



**Groundwater Sample Results,  
Combined Level 2 and Level 4 Laboratory Report,  
Electronic Data Deliverable, Data Validation Report,  
and the Sample Location Report, SDG 320-41647-1**

*Naval Air Warfare Center Warminster  
Warminster, Pennsylvania*

August 2019

N62269\_001201  
WARMINSTER\_NAWC  
SSIC 5000-33c

**LABORATORY DATA PACKAGE, 320-41647-1, NAS WILLOW GROVE NAWC  
WARMINSTER PA**  
08/15/2018  
TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

## ANALYTICAL REPORT

Job Number: 320-41647-1

Job Description: Warminster: PFAS, NAS JRB Willow Grove

For:  
Tetra Tech, Inc.  
234 Mall Boulevard  
Suite 260  
King of Prussia, PA 19406  
Attention: Andy Frebowitz



Approved for release.  
David R. Alltucker  
Project Manager I  
8/15/2018 12:24 PM

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08/15/2018

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# Definitions/Glossary

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

TestAmerica Job ID: 320-41647-1

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## Qualifiers

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### 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.

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## Glossary

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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**  
**320-41647-1**

**Receipt**

The samples were received on 7/31/2018 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.4° 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 320-237816.

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: 320-41647-1

## Client Sample ID: NAWC-073018-RW-055

Lab Sample ID: 320-41647-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	8.2	J	35	6.0	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	9.8	J	18	2.5	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.8	J	8.8	1.7	ng/L	1		537	Total/NA

## Client Sample ID: NAWC-073018-FRB-055

Lab Sample ID: 320-41647-2

No Detections.

## Client Sample ID: WGNA-073018-RW-4851

Lab Sample ID: 320-41647-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	6.1	J	18	2.5	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.1	J M	9.0	1.7	ng/L	1		537	Total/NA

## Client Sample ID: WGNA-073018-FRB-4851

Lab Sample ID: 320-41647-4

No Detections.

## Client Sample ID: WGNA-073018-RW-3604

Lab Sample ID: 320-41647-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	10	J	37	6.2	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	10	J	18	2.6	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.2	J	9.2	1.7	ng/L	1		537	Total/NA

## Client Sample ID: WGNA-073018-FRB-3604

Lab Sample ID: 320-41647-6

No Detections.

## Client Sample ID: WGNA-073018-RW-3529

Lab Sample ID: 320-41647-7

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	10	J	37	6.4	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	16	J	19	2.6	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.6	J	9.4	1.8	ng/L	1		537	Total/NA

## Client Sample ID: WGNA-073018-FRB-3529

Lab Sample ID: 320-41647-8

No Detections.

## Client Sample ID: WGNA-073018-RW-0500

Lab Sample ID: 320-41647-9

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	20	J	35	6.0	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	20		18	2.5	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	7.1	J	26	4.8	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	5.5	J	8.8	1.7	ng/L	1		537	Total/NA

## Client Sample ID: WGNA-073018-FRB-0500

Lab Sample ID: 320-41647-10

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento



# Detection Summary

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

TestAmerica Job ID: 320-41647-1

## Client Sample ID: WGNA-073018-RW-3957

Lab Sample ID: 320-41647-11

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	11	J	39	6.7	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	12	J	20	2.8	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.6	J	29	5.4	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.1	J	9.8	1.9	ng/L	1		537	Total/NA

## Client Sample ID: WGNA-073018-FRB-3957

Lab Sample ID: 320-41647-12

No Detections.

## Client Sample ID: WGNA-073018-DUP-42

Lab Sample ID: 320-41647-13

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	12	J	39	6.7	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	13	J	20	2.8	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.8	J	30	5.4	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.5	J	9.9	1.9	ng/L	1		537	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

# Client Sample Results

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

TestAmerica Job ID: 320-41647-1

**Client Sample ID: NAWC-073018-RW-055**

**Lab Sample ID: 320-41647-1**

Date Collected: 07/30/18 10:10

Matrix: Water

Date Received: 07/31/18 09:00

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Perfluorooctanesulfonic acid (PFOS)</b>	<b>8.2</b>	<b>J</b>	35	6.0	ng/L		08/03/18 10:24	08/08/18 01:38	1
<b>Perfluorooctanoic acid (PFOA)</b>	<b>9.8</b>	<b>J</b>	18	2.5	ng/L		08/03/18 10:24	08/08/18 01:38	1
Perfluorononanoic acid (PFNA)	18	U M	21	7.0	ng/L		08/03/18 10:24	08/08/18 01:38	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	26	4.8	ng/L		08/03/18 10:24	08/08/18 01:38	1
<b>Perfluoroheptanoic acid (PFHpA)</b>	<b>4.8</b>	<b>J</b>	8.8	1.7	ng/L		08/03/18 10:24	08/08/18 01:38	1
Perfluorobutanesulfonic acid (PFBS)	32	U	79	14	ng/L		08/03/18 10:24	08/08/18 01:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	97		70 - 130	08/03/18 10:24	08/08/18 01:38	1
13C2 PFDA	108		70 - 130	08/03/18 10:24	08/08/18 01:38	1

**Client Sample ID: NAWC-073018-FRB-055**

**Lab Sample ID: 320-41647-2**

Date Collected: 07/30/18 10:05

Matrix: Water

Date Received: 07/31/18 09:00

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	14	U	35	6.0	ng/L		08/03/18 10:24	08/08/18 01:43	1
Perfluorooctanoic acid (PFOA)	7.0	U	18	2.5	ng/L		08/03/18 10:24	08/08/18 01:43	1
Perfluorononanoic acid (PFNA)	18	U	21	7.0	ng/L		08/03/18 10:24	08/08/18 01:43	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	26	4.8	ng/L		08/03/18 10:24	08/08/18 01:43	1
Perfluoroheptanoic acid (PFHpA)	3.5	U	8.8	1.7	ng/L		08/03/18 10:24	08/08/18 01:43	1
Perfluorobutanesulfonic acid (PFBS)	32	U	79	14	ng/L		08/03/18 10:24	08/08/18 01:43	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	98		70 - 130	08/03/18 10:24	08/08/18 01:43	1
13C2 PFDA	101		70 - 130	08/03/18 10:24	08/08/18 01:43	1

**Client Sample ID: WGNA-073018-RW-4851**

**Lab Sample ID: 320-41647-3**

Date Collected: 07/30/18 11:10

Matrix: Water

Date Received: 07/31/18 09:00

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	14	U	36	6.1	ng/L		08/03/18 10:24	08/08/18 01:48	1
<b>Perfluorooctanoic acid (PFOA)</b>	<b>6.1</b>	<b>J</b>	18	2.5	ng/L		08/03/18 10:24	08/08/18 01:48	1
Perfluorononanoic acid (PFNA)	18	U	22	7.2	ng/L		08/03/18 10:24	08/08/18 01:48	1
Perfluorohexanesulfonic acid (PFHxS)	11	U M	27	5.0	ng/L		08/03/18 10:24	08/08/18 01:48	1
<b>Perfluoroheptanoic acid (PFHpA)</b>	<b>2.1</b>	<b>J M</b>	9.0	1.7	ng/L		08/03/18 10:24	08/08/18 01:48	1
Perfluorobutanesulfonic acid (PFBS)	33	U	81	15	ng/L		08/03/18 10:24	08/08/18 01:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	98		70 - 130	08/03/18 10:24	08/08/18 01:48	1
13C2 PFDA	109		70 - 130	08/03/18 10:24	08/08/18 01:48	1

# Client Sample Results

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

TestAmerica Job ID: 320-41647-1

**Client Sample ID: WGNA-073018-FRB-4851**

**Lab Sample ID: 320-41647-4**

**Date Collected: 07/30/18 11:05**

**Matrix: Water**

**Date Received: 07/31/18 09:00**

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	14	U	36	6.1	ng/L		08/03/18 10:24	08/08/18 01:52	1
Perfluorooctanoic acid (PFOA)	7.1	U	18	2.5	ng/L		08/03/18 10:24	08/08/18 01:52	1
Perfluorononanoic acid (PFNA)	18	U	21	7.1	ng/L		08/03/18 10:24	08/08/18 01:52	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	27	4.9	ng/L		08/03/18 10:24	08/08/18 01:52	1
Perfluoroheptanoic acid (PFHpA)	3.6	U	8.9	1.7	ng/L		08/03/18 10:24	08/08/18 01:52	1
Perfluorobutanesulfonic acid (PFBS)	32	U	80	14	ng/L		08/03/18 10:24	08/08/18 01:52	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	97		70 - 130	08/03/18 10:24	08/08/18 01:52	1
13C2 PFDA	104		70 - 130	08/03/18 10:24	08/08/18 01:52	1

**Client Sample ID: WGNA-073018-RW-3604**

**Lab Sample ID: 320-41647-5**

**Date Collected: 07/30/18 11:40**

**Matrix: Water**

**Date Received: 07/31/18 09:00**

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	10	J	37	6.2	ng/L		08/03/18 10:24	08/08/18 01:57	1
Perfluorooctanoic acid (PFOA)	10	J	18	2.6	ng/L		08/03/18 10:24	08/08/18 01:57	1
Perfluorononanoic acid (PFNA)	18	U	22	7.3	ng/L		08/03/18 10:24	08/08/18 01:57	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	28	5.0	ng/L		08/03/18 10:24	08/08/18 01:57	1
Perfluoroheptanoic acid (PFHpA)	4.2	J	9.2	1.7	ng/L		08/03/18 10:24	08/08/18 01:57	1
Perfluorobutanesulfonic acid (PFBS)	33	U	83	15	ng/L		08/03/18 10:24	08/08/18 01:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	78		70 - 130	08/03/18 10:24	08/08/18 01:57	1
13C2 PFDA	108		70 - 130	08/03/18 10:24	08/08/18 01:57	1

**Client Sample ID: WGNA-073018-FRB-3604**

**Lab Sample ID: 320-41647-6**

**Date Collected: 07/30/18 11:35**

**Matrix: Water**

**Date Received: 07/31/18 09:00**

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	U	38	6.4	ng/L		08/03/18 10:24	08/08/18 02:11	1
Perfluorooctanoic acid (PFOA)	7.5	U	19	2.6	ng/L		08/03/18 10:24	08/08/18 02:11	1
Perfluorononanoic acid (PFNA)	19	U	23	7.5	ng/L		08/03/18 10:24	08/08/18 02:11	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	28	5.2	ng/L		08/03/18 10:24	08/08/18 02:11	1
Perfluoroheptanoic acid (PFHpA)	3.8	U	9.4	1.8	ng/L		08/03/18 10:24	08/08/18 02:11	1
Perfluorobutanesulfonic acid (PFBS)	34	U	85	15	ng/L		08/03/18 10:24	08/08/18 02:11	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	101		70 - 130	08/03/18 10:24	08/08/18 02:11	1
13C2 PFDA	109		70 - 130	08/03/18 10:24	08/08/18 02:11	1

# Client Sample Results

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

TestAmerica Job ID: 320-41647-1

**Client Sample ID: WGNA-073018-RW-3529**

**Lab Sample ID: 320-41647-7**

Date Collected: 07/30/18 15:10

Matrix: Water

Date Received: 07/31/18 09:00

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	10	J	37	6.4	ng/L		08/03/18 10:24	08/08/18 02:16	1
Perfluorooctanoic acid (PFOA)	16	J	19	2.6	ng/L		08/03/18 10:24	08/08/18 02:16	1
Perfluorononanoic acid (PFNA)	19	U M	22	7.5	ng/L		08/03/18 10:24	08/08/18 02:16	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	28	5.2	ng/L		08/03/18 10:24	08/08/18 02:16	1
Perfluoroheptanoic acid (PFHpA)	6.6	J	9.4	1.8	ng/L		08/03/18 10:24	08/08/18 02:16	1
Perfluorobutanesulfonic acid (PFBS)	34	U	84	15	ng/L		08/03/18 10:24	08/08/18 02:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	89		70 - 130	08/03/18 10:24	08/08/18 02:16	1
13C2 PFDA	99		70 - 130	08/03/18 10:24	08/08/18 02:16	1

**Client Sample ID: WGNA-073018-FRB-3529**

**Lab Sample ID: 320-41647-8**

Date Collected: 07/30/18 15:05

Matrix: Water

Date Received: 07/31/18 09:00

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	U	37	6.2	ng/L		08/03/18 10:24	08/08/18 02:20	1
Perfluorooctanoic acid (PFOA)	7.4	U	18	2.6	ng/L		08/03/18 10:24	08/08/18 02:20	1
Perfluorononanoic acid (PFNA)	18	U	22	7.4	ng/L		08/03/18 10:24	08/08/18 02:20	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	28	5.1	ng/L		08/03/18 10:24	08/08/18 02:20	1
Perfluoroheptanoic acid (PFHpA)	3.7	U	9.2	1.7	ng/L		08/03/18 10:24	08/08/18 02:20	1
Perfluorobutanesulfonic acid (PFBS)	33	U	83	15	ng/L		08/03/18 10:24	08/08/18 02:20	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	101		70 - 130	08/03/18 10:24	08/08/18 02:20	1
13C2 PFDA	102		70 - 130	08/03/18 10:24	08/08/18 02:20	1

**Client Sample ID: WGNA-073018-RW-0500**

**Lab Sample ID: 320-41647-9**

Date Collected: 07/30/18 15:40

Matrix: Water

Date Received: 07/31/18 09:00

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	20	J	35	6.0	ng/L		08/03/18 10:24	08/08/18 02:25	1
Perfluorooctanoic acid (PFOA)	20		18	2.5	ng/L		08/03/18 10:24	08/08/18 02:25	1
Perfluorononanoic acid (PFNA)	18	U	21	7.0	ng/L		08/03/18 10:24	08/08/18 02:25	1
Perfluorohexanesulfonic acid (PFHxS)	7.1	J	26	4.8	ng/L		08/03/18 10:24	08/08/18 02:25	1
Perfluoroheptanoic acid (PFHpA)	5.5	J	8.8	1.7	ng/L		08/03/18 10:24	08/08/18 02:25	1
Perfluorobutanesulfonic acid (PFBS)	32	U	79	14	ng/L		08/03/18 10:24	08/08/18 02:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	98		70 - 130	08/03/18 10:24	08/08/18 02:25	1
13C2 PFDA	105		70 - 130	08/03/18 10:24	08/08/18 02:25	1

# Client Sample Results

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

TestAmerica Job ID: 320-41647-1

**Client Sample ID: WGNA-073018-FRB-0500**

**Lab Sample ID: 320-41647-10**

**Date Collected: 07/30/18 15:35**

**Matrix: Water**

**Date Received: 07/31/18 09:00**

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	14	U	35	5.9	ng/L		08/03/18 10:24	08/08/18 02:30	1
Perfluorooctanoic acid (PFOA)	7.0	U	17	2.4	ng/L		08/03/18 10:24	08/08/18 02:30	1
Perfluorononanoic acid (PFNA)	17	U	21	7.0	ng/L		08/03/18 10:24	08/08/18 02:30	1
Perfluorohexanesulfonic acid (PFHxS)	10	U	26	4.8	ng/L		08/03/18 10:24	08/08/18 02:30	1
Perfluoroheptanoic acid (PFHpA)	3.5	U	8.7	1.7	ng/L		08/03/18 10:24	08/08/18 02:30	1
Perfluorobutanesulfonic acid (PFBS)	31	U	78	14	ng/L		08/03/18 10:24	08/08/18 02:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	102		70 - 130	08/03/18 10:24	08/08/18 02:30	1
13C2 PFDA	104		70 - 130	08/03/18 10:24	08/08/18 02:30	1

**Client Sample ID: WGNA-073018-RW-3957**

**Lab Sample ID: 320-41647-11**

**Date Collected: 07/30/18 15:40**

**Matrix: Water**

**Date Received: 07/31/18 09:00**

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	11	J	39	6.7	ng/L		08/03/18 10:24	08/08/18 02:34	1
Perfluorooctanoic acid (PFOA)	12	J	20	2.8	ng/L		08/03/18 10:24	08/08/18 02:34	1
Perfluorononanoic acid (PFNA)	20	U	24	7.9	ng/L		08/03/18 10:24	08/08/18 02:34	1
Perfluorohexanesulfonic acid (PFHxS)	6.6	J	29	5.4	ng/L		08/03/18 10:24	08/08/18 02:34	1
Perfluoroheptanoic acid (PFHpA)	4.1	J	9.8	1.9	ng/L		08/03/18 10:24	08/08/18 02:34	1
Perfluorobutanesulfonic acid (PFBS)	35	U	88	16	ng/L		08/03/18 10:24	08/08/18 02:34	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	97		70 - 130	08/03/18 10:24	08/08/18 02:34	1
13C2 PFDA	104		70 - 130	08/03/18 10:24	08/08/18 02:34	1

**Client Sample ID: WGNA-073018-FRB-3957**

**Lab Sample ID: 320-41647-12**

**Date Collected: 07/30/18 15:35**

**Matrix: Water**

**Date Received: 07/31/18 09:00**

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	14	U	36	6.1	ng/L		08/03/18 10:24	08/08/18 02:39	1
Perfluorooctanoic acid (PFOA)	7.1	U	18	2.5	ng/L		08/03/18 10:24	08/08/18 02:39	1
Perfluorononanoic acid (PFNA)	18	U	21	7.1	ng/L		08/03/18 10:24	08/08/18 02:39	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	27	4.9	ng/L		08/03/18 10:24	08/08/18 02:39	1
Perfluoroheptanoic acid (PFHpA)	3.6	U	8.9	1.7	ng/L		08/03/18 10:24	08/08/18 02:39	1
Perfluorobutanesulfonic acid (PFBS)	32	U	80	14	ng/L		08/03/18 10:24	08/08/18 02:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	100		70 - 130	08/03/18 10:24	08/08/18 02:39	1
13C2 PFDA	101		70 - 130	08/03/18 10:24	08/08/18 02:39	1

# Client Sample Results

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

TestAmerica Job ID: 320-41647-1

**Client Sample ID: WGNA-073018-DUP-42**

**Lab Sample ID: 320-41647-13**

**Date Collected: 07/30/18 07:00**

**Matrix: Water**

**Date Received: 07/31/18 09:00**

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	12	J	39	6.7	ng/L		08/03/18 10:24	08/08/18 02:44	1
Perfluorooctanoic acid (PFOA)	13	J	20	2.8	ng/L		08/03/18 10:24	08/08/18 02:44	1
Perfluorononanoic acid (PFNA)	20	U	24	7.9	ng/L		08/03/18 10:24	08/08/18 02:44	1
Perfluorohexanesulfonic acid (PFHxS)	6.8	J	30	5.4	ng/L		08/03/18 10:24	08/08/18 02:44	1
Perfluoroheptanoic acid (PFHpA)	4.5	J	9.9	1.9	ng/L		08/03/18 10:24	08/08/18 02:44	1
Perfluorobutanesulfonic acid (PFBS)	36	U	89	16	ng/L		08/03/18 10:24	08/08/18 02:44	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
13C2 PFHxA	101		70 - 130				08/03/18 10:24	08/08/18 02:44	1
13C2 PFDA	114		70 - 130				08/03/18 10:24	08/08/18 02:44	1

# Default Detection Limits

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

TestAmerica Job ID: 320-41647-1

## 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: 320-41647-1

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

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		PFHxA (70-130)	PFDA (70-130)
320-41647-1	NAWC-073018-RW-055	97	108
320-41647-2	NAWC-073018-FRB-055	98	101
320-41647-3	WGNA-073018-RW-4851	98	109
320-41647-4	WGNA-073018-FRB-4851	97	104
320-41647-5	WGNA-073018-RW-3604	78	108
320-41647-6	WGNA-073018-FRB-3604	101	109
320-41647-7	WGNA-073018-RW-3529	89	99
320-41647-8	WGNA-073018-FRB-3529	101	102
320-41647-9	WGNA-073018-RW-0500	98	105
320-41647-10	WGNA-073018-FRB-0500	102	104
320-41647-11	WGNA-073018-RW-3957	97	104
320-41647-12	WGNA-073018-FRB-3957	100	101
320-41647-13	WGNA-073018-DUP-42	101	114
LLCS 320-237816/2-A	Lab Control Sample	99	111
LLCSD 320-237816/3-A	Lab Control Sample Dup	98	110
MB 320-237816/1-A	Method Blank	106	116

### Surrogate Legend

PFHxA = 13C2 PFHxA

PFDA = 13C2 PFDA



# QC Sample Results

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

TestAmerica Job ID: 320-41647-1

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

**Lab Sample ID: MB 320-237816/1-A**  
**Matrix: Water**  
**Analysis Batch: 238604**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 237816**

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		08/03/18 10:23	08/08/18 01:24	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		08/03/18 10:23	08/08/18 01:24	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		08/03/18 10:23	08/08/18 01:24	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		08/03/18 10:23	08/08/18 01:24	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		08/03/18 10:23	08/08/18 01:24	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		08/03/18 10:23	08/08/18 01:24	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C2 PFHxA	106		70 - 130	08/03/18 10:23	08/08/18 01:24	1
13C2 PFDA	116		70 - 130	08/03/18 10:23	08/08/18 01:24	1

**Lab Sample ID: LLCS 320-237816/2-A**  
**Matrix: Water**  
**Analysis Batch: 238604**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 237816**

Analyte	Spike Added	LLCS	LLCS	Unit	D	%Rec	%Rec. Limits
		Result	Qualifier				
Perfluorooctanesulfonic acid (PFOS)	40.2	41.6		ng/L		103	50 - 150
Perfluorooctanoic acid (PFOA)	20.0	18.6	J	ng/L		93	50 - 150
Perfluorononanoic acid (PFNA)	20.0	18.4	J	ng/L		92	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	30.3	31.4		ng/L		103	50 - 150
Perfluoroheptanoic acid (PFHpA)	10.0	9.50	J	ng/L		95	50 - 150
Perfluorobutanesulfonic acid (PFBS)	90.2	102		ng/L		113	50 - 150

Surrogate	LLCS	LLCS	Limits
	%Recovery	Qualifier	
13C2 PFHxA	99		70 - 130
13C2 PFDA	111		70 - 130

**Lab Sample ID: LLCSD 320-237816/3-A**  
**Matrix: Water**  
**Analysis Batch: 238604**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 237816**

Analyte	Spike Added	LLCSD	LLCSD	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
		Result	Qualifier						
Perfluorooctanesulfonic acid (PFOS)	40.2	39.7	J	ng/L		99	50 - 150	5	50
Perfluorooctanoic acid (PFOA)	20.0	18.4	J	ng/L		92	50 - 150	1	50
Perfluorononanoic acid (PFNA)	20.0	17.7	J	ng/L		89	50 - 150	4	50
Perfluorohexanesulfonic acid (PFHxS)	30.3	30.2		ng/L		100	50 - 150	4	50
Perfluoroheptanoic acid (PFHpA)	10.0	9.21	J	ng/L		92	50 - 150	3	50
Perfluorobutanesulfonic acid (PFBS)	90.2	92.7		ng/L		103	50 - 150	9	50

Surrogate	LLCSD	LLCSD	Limits
	%Recovery	Qualifier	
13C2 PFHxA	98		70 - 130
13C2 PFDA	110		70 - 130

# QC Association Summary

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

TestAmerica Job ID: 320-41647-1

## LCMS

### Prep Batch: 237816

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41647-1	NAWC-073018-RW-055	Total/NA	Water	537	
320-41647-2	NAWC-073018-FRB-055	Total/NA	Water	537	
320-41647-3	WGNA-073018-RW-4851	Total/NA	Water	537	
320-41647-4	WGNA-073018-FRB-4851	Total/NA	Water	537	
320-41647-5	WGNA-073018-RW-3604	Total/NA	Water	537	
320-41647-6	WGNA-073018-FRB-3604	Total/NA	Water	537	
320-41647-7	WGNA-073018-RW-3529	Total/NA	Water	537	
320-41647-8	WGNA-073018-FRB-3529	Total/NA	Water	537	
320-41647-9	WGNA-073018-RW-0500	Total/NA	Water	537	
320-41647-10	WGNA-073018-FRB-0500	Total/NA	Water	537	
320-41647-11	WGNA-073018-RW-3957	Total/NA	Water	537	
320-41647-12	WGNA-073018-FRB-3957	Total/NA	Water	537	
320-41647-13	WGNA-073018-DUP-42	Total/NA	Water	537	
MB 320-237816/1-A	Method Blank	Total/NA	Water	537	
LLCS 320-237816/2-A	Lab Control Sample	Total/NA	Water	537	
LLCSD 320-237816/3-A	Lab Control Sample Dup	Total/NA	Water	537	

### Analysis Batch: 238604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41647-1	NAWC-073018-RW-055	Total/NA	Water	537	237816
320-41647-2	NAWC-073018-FRB-055	Total/NA	Water	537	237816
320-41647-3	WGNA-073018-RW-4851	Total/NA	Water	537	237816
320-41647-4	WGNA-073018-FRB-4851	Total/NA	Water	537	237816
320-41647-5	WGNA-073018-RW-3604	Total/NA	Water	537	237816
MB 320-237816/1-A	Method Blank	Total/NA	Water	537	237816
LLCS 320-237816/2-A	Lab Control Sample	Total/NA	Water	537	237816
LLCSD 320-237816/3-A	Lab Control Sample Dup	Total/NA	Water	537	237816

### Analysis Batch: 238606

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41647-6	WGNA-073018-FRB-3604	Total/NA	Water	537	237816
320-41647-7	WGNA-073018-RW-3529	Total/NA	Water	537	237816
320-41647-8	WGNA-073018-FRB-3529	Total/NA	Water	537	237816
320-41647-9	WGNA-073018-RW-0500	Total/NA	Water	537	237816
320-41647-10	WGNA-073018-FRB-0500	Total/NA	Water	537	237816
320-41647-11	WGNA-073018-RW-3957	Total/NA	Water	537	237816
320-41647-12	WGNA-073018-FRB-3957	Total/NA	Water	537	237816
320-41647-13	WGNA-073018-DUP-42	Total/NA	Water	537	237816

# Lab Chronicle

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

TestAmerica Job ID: 320-41647-1

## Client Sample ID: NAWC-073018-RW-055

Date Collected: 07/30/18 10:10

Date Received: 07/31/18 09:00

## Lab Sample ID: 320-41647-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237816	08/03/18 10:24	KMK	TAL SAC
Total/NA	Analysis	537		1	238604	08/08/18 01:38	JRB	TAL SAC

## Client Sample ID: NAWC-073018-FRB-055

Date Collected: 07/30/18 10:05

Date Received: 07/31/18 09:00

## Lab Sample ID: 320-41647-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237816	08/03/18 10:24	KMK	TAL SAC
Total/NA	Analysis	537		1	238604	08/08/18 01:43	JRB	TAL SAC

## Client Sample ID: WGNA-073018-RW-4851

Date Collected: 07/30/18 11:10

Date Received: 07/31/18 09:00

## Lab Sample ID: 320-41647-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237816	08/03/18 10:24	KMK	TAL SAC
Total/NA	Analysis	537		1	238604	08/08/18 01:48	JRB	TAL SAC

## Client Sample ID: WGNA-073018-FRB-4851

Date Collected: 07/30/18 11:05

Date Received: 07/31/18 09:00

## Lab Sample ID: 320-41647-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237816	08/03/18 10:24	KMK	TAL SAC
Total/NA	Analysis	537		1	238604	08/08/18 01:52	JRB	TAL SAC

## Client Sample ID: WGNA-073018-RW-3604

Date Collected: 07/30/18 11:40

Date Received: 07/31/18 09:00

## Lab Sample ID: 320-41647-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237816	08/03/18 10:24	KMK	TAL SAC
Total/NA	Analysis	537		1	238604	08/08/18 01:57	JRB	TAL SAC

## Client Sample ID: WGNA-073018-FRB-3604

Date Collected: 07/30/18 11:35

Date Received: 07/31/18 09:00

## Lab Sample ID: 320-41647-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237816	08/03/18 10:24	KMK	TAL SAC
Total/NA	Analysis	537		1	238606	08/08/18 02:11	JRB	TAL SAC

TestAmerica Sacramento

# Lab Chronicle

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

TestAmerica Job ID: 320-41647-1

**Client Sample ID: WGNA-073018-RW-3529**

**Date Collected: 07/30/18 15:10**

**Date Received: 07/31/18 09:00**

**Lab Sample ID: 320-41647-7**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237816	08/03/18 10:24	KMK	TAL SAC
Total/NA	Analysis	537		1	238606	08/08/18 02:16	JRB	TAL SAC

**Client Sample ID: WGNA-073018-FRB-3529**

**Date Collected: 07/30/18 15:05**

**Date Received: 07/31/18 09:00**

**Lab Sample ID: 320-41647-8**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237816	08/03/18 10:24	KMK	TAL SAC
Total/NA	Analysis	537		1	238606	08/08/18 02:20	JRB	TAL SAC

**Client Sample ID: WGNA-073018-RW-0500**

**Date Collected: 07/30/18 15:40**

**Date Received: 07/31/18 09:00**

**Lab Sample ID: 320-41647-9**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237816	08/03/18 10:24	KMK	TAL SAC
Total/NA	Analysis	537		1	238606	08/08/18 02:25	JRB	TAL SAC

**Client Sample ID: WGNA-073018-FRB-0500**

**Date Collected: 07/30/18 15:35**

**Date Received: 07/31/18 09:00**

**Lab Sample ID: 320-41647-10**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237816	08/03/18 10:24	KMK	TAL SAC
Total/NA	Analysis	537		1	238606	08/08/18 02:30	JRB	TAL SAC

**Client Sample ID: WGNA-073018-RW-3957**

**Date Collected: 07/30/18 15:40**

**Date Received: 07/31/18 09:00**

**Lab Sample ID: 320-41647-11**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237816	08/03/18 10:24	KMK	TAL SAC
Total/NA	Analysis	537		1	238606	08/08/18 02:34	JRB	TAL SAC

**Client Sample ID: WGNA-073018-FRB-3957**

**Date Collected: 07/30/18 15:35**

**Date Received: 07/31/18 09:00**

**Lab Sample ID: 320-41647-12**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			237816	08/03/18 10:24	KMK	TAL SAC
Total/NA	Analysis	537		1	238606	08/08/18 02:39	JRB	TAL SAC

TestAmerica Sacramento

# Lab Chronicle

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

TestAmerica Job ID: 320-41647-1

**Client Sample ID: WGNA-073018-DUP-42**

**Lab Sample ID: 320-41647-13**

**Date Collected: 07/30/18 07:00**

**Matrix: Water**

**Date Received: 07/31/18 09:00**

<u>Prep Type</u>	<u>Batch Type</u>	<u>Batch Method</u>	<u>Run</u>	<u>Dilution Factor</u>	<u>Batch Number</u>	<u>Prepared or Analyzed</u>	<u>Analyst</u>	<u>Lab</u>
Total/NA	Prep	537			237816	08/03/18 10:24	KMK	TAL SAC
Total/NA	Analysis	537		1	238606	08/08/18 02:44	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: 320-41647-1

## Laboratory: TestAmerica Sacramento

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

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

# Method Summary

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

TestAmerica Job ID: 320-41647-1

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

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

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

# Sample Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-41647-1

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

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-41647-1	NAWC-073018-RW-055	Water	07/30/18 10:10	07/31/18 09:00
320-41647-2	NAWC-073018-FRB-055	Water	07/30/18 10:05	07/31/18 09:00
320-41647-3	WGNA-073018-RW-4851	Water	07/30/18 11:10	07/31/18 09:00
320-41647-4	WGNA-073018-FRB-4851	Water	07/30/18 11:05	07/31/18 09:00
320-41647-5	WGNA-073018-RW-3604	Water	07/30/18 11:40	07/31/18 09:00
320-41647-6	WGNA-073018-FRB-3604	Water	07/30/18 11:35	07/31/18 09:00
320-41647-7	WGNA-073018-RW-3529	Water	07/30/18 15:10	07/31/18 09:00
320-41647-8	WGNA-073018-FRB-3529	Water	07/30/18 15:05	07/31/18 09:00
320-41647-9	WGNA-073018-RW-0500	Water	07/30/18 15:40	07/31/18 09:00
320-41647-10	WGNA-073018-FRB-0500	Water	07/30/18 15:35	07/31/18 09:00
320-41647-11	WGNA-073018-RW-3957	Water	07/30/18 15:40	07/31/18 09:00
320-41647-12	WGNA-073018-FRB-3957	Water	07/30/18 15:35	07/31/18 09:00
320-41647-13	WGNA-073018-DUP-42	Water	07/30/18 07:00	07/31/18 09:00



LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Analysis Batch Number: 238604

Lab Sample ID: 320-41647-1 Client Sample ID: NAWC-073018-RW-055

Date Analyzed: 08/08/18 01:38 Lab File ID: 2018.08.07\_537AAA\_039.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	2.02	Missed Peak	barnettj	08/08/18 10:39

Lab Sample ID: 320-41647-3 Client Sample ID: WGNA-073018-RW-4851

Date Analyzed: 08/08/18 01:48 Lab File ID: 2018.08.07\_537AAA\_041.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	1.59	Missed Peak	barnettj	08/08/18 10:40
Perfluoroheptanoic acid (PFHpA)	1.60	Missed Peak	barnettj	08/08/18 10:40

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Analysis Batch Number: 238606

Lab Sample ID: 320-41647-7 Client Sample ID: WGNA-073018-RW-3529

Date Analyzed: 08/08/18 02:16 Lab File ID: 2018.08.07\_537AAA\_047.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	2.02	Missed Peak	barnettj	08/08/18 10:41

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
<b>LC537-ICV_00032</b>	08/15/18	06/23/18	MeOH/H2O, Lot 197626	10 mL	LC537-IS_00074	1000 uL	13C2-PFOA	10 ng/mL
.LC537-IS_00074	12/16/18	06/16/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	28.68 ng/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			LCMPFOS_00024	180 uL	13C4 PFOS	0.1 ug/mL
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C2-PFOA	0.2868 ug/mL
<b>LC537-ICV_00032</b>	08/15/18	06/23/18	MeOH/H2O, Lot 197626	10 mL	LC537-SU_00072	1000 uL	13C2-PFOA	50 ug/mL
					LC537ICIM2_00001	400 uL	13C4 PFOS	47.8 ug/mL
							13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	100.092 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	20.1619 ng/mL
							Perfluorononanoic acid (PFNA)	20.1641 ng/mL
							Perfluorooctanoic acid (PFOA)	20.167 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	20.1702 ng/mL
.LC537-SU_00072	12/16/18	06/16/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LC537ICIM2_00001	08/15/18	02/15/18	Methanol, Lot 090285	10 mL	LC537ICIM_00020	0.5 mL	13C2 PFHxA	50 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	2.5023 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.25 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.504047 ug/mL
							Perfluorononanoic acid (PFNA)	0.504103 ug/mL
							Perfluorooctanoic acid (PFOA)	0.504176 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.504255 ug/mL
..LC537ICIM_00020	08/15/18	02/15/18	Methanol, Lot 090285	25 mL	LC537-PFBS2_00009	0.625 mL	Perfluorobutanesulfonic acid (PFBS)	50.0459 ug/mL
					LC537-PFHxA2_00012	0.0625 mL	Perfluoroheptanoic acid (PFHpA)	5 ug/mL
					LC537-PFHxS2_00009	0.126 mL	Perfluorohexanesulfonic acid (PFHxS)	10.0809 ug/mL
					LC537-PFNA2_00010	0.126 mL	Perfluorononanoic acid (PFNA)	10.0821 ug/mL
					LC537-PFOA2_00011	0.126 mL	Perfluorooctanoic acid (PFOA)	10.0835 ug/mL
					LC537-PFOS2_00011	0.126 mL	Perfluorooctanesulfonic acid (PFOS)	10.0851 ug/mL
...LC537-PFBS2_00009	08/15/18	02/15/18	Methanol, Lot 090285	17.1 mL	LC537_PFBS2_00002	0.0343 g	Perfluorobutanesulfonic acid (PFBS)	2001.84 ug/mL
....LC537_PFBS2_00002	09/08/22	Santa Cruz Biotechnology, Lot F0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	0.998 g/g

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC537-PFHpA2_00012	08/15/18	02/15/18	Methanol, Lot 09092	23.95 mL	LC537_PFHpA2_00002	0.0479 g	Perfluoroheptanoic acid (PFHpA)	2000 ug/mL
....LC537_PFHpA2_00002	06/13/22	Afla Aesar, Lot 10200390			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	1 g/g
...LC537-PFHxS2_00009	08/15/18	02/15/18	Methanol, Lot 090285	25.87 mL	LC537_PFHxS2_00002	0.0569 g	Perfluorohexanesulfonic acid (PFHxS)	2000.19 ug/mL
....LC537_PFHxS2_00002	06/08/22	Santa Cruz Biotechnology, Lot G2516			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA2_00010	08/15/18	02/15/18	Methanol, Lot 090285	16.58 mL	LC537 PFNA2_00002	0.0333 g	Perfluorononanoic acid (PFNA)	2000.41 ug/mL
....LC537 PFNA2_00002	06/14/22	Aldrich, Lot MKCC0699			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.996 g/g
...LC537-PFOA2_00011	08/15/18	02/15/18	Methanol, Lot 090285	22.96 mL	LC537 PFOA2_00002	0.0464 g	Perfluorooctanoic acid (PFOA)	2000.7 ug/mL
....LC537 PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.99 g/g
...LC537-PFOS2_00011	08/15/18	02/15/18	Methanol, Lot 090285	14.71 mL	LC537_PFOS2_00002	0.0378 g	Perfluorooctanesulfonic acid (PFOS)	2001.01 ug/mL
....LC537_PFOS2_00002	06/14/22	Sigma, Lot BCBQ0108V			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.7787 g/g
<b>LC537-IS_00077</b>	01/05/19	07/16/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
.LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
<b>LC537-L1_00022</b>	09/30/18	04/02/18	MeOH/H2O, Lot 090285	5 mL	LC537-IS_00065	500 uL	13C2-PFOA	10 ng/mL
					LC537-MSP_00033	60 uL	13C4 PFOS	28.68 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	8.99912 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.96 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	3.003 ng/mL
							Perfluorononanoic acid (PFNA)	1.98 ng/mL
							Perfluorooctanoic acid (PFOA)	1.98 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	3.95328 ng/mL
					LC537-SU_00064	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-MSP_00033	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	509 uL	Perfluorobutanesulfonic acid (PFBS)	749.927 ng/mL
					LCPFHpA_00009	48 uL	Perfluoroheptanoic acid (PFHpA)	80 ng/mL
					LCPFHxS-br_00005	165 uL	Perfluorohexanesulfonic acid (PFHxS)	250.25 ng/mL
					LCPFNA_00009	99 uL	Perfluorononanoic acid (PFNA)	165 ng/mL
					LCPFOA_00010	99 uL	Perfluorooctanoic acid (PFOA)	165 ng/mL
					LCPFOS-br_00005	213 uL	Perfluorooctanesulfonic acid (PFOS)	329.44 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFDA	50 ug/mL
					(Purchased Reagent)		13C2 PFHxA	50 ug/mL
<b>LC537-L2_00022</b>	09/30/18	04/02/18	MeOH/H2O, Lot 090285	20 mL	LC537-HSP_00028	320 uL	Perfluorobutanesulfonic acid (PFBS)	20.0138 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.16 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	6.72187 ng/mL
							Perfluorononanoic acid (PFNA)	4.4 ng/mL
							Perfluorooctanoic acid (PFOA)	4.4 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	8.78507 ng/mL
					LC537-IS_00065	2 mL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00064	2 mL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00028	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid (PFBS)	1250.86 ng/mL
					LCPFHpA_00009	81 uL	Perfluoroheptanoic acid (PFHpA)	135 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid (PFHxS)	420.117 ng/mL
					LCPFNA_00009	165 uL	Perfluorononanoic acid (PFNA)	275 ng/mL
					LCPFOA_00010	165 uL	Perfluorooctanoic acid (PFOA)	275 ng/mL
					LCPFOS-br_00005	355 uL	Perfluorooctanesulfonic acid (PFOS)	549.067 ng/mL
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
LC537-L4_00022	09/30/18	04/02/18	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00028	360 uL	Perfluorobutanesulfonic acid (PFBS)	90.0619 ng/mL		
							Perfluoroheptanoic acid (PFHpA)	9.72 ng/mL		
							Perfluorohexanesulfonic acid (PFHxS)	30.2484 ng/mL		
							Perfluorononanoic acid (PFNA)	19.8 ng/mL		
							Perfluorooctanoic acid (PFOA)	19.8 ng/mL		
							Perfluorooctanesulfonic acid (PFOS)	39.5328 ng/mL		
LC537-IS_00065					LC537-IS_00065	500 uL	13C2-PFOA	10 ng/mL		
							13C4 PFOS	28.68 ng/mL		
							13C2 PFDA	10 ng/mL		
LC537-SU_00064					LC537-SU_00064	500 uL	13C2 PFHxA	10 ng/mL		
LC537-HSP_00028	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid (PFBS)	1250.86 ng/mL		
							LCPFHpA_00009	81 uL	Perfluoroheptanoic acid (PFHpA)	135 ng/mL
							LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid (PFHxS)	420.117 ng/mL
							LCPFNA_00009	165 uL	Perfluorononanoic acid (PFNA)	275 ng/mL
							LCPFOA_00010	165 uL	Perfluorooctanoic acid (PFOA)	275 ng/mL
							LCPFOS-br_00005	355 uL	Perfluorooctanesulfonic acid (PFOS)	549.067 ng/mL
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL		
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL		
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL		
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL		
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL		
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL		
LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL		
							LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL		
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL		
LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL		
							LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL		
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL		
LC537-L5_00026	09/30/18	04/02/18	MeOH/H2O, Lot 090285	20 mL	LC537-HSP_00028	2160 uL	Perfluorobutanesulfonic acid (PFBS)	135.093 ng/mL		
							Perfluoroheptanoic acid (PFHpA)	14.58 ng/mL		
							Perfluorohexanesulfonic acid (PFHxS)	45.3726 ng/mL		
							Perfluorononanoic acid (PFNA)	29.7 ng/mL		

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanoic acid (PFOA)	29.7 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	59.2992 ng/mL
					LC537-IS_00065	2 mL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00064	2 mL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00028	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid (PFBS)	1250.86 ng/mL
					LCPFHpA_00009	81 uL	Perfluoroheptanoic acid (PFHpA)	135 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid (PFHxS)	420.117 ng/mL
					LCPFNA_00009	165 uL	Perfluorononanoic acid (PFNA)	275 ng/mL
					LCPFOA_00010	165 uL	Perfluorooctanoic acid (PFOA)	275 ng/mL
					LCPFOS-br_00005	355 uL	Perfluorooctanesulfonic acid (PFOS)	549.067 ng/mL
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
<b>LC537-L6_00022</b>	09/30/18	04/02/18	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00028	720 uL	Perfluorobutanesulfonic acid (PFBS)	180.124 ng/mL
							Perfluoroheptanoic acid (PFHpA)	19.44 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	60.4968 ng/mL
							Perfluorononanoic acid (PFNA)	39.6 ng/mL
							Perfluorooctanoic acid (PFOA)	39.6 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	79.0656 ng/mL
					LC537-IS_00065	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00064	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL



REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LC537-HSP_00028	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid (PFBS)	1250.86 ng/mL
					LCPFHpA_00009	81 uL	Perfluoroheptanoic acid (PFHpA)	135 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid (PFHxS)	420.117 ng/mL
					LCPFNA_00009	165 uL	Perfluorononanoic acid (PFNA)	275 ng/mL
					LCPFOA_00010	165 uL	Perfluorooctanoic acid (PFOA)	275 ng/mL
					LCPFOS-br_00005	355 uL	Perfluorooctanesulfonic acid (PFOS)	549.067 ng/mL
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
<b>LC537-LSP_00032</b>	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	153 uL	Perfluorobutanesulfonic acid (PFBS)	225.42 ng/mL
					LCPFHpA_00009	15 uL	Perfluoroheptanoic acid (PFHpA)	25 ng/mL
					LCPFHxS-br_00005	50 uL	Perfluorohexane Sulfonate	75.8333 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	75.8333 ng/mL
					LCPFNA_00009	30 uL	Perfluorononanoic acid (PFNA)	50 ng/mL
					LCPFOA_00010	30 uL	Perfluorooctanoic acid (PFOA)	50 ng/mL
LCPFOS-br_00005	65 uL	Perfluorooctanesulfonic acid (PFOS)	100.533 ng/mL					
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117		(Purchased Reagent)		Perfluorohexane Sulfonate	45.5 ug/mL	
						Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL	
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

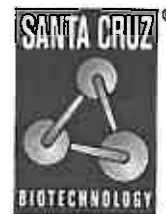
Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFOS-br_00005	01/12/22		Wellington Laboratories, Lot brPFOSK0117		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
<b>LC537-SU_00075</b>	01/05/19	07/16/18	Methanol, Lot 104453	30000 uL	LCMPFDA 00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA 00015	60 uL	13C2 PFHxA	0.1 ug/mL
.LCMPFDA 00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFHxA 00015	11/22/21		Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFHxA	50 ug/mL

Reagent

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**LC537\_PFB2\_00002**

P: 6.8.17 SW



# CERTIFICATE OF ANALYSIS

*The Power to Question*

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

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

Reagent

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**LC537\_PFHpA2\_00002**

# Certificate of analysis

R:6.13.17 SW

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

PFHpA

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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SCIENTIFIC

Reagent

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**LC537\_PFHxS2\_00002**

n: 6-E-17SKV

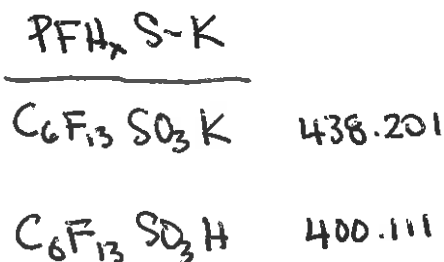


The Future is Custom

# 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 =  $\frac{400.11}{438.201} = 0.91307$  PFH<sub>2</sub>S  
 cas# 355-46-4

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

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



Reagent

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**LC537\_PFN2\_00002**

P: 6.14.17 SKW

3050 Spruce Street, Saint Louis, MO 63103, USA  
Website: [www.sigmaaldrich.com](http://www.sigmaaldrich.com)  
Email USA: [techserv@sial.com](mailto:techserv@sial.com)  
Outside USA: [eurtechserv@sial.com](mailto: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: C<sub>9</sub>HF<sub>17</sub>O<sub>2</sub>  
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

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**LC537\_PFOA2\_00002**

# Certificate of analysis

P: 6/9/17 

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

PFOA

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

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Reagent

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**LC537\_PFOs2\_00002**

N: 6.14.17 SKV

**Certificate of Analysis**

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

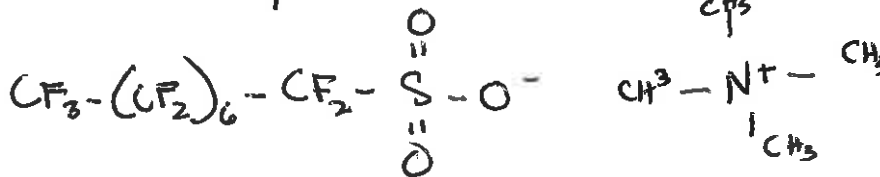
TEST	SPECIFICATION	RESULT
APPEARANCE (COLOR)	WHITE TO OFF WHITE	OFF-WHITE
APPEARANCE (FORM)	POWDER OR POWDER WITH CHUNK(S)	POWDER
CARBON CONTENT	29.77 % - 31.29 %	29.97 %
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS

*Claudia Geitner*

Dr. Claudia Geitner  
 Manager Quality Control  
 Buchs, Switzerland

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

Purity & MW correction = 77.87%



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

Reagent

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**LCM2PFOA\_00010**

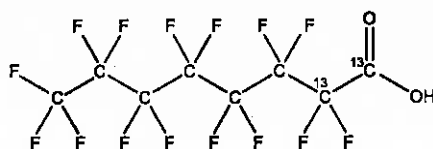


# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** M2PFOA **LOT NUMBER:** M2PFOA0216  
**COMPOUND:** Perfluoro-n-[1,2-<sup>13</sup>C<sub>2</sub>]octanoic acid

**STRUCTURE:** **CAS #:** Not available



**MOLECULAR FORMULA:** <sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>8</sub>HF<sub>16</sub>O<sub>2</sub>  
**CONCENTRATION:** 50 ± 2.5 µg/ml

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

**CHEMICAL PURITY:** >98%

**ISOTOPIC PURITY:** ≥99% <sup>13</sup>C  
 (1,2-<sup>13</sup>C<sub>2</sub>)

**LAST TESTED:** (mm/dd/yyyy) 02/12/2016

**EXPIRY DATE:** (mm/dd/yyyy) 02/12/2021

**RECOMMENDED STORAGE:** Store ampoule in a cool, dark place

### DOCUMENTATION/ DATA ATTACHED:


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

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

### ADDITIONAL INFORMATION:

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

**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:**

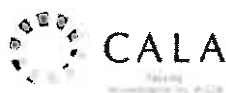
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**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.

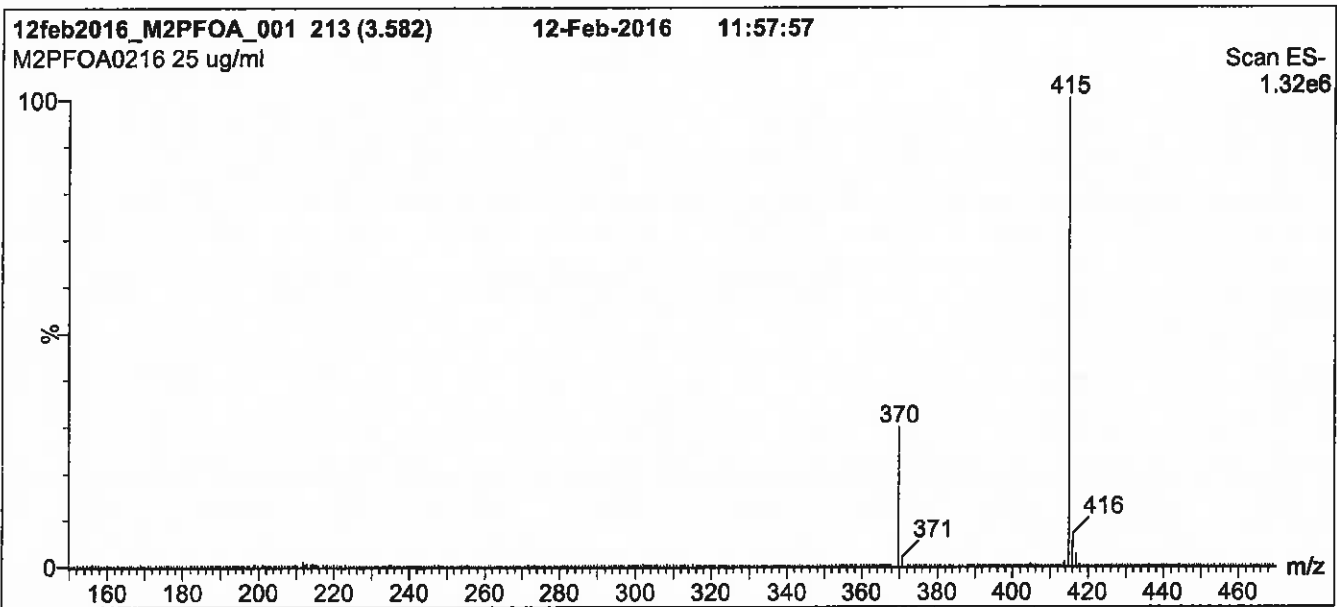
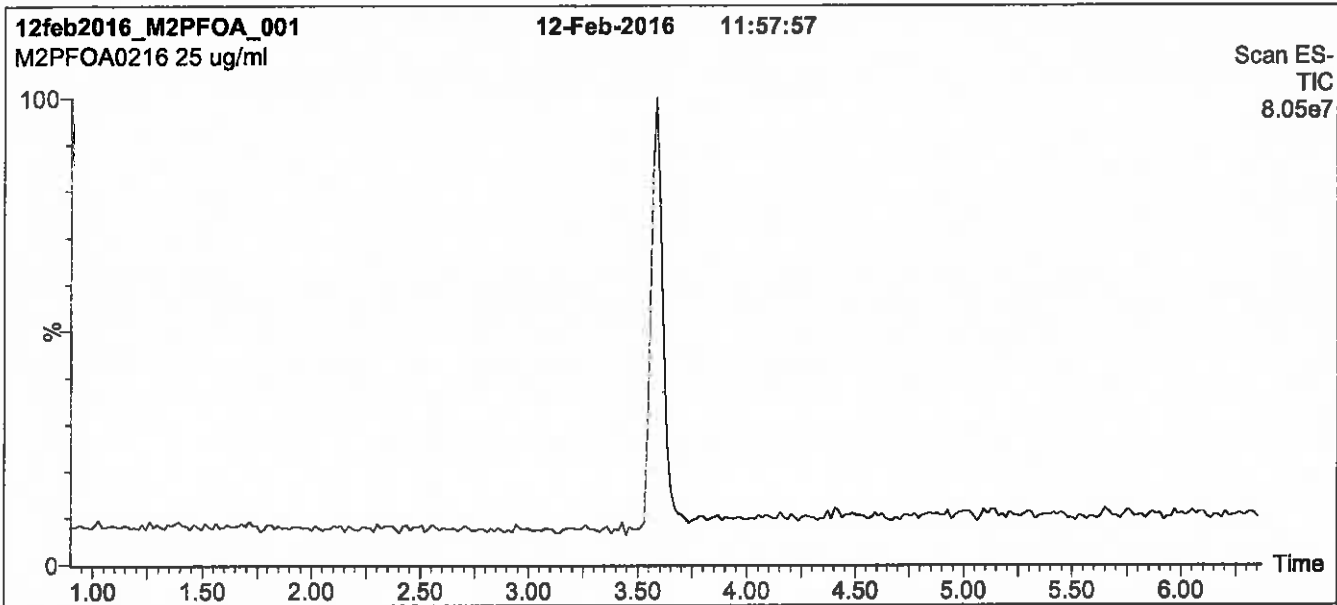
**QUALITY MANAGEMENT:**

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](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto: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 RP<sub>18</sub>  
 1.7  $\mu$ m, 2.1 x 100 mm

**Mobile phase:** Gradient  
 Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
 (both with 10 mM NH<sub>4</sub>OAc 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

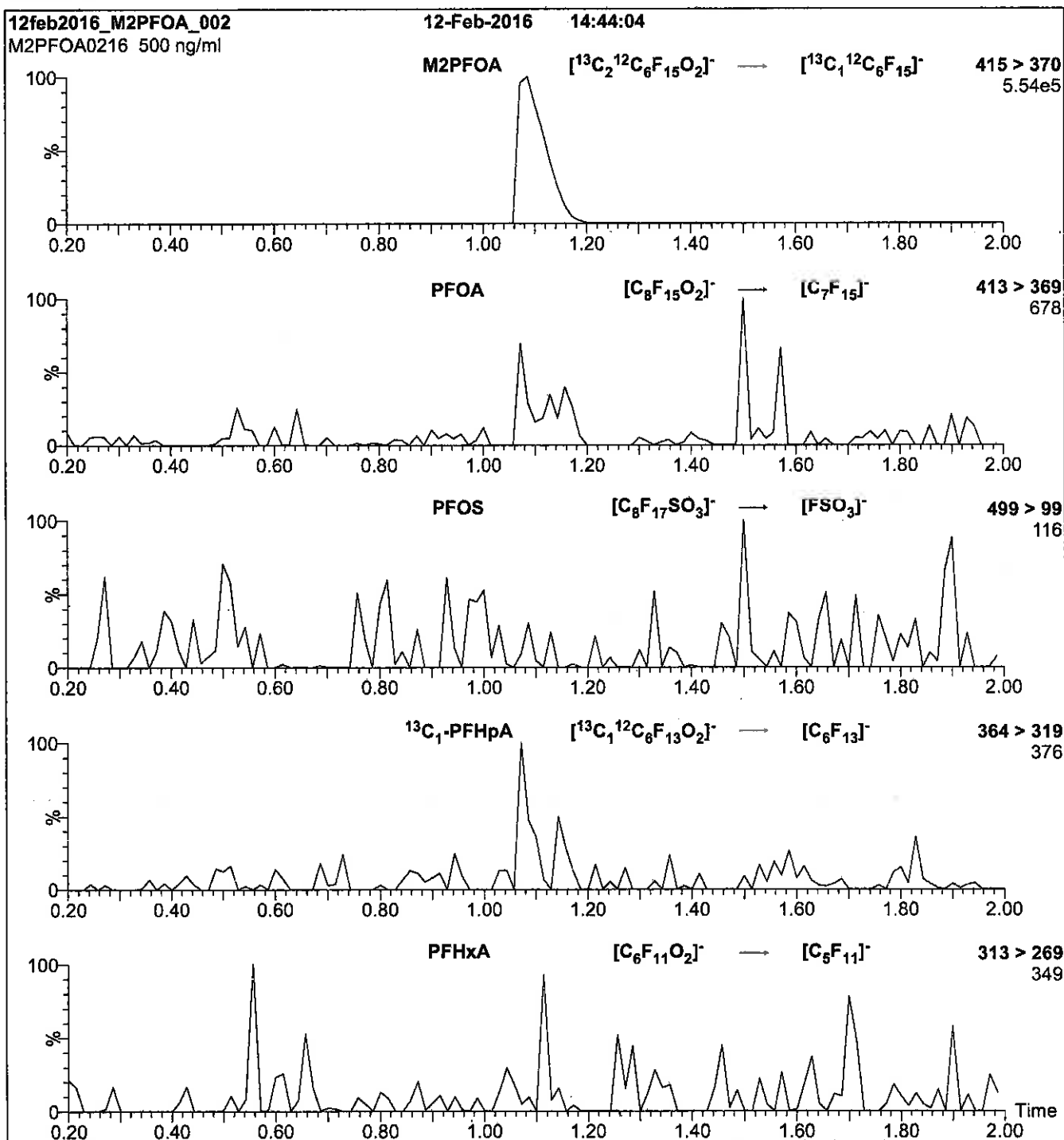
**Flow:** 300  $\mu$ l/min

**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  $\mu\text{l}$  (500 ng/ml M2PFOA)

**Mobile phase:** Isocratic 80% MeOH / 20%  $\text{H}_2\text{O}$

**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: LCMFDA\_00012

Exp: 09/30/21 Prpd: SBC

13C2-Perfluorodecanoic a



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

MPFDA

**LOT NUMBER:**

MPFDA0916

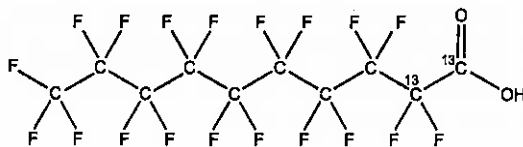
**COMPOUND:**

Perfluoro-n-[1,2-<sup>13</sup>C<sub>2</sub>]decanoic acid

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

<sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>8</sub>HF<sub>19</sub>O<sub>2</sub>

**MOLECULAR WEIGHT:**

516.07

**CONCENTRATION:**

50 ± 2.5 µg/ml

**SOLVENT(S):**

Methanol  
Water (<1%)

**CHEMICAL PURITY:**

>98%

**ISOTOPIC PURITY:**

≥99% <sup>13</sup>C  
(1,2-<sup>13</sup>C<sub>2</sub>)

**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 <sup>13</sup>C<sub>1</sub>-PFNA.

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

Certified By:

B.G. Chrftim

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:**

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.

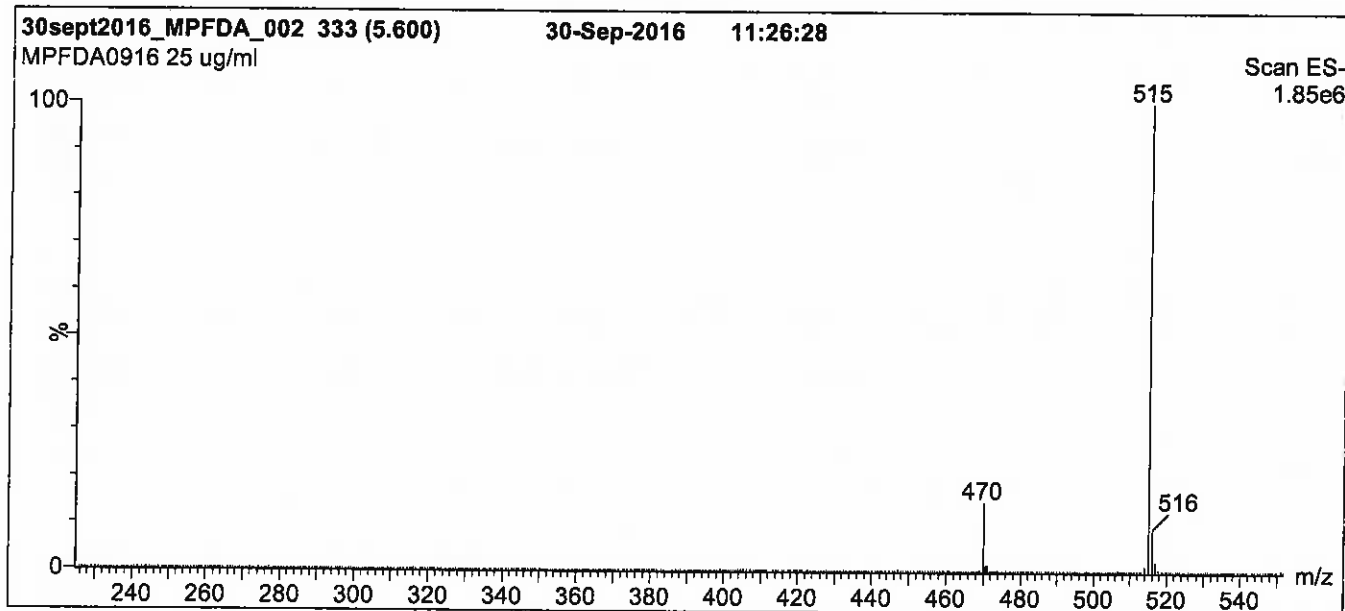
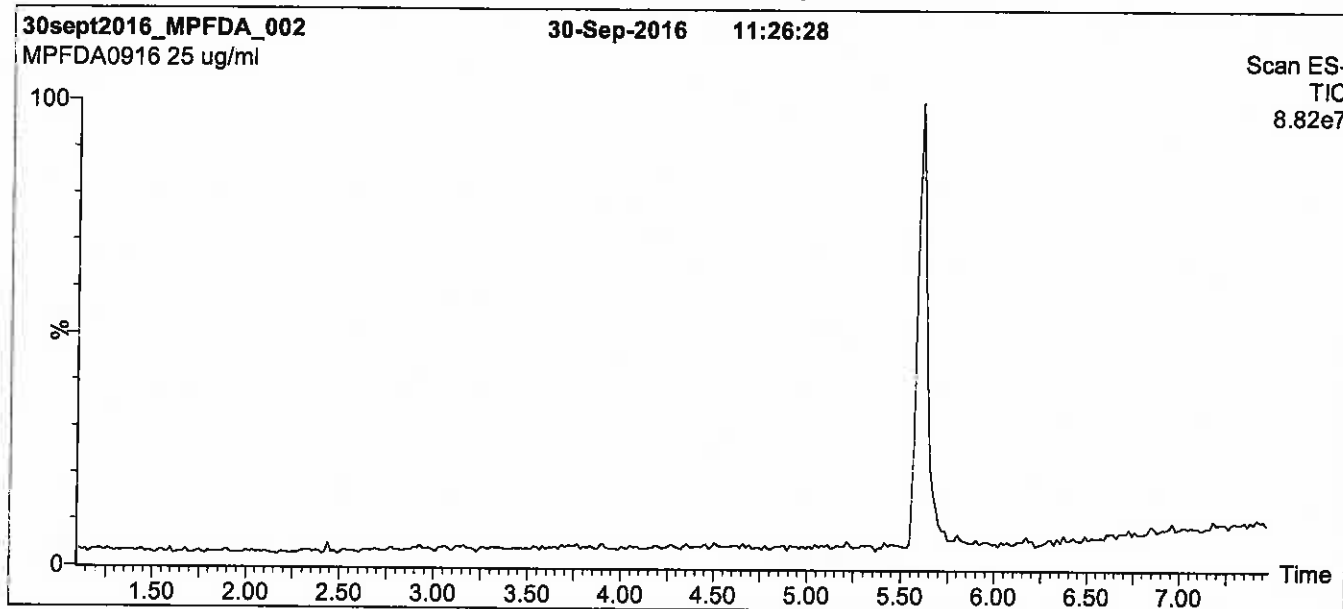
### **QUALITY MANAGEMENT:**

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](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto:info@well-labs.com)\*\*

**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 RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

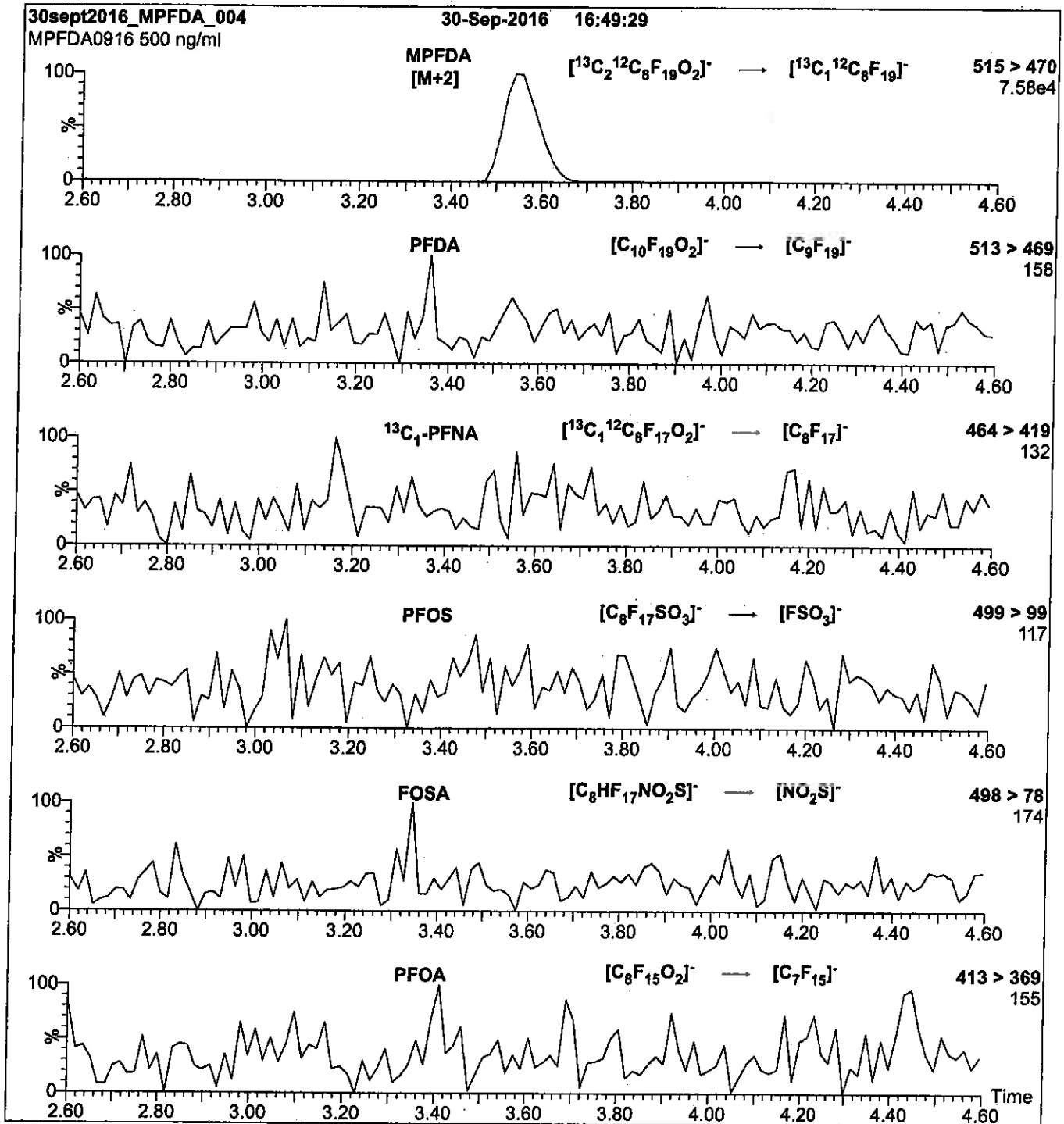
Mobile phase: Gradient  
Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 90% organic over 7 min and hold for 1.5 min  
before returning to initial conditions in 0.5 min.  
Time: 10 min

Flow: 300  $\mu$ 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  $\mu$ l (500 ng/ml MPFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)

Flow: 300  $\mu$ l/min

**MS Parameters**

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



Reagent

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**LCMPFHxA\_00015**

r: 5/17/17 SKJ



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

MPFHxA

**LOT NUMBER:**

MPFHxA1116

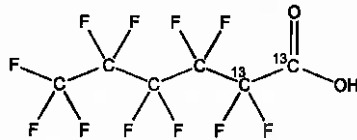
**COMPOUND:**

Perfluoro-n-[1,2-<sup>13</sup>C<sub>2</sub>]hexanoic acid

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

<sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>4</sub>HF<sub>11</sub>O<sub>2</sub>

**MOLECULAR WEIGHT:**

316.04

**CONCENTRATION:**

50 ± 2.5 µg/ml

**SOLVENT(S):**

Methanol  
Water (<1%)

**CHEMICAL PURITY:**

>98%

**ISOTOPIC PURITY:**

≥99%<sup>13</sup>C  
(1,2-<sup>13</sup>C<sub>2</sub>)

**LAST TESTED:** (mm/dd/yyyy)

11/22/2016

**EXPIRY DATE:** (mm/dd/yyyy)

11/22/2021

**RECOMMENDED STORAGE:**

Store ampoule in a cool, dark place

**DOCUMENTATION/ DATA ATTACHED:**

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

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

**ADDITIONAL INFORMATION:**

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

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

Certified By:

B.G. Chittim

Date: 12/13/2016

(mm/dd/yyyy)

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

### **INTENDED USE:**

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

### **HAZARDS:**

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### **SYNTHESIS / CHARACTERIZATION:**

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### **HOMOGENEITY:**

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

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

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:**

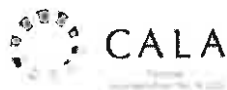
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

### **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.

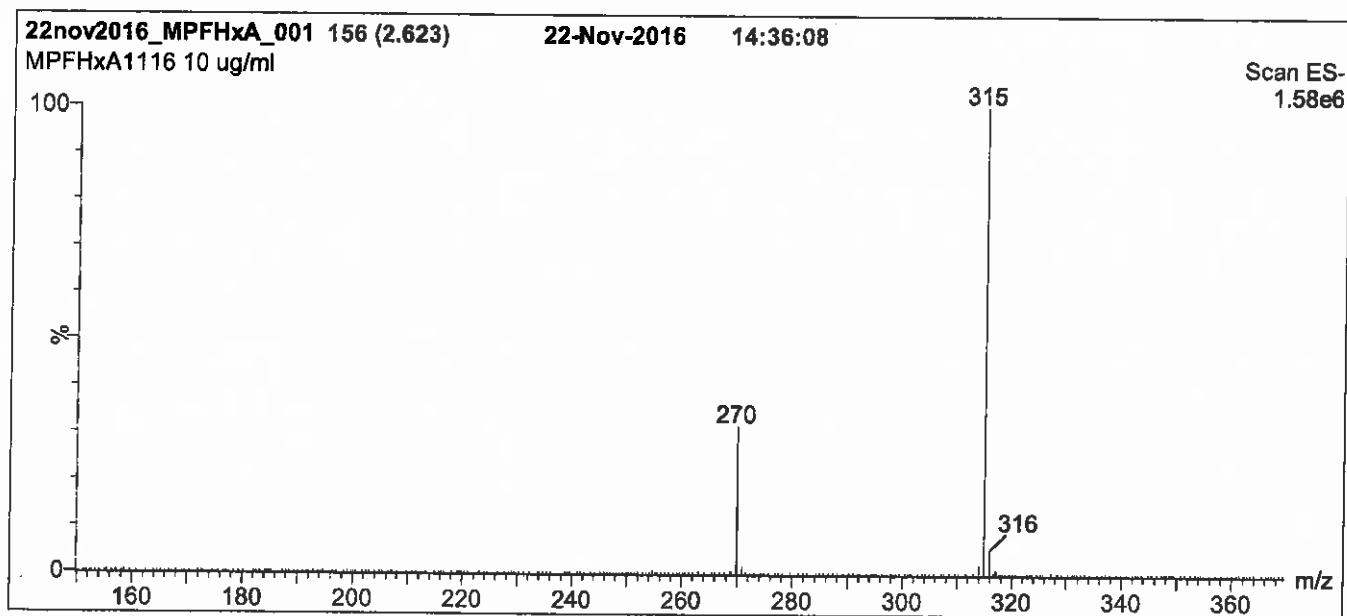
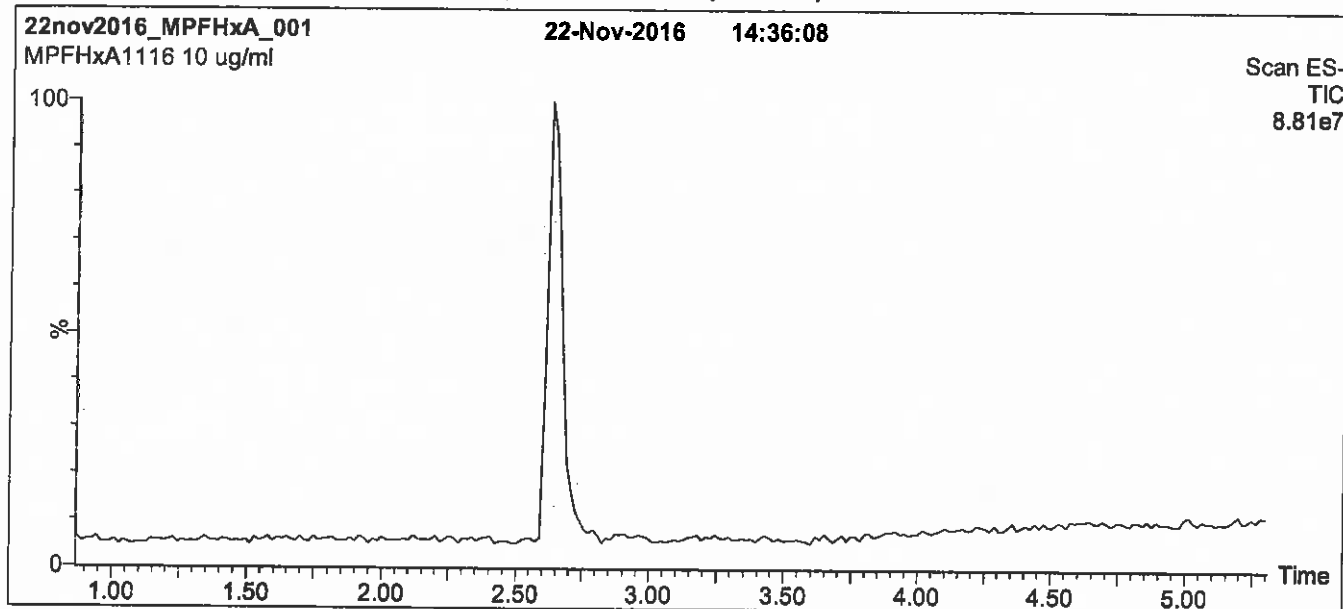
### **QUALITY MANAGEMENT:**

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](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto: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 RP<sub>ss</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient  
Start: 40% (80:20 MeOH:ACN) / 60% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 90% organic over 7 min and hold for 2 min  
before returning to initial conditions over 0.5 min.  
Time: 10 min

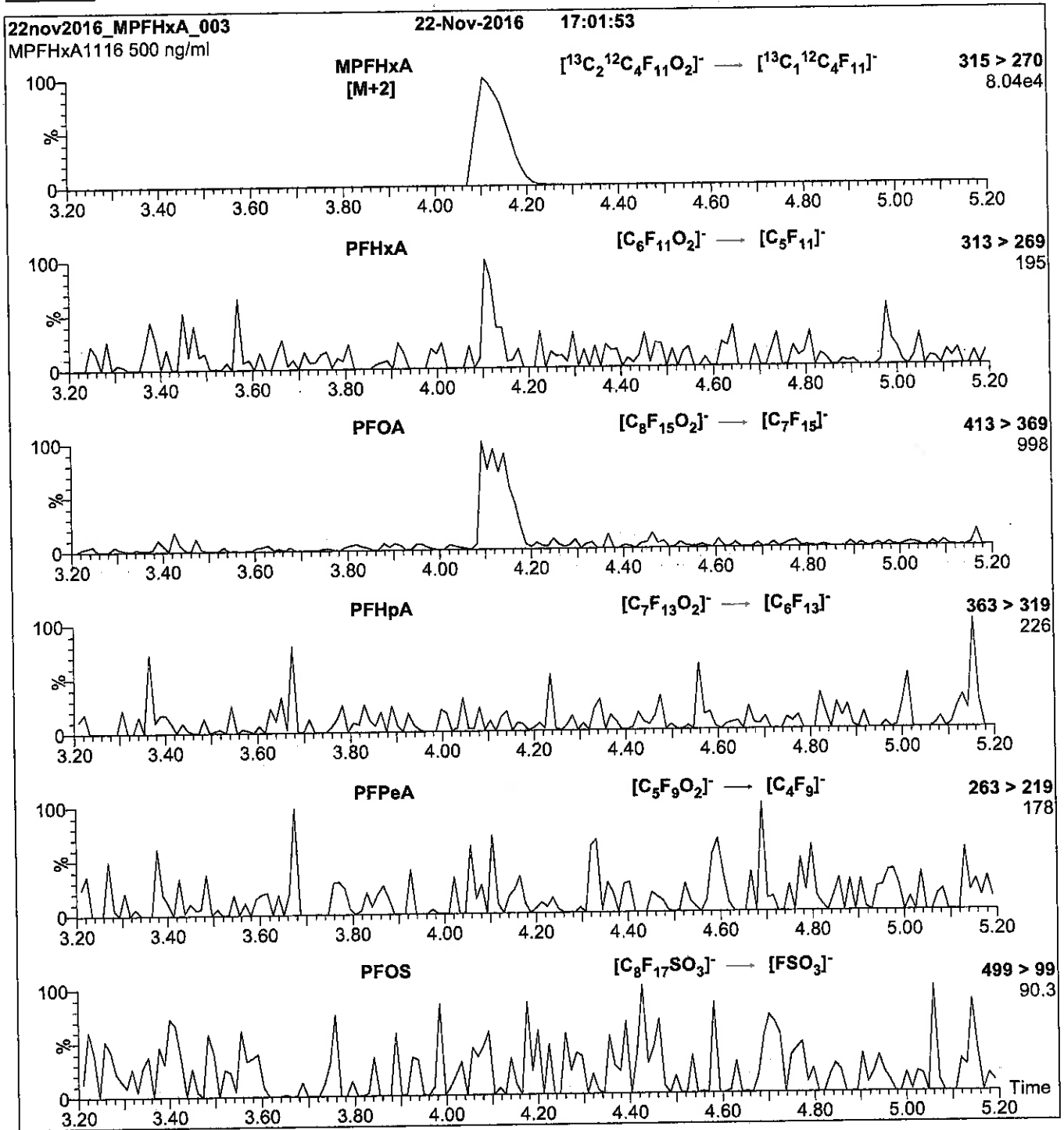
Flow: 300  $\mu$ l/min

**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  $\mu$ l (500 ng/ml MPFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O  
 (both with 10 mM NH<sub>4</sub>OAc buffer)

Flow: 300  $\mu$ l/min

**MS Parameters**

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

Reagent

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**LCMPFOS\_00024**

r: skln skj

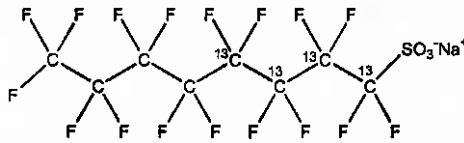


# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** MPFOS **LOT NUMBER:** MPFOS0517  
**COMPOUND:** Sodium perfluoro-1-[1,2,3,4-<sup>13</sup>C<sub>4</sub>]octanesulfonate

**STRUCTURE:** **CAS #:** Not available



<b>MOLECULAR FORMULA:</b>	<sup>13</sup> C <sub>4</sub> <sup>12</sup> C <sub>4</sub> F <sub>17</sub> SO <sub>3</sub> Na	<b>MOLECULAR WEIGHT:</b>	526.08
<b>CONCENTRATION:</b>	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	<b>SOLVENT(S):</b>	Methanol
<b>CHEMICAL PURITY:</b>	>98%	<b>ISOTOPIC PURITY:</b>	≥99% <sup>13</sup> C (1,2,3,4- <sup>13</sup> C <sub>4</sub> )
<b>LAST TESTED:</b> (mm/dd/yyyy)	05/19/2017		
<b>EXPIRY DATE:</b> (mm/dd/yyyy)	05/19/2022		
<b>RECOMMENDED STORAGE:</b>	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-<sup>13</sup>C<sub>3</sub>]heptanesulfonate.

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

**Certified By:**  **Date:** 05/30/2017  
B.G. Chittim, General Manager (mm/dd/yyyy)

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

### **INTENDED USE:**

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### **HAZARDS:**

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### **HOMOGENEITY:**

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### **UNCERTAINTY:**

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

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

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

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

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

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### **EXPIRY DATE / PERIOD OF VALIDITY:**

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

### **LIMITED WARRANTY:**

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### **QUALITY MANAGEMENT:**

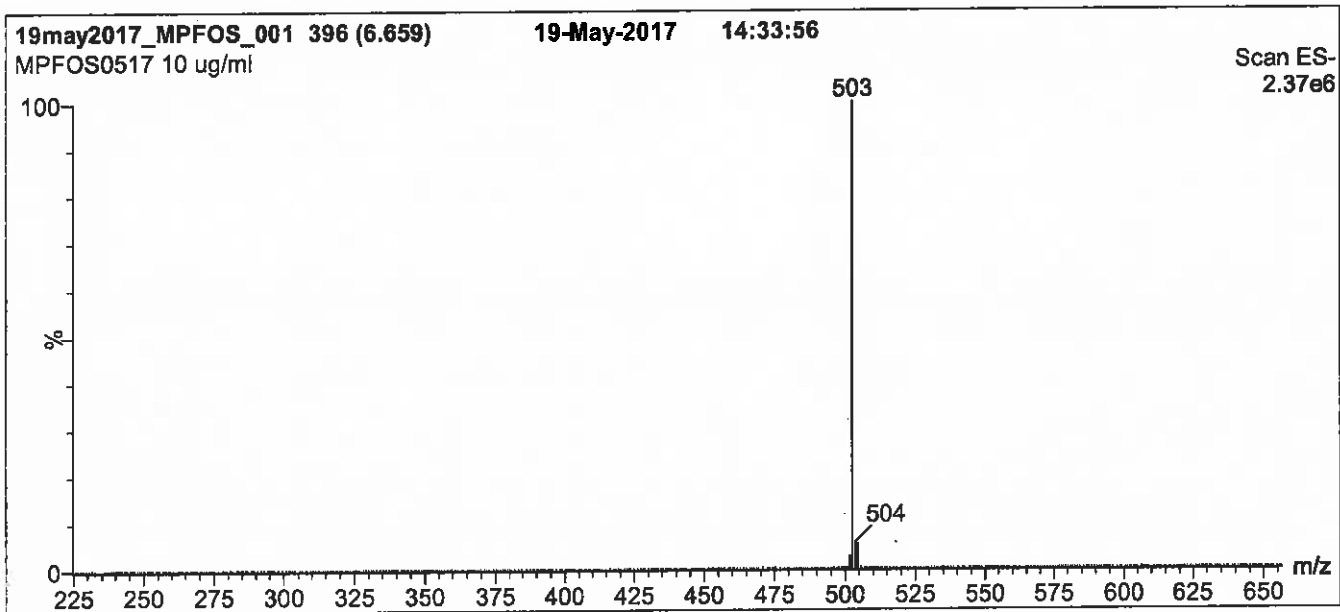
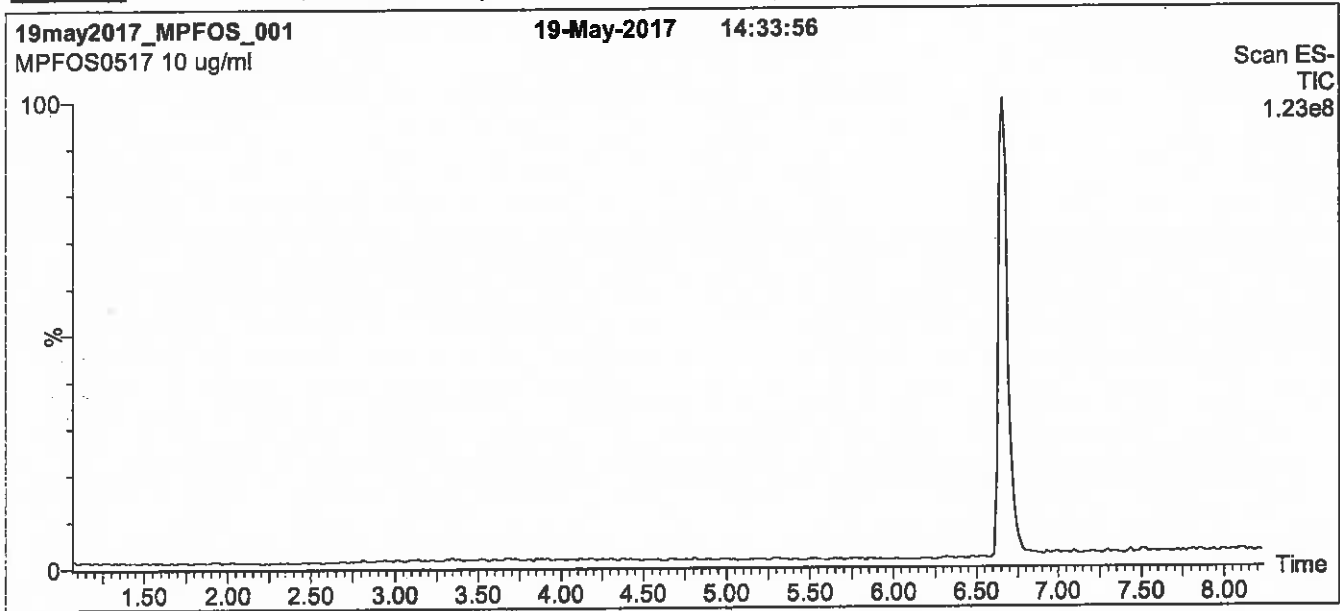
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at [www.well-labs.com](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto:info@well-labs.com)\*\*



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



**Conditions for Figure 1:**

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

**Chromatographic Conditions**

**Column:** Acquity UPLC BEH Shield RP<sub>18</sub>  
 1.7  $\mu$ m, 2.1 x 100 mm

**Mobile phase:** Gradient  
 Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
 (both with 10 mM NH<sub>4</sub>OAc buffer)  
 Ramp to 90% organic over 8 min and hold for 1 min  
 before returning to initial conditions in 0.5 min.  
 Time: 10 min

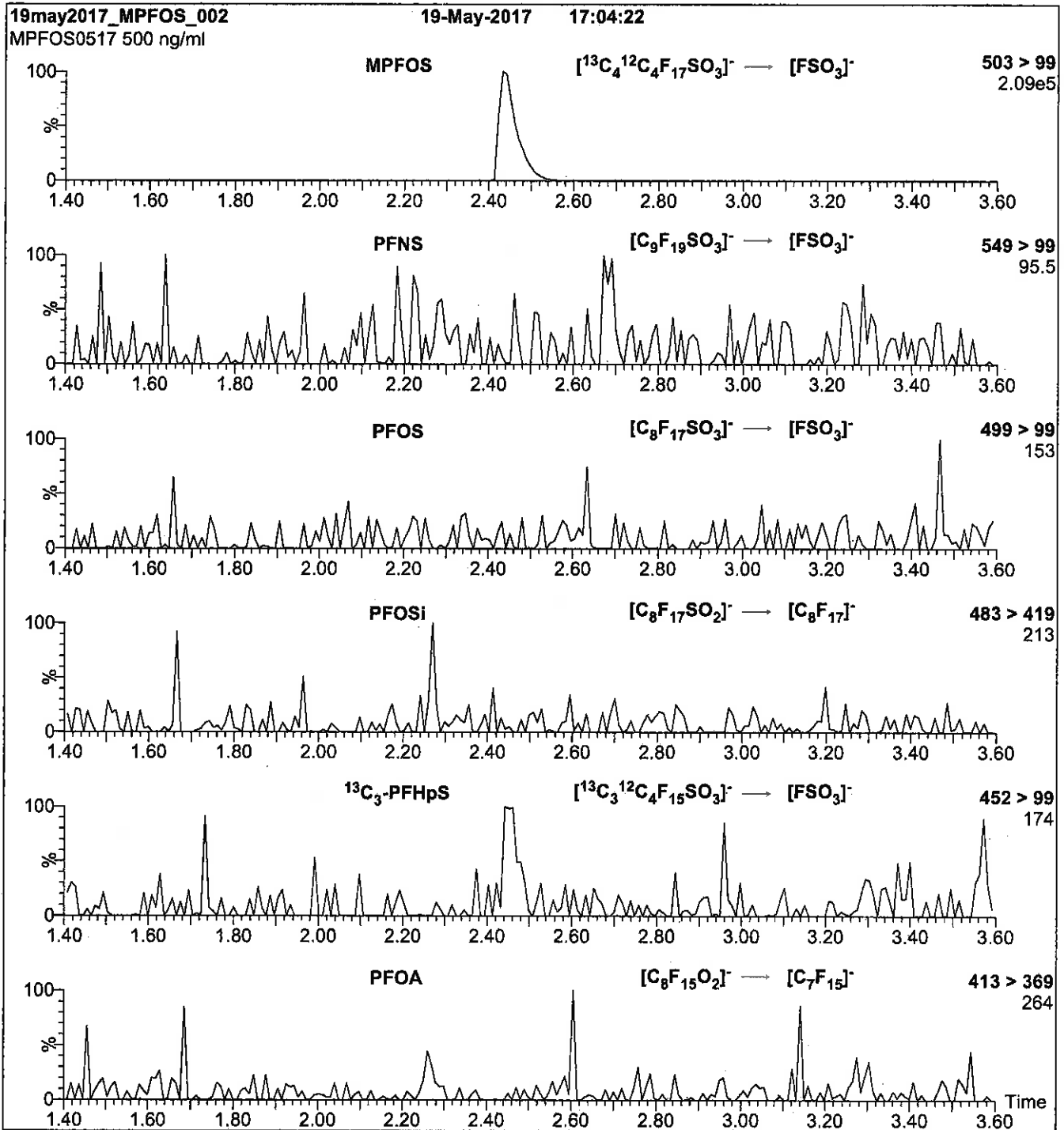
**Flow:** 300  $\mu$ l/min

**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  $\mu\text{l}$  (500 ng/ml MPFOS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20%  $\text{H}_2\text{O}$   
 (both with 10 mM  $\text{NH}_4\text{OAc}$  buffer)

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

**MS Parameters**

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

Reagent

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**LCPFBSA\_00002**

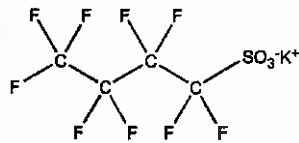
n: 12/17 SKW



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** L-PFBS      **LOT NUMBER:** LPFBS1116  
**COMPOUND:** Potassium perfluoro-1-butanesulfonate  
**STRUCTURE:**      **CAS #:** 29420-49-3



**MOLECULAR FORMULA:** C<sub>4</sub>F<sub>9</sub>SO<sub>3</sub>K      **MOLECULAR WEIGHT:** 338.19  
**CONCENTRATION:** 50.0 ± 2.5 µg/ml (K salt)      **SOLVENT(S):** Methanol  
44.2 ± 2.2 µg/ml (PFBS anion)  
**CHEMICAL PURITY:** >98%  
**LAST TESTED:** (mm/dd/yyyy) 12/02/2016  
**EXPIRY DATE:** (mm/dd/yyyy) 12/02/2021  
**RECOMMENDED STORAGE:** Store ampoule in a cool, dark place

**DOCUMENTATION/ DATA ATTACHED:**

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

**ADDITIONAL INFORMATION:**

• See page 2 for further details.

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

**Certified By:**  **Date:** 12/05/2016  
B.G. Chittim (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.

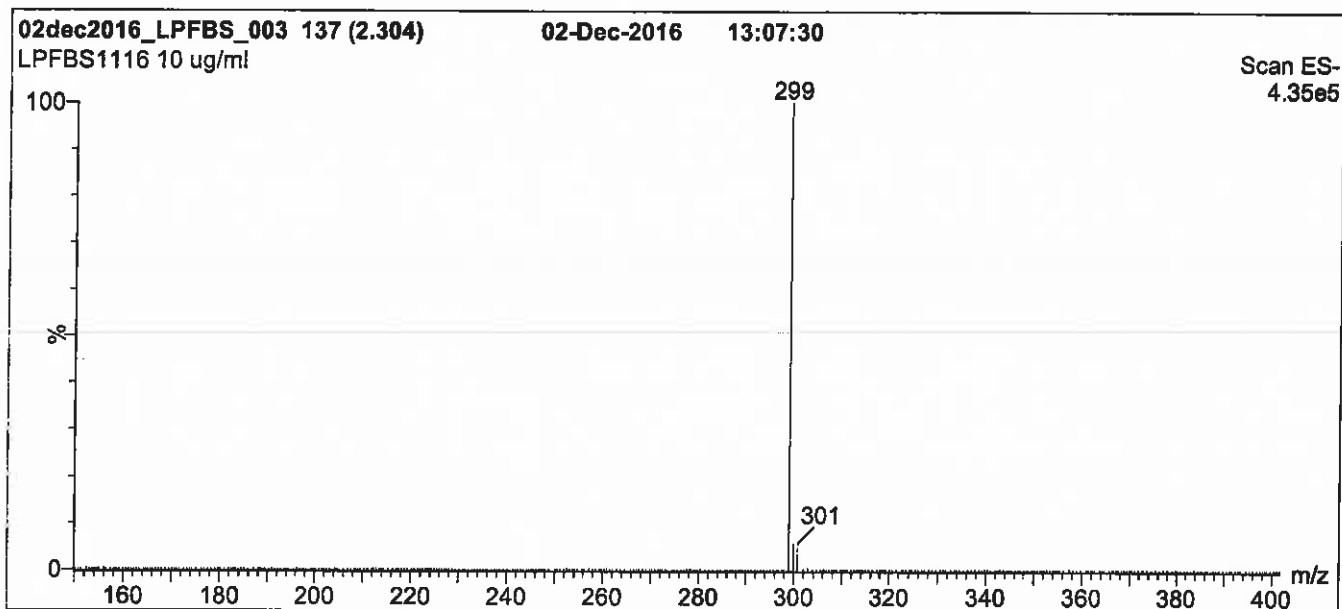
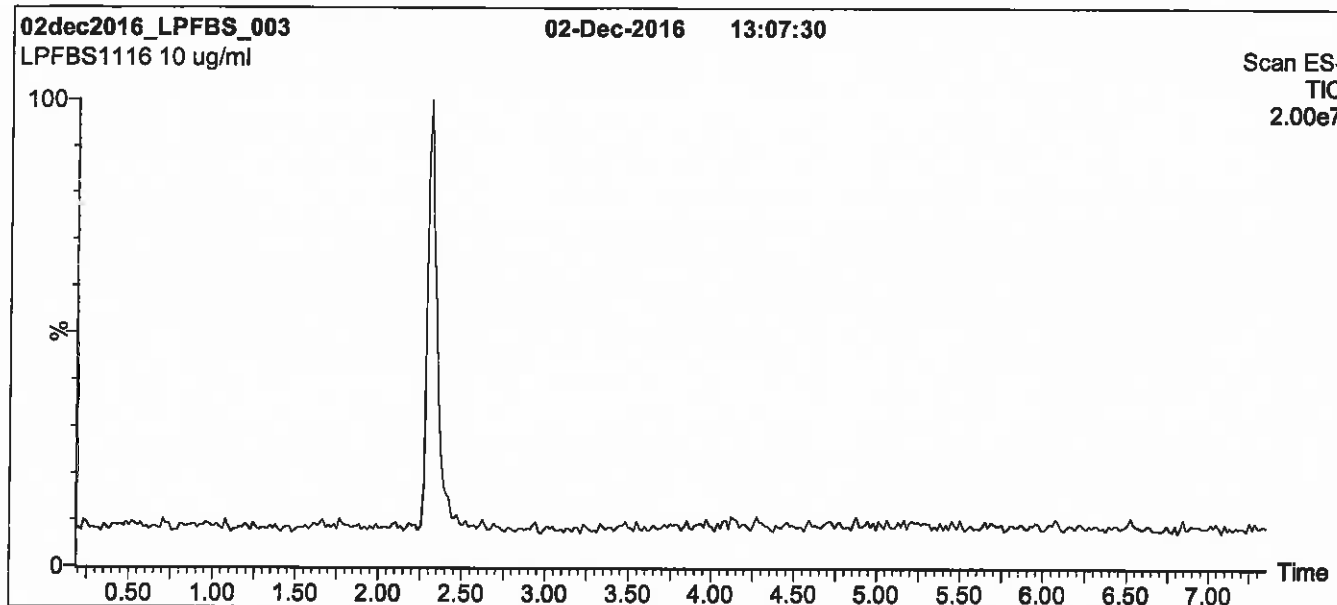
### **QUALITY MANAGEMENT:**

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](http://www.well-labs.com) or contact us directly at [Info@well-labs.com](mailto:Info@well-labs.com)\*\*

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



**Conditions for Figure 1:**

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

**Chromatographic Conditions**

**Column:** Acquity UPLC BEH Shield RP<sub>18</sub>,  
 1.7  $\mu$ m, 2.1 x 100 mm

**Mobile phase:** Gradient  
 Start: 40% (80:20 MeOH:ACN) / 60% H<sub>2</sub>O  
 (both with 10 mM NH<sub>4</sub>OAc buffer)  
 Ramp to 90% organic over 7 min and hold for 2 min  
 before returning to initial conditions in 0.5 min.  
 Time: 10 min

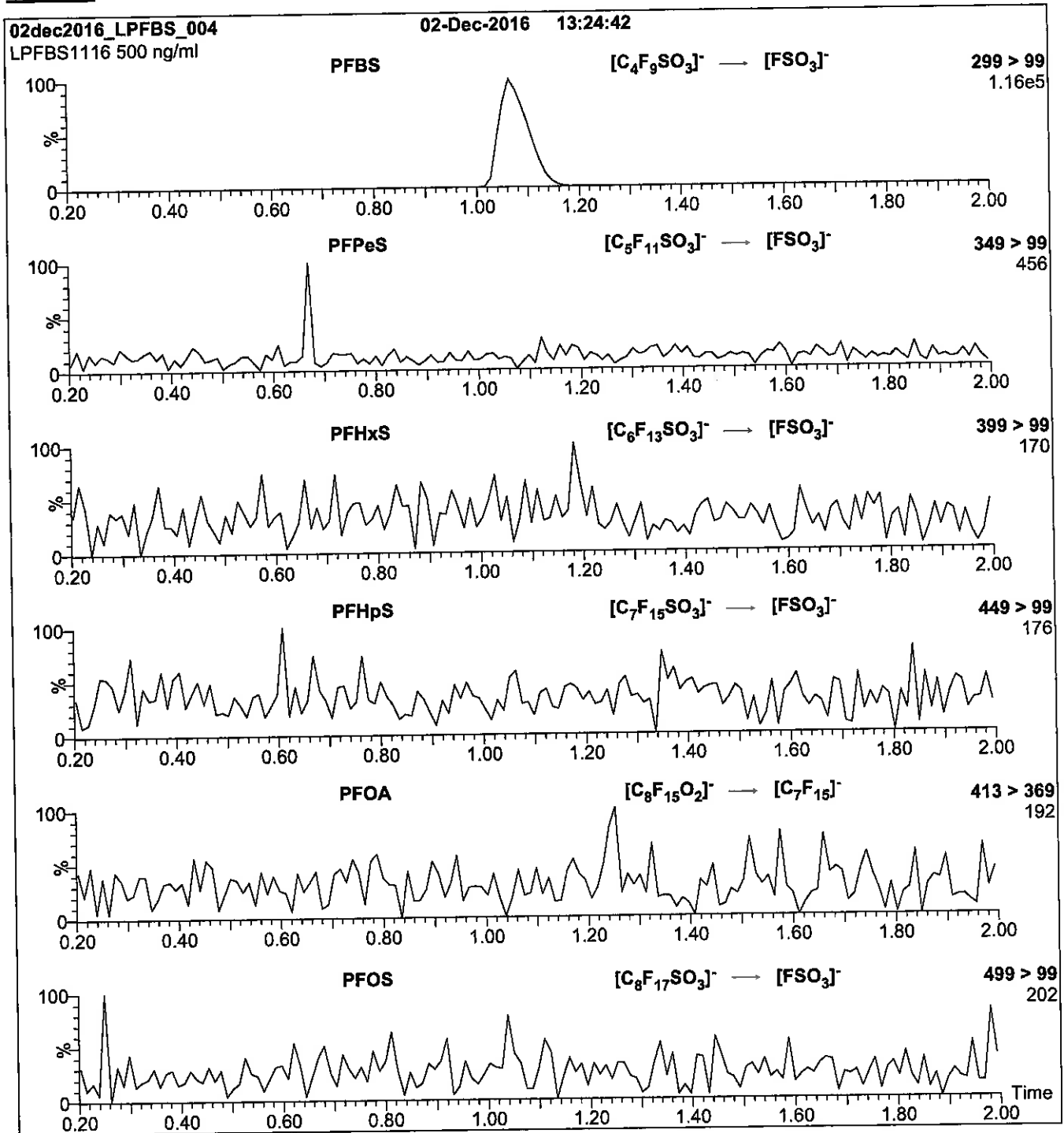
**Flow:** 300  $\mu$ l/min

**MS Parameters**

**Experiment:** Full Scan (150 - 850 amu)

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

**Figure 2: L-PFBS; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

**Injection:** Direct loop injection  
 10  $\mu$ l (500 ng/ml L-PFBS)

**Mobile phase:** Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O  
 (both with 10 mM NH<sub>4</sub>OAc buffer)

**Flow:** 300  $\mu$ l/min

**MS Parameters**

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

Reagent

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**LCPFHpA\_00009**





**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:**

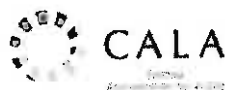
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**LIMITED WARRANTY:**

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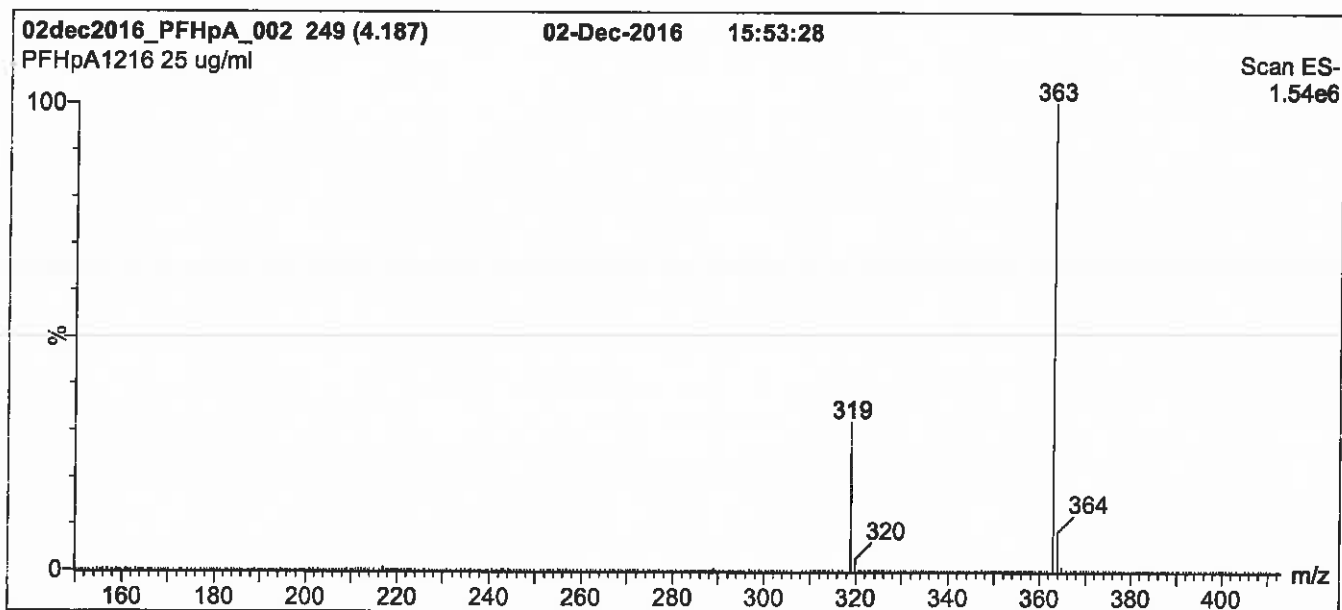
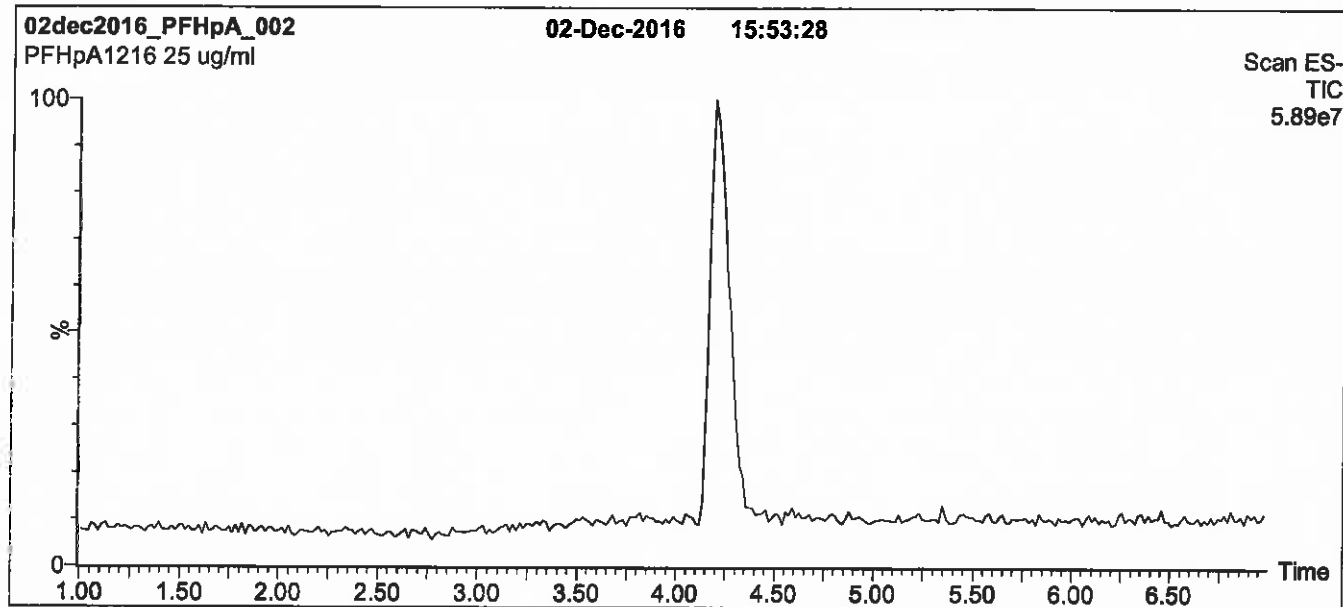
**QUALITY MANAGEMENT:**

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



**Conditions for Figure 1:**

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

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
 1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient  
 Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
 (both with 10 mM NH<sub>4</sub>OAc 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

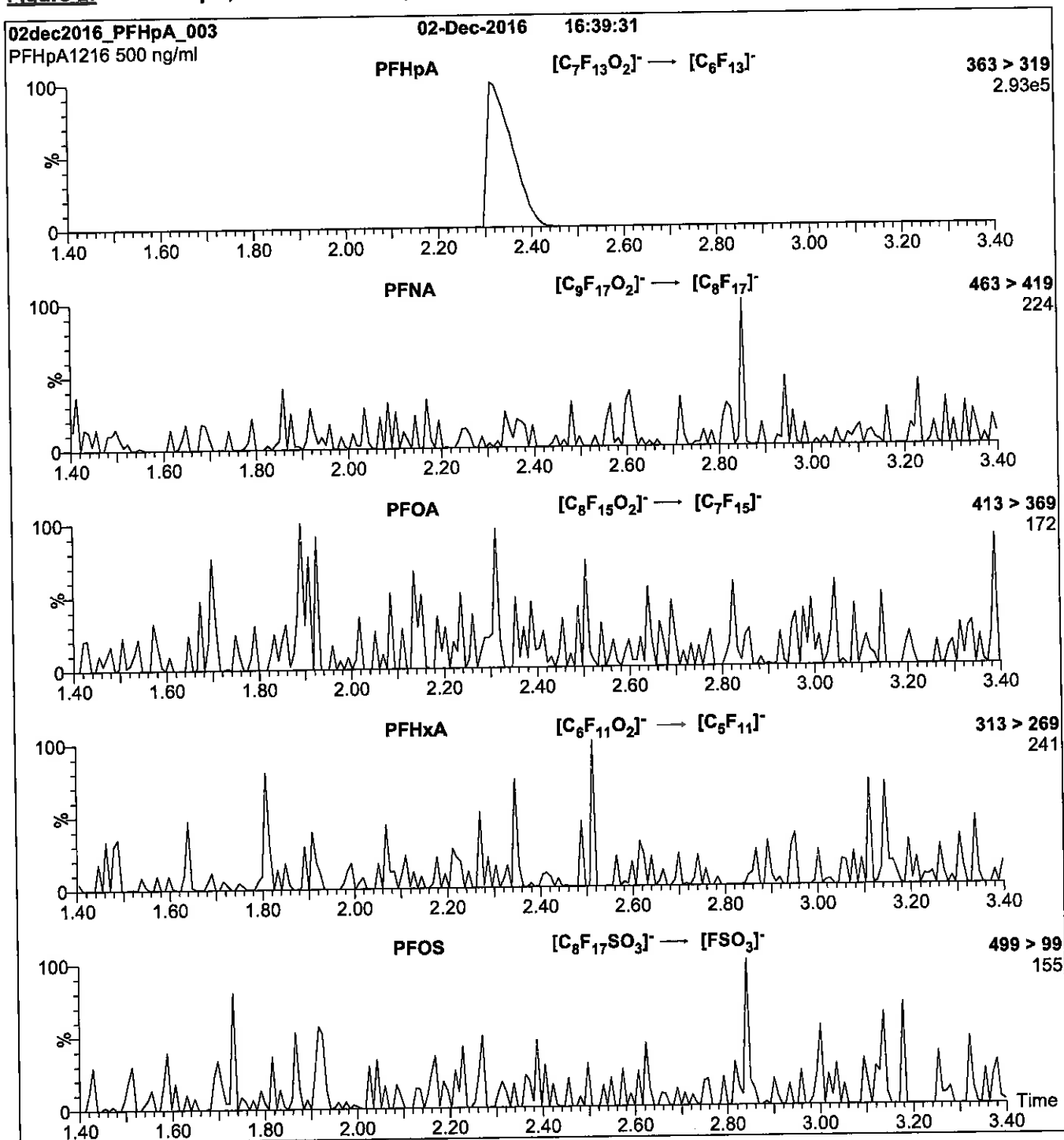
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

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

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



**Conditions for Figure 2:**

**Injection:** Direct loop injection  
 10  $\mu$ l (500 ng/ml PFHpA)

**Mobile phase:** Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O  
 (both with 10 mM NH<sub>4</sub>OAc buffer)

**Flow:** 300  $\mu$ l/min

**MS Parameters**

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

Reagent

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**LCPFHxS-br\_00005**

P: 10/2017 SKV



**WELLINGTON  
LABORATORIES**

**CERTIFICATE OF ANALYSIS  
DOCUMENTATION**

**br-PFHxSK**

**Potassium Perfluorohexanesulfonate  
Solution/Mixture of Linear and  
Branched Isomers**

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

**DESCRIPTION:**

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

**DOCUMENTATION/ DATA ATTACHED:**

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

**ADDITIONAL INFORMATION:**

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

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

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

### **INTENDED USE:**

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

### **HAZARDS:**

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

### **SYNTHESIS / CHARACTERIZATION:**

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

### **HOMOGENEITY:**

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

### **UNCERTAINTY:**

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

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

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

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

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

### **TRACEABILITY:**

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

### **EXPIRY DATE / PERIOD OF VALIDITY:**

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

### **LIMITED WARRANTY:**

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### **QUALITY MANAGEMENT:**

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**Table A: br-PFHxSK; Isomeric Components and Percent Composition (by <sup>19</sup>F-NMR)\***

Isomer	Name	Structure	Percent Composition by <sup>19</sup> F-NMR
1	Potassium perfluoro-1-hexanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> <sup>-</sup> K <sup>+</sup>	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}(\text{SO}_3^-\text{K}^+) \\   \\ \text{CF}_3 \end{array}$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}(\text{CF}_3)\text{CF}_2\text{SO}_3^-\text{K}^+ \\   \\ \text{CF}_3 \end{array}$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\   \\ \text{CF}_3 \end{array}$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\   \\ \text{CF}_3 \end{array}$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$\begin{array}{c} \text{CF}_3 \\   \\ \text{CF}_3\text{C}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\   \\ \text{CF}_3 \end{array}$	0.2
7	Other Unidentified Isomers		0.5

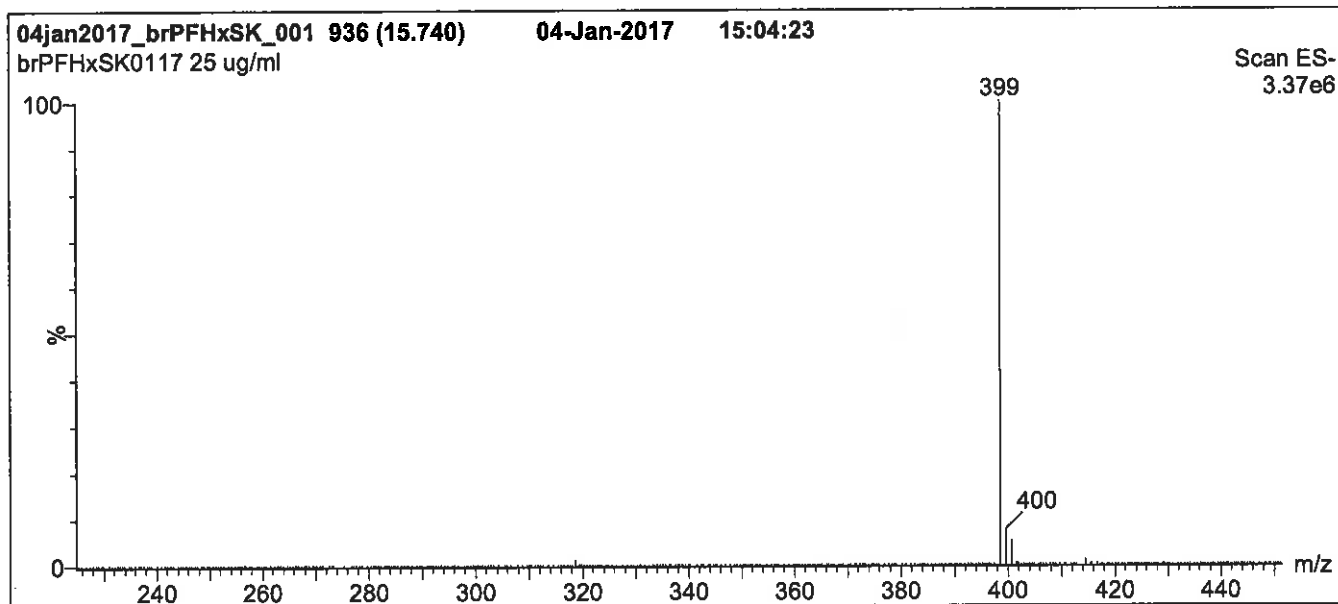
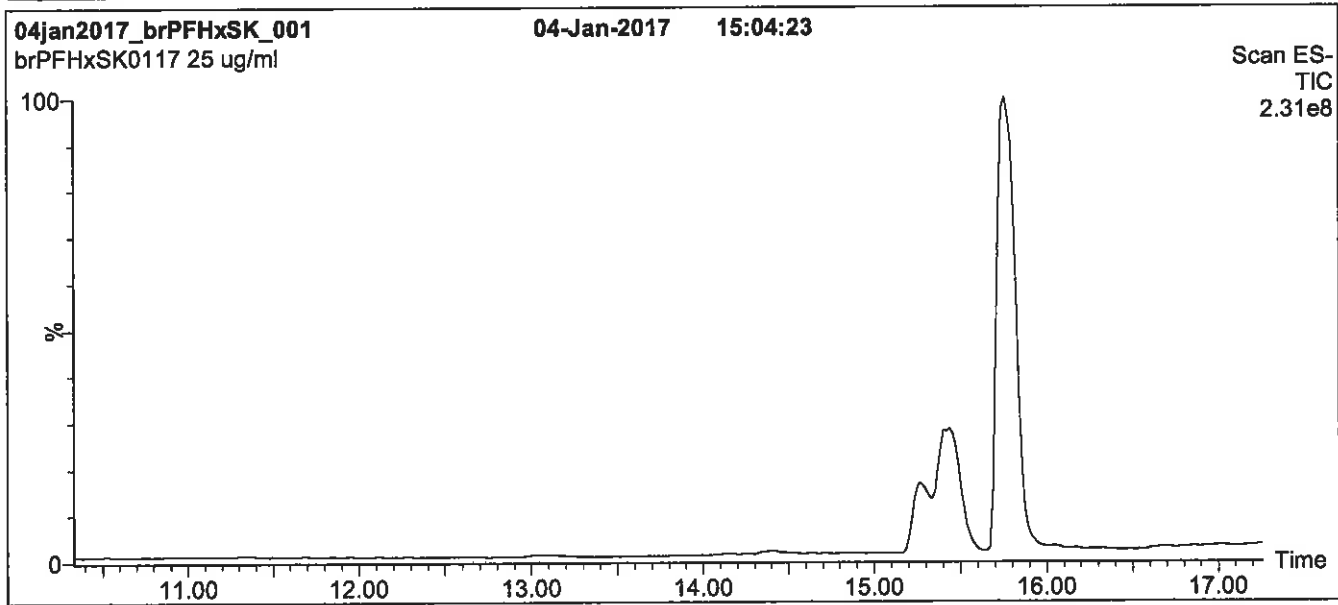
\* Percent of total perfluorohexanesulfonate isomers only.  
 \*\* Systematic Name: Potassium perfluorohexane-2-sulfonate.

Certified By:   
 B.G. Chittim

Date: 01/20/2017  
(mm/dd/yyyy)



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



**Conditions for Figure 1:**

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

**Chromatographic Conditions**

**Column:** Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

**Mobile phase:** Gradient  
Start: 20% (80:20 MeOH:ACN) / 80% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 50% organic over 14 min. Ramp to  
90% organic over 3 min and hold for 1.5 min  
before returning to initial conditions in 0.5 min.  
Time: 20 min

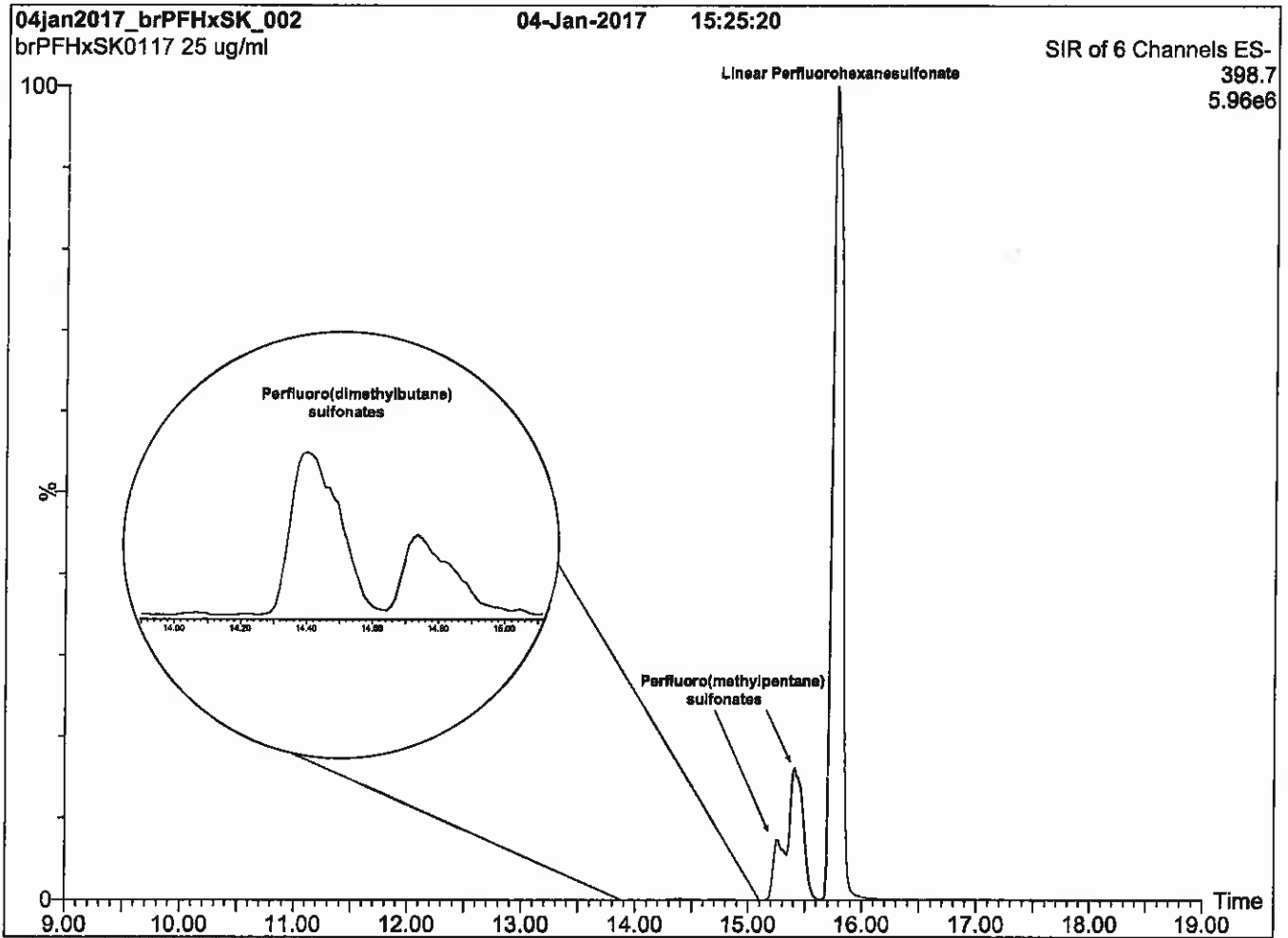
**Flow:** 300  $\mu$ l/min

**MS Parameters**

**Experiment:** Full Scan (225 - 850 amu)

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

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



**Conditions for Figure 2:**

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

**Chromatographic Conditions**

**Column:** Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

**Mobile phase:** Gradient  
Start: 20% (80:20 MeOH:ACN) / 80% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 50% organic over 14 min. Ramp to  
90% organic over 3 min and hold for 1.5 min  
before returning to initial conditions in 0.5 min.  
Time: 20 min

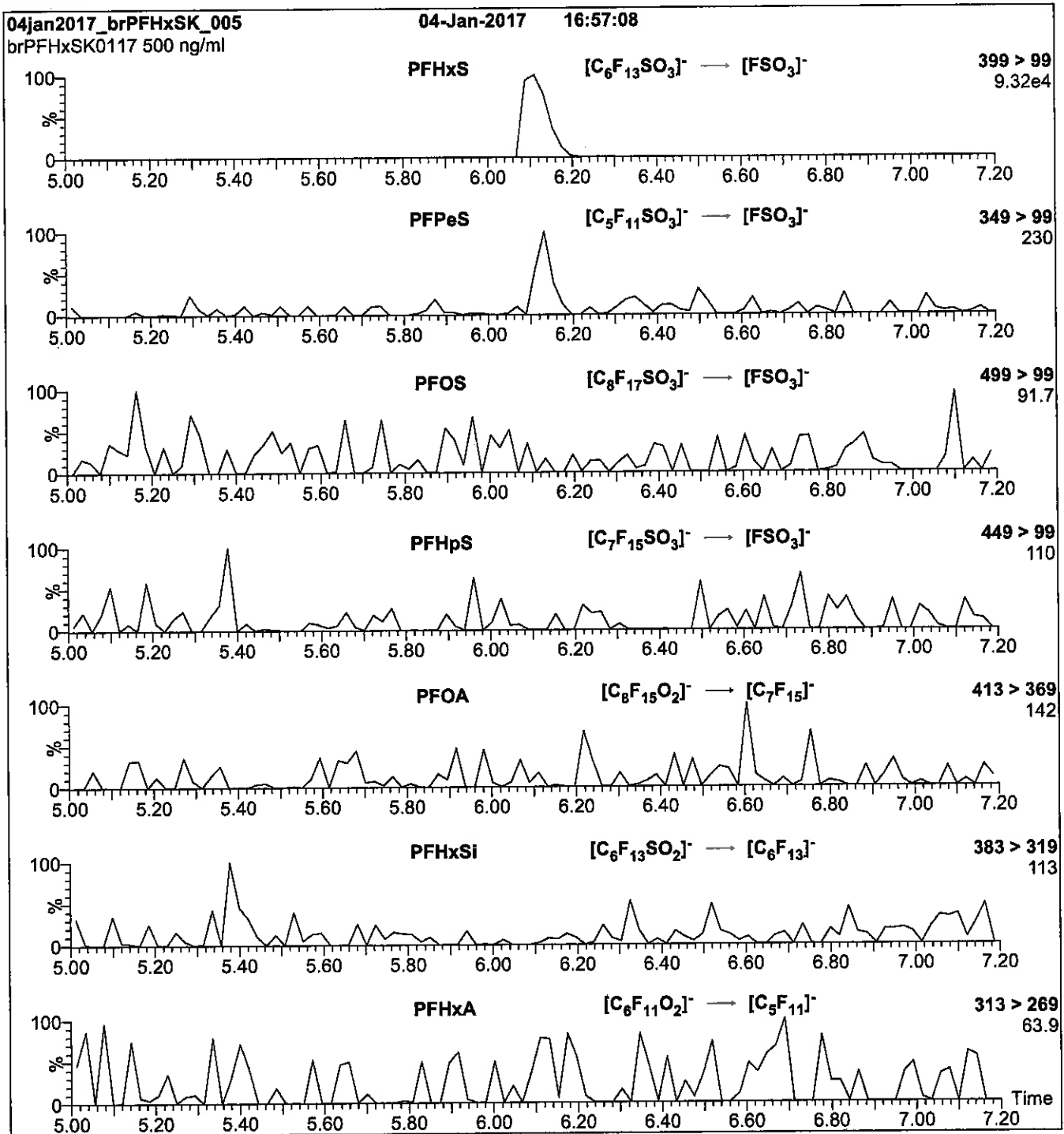
**Flow:** 300  $\mu$ l/min

**MS Parameters**

**Experiment:** SIR (6 channels)

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

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



**Conditions for Figure 3:**

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

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)

Flow: 300  $\mu$ l/min

**MS Parameters**

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

Reagent

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**LCPFNA\_00009**

r: 9/21/17 SKJ

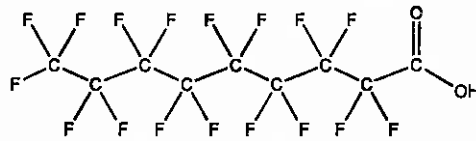


**WELLINGTON  
LABORATORIES**

**CERTIFICATE OF ANALYSIS  
DOCUMENTATION**

**PRODUCT CODE:** PFNA **LOT NUMBER:** PFNA0717  
**COMPOUND:** Perfluoro-n-nonanoic acid

**STRUCTURE:** **CAS #:** 375-95-1



**MOLECULAR FORMULA:** C<sub>9</sub>H<sub>17</sub>O<sub>2</sub> **MOLECULAR WEIGHT:** 464.08  
**CONCENTRATION:** 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol  
Water (<1%)  
**CHEMICAL PURITY:** >98%  
**LAST TESTED:** (mm/dd/yyyy) 07/20/2017  
**EXPIRY DATE:** (mm/dd/yyyy) 07/20/2022  
**RECOMMENDED STORAGE:** Store ampoule in a cool, dark place

**DOCUMENTATION/ DATA ATTACHED:**

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

**ADDITIONAL INFORMATION:**

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

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

**Certified By:**  **Date:** 07/24/2017  
B.G. Chittim, General Manager (mm/dd/yyyy)

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

**INTENDED USE:**

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

**HAZARDS:**

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

**SYNTHESIS / CHARACTERIZATION:**

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

**HOMOGENEITY:**

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

**UNCERTAINTY:**

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

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

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

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

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

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

**TRACEABILITY:**

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

**EXPIRY DATE / PERIOD OF VALIDITY:**

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

**LIMITED WARRANTY:**

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

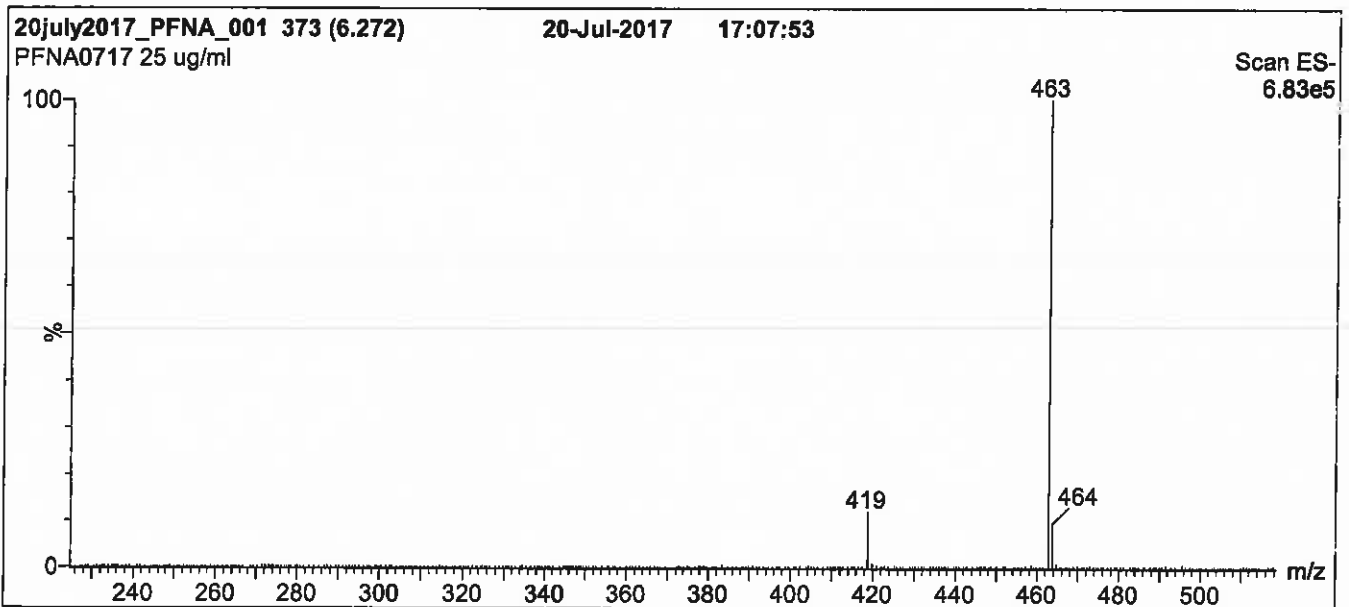
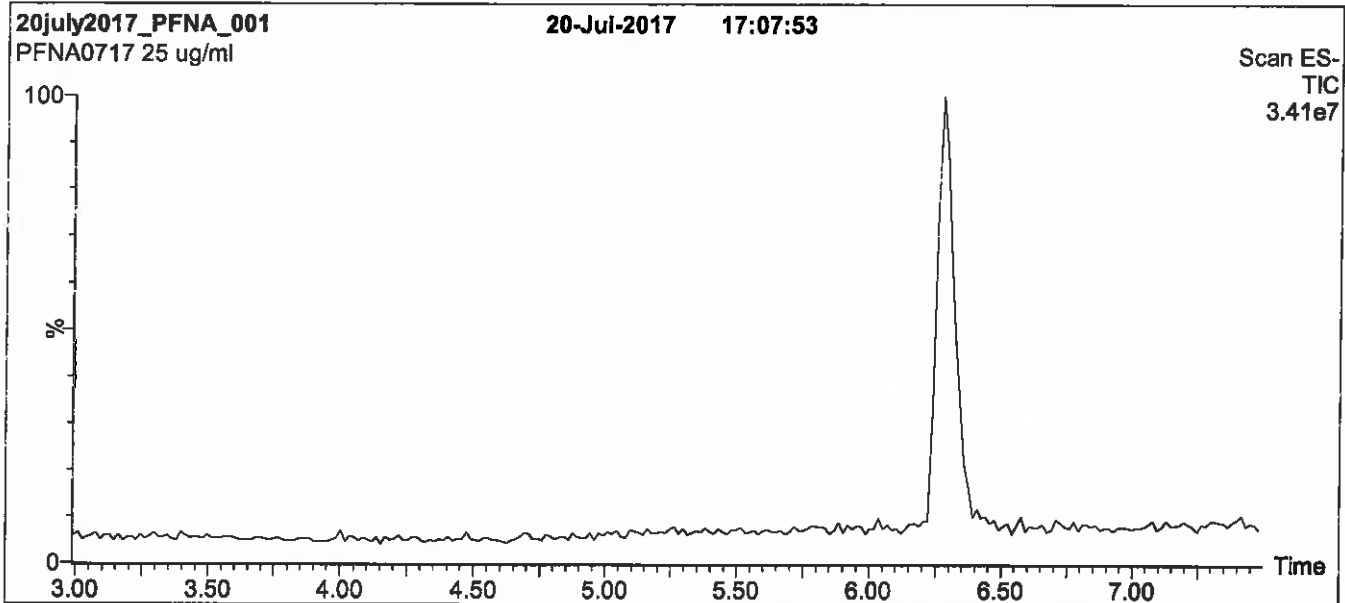
**QUALITY MANAGEMENT:**

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



\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at [www.well-labs.com](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto:info@well-labs.com)\*\*

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



**Conditions for Figure 1:**

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

**Chromatographic Conditions**

**Column:** Acquity UPLC BEH Shield RP<sub>18</sub>  
 1.7  $\mu$ m, 2.1 x 100 mm

**Mobile phase:** Gradient  
 Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
 (both with 10 mM NH<sub>4</sub>OAc buffer)  
 Hold for 1 min. Ramp to 90% organic over 7 min and hold  
 for 1 min before returning to initial conditions in 0.5 min.  
 Time: 10 min

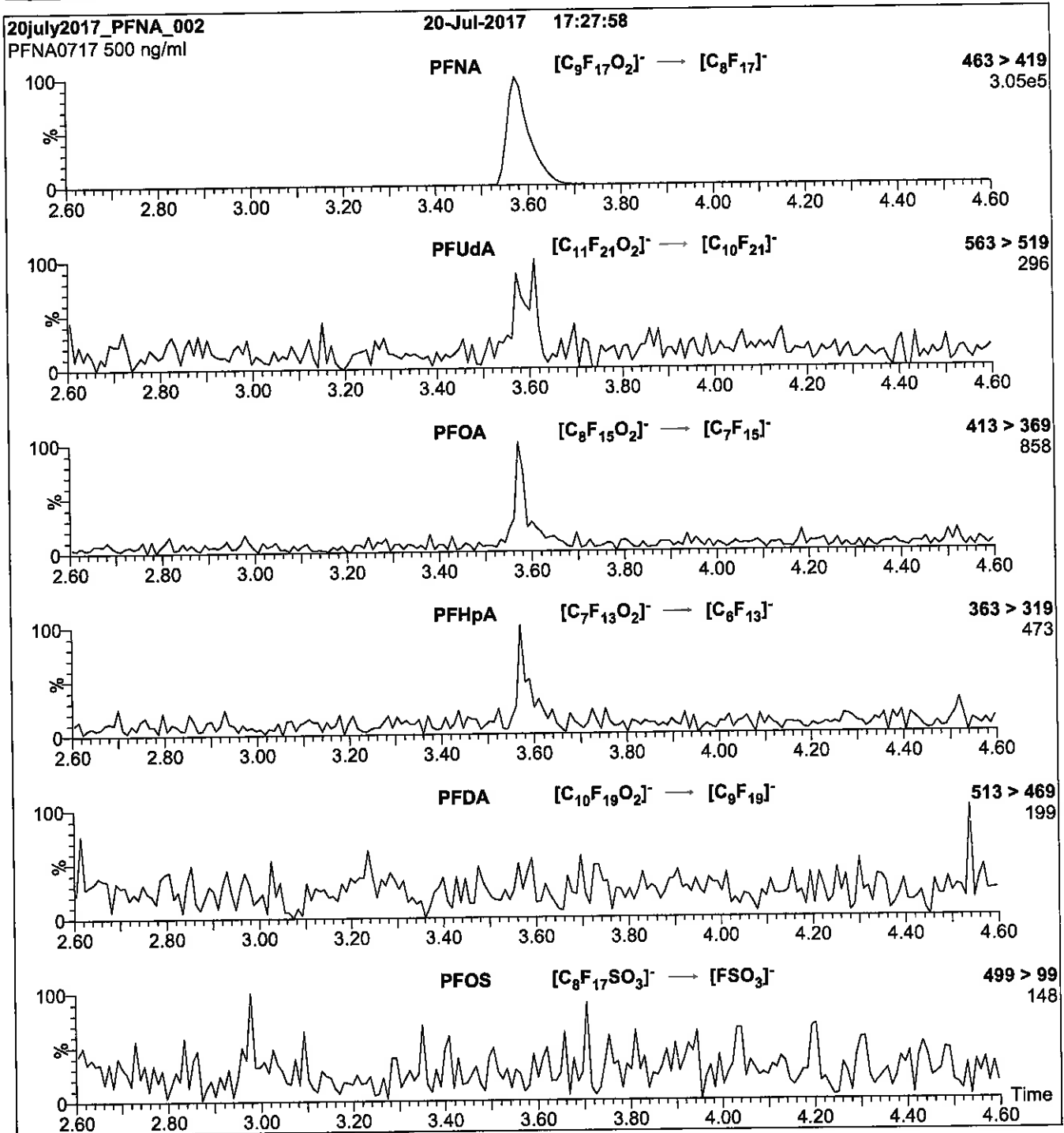
**Flow:** 300  $\mu$ l/min

**MS Parameters**

**Experiment:** Full Scan (225 - 850 amu)

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

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



**Conditions for Figure 2:**

**Injection:** Direct loop injection  
 10  $\mu$ l (500 ng/ml PFNA)

**Mobile phase:** Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O  
 (both with 10 mM NH<sub>4</sub>OAc buffer)

**Flow:** 300  $\mu$ l/min

**MS Parameters**

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



Reagent

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**LCPFOA\_00010**

P: 10/2017 SKV



# WELLINGTON LABORATORIES

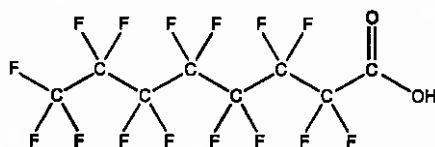
## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** PFOA  
**COMPOUND:** Perfluoro-n-octanoic acid

**LOT NUMBER:** PFOA0917

**STRUCTURE:**

**CAS #:** 335-67-1



**MOLECULAR FORMULA:** C<sub>8</sub>HF<sub>15</sub>O<sub>2</sub>  
**CONCENTRATION:** 50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:** 414.07  
**SOLVENT(S):** Methanol  
Water (<1%)

**CHEMICAL PURITY:** >98%  
**LAST TESTED:** (mm/dd/yyyy) 09/27/2017  
**EXPIRY DATE:** (mm/dd/yyyy) 09/27/2022  
**RECOMMENDED STORAGE:** Store ampoule in a cool, dark place

### DOCUMENTATION/ DATA ATTACHED:

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

### ADDITIONAL INFORMATION:

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

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

**Certified By:**   
B.G. Chittim, General Manager

**Date:** 09/28/2017  
(mm/dd/yyyy)

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

### **INTENDED USE:**

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

### **HAZARDS:**

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

### **SYNTHESIS / CHARACTERIZATION:**

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

### **HOMOGENEITY:**

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

### **UNCERTAINTY:**

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

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

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

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

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

### **TRACEABILITY:**

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

### **EXPIRY DATE / PERIOD OF VALIDITY:**

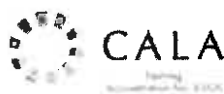
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

### **LIMITED WARRANTY:**

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

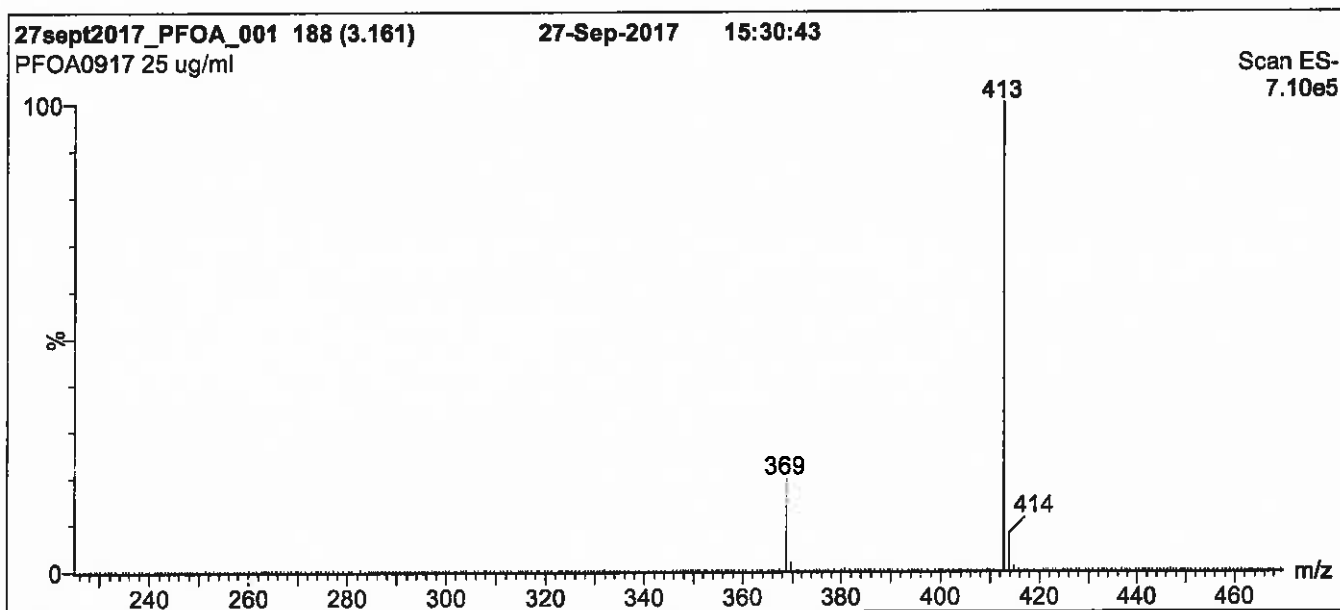
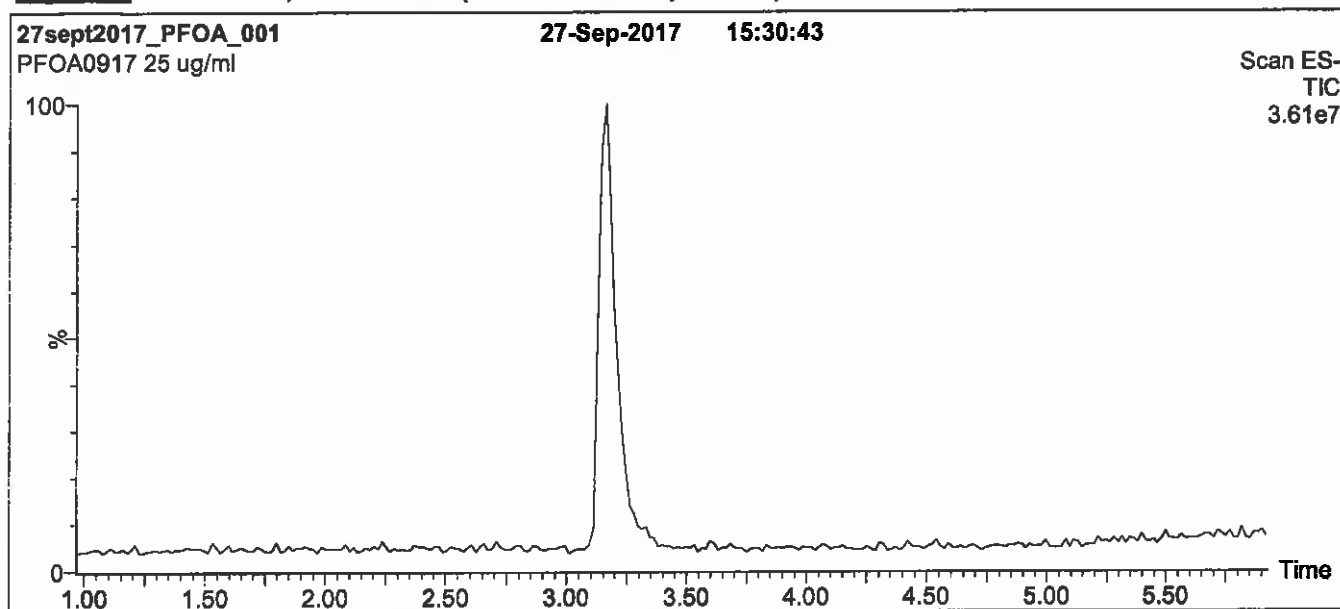
### **QUALITY MANAGEMENT:**

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



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



**Conditions for Figure 1:**

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

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient  
Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 90% organic over 7 min and hold for  
2 min before returning to initial conditions in 0.5 min.  
Time: 10 min

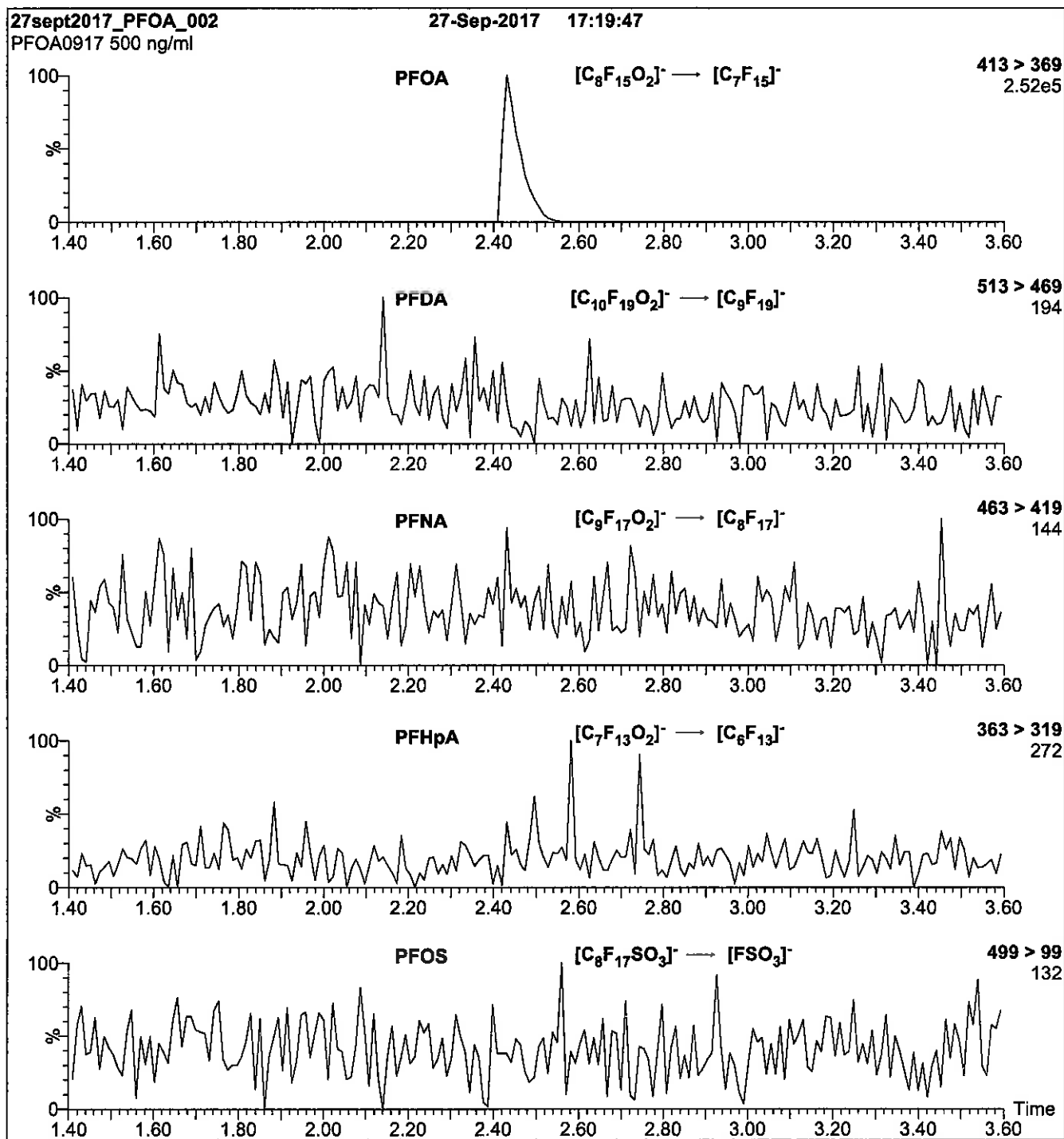
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

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

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



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu$ l (500 ng/ml PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)

Flow: 300  $\mu$ l/min

**MS Parameters**

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

Reagent

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**LCPFOS-br\_00005**

P: 10/2017 SKV



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

### br-PFOSK

#### Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

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

### DESCRIPTION:

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

### DOCUMENTATION/ DATA ATTACHED:

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

### ADDITIONAL INFORMATION:

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

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

### **INTENDED USE:**

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### **SYNTHESIS / CHARACTERIZATION:**

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### **HOMOGENEITY:**

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

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

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

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

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### **EXPIRY DATE / PERIOD OF VALIDITY:**

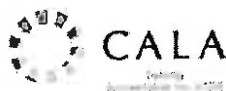
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**Table A: br-PFOSK; Isomeric Components and Percent Composition (by <sup>19</sup>F-NMR)\***

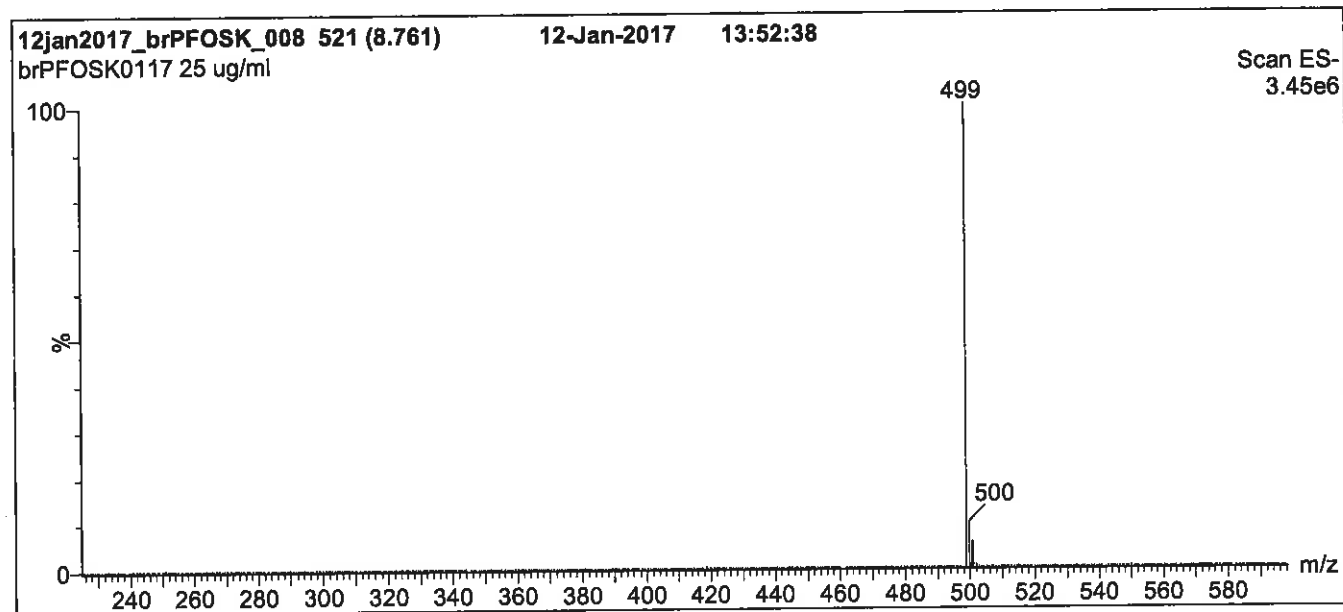
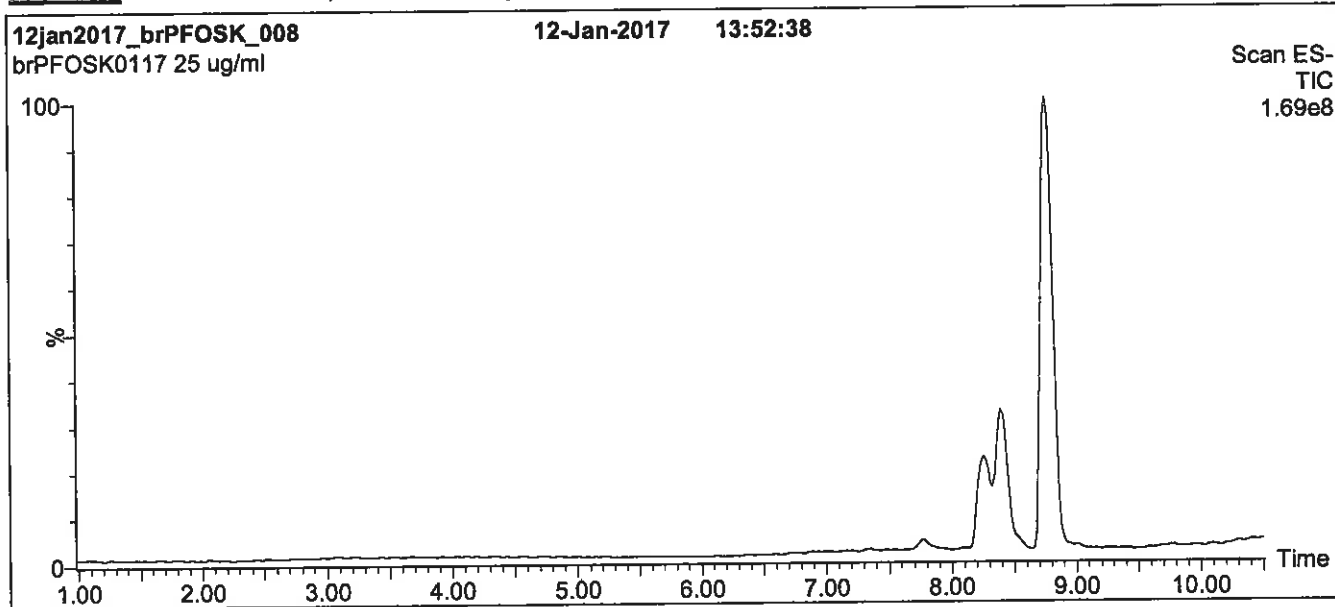
Isomer	Name	Structure	Percent Composition by <sup>19</sup> F-NMR
1	Potassium perfluoro-1-octanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> <sup>-</sup> K <sup>+</sup>	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**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

\* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.  
 \*\* Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By:   
 B.G. Chittim

Date: 01/20/2017  
 (mm/dd/yyyy)

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



**Conditions for Figure 1:**

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

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
 1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient  
 Start: 45% (80:20 MeOH:ACN) / 55% H<sub>2</sub>O  
 (both with 10 mM NH<sub>4</sub>OAc buffer)  
 Ramp to 90% organic over 12 min and hold for 2 min.  
 Return to initial conditions over 0.5 min.  
 Time: 16 min

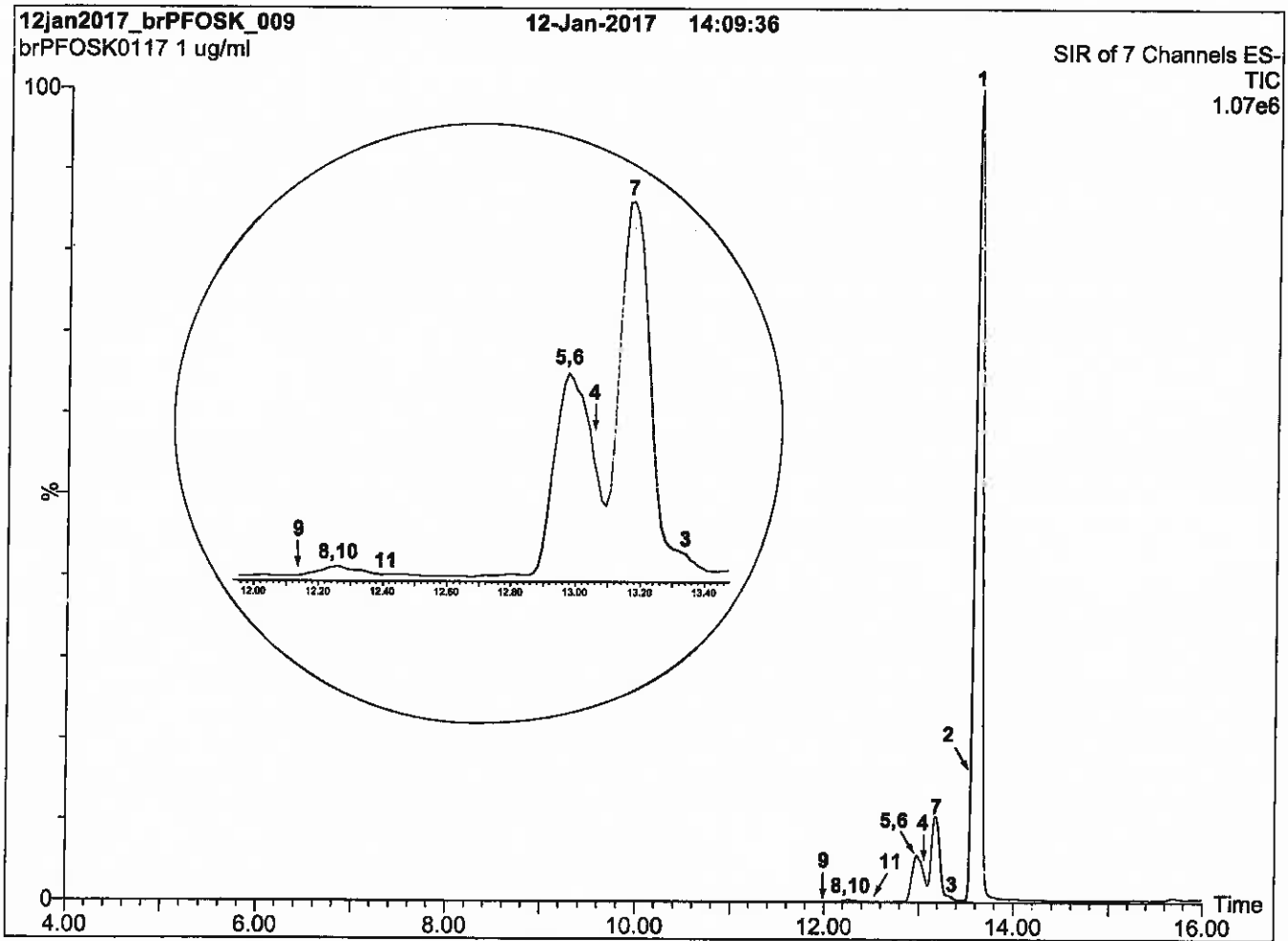
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

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

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



**Conditions for Figure 2:**

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

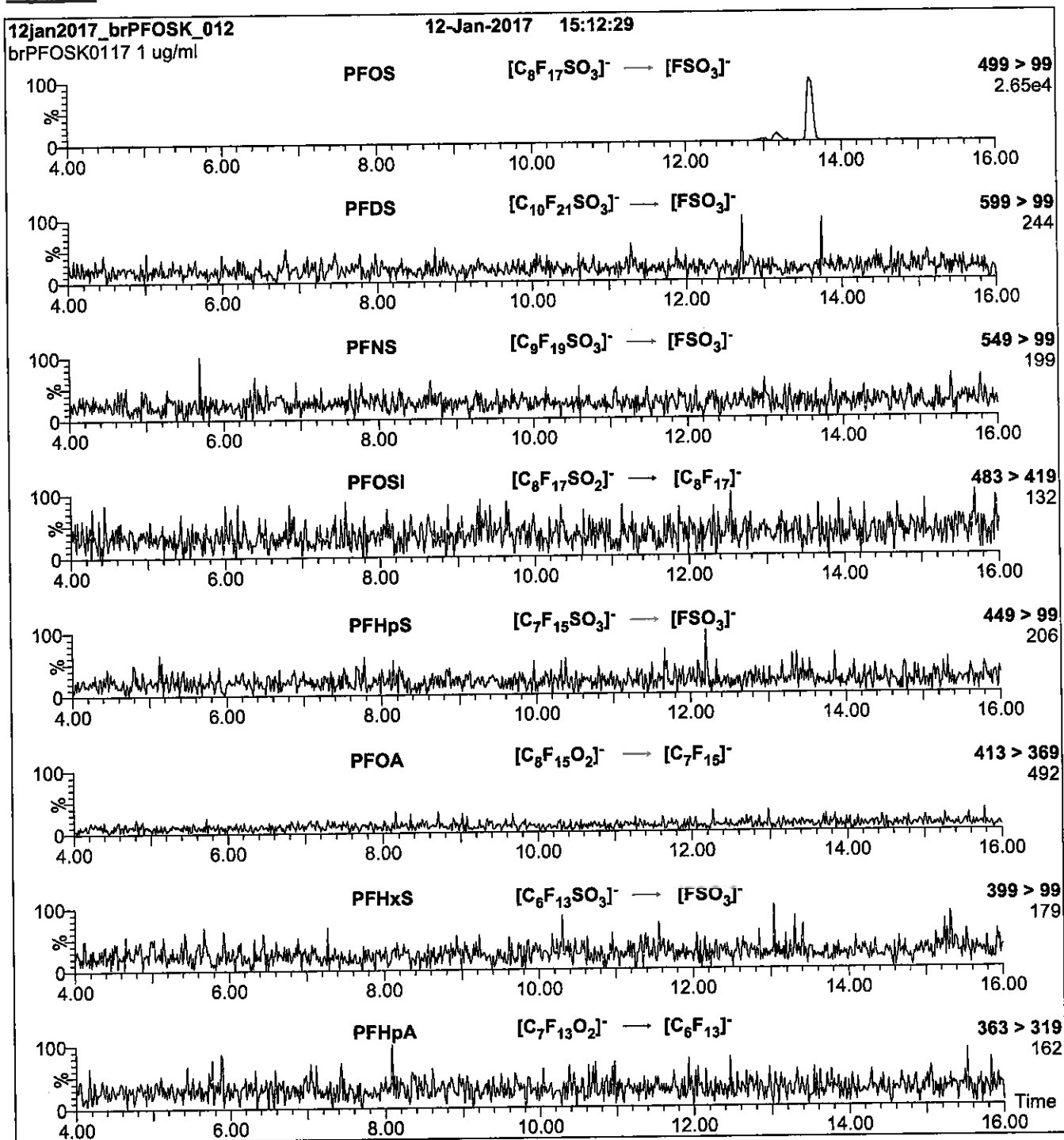
**Chromatographic Conditions:**

**Column:** Acquity UPLC BEH Shield RP<sub>18</sub> (1.7  $\mu$ m, 2.1 x 100 mm)  
**Injection:** 1.0  $\mu$ g/ml of br-PFOSK  
**Mobile Phase:** Gradient  
45% (80:20 MeOH:ACN) / 55% H<sub>2</sub>O (both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 90% organic over 15 min and hold for 3 min.  
Return to Initial conditions over 1 min.  
Time: 20 min  
**Flow:** 300  $\mu$ l/min

**MS Conditions:**

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

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



**Conditions for Figure 3:**

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300  $\mu$ l/min

**MS Parameters**

Collision Gas (mbar) = 3.31e-3  
Collision Energy (eV) = 11-50 (variable)

# Method 537 DOD

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

FORM II  
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Matrix: Water

Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-073018-RW-055	320-41647-1	97	108
NAWC-073018-FRB-055	320-41647-2	98	101
WGNA-073018-RW-4851	320-41647-3	98	109
WGNA-073018-FRB-4851	320-41647-4	97	104
WGNA-073018-RW-3604	320-41647-5	78	108
WGNA-073018-FRB-3604	320-41647-6	101	109
WGNA-073018-RW-3529	320-41647-7	89	99
WGNA-073018-FRB-3529	320-41647-8	101	102
WGNA-073018-RW-0500	320-41647-9	98	105
WGNA-073018-FRB-0500	320-41647-10	102	104
WGNA-073018-RW-3957	320-41647-11	97	104
WGNA-073018-FRB-3957	320-41647-12	100	101
WGNA-073018-DUP-42	320-41647-13	101	114
	MB 320-237816/1-A	106	116
	LLCS 320-237816/2-A	99	111
	LLCSD 320-237816/3-A	98	110

PFHxA = 13C2 PFHxA  
PFDA = 13C2 PFDA

QC LIMITS  
70-130  
70-130

# Column to be used to flag recovery values

FORM III  
LCMS LOW LEVEL CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Matrix: Water Level: Low Lab File ID: 2018.08.07\_537AAA\_037.d

Lab ID: LLCS 320-237816/2-A Client ID: \_\_\_\_\_

COMPOUND	SPIKE ADDED (ng/L)	LLCS CONCENTRATION (ng/L)	LLCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	40.2	41.6	103	50-150	
Perfluorooctanoic acid (PFOA)	20.0	18.6 J	93	50-150	
Perfluorononanoic acid (PFNA)	20.0	18.4 J	92	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.3	31.4	103	50-150	
Perfluoroheptanoic acid (PFHpA)	10.0	9.50 J	95	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.2	102	113	50-150	

# Column to be used to flag recovery and RPD values

FORM III  
LCMS LOW LEVEL CONTROL STANDARD DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Matrix: Water Level: Low Lab File ID: 2018.08.07\_537AAA\_038.d

Lab ID: LLCSD 320-237816/3-A Client ID: \_\_\_\_\_

COMPOUND	SPIKE ADDED (ng/L)	LLCSD CONCENTRATION (ng/L)	LLCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	40.2	39.7 J	99	5	50	50-150	
Perfluorooctanoic acid (PFOA)	20.0	18.4 J	92	1	50	50-150	
Perfluorononanoic acid (PFNA)	20.0	17.7 J	89	4	50	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.3	30.2	100	4	50	50-150	
Perfluoroheptanoic acid (PFHpA)	10.0	9.21 J	92	3	50	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.2	92.7	103	9	50	50-150	

# Column to be used to flag recovery and RPD values



FORM IV  
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Lab File ID: 2018.08.07\_537AAA\_036.d Lab Sample ID: MB 320-237816/1-A  
 Matrix: Water Date Extracted: 08/03/2018 10:23  
 Instrument ID: A8\_N Date Analyzed: 08/08/2018 01:24  
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LLCS 320-237816/2-A	2018.08.07_537AAA_037.d	08/08/2018 01:29
	LLCSD 320-237816/3-A	2018.08.07_537AAA_038.d	08/08/2018 01:33
NAWC-073018-RW-055	320-41647-1	2018.08.07_537AAA_039.d	08/08/2018 01:38
NAWC-073018-FRB-055	320-41647-2	2018.08.07_537AAA_040.d	08/08/2018 01:43
WGNA-073018-RW-4851	320-41647-3	2018.08.07_537AAA_041.d	08/08/2018 01:48
WGNA-073018-FRB-4851	320-41647-4	2018.08.07_537AAA_042.d	08/08/2018 01:52
WGNA-073018-RW-3604	320-41647-5	2018.08.07_537AAA_043.d	08/08/2018 01:57
WGNA-073018-FRB-3604	320-41647-6	2018.08.07_537AAA_046.d	08/08/2018 02:11
WGNA-073018-RW-3529	320-41647-7	2018.08.07_537AAA_047.d	08/08/2018 02:16
WGNA-073018-FRB-3529	320-41647-8	2018.08.07_537AAA_048.d	08/08/2018 02:20
WGNA-073018-RW-0500	320-41647-9	2018.08.07_537AAA_049.d	08/08/2018 02:25
WGNA-073018-FRB-0500	320-41647-10	2018.08.07_537AAA_050.d	08/08/2018 02:30
WGNA-073018-RW-3957	320-41647-11	2018.08.07_537AAA_051.d	08/08/2018 02:34
WGNA-073018-FRB-3957	320-41647-12	2018.08.07_537AAA_052.d	08/08/2018 02:39
WGNA-073018-DUP-42	320-41647-13	2018.08.07_537AAA_053.d	08/08/2018 02:44

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Instrument ID: A8\_N Calibration Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 08/07/2018 13:07  
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	1166146	1.77	2617368	2.02		
UPPER LIMIT	1749219	2.27	3926052	2.52		
LOWER LIMIT	583073	1.27	1308684	1.52		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCVL 320-238469/9		1156656	1.77	2655389	2.01	
ICV 320-238469/11		1199776	1.78	2744266	2.01	
CCV 320-238604/1 CCVIS		1157547	1.77	2558845	2.00	
MB 320-237816/1-A		1397094	1.77	3083560	2.00	
LLCS 320-237816/2-A		1337504	1.77	2889525	2.00	
LLCSD 320-237816/3-A		1421765	1.76	3146656	2.00	
320-41647-1	NAWC-073018-RW-055	1292794	1.77	2896464	2.00	
320-41647-2	NAWC-073018-FRB-055	1415779	1.76	3108523	2.00	
320-41647-3	WGNA-073018-RW-4851	1396964	1.77	3024904	2.00	
320-41647-4	WGNA-073018-FRB-4851	1541812	1.76	3258238	2.00	
320-41647-5	WGNA-073018-RW-3604	1499601	1.76	3325872	2.00	
CCV 320-238604/11 CCVIS		1169194	1.76	2703567	2.00	
CCV 320-238606/11 CCVIS		1169194	1.76	2703567	2.00	
320-41647-6	WGNA-073018-FRB-3604	1316224	1.76	2940798	2.00	
320-41647-7	WGNA-073018-RW-3529	1491339	1.77	3314712	2.00	
320-41647-8	WGNA-073018-FRB-3529	1451085	1.77	3073585	2.00	
320-41647-9	WGNA-073018-RW-0500	1367015	1.77	3006266	2.00	
320-41647-10	WGNA-073018-FRB-0500	1384234	1.76	3019813	2.00	
320-41647-11	WGNA-073018-RW-3957	1486609	1.77	3242355	2.01	
320-41647-12	WGNA-073018-FRB-3957	1473025	1.77	3216746	2.00	
320-41647-13	WGNA-073018-DUP-42	1347837	1.77	3048765	2.00	
CCV 320-238606/21 CCVIS		1184087	1.77	2681112	2.00	

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.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-238604/1 Date Analyzed: 08/08/2018 01:15  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.08.07\_537AAA\_0 Heated Purge: (Y/N) N  
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1157547	1.77	2558845	2.00		
UPPER LIMIT	1620566	2.27	3582383	2.50		
LOWER LIMIT	810283	1.27	1791192	1.50		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-237816/1-A		1397094	1.77	3083560	2.00	
LLCS 320-237816/2-A		1337504	1.77	2889525	2.00	
LLCSD 320-237816/3-A		1421765	1.76	3146656	2.00	
320-41647-1	NAWC-073018-RW-055	1292794	1.77	2896464	2.00	
320-41647-2	NAWC-073018-FRB-055	1415779	1.76	3108523	2.00	
320-41647-3	WGNA-073018-RW-4851	1396964	1.77	3024904	2.00	
320-41647-4	WGNA-073018-FRB-4851	1541812	1.76	3258238	2.00	
320-41647-5	WGNA-073018-RW-3604	1499601	1.76	3325872	2.00	

13PFOA = 13C2-PFOA  
 13PFOA = 13C2-PFOA  
 PFOS = 13C4 PFOS  
 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.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-238604/11 Date Analyzed: 08/08/2018 02:02  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.08.07\_537AAA\_0 Heated Purge: (Y/N) N  
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1169194	1.76	2703567	2.00		
UPPER LIMIT	1636872	2.26	3784994	2.50		
LOWER LIMIT	818436	1.26	1892497	1.50		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-237816/1-A		1397094	1.77	3083560	2.00	
LLCS 320-237816/2-A		1337504	1.77	2889525	2.00	
LLCSD 320-237816/3-A		1421765	1.76	3146656	2.00	
320-41647-1	NAWC-073018-RW-055	1292794	1.77	2896464	2.00	
320-41647-2	NAWC-073018-FRB-055	1415779	1.76	3108523	2.00	
320-41647-3	WGNA-073018-RW-4851	1396964	1.77	3024904	2.00	
320-41647-4	WGNA-073018-FRB-4851	1541812	1.76	3258238	2.00	
320-41647-5	WGNA-073018-RW-3604	1499601	1.76	3325872	2.00	

13PFOA = 13C2-PFOA  
 13PFOA = 13C2-PFOA  
 PFOS = 13C4 PFOS  
 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.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-238606/11 Date Analyzed: 08/08/2018 02:02  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.08.07\_537AAA\_0 Heated Purge: (Y/N) N  
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1169194	1.76	2703567	2.00		
UPPER LIMIT	1636872	2.26	3784994	2.50		
LOWER LIMIT	818436	1.26	1892497	1.50		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-41647-6	WGNA-073018-FRB-3604	1316224	1.76	2940798	2.00	
320-41647-7	WGNA-073018-RW-3529	1491339	1.77	3314712	2.00	
320-41647-8	WGNA-073018-FRB-3529	1451085	1.77	3073585	2.00	
320-41647-9	WGNA-073018-RW-0500	1367015	1.77	3006266	2.00	
320-41647-10	WGNA-073018-FRB-0500	1384234	1.76	3019813	2.00	
320-41647-11	WGNA-073018-RW-3957	1486609	1.77	3242355	2.01	
320-41647-12	WGNA-073018-FRB-3957	1473025	1.77	3216746	2.00	
320-41647-13	WGNA-073018-DUP-42	1347837	1.77	3048765	2.00	

13PFOA = 13C2-PFOA  
 13PFOA = 13C2-PFOA  
 PFOS = 13C4 PFOS  
 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.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-238606/21 Date Analyzed: 08/08/2018 02:48  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.08.07\_537AAA\_0 Heated Purge: (Y/N) N  
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1184087	1.77	2681112	2.00		
UPPER LIMIT	1657722	2.27	3753557	2.50		
LOWER LIMIT	828861	1.27	1876778	1.50		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-41647-6	WGNA-073018-FRB-3604	1316224	1.76	2940798	2.00	
320-41647-7	WGNA-073018-RW-3529	1491339	1.77	3314712	2.00	
320-41647-8	WGNA-073018-FRB-3529	1451085	1.77	3073585	2.00	
320-41647-9	WGNA-073018-RW-0500	1367015	1.77	3006266	2.00	
320-41647-10	WGNA-073018-FRB-0500	1384234	1.76	3019813	2.00	
320-41647-11	WGNA-073018-RW-3957	1486609	1.77	3242355	2.01	
320-41647-12	WGNA-073018-FRB-3957	1473025	1.77	3216746	2.00	
320-41647-13	WGNA-073018-DUP-42	1347837	1.77	3048765	2.00	

13PFOA = 13C2-PFOA  
 13PFOA = 13C2-PFOA  
 PFOS = 13C4 PFOS  
 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.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-073018-RW-055 Lab Sample ID: 320-41647-1  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_039.d  
 Analysis Method: 537 Date Collected: 07/30/2018 10:10  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 284.7(mL) Date Analyzed: 08/08/2018 01:38  
 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.: 238604 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	8.2	J	35	14	6.0
335-67-1	Perfluorooctanoic acid (PFOA)	9.8	J	18	7.0	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U M	21	18	7.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	26	11	4.8
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.8	J	8.8	3.5	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	79	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	108		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_039.d  
 Lims ID: 320-41647-A-1-A  
 Client ID: NAWC-073018-RW-055  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 01:38:39 ALS Bottle#: 26 Worklist Smp#: 6  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-1-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:19 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 10:40:07

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	239722	2.00		119	
298.90 > 99.00	1.350	1.350	0.0	1.000	161242		1.49(0.00-0.00)	180	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1376874	9.69		10444	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.601	0.0	1.000	149908	0.8325		52.3	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.601	0.0	1.000	189689	1.36		24.3	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.768	0.0		1292794	10.0		8019	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	396442	2.80		43.6	
413.00 > 169.00	1.768	1.768	0.0	1.000	220316		1.80(0.00-0.00)	329	
* 7 13C4 PFOS									
503.00 > 80.00	2.003	2.003	0.0		2896464	28.7		1889	
9 Perfluorononanoic acid									
463.00 > 419.00	2.018	2.011	0.007	1.000	49957	0.4903		5.2	M
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.003	2.018	-0.015	1.000	257663	2.34		58.6	
499.00 > 99.00	2.003	2.018	-0.015	1.000	47297		5.45(0.00-0.00)	55.3	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.215	0.0	1.000	1143366	10.8		9372	



## QC Flag Legend

### Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_039.d

Injection Date: 08-Aug-2018 01:38:39

Instrument ID: A8\_N

Lims ID: 320-41647-A-1-A

Lab Sample ID: 320-41647-1

Client ID: NAWC-073018-RW-055

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 26

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

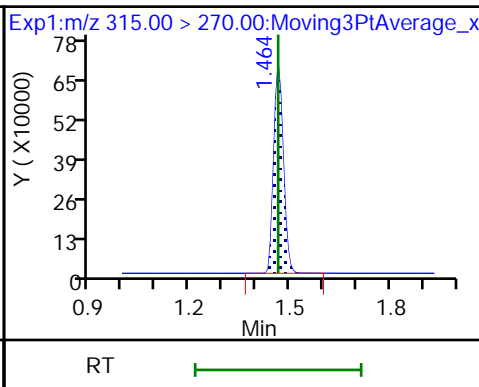
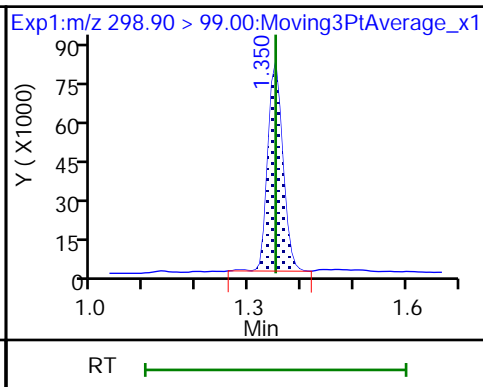
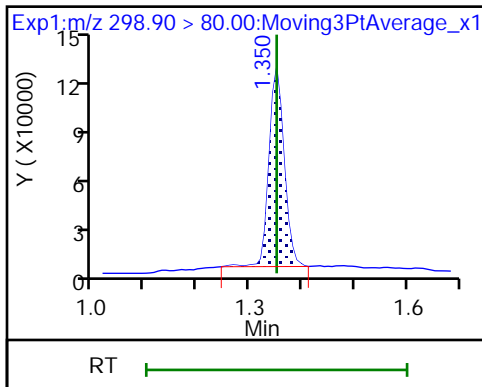
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

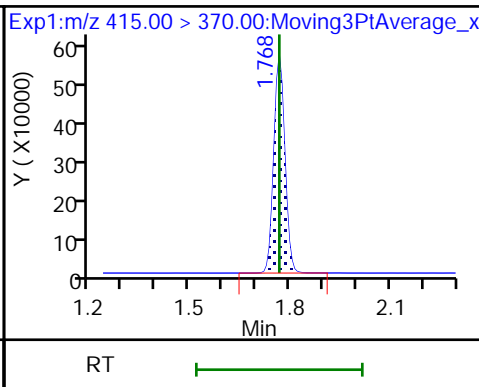
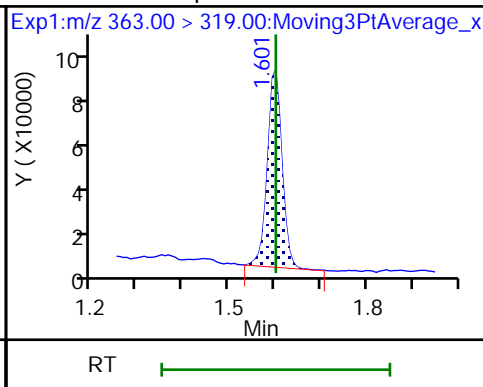
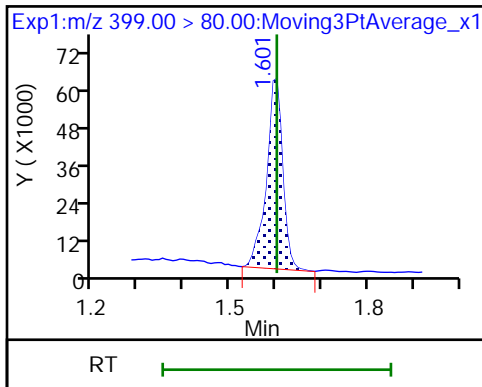
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

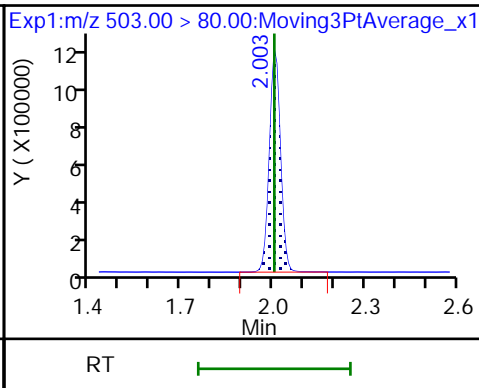
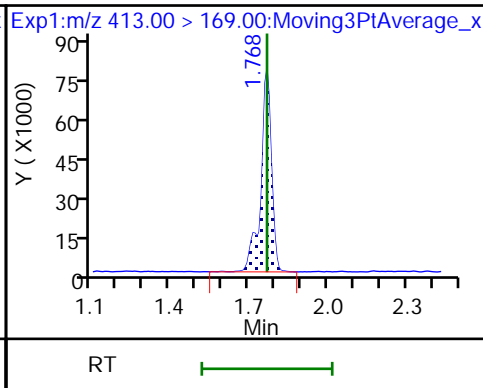
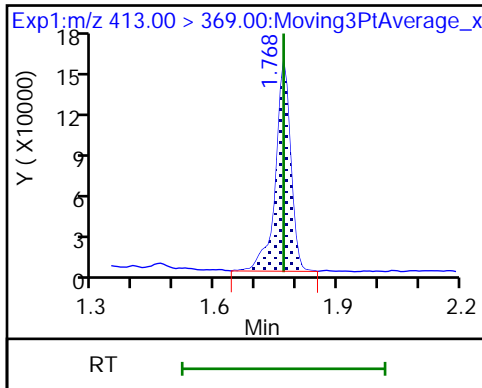
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

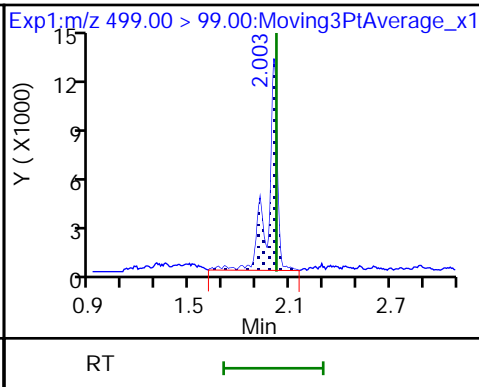
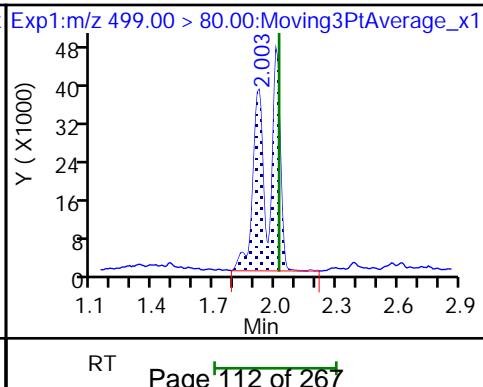
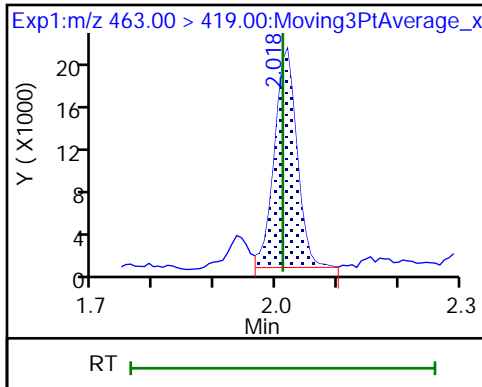
\* 7 13C4 PFOS



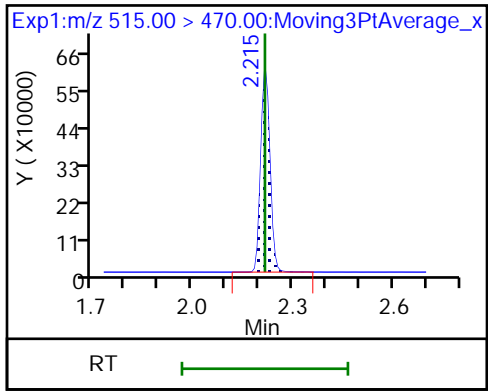
9 Perfluorononanoic acid (M)

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_039.d  
 Lims ID: 320-41647-A-1-A  
 Client ID: NAWC-073018-RW-055  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 01:38:39 ALS Bottle#: 26 Worklist Smp#: 6  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-1-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:19 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 10:40:07

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.69	96.86
\$ 10 13C2 PFDA	10.0	10.8	108.01

TestAmerica Sacramento

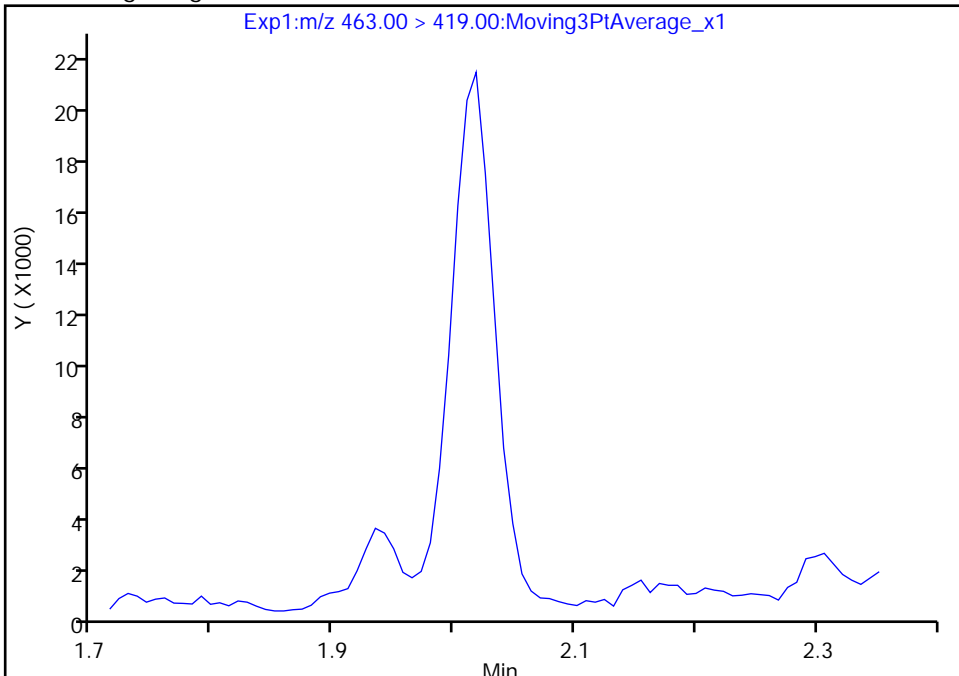
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Injection Date: 08-Aug-2018 01:38:39 Instrument ID: A8\_N  
Lims ID: 320-41647-A-1-A Lab Sample ID: 320-41647-1  
Client ID: NAWC-073018-RW-055  
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 26 Worklist Smp#: 6  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

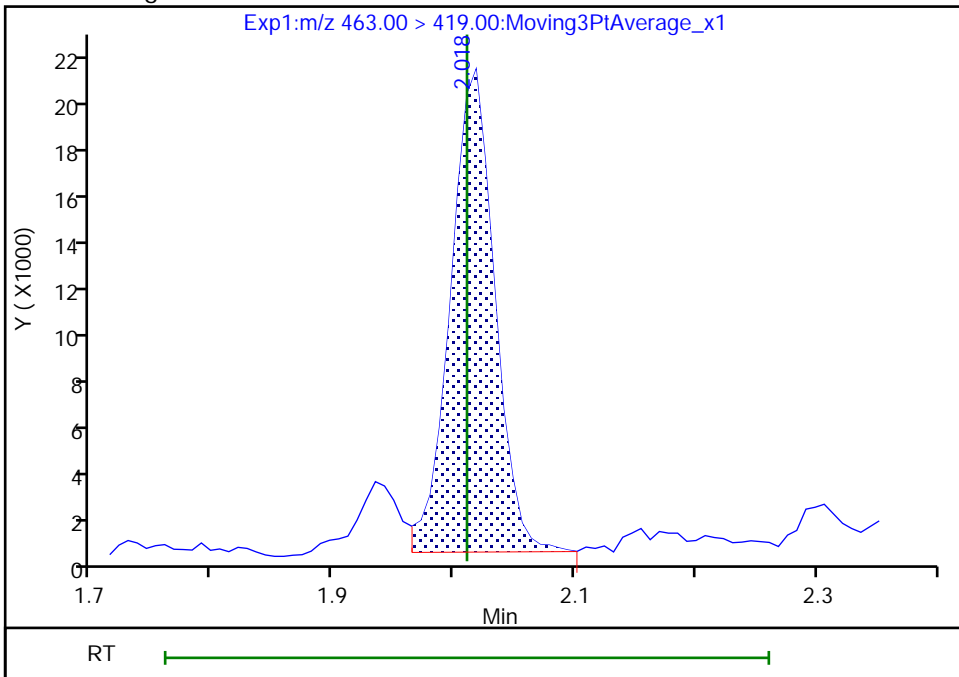
Not Detected  
Expected RT: 2.01

Processing Integration Results



Manual Integration Results

RT: 2.02  
Area: 49957  
Amount: 0.490274  
Amount Units: ng/ml



Reviewer: barnettj, 08-Aug-2018 10:39:59  
Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-073018-FRB-055 Lab Sample ID: 320-41647-2  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_040.d  
 Analysis Method: 537 Date Collected: 07/30/2018 10:05  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 284.9(mL) Date Analyzed: 08/08/2018 01:43  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238604 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	35	14	6.0
335-67-1	Perfluorooctanoic acid (PFOA)	7.0	U	18	7.0	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	21	18	7.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	26	11	4.8
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.5	U	8.8	3.5	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	79	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	101		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_040.d  
 Lims ID: 320-41647-A-2-A  
 Client ID: NAWC-073018-FRB-055  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 01:43:19 ALS Bottle#: 27 Worklist Smp#: 7  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-2-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:19 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.464	1.464	0.0	1.000	1529515	9.82	11848	
* 6 13C2-PFOA	415.00 > 370.00	1.760	1.768	-0.008		1415779	10.0	8462	
* 7 13C4 PFOS	503.00 > 80.00	2.003	2.003	0.0		3108523	28.7	3480	
\$ 10 13C2 PFDA	515.00 > 470.00	2.215	2.215	0.0	1.000	1174700	10.1	8641	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_040.d

Injection Date: 08-Aug-2018 01:43:19

Instrument ID: A8\_N

Lims ID: 320-41647-A-2-A

Lab Sample ID: 320-41647-2

Client ID: NAWC-073018-FRB-055

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 27

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

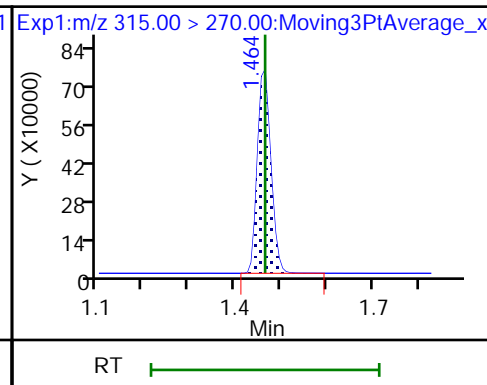
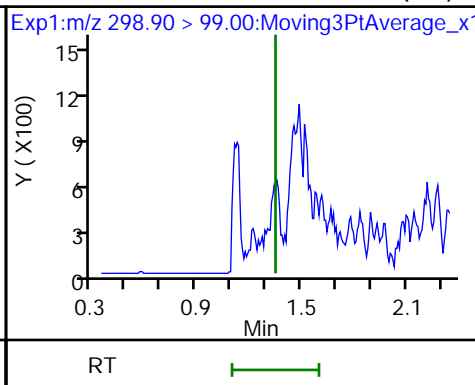
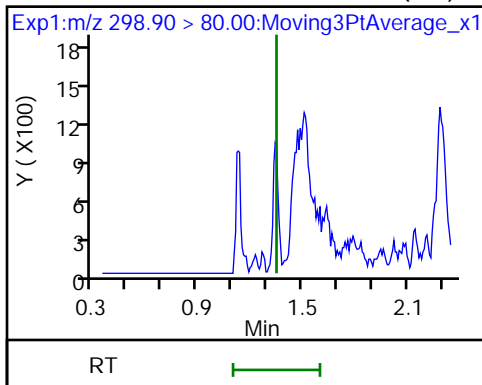
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

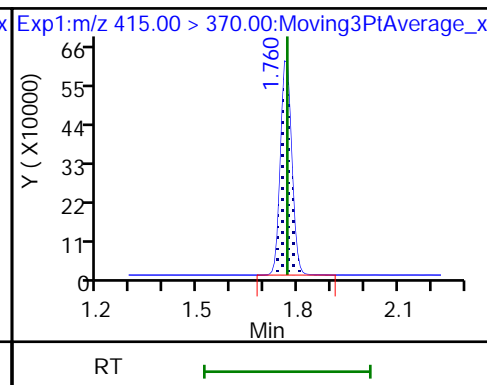
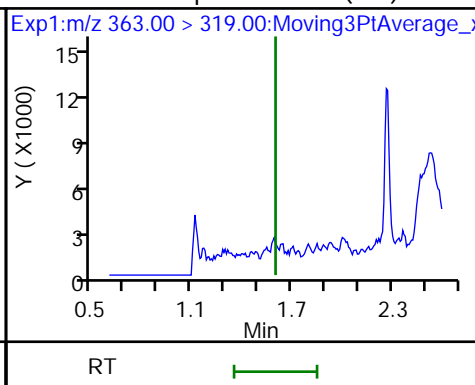
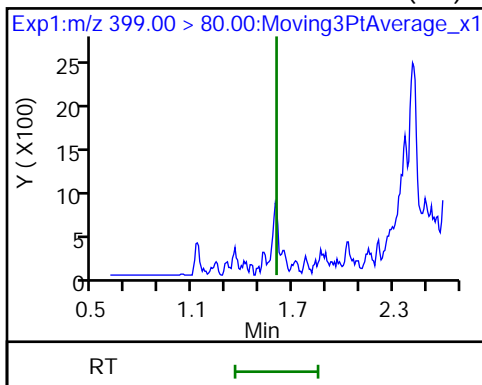
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

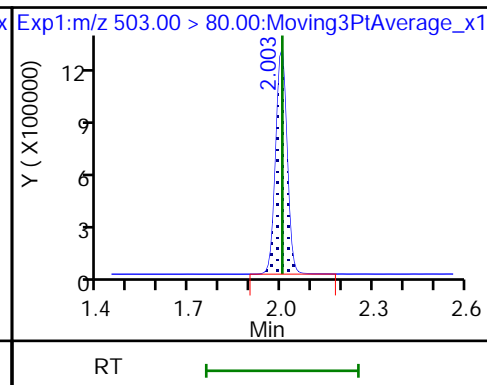
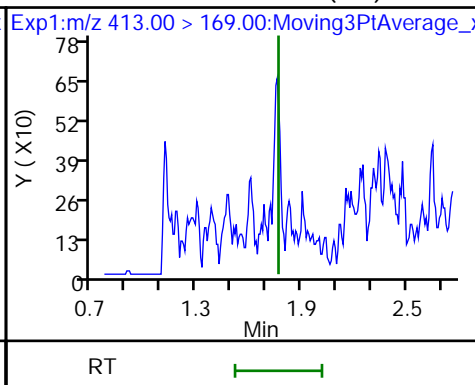
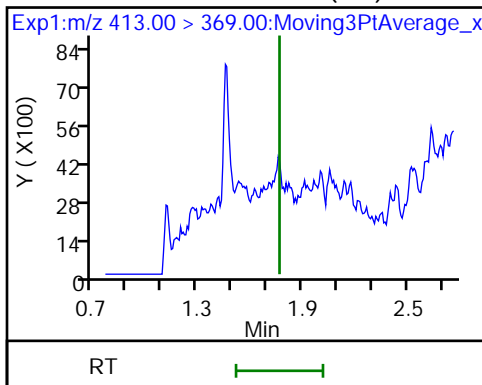
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

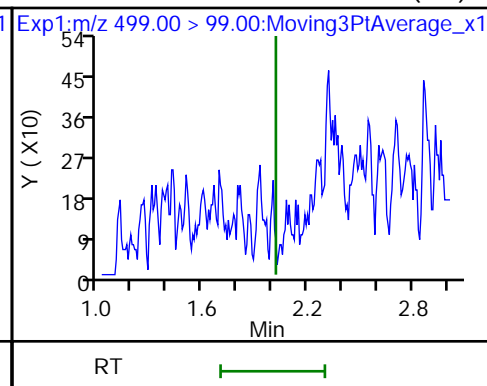
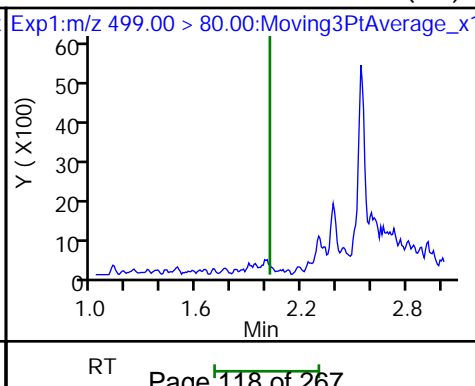
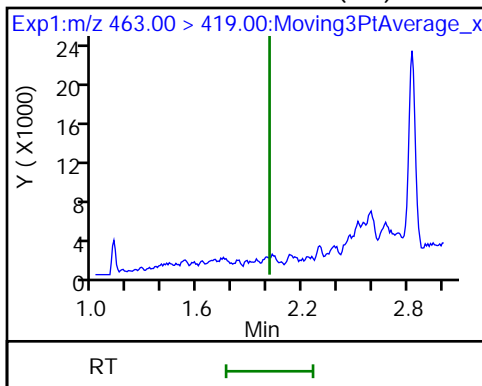
\* 7 13C4 PFOS



9 Perfluorononanoic acid (ND)

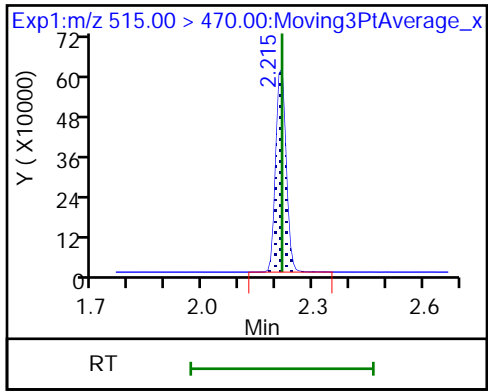
8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)





\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_040.d  
 Lims ID: 320-41647-A-2-A  
 Client ID: NAWC-073018-FRB-055  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 01:43:19 ALS Bottle#: 27 Worklist Smp#: 7  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-2-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:19 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.82	98.25
\$ 10 13C2 PFDA	10.0	10.1	101.33

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-RW-4851 Lab Sample ID: 320-41647-3  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_041.d  
 Analysis Method: 537 Date Collected: 07/30/2018 11:10  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 276.9(mL) Date Analyzed: 08/08/2018 01:48  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238604 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	36	14	6.1
335-67-1	Perfluorooctanoic acid (PFOA)	6.1	J	18	7.2	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U M	27	11	5.0
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.1	J M	9.0	3.6	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33	U	81	33	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	109		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_041.d  
 Lims ID: 320-41647-A-3-A  
 Client ID: WGNA-073018-RW-4851  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 01:48:00 ALS Bottle#: 28 Worklist Smp#: 8  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-3-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:19 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 10:41:00

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	74037	0.5928		56.3	
298.90 > 99.00	1.350	1.350	0.0	1.000	51365		1.44(0.00-0.00)	63.6	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1499341	9.76		13315	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.601	-0.008	1.000	72673	0.3865		31.5	M
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.601	0.0	1.000	89097	0.5929		13.6	M
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.768	0.0		1396964	10.0		9397	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	259659	1.70		33.3	
413.00 > 169.00	1.768	1.768	0.0	1.000	151123		1.72(0.00-0.00)	252	
* 7 13C4 PFOS									
503.00 > 80.00	2.003	2.003	0.0		3024904	28.7		2342	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.003	2.018	-0.015	1.000	143841	1.25		43.2	
499.00 > 99.00	2.003	2.018	-0.015	1.000	22056		6.52(0.00-0.00)	29.0	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.215	0.0	1.000	1248674	10.9		11343	

## QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_041.d

Injection Date: 08-Aug-2018 01:48:00

Instrument ID: A8\_N

Lims ID: 320-41647-A-3-A

Lab Sample ID: 320-41647-3

Client ID: WGNA-073018-RW-4851

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 28

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

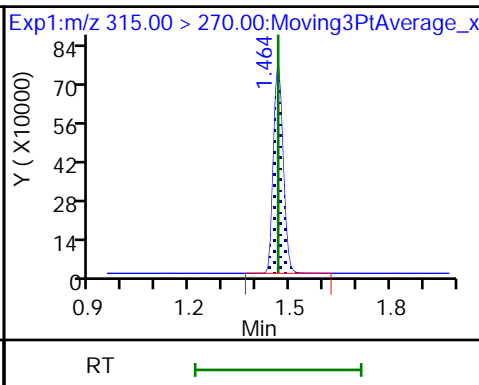
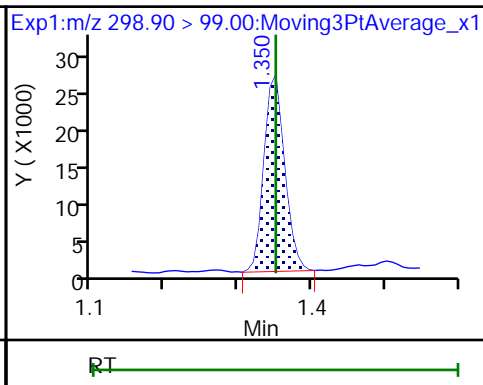
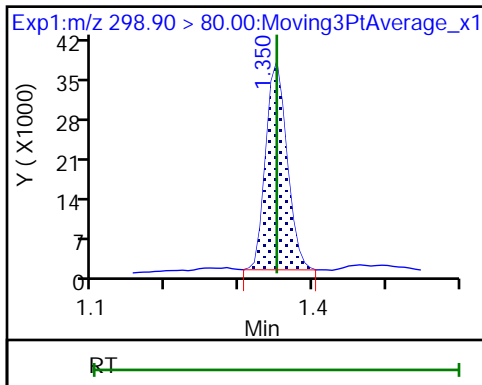
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

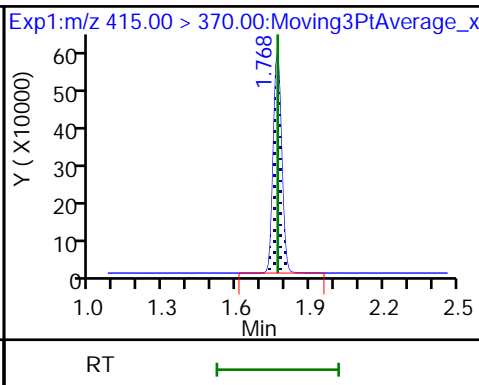
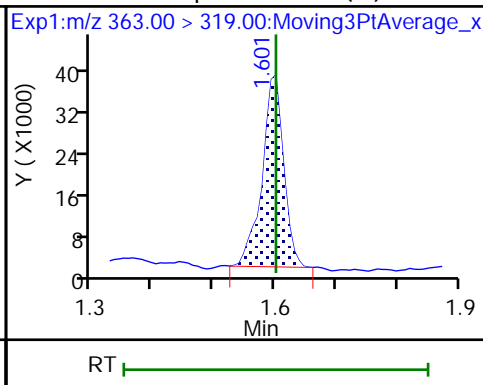
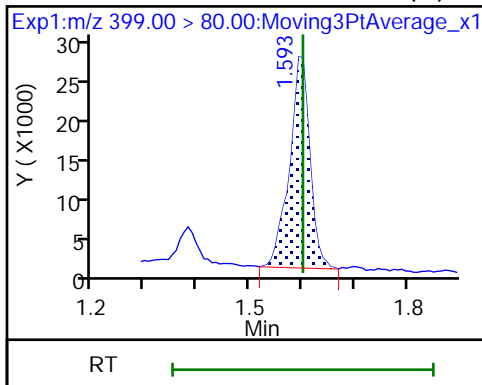
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (M)

4 Perfluoroheptanoic acid (M)

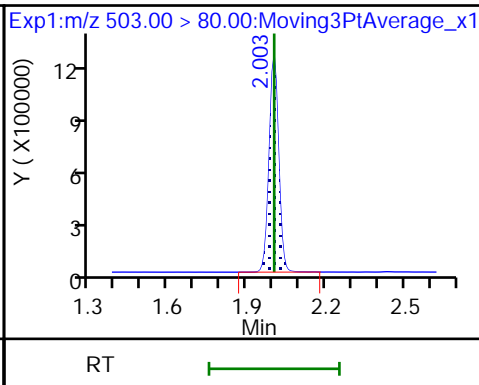
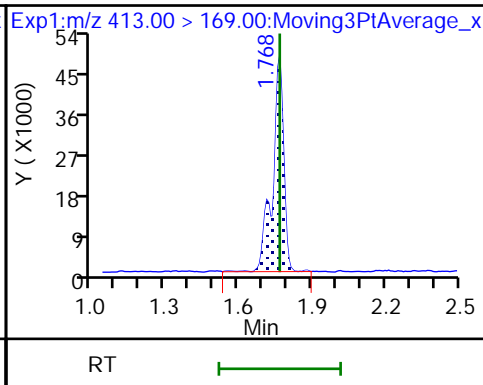
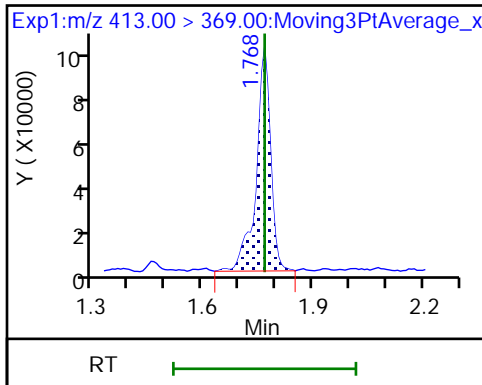
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

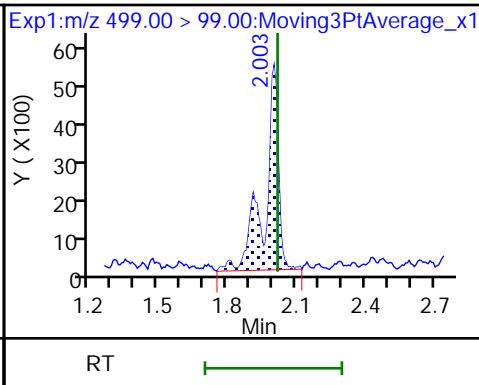
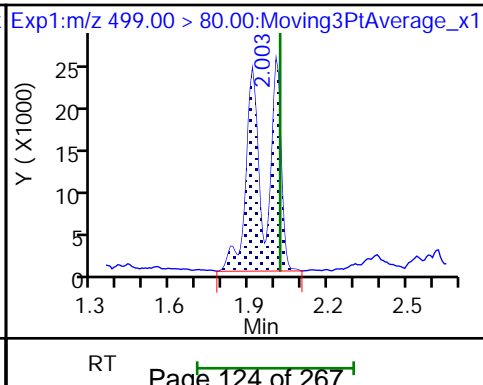
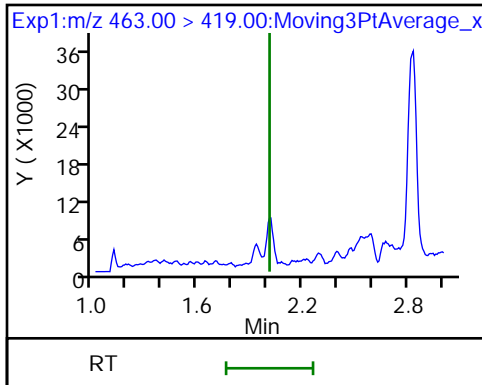
\* 7 13C4 PFOS



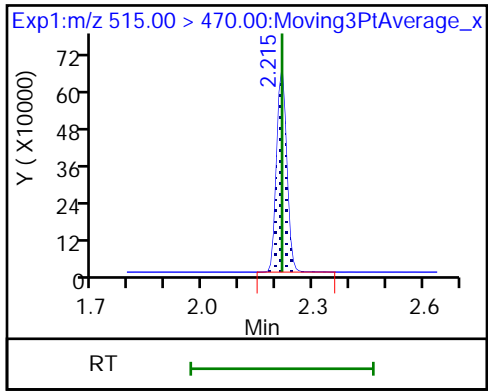
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_041.d  
 Lims ID: 320-41647-A-3-A  
 Client ID: WGNA-073018-RW-4851  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 01:48:00 ALS Bottle#: 28 Worklist Smp#: 8  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-3-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:19 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 10:41:00

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.76	97.61
\$ 10 13C2 PFDA	10.0	10.9	109.16



TestAmerica Sacramento

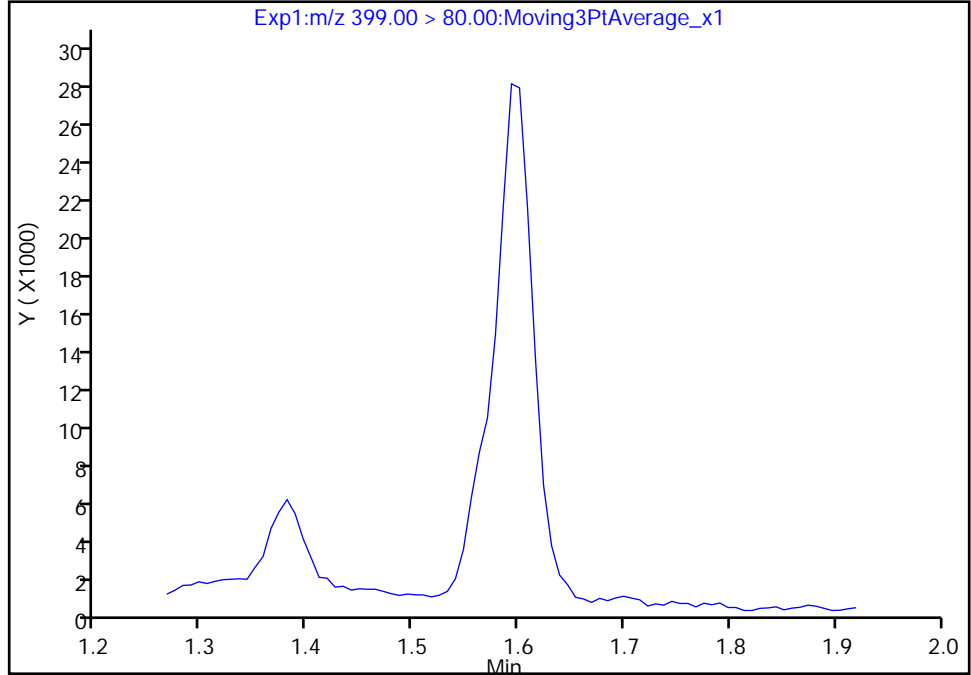
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_041.d  
Injection Date: 08-Aug-2018 01:48:00 Instrument ID: A8\_N  
Lims ID: 320-41647-A-3-A Lab Sample ID: 320-41647-3  
Client ID: WGNA-073018-RW-4851  
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 28 Worklist Smp#: 8  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

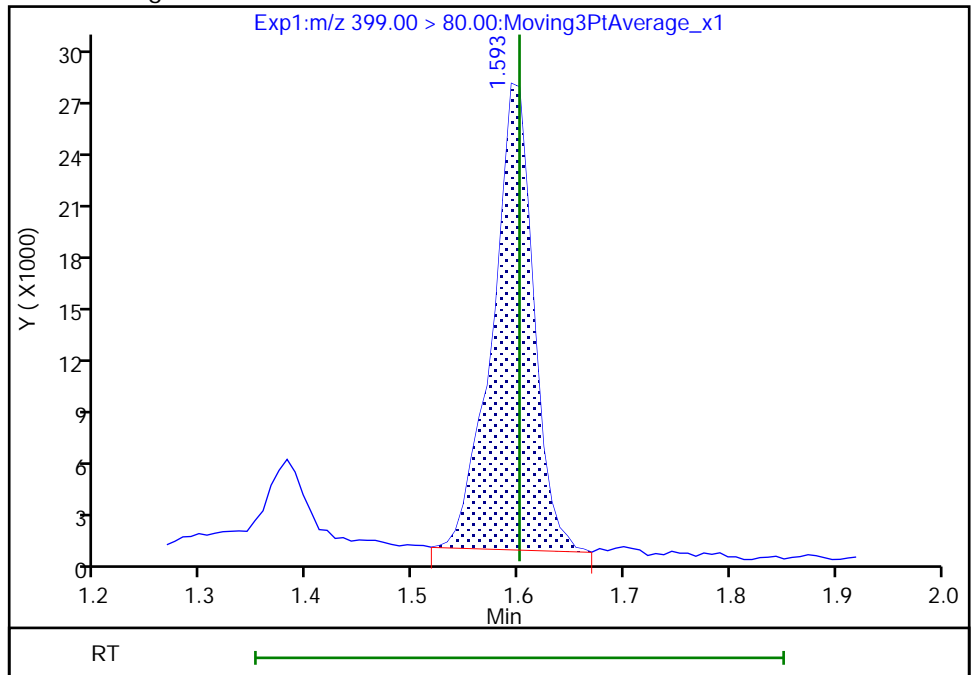
Not Detected  
Expected RT: 1.60

Processing Integration Results



Manual Integration Results

RT: 1.59  
Area: 72673  
Amount: 0.386454  
Amount Units: ng/ml



Reviewer: barnettj, 08-Aug-2018 10:40:33  
Audit Action: Manually Integrated

Audit Reason: Missed Peak  
Page 127 of 267

TestAmerica Sacramento

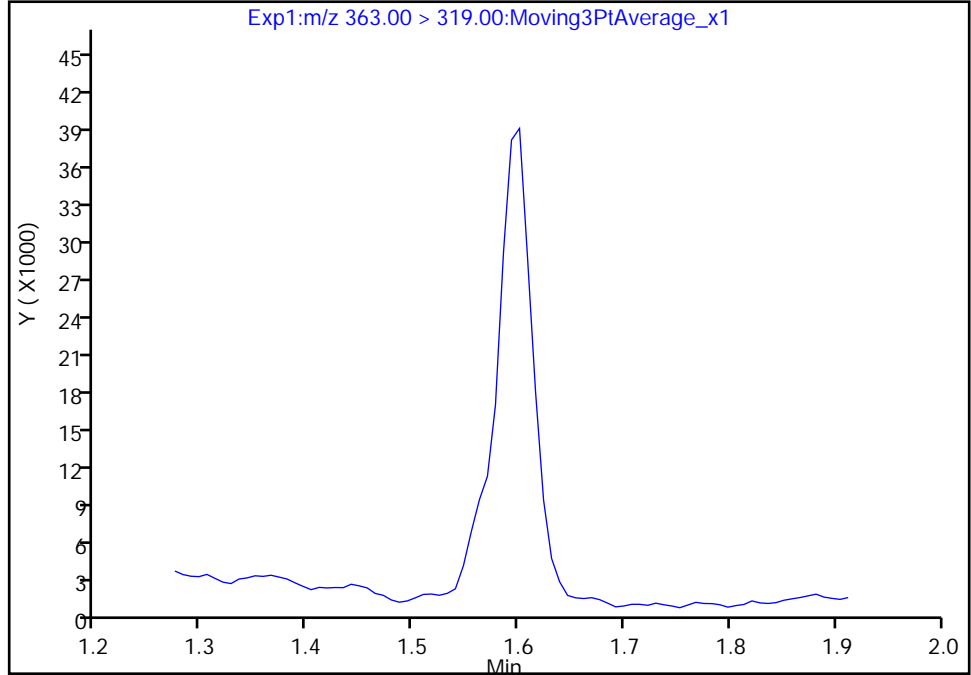
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Injection Date: 08-Aug-2018 01:48:00 Instrument ID: A8\_N  
Lims ID: 320-41647-A-3-A Lab Sample ID: 320-41647-3  
Client ID: WGNA-073018-RW-4851  
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 28 Worklist Smp#: 8  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

4 Perfluoroheptanoic acid, CAS: 375-85-9

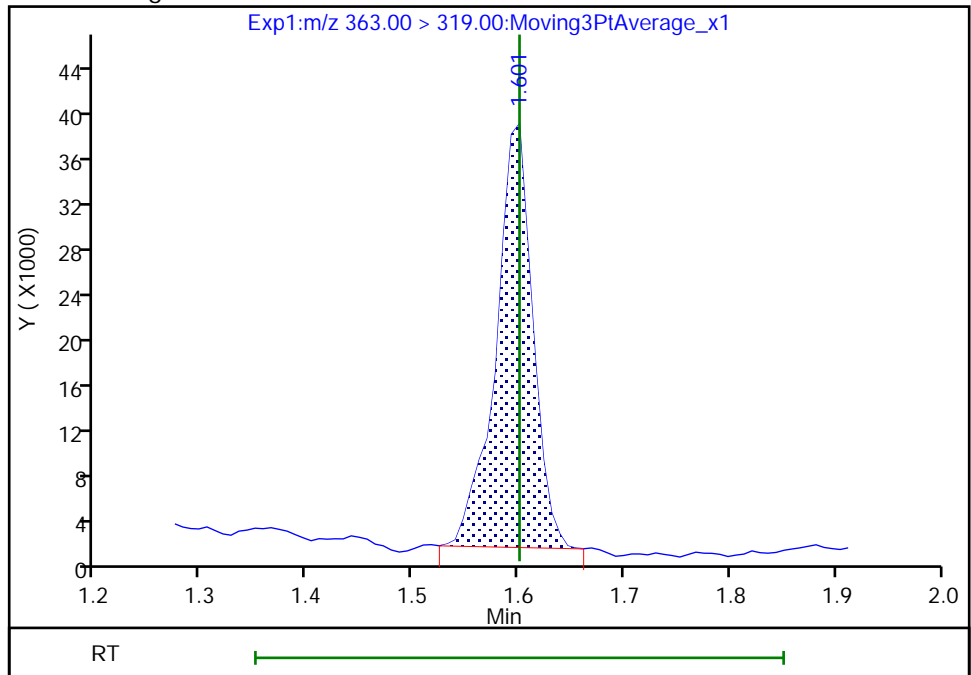
Signal: 1

Not Detected  
Expected RT: 1.60

Processing Integration Results



Manual Integration Results



RT: 1.60  
Area: 89097  
Amount: 0.592944  
Amount Units: ng/ml

Reviewer: barnettj, 08-Aug-2018 10:40:44  
Audit Action: Manually Integrated

Audit Reason: Missed Peak  
Page 128 of 267

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-FRB-4851 Lab Sample ID: 320-41647-4  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_042.d  
 Analysis Method: 537 Date Collected: 07/30/2018 11:05  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 280.8(mL) Date Analyzed: 08/08/2018 01:52  
 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.: 238604 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	36	14	6.1
335-67-1	Perfluorooctanoic acid (PFOA)	7.1	U	18	7.1	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	21	18	7.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	27	11	4.9
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.6	U	8.9	3.6	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	80	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	104		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_042.d  
 Lims ID: 320-41647-A-4-A  
 Client ID: WGNA-073018-FRB-4851  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 01:52:41 ALS Bottle#: 29 Worklist Smp#: 9  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-4-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:19 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.457	1.464	-0.007	1.000	1646184	9.71	12035	
* 6 13C2-PFOA	415.00 > 370.00	1.760	1.768	-0.008		1541812	10.0	9751	
* 7 13C4 PFOS	503.00 > 80.00	1.995	2.003	-0.008		3258238	28.7	3613	
\$ 10 13C2 PFDA	515.00 > 470.00	2.208	2.215	-0.007	1.000	1310141	10.4	10420	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_042.d

Injection Date: 08-Aug-2018 01:52:41

Instrument ID: A8\_N

Lims ID: 320-41647-A-4-A

Lab Sample ID: 320-41647-4

Client ID: WGNA-073018-FRB-4851

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 29

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

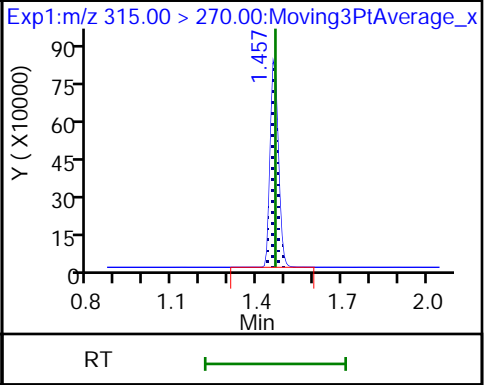
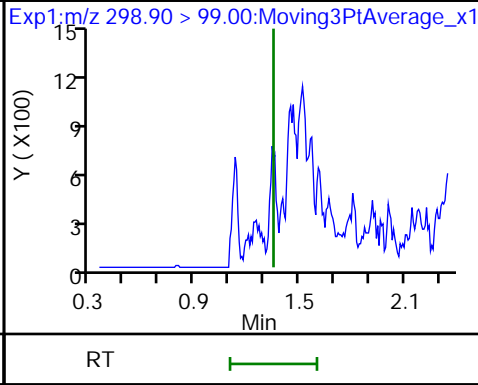
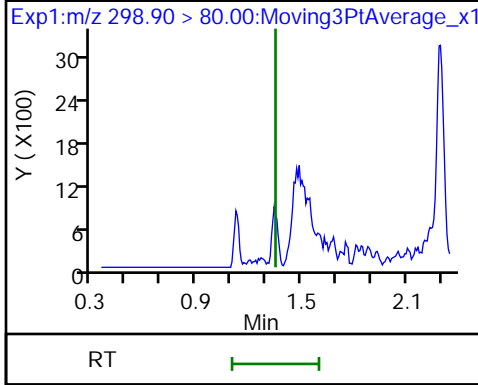
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

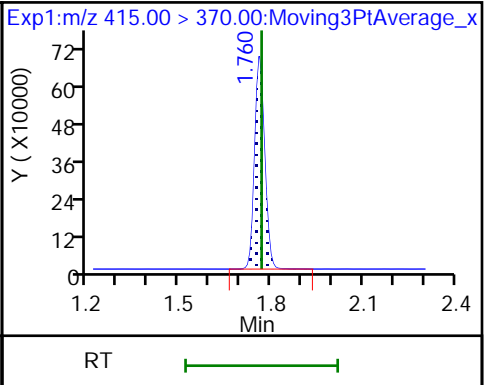
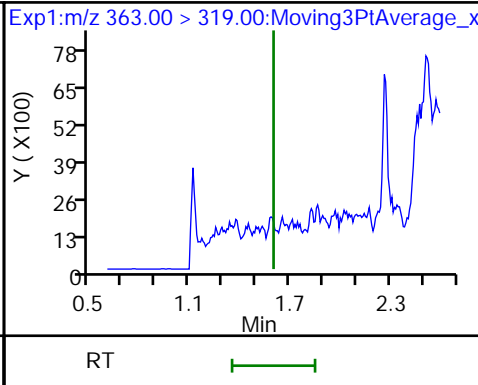
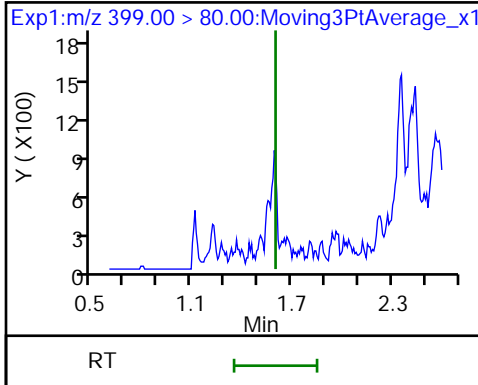
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

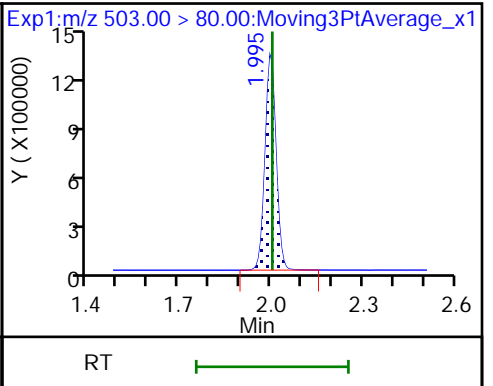
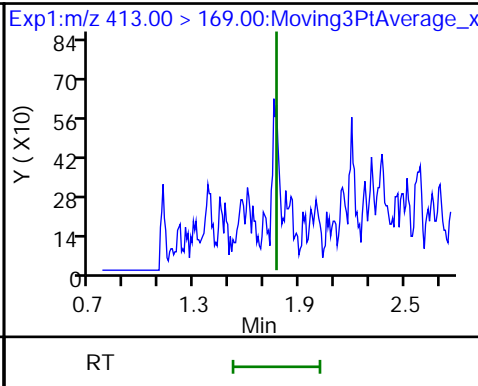
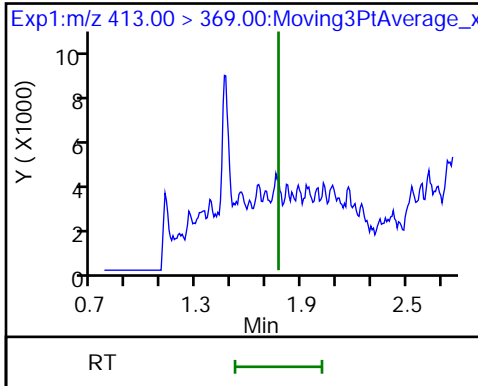
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

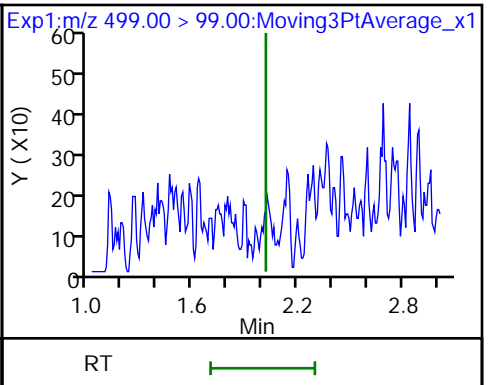
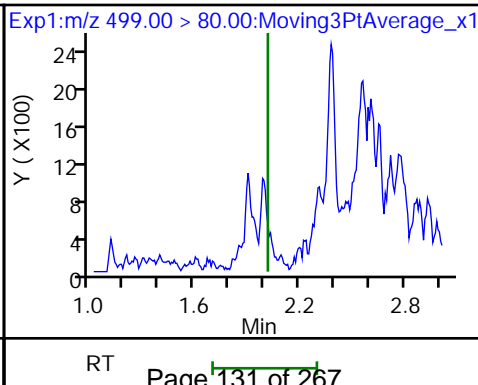
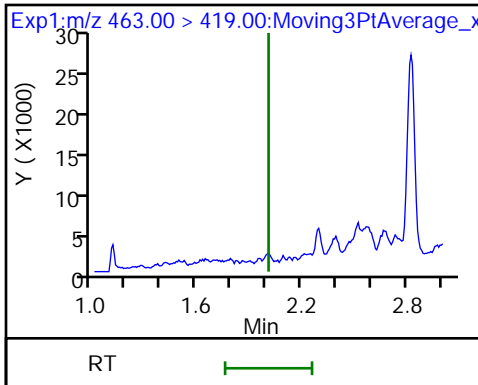
\* 7 13C4 PFOS



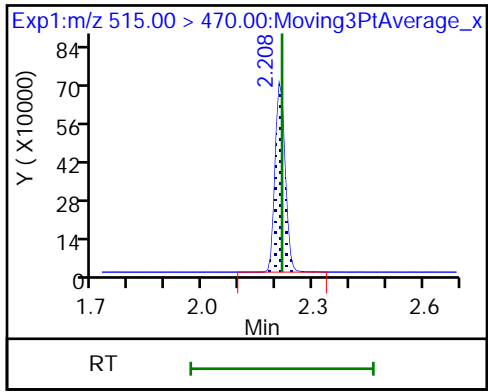
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_042.d  
 Lims ID: 320-41647-A-4-A  
 Client ID: WGNA-073018-FRB-4851  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 01:52:41 ALS Bottle#: 29 Worklist Smp#: 9  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-4-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:19 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.71	97.10
\$ 10 13C2 PFDA	10.0	10.4	103.77

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-RW-3604 Lab Sample ID: 320-41647-5  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_043.d  
 Analysis Method: 537 Date Collected: 07/30/2018 11:40  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 272.6(mL) Date Analyzed: 08/08/2018 01:57  
 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.: 238604 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	10	J	37	15	6.2
335-67-1	Perfluorooctanoic acid (PFOA)	10	J	18	7.3	2.6
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.3
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.0
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.2	J	9.2	3.7	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33	U	83	33	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	78		70-130
STL00996	13C2 PFDA	108		70-130



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_043.d  
 Lims ID: 320-41647-A-5-A  
 Client ID: WGNA-073018-RW-3604  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 01:57:22 ALS Bottle#: 30 Worklist Smp#: 10  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-5-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:19 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 10:41:22

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.343	1.350	-0.007	1.000	288128	2.10		210	
298.90 > 99.00	1.343	1.350	-0.007	1.000	195909		1.47(0.00-0.00)	262	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.457	1.464	-0.007	1.000	1289486	7.82		9691	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.601	-0.008	1.000	155420	0.7517		84.9	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.593	1.601	-0.008	1.000	183263	1.14		25.5	
* 6 13C2-PFOA									
415.00 > 370.00	1.760	1.768	-0.008		1499601	10.0		8363	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.760	1.768	-0.008	1.000	464200	2.83		59.2	
413.00 > 169.00	1.760	1.768	-0.008	1.000	257205		1.80(0.00-0.00)	427	
* 7 13C4 PFOS									
503.00 > 80.00	1.995	2.003	-0.008		3325872	28.7		2722	
9 Perfluorononanoic acid									
463.00 > 419.00	2.003	2.011	-0.008	1.000	51742	0.4378		5.6	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	1.995	2.018	-0.023	1.000	353070	2.79		112	
499.00 > 99.00	1.995	2.018	-0.023	1.000	60283		5.86(0.00-0.00)	79.6	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.208	2.215	-0.007	1.000	1324374	10.8		10282	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_043.d

Injection Date: 08-Aug-2018 01:57:22

Instrument ID: A8\_N

Lims ID: 320-41647-A-5-A

Lab Sample ID: 320-41647-5

Client ID: WGNA-073018-RW-3604

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 30

Worklist Smp#: 10

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

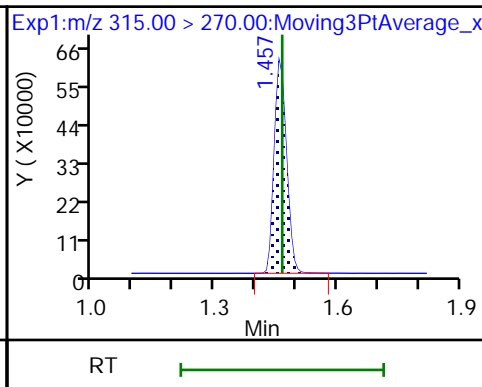
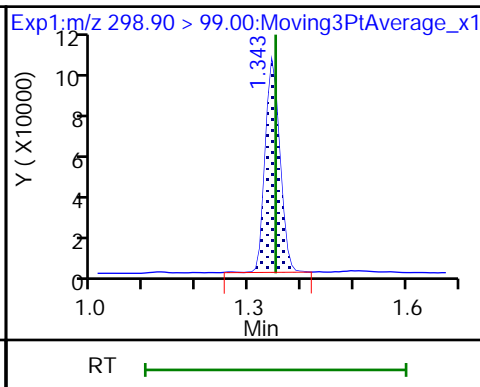
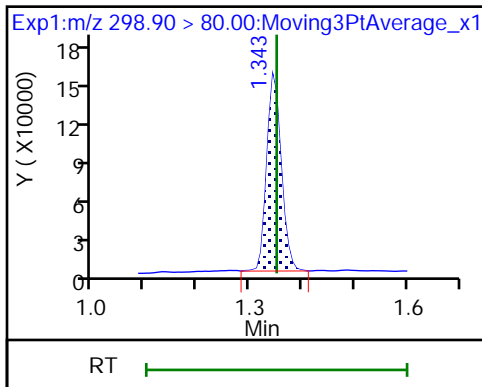
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

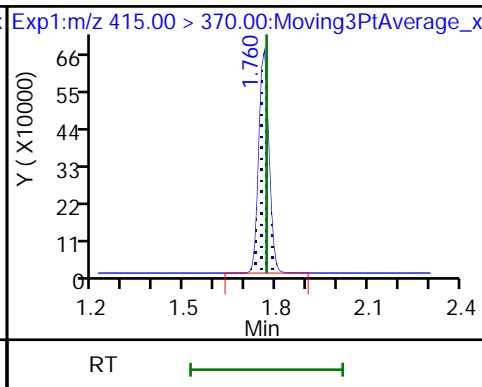
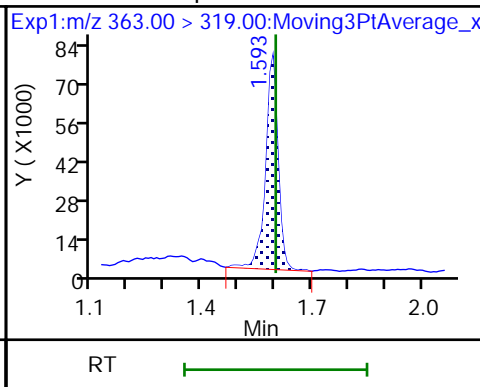
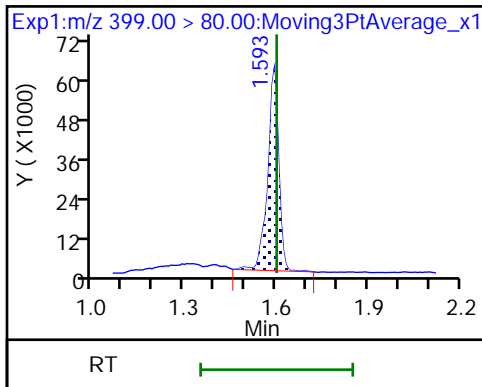
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

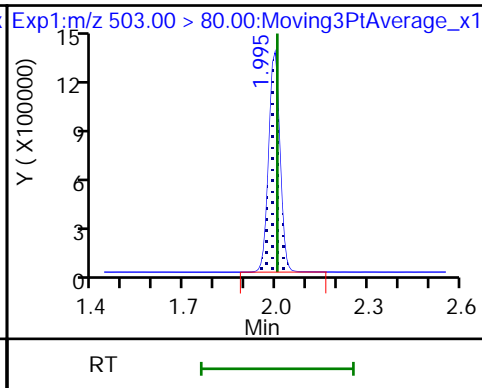
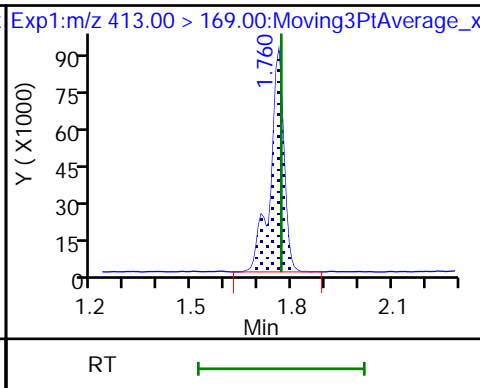
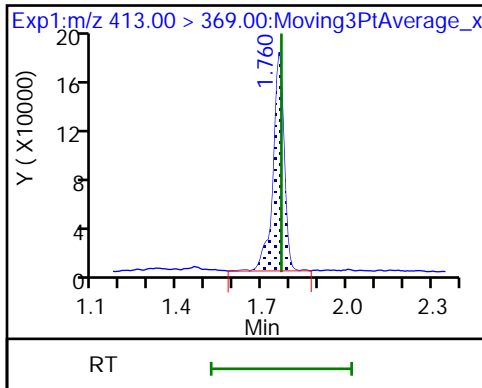
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

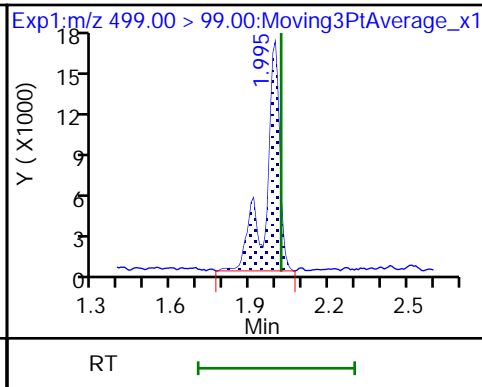
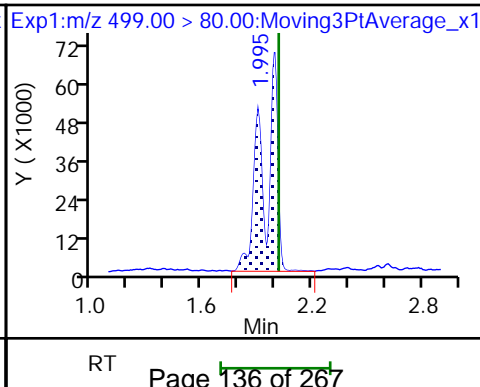
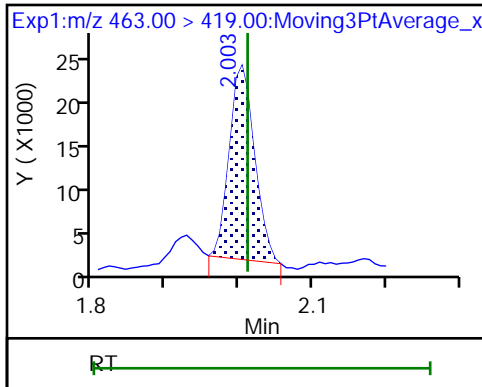
\* 7 13C4 PFOS



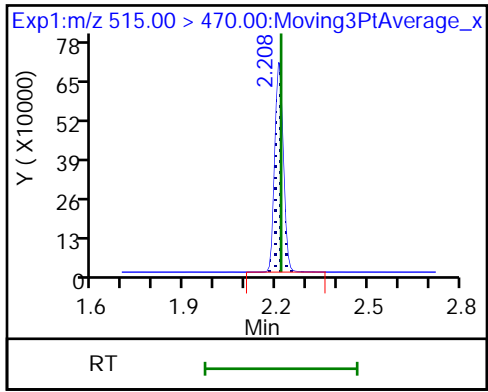
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_043.d  
 Lims ID: 320-41647-A-5-A  
 Client ID: WGNA-073018-RW-3604  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 01:57:22 ALS Bottle#: 30 Worklist Smp#: 10  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-5-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:19 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 10:41:22

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	7.82	78.20
\$ 10 13C2 PFDA	10.0	10.8	107.85

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-FRB-3604 Lab Sample ID: 320-41647-6  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_046.d  
 Analysis Method: 537 Date Collected: 07/30/2018 11:35  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 266(mL) Date Analyzed: 08/08/2018 02:11  
 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.: 238606 Units: ng/L

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

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

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_046.d  
 Lims ID: 320-41647-A-6-A  
 Client ID: WGNA-073018-FRB-3604  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 02:11:23 ALS Bottle#: 31 Worklist Smp#: 13  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-6-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:26 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.464	1.464	0.0	1.000	1465602	10.1	11257	
* 6 13C2-PFOA	415.00 > 370.00	1.760	1.760	0.0		1316224	10.0	7783	
* 7 13C4 PFOS	503.00 > 80.00	1.995	2.003	-0.008		2940798	28.7	3556	
\$ 10 13C2 PFDA	515.00 > 470.00	2.208	2.215	-0.007	1.000	1178046	10.9	9546	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_046.d

Injection Date: 08-Aug-2018 02:11:23

Instrument ID: A8\_N

Lims ID: 320-41647-A-6-A

Lab Sample ID: 320-41647-6

Client ID: WGNA-073018-FRB-3604

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 31

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

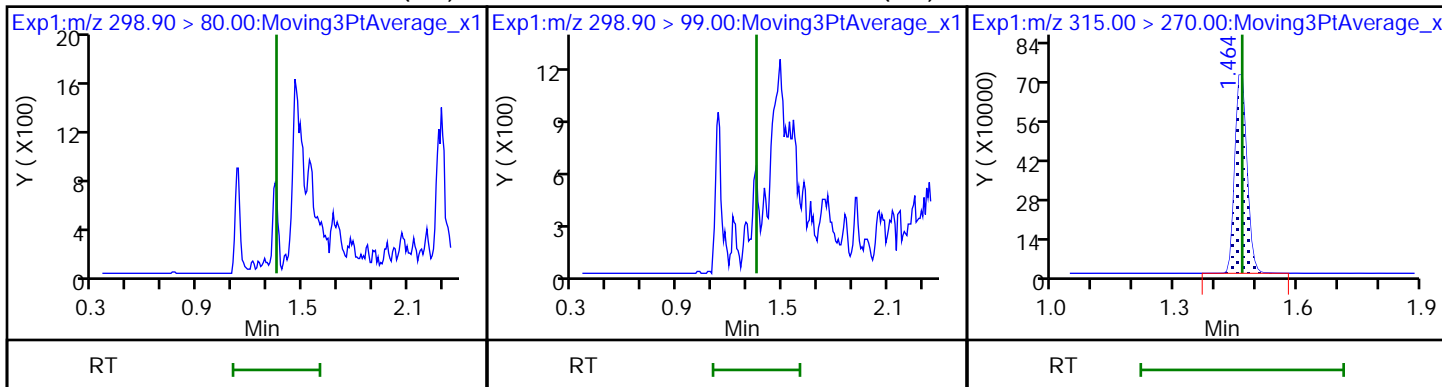
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

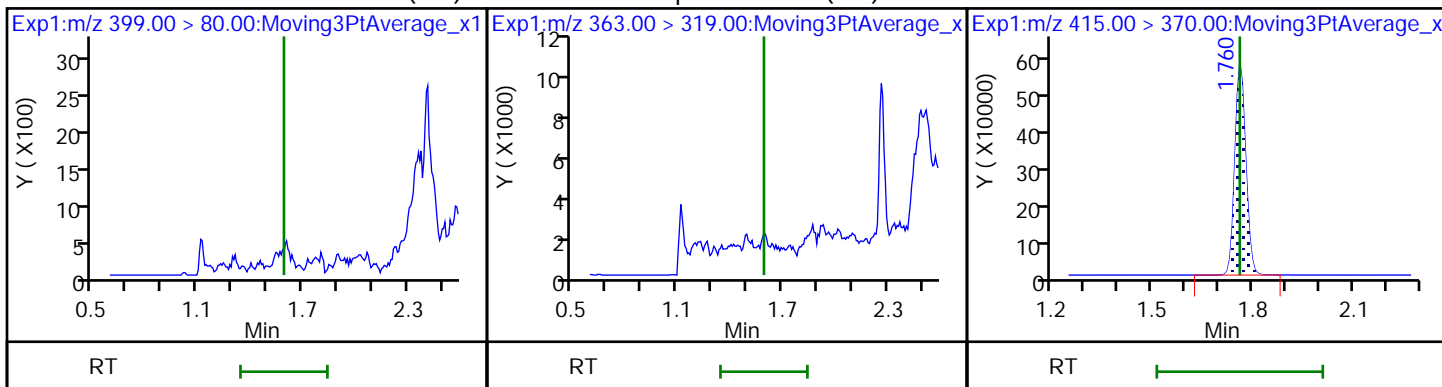
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

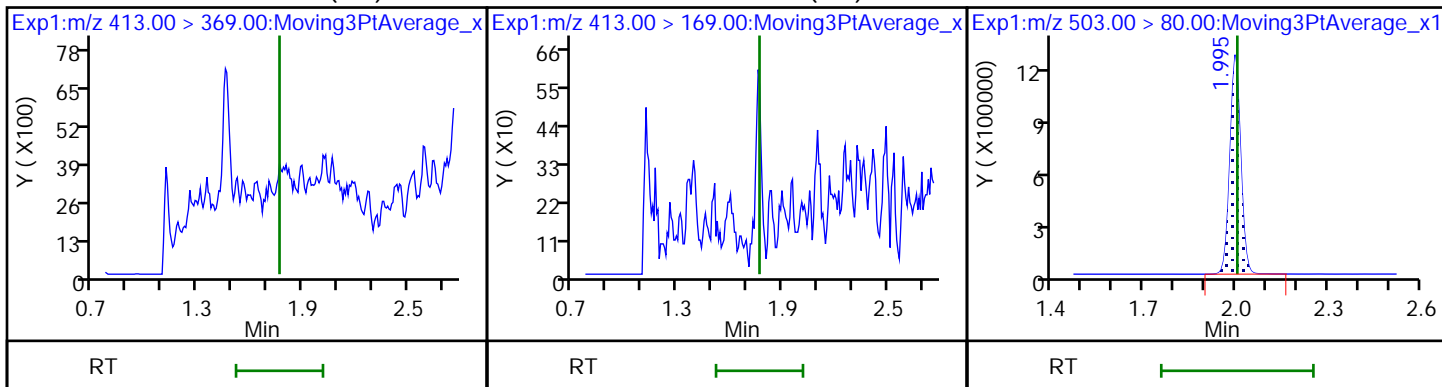
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

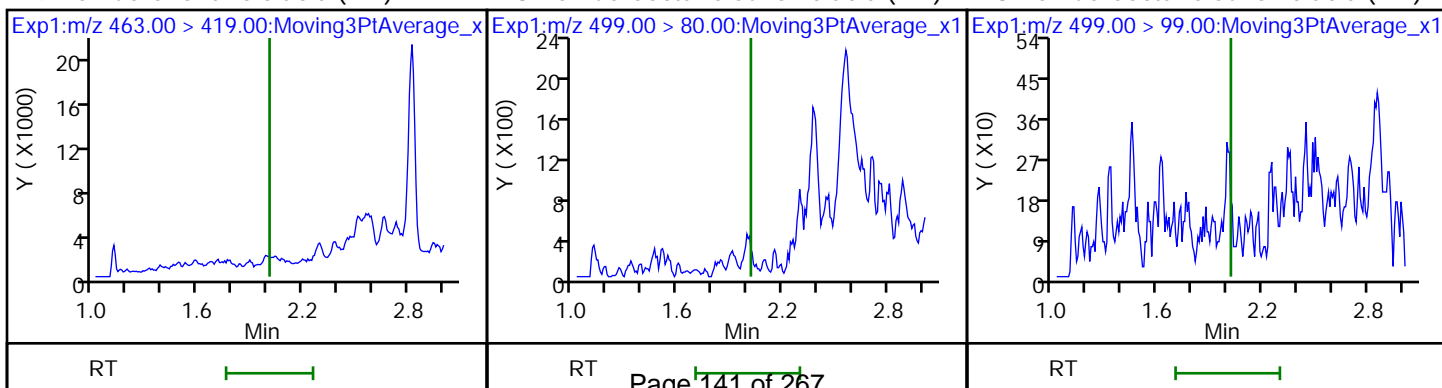
\* 7 13C4 PFOS



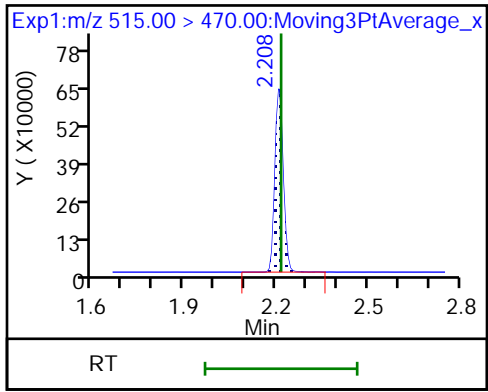
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA





TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_046.d  
 Lims ID: 320-41647-A-6-A  
 Client ID: WGNA-073018-FRB-3604  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 02:11:23 ALS Bottle#: 31 Worklist Smp#: 13  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-6-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:26 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.1	101.26
\$ 10 13C2 PFDA	10.0	10.9	109.30

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-RW-3529 Lab Sample ID: 320-41647-7  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_047.d  
 Analysis Method: 537 Date Collected: 07/30/2018 15:10  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 266.7(mL) Date Analyzed: 08/08/2018 02:16  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	10	J	37	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	16	J	19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U M	22	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.6	J	9.4	3.7	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	84	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	89		70-130
STL00996	13C2 PFDA	99		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_047.d  
 Lims ID: 320-41647-A-7-A  
 Client ID: WGNA-073018-RW-3529  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 02:16:04 ALS Bottle#: 32 Worklist Smp#: 14  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-7-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:26 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 10:41:58

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	134375	0.9818		96.5	
298.90 > 99.00	1.350	1.350	0.0	1.000	92860		1.45(0.00-0.00)	124	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1451424	8.85		10652	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.593	0.008	1.000	270062	1.31		129	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.593	0.008	1.000	280879	1.75		39.2	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.760	0.008		1491339	10.0		8101	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	688573	4.21		82.2	
413.00 > 169.00	1.768	1.768	0.0	1.000	402939		1.71(0.00-0.00)	684	
* 7 13C4 PFOS									
503.00 > 80.00	2.003	2.003	0.0		3314712	28.7		2336	
9 Perfluorononanoic acid									
463.00 > 419.00	2.018	2.011	0.007	1.000	51229	0.4358		5.4	M
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	1.920	2.018	-0.098	1.000	346759	2.75		79.5	
499.00 > 99.00	2.011	2.018	-0.007	1.047	59995		5.78(0.00-0.00)	66.3	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.215	0.0	1.000	1210676	9.91		9416	

## QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_047.d

Injection Date: 08-Aug-2018 02:16:04

Instrument ID: A8\_N

Lims ID: 320-41647-A-7-A

Lab Sample ID: 320-41647-7

Client ID: WGNA-073018-RW-3529

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 32

Worklist Smp#: 14

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

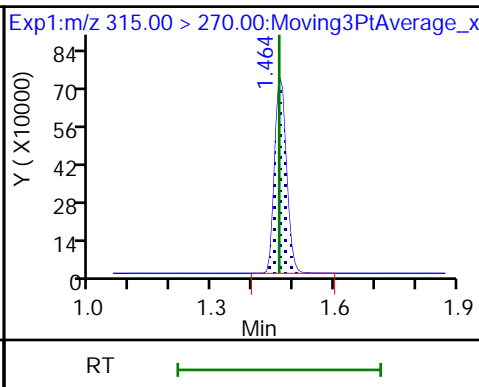
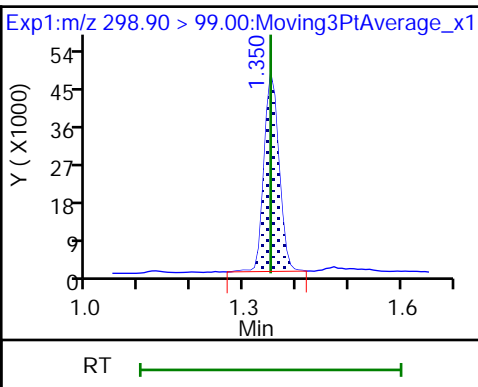
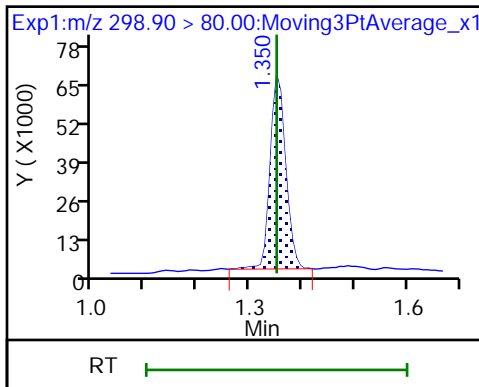
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

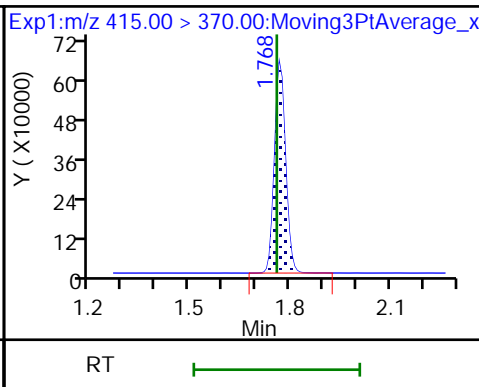
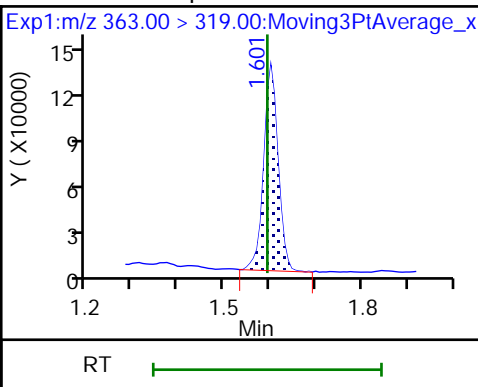
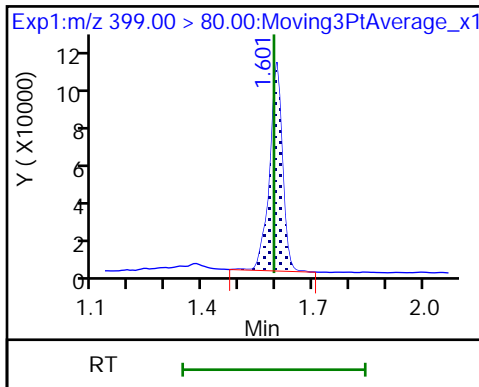
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

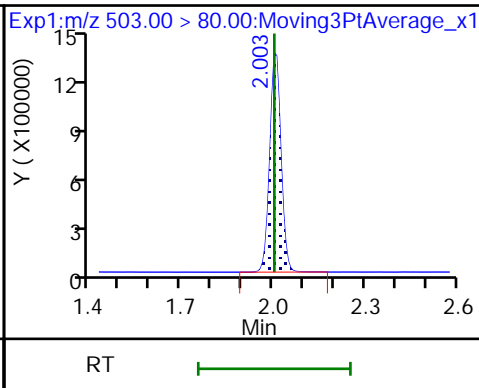
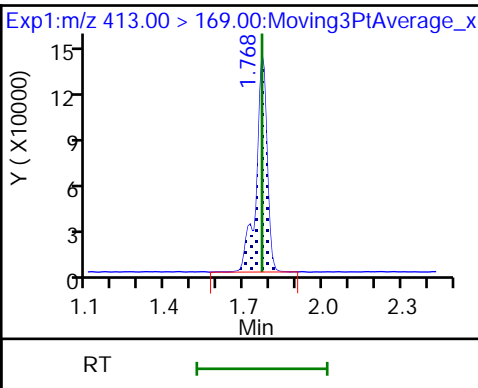
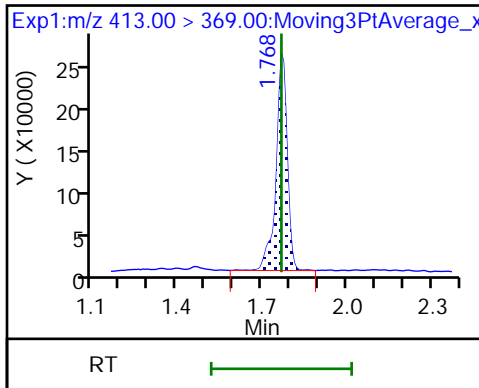
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

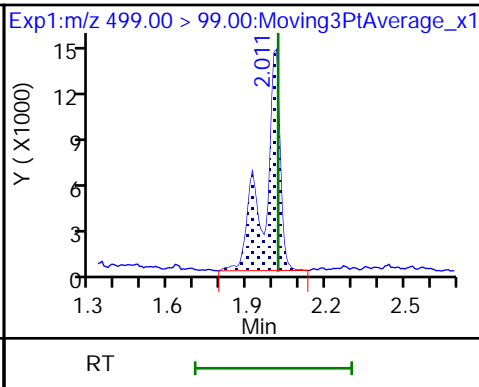
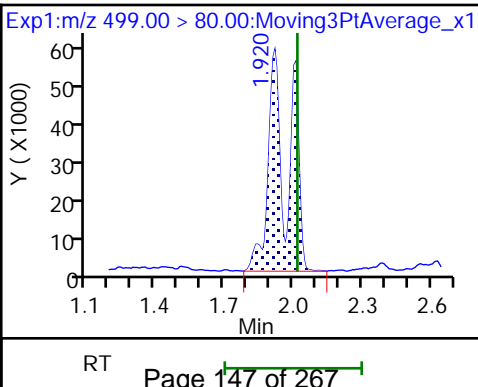
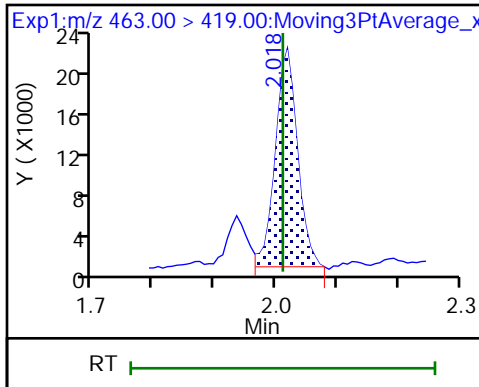
\* 7 13C4 PFOS



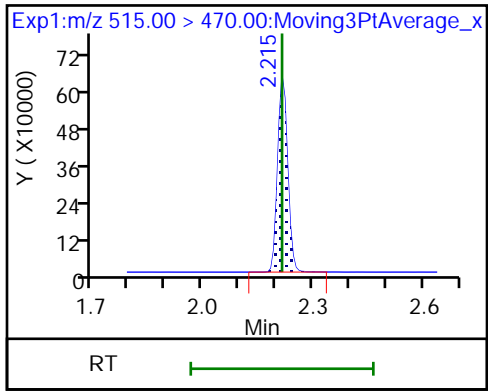
9 Perfluorononanoic acid (M)

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_047.d  
 Lims ID: 320-41647-A-7-A  
 Client ID: WGNA-073018-RW-3529  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 02:16:04 ALS Bottle#: 32 Worklist Smp#: 14  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-7-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:26 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 10:41:58

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.85	88.51
\$ 10 13C2 PFDA	10.0	9.91	99.14

TestAmerica Sacramento

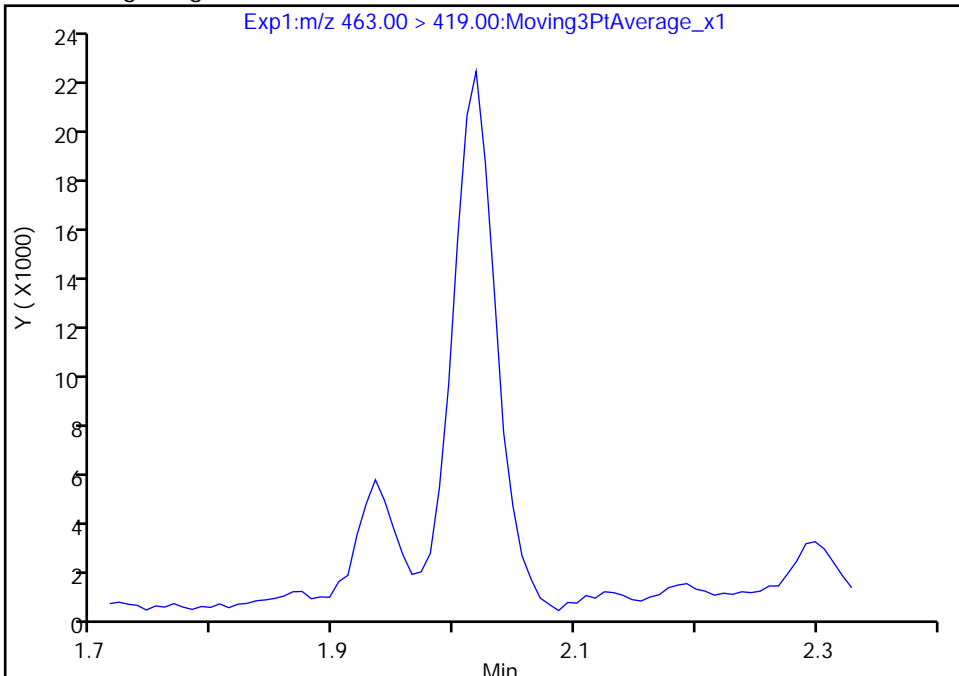
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Injection Date: 08-Aug-2018 02:16:04 Instrument ID: A8\_N  
Lims ID: 320-41647-A-7-A Lab Sample ID: 320-41647-7  
Client ID: WGNA-073018-RW-3529  
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 32 Worklist Smp#: 14  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

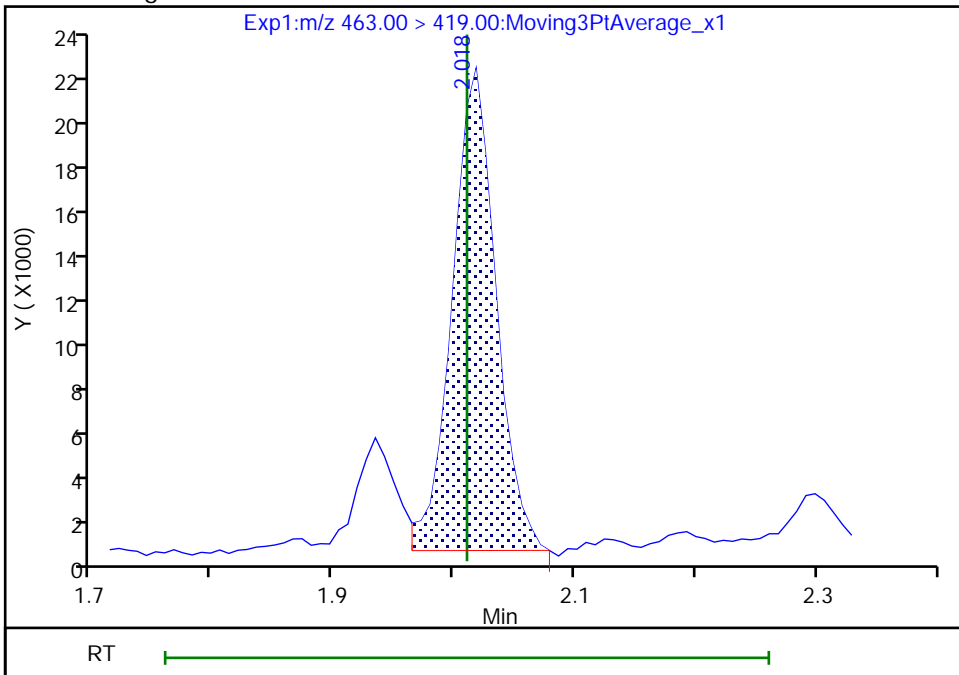
Not Detected  
Expected RT: 2.01

Processing Integration Results



Manual Integration Results

RT: 2.02  
Area: 51229  
Amount: 0.435824  
Amount Units: ng/ml



Reviewer: barnettj, 08-Aug-2018 10:41:49  
Audit Action: Manually Integrated

Audit Reason: Missed Peak  
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FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-FRB-3529 Lab Sample ID: 320-41647-8  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_048.d  
 Analysis Method: 537 Date Collected: 07/30/2018 15:05  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 272.1(mL) Date Analyzed: 08/08/2018 02:20  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	37	15	6.2
335-67-1	Perfluorooctanoic acid (PFOA)	7.4	U	18	7.4	2.6
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.4
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.7	U	9.2	3.7	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33	U	83	33	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	102		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_048.d  
 Lims ID: 320-41647-A-8-A  
 Client ID: WGNA-073018-FRB-3529  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 02:20:44 ALS Bottle#: 33 Worklist Smp#: 15  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-8-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:26 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.464	1.464	0.0	1.000	1606068	10.1	13462	
* 6 13C2-PFOA	415.00 > 370.00	1.768	1.760	0.008		1451085	10.0	8432	
* 7 13C4 PFOS	503.00 > 80.00	2.003	2.003	0.0		3073585	28.7	3596	
\$ 10 13C2 PFDA	515.00 > 470.00	2.215	2.215	0.0	1.000	1217870	10.2	8909	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_048.d

Injection Date: 08-Aug-2018 02:20:44

Instrument ID: A8\_N

Lims ID: 320-41647-A-8-A

Lab Sample ID: 320-41647-8

Client ID: WGNA-073018-FRB-3529

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 33

Worklist Smp#: 15

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

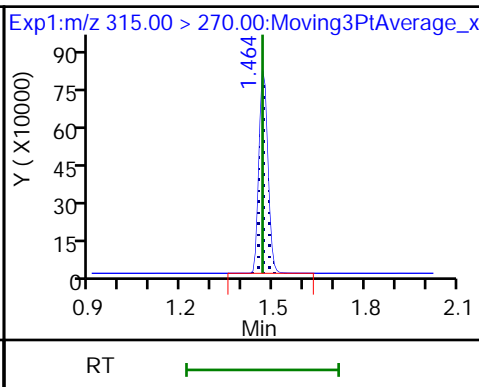
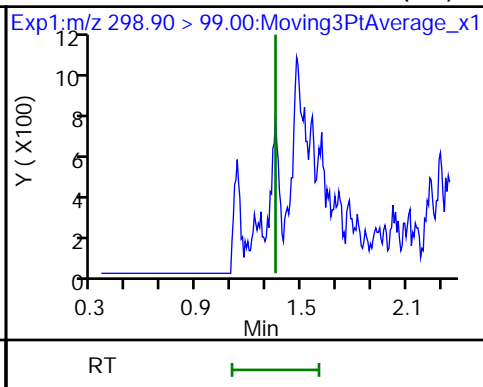
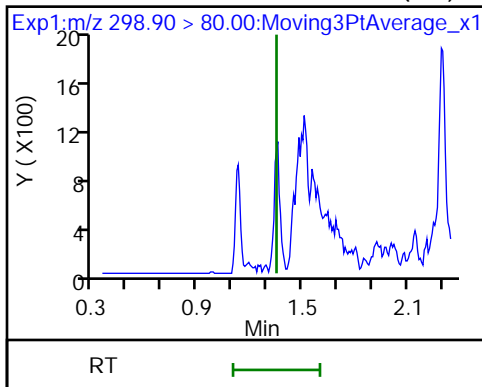
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

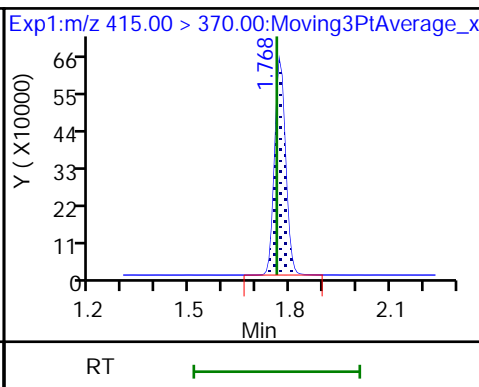
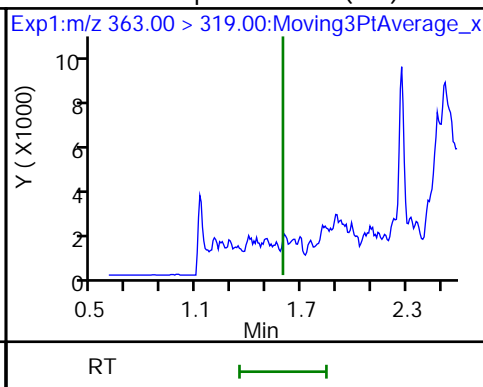
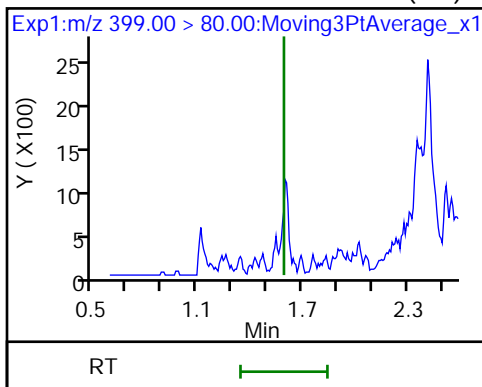
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

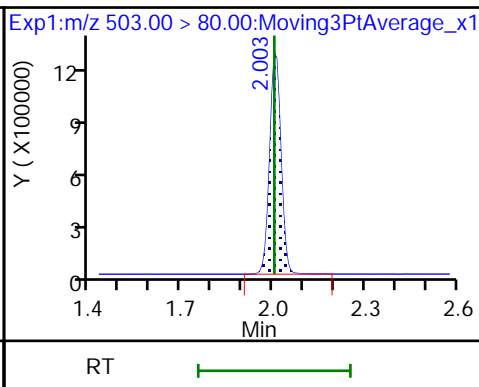
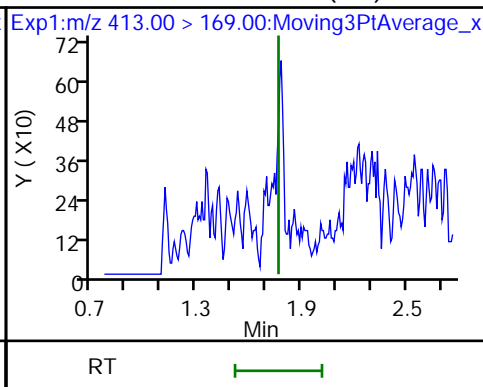
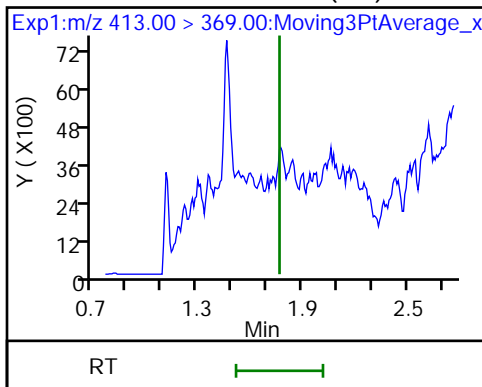
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

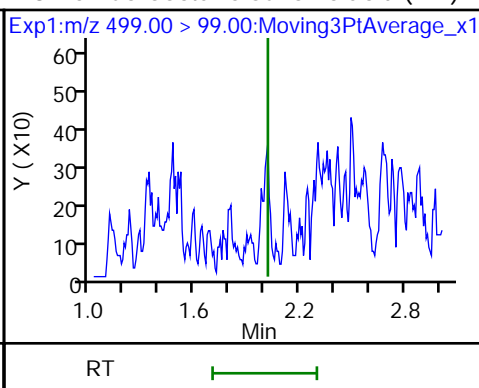
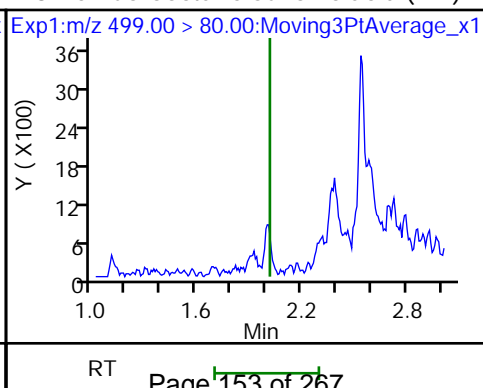
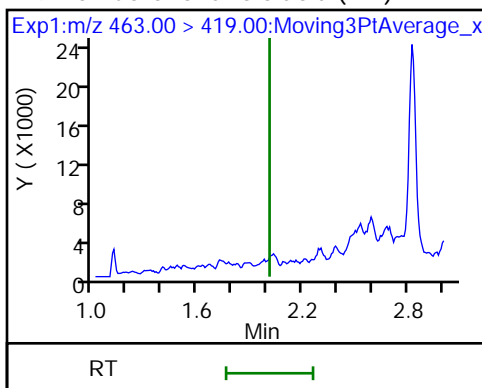
\* 7 13C4 PFOS



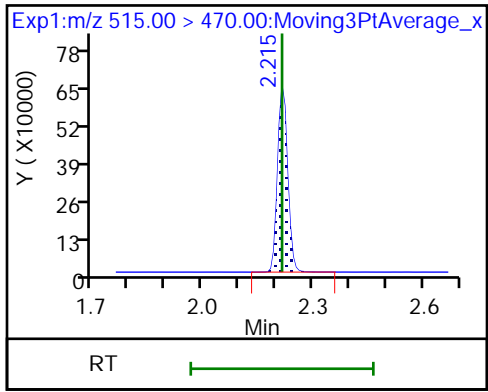
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_048.d  
 Lims ID: 320-41647-A-8-A  
 Client ID: WGNA-073018-FRB-3529  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 02:20:44 ALS Bottle#: 33 Worklist Smp#: 15  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-8-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:26 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.1	100.65
\$ 10 13C2 PFDA	10.0	10.2	102.49

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-RW-0500 Lab Sample ID: 320-41647-9  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_049.d  
 Analysis Method: 537 Date Collected: 07/30/2018 15:40  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 283.9(mL) Date Analyzed: 08/08/2018 02:25  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	20	J	35	14	6.0
335-67-1	Perfluorooctanoic acid (PFOA)	20		18	7.0	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	21	18	7.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.1	J	26	11	4.8
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.5	J	8.8	3.5	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	79	32	14

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

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_049.d  
 Lims ID: 320-41647-A-9-A  
 Client ID: WGNA-073018-RW-0500  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 02:25:24 ALS Bottle#: 34 Worklist Smp#: 16  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-9-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:26 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 10:42:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	296773	2.39		189	
298.90 > 99.00	1.350	1.350	0.0	1.000	202614		1.46(0.00-0.00)	262	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1470505	9.78		13044	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.593	0.008	1.000	375558	2.01		199	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.593	0.008	1.000	228816	1.56		32.7	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.760	0.008		1367015	10.0		8002	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	846115	5.65		105	
413.00 > 169.00	1.768	1.768	0.0	1.000	499722		1.69(0.00-0.00)	843	
* 7 13C4 PFOS									
503.00 > 80.00	2.003	2.003	0.0		3006266	28.7		2333	
9 Perfluorononanoic acid									
463.00 > 419.00	2.011	2.011	0.0	1.000	66812	0.6201		8.0	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.003	2.018	-0.015	1.000	656125	5.73		181	
499.00 > 99.00	2.003	2.018	-0.015	1.000	117014		5.61(0.00-0.00)	159	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.215	0.0	1.000	1173422	10.5		9996	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_049.d

Injection Date: 08-Aug-2018 02:25:24

Instrument ID: A8\_N

Lims ID: 320-41647-A-9-A

Lab Sample ID: 320-41647-9

Client ID: WGNA-073018-RW-0500

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 34

Worklist Smp#: 16

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

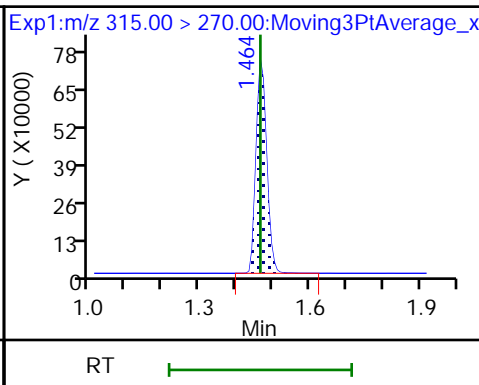
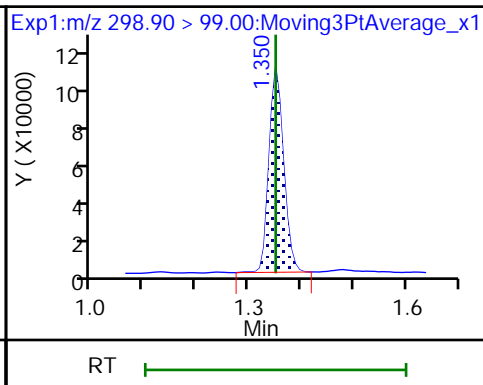
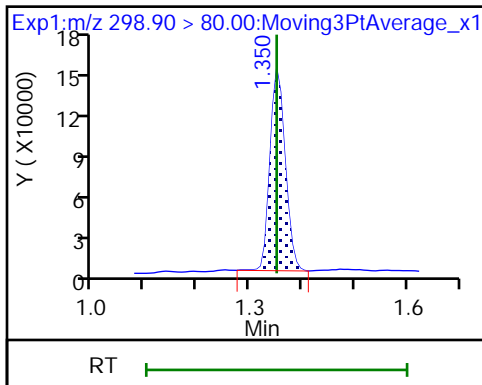
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

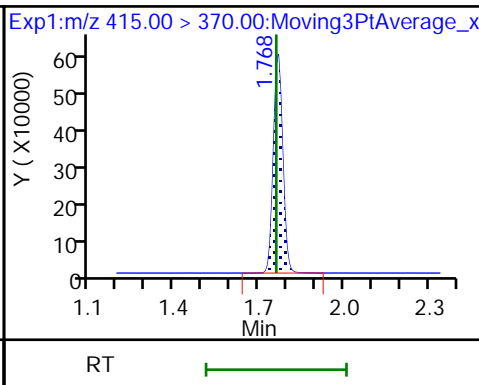
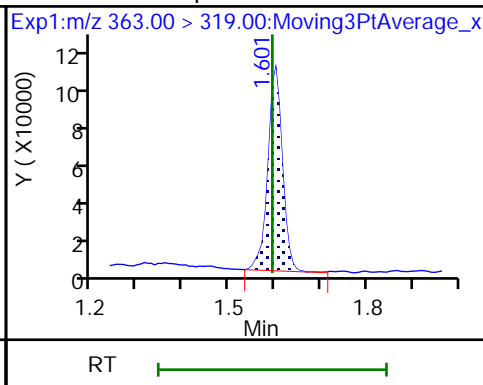
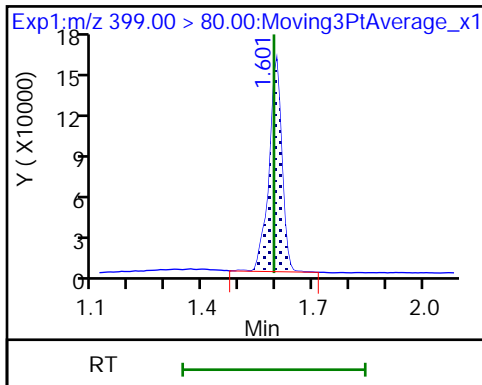
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

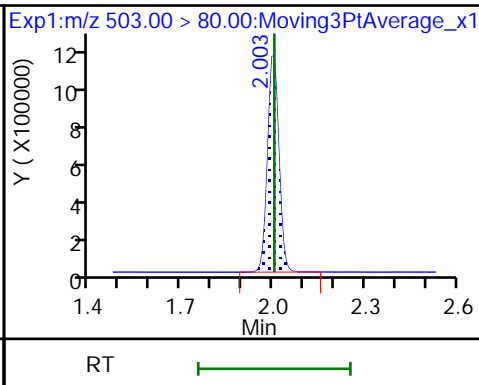
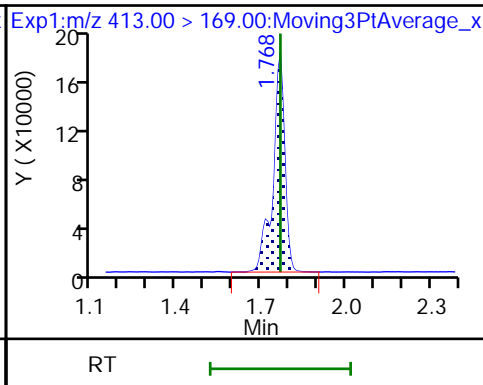
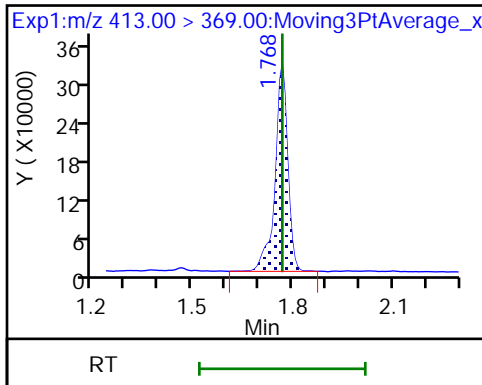
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

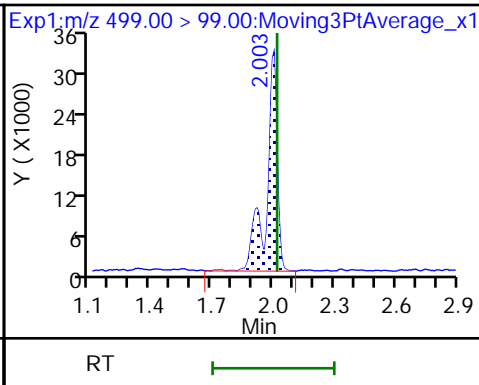
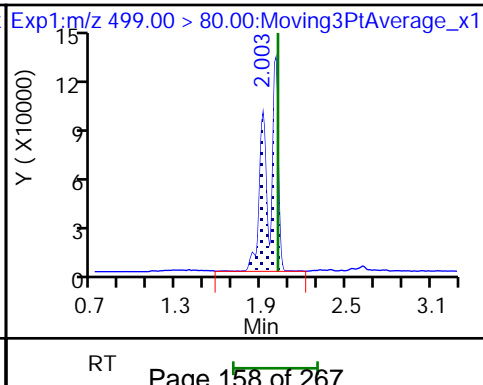
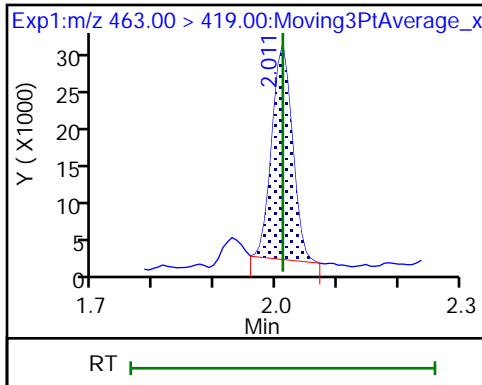
\* 7 13C4 PFOS



9 Perfluorononanoic acid

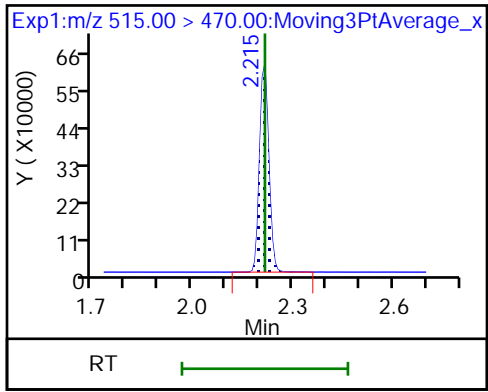
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid





\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_049.d  
 Lims ID: 320-41647-A-9-A  
 Client ID: WGNA-073018-RW-0500  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 02:25:24 ALS Bottle#: 34 Worklist Smp#: 16  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-9-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:26 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 10:42:17

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.78	97.83
\$ 10 13C2 PFDA	10.0	10.5	104.83

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-FRB-0500 Lab Sample ID: 320-41647-10  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_050.d  
 Analysis Method: 537 Date Collected: 07/30/2018 15:35  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 287.2 (mL) Date Analyzed: 08/08/2018 02:30  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	35	14	5.9
335-67-1	Perfluorooctanoic acid (PFOA)	7.0	U	17	7.0	2.4
375-95-1	Perfluorononanoic acid (PFNA)	17	U	21	17	7.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	10	U	26	10	4.8
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.5	U	8.7	3.5	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	31	U	78	31	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	104		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_050.d  
 Lims ID: 320-41647-A-10-A  
 Client ID: WGNA-073018-FRB-0500  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 02:30:04 ALS Bottle#: 35 Worklist Smp#: 17  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-10-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:26 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.457	1.464	-0.007	1.000	1549325	10.2	12871	
* 6 13C2-PFOA	415.00 > 370.00	1.760	1.760	0.0		1384234	10.0	7960	
* 7 13C4 PFOS	503.00 > 80.00	1.995	2.003	-0.008		3019813	28.7	3549	
\$ 10 13C2 PFDA	515.00 > 470.00	2.208	2.215	-0.007	1.000	1182656	10.4	8950	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_050.d

Injection Date: 08-Aug-2018 02:30:04

Instrument ID: A8\_N

Lims ID: 320-41647-A-10-A

Lab Sample ID: 320-41647-10

Client ID: WGNA-073018-FRB-0500

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 35

Worklist Smp#: 17

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

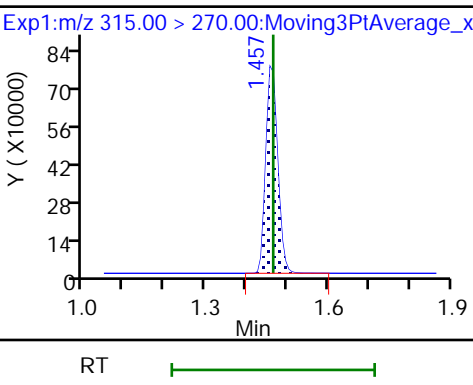
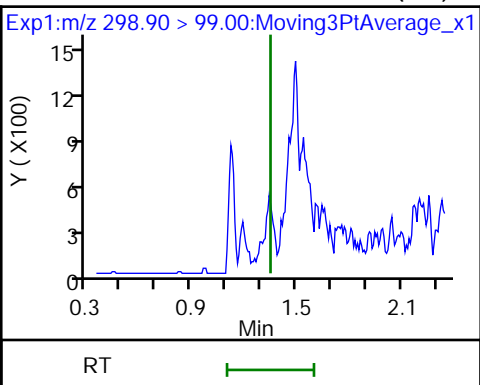
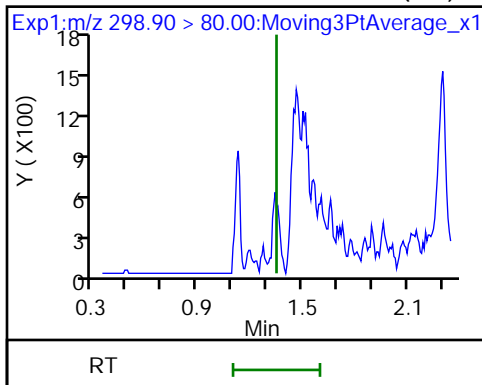
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

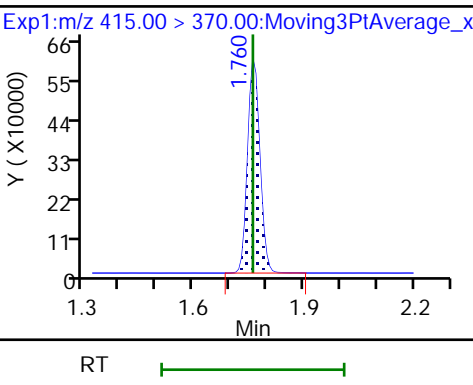
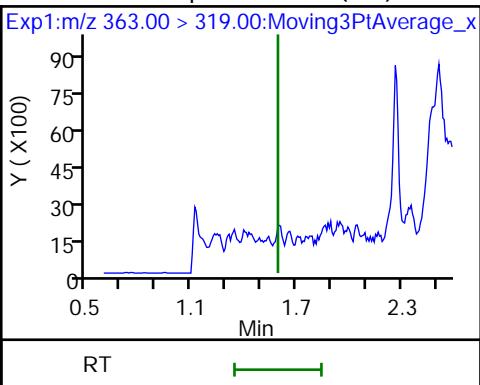
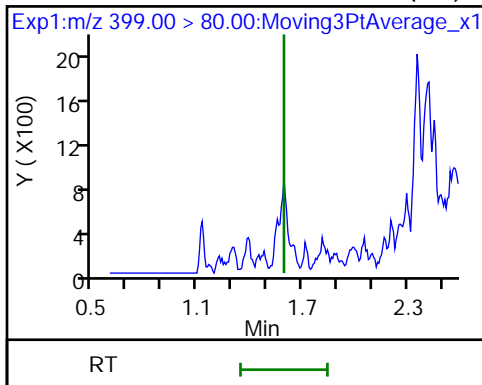
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

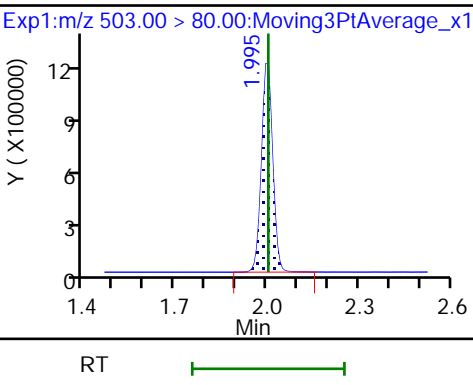
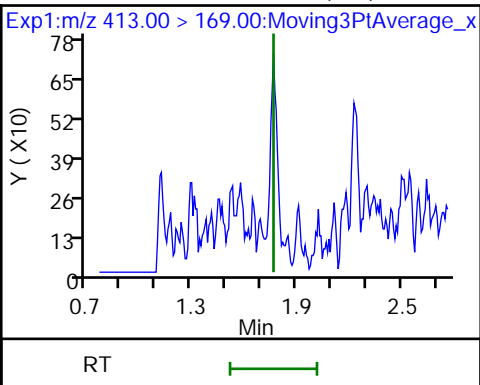
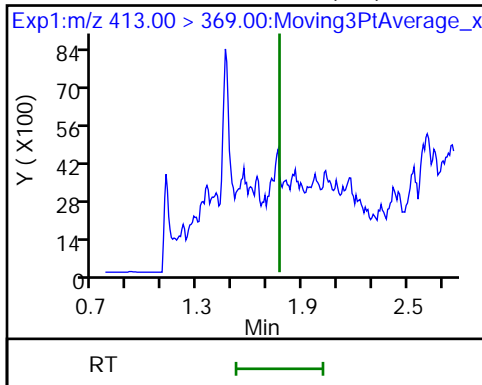
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

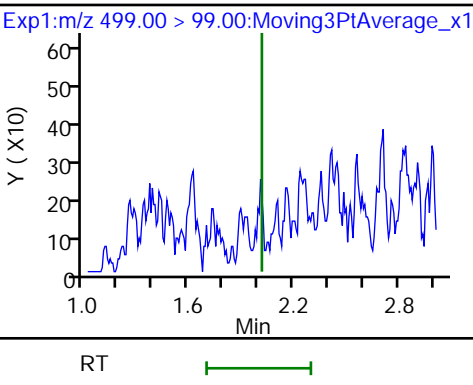
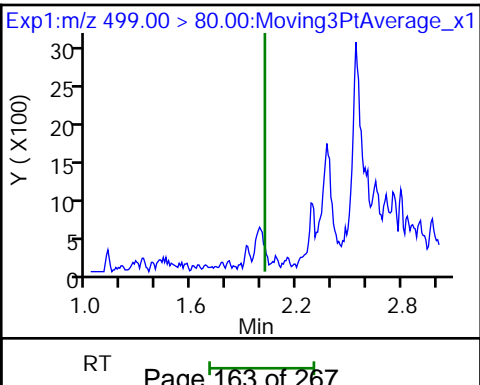
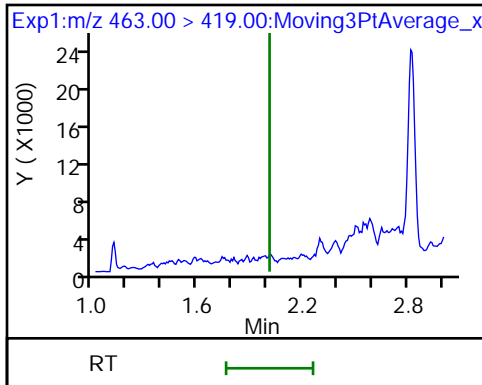
\* 7 13C4 PFOS



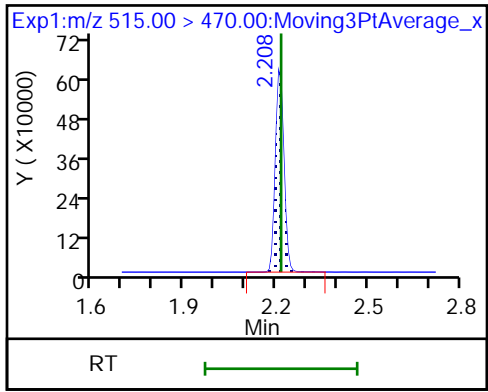
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_050.d  
 Lims ID: 320-41647-A-10-A  
 Client ID: WGNA-073018-FRB-0500  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 02:30:04 ALS Bottle#: 35 Worklist Smp#: 17  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-10-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:26 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.2	101.79
\$ 10 13C2 PFDA	10.0	10.4	104.34

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-RW-3957 Lab Sample ID: 320-41647-11  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_051.d  
 Analysis Method: 537 Date Collected: 07/30/2018 15:40  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 254.4 (mL) Date Analyzed: 08/08/2018 02:34  
 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.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	11	J	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	12	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.6	J	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	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	97		70-130
STL00996	13C2 PFDA	104		70-130



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_051.d  
 Lims ID: 320-41647-A-11-A  
 Client ID: WGNA-073018-RW-3957  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 02:34:45 ALS Bottle#: 36 Worklist Smp#: 18  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-11-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:26 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 10:42:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	309808	2.31		227	
298.90 > 99.00	1.350	1.350	0.0	1.000	202264		1.53(0.00-0.00)	276	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1592765	9.74		14198	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.593	0.008	1.000	337747	1.68		187	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.593	0.008	1.000	168145	1.05		24.1	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.760	0.008		1486609	10.0		8609	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.775	1.768	0.007	1.000	504597	3.10		59.4	
413.00 > 169.00	1.768	1.768	0.0	0.996	320816		1.57(0.00-0.00)	482	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.003	0.008		3242355	28.7		2642	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.011	2.018	-0.007	1.000	359192	2.91		108	
499.00 > 99.00	2.011	2.018	-0.007	1.000	60491		5.94(0.00-0.00)	77.5	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.215	0.0	1.000	1267446	10.4		9713	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_051.d

Injection Date: 08-Aug-2018 02:34:45

Instrument ID: A8\_N

Lims ID: 320-41647-A-11-A

Lab Sample ID: 320-41647-11

Client ID: WGNA-073018-RW-3957

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 36

Worklist Smp#: 18

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

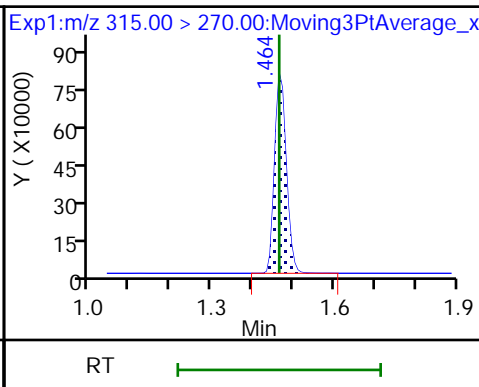
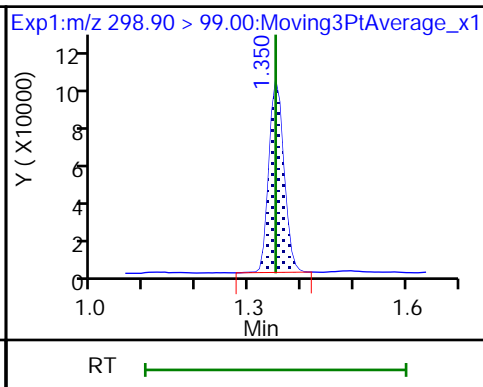
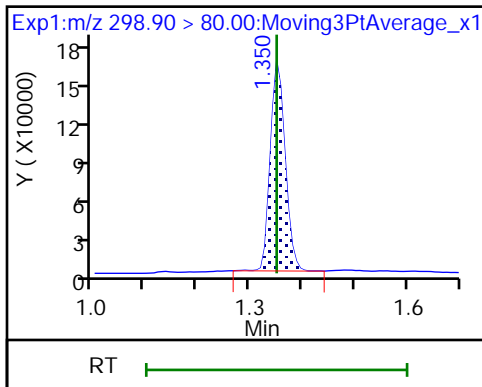
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

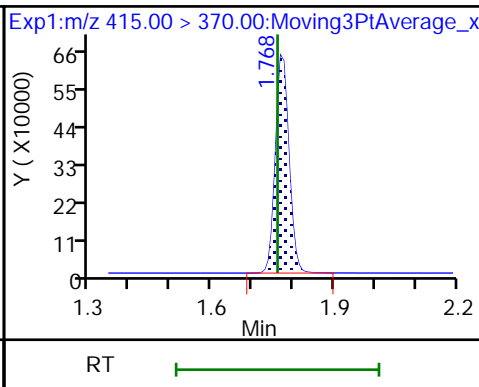
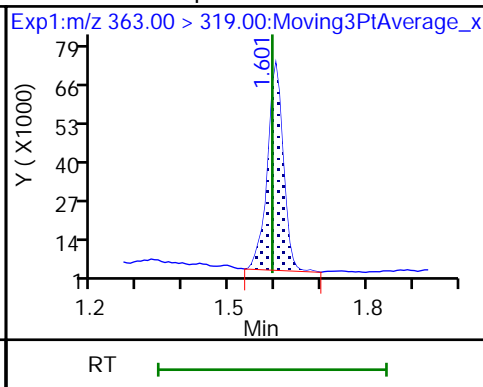
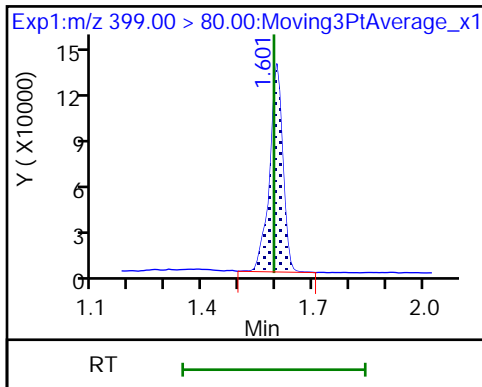
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

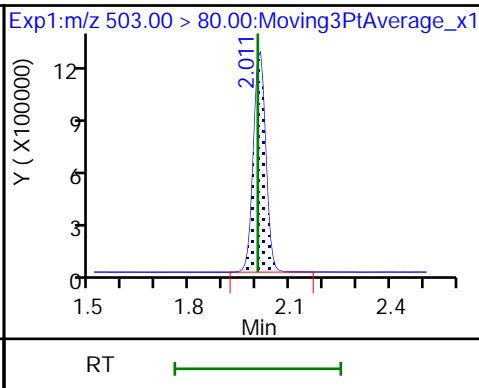
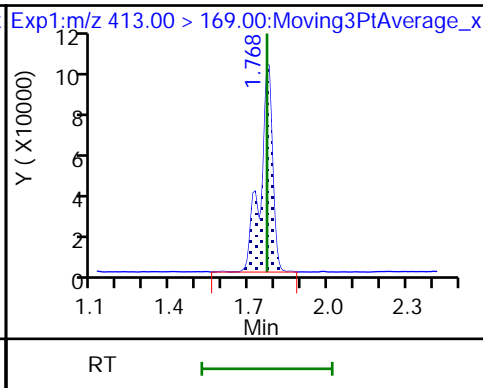
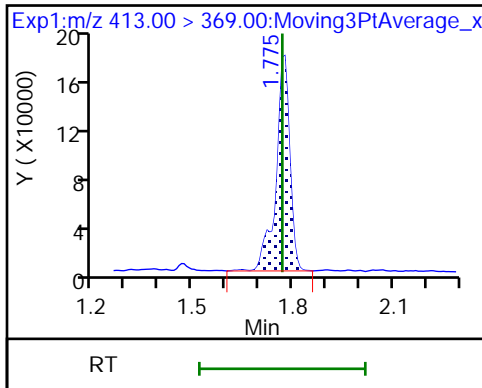
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

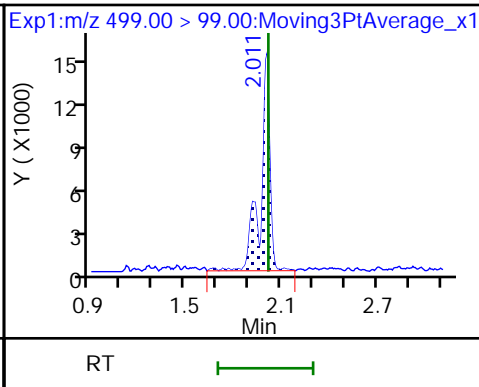
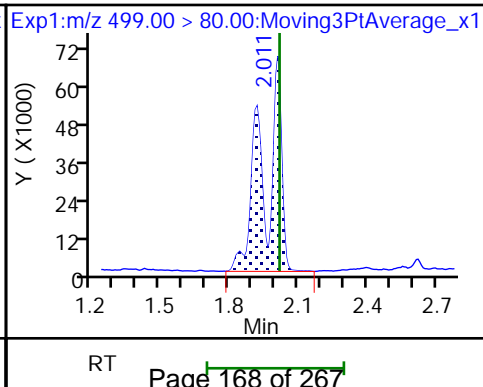
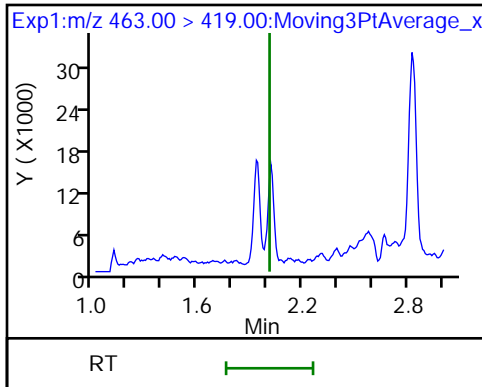
\* 7 13C4 PFOS



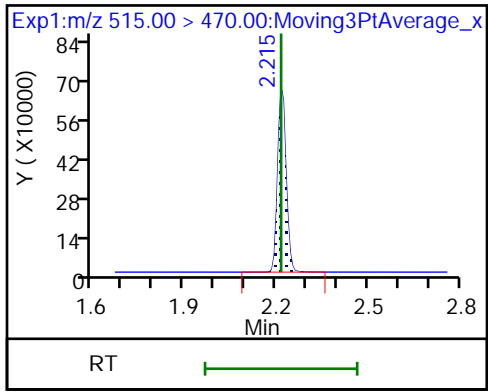
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_051.d  
 Lims ID: 320-41647-A-11-A  
 Client ID: WGNA-073018-RW-3957  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 02:34:45 ALS Bottle#: 36 Worklist Smp#: 18  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-11-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:26 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 10:42:40

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.74	97.44
\$ 10 13C2 PFDA	10.0	10.4	104.12

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-FRB-3957 Lab Sample ID: 320-41647-12  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_052.d  
 Analysis Method: 537 Date Collected: 07/30/2018 15:35  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 279.9(mL) Date Analyzed: 08/08/2018 02:39  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	36	14	6.1
335-67-1	Perfluorooctanoic acid (PFOA)	7.1	U	18	7.1	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	21	18	7.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	27	11	4.9
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.6	U	8.9	3.6	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	80	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	101		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_052.d  
 Lims ID: 320-41647-A-12-A  
 Client ID: WGNA-073018-FRB-3957  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 02:39:25 ALS Bottle#: 37 Worklist Smp#: 19  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-12-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:26 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.464	1.464	0.0	1.000	1626001	10.0	13169	
* 6 13C2-PFOA	415.00 > 370.00	1.768	1.760	0.008		1473025	10.0	9530	
* 7 13C4 PFOS	503.00 > 80.00	2.003	2.003	0.0		3216746	28.7	3646	
\$ 10 13C2 PFDA	515.00 > 470.00	2.215	2.215	0.0	1.000	1218906	10.1	9415	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_052.d

Injection Date: 08-Aug-2018 02:39:25

Instrument ID: A8\_N

Lims ID: 320-41647-A-12-A

Lab Sample ID: 320-41647-12

Client ID: WGNA-073018-FRB-3957

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 37

Worklist Smp#: 19

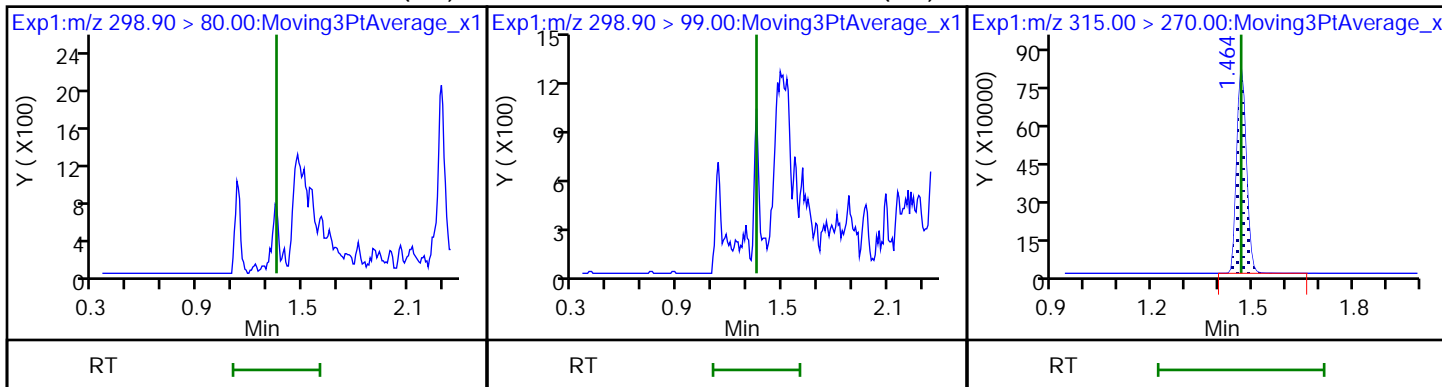
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

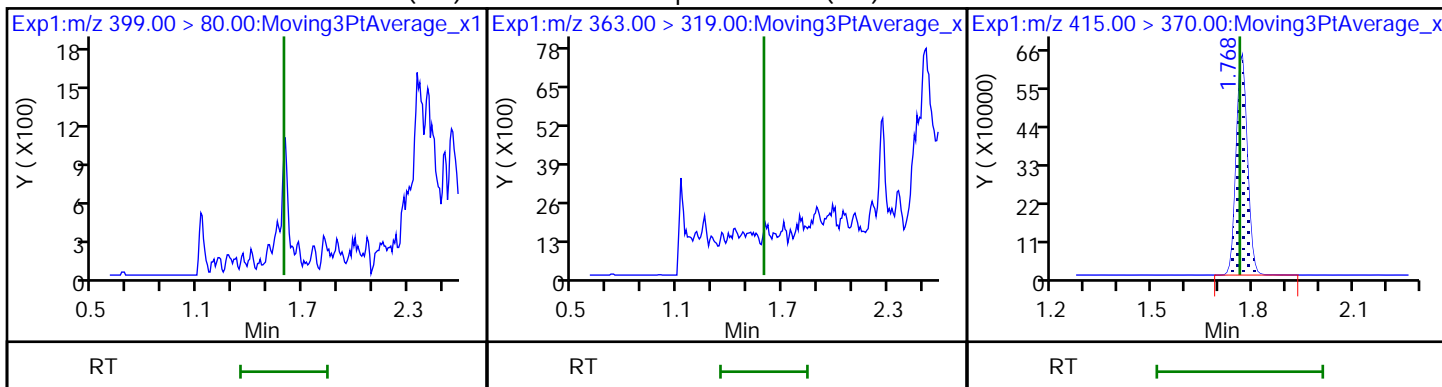
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

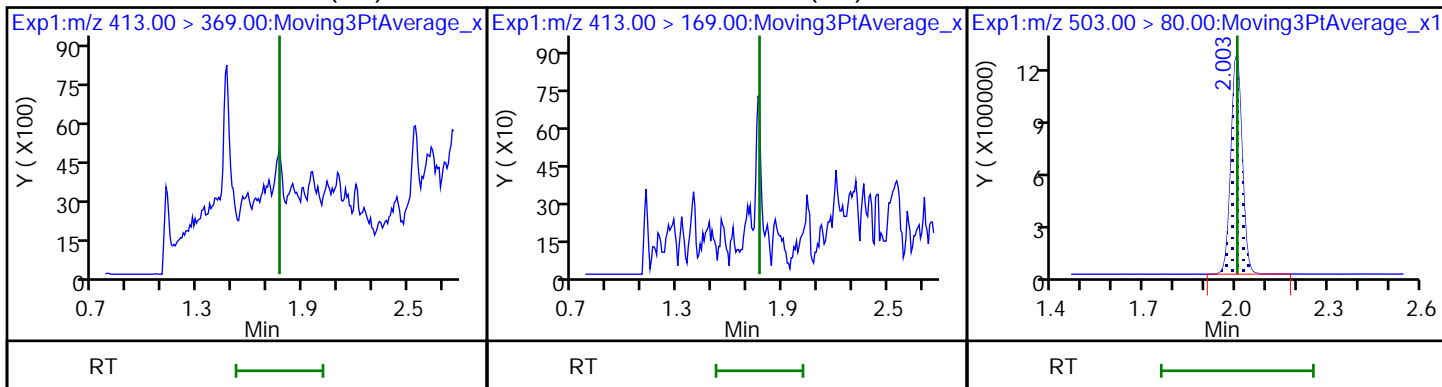
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



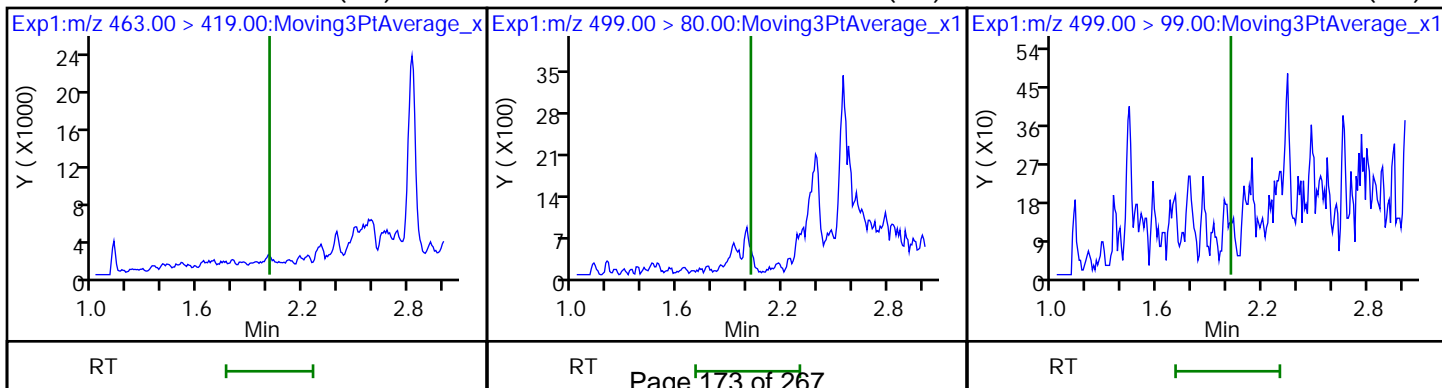
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) \* 6 13C2-PFOA



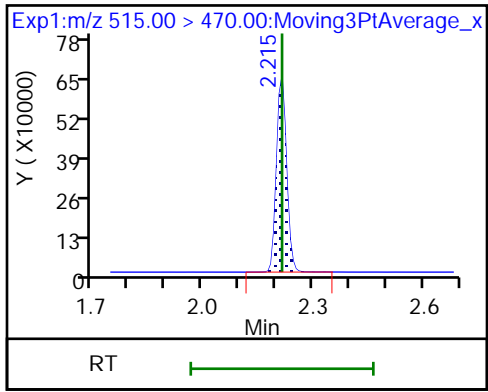
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) \* 7 13C4 PFOS



9 Perfluorononanoic acid (ND) 8 Perfluorooctane sulfonic acid (ND) 8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA





TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_052.d  
 Lims ID: 320-41647-A-12-A  
 Client ID: WGNA-073018-FRB-3957  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 02:39:25 ALS Bottle#: 37 Worklist Smp#: 19  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-12-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:26 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.0	100.39
\$ 10 13C2 PFDA	10.0	10.1	101.05

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-DUP-42 Lab Sample ID: 320-41647-13  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_053.d  
 Analysis Method: 537 Date Collected: 07/30/2018 07:00  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 253.2 (mL) Date Analyzed: 08/08/2018 02:44  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	12	J	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	13	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.8	J	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.5	J	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	114		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_053.d  
 Lims ID: 320-41647-A-13-A  
 Client ID: WGNA-073018-DUP-42  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 02:44:06 ALS Bottle#: 38 Worklist Smp#: 20  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-13-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:26 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 10:42:59

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	273583	2.17		200	
298.90 > 99.00	1.350	1.350	0.0	1.000	190131		1.44(0.00-0.00)	246	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1500582	10.1		12984	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.593	0.0	1.000	327512	1.73		181	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.593	1.593	0.0	1.000	164224	1.13		24.0	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.760	0.008		1347837	10.0		8749	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.760	1.768	-0.008	1.000	489449	3.32		57.9	
413.00 > 169.00	1.768	1.768	0.0	1.004	310960		1.57(0.00-0.00)	543	
* 7 13C4 PFOS									
503.00 > 80.00	1.995	2.003	-0.008		3048765	28.7		2500	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.003	2.018	-0.015	1.000	342936	2.96		106	
499.00 > 99.00	2.003	2.018	-0.015	1.000	57976		5.92(0.00-0.00)	77.4	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.215	0.0	1.000	1259036	11.4		9930	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_053.d

Injection Date: 08-Aug-2018 02:44:06

Instrument ID: A8\_N

Lims ID: 320-41647-A-13-A

Lab Sample ID: 320-41647-13

Client ID: WGNA-073018-DUP-42

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 38

Worklist Smp#: 20

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

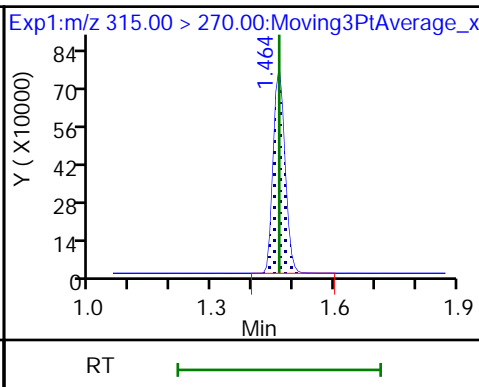
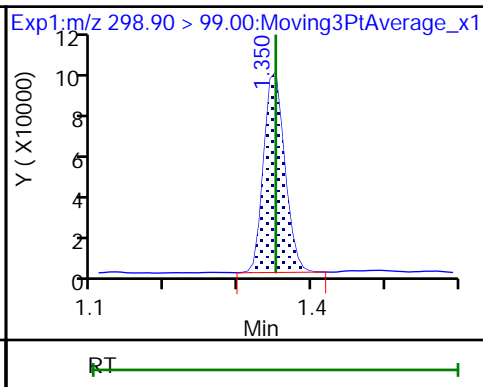
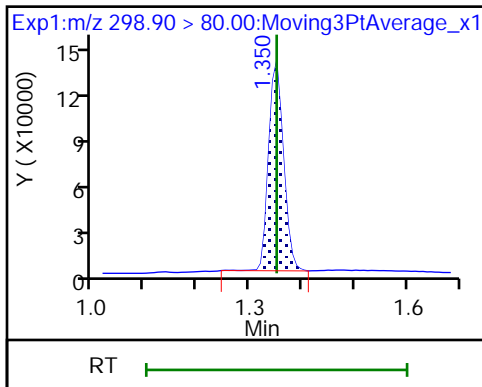
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

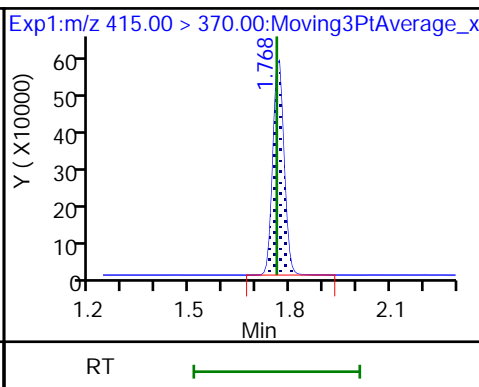
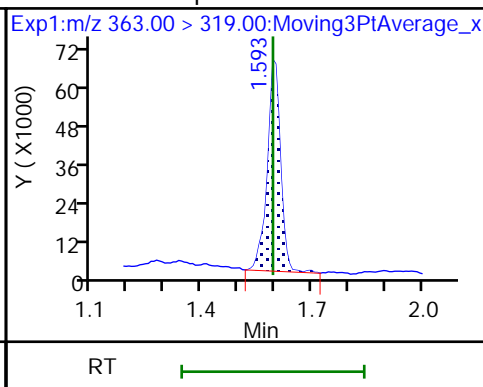
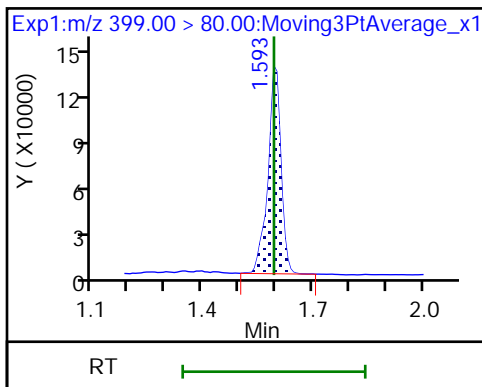
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

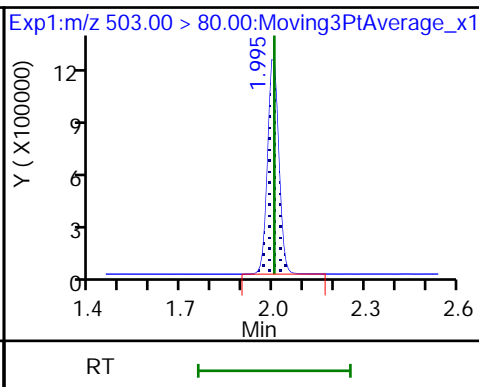
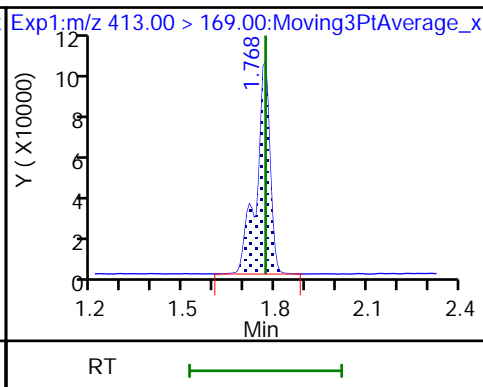
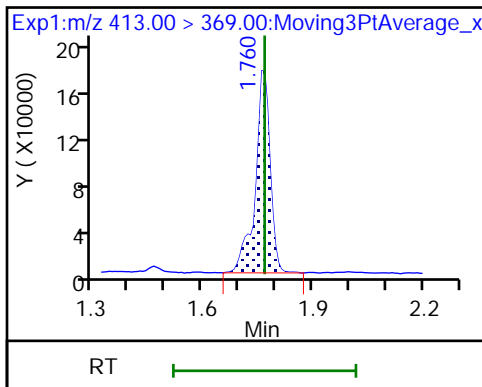
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

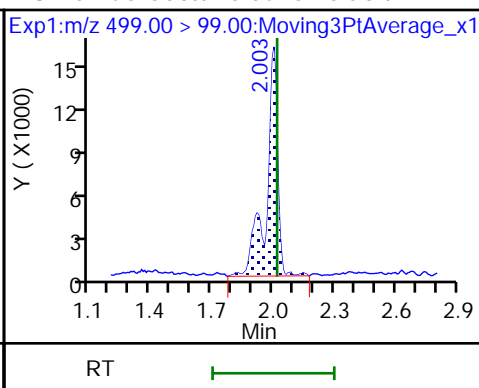
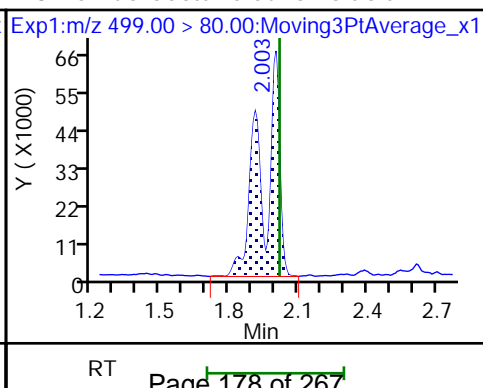
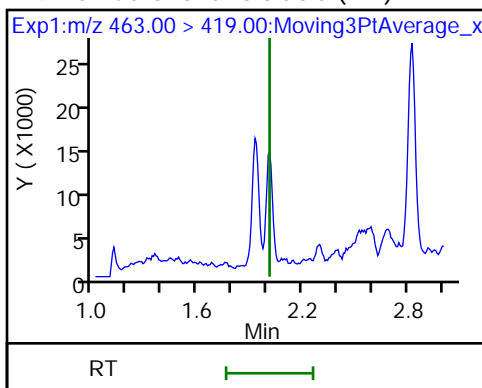
\* 7 13C4 PFOS



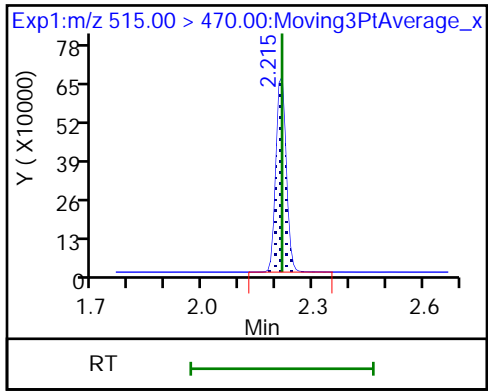
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_053.d  
 Lims ID: 320-41647-A-13-A  
 Client ID: WGNA-073018-DUP-42  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 02:44:06 ALS Bottle#: 38 Worklist Smp#: 20  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41647-a-13-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:26 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj Date: 08-Aug-2018 10:42:59

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.1	101.25
\$ 10 13C2 PFDA	10.0	11.4	114.07

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

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1 Analy Batch No.: 238469

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/07/2018 12:44 Calibration End Date: 08/07/2018 13:07 Calibration ID: 40513

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238469/2	2018.08.07_537CURVE_003.d
Level 2	IC 320-238469/3	2018.08.07_537CURVE_004.d
Level 3	IC 320-238469/4	2018.08.07_537CURVE_005.d
Level 4	IC 320-238469/5	2018.08.07_537CURVE_006.d
Level 5	IC 320-238469/6	2018.08.07_537CURVE_007.d
Level 6	IC 320-238469/7	2018.08.07_537CURVE_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R <sup>2</sup> OR COD	#	MIN R <sup>2</sup> OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid (PFBS)	1.2685 1.0148	1.2167	1.2831	1.2045	1.1178	Ave		1.1842			8.6		30.0				
Perfluorohexanesulfonic acid (PFHxS)	1.7386 1.7965	1.7248	1.7859	1.8499	1.8020	Ave		1.7830			2.6		30.0				
Perfluoroheptanoic acid (PFHpA)	+++++ 1.0701	1.0598	1.0963	1.0908	1.0612	Ave		1.0756			1.6		30.0				
Perfluorooctanoic acid (PFOA)	1.1708 1.0787	1.0454	1.0799	1.1146	1.0831	Ave		1.0954			3.9		30.0				
Perfluorooctanesulfonic acid (PFOS)	1.0605 1.1104	1.0466	1.1058	1.0956	1.1304	Ave		1.0915			2.9		30.0				
Perfluorononanoic acid (PFNA)	0.7952 0.7829	0.7632	0.7779	0.8207	0.7892	Ave		0.7882			2.5		30.0				
13C2 PFHxA	1.1215 1.1209	1.0683	1.0729	1.1134	1.1007	Ave		1.0996			2.2		30.0				
13C2 PFDA	0.8149 0.8273	0.8350	0.7672	0.8515	0.8172	Ave		0.8189			3.5		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.: 320-41647-1 Analy Batch No.: 238469

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/07/2018 12:44 Calibration End Date: 08/07/2018 13:07 Calibration ID: 40513

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238469/2	2018.08.07_537CURVE_003.d
Level 2	IC 320-238469/3	2018.08.07_537CURVE_004.d
Level 3	IC 320-238469/4	2018.08.07_537CURVE_005.d
Level 4	IC 320-238469/5	2018.08.07_537CURVE_006.d
Level 5	IC 320-238469/6	2018.08.07_537CURVE_007.d
Level 6	IC 320-238469/7	2018.08.07_537CURVE_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	Ave	1093854 16487048	2326382	5241287	9203217	13659010	9.00 180	20.0	45.0	90.1	135
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	500314 9803009	1107645	2450188	4747515	7395512	3.00 60.5	6.72	15.1	30.2	45.4
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	++++ 2459664	275735	621773	1128009	1828933	++++ 19.4	2.16	4.86	9.72	14.6
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	277484 5050799	554036	1247621	2347790	3802739	1.98 39.6	4.40	9.90	19.8	29.7
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	401757 7918924	878368	1982811	3674504	6063022	3.95 79.1	8.79	19.8	39.5	59.3
Perfluorononanoic acid (PFNA)	13PF OA	Ave	188460 3665889	404484	898787	1728770	2770632	1.98 39.6	4.40	9.90	19.8	29.7
13C2 PFHxA	13PF OA	Ave	1342383 1325342	1286815	1252048	1184544	1301097	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	975454 978205	1005796	895349	905914	965975	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD



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

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1 Analy Batch No.: 238469

SDG No.: \_\_\_\_\_

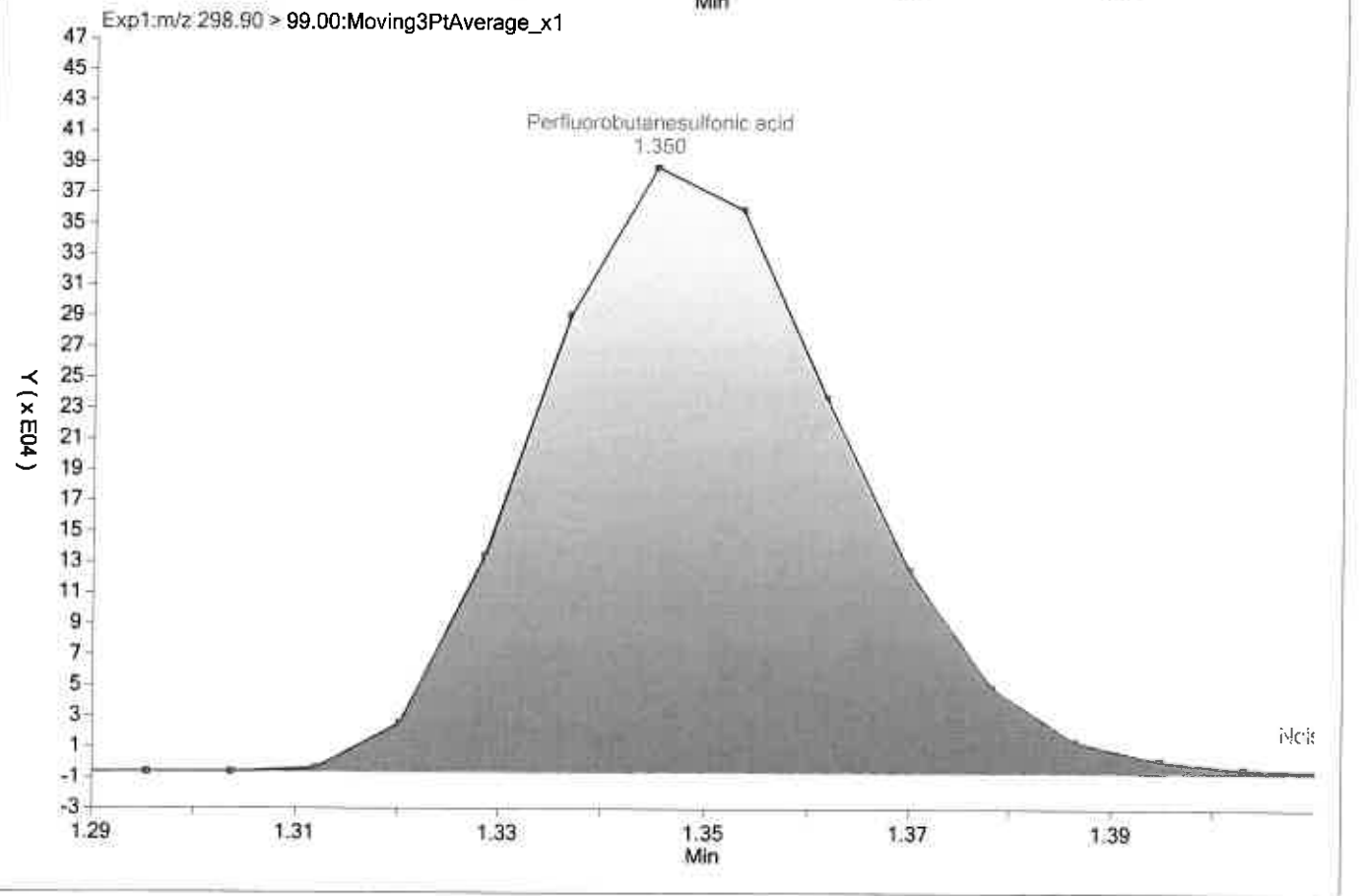
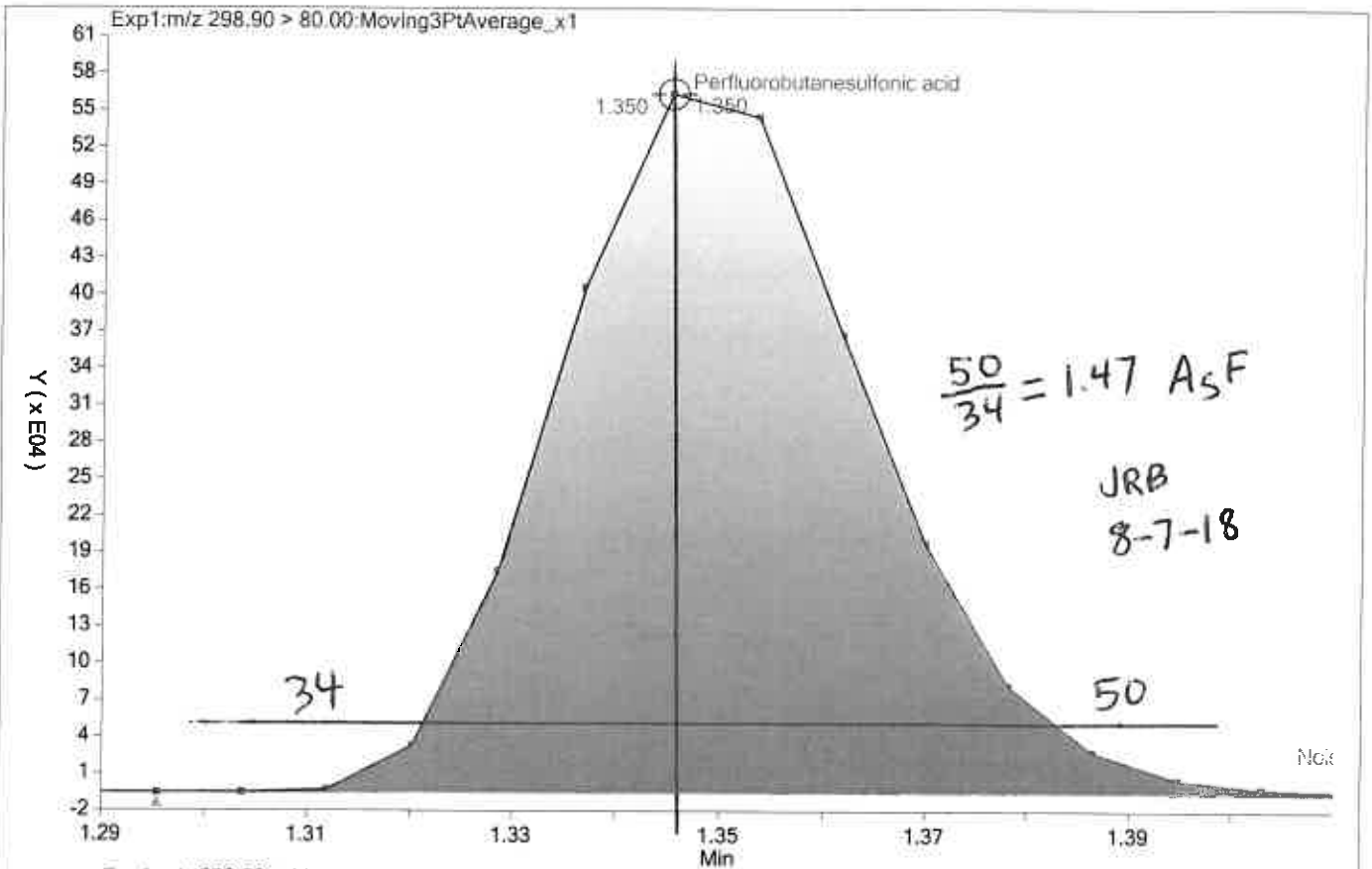
Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

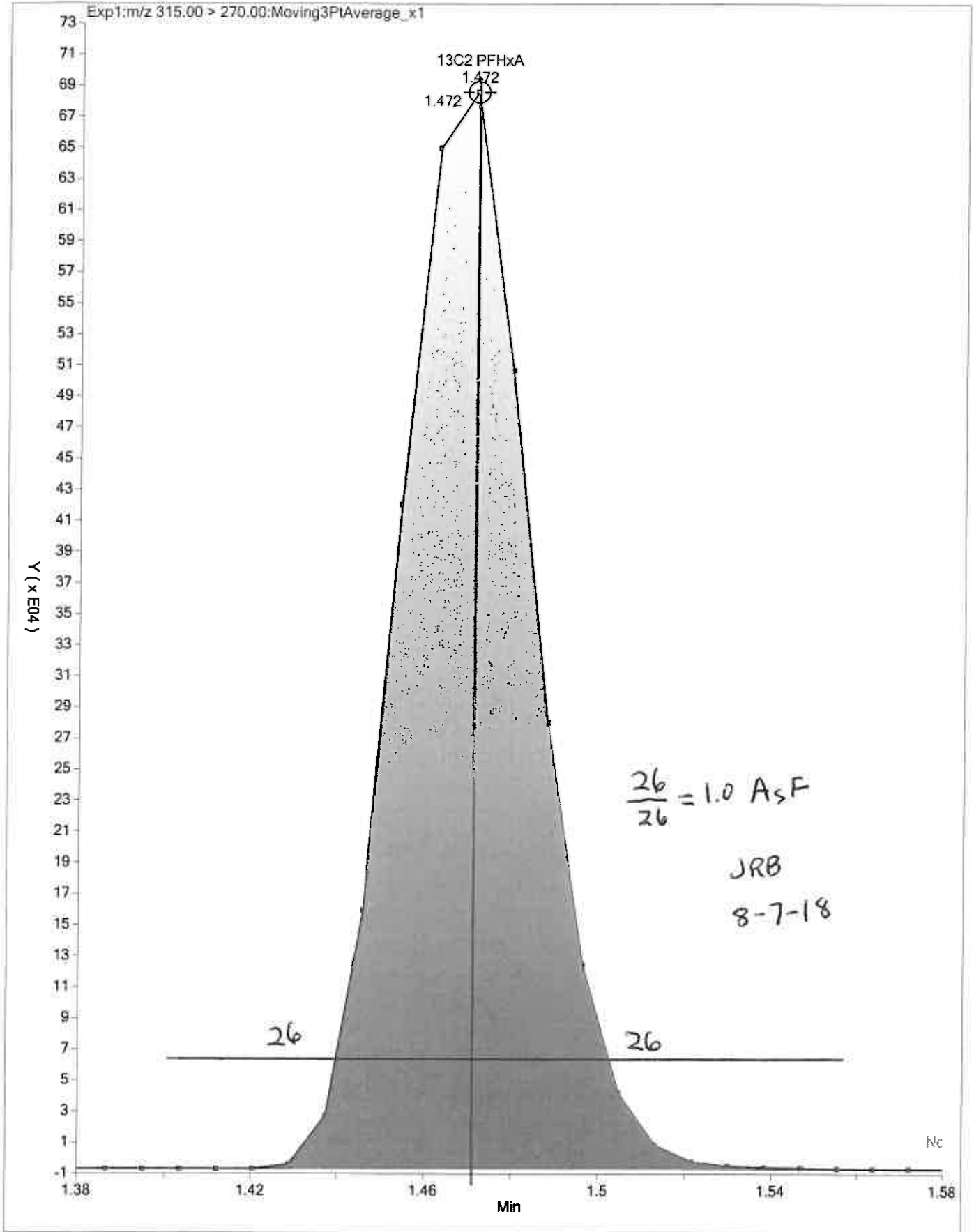
Calibration Start Date: 08/07/2018 12:44 Calibration End Date: 08/07/2018 13:07 Calibration ID: 40513

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238469/2	2018.08.07_537CURVE_003.d
Level 2	IC 320-238469/3	2018.08.07_537CURVE_004.d
Level 3	IC 320-238469/4	2018.08.07_537CURVE_005.d
Level 4	IC 320-238469/5	2018.08.07_537CURVE_006.d
Level 5	IC 320-238469/6	2018.08.07_537CURVE_007.d
Level 6	IC 320-238469/7	2018.08.07_537CURVE_008.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid (PFBS)	7.1	2.7	8.3	1.7	-5.6	-14.3	50	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	-2.5	-3.3	0.2	3.8	1.1	0.8	50	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	++++	-1.5	1.9	1.4	-1.3	-0.5		50	30	30	30	30
Perfluorooctanoic acid (PFOA)	6.9	-4.6	-1.4	1.7	-1.1	-1.5	50	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-2.8	-4.1	1.3	0.4	3.6	1.7	50	30	30	30	30	30
Perfluorononanoic acid (PFNA)	0.9	-3.2	-1.3	4.1	0.1	-0.7	50	30	30	30	30	30
13C2 PFHxA	2.0	-2.8	-2.4	1.3	0.1	1.9	30	30	30	30	30	30
13C2 PFDA	-0.5	2.0	-6.3	4.0	-0.2	1.0	30	30	30	30	30	30





TestAmerica Laboratories  
Istd/Surrogate Recovery Report

Worklist Name: 07AUG2018\_537\_ICAL      Worklist Num: 62276  
 Instrument: A8\_N      Method: 537\_A8\_N  
 Batch Directory: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b  
 Limit Group: LC 537 ICAL  
 Analysis Type: SemiVOA  
 Inj Volume: 2.00      Inj Vol Units: ul

Lims Batch: 238469  
 CCV IS Mode: Select Ical Level, Cal Level: 3  
 Non-Cal IS Mode: Last Ccal Sample

\$ 2 13C2 PFHxA  
 \$ 10 13C2 PFDA

Lab ID	Inj Date	\$ 2	\$ 10	* 6 13C2-PFOA	* 7 13C4 PFOS
IS Std				1167019 1.78	2601656 2.01
# 1 RB	07-Aug-2018 12:39:24			1233209 105.7 1.78	2632254 101.2 2.02
IS Std					
# 2 IC L1	07-Aug-2018 12:44:03	102.00 1.47	99.52 2.22	1196979> 100.0* 1.78	2748260> 100.0* 2.02
# 3 IC L2	07-Aug-2018 12:48:44	96.68 1.46	100.70 2.22	1204534> 100.6* 1.78	2739996> 99.7* 2.02
# 4 IC L3	07-Aug-2018 12:53:24	97.57 1.46	93.69 2.22	1167019> 97.5* 1.78	2601656> 94.7* 2.01
# 5 IC L4	07-Aug-2018 12:58:05	101.30 1.47	103.90 2.22	1063858> 88.9* 1.78	2433237> 88.5* 2.02
# 6 IC L5	07-Aug-2018 13:02:45	100.50 1.47	100.00 2.22	1182103> 98.8* 1.78	2594163> 94.4* 2.02
# 7 IC L6	07-Aug-2018 13:07:25	101.90 1.46	101.00 2.22	1182381> 98.8* 1.77	2586897> 94.1* 2.01

13C2-PFOA

$$RPD = \frac{1204534 - 1063858}{\frac{1204534 + 1063858}{2}} \times 100 = 12.4$$

13C4-PFOS

$$RPD = \frac{2748260 - 2433237}{\frac{2748260 + 2433237}{2}} \times 100 = 12.2$$

JRB  
8-7-18

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_003.d  
 Lims ID: IC L1  
 Client ID:  
 Sample Type: IC Calib Level: 1  
 Inject. Date: 07-Aug-2018 12:44:03 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@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Aug-2018 13:58:29 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 07-Aug-2018 13:11:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.352	-0.002	1.000	1093854	9.64		1874	
298.90 > 99.00	1.350	1.352	-0.002	1.000	747872		1.46(0.00-0.00)	1304	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.472	1.468	0.004	1.000	1342383	10.2		10671	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.603	-0.002	1.000	500314	2.93		500	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.608	1.605	0.003	1.000	643116	5.00		166	
* 6 13C2-PFOA									
415.00 > 370.00	1.775	1.774	0.001		1196979	10.0		7793	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.775	1.775	0.0	1.000	277484	2.12		37.2	
413.00 > 169.00	1.775	1.775	0.0	1.000	141293		1.96(0.00-0.00)	340	
* 7 13C4 PFOS									
503.00 > 80.00	2.018	2.016	0.002		2748260	28.7		3570	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.018	2.018	0.0	1.000	401757	3.84		501	
499.00 > 99.00	2.018	2.018	0.0	1.000	92241		4.36(0.00-0.00)	257	
9 Perfluorononanoic acid									
463.00 > 419.00	2.026	2.024	0.002	1.000	188460	2.00		33.7	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.220	0.003	1.000	975454	9.95		7598	

**Reagents:**

LC537-L1\_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_003.d

Injection Date: 07-Aug-2018 12:44:03

Instrument ID: A8\_N

Lims ID: IC L1

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 1

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

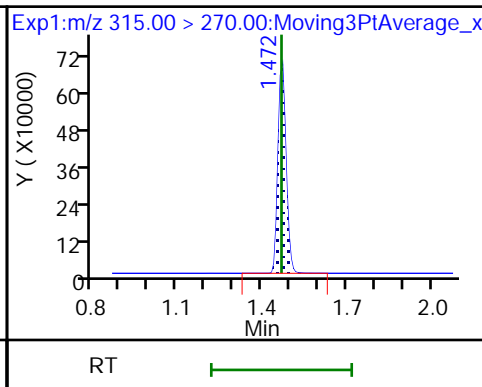
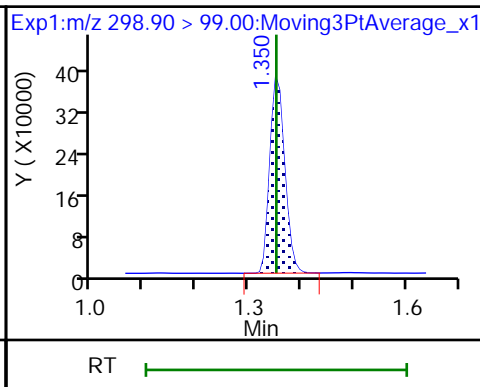
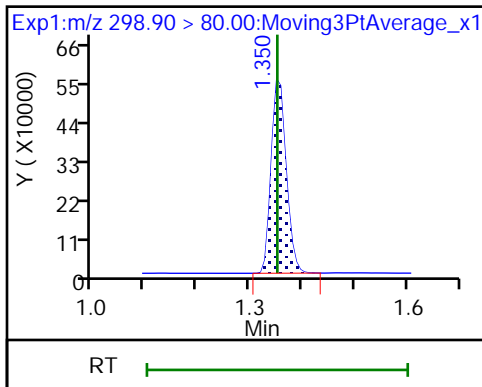
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

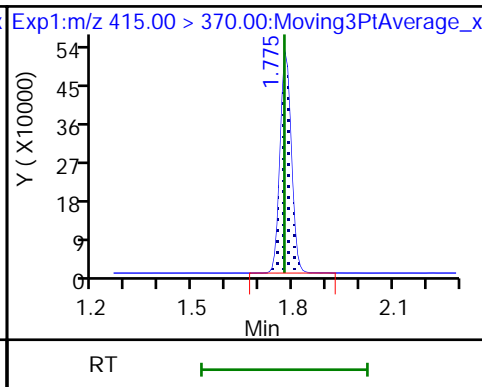
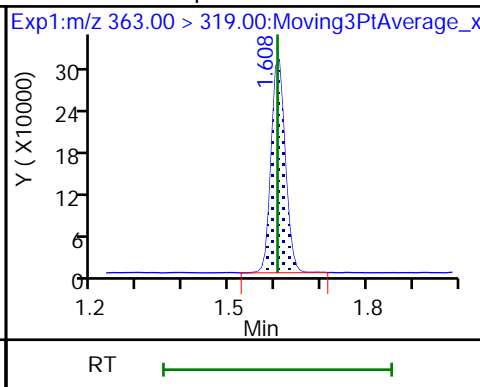
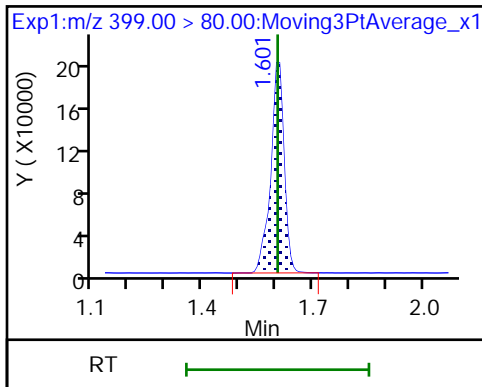
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

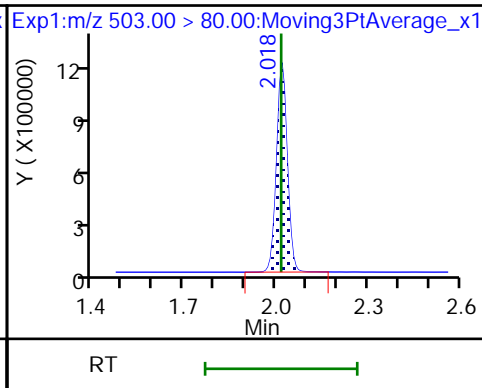
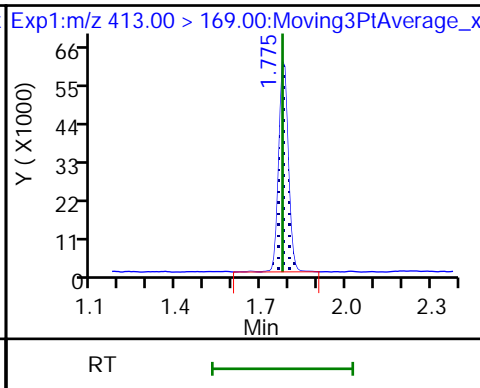
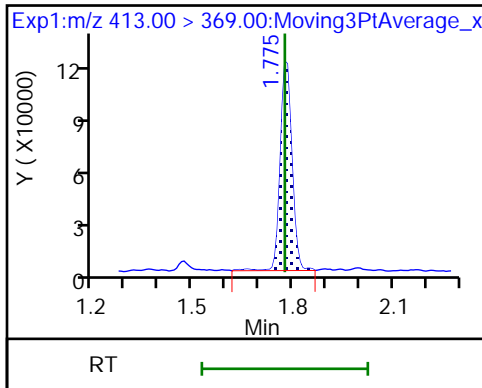
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

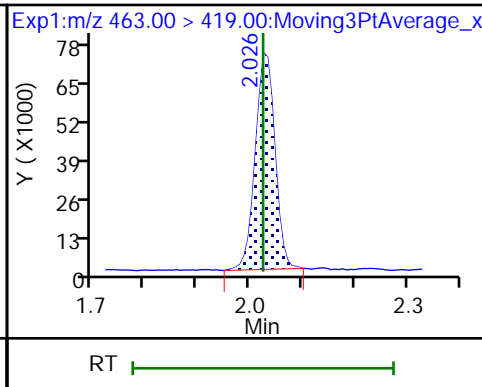
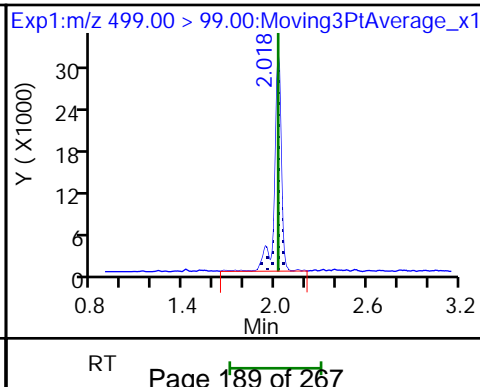
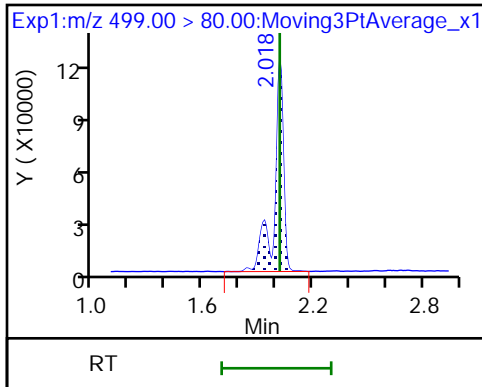
\* 7 13C4 PFOS



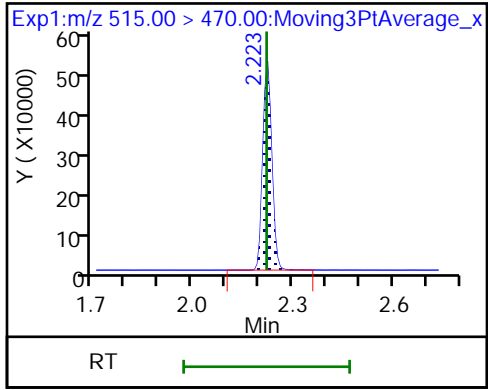
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA





TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_004.d  
 Lims ID: IC L2  
 Client ID:  
 Sample Type: IC Calib Level: 2  
 Inject. Date: 07-Aug-2018 12:48:44 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@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Aug-2018 13:58:31 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 07-Aug-2018 13:13:14

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.352	-0.002	1.000	2326382	20.6		3540	
298.90 > 99.00	1.350	1.352	-0.002	1.000	1596933		1.46(0.00-0.00)	2870	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.468	-0.004	1.000	1286815	9.72		9413	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.603	-0.002	1.000	1107645	6.50		1118	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.605	-0.004	1.000	275735	2.13		72.1	
* 6 13C2-PFOA									
415.00 > 370.00	1.775	1.774	0.001		1204534	10.0		7242	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.775	1.775	0.0	1.000	554036	4.20		75.8	
413.00 > 169.00	1.775	1.775	0.0	1.000	298803		1.85(0.00-0.00)	720	
* 7 13C4 PFOS									
503.00 > 80.00	2.018	2.016	0.002		2739996	28.7		3797	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.018	2.018	0.0	1.000	878368	8.42		1011	
499.00 > 99.00	2.018	2.018	0.0	1.000	188938		4.65(0.00-0.00)	520	
9 Perfluorononanoic acid									
463.00 > 419.00	2.026	2.024	0.002	1.000	404484	4.26		71.8	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.220	0.003	1.000	1005796	10.2		6997	

**Reagents:**

LC537-L2\_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_004.d

Injection Date: 07-Aug-2018 12:48:44

Instrument ID: A8\_N

Lims ID: IC L2

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 2

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

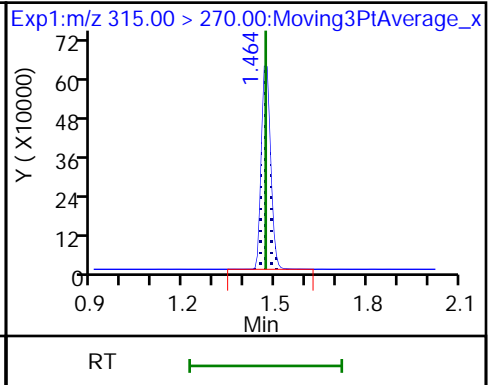
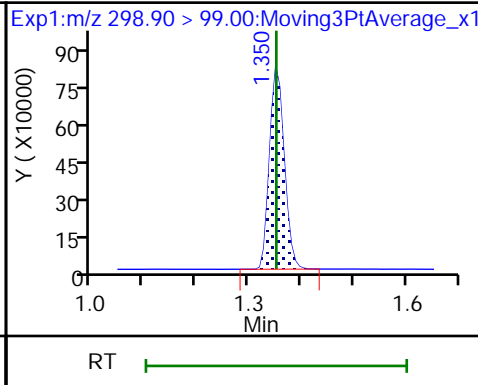
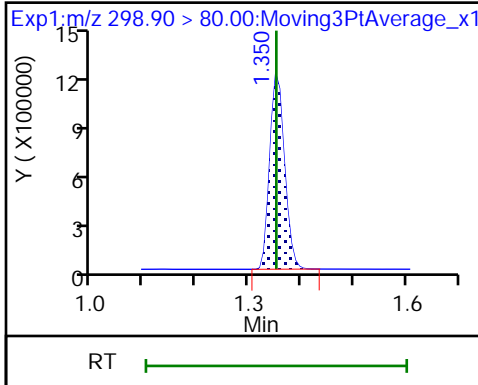
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

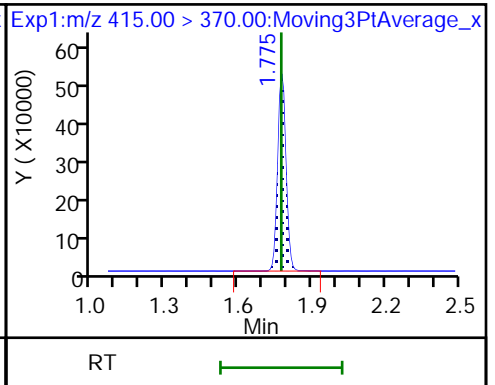
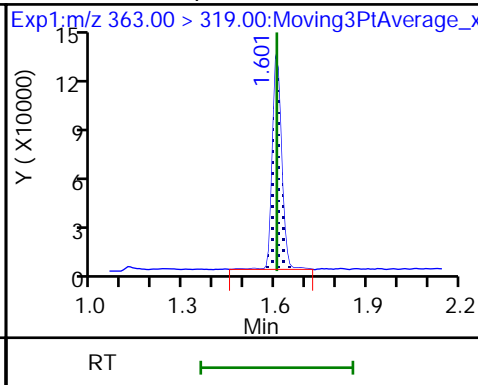
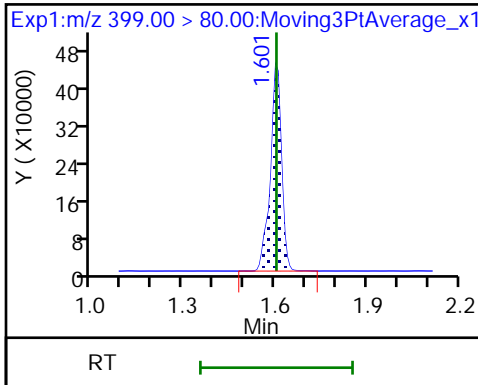
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

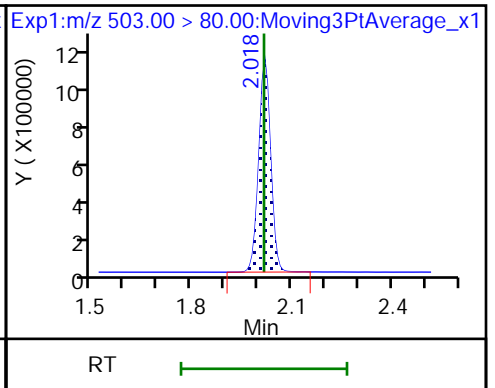
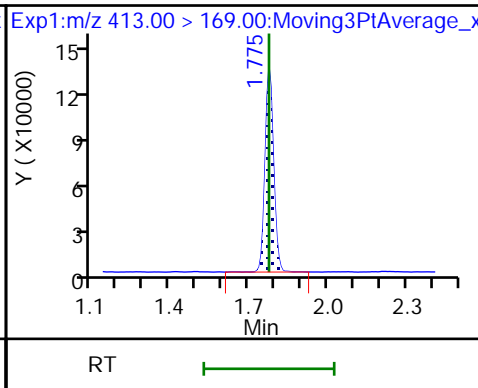
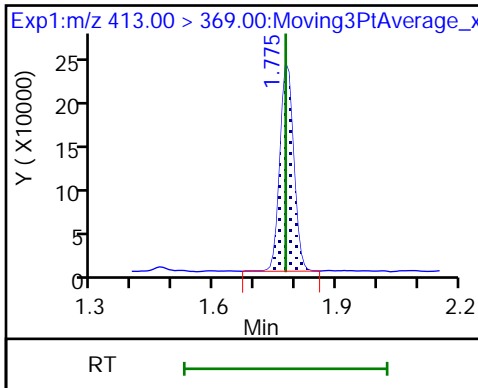
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

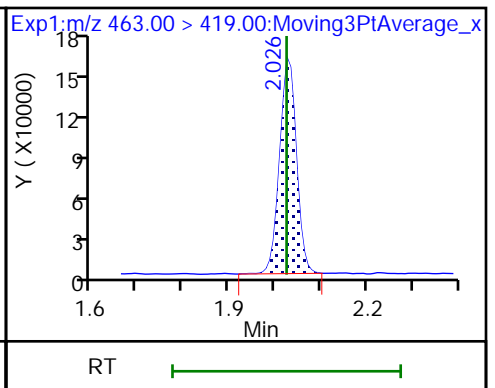
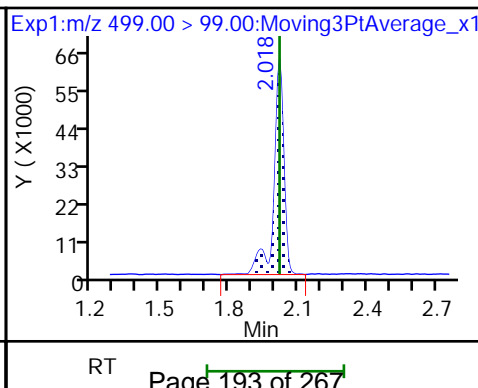
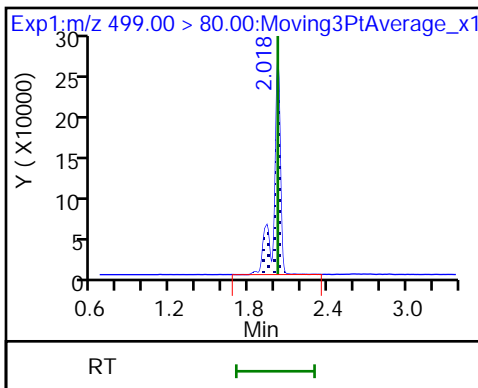
\* 7 13C4 PFOS



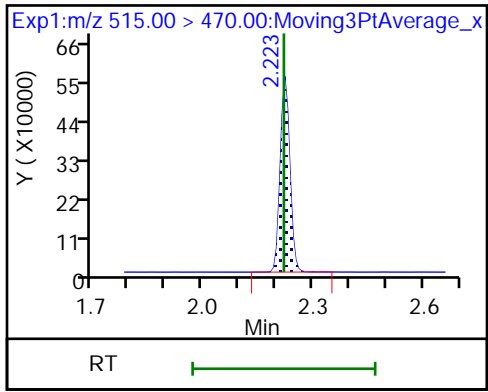
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_005.d  
 Lims ID: IC L3  
 Client ID:  
 Sample Type: IC Calib Level: 3  
 Inject. Date: 07-Aug-2018 12:53:24 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@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Aug-2018 13:58:32 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 07-Aug-2018 13:13:00

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.352	-0.002	1.000	5241287	48.8		7363	
298.90 > 99.00	1.350	1.352	-0.002	1.000	3626614		1.45(0.00-0.00)	5038	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.468	-0.004	1.000	1252048	9.76		11712	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.603	-0.002	1.000	2450188	15.1		2294	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.605	-0.004	1.000	621773	4.95		160	
* 6 13C2-PFOA									
415.00 > 370.00	1.775	1.774	0.001		1167019	10.0		7418	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.775	1.775	0.0	1.000	1247621	9.76		174	
413.00 > 169.00	1.775	1.775	0.0	1.000	660433		1.89(0.00-0.00)	1542	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.016	-0.005		2601656	28.7		3778	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.018	2.018	0.0	1.000	1982811	20.0		2060	
499.00 > 99.00	2.018	2.018	0.0	1.000	423366		4.68(0.00-0.00)	1173	
9 Perfluorononanoic acid									
463.00 > 419.00	2.026	2.024	0.002	1.000	898787	9.77		159	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.220	-0.005	1.000	895349	9.37		6051	

**Reagents:**

LC537-L3\_00025

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_005.d

Injection Date: 07-Aug-2018 12:53:24

Instrument ID: A8\_N

Lims ID: IC L3

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 3

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

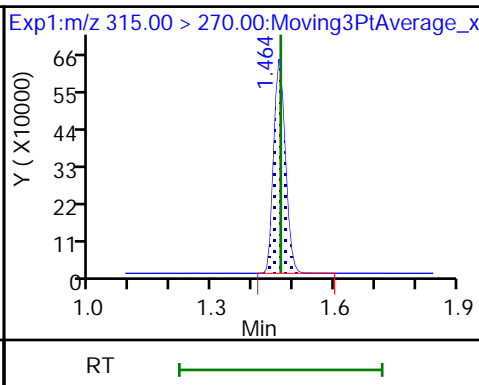
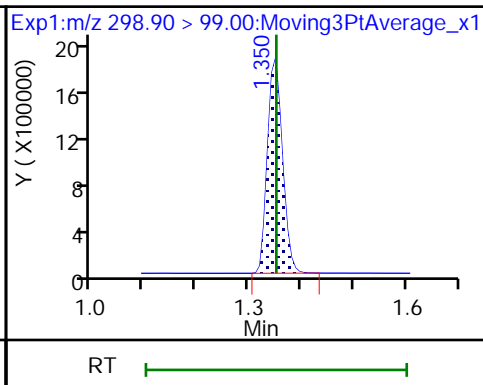
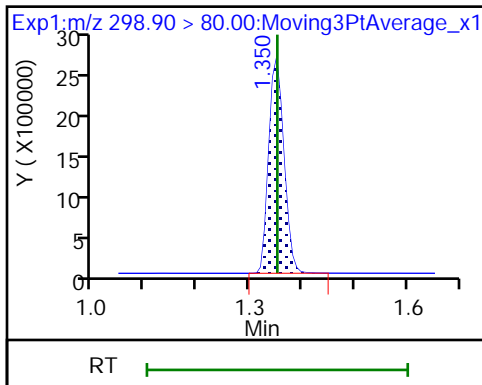
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

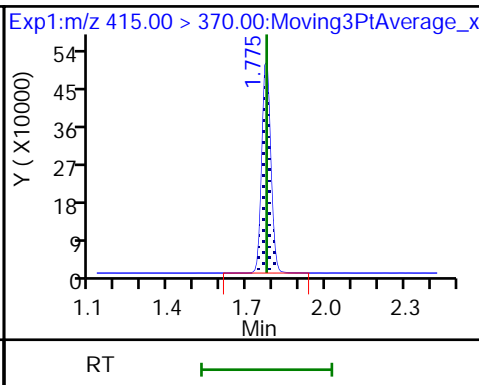
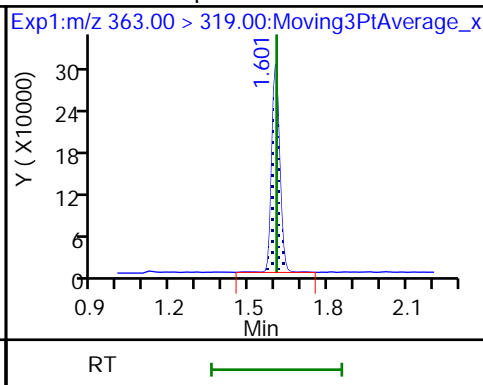
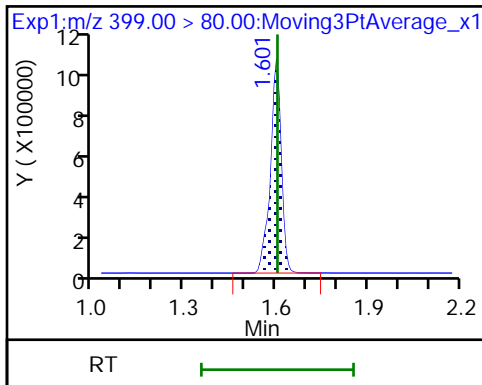
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

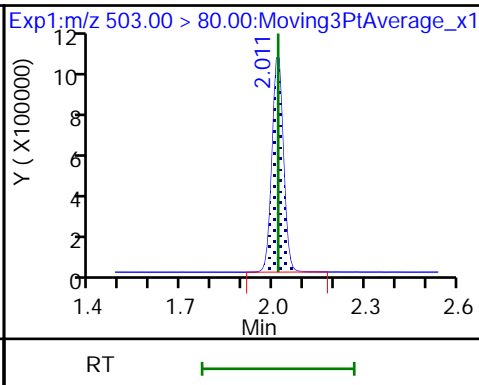
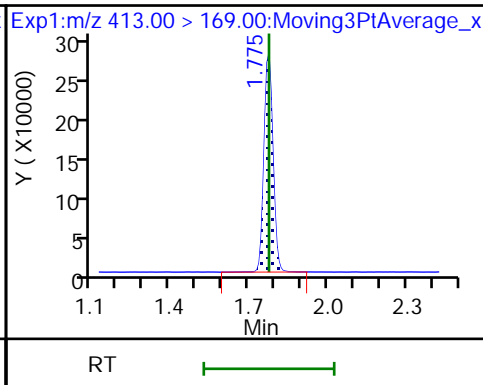
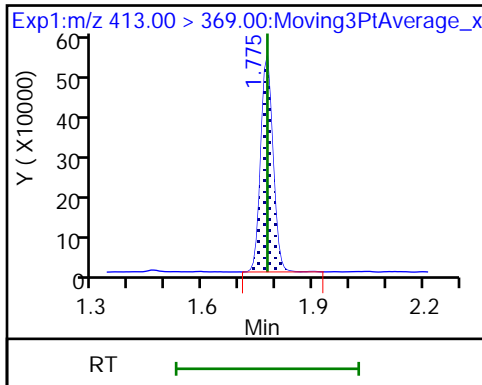
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

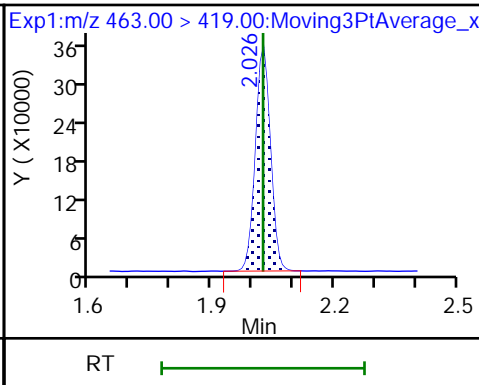
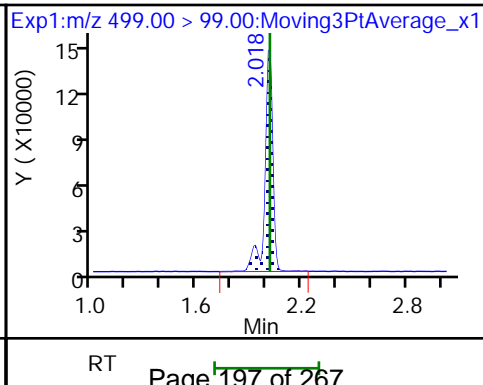
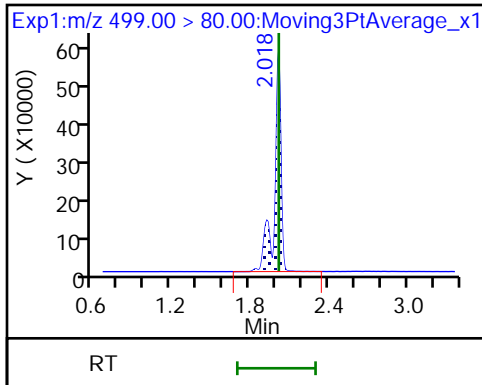
\* 7 13C4 PFOS



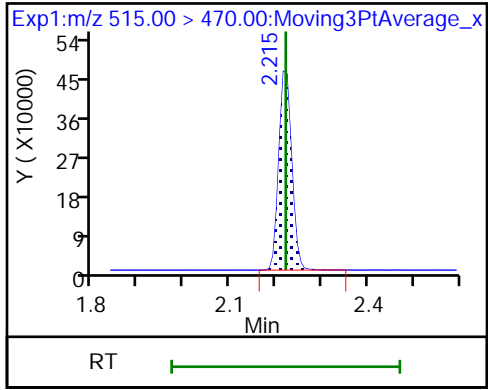
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA





TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_006.d  
 Lims ID: IC L4  
 Client ID:  
 Sample Type: ICISAV Calib Level: 4  
 Inject. Date: 07-Aug-2018 12:58:05 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@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Aug-2018 13:58:33 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 07-Aug-2018 13:12:46

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.352	-0.002	1.000	9203217	91.6		11252	
298.90 > 99.00	1.350	1.352	-0.002	1.000	6828220		1.35(0.00-0.00)	9534	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.472	1.468	0.004	1.000	1184544	10.1		8412	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.608	1.603	0.005	1.000	4747515	31.4		3878	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.608	1.605	0.003	1.000	1128009	9.86		285	
* 6 13C2-PFOA									
415.00 > 370.00	1.775	1.774	0.001		1063858	10.0		6639	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.775	1.775	0.0	1.000	2347790	20.1		325	
413.00 > 169.00	1.775	1.775	0.0	1.000	1230011		1.91(0.00-0.00)	2805	
* 7 13C4 PFOS									
503.00 > 80.00	2.018	2.016	0.002		2433237	28.7		3365	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.018	2.018	0.0	1.000	3674504	39.7		3538	
499.00 > 99.00	2.018	2.018	0.0	1.000	775982		4.74(0.00-0.00)	1971	
9 Perfluorononanoic acid									
463.00 > 419.00	2.026	2.024	0.002	1.000	1728770	20.6		300	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.220	0.003	1.000	905914	10.4		6669	

**Reagents:**

LC537-L4\_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_006.d

Injection Date: 07-Aug-2018 12:58:05

Instrument ID: A8\_N

Lims ID: IC L4

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 4

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

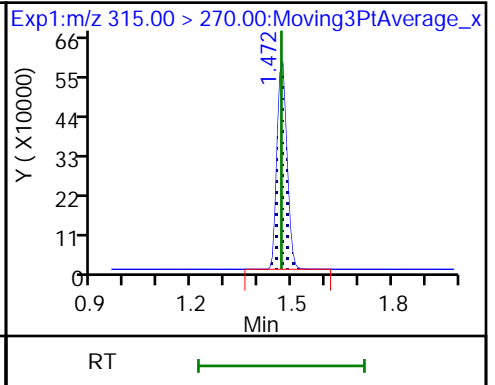
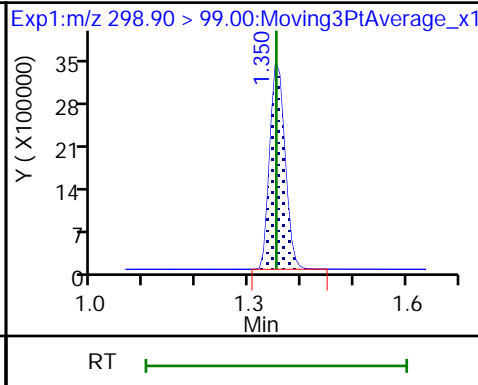
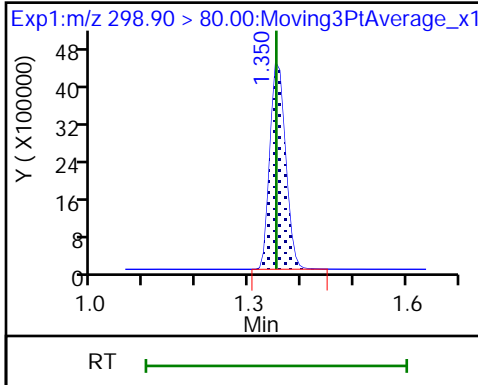
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

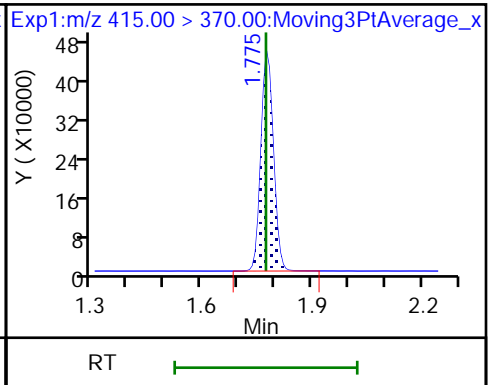
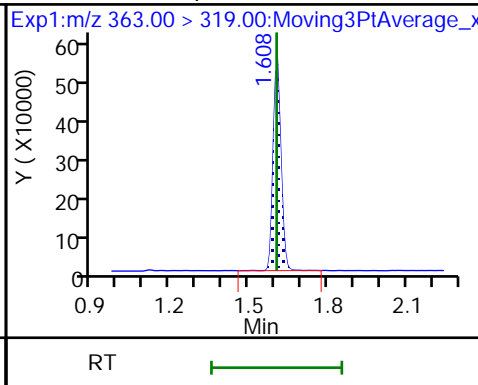
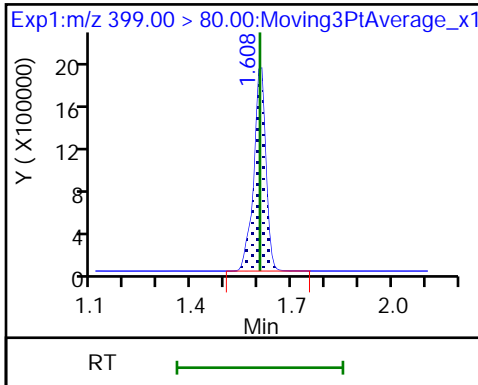
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

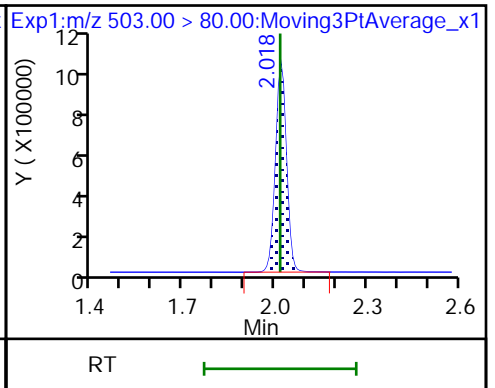
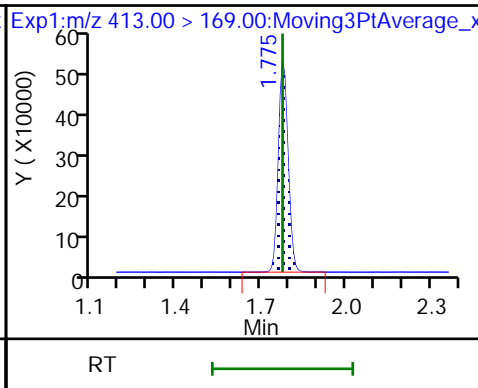
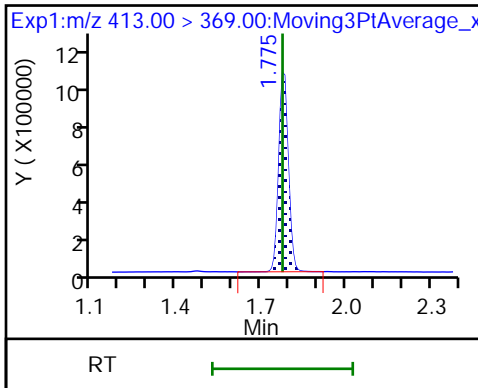
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

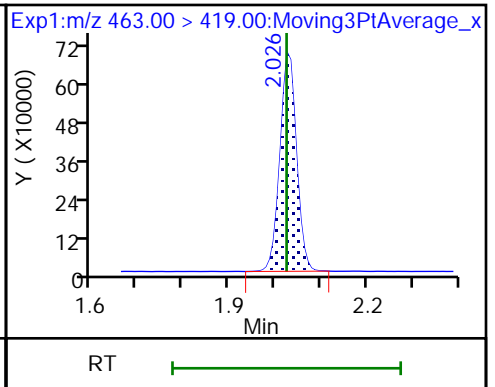
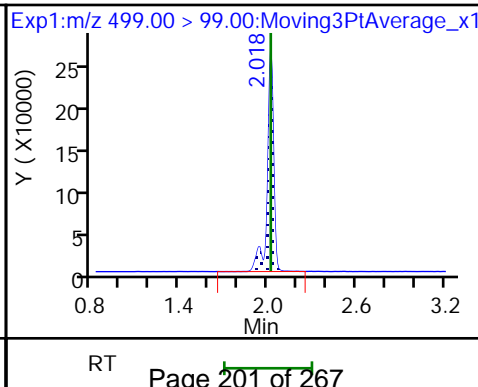
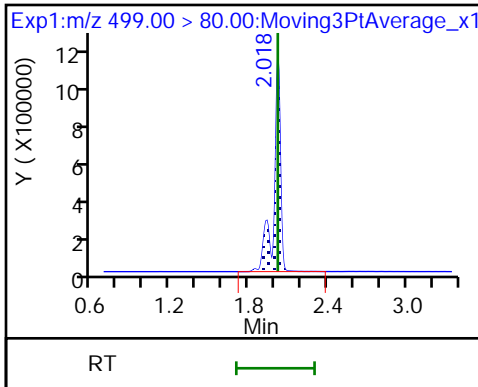
\* 7 13C4 PFOS



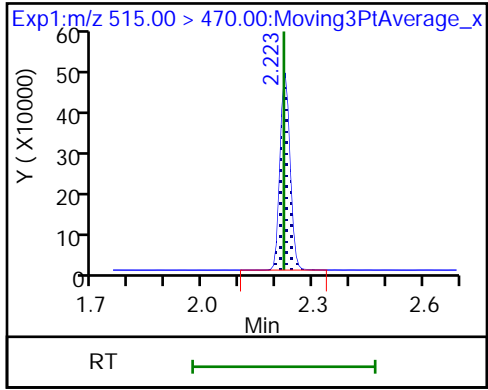
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_007.d  
 Lims ID: IC L5  
 Client ID:  
 Sample Type: IC Calib Level: 5  
 Inject. Date: 07-Aug-2018 13:02:45 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@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Aug-2018 13:58:34 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 07-Aug-2018 13:12:31

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.358	1.352	0.006	1.000	13659010	127.5		13401	
298.90 > 99.00	1.350	1.352	-0.002	0.994	9948848		1.37(0.00-0.00)	11116	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.472	1.468	0.004	1.000	1301097	10.0		10713	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.608	1.603	0.005	1.000	7395512	45.9		5855	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.608	1.605	0.003	1.000	1828933	14.4		441	
* 6 13C2-PFOA									
415.00 > 370.00	1.775	1.774	0.001		1182103	10.0		7154	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.783	1.775	0.008	1.000	3802739	29.4		515	
413.00 > 169.00	1.775	1.775	0.0	0.996	1988949		1.91(0.00-0.00)	3905	
* 7 13C4 PFOS									
503.00 > 80.00	2.018	2.016	0.002		2594163	28.7		3633	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.018	2.018	0.0	1.000	6063022	61.4		5018	
499.00 > 99.00	2.018	2.018	0.0	1.000	1263173		4.80(0.00-0.00)	2809	
9 Perfluorononanoic acid									
463.00 > 419.00	2.026	2.024	0.002	1.000	2770632	29.7		461	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.220	0.003	1.000	965975	9.98		7819	

**Reagents:**

LC537-L5\_00026

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_007.d

Injection Date: 07-Aug-2018 13:02:45

Instrument ID: A8\_N

Lims ID: IC L5

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 5

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

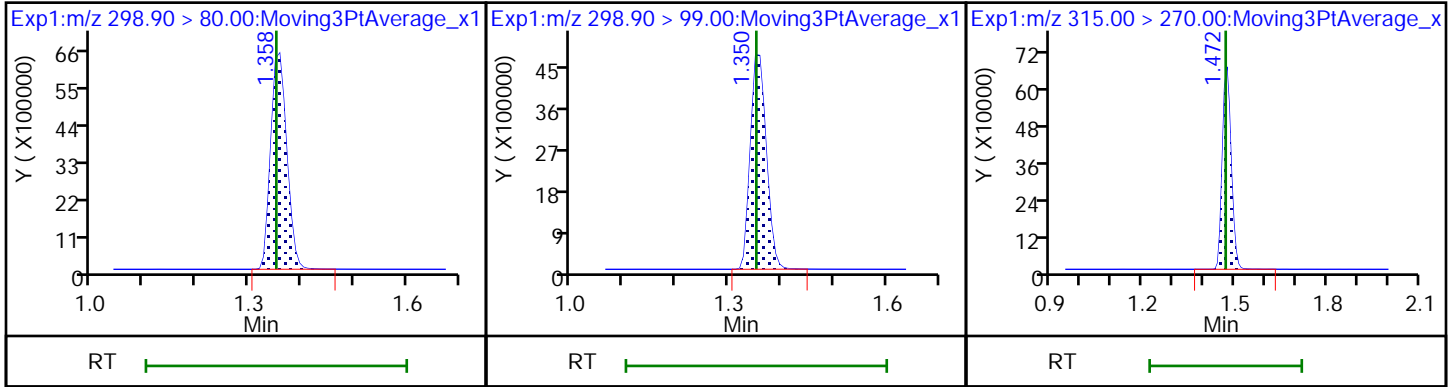
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

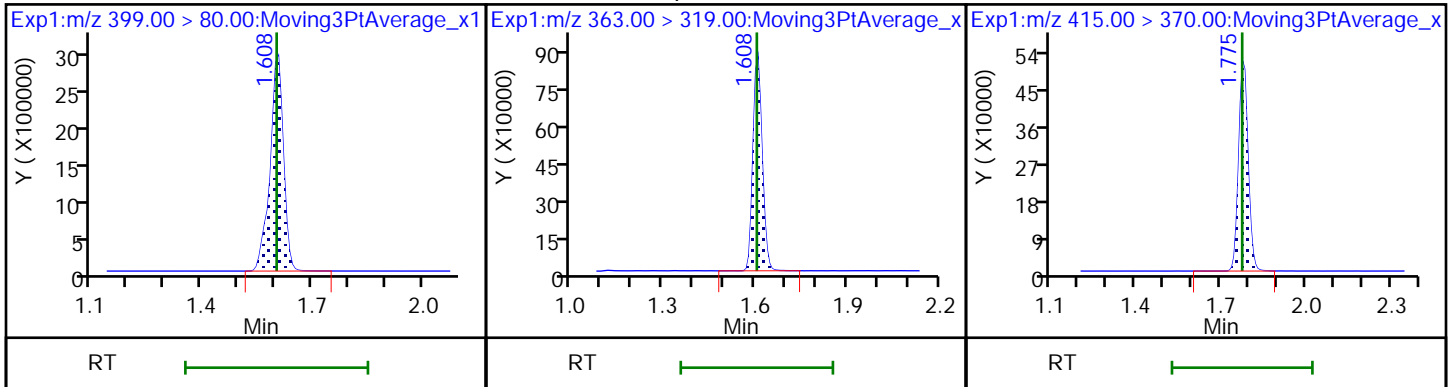
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

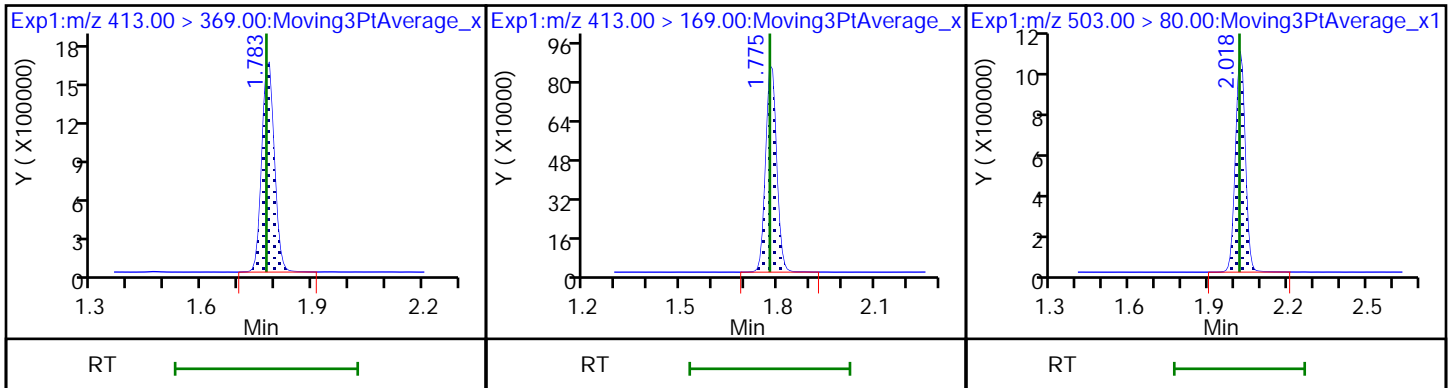
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

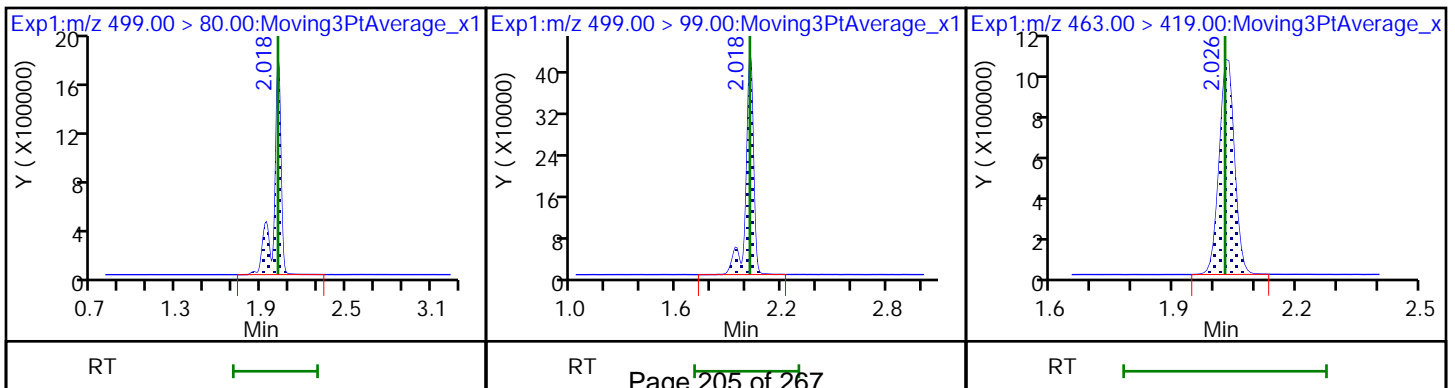
\* 7 13C4 PFOS



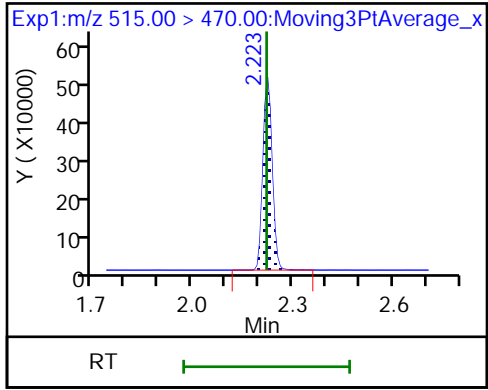
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA





TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Lims ID: IC L6  
 Client ID:  
 Sample Type: IC Calib Level: 6  
 Inject. Date: 07-Aug-2018 13:07:25 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@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Aug-2018 13:58:35 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 07-Aug-2018 13:17:58

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.352	-0.002	1.000	16487048	154.4		13956	
298.90 > 99.00	1.350	1.352	-0.002	1.000	12510280		1.32(0.00-0.00)	12516	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.468	-0.004	1.000	1325342	10.2		10456	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.603	-0.002	1.000	9803009	61.0		7313	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.605	-0.004	1.000	2459664	19.3		614	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.774	-0.006		1182381	10.0		7425	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.775	-0.007	1.000	5050799	39.0		695	
413.00 > 169.00	1.768	1.775	-0.007	1.000	2649100		1.91(0.00-0.00)	5173	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.016	-0.005		2586897	28.7		3267	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.011	2.018	-0.007	1.000	7918924	80.4		5918	
499.00 > 99.00	2.011	2.018	-0.007	1.000	1707086		4.64(0.00-0.00)	3518	
9 Perfluorononanoic acid									
463.00 > 419.00	2.018	2.024	-0.006	1.000	3665889	39.3		624	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.220	-0.005	1.000	978205	10.1		7944	

**Reagents:**

LC537-L6\_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Injection Date: 07-Aug-2018 13:07:25

Instrument ID: A8\_N

Lims ID: IC L6

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 6

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

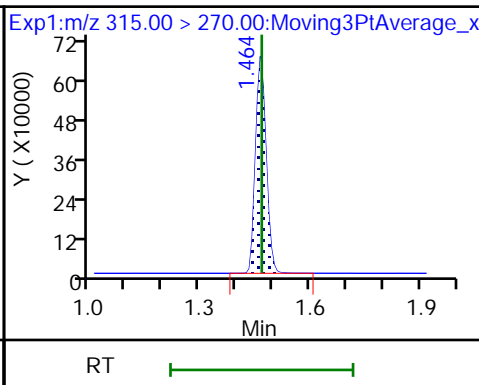
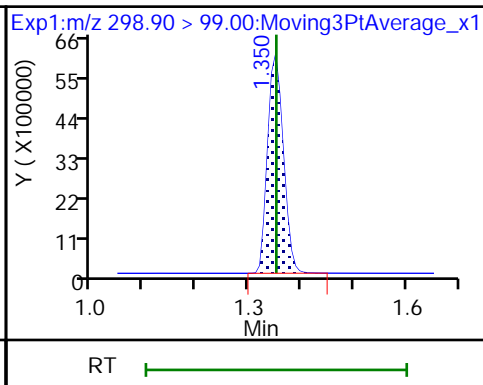
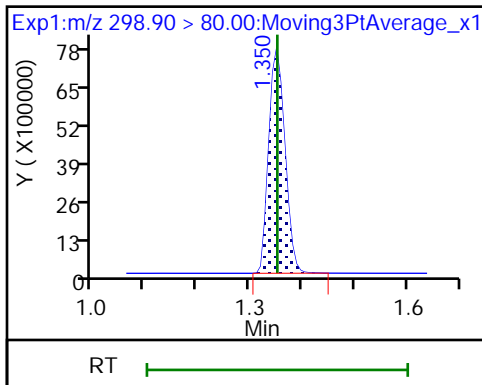
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

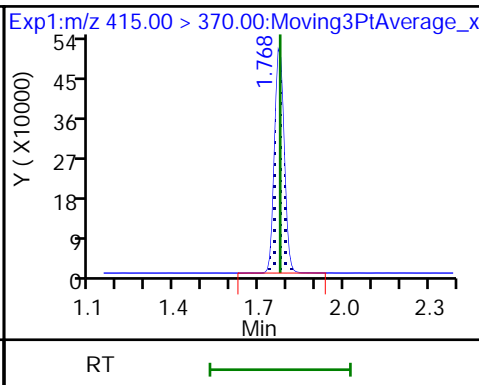
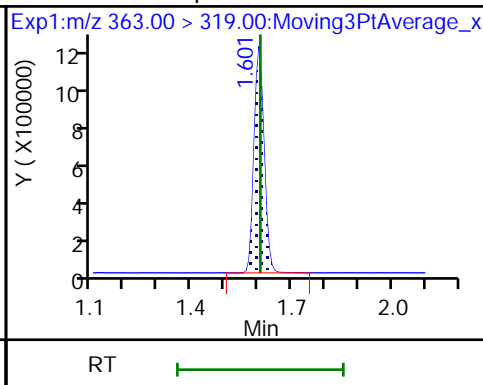
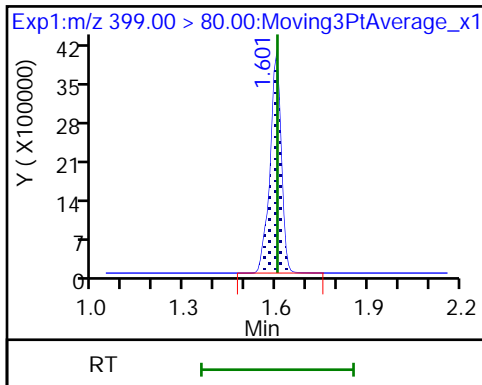
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

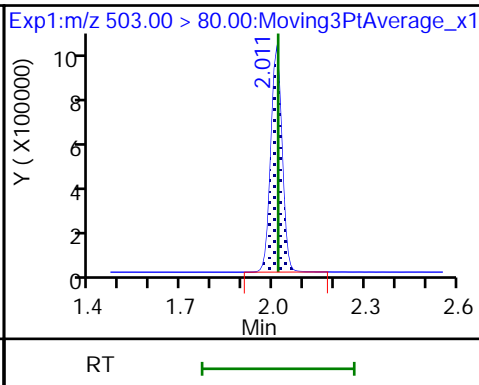
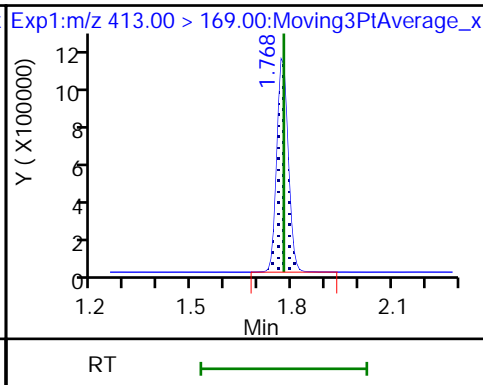
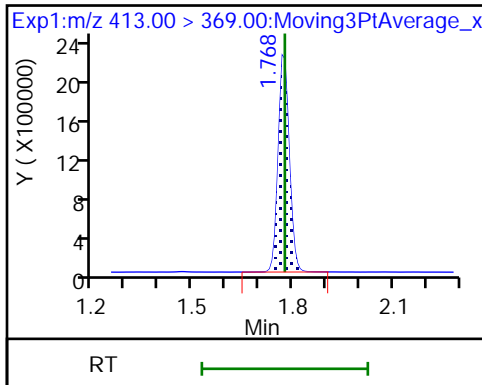
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

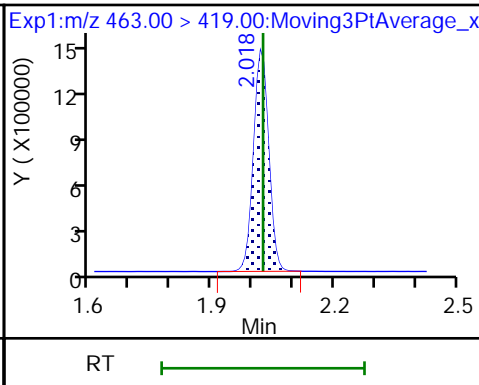
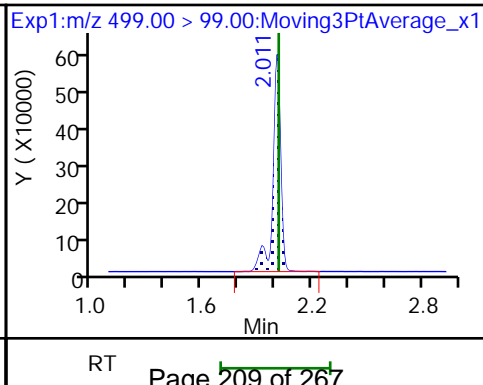
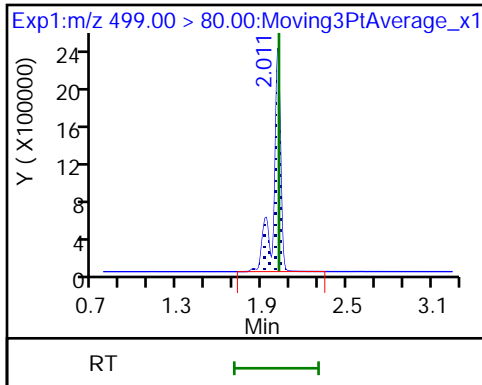
\* 7 13C4 PFOS



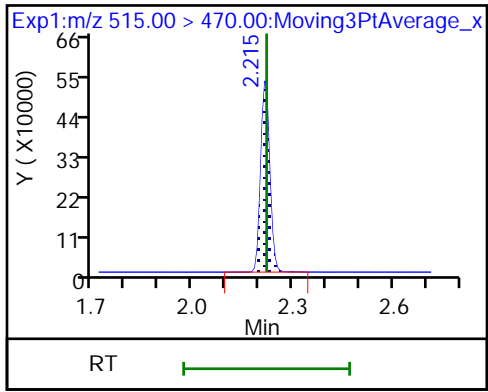
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



**Calibration**

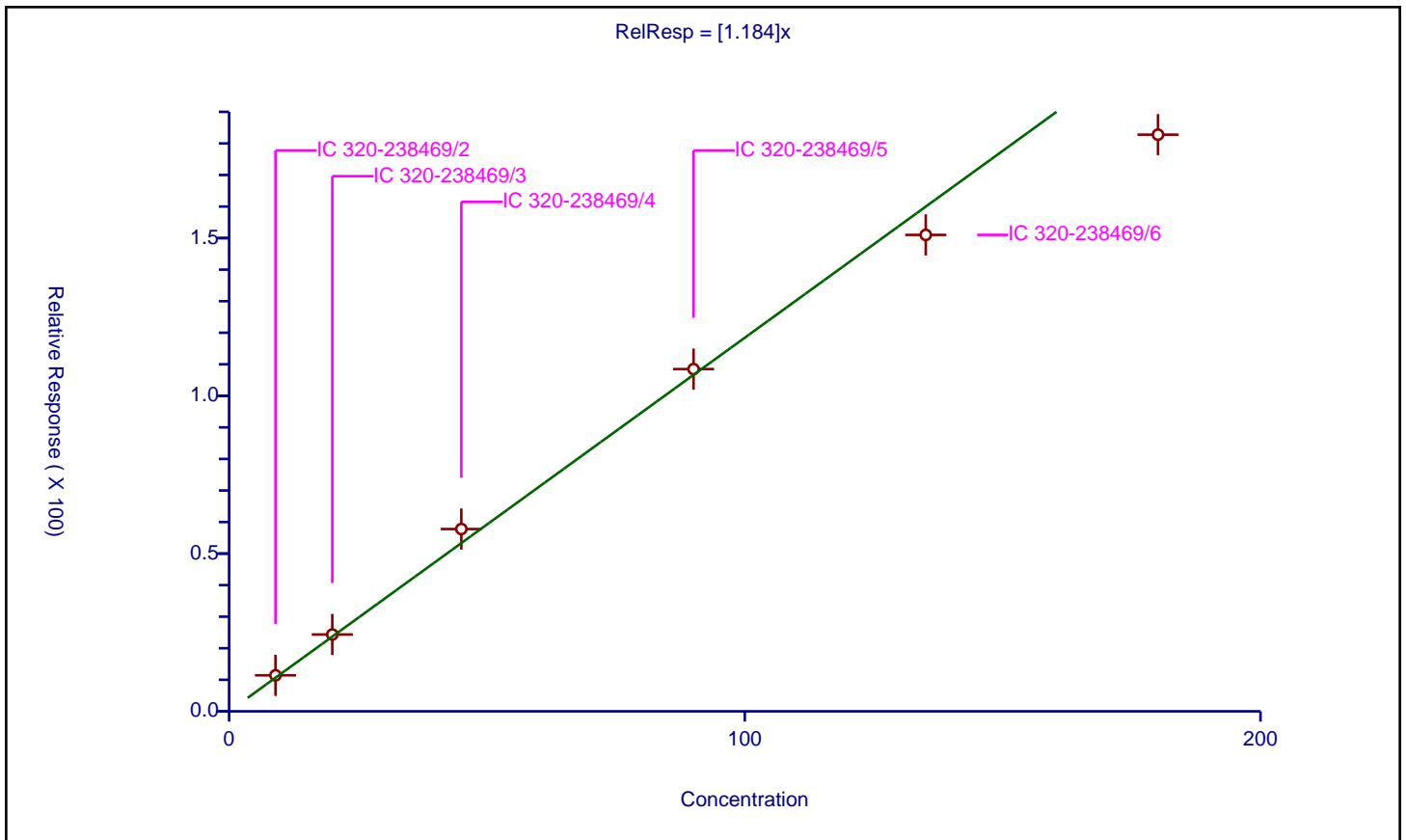
/ Perfluorobutanesulfonic acid

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

Curve Coefficients	
Intercept:	0
Slope:	1.184

Error Coefficients	
Standard Error:	10700000
Relative Standard Error:	8.6
Correlation Coefficient:	0.993
Coefficient of Determination (Adjusted):	0.988

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238469/2	8.99912	11.415125	28.68	2748260.0	1.268471	Y
2	IC 320-238469/3	20.01376	24.350633	28.68	2739996.0	1.216695	Y
3	IC 320-238469/4	45.03096	57.778627	28.68	2601656.0	1.283087	Y
4	IC 320-238469/5	90.06192	108.476184	28.68	2433237.0	1.204462	Y
5	IC 320-238469/6	135.09288	151.008401	28.68	2594163.0	1.117812	Y
6	IC 320-238469/7	180.12384	182.785993	28.68	2586897.0	1.01478	Y



**Calibration**

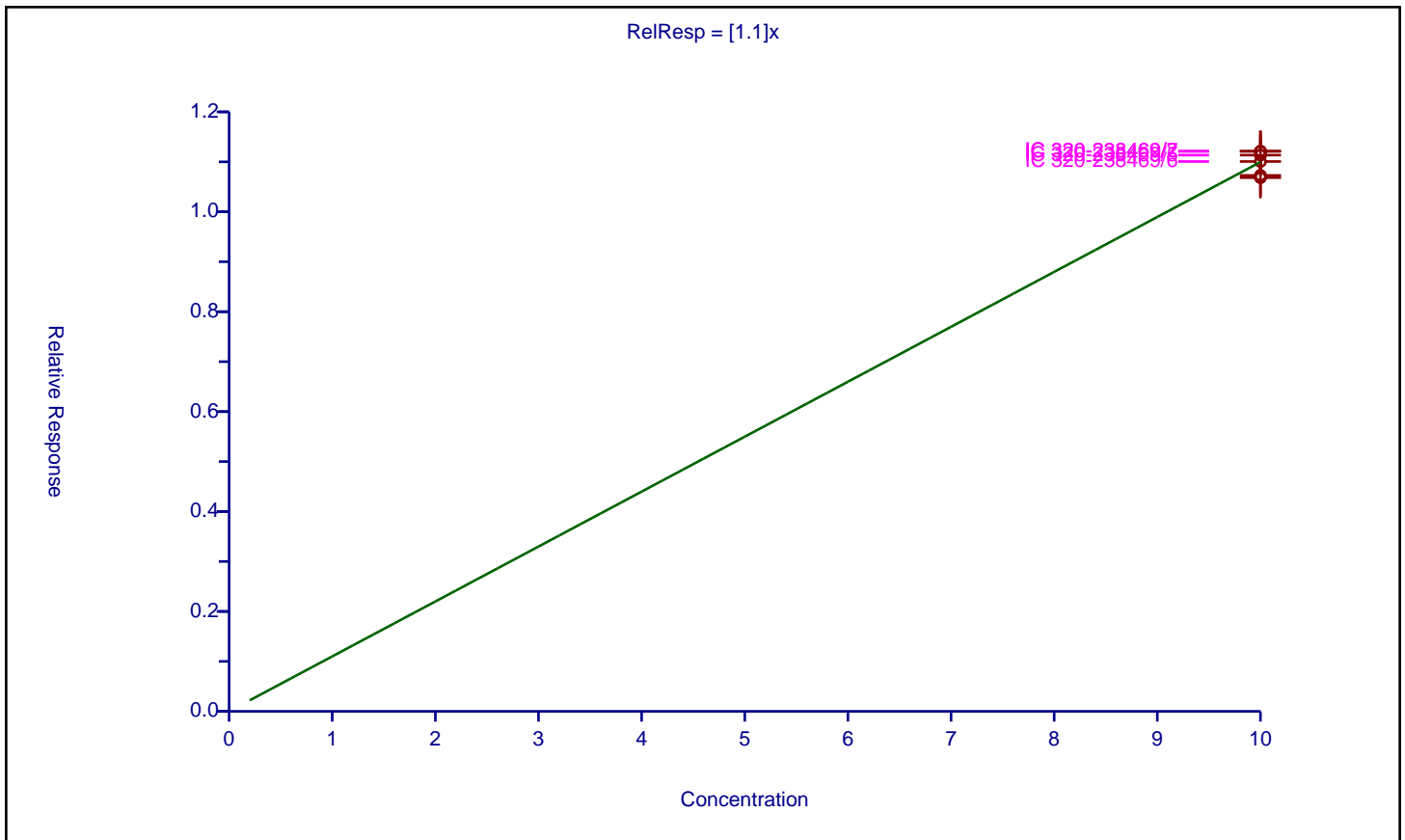
/ 13C2 PFHxA

**Curve Type:** Average  
**Weighting:** Conc\_Sq  
**Origin:** Force  
**Dependency:** Response  
**Calib Mode:** ISTD  
**Response Base:** AREA  
**RF Rounding:** 0

Curve Coefficients	
Intercept:	0
Slope:	1.1

Error Coefficients	
Standard Error:	1410000
Relative Standard Error:	2.2
Correlation Coefficient:	NA
Coefficient of Determination (Adjusted):	0

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238469/2	10.0	11.214758	10.0	1196979.0	1.121476	Y
2	IC 320-238469/3	10.0	10.683094	10.0	1204534.0	1.068309	Y
3	IC 320-238469/4	10.0	10.7286	10.0	1167019.0	1.07286	Y
4	IC 320-238469/5	10.0	11.134418	10.0	1063858.0	1.113442	Y
5	IC 320-238469/6	10.0	11.00663	10.0	1182103.0	1.100663	Y
6	IC 320-238469/7	10.0	11.209094	10.0	1182381.0	1.120909	Y



**Calibration**

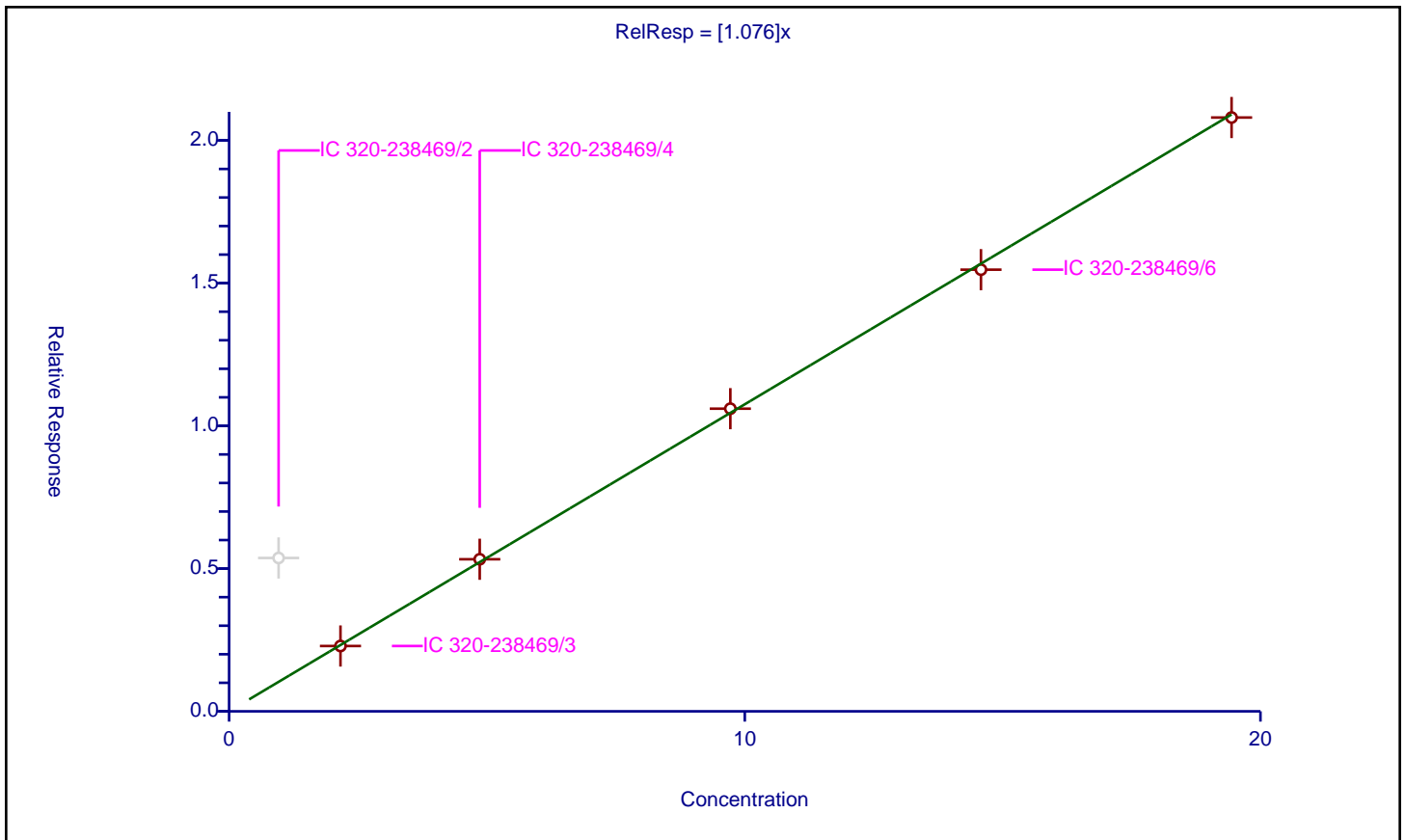
/ Perfluoroheptanoic acid

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

Curve Coefficients	
Intercept:	0
Slope:	1.076

Error Coefficients	
Standard Error:	1670000
Relative Standard Error:	1.6
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	1.000

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238469/2	0.96	5.372826	10.0	1196979.0	5.596694	N
2	IC 320-238469/3	2.16	2.289143	10.0	1204534.0	1.059788	Y
3	IC 320-238469/4	4.86	5.327874	10.0	1167019.0	1.09627	Y
4	IC 320-238469/5	9.72	10.603003	10.0	1063858.0	1.090844	Y
5	IC 320-238469/6	14.58	15.471858	10.0	1182103.0	1.06117	Y
6	IC 320-238469/7	19.44	20.802635	10.0	1182381.0	1.070094	Y



**Calibration**

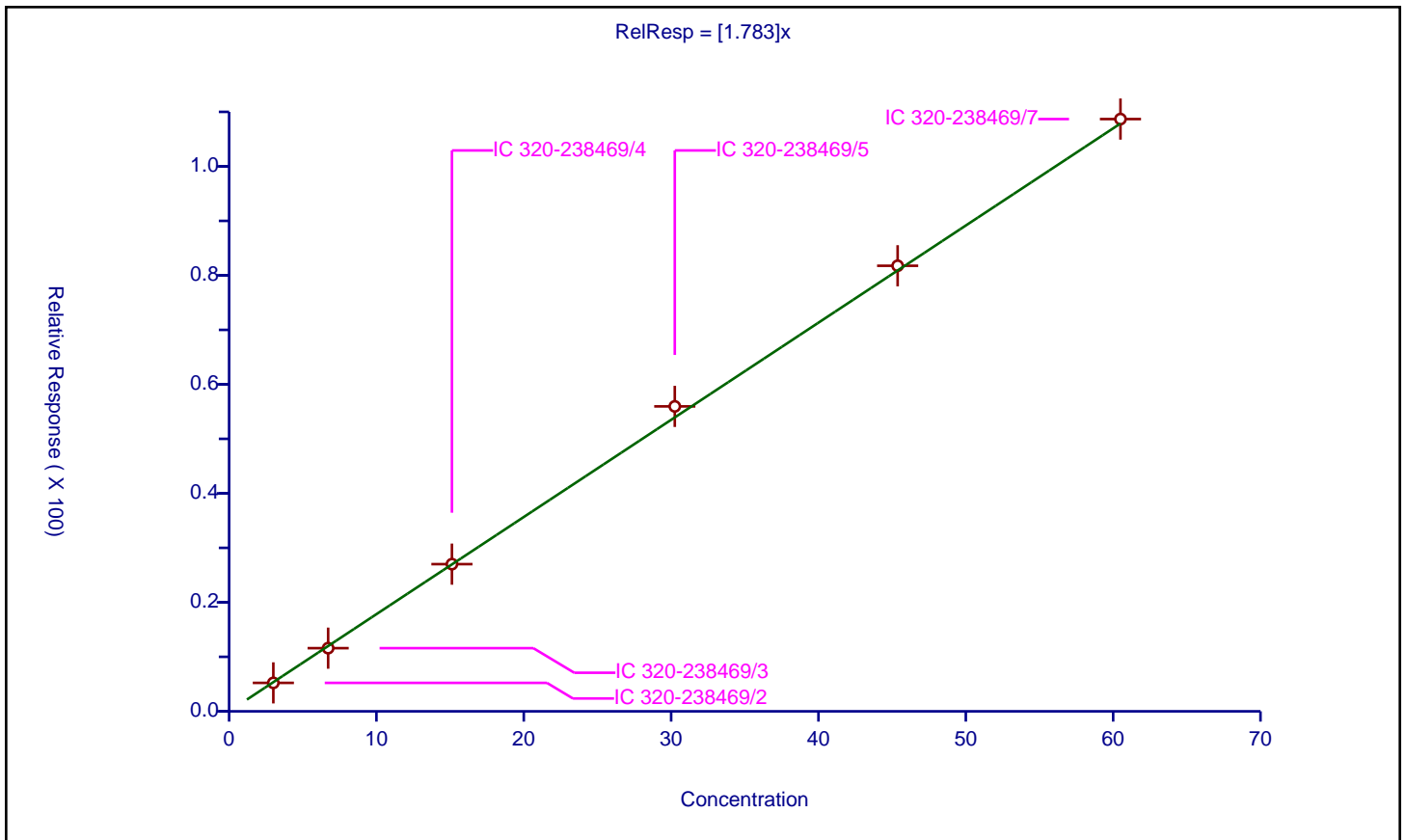
/ Perfluorohexanesulfonic acid

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

Curve Coefficients	
Intercept:	0
Slope:	1.783

Error Coefficients	
Standard Error:	6010000
Relative Standard Error:	2.6
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238469/2	3.003	5.221124	28.68	2748260.0	1.738636	Y
2	IC 320-238469/3	6.721867	11.593907	28.68	2739996.0	1.724805	Y
3	IC 320-238469/4	15.1242	27.010255	28.68	2601656.0	1.785896	Y
4	IC 320-238469/5	30.2484	55.957858	28.68	2433237.0	1.849944	Y
5	IC 320-238469/6	45.3726	81.761741	28.68	2594163.0	1.802007	Y
6	IC 320-238469/7	60.4968	108.682448	28.68	2586897.0	1.796499	Y





**Calibration**

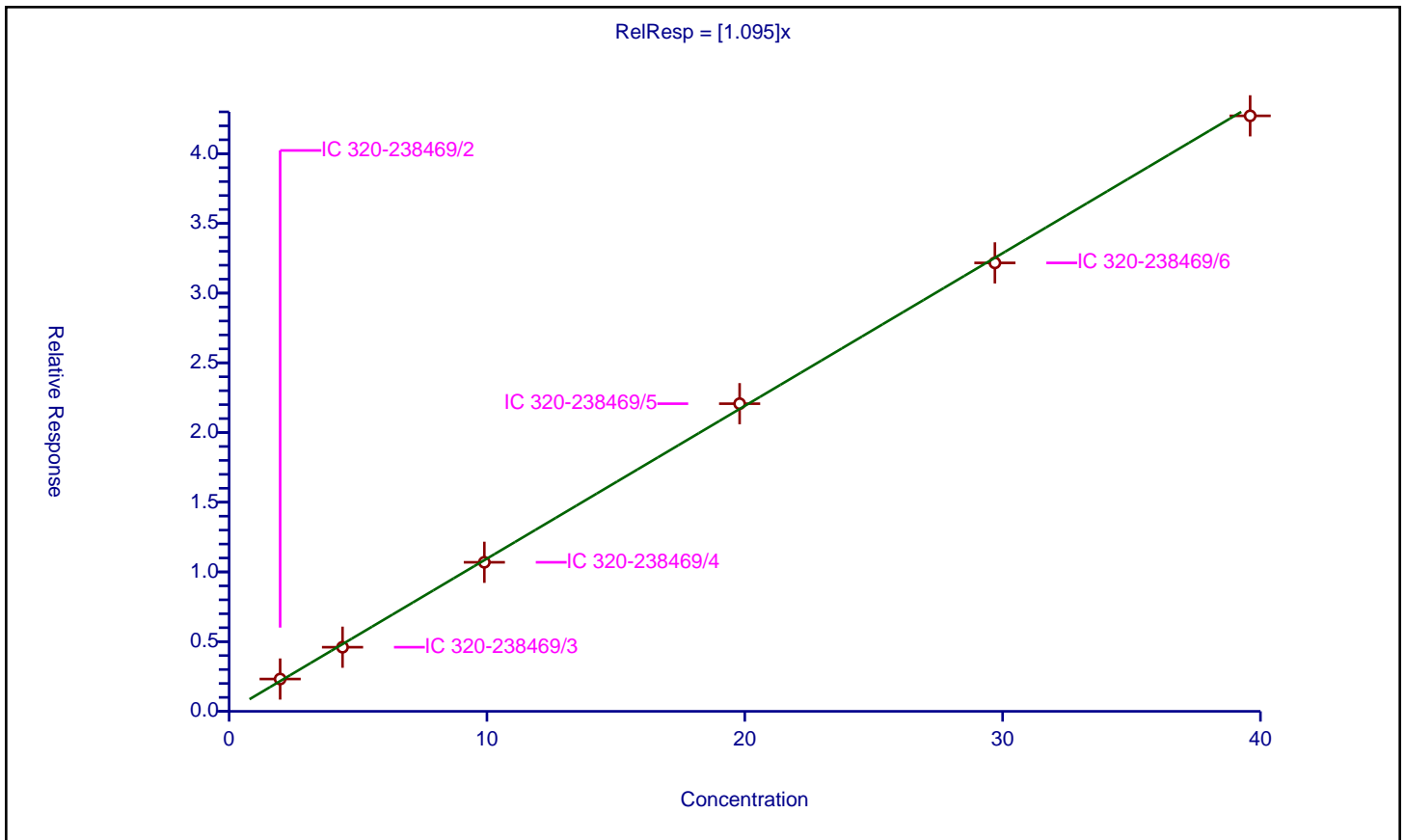
/ Perfluorooctanoic acid

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

Curve Coefficients	
Intercept:	0
Slope:	1.095

Error Coefficients	
Standard Error:	3080000
Relative Standard Error:	3.9
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238469/2	1.98	2.318203	10.0	1196979.0	1.170809	Y
2	IC 320-238469/3	4.4	4.599588	10.0	1204534.0	1.045361	Y
3	IC 320-238469/4	9.9	10.690666	10.0	1167019.0	1.079865	Y
4	IC 320-238469/5	19.8	22.068641	10.0	1063858.0	1.114578	Y
5	IC 320-238469/6	29.7	32.16927	10.0	1182103.0	1.08314	Y
6	IC 320-238469/7	39.6	42.717187	10.0	1182381.0	1.078717	Y



**Calibration**

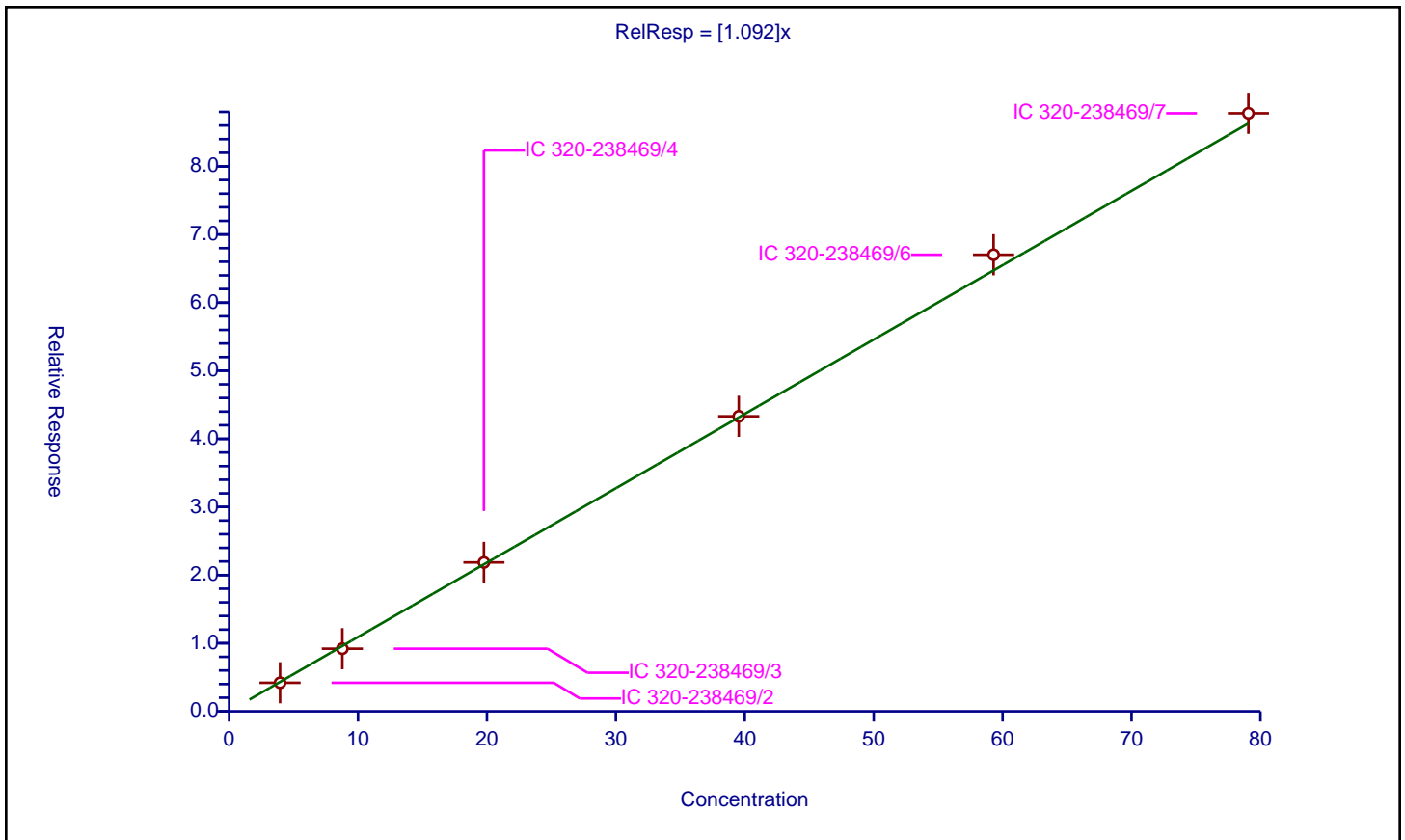
/ Perfluorooctane sulfonic acid

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

Curve Coefficients	
Intercept:	0
Slope:	1.092

Error Coefficients	
Standard Error:	4850000
Relative Standard Error:	2.9
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238469/2	3.95328	4.192613	28.68	2748260.0	1.06054	Y
2	IC 320-238469/3	8.785067	9.194026	28.68	2739996.0	1.046552	Y
3	IC 320-238469/4	19.7664	21.858009	28.68	2601656.0	1.105816	Y
4	IC 320-238469/5	39.5328	43.310526	28.68	2433237.0	1.095559	Y
5	IC 320-238469/6	59.2992	67.03028	28.68	2594163.0	1.130374	Y
6	IC 320-238469/7	79.0656	87.794273	28.68	2586897.0	1.110398	Y



**Calibration**

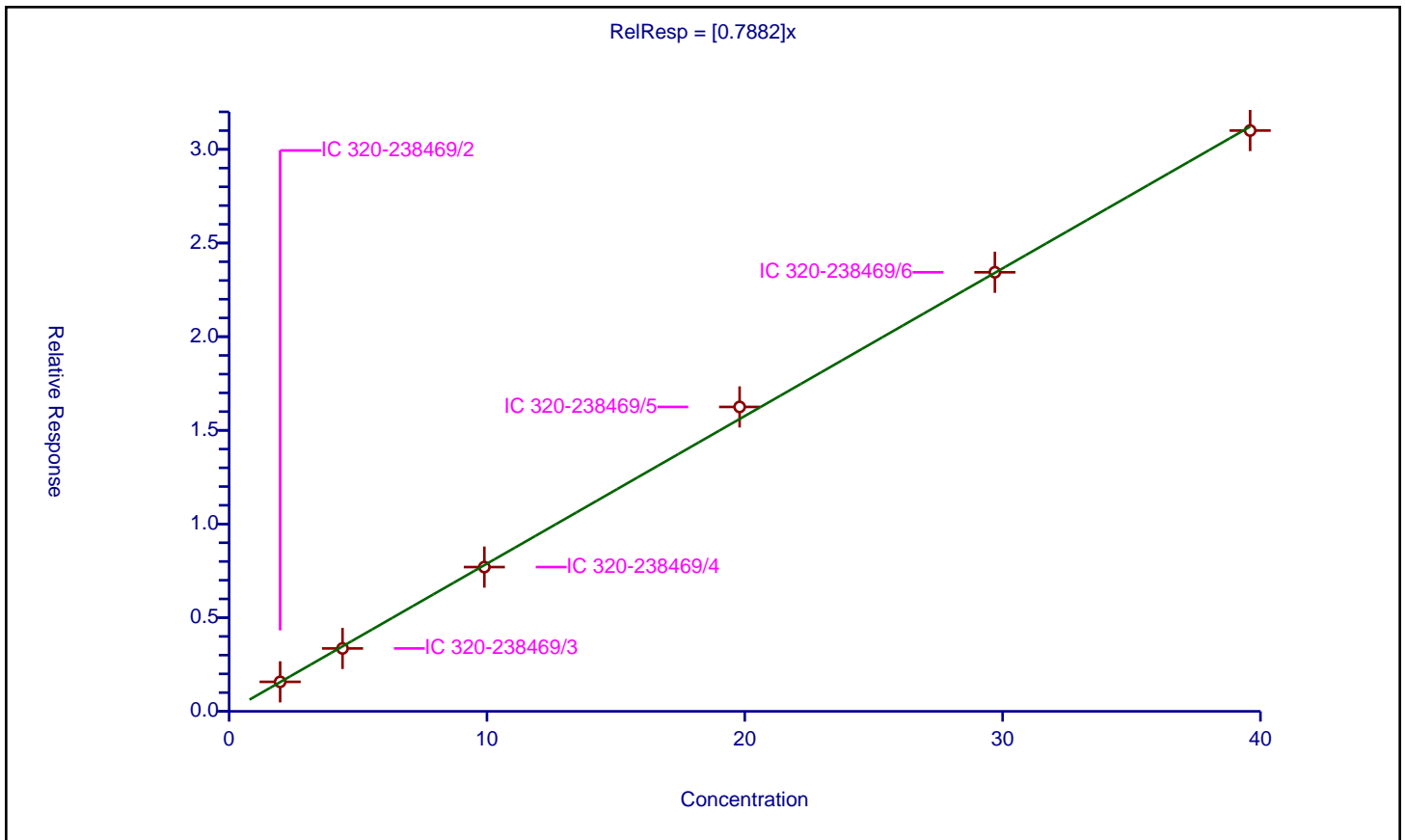
/ Perfluorononanoic acid

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

Curve Coefficients	
Intercept:	0
Slope:	0.7882

Error Coefficients	
Standard Error:	2240000
Relative Standard Error:	2.5
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238469/2	1.98	1.574464	10.0	1196979.0	0.795184	Y
2	IC 320-238469/3	4.4	3.358012	10.0	1204534.0	0.763185	Y
3	IC 320-238469/4	9.9	7.701563	10.0	1167019.0	0.777936	Y
4	IC 320-238469/5	19.8	16.250007	10.0	1063858.0	0.820707	Y
5	IC 320-238469/6	29.7	23.438161	10.0	1182103.0	0.789164	Y
6	IC 320-238469/7	39.6	31.004296	10.0	1182381.0	0.782937	Y



**Calibration**

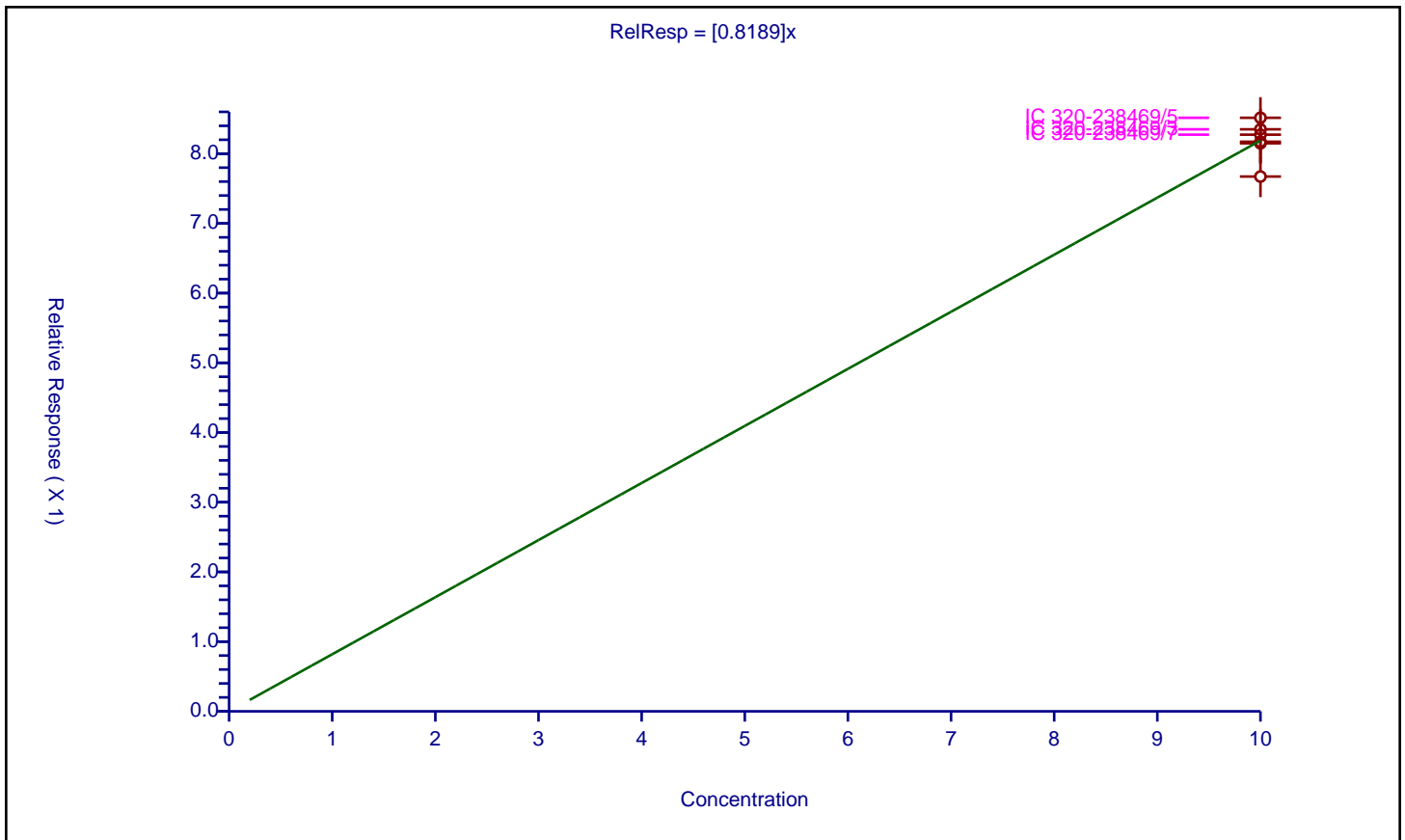
/ 13C2 PFDA

**Curve Type:** Average  
**Weighting:** Conc\_Sq  
**Origin:** Force  
**Dependency:** Response  
**Calib Mode:** ISTD  
**Response Base:** AREA  
**RF Rounding:** 0

Curve Coefficients	
Intercept:	0
Slope:	0.8189

Error Coefficients	
Standard Error:	1050000
Relative Standard Error:	3.5
Correlation Coefficient:	NA
Coefficient of Determination (Adjusted):	0.0000000000000000222

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238469/2	10.0	8.149299	10.0	1196979.0	0.81493	Y
2	IC 320-238469/3	10.0	8.350084	10.0	1204534.0	0.835008	Y
3	IC 320-238469/4	10.0	7.672103	10.0	1167019.0	0.76721	Y
4	IC 320-238469/5	10.0	8.515366	10.0	1063858.0	0.851537	Y
5	IC 320-238469/6	10.0	8.171665	10.0	1182103.0	0.817167	Y
6	IC 320-238469/7	10.0	8.273179	10.0	1182381.0	0.827318	Y



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-238469/9 Calibration Date: 08/07/2018 13:16  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537CURVE\_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.259		21.3	20.0	6.3	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.049		2.11	2.16	-2.5	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.727		6.51	6.72	-3.2	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.051		4.22	4.40	-4.1	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.042		8.39	8.79	-4.5	50.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7696		4.30	4.40	-2.4	50.0
13C2 PFHxA	Ave	1.100	1.095		9.96	10.0	-0.4	30.0
13C2 PFDA	Ave	0.8189	0.8007		9.78	10.0	-2.2	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_010.d  
 Lims ID: CCVL  
 Client ID:  
 Sample Type: CCVL  
 Inject. Date: 07-Aug-2018 13:16:43 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@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Aug-2018 13:58:37 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK014

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.352	-0.002	1.000	2332407	21.3		3628	
298.90 > 99.00	1.350	1.352	-0.002	1.000	1574823		1.48(0.00-0.00)	2431	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.468	-0.004	1.000	1266592	9.96		10956	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.603	-0.002	1.000	1074594	6.51		1073	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.605	-0.004	1.000	262029	2.11		64.1	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.774	-0.006		1156656	10.0		7558	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.775	1.775	0.0	1.000	534834	4.22		80.8	
413.00 > 169.00	1.768	1.775	-0.007	0.996	275061		1.94(0.00-0.00)	611	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.016	-0.005		2655389	28.7		3793	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.011	2.018	-0.007	1.000	847924	8.39		857	
499.00 > 99.00	2.011	2.018	-0.007	1.000	190952		4.44(0.00-0.00)	592	
9 Perfluorononanoic acid									
463.00 > 419.00	2.018	2.024	-0.006	1.000	391671	4.30		69.6	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.220	0.003	1.000	926133	9.78		6522	

Reagents:

LC537-L2\_00022 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_010.d

Injection Date: 07-Aug-2018 13:16:43

Instrument ID: A8\_N

Lims ID: CCVL

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 2

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

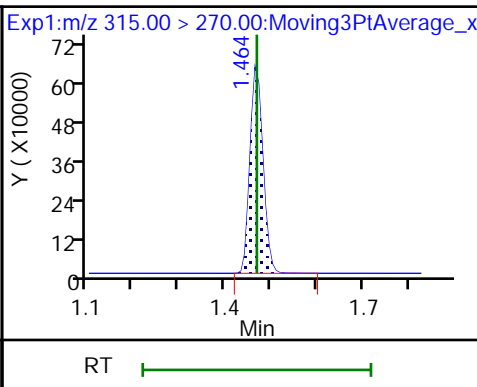
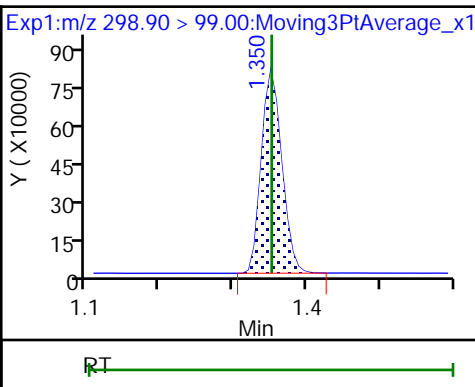
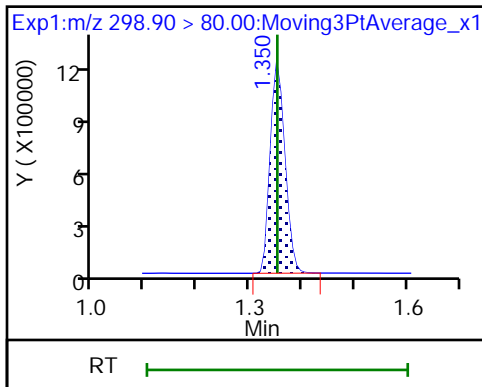
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

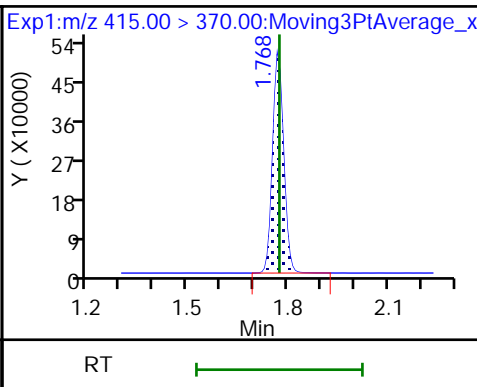
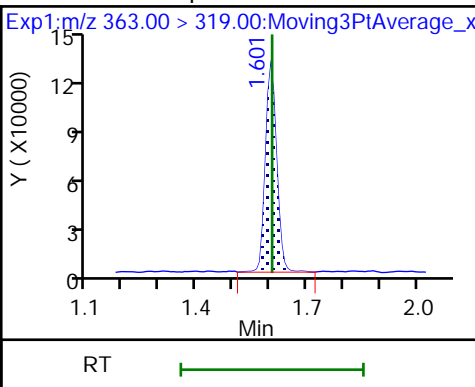
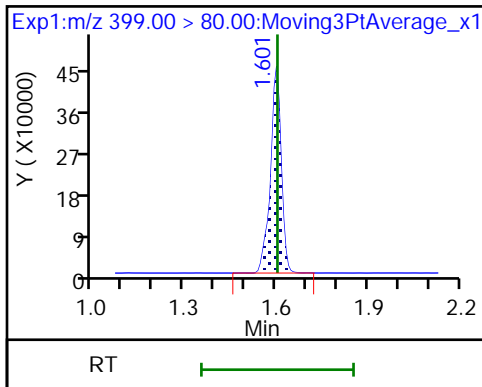
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

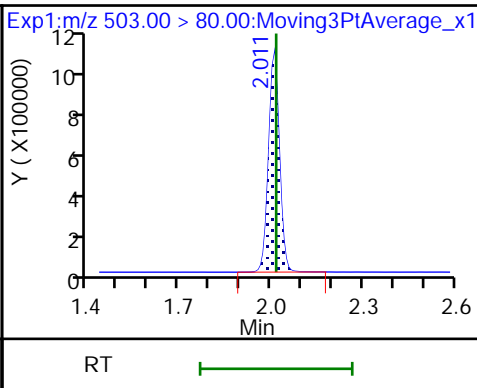
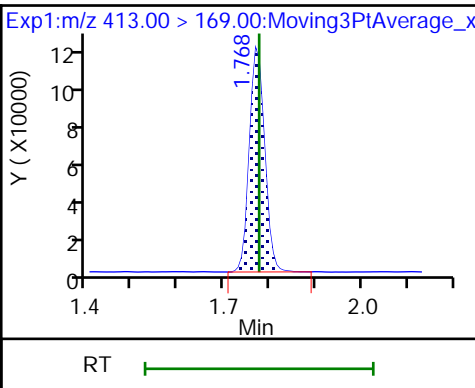
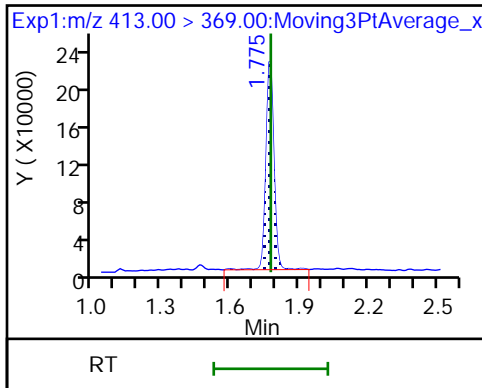
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

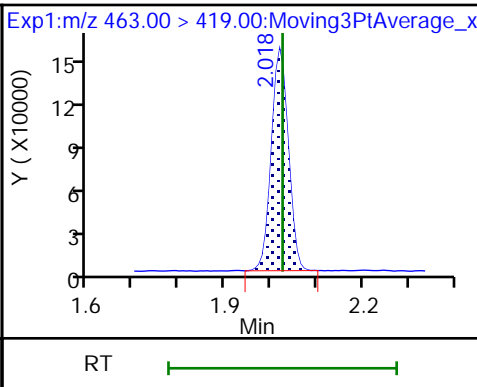
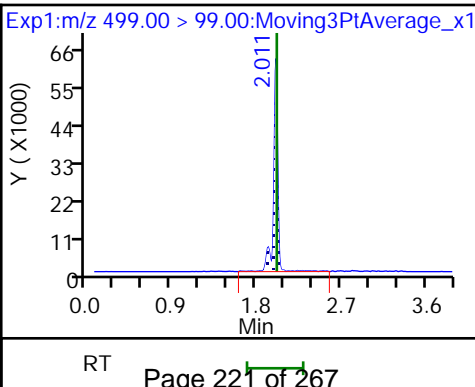
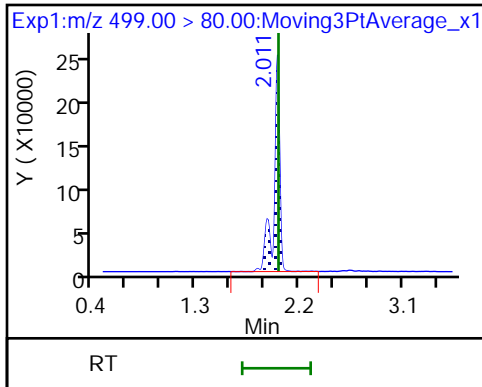
\* 7 13C4 PFOS



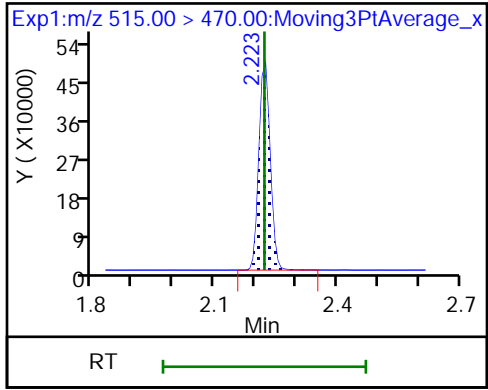
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA





FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: ICV 320-238469/11 Calibration Date: 08/07/2018 13:26  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537CURVE\_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	0.997		84.2	100	-15.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	0.9540		8.87	10.0	-11.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.603		18.1	20.2	-10.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	0.9056		16.7	20.2	-17.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	0.9574		17.7	20.2	-12.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7380		18.9	20.2	-6.4	30.0
13C2 PFHxA	Ave	1.100	1.045		9.51	10.0	-4.9	30.0
13C2 PFDA	Ave	0.8189	0.7952		9.71	10.0	-2.9	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_012.d  
 Lims ID: ICV  
 Client ID:  
 Sample Type: ICV  
 Inject. Date: 07-Aug-2018 13:26:01 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@tai.com Instrument ID: A8\_N  
 Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Aug-2018 13:58:48 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 07-Aug-2018 13:58:44

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.352	-0.002	1.000	9545617	84.2		11052	
298.90 > 99.00	1.350	1.352	-0.002	1.000	6956258		1.37(0.00-0.00)	8328	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.472	1.468	0.004	1.000	1254206	9.51		10046	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.603	-0.002	1.000	3092385	18.1		3048	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.605	-0.004	1.000	1144602	8.87		256	
* 6 13C2-PFOA									
415.00 > 370.00	1.775	1.774	0.001		1199776	10.0		6991	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.775	1.775	0.0	1.000	2191205	16.7		318	
413.00 > 169.00	1.775	1.775	0.0	1.000	1130846		1.94(0.00-0.00)	2324	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.016	-0.005		2744266	28.7		3771	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.011	2.018	-0.007	1.000	1847813	17.7		1537	
499.00 > 99.00	2.011	2.018	-0.007	1.000	358705		5.15(0.00-0.00)	799	
9 Perfluorononanoic acid									
463.00 > 419.00	2.018	2.024	-0.006	1.000	1785291	18.9		315	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.220	-0.005	1.000	954033	9.71		8012	

**Reagents:**

LC537-ICV\_00032

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_012.d

Injection Date: 07-Aug-2018 13:26:01

Instrument ID: A8\_N

Lims ID: ICV

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 7

Worklist Smp#: 11

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

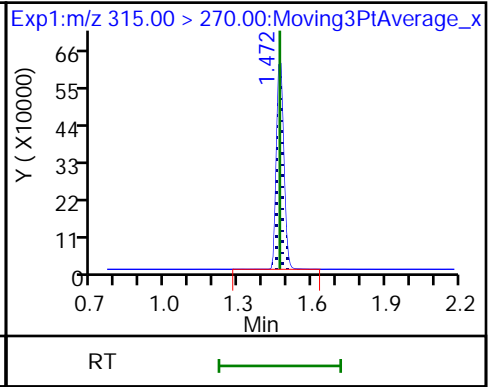
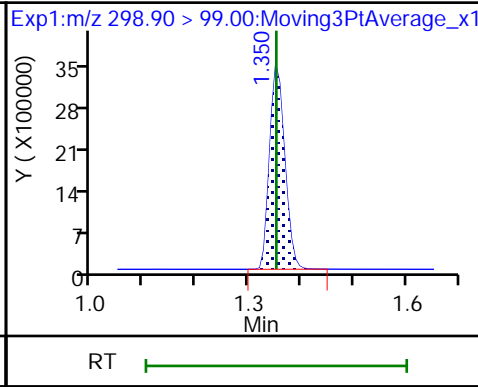
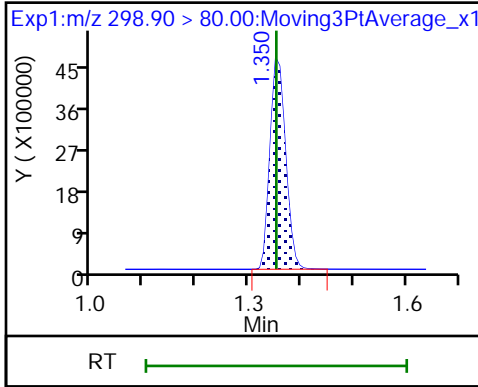
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

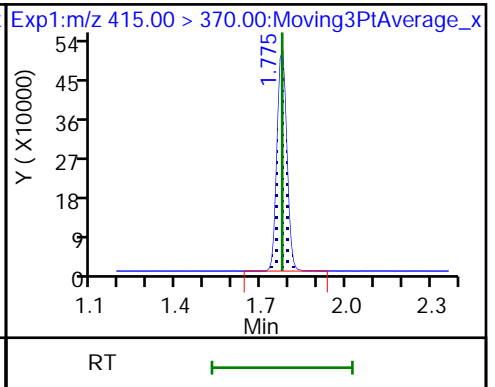
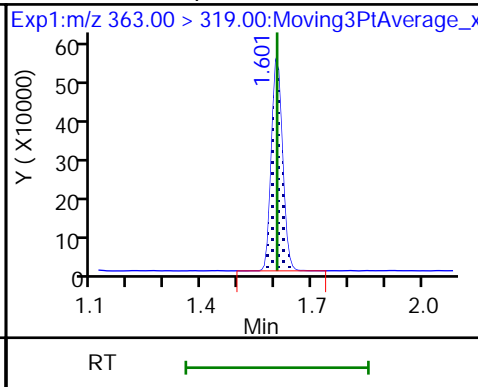
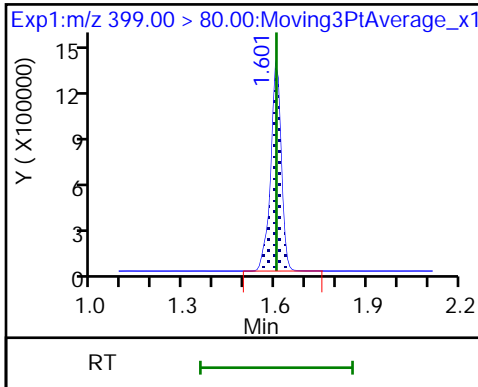
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

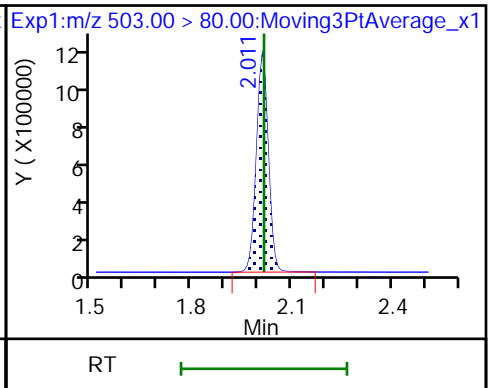
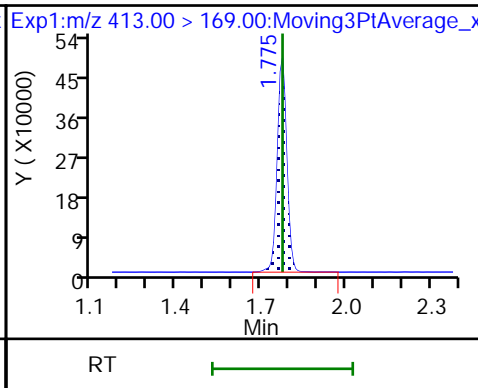
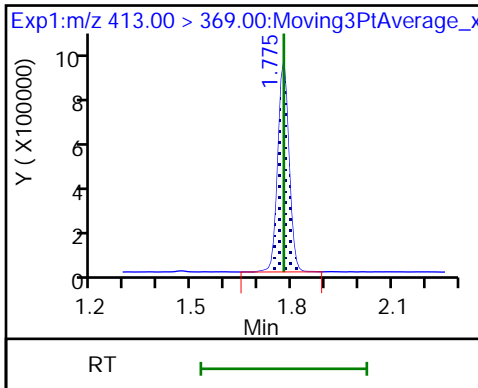
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

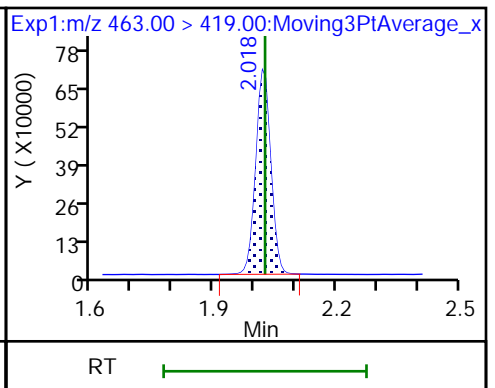
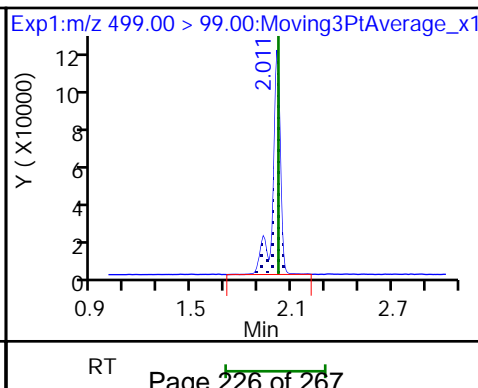
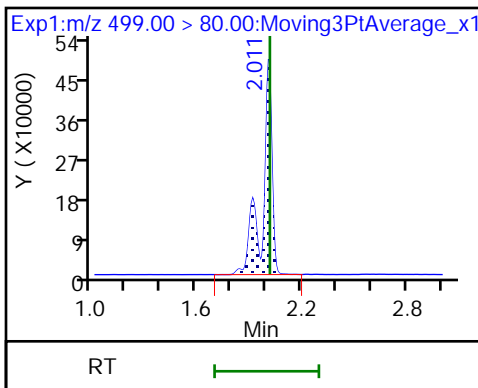
\* 7 13C4 PFOS



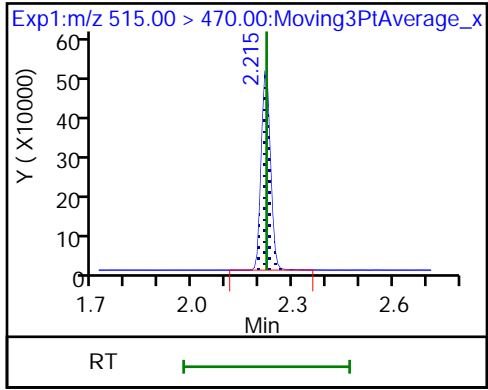
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-238604/1 Calibration Date: 08/08/2018 01:15  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537AAA\_034.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.092		125	135	-7.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.027		13.9	14.6	-4.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.794		45.7	45.4	0.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.032		28.0	29.7	-5.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.125		61.1	59.3	3.1	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7846		29.6	29.7	-0.5	30.0
13C2 PFHxA	Ave	1.100	1.089		9.90	10.0	-1.0	30.0
13C2 PFDA	Ave	0.8189	0.7984		9.75	10.0	-2.5	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_034.d  
 Lims ID: CCV L5  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 08-Aug-2018 01:15:18 ALS Bottle#: 5 Worklist Smp#: 1  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L5  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:19 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	13167574	124.6		9682	
298.90 > 99.00	1.350	1.350	0.0	1.000	9541243		1.38(0.00-0.00)	9395	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1260061	9.90		10985	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.601	0.0	1.000	7263104	45.7		5872	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.601	0.0	1.000	1734030	13.9		341	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.768	0.0		1157547	10.0		6699	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	3547659	28.0		551	
413.00 > 169.00	1.768	1.768	0.0	1.000	1928241		1.84(0.00-0.00)	3935	
* 7 13C4 PFOS									
503.00 > 80.00	2.003	2.003	0.0		2558845	28.7		3565	
9 Perfluorononanoic acid									
463.00 > 419.00	2.011	2.011	0.0	1.000	2697294	29.6		380	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.003	2.018	-0.015	1.000	5952531	61.1		3505	
499.00 > 99.00	2.003	2.018	-0.015	1.000	1234505		4.82(0.00-0.00)	2508	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.215	0.0	1.000	924161	9.75		6583	

Reagents:

LC537-L5\_00026 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_034.d

Injection Date: 08-Aug-2018 01:15:18

Instrument ID: A8\_N

Lims ID: CCV L5

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 5

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

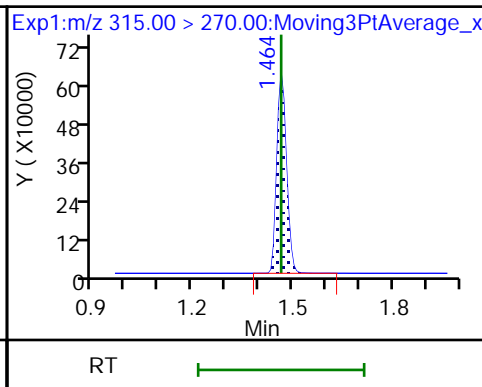
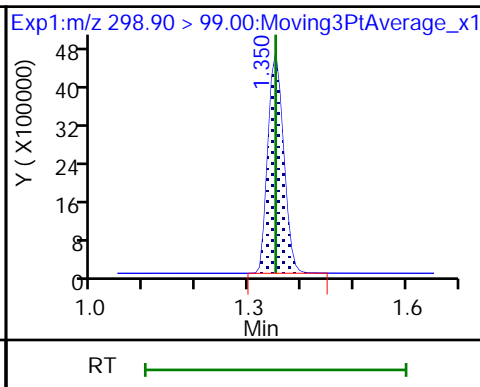
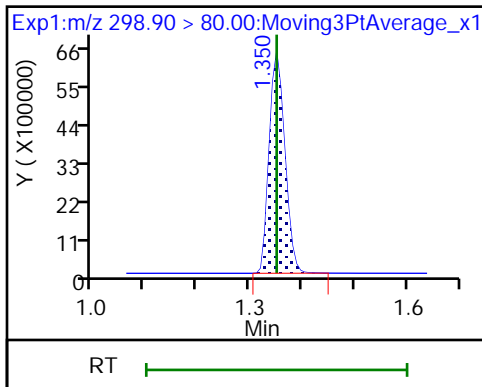
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

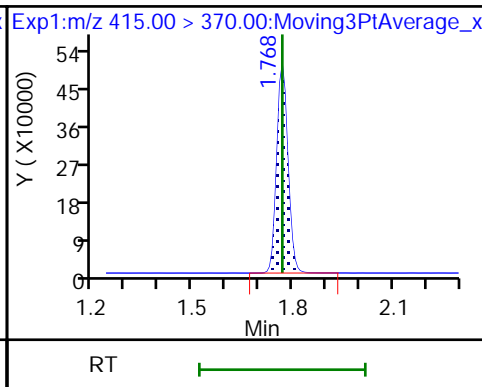
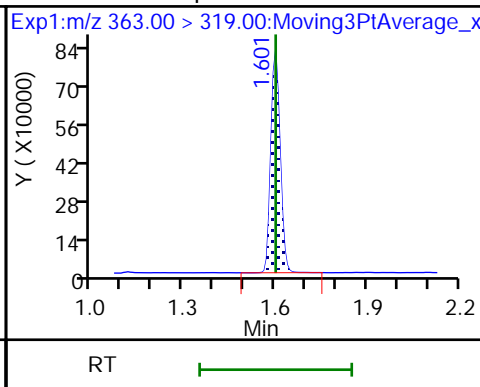
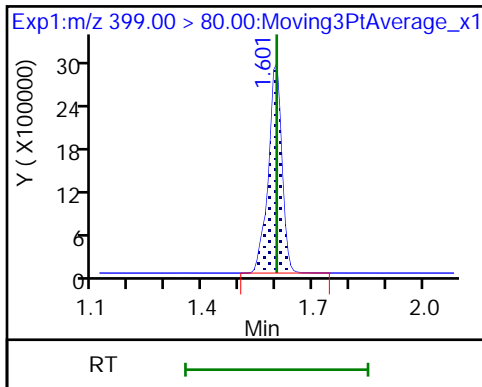
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

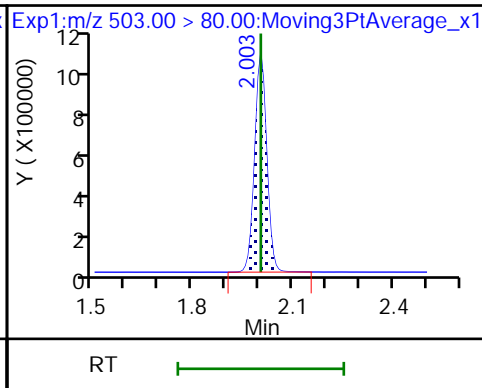
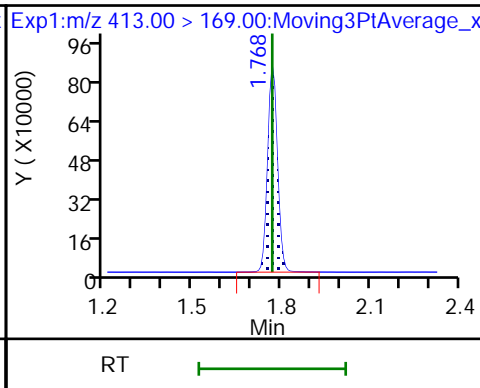
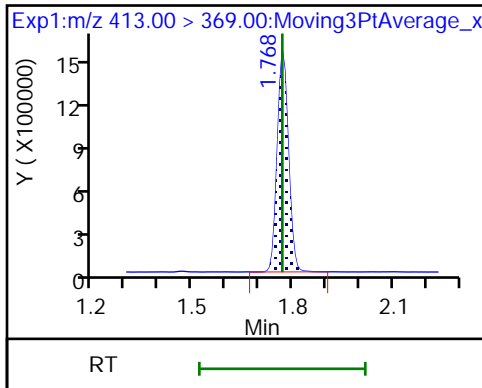
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

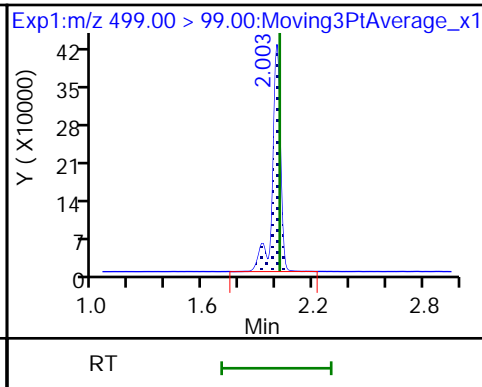
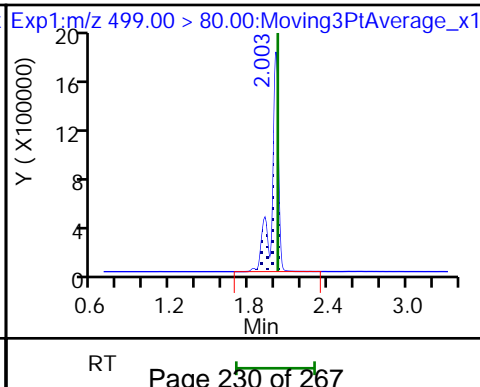
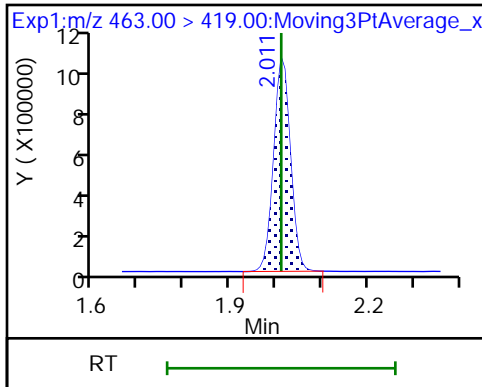
\* 7 13C4 PFOS



9 Perfluorononanoic acid

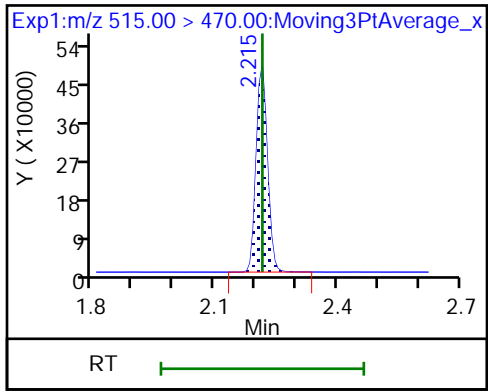
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid





\$ 10 13C2 PFDA



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-238604/11 Calibration Date: 08/08/2018 02:02  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537AAA\_044.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.288		49.0	45.0	8.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.071		4.84	4.86	-0.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.796		15.2	15.1	0.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.068		9.65	9.90	-2.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.093		19.8	19.8	0.1	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.8134		10.2	9.90	3.2	30.0
13C2 PFHxA	Ave	1.100	1.072		9.74	10.0	-2.6	30.0
13C2 PFDA	Ave	0.8189	0.8124		9.92	10.0	-0.8	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-238606/11 Calibration Date: 08/08/2018 02:02  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537AAA\_044.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.288		49.0	45.0	8.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.071		4.84	4.86	-0.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.796		15.2	15.1	0.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.068		9.65	9.90	-2.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.093		19.8	19.8	0.1	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.8134		10.2	9.90	3.2	30.0
13C2 PFHxA	Ave	1.100	1.072		9.74	10.0	-2.6	30.0
13C2 PFDA	Ave	0.8189	0.8124		9.92	10.0	-0.8	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_044.d  
 Lims ID: CCV L3  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 08-Aug-2018 02:02:03 ALS Bottle#: 3 Worklist Smp#: 11  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L3  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:26 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	5467443	49.0		4754	
298.90 > 99.00	1.350	1.350	0.0	1.000	3718760		1.47(0.00-0.00)	4561	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1252841	9.74		11122	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.593	0.0	1.000	2560278	15.2		2460	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.593	1.593	0.0	1.000	608771	4.84		116	
* 6 13C2-PFOA									
415.00 > 370.00	1.760	1.760	0.0		1169194	10.0		7747	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	1236357	9.65		191	
413.00 > 169.00	1.760	1.768	-0.008	0.996	661922		1.87(0.00-0.00)	1458	
* 7 13C4 PFOS									
503.00 > 80.00	2.003	2.003	0.0		2703567	28.7		3643	
9 Perfluorononanoic acid									
463.00 > 419.00	2.011	2.011	0.0	1.000	941476	10.2		125	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.003	2.018	-0.015	1.000	2036062	19.8		1433	
499.00 > 99.00	2.003	2.018	-0.015	1.000	437818		4.65(0.00-0.00)	1037	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.215	0.0	1.000	949820	9.92		7056	

Reagents:

LC537-L3\_00025 Amount Added: 1.00 Units: mL

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_044.d  
 Lims ID: CCV L3  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 08-Aug-2018 02:02:03 ALS Bottle#: 3 Worklist Smp#: 11  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L3  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:26 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	5467443	49.0		4754	
298.90 > 99.00	1.350	1.350	0.0	1.000	3718760		1.47(0.00-0.00)	4561	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1252841	9.74		11122	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.593	0.0	1.000	2560278	15.2		2460	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.593	1.593	0.0	1.000	608771	4.84		116	
* 6 13C2-PFOA									
415.00 > 370.00	1.760	1.760	0.0		1169194	10.0		7747	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	1236357	9.65		191	
413.00 > 169.00	1.760	1.768	-0.008	0.996	661922		1.87(0.00-0.00)	1458	
* 7 13C4 PFOS									
503.00 > 80.00	2.003	2.003	0.0		2703567	28.7		3643	
9 Perfluorononanoic acid									
463.00 > 419.00	2.011	2.011	0.0	1.000	941476	10.2		125	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.003	2.018	-0.015	1.000	2036062	19.8		1433	
499.00 > 99.00	2.003	2.018	-0.015	1.000	437818		4.65(0.00-0.00)	1037	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.215	0.0	1.000	949820	9.92		7056	

Reagents:

LC537-L3\_00025 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_044.d

Injection Date: 08-Aug-2018 02:02:03

Instrument ID: A8\_N

Lims ID: CCV L3

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 3

Worklist Smp#: 11

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

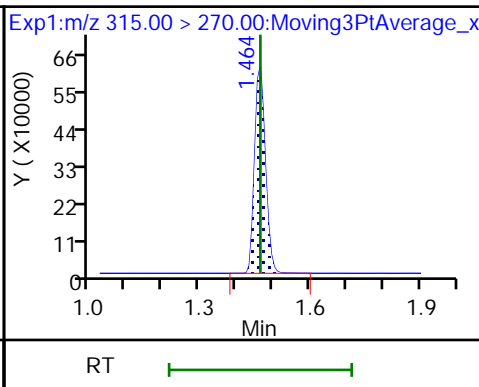
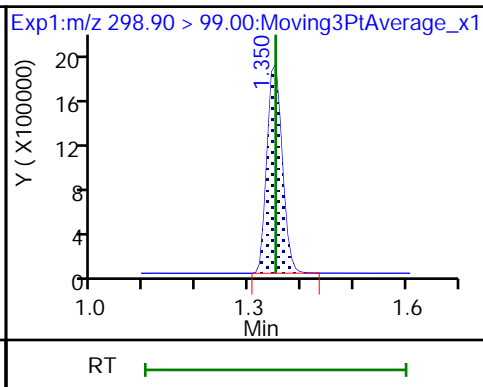
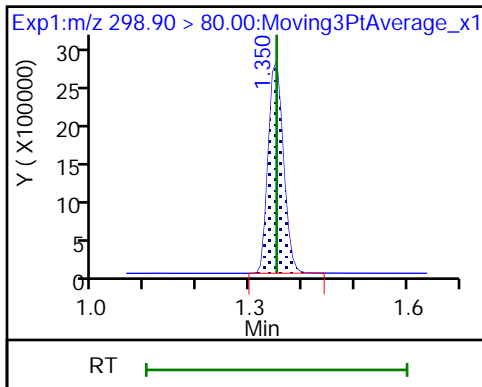
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

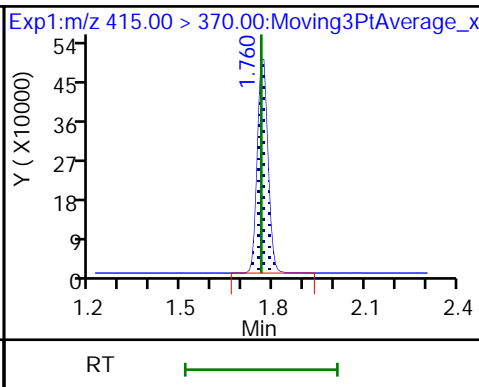
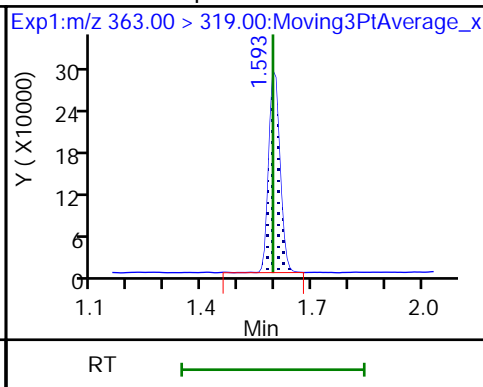
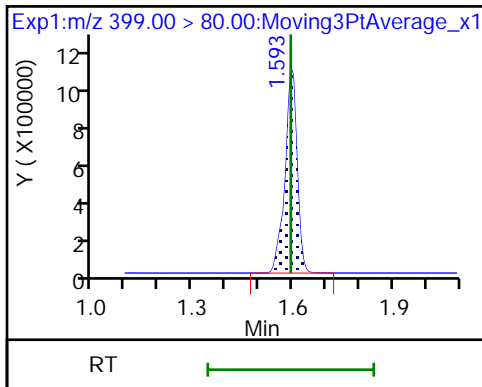
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

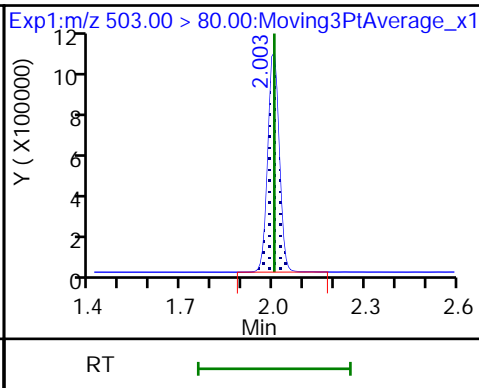
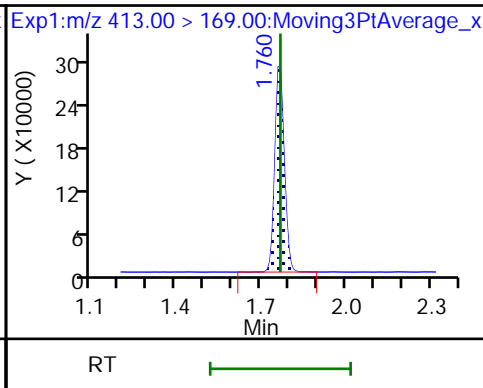
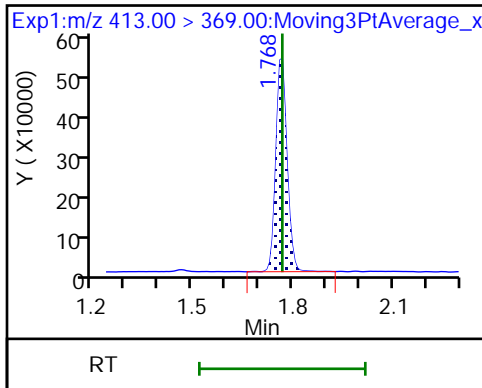
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

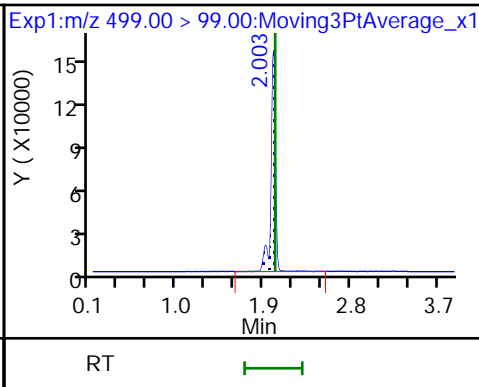
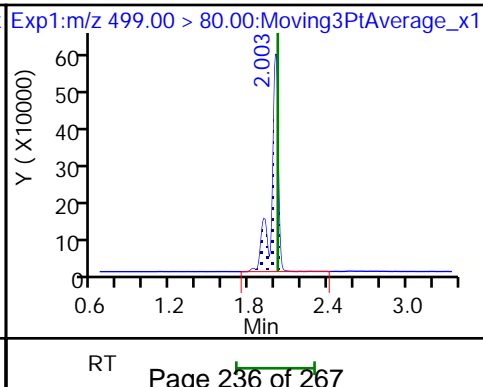
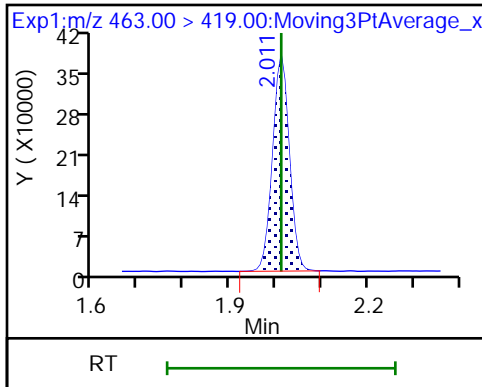
\* 7 13C4 PFOS



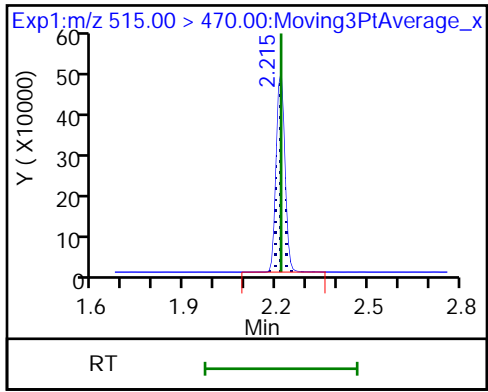
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_044.d

Injection Date: 08-Aug-2018 02:02:03

Instrument ID: A8\_N

Lims ID: CCV L3

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 3

Worklist Smp#: 11

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

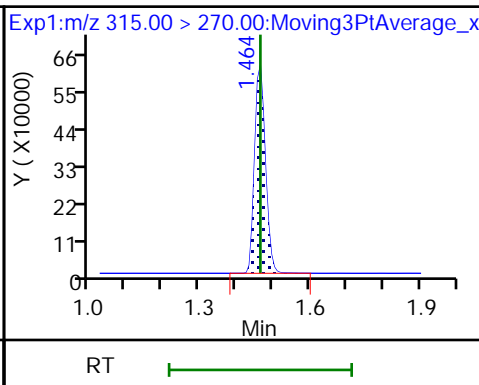
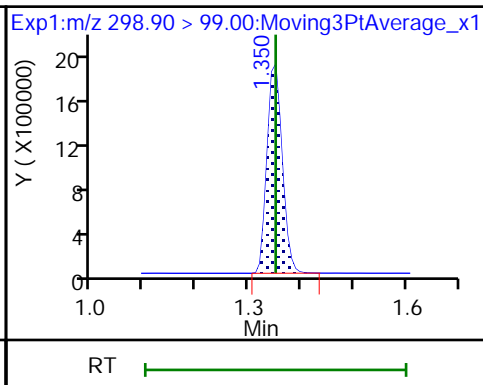
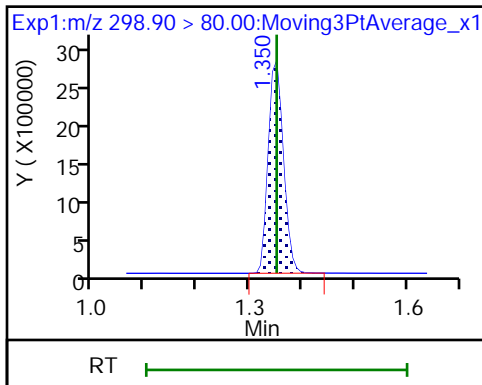
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

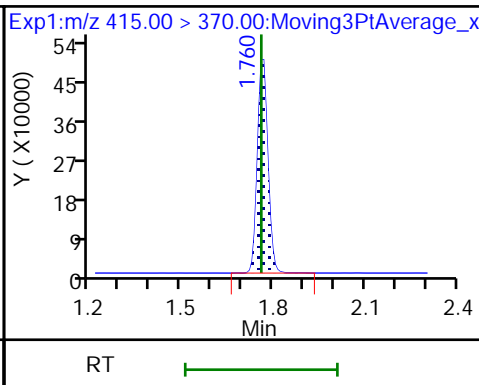
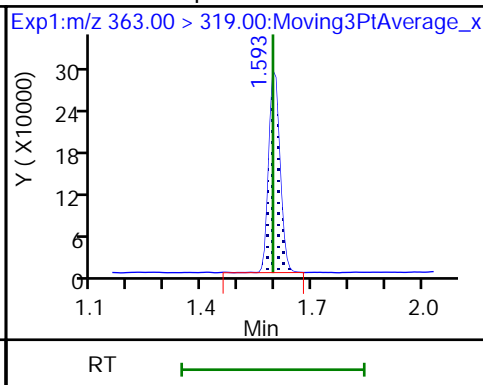
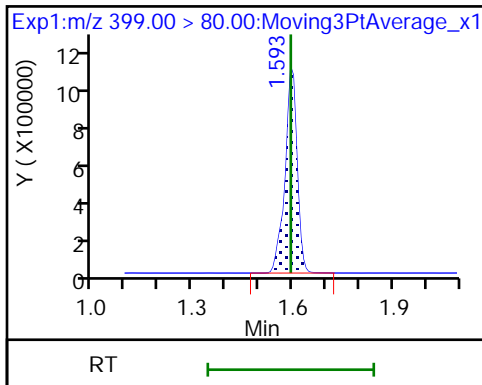
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

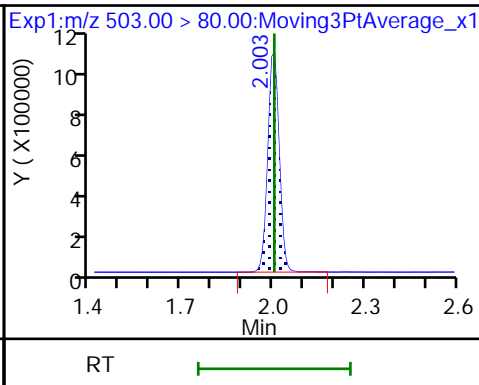
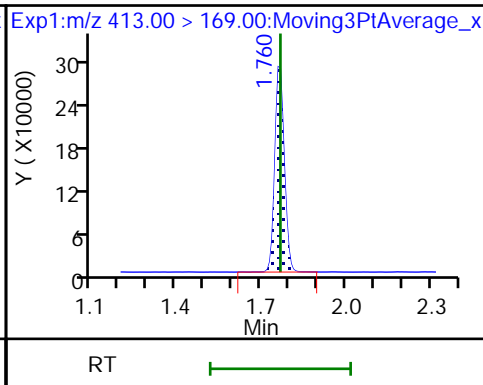
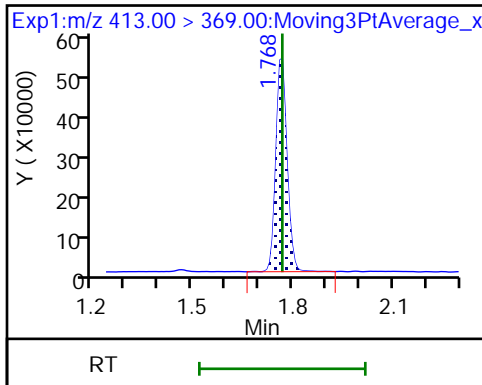
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

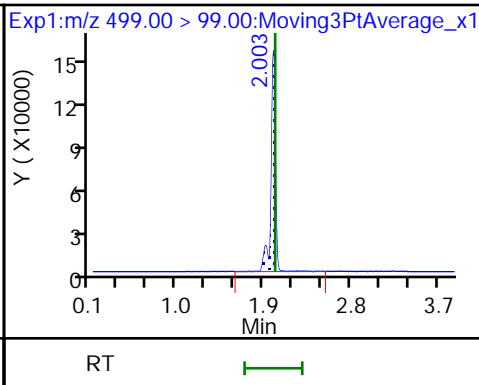
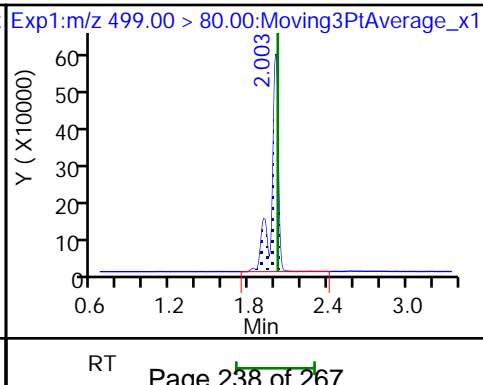
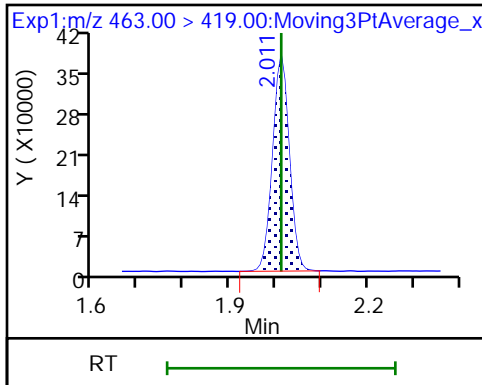
\* 7 13C4 PFOS



9 Perfluorononanoic acid

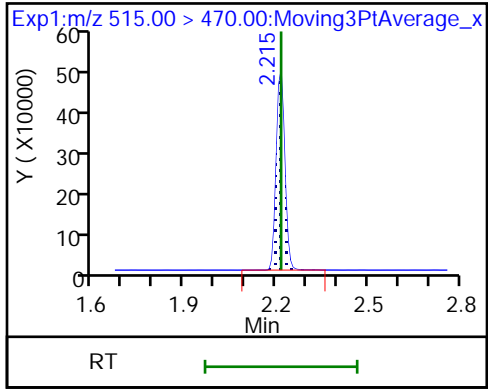
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid





\$ 10 13C2 PFDA



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-238606/21 Calibration Date: 08/08/2018 02:48  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537AAA\_054.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.109		126	135	-6.4	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.067		14.5	14.6	-0.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.770		45.1	45.4	-0.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.048		28.4	29.7	-4.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.118		60.7	59.3	2.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7751		29.2	29.7	-1.7	30.0
13C2 PFHxA	Ave	1.100	1.061		9.65	10.0	-3.5	30.0
13C2 PFDA	Ave	0.8189	0.7920		9.67	10.0	-3.3	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_054.d  
 Lims ID: CCV L5  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 08-Aug-2018 02:48:46 ALS Bottle#: 5 Worklist Smp#: 21  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L5  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:33 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	14002733	126.5		9512	
298.90 > 99.00	1.350	1.350	0.0	1.000	9941209		1.41(0.00-0.00)	9954	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1255917	9.65		10855	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.601	0.0	1.000	7509635	45.1		5839	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.601	0.0	1.000	1842651	14.5		336	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.768	0.0		1184087	10.0		7920	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	3686375	28.4		540	
413.00 > 169.00	1.768	1.768	0.0	1.000	1997581		1.85(0.00-0.00)	4280	
* 7 13C4 PFOS									
503.00 > 80.00	2.003	2.003	0.0		2681112	28.7		3436	
9 Perfluorononanoic acid									
463.00 > 419.00	2.011	2.011	0.0	1.000	2725790	29.2		364	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.003	2.018	-0.015	1.000	6197771	60.7		3971	
499.00 > 99.00	2.003	2.018	-0.015	1.000	1303891		4.75(0.00-0.00)	2474	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.215	0.0	1.000	937822	9.67		7890	

Reagents:

LC537-L5\_00026

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_054.d

Injection Date: 08-Aug-2018 02:48:46

Instrument ID: A8\_N

Lims ID: CCV L5

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 5

Worklist Smp#: 21

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

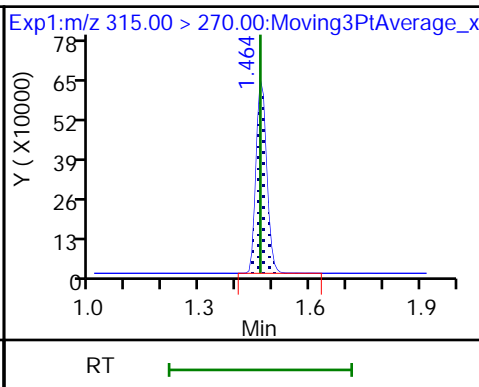
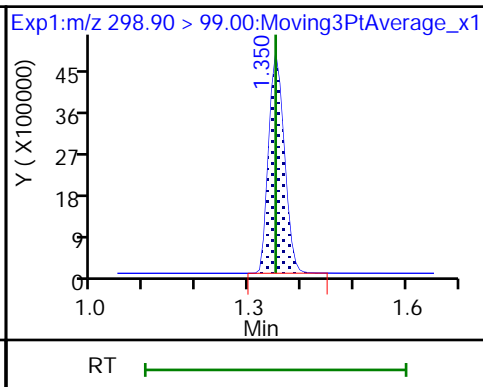
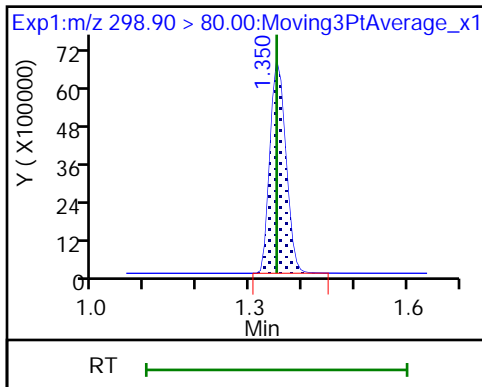
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

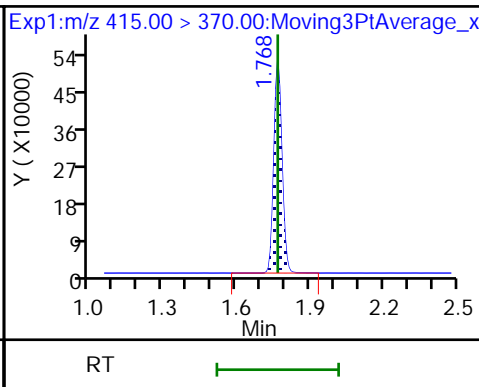
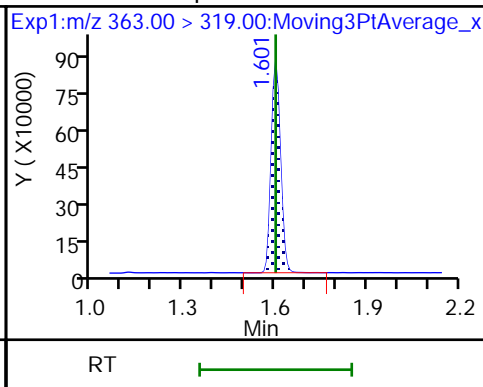
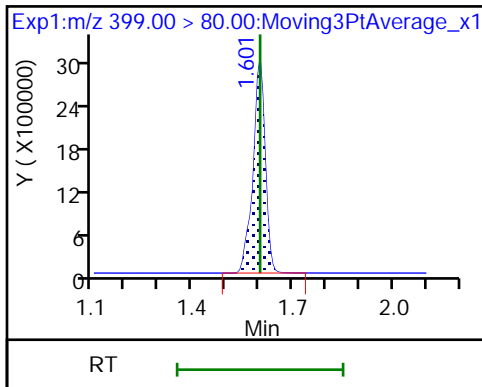
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

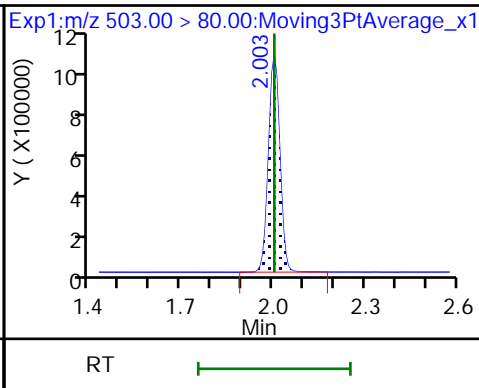
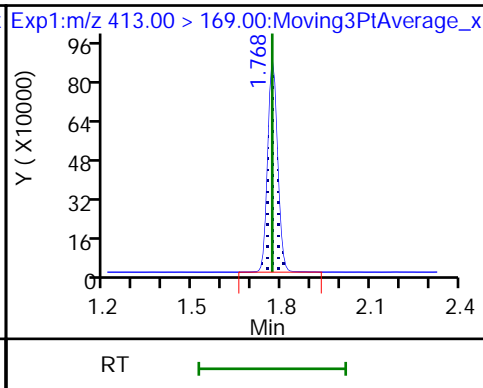
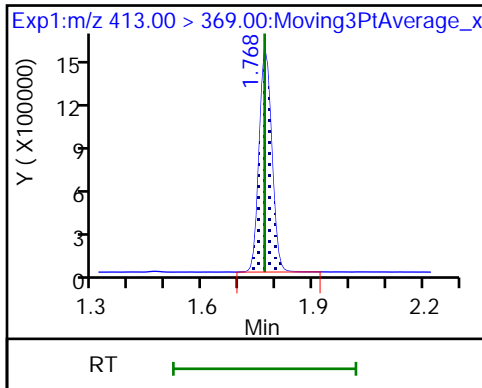
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

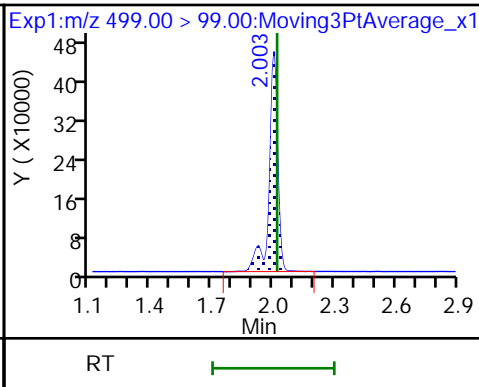
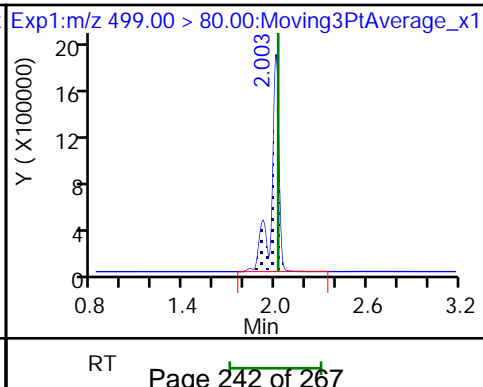
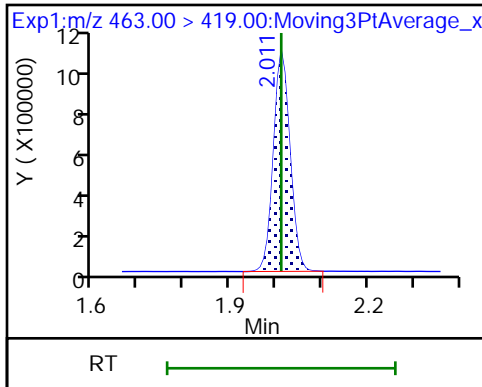
\* 7 13C4 PFOS



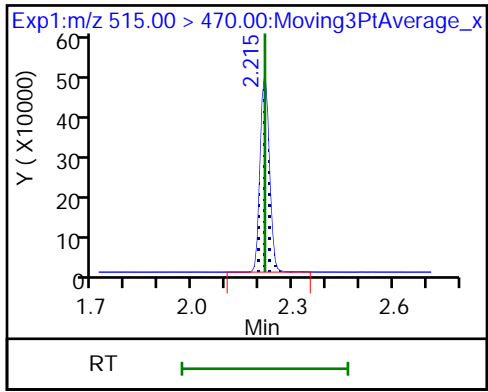
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: MB 320-237816/1-A  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_036.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:23  
 Sample wt/vol: 250 (mL) Date Analyzed: 08/08/2018 01:24  
 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.: 238604 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	106		70-130
STL00996	13C2 PFDA	116		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_036.d  
 Lims ID: MB 320-237816/1-A  
 Client ID:  
 Sample Type: MB  
 Inject. Date: 08-Aug-2018 01:24:37 ALS Bottle#: 23 Worklist Smp#: 3  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: mb 320-237816/1-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:19 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.464	1.464	0.0	1.000	1625045	10.6	13711	
* 6 13C2-PFOA	415.00 > 370.00	1.768	1.768	0.0		1397094	10.0	8241	
* 7 13C4 PFOS	503.00 > 80.00	2.003	2.003	0.0		3083560	28.7	3881	
\$ 10 13C2 PFDA	515.00 > 470.00	2.215	2.215	0.0	1.000	1331764	11.6	10081	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_036.d

Injection Date: 08-Aug-2018 01:24:37

Instrument ID: A8\_N

Lims ID: MB 320-237816/1-A

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 23

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

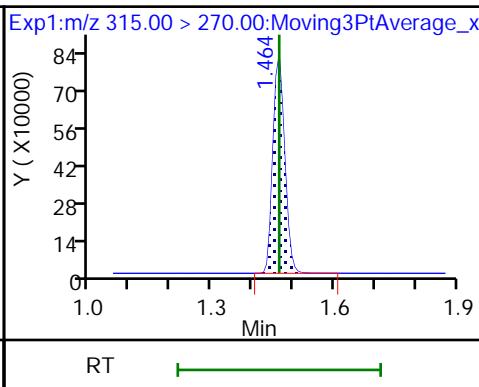
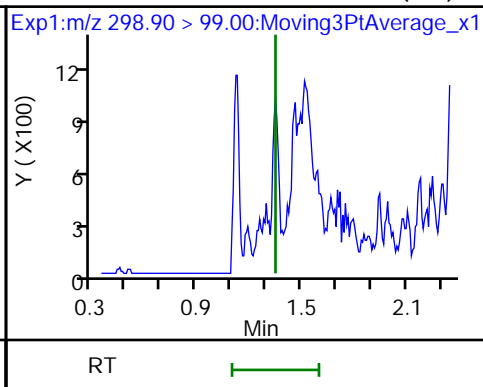
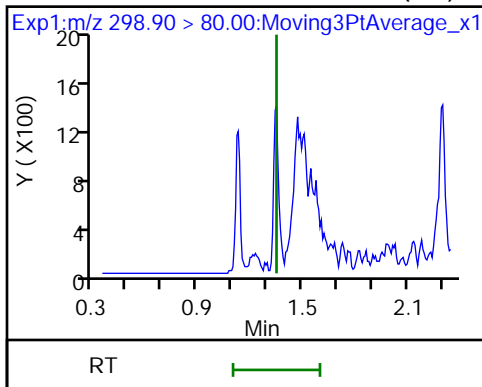
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

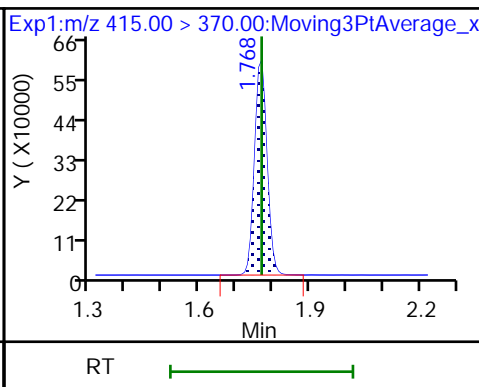
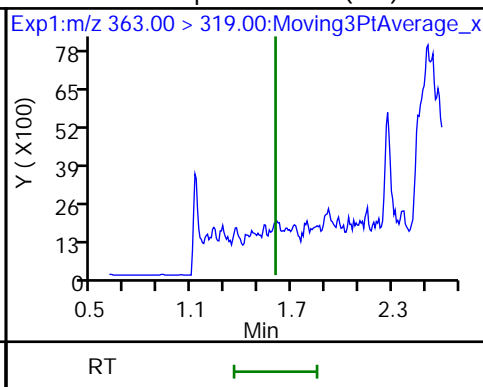
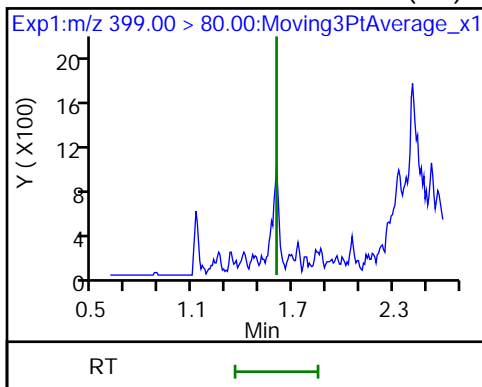
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

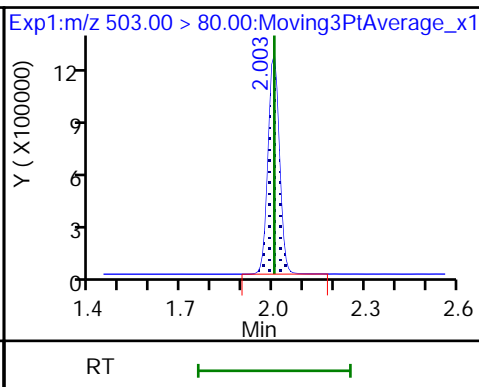
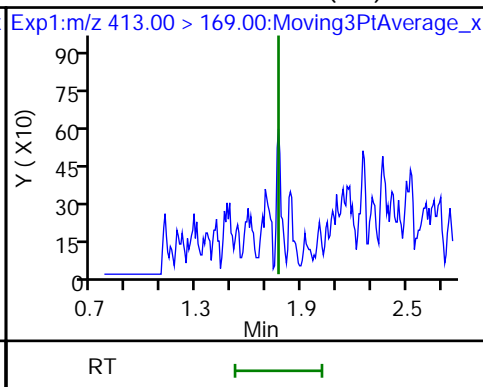
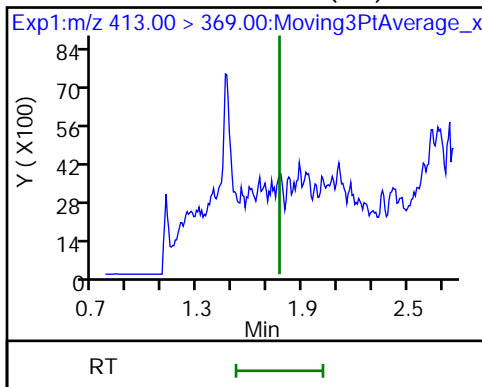
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

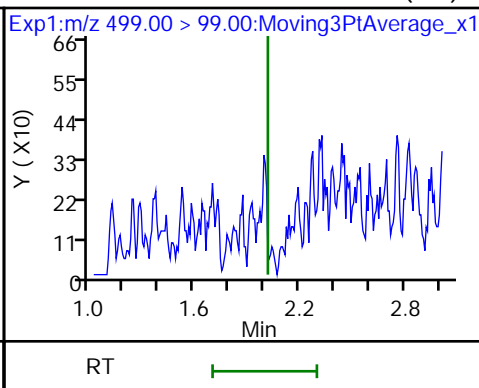
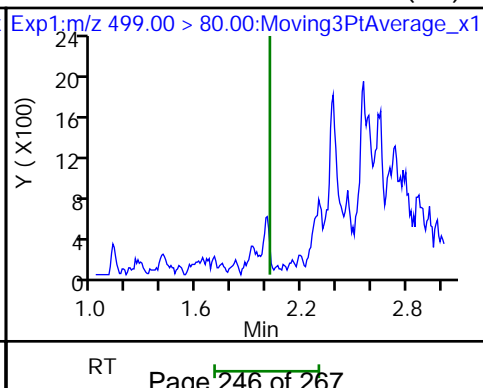
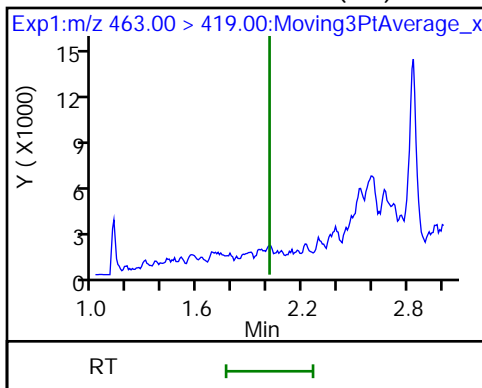
\* 7 13C4 PFOS



9 Perfluorononanoic acid (ND)

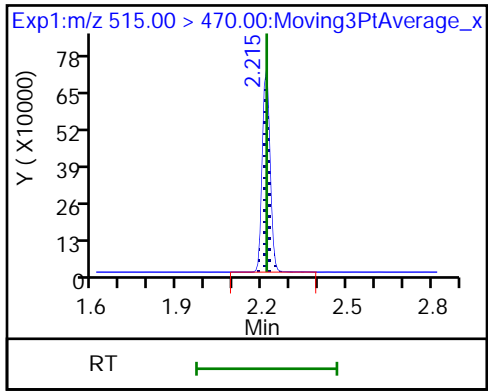
8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)





\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_036.d  
 Lims ID: MB 320-237816/1-A  
 Client ID:  
 Sample Type: MB  
 Inject. Date: 08-Aug-2018 01:24:37 ALS Bottle#: 23 Worklist Smp#: 3  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: mb 320-237816/1-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:19 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.6	105.78
\$ 10 13C2 PFDA	10.0	11.6	116.41

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: LLCS 320-237816/2-A  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_037.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:23  
 Sample wt/vol: 250 (mL) Date Analyzed: 08/08/2018 01:29  
 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.: 238604 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	41.6		40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	18.6	J	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	18.4	J	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	31.4		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	9.50	J	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	102		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	99		70-130
STL00996	13C2 PFDA	111		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_037.d  
 Lims ID: LLCS 320-237816/2-A  
 Client ID:  
 Sample Type: LLCS  
 Inject. Date: 08-Aug-2018 01:29:18 ALS Bottle#: 24 Worklist Smp#: 4  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: llcs 320-237816/2-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:19 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	3035587	25.4		2966	
298.90 > 99.00	1.350	1.350	0.0	1.000	2051121		1.48(0.00-0.00)	2578	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1448823	9.85		11250	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.601	0.0	1.000	1408991	7.84		1278	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.601	0.0	1.000	341525	2.37		68.1	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.768	0.0		1337504	10.0		8508	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	682525	4.66		104	
413.00 > 169.00	1.768	1.768	0.0	1.000	347732		1.96(0.00-0.00)	763	
* 7 13C4 PFOS									
503.00 > 80.00	2.003	2.003	0.0		2889525	28.7		3387	
9 Perfluorononanoic acid									
463.00 > 419.00	2.011	2.011	0.0	1.000	484777	4.60		54.7	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.003	2.018	-0.015	1.000	1144181	10.4		710	
499.00 > 99.00	2.003	2.018	-0.015	1.000	245393		4.66(0.00-0.00)	495	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.215	0.0	1.000	1213195	11.1		9907	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_037.d

Injection Date: 08-Aug-2018 01:29:18

Instrument ID: A8\_N

Lims ID: LLCS 320-237816/2-A

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 24

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

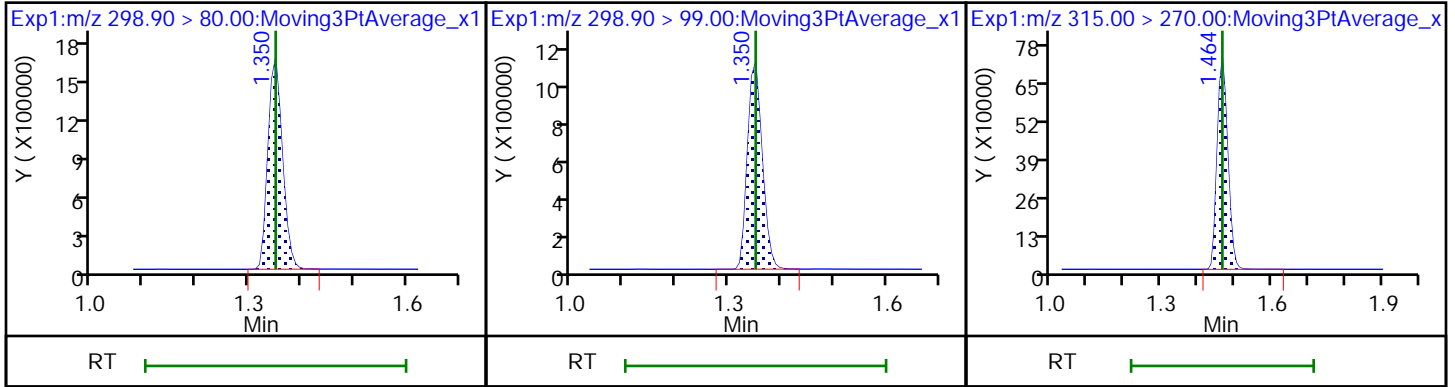
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

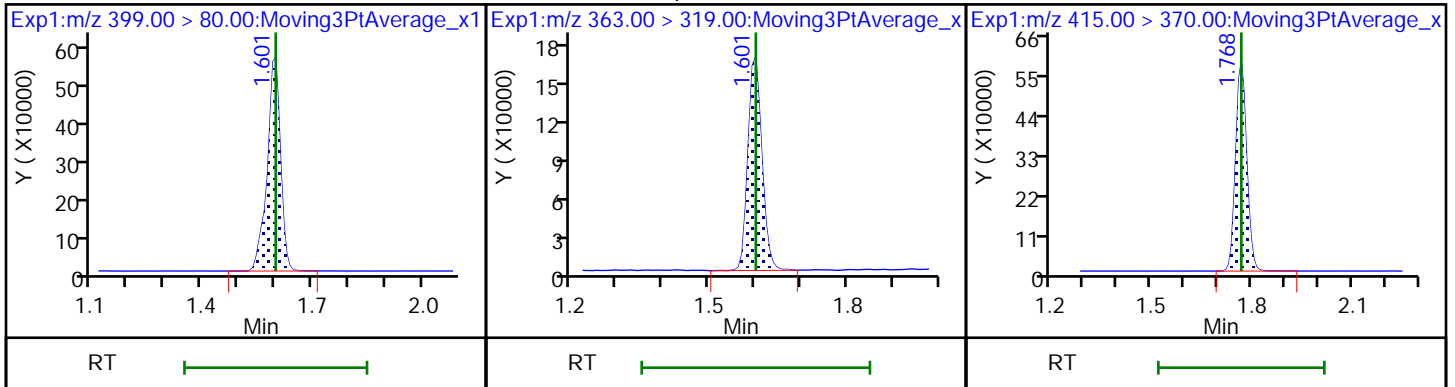
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

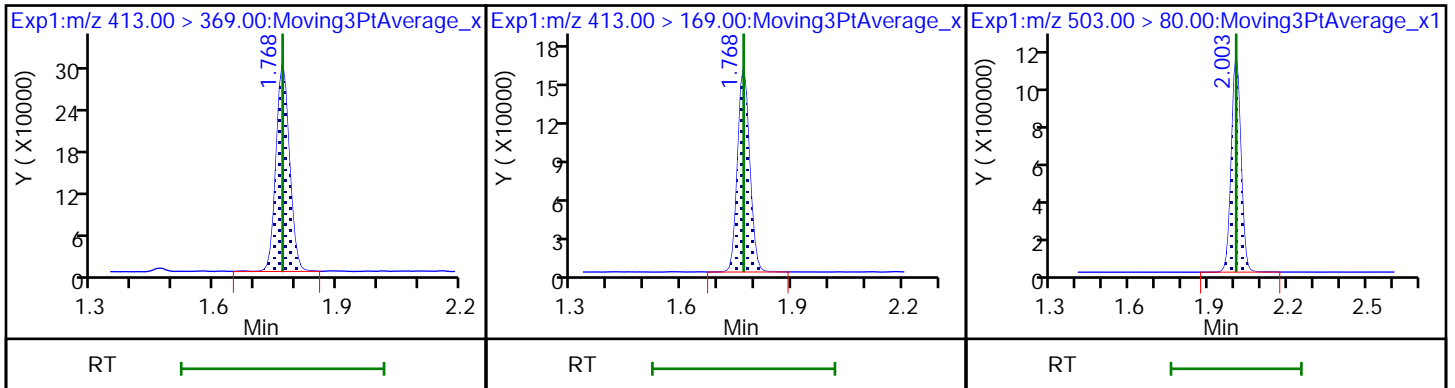
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

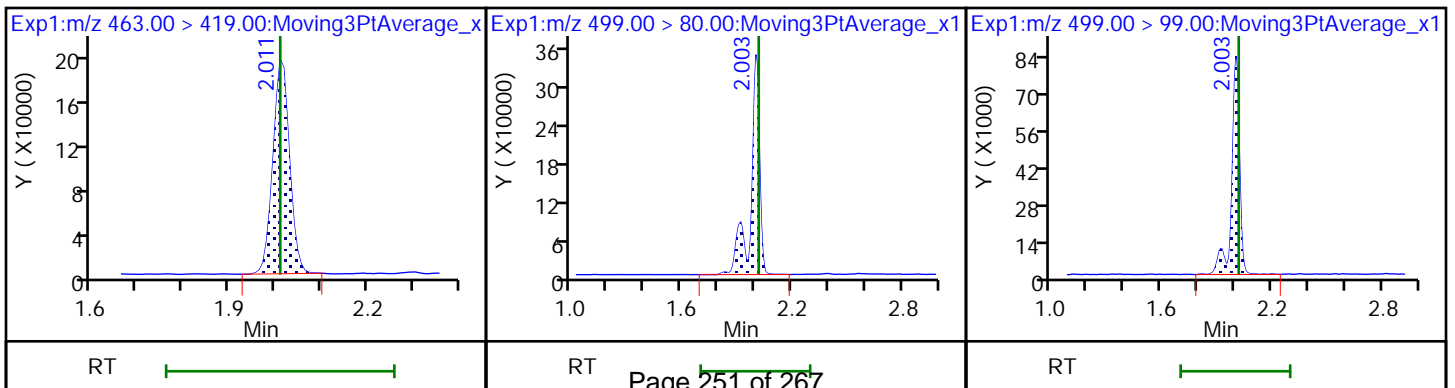
\* 7 13C4 PFOS



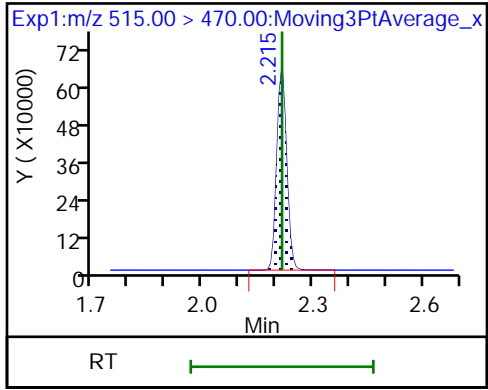
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_037.d  
 Lims ID: LLCS 320-237816/2-A  
 Client ID:  
 Sample Type: LLCS  
 Inject. Date: 08-Aug-2018 01:29:18 ALS Bottle#: 24 Worklist Smp#: 4  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: llcs 320-237816/2-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:19 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.85	98.51
\$ 10 13C2 PFDA	10.0	11.1	110.77

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: LLCSD 320-237816/3-A  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_038.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:23  
 Sample wt/vol: 250 (mL) Date Analyzed: 08/08/2018 01:33  
 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.: 238604 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	39.7	J	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	18.4	J	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	17.7	J	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	30.2		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	9.21	J	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	92.7		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	110		70-130



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_038.d  
 Lims ID: LLCSD 320-237816/3-A  
 Client ID:  
 Sample Type: LLCSD  
 Inject. Date: 08-Aug-2018 01:33:59 ALS Bottle#: 25 Worklist Smp#: 5  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: llcsd 320-237816/3-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:19 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.343	1.350	-0.007	1.000	3011668	23.2		2899	
298.90 > 99.00	1.343	1.350	-0.007	1.000	2028198		1.48(0.00-0.00)	2310	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1528666	9.78		11442	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.601	-0.008	1.000	1478688	7.56		1380	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.593	1.601	-0.008	1.000	352287	2.30		64.3	
* 6 13C2-PFOA									
415.00 > 370.00	1.760	1.768	-0.008		1421765	10.0		7418	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	716478	4.60		109	
413.00 > 169.00	1.768	1.768	0.0	1.000	361418		1.98(0.00-0.00)	742	
* 7 13C4 PFOS									
503.00 > 80.00	2.003	2.003	0.0		3146656	28.7		4015	
9 Perfluorononanoic acid									
463.00 > 419.00	2.011	2.011	0.0	1.000	496737	4.43		62.2	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.003	2.018	-0.015	1.000	1188580	9.92		749	
499.00 > 99.00	2.003	2.018	-0.015	1.000	259340		4.58(0.00-0.00)	520	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.215	0.0	1.000	1276279	11.0		10656	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_038.d

Injection Date: 08-Aug-2018 01:33:59

Instrument ID: A8\_N

Lims ID: LLCSD 320-237816/3-A

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 25

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

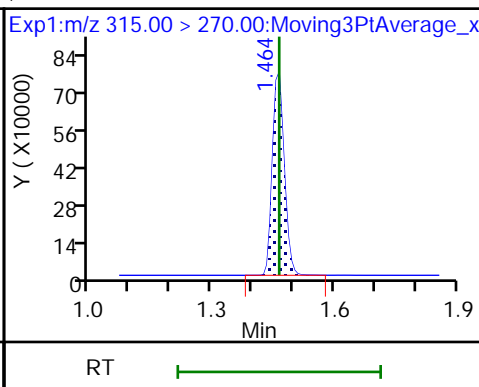
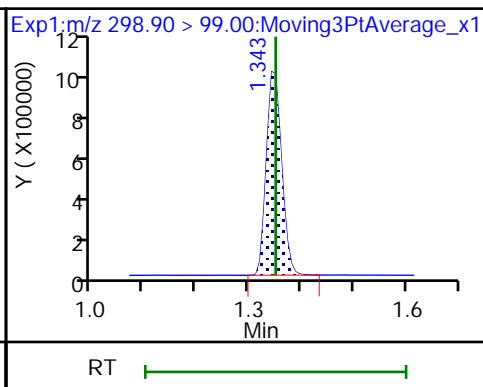
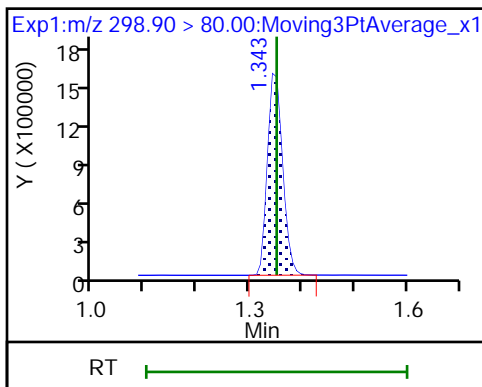
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

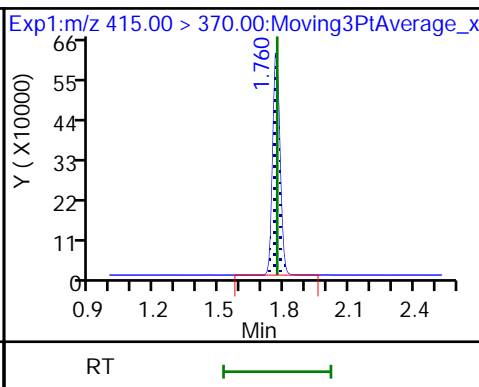
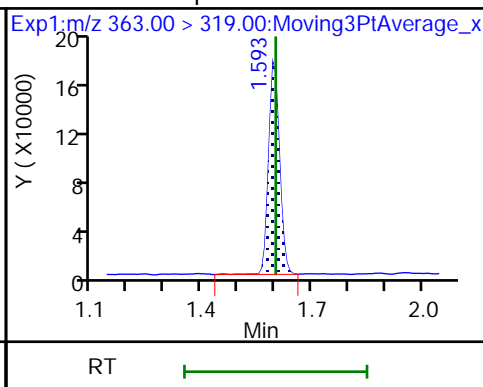
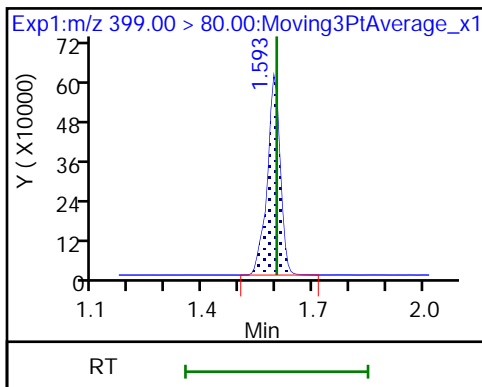
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

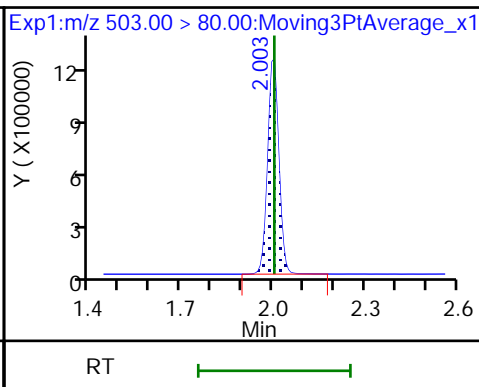
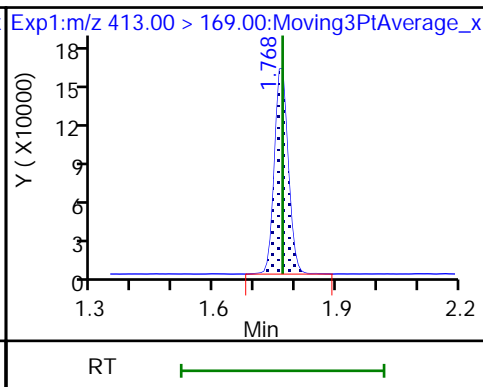
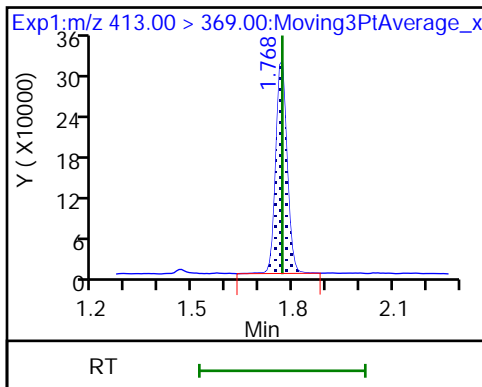
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

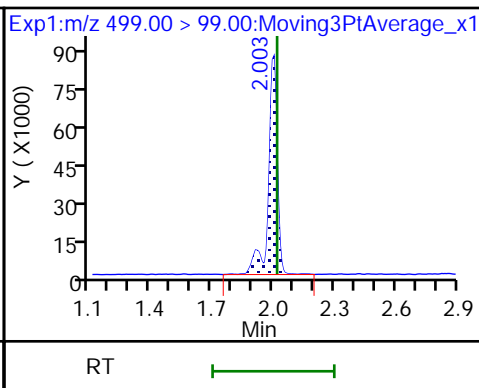
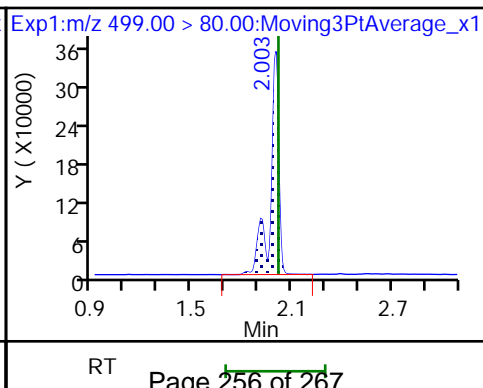
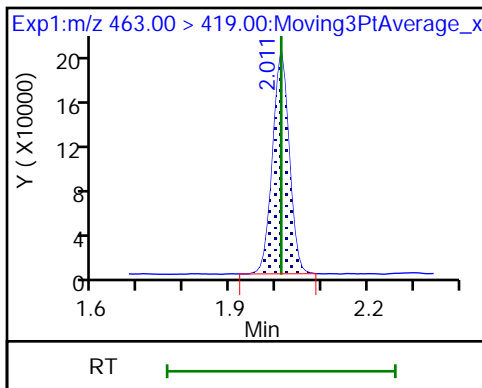
\* 7 13C4 PFOS



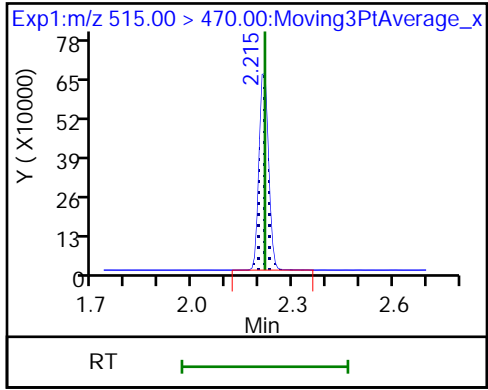
9 Perfluorononanoic acid

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\2018.08.07\_537AAA\_038.d  
 Lims ID: LLCSD 320-237816/3-A  
 Client ID:  
 Sample Type: LLCSD  
 Inject. Date: 08-Aug-2018 01:33:59 ALS Bottle#: 25 Worklist Smp#: 5  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: llcsd 320-237816/3-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62319.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 10:43:19 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1  
 Process Host: XAWRK002

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.78	97.78
\$ 10 13C2 PFDA	10.0	11.0	109.62

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Start Date: 08/07/2018 12:44

Analysis Batch Number: 238469 End Date: 08/07/2018 13:26

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-238469/2		08/07/2018 12:44	1	2018.08.07_537C URVE 003.d	GeminiC18 3x100 3(mm)
IC 320-238469/3		08/07/2018 12:48	1	2018.08.07_537C URVE 004.d	GeminiC18 3x100 3(mm)
IC 320-238469/4		08/07/2018 12:53	1	2018.08.07_537C URVE 005.d	GeminiC18 3x100 3(mm)
IC 320-238469/5 ICISAV		08/07/2018 12:58	1	2018.08.07_537C URVE 006.d	GeminiC18 3x100 3(mm)
IC 320-238469/6		08/07/2018 13:02	1	2018.08.07_537C URVE 007.d	GeminiC18 3x100 3(mm)
IC 320-238469/7		08/07/2018 13:07	1	2018.08.07_537C URVE 008.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/07/2018 13:12	1		GeminiC18 3x100 3(mm)
CCVL 320-238469/9		08/07/2018 13:16	1	2018.08.07_537C URVE 010.d	GeminiC18 3x100 3(mm)
ICB 320-238469/10		08/07/2018 13:21	1		GeminiC18 3x100 3(mm)
ICV 320-238469/11		08/07/2018 13:26	1	2018.08.07_537C URVE 012.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Start Date: 08/08/2018 01:15

Analysis Batch Number: 238604 End Date: 08/08/2018 02:02

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-238604/1 CCVIS		08/08/2018 01:15	1	2018.08.07_537A AA 034.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/08/2018 01:19	1		GeminiC18 3x100 3(mm)
MB 320-237816/1-A		08/08/2018 01:24	1	2018.08.07_537A AA 036.d	GeminiC18 3x100 3(mm)
LLCS 320-237816/2-A		08/08/2018 01:29	1	2018.08.07_537A AA 037.d	GeminiC18 3x100 3(mm)
LLCSD 320-237816/3-A		08/08/2018 01:33	1	2018.08.07_537A AA 038.d	GeminiC18 3x100 3(mm)
320-41647-1		08/08/2018 01:38	1	2018.08.07_537A AA 039.d	GeminiC18 3x100 3(mm)
320-41647-2		08/08/2018 01:43	1	2018.08.07_537A AA 040.d	GeminiC18 3x100 3(mm)
320-41647-3		08/08/2018 01:48	1	2018.08.07_537A AA 041.d	GeminiC18 3x100 3(mm)
320-41647-4		08/08/2018 01:52	1	2018.08.07_537A AA 042.d	GeminiC18 3x100 3(mm)
320-41647-5		08/08/2018 01:57	1	2018.08.07_537A AA 043.d	GeminiC18 3x100 3(mm)
CCV 320-238604/11 CCVIS		08/08/2018 02:02	1	2018.08.07_537A AA 044.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Start Date: 08/08/2018 02:02

Analysis Batch Number: 238606 End Date: 08/08/2018 02:48

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-238606/11 CCVIS		08/08/2018 02:02	1	2018.08.07_537A AA 044.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/08/2018 02:06	1		GeminiC18 3x100 3(mm)
320-41647-6		08/08/2018 02:11	1	2018.08.07_537A AA 046.d	GeminiC18 3x100 3(mm)
320-41647-7		08/08/2018 02:16	1	2018.08.07_537A AA 047.d	GeminiC18 3x100 3(mm)
320-41647-8		08/08/2018 02:20	1	2018.08.07_537A AA 048.d	GeminiC18 3x100 3(mm)
320-41647-9		08/08/2018 02:25	1	2018.08.07_537A AA 049.d	GeminiC18 3x100 3(mm)
320-41647-10		08/08/2018 02:30	1	2018.08.07_537A AA 050.d	GeminiC18 3x100 3(mm)
320-41647-11		08/08/2018 02:34	1	2018.08.07_537A AA 051.d	GeminiC18 3x100 3(mm)
320-41647-12		08/08/2018 02:39	1	2018.08.07_537A AA 052.d	GeminiC18 3x100 3(mm)
320-41647-13		08/08/2018 02:44	1	2018.08.07_537A AA 053.d	GeminiC18 3x100 3(mm)
CCV 320-238606/21 CCVIS		08/08/2018 02:48	1	2018.08.07_537A AA 054.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Batch Number: 237816 Batch Start Date: 08/03/18 10:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 08/04/18 15:55

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00077
MB 320-237816/1		537, 537				250 mL	1.00 mL	7 SU	100 uL
LLCS 320-237816/2		537, 537				250 mL	1.00 mL	7 SU	100 uL
LLCSD 320-237816/3		537, 537				250 mL	1.00 mL	7 SU	100 uL
320-41647-A-1	NAWC-073018-RW-055	537, 537	T	313.72 g	29.03 g	284.7 mL	1.00 mL	7 SU	100 uL
320-41647-A-2	NAWC-073018-FRB-055	537, 537	T	313.17 g	28.28 g	284.9 mL	1.00 mL	7 SU	100 uL
320-41647-A-3	WGNA-073018-RW-4851	537, 537	T	305.27 g	28.37 g	276.9 mL	1.00 mL	7 SU	100 uL
320-41647-A-4	WGNA-073018-FRB-4851	537, 537	T	308.75 g	27.98 g	280.8 mL	1.00 mL	7 SU	100 uL
320-41647-A-5	WGNA-073018-RW-3604	537, 537	T	300.93 g	28.38 g	272.6 mL	1.00 mL	7 SU	100 uL
320-41647-A-6	WGNA-073018-FRB-3604	537, 537	T	295.82 g	29.83 g	266 mL	1.00 mL	7 SU	100 uL
320-41647-A-7	WGNA-073018-RW-3529	537, 537	T	294.89 g	28.18 g	266.7 mL	1.00 mL	7 SU	100 uL
320-41647-A-8	WGNA-073018-FRB-500	537, 537	T	300.32 g	28.23 g	272.1 mL	1.00 mL	7 SU	100 uL
320-41647-A-9	WGNA-073018-RW-0500	537, 537	T	312.31 g	28.38 g	283.9 mL	1.00 mL	7 SU	100 uL
320-41647-A-10	WGNA-073018-FRB-957	537, 537	T	315.37 g	28.15 g	287.2 mL	1.00 mL	7 SU	100 uL
320-41647-A-11	WGNA-073018-RW-3957	537, 537	T	283.34 g	28.97 g	254.4 mL	1.00 mL	7 SU	100 uL
320-41647-A-12	WGNA-073018-FRB-42	537, 537	T	308.39 g	28.53 g	279.9 mL	1.00 mL	7 SU	100 uL
320-41647-A-13	WGNA-073018-DUP-42	537, 537	T	281.36 g	28.13 g	253.2 mL	1.00 mL	7 SU	100 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-LSP 00032	LC537-SU 00075	AnalysisComment			
MB 320-237816/1		537, 537			100 uL	C1 ND			
LLCS 320-237816/2		537, 537		100 uL	100 uL	C1 ND			
LLCSD 320-237816/3		537, 537		100 uL	100 uL	C1 ND			
320-41647-A-1	NAWC-073018-RW-055	537, 537	T		100 uL	C1 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.: 320-41647-1

SDG No.: \_\_\_\_\_

Batch Number: 237816 Batch Start Date: 08/03/18 10:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 08/04/18 15:55

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-LSP 00032	LC537-SU 00075	AnalysisComment			
320-41647-A-2	NAWC-073018-FRB-055	537, 537	T		100 uL	C1 ND			
320-41647-A-3	WGNA-073018-RW-4851	537, 537	T		100 uL	C1 ND			
320-41647-A-4	WGNA-073018-FRB-4851	537, 537	T		100 uL	C1 ND			
320-41647-A-5	WGNA-073018-RW-3604	537, 537	T		100 uL	C1 ND			
320-41647-A-6	WGNA-073018-FRB-3604	537, 537	T		100 uL	C1 ND			
320-41647-A-7	WGNA-073018-RW-3529	537, 537	T		100 uL	C1 ND			
320-41647-A-8	WGNA-073018-FRB-3529	537, 537	T		100 uL	C1 ND			
320-41647-A-9	WGNA-073018-RW-0500	537, 537	T		100 uL	C1 ND			
320-41647-A-10	WGNA-073018-FRB-0500	537, 537	T		100 uL	C1 ND			
320-41647-A-11	WGNA-073018-RW-3957	537, 537	T		100 uL	C1 ND			
320-41647-A-12	WGNA-073018-FRB-3957	537, 537	T		100 uL	C1 ND			
320-41647-A-13	WGNA-073018-DUP-42	537, 537	T		100 uL	C1 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.: 320-41647-1

SDG No.: \_\_\_\_\_

Batch Number: 237816 Batch Start Date: 08/03/18 10:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 08/04/18 15:55

Batch Notes	
Analyst ID - Aliquot Step	SKD
Batch Comment	Client labels match TA label, KMK
Analyst ID - Concentration	SKD
Analyst ID - Final Volume Step	SKD
Internal Standard ID#	1303558
Manifold ID	E, H
Methanol ID	1313683
pH Indicator ID	0818
Pipette ID	R40536G, I46162G
Analyst ID - IS Reagent Drop	SKD
Analyst ID - IS Reagent Drop Witness	SR
Analyst ID - SU Reagent Drop	KMK
Analyst ID - SU Reagent Drop Witness	SKD
Analyst ID - TA Reagent Drop	KMK
Analyst ID - TA Reagent Drop Witness	SKD
SPE Cartridge Lot ID	6390138-02
Trizma ID	SLBR5241V
Reagent Water ID	8/2/18

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

# Shipping and Receiving Documents

**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.**

**Client Contact**  
 TetraTech  
 234 Mall Boulevard Suite 260  
 King of Prussia, PA 19406  
 610-382-1174  
 610-491-9688  
 Project Name: WE04  
 Site: WE04  
 P O # 1132358 (through EarthToxics)

**Regulatory Program:**  DW  NPDES  RCRA  Other:  
 Project Manager: Andy Frebowilz  
 Tel/Fax: 610.382.1170

**Site Contact:** Mary Kay Bond  
**Lab Contact:** Dave Alltucker  
 Date: 7/30/2018  
 Carrier: FedEx

**Analysis Turnaround Time**  
 CALENDAR DAYS  WORKING DAYS  
 TAT if different from Below 21  
 2 weeks  
 1 week  
 2 days  
 1 day

**Sample Identification**

Sample Identification	Sample Date	Sample Time	Sample Type (C-Comp, G-Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)
NAWC-073018-RW-055	7/30/2018	10:10	G	DW	2	N	Y
NAWC-073018-FRB-055	7/30/2018	10:05	G	DW	2	N	Y
WGNA-073018-RW-4851	7/30/2018	11:10	G	DW	2	N	Y
WGNA-073018-FRB-4851	7/30/2018	11:05	G	DW	2	N	Y
WGNA-073018-RW-3604	7/30/2018	11:40	G	DW	2	N	Y
WGNA-073018-FRB-3604	7/30/2018	11:35	G	DW	2	N	Y
WGNA-073018-RW-3529	7/30/2018	15:10	G	DW	2	N	Y
WGNA-073018-FRB-3529	7/30/2018	15:05	G	DW	2	N	Y
WGNA-073018-RW-0500	7/30/2018	15:40	G	DW	2	N	Y
WGNA-073018-FRB-0500	7/30/2018	15:35	G	DW	2	N	Y
WGNA-073018-RW-3957	7/30/2018	16:40	G	DW	2	N	Y
WGNA-073018-FRB-3957	7/30/2018	16:35	G	DW	2	N	Y
WGNA-073018-DUP-42	7/30/2018	07:00	G	DW	2	N	Y

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

**Possible Hazard Identification:**  
 Comments Section if the lab is to dispose of the sample.  
 Non-Hazard  Flammable  Skin Irritant  
 Fed Ex Tracking

**Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)**  
 Return to Client  Disposal by Lab  Archive for Months

**Barcode:** 320-41647 Chain of Custody

**Sample Specific Notes:**  
 Field Reagent Blank  
 Field Reagent Blank  
 Field Reagent Blank  
 Field Reagent Blank  
 Field Reagent Blank  
 Field Reagent Blank  
 Field Reagent Blank  
 Duplicate

**Sampler:** Mary Kay Bond  
**For Lab Use Only:**  
**Walk-in Client:**  
**Lab Sampling:**  
**Job / SDG No.:**

**COC No:** 1 of 1 COCs

**Chain of Custody:**  
 Custody Seal No.: See #2  
 Company: Tetra Tech  
 Date/Time: 7/30/2018 18:00  
 Relinquished by: Mary Kay Bond  
 Relinquished by: Tetra Tech  
 Date/Time: 7/30/2018 18:00  
 Relinquished by: Tetra Tech  
 Date/Time: 7/30/2018 18:00  
 Relinquished by: Tetra Tech  
 Date/Time: 7/30/2018 18:00

**Therm ID No.:** AK-2  
**Cooler Temp. (°C):** 14.9  
**Obs'd:** 1.4  
**Company:** Tetra Tech  
**Date/Time:** 31 July 18 09:08

# Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-41647-1

**Login Number: 41647**  
**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	seals
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-073018-RW-055","537","RES","320-41647-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","8.2","ng/L","J","6.0","DL","","TRG","","","35","LOQ","YES","-99","","284.7","1.00","14",""  
"NAWC-073018-RW-055","537","RES","320-41647-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","9.8","ng/L","J","2.5","DL","","TRG","","","18","LOQ","YES","-99","","284.7","1.00","7.0",""  
"NAWC-073018-RW-055","537","RES","320-41647-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","11","ng/L","U","4.8","DL","","TRG","","","26","LOQ","YES","-99","","284.7","1.00","11",""  
"NAWC-073018-RW-055","537","RES","320-41647-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","32","ng/L","U","14","DL","","TRG","","","79","LOQ","YES","-99","","284.7","1.00","32",""  
"NAWC-073018-RW-055","537","RES","320-41647-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","4.8","ng/L","J","1.7","DL","","TRG","","","8.8","LOQ","YES","-99","","284.7","1.00","3.5",""  
"NAWC-073018-RW-055","537","RES","320-41647-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","18","ng/L","U M","7.0","DL","","TRG","","","21","LOQ","YES","-99","","284.7","1.00","18",""  
"NAWC-073018-RW-055","537","RES","320-41647-1","TALSAC","STL00993","13C2  
PFHxA","34","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","35.1","","284.7","1.00","0",""  
"NAWC-073018-RW-055","537","RES","320-41647-1","TALSAC","STL00996","13C2  
PFDA","38","ng/L","","-99","DL","","SURR","108","","-99","LOQ","YES","35.1","","284.7","1.00","0",""  
"WGNA-073018-FRB-0500","537","RES","320-41647-10","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","14","ng/L","U","5.9","DL","","TRG","","","35","LOQ","YES","-99","","287.2","1.00","14",""  
"WGNA-073018-FRB-0500","537","RES","320-41647-10","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.0","ng/L","U","2.4","DL","","TRG","","","17","LOQ","YES","-99","","287.2","1.00","7.0",""  
"WGNA-073018-FRB-0500","537","RES","320-41647-10","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","10","ng/L","U","4.8","DL","","TRG","","","26","LOQ","YES","-99","","287.2","1.00","10",""  
"WGNA-073018-FRB-0500","537","RES","320-41647-10","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","31","ng/L","U","14","DL","","TRG","","","78","LOQ","YES","-99","","287.2","1.00","31",""  
"WGNA-073018-FRB-0500","537","RES","320-41647-10","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.5","ng/L","U","1.7","DL","","TRG","","","8.7","LOQ","YES","-99","","287.2","1.00","3.5",""  
"WGNA-073018-FRB-0500","537","RES","320-41647-10","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","17","ng/L","U","7.0","DL","","TRG","","","21","LOQ","YES","-99","","287.2","1.00","17",""  
"WGNA-073018-FRB-0500","537","RES","320-41647-10","TALSAC","STL00993","13C2  
PFHxA","35","ng/L","","-99","DL","","SURR","102","","-99","LOQ","YES","34.8","","287.2","1.00","0",""  
"WGNA-073018-FRB-0500","537","RES","320-41647-10","TALSAC","STL00996","13C2  
PFDA","36","ng/L","","-99","DL","","SURR","104","","-99","LOQ","YES","34.8","","287.2","1.00","0",""  
"WGNA-073018-RW-3957","537","RES","320-41647-11","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","11","ng/L","J","6.7","DL","","TRG","","","39","LOQ","YES","-99","","254.4","1.00","16",""  
"WGNA-073018-RW-3957","537","RES","320-41647-11","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","12","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","254.4","1.00","7.9",""  
"WGNA-073018-RW-3957","537","RES","320-41647-11","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","6.6","ng/L","J","5.4","DL","","TRG","","","29","LOQ","YES","-99","","254.4","1.00","12",""  
"WGNA-073018-RW-3957","537","RES","320-41647-11","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35","ng/L","U","16","DL","","TRG","","","88","LOQ","YES","-99","","254.4","1.00","35",""  
"WGNA-073018-RW-3957","537","RES","320-41647-11","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","4.1","ng/L","J","1.9","DL","","TRG","","","9.8","LOQ","YES","-99","","254.4","1.00","3.9",""  
"WGNA-073018-RW-3957","537","RES","320-41647-11","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","7.9","DL","","TRG","","","24","LOQ","YES","-99","","254.4","1.00","20",""  
"WGNA-073018-RW-3957","537","RES","320-41647-11","TALSAC","STL00993","13C2  
PFHxA","38","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","39.3","","254.4","1.00","0",""  
"WGNA-073018-RW-3957","537","RES","320-41647-11","TALSAC","STL00996","13C2  
PFDA","41","ng/L","","-99","DL","","SURR","104","","-99","LOQ","YES","39.3","","254.4","1.00","0",""  
"WGNA-073018-FRB-3957","537","RES","320-41647-12","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","14","ng/L","U","6.1","DL","","TRG","","","36","LOQ","YES","-99","","279.9","1.00","14",""  
"WGNA-073018-FRB-3957","537","RES","320-41647-12","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.1","ng/L","U","2.5","DL","","TRG","","","18","LOQ","YES","-99","","279.9","1.00","7.1",""  
"WGNA-073018-FRB-3957","537","RES","320-41647-12","TALSAC","355-46-4","Perfluorohexanesulfonic acid

(PFHxS),"11","ng/L","U","4.9","DL","","TRG","","","27","LOQ","YES",-99,,,,,"279.9","1.00","11", ""  
"WGNA-073018-FRB-3957","537","RES","320-41647-12","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS),"32","ng/L","U","14","DL","","TRG","","","80","LOQ","YES",-99,,,,,"279.9","1.00","32", ""  
"WGNA-073018-FRB-3957","537","RES","320-41647-12","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA),"3.6","ng/L","U","1.7","DL","","TRG","","","8.9","LOQ","YES",-99,,,,,"279.9","1.00","3.6", ""  
"WGNA-073018-FRB-3957","537","RES","320-41647-12","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA),"18","ng/L","U","7.1","DL","","TRG","","","21","LOQ","YES",-99,,,,,"279.9","1.00","18", ""  
"WGNA-073018-FRB-3957","537","RES","320-41647-12","TALSAC","STL00993","13C2  
PFHxA","36","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","35.7","","279.9","1.00","0", ""  
"WGNA-073018-FRB-3957","537","RES","320-41647-12","TALSAC","STL00996","13C2  
PFDA","36","ng/L","","-99","DL","","SURR","101","","-99","LOQ","YES","35.7","","279.9","1.00","0", ""  
"WGNA-073018-DUP-42","537","RES","320-41647-13","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS),"12","ng/L","J","6.7","DL","","TRG","","","39","LOQ","YES",-99,,,,,"253.2","1.00","16", ""  
"WGNA-073018-DUP-42","537","RES","320-41647-13","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA),"13","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES",-99,,,,,"253.2","1.00","7.9", ""  
"WGNA-073018-DUP-42","537","RES","320-41647-13","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS),"6.8","ng/L","J","5.4","DL","","TRG","","","30","LOQ","YES",-99,,,,,"253.2","1.00","12", ""  
"WGNA-073018-DUP-42","537","RES","320-41647-13","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS),"36","ng/L","U","16","DL","","TRG","","","89","LOQ","YES",-99,,,,,"253.2","1.00","36", ""  
"WGNA-073018-DUP-42","537","RES","320-41647-13","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA),"4.5","ng/L","J","1.9","DL","","TRG","","","9.9","LOQ","YES",-99,,,,,"253.2","1.00","3.9", ""  
"WGNA-073018-DUP-42","537","RES","320-41647-13","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA),"20","ng/L","U","7.9","DL","","TRG","","","24","LOQ","YES",-99,,,,,"253.2","1.00","20", ""  
"WGNA-073018-DUP-42","537","RES","320-41647-13","TALSAC","STL00993","13C2  
PFHxA","40","ng/L","","-99","DL","","SURR","101","","-99","LOQ","YES","39.5","","253.2","1.00","0", ""  
"WGNA-073018-DUP-42","537","RES","320-41647-13","TALSAC","STL00996","13C2  
PFDA","45","ng/L","","-99","DL","","SURR","114","","-99","LOQ","YES","39.5","","253.2","1.00","0", ""  
"NAWC-073018-FRB-055","537","RES","320-41647-2","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS),"14","ng/L","U","6.0","DL","","TRG","","","35","LOQ","YES",-99,,,,,"284.9","1.00","14", ""  
"NAWC-073018-FRB-055","537","RES","320-41647-2","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA),"7.0","ng/L","U","2.5","DL","","TRG","","","18","LOQ","YES",-99,,,,,"284.9","1.00","7.0", ""  
"NAWC-073018-FRB-055","537","RES","320-41647-2","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS),"11","ng/L","U","4.8","DL","","TRG","","","26","LOQ","YES",-99,,,,,"284.9","1.00","11", ""  
"NAWC-073018-FRB-055","537","RES","320-41647-2","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS),"32","ng/L","U","14","DL","","TRG","","","79","LOQ","YES",-99,,,,,"284.9","1.00","32", ""  
"NAWC-073018-FRB-055","537","RES","320-41647-2","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA),"3.5","ng/L","U","1.7","DL","","TRG","","","8.8","LOQ","YES",-99,,,,,"284.9","1.00","3.5", ""  
"NAWC-073018-FRB-055","537","RES","320-41647-2","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA),"18","ng/L","U","7.0","DL","","TRG","","","21","LOQ","YES",-99,,,,,"284.9","1.00","18", ""  
"NAWC-073018-FRB-055","537","RES","320-41647-2","TALSAC","STL00993","13C2  
PFHxA","34","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","35.1","","284.9","1.00","0", ""  
"NAWC-073018-FRB-055","537","RES","320-41647-2","TALSAC","STL00996","13C2  
PFDA","36","ng/L","","-99","DL","","SURR","101","","-99","LOQ","YES","35.1","","284.9","1.00","0", ""  
"WGNA-073018-RW-4851","537","RES","320-41647-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS),"14","ng/L","U","6.1","DL","","TRG","","","36","LOQ","YES",-99,,,,,"276.9","1.00","14", ""  
"WGNA-073018-RW-4851","537","RES","320-41647-3","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA),"6.1","ng/L","J","2.5","DL","","TRG","","","18","LOQ","YES",-99,,,,,"276.9","1.00","7.2", ""  
"WGNA-073018-RW-4851","537","RES","320-41647-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS),"11","ng/L","U M","5.0","DL","","TRG","","","27","LOQ","YES",-99,,,,,"276.9","1.00","11", ""  
"WGNA-073018-RW-4851","537","RES","320-41647-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS),"33","ng/L","U","15","DL","","TRG","","","81","LOQ","YES",-99,,,,,"276.9","1.00","33", ""  
"WGNA-073018-RW-4851","537","RES","320-41647-3","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA),"2.1","ng/L","J M","1.7","DL","","TRG","","","9.0","LOQ","YES",-99,,,,,"276.9","1.00","3.6", ""  
"WGNA-073018-RW-4851","537","RES","320-41647-3","TALSAC","375-95-1","Perfluorononanoic acid

(PFNA),"18","ng/L","U","7.2","DL","","TRG","","","22","LOQ","YES",-99","","276.9","1.00","18","","  
"WGNA-073018-RW-4851","537","RES","320-41647-3","TALSAC","STL00993","13C2  
PFHxA","35","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","36.1","","276.9","1.00","0","","  
"WGNA-073018-RW-4851","537","RES","320-41647-3","TALSAC","STL00996","13C2  
PFDA","39","ng/L","","-99","DL","","SURR","109","","-99","LOQ","YES","36.1","","276.9","1.00","0","","  
"WGNA-073018-FRB-4851","537","RES","320-41647-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS)","14","ng/L","U","6.1","DL","","TRG","","","36","LOQ","YES",-99","","280.8","1.00","14","","  
"WGNA-073018-FRB-4851","537","RES","320-41647-4","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","7.1","ng/L","U","2.5","DL","","TRG","","","18","LOQ","YES",-99","","280.8","1.00","7.1","","  
"WGNA-073018-FRB-4851","537","RES","320-41647-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","11","ng/L","U","4.9","DL","","TRG","","","27","LOQ","YES",-99","","280.8","1.00","11","","  
"WGNA-073018-FRB-4851","537","RES","320-41647-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","32","ng/L","U","14","DL","","TRG","","","80","LOQ","YES",-99","","280.8","1.00","32","","  
"WGNA-073018-FRB-4851","537","RES","320-41647-4","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","3.6","ng/L","U","1.7","DL","","TRG","","","8.9","LOQ","YES",-99","","280.8","1.00","3.6","","  
"WGNA-073018-FRB-4851","537","RES","320-41647-4","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","18","ng/L","U","7.1","DL","","TRG","","","21","LOQ","YES",-99","","280.8","1.00","18","","  
"WGNA-073018-FRB-4851","537","RES","320-41647-4","TALSAC","STL00993","13C2  
PFHxA","35","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","35.6","","280.8","1.00","0","","  
"WGNA-073018-FRB-4851","537","RES","320-41647-4","TALSAC","STL00996","13C2  
PFDA","37","ng/L","","-99","DL","","SURR","104","","-99","LOQ","YES","35.6","","280.8","1.00","0","","  
"WGNA-073018-RW-3604","537","RES","320-41647-5","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS)","10","ng/L","J","6.2","DL","","TRG","","","37","LOQ","YES",-99","","272.6","1.00","15","","  
"WGNA-073018-RW-3604","537","RES","320-41647-5","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","10","ng/L","J","2.6","DL","","TRG","","","18","LOQ","YES",-99","","272.6","1.00","7.3","","  
"WGNA-073018-RW-3604","537","RES","320-41647-5","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","11","ng/L","U","5.0","DL","","TRG","","","28","LOQ","YES",-99","","272.6","1.00","11","","  
"WGNA-073018-RW-3604","537","RES","320-41647-5","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","33","ng/L","U","15","DL","","TRG","","","83","LOQ","YES",-99","","272.6","1.00","33","","  
"WGNA-073018-RW-3604","537","RES","320-41647-5","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","4.2","ng/L","J","1.7","DL","","TRG","","","9.2","LOQ","YES",-99","","272.6","1.00","3.7","","  
"WGNA-073018-RW-3604","537","RES","320-41647-5","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","18","ng/L","U","7.3","DL","","TRG","","","22","LOQ","YES",-99","","272.6","1.00","18","","  
"WGNA-073018-RW-3604","537","RES","320-41647-5","TALSAC","STL00993","13C2  
PFHxA","29","ng/L","","-99","DL","","SURR","78","","-99","LOQ","YES","36.7","","272.6","1.00","0","","  
"WGNA-073018-RW-3604","537","RES","320-41647-5","TALSAC","STL00996","13C2  
PFDA","40","ng/L","","-99","DL","","SURR","108","","-99","LOQ","YES","36.7","","272.6","1.00","0","","  
"WGNA-073018-FRB-3604","537","RES","320-41647-6","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS)","15","ng/L","U","6.4","DL","","TRG","","","38","LOQ","YES",-99","","266","1.00","15","","  
"WGNA-073018-FRB-3604","537","RES","320-41647-6","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","7.5","ng/L","U","2.6","DL","","TRG","","","19","LOQ","YES",-99","","266","1.00","7.5","","  
"WGNA-073018-FRB-3604","537","RES","320-41647-6","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","11","ng/L","U","5.2","DL","","TRG","","","28","LOQ","YES",-99","","266","1.00","11","","  
"WGNA-073018-FRB-3604","537","RES","320-41647-6","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","34","ng/L","U","15","DL","","TRG","","","85","LOQ","YES",-99","","266","1.00","34","","  
"WGNA-073018-FRB-3604","537","RES","320-41647-6","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","3.8","ng/L","U","1.8","DL","","TRG","","","9.4","LOQ","YES",-99","","266","1.00","3.8","","  
"WGNA-073018-FRB-3604","537","RES","320-41647-6","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","19","ng/L","U","7.5","DL","","TRG","","","23","LOQ","YES",-99","","266","1.00","19","","  
"WGNA-073018-FRB-3604","537","RES","320-41647-6","TALSAC","STL00993","13C2  
PFHxA","38","ng/L","","-99","DL","","SURR","101","","-99","LOQ","YES","37.6","","266","1.00","0","","  
"WGNA-073018-FRB-3604","537","RES","320-41647-6","TALSAC","STL00996","13C2  
PFDA","41","ng/L","","-99","DL","","SURR","109","","-99","LOQ","YES","37.6","","266","1.00","0","","  
"WGNA-073018-RW-3529","537","RES","320-41647-7","TALSAC","1763-23-1","Perfluorooctanesulfonic acid



(PFOS),"10","ng/L","J","6.4","DL","","TRG","","","37","LOQ","YES",-99,"","266.7","1.00","15",""  
"WGNA-073018-RW-3529","537","RES","320-41647-7","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA),"16","ng/L","J","2.6","DL","","TRG","","","19","LOQ","YES",-99,"","266.7","1.00","7.5",""  
"WGNA-073018-RW-3529","537","RES","320-41647-7","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS),"11","ng/L","U","5.2","DL","","TRG","","","28","LOQ","YES",-99,"","266.7","1.00","11",""  
"WGNA-073018-RW-3529","537","RES","320-41647-7","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS),"34","ng/L","U","15","DL","","TRG","","","84","LOQ","YES",-99,"","266.7","1.00","34",""  
"WGNA-073018-RW-3529","537","RES","320-41647-7","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA),"6.6","ng/L","J","1.8","DL","","TRG","","","9.4","LOQ","YES",-99,"","266.7","1.00","3.7",""  
"WGNA-073018-RW-3529","537","RES","320-41647-7","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA),"19","ng/L","U M","7.5","DL","","TRG","","","22","LOQ","YES",-99,"","266.7","1.00","19",""  
"WGNA-073018-RW-3529","537","RES","320-41647-7","TALSAC","STL00993","13C2  
PFHxA","33","ng/L","","-99","DL","","SURR","89","","-99","LOQ","YES","37.5","","266.7","1.00","0",""  
"WGNA-073018-RW-3529","537","RES","320-41647-7","TALSAC","STL00996","13C2  
PFDA","37","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","37.5","","266.7","1.00","0",""  
"WGNA-073018-FRB-3529","537","RES","320-41647-8","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS),"15","ng/L","U","6.2","DL","","TRG","","","37","LOQ","YES",-99,"","272.1","1.00","15",""  
"WGNA-073018-FRB-3529","537","RES","320-41647-8","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA),"7.4","ng/L","U","2.6","DL","","TRG","","","18","LOQ","YES",-99,"","272.1","1.00","7.4",""  
"WGNA-073018-FRB-3529","537","RES","320-41647-8","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS),"11","ng/L","U","5.1","DL","","TRG","","","28","LOQ","YES",-99,"","272.1","1.00","11",""  
"WGNA-073018-FRB-3529","537","RES","320-41647-8","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS),"33","ng/L","U","15","DL","","TRG","","","83","LOQ","YES",-99,"","272.1","1.00","33",""  
"WGNA-073018-FRB-3529","537","RES","320-41647-8","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA),"3.7","ng/L","U","1.7","DL","","TRG","","","9.2","LOQ","YES",-99,"","272.1","1.00","3.7",""  
"WGNA-073018-FRB-3529","537","RES","320-41647-8","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA),"18","ng/L","U","7.4","DL","","TRG","","","22","LOQ","YES",-99,"","272.1","1.00","18",""  
"WGNA-073018-FRB-3529","537","RES","320-41647-8","TALSAC","STL00993","13C2  
PFHxA","37","ng/L","","-99","DL","","SURR","101","","-99","LOQ","YES","36.8","","272.1","1.00","0",""  
"WGNA-073018-FRB-3529","537","RES","320-41647-8","TALSAC","STL00996","13C2  
PFDA","38","ng/L","","-99","DL","","SURR","102","","-99","LOQ","YES","36.8","","272.1","1.00","0",""  
"WGNA-073018-RW-0500","537","RES","320-41647-9","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS),"20","ng/L","J","6.0","DL","","TRG","","","35","LOQ","YES",-99,"","283.9","1.00","14",""  
"WGNA-073018-RW-0500","537","RES","320-41647-9","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA),"20","ng/L","","2.5","DL","","TRG","","","18","LOQ","YES",-99,"","283.9","1.00","7.0",""  
"WGNA-073018-RW-0500","537","RES","320-41647-9","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS),"7.1","ng/L","J","4.8","DL","","TRG","","","26","LOQ","YES",-99,"","283.9","1.00","11",""  
"WGNA-073018-RW-0500","537","RES","320-41647-9","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS),"32","ng/L","U","14","DL","","TRG","","","79","LOQ","YES",-99,"","283.9","1.00","32",""  
"WGNA-073018-RW-0500","537","RES","320-41647-9","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA),"5.5","ng/L","J","1.7","DL","","TRG","","","8.8","LOQ","YES",-99,"","283.9","1.00","3.5",""  
"WGNA-073018-RW-0500","537","RES","320-41647-9","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA),"18","ng/L","U","7.0","DL","","TRG","","","21","LOQ","YES",-99,"","283.9","1.00","18",""  
"WGNA-073018-RW-0500","537","RES","320-41647-9","TALSAC","STL00993","13C2  
PFHxA","34","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","35.2","","283.9","1.00","0",""  
"WGNA-073018-RW-0500","537","RES","320-41647-9","TALSAC","STL00996","13C2  
PFDA","37","ng/L","","-99","DL","","SURR","105","","-99","LOQ","YES","35.2","","283.9","1.00","0",""  
"LLCS 320-237816/2-A","537","RES","LLCS 320-237816/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic  
acid (PFOS),"41.6","ng/L","","6.8","DL","","SPK","103","","40","LOQ","YES","40.2","","250","1.00","16",""  
"LLCS 320-237816/2-A","537","RES","LLCS 320-237816/2-A","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA),"18.6","ng/L","J","2.8","DL","","SPK","93","","20","LOQ","YES","20.0","","250","1.00","8.0",""  
"LLCS 320-237816/2-A","537","RES","LLCS 320-237816/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS),"31.4","ng/L","","5.5","DL","","SPK","103","","30","LOQ","YES","30.3","","250","1.00","12",""  
"LLCS 320-237816/2-A","537","RES","LLCS 320-237816/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid

(PFBS)","102","ng/L","","16","DL","","SPK","113","","90","LOQ","YES","90.2","","250","1.00","36",""  
"LLCS 320-237816/2-A","537","RES","LLCS 320-237816/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","9.50","ng/L","J","1.9","DL","","SPK","95","","10","LOQ","YES","10.0","","250","1.00","4.0",""  
"LLCS 320-237816/2-A","537","RES","LLCS 320-237816/2-A","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","18.4","ng/L","J","8.0","DL","","SPK","92","","24","LOQ","YES","20.0","","250","1.00","20",""  
"LLCS 320-237816/2-A","537","RES","LLCS 320-237816/2-A","TALSAC","STL00993","13C2  
PFHxA","39.4","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","40.0","","250","1.00","0",""  
"LLCS 320-237816/2-A","537","RES","LLCS 320-237816/2-A","TALSAC","STL00996","13C2  
PFDA","44.3","ng/L","","-99","DL","","SURR","111","","-99","LOQ","YES","40.0","","250","1.00","0",""  
"LLCSD 320-237816/3-A","537","RES","LLCSD 320-237816/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic  
acid (PFOS)","39.7","ng/L","J","6.8","DL","","SPK","99","5","40","LOQ","YES","40.2","LLCS 320-237816/2-  
A","250","1.00","16",""  
"LLCSD 320-237816/3-A","537","RES","LLCSD 320-237816/3-A","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","18.4","ng/L","J","2.8","DL","","SPK","92","1","20","LOQ","YES","20.0","LLCS 320-237816/2-  
A","250","1.00","8.0",""  
"LLCSD 320-237816/3-A","537","RES","LLCSD 320-237816/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic  
acid (PFHxS)","30.2","ng/L","","5.5","DL","","SPK","100","4","30","LOQ","YES","30.3","LLCS 320-237816/2-  
A","250","1.00","12",""  
"LLCSD 320-237816/3-A","537","RES","LLCSD 320-237816/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic  
acid (PFBS)","92.7","ng/L","","16","DL","","SPK","103","9","90","LOQ","YES","90.2","LLCS 320-237816/2-  
A","250","1.00","36",""  
"LLCSD 320-237816/3-A","537","RES","LLCSD 320-237816/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","9.21","ng/L","J","1.9","DL","","SPK","92","3","10","LOQ","YES","10.0","LLCS 320-237816/2-  
A","250","1.00","4.0",""  
"LLCSD 320-237816/3-A","537","RES","LLCSD 320-237816/3-A","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","17.7","ng/L","J","8.0","DL","","SPK","89","4","24","LOQ","YES","20.0","LLCS 320-237816/2-  
A","250","1.00","20",""  
"LLCSD 320-237816/3-A","537","RES","LLCSD 320-237816/3-A","TALSAC","STL00993","13C2  
PFHxA","39.1","ng/L","","-99","DL","","SURR","98","0.7","-99","LOQ","YES","40.0","LLCS 320-237816/2-  
A","250","1.00","0",""  
"LLCSD 320-237816/3-A","537","RES","LLCSD 320-237816/3-A","TALSAC","STL00996","13C2  
PFDA","43.8","ng/L","","-99","DL","","SURR","110","1","-99","LOQ","YES","40.0","LLCS 320-237816/2-  
A","250","1.00","0",""  
"MB 320-237816/1-A","537","RES","MB 320-237816/1-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 320-237816/1-A","537","RES","MB 320-237816/1-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 320-237816/1-A","537","RES","MB 320-237816/1-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 320-237816/1-A","537","RES","MB 320-237816/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250","1.00","36",""  
"MB 320-237816/1-A","537","RES","MB 320-237816/1-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 320-237816/1-A","537","RES","MB 320-237816/1-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 320-237816/1-A","537","RES","MB 320-237816/1-A","TALSAC","STL00993","13C2  
PFHxA","42.3","ng/L","","-99","DL","","SURR","106","","-99","LOQ","YES","40.0","","250","1.00","0",""  
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PFDA","46.6","ng/L","","-99","DL","","SURR","116","","-99","LOQ","YES","40.0","","250","1.00","0",""  
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10","FB",,"1.40","537","METHOD","RES","08/03/2018 10:24","08/08/2018  
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238606","320-41647-1","07/31/2018 09:00","08/02/2018 13:10",,"  
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11","NM",,"1.40","537","METHOD","RES","08/03/2018 10:24","08/08/2018  
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12","FB",,"1.40","537","METHOD","RES","08/03/2018 10:24","08/08/2018  
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238606","320-41647-1","07/31/2018 09:00","08/02/2018 13:10",,"  
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13","FD",,"1.40","537","METHOD","RES","08/03/2018 10:24","08/08/2018  
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2","FB",,"1.40","537","METHOD","RES","08/03/2018 10:24","08/08/2018  
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238604","320-41647-1","07/31/2018 09:00","08/02/2018 13:10",,"  
"Unknown","Unknown","WGNA-073018-RW-4851","07/30/2018 11:10","AQ","320-41647-  
3","NM",,"1.40","537","METHOD","RES","08/03/2018 10:24","08/08/2018  
01:48","TALSAC","COA","WET","NA","1","NA","NA",,"100","320-237816","320-237816","NA","320-  
238604","320-41647-1","07/31/2018 09:00","08/02/2018 13:10",,"  
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4","FB",,"1.40","537","METHOD","RES","08/03/2018 10:24","08/08/2018  
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238606","320-41647-1","07/31/2018 09:00","08/02/2018 13:10",,"  
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9","NM",,"1.40","537","METHOD","RES","08/03/2018 10:24","08/08/2018  
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A","LCS",,"-99","537","METHOD","RES","08/03/2018 10:23","08/08/2018  
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A","LCSD",,"-99","537","METHOD","RES","08/03/2018 10:23","08/08/2018  
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238604","320-41647-1","08/03/2018 10:23","08/02/2018 13:10",""



**TO:** A. FREBOWITZ **DATE:** SEPTEMBER 19, 2018  
**FROM:** TERRI L. SOLOMON **COPIES:** DV FILE  
**SUBJECT:** ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)  
NAS JRB WILLOW GROVE  
SAMPLE DELIVERY GROUP (SDG) 320-41647-1

**SAMPLES:** 6/Field Reagent Blank (FRB)  
NAWC-073018-FRB-055 WGNA-073018-FRB-0500  
WGNA-073018-FRB-3529 WGNA-073018-FRB-3604  
WGNA-073018-FRB-3957 WGNA-073018-FRB-4851  
  
7/Drinking Water  
NAWC-073018-RW-055 WGNA-073018-DUP-42  
WGNA-073018-RW-0500 WGNA-073018-RW-3529  
WGNA-073018-RW-3604 WGNA-073018-RW-3957  
WGNA-073018-RW-4851

Overview

The sample set for NAS JRB Willow Grove, SDG 320-41647-1, consisted of seven (7) drinking water samples and six (6) FRB samples. All samples were analyzed for select perfluorinated alkyl acids including pentadecafluorooctanoic acid (PFOA), perfluorobutane sulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA) and perfluorooctane sulfonic acid (PFOS). One (1) field duplicate pair, WGNA-073018-RW-3957/ WGNA-073018-DUP-42, was included in this SDG.

The samples were collected by Tetra Tech on July 30, 2018 and analyzed by Test America-Sacramento. All sample analyses were conducted in accordance with EPA Method 537 version 1.1 analytical and reporting protocols.

The data contained in this SDG was validated with regard to the following parameters: data completeness, holding times, mass calibration, mass spectral acquisition rate, tune check, instrument sensitivity check, initial/continuing calibrations, ion transitions, laboratory method/FRBs, surrogate spike recoveries, laboratory control sample / laboratory control sample duplicate results, injected internal standard areas and recoveries, 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 the FRBs.

TO: A. FREBOWITZ  
SDG: 320-41647-1

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**Sample**

NAWC-073018-RW-055  
WGNA-073018-DUP-42  
WGNA-073018-RW-0500  
WGNA-073018-RW-3529  
WGNA-073018-RW-3604  
WGNA-073018-RW-3957  
WGNA-073018-RW-4851

**Associated FRB**

NAWC-073018-FRB-055  
WGNA-073018-FRB-3957  
WGNA-073018-FRB-0500  
WGNA-073018-FRB-3529  
WGNA-073018-FRB-3604  
WGNA-073018-FRB-3957  
WGNA-073018-FRB-4851

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.

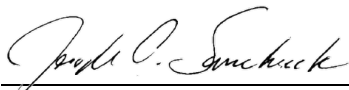
**Other Factors Affecting Data Quality:** Results below the RL were estimated.

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), US EPA National Functional Guidelines for Organic Data Review (January 2017), and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (July 2013) as applicable. The text of this report has been formulated to address only those areas affecting data quality.



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Tetra Tech, Inc.  
Terri L. Solomon  
Chemist/Data Validator



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

**Attachments:**

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

### Data Qualifier Definitions

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

<b>U</b>	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted detection limit.
<b>J</b>	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
<b>J+</b>	The result is an estimated quantity, but the result may be biased high.
<b>J-</b>	The result is an estimated quantity, but the result may be biased low.
<b>UJ</b>	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
<b>NJ</b>	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.
<b>R</b>	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.
<b>UR</b>	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.
<b>X</b>	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team, but exclusion of the data is recommended.

**Appendix A**

Qualified Analytical Results



**Qualifier Codes:**

- A = Lab Blank Contamination
- B = Field Blank Contamination
- C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
- C01 = GC/MS Tuning Noncompliance
- D = MS/MSD Recovery Noncompliance
- E = LCS/LCSD Recovery Noncompliance
- F = Lab Duplicate Imprecision
- G = Field Duplicate Imprecision
- H = Holding Time Exceedance
- I = ICP Serial Dilution Noncompliance
- J = ICP PDS Recovery Noncompliance; MSA's  $r < 0.995$
- K = ICP Interference - includes ICS % R Noncompliance
- L = Instrument Calibration Range Exceedance
- M = Sample Preservation Noncompliance
- N = Internal Standard Noncompliance
- N01 = Internal Standard Recovery Noncompliance Dioxins
- N02 = Recovery Standard Noncompliance Dioxins
- N03 = Clean-up Standard Noncompliance Dioxins
- O = Poor Instrument Performance (i.e., base-time drifting)
- P = Uncertainty near detection limit ( $< 2 \times$  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

<b>PROJ_NO: 08005-WE04</b> <b>SDG: 320-41647-1</b> <b>FRACTION: PFAS</b> <b>MEDIA: WATER</b>	NSAMPLE	NAWC-073018-FRB-055			NAWC-073018-RW-055			WGNA-073018-DUP-42			WGNA-073018-FRB-0500		
	LAB_ID	320-41647-2			320-41647-1			320-41647-13			320-41647-10		
	SAMP_DATE	7/30/2018			7/30/2018			7/30/2018			7/30/2018		
	QC_TYPE	FB			NM			FD			FB		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF							WGNA-073018-RW-3957					
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
PENTADECAFLUOROOCTANOIC ACID (PFOA)	7	U		9.8	J	P	13	J	P	7	U		
PERFLUOROBUTANESULFONIC ACID (PFBS)	32	U		32	U		36	U		31	U		
PERFLUOROHEPTANOIC ACID (PFHPA)	3.5	U		4.8	J	P	4.5	J	P	3.5	U		
PERFLUOROHEXANESULFONIC ACID (PFHXS)	11	U		11	U		6.8	J	P	10	U		
PERFLUORONONANOIC ACID (PFNA)	18	U		18	U		20	U		17	U		
PERFLUOROOCTANESULFONIC ACID (PFOS)	14	U		8.2	J	P	12	J	P	14	U		

<b>PROJ_NO: 08005-WE04</b> <b>SDG: 320-41647-1</b> <b>FRACTION: PFAS</b> <b>MEDIA: WATER</b>	NSAMPLE	WGNA-073018-FRB-3529			WGNA-073018-FRB-3604			WGNA-073018-FRB-3957			WGNA-073018-FRB-4851		
	LAB_ID	320-41647-8			320-41647-6			320-41647-12			320-41647-4		
	SAMP_DATE	7/30/2018			7/30/2018			7/30/2018			7/30/2018		
	QC_TYPE	FB			FB			FB			FB		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
PENTADECAFLUOROOCTANOIC ACID (PFOA)	7.4	U		7.5	U		7.1	U		7.1	U		
PERFLUOROBUTANESULFONIC ACID (PFBS)	33	U		34	U		32	U		32	U		
PERFLUOROHEPTANOIC ACID (PFHPA)	3.7	U		3.8	U		3.6	U		3.6	U		
PERFLUOROHEXANESULFONIC ACID (PFHXS)	11	U		11	U		11	U		11	U		
PERFLUORONONANOIC ACID (PFNA)	18	U		19	U		18	U		18	U		
PERFLUOROOCTANESULFONIC ACID (PFOS)	15	U		15	U		14	U		14	U		

<b>PROJ_NO: 08005-WE04</b> <b>SDG: 320-41647-1</b> <b>FRACTION: PFAS</b> <b>MEDIA: WATER</b>	NSAMPLE	WGNA-073018-RW-0500			WGNA-073018-RW-3529			WGNA-073018-RW-3604			WGNA-073018-RW-3957		
	LAB_ID	320-41647-9			320-41647-7			320-41647-5			320-41647-11		
	SAMP_DATE	7/30/2018			7/30/2018			7/30/2018			7/30/2018		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
PENTADECAFLUOROOCTANOIC ACID (PFOA)	20			16	J	P	10	J	P	12	J	P	
PERFLUOROBUTANESULFONIC ACID (PFBS)	32	U		34	U		33	U		35	U		
PERFLUOROHEPTANOIC ACID (PFHPA)	5.5	J	P	6.6	J	P	4.2	J	P	4.1	J	P	
PERFLUOROHEXANESULFONIC ACID (PFHXS)	7.1	J	P	11	U		11	U		6.6	J	P	
PERFLUORONONANOIC ACID (PFNA)	18	U		19	U		18	U		20	U		
PERFLUOROOCTANESULFONIC ACID (PFOS)	20	J	P	10	J	P	10	J	P	11	J	P	

<b>PROJ_NO: 08005-WE04</b> <b>SDG: 320-41647-1</b> <b>FRACTION: PFAS</b> <b>MEDIA: WATER</b>	NSAMPLE	WGNA-073018-RW-4851		
	LAB_ID	320-41647-3		
	SAMP_DATE	7/30/2018		
	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER	RESULT	VQL	QLCD	
PENTADECAFLUOROOCTANOIC ACID (PFOA)	6.1	J	P	
PERFLUOROBUTANESULFONIC ACID (PFBS)	33	U		
PERFLUOROHEPTANOIC ACID (PFHPA)	2.1	J	P	
PERFLUOROHEXANESULFONIC ACID (PFHXS)	11	U		
PERFLUORONONANOIC ACID (PFNA)	18	U		
PERFLUOROOCTANESULFONIC ACID (PFOS)	14	U		

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Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-073018-RW-055 Lab Sample ID: 320-41647-1  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_039.d  
 Analysis Method: 537 Date Collected: 07/30/2018 10:10  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 284.7(mL) Date Analyzed: 08/08/2018 01:38  
 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.: 238604 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	8.2	J	35	14	6.0
335-67-1	Perfluorooctanoic acid (PFOA)	9.8	J	18	7.0	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U <del>M</del>	21	18	7.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	26	11	4.8
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.8	J	8.8	3.5	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	79	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	108		70-130

*Wesley L. Selman*  
09/19/2018

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Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-073018-FRB-055 Lab Sample ID: 320-41647-2  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_040.d  
 Analysis Method: 537 Date Collected: 07/30/2018 10:05  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 284.9(mL) Date Analyzed: 08/08/2018 01:43  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238604 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	35	14	6.0
335-67-1	Perfluorooctanoic acid (PFOA)	7.0	U	18	7.0	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	21	18	7.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	26	11	4.8
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.5	U	8.8	3.5	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	79	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	101		70-130

*Wesley L. Salomon*  
09/19/2018

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LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-RW-4851 Lab Sample ID: 320-41647-3  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_041.d  
 Analysis Method: 537 Date Collected: 07/30/2018 11:10  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 276.9(mL) Date Analyzed: 08/08/2018 01:48  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238604 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	36	14	6.1
335-67-1	Perfluorooctanoic acid (PFOA)	6.1	J	18	7.2	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U <del>M</del>	27	11	5.0
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.1	J <del>M</del>	9.0	3.6	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33	U	81	33	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	109		70-130

*Mari L. Selman*  
09/19/2018



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Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-FRB-4851 Lab Sample ID: 320-41647-4  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_042.d  
 Analysis Method: 537 Date Collected: 07/30/2018 11:05  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 280.8(mL) Date Analyzed: 08/08/2018 01:52  
 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.: 238604 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	36	14	6.1
335-67-1	Perfluorooctanoic acid (PFOA)	7.1	U	18	7.1	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	21	18	7.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	27	11	4.9
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.6	U	8.9	3.6	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	80	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	104		70-130

*Maria L. Salomon*  
09/19/2018

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LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-RW-3604 Lab Sample ID: 320-41647-5  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_043.d  
 Analysis Method: 537 Date Collected: 07/30/2018 11:40  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 272.6(mL) Date Analyzed: 08/08/2018 01:57  
 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.: 238604 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	10	J	37	15	6.2
335-67-1	Perfluorooctanoic acid (PFOA)	10	J	18	7.3	2.6
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.3
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.0
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.2	J	9.2	3.7	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33	U	83	33	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	78		70-130
STL00996	13C2 PFDA	108		70-130

*Steve L. Selman*  
09/19/2018

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Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-FRB-3604 Lab Sample ID: 320-41647-6  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_046.d  
 Analysis Method: 537 Date Collected: 07/30/2018 11:35  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 266(mL) Date Analyzed: 08/08/2018 02:11  
 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.: 238606 Units: ng/L

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

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

*Wendy L. Selman*  
09/19/2018

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Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-RW-3529 Lab Sample ID: 320-41647-7  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_047.d  
 Analysis Method: 537 Date Collected: 07/30/2018 15:10  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 266.7(mL) Date Analyzed: 08/08/2018 02:16  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	10	J	37	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	16	J	19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U <del>M</del>	22	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.6	J	9.4	3.7	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	84	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	89		70-130
STL00996	13C2 PFDA	99		70-130

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09/19/2018

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Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-FRB-3529 Lab Sample ID: 320-41647-8  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_048.d  
 Analysis Method: 537 Date Collected: 07/30/2018 15:05  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 272.1(mL) Date Analyzed: 08/08/2018 02:20  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	37	15	6.2
335-67-1	Perfluorooctanoic acid (PFOA)	7.4	U	18	7.4	2.6
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.4
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.7	U	9.2	3.7	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33	U	83	33	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	102		70-130

*Wesley L. Selman*  
09/19/2018

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Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-RW-0500 Lab Sample ID: 320-41647-9  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_049.d  
 Analysis Method: 537 Date Collected: 07/30/2018 15:40  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 283.9(mL) Date Analyzed: 08/08/2018 02:25  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	20	J	35	14	6.0
335-67-1	Perfluorooctanoic acid (PFOA)	20		18	7.0	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	21	18	7.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.1	J	26	11	4.8
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.5	J	8.8	3.5	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	79	32	14

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

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09/19/2018

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LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-FRB-0500 Lab Sample ID: 320-41647-10  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_050.d  
 Analysis Method: 537 Date Collected: 07/30/2018 15:35  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 287.2 (mL) Date Analyzed: 08/08/2018 02:30  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	35	14	5.9
335-67-1	Perfluorooctanoic acid (PFOA)	7.0	U	17	7.0	2.4
375-95-1	Perfluorononanoic acid (PFNA)	17	U	21	17	7.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	10	U	26	10	4.8
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.5	U	8.7	3.5	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	31	U	78	31	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	104		70-130

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09/19/2018

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Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-RW-3957 Lab Sample ID: 320-41647-11  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_051.d  
 Analysis Method: 537 Date Collected: 07/30/2018 15:40  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 254.4 (mL) Date Analyzed: 08/08/2018 02:34  
 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.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	11	J	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	12	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.6	J	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	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	97		70-130
STL00996	13C2 PFDA	104		70-130

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09/19/2018



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-FRB-3957 Lab Sample ID: 320-41647-12  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_052.d  
 Analysis Method: 537 Date Collected: 07/30/2018 15:35  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 279.9(mL) Date Analyzed: 08/08/2018 02:39  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	36	14	6.1
335-67-1	Perfluorooctanoic acid (PFOA)	7.1	U	18	7.1	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	21	18	7.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	27	11	4.9
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.6	U	8.9	3.6	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	80	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	101		70-130

*Mari L. Slemmon*  
09/19/2018

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-DUP-42 Lab Sample ID: 320-41647-13  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_053.d  
 Analysis Method: 537 Date Collected: 07/30/2018 07:00  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 253.2 (mL) Date Analyzed: 08/08/2018 02:44  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	12	J	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	13	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.8	J	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.5	J	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	114		70-130

*Mari L. Salomon*  
09/19/2018

**Appendix B**

Results as Reported by the Laboratory

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-073018-RW-055 Lab Sample ID: 320-41647-1  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_039.d  
 Analysis Method: 537 Date Collected: 07/30/2018 10:10  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 284.7(mL) Date Analyzed: 08/08/2018 01:38  
 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.: 238604 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	8.2	J	35	14	6.0
335-67-1	Perfluorooctanoic acid (PFOA)	9.8	J	18	7.0	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U M	21	18	7.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	26	11	4.8
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.8	J	8.8	3.5	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	79	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	108		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-073018-FRB-055 Lab Sample ID: 320-41647-2  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_040.d  
 Analysis Method: 537 Date Collected: 07/30/2018 10:05  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 284.9(mL) Date Analyzed: 08/08/2018 01:43  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238604 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	35	14	6.0
335-67-1	Perfluorooctanoic acid (PFOA)	7.0	U	18	7.0	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	21	18	7.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	26	11	4.8
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.5	U	8.8	3.5	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	79	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	101		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-RW-4851 Lab Sample ID: 320-41647-3  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_041.d  
 Analysis Method: 537 Date Collected: 07/30/2018 11:10  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 276.9(mL) Date Analyzed: 08/08/2018 01:48  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238604 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	36	14	6.1
335-67-1	Perfluorooctanoic acid (PFOA)	6.1	J	18	7.2	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U M	27	11	5.0
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.1	J M	9.0	3.6	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33	U	81	33	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	109		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-FRB-4851 Lab Sample ID: 320-41647-4  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_042.d  
 Analysis Method: 537 Date Collected: 07/30/2018 11:05  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 280.8(mL) Date Analyzed: 08/08/2018 01:52  
 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.: 238604 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	36	14	6.1
335-67-1	Perfluorooctanoic acid (PFOA)	7.1	U	18	7.1	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	21	18	7.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	27	11	4.9
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.6	U	8.9	3.6	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	80	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	104		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-RW-3604 Lab Sample ID: 320-41647-5  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_043.d  
 Analysis Method: 537 Date Collected: 07/30/2018 11:40  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 272.6(mL) Date Analyzed: 08/08/2018 01:57  
 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.: 238604 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	10	J	37	15	6.2
335-67-1	Perfluorooctanoic acid (PFOA)	10	J	18	7.3	2.6
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.3
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.0
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.2	J	9.2	3.7	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33	U	83	33	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	78		70-130
STL00996	13C2 PFDA	108		70-130



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-FRB-3604 Lab Sample ID: 320-41647-6  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_046.d  
 Analysis Method: 537 Date Collected: 07/30/2018 11:35  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 266(mL) Date Analyzed: 08/08/2018 02:11  
 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.: 238606 Units: ng/L

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

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-RW-3529 Lab Sample ID: 320-41647-7  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_047.d  
 Analysis Method: 537 Date Collected: 07/30/2018 15:10  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 266.7(mL) Date Analyzed: 08/08/2018 02:16  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	10	J	37	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	16	J	19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U M	22	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.6	J	9.4	3.7	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	84	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	89		70-130
STL00996	13C2 PFDA	99		70-130

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LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-FRB-3529 Lab Sample ID: 320-41647-8  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_048.d  
 Analysis Method: 537 Date Collected: 07/30/2018 15:05  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 272.1(mL) Date Analyzed: 08/08/2018 02:20  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	37	15	6.2
335-67-1	Perfluorooctanoic acid (PFOA)	7.4	U	18	7.4	2.6
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.4
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.7	U	9.2	3.7	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33	U	83	33	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	102		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-RW-0500 Lab Sample ID: 320-41647-9  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_049.d  
 Analysis Method: 537 Date Collected: 07/30/2018 15:40  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 283.9(mL) Date Analyzed: 08/08/2018 02:25  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	20	J	35	14	6.0
335-67-1	Perfluorooctanoic acid (PFOA)	20		18	7.0	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	21	18	7.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.1	J	26	11	4.8
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.5	J	8.8	3.5	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	79	32	14

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

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-FRB-0500 Lab Sample ID: 320-41647-10  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_050.d  
 Analysis Method: 537 Date Collected: 07/30/2018 15:35  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 287.2 (mL) Date Analyzed: 08/08/2018 02:30  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	35	14	5.9
335-67-1	Perfluorooctanoic acid (PFOA)	7.0	U	17	7.0	2.4
375-95-1	Perfluorononanoic acid (PFNA)	17	U	21	17	7.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	10	U	26	10	4.8
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.5	U	8.7	3.5	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	31	U	78	31	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	104		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-RW-3957 Lab Sample ID: 320-41647-11  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_051.d  
 Analysis Method: 537 Date Collected: 07/30/2018 15:40  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 254.4 (mL) Date Analyzed: 08/08/2018 02:34  
 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.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	11	J	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	12	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.6	J	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	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	97		70-130
STL00996	13C2 PFDA	104		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-FRB-3957 Lab Sample ID: 320-41647-12  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_052.d  
 Analysis Method: 537 Date Collected: 07/30/2018 15:35  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 279.9(mL) Date Analyzed: 08/08/2018 02:39  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	36	14	6.1
335-67-1	Perfluorooctanoic acid (PFOA)	7.1	U	18	7.1	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	21	18	7.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	27	11	4.9
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.6	U	8.9	3.6	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	80	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	101		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073018-DUP-42 Lab Sample ID: 320-41647-13  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_053.d  
 Analysis Method: 537 Date Collected: 07/30/2018 07:00  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:24  
 Sample wt/vol: 253.2 (mL) Date Analyzed: 08/08/2018 02:44  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238606 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	12	J	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	13	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.8	J	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.5	J	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	114		70-130



**Appendix C**

Support Documentation

ANALYTE	ORIGINAL WGNA-	DUPLICATE WGNA-	RL	RPD	RPD > 50%	ORIGINAL	DUPLICATE SAMPLE	DIFFERENCE >2XRL
	073018-RW-3957	073018-DUP-42				SAMPLE CONC	CONC >2xRL	
Perfluorooctanoic acid (PFOA)	12	13	20	8.000	FALSE	FALSE	FALSE	FALSE
Perfluoroheptanoic acid (PFHpA)	4.1	4.5	9.8	9.302	FALSE	FALSE	FALSE	FALSE
Perfluorohexanesulfonic acid (PFHxS)	6.6	6.8	29	2.985	FALSE	FALSE	FALSE	FALSE
Perfluorooctanesulfonic acid (PFOS)	11	12	39	8.696	FALSE	FALSE	FALSE	FALSE

**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:

<b>Client Contact</b>		<b>Project Manager:</b> Andy Frebowitz			<b>Site Contact:</b> Mary Kay Bond			<b>Date:</b> 7/30/2018		<b>COC No.:</b>			
TetraTech		Tel/Fax: 610.382.1170			Lab Contact: Dave Alltucker			Carrier: FedEx		1 of 1 COCs			
234 Mall Boulevard Suite 260		<b>Analysis Turnaround Time</b>			Filtered Sample ( Y / N ) Perform MS / MSD ( Y / N ) EPA 537 UCMR3					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: Walk-in Client: Lab Sampling:	
610-382-1174		<input type="checkbox"/> 2 weeks											
610-491-9688		<input type="checkbox"/> 1 week											
Project Name: WE04		<input type="checkbox"/> 2 days											
Site: WE04		<input type="checkbox"/> 1 day					Job / SDG No.:						
P O # 1132358 (through EarthToxics)										Sample Specific Notes:			
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				
NAWC-073018-RW-055		7/30/2018	10:10	G	DW	2	N	N	Y				
NAWC-073018-FRB-055		7/30/2018	10:05	G	DW	2	N	N	Y	Field Reagent Blank			
WGNA-073018-RW-4851		7/30/2018	11:10	G	DW	2	N	N	Y				
WGNA-073018-FRB-4851		7/30/2018	11:05	G	DW	2	N	N	Y	Field Reagent Blank			
WGNA-073018-RW-3604		7/30/2018	11:40	G	DW	2	N	N	Y				
WGNA-073018-FRB-3604		7/30/2018	11:35	G	DW	2	N	N	Y	Field Reagent Blank			
WGNA-073018-RW-3529		7/30/2018	15:10	G	DW	2	N	N	Y				
WGNA-073018-FRB-3529		7/30/2018	15:05	G	DW	2	N	N	Y	Field Reagent Blank			
WGNA-073018-RW-0500		7/30/2018	15:40	G	DW	2	N	N	Y				
WGNA-073018-FRB-0500		7/30/2018	15:35	G	DW	2	N	N	Y	Field Reagent Blank			
WGNA-073018-RW-3957		7/30/2018	16:40	G	DW	2	N	N	Y				
WGNA-073018-FRB-3957		7/30/2018	16:35	G	DW	2	N	N	Y	Field Reagent Blank			
WGNA-073018-DUP-42		7/30/2018	07:00	G	DW	2	N	N	Y	Duplicate			
<b>Preservation Used:</b> 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other: Trizma							6						
<b>Possible Hazard Identification:</b> Comments Section if the lab is to dispose of the sample.							<b>Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)</b>						
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown							<input type="checkbox"/> Return to Client <input type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for Months						
Fed Ex Tracking:													
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.: Seal 82			Cooler Temp. (°C): Obs'd: 1.4°C Corr'd: 1.4°C		Therm ID No.: # K-2						
Relinquished by: Mary Kay Bond		Company: Tetra Tech		Date/Time: 7/30/2018 18:00		Received by: [Signature]		Company: TA W Sec		Date/Time: 31 July 18 09:08			
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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320-41647 Chain of Custody

**Job Narrative**  
**320-41647-1**

**Receipt**

The samples were received on 7/31/2018 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.4° 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 320-237816.

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

# Definitions/Glossary

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

TestAmerica Job ID: 320-41647-1

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## Qualifiers

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### 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.

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## Glossary

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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)

# Sample Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-41647-1

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

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-41647-1	NAWC-073018-RW-055	Water	07/30/18 10:10	07/31/18 09:00
320-41647-2	NAWC-073018-FRB-055	Water	07/30/18 10:05	07/31/18 09:00
320-41647-3	WGNA-073018-RW-4851	Water	07/30/18 11:10	07/31/18 09:00
320-41647-4	WGNA-073018-FRB-4851	Water	07/30/18 11:05	07/31/18 09:00
320-41647-5	WGNA-073018-RW-3604	Water	07/30/18 11:40	07/31/18 09:00
320-41647-6	WGNA-073018-FRB-3604	Water	07/30/18 11:35	07/31/18 09:00
320-41647-7	WGNA-073018-RW-3529	Water	07/30/18 15:10	07/31/18 09:00
320-41647-8	WGNA-073018-FRB-3529	Water	07/30/18 15:05	07/31/18 09:00
320-41647-9	WGNA-073018-RW-0500	Water	07/30/18 15:40	07/31/18 09:00
320-41647-10	WGNA-073018-FRB-0500	Water	07/30/18 15:35	07/31/18 09:00
320-41647-11	WGNA-073018-RW-3957	Water	07/30/18 15:40	07/31/18 09:00
320-41647-12	WGNA-073018-FRB-3957	Water	07/30/18 15:35	07/31/18 09:00
320-41647-13	WGNA-073018-DUP-42	Water	07/30/18 07:00	07/31/18 09:00

# Method Summary

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

TestAmerica Job ID: 320-41647-1

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

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

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

FORM II  
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Matrix: Water

Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-073018-RW-055	320-41647-1	97	108
NAWC-073018-FRB-055	320-41647-2	98	101
WGNA-073018-RW-4851	320-41647-3	98	109
WGNA-073018-FRB-4851	320-41647-4	97	104
WGNA-073018-RW-3604	320-41647-5	78	108
WGNA-073018-FRB-3604	320-41647-6	101	109
WGNA-073018-RW-3529	320-41647-7	89	99
WGNA-073018-FRB-3529	320-41647-8	101	102
WGNA-073018-RW-0500	320-41647-9	98	105
WGNA-073018-FRB-0500	320-41647-10	102	104
WGNA-073018-RW-3957	320-41647-11	97	104
WGNA-073018-FRB-3957	320-41647-12	100	101
WGNA-073018-DUP-42	320-41647-13	101	114
	MB 320-237816/1-A	106	116
	LLCS 320-237816/2-A	99	111
	LLCSD 320-237816/3-A	98	110

PFHxA = 13C2 PFHxA  
PFDA = 13C2 PFDA

QC LIMITS  
70-130  
70-130

# Column to be used to flag recovery values



FORM III  
LCMS LOW LEVEL CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Matrix: Water Level: Low Lab File ID: 2018.08.07\_537AAA\_037.d

Lab ID: LLCS 320-237816/2-A Client ID: \_\_\_\_\_

COMPOUND	SPIKE ADDED (ng/L)	LLCS CONCENTRATION (ng/L)	LLCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	40.2	41.6	103	50-150	
Perfluorooctanoic acid (PFOA)	20.0	18.6 J	93	50-150	
Perfluorononanoic acid (PFNA)	20.0	18.4 J	92	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.3	31.4	103	50-150	
Perfluoroheptanoic acid (PFHpA)	10.0	9.50 J	95	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.2	102	113	50-150	

# Column to be used to flag recovery and RPD values

FORM III  
LCMS LOW LEVEL CONTROL STANDARD DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Matrix: Water Level: Low Lab File ID: 2018.08.07\_537AAA\_038.d

Lab ID: LLCSD 320-237816/3-A Client ID: \_\_\_\_\_

COMPOUND	SPIKE ADDED (ng/L)	LLCSD CONCENTRATION (ng/L)	LLCSD		QC LIMITS		#
			% REC	% RPD	RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	40.2	39.7 J	99	5	50	50-150	
Perfluorooctanoic acid (PFOA)	20.0	18.4 J	92	1	50	50-150	
Perfluorononanoic acid (PFNA)	20.0	17.7 J	89	4	50	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.3	30.2	100	4	50	50-150	
Perfluoroheptanoic acid (PFHpA)	10.0	9.21 J	92	3	50	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.2	92.7	103	9	50	50-150	

# Column to be used to flag recovery and RPD values

FORM IV  
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Lab File ID: 2018.08.07\_537AAA\_036.d Lab Sample ID: MB 320-237816/1-A  
 Matrix: Water Date Extracted: 08/03/2018 10:23  
 Instrument ID: A8\_N Date Analyzed: 08/08/2018 01:24  
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LLCS 320-237816/2-A	2018.08.07_537AAA_037.d	08/08/2018 01:29
	LLCSD 320-237816/3-A	2018.08.07_537AAA_038.d	08/08/2018 01:33
NAWC-073018-RW-055	320-41647-1	2018.08.07_537AAA_039.d	08/08/2018 01:38
NAWC-073018-FRB-055	320-41647-2	2018.08.07_537AAA_040.d	08/08/2018 01:43
WGNA-073018-RW-4851	320-41647-3	2018.08.07_537AAA_041.d	08/08/2018 01:48
WGNA-073018-FRB-4851	320-41647-4	2018.08.07_537AAA_042.d	08/08/2018 01:52
WGNA-073018-RW-3604	320-41647-5	2018.08.07_537AAA_043.d	08/08/2018 01:57
WGNA-073018-FRB-3604	320-41647-6	2018.08.07_537AAA_046.d	08/08/2018 02:11
WGNA-073018-RW-3529	320-41647-7	2018.08.07_537AAA_047.d	08/08/2018 02:16
WGNA-073018-FRB-3529	320-41647-8	2018.08.07_537AAA_048.d	08/08/2018 02:20
WGNA-073018-RW-0500	320-41647-9	2018.08.07_537AAA_049.d	08/08/2018 02:25
WGNA-073018-FRB-0500	320-41647-10	2018.08.07_537AAA_050.d	08/08/2018 02:30
WGNA-073018-RW-3957	320-41647-11	2018.08.07_537AAA_051.d	08/08/2018 02:34
WGNA-073018-FRB-3957	320-41647-12	2018.08.07_537AAA_052.d	08/08/2018 02:39
WGNA-073018-DUP-42	320-41647-13	2018.08.07_537AAA_053.d	08/08/2018 02:44

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: MB 320-237816/1-A  
 Matrix: Water Lab File ID: 2018.08.07\_537AAA\_036.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 08/03/2018 10:23  
 Sample wt/vol: 250 (mL) Date Analyzed: 08/08/2018 01:24  
 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.: 238604 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	106		70-130
STL00996	13C2 PFDA	116		70-130

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Instrument ID: A8\_N Calibration Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 08/07/2018 13:07  
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	1166146	1.77	2617368	2.02		
UPPER LIMIT	1749219	2.27	3926052	2.52		
LOWER LIMIT	583073	1.27	1308684	1.52		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCVL 320-238469/9		1156656	1.77	2655389	2.01	
ICV 320-238469/11		1199776	1.78	2744266	2.01	
CCV 320-238604/1 CCVIS		1157547	1.77	2558845	2.00	
MB 320-237816/1-A		1397094	1.77	3083560	2.00	
LLCS 320-237816/2-A		1337504	1.77	2889525	2.00	
LLCSD 320-237816/3-A		1421765	1.76	3146656	2.00	
320-41647-1	NAWC-073018-RW-055	1292794	1.77	2896464	2.00	
320-41647-2	NAWC-073018-FRB-055	1415779	1.76	3108523	2.00	
320-41647-3	WGNA-073018-RW-4851	1396964	1.77	3024904	2.00	
320-41647-4	WGNA-073018-FRB-4851	1541812	1.76	3258238	2.00	
320-41647-5	WGNA-073018-RW-3604	1499601	1.76	3325872	2.00	
CCV 320-238604/11 CCVIS		1169194	1.76	2703567	2.00	
CCV 320-238606/11 CCVIS		1169194	1.76	2703567	2.00	
320-41647-6	WGNA-073018-FRB-3604	1316224	1.76	2940798	2.00	
320-41647-7	WGNA-073018-RW-3529	1491339	1.77	3314712	2.00	
320-41647-8	WGNA-073018-FRB-3529	1451085	1.77	3073585	2.00	
320-41647-9	WGNA-073018-RW-0500	1367015	1.77	3006266	2.00	
320-41647-10	WGNA-073018-FRB-0500	1384234	1.76	3019813	2.00	
320-41647-11	WGNA-073018-RW-3957	1486609	1.77	3242355	2.01	
320-41647-12	WGNA-073018-FRB-3957	1473025	1.77	3216746	2.00	
320-41647-13	WGNA-073018-DUP-42	1347837	1.77	3048765	2.00	
CCV 320-238606/21 CCVIS		1184087	1.77	2681112	2.00	

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.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-238604/1 Date Analyzed: 08/08/2018 01:15  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.08.07\_537AAA\_0 Heated Purge: (Y/N) N  
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1157547	1.77	2558845	2.00		
UPPER LIMIT	1620566	2.27	3582383	2.50		
LOWER LIMIT	810283	1.27	1791192	1.50		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-237816/1-A		1397094	1.77	3083560	2.00	
LLCS 320-237816/2-A		1337504	1.77	2889525	2.00	
LLCSD 320-237816/3-A		1421765	1.76	3146656	2.00	
320-41647-1	NAWC-073018-RW-055	1292794	1.77	2896464	2.00	
320-41647-2	NAWC-073018-FRB-055	1415779	1.76	3108523	2.00	
320-41647-3	WGNA-073018-RW-4851	1396964	1.77	3024904	2.00	
320-41647-4	WGNA-073018-FRB-4851	1541812	1.76	3258238	2.00	
320-41647-5	WGNA-073018-RW-3604	1499601	1.76	3325872	2.00	

13PFOA = 13C2-PFOA  
 13PFOA = 13C2-PFOA  
 PFOS = 13C4 PFOS  
 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.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-238604/11 Date Analyzed: 08/08/2018 02:02  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.08.07\_537AAA\_0 Heated Purge: (Y/N) N  
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1169194	1.76	2703567	2.00		
UPPER LIMIT	1636872	2.26	3784994	2.50		
LOWER LIMIT	818436	1.26	1892497	1.50		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-237816/1-A		1397094	1.77	3083560	2.00	
LLCS 320-237816/2-A		1337504	1.77	2889525	2.00	
LLCSD 320-237816/3-A		1421765	1.76	3146656	2.00	
320-41647-1	NAWC-073018-RW-055	1292794	1.77	2896464	2.00	
320-41647-2	NAWC-073018-FRB-055	1415779	1.76	3108523	2.00	
320-41647-3	WGNA-073018-RW-4851	1396964	1.77	3024904	2.00	
320-41647-4	WGNA-073018-FRB-4851	1541812	1.76	3258238	2.00	
320-41647-5	WGNA-073018-RW-3604	1499601	1.76	3325872	2.00	

13PFOA = 13C2-PFOA  
 13PFOA = 13C2-PFOA  
 PFOS = 13C4 PFOS  
 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.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-238606/11 Date Analyzed: 08/08/2018 02:02  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.08.07\_537AAA\_0 Heated Purge: (Y/N) N  
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1169194	1.76	2703567	2.00		
UPPER LIMIT	1636872	2.26	3784994	2.50		
LOWER LIMIT	818436	1.26	1892497	1.50		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-41647-6	WGNA-073018-FRB-3604	1316224	1.76	2940798	2.00	
320-41647-7	WGNA-073018-RW-3529	1491339	1.77	3314712	2.00	
320-41647-8	WGNA-073018-FRB-3529	1451085	1.77	3073585	2.00	
320-41647-9	WGNA-073018-RW-0500	1367015	1.77	3006266	2.00	
320-41647-10	WGNA-073018-FRB-0500	1384234	1.76	3019813	2.00	
320-41647-11	WGNA-073018-RW-3957	1486609	1.77	3242355	2.01	
320-41647-12	WGNA-073018-FRB-3957	1473025	1.77	3216746	2.00	
320-41647-13	WGNA-073018-DUP-42	1347837	1.77	3048765	2.00	

13PFOA = 13C2-PFOA  
 13PFOA = 13C2-PFOA  
 PFOS = 13C4 PFOS  
 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.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-238606/21 Date Analyzed: 08/08/2018 02:48  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.08.07\_537AAA\_0 Heated Purge: (Y/N) N  
 Calibration ID: 40513

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1184087	1.77	2681112	2.00		
UPPER LIMIT	1657722	2.27	3753557	2.50		
LOWER LIMIT	828861	1.27	1876778	1.50		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-41647-6	WGNA-073018-FRB-3604	1316224	1.76	2940798	2.00	
320-41647-7	WGNA-073018-RW-3529	1491339	1.77	3314712	2.00	
320-41647-8	WGNA-073018-FRB-3529	1451085	1.77	3073585	2.00	
320-41647-9	WGNA-073018-RW-0500	1367015	1.77	3006266	2.00	
320-41647-10	WGNA-073018-FRB-0500	1384234	1.76	3019813	2.00	
320-41647-11	WGNA-073018-RW-3957	1486609	1.77	3242355	2.01	
320-41647-12	WGNA-073018-FRB-3957	1473025	1.77	3216746	2.00	
320-41647-13	WGNA-073018-DUP-42	1347837	1.77	3048765	2.00	

13PFOA = 13C2-PFOA  
 13PFOA = 13C2-PFOA  
 PFOS = 13C4 PFOS  
 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.: 320-41647-1 Analy Batch No.: 238469

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/07/2018 12:44 Calibration End Date: 08/07/2018 13:07 Calibration ID: 40513

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238469/2	2018.08.07_537CURVE_003.d
Level 2	IC 320-238469/3	2018.08.07_537CURVE_004.d
Level 3	IC 320-238469/4	2018.08.07_537CURVE_005.d
Level 4	IC 320-238469/5	2018.08.07_537CURVE_006.d
Level 5	IC 320-238469/6	2018.08.07_537CURVE_007.d
Level 6	IC 320-238469/7	2018.08.07_537CURVE_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid (PFBS)	1.2685 1.0148	1.2167	1.2831	1.2045	1.1178	Ave		1.1842			8.6		30.0				
Perfluorohexanesulfonic acid (PFHxS)	1.7386 1.7965	1.7248	1.7859	1.8499	1.8020	Ave		1.7830			2.6		30.0				
Perfluoroheptanoic acid (PFHpA)	+++++ 1.0701	1.0598	1.0963	1.0908	1.0612	Ave		1.0756			1.6		30.0				
Perfluorooctanoic acid (PFOA)	1.1708 1.0787	1.0454	1.0799	1.1146	1.0831	Ave		1.0954			3.9		30.0				
Perfluorooctanesulfonic acid (PFOS)	1.0605 1.1104	1.0466	1.1058	1.0956	1.1304	Ave		1.0915			2.9		30.0				
Perfluorononanoic acid (PFNA)	0.7952 0.7829	0.7632	0.7779	0.8207	0.7892	Ave		0.7882			2.5		30.0				
13C2 PFHxA	1.1215 1.1209	1.0683	1.0729	1.1134	1.1007	Ave		1.0996			2.2		30.0				
13C2 PFDA	0.8149 0.8273	0.8350	0.7672	0.8515	0.8172	Ave		0.8189			3.5		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.: 320-41647-1 Analy Batch No.: 238469

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/07/2018 12:44 Calibration End Date: 08/07/2018 13:07 Calibration ID: 40513

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238469/2	2018.08.07_537CURVE_003.d
Level 2	IC 320-238469/3	2018.08.07_537CURVE_004.d
Level 3	IC 320-238469/4	2018.08.07_537CURVE_005.d
Level 4	IC 320-238469/5	2018.08.07_537CURVE_006.d
Level 5	IC 320-238469/6	2018.08.07_537CURVE_007.d
Level 6	IC 320-238469/7	2018.08.07_537CURVE_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	Ave	1093854 16487048	2326382	5241287	9203217	13659010	9.00 180	20.0	45.0	90.1	135
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	500314 9803009	1107645	2450188	4747515	7395512	3.00 60.5	6.72	15.1	30.2	45.4
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	++++ 2459664	275735	621773	1128009	1828933	++++ 19.4	2.16	4.86	9.72	14.6
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	277484 5050799	554036	1247621	2347790	3802739	1.98 39.6	4.40	9.90	19.8	29.7
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	401757 7918924	878368	1982811	3674504	6063022	3.95 79.1	8.79	19.8	39.5	59.3
Perfluorononanoic acid (PFNA)	13PF OA	Ave	188460 3665889	404484	898787	1728770	2770632	1.98 39.6	4.40	9.90	19.8	29.7
13C2 PFHxA	13PF OA	Ave	1342383 1325342	1286815	1252048	1184544	1301097	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	975454 978205	1005796	895349	905914	965975	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD

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

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1 Analy Batch No.: 238469

SDG No.: \_\_\_\_\_

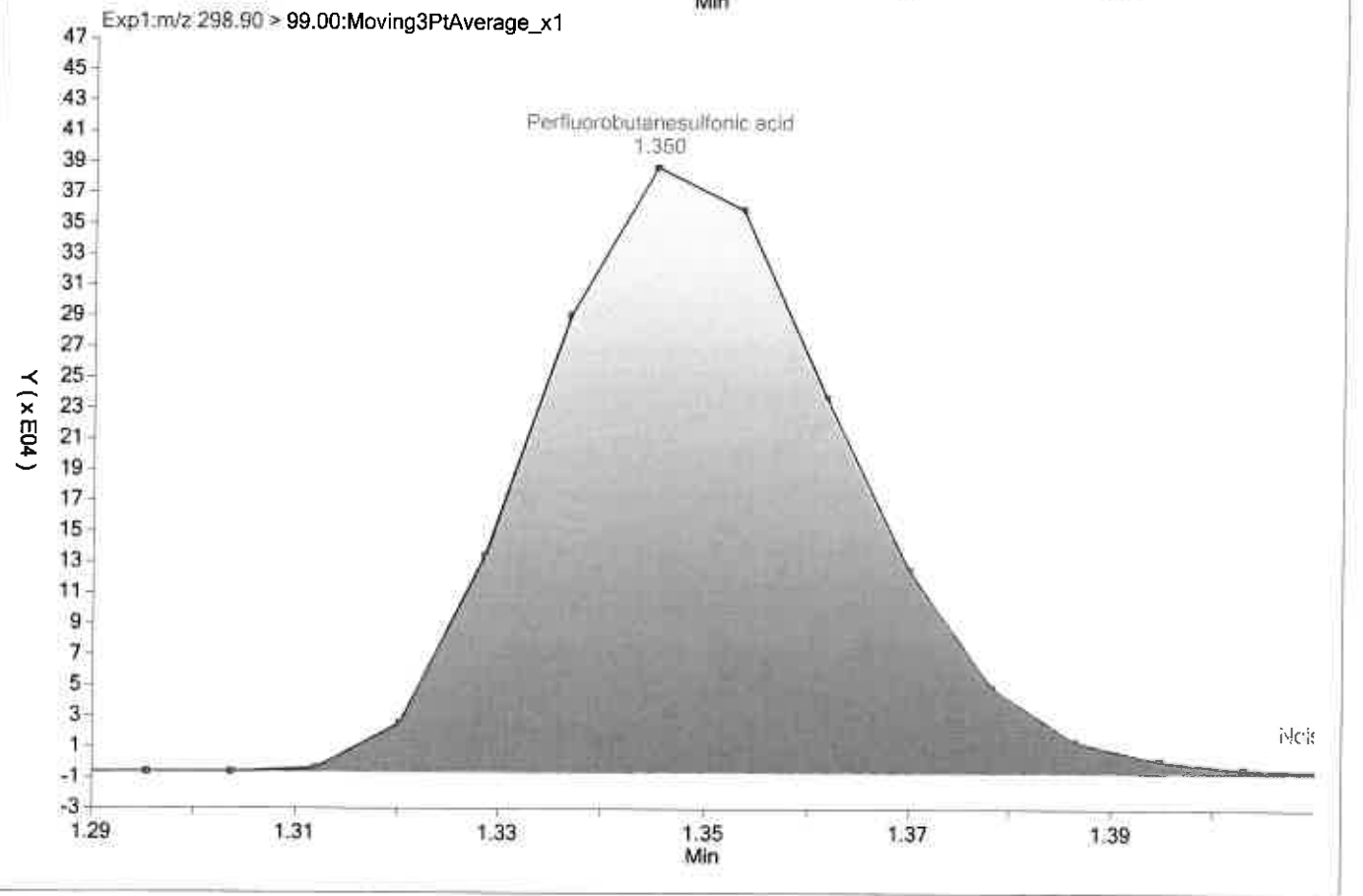
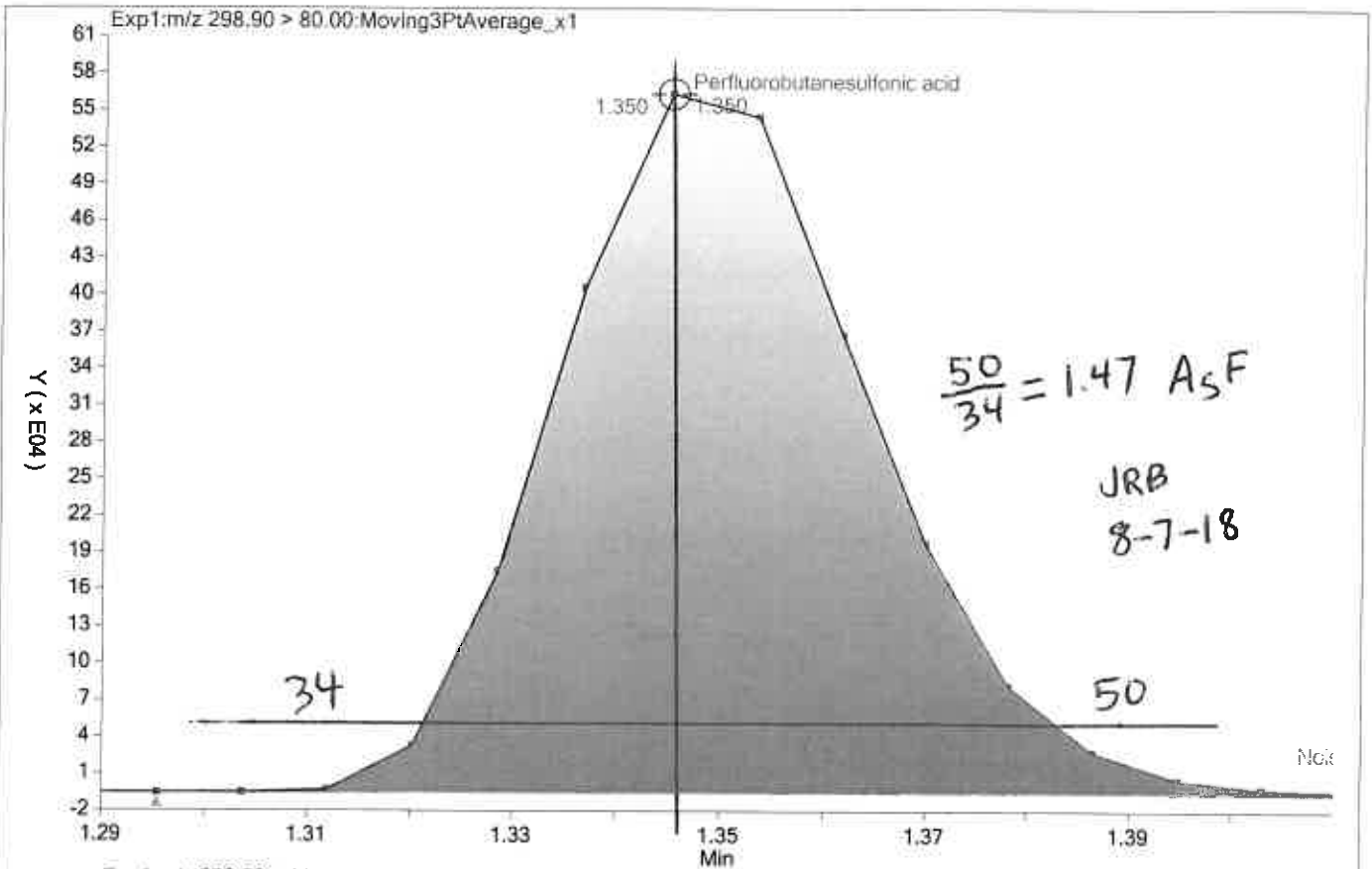
Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

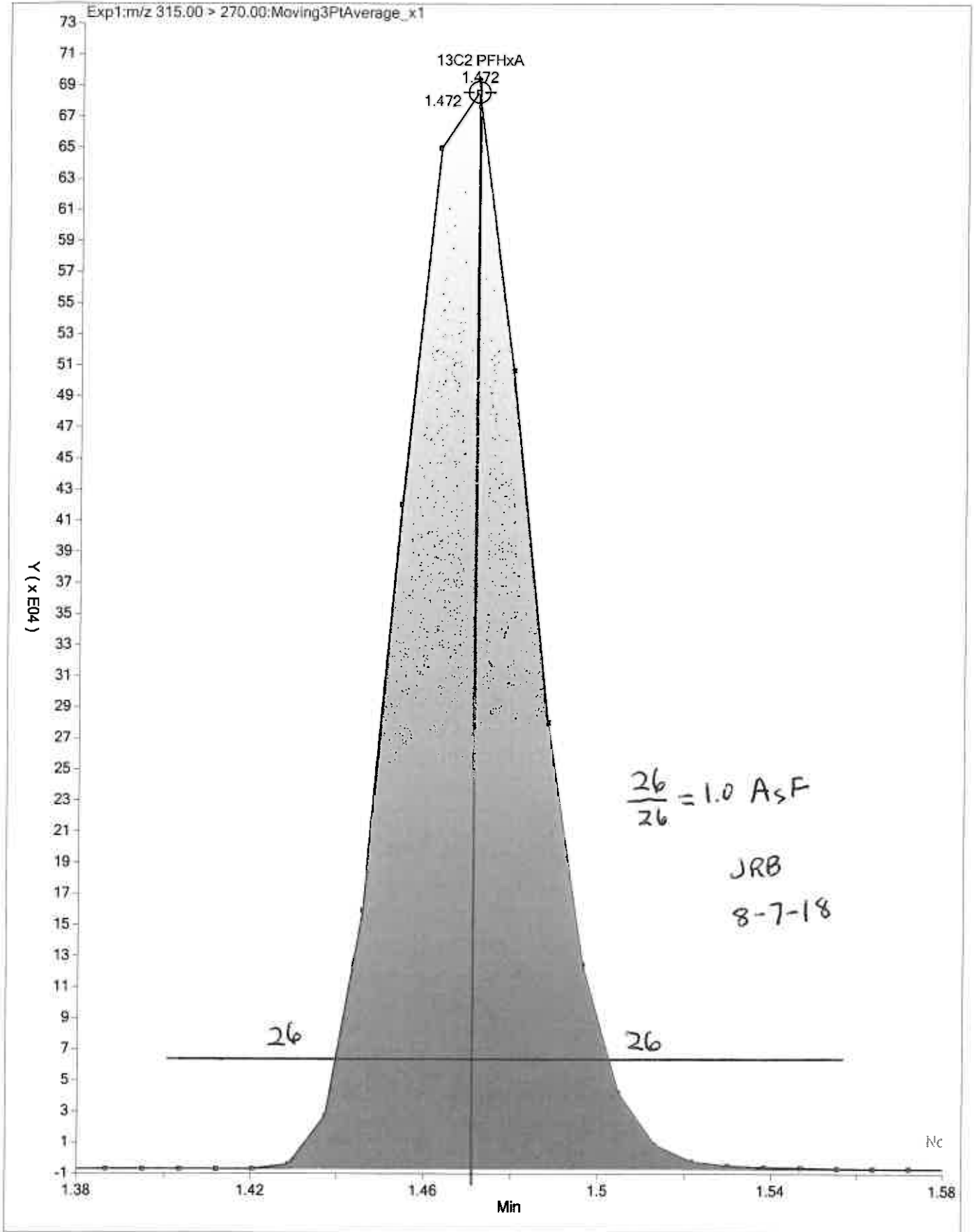
Calibration Start Date: 08/07/2018 12:44 Calibration End Date: 08/07/2018 13:07 Calibration ID: 40513

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238469/2	2018.08.07_537CURVE_003.d
Level 2	IC 320-238469/3	2018.08.07_537CURVE_004.d
Level 3	IC 320-238469/4	2018.08.07_537CURVE_005.d
Level 4	IC 320-238469/5	2018.08.07_537CURVE_006.d
Level 5	IC 320-238469/6	2018.08.07_537CURVE_007.d
Level 6	IC 320-238469/7	2018.08.07_537CURVE_008.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid (PFBS)	7.1	2.7	8.3	1.7	-5.6	-14.3	50	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	-2.5	-3.3	0.2	3.8	1.1	0.8	50	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	++++	-1.5	1.9	1.4	-1.3	-0.5		50	30	30	30	30
Perfluorooctanoic acid (PFOA)	6.9	-4.6	-1.4	1.7	-1.1	-1.5	50	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-2.8	-4.1	1.3	0.4	3.6	1.7	50	30	30	30	30	30
Perfluorononanoic acid (PFNA)	0.9	-3.2	-1.3	4.1	0.1	-0.7	50	30	30	30	30	30
13C2 PFHxA	2.0	-2.8	-2.4	1.3	0.1	1.9	30	30	30	30	30	30
13C2 PFDA	-0.5	2.0	-6.3	4.0	-0.2	1.0	30	30	30	30	30	30





FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-238469/9 Calibration Date: 08/07/2018 13:16  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537CURVE\_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.259		21.3	20.0	6.3	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.049		2.11	2.16	-2.5	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.727		6.51	6.72	-3.2	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.051		4.22	4.40	-4.1	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.042		8.39	8.79	-4.5	50.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7696		4.30	4.40	-2.4	50.0
13C2 PFHxA	Ave	1.100	1.095		9.96	10.0	-0.4	30.0
13C2 PFDA	Ave	0.8189	0.8007		9.78	10.0	-2.2	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: ICV 320-238469/11 Calibration Date: 08/07/2018 13:26  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537CURVE\_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	0.997		84.2	100	-15.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	0.9540		8.87	10.0	-11.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.603		18.1	20.2	-10.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	0.9056		16.7	20.2	-17.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	0.9574		17.7	20.2	-12.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7380		18.9	20.2	-6.4	30.0
13C2 PFHxA	Ave	1.100	1.045		9.51	10.0	-4.9	30.0
13C2 PFDA	Ave	0.8189	0.7952		9.71	10.0	-2.9	30.0



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-238604/1 Calibration Date: 08/08/2018 01:15  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537AAA\_034.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.092		125	135	-7.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.027		13.9	14.6	-4.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.794		45.7	45.4	0.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.032		28.0	29.7	-5.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.125		61.1	59.3	3.1	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7846		29.6	29.7	-0.5	30.0
13C2 PFHxA	Ave	1.100	1.089		9.90	10.0	-1.0	30.0
13C2 PFDA	Ave	0.8189	0.7984		9.75	10.0	-2.5	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-238604/11 Calibration Date: 08/08/2018 02:02  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537AAA\_044.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.288		49.0	45.0	8.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.071		4.84	4.86	-0.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.796		15.2	15.1	0.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.068		9.65	9.90	-2.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.093		19.8	19.8	0.1	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.8134		10.2	9.90	3.2	30.0
13C2 PFHxA	Ave	1.100	1.072		9.74	10.0	-2.6	30.0
13C2 PFDA	Ave	0.8189	0.8124		9.92	10.0	-0.8	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-238606/11 Calibration Date: 08/08/2018 02:02  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537AAA\_044.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.288		49.0	45.0	8.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.071		4.84	4.86	-0.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.796		15.2	15.1	0.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.068		9.65	9.90	-2.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.093		19.8	19.8	0.1	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.8134		10.2	9.90	3.2	30.0
13C2 PFHxA	Ave	1.100	1.072		9.74	10.0	-2.6	30.0
13C2 PFDA	Ave	0.8189	0.8124		9.92	10.0	-0.8	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-238606/21 Calibration Date: 08/08/2018 02:48  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537AAA\_054.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.184	1.109		126	135	-6.4	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.076	1.067		14.5	14.6	-0.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.783	1.770		45.1	45.4	-0.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.095	1.048		28.4	29.7	-4.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.092	1.118		60.7	59.3	2.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7882	0.7751		29.2	29.7	-1.7	30.0
13C2 PFHxA	Ave	1.100	1.061		9.65	10.0	-3.5	30.0
13C2 PFDA	Ave	0.8189	0.7920		9.67	10.0	-3.3	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Start Date: 08/08/2018 01:15

Analysis Batch Number: 238604 End Date: 08/08/2018 02:02

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-238604/1 CCVIS		08/08/2018 01:15	1	2018.08.07_537A AA 034.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/08/2018 01:19	1		GeminiC18 3x100 3(mm)
MB 320-237816/1-A		08/08/2018 01:24	1	2018.08.07_537A AA 036.d	GeminiC18 3x100 3(mm)
LLCS 320-237816/2-A		08/08/2018 01:29	1	2018.08.07_537A AA 037.d	GeminiC18 3x100 3(mm)
LLCSD 320-237816/3-A		08/08/2018 01:33	1	2018.08.07_537A AA 038.d	GeminiC18 3x100 3(mm)
320-41647-1		08/08/2018 01:38	1	2018.08.07_537A AA 039.d	GeminiC18 3x100 3(mm)
320-41647-2		08/08/2018 01:43	1	2018.08.07_537A AA 040.d	GeminiC18 3x100 3(mm)
320-41647-3		08/08/2018 01:48	1	2018.08.07_537A AA 041.d	GeminiC18 3x100 3(mm)
320-41647-4		08/08/2018 01:52	1	2018.08.07_537A AA 042.d	GeminiC18 3x100 3(mm)
320-41647-5		08/08/2018 01:57	1	2018.08.07_537A AA 043.d	GeminiC18 3x100 3(mm)
CCV 320-238604/11 CCVIS		08/08/2018 02:02	1	2018.08.07_537A AA 044.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Start Date: 08/08/2018 02:02

Analysis Batch Number: 238606 End Date: 08/08/2018 02:48

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-238606/11 CCVIS		08/08/2018 02:02	1	2018.08.07_537A AA 044.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/08/2018 02:06	1		GeminiC18 3x100 3(mm)
320-41647-6		08/08/2018 02:11	1	2018.08.07_537A AA 046.d	GeminiC18 3x100 3(mm)
320-41647-7		08/08/2018 02:16	1	2018.08.07_537A AA 047.d	GeminiC18 3x100 3(mm)
320-41647-8		08/08/2018 02:20	1	2018.08.07_537A AA 048.d	GeminiC18 3x100 3(mm)
320-41647-9		08/08/2018 02:25	1	2018.08.07_537A AA 049.d	GeminiC18 3x100 3(mm)
320-41647-10		08/08/2018 02:30	1	2018.08.07_537A AA 050.d	GeminiC18 3x100 3(mm)
320-41647-11		08/08/2018 02:34	1	2018.08.07_537A AA 051.d	GeminiC18 3x100 3(mm)
320-41647-12		08/08/2018 02:39	1	2018.08.07_537A AA 052.d	GeminiC18 3x100 3(mm)
320-41647-13		08/08/2018 02:44	1	2018.08.07_537A AA 053.d	GeminiC18 3x100 3(mm)
CCV 320-238606/21 CCVIS		08/08/2018 02:48	1	2018.08.07_537A AA 054.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41647-1

SDG No.: \_\_\_\_\_

Batch Number: 237816 Batch Start Date: 08/03/18 10:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 08/04/18 15:55

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00077
MB 320-237816/1		537, 537				250 mL	1.00 mL	7 SU	100 uL
LLCS 320-237816/2		537, 537				250 mL	1.00 mL	7 SU	100 uL
LLCSD 320-237816/3		537, 537				250 mL	1.00 mL	7 SU	100 uL
320-41647-A-1	NAWC-073018-RW-055	537, 537	T	313.72 g	29.03 g	284.7 mL	1.00 mL	7 SU	100 uL
320-41647-A-2	NAWC-073018-FRB-055	537, 537	T	313.17 g	28.28 g	284.9 mL	1.00 mL	7 SU	100 uL
320-41647-A-3	WGNA-073018-RW-4851	537, 537	T	305.27 g	28.37 g	276.9 mL	1.00 mL	7 SU	100 uL
320-41647-A-4	WGNA-073018-FRB-4851	537, 537	T	308.75 g	27.98 g	280.8 mL	1.00 mL	7 SU	100 uL
320-41647-A-5	WGNA-073018-RW-3604	537, 537	T	300.93 g	28.38 g	272.6 mL	1.00 mL	7 SU	100 uL
320-41647-A-6	WGNA-073018-FRB-3604	537, 537	T	295.82 g	29.83 g	266 mL	1.00 mL	7 SU	100 uL
320-41647-A-7	WGNA-073018-RW-3529	537, 537	T	294.89 g	28.18 g	266.7 mL	1.00 mL	7 SU	100 uL
320-41647-A-8	WGNA-073018-FRB-500	537, 537	T	300.32 g	28.23 g	272.1 mL	1.00 mL	7 SU	100 uL
320-41647-A-9	WGNA-073018-RW-0500	537, 537	T	312.31 g	28.38 g	283.9 mL	1.00 mL	7 SU	100 uL
320-41647-A-10	WGNA-073018-FRB-957	537, 537	T	315.37 g	28.15 g	287.2 mL	1.00 mL	7 SU	100 uL
320-41647-A-11	WGNA-073018-RW-3957	537, 537	T	283.34 g	28.97 g	254.4 mL	1.00 mL	7 SU	100 uL
320-41647-A-12	WGNA-073018-FRB-42	537, 537	T	308.39 g	28.53 g	279.9 mL	1.00 mL	7 SU	100 uL
320-41647-A-13	WGNA-073018-DUP-42	537, 537	T	281.36 g	28.13 g	253.2 mL	1.00 mL	7 SU	100 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-LSP 00032	LC537-SU 00075	AnalysisComment			
MB 320-237816/1		537, 537			100 uL	C1 ND			
LLCS 320-237816/2		537, 537		100 uL	100 uL	C1 ND			
LLCSD 320-237816/3		537, 537		100 uL	100 uL	C1 ND			
320-41647-A-1	NAWC-073018-RW-055	537, 537	T		100 uL	C1 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.: 320-41647-1

SDG No.: \_\_\_\_\_

Batch Number: 237816 Batch Start Date: 08/03/18 10:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 08/04/18 15:55

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-LSP 00032	LC537-SU 00075	AnalysisComment			
320-41647-A-2	NAWC-073018-FRB-055	537, 537	T		100 uL	C1 ND			
320-41647-A-3	WGNA-073018-RW-4851	537, 537	T		100 uL	C1 ND			
320-41647-A-4	WGNA-073018-FRB-4851	537, 537	T		100 uL	C1 ND			
320-41647-A-5	WGNA-073018-RW-3604	537, 537	T		100 uL	C1 ND			
320-41647-A-6	WGNA-073018-FRB-3604	537, 537	T		100 uL	C1 ND			
320-41647-A-7	WGNA-073018-RW-3529	537, 537	T		100 uL	C1 ND			
320-41647-A-8	WGNA-073018-FRB-3529	537, 537	T		100 uL	C1 ND			
320-41647-A-9	WGNA-073018-RW-0500	537, 537	T		100 uL	C1 ND			
320-41647-A-10	WGNA-073018-FRB-0500	537, 537	T		100 uL	C1 ND			
320-41647-A-11	WGNA-073018-RW-3957	537, 537	T		100 uL	C1 ND			
320-41647-A-12	WGNA-073018-FRB-3957	537, 537	T		100 uL	C1 ND			
320-41647-A-13	WGNA-073018-DUP-42	537, 537	T		100 uL	C1 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.: 320-41647-1

SDG No.: \_\_\_\_\_

Batch Number: 237816 Batch Start Date: 08/03/18 10:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 08/04/18 15:55

Batch Notes	
Analyst ID - Aliquot Step	SKD
Batch Comment	Client labels match TA label, KMK
Analyst ID - Concentration	SKD
Analyst ID - Final Volume Step	SKD
Internal Standard ID#	1303558
Manifold ID	E, H
Methanol ID	1313683
pH Indicator ID	0818
Pipette ID	R40536G, I46162G
Analyst ID - IS Reagent Drop	SKD
Analyst ID - IS Reagent Drop Witness	SR
Analyst ID - SU Reagent Drop	KMK
Analyst ID - SU Reagent Drop Witness	SKD
Analyst ID - TA Reagent Drop	KMK
Analyst ID - TA Reagent Drop Witness	SKD
SPE Cartridge Lot ID	6390138-02
Trizma ID	SLBR5241V
Reagent Water ID	8/2/18

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

PFAS Calibration Calculations:

**Initial Calibration**  
Instrument A8\_N

8/7/2018

PFOA

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	Reported RRF
1.98	277484	1196979	10	1.17081	1.1708
4.4	554036	1204534	10	1.04536	1.0454
9.9	1247621	1167019	10	1.07987	1.0799
19.8	2347790	1063858	10	1.11458	1.1146
29.7	3802739	1182103	10	1.08314	1.0831
39.6	5050799	1182381	10	1.07872	1.0787
Average				1.09541	1.0954
Standard Deviation				0.0430	
RSD				0.0392	
%RSD				3.92191	3.9

**Continuing Calibration**

08/08/2018 @ 1:15

PFOA

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	%D	Reported RRF	Reported %D
29.7	3547659	1157547	10	1.0319	-5.794979	1.032	-5.8

**Sample Identification**  
Compound

NAWC-073018-RW-055  
PFOA

Compound Area	396442	Average RRF	1.0954
Internal Standard Amount (ng)	10	Sample Volume(ml)	284.7
Dilution Factor	1	Volume Extract (ml)	1
Internal Standard Area	1292794	Injection Volume (µl)	1

Concentration	9.8331 ng/L
Reported Result	9.8 ng/L

**Surrogate PFHxA**

Compound Area	1376874		
Internal Standard Amount (ng)	10		
Dilution Factor	1	Volume Extract (ml)	1
Internal Standard Area	1292794	Injection Volume (µl)	1
Average RRF	1.0996		
Concentration	9.6857		
Surrogate %R	96.86	Spike amount	10

**LCS %R**

320-237816/2-A		
PFOA	Spike amount	LCS concentration
93.00	20	18.6

DODCMD_ID	INSTALLATION_ID	SDG	SITE_NAME	NORM_SITE_NAME	LOCATION_NAME	LOCATION_TYPE_DESC	COORD_X	COORD_Y	CONTRACT_ID	DO_CTO_NUMBER	CONTR_NAME	SAMPLE_NAME	SAMPLE_MATRIX_DESC	SAMPLE_TYPE_DESC	COLLECT_DATE	ANALYTICAL_METHOD	ANALYTICAL_METHOD_GRP_DESC
MID_ATLANTIC	WARMINSTER_NAWC	320-41647-1							N6247016D99008	WE04	TETRA TECH, INC.	NAWC-073018-FRB-055	Water for QC samples	Field Reagent Blank	30-Jul-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	WARMINSTER_NAWC	320-41647-1	OFFSITE_RW	SITE 00001	NAWC-RW-055	Domestic well	2711095.22	328289.627	N6247016D99008	WE04	TETRA TECH, INC.	NAWC-073018-RW-055	Ground water	Normal (Regular)	30-Jul-18	537	Perfluoroalkyl Compounds