



**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 320-34235-1**

*Naval Air Warfare Center Warminster
Warminster, Pennsylvania*

August 2019

N62269_001160
WARMINSTER_NAWC
SSIC 5000-33c

LABORATORY DATA PACKAGE, 320-34235-1, NAS WILLOW GROVE NAWC
WARMINSTER PA
12/21/2017
TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

ANALYTICAL REPORT

Job Number: 320-34235-1

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
12/21/2017 10:39 AM

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12/21/2017

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Definitions/Glossary

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

TestAmerica Job ID: 320-34235-1

Qualifiers

LCMS

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

Glossary

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

Job Narrative
320-34235-1

Receipt

The samples were received on 12/13/2017 10:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.7° C.

LCMS

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

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 320-199900.

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: 320-34235-1

Client Sample ID: NAWC-121217-RW-061

Lab Sample ID: 320-34235-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	27	J M	41	6.9	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	18	J	20	2.8	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	11	J	30	5.6	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	5.0	J	10	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-121217-FRB-061

Lab Sample ID: 320-34235-2

No Detections.

Client Sample ID: NAWC-121217-RW-054

Lab Sample ID: 320-34235-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	21	J M	41	6.9	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	23		20	2.8	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	11	J	30	5.6	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	5.6	J	10	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-121217-FRB-054

Lab Sample ID: 320-34235-4

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: 320-34235-1

Client Sample ID: NAWC-121217-RW-061

Lab Sample ID: 320-34235-1

Date Collected: 12/12/17 09:10

Matrix: Water

Date Received: 12/13/17 10:20

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	27	J M	41	6.9	ng/L		12/14/17 12:48	12/19/17 21:46	1
Perfluorooctanoic acid (PFOA)	18	J	20	2.8	ng/L		12/14/17 12:48	12/19/17 21:46	1
Perfluorononanoic acid (PFNA)	20	U	24	8.1	ng/L		12/14/17 12:48	12/19/17 21:46	1
Perfluorohexanesulfonic acid (PFHxS)	11	J	30	5.6	ng/L		12/14/17 12:48	12/19/17 21:46	1
Perfluoroheptanoic acid (PFHpA)	5.0	J	10	1.9	ng/L		12/14/17 12:48	12/19/17 21:46	1
Perfluorobutanesulfonic acid (PFBS)	36	U	91	16	ng/L		12/14/17 12:48	12/19/17 21:46	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	93		70 - 130				12/14/17 12:48	12/19/17 21:46	1
13C2 PFDA	95		70 - 130				12/14/17 12:48	12/19/17 21:46	1

Client Sample ID: NAWC-121217-FRB-061

Lab Sample ID: 320-34235-2

Date Collected: 12/12/17 09:05

Matrix: Water

Date Received: 12/13/17 10:20

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		12/14/17 12:48	12/19/17 21:50	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		12/14/17 12:48	12/19/17 21:50	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		12/14/17 12:48	12/19/17 21:50	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		12/14/17 12:48	12/19/17 21:50	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		12/14/17 12:48	12/19/17 21:50	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		12/14/17 12:48	12/19/17 21:50	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	77		70 - 130				12/14/17 12:48	12/19/17 21:50	1
13C2 PFDA	89		70 - 130				12/14/17 12:48	12/19/17 21:50	1

Client Sample ID: NAWC-121217-RW-054

Lab Sample ID: 320-34235-3

Date Collected: 12/12/17 10:10

Matrix: Water

Date Received: 12/13/17 10:20

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	21	J M	41	6.9	ng/L		12/14/17 12:48	12/19/17 21:55	1
Perfluorooctanoic acid (PFOA)	23		20	2.8	ng/L		12/14/17 12:48	12/19/17 21:55	1
Perfluorononanoic acid (PFNA)	20	U	24	8.1	ng/L		12/14/17 12:48	12/19/17 21:55	1
Perfluorohexanesulfonic acid (PFHxS)	11	J	30	5.6	ng/L		12/14/17 12:48	12/19/17 21:55	1
Perfluoroheptanoic acid (PFHpA)	5.6	J	10	1.9	ng/L		12/14/17 12:48	12/19/17 21:55	1
Perfluorobutanesulfonic acid (PFBS)	36	U	91	16	ng/L		12/14/17 12:48	12/19/17 21:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	83		70 - 130				12/14/17 12:48	12/19/17 21:55	1
13C2 PFDA	88		70 - 130				12/14/17 12:48	12/19/17 21:55	1

Client Sample Results

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

TestAmerica Job ID: 320-34235-1

Client Sample ID: NAWC-121217-FRB-054

Lab Sample ID: 320-34235-4

Date Collected: 12/12/17 10:05

Matrix: Water

Date Received: 12/13/17 10:20

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	18	U	45	7.6	ng/L		12/14/17 12:48	12/19/17 22:00	1
Perfluorooctanoic acid (PFOA)	9.0	U	22	3.1	ng/L		12/14/17 12:48	12/19/17 22:00	1
Perfluorononanoic acid (PFNA)	22	U	27	9.0	ng/L		12/14/17 12:48	12/19/17 22:00	1
Perfluorohexanesulfonic acid (PFHxS)	13	U	34	6.2	ng/L		12/14/17 12:48	12/19/17 22:00	1
Perfluoroheptanoic acid (PFHpA)	4.5	U	11	2.1	ng/L		12/14/17 12:48	12/19/17 22:00	1
Perfluorobutanesulfonic acid (PFBS)	40	U	100	18	ng/L		12/14/17 12:48	12/19/17 22:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
¹³ C2 PFHxA	92		70 - 130	12/14/17 12:48	12/19/17 22:00	1
¹³ C2 PFDA	84		70 - 130	12/14/17 12:48	12/19/17 22:00	1

Default Detection Limits

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-34235-1

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

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

Prep: 537

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

Surrogate Summary

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

TestAmerica Job ID: 320-34235-1

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)
320-34235-1	NAWC-121217-RW-061	93	95
320-34235-2	NAWC-121217-FRB-061	77	89
320-34235-3	NAWC-121217-RW-054	83	88
320-34235-4	NAWC-121217-FRB-054	92	84
LCS 320-199900/2-A	Lab Control Sample	97	98
LCSD 320-199900/3-A	Lab Control Sample Dup	97	103
MB 320-199900/1-A	Method Blank	93	96

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: 320-34235-1

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

Lab Sample ID: MB 320-199900/1-A
Matrix: Water
Analysis Batch: 200646

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 199900

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		12/14/17 12:48	12/19/17 20:40	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		12/14/17 12:48	12/19/17 20:40	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		12/14/17 12:48	12/19/17 20:40	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		12/14/17 12:48	12/19/17 20:40	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		12/14/17 12:48	12/19/17 20:40	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		12/14/17 12:48	12/19/17 20:40	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C2 PFHxA	93		70 - 130	12/14/17 12:48	12/19/17 20:40	1
13C2 PFDA	96		70 - 130	12/14/17 12:48	12/19/17 20:40	1

Lab Sample ID: LCS 320-199900/2-A
Matrix: Water
Analysis Batch: 200646

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 199900

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanoic acid (PFOA)	111	110		ng/L		99	70 - 130
Perfluorononanoic acid (PFNA)	111	109		ng/L		98	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	167	183		ng/L		110	70 - 130
Perfluoroheptanoic acid (PFHpA)	55.6	62.1		ng/L		112	70 - 130
Perfluorobutanesulfonic acid (PFBS)	500	494		ng/L		99	70 - 130

Surrogate	LCS	LCS	Limits
	%Recovery	Qualifier	
13C2 PFHxA	97		70 - 130
13C2 PFDA	98		70 - 130

Lab Sample ID: LCSD 320-199900/3-A
Matrix: Water
Analysis Batch: 200646

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 199900

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	111	109		ng/L		98	70 - 130	1	30
Perfluorononanoic acid (PFNA)	111	106		ng/L		95	70 - 130	3	30
Perfluorohexanesulfonic acid (PFHxS)	167	174		ng/L		104	70 - 130	5	30
Perfluoroheptanoic acid (PFHpA)	55.6	60.0		ng/L		108	70 - 130	3	30
Perfluorobutanesulfonic acid (PFBS)	500	480		ng/L		96	70 - 130	3	30

Surrogate	LCSD	LCSD	Limits
	%Recovery	Qualifier	
13C2 PFHxA	97		70 - 130
13C2 PFDA	103		70 - 130

QC Association Summary

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

TestAmerica Job ID: 320-34235-1

LCMS

Prep Batch: 199900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-34235-1	NAWC-121217-RW-061	Total/NA	Water	537	
320-34235-2	NAWC-121217-FRB-061	Total/NA	Water	537	
320-34235-3	NAWC-121217-RW-054	Total/NA	Water	537	
320-34235-4	NAWC-121217-FRB-054	Total/NA	Water	537	
MB 320-199900/1-A	Method Blank	Total/NA	Water	537	
LCS 320-199900/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 320-199900/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 200646

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-199900/1-A	Method Blank	Total/NA	Water	537	199900
LCS 320-199900/2-A	Lab Control Sample	Total/NA	Water	537	199900
LCSD 320-199900/3-A	Lab Control Sample Dup	Total/NA	Water	537	199900

Analysis Batch: 200767

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-34235-1	NAWC-121217-RW-061	Total/NA	Water	537	199900
320-34235-2	NAWC-121217-FRB-061	Total/NA	Water	537	199900
320-34235-3	NAWC-121217-RW-054	Total/NA	Water	537	199900
320-34235-4	NAWC-121217-FRB-054	Total/NA	Water	537	199900

Lab Chronicle

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

TestAmerica Job ID: 320-34235-1

Client Sample ID: NAWC-121217-RW-061

Date Collected: 12/12/17 09:10

Date Received: 12/13/17 10:20

Lab Sample ID: 320-34235-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			199900	12/14/17 12:48	KMK	TAL SAC
Total/NA	Analysis	537		1	200767	12/19/17 21:46	JRB	TAL SAC

Client Sample ID: NAWC-121217-FRB-061

Date Collected: 12/12/17 09:05

Date Received: 12/13/17 10:20

Lab Sample ID: 320-34235-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			199900	12/14/17 12:48	KMK	TAL SAC
Total/NA	Analysis	537		1	200767	12/19/17 21:50	JRB	TAL SAC

Client Sample ID: NAWC-121217-RW-054

Date Collected: 12/12/17 10:10

Date Received: 12/13/17 10:20

Lab Sample ID: 320-34235-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			199900	12/14/17 12:48	KMK	TAL SAC
Total/NA	Analysis	537		1	200767	12/19/17 21:55	JRB	TAL SAC

Client Sample ID: NAWC-121217-FRB-054

Date Collected: 12/12/17 10:05

Date Received: 12/13/17 10:20

Lab Sample ID: 320-34235-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			199900	12/14/17 12:48	KMK	TAL SAC
Total/NA	Analysis	537		1	200767	12/19/17 22:00	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: 320-34235-1

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	UST-055	12-18-17 *
Arizona	State Program	9	AZ0708	08-11-18
Arkansas DEQ	State Program	6	88-0691	06-17-18
California	State Program	9	2897	01-31-18
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	01-29-18
Illinois	NELAP	5	200060	03-17-18
Kansas	NELAP	7	E-10375	12-31-17
L-A-B	DoD ELAP		L2468	01-20-18
Louisiana	NELAP	6	30612	06-30-18
Maine	State Program	1	CA0004	04-18-18
Michigan	State Program	5	9947	01-31-18
Nevada	State Program	9	CA00044	07-31-18
New Hampshire	NELAP	1	2997	04-18-18
New Jersey	NELAP	2	CA005	06-30-18
New York	NELAP	2	11666	04-01-18
Oregon	NELAP	10	4040	01-28-18
Pennsylvania	NELAP	3	68-01272	03-31-18
Texas	NELAP	6	T104704399	05-31-18
US Fish & Wildlife	Federal		LE148388-0	07-31-18
USDA	Federal		P330-11-00436	12-30-17 *
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-18
Virginia	NELAP	3	460278	03-14-18
Washington	State Program	10	C581	05-05-18
West Virginia (DW)	State Program	3	9930C	12-31-17
Wyoming	State Program	8	8TMS-L	01-28-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

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

TestAmerica Job ID: 320-34235-1

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

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

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

TestAmerica Job ID: 320-34235-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-34235-1	NAWC-121217-RW-061	Water	12/12/17 09:10	12/13/17 10:20
320-34235-2	NAWC-121217-FRB-061	Water	12/12/17 09:05	12/13/17 10:20
320-34235-3	NAWC-121217-RW-054	Water	12/12/17 10:10	12/13/17 10:20
320-34235-4	NAWC-121217-FRB-054	Water	12/12/17 10:05	12/13/17 10:20

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 192908

Lab Sample ID: IC 320-192908/4 Client Sample ID: _____

Date Analyzed: 11/03/17 13:37 Lab File ID: 2017.11.03_537XICAL_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.16	Assign Peak	phomsopha t	11/06/17 07:17

Lab Sample ID: IC 320-192908/5 Client Sample ID: _____

Date Analyzed: 11/03/17 13:42 Lab File ID: 2017.11.03_537XICAL_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.16	Assign Peak	phomsopha t	11/06/17 07:18

Lab Sample ID: IC 320-192908/7 ICISAV Client Sample ID: _____

Date Analyzed: 11/03/17 13:52 Lab File ID: 2017.11.03_537XICAL_007.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.16	Assign Peak	phomsopha t	11/06/17 07:20

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 200292

Lab Sample ID: CCVL 320-200292/1 Client Sample ID: _____

Date Analyzed: 12/18/17 09:53 Lab File ID: 2017.12.18_537A_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.12	Assign Peak	hannigana	12/18/17 10:44

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 200646

Lab Sample ID: CCV 320-200646/1 CCVIS Client Sample ID: _____

Date Analyzed: 12/19/17 20:31 Lab File ID: 2017.12.19_537A_050.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.06	Missed Peak	barnettj	12/20/17 14:18

Lab Sample ID: LCS 320-199900/2-A Client Sample ID: _____

Date Analyzed: 12/19/17 20:45 Lab File ID: 2017.12.19_537A_053.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.07	Missed Peak	barnettj	12/20/17 14:20

Lab Sample ID: LCSD 320-199900/3-A Client Sample ID: _____

Date Analyzed: 12/19/17 20:49 Lab File ID: 2017.12.19_537A_054.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.07	Missed Peak	barnettj	12/20/17 14:21

Lab Sample ID: CCV 320-200646/13 CCVIS Client Sample ID: _____

Date Analyzed: 12/19/17 21:27 Lab File ID: 2017.12.19_537A_062.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.06	Missed Peak	barnettj	12/20/17 14:19

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 200767

Lab Sample ID: CCV 320-200767/13 CCVIS Client Sample ID: _____

Date Analyzed: 12/19/17 21:27 Lab File ID: 2017.12.19_537A_062.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.06	Missed Peak	barnettj	12/20/17 14:19

Lab Sample ID: 320-34235-1 Client Sample ID: NAWC-121217-RW-061

Date Analyzed: 12/19/17 21:46 Lab File ID: 2017.12.19_537A_066.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.07	Missed Peak	barnettj	12/20/17 14:30

Lab Sample ID: 320-34235-3 Client Sample ID: NAWC-121217-RW-054

Date Analyzed: 12/19/17 21:55 Lab File ID: 2017.12.19_537A_068.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.06	Missed Peak	barnettj	12/20/17 14:31

Lab Sample ID: CCV 320-200767/21 CCVIS Client Sample ID: _____

Date Analyzed: 12/19/17 22:04 Lab File ID: 2017.12.19_537A_070.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.07	Missed Peak	barnettj	12/20/17 14:19

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-34235-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
LC537-HSP_00023	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	Perfluorobutane Sulfonate	1250.1 ng/mL		
							Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL		
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL		
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL		
							Perfluorononanoic acid (PFNA)	277.827 ng/mL		
							Perfluorooctanoic acid (PFOA)	278.01 ng/mL		
.LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutane Sulfonate	90 ug/mL		
							Perfluorobutanesulfonic acid (PFBS)	90 ug/mL		
							LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
							LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
							LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
							LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
..LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFOS_00002	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL		
							Perfluorobutane Sulfonate	2 mg/mL		
...LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutane Sulfonate	2 mg/mL		
							Perfluorobutanesulfonic acid (PFBS)	1 g/g		
..LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1 g/g		
							Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL		
...LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g		
..LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL		
							Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL		
...LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g		
..LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537 PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL		
...LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g		
..LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537 PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL		
...LC537 PFOA_00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g		
..LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL		
							Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL		
...LC537_PFOS_00003	04/17/19		sigma alrich, Lot SZBE107XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g		
LC537-ICV_00028	01/05/18	08/02/17	MeOH/H2O, Lot 067374	10 mL	LC537-IS_00045	1000 uL	13C2-PFOA	10 ng/mL		
							13C4 PFOS	28.68 ng/mL		
.LC537-IS_00045	01/05/18	07/05/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL		
							LCMPFOS_00019	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL		

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-34235-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFOS_00019	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
LC537-ICV_00028	01/05/18	08/02/17	MeOH/H2O, Lot 067374	10 mL	LC537-SU_00046	1000 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
					LC537ICIM_00019	20 uL	Perfluorobutanesulfonic acid (PFBS)	100.119 ng/mL
							Perfluoroheptanoic acid (PFHpA)	9.99613 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	20.0761 ng/mL
							Perfluorononanoic acid (PFNA)	20.1272 ng/mL
							Perfluorooctanoic acid (PFOA)	20.4843 ng/mL
			Perfluorooctanesulfonic acid (PFOS)	19.698 ng/mL				
.LC537-SU_00046	01/05/18	07/05/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LC537ICIM_00019	01/25/18	08/01/17	Methanol, Lot 090285	25 mL	LC537-PFBS2_00008	0.6 mL	Perfluorobutanesulfonic acid (PFBS)	50.0597 ug/mL
					LC537-PFHpA2_00011	0.061 mL	Perfluoroheptanoic acid (PFHpA)	4.99806 ug/mL
					LC537-PFHxS2_00008	0.122 mL	Perfluorohexanesulfonic acid (PFHxS)	10.038 ug/mL
					LC537-PFNA2_00009	0.126 mL	Perfluorononanoic acid (PFNA)	10.0636 ug/mL
					LC537-PFOA2_00010	0.122 mL	Perfluorooctanoic acid (PFOA)	10.2421 ug/mL
					LC537-PFOS2_00010	0.124 mL	Perfluorooctanesulfonic acid (PFOS)	9.849 ug/mL
..LC537-PFBS2_00008	01/25/18	07/25/17	Methanol, Lot 090285	20 mL	LC537_PFBS2_00002	0.0418 g	Perfluorobutanesulfonic acid (PFBS)	2085.82 ug/mL
...LC537_PFBS2_00002	09/08/22	Santa Cruz Biotechnology, Lot F0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	0.998 g/g
..LC537-PFHpA2_00011	01/25/18	07/25/17	Methanol, Lot 09092	31 mL	LC537_PFHpA2_00002	0.0635 g	Perfluoroheptanoic acid (PFHpA)	2048.39 ug/mL
...LC537_PFHpA2_00002	06/13/22	Afla Aesar, Lot 10200390			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	1 g/g
..LC537-PFHxS2_00008	01/25/18	07/25/17	Methanol, Lot 090285	21 mL	LC537_PFHxS2_00002	0.0475 g	Perfluorohexanesulfonic acid (PFHxS)	2056.98 ug/mL
...LC537_PFHxS2_00002	06/08/22	Santa Cruz Biotechnology, Lot G2516			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
..LC537-PFNA2_00009	01/25/18	07/25/17	Methanol, Lot 090285	21 mL	LC537_PFNA2_00002	0.0421 g	Perfluorononanoic acid (PFNA)	1996.74 ug/mL
...LC537_PFNA2_00002	06/14/22	Aldrich, Lot MKCC0699			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.996 g/g
..LC537-PFOA2_00010	01/25/18	08/01/17	Methanol, Lot 090285	20 mL	LC537_PFOA2_00002	0.0424 g	Perfluorooctanoic acid (PFOA)	2098.8 ug/mL
...LC537_PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.99 g/g
..LC537-PFOS2_00010	01/25/18	08/01/17	Methanol, Lot 090285	22 mL	LC537_PFOS2_00002	0.0561 g	Perfluorooctanesulfonic acid (PFOS)	1985.68 ug/mL
...LC537_PFOS2_00002	06/14/22	Sigma, Lot BCBQ0108V			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.7787 g/g
LC537-IS_00054	05/27/18	11/27/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-34235-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
.LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)	13C2-PFOA	50 ug/mL		
.LCMPFOS_00021	12/12/21		Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)	13C4 PFOS	47.8 ug/mL		
LC537-L1_00020	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL		
					LC537-MSP_00029	60 uL	13C4 PFOS	28.68 ng/mL		
							Perfluorobutanesulfonic acid (PFBS)	9.0018 ng/mL		
							Perfluoroheptanoic acid (PFHpA)	1.00036 ng/mL		
							Perfluorohexanesulfonic acid (PFHxS)	3.00103 ng/mL		
							Perfluorononanoic acid (PFNA)	2.0006 ng/mL		
							Perfluorooctanoic acid (PFOA)	2.00191 ng/mL		
					Perfluorooctanesulfonic acid (PFOS)	4.00146 ng/mL				
LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL							
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL		
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL		
..LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)	13C2-PFOA	50 ug/mL		
..LCMPFOS_00021	12/12/21		Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)	13C4 PFOS	47.8 ug/mL		
.LC537-MSP_00029	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	166.7 uL	Perfluorobutanesulfonic acid (PFBS)	750.15 ng/mL		
							Perfluoroheptanoic acid (PFHpA)	83.3637 ng/mL		
							Perfluorohexanesulfonic acid (PFHxS)	250.086 ng/mL		
							Perfluorononanoic acid (PFNA)	166.716 ng/mL		
							Perfluorooctanoic acid (PFOA)	166.826 ng/mL		
							Perfluorooctanesulfonic acid (PFOS)	333.455 ng/mL		
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL		
							LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
							LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
							LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
							LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
							LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL		
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V			(Purchased Reagent)	Perfluorobutanesulfonic acid (PFBS)	1 g/g		
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL		
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V			(Purchased Reagent)	Perfluoroheptanoic acid (PFHpA)	0.99 g/g		

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-34235-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA 00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537 PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
...LC537 PFNA 00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA 00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537 PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
...LC537 PFOA 00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19		sigma alrich, Lot SZBE107XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA 00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA 00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA 00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA 00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L2_00020	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	80 uL	Perfluorobutanesulfonic acid (PFBS)	20.0016 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.22277 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	6.66817 ng/mL
							Perfluorononanoic acid (PFNA)	4.44524 ng/mL
							Perfluorooctanoic acid (PFOA)	4.44816 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	8.89106 ng/mL
					LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL
							Perfluorononanoic acid (PFNA)	277.827 ng/mL
							Perfluorooctanoic acid (PFOA)	278.01 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHxA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-34235-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537 PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537_PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537_PFOA_00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19		sigma alrich, Lot SZBE107XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L3_00023	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	180 uL	Perfluorobutanesulfonic acid (PFBS)	45.0036 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5.00122 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	15.0034 ng/mL
							Perfluorononanoic acid (PFNA)	10.0018 ng/mL
							Perfluorooctanoic acid (PFOA)	10.0084 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	20.0049 ng/mL
					LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-34235-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL
							Perfluorononanoic acid (PFNA)	277.827 ng/mL
							Perfluorooctanoic acid (PFOA)	278.01 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537 PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537 PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537 PFOA_00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19		sigma alrich, Lot SZBE107XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L4_00020	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	360 uL	Perfluorobutanesulfonic acid (PFBS)	90.0072 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10.0024 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-34235-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
							Perfluorohexanesulfonic acid (PFHxS)	30.0067 ng/mL		
							Perfluorononanoic acid (PFNA)	20.0036 ng/mL		
							Perfluorooctanoic acid (PFOA)	20.0167 ng/mL		
							Perfluorooctanesulfonic acid (PFOS)	40.0098 ng/mL		
							LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
									13C4 PFOS	28.68 ng/mL
..LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	13C2 PFDA	10 ng/mL		
							13C2 PFHxA	10 ng/mL		
							Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL		
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL		
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL		
							Perfluorononanoic acid (PFNA)	277.827 ng/mL		
		Perfluorooctanoic acid (PFOA)	278.01 ng/mL							
		Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL							
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL		
							LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
							LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
							LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
							LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
							LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL		
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g		
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL		
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g		
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL		
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g		
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537 PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL		
....LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g		
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537 PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL		
....LC537 PFOA_00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g		
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL		
....LC537_PFOS_00003	04/17/19		sigma alrich, Lot SZBE107XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g		

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-34235-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L5_00024	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	540 uL	Perfluorobutanesulfonic acid (PFBS)	135.011 ng/mL
							Perfluoroheptanoic acid (PFHpA)	15.0037 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.0101 ng/mL
							Perfluorononanoic acid (PFNA)	30.0053 ng/mL
							Perfluorooctanoic acid (PFOA)	30.0251 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	60.0146 ng/mL
					LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL
							Perfluorononanoic acid (PFNA)	277.827 ng/mL
							Perfluorooctanoic acid (PFOA)	278.01 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
..LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-34235-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration				
					Reagent ID	Volume Added						
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g				
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL				
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g				
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537_PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL				
....LC537_PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g				
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537_PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL				
....LC537_PFOA_00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g				
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL				
....LC537_PFOS_00003	04/17/19		sigma alrich, Lot SZBE107XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g				
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL				
..LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216		LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL				
..LCMPFOS_00021	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C2-PFOA	50 ug/mL				
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL				
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL				
..LCMPFHxA_00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFDA	50 ug/mL				
LC537-L6_00020	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	720 uL	Perfluorobutanesulfonic acid (PFBS)	180.014 ng/mL				
							Perfluoroheptanoic acid (PFHpA)	20.0049 ng/mL				
							Perfluorohexanesulfonic acid (PFHxS)	60.0135 ng/mL				
											Perfluorononanoic acid (PFNA)	40.0071 ng/mL
											Perfluorooctanoic acid (PFOA)	40.0334 ng/mL
											Perfluorooctanesulfonic acid (PFOS)	80.0195 ng/mL
										LC537-IS_00048	500 uL	13C2-PFOA
							13C4 PFOS	28.68 ng/mL				
					LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL				
							13C2 PFHxA	10 ng/mL				
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL				
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL				
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL				
							Perfluorononanoic acid (PFNA)	277.827 ng/mL				
							Perfluorooctanoic acid (PFOA)	278.01 ng/mL				
							Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL				
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL				

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-34235-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537_PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537_PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537_PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C4 PFOS	47.8 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			LCMPFHxA_00013	60 uL	13C2 PFDA	0.1 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	0.1 ug/mL
LC537-SU_00056	05/27/18	11/27/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
.LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
.LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFDA	50 ug/mL
					(Purchased Reagent)		13C2 PFHxA	50 ug/mL

Reagent

LC537_PFB_00002

#: 4/1/15 SPV

3050 Spruce Street, Saint Louis, MO 63103, USA

Website: www.sigmaaldrich.com

Email USA: techserv@sial.com

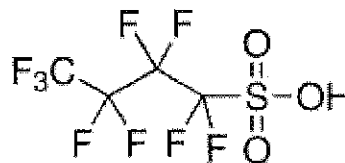
Outside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name:

Nonafluorobutane-1-sulfonic acid - 97%

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



PFBS

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

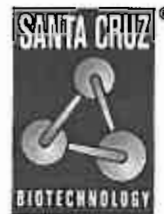
Jamie Gleason, Manager
 Quality Control
 Milwaukee, Wisconsin US

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Reagent

LC537_PFB2_00002

F: 6.8.17 SW



CERTIFICATE OF ANALYSIS

The Power to Question

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

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

Reagent

LC537_PFHpA_00002

R: 4/1/15 4V

Certificate of Analysis

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

PFHpA

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

Dr. Claudia Geitner
 Manager Quality Control
 Buchs, Switzerland

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

Reagent

LC537_PFHpA2_00002

Certificate of analysis

r:6.13.17 SW

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

PFHe A

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

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Reagent

LC537_PFHxS_00002

r: 4/1/15 stw

Certificate of Analysis

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

Product Number: 50929

Batch Number: BCBL3545V

Brand: Aldrich

CAS Number: 3871-99-6

Formula: C₆F₁₃KO₃S

Formula Weight: 438.20

Quality Release Date: 20 JUN 2013

PFH₁₃S-K

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

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

$$MW_{corr} = \frac{(k_{form}) - (k) + (H)}{438.20 (k_{form})} = \frac{(438.20 - 39.10 + 1.01)}{438.20 (k_{form})} = 0.91307 \text{ (anion form)}$$

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

stw 4/1/15

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

Reagent

LC537_PFHxS2_00002

n: 6-8-17 SKJ

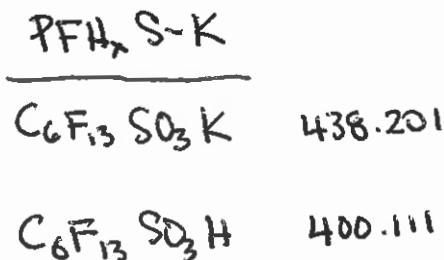


The Future of Science

CERTIFICATE OF ANALYSIS

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

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



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

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

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Reagent

LC537_PENA_00002

R: 4/1/15 SKV



Certificate of Analysis

Apr 2, 2015 (JST)

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

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

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

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

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

PFNA

Reagent

LC537_PFN2_00002

P: 6.14.17 SKW

3050 Spruce Street, Saint Louis, MO 63103, USA

Website: www.sigmaaldrich.com

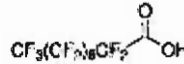
Email USA: techserv@sial.com

Outside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name:
Perfluorononanoic acid - 97%

Product Number: 394459
Batch Number: MKCC0699
Brand: ALDRICH
CAS Number: 375-95-1
MDL Number: MFCD00039605
Formula: C9HF17O2
Formula Weight: 464.08 g/mol
Quality Release Date: 07 DEC 2016



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

Michael Grady, Manager
Quality Control
Milwaukee, WI US

PFNA

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Reagent

LC537_PFOA_00003

R: 11/30/16 SKV
PFA

SIGMA-ALDRICH

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

Certificate of Analysis

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

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



Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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Reagent

LC537_PFOA2_00002

Certificate of analysis

P: 6/21/17 SW ✓

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

PFOA

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

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Reagent

LC537_PFOs_00003

n: 11/30/16 SV
PFOS

SIGMA-ALDRICH

CERTIFICATE OF ANALYSIS

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

Seelze, 22.04.2014/524107/14/08646

Order-No.:

Customer-No.:

Order-Code:

Quantity:

Production Date: 17.Apr.2014

Expiry Date: 17.Apr.2019

Article/Product: 33829

Batch : SZBE107XV

Heptadecafluorooctanesulfonic acid potassium salt OEKANAL[®]

Reference Material (RM)

1. General Information

Formula: C₈F₁₇KO₃S

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

Usage : PFOS

Molar mass: 538.22 g/Mole

Recomm. storage temp.: roomtemp.

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

2. Batch Analysis

Identity

Assay (LC-MS)

Date of Analysis

complying

98 %

22.Apr.2014

3. Advice and Remarks

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

Sigma-Aldrich Laborchemikalien GmbH
Quality Management SA-LC

Reagent

LC537_PFOs2_00002

R: 6.14.17 SKV

Certificate of Analysis

Product Name: 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

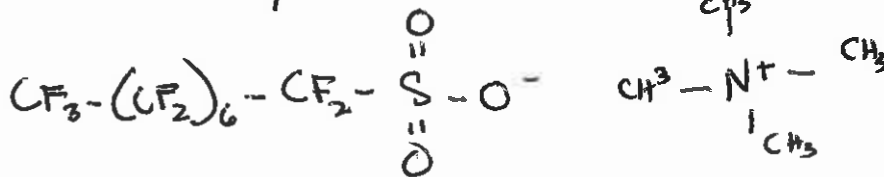
Quality Release Date: 11 JUN 2015

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

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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

Purity & MW correction = 77.37%



	$C_8 F_{17} SO_3^+ H$	$C_8 H_{20} N$
C = 12.011	96.088	96.088
F = 18.998	322.966	—
S = 32.066	32.066	—
O = 16.999	47.997	20.60
H = 1.008	1.008	14.007
N = 14.007	—	—
	<hr/>	<hr/>
	500.125	130.255

Reagent

LCM2PFOA_00007



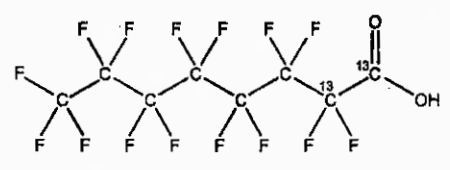
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: M2PFOA0216

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₆HF₁₆O₂
CONCENTRATION: 50 ± 2.5 µg/ml

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

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

ISOTOPIC PURITY: ≥99%¹³C
(1,2-¹³C₂)

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

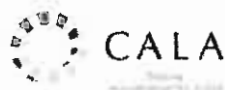
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

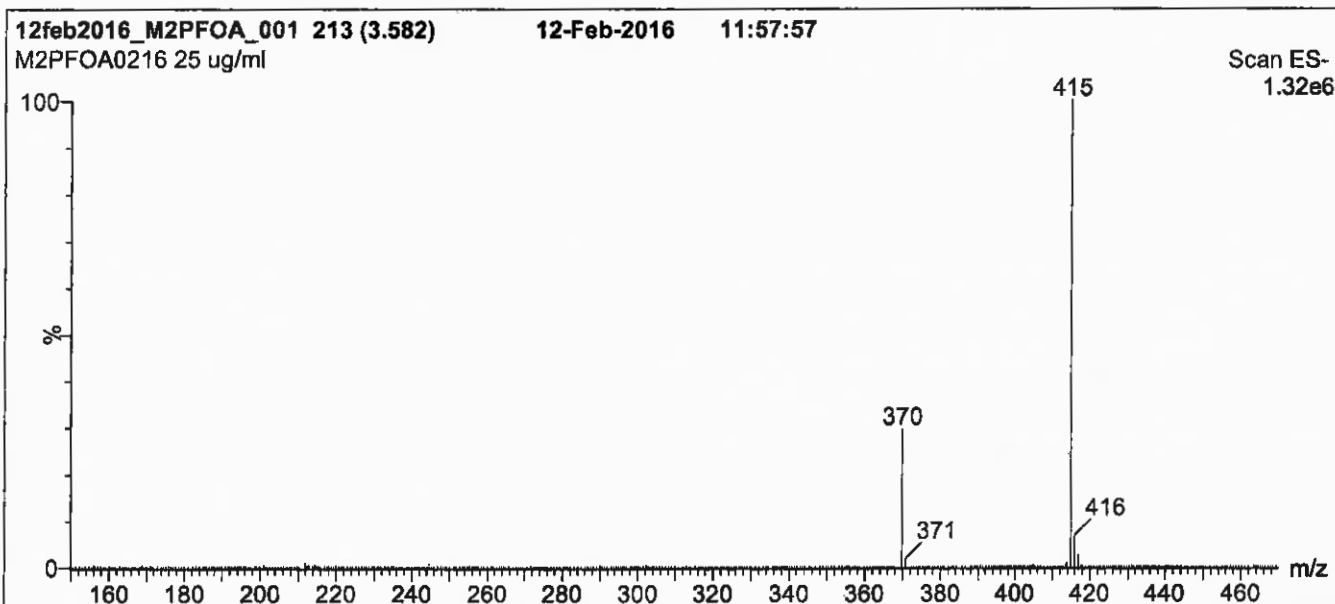
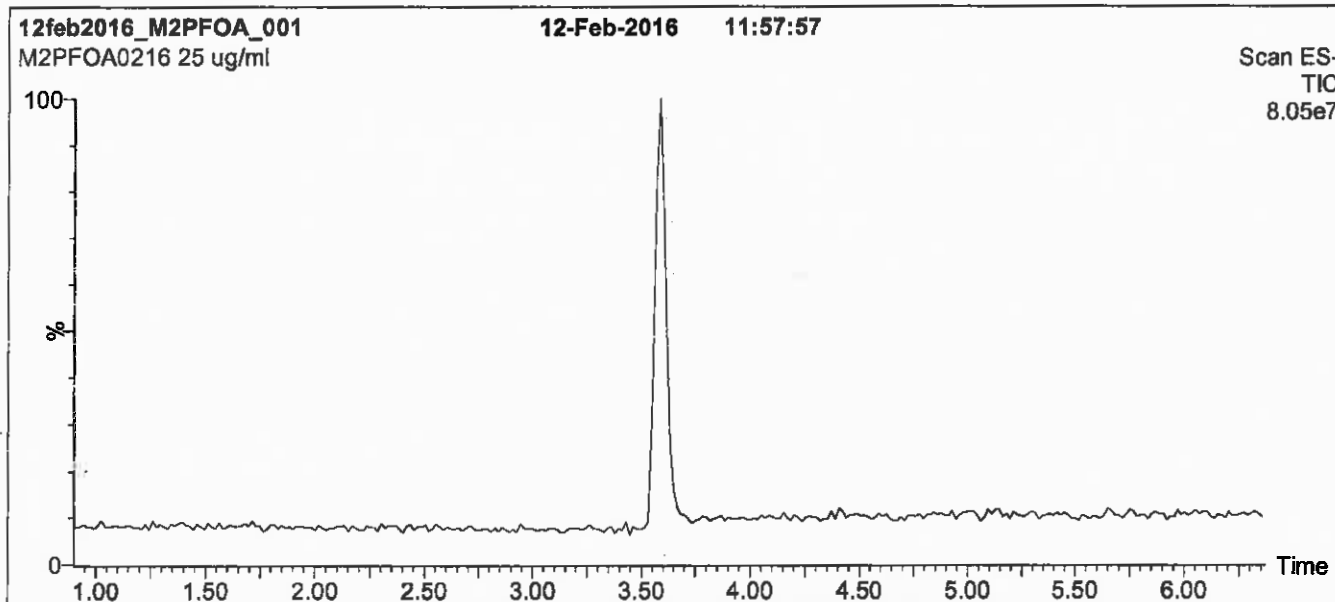
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

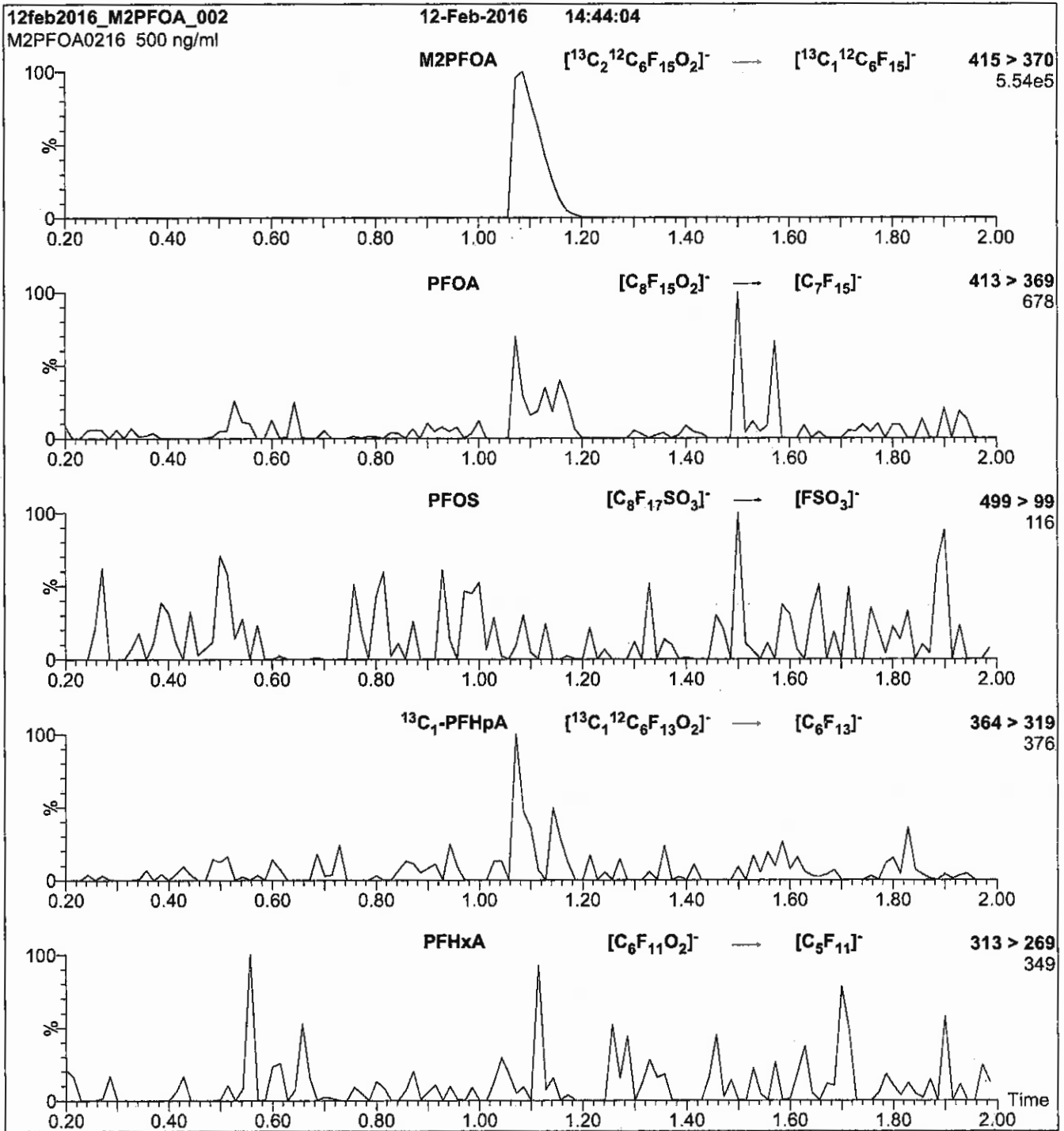
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)
Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% MeOH / 20% H_2O

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

MS Parameters

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

Reagent

LCMPFDA_00012

R: SBC 12/21/16



814255

ID: LCMPPFDA_00012

Exp: 09/30/21 Prpd: SBC

13C2-Perfluorodecanoic acid

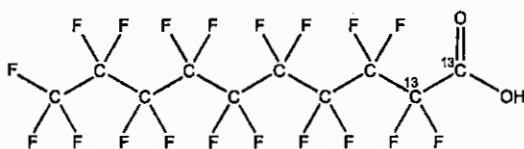


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₈HF₁₉O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 516.07
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

LAST TESTED: (mm/dd/yyyy) 09/30/2016

EXPIRY DATE: (mm/dd/yyyy) 09/30/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:
B.G. Chríttim

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

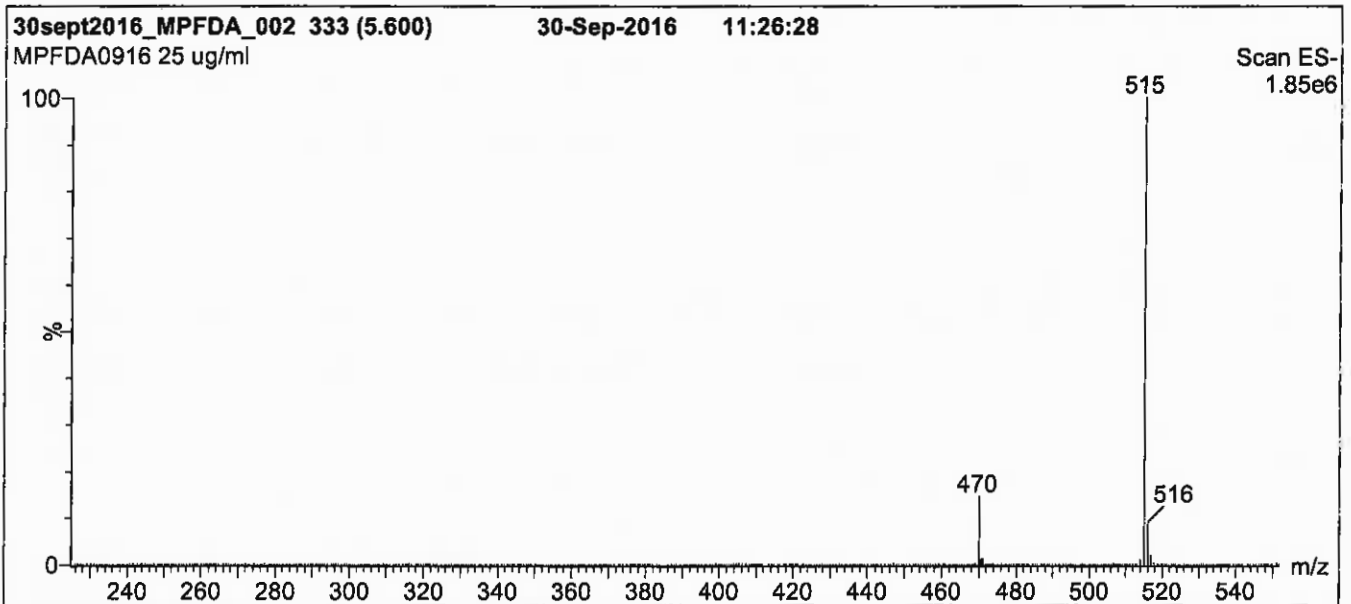
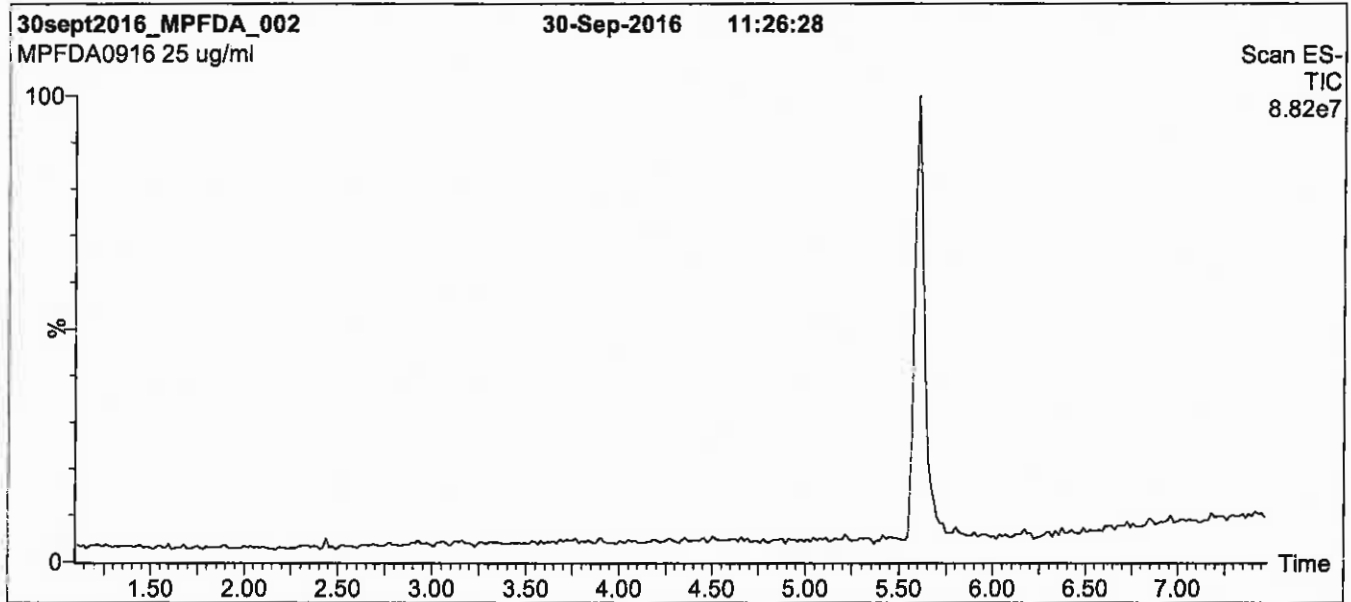
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

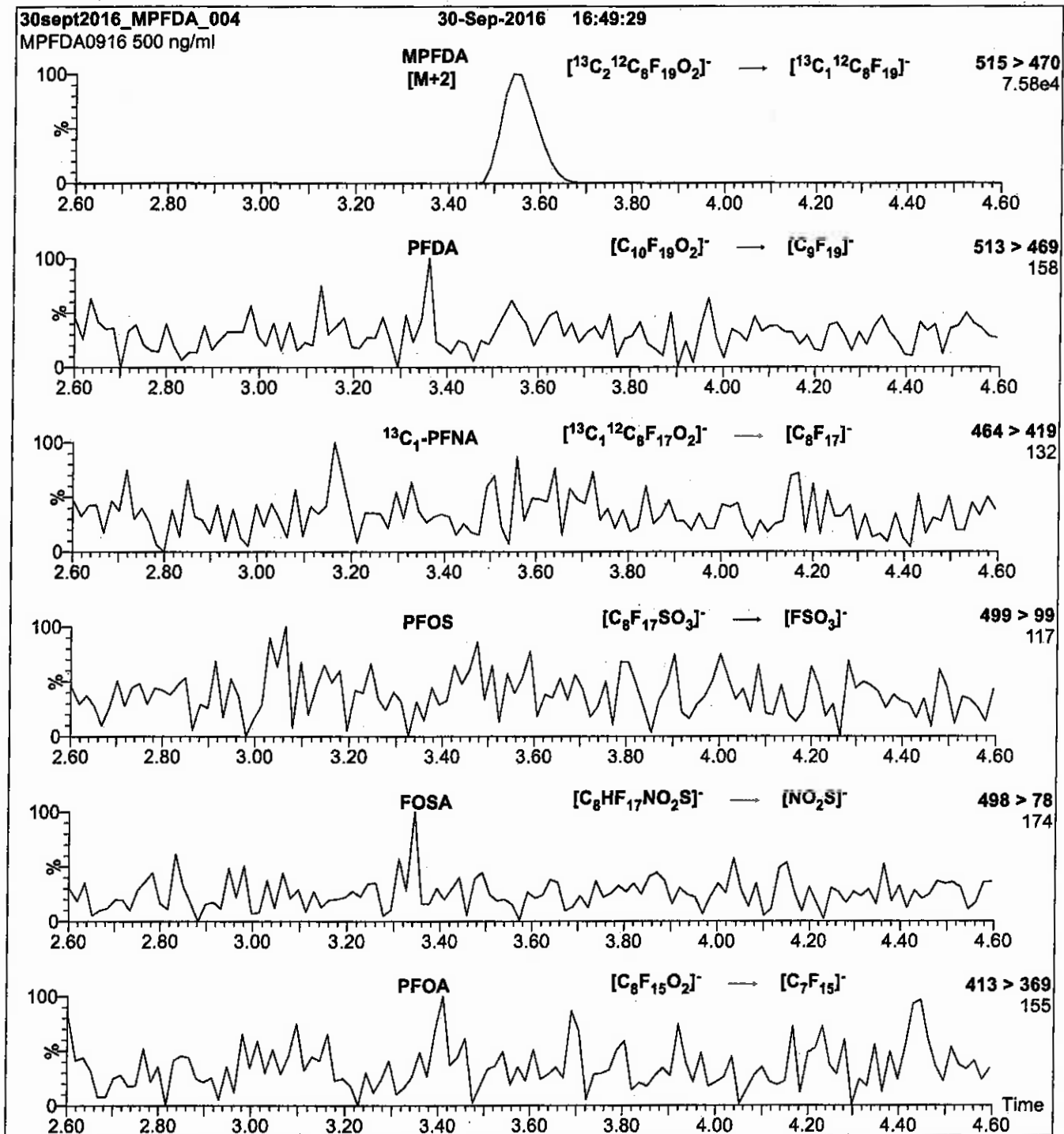
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFHxA_00013

R: SBC 12/21/16



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



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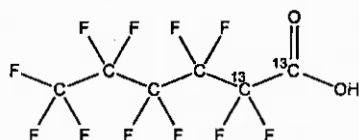
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFHxA0416

STRUCTURE:

CAS #: Not available



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

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

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99%¹³C
(1,2-¹³C₂)

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

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

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:
B.G. Chittim

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

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

INTENDED USE:

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.

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SYNTHESIS / CHARACTERIZATION:

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

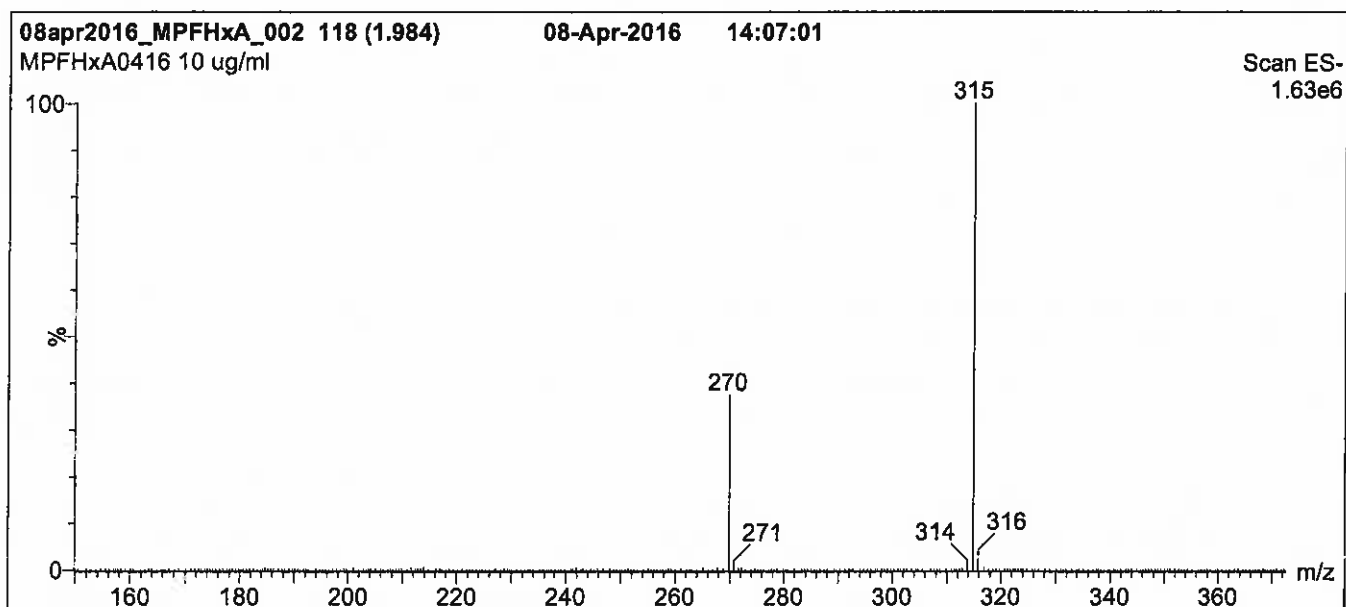
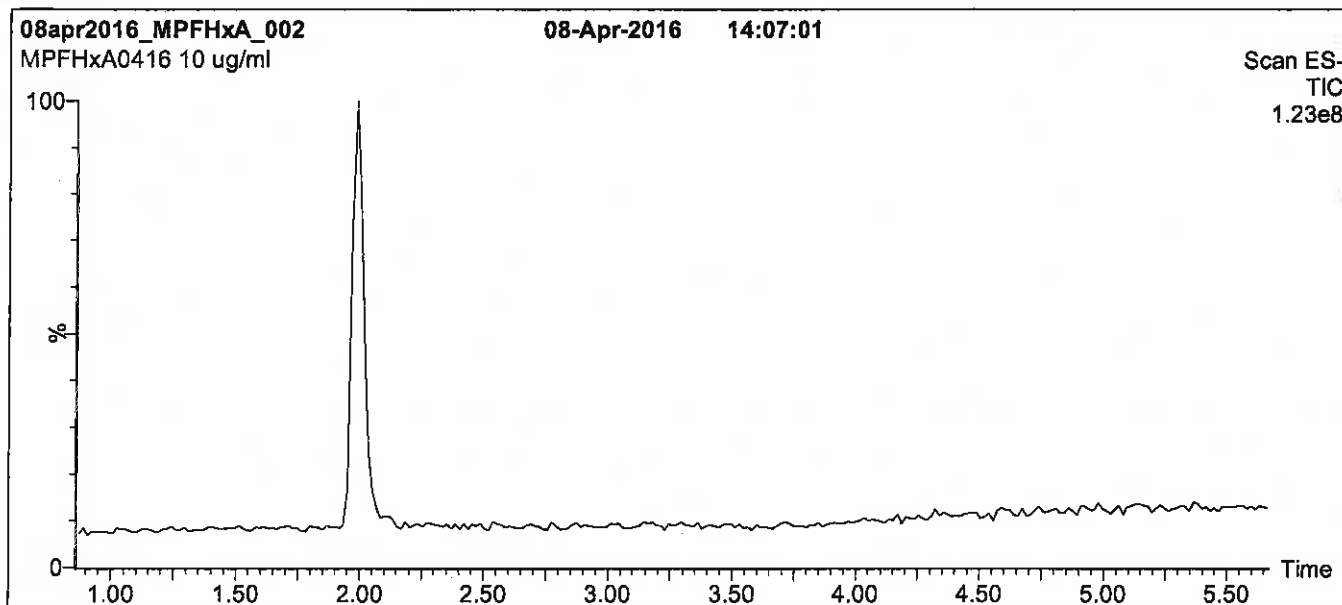
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

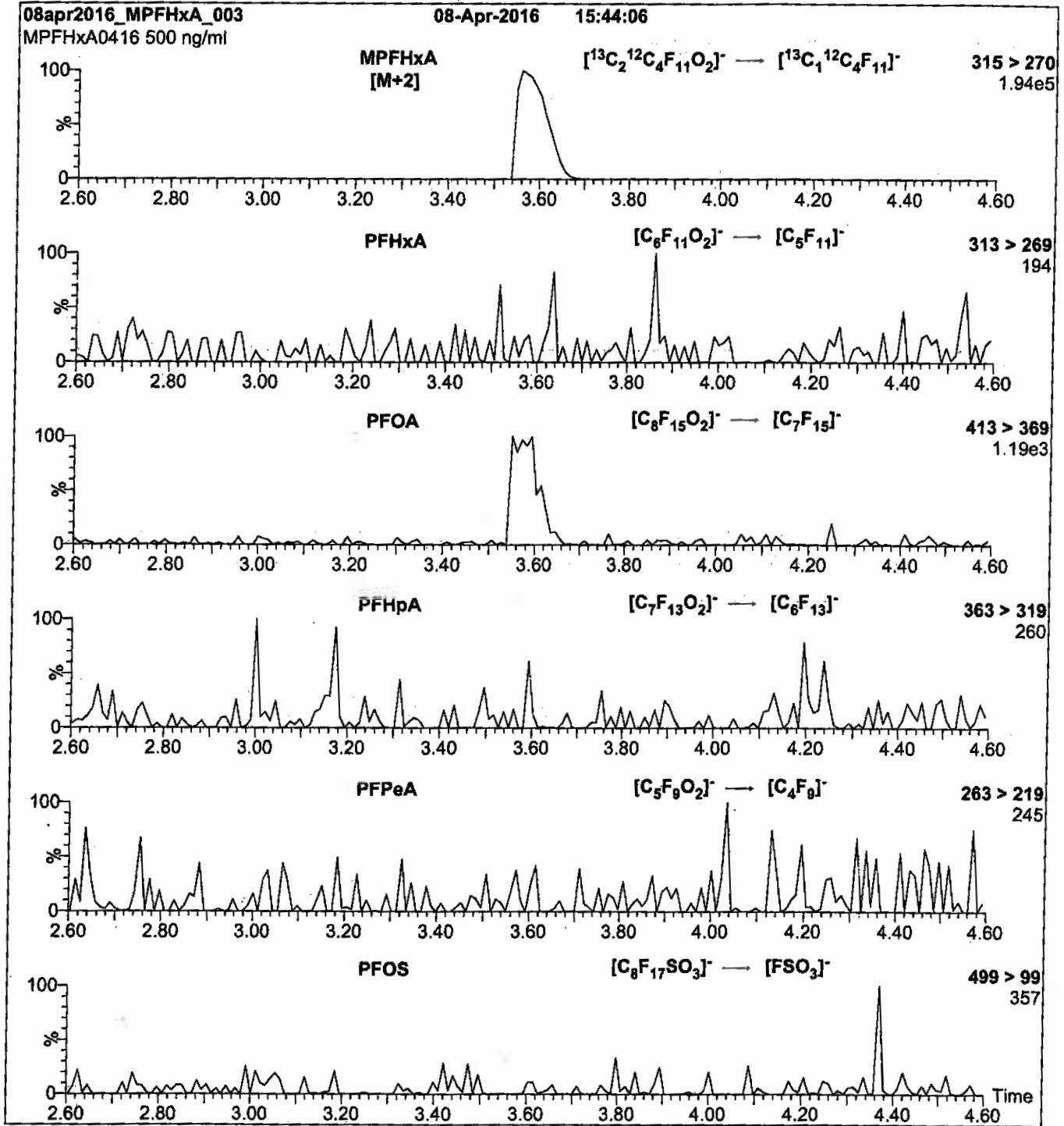
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFHxA_00015

r: 5/10/17 skd



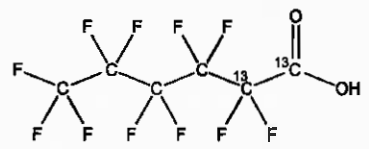
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFHxA1116

STRUCTURE: **CAS #:** Not available



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

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

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

LAST TESTED: (mm/dd/yyyy) 11/22/2016

EXPIRY DATE: (mm/dd/yyyy) 11/22/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim

Date: 12/13/2016
(mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

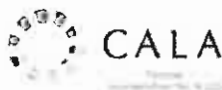
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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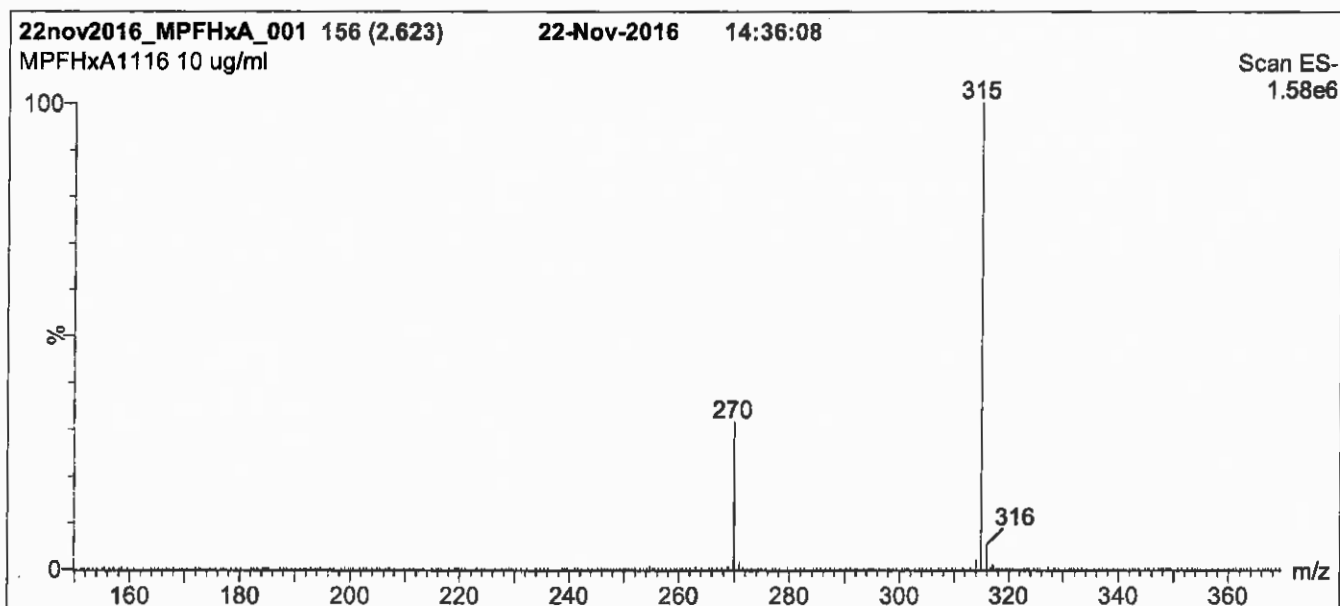
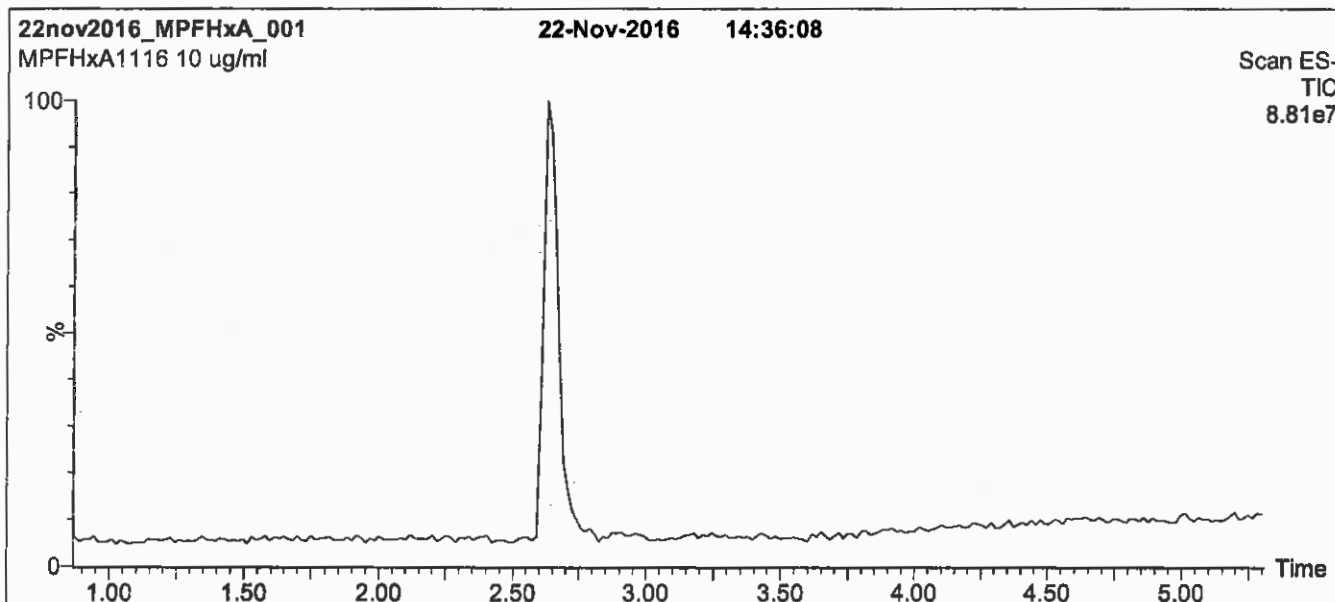
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

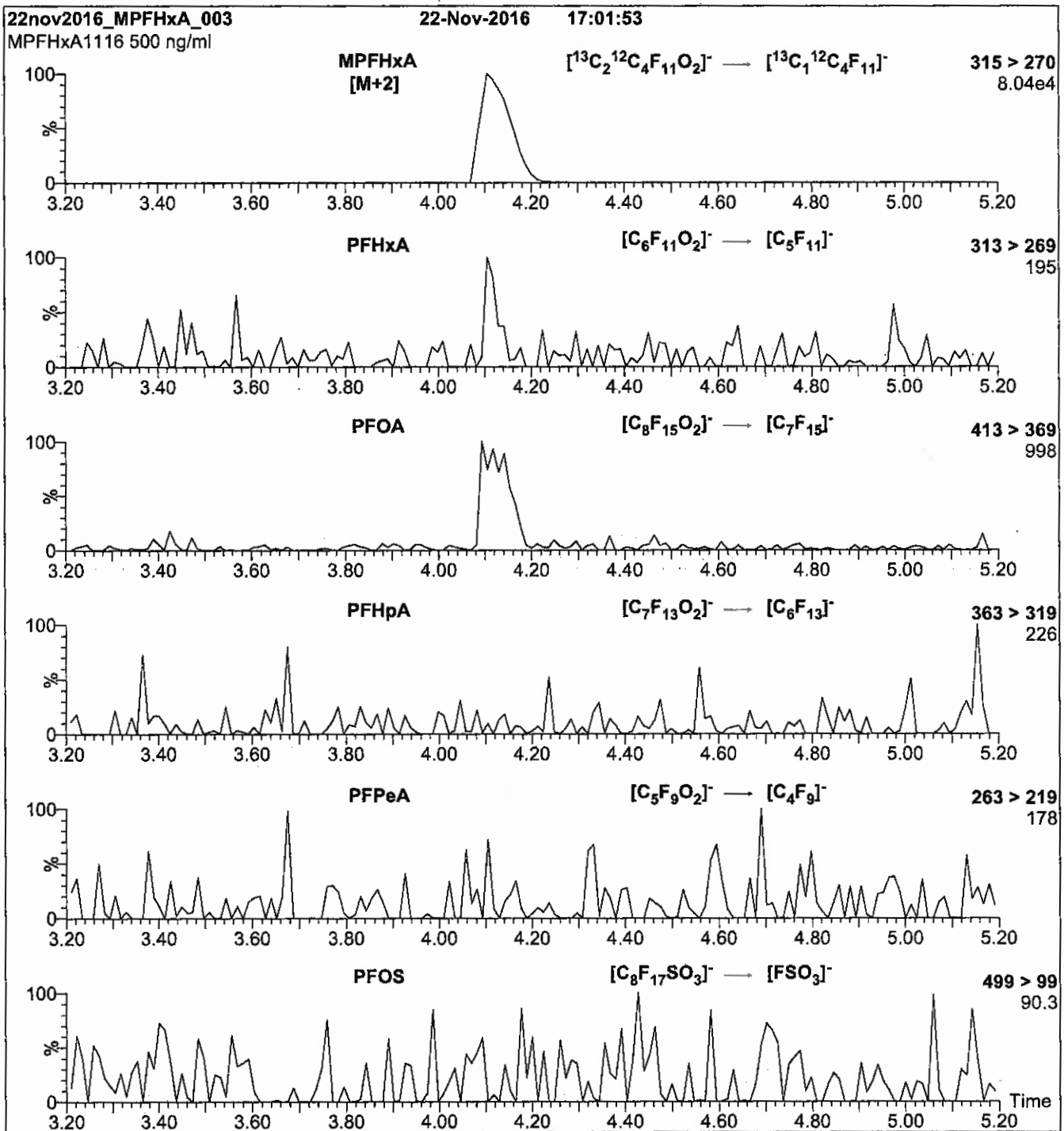
Mobile phase: Gradient
 Start: 40% (80:20 MeOH:ACN) / 60% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for 2 min
 before returning to initial conditions over 0.5 min.
 Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)
 Source: Electrospray (negative)
 Capillary Voltage (kV) = 2.00
 Cone Voltage (V) = 15.00
 Cone Gas Flow (l/hr) = 100
 Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = $3.46\text{e-}3$
 Collision Energy (eV) = 10

Reagent

LCMPFOS_00019

R: SBC 12/21/16



814253
ID: LCMFOS_00019
Exp: 08/03/21 Ppfd: SBC
13C4-Perfluorooctanesulfo

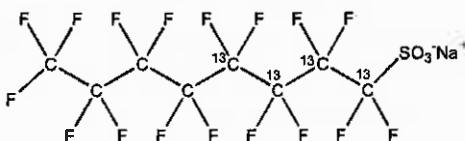


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE: **CAS #:** Not available



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


DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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HAZARDS:

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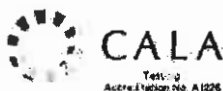
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

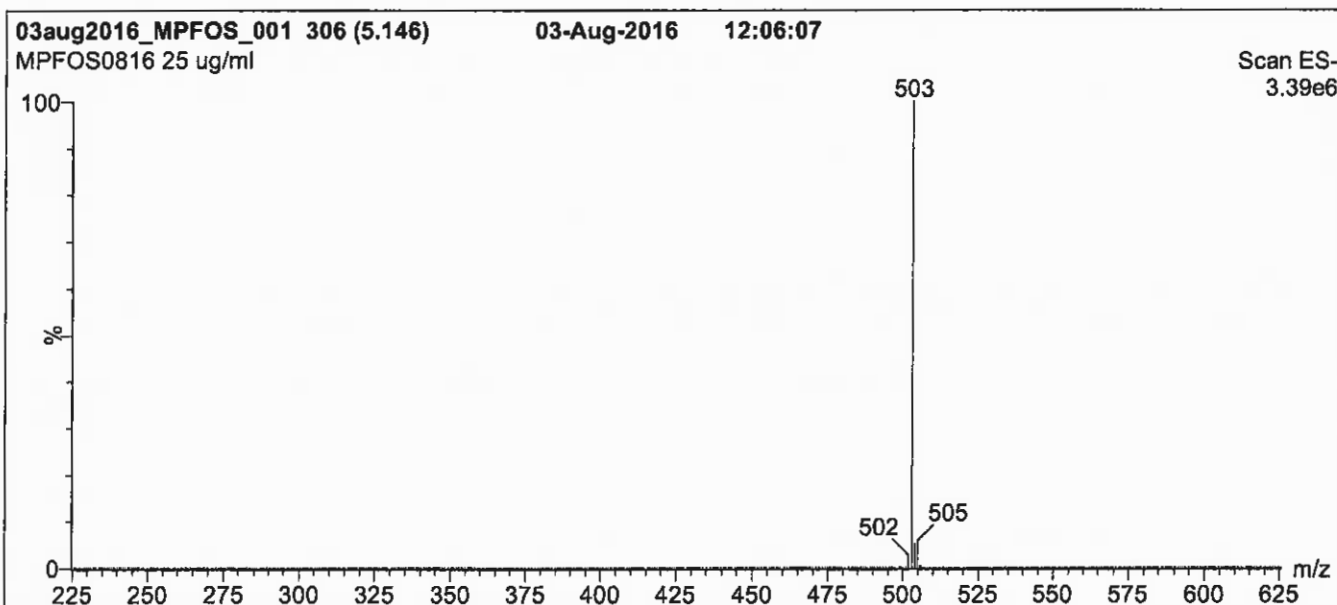
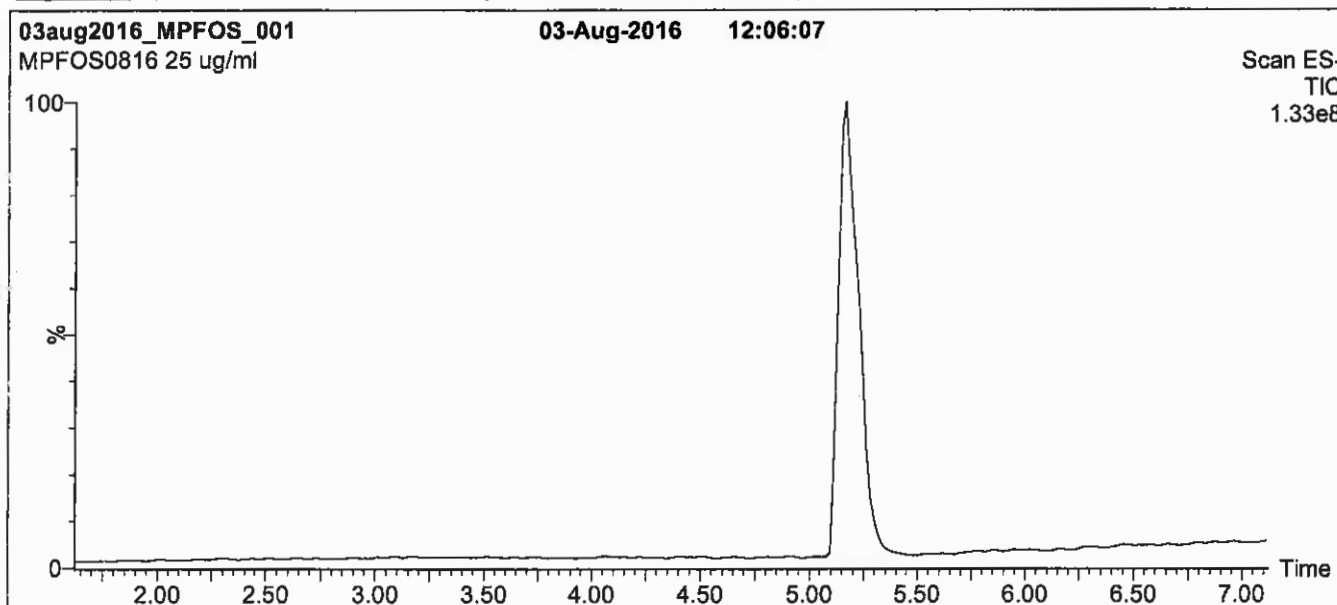
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

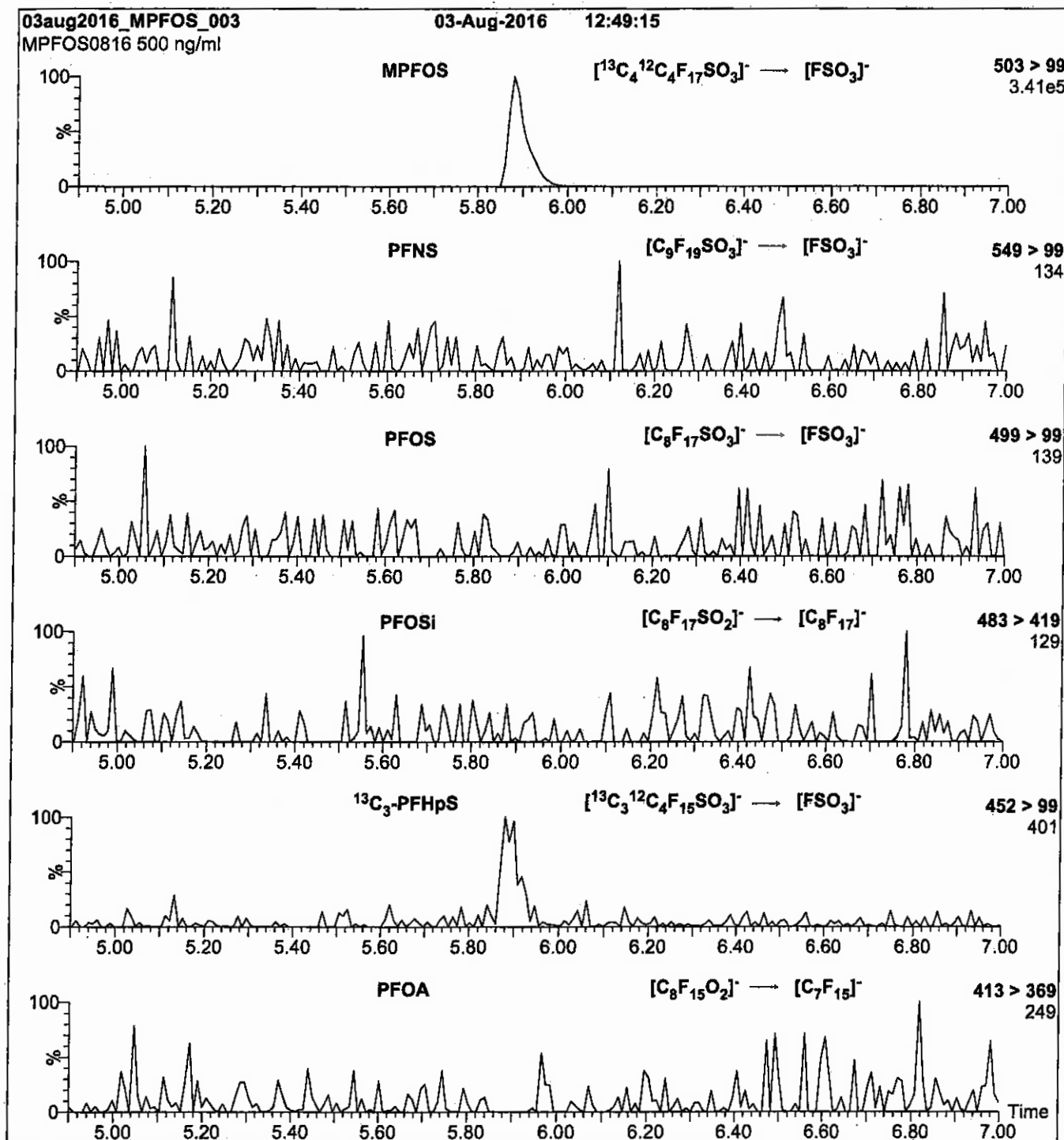
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCMPFOS_00021

r: 5/6/17 SKV

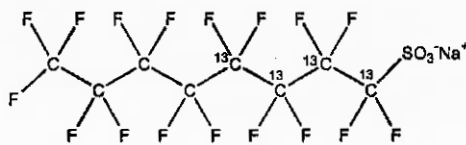


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₄¹²C₄F₁₇SO₃Na **MOLECULAR WEIGHT:** 526.08
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
47.8 ± 2.4 µg/ml (MPFOS anion)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
LAST TESTED: (mm/dd/yyyy) 12/12/2016 (1,2,3,4-¹³C₄)
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-[1,2,3-¹³C₃]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

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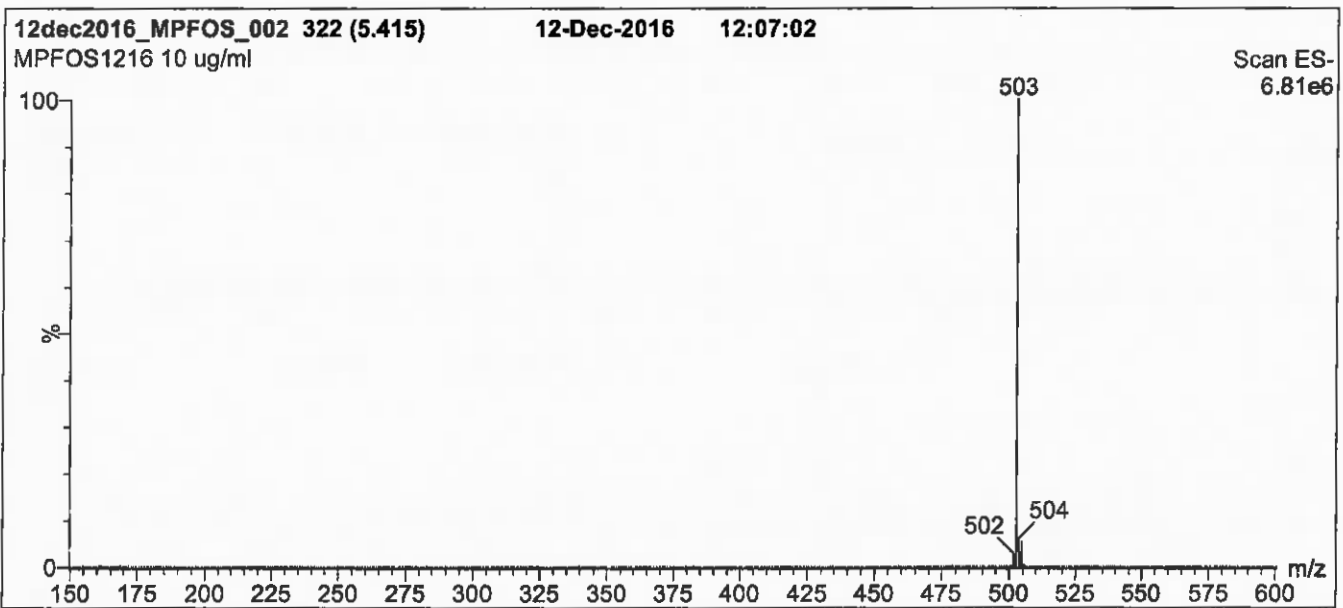
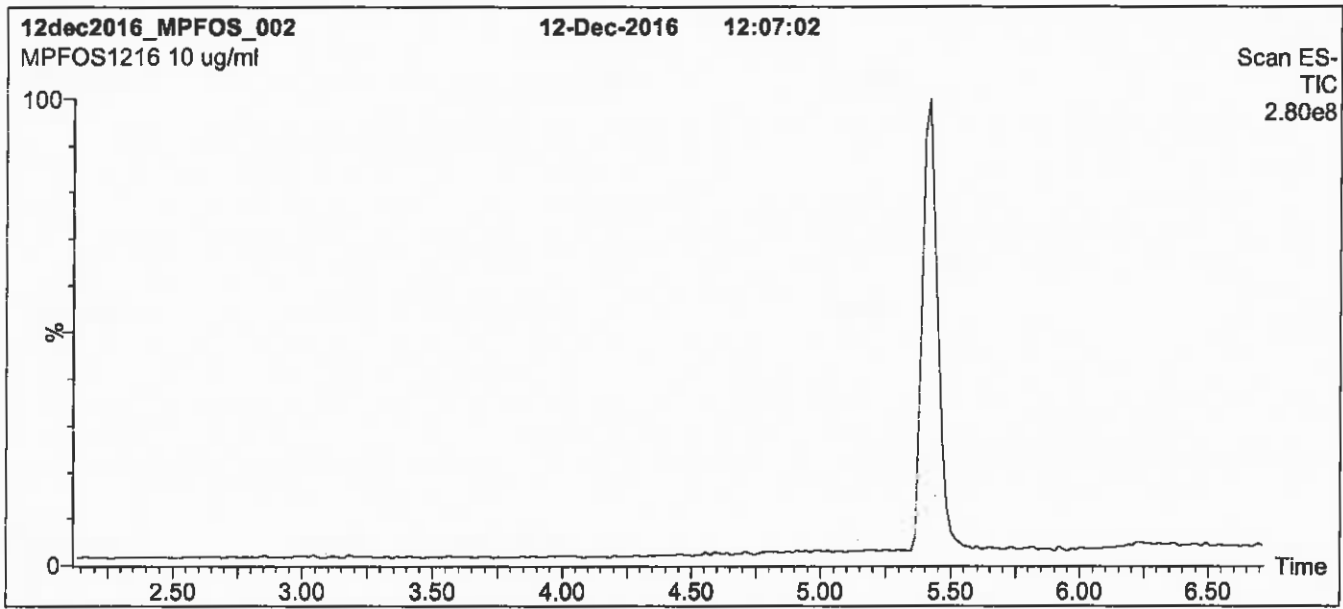
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MS: Micromass Quattro *micro* API MS

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

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

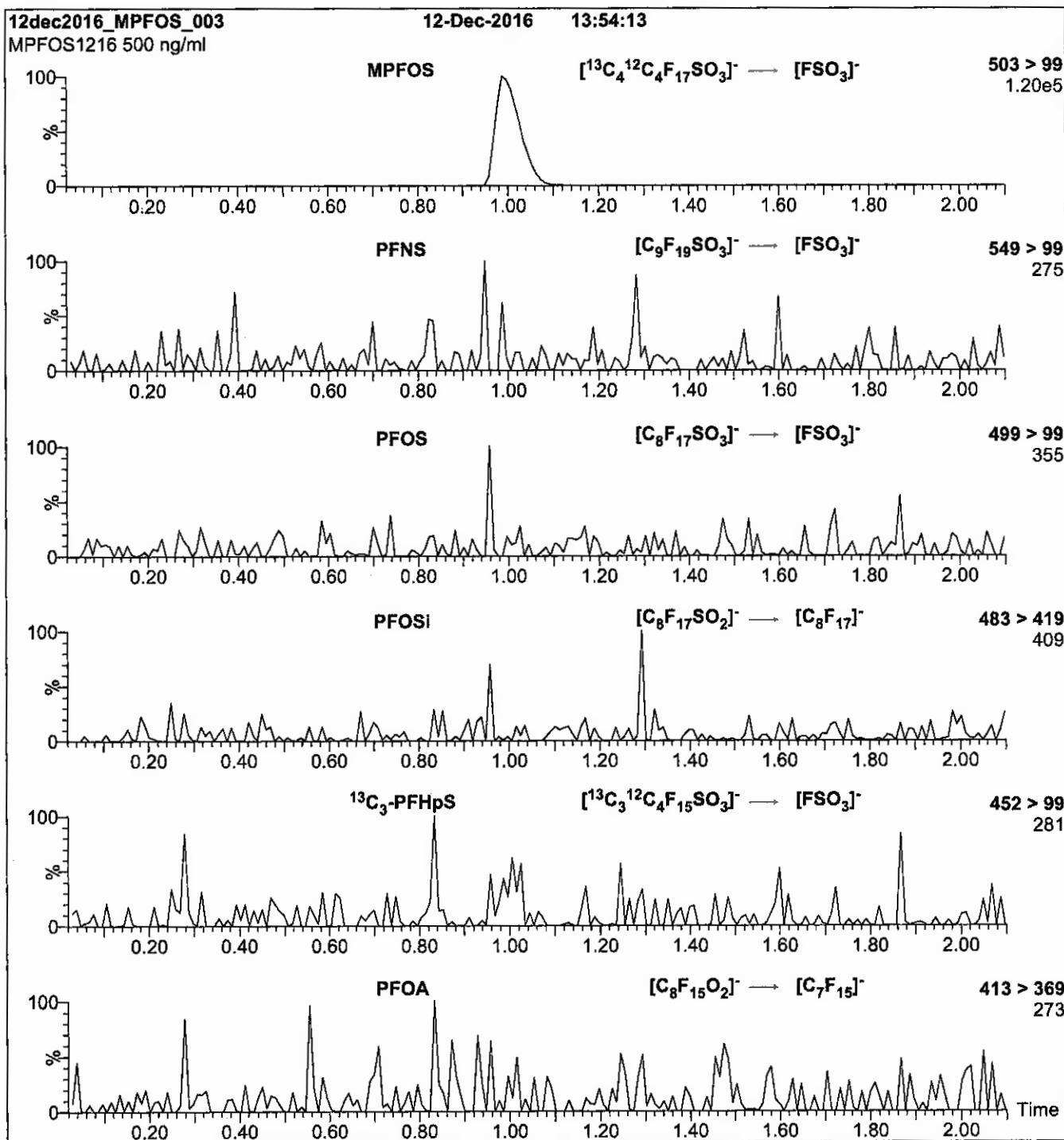
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Method 537 DOD

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

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1

SDG No.: _____

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-121217-RW-061	320-34235-1	93	95
NAWC-121217-FRB-061	320-34235-2	77	89
NAWC-121217-RW-054	320-34235-3	83	88
NAWC-121217-FRB-054	320-34235-4	92	84
	MB 320-199900/1-A	93	96
	LCS 320-199900/2-A	97	98
	LCSD 320-199900/3-A	97	103

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.: 320-34235-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2017.12.19_537A_053.d
 Lab ID: LCS 320-199900/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	222	223	100	70-130	M
Perfluorooctanoic acid (PFOA)	111	110	99	70-130	
Perfluorononanoic acid (PFNA)	111	109	98	70-130	
Perfluorohexanesulfonic acid (PFHxS)	167	183	110	70-130	
Perfluoroheptanoic acid (PFHpA)	55.6	62.1	112	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	494	99	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.: 320-34235-1

SDG No.: _____

Matrix: Water Level: Low Lab File ID: 2017.12.19_537A_054.d

Lab ID: LCSD 320-199900/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	222	216	97	3	30	70-130	M
Perfluorooctanoic acid (PFOA)	111	109	98	1	30	70-130	
Perfluorononanoic acid (PFNA)	111	106	95	3	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	167	174	104	5	30	70-130	
Perfluoroheptanoic acid (PFHpA)	55.6	60.0	108	3	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	480	96	3	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.: 320-34235-1
 SDG No.: _____
 Lab File ID: 2017.12.19_537A_052.d Lab Sample ID: MB 320-199900/1-A
 Matrix: Water Date Extracted: 12/14/2017 12:48
 Instrument ID: A8_N Date Analyzed: 12/19/2017 20:40
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-199900/2-A	2017.12.19_537A_053.d	12/19/2017 20:45
	LCSD 320-199900/3-A	2017.12.19_537A_054.d	12/19/2017 20:49
NAWC-121217-RW-061	320-34235-1	2017.12.19_537A_066.d	12/19/2017 21:46
NAWC-121217-FRB-061	320-34235-2	2017.12.19_537A_067.d	12/19/2017 21:50
NAWC-121217-RW-054	320-34235-3	2017.12.19_537A_068.d	12/19/2017 21:55
NAWC-121217-FRB-054	320-34235-4	2017.12.19_537A_069.d	12/19/2017 22:00

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Instrument ID: A8_N Calibration Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 11/03/2017 14:01
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	1535518	1.91	3276559	2.15		
UPPER LIMIT	2303277	2.41	4914839	2.65		
LOWER LIMIT	767759	1.41	1638280	1.65		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCVL 320-192908/11		1586829	1.91	3305852	2.15	
ICV 320-192908/13		1512045	1.90	3433628	2.14	
CCV 320-200646/1 CCVIS		1495978	1.81	3096651	2.06	
MB 320-199900/1-A		1460001	1.81	3186036	2.07	
LCS 320-199900/2-A		1457783	1.81	3055078	2.07	
LCSD 320-199900/3-A		1467291	1.81	3102295	2.07	
CCV 320-200646/13 CCVIS		1490421	1.81	3162377	2.06	
CCV 320-200767/13 CCVIS		1490421	1.81	3162377	2.06	
320-34235-1	NAWC-121217-RW-061	1539640	1.81	3335126	2.07	
320-34235-2	NAWC-121217-FRB-061	1568496	1.81	3201291	2.06	
320-34235-3	NAWC-121217-RW-054	1613661	1.81	3364132	2.06	
320-34235-4	NAWC-121217-FRB-054	1598402	1.81	3306781	2.06	
CCV 320-200767/21 CCVIS		1464558	1.81	3048007	2.07	

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.: 320-34235-1
 SDG No.: _____
 Sample No.: CCV 320-200646/1 Date Analyzed: 12/19/2017 20:31
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.19_537A_050 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1495978	1.81	3096651	2.06		
UPPER LIMIT	2094369	2.31	4335311	2.56		
LOWER LIMIT	1047185	1.31	2167656	1.56		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-199900/1-A			1460001	1.81	3186036	2.07
LCS 320-199900/2-A			1457783	1.81	3055078	2.07
LCSD 320-199900/3-A			1467291	1.81	3102295	2.07

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.: 320-34235-1
 SDG No.: _____
 Sample No.: CCV 320-200646/13 Date Analyzed: 12/19/2017 21:27
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.19_537A_062 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1490421	1.81	3162377	2.06		
UPPER LIMIT	2086589	2.31	4427328	2.56		
LOWER LIMIT	1043295	1.31	2213664	1.56		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-199900/1-A		1460001	1.81	3186036	2.07	
LCS 320-199900/2-A		1457783	1.81	3055078	2.07	
LCSD 320-199900/3-A		1467291	1.81	3102295	2.07	

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.: 320-34235-1
 SDG No.: _____
 Sample No.: CCV 320-200767/13 Date Analyzed: 12/19/2017 21:27
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.19_537A_062 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1490421	1.81	3162377	2.06		
UPPER LIMIT	2086589	2.31	4427328	2.56		
LOWER LIMIT	1043295	1.31	2213664	1.56		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-34235-1	NAWC-121217-RW-061	1539640	1.81	3335126	2.07	
320-34235-2	NAWC-121217-FRB-061	1568496	1.81	3201291	2.06	
320-34235-3	NAWC-121217-RW-054	1613661	1.81	3364132	2.06	
320-34235-4	NAWC-121217-FRB-054	1598402	1.81	3306781	2.06	

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.: 320-34235-1
 SDG No.: _____
 Sample No.: CCV 320-200767/21 Date Analyzed: 12/19/2017 22:04
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.19_537A_070 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1464558	1.81	3048007	2.07		
UPPER LIMIT	2050381	2.31	4267210	2.57		
LOWER LIMIT	1025191	1.31	2133605	1.57		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-34235-1	NAWC-121217-RW-061	1539640	1.81	3335126	2.07	
320-34235-2	NAWC-121217-FRB-061	1568496	1.81	3201291	2.06	
320-34235-3	NAWC-121217-RW-054	1613661	1.81	3364132	2.06	
320-34235-4	NAWC-121217-FRB-054	1598402	1.81	3306781	2.06	

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

Area Limit = 70%-140% of internal standard area
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FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Client Sample ID: NAWC-121217-RW-061 Lab Sample ID: 320-34235-1
 Matrix: Water Lab File ID: 2017.12.19_537A_066.d
 Analysis Method: 537 Date Collected: 12/12/2017 09:10
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 246.6(mL) Date Analyzed: 12/19/2017 21:46
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200767 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	27	J M	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	18	J	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	J	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.0	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	95		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_066.d
 Lims ID: 320-34235-A-1-A
 Client ID: NAWC-121217-RW-061
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:46:00 ALS Bottle#: 46 Worklist Smp#: 17
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34235-a-1-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:31 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:30:23

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.366	1.444	-0.078	1.000	173434	1.33		118	
298.90 > 99.00	1.366	1.444	-0.078	1.000	124530		1.39(0.00-0.00)	240	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.487	1.573	-0.086	1.000	1571761	9.28		9687	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.631	1.725	-0.094	1.000	506290	2.60		194	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.631	1.725	-0.094	1.000	179361	1.24		31.9	
* 6 13C2-PFOA									
415.00 > 370.00	1.813	1.913	-0.100		1539640	10.0		7314	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.813	1.914	-0.101	1.000	643952	4.52		79.8	
413.00 > 169.00	1.813	1.914	-0.101	1.000	395508		1.63(0.00-0.00)	1109	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.071	2.071	0.0	1.000	716686	6.56		89.0	M
499.00 > 99.00	2.071	2.071	0.0	1.000	131188		5.46(0.00-0.00)	121	M
* 7 13C4 PFOS									
503.00 > 80.00	2.071	2.151	-0.080		3335126	28.7		3273	
9 Perfluorononanoic acid									
463.00 > 419.00	2.079	2.158	-0.079	1.000	50771	0.4965		7.5	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.253	2.312	-0.059	1.000	1119788	9.50		10383	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_066.d

Injection Date: 19-Dec-2017 21:46:00

Instrument ID: A8_N

Lims ID: 320-34235-A-1-A

Lab Sample ID: 320-34235-1

Client ID: NAWC-121217-RW-061

Operator ID: SACINSTLCMS01

ALS Bottle#: 46

Worklist Smp#: 17

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

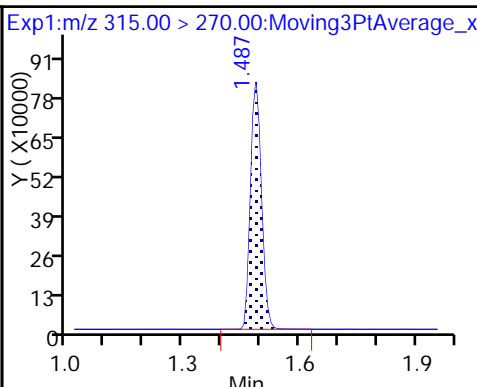
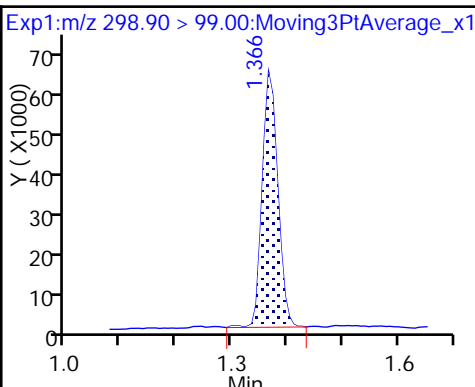
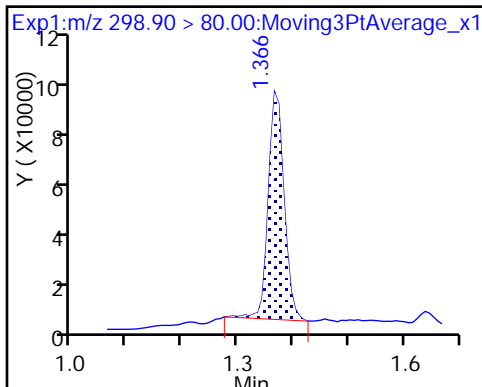
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

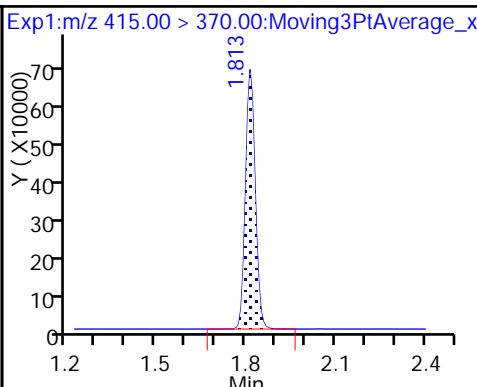
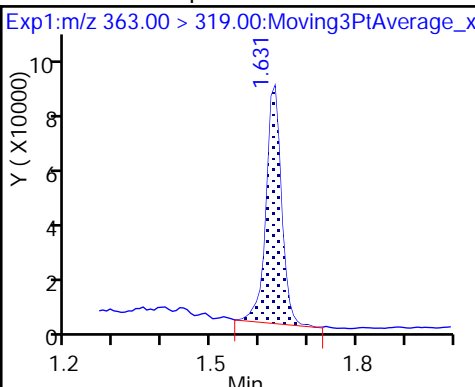
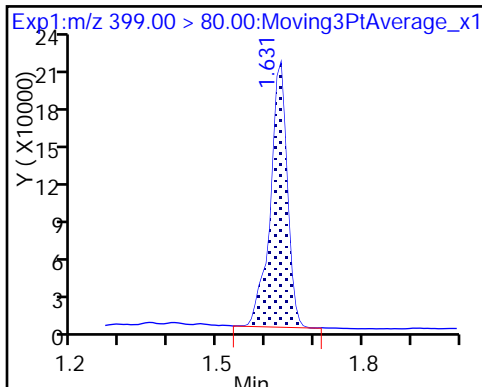
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

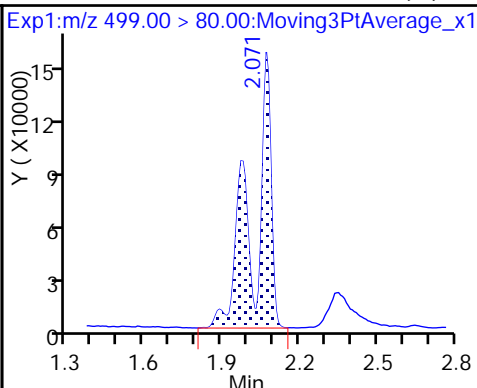
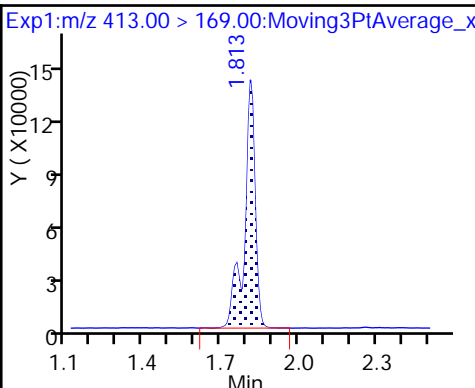
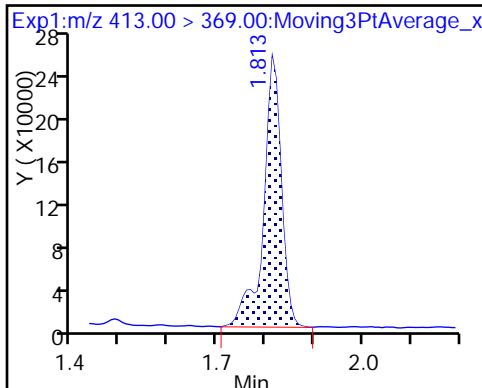
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

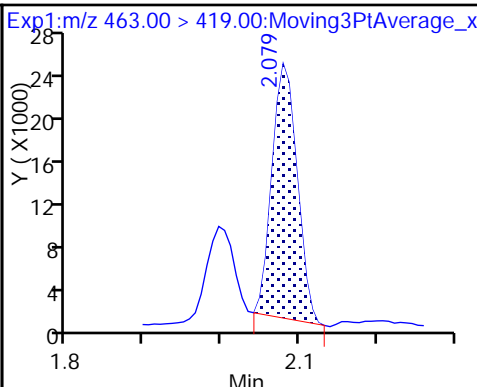
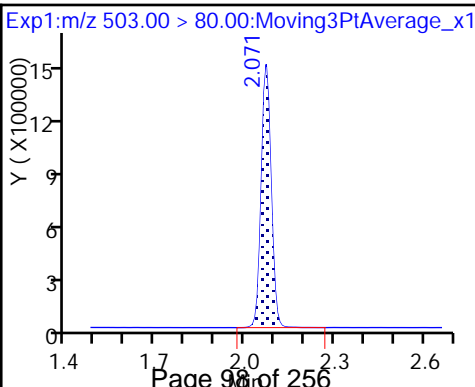
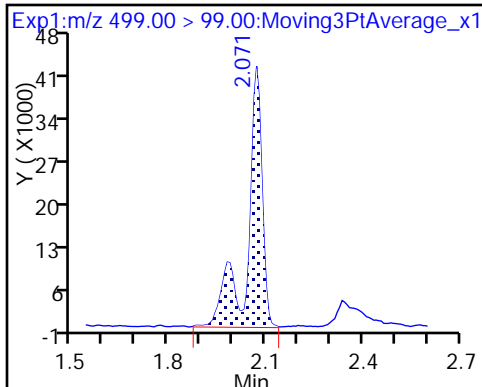
8 Perfluorooctane sulfonic acid (M)



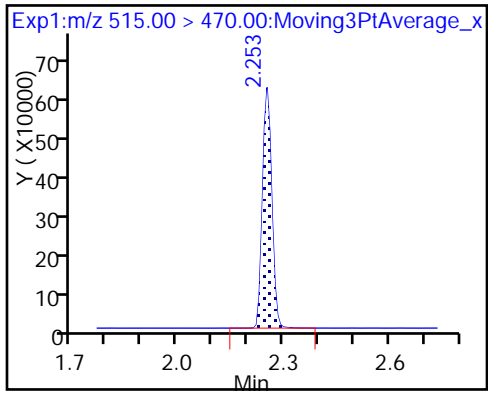
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_066.d
 Lims ID: 320-34235-A-1-A
 Client ID: NAWC-121217-RW-061
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:46:00 ALS Bottle#: 46 Worklist Smp#: 17
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34235-a-1-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:31 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:30:23

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.28	92.78
\$ 10 13C2 PFDA	10.0	9.50	95.05

TestAmerica Sacramento

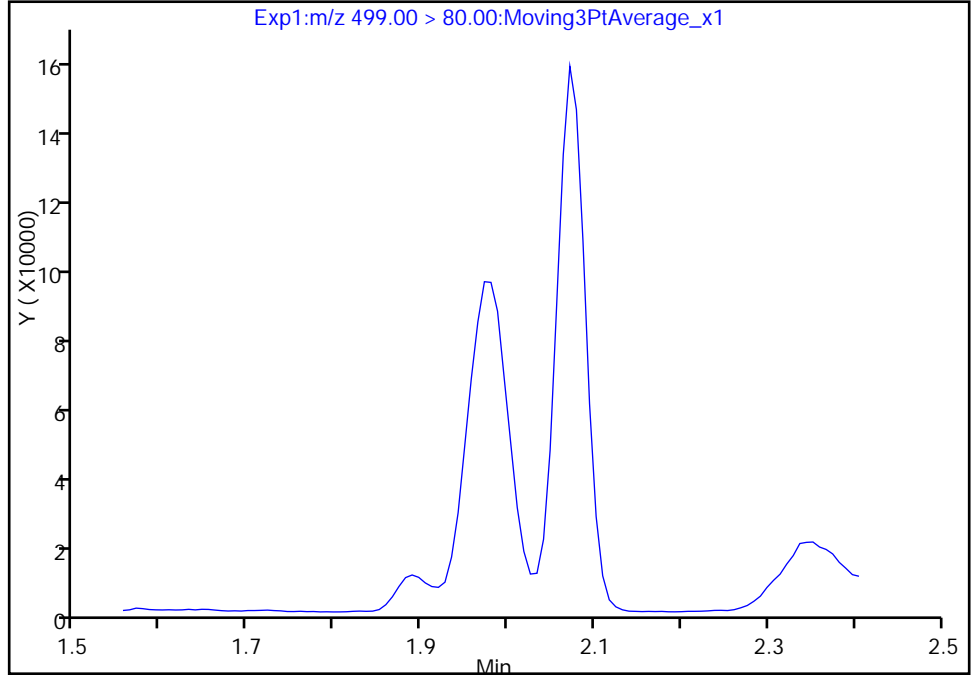
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_066.d
Injection Date: 19-Dec-2017 21:46:00 Instrument ID: A8_N
Lims ID: 320-34235-A-1-A Lab Sample ID: 320-34235-1
Client ID: NAWC-121217-RW-061
Operator ID: SACINSTLCMS01 ALS Bottle#: 46 Worklist Smp#: 17
Injection Vol: 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

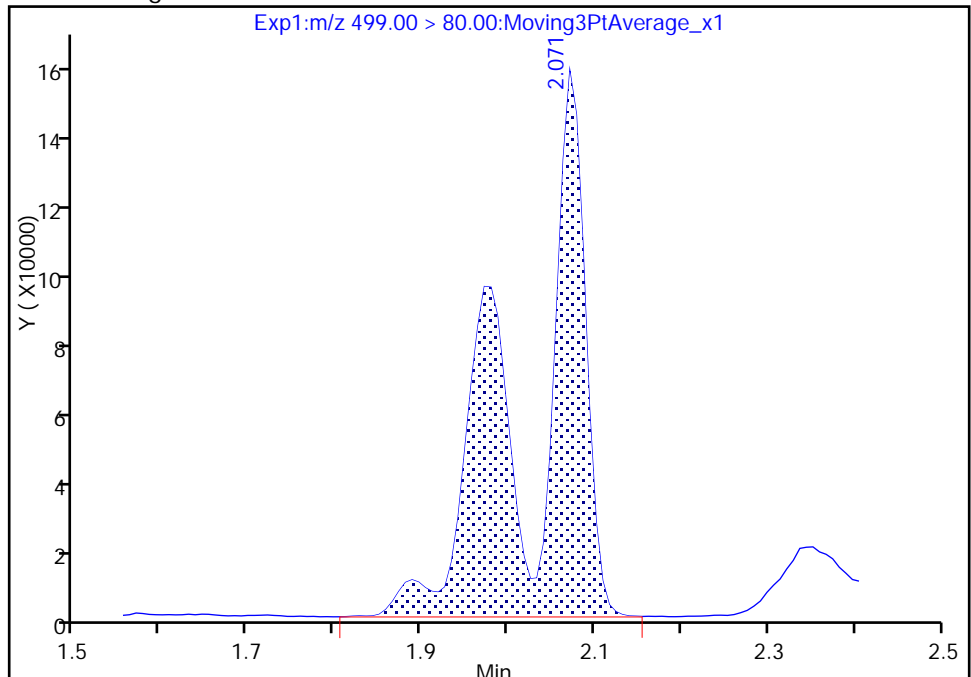
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 716686
Amount: 6.563779
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:29:36
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

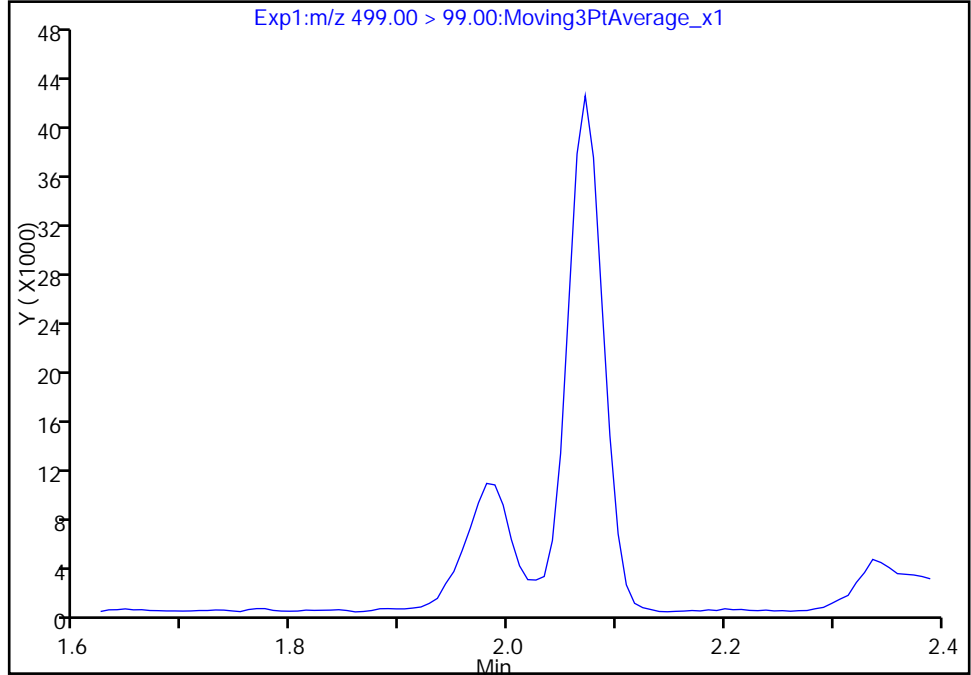
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Injection Date: 19-Dec-2017 21:46:00 Instrument ID: A8_N
Lims ID: 320-34235-A-1-A Lab Sample ID: 320-34235-1
Client ID: NAWC-121217-RW-061
Operator ID: SACINSTLCMS01 ALS Bottle#: 46 Worklist Smp#: 17
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

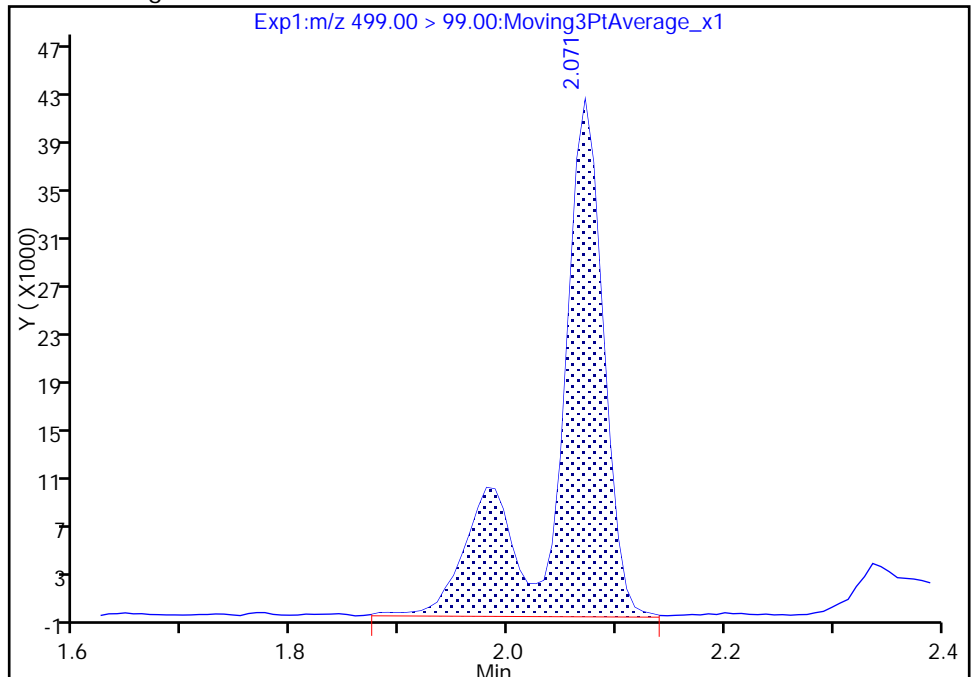
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 131188
Amount: 6.563779
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:30:00

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

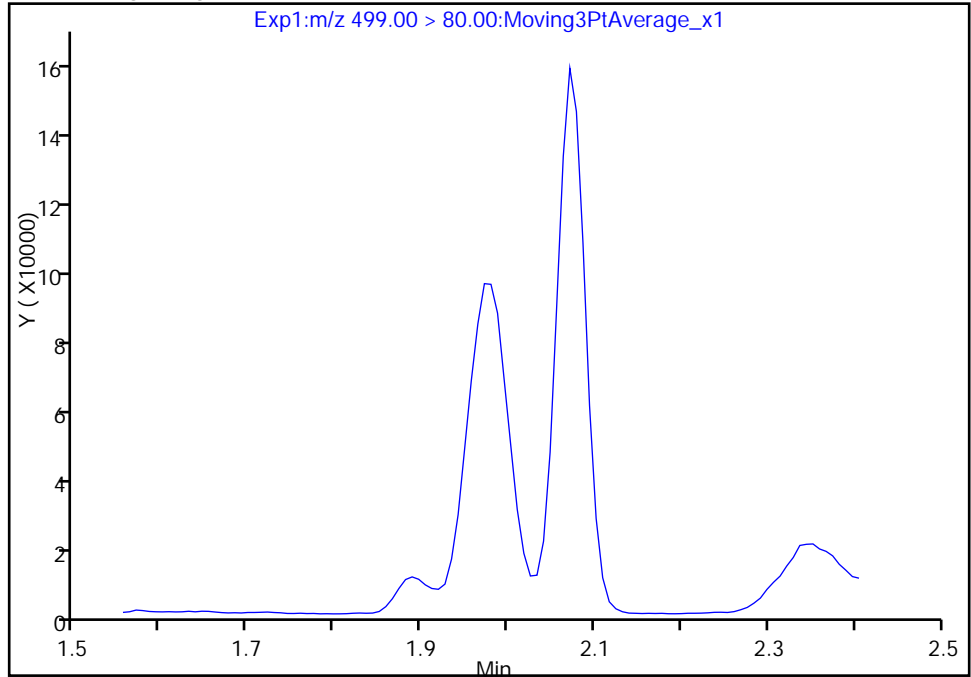
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Injection Date: 19-Dec-2017 21:46:00 Instrument ID: A8_N
Lims ID: 320-34235-A-1-A Lab Sample ID: 320-34235-1
Client ID: NAWC-121217-RW-061
Operator ID: SACINSTLCMS01 ALS Bottle#: 46 Worklist Smp#: 17
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

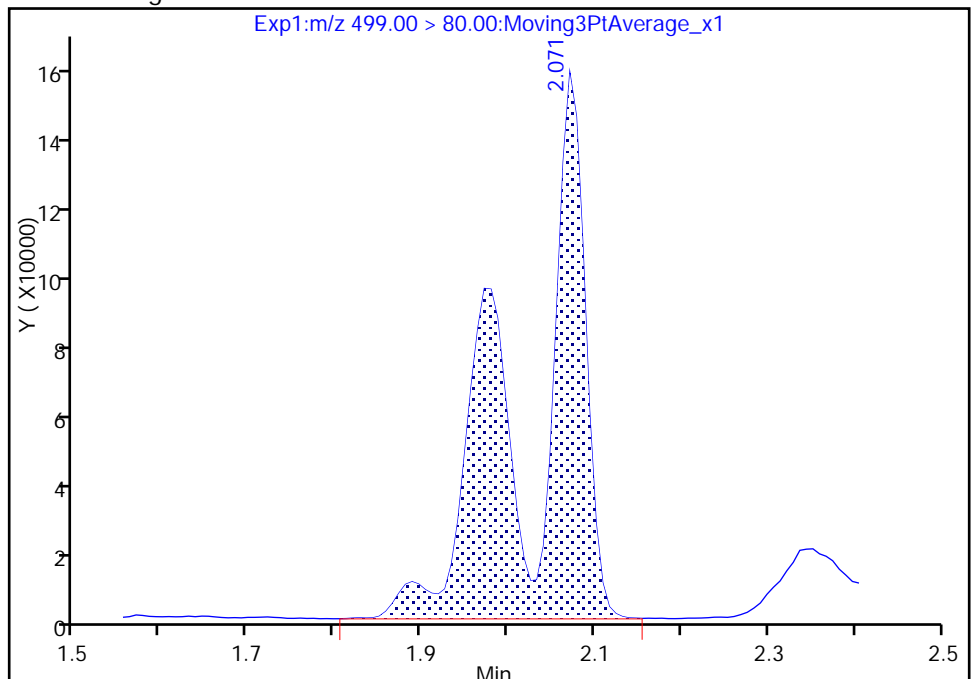
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 716686
Amount: 6.563779
Amount Units: ng/ml



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Client Sample ID: NAWC-121217-FRB-061 Lab Sample ID: 320-34235-2
 Matrix: Water Lab File ID: 2017.12.19_537A_067.d
 Analysis Method: 537 Date Collected: 12/12/2017 09:05
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 249.5 (mL) Date Analyzed: 12/19/2017 21:50
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200767 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	77		70-130
STL00996	13C2 PFDA	89		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_067.d
 Lims ID: 320-34235-A-2-A
 Client ID: NAWC-121217-FRB-061
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:50:39 ALS Bottle#: 47 Worklist Smp#: 18
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34235-a-2-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:31 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:31:25

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.479	1.573	-0.094	1.000	1324181	7.67	8338	
* 6 13C2-PFOA	415.00 > 370.00	1.806	1.913	-0.107		1568496	10.0	9205	
* 7 13C4 PFOS	503.00 > 80.00	2.064	2.151	-0.087		3201291	28.7	7648	
\$ 10 13C2 PFDA	515.00 > 470.00	2.253	2.312	-0.059	1.000	1070170	8.92	8446	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_067.d

Injection Date: 19-Dec-2017 21:50:39

Instrument ID: A8_N

Lims ID: 320-34235-A-2-A

Lab Sample ID: 320-34235-2

Client ID: NAWC-121217-FRB-061

Operator ID: SACINSTLCMS01

ALS Bottle#: 47

Worklist Smp#: 18

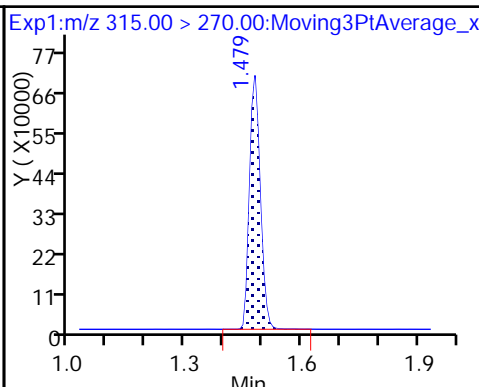
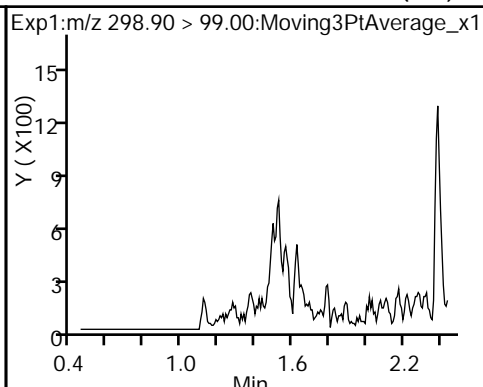
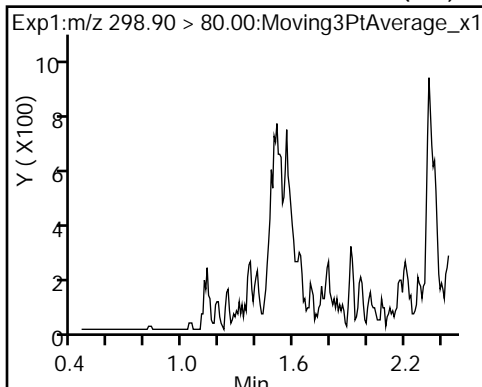
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537_A8_N

Limit Group: LC 537 ICAL

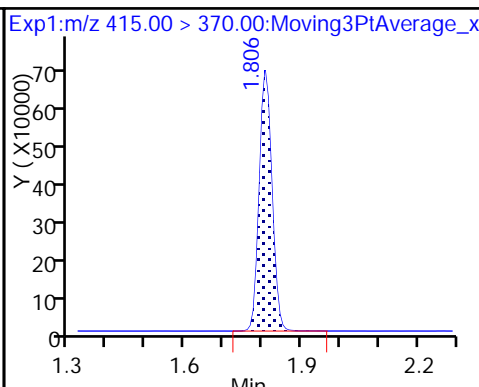
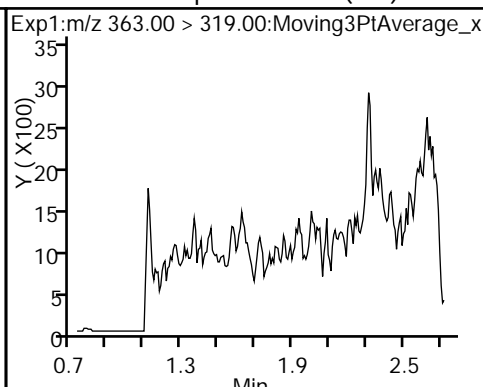
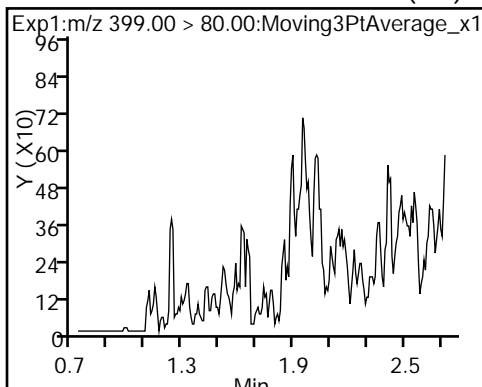
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

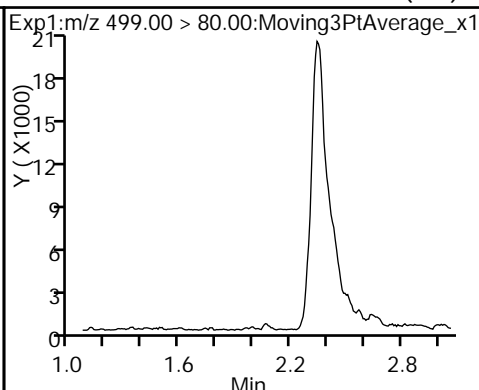
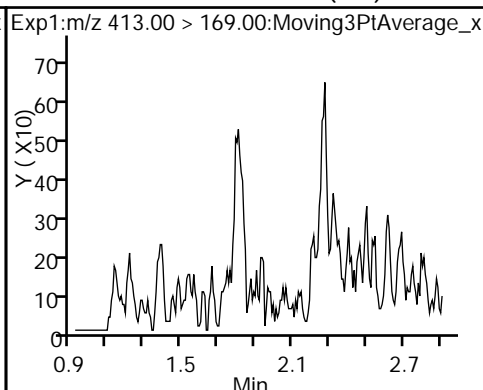
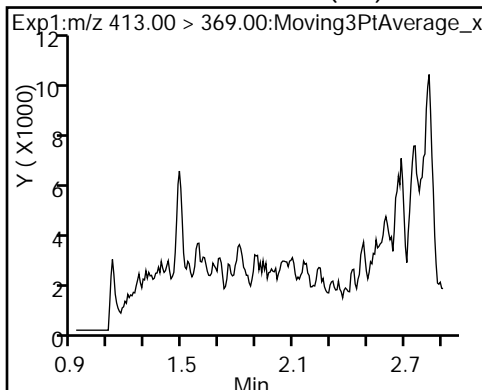
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

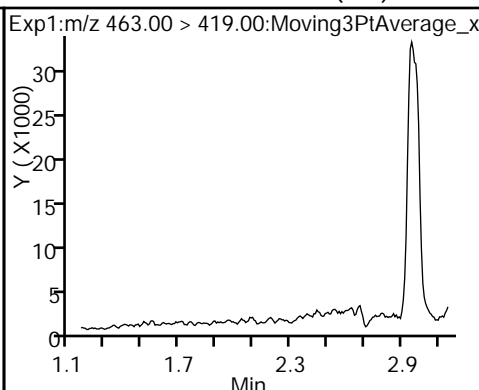
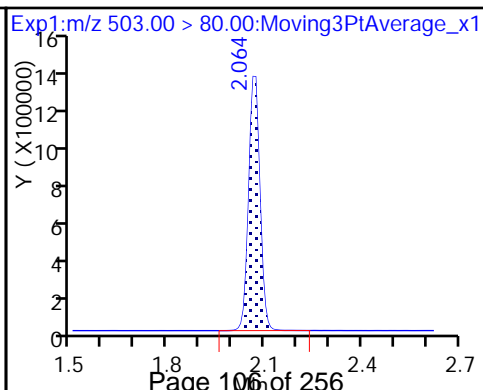
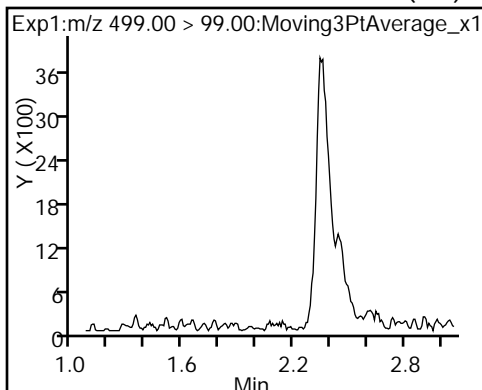
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

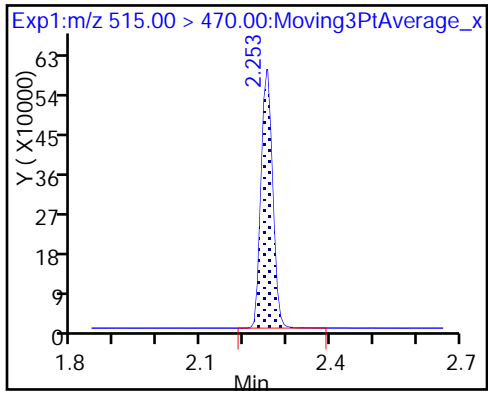


8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_067.d
 Lims ID: 320-34235-A-2-A
 Client ID: NAWC-121217-FRB-061
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:50:39 ALS Bottle#: 47 Worklist Smp#: 18
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34235-a-2-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:31 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:31:25

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	7.67	76.73
\$ 10 13C2 PFDA	10.0	8.92	89.16

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Client Sample ID: NAWC-121217-RW-054 Lab Sample ID: 320-34235-3
 Matrix: Water Lab File ID: 2017.12.19_537A_068.d
 Analysis Method: 537 Date Collected: 12/12/2017 10:10
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 246.9(mL) Date Analyzed: 12/19/2017 21:55
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200767 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J M	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	23		20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	J	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.6	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	83		70-130
STL00996	13C2 PFDA	88		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_068.d
 Lims ID: 320-34235-A-3-A
 Client ID: NAWC-121217-RW-054
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:55:21 ALS Bottle#: 48 Worklist Smp#: 19
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34235-a-3-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:31 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:32:16

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.366	1.444	-0.078	1.000	200696	1.53		210	
298.90 > 99.00	1.366	1.444	-0.078	1.000	136984		1.47(0.00-0.00)	257	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.479	1.573	-0.094	1.000	1471562	8.29		9281	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.725	-0.101	1.000	509984	2.60		289	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.725	-0.101	1.000	210450	1.39		40.5	
* 6 13C2-PFOA									
415.00 > 370.00	1.806	1.913	-0.107		1613661	10.0		8683	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.806	1.914	-0.108	1.000	835320	5.59		110	
413.00 > 169.00	1.806	1.914	-0.108	1.000	492212		1.70(0.00-0.00)	1303	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.064	2.071	-0.007	1.000	557972	5.07		57.6	M
499.00 > 99.00	2.064	2.071	-0.007	1.000	93416		5.97(0.00-0.00)	68.2	M
* 7 13C4 PFOS									
503.00 > 80.00	2.064	2.151	-0.087		3364132	28.7		3449	
9 Perfluorononanoic acid									
463.00 > 419.00	2.079	2.158	-0.079	1.000	62872	0.5866		8.9	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.246	2.312	-0.066	1.000	1088038	8.81		8194	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_068.d

Injection Date: 19-Dec-2017 21:55:21

Instrument ID: A8_N

Lims ID: 320-34235-A-3-A

Lab Sample ID: 320-34235-3

Client ID: NAWC-121217-RW-054

Operator ID: SACINSTLCMS01

ALS Bottle#: 48

Worklist Smp#: 19

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

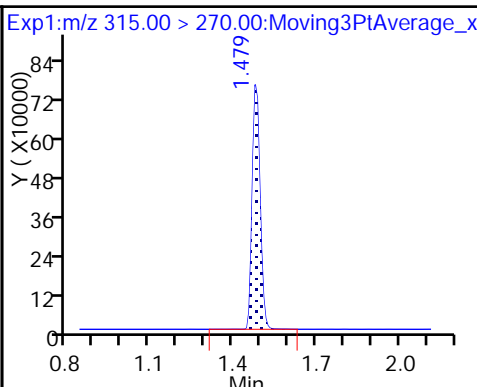
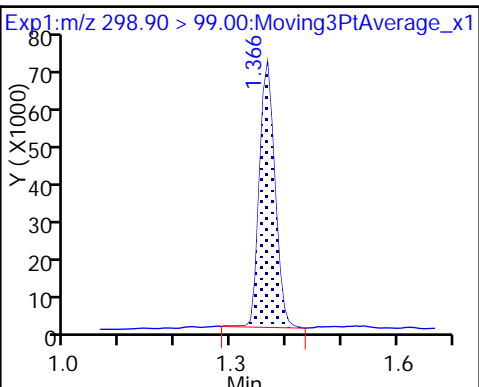
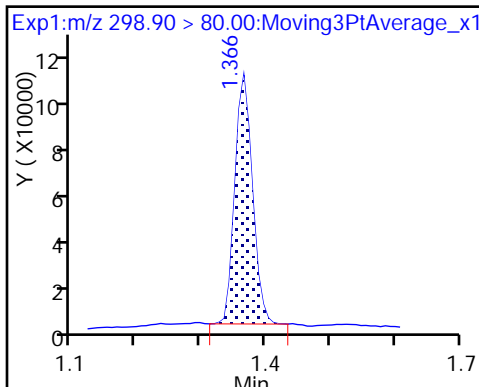
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

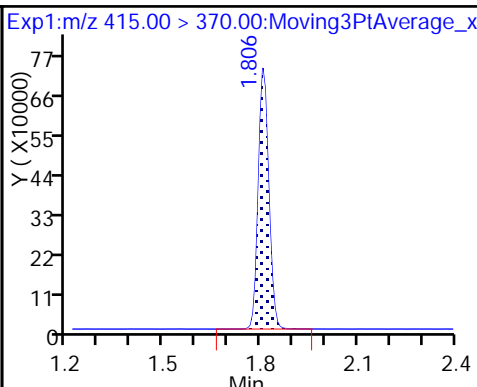
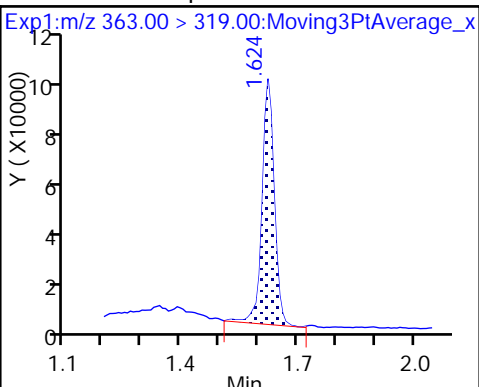
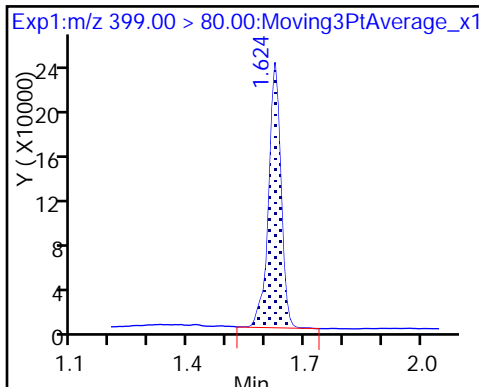
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

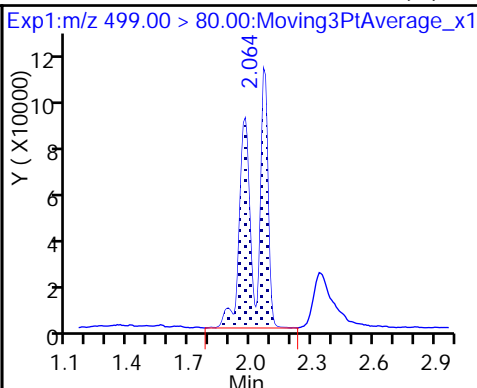
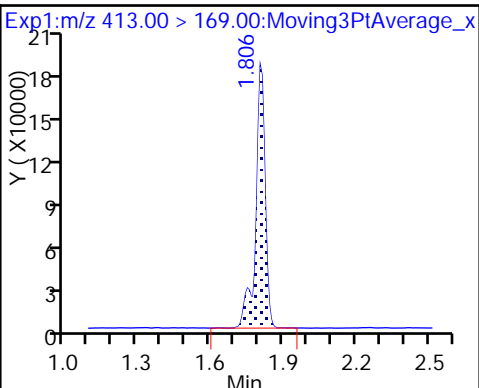
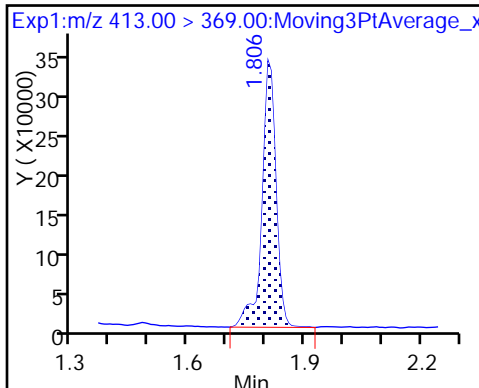
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

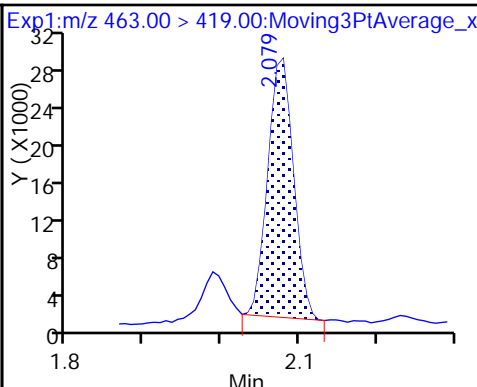
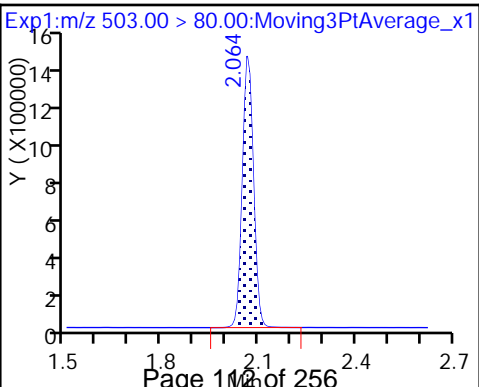
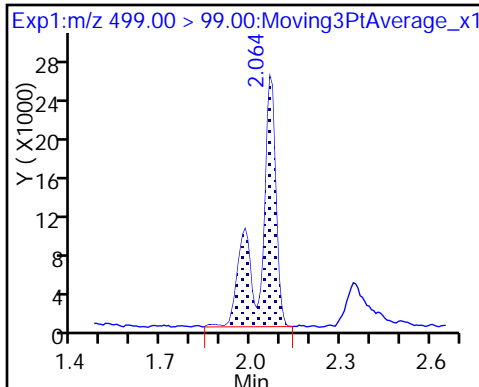
8 Perfluorooctane sulfonic acid (M)



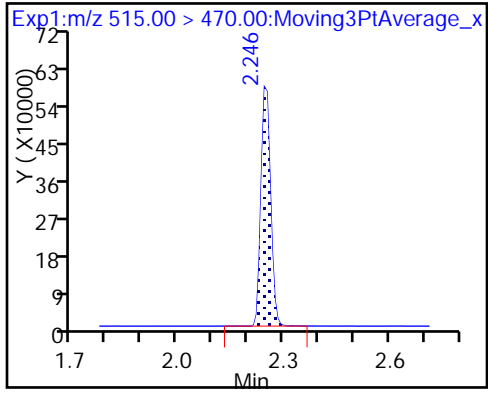
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_068.d
 Lims ID: 320-34235-A-3-A
 Client ID: NAWC-121217-RW-054
 Sample Type: Client
 Inject. Date: 19-Dec-2017 21:55:21 ALS Bottle#: 48 Worklist Smp#: 19
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34235-a-3-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:31 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:32:16

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.29	82.88
\$ 10 13C2 PFDA	10.0	8.81	88.12

TestAmerica Sacramento

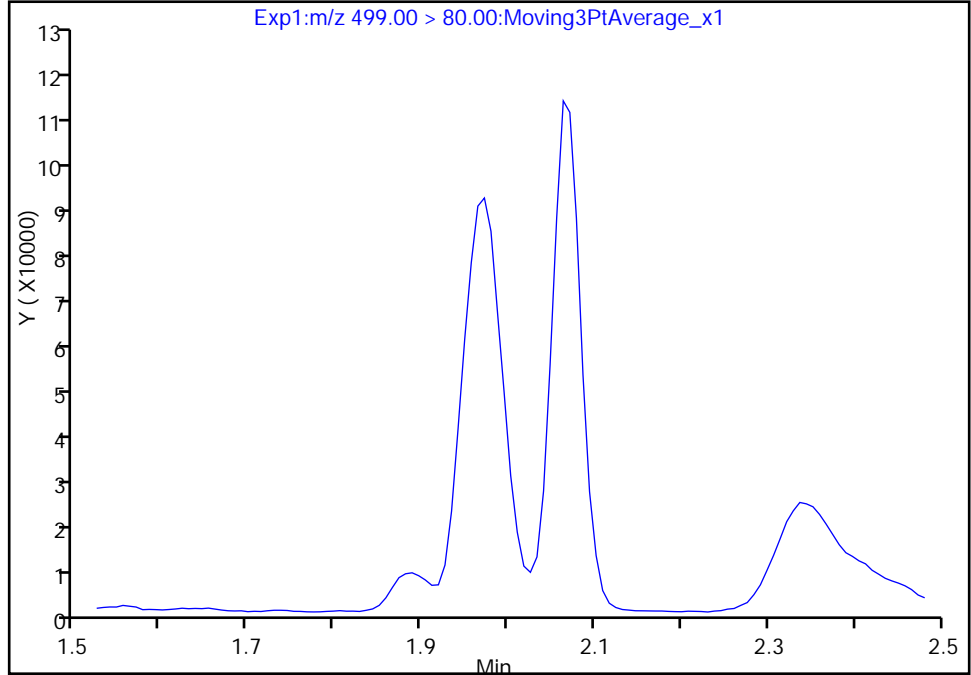
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_068.d
Injection Date: 19-Dec-2017 21:55:21 Instrument ID: A8_N
Lims ID: 320-34235-A-3-A Lab Sample ID: 320-34235-3
Client ID: NAWC-121217-RW-054
Operator ID: SACINSTLCMS01 ALS Bottle#: 48 Worklist Smp#: 19
Injection Vol: 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

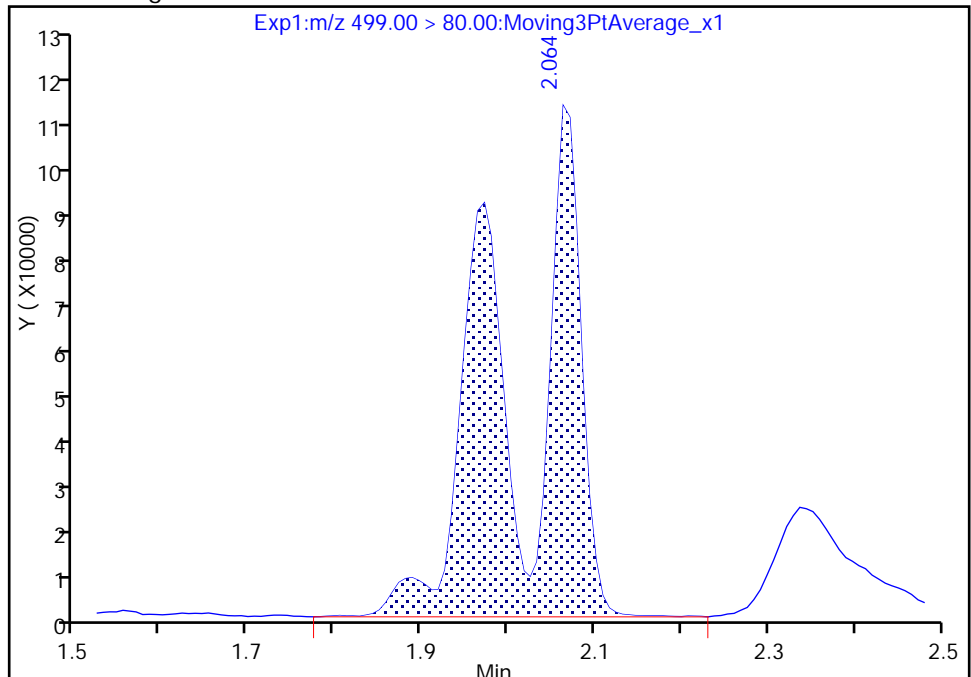
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 557972
Amount: 5.066134
Amount Units: ng/ml



TestAmerica Sacramento

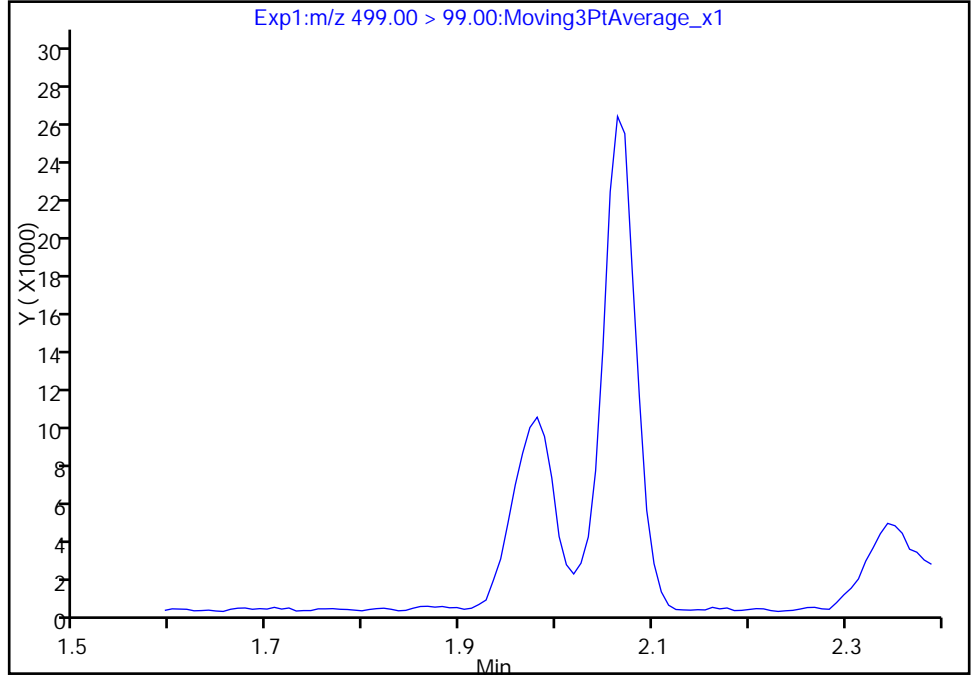
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Injection Date: 19-Dec-2017 21:55:21 Instrument ID: A8_N
Lims ID: 320-34235-A-3-A Lab Sample ID: 320-34235-3
Client ID: NAWC-121217-RW-054
Operator ID: SACINSTLCMS01 ALS Bottle#: 48 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

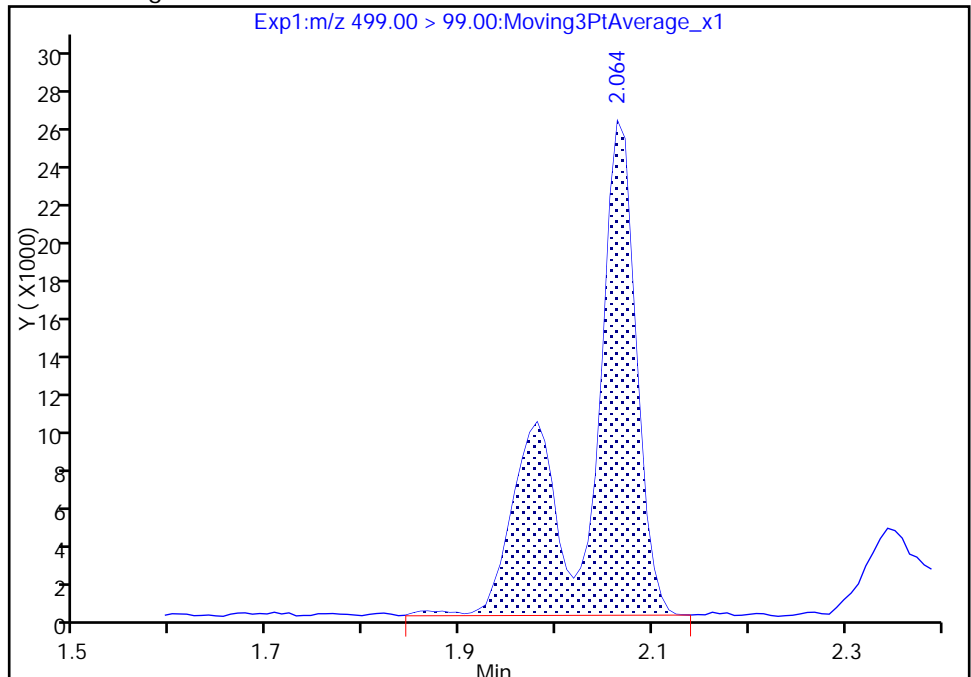
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 93416
Amount: 5.066134
Amount Units: ng/ml



TestAmerica Sacramento

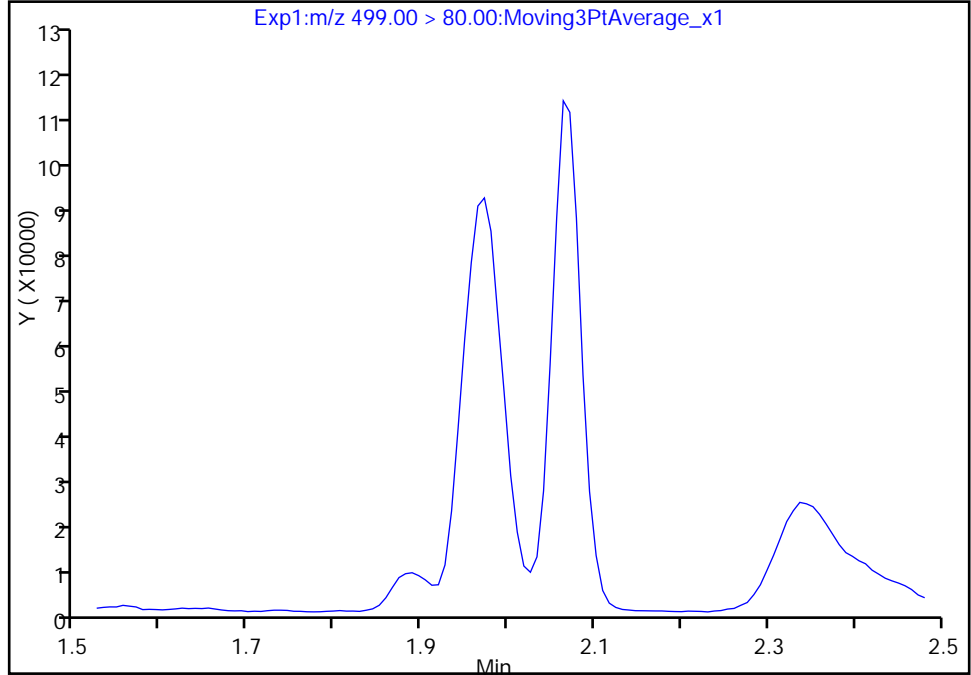
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Injection Date: 19-Dec-2017 21:55:21 Instrument ID: A8_N
Lims ID: 320-34235-A-3-A Lab Sample ID: 320-34235-3
Client ID: NAWC-121217-RW-054
Operator ID: SACINSTLCMS01 ALS Bottle#: 48 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

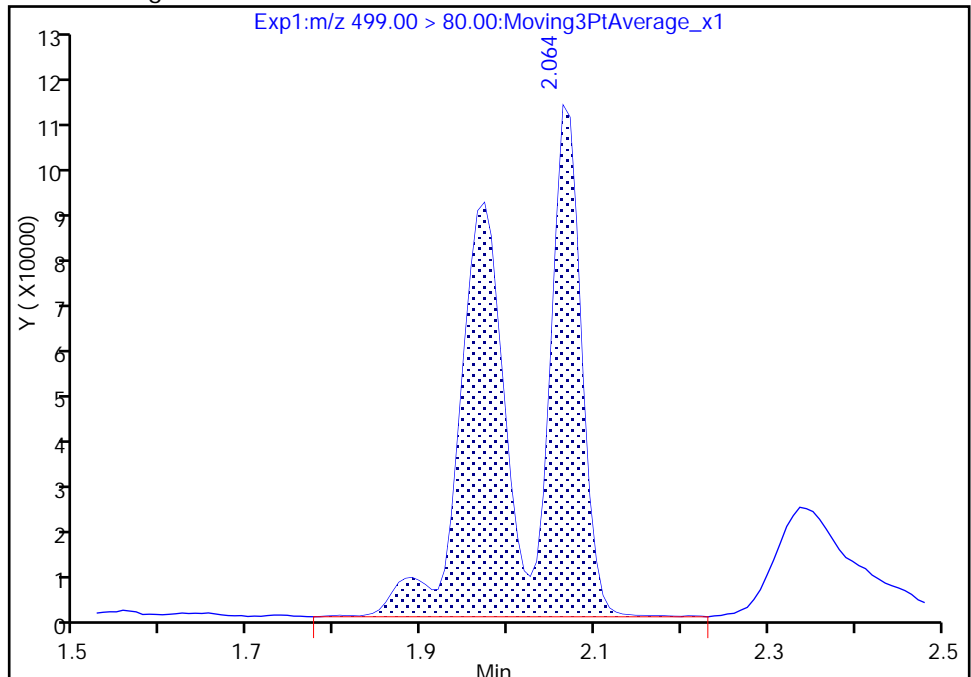
Not Detected
Expected RT: 2.07

Processing Integration Results



RT: 2.06
Area: 557972
Amount: 5.066134
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 20-Dec-2017 14:31:48

Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Client Sample ID: NAWC-121217-FRB-054 Lab Sample ID: 320-34235-4
 Matrix: Water Lab File ID: 2017.12.19_537A_069.d
 Analysis Method: 537 Date Collected: 12/12/2017 10:05
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 222.6(mL) Date Analyzed: 12/19/2017 22:00
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200767 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	18	U	45	18	7.6
335-67-1	Perfluorooctanoic acid (PFOA)	9.0	U	22	9.0	3.1
375-95-1	Perfluorononanoic acid (PFNA)	22	U	27	22	9.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	13	U	34	13	6.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.5	U	11	4.5	2.1
375-73-5	Perfluorobutanesulfonic acid (PFBS)	40	U	100	40	18

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	92		70-130
STL00996	13C2 PFDA	84		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_069.d
 Lims ID: 320-34235-A-4-A
 Client ID: NAWC-121217-FRB-054
 Sample Type: Client
 Inject. Date: 19-Dec-2017 22:00:02 ALS Bottle#: 49 Worklist Smp#: 20
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34235-a-4-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:31 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:34:30

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.479	1.573	-0.094	1.000	1619526	9.21	10676	
* 6 13C2-PFOA	415.00 > 370.00	1.806	1.913	-0.107		1598402	10.0	8518	
* 7 13C4 PFOS	503.00 > 80.00	2.064	2.151	-0.087		3306781	28.7	9236	
\$ 10 13C2 PFDA	515.00 > 470.00	2.246	2.312	-0.066	1.000	1032621	8.44	8591	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_069.d

Injection Date: 19-Dec-2017 22:00:02

Instrument ID: A8_N

Lims ID: 320-34235-A-4-A

Lab Sample ID: 320-34235-4

Client ID: NAWC-121217-FRB-054

Operator ID: SACINSTLCMS01

ALS Bottle#: 49

Worklist Smp#: 20

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

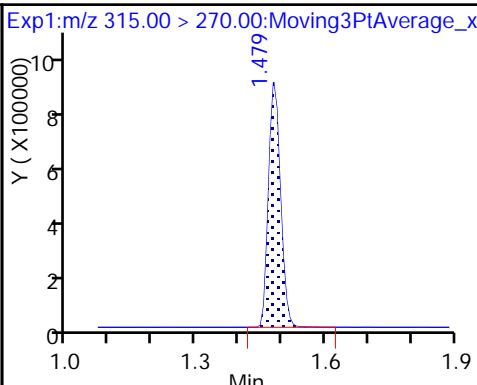
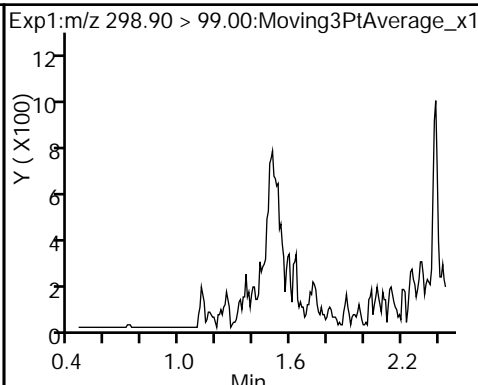
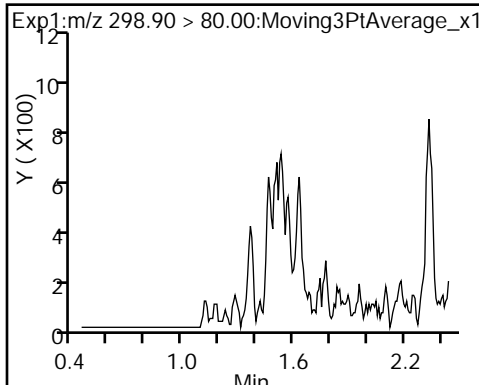
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

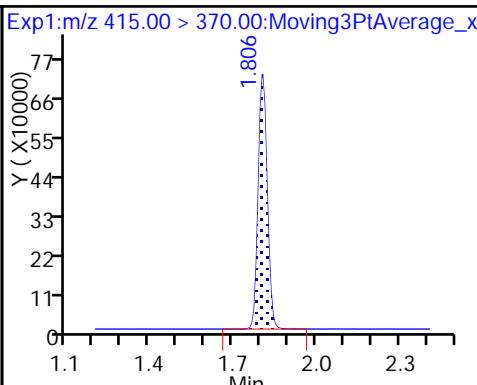
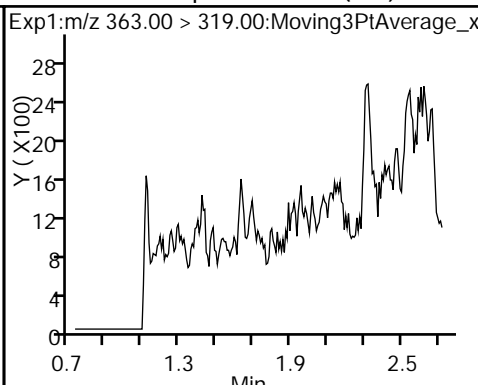
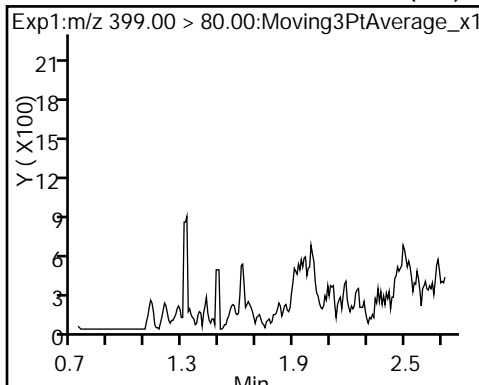
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

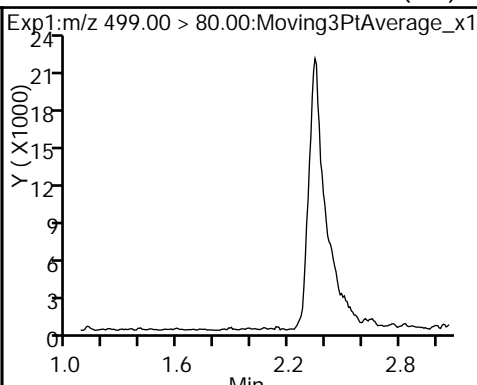
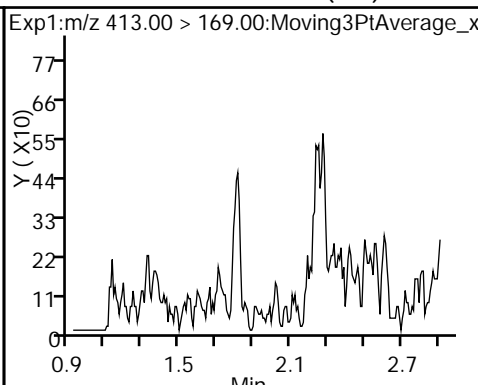
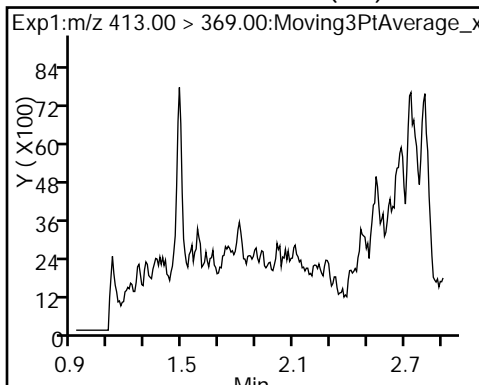
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

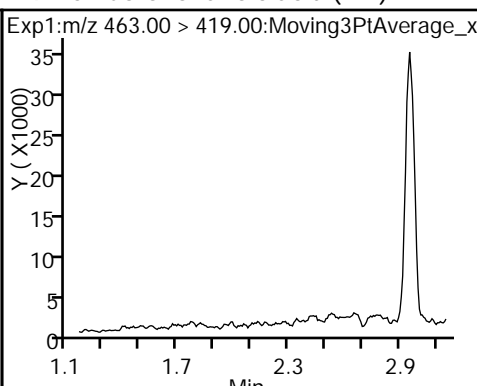
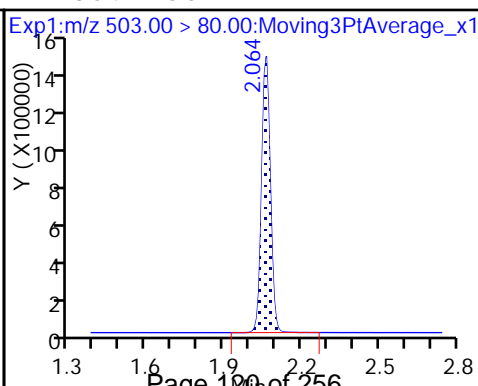
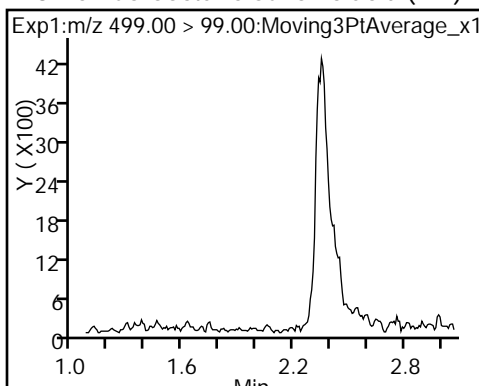
8 Perfluorooctane sulfonic acid (ND)



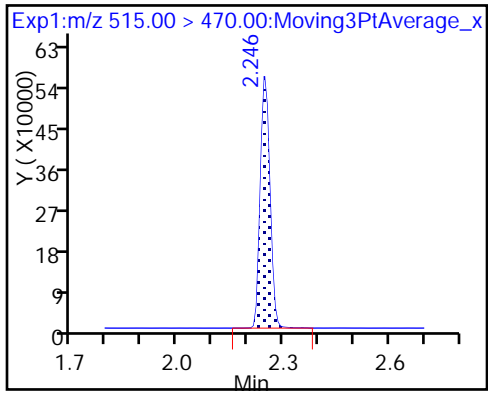
8 Perfluorooctane sulfonic acid (ND)

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_069.d
 Lims ID: 320-34235-A-4-A
 Client ID: NAWC-121217-FRB-054
 Sample Type: Client
 Inject. Date: 19-Dec-2017 22:00:02 ALS Bottle#: 49 Worklist Smp#: 20
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-34235-a-4-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:31 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:34:30

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.21	92.09
\$ 10 13C2 PFDA	10.0	8.44	84.43

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

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1 Analy Batch No.: 192908

SDG No.: _____

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

Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-192908/4	2017.11.03_537XICAL_004.d
Level 2	IC 320-192908/5	2017.11.03_537XICAL_005.d
Level 3	IC 320-192908/6	2017.11.03_537XICAL_006.d
Level 4	IC 320-192908/7	2017.11.03_537XICAL_007.d
Level 5	IC 320-192908/8	2017.11.03_537XICAL_008.d
Level 6	IC 320-192908/9	2017.11.03_537XICAL_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)	1.0397 0.8468	1.0767	1.0898	0.9577	0.9303	QuaF		1.1193	-0.001498					0.9990		0.9600	
Perfluoroheptanoic acid (PFHpA)	0.9433 0.9848	0.9187	0.9551	0.9185	0.9011	Ave		0.9369			3.2		30.0				
Perfluorohexanesulfonic acid (PFHxS)	1.6459 1.6841	1.6355	1.7405	1.6631	1.6755	Ave		1.6741			2.2		30.0				
Perfluorooctanoic acid (PFOA)	0.9757 0.9799	0.8919	0.9000	0.8953	0.9117	Ave		0.9258			4.4		30.0				
Perfluorooctanesulfonic acid (PFOS)	0.8958 0.9902	0.9213	0.9281	0.9268	0.9715	Ave		0.9389			3.7		30.0				
Perfluorononanoic acid (PFNA)	0.6610 0.7042	0.6285	0.6624	0.6810	0.6478	Ave		0.6642			3.9		30.0				
13C2 PFHxA	1.0891 1.1664	1.0526	1.1042	1.1123	1.0772	Ave		1.1003			3.5		30.0				
13C2 PFDA	0.7748 0.8159	0.7295	0.7569	0.7811	0.7330	Ave		0.7652			4.3		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.: 320-34235-1 Analy Batch No.: 192908

SDG No.: _____

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

Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-192908/4	2017.11.03_537XICAL_004.d
Level 2	IC 320-192908/5	2017.11.03_537XICAL_005.d
Level 3	IC 320-192908/6	2017.11.03_537XICAL_006.d
Level 4	IC 320-192908/7	2017.11.03_537XICAL_007.d
Level 5	IC 320-192908/8	2017.11.03_537XICAL_008.d
Level 6	IC 320-192908/9	2017.11.03_537XICAL_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	QuaF	1076553 16699152	2591121	5461974	10142530	14011858	9.00 180	20.0	45.0	90.0	135
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	143455 2810797	331548	736034	1420703	2102676	1.00 20.0	2.22	5.00	10.0	15.0
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	568156 11071993	1312135	2908204	5871843	8413133	3.00 60.0	6.67	15.0	30.0	45.0
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	296934 5597122	644149	1388033	2771271	4257225	2.00 40.0	4.45	10.0	20.0	30.0
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	412315 8679676	985487	2067792	4363079	6504279	4.00 80.0	8.89	20.0	40.0	60.0
Perfluorononanoic acid (PFNA)	13PF OA	Ave	201053 4019666	453612	1020851	2106479	3023088	2.00 40.0	4.45	10.0	20.0	30.0
13C2 PFHxA	13PF OA	Ave	1655691 1664260	1708988	1701491	1719911	1675220	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	1177922 1164156	1184358	1166275	1207887	1139992	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD
QuaF = Quadratic ISTD forced zero

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

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1 Analy Batch No.: 192908

SDG No.: _____

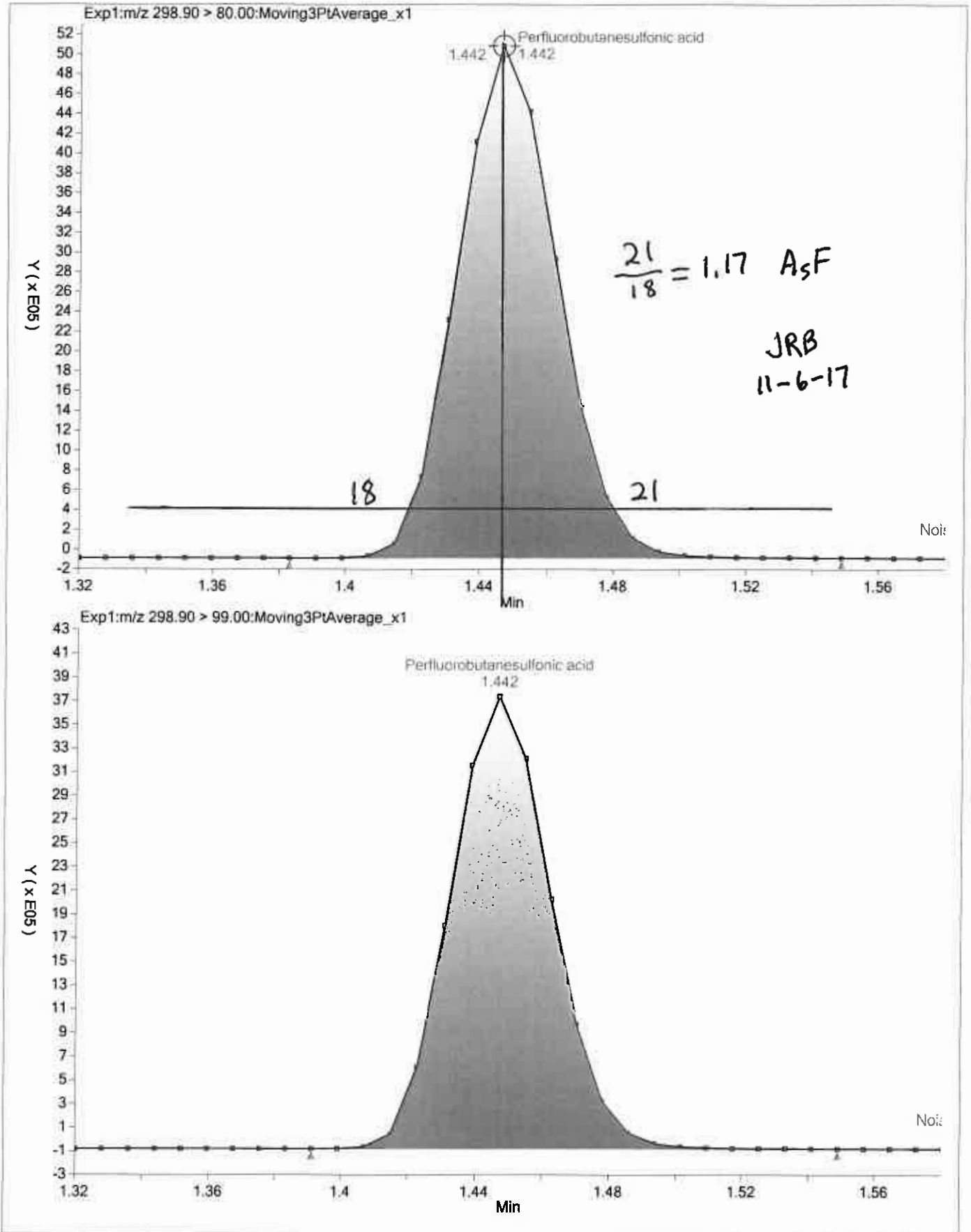
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3 (mm) Heated Purge: (Y/N) N

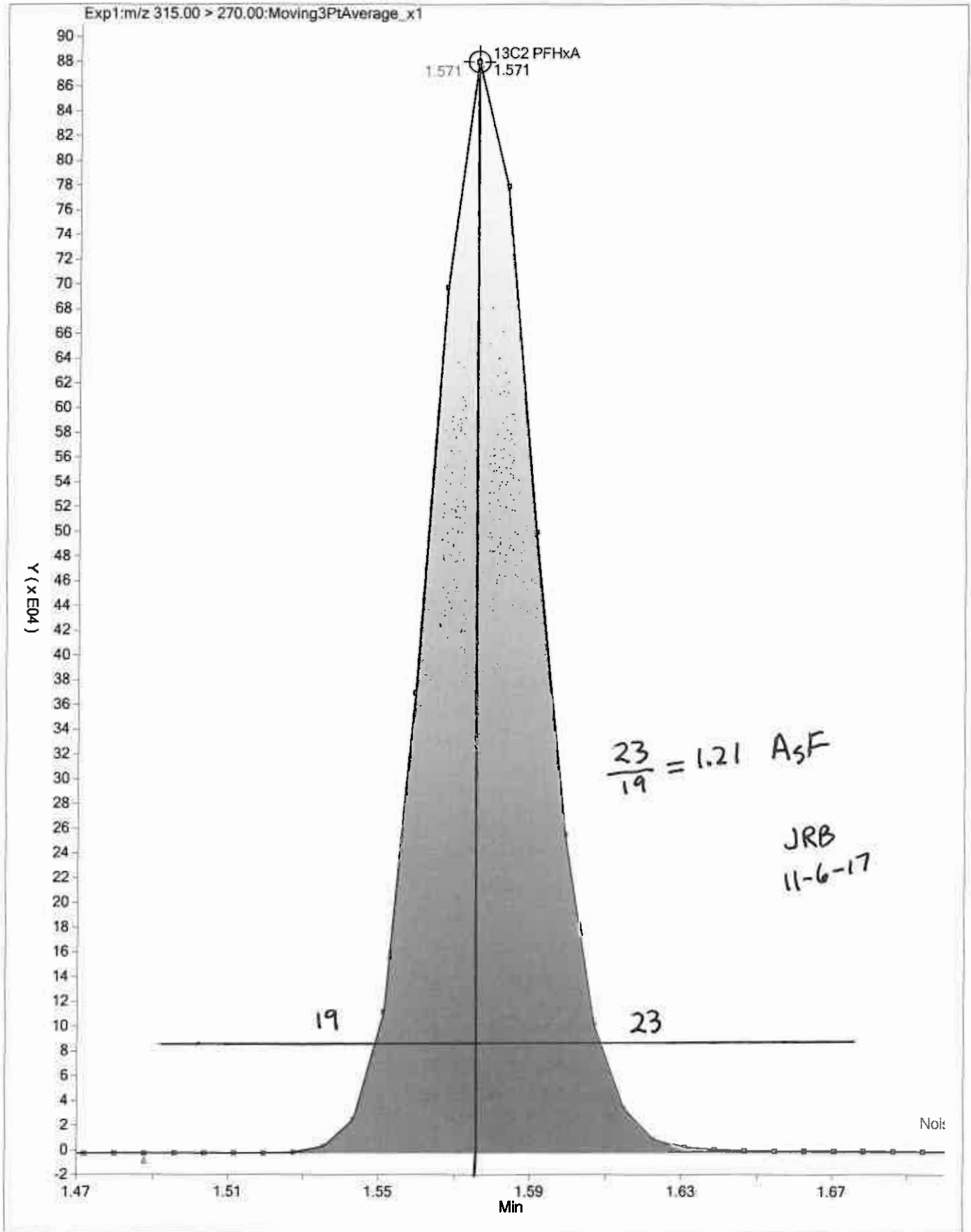
Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-192908/4	2017.11.03_537XICAL_004.d
Level 2	IC 320-192908/5	2017.11.03_537XICAL_005.d
Level 3	IC 320-192908/6	2017.11.03_537XICAL_006.d
Level 4	IC 320-192908/7	2017.11.03_537XICAL_007.d
Level 5	IC 320-192908/8	2017.11.03_537XICAL_008.d
Level 6	IC 320-192908/9	2017.11.03_537XICAL_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)	-6.0	-1.2	3.9	-3.1	1.9	-0.5	50	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	0.7	-1.9	1.9	-2.0	-3.8	5.1	50	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	-1.7	-2.3	4.0	-0.7	0.1	0.6	50	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	5.4	-3.7	-2.8	-3.3	-1.5	5.8	50	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-4.6	-1.9	-1.2	-1.3	3.5	5.5	50	30	30	30	30	30
Perfluorononanoic acid (PFNA)	-0.5	-5.4	-0.3	2.5	-2.5	6.0	50	30	30	30	30	30
13C2 PFHxA	-1.0	-4.3	0.4	1.1	-2.1	6.0	30	30	30	30	30	30
13C2 PFDA	1.3	-4.7	-1.1	2.1	-4.2	6.6	30	30	30	30	30	30





TestAmerica Laboratories
Istd/Surrogate Recovery Report

Worklist Name: 03NOV2017_537A_ICAL
Instrument: A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b
Limit Group: LC 537 ICAL
Analysis Type: SemiVOA
Inj Volume: 2.00

Worklist Num: 49975
Method: 537_A8_N
Inj Vol Units: ul

Lims Batch: 192908
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			2864400 1.87	6253426 2.11
# 1 RB	03-Nov-2017 13:23:59			1485386 51.9	3471256 55.5
# 2 RB	03-Nov-2017 13:28:38			1511056 52.8	3340239 53.4
# 3 RB	03-Nov-2017 13:33:19			1483949 51.8	3285228 52.5
	IS Std				
# 4 IC L1	03-Nov-2017 13:37:59	1.58 98.98	2.31 101.30	1520258> 100.0*	3298877> 100.0*
# 5 IC L2	03-Nov-2017 13:42:39	1.58 95.66	2.31 95.33	1623614> 106.8*	3450592> 104.6*
# 6 IC L3	03-Nov-2017 13:47:20	1.57 100.40	2.31 98.91	1540946> 101.4*	3194016> 96.8*
# 7 IC L4	03-Nov-2017 13:52:00	1.57 101.10	2.31 102.10	1546307> 101.7*	3374600> 102.3*
# 8 IC L5	03-Nov-2017 13:56:41	1.57 97.90	2.31 95.80	1555174> 102.3*	3199479> 97.0*
# 9 IC L6	03-Nov-2017 14:01:24	1.57 106.00	2.31 106.60	1426806> 93.9*	3141787> 95.2*
	IS Std			1540946 1.91	3194016 2.15
#10 RB	03-Nov-2017 14:06:04			1395383 90.6	3212781 100.6
	IS Std			1546307 1.91	3374600 2.16
#11 CCVL	03-Nov-2017 14:10:44	1.58 97.03	2.31 97.49	1586829 102.6	3305852 98.0
	IS Std			1586829 1.91	3305852 2.15
#12 RB	03-Nov-2017 14:15:23			1415042 89.2	3122656 94.5
	IS Std			1546307 1.91	3374600 2.16
#13 ICV	03-Nov-2017 14:20:03	1.57 94.41	2.31 96.59	1512045 97.8	3433628 101.7
	IS Std			1395100 1.91	3254950 2.15
#14 RB	03-Nov-2017 14:24:44			1395100 100.0	3254950 100.0

13C2-PFOA

$$RPD = \frac{1623614 - 1426806}{\left(\frac{1623614 + 1426806}{2}\right)} (100) = 12.9$$

13C4-PFOS

$$RPD = \frac{3450592 - 3141787}{\left(\frac{3450592 + 3141787}{2}\right)} (100) = 9.37$$

JRB
11-6-17

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_004.d
 Lims ID: IC L1
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 03-Nov-2017 13:37:59 ALS Bottle#: 1 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L1_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Nov-2017 15:52:07 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:18:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.449	1.444	0.005	1.000	1076553	8.46		654	
298.90 > 99.00	1.449	1.444	0.005	1.000	763262		1.41(0.00-0.00)	2025	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.573	0.005	1.000	1655691	9.90		8732	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.730	1.725	0.005	1.000	568156	2.95		1122	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.730	1.725	0.005	1.000	143455	1.01		42.2	
* 6 13C2-PFOA									
415.00 > 370.00	1.920	1.913	0.007		1520258	10.0		6863	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.920	1.914	0.006	1.000	296934	2.11		53.5	
413.00 > 169.00	1.920	1.914	0.006	1.000	149720		1.98(0.00-0.00)	184	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.155	2.147	0.008	1.000	412315	3.82		235	M
499.00 > 99.00	2.155	2.147	0.008	1.000	85347		4.83(0.00-0.00)	209	M
* 7 13C4 PFOS									
503.00 > 80.00	2.155	2.151	0.004		3298877	28.7		5279	
9 Perfluorononanoic acid									
463.00 > 419.00	2.162	2.158	0.004	1.000	201053	1.99		67.8	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.312	0.002	1.000	1177922	10.1		7012	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L1_00020

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537ICAL_004.d

Injection Date: 03-Nov-2017 13:37:59

Instrument ID: A8_N

Lims ID: IC L1

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 1

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

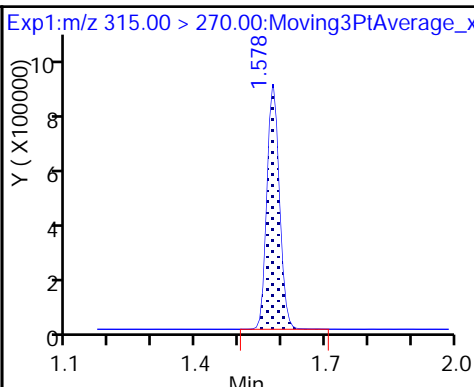
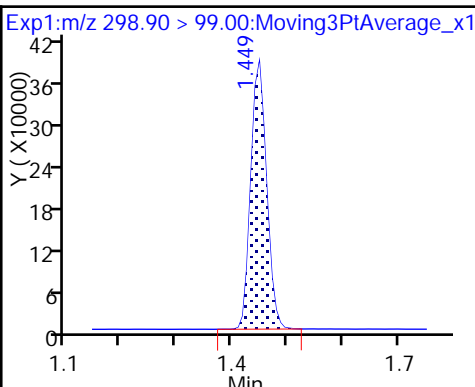
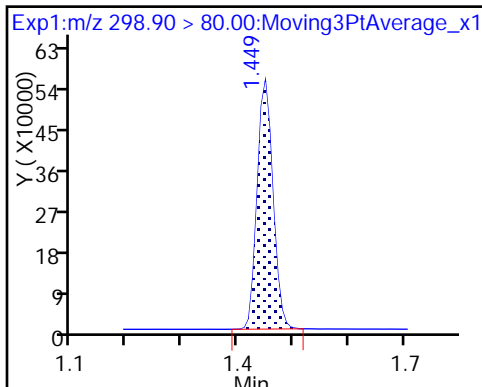
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

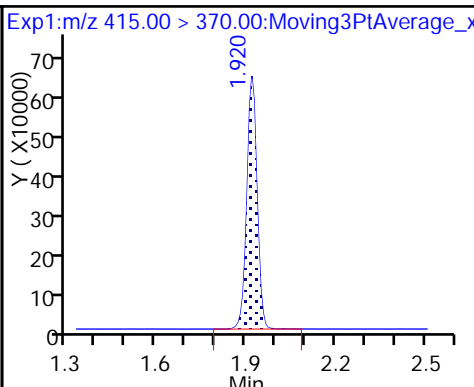
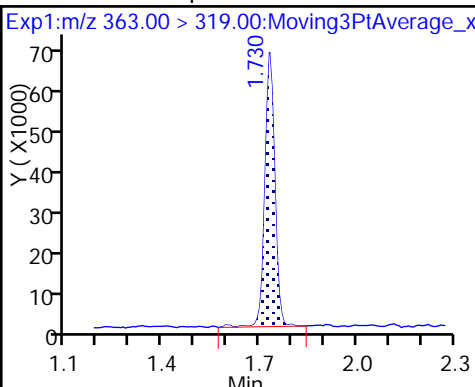
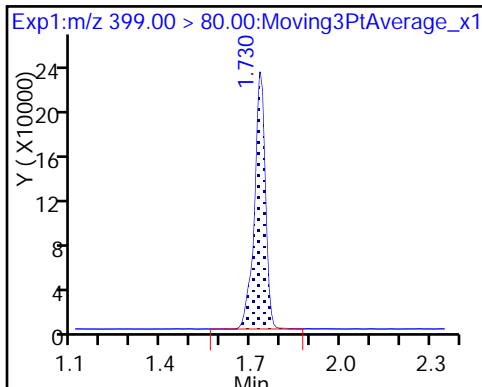
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

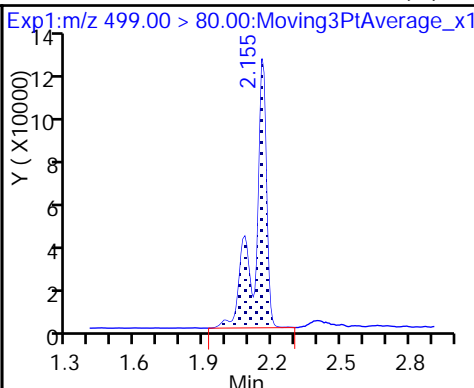
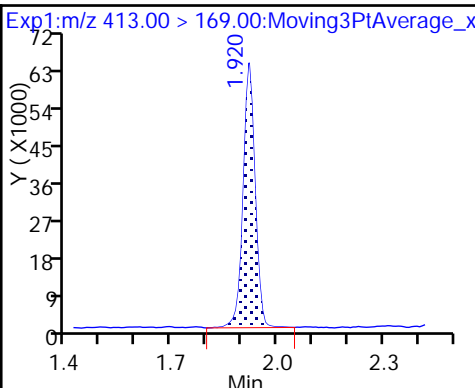
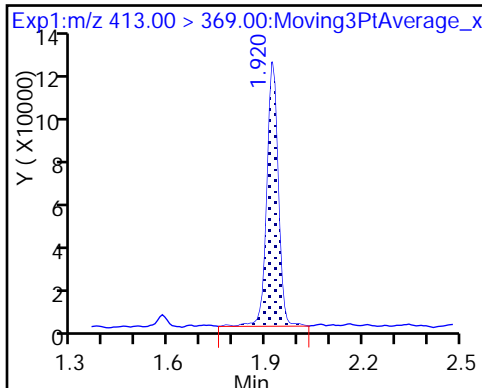
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

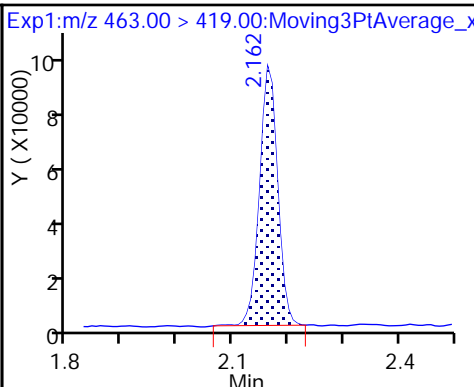
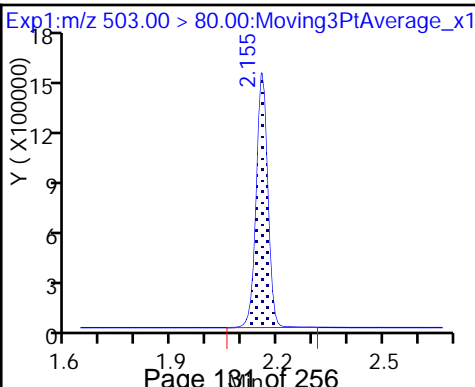
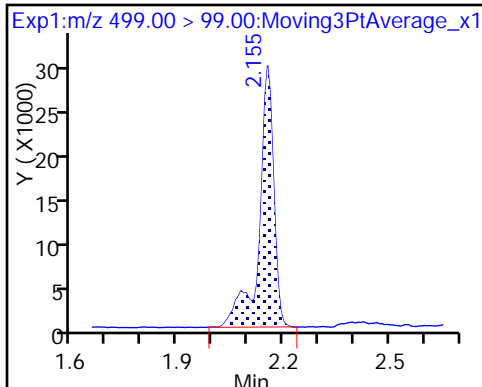
8 Perfluorooctane sulfonic acid (M)



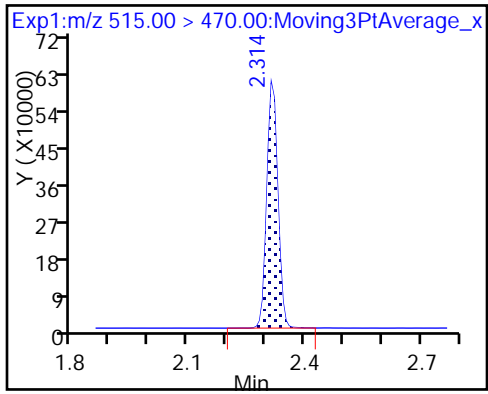
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

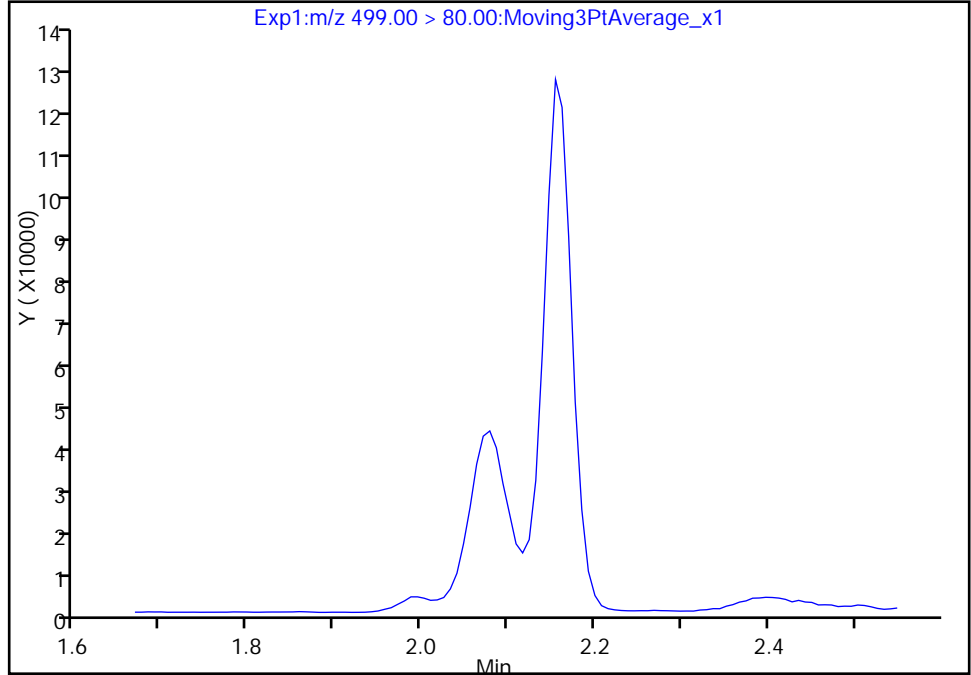
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Injection Date: 03-Nov-2017 13:37:59 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

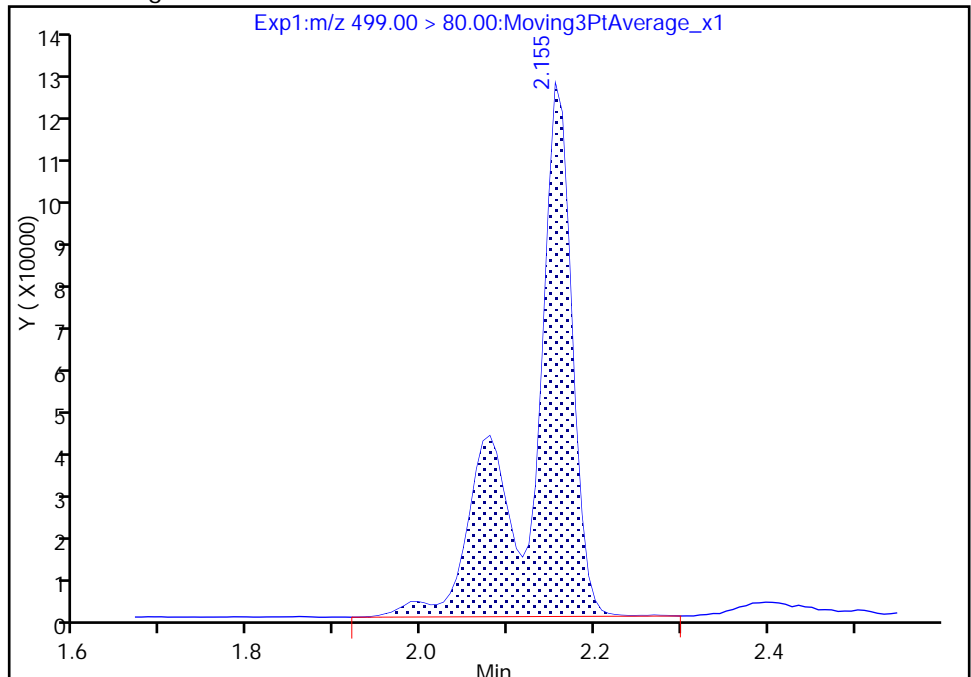
Not Detected
Expected RT: 2.15

Processing Integration Results



RT: 2.15
Area: 412315
Amount: 3.817687
Amount Units: ng/ml

Manual Integration Results



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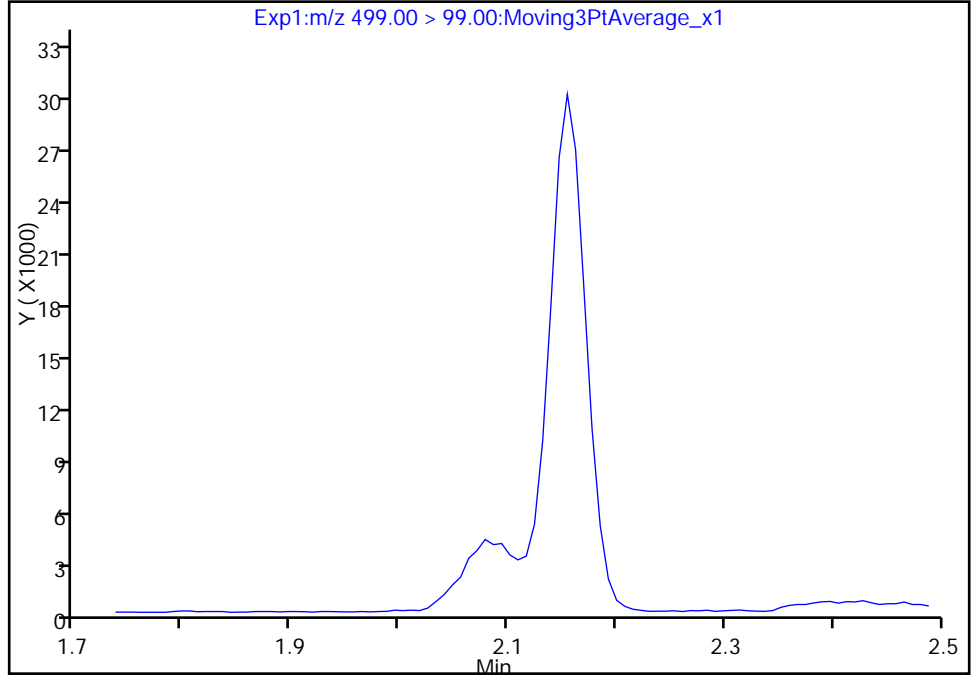
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Injection Date: 03-Nov-2017 13:37:59 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

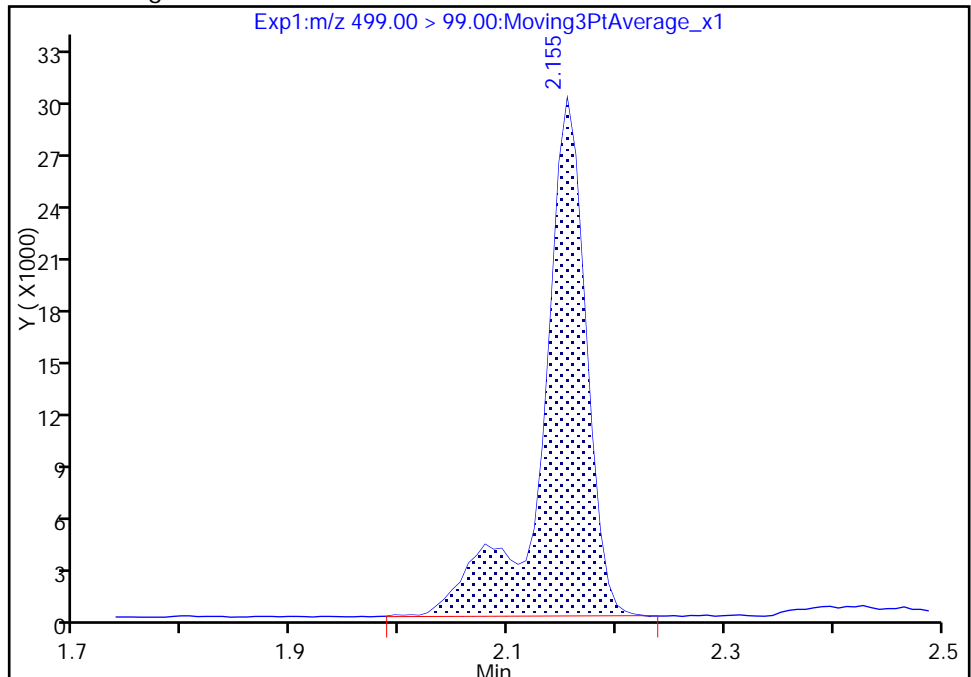
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 85347
Amount: 3.817687
Amount Units: ng/ml



Reviewer: phomsophat, 06-Nov-2017 07:17:37

Audit Action: Manually Integrated

Audit Reason: Assign Peak

TestAmerica Sacramento

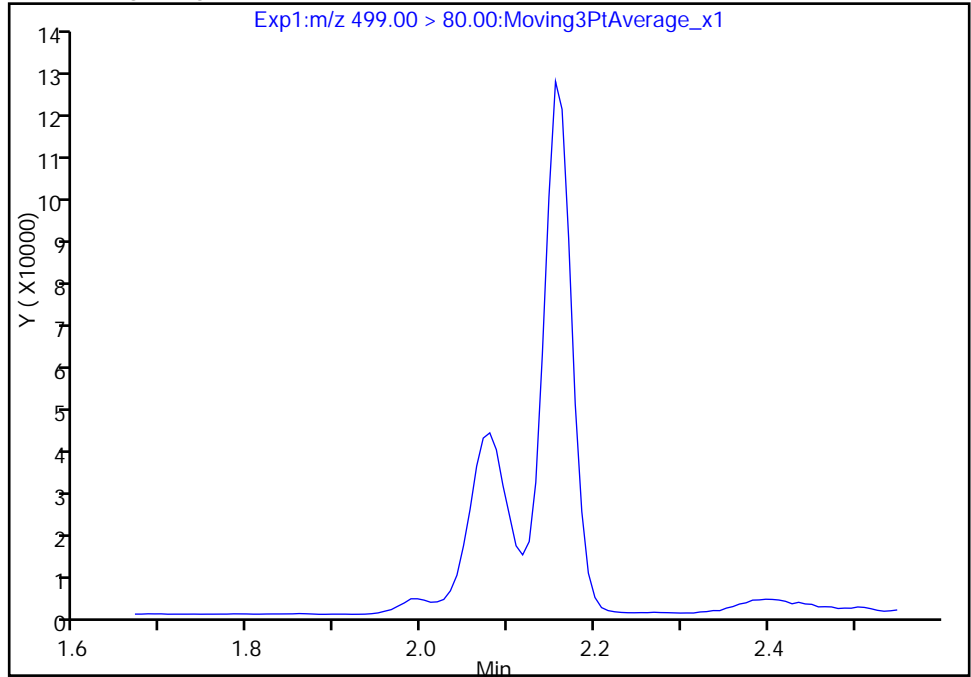
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Injection Date: 03-Nov-2017 13:37:59 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

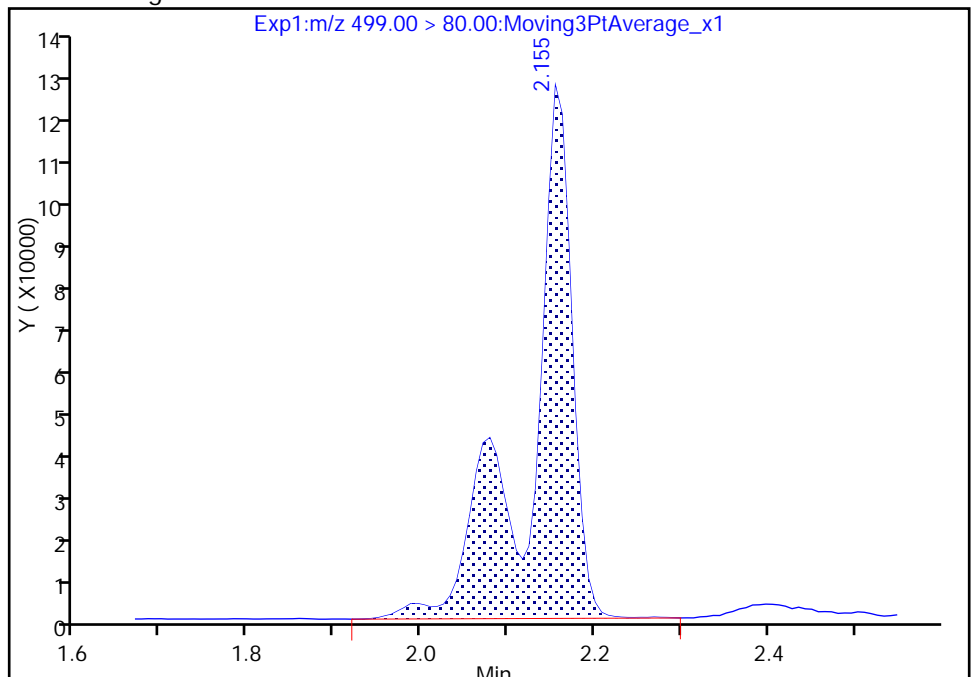
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 412315
Amount: 3.817687
Amount Units: ng/ml



Reviewer: phomsophat, 06-Nov-2017 07:17:37

Audit Action: Manually Integrated

Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_005.d
 Lims ID: IC L2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 03-Nov-2017 13:42:39 ALS Bottle#: 2 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L2_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Nov-2017 15:52:08 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:18:56

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.449	1.444	0.005	1.000	2591121	19.8		1479	
298.90 > 99.00	1.442	1.444	-0.002	0.995	1874928		1.38(0.00-0.00)	4315	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.573	0.005	1.000	1708988	9.57		8562	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.730	1.725	0.005	1.000	331548	2.18		87.8	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.730	1.725	0.005	1.000	1312135	6.51		2317	
* 6 13C2-PFOA									
415.00 > 370.00	1.920	1.913	0.007		1623614	10.0		6970	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.920	1.914	0.006	1.000	644149	4.29		113	
413.00 > 169.00	1.920	1.914	0.006	1.000	329479		1.96(0.00-0.00)	459	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.155	2.147	0.008	1.000	985487	8.72		578	M
499.00 > 99.00	2.155	2.147	0.008	1.000	200739		4.91(0.00-0.00)	449	M
* 7 13C4 PFOS									
503.00 > 80.00	2.155	2.151	0.004		3450592	28.7		5334	
9 Perfluorononanoic acid									
463.00 > 419.00	2.162	2.158	0.004	1.000	453612	4.21		136	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.312	0.002	1.000	1184358	9.53		7573	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00020

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537ICAL_005.d

Injection Date: 03-Nov-2017 13:42:39

Instrument ID: A8_N

Lims ID: IC L2

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

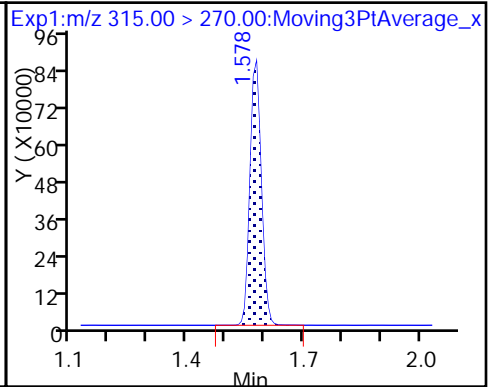
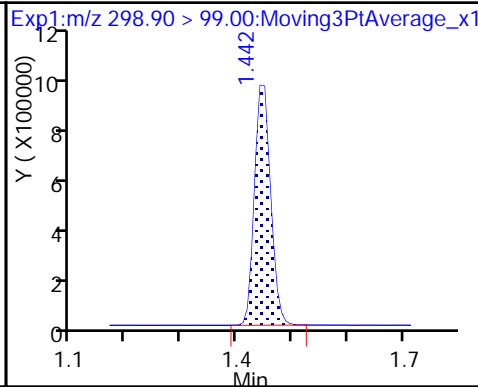
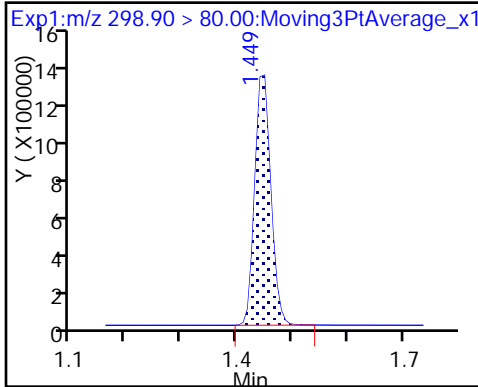
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

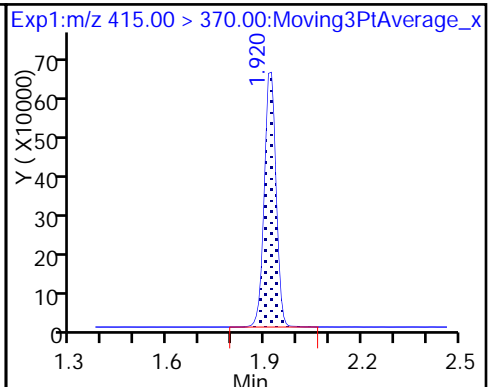
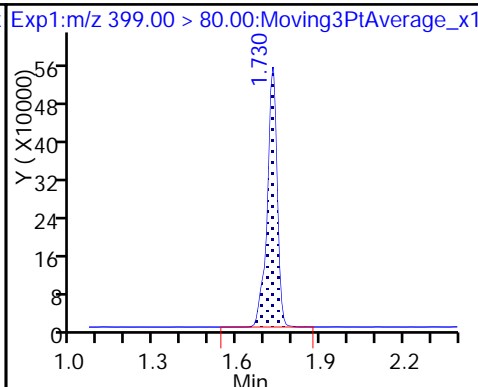
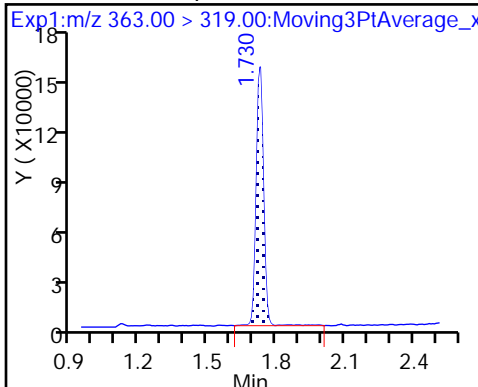
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

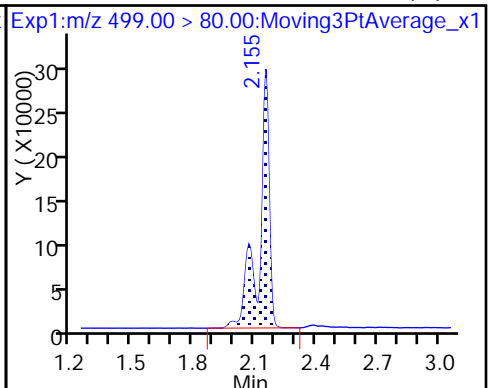
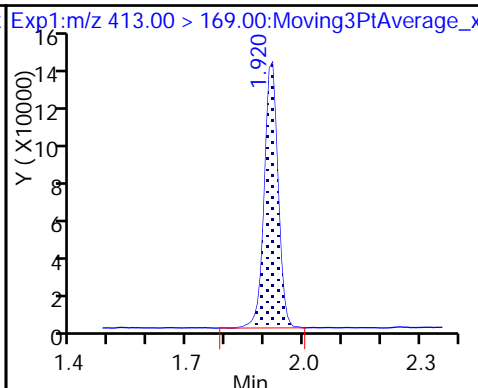
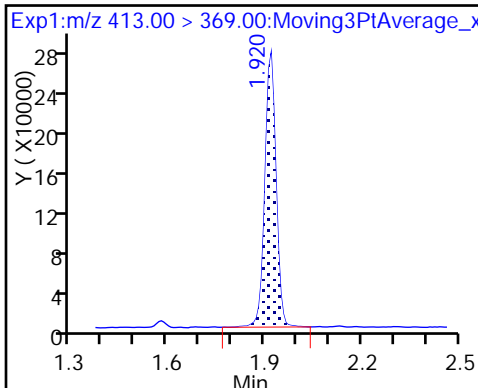
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

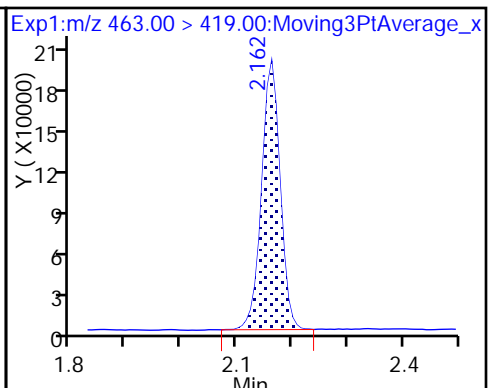
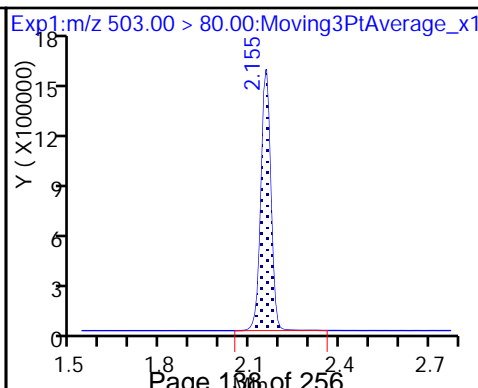
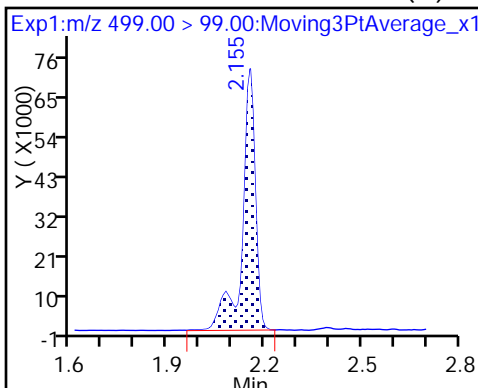
8 Perfluorooctane sulfonic acid (M)



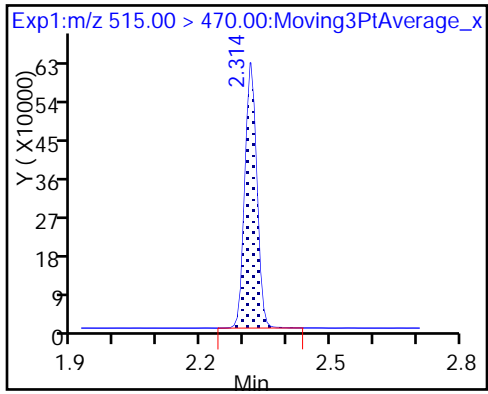
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

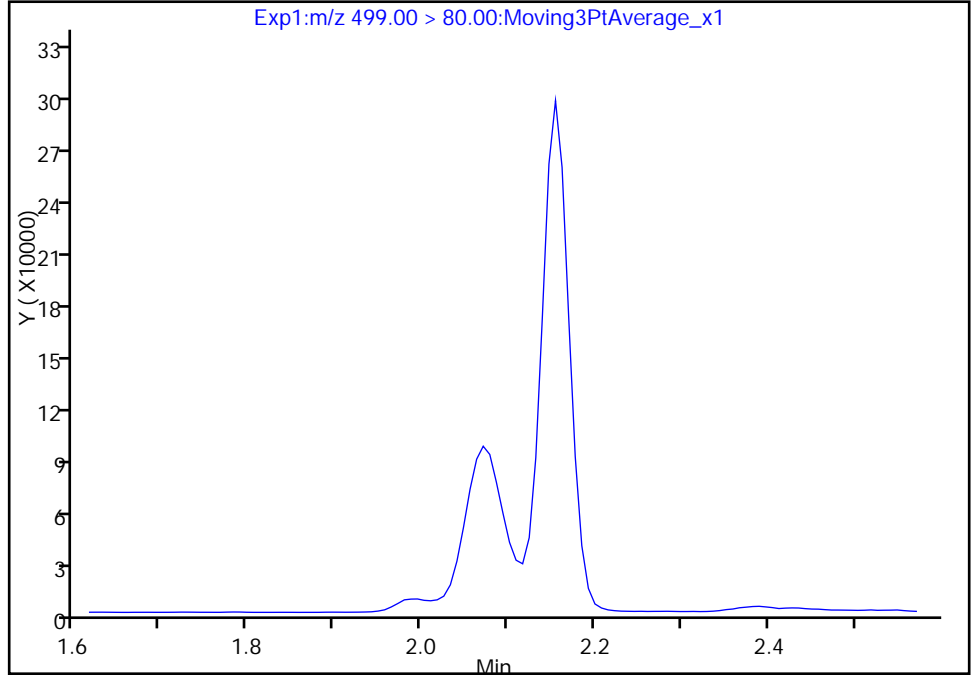
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_005.d
Injection Date: 03-Nov-2017 13:42:39 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

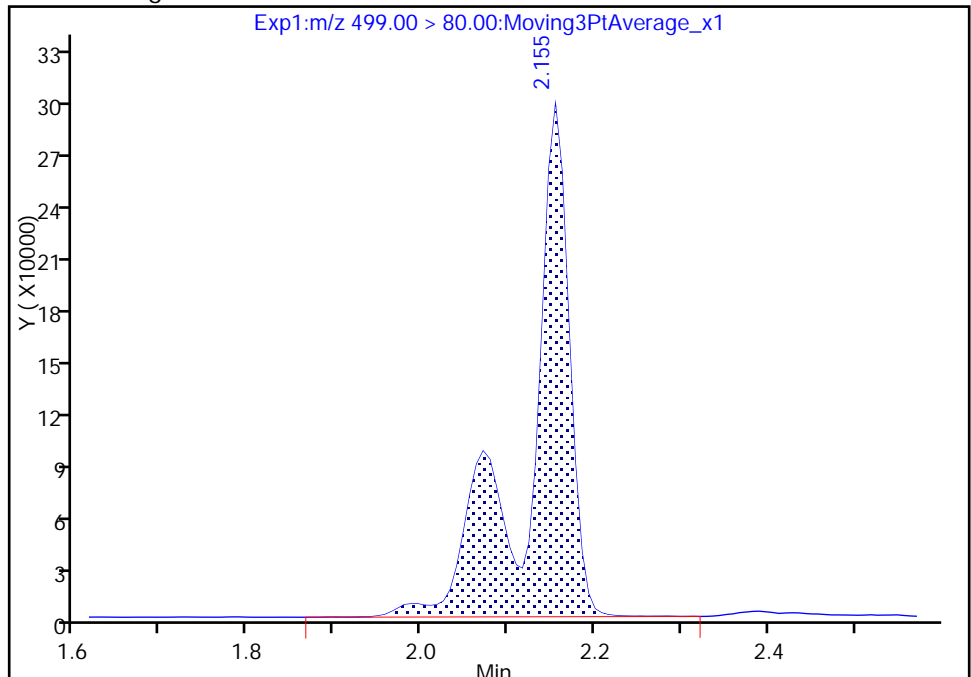
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 985487
Amount: 8.723576
Amount Units: ng/ml



TestAmerica Sacramento

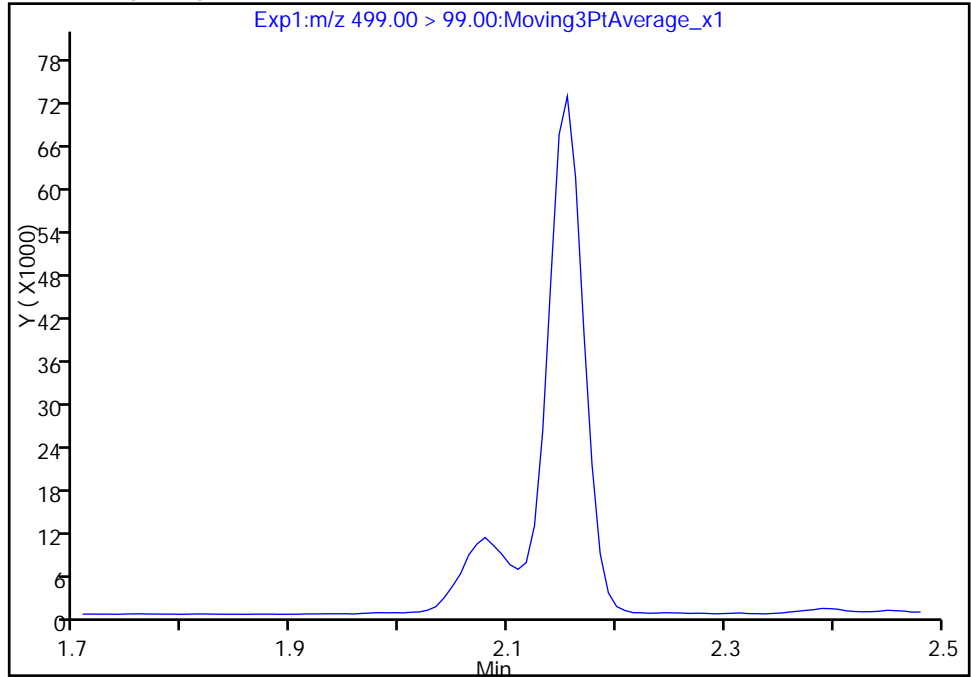
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Injection Date: 03-Nov-2017 13:42:39 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

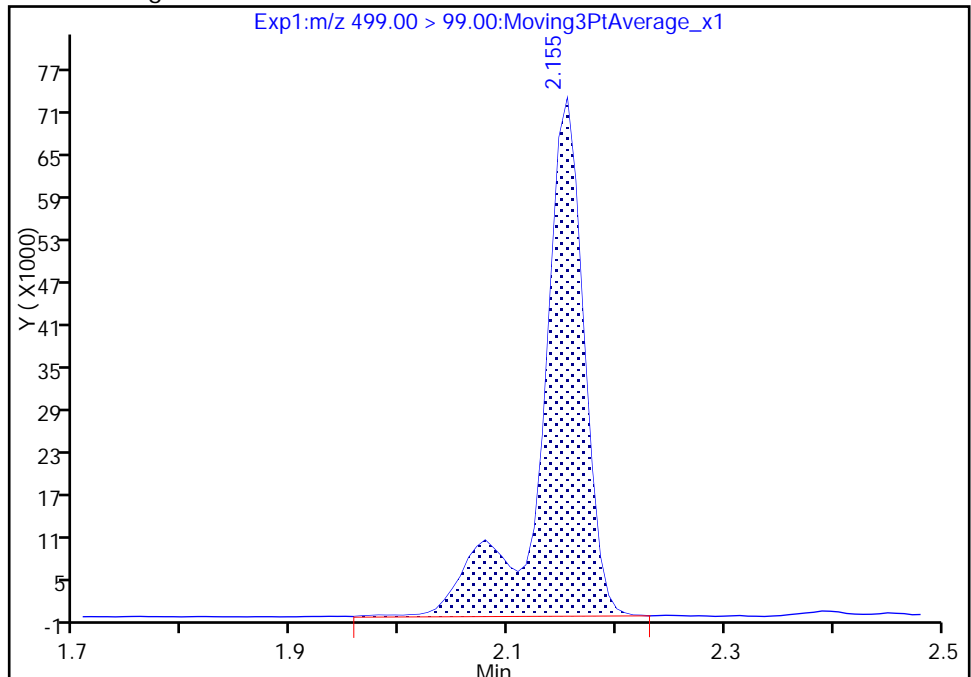
Not Detected
Expected RT: 2.15

Processing Integration Results



RT: 2.15
Area: 200739
Amount: 8.723576
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

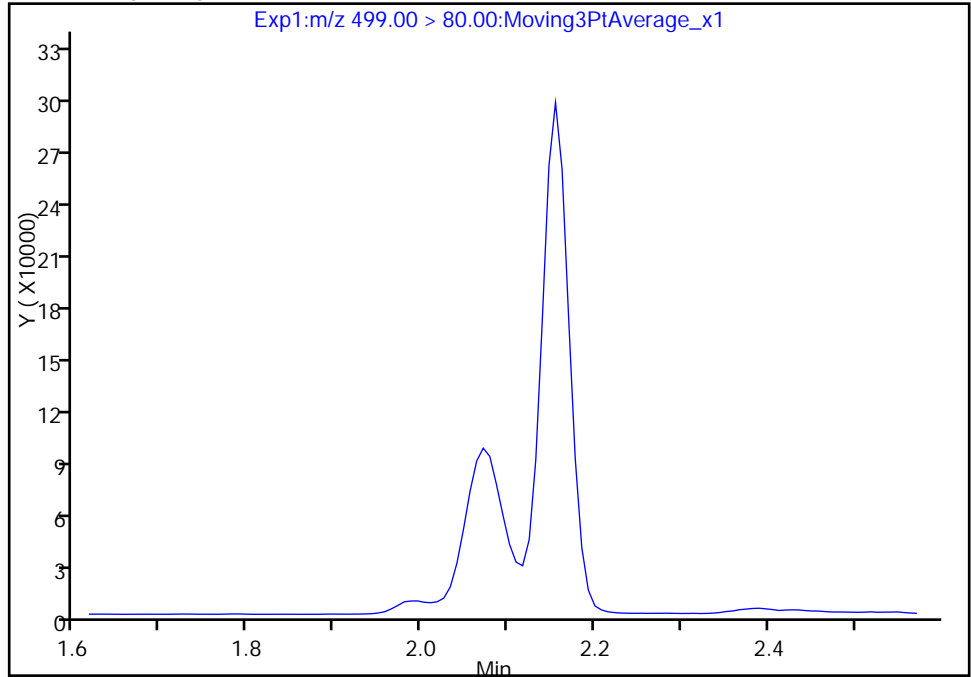
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Injection Date: 03-Nov-2017 13:42:39 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

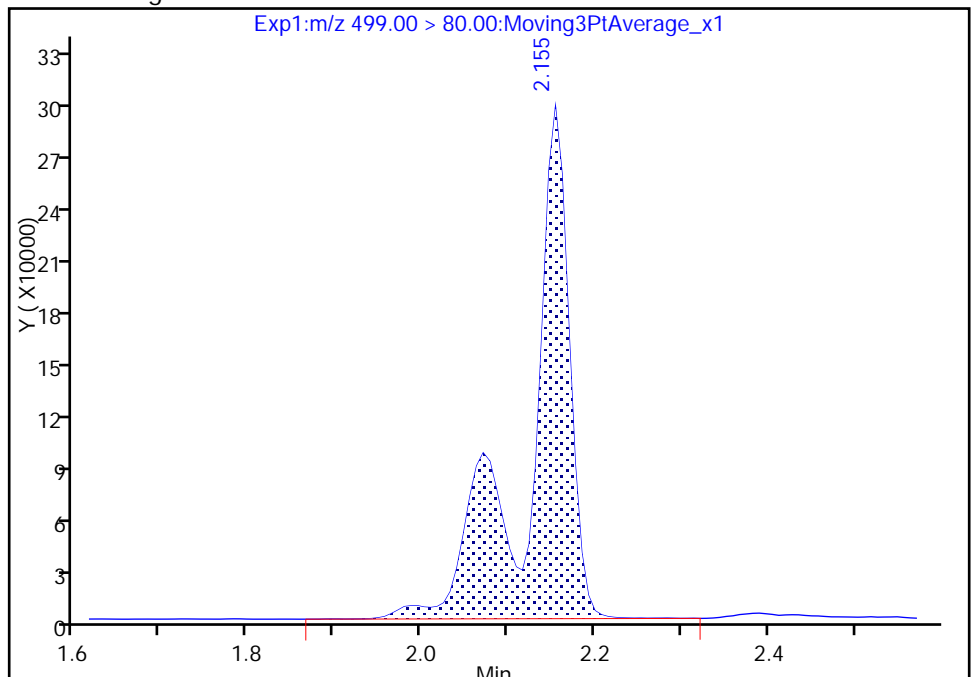
Not Detected
Expected RT: 2.15

Processing Integration Results



RT: 2.15
Area: 985487
Amount: 8.723576
Amount Units: ng/ml

Manual Integration Results



Reviewer: phomsophat, 06-Nov-2017 07:18:24

Audit Action: Manually Integrated

Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_006.d
 Lims ID: IC L3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 03-Nov-2017 13:47:20 ALS Bottle#: 3 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L3_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Nov-2017 15:52:09 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:20:04

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.444	-0.002	1.000	5461974	46.7		3220	
298.90 > 99.00	1.442	1.444	-0.002	1.000	3903438		1.40(0.00-0.00)	8589	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.573	-0.003	1.000	1701491	10.0		9021	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.722	1.725	-0.003	1.000	2908204	15.6		5000	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.725	-0.003	1.000	736034	5.10		208	
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.913	-0.001		1540946	10.0		6787	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.912	1.914	-0.002	1.000	1388033	9.73		256	
413.00 > 169.00	1.912	1.914	-0.002	1.000	715399		1.94(0.00-0.00)	904	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.147	2.147	0.0	1.000	2067792	19.8		2001	
499.00 > 99.00	2.147	2.147	0.0	1.000	431075		4.80(0.00-0.00)	922	
* 7 13C4 PFOS									
503.00 > 80.00	2.147	2.151	-0.004		3194016	28.7		4956	
9 Perfluorononanoic acid									
463.00 > 419.00	2.155	2.158	-0.003	1.000	1020851	9.97		302	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.306	2.312	-0.006	1.000	1166275	9.89		6310	

Reagents:

LC537-L3_00023

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_006.d

Injection Date: 03-Nov-2017 13:47:20

Instrument ID: A8_N

Lims ID: IC L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

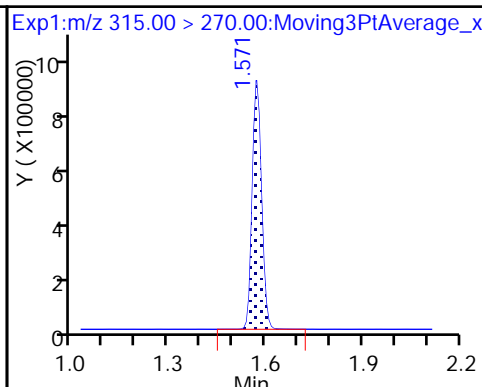
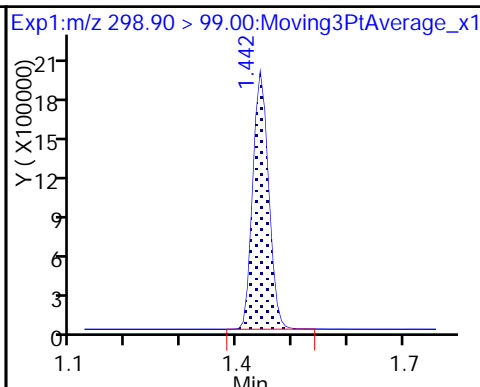
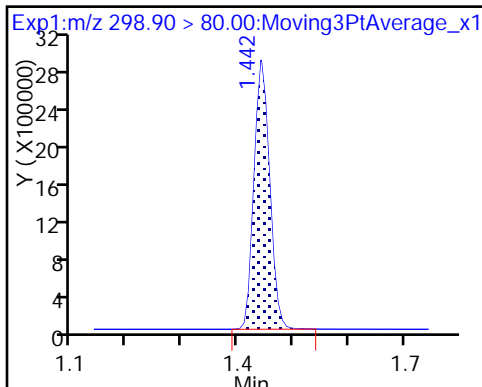
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

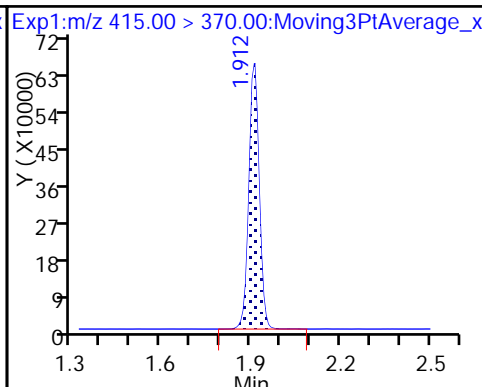
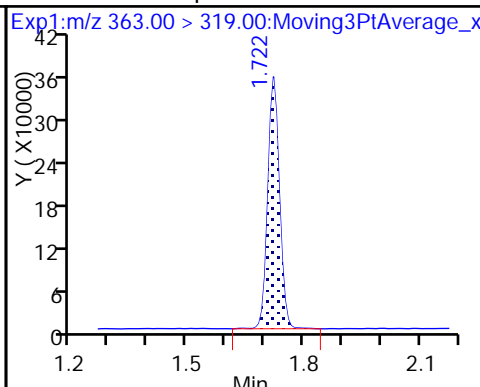
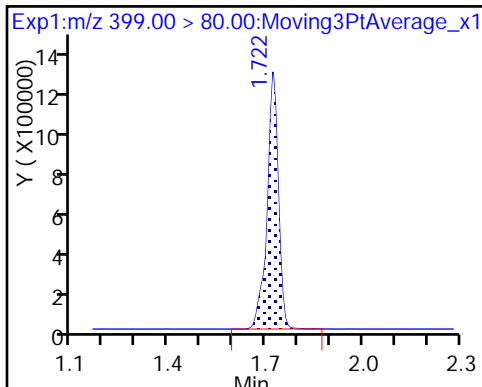
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

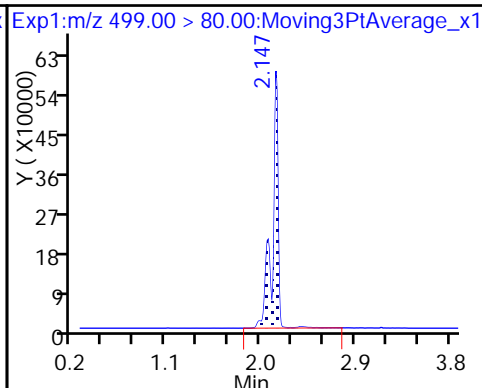
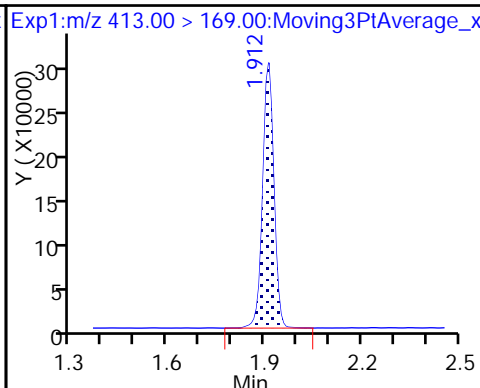
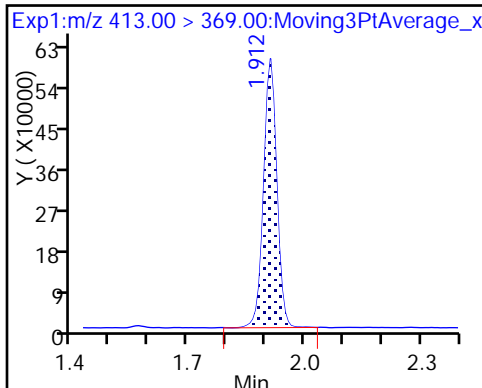
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

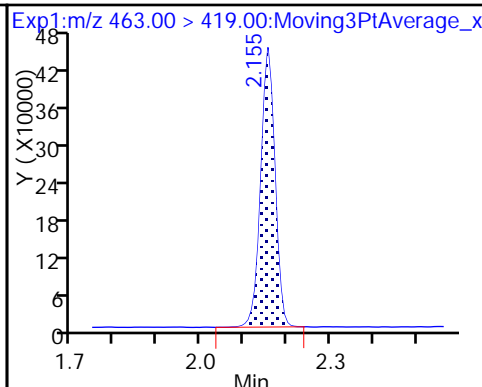
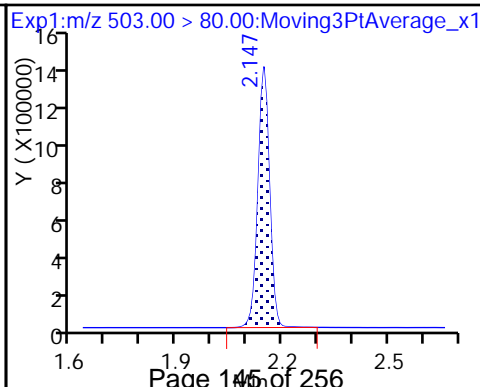
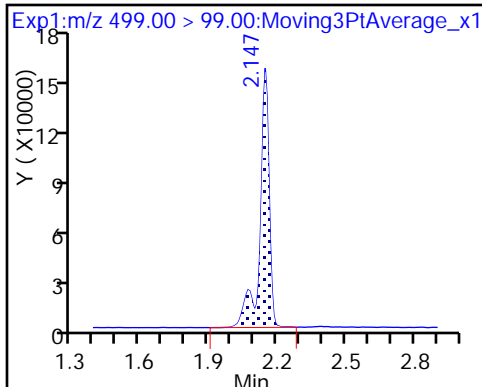
8 Perfluorooctane sulfonic acid



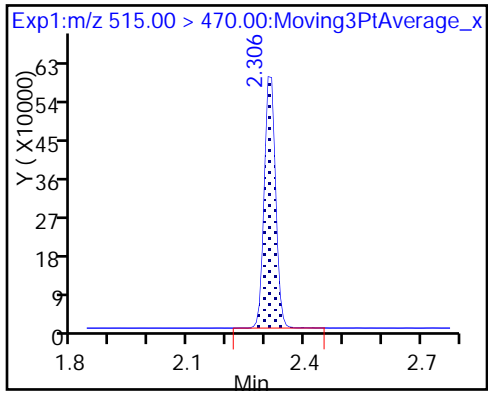
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_007.d
 Lims ID: IC L4
 Client ID:
 Sample Type: ICISAV Calib Level: 4
 Inject. Date: 03-Nov-2017 13:52:00 ALS Bottle#: 4 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L4_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Nov-2017 15:52:10 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:20:46

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.444	-0.002	1.000	10142530	87.2		5274	
298.90 > 99.00	1.442	1.444	-0.002	1.000	7408390		1.37(0.00-0.00)	12862	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.573	-0.003	1.000	1719911	10.1		8503	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.725	-0.003	1.000	1420703	9.81		399	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.722	1.725	-0.003	1.000	5871843	29.8		7622	
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.913	-0.001		1546307	10.0		6563	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.912	1.914	-0.002	1.000	2771271	19.4		505	
413.00 > 169.00	1.912	1.914	-0.002	1.000	1520933		1.82(0.00-0.00)	1919	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.155	2.147	0.008	1.000	4363079	39.5		3896	M
499.00 > 99.00	2.155	2.147	0.008	1.000	902486		4.83(0.00-0.00)	1588	M
* 7 13C4 PFOS									
503.00 > 80.00	2.155	2.151	0.004		3374600	28.7		5331	
9 Perfluorononanoic acid									
463.00 > 419.00	2.162	2.158	0.004	1.000	2106479	20.5		638	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.312	0.002	1.000	1207887	10.2		7165	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L4_00020

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_007.d

Injection Date: 03-Nov-2017 13:52:00

Instrument ID: A8_N

Lims ID: IC L4

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 4

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

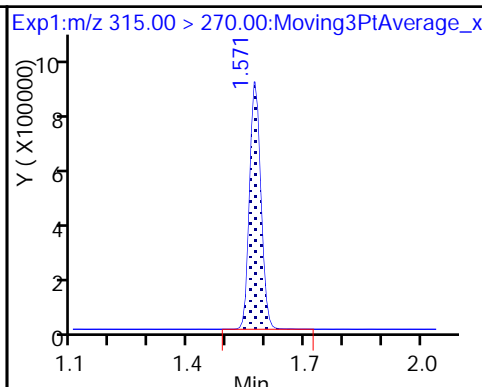
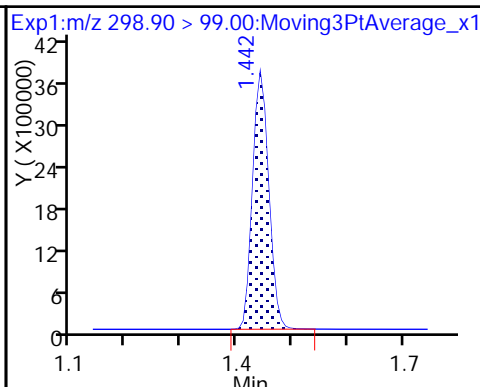
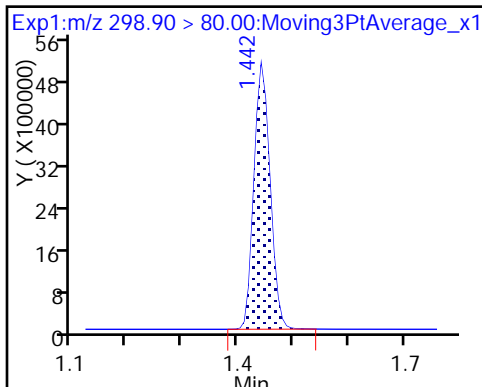
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

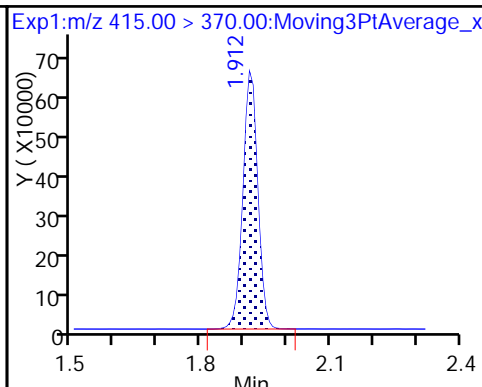
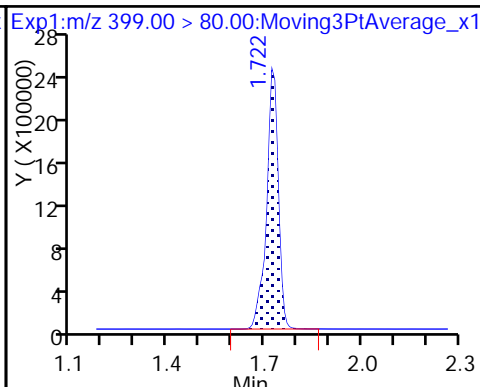
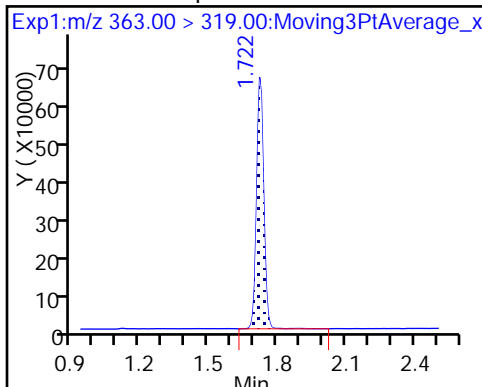
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

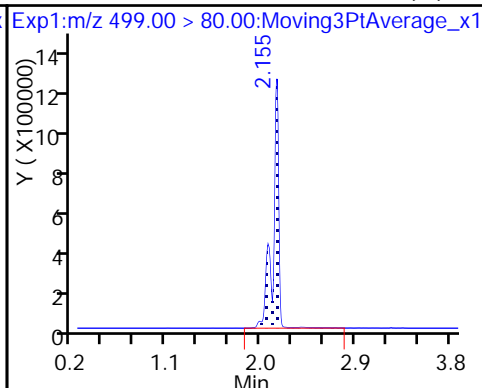
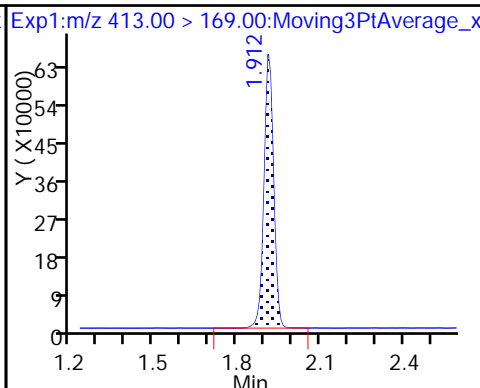
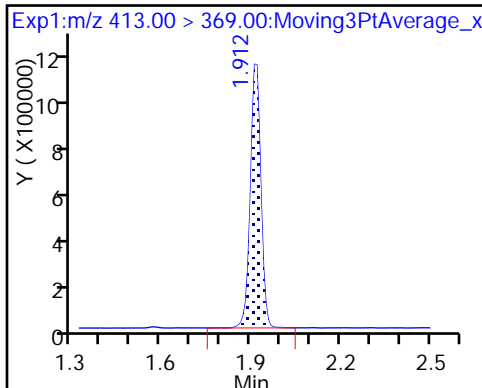
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

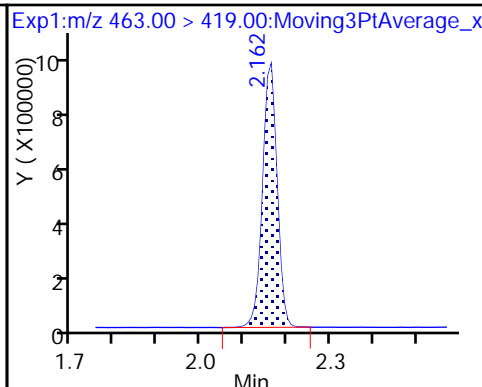
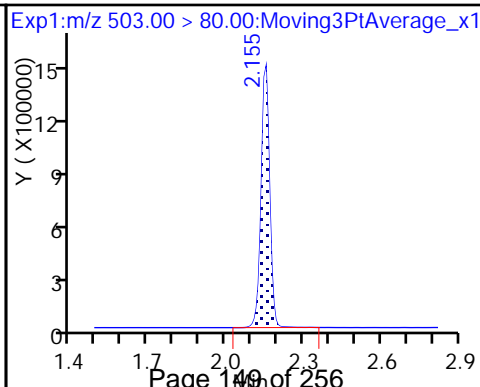
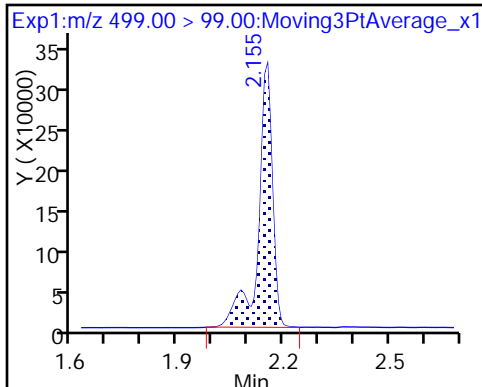
8 Perfluorooctane sulfonic acid (M)



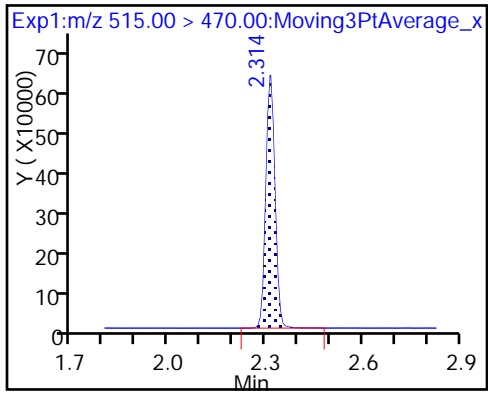
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

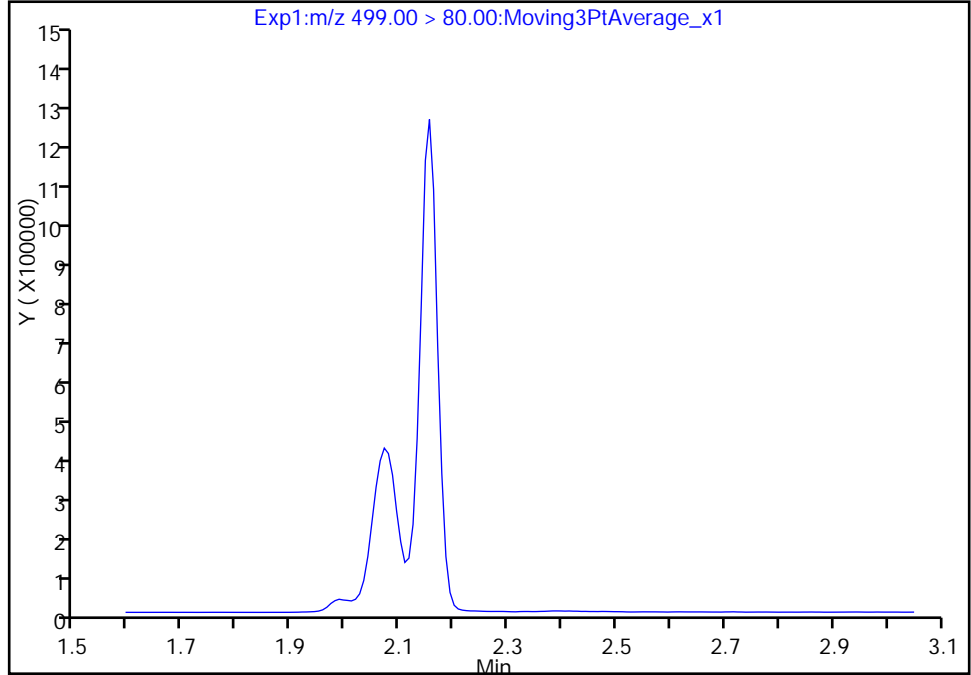
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_007.d
Injection Date: 03-Nov-2017 13:52:00 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

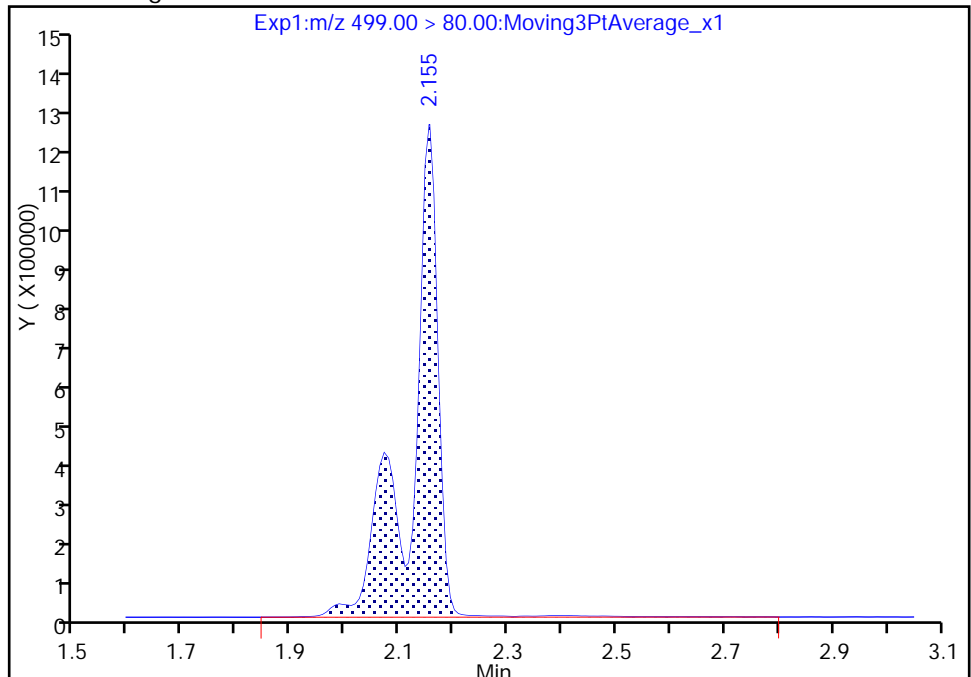
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 4363079
Amount: 39.491903
Amount Units: ng/ml



TestAmerica Sacramento

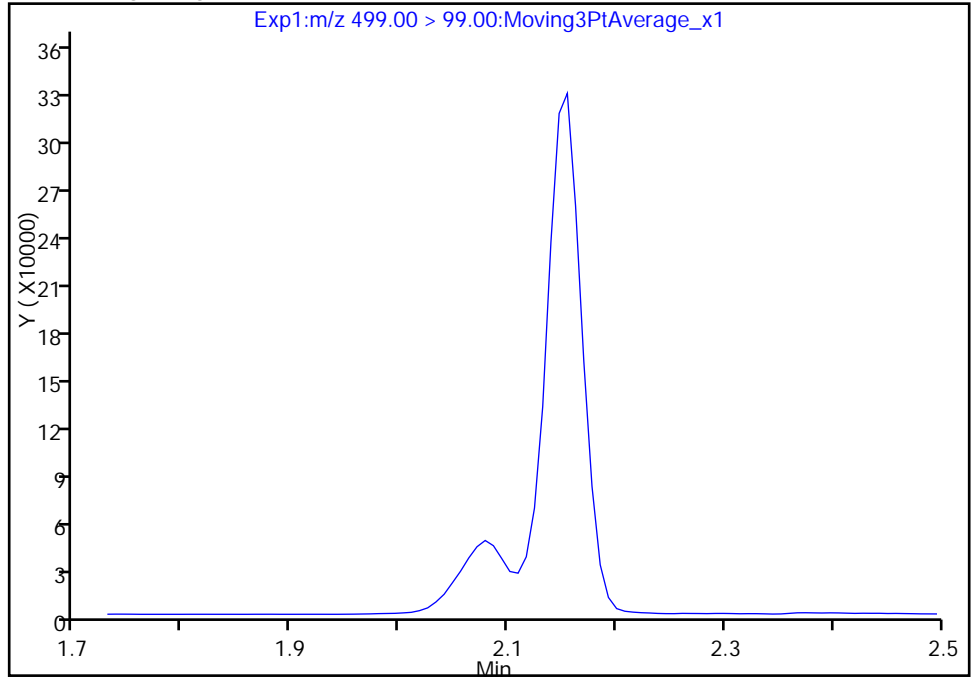
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_007.d
Injection Date: 03-Nov-2017 13:52:00 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

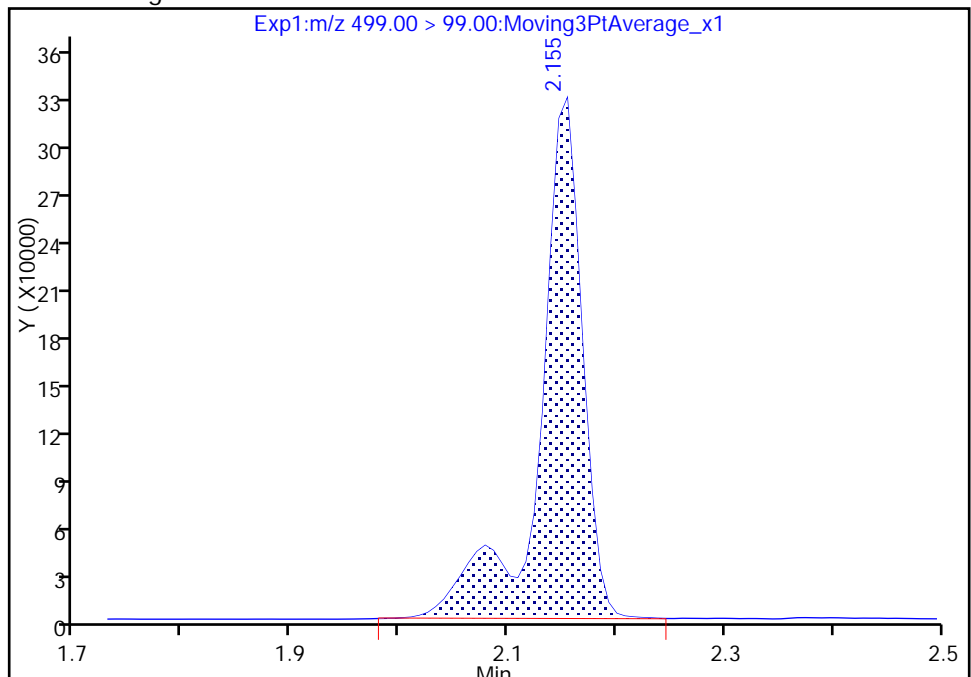
Not Detected
Expected RT: 2.15

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 902486
Amount: 39.491903
Amount Units: ng/ml



Reviewer: phomsophat, 06-Nov-2017 07:20:20

Audit Action: Manually Integrated

Audit Reason: Assign Peak

TestAmerica Sacramento

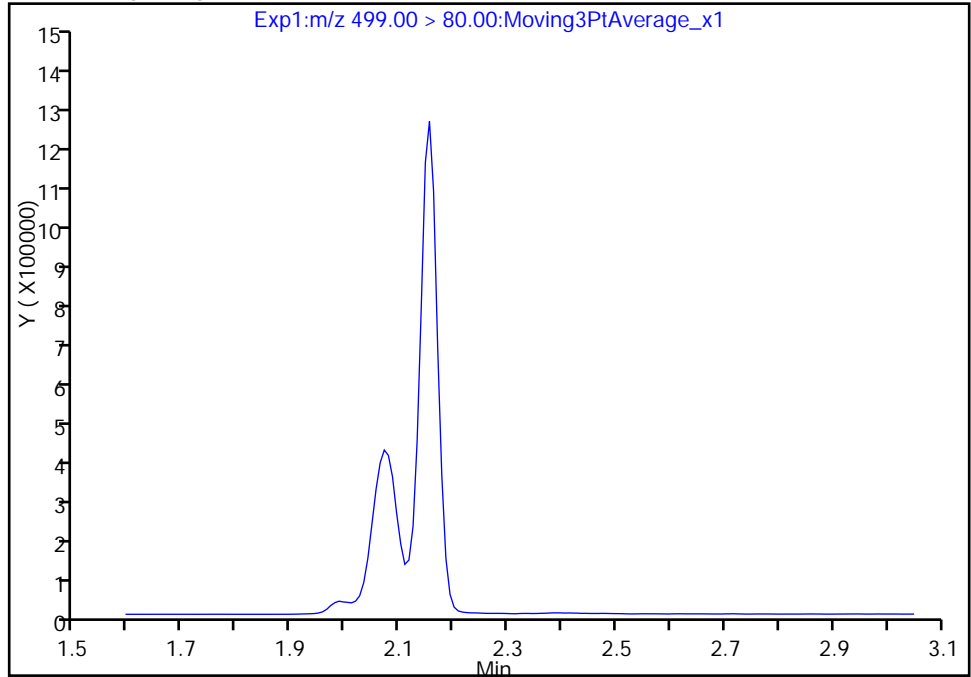
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Injection Date: 03-Nov-2017 13:52:00 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

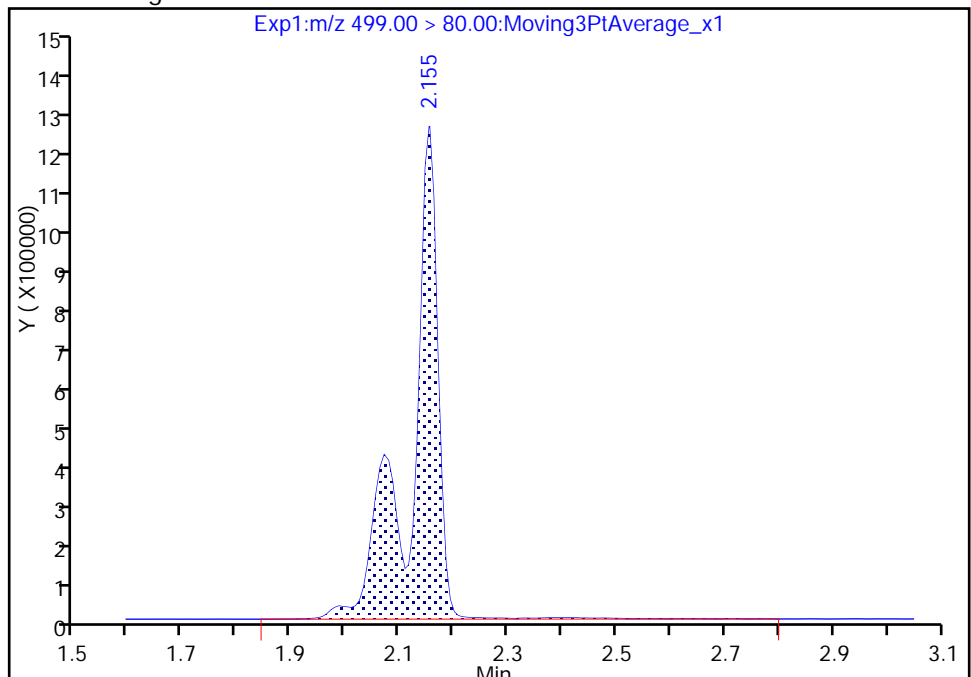
Not Detected
Expected RT: 2.15

Processing Integration Results



RT: 2.15
Area: 4363079
Amount: 39.491903
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_008.d
 Lims ID: IC L5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 03-Nov-2017 13:56:41 ALS Bottle#: 5 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L5_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Nov-2017 15:52:11 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:21:19

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.444	-0.002	1.000	14011858	137.5		6452	
298.90 > 99.00	1.442	1.444	-0.002	1.000	10411479		1.35(0.00-0.00)	14800	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.573	-0.003	1.000	1675220	9.79		9525	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.722	1.725	-0.003	1.000	8413133	45.0		9078	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.725	-0.003	1.000	2102676	14.4		562	
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.913	-0.001		1555174	10.0		6769	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.912	1.914	-0.002	1.000	4257225	29.6		800	
413.00 > 169.00	1.912	1.914	-0.002	1.000	2294552		1.86(0.00-0.00)	2838	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.147	2.147	0.0	1.000	6504279	62.1		5682	
499.00 > 99.00	2.147	2.147	0.0	1.000	1339120		4.86(0.00-0.00)	2329	
* 7 13C4 PFOS									
503.00 > 80.00	2.147	2.151	-0.004		3199479	28.7		4946	
9 Perfluorononanoic acid									
463.00 > 419.00	2.155	2.158	-0.003	1.000	3023088	29.3		870	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.312	0.002	1.000	1139992	9.58		5885	

Reagents:

LC537-L5_00024

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537ICAL_008.d

Injection Date: 03-Nov-2017 13:56:41

Instrument ID: A8_N

Lims ID: IC L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

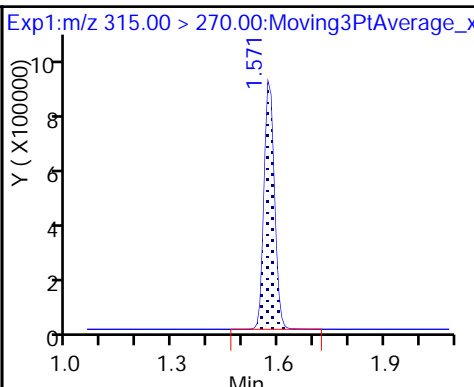
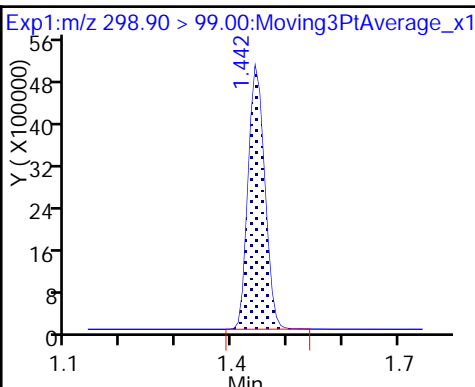
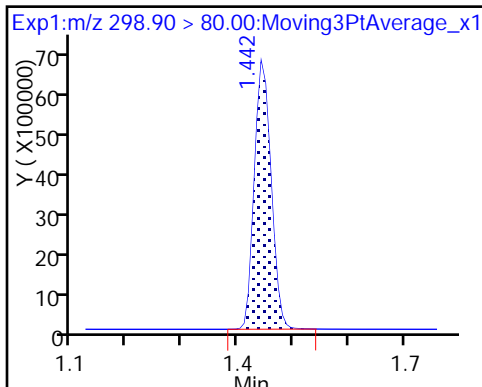
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

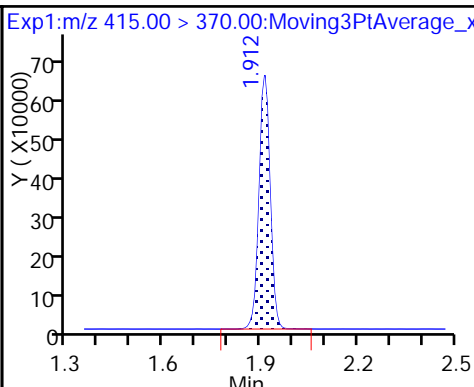
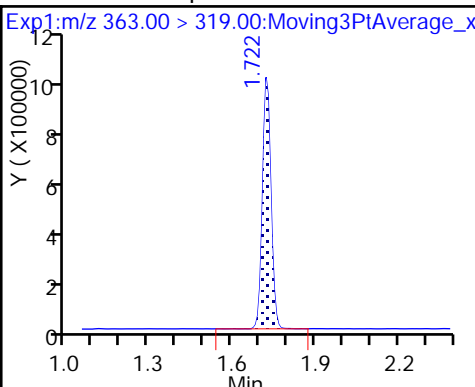
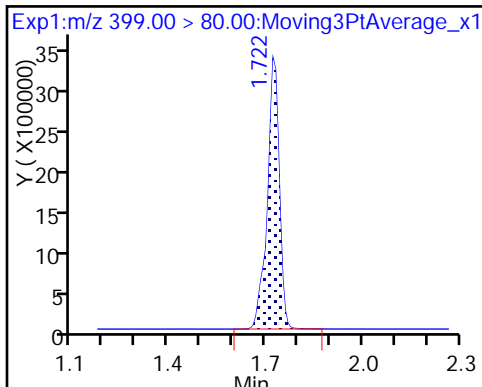
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

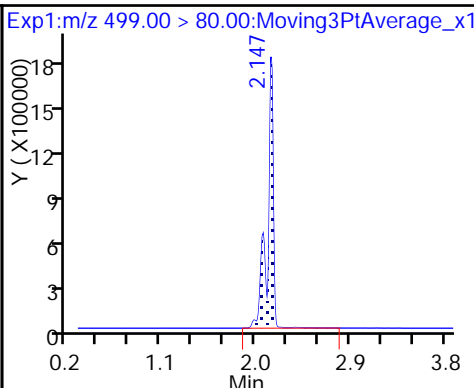
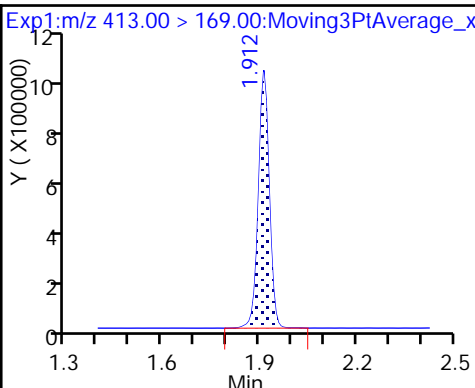
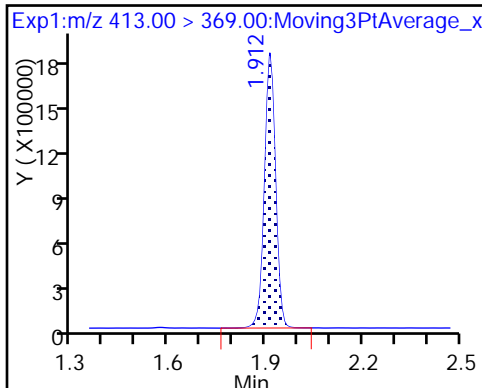
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

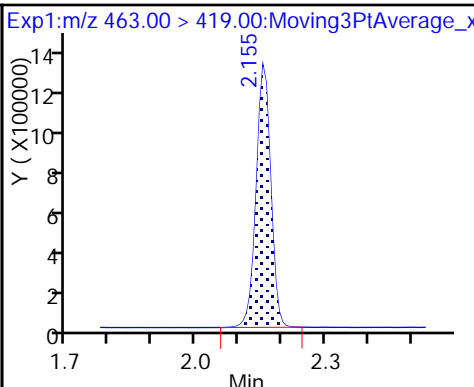
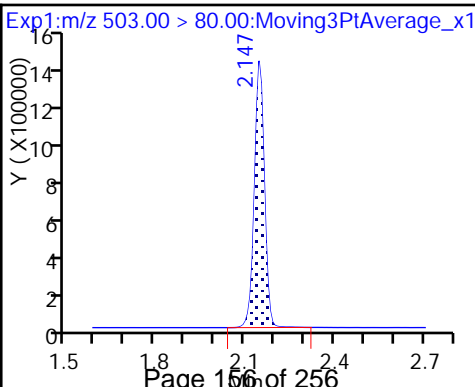
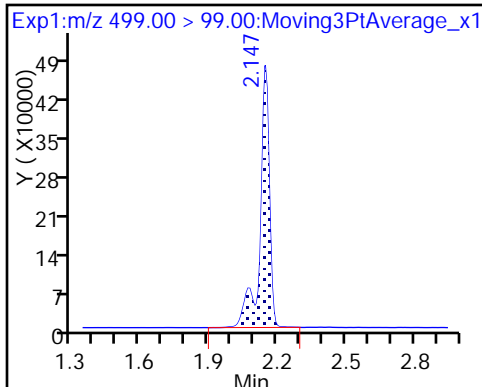
8 Perfluorooctane sulfonic acid



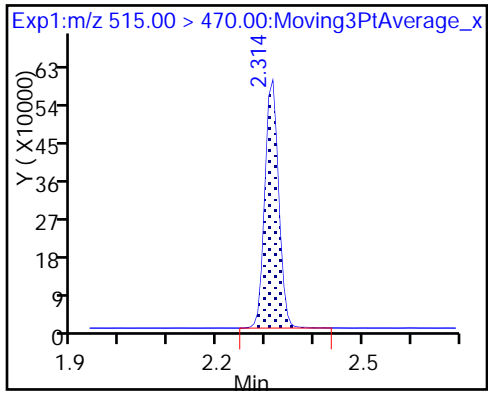
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Lims ID: IC L6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 03-Nov-2017 14:01:24 ALS Bottle#: 6 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L6_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Nov-2017 15:52:12 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:25:41

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.444	-0.002	1.000	16699152	179.1		7089	
298.90 > 99.00	1.442	1.444	-0.002	1.000	12929978		1.29(0.00-0.00)	15608	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.573	-0.003	1.000	1664260	10.6		9116	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.725	-0.003	1.000	2810797	21.0		763	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.722	1.725	-0.003	1.000	11071993	60.4		10884	
* 6 13C2-PFOA									
415.00 > 370.00	1.904	1.913	-0.009		1426806	10.0		5446	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.912	1.914	-0.002	1.000	5597122	42.4		962	
413.00 > 169.00	1.904	1.914	-0.010	0.996	3028676		1.85(0.00-0.00)	3704	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.147	2.147	0.0	1.000	8679676	84.4		6114	
499.00 > 99.00	2.147	2.147	0.0	1.000	1807143		4.80(0.00-0.00)	2991	
* 7 13C4 PFOS									
503.00 > 80.00	2.147	2.151	-0.004		3141787	28.7		4961	
9 Perfluorononanoic acid									
463.00 > 419.00	2.155	2.158	-0.003	1.000	4019666	42.4		1149	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.306	2.312	-0.006	1.000	1164156	10.7		6124	

Reagents:

LC537-L6_00020

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Injection Date: 03-Nov-2017 14:01:24

Instrument ID: A8_N

Lims ID: IC L6

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 6

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

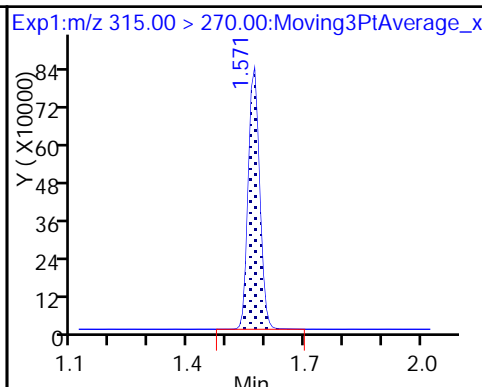
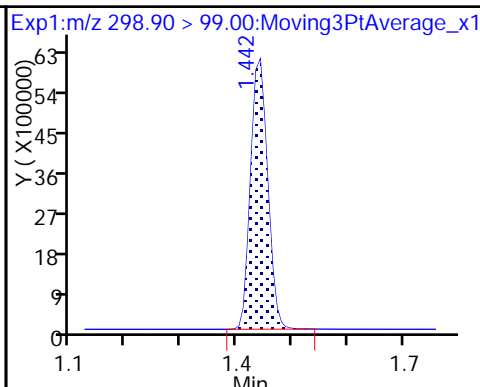
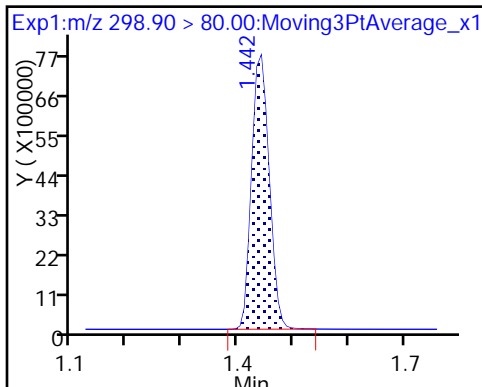
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

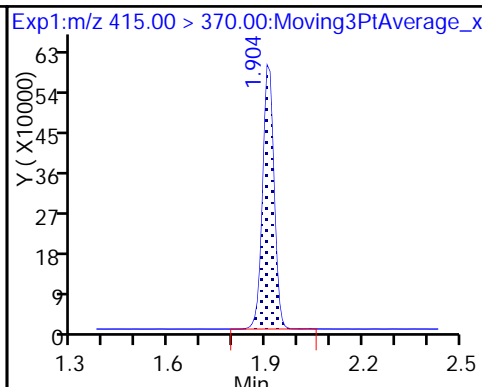
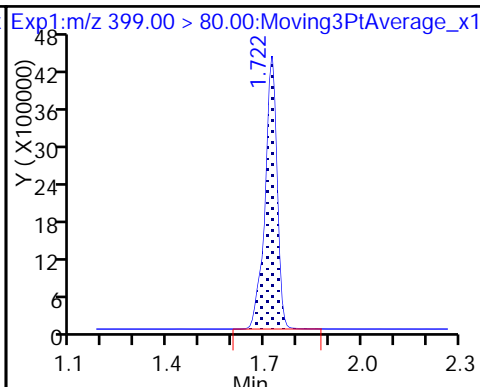
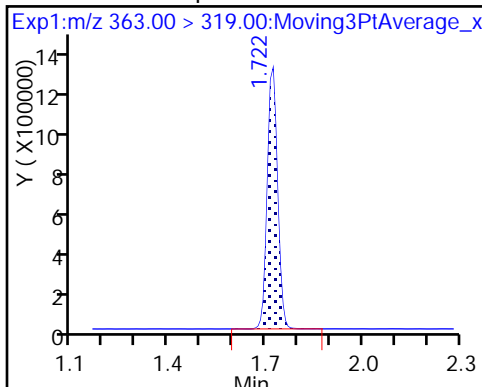
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

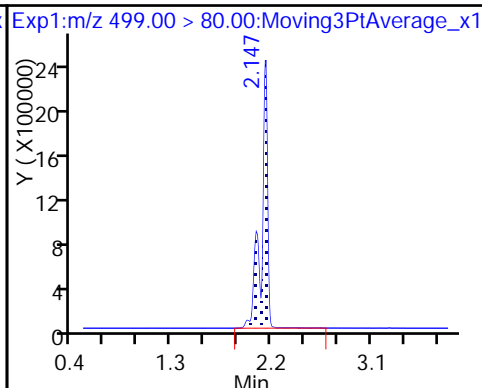
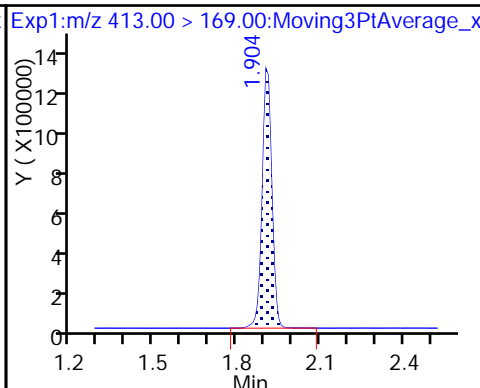
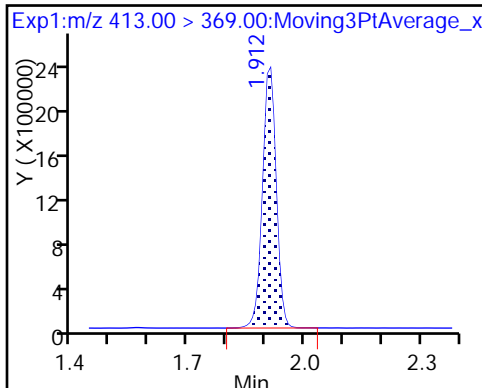
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

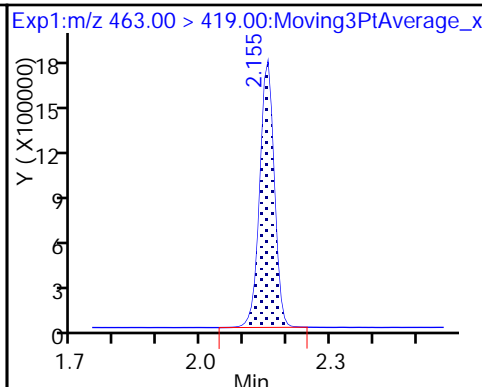
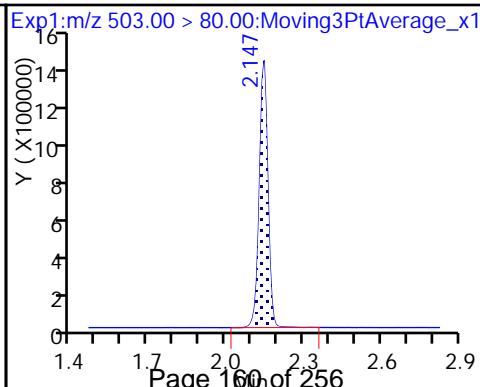
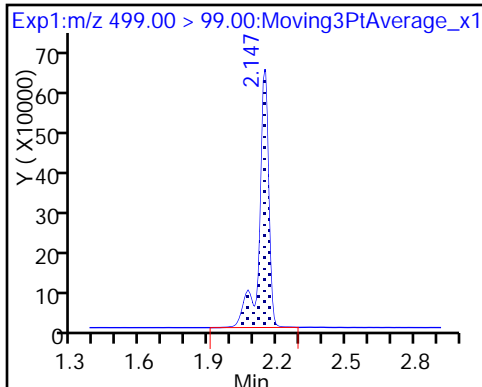
8 Perfluorooctane sulfonic acid



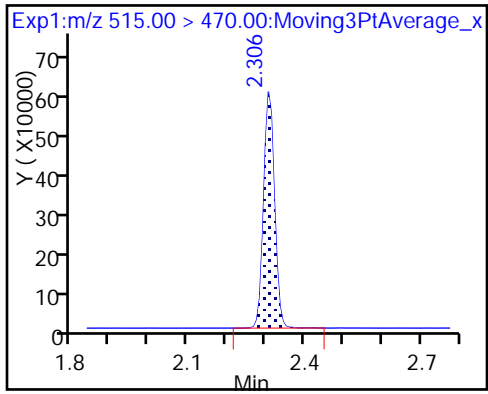
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-192908/11 Calibration Date: 11/03/2017 14:10
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.11.03_537XICAL_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.109		20.4	20.0	1.9	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9382		2.23	2.22	0.1	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.688		6.72	6.67	0.8	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.8825		4.24	4.45	-4.7	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9176		8.69	8.89	-2.3	50.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6625		4.43	4.45	-0.2	50.0
13C2 PFHxA	Ave	1.100	1.068		9.70	10.0	-3.0	30.0
13C2 PFDA	Ave	0.7652	0.7460		9.75	10.0	-2.5	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_011.d
 Lims ID: CCVL
 Client ID:
 Sample Type: CCVL
 Inject. Date: 03-Nov-2017 14:10:44 ALS Bottle#: 2 Worklist Smp#: 11
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L2
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Nov-2017 15:39:07 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:26:29

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.449	1.444	0.005	1.000	2556738	20.4		1537	
298.90 > 99.00	1.449	1.444	0.005	1.000	1750170		1.46(0.00-0.00)	4023	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.573	0.005	1.000	1694196	9.70		8915	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.730	1.725	0.005	1.000	1297654	6.72		2410	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.730	1.725	0.005	1.000	330927	2.23		99.4	
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.913	-0.001		1586829	10.0		6840	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.912	1.914	-0.002	1.000	622915	4.24		116	
413.00 > 169.00	1.912	1.914	-0.002	1.000	335080		1.86(0.00-0.00)	460	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.155	2.147	0.008	1.000	940397	8.69		528	
499.00 > 99.00	2.147	2.147	0.0	0.996	196397		4.79(0.00-0.00)	430	
* 7 13C4 PFOS									
503.00 > 80.00	2.147	2.151	-0.004		3305852	28.7		5135	
9 Perfluorononanoic acid									
463.00 > 419.00	2.162	2.158	0.004	1.000	467323	4.43		143	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.312	0.002	1.000	1183747	9.75		6763	

Reagents:

LC537-L2_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_011.d

Injection Date: 03-Nov-2017 14:10:44

Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 11

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

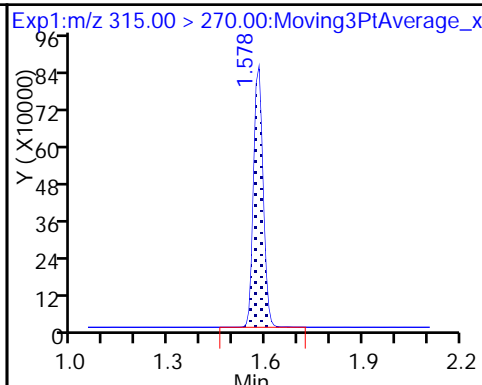
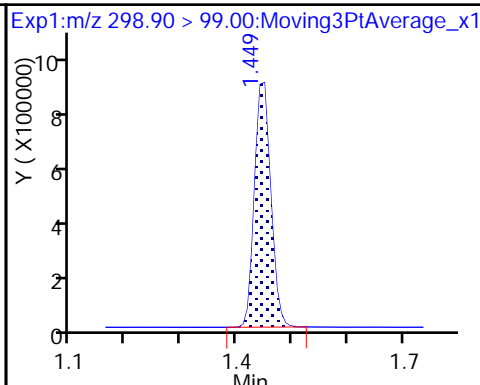
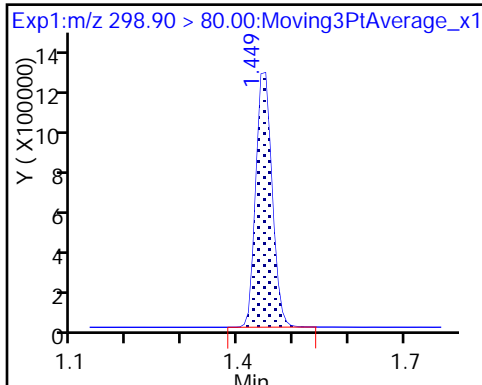
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

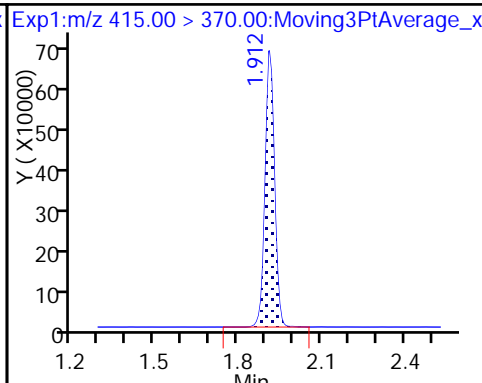
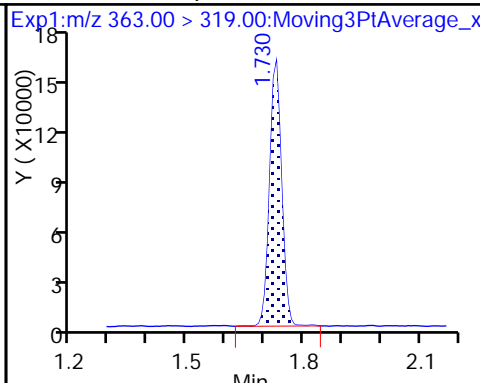
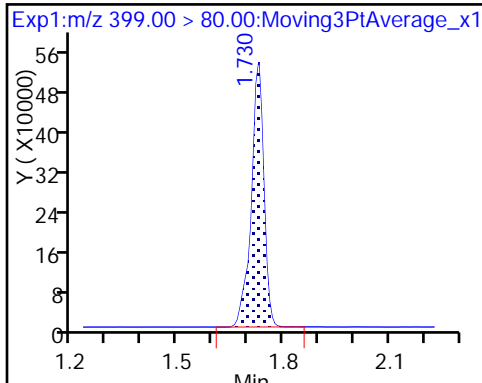
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

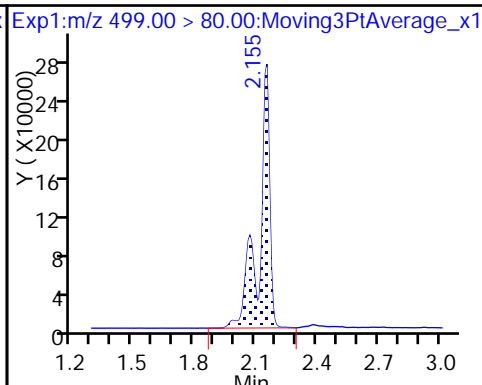
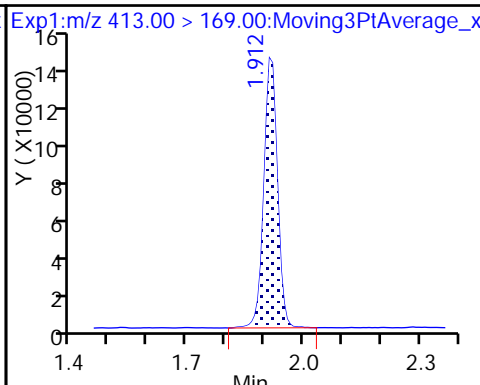
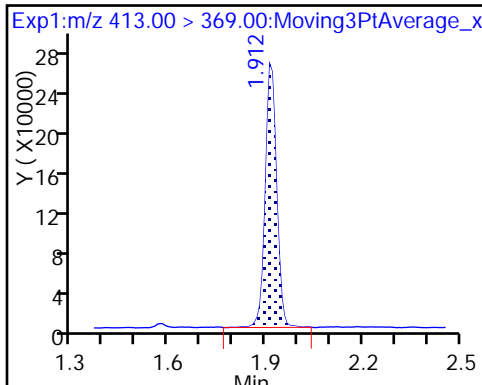
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

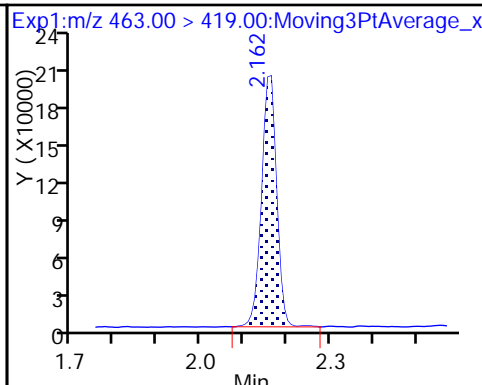
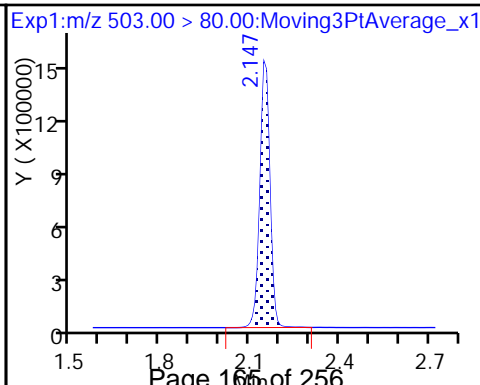
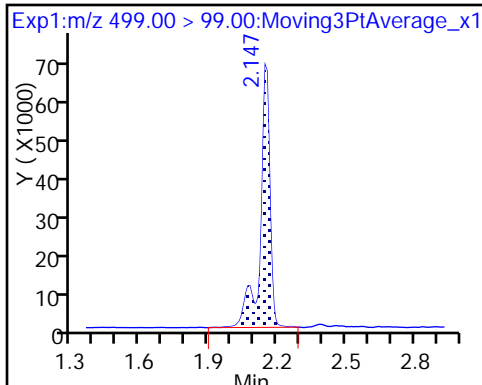
8 Perfluorooctane sulfonic acid



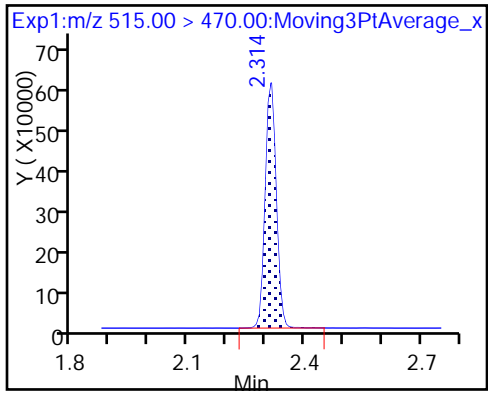
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Lab Sample ID: ICV 320-192908/13 Calibration Date: 11/03/2017 14:20
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.11.03_537XICAL_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.8310		83.7	100	-16.4	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.8136		8.68	10.0	-13.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.463		17.5	20.1	-12.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.7995		17.7	20.5	-13.6	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.8637		18.1	19.7	-8.0	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6428		19.5	20.1	-3.2	30.0
13C2 PFHxA	Ave	1.100	1.039		9.44	10.0	-5.6	30.0
13C2 PFDA	Ave	0.7652	0.7391		9.66	10.0	-3.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_013.d
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 03-Nov-2017 14:20:03 ALS Bottle#: 7 Worklist Smp#: 13
 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\20171106-49975.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 07-Nov-2017 15:39:08 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK021

First Level Reviewer: phomsophat Date: 06-Nov-2017 07:27:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.444	-0.002	1.000	9960387	83.7		4998	
298.90 > 99.00	1.442	1.444	-0.002	1.000	7235967		1.38(0.00-0.00)	13514	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.573	-0.003	1.000	1570629	9.44		8393	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.722	1.725	-0.003	1.000	3517469	17.5		5659	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.725	-0.003	1.000	1229696	8.68		345	
* 6 13C2-PFOA									
415.00 > 370.00	1.904	1.913	-0.009		1512045	10.0		7643	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.904	1.914	-0.010	1.000	2476221	17.7		475	
413.00 > 169.00	1.904	1.914	-0.010	1.000	1327388		1.87(0.00-0.00)	1724	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.140	2.147	-0.007	1.000	2036944	18.1		2323	
499.00 > 99.00	2.140	2.147	-0.007	1.000	389736		5.23(0.00-0.00)	830	
* 7 13C4 PFOS									
503.00 > 80.00	2.140	2.151	-0.011		3433628	28.7		5334	
9 Perfluorononanoic acid									
463.00 > 419.00	2.147	2.158	-0.011	1.000	1956116	19.5		652	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.306	2.312	-0.006	1.000	1117553	9.66		6230	

Reagents:

LC537-ICV_00028

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_013.d

Injection Date: 03-Nov-2017 14:20:03

Instrument ID: A8_N

Lims ID: ICV

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 7

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

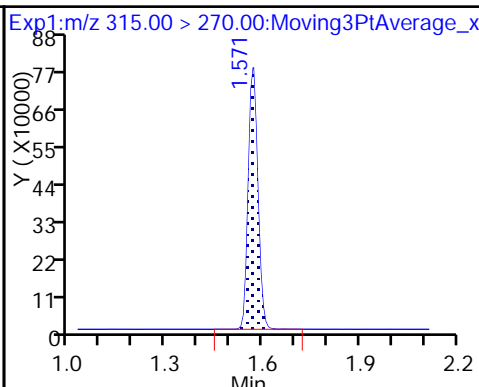
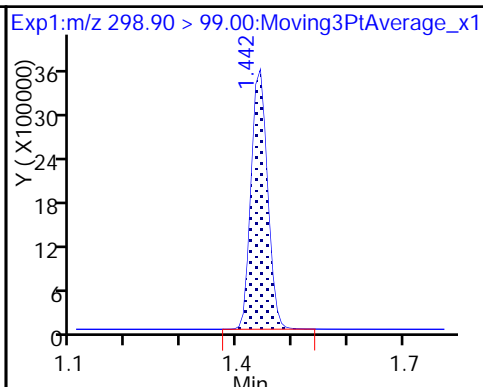
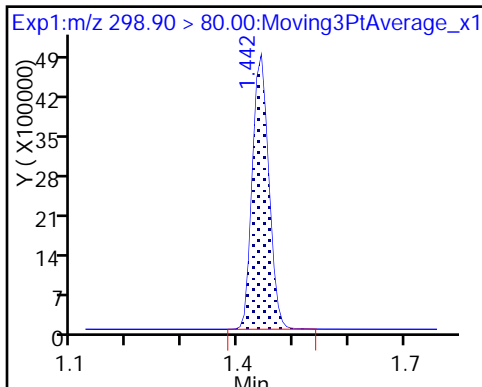
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

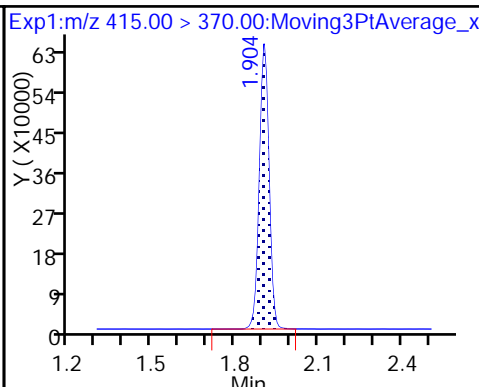
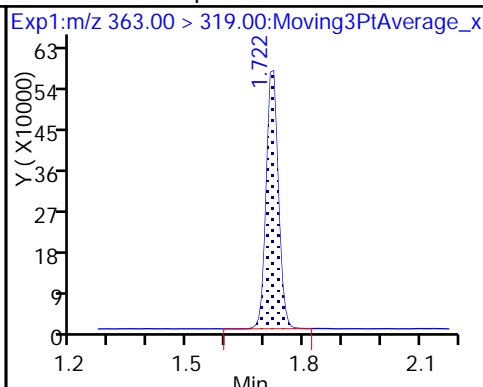
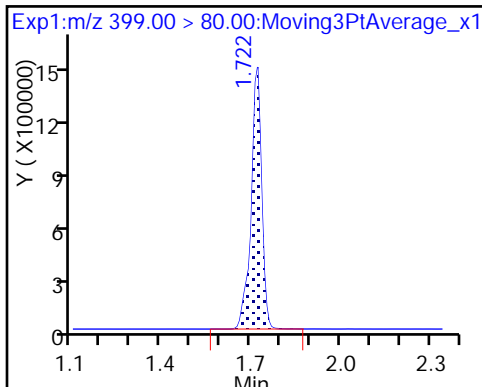
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

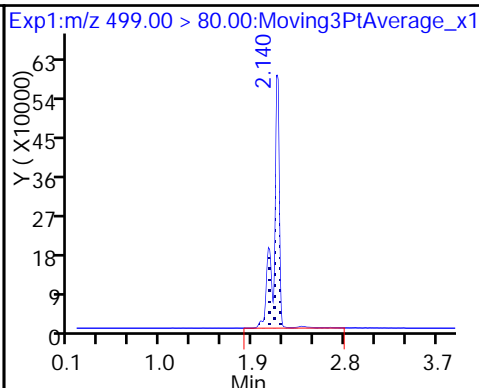
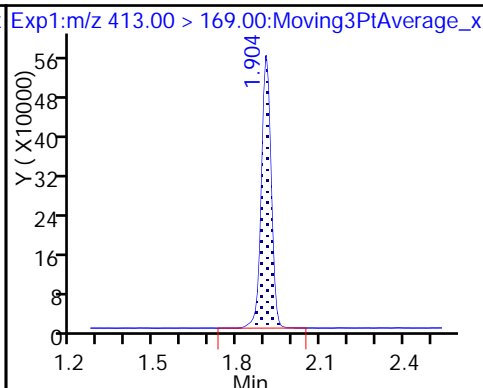
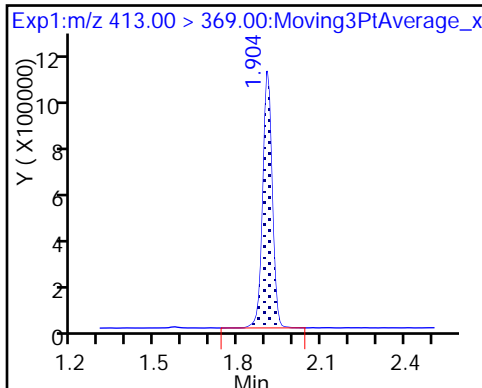
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

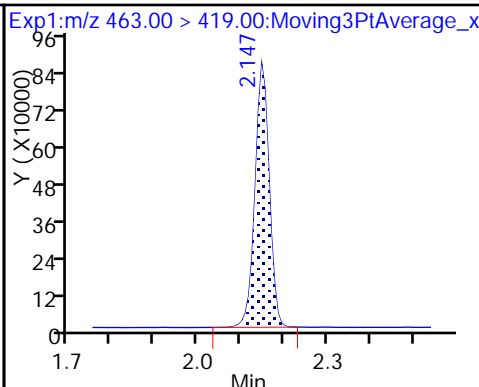
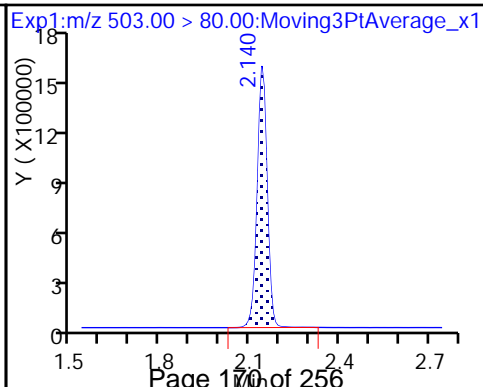
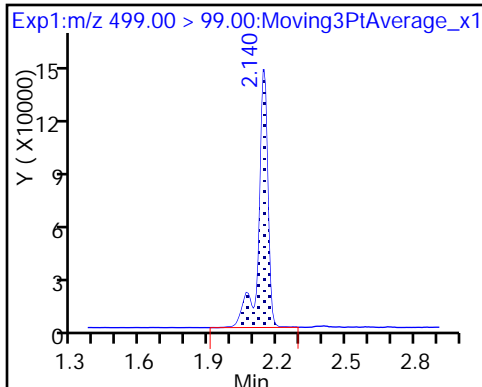
8 Perfluorooctane sulfonic acid



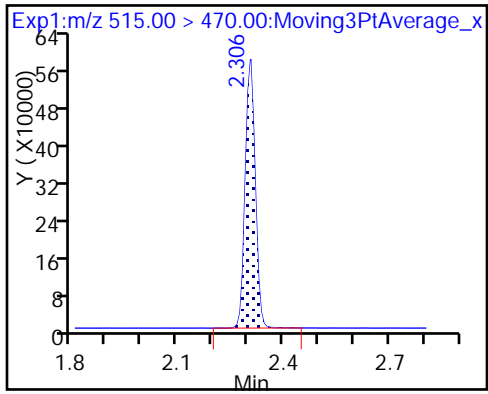
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-200292/1 Calibration Date: 12/18/2017 09:53
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.18_537A_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.225		22.6	20.0	12.9	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.8814		2.09	2.22	-5.9	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.771		7.05	6.67	5.8	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.8987		4.32	4.45	-2.9	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9280		8.79	8.89	-1.2	50.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6110		4.09	4.45	-8.0	50.0
13C2 PFHxA	Ave	1.100	1.093		9.93	10.0	-0.7	30.0
13C2 PFDA	Ave	0.7652	0.7211		9.42	10.0	-5.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171218-51859.b\2017.12.18_537A_004.d
 Lims ID: CCVL
 Client ID:
 Sample Type: CCVL
 Inject. Date: 18-Dec-2017 09:53:44 ALS Bottle#: 2 Worklist Smp#: 1
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCVL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171218-51859.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 18-Dec-2017 10:46:47 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d

Column 1 : Det: EXP1
 Process Host: XAWRK048

First Level Reviewer: hannigana Date: 18-Dec-2017 10:44:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.373	1.444	-0.071	1.000	2729426	22.6		8493	
298.90 > 99.00	1.373	1.444	-0.071	1.000	1995107		1.37(0.00-0.00)	5994	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.495	1.573	-0.078	1.000	1752451	9.93		9446	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.646	1.725	-0.079	1.000	1315510	7.05		5027	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.646	1.725	-0.079	1.000	314078	2.09		133	
* 6 13C2-PFOA									
415.00 > 370.00	1.851	1.913	-0.062		1603154	10.0		7883	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.851	1.914	-0.063	1.000	640876	4.32		222	
413.00 > 169.00	1.851	1.914	-0.063	1.000	363928		1.76(0.00-0.00)	1015	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.117	2.064	0.053	1.000	919133	8.79		1023	M
499.00 > 99.00	2.117	2.064	0.053	1.000	192468		4.78(0.00-0.00)	898	M
* 7 13C4 PFOS									
503.00 > 80.00	2.117	2.151	-0.034		3194742	28.7		10833	
9 Perfluorononanoic acid									
463.00 > 419.00	2.124	2.158	-0.034	1.000	435412	4.09		194	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.276	2.312	-0.036	1.000	1156005	9.42		8096	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00020

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171218-51859.b\2017.12.18_537A_004.d

Injection Date: 18-Dec-2017 09:53:44

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

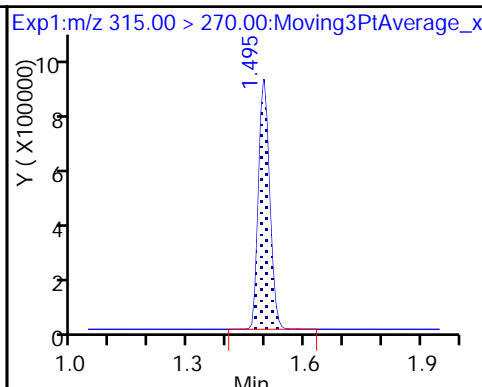
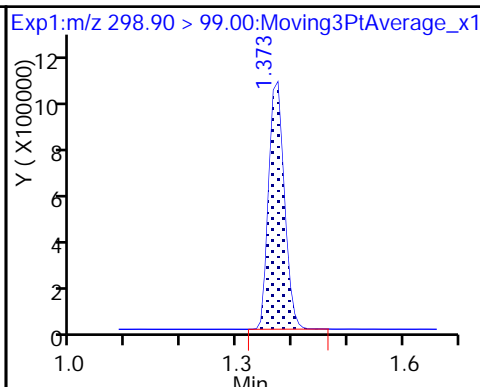
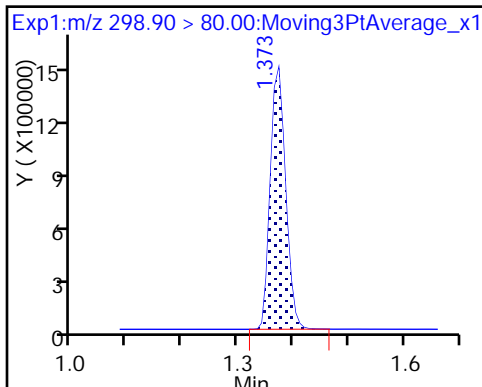
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

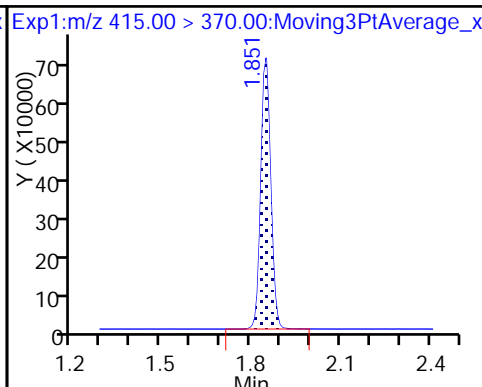
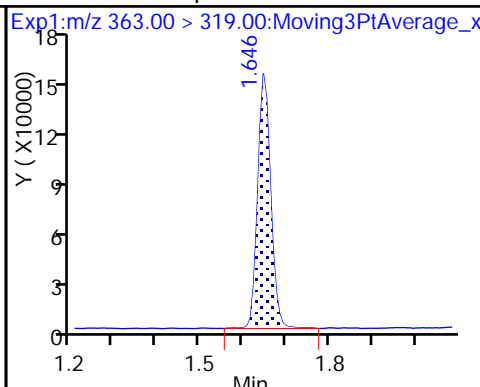
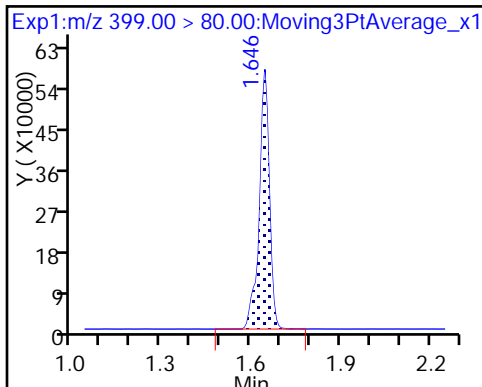
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

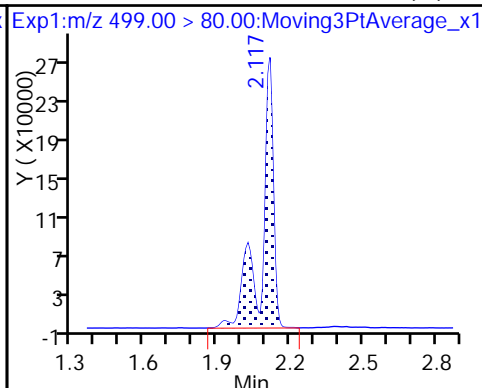
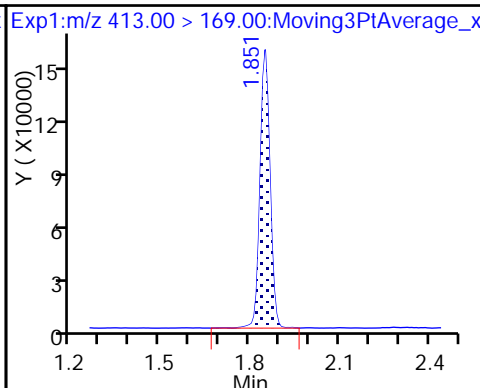
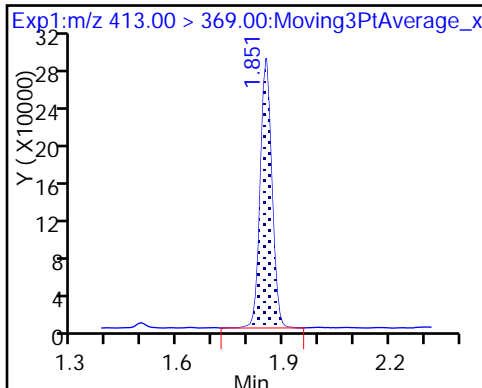
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

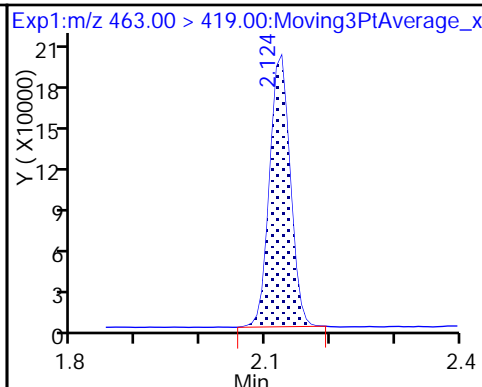
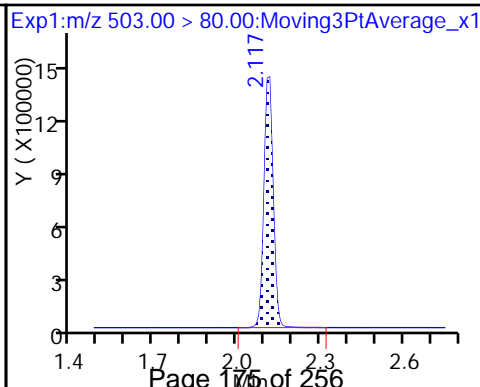
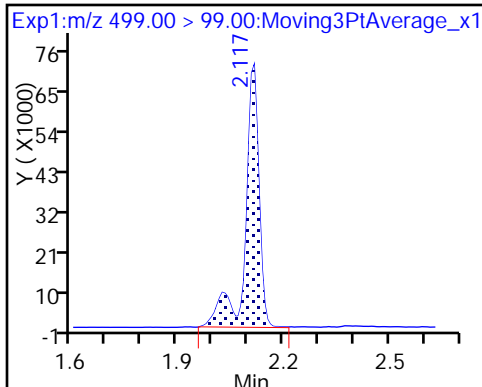
8 Perfluorooctane sulfonic acid (M)



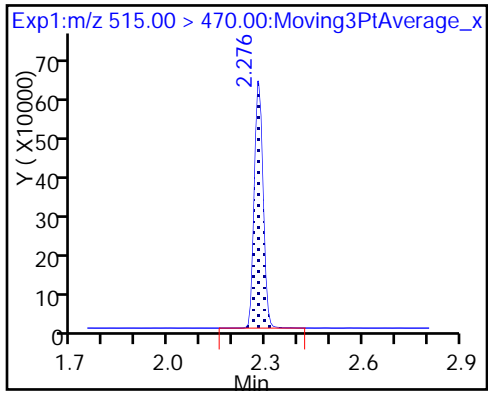
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

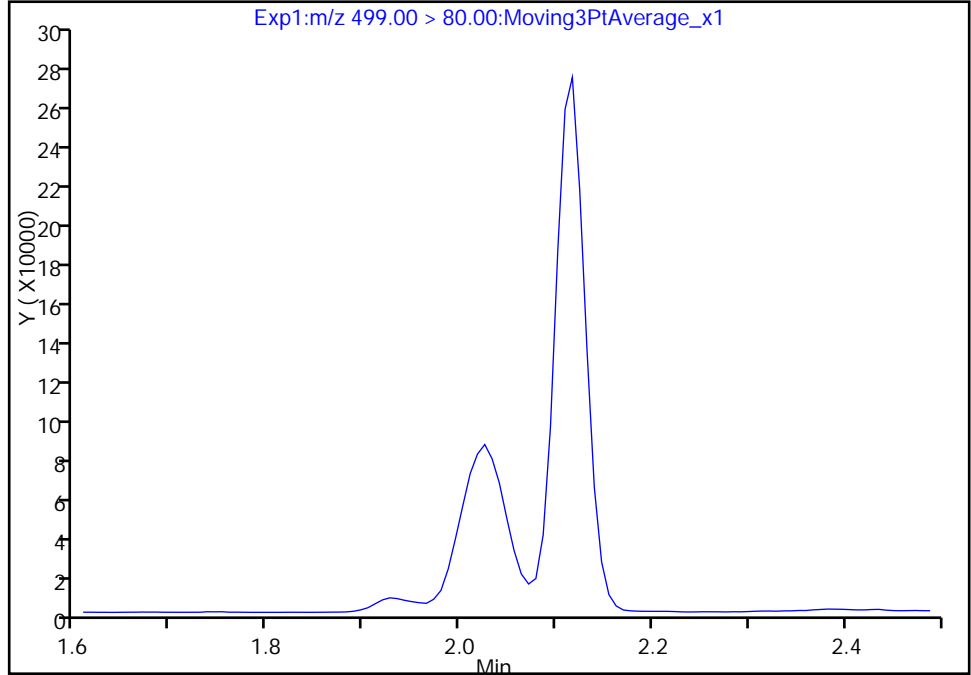
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171218-51859.b\2017.12.18_537A_004.d
Injection Date: 18-Dec-2017 09:53:44 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

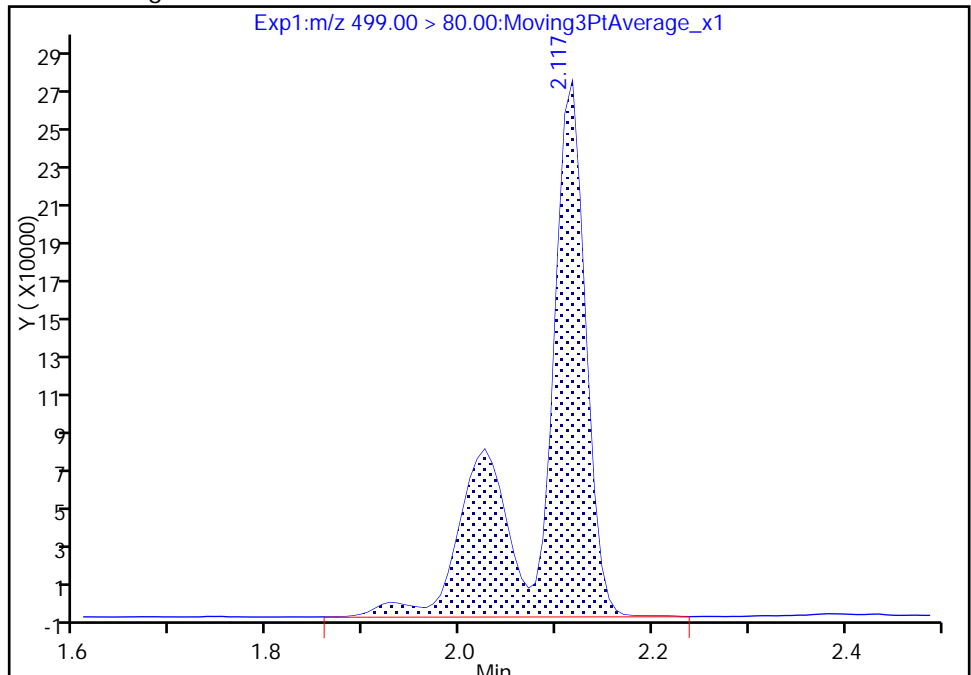
Not Detected
Expected RT: 2.06

Processing Integration Results



RT: 2.12
Area: 919133
Amount: 8.787794
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 18-Dec-2017 10:44:27
Audit Action: Manually Integrated

TestAmerica Sacramento

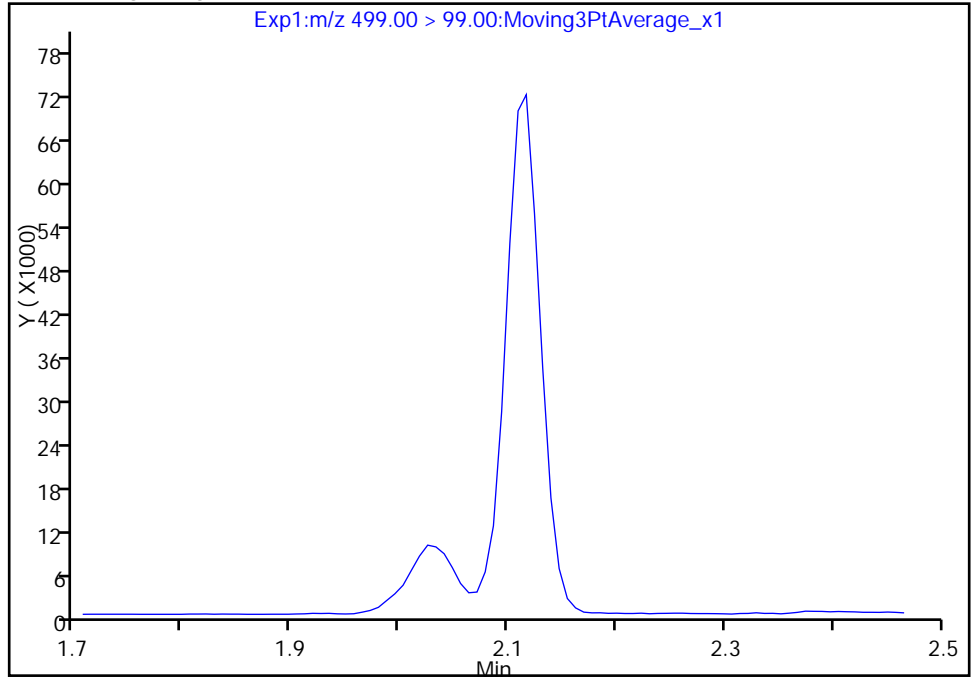
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Injection Date: 18-Dec-2017 09:53:44 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

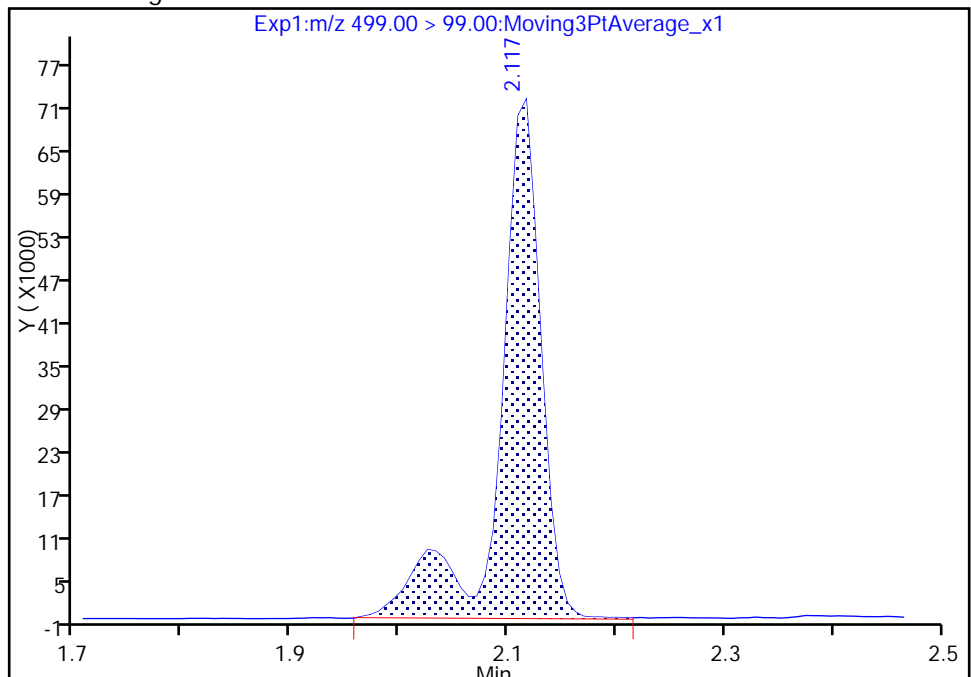
Not Detected
Expected RT: 2.06

Processing Integration Results



RT: 2.12
Area: 192468
Amount: 8.787794
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 18-Dec-2017 10:44:30

Audit Action: Manually Integrated

Audit Reason: Assign Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Lab Sample ID: CCV 320-200646/1 Calibration Date: 12/19/2017 20:31
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.19_537A_050.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.9623		144	135	6.4	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9524		15.3	15.0	1.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.793		48.2	45.0	7.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.8880		28.8	30.0	-4.1	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9364		59.9	60.0	-0.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6144		27.8	30.0	-7.5	30.0
13C2 PFHxA	Ave	1.100	1.132		10.3	10.0	2.9	30.0
13C2 PFDA	Ave	0.7652	0.7335		9.58	10.0	-4.2	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_050.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 19-Dec-2017 20:31:10 ALS Bottle#: 5 Worklist Smp#: 1
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:18:37

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.366	1.444	-0.078	1.000	14027603	143.7		17136	
298.90 > 99.00	1.358	1.444	-0.086	0.994	10960418		1.28(0.00-0.00)	16736	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.479	1.573	-0.094	1.000	1693100	10.3		11030	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.725	-0.101	1.000	8711333	48.2		11704	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.725	-0.101	1.000	2137582	15.3		804	
* 6 13C2-PFOA									
415.00 > 370.00	1.806	1.913	-0.107		1495978	10.0		7107	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.806	1.914	-0.108	1.000	3988613	28.8		786	
413.00 > 169.00	1.806	1.914	-0.108	1.000	2182453		1.83(0.00-0.00)	6364	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.064	2.071	-0.007	1.000	6067740	59.9		1245	M
499.00 > 99.00	2.064	2.071	-0.007	1.000	1264920		4.80(0.00-0.00)	1511	M
* 7 13C4 PFOS									
503.00 > 80.00	2.064	2.151	-0.087		3096651	28.7		10382	
9 Perfluorononanoic acid									
463.00 > 419.00	2.071	2.158	-0.087	1.000	2757981	27.8		916	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.246	2.312	-0.066	1.000	1097220	9.58		8074	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L5_00024

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_050.d

Injection Date: 19-Dec-2017 20:31:10

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

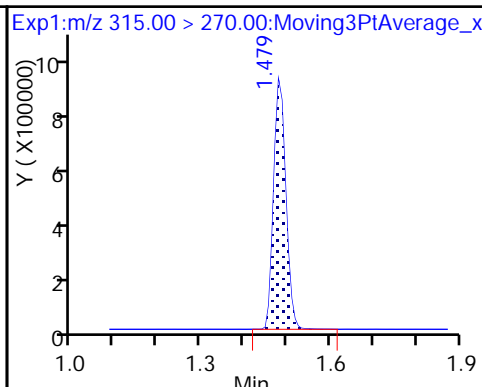
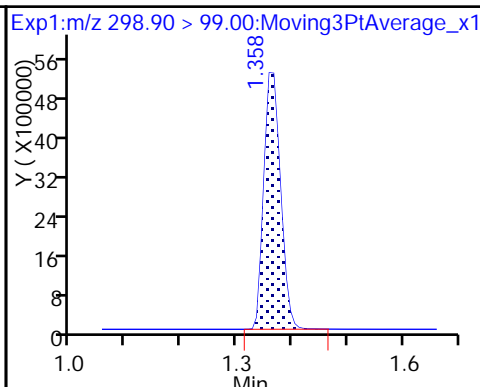
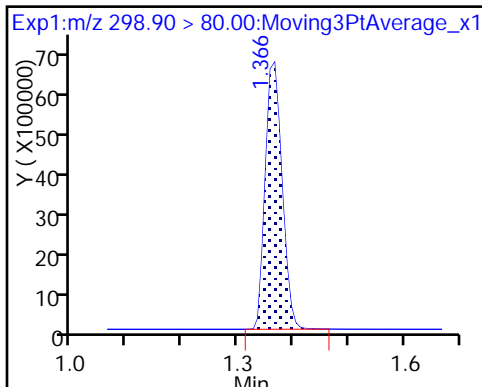
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

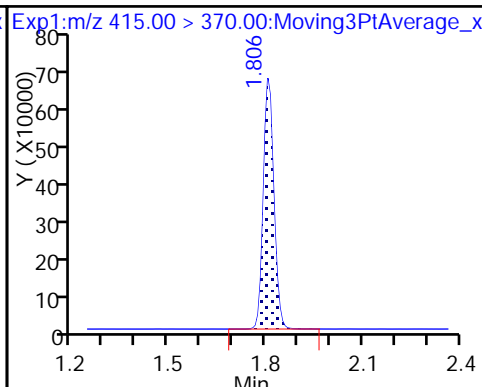
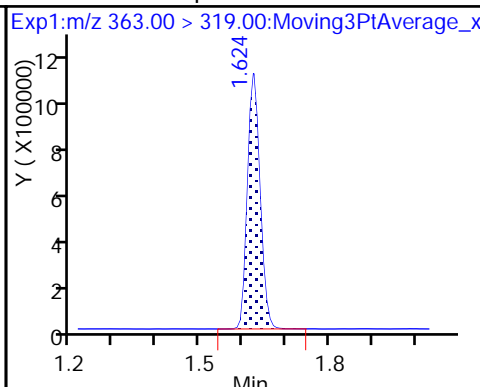
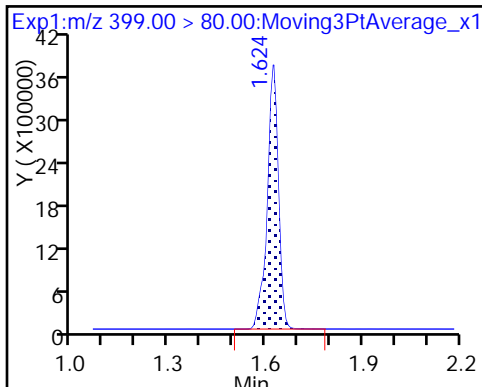
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

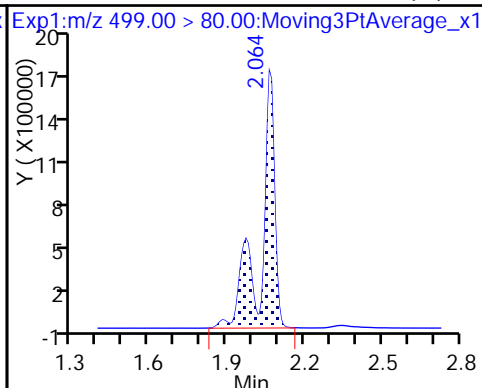
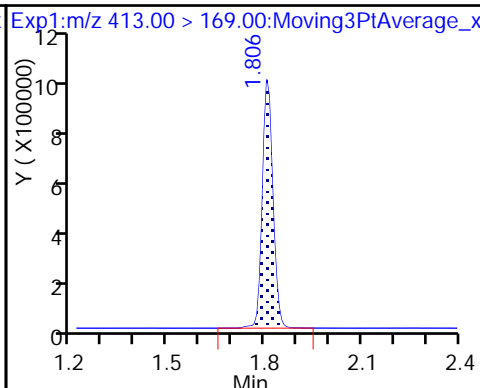
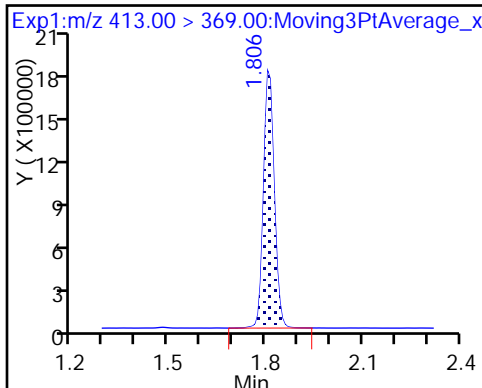
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

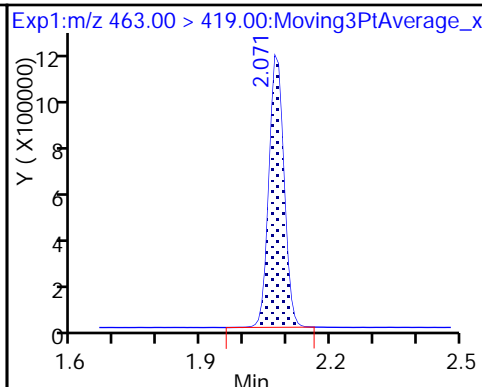
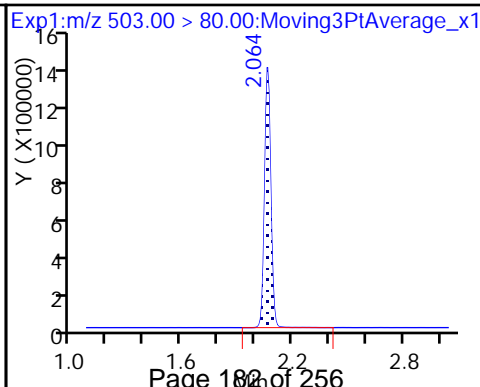
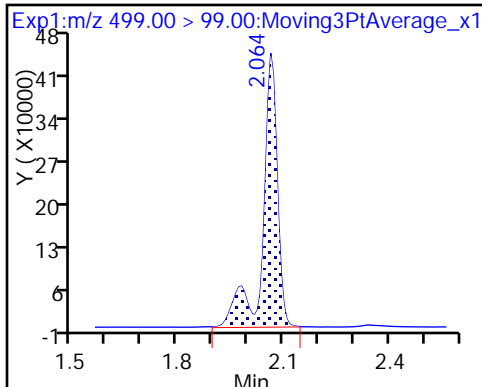
8 Perfluorooctane sulfonic acid (M)



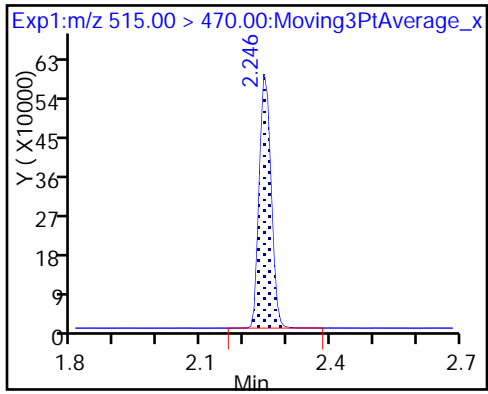
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

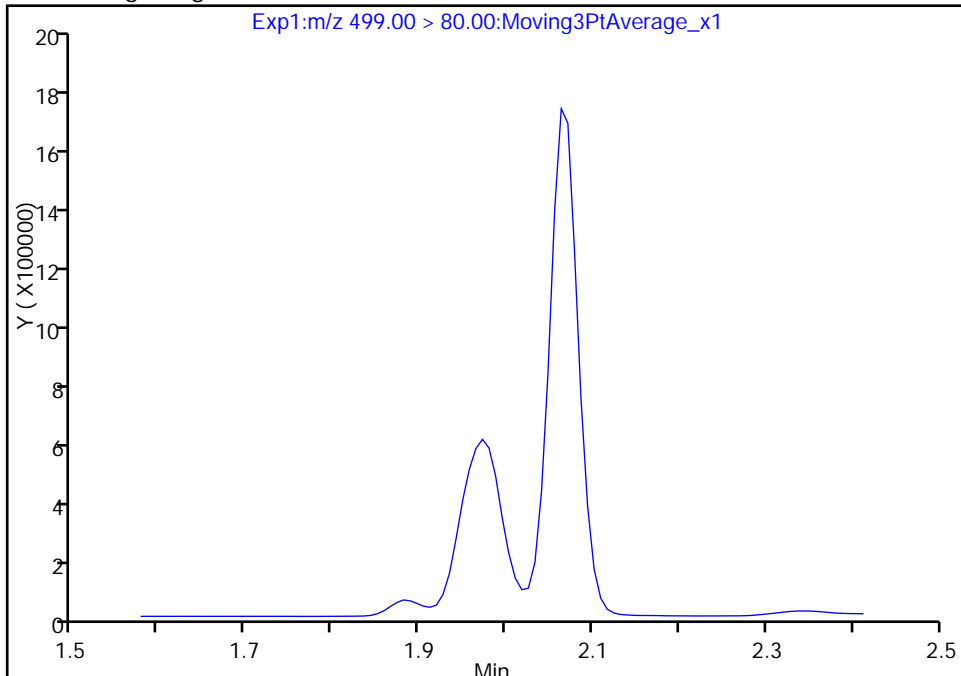
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_050.d
Injection Date: 19-Dec-2017 20:31:10 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

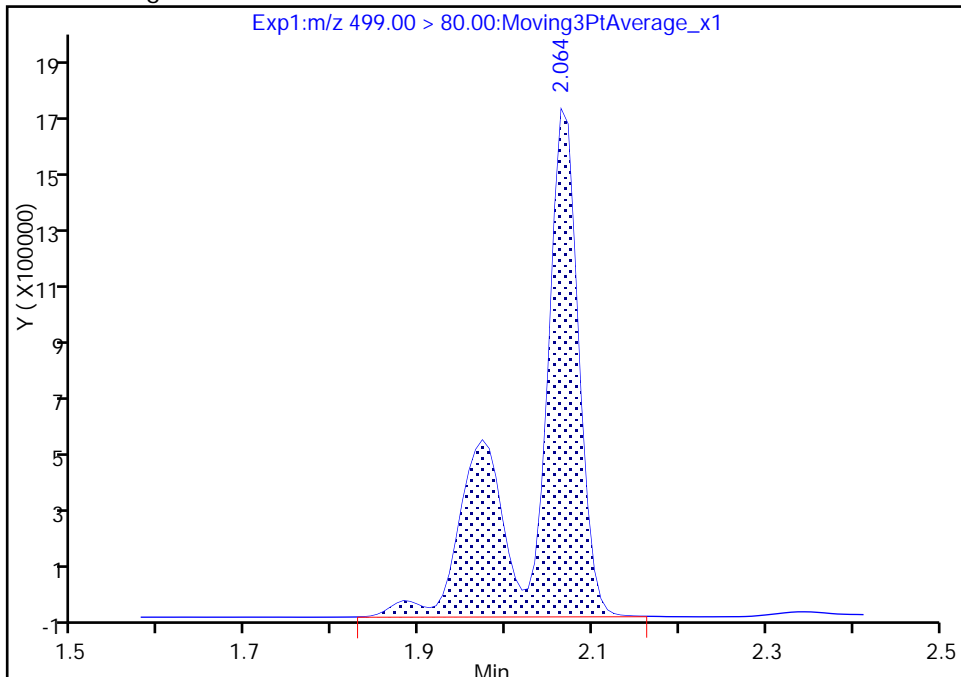
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 6067740
Amount: 59.851079
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:18:06
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

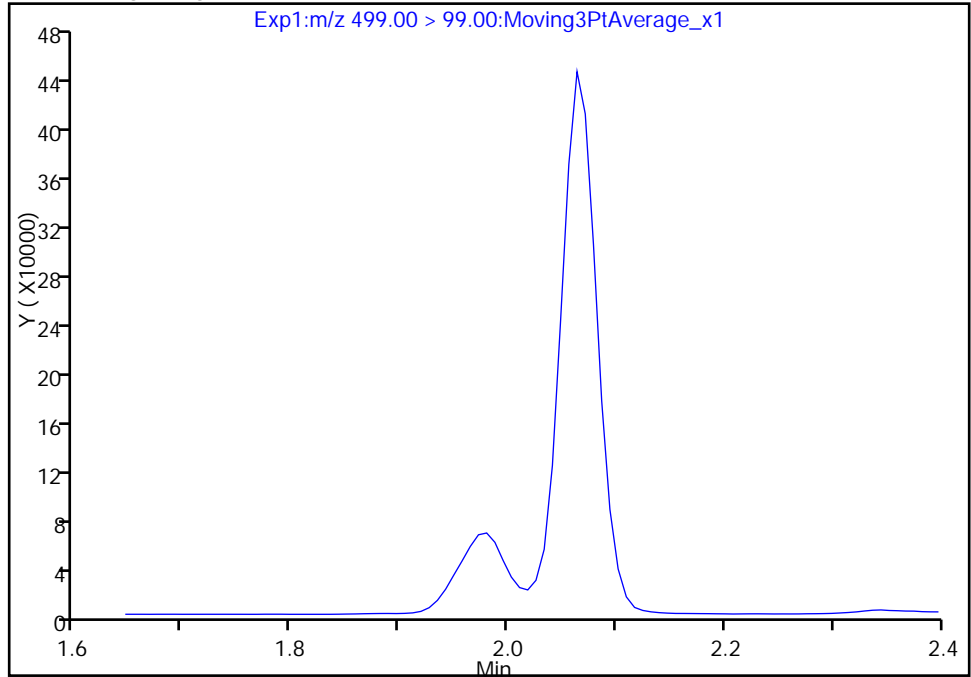
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_050.d
Injection Date: 19-Dec-2017 20:31:10 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

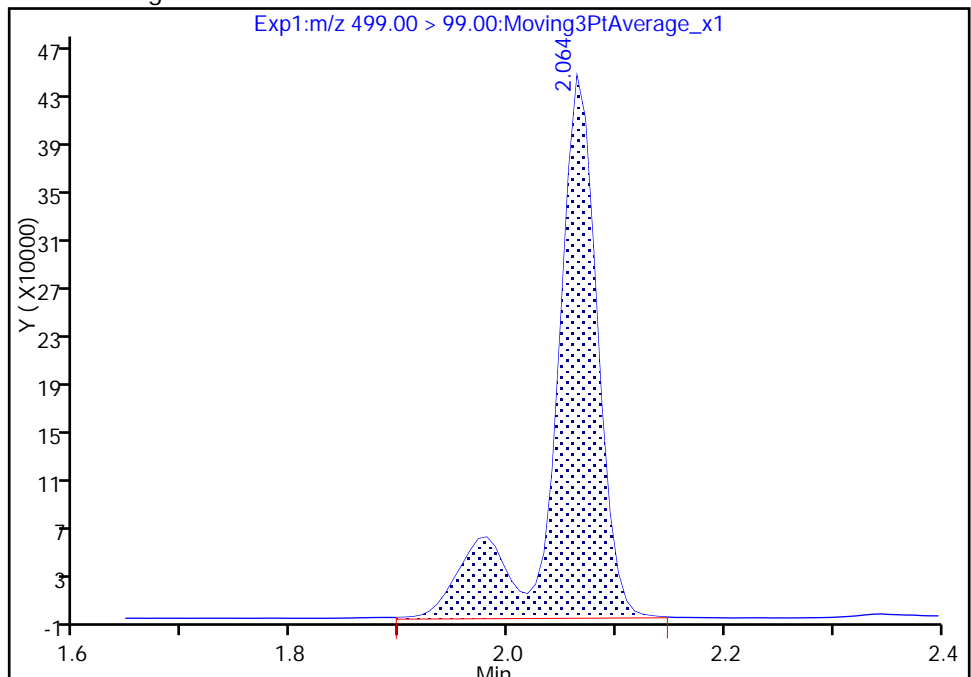
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 1264920
Amount: 59.851079
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:18:28

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

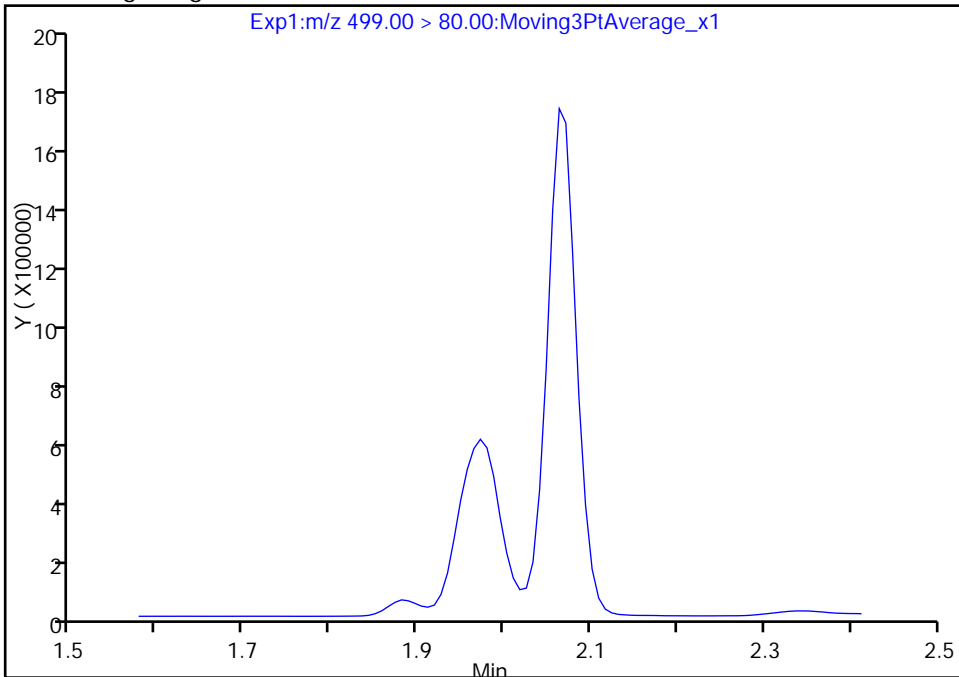
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_050.d
Injection Date: 19-Dec-2017 20:31:10 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

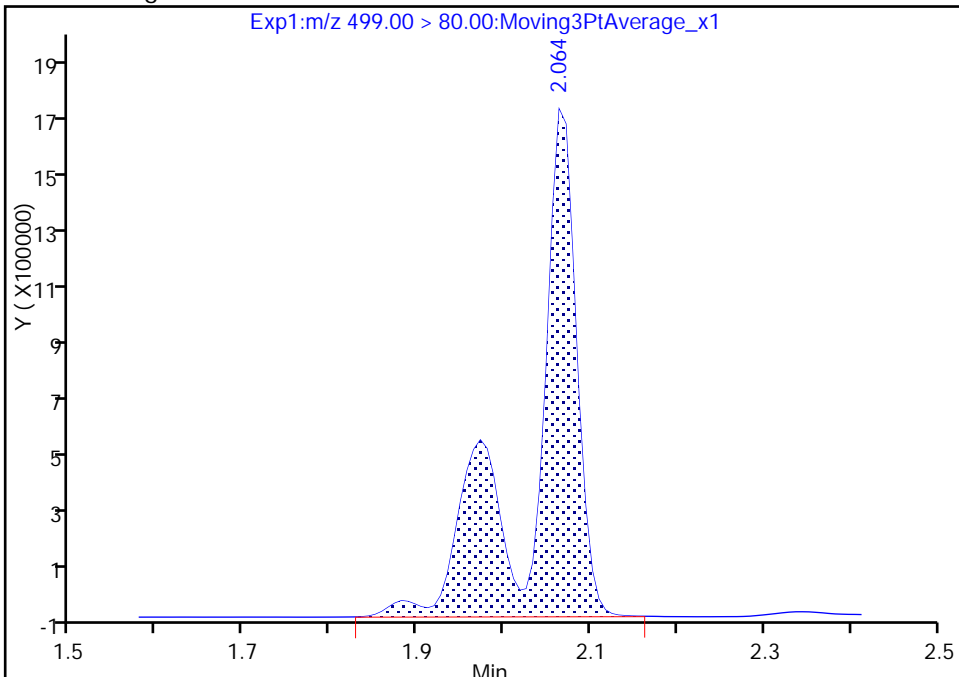
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 6067740
Amount: 59.851079
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:18:28

Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Lab Sample ID: CCV 320-200646/13 Calibration Date: 12/19/2017 21:27
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.19_537A_062.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.111		47.7	45.0	6.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9480		5.06	5.00	1.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.748		15.7	15.0	4.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.8955		9.68	10.0	-3.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9133		19.5	20.0	-2.7	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6453		9.72	10.0	-2.8	30.0
13C2 PFHxA	Ave	1.100	1.148		10.4	10.0	4.3	30.0
13C2 PFDA	Ave	0.7652	0.7191		9.40	10.0	-6.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Lab Sample ID: CCV 320-200767/13 Calibration Date: 12/19/2017 21:27
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.19_537A_062.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.111		47.7	45.0	6.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9480		5.06	5.00	1.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.748		15.7	15.0	4.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.8955		9.68	10.0	-3.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9133		19.5	20.0	-2.7	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6453		9.72	10.0	-2.8	30.0
13C2 PFHxA	Ave	1.100	1.148		10.4	10.0	4.3	30.0
13C2 PFDA	Ave	0.7652	0.7191		9.40	10.0	-6.0	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_062.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 19-Dec-2017 21:27:18 ALS Bottle#: 3 Worklist Smp#: 13
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L3
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:31 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:19:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.366	1.444	-0.078	1.000	5511171	47.7		11759	
298.90 > 99.00	1.366	1.444	-0.078	1.000	4129321		1.33(0.00-0.00)	10392	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.479	1.573	-0.094	1.000	1710730	10.4		11594	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.725	-0.101	1.000	2892254	15.7		5179	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.725	-0.101	1.000	706631	5.06		274	
* 6 13C2-PFOA									
415.00 > 370.00	1.806	1.913	-0.107		1490421	10.0		8643	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.806	1.914	-0.108	1.000	1335746	9.68		266	
413.00 > 169.00	1.806	1.914	-0.108	1.000	728951		1.83(0.00-0.00)	2721	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.064	2.071	-0.007	1.000	2014489	19.5		406	M
499.00 > 99.00	2.064	2.071	-0.007	1.000	418104		4.82(0.00-0.00)	480	M
* 7 13C4 PFOS									
503.00 > 80.00	2.064	2.151	-0.087		3162377	28.7		8557	
9 Perfluorononanoic acid									
463.00 > 419.00	2.071	2.158	-0.087	1.000	961975	9.72		312	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.246	2.312	-0.066	1.000	1071804	9.40		8243	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00023

Amount Added: 1.00

Units: mL

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_062.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 19-Dec-2017 21:27:18 ALS Bottle#: 3 Worklist Smp#: 13
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L3
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:31 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:19:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.366	1.444	-0.078	1.000	5511171	47.7		11759	
298.90 > 99.00	1.366	1.444	-0.078	1.000	4129321		1.33(0.00-0.00)	10392	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.479	1.573	-0.094	1.000	1710730	10.4		11594	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.725	-0.101	1.000	2892254	15.7		5179	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.725	-0.101	1.000	706631	5.06		274	
* 6 13C2-PFOA									
415.00 > 370.00	1.806	1.913	-0.107		1490421	10.0		8643	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.806	1.914	-0.108	1.000	1335746	9.68		266	
413.00 > 169.00	1.806	1.914	-0.108	1.000	728951		1.83(0.00-0.00)	2721	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.064	2.071	-0.007	1.000	2014489	19.5		406	M
499.00 > 99.00	2.064	2.071	-0.007	1.000	418104		4.82(0.00-0.00)	480	M
* 7 13C4 PFOS									
503.00 > 80.00	2.064	2.151	-0.087		3162377	28.7		8557	
9 Perfluorononanoic acid									
463.00 > 419.00	2.071	2.158	-0.087	1.000	961975	9.72		312	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.246	2.312	-0.066	1.000	1071804	9.40		8243	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00023

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_062.d

Injection Date: 19-Dec-2017 21:27:18

Instrument ID: A8_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

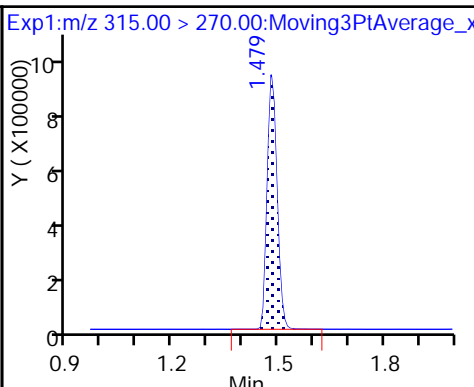
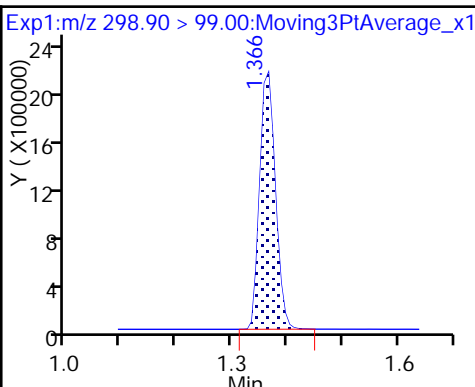
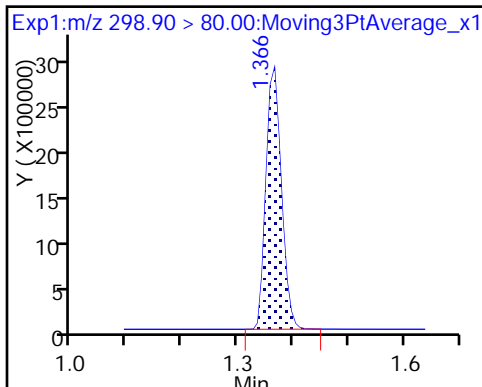
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

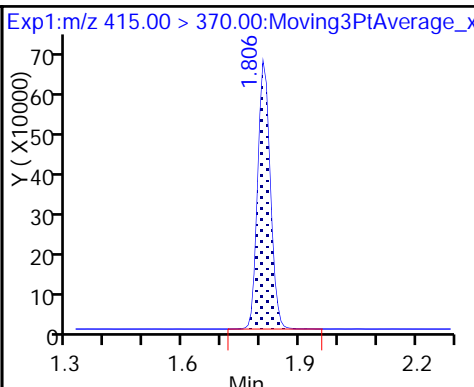
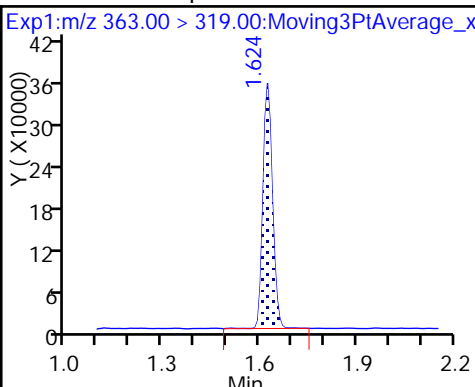
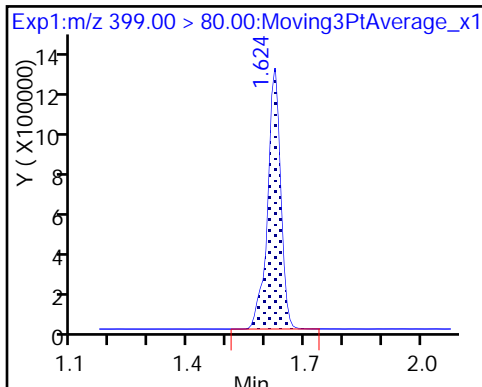
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

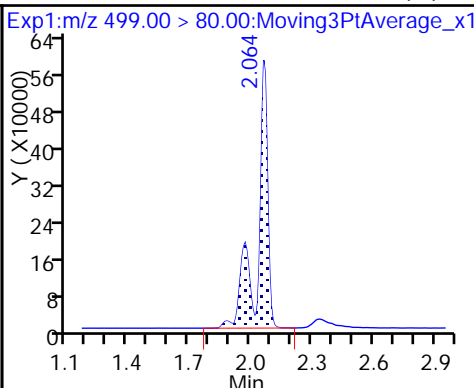
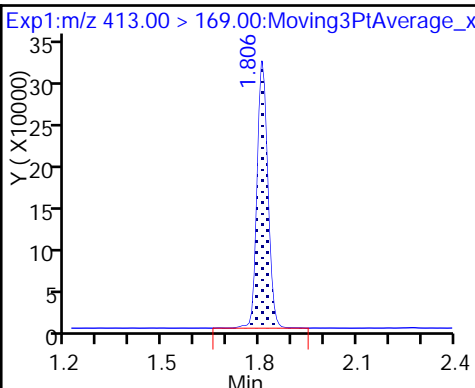
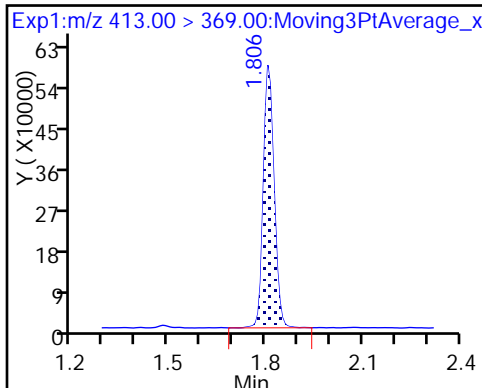
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

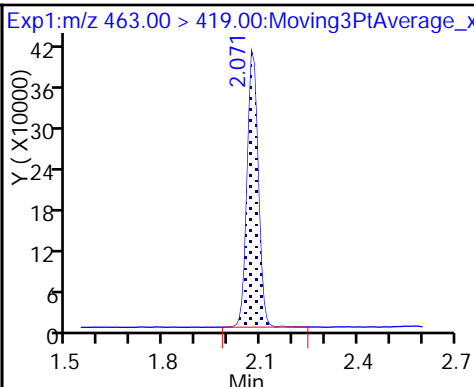
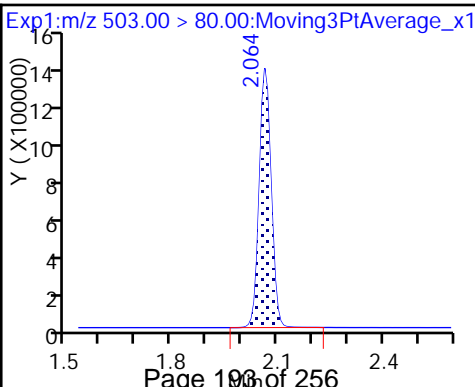
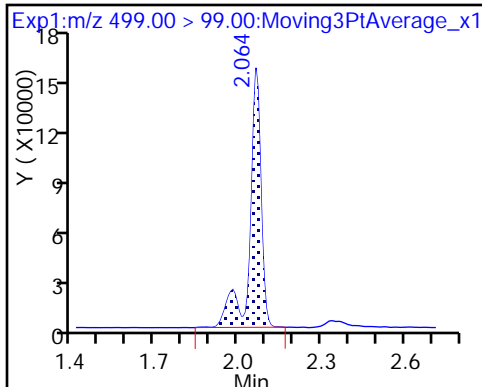
8 Perfluorooctane sulfonic acid (M)



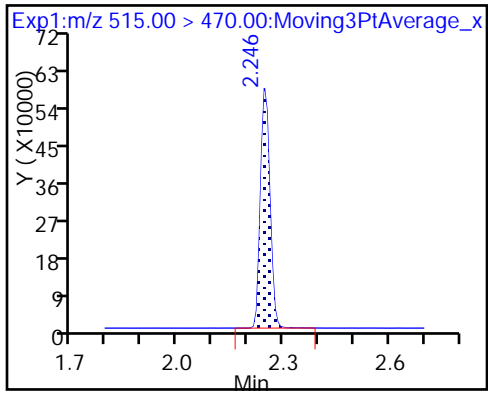
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_062.d

Injection Date: 19-Dec-2017 21:27:18

Instrument ID: A8_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

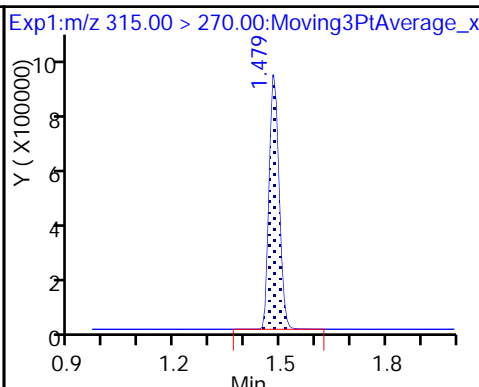
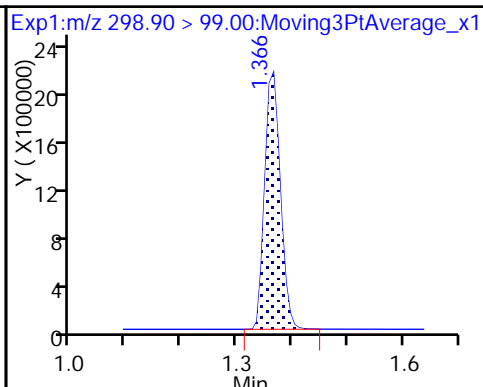
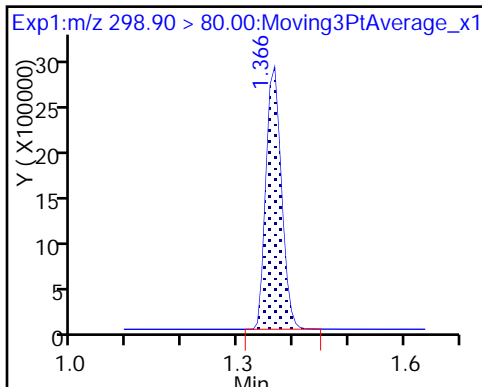
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

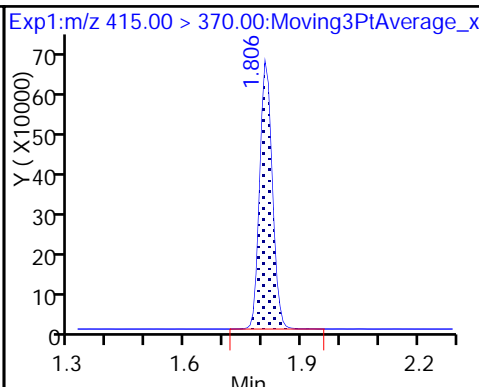
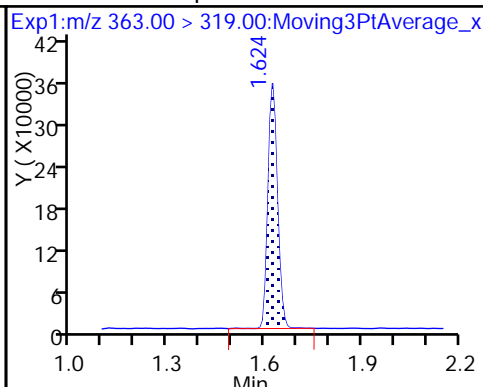
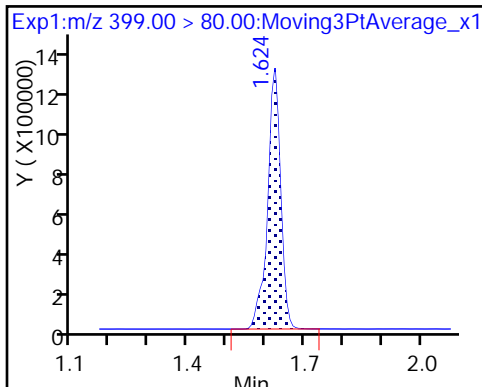
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

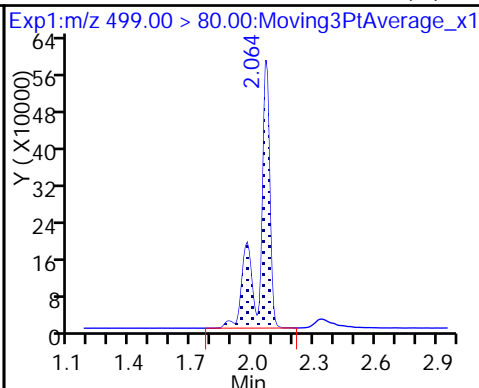
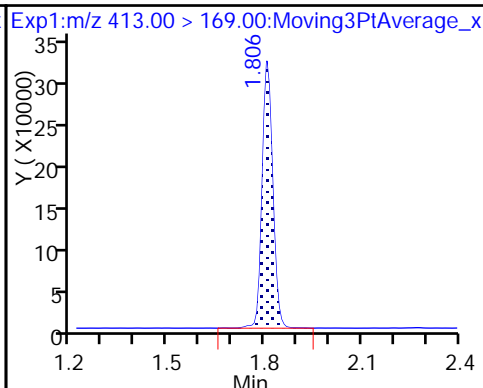
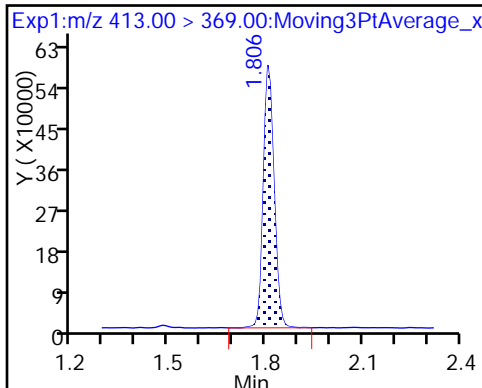
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

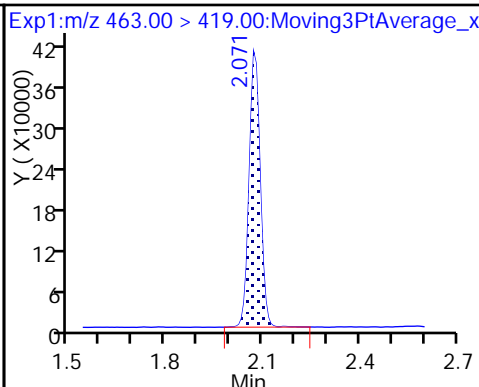
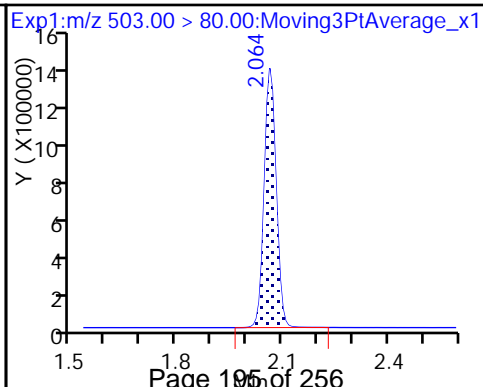
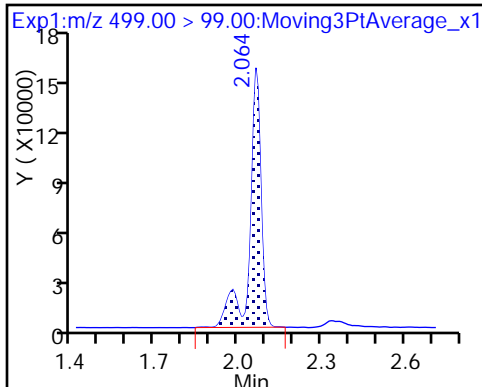
8 Perfluorooctane sulfonic acid (M)



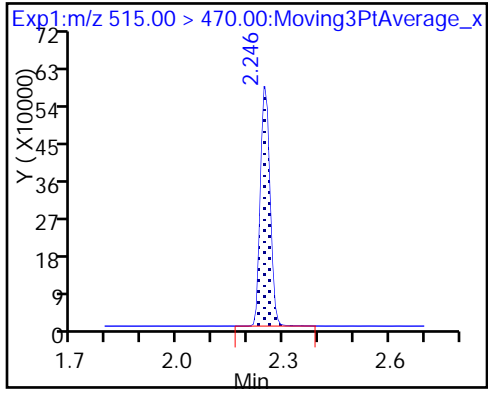
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

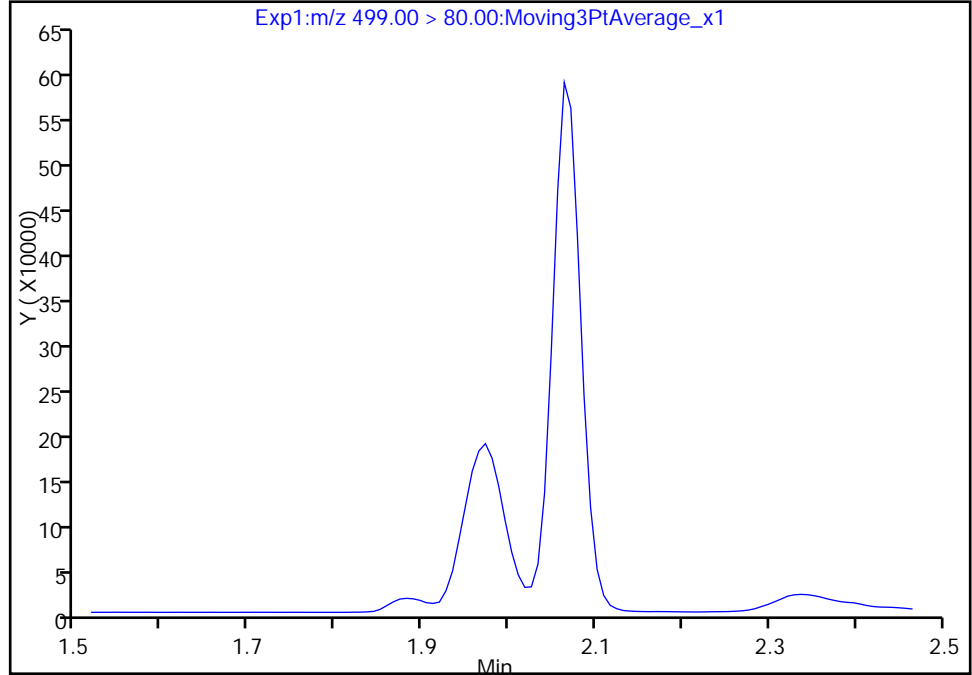
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_062.d
Injection Date: 19-Dec-2017 21:27:18 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

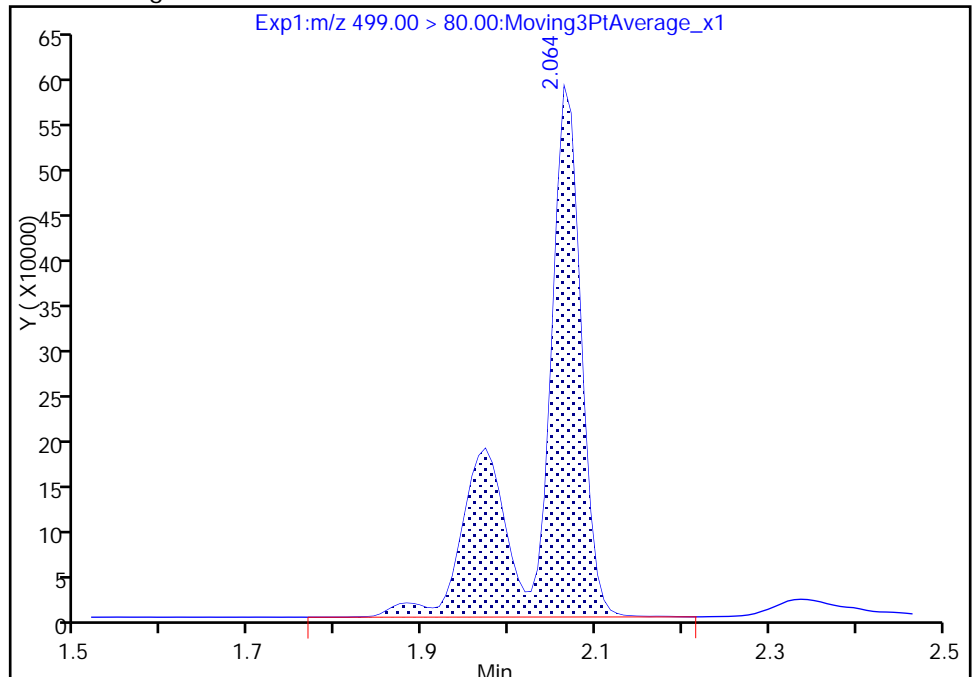
Not Detected
Expected RT: 2.07

Processing Integration Results



RT: 2.06
Area: 2014489
Amount: 19.457567
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 20-Dec-2017 14:18:44
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

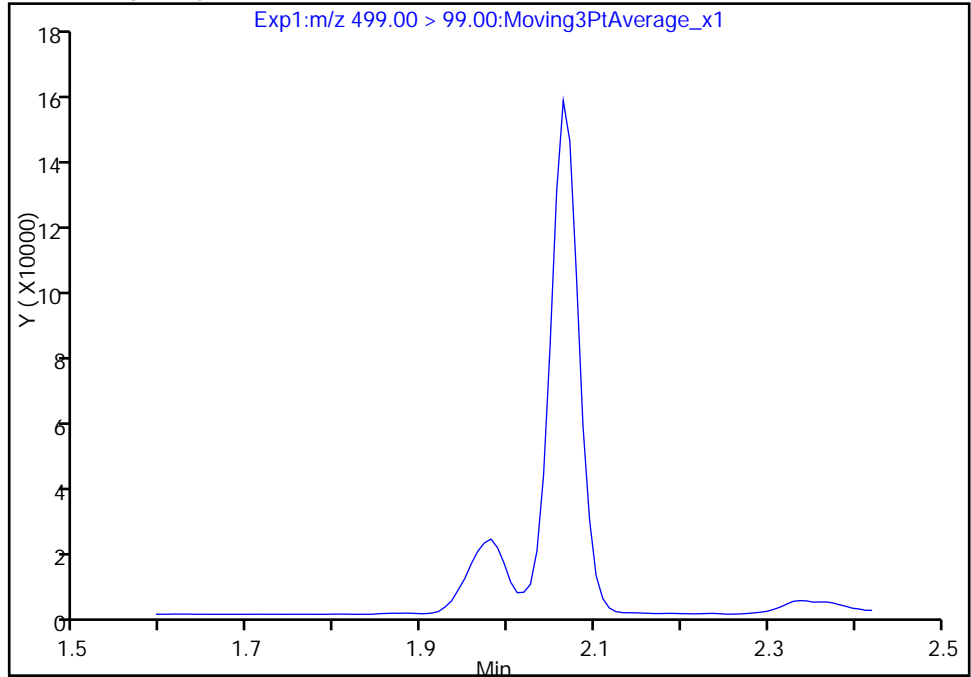
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Injection Date: 19-Dec-2017 21:27:18 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

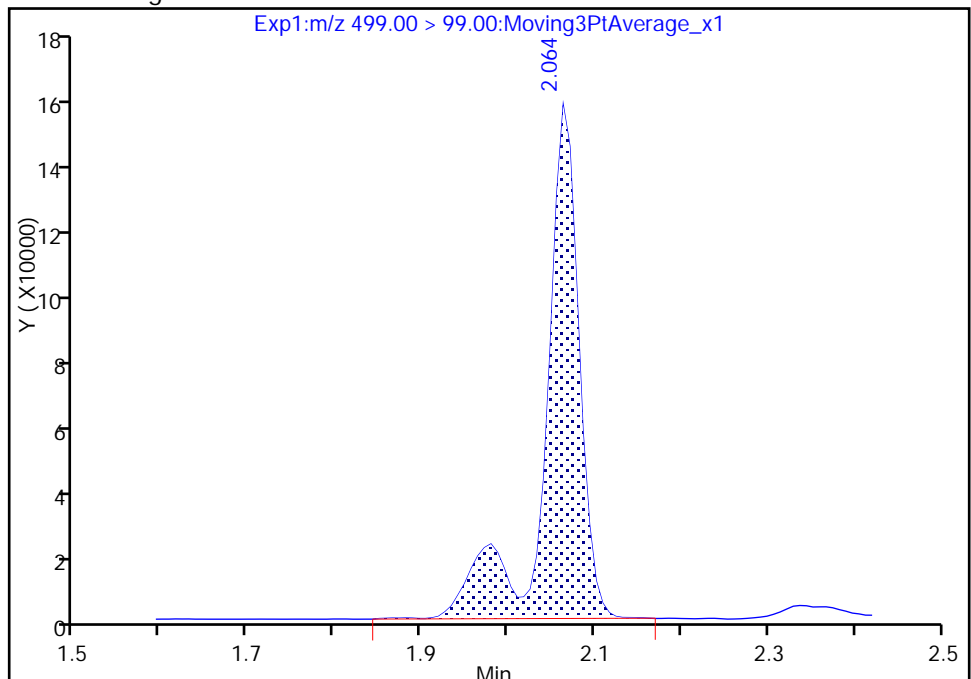
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 418104
Amount: 19.457567
Amount Units: ng/ml



TestAmerica Sacramento

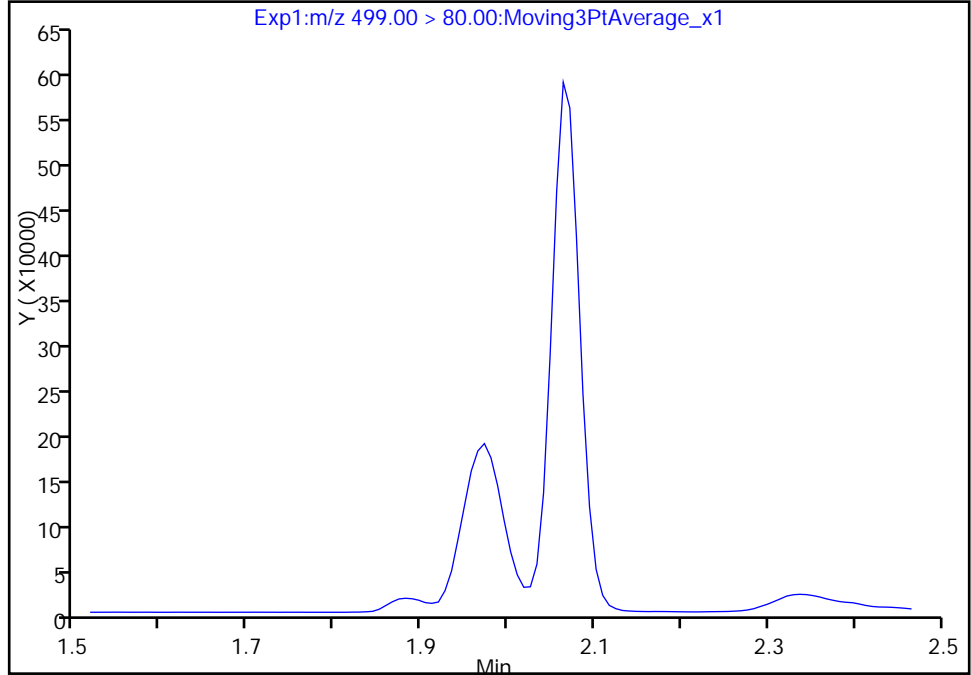
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_062.d
Injection Date: 19-Dec-2017 21:27:18 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

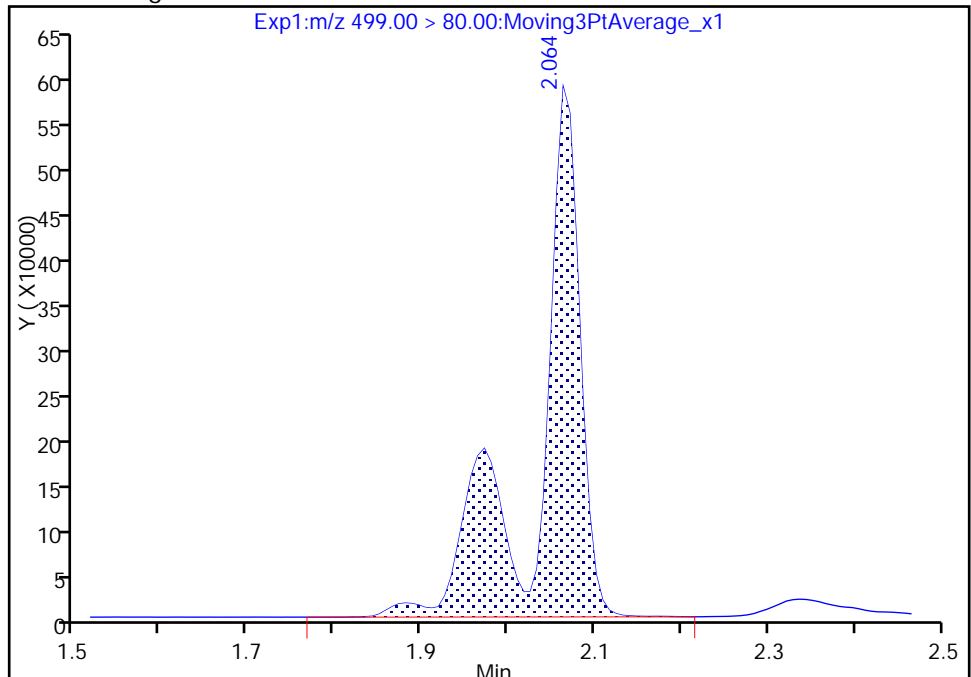
Not Detected
Expected RT: 2.07

Processing Integration Results



RT: 2.06
Area: 2014489
Amount: 19.457567
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 20-Dec-2017 14:19:02

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

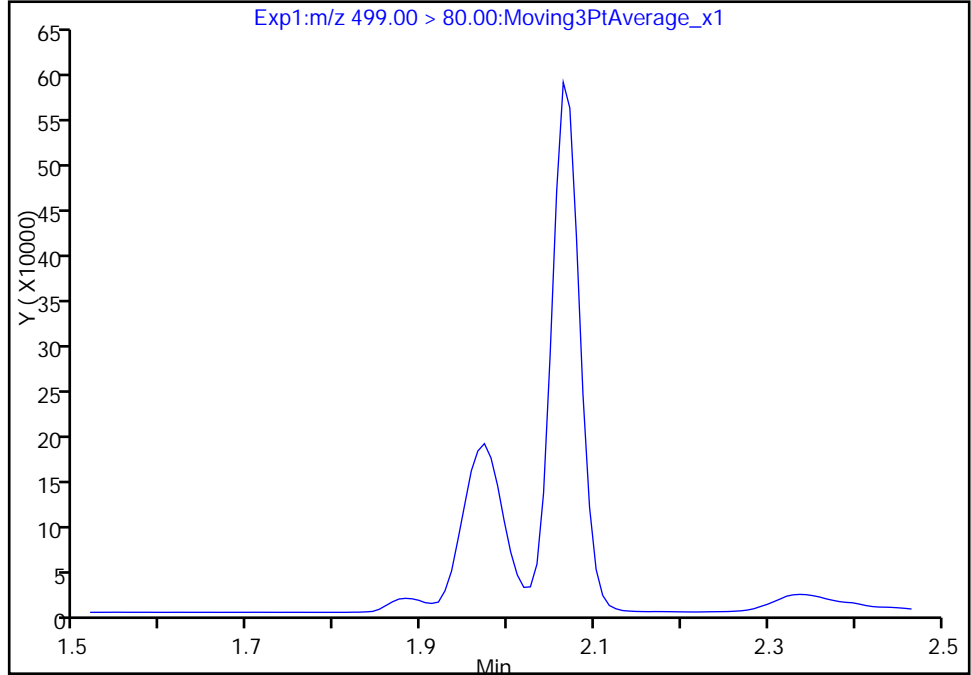
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_062.d
Injection Date: 19-Dec-2017 21:27:18 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

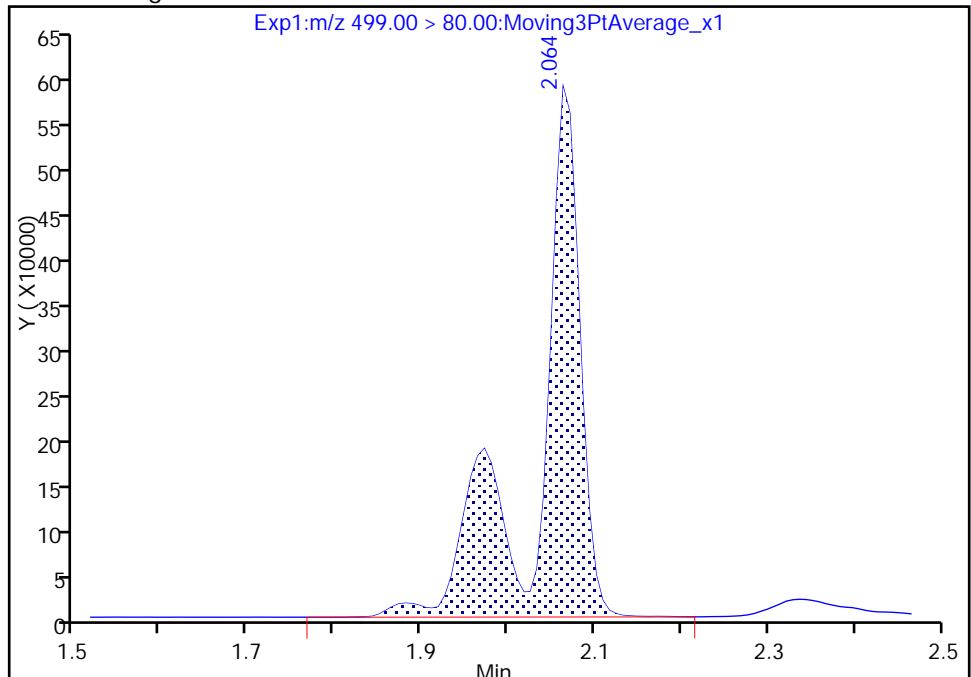
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 2014489
Amount: 19.457567
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:18:44
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

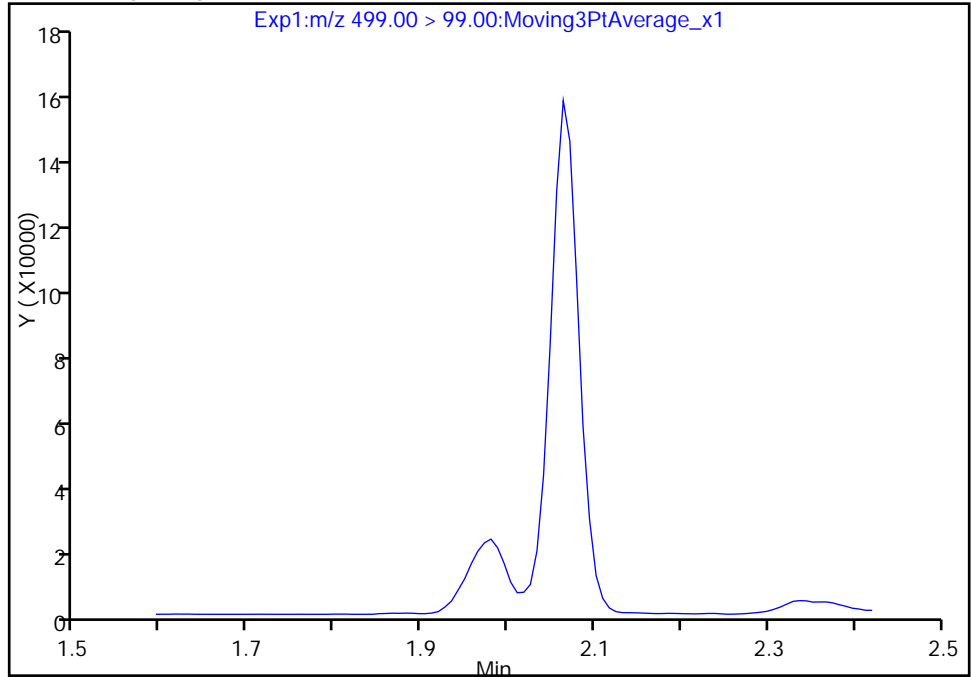
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_062.d
Injection Date: 19-Dec-2017 21:27:18 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

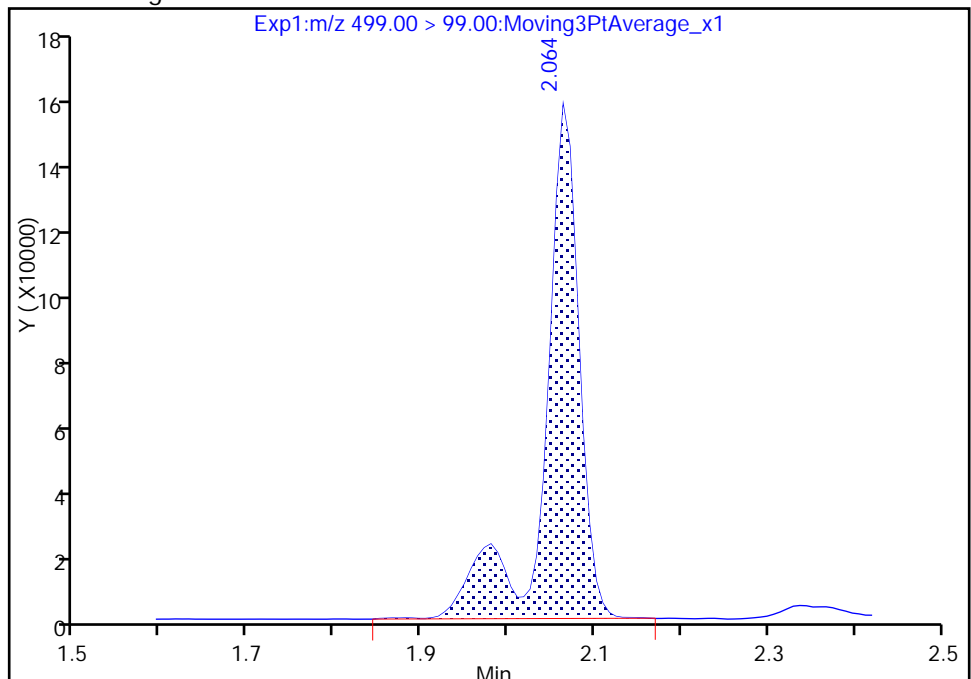
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 418104
Amount: 19.457567
Amount Units: ng/ml



TestAmerica Sacramento

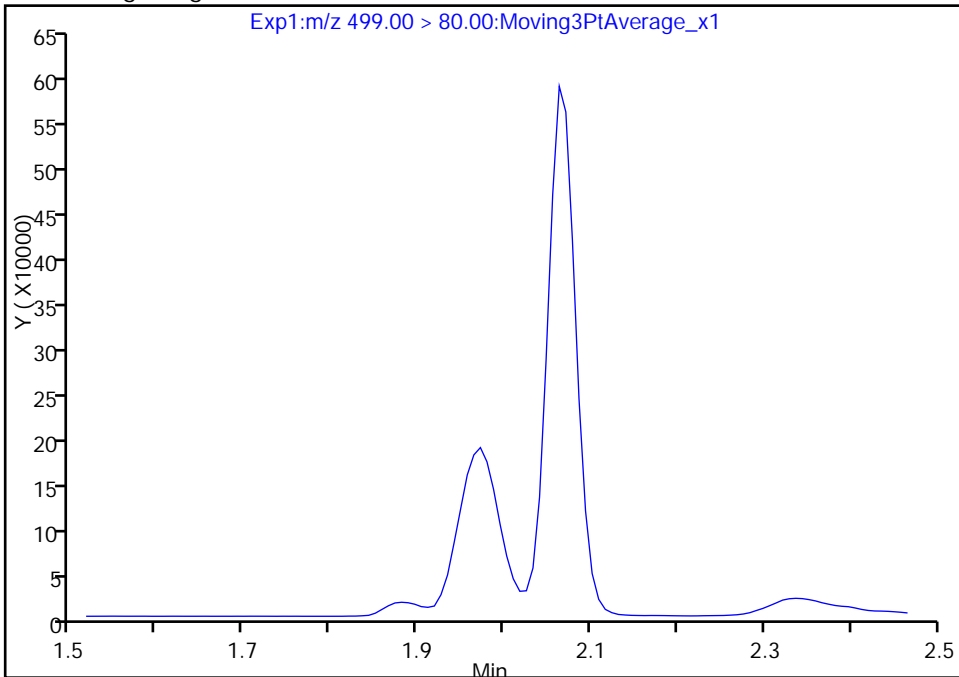
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_062.d
Injection Date: 19-Dec-2017 21:27:18 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

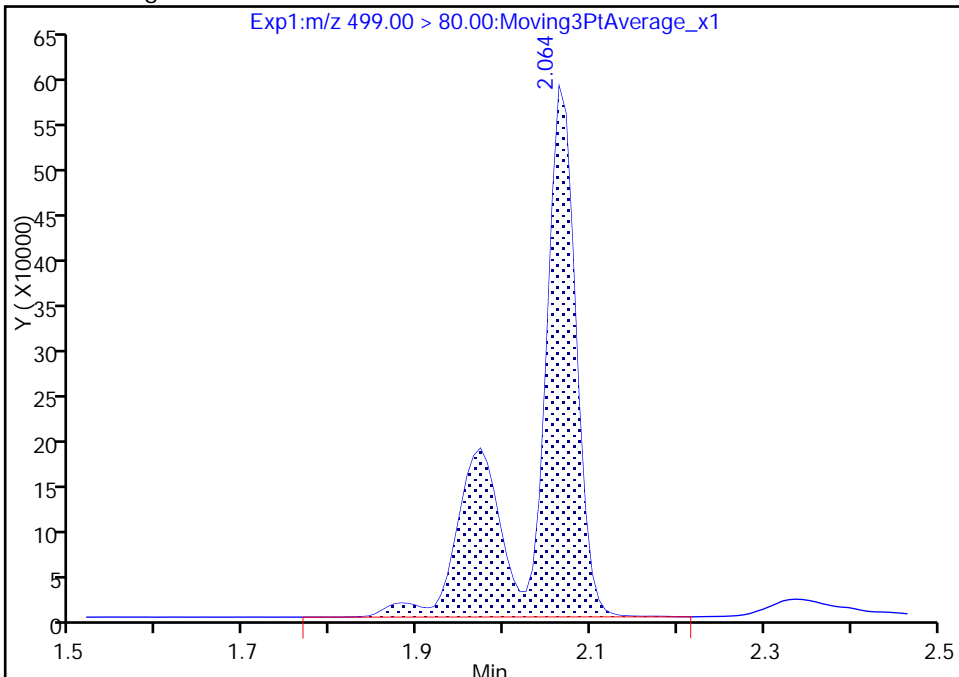
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 2014489
Amount: 19.457567
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:19:02

Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Lab Sample ID: CCV 320-200767/21 Calibration Date: 12/19/2017 22:04
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.19_537A_070.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.9658		144	135	7.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9586		15.4	15.0	2.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.786		48.0	45.0	6.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9363		30.4	30.0	1.1	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9746		62.3	60.0	3.8	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6549		29.6	30.0	-1.4	30.0
13C2 PFHxA	Ave	1.100	1.154		10.5	10.0	4.9	30.0
13C2 PFDA	Ave	0.7652	0.7632		9.97	10.0	-0.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_070.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 19-Dec-2017 22:04:42 ALS Bottle#: 5 Worklist Smp#: 21
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:37 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK018

First Level Reviewer: westendorfc Date: 20-Dec-2017 13:05:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.366	1.444	-0.078	1.000	13857186	144.4		17569	
298.90 > 99.00	1.366	1.444	-0.078	1.000	10556871		1.31(0.00-0.00)	17313	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.479	1.573	-0.094	1.000	1690592	10.5		9568	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.725	-0.101	1.000	8544178	48.0		11455	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.725	-0.101	1.000	2106476	15.4		787	
* 6 13C2-PFOA									
415.00 > 370.00	1.813	1.913	-0.100		1464558	10.0		7355	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.813	1.914	-0.101	1.000	4117270	30.4		749	
413.00 > 169.00	1.813	1.914	-0.101	1.000	2224329		1.85(0.00-0.00)	6975	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.071	2.071	0.0	1.000	6216058	62.3		1085	M
499.00 > 99.00	2.071	2.071	0.0	1.000	1239289		5.02(0.00-0.00)	1308	M
* 7 13C4 PFOS									
503.00 > 80.00	2.071	2.151	-0.080		3048007	28.7		7017	
9 Perfluorononanoic acid									
463.00 > 419.00	2.079	2.158	-0.079	1.000	2878003	29.6		881	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.253	2.312	-0.059	1.000	1117744	9.97		8608	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L5_00024

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_070.d

Injection Date: 19-Dec-2017 22:04:42

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 21

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

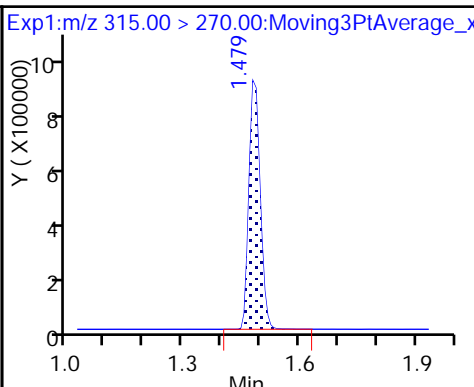
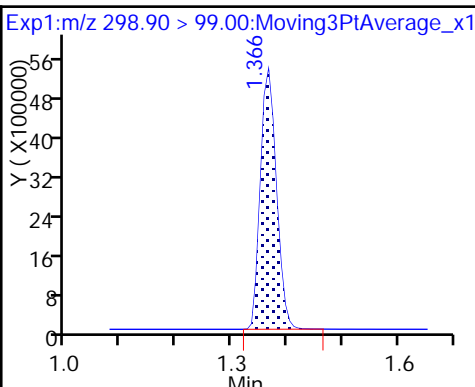
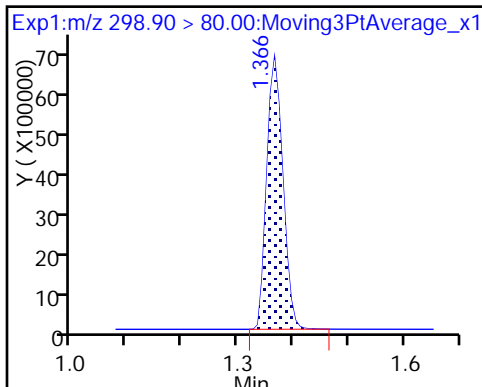
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

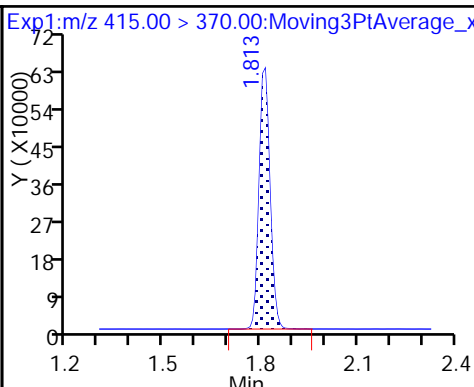
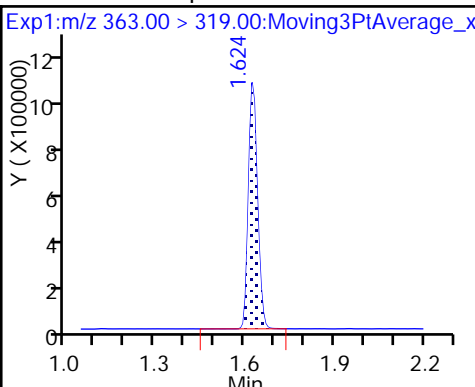
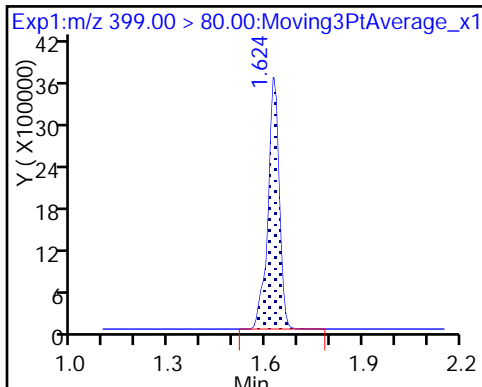
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

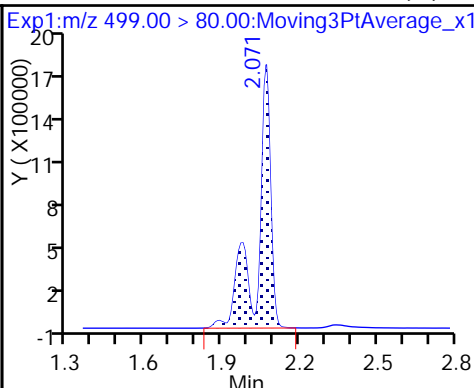
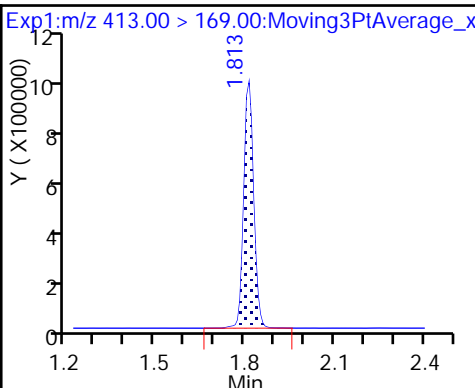
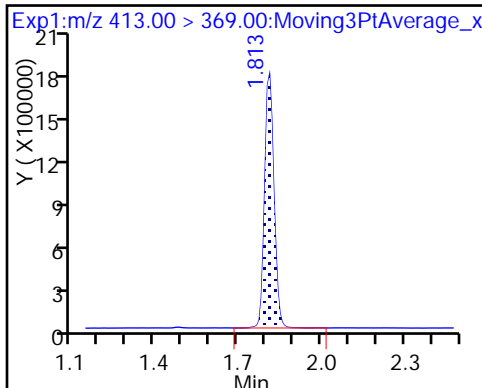
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

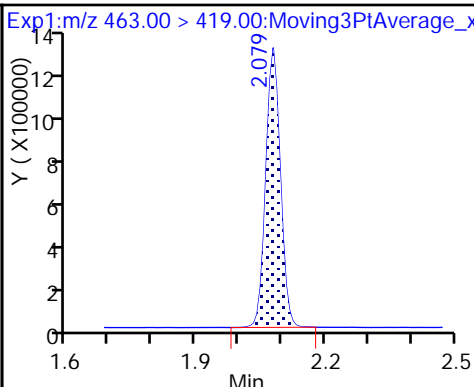
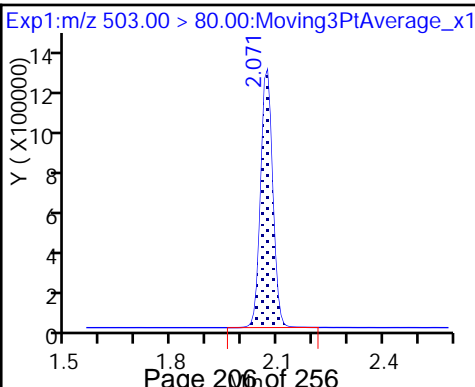
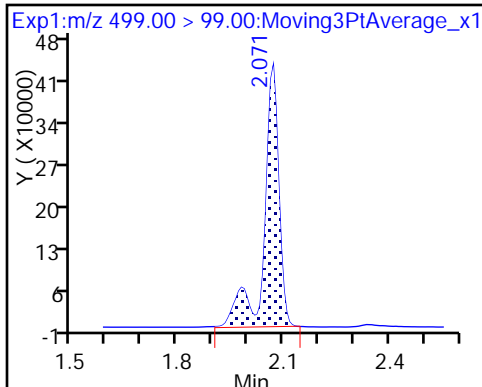
8 Perfluorooctane sulfonic acid (M)



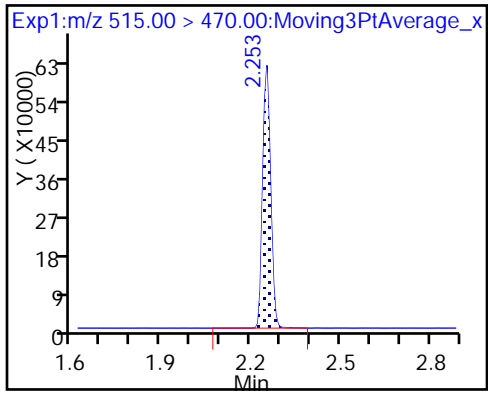
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

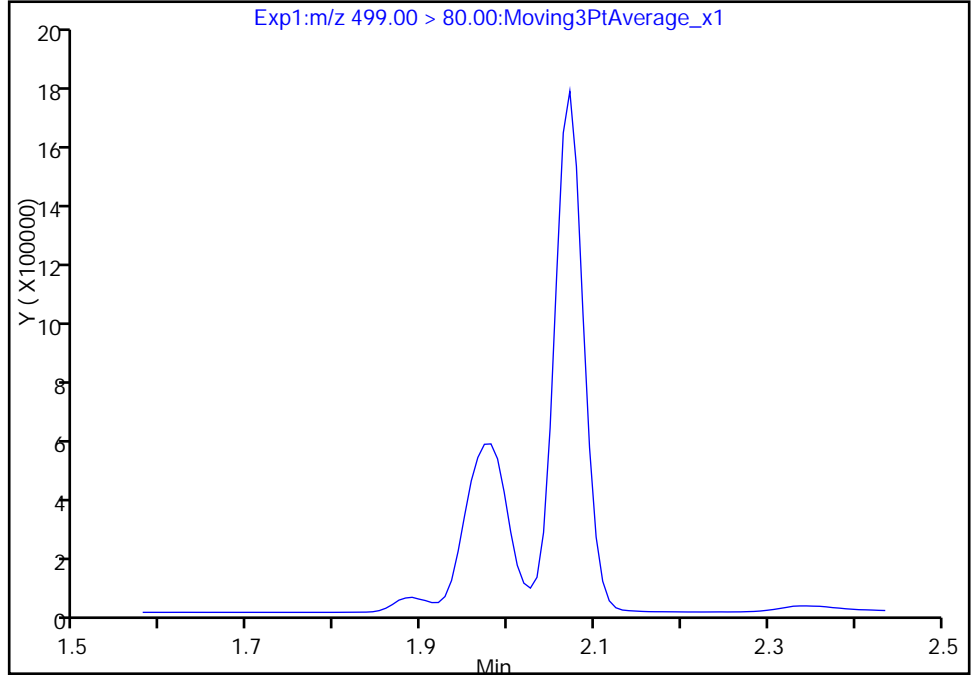
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_070.d
Injection Date: 19-Dec-2017 22:04:42 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

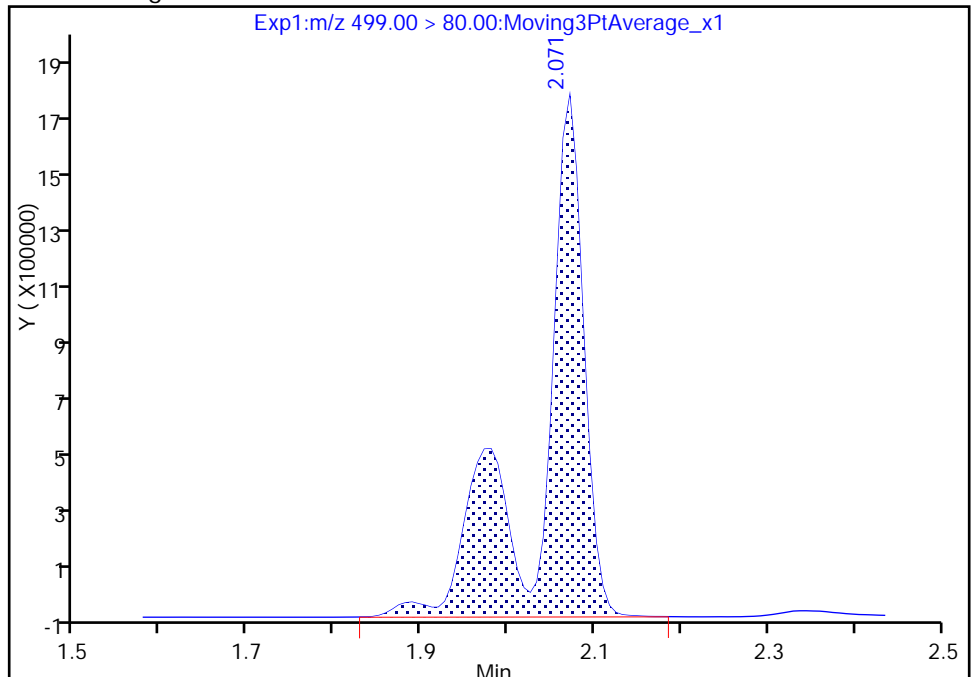
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 6216058
Amount: 62.292589
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:19:27
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

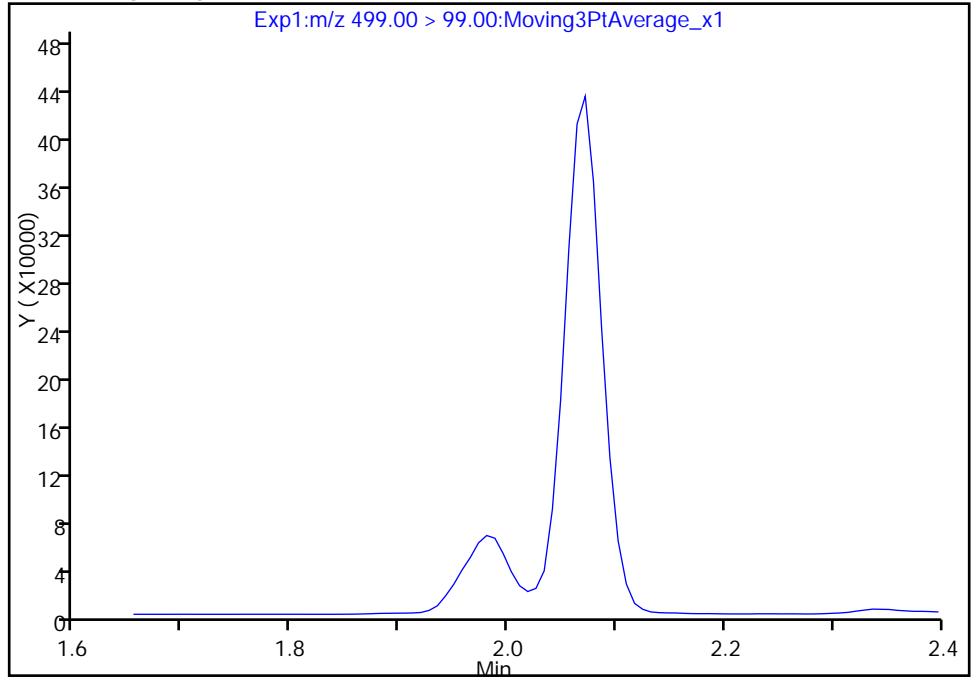
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_070.d
Injection Date: 19-Dec-2017 22:04:42 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

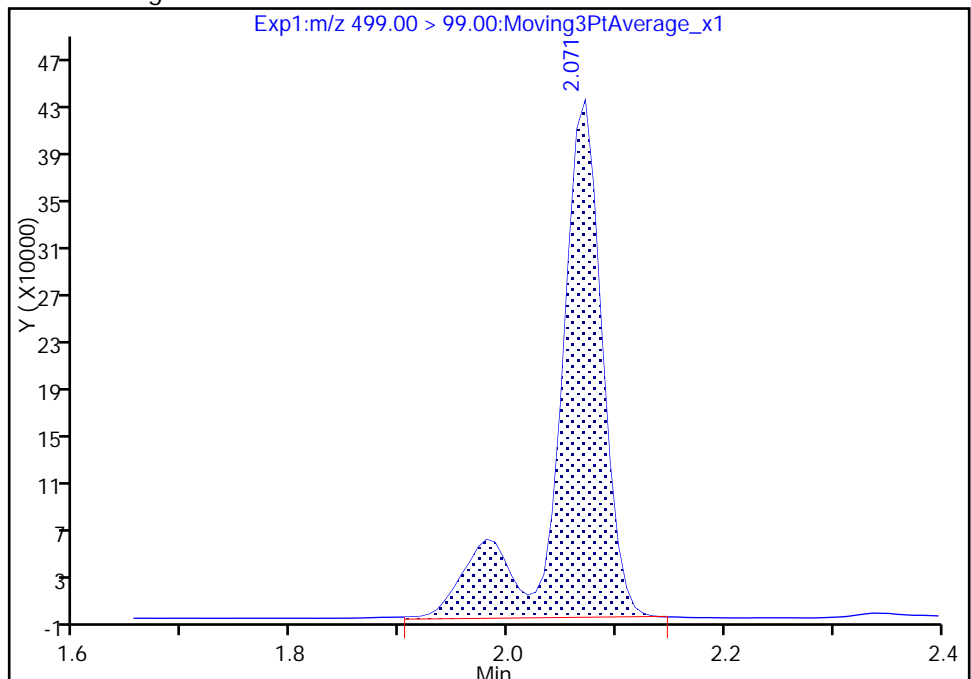
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 1239289
Amount: 62.292589
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:19:49

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

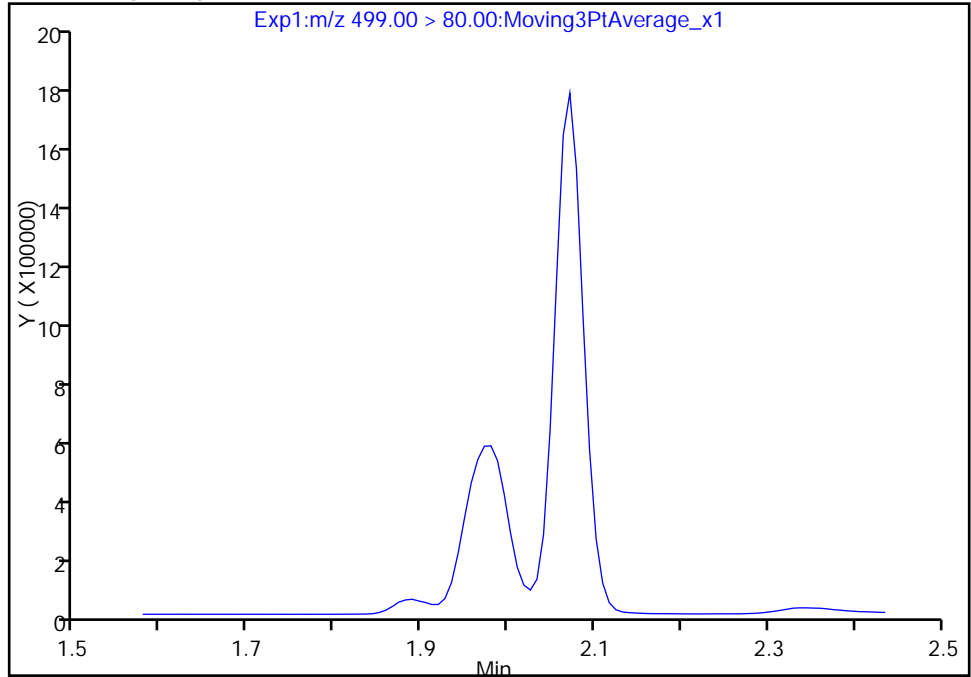
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_070.d
Injection Date: 19-Dec-2017 22:04:42 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

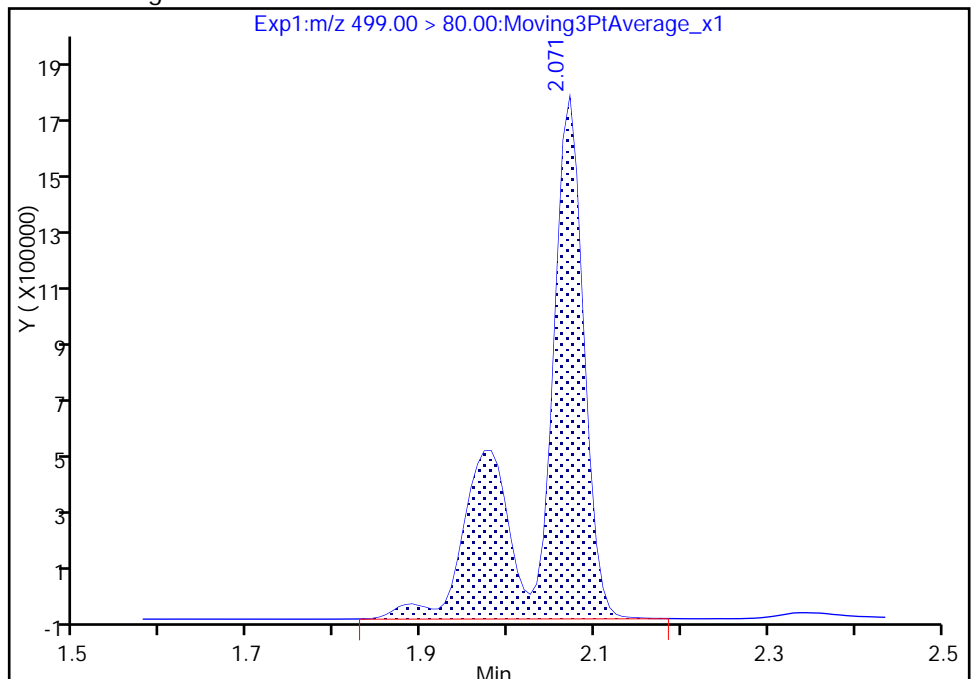
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 6216058
Amount: 62.292589
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:19:49

Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-199900/1-A
 Matrix: Water Lab File ID: 2017.12.19_537A_052.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 250.00 (mL) Date Analyzed: 12/19/2017 20:40
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200646 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	93		70-130
STL00996	13C2 PFDA	96		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_052.d
 Lims ID: MB 320-199900/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 19-Dec-2017 20:40:31 ALS Bottle#: 34 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-199900/1-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:20:18

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.487	1.573	-0.086	1.000	1496305	9.31	9316	
* 6 13C2-PFOA	415.00 > 370.00	1.813	1.913	-0.100		1460001	10.0	8092	
* 7 13C4 PFOS	503.00 > 80.00	2.071	2.151	-0.080		3186036	28.7	8417	
\$ 10 13C2 PFDA	515.00 > 470.00	2.253	2.312	-0.059	1.000	1070037	9.58	7979	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_052.d

Injection Date: 19-Dec-2017 20:40:31

Instrument ID: A8_N

Lims ID: MB 320-199900/1-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 34

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

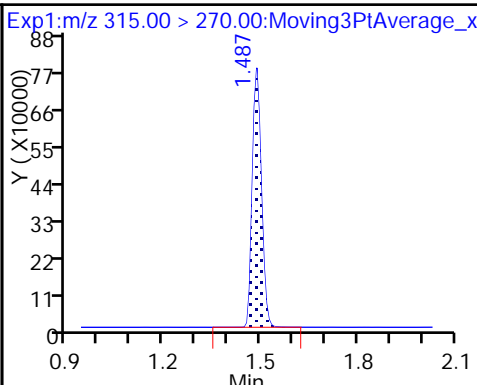
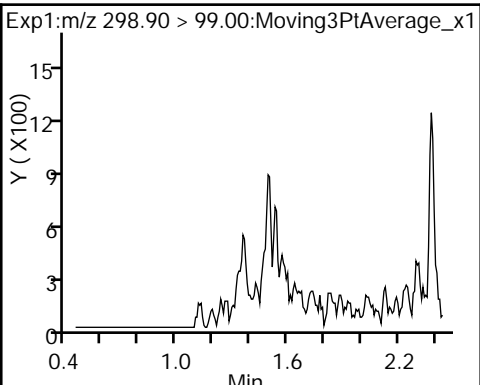
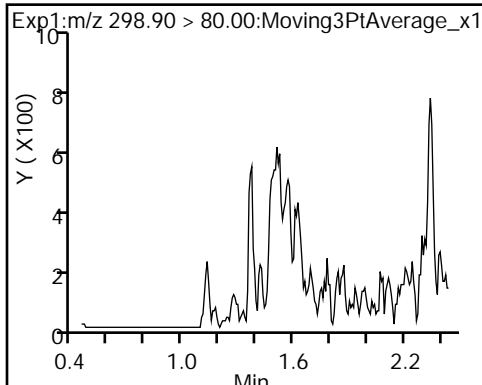
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

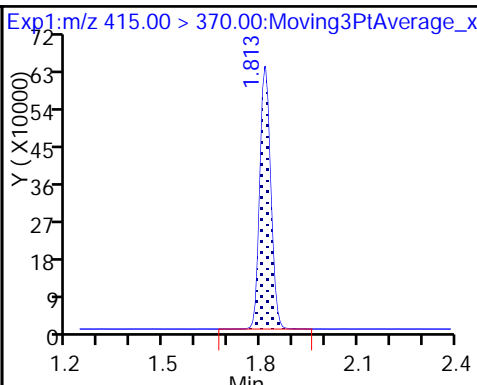
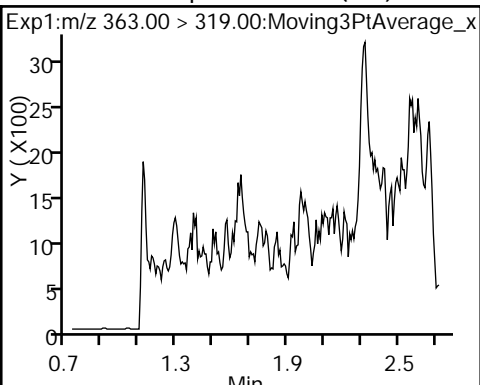
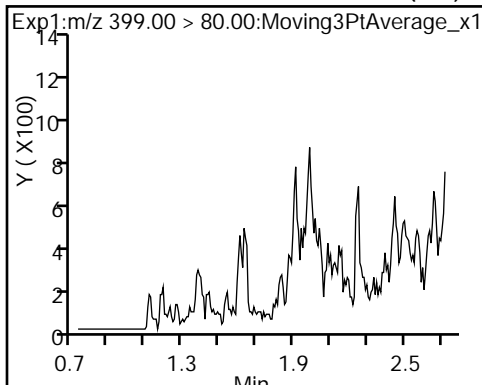
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

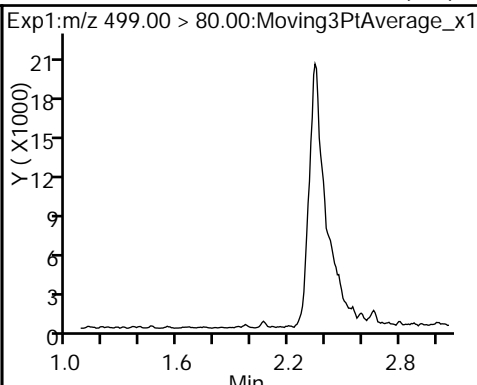
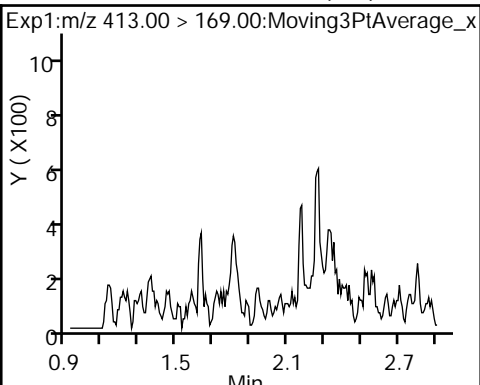
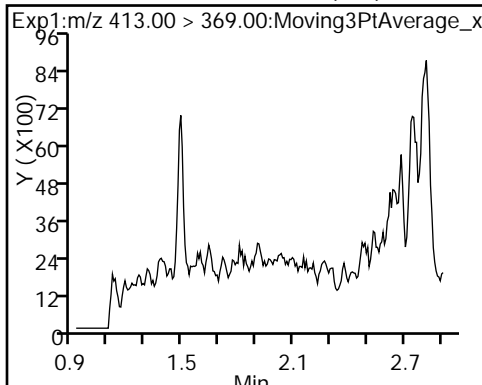
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

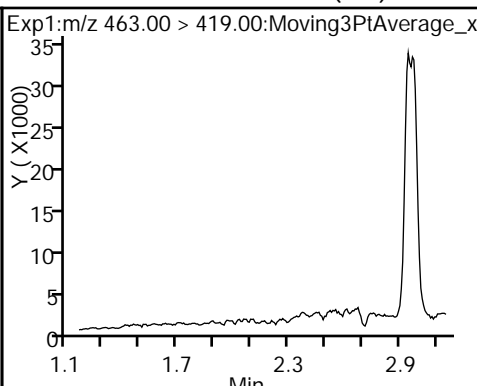
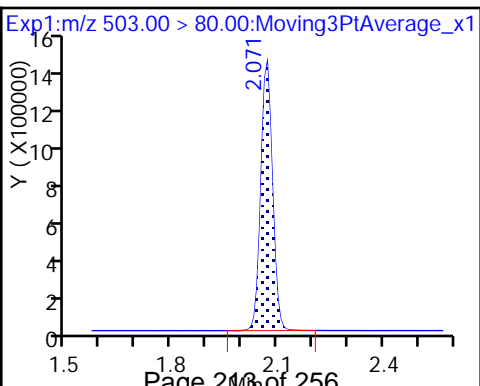
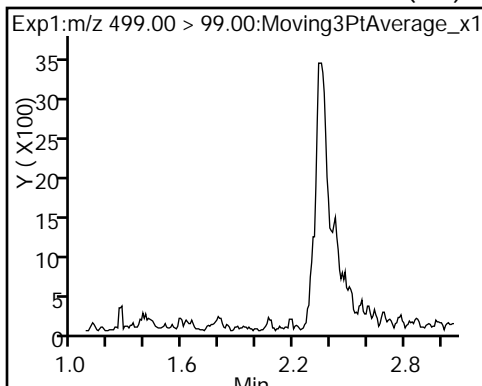
8 Perfluorooctane sulfonic acid (ND)



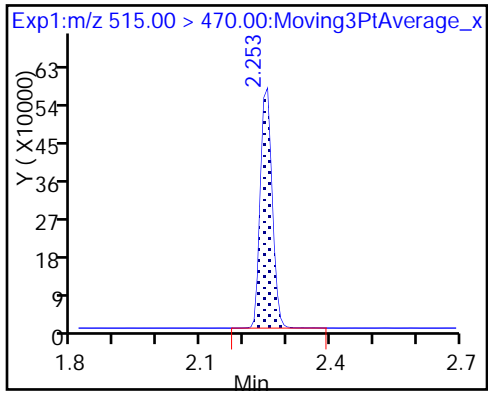
8 Perfluorooctane sulfonic acid (ND)

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_052.d
 Lims ID: MB 320-199900/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 19-Dec-2017 20:40:31 ALS Bottle#: 34 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-199900/1-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:20:18

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.31	93.15
\$ 10 13C2 PFDA	10.0	9.58	95.78

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 320-199900/2-A
 Matrix: Water Lab File ID: 2017.12.19_537A_053.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 250.00 (mL) Date Analyzed: 12/19/2017 20:45
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200646 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	223	M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	110		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	109		24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	183		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	62.1		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	494		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	98		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_053.d
 Lims ID: LCS 320-199900/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 19-Dec-2017 20:45:11 ALS Bottle#: 35 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-199900/2-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:21:28

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.366	1.444	-0.078	1.000	12284191	123.4		17381	
298.90 > 99.00	1.366	1.444	-0.078	1.000	9361873		1.31(0.00-0.00)	13556	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.487	1.573	-0.086	1.000	1551887	9.68		10339	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.631	1.725	-0.094	1.000	8149979	45.7		10874	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.631	1.725	-0.094	1.000	2121512	15.5		838	
* 6 13C2-PFOA									
415.00 > 370.00	1.813	1.913	-0.100		1457783	10.0		7816	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.813	1.914	-0.101	1.000	3720578	27.6		755	
413.00 > 169.00	1.813	1.914	-0.101	1.000	2052159		1.81(0.00-0.00)	6481	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.071	2.071	0.0	1.000	5577914	55.8		1140	M
499.00 > 99.00	2.071	2.071	0.0	1.000	1148873		4.86(0.00-0.00)	1270	M
* 7 13C4 PFOS									
503.00 > 80.00	2.071	2.151	-0.080		3055078	28.7		7397	
9 Perfluorononanoic acid									
463.00 > 419.00	2.079	2.158	-0.079	1.000	2626948	27.1		505	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.253	2.312	-0.059	1.000	1088438	9.76		8599	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_053.d

Injection Date: 19-Dec-2017 20:45:11

Instrument ID: A8_N

Lims ID: LCS 320-199900/2-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 35

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

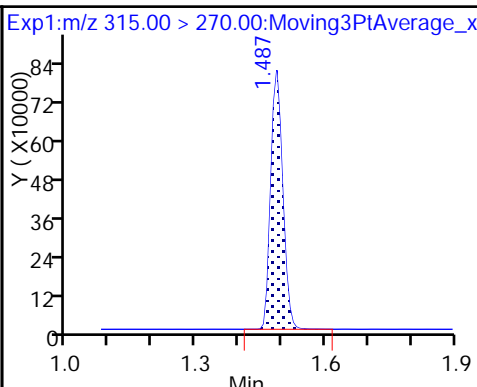
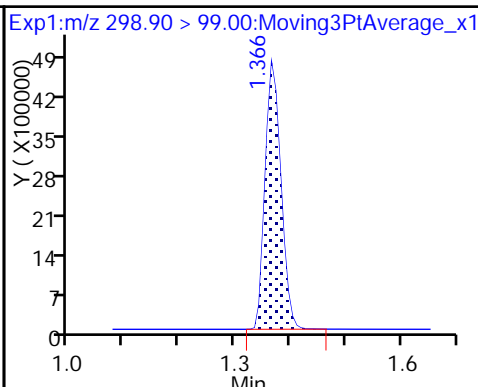
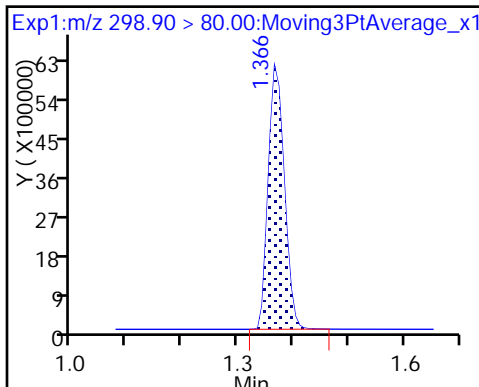
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

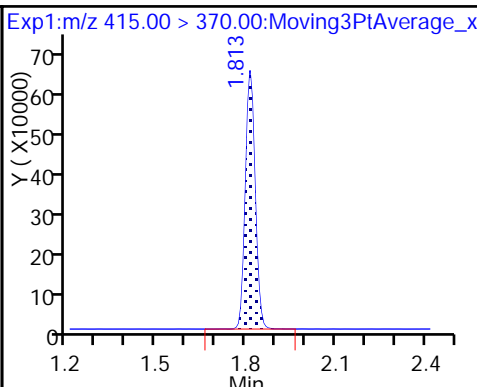
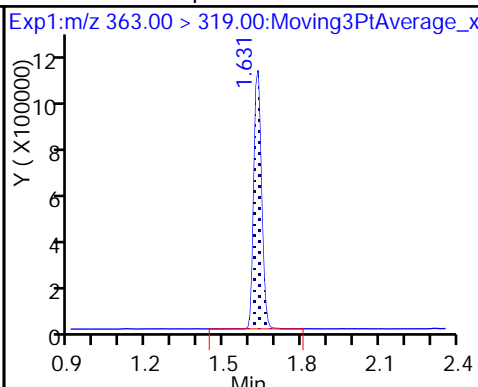
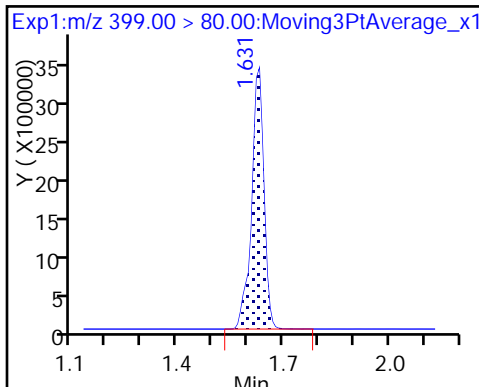
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

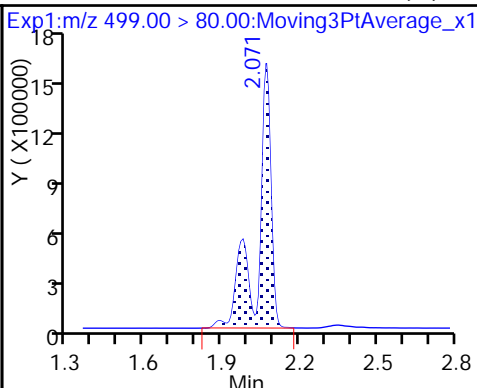
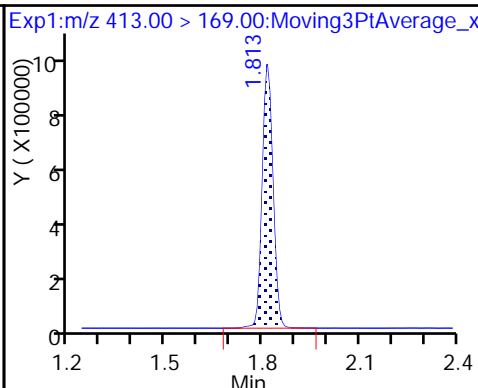
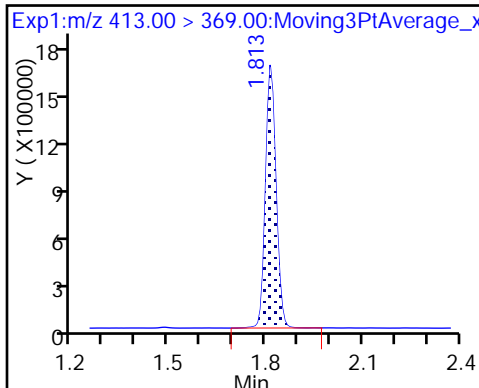
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

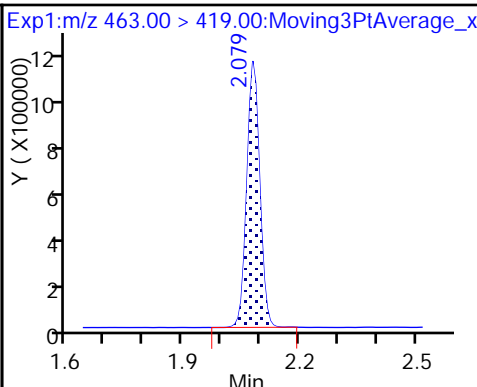
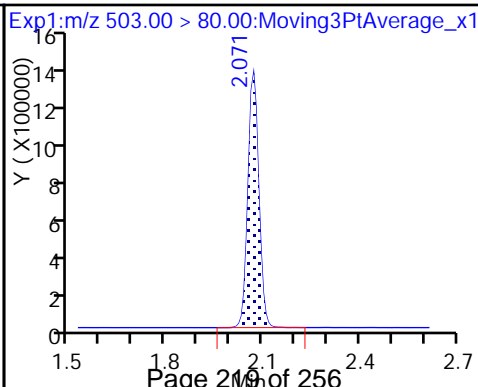
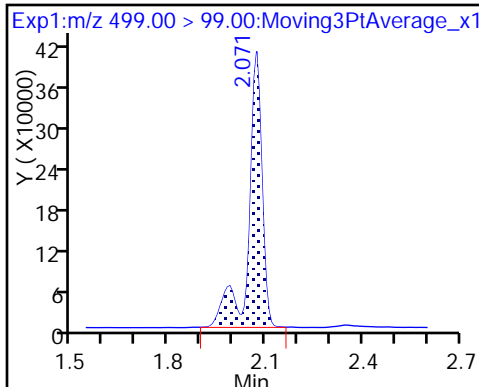
8 Perfluorooctane sulfonic acid (M)



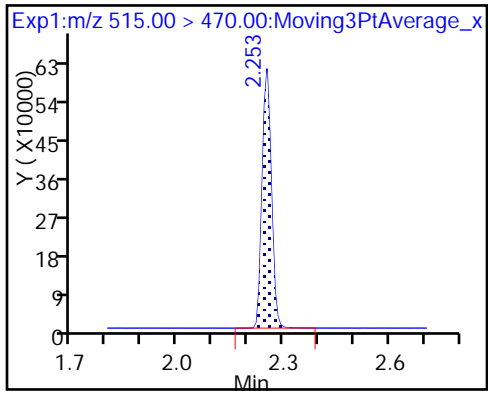
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_053.d
 Lims ID: LCS 320-199900/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 19-Dec-2017 20:45:11 ALS Bottle#: 35 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-199900/2-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:21:28

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.68	96.75
\$ 10 13C2 PFDA	10.0	9.76	97.57

TestAmerica Sacramento

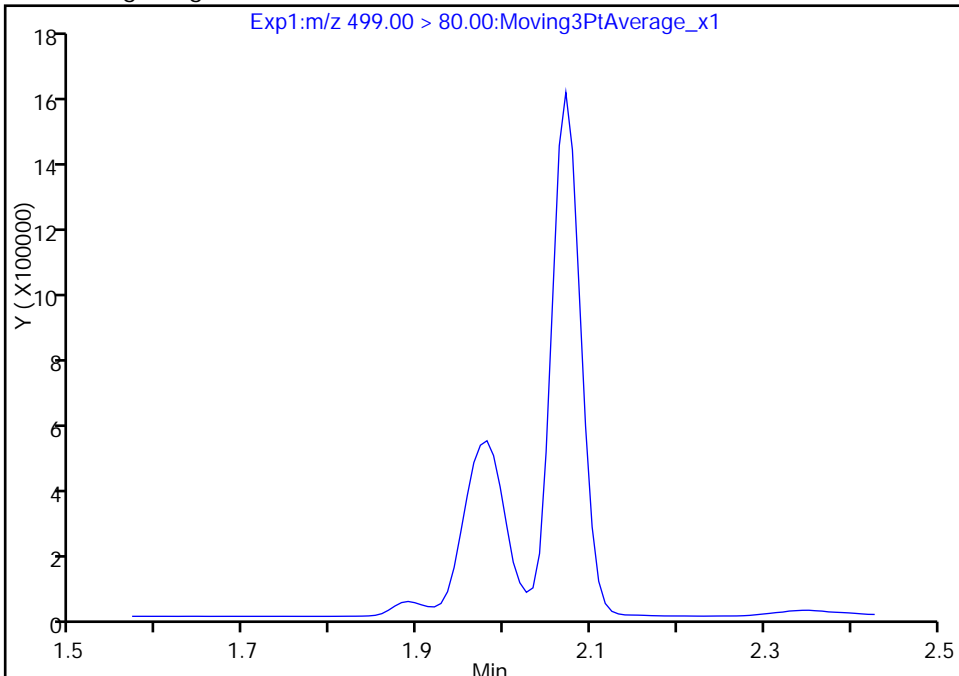
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_053.d
Injection Date: 19-Dec-2017 20:45:11 Instrument ID: A8_N
Lims ID: LCS 320-199900/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 35 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

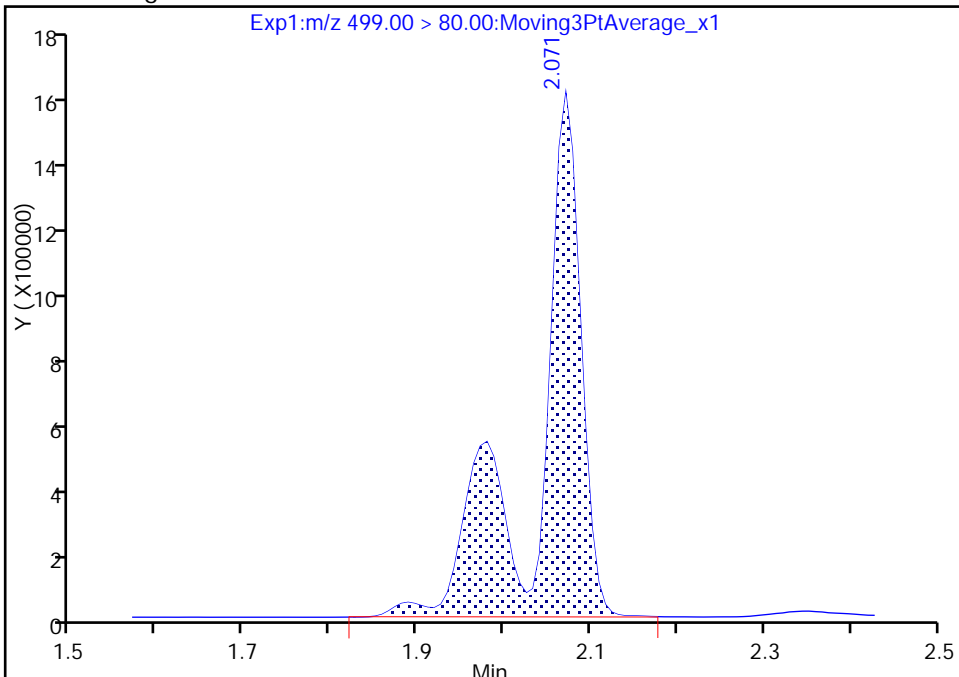
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 5577914
Amount: 55.768222
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:20:25
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

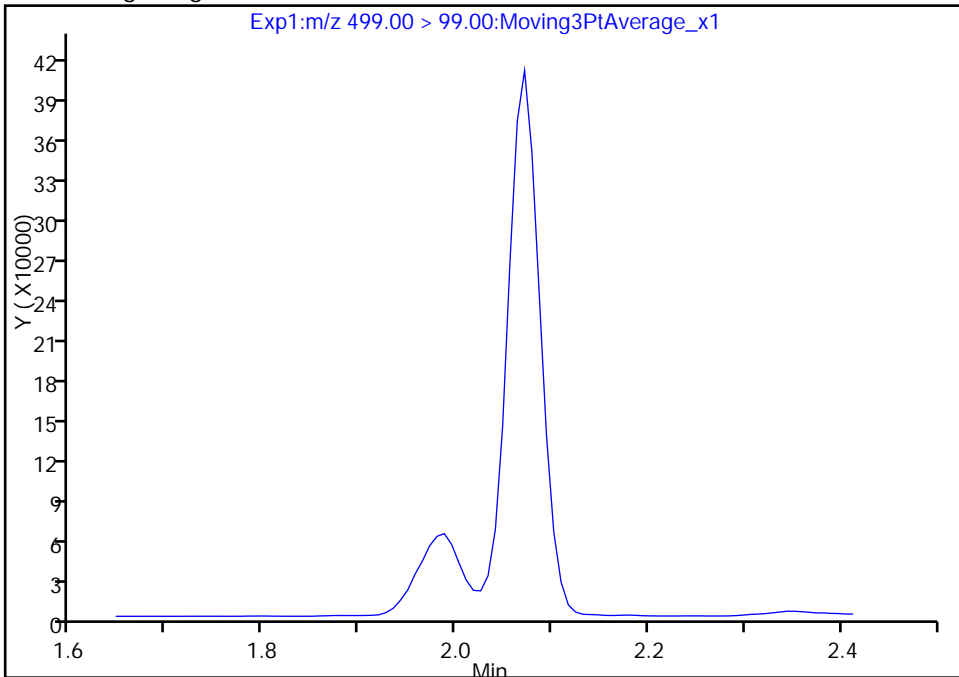
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_053.d
Injection Date: 19-Dec-2017 20:45:11 Instrument ID: A8_N
Lims ID: LCS 320-199900/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 35 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

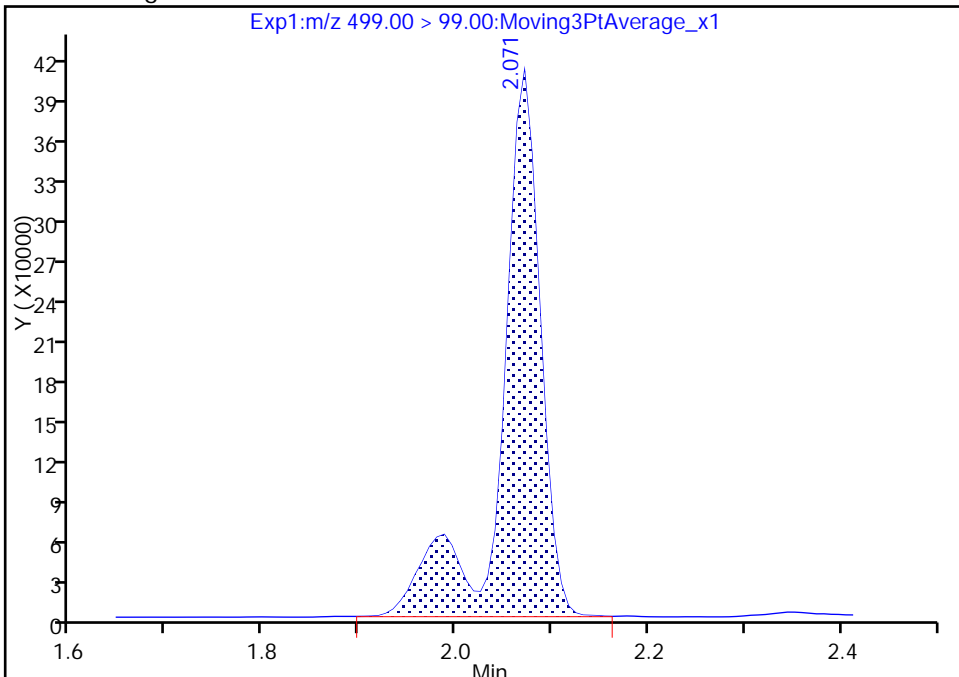
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 1148873
Amount: 55.768222
Amount Units: ng/ml



TestAmerica Sacramento

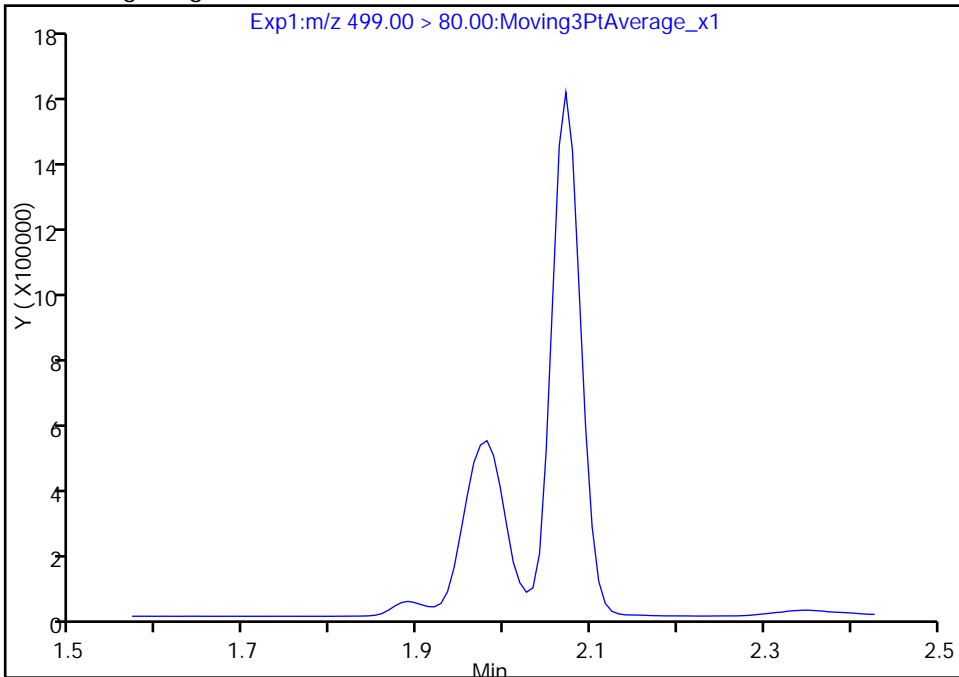
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_053.d
Injection Date: 19-Dec-2017 20:45:11 Instrument ID: A8_N
Lims ID: LCS 320-199900/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 35 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

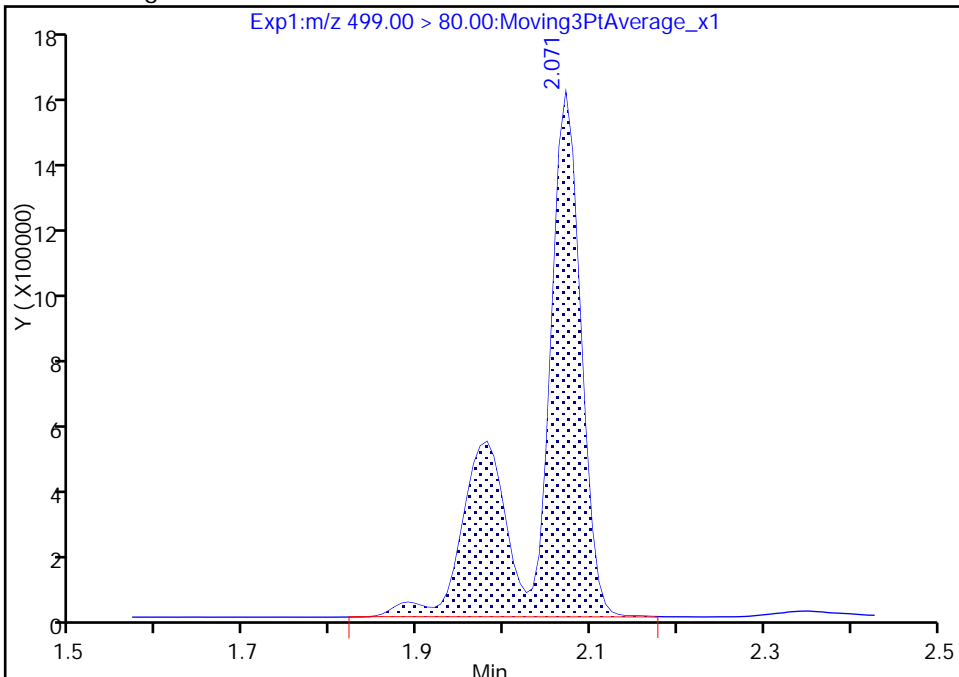
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 5577914
Amount: 55.768222
Amount Units: ng/ml



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCSD 320-199900/3-A
 Matrix: Water Lab File ID: 2017.12.19_537A_054.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 250.00 (mL) Date Analyzed: 12/19/2017 20:49
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200646 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	216	M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	109		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	106		24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	174		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	60.0		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	480		90	36	16

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

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_054.d
 Lims ID: LCSD 320-199900/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 19-Dec-2017 20:49:52 ALS Bottle#: 36 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcsd 320-199900/3-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:22:28

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.366	1.444	-0.078	1.000	12204287	120.1		16943	
298.90 > 99.00	1.366	1.444	-0.078	1.000	8889936		1.37(0.00-0.00)	11742	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.479	1.573	-0.094	1.000	1564977	9.69		9092	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.725	-0.101	1.000	7866431	43.4		11306	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.725	-0.101	1.000	2062101	15.0		841	
* 6 13C2-PFOA									
415.00 > 370.00	1.813	1.913	-0.100		1467291	10.0		6707	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.813	1.914	-0.101	1.000	3711921	27.3		716	
413.00 > 169.00	1.813	1.914	-0.101	1.000	2008431		1.85(0.00-0.00)	6500	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.071	2.071	0.0	1.000	5472933	53.9		1158	M
499.00 > 99.00	2.071	2.071	0.0	1.000	1119568		4.89(0.00-0.00)	1400	M
* 7 13C4 PFOS									
503.00 > 80.00	2.071	2.151	-0.080		3102295	28.7		8601	
9 Perfluorononanoic acid									
463.00 > 419.00	2.079	2.158	-0.079	1.000	2576669	26.4		437	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.253	2.312	-0.059	1.000	1154029	10.3		8898	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_054.d

Injection Date: 19-Dec-2017 20:49:52 Instrument ID: A8_N

Lims ID: LCSD 320-199900/3-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 36

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

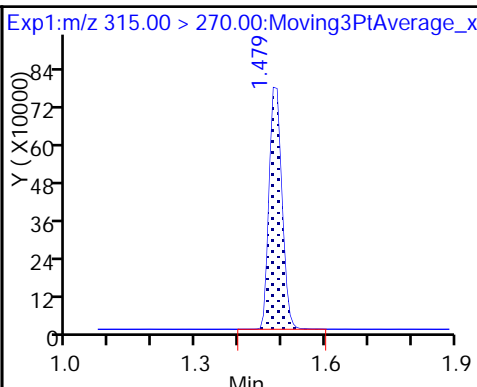
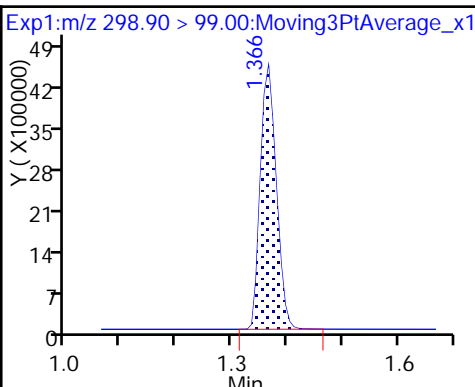
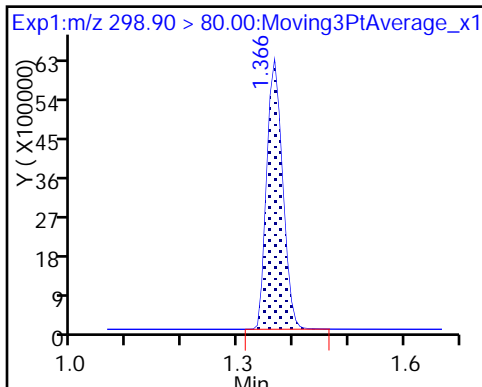
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

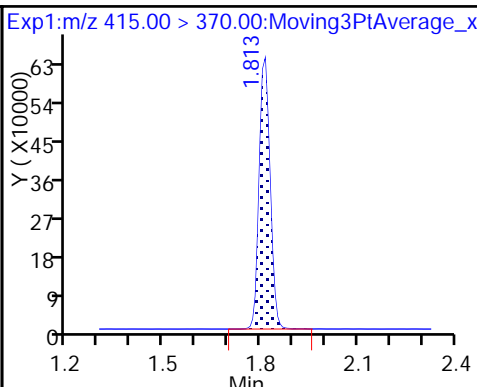
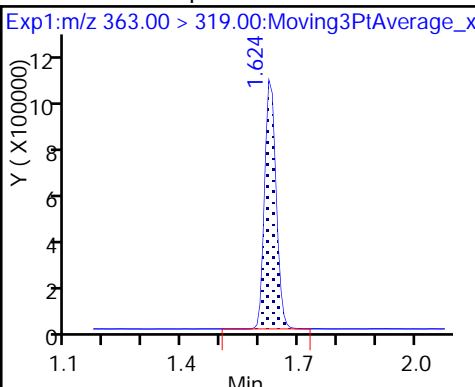
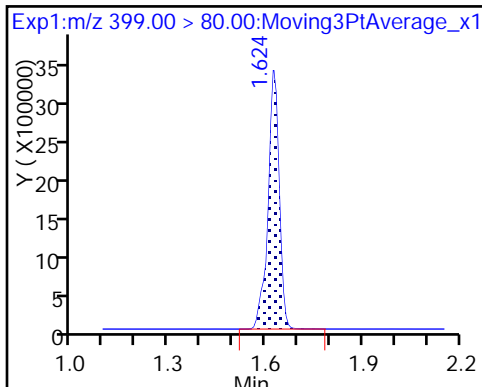
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

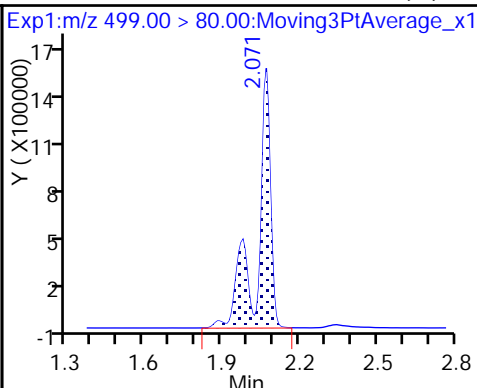
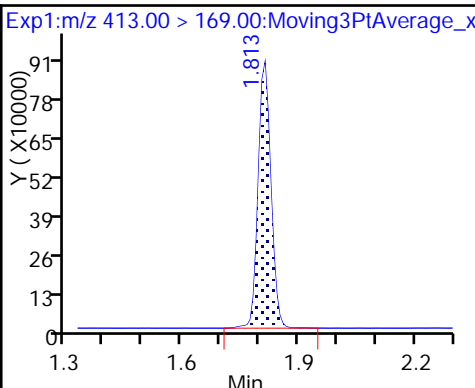
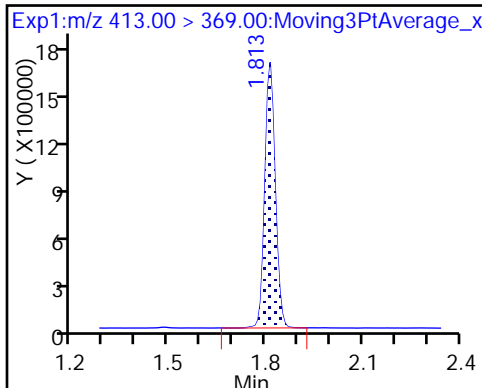
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

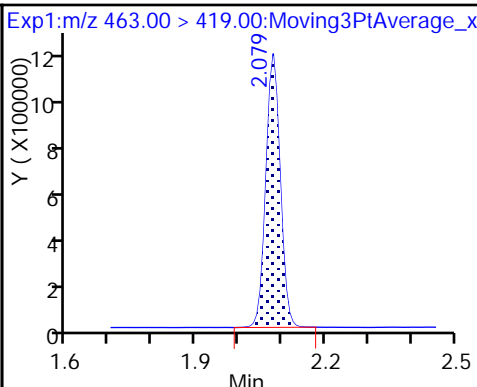
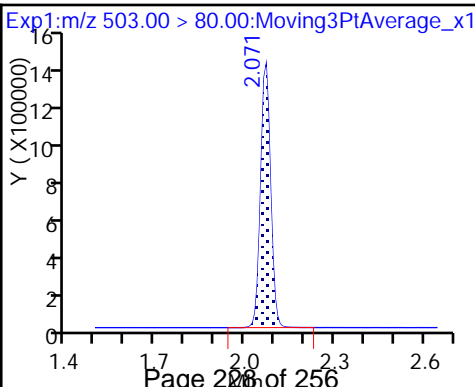
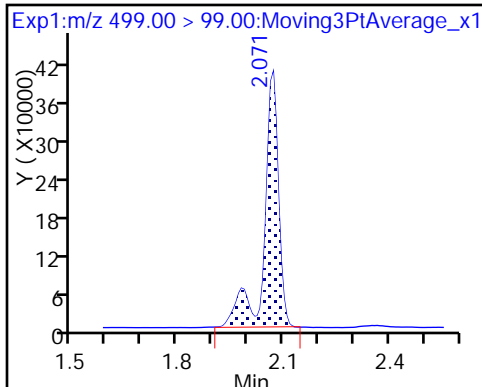
8 Perfluorooctane sulfonic acid (M)



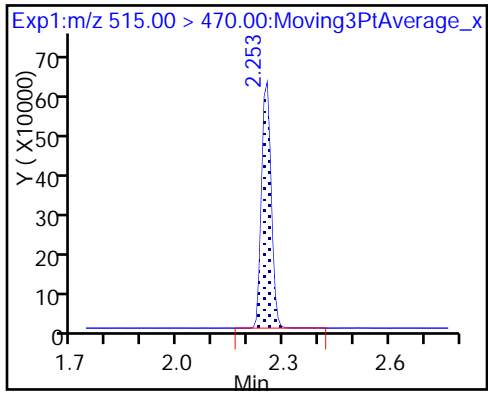
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_054.d
 Lims ID: LCSD 320-199900/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 19-Dec-2017 20:49:52 ALS Bottle#: 36 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcsd 320-199900/3-a
 Misc. Info.: Plate: 1 Rack: 2
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 20-Dec-2017 14:36:21 Calib Date: 03-Nov-2017 14:01:24
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171106-49975.b\2017.11.03_537XICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 20-Dec-2017 14:22:28

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.69	96.94
\$ 10 13C2 PFDA	10.0	10.3	102.78

TestAmerica Sacramento

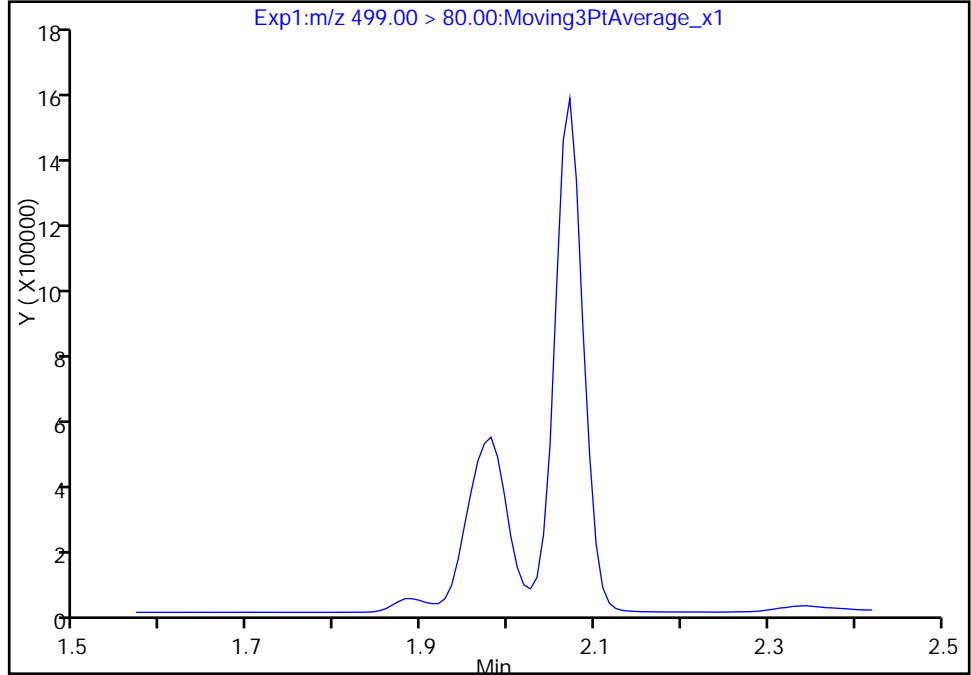
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_054.d
Injection Date: 19-Dec-2017 20:49:52 Instrument ID: A8_N
Lims ID: LCSD 320-199900/3-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 36 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

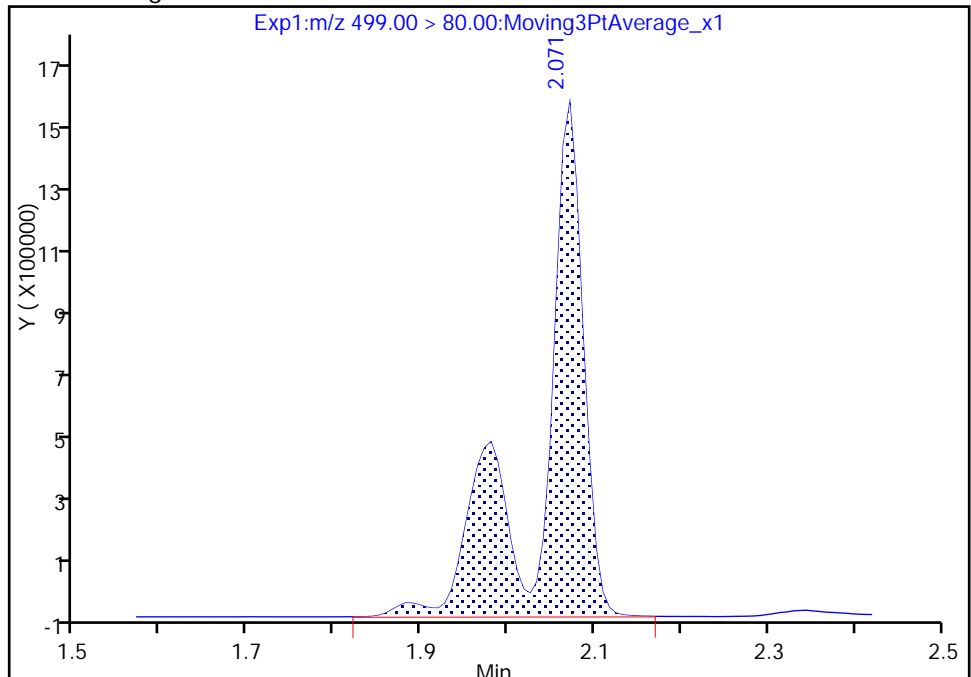
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 5472933
Amount: 53.885799
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:21:34
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

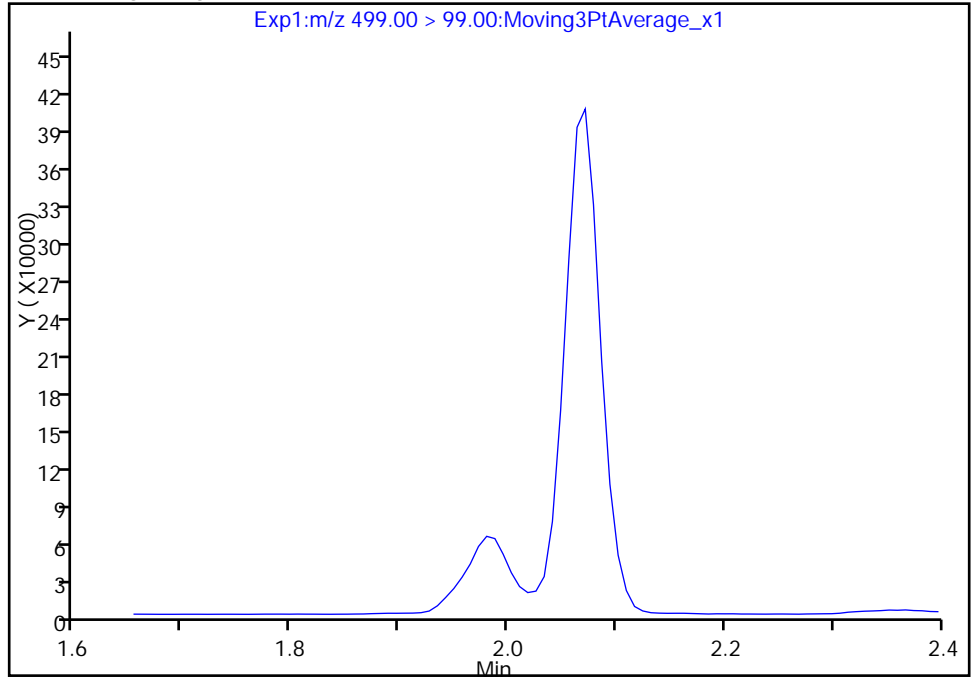
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_054.d
Injection Date: 19-Dec-2017 20:49:52 Instrument ID: A8_N
Lims ID: LCSD 320-199900/3-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 36 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

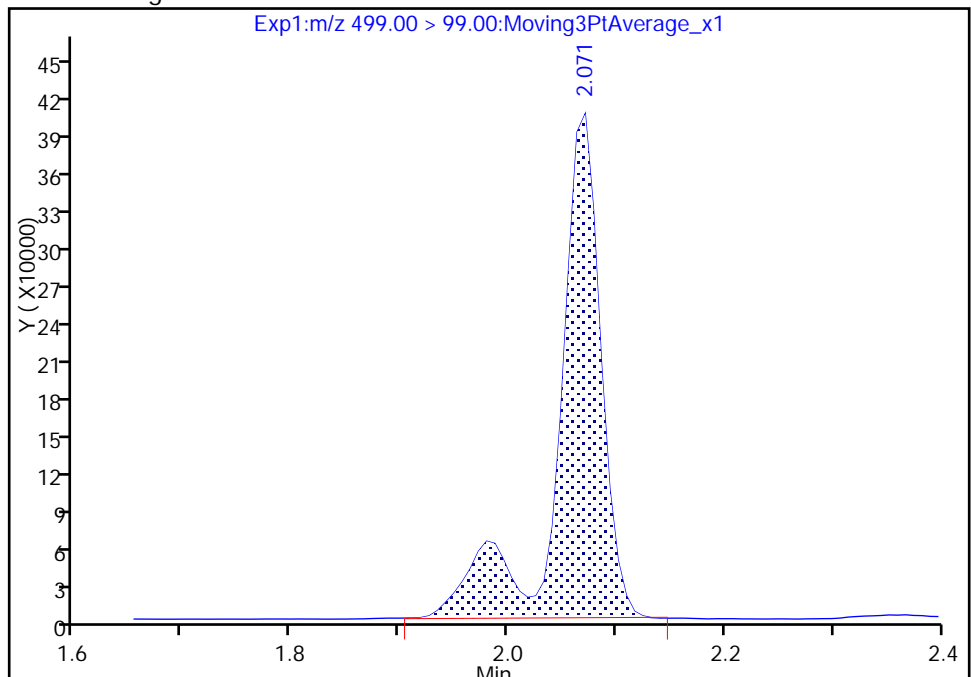
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 1119568
Amount: 53.885799
Amount Units: ng/ml



TestAmerica Sacramento

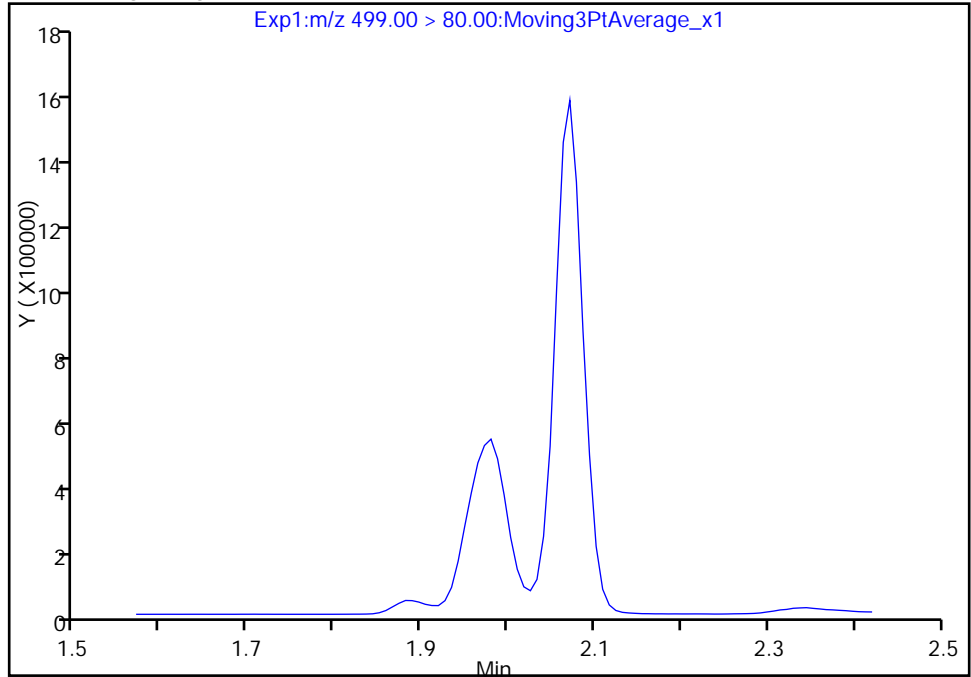
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b\2017.12.19_537A_054.d
Injection Date: 19-Dec-2017 20:49:52 Instrument ID: A8_N
Lims ID: LCSD 320-199900/3-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 36 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

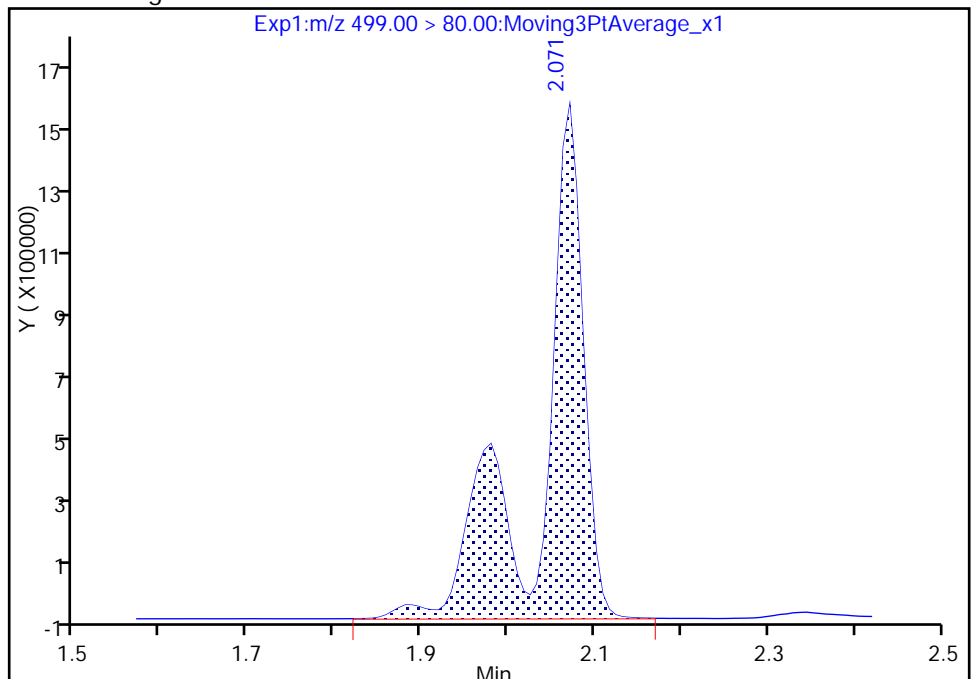
Not Detected
Expected RT: 2.07

Processing Integration Results



Manual Integration Results

RT: 2.07
Area: 5472933
Amount: 53.885799
Amount Units: ng/ml



Reviewer: barnettj, 20-Dec-2017 14:21:54

Audit Action: Manually Integrated

Audit Reason: Missed Peak

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1

SDG No.: _____

Instrument ID: A8_N Start Date: 11/03/2017 13:37

Analysis Batch Number: 192908 End Date: 11/03/2017 14:24

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-192908/4		11/03/2017 13:37	1	2017.11.03_537X ICAL 004.d	GeminiC18 3x100 3(mm)
IC 320-192908/5		11/03/2017 13:42	1	2017.11.03_537X ICAL 005.d	GeminiC18 3x100 3(mm)
IC 320-192908/6		11/03/2017 13:47	1	2017.11.03_537X ICAL 006.d	GeminiC18 3x100 3(mm)
IC 320-192908/7 ICISAV		11/03/2017 13:52	1	2017.11.03_537X ICAL 007.d	GeminiC18 3x100 3(mm)
IC 320-192908/8		11/03/2017 13:56	1	2017.11.03_537X ICAL 008.d	GeminiC18 3x100 3(mm)
IC 320-192908/9		11/03/2017 14:01	1	2017.11.03_537X ICAL 009.d	GeminiC18 3x100 3(mm)
ZZZZZ		11/03/2017 14:06	1		GeminiC18 3x100 3(mm)
CCVL 320-192908/11		11/03/2017 14:10	1	2017.11.03_537X ICAL 011.d	GeminiC18 3x100 3(mm)
ZZZZZ		11/03/2017 14:15	1		GeminiC18 3x100 3(mm)
ICV 320-192908/13		11/03/2017 14:20	1	2017.11.03_537X ICAL 013.d	GeminiC18 3x100 3(mm)
ZZZZZ		11/03/2017 14:24	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/18/2017 09:53

Analysis Batch Number: 200292 End Date: 12/18/2017 10:31

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-200292/1		12/18/2017 09:53	1	2017.12.18_537A 004.d	GeminiC18 3x100 3(mm)
CCV 320-200292/2 CCVIS		12/18/2017 09:58	1		GeminiC18 3x100 3(mm)
CCV 320-200292/9 CCVIS		12/18/2017 10:31	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/19/2017 20:31

Analysis Batch Number: 200646 End Date: 12/19/2017 21:27

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-200646/1 CCVIS		12/19/2017 20:31	1	2017.12.19_537A 050.d	GeminiC18 3x100 3(mm)
MB 320-199900/1-A		12/19/2017 20:40	1	2017.12.19_537A 052.d	GeminiC18 3x100 3(mm)
LCS 320-199900/2-A		12/19/2017 20:45	1	2017.12.19_537A 053.d	GeminiC18 3x100 3(mm)
LCSD 320-199900/3-A		12/19/2017 20:49	1	2017.12.19_537A 054.d	GeminiC18 3x100 3(mm)
ZZZZZ		12/19/2017 20:54	1		GeminiC18 3x100 3(mm)
ZZZZZ		12/19/2017 20:59	1		GeminiC18 3x100 3(mm)
ZZZZZ		12/19/2017 21:03	1		GeminiC18 3x100 3(mm)
ZZZZZ		12/19/2017 21:08	1		GeminiC18 3x100 3(mm)
ZZZZZ		12/19/2017 21:13	1		GeminiC18 3x100 3(mm)
ZZZZZ		12/19/2017 21:17	1		GeminiC18 3x100 3(mm)
ZZZZZ		12/19/2017 21:22	1		GeminiC18 3x100 3(mm)
CCV 320-200646/13 CCVIS		12/19/2017 21:27	1	2017.12.19_537A 062.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/19/2017 21:27

Analysis Batch Number: 200767 End Date: 12/19/2017 22:04

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-200767/13 CCVIS		12/19/2017 21:27	1	2017.12.19_537A 062.d	GeminiC18 3x100 3(mm)
ZZZZZ		12/19/2017 21:36	1		GeminiC18 3x100 3(mm)
ZZZZZ		12/19/2017 21:41	1		GeminiC18 3x100 3(mm)
320-34235-1		12/19/2017 21:46	1	2017.12.19_537A 066.d	GeminiC18 3x100 3(mm)
320-34235-2		12/19/2017 21:50	1	2017.12.19_537A 067.d	GeminiC18 3x100 3(mm)
320-34235-3		12/19/2017 21:55	1	2017.12.19_537A 068.d	GeminiC18 3x100 3(mm)
320-34235-4		12/19/2017 22:00	1	2017.12.19_537A 069.d	GeminiC18 3x100 3(mm)
CCV 320-200767/21 CCVIS		12/19/2017 22:04	1	2017.12.19_537A 070.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1

SDG No.: _____

Batch Number: 199900 Batch Start Date: 12/14/17 12:48 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 12/18/17 15:10

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-HSP 00023
MB 320-199900/1		537, 537				250.00 mL	1.00 mL	7 SU	
LCS 320-199900/2		537, 537				250.00 mL	1.00 mL	7 SU	100 uL
LCSD 320-199900/3		537, 537				250.00 mL	1.00 mL	7 SU	100 uL
320-34235-A-1	NAWC-121217-RW-061	537, 537	T	273.57 g	27.01 g	246.6 mL	1.00 mL	7 SU	
320-34235-A-2	NAWC-121217-FRB-061	537, 537	T	276.41 g	26.87 g	249.5 mL	1.00 mL	7 SU	
320-34235-A-3	NAWC-121217-RW-054	537, 537	T	274.48 g	27.57 g	246.9 mL	1.00 mL	7 SU	
320-34235-A-4	NAWC-121217-FRB-054	537, 537	T	249.49 g	26.86 g	222.6 mL	1.00 mL	7 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00054	LC537-SU 00056	AnalysisComment			
MB 320-199900/1		537, 537		100 uL	100 uL	C1 ND			
LCS 320-199900/2		537, 537		100 uL	100 uL	C1 ND			
LCSD 320-199900/3		537, 537		100 uL	100 uL	C1 ND			
320-34235-A-1	NAWC-121217-RW-061	537, 537	T	100 uL	100 uL	C1 ND			
320-34235-A-2	NAWC-121217-FRB-061	537, 537	T	100 uL	100 uL	C1 ND			
320-34235-A-3	NAWC-121217-RW-054	537, 537	T	100 uL	100 uL	C1 ND			
320-34235-A-4	NAWC-121217-FRB-054	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.: 320-34235-1

SDG No.: _____

Batch Number: 199900 Batch Start Date: 12/14/17 12:48 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 12/18/17 15:10

Batch Notes	
Analyst ID - Aliquot Step	CCB
Analyst ID - Concentration	CCB/KMK
Analyst ID - Final Volume Step	CCB
Internal Standard ID#	1099354
Manifold ID	1,3
Methanol ID	1105466
pH Indicator ID	4390-01 (Lot 2517)
Pipette ID	M16387D
Analyst ID - IS Reagent Drop	CCB
Analyst ID - IS Reagent Drop Witness	HJA
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	KMK
Analyst ID - TA Reagent Drop	JER
Analyst ID - TA Reagent Drop Witness	KMK
SPE Cartridge ID	6357081-11
Trizma ID	SLBR4303V
Reagent Water ID	12-12-17

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

A8

Job No: 34181,34235 Instrument ID & Date: 12-19-17 ICAL Batch: 192908
 Extraction Batch: 199900 Worklist #: 51953 TALS Batch: 200646,200767

Review Items	-- Level 1 --			Level 2
	Yes	No	N/A	
Initial Calibration				
1. Is ICAL verified and locked in Chrom & TALS?	✓			✓
2. Is ICV properly linked in TALS?	✓			✓
Continuing Calibration				
1. Low-range CCV injected at start of analytical run? CCV injected after every 10 samples and at the end of the analytical run and alternated between Low-range, Mid-range and High-range?	✓			✓
2. If sequence was not after an ICAL was a low and mid range CCV injected at the start of the analytical run? <u>200292</u>	✓			✓
3. Native compounds and surrogates in control? Low-range within ±50% of true value Mid and High-range within ±30% of true value	✓			✓
4. Internal Standard areas in control? Areas ≥ 50% of average area of the ICAL and 70-140% of the most recent CCV.	✓			✓
Client Samples & QC Sample Results				
1. Were preparation and analysis done within holding times?	✓			✓
2. Are Chromatograms reviewed and spectra verified?	✓			✓
3. Are positive results within calibration range?	✓			✓
4. Dilutions due to target cpds? _____ Dilutions due to non-targets? _____			✓	
5. All target compounds in MB < 1/3 RL ? (Requires NCM if "no.")	✓			✓
6. Are target constituents in LCS/LCSD within method control limits?	✓			✓
7. Internal Standard areas in control for all samples and QC reported? ±50% from the average area of the ICAL and 70-140% of the most recent CCV	✓			✓
8. Do results (e.g., dilutions/trip blanks) make sense?	✓			✓
9. Are MS/MSD recoveries and RPDs within method control limits?			✓	
10. Are all QC samples properly linked in TALS?	✓			✓
11. All manual integrations appropriate and completely documented?	✓			✓
12. Are nonconformances documented as NCMs?			✓	
13. Are all Chrom graphics uploaded?	✓			✓

1st Level Reviewer / Date: JRB 12-20-17 2nd Level Reviewer / Date: AN... 12/21/17

NCM # and Comments: _____

A8

Instrument ID & Date: 11-3-17 Worklist#: 49975

ICAL Batch: 192908, 192909 Calibration ID number: 36012, 36013

Review Items	-- Level 1 --			Level 2
	Yes	No	N/A	
Initial Calibration				
1. Mass calibration, as needed, verified by full scan of PFC stock standard. All PFC ions used for quantitation are within 0.3 m/z of true mass?	✓			✓
2. Responses increase with increasing concentration?	✓			✓
3. Fit used (circle): <u>Average</u> Linear (1/x ²)Linear <u>Quadratic</u> (6 points minimum)				
4. Meets fit criteria? Intercept ≤ ½ RL RSD ≤ 30% for Average R ² ≥ 0.990 for Linear R ² ≥ 0.990 for Quadratic NOTE: "Force through Zero" must be used and weighted if needed	✓			✓
5. If quadratic fit used the curve does not "bend over".	✓			✓
6. Feed calibration points into the calculated curve. Are points ≤MRL within ±50% of true value? Are points >MRL within ±30% of true value?	✓			✓
7. Any carryover from the high calibration point must be ≤ 1/3 RL	✓			✓
8. Asymmetry check meets criteria for the first two eluting peaks?.(0.8 - 1.5).	✓			✓
9. Is the asymmetry check scanned and linked in TALS to the calibration point?	✓			✓
10. Is ICV (2 nd source) ± 30% of true value?	✓			✓
11. Is ICV (2 nd source) internal standards ±50% of average area of the ICAL?	✓			✓
12. ICAL locked in Chrom and uploaded to TALS?	✓			✓
13. ICAL locked in TALS and scanned?				✓

1st Level Reviewer / Date: JRB 11-6-17

2nd Level Reviewer / Date: Murray 11/6/2017

NCM # and Comments: _____

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 18DEC2017_537C

Worklist Number: 51953

Instrument Name: A8_N

Chrom Method: 537_A8_N

Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b

QC Batching: Enabled

Limit Group Batching: Enabled

QC Batch 1	LC 537 ICAL Raw Batch: 200646
# 1 CCV L5	# 1 CCV L5
# 2 RB	# 2 RB
# 3 MB 320-199900/1-A	# 3 MB 320-199900/1-A
# 4 LCS 320-199900/2-A	# 4 LCS 320-199900/2-A
# 5 LCSD 320-199900/3-A	# 5 LCSD 320-199900/3-A
# 6 320-34181-A-1-A	# 6 320-34181-A-1-A
# 7 320-34181-A-2-A	# 7 320-34181-A-2-A
# 8 320-34181-A-3-A	# 8 320-34181-A-3-A
# 9 320-34181-A-4-A	# 9 320-34181-A-4-A
#10 320-34181-A-5-A	#10 320-34181-A-5-A
#11 320-34181-A-6-A	#11 320-34181-A-6-A
#12 320-34181-A-7-A	#12 320-34181-A-7-A
#13 CCV L3	#13 CCV L3

QC Batch 2	LC 537 ICAL Raw Batch: 200767
#13 CCV L3	#13 CCV L3
#14 RB	#14 RB
#15 320-34181-A-8-A	#15 320-34181-A-8-A
#16 320-34181-A-9-A	#16 320-34181-A-9-A
#17 320-34235-A-1-A	#17 320-34235-A-1-A
#18 320-34235-A-2-A	#18 320-34235-A-2-A
#19 320-34235-A-3-A	#19 320-34235-A-3-A
#20 320-34235-A-4-A	#20 320-34235-A-4-A
#21 CCV L5	#21 CCV L5
#22 RB	#22 RB

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 18DEC2017_537C

Worklist Num: 51953

Instrument: A8_N

Method: 537_A8_N

Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171220-51953.b

Analysis Type: SemiVOA

Creator: Royce, Amani A

Inj Volume: 2.00

Inj Vol Units: ul

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
CCV L5	320-0051953-001	CCVIS	19-Dec-2017 20:31:10	2017.12.19_537A_050.d	5	1.0		sv
RB	320-0051953-002	RB	19-Dec-2017 20:35:51	2017.12.19_537A_051.d	8	1.0		sv
MB 320-199900/1-A	320-0051953-003	MB	19-Dec-2017 20:40:31	2017.12.19_537A_052.d	34	1.0		sv
LCS 320-199900/2-A	320-0051953-004	LCS	19-Dec-2017 20:45:11	2017.12.19_537A_053.d	35	1.0		sv
LCSD 320-199900/3-A	320-0051953-005	LCSD	19-Dec-2017 20:49:52	2017.12.19_537A_054.d	36	1.0		sv
320-34181-A-1-A	320-0051953-006	Client	19-Dec-2017 20:54:32	2017.12.19_537A_055.d	37	1.0	WGNA-121117-RW-0488	sv
320-34181-A-2-A	320-0051953-007	Client	19-Dec-2017 20:59:14	2017.12.19_537A_056.d	38	1.0	WGNA-121117-FRB-0488	sv
320-34181-A-3-A	320-0051953-008	Client	19-Dec-2017 21:03:56	2017.12.19_537A_057.d	39	1.0	NAWC-121117-RW-136	sv
320-34181-A-4-A	320-0051953-009	Client	19-Dec-2017 21:08:36	2017.12.19_537A_058.d	40	1.0	NAWC-121117-FRB-136	sv
320-34181-A-5-A	320-0051953-010	Client	19-Dec-2017 21:13:17	2017.12.19_537A_059.d	41	1.0	NAWC-121117-RW-040	sv
320-34181-A-6-A	320-0051953-011	Client	19-Dec-2017 21:17:58	2017.12.19_537A_060.d	42	1.0	NAWC-121117-FRB-040	sv
320-34181-A-7-A	320-0051953-012	Client	19-Dec-2017 21:22:37	2017.12.19_537A_061.d	43	1.0	WGNA-121117-RW-4846	sv
CCV L3	320-0051953-013	CCVIS	19-Dec-2017 21:27:18	2017.12.19_537A_062.d	3	1.0		sv
RB	320-0051953-014	RB	19-Dec-2017 21:31:59	2017.12.19_537A_063.d	8	1.0		sv
320-34181-A-8-A	320-0051953-015	Client	19-Dec-2017 21:36:39	2017.12.19_537A_064.d	44	1.0	WGNA-121117-FRB-4846	sv
320-34181-A-9-A	320-0051953-016	Client	19-Dec-2017 21:41:19	2017.12.19_537A_065.d	45	1.0	WGNA-121117-DUP14	sv
320-34235-A-1-A	320-0051953-017	Client	19-Dec-2017 21:46:00	2017.12.19_537A_066.d	46	1.0	NAWC-121217-RW-061	sv
320-34235-A-2-A	320-0051953-018	Client	19-Dec-2017 21:50:39	2017.12.19_537A_067.d	47	1.0	NAWC-121217-FRB-061	sv
320-34235-A-3-A	320-0051953-019	Client	19-Dec-2017 21:55:21	2017.12.19_537A_068.d	48	1.0	NAWC-121217-RW-054	sv
320-34235-A-4-A	320-0051953-020	Client	19-Dec-2017 22:00:02	2017.12.19_537A_069.d	49	1.0	NAWC-121217-FRB-054	sv
CCV L5	320-0051953-021	CCVIS	19-Dec-2017 22:04:42	2017.12.19_537A_070.d	5	1.0		sv
RB	320-0051953-022	RB	19-Dec-2017 22:09:21	2017.12.19_537A_071.d	8	1.0		sv

TestAmerica Laboratories
 Worklist Run Log Report

Worklist Name: 18DEC2017_537A Worklist Num: 51859
 Instrument: A8_N Method: 537_A8_N
 Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171218-51859.b
 Anaylsis Type: SemiVOA Creator: Hannigan, Alyssa B
 Inj Volume: 2.00 Inj Vol Units: ul

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
CCVL	320-0051859-001	CCVL	18-Dec-2017 09:53:44	2017.12.18_537A_004.d	2	1.0		sv
CCV L3	320-0051859-002	CCVIS	18-Dec-2017 09:58:23	2017.12.18_537A_005.d	3	1.0		sv
RB	320-0051859-003	RB	18-Dec-2017 10:03:03	2017.12.18_537A_006.d	8	1.0		sv
320-34175-A-6-A	320-0051859-004	Client	18-Dec-2017 10:07:44	2017.12.18_537A_007.d	1	100.	GC121117-LHWA-PT	sv
320-34175-A-6-A	320-0051859-005	Client	18-Dec-2017 10:12:25	2017.12.18_537A_008.d	2	1.0	GC121117-LHWA-PT	sv
RB	320-0051859-006	RB	18-Dec-2017 10:17:07	2017.12.18_537A_009.d	8	1.0		sv
RB	320-0051859-007	RB	18-Dec-2017 10:21:46	2017.12.18_537A_010.d	8	1.0		sv
RB	320-0051859-008	RB	18-Dec-2017 10:26:25	2017.12.18_537A_011.d	8	1.0		sv
CCV L5	320-0051859-009	CCVIS	18-Dec-2017 10:31:04	2017.12.18_537A_012.d	5	1.0		sv
RB	320-0051859-010	RB						

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M











Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End: 12/18/2017 3:10:00PM

19 AB 12/19/17

Extraction of Perfluorinated Alkyl Acids

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	Rcvd	PHs Adj1	Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1 MB-320-199900/1 N/A	N/A		250.00 mL	7			N/A	N/A	N/A	CI ND	
			1.00 mL								
2 LCS-320-199900/2 N/A	N/A		250.00 mL	7			N/A	N/A	N/A	CI ND	
			1.00 mL								
3 LCSD-320-199900/3 N/A	N/A		250.00 mL	7			N/A	N/A	N/A	CI ND	
			1.00 mL								
4 320-34181-A-1 (537_DOD5)	N/A (320-34181-1)	255.67 g	228.6 mL	7			12/16/17	16_Days	4	CI ND	
		27.09 g	1.00 mL								
5 320-34181-A-2 (537_DOD5)	N/A (320-34181-1)	280.58 g	253.6 mL	7			12/16/17	16_Days	4	CI ND	
		27.03 g	1.00 mL								
6 320-34181-A-3 (537_DOD5)	N/A (320-34181-1)	273.58 g	246 mL	7			12/16/17	16_Days	4	CI ND	
		27.55 g	1.00 mL								
7 320-34181-A-4 (537_DOD5)	N/A (320-34181-1)	275.68 g	248.7 mL	7			12/16/17	16_Days	4	CI ND	
		26.94 g	1.00 mL								
8 320-34181-A-5 (537_DOD5)	N/A (320-34181-1)	275.87 g	248.4 mL	7			12/16/17	16_Days	4	CI ND	
		27.47 g	1.00 mL								
9 320-34181-A-6 (537_DOD5)	N/A (320-34181-1)	274.29 g	247.4 mL	7			12/16/17	16_Days	4	CI ND	
		26.91 g	1.00 mL								
10 320-34181-A-7 (537_DOD5)	N/A (320-34181-1)	274.34 g	246.8 mL	7			12/16/17	16_Days	4	CI ND	
		27.57 g	1.00 mL								

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)







Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End: 12/18/2017 3:10:00PM

11	320-34181-A-8 (537_DOD5)	N/A (320-34181-1)	277.49 g	250.3 mL	7		12/16/17	16_Days	4	CI ND	
			27.17 g	1.00 mL							
12	320-34181-A-9 (537_DOD5)	N/A (320-34181-1)	272.99 g	245.8 mL	7		12/16/17	16_Days	4	CI ND	
			27.17 g	1.00 mL							
13	320-34235-A-1 (537_DOD5)	N/A (320-34235-1)	273.57 g	246.6 mL	7		12/17/17	16_Days	4	CI ND	
			27.01 g	1.00 mL							
14	320-34235-A-2 (537_DOD5)	N/A (320-34235-1)	276.41 g	249.5 mL	7		12/17/17	16_Days	4	CI ND	
			26.87 g	1.00 mL							
15	320-34235-A-3 (537_DOD5)	N/A (320-34235-1)	274.48 g	246.9 mL	7		12/17/17	16_Days	4	CI ND	
			27.57 g	1.00 mL							
16	320-34235-A-4 (537_DOD5)	N/A (320-34235-1)	249.49 g	222.6 mL	7		12/17/17	16_Days	4	CI ND	
			26.86 g	1.00 mL							

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End: 12/18/2017 3:10:00PM

Batch Notes

Manifold ID 1,3

pH Indicator ID 4390-01 (Lot 2517)

Trizma ID SLBR4303V

SPE Cartridge ID 6357081-11

Methanol ID 1105466

Reagent Water ID 12-12-17

Internal Standard ID# 1099354

Pipette ID M16387D

Analyst ID - TA Reagent Drop JER

Analyst ID - TA Reagent Drop KMK

Witness

Analyst ID - SU Reagent Drop JER

Analyst ID - SU Reagent Drop KMK

Witness

Analyst ID - IS Reagent Drop CCB

Analyst ID - IS Reagent Drop HJA

Witness

Analyst ID - Concentration CCB/KMK

Analyst ID - Aliquot Step CCB

Analyst ID - Final Volume Step CCB

Batch Comment N/A

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End: 12/18/2017 3:10:00PM

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End:

Batch Notes

Manifold ID 1,3

pH Indicator ID 4390-01 (Lot 2517)

Trizma ID SLBR4303V

SPE Cartridge ID 6357081-11

Methanol ID 1105466

Reagent Water ID 12-12-17

Internal Standard ID# 1099354

Pipette ID M16387D

Analyst ID - TA Reagent Drop JER

Analyst ID - TA Reagent Drop Witness KMK

Analyst ID - SU Reagent Drop JER

Analyst ID - SU Reagent Drop Witness KMK

Analyst ID - IS Reagent Drop CES

Analyst ID - IS Reagent Drop Witness HQA

Analyst ID - Concentration nights

Analyst ID - Aliquot Step CES

Analyst ID - Final Volume Step CES

Batch Comment N/A

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End:

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-199900/1	LC537-SU_00056	100 uL	1.00 mL	<i>[Signature]</i>	KMK 12-14-17
LCS 320-199900/2	LC537-HSP_00023	100 uL	1.00 mL		
LCS 320-199900/2	LC537-SU_00056	100 uL	1.00 mL	↓	↓
LCSD 320-199900/3	LC537-HSP_00023	100 uL	1.00 mL		
LCSD 320-199900/3	LC537-SU_00056	100 uL	1.00 mL		
320-34181-A-1	LC537-SU_00056	100 uL	1.00 mL		
320-34181-A-2	LC537-SU_00056	100 uL	1.00 mL		
320-34181-A-3	LC537-SU_00056	100 uL	1.00 mL		
320-34181-A-4	LC537-SU_00056	100 uL	1.00 mL		
320-34181-A-5	LC537-SU_00056	100 uL	1.00 mL		
320-34181-A-6	LC537-SU_00056	100 uL	1.00 mL		
320-34181-A-7	LC537-SU_00056	100 uL	1.00 mL		
320-34181-A-8	LC537-SU_00056	100 uL	1.00 mL		
320-34181-A-9	LC537-SU_00056	100 uL	1.00 mL		
320-34235-A-1	LC537-SU_00056	100 uL	1.00 mL		
320-34235-A-2	LC537-SU_00056	100 uL	1.00 mL		
320-34235-A-3	LC537-SU_00056	100 uL	1.00 mL		
320-34235-A-4	LC537-SU_00056	100 uL	1.00 mL		

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End:

Other Reagents:		
Reagent	Amount/Units	Lot#:

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Preparation Batch Number(s) 199900 Test 537-Prep

Earliest Holding Time 12-25-17

Batch Information	1 st Level Reviewer	2 nd Level Reviewer
Date and time accurate and entered into TALS correctly	✓	✓
All necessary batch information complete and entered into TALS correctly	✓	✓
BD, FV, and AL initials are transcribed into the batch comment	✓	✓
Sample List Tab	1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method	✓	✓
Holding time violation NCM filed	NA	NA
MS/MSD or MS/DU NCM filed	✓	✓
NCM for any anomalies filed	NA	NA
All NCMs include method code, matrix, and prep batch	✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Batch contains no more than 20 live samples	✓	✓
Worksheet Tab	1 st Level Reviewer	2 nd Level Reviewer
All samples properly preserved	✓	✓
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check)	✓	✓
The pH is transcribed properly in TALS	✓	✓
All additional information is transcribed into TALS and is correct and raw data is attached	✓	✓
Comments/Observations are transcribed correctly in TALS	✓	✓
Reagents Tab	1 st Level Reviewer	2 nd Level Reviewer
All necessary reagents not expired and checked into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Internal Standard is added to the reagents	✓	✓
All units are correctly transcribed into TALS	✓	✓

1st Level Reviewer: 

Date: 12/18/17

2nd Level Reviewer: VPM

Date: 12/19/17

Comments: _____

Shipping and Receiving Documents

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

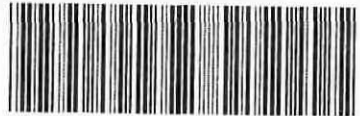

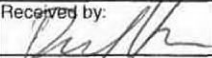
Chain of Custody Record



THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: DW NPDES RCRA Other:

Client Contact		Project Manager: Andy Frebowitz		Site Contact: Mary Kay Bond		Date: 12/12/2017		COC No.:	
TetraTech		Tel/Fax: 610.382.1170		Lab Contact: Dave Alltucker		Carrier: FedEx		1 of 1 COCs	
234 Mall Boulevard Suite 260		Analysis Turnaround Time		Filtered Sample (Y/N) Perform MS/MSD (Y/N) EPA 537 UCMR3				Sampler: Mary Kay Bond For Lab Use Only: Walk-in Client: _____ Lab Sampling: _____ Job / SDG No.: _____ Sample Specific Notes: _____	
King of Prussia, PA 19406		<input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS							
610-382-1174		TAT if different from Below 21							
610-491-9688		<input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day							
Project Name: WE04									
Site: WE04									
P O # 1132358 (through EarthToxics)									
Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	EPA 537 UCMR3	
NAWC-121217-RW-061	12/12/2017	09:10	G	DW	2	N	N	Y	
NAWC-121217-FRB-061	12/12/2017	09:05	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-121217-RW-054	12/12/2017	10:10	G	DW	2	N	N	Y	
NAWC-121217-FRB-054	12/12/2017	10:05	G	DW	2	N	N	Y	Field Reagent Blank
 320-34235 Chain of Custody									
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other: Trizma					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)				
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the					<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months				
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown									
Fed Ex Tracking: 7709 6823 2188									
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temp. (°C): Obs'd: 4.7		Corr'd: _____		Therm ID No.: AK2	
Relinquished by: 		Company: Tetra Tech		Date/Time: 12/12/2017 16:00		Received by: 		Company: THWS	
Relinquished by:		Company:		Date/Time:		Received by:		Date/Time: 12/13/17 1020	
Relinquished by:		Company:		Date/Time:		Received in Laboratory by:		Date/Time:	

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Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-34235-1

Login Number: 34235
List Number: 1
Creator: Aguayo, Alonso

List Source: TestAmerica Sacramento

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

"NAWC-121217-RW-061", "537", "RES", "320-34235-1", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "27", "ng/L", "J M", "6.9", "DL", "", "TRG", "", "", "41", "LOQ", "YES", "-99", "", "246.6", "1.00", "16", ""

"NAWC-121217-RW-061", "537", "RES", "320-34235-1", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "18", "ng/L", "J", "2.8", "DL", "", "TRG", "", "", "20", "LOQ", "YES", "-99", "", "246.6", "1.00", "8.1", ""

"NAWC-121217-RW-061", "537", "RES", "320-34235-1", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "11", "ng/L", "J", "5.6", "DL", "", "TRG", "", "", "30", "LOQ", "YES", "-99", "", "246.6", "1.00", "12", ""

"NAWC-121217-RW-061", "537", "RES", "320-34235-1", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "36", "ng/L", "U", "16", "DL", "", "TRG", "", "", "91", "LOQ", "YES", "-99", "", "246.6", "1.00", "36", ""

"NAWC-121217-RW-061", "537", "RES", "320-34235-1", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "5.0", "ng/L", "J", "1.9", "DL", "", "TRG", "", "", "10", "LOQ", "YES", "-99", "", "246.6", "1.00", "4.1", ""

"NAWC-121217-RW-061", "537", "RES", "320-34235-1", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "20", "ng/L", "U", "8.1", "DL", "", "TRG", "", "", "24", "LOQ", "YES", "-99", "", "246.6", "1.00", "20", ""

"NAWC-121217-RW-061", "537", "RES", "320-34235-1", "TALSAC", "STL00993", "13C2
PFHxA", "38", "ng/L", "", "-99", "DL", "", "SURR", "93", "", "-99", "LOQ", "YES", "40.6", "", "246.6", "1.00", "0", ""

"NAWC-121217-RW-061", "537", "RES", "320-34235-1", "TALSAC", "STL00996", "13C2
PFDA", "39", "ng/L", "", "-99", "DL", "", "SURR", "95", "", "-99", "LOQ", "YES", "40.6", "", "246.6", "1.00", "0", ""

"NAWC-121217-FRB-061", "537", "RES", "320-34235-2", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "16", "ng/L", "U", "6.8", "DL", "", "TRG", "", "", "40", "LOQ", "YES", "-99", "", "249.5", "1.00", "16", ""

"NAWC-121217-FRB-061", "537", "RES", "320-34235-2", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "8.0", "ng/L", "U", "2.8", "DL", "", "TRG", "", "", "20", "LOQ", "YES", "-99", "", "249.5", "1.00", "8.0", ""

"NAWC-121217-FRB-061", "537", "RES", "320-34235-2", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "12", "ng/L", "U", "5.5", "DL", "", "TRG", "", "", "30", "LOQ", "YES", "-99", "", "249.5", "1.00", "12", ""

"NAWC-121217-FRB-061", "537", "RES", "320-34235-2", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "36", "ng/L", "U", "16", "DL", "", "TRG", "", "", "90", "LOQ", "YES", "-99", "", "249.5", "1.00", "36", ""

"NAWC-121217-FRB-061", "537", "RES", "320-34235-2", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "4.0", "ng/L", "U", "1.9", "DL", "", "TRG", "", "", "10", "LOQ", "YES", "-99", "", "249.5", "1.00", "4.0", ""

"NAWC-121217-FRB-061", "537", "RES", "320-34235-2", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "20", "ng/L", "U", "8.0", "DL", "", "TRG", "", "", "24", "LOQ", "YES", "-99", "", "249.5", "1.00", "20", ""

"NAWC-121217-FRB-061", "537", "RES", "320-34235-2", "TALSAC", "STL00993", "13C2
PFHxA", "31", "ng/L", "", "-99", "DL", "", "SURR", "77", "", "-99", "LOQ", "YES", "40.1", "", "249.5", "1.00", "0", ""

"NAWC-121217-FRB-061", "537", "RES", "320-34235-2", "TALSAC", "STL00996", "13C2
PFDA", "36", "ng/L", "", "-99", "DL", "", "SURR", "89", "", "-99", "LOQ", "YES", "40.1", "", "249.5", "1.00", "0", ""

"NAWC-121217-RW-054", "537", "RES", "320-34235-3", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "21", "ng/L", "J M", "6.9", "DL", "", "TRG", "", "", "41", "LOQ", "YES", "-99", "", "246.9", "1.00", "16", ""

"NAWC-121217-RW-054", "537", "RES", "320-34235-3", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "23", "ng/L", "", "2.8", "DL", "", "TRG", "", "", "20", "LOQ", "YES", "-99", "", "246.9", "1.00", "8.1", ""

"NAWC-121217-RW-054", "537", "RES", "320-34235-3", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "11", "ng/L", "J", "5.6", "DL", "", "TRG", "", "", "30", "LOQ", "YES", "-99", "", "246.9", "1.00", "12", ""

"NAWC-121217-RW-054", "537", "RES", "320-34235-3", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "36", "ng/L", "U", "16", "DL", "", "TRG", "", "", "91", "LOQ", "YES", "-99", "", "246.9", "1.00", "36", ""

"NAWC-121217-RW-054", "537", "RES", "320-34235-3", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "5.6", "ng/L", "J", "1.9", "DL", "", "TRG", "", "", "10", "LOQ", "YES", "-99", "", "246.9", "1.00", "4.1", ""

"NAWC-121217-RW-054", "537", "RES", "320-34235-3", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "20", "ng/L", "U", "8.1", "DL", "", "TRG", "", "", "24", "LOQ", "YES", "-99", "", "246.9", "1.00", "20", ""

"NAWC-121217-RW-054", "537", "RES", "320-34235-3", "TALSAC", "STL00993", "13C2
PFHxA", "34", "ng/L", "", "-99", "DL", "", "SURR", "83", "", "-99", "LOQ", "YES", "40.5", "", "246.9", "1.00", "0", ""

"NAWC-121217-RW-054", "537", "RES", "320-34235-3", "TALSAC", "STL00996", "13C2
PFDA", "36", "ng/L", "", "-99", "DL", "", "SURR", "88", "", "-99", "LOQ", "YES", "40.5", "", "246.9", "1.00", "0", ""

"NAWC-121217-FRB-054", "537", "RES", "320-34235-4", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "18", "ng/L", "U", "7.6", "DL", "", "TRG", "", "", "45", "LOQ", "YES", "-99", "", "222.6", "1.00", "18", ""

"NAWC-121217-FRB-054", "537", "RES", "320-34235-4", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "9.0", "ng/L", "U", "3.1", "DL", "", "TRG", "", "", "22", "LOQ", "YES", "-99", "", "222.6", "1.00", "9.0", ""

"NAWC-121217-FRB-054", "537", "RES", "320-34235-4", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid

(PFHxS),"13","ng/L","U","6.2","DL","","TRG","","","34","LOQ","YES",-99,"","222.6","1.00","13",""
"NAWC-121217-FRB-054","537","RES","320-34235-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"40","ng/L","U","18","DL","","TRG","","","100","LOQ","YES",-99,"","222.6","1.00","40",""
"NAWC-121217-FRB-054","537","RES","320-34235-4","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"4.5","ng/L","U","2.1","DL","","TRG","","","11","LOQ","YES",-99,"","222.6","1.00","4.5",""
"NAWC-121217-FRB-054","537","RES","320-34235-4","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"22","ng/L","U","9.0","DL","","TRG","","","27","LOQ","YES",-99,"","222.6","1.00","22",""
"NAWC-121217-FRB-054","537","RES","320-34235-4","TALSAC","STL00993","13C2
PFHxA","41","ng/L","","-99","DL","","SURR","92","","-99","LOQ","YES","44.9","","222.6","1.00","0",""
"NAWC-121217-FRB-054","537","RES","320-34235-4","TALSAC","STL00996","13C2
PFDA","38","ng/L","","-99","DL","","SURR","84","","-99","LOQ","YES","44.9","","222.6","1.00","0",""
"LCS 320-199900/2-A","537","RES","LCS 320-199900/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"223","ng/L","M","6.8","DL","","SPK","100","","40","LOQ","YES","222","","250.00","1.00","16",""
"LCS 320-199900/2-A","537","RES","LCS 320-199900/2-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"110","ng/L","","2.8","DL","","SPK","99","","20","LOQ","YES","111","","250.00","1.00","8.0",""
"LCS 320-199900/2-A","537","RES","LCS 320-199900/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"183","ng/L","","5.5","DL","","SPK","110","","30","LOQ","YES","167","","250.00","1.00","12",""
"LCS 320-199900/2-A","537","RES","LCS 320-199900/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"494","ng/L","","16","DL","","SPK","99","","90","LOQ","YES","500","","250.00","1.00","36",""
"LCS 320-199900/2-A","537","RES","LCS 320-199900/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"62.1","ng/L","","1.9","DL","","SPK","112","","10","LOQ","YES","55.6","","250.00","1.00","4.0",""
"LCS 320-199900/2-A","537","RES","LCS 320-199900/2-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"109","ng/L","","8.0","DL","","SPK","98","","24","LOQ","YES","111","","250.00","1.00","20",""
"LCS 320-199900/2-A","537","RES","LCS 320-199900/2-A","TALSAC","STL00993","13C2
PFHxA","38.7","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","40.0","","250.00","1.00","0",""
"LCS 320-199900/2-A","537","RES","LCS 320-199900/2-A","TALSAC","STL00996","13C2
PFDA","39.0","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","40.0","","250.00","1.00","0",""
"LCSD 320-199900/3-A","537","RES","LCSD 320-199900/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic
acid (PFOS),"216","ng/L","M","6.8","DL","","SPK","97","3","40","LOQ","YES","222","LCS 320-199900/2-
A","250.00","1.00","16",""
"LCSD 320-199900/3-A","537","RES","LCSD 320-199900/3-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"109","ng/L","","2.8","DL","","SPK","98","1","20","LOQ","YES","111","LCS 320-199900/2-
A","250.00","1.00","8.0",""
"LCSD 320-199900/3-A","537","RES","LCSD 320-199900/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic
acid (PFHxS),"174","ng/L","","5.5","DL","","SPK","104","5","30","LOQ","YES","167","LCS 320-199900/2-
A","250.00","1.00","12",""
"LCSD 320-199900/3-A","537","RES","LCSD 320-199900/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"480","ng/L","","16","DL","","SPK","96","3","90","LOQ","YES","500","LCS 320-199900/2-
A","250.00","1.00","36",""
"LCSD 320-199900/3-A","537","RES","LCSD 320-199900/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"60.0","ng/L","","1.9","DL","","SPK","108","3","10","LOQ","YES","55.6","LCS 320-199900/2-
A","250.00","1.00","4.0",""
"LCSD 320-199900/3-A","537","RES","LCSD 320-199900/3-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"106","ng/L","","8.0","DL","","SPK","95","3","24","LOQ","YES","111","LCS 320-199900/2-
A","250.00","1.00","20",""
"LCSD 320-199900/3-A","537","RES","LCSD 320-199900/3-A","TALSAC","STL00993","13C2
PFHxA","38.8","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","40.0","LCS 320-199900/2-
A","250.00","1.00","0",""
"LCSD 320-199900/3-A","537","RES","LCSD 320-199900/3-A","TALSAC","STL00996","13C2
PFDA","41.1","ng/L","","-99","DL","","SURR","103","","-99","LOQ","YES","40.0","LCS 320-199900/2-
A","250.00","1.00","0",""
"MB 320-199900/1-A","537","RES","MB 320-199900/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES",-99,"","250.00","1.00","16",""
"MB 320-199900/1-A","537","RES","MB 320-199900/1-A","TALSAC","335-67-1","Perfluorooctanoic acid

(PFOA),"8.0","ng/L","U","2.8","DL","","","TRG","","","20","LOQ","YES",-99","","250.00","1.00","8.0","","
"MB 320-199900/1-A","537","RES","MB 320-199900/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.5","DL","","","TRG","","","30","LOQ","YES",-99","","250.00","1.00","12","","
"MB 320-199900/1-A","537","RES","MB 320-199900/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","","TRG","","","90","LOQ","YES",-99","","250.00","1.00","36","","
"MB 320-199900/1-A","537","RES","MB 320-199900/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.0","ng/L","U","1.9","DL","","","TRG","","","10","LOQ","YES",-99","","250.00","1.00","4.0","","
"MB 320-199900/1-A","537","RES","MB 320-199900/1-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","20","ng/L","U","8.0","DL","","","TRG","","","24","LOQ","YES",-99","","250.00","1.00","20","","
"MB 320-199900/1-A","537","RES","MB 320-199900/1-A","TALSAC","STL00993","13C2
PFHxA","37.3","ng/L","","-99","DL","","","SURR","93","","-99","LOQ","YES","40.0","","250.00","1.00","0","","
"MB 320-199900/1-A","537","RES","MB 320-199900/1-A","TALSAC","STL00996","13C2
PFDA","38.3","ng/L","","-99","DL","","","SURR","96","","-99","LOQ","YES","40.0","","250.00","1.00","0","","
"Unknown","Unknown","NAWC-121217-RW-061","12/12/2017 09:10","AQ","320-34235-
1","NM","","4.70","537","METHOD","RES","12/14/2017 12:48","12/19/2017
21:46","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199900","320-199900","NA","320-
200767","320-34235-1","12/13/2017 10:20","12/13/2017 17:30","","
"Unknown","Unknown","NAWC-121217-FRB-061","12/12/2017 09:05","AQ","320-34235-
2","FB","","4.70","537","METHOD","RES","12/14/2017 12:48","12/19/2017
21:50","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199900","320-199900","NA","320-
200767","320-34235-1","12/13/2017 10:20","12/13/2017 17:30","","
"Unknown","Unknown","NAWC-121217-RW-054","12/12/2017 10:10","AQ","320-34235-
3","NM","","4.70","537","METHOD","RES","12/14/2017 12:48","12/19/2017
21:55","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199900","320-199900","NA","320-
200767","320-34235-1","12/13/2017 10:20","12/13/2017 17:30","","
"Unknown","Unknown","NAWC-121217-FRB-054","12/12/2017 10:05","AQ","320-34235-
4","FB","","4.70","537","METHOD","RES","12/14/2017 12:48","12/19/2017
22:00","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199900","320-199900","NA","320-
200767","320-34235-1","12/13/2017 10:20","12/13/2017 17:30","","
"Unknown","Unknown","LCS 320-199900/2-A","","AQ","LCS 320-199900/2-
A","LCS","","-99","537","METHOD","RES","12/14/2017 12:48","12/19/2017
20:45","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199900","320-199900","NA","320-
200646","320-34235-1","12/14/2017 12:48","12/13/2017 17:30","","
"Unknown","Unknown","LCSD 320-199900/3-A","","AQ","LCSD 320-199900/3-
A","LCSD","","-99","537","METHOD","RES","12/14/2017 12:48","12/19/2017
20:49","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199900","320-199900","NA","320-
200646","320-34235-1","12/14/2017 12:48","12/13/2017 17:30","","
"Unknown","Unknown","MB 320-199900/1-A","","AQ","MB 320-199900/1-
A","MB","","-99","537","METHOD","RES","12/14/2017 12:48","12/19/2017
20:40","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199900","320-199900","NA","320-
200646","320-34235-1","12/14/2017 12:48","12/13/2017 17:30","","



TO: A. FREBOWITZ **DATE:** JANUARY 12, 2018
FROM: TERRI L. SOLOMON **COPIES:** DV FILE
SUBJECT: ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)
NAS JRB WILLOW GROVE
SAMPLE DELIVERY GROUP (SDG) 320-34235-1

SAMPLES: 2/Field Reagent Blank (FRB)
NAWC-121217-FRB-054 NAWC-121217-FRB-061

2/Drinking Water
NAWC-121217-RW-054 NAWC-121217-RW-061

Overview

The sample set for NAS JRB Willow Grove, SDG 320-34235-1, consisted of two (2) drinking water samples and two (2) FRB samples. All samples were analyzed for select perfluorinated alkyl acids including pentadecafluorooctanoic acid (PFOA), perfluorobutane sulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA) and perfluorooctane sulfonic acid (PFOS). No field duplicate sample pairs were included in this SDG.

The samples were collected by Tetra Tech on December 12, 2017 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, initial/continuing calibrations, laboratory method/FRBs, surrogate spike recoveries, laboratory control sample / laboratory control sample duplicate results, internal standard areas and recoveries, chromatographic resolution, analyte identification, analyte quantitation, and detection limits. Areas of concern are listed below.

Major

None.

Minor

Detected results reported below the limit of quantitation (LOQ) but above the detection limit (DL) were qualified as estimated, (J).

Notes

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

<u>Sample</u>	<u>Associated FRB</u>
NAWC-121217-RW-054	NAWC-121217-FRB-054
NAWC-121217-RW-061	NAWC-121217-FRB-061

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

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

TO: A. FREBOWITZ
SDG: 320-34235-1

PAGE 2

Executive Summary

Laboratory Performance: No issues.

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

The data for these analyses were reviewed with reference to the Environmental Protection Agency document EPA/600/R-08/092, Method 537, "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)", (September 2009) and the US EPA National Functional Guidelines for Organic Data Review (January 2017) as applicable. The text of this report has been formulated to address only those areas affecting data quality.



Tetra Tech, Inc.
Terri L. Solomon
Chemist/Data Validator



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

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

Data Qualifier Definitions

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

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

Appendix A

Qualified Analytical Results

Qualifier Codes:

- A = Lab Blank Contamination
- B = Field Blank Contamination
- C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
- C01 = GC/MS Tuning Noncompliance
- D = MS/MSD Recovery Noncompliance
- E = LCS/LCSD Recovery Noncompliance
- F = Lab Duplicate Imprecision
- G = Field Duplicate Imprecision
- H = Holding Time Exceedance
- I = ICP Serial Dilution Noncompliance
- J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
- K = ICP Interference - includes ICS % R Noncompliance
- L = Instrument Calibration Range Exceedance
- M = Sample Preservation Noncompliance
- N = Internal Standard Noncompliance
- N01 = Internal Standard Recovery Noncompliance Dioxins
- N02 = Recovery Standard Noncompliance Dioxins
- N03 = Clean-up Standard Noncompliance Dioxins
- O = Poor Instrument Performance (i.e., base-time drifting)
- P = Uncertainty near detection limit ($< 2 \times$ IDL for inorganics and $<$ CRQL for organics)
- Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
- R = Surrogates Recovery Noncompliance
- S = Pesticide/PCB Resolution
- T = % Breakdown Noncompliance for DDT and Endrin
- U = RPD between columns/detectors $>40\%$ for positive results determined via GC/HPLC
- V = Non-linear calibrations; correlation coefficient $r < 0.995$
- W = EMPC result
- X = Signal to noise response drop
- Y = Percent solids $<30\%$
- Z = Uncertainty at 2 standard deviations is greater than sample activity
- Z1 = Tentatively Identified Compound considered presumptively present
- Z2 = Tentatively Identified Compound column bleed
- Z3 = Tentatively Identified Compound aldol condensate
- Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
- Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04 SDG: 320-34235-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	NAWC-121217-FRB-054			NAWC-121217-FRB-061			NAWC-121217-RW-054			NAWC-121217-RW-061		
	LAB_ID	320-34235-4			320-34235-2			320-34235-3			320-34235-1		
	SAMP_DATE	12/12/2017			12/12/2017			12/12/2017			12/12/2017		
	QC_TYPE	FB			FB			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
PENTADECAFLUOROOCTANOIC ACID	9	U		8	U		23			18	J	P	
PERFLUOROBUTANESULFONIC ACID	40	U		36	U		36	U		36	U		
PERFLUOROHEPTANOIC ACID	4.5	U		4	U		5.6	J	P	5	J	P	
PERFLUOROHXANESULFONIC ACID	13	U		12	U		11	J	P	11	J	P	
PERFLUORONONANOIC ACID	22	U		20	U		20	U		20	U		
PERFLUOROOCTANE SULFONIC ACID	18	U		16	U		21	J	P	27	J	P	

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Client Sample ID: NAWC-121217-RW-061 Lab Sample ID: 320-34235-1
 Matrix: Water Lab File ID: 2017.12.19_537A_066.d
 Analysis Method: 537 Date Collected: 12/12/2017 09:10
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 246.6(mL) Date Analyzed: 12/19/2017 21:46
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200767 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	27	J M	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	18	J	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	J	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.0	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	95		70-130

Amir L. Salaman
01/12/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Client Sample ID: NAWC-121217-FRB-061 Lab Sample ID: 320-34235-2
 Matrix: Water Lab File ID: 2017.12.19_537A_067.d
 Analysis Method: 537 Date Collected: 12/12/2017 09:05
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 249.5 (mL) Date Analyzed: 12/19/2017 21:50
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200767 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	77		70-130
STL00996	13C2 PFDA	89		70-130

W. L. Selman
01/12/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Client Sample ID: NAWC-121217-RW-054 Lab Sample ID: 320-34235-3
 Matrix: Water Lab File ID: 2017.12.19_537A_068.d
 Analysis Method: 537 Date Collected: 12/12/2017 10:10
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 246.9(mL) Date Analyzed: 12/19/2017 21:55
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200767 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J M	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	23		20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	J	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.6	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	83		70-130
STL00996	13C2 PFDA	88		70-130

Wesley L. Salaman
01/12/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Client Sample ID: NAWC-121217-FRB-054 Lab Sample ID: 320-34235-4
 Matrix: Water Lab File ID: 2017.12.19_537A_069.d
 Analysis Method: 537 Date Collected: 12/12/2017 10:05
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 222.6(mL) Date Analyzed: 12/19/2017 22:00
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200767 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	18	U	45	18	7.6
335-67-1	Perfluorooctanoic acid (PFOA)	9.0	U	22	9.0	3.1
375-95-1	Perfluorononanoic acid (PFNA)	22	U	27	22	9.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	13	U	34	13	6.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.5	U	11	4.5	2.1
375-73-5	Perfluorobutanesulfonic acid (PFBS)	40	U	100	40	18

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	92		70-130
STL00996	13C2 PFDA	84		70-130

Wesley L. Selman
01/12/2018

Appendix B

Results as Reported by the Laboratory

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Client Sample ID: NAWC-121217-RW-061 Lab Sample ID: 320-34235-1
 Matrix: Water Lab File ID: 2017.12.19_537A_066.d
 Analysis Method: 537 Date Collected: 12/12/2017 09:10
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 246.6(mL) Date Analyzed: 12/19/2017 21:46
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200767 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	27	J M	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	18	J	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	J	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.0	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	95		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Client Sample ID: NAWC-121217-FRB-061 Lab Sample ID: 320-34235-2
 Matrix: Water Lab File ID: 2017.12.19_537A_067.d
 Analysis Method: 537 Date Collected: 12/12/2017 09:05
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 249.5 (mL) Date Analyzed: 12/19/2017 21:50
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200767 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	77		70-130
STL00996	13C2 PFDA	89		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Client Sample ID: NAWC-121217-RW-054 Lab Sample ID: 320-34235-3
 Matrix: Water Lab File ID: 2017.12.19_537A_068.d
 Analysis Method: 537 Date Collected: 12/12/2017 10:10
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 246.9(mL) Date Analyzed: 12/19/2017 21:55
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200767 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J M	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	23		20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	J	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.6	J	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	83		70-130
STL00996	13C2 PFDA	88		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Client Sample ID: NAWC-121217-FRB-054 Lab Sample ID: 320-34235-4
 Matrix: Water Lab File ID: 2017.12.19_537A_069.d
 Analysis Method: 537 Date Collected: 12/12/2017 10:05
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 222.6(mL) Date Analyzed: 12/19/2017 22:00
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200767 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	18	U	45	18	7.6
335-67-1	Perfluorooctanoic acid (PFOA)	9.0	U	22	9.0	3.1
375-95-1	Perfluorononanoic acid (PFNA)	22	U	27	22	9.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	13	U	34	13	6.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.5	U	11	4.5	2.1
375-73-5	Perfluorobutanesulfonic acid (PFBS)	40	U	100	40	18

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	92		70-130
STL00996	13C2 PFDA	84		70-130

Appendix C



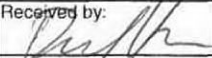
Support Documentation

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

Chain of Custody Record

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.

Regulatory Program: DW NPDES RCRA Other:

Client Contact		Project Manager: Andy Frebowitz		Site Contact: Mary Kay Bond		Date: 12/12/2017		COC No.:	
TetraTech		Tel/Fax: 610.382.1170		Lab Contact: Dave Alltucker		Carrier: FedEx		1 of 1 COCs	
234 Mall Boulevard Suite 260		Analysis Turnaround Time		Filtered Sample (Y/N) Perform MS/MSD (Y/N) EPA 537 UCMR3				Sampler: Mary Kay Bond For Lab Use Only: Walk-in Client: Lab Sampling: Job / SDG No.:	
King of Prussia, PA 19406		<input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS							
610-382-1174		TAT if different from Below 21							
610-491-9688		<input type="checkbox"/> 2 weeks							
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							
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	Sample Specific Notes:
NAWC-121217-RW-061		12/12/2017	09:10	G	DW	2	N	Y	
NAWC-121217-FRB-061		12/12/2017	09:05	G	DW	2	N	Y	Field Reagent Blank
NAWC-121217-RW-054		12/12/2017	10:10	G	DW	2	N	Y	
NAWC-121217-FRB-054		12/12/2017	10:05	G	DW	2	N	Y	Field Reagent Blank
 320-34235 Chain of Custody									
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other: Trizma					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)				
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the					<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months				
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown									
Fed Ex Tracking: 7709 6823 2188									
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temp. (°C): Obs'd: 4.7		Corr'd:		Therm ID No.: AK2	
Relinquished by: 		Company: Tetra Tech		Date/Time: 12/12/2017 16:00		Received by: 		Company: TAWS	
Relinquished by:		Company:		Date/Time:		Received by:		Date/Time: 12/13/17 1020	
Relinquished by:		Company:		Date/Time:		Received in Laboratory by:		Date/Time:	

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Job Narrative
320-34235-1

Receipt

The samples were received on 12/13/2017 10:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.7° C.

LCMS

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

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 320-199900.

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: 320-34235-1

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

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

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

TestAmerica Job ID: 320-34235-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-34235-1	NAWC-121217-RW-061	Water	12/12/17 09:10	12/13/17 10:20
320-34235-2	NAWC-121217-FRB-061	Water	12/12/17 09:05	12/13/17 10:20
320-34235-3	NAWC-121217-RW-054	Water	12/12/17 10:10	12/13/17 10:20
320-34235-4	NAWC-121217-FRB-054	Water	12/12/17 10:05	12/13/17 10:20

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1

SDG No.: _____

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-121217-RW-061	320-34235-1	93	95
NAWC-121217-FRB-061	320-34235-2	77	89
NAWC-121217-RW-054	320-34235-3	83	88
NAWC-121217-FRB-054	320-34235-4	92	84
	MB 320-199900/1-A	93	96
	LCS 320-199900/2-A	97	98
	LCSD 320-199900/3-A	97	103

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.: 320-34235-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2017.12.19_537A_053.d
 Lab ID: LCS 320-199900/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	222	223	100	70-130	M
Perfluorooctanoic acid (PFOA)	111	110	99	70-130	
Perfluorononanoic acid (PFNA)	111	109	98	70-130	
Perfluorohexanesulfonic acid (PFHxS)	167	183	110	70-130	
Perfluoroheptanoic acid (PFHpA)	55.6	62.1	112	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	494	99	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.: 320-34235-1

SDG No.: _____

Matrix: Water Level: Low Lab File ID: 2017.12.19_537A_054.d

Lab ID: LCSD 320-199900/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	222	216	97	3	30	70-130	M
Perfluorooctanoic acid (PFOA)	111	109	98	1	30	70-130	
Perfluorononanoic acid (PFNA)	111	106	95	3	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	167	174	104	5	30	70-130	
Perfluoroheptanoic acid (PFHpA)	55.6	60.0	108	3	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	480	96	3	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.: 320-34235-1
 SDG No.: _____
 Lab File ID: 2017.12.19_537A_052.d Lab Sample ID: MB 320-199900/1-A
 Matrix: Water Date Extracted: 12/14/2017 12:48
 Instrument ID: A8_N Date Analyzed: 12/19/2017 20:40
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-199900/2-A	2017.12.19_537A_053.d	12/19/2017 20:45
	LCSD 320-199900/3-A	2017.12.19_537A_054.d	12/19/2017 20:49
NAWC-121217-RW-061	320-34235-1	2017.12.19_537A_066.d	12/19/2017 21:46
NAWC-121217-FRB-061	320-34235-2	2017.12.19_537A_067.d	12/19/2017 21:50
NAWC-121217-RW-054	320-34235-3	2017.12.19_537A_068.d	12/19/2017 21:55
NAWC-121217-FRB-054	320-34235-4	2017.12.19_537A_069.d	12/19/2017 22:00

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-199900/1-A
 Matrix: Water Lab File ID: 2017.12.19_537A_052.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 12/14/2017 12:48
 Sample wt/vol: 250.00 (mL) Date Analyzed: 12/19/2017 20:40
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 200646 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	93		70-130
STL00996	13C2 PFDA	96		70-130

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Instrument ID: A8_N Calibration Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 11/03/2017 14:01
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	1535518	1.91	3276559	2.15		
UPPER LIMIT	2303277	2.41	4914839	2.65		
LOWER LIMIT	767759	1.41	1638280	1.65		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCVL 320-192908/11		1586829	1.91	3305852	2.15	
ICV 320-192908/13		1512045	1.90	3433628	2.14	
CCV 320-200646/1 CCVIS		1495978	1.81	3096651	2.06	
MB 320-199900/1-A		1460001	1.81	3186036	2.07	
LCS 320-199900/2-A		1457783	1.81	3055078	2.07	
LCSD 320-199900/3-A		1467291	1.81	3102295	2.07	
CCV 320-200646/13 CCVIS		1490421	1.81	3162377	2.06	
CCV 320-200767/13 CCVIS		1490421	1.81	3162377	2.06	
320-34235-1	NAWC-121217-RW-061	1539640	1.81	3335126	2.07	
320-34235-2	NAWC-121217-FRB-061	1568496	1.81	3201291	2.06	
320-34235-3	NAWC-121217-RW-054	1613661	1.81	3364132	2.06	
320-34235-4	NAWC-121217-FRB-054	1598402	1.81	3306781	2.06	
CCV 320-200767/21 CCVIS		1464558	1.81	3048007	2.07	

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.: 320-34235-1
 SDG No.: _____
 Sample No.: CCV 320-200646/1 Date Analyzed: 12/19/2017 20:31
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.19_537A_050 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1495978	1.81	3096651	2.06		
UPPER LIMIT	2094369	2.31	4335311	2.56		
LOWER LIMIT	1047185	1.31	2167656	1.56		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-199900/1-A		1460001	1.81	3186036	2.07	
LCS 320-199900/2-A		1457783	1.81	3055078	2.07	
LCSD 320-199900/3-A		1467291	1.81	3102295	2.07	

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.: 320-34235-1
 SDG No.: _____
 Sample No.: CCV 320-200646/13 Date Analyzed: 12/19/2017 21:27
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.19_537A_062 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1490421	1.81	3162377	2.06		
UPPER LIMIT	2086589	2.31	4427328	2.56		
LOWER LIMIT	1043295	1.31	2213664	1.56		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-199900/1-A		1460001	1.81	3186036	2.07	
LCS 320-199900/2-A		1457783	1.81	3055078	2.07	
LCSD 320-199900/3-A		1467291	1.81	3102295	2.07	

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.: 320-34235-1
 SDG No.: _____
 Sample No.: CCV 320-200767/13 Date Analyzed: 12/19/2017 21:27
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.19_537A_062 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1490421	1.81	3162377	2.06		
UPPER LIMIT	2086589	2.31	4427328	2.56		
LOWER LIMIT	1043295	1.31	2213664	1.56		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-34235-1	NAWC-121217-RW-061	1539640	1.81	3335126	2.07	
320-34235-2	NAWC-121217-FRB-061	1568496	1.81	3201291	2.06	
320-34235-3	NAWC-121217-RW-054	1613661	1.81	3364132	2.06	
320-34235-4	NAWC-121217-FRB-054	1598402	1.81	3306781	2.06	

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.: 320-34235-1
 SDG No.: _____
 Sample No.: CCV 320-200767/21 Date Analyzed: 12/19/2017 22:04
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.12.19_537A_070 Heated Purge: (Y/N) N
 Calibration ID: 36012

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1464558	1.81	3048007	2.07		
UPPER LIMIT	2050381	2.31	4267210	2.57		
LOWER LIMIT	1025191	1.31	2133605	1.57		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-34235-1	NAWC-121217-RW-061	1539640	1.81	3335126	2.07	
320-34235-2	NAWC-121217-FRB-061	1568496	1.81	3201291	2.06	
320-34235-3	NAWC-121217-RW-054	1613661	1.81	3364132	2.06	
320-34235-4	NAWC-121217-FRB-054	1598402	1.81	3306781	2.06	

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.: 320-34235-1 Analy Batch No.: 192908

SDG No.: _____

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

Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-192908/4	2017.11.03_537XICAL_004.d
Level 2	IC 320-192908/5	2017.11.03_537XICAL_005.d
Level 3	IC 320-192908/6	2017.11.03_537XICAL_006.d
Level 4	IC 320-192908/7	2017.11.03_537XICAL_007.d
Level 5	IC 320-192908/8	2017.11.03_537XICAL_008.d
Level 6	IC 320-192908/9	2017.11.03_537XICAL_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)	1.0397 0.8468	1.0767	1.0898	0.9577	0.9303	QuaF		1.1193	-0.001498					0.9990			0.9600
Perfluoroheptanoic acid (PFHpA)	0.9433 0.9848	0.9187	0.9551	0.9185	0.9011	Ave		0.9369			3.2		30.0				
Perfluorohexanesulfonic acid (PFHxS)	1.6459 1.6841	1.6355	1.7405	1.6631	1.6755	Ave		1.6741			2.2		30.0				
Perfluorooctanoic acid (PFOA)	0.9757 0.9799	0.8919	0.9000	0.8953	0.9117	Ave		0.9258			4.4		30.0				
Perfluorooctanesulfonic acid (PFOS)	0.8958 0.9902	0.9213	0.9281	0.9268	0.9715	Ave		0.9389			3.7		30.0				
Perfluorononanoic acid (PFNA)	0.6610 0.7042	0.6285	0.6624	0.6810	0.6478	Ave		0.6642			3.9		30.0				
13C2 PFHxA	1.0891 1.1664	1.0526	1.1042	1.1123	1.0772	Ave		1.1003			3.5		30.0				
13C2 PFDA	0.7748 0.8159	0.7295	0.7569	0.7811	0.7330	Ave		0.7652			4.3		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.: 320-34235-1 Analy Batch No.: 192908

SDG No.: _____

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

Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-192908/4	2017.11.03_537XICAL_004.d
Level 2	IC 320-192908/5	2017.11.03_537XICAL_005.d
Level 3	IC 320-192908/6	2017.11.03_537XICAL_006.d
Level 4	IC 320-192908/7	2017.11.03_537XICAL_007.d
Level 5	IC 320-192908/8	2017.11.03_537XICAL_008.d
Level 6	IC 320-192908/9	2017.11.03_537XICAL_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	QuaF	1076553 16699152	2591121	5461974	10142530	14011858	9.00 180	20.0	45.0	90.0	135
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	143455 2810797	331548	736034	1420703	2102676	1.00 20.0	2.22	5.00	10.0	15.0
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	568156 11071993	1312135	2908204	5871843	8413133	3.00 60.0	6.67	15.0	30.0	45.0
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	296934 5597122	644149	1388033	2771271	4257225	2.00 40.0	4.45	10.0	20.0	30.0
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	412315 8679676	985487	2067792	4363079	6504279	4.00 80.0	8.89	20.0	40.0	60.0
Perfluorononanoic acid (PFNA)	13PF OA	Ave	201053 4019666	453612	1020851	2106479	3023088	2.00 40.0	4.45	10.0	20.0	30.0
13C2 PFHxA	13PF OA	Ave	1655691 1664260	1708988	1701491	1719911	1675220	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	1177922 1164156	1184358	1166275	1207887	1139992	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD
QuaF = Quadratic ISTD forced zero

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

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1 Analy Batch No.: 192908

SDG No.: _____

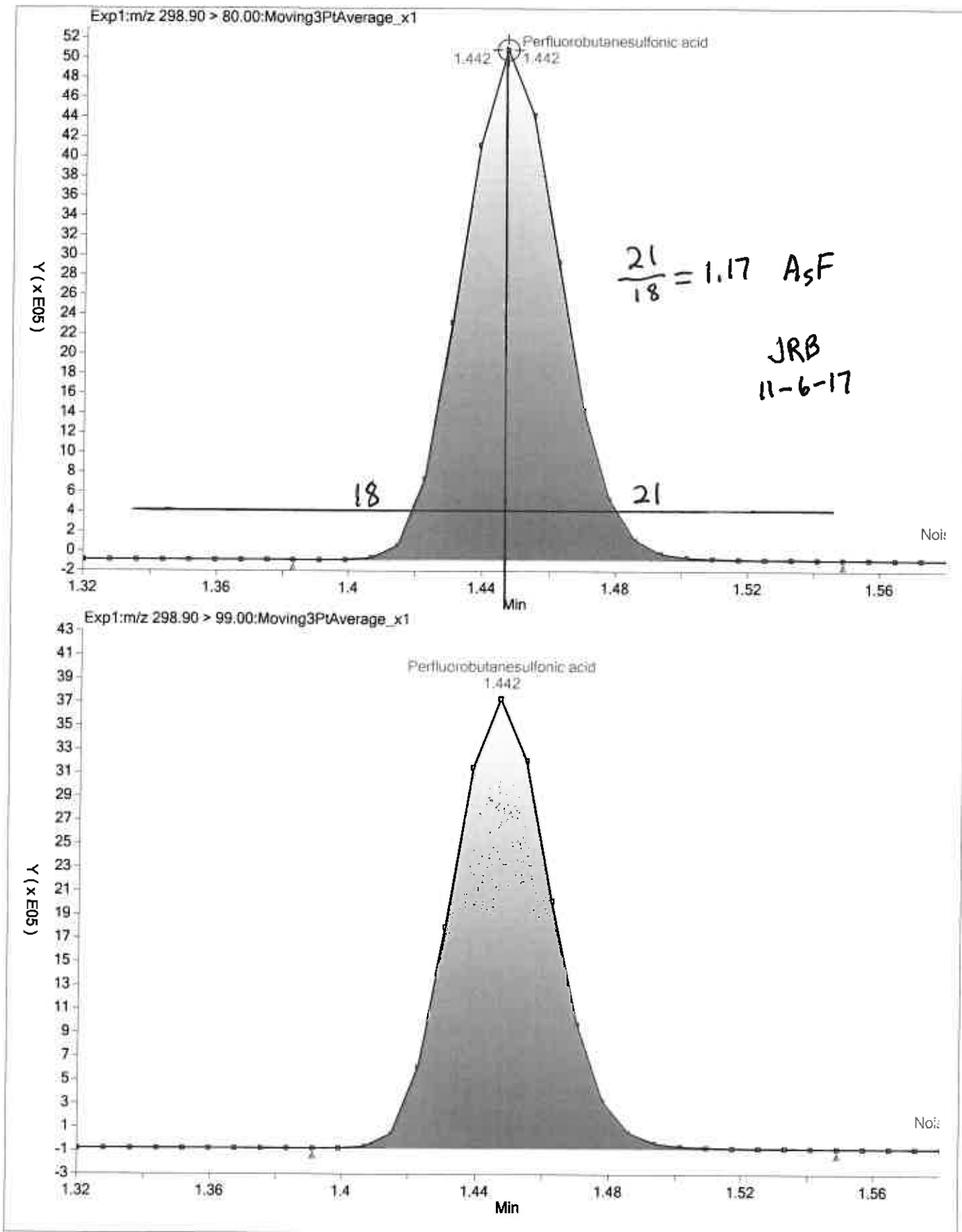
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3 (mm) Heated Purge: (Y/N) N

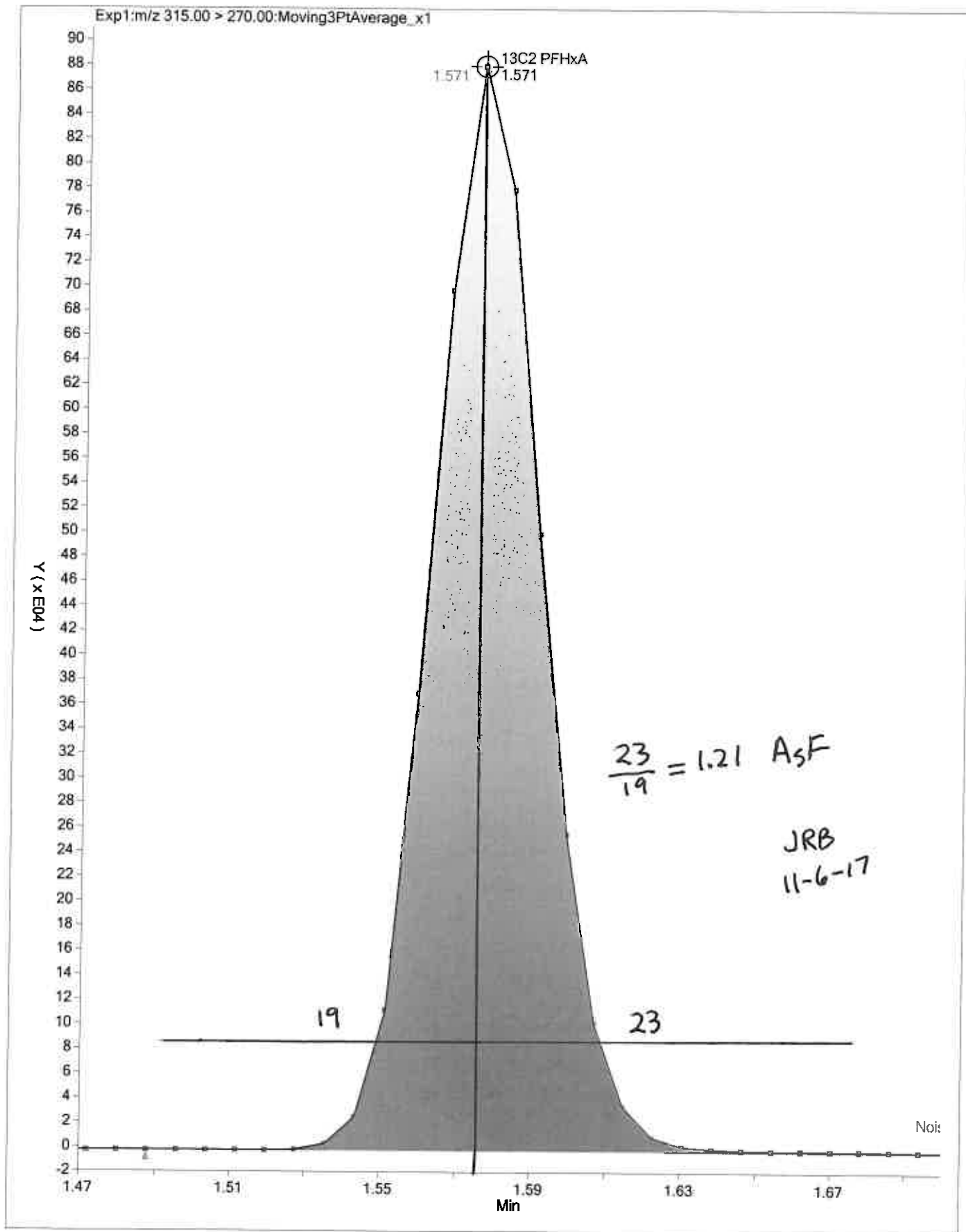
Calibration Start Date: 11/03/2017 13:37 Calibration End Date: 11/03/2017 14:01 Calibration ID: 36012

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-192908/4	2017.11.03_537XICAL_004.d
Level 2	IC 320-192908/5	2017.11.03_537XICAL_005.d
Level 3	IC 320-192908/6	2017.11.03_537XICAL_006.d
Level 4	IC 320-192908/7	2017.11.03_537XICAL_007.d
Level 5	IC 320-192908/8	2017.11.03_537XICAL_008.d
Level 6	IC 320-192908/9	2017.11.03_537XICAL_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)	-6.0	-1.2	3.9	-3.1	1.9	-0.5	50	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	0.7	-1.9	1.9	-2.0	-3.8	5.1	50	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	-1.7	-2.3	4.0	-0.7	0.1	0.6	50	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	5.4	-3.7	-2.8	-3.3	-1.5	5.8	50	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-4.6	-1.9	-1.2	-1.3	3.5	5.5	50	30	30	30	30	30
Perfluorononanoic acid (PFNA)	-0.5	-5.4	-0.3	2.5	-2.5	6.0	50	30	30	30	30	30
13C2 PFHxA	-1.0	-4.3	0.4	1.1	-2.1	6.0	30	30	30	30	30	30
13C2 PFDA	1.3	-4.7	-1.1	2.1	-4.2	6.6	30	30	30	30	30	30





FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-192908/11 Calibration Date: 11/03/2017 14:10
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.11.03_537XICAL_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.109		20.4	20.0	1.9	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9382		2.23	2.22	0.1	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.688		6.72	6.67	0.8	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.8825		4.24	4.45	-4.7	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9176		8.69	8.89	-2.3	50.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6625		4.43	4.45	-0.2	50.0
13C2 PFHxA	Ave	1.100	1.068		9.70	10.0	-3.0	30.0
13C2 PFDA	Ave	0.7652	0.7460		9.75	10.0	-2.5	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Lab Sample ID: ICV 320-192908/13 Calibration Date: 11/03/2017 14:20
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.11.03_537XICAL_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.8310		83.7	100	-16.4	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.8136		8.68	10.0	-13.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.463		17.5	20.1	-12.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.7995		17.7	20.5	-13.6	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.8637		18.1	19.7	-8.0	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6428		19.5	20.1	-3.2	30.0
13C2 PFHxA	Ave	1.100	1.039		9.44	10.0	-5.6	30.0
13C2 PFDA	Ave	0.7652	0.7391		9.66	10.0	-3.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-200292/1 Calibration Date: 12/18/2017 09:53
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.18_537A_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.225		22.6	20.0	12.9	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.8814		2.09	2.22	-5.9	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.771		7.05	6.67	5.8	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.8987		4.32	4.45	-2.9	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9280		8.79	8.89	-1.2	50.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6110		4.09	4.45	-8.0	50.0
13C2 PFHxA	Ave	1.100	1.093		9.93	10.0	-0.7	30.0
13C2 PFDA	Ave	0.7652	0.7211		9.42	10.0	-5.8	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Lab Sample ID: CCV 320-200646/1 Calibration Date: 12/19/2017 20:31
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.19_537A_050.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.9623		144	135	6.4	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9524		15.3	15.0	1.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.793		48.2	45.0	7.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.8880		28.8	30.0	-4.1	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9364		59.9	60.0	-0.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6144		27.8	30.0	-7.5	30.0
13C2 PFHxA	Ave	1.100	1.132		10.3	10.0	2.9	30.0
13C2 PFDA	Ave	0.7652	0.7335		9.58	10.0	-4.2	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Lab Sample ID: CCV 320-200646/13 Calibration Date: 12/19/2017 21:27
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.19_537A_062.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.111		47.7	45.0	6.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9480		5.06	5.00	1.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.748		15.7	15.0	4.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.8955		9.68	10.0	-3.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9133		19.5	20.0	-2.7	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6453		9.72	10.0	-2.8	30.0
13C2 PFHxA	Ave	1.100	1.148		10.4	10.0	4.3	30.0
13C2 PFDA	Ave	0.7652	0.7191		9.40	10.0	-6.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Lab Sample ID: CCV 320-200767/13 Calibration Date: 12/19/2017 21:27
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.19_537A_062.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.111		47.7	45.0	6.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9480		5.06	5.00	1.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.748		15.7	15.0	4.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.8955		9.68	10.0	-3.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9133		19.5	20.0	-2.7	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6453		9.72	10.0	-2.8	30.0
13C2 PFHxA	Ave	1.100	1.148		10.4	10.0	4.3	30.0
13C2 PFDA	Ave	0.7652	0.7191		9.40	10.0	-6.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1
 SDG No.: _____
 Lab Sample ID: CCV 320-200767/21 Calibration Date: 12/19/2017 22:04
 Instrument ID: A8_N Calib Start Date: 11/03/2017 13:37
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 11/03/2017 14:01
 Lab File ID: 2017.12.19_537A_070.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.9658		144	135	7.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9369	0.9586		15.4	15.0	2.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.674	1.786		48.0	45.0	6.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9258	0.9363		30.4	30.0	1.1	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9389	0.9746		62.3	60.0	3.8	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6642	0.6549		29.6	30.0	-1.4	30.0
13C2 PFHxA	Ave	1.100	1.154		10.5	10.0	4.9	30.0
13C2 PFDA	Ave	0.7652	0.7632		9.97	10.0	-0.3	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1

SDG No.: _____

Instrument ID: A8_N Start Date: 11/03/2017 13:37

Analysis Batch Number: 192908 End Date: 11/03/2017 14:24

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-192908/4		11/03/2017 13:37	1	2017.11.03_537X ICAL 004.d	GeminiC18 3x100 3(mm)
IC 320-192908/5		11/03/2017 13:42	1	2017.11.03_537X ICAL 005.d	GeminiC18 3x100 3(mm)
IC 320-192908/6		11/03/2017 13:47	1	2017.11.03_537X ICAL 006.d	GeminiC18 3x100 3(mm)
IC 320-192908/7 ICISAV		11/03/2017 13:52	1	2017.11.03_537X ICAL 007.d	GeminiC18 3x100 3(mm)
IC 320-192908/8		11/03/2017 13:56	1	2017.11.03_537X ICAL 008.d	GeminiC18 3x100 3(mm)
IC 320-192908/9		11/03/2017 14:01	1	2017.11.03_537X ICAL 009.d	GeminiC18 3x100 3(mm)
ZZZZZ		11/03/2017 14:06	1		GeminiC18 3x100 3(mm)
CCVL 320-192908/11		11/03/2017 14:10	1	2017.11.03_537X ICAL 011.d	GeminiC18 3x100 3(mm)
ZZZZZ		11/03/2017 14:15	1		GeminiC18 3x100 3(mm)
ICV 320-192908/13		11/03/2017 14:20	1	2017.11.03_537X ICAL 013.d	GeminiC18 3x100 3(mm)
ZZZZZ		11/03/2017 14:24	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/18/2017 09:53

Analysis Batch Number: 200292 End Date: 12/18/2017 10:31

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-200292/1		12/18/2017 09:53	1	2017.12.18_537A 004.d	GeminiC18 3x100 3(mm)
CCV 320-200292/2 CCVIS		12/18/2017 09:58	1		GeminiC18 3x100 3(mm)
CCV 320-200292/9 CCVIS		12/18/2017 10:31	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/19/2017 20:31

Analysis Batch Number: 200646 End Date: 12/19/2017 21:27

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-200646/1 CCVIS		12/19/2017 20:31	1	2017.12.19_537A 050.d	GeminiC18 3x100 3(mm)
MB 320-199900/1-A		12/19/2017 20:40	1	2017.12.19_537A 052.d	GeminiC18 3x100 3(mm)
LCS 320-199900/2-A		12/19/2017 20:45	1	2017.12.19_537A 053.d	GeminiC18 3x100 3(mm)
LCSD 320-199900/3-A		12/19/2017 20:49	1	2017.12.19_537A 054.d	GeminiC18 3x100 3(mm)
ZZZZZ		12/19/2017 20:54	1		GeminiC18 3x100 3(mm)
ZZZZZ		12/19/2017 20:59	1		GeminiC18 3x100 3(mm)
ZZZZZ		12/19/2017 21:03	1		GeminiC18 3x100 3(mm)
ZZZZZ		12/19/2017 21:08	1		GeminiC18 3x100 3(mm)
ZZZZZ		12/19/2017 21:13	1		GeminiC18 3x100 3(mm)
ZZZZZ		12/19/2017 21:17	1		GeminiC18 3x100 3(mm)
ZZZZZ		12/19/2017 21:22	1		GeminiC18 3x100 3(mm)
CCV 320-200646/13 CCVIS		12/19/2017 21:27	1	2017.12.19_537A 062.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/19/2017 21:27

Analysis Batch Number: 200767 End Date: 12/19/2017 22:04

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-200767/13 CCVIS		12/19/2017 21:27	1	2017.12.19_537A 062.d	GeminiC18 3x100 3(mm)
ZZZZZ		12/19/2017 21:36	1		GeminiC18 3x100 3(mm)
ZZZZZ		12/19/2017 21:41	1		GeminiC18 3x100 3(mm)
320-34235-1		12/19/2017 21:46	1	2017.12.19_537A 066.d	GeminiC18 3x100 3(mm)
320-34235-2		12/19/2017 21:50	1	2017.12.19_537A 067.d	GeminiC18 3x100 3(mm)
320-34235-3		12/19/2017 21:55	1	2017.12.19_537A 068.d	GeminiC18 3x100 3(mm)
320-34235-4		12/19/2017 22:00	1	2017.12.19_537A 069.d	GeminiC18 3x100 3(mm)
CCV 320-200767/21 CCVIS		12/19/2017 22:04	1	2017.12.19_537A 070.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34235-1

SDG No.: _____

Batch Number: 199900 Batch Start Date: 12/14/17 12:48 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 12/18/17 15:10

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-HSP 00023
MB 320-199900/1		537, 537				250.00 mL	1.00 mL	7 SU	
LCS 320-199900/2		537, 537				250.00 mL	1.00 mL	7 SU	100 uL
LCSD 320-199900/3		537, 537				250.00 mL	1.00 mL	7 SU	100 uL
320-34235-A-1	NAWC-121217-RW-061	537, 537	T	273.57 g	27.01 g	246.6 mL	1.00 mL	7 SU	
320-34235-A-2	NAWC-121217-FRB-061	537, 537	T	276.41 g	26.87 g	249.5 mL	1.00 mL	7 SU	
320-34235-A-3	NAWC-121217-RW-054	537, 537	T	274.48 g	27.57 g	246.9 mL	1.00 mL	7 SU	
320-34235-A-4	NAWC-121217-FRB-054	537, 537	T	249.49 g	26.86 g	222.6 mL	1.00 mL	7 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00054	LC537-SU 00056	AnalysisComment			
MB 320-199900/1		537, 537		100 uL	100 uL	C1 ND			
LCS 320-199900/2		537, 537		100 uL	100 uL	C1 ND			
LCSD 320-199900/3		537, 537		100 uL	100 uL	C1 ND			
320-34235-A-1	NAWC-121217-RW-061	537, 537	T	100 uL	100 uL	C1 ND			
320-34235-A-2	NAWC-121217-FRB-061	537, 537	T	100 uL	100 uL	C1 ND			
320-34235-A-3	NAWC-121217-RW-054	537, 537	T	100 uL	100 uL	C1 ND			
320-34235-A-4	NAWC-121217-FRB-054	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.: 320-34235-1

SDG No.: _____

Batch Number: 199900 Batch Start Date: 12/14/17 12:48 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 12/18/17 15:10

Batch Notes	
Analyst ID - Aliquot Step	CCB
Analyst ID - Concentration	CCB/KMK
Analyst ID - Final Volume Step	CCB
Internal Standard ID#	1099354
Manifold ID	1,3
Methanol ID	1105466
pH Indicator ID	4390-01 (Lot 2517)
Pipette ID	M16387D
Analyst ID - IS Reagent Drop	CCB
Analyst ID - IS Reagent Drop Witness	HJA
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	KMK
Analyst ID - TA Reagent Drop	JER
Analyst ID - TA Reagent Drop Witness	KMK
SPE Cartridge ID	6357081-11
Trizma ID	SLBR4303V
Reagent Water ID	12-12-17

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Aqueous Extraction Analysis Sheet

19 A8 12/19/17

(To Accompany Samples to Instruments)

Batch Number: 320-199900











Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End: 12/18/2017 3:10:00PM

Extraction of Perfluorinated Alkyl Acids

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	Rcvd	PHs Adj1 Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1 MB~320-199900/1 N/A	N/A		250.00 mL	7		N/A	N/A	N/A	CI ND	
			1.00 mL							
2 LCS~320-199900/2 N/A	N/A		250.00 mL	7		N/A	N/A	N/A	CI ND	
			1.00 mL							
3 LCSD~320-199900/3 N/A	N/A		250.00 mL	7		N/A	N/A	N/A	CI ND	
			1.00 mL							
4 320-34181-A-1 (537_DOD5)	N/A (320-34181-1)	255.67 g	228.6 mL	7		12/16/17	16_Days	4	CI ND	
		27.09 g	1.00 mL							
5 320-34181-A-2 (537_DOD5)	N/A (320-34181-1)	280.58 g	253.6 mL	7		12/16/17	16_Days	4	CI ND	
		27.03 g	1.00 mL							
6 320-34181-A-3 (537_DOD5)	N/A (320-34181-1)	273.58 g	246 mL	7		12/16/17	16_Days	4	CI ND	
		27.55 g	1.00 mL							
7 320-34181-A-4 (537_DOD5)	N/A (320-34181-1)	275.68 g	248.7 mL	7		12/16/17	16_Days	4	CI ND	
		26.94 g	1.00 mL							
8 320-34181-A-5 (537_DOD5)	N/A (320-34181-1)	275.87 g	248.4 mL	7		12/16/17	16_Days	4	CI ND	
		27.47 g	1.00 mL							
9 320-34181-A-6 (537_DOD5)	N/A (320-34181-1)	274.29 g	247.4 mL	7		12/16/17	16_Days	4	CI ND	
		26.91 g	1.00 mL							
10 320-34181-A-7 (537_DOD5)	N/A (320-34181-1)	274.34 g	246.8 mL	7		12/16/17	16_Days	4	CI ND	
		27.57 g	1.00 mL							

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)







Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End: 12/18/2017 3:10:00PM

11	320-34181-A-8 (537_DOD5)	N/A (320-34181-1)	277.49 g	250.3 mL	7			12/16/17	16_Days	4	CI ND	 <small>3 2 0 - 3 4 1 8 1 - A - 8 - A</small>
			27.17 g	1.00 mL								
12	320-34181-A-9 (537_DOD5)	N/A (320-34181-1)	272.99 g	245.8 mL	7			12/16/17	16_Days	4	CI ND	 <small>3 2 0 - 3 4 1 8 1 - A - 9 - A</small>
			27.17 g	1.00 mL								
13	320-34235-A-1 (537_DOD5)	N/A (320-34235-1)	273.57 g	246.6 mL	7			12/17/17	16_Days	4	CI ND	 <small>3 2 0 - 3 4 2 3 5 - A - 1 - A</small>
			27.01 g	1.00 mL								
14	320-34235-A-2 (537_DOD5)	N/A (320-34235-1)	276.41 g	249.5 mL	7			12/17/17	16_Days	4	CI ND	 <small>3 2 0 - 3 4 2 3 5 - A - 2 - A</small>
			26.87 g	1.00 mL								
15	320-34235-A-3 (537_DOD5)	N/A (320-34235-1)	274.48 g	246.9 mL	7			12/17/17	16_Days	4	CI ND	 <small>3 2 0 - 3 4 2 3 5 - A - 3 - A</small>
			27.57 g	1.00 mL								
16	320-34235-A-4 (537_DOD5)	N/A (320-34235-1)	249.49 g	222.6 mL	7			12/17/17	16_Days	4	CI ND	 <small>3 2 0 - 3 4 2 3 5 - A - 4 - A</small>
			26.86 g	1.00 mL								

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End: 12/18/2017 3:10:00PM

Batch Notes

Manifold ID 1,3

pH Indicator ID 4390-01 (Lot 2517)

Trizma ID SLBR4303V

SPE Cartridge ID 6357081-11

Methanol ID 1105466

Reagent Water ID 12-12-17

Internal Standard ID# 1099354

Pipette ID M16387D

Analyst ID - TA Reagent Drop JER

Analyst ID - TA Reagent Drop KMK
Witness

Analyst ID - SU Reagent Drop JER

Analyst ID - SU Reagent Drop KMK
Witness

Analyst ID - IS Reagent Drop CCB

Analyst ID - IS Reagent Drop HJA
Witness

Analyst ID - Concentration CCB/KMK

Analyst ID - Aliquot Step CCB

Analyst ID - Final Volume Step CCB

Batch Comment N/A

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End:

Batch Notes

Manifold ID 1, 3

pH Indicator ID 4390-01 (Lot 2517)

Trizma ID SLBR4303V

SPE Cartridge ID 6357081-11

Methanol ID 1105466

Reagent Water ID 12-12-17

Internal Standard ID# 1899354

Pipette ID M16387D

Analyst ID - TA Reagent Drop JER

Analyst ID - TA Reagent Drop Witness KMK

Analyst ID - SU Reagent Drop JER

Analyst ID - SU Reagent Drop Witness KMK

Analyst ID - IS Reagent Drop ceB

Analyst ID - IS Reagent Drop Witness 41QA

Analyst ID - Concentration nights

Analyst ID - Aliquot Step ceB

Analyst ID - Final Volume Step ceB

Batch Comment N/A

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199900

Analyst: Kolstad, Kate M

Batch Open: 12/14/2017 12:48:00PM

Method Code: 320-537_Prep-320

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-199900/1	LC537-SU_00056	100 uL	1.00 mL	<i>KMK 12/14/17</i>	KMK 12-14-17
LCS 320-199900/2	LC537-HSP_00023	100 uL	1.00 mL		
LCS 320-199900/2	LC537-SU_00056	100 uL	1.00 mL	↓	↓
LCSD 320-199900/3	LC537-HSP_00023	100 uL	1.00 mL		
LCSD 320-199900/3	LC537-SU_00056	100 uL	1.00 mL		
320-34181-A-1	LC537-SU_00056	100 uL	1.00 mL		
320-34181-A-2	LC537-SU_00056	100 uL	1.00 mL		
320-34181-A-3	LC537-SU_00056	100 uL	1.00 mL		
320-34181-A-4	LC537-SU_00056	100 uL	1.00 mL		
320-34181-A-5	LC537-SU_00056	100 uL	1.00 mL		
320-34181-A-6	LC537-SU_00056	100 uL	1.00 mL		
320-34181-A-7	LC537-SU_00056	100 uL	1.00 mL		
320-34181-A-8	LC537-SU_00056	100 uL	1.00 mL		
320-34181-A-9	LC537-SU_00056	100 uL	1.00 mL		
320-34235-A-1	LC537-SU_00056	100 uL	1.00 mL		
320-34235-A-2	LC537-SU_00056	100 uL	1.00 mL		
320-34235-A-3	LC537-SU_00056	100 uL	1.00 mL		
320-34235-A-4	LC537-SU_00056	100 uL	1.00 mL		

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PFAS Calibration Calculations:

Initial Calibration 11/3/2017
 Instrument A8_N

Perfluorohexanesulfonic acid

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	Reported RRF
3	568156	3298877	28.7	1.64764	1.6459
6.67	1312135	3450592	28.7	1.63622	1.6355
15	2908204	3194016	28.7	1.74212	1.7405
30	5871843	3374600	28.7	1.66461	1.6631
45	8413133	3199479	28.7	1.67706	1.6755
60	11071993	3141787	28.7	1.68570	1.6841
Average				1.67556	1.6741
Standard Deviation				0.0374	
RSD				0.0223	
%RSD				2.23033	2.2

Continuing Calibration 12/18/2017 @ 09:53
 Instrument A8_N

Perfluorohexanesulfonic acid

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	%D	Reported RRF	Reported %D
6.67	1315510	3194742	28.7	1.7718	5.8359053	1.771	5.8

Willow Grove
SDG 320-34235-1

Sample Identification NAWC-121217-RW-061

Compound Perfluorohexanesulfonic acid

Compound Area 506290

Internal Standard Amount (ng) 28.7

Dilution Factor 1

Internal Standard Area 1539640

Average RRF 1.6741

Sample Volume(ml) 246.6

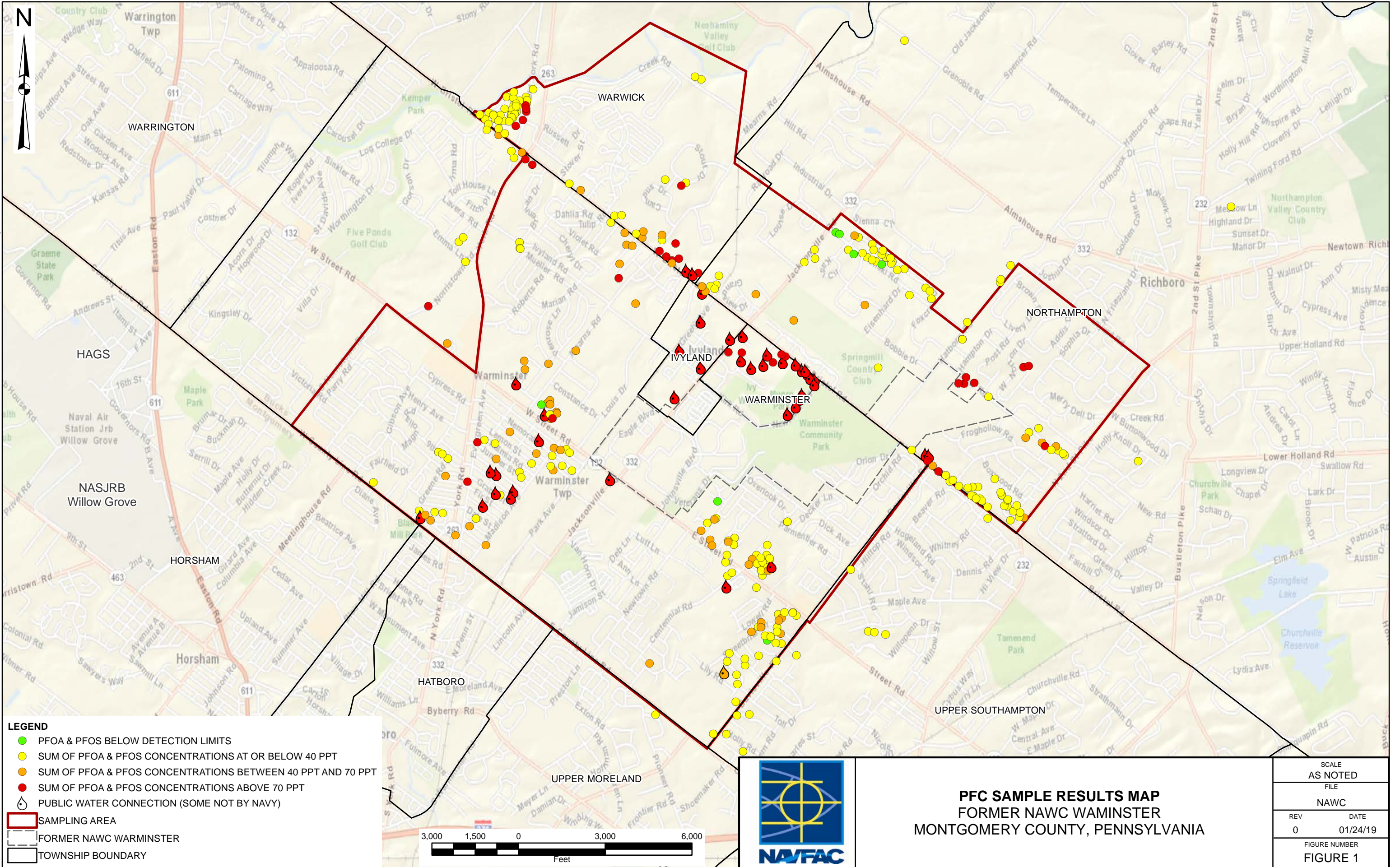
Volume Extract (ml) 1

Injection Volume (μ l) 2

Concentration 0.0114 ug/L

11.43 ng/L

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LEGEND

- PFOA & PFOS BELOW DETECTION LIMITS
- SUM OF PFOA & PFOS CONCENTRATIONS AT OR BELOW 40 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS BETWEEN 40 PPT AND 70 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS ABOVE 70 PPT
- 👉 PUBLIC WATER CONNECTION (SOME NOT BY NAVY)
- SAMPLING AREA
- 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	