



**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 320-29926-1**

*Naval Air Station Willow Grove
Willow Grove, Pennsylvania*

August 2019

N00158_000724
WILLOW_GROVE_NAS
SSIC 5000-33c

**LABORATORY DATA PACKAGE, 320-29926-1, NAWC WARMINSTER NAS
WILLOW GROVE PA**

08/09/2017
TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

ANALYTICAL REPORT

Job Number: 320-29926-1

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.
Laura Turpen
Project Manager I
8/9/2017 10:32 AM

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08/09/2017

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Definitions/Glossary

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

TestAmerica Job ID: 320-29926-1

Qualifiers

LCMS

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

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
320-29926-1

Receipt

The samples were received on 7/18/2017 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 8.5° C.

LCMS

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

Organic Prep

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

Detection Summary

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

TestAmerica Job ID: 320-29926-1

Client Sample ID: WGNA-071717-RW-3826

Lab Sample ID: 320-29926-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	6.8	J	39	6.7	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	9.6	J	20	2.8	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.8	J M	9.9	1.9	ng/L	1		537	Total/NA

Client Sample ID: WGNA-071717-FRB-3826

Lab Sample ID: 320-29926-2

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: 320-29926-1

Client Sample ID: WGNA-071717-RW-3826

Date Collected: 07/17/17 14:20

Date Received: 07/18/17 09:30

Lab Sample ID: 320-29926-1

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	6.8	J	39	6.7	ng/L	—	07/27/17 10:45	08/03/17 18:49	1
Perfluorooctanoic acid (PFOA)	9.6	J	20	2.8	ng/L	—	07/27/17 10:45	08/03/17 18:49	1
Perfluorononanoic acid (PFNA)	20	U M	24	7.9	ng/L	—	07/27/17 10:45	08/03/17 18:49	1
Perfluorohexanesulfonic acid (PFHxS)	12	U M	30	5.4	ng/L	—	07/27/17 10:45	08/03/17 18:49	1
Perfluoroheptanoic acid (PFHpA)	3.8	J M	9.9	1.9	ng/L	—	07/27/17 10:45	08/03/17 18:49	1
Perfluorobutanesulfonic acid (PFBS)	36	U M	89	16	ng/L	—	07/27/17 10:45	08/03/17 18:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	81		70 - 130	07/27/17 10:45	08/03/17 18:49	1
13C2 PFDA	105		70 - 130	07/27/17 10:45	08/03/17 18:49	1

Client Sample ID: WGNA-071717-FRB-3826

Date Collected: 07/17/17 14:15

Date Received: 07/18/17 09:30

Lab Sample ID: 320-29926-2

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.7	ng/L	—	07/27/17 10:45	08/03/17 18:58	1
Perfluorooctanoic acid (PFOA)	7.9	U	20	2.8	ng/L	—	07/27/17 10:45	08/03/17 18:58	1
Perfluorononanoic acid (PFNA)	20	U	24	7.9	ng/L	—	07/27/17 10:45	08/03/17 18:58	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.4	ng/L	—	07/27/17 10:45	08/03/17 18:58	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	9.9	1.9	ng/L	—	07/27/17 10:45	08/03/17 18:58	1
Perfluorobutanesulfonic acid (PFBS)	36	U	89	16	ng/L	—	07/27/17 10:45	08/03/17 18:58	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	97		70 - 130	07/27/17 10:45	08/03/17 18:58	1
13C2 PFDA	103		70 - 130	07/27/17 10:45	08/03/17 18:58	1

Default Detection Limits

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-29926-1

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: 320-29926-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	3C2 PFHx (70-130)	3C2 PFD/ (70-130)
320-29926-1	WGNA-071717-RW-3826	81	105
320-29926-2	WGNA-071717-FRB-3826	97	103
LLCS 320-176265/2-A	Lab Control Sample	93	99
MB 320-176265/1-A	Method Blank	110	105

Surrogate Legend

13C2 PFHxA = 13C2 PFHxA

13C2 PFDA = 13C2 PFDA

QC Sample Results

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

TestAmerica Job ID: 320-29926-1

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

Lab Sample ID: MB 320-176265/1-A

Matrix: Water

Analysis Batch: 177368

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 176265

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		07/27/17 10:45	08/03/17 18:31	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		07/27/17 10:45	08/03/17 18:31	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		07/27/17 10:45	08/03/17 18:31	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		07/27/17 10:45	08/03/17 18:31	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		07/27/17 10:45	08/03/17 18:31	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		07/27/17 10:45	08/03/17 18:31	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	110		70 - 130	07/27/17 10:45	08/03/17 18:31	1
13C2 PFDA	105		70 - 130	07/27/17 10:45	08/03/17 18:31	1

Lab Sample ID: LLCS 320-176265/2-A

Matrix: Water

Analysis Batch: 177368

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 176265

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	40.0	40.2		ng/L		100	50 - 150
Perfluorooctanoic acid (PFOA)	20.0	18.3	J	ng/L		92	50 - 150
Perfluorononanoic acid (PFNA)	19.3	18.6	J	ng/L		97	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	30.1	29.5	J	ng/L		98	50 - 150
Perfluoroheptanoic acid (PFHpA)	9.90	7.73	J	ng/L		78	50 - 150
Perfluorobutanesulfonic acid (PFBS)	88.3	79.9	J	ng/L		90	50 - 150

Surrogate	LLCS %Recovery	LLCS Qualifier	Limits
13C2 PFHxA	93		70 - 130
13C2 PFDA	99		70 - 130

QC Association Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-29926-1

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

LCMS

Prep Batch: 176265

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-29926-1	WGNA-071717-RW-3826	Total/NA	Water	537	
320-29926-2	WGNA-071717-FRB-3826	Total/NA	Water	537	
MB 320-176265/1-A	Method Blank	Total/NA	Water	537	
LLCS 320-176265/2-A	Lab Control Sample	Total/NA	Water	537	

Analysis Batch: 177368

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-29926-1	WGNA-071717-RW-3826	Total/NA	Water	537	176265
320-29926-2	WGNA-071717-FRB-3826	Total/NA	Water	537	176265
MB 320-176265/1-A	Method Blank	Total/NA	Water	537	176265
LLCS 320-176265/2-A	Lab Control Sample	Total/NA	Water	537	176265

Lab Chronicle

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

TestAmerica Job ID: 320-29926-1

Client Sample ID: WGNA-071717-RW-3826

Date Collected: 07/17/17 14:20

Date Received: 07/18/17 09:30

Lab Sample ID: 320-29926-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			176265	07/27/17 10:45	KMK	TAL SAC
Total/NA	Analysis	537		1	177368	08/03/17 18:49	JRB	TAL SAC

Client Sample ID: WGNA-071717-FRB-3826

Date Collected: 07/17/17 14:15

Date Received: 07/18/17 09:30

Lab Sample ID: 320-29926-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			176265	07/27/17 10:45	KMK	TAL SAC
Total/NA	Analysis	537		1	177368	08/03/17 18:58	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: 320-29926-1

Laboratory: TestAmerica Sacramento

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

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

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

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

Method Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-29926-1

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

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

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-29926-1

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

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-29926-1	WGNA-071717-RW-3826	Water	07/17/17 14:20	07/18/17 09:30
320-29926-2	WGNA-071717-FRB-3826	Water	07/17/17 14:15	07/18/17 09:30

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 177368Lab Sample ID: 320-29926-1 Client Sample ID: WGNA-071717-RW-3826Date Analyzed: 08/03/17 18:49 Lab File ID: 03AUG2017A6B_056.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	2.46	Missed Peak	barnettj	08/04/17 10:18
Perfluoroheptanoic acid (PFHpA)	3.15	Split Peak	barnettj	08/04/17 10:19
Perfluorohexanesulfonic acid (PFHxS)	3.16	Missed Peak	barnettj	08/04/17 10:18
Perfluorononanoic acid (PFNA)	3.87	Missed Peak	barnettj	08/04/17 10:19

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 177369Lab Sample ID: CCV 320-177369/25 CCVIS Client Sample ID: _____Date Analyzed: 08/03/17 21:51 Lab File ID: 03AUG2017A6B_076.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.88	Isomers	barnettj	08/04/17 10:31

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 177447Lab Sample ID: STD 320-177447/4 IC Client Sample ID: _____Date Analyzed: 08/03/17 10:56 Lab File ID: 03AUG2017A6B_004.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.92	Isomers	barnettj	08/03/17 13:04

Lab Sample ID: STD 320-177447/5 IC Client Sample ID: _____Date Analyzed: 08/03/17 11:05 Lab File ID: 03AUG2017A6B_005.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.92	Isomers	barnettj	08/03/17 13:05

Lab Sample ID: STD 320-177447/6 IC Client Sample ID: _____Date Analyzed: 08/03/17 11:14 Lab File ID: 03AUG2017A6B_006.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.92	Isomers	barnettj	08/03/17 13:06

Lab Sample ID: STD 320-177447/7 ICISAV Client Sample ID: _____Date Analyzed: 08/03/17 11:24 Lab File ID: 03AUG2017A6B_007.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	3.17	Incomplete Integration	barnettj	08/03/17 13:07
Perfluorooctanesulfonic acid (PFOS)	3.91	Isomers	barnettj	08/03/17 13:06

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 177447Lab Sample ID: STD 320-177447/8 IC Client Sample ID: _____Date Analyzed: 08/03/17 11:33 Lab File ID: 03AUG2017A6B_008.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.91	Isomers	barnettj	08/03/17 13:07

Lab Sample ID: STD 320-177447/9 IC Client Sample ID: _____Date Analyzed: 08/03/17 11:42 Lab File ID: 03AUG2017A6B_009.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.91	Isomers	barnettj	08/03/17 13:08

Lab Sample ID: CCVL 320-177447/11 Client Sample ID: _____Date Analyzed: 08/03/17 12:00 Lab File ID: 03AUG2017A6B_011.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.90	Isomers	barnettj	08/03/17 13:12

Lab Sample ID: ICV 320-177447/12 Client Sample ID: _____Date Analyzed: 08/03/17 12:09 Lab File ID: 03AUG2017A6B_012.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.90	Isomers	barnettj	08/03/17 13:13

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-29926-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-ICV_00021	01/05/18	07/25/17	MeOH/H2O, Lot 067374	10 mL	LC537-IS_00045	1000 uL	13C2-PFOA	10 ng/mL
..LC537-IS_00045	01/05/18	07/05/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	28.68 ng/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			LCMPFOS_00019	180 uL	13C4 PFOS	0.1 ug/mL
..LCMPFOS_00019	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C2-PFOA	0.2868 ug/mL
LC537-ICV_00021	01/05/18	07/25/17	MeOH/H2O, Lot 067374	10 mL	LC537-SU_00045	1000 uL	13C2-PFOA	50 ug/mL
..LC537-SU_00045	01/05/18	07/05/17	Methanol, Lot 104453	30000 uL	LC537ICIM_00016	20 uL	13C4 PFOS	47.8 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			LC537-SU_00045	1000 uL	13C2 PFDA	10 ng/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			LC537ICIM_00016	20 uL	13C2 PFHxA	10 ng/mL
..LC537ICIM_00016	01/25/18	07/25/17	Methanol, Lot 090285	25 mL	LCMPFDA_00012	60 uL	Perfluorobutanesulfonic acid (PFBS)	100.119 ng/mL
..LC537-PFBS2_00008	01/25/18	07/25/17	Methanol, Lot 090285	20 mL	LCMPFHxA_00013	60 uL	Perfluoroheptanoic acid (PFHpA)	9.99613 ng/mL
...LC537-PFBS2_00002	09/08/22	Santa Cruz Biotechnology, Lot F0917			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	20.0761 ng/mL
..LC537-PFHxA2_00011	01/25/18	07/25/17	Methanol, Lot 09092	31 mL	LC537-PFBS2_00008	0.6 mL	Perfluorononanoic acid (PFNA)	20.1272 ng/mL
...LC537-PFHxA2_00002	06/13/22	Afla Aesar, Lot 10200390			LC537-PFHxA2_00011	0.061 mL	Perfluorooctanoic acid (PFOA)	20.0978 ng/mL
..LC537-PFHxS2_00008	01/25/18	07/25/17	Methanol, Lot 090285	21 mL	LC537-PFHxS2_00008	0.122 mL	Perfluorooctanesulfonic acid (PFOS)	20.1138 ng/mL
...LC537-PFHxS2_00002	06/08/22	Santa Cruz Biotechnology, Lot G2516			LC537-PFNA2_00009	0.126 mL	Perfluorobutanesulfonic acid (PFBS)	50.0597 ug/mL
..LC537-PFNA2_00009	01/25/18	07/25/17	Methanol, Lot 090285	21 mL	LC537-PFOA2_00009	0.122 mL	Perfluoroheptanoic acid (PFHpA)	4.99806 ug/mL
...LC537-PFNA2_00002	06/14/22	Aldrich, Lot MKCC0699			LC537-PFOS2_00008	0.123 mL	Perfluorohexanesulfonic acid (PFHxS)	10.038 ug/mL
..LC537-PFOA2_00009	01/25/18	07/25/17	Methanol, Lot 090285	20 mL	LC537-PFOS2_00008	0.123 mL	Perfluorononanoic acid (PFNA)	10.0636 ug/mL
...LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	10.0489 ug/mL
..LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	10.0569 ug/mL
..LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	2085.82 ug/mL
..LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.998 g/g
..LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	2048.39 ug/mL
..LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	1 g/g
..LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	2056.98 ug/mL
..LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.9094 g/g
..LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	1996.74 ug/mL
..LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.996 g/g
..LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	2059.2 ug/mL
..LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.99 g/g

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LC537-PFOS2_00008	01/25/18	07/25/17	Methanol, Lot 090285	20 mL	LC537_PFOS2_00002	0.0525 g	Perfluorooctanesulfonic acid (PFOS)	2044.09 ug/mL
...LC537_PFOS2_00002	06/14/22	Sigma, Lot BCBQ0108V			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.7787 g/g
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
.LCMPFOS_00019	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
LC537-L1_00019	08/09/17	07/05/17	MeOH/H2O, Lot 090285	5 mL	LC537-IS_00045	500 uL	13C2-PFOA	10 ng/mL
					LC537-MSP_00025	50 uL	13C4 PFOS	28.68 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	8.83417 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.99 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	3.00607 ng/mL
							Perfluorononanoic acid (PFNA)	1.926 ng/mL
							Perfluorooctanoic acid (PFOA)	1.998 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.00329 ng/mL
					LC537-SU_00045	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 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
..LCMPFOS_00019	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-MSP_00025	08/09/17	03/30/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00022	200 uL	Perfluorobutanesulfonic acid (PFBS)	883.417 ng/mL
							Perfluoroheptanoic acid (PFHpA)	99 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	300.607 ng/mL
							Perfluorononanoic acid (PFNA)	192.6 ng/mL
							Perfluorooctanoic acid (PFOA)	199.8 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	400.329 ng/mL
..LC537SPIM_00022	08/09/17	03/22/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00007	440 uL	Perfluorobutanesulfonic acid (PFBS)	88.3417 ug/mL
					LC537-PFHpA_00014	100 uL	Perfluoroheptanoic acid (PFHpA)	9.9 ug/mL
					LC537-PFHxS_00009	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0607 ug/mL
					LC537-PFNA_00012	200 uL	Perfluorononanoic acid (PFNA)	19.26 ug/mL
					LC537-PFOA_00012	200 uL	Perfluorooctanoic acid (PFOA)	19.98 ug/mL
					LC537-PFOS_00007	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0329 ug/mL
...LC537-PFBS_00007	01/04/18	01/04/17	Methanol, Lot 090285	51.5 mL	LC537_PFBS_00002	0.1034 g	Perfluorobutanesulfonic acid (PFBS)	2007.77 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-29926-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
....LC537_PFBs_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBs)	1 g/g
...LC537-PFHpA_00014	03/22/18	03/22/17	Methanol, Lot 090285	50 mL	LC537_PFHpA_00002	0.05 g	Perfluoroheptanoic acid (PFHpA)	990 ug/mL
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00009	01/04/18	01/04/17	Methanol, Lot 090285	54 mL	LC537_PFHxS_00002	0.119 g	Perfluorohexanesulfonic acid (PFHxS)	2004.05 ug/mL
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00012	03/22/18	03/22/17	Methanol, Lot 090285	23 mL	LC537 PFNA_00002	0.023 g	Perfluorononanoic acid (PFNA)	963 ug/mL
....LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00012	03/22/18	03/22/17	Methanol, Lot 090285	21.5 mL	LC537 PFOA_00002	0.0215 g	Perfluorooctanoic acid (PFOA)	999 ug/mL
....LC537 PFOA_00002	11/04/18		Fluka, Lot SZBD308XV		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00007	08/09/17	01/04/17	Methanol, Lot 090285	48.95 mL	LC537_PFOS_00002	0.0538 g	Perfluorooctanesulfonic acid (PFOS)	1000.82 ug/mL
....LC537_PFOS_00002	08/09/17		Fluka, Lot SZBC222XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-SU_00045	01/05/18	07/05/17	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
					(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L2_00019	08/09/17	07/05/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00019	64 uL	Perfluorobutanesulfonic acid (PFBs)	21.202 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.376 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	7.21457 ng/mL
							Perfluorononanoic acid (PFNA)	4.6224 ng/mL
							Perfluorooctanoic acid (PFOA)	4.7952 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	9.6079 ng/mL
					LC537-IS_00045	500 uL	13C2-PFOA	10 ng/mL
					LC537-SU_00045	500 uL	13C4 PFOS	28.68 ng/mL
							13C2 PFDA	10 ng/mL
.LC537-HSP_00019	08/09/17	03/30/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00022	375 uL	13C2 PFHxA	10 ng/mL
							Perfluorobutanesulfonic acid (PFBs)	1656.41 ng/mL
							Perfluoroheptanoic acid (PFHpA)	185.625 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	563.639 ng/mL
							Perfluorononanoic acid (PFNA)	361.125 ng/mL
							Perfluorooctanoic acid (PFOA)	374.625 ng/mL
..LC537SPIM_00022	08/09/17	03/22/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00007	440 uL	Perfluorooctanesulfonic acid (PFOS)	750.617 ng/mL
							Perfluorobutanesulfonic acid (PFBs)	88.3417 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-29926-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC537-PFHpA_00014	100 uL	Perfluoroheptanoic acid (PFHpA)	9.9 ug/mL
					LC537-PFHxS_00009	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0607 ug/mL
					LC537-PFNA_00012	200 uL	Perfluorononanoic acid (PFNA)	19.26 ug/mL
					LC537-PFOA_00012	200 uL	Perfluorooctanoic acid (PFOA)	19.98 ug/mL
					LC537-PFOS_00007	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0329 ug/mL
...LC537-PFBS_00007	01/04/18	01/04/17	Methanol, Lot 090285	51.5 mL	LC537_PFBS_00002	0.1034 g	Perfluorobutanesulfonic acid (PFBS)	2007.77 ug/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00014	03/22/18	03/22/17	Methanol, Lot 090285	50 mL	LC537_PFHpA_00002	0.05 g	Perfluoroheptanoic acid (PFHpA)	990 ug/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00009	01/04/18	01/04/17	Methanol, Lot 090285	54 mL	LC537_PFHxS_00002	0.119 g	Perfluorohexanesulfonic acid (PFHxS)	2004.05 ug/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00012	03/22/18	03/22/17	Methanol, Lot 090285	23 mL	LC537_PFNA_00002	0.023 g	Perfluorononanoic acid (PFNA)	963 ug/mL
....LC537 PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00012	03/22/18	03/22/17	Methanol, Lot 090285	21.5 mL	LC537_PFOA_00002	0.0215 g	Perfluorooctanoic acid (PFOA)	999 ug/mL
....LC537 PFOA_00002	11/04/18	Fluka, Lot SZBD308XV			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00007	08/09/17	01/04/17	Methanol, Lot 090285	48.95 mL	LC537_PFOS_00002	0.0538 g	Perfluorooctanesulfonic acid (PFOS)	1000.82 ug/mL
....LC537_PFOS_00002	08/09/17	Fluka, Lot SZBC222XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00045	01/05/18	07/05/17	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_00019	180 uL	13C4 PFOS	0.2868 ug/mL
..LCMPFOS_00019	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LC537-SU_00045	01/05/18	07/05/17	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-L3_00022	08/09/17	07/05/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00019	134 uL	Perfluorobutanesulfonic acid (PFBS)	44.3917 ng/mL
							Perfluoroheptanoic acid (PFHpA)	4.97475 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	15.1055 ng/mL
							Perfluorononanoic acid (PFNA)	9.67815 ng/mL
							Perfluorooctanoic acid (PFOA)	10.0399 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	20.1165 ng/mL
					LC537-IS_00045	500 uL	13C2-PFOA	10 ng/mL
					LC537-SU_00045	500 uL	13C4 PFOS	28.68 ng/mL
							13C2 PFDA	10 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-29926-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LC537-HSP_00019	08/09/17	03/30/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00022	375 uL	13C2 PFHxA	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	1656.41 ng/mL
							Perfluoroheptanoic acid (PFHpA)	185.625 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	563.639 ng/mL
							Perfluorononanoic acid (PFNA)	361.125 ng/mL
							Perfluorooctanoic acid (PFOA)	374.625 ng/mL
..LC537SPIM_00022	08/09/17	03/22/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00007	440 uL	Perfluorobutanesulfonic acid (PFBS)	88.3417 ug/mL
							Perfluoroheptanoic acid (PFHpA)	9.9 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	30.0607 ug/mL
							Perfluorononanoic acid (PFNA)	19.26 ug/mL
							Perfluorooctanoic acid (PFOA)	19.98 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	40.0329 ug/mL
...LC537-PFBS_00007	01/04/18	01/04/17	Methanol, Lot 090285	51.5 mL	LC537_PFBS_00002	0.1034 g	Perfluorobutanesulfonic acid (PFBS)	2007.77 ug/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00014	03/22/18	03/22/17	Methanol, Lot 090285	50 mL	LC537_PFHpA_00002	0.05 g	Perfluoroheptanoic acid (PFHpA)	990 ug/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00009	01/04/18	01/04/17	Methanol, Lot 090285	54 mL	LC537_PFHxS_00002	0.119 g	Perfluorohexanesulfonic acid (PFHxS)	2004.05 ug/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00012	03/22/18	03/22/17	Methanol, Lot 090285	23 mL	LC537 PFNA_00002	0.023 g	Perfluorononanoic acid (PFNA)	963 ug/mL
....LC537 PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00012	03/22/18	03/22/17	Methanol, Lot 090285	21.5 mL	LC537 PFOA_00002	0.0215 g	Perfluorooctanoic acid (PFOA)	999 ug/mL
....LC537 PFOA_00002	11/04/18	Fluka, Lot SZBD308XV			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00007	08/09/17	01/04/17	Methanol, Lot 090285	48.95 mL	LC537_PFOS_00002	0.0538 g	Perfluorooctanesulfonic acid (PFOS)	1000.82 ug/mL
....LC537_PFOS_00002	08/09/17	Fluka, Lot SZBC222XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00045	01/05/18	07/05/17	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_00019	180 uL	13C4 PFOS	0.2868 ug/mL
..LCMPFOS_00019	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LC537-SU_00045	01/05/18	07/05/17	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
							13C2 PFDA	50 ug/mL
							13C2 PFHxA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

 Lab Name: TestAmerica Sacramento

 Job No.: 320-29926-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-L4_00019	08/09/17	07/05/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00019	270 uL	Perfluorobutanesulfonic acid (PFBS)	89.446 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10.0238 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	30.4365 ng/mL
							Perfluorononanoic acid (PFNA)	19.5008 ng/mL
							Perfluorooctanoic acid (PFOA)	20.2297 ng/mL
					Perfluorooctanesulfonic acid (PFOS)	40.5333 ng/mL		
					LC537-IS_00045	500 uL	13C2-PFOA	10 ng/mL
					LC537-SU_00045	500 uL	13C4 PFOS	28.68 ng/mL
							13C2 PFDA	10 ng/mL
LC537-HSP_00019	08/09/17	03/30/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00022	375 uL	13C2 PFHxA	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	1656.41 ng/mL
							Perfluoroheptanoic acid (PFHpA)	185.625 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	563.639 ng/mL
							Perfluorononanoic acid (PFNA)	361.125 ng/mL
Perfluorooctanoic acid (PFOA)	374.625 ng/mL							
LC537SPIM_00022	08/09/17	03/22/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00007	440 uL	Perfluorooctanesulfonic acid (PFOS)	750.617 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	88.3417 ug/mL
							Perfluoroheptanoic acid (PFHpA)	9.9 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	30.0607 ug/mL
							LC537-PFNA_00012	200 uL
LC537-PFOA_00012	200 uL	Perfluorooctanoic acid (PFOA)	19.98 ug/mL					
LC537-PFOS_00007	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0329 ug/mL					
LC537-PFBS_00007	01/04/18	01/04/17	Methanol, Lot 090285	51.5 mL	LC537_PFBS_00002	0.1034 g	Perfluorobutanesulfonic acid (PFBS)	2007.77 ug/mL
LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	1 g/g
LC537-PFHpA_00014	03/22/18	03/22/17	Methanol, Lot 090285	50 mL	LC537_PFHpA_00002	0.05 g	Perfluorobutanesulfonic acid (PFBS)	990 ug/mL
LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
LC537-PFHxS_00009	01/04/18	01/04/17	Methanol, Lot 090285	54 mL	LC537_PFHxS_00002	0.119 g	Perfluoroheptanoic acid (PFHpA)	2004.05 ug/mL
LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
LC537-PFNA_00012	03/22/18	03/22/17	Methanol, Lot 090285	23 mL	LC537_PFNA_00002	0.023 g	Perfluorohexanesulfonic acid (PFHxS)	963 ug/mL
LC537 PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
LC537-PFOA_00012	03/22/18	03/22/17	Methanol, Lot 090285	21.5 mL	LC537_PFOA_00002	0.0215 g	Perfluorononanoic acid (PFNA)	999 ug/mL
LC537 PFOA_00002	11/04/18	Fluka, Lot SZBD308XV			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-29926-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC537-PFOS_00007	08/09/17	01/04/17	Methanol, Lot 090285	48.95 mL	LC537_PFOS_00002	0.0538 g	Perfluorooctanesulfonic acid (PFOS)	1000.82 ug/mL
....LC537_PFOS_00002	08/09/17	Fluka, Lot SZBC222XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.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
..LCMPFOS_00019	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00045	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
LC537-L5_00023	08/09/17	07/05/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00019	400 uL	Perfluorobutanesulfonic acid (PFBS)	132.513 ng/mL
							Perfluoroheptanoic acid (PFHpA)	14.85 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.0911 ng/mL
							Perfluorononanoic acid (PFNA)	28.89 ng/mL
							Perfluorooctanoic acid (PFOA)	29.97 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	60.0494 ng/mL
					LC537-IS_00045	500 uL	13C2-PFOA	10 ng/mL
					LC537-SU_00045	500 uL	13C4 PFOS	28.68 ng/mL
							13C2 PFDA	10 ng/mL
.LC537-HSP_00019	08/09/17	03/30/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00022	375 uL	13C2 PFHxA	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	1656.41 ng/mL
							Perfluoroheptanoic acid (PFHpA)	185.625 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	563.639 ng/mL
							Perfluorononanoic acid (PFNA)	361.125 ng/mL
							Perfluorooctanoic acid (PFOA)	374.625 ng/mL
..LC537SPIM_00022	08/09/17	03/22/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00007	440 uL	Perfluorooctanesulfonic acid (PFOS)	750.617 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	88.3417 ug/mL
							Perfluoroheptanoic acid (PFHpA)	9.9 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	30.0607 ug/mL
							Perfluorononanoic acid (PFNA)	19.26 ug/mL
							Perfluorooctanoic acid (PFOA)	19.98 ug/mL
...LC537-PFBS_00007	01/04/18	01/04/17	Methanol, Lot 090285	51.5 mL	LC537-PFOS_00007	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0329 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	2007.77 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-29926-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
....LC537_PFBs_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00014	03/22/18	03/22/17	Methanol, Lot 090285	50 mL	LC537_PFHpA_00002	0.05 g	Perfluoroheptanoic acid (PFHpA)	990 ug/mL
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00009	01/04/18	01/04/17	Methanol, Lot 090285	54 mL	LC537_PFHxS_00002	0.119 g	Perfluorohexanesulfonic acid (PFHxS)	2004.05 ug/mL
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00012	03/22/18	03/22/17	Methanol, Lot 090285	23 mL	LC537 PFNA_00002	0.023 g	Perfluorononanoic acid (PFNA)	963 ug/mL
....LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00012	03/22/18	03/22/17	Methanol, Lot 090285	21.5 mL	LC537 PFOA_00002	0.0215 g	Perfluorooctanoic acid (PFOA)	999 ug/mL
....LC537 PFOA_00002	11/04/18		Fluka, Lot SZBD308XV		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00007	08/09/17	01/04/17	Methanol, Lot 090285	48.95 mL	LC537_PFOS_00002	0.0538 g	Perfluorooctanesulfonic acid (PFOS)	1000.82 ug/mL
....LC537_PFOS_00002	08/09/17		Fluka, Lot SZBC222XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00045	01/05/18	07/05/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
..LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C4 PFOS	0.2868 ug/mL
..LCMPFOS_00019	08/03/21		Wellington Laboratories, Lot MPFOS0816		(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LC537-SU_00045	01/05/18	07/05/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFHxA	0.1 ug/mL
..LCMPFHxA_00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFDA	50 ug/mL
LC537-L6_00018	08/09/17	07/05/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00019	530 uL	Perfluorobutanesulfonic acid (PFBS)	175.579 ng/mL
							Perfluoroheptanoic acid (PFHpA)	19.6763 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	59.7457 ng/mL
							Perfluorononanoic acid (PFNA)	38.2792 ng/mL
							Perfluorooctanoic acid (PFOA)	39.7103 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	79.5654 ng/mL
					LC537-IS_00045	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
							13C2 PFDA	10 ng/mL
.LC537-HSP_00019	08/09/17	03/30/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00022	375 uL	13C2 PFHxA	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	1656.41 ng/mL
							Perfluoroheptanoic acid (PFHpA)	185.625 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	563.639 ng/mL
							Perfluorononanoic acid (PFNA)	361.125 ng/mL
							Perfluorooctanoic acid (PFOA)	374.625 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-29926-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	750.617 ng/mL
..LC537SPIM_00022	08/09/17	03/22/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00007	440 uL	Perfluorobutanesulfonic acid (PFBS)	88.3417 ug/mL
					LC537-PFHpA_00014	100 uL	Perfluoroheptanoic acid (PFHpA)	9.9 ug/mL
					LC537-PFHxS_00009	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0607 ug/mL
					LC537-PFNA_00012	200 uL	Perfluorononanoic acid (PFNA)	19.26 ug/mL
					LC537-PFOA_00012	200 uL	Perfluorooctanoic acid (PFOA)	19.98 ug/mL
					LC537-PFOS_00007	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0329 ug/mL
...LC537-PFBS_00007	01/04/18	01/04/17	Methanol, Lot 090285	51.5 mL	LC537_PFBS_00002	0.1034 g	Perfluorobutanesulfonic acid (PFBS)	2007.77 ug/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00014	03/22/18	03/22/17	Methanol, Lot 090285	50 mL	LC537_PFHpA_00002	0.05 g	Perfluoroheptanoic acid (PFHpA)	990 ug/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00009	01/04/18	01/04/17	Methanol, Lot 090285	54 mL	LC537_PFHxS_00002	0.119 g	Perfluorohexanesulfonic acid (PFHxS)	2004.05 ug/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00012	03/22/18	03/22/17	Methanol, Lot 090285	23 mL	LC537 PFNA_00002	0.023 g	Perfluorononanoic acid (PFNA)	963 ug/mL
....LC537 PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00012	03/22/18	03/22/17	Methanol, Lot 090285	21.5 mL	LC537 PFOA_00002	0.0215 g	Perfluorooctanoic acid (PFOA)	999 ug/mL
....LC537_PFOA_00002	11/04/18	Fluka, Lot SZBD308XV			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00007	08/09/17	01/04/17	Methanol, Lot 090285	48.95 mL	LC537_PFOS_00002	0.0538 g	Perfluorooctanesulfonic acid (PFOS)	1000.82 ug/mL
....LC537_PFOS_00002	08/09/17	Fluka, Lot SZBC222XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00045	01/05/18	07/05/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C4 PFOS	0.2868 ug/mL
..LCMPFOS_00019	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LC537-SU_00045	01/05/18	07/05/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C4 PFOS	47.8 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	0.1 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	0.1 ug/mL
LC537-LSP_00021	08/08/17	03/23/17	Methanol, Lot 090285	20000 uL	LC537SPIM_00022	50 uL	Perfluorobutane Sulfonate	220.854 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	220.854 ng/mL
							Perfluoroheptanoic acid (PFHpA)	24.75 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	75.1518 ng/mL
							Perfluorononanoic acid (PFNA)	48.15 ng/mL
							Perfluorooctanoic acid (PFOA)	49.95 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-29926-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	100.082 ng/mL
.LC537SPIM_00022	08/09/17	03/22/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00007	440 uL	Perfluorobutane Sulfonate	88.3417 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	88.3417 ug/mL
					LC537-PFHpA_00014	100 uL	Perfluoroheptanoic acid (PFHpA)	9.9 ug/mL
					LC537-PFHxS_00009	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0607 ug/mL
					LC537-PFNA_00012	200 uL	Perfluorononanoic acid (PFNA)	19.26 ug/mL
					LC537-PFOA_00012	200 uL	Perfluorooctanoic acid (PFOA)	19.98 ug/mL
					LC537-PFOS_00007	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0329 ug/mL
..LC537-PFBS_00007	01/04/18	01/04/17	Methanol, Lot 090285	51.5 mL	LC537_PFBS_00002	0.1034 g	Perfluorobutane Sulfonate	2007.77 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	2007.77 ug/mL
...LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutane Sulfonate	1 g/g
							Perfluorobutanesulfonic acid (PFBS)	1 g/g
..LC537-PFHpA_00014	03/22/18	03/22/17	Methanol, Lot 090285	50 mL	LC537_PFHpA_00002	0.05 g	Perfluoroheptanoic acid (PFHpA)	990 ug/mL
...LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
..LC537-PFHxS_00009	01/04/18	01/04/17	Methanol, Lot 090285	54 mL	LC537_PFHxS_00002	0.119 g	Perfluorohexanesulfonic acid (PFHxS)	2004.05 ug/mL
...LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
..LC537-PFNA_00012	03/22/18	03/22/17	Methanol, Lot 090285	23 mL	LC537 PFNA_00002	0.023 g	Perfluorononanoic acid (PFNA)	963 ug/mL
...LC537 PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
..LC537-PFOA_00012	03/22/18	03/22/17	Methanol, Lot 090285	21.5 mL	LC537 PFOA_00002	0.0215 g	Perfluorooctanoic acid (PFOA)	999 ug/mL
...LC537 PFOA_00002	11/04/18	Fluka, Lot SZBD308XV			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
..LC537-PFOS_00007	08/09/17	01/04/17	Methanol, Lot 090285	48.95 mL	LC537_PFOS_00002	0.0538 g	Perfluorooctanesulfonic acid (PFOS)	1000.82 ug/mL
...LC537_PFOS_00002	08/09/17	Fluka, Lot SZBC222XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
LC537-SU_00044	12/20/17	06/20/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
.LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL

Reagent

LC537_PFB_00002

4/1/15 SPV

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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:

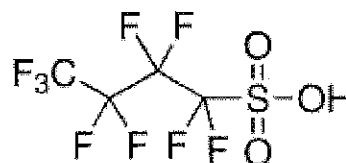
300.10 g/mol

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

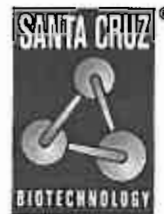
Jamie Gleason, Manager
Quality Control
Milwaukee, Wisconsin US

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

Reagent

LC537_PFB2_00002

17.6.8.17 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

Certificate of Analysis

Product Name: PERFLUOROHEPTANOIC ACID
99 %
Product Number: 342041
Batch Number: BCBM2579V
Brand: Aldrich
CAS Number: 375-85-9
Formula: $\text{CF}_3(\text{CF}_2)_5\text{CO}_2\text{H}$
Formula Weight: 364.06
Quality Release Date: 06 DEC 2013
Recommended Retest Date: OCT 2018

PFH₇A

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



Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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Reagent

LC537_PFHpA2_00002

Certificate of analysis

r:6.13.17 SW

PFHe A

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

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

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Reagent

LC537_PFHxS_00002

r: 4/1/15 stw

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: TRIDECAFLUOROHXANE-1-SULFONIC ACID POTASSIUM SALT
Product Number: 50929
Batch Number: BCBL3545V
Brand: Aldrich
CAS Number: 3871-99-6
Formula: $C_{13}F_{27}KO_2S$
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

Claudia Geitner

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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

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

stw 4/1/15

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

Reagent

LC537_PFHxS2_00002

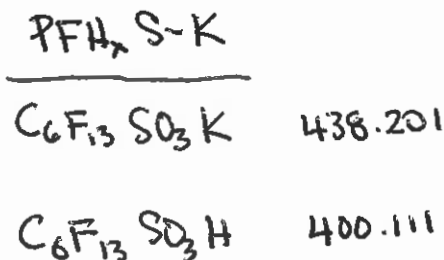


The Future is Now

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: $C_{13}F_{27}KO_2S$
 Molecular Weight: 438.20

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



$$MW \text{ correction} = \frac{400.11}{438.201} = 0.91307 \quad \frac{PFH_2S}{\text{CAS \# 355-46-4}}$$

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

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

Reagent

LC537_PFNA_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	Lot: QN44F	
CAS: 375-95-1		

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_PFNA2_00002

17.14.16 SKW

SIGMA-ALDRICH

sigma-aldrich.com

3050 Spruce Street, Saint Louis, MO 63103, USA

Website: www.sigmaaldrich.com

Email USA: techserv@sial.com

Outside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name:

Perfluorononanoic acid - 97%

Product Number:

394459

Batch Number:

MKCC0699

Brand:

ALDRICH

CAS Number:

375-95-1

MDL Number:

MFCD00039605

Formula:

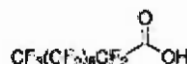
C₉H₁₇O₂

Formula Weight:

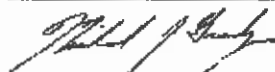
464.08 g/mol

Quality Release Date:

07 DEC 2016



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



Michael Grady, Manager
Quality Control
Milwaukee, WI US

PFNA

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

Reagent

LC537_PFOA_00002

11/3/2015 2

SIGMA-ALDRICH®

CERTIFICATE OF ANALYSIS

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

Seelze, 13.11.2013/505378/13/24029

Order-No.:

Customer-No.:

Order-Code:

Quantity:

Production Date: 04.Nov.2013

Expiry Date: 04.Nov.2018

Article/Product: 33824

Batch : SZBD308XV

Pentadecafluorooctanoic acid OEKANAL®

PFOA

Reference Material (RM)

1. General Information

Formula: C₈HF₁₅O₂

CAS-No.: [335-67-1]

Usage : PFOA

Molar mass: 414.07 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 (GC-MS)

Assay (GCMS)

Date of Analysis

complying

99.4 %

13.Nov.2013

3. Advice and Remarks

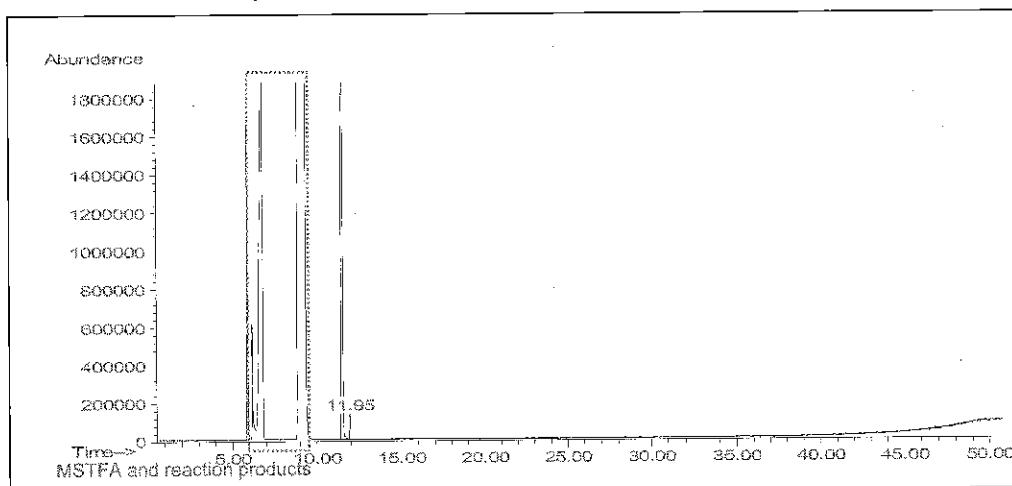
- The expiry date is based on the current knowledge and holds only for proper storage conditions in the originally closed flasks/ packages.
- Whenever the container is opened for removal of aliquot portions of the substance, the person handling the substance must assure, that the integrity of the substance 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

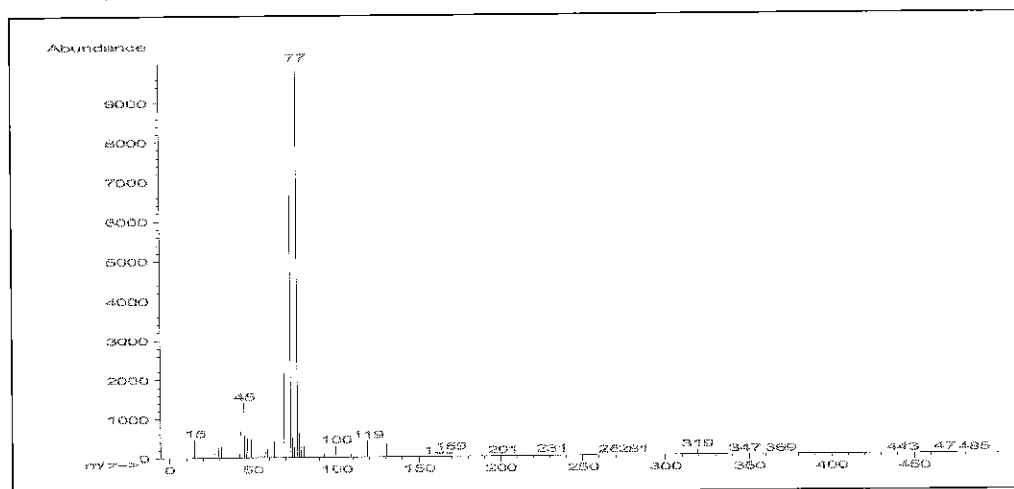
This document was produced electronically and is valid without a signature

GC/MS-Method**Analytical Department****Article:** Pentadecafluorooctanoic acid OEKANAL**Article-No.:** 33824**Batch:** SZBD308XV**Column:** XTI-5 (Restek); 30 m; fs cap.; I.D.:0.25 mm; 1 µm df**Injector:** Split mode**Injection:** approx. 1 µl of reaction mixture with MSTFA (approx. 10 mg + 200 µl MSTFA)**Inj.-temp.:** 280°C**Oven-temp.:** 40°C (for 2 min) to 320°C (6°C/min) hold for 2 min**Split:** 1:100**Flow:** 1 ml He/min (Constant flow mode)**Detector:** MSD**Mass range:** 10-600 amu (Scan mode)**Evaluation:** Purity: Total Ion Chromatogram
(MSTFA and reaction products blinded out in report)

Identity: Mass spectrum complies

Operator: Ahrens / 2013-11-13**Total Ion Chromatogram:**

Ret.time	Area	Area-%	Com
11.54	565.1670	99.4	Pentadecafluorooctanoic acid (as TMS-ester)
11.95	3.6792	0.64	

Mass spectrum (rt = 11.54 min):

Reagent

LC537_PFOA2_00002

Certificate of analysis

17: 6/9/17 SW

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

PFOA

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

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Order our products online www.alfa.com

ThermoFisher
SCIENTIFIC

Reagent

LC537_PFOS_00002

F: 4/1/15 SV

SIGMA-ALDRICH®

CERTIFICATE OF ANALYSIS

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

Seelze, 13.08.2012/419060/12/17583

Order-No.:

Customer-No.:

Order-Code:

Quantity:

Production Date: 09.Aug.2012

Expiry Date: 09.Aug.2017 - *ex date*

Article/Product: 33829

Batch : SZBC222XV

Heptadecafluorooctanesulfonic acid potassium salt OEKANAL®

PFOS-K⁺

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 %

10.Aug.2012

PW-correction:

$$\frac{538.22 - 39.10 + 1.01}{538.22} = \frac{500.13}{538.22} = 0.92923$$

Purity = 91.66%

3. Advice and Remarks

- The minimum shelf life 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

1: 6.14.17 SKV

SIGMA-ALDRICH

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

Certificate of Analysis

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

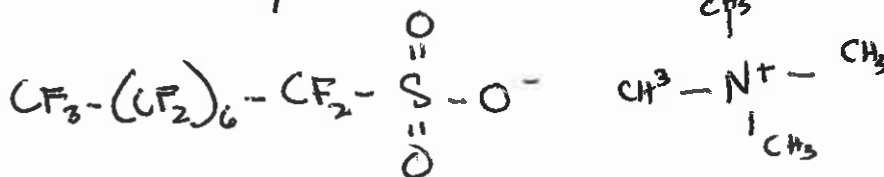
TEST	SPECIFICATION	RESULT
APPEARANCE (COLOR)	WHITE TO OFF WHITE	OFF-WHITE
APPEARANCE (FORM)	POWDER OR POWDER WITH CHUNK(S)	POWDER
CARBON CONTENT	29.77 % - 31.29 %	29.97 %
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS

Claudia Geitner

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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

$$\text{Purity \& mw correction} = 77.37\%$$



$$\begin{array}{r} \text{C}_8\text{F}_{17}\text{SO}_3^+\text{H} \\ \text{C} = 12.011 \quad 96.088 \\ \text{F} = 18.998 \quad 322.966 \\ \text{S} = 32.066 \quad 32.066 \\ \text{O} = 16.000 \quad 47.947 \\ \text{H} = 1.008 \quad 1.008 \\ \text{N} = 14.007 \quad - \\ \hline 500.125 \end{array}$$

$$\begin{array}{r} \text{C}_8\text{H}_{20}\text{N} \\ 96.088 \\ - \\ - \\ 20.60 \\ 14.007 \\ \hline 130.255 \end{array}$$

Reagent

LCM2PFOA_00007



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

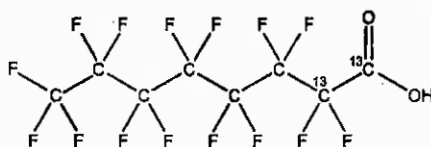
M2PFOA

LOT NUMBER:

M2PFOA0216

COMPOUND:Perfluoro-n-[1,2-¹³C₂]octanoic acid**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%

ISOTOPIC PURITY:≥99% ¹³C(1,2-¹³C₂)**LAST TESTED:** (mm/dd/yyyy)

02/12/2016

EXPIRY DATE: (mm/dd/yyyy)

02/12/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 02/24/2016

(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

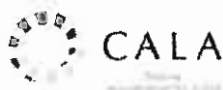
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

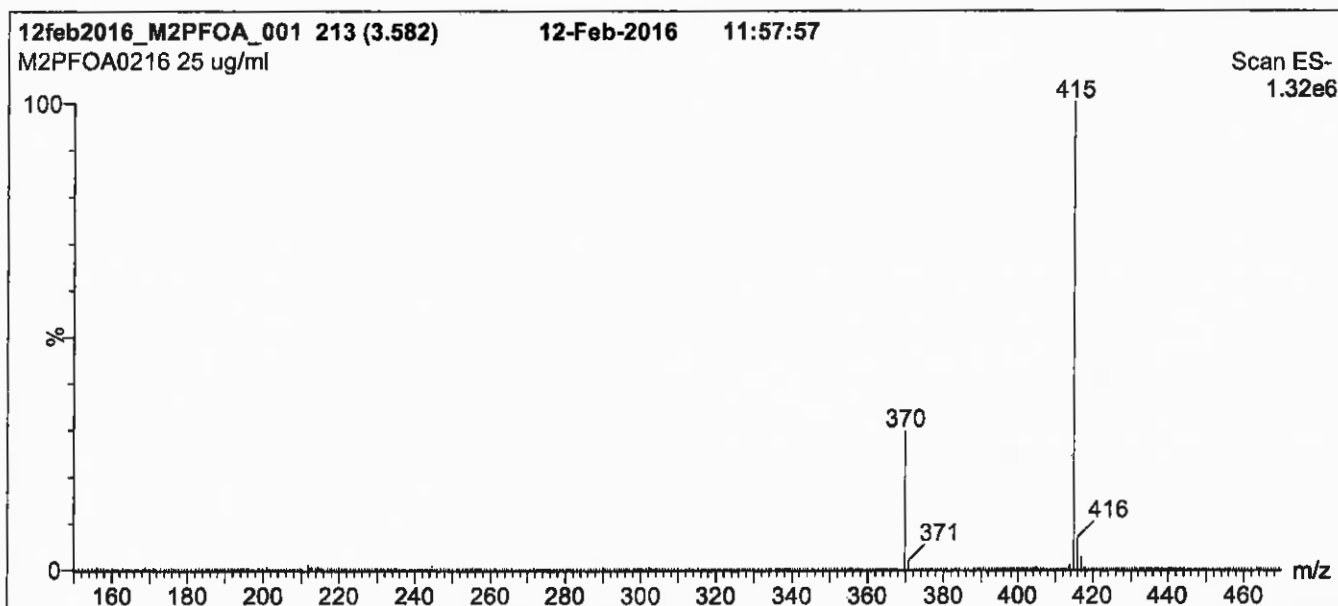
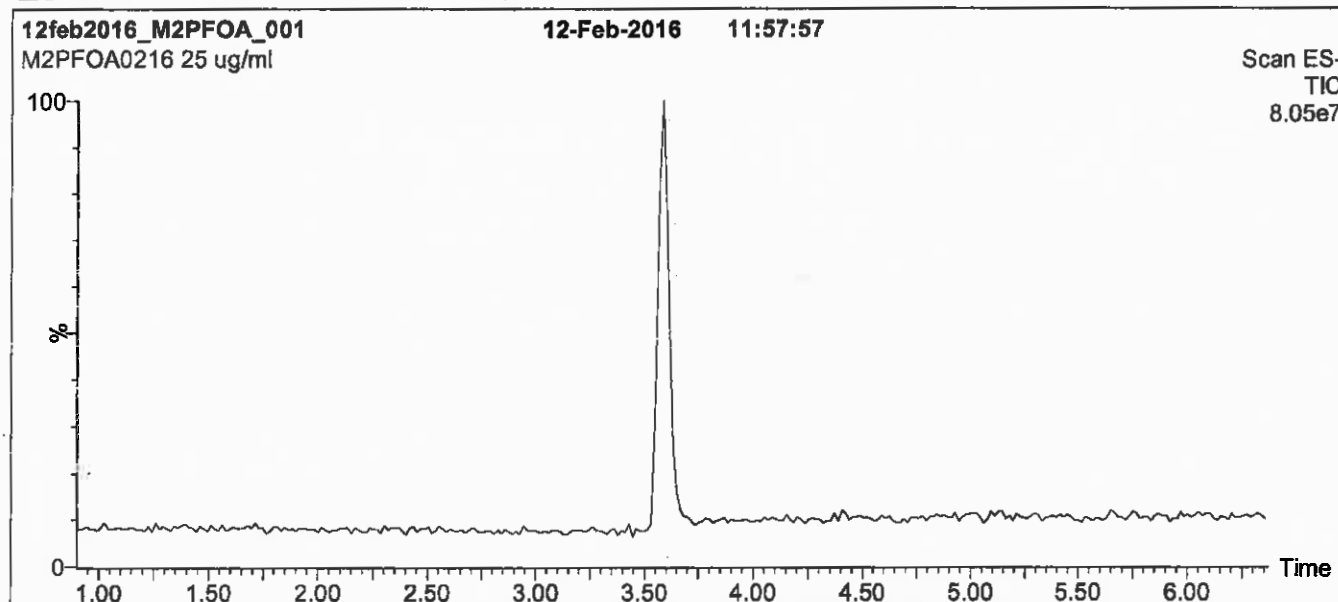
QUALITY MANAGEMENT:

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



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

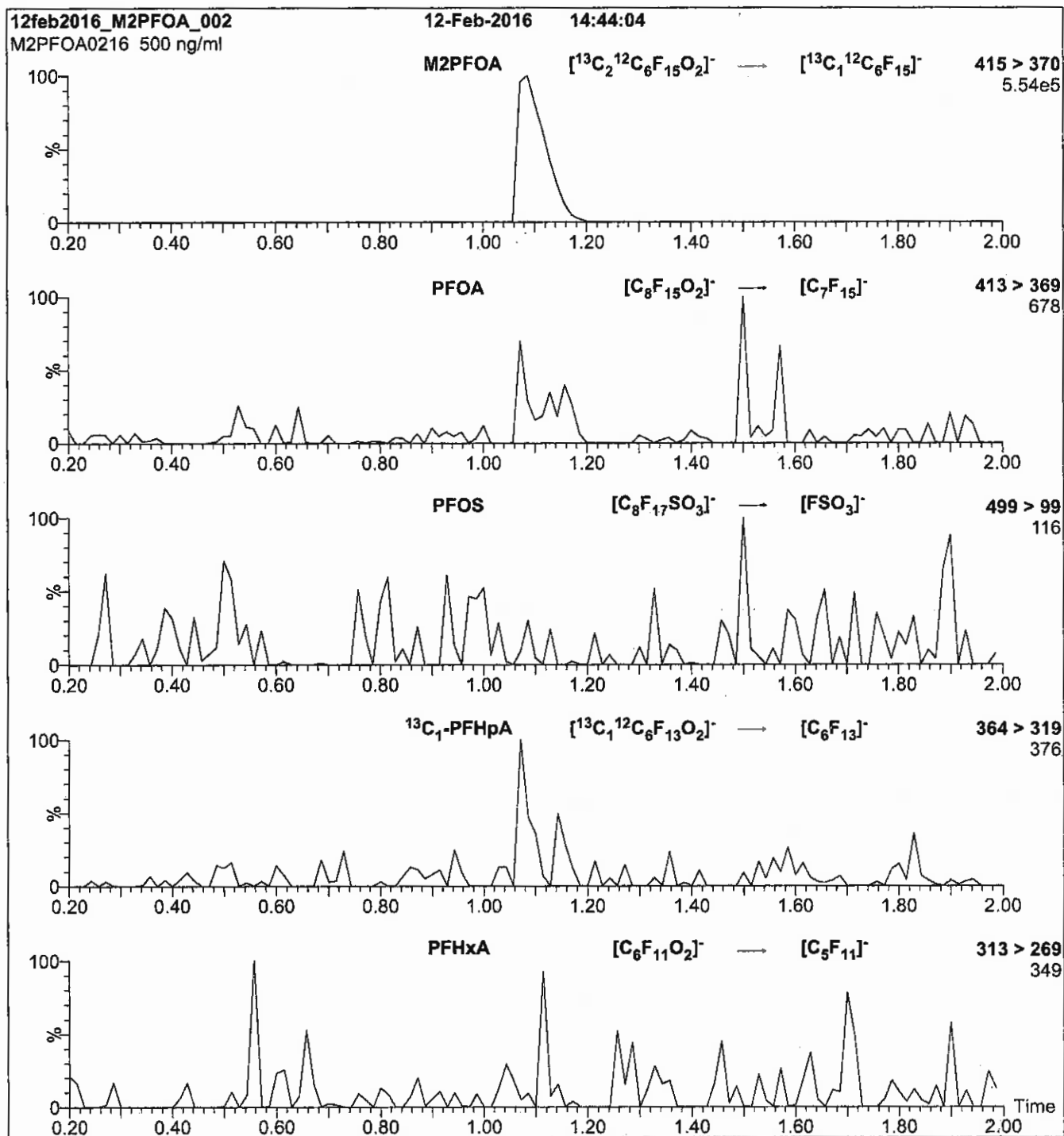
Capillary Voltage (kV) = 3.00

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: LCMFDA_00012

Exp: 09/30/21 Prod: SBC

13C2-Perfluorodecanoic acid



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFDA

COMPOUND:

Perfluoro-n-[1,2-¹³C₂]decanoic acid

LOT NUMBER:

MPFDA0916

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₈HF₁₉O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

516.07

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

LAST TESTED: (mm/dd/yyyy)

09/30/2016

(1,2-¹³C₂)

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. Chritton

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:

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UNCERTAINTY:

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

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

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

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

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using 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:

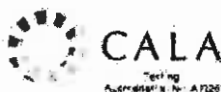
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

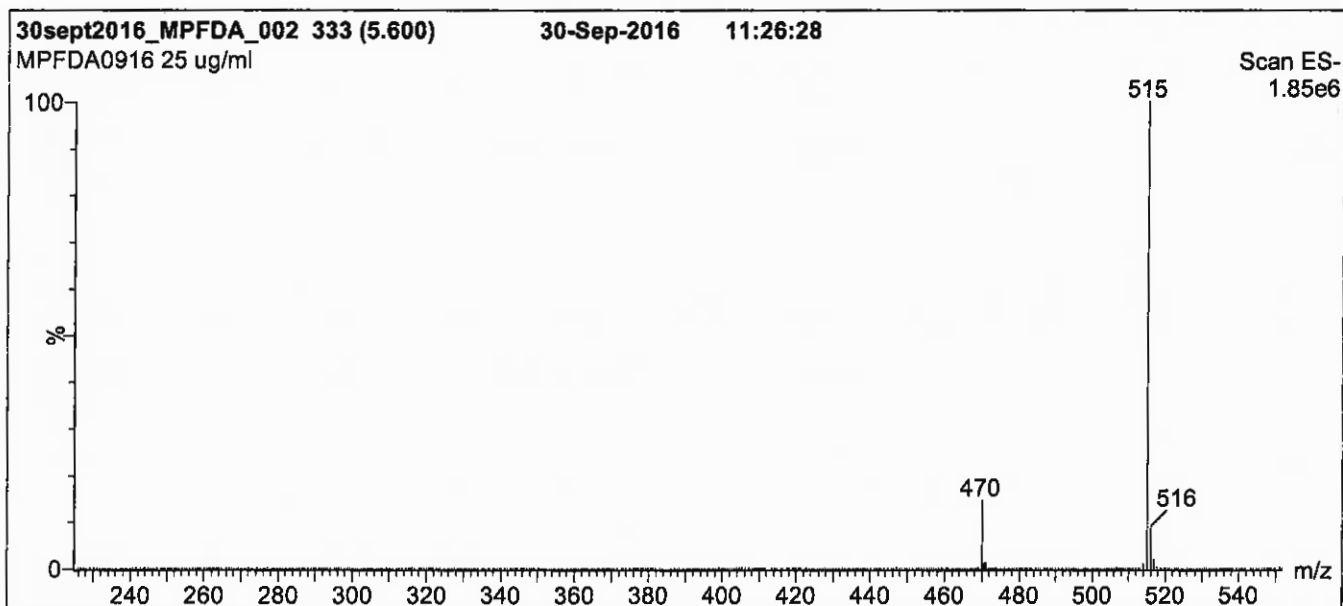
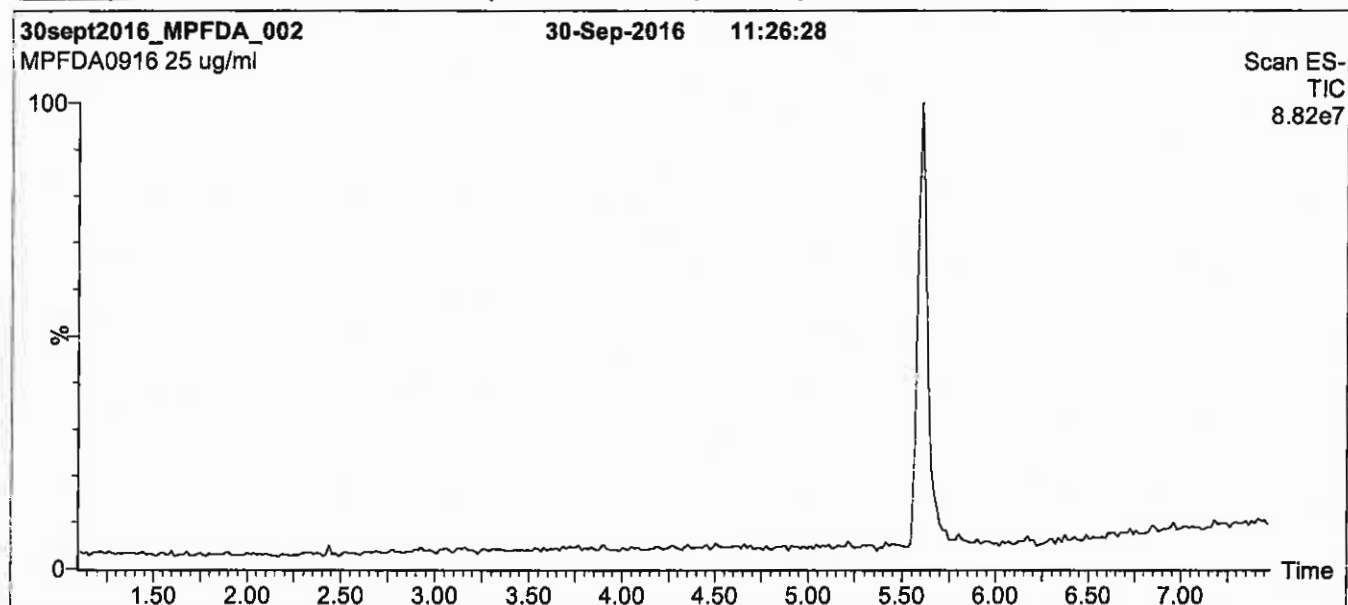
QUALITY MANAGEMENT:

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

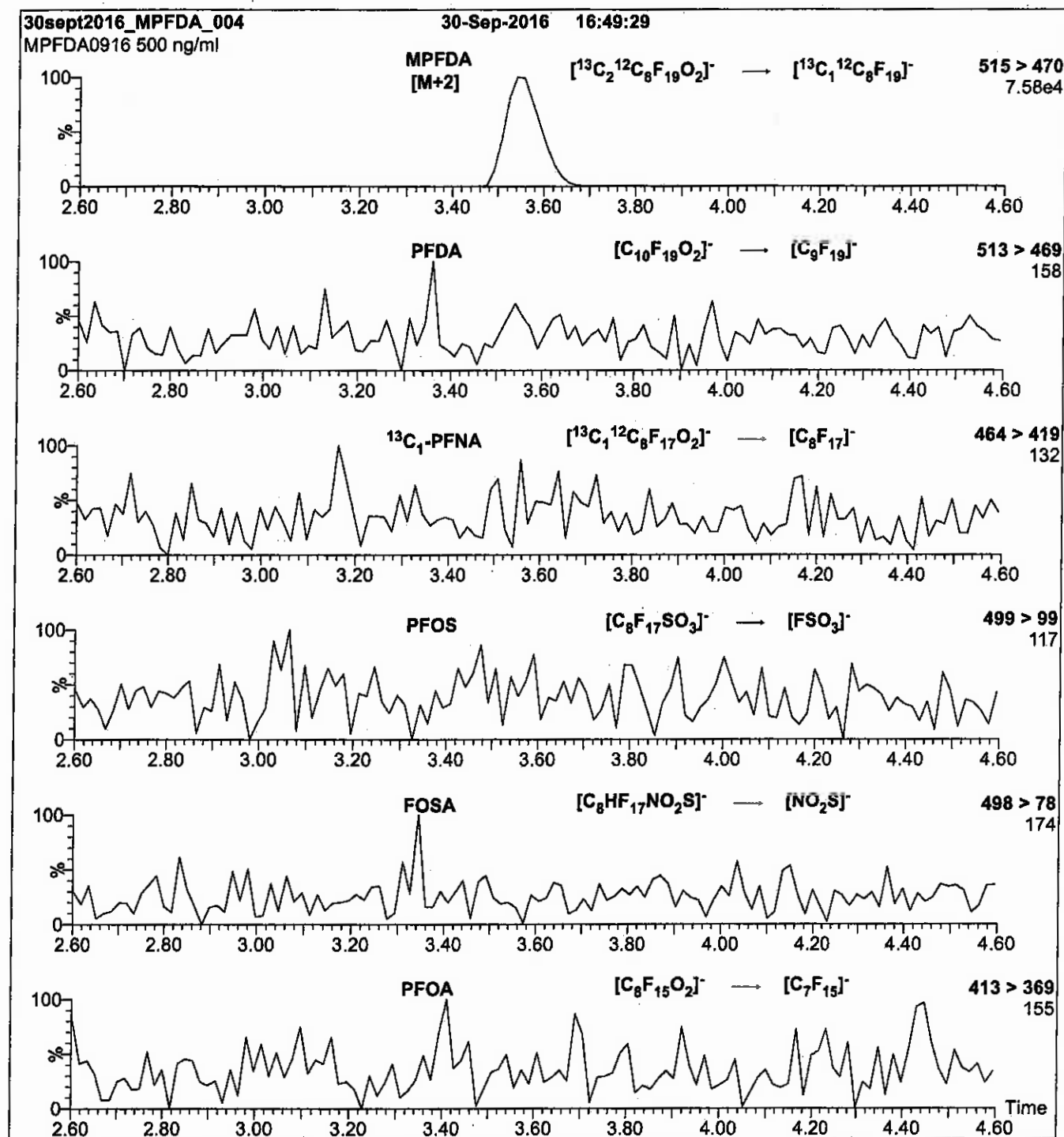
Flow: 300 μ l/min

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% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFHxA_00013

R: SBC 12/21/16

814258
ID: LCMPFHxA_00013
Exp: 04/08/21 Ppdt: SBC
13C2-Perfluorohexanoic ac**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PRODUCT CODE:**

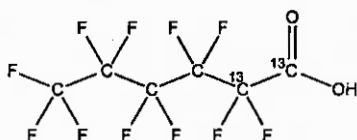
MPFHxA

LOT NUMBER:

MPFHxA0416

COMPOUND:Perfluoro-n-[1,2-¹³C₂]hexanoic acid**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**LAST TESTED:** (mm/dd/yyyy)

04/08/2016

(1,2-¹³C₂)**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.

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

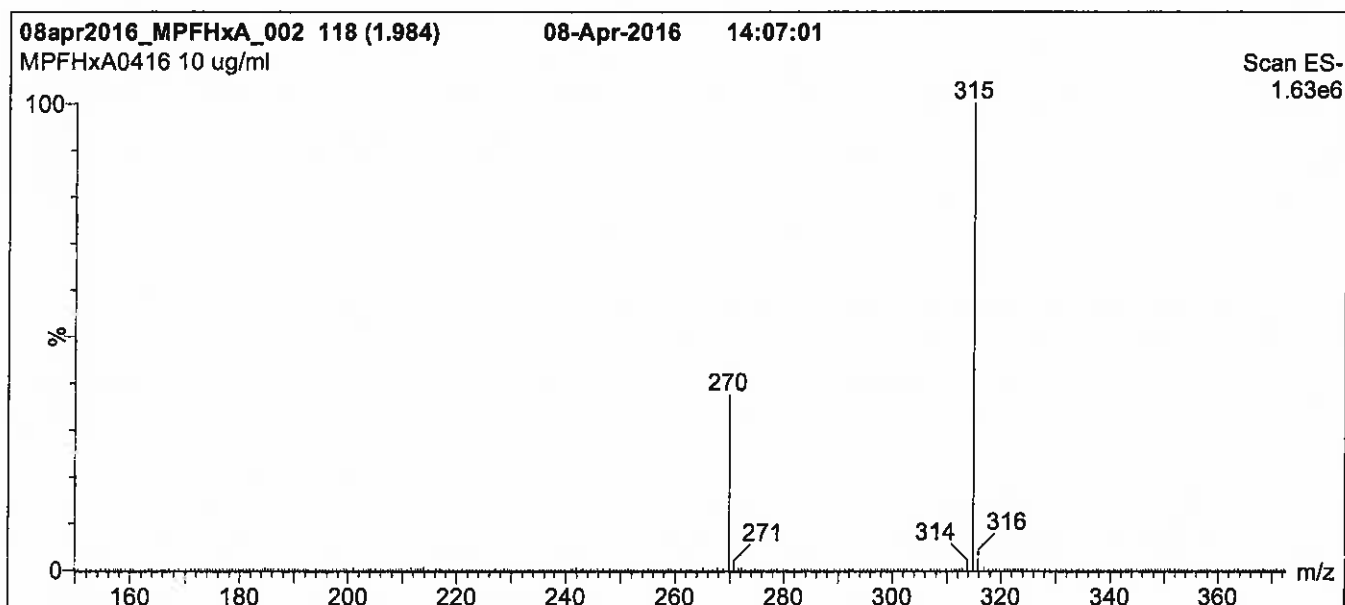
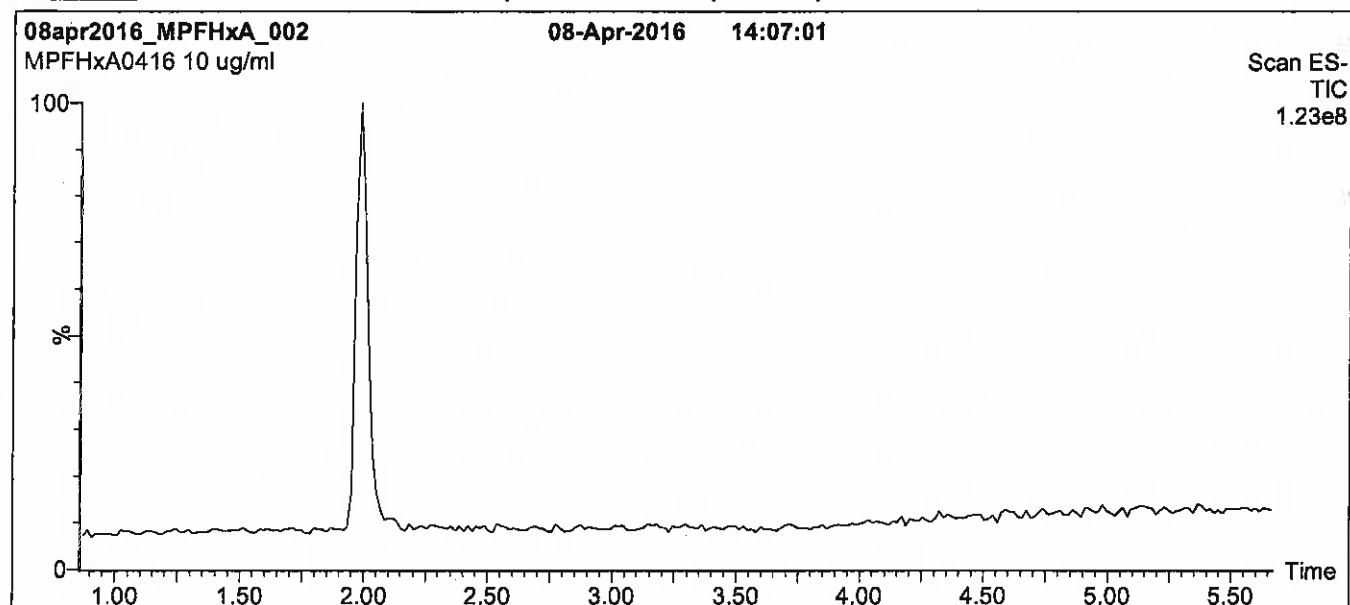
QUALITY MANAGEMENT:

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



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Figure 1: 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

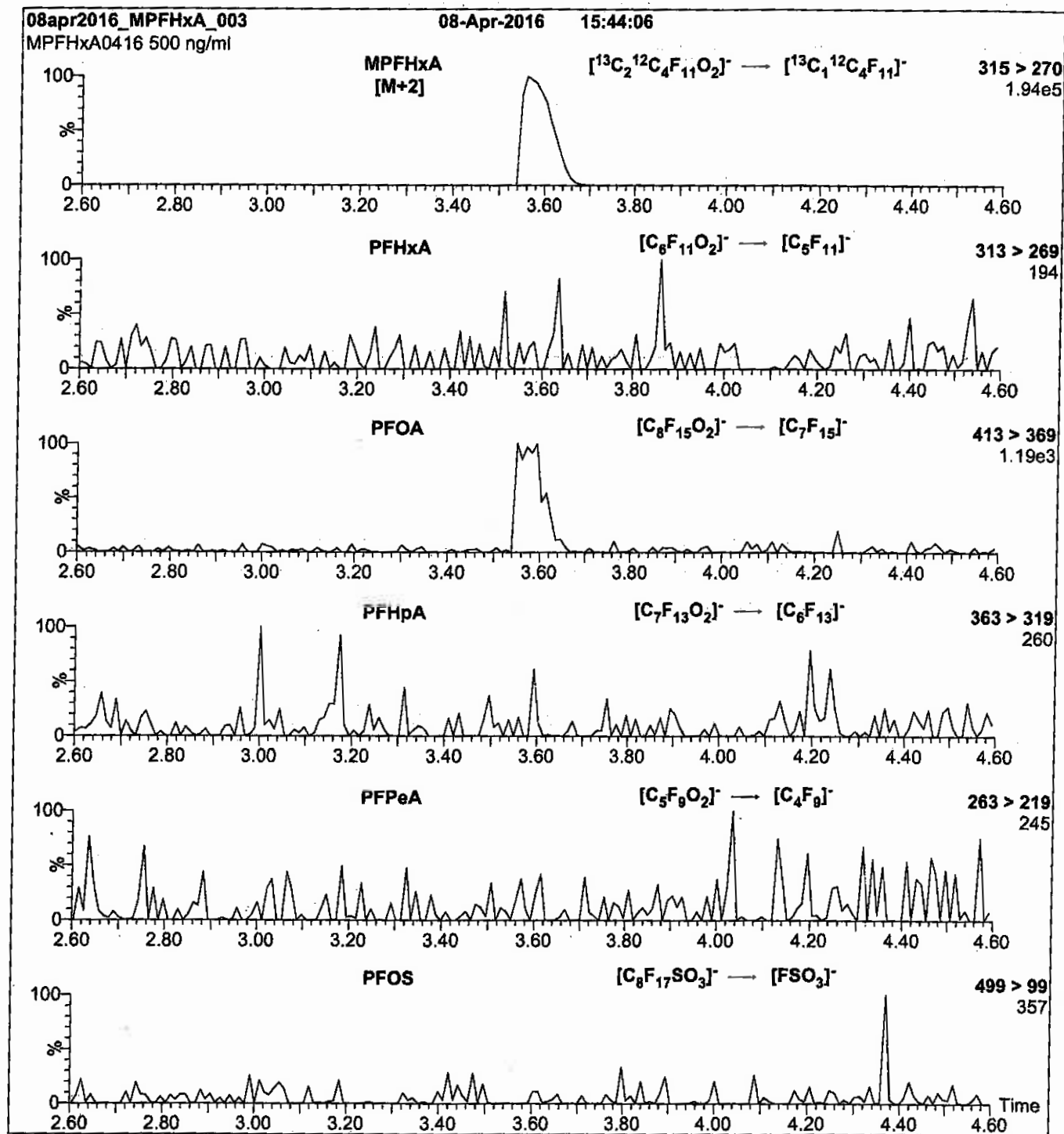
Flow: 300 μ l/min

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

Reagent

LCMPFOS_00019

R: SBC 12/21/16



814253

ID: LCMPFOS_00019

Exp: 08/03/21 Ppdt: SBC

13C4-Perfluorooctanesulfo

WELLINGTON
LABORATORIESCERTIFICATE OF ANALYSIS
DOCUMENTATION**PRODUCT CODE:**

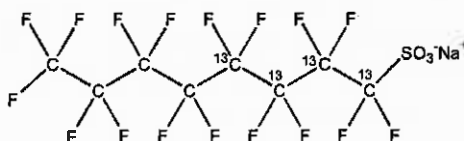
MPFOS

LOT NUMBER:

MPFOS0816

COMPOUND:Sodium perfluoro-1-[1,2,3,4-¹³C₄]octanesulfonate**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**¹³C₄¹²C₄F₁₇SO₃Na**CONCENTRATION:**

50.0 ± 2.5 µg/ml (Na salt)

47.8 ± 2.4 µg/ml (MPFOS anion)

MOLECULAR WEIGHT:

526.08

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:≥99% ¹³C**LAST TESTED:** (mm/dd/yyyy)

08/03/2016

EXPIRY DATE: (mm/dd/yyyy)

08/03/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

(1,2,3,4-¹³C₄)**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)

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

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

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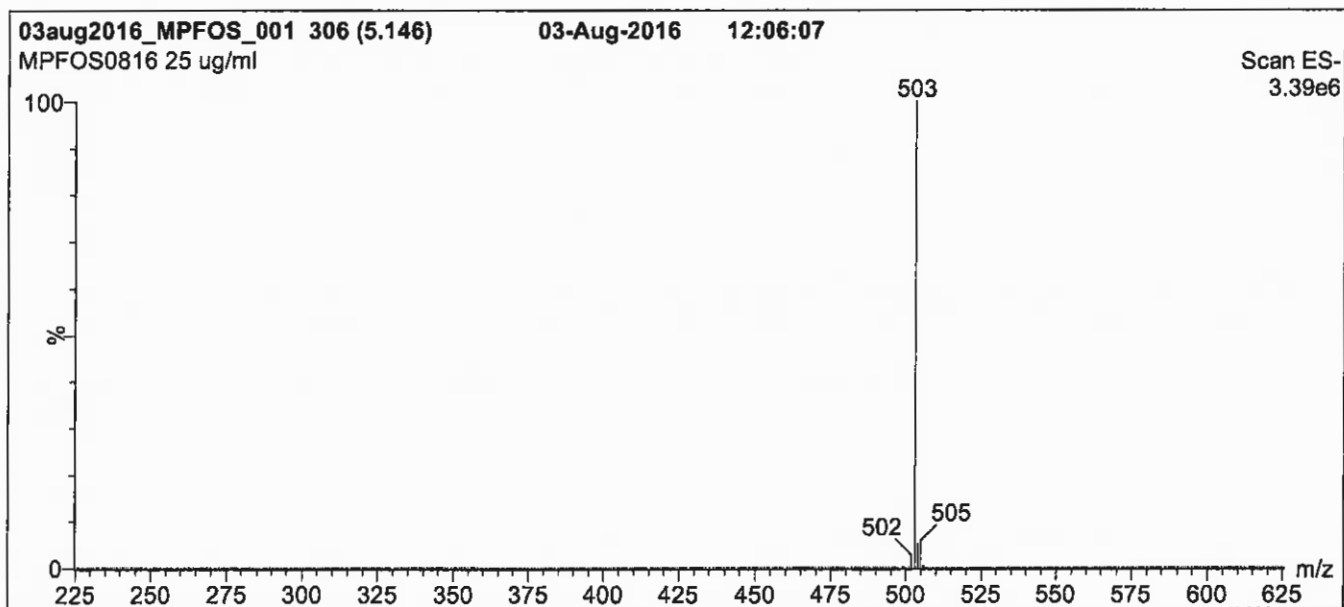
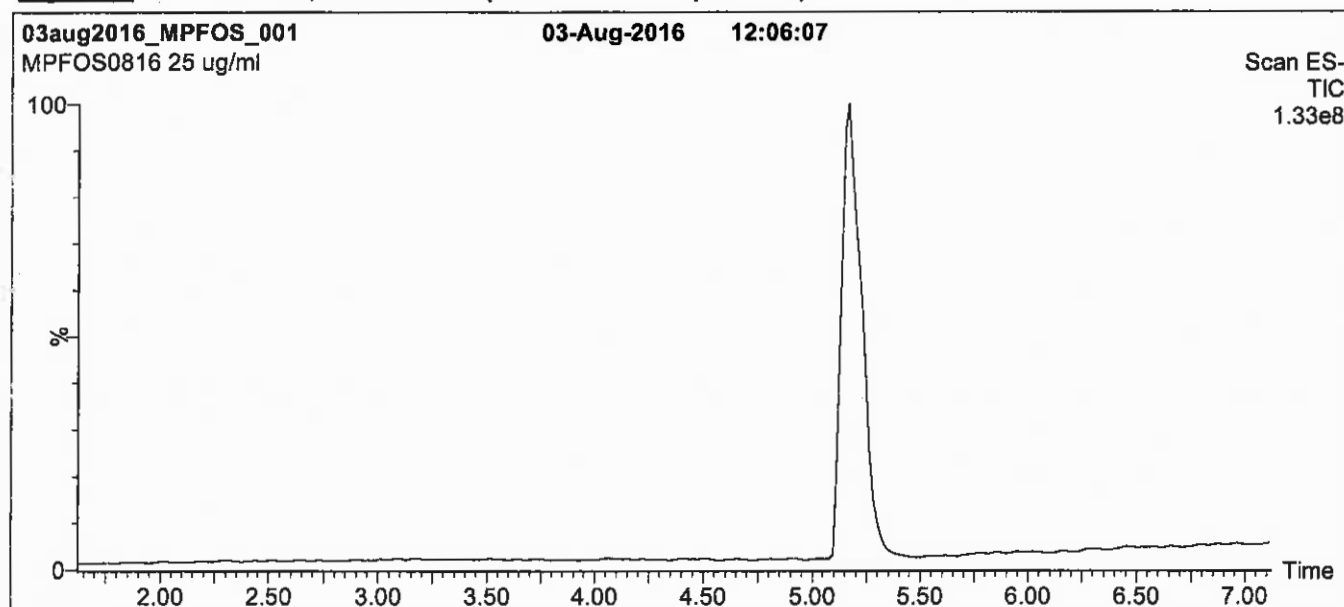
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Figure 1: MPFOS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient

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

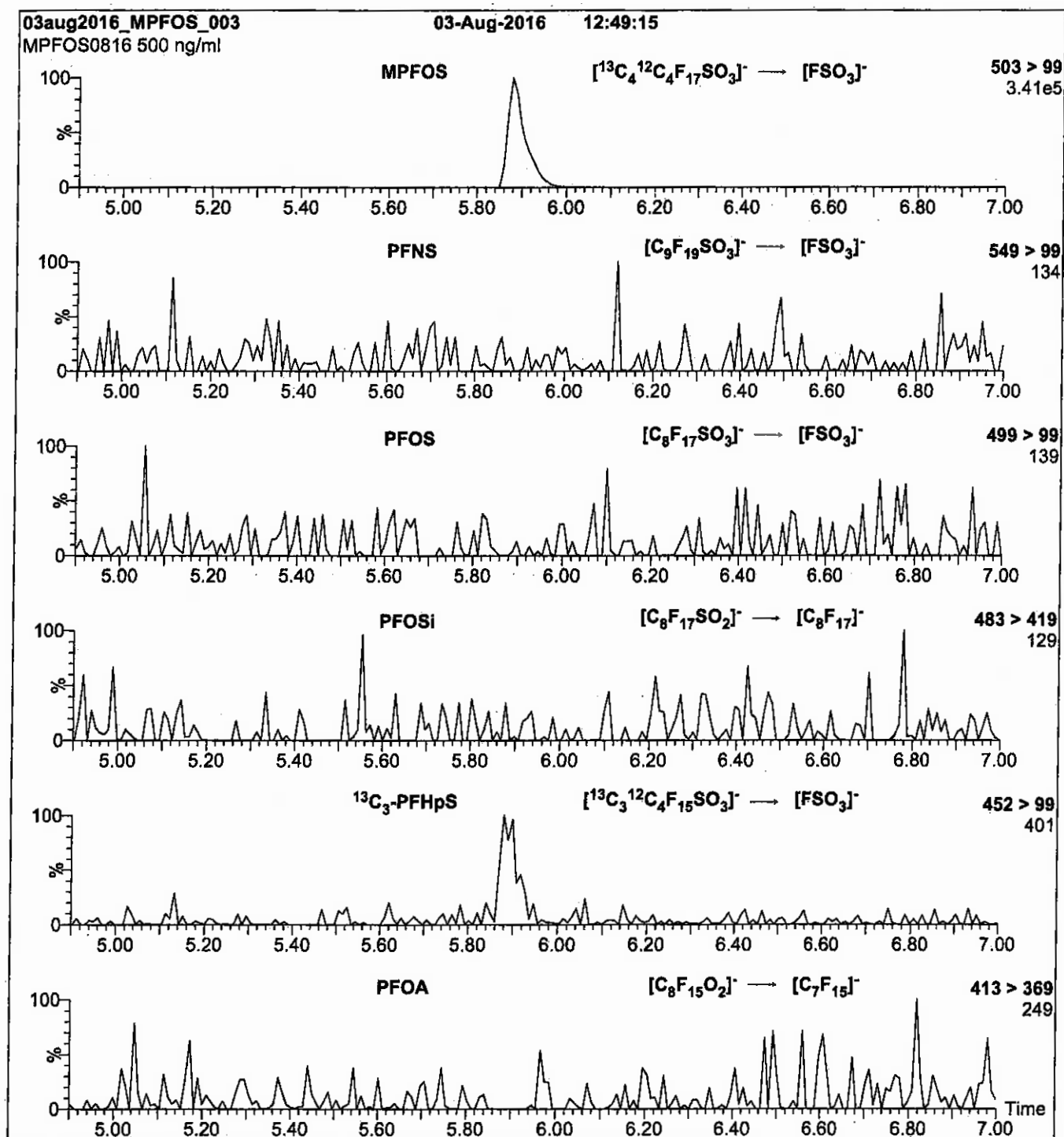
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Method 537 DOD

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

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1

SDG No.: _____

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WGNA-071717-RW-3826	320-29926-1	81	105
WGNA-071717-FRB-3826	320-29926-2	97	103
	MB 320-176265/1-A	110	105
	LLCS 320-176265/2-A	93	99

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA

QC LIMITS
70-130
70-130

Column to be used to flag recovery values

FORM III
LCMS LOW LEVEL CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 03AUG2017A6B_055.d
 Lab ID: LLCS 320-176265/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LLCS CONCENTRATION (ng/L)	LLCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	40.0	40.2	100	50-150	
Perfluorooctanoic acid (PFOA)	20.0	18.3 J	92	50-150	
Perfluorononanoic acid (PFNA)	19.3	18.6 J	97	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.1	29.5 J	98	50-150	
Perfluoroheptanoic acid (PFHpA)	9.90	7.73 J	78	50-150	
Perfluorobutanesulfonic acid (PFBS)	88.3	79.9 J	90	50-150	

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
SDG No.: _____
Lab File ID: 03AUG2017A6B_054.d Lab Sample ID: MB 320-176265/1-A
Matrix: Water Date Extracted: 07/27/2017 10:45
Instrument ID: A6 Date Analyzed: 08/03/2017 18:31
Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LLCS 320-176265/2-A	03AUG2017A6 B 055.d	08/03/2017 18:40
WGNA-071717-RW-3826	320-29926-1	03AUG2017A6 B 056.d	08/03/2017 18:49
WGNA-071717-FRB-3826	320-29926-2	03AUG2017A6 B 057.d	08/03/2017 18:58

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Instrument ID: A6 Calibration Start Date: 08/03/2017 10:56
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 08/03/2017 11:42
 Calibration ID: 32985

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		420080	3.49	840607	3.91		
UPPER LIMIT		630120	3.99	1260911	4.41		
LOWER LIMIT		210040	2.99	420304	3.41		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 320-177447/11		408282	3.49	763196	3.90		
ICV 320-177447/12		408295	3.48	787513	3.90		
CCV 320-177368/1 CCVIS		462227	3.45	914753	3.85		
MB 320-176265/1-A		384243	3.45	821358	3.85		
LLCS 320-176265/2-A		413088	3.46	834601	3.85		
320-29926-1	WGNA-071717-RW-3826	387986	3.46	870499	3.85		
320-29926-2	WGNA-071717-FRB-3826	387457	3.46	830117	3.86		
CCV 320-177368/13 CCVIS		408862	3.47	837526	3.87		
CCV 320-177369/13 CCVIS		408862	3.47	837526	3.87		
CCV 320-177369/25 CCVIS		439037	3.48	847962	3.87		

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Sample No.: CCV 320-177368/1 Date Analyzed: 08/03/2017 18:13
 Instrument ID: A6 GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 03AUG2017A6B_052.d Heated Purge: (Y/N) N
 Calibration ID: 32985

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	462227	3.45	914753	3.85		
UPPER LIMIT	647118	3.95	1280654	4.35		
LOWER LIMIT	323559	2.95	640327	3.35		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-176265/1-A		384243	3.45	821358	3.85	
LLCS 320-176265/2-A		413088	3.46	834601	3.85	
320-29926-1	WGNA-071717-RW-3826	387986	3.46	870499	3.85	
320-29926-2	WGNA-071717-FRB-3826	387457	3.46	830117	3.86	

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Sample No.: CCV 320-177368/13 Date Analyzed: 08/03/2017 20:02
 Instrument ID: A6 GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 03AUG2017A6B_064.d Heated Purge: (Y/N) N
 Calibration ID: 32985

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	408862	3.47	837526	3.87		
UPPER LIMIT	572407	3.97	1172536	4.37		
LOWER LIMIT	286203	2.97	586268	3.37		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-176265/1-A		384243	3.45	821358	3.85	
LLCS 320-176265/2-A		413088	3.46	834601	3.85	
320-29926-1	WGNA-071717-RW-3826	387986	3.46	870499	3.85	
320-29926-2	WGNA-071717-FRB-3826	387457	3.46	830117	3.86	

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

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

Column used to flag values outside QC limits

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-29926-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-071717-RW-3826</u>	Lab Sample ID: <u>320-29926-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>03AUG2017A6B_056.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>07/17/2017 14:20</u>
Extraction Method: <u>537</u>	Date Extracted: <u>07/27/2017 10:45</u>
Sample wt/vol: <u>253.4 (mL)</u>	Date Analyzed: <u>08/03/2017 18:49</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>10 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>177368</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	6.8	J	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	9.6	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U M	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	J M	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U M	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	81		70-130
STL00996	13C2 PFDA	105		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_056.d
 Lims ID: 320-29926-A-1-A
 Client ID: WGNA-071717-RW-3826
 Sample Type: Client
 Inject. Date: 03-Aug-2017 18:49:27 ALS Bottle#: 22 Worklist Smp#: 5
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: 320-29926-a-1-a
 Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 04-Aug-2017 12:59:51 Calib Date: 03-Aug-2017 11:42:11
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
 Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
 Process Host: XAWRK021

First Level Reviewer: barnettj

Date: 04-Aug-2017 10:19:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								M
299.0 > 80.0	2.458	2.461	-0.003	1.000	45326	2.21	150	M
\$ 2 13C2 PFHxA								
315.0 > 270.0	2.807	2.807	0.0	1.000	396022	8.13	235	
4 Perfluoroheptanoic acid								M
363.0 > 319.0	3.145	3.145	0.0	1.000	46706	0.9504	87.3	M
3 Perfluorohexanesulfonic acid								M
399.0 > 80.0	3.160	3.152	0.008	1.000	5500	0.2181	30.2	M
6 Perfluorooctanoic acid								
413.0 > 369.0	3.458	3.447	0.011	1.000	100710	2.44	145	
* 5 13C2-PFOA								
415.0 > 370.0	3.458	3.447	0.011		387986	10.0	1457	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	3.707	3.699	0.008	1.000	50442	1.73	1519	
* 8 13C4 PFOS								
503.0 > 80.0	3.852	3.845	0.007		870499	28.7	7457	
9 Perfluorononanoic acid								M
463.0 > 419.0	3.867	3.859	0.008	1.000	15920	0.3488	153	M
\$ 10 13C2 PFDA								
515.0 > 470.0	4.513	4.503	0.010	1.000	451392	10.5	12900	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_056.d

Injection Date: 03-Aug-2017 18:49:27

Instrument ID: A6

Lims ID: 320-29926-A-1-A

Lab Sample ID: 320-29926-1

Client ID: WGNA-071717-RW-3826

Operator ID: JRB

ALS Bottle#: 22

Worklist Smp#: 5

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

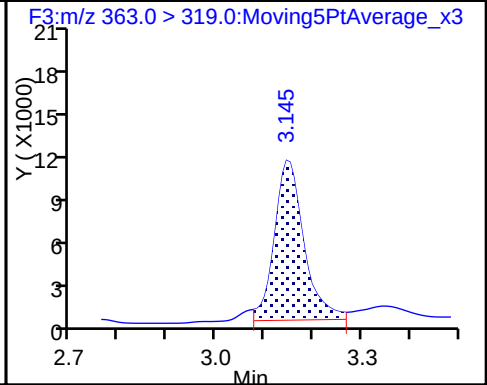
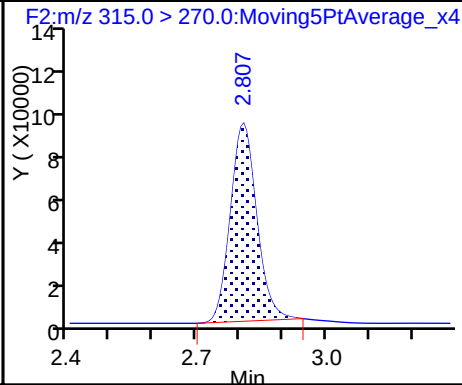
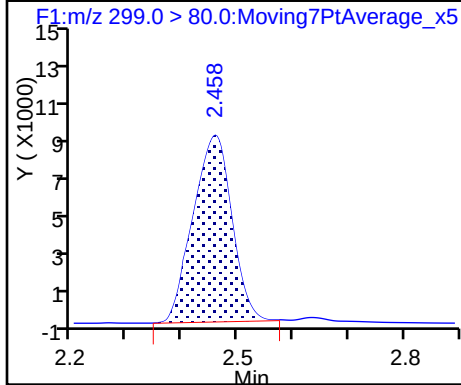
Method: 537__A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (M)

\$ 2 13C2 PFHxA

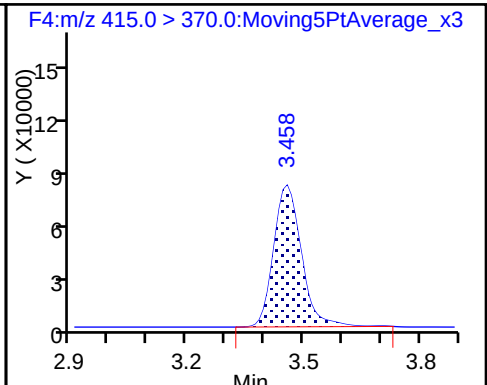
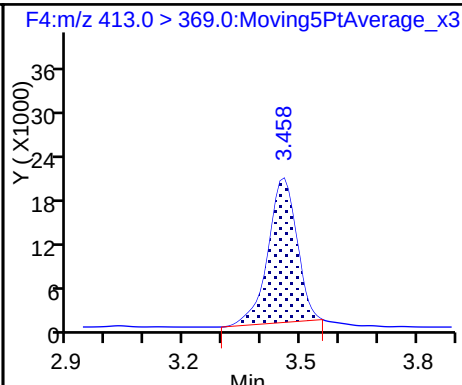
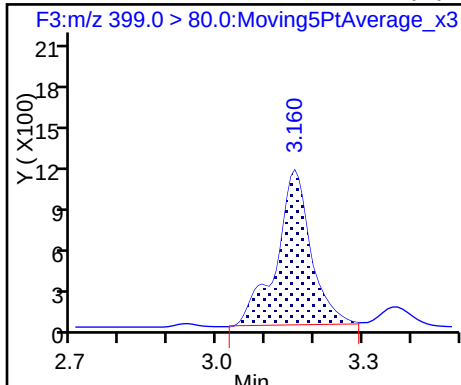
4 Perfluoroheptanoic acid (M)



3 Perfluorohexanesulfonic acid (M)

6 Perfluorooctanoic acid

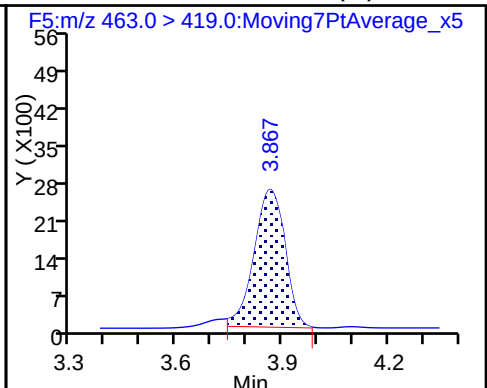
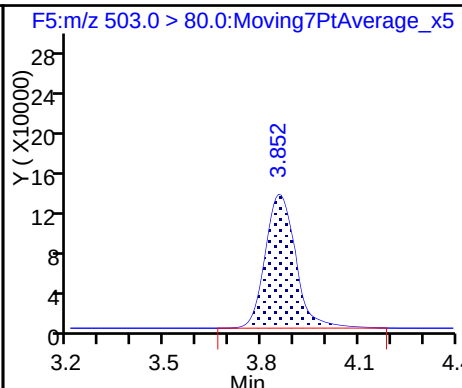
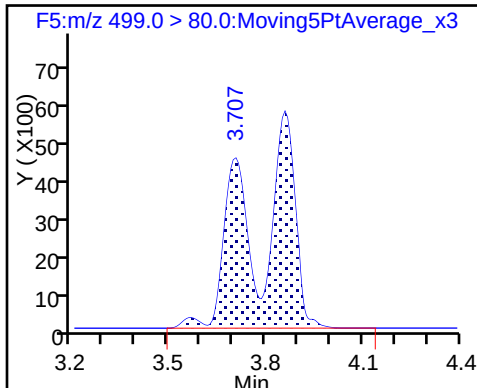
* 5 13C2-PFOA



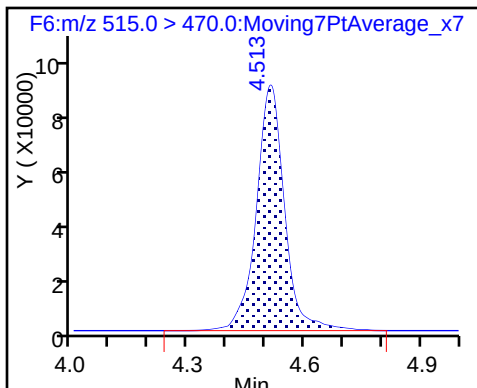
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_056.d
Lims ID: 320-29926-A-1-A
Client ID: WGNA-071717-RW-3826
Sample Type: Client
Inject. Date: 03-Aug-2017 18:49:27 ALS Bottle#: 22 Worklist Smp#: 5
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 320-29926-a-1-a
Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
Operator ID: JRB Instrument ID: A6
Method: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 04-Aug-2017 12:59:51 Calib Date: 03-Aug-2017 11:42:11
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK021

First Level Reviewer: barnettj

Date: 04-Aug-2017 10:19:34

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.13	81.29
\$ 10 13C2 PFDA	10.0	10.5	105.22

TestAmerica Sacramento

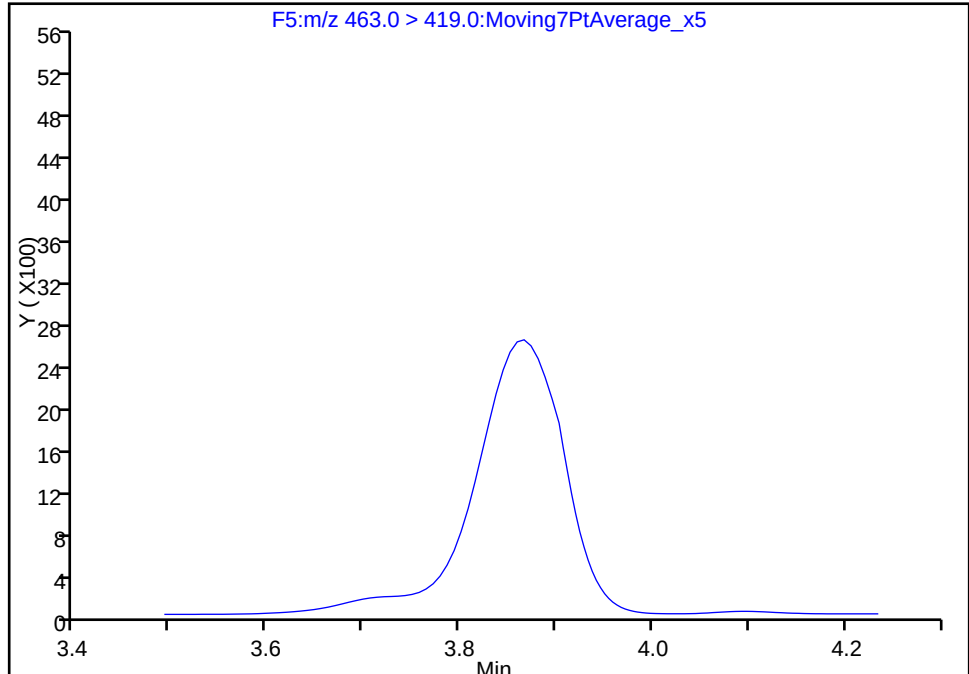
Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_056.d
Injection Date: 03-Aug-2017 18:49:27 Instrument ID: A6
Lims ID: 320-29926-A-1-A Lab Sample ID: 320-29926-1
Client ID: WGNA-071717-RW-3826
Operator ID: JRB ALS Bottle#: 22 Worklist Smp#: 5
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector: F5:MRM

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

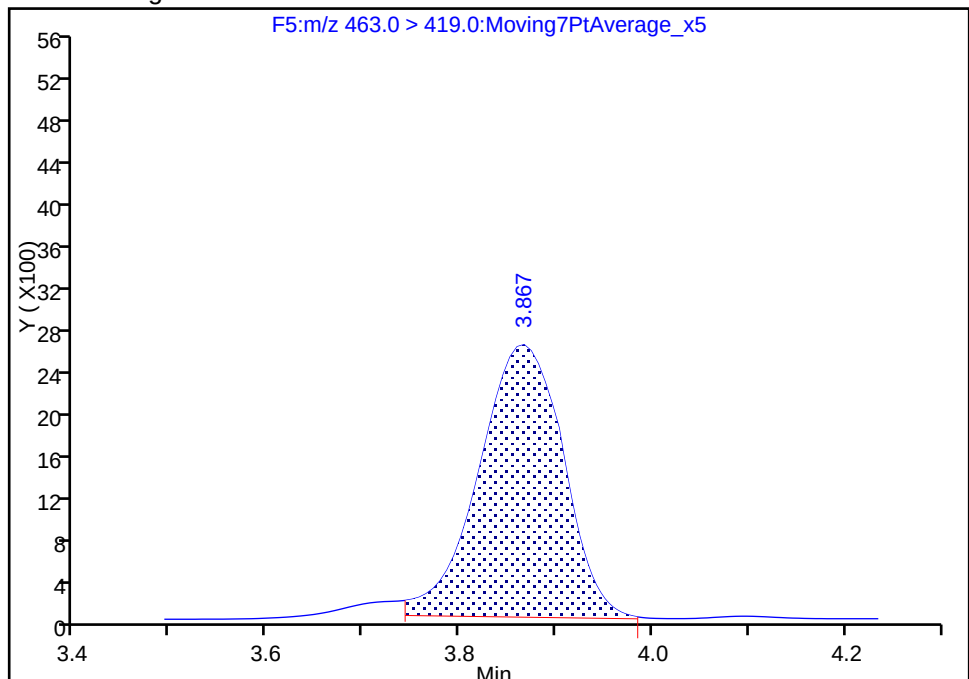
Not Detected
Expected RT: 3.86

Processing Integration Results



RT: 3.87
Area: 15920
Amount: 0.348811
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 04-Aug-2017 10:19:26
Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

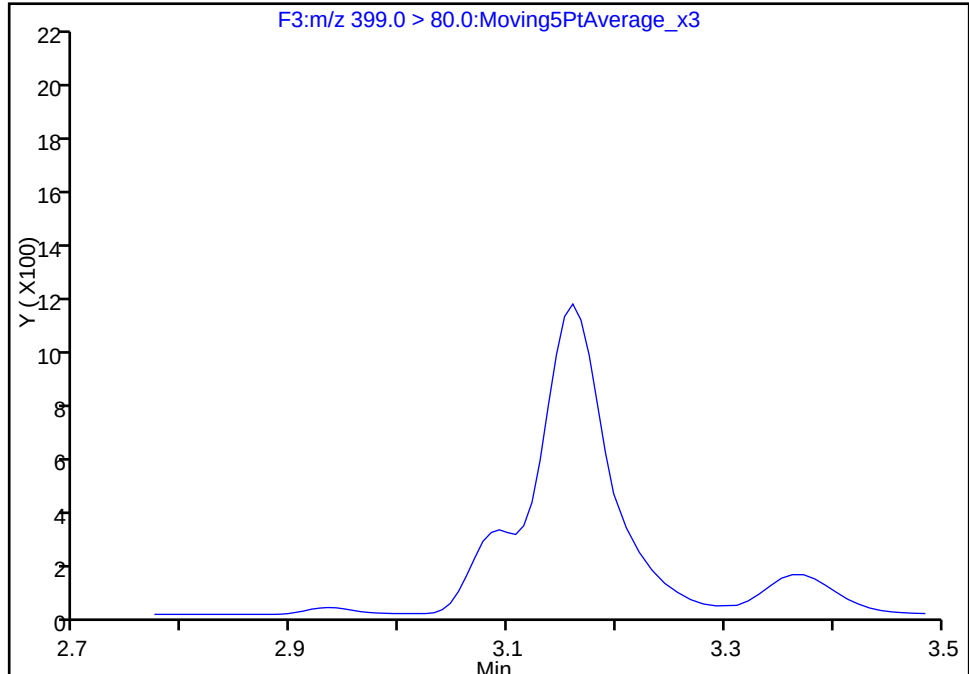
Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_056.d
Injection Date: 03-Aug-2017 18:49:27 Instrument ID: A6
Lims ID: 320-29926-A-1-A Lab Sample ID: 320-29926-1
Client ID: WGNA-071717-RW-3826
Operator ID: JRB ALS Bottle#: 22 Worklist Smp#: 5
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector: F3:MRM

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

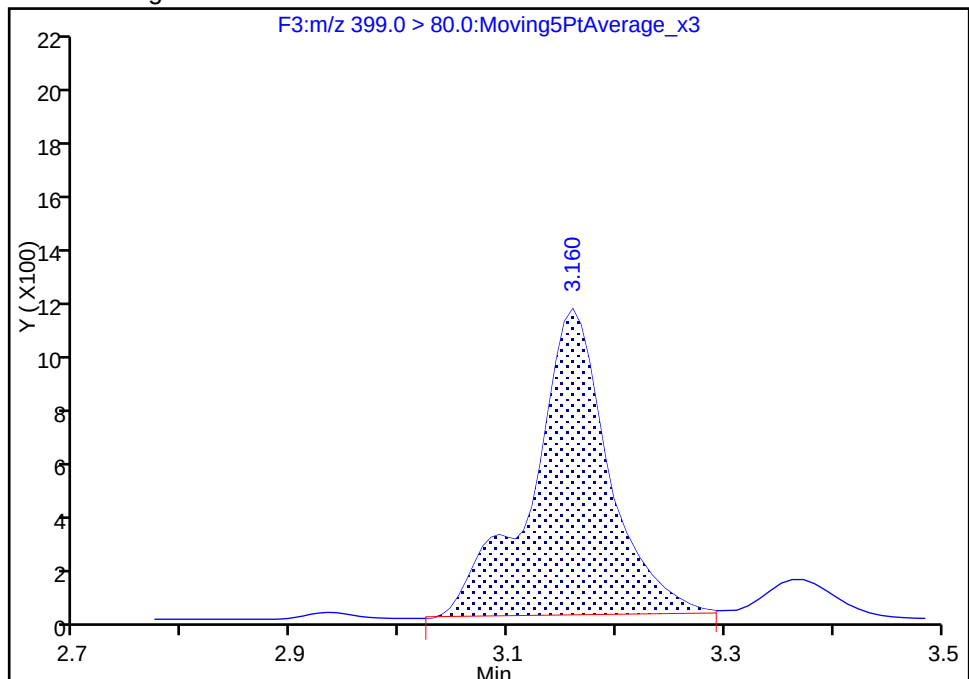
Not Detected
Expected RT: 3.15

Processing Integration Results



RT: 3.16
Area: 5500
Amount: 0.218109
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 04-Aug-2017 10:18:35
Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

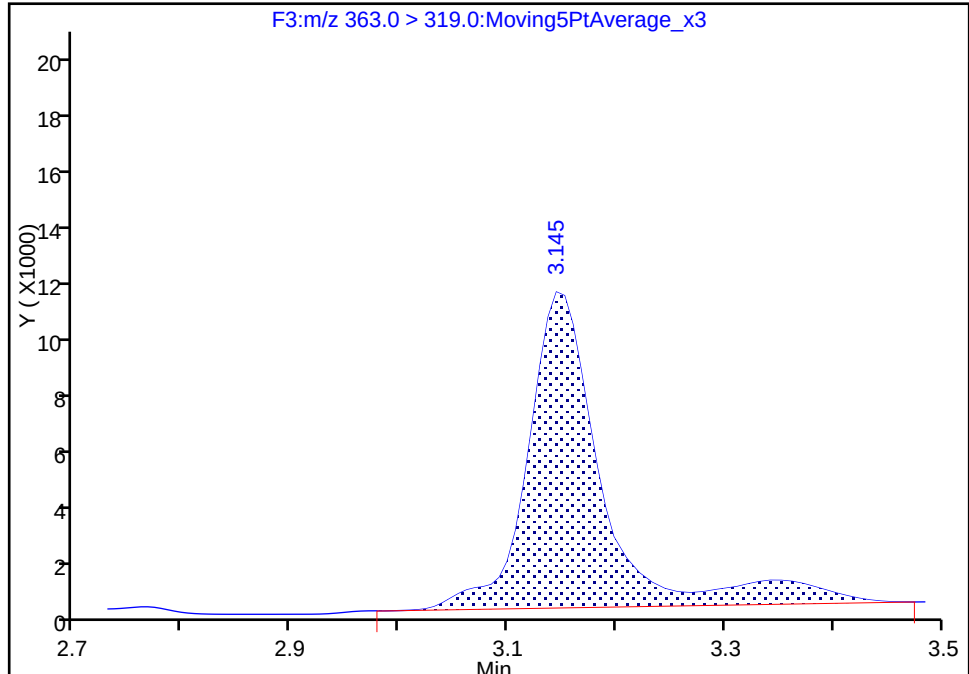
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Injection Date: 03-Aug-2017 18:49:27 Instrument ID: A6
Lims ID: 320-29926-A-1-A Lab Sample ID: 320-29926-1
Client ID: WGNA-071717-RW-3826
Operator ID: JRB ALS Bottle#: 22 Worklist Smp#: 5
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector: F3:MRM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

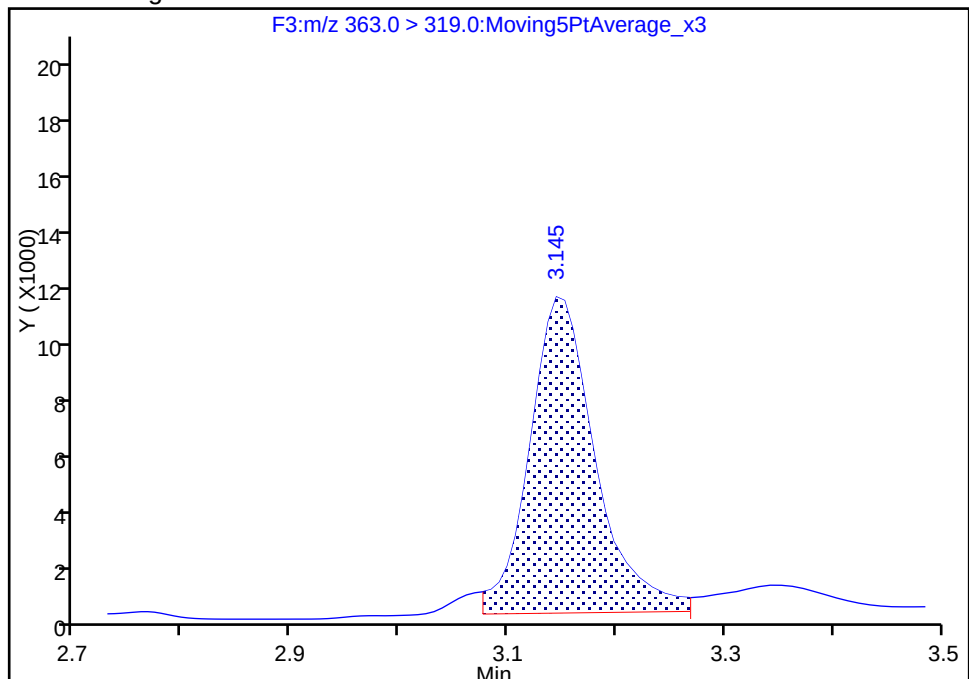
RT: 3.14
Area: 53758
Amount: 1.093945
Amount Units: ng/ml

Processing Integration Results



RT: 3.14
Area: 46706
Amount: 0.950441
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 04-Aug-2017 10:19:01

Audit Action: Manually Integrated

Audit Reason: Split Peak

TestAmerica Sacramento

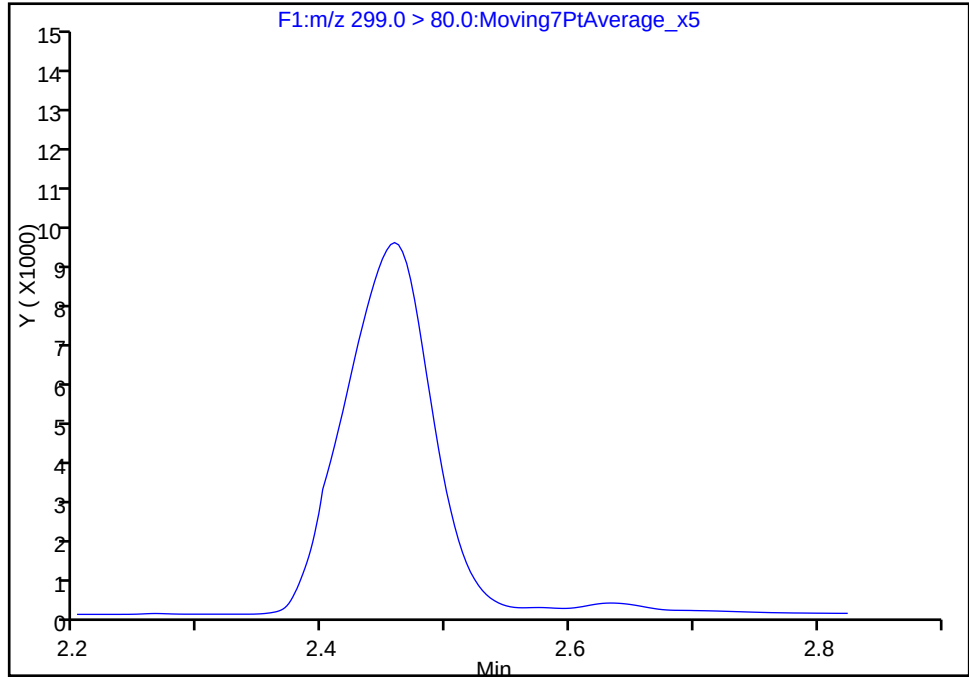
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Injection Date: 03-Aug-2017 18:49:27 Instrument ID: A6
Lims ID: 320-29926-A-1-A Lab Sample ID: 320-29926-1
Client ID: WGNA-071717-RW-3826
Operator ID: JRB ALS Bottle#: 22 Worklist Smp#: 5
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector: F1:MRM

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

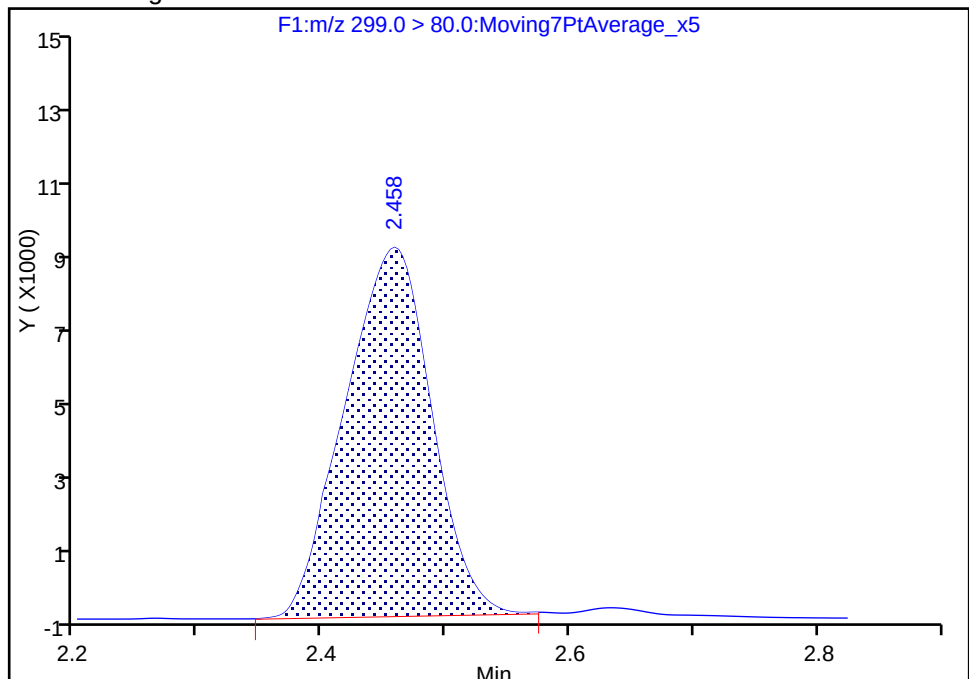
Signal: 1

Not Detected
Expected RT: 2.46

Processing Integration Results



Manual Integration Results



RT: 2.46
Area: 45326
Amount: 2.205750
Amount Units: ng/ml

Reviewer: barnettj, 04-Aug-2017 10:18:17

Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-29926-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-071717-FRB-3826</u>	Lab Sample ID: <u>320-29926-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>03AUG2017A6B_057.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>07/17/2017 14:15</u>
Extraction Method: <u>537</u>	Date Extracted: <u>07/27/2017 10:45</u>
Sample wt/vol: <u>253(mL)</u>	Date Analyzed: <u>08/03/2017 18:58</u>
Con. Extract Vol.: <u>1.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>10(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>177368</u>	Units: <u>ng/L</u>

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

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

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_057.d
 Lims ID: 320-29926-A-2-A
 Client ID: WGNA-071717-FRB-3826
 Sample Type: Client
 Inject. Date: 03-Aug-2017 18:58:33 ALS Bottle#: 23 Worklist Smp#: 6
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: 320-29926-a-2-a
 Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 04-Aug-2017 12:59:51 Calib Date: 03-Aug-2017 11:42:11
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
 Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
 Process Host: XAWRK021

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
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\$ 2 13C2 PFHxA

315.0 > 270.0	2.808	2.807	0.001	1.000	472703	9.72	341
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* 5 13C2-PFOA

415.0 > 370.0	3.458	3.447	0.011		387457	10.0	2586
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* 8 13C4 PFOS

503.0 > 80.0	3.859	3.845	0.014		830117	28.7	8657
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\$ 10 13C2 PFDA

515.0 > 470.0	4.517	4.503	0.014	1.000	442696	10.3	6489
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TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_057.d

Injection Date: 03-Aug-2017 18:58:33

Instrument ID: A6

Lims ID: 320-29926-A-2-A

Lab Sample ID: 320-29926-2

Client ID: WGNA-071717-FRB-3826

Operator ID: JRB

ALS Bottle#: 23

Worklist Smp#: 6

Injection Vol: 10.0 ul

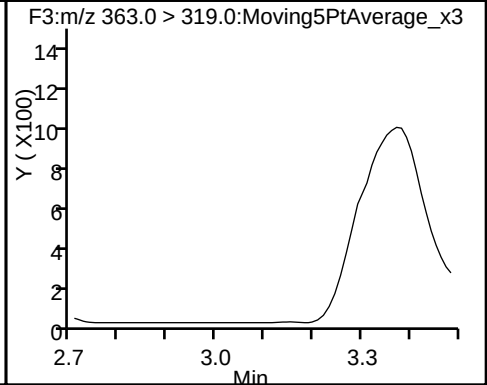
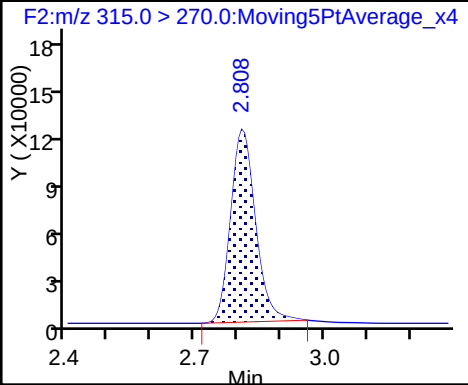
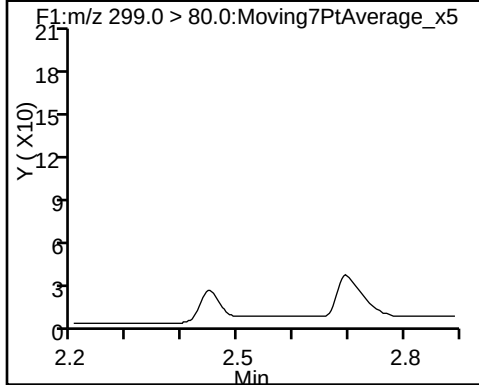
Dil. Factor: 1.0000

Method: 537__A6

Limit Group: LC 537 ICAL

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

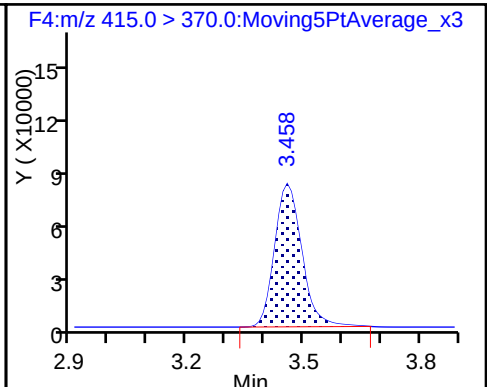
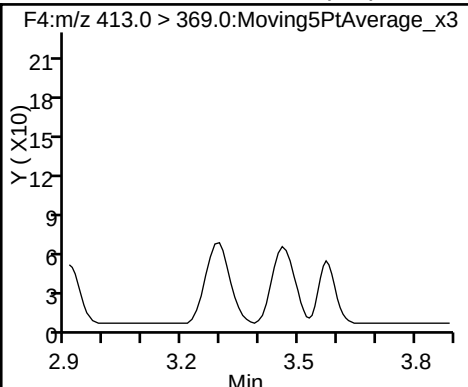
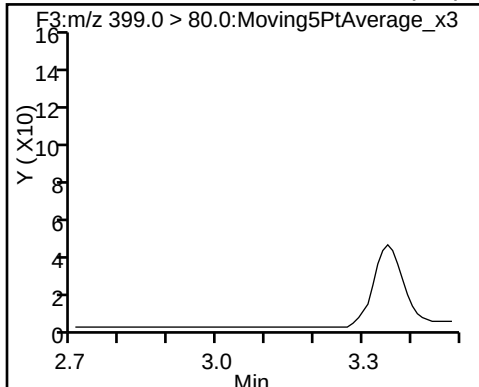
4 Perfluoroheptanoic acid (ND)



3 Perfluorohexanesulfonic acid (ND)

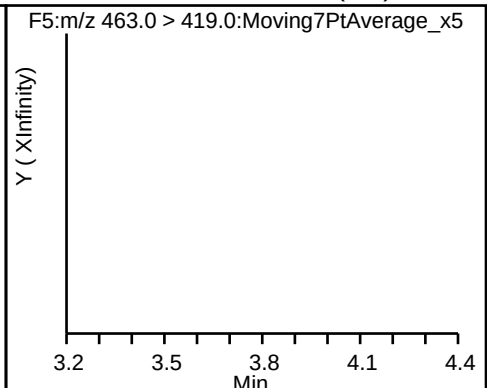
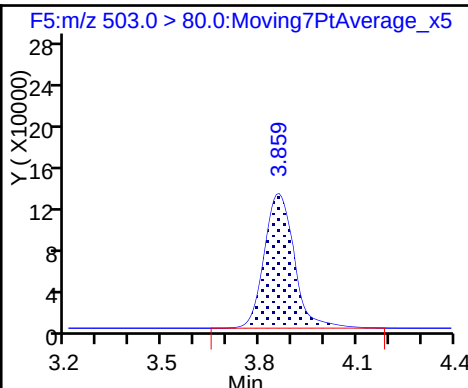
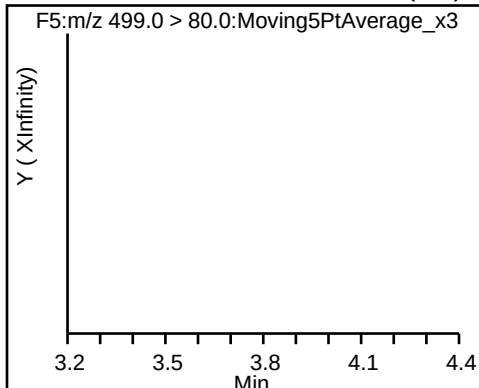
6 Perfluorooctanoic acid (ND)

* 5 13C2-PFOA

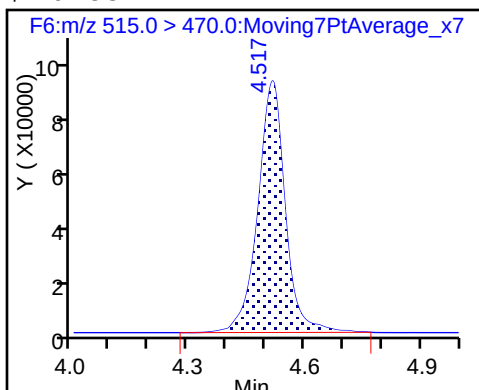


7 Perfluorooctane sulfonic acid (ND) * 8 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_057.d
Lims ID: 320-29926-A-2-A
Client ID: WGNA-071717-FRB-3826
Sample Type: Client
Inject. Date: 03-Aug-2017 18:58:33 ALS Bottle#: 23 Worklist Smp#: 6
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 320-29926-a-2-a
Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
Operator ID: JRB Instrument ID: A6
Method: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 04-Aug-2017 12:59:51 Calib Date: 03-Aug-2017 11:42:11
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK021

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.72	97.17
\$ 10 13C2 PFDA	10.0	10.3	103.33

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

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1 Analy Batch No.: 177447

SDG No.: _____

Instrument ID: A6 GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/03/2017 10:56 Calibration End Date: 08/03/2017 11:42 Calibration ID: 32985

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-177447/4	03AUG2017A6B_004.d
Level 2	STD 320-177447/5	03AUG2017A6B_005.d
Level 3	STD 320-177447/6	03AUG2017A6B_006.d
Level 4	STD 320-177447/7	03AUG2017A6B_007.d
Level 5	STD 320-177447/8	03AUG2017A6B_008.d
Level 6	STD 320-177447/9	03AUG2017A6B_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)	0.6351 0.7359	0.6630	0.6524	0.6708	0.7049	Ave		0.6770				5.5		30.0			
Perfluoroheptanoic acid (PFHpA)	1.3642 1.1806	1.2608	1.3381	1.2105	1.2452	Ave		1.2666				5.7		30.0			
Perfluorohexanesulfonic acid (PFHxS)	0.8427 0.8934	0.8356	0.7992	0.8158	0.7981	Ave		0.8308				4.3		30.0			
Perfluorooctanoic acid (PFOA)	1.0023 1.1498	0.9895	1.1066	1.0673	1.0609	Ave		1.0627				5.7		30.0			
Perfluorooctanesulfonic acid (PFOS)	0.8906 1.0593	0.9034	0.9384	0.9759	0.9939	Ave		0.9603				6.5		30.0			
Perfluorononanoic acid (PFNA)	1.2578 1.1194	1.2117	1.1961	1.1598	1.1133	Ave		1.1764				4.8		30.0			
13C2 PFHxA	1.2162 1.3045	1.1717	1.2382	1.3273	1.2756	Ave		1.2556				4.6		30.0			
13C2 PFDA	1.1138 1.1488	1.0229	1.1023	1.1197	1.1271	Ave		1.1057				3.9		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.: 320-29926-1 Analy Batch No.: 177447

SDG No.: _____

Instrument ID: A6 GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/03/2017 10:56 Calibration End Date: 08/03/2017 11:42 Calibration ID: 32985

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-177447/4	03AUG2017A6B_004.d
Level 2	STD 320-177447/5	03AUG2017A6B_005.d
Level 3	STD 320-177447/6	03AUG2017A6B_006.d
Level 4	STD 320-177447/7	03AUG2017A6B_007.d
Level 5	STD 320-177447/8	03AUG2017A6B_008.d
Level 6	STD 320-177447/9	03AUG2017A6B_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	Ave	176065 3327014	385526	851906	1962785	2725297	8.83 176	21.2	44.4	89.4	133
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	59914 863584	123802	280573	548477	773549	0.990 19.7	2.38	4.97	10.0	14.9
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	79490 1374485	165324	355083	812337	1050045	3.01 59.7	7.21	15.1	30.4	45.1
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	88843 1697286	196099	468310	975942	1330020	2.00 39.7	4.80	10.0	20.2	30.0
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	111880 2170397	238041	555265	1294088	1741359	4.00 79.6	9.61	20.1	40.5	60.0
Perfluorononanoic acid (PFNA)	13PF OA	Ave	107471 1592953	231464	487938	1022278	1345502	1.93 38.3	4.62	9.68	19.5	28.9
13C2 PFHxA	13PF OA	Ave	539529 484952	484242	521885	599933	533596	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	494099 427049	422748	464626	506095	471470	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD

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

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1 Analy Batch No.: 177447

SDG No.: _____

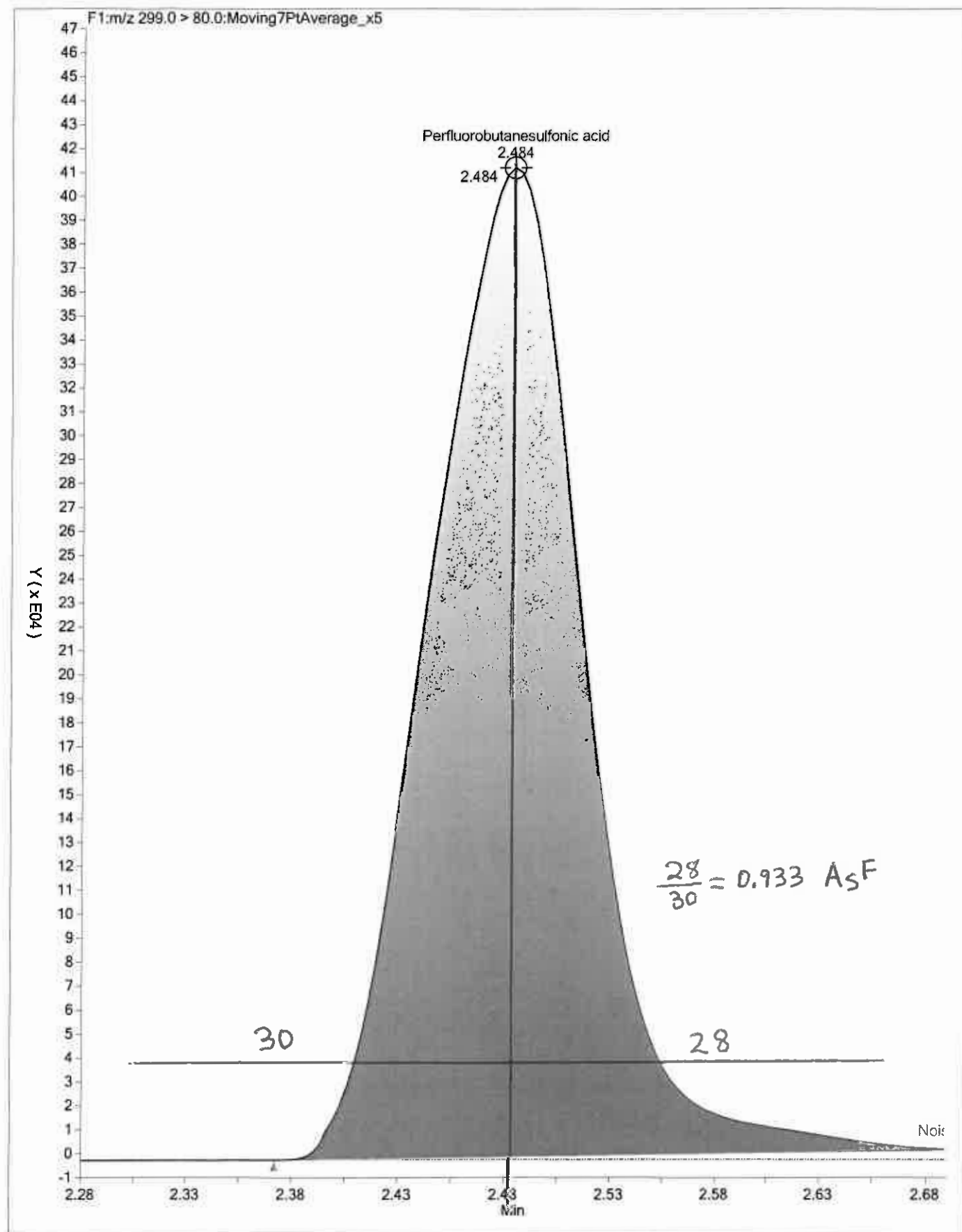
Instrument ID: A6 GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

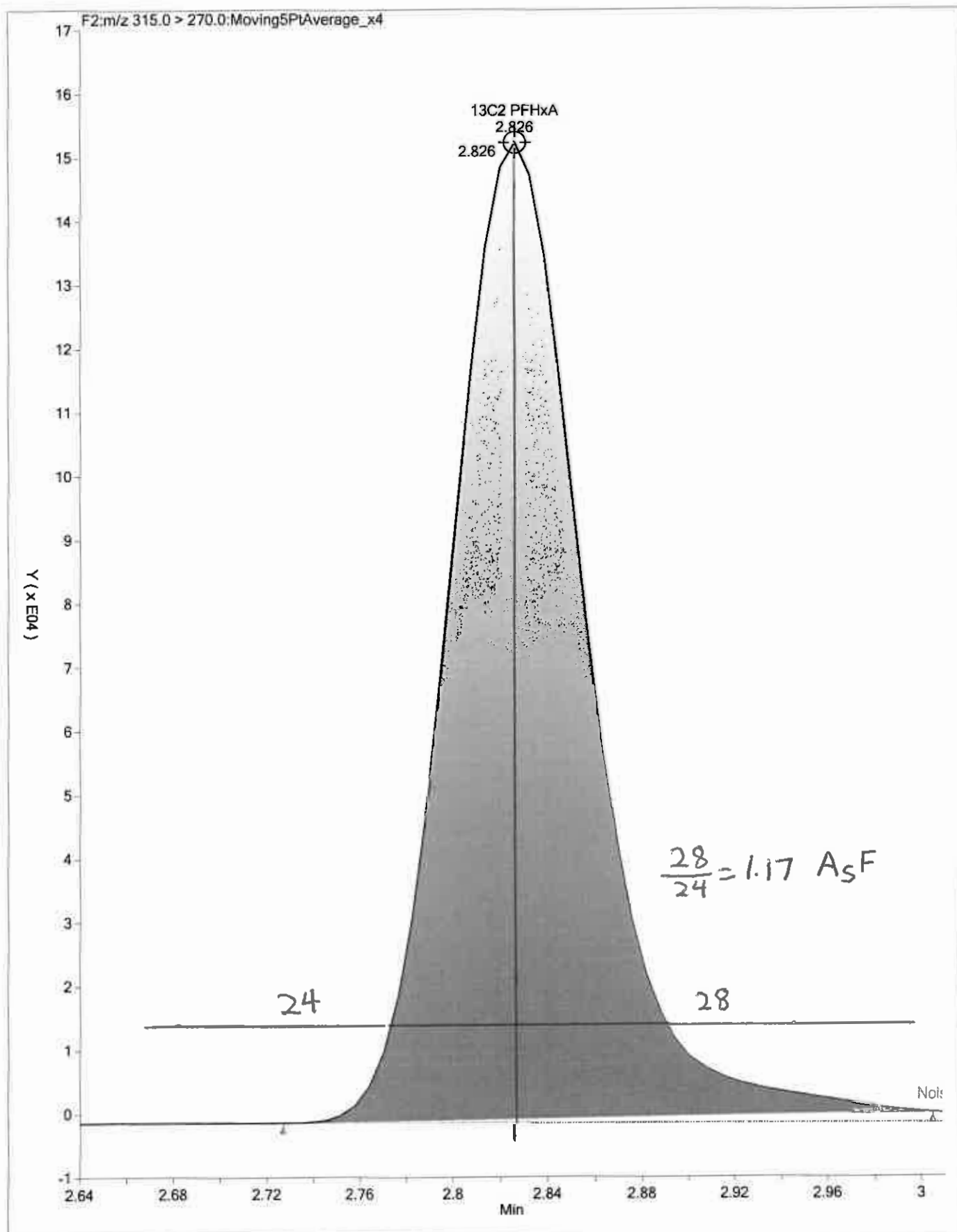
Calibration Start Date: 08/03/2017 10:56 Calibration End Date: 08/03/2017 11:42 Calibration ID: 32985

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-177447/4	03AUG2017A6B_004.d
Level 2	STD 320-177447/5	03AUG2017A6B_005.d
Level 3	STD 320-177447/6	03AUG2017A6B_006.d
Level 4	STD 320-177447/7	03AUG2017A6B_007.d
Level 5	STD 320-177447/8	03AUG2017A6B_008.d
Level 6	STD 320-177447/9	03AUG2017A6B_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)	-6.2	-2.1	-3.6	-0.9	4.1	8.7	50	50	50	50	50	50
Perfluoroheptanoic acid (PFHpA)	7.7	-0.5	5.6	-4.4	-1.7	-6.8	50	50	50	50	50	50
Perfluorohexanesulfonic acid (PFHxS)	1.4	0.6	-3.8	-1.8	-3.9	7.5	50	50	50	50	50	50
Perfluorooctanoic acid (PFOA)	-5.7	-6.9	4.1	0.4	-0.2	8.2	50	50	50	50	50	50
Perfluorooctanesulfonic acid (PFOS)	-7.3	-5.9	-2.3	1.6	3.5	10.3	50	50	50	50	50	50
Perfluorononanoic acid (PFNA)	6.9	3.0	1.7	-1.4	-5.4	-4.8	50	50	50	50	50	50
13C2 PFHxA	-3.1	-6.7	-1.4	5.7	1.6	3.9	30	30	30	30	30	30
13C2 PFDA	0.7	-7.5	-0.3	1.3	1.9	3.9	30	30	30	30	30	30





TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_004.d
 Lims ID: STD L1
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 03-Aug-2017 10:56:43 ALS Bottle#: 1 Worklist Smp#: 4
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: STD L1 L1
 Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-537__A6*sub3
 Method: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 03-Aug-2017 13:24:28 Calib Date: 03-Aug-2017 11:42:11
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
 Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: barnettj Date: 03-Aug-2017 13:05:06

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	2.500	2.488	0.012	1.000	176065	8.29	144	
\$ 2 13C2 PFHxA								
315.0 > 270.0	2.832	2.827	0.005	1.000	539529	9.69	427	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.167	3.165	0.002	1.000	59914	1.07	76.3	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	3.175	3.175	0.0	1.000	79490	3.05	326	
6 Perfluorooctanoic acid								
413.0 > 369.0	3.488	3.487	0.001	1.000	88843	1.88	365	
* 5 13C2-PFOA								
415.0 > 370.0	3.488	3.487	0.001		443631	10.0	229	
* 8 13C4 PFOS								
503.0 > 80.0	3.911	3.909	0.002		899935	28.7	1786	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.916	3.914	0.002	1.000	111880	3.71	1825	M
9 Perfluorononanoic acid								
463.0 > 419.0	3.929	3.924	0.005	1.000	107471	2.06	785	
\$ 10 13C2 PFDA								
515.0 > 470.0	4.621	4.609	0.012	1.000	494099	10.1	153	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L1_00019

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_004.d

Injection Date: 03-Aug-2017 10:56:43

Instrument ID: A6

Lims ID: STD L1

Client ID:

Operator ID: JRB

ALS Bottle#: 1

Worklist Smp#: 4

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

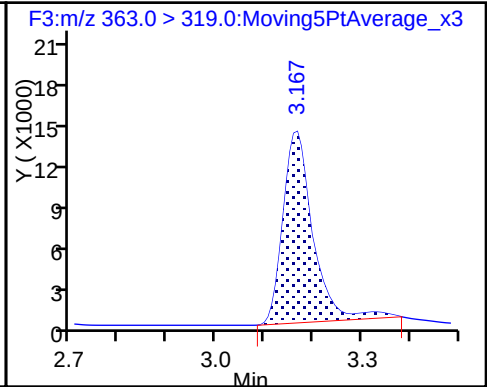
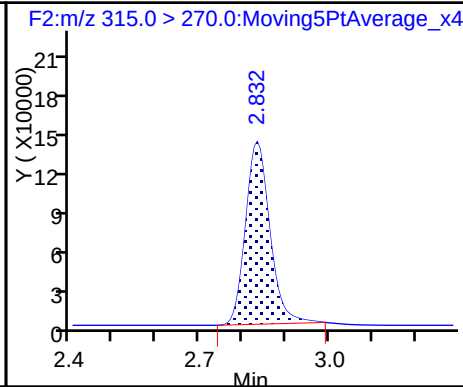
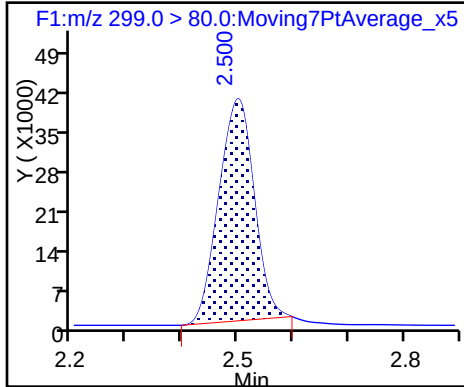
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

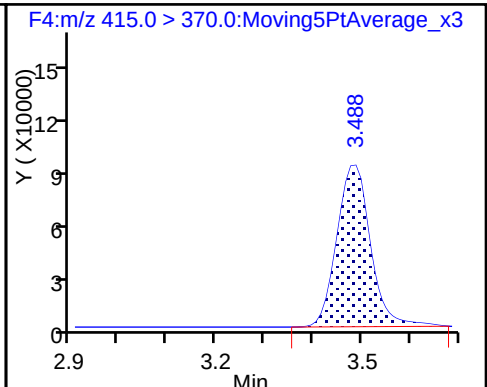
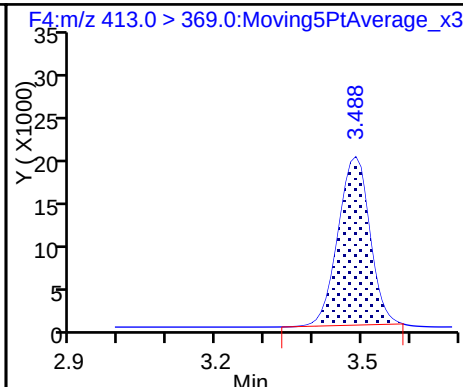
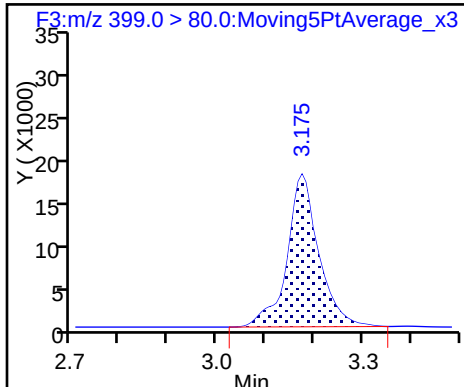
4 Perfluoroheptanoic acid



3 Perfluorohexanesulfonic acid

6 Perfluorooctanoic acid

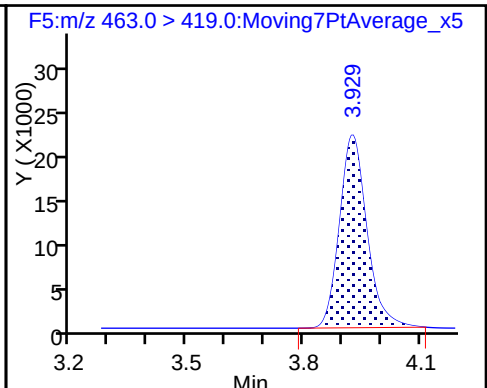
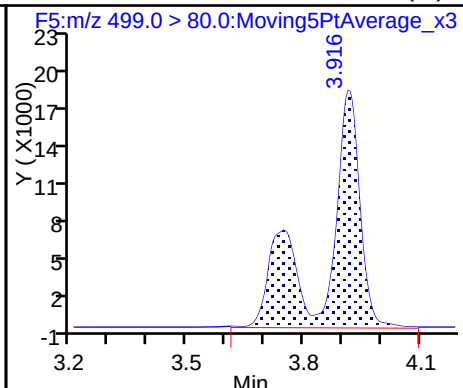
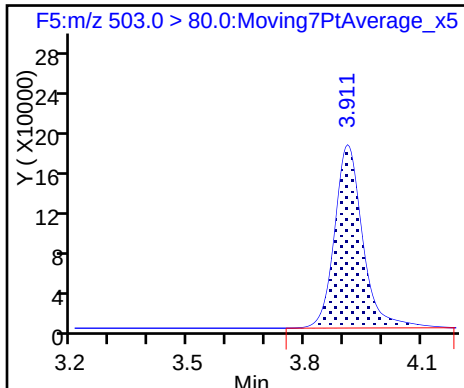
* 5 13C2-PFOA



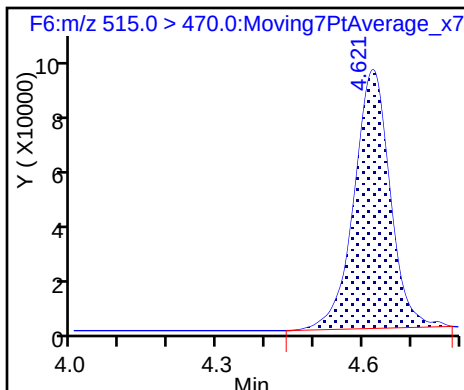
* 8 13C4 PFOS

7 Perfluorooctane sulfonic acid (M)

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

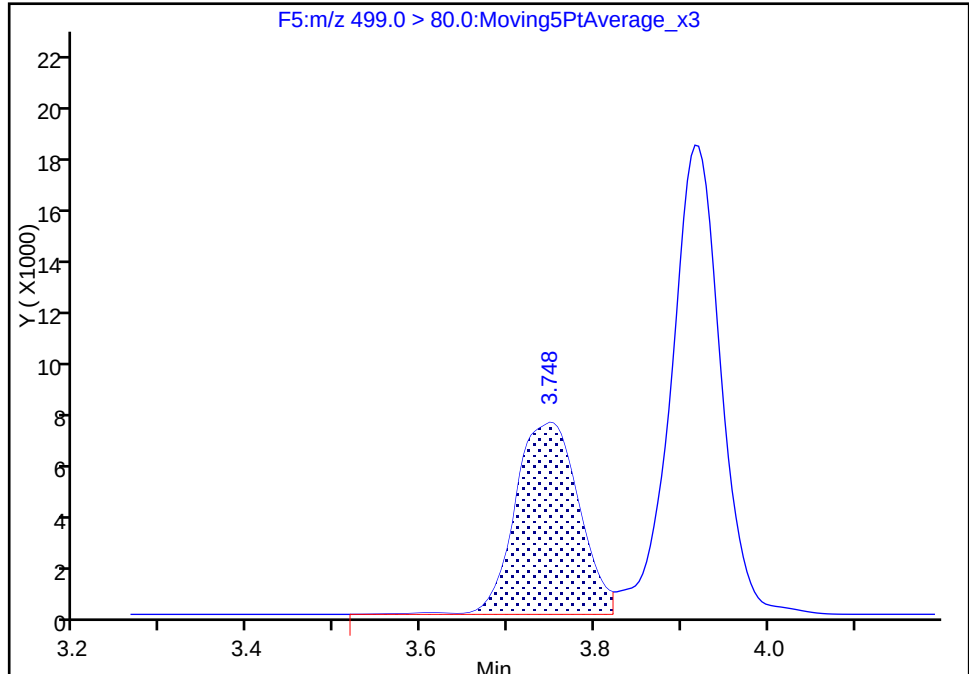
Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_004.d
Injection Date: 03-Aug-2017 10:56:43 Instrument ID: A6
Lims ID: STD L1
Client ID:
Operator ID: JRB ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector: F5:MRM

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

Signal: 1

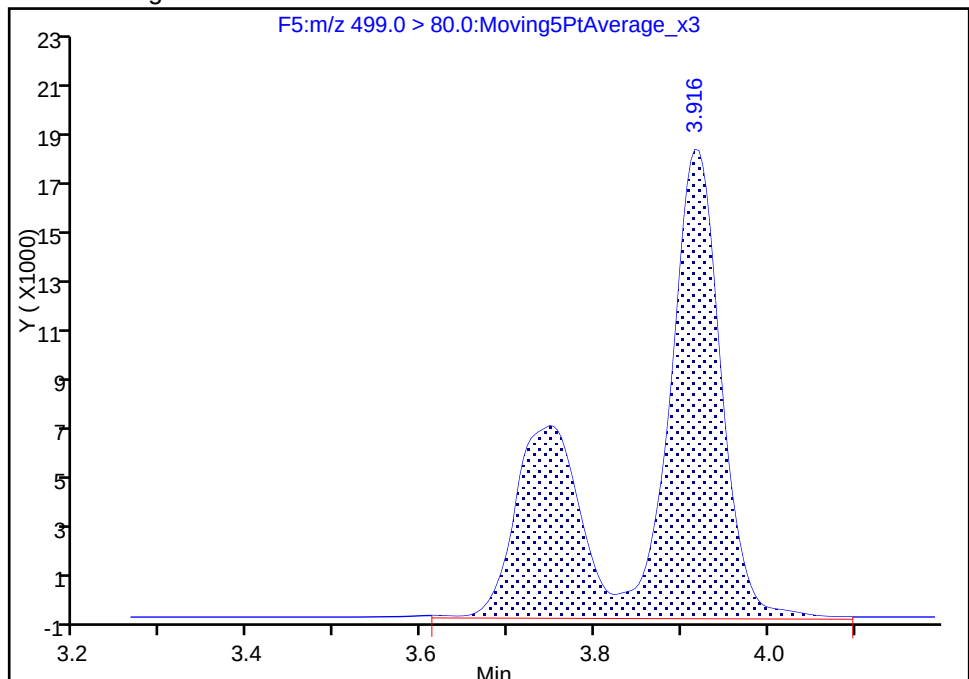
RT: 3.75
Area: 37745
Amount: 3.665979
Amount Units: ng/ml

Processing Integration Results



RT: 3.92
Area: 111880
Amount: 3.713038
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 03-Aug-2017 13:04:46
Audit Action: Manually Integrated

Audit Reason: Isomers
Page 102 of 173

08/09/2017

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_005.d
 Lims ID: STD L2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 03-Aug-2017 11:05:49 ALS Bottle#: 2 Worklist Smp#: 5
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: STD L2 L2
 Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-537__A6*sub3
 Method: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 03-Aug-2017 13:24:34 Calib Date: 03-Aug-2017 11:42:11
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
 Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: barnettj Date: 03-Aug-2017 13:05:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	2.497	2.488	0.009	1.000	385526	20.8	109	
\$ 2 13C2 PFHxA								
315.0 > 270.0	2.832	2.827	0.005	1.000	484242	9.33	468	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.167	3.165	0.002	1.000	123802	2.37	113	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	3.175	3.175	0.0	1.000	165324	7.26	331	
* 5 13C2-PFOA								
415.0 > 370.0	3.488	3.487	0.001		413268	10.0	188	
6 Perfluorooctanoic acid								
413.0 > 369.0	3.488	3.487	0.001	1.000	196099	4.46	57.9	
* 8 13C4 PFOS								
503.0 > 80.0	3.911	3.909	0.002		786545	28.7	982	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.916	3.914	0.002	1.000	238041	9.04	661	M
9 Perfluorononanoic acid								
463.0 > 419.0	3.929	3.924	0.005	1.000	231464	4.76	914	
\$ 10 13C2 PFDA								
515.0 > 470.0	4.621	4.609	0.012	1.000	422748	9.25	135	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00019

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_005.d

Injection Date: 03-Aug-2017 11:05:49

Instrument ID: A6

Lims ID: STD L2

Client ID:

Operator ID: JRB

ALS Bottle#: 2

Worklist Smp#: 5

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

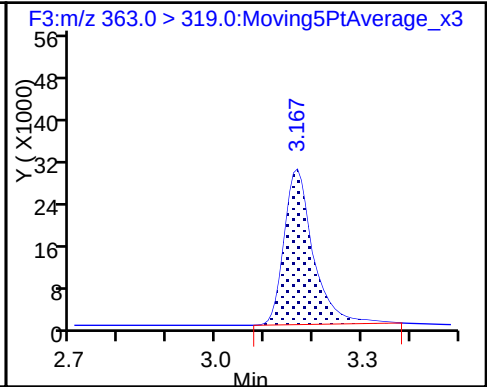
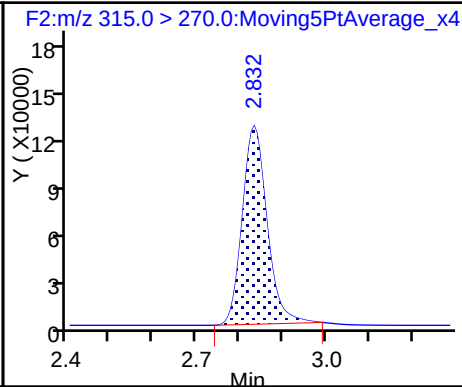
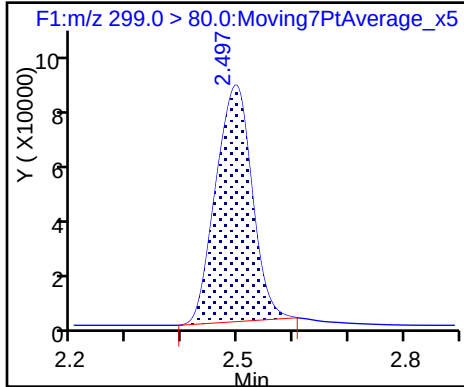
Method: 537__A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

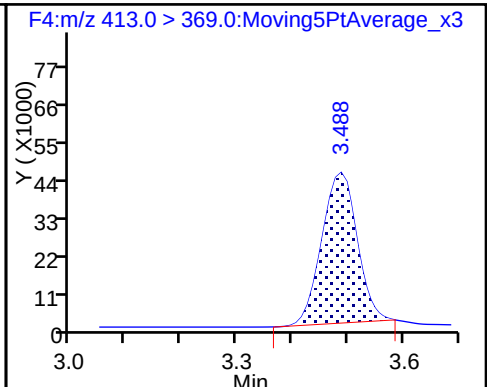
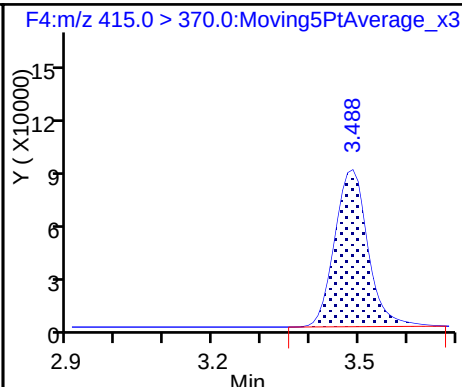
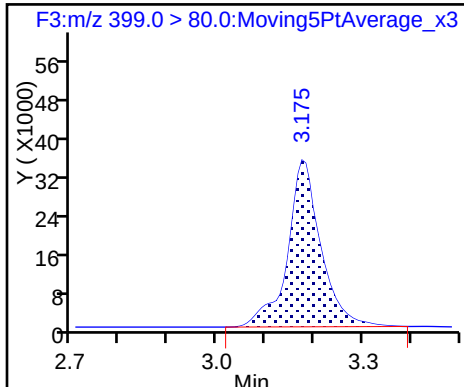
4 Perfluoroheptanoic acid



3 Perfluorohexanesulfonic acid

* 5 13C2-PFOA

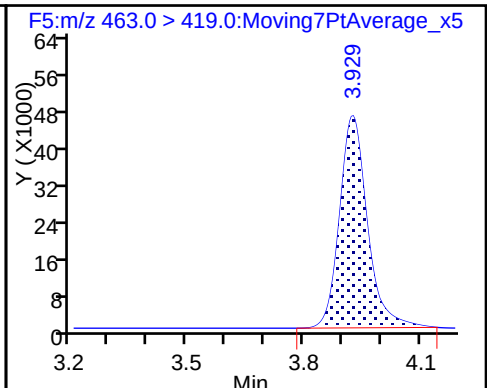
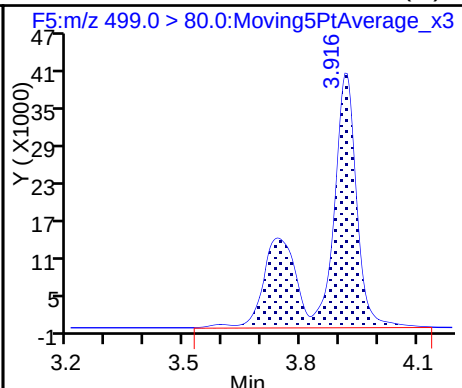
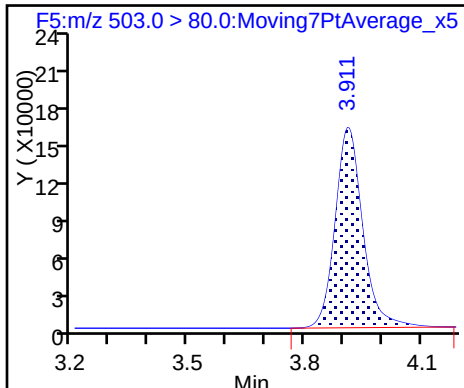
6 Perfluorooctanoic acid



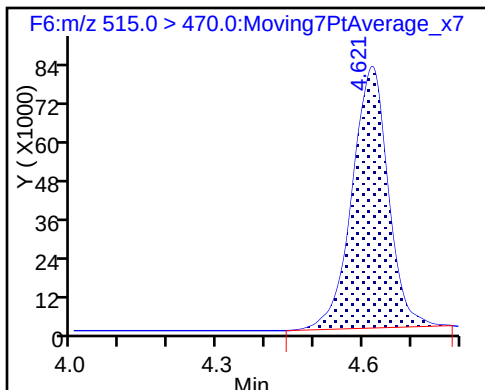
* 8 13C4 PFOS

7 Perfluorooctane sulfonic acid (M)

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

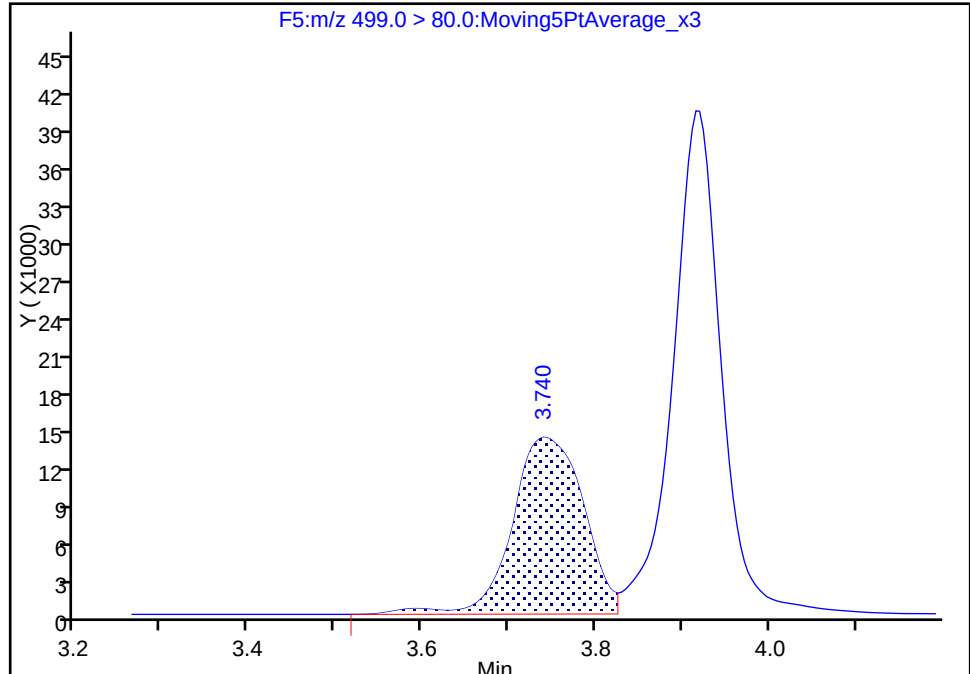
Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_005.d
Injection Date: 03-Aug-2017 11:05:49 Instrument ID: A6
Lims ID: STD L2
Client ID:
Operator ID: JRB ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector: F5:MRM

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

Signal: 1

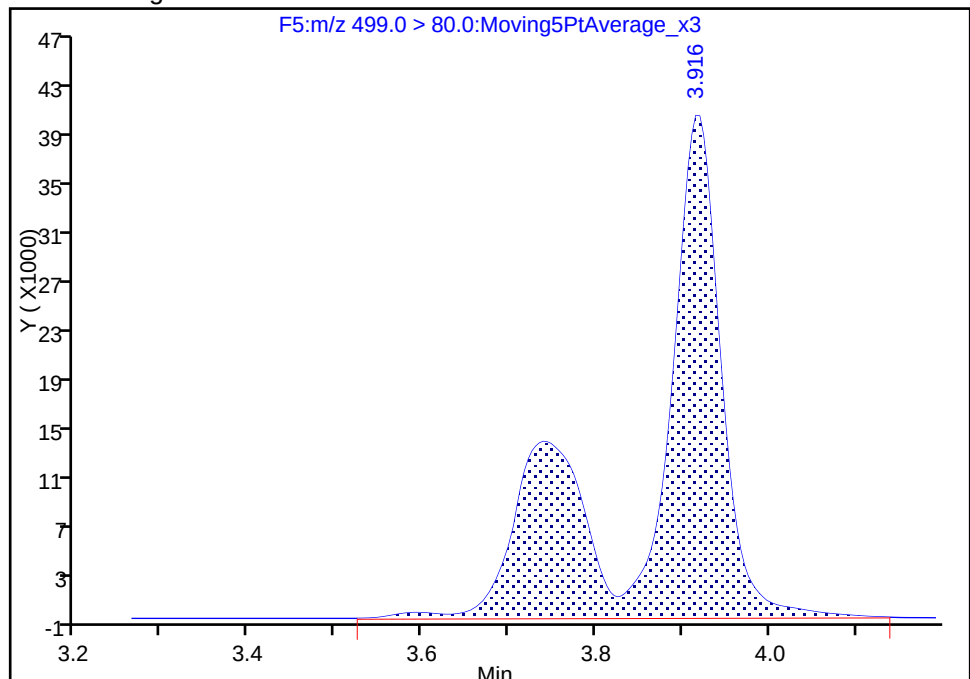
RT: 3.74
Area: 80816
Amount: 6.909547
Amount Units: ng/ml

Processing Integration Results



RT: 3.92
Area: 238041
Amount: 9.038915
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 03-Aug-2017 13:05:38
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_006.d
 Lims ID: STD L3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 03-Aug-2017 11:14:55 ALS Bottle#: 3 Worklist Smp#: 6
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: STD L3 L3
 Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-537__A6*sub3
 Method: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 03-Aug-2017 13:24:39 Calib Date: 03-Aug-2017 11:42:11
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
 Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: barnettj Date: 03-Aug-2017 13:06:32

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	2.487	2.488	-0.001	1.000	851906	42.8	133	
\$ 2 13C2 PFHxA								
315.0 > 270.0	2.826	2.827	-0.001	1.000	521885	9.86	284	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.167	3.165	0.002	1.000	280573	5.26	1420	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	3.175	3.175	0.0	1.000	355083	14.5	14460	
6 Perfluorooctanoic acid								
413.0 > 369.0	3.488	3.487	0.001	1.000	468310	10.5	149	
* 5 13C2-PFOA								
415.0 > 370.0	3.488	3.487	0.001		421502	10.0	196	
* 8 13C4 PFOS								
503.0 > 80.0	3.912	3.909	0.003		843598	28.7	2573	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.920	3.914	0.006	1.000	555265	19.7	1283	M
9 Perfluorononanoic acid								
463.0 > 419.0	3.924	3.924	0.0	1.000	487938	9.84	351	
\$ 10 13C2 PFDA								
515.0 > 470.0	4.613	4.609	0.004	1.000	464626	9.97	309	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_006.d

Injection Date: 03-Aug-2017 11:14:55

Instrument ID: A6

Lims ID: STD L3

Client ID:

Operator ID: JRB

ALS Bottle#: 3

Worklist Smp#: 6

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

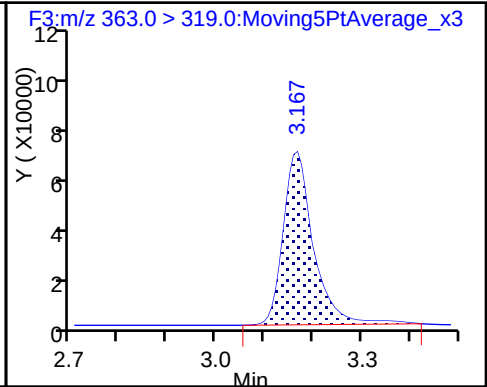
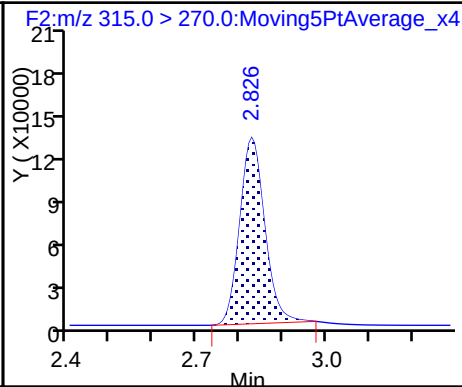
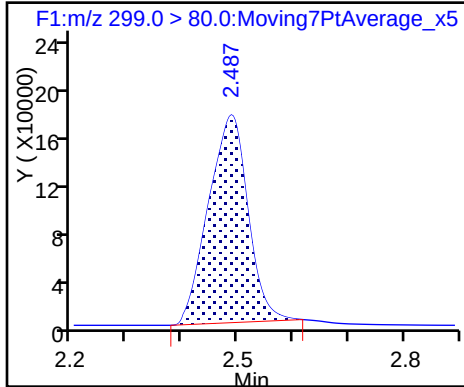
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

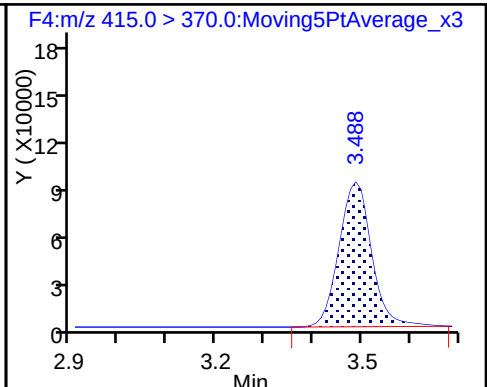
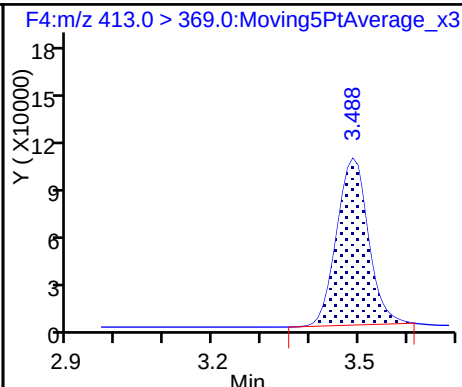
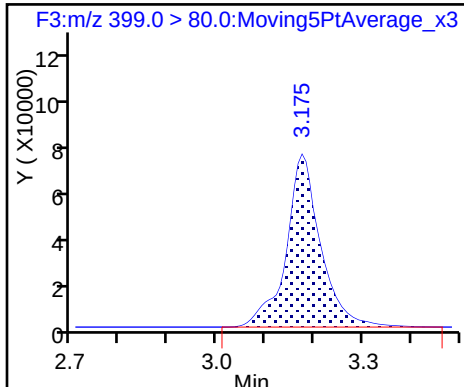
4 Perfluoroheptanoic acid



3 Perfluorohexanesulfonic acid

6 Perfluorooctanoic acid

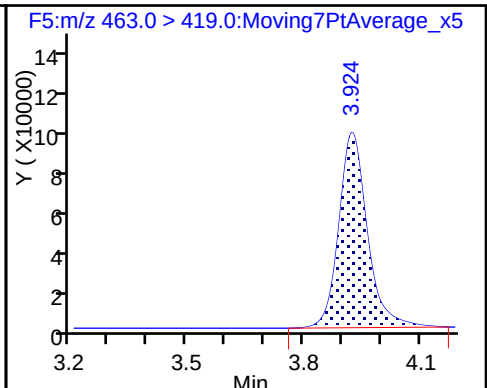
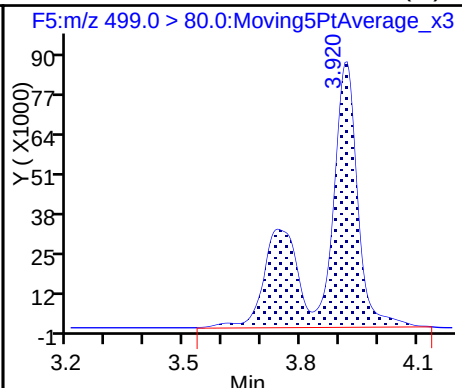
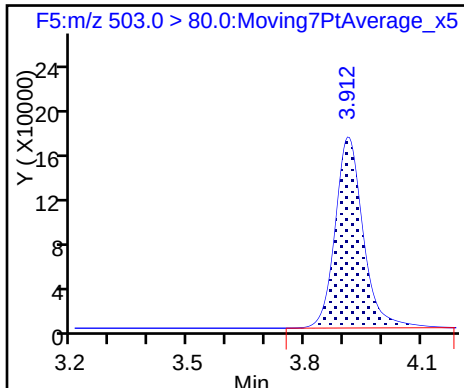
* 5 13C2-PFOA



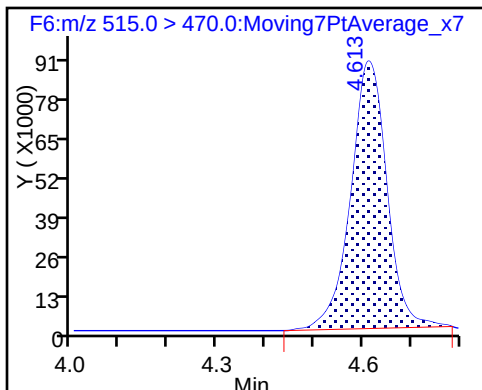
* 8 13C4 PFOS

7 Perfluorooctane sulfonic acid (M)

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

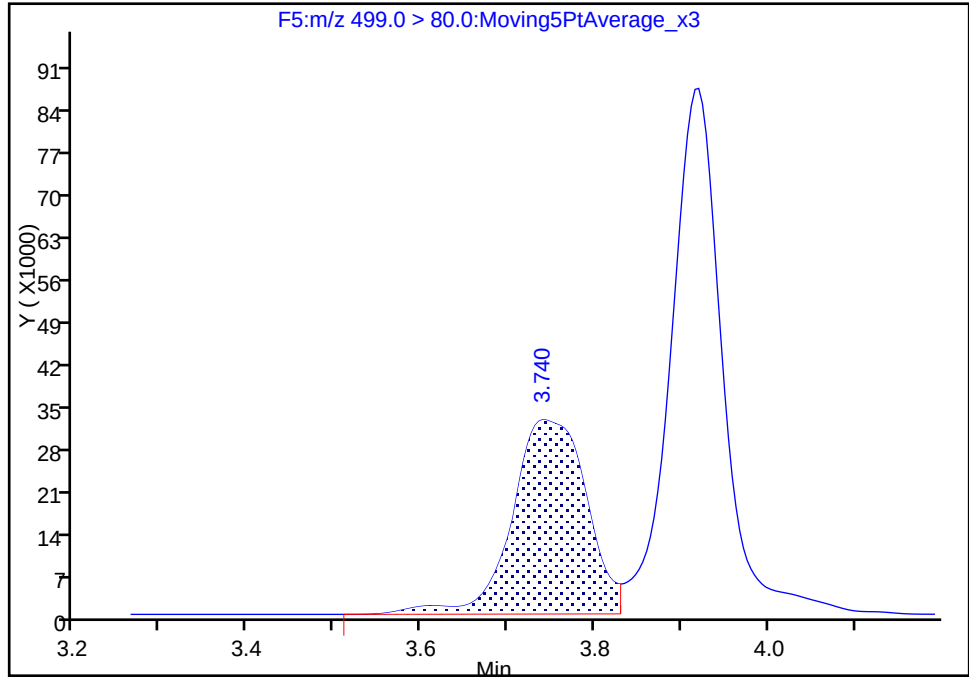
Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_006.d
Injection Date: 03-Aug-2017 11:14:55 Instrument ID: A6
Lims ID: STD L3
Client ID:
Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm) Detector: F5:MRM

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

Signal: 1

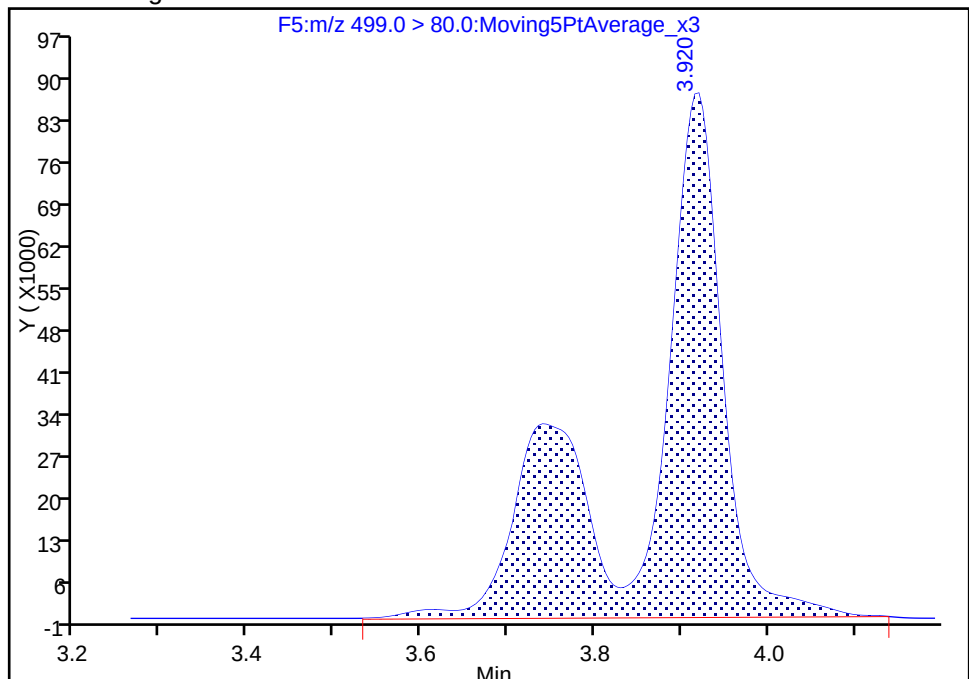
RT: 3.74
Area: 193089
Amount: 12.481615
Amount Units: ng/ml

Processing Integration Results



RT: 3.92
Area: 555265
Amount: 19.658614
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 03-Aug-2017 13:06:26
Audit Action: Manually Integrated

Audit Reason: Isomers
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08/09/2017

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_007.d
 Lims ID: STD L4
 Client ID:
 Sample Type: ICISAV Calib Level: 4
 Inject. Date: 03-Aug-2017 11:24:00 ALS Bottle#: 4 Worklist Smp#: 7
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: STD L4 L4
 Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-537__A6*sub3
 Method: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 03-Aug-2017 13:24:43 Calib Date: 03-Aug-2017 11:42:11
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
 Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: barnettj

Date: 03-Aug-2017 13:07:27

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
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1 Perfluorobutanesulfonic acid
 299.0 > 80.0 2.484 2.488 -0.004 1.000 1962785 88.6 411
 \$ 2 13C2 PFHxA
 315.0 > 270.0 2.826 2.827 -0.001 1.000 599933 10.6 452
 4 Perfluoroheptanoic acid M
 363.0 > 319.0 3.167 3.165 0.002 1.000 548477 9.58 132 M
 3 Perfluorohexanesulfonic acid
 399.0 > 80.0 3.175 3.175 0.0 1.000 812337 29.9 411
 * 5 13C2-PFOA
 415.0 > 370.0 3.488 3.487 0.001 452008 10.0 123
 6 Perfluorooctanoic acid
 413.0 > 369.0 3.488 3.487 0.001 1.000 975942 20.3 85.0
 * 8 13C4 PFOS
 503.0 > 80.0 3.907 3.909 -0.002 938262 28.7 1525
 7 Perfluorooctane sulfonic acid M
 499.0 > 80.0 3.911 3.914 -0.003 1.000 1294088 41.2 573 M
 9 Perfluorononanoic acid
 463.0 > 419.0 3.924 3.924 0.0 1.000 1022278 19.2 1004
 \$ 10 13C2 PFDA
 515.0 > 470.0 4.604 4.609 -0.005 1.000 506095 10.1 352

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L4_00019

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_007.d

Injection Date: 03-Aug-2017 11:24:00

Instrument ID: A6

Lims ID: STD L4

Client ID:

Operator ID: JRB

ALS Bottle#: 4

Worklist Smp#: 7

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

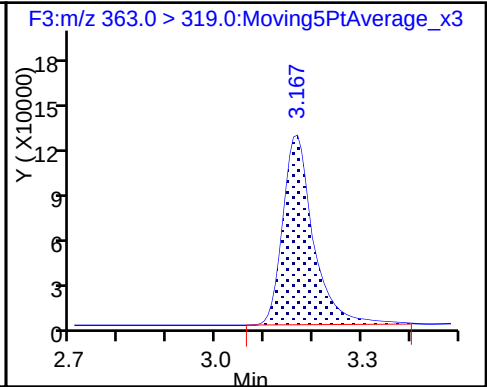
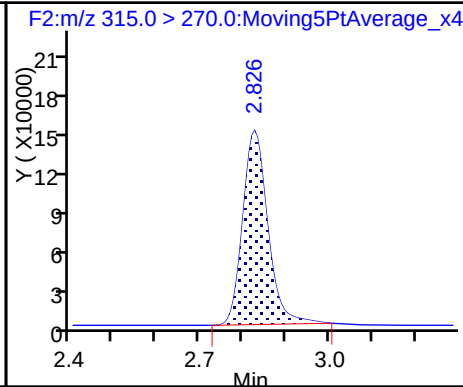
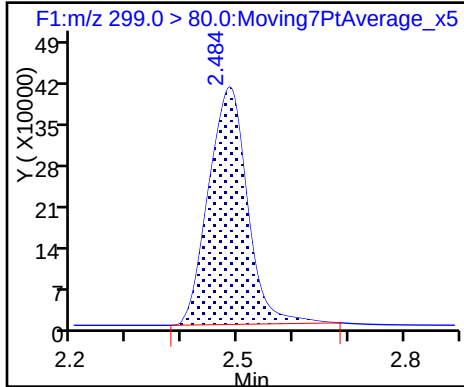
Method: 537__A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

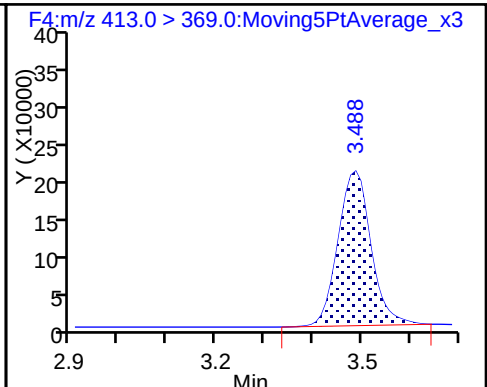
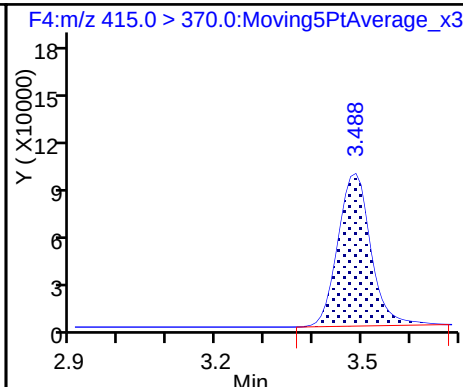
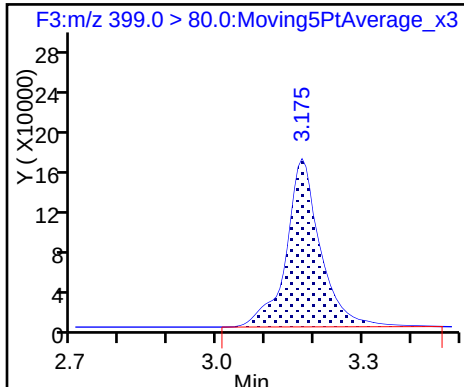
4 Perfluoroheptanoic acid (M)



3 Perfluorohexanesulfonic acid

* 5 13C2-PFOA

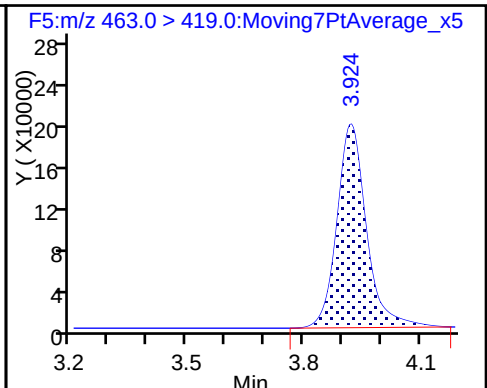
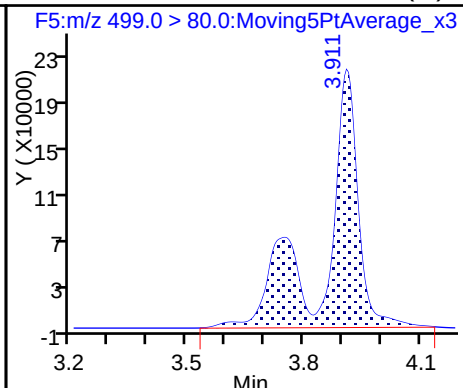
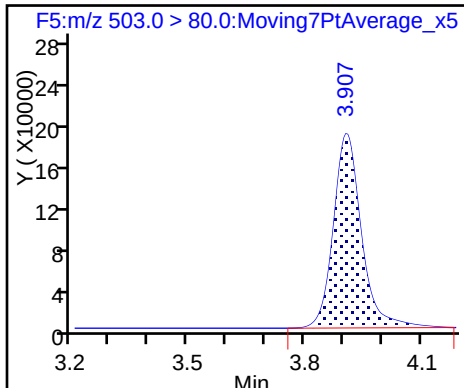
6 Perfluorooctanoic acid



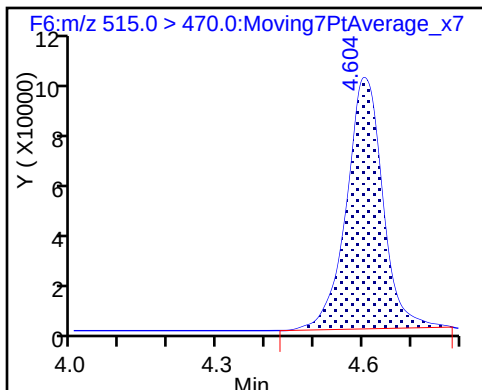
* 8 13C4 PFOS

7 Perfluorooctane sulfonic acid (M)

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

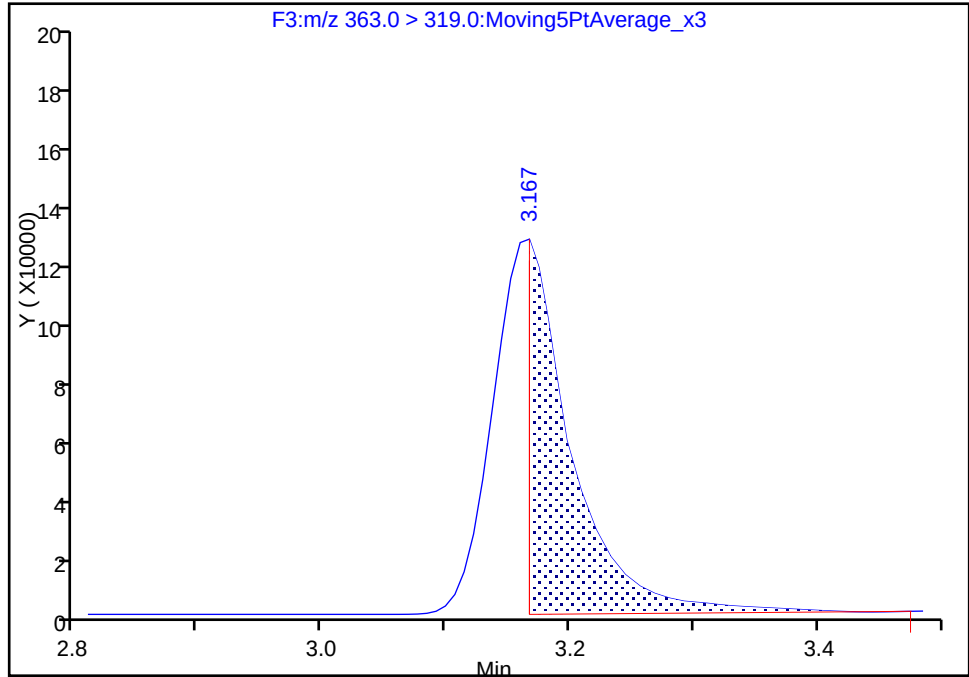
Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_007.d
Injection Date: 03-Aug-2017 11:24:00 Instrument ID: A6
Lims ID: STD L4
Client ID:
Operator ID: JRB ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector: F3:MRM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

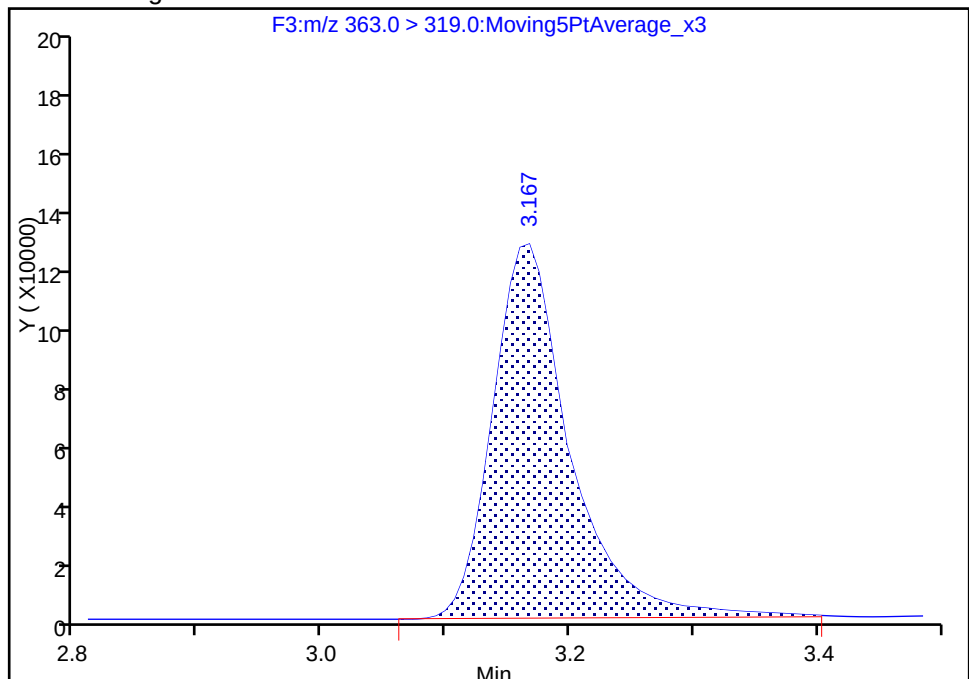
RT: 3.17
Area: 299083
Amount: 5.632068
Amount Units: ng/ml

Processing Integration Results



RT: 3.17
Area: 548477
Amount: 9.580334
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 03-Aug-2017 13:07:13
Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

TestAmerica Sacramento

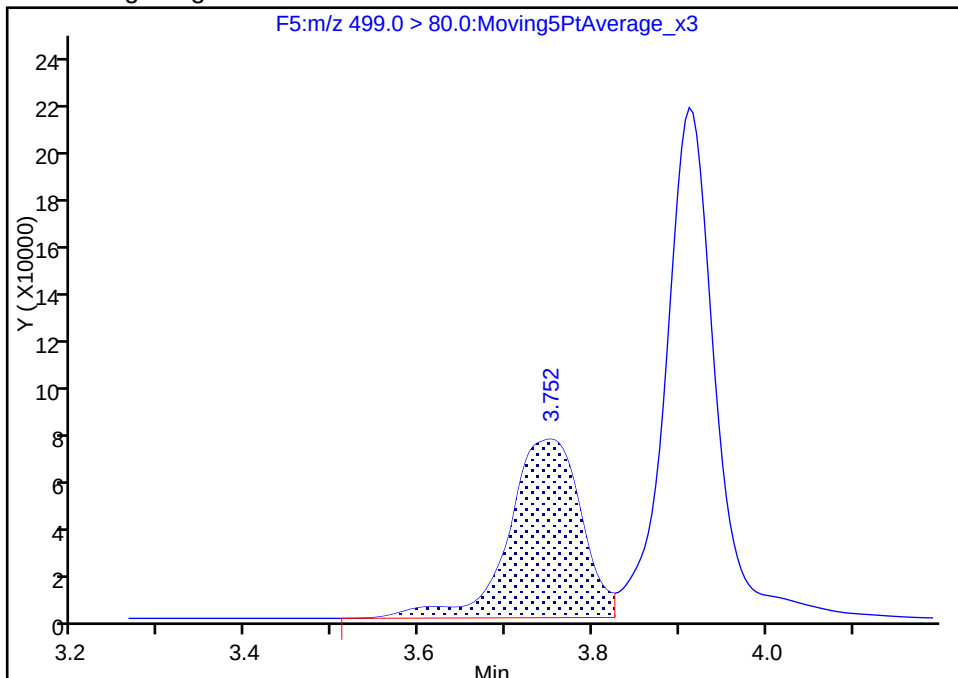
Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_007.d
Injection Date: 03-Aug-2017 11:24:00 Instrument ID: A6
Lims ID: STD L4
Client ID:
Operator ID: JRB ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm) Detector: F5:MRM

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

Signal: 1

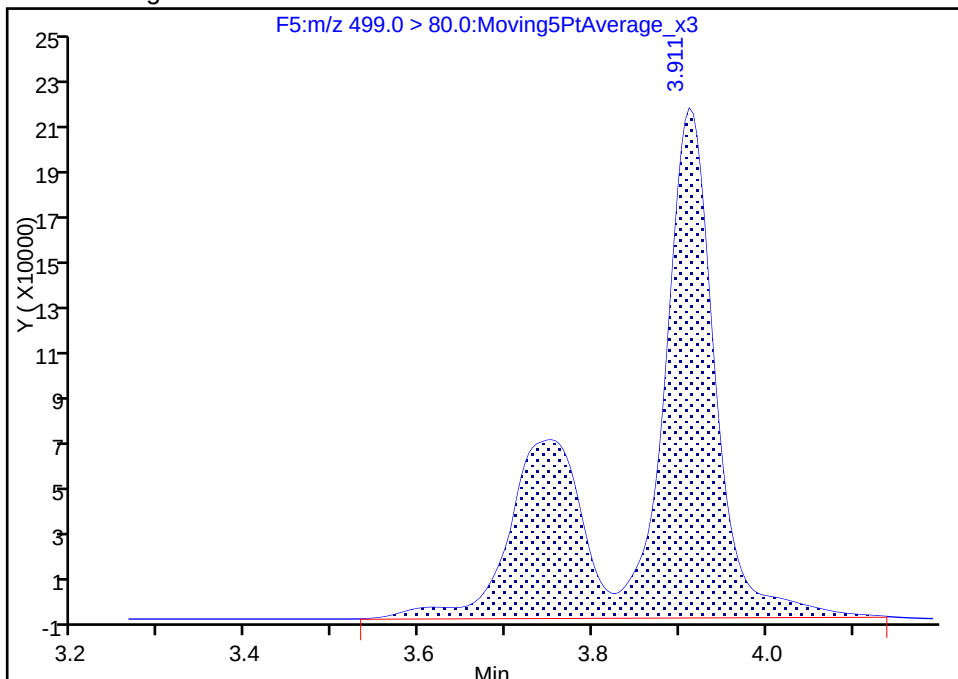
RT: 3.75
Area: 439311
Amount: 21.384757
Amount Units: ng/ml

Processing Integration Results



RT: 3.91
Area: 1294088
Amount: 41.193417
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 03-Aug-2017 13:06:57

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_008.d
 Lims ID: STD L5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 03-Aug-2017 11:33:06 ALS Bottle#: 5 Worklist Smp#: 8
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: STD L5 L5
 Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-537__A6*sub3
 Method: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 03-Aug-2017 13:24:48 Calib Date: 03-Aug-2017 11:42:11
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
 Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: barnettj

Date: 03-Aug-2017 13:08:14

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	2.481	2.488	-0.007	1.000	2725297	138.0	1113	
\$ 2 13C2 PFHxA								
315.0 > 270.0	2.826	2.827	-0.001	1.000	533596	10.2	351	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.160	3.165	-0.005	1.000	773549	14.6	436	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	3.175	3.175	0.0	1.000	1050045	43.3	588	
6 Perfluorooctanoic acid								
413.0 > 369.0	3.488	3.487	0.001	1.000	1330020	29.9	89.1	
* 5 13C2-PFOA								
415.0 > 370.0	3.488	3.487	0.001		418321	10.0	255	
* 8 13C4 PFOS								
503.0 > 80.0	3.907	3.909	-0.002		836796	28.7	2319	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.911	3.914	-0.003	1.000	1741359	62.2	273	M
9 Perfluorononanoic acid								
463.0 > 419.0	3.920	3.924	-0.004	1.000	1345502	27.3	2771	
\$ 10 13C2 PFDA								
515.0 > 470.0	4.602	4.609	-0.007	1.000	471470	10.2	394	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L5_00023

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_008.d

Injection Date: 03-Aug-2017 11:33:06

Instrument ID: A6

Lims ID: STD L5

Client ID:

Operator ID: JRB

ALS Bottle#: 5

Worklist Smp#: 8

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

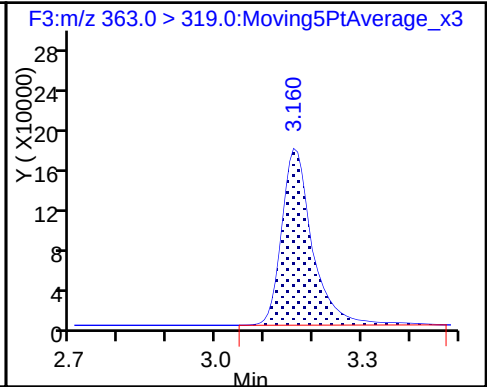
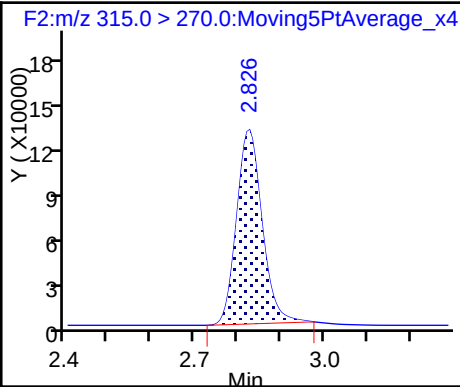
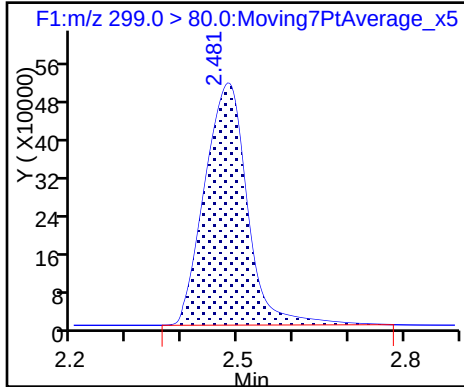
Method: 537__A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

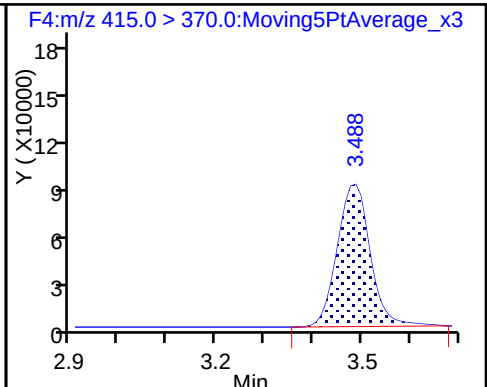
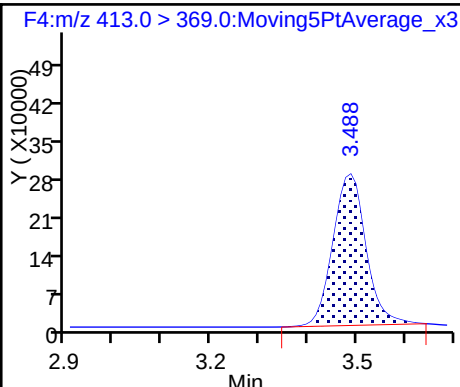
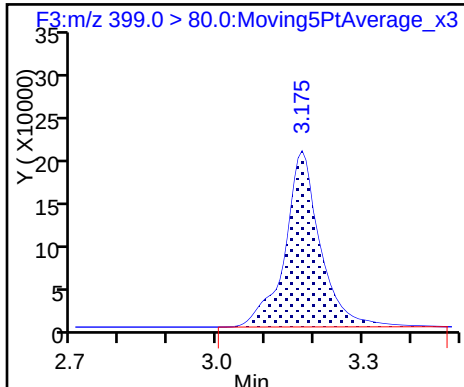
4 Perfluoroheptanoic acid



3 Perfluorohexanesulfonic acid

6 Perfluorooctanoic acid

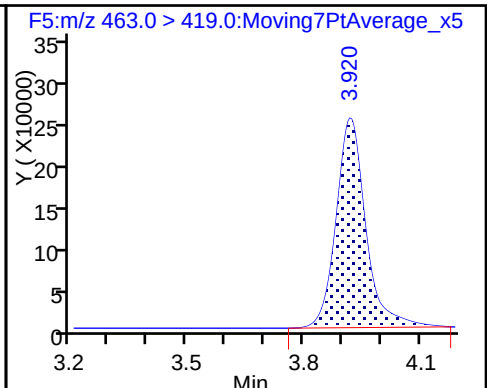
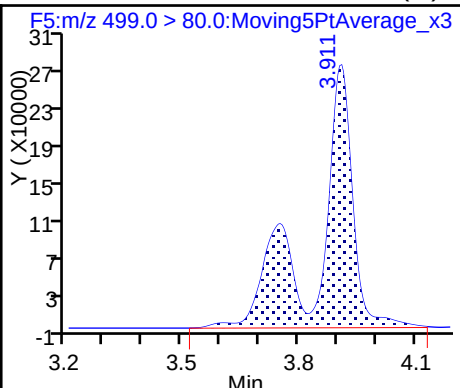
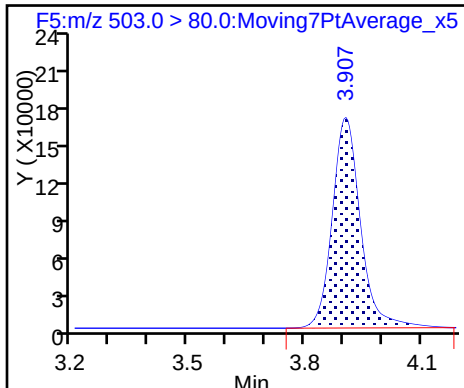
* 5 13C2-PFOA



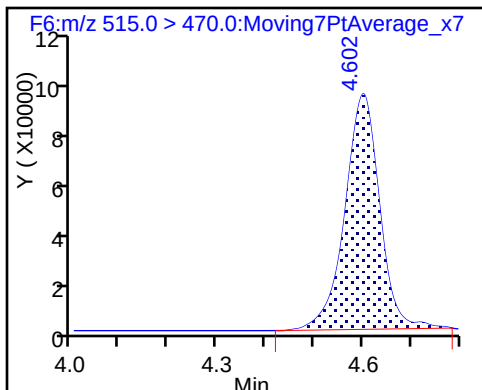
* 8 13C4 PFOS

7 Perfluorooctane sulfonic acid (M)

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

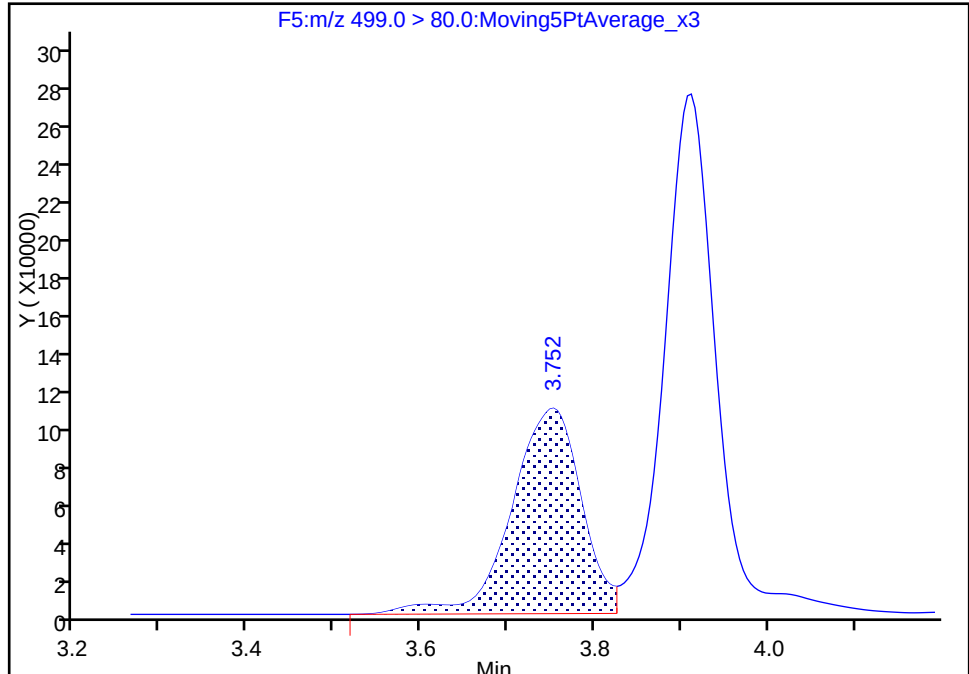
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Injection Date: 03-Aug-2017 11:33:06 Instrument ID: A6
Lims ID: STD L5
Client ID:
Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector: F5:MRM

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

Signal: 1

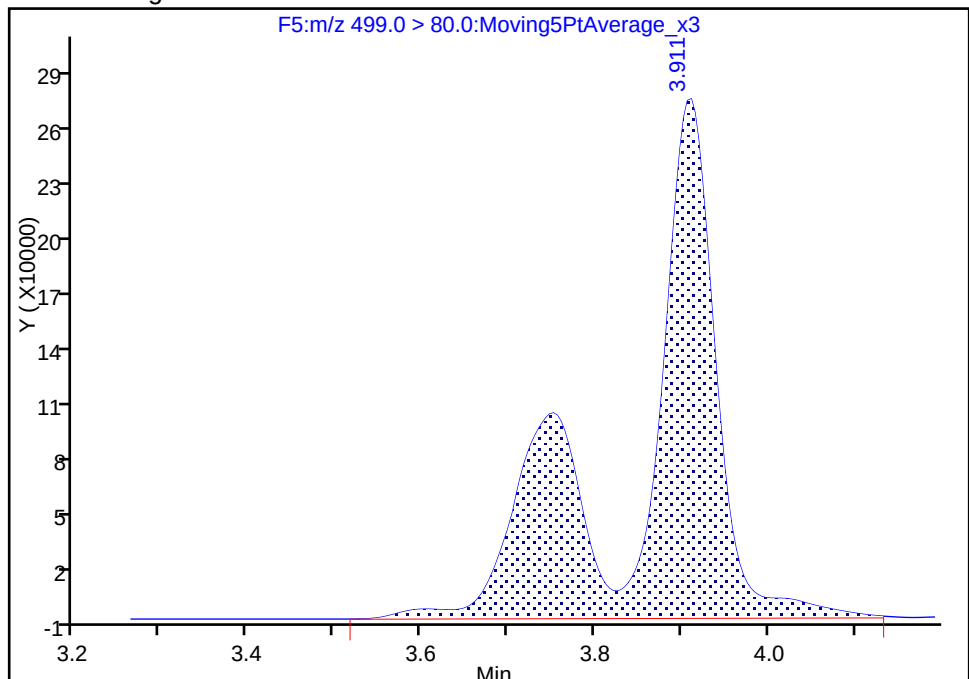
RT: 3.75
Area: 602808
Amount: 28.094801
Amount Units: ng/ml

Processing Integration Results



RT: 3.91
Area: 1741359
Amount: 62.152249
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 03-Aug-2017 13:07:48
Audit Action: Manually Integrated

Audit Reason: Isomers
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TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
 Lims ID: STD L6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 03-Aug-2017 11:42:11 ALS Bottle#: 6 Worklist Smp#: 9
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: STD L6 L6
 Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-537__A6*sub3
 Method: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 03-Aug-2017 13:24:53 Calib Date: 03-Aug-2017 11:42:11
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
 Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: barnettj

Date: 03-Aug-2017 13:08:50

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
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1 Perfluorobutanesulfonic acid								
299.0 > 80.0	2.478	2.488	-0.010	1.000	3327014	190.8	853	
\$ 2 13C2 PFHxA								
315.0 > 270.0	2.820	2.827	-0.007	1.000	484952	10.4	256	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.160	3.165	-0.005	1.000	863584	18.3	874	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	3.175	3.175	0.0	1.000	1374485	64.2	860	
* 5 13C2-PFOA								
415.0 > 370.0	3.478	3.487	-0.009		371747	10.0	295	
6 Perfluorooctanoic acid								
413.0 > 369.0	3.478	3.487	-0.009	1.000	1697286	43.0	132	
* 8 13C4 PFOS								
503.0 > 80.0	3.903	3.909	-0.006		738508	28.7	2274	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.907	3.914	-0.007	1.000	2170397	87.8	899	M
9 Perfluorononanoic acid								
463.0 > 419.0	3.916	3.924	-0.008	1.000	1592953	36.4	716	
\$ 10 13C2 PFDA								
515.0 > 470.0	4.594	4.609	-0.015	1.000	427049	10.4	529	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L6_00018

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d

Injection Date: 03-Aug-2017 11:42:11

Instrument ID: A6

Lims ID: STD L6

Client ID:

Operator ID: JRB

ALS Bottle#: 6

Worklist Smp#: 9

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

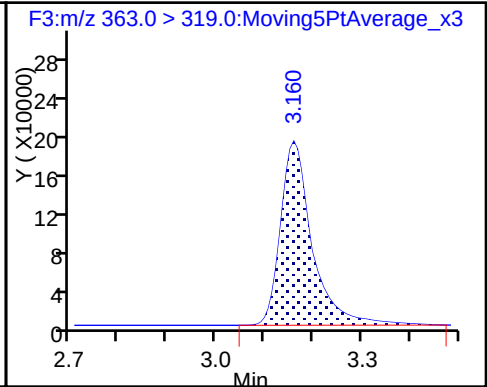
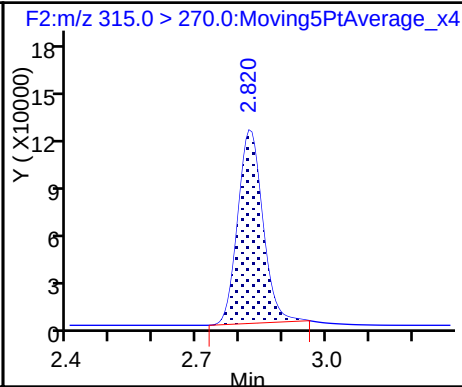
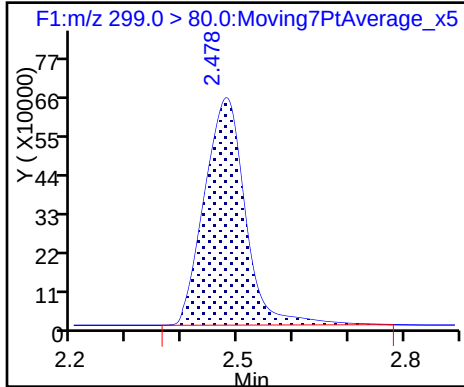
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

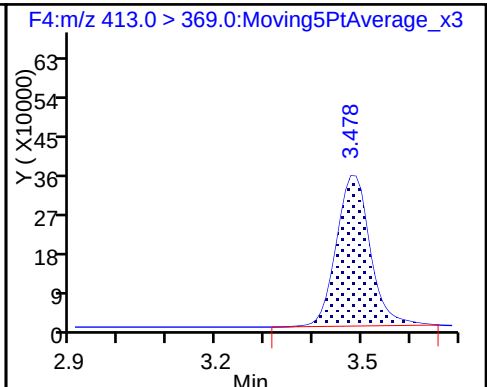
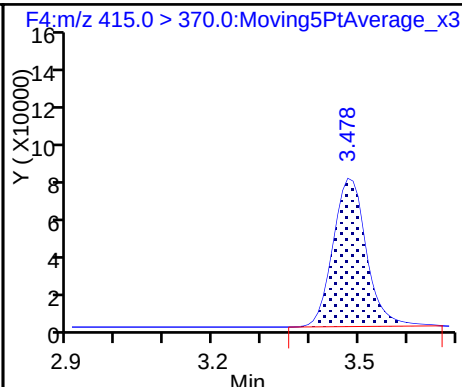
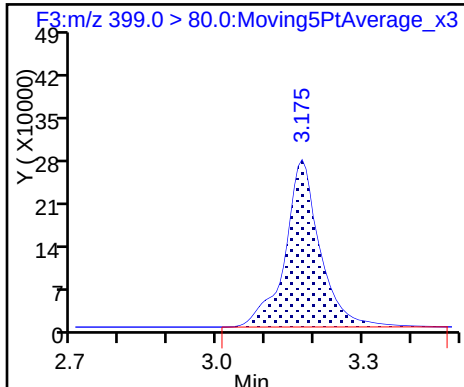
4 Perfluoroheptanoic acid



3 Perfluorohexanesulfonic acid

* 5 13C2-PFOA

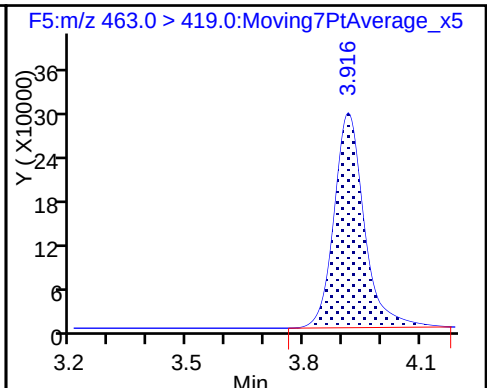
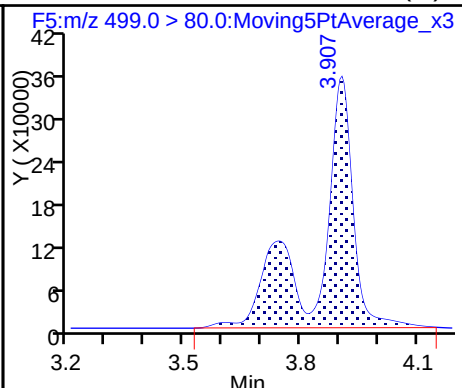
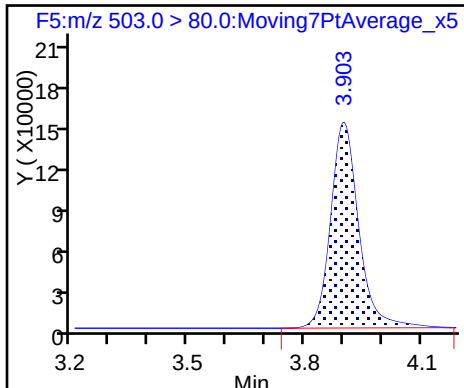
6 Perfluorooctanoic acid



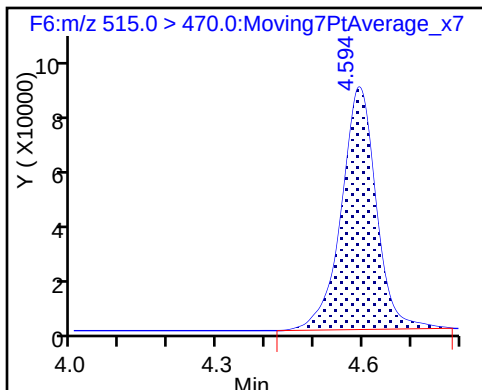
* 8 13C4 PFOS

7 Perfluorooctane sulfonic acid (M)

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

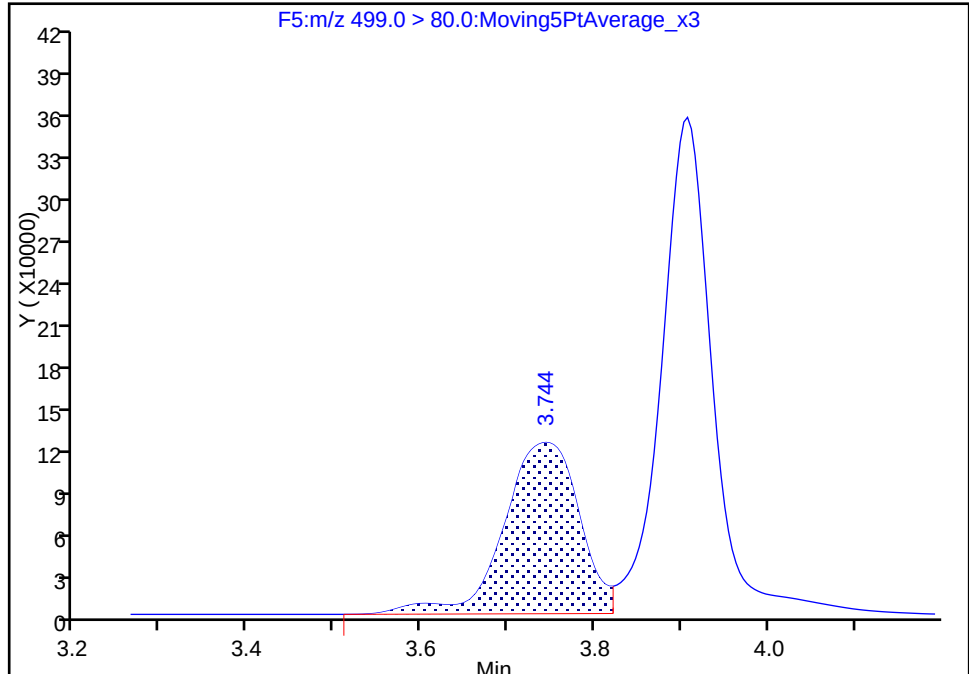
Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
Injection Date: 03-Aug-2017 11:42:11 Instrument ID: A6
Lims ID: STD L6
Client ID:
Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector: F5:MRM

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

Signal: 1

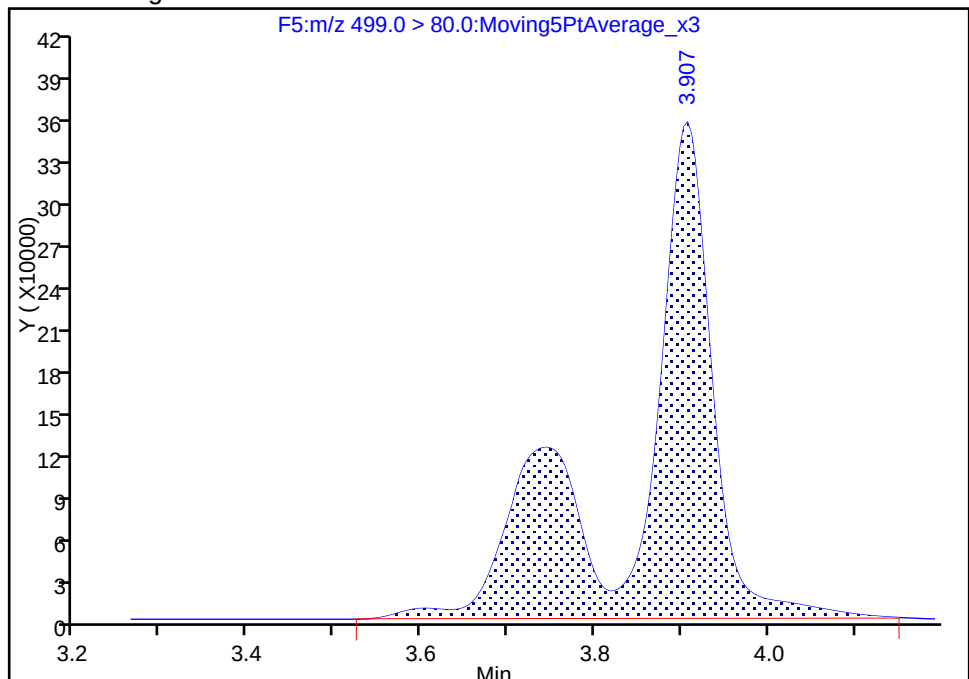
RT: 3.74
Area: 737330
Amount: 33.939414
Amount Units: ng/ml

Processing Integration Results



RT: 3.91
Area: 2170397
Amount: 87.775257
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 03-Aug-2017 13:08:34
Audit Action: Manually Integrated

Audit Reason: Isomers
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08/09/2017

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-177447/11 Calibration Date: 08/03/2017 12:00
 Instrument ID: A6 Calib Start Date: 08/03/2017 10:56
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/03/2017 11:42
 Lab File ID: 03AUG2017A6B_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.6770	0.6982		21.9	21.2	3.1	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.267	1.253		2.35	2.38	-1.0	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8308	0.8110		7.04	7.21	-2.4	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.063	1.066		4.81	4.80	0.4	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9603	0.9652		9.66	9.61	0.5	50.0
Perfluorononanoic acid (PFNA)	Ave	1.176	1.153		4.53	4.62	-2.0	50.0
13C2 PFHxA	Ave	1.256	1.203		9.58	10.0	-4.2	30.0
13C2 PFDA	Ave	1.106	1.046		9.46	10.0	-5.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_011.d
 Lims ID: CCVL
 Client ID:
 Sample Type: CCVL
 Inject. Date: 03-Aug-2017 12:00:24 ALS Bottle#: 2 Worklist Smp#: 11
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L2 CCV L2
 Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-537__A6*sub3
 Method: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 03-Aug-2017 13:25:03 Calib Date: 03-Aug-2017 11:42:11
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
 Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: barnettj

Date: 03-Aug-2017 13:12:37

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	2.474	2.488	-0.014	1.000	393911	21.9	156	
\$ 2 13C2 PFHxA								
315.0 > 270.0	2.820	2.827	-0.007	1.000	491027	9.58	326	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.160	3.165	-0.005	1.000	121592	2.35	100	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	3.175	3.175	0.0	1.000	155707	7.04	2279	
6 Perfluorooctanoic acid								
413.0 > 369.0	3.488	3.487	0.001	1.000	208795	4.81	108	
* 5 13C2-PFOA								
415.0 > 370.0	3.488	3.487	0.001		408282	10.0	152	
* 8 13C4 PFOS								
503.0 > 80.0	3.903	3.909	-0.006		763196	28.7	2138	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.903	3.914	-0.011	1.000	246780	9.66	10997	M
9 Perfluorononanoic acid								
463.0 > 419.0	3.916	3.924	-0.008	1.000	217535	4.53	673	
\$ 10 13C2 PFDA								
515.0 > 470.0	4.589	4.609	-0.020	1.000	427089	9.46	269	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00019

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_011.d

Injection Date: 03-Aug-2017 12:00:24

Instrument ID: A6

Lims ID: CCVL

Client ID:

Operator ID: JRB

ALS Bottle#: 2

Worklist Smp#: 11

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

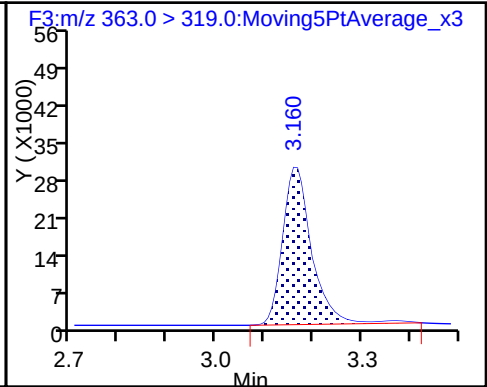
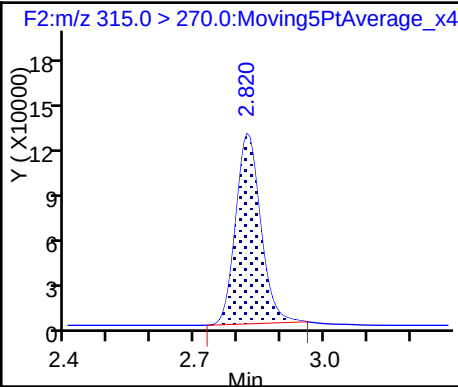
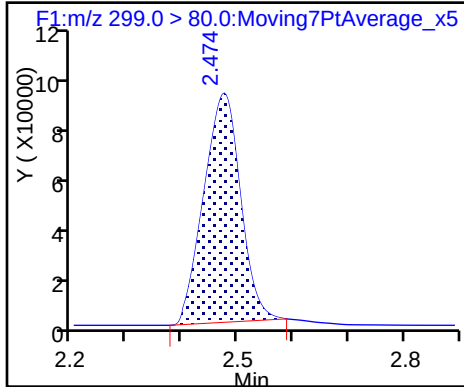
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

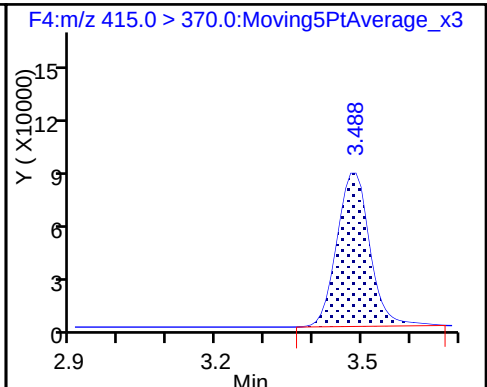
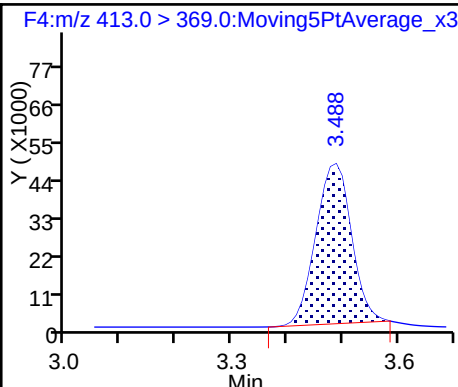
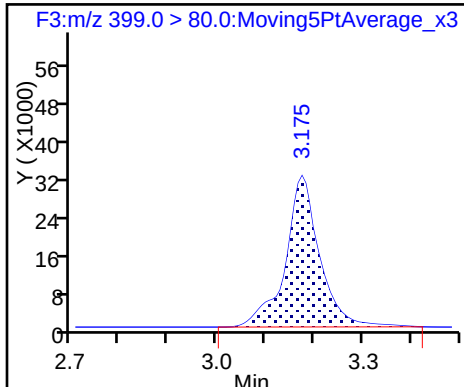
4 Perfluoroheptanoic acid



3 Perfluorohexanesulfonic acid

6 Perfluorooctanoic acid

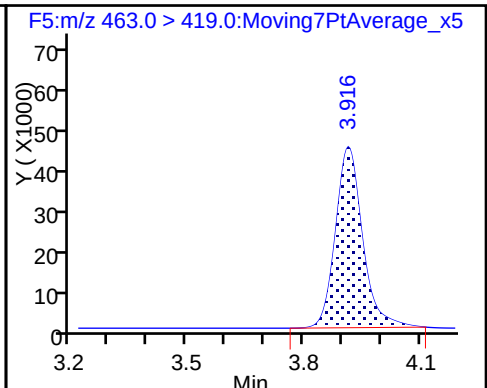
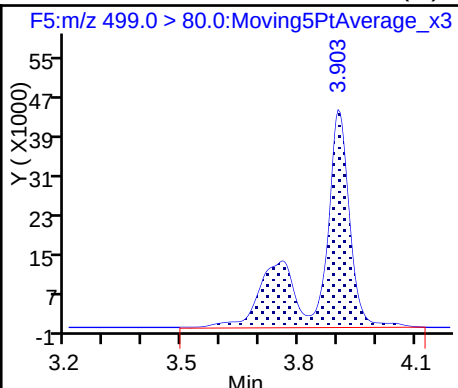
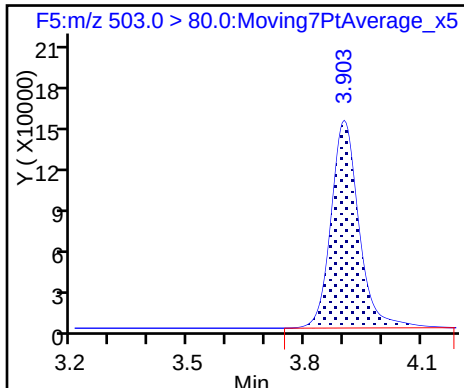
* 5 13C2-PFOA



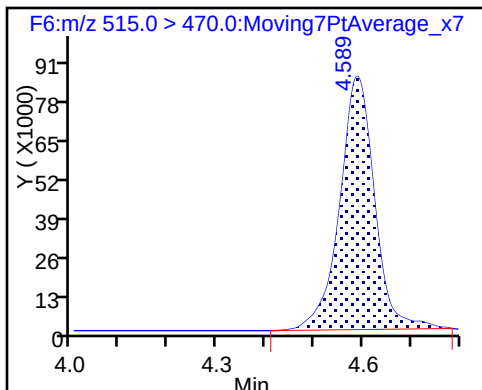
* 8 13C4 PFOS

7 Perfluorooctane sulfonic acid (M)

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

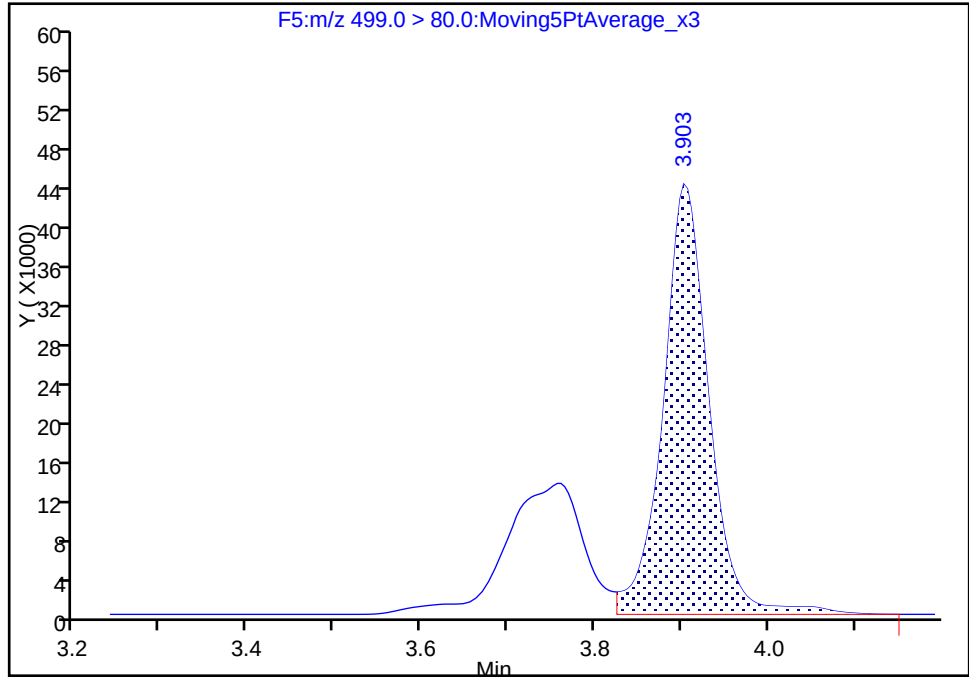
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Injection Date: 03-Aug-2017 12:00:24 Instrument ID: A6
Lims ID: CCVL
Client ID:
Operator ID: JRB ALS Bottle#: 2 Worklist Smp#: 11
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector: F5:MRM

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

Signal: 1

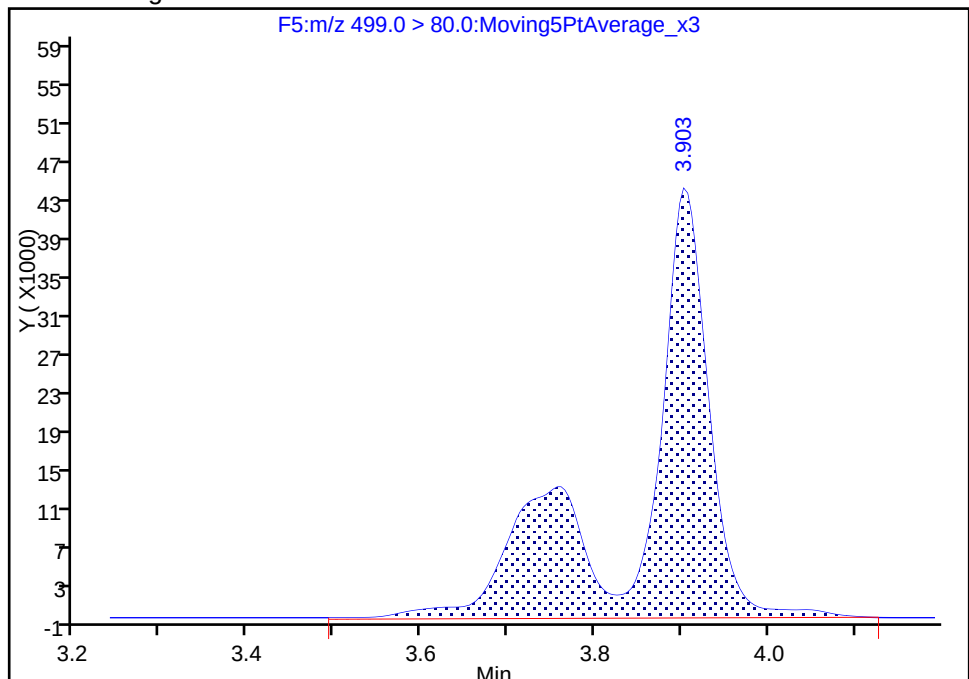
RT: 3.90
Area: 161033
Amount: 6.301834
Amount Units: ng/ml

Processing Integration Results



RT: 3.90
Area: 246780
Amount: 9.657440
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 03-Aug-2017 13:12:09
Audit Action: Manually Integrated

Audit Reason: Isomers
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08/09/2017

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Lab Sample ID: ICV 320-177447/12 Calibration Date: 08/03/2017 12:09
 Instrument ID: A6 Calib Start Date: 08/03/2017 10:56
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/03/2017 11:42
 Lab File ID: 03AUG2017A6B_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.6770	0.5939		87.8	100	-12.3	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.267	0.9149		7.22	10.0	-27.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8308	0.8163		19.7	20.1	-1.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.063	0.9078		17.2	20.1	-14.6	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9603	0.8083		16.9	20.1	-15.8	30.0
Perfluorononanoic acid (PFNA)	Ave	1.176	0.9576		16.4	20.1	-18.6	30.0
13C2 PFHxA	Ave	1.256	1.226		9.77	10.0	-2.3	30.0
13C2 PFDA	Ave	1.106	1.087		9.83	10.0	-1.7	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_012.d
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 03-Aug-2017 12:09:29 ALS Bottle#: 7 Worklist Smp#: 12
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: ICV ICV
 Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
 Operator ID: JRB Instrument ID: A6
 Sublist:
 Method: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 03-Aug-2017 13:25:10 Calib Date: 03-Aug-2017 11:42:11
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
 Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: barnettj Date: 03-Aug-2017 13:13:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	2.474	2.488	-0.014	1.000	1632771	87.8	316	
\$ 2 13C2 PFHxA								
315.0 > 270.0	2.820	2.827	-0.007	1.000	500630	9.77	282	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.160	3.165	-0.005	1.000	373398	7.22	187	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	3.175	3.175	0.0	1.000	450009	19.7	772	
6 Perfluorooctanoic acid								
413.0 > 369.0	3.478	3.487	-0.009	1.000	744906	17.2	99.5	
* 5 13C2-PFOA								
415.0 > 370.0	3.478	3.487	-0.009		408295	10.0	350	
* 8 13C4 PFOS								
503.0 > 80.0	3.899	3.909	-0.010		787513	28.7	1945	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.903	3.914	-0.011	1.000	446418	16.9	564	M
9 Perfluorononanoic acid								
463.0 > 419.0	3.911	3.924	-0.013	1.000	786924	16.4	783	
\$ 10 13C2 PFDA								
515.0 > 470.0	4.586	4.609	-0.023	1.000	443979	9.83	730	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-ICV_00021

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_012.d

Injection Date: 03-Aug-2017 12:09:29

Instrument ID: A6

Lims ID: ICV

Client ID:

Operator ID: JRB

ALS Bottle#: 7

Worklist Smp#: 12

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

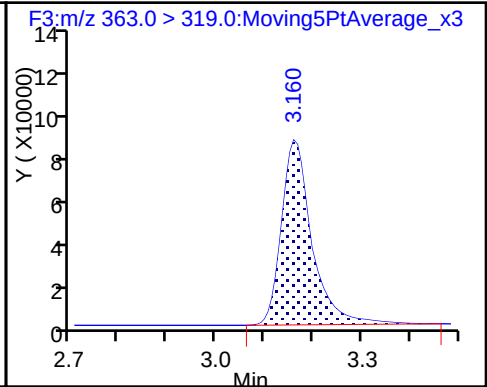
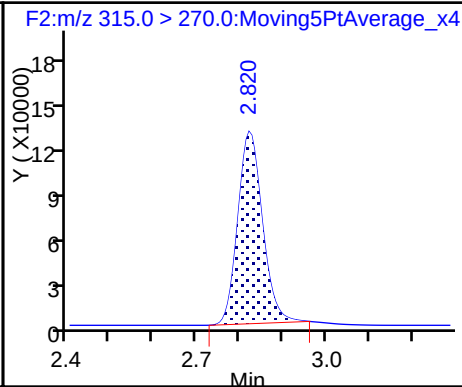
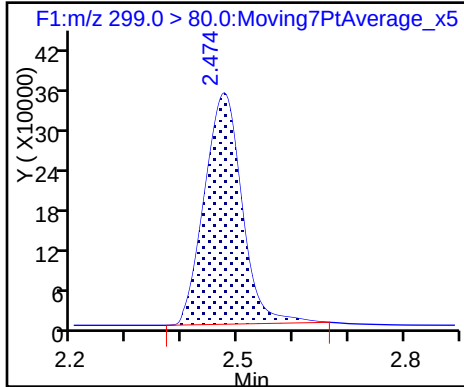
Method: 537__A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

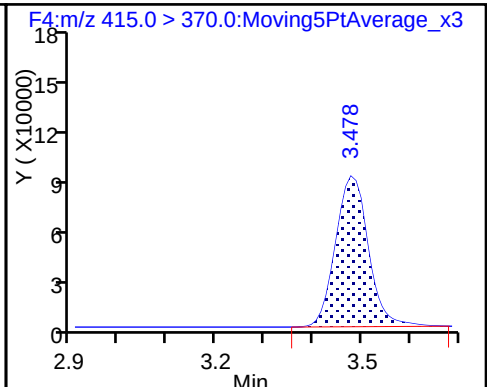
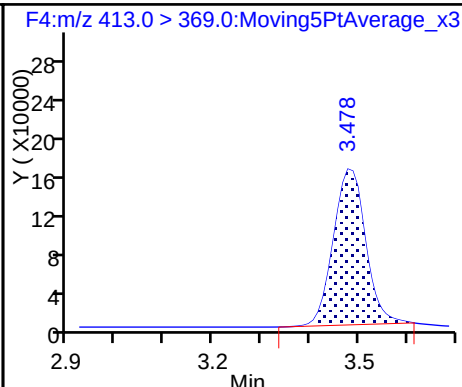
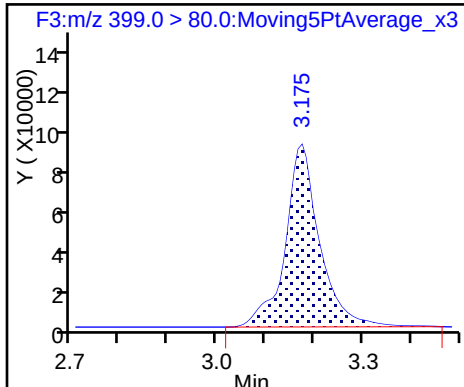
4 Perfluoroheptanoic acid



3 Perfluorohexanesulfonic acid

6 Perfluorooctanoic acid

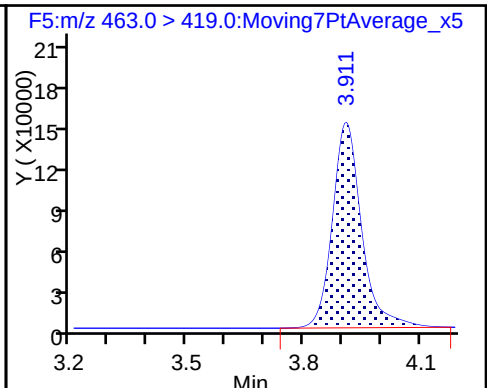
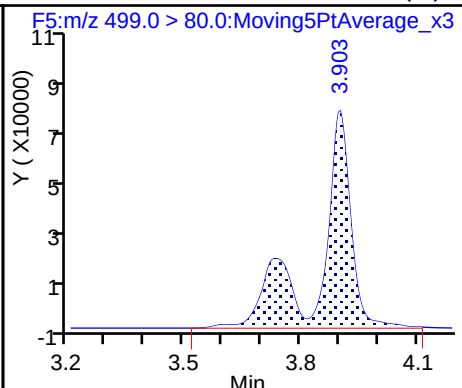
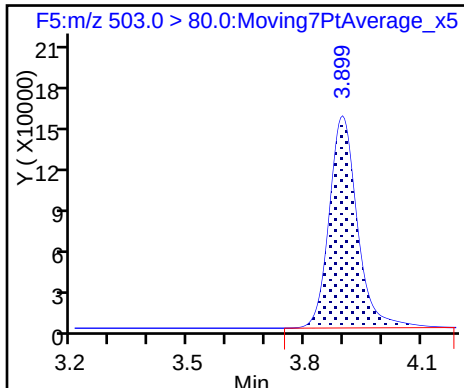
* 5 13C2-PFOA



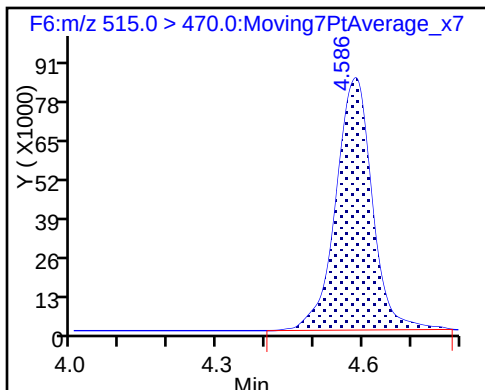
* 8 13C4 PFOS

7 Perfluorooctane sulfonic acid (M)

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

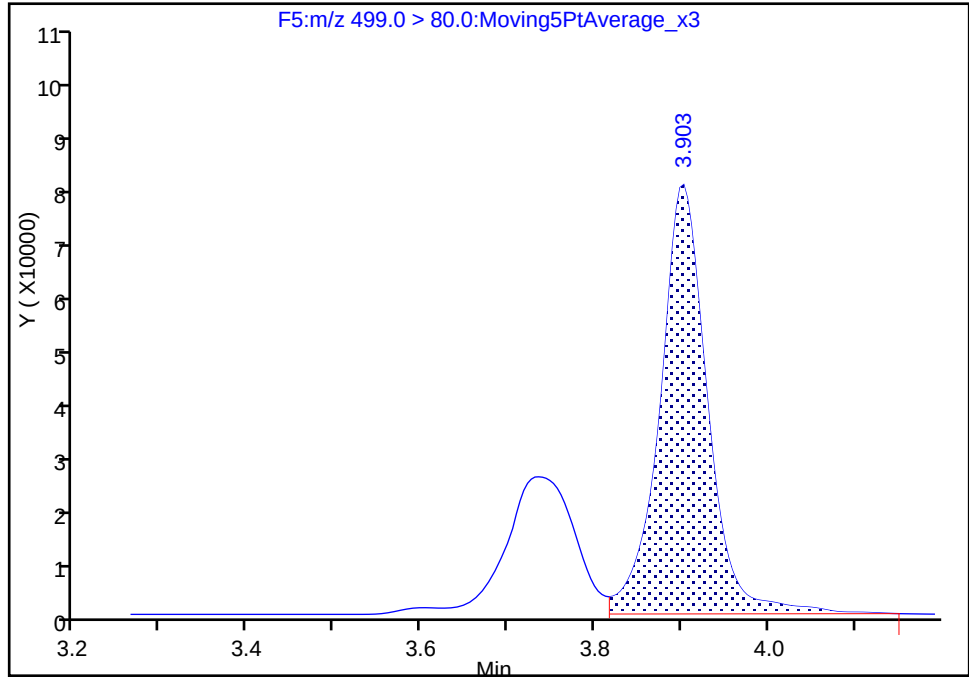
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Injection Date: 03-Aug-2017 12:09:29 Instrument ID: A6
Lims ID: ICV
Client ID:
Operator ID: JRB ALS Bottle#: 7 Worklist Smp#: 12
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector: F5:MRM

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

Signal: 1

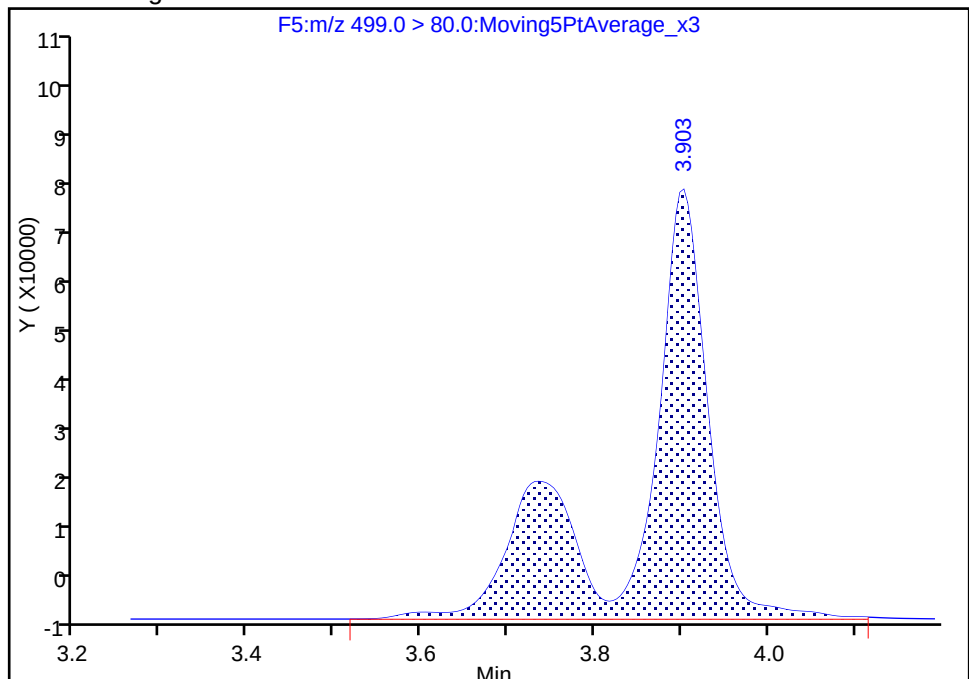
RT: 3.90
Area: 301795
Amount: 11.445702
Amount Units: ng/ml

Processing Integration Results



RT: 3.90
Area: 446418
Amount: 16.930590
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 03-Aug-2017 13:13:03

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Lab Sample ID: CCV 320-177368/1 Calibration Date: 08/03/2017 18:13
 Instrument ID: A6 Calib Start Date: 08/03/2017 10:56
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/03/2017 11:42
 Lab File ID: 03AUG2017A6B_052.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.6770	0.7052		46.2	44.4	4.2	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.267	1.093		4.29	4.97	-13.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8308	0.7888		14.3	15.1	-5.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.063	0.9803		9.26	10.0	-7.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9603	1.033		21.6	20.1	7.5	30.0
Perfluorononanoic acid (PFNA)	Ave	1.176	1.189		9.78	9.68	1.0	30.0
13C2 PFHxA	Ave	1.256	1.087		8.66	10.0	-13.4	30.0
13C2 PFDA	Ave	1.106	1.055		9.54	10.0	-4.6	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_052.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 03-Aug-2017 18:13:05 ALS Bottle#: 3 Worklist Smp#: 1
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L3 CCV L3
 Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-537__A6*sub3
 Method: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 04-Aug-2017 12:59:51 Calib Date: 03-Aug-2017 11:42:11
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
 Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
 Process Host: XAWRK021

First Level Reviewer: barnettj Date: 04-Aug-2017 10:03:47

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	2.461	2.461	0.0	1.000	998531	46.2	136	
\$ 2 13C2 PFHxA								
315.0 > 270.0	2.807	2.807	0.0	1.000	502516	8.66	223	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.145	3.145	0.0	1.000	251338	4.29	71.3	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	3.152	3.152	0.0	1.000	380043	14.3	4156	
6 Perfluorooctanoic acid								
413.0 > 369.0	3.447	3.447	0.0	1.000	454918	9.26	239	
* 5 13C2-PFOA								
415.0 > 370.0	3.447	3.447	0.0		462227	10.0	1311	
* 8 13C4 PFOS								
503.0 > 80.0	3.845	3.845	0.0		914753	28.7	5818	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	3.699	3.699	0.0	1.000	662537	21.6	7534	
9 Perfluorononanoic acid								
463.0 > 419.0	3.859	3.859	0.0	1.000	531754	9.78	1782	
\$ 10 13C2 PFDA								
515.0 > 470.0	4.503	4.503	0.0	1.000	487848	9.54	9972	

Reagents:

LC537-L3_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_052.d

Injection Date: 03-Aug-2017 18:13:05

Instrument ID: A6

Lims ID: CCV L3

Client ID:

Operator ID: JRB

ALS Bottle#: 3

Worklist Smp#: 1

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

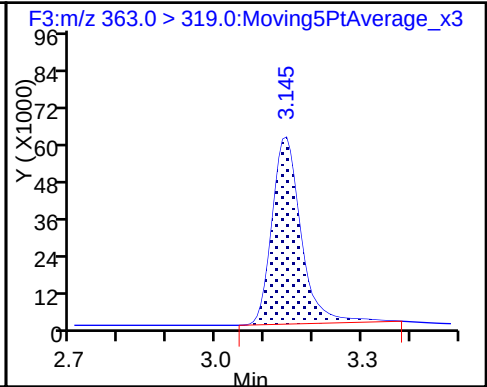
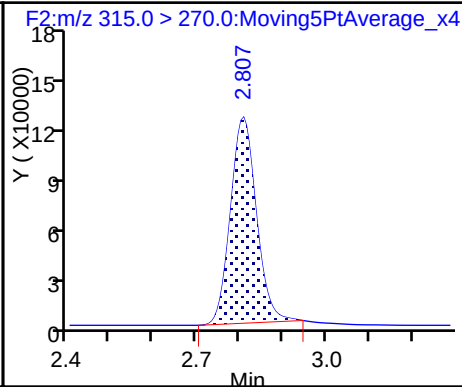
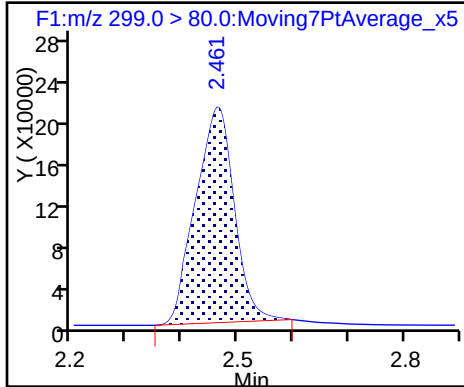
Method: 537__A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

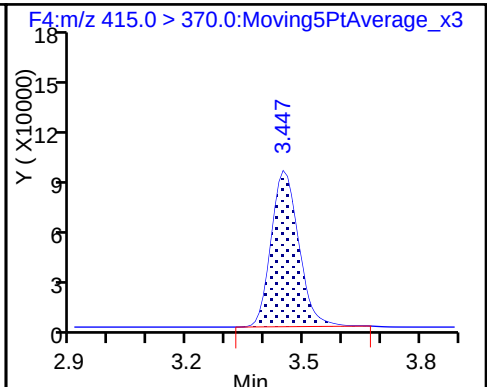
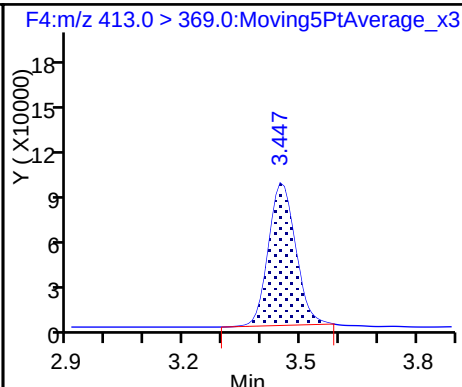
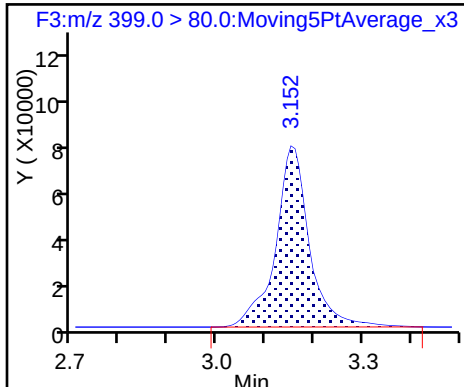
4 Perfluoroheptanoic acid



3 Perfluorohexanesulfonic acid

6 Perfluorooctanoic acid

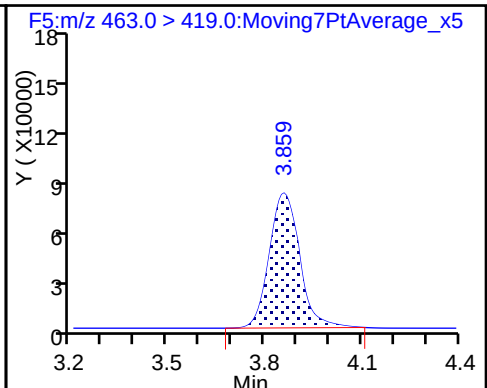
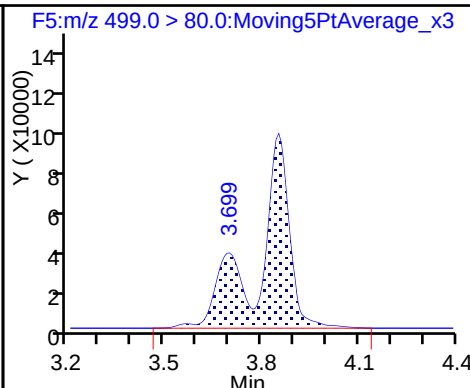
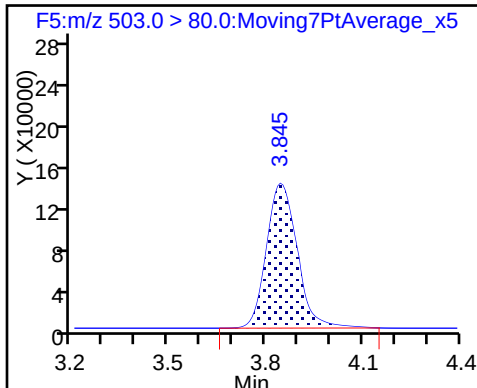
* 5 13C2-PFOA



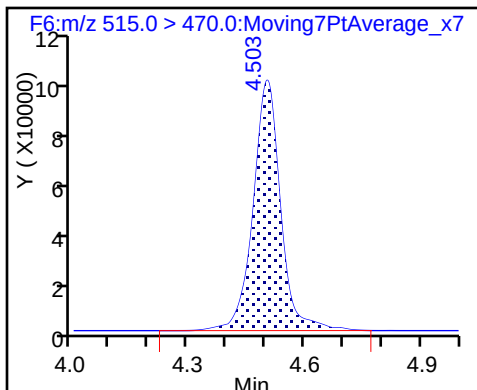
* 8 13C4 PFOS

7 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Lab Sample ID: CCV 320-177368/13 Calibration Date: 08/03/2017 20:02
 Instrument ID: A6 Calib Start Date: 08/03/2017 10:56
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/03/2017 11:42
 Lab File ID: 03AUG2017A6B_064.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.6770	0.7195		141	133	6.3	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.267	1.236		14.5	14.9	-2.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8308	0.8552		46.4	45.1	2.9	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.063	1.061		29.9	30.0	-0.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9603	1.055		66.0	60.0	9.8	30.0
Perfluorononanoic acid (PFNA)	Ave	1.176	1.180		29.0	28.9	0.3	30.0
13C2 PFHxA	Ave	1.256	1.282		10.2	10.0	2.1	30.0
13C2 PFDA	Ave	1.106	1.109		10.0	10.0	0.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Lab Sample ID: CCV 320-177369/13 Calibration Date: 08/03/2017 20:02
 Instrument ID: A6 Calib Start Date: 08/03/2017 10:56
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/03/2017 11:42
 Lab File ID: 03AUG2017A6B_064.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.6770	0.7195		141	133	6.3	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.267	1.236		14.5	14.9	-2.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8308	0.8552		46.4	45.1	2.9	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.063	1.061		29.9	30.0	-0.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9603	1.055		66.0	60.0	9.8	30.0
Perfluorononanoic acid (PFNA)	Ave	1.176	1.180		29.0	28.9	0.3	30.0
13C2 PFHxA	Ave	1.256	1.282		10.2	10.0	2.1	30.0
13C2 PFDA	Ave	1.106	1.109		10.0	10.0	0.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_064.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 03-Aug-2017 20:02:12 ALS Bottle#: 5 Worklist Smp#: 13
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5 CCV L5
 Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-537__A6*sub3
 Method: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 04-Aug-2017 13:01:41 Calib Date: 03-Aug-2017 11:42:11
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
 Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
 Process Host: XAWRK021

First Level Reviewer: barnettj

Date: 04-Aug-2017 10:04:05

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
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1 Perfluorobutanesulfonic acid
 299.0 > 80.0 2.445 2.445 0.0 1.000 2784396 140.8 283
 \$ 2 13C2 PFHxA
 315.0 > 270.0 2.801 2.801 0.0 1.000 524093 10.2 276
 4 Perfluoroheptanoic acid
 363.0 > 319.0 3.152 3.152 0.0 1.000 750570 14.5 1079
 3 Perfluorohexanesulfonic acid
 399.0 > 80.0 3.160 3.160 0.0 1.000 1126118 46.4 428
 6 Perfluorooctanoic acid
 413.0 > 369.0 3.468 3.468 0.0 1.000 1300163 29.9 234
 * 5 13C2-PFOA
 415.0 > 370.0 3.468 3.468 0.0 408862 10.0 1110
 7 Perfluorooctane sulfonic acid
 499.0 > 80.0 3.721 3.721 0.0 1.000 1849693 66.0 1248
 * 8 13C4 PFOS
 503.0 > 80.0 3.867 3.867 0.0 837526 28.7 2587
 9 Perfluorononanoic acid
 463.0 > 419.0 3.888 3.888 0.0 1.000 1394297 29.0 7094
 \$ 10 13C2 PFDA
 515.0 > 470.0 4.530 4.530 0.0 1.000 453416 10.0 12716

Reagents:

LC537-L5_00023

Amount Added: 1.00

Units: mL

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_064.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 03-Aug-2017 20:02:12 ALS Bottle#: 5 Worklist Smp#: 13
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5 CCV L5
 Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-537__A6*sub3
 Method: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 04-Aug-2017 13:01:41 Calib Date: 03-Aug-2017 11:42:11
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
 Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
 Process Host: XAWRK021

First Level Reviewer: barnettj

Date: 04-Aug-2017 10:04:05

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
--------	----	-----------	-----------	-----------	----------	-----------------	-----	-------

1 Perfluorobutanesulfonic acid
 299.0 > 80.0 2.445 2.445 0.0 1.000 2784396 140.8 283
 \$ 2 13C2 PFHxA
 315.0 > 270.0 2.801 2.801 0.0 1.000 524093 10.2 276
 4 Perfluoroheptanoic acid
 363.0 > 319.0 3.152 3.152 0.0 1.000 750570 14.5 1079
 3 Perfluorohexanesulfonic acid
 399.0 > 80.0 3.160 3.160 0.0 1.000 1126118 46.4 428
 6 Perfluorooctanoic acid
 413.0 > 369.0 3.468 3.468 0.0 1.000 1300163 29.9 234
 * 5 13C2-PFOA
 415.0 > 370.0 3.468 3.468 0.0 408862 10.0 1110
 7 Perfluorooctane sulfonic acid
 499.0 > 80.0 3.721 3.721 0.0 1.000 1849693 66.0 1248
 * 8 13C4 PFOS
 503.0 > 80.0 3.867 3.867 0.0 837526 28.7 2587
 9 Perfluorononanoic acid
 463.0 > 419.0 3.888 3.888 0.0 1.000 1394297 29.0 7094
 \$ 10 13C2 PFDA
 515.0 > 470.0 4.530 4.530 0.0 1.000 453416 10.0 12716

Reagents:

LC537-L5_00023

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_064.d

Injection Date: 03-Aug-2017 20:02:12

Instrument ID: A6

Lims ID: CCV L5

Client ID:

Operator ID: JRB

ALS Bottle#: 5

Worklist Smp#: 13

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

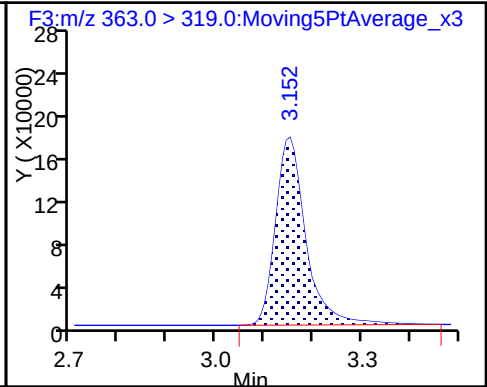
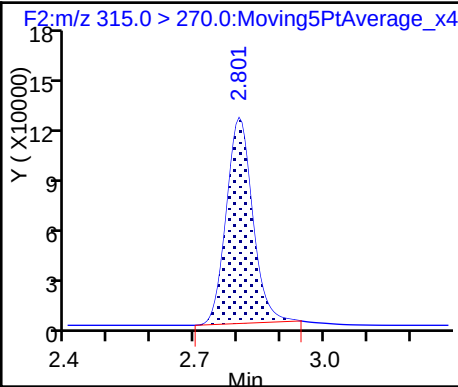
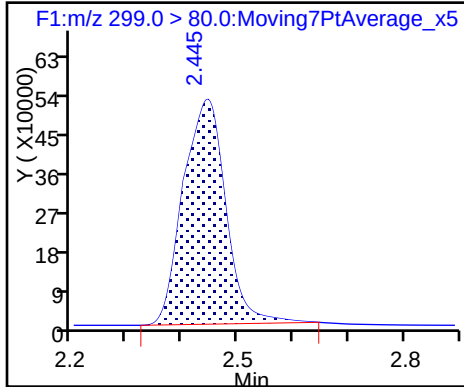
Method: 537__A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

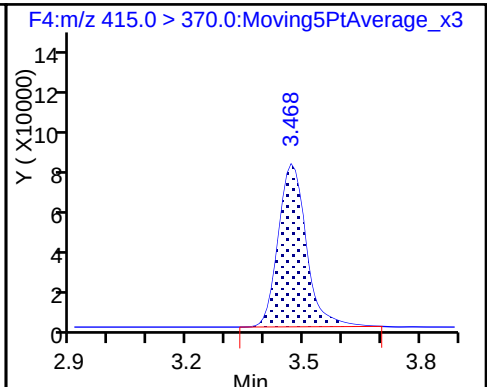
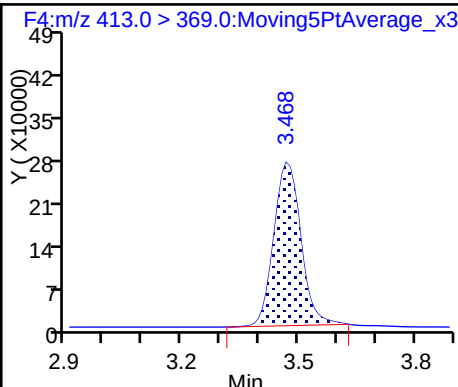
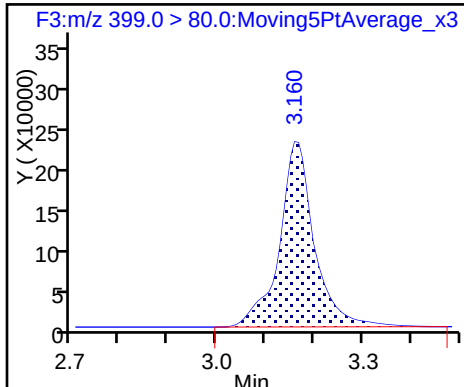
4 Perfluoroheptanoic acid



3 Perfluorohexanesulfonic acid

6 Perfluorooctanoic acid

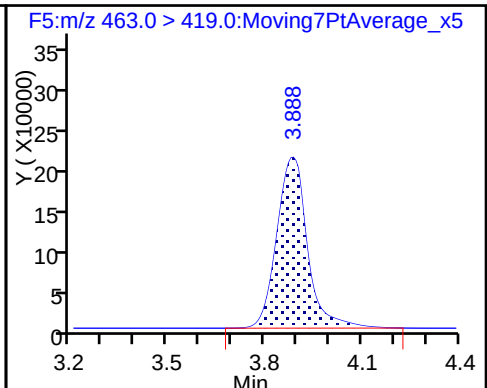
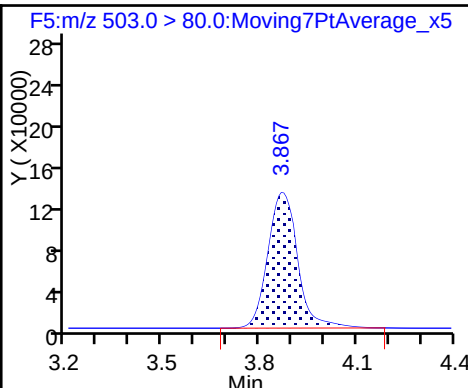
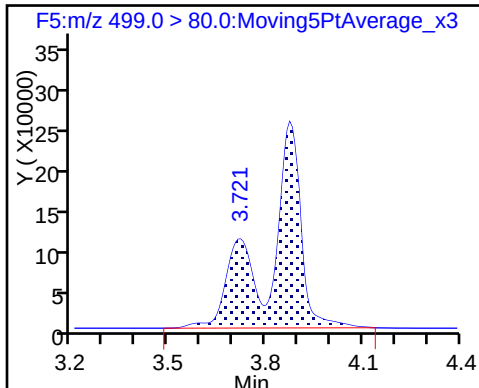
* 5 13C2-PFOA



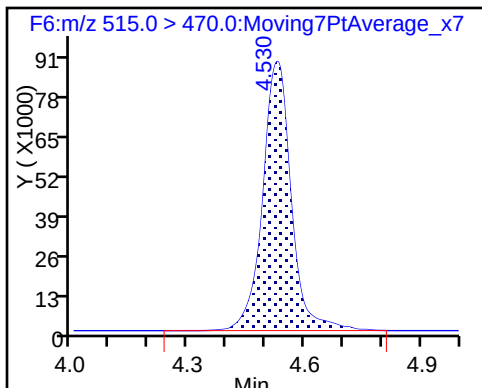
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_064.d

Injection Date: 03-Aug-2017 20:02:12

Instrument ID: A6

Lims ID: CCV L5

Client ID:

Operator ID: JRB

ALS Bottle#: 5

Worklist Smp#: 13

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

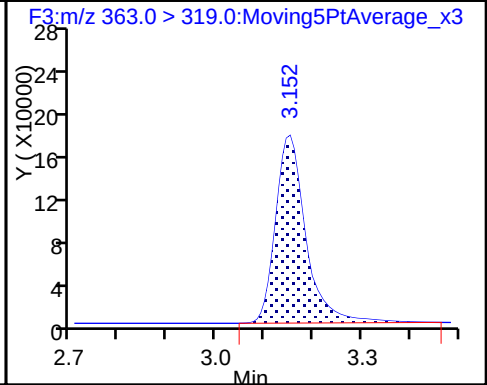
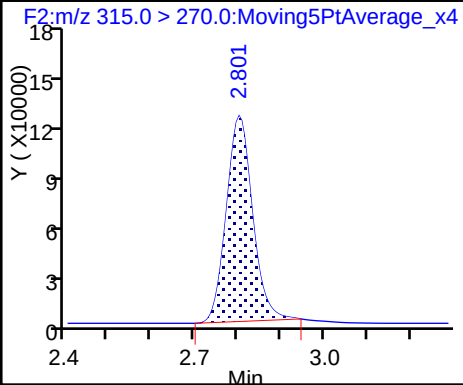
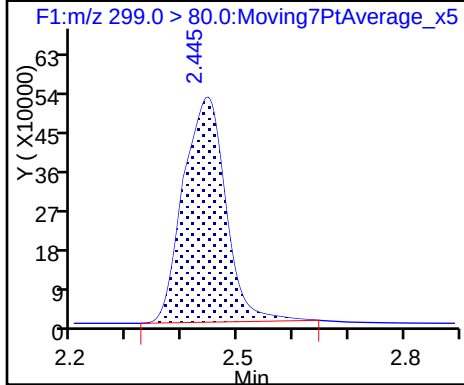
Method: 537__A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

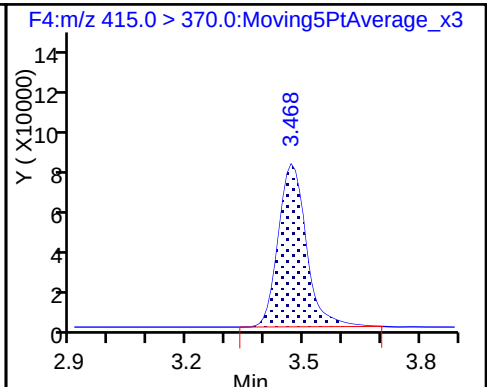
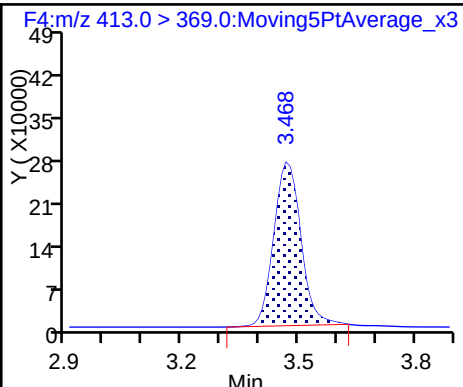
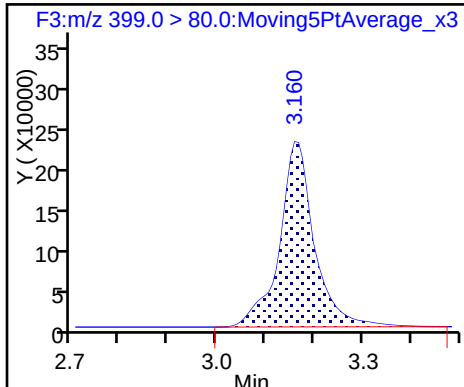
4 Perfluoroheptanoic acid



3 Perfluorohexanesulfonic acid

6 Perfluorooctanoic acid

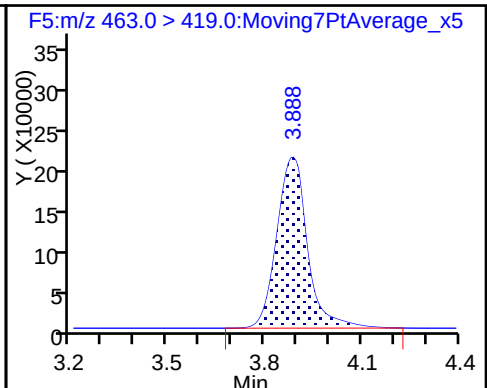
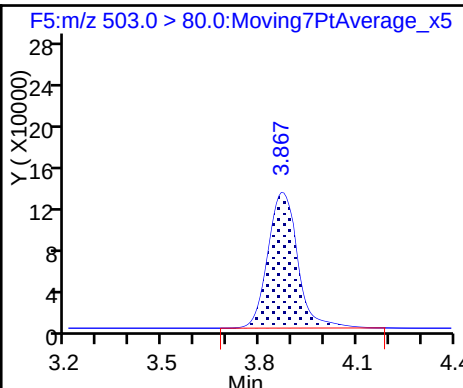
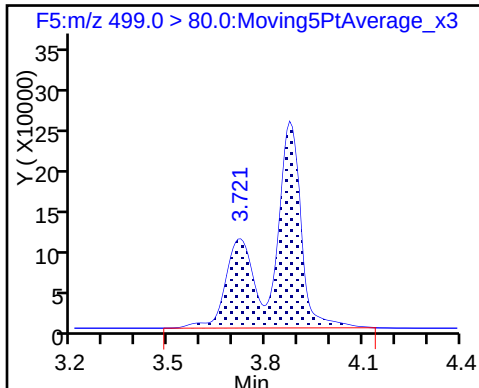
* 5 13C2-PFOA



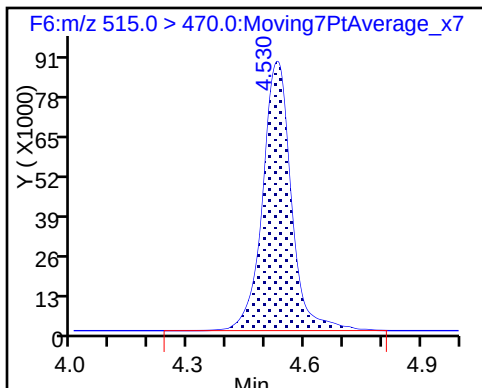
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Lab Sample ID: CCV 320-177369/25 Calibration Date: 08/03/2017 21:51
 Instrument ID: A6 Calib Start Date: 08/03/2017 10:56
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/03/2017 11:42
 Lab File ID: 03AUG2017A6B_076.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.6770	0.6824		44.7	44.4	0.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.267	1.161		4.56	4.97	-8.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8308	0.7848		14.3	15.1	-5.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.063	0.9851		9.31	10.0	-7.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9603	0.9836		20.6	20.1	2.4	30.0
Perfluorononanoic acid (PFNA)	Ave	1.176	1.218		10.0	9.68	3.6	30.0
13C2 PFHxA	Ave	1.256	1.175		9.36	10.0	-6.4	30.0
13C2 PFDA	Ave	1.106	1.039		9.39	10.0	-6.1	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_076.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 03-Aug-2017 21:51:19 ALS Bottle#: 3 Worklist Smp#: 25
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L3 CCV L3
 Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-537__A6*sub3
 Method: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 04-Aug-2017 13:02:58 Calib Date: 03-Aug-2017 11:42:11
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
 Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
 Process Host: XAWRK021

First Level Reviewer: barnettj Date: 04-Aug-2017 10:31:41

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	2.439	2.439	0.0	1.000	895643	44.7	160	
\$ 2 13C2 PFHxA								
315.0 > 270.0	2.801	2.801	0.0	1.000	515962	9.36	305	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.152	3.152	0.0	1.000	253625	4.56	238	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	3.167	3.167	0.0	1.000	350510	14.3	1711	
6 Perfluorooctanoic acid								
413.0 > 369.0	3.478	3.478	0.0	1.000	434199	9.31	186	
* 5 13C2-PFOA								
415.0 > 370.0	3.478	3.478	0.0		439037	10.0	631	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.881	3.881	0.0	1.000	585013	20.6	6143	M
* 8 13C4 PFOS								
503.0 > 80.0	3.874	3.874	0.0		847962	28.7	8471	
9 Perfluorononanoic acid								
463.0 > 419.0	3.888	3.888	0.0	1.000	517602	10.0	2882	
\$ 10 13C2 PFDA								
515.0 > 470.0	4.533	4.533	0.0	1.000	456005	9.39	13239	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_076.d

Injection Date: 03-Aug-2017 21:51:19

Instrument ID: A6

Lims ID: CCV L3

Client ID:

Operator ID: JRB

ALS Bottle#: 3

Worklist Smp#: 25

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

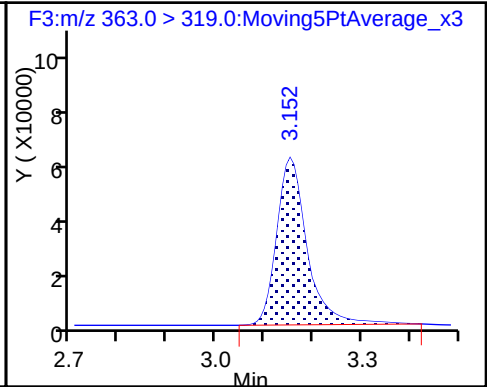
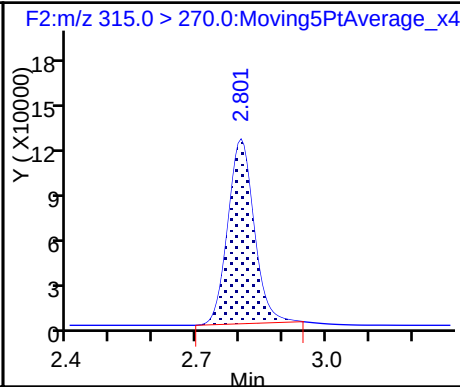
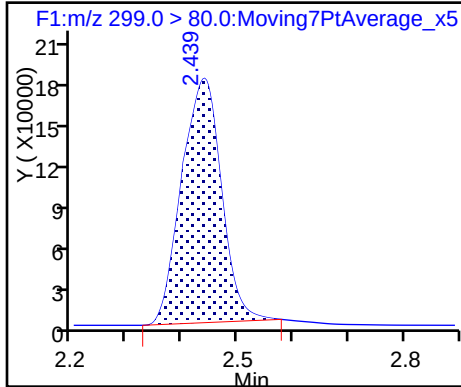
Method: 537__A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

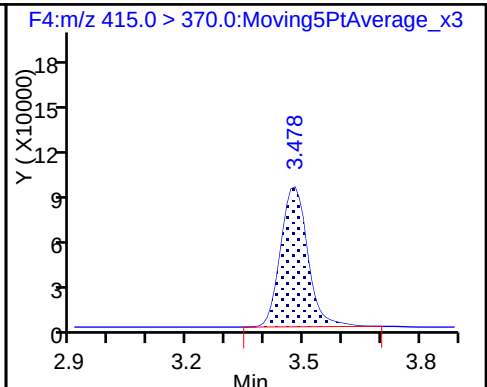
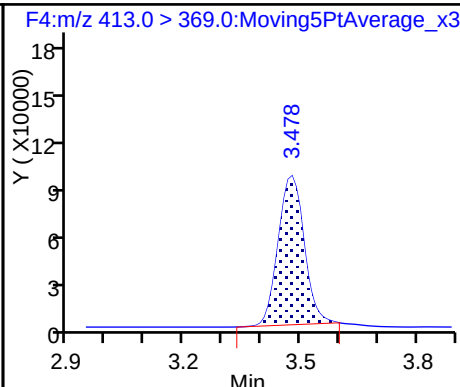
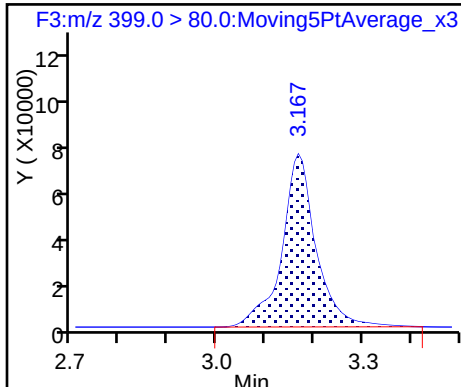
4 Perfluoroheptanoic acid



3 Perfluorohexanesulfonic acid

6 Perfluorooctanoic acid

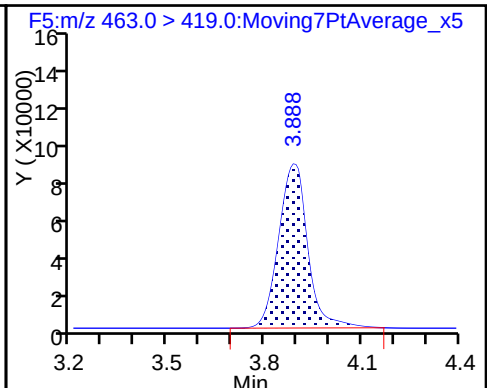
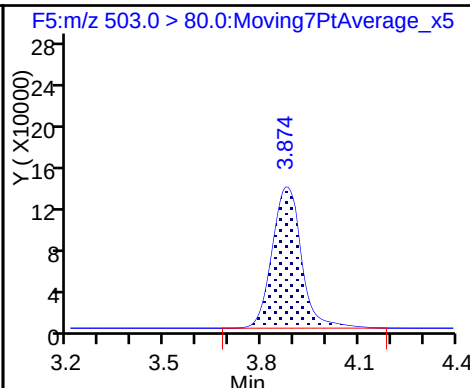
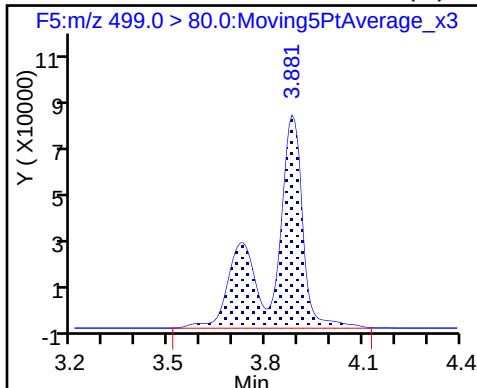
* 5 13C2-PFOA



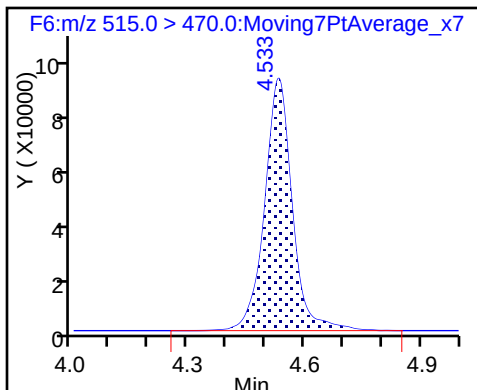
7 Perfluorooctane sulfonic acid (M)

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

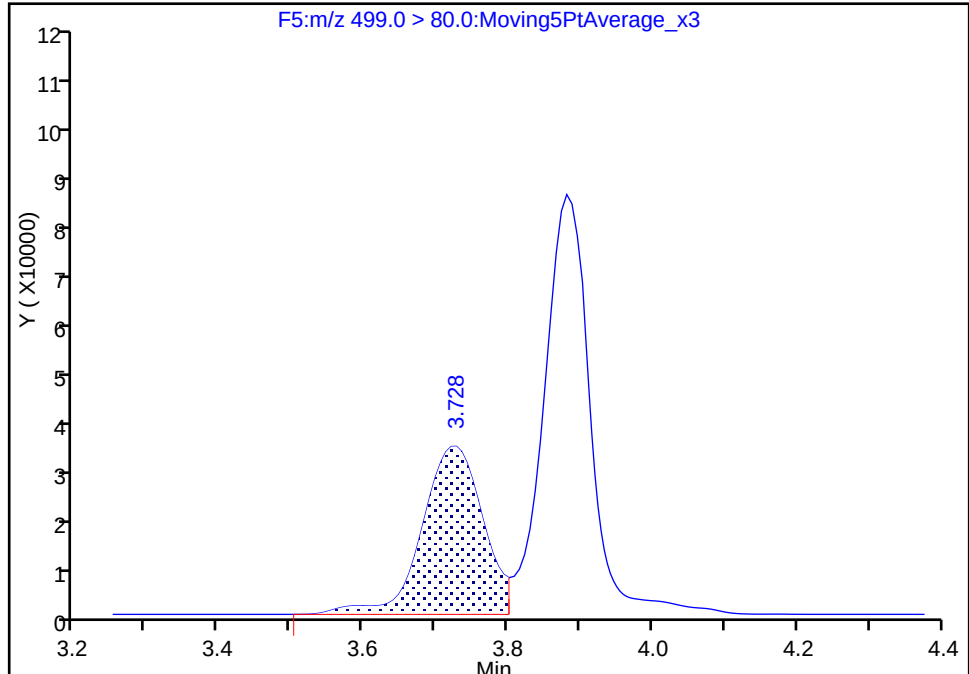
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Injection Date: 03-Aug-2017 21:51:19 Instrument ID: A6
Lims ID: CCV L3
Client ID:
Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 25
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector: F5:MRM

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

Signal: 1

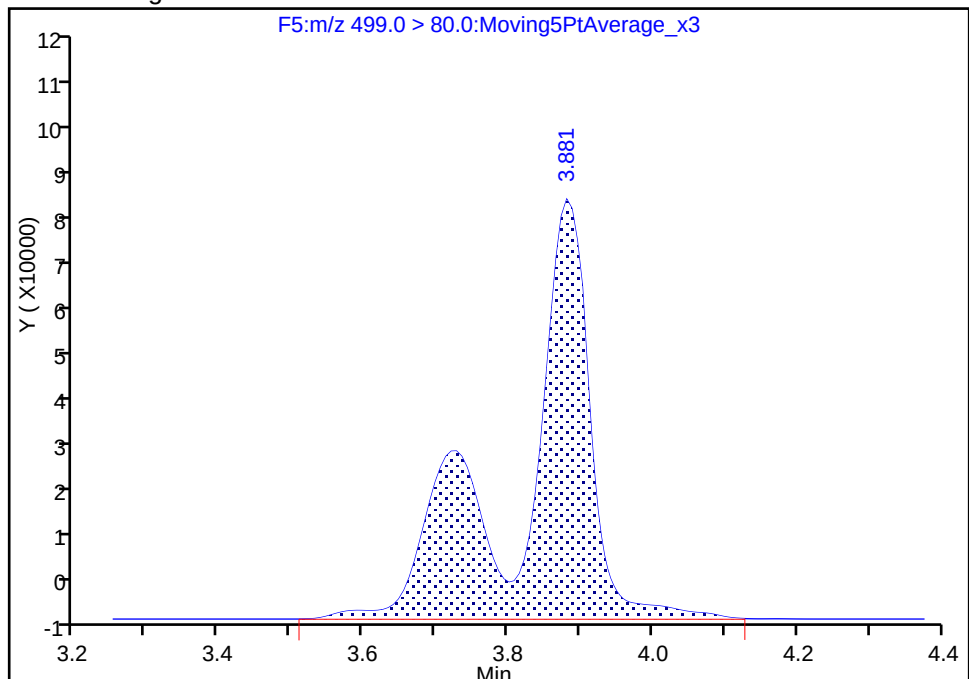
RT: 3.73
Area: 201218
Amount: 7.087263
Amount Units: ng/ml

Processing Integration Results



RT: 3.88
Area: 585013
Amount: 20.605220
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 04-Aug-2017 10:31:35
Audit Action: Manually Integrated

Audit Reason: Isomers
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08/09/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-176265/1-A
 Matrix: Water Lab File ID: 03AUG2017A6B_054.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 07/27/2017 10:45
 Sample wt/vol: 250.00 (mL) Date Analyzed: 08/03/2017 18:31
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 10 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177368 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	110		70-130
STL00996	13C2 PFDA	105		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_054.d
 Lims ID: MB 320-176265/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 03-Aug-2017 18:31:15 ALS Bottle#: 20 Worklist Smp#: 3
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-176265/1-a
 Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 04-Aug-2017 12:59:51 Calib Date: 03-Aug-2017 11:42:11
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
 Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
 Process Host: XAWRK021

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
--------	----	-----------	-----------	-----------	----------	-----------------	-----	-------

\$ 2 13C2 PFHxA

315.0 > 270.0 2.807 2.807 0.0 1.000 531086 11.0 373

* 5 13C2-PFOA

415.0 > 370.0 3.447 3.447 0.0 384243 10.0 998

* 8 13C4 PFOS

503.0 > 80.0 3.852 3.845 0.007 821358 28.7 8280

\$ 10 13C2 PFDA

515.0 > 470.0 4.509 4.503 0.006 1.000 447925 10.5 12572

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_054.d

Injection Date: 03-Aug-2017 18:31:15

Instrument ID: A6

Lims ID: MB 320-176265/1-A

Client ID:

Operator ID: JRB

ALS Bottle#: 20

Worklist Smp#: 3

Injection Vol: 10.0 ul

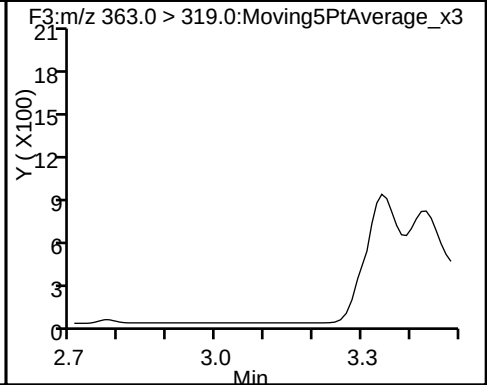
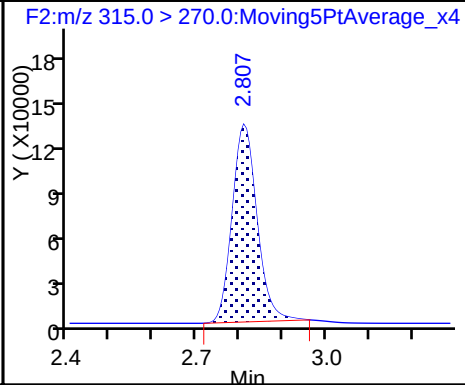
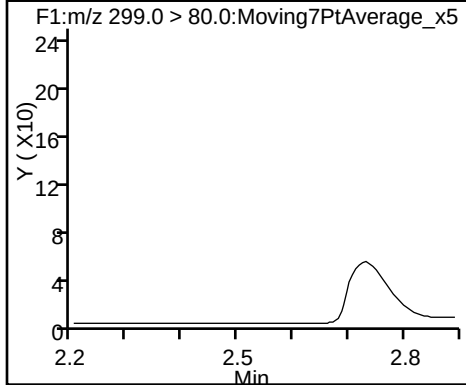
Dil. Factor: 1.0000

Method: 537__A6

Limit Group: LC 537 ICAL

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

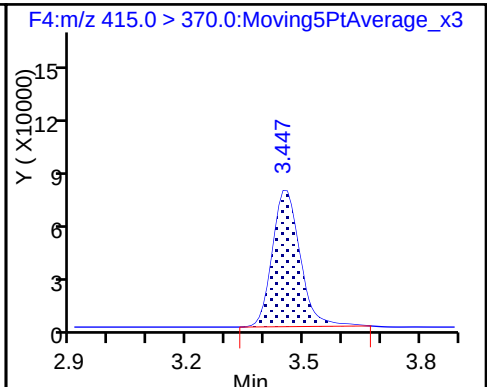
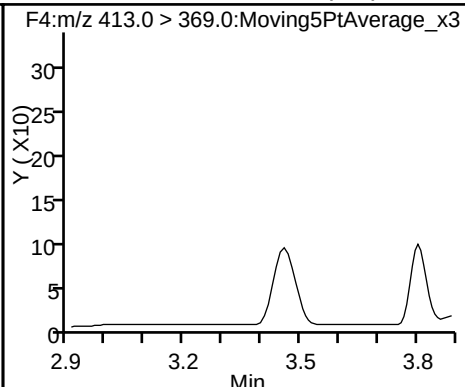
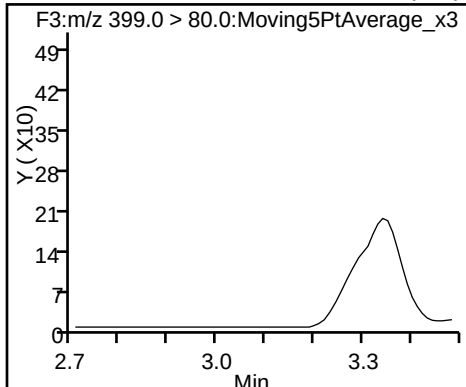
4 Perfluoroheptanoic acid (ND)



3 Perfluorohexanesulfonic acid (ND)

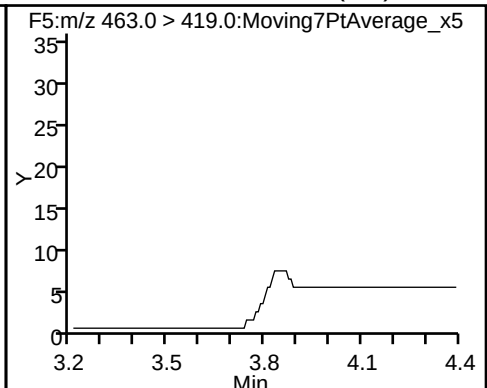
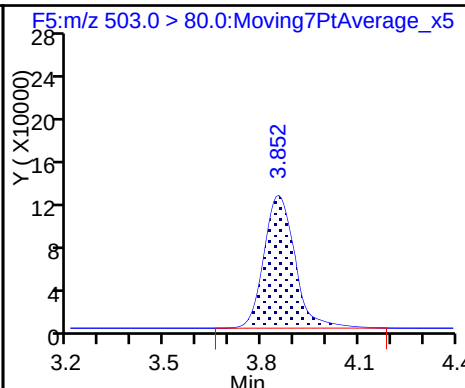
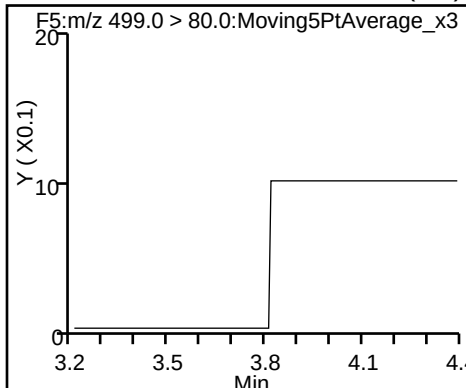
6 Perfluorooctanoic acid (ND)

* 5 13C2-PFOA

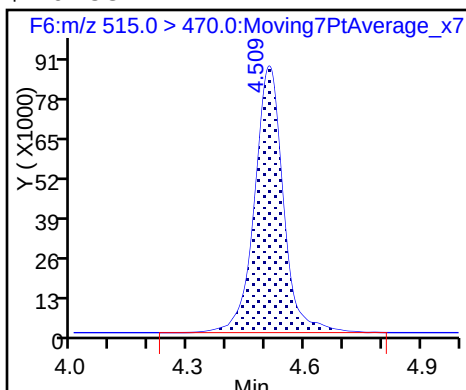


7 Perfluorooctane sulfonic acid (ND) * 8 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_054.d
Lims ID: MB 320-176265/1-A
Client ID:
Sample Type: MB
Inject. Date: 03-Aug-2017 18:31:15 ALS Bottle#: 20 Worklist Smp#: 3
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-176265/1-a
Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
Operator ID: JRB Instrument ID: A6
Method: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 04-Aug-2017 12:59:51 Calib Date: 03-Aug-2017 11:42:11
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK021

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	11.0	110.08
\$ 10 13C2 PFDA	10.0	10.5	105.42

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LLCS 320-176265/2-A
 Matrix: Water Lab File ID: 03AUG2017A6B_055.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 07/27/2017 10:45
 Sample wt/vol: 250.00 (mL) Date Analyzed: 08/03/2017 18:40
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 10 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177368 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	40.2		40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	18.3	J	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	18.6	J	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	29.5	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.73	J	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	79.9	J	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	99		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_055.d
 Lims ID: LLCS 320-176265/2-A
 Client ID:
 Sample Type: LLCS
 Inject. Date: 03-Aug-2017 18:40:21 ALS Bottle#: 21 Worklist Smp#: 4
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: llcs 320-176265/2-a
 Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 04-Aug-2017 12:59:51 Calib Date: 03-Aug-2017 11:42:11
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
 Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
 Process Host: XAWRK021

First Level Reviewer: barnettj

Date: 04-Aug-2017 10:09:52

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
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1 Perfluorobutanesulfonic acid
 299.0 > 80.0 2.458 2.461 -0.003 1.000 393477 20.0 164
 \$ 2 13C2 PFHxA
 315.0 > 270.0 2.807 2.807 0.0 1.000 482876 9.31 480
 4 Perfluoroheptanoic acid
 363.0 > 319.0 3.145 3.145 0.0 1.000 101120 1.93 66.4
 3 Perfluorohexanesulfonic acid
 399.0 > 80.0 3.160 3.152 0.008 1.000 178491 7.38 2240
 6 Perfluorooctanoic acid
 413.0 > 369.0 3.458 3.447 0.011 1.000 201274 4.58 234
 * 5 13C2-PFOA
 415.0 > 370.0 3.458 3.447 0.011 413088 10.0 4852
 7 Perfluorooctane sulfonic acid
 499.0 > 80.0 3.707 3.699 0.008 1.000 280705 10.0 5513
 * 8 13C4 PFOS
 503.0 > 80.0 3.852 3.845 0.007 834601 28.7 3671
 9 Perfluorononanoic acid
 463.0 > 419.0 3.867 3.859 0.008 1.000 226104 4.65 360
 \$ 10 13C2 PFDA
 515.0 > 470.0 4.509 4.503 0.006 1.000 454117 9.94 12962

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_055.d

Injection Date: 03-Aug-2017 18:40:21

Instrument ID: A6

Lims ID: LLCS 320-176265/2-A

Client ID:

Operator ID: JRB

ALS Bottle#: 21

Worklist Smp#: 4

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

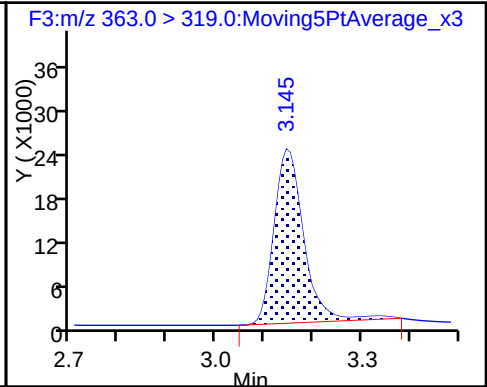
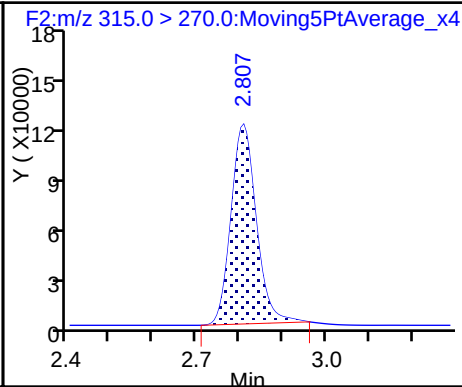
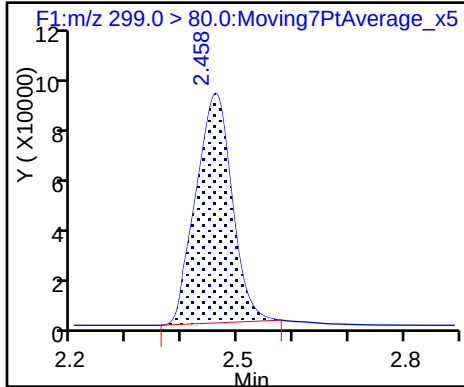
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

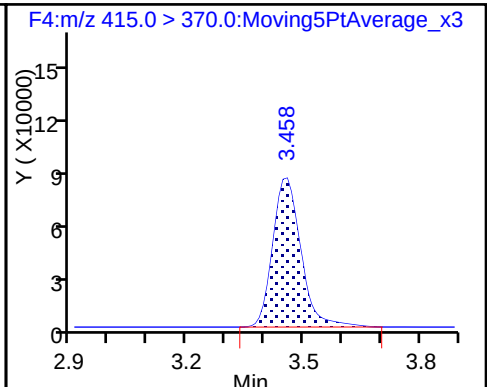
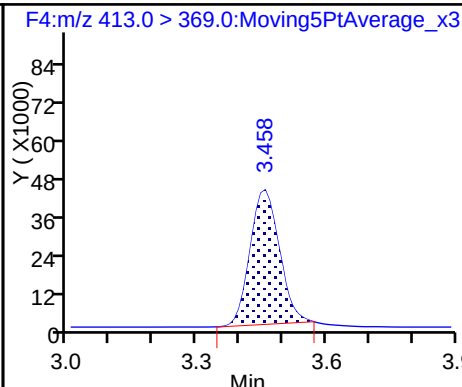
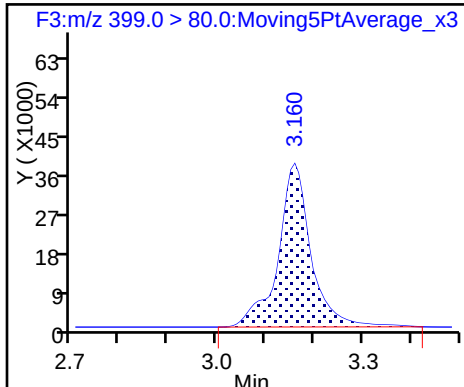
4 Perfluoroheptanoic acid



3 Perfluorohexanesulfonic acid

6 Perfluorooctanoic acid

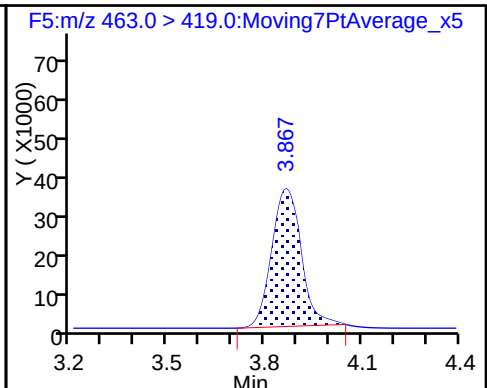
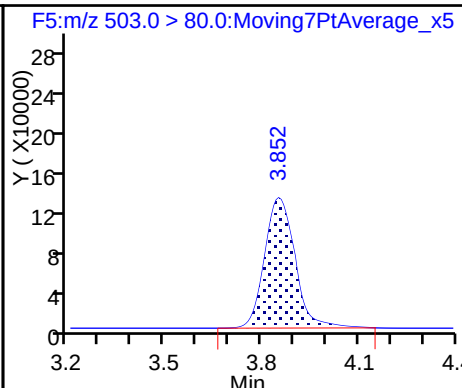
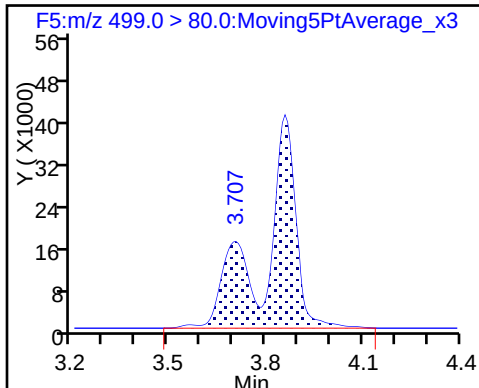
* 5 13C2-PFOA



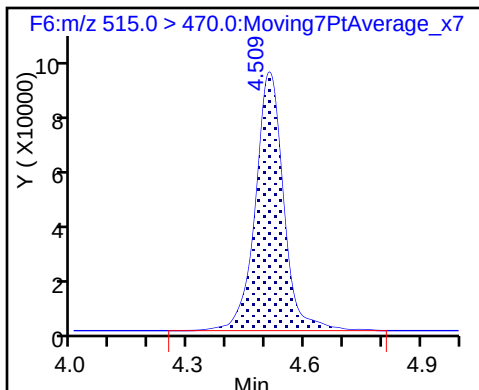
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\03AUG2017A6B_055.d
Lims ID: LLCS 320-176265/2-A
Client ID:
Sample Type: LLCS
Inject. Date: 03-Aug-2017 18:40:21 ALS Bottle#: 21 Worklist Smp#: 4
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: llcs 320-176265/2-a
Misc. Info.: Gemini C18, 3um, 2X50mm , T=35°C
Operator ID: JRB Instrument ID: A6
Method: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 04-Aug-2017 12:59:51 Calib Date: 03-Aug-2017 11:42:11
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170803-46218.b\03AUG2017A6B_009.d
Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK021

First Level Reviewer: barnettj

Date: 04-Aug-2017 10:09:52

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.31	93.10
\$ 10 13C2 PFDA	10.0	9.94	99.42

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-29926-1

SDG No.: _____

Instrument ID: A6Start Date: 08/03/2017 18:13Analysis Batch Number: 177368End Date: 08/03/2017 20:02

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-177368/1 CCVIS		08/03/2017 18:13	1	03AUG2017A6B_05 2.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 18:22	1		GeminiC18 3x100 3(mm)
MB 320-176265/1-A		08/03/2017 18:31	1	03AUG2017A6B_05 4.d	GeminiC18 3x100 3(mm)
LLCS 320-176265/2-A		08/03/2017 18:40	1	03AUG2017A6B_05 5.d	GeminiC18 3x100 3(mm)
320-29926-1		08/03/2017 18:49	1	03AUG2017A6B_05 6.d	GeminiC18 3x100 3(mm)
320-29926-2		08/03/2017 18:58	1	03AUG2017A6B_05 7.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 19:07	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 19:16	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 19:25	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 19:34	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 19:44	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 19:53	1		GeminiC18 3x100 3(mm)
CCV 320-177368/13 CCVIS		08/03/2017 20:02	1	03AUG2017A6B_06 4.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1

SDG No.: _____

Instrument ID: A6 Start Date: 08/03/2017 20:02Analysis Batch Number: 177369 End Date: 08/03/2017 21:51

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-177369/13 CCVIS		08/03/2017 20:02	1	03AUG2017A6B_06 4.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 20:11	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 20:20	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 20:29	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 20:38	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 20:47	1		GeminiC18 3x100 3(mm)
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ZZZZZ		08/03/2017 21:14	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 21:24	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 21:33	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 21:42	1		GeminiC18 3x100 3(mm)
CCV 320-177369/25 CCVIS		08/03/2017 21:51	1	03AUG2017A6B_07 6.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-29926-1

SDG No.: _____

Instrument ID: A6Start Date: 08/03/2017 10:56Analysis Batch Number: 177447End Date: 08/03/2017 13:49

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD 320-177447/4 IC		08/03/2017 10:56	1	03AUG2017A6B_00 4.d	GeminiC18 3x100 3(mm)
STD 320-177447/5 IC		08/03/2017 11:05	1	03AUG2017A6B_00 5.d	GeminiC18 3x100 3(mm)
STD 320-177447/6 IC		08/03/2017 11:14	1	03AUG2017A6B_00 6.d	GeminiC18 3x100 3(mm)
STD 320-177447/7 ICISAV		08/03/2017 11:24	1	03AUG2017A6B_00 7.d	GeminiC18 3x100 3(mm)
STD 320-177447/8 IC		08/03/2017 11:33	1	03AUG2017A6B_00 8.d	GeminiC18 3x100 3(mm)
STD 320-177447/9 IC		08/03/2017 11:42	1	03AUG2017A6B_00 9.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 11:51	1		GeminiC18 3x100 3(mm)
CCVL 320-177447/11		08/03/2017 12:00	1	03AUG2017A6B_01 1.d	GeminiC18 3x100 3(mm)
ICV 320-177447/12		08/03/2017 12:09	1	03AUG2017A6B_01 2.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 12:18	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 12:27	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 12:36	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 12:45	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 12:54	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 13:03	50		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 13:13	5		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 13:22	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/03/2017 13:40	1		GeminiC18 3x100 3(mm)
CCV 320-177447/23 CCVIS		08/03/2017 13:49	1		GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1

SDG No.: _____

Batch Number: 176265 Batch Start Date: 07/27/17 10:45 Batch Analyst: Kolstad, Kate MBatch Method: 537 Batch End Date: 08/01/17 22:02

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00045
MB 320-176265/1		537, 537				250.00 mL	1.00 mL	7 SU	100 uL
LLCS 320-176265/2		537, 537				250.00 mL	1.00 mL	7 SU	100 uL
320-29926-A-1	WGNA-071717-RW-3 826	537, 537	T	281.82 g	28.38 g	253.4 mL	1.00 mL	7 SU	100 uL
320-29926-A-2	WGNA-071717-FRB- 3826	537, 537	T	280.26 g	27.25 g	253 mL	1.00 mL	7 SU	100 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-LSP 00021	LC537-SU 00044				
MB 320-176265/1		537, 537			100 uL				
LLCS 320-176265/2		537, 537		100 uL	100 uL				
320-29926-A-1	WGNA-071717-RW-3 826	537, 537	T		100 uL				
320-29926-A-2	WGNA-071717-FRB- 3826	537, 537	T		100 uL				

Batch Notes	
Batch Comment	IS: 975030
Manifold ID	3, 7
Methanol ID	983104
Pipette ID	M16387D
Analyst ID - IS Reagent Drop	JER
Analyst ID - IS Reagent Drop Witness	TN
Analyst ID - SU Reagent Drop	KMK
Analyst ID - SU Reagent Drop Witness	JNS
Analyst ID - TA Reagent Drop	KMK
Analyst ID - TA Reagent Drop Witness	JNS
SPE Cartridge ID	6357081-02
Trizma ID	SLBR5241V
Reagent Water ID	7-27-17

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.: 320-29926-1

SDG No.: _____

Batch Number: 176265 Batch Start Date: 07/27/17 10:45 Batch Analyst: Kolstad, Kate MBatch Method: 537 Batch End Date: 08/01/17 22:02

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.

Job No: 29926, 29930 Instrument ID & Date: Ab 8-3-17 ICAL Batch: 177447
 Extraction Batch: 176265 Worklist #: 46198 TALS Batch: 177368, 177369,

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

1st Level Reviewer / Date: JRB 8-4-17 2nd Level Reviewer / Date: Murray 8/4/2017

NCM # and Comments: 96552

Instrument ID & Date: A6 8-3-17 Worklist#: 46218

ICAL Batch: 171447, 171448 Calibration ID number: 32985, 32986

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 Quadratic (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 8-3-17 2nd Level Reviewer / Date: Mreda 8/3/17

NCM # and Comments: _____

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 03AUG2017C_537

Worklist Number: 46198

Instrument Name: A6

Chrom Method: 537__A6

Data Directory: \\ChromNA\Sacramento\ChromData\A6\20170802-46198.b

QC Batching: Enabled

Limit Group Batching: Enabled

QC Batch: 1	LC 537 ICAL Raw Batch: 177368
# 1 CCV L3	# 1 CCV L3
# 2 RB	# 2 RB
# 3 MB 320-176265/1-A	# 3 MB 320-176265/1-A
# 4 LLCS 320-176265/2-A	# 4 LLCS 320-176265/2-A
# 5 320-29926-A-1-A	# 5 320-29926-A-1-A
# 6 320-29926-A-2-A	# 6 320-29926-A-2-A
# 7 320-29930-A-1-A	# 7 320-29930-A-1-A
# 8 320-29930-A-2-A	# 8 320-29930-A-2-A
# 9 320-29930-A-3-A	# 9 320-29930-A-3-A
#10 320-29930-A-4-A	#10 320-29930-A-4-A
#11 320-29930-A-5-A	#11 320-29930-A-5-A
#12 320-29930-A-6-A	#12 320-29930-A-6-A
#13 CCV L5	#13 CCV L5

QC Batch: 2	LC 537 ICAL Raw Batch: 177369
#13 CCV L5	#13 CCV L5
#14 RB	#14 RB
#15 320-29930-A-7-A	#15 320-29930-A-7-A
#16 320-29930-A-8-A	#16 320-29930-A-8-A
#17 320-29930-A-9-A	#17 320-29930-A-9-A
#18 320-29930-A-10-A	#18 320-29930-A-10-A
#19 320-29930-A-11-A	#19 320-29930-A-11-A
#20 320-29930-A-12-A	#20 320-29930-A-12-A
#21 320-29930-A-23-A	#21 320-29930-A-23-A
#22 320-29930-A-23-D LMS	#22 320-29930-A-23-D LMS
#23 320-29930-A-23-E LMSD	#23 320-29930-A-23-E LMSD
#24 320-29930-A-24-A	#24 320-29930-A-24-A
#25 CCV L3	#25 CCV L3

QC Batch: 3	LC 537 ICAL Raw Batch: 177370
#25 CCV L3	#25 CCV L3
#26 RB	#26 RB
#27 320-29930-A-25-A	#27 320-29930-A-25-A
#28 320-29930-A-26-A	#28 320-29930-A-26-A
#29 CCV L5	#29 CCV L5

QC Batch: 4	LC 537 ICAL Raw Batch: 177371
#29 CCV L5	#29 CCV L5
#30 RB	#30 RB
#31 MB 320-176265/1-A	#31 MB 320-176265/1-A
#32 LLCS 320-176265/2-A	#32 LLCS 320-176265/2-A
#33 320-29926-A-1-A	#33 320-29926-A-1-A
#34 320-29926-A-2-A	#34 320-29926-A-2-A
#35 320-29930-A-1-A	#35 320-29930-A-1-A
#36 320-29930-A-2-A	#36 320-29930-A-2-A
#37 320-29930-A-3-A	#37 320-29930-A-3-A
#38 320-29930-A-4-A	#38 320-29930-A-4-A

QC Batch: 4	LC 537 ICAL Raw Batch: 177371
#39 320-29930-A-5-A	#39 320-29930-A-5-A
#40 320-29930-A-6-A	#40 320-29930-A-6-A
#41 CCV L3	#41 CCV L3

QC Batch: 5	LC 537 ICAL Raw Batch: 177372
#41 CCV L3	#41 CCV L3
#42 RB	#42 RB
#43 320-29930-A-7-A	#43 320-29930-A-7-A
#44 320-29930-A-8-A	#44 320-29930-A-8-A
#45 320-29930-A-9-A	#45 320-29930-A-9-A
#46 320-29930-A-10-A	#46 320-29930-A-10-A
#47 320-29930-A-11-A	#47 320-29930-A-11-A
#48 320-29930-A-12-A	#48 320-29930-A-12-A
#49 320-29930-A-23-A	#49 320-29930-A-23-A
#50 320-29930-A-23-D LMS	#50 320-29930-A-23-D LMS
#51 320-29930-A-23-E LMSD	#51 320-29930-A-23-E LMSD
#52 320-29930-A-24-A	#52 320-29930-A-24-A
#53 CCV L5	#53 CCV L5

QC Batch: 6	LC 537 ICAL Raw Batch: 177373
#53 CCV L5	#53 CCV L5
#54 RB	#54 RB
#55 320-29930-A-25-A	#55 320-29930-A-25-A
#56 320-29930-A-26-A	#56 320-29930-A-26-A
#57 CCV L3	#57 CCV L3
#58 RB	#58 RB

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-176265

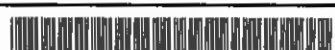
Analyst: Kolstad, Kate M

Batch Open: 7/27/2017 10:45:00AM

Method Code: 320-537_Prep-320

Batch End: 8/1/2017 10:02:00PM

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-320-176265/1 N/A	N/A		250.00 mL	7		N/A	N/A	N/A		
				1.00 mL							
2	LLCS-320-176265/2 N/A	N/A		250.00 mL	7		N/A	N/A	N/A		
				1.00 mL							
3	320-29926-A-1 (537_DOD5)	N/A (320-29926-1)	281.82 g	253.4 mL	7		7/24/17	16_Days	4		
			28.38 g	1.00 mL							
4	320-29926-A-2 (537_DOD5)	N/A (320-29926-1)	280.26 g	253 mL	7		7/24/17	16_Days	4		
			27.25 g	1.00 mL							
5	320-29930-A-1 (537_DOD5)	N/A (320-29930-1)	280.85 g	253 mL	7		7/24/17	16_Days	4		
			27.90 g	1.00 mL							
6	320-29930-A-2 (537_DOD5)	N/A (320-29930-1)	280.28 g	252.8 mL	7		7/24/17	16_Days	4		
			27.44 g	1.00 mL							
7	320-29930-A-3 (537_DOD5)	N/A (320-29930-1)	276.44 g	248.6 mL	7		7/24/17	16_Days	4		
			27.88 g	1.00 mL							
8	320-29930-A-4 (537_DOD5)	N/A (320-29930-1)	281.33 g	254 mL	7		7/24/17	16_Days	4		
			27.38 g	1.00 mL							
9	320-29930-A-5 (537_DOD5)	N/A (320-29930-1)	279.23 g	251 mL	7		7/24/17	16_Days	4		
			28.25 g	1.00 mL							
10	320-29930-A-6 (537_DOD5)	N/A (320-29930-1)	285.33 g	258.1 mL	7		7/24/17	16_Days	4		
			27.28 g	1.00 mL							

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-176265

Analyst: Kolstad, Kate M

Batch Open: 7/27/2017 10:45:00AM

Method Code: 320-537_Prep-320

Batch End: 8/1/2017 10:02:00PM

11	320-29930-A-7 (537_DOD5)	N/A (320-29930-1)	279.82 g	252.2 mL	7		7/24/17	16_Days	4	
			27.66 g	1.00 mL						
12	320-29930-A-8 (537_DOD5)	N/A (320-29930-1)	277.28 g	249.6 mL	7		7/24/17	16_Days	4	
			27.64 g	1.00 mL						
13	320-29930-A-9 (537_DOD5)	N/A (320-29930-1)	279.89 g	252.3 mL	7		7/24/17	16_Days	4	
			27.59 g	1.00 mL						
14	320-29930-A-10 (537_DOD5)	N/A (320-29930-1)	283.52 g	256.3 mL	7		7/24/17	16_Days	4	
			27.19 g	1.00 mL						
15	320-29930-A-11 (537_DOD5)	N/A (320-29930-1)	284.04 g	256.1 mL	7		7/24/17	16_Days	4	
			27.94 g	1.00 mL						
16	320-29930-A-12 (537_DOD5)	N/A (320-29930-1)	280.26 g	252.9 mL	7		7/24/17	16_Days	4	
			27.32 g	1.00 mL						
17	320-29930-A-23 (537_DOD5)	N/A (320-29930-1)	281.12 g	253.6 mL	7		7/24/17	16_Days	4	
			27.49 g	1.00 mL						
18	320-29930-A-23~LMS (537_DOD5)	N/A (320-29930-1)	281.94 g	253.8 mL	7		7/24/17	16_Days	4	
			28.19 g	1.00 mL						
19	320-29930-A-23~LMSD (537_DOD5)	N/A (320-29930-1)	280.29 g	252.7 mL	7		7/24/17	16_Days	4	
			27.60 g	1.00 mL						
20	320-29930-A-24 (537_DOD5)	N/A (320-29930-1)	278.82 g	251.2 mL	7		7/24/17	16_Days	4	
			27.59 g	1.00 mL						
21	320-29930-A-25 (537_DOD5)	N/A (320-29930-1)	278.93 g	251.5 mL	7		7/24/17	16_Days	4	
			27.43 g	1.00 mL						
22	320-29930-A-26 (537_DOD5)	N/A (320-29930-1)	280.06 g	252.8 mL	7		7/24/17	16_Days	4	
			27.26 g	1.00 mL						

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08/09/2017

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-176265

Analyst: Kolstad, Kate M

Batch Open: 7/27/2017 10:45:00AM

Method Code: 320-537_Prep-320

Batch End: 8/1/2017 10:02:00PM

Batch Notes

Manifold ID 3, 7

Trizma ID SLBR5241V

SPE Cartridge ID 6357081-02

Methanol ID 983104

Reagent Water ID 7-27-17

Pipette ID M16387D

Analyst ID - TA Reagent Drop KMK

Analyst ID - TA Reagent Drop JNS

Witness

Analyst ID - SU Reagent Drop KMK

Analyst ID - SU Reagent Drop JNS

Witness

Analyst ID - IS Reagent Drop JER

Analyst ID - IS Reagent Drop TN

Witness

Batch Comment IS: 975030

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-176265

Analyst: Kolstad, Kate M

Batch Open: 7/27/2017 10:45:00AM

Method Code: 320-537_Prep-320

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-176265/1	LC537-SU_00044	100 uL	1.00 mL	KMK 7-27-17	JNS 7/27/17
LLCS 320-176265/2	LC537-LSP_00021	100 uL	1.00 mL		
LLCS 320-176265/2	LC537-SU_00044	100 uL	1.00 mL		
320-29926-A-1	LC537-SU_00044	100 uL	1.00 mL		
320-29926-A-2	LC537-SU_00044	100 uL	1.00 mL		
320-29930-A-1	LC537-SU_00044	100 uL	1.00 mL		
320-29930-A-2	LC537-SU_00044	100 uL	1.00 mL		
320-29930-A-3	LC537-SU_00044	100 uL	1.00 mL		
320-29930-A-4	LC537-SU_00044	100 uL	1.00 mL		
320-29930-A-5	LC537-SU_00044	100 uL	1.00 mL		
320-29930-A-6	LC537-SU_00044	100 uL	1.00 mL		
320-29930-A-7	LC537-SU_00044	100 uL	1.00 mL		
320-29930-A-8	LC537-SU_00044	100 uL	1.00 mL		
320-29930-A-9	LC537-SU_00044	100 uL	1.00 mL		
320-29930-A-10	LC537-SU_00044	100 uL	1.00 mL		
320-29930-A-11	LC537-SU_00044	100 uL	1.00 mL		
320-29930-A-12	LC537-SU_00044	100 uL	1.00 mL		
320-29930-A-23	LC537-SU_00044	100 uL	1.00 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-176265

Analyst: Kolstad, Kate M

Batch Open: 7/27/2017 10:45:00AM

Method Code: 320-537_Prep-320

Batch End:

320-29930-A-23 LMS	LC537-LSP_00021	100 uL	1.00 mL	KMK 7-27-17	JMS 7/27/17
320-29930-A-23 LMS	LC537-SU_00044	100 uL	1.00 mL		
320-29930-A-23 LMSD	LC537-LSP_00021	100 uL	1.00 mL		
320-29930-A-23 LMSD	LC537-SU_00044	100 uL	1.00 mL		
320-29930-A-24	LC537-SU_00044	100 uL	1.00 mL		
320-29930-A-25	LC537-SU_00044	100 uL	1.00 mL		
320-29930-A-26	LC537-SU_00044	100 uL	1.00 mL		

Other Reagents:

Reagent

Amount/Units

Lot#:

Preparation Batch Number(s): 176265 Test: 537-Prep
Earliest Holding Time: 7-31-17

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

1st Level Reviewer: TH Date: 08/01/17
2nd Level Reviewer: vpm Date: 8/2/17
Comments: _____

Shipping and Receiving Documents

West Sacramento, CA 95605-1500
phone 916.373.5600 fax 303.467.7248

Regulatory Program: ☒ DW ☐ NPDES ☐ RCRA ☐ Other:

TestAmerica Laboratories, Inc.

[illegible]

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-29926-1

Login Number: 29926

List Source: TestAmerica Sacramento

List Number: 1

Creator: Edman, Connor M

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	095143 ; 095144
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.	False	Refer to Job Narrative for details.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

"WGNA-071717-RW-3826","537","RES","320-29926-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","6.8","ng/L","J","6.7","DL","","","TRG","","","39","LOQ","YES","-99","","253.4","1.00","16",""
"WGNA-071717-RW-3826","537","RES","320-29926-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","9.6","ng/L","J","2.8","DL","","","TRG","","","20","LOQ","YES","-99","","253.4","1.00","7.9",""
"WGNA-071717-RW-3826","537","RES","320-29926-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U M","5.4","DL","","","TRG","","","30","LOQ","YES","-99","","253.4","1.00","12",""
"WGNA-071717-RW-3826","537","RES","320-29926-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U M","16","DL","","","TRG","","","89","LOQ","YES","-99","","253.4","1.00","36",""
"WGNA-071717-RW-3826","537","RES","320-29926-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.8","ng/L","J M","1.9","DL","","","TRG","","","9.9","LOQ","YES","-99","","253.4","1.00","3.9",""
"WGNA-071717-RW-3826","537","RES","320-29926-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U M","7.9","DL","","","TRG","","","24","LOQ","YES","-99","","253.4","1.00","20",""
"WGNA-071717-RW-3826","537","RES","320-29926-1","TALSAC","STL00993","13C2 PFHxA","32","ng/L","","","-99","DL","","","SURR","81","","","-99","LOQ","YES","39.5","","253.4","1.00","0",""
"WGNA-071717-RW-3826","537","RES","320-29926-1","TALSAC","STL00996","13C2 PFDA","42","ng/L","","","-99","DL","","","SURR","105","","","-99","LOQ","YES","39.5","","253.4","1.00","0",""
"WGNA-071717-FRB-3826","537","RES","320-29926-2","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.7","DL","","","TRG","","","40","LOQ","YES","-99","","253","1.00","16",""
"WGNA-071717-FRB-3826","537","RES","320-29926-2","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.9","ng/L","U","2.8","DL","","","TRG","","","20","LOQ","YES","-99","","253","1.00","7.9",""
"WGNA-071717-FRB-3826","537","RES","320-29926-2","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.4","DL","","","TRG","","","30","LOQ","YES","-99","","253","1.00","12",""
"WGNA-071717-FRB-3826","537","RES","320-29926-2","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U","16","DL","","","TRG","","","89","LOQ","YES","-99","","253","1.00","36",""
"WGNA-071717-FRB-3826","537","RES","320-29926-2","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","4.0","ng/L","U","1.9","DL","","","TRG","","","9.9","LOQ","YES","-99","","253","1.00","4.0",""
"WGNA-071717-FRB-3826","537","RES","320-29926-2","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","7.9","DL","","","TRG","","","24","LOQ","YES","-99","","253","1.00","20",""
"WGNA-071717-FRB-3826","537","RES","320-29926-2","TALSAC","STL00993","13C2 PFHxA","38","ng/L","","","-99","DL","","","SURR","97","","","-99","LOQ","YES","39.5","","253","1.00","0",""
"WGNA-071717-FRB-3826","537","RES","320-29926-2","TALSAC","STL00996","13C2 PFDA","41","ng/L","","","-99","DL","","","SURR","103","","","-99","LOQ","YES","39.5","","253","1.00","0",""
"LLCS 320-176265/2-A","537","RES","LLCS 320-176265/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","40.2","ng/L","","","6.8","DL","","","SPK","100","","","40","LOQ","YES","40.0","","250.00","1.00","16",""
"LLCS 320-176265/2-A","537","RES","LLCS 320-176265/2-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","18.3","ng/L","J","2.8","DL","","","SPK","92","","","20","LOQ","YES","20.0","","250.00","1.00","8.0",""
"LLCS 320-176265/2-A","537","RES","LLCS 320-176265/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","29.5","ng/L","J","5.5","DL","","","SPK","98","","","30","LOQ","YES","30.1","","250.00","1.00","12",""
"LLCS 320-176265/2-A","537","RES","LLCS 320-176265/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","79.9","ng/L","J","16","DL","","","SPK","90","","","90","LOQ","YES","88.3","","250.00","1.00","36",""
"LLCS 320-176265/2-A","537","RES","LLCS 320-176265/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","7.73","ng/L","J","1.9","DL","","","SPK","78","","","10","LOQ","YES","9.90","","250.00","1.00","4.0",""
"LLCS 320-176265/2-A","537","RES","LLCS 320-176265/2-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","18.6","ng/L","J","8.0","DL","","","SPK","97","","","24","LOQ","YES","19.3","","250.00","1.00","20",""
"LLCS 320-176265/2-A","537","RES","LLCS 320-176265/2-A","TALSAC","STL00993","13C2 PFHxA","37.2","ng/L","","","-99","DL","","","SURR","93","","","-99","LOQ","YES","40.0","","250.00","1.00","0",""
"LLCS 320-176265/2-A","537","RES","LLCS 320-176265/2-A","TALSAC","STL00996","13C2 PFDA","39.8","ng/L","","","-99","DL","","","SURR","99","","","-99","LOQ","YES","40.0","","250.00","1.00","0",""
"MB 320-176265/1-A","537","RES","MB 320-176265/1-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 320-176265/1-A","537","RES","MB 320-176265/1-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 320-176265/1-A","537","RES","MB 320-176265/1-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 320-176265/1-A","537","RES","MB 320-176265/1-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 320-176265/1-A","537","RES","MB 320-176265/1-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 320-176265/1-A","537","RES","MB 320-176265/1-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 320-176265/1-A","537","RES","MB 320-176265/1-A","TALSAC","STL00993","13C2
PFHxA","44.0","ng/L","","","-99","DL","","","SURR","110","","","-99","LOQ","YES","40.0","","","250.00","1.00","0",""
"MB 320-176265/1-A","537","RES","MB 320-176265/1-A","TALSAC","STL00996","13C2
PFDA","42.2","ng/L","","","-99","DL","","","SURR","105","","","-99","LOQ","YES","40.0","","","250.00","1.00","0",""
"Unknown","Unknown","WGNA-071717-RW-3826","07/17/2017 14:20","AQ","320-29926-
1","NM","","","8.50","537","METHOD","RES","07/27/2017 10:45","08/03/2017
18:49","TALSAC","COA","WET","NA","1","NA","NA","","","100","320-176265","320-176265","NA","320-
177368","320-29926-1","07/18/2017 09:30","07/18/2017 15:45",""
"Unknown","Unknown","WGNA-071717-FRB-3826","07/17/2017 14:15","AQ","320-29926-
2","NM","","","8.50","537","METHOD","RES","07/27/2017 10:45","08/03/2017
18:58","TALSAC","COA","WET","NA","1","NA","NA","","","100","320-176265","320-176265","NA","320-
177368","320-29926-1","07/18/2017 09:30","07/18/2017 15:45",""
"Unknown","Unknown","LLCS 320-176265/2-A","","","AQ","LLCS 320-176265/2-
A","LCS","","","-99","537","METHOD","RES","07/27/2017 10:45","08/03/2017
18:40","TALSAC","COA","WET","NA","1","NA","NA","","","100","320-176265","320-176265","NA","320-
177368","320-29926-1","07/27/2017 10:45","07/18/2017 15:45",""
"Unknown","Unknown","MB 320-176265/1-A","","","AQ","MB 320-176265/1-
A","MB","","","-99","537","METHOD","RES","07/27/2017 10:45","08/03/2017
18:31","TALSAC","COA","WET","NA","1","NA","NA","","","100","320-176265","320-176265","NA","320-
177368","320-29926-1","07/27/2017 10:45","07/18/2017 15:45",""



TO:	A. FREBOWITZ	DATE:	AUGUST 22, 2017
FROM:	TERRI L. SOLOMON	COPIES:	DV FILE
SUBJECT:	ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS) NAS JRB WILLOW GROVE SAMPLE DELIVERY GROUP (SDG) 320-29926-1		
SAMPLES:	1/Field Reagent Blank (FRB) WGNA-071717-FRB-3826 1/Drinking Water WGNA-071717-RW-3826		

The sample set for NAS JRB Willow Grove, SDG 320-29926-1, consisted of one (1) drinking water sample and one (1) FRB sample. All samples were analyzed for select perfluorinated alkyl acids including pentadecafluorooctanoic acid (PFOA), perfluorobutane sulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA) and perfluorooctane sulfonic acid (PFOS). No field duplicate pairs were included in this SDG.

The 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 results, internal standard areas and recoveries, chromatographic resolution, analyte identification, analyte quantitation, and detection limits. Areas of concern are listed below.

None.

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

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

Associated FRB
WGNA-071717-FRB-3826

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

TO: A. FREBOWITZ
SDG: 320-29926-1

PAGE 2

Executive Summary

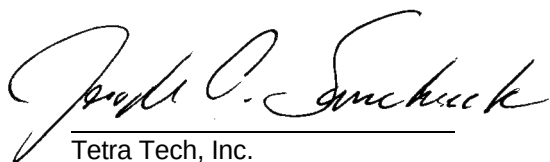
Laboratory Performance: None.

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

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



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



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

PROJ_NO: 08005-WE04 SDG: 320-29926-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	WGNA-071717-FRB-3826			WGNA-071717-RW-3826		
	LAB_ID	320-29926-2			320-29926-1		
	SAMP_DATE	7/17/2017			7/17/2017		
	QC_TYPE	NM			NM		
	UNITS	NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		7.9	U		9.6	J	P
PERFLUOROBUTANESULFONIC ACID		36	U		36	U	
PERFLUOROHEPTANOIC ACID		4	U		3.8	J	P
PERFLUOROHXANESULFONIC ACID		12	U		12	U	
PERFLUORONONANOIC ACID		20	U		20	U	
PERFLUOROOCTANE SULFONIC ACID		16	U		6.8	J	P

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Client Sample ID: WGNA-071717-RW-3826 Lab Sample ID: 320-29926-1
 Matrix: Water Lab File ID: 03AUG2017A6B_056.d
 Analysis Method: 537 Date Collected: 07/17/2017 14:20
 Extraction Method: 537 Date Extracted: 07/27/2017 10:45
 Sample wt/vol: 253.4 (mL) Date Analyzed: 08/03/2017 18:49
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 10 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177368 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	6.8	J	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	9.6	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U M	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	J M	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U M	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	81		70-130
STL00996	13C2 PFDA	105		70-130

TLS
08/21/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-29926-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-071717-FRB-3826</u>	Lab Sample ID: <u>320-29926-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>03AUG2017A6B_057.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>07/17/2017 14:15</u>
Extraction Method: <u>537</u>	Date Extracted: <u>07/27/2017 10:45</u>
Sample wt/vol: <u>253 (mL)</u>	Date Analyzed: <u>08/03/2017 18:58</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>10 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>177368</u>	Units: <u>ng/L</u>

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

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

TLS
08/21/2017

Appendix B

Results as Reported by the Laboratory

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Client Sample ID: WGNA-071717-RW-3826 Lab Sample ID: 320-29926-1
 Matrix: Water Lab File ID: 03AUG2017A6B_056.d
 Analysis Method: 537 Date Collected: 07/17/2017 14:20
 Extraction Method: 537 Date Extracted: 07/27/2017 10:45
 Sample wt/vol: 253.4 (mL) Date Analyzed: 08/03/2017 18:49
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 10 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177368 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	6.8	J	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	9.6	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U M	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	J M	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U M	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	81		70-130
STL00996	13C2 PFDA	105		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-29926-1</u>
SDG No.: _____	
Client Sample ID: <u>WGNA-071717-FRB-3826</u>	Lab Sample ID: <u>320-29926-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>03AUG2017A6B_057.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>07/17/2017 14:15</u>
Extraction Method: <u>537</u>	Date Extracted: <u>07/27/2017 10:45</u>
Sample wt/vol: <u>253(mL)</u>	Date Analyzed: <u>08/03/2017 18:58</u>
Con. Extract Vol.: <u>1.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>10(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>177368</u>	Units: <u>ng/L</u>

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

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

Appendix C

Support Documentation

Chain of Custody Record

TestAmerica Laboratories, Inc.

Regulatory Program: ☒ DW ☐ NPDES ☐ RCRA ☐ Other:[illegible]

Job Narrative
320-29926-1

Receipt

The samples were received on 7/18/2017 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 8.5° C.

LCMS

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

Organic Prep

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

Method Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-29926-1

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

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

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-29926-1

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

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-29926-1	WGNA-071717-RW-3826	Water	07/17/17 14:20	07/18/17 09:30
320-29926-2	WGNA-071717-FRB-3826	Water	07/17/17 14:15	07/18/17 09:30

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1

SDG No.: _____

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WGNA-071717-RW-3826	320-29926-1	81	105
WGNA-071717-FRB-3826	320-29926-2	97	103
	MB 320-176265/1-A	110	105
	LLCS 320-176265/2-A	93	99

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA

QC LIMITS
70-130
70-130

Column to be used to flag recovery values

FORM III
LCMS LOW LEVEL CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 03AUG2017A6B_055.d
 Lab ID: LLCS 320-176265/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LLCS CONCENTRATION (ng/L)	LLCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	40.0	40.2	100	50-150	
Perfluorooctanoic acid (PFOA)	20.0	18.3 J	92	50-150	
Perfluorononanoic acid (PFNA)	19.3	18.6 J	97	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.1	29.5 J	98	50-150	
Perfluoroheptanoic acid (PFHpA)	9.90	7.73 J	78	50-150	
Perfluorobutanesulfonic acid (PFBS)	88.3	79.9 J	90	50-150	

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
SDG No.: _____
Lab File ID: 03AUG2017A6B_054.d Lab Sample ID: MB 320-176265/1-A
Matrix: Water Date Extracted: 07/27/2017 10:45
Instrument ID: A6 Date Analyzed: 08/03/2017 18:31
Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LLCS 320-176265/2-A	03AUG2017A6 B 055.d	08/03/2017 18:40
WGNA-071717-RW-3826	320-29926-1	03AUG2017A6 B 056.d	08/03/2017 18:49
WGNA-071717-FRB-3826	320-29926-2	03AUG2017A6 B 057.d	08/03/2017 18:58

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-176265/1-A
 Matrix: Water Lab File ID: 03AUG2017A6B_054.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 07/27/2017 10:45
 Sample wt/vol: 250.00 (mL) Date Analyzed: 08/03/2017 18:31
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 10 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 177368 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	110		70-130
STL00996	13C2 PFDA	105		70-130

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Instrument ID: A6 Calibration Start Date: 08/03/2017 10:56
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 08/03/2017 11:42
 Calibration ID: 32985

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		420080	3.49	840607	3.91		
UPPER LIMIT		630120	3.99	1260911	4.41		
LOWER LIMIT		210040	2.99	420304	3.41		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 320-177447/11		408282	3.49	763196	3.90		
ICV 320-177447/12		408295	3.48	787513	3.90		
CCV 320-177368/1 CCVIS		462227	3.45	914753	3.85		
MB 320-176265/1-A		384243	3.45	821358	3.85		
LLCS 320-176265/2-A		413088	3.46	834601	3.85		
320-29926-1	WGNA-071717-RW-3826	387986	3.46	870499	3.85		
320-29926-2	WGNA-071717-FRB-3826	387457	3.46	830117	3.86		
CCV 320-177368/13 CCVIS		408862	3.47	837526	3.87		
CCV 320-177369/13 CCVIS		408862	3.47	837526	3.87		
CCV 320-177369/25 CCVIS		439037	3.48	847962	3.87		

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Sample No.: CCV 320-177368/1 Date Analyzed: 08/03/2017 18:13
 Instrument ID: A6 GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 03AUG2017A6B_052.d Heated Purge: (Y/N) N
 Calibration ID: 32985

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	462227	3.45	914753	3.85		
UPPER LIMIT	647118	3.95	1280654	4.35		
LOWER LIMIT	323559	2.95	640327	3.35		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-176265/1-A		384243	3.45	821358	3.85	
LLCS 320-176265/2-A		413088	3.46	834601	3.85	
320-29926-1	WGNA-071717-RW-3826	387986	3.46	870499	3.85	
320-29926-2	WGNA-071717-FRB-3826	387457	3.46	830117	3.86	

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Sample No.: CCV 320-177368/13 Date Analyzed: 08/03/2017 20:02
 Instrument ID: A6 GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 03AUG2017A6B_064.d Heated Purge: (Y/N) N
 Calibration ID: 32985

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	408862	3.47	837526	3.87		
UPPER LIMIT	572407	3.97	1172536	4.37		
LOWER LIMIT	286203	2.97	586268	3.37		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-176265/1-A		384243	3.45	821358	3.85	
LLCS 320-176265/2-A		413088	3.46	834601	3.85	
320-29926-1	WGNA-071717-RW-3826	387986	3.46	870499	3.85	
320-29926-2	WGNA-071717-FRB-3826	387457	3.46	830117	3.86	

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

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

Column used to flag values outside QC limits

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

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1 Analy Batch No.: 177447

SDG No.: _____

Instrument ID: A6 GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/03/2017 10:56 Calibration End Date: 08/03/2017 11:42 Calibration ID: 32985

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-177447/4	03AUG2017A6B_004.d
Level 2	STD 320-177447/5	03AUG2017A6B_005.d
Level 3	STD 320-177447/6	03AUG2017A6B_006.d
Level 4	STD 320-177447/7	03AUG2017A6B_007.d
Level 5	STD 320-177447/8	03AUG2017A6B_008.d
Level 6	STD 320-177447/9	03AUG2017A6B_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)	0.6351 0.7359	0.6630	0.6524	0.6708	0.7049	Ave		0.6770				5.5		30.0			
Perfluoroheptanoic acid (PFHpA)	1.3642 1.1806	1.2608	1.3381	1.2105	1.2452	Ave		1.2666				5.7		30.0			
Perfluorohexanesulfonic acid (PFHxS)	0.8427 0.8934	0.8356	0.7992	0.8158	0.7981	Ave		0.8308				4.3		30.0			
Perfluorooctanoic acid (PFOA)	1.0023 1.1498	0.9895	1.1066	1.0673	1.0609	Ave		1.0627				5.7		30.0			
Perfluorooctanesulfonic acid (PFOS)	0.8906 1.0593	0.9034	0.9384	0.9759	0.9939	Ave		0.9603				6.5		30.0			
Perfluorononanoic acid (PFNA)	1.2578 1.1194	1.2117	1.1961	1.1598	1.1133	Ave		1.1764				4.8		30.0			
13C2 PFHxA	1.2162 1.3045	1.1717	1.2382	1.3273	1.2756	Ave		1.2556				4.6		30.0			
13C2 PFDA	1.1138 1.1488	1.0229	1.1023	1.1197	1.1271	Ave		1.1057				3.9		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.: 320-29926-1 Analy Batch No.: 177447

SDG No.: _____

Instrument ID: A6 GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/03/2017 10:56 Calibration End Date: 08/03/2017 11:42 Calibration ID: 32985

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-177447/4	03AUG2017A6B_004.d
Level 2	STD 320-177447/5	03AUG2017A6B_005.d
Level 3	STD 320-177447/6	03AUG2017A6B_006.d
Level 4	STD 320-177447/7	03AUG2017A6B_007.d
Level 5	STD 320-177447/8	03AUG2017A6B_008.d
Level 6	STD 320-177447/9	03AUG2017A6B_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	Ave	176065 3327014	385526	851906	1962785	2725297	8.83 176	21.2	44.4	89.4	133
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	59914 863584	123802	280573	548477	773549	0.990 19.7	2.38	4.97	10.0	14.9
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	79490 1374485	165324	355083	812337	1050045	3.01 59.7	7.21	15.1	30.4	45.1
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	88843 1697286	196099	468310	975942	1330020	2.00 39.7	4.80	10.0	20.2	30.0
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	111880 2170397	238041	555265	1294088	1741359	4.00 79.6	9.61	20.1	40.5	60.0
Perfluorononanoic acid (PFNA)	13PF OA	Ave	107471 1592953	231464	487938	1022278	1345502	1.93 38.3	4.62	9.68	19.5	28.9
13C2 PFHxA	13PF OA	Ave	539529 484952	484242	521885	599933	533596	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	494099 427049	422748	464626	506095	471470	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD

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

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1 Analy Batch No.: 177447

SDG No.: _____

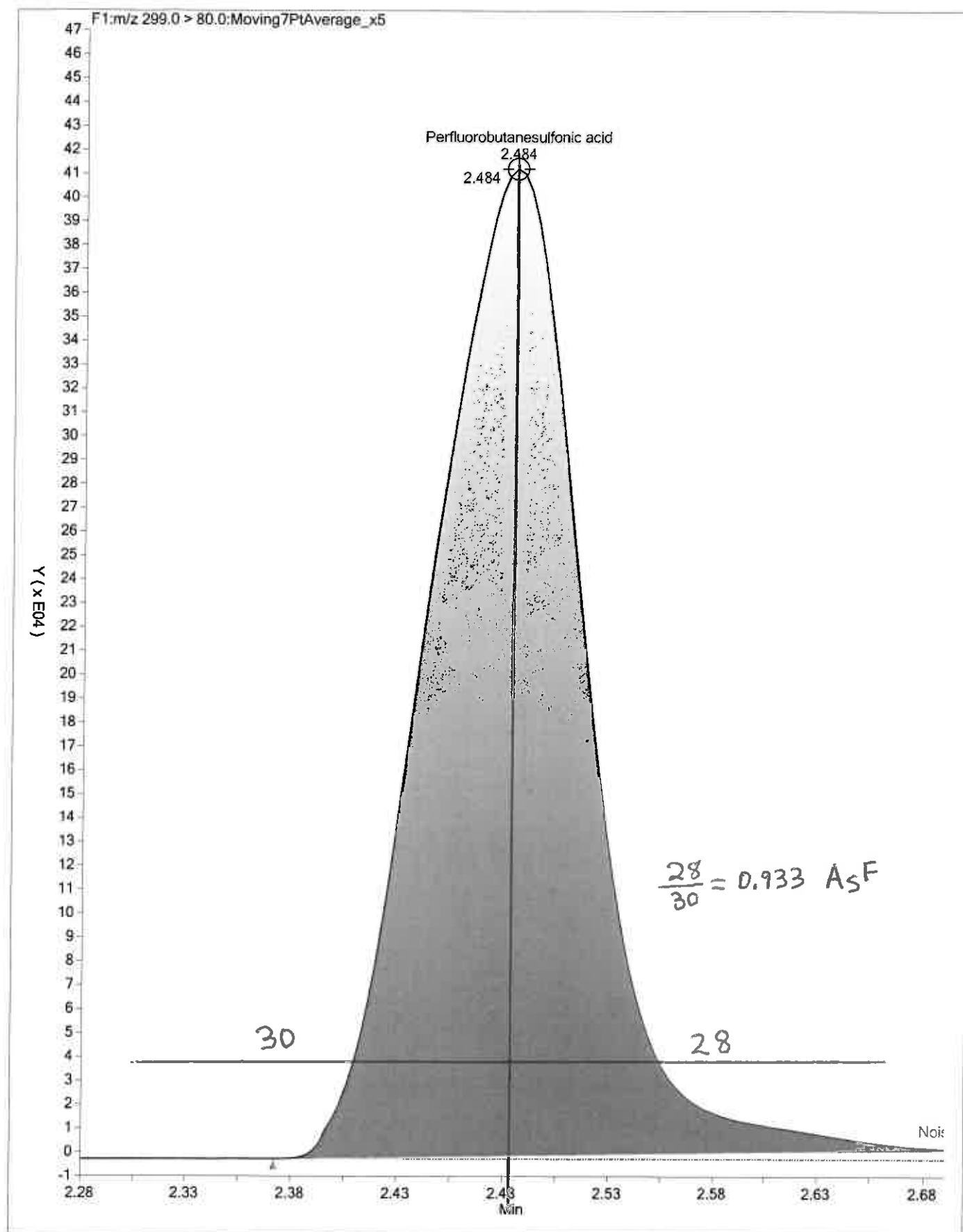
Instrument ID: A6 GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

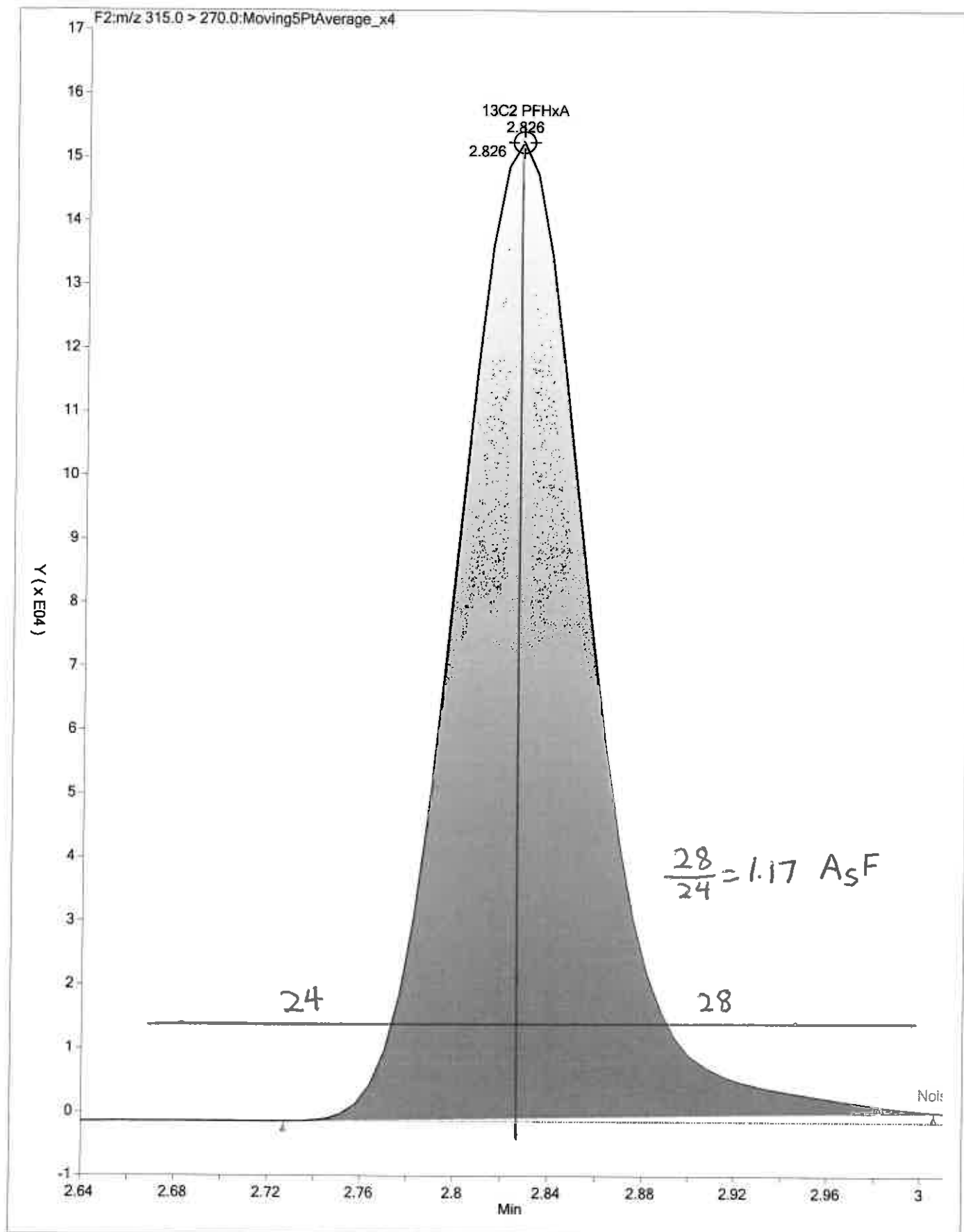
Calibration Start Date: 08/03/2017 10:56 Calibration End Date: 08/03/2017 11:42 Calibration ID: 32985

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-177447/4	03AUG2017A6B_004.d
Level 2	STD 320-177447/5	03AUG2017A6B_005.d
Level 3	STD 320-177447/6	03AUG2017A6B_006.d
Level 4	STD 320-177447/7	03AUG2017A6B_007.d
Level 5	STD 320-177447/8	03AUG2017A6B_008.d
Level 6	STD 320-177447/9	03AUG2017A6B_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)	-6.2	-2.1	-3.6	-0.9	4.1	8.7	50	50	50	50	50	50
Perfluoroheptanoic acid (PFHpA)	7.7	-0.5	5.6	-4.4	-1.7	-6.8	50	50	50	50	50	50
Perfluorohexanesulfonic acid (PFHxS)	1.4	0.6	-3.8	-1.8	-3.9	7.5	50	50	50	50	50	50
Perfluorooctanoic acid (PFOA)	-5.7	-6.9	4.1	0.4	-0.2	8.2	50	50	50	50	50	50
Perfluorooctanesulfonic acid (PFOS)	-7.3	-5.9	-2.3	1.6	3.5	10.3	50	50	50	50	50	50
Perfluorononanoic acid (PFNA)	6.9	3.0	1.7	-1.4	-5.4	-4.8	50	50	50	50	50	50
13C2 PFHxA	-3.1	-6.7	-1.4	5.7	1.6	3.9	30	30	30	30	30	30
13C2 PFDA	0.7	-7.5	-0.3	1.3	1.9	3.9	30	30	30	30	30	30





FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-177447/11 Calibration Date: 08/03/2017 12:00
 Instrument ID: A6 Calib Start Date: 08/03/2017 10:56
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/03/2017 11:42
 Lab File ID: 03AUG2017A6B_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.6770	0.6982		21.9	21.2	3.1	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.267	1.253		2.35	2.38	-1.0	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8308	0.8110		7.04	7.21	-2.4	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.063	1.066		4.81	4.80	0.4	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9603	0.9652		9.66	9.61	0.5	50.0
Perfluorononanoic acid (PFNA)	Ave	1.176	1.153		4.53	4.62	-2.0	50.0
13C2 PFHxA	Ave	1.256	1.203		9.58	10.0	-4.2	30.0
13C2 PFDA	Ave	1.106	1.046		9.46	10.0	-5.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Lab Sample ID: ICV 320-177447/12 Calibration Date: 08/03/2017 12:09
 Instrument ID: A6 Calib Start Date: 08/03/2017 10:56
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/03/2017 11:42
 Lab File ID: 03AUG2017A6B_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.6770	0.5939		87.8	100	-12.3	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.267	0.9149		7.22	10.0	-27.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8308	0.8163		19.7	20.1	-1.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.063	0.9078		17.2	20.1	-14.6	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9603	0.8083		16.9	20.1	-15.8	30.0
Perfluorononanoic acid (PFNA)	Ave	1.176	0.9576		16.4	20.1	-18.6	30.0
13C2 PFHxA	Ave	1.256	1.226		9.77	10.0	-2.3	30.0
13C2 PFDA	Ave	1.106	1.087		9.83	10.0	-1.7	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Lab Sample ID: CCV 320-177368/1 Calibration Date: 08/03/2017 18:13
 Instrument ID: A6 Calib Start Date: 08/03/2017 10:56
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/03/2017 11:42
 Lab File ID: 03AUG2017A6B_052.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.6770	0.7052		46.2	44.4	4.2	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.267	1.093		4.29	4.97	-13.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8308	0.7888		14.3	15.1	-5.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.063	0.9803		9.26	10.0	-7.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9603	1.033		21.6	20.1	7.5	30.0
Perfluorononanoic acid (PFNA)	Ave	1.176	1.189		9.78	9.68	1.0	30.0
13C2 PFHxA	Ave	1.256	1.087		8.66	10.0	-13.4	30.0
13C2 PFDA	Ave	1.106	1.055		9.54	10.0	-4.6	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Lab Sample ID: CCV 320-177368/13 Calibration Date: 08/03/2017 20:02
 Instrument ID: A6 Calib Start Date: 08/03/2017 10:56
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/03/2017 11:42
 Lab File ID: 03AUG2017A6B_064.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.6770	0.7195		141	133	6.3	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.267	1.236		14.5	14.9	-2.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8308	0.8552		46.4	45.1	2.9	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.063	1.061		29.9	30.0	-0.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9603	1.055		66.0	60.0	9.8	30.0
Perfluorononanoic acid (PFNA)	Ave	1.176	1.180		29.0	28.9	0.3	30.0
13C2 PFHxA	Ave	1.256	1.282		10.2	10.0	2.1	30.0
13C2 PFDA	Ave	1.106	1.109		10.0	10.0	0.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Lab Sample ID: CCV 320-177369/13 Calibration Date: 08/03/2017 20:02
 Instrument ID: A6 Calib Start Date: 08/03/2017 10:56
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/03/2017 11:42
 Lab File ID: 03AUG2017A6B_064.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.6770	0.7195		141	133	6.3	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.267	1.236		14.5	14.9	-2.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8308	0.8552		46.4	45.1	2.9	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.063	1.061		29.9	30.0	-0.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9603	1.055		66.0	60.0	9.8	30.0
Perfluorononanoic acid (PFNA)	Ave	1.176	1.180		29.0	28.9	0.3	30.0
13C2 PFHxA	Ave	1.256	1.282		10.2	10.0	2.1	30.0
13C2 PFDA	Ave	1.106	1.109		10.0	10.0	0.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29926-1
 SDG No.: _____
 Lab Sample ID: CCV 320-177369/25 Calibration Date: 08/03/2017 21:51
 Instrument ID: A6 Calib Start Date: 08/03/2017 10:56
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/03/2017 11:42
 Lab File ID: 03AUG2017A6B_076.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.6770	0.6824		44.7	44.4	0.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.267	1.161		4.56	4.97	-8.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8308	0.7848		14.3	15.1	-5.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.063	0.9851		9.31	10.0	-7.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9603	0.9836		20.6	20.1	2.4	30.0
Perfluorononanoic acid (PFNA)	Ave	1.176	1.218		10.0	9.68	3.6	30.0
13C2 PFHxA	Ave	1.256	1.175		9.36	10.0	-6.4	30.0
13C2 PFDA	Ave	1.106	1.039		9.39	10.0	-6.1	30.0

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-176265

Analyst: Kolstad, Kate M

Batch Open: 7/27/2017 10:45:00AM

Method Code: 320-537_Prep-320

Batch End: 8/1/2017 10:02:00PM

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-320-176265/1 N/A	N/A		250.00 mL	7			N/A	N/A	N/A		
			1.00 mL								
2 LLCS-320-176265/2 N/A	N/A		250.00 mL	7			N/A	N/A	N/A		
			1.00 mL								
3 320-29926-A-1 (537_DOD5)	N/A (320-29926-1)	281.82 g	253.4 mL	7			7/24/17	16_Days	4		
		28.38 g	1.00 mL								
320-29926-A-2 (537_DOD5)	N/A (320-29926-1)	280.26 g	253 mL	7			7/24/17	16_Days	4		
		27.25 g	1.00 mL								
320-29930-A-1 (537_DOD5)	N/A (320-29930-1)	280.85 g	253 mL	7			7/24/17	16_Days	4		
		27.90 g	1.00 mL								
320-29930-A-2 (537_DOD5)	N/A (320-29930-1)	280.28 g	252.8 mL	7			7/24/17	16_Days	4		
		27.44 g	1.00 mL								
320-29930-A-3 (537_DOD5)	N/A (320-29930-1)	276.44 g	248.6 mL	7			7/24/17	16_Days	4		
		27.88 g	1.00 mL								
320-29930-A-4 (537_DOD5)	N/A (320-29930-1)	281.33 g	254 mL	7			7/24/17	16_Days	4		
		27.38 g	1.00 mL								
320-29930-A-5 (537_DOD5)	N/A (320-29930-1)	279.23 g	251 mL	7			7/24/17	16_Days	4		
		28.25 g	1.00 mL								
320-29930-A-6 (537_DOD5)	N/A (320-29930-1)	285.33 g	258.1 mL	7			7/24/17	16_Days	4		
		27.28 g	1.00 mL								

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08/09/2017

Printed : 8/1/2017

Page 1 of 6

TestAmerica Sacramento

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-176265

Analyst: Kolstad, Kate M

Batch Open: 7/27/2017 10:45:00AM

Method Code: 320-537_Prep-320

Batch End: 8/1/2017 10:02:00PM

11	320-29930-A-7 (537_DOD5)	N/A (320-29930-1)	279.82 g	252.2 mL	7		7/24/17	16_Days	4	
			27.66 g	1.00 mL						
12	320-29930-A-8 (537_DOD5)	N/A (320-29930-1)	277.28 g	249.6 mL	7		7/24/17	16_Days	4	
			27.64 g	1.00 mL						
13	320-29930-A-9 (537_DOD5)	N/A (320-29930-1)	279.89 g	252.3 mL	7		7/24/17	16_Days	4	
			27.59 g	1.00 mL						
14	320-29930-A-10 (537_DOD5)	N/A (320-29930-1)	283.52 g	256.3 mL	7		7/24/17	16_Days	4	
			27.19 g	1.00 mL						
15	320-29930-A-11 (537_DOD5)	N/A (320-29930-1)	284.04 g	256.1 mL	7		7/24/17	16_Days	4	
			27.94 g	1.00 mL						
16	320-29930-A-12 (537_DOD5)	N/A (320-29930-1)	280.26 g	252.9 mL	7		7/24/17	16_Days	4	
			27.32 g	1.00 mL						
17	320-29930-A-23 (537_DOD5)	N/A (320-29930-1)	281.12 g	253.6 mL	7		7/24/17	16_Days	4	
			27.49 g	1.00 mL						
18	320-29930-A-23-LMS (537_DOD5)	N/A (320-29930-1)	281.94 g	253.8 mL	7		7/24/17	16_Days	4	
			28.19 g	1.00 mL						
19	320-29930-A-23-LMSD (537_DOD5)	N/A (320-29930-1)	280.29 g	252.7 mL	7		7/24/17	16_Days	4	
			27.60 g	1.00 mL						
20	320-29930-A-24 (537_DOD5)	N/A (320-29930-1)	278.82 g	251.2 mL	7		7/24/17	16_Days	4	
			27.59 g	1.00 mL						
21	320-29930-A-25 (537_DOD5)	N/A (320-29930-1)	278.93 g	251.5 mL	7		7/24/17	16_Days	4	
			27.43 g	1.00 mL						
22	320-29930-A-26 (537_DOD5)	N/A (320-29930-1)	280.06 g	252.8 mL	7		7/24/17	16_Days	4	
			27.26 g	1.00 mL						

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-176265

Analyst: Kolstad, Kate M

Batch Open: 7/27/2017 10:45:00AM

Method Code: 320-537_Prep-320

Batch End: 8/1/2017 10:02:00PM

Batch Notes

Manifold ID 3, 7

Trizma ID SLBR5241V

SPE Cartridge ID 6357081-02

Methanol ID 983104

Reagent Water ID 7-27-17

Pipette ID M16387D

Analyst ID - TA Reagent Drop KMK

Analyst ID - TA Reagent Drop JNS

Witness

Analyst ID - SU Reagent Drop KMK

Analyst ID - SU Reagent Drop JNS

Witness

Analyst ID - IS Reagent Drop JER

Analyst ID - IS Reagent Drop TN

Witness

Batch Comment IS: 975030

Comments

PFAS Calibration Calculations:

Initial Calibration 8/3/2017
Instrument A6

Perfluorohexanesulfonic acid

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	Reported RRF
3.01	79490	899935	28.7	0.84220	0.8427
7.21	165324	786545	28.7	0.83668	0.8356
15.1	355083	843598	28.7	0.80002	0.7992
30.4	812337	938262	28.7	0.81737	0.8158
45.1	1050045	836796	28.7	0.79853	0.7981
59.7	1374485	738508	28.7	0.89473	0.8934
Average				0.83159	0.8308
Standard Deviation				0.0358	
RSD				0.0431	
%RSD				4.30794	4.4

Continuing Calibration 08/03/2017 @ 18:13
A6

Perfluorohexanesulfonic acid

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	%D	Reported RRF	Reported %D
15.1	380043	914753	28.7	0.7896	-4.953231	0.7888	-5.1

Willow Grove
SDG 320-29926-1

Sample Identification

WGNA-071717-RW-3826

Compound

Perfluoroheptanoic acid

Compound Area 46706

Internal Standard Amount (ng) 10

Dilution Factor 1

Internal Standard Area 387986

Average RRF 1.2666

Sample Volume(ml) 253.4

Volume Extract (ml) 1

Injection Volume (µl) 1

µl to ml 1000.00

Concentration 3.75 ng/L

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