	8/6/17

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.

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Aqueous Extraction Analysis Sheet

AG 8/17/17

(To Accompany Samples to Instruments)

Batch Number: 320-179409











Analyst: Branscum, Cassie

Batch Open: 8/15/2017 7:52:00AM

Method Code: 320-537_Prep-320

Batch End: 8/17/2017 2:41:00PM

Extraction of Perfluorinated Alkyl Acids

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	Rcvd	PHs Adj1	Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1 MB-320-179409/1 N/A	N/A		250 mL	7			N/A	N/A	N/A	ch nd	
			1.00 mL								
2 LCS-320-179409/2 N/A	N/A		250 mL	7			N/A	N/A	N/A	ch nd	
			1.00 mL								
3 LCSD-320-179409/3 N/A	N/A		250 mL	7			N/A	N/A	N/A	ch nd	
			1.00 mL								
4 320-30576-A-1 (537_DOD5)	N/A (320-30576-1)	282.78 g	253.8 mL	7			8/16/17	16_Days	4	ch nd	
		28.96 g	1.00 mL								
5 320-30576-A-2 (537_DOD5)	N/A (320-30576-1)	285.79 g	257.7 mL	7			8/16/17	16_Days	4	ch nd	
		28.11 g	1.00 mL								
6 320-30576-A-3 (537_DOD5)	N/A (320-30576-1)	290.40 g	261.6 mL	7			8/16/17	16_Days	4	ch nd	
		28.82 g	1.00 mL								
7 320-30576-A-4 (537_DOD5)	N/A (320-30576-1)	286.31 g	256.3 mL	7			8/16/17	16_Days	4	ch nd	
		30.04 g	1.00 mL								
8 320-30576-A-5 (537_DOD5)	N/A (320-30576-1)	286.43 g	257.4 mL	7			8/16/17	16_Days	4	ch nd	
		29.07 g	1.00 mL								
9 320-30576-A-6 (537_DOD5)	N/A (320-30576-1)	287.60 g	258.5 mL	7			8/16/17	16_Days	4	ch nd	
		29.07 g	1.00 mL								
10 320-30576-A-7 (537_DOD5)	N/A (320-30576-1)	277.50 g	248.8 mL	7			8/16/17	16_Days	4	ch nd	
		28.74 g	1.00 mL								

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)




Batch Number: 320-179409

Analyst: Branscum, Cassie

Batch Open: 8/15/2017 7:52:00AM

Method Code: 320-537_Prep-320

Batch End: 8/17/2017 2:41:00PM

11	320-30576-A-8 (537_DOD5)	N/A (320-30576-1)	282.63 g	254 mL	7			8/16/17	16_Days	4	ch nd	
			28.67 g	1.00 mL								
12	320-30576-A-9 (537_DOD5)	N/A (320-30576-1)	286.28 g	257.4 mL	7			8/16/17	16_Days	4	ch nd	
			28.92 g	1.00 mL								
13	320-30576-A-10 (537_DOD5)	N/A (320-30576-1)	290.86 g	262.1 mL	7			8/16/17	16_Days	4	ch nd	
			28.72 g	1.00 mL								

Batch Notes

Manifold ID 7,9

Trizma ID SLBR4303V

SPE Cartridge ID 6357081-03

Methanol ID 1002843

Reagent Water ID 8/6/17

Pipette ID H14930F

Analyst ID - TA Reagent Drop CCB

Analyst ID - TA Reagent Drop HJA

Witness

Analyst ID - SU Reagent Drop CCB

Analyst ID - SU Reagent Drop HJA

Witness

Analyst ID - IS Reagent Drop NSH

Analyst ID - IS Reagent Drop TQN

Witness

Batch Comment IS:1002957

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PFAS Calibration Calculations:

Initial Calibration 8/17/2017
 Instrument A8_N

Perfluorohexanesulfonic acid

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	Reported RRF	
3	896364	5800695	28.7	1.47831	1.4768	
6.67	2100734	5482857	28.7	1.64862	1.6479	
15	4674793	5631219	28.7	1.58837	1.5869	
30	9242464	5646402	28.7	1.56595	1.5645	
45	13223291	5623095	28.7	1.49980	1.4984	
60	16959937	5568319	28.7	1.45690	1.4556	
				Average	1.53966	1.5383
				Standard Deviation	0.0737	
				RSD	0.0478	
				%RSD	4.78486	4.8

Continuing Calibration 08/17/2017 @ 20:36
 A8_N

Perfluorohexanesulfonic acid

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	%D	Reported RRF	Reported %D
15	4703403	5441619	28.7	1.6538	7.5062365	1.652	7.4

Willow Grove
SDG 320-30576-1

Sample Identification NAWC-080917-RW-337A

Compound Perfluoroheptanoic acid

Compound Area 225630

Internal Standard Amount (ng) 10

Dilution Factor 1

Internal Standard Area 1947686

Average RRF 0.9415

Sample Volume(ml) 253.8

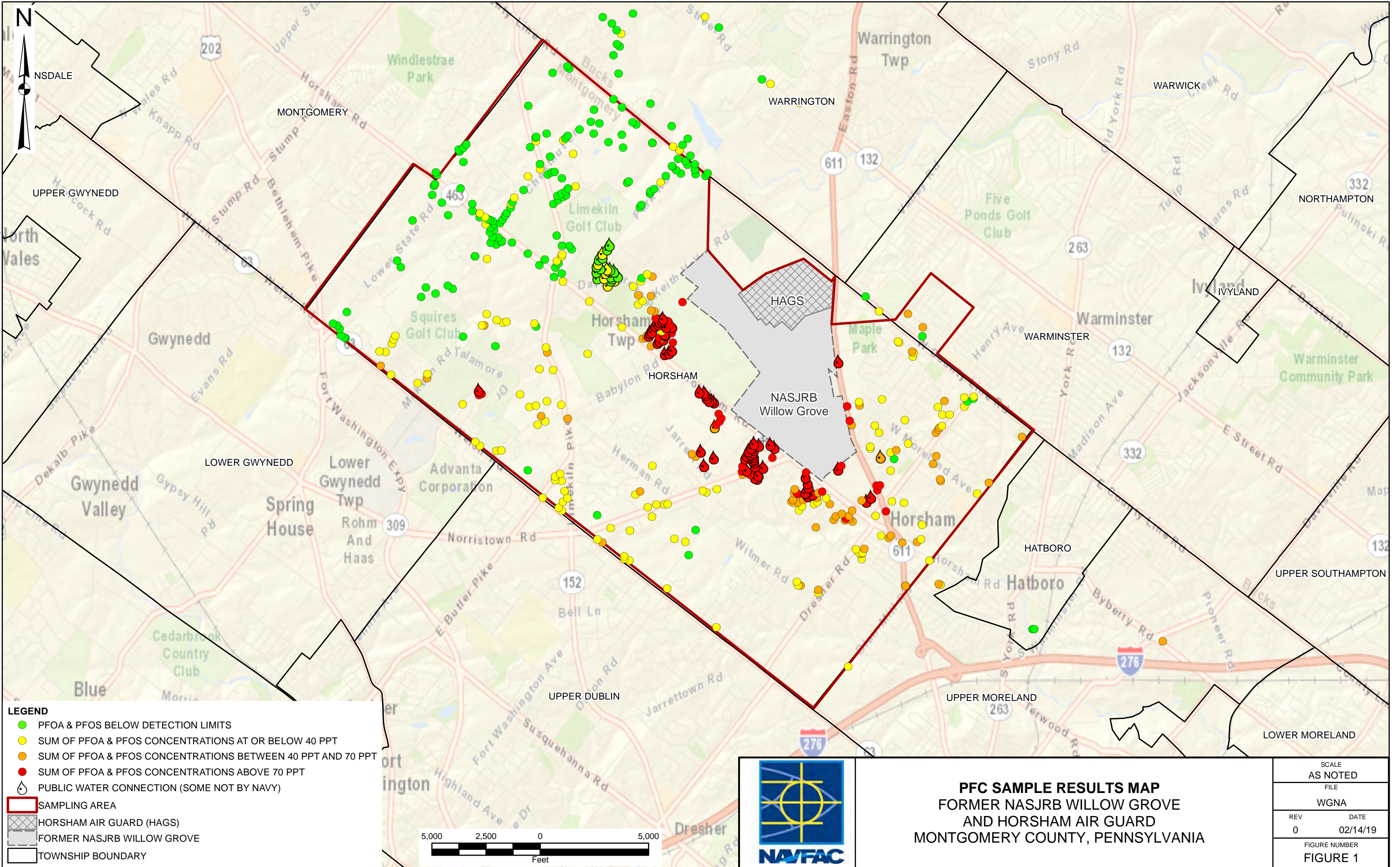
Volume Extract (ml) 1

Injection Volume (µl) 1

µl to ml 1000.00

Concentration 4.85 ng/L

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LEGEND

- PFOA & PFOS BELOW DETECTION LIMITS
- SUM OF PFOA & PFOS CONCENTRATIONS AT OR BELOW 40 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS BETWEEN 40 PPT AND 70 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS ABOVE 70 PPT
- PUBLIC WATER CONNECTION (SOME NOT BY NAVY)
- SAMPLING AREA
- HORSHAM AIR GUARD (HAGS)
- FORMER NASJRB WILLOW GROVE
- TOWNSHIP BOUNDARY



**PFC SAMPLE RESULTS MAP
FORMER NASJRB WILLOW GROVE
AND HORSHAM AIR GUARD
MONTGOMERY COUNTY, PENNSYLVANIA**

SCALE AS NOTED	
FILE WGNA	
REV 0	DATE 02/14/19
FIGURE NUMBER FIGURE 1	