



**Off-Base Drinking Water Sample Results,  
Combined Level 2 and Level 4 Laboratory Report,  
Electronic Data Deliverable, Data Validation Report,  
and the Sample Location Figure, SDG 320-38284-1**

*Naval Air Warfare Center Warminster  
Warminster, Pennsylvania*

August 2019

N62269\_001172  
WARMINSTER\_NAWC  
SSIC 5000-33c

**LABORATORY DATA PACKAGE, 320-38284-1, NAS WILLOW GROVE NAWC  
WARMINSTER PA**  
04/26/2018  
TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

## ANALYTICAL REPORT

Job Number: 320-38284-1

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  
4/26/2018 2:07 PM

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04/26/2018

# Table of Contents

Cover Title Page . . . . .	1
Data Summaries . . . . .	4
Definitions . . . . .	4
Case Narrative . . . . .	5
Detection Summary . . . . .	6
Client Sample Results . . . . .	7
Default Detection Limits . . . . .	10
Surrogate Summary . . . . .	11
QC Sample Results . . . . .	12
QC Association . . . . .	13
Chronicle . . . . .	14
Certification Summary . . . . .	16
Method Summary . . . . .	17
Sample Summary . . . . .	18
Manual Integration Summary . . . . .	19
Reagent Traceability . . . . .	26
COAs . . . . .	34
Organic Sample Data . . . . .	110
LCMS . . . . .	110
Method 537 DOD . . . . .	110
Method 537 DOD QC Summary . . . . .	111
Method 537 DOD Sample Data . . . . .	122
Standards Data . . . . .	188
Method 537 DOD ICAL Data . . . . .	188
Method 537 DOD CCAL Data . . . . .	232
Raw QC Data . . . . .	286

# Table of Contents

Method 537 DOD Blank Data .....	286
Method 537 DOD LCS/LCSD Data .....	291
Method 537 DOD Run Logs .....	305
Method 537 DOD Prep Data .....	310
Shipping and Receiving Documents .....	312
Client Chain of Custody .....	313
Sample Receipt Checklist .....	314

# Definitions/Glossary

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

TestAmerica Job ID: 320-38284-1

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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**  
**320-38284-1**

**Receipt**

The samples were received on 4/18/2018 9:05 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.9° 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 320-218953.

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: 320-38284-1

## Client Sample ID: WGNA-041718-DUP-32

Lab Sample ID: 320-38284-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	16	J M	40	6.7	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	22		20	2.8	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	7.7	J	30	5.4	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	5.9	J	9.9	1.9	ng/L	1		537	Total/NA

## Client Sample ID: NAWC-041718-RW-278

Lab Sample ID: 320-38284-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	15	J M	41	6.9	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	22		20	2.9	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	8.7	J	10	1.9	ng/L	1		537	Total/NA

## Client Sample ID: NAWC-041718-FRB-278

Lab Sample ID: 320-38284-3

No Detections.

## Client Sample ID: NAWC-041718-RW-360

Lab Sample ID: 320-38284-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	17	J M	41	6.9	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	9.3	J	20	2.9	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.6	J M	10	1.9	ng/L	1		537	Total/NA

## Client Sample ID: NAWC-041718-FRB-360

Lab Sample ID: 320-38284-5

No Detections.

## Client Sample ID: NAWC-041718-RW-150

Lab Sample ID: 320-38284-6

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	7.9	J M	40	6.7	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	17	J	20	2.8	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	8.1	J	9.9	1.9	ng/L	1		537	Total/NA

## Client Sample ID: NAWC-041718-FRB-150

Lab Sample ID: 320-38284-7

No Detections.

## Client Sample ID: NAWC-041718-RW-179

Lab Sample ID: 320-38284-8

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	15	J M	40	6.8	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	22		20	2.8	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	7.8	J	30	5.5	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.5	J	10	1.9	ng/L	1		537	Total/NA

## Client Sample ID: NAWC-041718-FRB-179

Lab Sample ID: 320-38284-9

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento



# Client Sample Results

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

TestAmerica Job ID: 320-38284-1

**Client Sample ID: WGNA-041718-DUP-32**

**Lab Sample ID: 320-38284-1**

Date Collected: 04/17/18 07:00

Matrix: Water

Date Received: 04/18/18 09:05

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	J M	40	6.7	ng/L		04/20/18 09:26	04/23/18 22:33	1
Perfluorooctanoic acid (PFOA)	22		20	2.8	ng/L		04/20/18 09:26	04/23/18 22:33	1
Perfluorononanoic acid (PFNA)	20	U M	24	7.9	ng/L		04/20/18 09:26	04/23/18 22:33	1
Perfluorohexanesulfonic acid (PFHxS)	7.7	J	30	5.4	ng/L		04/20/18 09:26	04/23/18 22:33	1
Perfluoroheptanoic acid (PFHpA)	5.9	J	9.9	1.9	ng/L		04/20/18 09:26	04/23/18 22:33	1
Perfluorobutanesulfonic acid (PFBS)	36	U	89	16	ng/L		04/20/18 09:26	04/23/18 22:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	90		70 - 130	04/20/18 09:26	04/23/18 22:33	1
13C2 PFDA	90		70 - 130	04/20/18 09:26	04/23/18 22:33	1

**Client Sample ID: NAWC-041718-RW-278**

**Lab Sample ID: 320-38284-2**

Date Collected: 04/17/18 08:10

Matrix: Water

Date Received: 04/18/18 09:05

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	J M	41	6.9	ng/L		04/20/18 09:26	04/23/18 22:37	1
Perfluorooctanoic acid (PFOA)	22		20	2.9	ng/L		04/20/18 09:26	04/23/18 22:37	1
Perfluorononanoic acid (PFNA)	20	U M	24	8.2	ng/L		04/20/18 09:26	04/23/18 22:37	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	31	5.6	ng/L		04/20/18 09:26	04/23/18 22:37	1
Perfluoroheptanoic acid (PFHpA)	8.7	J	10	1.9	ng/L		04/20/18 09:26	04/23/18 22:37	1
Perfluorobutanesulfonic acid (PFBS)	37	U M	92	16	ng/L		04/20/18 09:26	04/23/18 22:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	93		70 - 130	04/20/18 09:26	04/23/18 22:37	1
13C2 PFDA	89		70 - 130	04/20/18 09:26	04/23/18 22:37	1

**Client Sample ID: NAWC-041718-FRB-278**

**Lab Sample ID: 320-38284-3**

Date Collected: 04/17/18 08:05

Matrix: Water

Date Received: 04/18/18 09:05

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		04/20/18 09:26	04/23/18 22:42	1
Perfluorooctanoic acid (PFOA)	8.1	U	20	2.8	ng/L		04/20/18 09:26	04/23/18 22:42	1
Perfluorononanoic acid (PFNA)	20	U	24	8.1	ng/L		04/20/18 09:26	04/23/18 22:42	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		04/20/18 09:26	04/23/18 22:42	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		04/20/18 09:26	04/23/18 22:42	1
Perfluorobutanesulfonic acid (PFBS)	36	U	91	16	ng/L		04/20/18 09:26	04/23/18 22:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	96		70 - 130	04/20/18 09:26	04/23/18 22:42	1
13C2 PFDA	90		70 - 130	04/20/18 09:26	04/23/18 22:42	1

# Client Sample Results

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

TestAmerica Job ID: 320-38284-1

**Client Sample ID: NAWC-041718-RW-360**

**Lab Sample ID: 320-38284-4**

Date Collected: 04/17/18 08:25

Matrix: Water

Date Received: 04/18/18 09:05

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	17	J M	41	6.9	ng/L		04/20/18 09:26	04/23/18 22:47	1
Perfluorooctanoic acid (PFOA)	9.3	J	20	2.9	ng/L		04/20/18 09:26	04/23/18 22:47	1
Perfluorononanoic acid (PFNA)	20	U M	25	8.2	ng/L		04/20/18 09:26	04/23/18 22:47	1
Perfluorohexanesulfonic acid (PFHxS)	12	U M	31	5.6	ng/L		04/20/18 09:26	04/23/18 22:47	1
Perfluoroheptanoic acid (PFHpA)	2.6	J M	10	1.9	ng/L		04/20/18 09:26	04/23/18 22:47	1
Perfluorobutanesulfonic acid (PFBS)	37	U	92	16	ng/L		04/20/18 09:26	04/23/18 22:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	95		70 - 130	04/20/18 09:26	04/23/18 22:47	1
13C2 PFDA	89		70 - 130	04/20/18 09:26	04/23/18 22:47	1

**Client Sample ID: NAWC-041718-FRB-360**

**Lab Sample ID: 320-38284-5**

Date Collected: 04/17/18 08:20

Matrix: Water

Date Received: 04/18/18 09:05

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		04/20/18 09:26	04/23/18 22:51	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		04/20/18 09:26	04/23/18 22:51	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		04/20/18 09:26	04/23/18 22:51	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		04/20/18 09:26	04/23/18 22:51	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	9.9	1.9	ng/L		04/20/18 09:26	04/23/18 22:51	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		04/20/18 09:26	04/23/18 22:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	90		70 - 130	04/20/18 09:26	04/23/18 22:51	1
13C2 PFDA	85		70 - 130	04/20/18 09:26	04/23/18 22:51	1

**Client Sample ID: NAWC-041718-RW-150**

**Lab Sample ID: 320-38284-6**

Date Collected: 04/17/18 09:10

Matrix: Water

Date Received: 04/18/18 09:05

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	7.9	J M	40	6.7	ng/L		04/20/18 09:26	04/23/18 22:56	1
Perfluorooctanoic acid (PFOA)	17	J	20	2.8	ng/L		04/20/18 09:26	04/23/18 22:56	1
Perfluorononanoic acid (PFNA)	20	U M	24	7.9	ng/L		04/20/18 09:26	04/23/18 22:56	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.4	ng/L		04/20/18 09:26	04/23/18 22:56	1
Perfluoroheptanoic acid (PFHpA)	8.1	J	9.9	1.9	ng/L		04/20/18 09:26	04/23/18 22:56	1
Perfluorobutanesulfonic acid (PFBS)	36	U M	89	16	ng/L		04/20/18 09:26	04/23/18 22:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	100		70 - 130	04/20/18 09:26	04/23/18 22:56	1
13C2 PFDA	95		70 - 130	04/20/18 09:26	04/23/18 22:56	1

# Client Sample Results

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

TestAmerica Job ID: 320-38284-1

**Client Sample ID: NAWC-041718-FRB-150**

**Lab Sample ID: 320-38284-7**

**Date Collected: 04/17/18 09:05**

**Matrix: Water**

**Date Received: 04/18/18 09:05**

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.7	ng/L		04/20/18 09:26	04/23/18 23:01	1
Perfluorooctanoic acid (PFOA)	7.9	U	20	2.8	ng/L		04/20/18 09:26	04/23/18 23:01	1
Perfluorononanoic acid (PFNA)	20	U	24	7.9	ng/L		04/20/18 09:26	04/23/18 23:01	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.4	ng/L		04/20/18 09:26	04/23/18 23:01	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	9.9	1.9	ng/L		04/20/18 09:26	04/23/18 23:01	1
Perfluorobutanesulfonic acid (PFBS)	36	U	89	16	ng/L		04/20/18 09:26	04/23/18 23:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	96		70 - 130	04/20/18 09:26	04/23/18 23:01	1
13C2 PFDA	93		70 - 130	04/20/18 09:26	04/23/18 23:01	1

**Client Sample ID: NAWC-041718-RW-179**

**Lab Sample ID: 320-38284-8**

**Date Collected: 04/17/18 10:10**

**Matrix: Water**

**Date Received: 04/18/18 09:05**

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	J M	40	6.8	ng/L		04/20/18 09:26	04/23/18 23:15	1
Perfluorooctanoic acid (PFOA)	22		20	2.8	ng/L		04/20/18 09:26	04/23/18 23:15	1
Perfluorononanoic acid (PFNA)	20	U M	24	8.1	ng/L		04/20/18 09:26	04/23/18 23:15	1
Perfluorohexanesulfonic acid (PFHxS)	7.8	J	30	5.5	ng/L		04/20/18 09:26	04/23/18 23:15	1
Perfluoroheptanoic acid (PFHpA)	6.5	J	10	1.9	ng/L		04/20/18 09:26	04/23/18 23:15	1
Perfluorobutanesulfonic acid (PFBS)	36	U	91	16	ng/L		04/20/18 09:26	04/23/18 23:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	103		70 - 130	04/20/18 09:26	04/23/18 23:15	1
13C2 PFDA	82		70 - 130	04/20/18 09:26	04/23/18 23:15	1

**Client Sample ID: NAWC-041718-FRB-179**

**Lab Sample ID: 320-38284-9**

**Date Collected: 04/17/18 10:05**

**Matrix: Water**

**Date Received: 04/18/18 09:05**

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		04/20/18 09:26	04/23/18 23:19	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		04/20/18 09:26	04/23/18 23:19	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		04/20/18 09:26	04/23/18 23:19	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		04/20/18 09:26	04/23/18 23:19	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		04/20/18 09:26	04/23/18 23:19	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		04/20/18 09:26	04/23/18 23:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	95		70 - 130	04/20/18 09:26	04/23/18 23:19	1
13C2 PFDA	94		70 - 130	04/20/18 09:26	04/23/18 23:19	1

# Default Detection Limits

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

TestAmerica Job ID: 320-38284-1

## 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: 320-38284-1

**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)
320-38284-1	WGNA-041718-DUP-32	90	90
320-38284-2	NAWC-041718-RW-278	93	89
320-38284-3	NAWC-041718-FRB-278	96	90
320-38284-4	NAWC-041718-RW-360	95	89
320-38284-5	NAWC-041718-FRB-360	90	85
320-38284-6	NAWC-041718-RW-150	100	95
320-38284-7	NAWC-041718-FRB-150	96	93
320-38284-8	NAWC-041718-RW-179	103	82
320-38284-9	NAWC-041718-FRB-179	95	94
LCS 320-218953/2-A	Lab Control Sample	115	110
LCSD 320-218953/3-A	Lab Control Sample Dup	94	94
MB 320-218953/1-A	Method Blank	96	93

### 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: 320-38284-1

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

**Lab Sample ID: MB 320-218953/1-A**  
**Matrix: Water**  
**Analysis Batch: 219464**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 218953**

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		04/20/18 09:26	04/23/18 21:27	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		04/20/18 09:26	04/23/18 21:27	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		04/20/18 09:26	04/23/18 21:27	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		04/20/18 09:26	04/23/18 21:27	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		04/20/18 09:26	04/23/18 21:27	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		04/20/18 09:26	04/23/18 21:27	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C2 PFHxA	96		70 - 130	04/20/18 09:26	04/23/18 21:27	1
13C2 PFDA	93		70 - 130	04/20/18 09:26	04/23/18 21:27	1

**Lab Sample ID: LCS 320-218953/2-A**  
**Matrix: Water**  
**Analysis Batch: 219464**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 218953**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanoic acid (PFOA)	110	124		ng/L		113	70 - 130
Perfluorononanoic acid (PFNA)	110	117		ng/L		106	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	168	196		ng/L		116	70 - 130
Perfluoroheptanoic acid (PFHpA)	54.0	61.0		ng/L		113	70 - 130
Perfluorobutanesulfonic acid (PFBS)	500	570		ng/L		114	70 - 130

Surrogate	LCS	LCS	Limits
	%Recovery	Qualifier	
13C2 PFHxA	115		70 - 130
13C2 PFDA	110		70 - 130

**Lab Sample ID: LCSD 320-218953/3-A**  
**Matrix: Water**  
**Analysis Batch: 219464**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 218953**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	110	101		ng/L		92	70 - 130	20	30
Perfluorononanoic acid (PFNA)	110	98.5		ng/L		90	70 - 130	17	30
Perfluorohexanesulfonic acid (PFHxS)	168	164		ng/L		97	70 - 130	18	30
Perfluoroheptanoic acid (PFHpA)	54.0	50.0		ng/L		93	70 - 130	20	30
Perfluorobutanesulfonic acid (PFBS)	500	445		ng/L		89	70 - 130	25	30

Surrogate	LCSD	LCSD	Limits
	%Recovery	Qualifier	
13C2 PFHxA	94		70 - 130
13C2 PFDA	94		70 - 130

# QC Association Summary

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

TestAmerica Job ID: 320-38284-1

## LCMS

### Prep Batch: 218953

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-38284-1	WGNA-041718-DUP-32	Total/NA	Water	537	
320-38284-2	NAWC-041718-RW-278	Total/NA	Water	537	
320-38284-3	NAWC-041718-FRB-278	Total/NA	Water	537	
320-38284-4	NAWC-041718-RW-360	Total/NA	Water	537	
320-38284-5	NAWC-041718-FRB-360	Total/NA	Water	537	
320-38284-6	NAWC-041718-RW-150	Total/NA	Water	537	
320-38284-7	NAWC-041718-FRB-150	Total/NA	Water	537	
320-38284-8	NAWC-041718-RW-179	Total/NA	Water	537	
320-38284-9	NAWC-041718-FRB-179	Total/NA	Water	537	
MB 320-218953/1-A	Method Blank	Total/NA	Water	537	
LCS 320-218953/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 320-218953/3-A	Lab Control Sample Dup	Total/NA	Water	537	

### Analysis Batch: 219464

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-218953/1-A	Method Blank	Total/NA	Water	537	218953
LCS 320-218953/2-A	Lab Control Sample	Total/NA	Water	537	218953
LCSD 320-218953/3-A	Lab Control Sample Dup	Total/NA	Water	537	218953

### Analysis Batch: 219466

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-38284-1	WGNA-041718-DUP-32	Total/NA	Water	537	218953
320-38284-2	NAWC-041718-RW-278	Total/NA	Water	537	218953
320-38284-3	NAWC-041718-FRB-278	Total/NA	Water	537	218953
320-38284-4	NAWC-041718-RW-360	Total/NA	Water	537	218953
320-38284-5	NAWC-041718-FRB-360	Total/NA	Water	537	218953
320-38284-6	NAWC-041718-RW-150	Total/NA	Water	537	218953
320-38284-7	NAWC-041718-FRB-150	Total/NA	Water	537	218953

### Analysis Batch: 219468

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-38284-8	NAWC-041718-RW-179	Total/NA	Water	537	218953
320-38284-9	NAWC-041718-FRB-179	Total/NA	Water	537	218953

# Lab Chronicle

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

TestAmerica Job ID: 320-38284-1

## Client Sample ID: WGNA-041718-DUP-32

Date Collected: 04/17/18 07:00

Date Received: 04/18/18 09:05

## Lab Sample ID: 320-38284-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			218953	04/20/18 09:26	KMK	TAL SAC
Total/NA	Analysis	537		1	219466	04/23/18 22:33	JRB	TAL SAC

## Client Sample ID: NAWC-041718-RW-278

Date Collected: 04/17/18 08:10

Date Received: 04/18/18 09:05

## Lab Sample ID: 320-38284-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			218953	04/20/18 09:26	KMK	TAL SAC
Total/NA	Analysis	537		1	219466	04/23/18 22:37	JRB	TAL SAC

## Client Sample ID: NAWC-041718-FRB-278

Date Collected: 04/17/18 08:05

Date Received: 04/18/18 09:05

## Lab Sample ID: 320-38284-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			218953	04/20/18 09:26	KMK	TAL SAC
Total/NA	Analysis	537		1	219466	04/23/18 22:42	JRB	TAL SAC

## Client Sample ID: NAWC-041718-RW-360

Date Collected: 04/17/18 08:25

Date Received: 04/18/18 09:05

## Lab Sample ID: 320-38284-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			218953	04/20/18 09:26	KMK	TAL SAC
Total/NA	Analysis	537		1	219466	04/23/18 22:47	JRB	TAL SAC

## Client Sample ID: NAWC-041718-FRB-360

Date Collected: 04/17/18 08:20

Date Received: 04/18/18 09:05

## Lab Sample ID: 320-38284-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			218953	04/20/18 09:26	KMK	TAL SAC
Total/NA	Analysis	537		1	219466	04/23/18 22:51	JRB	TAL SAC

## Client Sample ID: NAWC-041718-RW-150

Date Collected: 04/17/18 09:10

Date Received: 04/18/18 09:05

## Lab Sample ID: 320-38284-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			218953	04/20/18 09:26	KMK	TAL SAC
Total/NA	Analysis	537		1	219466	04/23/18 22:56	JRB	TAL SAC

TestAmerica Sacramento



# Lab Chronicle

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

TestAmerica Job ID: 320-38284-1

## Client Sample ID: NAWC-041718-FRB-150

Date Collected: 04/17/18 09:05

Date Received: 04/18/18 09:05

## Lab Sample ID: 320-38284-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			218953	04/20/18 09:26	KMK	TAL SAC
Total/NA	Analysis	537		1	219466	04/23/18 23:01	JRB	TAL SAC

## Client Sample ID: NAWC-041718-RW-179

Date Collected: 04/17/18 10:10

Date Received: 04/18/18 09:05

## Lab Sample ID: 320-38284-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			218953	04/20/18 09:26	KMK	TAL SAC
Total/NA	Analysis	537		1	219468	04/23/18 23:15	JRB	TAL SAC

## Client Sample ID: NAWC-041718-FRB-179

Date Collected: 04/17/18 10:05

Date Received: 04/18/18 09:05

## Lab Sample ID: 320-38284-9

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			218953	04/20/18 09:26	KMK	TAL SAC
Total/NA	Analysis	537		1	219468	04/23/18 23:19	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: 320-38284-1

## 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
Arizona	State Program	9	AZ0708	08-11-18
Arkansas DEQ	State Program	6	88-0691	06-17-18
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-18
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-18
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
L-A-B	DoD ELAP		L2468	01-20-21
Louisiana	NELAP	6	30612	06-30-18
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-18
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-18
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	05-31-18
US Fish & Wildlife	Federal		LE148388-0	07-31-18
USDA	Federal		P330-11-00436	01-17-21
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-18
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: 320-38284-1

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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: 320-38284-1

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

<b>Lab Sample ID</b>	<b>Client Sample ID</b>	<b>Matrix</b>	<b>Collected</b>	<b>Received</b>
320-38284-1	WGNA-041718-DUP-32	Water	04/17/18 07:00	04/18/18 09:05
320-38284-2	NAWC-041718-RW-278	Water	04/17/18 08:10	04/18/18 09:05
320-38284-3	NAWC-041718-FRB-278	Water	04/17/18 08:05	04/18/18 09:05
320-38284-4	NAWC-041718-RW-360	Water	04/17/18 08:25	04/18/18 09:05
320-38284-5	NAWC-041718-FRB-360	Water	04/17/18 08:20	04/18/18 09:05
320-38284-6	NAWC-041718-RW-150	Water	04/17/18 09:10	04/18/18 09:05
320-38284-7	NAWC-041718-FRB-150	Water	04/17/18 09:05	04/18/18 09:05
320-38284-8	NAWC-041718-RW-179	Water	04/17/18 10:10	04/18/18 09:05
320-38284-9	NAWC-041718-FRB-179	Water	04/17/18 10:05	04/18/18 09:05

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Instrument ID: A8\_N Analysis Batch Number: 217453

Lab Sample ID: IC 320-217453/3 Client Sample ID: \_\_\_\_\_

Date Analyzed: 04/11/18 11:45 Lab File ID: 2018.04.11\_537ICALB\_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Peak assignment corrected	westendor fc	04/11/18 12:31

Lab Sample ID: IC 320-217453/4 Client Sample ID: \_\_\_\_\_

Date Analyzed: 04/11/18 11:50 Lab File ID: 2018.04.11\_537ICALB\_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Peak assignment corrected	westendor fc	04/11/18 12:31

Lab Sample ID: IC 320-217453/5 Client Sample ID: \_\_\_\_\_

Date Analyzed: 04/11/18 11:55 Lab File ID: 2018.04.11\_537ICALB\_006.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.11	Peak assignment corrected	westendor fc	04/11/18 12:31

Lab Sample ID: IC 320-217453/6 ICISAV Client Sample ID: \_\_\_\_\_

Date Analyzed: 04/11/18 11:59 Lab File ID: 2018.04.11\_537ICALB\_007.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Peak assignment corrected	westendor fc	04/11/18 12:31

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Instrument ID: A8\_N Analysis Batch Number: 217453

Lab Sample ID: IC 320-217453/7 Client Sample ID: \_\_\_\_\_

Date Analyzed: 04/11/18 12:04 Lab File ID: 2018.04.11\_537ICALB\_008.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Peak assignment corrected	westendor fc	04/11/18 12:31

Lab Sample ID: IC 320-217453/8 Client Sample ID: \_\_\_\_\_

Date Analyzed: 04/11/18 12:09 Lab File ID: 2018.04.11\_537ICALB\_009.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.09	Peak assignment corrected	westendor fc	04/11/18 12:31

Lab Sample ID: CCVL 320-217453/10 Client Sample ID: \_\_\_\_\_

Date Analyzed: 04/11/18 12:18 Lab File ID: 2018.04.11\_537ICALB\_011.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Peak assignment corrected	westendor fc	04/11/18 12:32

Lab Sample ID: ICV 320-217453/12 Client Sample ID: \_\_\_\_\_

Date Analyzed: 04/11/18 12:27 Lab File ID: 2018.04.11\_537ICALB\_013.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Peak assignment corrected	westendor fc	04/11/18 12:35

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Instrument ID: A8\_N Analysis Batch Number: 219315

Lab Sample ID: CCVL 320-219315/1 Client Sample ID: \_\_\_\_\_

Date Analyzed: 04/23/18 12:21 Lab File ID: 2018.04.23\_537A\_003.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.13	Peak assignment corrected	barnettj	04/23/18 13:03

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Instrument ID: A8\_N Analysis Batch Number: 219464

Lab Sample ID: CCV 320-219464/17 CCVIS Client Sample ID: \_\_\_\_\_

Date Analyzed: 04/23/18 21:18 Lab File ID: 2018.04.23\_537C\_049.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.11	Peak assignment corrected	barnettj	04/24/18 10:53

Lab Sample ID: LCS 320-218953/2-A Client Sample ID: \_\_\_\_\_

Date Analyzed: 04/23/18 21:32 Lab File ID: 2018.04.23\_537C\_052.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.11	Peak assignment corrected	barnettj	04/24/18 11:03

Lab Sample ID: LCSD 320-218953/3-A Client Sample ID: \_\_\_\_\_

Date Analyzed: 04/23/18 21:37 Lab File ID: 2018.04.23\_537C\_053.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Peak assignment corrected	barnettj	04/24/18 11:04

Lab Sample ID: CCV 320-219464/28 CCVIS Client Sample ID: \_\_\_\_\_

Date Analyzed: 04/23/18 22:09 Lab File ID: 2018.04.23\_537C\_060.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Peak assignment corrected	barnettj	04/24/18 10:53



LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Instrument ID: A8\_N Analysis Batch Number: 219466

Lab Sample ID: CCV 320-219466/28 CCVIS Client Sample ID: \_\_\_\_\_

Date Analyzed: 04/23/18 22:09 Lab File ID: 2018.04.23\_537C\_060.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Peak assignment corrected	barnettj	04/24/18 10:53

Lab Sample ID: 320-38284-1 Client Sample ID: WGNA-041718-DUP-32

Date Analyzed: 04/23/18 22:33 Lab File ID: 2018.04.23\_537C\_065.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Peak assignment corrected	barnettj	04/24/18 11:07
Perfluorononanoic acid (PFNA)	2.11	Incomplete Integration	barnettj	04/24/18 11:07

Lab Sample ID: 320-38284-2 Client Sample ID: NAWC-041718-RW-278

Date Analyzed: 04/23/18 22:37 Lab File ID: 2018.04.23\_537C\_066.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.39	Peak assignment corrected	barnettj	04/24/18 11:07
Perfluorooctanesulfonic acid (PFOS)	2.11	Missed Peak	barnettj	04/24/18 11:08
Perfluorononanoic acid (PFNA)	2.12	Missed Peak	barnettj	04/24/18 11:08

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Instrument ID: A8\_N Analysis Batch Number: 219466

Lab Sample ID: 320-38284-4 Client Sample ID: NAWC-041718-RW-360

Date Analyzed: 04/23/18 22:47 Lab File ID: 2018.04.23\_537C\_068.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	1.66	Missed Peak	barnettj	04/24/18 11:09
Perfluorohexanesulfonic acid (PFHxS)	1.66	Missed Peak	barnettj	04/24/18 11:09
Perfluorooctanesulfonic acid (PFOS)	2.09	Peak assignment corrected	barnettj	04/24/18 11:08
Perfluorononanoic acid (PFNA)	2.11	Missed Peak	barnettj	04/24/18 11:09

Lab Sample ID: 320-38284-6 Client Sample ID: NAWC-041718-RW-150

Date Analyzed: 04/23/18 22:56 Lab File ID: 2018.04.23\_537C\_070.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.39	Missed Peak	barnettj	04/24/18 11:10
Perfluorooctanesulfonic acid (PFOS)	2.10	Peak assignment corrected	barnettj	04/24/18 11:09
Perfluorononanoic acid (PFNA)	2.11	Incomplete Integration	barnettj	04/24/18 11:10

Lab Sample ID: CCV 320-219466/40 CCVIS Client Sample ID: \_\_\_\_\_

Date Analyzed: 04/23/18 23:05 Lab File ID: 2018.04.23\_537C\_072.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Peak assignment corrected	barnettj	04/24/18 10:53

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Instrument ID: A8\_N Analysis Batch Number: 219468

Lab Sample ID: CCV 320-219468/40 CCVIS Client Sample ID: \_\_\_\_\_

Date Analyzed: 04/23/18 23:05 Lab File ID: 2018.04.23\_537C\_072.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Peak assignment corrected	barnettj	04/24/18 10:53

Lab Sample ID: 320-38284-8 Client Sample ID: NAWC-041718-RW-179

Date Analyzed: 04/23/18 23:15 Lab File ID: 2018.04.23\_537C\_074.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.11	Peak assignment corrected	barnettj	04/24/18 11:10
Perfluorononanoic acid (PFNA)	2.12	Missed Peak	barnettj	04/24/18 11:11

Lab Sample ID: CCV 320-219468/44 CCVIS Client Sample ID: \_\_\_\_\_

Date Analyzed: 04/23/18 23:24 Lab File ID: 2018.04.23\_537C\_076.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Peak assignment corrected	barnettj	04/24/18 10:53

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-38284-1

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

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
<b>LC537-HSP_00029</b>	10/06/18	04/06/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid (PFBS)	1250.86 ng/mL
					LCPFHpA_00009	81 uL	Perfluoroheptanoic acid (PFHpA)	135 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluorohexane Sulfonate	420.117 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	420.117 ng/mL
					LCPFNA_00009	165 uL	Perfluorononanoic acid (PFNA)	275 ng/mL
					LCPFOA_00010	165 uL	Perfluorooctanoic acid (PFOA)	275 ng/mL
		LCPFOS-br_00005	355 uL	Perfluorooctanesulfonic acid (PFOS)	549.067 ng/mL			
.LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL	
.LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL	
.LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117		(Purchased Reagent)		Perfluorohexane Sulfonate	45.5 ug/mL	
						Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL	
.LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL	
.LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL	
.LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL	
<b>LC537-ICV_00030</b>	07/30/18	02/15/18	MeOH/H2O, Lot 067374	10 mL	LC537-IS_00059	1000 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
.LC537-IS_00059	07/30/18	01/30/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL	
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL	
<b>LC537-ICV_00030</b>	07/30/18	02/15/18	MeOH/H2O, Lot 067374	10 mL	LC537-SU_00059	1000 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
					LC537ICIM2_00001	400 uL	Perfluorobutanesulfonic acid (PFBS)	100.092 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	20.1619 ng/mL
							Perfluorononanoic acid (PFNA)	20.1641 ng/mL
							Perfluorooctanoic acid (PFOA)	20.167 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	20.1702 ng/mL
.LC537-SU_00059	07/30/18	01/30/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL	
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFHxA	50 ug/mL	
.LC537ICIM2_00001	08/15/18	02/15/18	Methanol, Lot 090285	10 mL	LC537ICIM_00020	0.5 mL	Perfluorobutanesulfonic acid (PFBS)	2.5023 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.25 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-38284-1

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

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	0.504047 ug/mL
							Perfluorononanoic acid (PFNA)	0.504103 ug/mL
							Perfluorooctanoic acid (PFOA)	0.504176 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.504255 ug/mL
..LC537ICIM_00020	08/15/18	02/15/18	Methanol, Lot 090285	25 mL	LC537-PFBS2_00009	0.625 mL	Perfluorobutanesulfonic acid (PFBS)	50.0459 ug/mL
					LC537-PFHpa2_00012	0.0625 mL	Perfluoroheptanoic acid (PFHpA)	5 ug/mL
					LC537-PFHxS2_00009	0.126 mL	Perfluorohexanesulfonic acid (PFHxS)	10.0809 ug/mL
					LC537-PFNA2_00010	0.126 mL	Perfluorononanoic acid (PFNA)	10.0821 ug/mL
					LC537-PFOA2_00011	0.126 mL	Perfluorooctanoic acid (PFOA)	10.0835 ug/mL
					LC537-PFOS2_00011	0.126 mL	Perfluorooctanesulfonic acid (PFOS)	10.0851 ug/mL
...LC537-PFBS2_00009	08/15/18	02/15/18	Methanol, Lot 090285	17.1 mL	LC537_PFBS2_00002	0.0343 g	Perfluorobutanesulfonic acid (PFBS)	2001.84 ug/mL
....LC537_PFBS2_00002	09/08/22	Santa Cruz Biotechnology, Lot F0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	0.998 g/g
..LC537-PFHpa2_00012	08/15/18	02/15/18	Methanol, Lot 09092	23.95 mL	LC537_PFHpa2_00002	0.0479 g	Perfluoroheptanoic acid (PFHpA)	2000 ug/mL
....LC537_PFHpa2_00002	06/13/22	Afla Aesar, Lot 10200390			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	1 g/g
..LC537-PFHxS2_00009	08/15/18	02/15/18	Methanol, Lot 090285	25.87 mL	LC537_PFHxS2_00002	0.0569 g	Perfluorohexanesulfonic acid (PFHxS)	2000.19 ug/mL
....LC537_PFHxS2_00002	06/08/22	Santa Cruz Biotechnology, Lot G2516			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
..LC537-PFNA2_00010	08/15/18	02/15/18	Methanol, Lot 090285	16.58 mL	LC537 PFNA2_00002	0.0333 g	Perfluorononanoic acid (PFNA)	2000.41 ug/mL
....LC537 PFNA2_00002	06/14/22	Aldrich, Lot MKCC0699			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.996 g/g
..LC537-PFOA2_00011	08/15/18	02/15/18	Methanol, Lot 090285	22.96 mL	LC537 PFOA2_00002	0.0464 g	Perfluorooctanoic acid (PFOA)	2000.7 ug/mL
....LC537 PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.99 g/g
..LC537-PFOS2_00011	08/15/18	02/15/18	Methanol, Lot 090285	14.71 mL	LC537_PFOS2_00002	0.0378 g	Perfluorooctanesulfonic acid (PFOS)	2001.01 ug/mL
....LC537_PFOS2_00002	06/14/22	Sigma, Lot BCBQ0108V			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.7787 g/g
<b>LC537-IS_00066</b>	10/10/18	04/10/18	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
							13C4 PFOS	28.68 ng/mL
					LC537-MSP_00033	60 uL	Perfluorobutanesulfonic acid (PFBS)	8.99912 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.96 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-38284-1

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

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	3.003 ng/mL
							Perfluorononanoic acid (PFNA)	1.98 ng/mL
							Perfluorooctanoic acid (PFOA)	1.98 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	3.95328 ng/mL
					LC537-SU_00064	500 uL	13C2 PFDA	10 ng/mL
							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
..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
					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-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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-38284-1

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	13C2 PFHxA	10 ng/mL
					LCPFHpA_00009	81 uL	Perfluorobutanesulfonic acid (PFBS)	1250.86 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluoroheptanoic acid (PFHpA)	135 ng/mL
					LCPFNA_00009	165 uL	Perfluorohexanesulfonic acid (PFHxS)	420.117 ng/mL
					LCPFOA_00010	165 uL	Perfluorononanoic acid (PFNA)	275 ng/mL
LCPFOS-br_00005	355 uL	Perfluorooctanoic acid (PFOA)	275 ng/mL					
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	549.067 ng/mL
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 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-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	13C2 PFDA	10 ng/mL
					LCPFHpA_00009	81 uL	13C2 PFHxA	10 ng/mL
					LCPFHxS-br_00005	277 uL	13C2 PFHxA	10 ng/mL
LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid (PFBS)	1250.86 ng/mL					
LCPFHpA_00009	81 uL	Perfluoroheptanoic acid (PFHpA)	135 ng/mL					
LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid (PFHxS)	420.117 ng/mL					

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-38284-1

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

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



REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-38284-1

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

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-38284-1

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

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

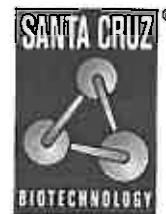
Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFHxA_00015	11/22/21		Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFDA	50 ug/mL
<b>LC537-SU_00064</b>	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFHxA_00015	60 uL	13C2 PFHxA	50 ug/mL
..LCMPFHxA_00015	11/22/21		Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFDA	50 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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**LC537\_PFHxS2\_00002**



n: 6-E-17SKV

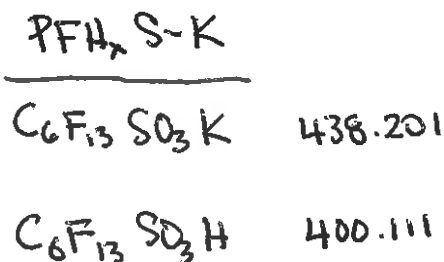


The Future is Custom

# 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 SW

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

PFOA

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

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Reagent

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**LC537\_PFO2\_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

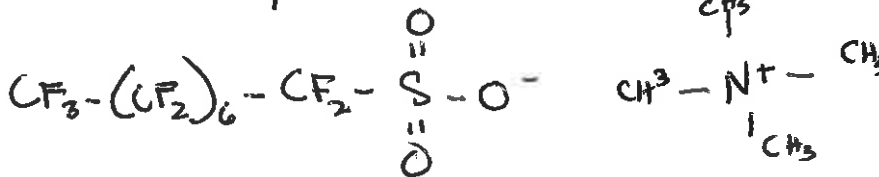
TEST	SPECIFICATION	RESULT
APPEARANCE (COLOR)	WHITE TO OFF WHITE	OFF-WHITE
APPEARANCE (FORM)	POWDER OR POWDER WITH CHUNK(S)	POWDER
CARBON CONTENT	29.77 % - 31.29 %	29.97 %
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS

*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 = 12.011	96.088
F = 18.998	322.966
S = 32.066	32.066
O = 16.999	47.997
H = 1.008	1.008
N = 14.007	-
	<hr/>
	500.125

$C_8H_{20}N$
96.088
-
-
-
20.160
14.007
<hr/>
130.255

Reagent

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**LCM2PFOA\_00007**



r: 5/11/17 skv

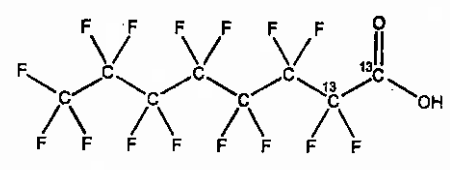


# WELLINGTON LABORATORIES

## 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



<b>MOLECULAR FORMULA:</b>	<sup>13</sup> C <sub>2</sub> <sup>12</sup> C <sub>6</sub> HF <sub>16</sub> O <sub>2</sub>	<b>MOLECULAR WEIGHT:</b>	416.05
<b>CONCENTRATION:</b>	50 ± 2.5 µg/ml	<b>SOLVENT(S):</b>	Methanol Water (<1%)
<b>CHEMICAL PURITY:</b>	>98%	<b>ISOTOPIC PURITY:</b>	≥99% <sup>13</sup> C (1,2- <sup>13</sup> C <sub>2</sub> )
<b>LAST TESTED:</b> (mm/dd/yyyy)	02/12/2016		
<b>EXPIRY DATE:</b> (mm/dd/yyyy)	02/12/2021		
<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 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

Form#:27, Issued 2004-11-10  
 Revision#:3, Revised 2015-03-24

### **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:**

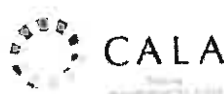
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

### **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.

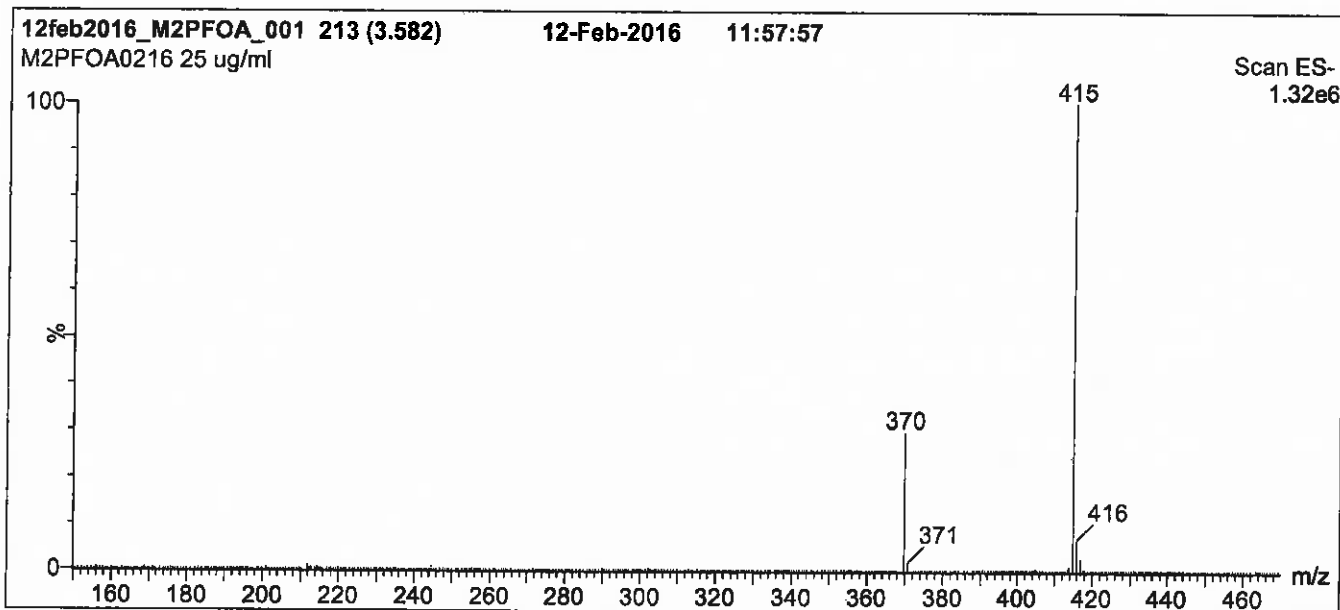
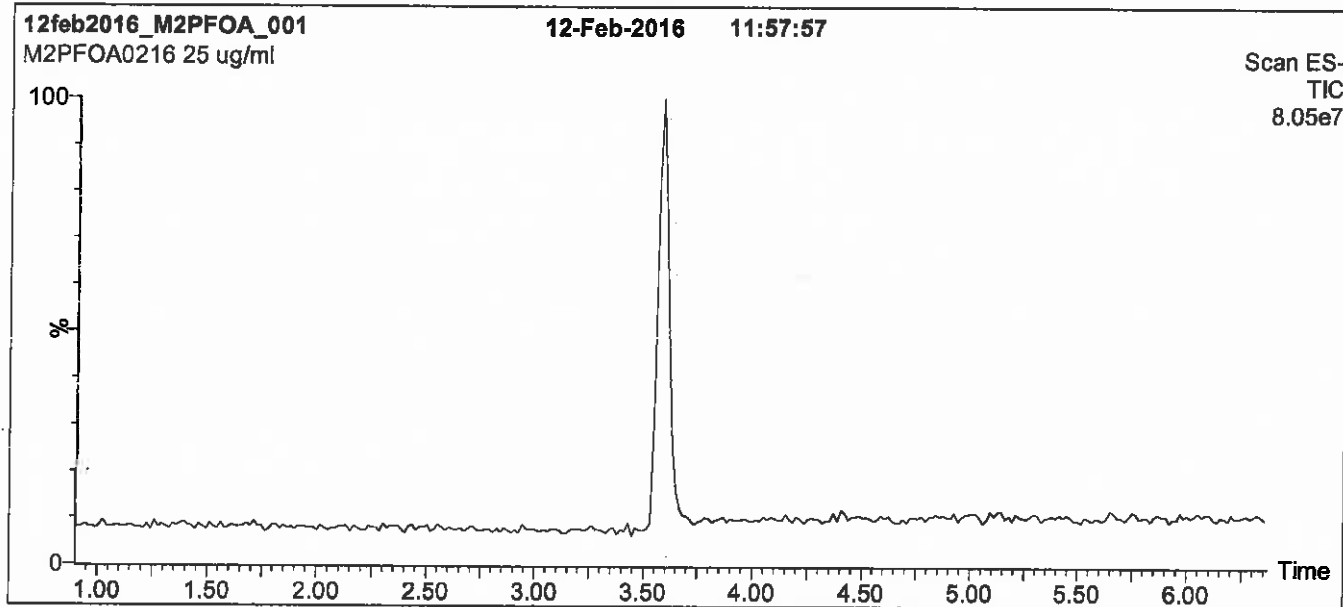
### **QUALITY MANAGEMENT:**

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

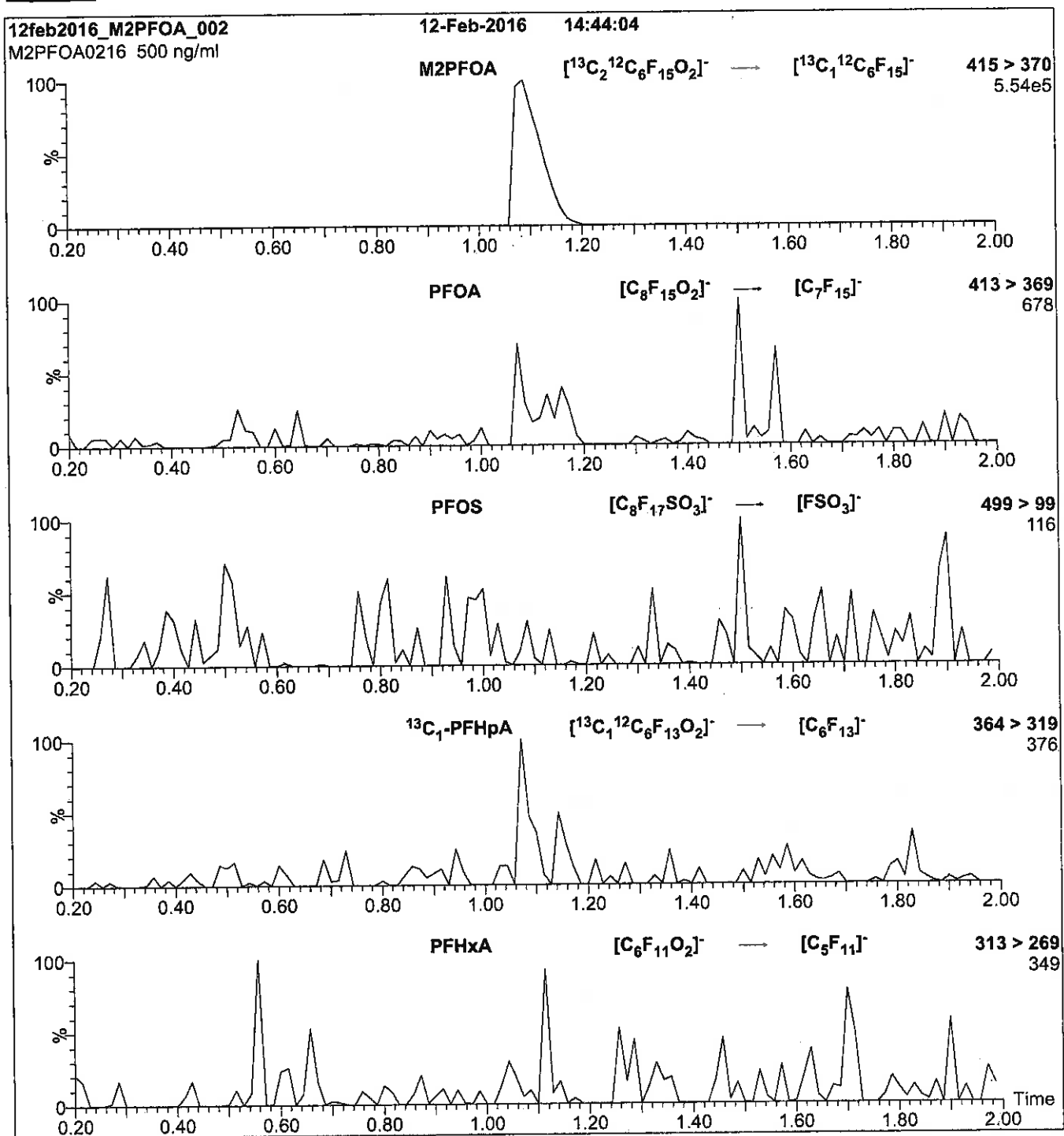
**Flow:** 300  $\mu$ l/min

**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% H<sub>2</sub>O

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

**MS Parameters**

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

Reagent

---

**LCM2PFOA\_00010**

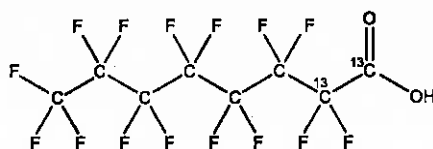


# WELLINGTON LABORATORIES

## 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:**

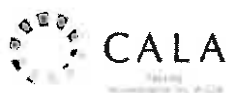
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**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.

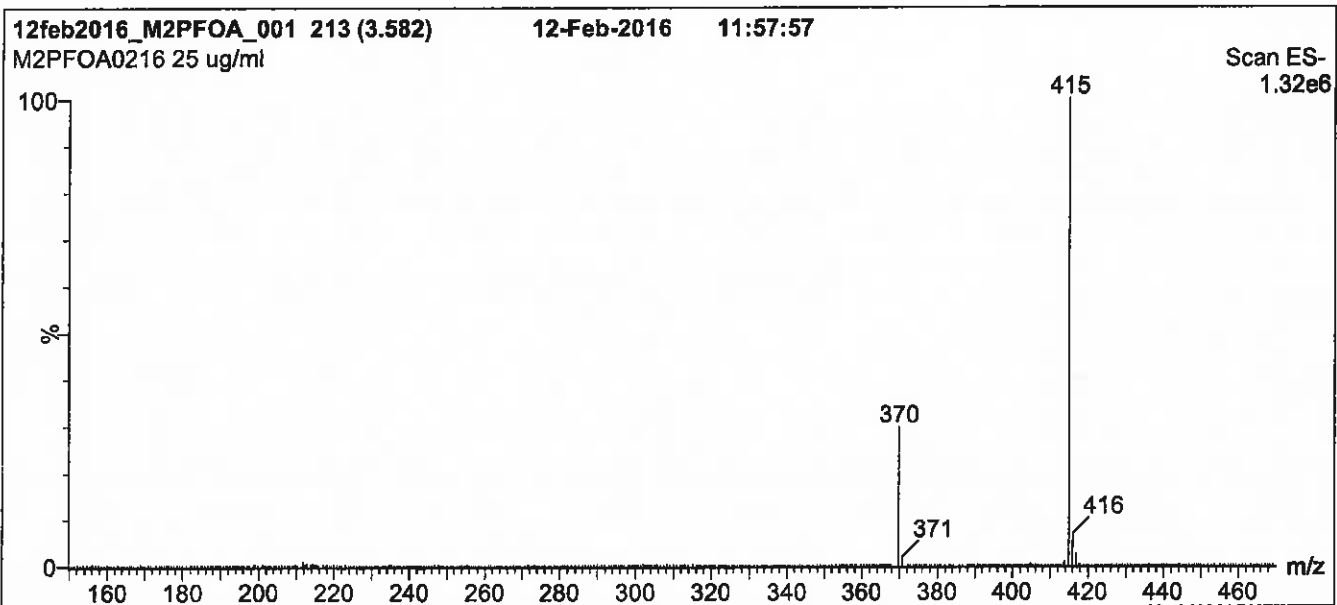
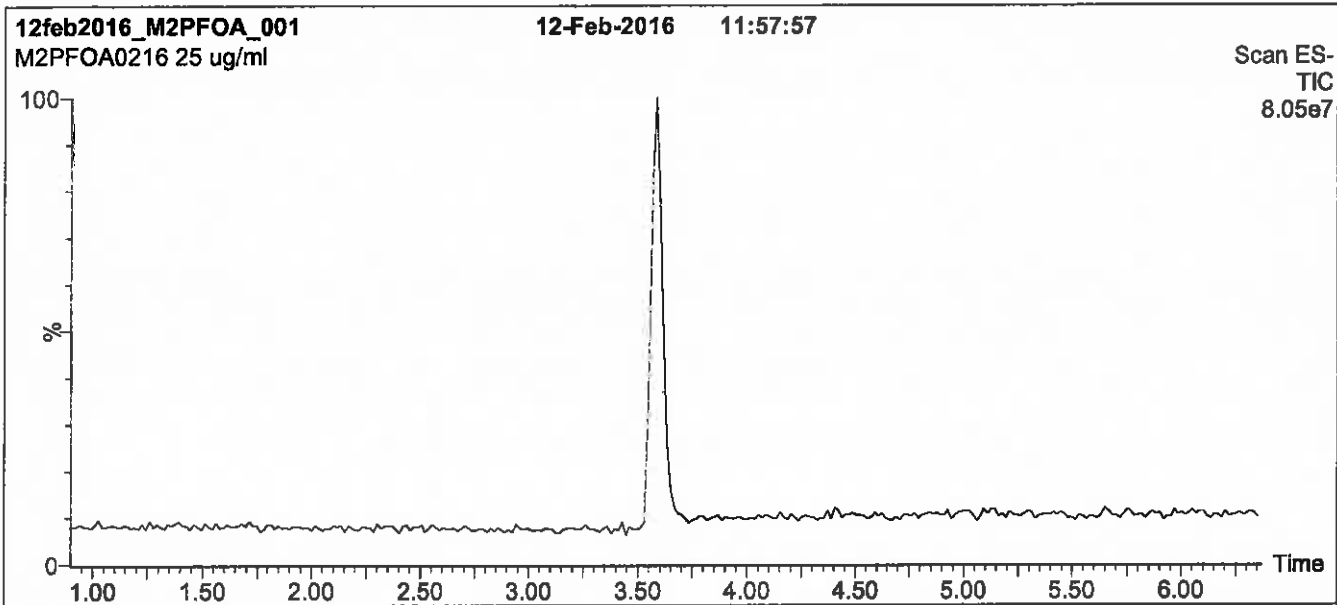
**QUALITY MANAGEMENT:**

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

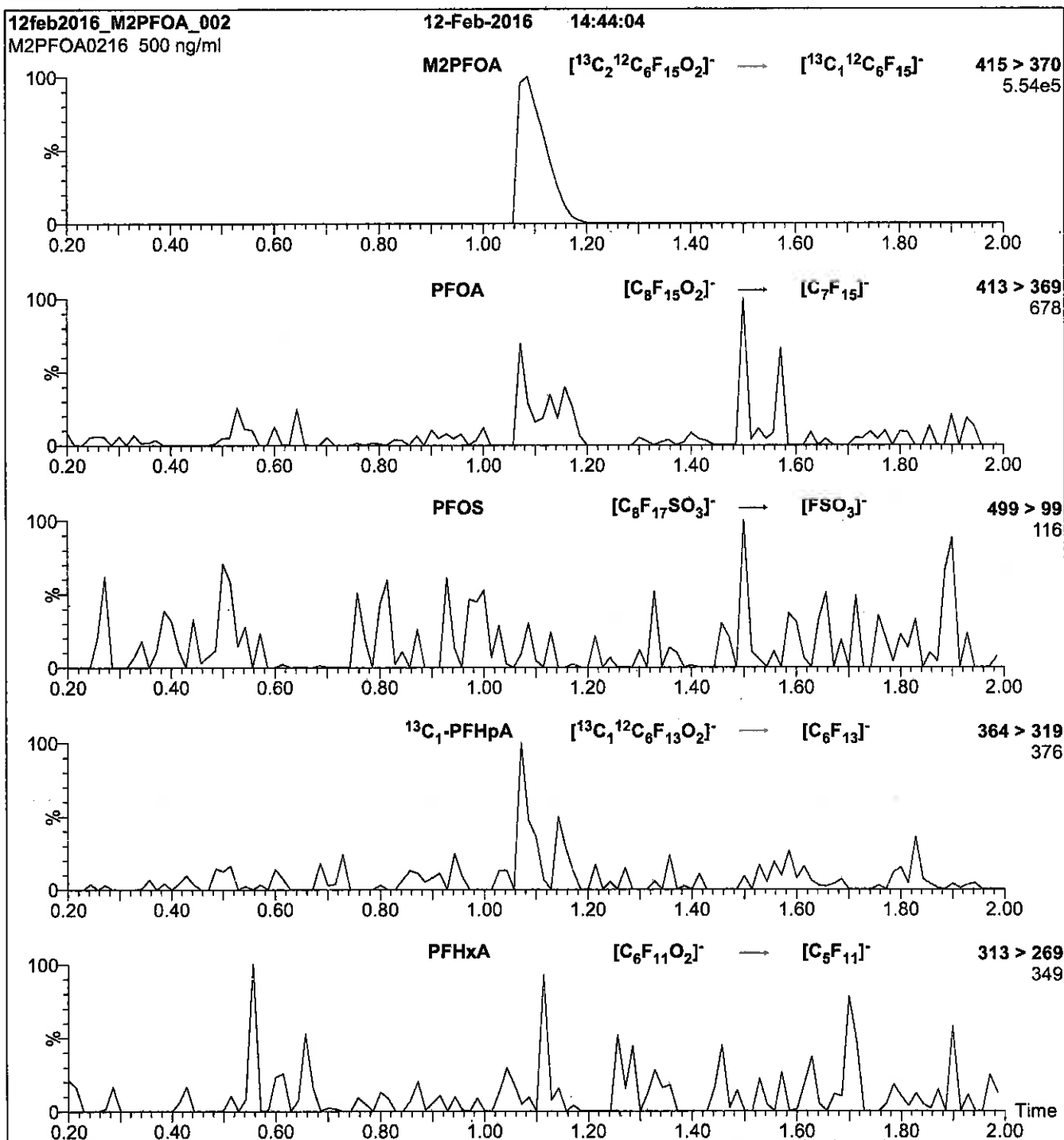
**MS Parameters**

**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

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**LCMPFDA\_00012**

R: SBC 12/21/16



814255

ID: LCMFDA\_00012

Exp: 09/30/21 Prpd: SBC

13C2-Perfluorodecanoic a

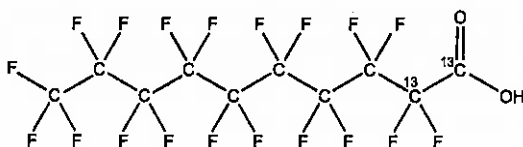


# WELLINGTON LABORATORIES

## 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>  
**CONCENTRATION:** 50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:** 516.07  
**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

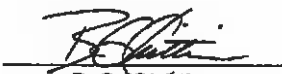
**DOCUMENTATION/ DATA ATTACHED:**

- 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.

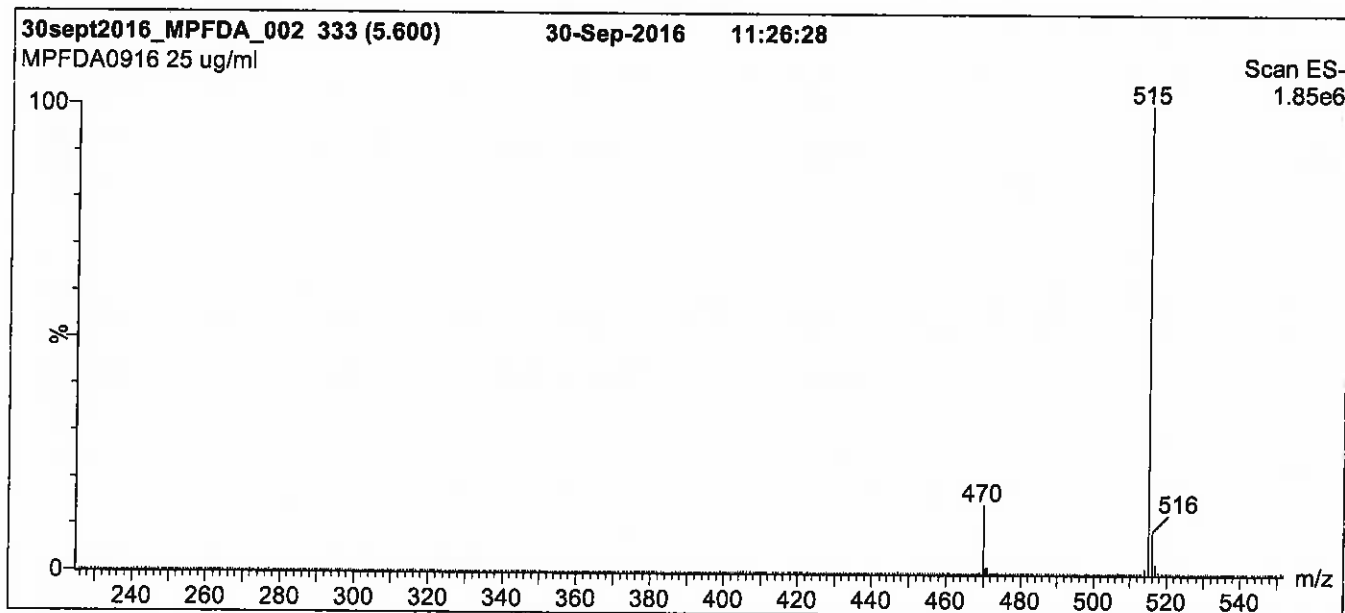
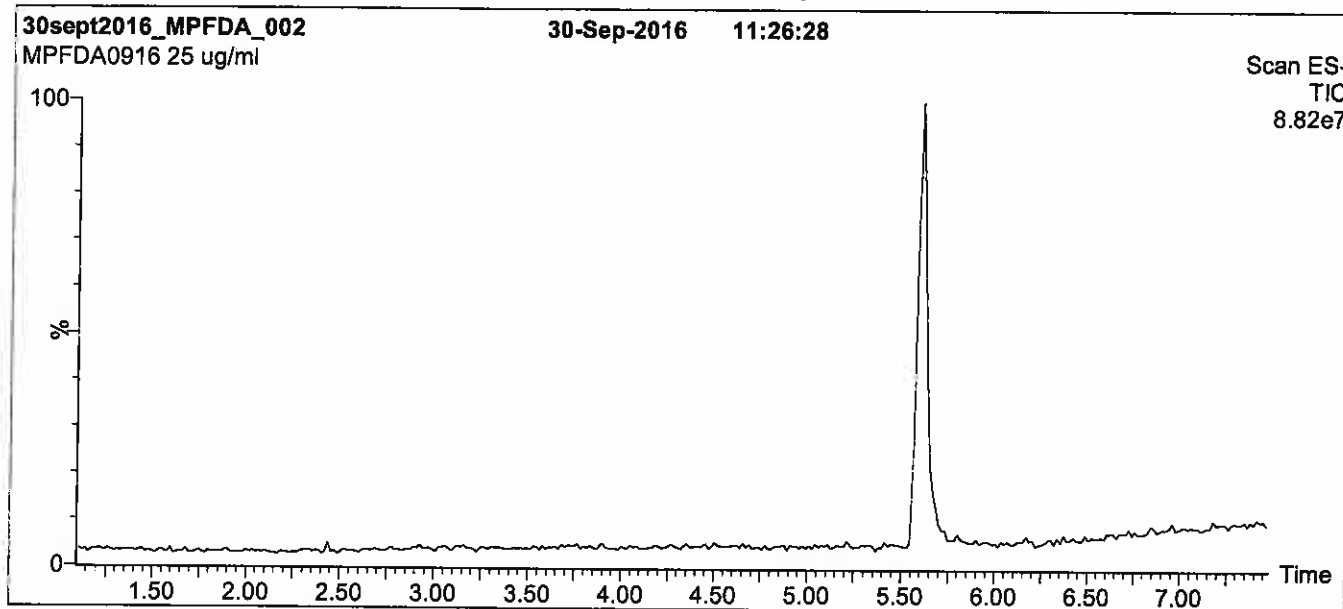
### **QUALITY MANAGEMENT:**

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

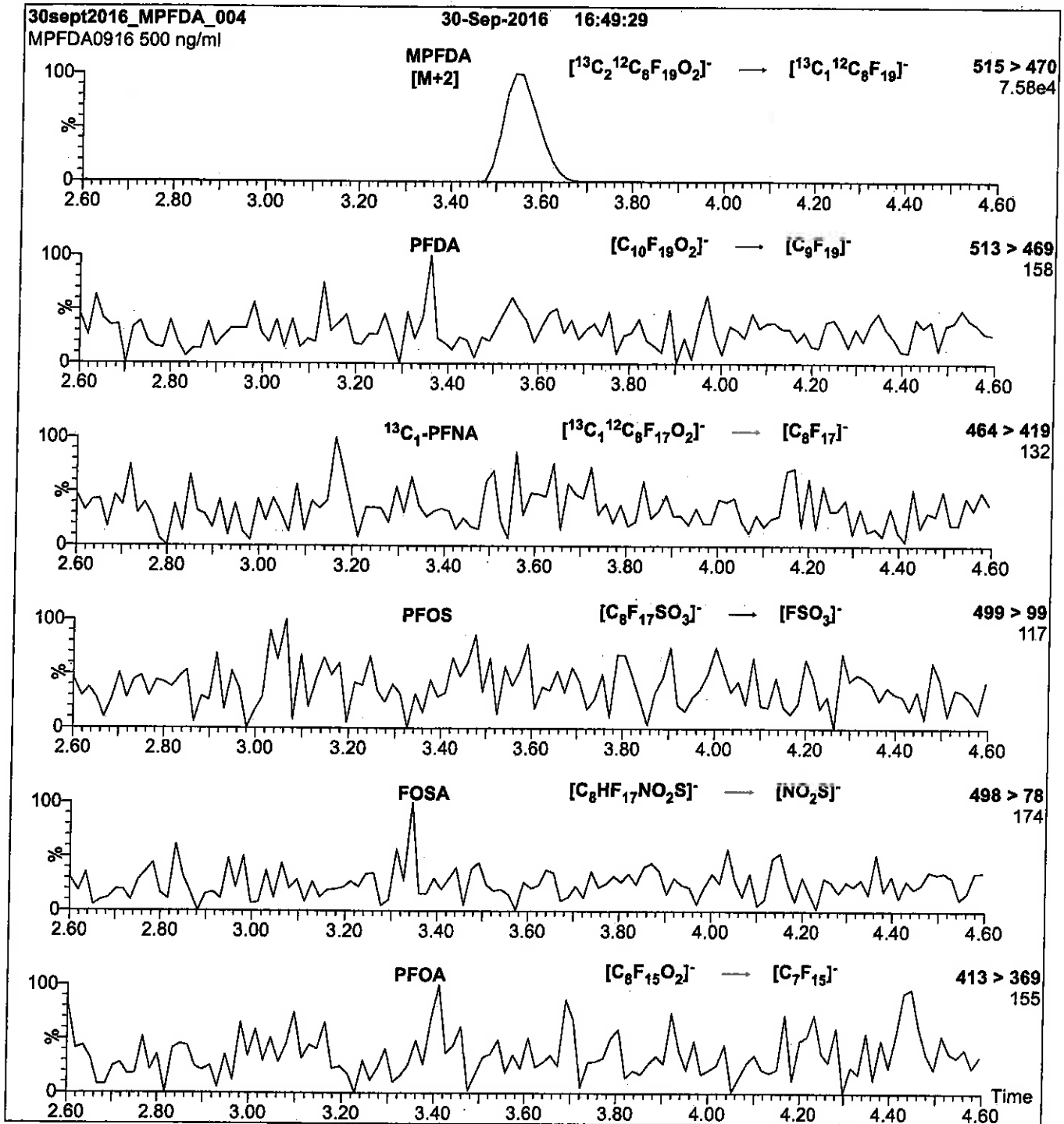
Mobile phase: Gradient  
Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 90% organic over 7 min and hold for 1.5 min  
before returning to initial conditions in 0.5 min.  
Time: 10 min

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**

12/5/17 SKW



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

MPFHxA

**LOT NUMBER:**

MPFHxA1116

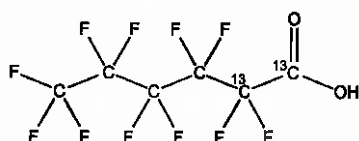
**COMPOUND:**

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

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

11/22/2016

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

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

11/22/2021

**RECOMMENDED STORAGE:**

Store ampoule in a cool, dark place

**DOCUMENTATION/ DATA ATTACHED:**

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

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

**ADDITIONAL INFORMATION:**

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

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

Certified By:

B.G. Chittim

Date: 12/13/2016

(mm/dd/yyyy)

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



### **INTENDED USE:**

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

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

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### **TRACEABILITY:**

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

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

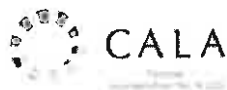
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

### **LIMITED WARRANTY:**

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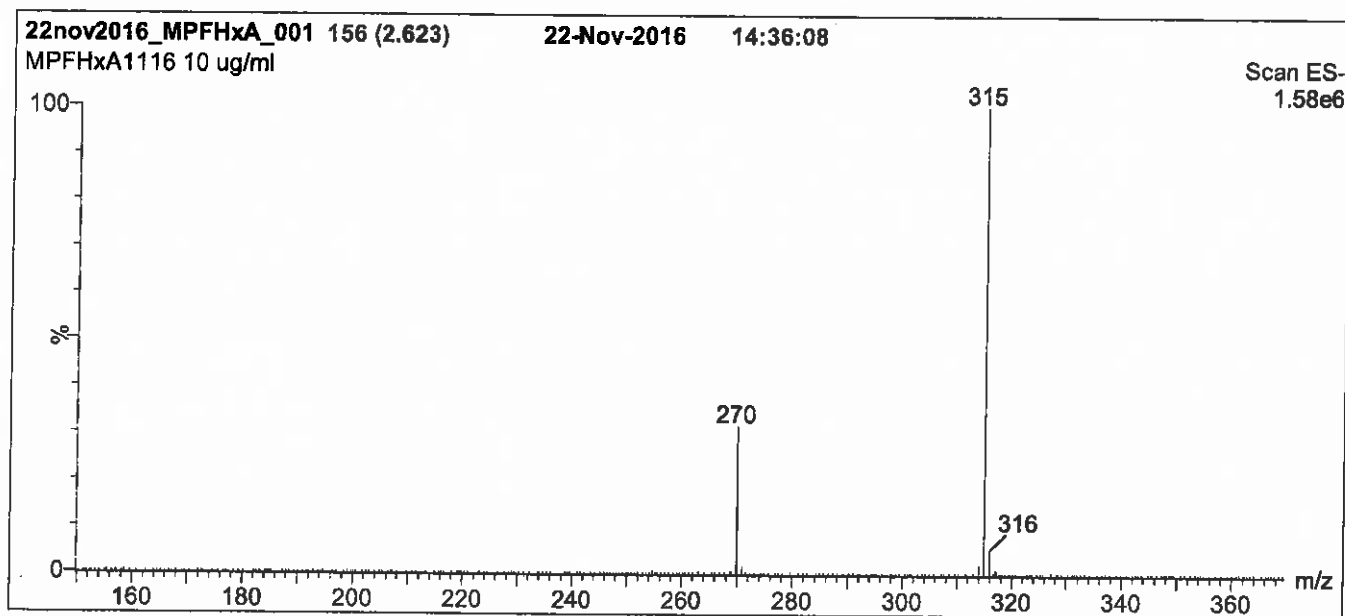
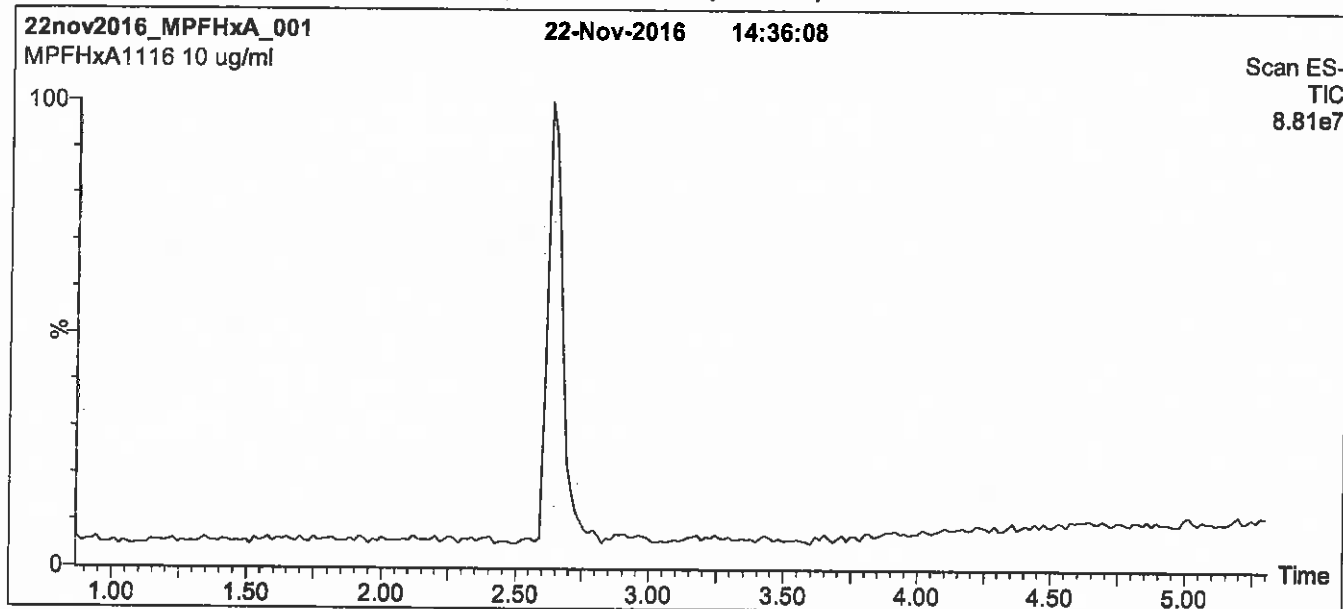
### **QUALITY MANAGEMENT:**

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**Figure 1: 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>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 over 0.5 min.  
Time: 10 min

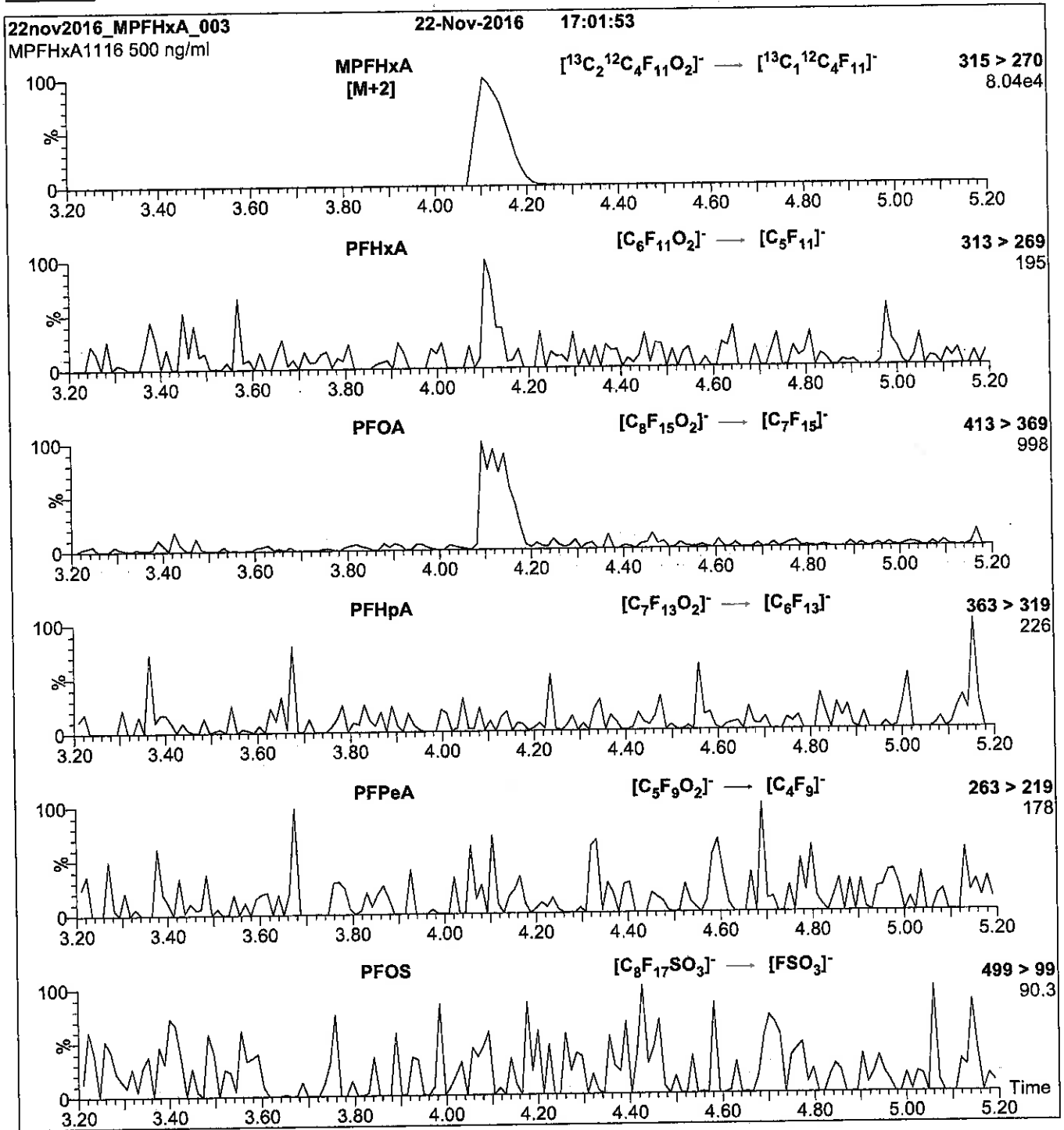
Flow: 300  $\mu$ l/min

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

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

Reagent

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**LCMPFOS\_00021**

r: 5/6/17 skv

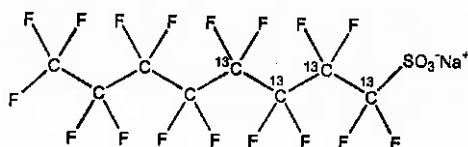


# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** MPFOS **LOT NUMBER:** MPFOS1216  
**COMPOUND:** Sodium perfluoro-1-[1,2,3,4-<sup>13</sup>C<sub>4</sub>]octanesulfonate

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



**MOLECULAR FORMULA:** <sup>13</sup>C<sub>4</sub><sup>12</sup>C<sub>4</sub>F<sub>17</sub>SO<sub>3</sub>Na **MOLECULAR WEIGHT:** 526.08  
**CONCENTRATION:** 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol  
47.8 ± 2.4 µg/ml (MPFOS anion)  
**CHEMICAL PURITY:** >98% **ISOTOPIC PURITY:** ≥99% <sup>13</sup>C  
**LAST TESTED:** (mm/dd/yyyy) 12/12/2016 (1,2,3,4-<sup>13</sup>C<sub>4</sub>)  
**EXPIRY DATE:** (mm/dd/yyyy) 12/12/2021  
**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 ~ 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:**   
B.G. Chrifim **Date:** 12/14/2016  
(mm/dd/yyyy)

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

**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.

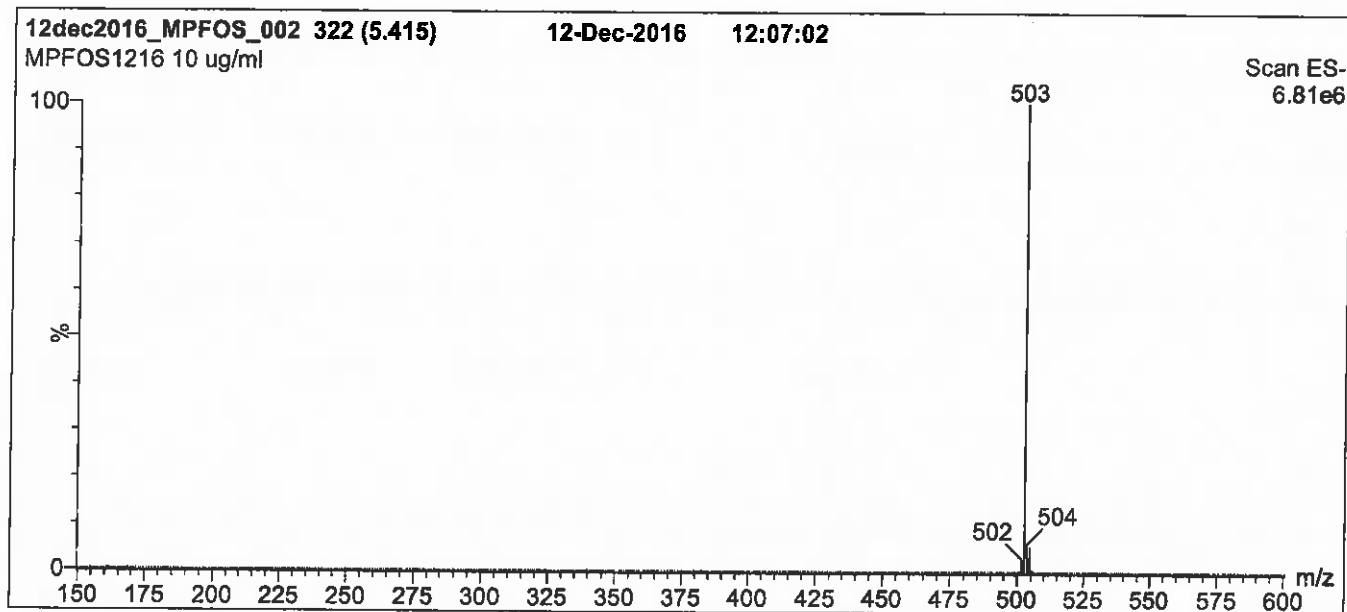
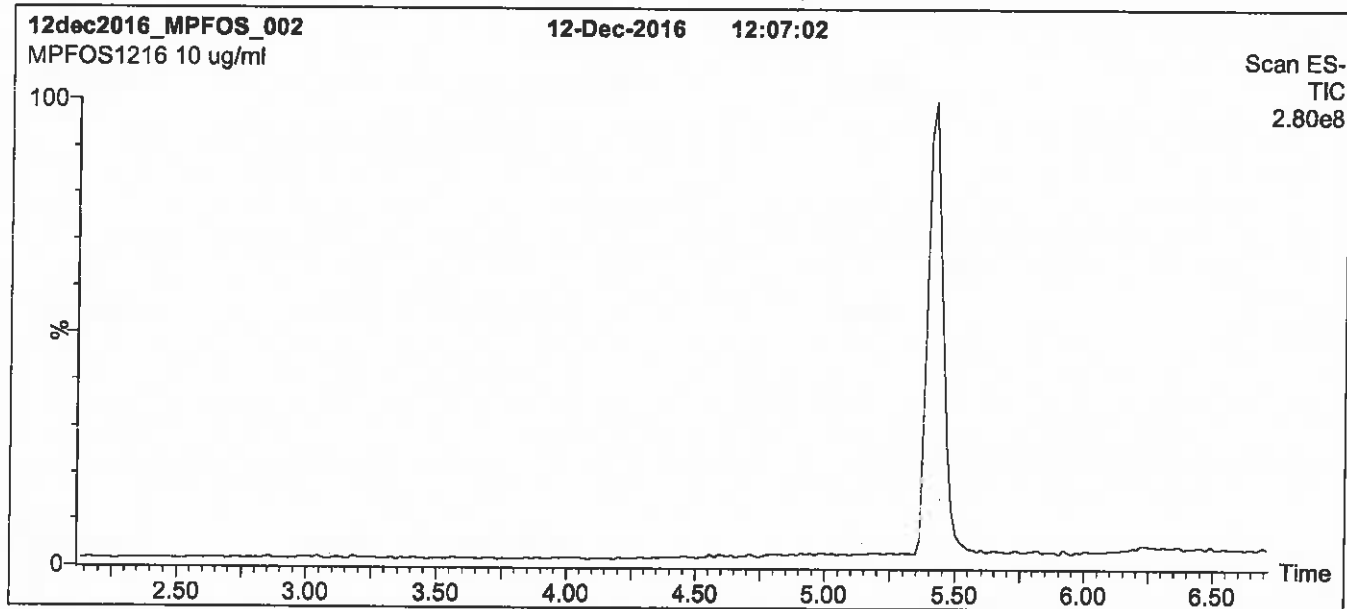
**QUALITY MANAGEMENT:**

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: 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 85% organic over 7.5 min and hold for 1.5 min  
before returning to initial conditions in 0.5 min.  
Time: 10 min

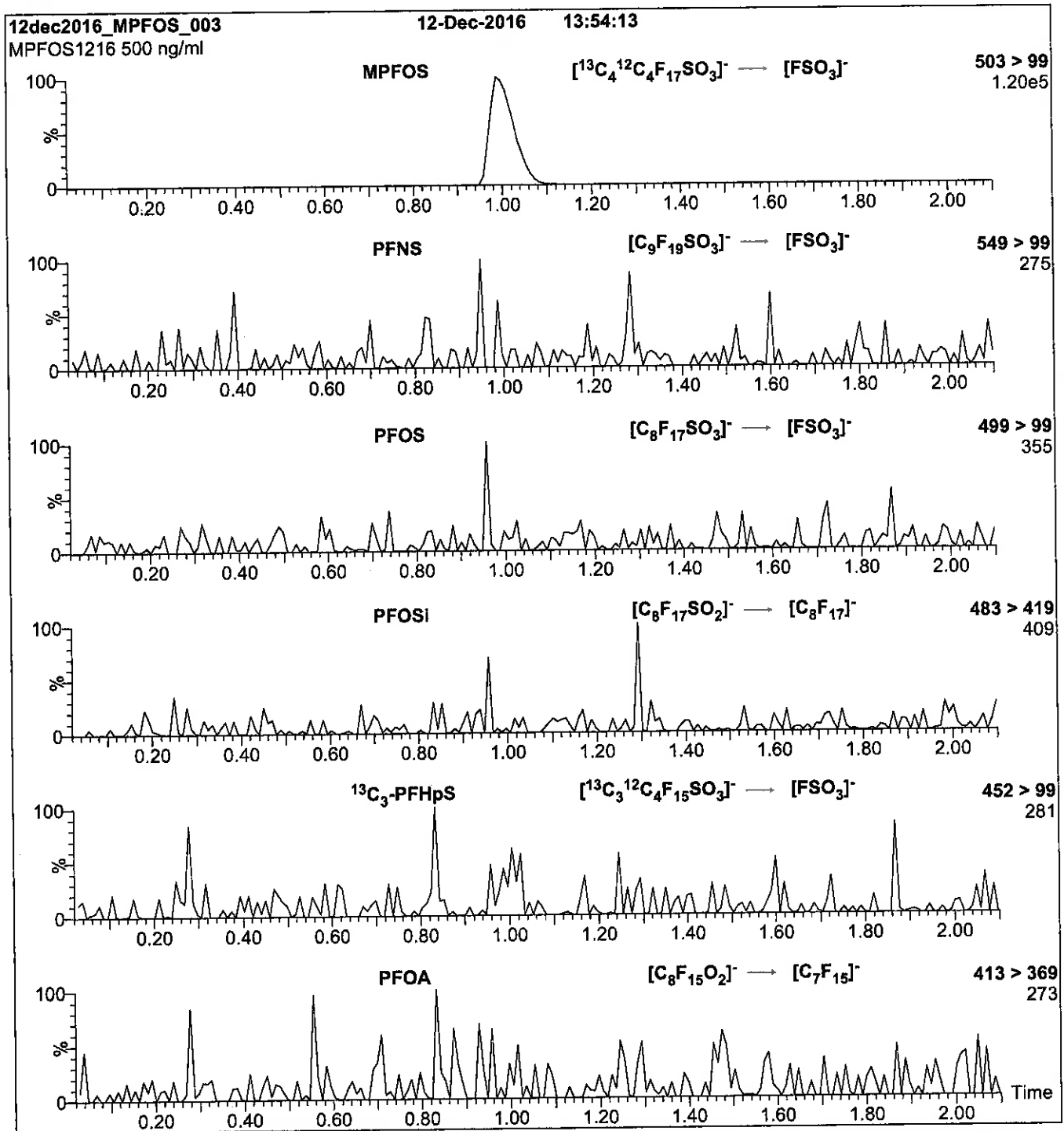
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

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

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



**Conditions for Figure 2:**

**Injection:** Direct loop injection  
 10  $\mu\text{l}$  (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) = 3.35e-3  
 Collision Energy (eV) = 40



Reagent

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**LCMPFOS\_00024**

r: skln skj

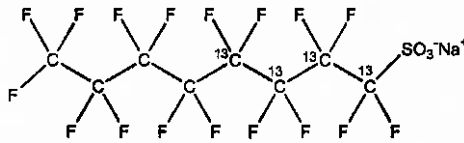


# WELLINGTON LABORATORIES

## 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:**   
 B.G. Chittim, General Manager **Date:** 05/30/2017  
(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:**

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### **HAZARDS:**

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### **SYNTHESIS / CHARACTERIZATION:**

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

### **HOMOGENEITY:**

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

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

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

### **LIMITED WARRANTY:**

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

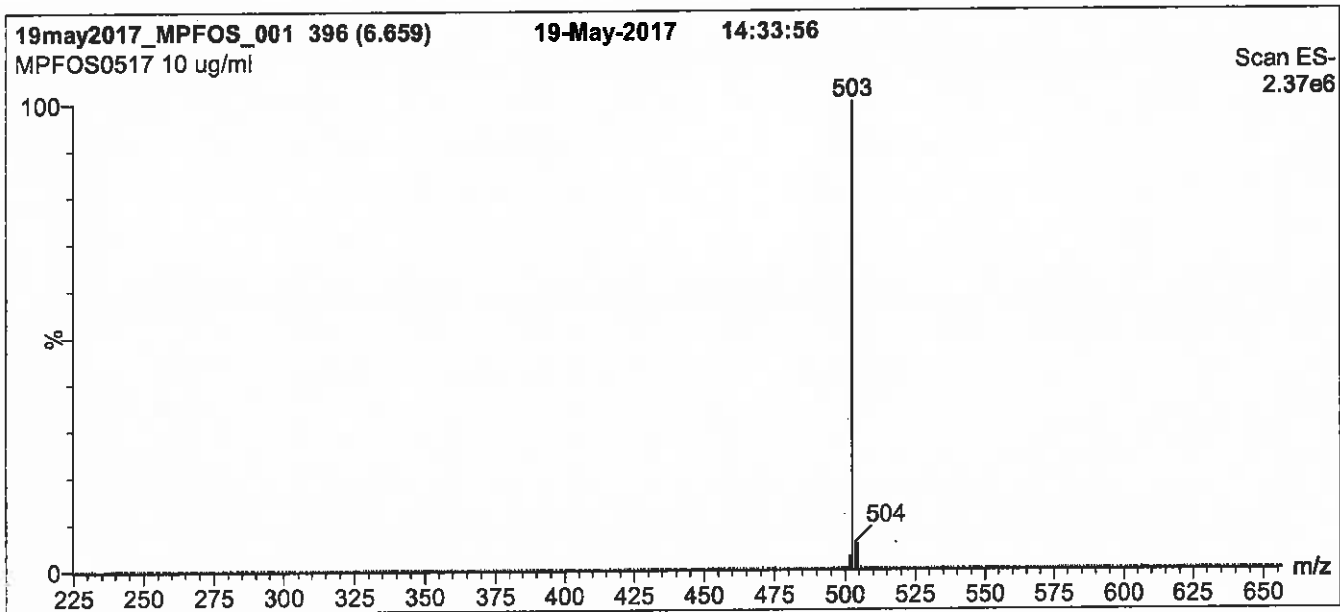
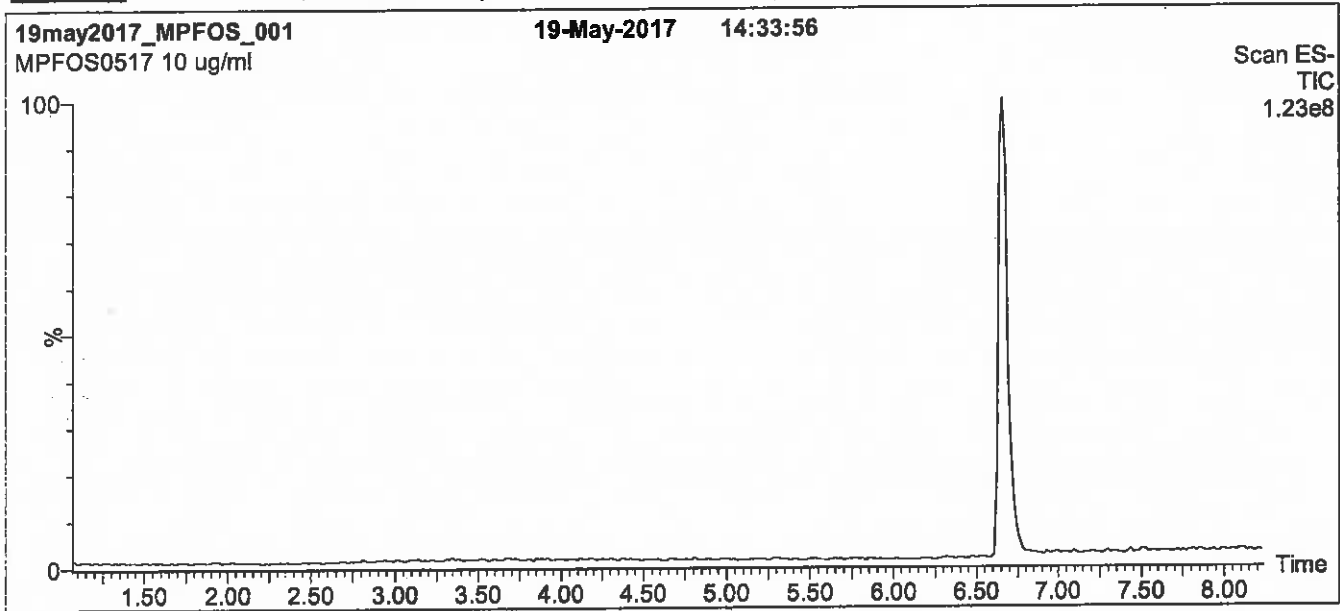
### **QUALITY MANAGEMENT:**

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



\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at [www.well-labs.com](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

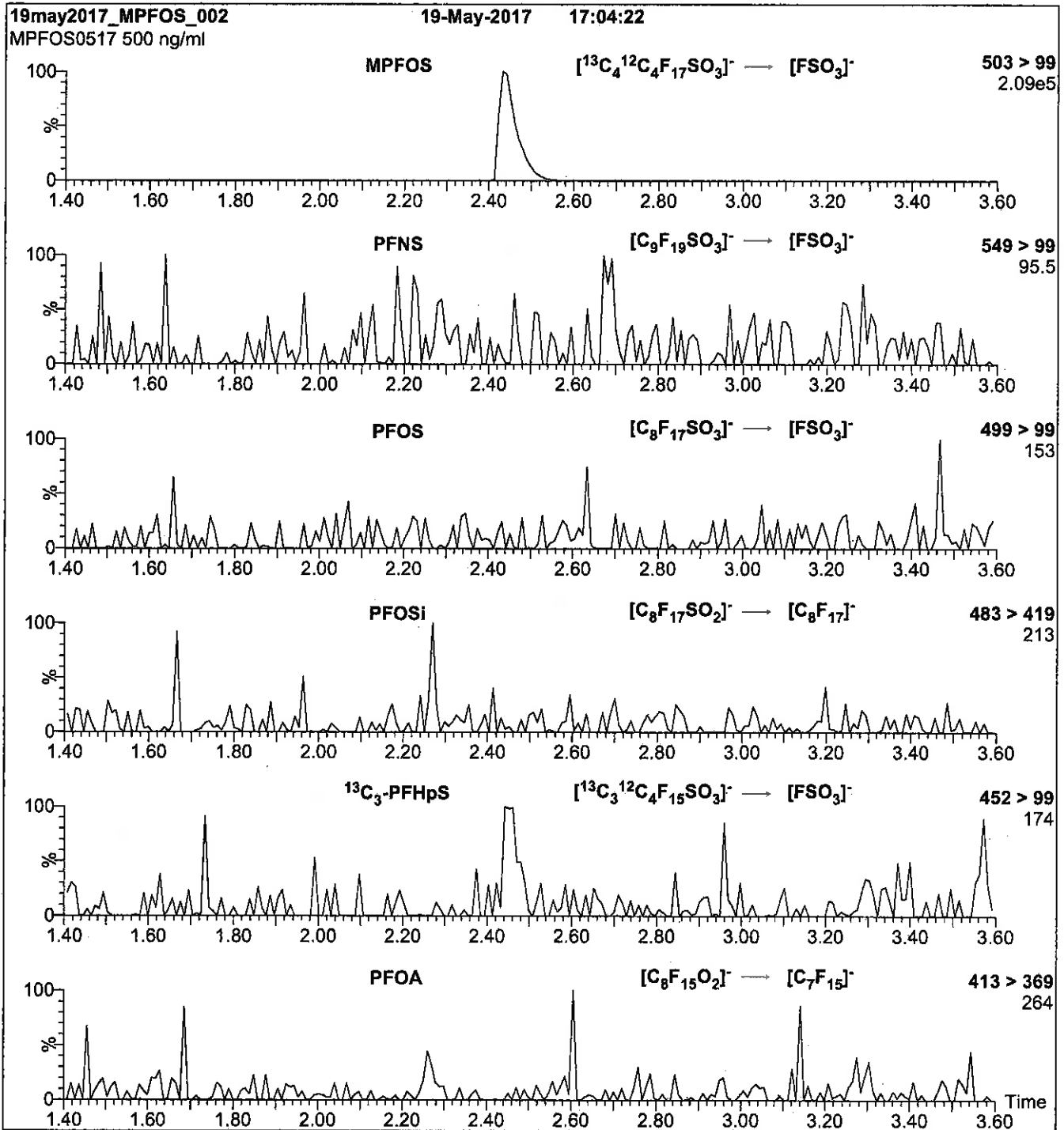
**Flow:** 300  $\mu$ l/min

**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**

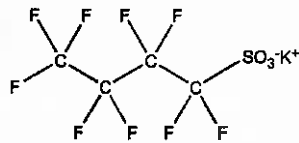
n: 4/21/7 SKW



# 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:**

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### **HAZARDS:**

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### **SYNTHESIS / CHARACTERIZATION:**

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

### **HOMOGENEITY:**

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

### **UNCERTAINTY:**

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

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

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

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

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

### **TRACEABILITY:**

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

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

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

### **LIMITED WARRANTY:**

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

### **QUALITY MANAGEMENT:**

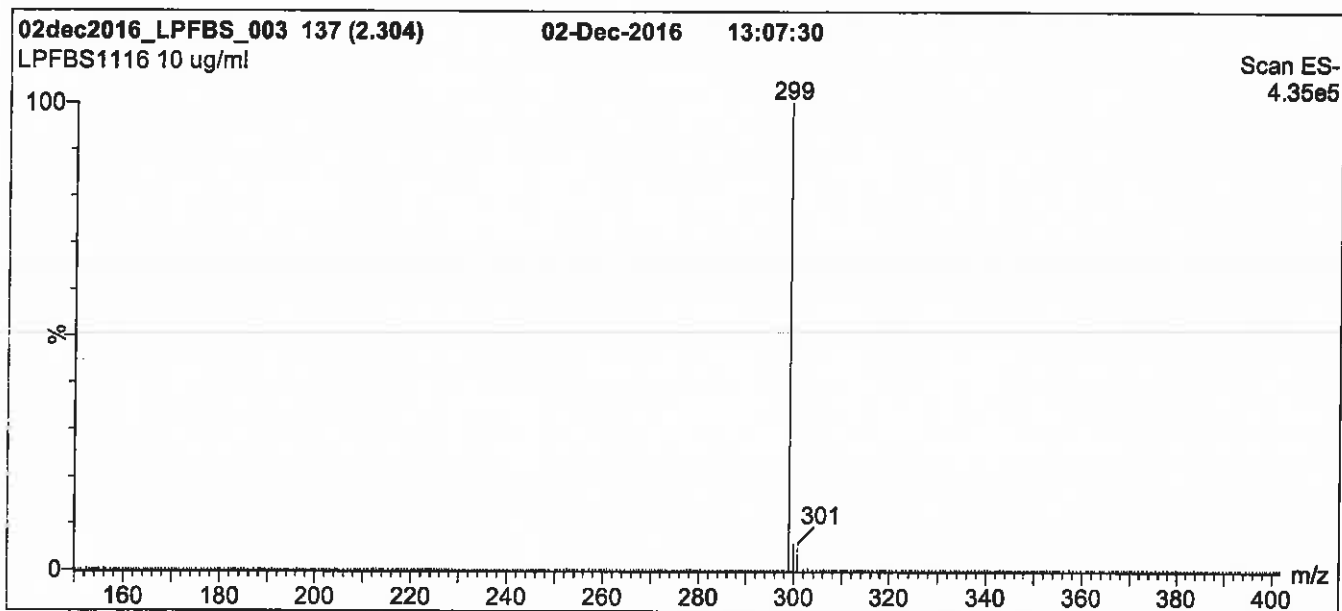
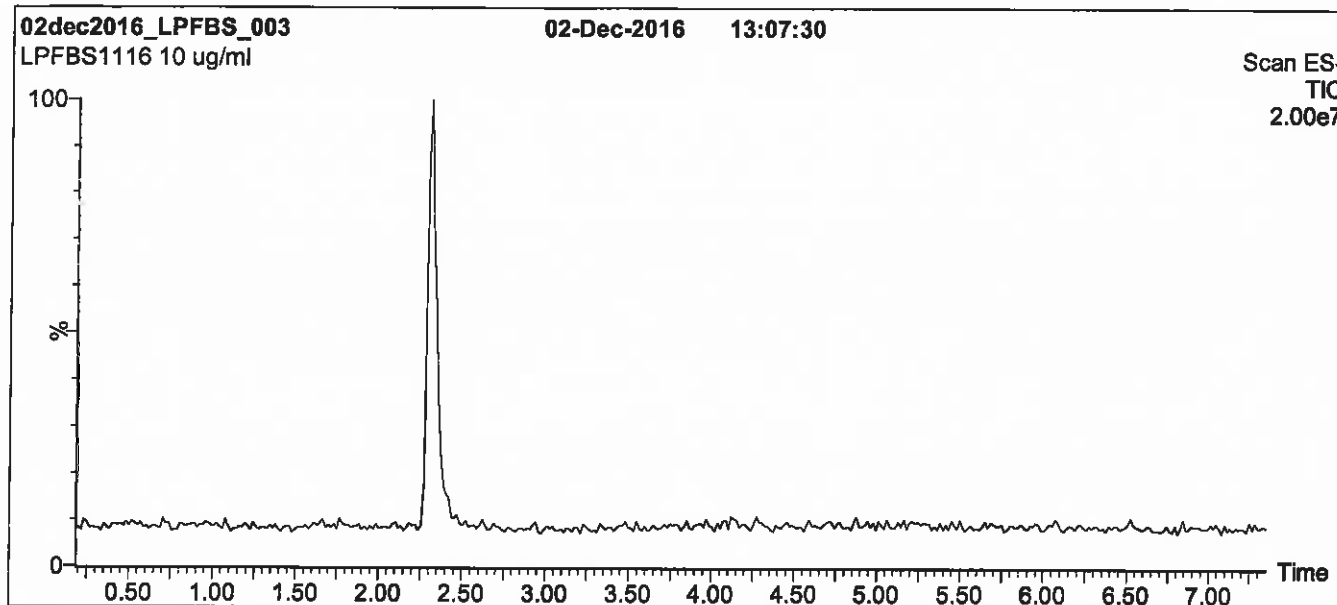
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



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



**Conditions for Figure 1:**

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

**Chromatographic Conditions**

**Column:** Acquity UPLC BEH Shield 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

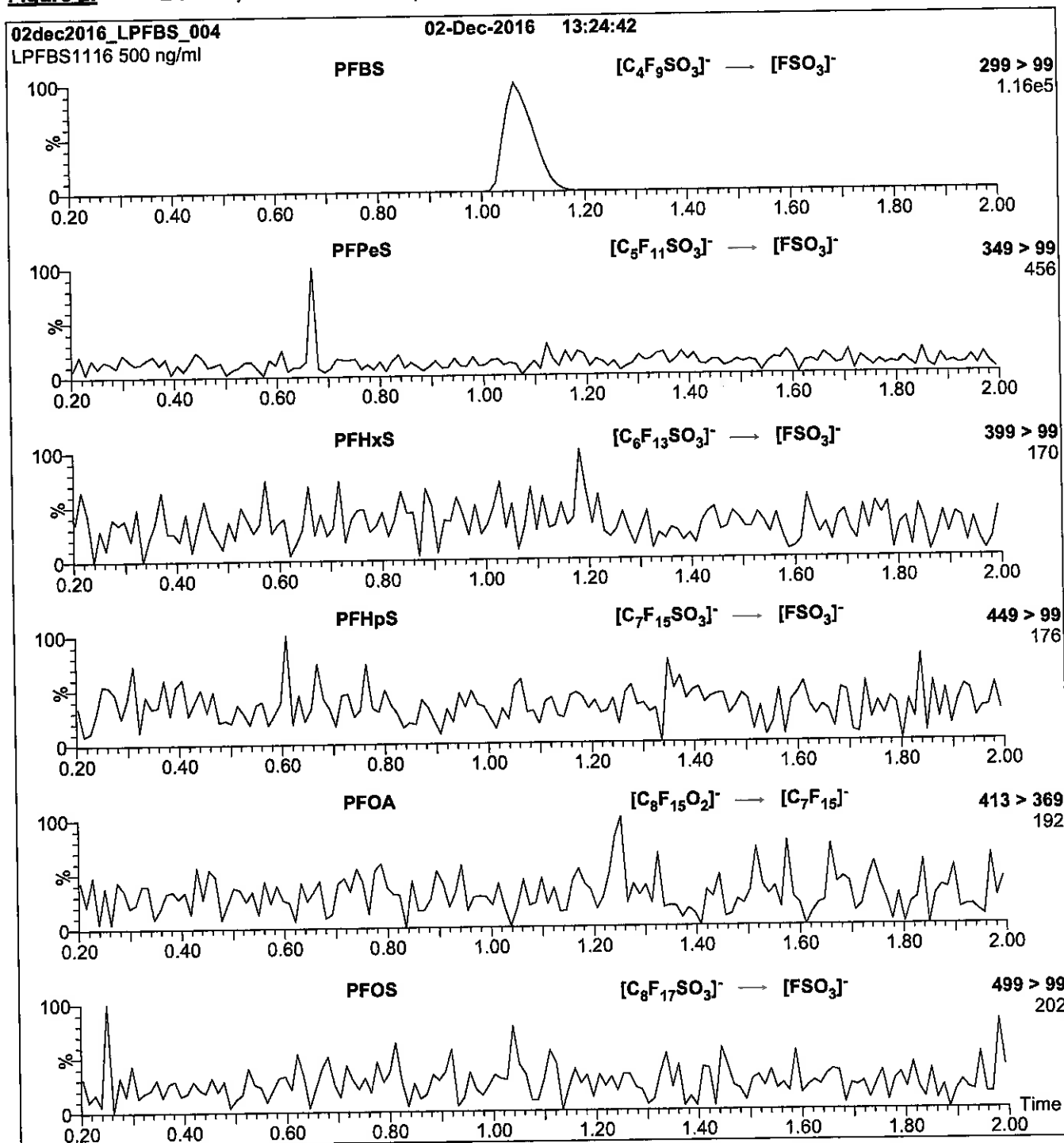
**Flow:** 300  $\mu$ l/min

**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**

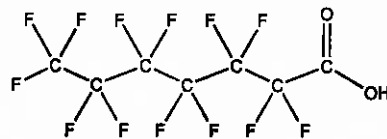
P: 9/21/17 SW



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** PFHpA  
**COMPOUND:** Perfluoro-n-heptanoic acid  
**LOT NUMBER:** PFHpA1216  
**STRUCTURE:**  
**CAS #:** 375-85-9



**MOLECULAR FORMULA:** C<sub>7</sub>HF<sub>13</sub>O<sub>2</sub>  
**CONCENTRATION:** 50 ± 2.5 µg/ml  
**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  
**MOLECULAR WEIGHT:** 364.06  
**SOLVENT(S):** Methanol  
Water (<1%)


### DOCUMENTATION/ DATA ATTACHED:

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

### ADDITIONAL INFORMATION:

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

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

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

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

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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:**

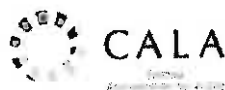
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**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.

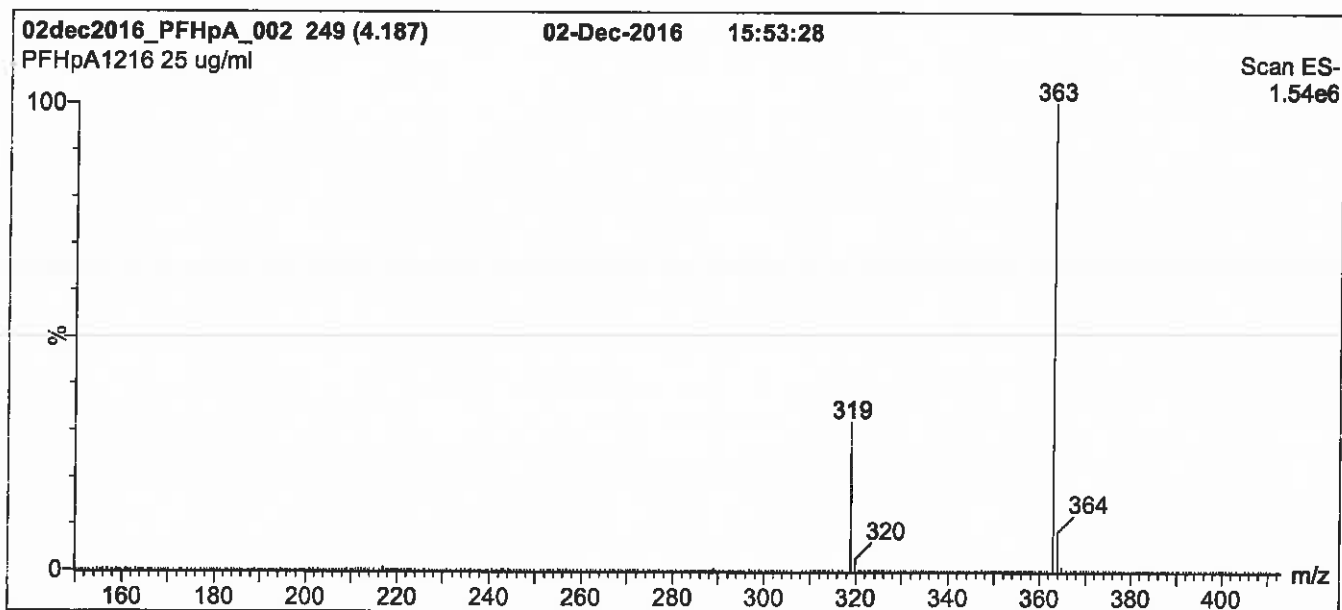
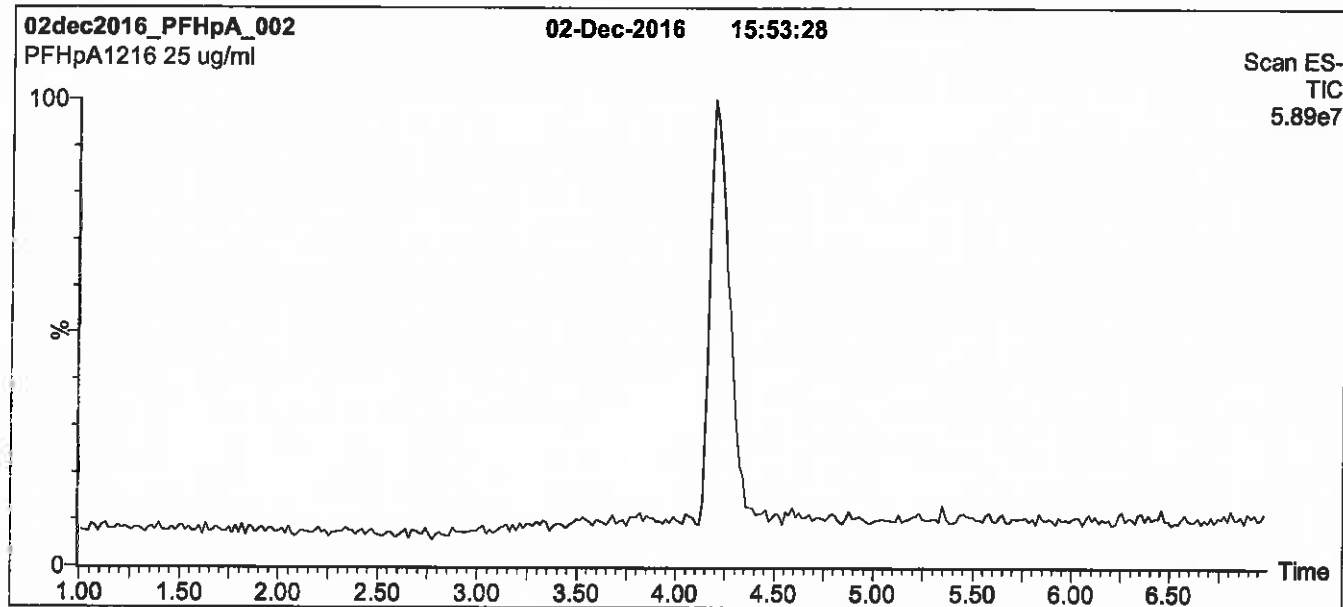
**QUALITY MANAGEMENT:**

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: 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

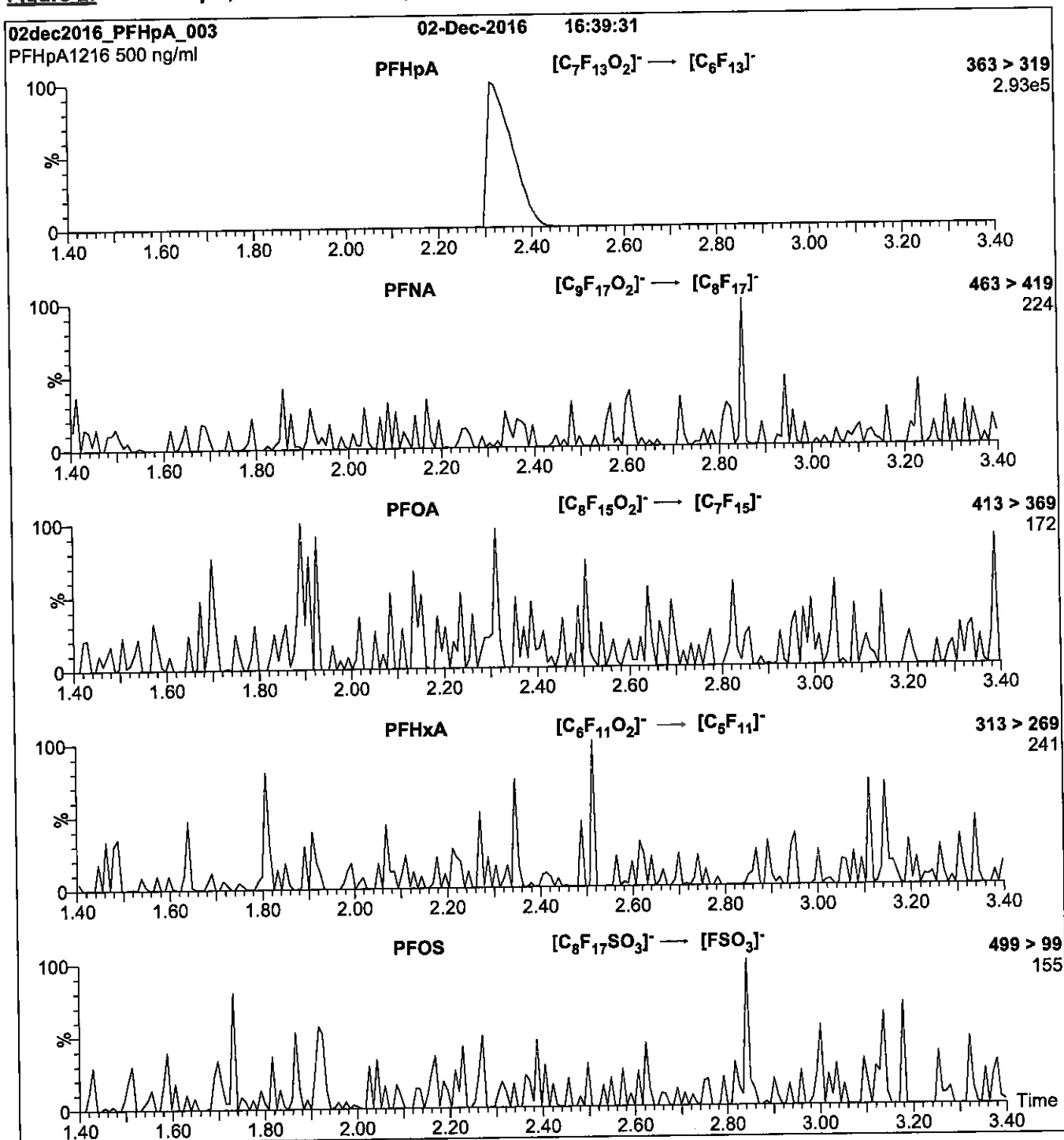
Flow: 300  $\mu$ l/min

**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.

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

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

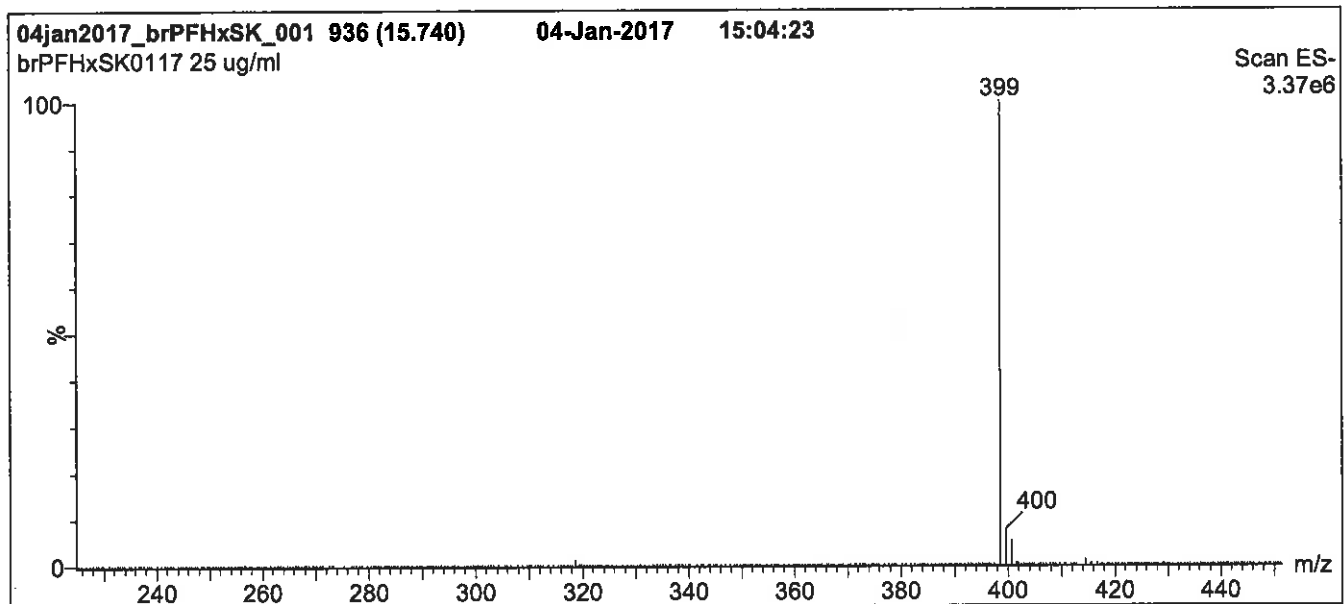
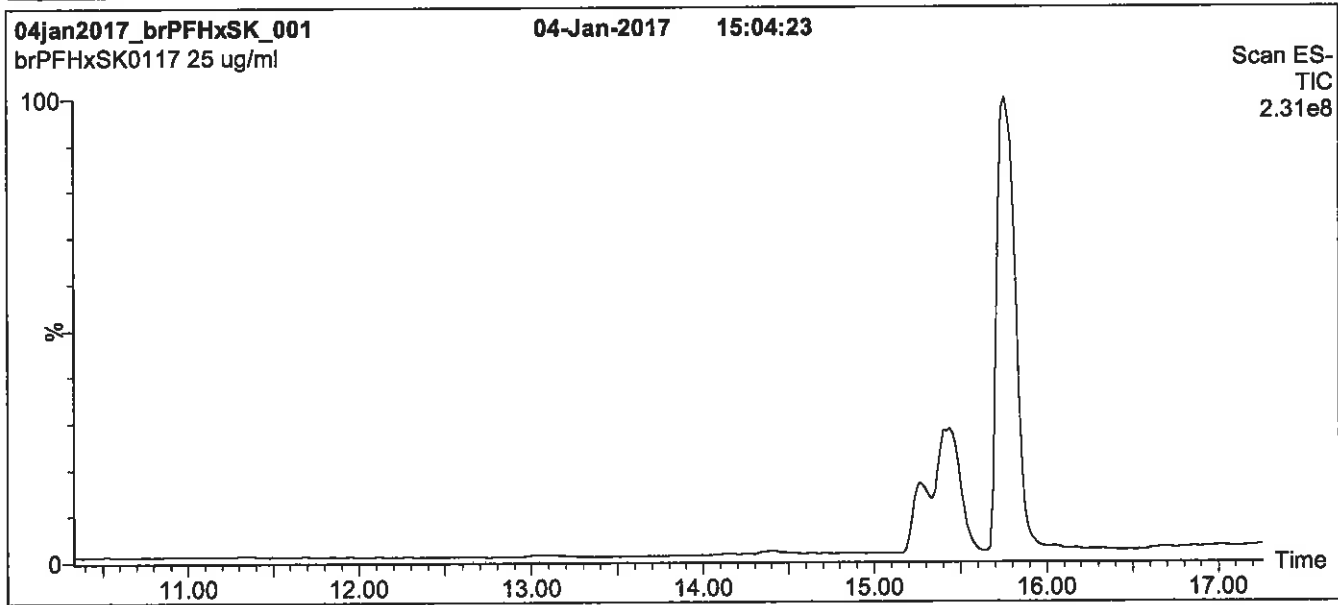
Isomer	Name	Structure	Percent Composition by <sup>19</sup> F-NMR
1	Potassium perfluoro-1-hexanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> <sup>-</sup> K <sup>+</sup>	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}(\text{SO}_3^-\text{K}^+) \\   \\ \text{CF}_3 \end{array}$	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

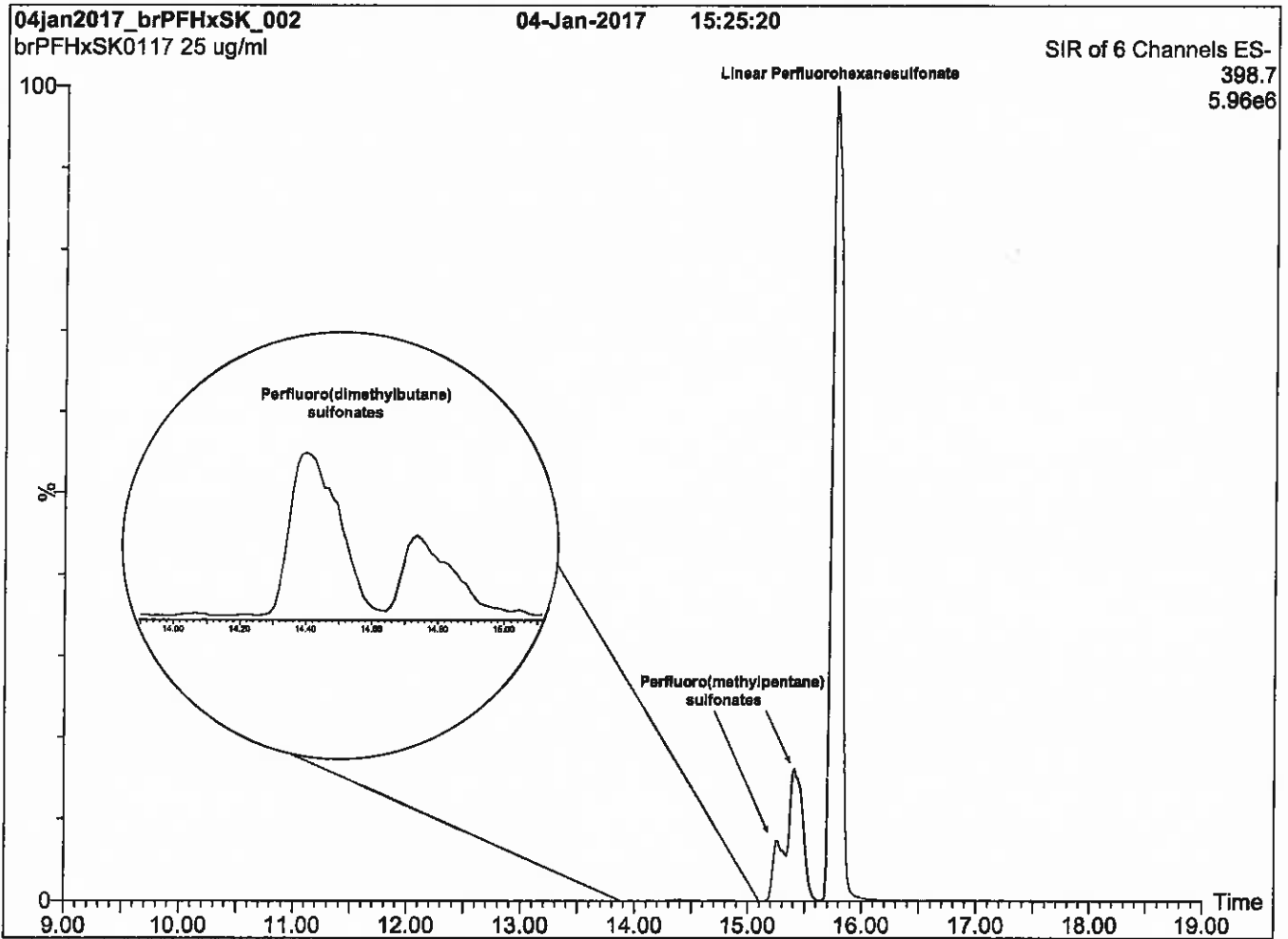
**Flow:** 300  $\mu$ l/min

**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

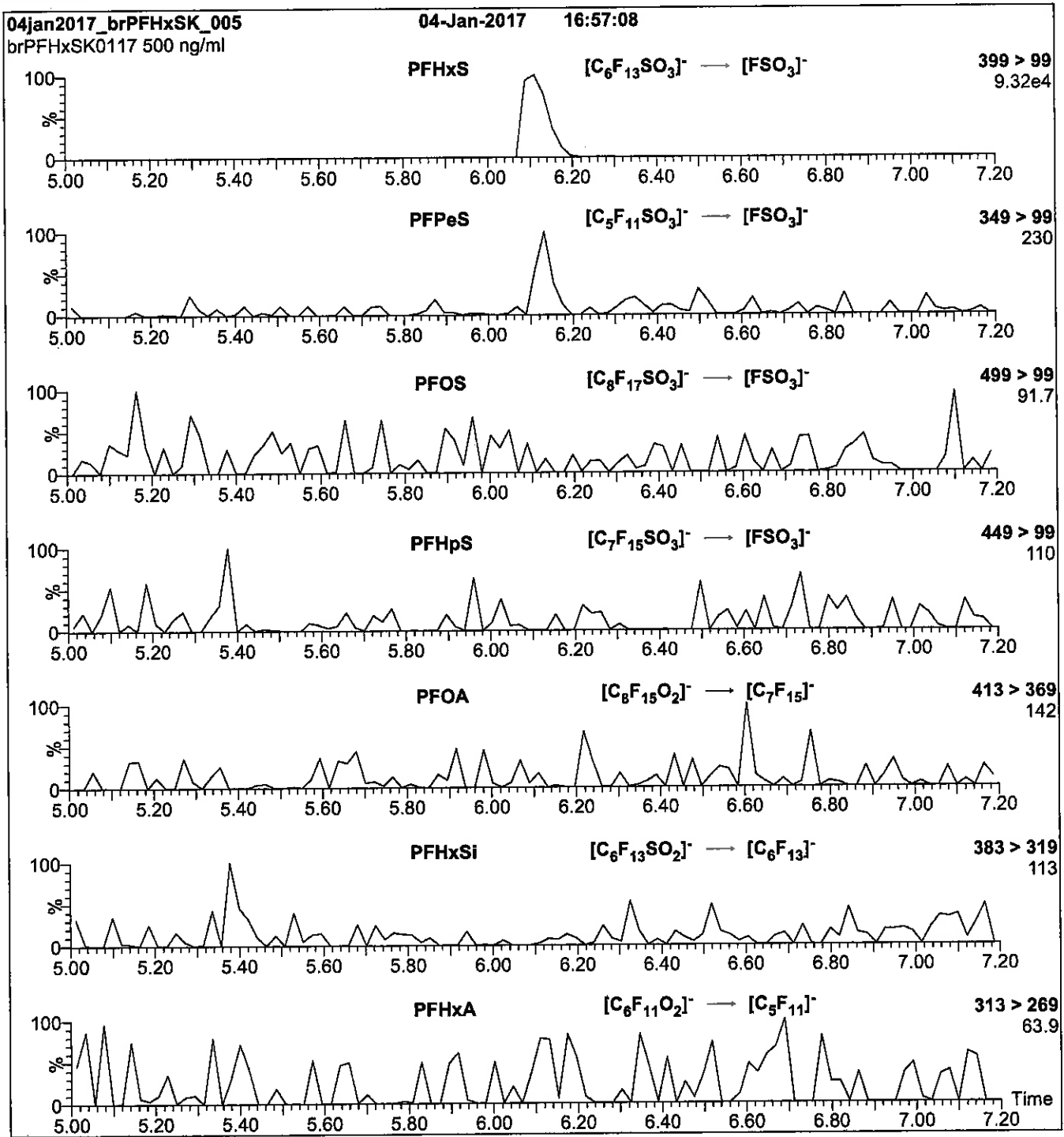
**Flow:** 300  $\mu$ l/min

**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**

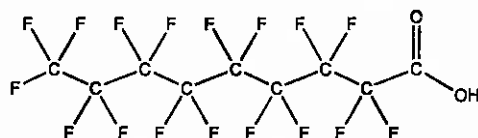
r: 9/2/17 SKJ



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** PFNA  
**COMPOUND:** Perfluoro-n-nonanoic acid  
**LOT NUMBER:** PFNA0717  
**STRUCTURE:**  
**CAS #:** 375-95-1



**MOLECULAR FORMULA:**  $C_9HF_{17}O_2$   
**CONCENTRATION:**  $50 \pm 2.5 \mu\text{g/ml}$   
**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

**MOLECULAR WEIGHT:** 464.08  
**SOLVENT(S):** Methanol  
Water (<1%)

### DOCUMENTATION/ DATA ATTACHED:

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

### ADDITIONAL INFORMATION:

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

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

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

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



**INTENDED USE:**

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

**HAZARDS:**

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

**SYNTHESIS / CHARACTERIZATION:**

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

**HOMOGENEITY:**

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

**UNCERTAINTY:**

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

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

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

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

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

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

**TRACEABILITY:**

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

**EXPIRY DATE / PERIOD OF VALIDITY:**

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

**LIMITED WARRANTY:**

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

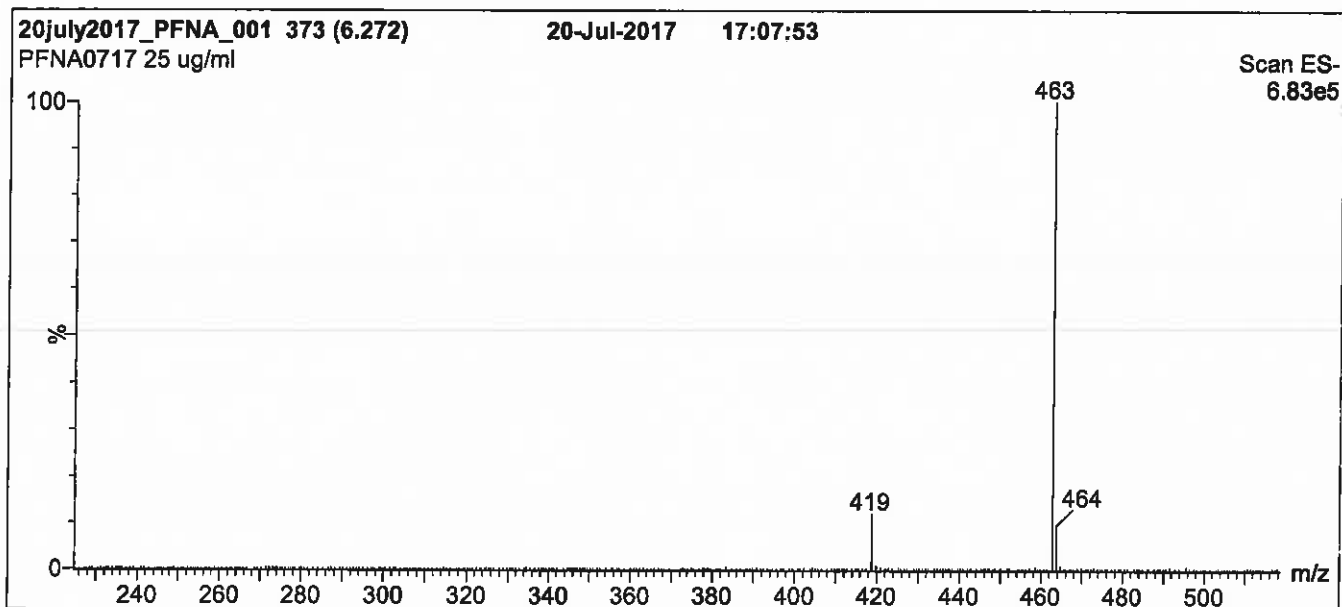
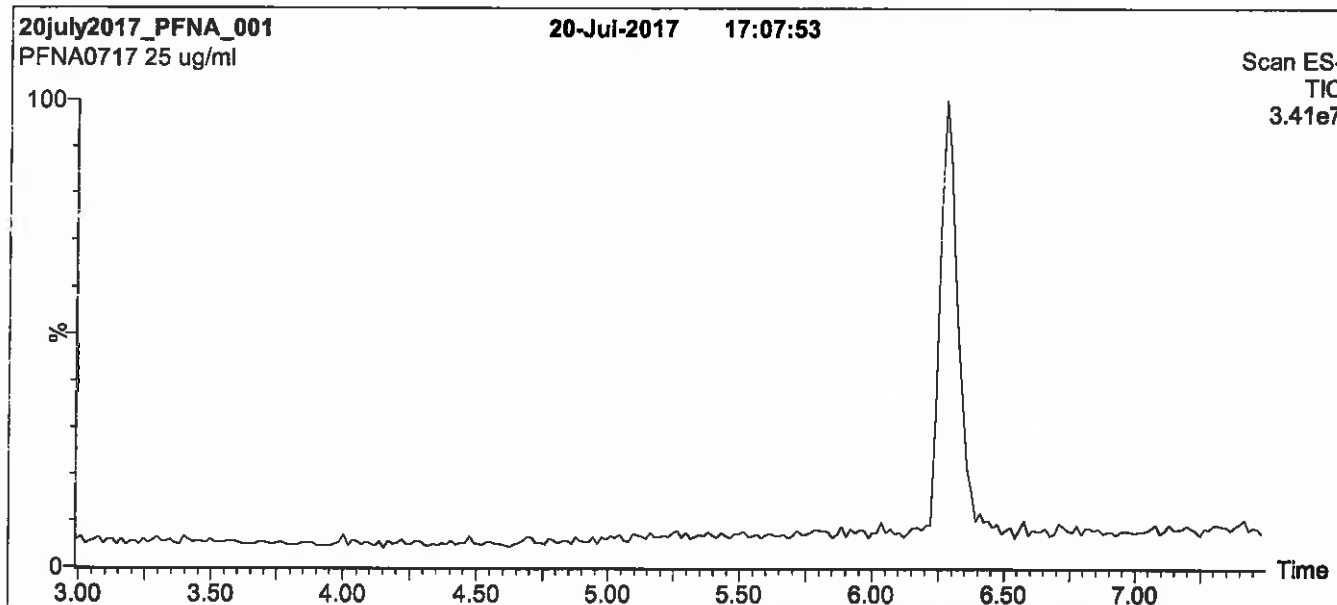
**QUALITY MANAGEMENT:**

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



**Conditions for Figure 1:**

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

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<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

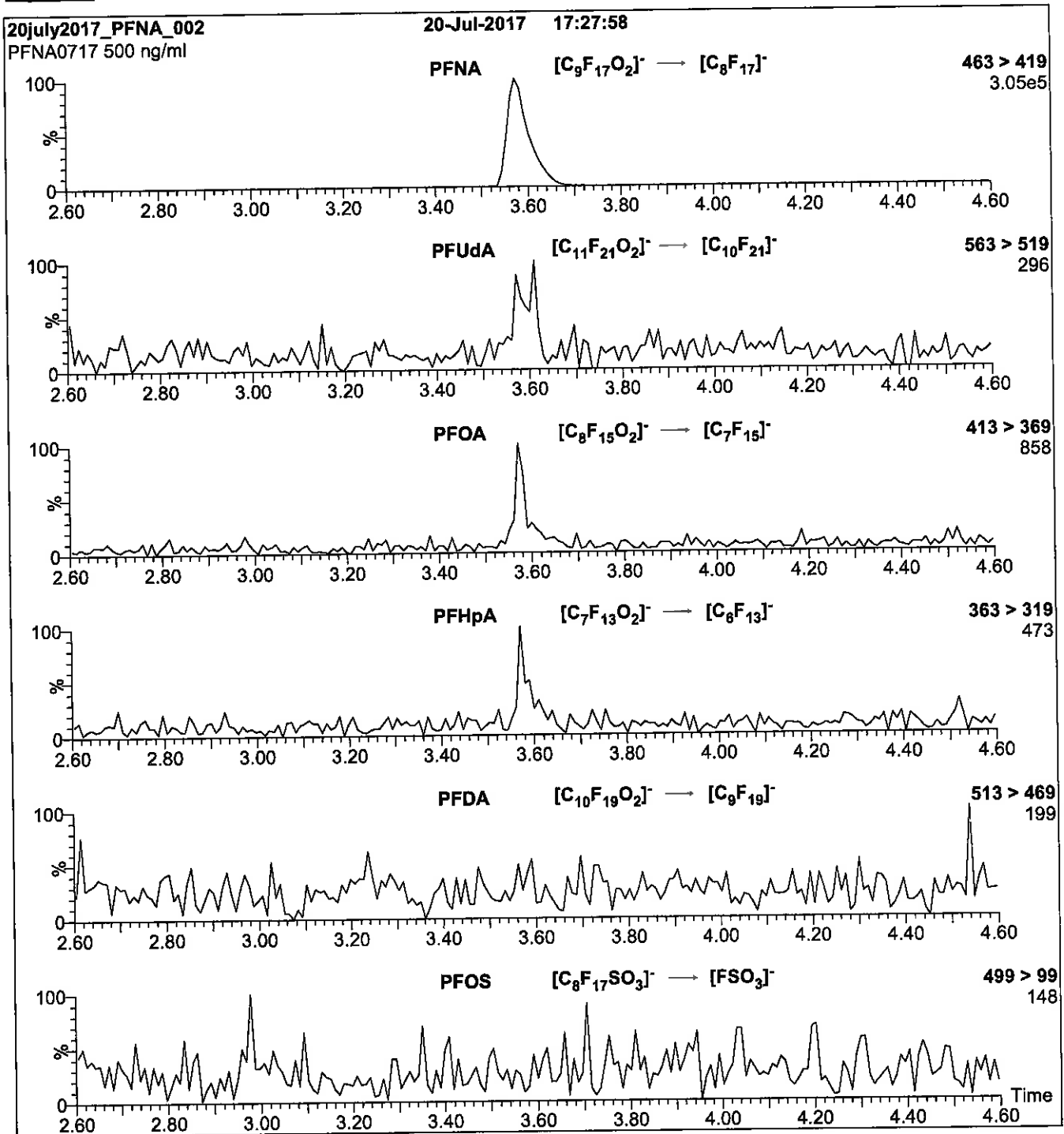
Flow: 300  $\mu$ l/min

**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

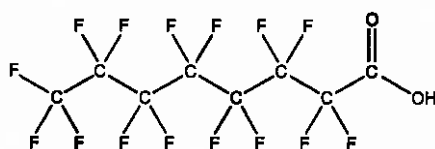
**LOT NUMBER:** PFOA0917

**COMPOUND:**

Perfluoro-n-octanoic acid

**STRUCTURE:**

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



**MOLECULAR FORMULA:**

$C_8HF_{15}O_2$

**MOLECULAR WEIGHT:** 414.07

**CONCENTRATION:**

$50 \pm 2.5 \mu\text{g/ml}$

**SOLVENT(S):** Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

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

09/27/2017

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

09/27/2022

**RECOMMENDED STORAGE:**

Store ampoule in a cool, dark place

### DOCUMENTATION/ DATA ATTACHED:

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

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

### ADDITIONAL INFORMATION:

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

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

**Certified By:**

  
B.G. Chittim, General Manager

**Date:** 09/28/2017

(mm/dd/yyyy)

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

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### **SYNTHESIS / CHARACTERIZATION:**

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

### **HOMOGENEITY:**

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

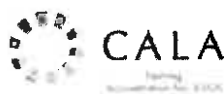
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

### **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.

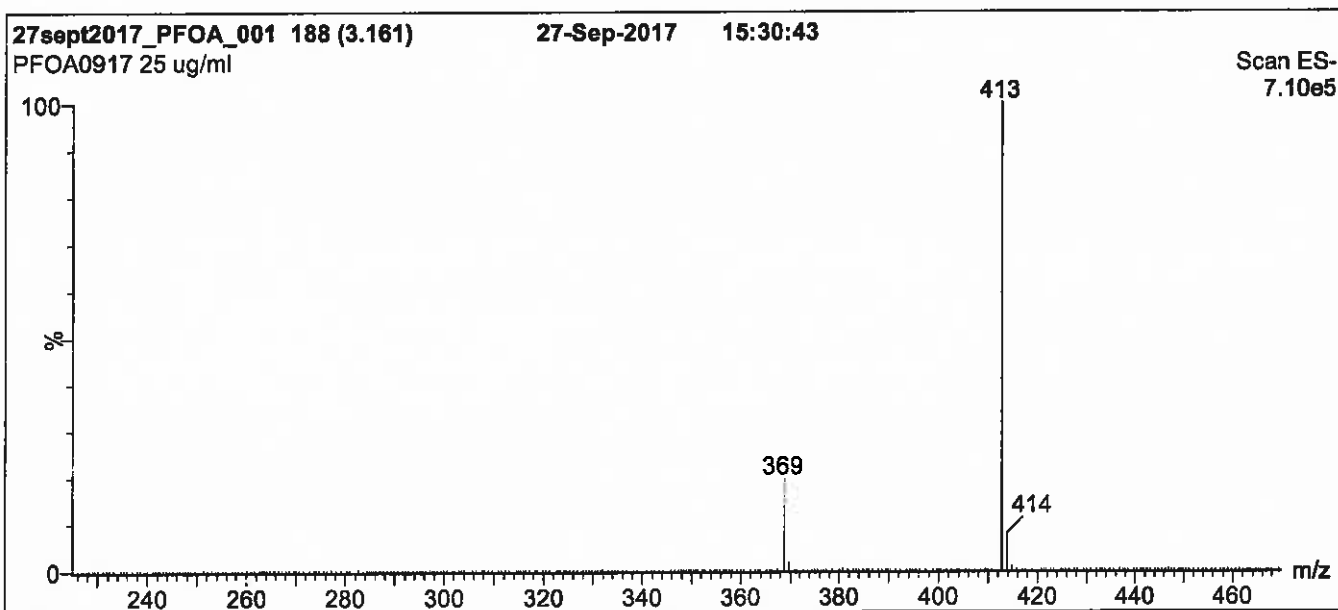
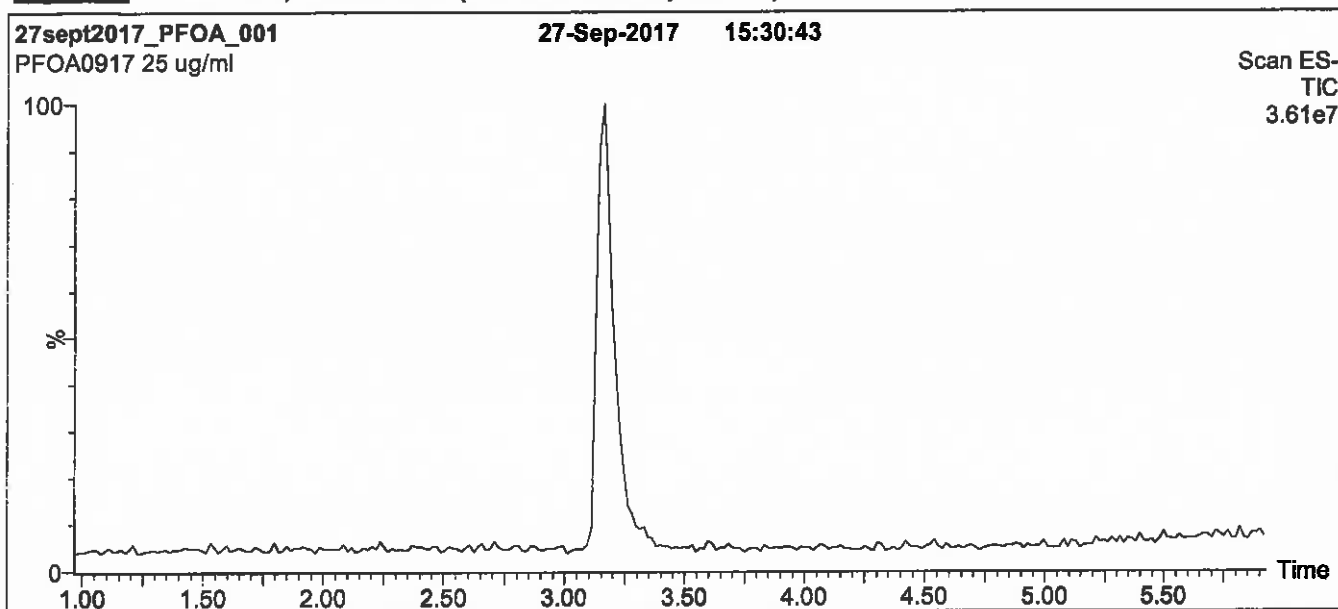
### **QUALITY MANAGEMENT:**

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: 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

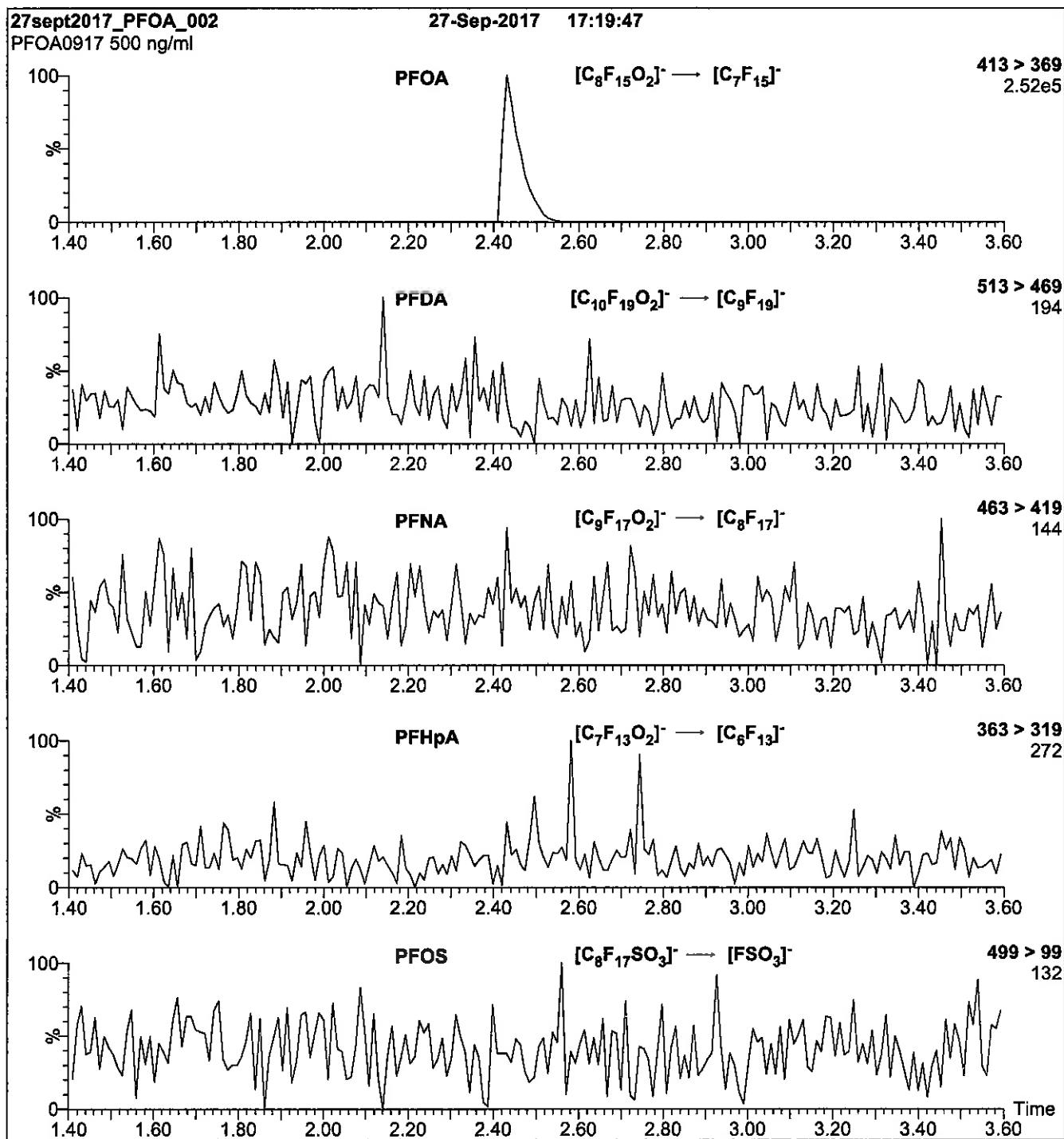
Flow: 300  $\mu$ l/min

**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

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

### DESCRIPTION:

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

### DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by <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).

**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.

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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.

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

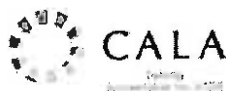
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### **LIMITED WARRANTY:**

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

### **QUALITY MANAGEMENT:**

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




\*\*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)\*\*

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

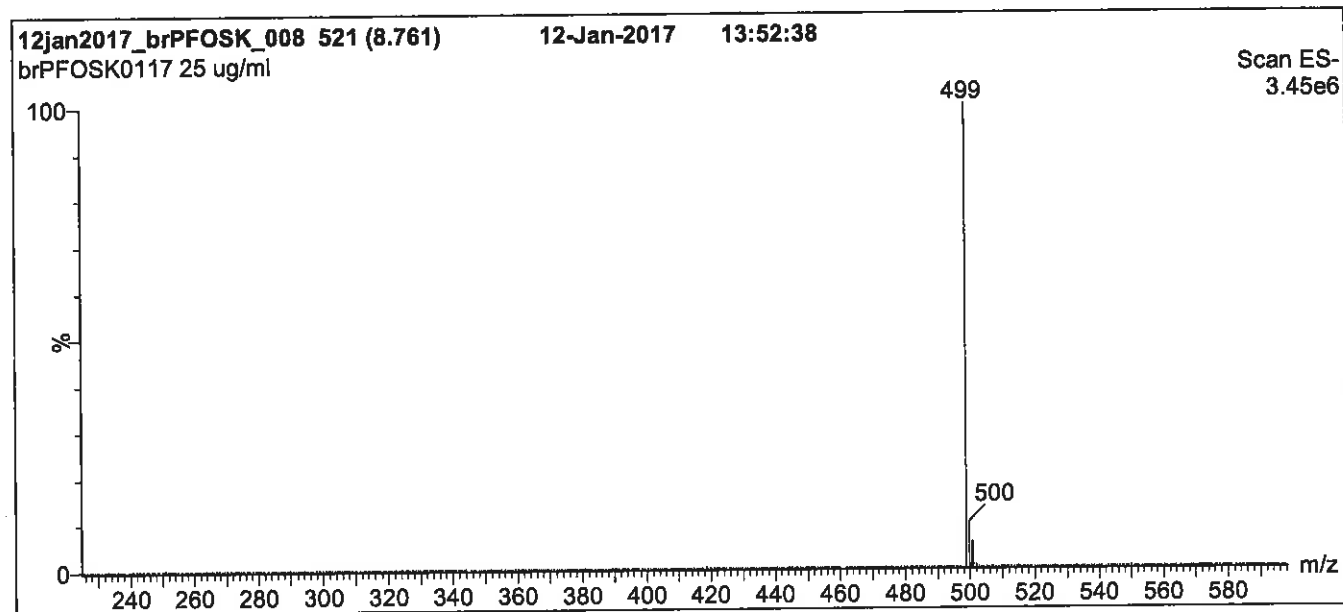
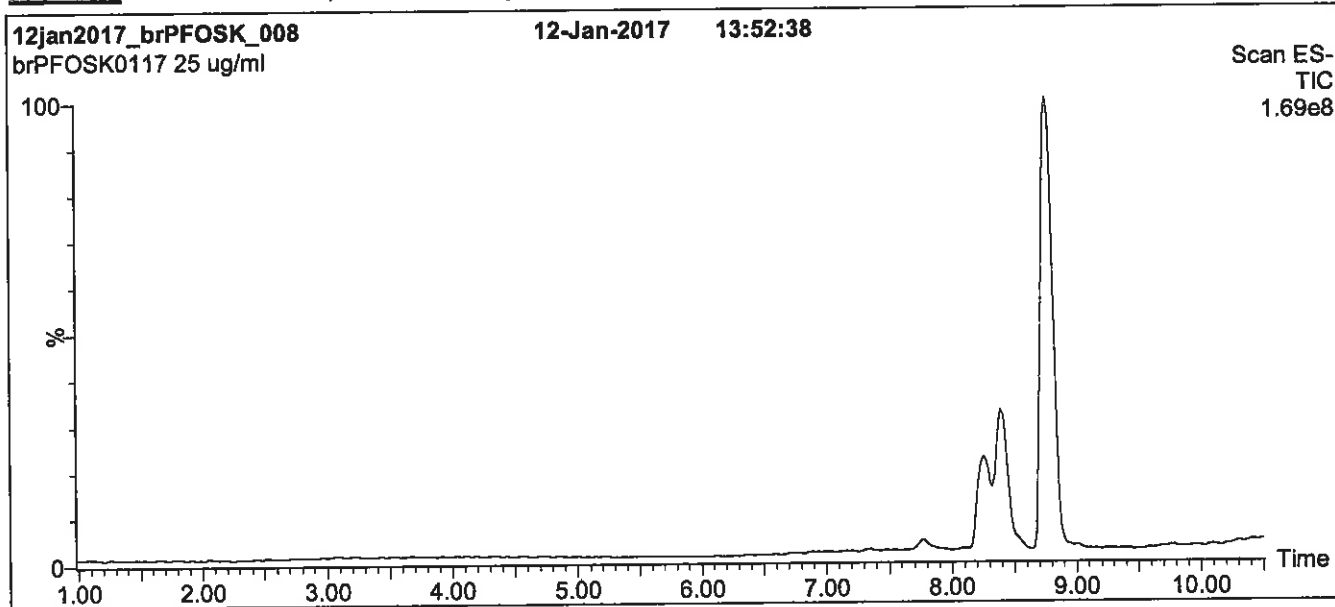
Isomer	Name	Structure	Percent Composition by <sup>19</sup> F-NMR
1	Potassium perfluoro-1-octanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> <sup>-</sup> K <sup>+</sup>	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	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

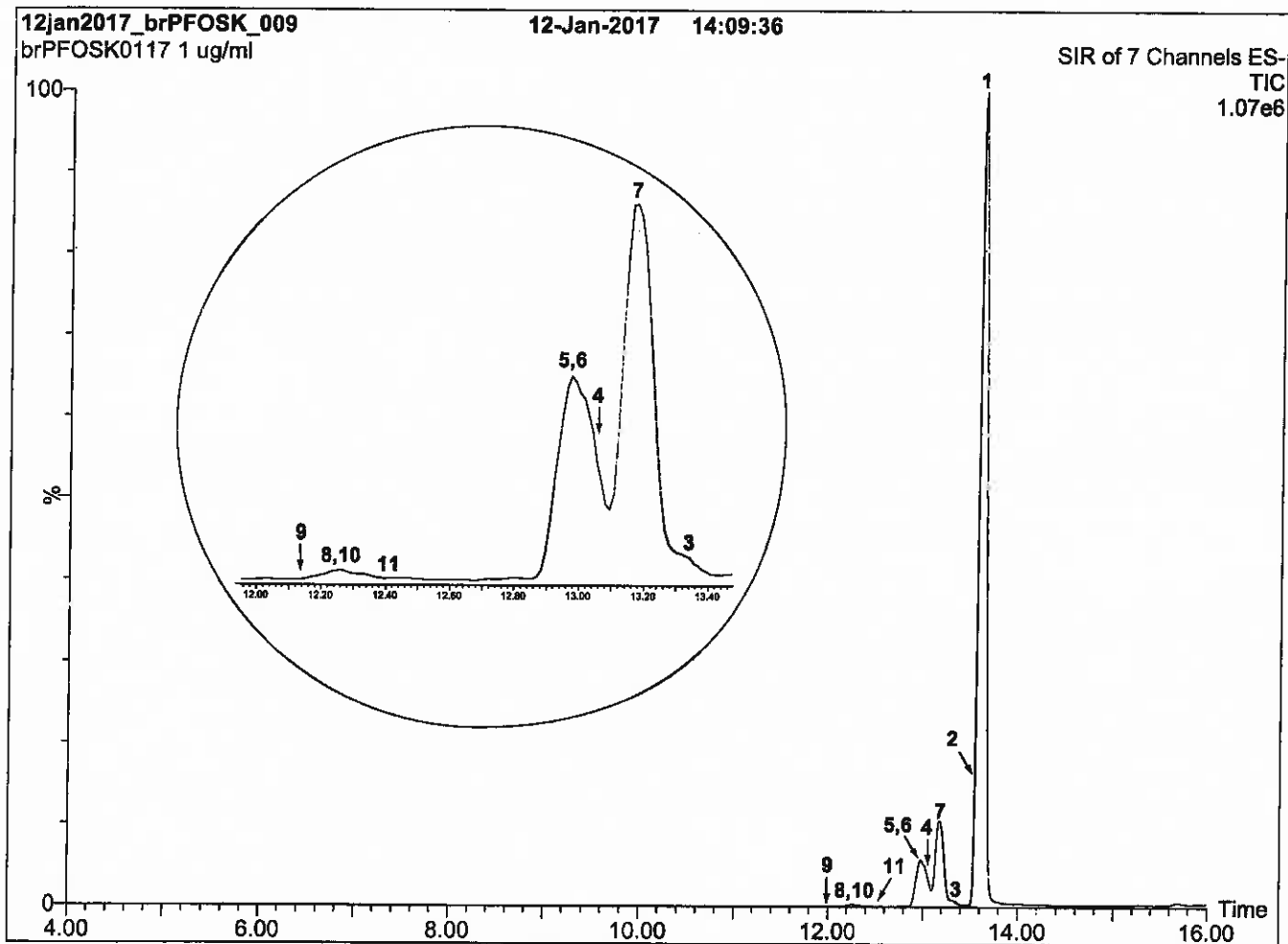
Flow: 300  $\mu$ l/min

**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

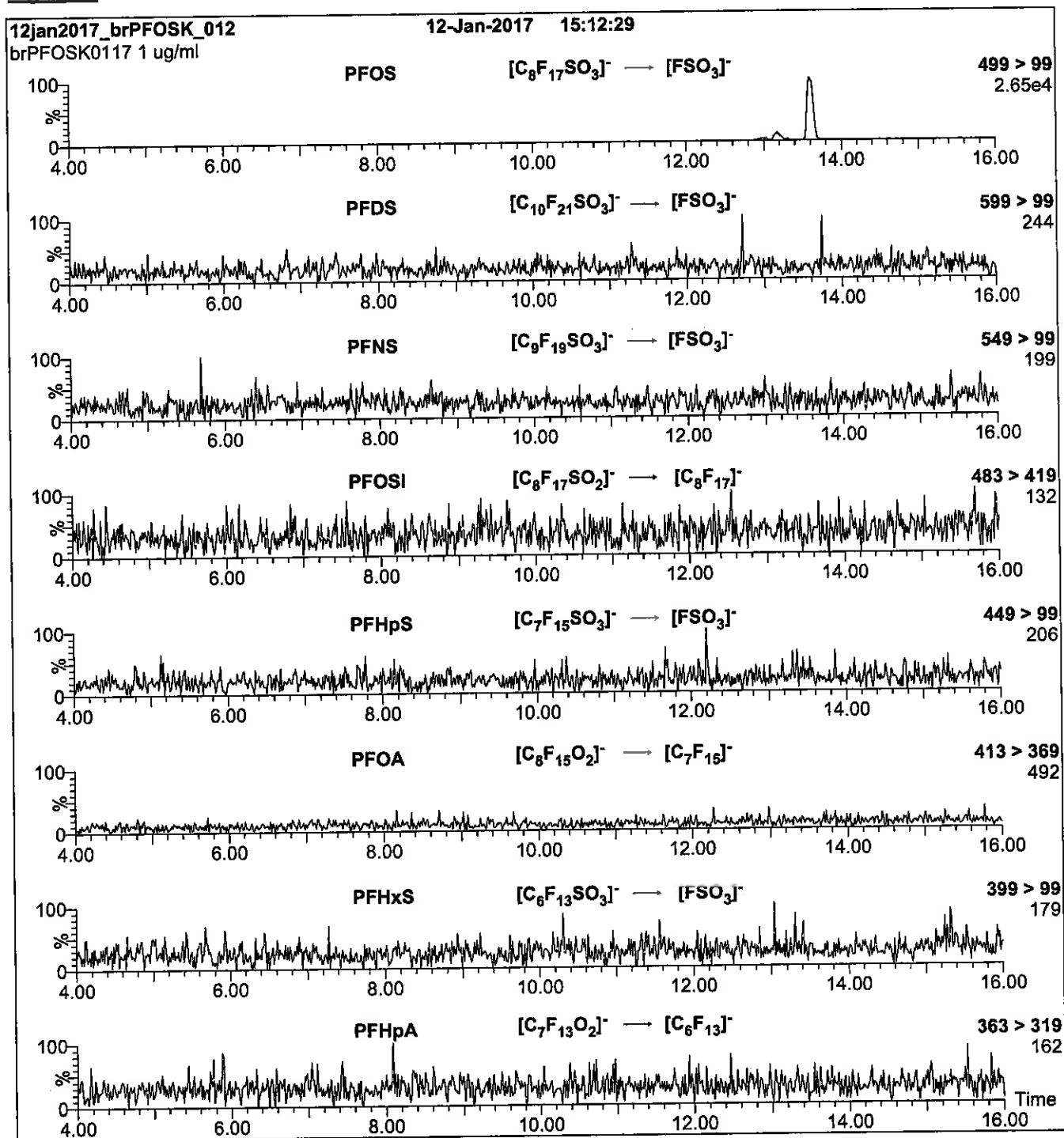
**Chromatographic Conditions:**

**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.: 320-38284-1

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

Matrix: Water

Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WGNA-041718-DUP-32	320-38284-1	90	90
NAWC-041718-RW-278	320-38284-2	93	89
NAWC-041718-FRB-278	320-38284-3	96	90
NAWC-041718-RW-360	320-38284-4	95	89
NAWC-041718-FRB-360	320-38284-5	90	85
NAWC-041718-RW-150	320-38284-6	100	95
NAWC-041718-FRB-150	320-38284-7	96	93
NAWC-041718-RW-179	320-38284-8	103	82
NAWC-041718-FRB-179	320-38284-9	95	94
	MB 320-218953/1-A	96	93
	LCS 320-218953/2-A	115	110
	LCSD 320-218953/3-A	94	94

PFHxA = 13C2 PFHxA  
PFDA = 13C2 PFDA

QC LIMITS  
70-130  
70-130

# Column to be used to flag recovery values

FORM III  
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Matrix: Water Level: Low Lab File ID: 2018.04.23\_537C\_052.d  
 Lab ID: LCS 320-218953/2-A Client ID: \_\_\_\_\_

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	220	247	112	70-130	M
Perfluorooctanoic acid (PFOA)	110	124	113	70-130	
Perfluorononanoic acid (PFNA)	110	117	106	70-130	
Perfluorohexanesulfonic acid (PFHxS)	168	196	116	70-130	
Perfluoroheptanoic acid (PFHpA)	54.0	61.0	113	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	570	114	70-130	

# Column to be used to flag recovery and RPD values

FORM III  
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Matrix: Water Level: Low Lab File ID: 2018.04.23\_537C\_053.d

Lab ID: LCSD 320-218953/3-A Client ID: \_\_\_\_\_

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	220	207	94	18	30	70-130	M
Perfluorooctanoic acid (PFOA)	110	101	92	20	30	70-130	
Perfluorononanoic acid (PFNA)	110	98.5	90	17	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	168	164	97	18	30	70-130	
Perfluoroheptanoic acid (PFHpA)	54.0	50.0	93	20	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	445	89	25	30	70-130	

# Column to be used to flag recovery and RPD values

FORM IV  
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab File ID: 2018.04.23\_537C\_051.d Lab Sample ID: MB 320-218953/1-A  
 Matrix: Water Date Extracted: 04/20/2018 09:26  
 Instrument ID: A8\_N Date Analyzed: 04/23/2018 21:27  
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-218953/2-A	2018.04.23_537C_052.d	04/23/2018 21:32
	LCSD 320-218953/3-A	2018.04.23_537C_053.d	04/23/2018 21:37
WGNA-041718-DUP-32	320-38284-1	2018.04.23_537C_065.d	04/23/2018 22:33
NAWC-041718-RW-278	320-38284-2	2018.04.23_537C_066.d	04/23/2018 22:37
NAWC-041718-FRB-278	320-38284-3	2018.04.23_537C_067.d	04/23/2018 22:42
NAWC-041718-RW-360	320-38284-4	2018.04.23_537C_068.d	04/23/2018 22:47
NAWC-041718-FRB-360	320-38284-5	2018.04.23_537C_069.d	04/23/2018 22:51
NAWC-041718-RW-150	320-38284-6	2018.04.23_537C_070.d	04/23/2018 22:56
NAWC-041718-FRB-150	320-38284-7	2018.04.23_537C_071.d	04/23/2018 23:01
NAWC-041718-RW-179	320-38284-8	2018.04.23_537C_074.d	04/23/2018 23:15
NAWC-041718-FRB-179	320-38284-9	2018.04.23_537C_075.d	04/23/2018 23:19

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Instrument ID: A8\_N Calibration Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 04/11/2018 12:09  
 Calibration ID: 38530

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	970041	1.86	2344935	2.10		
UPPER LIMIT	1455062	2.36	3517403	2.60		
LOWER LIMIT	485021	1.36	1172468	1.60		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCVL 320-217453/10	964533	1.87	2387973	2.10		
ICV 320-217453/12	1123391	1.86	2710764	2.10		
CCVL 320-219315/1	860713	1.88	2040827	2.12		
CCV 320-219464/17 CCVIS	871239	1.86	2013363	2.10		
MB 320-218953/1-A	866508	1.85	2105233	2.09		
LCS 320-218953/2-A	807996	1.86	1921927	2.10		
LCSD 320-218953/3-A	960967	1.85	2254298	2.10		
CCV 320-219464/28 CCVIS	936349	1.86	2188060	2.10		
CCV 320-219466/28 CCVIS	936349	1.86	2188060	2.10		
320-38284-1	WGNA-041718-DUP-32	859854	1.85	2115564	2.10	
320-38284-2	NAWC-041718-RW-278	951398	1.86	2330949	2.10	
320-38284-3	NAWC-041718-FRB-278	873024	1.86	2067103	2.10	
320-38284-4	NAWC-041718-RW-360	959095	1.85	2353519	2.09	
320-38284-5	NAWC-041718-FRB-360	1007902	1.86	2335785	2.10	
320-38284-6	NAWC-041718-RW-150	896870	1.86	2186928	2.10	
320-38284-7	NAWC-041718-FRB-150	1020151	1.85	2303453	2.09	
CCV 320-219466/40 CCVIS	865956	1.86	2057189	2.10		
CCV 320-219468/40 CCVIS	865956	1.86	2057189	2.10		
320-38284-8	NAWC-041718-RW-179	830741	1.87	2040767	2.11	
320-38284-9	NAWC-041718-FRB-179	843905	1.86	2044636	2.11	
CCV 320-219468/44 CCVIS	822310	1.85	1943602	2.10		

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.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-219464/17 Date Analyzed: 04/23/2018 21:18  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.04.23\_537C\_049 Heated Purge: (Y/N) N  
 Calibration ID: 38530

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	871239	1.86	2013363	2.10		
UPPER LIMIT	1219735	2.36	2818708	2.60		
LOWER LIMIT	609867	1.36	1409354	1.60		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-218953/1-A			866508	1.85	2105233	2.09
LCS 320-218953/2-A			807996	1.86	1921927	2.10
LCSD 320-218953/3-A			960967	1.85	2254298	2.10

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

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

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-219464/28 Date Analyzed: 04/23/2018 22:09  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.04.23\_537C\_060 Heated Purge: (Y/N) N  
 Calibration ID: 38530

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	936349	1.86	2188060	2.10		
UPPER LIMIT	1310889	2.36	3063284	2.60		
LOWER LIMIT	655444	1.36	1531642	1.60		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-218953/1-A		866508	1.85	2105233	2.09	
LCS 320-218953/2-A		807996	1.86	1921927	2.10	
LCSD 320-218953/3-A		960967	1.85	2254298	2.10	

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

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

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-219466/28 Date Analyzed: 04/23/2018 22:09  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.04.23\_537C\_060 Heated Purge: (Y/N) N  
 Calibration ID: 38530

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	936349	1.86	2188060	2.10		
UPPER LIMIT	1310889	2.36	3063284	2.60		
LOWER LIMIT	655444	1.36	1531642	1.60		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-38284-1	WGNA-041718-DUP-32	859854	1.85	2115564	2.10	
320-38284-2	NAWC-041718-RW-278	951398	1.86	2330949	2.10	
320-38284-3	NAWC-041718-FRB-278	873024	1.86	2067103	2.10	
320-38284-4	NAWC-041718-RW-360	959095	1.85	2353519	2.09	
320-38284-5	NAWC-041718-FRB-360	1007902	1.86	2335785	2.10	
320-38284-6	NAWC-041718-RW-150	896870	1.86	2186928	2.10	
320-38284-7	NAWC-041718-FRB-150	1020151	1.85	2303453	2.09	

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

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

# Column used to flag values outside QC limits



FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-219466/40 Date Analyzed: 04/23/2018 23:05  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.04.23\_537C\_072 Heated Purge: (Y/N) N  
 Calibration ID: 38530

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	865956	1.86	2057189	2.10		
UPPER LIMIT	1212338	2.36	2880065	2.60		
LOWER LIMIT	606169	1.36	1440032	1.60		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-38284-1	WGNA-041718-DUP-32	859854	1.85	2115564	2.10	
320-38284-2	NAWC-041718-RW-278	951398	1.86	2330949	2.10	
320-38284-3	NAWC-041718-FRB-278	873024	1.86	2067103	2.10	
320-38284-4	NAWC-041718-RW-360	959095	1.85	2353519	2.09	
320-38284-5	NAWC-041718-FRB-360	1007902	1.86	2335785	2.10	
320-38284-6	NAWC-041718-RW-150	896870	1.86	2186928	2.10	
320-38284-7	NAWC-041718-FRB-150	1020151	1.85	2303453	2.09	

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

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

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-219468/40 Date Analyzed: 04/23/2018 23:05  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.04.23\_537C\_072 Heated Purge: (Y/N) N  
 Calibration ID: 38530

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	865956	1.86	2057189	2.10		
UPPER LIMIT	1212338	2.36	2880065	2.60		
LOWER LIMIT	606169	1.36	1440032	1.60		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-38284-8	NAWC-041718-RW-179	830741	1.87	2040767	2.11	
320-38284-9	NAWC-041718-FRB-179	843905	1.86	2044636	2.11	

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

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

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-219468/44 Date Analyzed: 04/23/2018 23:24  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.04.23\_537C\_076 Heated Purge: (Y/N) N  
 Calibration ID: 38530

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	822310	1.85	1943602	2.10		
UPPER LIMIT	1151234	2.35	2721043	2.60		
LOWER LIMIT	575617	1.35	1360521	1.60		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-38284-8	NAWC-041718-RW-179	830741	1.87	2040767	2.11	
320-38284-9	NAWC-041718-FRB-179	843905	1.86	2044636	2.11	

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

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

# Column used to flag values outside QC limits

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-041718-DUP-32 Lab Sample ID: 320-38284-1  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_065.d  
 Analysis Method: 537 Date Collected: 04/17/2018 07:00  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 252.3(mL) Date Analyzed: 04/23/2018 22:33  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	J M	40	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	22		20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.7	J	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.9	J	9.9	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	90		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_065.d  
 Lims ID: 320-38284-A-1-A  
 Client ID: WGNA-041718-DUP-32  
 Sample Type: Client  
 Inject. Date: 23-Apr-2018 22:33:04 ALS Bottle#: 45 Worklist Smp#: 33  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-38284-a-1-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:59 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 11:07:43

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.388	1.388	0.0	1.000	137512	1.77		88.3	
298.90 > 99.00	1.388	1.388	0.0	1.000	104336		1.32(0.00-0.00)	108	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.517	1.517	0.0	1.000	819049	8.96		6790	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.662	1.669	-0.007	1.000	236402	1.95		59.0	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.669	1.669	0.0	1.000	136581	1.48		12.5	
* 6 13C2-PFOA									
415.00 > 370.00	1.851	1.859	-0.008		859854	10.0		6209	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.859	0.0	1.000	498668	5.46		70.6	
413.00 > 169.00	1.851	1.859	-0.008	0.996	302247		1.65(0.00-0.00)	206	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.102	2.102	0.0	1.000	318145	4.05		55.6	a
499.00 > 99.00	2.102	2.102	0.0	1.000	54018		5.89(0.00-0.00)	74.5	a
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.102	0.0		2115564	28.7		978	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.109	0.0	1.000	57436	0.7929		10.7	M
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.269	0.0	1.000	657073	8.99		8154	

## QC Flag Legend

### Review Flags

M - Manually Integrated

a - User Assigned ID

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_065.d

Injection Date: 23-Apr-2018 22:33:04

Instrument ID: A8\_N

Lims ID: 320-38284-A-1-A

Lab Sample ID: 320-38284-1

Client ID: WGNA-041718-DUP-32

Operator ID: SACINSTLCMS01

ALS Bottle#: 45

Worklist Smp#: 33

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

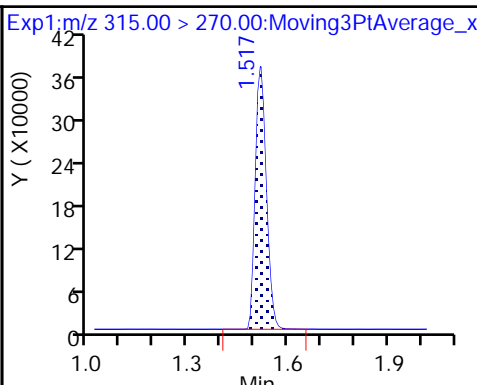
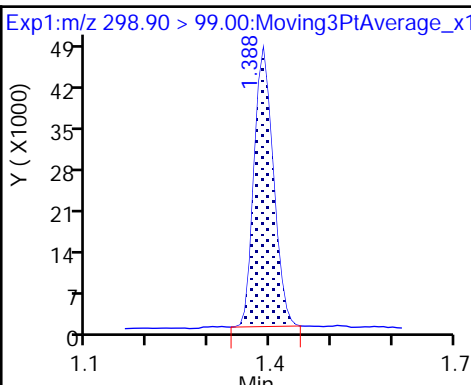
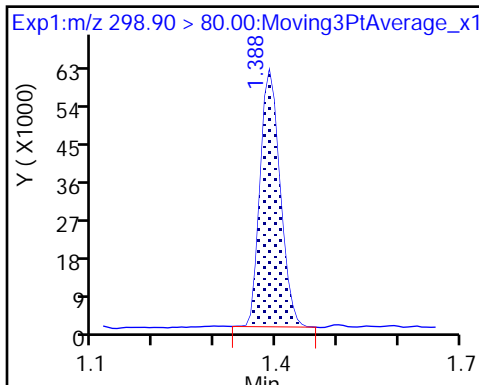
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

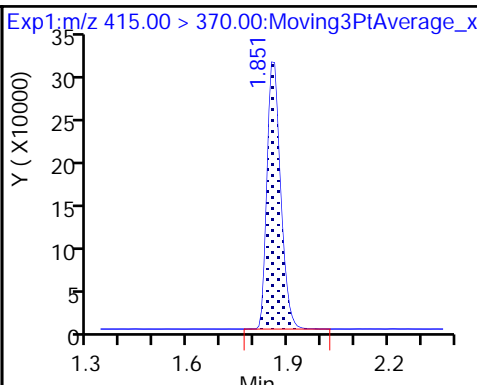
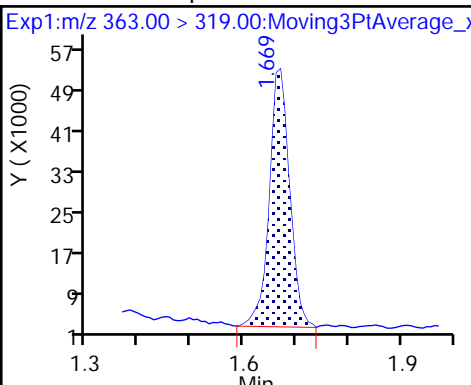
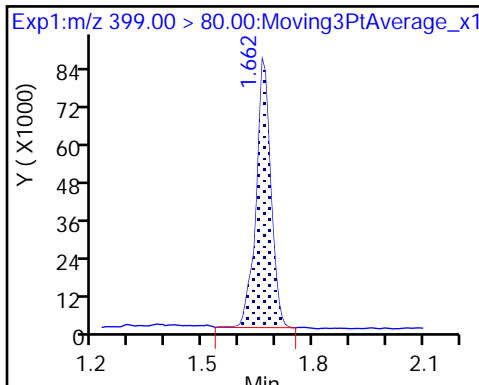
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

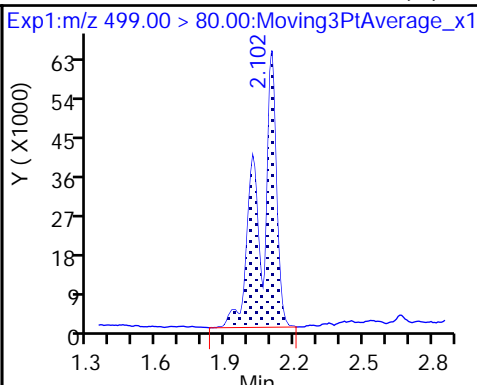
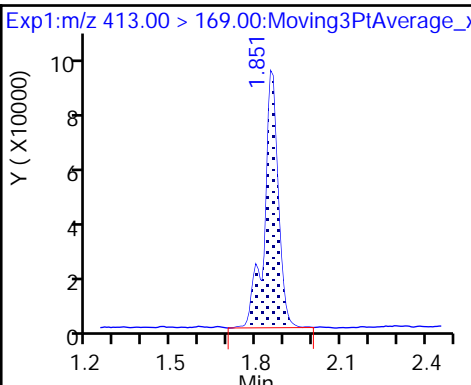
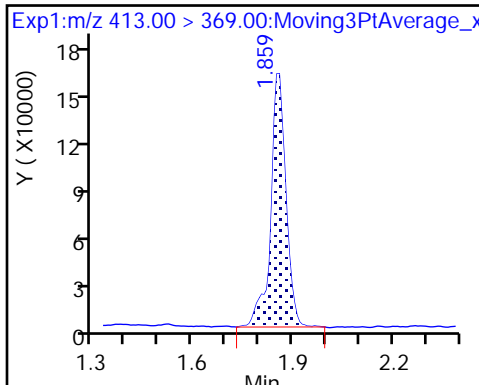
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

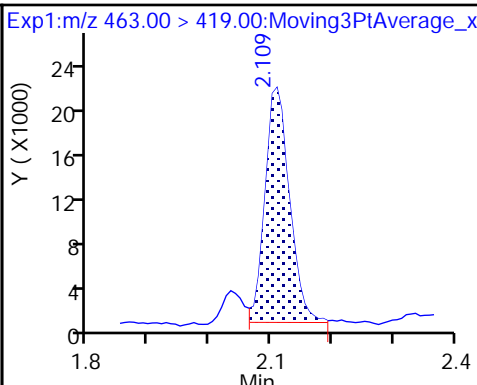
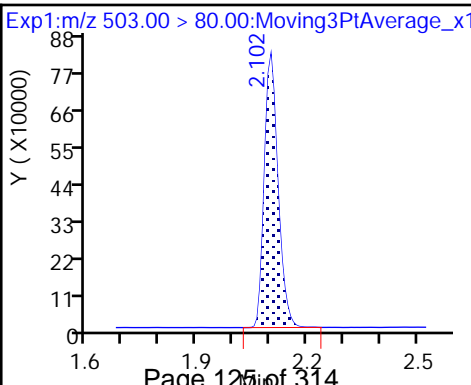
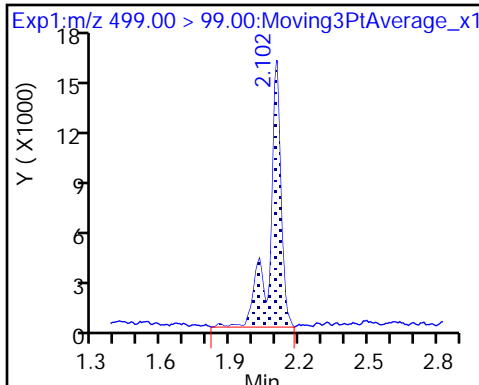
8 Perfluorooctane sulfonic acid (M)



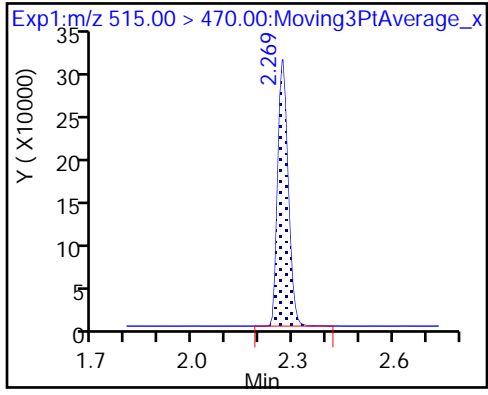
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA





TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_065.d  
 Lims ID: 320-38284-A-1-A  
 Client ID: WGNA-041718-DUP-32  
 Sample Type: Client  
 Inject. Date: 23-Apr-2018 22:33:04 ALS Bottle#: 45 Worklist Smp#: 33  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-38284-a-1-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:59 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 11:07:43

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.96	89.59
\$ 10 13C2 PFDA	10.0	8.99	89.85

TestAmerica Sacramento

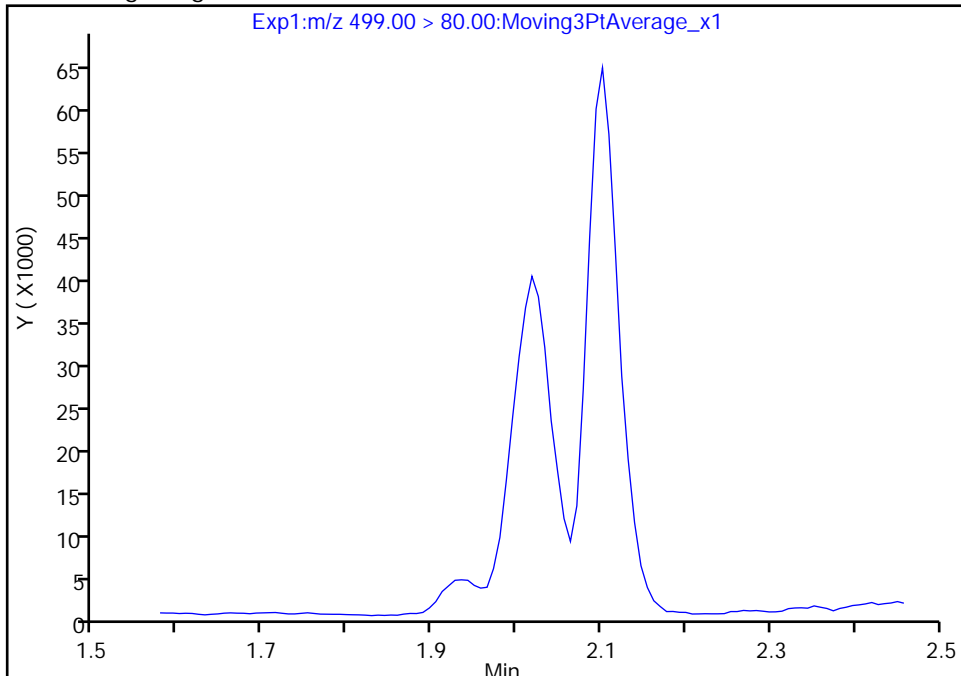
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Injection Date: 23-Apr-2018 22:33:04 Instrument ID: A8\_N  
Lims ID: 320-38284-A-1-A Lab Sample ID: 320-38284-1  
Client ID: WGNA-041718-DUP-32  
Operator ID: SACINSTLCMS01 ALS Bottle#: 45 Worklist Smp#: 33  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

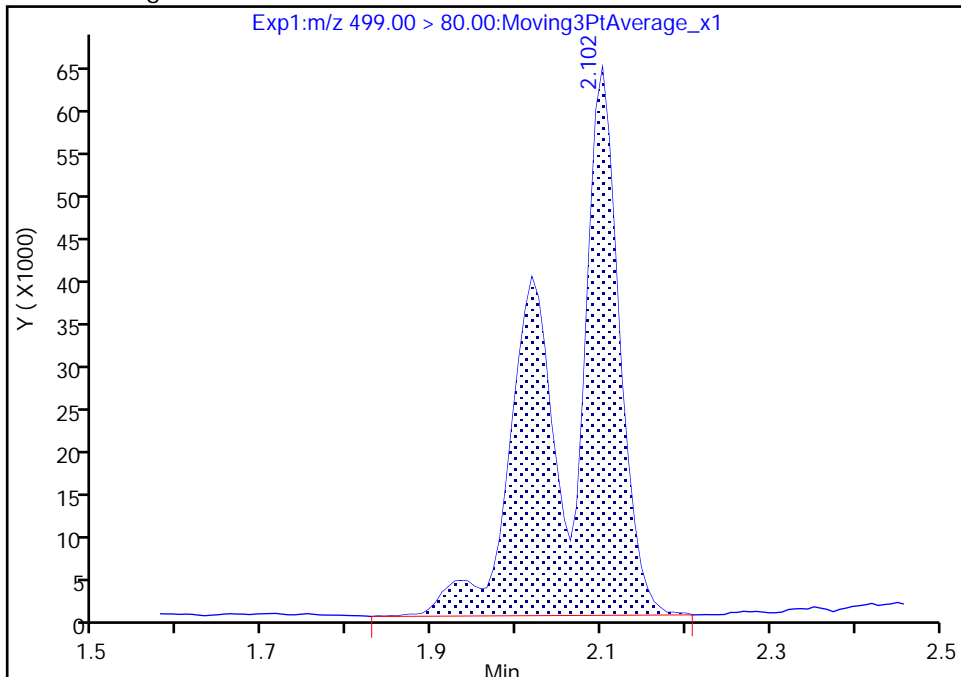
Not Detected  
Expected RT: 2.10

Processing Integration Results



Manual Integration Results

RT: 2.10  
Area: 318145  
Amount: 4.045677  
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 11:07:13  
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

TestAmerica Sacramento

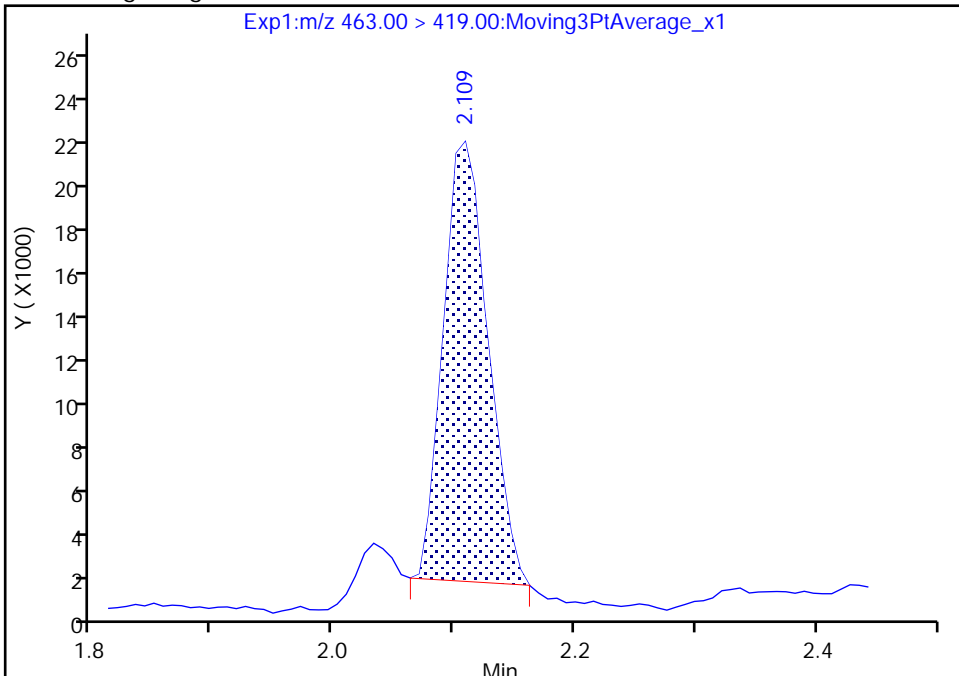
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Injection Date: 23-Apr-2018 22:33:04 Instrument ID: A8\_N  
Lims ID: 320-38284-A-1-A Lab Sample ID: 320-38284-1  
Client ID: WGNA-041718-DUP-32  
Operator ID: SACINSTLCMS01 ALS Bottle#: 45 Worklist Smp#: 33  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

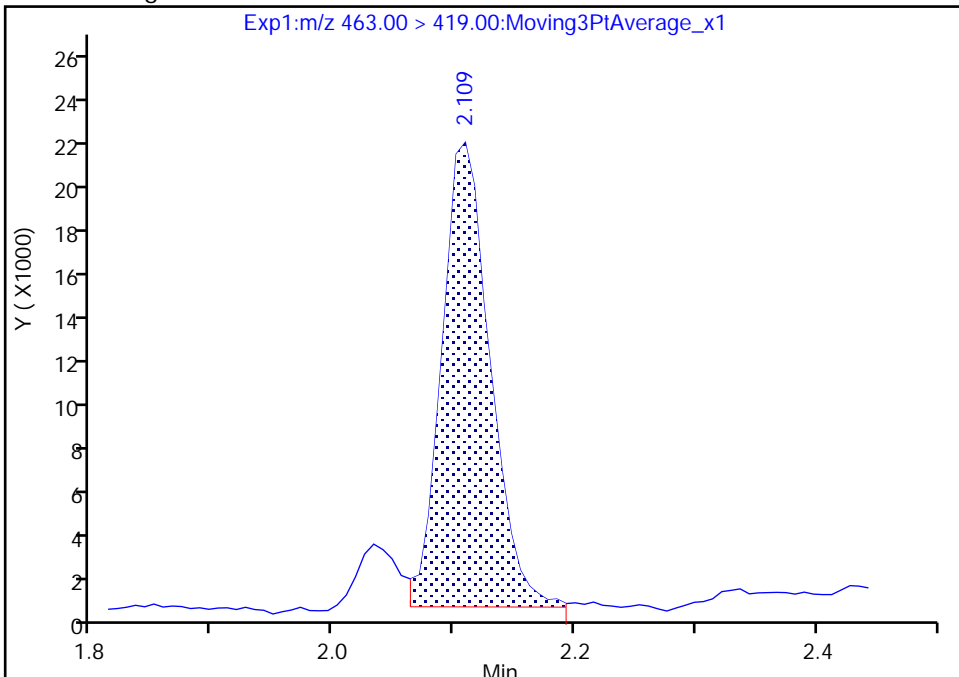
RT: 2.11  
Area: 50169  
Amount: 0.692623  
Amount Units: ng/ml

Processing Integration Results



RT: 2.11  
Area: 57436  
Amount: 0.792949  
Amount Units: ng/ml

Manual Integration Results



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-RW-278 Lab Sample ID: 320-38284-2  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_066.d  
 Analysis Method: 537 Date Collected: 04/17/2018 08:10  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 245 (mL) Date Analyzed: 04/23/2018 22:37  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	J M	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	22		20	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.7	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U M	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	89		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_066.d  
 Lims ID: 320-38284-A-2-A  
 Client ID: NAWC-041718-RW-278  
 Sample Type: Client  
 Inject. Date: 23-Apr-2018 22:37:44 ALS Bottle#: 46 Worklist Smp#: 34  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-38284-a-2-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:59 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 11:08:33

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.388	1.388	0.0	1.000	95775	1.12		50.3	M
298.90 > 99.00	1.388	1.388	0.0	1.000	74277		1.29(0.00-0.00)	73.2	M
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.517	1.517	0.0	1.000	936489	9.26		7847	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.669	1.669	0.0	1.000	103802	0.7777		20.9	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.669	1.669	0.0	1.000	218940	2.14		17.1	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.859	0.0		951398	10.0		5830	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.859	0.0	1.000	541294	5.36		60.5	
413.00 > 169.00	1.859	1.859	0.0	1.000	331179		1.63(0.00-0.00)	224	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.109	2.102	0.007	1.000	327843	3.78		52.8	a
499.00 > 99.00	2.102	2.102	0.0	0.996	59766		5.49(0.00-0.00)	63.4	a
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.102	0.0		2330949	28.7		841	
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.109	0.008	1.000	49461	0.6171		8.2	M
\$ 10 13C2 PFDA									
515.00 > 470.00	2.276	2.269	0.008	1.000	718472	8.88		7559	

## QC Flag Legend

### Review Flags

M - Manually Integrated

a - User Assigned ID

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_066.d

Injection Date: 23-Apr-2018 22:37:44

Instrument ID: A8\_N

Lims ID: 320-38284-A-2-A

Lab Sample ID: 320-38284-2

Client ID: NAWC-041718-RW-278

Operator ID: SACINSTLCMS01

ALS Bottle#: 46

Worklist Smp#: 34

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

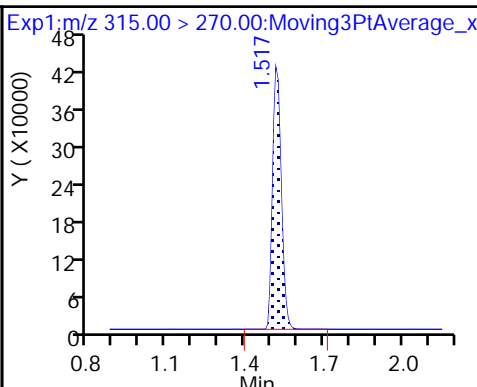
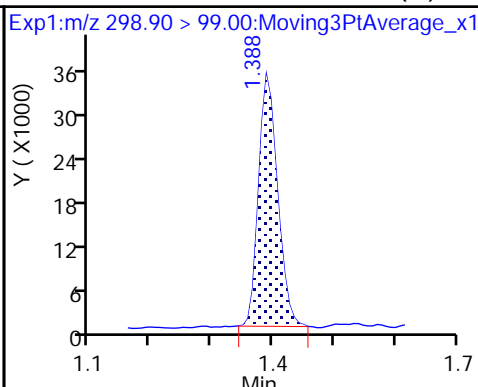
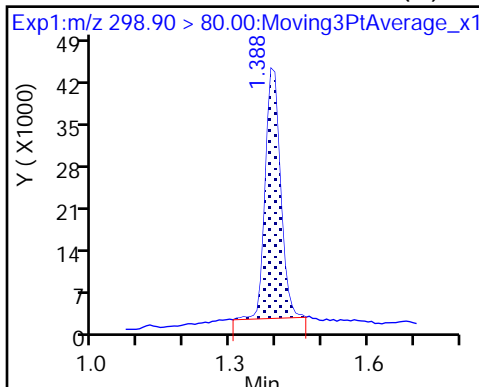
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (M)

1 Perfluorobutanesulfonic acid (M)

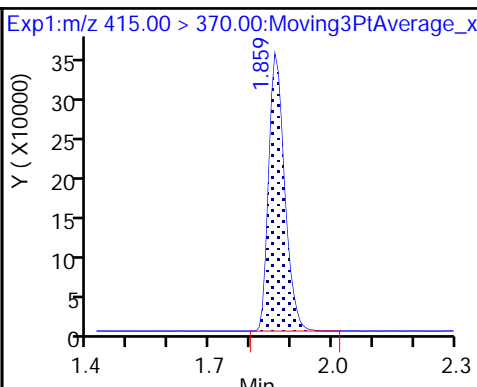
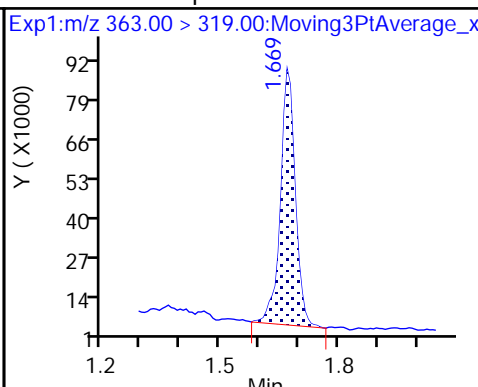
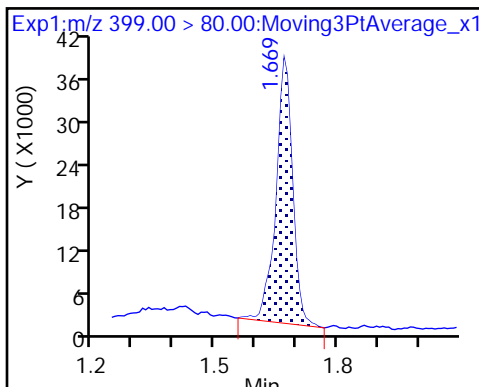
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

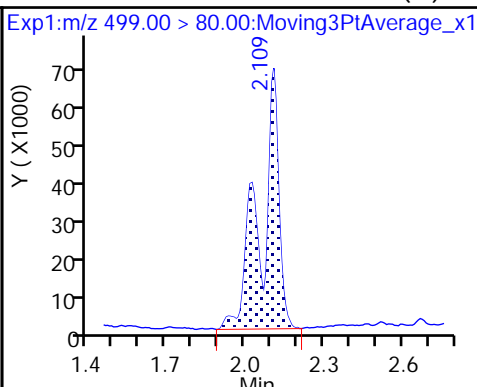
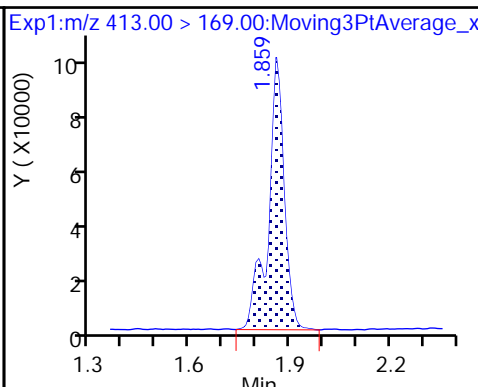
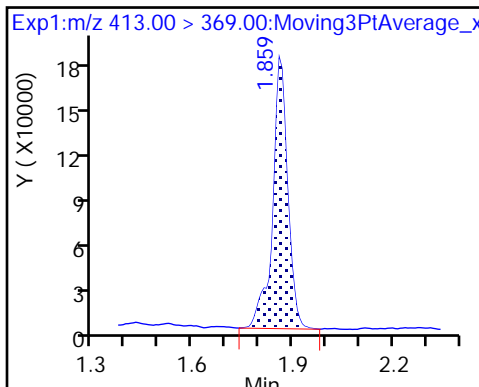
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

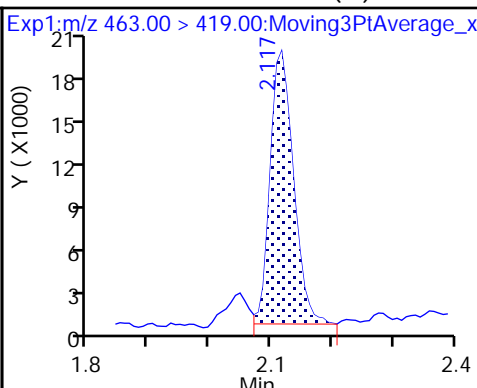
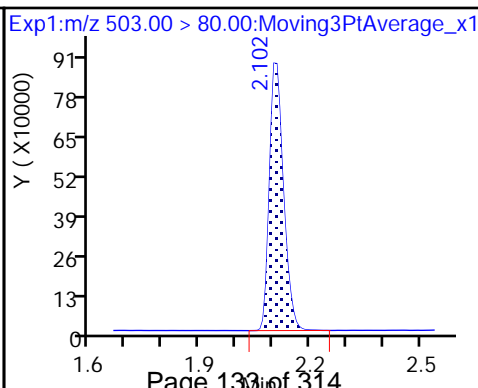
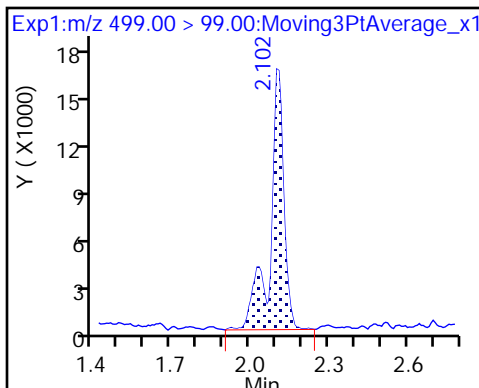
8 Perfluorooctane sulfonic acid (M)



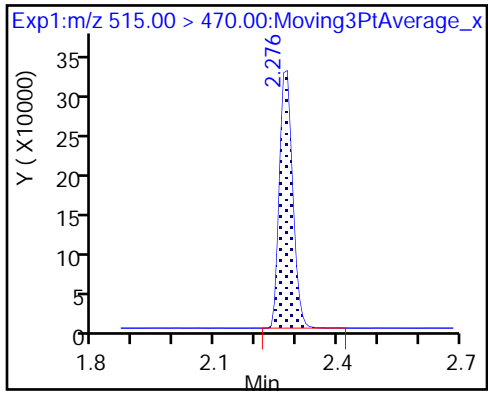
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA





TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_066.d  
 Lims ID: 320-38284-A-2-A  
 Client ID: NAWC-041718-RW-278  
 Sample Type: Client  
 Inject. Date: 23-Apr-2018 22:37:44 ALS Bottle#: 46 Worklist Smp#: 34  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-38284-a-2-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:59 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 11:08:33

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.26	92.58
\$ 10 13C2 PFDA	10.0	8.88	88.80

TestAmerica Sacramento

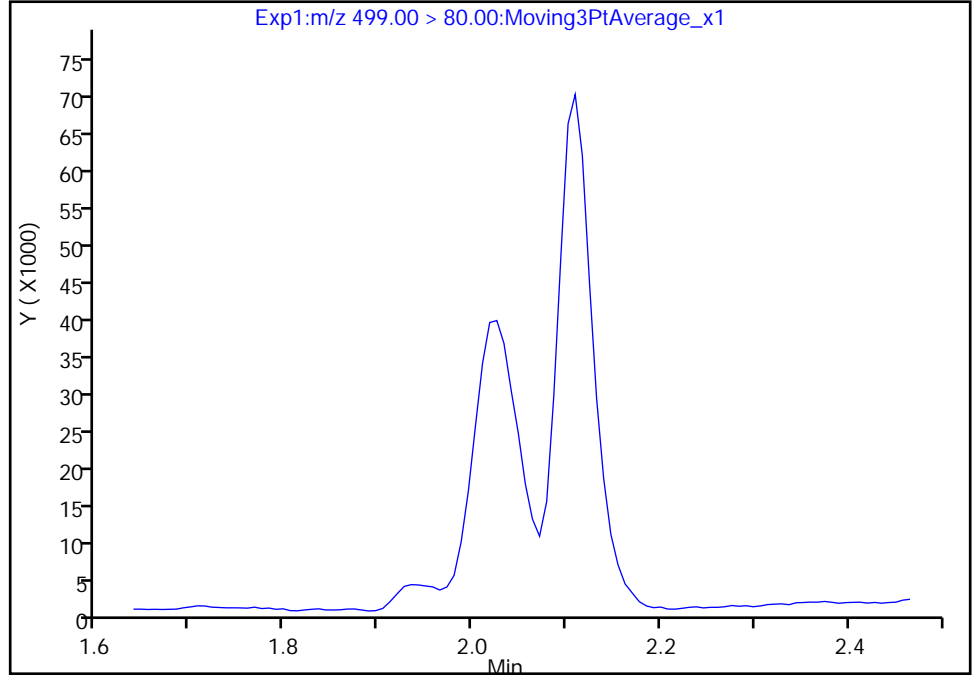
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_066.d  
Injection Date: 23-Apr-2018 22:37:44 Instrument ID: A8\_N  
Lims ID: 320-38284-A-2-A Lab Sample ID: 320-38284-2  
Client ID: NAWC-041718-RW-278  
Operator ID: SACINSTLCMS01 ALS Bottle#: 46 Worklist Smp#: 34  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

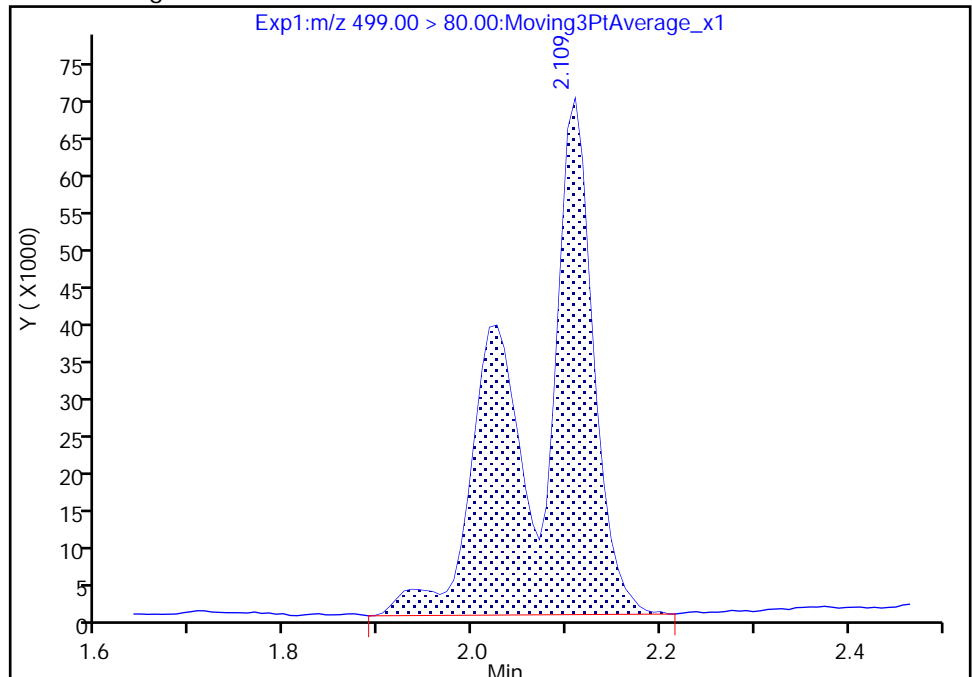
Not Detected  
Expected RT: 2.10

Processing Integration Results



Manual Integration Results

RT: 2.11  
Area: 327843  
Amount: 3.783776  
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 11:08:08  
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

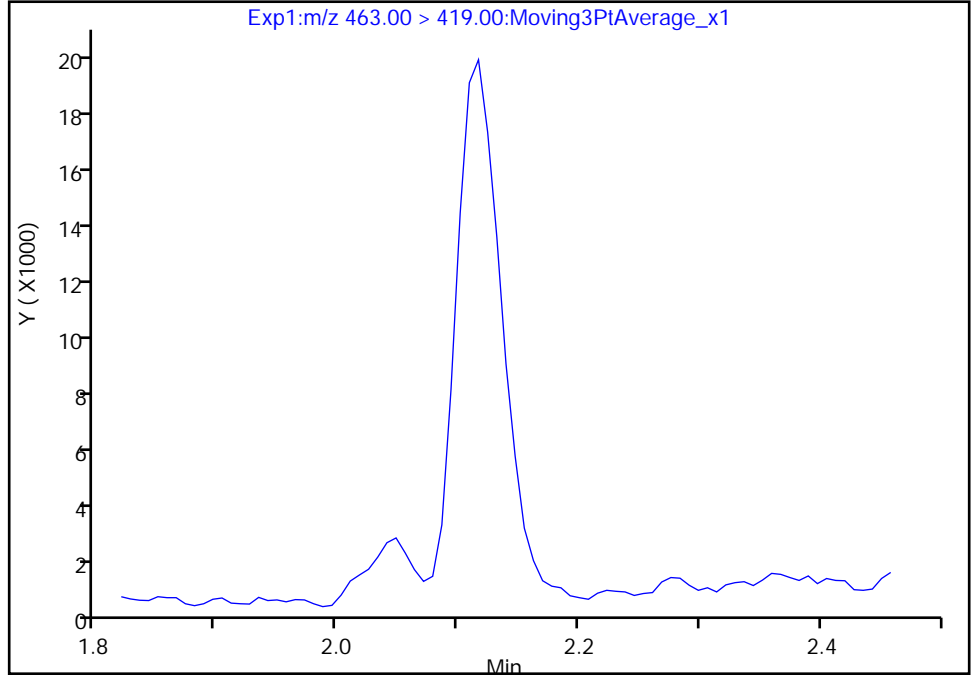
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Injection Date: 23-Apr-2018 22:37:44 Instrument ID: A8\_N  
Lims ID: 320-38284-A-2-A Lab Sample ID: 320-38284-2  
Client ID: NAWC-041718-RW-278  
Operator ID: SACINSTLCMS01 ALS Bottle#: 46 Worklist Smp#: 34  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

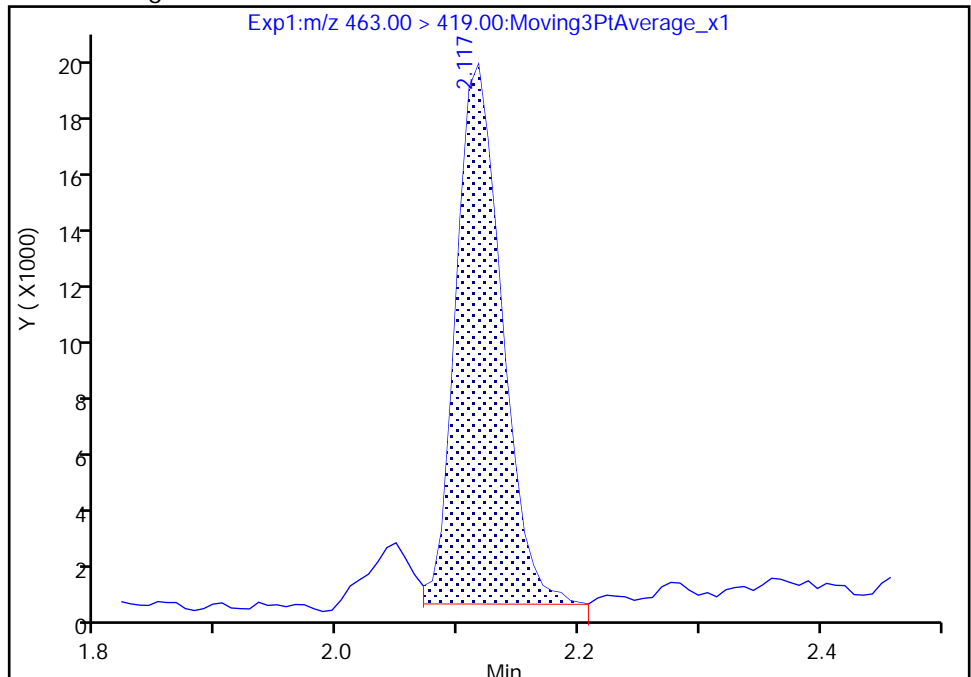
Not Detected  
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.12  
Area: 49461  
Amount: 0.617144  
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 11:08:19  
Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

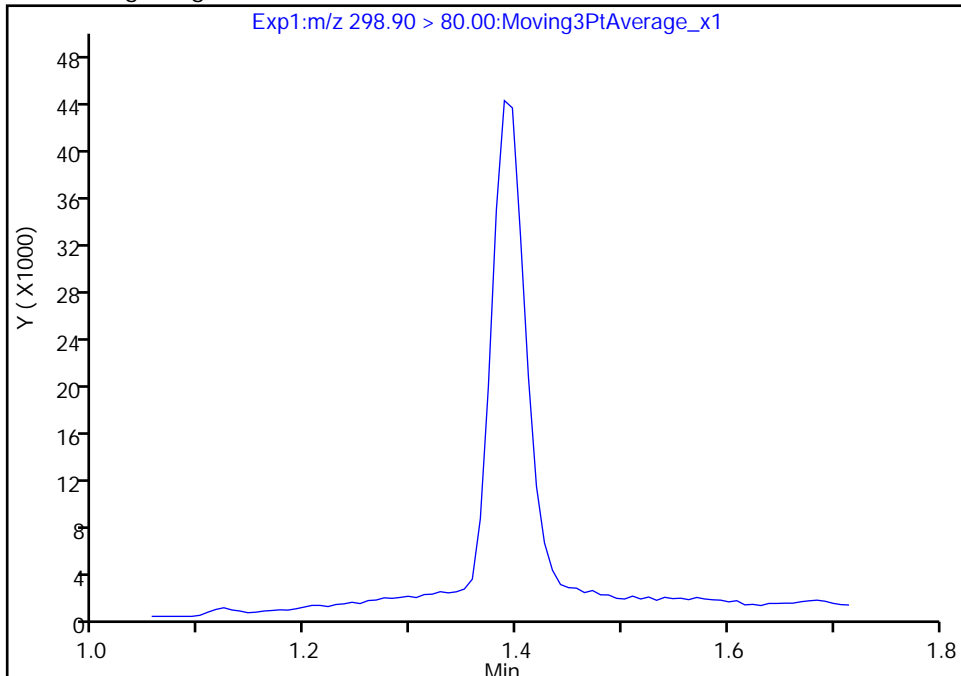
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Injection Date: 23-Apr-2018 22:37:44 Instrument ID: A8\_N  
Lims ID: 320-38284-A-2-A Lab Sample ID: 320-38284-2  
Client ID: NAWC-041718-RW-278  
Operator ID: SACINSTLCMS01 ALS Bottle#: 46 Worklist Smp#: 34  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

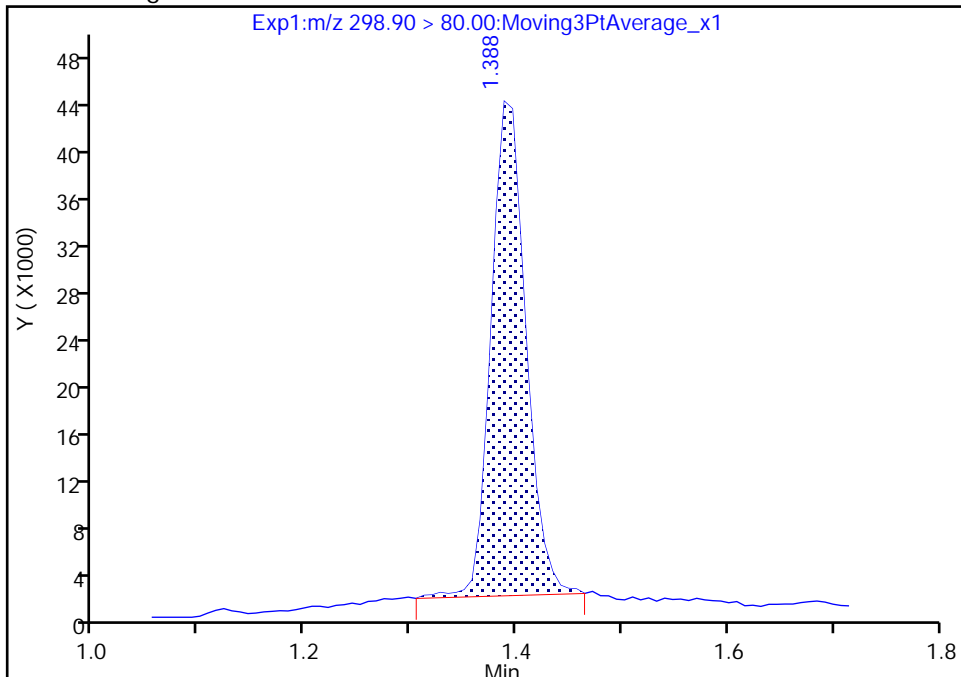
Not Detected  
Expected RT: 1.39

Processing Integration Results



Manual Integration Results

RT: 1.39  
Area: 95775  
Amount: 1.120242  
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 11:07:51  
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

TestAmerica Sacramento

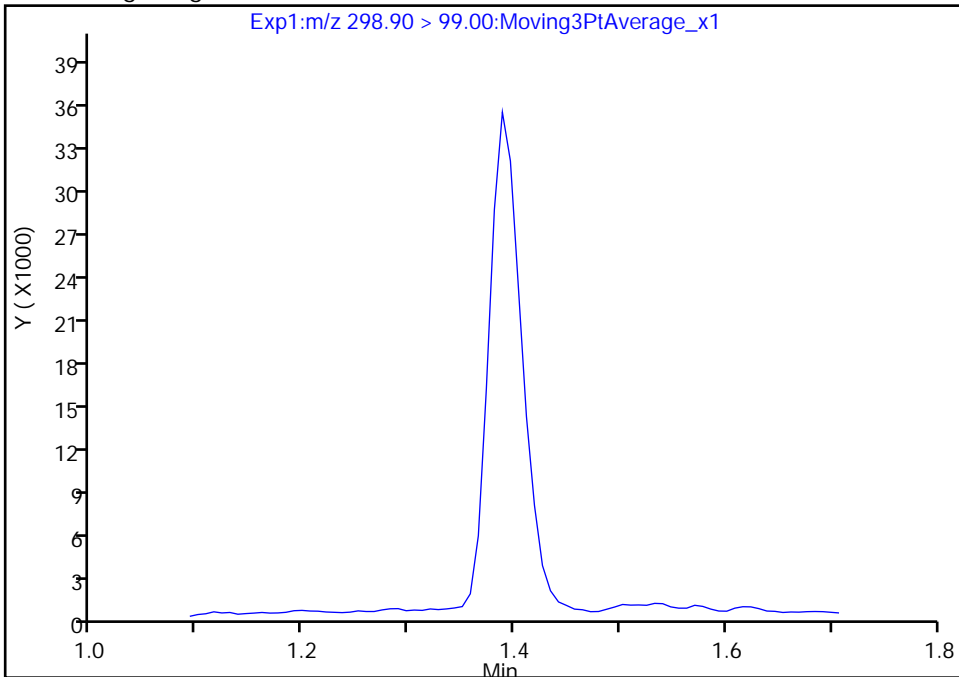
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Injection Date: 23-Apr-2018 22:37:44 Instrument ID: A8\_N  
Lims ID: 320-38284-A-2-A Lab Sample ID: 320-38284-2  
Client ID: NAWC-041718-RW-278  
Operator ID: SACINSTLCMS01 ALS Bottle#: 46 Worklist Smp#: 34  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

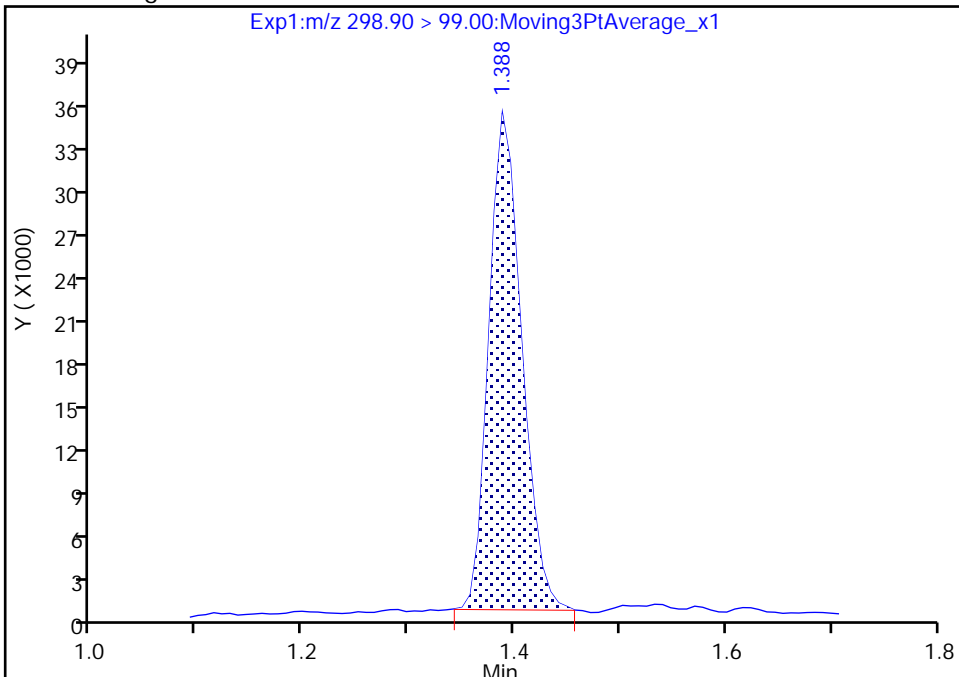
Not Detected  
Expected RT: 1.39

Processing Integration Results



Manual Integration Results

RT: 1.39  
Area: 74277  
Amount: 1.120242  
Amount Units: ng/ml



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-FRB-278 Lab Sample ID: 320-38284-3  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_067.d  
 Analysis Method: 537 Date Collected: 04/17/2018 08:05  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 248.4 (mL) Date Analyzed: 04/23/2018 22:42  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 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)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
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	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	90		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_067.d  
 Lims ID: 320-38284-A-3-A  
 Client ID: NAWC-041718-FRB-278  
 Sample Type: Client  
 Inject. Date: 23-Apr-2018 22:42:24 ALS Bottle#: 47 Worklist Smp#: 35  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-38284-a-3-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:59 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.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
\$ 2 13C2 PFHxA	315.00 > 270.00	1.517	1.517	0.0	1.000	889525	9.58	7159	
* 6 13C2-PFOA	415.00 > 370.00	1.859	1.859	0.0		873024	10.0	6280	
* 7 13C4 PFOS	503.00 > 80.00	2.102	2.102	0.0		2067103	28.7	989	
\$ 10 13C2 PFDA	515.00 > 470.00	2.269	2.269	0.0	1.000	665153	8.96	6329	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_067.d

Injection Date: 23-Apr-2018 22:42:24

Instrument ID: A8\_N

Lims ID: 320-38284-A-3-A

Lab Sample ID: 320-38284-3

Client ID: NAWC-041718-FRB-278

Operator ID: SACINSTLCMS01

ALS Bottle#: 47

Worklist Smp#: 35

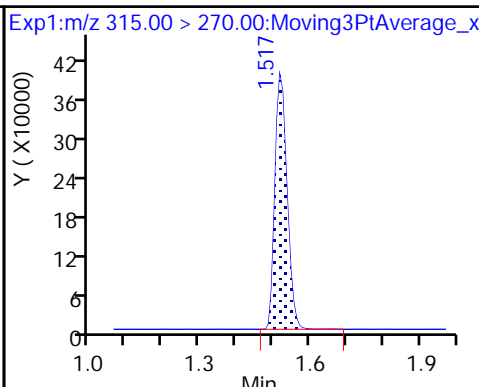
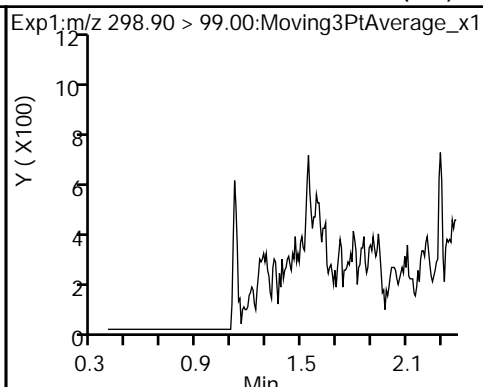
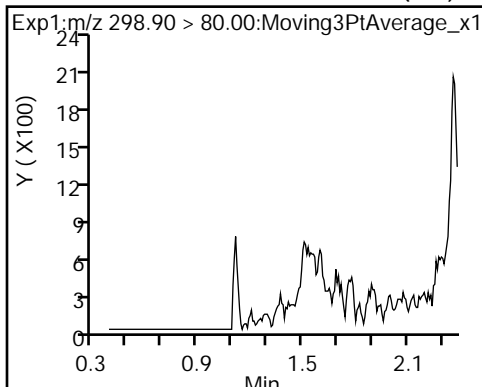
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

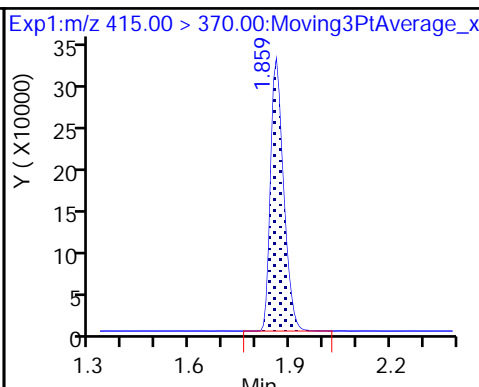
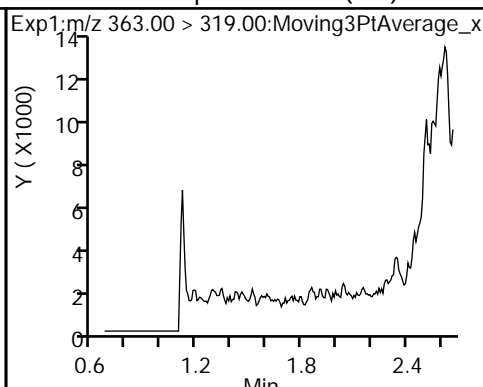
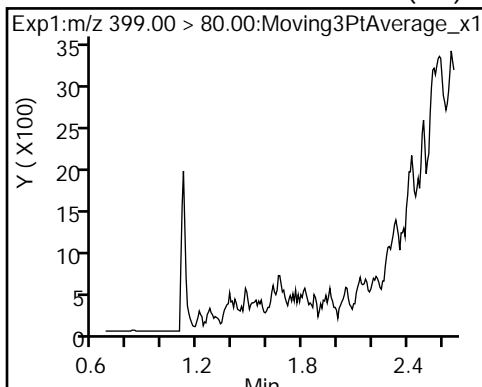
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

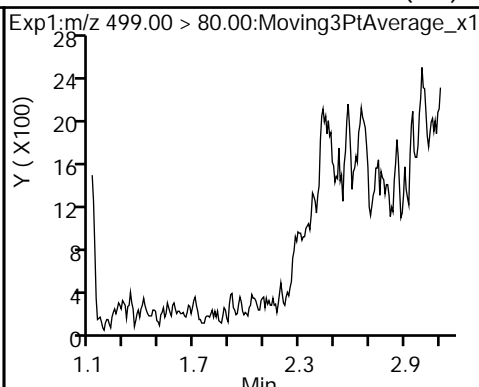
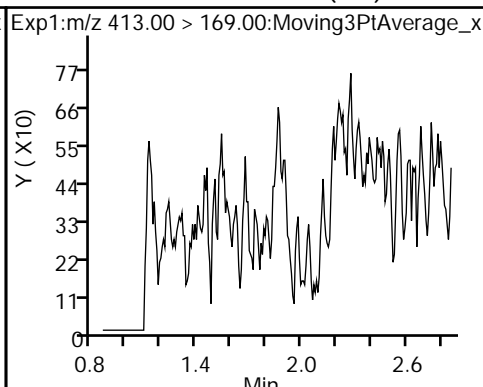
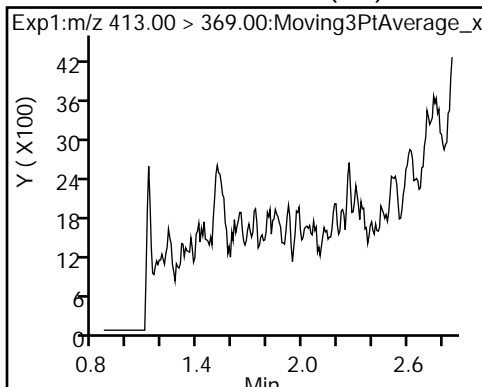
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



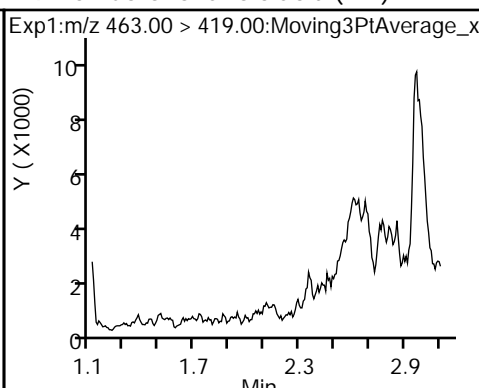
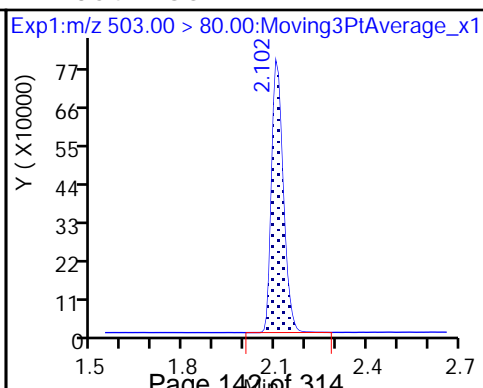
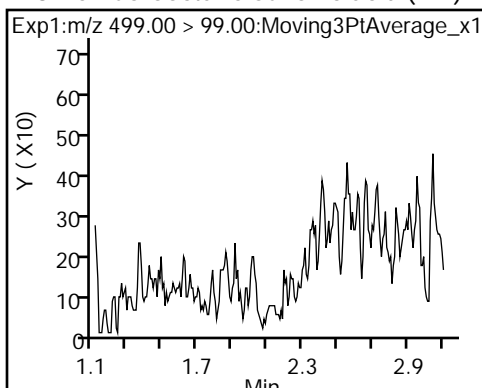
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) \* 6 13C2-PFOA



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

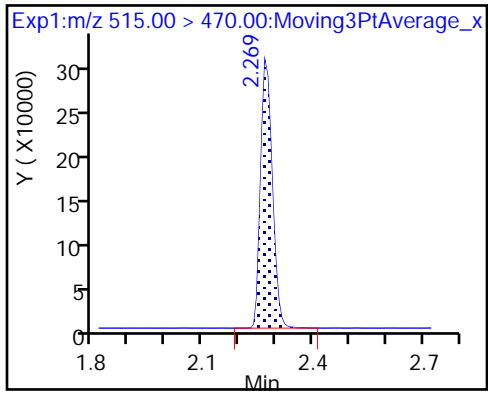


8 Perfluorooctane sulfonic acid (ND) \* 7 13C4 PFOS 9 Perfluorononanoic acid (ND)





\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_067.d  
 Lims ID: 320-38284-A-3-A  
 Client ID: NAWC-041718-FRB-278  
 Sample Type: Client  
 Inject. Date: 23-Apr-2018 22:42:24 ALS Bottle#: 47 Worklist Smp#: 35  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-38284-a-3-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:59 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK014

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.58	95.84
\$ 10 13C2 PFDA	10.0	8.96	89.59

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-RW-360 Lab Sample ID: 320-38284-4  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_068.d  
 Analysis Method: 537 Date Collected: 04/17/2018 08:25  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 244.7(mL) Date Analyzed: 04/23/2018 22:47  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	17	J M	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	9.3	J	20	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	25	20	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U M	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.6	J M	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	89		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_068.d  
 Lims ID: 320-38284-A-4-A  
 Client ID: NAWC-041718-RW-360  
 Sample Type: Client  
 Inject. Date: 23-Apr-2018 22:47:04 ALS Bottle#: 48 Worklist Smp#: 36  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-38284-a-4-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:59 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 11:09:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.388	1.388	0.0	1.000	80603	0.9337		46.6	
298.90 > 99.00	1.388	1.388	0.0	1.000	60596		1.33(0.00-0.00)	55.5	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.517	1.517	0.0	1.000	971295	9.53		7398	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.662	1.669	-0.007	1.000	73186	0.5431		14.6	M
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.662	1.669	-0.007	1.000	65287	0.6340		5.3	M
* 6 13C2-PFOA									
415.00 > 370.00	1.851	1.859	-0.008		959095	10.0		6331	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.851	1.859	-0.008	1.000	232656	2.28		28.9	
413.00 > 169.00	1.851	1.859	-0.008	1.000	139780		1.66(0.00-0.00)	99.1	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.094	2.102	-0.008	1.000	360247	4.12		59.0	a
499.00 > 99.00	2.094	2.102	-0.008	1.000	66014		5.46(0.00-0.00)	73.9	a
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.102	-0.008		2353519	28.7		916	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.109	0.0	1.000	25603	0.3169		4.7	M
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.269	0.0	1.000	727207	8.92		6635	

## QC Flag Legend

### Review Flags

M - Manually Integrated

a - User Assigned ID

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_068.d

Injection Date: 23-Apr-2018 22:47:04

Instrument ID: A8\_N

Lims ID: 320-38284-A-4-A

Lab Sample ID: 320-38284-4

Client ID: NAWC-041718-RW-360

Operator ID: SACINSTLCMS01

ALS Bottle#: 48

Worklist Smp#: 36

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

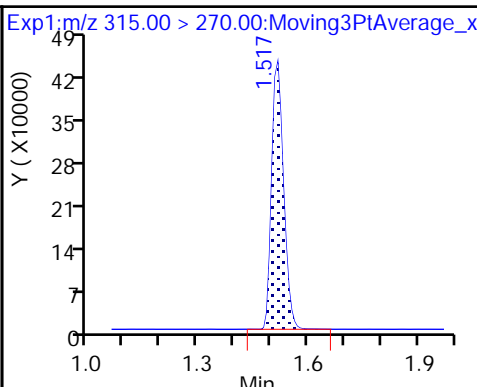
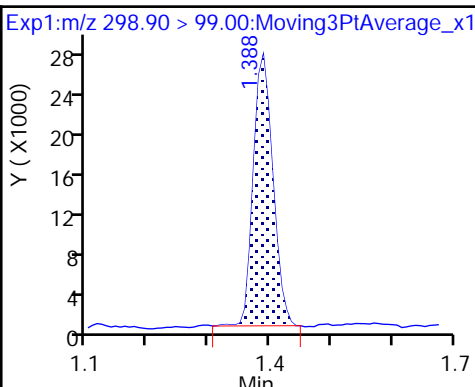
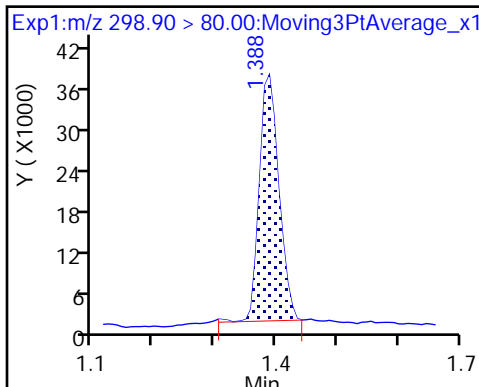
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

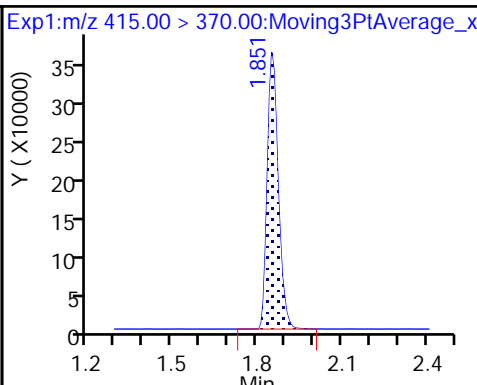
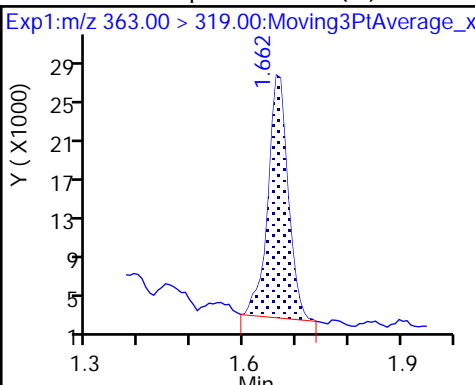
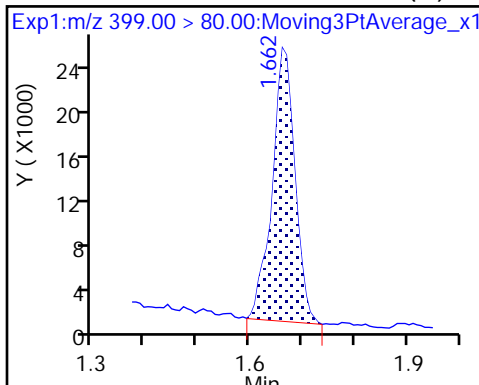
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (M)

4 Perfluoroheptanoic acid (M)

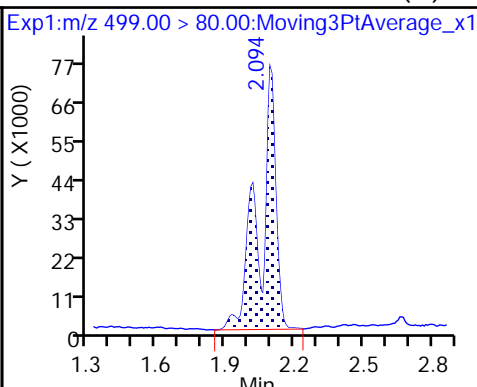
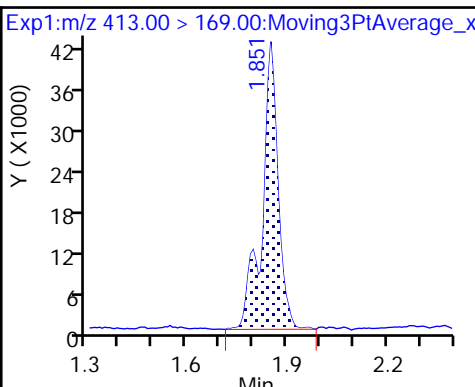
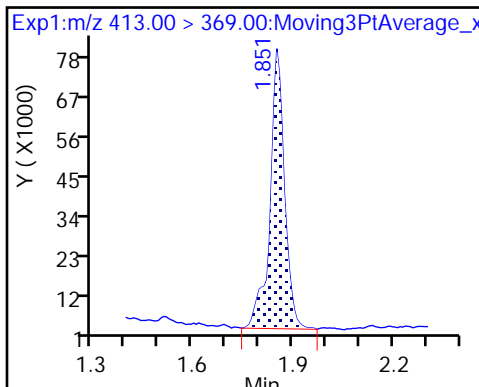
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

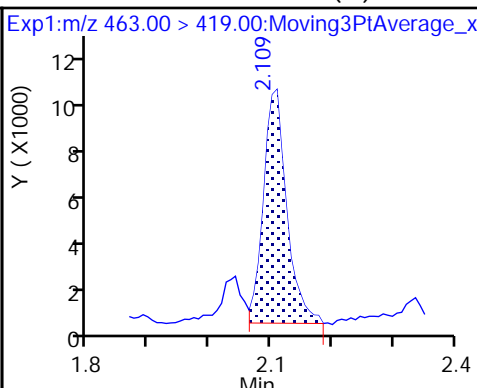
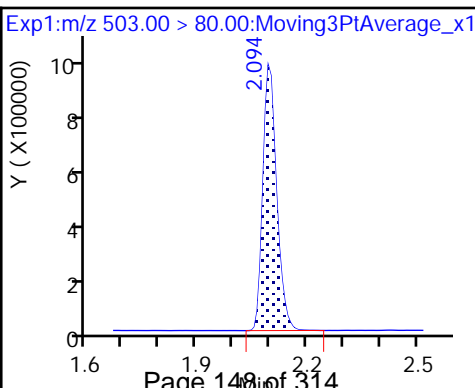
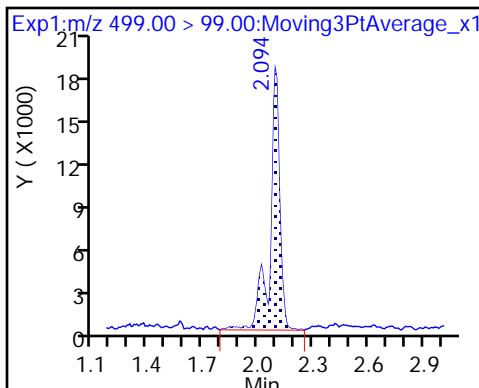
8 Perfluorooctane sulfonic acid (M)



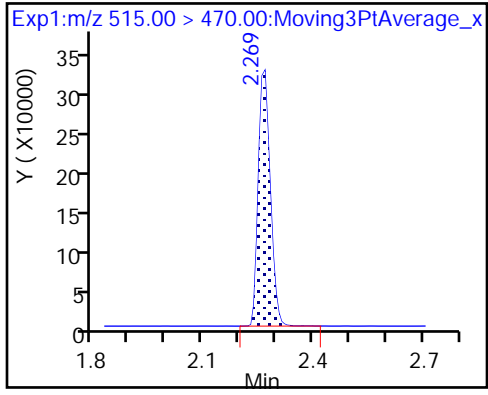
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_068.d  
 Lims ID: 320-38284-A-4-A  
 Client ID: NAWC-041718-RW-360  
 Sample Type: Client  
 Inject. Date: 23-Apr-2018 22:47:04 ALS Bottle#: 48 Worklist Smp#: 36  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-38284-a-4-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:59 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 11:09:35

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.53	95.25
\$ 10 13C2 PFDA	10.0	8.92	89.15



TestAmerica Sacramento

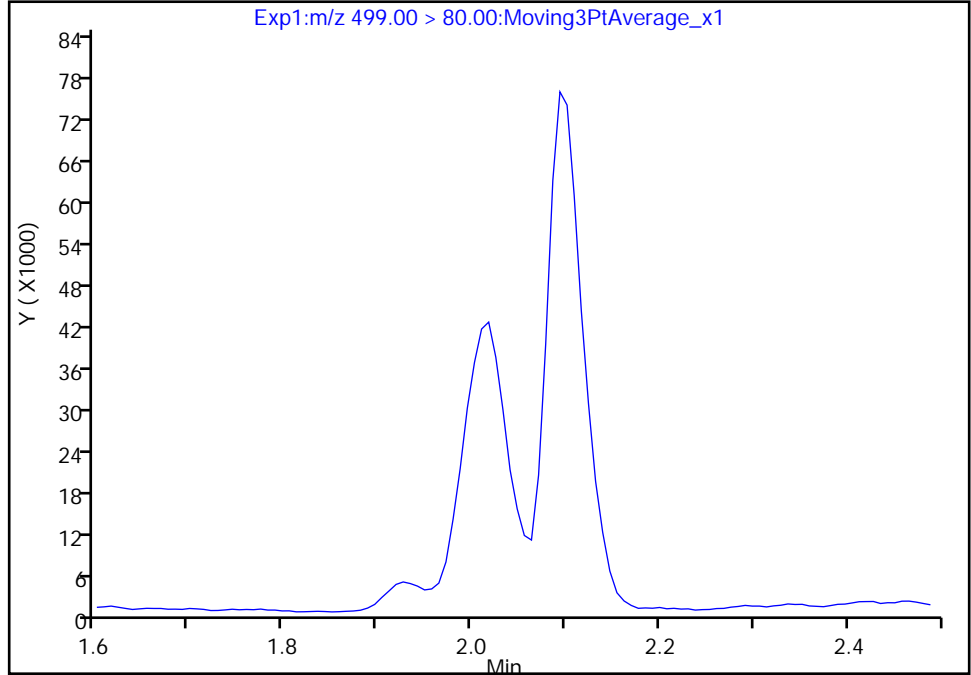
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_068.d  
Injection Date: 23-Apr-2018 22:47:04 Instrument ID: A8\_N  
Lims ID: 320-38284-A-4-A Lab Sample ID: 320-38284-4  
Client ID: NAWC-041718-RW-360  
Operator ID: SACINSTLCMS01 ALS Bottle#: 48 Worklist Smp#: 36  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

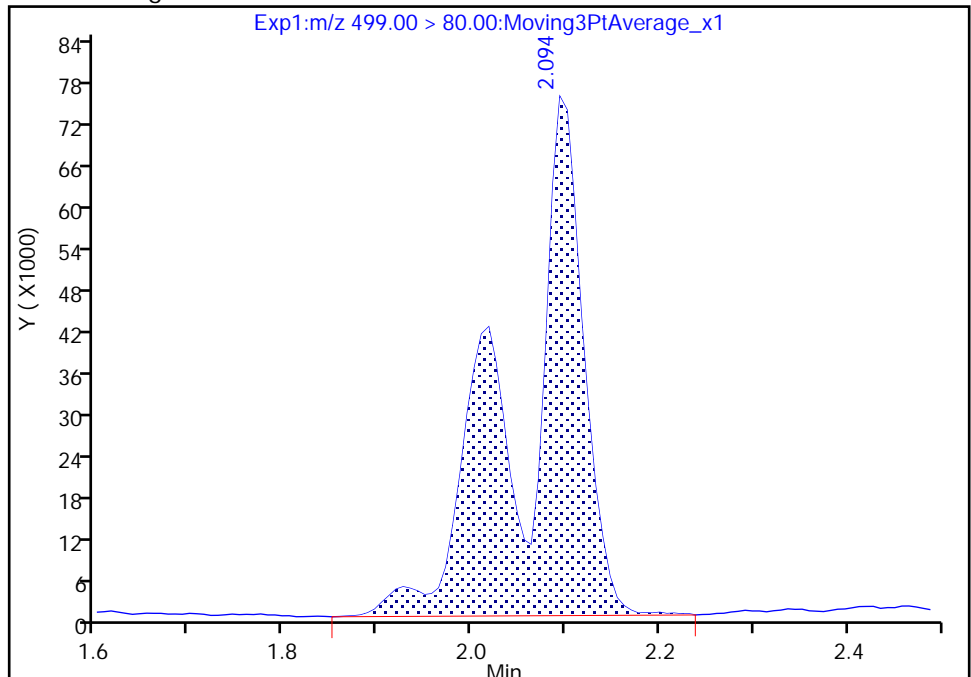
Not Detected  
Expected RT: 2.10

Processing Integration Results



RT: 2.09  
Area: 360247  
Amount: 4.117892  
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

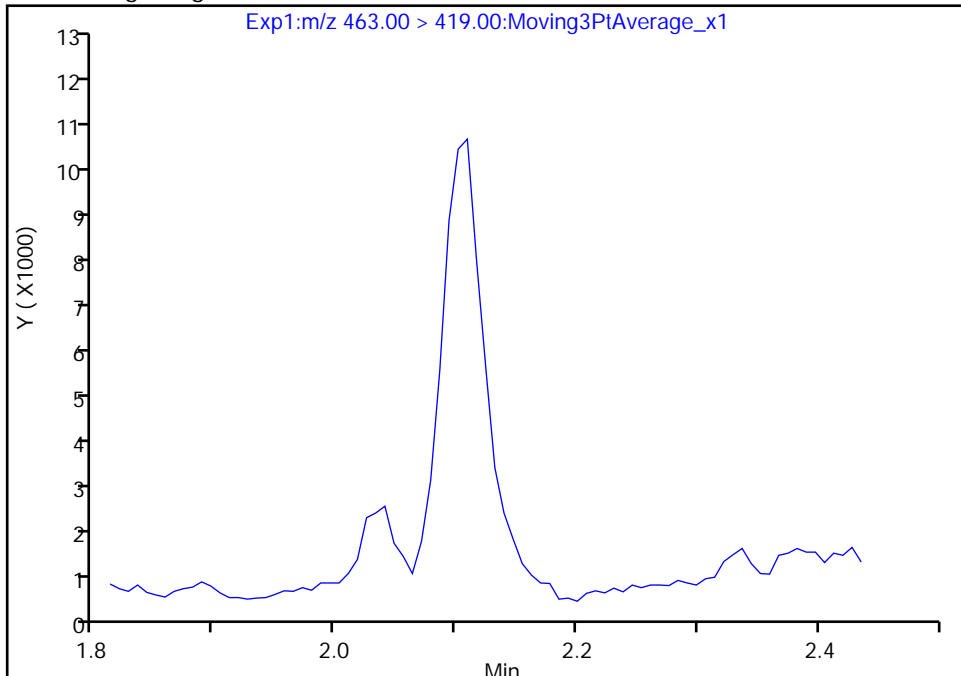
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_068.d  
Injection Date: 23-Apr-2018 22:47:04 Instrument ID: A8\_N  
Lims ID: 320-38284-A-4-A Lab Sample ID: 320-38284-4  
Client ID: NAWC-041718-RW-360  
Operator ID: SACINSTLCMS01 ALS Bottle#: 48 Worklist Smp#: 36  
Injection 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

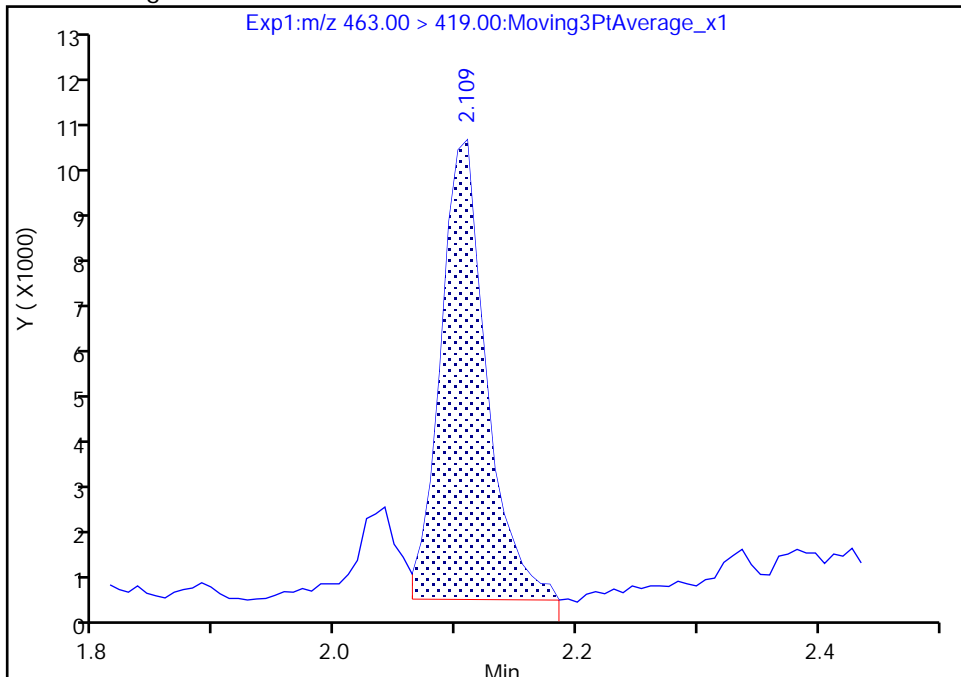
Not Detected  
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.11  
Area: 25603  
Amount: 0.316895  
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 11:09:22  
Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

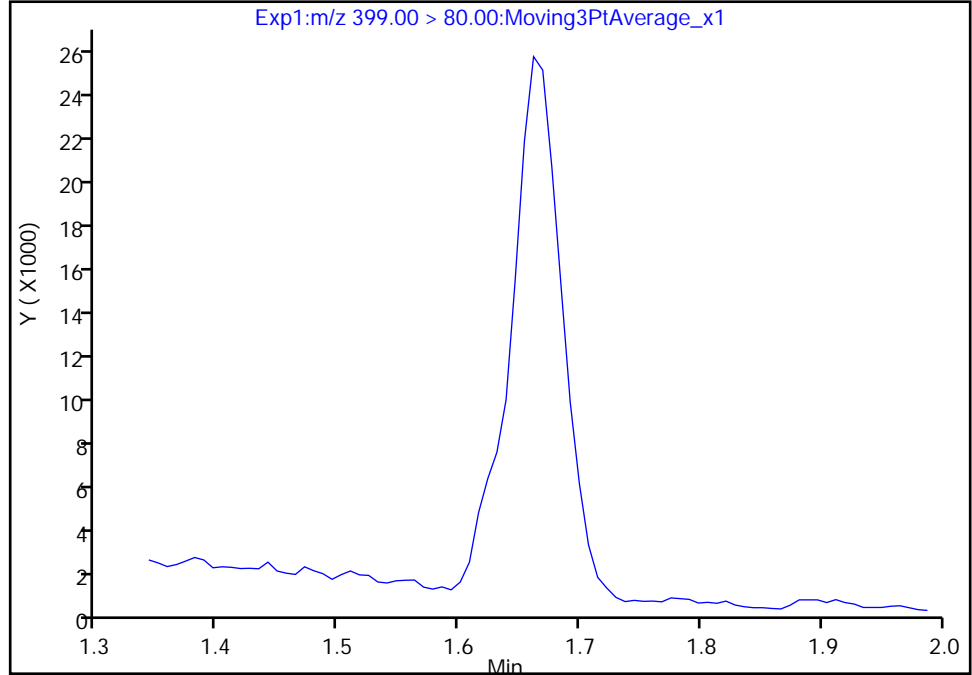
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Injection Date: 23-Apr-2018 22:47:04 Instrument ID: A8\_N  
Lims ID: 320-38284-A-4-A Lab Sample ID: 320-38284-4  
Client ID: NAWC-041718-RW-360  
Operator ID: SACINSTLCMS01 ALS Bottle#: 48 Worklist Smp#: 36  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

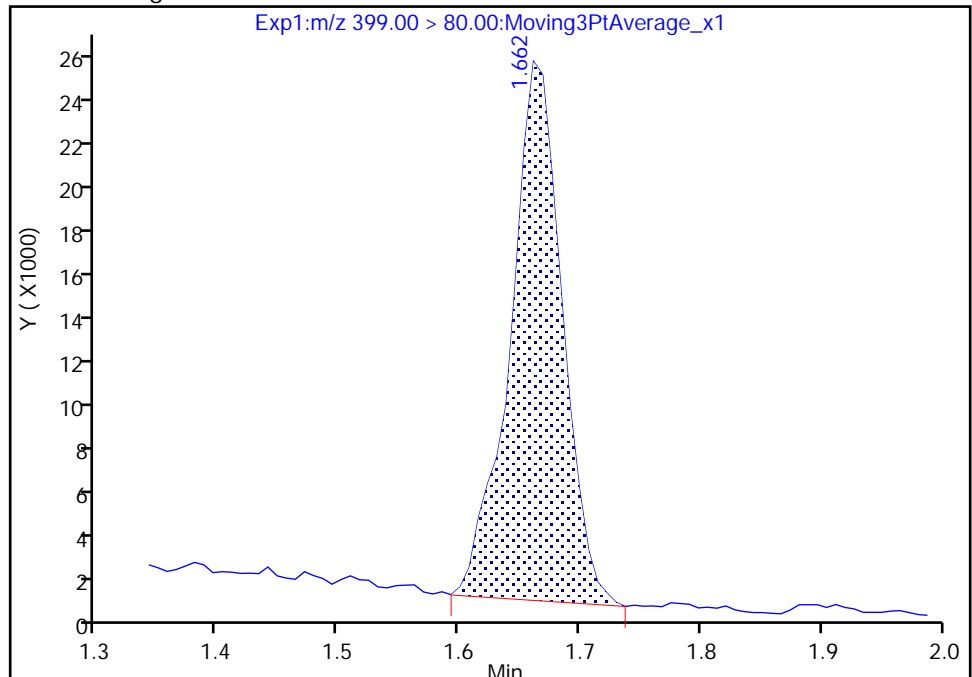
Signal: 1

Not Detected  
Expected RT: 1.67

Processing Integration Results



Manual Integration Results



RT: 1.66  
Area: 73186  
Amount: 0.543069  
Amount Units: ng/ml

Reviewer: barnettj, 24-Apr-2018 11:09:02  
Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

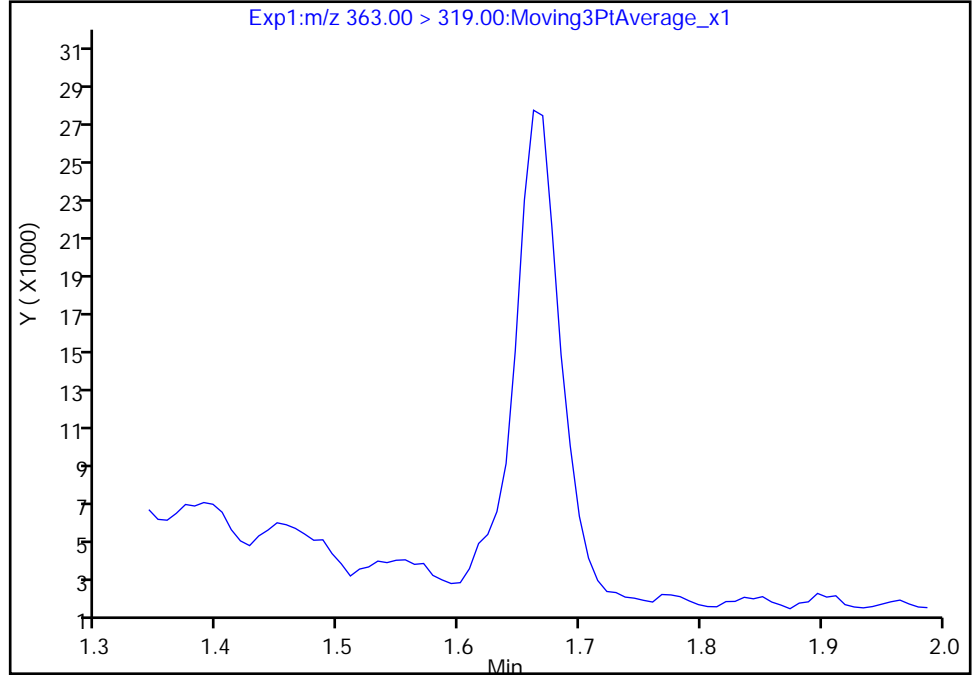
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_068.d  
Injection Date: 23-Apr-2018 22:47:04 Instrument ID: A8\_N  
Lims ID: 320-38284-A-4-A Lab Sample ID: 320-38284-4  
Client ID: NAWC-041718-RW-360  
Operator ID: SACINSTLCMS01 ALS Bottle#: 48 Worklist Smp#: 36  
Injection 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

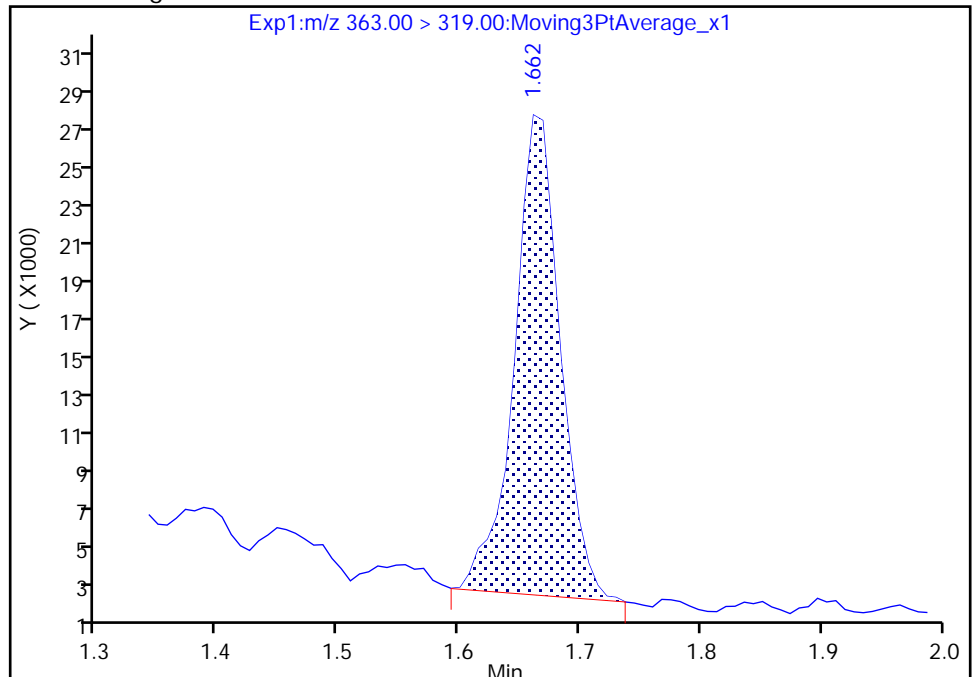
Not Detected  
Expected RT: 1.67

Processing Integration Results



Manual Integration Results

RT: 1.66  
Area: 65287  
Amount: 0.633997  
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 11:09:14  
Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-FRB-360 Lab Sample ID: 320-38284-5  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_069.d  
 Analysis Method: 537 Date Collected: 04/17/2018 08:20  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 251.3(mL) Date Analyzed: 04/23/2018 22:51  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 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	9.9	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	85		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_069.d  
 Lims ID: 320-38284-A-5-A  
 Client ID: NAWC-041718-FRB-360  
 Sample Type: Client  
 Inject. Date: 23-Apr-2018 22:51:44 ALS Bottle#: 49 Worklist Smp#: 37  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-38284-a-5-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:59 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.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
\$ 2 13C2 PFHxA	315.00 > 270.00	1.517	1.517	0.0	1.000	964011	9.00	9049	
* 6 13C2-PFOA	415.00 > 370.00	1.859	1.859	0.0		1007902	10.0	5722	
* 7 13C4 PFOS	503.00 > 80.00	2.102	2.102	0.0		2335785	28.7	1277	
\$ 10 13C2 PFDA	515.00 > 470.00	2.269	2.269	0.0	1.000	726685	8.48	7792	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_069.d

Injection Date: 23-Apr-2018 22:51:44

Instrument ID: A8\_N

Lims ID: 320-38284-A-5-A

Lab Sample ID: 320-38284-5

Client ID: NAWC-041718-FRB-360

Operator ID: SACINSTLCMS01

ALS Bottle#: 49

Worklist Smp#: 37

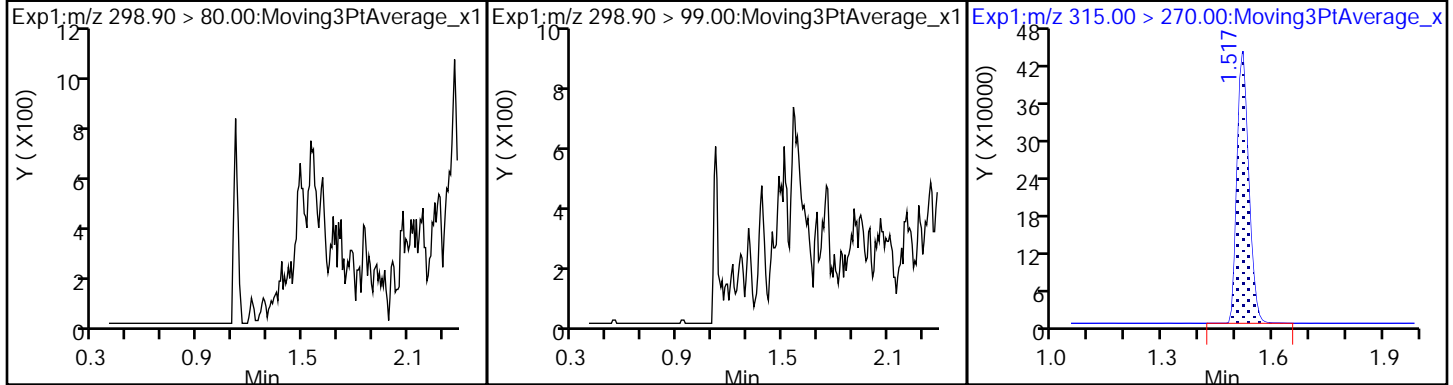
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

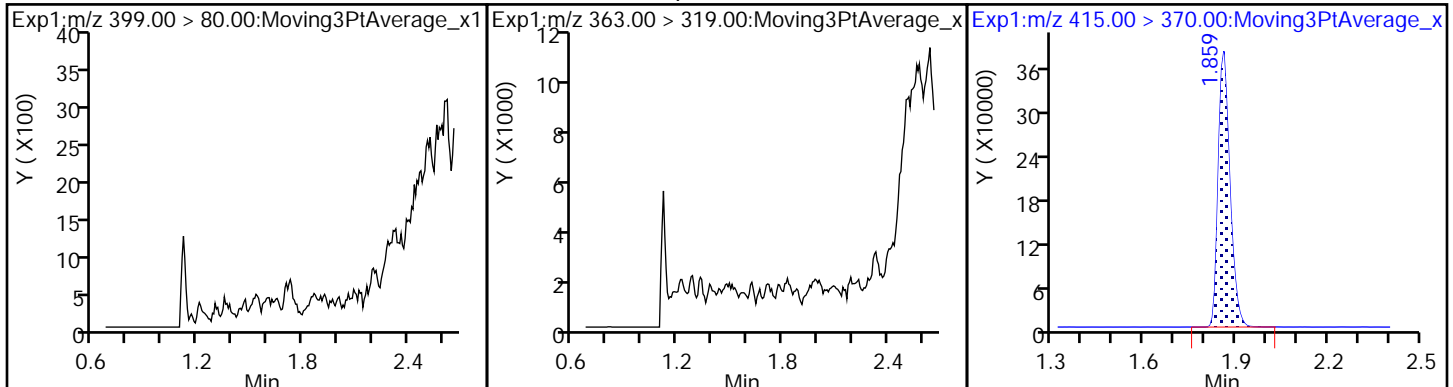
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

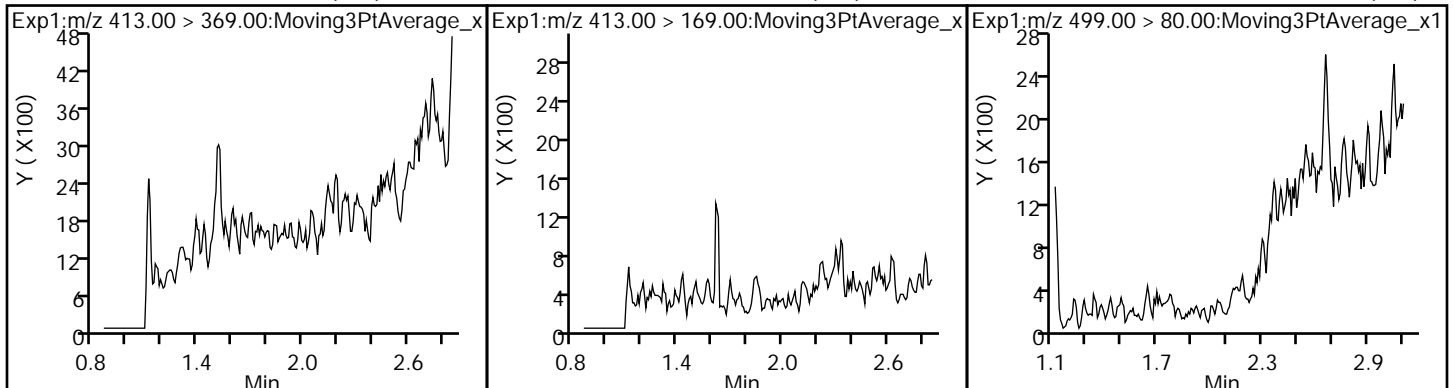
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



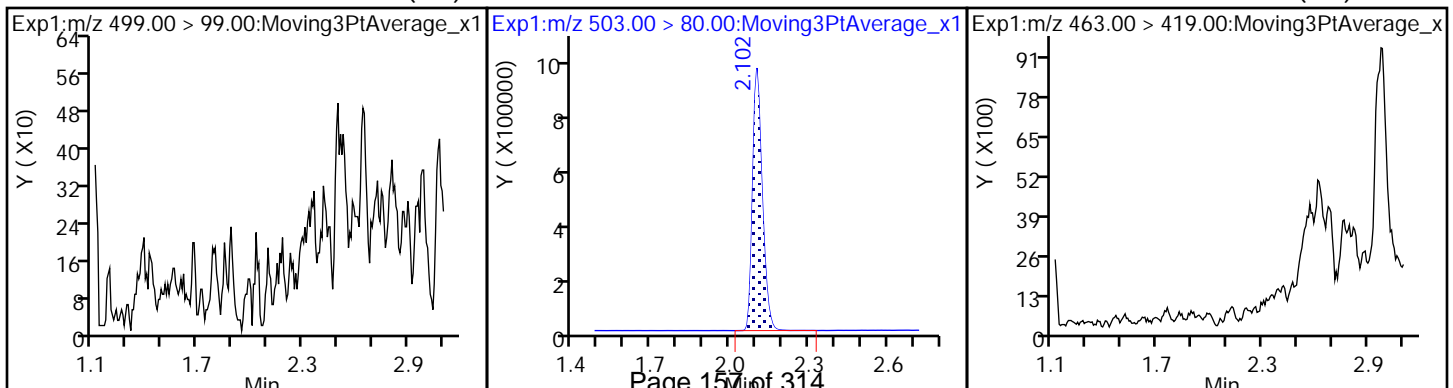
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) \* 6 13C2-PFOA



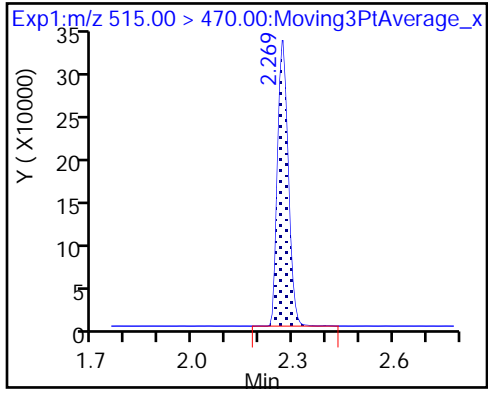
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) 8 Perfluorooctane sulfonic acid (ND)



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



\$ 10 13C2 PFDA





TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_069.d  
 Lims ID: 320-38284-A-5-A  
 Client ID: NAWC-041718-FRB-360  
 Sample Type: Client  
 Inject. Date: 23-Apr-2018 22:51:44 ALS Bottle#: 49 Worklist Smp#: 37  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-38284-a-5-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:59 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.00	89.96
\$ 10 13C2 PFDA	10.0	8.48	84.78

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-RW-150 Lab Sample ID: 320-38284-6  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_070.d  
 Analysis Method: 537 Date Collected: 04/17/2018 09:10  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 252.3(mL) Date Analyzed: 04/23/2018 22:56  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	7.9	J M	40	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	17	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.1	J	9.9	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U M	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	95		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_070.d  
 Lims ID: 320-38284-A-6-A  
 Client ID: NAWC-041718-RW-150  
 Sample Type: Client  
 Inject. Date: 23-Apr-2018 22:56:24 ALS Bottle#: 50 Worklist Smp#: 38  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-38284-a-6-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:59 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 11:10:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.388	1.388	0.0	1.000	40274	0.5021		15.7	M
298.90 > 99.00	1.388	1.388	0.0	1.000	31767		1.27(0.00-0.00)	30.0	M
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.525	1.517	0.008	1.000	951979	9.98		6781	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.669	1.669	0.0	1.000	143367	1.14		24.4	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.669	1.669	0.0	1.000	196622	2.04		16.8	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.859	0.0		896870	10.0		5474	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.859	0.0	1.000	416947	4.38		52.1	
413.00 > 169.00	1.859	1.859	0.0	1.000	253859		1.64(0.00-0.00)	180	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.102	2.102	0.0	1.000	162328	2.00		19.1	a
499.00 > 99.00	2.102	2.102	0.0	1.000	28972		5.60(0.00-0.00)	33.5	a
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.102	0.0		2186928	28.7		752	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.109	0.0	1.000	54062	0.7156		10.4	M
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.269	0.0	1.000	726119	9.52		7729	

## QC Flag Legend

### Review Flags

M - Manually Integrated

a - User Assigned ID

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_070.d

Injection Date: 23-Apr-2018 22:56:24

Instrument ID: A8\_N

Lims ID: 320-38284-A-6-A

Lab Sample ID: 320-38284-6

Client ID: NAWC-041718-RW-150

Operator ID: SACINSTLCMS01

ALS Bottle#: 50

Worklist Smp#: 38

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

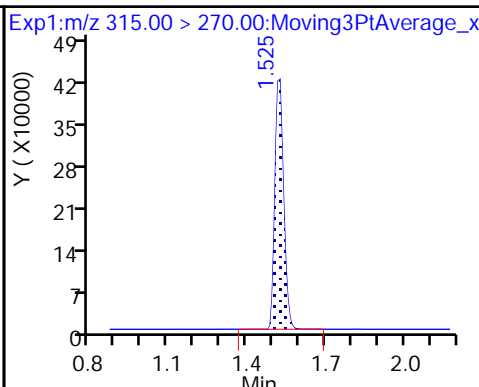
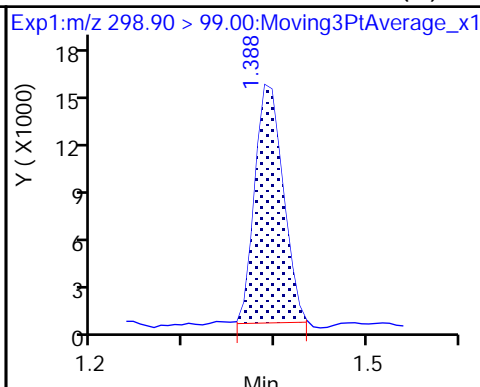
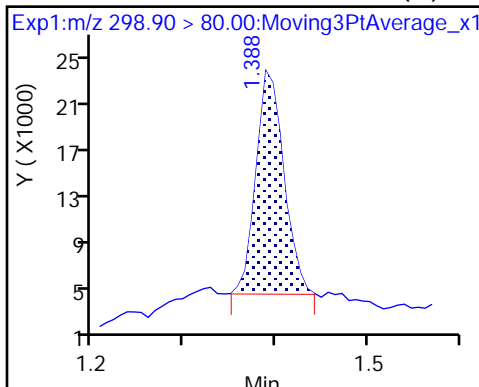
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (M)

1 Perfluorobutanesulfonic acid (M)

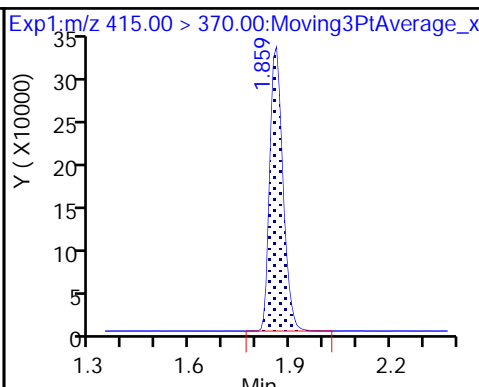
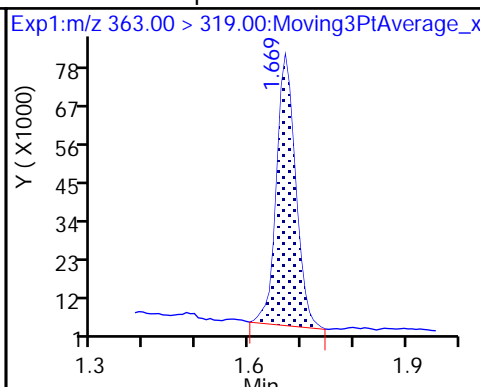
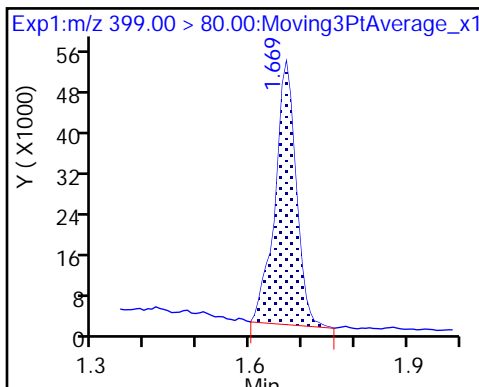
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

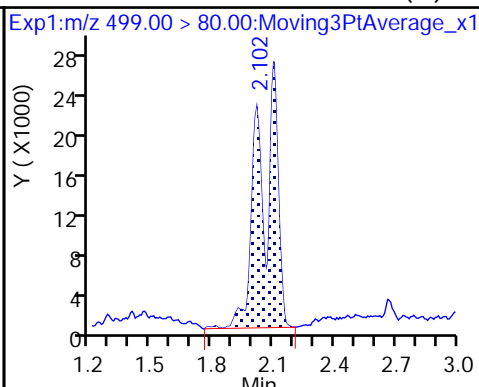
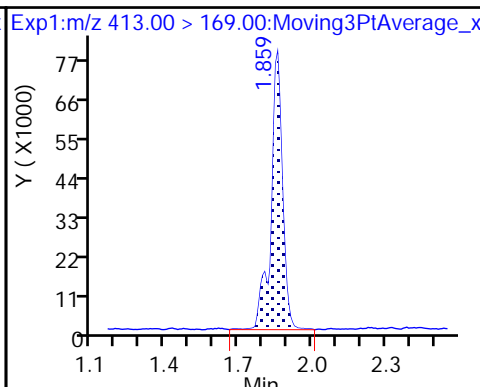
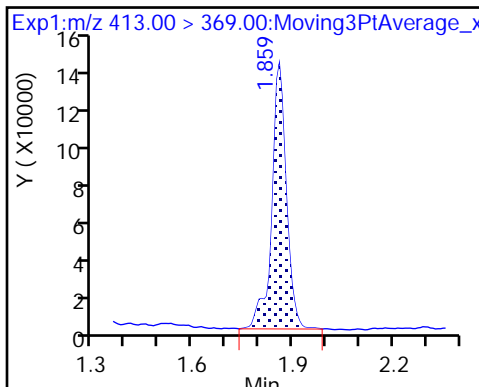
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

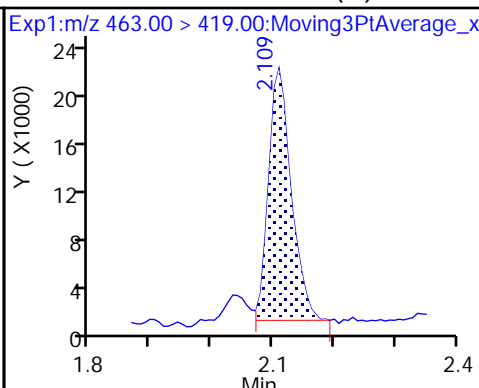
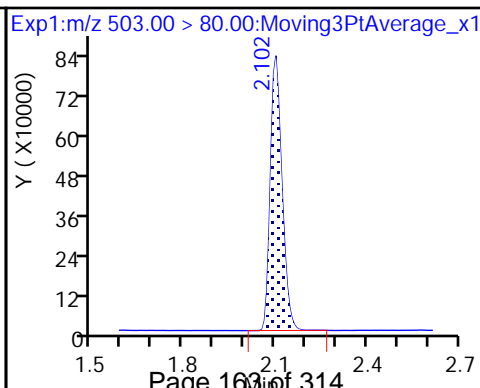
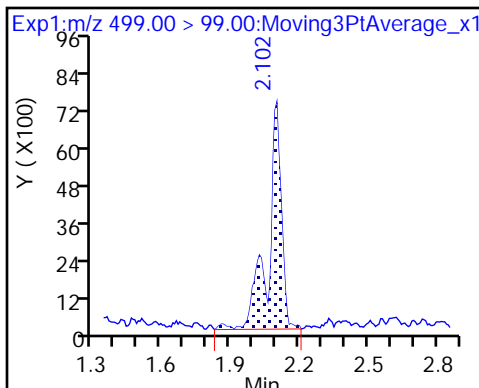
8 Perfluorooctane sulfonic acid (M)



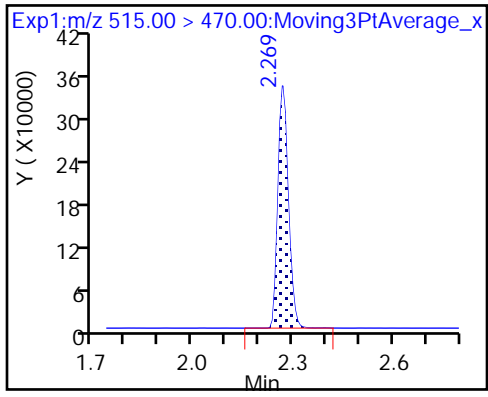
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_070.d  
 Lims ID: 320-38284-A-6-A  
 Client ID: NAWC-041718-RW-150  
 Sample Type: Client  
 Inject. Date: 23-Apr-2018 22:56:24 ALS Bottle#: 50 Worklist Smp#: 38  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-38284-a-6-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:59 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 11:10:40

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.98	99.84
\$ 10 13C2 PFDA	10.0	9.52	95.20

TestAmerica Sacramento

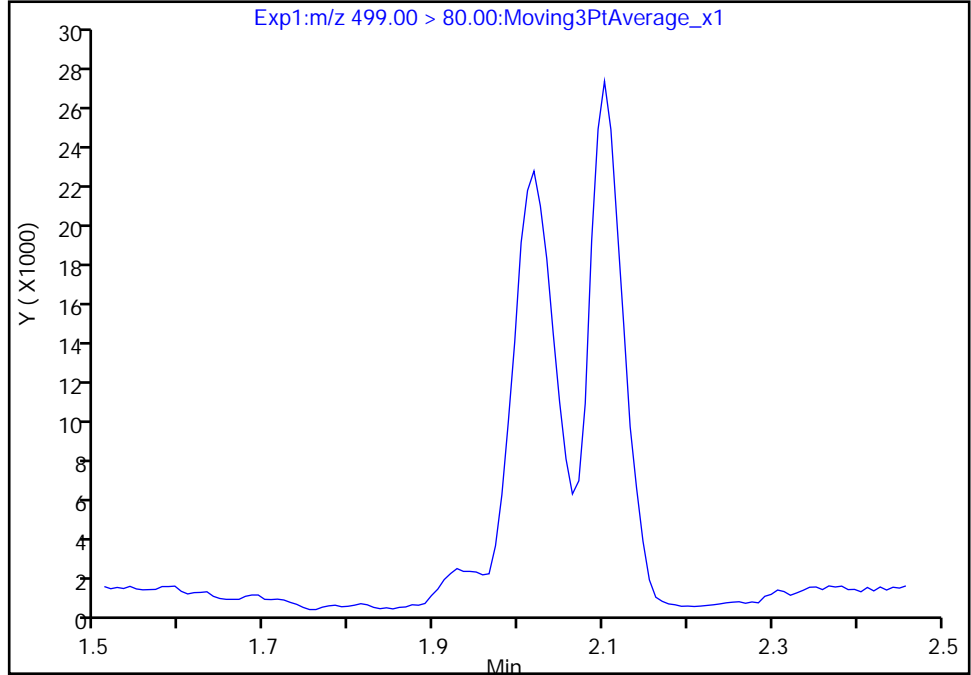
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Injection Date: 23-Apr-2018 22:56:24 Instrument ID: A8\_N  
Lims ID: 320-38284-A-6-A Lab Sample ID: 320-38284-6  
Client ID: NAWC-041718-RW-150  
Operator ID: SACINSTLCMS01 ALS Bottle#: 50 Worklist Smp#: 38  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

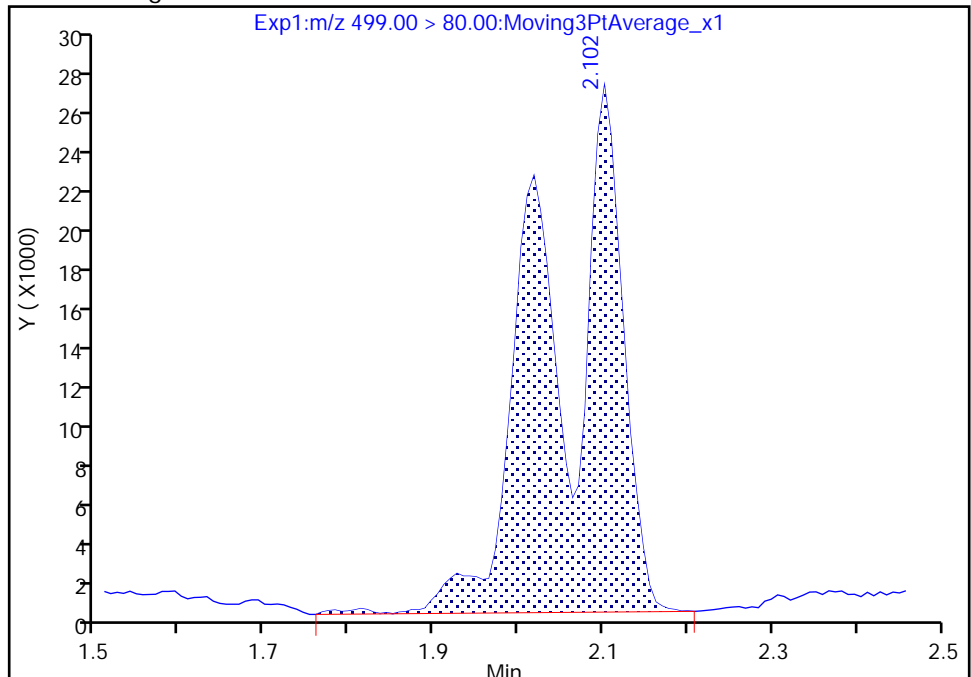
Signal: 1

Not Detected  
Expected RT: 2.10

Processing Integration Results



Manual Integration Results



RT: 2.10  
Area: 162328  
Amount: 1.996876  
Amount Units: ng/ml



TestAmerica Sacramento

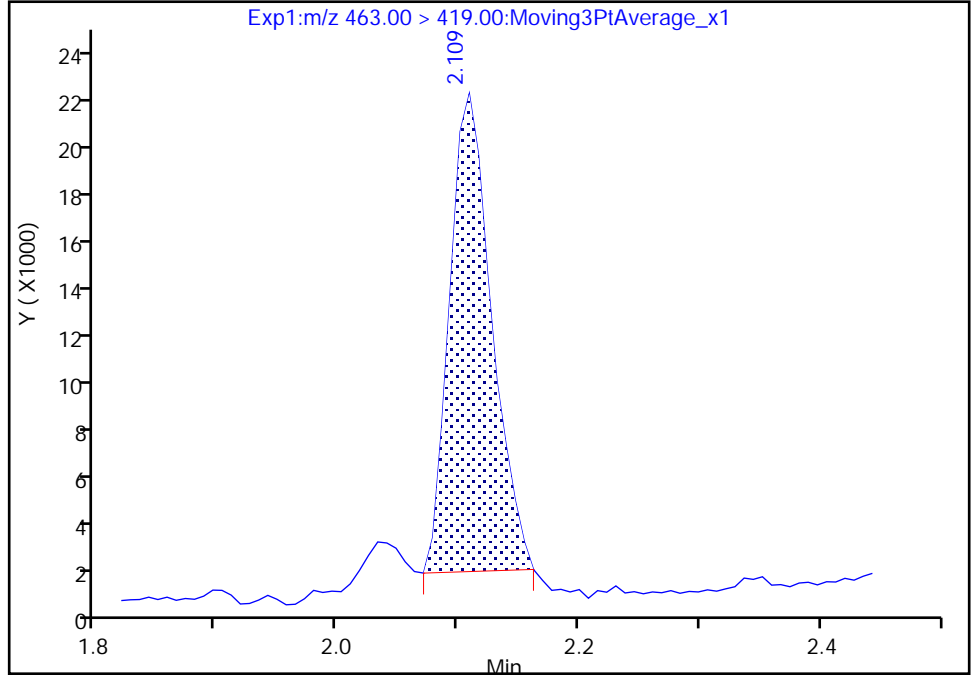
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_070.d  
Injection Date: 23-Apr-2018 22:56:24 Instrument ID: A8\_N  
Lims ID: 320-38284-A-6-A Lab Sample ID: 320-38284-6  
Client ID: NAWC-041718-RW-150  
Operator ID: SACINSTLCMS01 ALS Bottle#: 50 Worklist Smp#: 38  
Injection 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

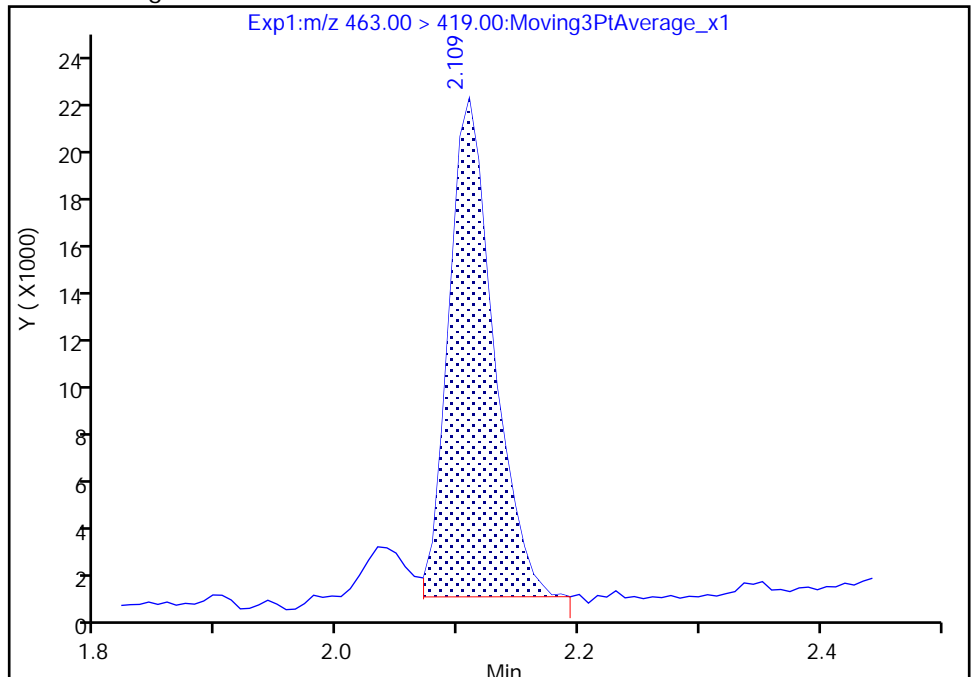
RT: 2.11  
Area: 48749  
Amount: 0.645241  
Amount Units: ng/ml

Processing Integration Results



RT: 2.11  
Area: 54062  
Amount: 0.715564  
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 24-Apr-2018 11:10:33  
Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

TestAmerica Sacramento

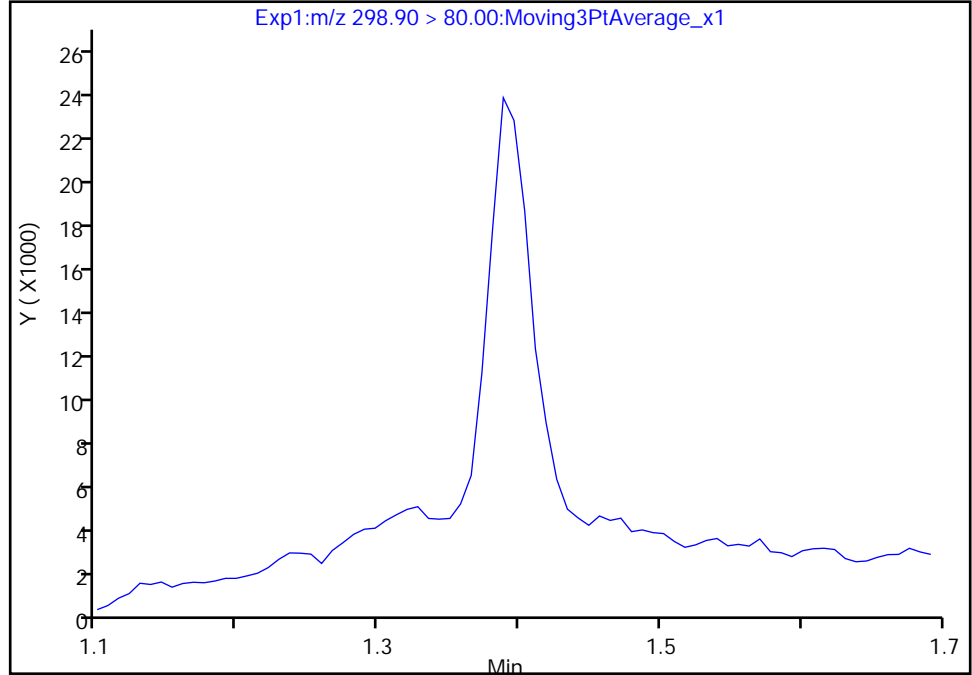
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_070.d  
Injection Date: 23-Apr-2018 22:56:24 Instrument ID: A8\_N  
Lims ID: 320-38284-A-6-A Lab Sample ID: 320-38284-6  
Client ID: NAWC-041718-RW-150  
Operator ID: SACINSTLCMS01 ALS Bottle#: 50 Worklist Smp#: 38  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

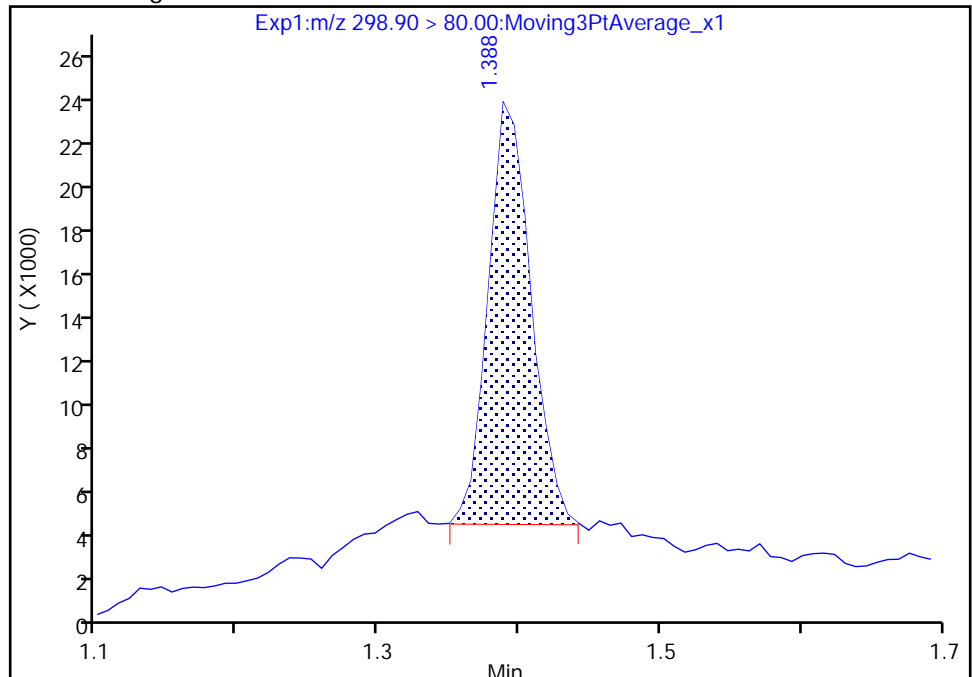
Not Detected  
Expected RT: 1.39

Processing Integration Results



Manual Integration Results

RT: 1.39  
Area: 40274  
Amount: 0.502091  
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 11:10:00  
Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

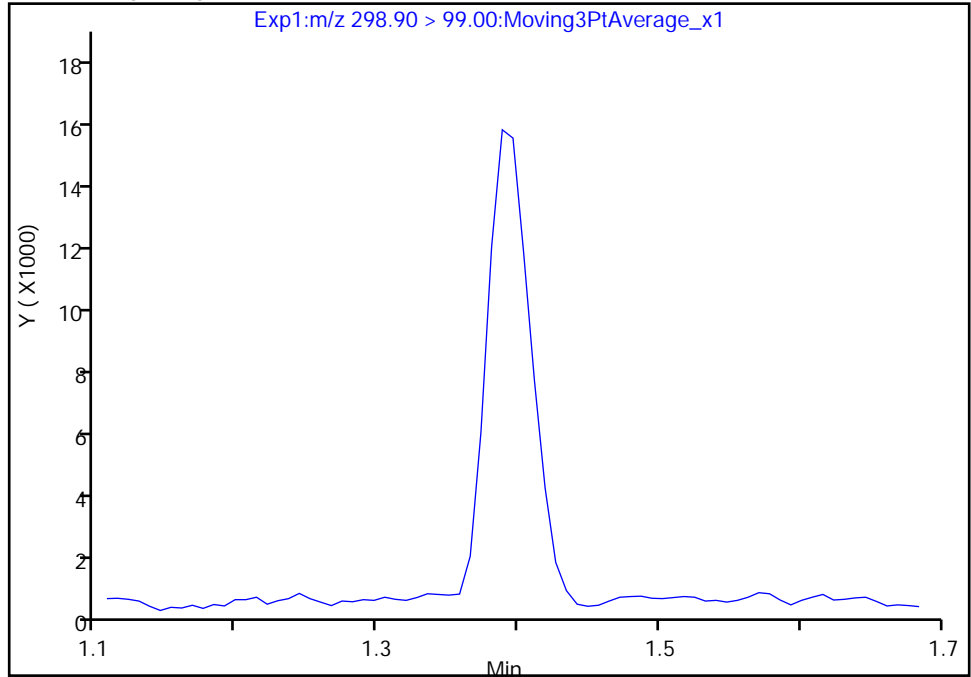
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_070.d  
Injection Date: 23-Apr-2018 22:56:24 Instrument ID: A8\_N  
Lims ID: 320-38284-A-6-A Lab Sample ID: 320-38284-6  
Client ID: NAWC-041718-RW-150  
Operator ID: SACINSTLCMS01 ALS Bottle#: 50 Worklist Smp#: 38  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

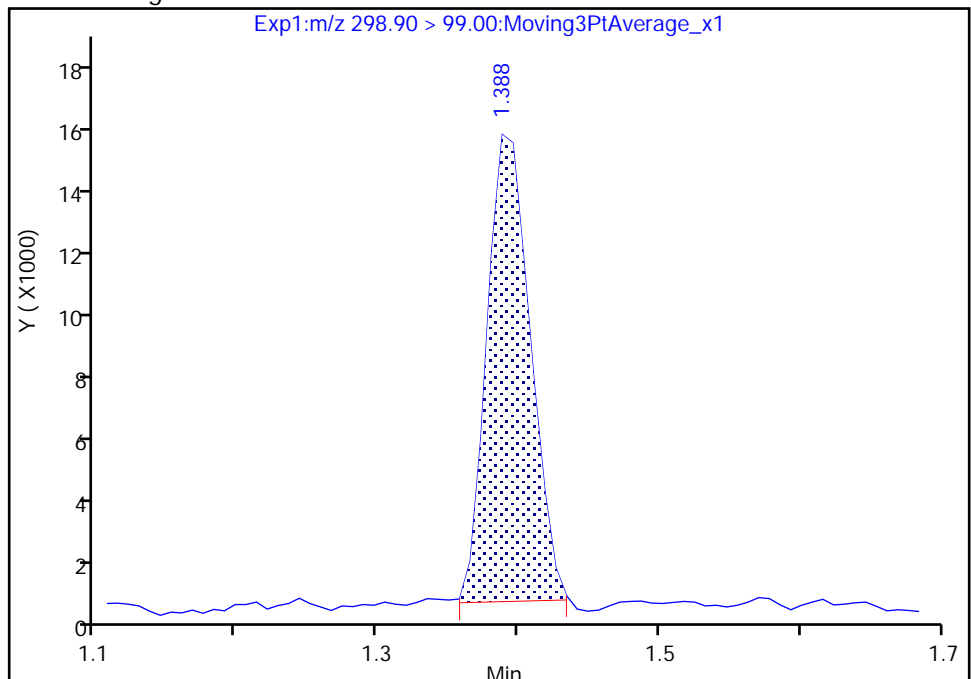
Not Detected  
Expected RT: 1.39

Processing Integration Results



Manual Integration Results

RT: 1.39  
Area: 31767  
Amount: 0.502091  
Amount Units: ng/ml



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-FRB-150 Lab Sample ID: 320-38284-7  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_071.d  
 Analysis Method: 537 Date Collected: 04/17/2018 09:05  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 252.8(mL) Date Analyzed: 04/23/2018 23:01  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	40	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	7.9	U	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	9.9	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	93		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_071.d  
 Lims ID: 320-38284-A-7-A  
 Client ID: NAWC-041718-FRB-150  
 Sample Type: Client  
 Inject. Date: 23-Apr-2018 23:01:04 ALS Bottle#: 51 Worklist Smp#: 39  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-38284-a-7-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:59 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 11:10:49

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.517	1.517	0.0	1.000	1040233	9.59	8230	
* 6 13C2-PFOA	415.00 > 370.00	1.851	1.859	-0.008		1020151	10.0	6647	
* 7 13C4 PFOS	503.00 > 80.00	2.094	2.102	-0.008		2303453	28.7	1127	
\$ 10 13C2 PFDA	515.00 > 470.00	2.261	2.269	-0.007	1.000	808827	9.32	8265	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_071.d

Injection Date: 23-Apr-2018 23:01:04

Instrument ID: A8\_N

Lims ID: 320-38284-A-7-A

Lab Sample ID: 320-38284-7

Client ID: NAWC-041718-FRB-150

Operator ID: SACINSTLCMS01

ALS Bottle#: 51

Worklist Smp#: 39

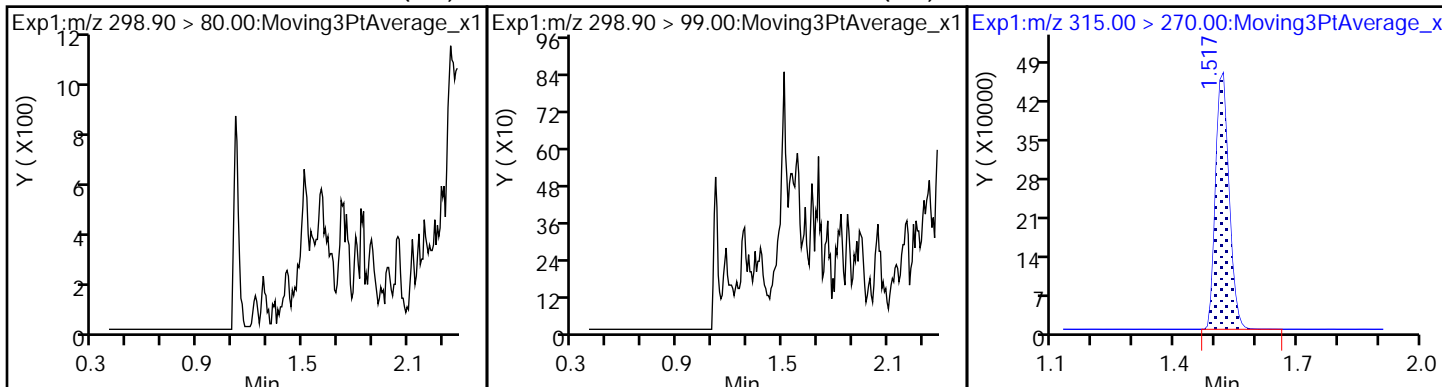
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

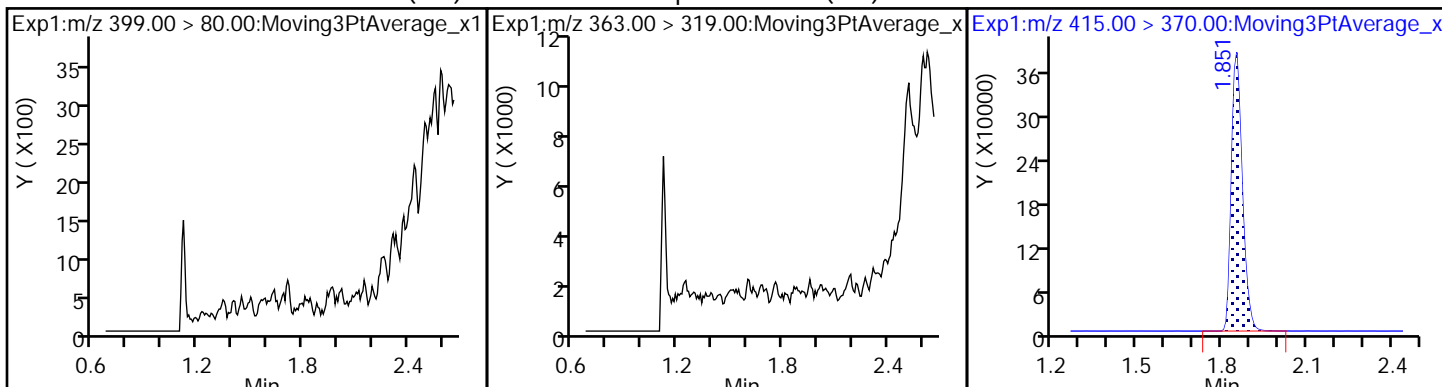
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

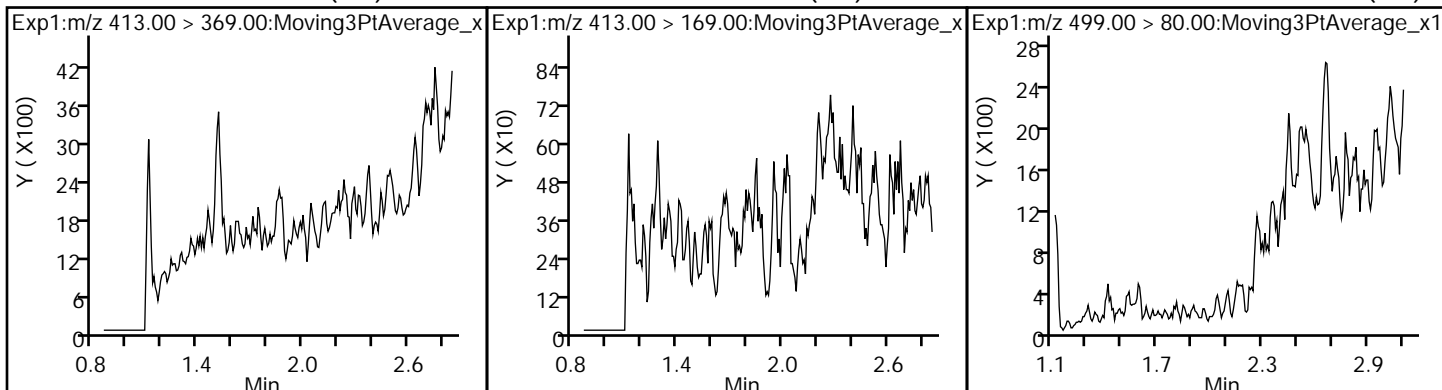
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



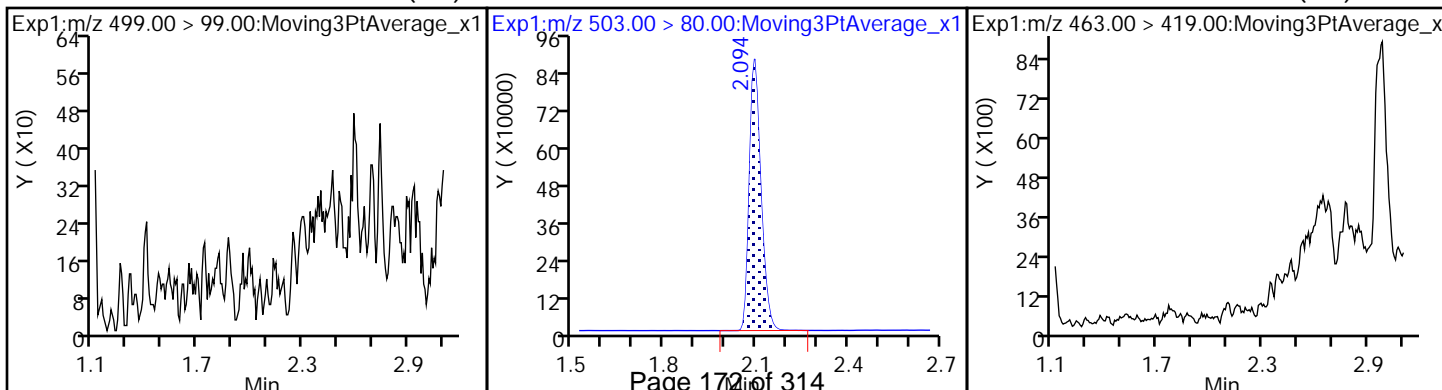
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) \* 6 13C2-PFOA



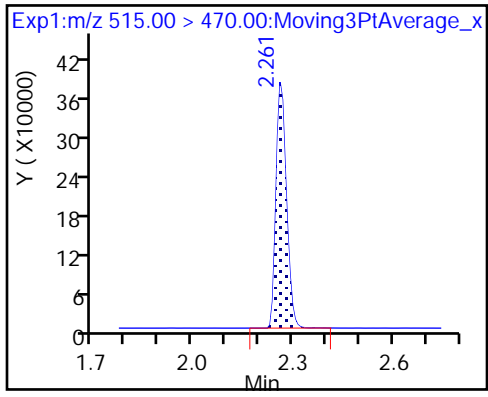
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) 8 Perfluorooctane sulfonic acid (ND)



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



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_071.d  
 Lims ID: 320-38284-A-7-A  
 Client ID: NAWC-041718-FRB-150  
 Sample Type: Client  
 Inject. Date: 23-Apr-2018 23:01:04 ALS Bottle#: 51 Worklist Smp#: 39  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-38284-a-7-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:59 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 11:10:49

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.59	95.91
\$ 10 13C2 PFDA	10.0	9.32	93.22



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-RW-179 Lab Sample ID: 320-38284-8  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_074.d  
 Analysis Method: 537 Date Collected: 04/17/2018 10:10  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 248.3(mL) Date Analyzed: 04/23/2018 23:15  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219468 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	J M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	22		20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.8	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.5	J	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	103		70-130
STL00996	13C2 PFDA	82		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_074.d  
 Lims ID: 320-38284-A-8-A  
 Client ID: NAWC-041718-RW-179  
 Sample Type: Client  
 Inject. Date: 23-Apr-2018 23:15:04 ALS Bottle#: 52 Worklist Smp#: 42  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-38284-a-8-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:13:09 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 11:11:30

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.396	1.396	0.0	1.000	128550	1.72		83.9	
298.90 > 99.00	1.388	1.396	-0.008	0.995	96135		1.34(0.00-0.00)	103	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.525	1.525	0.0	1.000	910301	10.3		7329	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.677	1.669	0.008	1.000	225740	1.93		54.2	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.677	1.669	0.008	1.000	144674	1.62		13.9	
* 6 13C2-PFOA									
415.00 > 370.00	1.866	1.859	0.007		830741	10.0		5313	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.866	1.859	0.007	1.000	471508	5.34		70.5	
413.00 > 169.00	1.866	1.859	0.007	1.000	280361		1.68(0.00-0.00)	196	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.109	2.102	0.007	1.000	284959	3.76		52.8	a
499.00 > 99.00	2.109	2.102	0.007	1.000	50416		5.65(0.00-0.00)	72.7	a
* 7 13C4 PFOS									
503.00 > 80.00	2.109	2.102	0.007		2040767	28.7		885	
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.109	0.008	1.000	53899	0.7702		10.9	M
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.269	0.0	1.000	580690	8.22		6743	

## QC Flag Legend

### Review Flags

M - Manually Integrated

a - User Assigned ID

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_074.d

Injection Date: 23-Apr-2018 23:15:04

Instrument ID: A8\_N

Lims ID: 320-38284-A-8-A

Lab Sample ID: 320-38284-8

Client ID: NAWC-041718-RW-179

Operator ID: SACINSTLCMS01

ALS Bottle#: 52

Worklist Smp#: 42

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

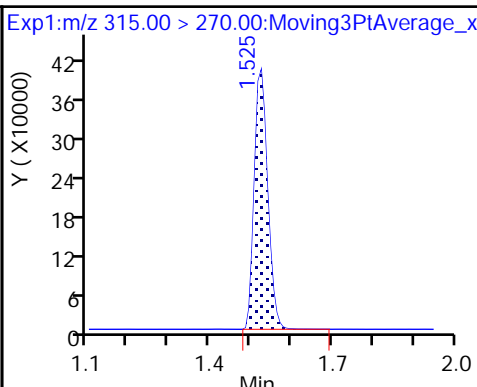
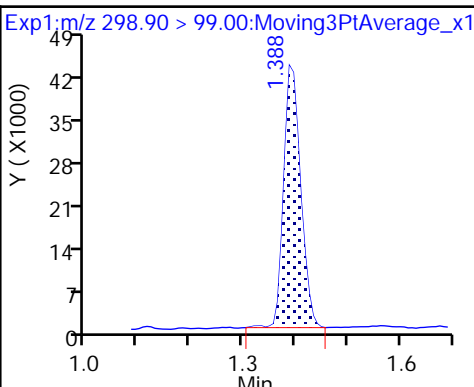
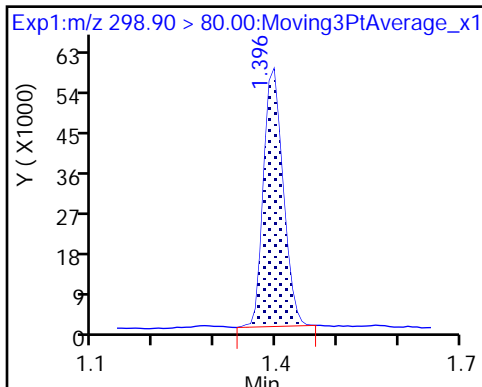
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

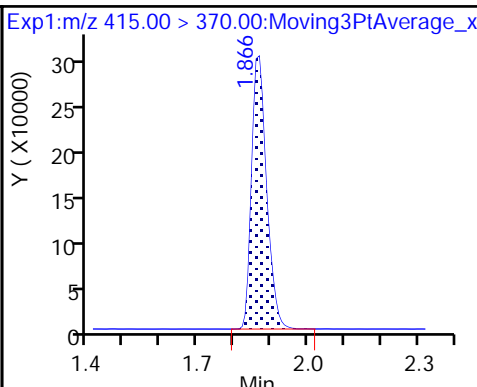
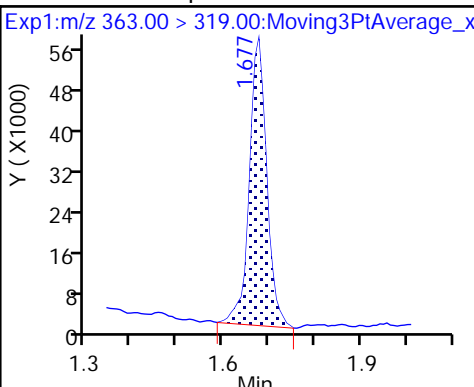
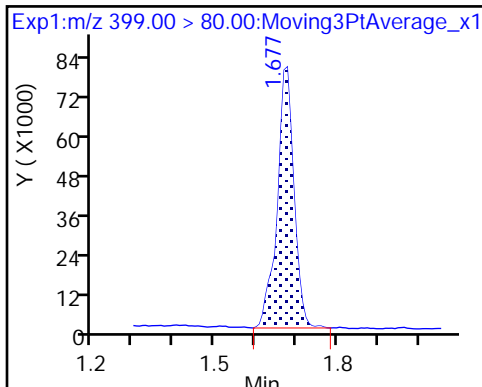
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

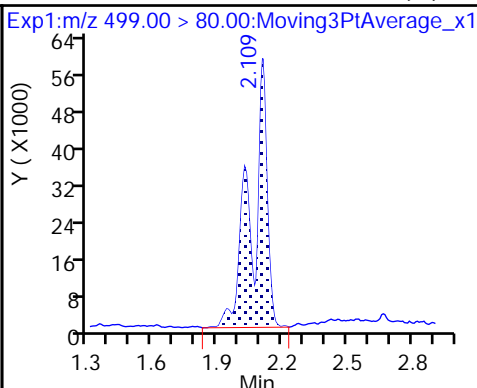
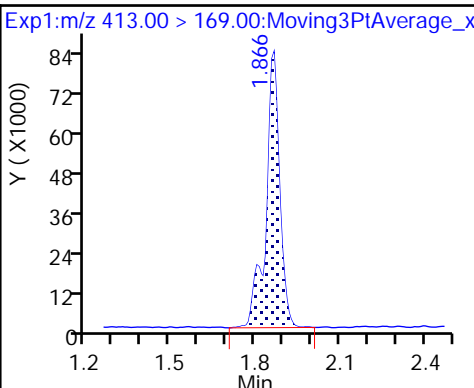
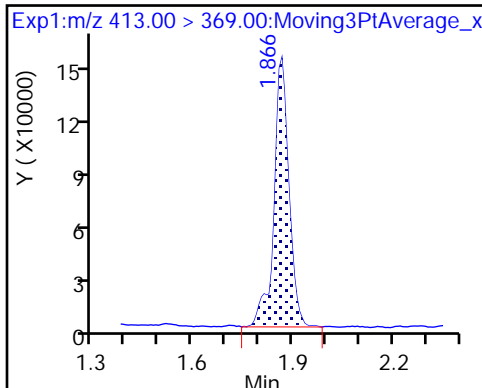
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

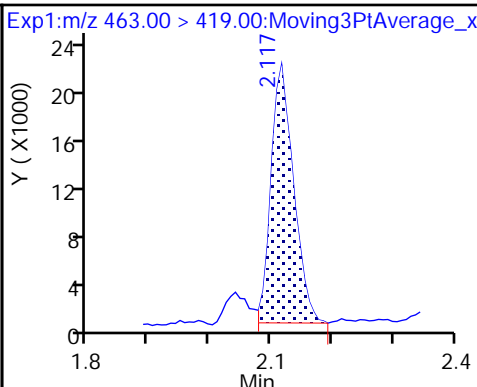
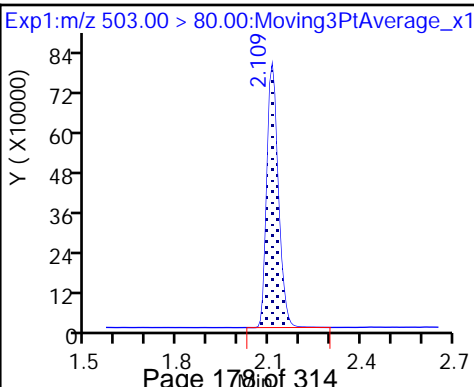
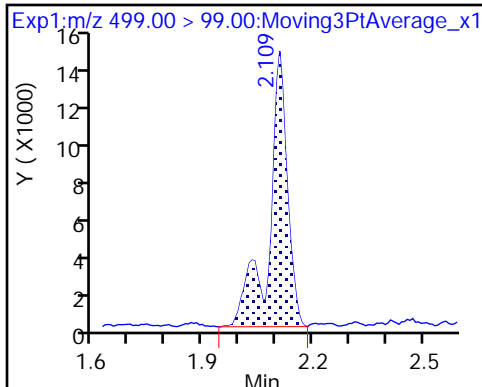
8 Perfluorooctane sulfonic acid (M)



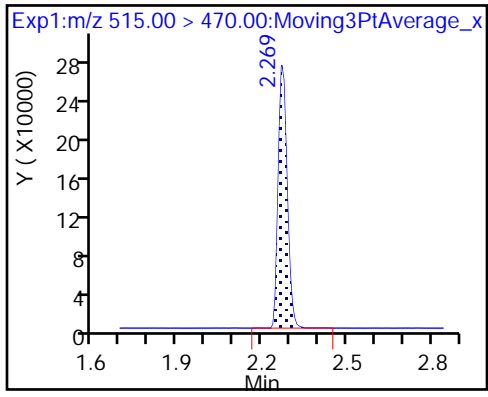
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_074.d  
 Lims ID: 320-38284-A-8-A  
 Client ID: NAWC-041718-RW-179  
 Sample Type: Client  
 Inject. Date: 23-Apr-2018 23:15:04 ALS Bottle#: 52 Worklist Smp#: 42  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-38284-a-8-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:13:09 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 11:11:30

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.3	103.07
\$ 10 13C2 PFDA	10.0	8.22	82.19

TestAmerica Sacramento

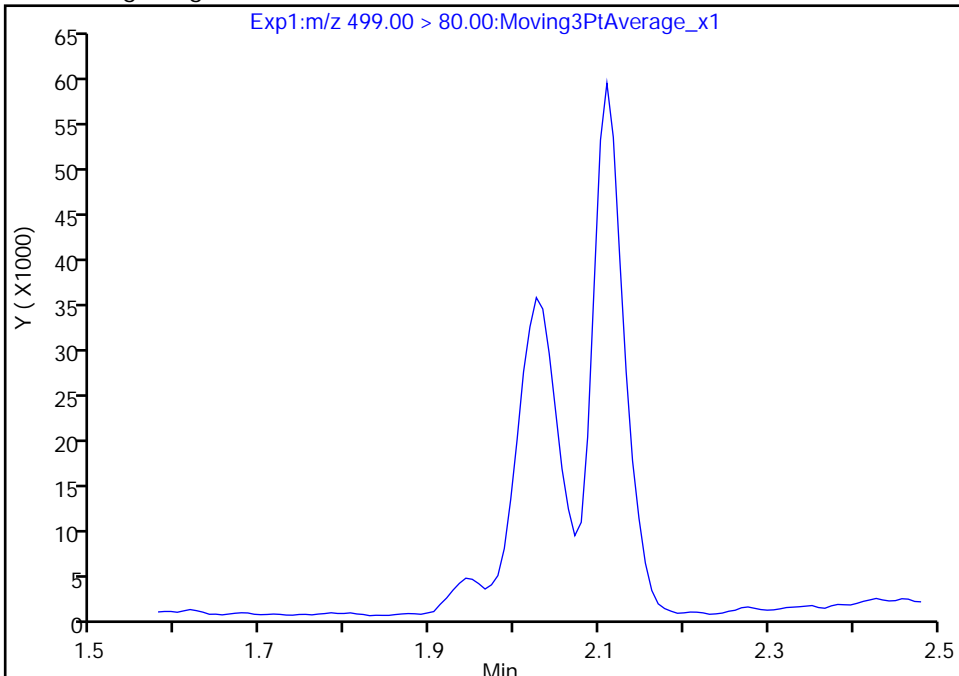
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Injection Date: 23-Apr-2018 23:15:04 Instrument ID: A8\_N  
Lims ID: 320-38284-A-8-A Lab Sample ID: 320-38284-8  
Client ID: NAWC-041718-RW-179  
Operator ID: SACINSTLCMS01 ALS Bottle#: 52 Worklist Smp#: 42  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

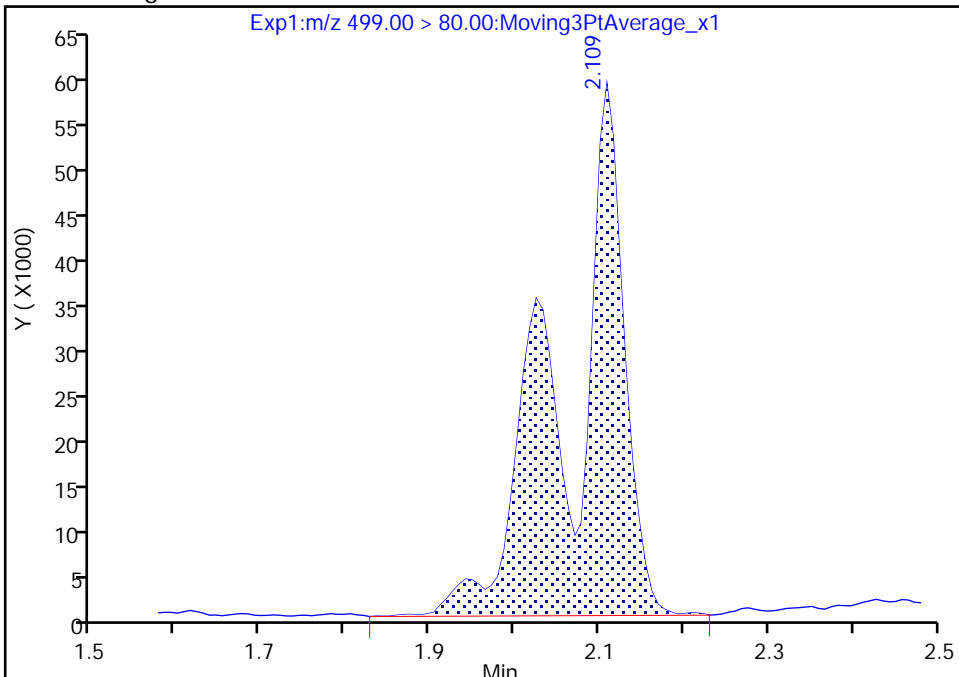
Not Detected  
Expected RT: 2.10

Processing Integration Results



RT: 2.11  
Area: 284959  
Amount: 3.756481  
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

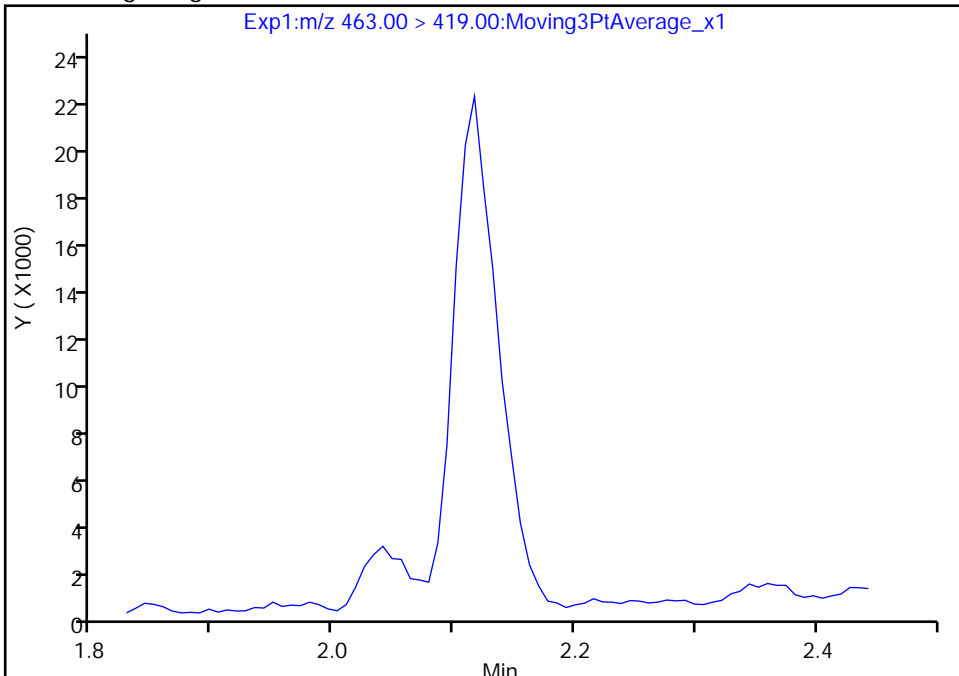
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Injection Date: 23-Apr-2018 23:15:04 Instrument ID: A8\_N  
Lims ID: 320-38284-A-8-A Lab Sample ID: 320-38284-8  
Client ID: NAWC-041718-RW-179  
Operator ID: SACINSTLCMS01 ALS Bottle#: 52 Worklist Smp#: 42  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

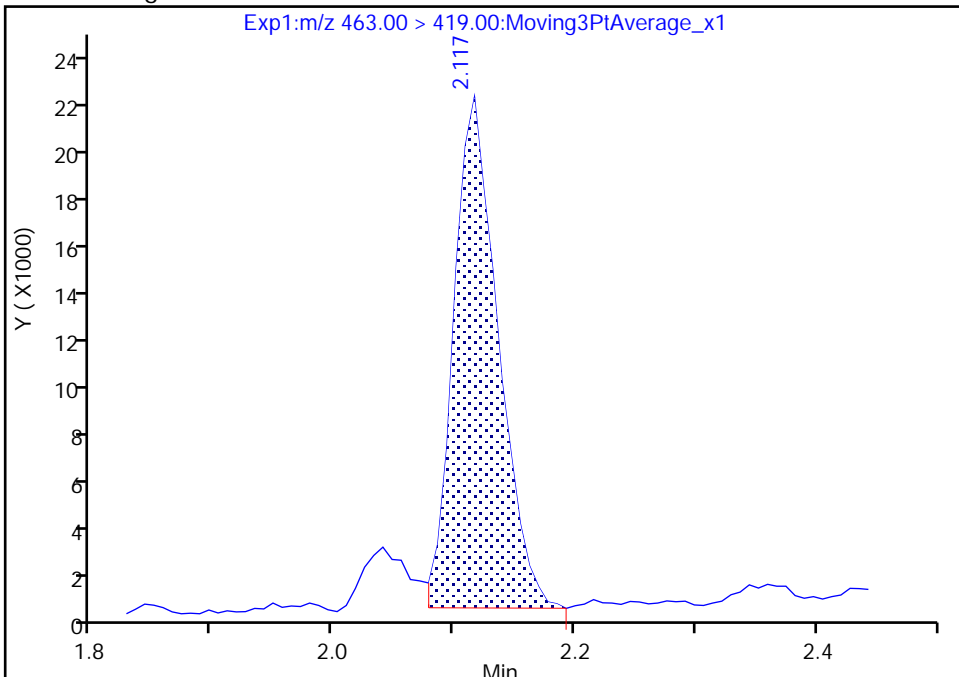
Not Detected  
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.12  
Area: 53899  
Amount: 0.770196  
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 11:11:09  
Audit Action: Manually Integrated

Audit Reason: Missed Peak



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-FRB-179 Lab Sample ID: 320-38284-9  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_075.d  
 Analysis Method: 537 Date Collected: 04/17/2018 10:05  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 250.5 (mL) Date Analyzed: 04/23/2018 23:19  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219468 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	95		70-130
STL00996	13C2 PFDA	94		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_075.d  
 Lims ID: 320-38284-A-9-A  
 Client ID: NAWC-041718-FRB-179  
 Sample Type: Client  
 Inject. Date: 23-Apr-2018 23:19:44 ALS Bottle#: 53 Worklist Smp#: 43  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-38284-a-9-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:13:12 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 11:27:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.517	1.517	0.0	1.000	848302	9.45	6958	
* 6 13C2-PFOA	415.00 > 370.00	1.859	1.851	0.008		843905	10.0	5111	
* 7 13C4 PFOS	503.00 > 80.00	2.109	2.102	0.007		2044636	28.7	1059	
\$ 10 13C2 PFDA	515.00 > 470.00	2.269	2.269	0.0	1.000	673150	9.38	7149	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_075.d

Injection Date: 23-Apr-2018 23:19:44

Instrument ID: A8\_N

Lims ID: 320-38284-A-9-A

Lab Sample ID: 320-38284-9

Client ID: NAWC-041718-FRB-179

Operator ID: SACINSTLCMS01

ALS Bottle#: 53

Worklist Smp#: 43

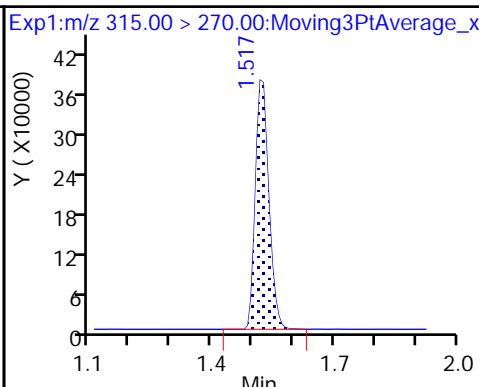
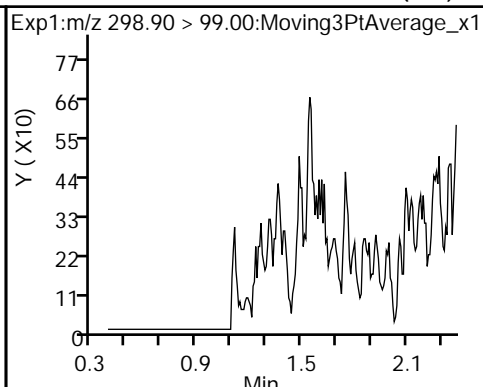
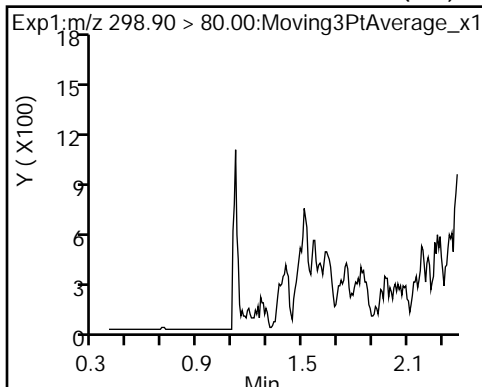
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

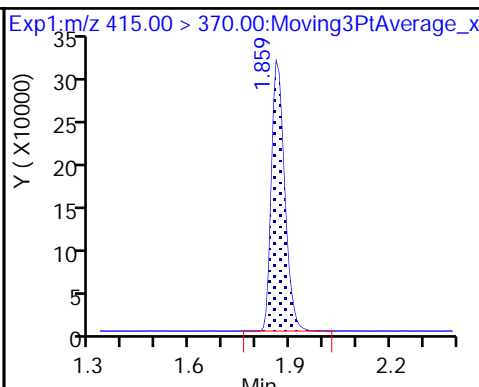
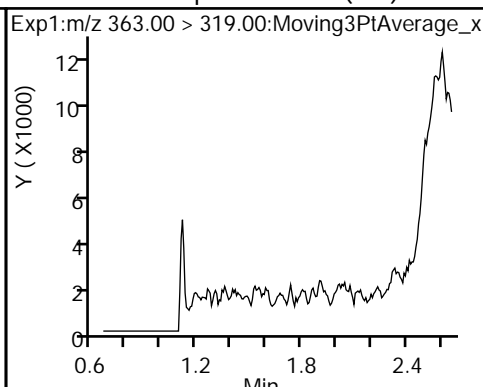
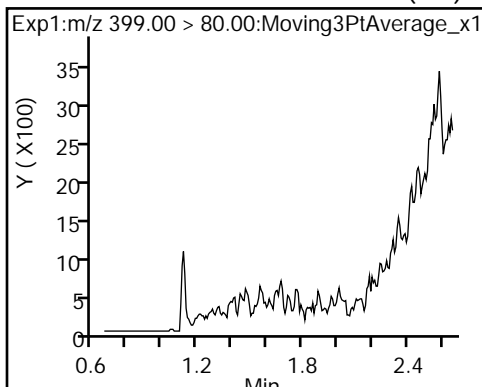
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

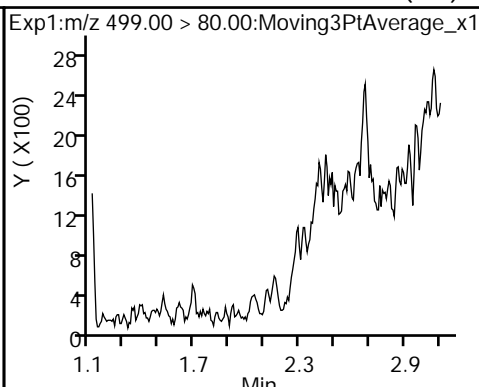
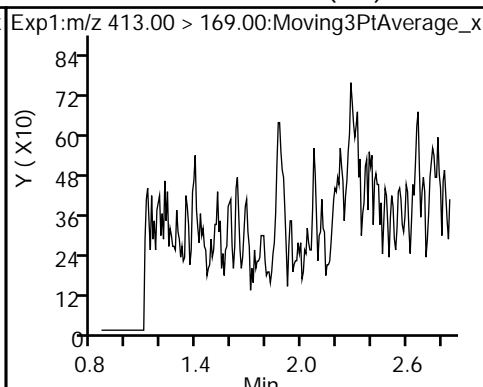
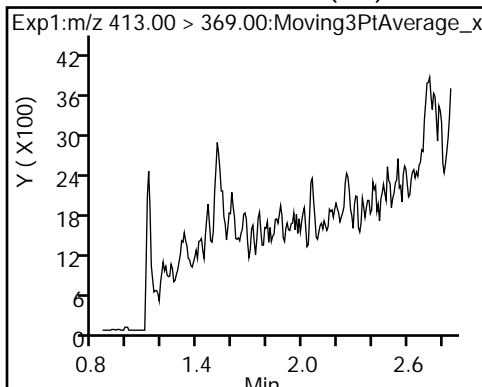
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



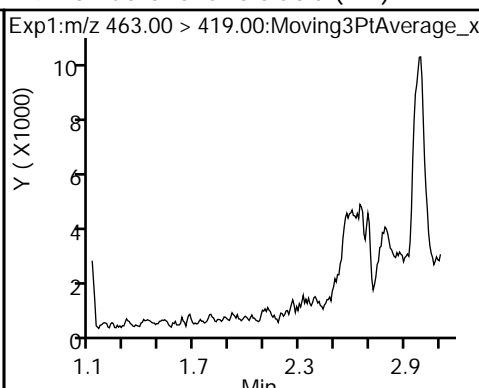
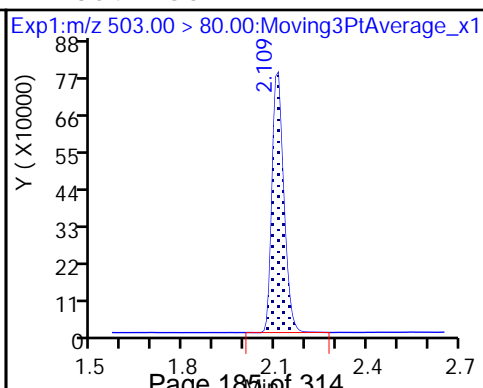
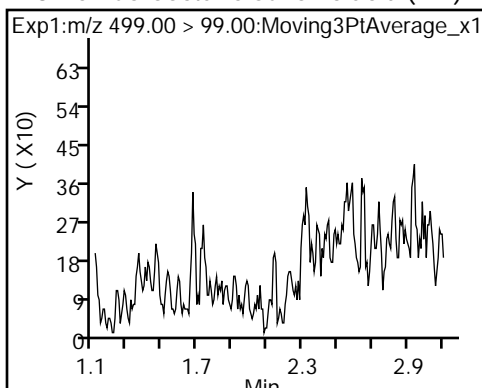
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) \* 6 13C2-PFOA



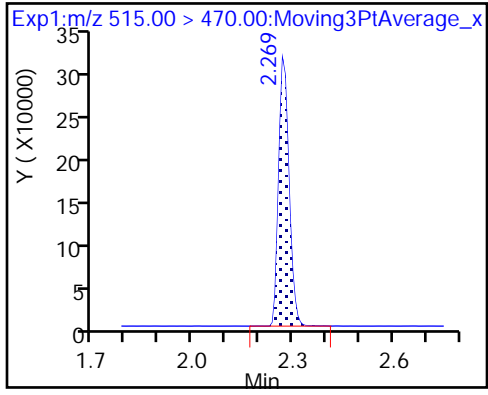
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) 8 Perfluorooctane sulfonic acid (ND)



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



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_075.d  
 Lims ID: 320-38284-A-9-A  
 Client ID: NAWC-041718-FRB-179  
 Sample Type: Client  
 Inject. Date: 23-Apr-2018 23:19:44 ALS Bottle#: 53 Worklist Smp#: 43  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-38284-a-9-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:13:12 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 11:27:17

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.45	94.55
\$ 10 13C2 PFDA	10.0	9.38	93.79

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

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1 Analy Batch No.: 217453

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

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

Calibration Start Date: 04/11/2018 11:45 Calibration End Date: 04/11/2018 12:09 Calibration ID: 38530

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-217453/3	2018.04.11_537ICALB_004.d
Level 2	IC 320-217453/4	2018.04.11_537ICALB_005.d
Level 3	IC 320-217453/5	2018.04.11_537ICALB_006.d
Level 4	IC 320-217453/6	2018.04.11_537ICALB_007.d
Level 5	IC 320-217453/7	2018.04.11_537ICALB_008.d
Level 6	IC 320-217453/8	2018.04.11_537ICALB_009.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)	1.1422 0.9535	1.0952	1.0744	1.0454	1.0008	Ave		1.0519			6.4		30.0				
Perfluoroheptanoic acid (PFHpA)	1.0850 1.0447	1.0991	1.0649	1.0783	1.0702	Ave		1.0737			1.7		30.0				
Perfluorohexanesulfonic acid (PFHxS)	1.6457 1.6837	1.5988	1.6030	1.6384	1.6838	Ave		1.6422			2.3		30.0				
Perfluorooctanoic acid (PFOA)	1.0599 1.0325	1.0296	1.0703	1.0516	1.1300	Ave		1.0623			3.5		30.0				
Perfluorooctanesulfonic acid (PFOS)	1.0432 1.0989	1.0519	1.0326	1.0935	1.0764	Ave		1.0661			2.6		30.0				
Perfluorononanoic acid (PFNA)	0.8261 0.8363	0.8133	0.8488	0.8818	0.8480	Ave		0.8424			2.8		30.0				
13C2 PFHxA	1.0447 1.0648	1.0532	1.0875	1.0687	1.0602	Ave		1.0632			1.4		30.0				
13C2 PFDA	0.8513 0.8262	0.8714	0.8533	0.8487	0.8519	Ave		0.8505			1.7		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.: 320-38284-1 Analy Batch No.: 217453

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

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

Calibration Start Date: 04/11/2018 11:45 Calibration End Date: 04/11/2018 12:09 Calibration ID: 38530

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-217453/3	2018.04.11_537ICALB_004.d
Level 2	IC 320-217453/4	2018.04.11_537ICALB_005.d
Level 3	IC 320-217453/5	2018.04.11_537ICALB_006.d
Level 4	IC 320-217453/6	2018.04.11_537ICALB_007.d
Level 5	IC 320-217453/7	2018.04.11_537ICALB_008.d
Level 6	IC 320-217453/8	2018.04.11_537ICALB_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	Ave	870696 13871852	1696932	4015148	8010147	10764182	9.00 180	20.0	45.0	90.1	135
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	108741 1996261	218860	489075	1044752	1450463	0.960 19.4	2.16	4.86	9.72	14.6
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	418640 8226588	831963	2012030	4216387	6082352	3.00 60.5	6.72	15.1	30.2	45.4
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	219100 4019004	417632	1001316	2075568	3119787	1.98 39.6	4.40	9.90	19.8	29.7
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	349354 7016962	715378	1693810	3678059	5081660	3.95 79.1	8.79	19.8	39.5	59.3
Perfluorononanoic acid (PFNA)	13PF OA	Ave	170770 3255374	329904	794076	1740422	2341235	1.98 39.6	4.40	9.90	19.8	29.7
13C2 PFHxA	13PF OA	Ave	1090690 1046576	970942	1027706	1065262	985534	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	888742 812112	803402	806360	845990	791901	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.: 320-38284-1 Analy Batch No.: 217453

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

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

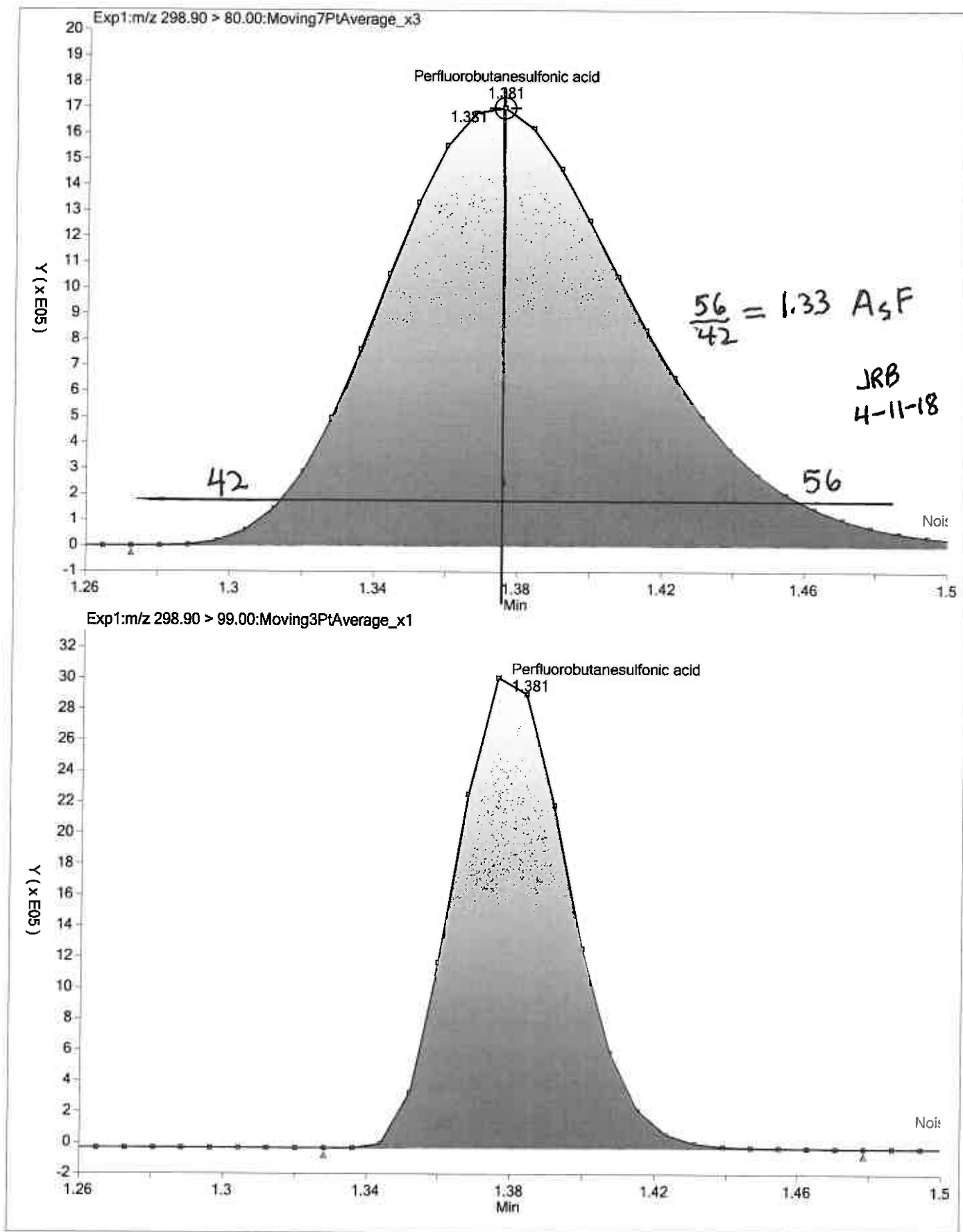
Calibration Start Date: 04/11/2018 11:45 Calibration End Date: 04/11/2018 12:09 Calibration ID: 38530

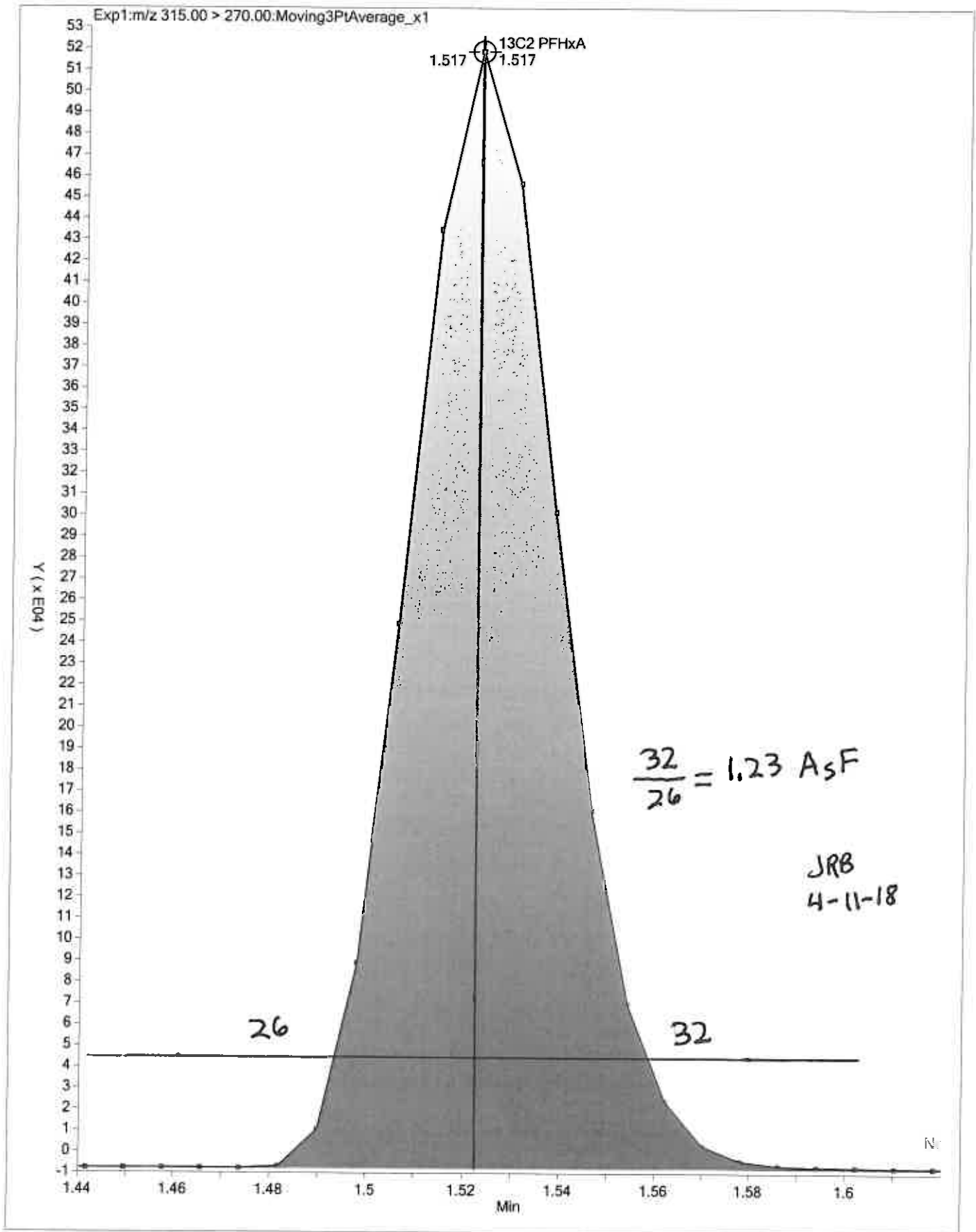
Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-217453/3	2018.04.11_537ICALB_004.d
Level 2	IC 320-217453/4	2018.04.11_537ICALB_005.d
Level 3	IC 320-217453/5	2018.04.11_537ICALB_006.d
Level 4	IC 320-217453/6	2018.04.11_537ICALB_007.d
Level 5	IC 320-217453/7	2018.04.11_537ICALB_008.d
Level 6	IC 320-217453/8	2018.04.11_537ICALB_009.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid (PFBS)	8.6	4.1	2.1	-0.6	-4.9	-9.4	50	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	1.0	2.4	-0.8	0.4	-0.3	-2.7	50	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	0.2	-2.6	-2.4	-0.2	2.5	2.5	50	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	-0.2	-3.1	0.7	-1.0	6.4	-2.8	50	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-2.1	-1.3	-3.1	2.6	1.0	3.1	50	30	30	30	30	30
Perfluorononanoic acid (PFNA)	-1.9	-3.5	0.8	4.7	0.7	-0.7	50	30	30	30	30	30
13C2 PFHxA	-1.7	-0.9	2.3	0.5	-0.3	0.1	30	30	30	30	30	30
13C2 PFDA	0.1	2.5	0.3	-0.2	0.2	-2.9	30	30	30	30	30	30







TestAmerica Laboratories  
Istd/Surrogate Recovery Report

Worklist Name: 11APR2018A\_537B\_ICAL      Worklist Num: 56557  
 Instrument: A8\_N      Method: 537\_A8\_N  
 Batch Directory: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b  
 Limit Group: LC 537 ICAL  
 Analysis Type: SemiVOA  
 Inj Volume: 2.00      Inj Vol Units: ul

Lims Batch: 217453  
 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					
# 1 RB	11-Apr-2018 11:36:27			1027183 1.87	2580682 2.11
# 2 RB	11-Apr-2018 11:41:06			957389 93.2	2343443 90.8
IS Std					
# 3 IC L1	11-Apr-2018 11:45:47	1.52	2.26	1044020> 100.0*	2429483> 100.0*
# 4 IC L2	11-Apr-2018 11:50:27	1.51	2.26	921915> 88.3*	2220259> 91.4*
# 5 IC L3	11-Apr-2018 11:55:08	1.52	2.26	945031> 90.5*	2380125> 98.0*
# 6 IC L4	11-Apr-2018 11:59:48	1.52	2.26	996809> 95.5*	2440107> 100.4*
# 7 IC L5	11-Apr-2018 12:04:29	1.52	2.26	929546> 89.0*	2283311> 94.0*
# 8 IC L6	11-Apr-2018 12:09:09	1.51	2.25	982926> 94.1*	2316327> 95.3*
IS Std					
# 9 RB	11-Apr-2018 12:13:50			945031 1.87	2380125 2.11
IS Std					
#10 CCVL	11-Apr-2018 12:18:29	1.52	2.26	919421 97.3	2344246 98.5
IS Std					
#11 ICB	11-Apr-2018 12:23:10			996809 1.87	2440107 2.10
IS Std					
#12 ICV	11-Apr-2018 12:27:50	1.51	2.25	943600 97.8	2246875 94.1
IS Std					
		92.99	91.91	1123391 112.7	2710764 111.1

13C2-PFOA

$$RPD = \frac{1044020 - 921915}{\frac{1044020 + 921915}{2}} \times 100 = 12.4$$

13C4-PFOS

$$RPD = \frac{2440107 - 2220259}{\frac{2440107 + 2220259}{2}} \times 100 = 9.43$$

JRB  
4-11-18

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_004.d  
 Lims ID: IC L1  
 Client ID:  
 Sample Type: IC Calib Level: 1  
 Inject. Date: 11-Apr-2018 11:45:47 ALS Bottle#: 1 Worklist Smp#: 3  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L1\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 11-Apr-2018 12:35:27 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK015

First Level Reviewer: westendorfc Date: 11-Apr-2018 12:31:32

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.382	-0.001	1.000	870696	9.77		690	
298.90 > 99.00	1.381	1.382	-0.001	1.000	638403		1.36(0.00-0.00)	875	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.517	1.515	0.002	1.000	1090690	9.83		11391	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.669	1.669	0.0	1.000	418640	3.01		133	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.669	1.669	0.0	1.000	108741	0.9701		13.9	
* 6 13C2-PFOA									
415.00 > 370.00	1.866	1.865	0.001		1044020	10.0		6295	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.866	1.866	0.0	1.000	219100	1.98		35.1	
413.00 > 169.00	1.866	1.866	0.0	1.000	116014		1.89(0.00-0.00)	128	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.102	2.094	0.008	1.000	349354	3.87		105	a
499.00 > 99.00	2.102	2.094	0.008	1.000	79188		4.41(0.00-0.00)	237	a
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.102	0.0		2429483	28.7		1437	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.109	0.0	1.000	170770	1.94		31.2	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.260	0.001	1.000	888742	10.0		8004	

**QC Flag Legend**

Review Flags

a - User Assigned ID

**Reagents:**

LC537-L1\_00022

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_004.d

Injection Date: 11-Apr-2018 11:45:47

Instrument ID: A8\_N

Lims ID: IC L1

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 1

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

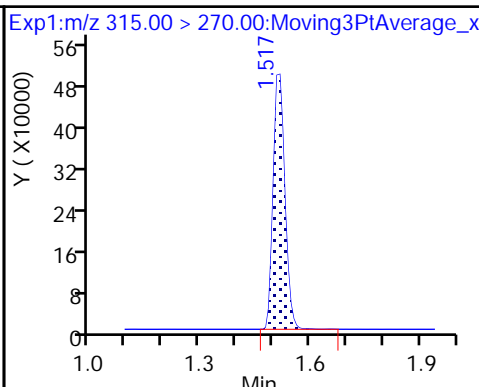
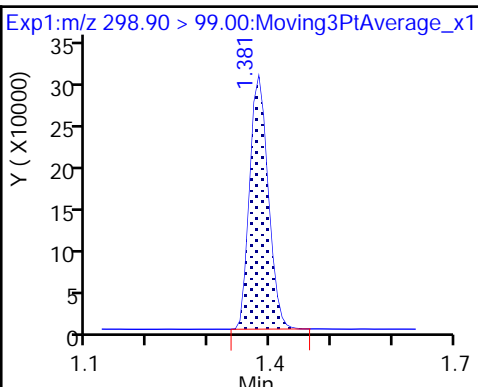
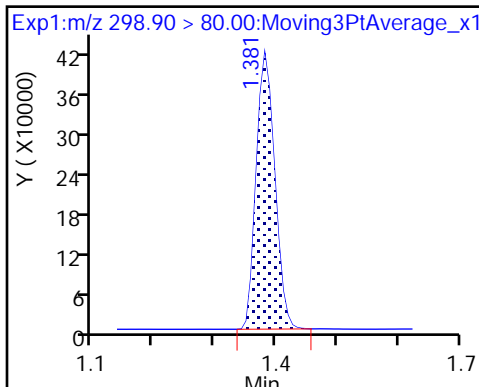
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

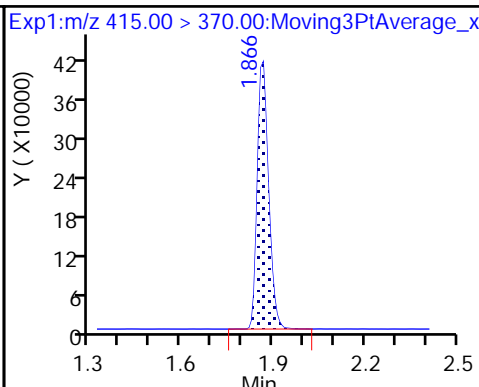
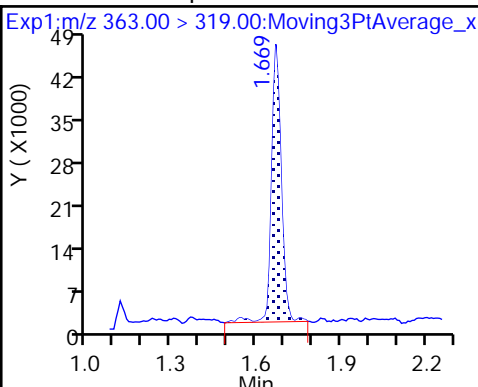
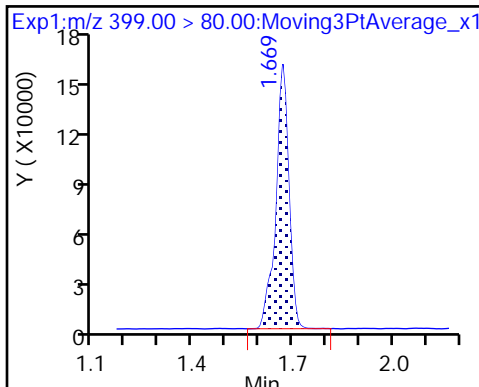
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

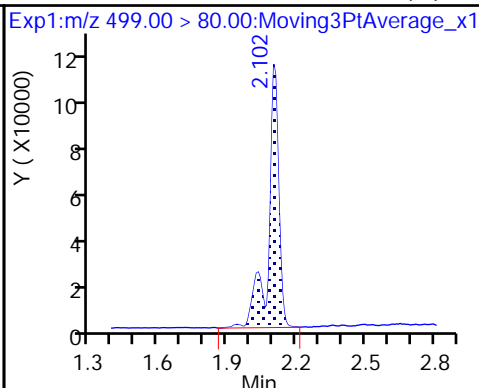
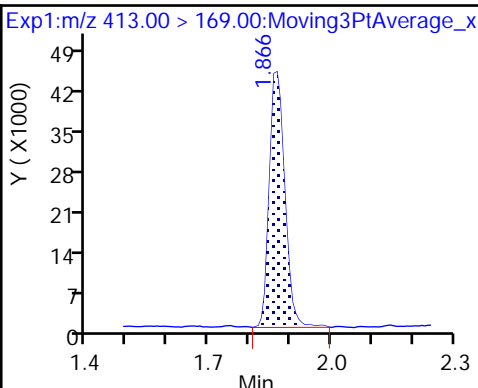
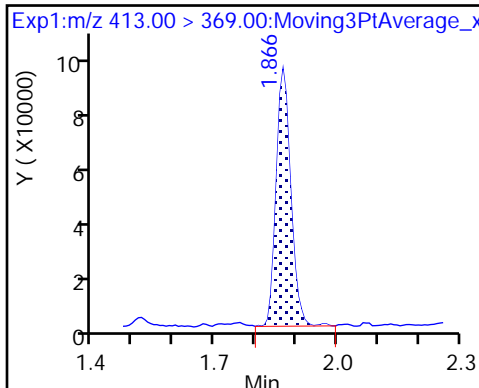
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

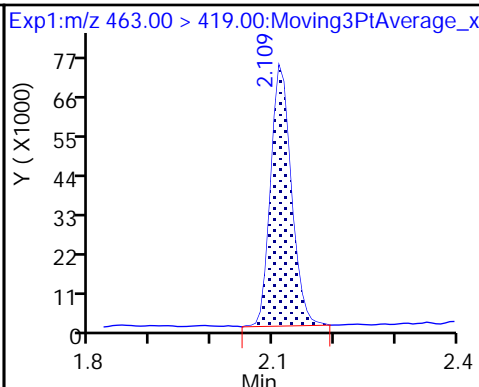
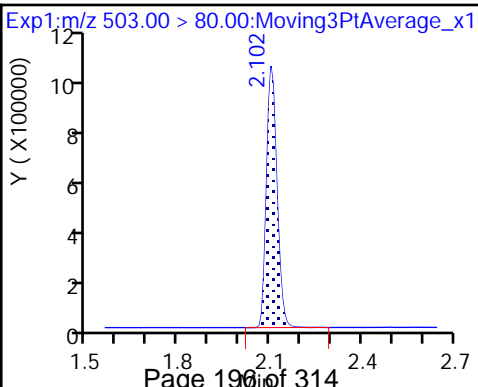
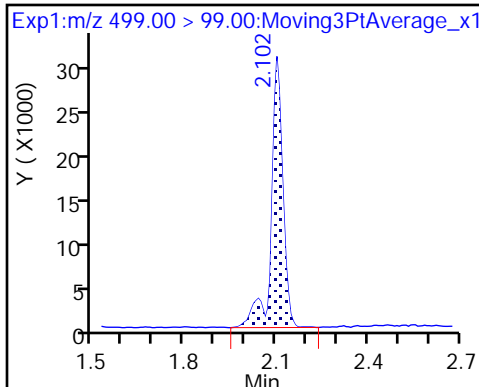
8 Perfluorooctane sulfonic acid (M)



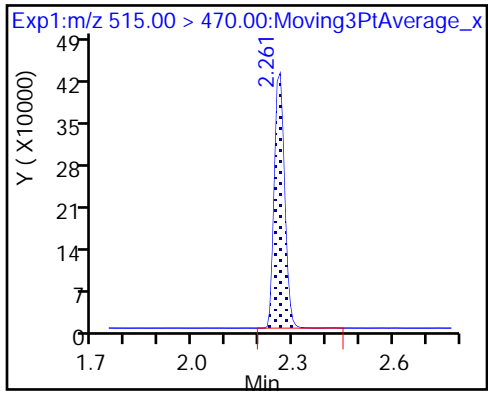
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

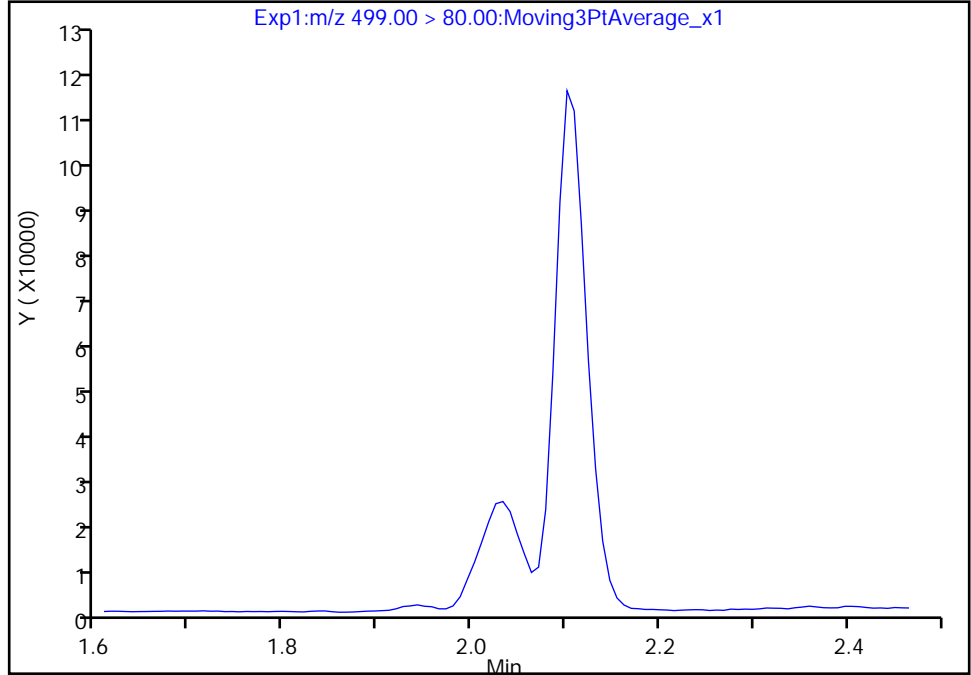
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_004.d  
Injection Date: 11-Apr-2018 11:45:47 Instrument ID: A8\_N  
Lims ID: IC L1  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 3  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

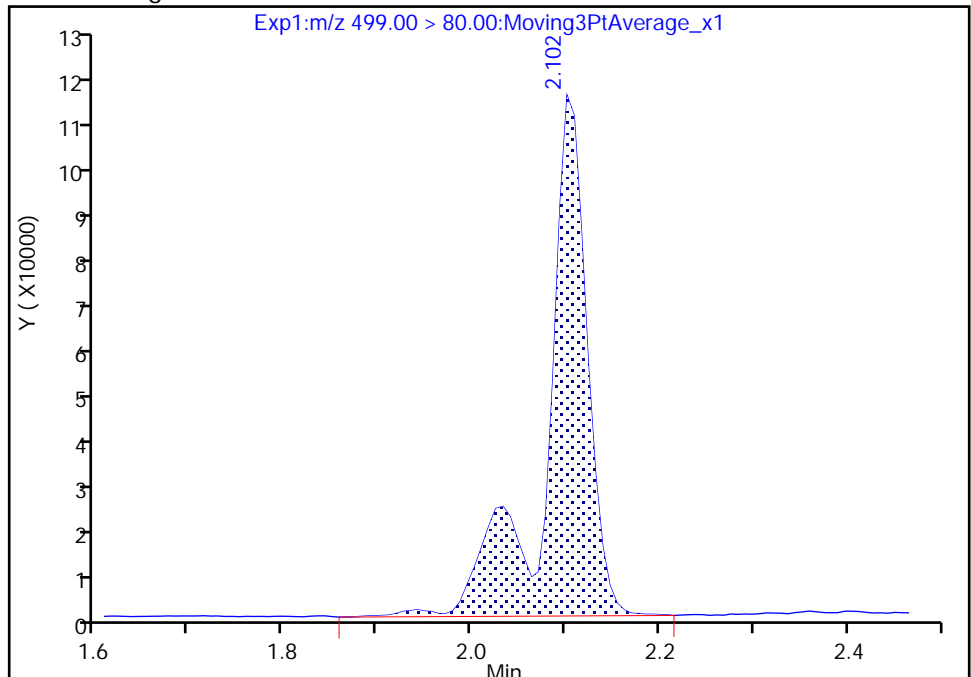
Not Detected  
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.10  
Area: 349354  
Amount: 3.868513  
Amount Units: ng/ml



Reviewer: westendorfc, 11-Apr-2018 12:31:29  
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_005.d  
 Lims ID: IC L2  
 Client ID:  
 Sample Type: IC Calib Level: 2  
 Inject. Date: 11-Apr-2018 11:50:27 ALS Bottle#: 2 Worklist Smp#: 4  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L2\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 11-Apr-2018 12:35:28 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK015

First Level Reviewer: westendorfc Date: 11-Apr-2018 12:31:37

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.382	-0.001	1.000	1696932	20.8		1370	
298.90 > 99.00	1.381	1.382	-0.001	1.000	1238814		1.37(0.00-0.00)	1448	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.510	1.515	-0.005	1.000	970942	9.91		9056	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.669	1.669	0.0	1.000	218860	2.21		24.5	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.669	1.669	0.0	1.000	831963	6.54		251	
* 6 13C2-PFOA									
415.00 > 370.00	1.866	1.865	0.001		921915	10.0		5396	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.866	1.866	0.0	1.000	417632	4.26		64.6	
413.00 > 169.00	1.866	1.866	0.0	1.000	226435		1.84(0.00-0.00)	235	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.102	2.094	0.008	1.000	715378	8.67		193	a
499.00 > 99.00	2.102	2.094	0.008	1.000	153149		4.67(0.00-0.00)	389	a
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.102	0.0		2220259	28.7		1258	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.109	0.0	1.000	329904	4.25		54.3	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.260	0.001	1.000	803402	10.2		7224	

**QC Flag Legend**

Review Flags

a - User Assigned ID

**Reagents:**

LC537-L2\_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_005.d

Injection Date: 11-Apr-2018 11:50:27

Instrument ID: A8\_N

Lims ID: IC L2

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

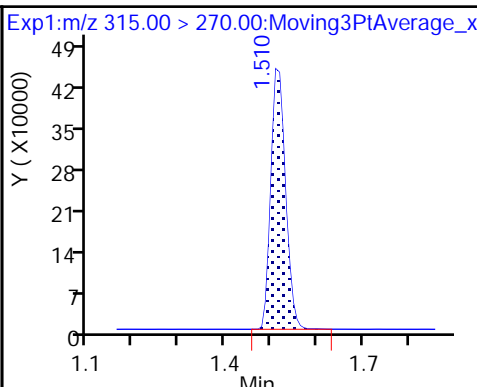
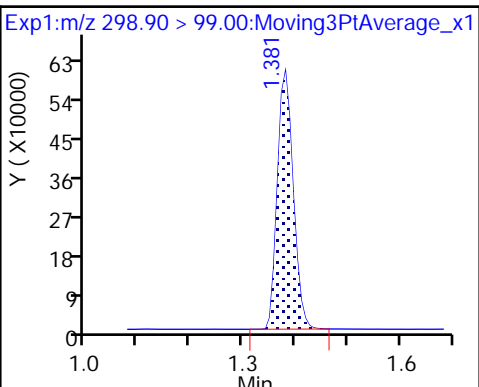
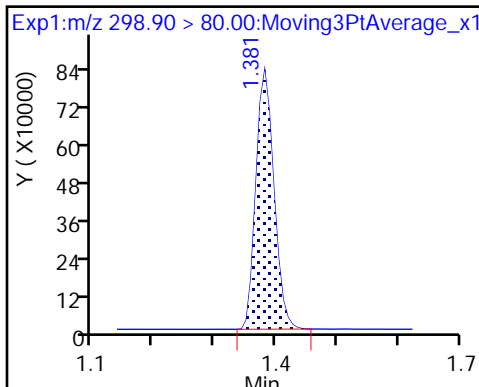
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

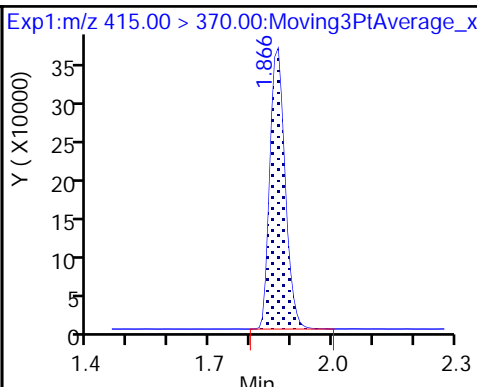
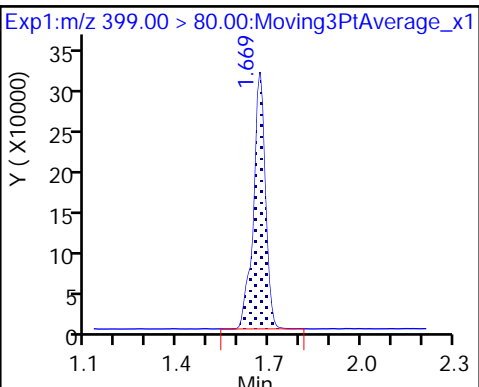
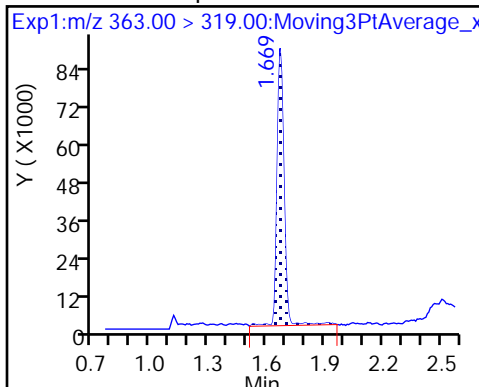
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

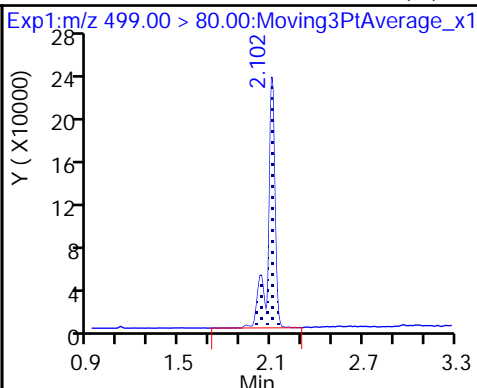
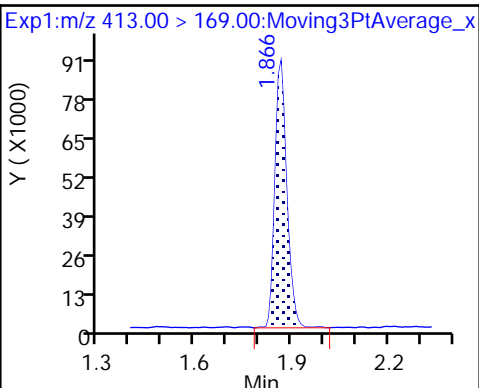
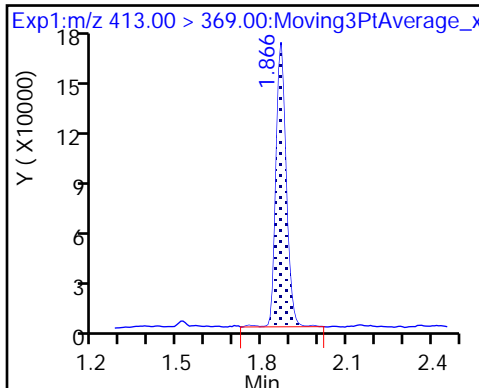
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

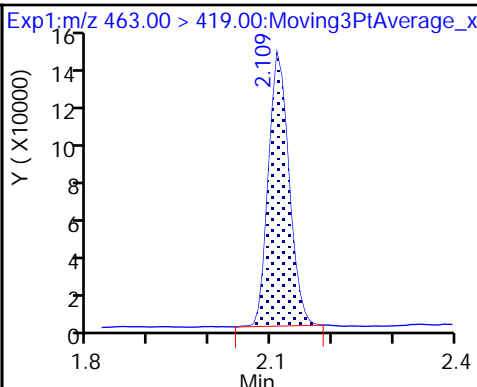
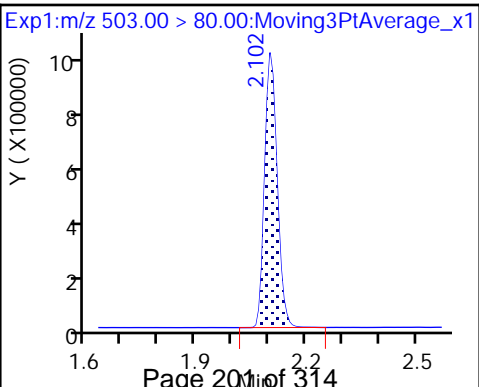
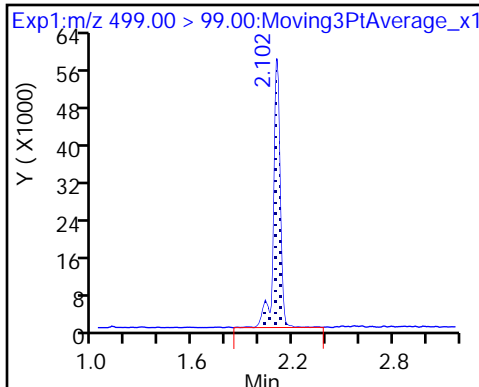
8 Perfluorooctane sulfonic acid (M)



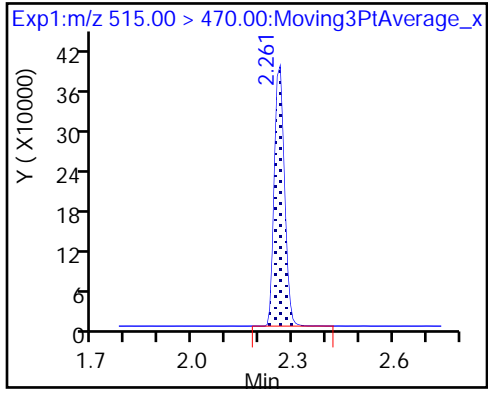
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

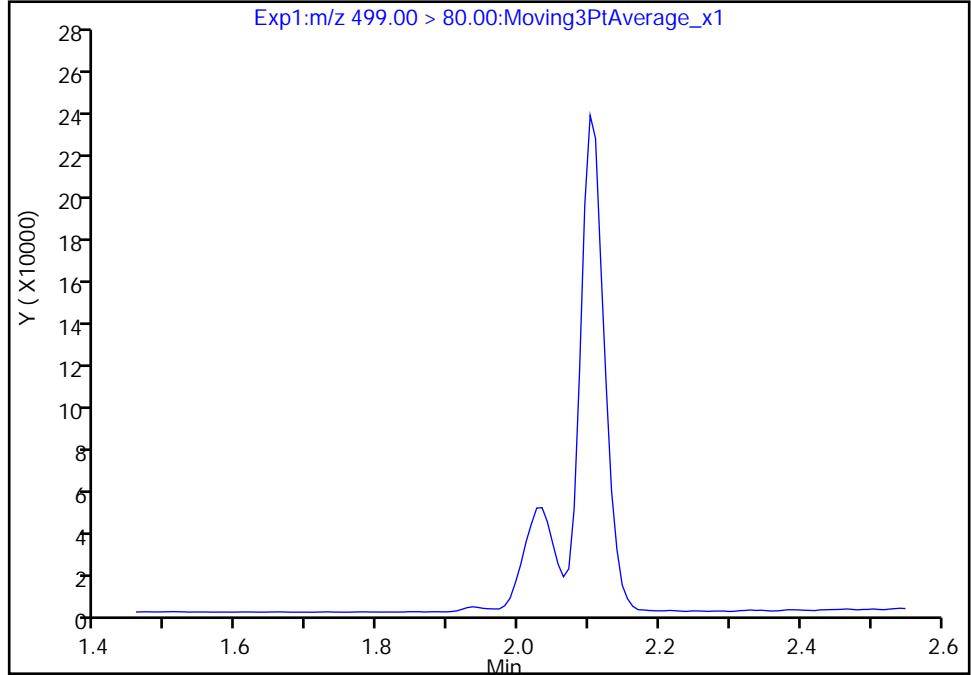
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_005.d  
Injection Date: 11-Apr-2018 11:50:27 Instrument ID: A8\_N  
Lims ID: IC L2  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 4  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

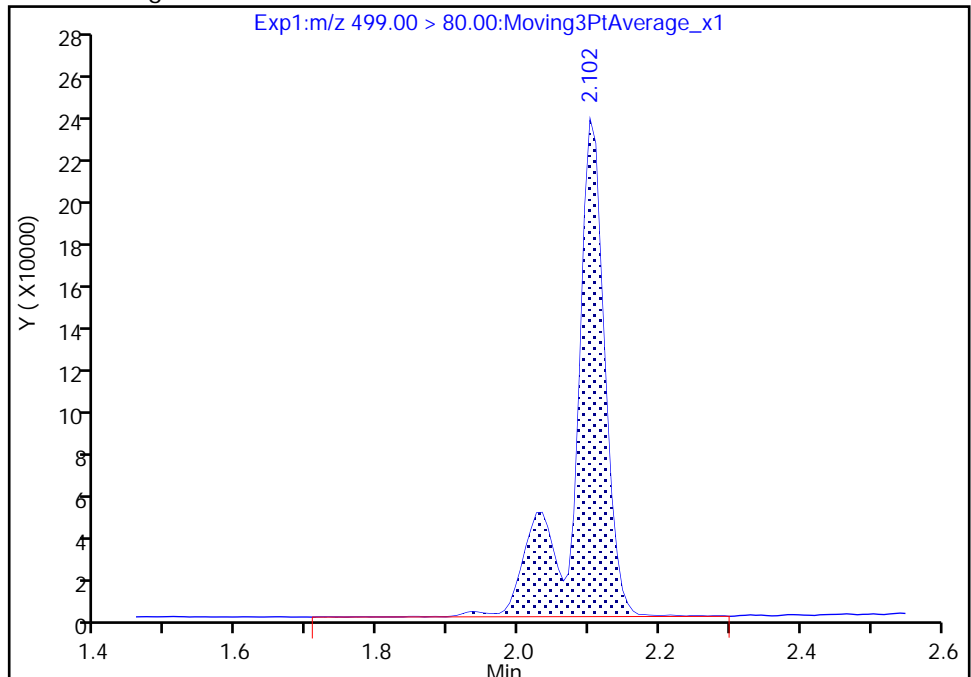
Not Detected  
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.10  
Area: 715378  
Amount: 8.668106  
Amount Units: ng/ml



Reviewer: westendorfc, 11-Apr-2018 12:31:35  
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_006.d  
 Lims ID: IC L3  
 Client ID:  
 Sample Type: IC Calib Level: 3  
 Inject. Date: 11-Apr-2018 11:55:08 ALS Bottle#: 3 Worklist Smp#: 5  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L3\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 11-Apr-2018 12:35:29 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK015

First Level Reviewer: westendorfc Date: 11-Apr-2018 12:31:41

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.388	1.382	0.006	1.000	4015148	46.0		3087	
298.90 > 99.00	1.388	1.382	0.006	1.000	3101910		1.29(0.00-0.00)	3481	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.517	1.515	0.002	1.000	1027706	10.2		8913	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.677	1.669	0.008	1.000	2012030	14.8		618	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.677	1.669	0.008	1.000	489075	4.82		58.8	
* 6 13C2-PFOA									
415.00 > 370.00	1.866	1.865	0.001		945031	10.0		5639	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.874	1.866	0.008	1.000	1001316	9.97		149	
413.00 > 169.00	1.866	1.866	0.0	0.996	522184		1.92(0.00-0.00)	570	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.109	2.094	0.015	1.000	1693810	19.1		469	a
499.00 > 99.00	2.109	2.094	0.015	1.000	359496		4.71(0.00-0.00)	862	a
* 7 13C4 PFOS									
503.00 > 80.00	2.109	2.102	0.007		2380125	28.7		1348	
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.109	0.008	1.000	794076	9.97		123	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.260	0.001	1.000	806360	10.0		7204	

**QC Flag Legend**

Review Flags

a - User Assigned ID

**Reagents:**

LC537-L3\_00025

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_006.d

Injection Date: 11-Apr-2018 11:55:08

Instrument ID: A8\_N

Lims ID: IC L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

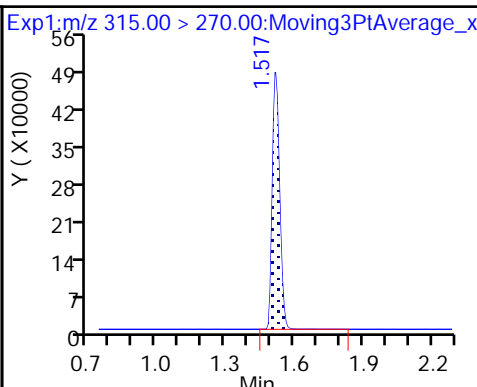
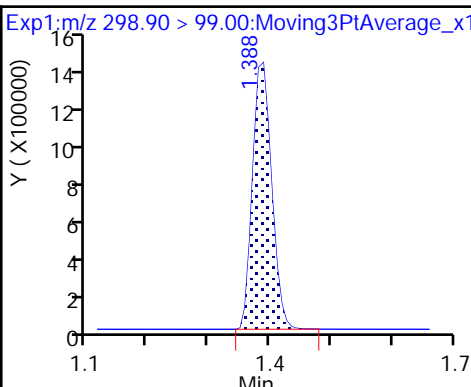
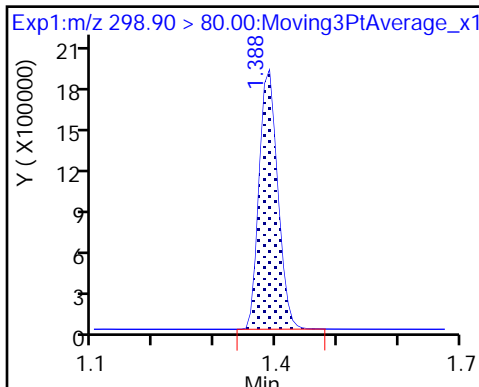
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

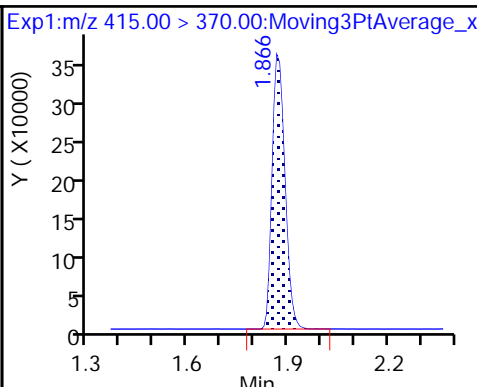
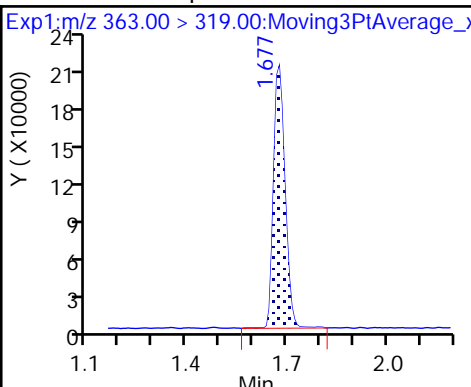
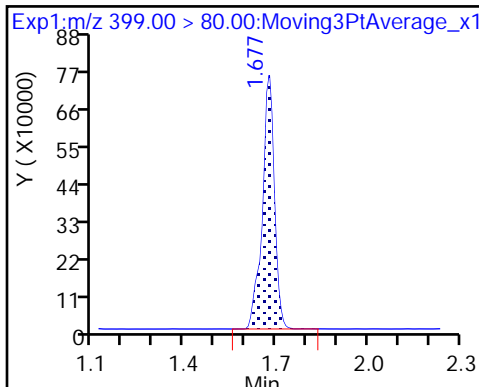
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

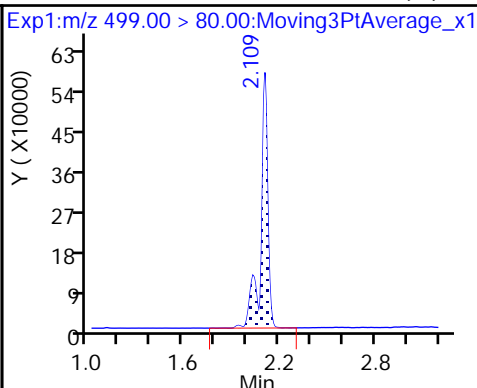
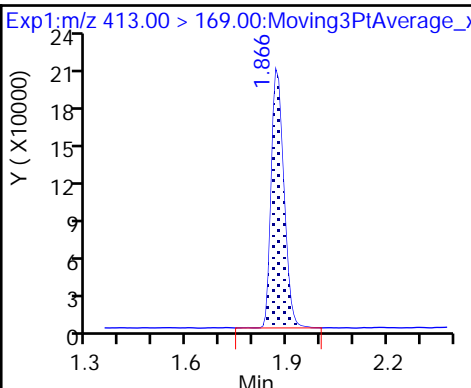
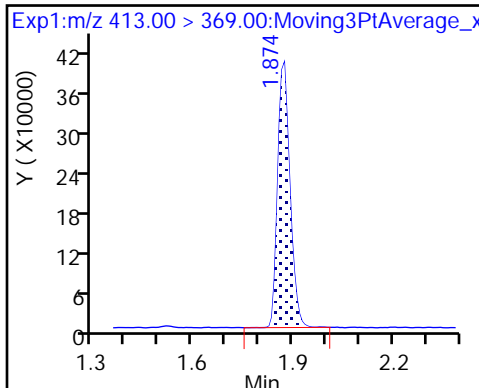
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

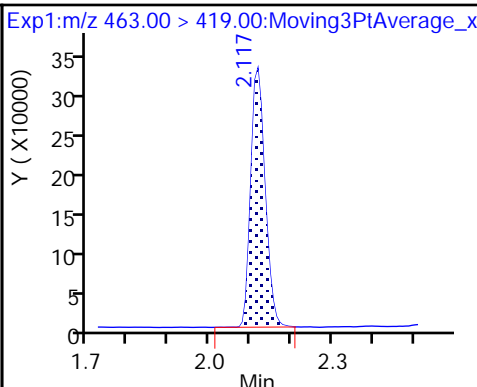
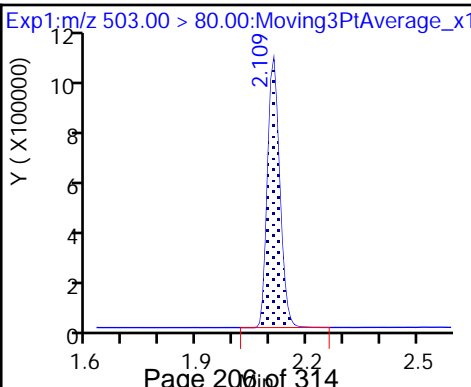
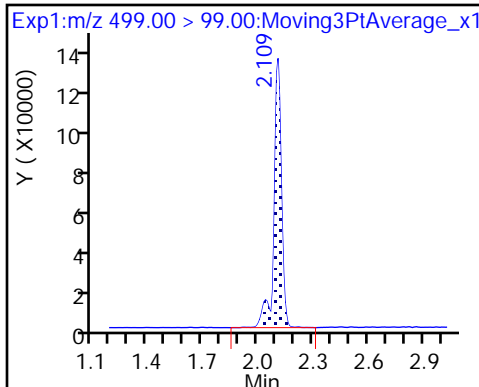
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid

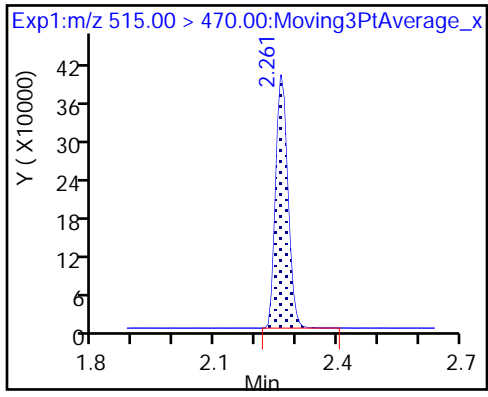
\* 7 13C4 PFOS

9 Perfluorononanoic acid





\$ 10 13C2 PFDA



TestAmerica Sacramento

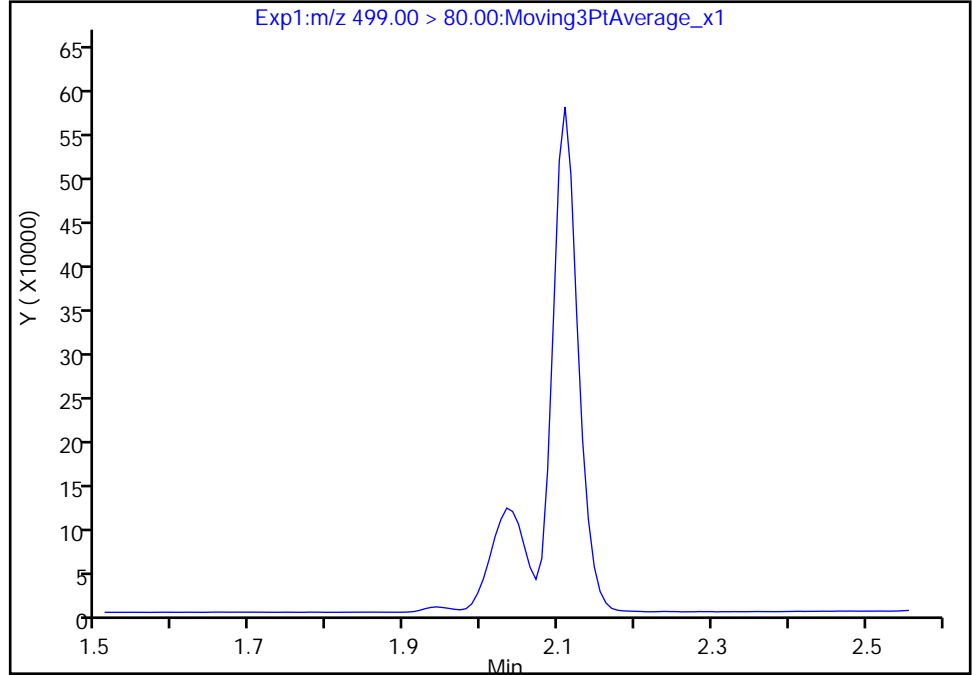
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_006.d  
Injection Date: 11-Apr-2018 11:55:08 Instrument ID: A8\_N  
Lims ID: IC L3  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 5  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

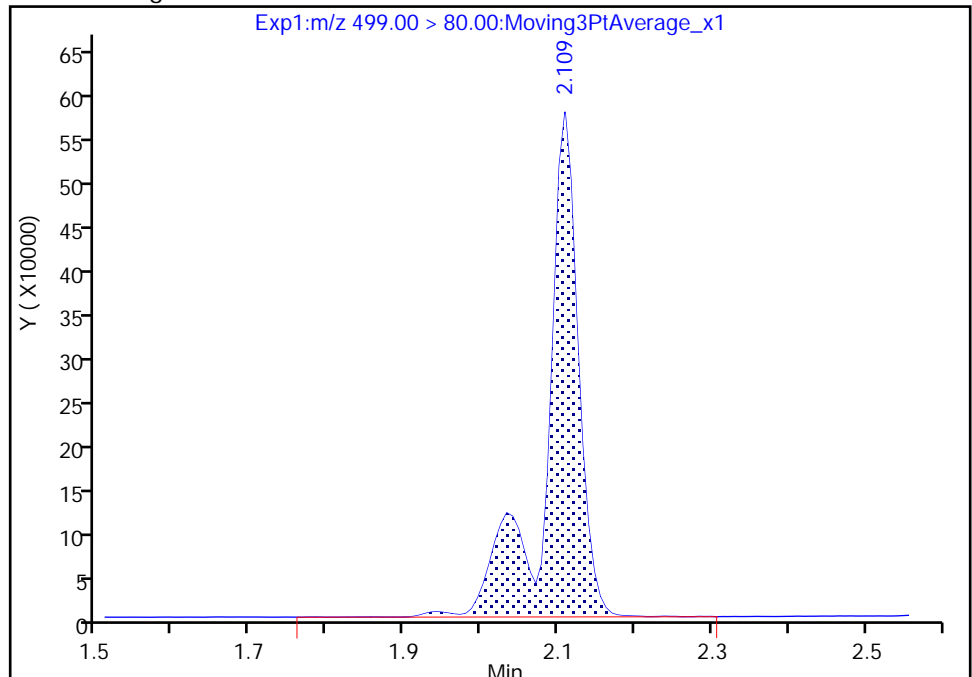
Not Detected  
Expected RT: 2.09

Processing Integration Results



RT: 2.11  
Area: 1693810  
Amount: 19.145080  
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 11-Apr-2018 12:31:39  
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_007.d  
 Lims ID: IC L4  
 Client ID:  
 Sample Type: ICISAV Calib Level: 4  
 Inject. Date: 11-Apr-2018 11:59:48 ALS Bottle#: 4 Worklist Smp#: 6  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L4\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 11-Apr-2018 12:35:30 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK015

First Level Reviewer: westendorfc Date: 11-Apr-2018 12:31:47

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.382	-0.001	1.000	8010147	89.5		5376	
298.90 > 99.00	1.381	1.382	-0.001	1.000	6369602		1.26(0.00-0.00)	6440	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.517	1.515	0.002	1.000	1065262	10.1		8514	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.669	1.669	0.0	1.000	1044752	9.76		122	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.669	1.669	0.0	1.000	4216387	30.2		1268	
* 6 13C2-PFOA									
415.00 > 370.00	1.866	1.865	0.001		996809	10.0		6544	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.866	1.866	0.0	1.000	2075568	19.6		309	
413.00 > 169.00	1.866	1.866	0.0	1.000	1142250		1.82(0.00-0.00)	1229	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.102	2.094	0.008	1.000	3678059	40.6		1000	a
499.00 > 99.00	2.102	2.094	0.008	1.000	748966		4.91(0.00-0.00)	1731	a
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.102	0.0		2440107	28.7		1331	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.109	0.0	1.000	1740422	20.7		274	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.260	0.001	1.000	845990	9.98		7531	

**QC Flag Legend**

Review Flags

a - User Assigned ID

**Reagents:**

LC537-L4\_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_007.d

Injection Date: 11-Apr-2018 11:59:48

Instrument ID: A8\_N

Lims ID: IC L4

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 4

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

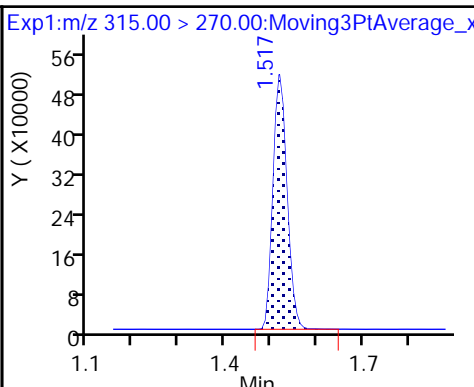
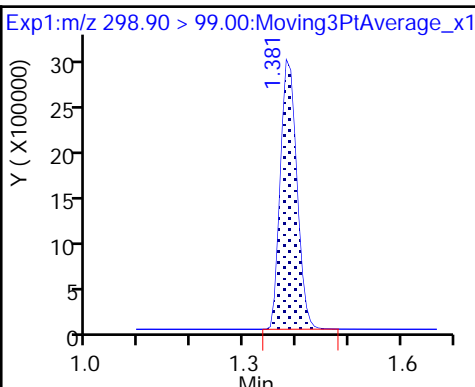
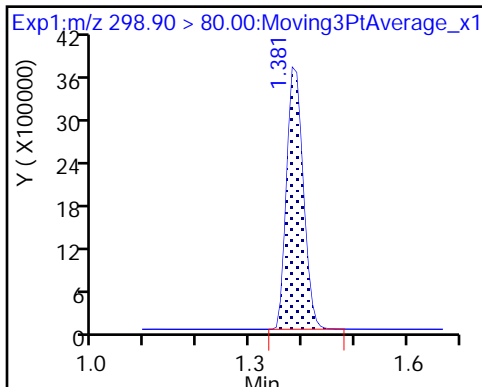
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

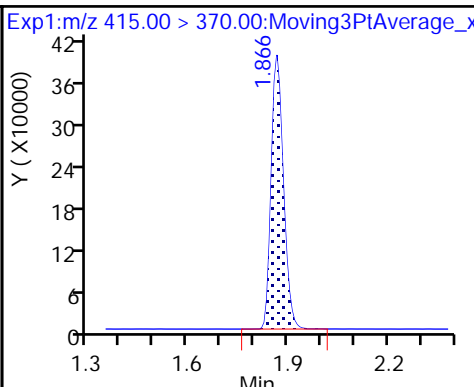
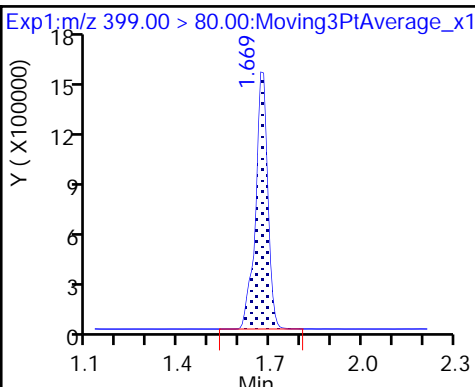
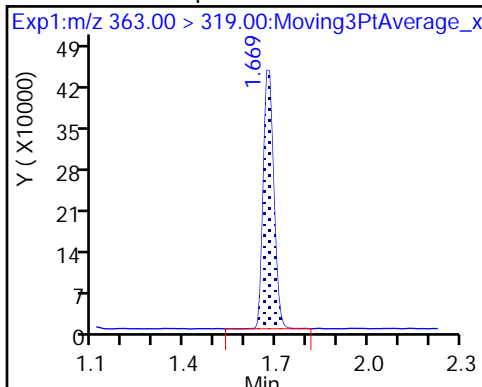
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

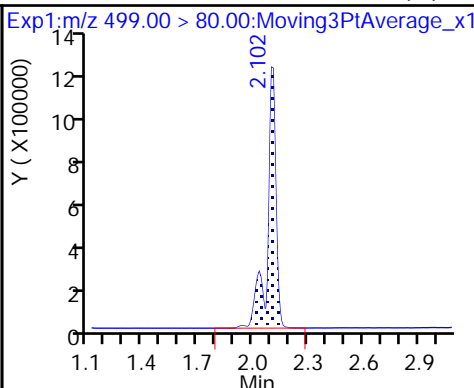
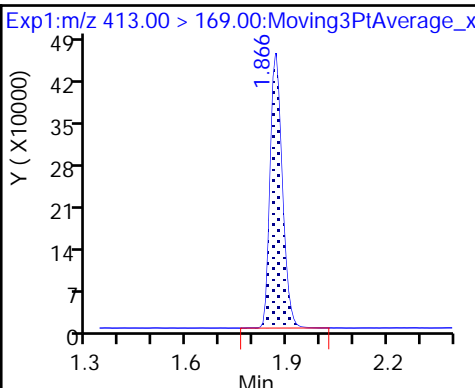
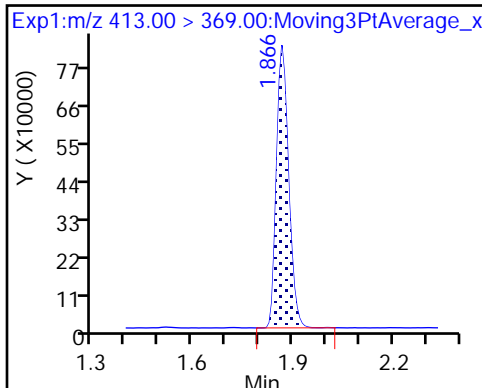
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

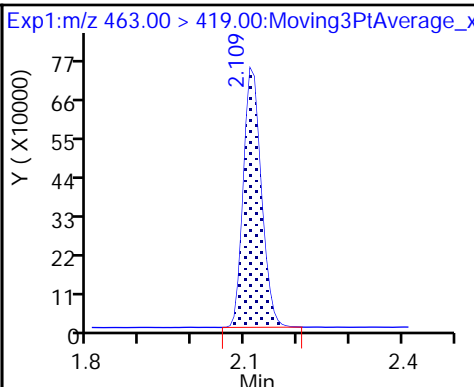
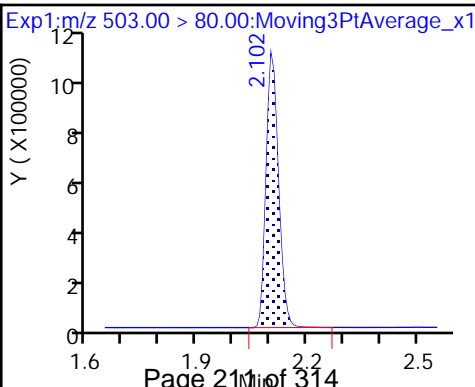
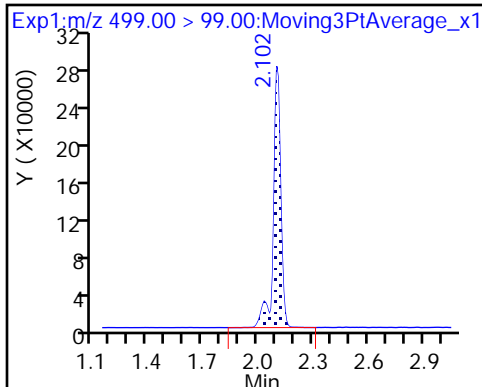
8 Perfluorooctane sulfonic acid (M)



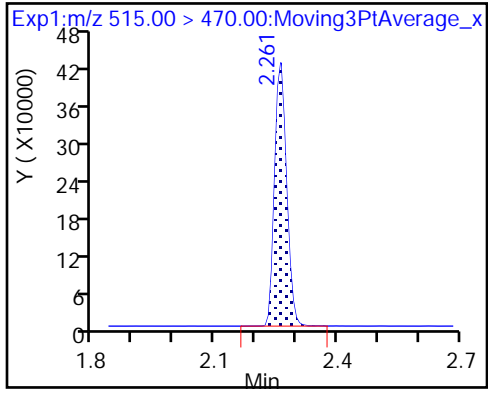
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

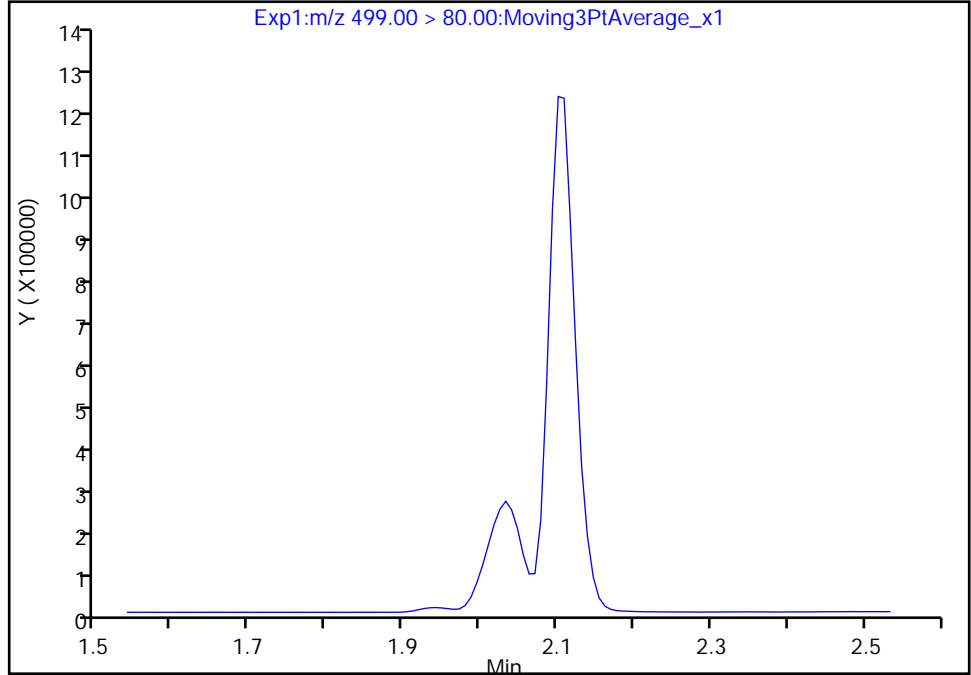
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_007.d  
Injection Date: 11-Apr-2018 11:59:48 Instrument ID: A8\_N  
Lims ID: IC L4  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 6  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

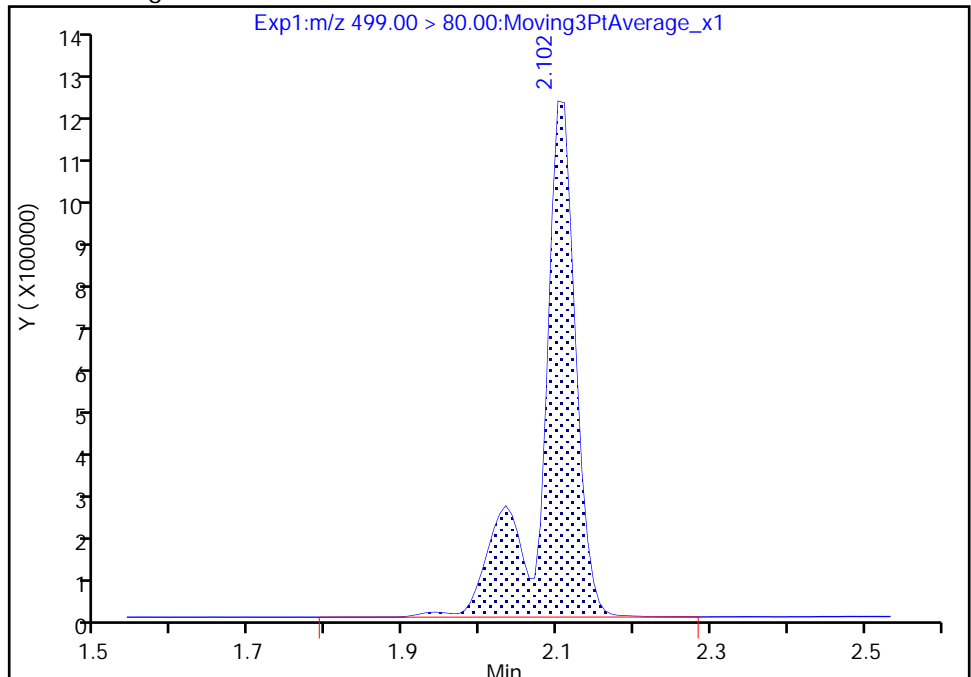
Not Detected  
Expected RT: 2.09

Processing Integration Results



RT: 2.10  
Area: 3678059  
Amount: 40.551047  
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 11-Apr-2018 12:31:45  
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_008.d  
 Lims ID: IC L5  
 Client ID:  
 Sample Type: IC Calib Level: 5  
 Inject. Date: 11-Apr-2018 12:04:29 ALS Bottle#: 5 Worklist Smp#: 7  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L5\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 11-Apr-2018 12:35:32 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK015

First Level Reviewer: westendorfc Date: 11-Apr-2018 12:31:52

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.382	-0.001	1.000	10764182	128.5		6999	
298.90 > 99.00	1.381	1.382	-0.001	1.000	8269613		1.30(0.00-0.00)	7836	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.517	1.515	0.002	1.000	985534	9.97		7814	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.669	1.669	0.0	1.000	6082352	46.5		1721	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.669	1.669	0.0	1.000	1450463	14.5		171	
* 6 13C2-PFOA									
415.00 > 370.00	1.866	1.865	0.001		929546	10.0		5174	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.866	1.866	0.0	1.000	3119787	31.6		475	
413.00 > 169.00	1.866	1.866	0.0	1.000	1555272		2.01(0.00-0.00)	1662	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.102	2.094	0.008	1.000	5081660	59.9		1317	a
499.00 > 99.00	2.102	2.094	0.008	1.000	1106855		4.59(0.00-0.00)	2490	a
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.102	0.0		2283311	28.7		1206	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.109	0.0	1.000	2341235	29.9		363	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.260	0.001	1.000	791901	10.0		6104	



**QC Flag Legend**

Review Flags

a - User Assigned ID

**Reagents:**

LC537-L5\_00026

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_008.d

Injection Date: 11-Apr-2018 12:04:29

Instrument ID: A8\_N

Lims ID: IC L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

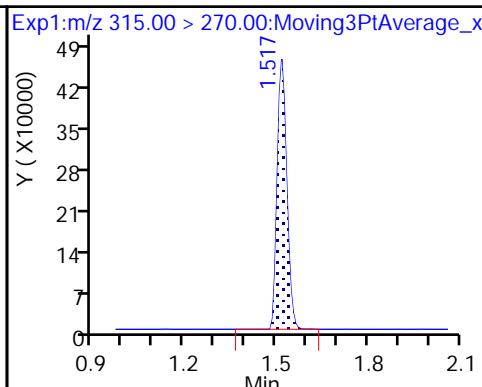
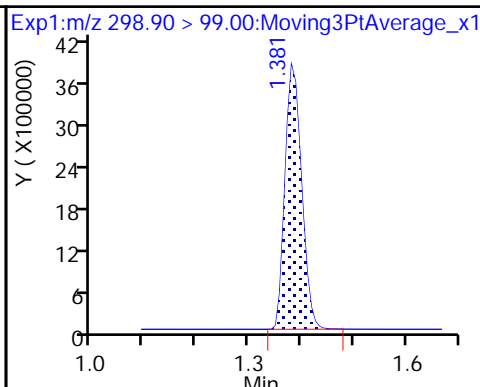
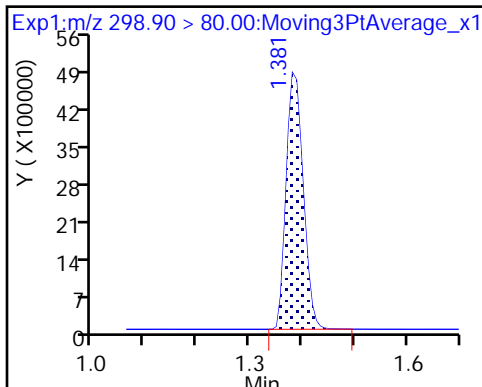
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

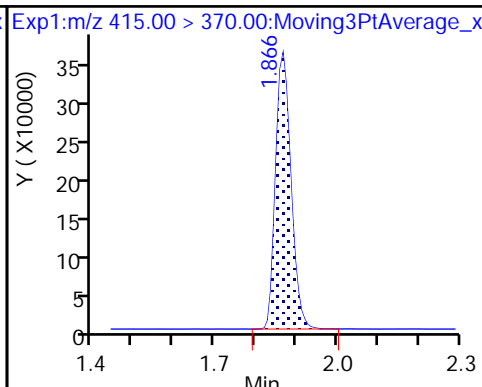
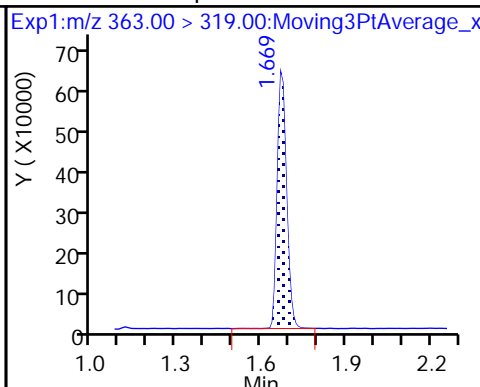
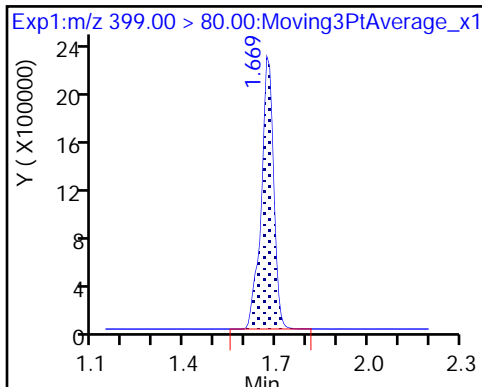
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

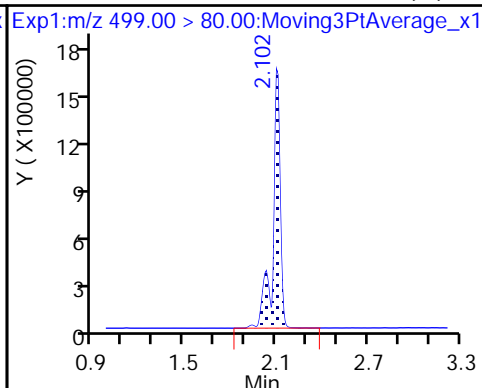
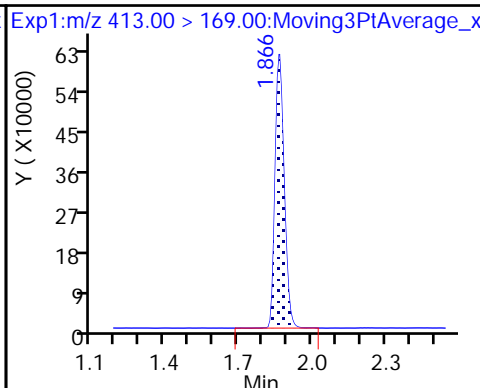
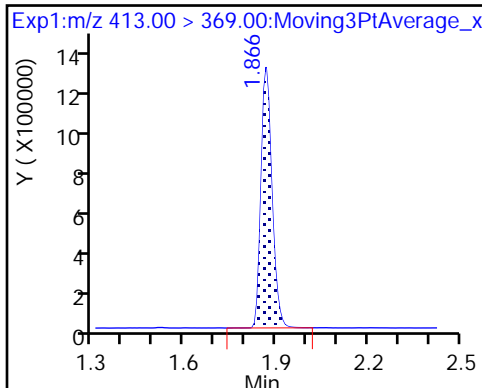
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

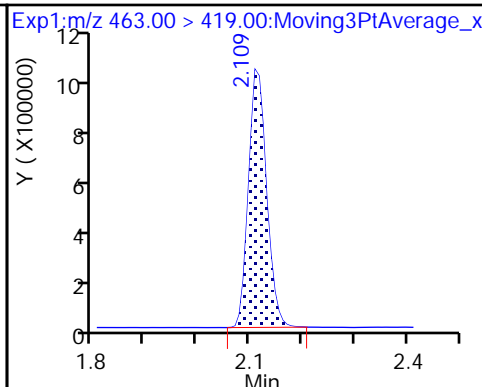
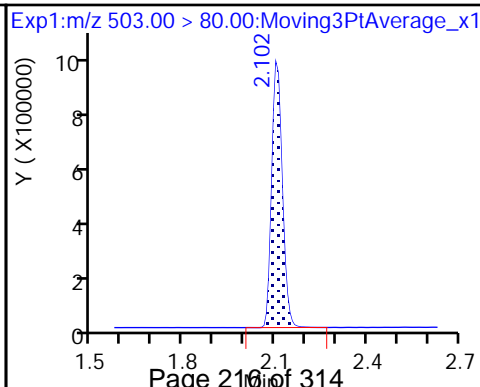
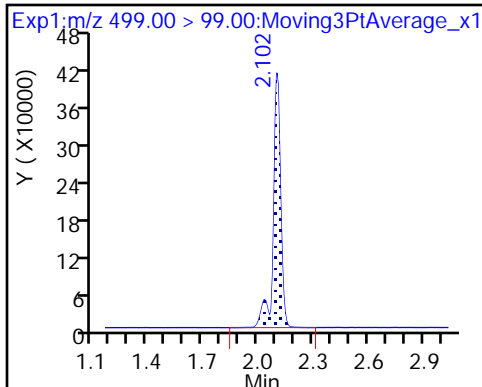
8 Perfluorooctane sulfonic acid (M)



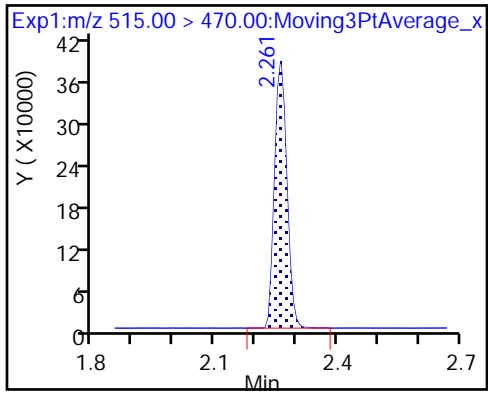
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

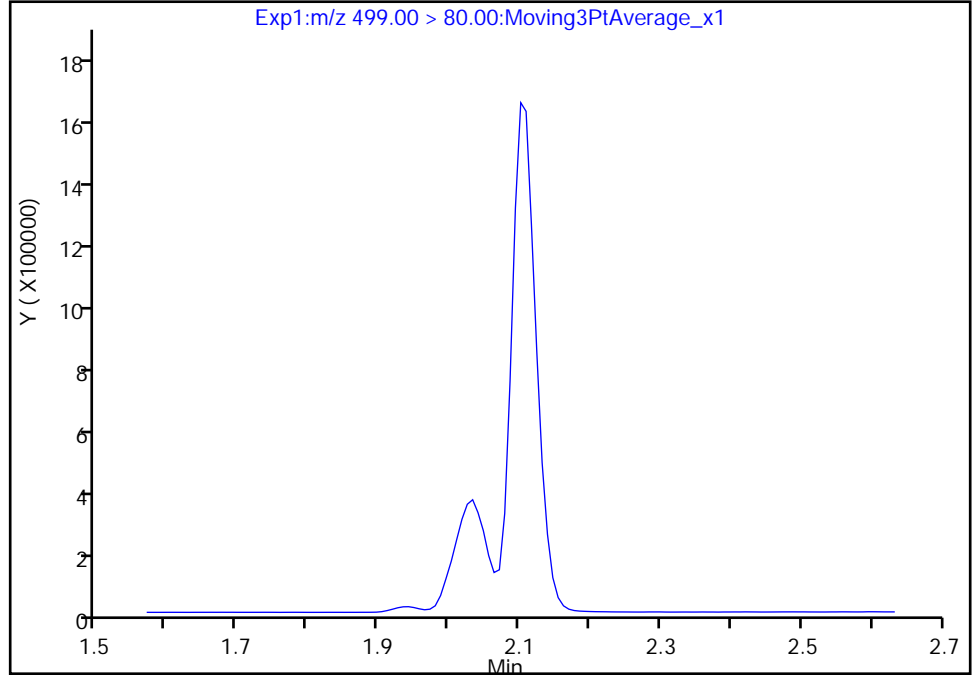
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_008.d  
Injection Date: 11-Apr-2018 12:04:29 Instrument ID: A8\_N  
Lims ID: IC L5  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 7  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

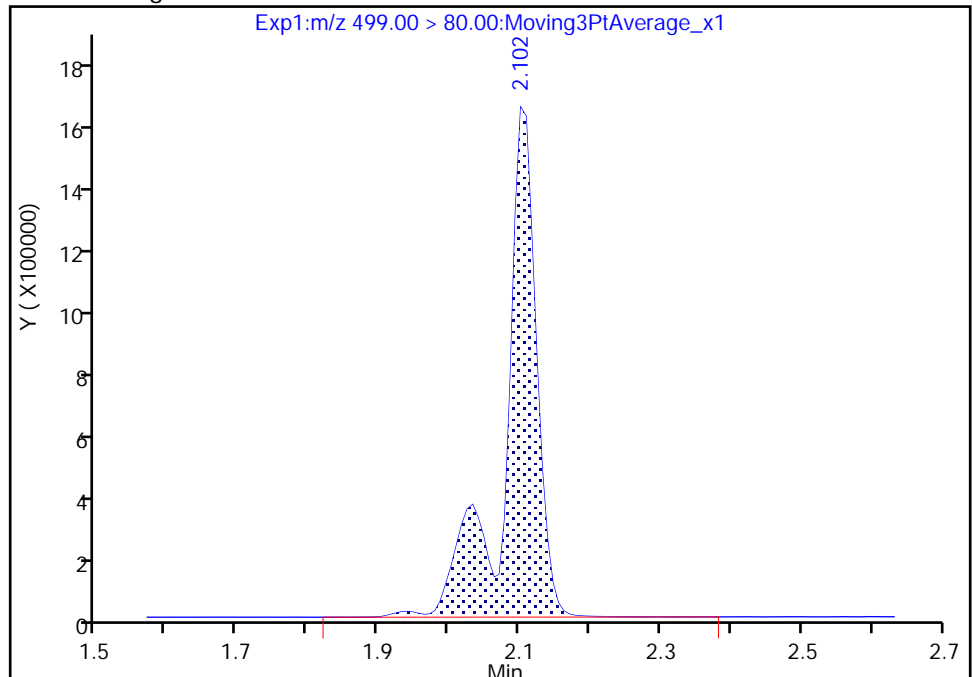
Not Detected  
Expected RT: 2.09

Processing Integration Results



RT: 2.10  
Area: 5081660  
Amount: 59.873244  
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 11-Apr-2018 12:31:49  
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Lims ID: IC L6  
 Client ID:  
 Sample Type: IC Calib Level: 6  
 Inject. Date: 11-Apr-2018 12:09:09 ALS Bottle#: 6 Worklist Smp#: 8  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L6\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 11-Apr-2018 12:35:33 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK015

First Level Reviewer: westendorfc Date: 11-Apr-2018 12:31:59

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.382	-0.001	1.000	13871852	163.3		8258	
298.90 > 99.00	1.381	1.382	-0.001	1.000	10985181		1.26(0.00-0.00)	9440	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.510	1.515	-0.005	1.000	1046576	10.0		9565	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.662	1.669	-0.007	1.000	1996261	18.9		234	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.662	1.669	-0.007	1.000	8226588	62.0		2319	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.865	-0.006		982926	10.0		5616	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.866	-0.007	1.000	4019004	38.5		570	
413.00 > 169.00	1.859	1.866	-0.007	1.000	2217251		1.81(0.00-0.00)	2465	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.094	2.094	0.0	1.000	7016962	81.5		1855	a
499.00 > 99.00	2.094	2.094	0.0	1.000	1468337		4.78(0.00-0.00)	3642	a
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.102	-0.008		2316327	28.7		1268	
9 Perfluorononanoic acid									
463.00 > 419.00	2.102	2.109	-0.007	1.000	3255374	39.3		485	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.253	2.260	-0.007	1.000	812112	9.71		7134	

**QC Flag Legend**

Review Flags

a - User Assigned ID

**Reagents:**

LC537-L6\_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d

Injection Date: 11-Apr-2018 12:09:09

Instrument ID: A8\_N

Lims ID: IC L6

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 6

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

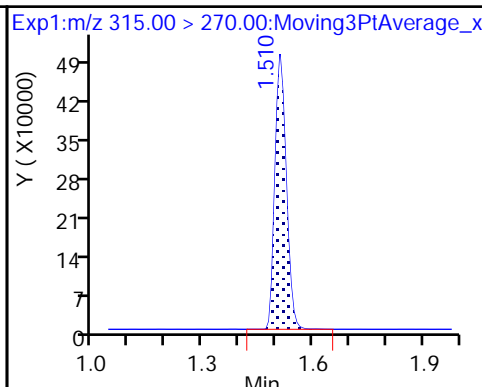
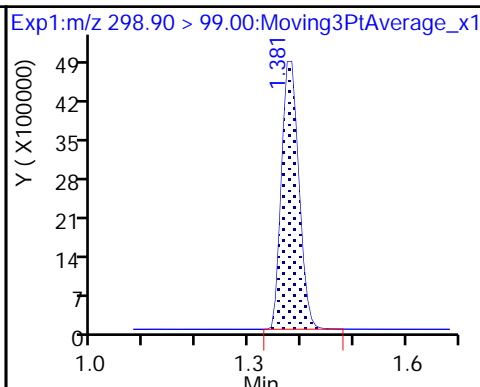
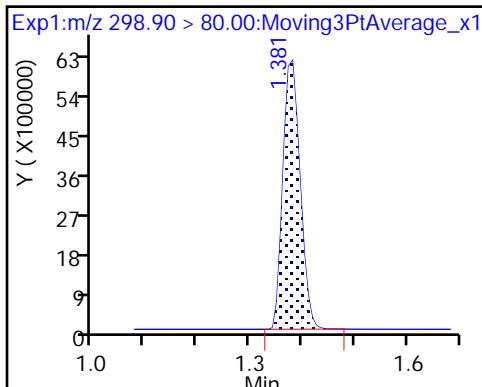
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

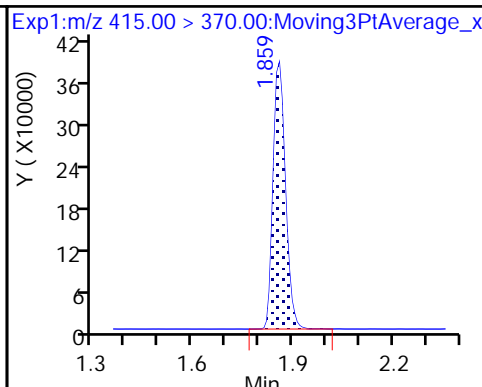
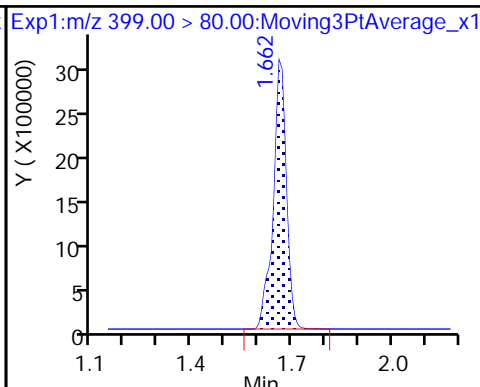
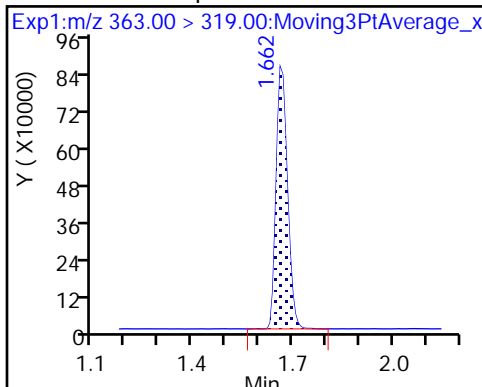
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

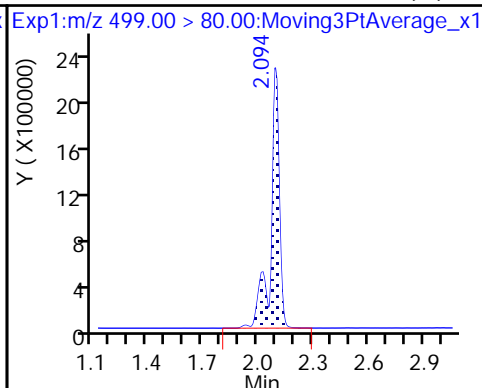
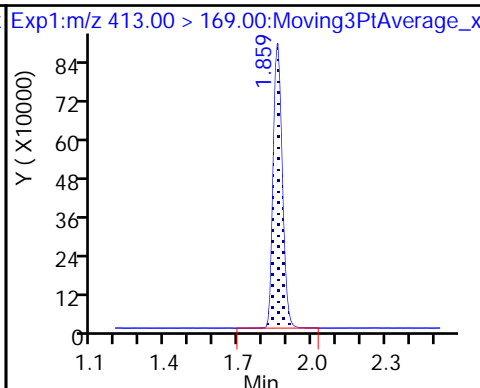
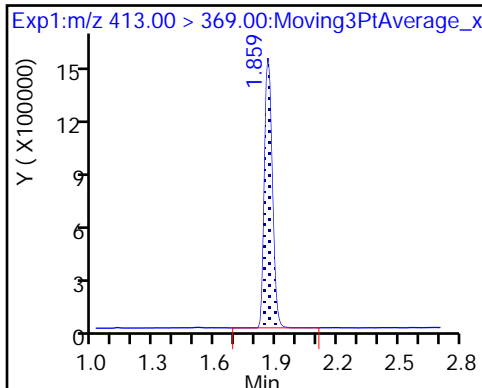
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

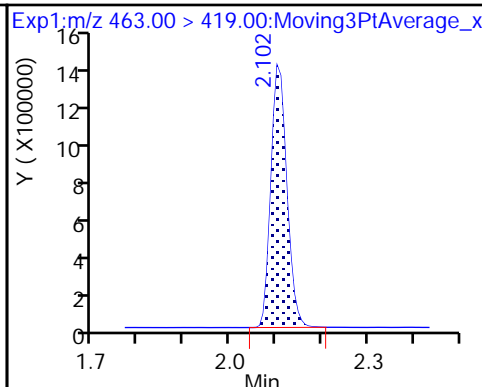
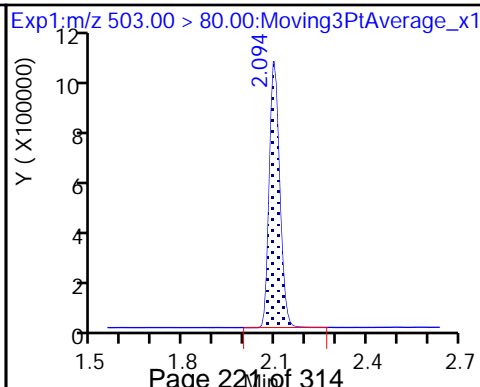
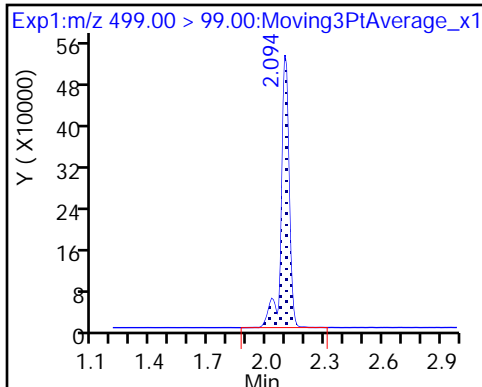
8 Perfluorooctane sulfonic acid (M)



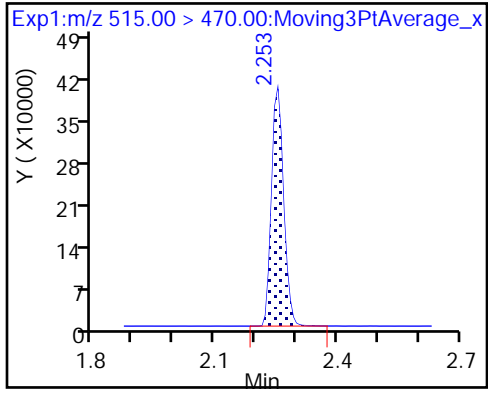
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA





TestAmerica Sacramento

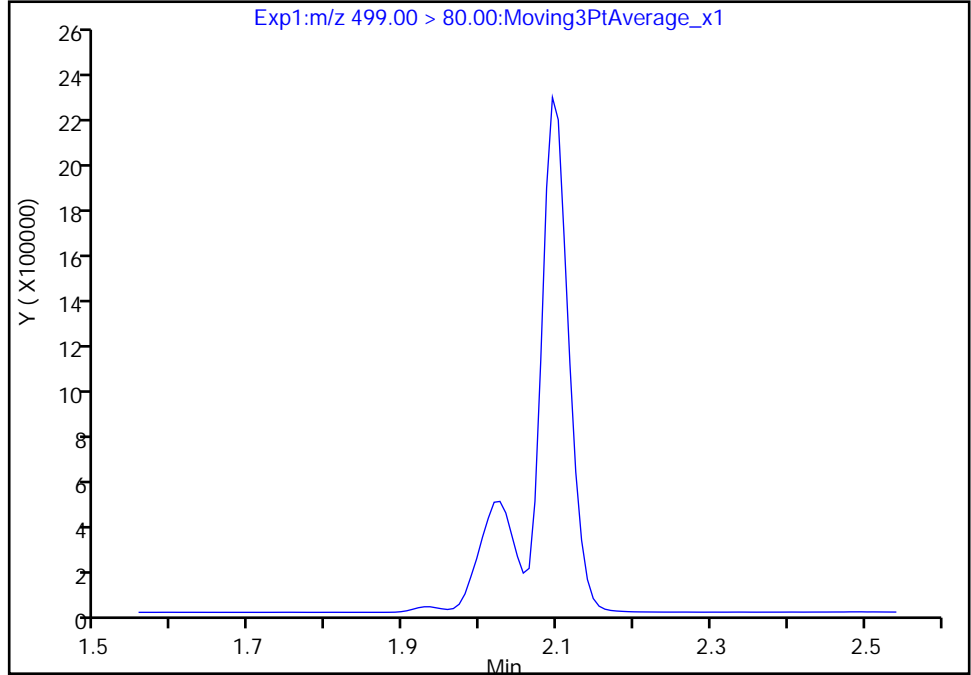
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
Injection Date: 11-Apr-2018 12:09:09 Instrument ID: A8\_N  
Lims ID: IC L6  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 6 Worklist Smp#: 8  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

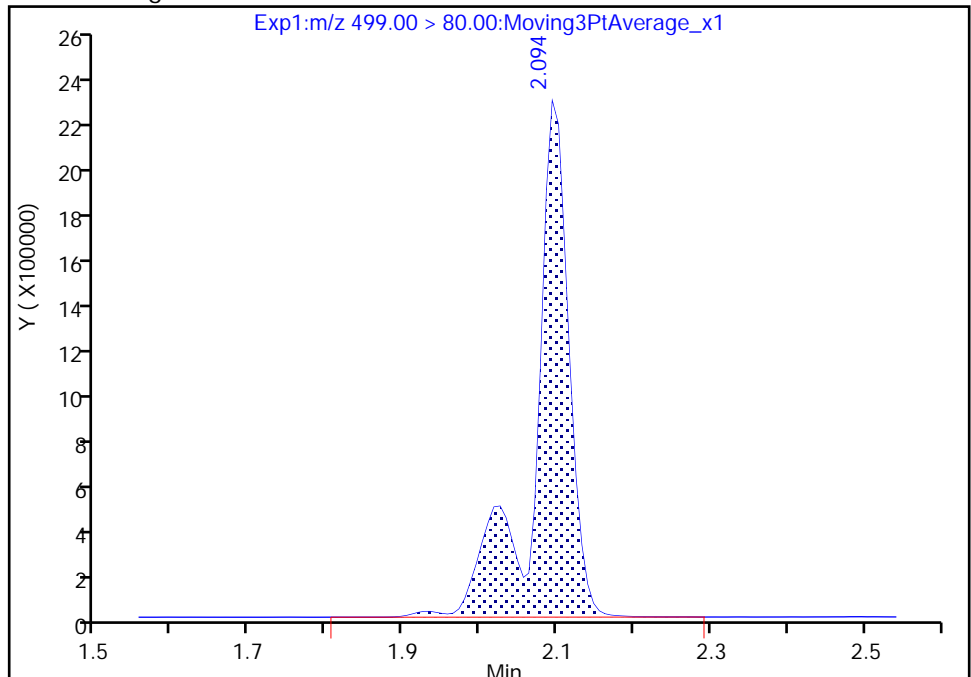
Not Detected  
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.09  
Area: 7016962  
Amount: 81.496978  
Amount Units: ng/ml



Reviewer: westendorfc, 11-Apr-2018 12:31:55  
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

**Calibration**

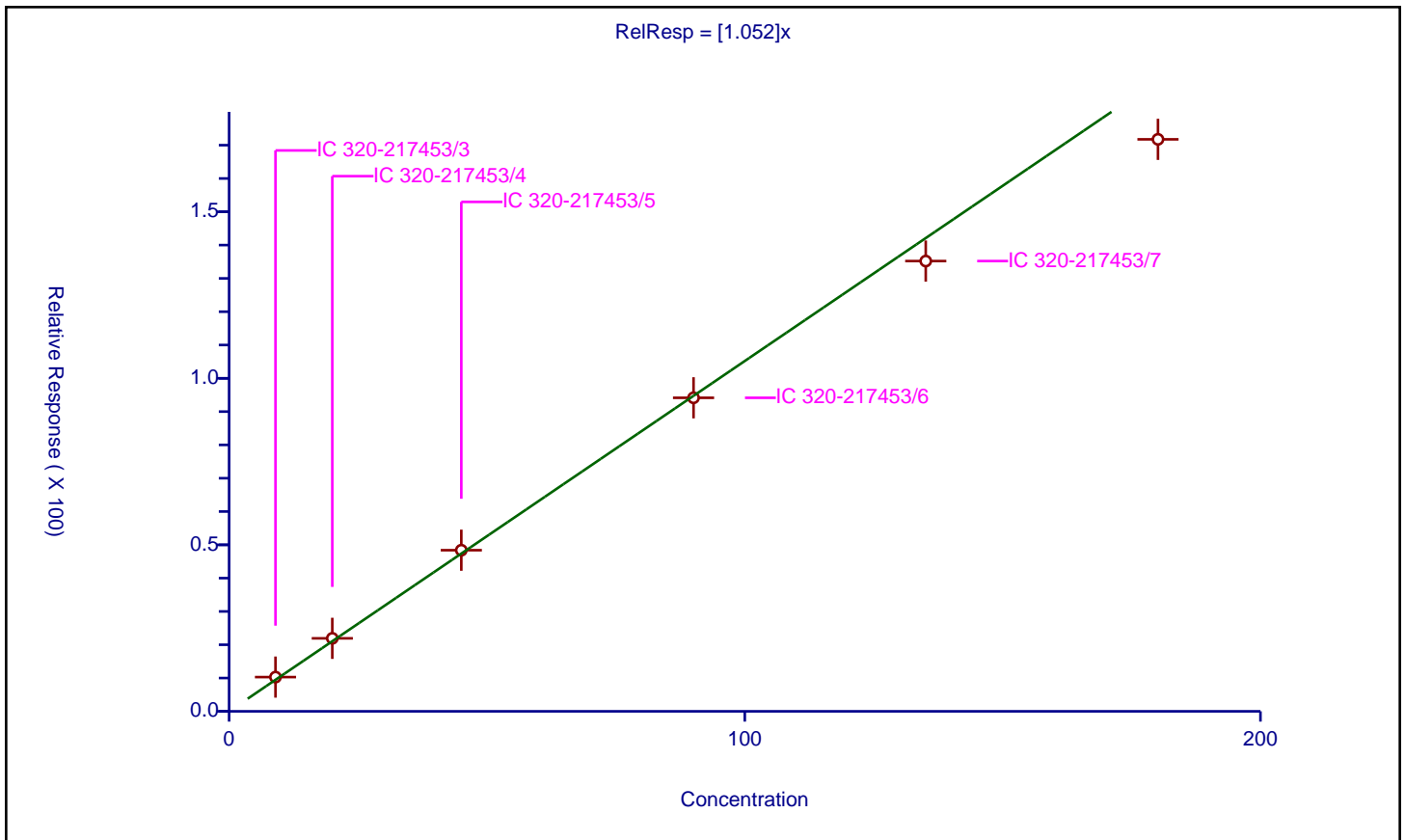
/ Perfluorobutanesulfonic acid

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

Curve Coefficients	
Intercept:	0
Slope:	1.052

Error Coefficients	
Standard Error:	8860000
Relative Standard Error:	6.4
Correlation Coefficient:	0.995
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217453/3	8.99912	10.27855	28.68	2429483.0	1.142173	Y
2	IC 320-217453/4	20.01376	21.91997	28.68	2220259.0	1.095245	Y
3	IC 320-217453/5	45.03096	48.381679	28.68	2380125.0	1.074409	Y
4	IC 320-217453/6	90.06192	94.147927	28.68	2440107.0	1.045369	Y
5	IC 320-217453/7	135.09288	135.205734	28.68	2283311.0	1.000835	Y
6	IC 320-217453/8	180.12384	171.756715	28.68	2316327.0	0.953548	Y



**Calibration**

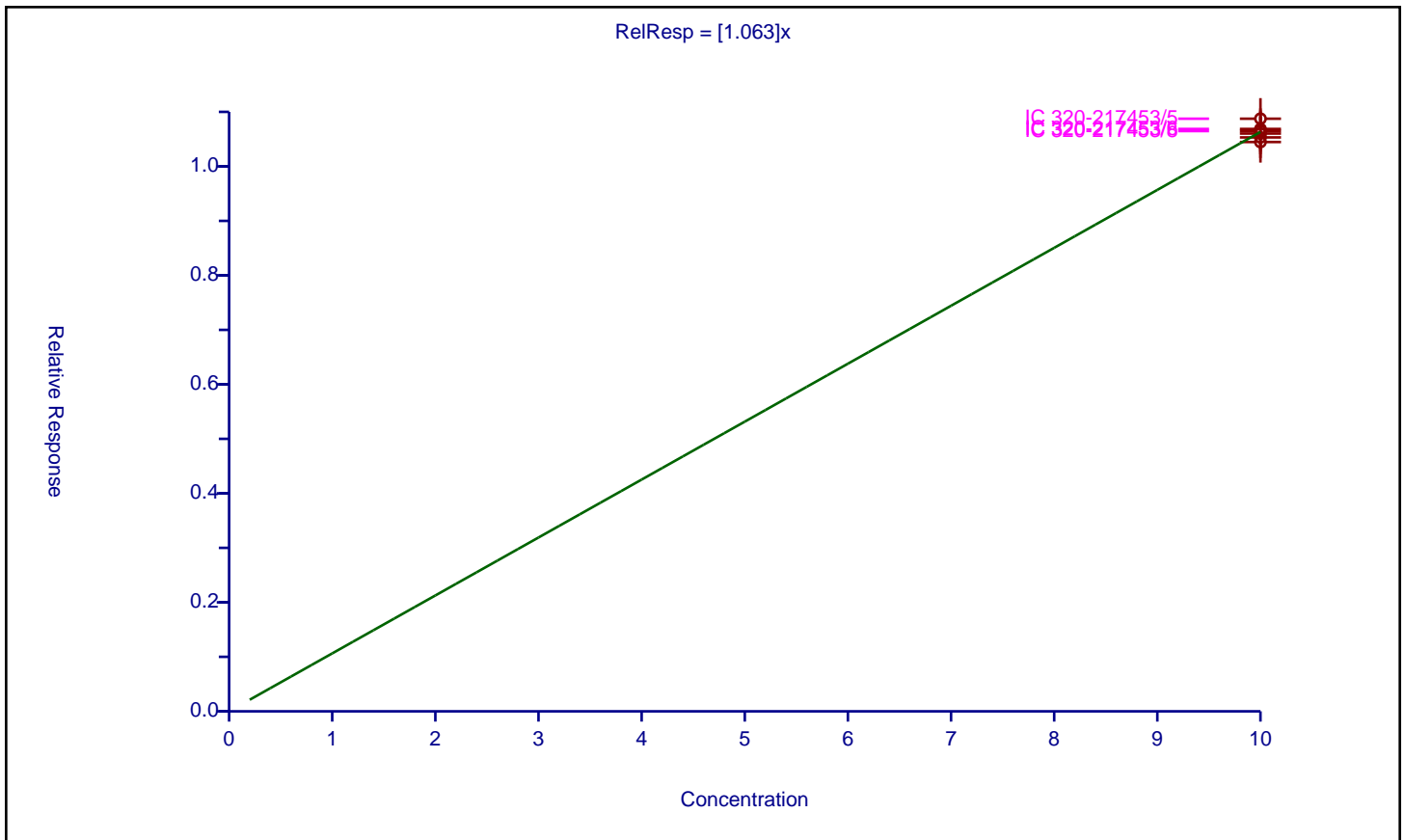
/ 13C2 PFHxA

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

Curve Coefficients	
Intercept:	0
Slope:	1.063

Error Coefficients	
Standard Error:	1130000
Relative Standard Error:	1.4
Correlation Coefficient:	NA
Coefficient of Determination (Adjusted):	0

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217453/3	10.0	10.447022	10.0	1044020.0	1.044702	Y
2	IC 320-217453/4	10.0	10.531795	10.0	921915.0	1.05318	Y
3	IC 320-217453/5	10.0	10.874839	10.0	945031.0	1.087484	Y
4	IC 320-217453/6	10.0	10.686721	10.0	996809.0	1.068672	Y
5	IC 320-217453/7	10.0	10.602316	10.0	929546.0	1.060232	Y
6	IC 320-217453/8	10.0	10.647556	10.0	982926.0	1.064756	Y



**Calibration**

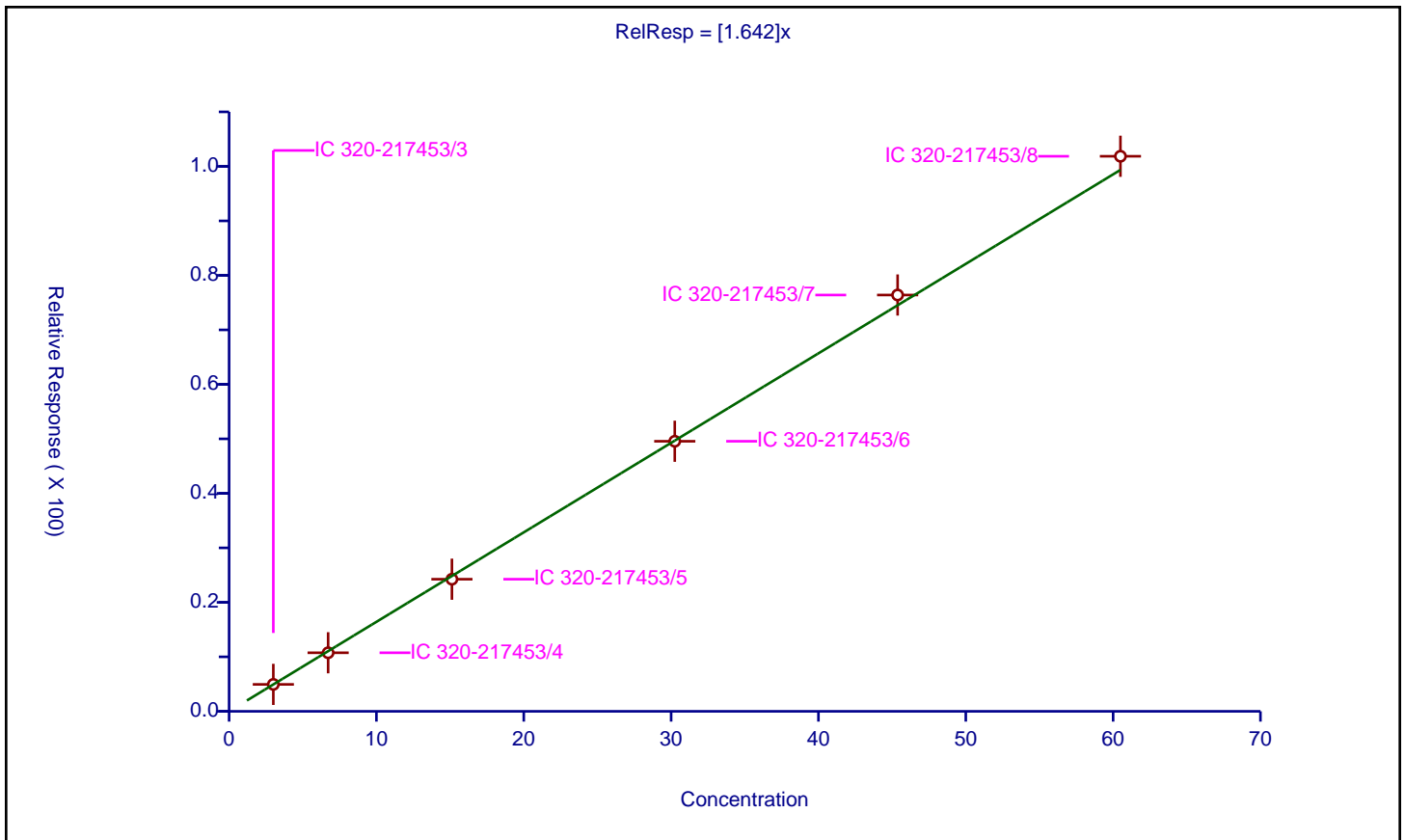
/ Perfluorohexanesulfonic acid

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

Curve Coefficients	
Intercept:	0
Slope:	1.642

Error Coefficients	
Standard Error:	5050000
Relative Standard Error:	2.3
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217453/3	3.003	4.942037	28.68	2429483.0	1.6457	Y
2	IC 320-217453/4	6.721867	10.746809	28.68	2220259.0	1.598783	Y
3	IC 320-217453/5	15.1242	24.244534	28.68	2380125.0	1.603029	Y
4	IC 320-217453/6	30.2484	49.557654	28.68	2440107.0	1.638356	Y
5	IC 320-217453/7	45.3726	76.39864	28.68	2283311.0	1.683806	Y
6	IC 320-217453/8	60.4968	101.85891	28.68	2316327.0	1.683707	Y



**Calibration**

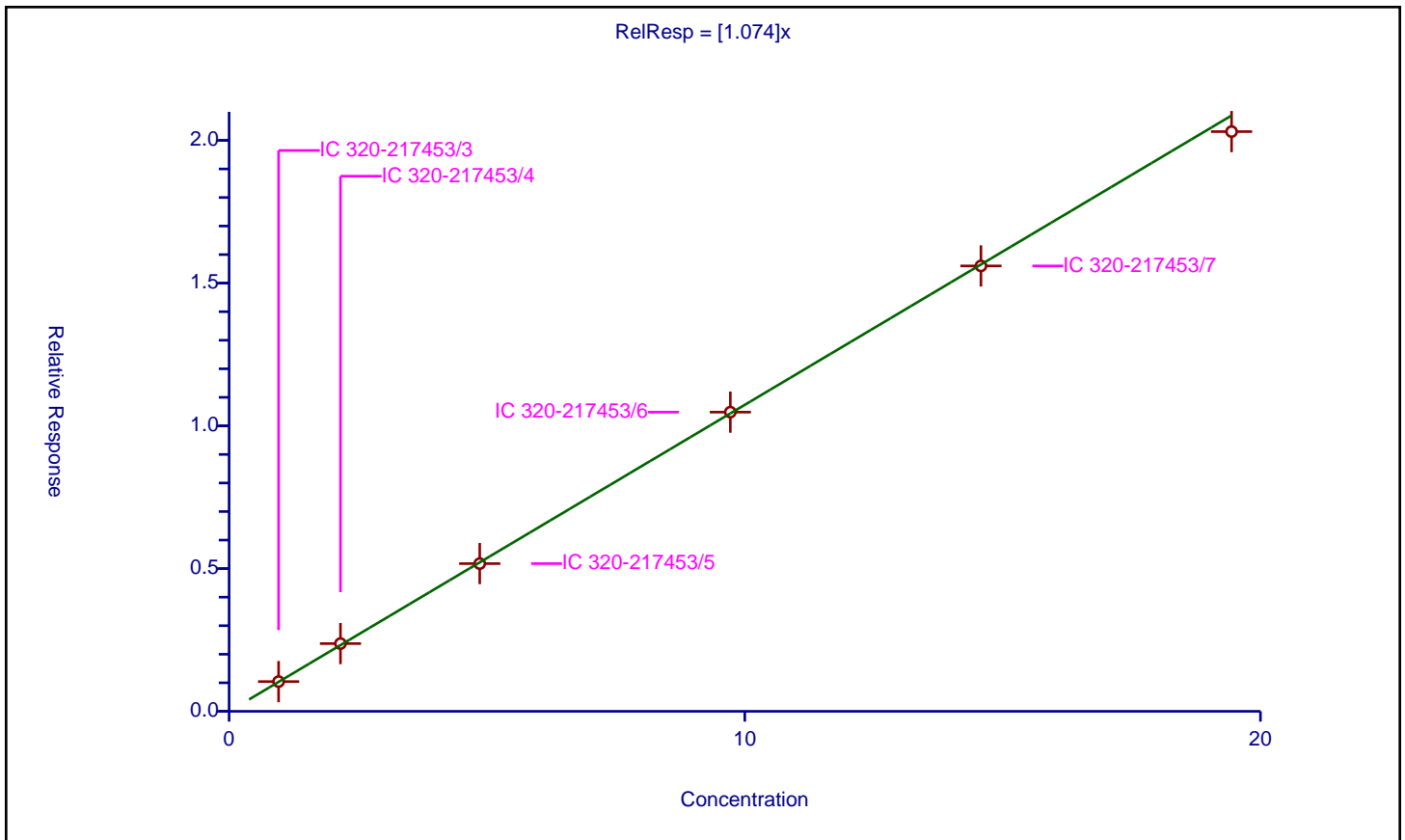
/ Perfluoroheptanoic acid

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

Curve Coefficients	
Intercept:	0
Slope:	1.074

Error Coefficients	
Standard Error:	1220000
Relative Standard Error:	1.7
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	1.000

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217453/3	0.96	1.041561	10.0	1044020.0	1.084959	Y
2	IC 320-217453/4	2.16	2.373972	10.0	921915.0	1.099061	Y
3	IC 320-217453/5	4.86	5.175227	10.0	945031.0	1.064862	Y
4	IC 320-217453/6	9.72	10.480965	10.0	996809.0	1.078289	Y
5	IC 320-217453/7	14.58	15.603994	10.0	929546.0	1.070233	Y
6	IC 320-217453/8	19.44	20.309372	10.0	982926.0	1.044721	Y



**Calibration**

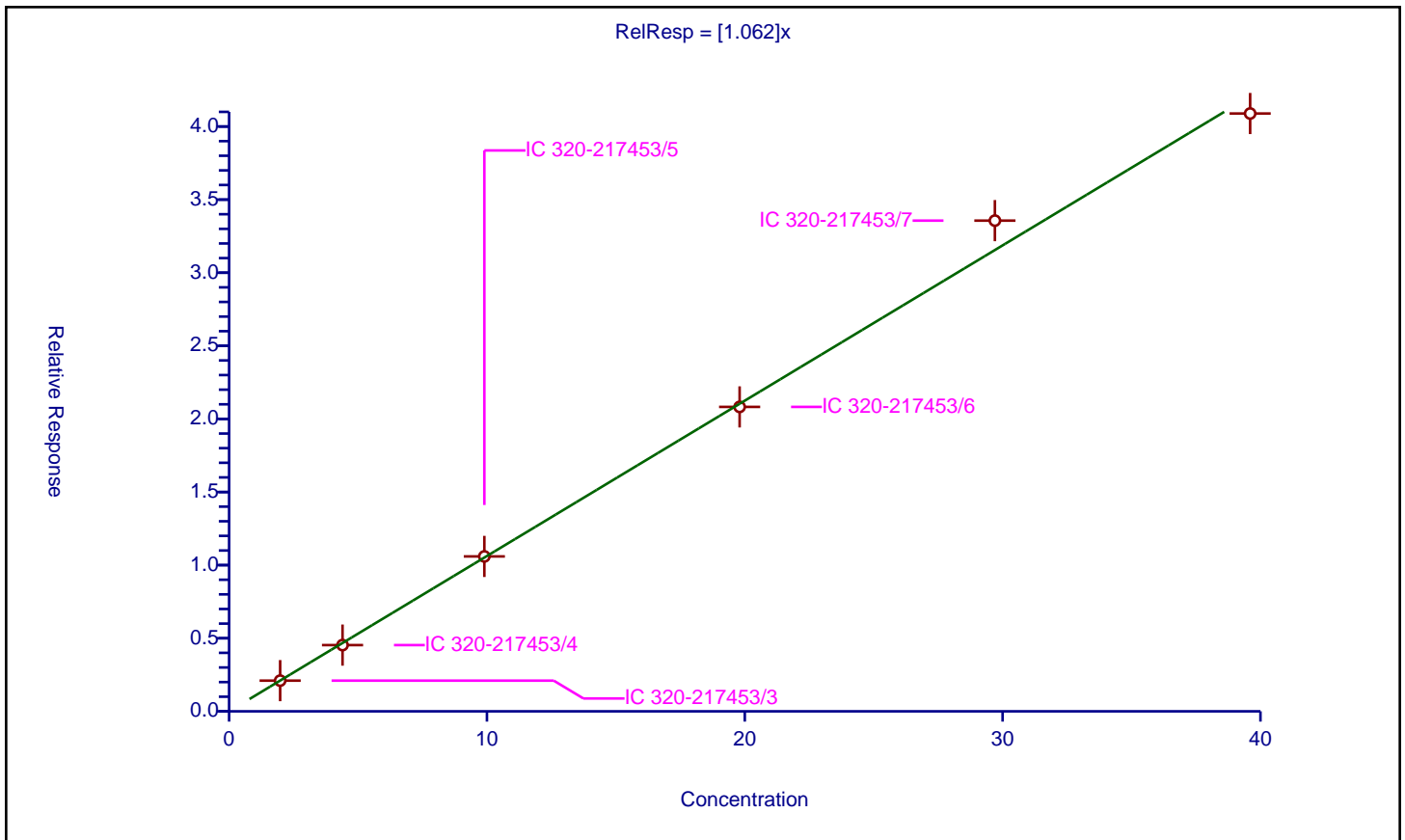
/ Perfluorooctanoic acid

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

Curve Coefficients	
Intercept:	0
Slope:	1.062

Error Coefficients	
Standard Error:	2510000
Relative Standard Error:	3.5
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217453/3	1.98	2.098619	10.0	1044020.0	1.059908	Y
2	IC 320-217453/4	4.4	4.530049	10.0	921915.0	1.029557	Y
3	IC 320-217453/5	9.9	10.595589	10.0	945031.0	1.070262	Y
4	IC 320-217453/6	19.8	20.822123	10.0	996809.0	1.051622	Y
5	IC 320-217453/7	29.7	33.562481	10.0	929546.0	1.13005	Y
6	IC 320-217453/8	39.6	40.888165	10.0	982926.0	1.032529	Y



**Calibration**

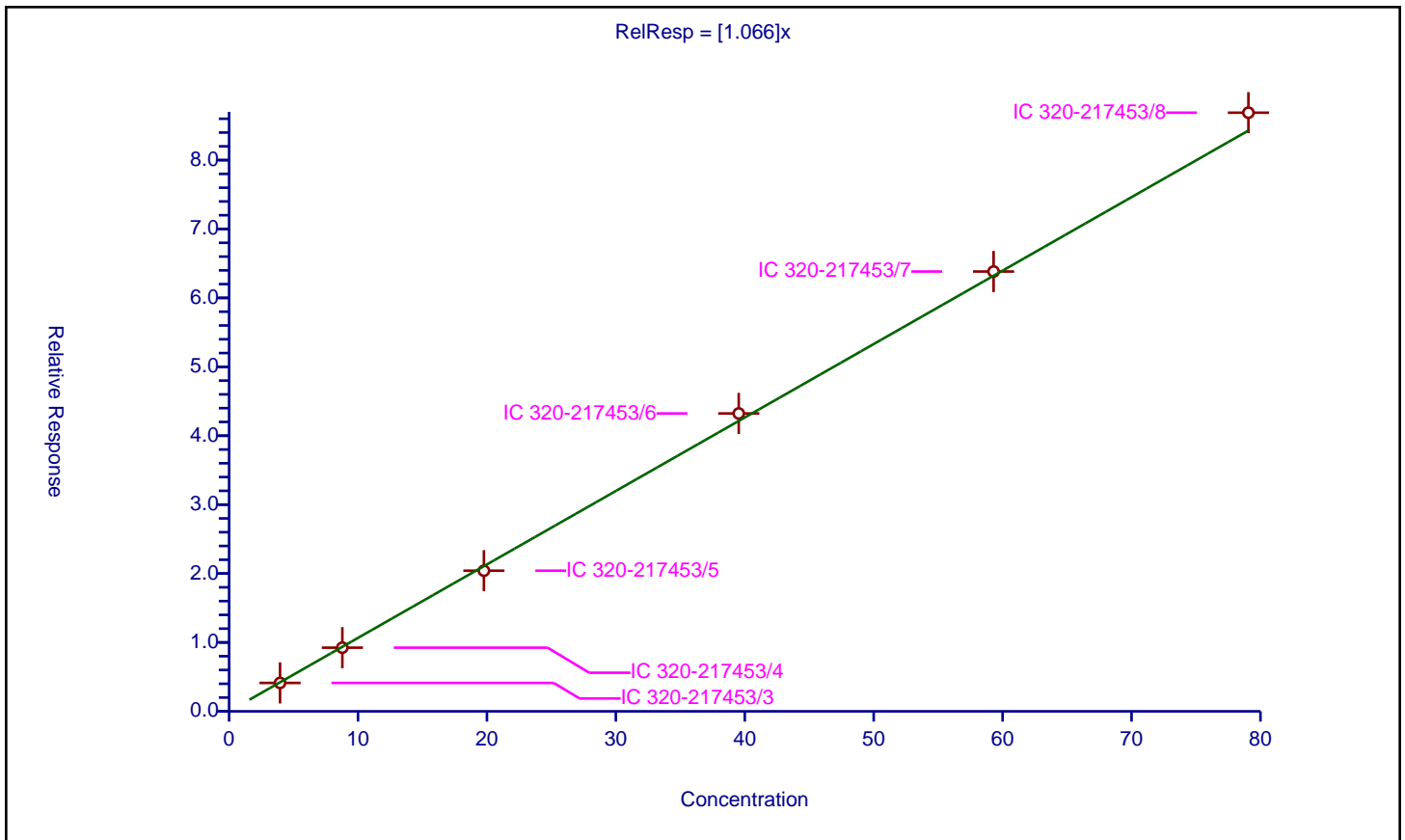
**/ Perfluorooctane sulfonic acid**

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

Curve Coefficients	
<b>Intercept:</b>	0
<b>Slope:</b>	1.066

Error Coefficients	
<b>Standard Error:</b>	4290000
<b>Relative Standard Error:</b>	2.6
<b>Correlation Coefficient:</b>	0.998
<b>Coefficient of Determination (Adjusted):</b>	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217453/3	3.95328	4.124117	28.68	2429483.0	1.043214	Y
2	IC 320-217453/4	8.785067	9.240832	28.68	2220259.0	1.05188	Y
3	IC 320-217453/5	19.7664	20.41005	28.68	2380125.0	1.032563	Y
4	IC 320-217453/6	39.5328	43.230372	28.68	2440107.0	1.093532	Y
5	IC 320-217453/7	59.2992	63.829241	28.68	2283311.0	1.076393	Y
6	IC 320-217453/8	79.0656	86.881718	28.68	2316327.0	1.098856	Y



**Calibration**

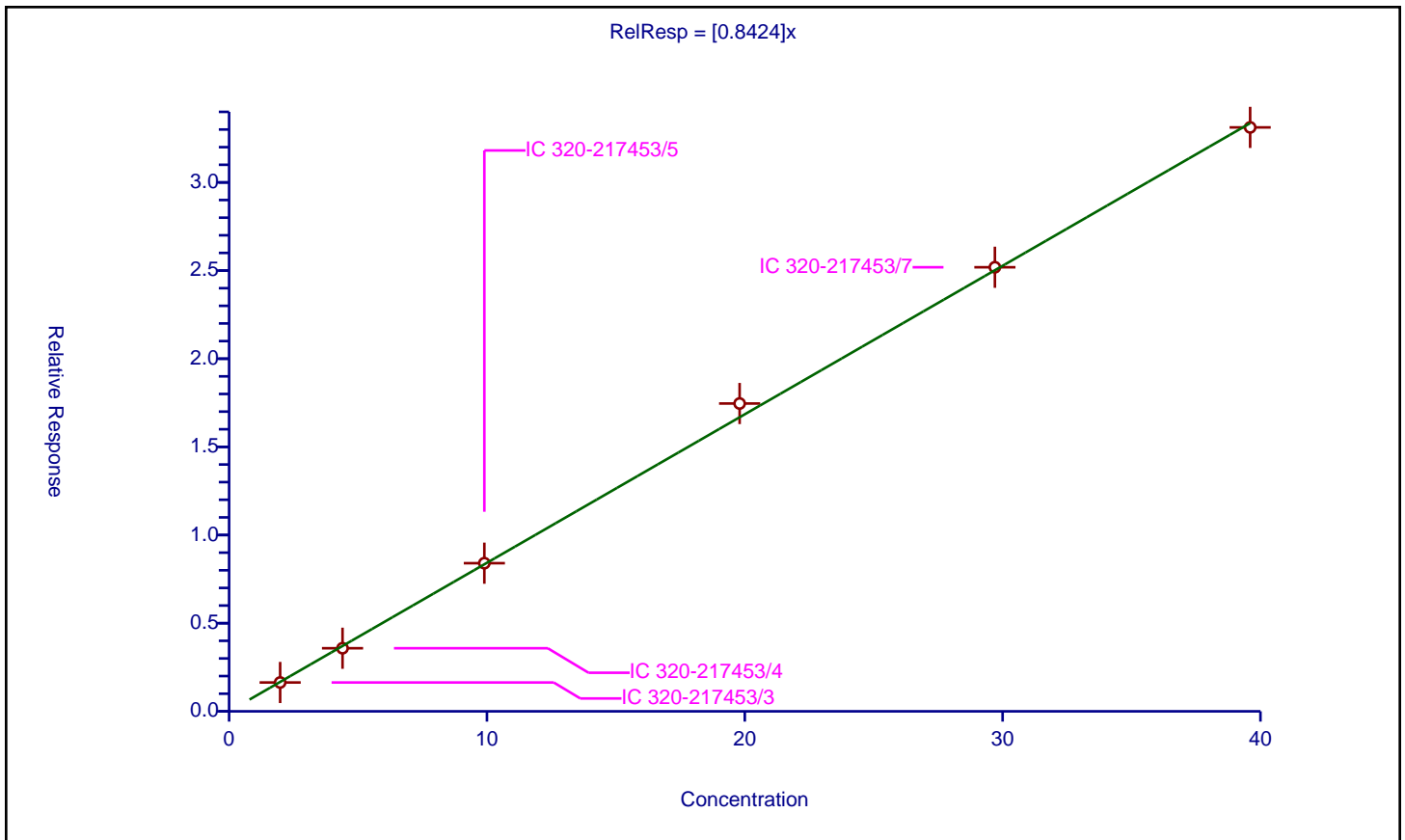
/ Perfluorononanoic acid

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

Curve Coefficients	
Intercept:	0
Slope:	0.8424

Error Coefficients	
Standard Error:	1990000
Relative Standard Error:	2.8
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217453/3	1.98	1.635697	10.0	1044020.0	0.826109	Y
2	IC 320-217453/4	4.4	3.578464	10.0	921915.0	0.813287	Y
3	IC 320-217453/5	9.9	8.402645	10.0	945031.0	0.848752	Y
4	IC 320-217453/6	19.8	17.459935	10.0	996809.0	0.881815	Y
5	IC 320-217453/7	29.7	25.186865	10.0	929546.0	0.848043	Y
6	IC 320-217453/8	39.6	33.119218	10.0	982926.0	0.836344	Y





**Calibration**

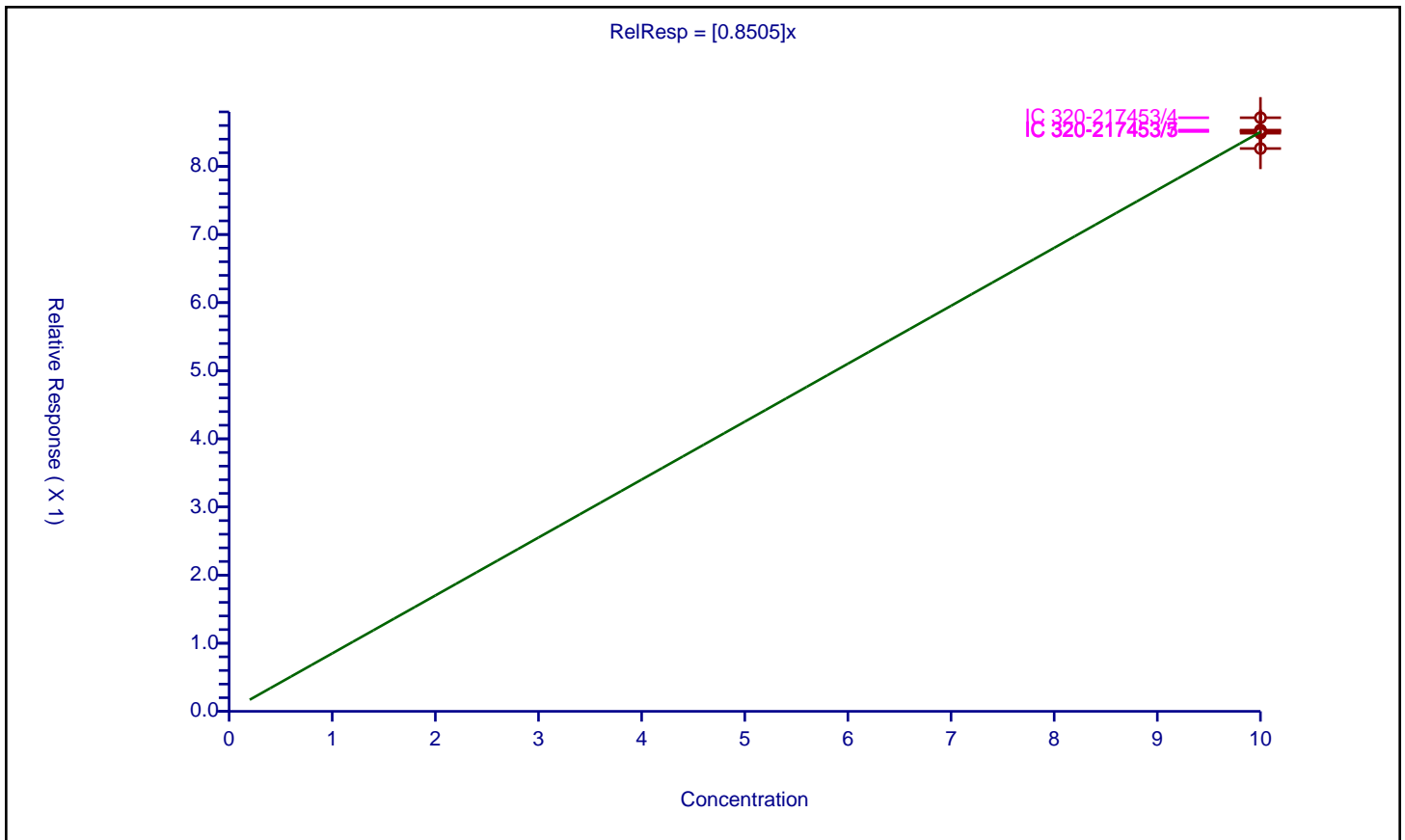
/ 13C2 PFDA

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

Curve Coefficients	
Intercept:	0
Slope:	0.8505

Error Coefficients	
Standard Error:	904000
Relative Standard Error:	1.7
Correlation Coefficient:	NA
Coefficient of Determination (Adjusted):	0

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217453/3	10.0	8.512691	10.0	1044020.0	0.851269	Y
2	IC 320-217453/4	10.0	8.714491	10.0	921915.0	0.871449	Y
3	IC 320-217453/5	10.0	8.53263	10.0	945031.0	0.853263	Y
4	IC 320-217453/6	10.0	8.486982	10.0	996809.0	0.848698	Y
5	IC 320-217453/7	10.0	8.519223	10.0	929546.0	0.851922	Y
6	IC 320-217453/8	10.0	8.262189	10.0	982926.0	0.826219	Y



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-217453/10 Calibration Date: 04/11/2018 12:18  
 Instrument ID: A8\_N Calib Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 04/11/2018 12:09  
 Lab File ID: 2018.04.11\_537ICALB\_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.052	1.078		20.5	20.0	2.5	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.074	1.079		2.17	2.16	0.5	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.642	1.583		6.48	6.72	-3.6	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.062	1.067		4.42	4.40	0.4	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.066	1.026		8.45	8.79	-3.8	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8424	0.8056		4.21	4.40	-4.4	50.0
13C2 PFHxA	Ave	1.063	1.036		9.74	10.0	-2.6	30.0
13C2 PFDA	Ave	0.8505	0.8798		10.3	10.0	3.4	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_011.d  
 Lims ID: CCVL  
 Client ID:  
 Sample Type: CCVL  
 Inject. Date: 11-Apr-2018 12:18:29 ALS Bottle#: 2 Worklist Smp#: 10  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L2  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 11-Apr-2018 12:35:34 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK015

First Level Reviewer: westendorfc Date: 11-Apr-2018 12:32:05

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.382	-0.001	1.000	1796973	20.5		1419	
298.90 > 99.00	1.381	1.382	-0.001	1.000	1315166		1.37(0.00-0.00)	1507	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.517	1.515	0.002	1.000	999202	9.74		8081	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.669	1.669	0.0	1.000	886015	6.48		254	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.669	1.669	0.0	1.000	224797	2.17		28.4	
* 6 13C2-PFOA									
415.00 > 370.00	1.866	1.865	0.001		964533	10.0		6486	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.866	1.866	0.0	1.000	452711	4.42		66.1	
413.00 > 169.00	1.859	1.866	-0.007	0.996	238029		1.90(0.00-0.00)	253	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.102	2.094	0.008	1.000	750245	8.45		211	a
499.00 > 99.00	2.102	2.094	0.008	1.000	160618		4.67(0.00-0.00)	405	a
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.102	0.0		2387973	28.7		1256	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.109	0.0	1.000	341890	4.21		51.1	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.261	2.260	0.001	1.000	848574	10.3		7810	

**QC Flag Legend**

Review Flags

a - User Assigned ID

**Reagents:**

LC537-L2\_00022

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_011.d

Injection Date: 11-Apr-2018 12:18:29

Instrument ID: A8\_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 10

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

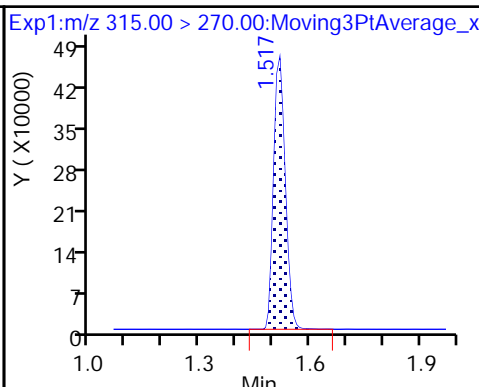
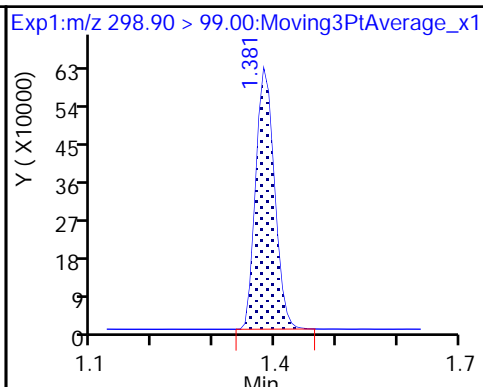
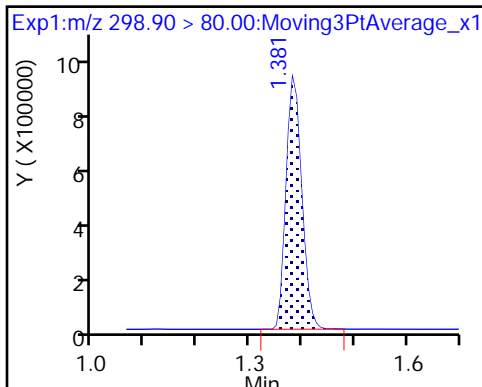
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

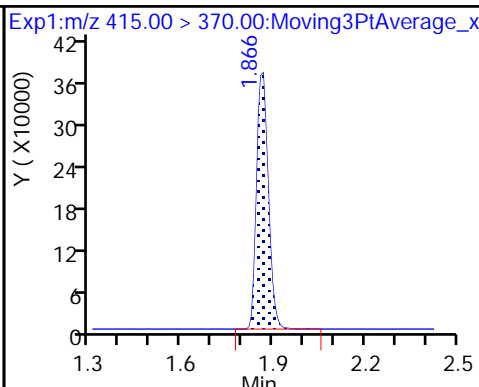
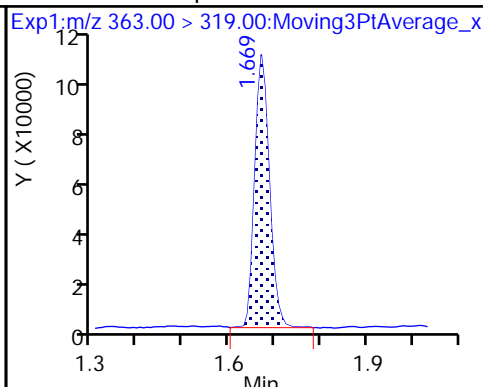
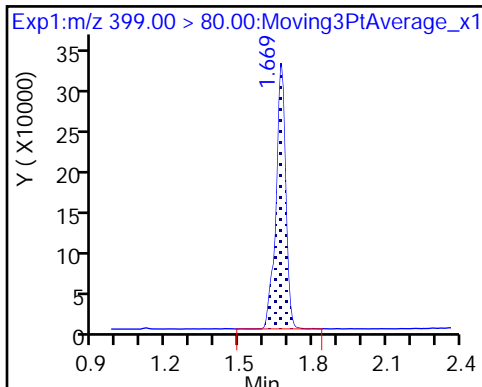
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

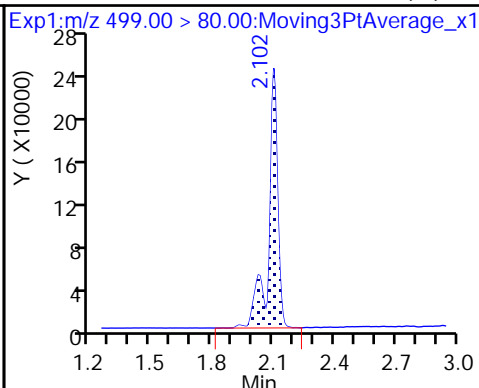
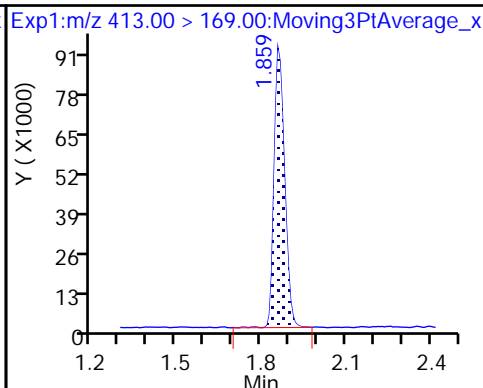
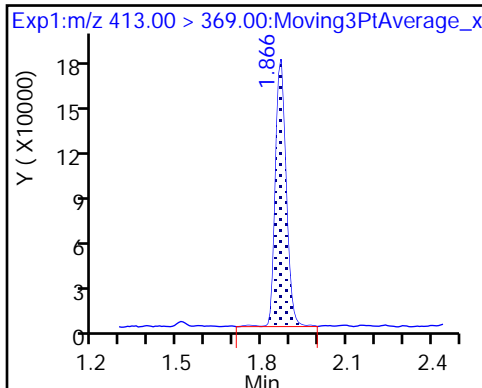
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

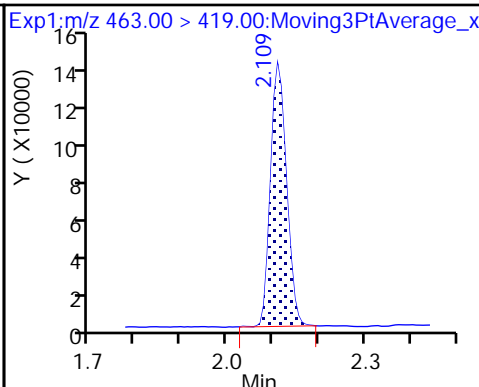
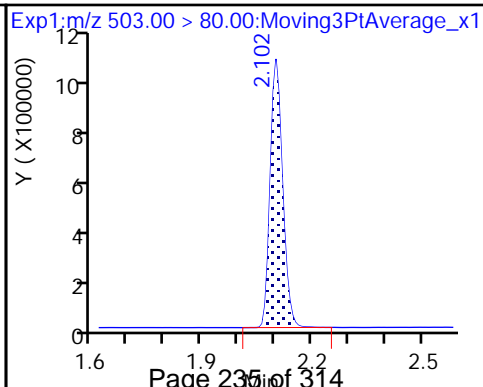
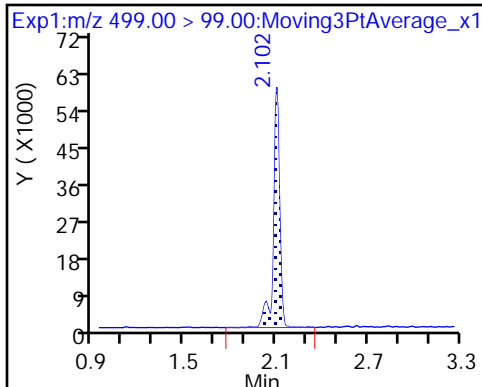
8 Perfluorooctane sulfonic acid (M)



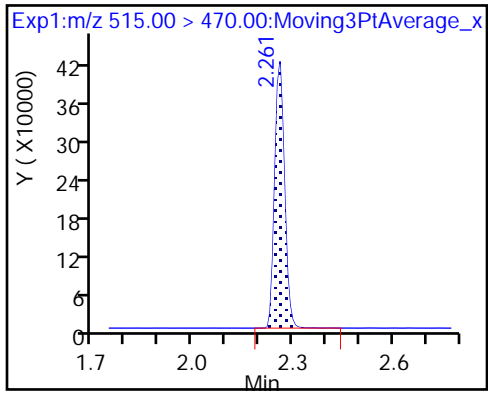
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

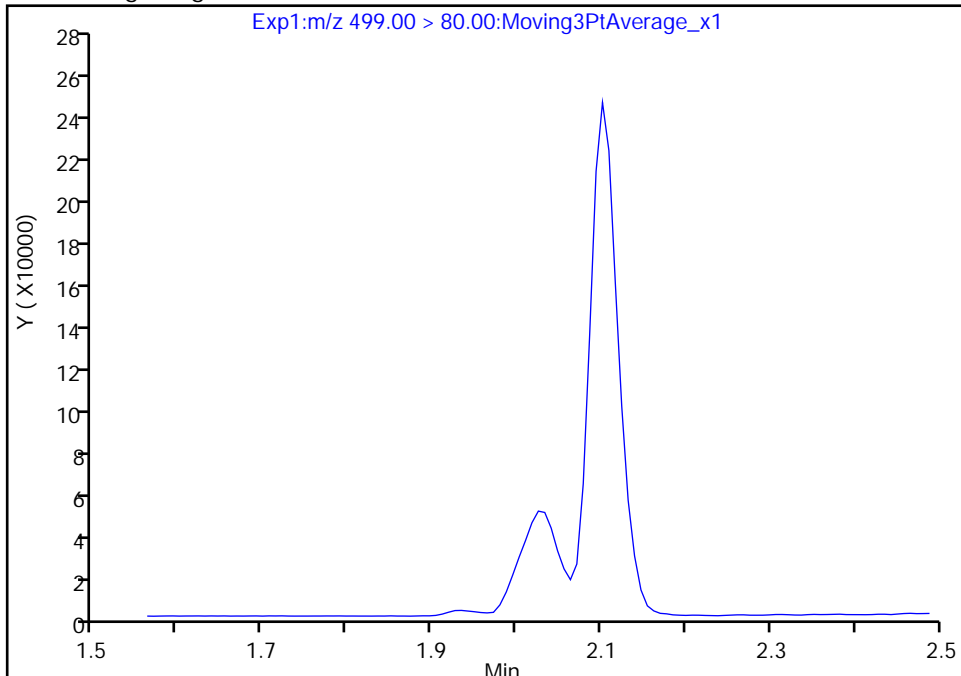
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_011.d  
Injection Date: 11-Apr-2018 12:18:29 Instrument ID: A8\_N  
Lims ID: CCVL  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 10  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

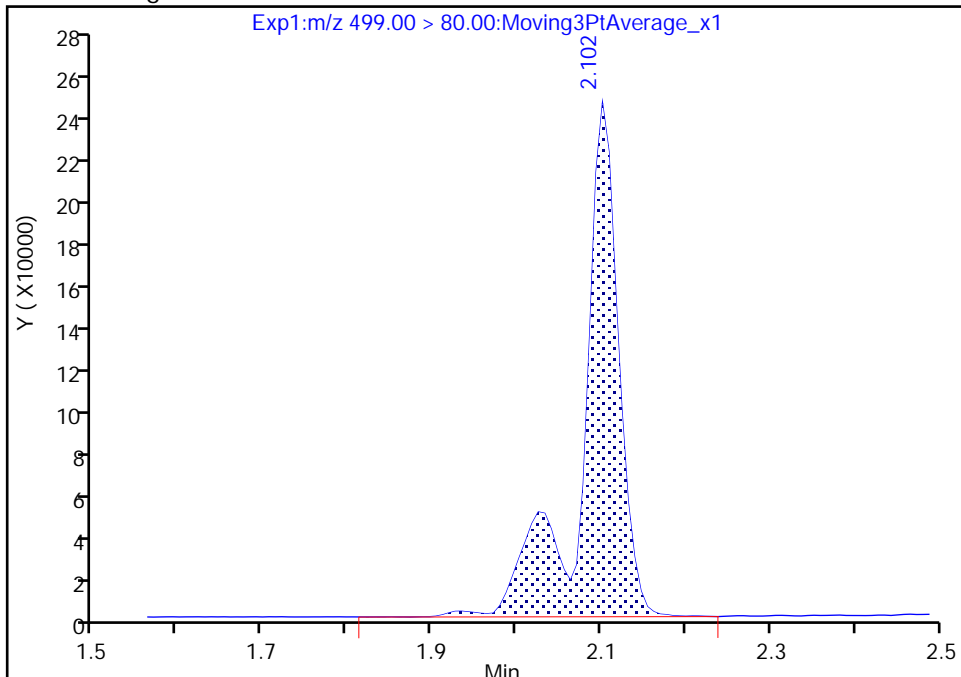
Not Detected  
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.10  
Area: 750245  
Amount: 8.452126  
Amount Units: ng/ml



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: ICV 320-217453/12 Calibration Date: 04/11/2018 12:27  
 Instrument ID: A8\_N Calib Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 04/11/2018 12:09  
 Lab File ID: 2018.04.11\_537ICALB\_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.052	0.9079		86.4	100	-13.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.074	0.9453		8.80	10.0	-12.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.642	1.546		19.0	20.2	-5.8	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.062	0.8947		17.0	20.2	-15.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.066	0.9451		17.9	20.2	-11.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8424	0.7643		18.3	20.2	-9.3	30.0
13C2 PFHxA	Ave	1.063	0.9887		9.30	10.0	-7.0	30.0
13C2 PFDA	Ave	0.8505	0.7817		9.19	10.0	-8.1	30.0



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_013.d  
 Lims ID: ICV  
 Client ID:  
 Sample Type: ICV  
 Inject. Date: 11-Apr-2018 12:27:50 ALS Bottle#: 7 Worklist Smp#: 12  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: ICV  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 11-Apr-2018 12:35:36 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK015

First Level Reviewer: westendorfc Date: 11-Apr-2018 12:35:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.381	1.382	-0.001	1.000	8588615	86.4		6016	
298.90 > 99.00	1.381	1.382	-0.001	1.000	6638954		1.29(0.00-0.00)	7031	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.510	1.515	-0.005	1.000	1110636	9.30		10046	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.669	1.669	0.0	1.000	2946450	19.0		915	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.669	1.669	0.0	1.000	1061944	8.80		129	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.865	-0.006		1123391	10.0		7104	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.866	-0.007	1.000	2026973	17.0		297	
413.00 > 169.00	1.859	1.866	-0.007	1.000	1039561		1.95(0.00-0.00)	1075	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.102	2.094	0.008	1.000	1801850	17.9		451	a
499.00 > 99.00	2.102	2.094	0.008	1.000	352970		5.10(0.00-0.00)	761	a
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.102	0.0		2710764	28.7		1406	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.109	0.0	1.000	1731220	18.3		262	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.253	2.260	-0.007	1.000	878101	9.19		8492	

**QC Flag Legend**

Review Flags

a - User Assigned ID

**Reagents:**

LC537-ICV\_00030

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_013.d

Injection Date: 11-Apr-2018 12:27:50

Instrument ID: A8\_N

Lims ID: ICV

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 7

Worklist Smp#: 12

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

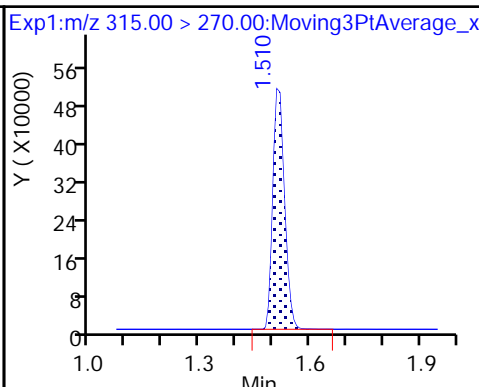
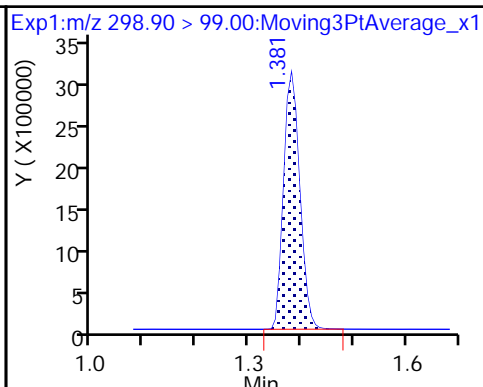
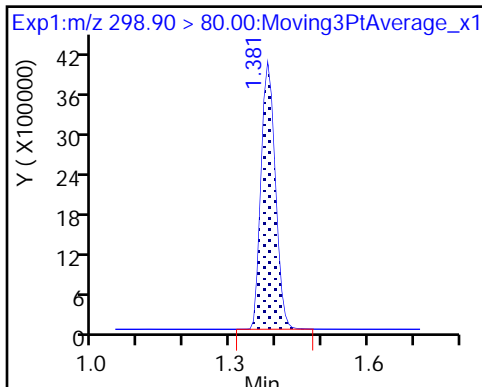
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

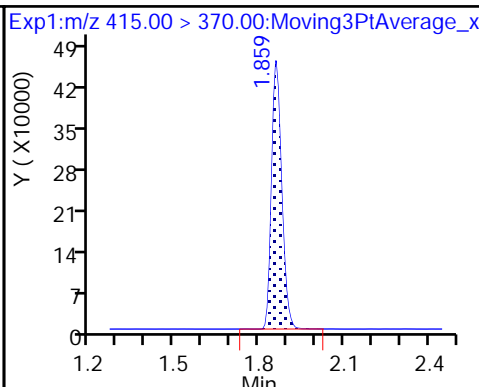
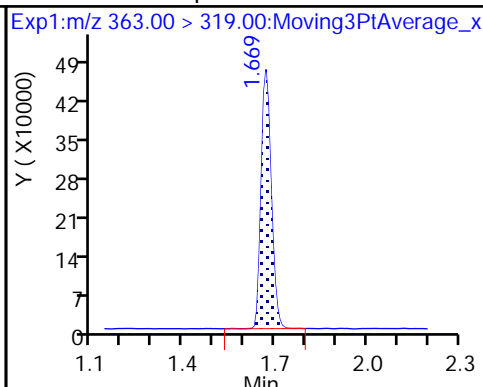
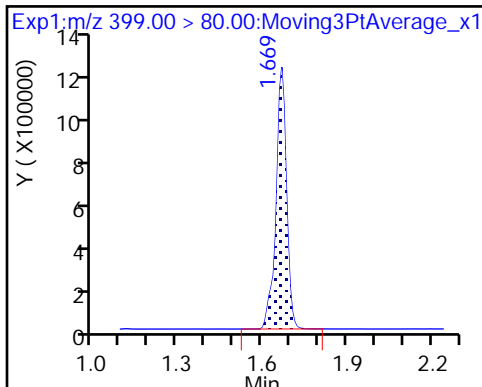
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

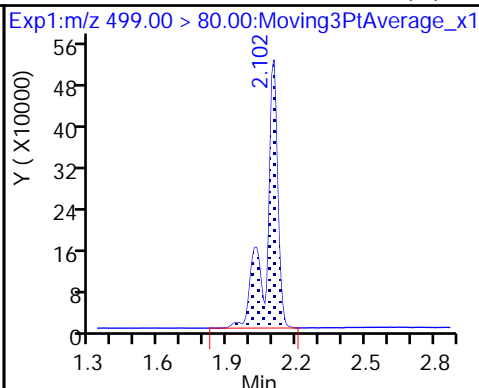
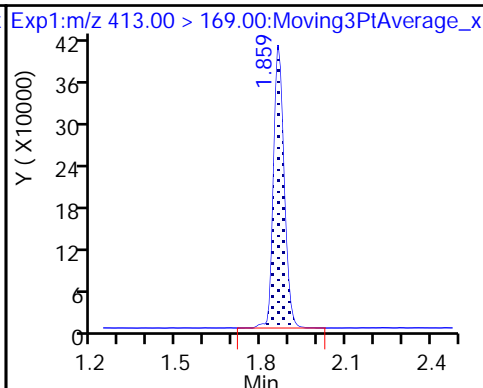
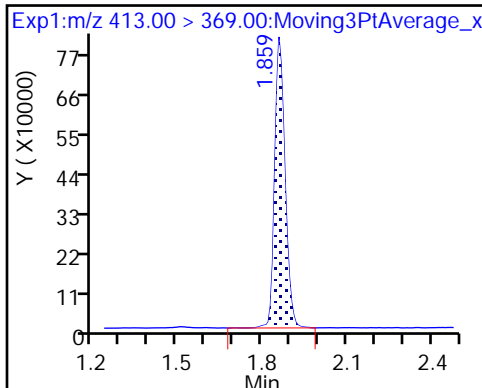
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

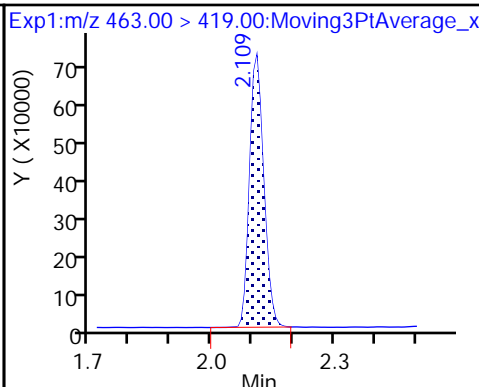
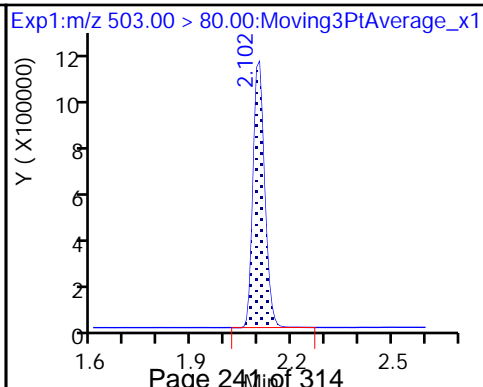
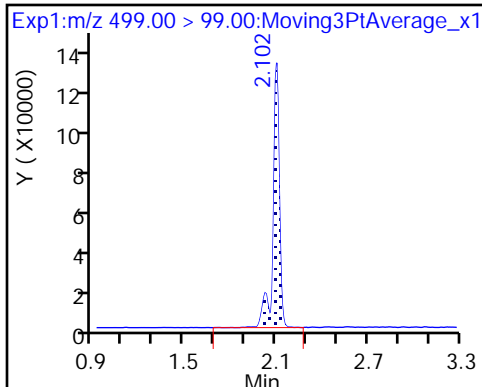
8 Perfluorooctane sulfonic acid (M)



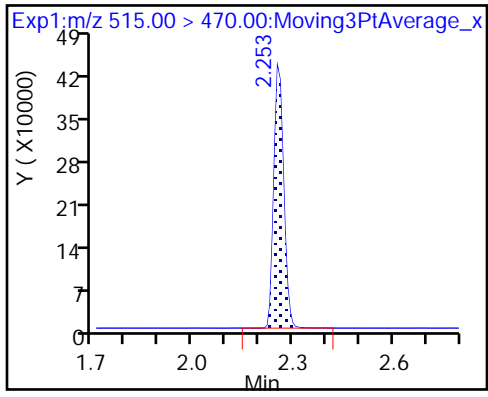
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

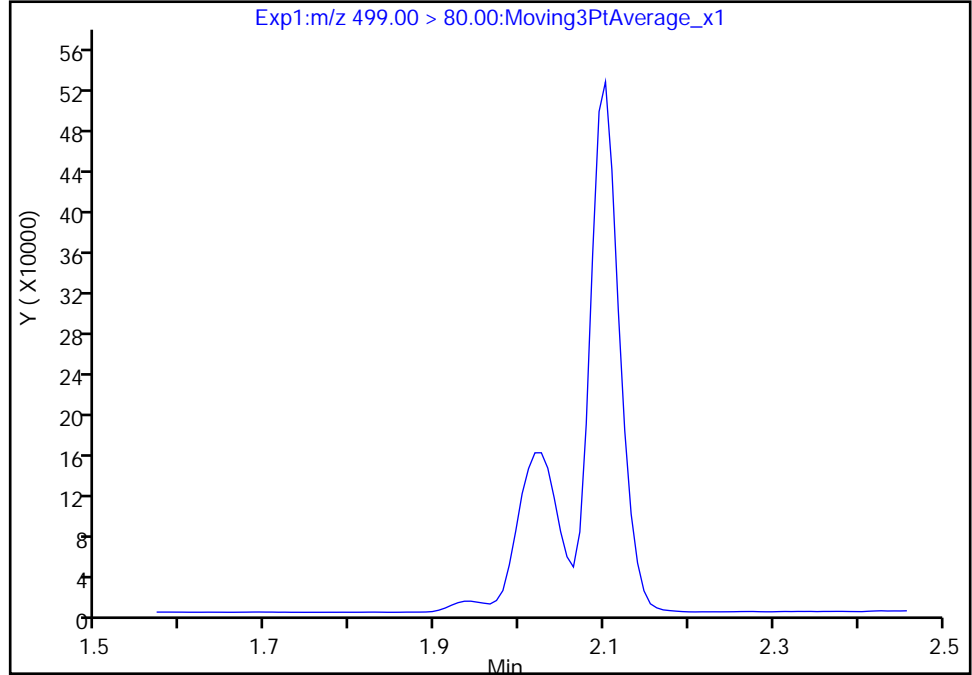
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_013.d  
Injection Date: 11-Apr-2018 12:27:50 Instrument ID: A8\_N  
Lims ID: ICV  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 7 Worklist Smp#: 12  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

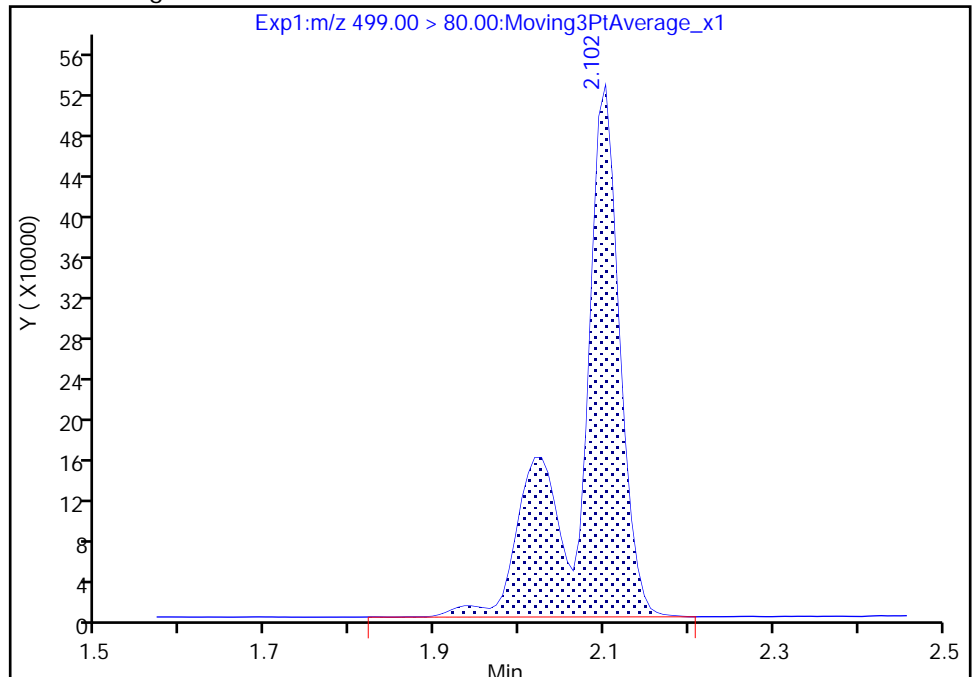
Not Detected  
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.10  
Area: 1801850  
Amount: 17.882127  
Amount Units: ng/ml



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-219315/1 Calibration Date: 04/23/2018 12:21  
 Instrument ID: A8\_N Calib Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 04/11/2018 12:09  
 Lab File ID: 2018.04.23\_537A\_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.052	1.103		21.0	20.0	4.9	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.074	1.038		2.09	2.16	-3.3	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.642	1.597		6.54	6.72	-2.8	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.062	1.040		4.31	4.40	-2.1	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8424	0.7896		4.12	4.40	-6.3	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.066	1.051		8.66	8.79	-1.4	50.0
13C2 PFHxA	Ave	1.063	1.036		9.74	10.0	-2.6	30.0
13C2 PFDA	Ave	0.8505	0.7918		9.31	10.0	-6.9	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180423-57074.b\2018.04.23\_537A\_003.d  
 Lims ID: CCVL  
 Client ID:  
 Sample Type: CCVL  
 Inject. Date: 23-Apr-2018 12:21:52 ALS Bottle#: 2 Worklist Smp#: 1  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L2  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180423-57074.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 23-Apr-2018 13:04:40 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK022

First Level Reviewer: barnettj Date: 23-Apr-2018 13:03:18

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.396	1.388	0.008	1.000	1571513	21.0		1161	
298.90 > 99.00	1.396	1.388	0.008	1.000	1188035		1.32(0.00-0.00)	1454	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.525	1.517	0.008	1.000	891479	9.74		6666	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.684	1.677	0.007	1.000	763731	6.54		231	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.684	1.677	0.007	1.000	193058	2.09		21.4	
* 6 13C2-PFOA									
415.00 > 370.00	1.882	1.874	0.008		860713	10.0		6298	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.882	1.874	0.008	1.000	393985	4.31		72.6	
413.00 > 169.00	1.882	1.874	0.008	1.000	210467		1.87(0.00-0.00)	185	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.132	2.102	0.030	1.000	657160	8.66		218	a
499.00 > 99.00	2.132	2.102	0.030	1.000	140540		4.68(0.00-0.00)	279	a
* 7 13C4 PFOS									
503.00 > 80.00	2.124	2.124	0.0		2040827	28.7		1127	
9 Perfluorononanoic acid									
463.00 > 419.00	2.132	2.132	0.0	1.000	299040	4.12		71.7	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.284	2.284	0.0	1.000	681545	9.31		6095	

**QC Flag Legend**

Review Flags

a - User Assigned ID

**Reagents:**

LC537-L2\_00022

Amount Added: 1.00

Units: mL



Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180423-57074.b\2018.04.23\_537A\_003.d

Injection Date: 23-Apr-2018 12:21:52

Instrument ID: A8\_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

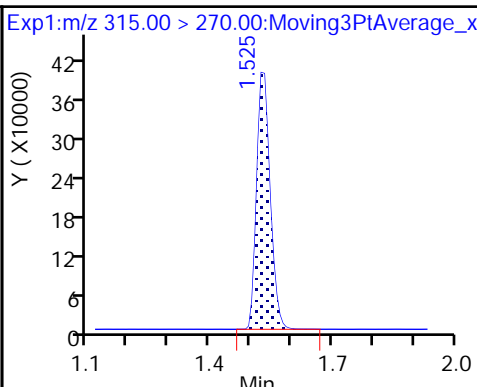
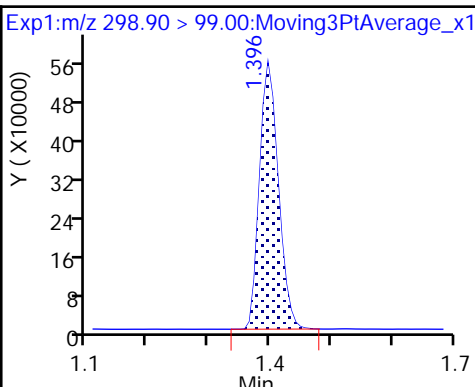
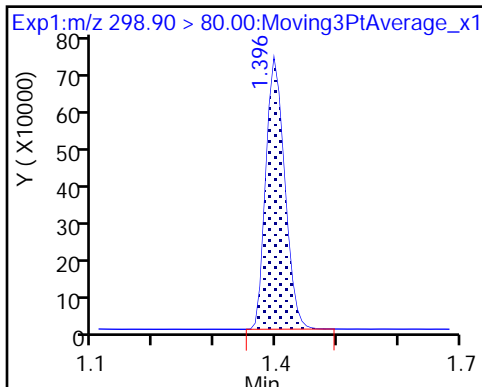
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

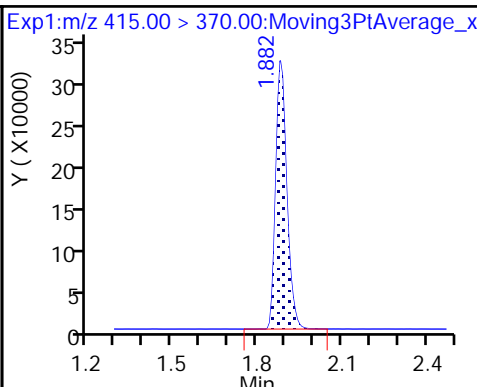
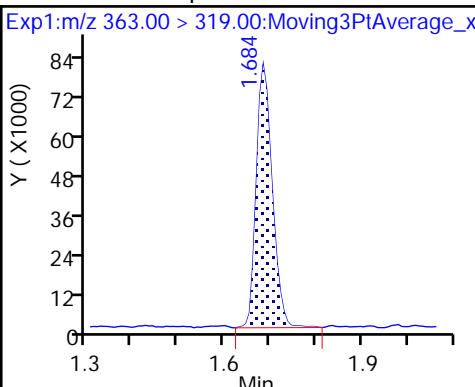
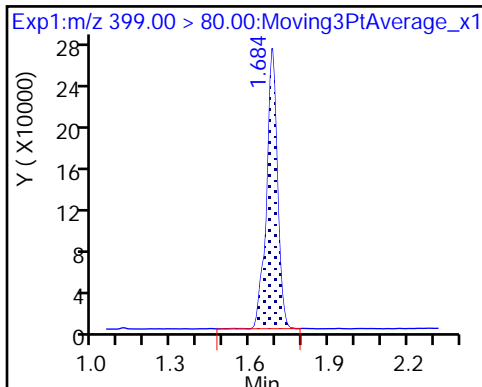
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

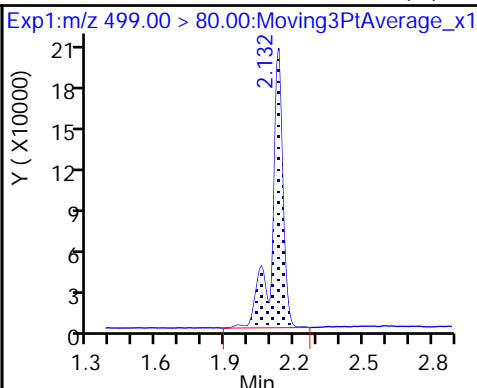
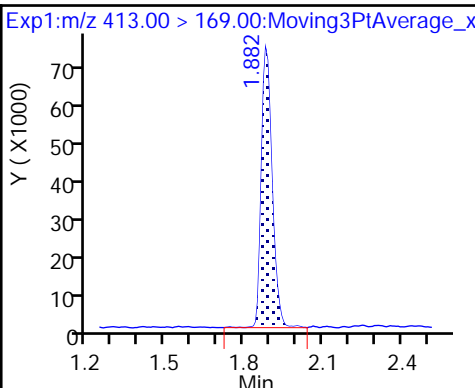
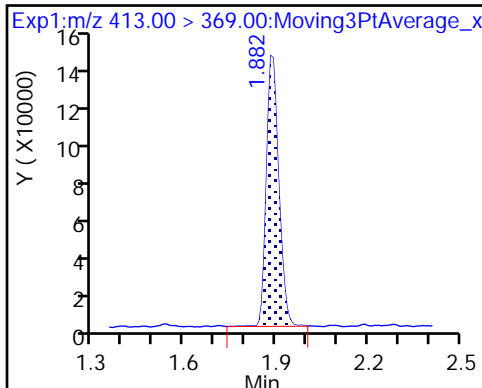
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

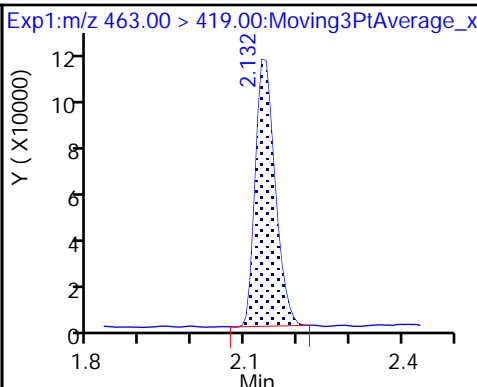
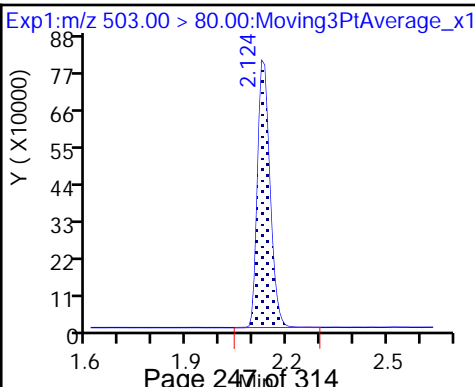
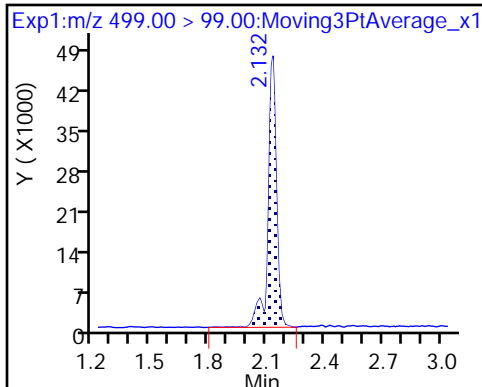
8 Perfluorooctane sulfonic acid (M)



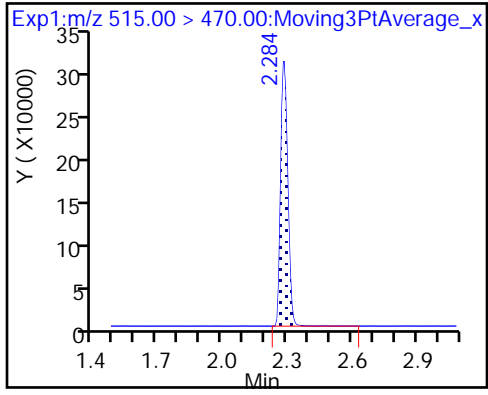
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

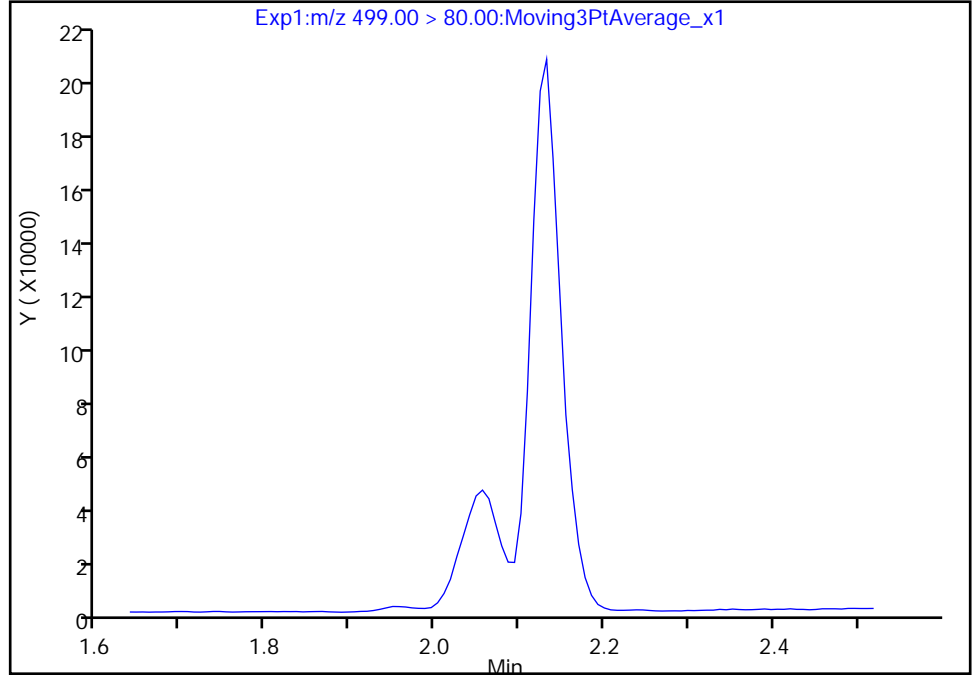
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180423-57074.b\2018.04.23\_537A\_003.d  
Injection Date: 23-Apr-2018 12:21:52 Instrument ID: A8\_N  
Lims ID: CCVL  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 1  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

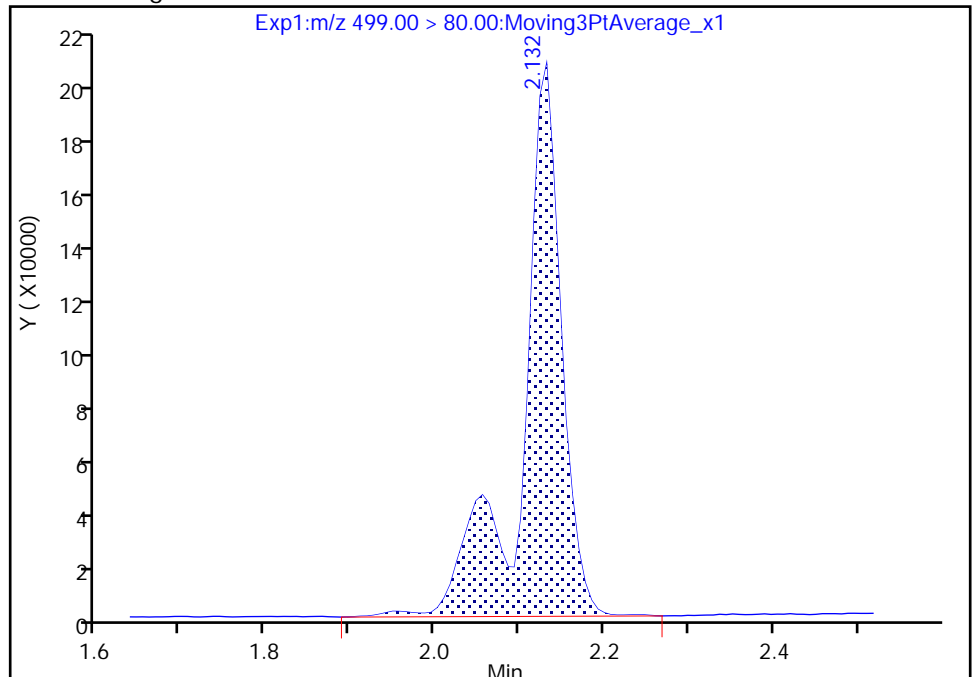
Not Detected  
Expected RT: 2.10

Processing Integration Results



RT: 2.13  
Area: 657160  
Amount: 8.662778  
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 23-Apr-2018 13:03:13  
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-219464/17 Calibration Date: 04/23/2018 21:18  
 Instrument ID: A8\_N Calib Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 04/11/2018 12:09  
 Lab File ID: 2018.04.23\_537C\_049.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.052	1.083		139	135	3.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.074	1.039		14.1	14.6	-3.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.642	1.736		48.0	45.4	5.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.062	1.049		29.3	29.7	-1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.066	1.076		59.8	59.3	0.9	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8424	0.8155		28.8	29.7	-3.2	30.0
13C2 PFHxA	Ave	1.063	1.073		10.1	10.0	0.9	30.0
13C2 PFDA	Ave	0.8505	0.8144		9.58	10.0	-4.2	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_049.d  
 Lims ID: CCV L5  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 23-Apr-2018 21:18:19 ALS Bottle#: 5 Worklist Smp#: 17  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L5  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:48 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 10:53:25

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.396	1.396	0.0	1.000	10275326	139.1		6323	
298.90 > 99.00	1.396	1.396	0.0	1.000	8066298		1.27(0.00-0.00)	7282	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.525	1.525	0.0	1.000	934742	10.1		9025	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.677	1.677	0.0	1.000	5529675	48.0		1631	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.677	1.677	0.0	1.000	1319815	14.1		140	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.859	0.0		871239	10.0		6439	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.859	0.0	1.000	2715620	29.3		511	
413.00 > 169.00	1.859	1.859	0.0	1.000	1469605		1.85(0.00-0.00)	1324	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.109	2.102	0.007	1.000	4478813	59.8		1327	a
499.00 > 99.00	2.102	2.102	0.0	0.996	959063		4.67(0.00-0.00)	1803	a
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.102	0.0		2013363	28.7		1120	
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.117	0.0	1.000	2110230	28.8		513	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.269	0.0	1.000	709557	9.58		6959	

**QC Flag Legend**

Review Flags

a - User Assigned ID

**Reagents:**

LC537-L5\_00026

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_049.d

Injection Date: 23-Apr-2018 21:18:19

Instrument ID: A8\_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 17

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

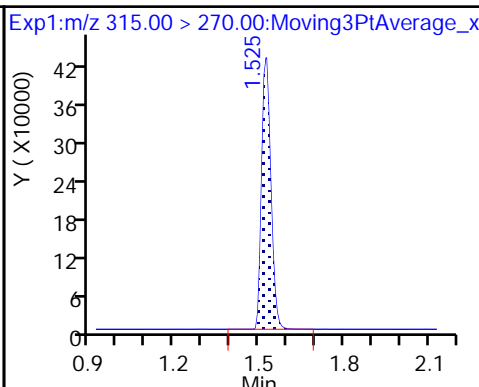
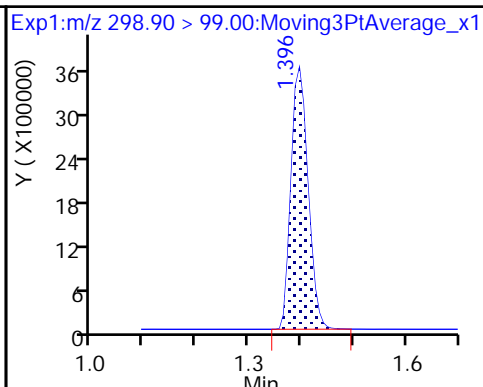
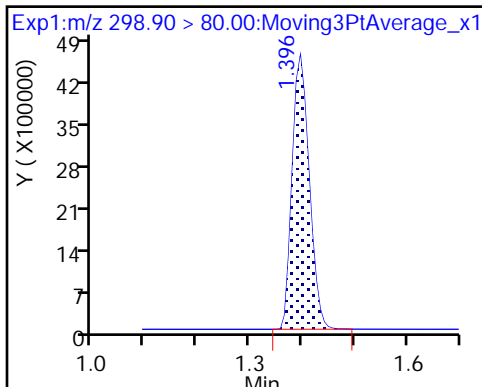
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

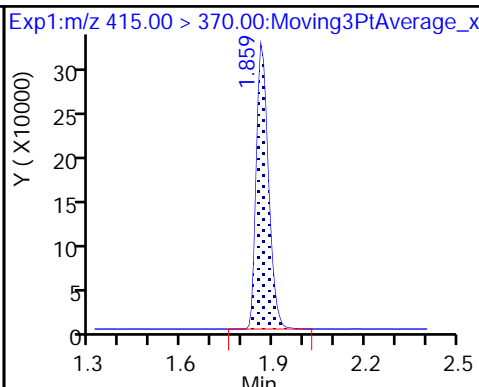
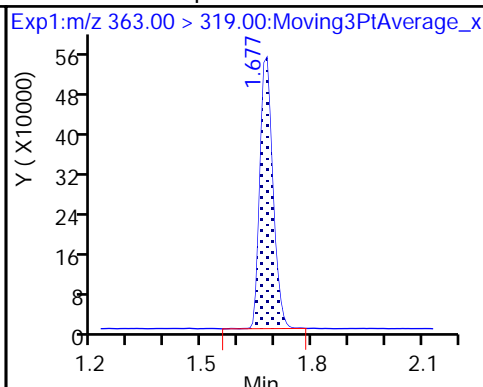
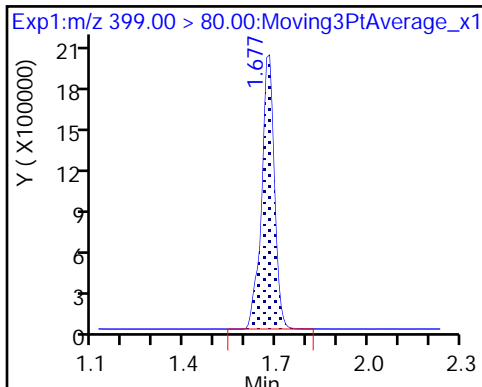
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

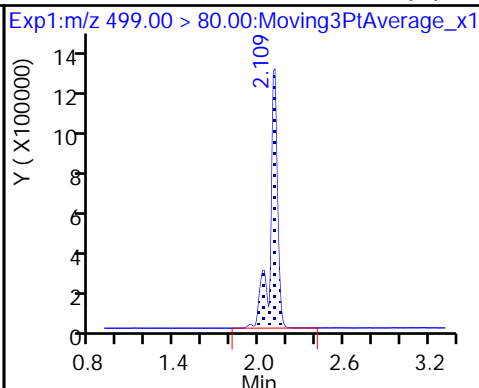
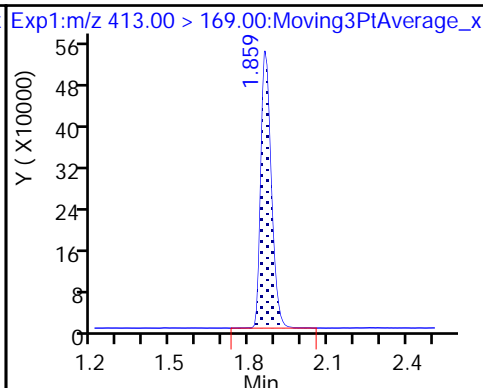
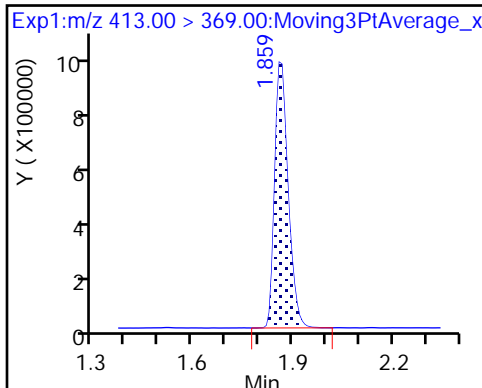
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

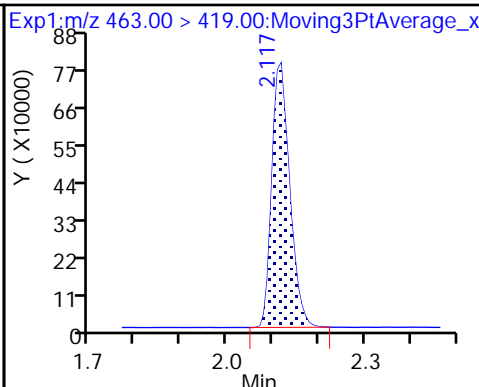
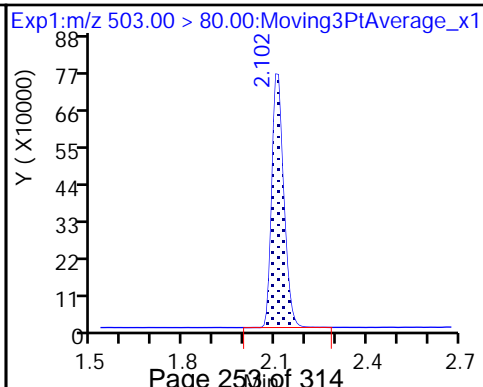
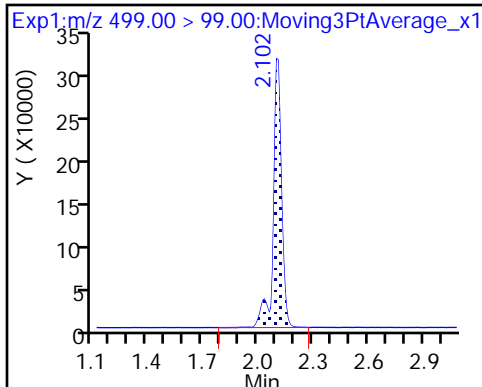
8 Perfluorooctane sulfonic acid (M)



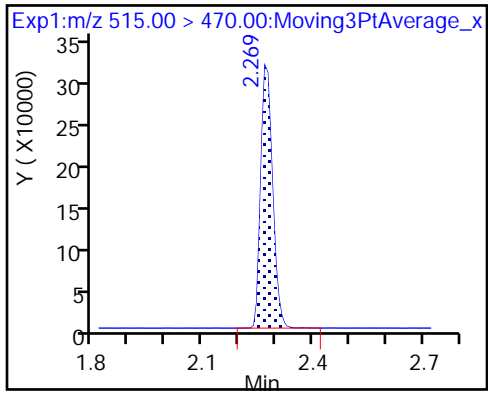
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA





TestAmerica Sacramento

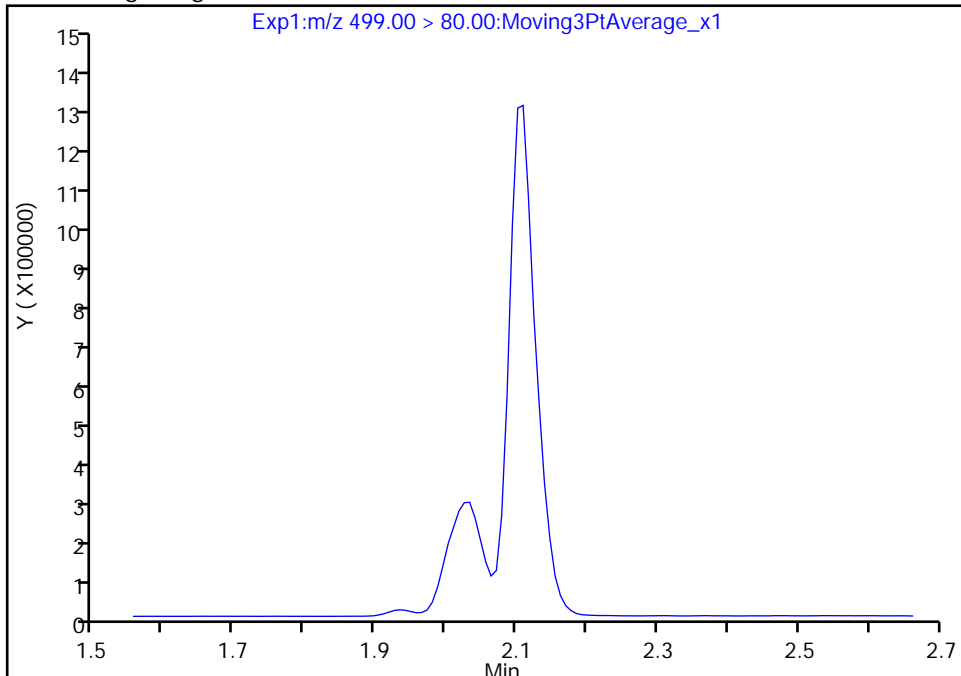
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_049.d  
Injection Date: 23-Apr-2018 21:18:19 Instrument ID: A8\_N  
Lims ID: CCV L5  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 17  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

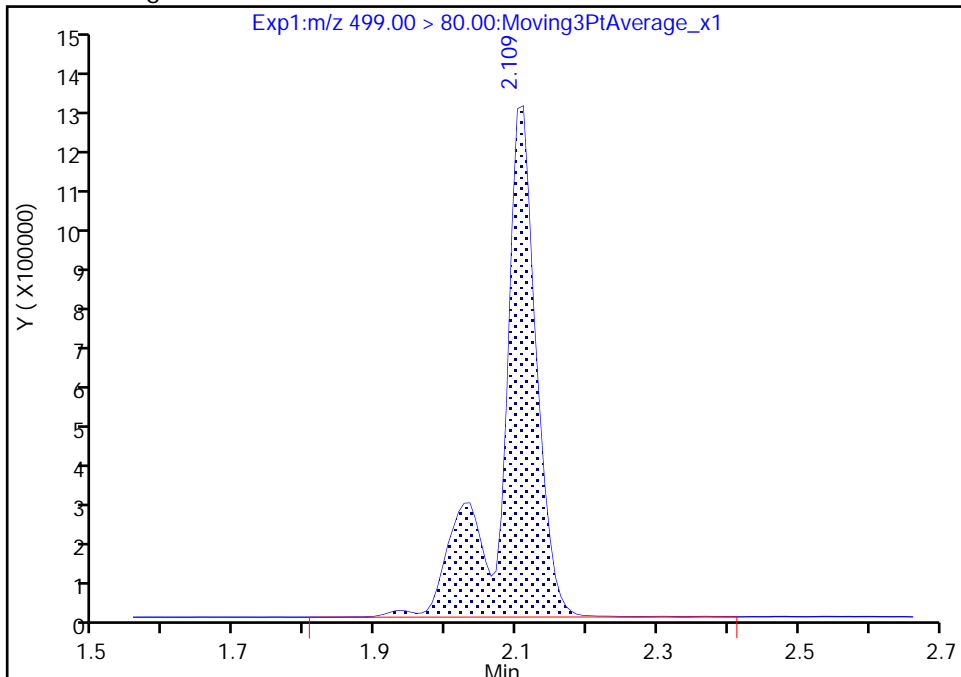
Not Detected  
Expected RT: 2.10

Processing Integration Results



Manual Integration Results

RT: 2.11  
Area: 4478813  
Amount: 59.845720  
Amount Units: ng/ml



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-219464/28 Calibration Date: 04/23/2018 22:09  
 Instrument ID: A8\_N Calib Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 04/11/2018 12:09  
 Lab File ID: 2018.04.23\_537C\_060.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.052	1.164		49.8	45.0	10.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.074	1.101		4.98	4.86	2.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.642	1.760		16.2	15.1	7.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.062	1.050		9.79	9.90	-1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.066	1.073		19.9	19.8	0.7	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8424	0.8110		9.53	9.90	-3.7	30.0
13C2 PFHxA	Ave	1.063	1.083		10.2	10.0	1.9	30.0
13C2 PFDA	Ave	0.8505	0.8734		10.3	10.0	2.7	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-219466/28 Calibration Date: 04/23/2018 22:09  
 Instrument ID: A8\_N Calib Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 04/11/2018 12:09  
 Lab File ID: 2018.04.23\_537C\_060.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.052	1.164		49.8	45.0	10.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.074	1.101		4.98	4.86	2.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.642	1.760		16.2	15.1	7.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.062	1.050		9.79	9.90	-1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.066	1.073		19.9	19.8	0.7	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8424	0.8110		9.53	9.90	-3.7	30.0
13C2 PFHxA	Ave	1.063	1.083		10.2	10.0	1.9	30.0
13C2 PFDA	Ave	0.8505	0.8734		10.3	10.0	2.7	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_060.d  
 Lims ID: CCV L3  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 23-Apr-2018 22:09:45 ALS Bottle#: 3 Worklist Smp#: 28  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L3  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:59 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 10:53:38

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.388	1.388	0.0	1.000	4000114	49.8		2801	
298.90 > 99.00	1.388	1.388	0.0	1.000	3082120		1.30(0.00-0.00)	3182	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.517	1.517	0.0	1.000	1014376	10.2		7727	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.669	1.669	0.0	1.000	2030773	16.2		565	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.669	1.669	0.0	1.000	500820	4.98		50.6	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.859	0.0		936349	10.0		5850	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.859	0.0	1.000	973368	9.79		188	
413.00 > 169.00	1.859	1.859	0.0	1.000	529482		1.84(0.00-0.00)	457	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.102	2.102	0.0	1.000	1618180	19.9		472	a
499.00 > 99.00	2.102	2.102	0.0	1.000	351326		4.61(0.00-0.00)	768	a
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.102	0.0		2188060	28.7		1160	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.109	0.0	1.000	751735	9.53		180	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.269	0.0	1.000	817810	10.3		8257	

**QC Flag Legend**

Review Flags

a - User Assigned ID

**Reagents:**

LC537-L3\_00025

Amount Added: 1.00

Units: mL

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_060.d  
 Lims ID: CCV L3  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 23-Apr-2018 22:09:45 ALS Bottle#: 3 Worklist Smp#: 28  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L3  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:59 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 10:53:38

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.388	1.388	0.0	1.000	4000114	49.8		2801	
298.90 > 99.00	1.388	1.388	0.0	1.000	3082120		1.30(0.00-0.00)	3182	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.517	1.517	0.0	1.000	1014376	10.2		7727	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.669	1.669	0.0	1.000	2030773	16.2		565	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.669	1.669	0.0	1.000	500820	4.98		50.6	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.859	0.0		936349	10.0		5850	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.859	0.0	1.000	973368	9.79		188	
413.00 > 169.00	1.859	1.859	0.0	1.000	529482		1.84(0.00-0.00)	457	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.102	2.102	0.0	1.000	1618180	19.9		472	a
499.00 > 99.00	2.102	2.102	0.0	1.000	351326		4.61(0.00-0.00)	768	a
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.102	0.0		2188060	28.7		1160	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.109	0.0	1.000	751735	9.53		180	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.269	0.0	1.000	817810	10.3		8257	

**QC Flag Legend**

Review Flags

a - User Assigned ID

**Reagents:**

LC537-L3\_00025

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_060.d

Injection Date: 23-Apr-2018 22:09:45

Instrument ID: A8\_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 28

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

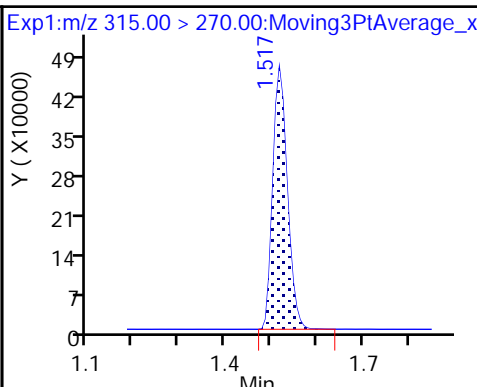
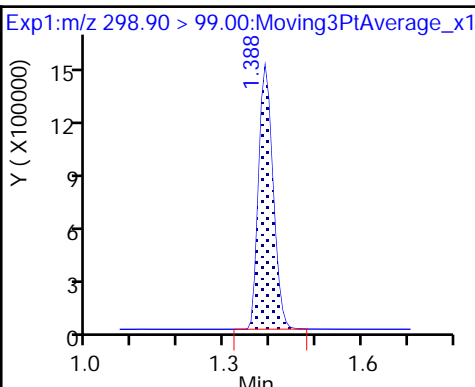
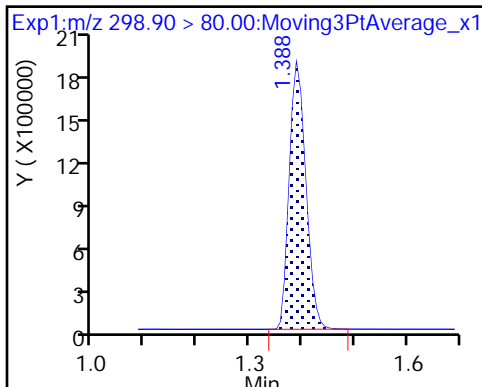
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

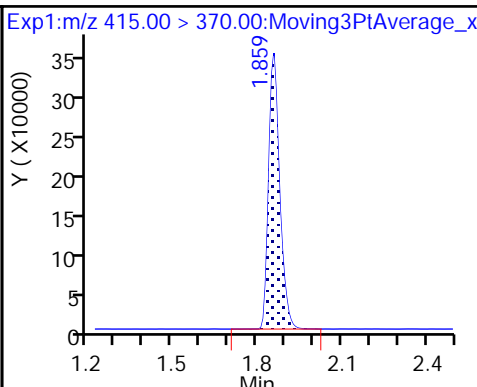
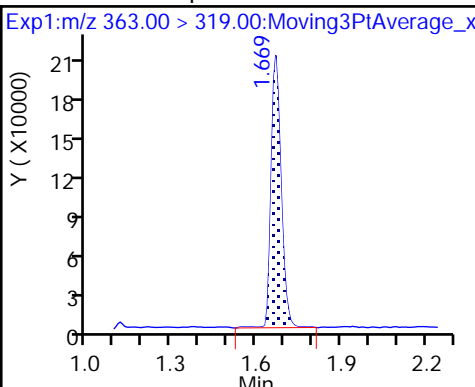
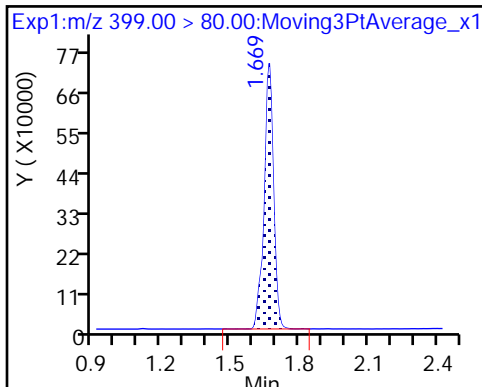
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

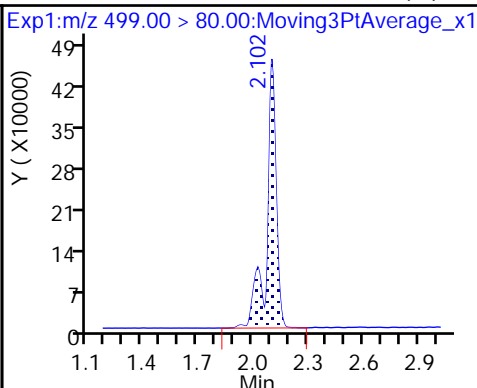
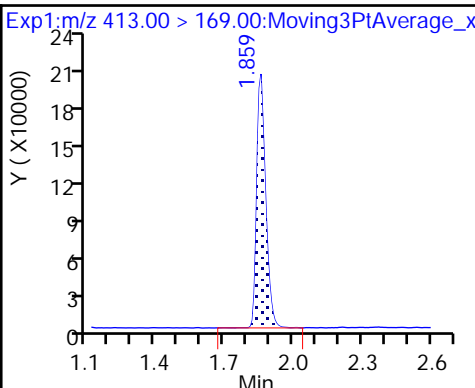
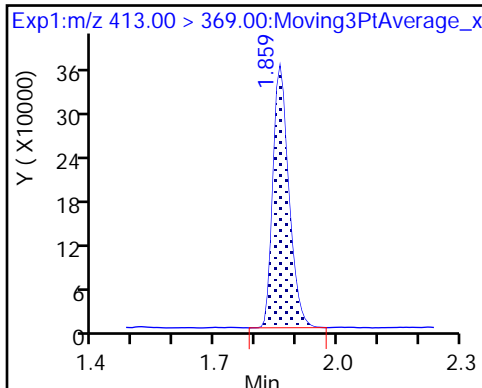
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

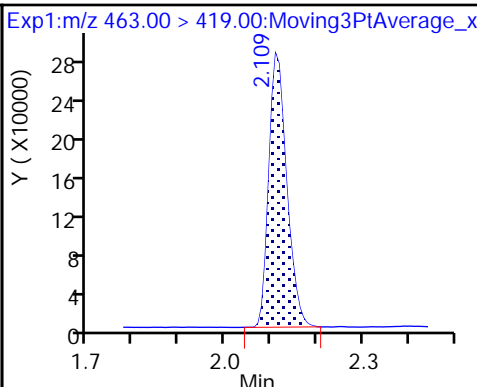
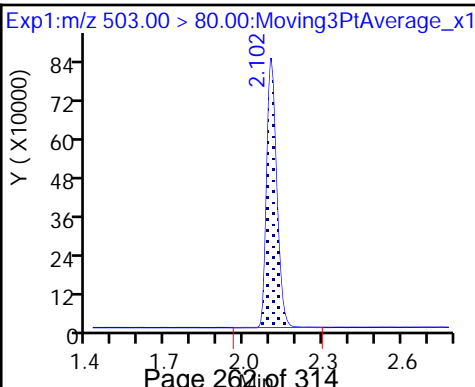
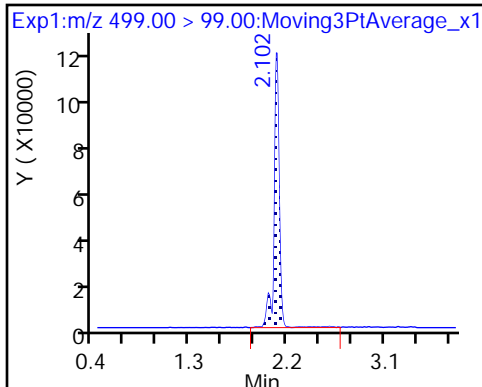
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid

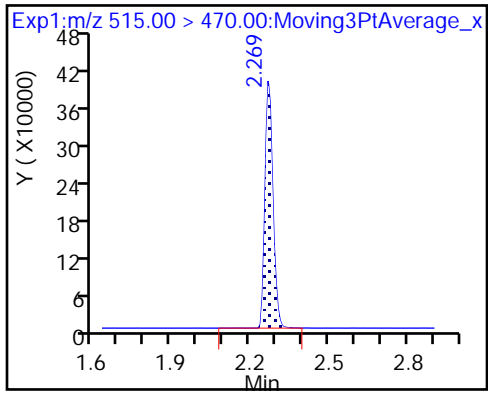
\* 7 13C4 PFOS

9 Perfluorononanoic acid





\$ 10 13C2 PFDA



TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_060.d

Injection Date: 23-Apr-2018 22:09:45

Instrument ID: A8\_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 28

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

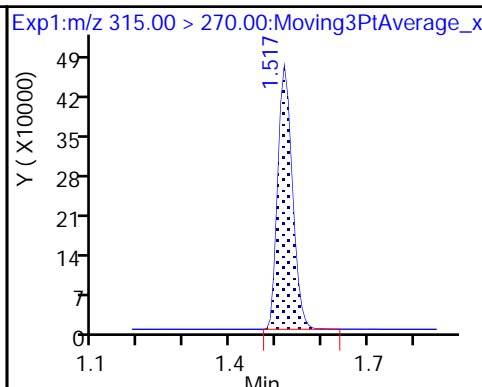
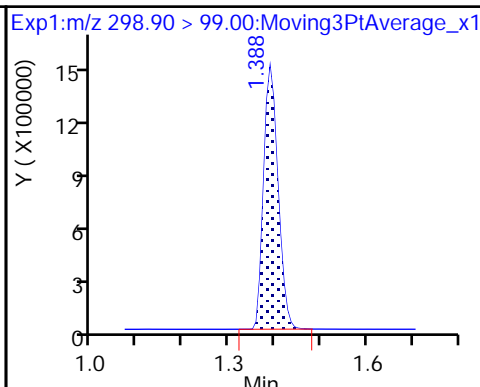
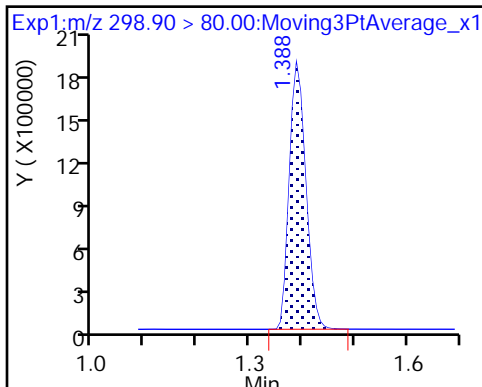
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

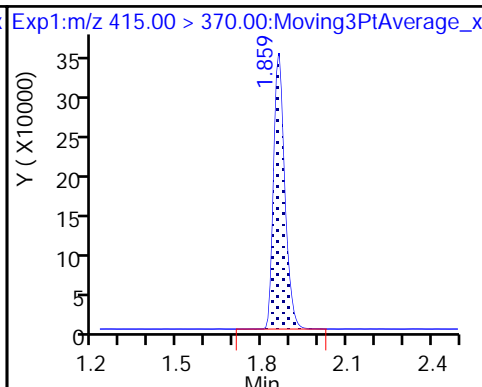
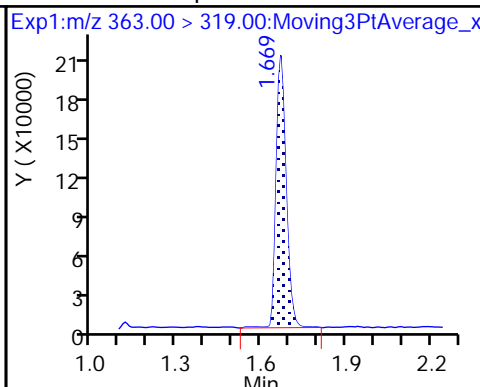
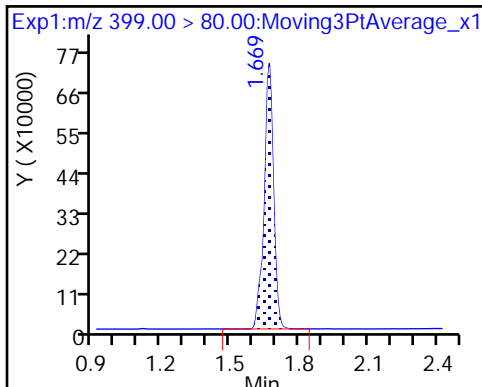
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

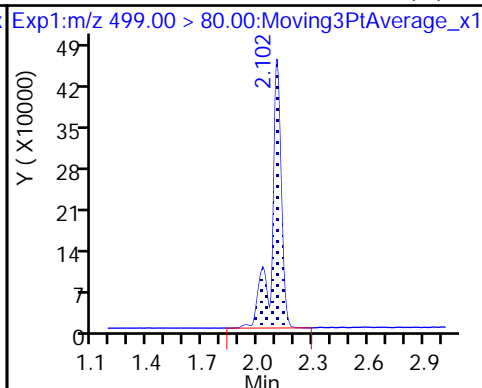
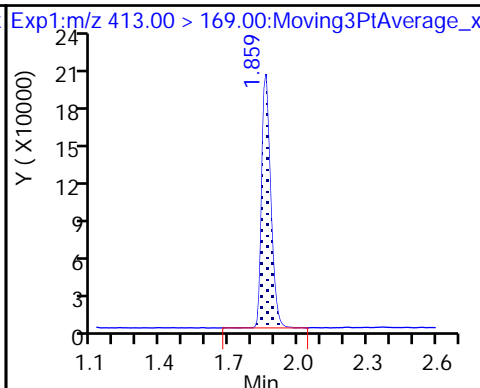
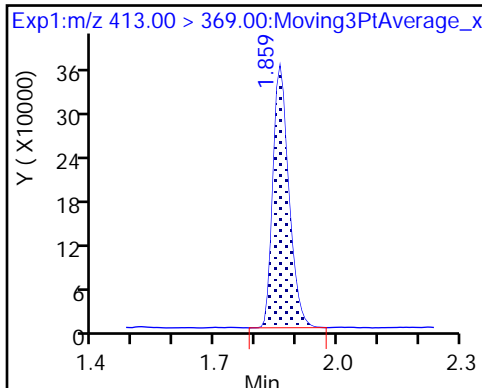
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

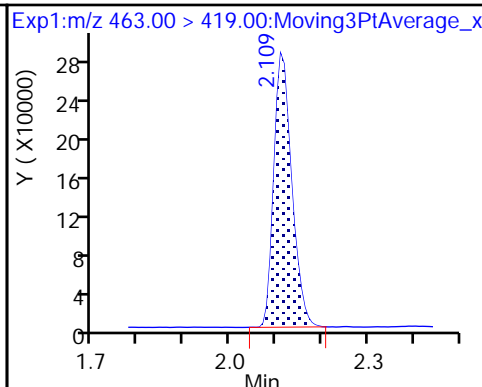
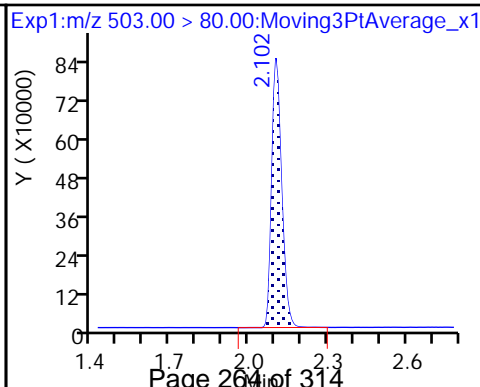
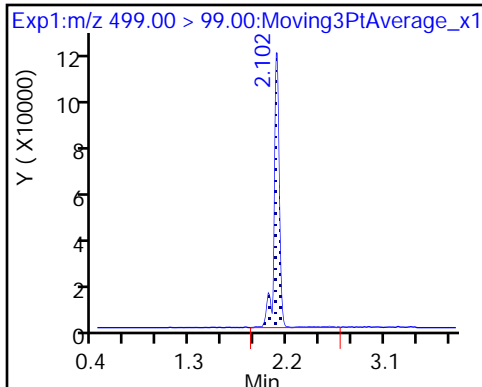
8 Perfluorooctane sulfonic acid (M)



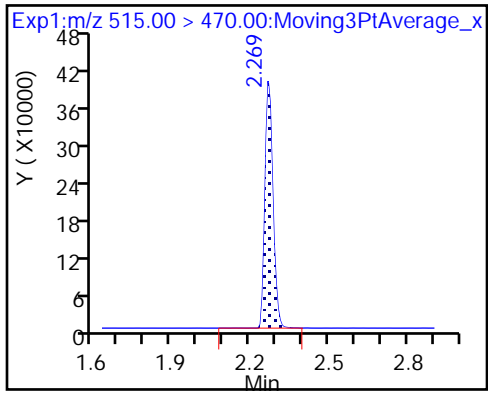
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

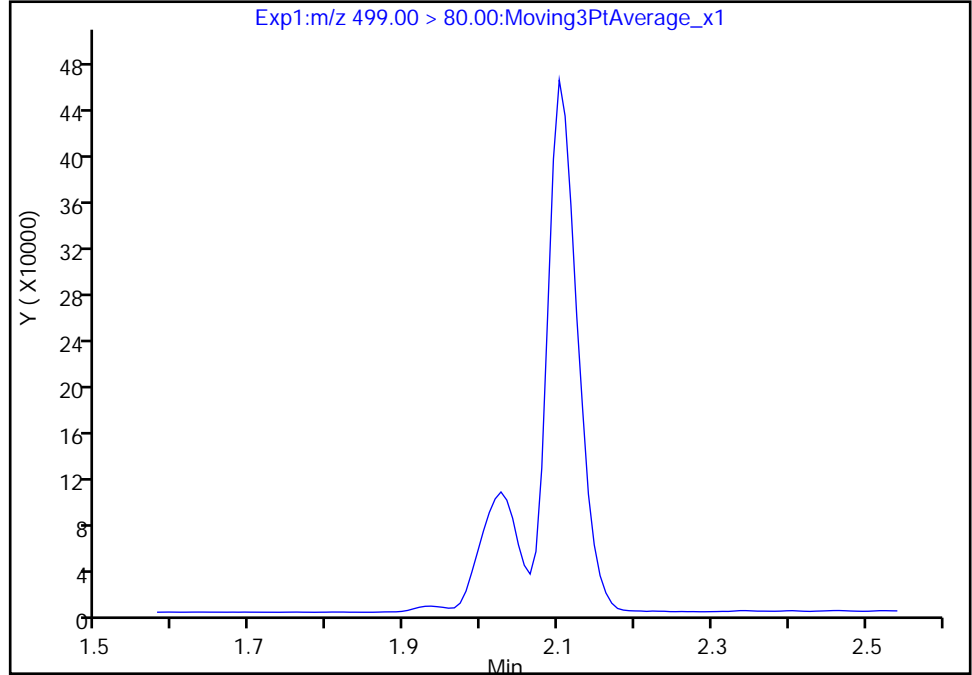
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_060.d  
Injection Date: 23-Apr-2018 22:09:45 Instrument ID: A8\_N  
Lims ID: CCV L3  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 28  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

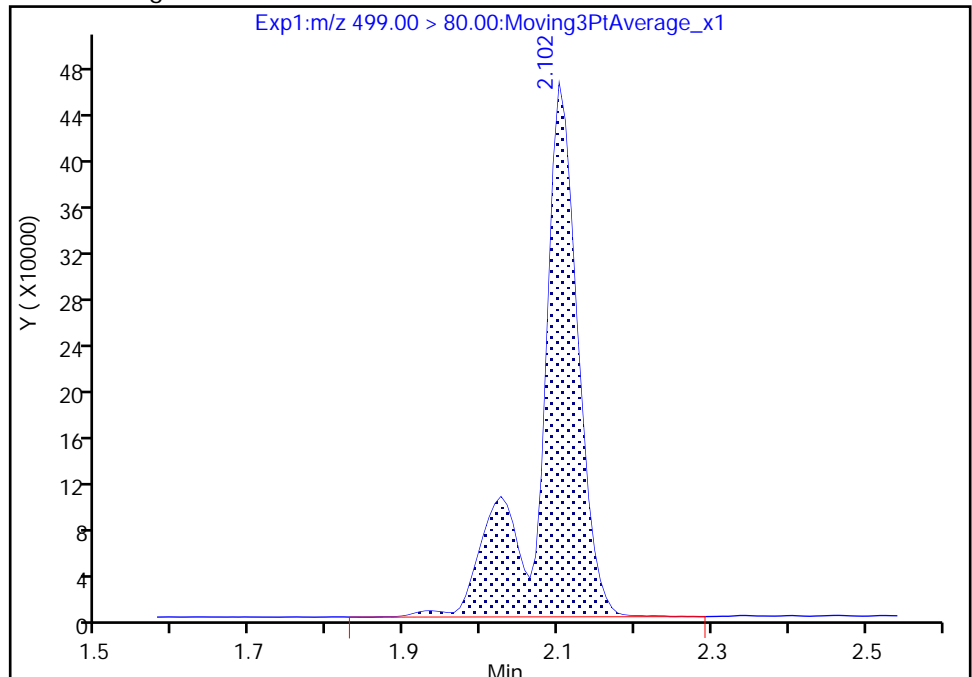
Not Detected  
Expected RT: 2.10

Processing Integration Results



RT: 2.10  
Area: 1618180  
Amount: 19.895729  
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 24-Apr-2018 10:53:31  
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

TestAmerica Sacramento

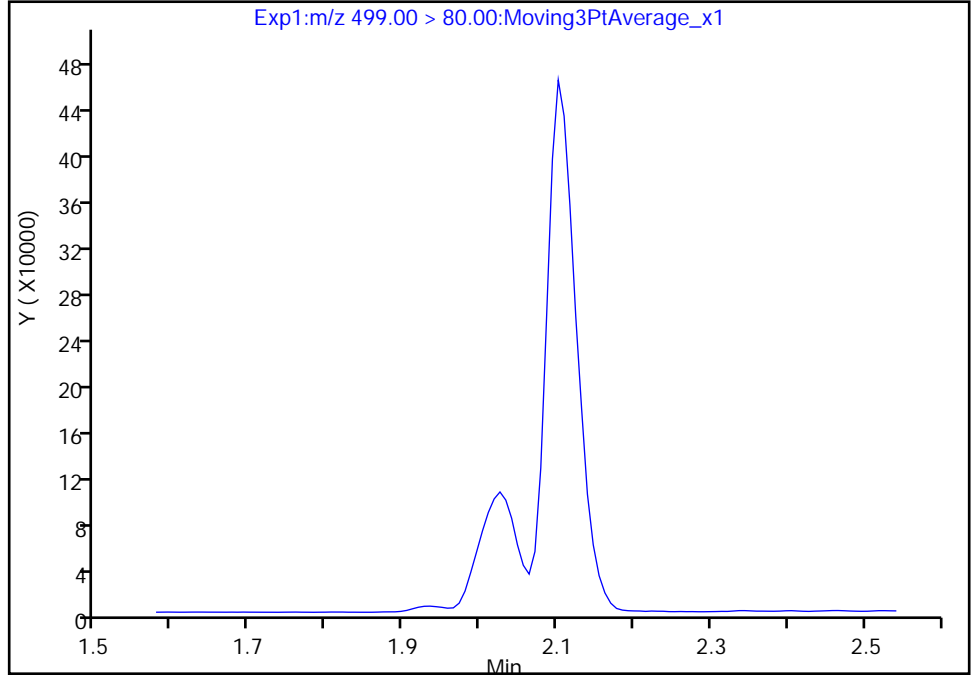
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_060.d  
Injection Date: 23-Apr-2018 22:09:45 Instrument ID: A8\_N  
Lims ID: CCV L3  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 28  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

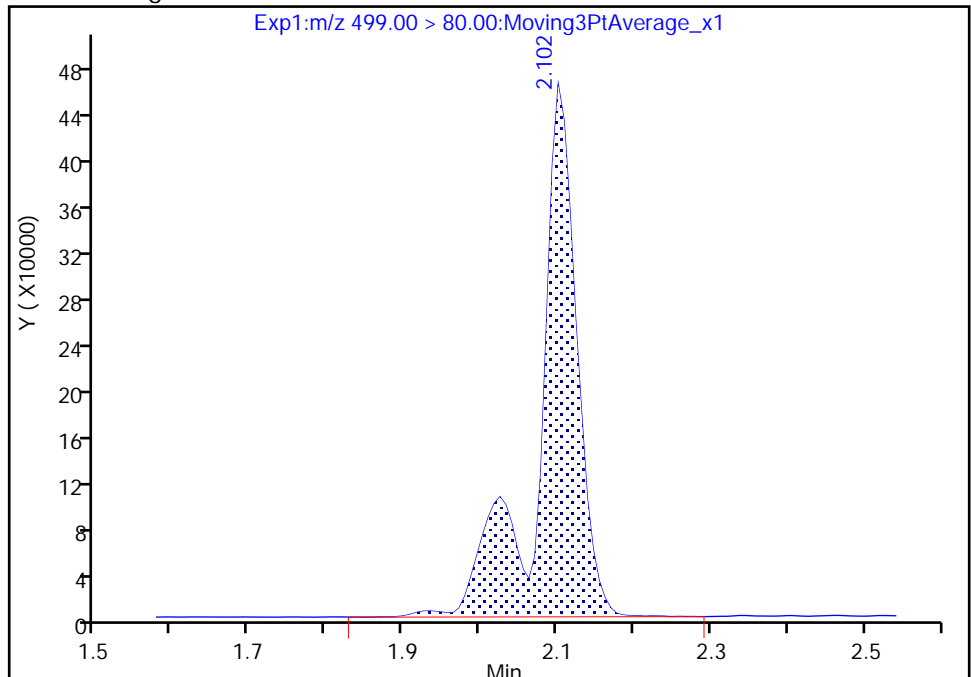
Not Detected  
Expected RT: 2.10

Processing Integration Results



RT: 2.10  
Area: 1618180  
Amount: 19.895729  
Amount Units: ng/ml

Manual Integration Results



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-219466/40 Calibration Date: 04/23/2018 23:05  
 Instrument ID: A8\_N Calib Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 04/11/2018 12:09  
 Lab File ID: 2018.04.23\_537C\_072.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.052	1.059		136	135	0.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.074	1.054		14.3	14.6	-1.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.642	1.699		46.9	45.4	3.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.062	1.069		29.9	29.7	0.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.066	1.085		60.3	59.3	1.7	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8424	0.7989		28.2	29.7	-5.2	30.0
13C2 PFHxA	Ave	1.063	1.064		10.0	10.0	0.1	30.0
13C2 PFDA	Ave	0.8505	0.8245		9.69	10.0	-3.1	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-219468/40 Calibration Date: 04/23/2018 23:05  
 Instrument ID: A8\_N Calib Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 04/11/2018 12:09  
 Lab File ID: 2018.04.23\_537C\_072.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.052	1.059		136	135	0.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.074	1.054		14.3	14.6	-1.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.642	1.699		46.9	45.4	3.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.062	1.069		29.9	29.7	0.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.066	1.085		60.3	59.3	1.7	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8424	0.7989		28.2	29.7	-5.2	30.0
13C2 PFHxA	Ave	1.063	1.064		10.0	10.0	0.1	30.0
13C2 PFDA	Ave	0.8505	0.8245		9.69	10.0	-3.1	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_072.d  
 Lims ID: CCV L5  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 23-Apr-2018 23:05:44 ALS Bottle#: 5 Worklist Smp#: 40  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L5  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:13:09 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 10:53:46

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.396	1.396	0.0	1.000	10257776	135.9		6412	
298.90 > 99.00	1.396	1.396	0.0	1.000	7954351		1.29(0.00-0.00)	7331	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.525	1.525	0.0	1.000	921731	10.0		7709	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.669	1.669	0.0	1.000	5528035	46.9		1602	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.669	1.669	0.0	1.000	1331013	14.3		142	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.859	0.0		865956	10.0		4991	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.859	0.0	1.000	2750081	29.9		519	
413.00 > 169.00	1.859	1.859	0.0	1.000	1458663		1.89(0.00-0.00)	1290	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.102	2.102	0.0	1.000	4613206	60.3		1308	a
499.00 > 99.00	2.102	2.102	0.0	1.000	970942		4.75(0.00-0.00)	1814	a
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.102	0.0		2057189	28.7		1113	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.109	0.0	1.000	2054667	28.2		499	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.269	0.0	1.000	713986	9.69		6930	



**QC Flag Legend**

Review Flags

a - User Assigned ID

**Reagents:**

LC537-L5\_00026

Amount Added: 1.00

Units: mL

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_072.d  
 Lims ID: CCV L5  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 23-Apr-2018 23:05:44 ALS Bottle#: 5 Worklist Smp#: 40  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L5  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:13:09 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 10:53:46

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.396	1.396	0.0	1.000	10257776	135.9		6412	
298.90 > 99.00	1.396	1.396	0.0	1.000	7954351		1.29(0.00-0.00)	7331	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.525	1.525	0.0	1.000	921731	10.0		7709	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.669	1.669	0.0	1.000	5528035	46.9		1602	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.669	1.669	0.0	1.000	1331013	14.3		142	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.859	0.0		865956	10.0		4991	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.859	0.0	1.000	2750081	29.9		519	
413.00 > 169.00	1.859	1.859	0.0	1.000	1458663		1.89(0.00-0.00)	1290	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.102	2.102	0.0	1.000	4613206	60.3		1308	a
499.00 > 99.00	2.102	2.102	0.0	1.000	970942		4.75(0.00-0.00)	1814	a
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.102	0.0		2057189	28.7		1113	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.109	0.0	1.000	2054667	28.2		499	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.269	0.0	1.000	713986	9.69		6930	

**QC Flag Legend**

Review Flags

a - User Assigned ID

**Reagents:**

LC537-L5\_00026

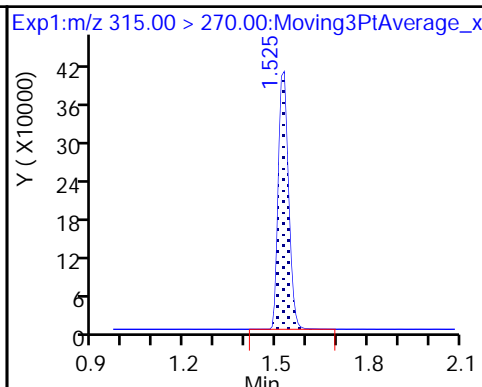
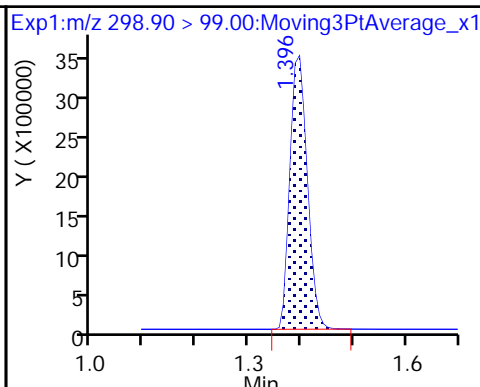
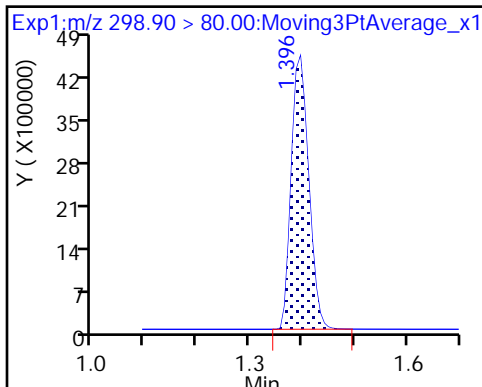
Amount Added: 1.00

Units: mL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

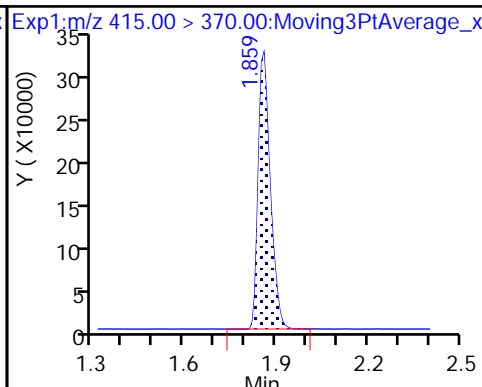
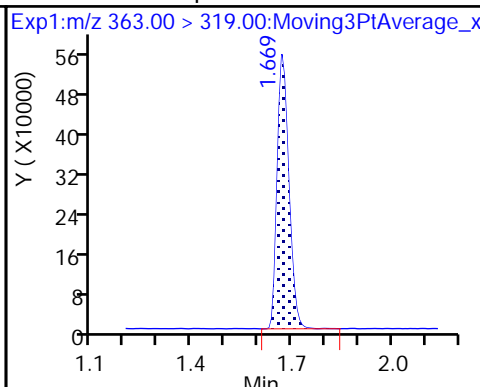
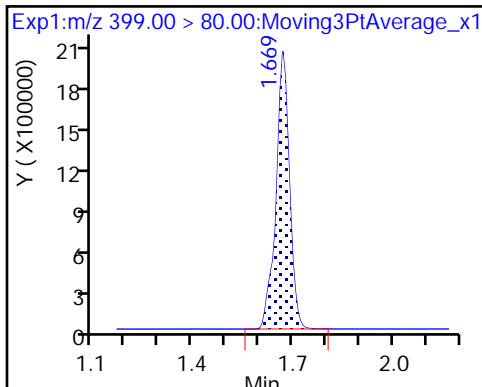
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

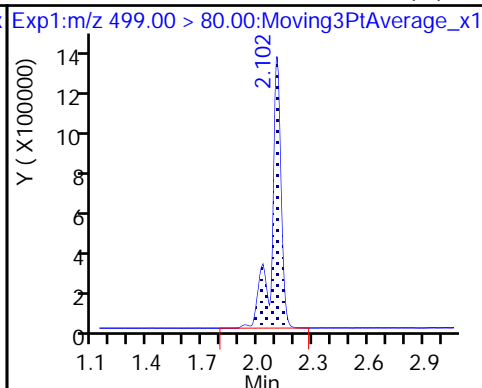
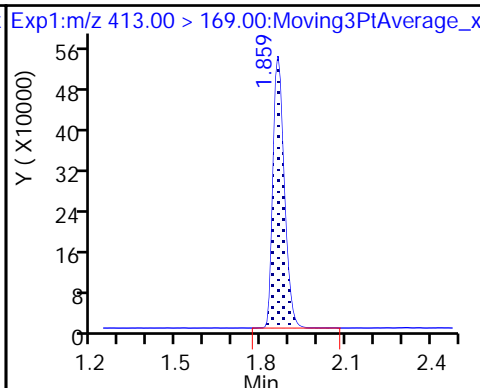
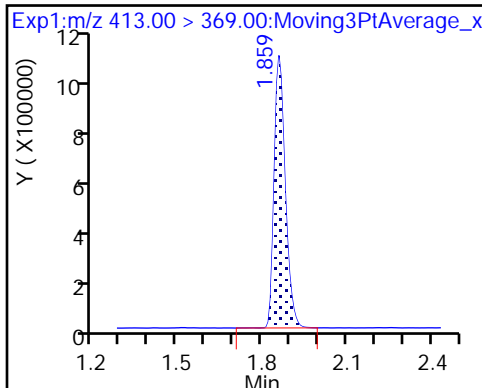
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

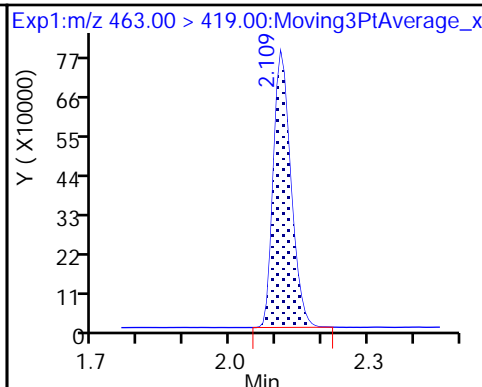
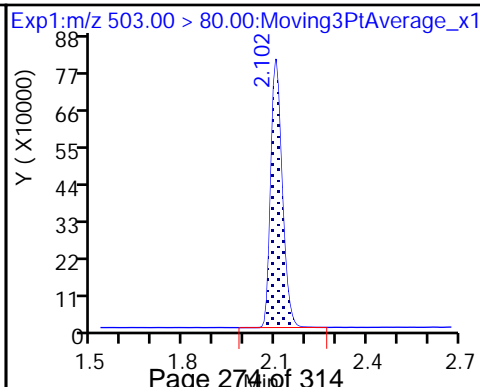
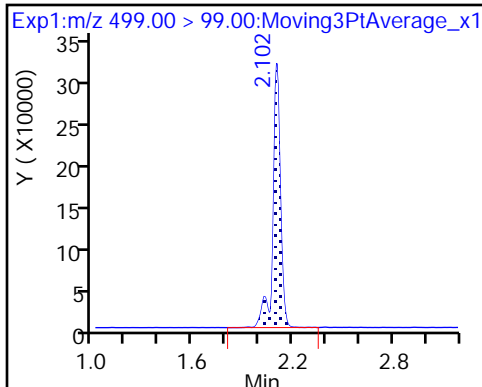
8 Perfluorooctane sulfonic acid (M)



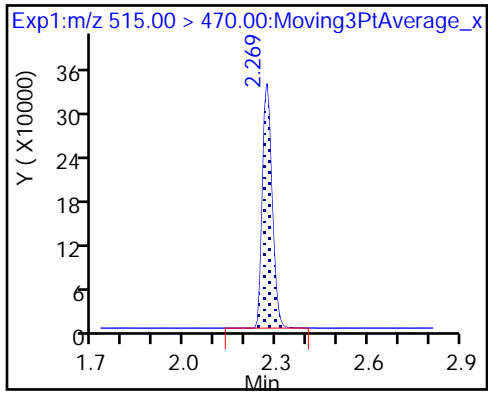
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_072.d

Injection Date: 23-Apr-2018 23:05:44

Instrument ID: A8\_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 40

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

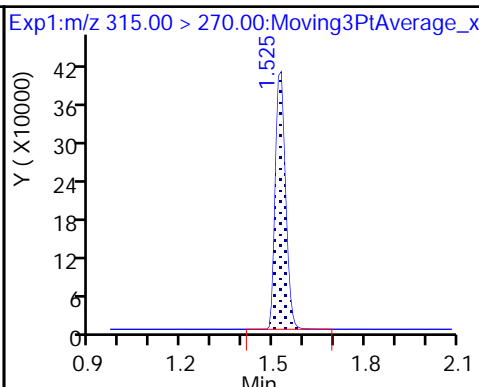
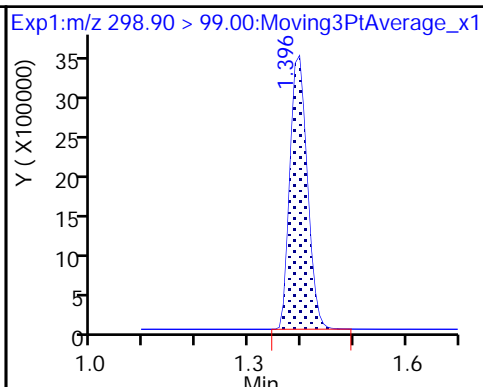
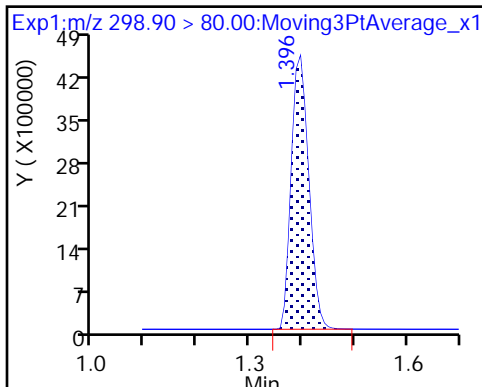
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

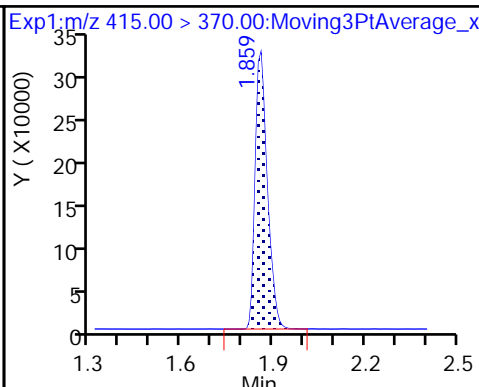
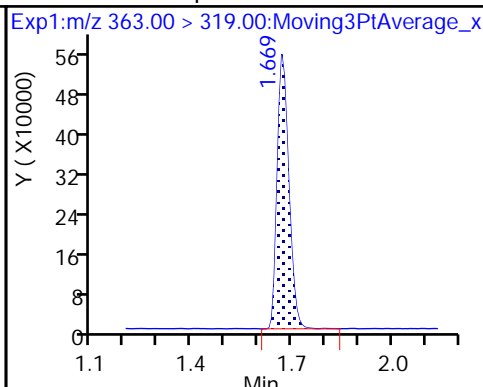
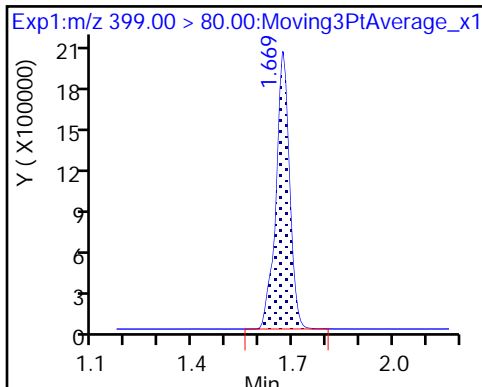
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

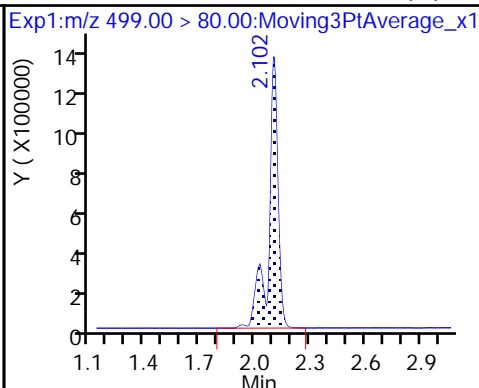
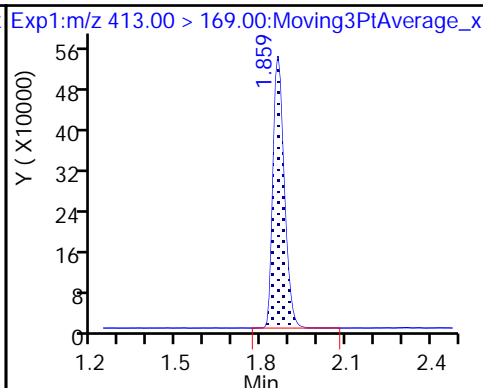
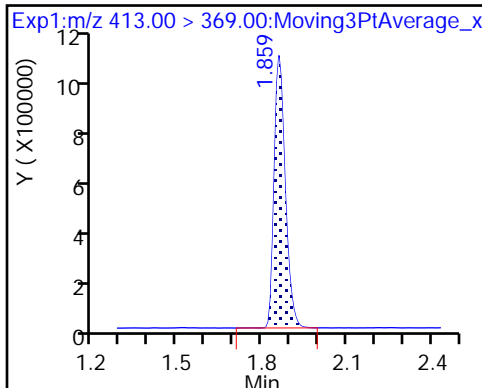
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

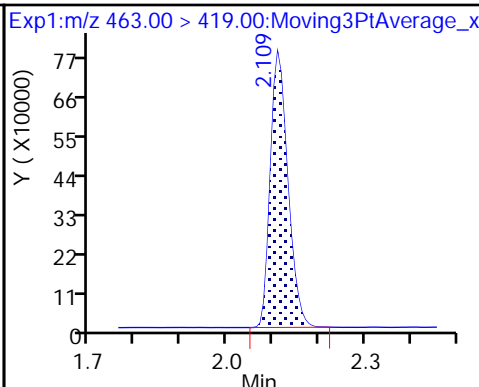
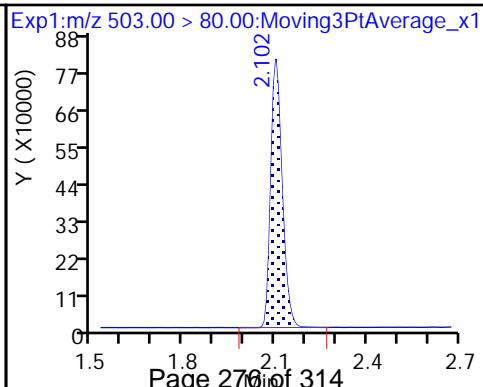
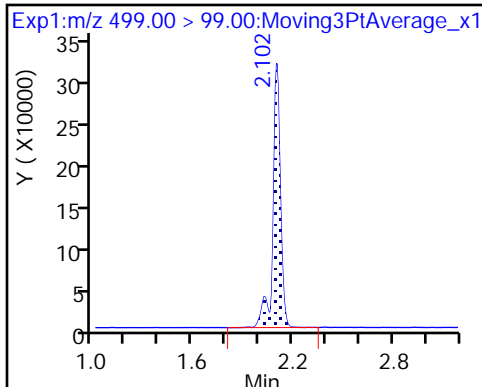
8 Perfluorooctane sulfonic acid (M)



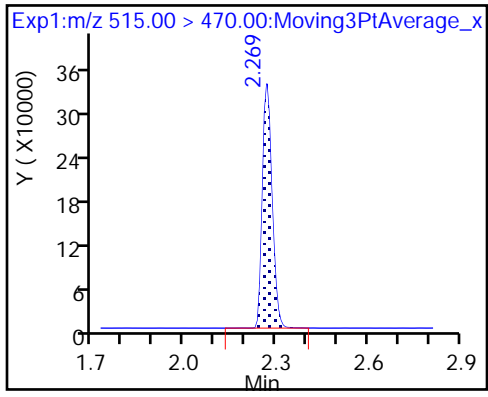
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

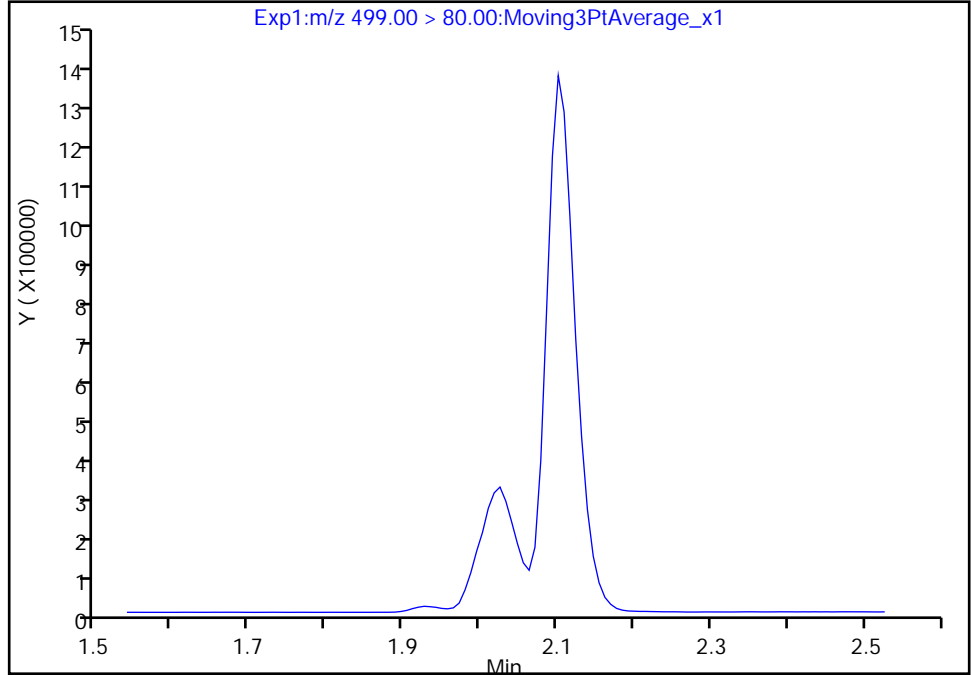
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Injection Date: 23-Apr-2018 23:05:44 Instrument ID: A8\_N  
Lims ID: CCV L5  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 40  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

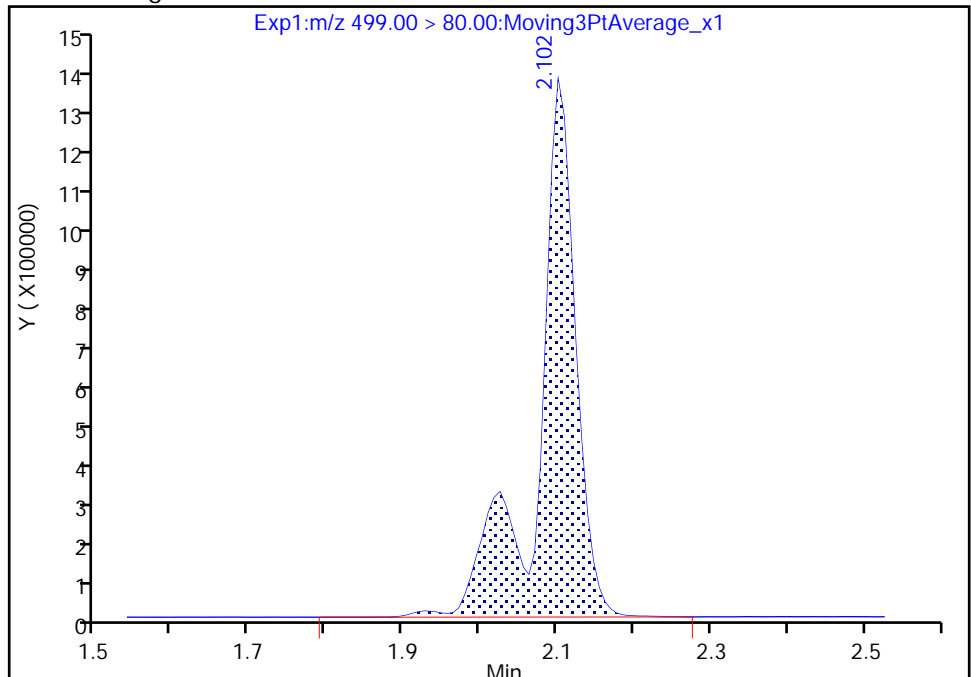
Not Detected  
Expected RT: 2.10

Processing Integration Results



RT: 2.10  
Area: 4613206  
Amount: 60.328275  
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 24-Apr-2018 10:53:42  
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected



TestAmerica Sacramento

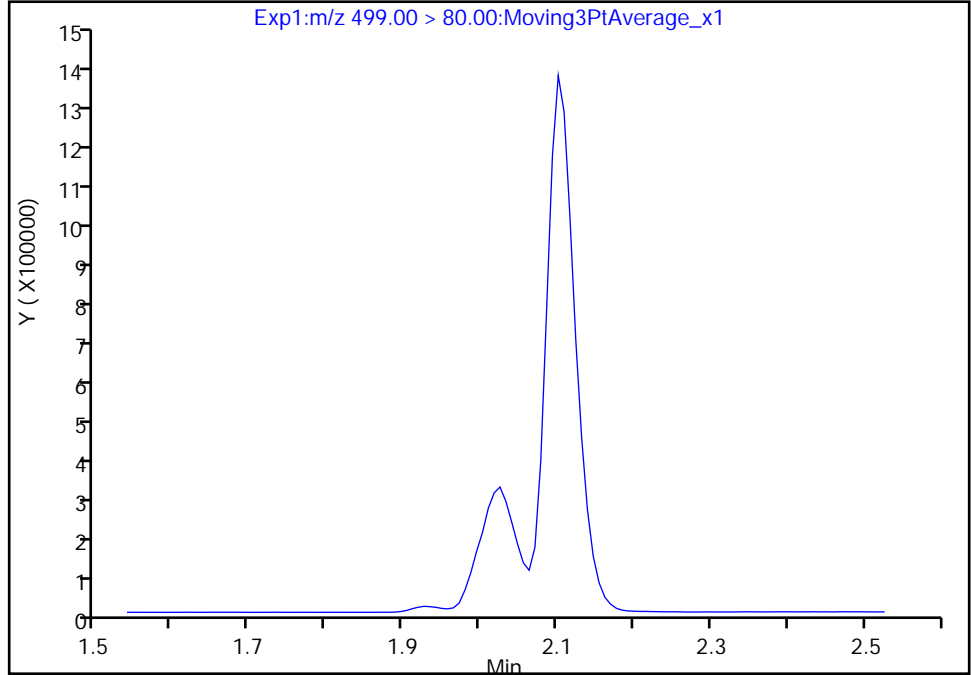
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Injection Date: 23-Apr-2018 23:05:44 Instrument ID: A8\_N  
Lims ID: CCV L5  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 40  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

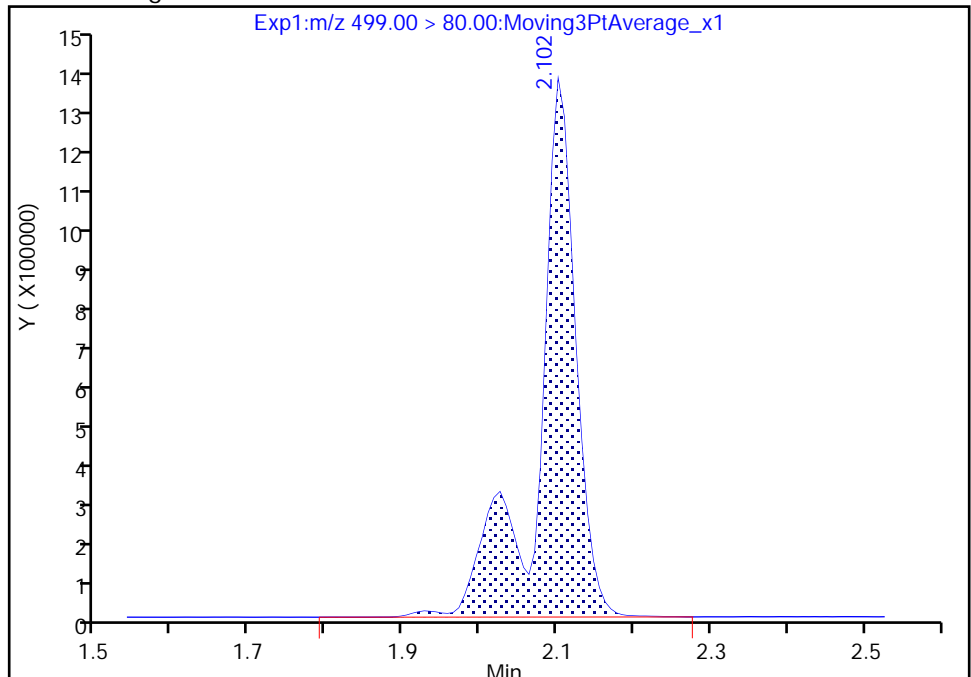
Not Detected  
Expected RT: 2.10

Processing Integration Results



RT: 2.10  
Area: 4613206  
Amount: 60.328275  
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 24-Apr-2018 10:53:42  
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-219468/44 Calibration Date: 04/23/2018 23:24  
 Instrument ID: A8\_N Calib Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 04/11/2018 12:09  
 Lab File ID: 2018.04.23\_537C\_076.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.052	1.210		51.8	45.0	15.1	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.074	1.079		4.89	4.86	0.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.642	1.732		16.0	15.1	5.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.062	1.030		9.60	9.90	-3.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.066	1.072		19.9	19.8	0.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8424	0.8297		9.75	9.90	-1.5	30.0
13C2 PFHxA	Ave	1.063	1.097		10.3	10.0	3.2	30.0
13C2 PFDA	Ave	0.8505	0.8042		9.46	10.0	-5.4	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_076.d  
 Lims ID: CCV L3  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 23-Apr-2018 23:24:25 ALS Bottle#: 3 Worklist Smp#: 44  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L3  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:13:12 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 10:54:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.388	1.388	0.0	1.000	3693601	51.8		2587	
298.90 > 99.00	1.388	1.388	0.0	1.000	2799108		1.32(0.00-0.00)	2745	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.517	1.517	0.0	1.000	902471	10.3		6836	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.662	1.662	0.0	1.000	1775613	16.0		513	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.662	1.662	0.0	1.000	431388	4.89		44.6	
* 6 13C2-PFOA									
415.00 > 370.00	1.851	1.851	0.0		822310	10.0		5672	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.851	1.851	0.0	1.000	838517	9.60		144	
413.00 > 169.00	1.851	1.851	0.0	1.000	466704		1.80(0.00-0.00)	426	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.102	2.102	0.0	1.000	1436214	19.9		425	a
499.00 > 99.00	2.102	2.102	0.0	1.000	313452		4.58(0.00-0.00)	592	a
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.102	0.0		1943602	28.7		1025	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.109	0.0	1.000	675409	9.75		168	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.269	0.0	1.000	661313	9.46		7401	

**QC Flag Legend**

Review Flags

a - User Assigned ID

**Reagents:**

LC537-L3\_00025

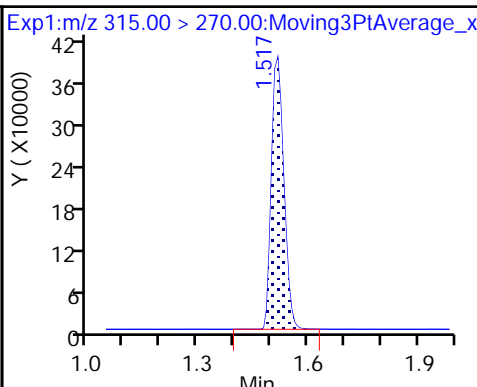
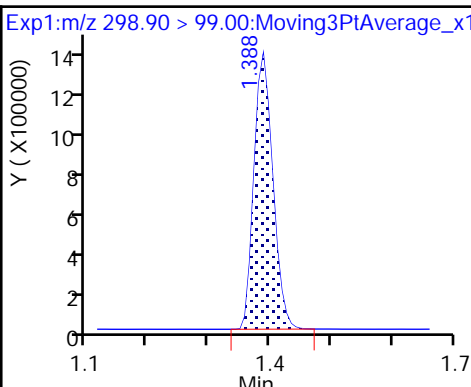
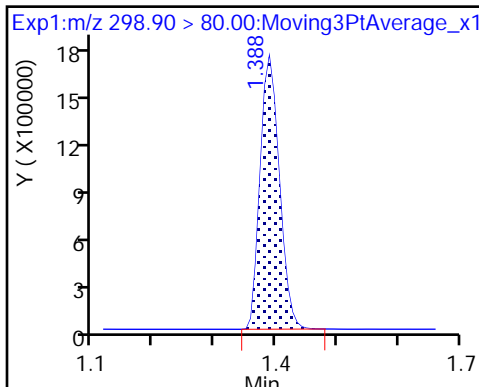
Amount Added: 1.00

Units: mL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

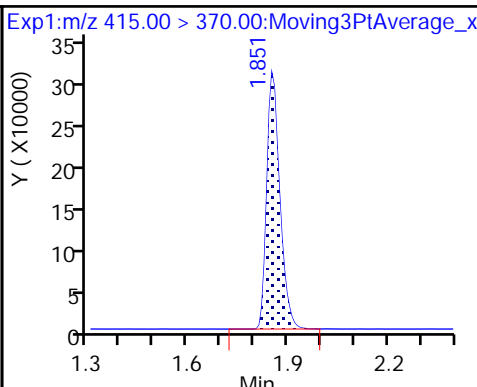
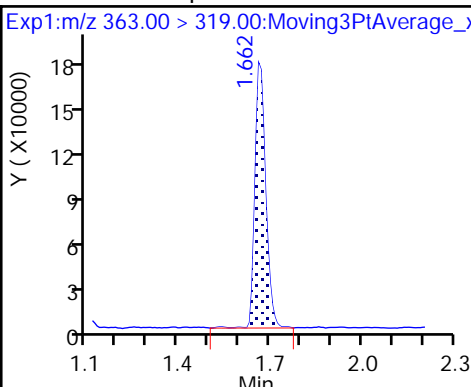
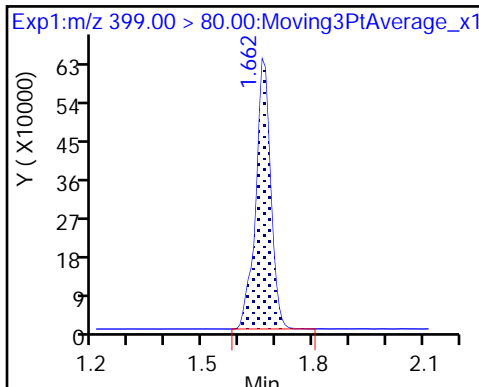
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

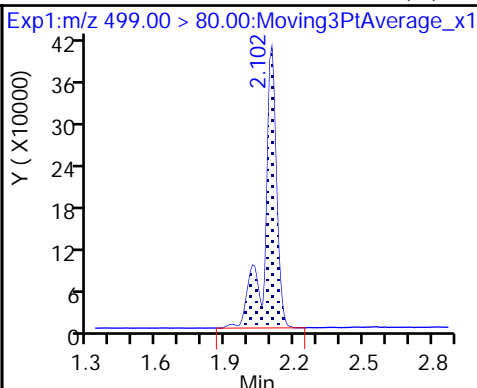
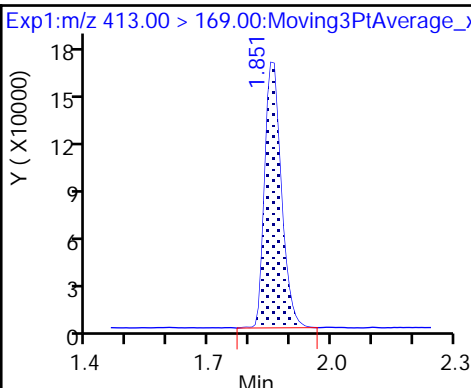
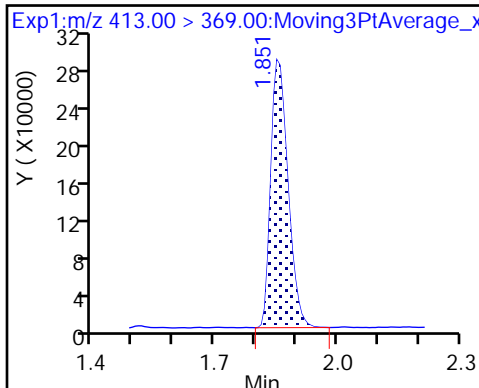
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

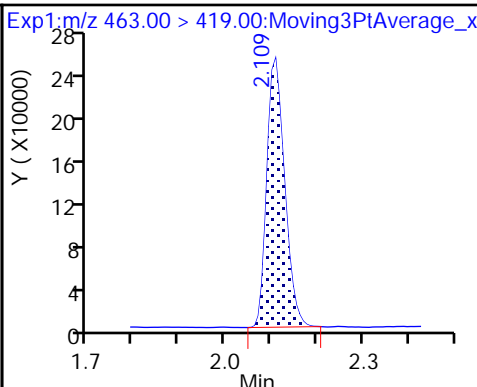
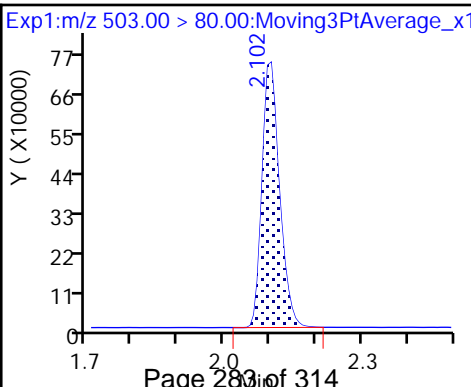
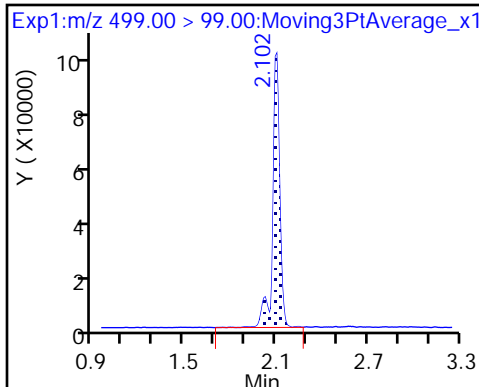
8 Perfluorooctane sulfonic acid (M)



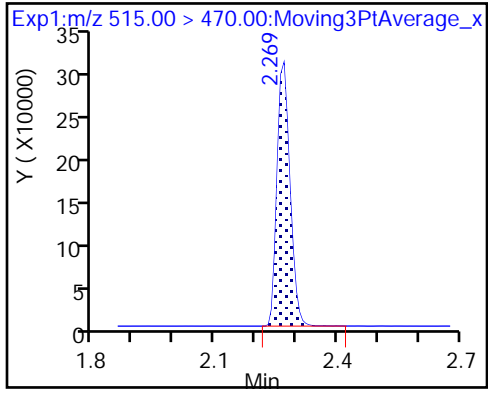
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

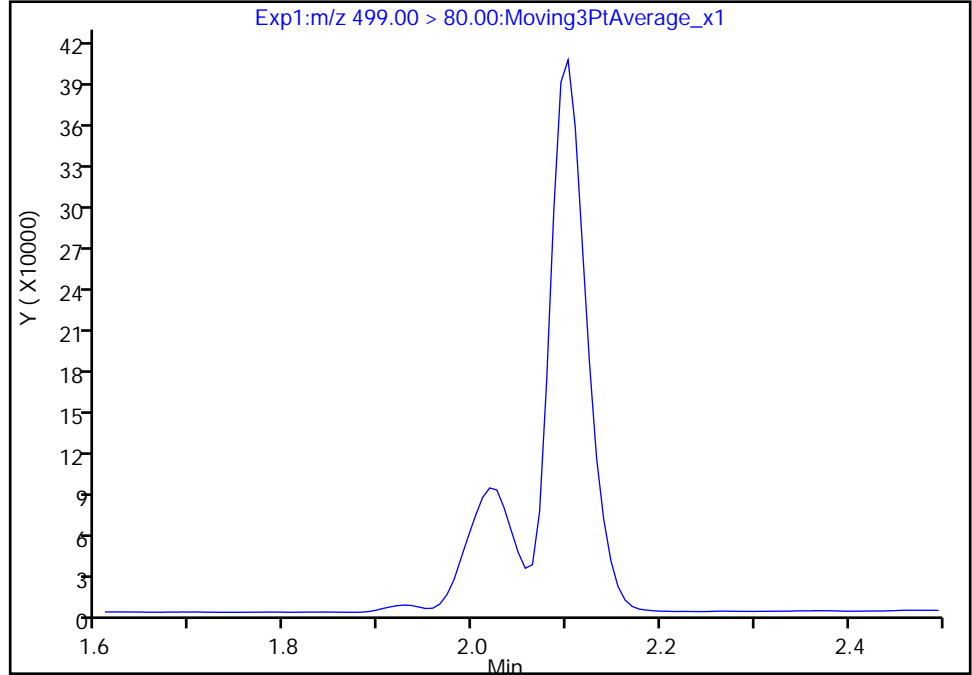
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_076.d  
Injection Date: 23-Apr-2018 23:24:25 Instrument ID: A8\_N  
Lims ID: CCV L3  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 44  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

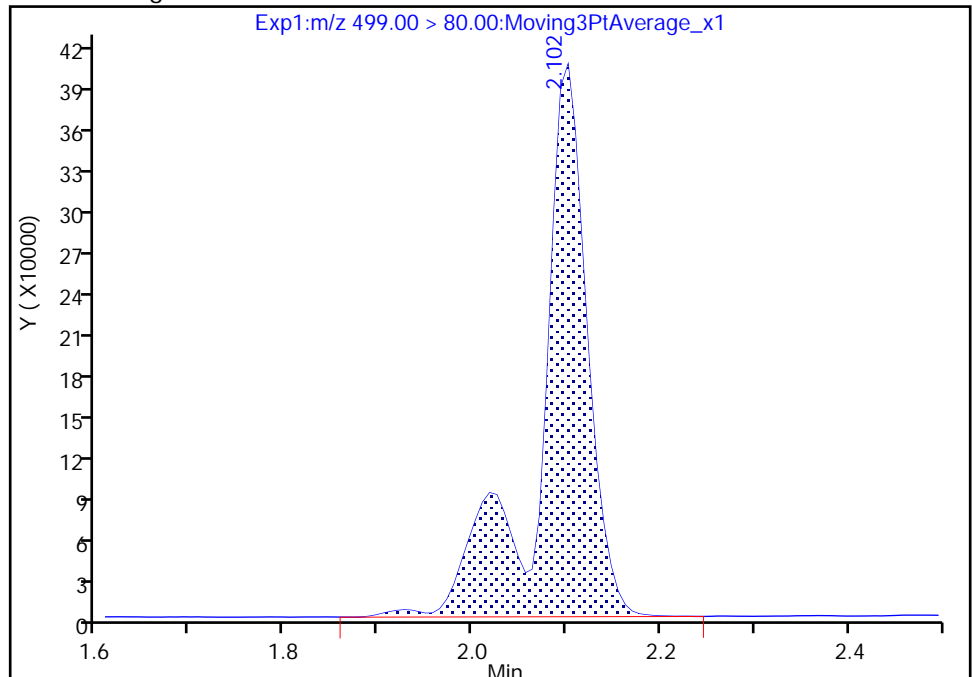
Not Detected  
Expected RT: 2.10

Processing Integration Results



RT: 2.10  
Area: 1436214  
Amount: 19.879436  
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 24-Apr-2018 10:53:51  
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: MB 320-218953/1-A  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_051.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 250.0 (mL) Date Analyzed: 04/23/2018 21:27  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219464 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	96		70-130
STL00996	13C2 PFDA	93		70-130



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_051.d  
 Lims ID: MB 320-218953/1-A  
 Client ID:  
 Sample Type: MB  
 Inject. Date: 23-Apr-2018 21:27:40 ALS Bottle#: 34 Worklist Smp#: 19  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: mb 320-218953/1-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:48 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.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
\$ 2 13C2 PFHxA	315.00 > 270.00	1.517	1.525	-0.008	1.000	883697	9.59	8438	
* 6 13C2-PFOA	415.00 > 370.00	1.851	1.859	-0.008		866508	10.0	5307	
* 7 13C4 PFOS	503.00 > 80.00	2.094	2.102	-0.008		2105233	28.7	1140	
\$ 10 13C2 PFDA	515.00 > 470.00	2.261	2.269	-0.007	1.000	681736	9.25	6114	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_051.d

Injection Date: 23-Apr-2018 21:27:40

Instrument ID: A8\_N

Lims ID: MB 320-218953/1-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 34

Worklist Smp#: 19

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

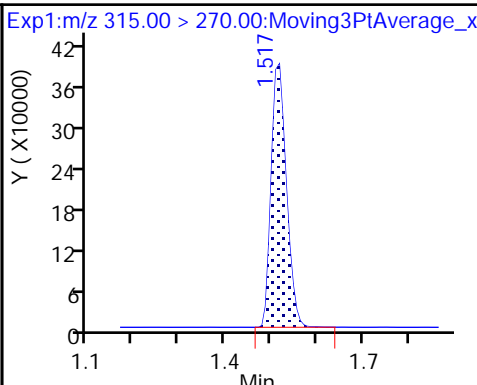
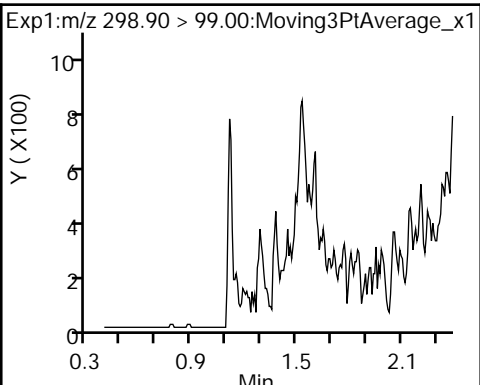
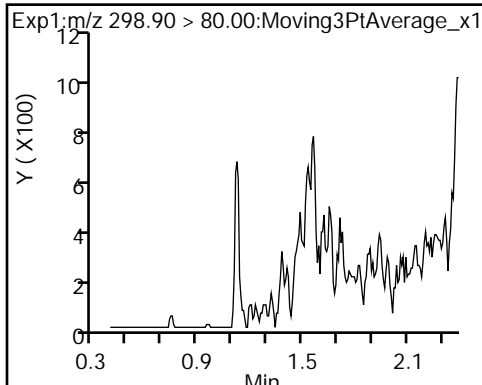
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

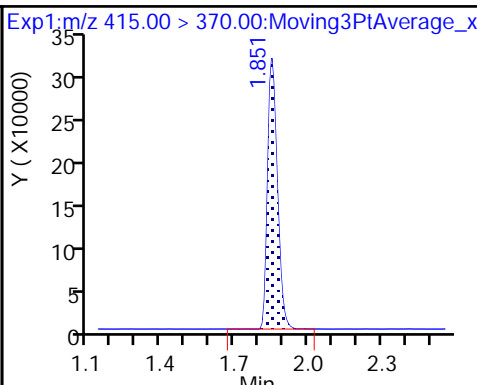
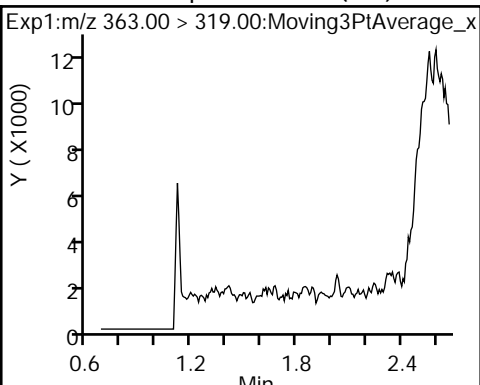
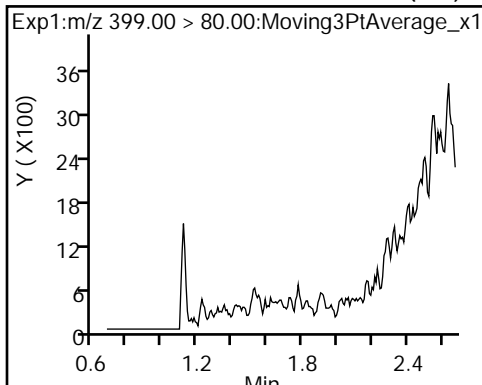
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

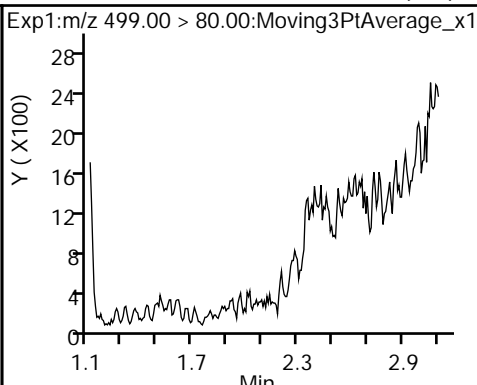
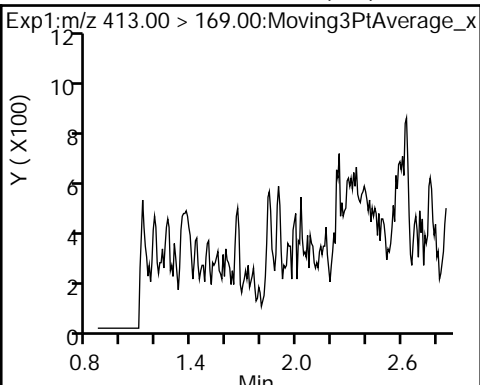
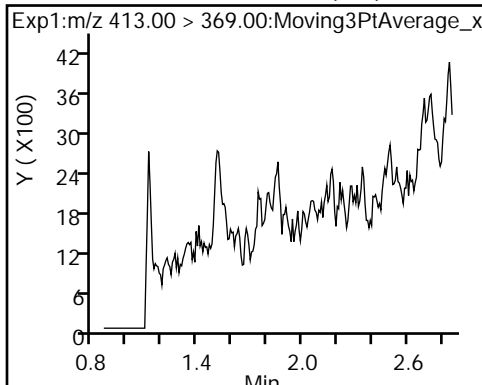
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

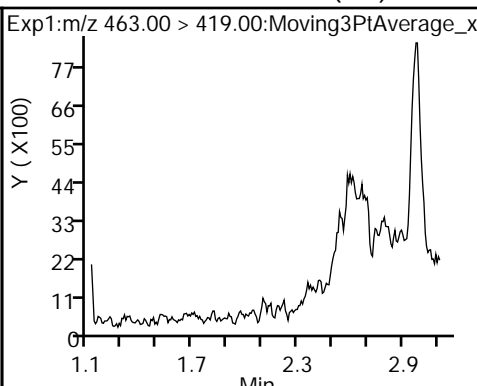
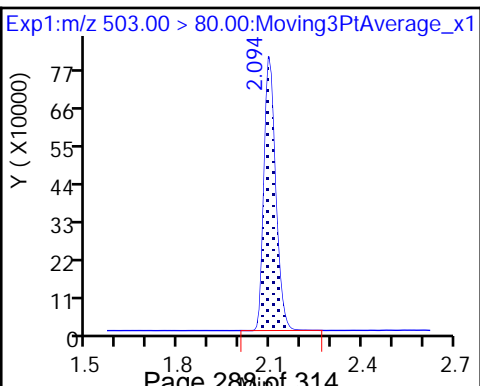
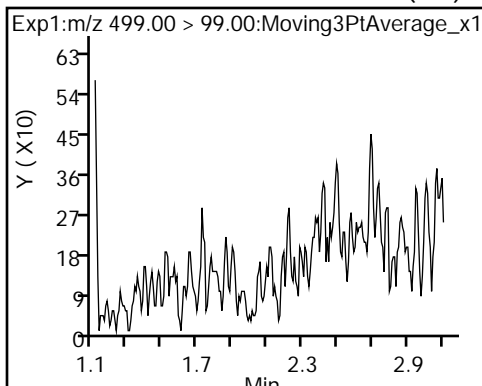
8 Perfluorooctane sulfonic acid (ND)



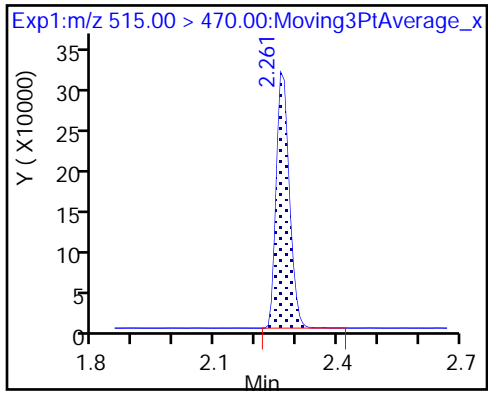
8 Perfluorooctane sulfonic acid (ND)

\* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_051.d  
 Lims ID: MB 320-218953/1-A  
 Client ID:  
 Sample Type: MB  
 Inject. Date: 23-Apr-2018 21:27:40 ALS Bottle#: 34 Worklist Smp#: 19  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: mb 320-218953/1-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:48 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.59	95.92
\$ 10 13C2 PFDA	10.0	9.25	92.51

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: LCS 320-218953/2-A  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_052.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 250.0 (mL) Date Analyzed: 04/23/2018 21:32  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219464 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	247	M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	124		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	117		24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	196		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	61.0		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	570		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	115		70-130
STL00996	13C2 PFDA	110		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_052.d  
 Lims ID: LCS 320-218953/2-A  
 Client ID:  
 Sample Type: LCS  
 Inject. Date: 23-Apr-2018 21:32:21 ALS Bottle#: 35 Worklist Smp#: 20  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: lcs 320-218953/2-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:48 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 11:04:05

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.396	1.396	0.0	1.000	10052848	142.6		6555	
298.90 > 99.00	1.396	1.396	0.0	1.000	7787248		1.29(0.00-0.00)	6929	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.525	1.525	0.0	1.000	988563	11.5		8184	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.669	1.677	-0.008	1.000	5380514	48.9		1575	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.669	1.677	-0.008	1.000	1323095	15.3		142	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.859	0.0		807996	10.0		4962	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.859	0.0	1.000	2659238	31.0		516	
413.00 > 169.00	1.859	1.859	0.0	1.000	1369868		1.94(0.00-0.00)	1236	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.109	2.102	0.007	1.000	4410933	61.7		1229	a
499.00 > 99.00	2.102	2.102	0.0	0.996	945586		4.66(0.00-0.00)	1979	a
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.102	0.0		1921927	28.7		965	
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.117	0.0	1.000	1983789	29.1		438	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.269	0.0	1.000	756244	11.0		7961	

## QC Flag Legend

Review Flags

a - User Assigned ID

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_052.d

Injection Date: 23-Apr-2018 21:32:21

Instrument ID: A8\_N

Lims ID: LCS 320-218953/2-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 35

Worklist Smp#: 20

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

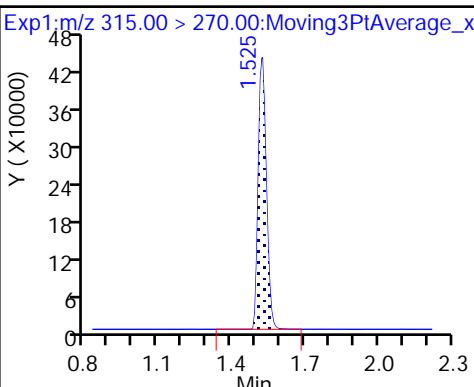
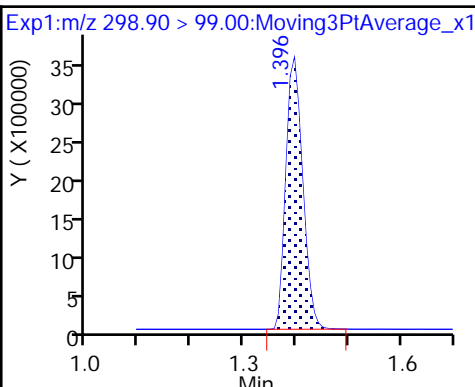
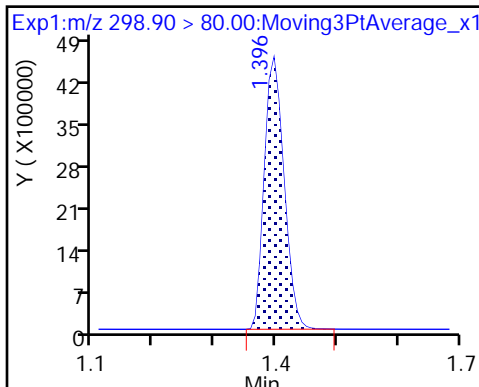
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

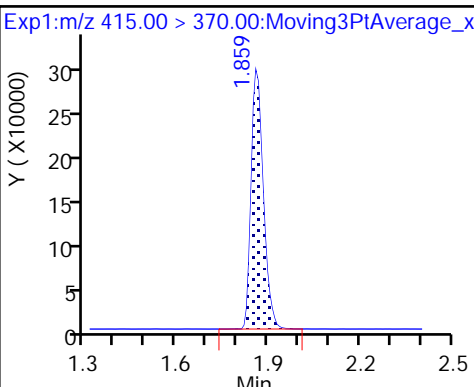
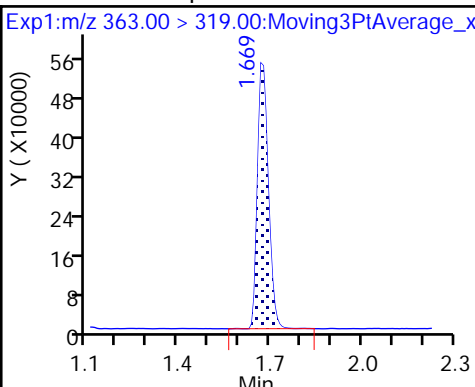
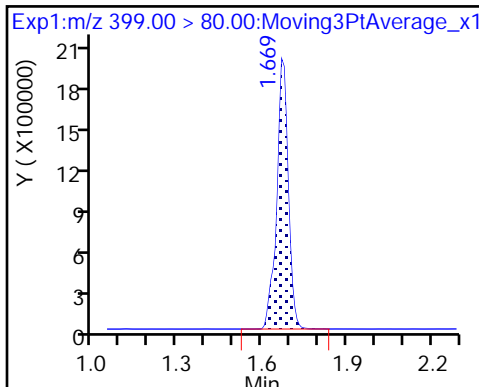
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

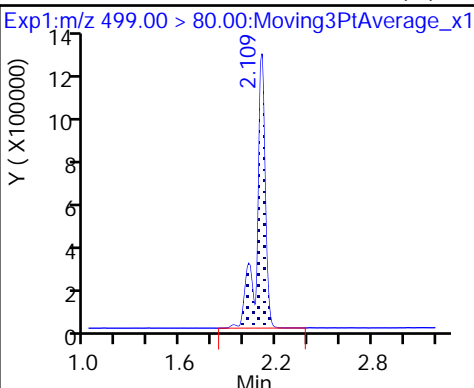
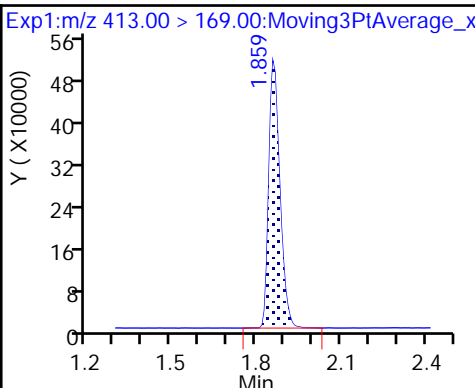
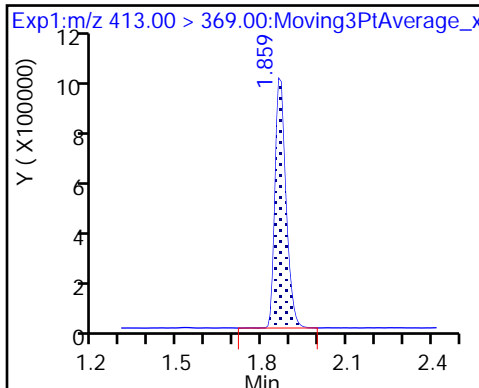
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

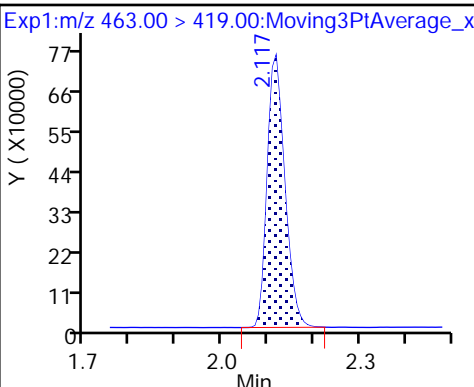
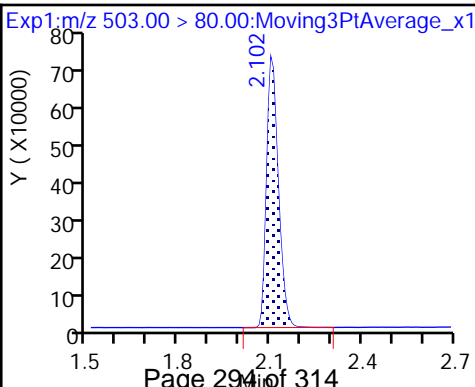
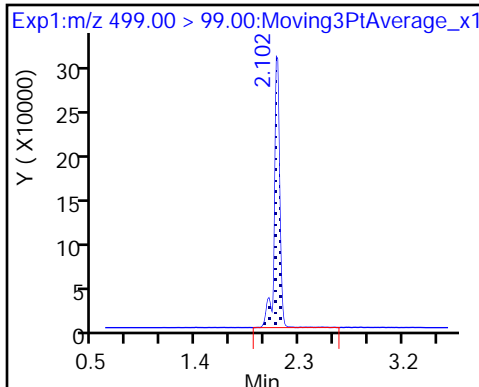
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid

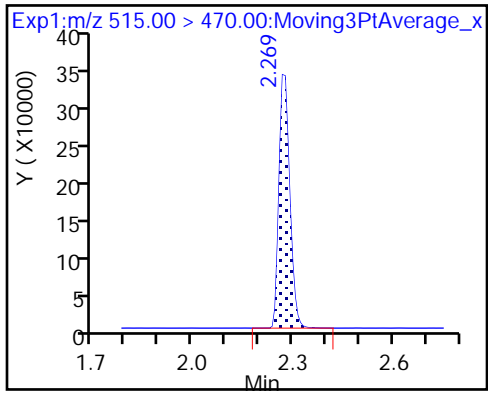
\* 7 13C4 PFOS

9 Perfluorononanoic acid





\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_052.d  
 Lims ID: LCS 320-218953/2-A  
 Client ID:  
 Sample Type: LCS  
 Inject. Date: 23-Apr-2018 21:32:21 ALS Bottle#: 35 Worklist Smp#: 20  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: lcs 320-218953/2-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:48 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 11:04:05

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	11.5	115.08
\$ 10 13C2 PFDA	10.0	11.0	110.05

TestAmerica Sacramento

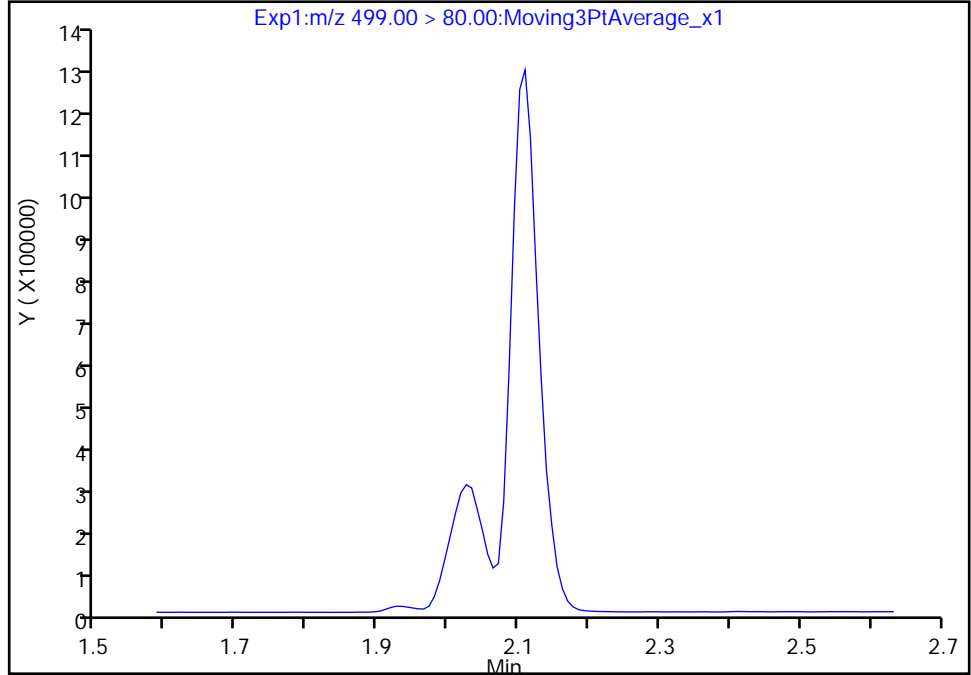
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Injection Date: 23-Apr-2018 21:32:21 Instrument ID: A8\_N  
Lims ID: LCS 320-218953/2-A  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 35 Worklist Smp#: 20  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

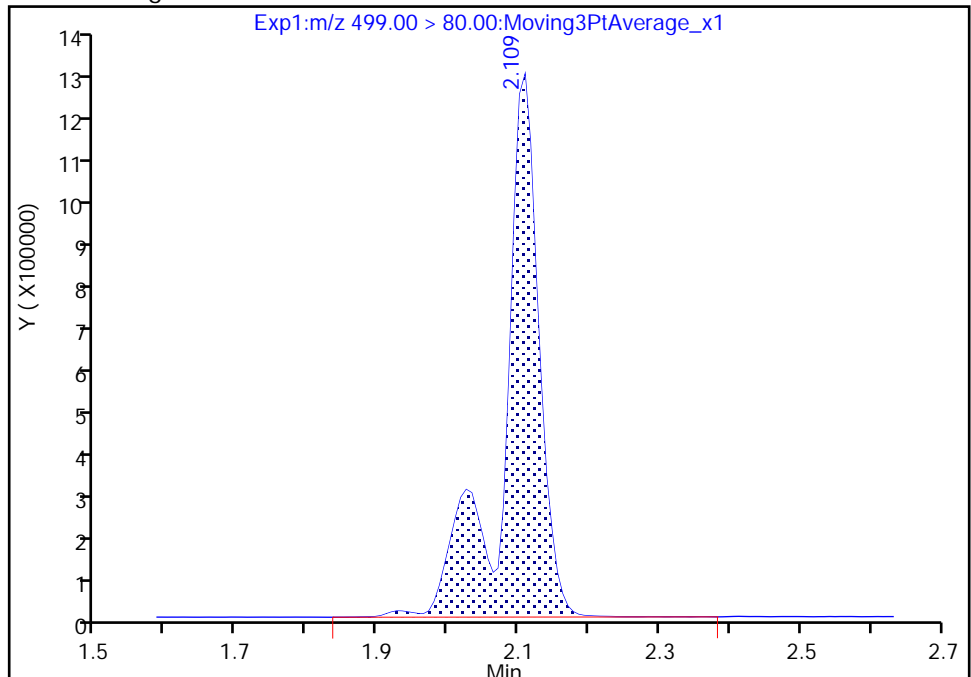
Not Detected  
Expected RT: 2.10

Processing Integration Results



RT: 2.11  
Area: 4410933  
Amount: 61.742729  
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 24-Apr-2018 11:03:59  
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: LCSD 320-218953/3-A  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_053.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 250.0 (mL) Date Analyzed: 04/23/2018 21:37  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219464 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	207	M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	101		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	98.5		24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	164		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	50.0		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	445		90	36	16

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

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_053.d  
 Lims ID: LCSD 320-218953/3-A  
 Client ID:  
 Sample Type: LCSD  
 Inject. Date: 23-Apr-2018 21:37:01 ALS Bottle#: 36 Worklist Smp#: 21  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: lcsd 320-218953/3-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:48 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 11:04:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.388	1.396	-0.008	1.000	9191017	111.2		5819	
298.90 > 99.00	1.381	1.396	-0.015	0.995	7161443		1.28(0.00-0.00)	6249	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.510	1.525	-0.015	1.000	962601	9.42		7871	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.662	1.677	-0.015	1.000	5279553	40.9		1442	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.662	1.677	-0.015	1.000	1289936	12.5		139	
* 6 13C2-PFOA									
415.00 > 370.00	1.851	1.859	-0.008		960967	10.0		6340	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.851	1.859	-0.008	1.000	2576376	25.2		467	
413.00 > 169.00	1.851	1.859	-0.008	1.000	1357643		1.90(0.00-0.00)	1234	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.102	2.102	0.0	1.000	4336787	51.8		1255	a
499.00 > 99.00	2.102	2.102	0.0	1.000	909142		4.77(0.00-0.00)	1554	a
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.102	0.0		2254298	28.7		1194	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.117	-0.008	1.000	1992431	24.6		447	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.269	0.0	1.000	767969	9.40		7844	

## QC Flag Legend

### Review Flags

a - User Assigned ID

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_053.d

Injection Date: 23-Apr-2018 21:37:01

Instrument ID: A8\_N

Lims ID: LCSD 320-218953/3-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 36

Worklist Smp#: 21

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

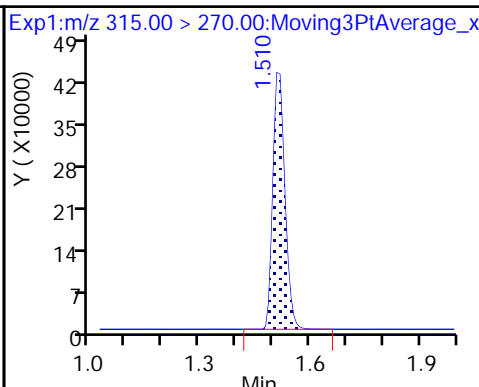
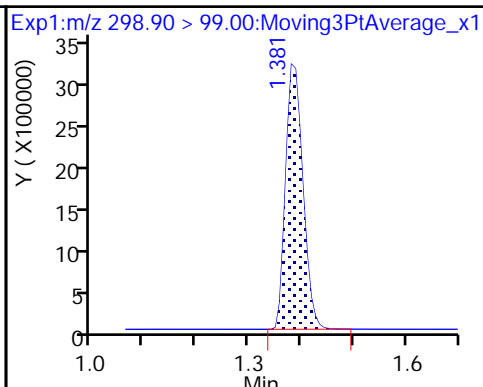
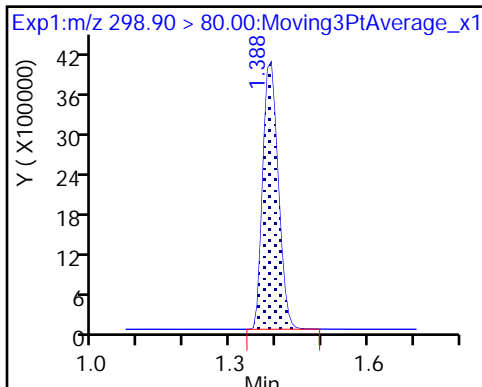
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

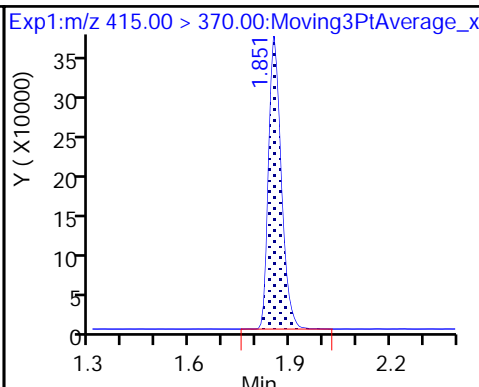
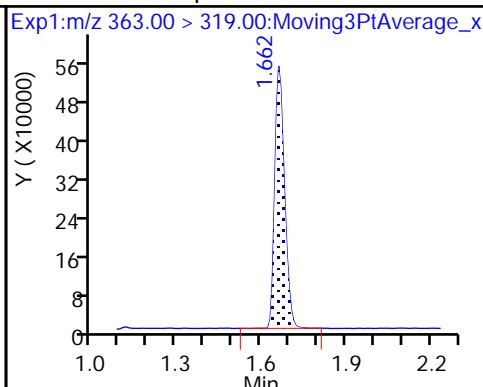
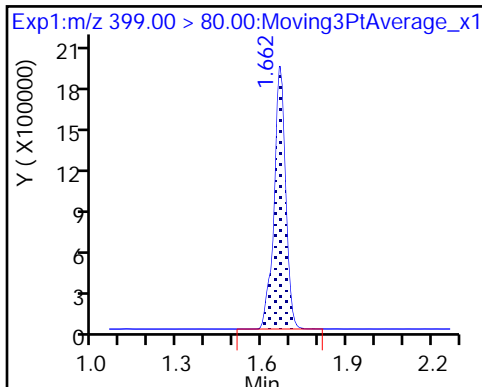
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

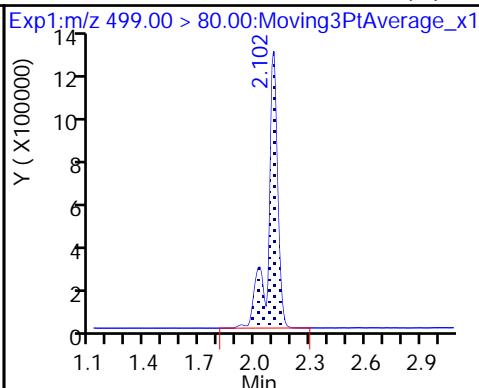
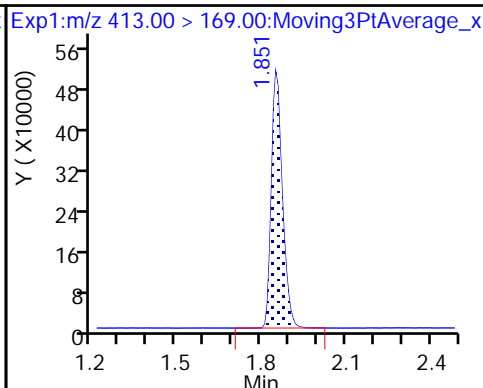
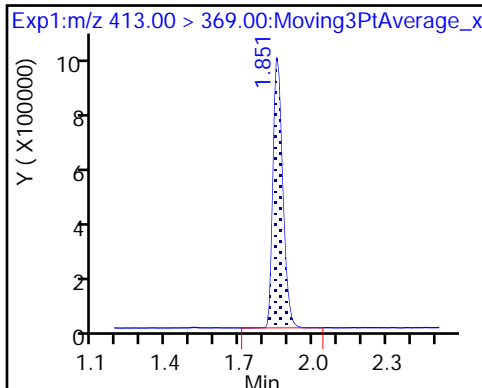
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

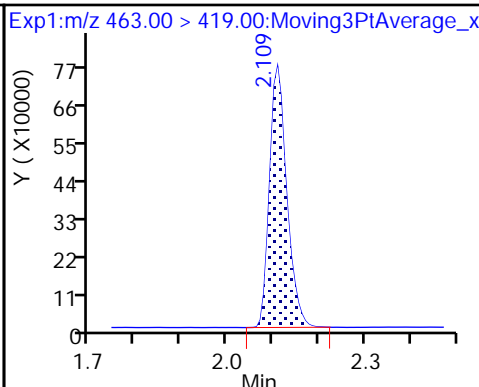
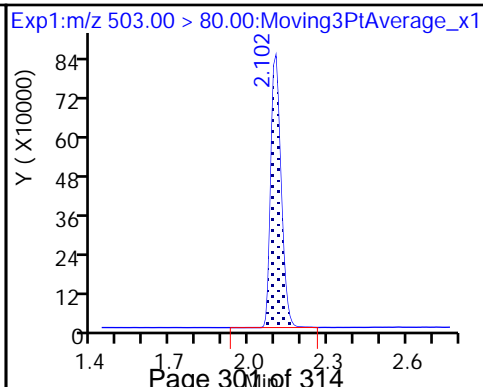
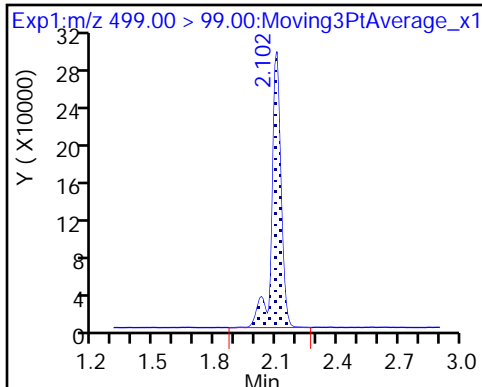
8 Perfluorooctane sulfonic acid (M)



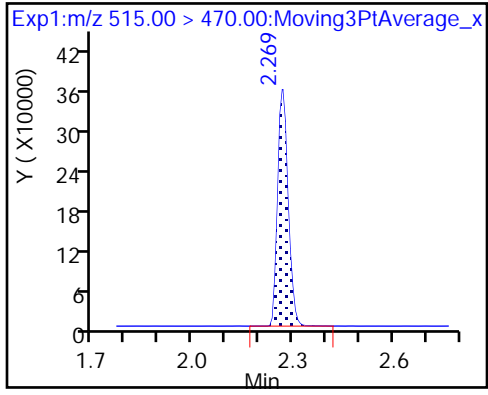
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA





TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_053.d  
 Lims ID: LCSD 320-218953/3-A  
 Client ID:  
 Sample Type: LCSD  
 Inject. Date: 23-Apr-2018 21:37:01 ALS Bottle#: 36 Worklist Smp#: 21  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: lcsd 320-218953/3-a  
 Misc. Info.: Plate: 1 Rack: 3  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 24-Apr-2018 11:12:48 Calib Date: 11-Apr-2018 12:09:09  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180411-56557.b\2018.04.11\_537ICALB\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 11:04:17

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.42	94.22
\$ 10 13C2 PFDA	10.0	9.40	93.97

TestAmerica Sacramento

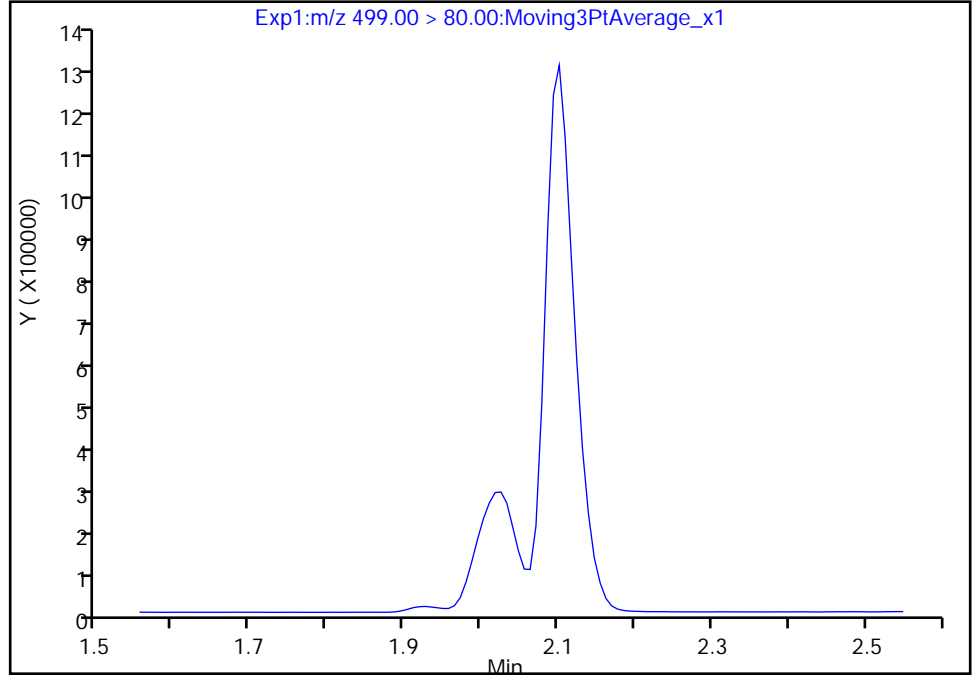
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180424-57106.b\2018.04.23\_537C\_053.d  
Injection Date: 23-Apr-2018 21:37:01 Instrument ID: A8\_N  
Lims ID: LCSD 320-218953/3-A  
Client ID:  
Operator ID: SACINSTLCMS01 ALS Bottle#: 36 Worklist Smp#: 21  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

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

Signal: 1

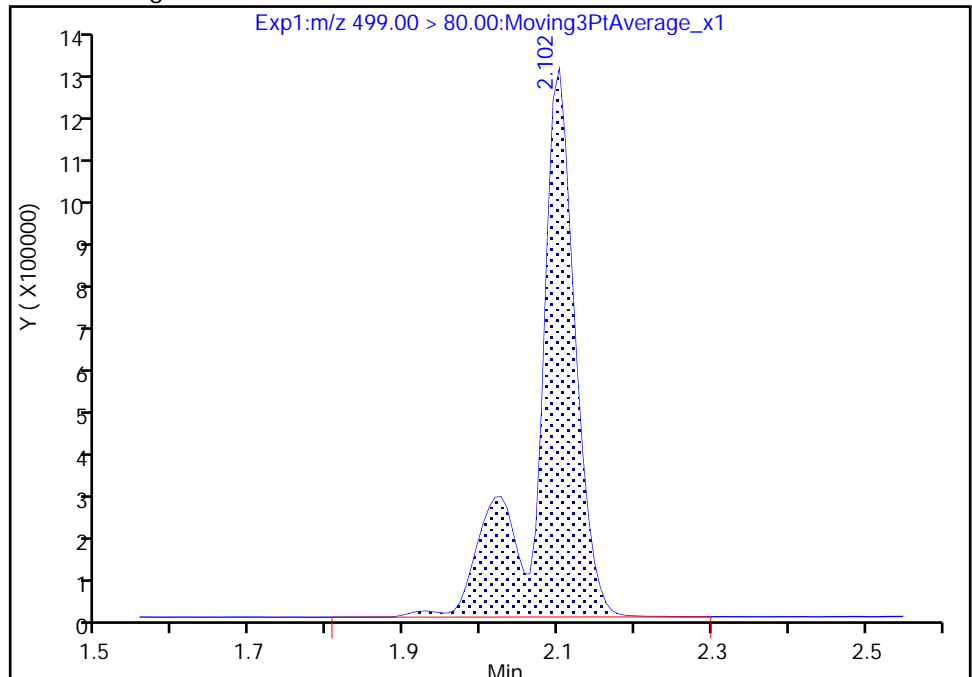
Not Detected  
Expected RT: 2.10

Processing Integration Results



Manual Integration Results

RT: 2.10  
Area: 4336787  
Amount: 51.754607  
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 11:04:11  
Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Instrument ID: A8\_N Start Date: 04/11/2018 11:45

Analysis Batch Number: 217453 End Date: 04/11/2018 12:27

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-217453/3		04/11/2018 11:45	1	2018.04.11_537I CALB 004.d	GeminiC18 3x100 3(mm)
IC 320-217453/4		04/11/2018 11:50	1	2018.04.11_537I CALB 005.d	GeminiC18 3x100 3(mm)
IC 320-217453/5		04/11/2018 11:55	1	2018.04.11_537I CALB 006.d	GeminiC18 3x100 3(mm)
IC 320-217453/6 ICISAV		04/11/2018 11:59	1	2018.04.11_537I CALB 007.d	GeminiC18 3x100 3(mm)
IC 320-217453/7		04/11/2018 12:04	1	2018.04.11_537I CALB 008.d	GeminiC18 3x100 3(mm)
IC 320-217453/8		04/11/2018 12:09	1	2018.04.11_537I CALB 009.d	GeminiC18 3x100 3(mm)
ZZZZZ		04/11/2018 12:13	1		GeminiC18 3x100 3(mm)
CCVL 320-217453/10		04/11/2018 12:18	1	2018.04.11_537I CALB 011.d	GeminiC18 3x100 3(mm)
ICB 320-217453/11		04/11/2018 12:23	1		GeminiC18 3x100 3(mm)
ICV 320-217453/12		04/11/2018 12:27	1	2018.04.11_537I CALB 013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Instrument ID: A8\_N Start Date: 04/23/2018 12:21

Analysis Batch Number: 219315 End Date: 04/23/2018 12:21

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-219315/1		04/23/2018 12:21	1	2018.04.23_537A 003.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Instrument ID: A8\_N Start Date: 04/23/2018 21:18

Analysis Batch Number: 219464 End Date: 04/23/2018 22:09

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-219464/17 CCVIS		04/23/2018 21:18	1	2018.04.23_537C 049.d	GeminiC18 3x100 3(mm)
MB 320-218953/1-A		04/23/2018 21:27	1	2018.04.23_537C 051.d	GeminiC18 3x100 3(mm)
LCS 320-218953/2-A		04/23/2018 21:32	1	2018.04.23_537C 052.d	GeminiC18 3x100 3(mm)
LCSD 320-218953/3-A		04/23/2018 21:37	1	2018.04.23_537C 053.d	GeminiC18 3x100 3(mm)
ZZZZZ		04/23/2018 21:41	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/23/2018 21:46	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/23/2018 21:51	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/23/2018 21:55	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/23/2018 22:00	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/23/2018 22:05	1		GeminiC18 3x100 3(mm)
CCV 320-219464/28 CCVIS		04/23/2018 22:09	1	2018.04.23_537C 060.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Instrument ID: A8\_N Start Date: 04/23/2018 22:09

Analysis Batch Number: 219466 End Date: 04/23/2018 23:05

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-219466/28 CCVIS		04/23/2018 22:09	1	2018.04.23_537C 060.d	GeminiC18 3x100 3(mm)
ZZZZZ		04/23/2018 22:19	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/23/2018 22:28	1		GeminiC18 3x100 3(mm)
320-38284-1		04/23/2018 22:33	1	2018.04.23_537C 065.d	GeminiC18 3x100 3(mm)
320-38284-2		04/23/2018 22:37	1	2018.04.23_537C 066.d	GeminiC18 3x100 3(mm)
320-38284-3		04/23/2018 22:42	1	2018.04.23_537C 067.d	GeminiC18 3x100 3(mm)
320-38284-4		04/23/2018 22:47	1	2018.04.23_537C 068.d	GeminiC18 3x100 3(mm)
320-38284-5		04/23/2018 22:51	1	2018.04.23_537C 069.d	GeminiC18 3x100 3(mm)
320-38284-6		04/23/2018 22:56	1	2018.04.23_537C 070.d	GeminiC18 3x100 3(mm)
320-38284-7		04/23/2018 23:01	1	2018.04.23_537C 071.d	GeminiC18 3x100 3(mm)
CCV 320-219466/40 CCVIS		04/23/2018 23:05	1	2018.04.23_537C 072.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Instrument ID: A8\_N Start Date: 04/23/2018 23:05

Analysis Batch Number: 219468 End Date: 04/23/2018 23:24

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-219468/40 CCVIS		04/23/2018 23:05	1	2018.04.23_537C 072.d	GeminiC18 3x100 3(mm)
320-38284-8		04/23/2018 23:15	1	2018.04.23_537C 074.d	GeminiC18 3x100 3(mm)
320-38284-9		04/23/2018 23:19	1	2018.04.23_537C 075.d	GeminiC18 3x100 3(mm)
CCV 320-219468/44 CCVIS		04/23/2018 23:24	1	2018.04.23_537C 076.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Batch Number: 218953 Batch Start Date: 04/20/18 09:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 04/23/18 14:20

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-HSP 00029
MB 320-218953/1		537, 537				250.0 mL	1.0 mL	7 SU	
LCS 320-218953/2		537, 537				250.0 mL	1.0 mL	7 SU	100 uL
LCSD 320-218953/3		537, 537				250.0 mL	1.0 mL	7 SU	100 uL
320-38284-A-1	WGNA-041718-DUP-32	537, 537	T	280.45 g	28.11 g	252.3 mL	1.0 mL	7 SU	
320-38284-A-2	NAWC-041718-RW-278	537, 537	T	273.15 g	28.20 g	245 mL	1.0 mL	7 SU	
320-38284-A-3	NAWC-041718-FRB-278	537, 537	T	276.07 g	27.71 g	248.4 mL	1.0 mL	7 SU	
320-38284-A-4	NAWC-041718-RW-360	537, 537	T	273.28 g	28.61 g	244.7 mL	1.0 mL	7 SU	
320-38284-A-5	NAWC-041718-FRB-360	537, 537	T	279.49 g	28.16 g	251.3 mL	1.0 mL	7 SU	
320-38284-A-6	NAWC-041718-RW-150	537, 537	T	280.35 g	28.09 g	252.3 mL	1.0 mL	7 SU	
320-38284-A-7	NAWC-041718-FRB-150	537, 537	T	280.50 g	27.67 g	252.8 mL	1.0 mL	7 SU	
320-38284-A-8	NAWC-041718-RW-179	537, 537	T	277.17 g	28.85 g	248.3 mL	1.0 mL	7 SU	
320-38284-A-9	NAWC-041718-FRB-179	537, 537	T	278.11 g	27.62 g	250.5 mL	1.0 mL	7 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00066	LC537-SU 00064	AnalysisComment			
MB 320-218953/1		537, 537		100 uL	100 uL	C1 ND			
LCS 320-218953/2		537, 537		100 uL	100 uL	C1 ND			
LCSD 320-218953/3		537, 537		100 uL	100 uL	C1 ND			
320-38284-A-1	WGNA-041718-DUP-32	537, 537	T	100 uL	100 uL	C1 ND			
320-38284-A-2	NAWC-041718-RW-278	537, 537	T	100 uL	100 uL	C1 ND			
320-38284-A-3	NAWC-041718-FRB-278	537, 537	T	100 uL	100 uL	C1 ND			
320-38284-A-4	NAWC-041718-RW-360	537, 537	T	100 uL	100 uL	C1 ND			
320-38284-A-5	NAWC-041718-FRB-360	537, 537	T	100 uL	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.: 320-38284-1

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

Batch Number: 218953 Batch Start Date: 04/20/18 09:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 04/23/18 14:20

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00066	LC537-SU 00064	AnalysisComment			
320-38284-A-6	NAWC-041718-RW-150	537, 537	T	100 uL	100 uL	C1 ND			
320-38284-A-7	NAWC-041718-FRB-150	537, 537	T	100 uL	100 uL	C1 ND			
320-38284-A-8	NAWC-041718-RW-179	537, 537	T	100 uL	100 uL	C1 ND			
320-38284-A-9	NAWC-041718-FRB-179	537, 537	T	100 uL	100 uL	C1 ND			

Batch Notes	
Analyst ID - Aliquot Step	VPM
Batch Comment	Client labels match TA labels: KMK
Analyst ID - Concentration	SKD
Analyst ID - Final Volume Step	VPM
Internal Standard ID#	1208544
Manifold ID	2, 4, 9
Methanol ID	1207213
pH Indicator ID	3817
Pipette ID	O43093F
Analyst ID - IS Reagent Drop	VPM
Analyst ID - IS Reagent Drop Witness	JER
Analyst ID - SU Reagent Drop	KMK
Analyst ID - SU Reagent Drop Witness	TWL
Analyst ID - TA Reagent Drop	KMK
Analyst ID - TA Reagent Drop Witness	TWL
SPE Cartridge Lot ID	6369499-12
Trizma ID	SLBR5241V
Reagent Water ID	4-18-18

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



320-38284 Chain of Custody

### Chain of Custody Record

### TestAmerica Sacramento

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



THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

COC No: 1 of 1 COCs

Date: 4/17/2018

Carrier: FedEx

Regulatory Program:  IDW  IMPDES  RCRA  Other:

Project Manager: Andy Frebowitz  
Tel/Fax: 610.382.1170

Site Contact: Mary Kay Bond

**Tetra Tech**  
234 Mall Boulevard Suite 260  
King of Prussia, PA 19406  
610-382-1174  
610-491-9688

Project Name: WEO4  
Site: WEO4  
P O # 1132358 (through EarthToxics)

**Client Contact**

Lab Contact: Dave Alltucker  
Lab Contact: Mary Kay Bond

**Analysis Turnaround Time**  
 CALENDAR DAYS  WORKING DAYS  
 TAT if different from Below 21  
 2 weeks  
 1 week  
 2 days  
 1 day

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	EPA 537 UCMR3	Sample Specific Notes:
WGNA-041718-DUP-32	4/17/2018	7:00	G	DW	2	N	N	Y	Duplicate
NAWC-041718-RW-278	4/17/2018	8:10	G	DW	2	N	N	Y	
NAWC-041718-FRB-278	4/17/2018	8:05	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-041718-RW-360	4/17/2018	8:25	G	DW	2	N	N	Y	
NAWC-041718-FRB-360	4/17/2018	8:20	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-041718-RW-150	4/17/2018	9:10	G	DW	2	N	N	Y	
NAWC-041718-FRB-150	4/17/2018	9:05	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-041718-RW-179	4/17/2018	10:10	G	DW	2	N	N	Y	
NAWC-041718-FRB-179	4/17/2018	10:05	G	DW	2	N	N	Y	Field Reagent Blank
						6			

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

**Possible Hazard Identification:**  
 Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the  
 Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

**Fed Ex Tracking: 7720 1664 3165**

Return to Client  Disposal by Lab  Archive for \_\_\_\_\_ Months

**Custody Seal No.:** \_\_\_\_\_  
 Company: Tetra Tech  
 Date/Time: 4/17/2018 16:00

**Relinquished by:** Mary Kay Bond  
 Company: Tetra Tech  
 Date/Time: 4/17/2018 16:00

**Relinquished by:** \_\_\_\_\_  
 Company: \_\_\_\_\_  
 Date/Time: \_\_\_\_\_

**Relinquished by:** \_\_\_\_\_  
 Company: \_\_\_\_\_  
 Date/Time: \_\_\_\_\_

**Received by:** \_\_\_\_\_  
 Company: M-SAC  
 Date/Time: 4/18/18 0905

**Received by:** \_\_\_\_\_  
 Company: \_\_\_\_\_  
 Date/Time: \_\_\_\_\_

**Received in Laboratory by:** \_\_\_\_\_  
 Company: \_\_\_\_\_  
 Date/Time: \_\_\_\_\_

**Therm ID No.:** 1122 ice  
 Cooler Temp. (°C): Obs'd: 19 Corr'd: 19

# Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-38284-1

**Login Number: 38284**

**List Source: TestAmerica Sacramento**

**List Number: 1**

**Creator: Turpen, Troy**

<b>Question</b>	<b>Answer</b>	<b>Comment</b>
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	094861, 094862
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	

"WGNA-041718-DUP-32","537","RES","320-38284-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","J M","6.7","DL","","TRG","","","40","LOQ","YES","-99","","252.3","1.0","16",""

"WGNA-041718-DUP-32","537","RES","320-38284-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","22","ng/L","","2.8","DL","","TRG","","","20","LOQ","YES","-99","","252.3","1.0","7.9",""

"WGNA-041718-DUP-32","537","RES","320-38284-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","7.7","ng/L","J","5.4","DL","","TRG","","","30","LOQ","YES","-99","","252.3","1.0","12",""

"WGNA-041718-DUP-32","537","RES","320-38284-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U","16","DL","","TRG","","","89","LOQ","YES","-99","","252.3","1.0","36",""

"WGNA-041718-DUP-32","537","RES","320-38284-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","5.9","ng/L","J","1.9","DL","","TRG","","","9.9","LOQ","YES","-99","","252.3","1.0","4.0",""

"WGNA-041718-DUP-32","537","RES","320-38284-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U M","7.9","DL","","TRG","","","24","LOQ","YES","-99","","252.3","1.0","20",""

"WGNA-041718-DUP-32","537","RES","320-38284-1","TALSAC","STL00993","13C2  
PFHxA","36","ng/L","","-99","DL","","SURR","90","","-99","LOQ","YES","39.6","","252.3","1.0","0",""

"WGNA-041718-DUP-32","537","RES","320-38284-1","TALSAC","STL00996","13C2  
PFDA","36","ng/L","","-99","DL","","SURR","90","","-99","LOQ","YES","39.6","","252.3","1.0","0",""

"NAWC-041718-RW-278","537","RES","320-38284-2","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","15","ng/L","J M","6.9","DL","","TRG","","","41","LOQ","YES","-99","","245","1.0","16",""

"NAWC-041718-RW-278","537","RES","320-38284-2","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","22","ng/L","","2.9","DL","","TRG","","","20","LOQ","YES","-99","","245","1.0","8.2",""

"NAWC-041718-RW-278","537","RES","320-38284-2","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.6","DL","","TRG","","","31","LOQ","YES","-99","","245","1.0","12",""

"NAWC-041718-RW-278","537","RES","320-38284-2","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","37","ng/L","U M","16","DL","","TRG","","","92","LOQ","YES","-99","","245","1.0","37",""

"NAWC-041718-RW-278","537","RES","320-38284-2","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","8.7","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES","-99","","245","1.0","4.1",""

"NAWC-041718-RW-278","537","RES","320-38284-2","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U M","8.2","DL","","TRG","","","24","LOQ","YES","-99","","245","1.0","20",""

"NAWC-041718-RW-278","537","RES","320-38284-2","TALSAC","STL00993","13C2  
PFHxA","38","ng/L","","-99","DL","","SURR","93","","-99","LOQ","YES","40.8","","245","1.0","0",""

"NAWC-041718-RW-278","537","RES","320-38284-2","TALSAC","STL00996","13C2  
PFDA","36","ng/L","","-99","DL","","SURR","89","","-99","LOQ","YES","40.8","","245","1.0","0",""

"NAWC-041718-FRB-278","537","RES","320-38284-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","248.4","1.0","16",""

"NAWC-041718-FRB-278","537","RES","320-38284-3","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","8.1","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","248.4","1.0","8.1",""

"NAWC-041718-FRB-278","537","RES","320-38284-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","248.4","1.0","12",""

"NAWC-041718-FRB-278","537","RES","320-38284-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U","16","DL","","TRG","","","91","LOQ","YES","-99","","248.4","1.0","36",""

"NAWC-041718-FRB-278","537","RES","320-38284-3","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","248.4","1.0","4.0",""

"NAWC-041718-FRB-278","537","RES","320-38284-3","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","8.1","DL","","TRG","","","24","LOQ","YES","-99","","248.4","1.0","20",""

"NAWC-041718-FRB-278","537","RES","320-38284-3","TALSAC","STL00993","13C2  
PFHxA","39","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","40.3","","248.4","1.0","0",""

"NAWC-041718-FRB-278","537","RES","320-38284-3","TALSAC","STL00996","13C2  
PFDA","36","ng/L","","-99","DL","","SURR","90","","-99","LOQ","YES","40.3","","248.4","1.0","0",""

"NAWC-041718-RW-360","537","RES","320-38284-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","17","ng/L","J M","6.9","DL","","TRG","","","41","LOQ","YES","-99","","244.7","1.0","16",""

"NAWC-041718-RW-360","537","RES","320-38284-4","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","9.3","ng/L","J","2.9","DL","","TRG","","","20","LOQ","YES","-99","","244.7","1.0","8.2",""

"NAWC-041718-RW-360","537","RES","320-38284-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid

(PFHxS),"12","ng/L","U M","5.6","DL","","TRG","","","31","LOQ","YES","-99","","244.7","1.0","12",""  
"NAWC-041718-RW-360","537","RES","320-38284-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","37","ng/L","U","16","DL","","TRG","","","92","LOQ","YES","-99","","244.7","1.0","37",""  
"NAWC-041718-RW-360","537","RES","320-38284-4","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","2.6","ng/L","J M","1.9","DL","","TRG","","","10","LOQ","YES","-99","","244.7","1.0","4.1",""  
"NAWC-041718-RW-360","537","RES","320-38284-4","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","20","ng/L","U M","8.2","DL","","TRG","","","25","LOQ","YES","-99","","244.7","1.0","20",""  
"NAWC-041718-RW-360","537","RES","320-38284-4","TALSAC","STL00993","13C2  
PFHxA","39","ng/L","","-99","DL","","SURR","95","","-99","LOQ","YES","40.9","","244.7","1.0","0",""  
"NAWC-041718-RW-360","537","RES","320-38284-4","TALSAC","STL00996","13C2  
PFDA","36","ng/L","","-99","DL","","SURR","89","","-99","LOQ","YES","40.9","","244.7","1.0","0",""  
"NAWC-041718-FRB-360","537","RES","320-38284-5","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","251.3","1.0","16",""  
"NAWC-041718-FRB-360","537","RES","320-38284-5","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","251.3","1.0","8.0",""  
"NAWC-041718-FRB-360","537","RES","320-38284-5","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","251.3","1.0","12",""  
"NAWC-041718-FRB-360","537","RES","320-38284-5","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","251.3","1.0","36",""  
"NAWC-041718-FRB-360","537","RES","320-38284-5","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","9.9","LOQ","YES","-99","","251.3","1.0","4.0",""  
"NAWC-041718-FRB-360","537","RES","320-38284-5","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","251.3","1.0","20",""  
"NAWC-041718-FRB-360","537","RES","320-38284-5","TALSAC","STL00993","13C2  
PFHxA","36","ng/L","","-99","DL","","SURR","90","","-99","LOQ","YES","39.8","","251.3","1.0","0",""  
"NAWC-041718-FRB-360","537","RES","320-38284-5","TALSAC","STL00996","13C2  
PFDA","34","ng/L","","-99","DL","","SURR","85","","-99","LOQ","YES","39.8","","251.3","1.0","0",""  
"NAWC-041718-RW-150","537","RES","320-38284-6","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS)","7.9","ng/L","J M","6.7","DL","","TRG","","","40","LOQ","YES","-99","","252.3","1.0","16",""  
"NAWC-041718-RW-150","537","RES","320-38284-6","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","17","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","252.3","1.0","7.9",""  
"NAWC-041718-RW-150","537","RES","320-38284-6","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","12","ng/L","U","5.4","DL","","TRG","","","30","LOQ","YES","-99","","252.3","1.0","12",""  
"NAWC-041718-RW-150","537","RES","320-38284-6","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","36","ng/L","U M","16","DL","","TRG","","","89","LOQ","YES","-99","","252.3","1.0","36",""  
"NAWC-041718-RW-150","537","RES","320-38284-6","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","8.1","ng/L","J","1.9","DL","","TRG","","","9.9","LOQ","YES","-99","","252.3","1.0","4.0",""  
"NAWC-041718-RW-150","537","RES","320-38284-6","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","20","ng/L","U M","7.9","DL","","TRG","","","24","LOQ","YES","-99","","252.3","1.0","20",""  
"NAWC-041718-RW-150","537","RES","320-38284-6","TALSAC","STL00993","13C2  
PFHxA","40","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","39.6","","252.3","1.0","0",""  
"NAWC-041718-RW-150","537","RES","320-38284-6","TALSAC","STL00996","13C2  
PFDA","38","ng/L","","-99","DL","","SURR","95","","-99","LOQ","YES","39.6","","252.3","1.0","0",""  
"NAWC-041718-FRB-150","537","RES","320-38284-7","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS)","16","ng/L","U","6.7","DL","","TRG","","","40","LOQ","YES","-99","","252.8","1.0","16",""  
"NAWC-041718-FRB-150","537","RES","320-38284-7","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","7.9","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","252.8","1.0","7.9",""  
"NAWC-041718-FRB-150","537","RES","320-38284-7","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","12","ng/L","U","5.4","DL","","TRG","","","30","LOQ","YES","-99","","252.8","1.0","12",""  
"NAWC-041718-FRB-150","537","RES","320-38284-7","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","36","ng/L","U","16","DL","","TRG","","","89","LOQ","YES","-99","","252.8","1.0","36",""  
"NAWC-041718-FRB-150","537","RES","320-38284-7","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","9.9","LOQ","YES","-99","","252.8","1.0","4.0",""  
"NAWC-041718-FRB-150","537","RES","320-38284-7","TALSAC","375-95-1","Perfluorononanoic acid

(PFNA),"20","ng/L","U","7.9","DL","","TRG","","","24","LOQ","YES","-99","","252.8","1.0","20","","  
"NAWC-041718-FRB-150","537","RES","320-38284-7","TALSAC","STL00993","13C2  
PFHxA","38","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","39.6","","252.8","1.0","0","","  
"NAWC-041718-FRB-150","537","RES","320-38284-7","TALSAC","STL00996","13C2  
PFDA","37","ng/L","","-99","DL","","SURR","93","","-99","LOQ","YES","39.6","","252.8","1.0","0","","  
"NAWC-041718-RW-179","537","RES","320-38284-8","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS)","15","ng/L","J M","6.8","DL","","TRG","","","40","LOQ","YES","-99","","248.3","1.0","16","","  
"NAWC-041718-RW-179","537","RES","320-38284-8","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","22","ng/L","","2.8","DL","","TRG","","","20","LOQ","YES","-99","","248.3","1.0","8.1","","  
"NAWC-041718-RW-179","537","RES","320-38284-8","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","7.8","ng/L","J","5.5","DL","","TRG","","","30","LOQ","YES","-99","","248.3","1.0","12","","  
"NAWC-041718-RW-179","537","RES","320-38284-8","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","36","ng/L","U","16","DL","","TRG","","","91","LOQ","YES","-99","","248.3","1.0","36","","  
"NAWC-041718-RW-179","537","RES","320-38284-8","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","6.5","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES","-99","","248.3","1.0","4.0","","  
"NAWC-041718-RW-179","537","RES","320-38284-8","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","20","ng/L","U M","8.1","DL","","TRG","","","24","LOQ","YES","-99","","248.3","1.0","20","","  
"NAWC-041718-RW-179","537","RES","320-38284-8","TALSAC","STL00993","13C2  
PFHxA","42","ng/L","","-99","DL","","SURR","103","","-99","LOQ","YES","40.3","","248.3","1.0","0","","  
"NAWC-041718-RW-179","537","RES","320-38284-8","TALSAC","STL00996","13C2  
PFDA","33","ng/L","","-99","DL","","SURR","82","","-99","LOQ","YES","40.3","","248.3","1.0","0","","  
"NAWC-041718-FRB-179","537","RES","320-38284-9","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","250.5","1.0","16","","  
"NAWC-041718-FRB-179","537","RES","320-38284-9","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","250.5","1.0","8.0","","  
"NAWC-041718-FRB-179","537","RES","320-38284-9","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","250.5","1.0","12","","  
"NAWC-041718-FRB-179","537","RES","320-38284-9","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250.5","1.0","36","","  
"NAWC-041718-FRB-179","537","RES","320-38284-9","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","250.5","1.0","4.0","","  
"NAWC-041718-FRB-179","537","RES","320-38284-9","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","250.5","1.0","20","","  
"NAWC-041718-FRB-179","537","RES","320-38284-9","TALSAC","STL00993","13C2  
PFHxA","38","ng/L","","-99","DL","","SURR","95","","-99","LOQ","YES","39.9","","250.5","1.0","0","","  
"NAWC-041718-FRB-179","537","RES","320-38284-9","TALSAC","STL00996","13C2  
PFDA","37","ng/L","","-99","DL","","SURR","94","","-99","LOQ","YES","39.9","","250.5","1.0","0","","  
"LCS 320-218953/2-A","537","RES","LCS 320-218953/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS)","247","ng/L","M","6.8","DL","","SPK","112","","40","LOQ","YES","220","","250.0","1.0","16","","  
"LCS 320-218953/2-A","537","RES","LCS 320-218953/2-A","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","124","ng/L","","2.8","DL","","SPK","113","","20","LOQ","YES","110","","250.0","1.0","8.0","","  
"LCS 320-218953/2-A","537","RES","LCS 320-218953/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","196","ng/L","","5.5","DL","","SPK","116","","30","LOQ","YES","168","","250.0","1.0","12","","  
"LCS 320-218953/2-A","537","RES","LCS 320-218953/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","570","ng/L","","16","DL","","SPK","114","","90","LOQ","YES","500","","250.0","1.0","36","","  
"LCS 320-218953/2-A","537","RES","LCS 320-218953/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","61.0","ng/L","","1.9","DL","","SPK","113","","10","LOQ","YES","54.0","","250.0","1.0","4.0","","  
"LCS 320-218953/2-A","537","RES","LCS 320-218953/2-A","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","117","ng/L","","8.0","DL","","SPK","106","","24","LOQ","YES","110","","250.0","1.0","20","","  
"LCS 320-218953/2-A","537","RES","LCS 320-218953/2-A","TALSAC","STL00993","13C2  
PFHxA","46.0","ng/L","","-99","DL","","SURR","115","","-99","LOQ","YES","40.0","","250.0","1.0","0","","  
"LCS 320-218953/2-A","537","RES","LCS 320-218953/2-A","TALSAC","STL00996","13C2  
PFDA","44.0","ng/L","","-99","DL","","SURR","110","","-99","LOQ","YES","40.0","","250.0","1.0","0","","  
"LCSD 320-218953/3-A","537","RES","LCSD 320-218953/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic

acid (PFOS),"207","ng/L","M","6.8","DL","","SPK","94","18","40","LOQ","YES","220","LCS 320-218953/2-A","250.0","1.0","16",""  
"LCSD 320-218953/3-A","537","RES","LCSD 320-218953/3-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","101","ng/L","","2.8","DL","","SPK","92","20","20","LOQ","YES","110","LCS 320-218953/2-A","250.0","1.0","8.0",""  
"LCSD 320-218953/3-A","537","RES","LCSD 320-218953/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","164","ng/L","","5.5","DL","","SPK","97","18","30","LOQ","YES","168","LCS 320-218953/2-A","250.0","1.0","12",""  
"LCSD 320-218953/3-A","537","RES","LCSD 320-218953/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","445","ng/L","","16","DL","","SPK","89","25","90","LOQ","YES","500","LCS 320-218953/2-A","250.0","1.0","36",""  
"LCSD 320-218953/3-A","537","RES","LCSD 320-218953/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","50.0","ng/L","","1.9","DL","","SPK","93","20","10","LOQ","YES","54.0","LCS 320-218953/2-A","250.0","1.0","4.0",""  
"LCSD 320-218953/3-A","537","RES","LCSD 320-218953/3-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","98.5","ng/L","","8.0","DL","","SPK","90","17","24","LOQ","YES","110","LCS 320-218953/2-A","250.0","1.0","20",""  
"LCSD 320-218953/3-A","537","RES","LCSD 320-218953/3-A","TALSAC","STL00993","13C2 PFHxA","37.7","ng/L","","-99","DL","","SURR","94","","-99","LOQ","YES","40.0","LCS 320-218953/2-A","250.0","1.0","0",""  
"LCSD 320-218953/3-A","537","RES","LCSD 320-218953/3-A","TALSAC","STL00996","13C2 PFDA","37.6","ng/L","","-99","DL","","SURR","94","","-99","LOQ","YES","40.0","LCS 320-218953/2-A","250.0","1.0","0",""  
"MB 320-218953/1-A","537","RES","MB 320-218953/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","250.0","1.0","16",""  
"MB 320-218953/1-A","537","RES","MB 320-218953/1-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","250.0","1.0","8.0",""  
"MB 320-218953/1-A","537","RES","MB 320-218953/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","250.0","1.0","12",""  
"MB 320-218953/1-A","537","RES","MB 320-218953/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250.0","1.0","36",""  
"MB 320-218953/1-A","537","RES","MB 320-218953/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","250.0","1.0","4.0",""  
"MB 320-218953/1-A","537","RES","MB 320-218953/1-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","250.0","1.0","20",""  
"MB 320-218953/1-A","537","RES","MB 320-218953/1-A","TALSAC","STL00993","13C2 PFHxA","38.4","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","40.0","","250.0","1.0","0",""  
"MB 320-218953/1-A","537","RES","MB 320-218953/1-A","TALSAC","STL00996","13C2 PFDA","37.0","ng/L","","-99","DL","","SURR","93","","-99","LOQ","YES","40.0","","250.0","1.0","0",""  
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"Unknown","Unknown","NAWC-041718-FRB-278","04/17/2018 08:05","AQ","320-38284-3","FB","","1.90","537","METHOD","RES","04/20/2018 09:26","04/23/2018 22:42","TALSAC","COA","WET","NA","1","NA","NA","","100","320-218953","320-218953","NA","320-219466","320-38284-1","04/18/2018 09:05","04/19/2018 09:05",""  
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219466","320-38284-1","04/18/2018 09:05","04/19/2018 09:05",""  
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5","FB","","1.90","537","METHOD","RES","04/20/2018 09:26","04/23/2018  
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6","NM","","1.90","537","METHOD","RES","04/20/2018 09:26","04/23/2018  
22:56","TALSAC","COA","WET","NA","1","NA","NA","","100","320-218953","320-218953","NA","320-  
219466","320-38284-1","04/18/2018 09:05","04/19/2018 09:05",""  
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7","FB","","1.90","537","METHOD","RES","04/20/2018 09:26","04/23/2018  
23:01","TALSAC","COA","WET","NA","1","NA","NA","","100","320-218953","320-218953","NA","320-  
219466","320-38284-1","04/18/2018 09:05","04/19/2018 09:05",""  
"Unknown","Unknown","NAWC-041718-RW-179","04/17/2018 10:10","AQ","320-38284-  
8","NM","","1.90","537","METHOD","RES","04/20/2018 09:26","04/23/2018  
23:15","TALSAC","COA","WET","NA","1","NA","NA","","100","320-218953","320-218953","NA","320-  
219468","320-38284-1","04/18/2018 09:05","04/19/2018 09:05",""  
"Unknown","Unknown","NAWC-041718-FRB-179","04/17/2018 10:05","AQ","320-38284-  
9","FB","","1.90","537","METHOD","RES","04/20/2018 09:26","04/23/2018  
23:19","TALSAC","COA","WET","NA","1","NA","NA","","100","320-218953","320-218953","NA","320-  
219468","320-38284-1","04/18/2018 09:05","04/19/2018 09:05",""  
"Unknown","Unknown","LCS 320-218953/2-A","","AQ","LCS 320-218953/2-  
A","LCS","","-99","537","METHOD","RES","04/20/2018 09:26","04/23/2018  
21:32","TALSAC","COA","WET","NA","1","NA","NA","","100","320-218953","320-218953","NA","320-  
219464","320-38284-1","04/20/2018 09:26","04/19/2018 09:05",""  
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A","LCSD","","-99","537","METHOD","RES","04/20/2018 09:26","04/23/2018  
21:37","TALSAC","COA","WET","NA","1","NA","NA","","100","320-218953","320-218953","NA","320-  
219464","320-38284-1","04/20/2018 09:26","04/19/2018 09:05",""  
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A","MB","","-99","537","METHOD","RES","04/20/2018 09:26","04/23/2018  
21:27","TALSAC","COA","WET","NA","1","NA","NA","","100","320-218953","320-218953","NA","320-  
219464","320-38284-1","04/20/2018 09:26","04/19/2018 09:05",""



TO: A. FREBOWITZ DATE: MAY 25, 2018

FROM: TERRI L. SOLOMON COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)  
 NAS JRB WILLOW GROVE  
 SAMPLE DELIVERY GROUP (SDG) 320-38284-1

SAMPLES: 4/Field Reagent Blank (FRB)  
 NAWC-041718-FRB-150 NAWC-041718-FRB-179  
 NAWC-041718-FRB-278 NAWC-041718-FRB-360

5/Drinking Water  
 NAWC-041718-RW-150 NAWC-041718-RW-179  
 NAWC-041718-RW-278 NAWC-041718-RW-360  
 WGNA-041718-DUP-32

Overview

The sample set for NAS JRB Willow Grove, SDG 320-38284-1, consisted of five (5) drinking water samples and four (4) FRB samples. All samples were analyzed for select perfluorinated alkyl acids including pentadecafluorooctanoic acid (PFOA), perfluorobutane sulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA) and perfluorooctane sulfonic acid (PFOS). One (1) field duplicate pair, NAWC-041718-RW-179 / WGNA-041718-DUP-32 was included in this SDG.

The samples were collected by Tetra Tech on April 17, 2018 and analyzed by Test America-Sacramento. All sample analyses were conducted in accordance with EPA Method 537 version 1.1 analytical and reporting protocols.

The data contained in this SDG was validated with regard to the following parameters: data completeness, holding times, mass calibration, mass spectral acquisition rate, tune check, instrument sensitivity check, initial/continuing calibrations, ion transitions, laboratory method/FRBs, surrogate spike recoveries, laboratory control sample / laboratory control sample duplicate results, injected internal standard areas and recoveries, field duplicate results, chromatographic resolution, analyte identification, analyte quantitation, and detection limits. Areas of concern are listed below.

**Major**

None.

**Minor**

Detected results reported below the limit of quantitation (LOQ) but above the detection limit (DL) were qualified as estimated (J).

**Notes**

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

<b><u>Sample</u></b>	<b><u>Associated FRB</u></b>
NAWC-041718-RW-150	NAWC-041718-FRB-150
NAWC-041718-RW-179	NAWC-041718-FRB-179

TO: A. FREBOWITZ  
SDG: 320-38284-1

PAGE 2

NAWC-041718-RW-278  
NAWC-041718-RW-360  
WGNA-041718-DUP-32

NAWC-041718-FRB-278  
NAWC-041718-FRB-360  
NAWC-041718-FRB-179

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 method detection limit for sample and method.
<b>J</b>	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
<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>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.

**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: 320-38284-1</b> <b>FRACTION: PFAS</b> <b>MEDIA: WATER</b>	NSAMPLE	NAWC-041718-FRB-150			NAWC-041718-FRB-179			NAWC-041718-FRB-278			NAWC-041718-FRB-360		
	LAB_ID	320-38284-7			320-38284-9			320-38284-3			320-38284-5		
	SAMP_DATE	4/17/2018			4/17/2018			4/17/2018			4/17/2018		
	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)	7.9	U		8	U		8.1	U		8	U		
PERFLUOROBUTANESULFONIC ACID (PFBS)	36	U		36	U		36	U		36	U		
PERFLUOROHEPTANOIC ACID (PFHPA)	4	U		4	U		4	U		4	U		
PERFLUOROHEXANESULFONIC ACID (PFHXS)	12	U		12	U		12	U		12	U		
PERFLUORONONANOIC ACID (PFNA)	20	U		20	U		20	U		20	U		
PERFLUOROOCTANESULFONIC ACID (PFOS)	16	U		16	U		16	U		16	U		

<b>PROJ_NO: 08005-WE04</b> <b>SDG: 320-38284-1</b> <b>FRACTION: PFAS</b> <b>MEDIA: WATER</b>	NSAMPLE	NAWC-041718-RW-150			NAWC-041718-RW-179			NAWC-041718-RW-278			NAWC-041718-RW-360		
	LAB_ID	320-38284-6			320-38284-8			320-38284-2			320-38284-4		
	SAMP_DATE	4/17/2018			4/17/2018			4/17/2018			4/17/2018		
	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)	17	J	P	22			22			9.3	J	P	
PERFLUOROBUTANESULFONIC ACID (PFBS)	36	U		36	U		37	U		37	U		
PERFLUOROHEPTANOIC ACID (PFHPA)	8.1	J	P	6.5	J	P	8.7	J	P	2.6	J	P	
PERFLUOROHEXANESULFONIC ACID (PFHXS)	12	U		7.8	J	P	12	U		12	U		
PERFLUORONONANOIC ACID (PFNA)	20	U		20	U		20	U		20	U		
PERFLUOROOCTANESULFONIC ACID (PFOS)	7.9	J	P	15	J	P	15	J	P	17	J	P	



<b>PROJ_NO: 08005-WE04</b> <b>SDG: 320-38284-1</b> <b>FRACTION: PFAS</b> <b>MEDIA: WATER</b>	NSAMPLE	WGNA-041718-DUP-32		
	LAB_ID	320-38284-1		
	SAMP_DATE	4/17/2018		
	QC_TYPE	FD		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF	NAWC-041718-RW-179		
PARAMETER	RESULT	VQL	QLCD	
PENTADECAFLUOROOCTANOIC ACID (PFOA)	22			
PERFLUOROBUTANESULFONIC ACID (PFBS)	36	U		
PERFLUOROHEPTANOIC ACID (PFHPA)	5.9	J	P	
PERFLUOROHEXANESULFONIC ACID (PFHXS)	7.7	J	P	
PERFLUORONONANOIC ACID (PFNA)	20	U		
PERFLUOROOCETANESULFONIC ACID (PFOS)	16	J	P	

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-041718-DUP-32 Lab Sample ID: 320-38284-1  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_065.d  
 Analysis Method: 537 Date Collected: 04/17/2018 07:00  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 252.3(mL) Date Analyzed: 04/23/2018 22:33  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	J <del>M</del>	40	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	22		20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U <del>M</del>	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.7	J	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.9	J	9.9	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	90		70-130

*Teri L. Selman*  
05/25/2018

FORM I  
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Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-RW-278 Lab Sample ID: 320-38284-2  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_066.d  
 Analysis Method: 537 Date Collected: 04/17/2018 08:10  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 245 (mL) Date Analyzed: 04/23/2018 22:37  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	J <del>M</del>	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	22		20	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	20	U <del>M</del>	24	20	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.7	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U <del>M</del>	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	89		70-130

*Ali L. Salem*  
05/25/2018

FORM I  
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Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-FRB-278 Lab Sample ID: 320-38284-3  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_067.d  
 Analysis Method: 537 Date Collected: 04/17/2018 08:05  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 248.4 (mL) Date Analyzed: 04/23/2018 22:42  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 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)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
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	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	90		70-130

*Steve L. Selman*  
05/25/2018

FORM I  
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Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-RW-360 Lab Sample ID: 320-38284-4  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_068.d  
 Analysis Method: 537 Date Collected: 04/17/2018 08:25  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 244.7(mL) Date Analyzed: 04/23/2018 22:47  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	17	J <del>M</del>	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	9.3	J	20	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	20	U <del>M</del>	25	20	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U <del>M</del>	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.6	J <del>M</del>	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	89		70-130

*Ali L. Salem*  
05/25/2018

FORM I  
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Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-FRB-360 Lab Sample ID: 320-38284-5  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_069.d  
 Analysis Method: 537 Date Collected: 04/17/2018 08:20  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 251.3(mL) Date Analyzed: 04/23/2018 22:51  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 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	9.9	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	85		70-130

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05/25/2018

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-RW-150 Lab Sample ID: 320-38284-6  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_070.d  
 Analysis Method: 537 Date Collected: 04/17/2018 09:10  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 252.3(mL) Date Analyzed: 04/23/2018 22:56  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	7.9	J <del>M</del>	40	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	17	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U <del>M</del>	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.1	J	9.9	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U <del>M</del>	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	95		70-130

*Steve L. Selman*  
05/25/2018

FORM I  
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Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-FRB-150 Lab Sample ID: 320-38284-7  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_071.d  
 Analysis Method: 537 Date Collected: 04/17/2018 09:05  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 252.8(mL) Date Analyzed: 04/23/2018 23:01  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	40	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	7.9	U	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	9.9	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	93		70-130

*Mari L. Selman*  
05/25/2018



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-RW-179 Lab Sample ID: 320-38284-8  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_074.d  
 Analysis Method: 537 Date Collected: 04/17/2018 10:10  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 248.3(mL) Date Analyzed: 04/23/2018 23:15  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219468 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	J <del>M</del>	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	22		20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U <del>M</del>	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.8	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.5	J	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	103		70-130
STL00996	13C2 PFDA	82		70-130

*Steve L. Selman*  
05/25/2018

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-FRB-179 Lab Sample ID: 320-38284-9  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_075.d  
 Analysis Method: 537 Date Collected: 04/17/2018 10:05  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 250.5 (mL) Date Analyzed: 04/23/2018 23:19  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219468 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	95		70-130
STL00996	13C2 PFDA	94		70-130

*Teri L. Selman*  
05/25/2018

**Appendix B**

Results as Reported by the Laboratory

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-041718-DUP-32 Lab Sample ID: 320-38284-1  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_065.d  
 Analysis Method: 537 Date Collected: 04/17/2018 07:00  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 252.3(mL) Date Analyzed: 04/23/2018 22:33  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	J M	40	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	22		20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.7	J	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.9	J	9.9	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	90		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-RW-278 Lab Sample ID: 320-38284-2  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_066.d  
 Analysis Method: 537 Date Collected: 04/17/2018 08:10  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 245 (mL) Date Analyzed: 04/23/2018 22:37  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	J M	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	22		20	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.7	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U M	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	89		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-FRB-278 Lab Sample ID: 320-38284-3  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_067.d  
 Analysis Method: 537 Date Collected: 04/17/2018 08:05  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 248.4 (mL) Date Analyzed: 04/23/2018 22:42  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 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)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
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	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	90		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-RW-360 Lab Sample ID: 320-38284-4  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_068.d  
 Analysis Method: 537 Date Collected: 04/17/2018 08:25  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 244.7(mL) Date Analyzed: 04/23/2018 22:47  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	17	J M	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	9.3	J	20	8.2	2.9
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	25	20	8.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U M	31	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.6	J M	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	92	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	89		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-FRB-360 Lab Sample ID: 320-38284-5  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_069.d  
 Analysis Method: 537 Date Collected: 04/17/2018 08:20  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 251.3(mL) Date Analyzed: 04/23/2018 22:51  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 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	9.9	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	85		70-130



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-RW-150 Lab Sample ID: 320-38284-6  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_070.d  
 Analysis Method: 537 Date Collected: 04/17/2018 09:10  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 252.3(mL) Date Analyzed: 04/23/2018 22:56  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	7.9	J M	40	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	17	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.1	J	9.9	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U M	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	95		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-FRB-150 Lab Sample ID: 320-38284-7  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_071.d  
 Analysis Method: 537 Date Collected: 04/17/2018 09:05  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 252.8(mL) Date Analyzed: 04/23/2018 23:01  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219466 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	40	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	7.9	U	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	9.9	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	93		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-RW-179 Lab Sample ID: 320-38284-8  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_074.d  
 Analysis Method: 537 Date Collected: 04/17/2018 10:10  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 248.3(mL) Date Analyzed: 04/23/2018 23:15  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219468 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	J M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	22		20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.8	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.5	J	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	103		70-130
STL00996	13C2 PFDA	82		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-041718-FRB-179 Lab Sample ID: 320-38284-9  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_075.d  
 Analysis Method: 537 Date Collected: 04/17/2018 10:05  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 250.5 (mL) Date Analyzed: 04/23/2018 23:19  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219468 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	95		70-130
STL00996	13C2 PFDA	94		70-130

**Appendix C**

Support Documentation

ANALYTE	ORIGINAL NAWC-	DUPLICATE WGNA-	RL	RPD	RPD > 50%	ORIGINAL	DUPLICATE SAMPLE	DIFFERENCE >2XRL
	041718-RW-179	041718-DUP-32				SAMPLE CONC	CONC >2xRL	
Perfluorooctanoic acid (PFOA)	22	22	20	0.000	FALSE	FALSE	FALSE	FALSE
Perfluoroheptanoic acid (PFHpA)	6.5	5.9	10	9.677	FALSE	FALSE	FALSE	FALSE
Perfluorohexanesulfonic acid (PFHxS)	7.8	7.7	30	1.290	FALSE	FALSE	FALSE	FALSE
Perfluorooctanesulfonic acid (PFOS)	15	16	40	6.452	FALSE	FALSE	FALSE	FALSE



320-38284 Chain of Custody

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

### Chain of Custody Record



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> 4/17/2018	<b>COC No.:</b>
TetraTech	<b>Tel/Fax:</b> 610.382.1170	<b>Lab Contact:</b> Dave Alltucker	<b>Carrier:</b> FedEx	1 of 1 COCs
234 Mall Boulevard Suite 260	<b>Analysis Turnaround Time</b>			<b>Sampler:</b> Mary Kay Bond
King of Prussia, PA 19406	<input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS			<b>For Lab Use Only:</b>
610-382-1174	TAT if different from Below 21			Walk-in Client:
610-491-9688	<input type="checkbox"/> 2 weeks			Lab Sampling:
Project Name: WE04	<input type="checkbox"/> 1 week			
Site: WE04	<input type="checkbox"/> 2 days			
P O # 1132358 (through EarthToxics)	<input type="checkbox"/> 1 day			Job / SDG No.:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	EPA 537 UCMR3	Sample Specific Notes:
WGNA-041718-DUP-32	4/17/2018	7:00	G	DW	2	N	N	Y	Duplicate
NAWC-041718-RW-278	4/17/2018	8:10	G	DW	2	N	N	Y	
NAWC-041718-FRB-278	4/17/2018	8:05	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-041718-RW-360	4/17/2018	8:25	G	DW	2	N	N	Y	
NAWC-041718-FRB-360	4/17/2018	8:20	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-041718-RW-150	4/17/2018	9:10	G	DW	2	N	N	Y	
NAWC-041718-FRB-150	4/17/2018	9:05	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-041718-RW-179	4/17/2018	10:10	G	DW	2	N	N	Y	
NAWC-041718-FRB-179	4/17/2018	10:05	G	DW	2	N	N	Y	Field Reagent Blank

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

Possible Hazard Identification:  
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the

Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month )  
 Return to Client  Disposal by Lab  Archive for \_\_\_\_\_ Months

Fed Ex Tracking: 7720 1664 3165

Custody Seals Intact:  Yes  No

Custody Seal No.: \_\_\_\_\_ Cooler Temp. (°C): Obs'd: 1-9 Corr'd: 1-9 Therm ID No.: ALZ ice

Relinquished by: <i>Mary Kay Bond</i>	Company: Tetra Tech	Date/Time: 4/17/2018 16:00	Received by: <i>[Signature]</i>	Company: TA-SAC	Date/Time: 4/18/18 0905
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.11, dated 1/24/2017

Page 313 of 314

**Job Narrative**  
**320-38284-1**

**Receipt**

The samples were received on 4/18/2018 9:05 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.9° 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 320-218953.

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



# Method Summary

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

TestAmerica Job ID: 320-38284-1

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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: 320-38284-1

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

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<b>Lab Sample ID</b>	<b>Client Sample ID</b>	<b>Matrix</b>	<b>Collected</b>	<b>Received</b>
320-38284-1	WGNA-041718-DUP-32	Water	04/17/18 07:00	04/18/18 09:05
320-38284-2	NAWC-041718-RW-278	Water	04/17/18 08:10	04/18/18 09:05
320-38284-3	NAWC-041718-FRB-278	Water	04/17/18 08:05	04/18/18 09:05
320-38284-4	NAWC-041718-RW-360	Water	04/17/18 08:25	04/18/18 09:05
320-38284-5	NAWC-041718-FRB-360	Water	04/17/18 08:20	04/18/18 09:05
320-38284-6	NAWC-041718-RW-150	Water	04/17/18 09:10	04/18/18 09:05
320-38284-7	NAWC-041718-FRB-150	Water	04/17/18 09:05	04/18/18 09:05
320-38284-8	NAWC-041718-RW-179	Water	04/17/18 10:10	04/18/18 09:05
320-38284-9	NAWC-041718-FRB-179	Water	04/17/18 10:05	04/18/18 09:05

FORM II  
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-38284-1

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

Matrix: Water

Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WGNA-041718-DUP-32	320-38284-1	90	90
NAWC-041718-RW-278	320-38284-2	93	89
NAWC-041718-FRB-278	320-38284-3	96	90
NAWC-041718-RW-360	320-38284-4	95	89
NAWC-041718-FRB-360	320-38284-5	90	85
NAWC-041718-RW-150	320-38284-6	100	95
NAWC-041718-FRB-150	320-38284-7	96	93
NAWC-041718-RW-179	320-38284-8	103	82
NAWC-041718-FRB-179	320-38284-9	95	94
	MB 320-218953/1-A	96	93
	LCS 320-218953/2-A	115	110
	LCSD 320-218953/3-A	94	94

PFHxA = 13C2 PFHxA  
PFDA = 13C2 PFDA

QC LIMITS  
70-130  
70-130

# Column to be used to flag recovery values

FORM III  
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Matrix: Water Level: Low Lab File ID: 2018.04.23\_537C\_052.d  
 Lab ID: LCS 320-218953/2-A Client ID: \_\_\_\_\_

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	220	247	112	70-130	M
Perfluorooctanoic acid (PFOA)	110	124	113	70-130	
Perfluorononanoic acid (PFNA)	110	117	106	70-130	
Perfluorohexanesulfonic acid (PFHxS)	168	196	116	70-130	
Perfluoroheptanoic acid (PFHpA)	54.0	61.0	113	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	570	114	70-130	

# Column to be used to flag recovery and RPD values

FORM III  
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Matrix: Water Level: Low Lab File ID: 2018.04.23\_537C\_053.d

Lab ID: LCSD 320-218953/3-A Client ID: \_\_\_\_\_

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	220	207	94	18	30	70-130	M
Perfluorooctanoic acid (PFOA)	110	101	92	20	30	70-130	
Perfluorononanoic acid (PFNA)	110	98.5	90	17	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	168	164	97	18	30	70-130	
Perfluoroheptanoic acid (PFHpA)	54.0	50.0	93	20	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	445	89	25	30	70-130	

# Column to be used to flag recovery and RPD values

FORM IV  
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab File ID: 2018.04.23\_537C\_051.d Lab Sample ID: MB 320-218953/1-A  
 Matrix: Water Date Extracted: 04/20/2018 09:26  
 Instrument ID: A8\_N Date Analyzed: 04/23/2018 21:27  
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-218953/2-A	2018.04.23_537C_052.d	04/23/2018 21:32
	LCSD 320-218953/3-A	2018.04.23_537C_053.d	04/23/2018 21:37
WGNA-041718-DUP-32	320-38284-1	2018.04.23_537C_065.d	04/23/2018 22:33
NAWC-041718-RW-278	320-38284-2	2018.04.23_537C_066.d	04/23/2018 22:37
NAWC-041718-FRB-278	320-38284-3	2018.04.23_537C_067.d	04/23/2018 22:42
NAWC-041718-RW-360	320-38284-4	2018.04.23_537C_068.d	04/23/2018 22:47
NAWC-041718-FRB-360	320-38284-5	2018.04.23_537C_069.d	04/23/2018 22:51
NAWC-041718-RW-150	320-38284-6	2018.04.23_537C_070.d	04/23/2018 22:56
NAWC-041718-FRB-150	320-38284-7	2018.04.23_537C_071.d	04/23/2018 23:01
NAWC-041718-RW-179	320-38284-8	2018.04.23_537C_074.d	04/23/2018 23:15
NAWC-041718-FRB-179	320-38284-9	2018.04.23_537C_075.d	04/23/2018 23:19

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: MB 320-218953/1-A  
 Matrix: Water Lab File ID: 2018.04.23\_537C\_051.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 04/20/2018 09:26  
 Sample wt/vol: 250.0 (mL) Date Analyzed: 04/23/2018 21:27  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 219464 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	96		70-130
STL00996	13C2 PFDA	93		70-130

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Instrument ID: A8\_N Calibration Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 04/11/2018 12:09  
 Calibration ID: 38530

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	970041	1.86	2344935	2.10		
UPPER LIMIT	1455062	2.36	3517403	2.60		
LOWER LIMIT	485021	1.36	1172468	1.60		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCVL 320-217453/10		964533	1.87	2387973	2.10	
ICV 320-217453/12		1123391	1.86	2710764	2.10	
CCVL 320-219315/1		860713	1.88	2040827	2.12	
CCV 320-219464/17 CCVIS		871239	1.86	2013363	2.10	
MB 320-218953/1-A		866508	1.85	2105233	2.09	
LCS 320-218953/2-A		807996	1.86	1921927	2.10	
LCSD 320-218953/3-A		960967	1.85	2254298	2.10	
CCV 320-219464/28 CCVIS		936349	1.86	2188060	2.10	
CCV 320-219466/28 CCVIS		936349	1.86	2188060	2.10	
320-38284-1	WGNA-041718-DUP-32	859854	1.85	2115564	2.10	
320-38284-2	NAWC-041718-RW-278	951398	1.86	2330949	2.10	
320-38284-3	NAWC-041718-FRB-278	873024	1.86	2067103	2.10	
320-38284-4	NAWC-041718-RW-360	959095	1.85	2353519	2.09	
320-38284-5	NAWC-041718-FRB-360	1007902	1.86	2335785	2.10	
320-38284-6	NAWC-041718-RW-150	896870	1.86	2186928	2.10	
320-38284-7	NAWC-041718-FRB-150	1020151	1.85	2303453	2.09	
CCV 320-219466/40 CCVIS		865956	1.86	2057189	2.10	
CCV 320-219468/40 CCVIS		865956	1.86	2057189	2.10	
320-38284-8	NAWC-041718-RW-179	830741	1.87	2040767	2.11	
320-38284-9	NAWC-041718-FRB-179	843905	1.86	2044636	2.11	
CCV 320-219468/44 CCVIS		822310	1.85	1943602	2.10	

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.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-219464/17 Date Analyzed: 04/23/2018 21:18  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.04.23\_537C\_049 Heated Purge: (Y/N) N  
 Calibration ID: 38530

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	871239	1.86	2013363	2.10		
UPPER LIMIT	1219735	2.36	2818708	2.60		
LOWER LIMIT	609867	1.36	1409354	1.60		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-218953/1-A			866508	1.85	2105233	2.09
LCS 320-218953/2-A			807996	1.86	1921927	2.10
LCSD 320-218953/3-A			960967	1.85	2254298	2.10

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

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

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-219464/28 Date Analyzed: 04/23/2018 22:09  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.04.23\_537C\_060 Heated Purge: (Y/N) N  
 Calibration ID: 38530

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	936349	1.86	2188060	2.10		
UPPER LIMIT	1310889	2.36	3063284	2.60		
LOWER LIMIT	655444	1.36	1531642	1.60		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-218953/1-A			866508	1.85	2105233	2.09
LCS 320-218953/2-A			807996	1.86	1921927	2.10
LCSD 320-218953/3-A			960967	1.85	2254298	2.10

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

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

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-219466/28 Date Analyzed: 04/23/2018 22:09  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.04.23\_537C\_060 Heated Purge: (Y/N) N  
 Calibration ID: 38530

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	936349	1.86	2188060	2.10		
UPPER LIMIT	1310889	2.36	3063284	2.60		
LOWER LIMIT	655444	1.36	1531642	1.60		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-38284-1	WGNA-041718-DUP-32	859854	1.85	2115564	2.10	
320-38284-2	NAWC-041718-RW-278	951398	1.86	2330949	2.10	
320-38284-3	NAWC-041718-FRB-278	873024	1.86	2067103	2.10	
320-38284-4	NAWC-041718-RW-360	959095	1.85	2353519	2.09	
320-38284-5	NAWC-041718-FRB-360	1007902	1.86	2335785	2.10	
320-38284-6	NAWC-041718-RW-150	896870	1.86	2186928	2.10	
320-38284-7	NAWC-041718-FRB-150	1020151	1.85	2303453	2.09	

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

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

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-219466/40 Date Analyzed: 04/23/2018 23:05  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.04.23\_537C\_072 Heated Purge: (Y/N) N  
 Calibration ID: 38530

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	865956	1.86	2057189	2.10		
UPPER LIMIT	1212338	2.36	2880065	2.60		
LOWER LIMIT	606169	1.36	1440032	1.60		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-38284-1	WGNA-041718-DUP-32		859854	1.85	2115564	2.10
320-38284-2	NAWC-041718-RW-278		951398	1.86	2330949	2.10
320-38284-3	NAWC-041718-FRB-278		873024	1.86	2067103	2.10
320-38284-4	NAWC-041718-RW-360		959095	1.85	2353519	2.09
320-38284-5	NAWC-041718-FRB-360		1007902	1.86	2335785	2.10
320-38284-6	NAWC-041718-RW-150		896870	1.86	2186928	2.10
320-38284-7	NAWC-041718-FRB-150		1020151	1.85	2303453	2.09

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

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

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-219468/40 Date Analyzed: 04/23/2018 23:05  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.04.23\_537C\_072 Heated Purge: (Y/N) N  
 Calibration ID: 38530

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	865956	1.86	2057189	2.10		
UPPER LIMIT	1212338	2.36	2880065	2.60		
LOWER LIMIT	606169	1.36	1440032	1.60		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-38284-8	NAWC-041718-RW-179		830741	1.87	2040767	2.11
320-38284-9	NAWC-041718-FRB-179		843905	1.86	2044636	2.11

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

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

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-219468/44 Date Analyzed: 04/23/2018 23:24  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.04.23\_537C\_076 Heated Purge: (Y/N) N  
 Calibration ID: 38530

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	822310	1.85	1943602	2.10		
UPPER LIMIT	1151234	2.35	2721043	2.60		
LOWER LIMIT	575617	1.35	1360521	1.60		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-38284-8	NAWC-041718-RW-179		830741	1.87	2040767	2.11
320-38284-9	NAWC-041718-FRB-179		843905	1.86	2044636	2.11

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

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

# Column used to flag values outside QC limits

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

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1 Analy Batch No.: 217453

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

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

Calibration Start Date: 04/11/2018 11:45 Calibration End Date: 04/11/2018 12:09 Calibration ID: 38530

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-217453/3	2018.04.11_537ICALB_004.d
Level 2	IC 320-217453/4	2018.04.11_537ICALB_005.d
Level 3	IC 320-217453/5	2018.04.11_537ICALB_006.d
Level 4	IC 320-217453/6	2018.04.11_537ICALB_007.d
Level 5	IC 320-217453/7	2018.04.11_537ICALB_008.d
Level 6	IC 320-217453/8	2018.04.11_537ICALB_009.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid (PFBS)	1.1422 0.9535	1.0952	1.0744	1.0454	1.0008	Ave		1.0519			6.4		30.0				
Perfluoroheptanoic acid (PFHpA)	1.0850 1.0447	1.0991	1.0649	1.0783	1.0702	Ave		1.0737			1.7		30.0				
Perfluorohexanesulfonic acid (PFHxS)	1.6457 1.6837	1.5988	1.6030	1.6384	1.6838	Ave		1.6422			2.3		30.0				
Perfluorooctanoic acid (PFOA)	1.0599 1.0325	1.0296	1.0703	1.0516	1.1300	Ave		1.0623			3.5		30.0				
Perfluorooctanesulfonic acid (PFOS)	1.0432 1.0989	1.0519	1.0326	1.0935	1.0764	Ave		1.0661			2.6		30.0				
Perfluorononanoic acid (PFNA)	0.8261 0.8363	0.8133	0.8488	0.8818	0.8480	Ave		0.8424			2.8		30.0				
13C2 PFHxA	1.0447 1.0648	1.0532	1.0875	1.0687	1.0602	Ave		1.0632			1.4		30.0				
13C2 PFDA	0.8513 0.8262	0.8714	0.8533	0.8487	0.8519	Ave		0.8505			1.7		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.: 320-38284-1 Analy Batch No.: 217453

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

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

Calibration Start Date: 04/11/2018 11:45 Calibration End Date: 04/11/2018 12:09 Calibration ID: 38530

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-217453/3	2018.04.11_537ICALB_004.d
Level 2	IC 320-217453/4	2018.04.11_537ICALB_005.d
Level 3	IC 320-217453/5	2018.04.11_537ICALB_006.d
Level 4	IC 320-217453/6	2018.04.11_537ICALB_007.d
Level 5	IC 320-217453/7	2018.04.11_537ICALB_008.d
Level 6	IC 320-217453/8	2018.04.11_537ICALB_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	Ave	870696 13871852	1696932	4015148	8010147	10764182	9.00 180	20.0	45.0	90.1	135
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	108741 1996261	218860	489075	1044752	1450463	0.960 19.4	2.16	4.86	9.72	14.6
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	418640 8226588	831963	2012030	4216387	6082352	3.00 60.5	6.72	15.1	30.2	45.4
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	219100 4019004	417632	1001316	2075568	3119787	1.98 39.6	4.40	9.90	19.8	29.7
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	349354 7016962	715378	1693810	3678059	5081660	3.95 79.1	8.79	19.8	39.5	59.3
Perfluorononanoic acid (PFNA)	13PF OA	Ave	170770 3255374	329904	794076	1740422	2341235	1.98 39.6	4.40	9.90	19.8	29.7
13C2 PFHxA	13PF OA	Ave	1090690 1046576	970942	1027706	1065262	985534	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	888742 812112	803402	806360	845990	791901	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.: 320-38284-1 Analy Batch No.: 217453

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

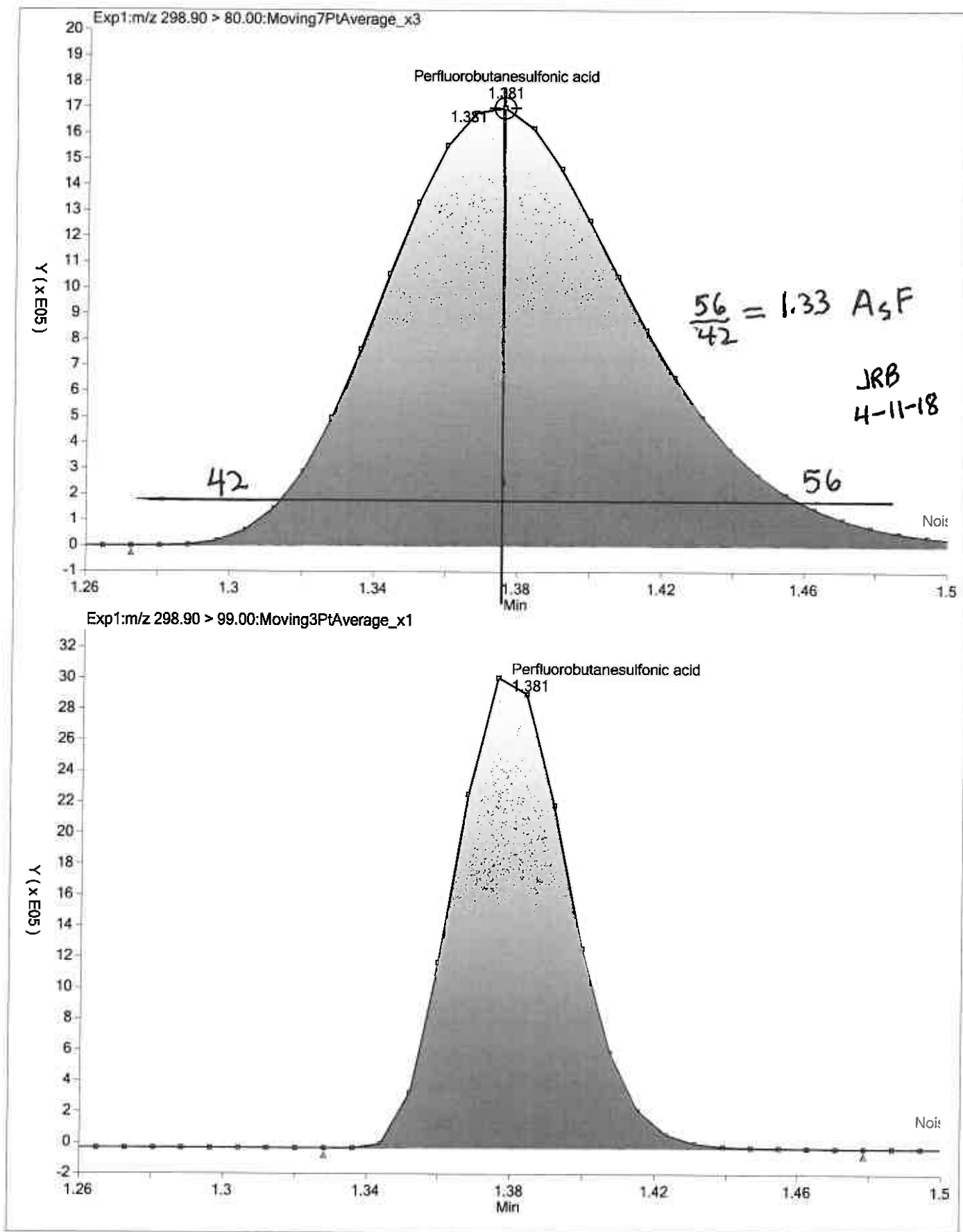
Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

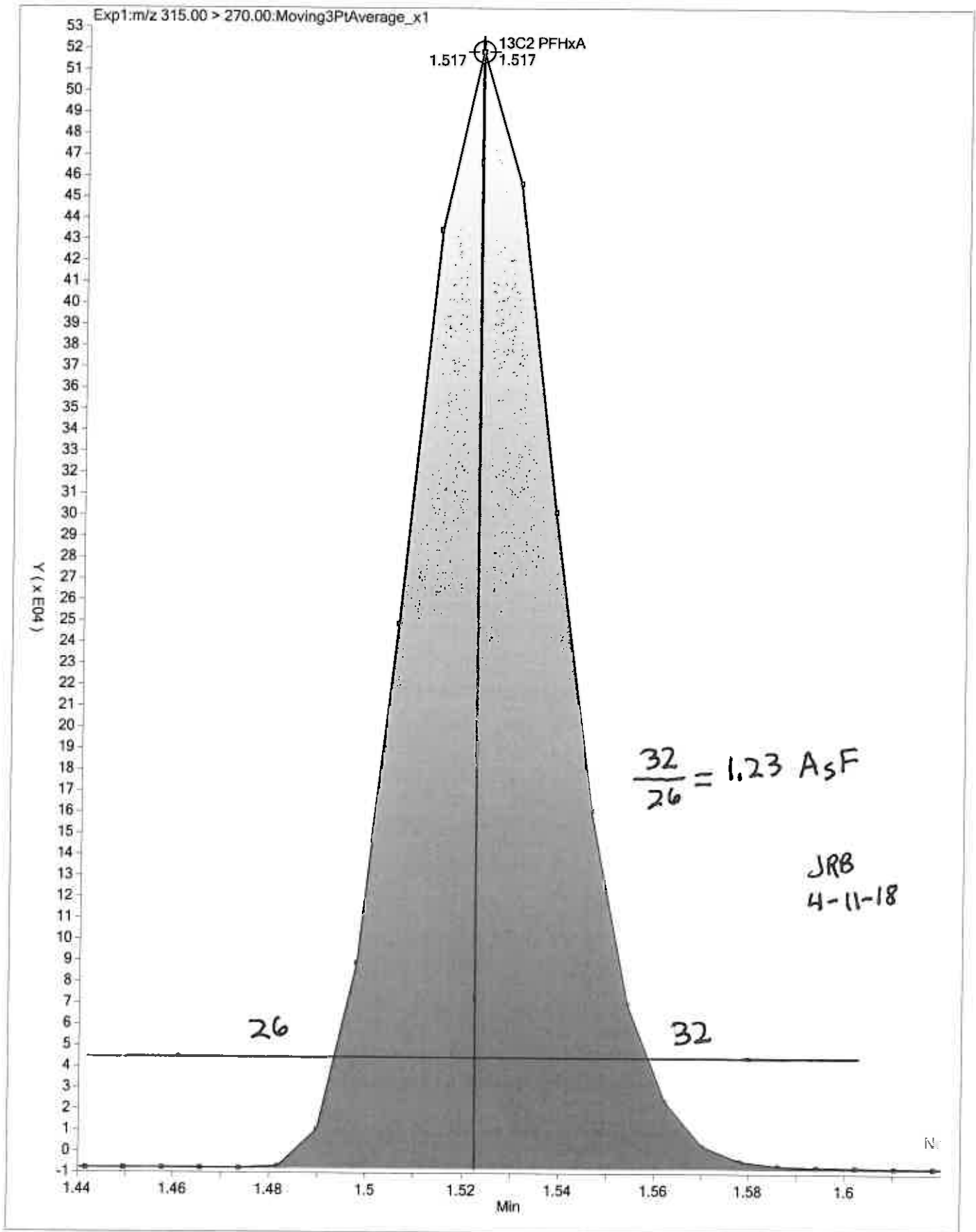
Calibration Start Date: 04/11/2018 11:45 Calibration End Date: 04/11/2018 12:09 Calibration ID: 38530

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-217453/3	2018.04.11_537ICALB_004.d
Level 2	IC 320-217453/4	2018.04.11_537ICALB_005.d
Level 3	IC 320-217453/5	2018.04.11_537ICALB_006.d
Level 4	IC 320-217453/6	2018.04.11_537ICALB_007.d
Level 5	IC 320-217453/7	2018.04.11_537ICALB_008.d
Level 6	IC 320-217453/8	2018.04.11_537ICALB_009.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid (PFBS)	8.6	4.1	2.1	-0.6	-4.9	-9.4	50	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	1.0	2.4	-0.8	0.4	-0.3	-2.7	50	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	0.2	-2.6	-2.4	-0.2	2.5	2.5	50	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	-0.2	-3.1	0.7	-1.0	6.4	-2.8	50	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-2.1	-1.3	-3.1	2.6	1.0	3.1	50	30	30	30	30	30
Perfluorononanoic acid (PFNA)	-1.9	-3.5	0.8	4.7	0.7	-0.7	50	30	30	30	30	30
13C2 PFHxA	-1.7	-0.9	2.3	0.5	-0.3	0.1	30	30	30	30	30	30
13C2 PFDA	0.1	2.5	0.3	-0.2	0.2	-2.9	30	30	30	30	30	30





FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-217453/10 Calibration Date: 04/11/2018 12:18  
 Instrument ID: A8\_N Calib Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 04/11/2018 12:09  
 Lab File ID: 2018.04.11\_537ICALB\_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.052	1.078		20.5	20.0	2.5	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.074	1.079		2.17	2.16	0.5	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.642	1.583		6.48	6.72	-3.6	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.062	1.067		4.42	4.40	0.4	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.066	1.026		8.45	8.79	-3.8	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8424	0.8056		4.21	4.40	-4.4	50.0
13C2 PFHxA	Ave	1.063	1.036		9.74	10.0	-2.6	30.0
13C2 PFDA	Ave	0.8505	0.8798		10.3	10.0	3.4	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: ICV 320-217453/12 Calibration Date: 04/11/2018 12:27  
 Instrument ID: A8\_N Calib Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 04/11/2018 12:09  
 Lab File ID: 2018.04.11\_537ICALB\_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.052	0.9079		86.4	100	-13.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.074	0.9453		8.80	10.0	-12.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.642	1.546		19.0	20.2	-5.8	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.062	0.8947		17.0	20.2	-15.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.066	0.9451		17.9	20.2	-11.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8424	0.7643		18.3	20.2	-9.3	30.0
13C2 PFHxA	Ave	1.063	0.9887		9.30	10.0	-7.0	30.0
13C2 PFDA	Ave	0.8505	0.7817		9.19	10.0	-8.1	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-219315/1 Calibration Date: 04/23/2018 12:21  
 Instrument ID: A8\_N Calib Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 04/11/2018 12:09  
 Lab File ID: 2018.04.23\_537A\_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.052	1.103		21.0	20.0	4.9	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.074	1.038		2.09	2.16	-3.3	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.642	1.597		6.54	6.72	-2.8	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.062	1.040		4.31	4.40	-2.1	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8424	0.7896		4.12	4.40	-6.3	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.066	1.051		8.66	8.79	-1.4	50.0
13C2 PFHxA	Ave	1.063	1.036		9.74	10.0	-2.6	30.0
13C2 PFDA	Ave	0.8505	0.7918		9.31	10.0	-6.9	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-219464/17 Calibration Date: 04/23/2018 21:18  
 Instrument ID: A8\_N Calib Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 04/11/2018 12:09  
 Lab File ID: 2018.04.23\_537C\_049.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.052	1.083		139	135	3.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.074	1.039		14.1	14.6	-3.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.642	1.736		48.0	45.4	5.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.062	1.049		29.3	29.7	-1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.066	1.076		59.8	59.3	0.9	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8424	0.8155		28.8	29.7	-3.2	30.0
13C2 PFHxA	Ave	1.063	1.073		10.1	10.0	0.9	30.0
13C2 PFDA	Ave	0.8505	0.8144		9.58	10.0	-4.2	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-219464/28 Calibration Date: 04/23/2018 22:09  
 Instrument ID: A8\_N Calib Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 04/11/2018 12:09  
 Lab File ID: 2018.04.23\_537C\_060.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.052	1.164		49.8	45.0	10.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.074	1.101		4.98	4.86	2.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.642	1.760		16.2	15.1	7.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.062	1.050		9.79	9.90	-1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.066	1.073		19.9	19.8	0.7	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8424	0.8110		9.53	9.90	-3.7	30.0
13C2 PFHxA	Ave	1.063	1.083		10.2	10.0	1.9	30.0
13C2 PFDA	Ave	0.8505	0.8734		10.3	10.0	2.7	30.0



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-219466/28 Calibration Date: 04/23/2018 22:09  
 Instrument ID: A8\_N Calib Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 04/11/2018 12:09  
 Lab File ID: 2018.04.23\_537C\_060.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.052	1.164		49.8	45.0	10.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.074	1.101		4.98	4.86	2.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.642	1.760		16.2	15.1	7.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.062	1.050		9.79	9.90	-1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.066	1.073		19.9	19.8	0.7	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8424	0.8110		9.53	9.90	-3.7	30.0
13C2 PFHxA	Ave	1.063	1.083		10.2	10.0	1.9	30.0
13C2 PFDA	Ave	0.8505	0.8734		10.3	10.0	2.7	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-219466/40 Calibration Date: 04/23/2018 23:05  
 Instrument ID: A8\_N Calib Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 04/11/2018 12:09  
 Lab File ID: 2018.04.23\_537C\_072.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.052	1.059		136	135	0.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.074	1.054		14.3	14.6	-1.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.642	1.699		46.9	45.4	3.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.062	1.069		29.9	29.7	0.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.066	1.085		60.3	59.3	1.7	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8424	0.7989		28.2	29.7	-5.2	30.0
13C2 PFHxA	Ave	1.063	1.064		10.0	10.0	0.1	30.0
13C2 PFDA	Ave	0.8505	0.8245		9.69	10.0	-3.1	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-219468/40 Calibration Date: 04/23/2018 23:05  
 Instrument ID: A8\_N Calib Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 04/11/2018 12:09  
 Lab File ID: 2018.04.23\_537C\_072.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.052	1.059		136	135	0.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.074	1.054		14.3	14.6	-1.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.642	1.699		46.9	45.4	3.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.062	1.069		29.9	29.7	0.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.066	1.085		60.3	59.3	1.7	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8424	0.7989		28.2	29.7	-5.2	30.0
13C2 PFHxA	Ave	1.063	1.064		10.0	10.0	0.1	30.0
13C2 PFDA	Ave	0.8505	0.8245		9.69	10.0	-3.1	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-219468/44 Calibration Date: 04/23/2018 23:24  
 Instrument ID: A8\_N Calib Start Date: 04/11/2018 11:45  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 04/11/2018 12:09  
 Lab File ID: 2018.04.23\_537C\_076.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.052	1.210		51.8	45.0	15.1	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.074	1.079		4.89	4.86	0.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.642	1.732		16.0	15.1	5.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.062	1.030		9.60	9.90	-3.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.066	1.072		19.9	19.8	0.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8424	0.8297		9.75	9.90	-1.5	30.0
13C2 PFHxA	Ave	1.063	1.097		10.3	10.0	3.2	30.0
13C2 PFDA	Ave	0.8505	0.8042		9.46	10.0	-5.4	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Instrument ID: A8\_N Start Date: 04/11/2018 11:45

Analysis Batch Number: 217453 End Date: 04/11/2018 12:27

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-217453/3		04/11/2018 11:45	1	2018.04.11_537I CALB 004.d	GeminiC18 3x100 3(mm)
IC 320-217453/4		04/11/2018 11:50	1	2018.04.11_537I CALB 005.d	GeminiC18 3x100 3(mm)
IC 320-217453/5		04/11/2018 11:55	1	2018.04.11_537I CALB 006.d	GeminiC18 3x100 3(mm)
IC 320-217453/6 ICISAV		04/11/2018 11:59	1	2018.04.11_537I CALB 007.d	GeminiC18 3x100 3(mm)
IC 320-217453/7		04/11/2018 12:04	1	2018.04.11_537I CALB 008.d	GeminiC18 3x100 3(mm)
IC 320-217453/8		04/11/2018 12:09	1	2018.04.11_537I CALB 009.d	GeminiC18 3x100 3(mm)
ZZZZZ		04/11/2018 12:13	1		GeminiC18 3x100 3(mm)
CCVL 320-217453/10		04/11/2018 12:18	1	2018.04.11_537I CALB 011.d	GeminiC18 3x100 3(mm)
ICB 320-217453/11		04/11/2018 12:23	1		GeminiC18 3x100 3(mm)
ICV 320-217453/12		04/11/2018 12:27	1	2018.04.11_537I CALB 013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Instrument ID: A8\_N Start Date: 04/23/2018 12:21

Analysis Batch Number: 219315 End Date: 04/23/2018 12:21

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-219315/1		04/23/2018 12:21	1	2018.04.23_537A 003.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Instrument ID: A8\_N Start Date: 04/23/2018 21:18

Analysis Batch Number: 219464 End Date: 04/23/2018 22:09

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-219464/17 CCVIS	<b>Level 5</b>	04/23/2018 21:18	1	2018.04.23_537C 049.d	GeminiC18 3x100 3(mm)
MB 320-218953/1-A		04/23/2018 21:27	1	2018.04.23_537C 051.d	GeminiC18 3x100 3(mm)
LCS 320-218953/2-A		04/23/2018 21:32	1	2018.04.23_537C 052.d	GeminiC18 3x100 3(mm)
LCSD 320-218953/3-A		04/23/2018 21:37	1	2018.04.23_537C 053.d	GeminiC18 3x100 3(mm)
ZZZZZ		04/23/2018 21:41	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/23/2018 21:46	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/23/2018 21:51	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/23/2018 21:55	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/23/2018 22:00	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/23/2018 22:05	1		GeminiC18 3x100 3(mm)
CCV 320-219464/28 CCVIS	<b>Level 3</b>	04/23/2018 22:09	1	2018.04.23_537C 060.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Instrument ID: A8\_N Start Date: 04/23/2018 22:09

Analysis Batch Number: 219466 End Date: 04/23/2018 23:05

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-219466/28 CCVIS	<b>Level 3</b>	04/23/2018 22:09	1	2018.04.23_537C 060.d	GeminiC18 3x100 3(mm)
ZZZZZ		04/23/2018 22:19	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/23/2018 22:28	1		GeminiC18 3x100 3(mm)
320-38284-1		04/23/2018 22:33	1	2018.04.23_537C 065.d	GeminiC18 3x100 3(mm)
320-38284-2		04/23/2018 22:37	1	2018.04.23_537C 066.d	GeminiC18 3x100 3(mm)
320-38284-3		04/23/2018 22:42	1	2018.04.23_537C 067.d	GeminiC18 3x100 3(mm)
320-38284-4		04/23/2018 22:47	1	2018.04.23_537C 068.d	GeminiC18 3x100 3(mm)
320-38284-5		04/23/2018 22:51	1	2018.04.23_537C 069.d	GeminiC18 3x100 3(mm)
320-38284-6		04/23/2018 22:56	1	2018.04.23_537C 070.d	GeminiC18 3x100 3(mm)
320-38284-7		04/23/2018 23:01	1	2018.04.23_537C 071.d	GeminiC18 3x100 3(mm)
CCV 320-219466/40 CCVIS	<b>Level 5</b>	04/23/2018 23:05	1	2018.04.23_537C 072.d	GeminiC18 3x100 3(mm)



LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Instrument ID: A8\_N Start Date: 04/23/2018 23:05

Analysis Batch Number: 219468 End Date: 04/23/2018 23:24

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-219468/40 CCVIS	<b>Level 5</b>	04/23/2018 23:05	1	2018.04.23_537C 072.d	GeminiC18 3x100 3(mm)
320-38284-8		04/23/2018 23:15	1	2018.04.23_537C 074.d	GeminiC18 3x100 3(mm)
320-38284-9		04/23/2018 23:19	1	2018.04.23_537C 075.d	GeminiC18 3x100 3(mm)
CCV 320-219468/44 CCVIS	<b>Level 3</b>	04/23/2018 23:24	1	2018.04.23_537C 076.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38284-1

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

Batch Number: 218953 Batch Start Date: 04/20/18 09:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 04/23/18 14:20

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-HSP 00029
MB 320-218953/1		537, 537				250.0 mL	1.0 mL	7 SU	
LCS 320-218953/2		537, 537				250.0 mL	1.0 mL	7 SU	100 uL
LCSD 320-218953/3		537, 537				250.0 mL	1.0 mL	7 SU	100 uL
320-38284-A-1	WGNA-041718-DUP-32	537, 537	T	280.45 g	28.11 g	252.3 mL	1.0 mL	7 SU	
320-38284-A-2	NAWC-041718-RW-278	537, 537	T	273.15 g	28.20 g	245 mL	1.0 mL	7 SU	
320-38284-A-3	NAWC-041718-FRB-278	537, 537	T	276.07 g	27.71 g	248.4 mL	1.0 mL	7 SU	
320-38284-A-4	NAWC-041718-RW-360	537, 537	T	273.28 g	28.61 g	244.7 mL	1.0 mL	7 SU	
320-38284-A-5	NAWC-041718-FRB-360	537, 537	T	279.49 g	28.16 g	251.3 mL	1.0 mL	7 SU	
320-38284-A-6	NAWC-041718-RW-150	537, 537	T	280.35 g	28.09 g	252.3 mL	1.0 mL	7 SU	
320-38284-A-7	NAWC-041718-FRB-150	537, 537	T	280.50 g	27.67 g	252.8 mL	1.0 mL	7 SU	
320-38284-A-8	NAWC-041718-RW-179	537, 537	T	277.17 g	28.85 g	248.3 mL	1.0 mL	7 SU	
320-38284-A-9	NAWC-041718-FRB-179	537, 537	T	278.11 g	27.62 g	250.5 mL	1.0 mL	7 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00066	LC537-SU 00064	AnalysisComment			
MB 320-218953/1		537, 537		100 uL	100 uL	C1 ND			
LCS 320-218953/2		537, 537		100 uL	100 uL	C1 ND			
LCSD 320-218953/3		537, 537		100 uL	100 uL	C1 ND			
320-38284-A-1	WGNA-041718-DUP-32	537, 537	T	100 uL	100 uL	C1 ND			
320-38284-A-2	NAWC-041718-RW-278	537, 537	T	100 uL	100 uL	C1 ND			
320-38284-A-3	NAWC-041718-FRB-278	537, 537	T	100 uL	100 uL	C1 ND			
320-38284-A-4	NAWC-041718-RW-360	537, 537	T	100 uL	100 uL	C1 ND			
320-38284-A-5	NAWC-041718-FRB-360	537, 537	T	100 uL	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.: 320-38284-1

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

Batch Number: 218953 Batch Start Date: 04/20/18 09:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 04/23/18 14:20

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00066	LC537-SU 00064	AnalysisComment			
320-38284-A-6	NAWC-041718-RW-150	537, 537	T	100 uL	100 uL	C1 ND			
320-38284-A-7	NAWC-041718-FRB-150	537, 537	T	100 uL	100 uL	C1 ND			
320-38284-A-8	NAWC-041718-RW-179	537, 537	T	100 uL	100 uL	C1 ND			
320-38284-A-9	NAWC-041718-FRB-179	537, 537	T	100 uL	100 uL	C1 ND			

Batch Notes	
Analyst ID - Aliquot Step	VPM
Batch Comment	Client labels match TA labels: KMK
Analyst ID - Concentration	SKD
Analyst ID - Final Volume Step	VPM
Internal Standard ID#	1208544
Manifold ID	2, 4, 9
Methanol ID	1207213
pH Indicator ID	3817
Pipette ID	O43093F
Analyst ID - IS Reagent Drop	VPM
Analyst ID - IS Reagent Drop Witness	JER
Analyst ID - SU Reagent Drop	KMK
Analyst ID - SU Reagent Drop Witness	TWL
Analyst ID - TA Reagent Drop	KMK
Analyst ID - TA Reagent Drop Witness	TWL
SPE Cartridge Lot ID	6369499-12
Trizma ID	SLBR5241V
Reagent Water ID	4-18-18

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**

4/11/2018

Instrument A&\_N

PFHxS

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	Reported RRF
3	418640	2429483	28.7	1.64849	1.6457
6.72	831963	2220259	28.7	1.60034	1.5988
15.1	2012030	2380125	28.7	1.60672	1.603
30.2	4216387	2440107	28.7	1.64213	1.6384
45.4	6082352	2283311	28.7	1.68396	1.6838
60.5	8226588	2316327	28.7	1.68479	1.6837
Average				1.64441	1.6422
Standard Deviation				0.0363	
RSD				0.0221	
%RSD				2.20602	2.3

**Continuing Calibration**

04/23/2018 @ 22:09

PFHxS

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	%D	Reported RRF	Reported %D
15.1	2030773	2188060	28.7	1.7640	7.4189877	1.76	7.2

**Sample Identification**

WGNA-041718-DUP-32

Compound

PFHxS

Compound Area	236402	Average RRF	1.6422
Internal Standard Amount (ng)	28.7	Sample Volume(ml)	252.3
Dilution Factor	1	Volume Extract (ml)	1
Internal Standard Area	2115564	Injection Volume (µl)	1

Concentration	7.7404 ng/L
Reported Result	7.7 ng/L

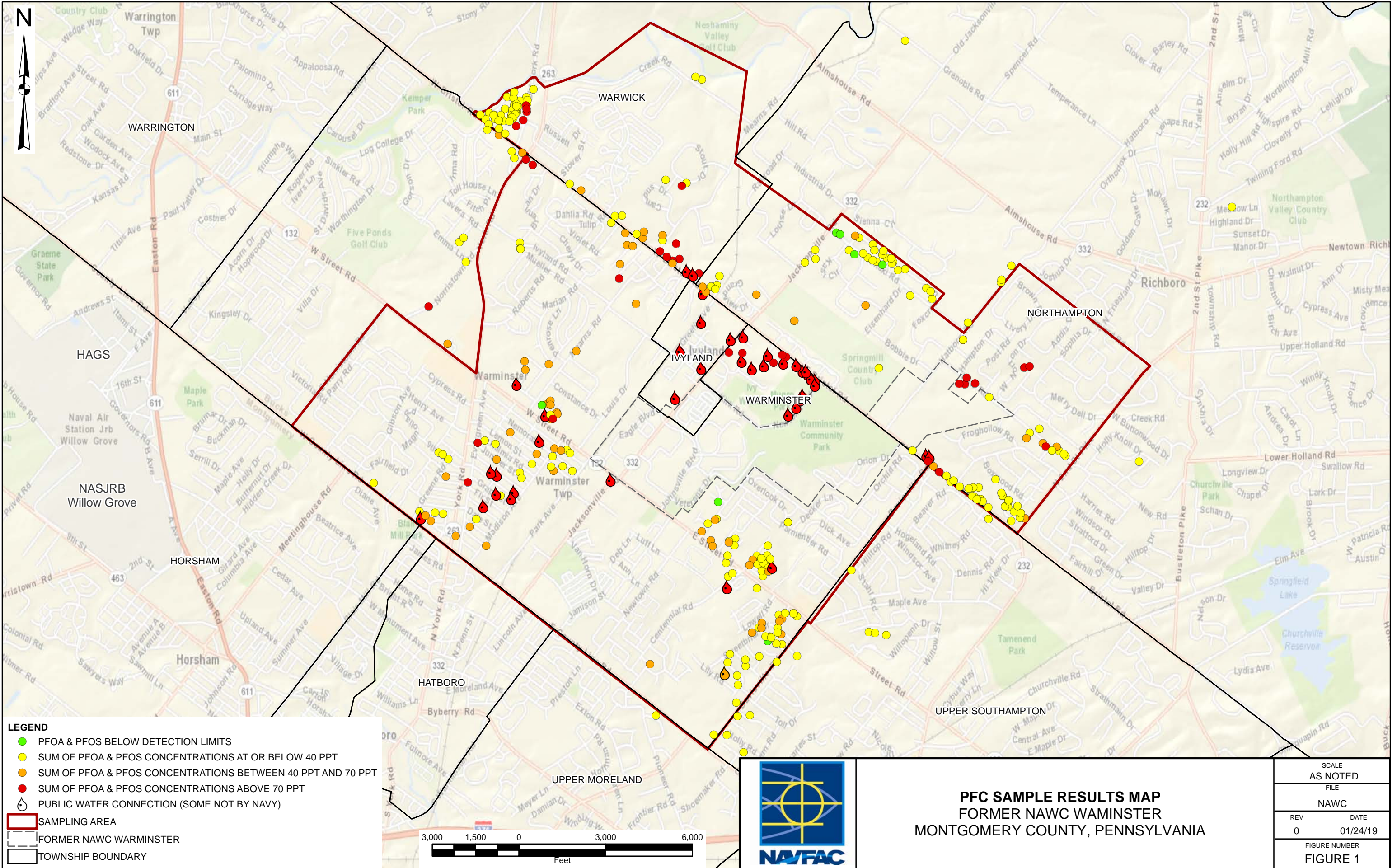
**Surrogate PFHxA**

Compound Area	819049		
Internal Standard Amount (ng)	10		
Dilution Factor	1	Volume Extract (ml)	1
Internal Standard Area	859854	Injection Volume (µl)	1
Average RRF	1.0623		
Concentration	8.9668		
Surrogate %R	89.67	Spike amount	10

**LCS %R**

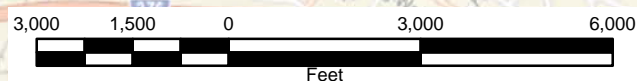
320-218953/2-A		
PFHxS	Spike amount	LCS concentration
116.67	168	196

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**LEGEND**

- PFOA & PFOS BELOW DETECTION LIMITS
- SUM OF PFOA & PFOS CONCENTRATIONS AT OR BELOW 40 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS BETWEEN 40 PPT AND 70 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS ABOVE 70 PPT
- 👉 PUBLIC WATER CONNECTION (SOME NOT BY NAVY)
- SAMPLING AREA
- FORMER NAWC WARRINSTER
- TOWNSHIP BOUNDARY



**PFC SAMPLE RESULTS MAP**  
 FORMER NAWC WARRINSTER  
 MONTGOMERY COUNTY, PENNSYLVANIA

SCALE AS NOTED	
FILE	
NAWC	
REV 0	DATE 01/24/19
FIGURE NUMBER	
FIGURE 1	