NAVFAC
Naval Facilities Engineering Command

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 320-29503-1

Naval Air Warfare Center Warminster
Warminster, Pennsylvania

August 2019

N62269_001150
WARMINSTER_NAWC
SSIC 5000-33c

LABORATORY DATA PACKAGE, 320-29503-1, NAS WILLOW GROVE NAWC WARMINSTER PA

07/13/2017

TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

ANALYTICAL REPORT

Job Number: 320-29503-1

Job Description: Warminster: PFAS, NAS JRB Willow Grove

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

Attention: Andy Frebowitz

Approved for release.
David R Alltucker
Project Manager I
7/13/2017 4:28 PM

David R Alltucker, Project Manager I
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4383
david.alltucker@testamericainc.com
07/13/2017

Table of Contents

Table of Contents

Qualifiers

LCMS

Qualifier	Qualifier Description
Q	One or more quality control criteria failed.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
E	Result exceeded calibration range.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	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
320-29503-1

Receipt
The samples were received on 6/28/2017 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.7º C.

LCMS
Method(s) 537: Surrogate recovery for the following sample was outside control limits: NAWC-062617-RW-032 (320-29503-1). Re-analysis was performed with concurring results. The original analysis has been reported.

Method(s) 537: The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) have E flags because they are spiked at the upper level of the calibration curve as specified in the method. (LCS 320-173098/2-A) and (LCSD 320-173098/3-A)

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

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

Organic Prep
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: 320-29503-1

Client Sample ID: NAWC-062617-RW-032 — Lab Sample ID: 320-29503-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	19	J M	39	6.6	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	16	J M	19	2.7	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	13	J M	29	5.3	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	5.4	J	9.7	1.8	ng/L	1		537	Total/NA

Client Sample ID: NAWC-062617-FRB-032 — Lab Sample ID: 320-29503-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: NAWC-062617-RW-032 — Lab Sample ID: 320-29503-1

Date Collected: 06/27/17 09:15 — **Matrix: Water**
Date Received: 06/28/17 09:30

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**19**	**J M**	39	6.6	ng/L		07/08/17 09:00	07/11/17 17:40	1
Perfluorooctanoic acid (PFOA)	**16**	**J M**	19	2.7	ng/L		07/08/17 09:00	07/11/17 17:40	1
Perfluorononanoic acid (PFNA)	19	U	23	7.7	ng/L		07/08/17 09:00	07/11/17 17:40	1
Perfluorohexanesulfonic acid (PFHxS)	**13**	**J M**	29	5.3	ng/L		07/08/17 09:00	07/11/17 17:40	1
Perfluoroheptanoic acid (PFHpA)	**5.4**	**J**	9.7	1.8	ng/L		07/08/17 09:00	07/11/17 17:40	1
Perfluorobutanesulfonic acid (PFBS)	35	U M	87	16	ng/L		07/08/17 09:00	07/11/17 17:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*64*	*Q*	*70 - 130*	*07/08/17 09:00*	*07/11/17 17:40*	*1*
13C2 PFDA	*98*		*70 - 130*	*07/08/17 09:00*	*07/11/17 17:40*	*1*

Client Sample ID: NAWC-062617-FRB-032 — Lab Sample ID: 320-29503-2

Date Collected: 06/27/17 09:10 — **Matrix: Water**
Date Received: 06/28/17 09:30

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	U	37	6.3	ng/L		07/08/17 09:00	07/11/17 17:49	1
Perfluorooctanoic acid (PFOA)	7.4	U	18	2.6	ng/L		07/08/17 09:00	07/11/17 17:49	1
Perfluorononanoic acid (PFNA)	18	U	22	7.4	ng/L		07/08/17 09:00	07/11/17 17:49	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	28	5.1	ng/L		07/08/17 09:00	07/11/17 17:49	1
Perfluoroheptanoic acid (PFHpA)	3.7	U	9.2	1.8	ng/L		07/08/17 09:00	07/11/17 17:49	1
Perfluorobutanesulfonic acid (PFBS)	33	U	83	15	ng/L		07/08/17 09:00	07/11/17 17:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*93*		*70 - 130*	*07/08/17 09:00*	*07/11/17 17:49*	*1*
13C2 PFDA	*90*		*70 - 130*	*07/08/17 09:00*	*07/11/17 17:49*	*1*

Default Detection Limits

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-29503-1
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. TestAmerica Job ID: 320-29503-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

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

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
		3C2 PFHx	3C2 PFDA								
Lab Sample ID	Client Sample ID	(70-130)	(70-130)								
320-29503-1	NAWC-062617-RW-032	64 Q	98								
320-29503-2	NAWC-062617-FRB-032	93	90								
LCS 320-173098/2-A	Lab Control Sample	99	99								
LCSD 320-173098/3-A	Lab Control Sample Dup	92	103								
MB 320-173098/1-A	Method Blank	94	99								

Surrogate Legend

13C2 PFHxA = 13C2 PFHxA
13C2 PFDA = 13C2 PFDA

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

Lab Sample ID: MB 320-173098/1-A
Matrix: Water
Analysis Batch: 173554

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 173098

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		07/08/17 09:00	07/11/17 17:12	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		07/08/17 09:00	07/11/17 17:12	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		07/08/17 09:00	07/11/17 17:12	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		07/08/17 09:00	07/11/17 17:12	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		07/08/17 09:00	07/11/17 17:12	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		07/08/17 09:00	07/11/17 17:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*94*		*70 - 130*	*07/08/17 09:00*	*07/11/17 17:12*	*1*
13C2 PFDA	*99*		*70 - 130*	*07/08/17 09:00*	*07/11/17 17:12*	*1*

Lab Sample ID: LCS 320-173098/2-A
Matrix: Water
Analysis Batch: 173554

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 173098

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	300	297	M	ng/L		99	70 - 130
Perfluorooctanoic acid (PFOA)	150	145		ng/L		97	70 - 130
Perfluorononanoic acid (PFNA)	144	133		ng/L		92	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	225	215	M	ng/L		95	70 - 130
Perfluoroheptanoic acid (PFHpA)	74.3	82.6	E	ng/L		111	70 - 130
Perfluorobutanesulfonic acid (PFBS)	663	631		ng/L		95	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*99*		*70 - 130*
13C2 PFDA	*99*		*70 - 130*

Lab Sample ID: LCSD 320-173098/3-A
Matrix: Water
Analysis Batch: 173554

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 173098

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)	300	303	M	ng/L		101	70 - 130	2	30
Perfluorooctanoic acid (PFOA)	150	153		ng/L		102	70 - 130	5	30
Perfluorononanoic acid (PFNA)	144	144	M	ng/L		100	70 - 130	8	30
Perfluorohexanesulfonic acid (PFHxS)	225	214	M	ng/L		95	70 - 130	0	30
Perfluoroheptanoic acid (PFHpA)	74.3	83.0	E	ng/L		112	70 - 130	1	30
Perfluorobutanesulfonic acid (PFBS)	663	657		ng/L		99	70 - 130	4	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFHxA	*92*		*70 - 130*
13C2 PFDA	*103*		*70 - 130*

LCMS

Prep Batch: 173098

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-29503-1	NAWC-062617-RW-032	Total/NA	Water	537	
320-29503-2	NAWC-062617-FRB-032	Total/NA	Water	537	
MB 320-173098/1-A	Method Blank	Total/NA	Water	537	
LCS 320-173098/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 320-173098/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 173554

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-29503-1	NAWC-062617-RW-032	Total/NA	Water	537	173098
320-29503-2	NAWC-062617-FRB-032	Total/NA	Water	537	173098
MB 320-173098/1-A	Method Blank	Total/NA	Water	537	173098
LCS 320-173098/2-A	Lab Control Sample	Total/NA	Water	537	173098
LCSD 320-173098/3-A	Lab Control Sample Dup	Total/NA	Water	537	173098

Lab Chronicle

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

TestAmerica Job ID: 320-29503-1

Client Sample ID: NAWC-062617-RW-032

Lab Sample ID: 320-29503-1

Date Collected: 06/27/17 09:15

Matrix: Water

Date Received: 06/28/17 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			173098	07/08/17 09:00	NS1	TAL SAC
Total/NA	Analysis	537		1	173554	07/11/17 17:40	JRB	TAL SAC

Client Sample ID: NAWC-062617-FRB-032

Lab Sample ID: 320-29503-2

Date Collected: 06/27/17 09:10

Matrix: Water

Date Received: 06/28/17 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			173098	07/08/17 09:00	NS1	TAL SAC
Total/NA	Analysis	537		1	173554	07/11/17 17:49	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. TestAmerica Job ID: 320-29503-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

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: 320-29503-1
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: 320-29503-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-29503-1	NAWC-062617-RW-032	Water	06/27/17 09:15	06/28/17 09:30
320-29503-2	NAWC-062617-FRB-032	Water	06/27/17 09:10	06/28/17 09:30

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 173534

Lab Sample ID: STD 320-173534/7 IC Client Sample ID:

Date Analyzed: 07/11/17 14:18 Lab File ID: 11JUL2017A6B_007.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	2.44	Incomplete Integration	barnettj	07/11/17 15:17
Perfluorohexanesulfonic acid (PFHxS)	3.07	Isomers	barnettj	07/11/17 15:18
Perfluorooctanoic acid (PFOA)	3.42	Baseline	barnettj	07/11/17 15:19
Perfluorooctanesulfonic acid (PFOS)	3.85	Isomers	barnettj	07/11/17 15:19

Lab Sample ID: STD 320-173534/8 IC Client Sample ID:

Date Analyzed: 07/11/17 14:29 Lab File ID: 11JUL2017A6B_008.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	3.07	Isomers	barnettj	07/11/17 15:20
Perfluorooctanoic acid (PFOA)	3.42	Baseline	barnettj	07/11/17 15:20
Perfluorooctanesulfonic acid (PFOS)	3.84	Isomers	barnettj	07/11/17 15:20

Lab Sample ID: STD 320-173534/9 IC Client Sample ID:

Date Analyzed: 07/11/17 14:38 Lab File ID: 11JUL2017A6B_009.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	2.44	Incomplete Integration	barnettj	07/11/17 15:21
Perfluorohexanesulfonic acid (PFHxS)	3.07	Isomers	barnettj	07/11/17 15:21
Perfluorooctanesulfonic acid (PFOS)	3.84	Isomers	barnettj	07/11/17 15:27

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 173534

Lab Sample ID: STD 320-173534/10 ICISA Client Sample ID:

Date Analyzed: 07/11/17 14:47 Lab File ID: 11JUL2017A6B_010.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	3.07	Isomers	barnettj	07/11/17 15:41
Perfluorononanoic acid (PFNA)	3.84	Incomplete Integration	barnettj	07/11/17 15:49
Perfluorooctanesulfonic acid (PFOS)	3.84	Isomers	barnettj	07/11/17 15:48

Lab Sample ID: STD 320-173534/11 IC Client Sample ID:

Date Analyzed: 07/11/17 14:56 Lab File ID: 11JUL2017A6B_011.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	3.07	Isomers	barnettj	07/11/17 15:23
Perfluorooctanesulfonic acid (PFOS)	3.83	Isomers	barnettj	07/11/17 15:23
Perfluorononanoic acid (PFNA)	3.84	Incomplete Integration	barnettj	07/11/17 15:24

Lab Sample ID: STD 320-173534/12 IC Client Sample ID:

Date Analyzed: 07/11/17 15:05 Lab File ID: 11JUL2017A6B_012.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	2.45	Incomplete Integration	barnettj	07/11/17 15:24
Perfluorohexanesulfonic acid (PFHxS)	3.07	Isomers	barnettj	07/11/17 15:24
Perfluorooctanesulfonic acid (PFOS)	3.83	Isomers	barnettj	07/11/17 15:25

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 173534

Lab Sample ID: CCVL 320-173534/14 Client Sample ID:

Date Analyzed: 07/11/17 15:23 Lab File ID: 11JUL2017A6B_014.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	3.07	Isomers	barnettj	07/11/17 15:52
Perfluorooctanesulfonic acid (PFOS)	3.82	Isomers	barnettj	07/11/17 15:52

Lab Sample ID: ICV 320-173534/16 Client Sample ID:

Date Analyzed: 07/11/17 15:42 Lab File ID: 11JUL2017A6B_016.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	3.07	Isomers	barnettj	07/11/17 15:57
Perfluorooctanesulfonic acid (PFOS)	3.82	Isomers	barnettj	07/11/17 15:58

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 173554

Lab Sample ID: CCV 320-173554/24 CCVIS Client Sample ID:

Date Analyzed: 07/11/17 16:54 Lab File ID: 11JUL2017A6B_024.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	3.07	Isomers	barnettj	07/11/17 17:21
Perfluorooctanesulfonic acid (PFOS)	3.81	Isomers	barnettj	07/11/17 17:22

Lab Sample ID: LCS 320-173098/2-A Client Sample ID:

Date Analyzed: 07/11/17 17:22 Lab File ID: 11JUL2017A6B_027.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	3.07	Isomers	barnettj	07/12/17 09:47
Perfluorooctanesulfonic acid (PFOS)	3.81	Isomers	barnettj	07/12/17 09:47

Lab Sample ID: LCSD 320-173098/3-A Client Sample ID:

Date Analyzed: 07/11/17 17:31 Lab File ID: 11JUL2017A6B_028.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	3.07	Isomers	barnettj	07/12/17 09:48
Perfluorooctanesulfonic acid (PFOS)	3.81	Isomers	barnettj	07/12/17 09:48
Perfluorononanoic acid (PFNA)	3.82	Incomplete Integration	barnettj	07/12/17 09:48

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 173554

Lab Sample ID: 320-29503-1 Client Sample ID: NAWC-062617-RW-032

Date Analyzed: 07/11/17 17:40 Lab File ID: 11JUL2017A6B_029.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	2.45	Missed Peak	barnettj	07/12/17 09:49
Perfluorohexanesulfonic acid (PFHxS)	3.07	Isomers	barnettj	07/12/17 09:50
Perfluorooctanoic acid (PFOA)	3.41	Isomers	barnettj	07/12/17 09:50
Perfluorooctanesulfonic acid (PFOS)	3.81	Isomers	barnettj	07/12/17 09:50

Lab Sample ID: CCV 320-173554/34 CCVIS Client Sample ID:

Date Analyzed: 07/11/17 18:25 Lab File ID: 11JUL2017A6B_034.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	3.08	Isomers	barnettj	07/12/17 09:52
Perfluorooctanesulfonic acid (PFOS)	3.81	Isomers	barnettj	07/12/17 09:52

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-HSP_00017	08/09/17	03/23/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00022	375 uL	Perfluorobutane Sulfonate	1656.41 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
							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	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 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-ICV_00020	07/25/17	02/21/17	MeOH/H2O, Lot 067374	10 mL	LC537-IS_00031	200 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
.LC537-IS_00031	07/31/17	01/31/17	Methanol, Lot 090285	10000 uL	LCM2PFOA_00005	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00019	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA_00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			(Purchased Reagent)		13C2-PFOA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFOS_00019	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
LC537-ICV_00020	07/25/17	02/21/17	MeOH/H2O, Lot 067374	10 mL	LC537-SU_00030	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
					LC537ICIM_00015	20 uL	Perfluorobutanesulfonic acid (PFBS)	100.676 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10.08 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	21.1854 ng/mL
							Perfluorononanoic acid (PFNA)	20.0076 ng/mL
							Perfluorooctanoic acid (PFOA)	20.0186 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	20.6936 ng/mL
.LC537-SU_00030	07/31/17	01/31/17	Methanol, Lot 104453	20000 uL	LCMPFDA_00012	80 uL	13C2 PFDA	0.2 ug/mL
					LCMPFHxA_00013	80 uL	13C2 PFHxA	0.2 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LC537ICIM_00015	07/25/17	02/21/17	Methanol, Lot 090285	25 mL	LC537-PFBS2_00007	0.55 mL	Perfluorobutanesulfonic acid (PFBS)	50.3381 ug/mL
					LC537-PFHpA2_00010	0.05 mL	Perfluoroheptanoic acid (PFHpA)	5.04 ug/mL
					LC537-PFHxS2_00007	0.13 mL	Perfluorohexanesulfonic acid (PFHxS)	10.5927 ug/mL
					LC537-PFNA2_00008	0.093 mL	Perfluorononanoic acid (PFNA)	10.0038 ug/mL
					LC537-PFOA2_00008	0.142 mL	Perfluorooctanoic acid (PFOA)	10.0093 ug/mL
					LC537-PFOS2_00007	0.21 mL	Perfluorooctanesulfonic acid (PFOS)	10.3468 ug/mL
..LC537-PFBS2_00007	08/09/17	02/20/17	Methanol, Lot 090285	8.2 mL	LC537_PFBS2_00001	0.0188 g	Perfluorobutanesulfonic acid (PFBS)	2288.1 ug/mL
...LC537_PFBS2_00001	08/09/17	Santa Cruz Biotechnology, Lot H0112			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	0.998 g/g
..LC537-PFHpA2_00010	07/25/17	12/20/16	Methanol, Lot 09092	25 mL	LC537_PFHpA2_00001	0.063 g	Perfluoroheptanoic acid (PFHpA)	2520 ug/mL
...LC537_PFHpA2_00001	07/25/17	Afla Aesar, Lot 10160443			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	1 g/g
..LC537-PFHxS2_00007	07/25/17	02/20/17	Methanol, Lot 090285	10 mL	LC537_PFHxS2_00001	0.0224 g	Perfluorohexanesulfonic acid (PFHxS)	2037.06 ug/mL
...LC537_PFHxS2_00001	07/25/17	Santa Cruz Biotechnology, Lot F2612			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
..LC537-PFNA2_00008	07/25/17	12/20/16	Methanol, Lot 090285	10 mL	LC537_PFNA2_00001	0.027 g	Perfluorononanoic acid (PFNA)	2689.2 ug/mL
...LC537_PFNA2_00001	07/25/17	Aldrich, Lot MKBJ2926V			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.996 g/g
..LC537-PFOA2_00008	07/25/17	12/20/16	Methanol, Lot 090285	10 mL	LC537_PFOA2_00001	0.0178 g	Perfluorooctanoic acid (PFOA)	1762.2 ug/mL
...LC537_PFOA2_00001	07/25/17	Afla Aesar, Lot D24Y026			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.99 g/g
..LC537-PFOS2_00007	07/26/17	02/20/17	Methanol, Lot 090285	11 mL	LC537_PFOS2_00001	0.0174 g	Perfluorooctanesulfonic acid (PFOS)	1231.76 ug/mL
...LC537_PFOS2_00001	07/26/17	Sigma, Lot BCBF5116V			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.7787 g/g
LC537-IS_00043	12/19/17	06/20/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00005	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00019	180 uL	13C4 PFOS	0.2868 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCM2PFOA_00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			(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
							13C4 PFOS	28.68 ng/mL
					LC537-MSP_00025	50 uL	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
....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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...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
					LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L2_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
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00045	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00019	08/09/17	03/30/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00022	375 uL	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
							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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC537-PFOS_00007	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
					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-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
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00045	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00019	08/09/17	03/30/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00022	375 uL	Perfluorobutanesulfonic acid (PFBS)	1656.41 ng/mL
							Perfluoroheptanoic acid (PFHpA)	185.625 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	563.639 ng/mL
							Perfluorononanoic acid (PFNA)	361.125 ng/mL
							Perfluorooctanoic acid (PFOA)	374.625 ng/mL
							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
					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-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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	30.4365 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
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00045	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00019	08/09/17	03/30/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00022	375 uL	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
							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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.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
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00045	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00019	08/09/17	03/30/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00022	375 uL	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
							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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot 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
					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-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
					LC537-SU_00045	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00019	08/09/17	03/30/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00022	375 uL	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
							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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

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
					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-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_PFBS_00002

R: 4/1/15 SPV

SIGMA-ALDRICH®

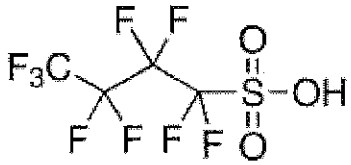
sigma-aldrich.com

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:
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

Reagent

LC537_PFBS2_00001

CERTIFICATE OF ANALYSIS

The Power to Question

Catalog Number:	sc-236187
Product Name:	Nonafluorobutane-1-sulfonic acid
CAS Number:	375-73-5
Molecular Formula:	$C_4HF_9O_3S$
Molecular Weight:	300.10
Lot Number:	H0112

Test		Result
Refractive Index	1.3200 to 1.3290	1.3219
Purity (Titration)	min. 98.0%	99.8%

Test Conditions: Refractive Indea: n20/D

Reagent

LC537_PFHpA_00002

R: 4/1/15 SRV

SIGMA-ALDRICH®

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

Certificate of Analysis

PFHpA

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

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

Claudia Geitner

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

Reagent

LC537_PFHpA2_00001

Certificate of Analysis

Alfa Aesar
A Johnson Matthey Company

Product No.:	A12092
Product:	Perfluoroheptanoic acid, 98+%
Lot No.:	10160443

PFH_pA

Appearance:	White crystalline powder
Melting Point:	28.2 (slip point)

Assay (Aqueous acid-base titration): 100.2%

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

NORTH AMERICA
Tel: +1-800-343-0660 or
+1-978-521-6300
Fax: +1-800-322-4757
Email: info@alfa.com

GERMANY
Tel: 00800 4566 4566 or
+49 721 84007 280
Fax: 00800 4577 4577 or
+49 721 84007 300
Email: Eurosales@alfa.com

UNITED KINGDOM
Tel: 0800-801812 or
+44 (0)1524-850506
Fax: +44 (0)1524-850608
Email: UKsales@alfa.com

FRANCE
Tel: 0800 03 51 47 or
+33 (0)3 8862 2690
Fax: 0800 10 20 67 or
+33 (0)3 8862 6864
Email: frventes@alfa.com

INDIA
Tel: +91 8008 812424 or
+91 8008 812525 or
+91 8008 812626
Fax: +91 8418 260060
Email: India@alfa.com

CHINA
Tel: +86 (010) 8567-8600
Fax: +86 (010) 8567-8601
Email: saleschina@alfa-asia.com

KOREA
Tel: +82-2-3140-6000
Fax: +82-2-3140-6002
Email: saleskorea@alfa-asia.com

Reagent

LC537_PFHxS_00002

R: 4/1/15 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:	TRIDECAFLUOROHEXANE-1-SULFONIC ACID POTASSIUM SALT >= 98.0 % T
Product Number:	50929
Batch Number:	BCBL3545V
Brand:	Aldrich
CAS Number:	3871-99-6
Formula:	$C_6F_{13}KO_3S$
Formula Weight:	438.20
Quality Release Date:	20 JUN 2013

PFH_xS-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

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

Purity = 90.94 / w/m.w correction

SKV 4/1/15

Reagent

LC537_PFHxS2_00001

CERTIFICATE OF ANALYSIS

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

Catalog Number:	sc-237289
Product Name:	Tridecafluorohexane-1-sulfonic acid potassium salt
CAS Number:	3871-99-6
Molecular Formula:	$C_6F_{13}KO_3S$
Molecular Weight:	438.20
Lot Number:	F2612

Test	Specification	Result
Appearance	White to feint beige powder or crystals	White powder
Infrared Spectrum	Conforms to structure	Complies
Purity (Titration, Ion Exchange)	≥ 98.0%	99.6 %

PFHxS-K

$C_6F_{13}SO_3K$ 438.201

$C_6F_{13}SO_3H$ 400.111

MW correction = $\frac{400.111}{438.201}$ = 0.91307 PFHxS CAS 355-46-4

Purity & MW correction = 90.9%

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 CAS: 375-95-1	Lot: QN44F	

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

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

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

PFNA

Reagent

LC537_PFNA2_00001

SIGMA-ALDRICH®

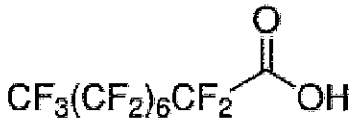
sigma-aldrich.com

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**
Lot Number:	**MKBJ2926V**
Brand:	ALDRICH
CAS Number:	375-95-1
MDL Number:	MFCD00039605
Formula:	C9HF17O2
Formula Weight:	464.08 g/mol
Quality Release Date:	20 OCT 2011



Test	Specification	Result
Appearance (Color)	White to Off-White	White
Appearance (Form) Crystalline Chunk(s) or Granule or Flakes or Solid	Powder or Crystals or	Powder
Infrared spectrum	Conforms to Structure	Conforms
Purity (Titration by NaOH)	96.5 - 103.5 %	100.3 %
GC (area %)	≥ 96.5 %	99.6 %

Jamie Gleason

Jamie Gleason, Manager
Quality Control
Milwaukee, Wisconsin US

PFNA

Reagent

LC537_PFOA_00002

P: 3/26/15 RV

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

PFOA

Pentadecafluorooctanoic acid OEKANAL®

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

identiy (GC-MS)	complying
Assay (GCMS)	99.4 %
Date of Analysis	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 aliqout 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

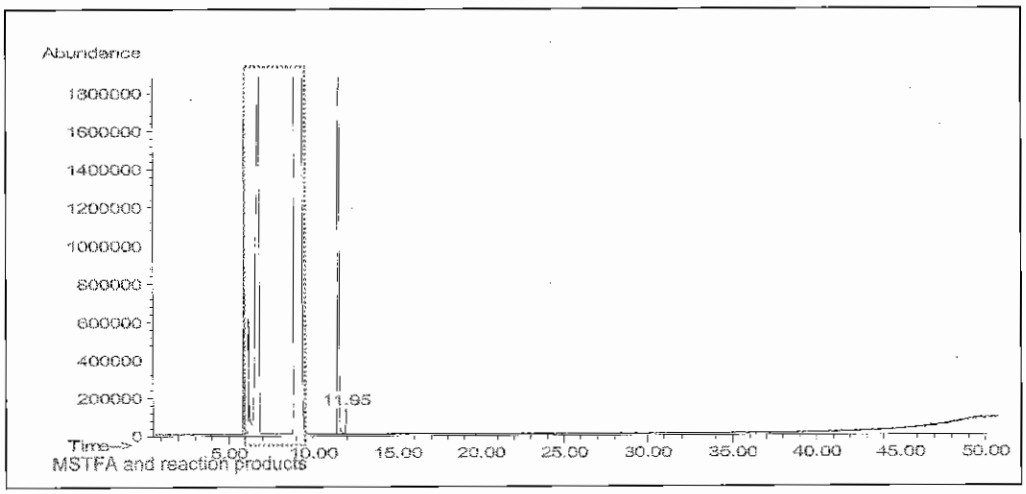
GC/MS-Method

Analytical Department

Article: **Pentadecafluorooctanoic acid OEKANAL**
Article-No.: **33824**
Batch: **SZBD308XV**

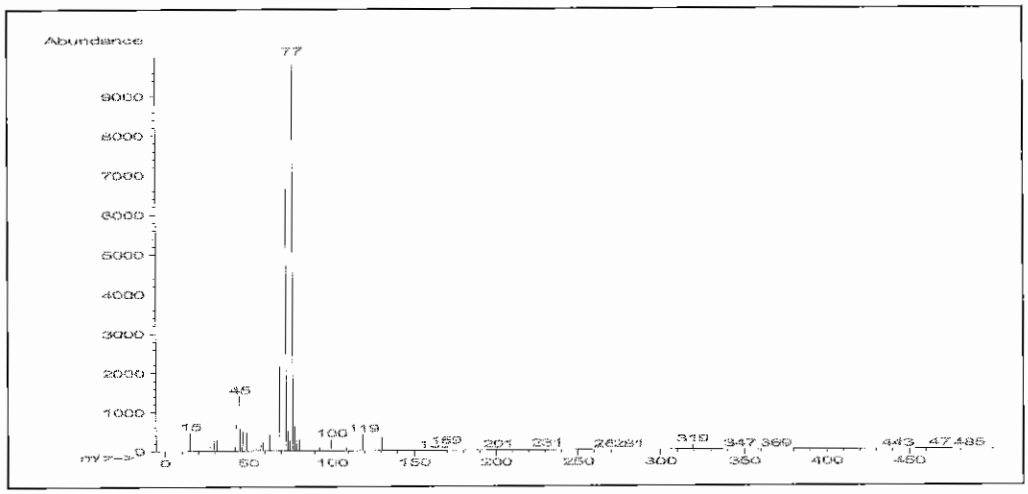
Column:	XTI-5 (Restek); 30 m; fs cap.; I.D.:0.25 mm; 1 µm df
Injector:	Split mode
Injection:	approx. 1 µl of reaction mixture with MSTFA (approx. 10 mg + 200 µl MSTFA)
Inj.-temp.:	280°C
Oven-temp.:	40°C (for 2 min) to 320°C (6°C/min) hold for 2 min
Split:	1:100
Flow:	1 ml He/min (Constant flow mode)
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_00001

Certificate of Analysis

Alfa Aesar
A Johnson Matthey Company

Product No.:	L08862
Product:	Perfluorooctanoic acid, 95%
Lot No.:	D24Y026

PFOA

Appearance	White solid
Melting point	58 - 60°C
Assay	99 %
Identity	Matches reference

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

NORTH AMERICA
Tel: +1-800-343-0660 or +1-978-521-6300
Fax: +1-800-322-4757
Email: info@alfa.com

GERMANY
Tel: 00800 4566 4566 or +49 721 84007 280
Fax: 00800 4577 4577 or +49 721 84007 300
Email: Eurosales@alfa.com

UNITED KINGDOM
Tel: 0800-801812 or +44 (0)1524-850506
Fax: +44 (0)1524-850608
Email: UKsales@alfa.com

FRANCE
Tel: 0800 03 51 47 or +33 (0)3 8862 2690
Fax: 0800 10 20 67 or +33 (0)3 8862 6864
Email: frventes@alfa.com

INDIA
Tel: +91 8008 812424 or +91 8008 812525 or +91 8008 812626
Fax: +91 8418 260060
Email: India@alfa.com

CHINA
Tel: +86 (010) 8567-8600
Fax: +86 (010) 8567-8601
Email: saleschina@alfa-asia.com

KOREA
Tel: +82-2-3140-6000
Fax: +82-2-3140-6002
Email: saleskorea@alfa-asia.com

Reagent

LC537_PFOS_00002

Γ: 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 – EXP 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	complying
Assay (LC-MS)	98 %
Date of Analysis	10.Aug.2012

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

Purity: 91.06 %

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 aliqout 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

Reagent

LC537_PFOS2_00001

SIGMA-ALDRICH

ALDRICH

Industriestrasse 25, CH-9471 Buchs (SG), Switzerland
Tel: +41 81 755 2511 Fax: +41 81 756 5449

INV 820
12LCMS 0579

Certificate of Analysis

Product Name:	HEPTADECAFLUOROOCTANESULFONIC ACID TETRAETHYLAMMONIUM SALT 98 %
Product Number:	365289
Product Brand:	Aldrich
Molecular Formula:	$C_{16}H_{20}F_{17}NO_3S$
Molecular Mass:	629.37
CAS Number:	56773-42-3

TEST	SPECIFICATION	LOT BCBF5116V RESULTS
APPEARANCE (COLOR)	OFF-WHITE TO WHITE	WHITE
APPEARANCE (FORM)	POWDER, LUMPS OR CHUNKS	POWDER WITH LUMPS
CARBON CONTENT	29.77 % - 31.29 %	30.52
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS

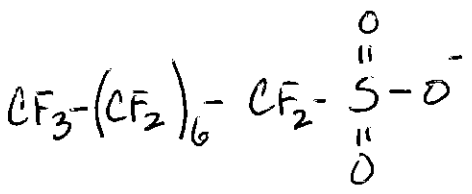
QC RELEASE DATE 13/APR/11

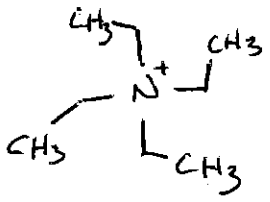
MW correction = $\frac{500.125}{629.37} = 0.7946$ ~~= 79.46%~~ DEH 7-26-12

Purity + MW Correction = 77.87%

E. Schwärzler

Edeltraud Schwärzler, Manager
Quality Control
Buchs, Switzerland





	$C_8F_{17}SO_3H$	$C_8H_{20}N$
C = 12.011	96.088	96.088
F = 18.998	322.964	-
S = 32.066	32.066	-
O = 15.999	47.997	-
H = 1.008	1.008	20.160
N = 14.007	-	14.007
	500.125	130.255 →

SIGMA-ALDRICH

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

Certificate of Origin

Product Name:	Heptadecafluorooctanesulfonic acid tetraethylammonium salt 98 %
Product Number:	365289
Product Brand:	Aldrich
Lot:	BCBF5116V
Molecular Formula:	$C_{16}H_{20}F_{17}NO_3S$
Molecular Mass:	629.37
CAS Number:	56773-42-3
Date of Issue:	30-MAR-11

Country of Origin	China

product is of synthetic origin	yes
only synthetic materials used in the manufacturing process	yes
compounds of animal origin used	no
genetically modified organisms used	no
allergenic materials used	no
procedures in place to avoid cross contamination with residue of animal, human, GMO or allergenes in manufacturing process	yes

Sigma-Aldrich has quality systems and procedures in place for monitoring the production process, traceablility and batch consistency.

Document issued by Sigma-Aldrich Corporation "Sigma-Aldrich". This document is valid without signature and has been produced digitally.

For further questions please contact your local Sigma-Aldrich representative.

We are committed to the success of our Customers, Employees and Shareholders through leadership in Life Science, High Technology and Service.

Reagent

LCM2PFOA_00005

Rec'd. 2/10/15 SV

WELLINGTON LABORATORIES

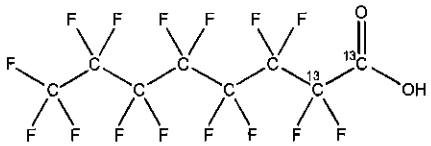
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFOA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]octanoic acid

LOT NUMBER: M2PFOA0613

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_6HF_{15}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 06/19/2013
EXPIRY DATE: (mm/dd/yyyy) 06/19/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C ($1,2\text{-}^{13}C_2$)

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:** 07/16/2013 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 $x_1, x_2,...x_n$ on which it depends is:

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

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 ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all 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 17025:2005 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 for the period of time specified by the 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:

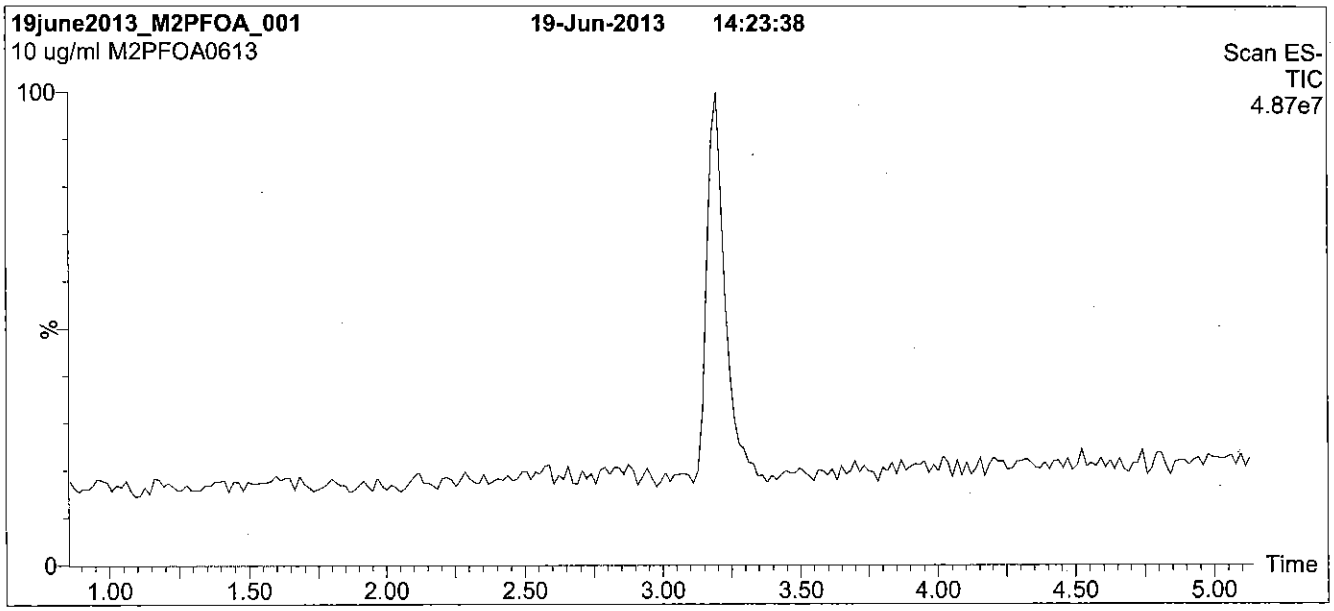
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

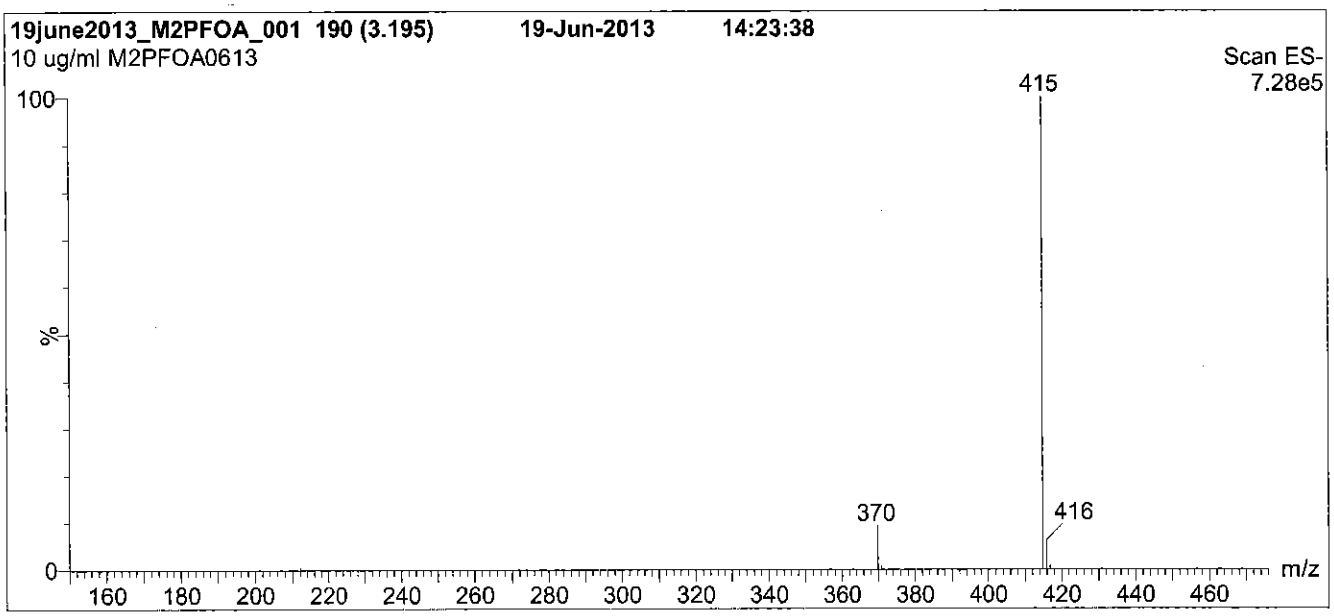
CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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 RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

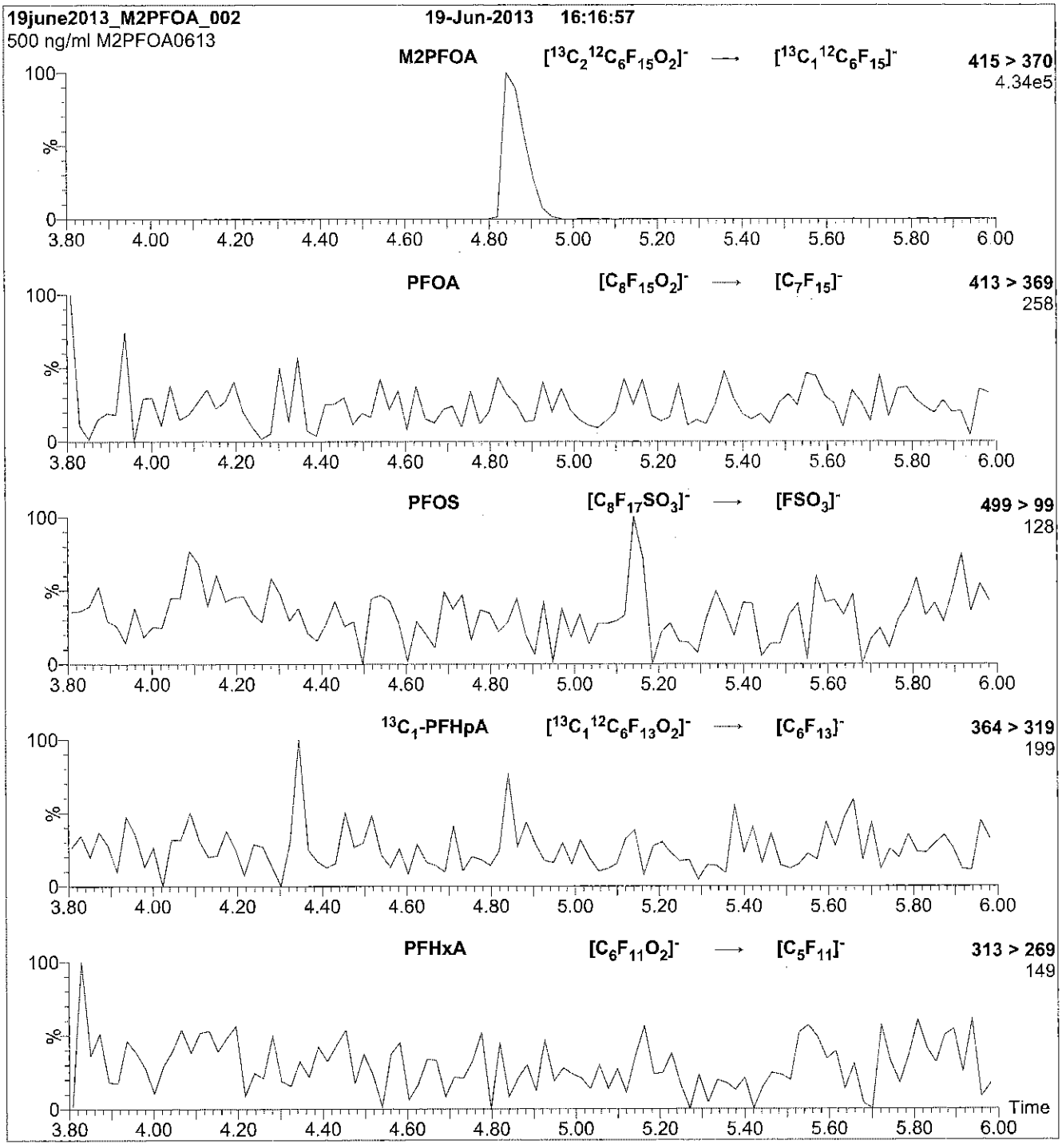
Flow: 300 µl/min

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: **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% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 11

Reagent

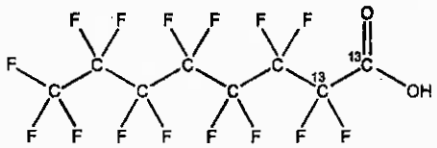
LCM2PFOA_00007

P: 5/6/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2PFOA	**LOT NUMBER:**	M2PFOA0216
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]octanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6HF_{15}O_2$	**MOLECULAR WEIGHT:**	416.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
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 $x_1, x_2, \ldots x_n$ on which it depends is:

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

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 ±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:

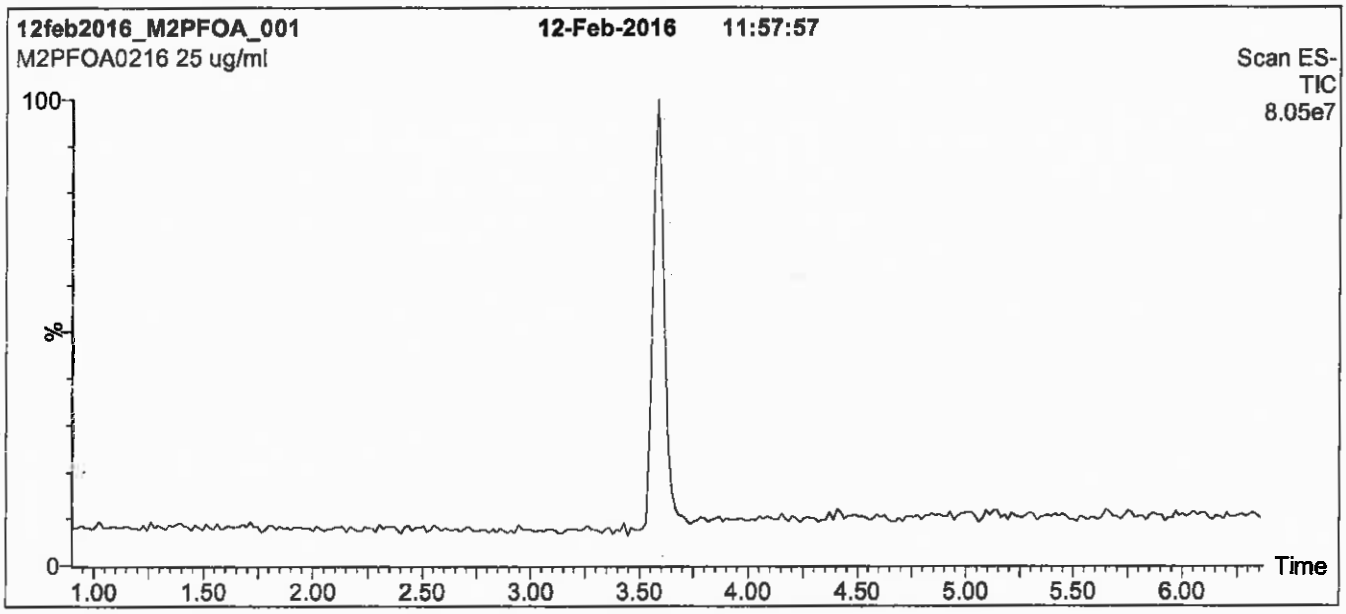
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

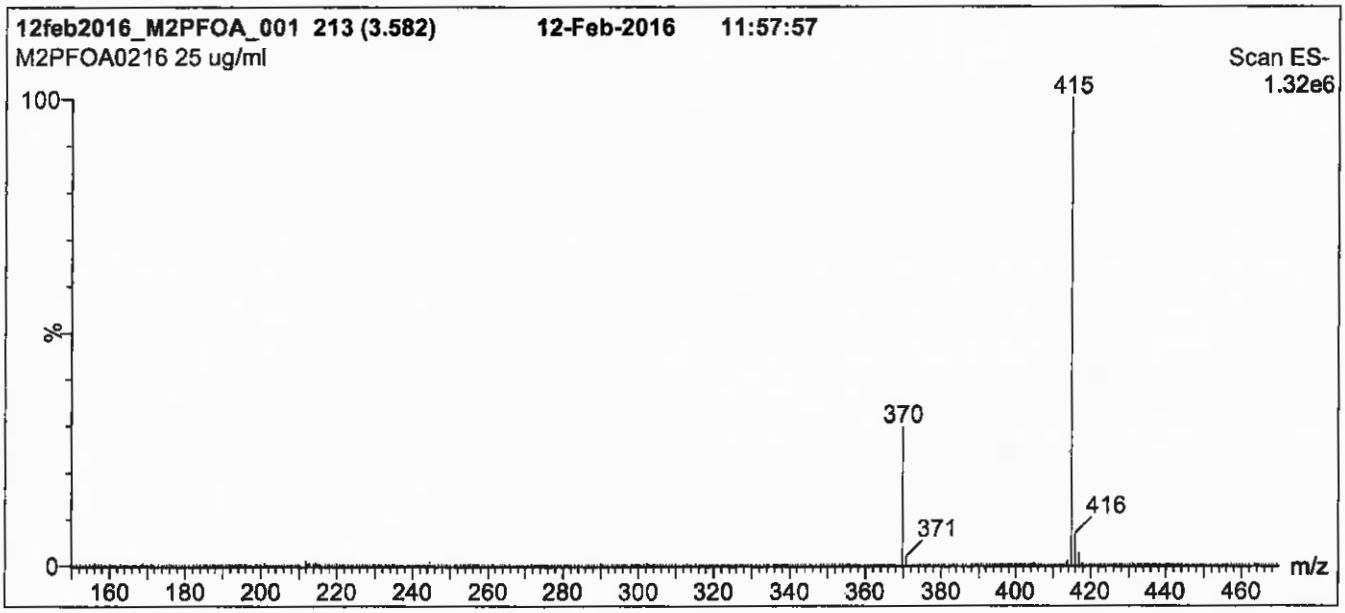
CALA

ANAB ACCREDITED

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 RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

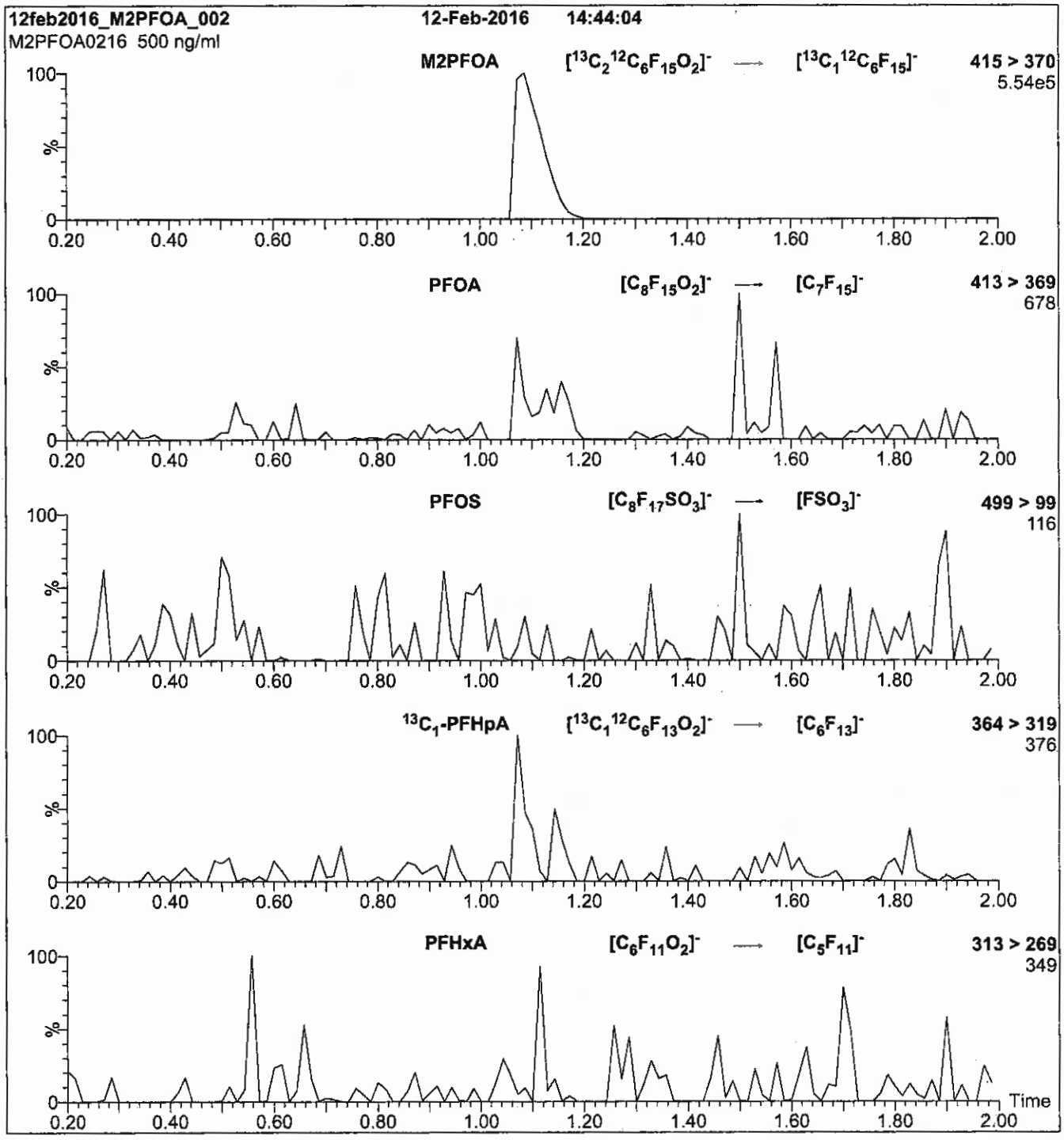
Flow: 300 µl/min

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 µl/min

MS Parameters

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

Reagent

LCMPFDA_00012

R: SBC 12/21/16

814255
ID: LCMPFDA_00012
Exp: 09/30/21 Prpd: SBC
13C2-Perfluorodecanoic a

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFDA	**LOT NUMBER:**	MPFDA0916
COMPOUND:	Perfluoro-*n*-[1,2-$^{13}C_2$]decanoic acid		
STRUCTURE:		**CAS #:**	Not available

MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{19}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of $^{13}C_1$-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/07/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 ±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:

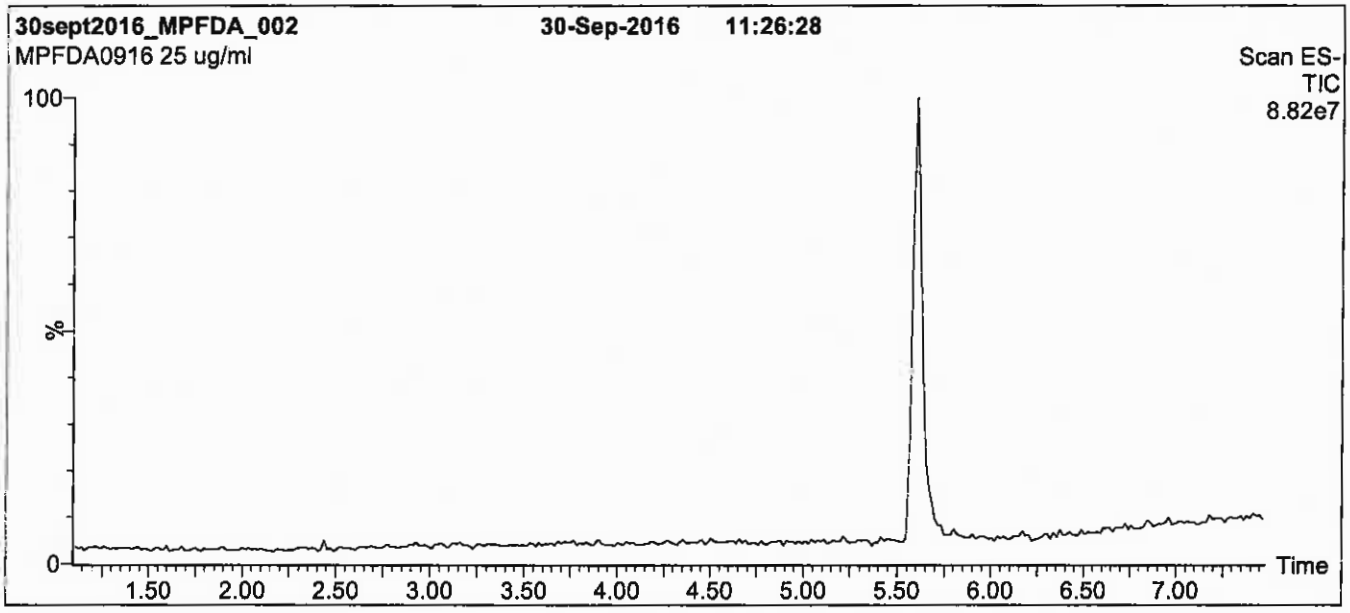
At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

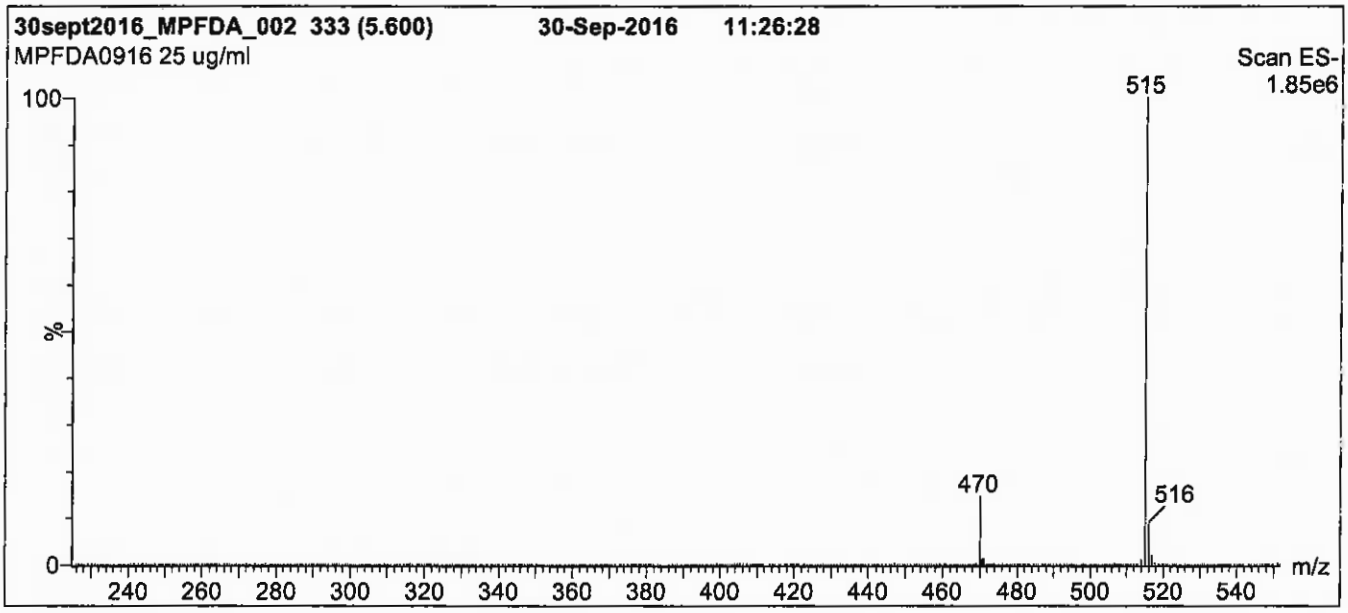
QUALITY MANAGEMENT:

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 RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

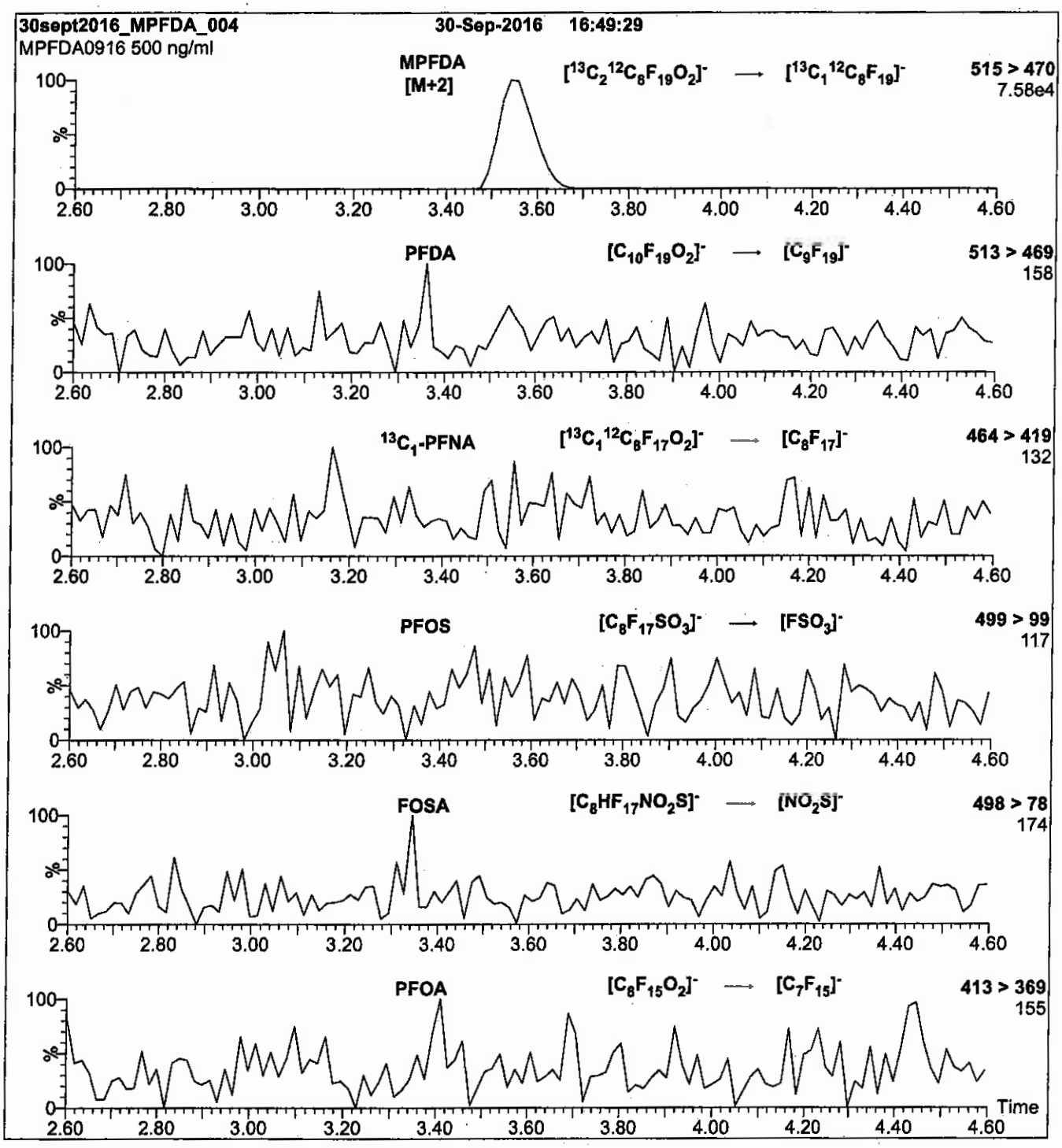
Flow: 300 µl/min

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 µl (500 ng/ml MPFDA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

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

Reagent

LCMPFHxA_00013

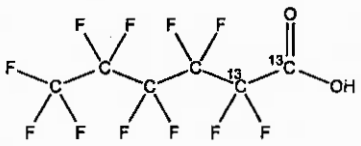
R: SBC 12/21/16

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFHxA	**LOT NUMBER:**	MPFHxA0416
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]hexanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_4HF_{11}O_2$	**MOLECULAR WEIGHT:**	316.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	04/08/2016		
EXPIRY DATE: (mm/dd/yyyy)	04/08/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/29/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

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

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

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 ±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:

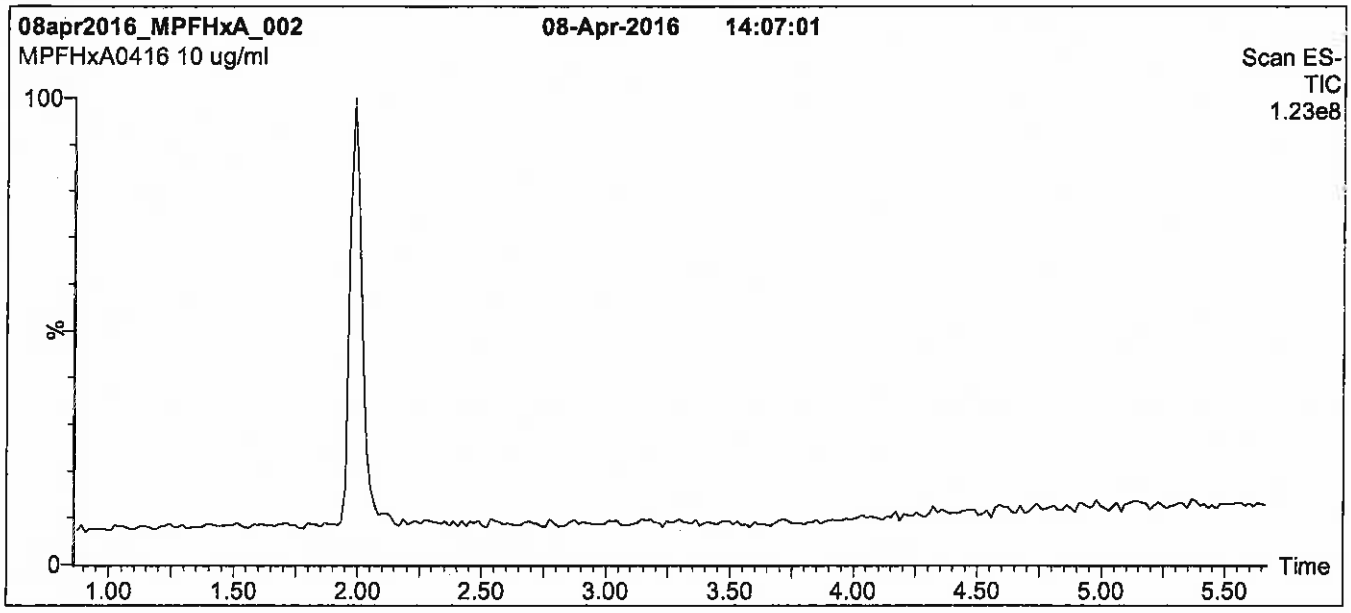
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

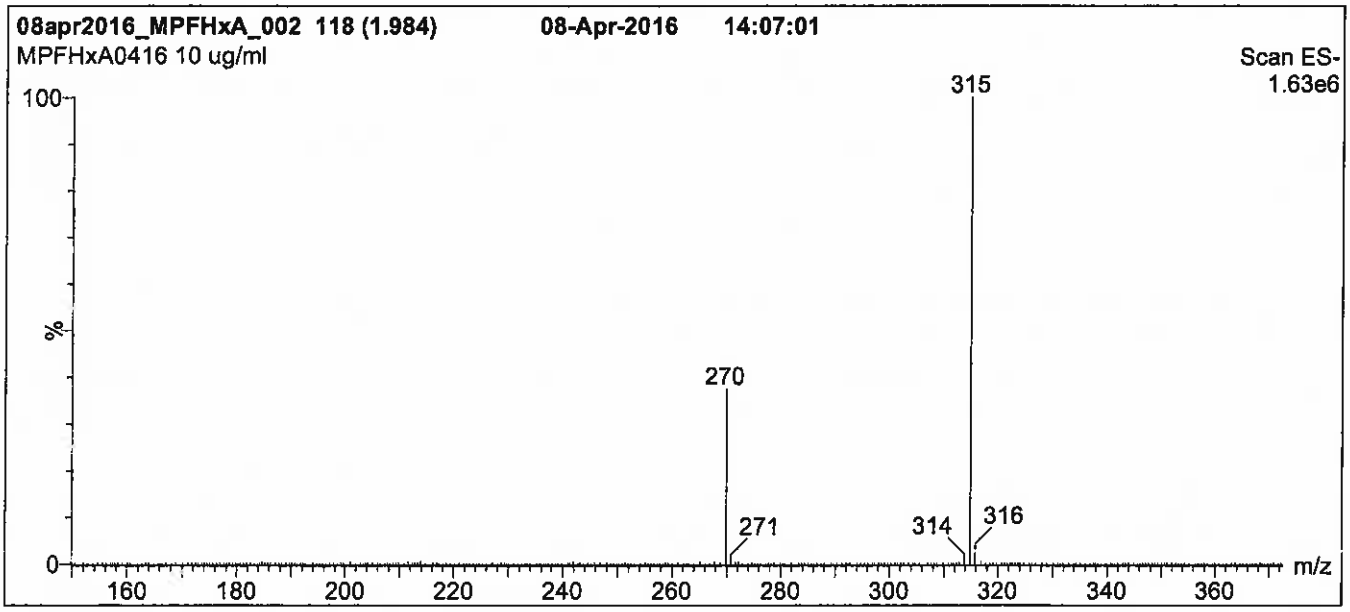
CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

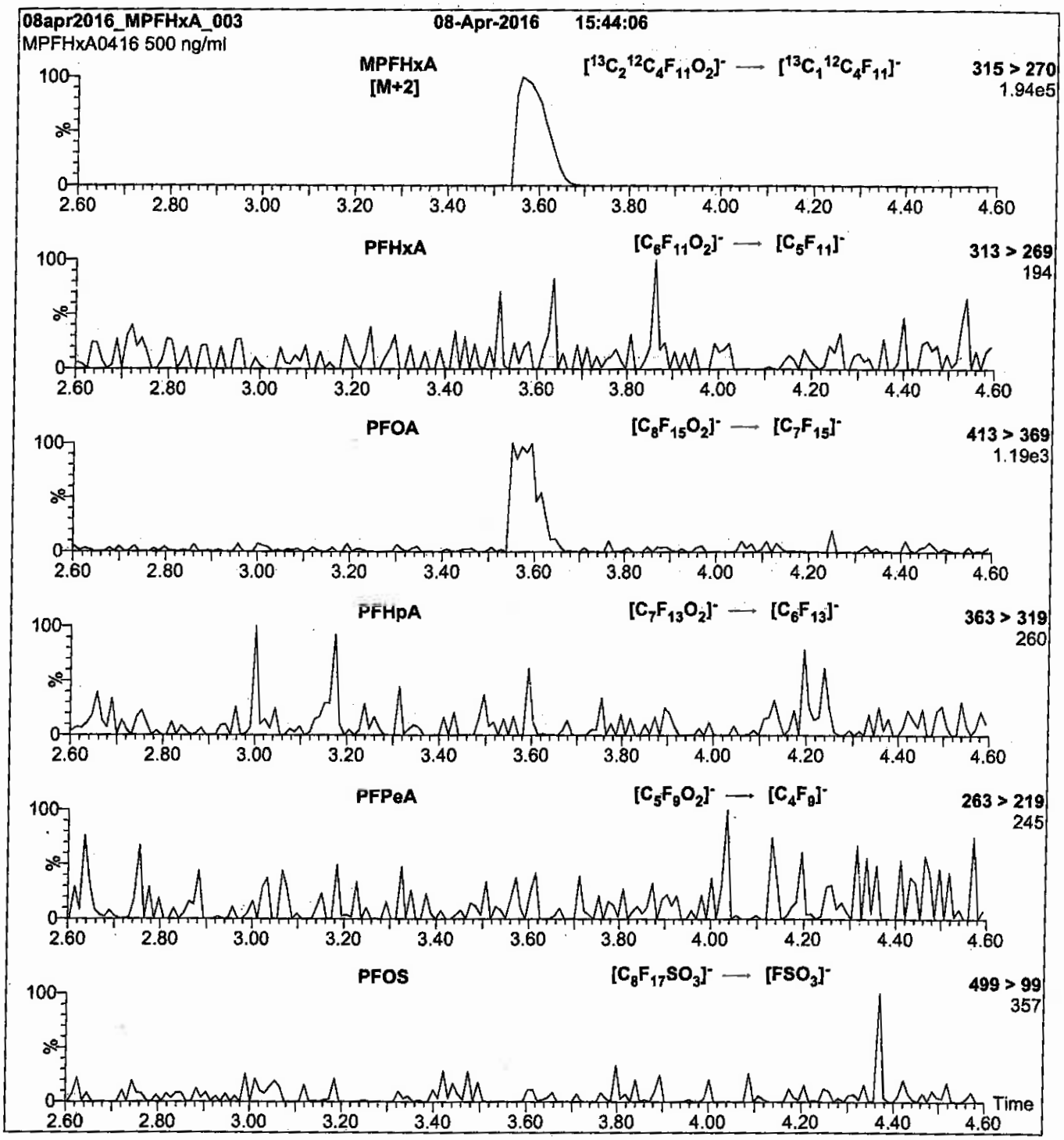
Flow: 300 µl/min

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 µl/min

MS Parameters

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

Reagent

LCMPFOS_00019

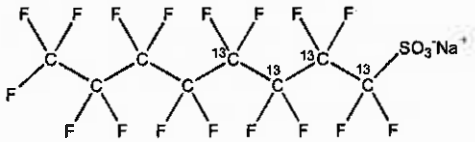
R: SBC 12/21/16

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFOS	**LOT NUMBER:**	MPFOS0816
COMPOUND:	Sodium perfluoro-1-[1,2,3,4-$^{13}C_4$]octanesulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	526.08
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4$-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	08/03/2016		
EXPIRY DATE: (mm/dd/yyyy)	08/03/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.8% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 ±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:

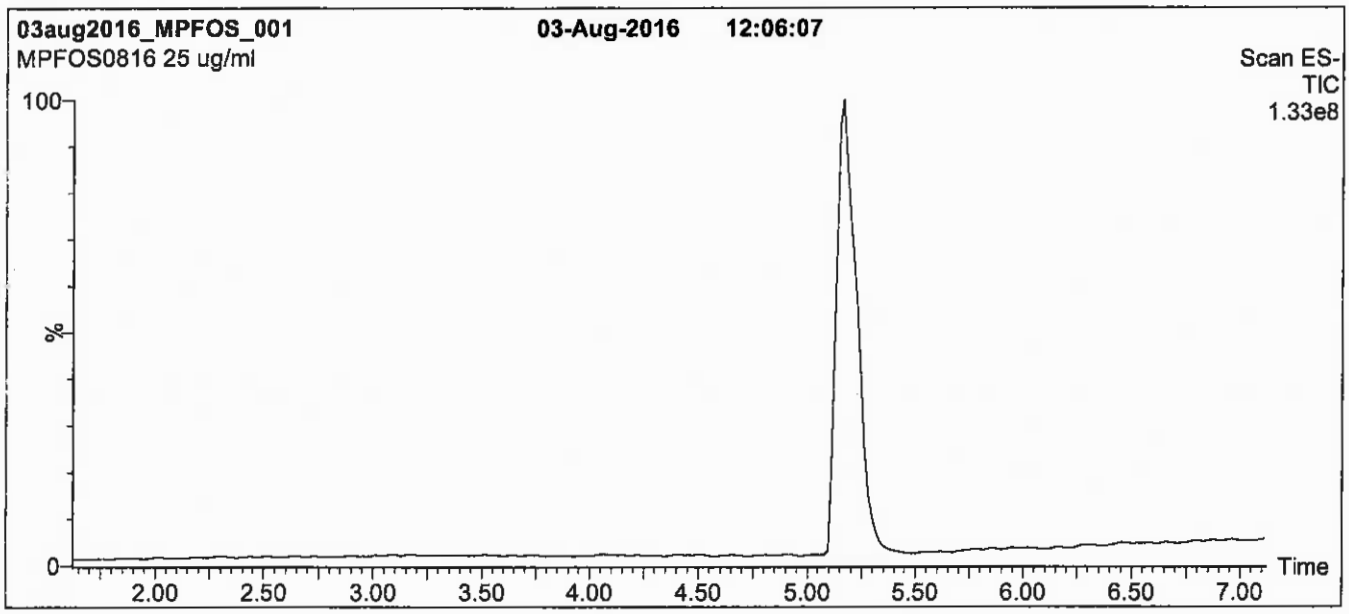
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

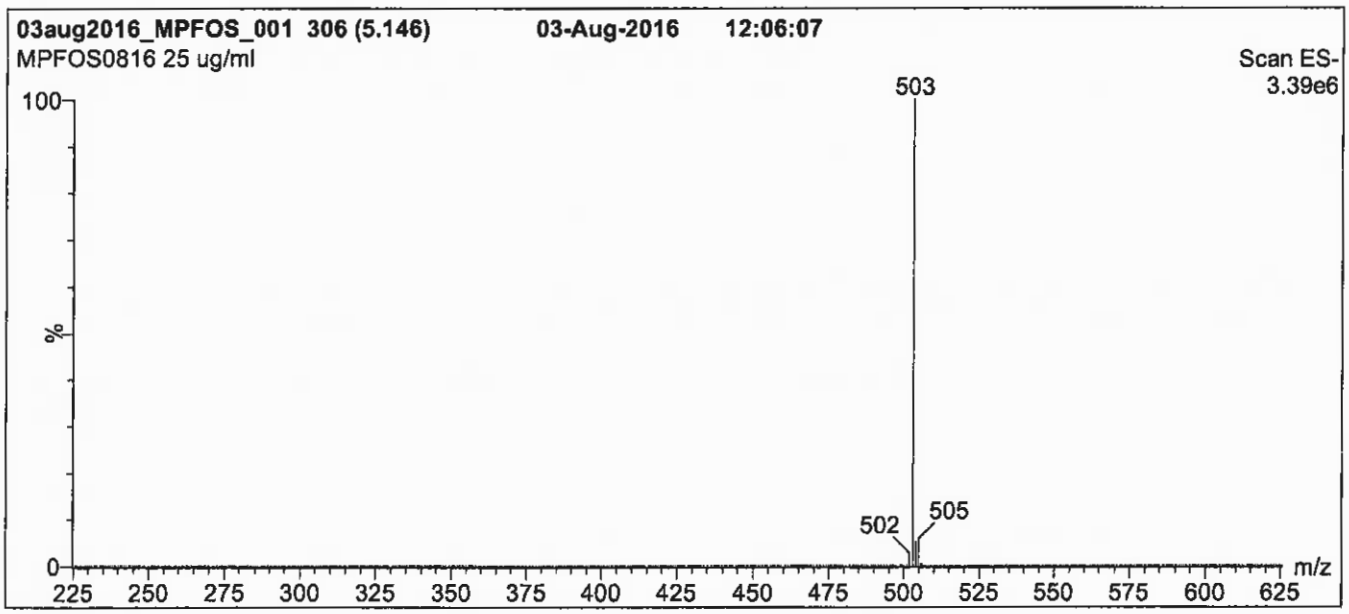
CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc 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

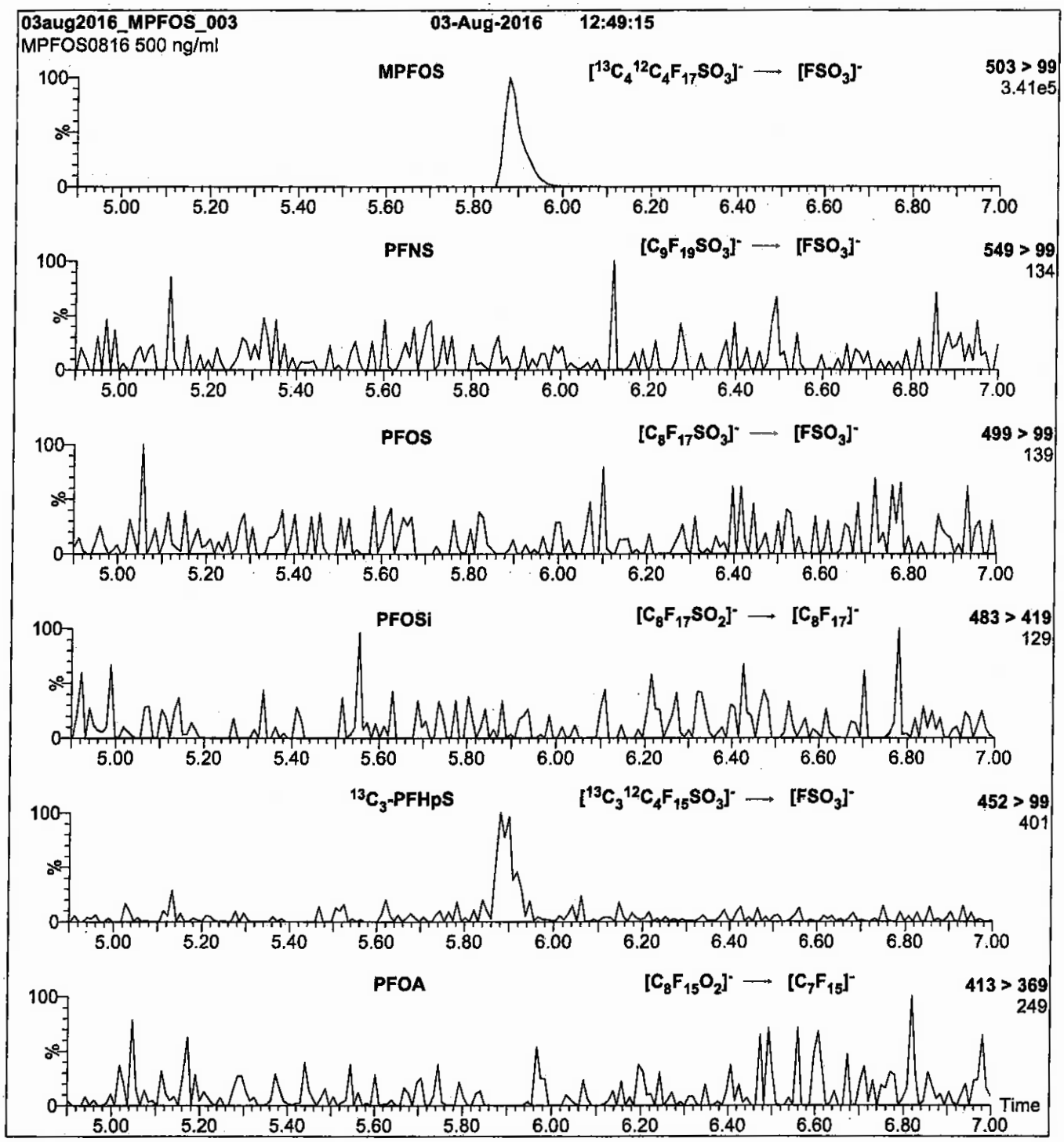
Flow: 300 µl/min

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 µl/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.: 320-29503-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-062617-RW-032	320-29503-1	64 Q	98
NAWC-062617-FRB-032	320-29503-2	93	90
	MB 320-173098/1-A	94	99
	LCS 320-173098/2-A	99	99
	LCSD 320-173098/3-A	92	103

	QC LIMITS
PFHxA = 13C2 PFHxA	70-130
PFDA = 13C2 PFDA	70-130

Column to be used to flag recovery values

FORM II 537

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 11JUL2017A6B_027.d

Lab ID: LCS 320-173098/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	300	297	99	70-130	M
Perfluorooctanoic acid (PFOA)	150	145	97	70-130	
Perfluorononanoic acid (PFNA)	144	133	92	70-130	
Perfluorohexanesulfonic acid (PFHxS)	225	215	95	70-130	M
Perfluoroheptanoic acid (PFHpA)	74.3	82.6	111	70-130	E
Perfluorobutanesulfonic acid (PFBS)	663	631	95	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 11JUL2017A6B_028.d

Lab ID: LCSD 320-173098/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	300	303	101	2	30	70-130	M
Perfluorooctanoic acid (PFOA)	150	153	102	5	30	70-130	
Perfluorononanoic acid (PFNA)	144	144	100	8	30	70-130	M
Perfluorohexanesulfonic acid (PFHxS)	225	214	95	0	30	70-130	M
Perfluoroheptanoic acid (PFHpA)	74.3	83.0	112	1	30	70-130	E
Perfluorobutanesulfonic acid (PFBS)	663	657	99	4	30	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Lab File ID: 11JUL2017A6B_026.d Lab Sample ID: MB 320-173098/1-A

Matrix: Water Date Extracted: 07/08/2017 09:00

Instrument ID: A6 Date Analyzed: 07/11/2017 17:12

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-173098/2-A	11JUL2017A6B_027.d	07/11/2017 17:22
	LCSD 320-173098/3-A	11JUL2017A6B_028.d	07/11/2017 17:31
NAWC-062617-RW-032	320-29503-1	11JUL2017A6B_029.d	07/11/2017 17:40
NAWC-062617-FRB-032	320-29503-2	11JUL2017A6B_030.d	07/11/2017 17:49

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Instrument ID: A6 Calibration Start Date: 07/11/2017 14:18

GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 07/11/2017 15:05

Calibration ID: 32318

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		450436	3.41	941742	3.83		
UPPER LIMIT		675654	3.91	1412613	4.33		
LOWER LIMIT		225218	2.91	470871	3.33		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 320-173534/14		427789	3.41	968938	3.82		
ICV 320-173534/16		465673	3.41	985132	3.81		
CCV 320-173554/24 CCVIS		472036	3.40	1003613	3.81		
MB 320-173098/1-A		471647	3.40	1099502	3.81		
LCS 320-173098/2-A		466257	3.40	993569	3.81		
LCSD 320-173098/3-A		441160	3.40	964865	3.80		
320-29503-1	NAWC-062617-RW-032	426700	3.41	1051478	3.81		
320-29503-2	NAWC-062617-FRB-032	479570	3.41	1083101	3.81		
CCV 320-173554/34 CCVIS		479097	3.41	1044247	3.81		

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

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Sample No.: CCV 320-173554/24 Date Analyzed: 07/11/2017 16:54

Instrument ID: A6 GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 11JUL2017A6B_024.d Heated Purge: (Y/N) N

Calibration ID: 32318

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		472036	3.40	1003613	3.81		
UPPER LIMIT		660850	3.90	1405058	4.31		
LOWER LIMIT		330425	2.90	702529	3.31		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-173098/1-A		471647	3.40	1099502	3.81		
LCS 320-173098/2-A		466257	3.40	993569	3.81		
LCSD 320-173098/3-A		441160	3.40	964865	3.80		
320-29503-1	NAWC-062617-RW-032	426700	3.41	1051478	3.81		
320-29503-2	NAWC-062617-FRB-032	479570	3.41	1083101	3.81		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Sample No.: CCV 320-173554/34 Date Analyzed: 07/11/2017 18:25

Instrument ID: A6 GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 11JUL2017A6B_034.d Heated Purge: (Y/N) N

Calibration ID: 32318

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		479097	3.41	1044247	3.81		
UPPER LIMIT		670736	3.91	1461946	4.31		
LOWER LIMIT		335368	2.91	730973	3.31		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-173098/1-A		471647	3.40	1099502	3.81		
LCS 320-173098/2-A		466257	3.40	993569	3.81		
LCSD 320-173098/3-A		441160	3.40	964865	3.80		
320-29503-1	NAWC-062617-RW-032	426700	3.41	1051478	3.81		
320-29503-2	NAWC-062617-FRB-032	479570	3.41	1083101	3.81		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Client Sample ID: NAWC-062617-RW-032 Lab Sample ID: 320-29503-1

Matrix: Water Lab File ID: 11JUL2017A6B_029.d

Analysis Method: 537 Date Collected: 06/27/2017 09:15

Extraction Method: 537 Date Extracted: 07/08/2017 09:00

Sample wt/vol: 258.8(mL) Date Analyzed: 07/11/2017 17:40

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.: 173554 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J M	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	16	J M	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	13	J M	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.4	J	9.7	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U M	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	64	Q	70-130
STL00996	13C2 PFDA	98		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_029.d
Lims ID: 320-29503-A-1-A
Client ID: NAWC-062617-RW-032
Sample Type: Client
Inject. Date: 11-Jul-2017 17:40:20 ALS Bottle#: 8 Worklist Smp#: 29
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 320-29503-a-1-a
Misc. Info.: Gemini C18, 3um, 2X50mm , T=35*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 12-Jul-2017 10:03:53 Calib Date: 11-Jul-2017 15:05:33
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK019

First Level Reviewer: barnettj Date: 12-Jul-2017 09:50:48

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								M
299.0 > 80.0	2.452	2.442	0.010	1.000	46691	1.59	536	M
$ 2 13C2 PFHxA								
315.0 > 270.0	2.744	2.733	0.011	1.000	382066	6.39	420	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.060	3.060	0.0	1.000	69958	1.41	130	
3 Perfluorohexanesulfonic acid								M
399.0 > 80.0	3.071	3.071	0.0	1.000	102622	3.49	493	M
* 5 13C2-PFOA								
415.0 > 370.0	3.408	3.411	-0.003		426700	10.0	479	
6 Perfluorooctanoic acid								M
413.0 > 369.0	3.408	3.413	-0.005	1.000	188078	4.04	256	M
* 8 13C4 PFOS								
503.0 > 80.0	3.805	3.830	-0.025		1051478	28.7	602	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.805	3.835	-0.030	1.000	181089	4.87	4558	M
9 Perfluorononanoic acid								
463.0 > 419.0	3.817	3.842	-0.025	1.000	28175	0.5379	11.4	
$ 10 13C2 PFDA								
515.0 > 470.0	4.415	4.465	-0.050	1.000	430324	9.84	893	

QC Flag Legend

Review Flags
M - Manually Integrated

Report Date: 12-Jul-2017 10:04:10 Chrom Revision: 2.2 26-Jun-2017 08:09:44

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_029.d

Injection Date: 11-Jul-2017 17:40:20 Instrument ID: A6

Lims ID: 320-29503-A-1-A Lab Sample ID: 320-29503-1

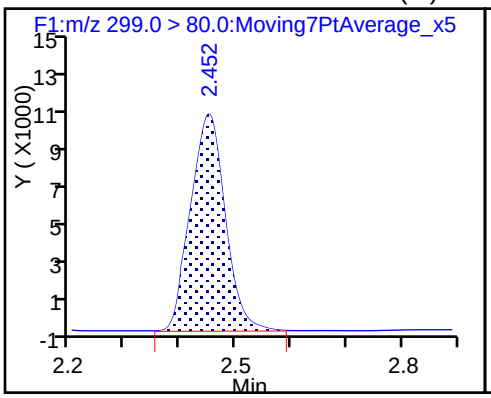
Client ID: NAWC-062617-RW-032

Operator ID: JRB ALS Bottle#: 8 Worklist Smp#: 29

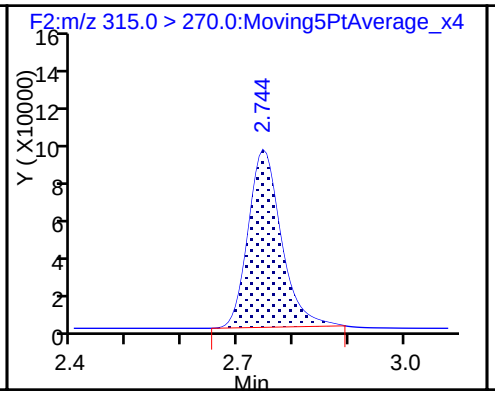
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

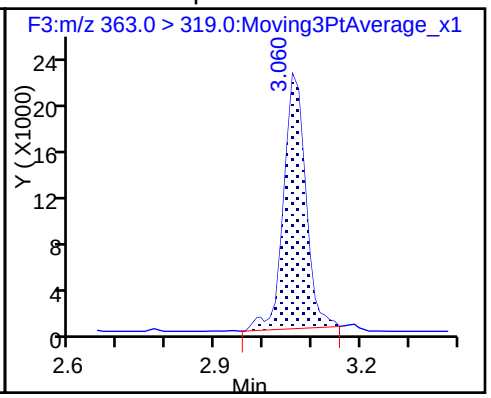
1 Perfluorobutanesulfonic acid (M)



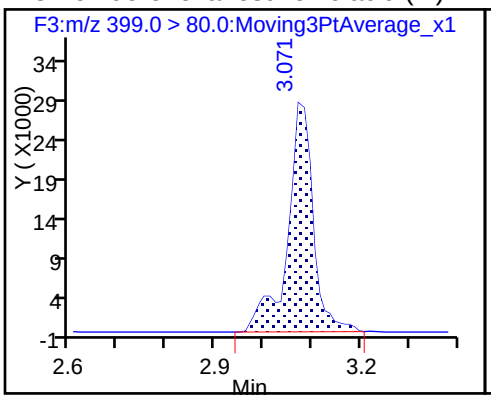
$ 2 13C2 PFHxA



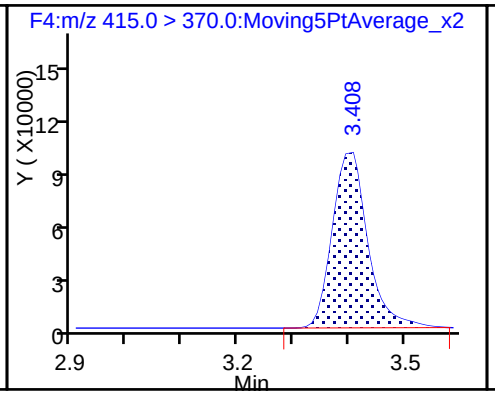
4 Perfluoroheptanoic acid



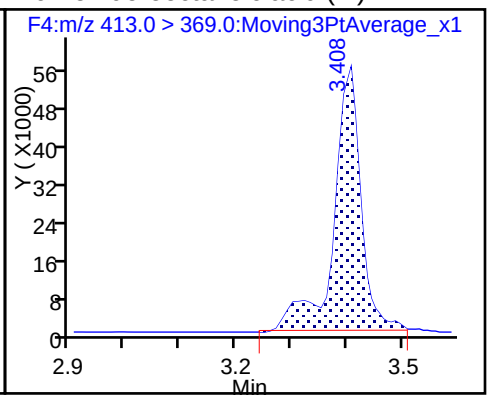
3 Perfluorohexanesulfonic acid (M)



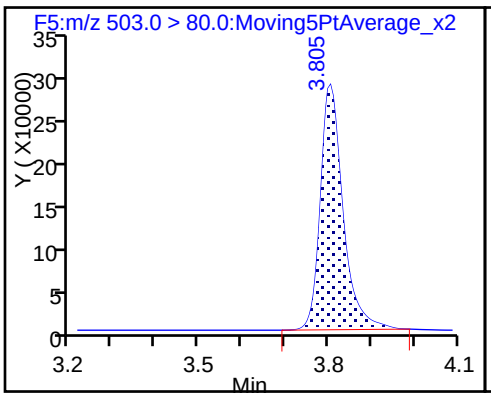
* 5 13C2-PFOA



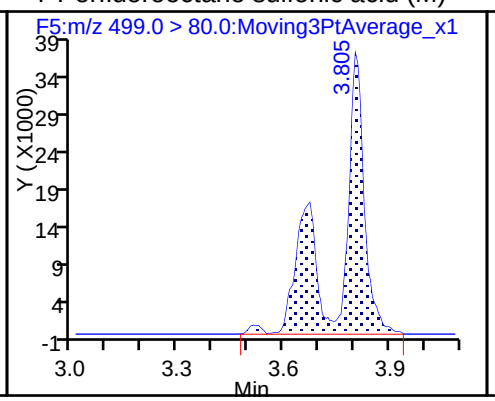
6 Perfluorooctanoic acid (M)



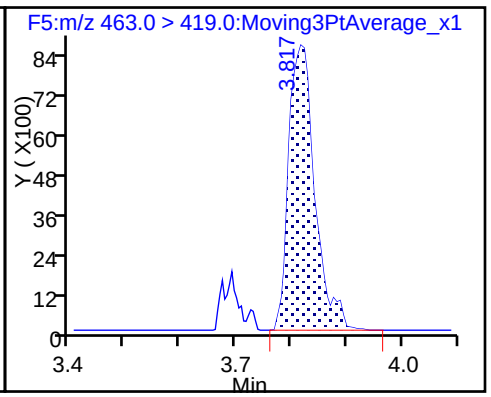
* 8 13C4 PFOS



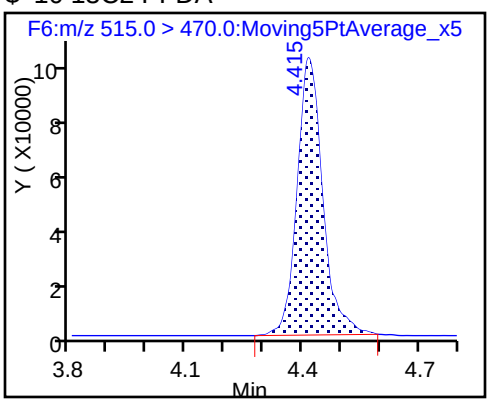
7 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid



$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_029.d
Lims ID: 320-29503-A-1-A
Client ID: NAWC-062617-RW-032
Sample Type: Client
Inject. Date: 11-Jul-2017 17:40:20 ALS Bottle#: 8 Worklist Smp#: 29
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 320-29503-a-1-a
Misc. Info.: Gemini C18, 3um, 2X50mm , T=35*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 12-Jul-2017 10:03:53 Calib Date: 11-Jul-2017 15:05:33
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK019

First Level Reviewer: barnettj Date: 12-Jul-2017 09:50:48

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	6.39	63.88
$ 10 13C2 PFDA	10.0	9.84	98.39

TestAmerica Sacramento

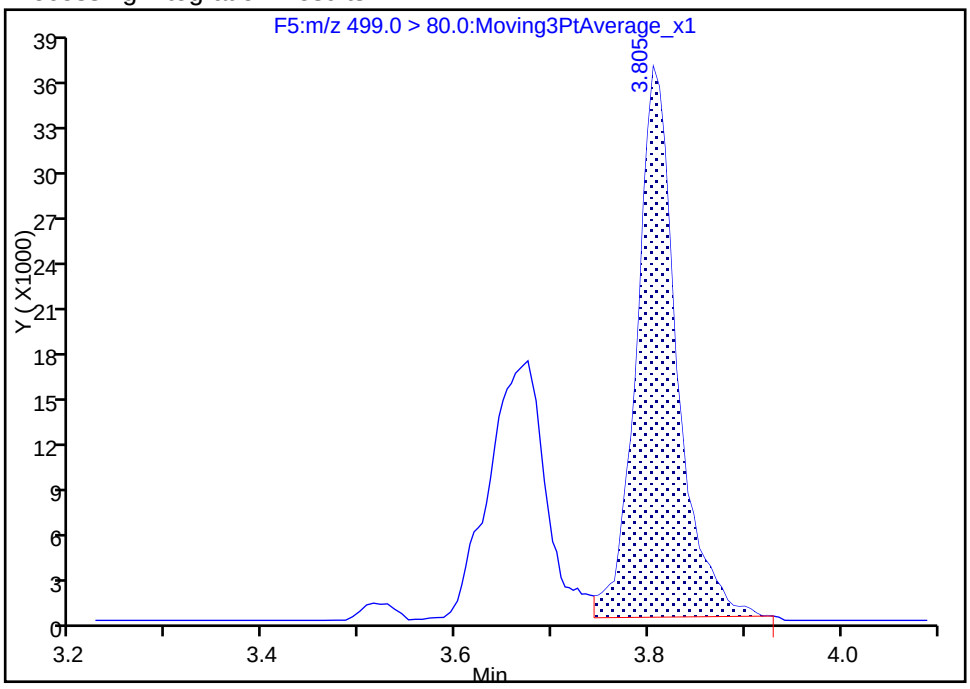
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_029.d
Injection Date: 11-Jul-2017 17:40:20 Instrument ID: A6
Lims ID: 320-29503-A-1-A Lab Sample ID: 320-29503-1
Client ID: NAWC-062617-RW-032
Operator ID: JRB ALS Bottle#: 8 Worklist Smp#: 29
Injection Vol: 10.0 ul Dil. Factor: 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

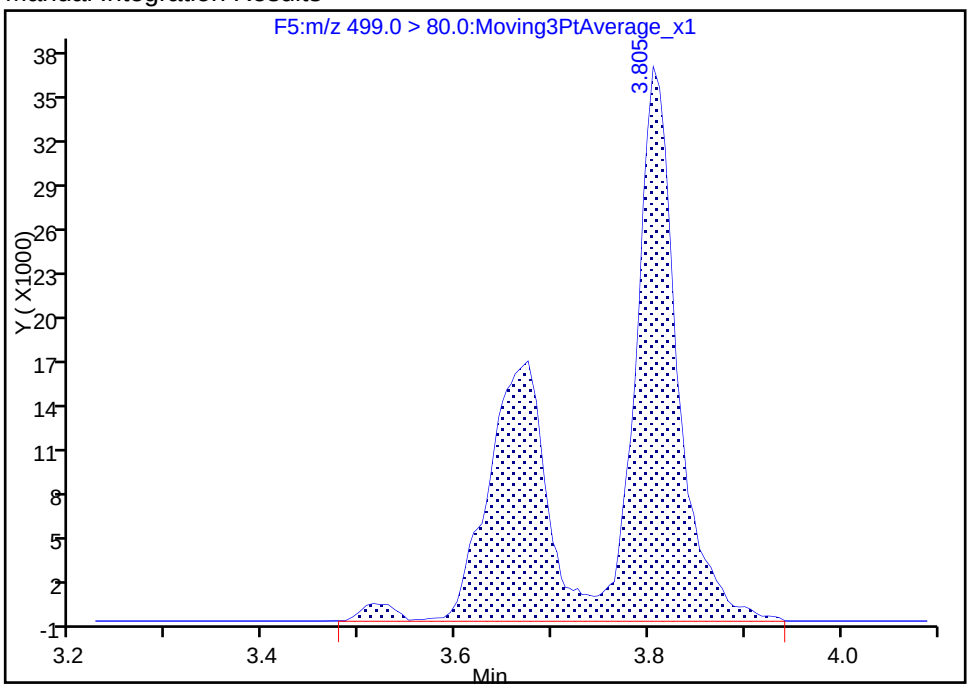
Processing Integration Results

RT: 3.81
Area: 105027
Amount: 2.822576
Amount Units: ng/ml



Manual Integration Results

RT: 3.81
Area: 181089
Amount: 4.866725
Amount Units: ng/ml



Reviewer: barnettj, 12-Jul-2017 09:50:34
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

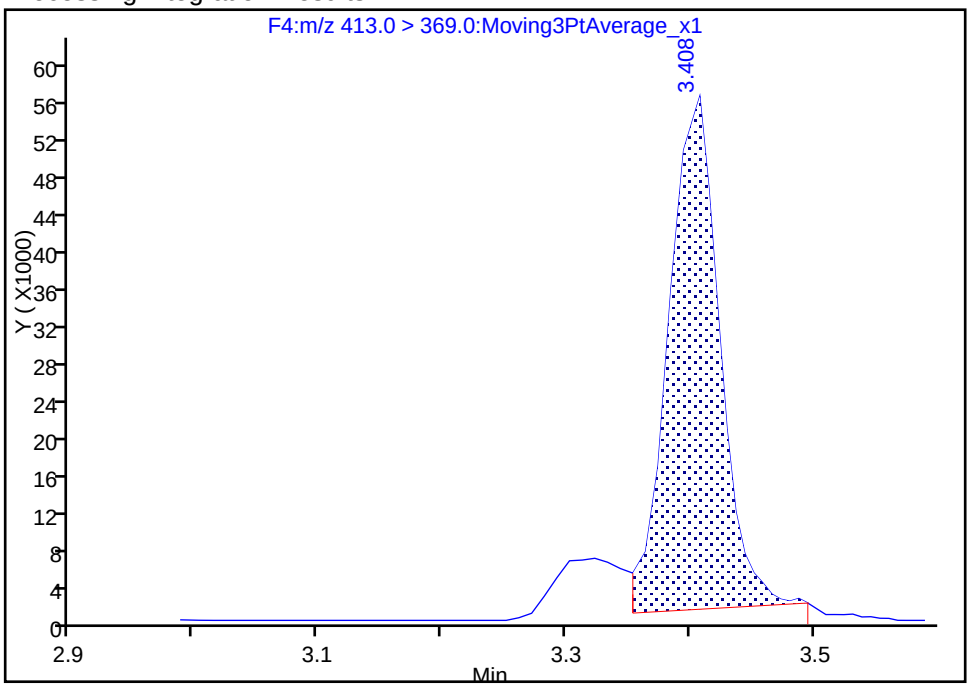
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_029.d
Injection Date: 11-Jul-2017 17:40:20 Instrument ID: A6
Lims ID: 320-29503-A-1-A Lab Sample ID: 320-29503-1
Client ID: NAWC-062617-RW-032
Operator ID: JRB ALS Bottle#: 8 Worklist Smp#: 29
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F4:MRM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

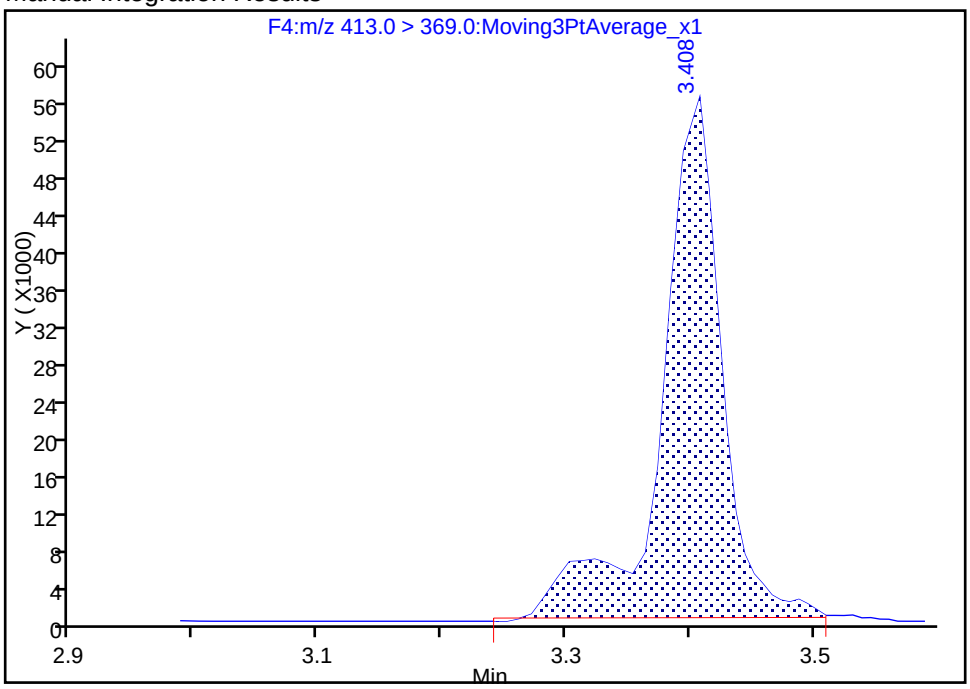
Processing Integration Results

RT: 3.41
Area: 156253
Amount: 3.360280
Amount Units: ng/ml



Manual Integration Results

RT: 3.41
Area: 188078
Amount: 4.044689
Amount Units: ng/ml



Reviewer: barnettj, 12-Jul-2017 09:50:21
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

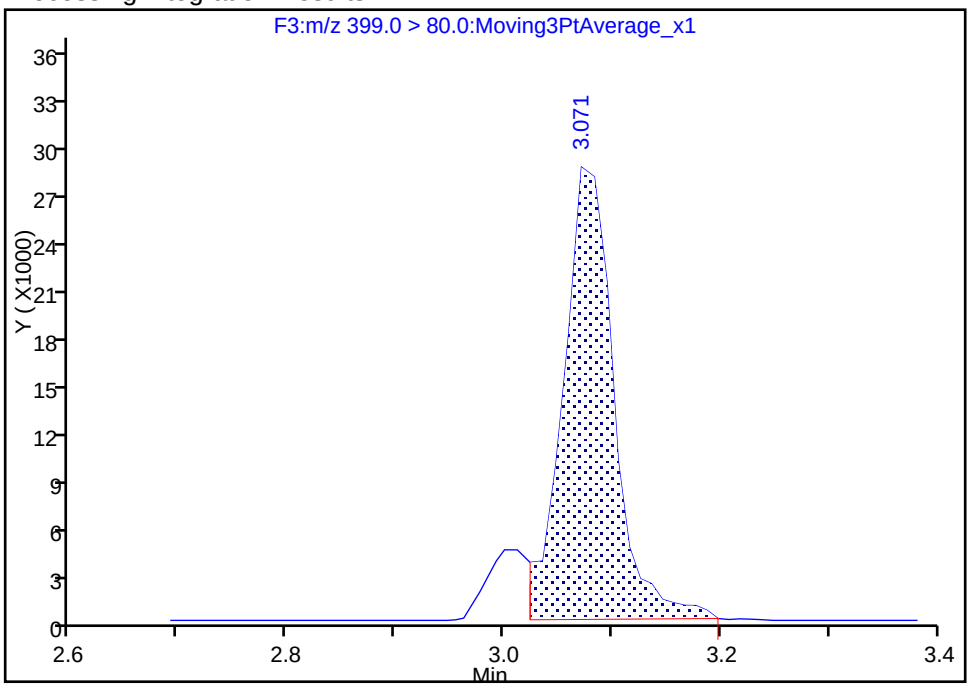
Data File:	\\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_029.d				
Injection Date:	11-Jul-2017 17:40:20	Instrument ID:	A6		
Lims ID:	320-29503-A-1-A	Lab Sample ID:	320-29503-1		
Client ID:	NAWC-062617-RW-032				
Operator ID:	JRB	ALS Bottle#:	8	Worklist Smp#:	29
Injection Vol:	10.0 ul	Dil. Factor:	1.0000		
Method:	537__A6	Limit Group:	LC 537 ICAL		
Column:	Gemini C18 3um 3 x 100mm (3.00 mm)	Detector	F3:MRM		

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

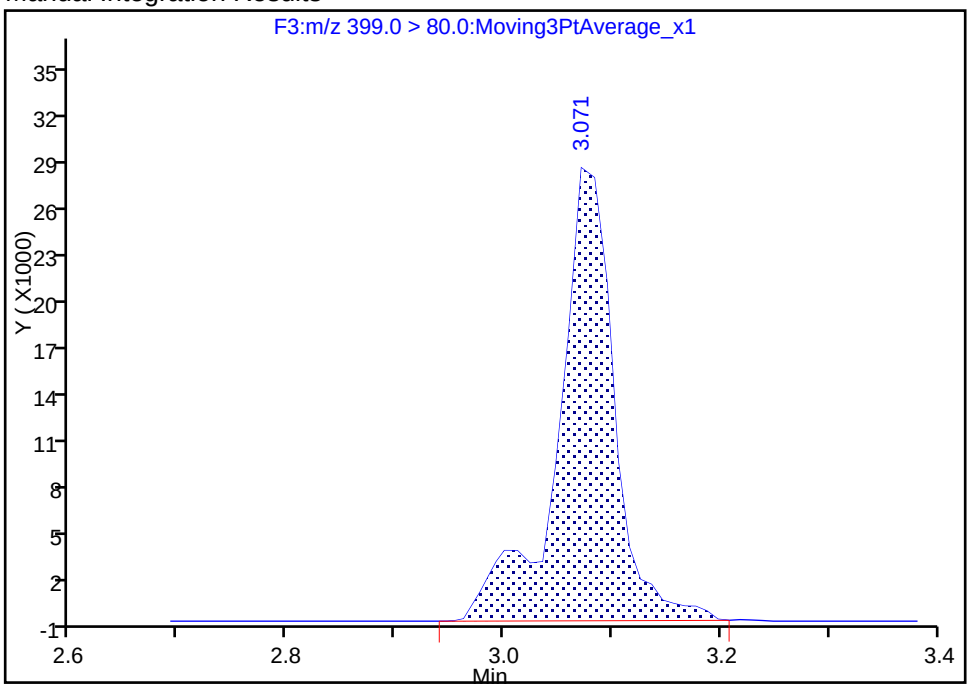
Processing Integration Results

RT: 3.07
Area: 90981
Amount: 3.097343
Amount Units: ng/ml



Manual Integration Results

RT: 3.07
Area: 102622
Amount: 3.493647
Amount Units: ng/ml



Reviewer: barnettj, 12-Jul-2017 09:50:01

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

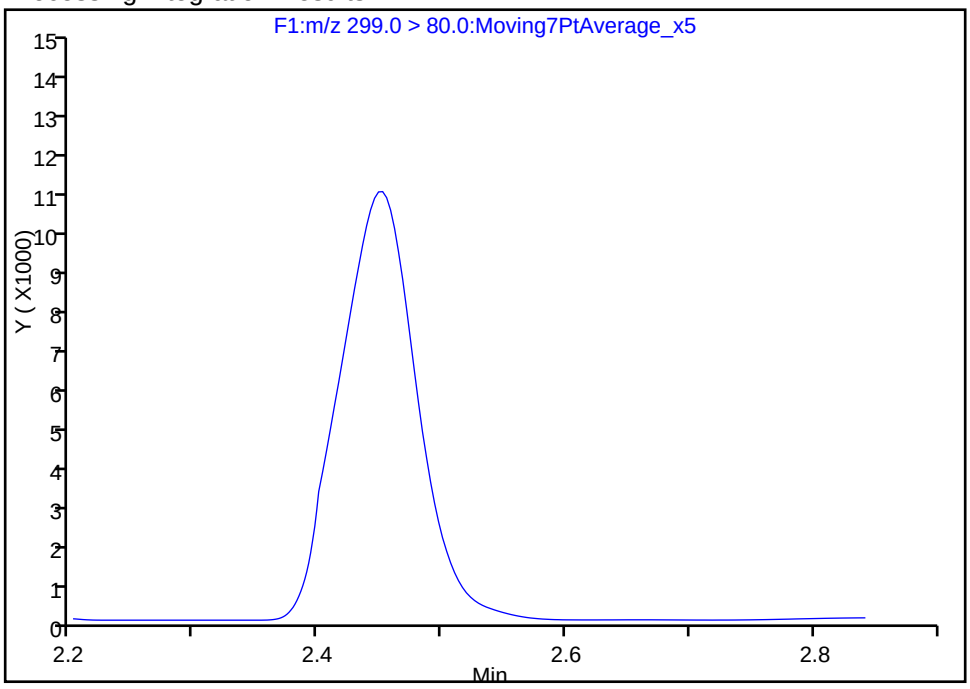
Data File:	\\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_029.d				
Injection Date:	11-Jul-2017 17:40:20	Instrument ID:	A6		
Lims ID:	320-29503-A-1-A	Lab Sample ID:	320-29503-1		
Client ID:	NAWC-062617-RW-032				
Operator ID:	JRB	ALS Bottle#:	8	Worklist Smp#:	29
Injection Vol:	10.0 ul	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

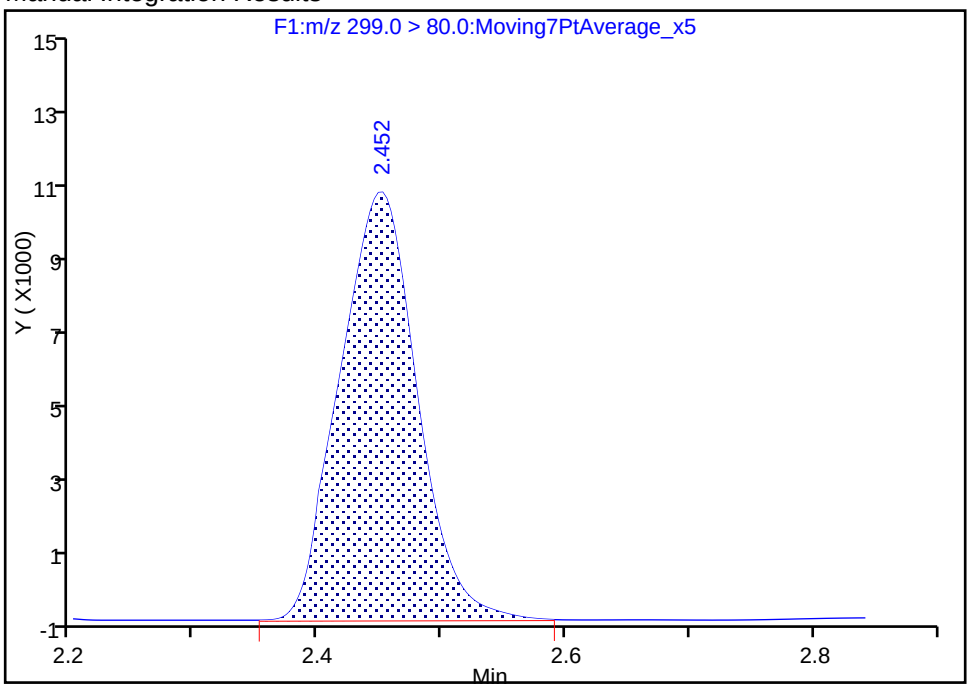
Processing Integration Results

Not Detected
Expected RT: 2.44



Manual Integration Results

RT: 2.45
Area: 46691
Amount: 1.589950
Amount Units: ng/ml



Reviewer: barnettj, 12-Jul-2017 09:49:25
Audit Action: Manually Integrated Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-29503-1

SDG No.:

Client Sample ID: NAWC-062617-FRB-032 | Lab Sample ID: 320-29503-2

Matrix: Water | Lab File ID: 11JUL2017A6B_030.d

Analysis Method: 537 | Date Collected: 06/27/2017 09:10

Extraction Method: 537 | Date Extracted: 07/08/2017 09:00

Sample wt/vol: 271.4(mL) | Date Analyzed: 07/11/2017 17:49

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.: 173554 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	37	15	6.3
335-67-1	Perfluorooctanoic acid (PFOA)	7.4	U	18	7.4	2.6
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.4
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.7	U	9.2	3.7	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33	U	83	33	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	90		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File:	\\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_030.d				
Lims ID:	320-29503-B-2-A				
Client ID:	NAWC-062617-FRB-032				
Sample Type:	Client				
Inject. Date:	11-Jul-2017 17:49:28	ALS Bottle#:	9	Worklist Smp#:	30
Injection Vol:	10.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-29503-b-2-a				
Misc. Info.:	Gemini C18, 3um, 2X50mm , T=35*C				
Operator ID:	JRB	Instrument ID:	A6		
Method:	\\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\537__A6.m				
Limit Group:	LC 537 ICAL				
Last Update:	12-Jul-2017 10:03:53	Calib Date:	11-Jul-2017 15:05:33		
Integrator:	Picker				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d				
Column 1 :	Gemini C18 3um 3 x 100mm (3.00 mm)		Det: F1:MRM		
Process Host:	XAWRK019				

First Level Reviewer: barnettj Date: 12-Jul-2017 09:51:11

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
$ 2 13C2 PFHxA								
315.0 > 270.0	2.744	2.733	0.011	1.000	622458	9.26	711	
* 5 13C2-PFOA								
415.0 > 370.0	3.408	3.411	-0.003		479570	10.0	2188	
* 8 13C4 PFOS								
503.0 > 80.0	3.805	3.830	-0.025		1083101	28.7	396	
$ 10 13C2 PFDA								
515.0 > 470.0	4.414	4.465	-0.051	1.000	441656	8.98	3769	

Report Date: 12-Jul-2017 10:04:11 Chrom Revision: 2.2 26-Jun-2017 08:09:44

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_030.d

Injection Date: 11-Jul-2017 17:49:28 Instrument ID: A6

Lims ID: 320-29503-B-2-A Lab Sample ID: 320-29503-2

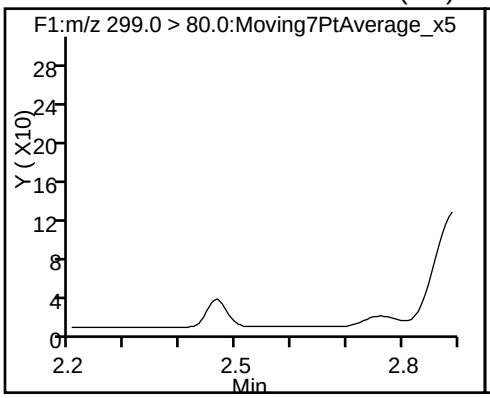
Client ID: NAWC-062617-FRB-032

Operator ID: JRB ALS Bottle#: 9 Worklist Smp#: 30

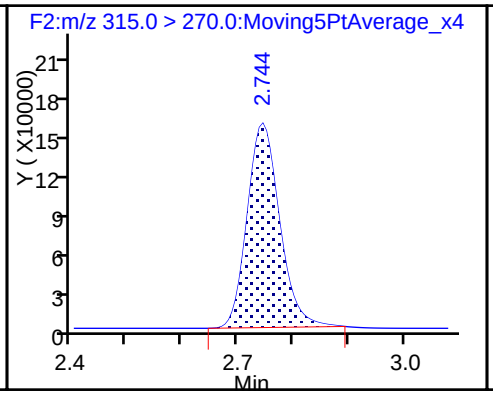
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

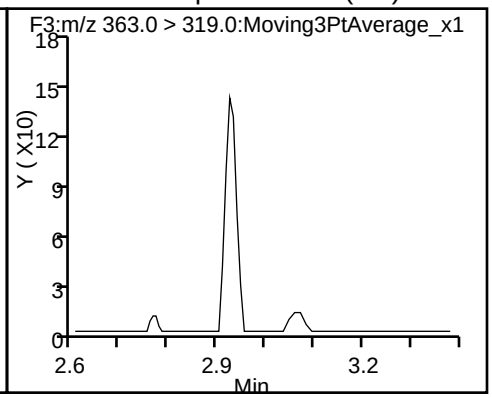
1 Perfluorobutanesulfonic acid (ND)



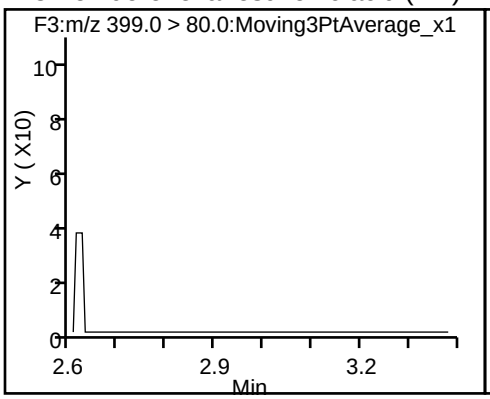
$ 2 13C2 PFHxA



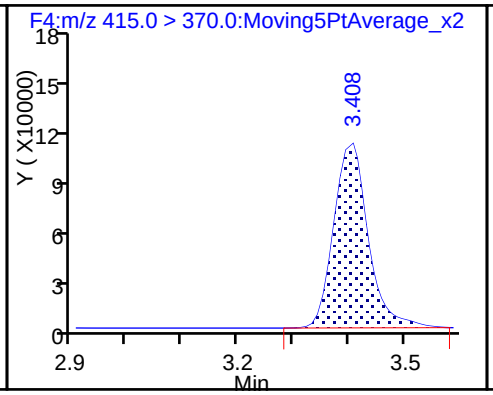
4 Perfluoroheptanoic acid (ND)



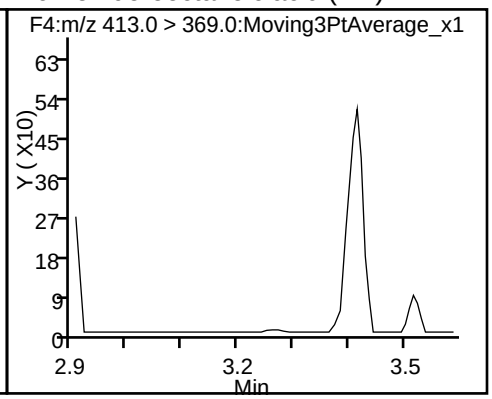
3 Perfluorohexanesulfonic acid (ND)



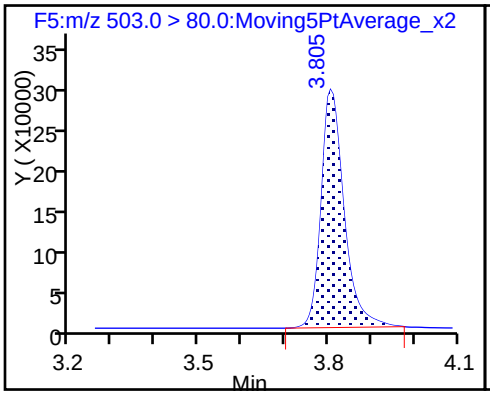
* 5 13C2-PFOA



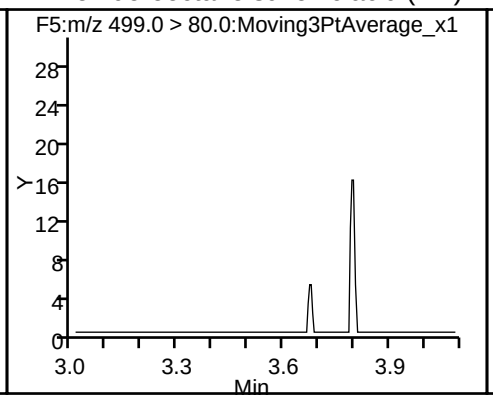
6 Perfluorooctanoic acid (ND)



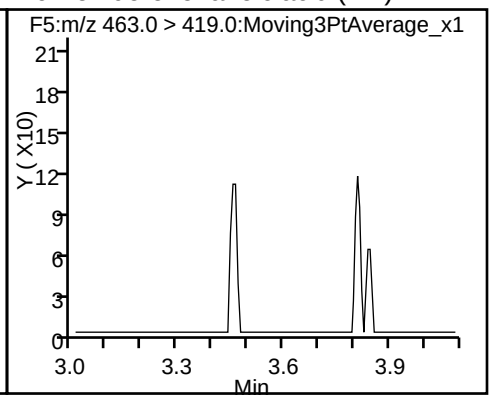
* 8 13C4 PFOS



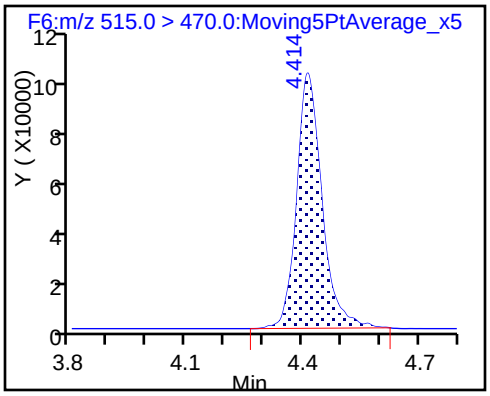
7 Perfluorooctane sulfonic acid (ND)



9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_030.d
Lims ID: 320-29503-B-2-A
Client ID: NAWC-062617-FRB-032
Sample Type: Client
Inject. Date: 11-Jul-2017 17:49:28 ALS Bottle#: 9 Worklist Smp#: 30
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 320-29503-b-2-a
Misc. Info.: Gemini C18, 3um, 2X50mm , T=35*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 12-Jul-2017 10:03:53 Calib Date: 11-Jul-2017 15:05:33
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK019

First Level Reviewer: barnettj Date: 12-Jul-2017 09:51:11

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	9.26	92.59
$ 10 13C2 PFDA	10.0	8.98	89.85

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

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1 Analy Batch No.: 173534

SDG No.:

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

Calibration Start Date: 07/11/2017 14:18 Calibration End Date: 07/11/2017 15:05 Calibration ID: 32318

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-173534/7	11JUL2017A6B_007.d
Level 2	STD 320-173534/8	11JUL2017A6B_008.d
Level 3	STD 320-173534/9	11JUL2017A6B_009.d
Level 4	STD 320-173534/10	11JUL2017A6B_010.d
Level 5	STD 320-173534/11	11JUL2017A6B_011.d
Level 6	STD 320-173534/12	11JUL2017A6B_012.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)	0.7749 0.8618	0.7766	0.7594	0.8073	0.8259	Ave		0.8010				4.8		30.0			
Perfluoroheptanoic acid (PFHpA)	1.1363 1.1338	1.1029	1.1533	1.2571	1.2026	Ave		1.1643				4.8		30.0			
Perfluorohexanesulfonic acid (PFHxS)	0.7347 0.9646	0.8116	0.6871	0.7955	0.8137	Ave		0.8012				11.8		30.0			
Perfluorooctanoic acid (PFOA)	0.9900 1.1908	1.0617	1.1075	1.1164	1.0721	Ave		1.0898				6.1		30.0			
Perfluorooctanesulfonic acid (PFOS)	0.8857 1.1433	0.9839	0.9996	0.9975	1.0796	Ave		1.0149				8.7		30.0			
Perfluorononanoic acid (PFNA)	1.2732 1.1319	1.2394	1.2801	1.2530	1.1883	Ave		1.2277				4.7		30.0			
13C2 PFHxA	1.4739 1.4411	1.3152	1.4752	1.4134	1.2918	Ave		1.4018				5.7		30.0			
13C2 PFDA	1.0447 1.0450	0.9322	1.0778	1.0654	0.9849	Ave		1.0250				5.4		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.: 320-29503-1 Analy Batch No.: 173534

SDG No.:

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

Calibration Start Date: 07/11/2017 14:18 Calibration End Date: 07/11/2017 15:05 Calibration ID: 32318

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-173534/7	11JUL2017A6B_007.d
Level 2	STD 320-173534/8	11JUL2017A6B_008.d
Level 3	STD 320-173534/9	11JUL2017A6B_009.d
Level 4	STD 320-173534/10	11JUL2017A6B_010.d
Level 5	STD 320-173534/11	11JUL2017A6B_011.d
Level 6	STD 320-173534/12	11JUL2017A6B_012.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	224824 4732899	543185	1163511	2360302	3579670	8.83 176	21.2	44.4	89.4	133
Perfluoroheptanoic acid (PFHpA)	13PFOA	Ave	46641 1046972	119710	257968	551247	847873	0.990 19.7	2.38	4.97	10.0	14.9
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	72532 1802638	193156	358215	791471	1199989	3.01 59.7	7.21	15.1	30.4	45.1
Perfluorooctanoic acid (PFOA)	13PFOA	Ave	82014 2219289	232563	499953	988038	1525464	2.00 39.7	4.80	10.0	20.2	30.0
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	116446 2845332	311845	694018	1321595	2120345	4.00 79.6	9.61	20.1	40.5	60.0
Perfluorononanoic acid (PFNA)	13PFOA	Ave	101669 2033486	261713	557035	1068968	1629901	1.93 38.3	4.62	9.68	19.5	28.9
13C2 PFHxA	13PFOA	Ave	611112 676347	600819	663271	618332	613307	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PFOA	Ave	433139 490441	425840	484590	466074	467617	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.: 320-29503-1 Analy Batch No.: 173534

SDG No.:

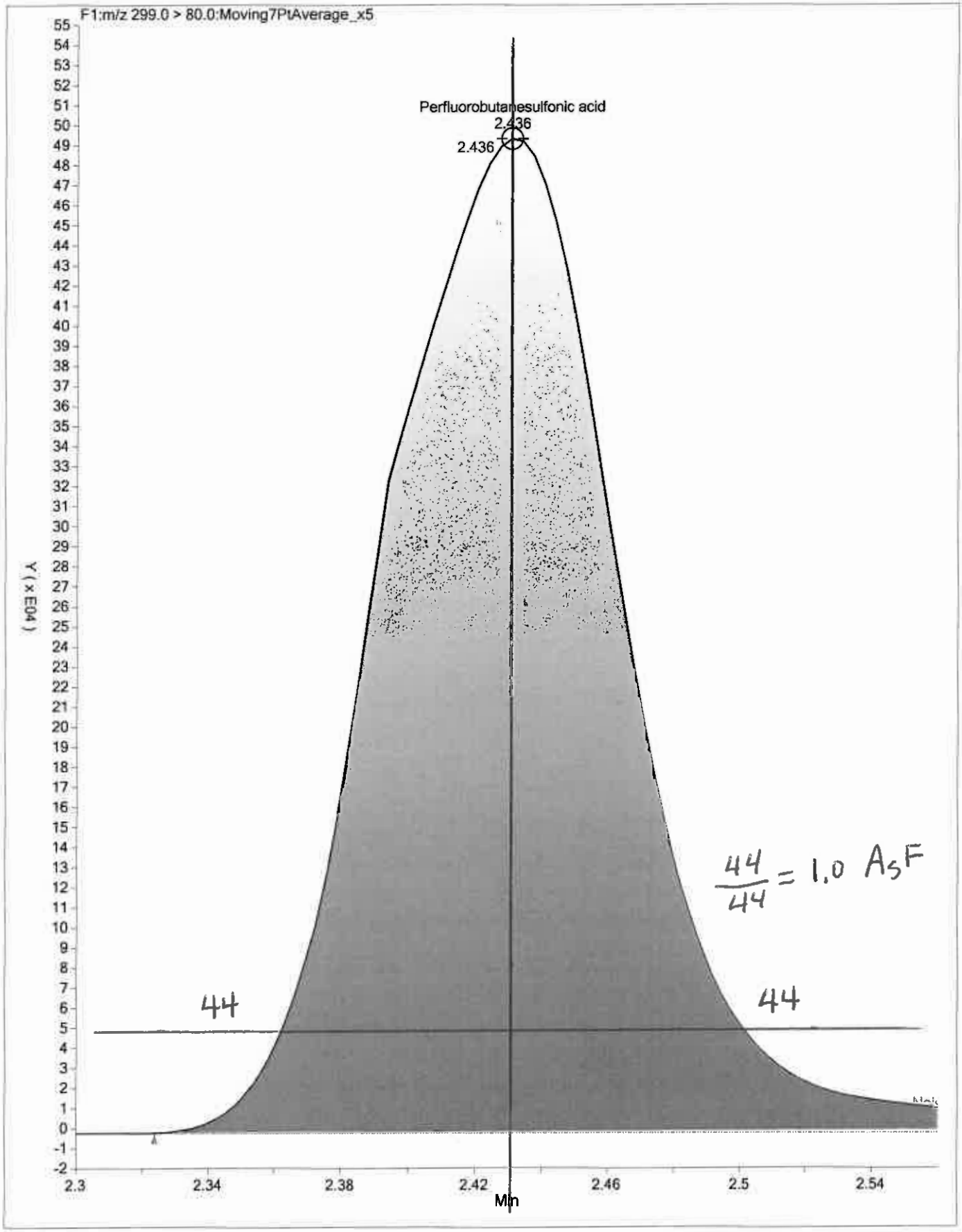
Instrument ID: A6 GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

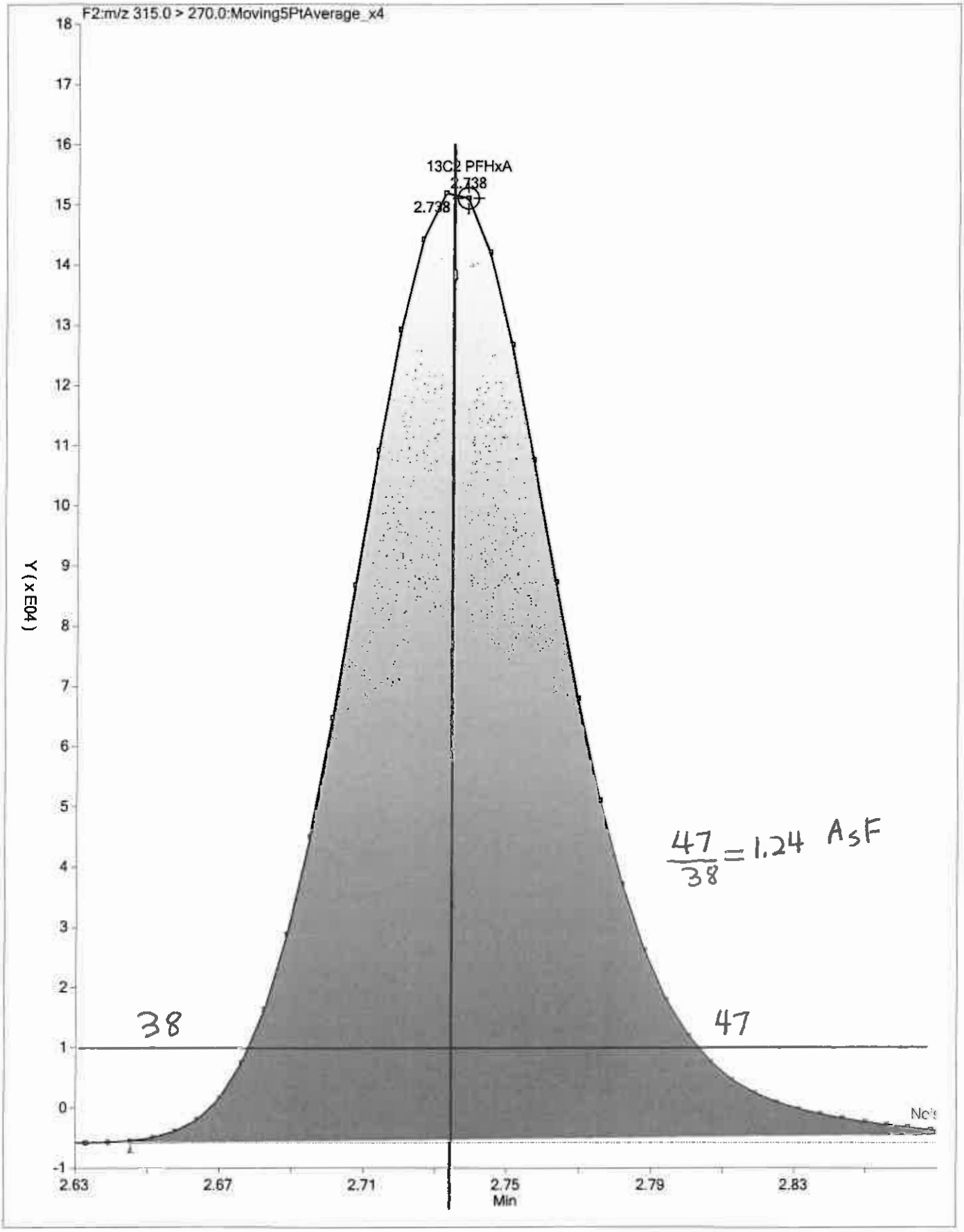
Calibration Start Date: 07/11/2017 14:18 Calibration End Date: 07/11/2017 15:05 Calibration ID: 32318

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-173534/7	11JUL2017A6B_007.d
Level 2	STD 320-173534/8	11JUL2017A6B_008.d
Level 3	STD 320-173534/9	11JUL2017A6B_009.d
Level 4	STD 320-173534/10	11JUL2017A6B_010.d
Level 5	STD 320-173534/11	11JUL2017A6B_011.d
Level 6	STD 320-173534/12	11JUL2017A6B_012.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)	-3.3	-3.0	-5.2	0.8	3.1	7.6	50	50	50	50	50	50
Perfluoroheptanoic acid (PFHpA)	-2.4	-5.3	-0.9	8.0	3.3	-2.6	50	50	50	50	50	50
Perfluorohexanesulfonic acid (PFHxS)	-8.3	1.3	-14.2	-0.7	1.6	20.4	50	50	50	50	50	50
Perfluorooctanoic acid (PFOA)	-9.2	-2.6	1.6	2.4	-1.6	9.3	50	50	50	50	50	50
Perfluorooctanesulfonic acid (PFOS)	-12.7	-3.1	-1.5	-1.7	6.4	12.7	50	50	50	50	50	50
Perfluorononanoic acid (PFNA)	3.7	1.0	4.3	2.1	-3.2	-7.8	50	50	50	50	50	50
13C2 PFHxA	5.1	-6.2	5.2	0.8	-7.8	2.8	30	30	30	30	30	30
13C2 PFDA	1.9	-9.1	5.1	3.9	-3.9	2.0	30	30	30	30	30	30


F1:m/z 299.0 > 80.0:Moving7PtAverage_x5
Perfluorobutanesulfonic acid
2.436
2.436
Y (x E04)
Min
44
44
44/44 = 1.0 A_SF


F2:m/z 315.0 > 270.0:Moving5PtAverage_x4
13C2 PFHxA
2.738
2.738
Y (x E04)
38
47
47/38 = 1.24 AsF
2.63
2.67
2.71
2.75
Min
2.79
2.83

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_007.d
Lims ID: STD L1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 11-Jul-2017 14:18:46 ALS Bottle#: 1 Worklist Smp#: 7
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: L1_537
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\20170711-45298.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 11-Jul-2017 15:53:29 Calib Date: 11-Jul-2017 15:05:33
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK020

First Level Reviewer: barnettj Date: 11-Jul-2017 15:19:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								M
299.0 > 80.0	2.439	2.442	-0.003	1.000	224824	8.55	274	M
$ 2 13C2 PFHxA								
315.0 > 270.0	2.732	2.733	-0.001	1.000	611112	10.5	534	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.060	3.060	0.0	1.000	46641	0.9662	66.6	
3 Perfluorohexanesulfonic acid								M
399.0 > 80.0	3.071	3.071	0.0	1.000	72532	2.76	1453	M
* 5 13C2-PFOA								
415.0 > 370.0	3.416	3.411	0.005		414618	10.0	235	
6 Perfluorooctanoic acid								M
413.0 > 369.0	3.416	3.413	0.003	1.000	82014	1.82	112	M
* 8 13C4 PFOS								
503.0 > 80.0	3.841	3.830	0.011		941885	28.7	278	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.847	3.835	0.012	1.000	116446	3.49	4.5	M
9 Perfluorononanoic acid								
463.0 > 419.0	3.853	3.842	0.011	1.000	101669	2.00	500	
$ 10 13C2 PFDA								
515.0 > 470.0	4.486	4.465	0.021	1.000	433139	10.2	498	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L1_00019 Amount Added: 1.00 Units: mL

Report Date: 11-Jul-2017 15:53:29 Chrom Revision: 2.2 26-Jun-2017 08:09:44

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_007.d

Injection Date: 11-Jul-2017 14:18:46 Instrument ID: A6

Lims ID: STD L1

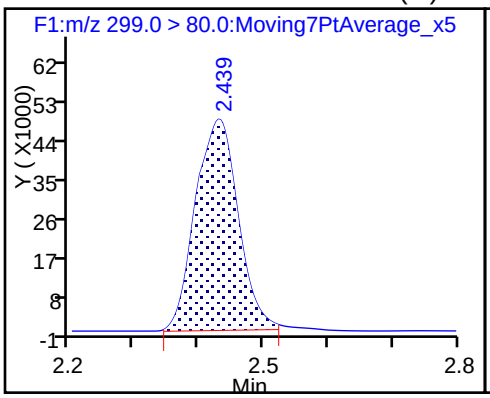
Client ID:

Operator ID: JRB ALS Bottle#: 1 Worklist Smp#: 7

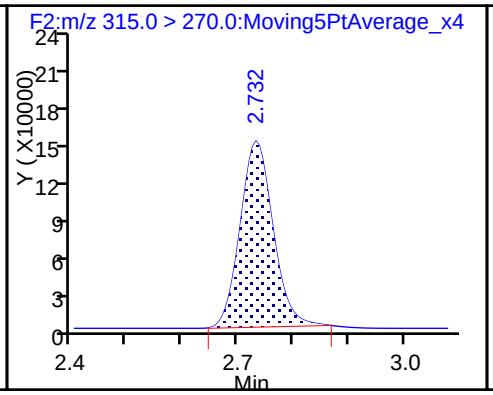
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

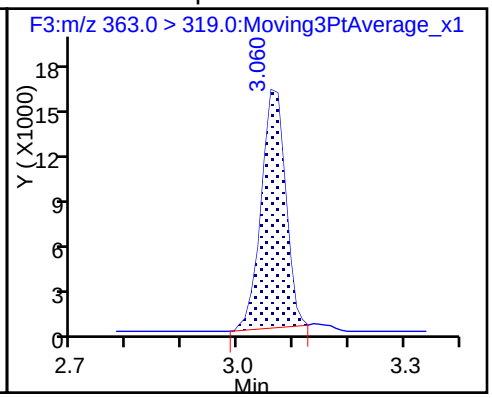
1 Perfluorobutanesulfonic acid (M)



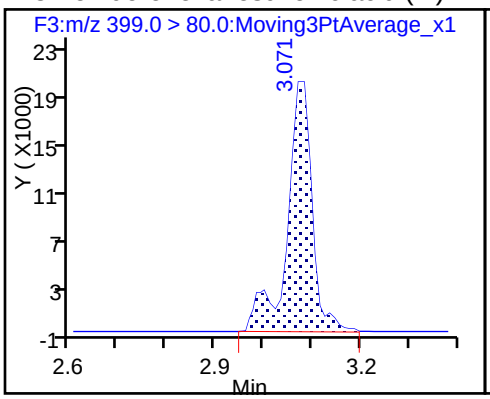
$ 2 13C2 PFHxA



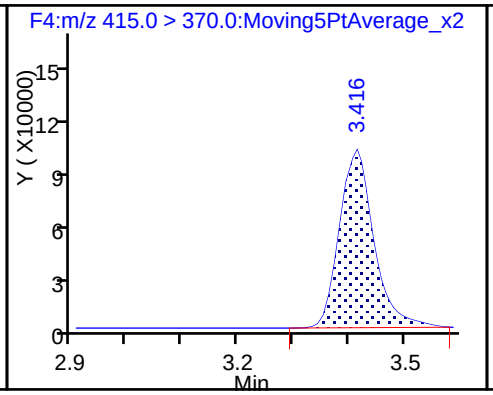
4 Perfluoroheptanoic acid



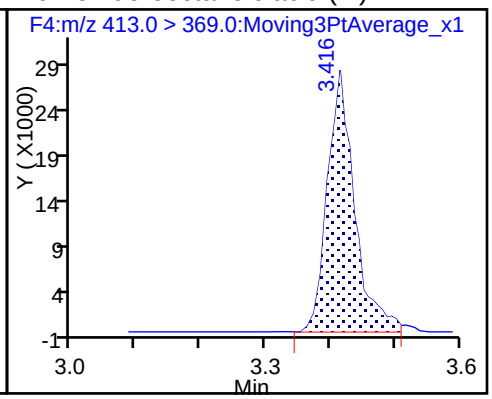
3 Perfluorohexanesulfonic acid (M)



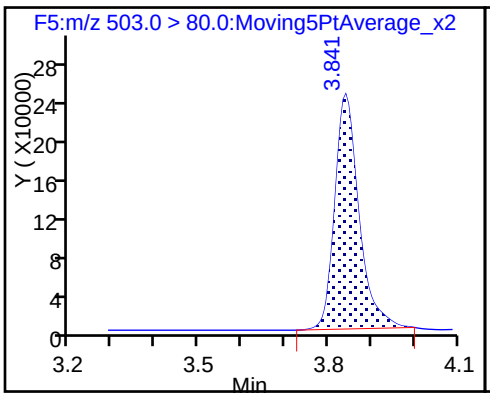
* 5 13C2-PFOA



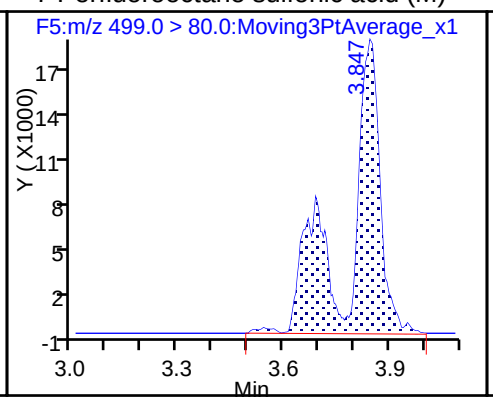
6 Perfluorooctanoic acid (M)



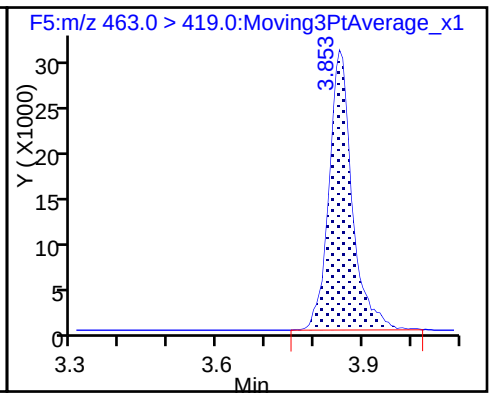
* 8 13C4 PFOS



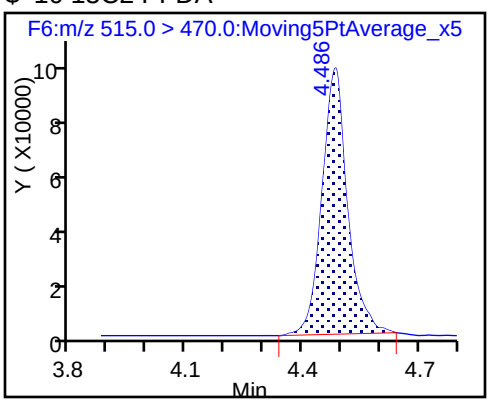
7 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

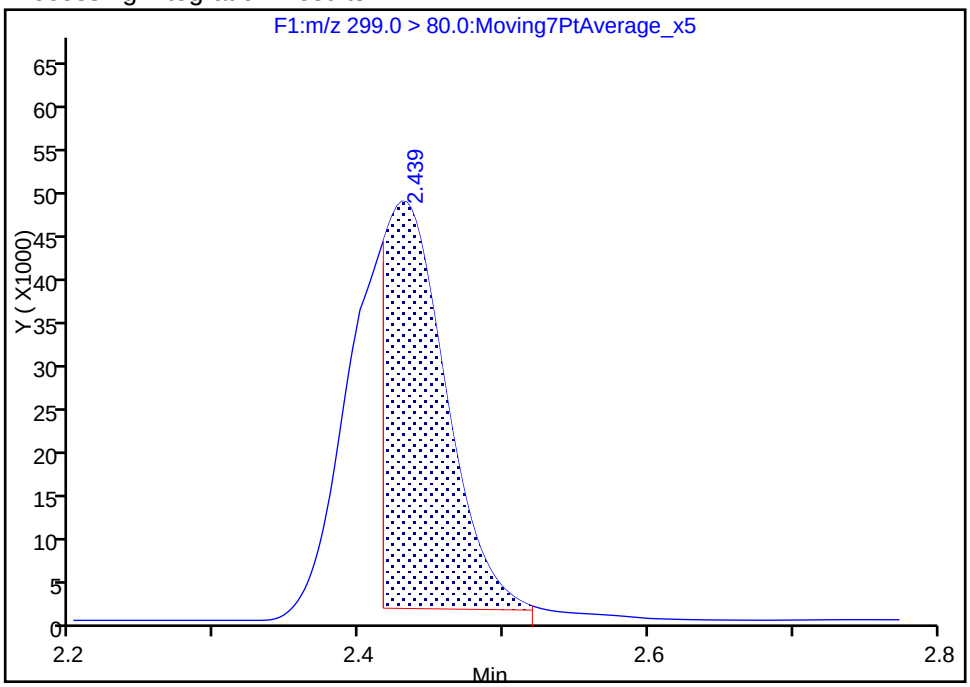
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_007.d
Injection Date: 11-Jul-2017 14:18:46 Instrument ID: A6
Lims ID: STD L1
Client ID:
Operator ID: JRB ALS Bottle#: 1 Worklist Smp#: 7
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F1:MRM

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

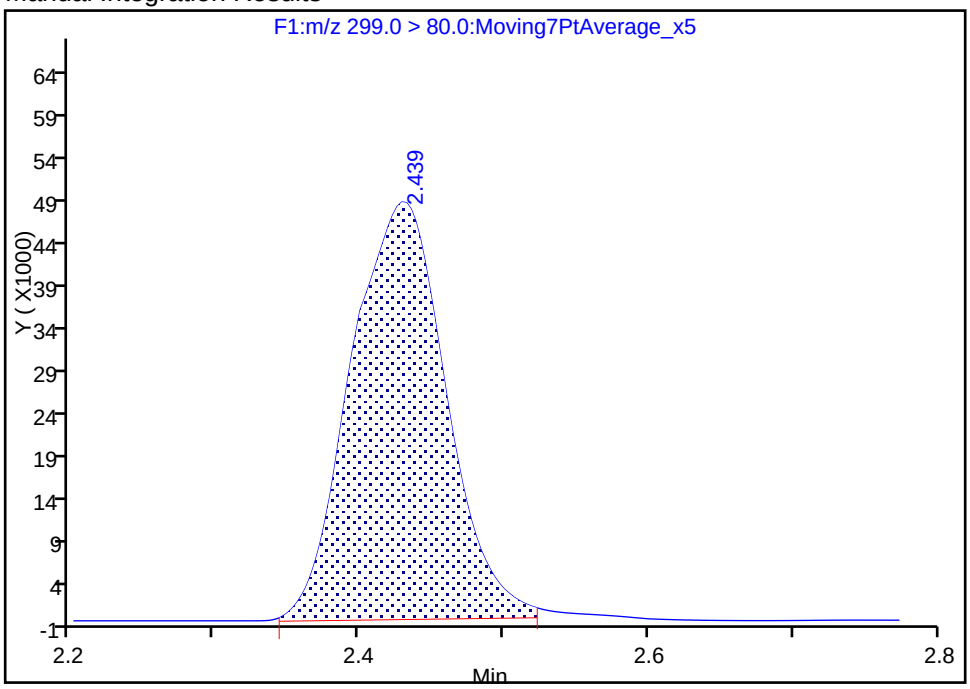
Processing Integration Results

RT: 2.44
Area: 138868
Amount: 6.309732
Amount Units: ng/ml



Manual Integration Results

RT: 2.44
Area: 224824
Amount: 8.546638
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:17:38
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

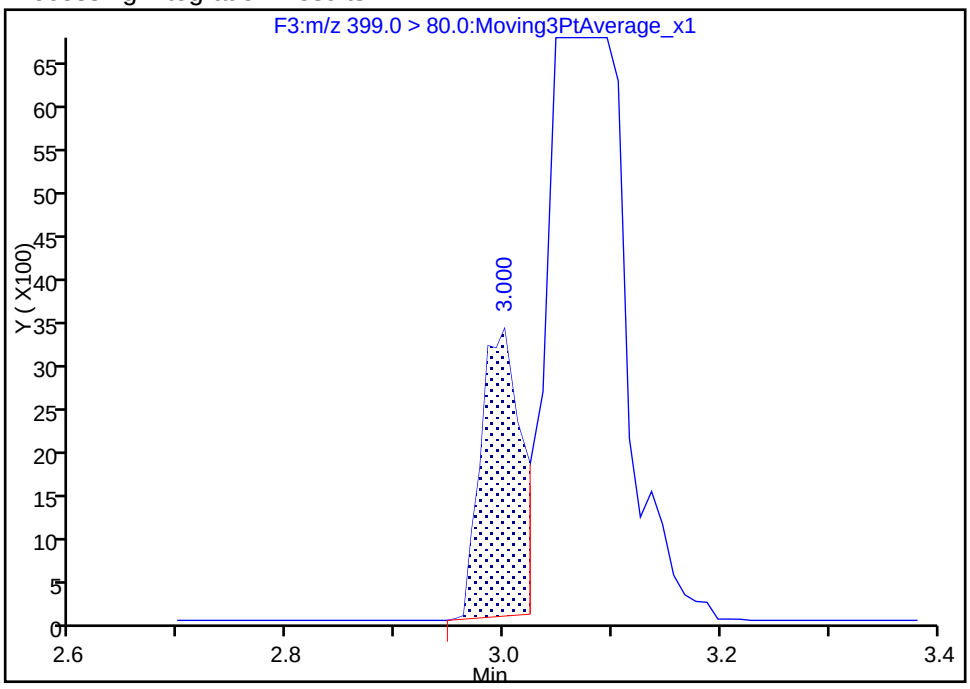
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_007.d
Injection Date: 11-Jul-2017 14:18:46 Instrument ID: A6
Lims ID: STD L1
Client ID:
Operator ID: JRB ALS Bottle#: 1 Worklist Smp#: 7
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F3:MRM

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

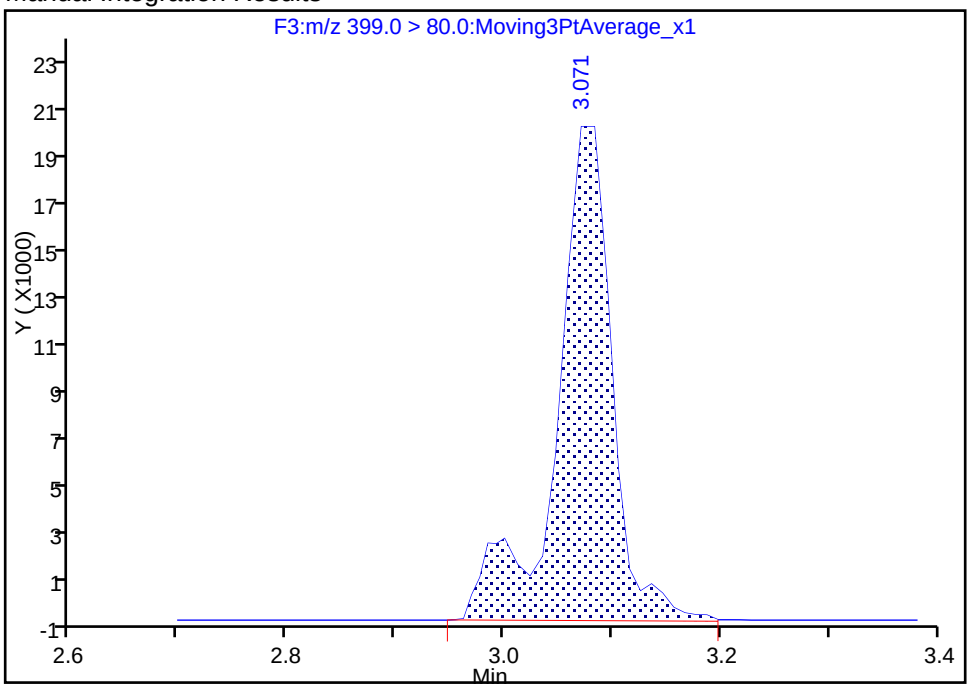
Processing Integration Results

RT: 3.00
Area: 8209
Amount: 2.741437
Amount Units: ng/ml



Manual Integration Results

RT: 3.07
Area: 72532
Amount: 2.756580
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:18:29
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

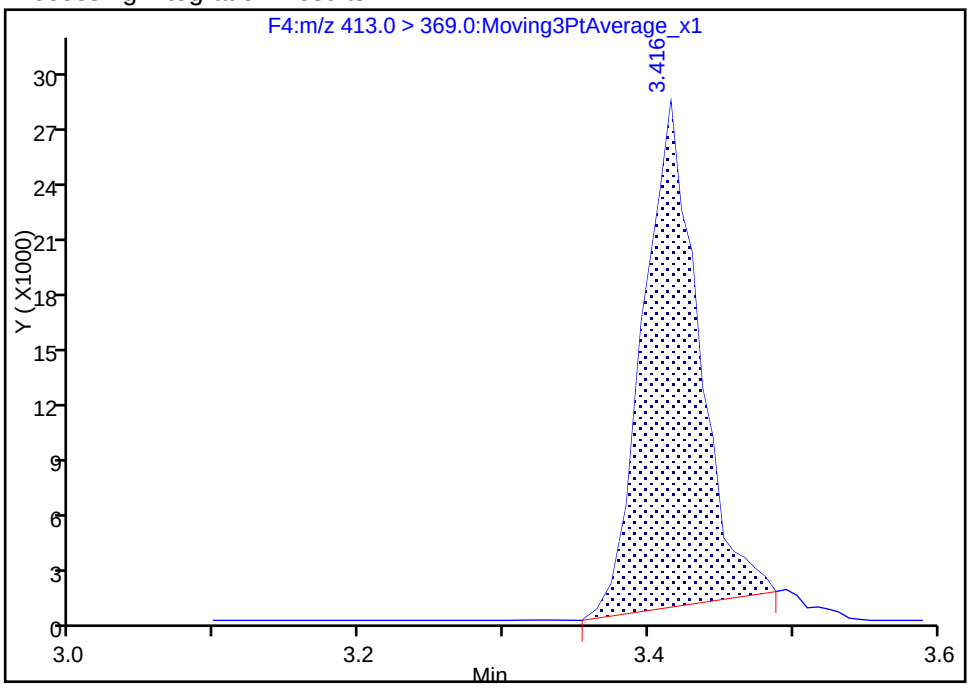
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_007.d
Injection Date: 11-Jul-2017 14:18:46 Instrument ID: A6
Lims ID: STD L1
Client ID:
Operator ID: JRB ALS Bottle#: 1 Worklist Smp#: 7
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm) Detector F4:MRM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

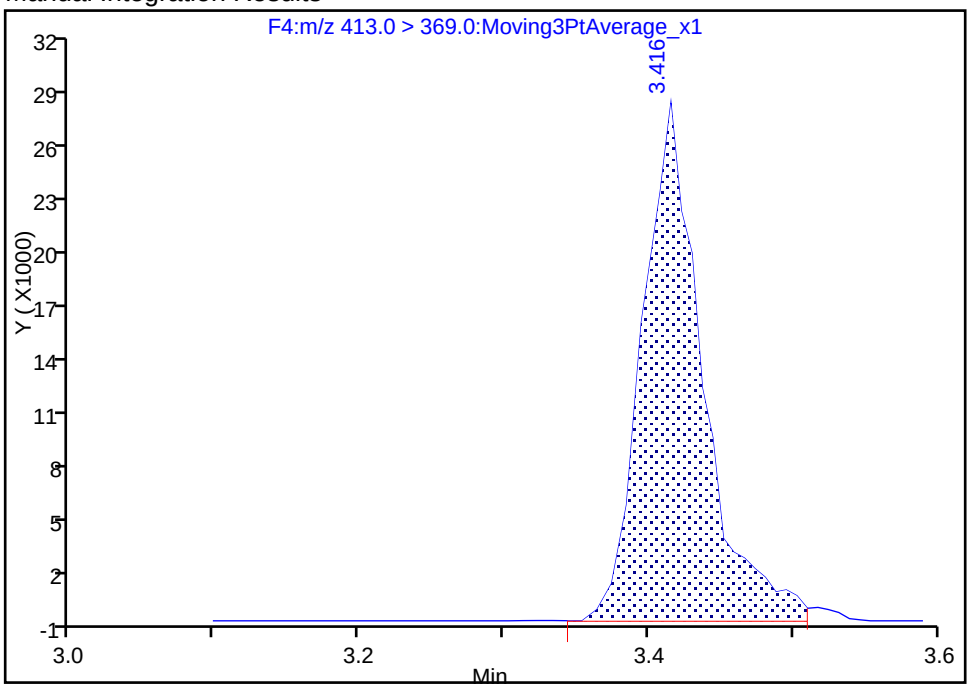
Processing Integration Results

RT: 3.42
Area: 73622
Amount: 1.671183
Amount Units: ng/ml



Manual Integration Results

RT: 3.42
Area: 82014
Amount: 1.815138
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:19:20
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

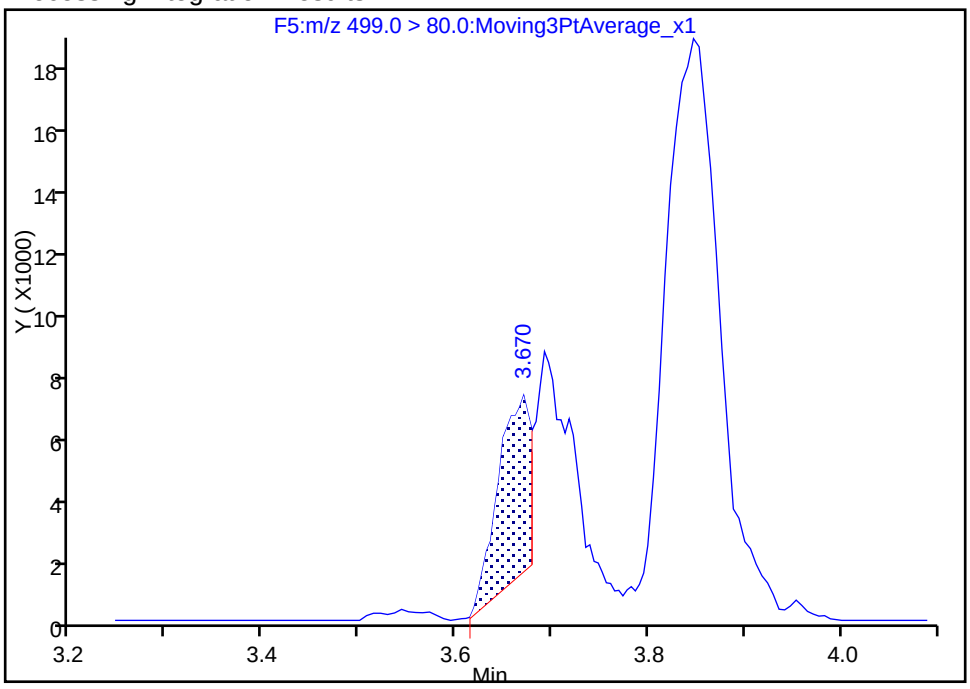
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_007.d
Injection Date: 11-Jul-2017 14:18:46 Instrument ID: A6
Lims ID: STD L1
Client ID:
Operator ID: JRB ALS Bottle#: 1 Worklist Smp#: 7
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F5:MRM

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

Signal: 1

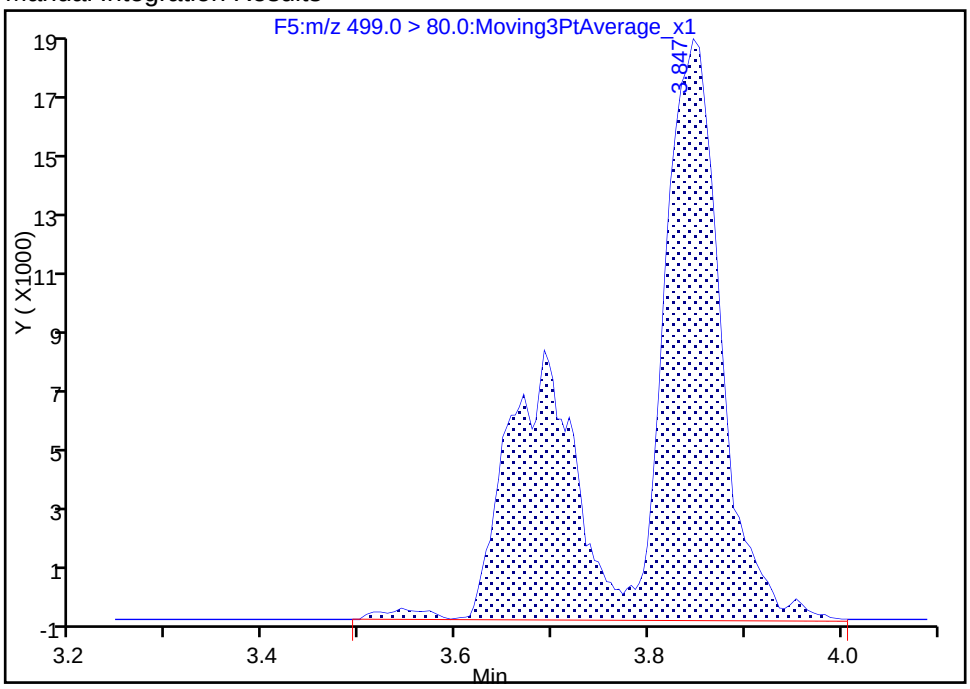
Processing Integration Results

RT: 3.67
Area: 13019
Amount: 2.024064
Amount Units: ng/ml



Manual Integration Results

RT: 3.85
Area: 116446
Amount: 3.493588
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:19:00
Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_008.d
Lims ID: STD L2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 11-Jul-2017 14:29:14 ALS Bottle#: 2 Worklist Smp#: 8
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: L2_537
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\20170711-45298.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 11-Jul-2017 15:53:30 Calib Date: 11-Jul-2017 15:05:33
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK020

First Level Reviewer: barnettj Date: 11-Jul-2017 15:20:48

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	2.439	2.442	-0.003	1.000	543185	20.6	276	
$ 2 13C2 PFHxA								
315.0 > 270.0	2.732	2.733	-0.001	1.000	600819	9.38	695	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.060	3.060	0.0	1.000	119710	2.25	185	
3 Perfluorohexanesulfonic acid								M
399.0 > 80.0	3.071	3.071	0.0	1.000	193156	7.31	825	M
* 5 13C2-PFOA								
415.0 > 370.0	3.415	3.411	0.004		456818	10.0	464	
6 Perfluorooctanoic acid								M
413.0 > 369.0	3.415	3.413	0.002	1.000	232563	4.67	327	M
* 8 13C4 PFOS								
503.0 > 80.0	3.835	3.830	0.005		946126	28.7	336	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.835	3.835	0.0	1.000	311845	9.31	798	M
9 Perfluorononanoic acid								
463.0 > 419.0	3.847	3.842	0.005	1.000	261713	4.67	1252	
$ 10 13C2 PFDA								
515.0 > 470.0	4.475	4.465	0.010	1.000	425840	9.09	704	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00019 Amount Added: 1.00 Units: mL

Report Date: 11-Jul-2017 15:53:30 Chrom Revision: 2.2 26-Jun-2017 08:09:44

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_008.d

Injection Date: 11-Jul-2017 14:29:14 Instrument ID: A6

Lims ID: STD L2

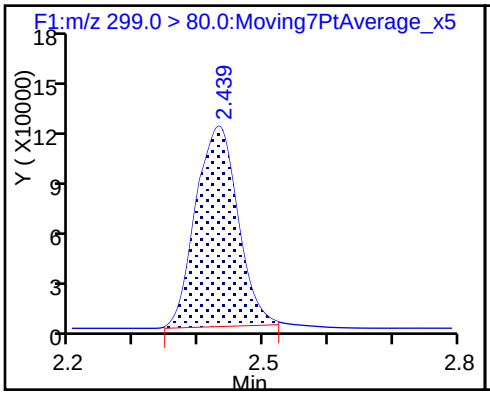
Client ID:

Operator ID: JRB ALS Bottle#: 2 Worklist Smp#: 8

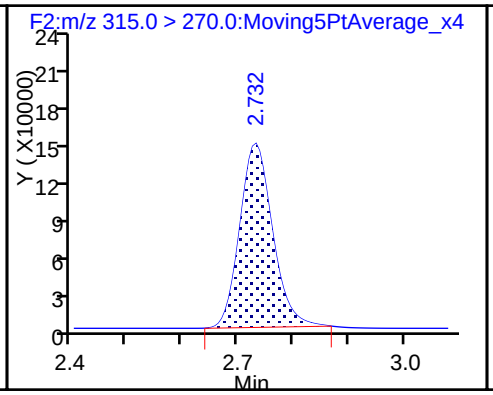
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

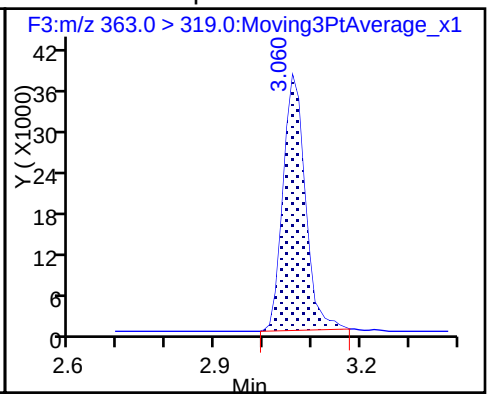
1 Perfluorobutanesulfonic acid



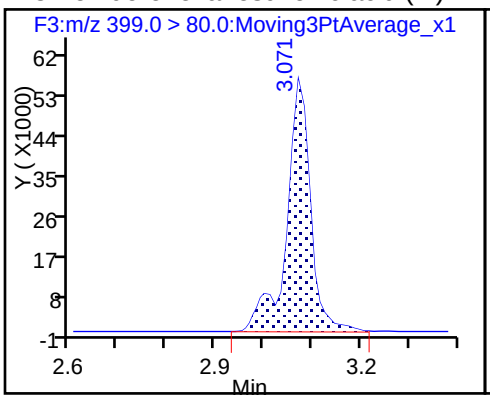
$ 2 13C2 PFHxA



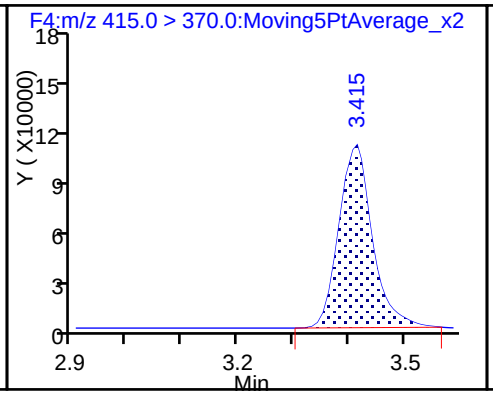
4 Perfluoroheptanoic acid



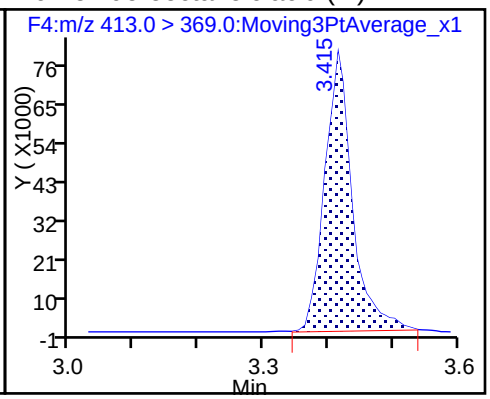
3 Perfluorohexanesulfonic acid (M)



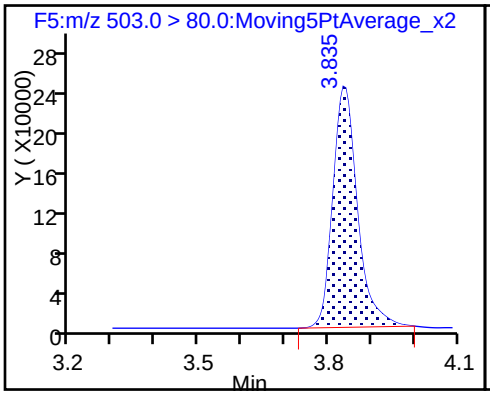
* 5 13C2-PFOA



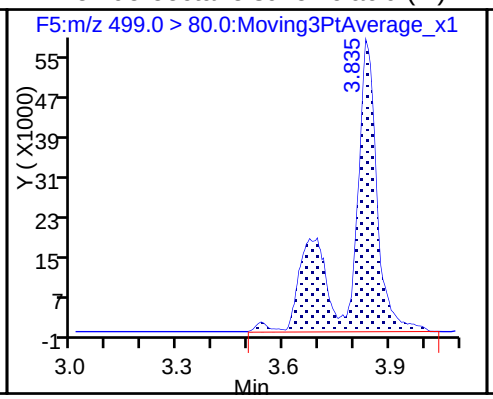
6 Perfluorooctanoic acid (M)



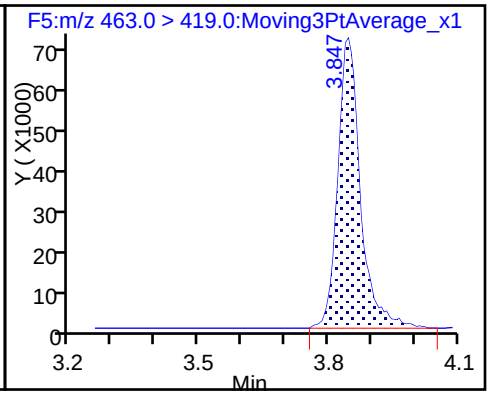
* 8 13C4 PFOS



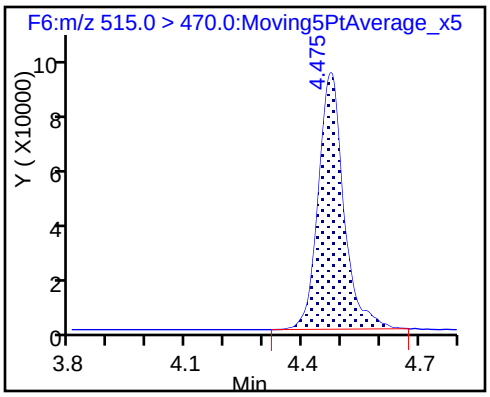
7 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

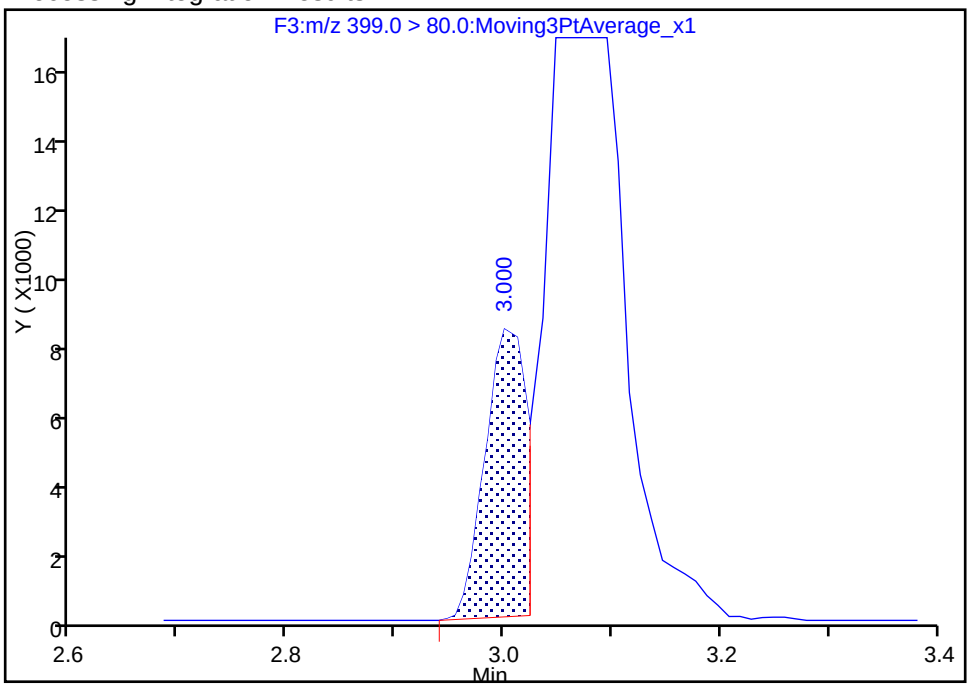
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_008.d
Injection Date: 11-Jul-2017 14:29:14 Instrument ID: A6
Lims ID: STD L2
Client ID:
Operator ID: JRB ALS Bottle#: 2 Worklist Smp#: 8
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F3:MRM

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

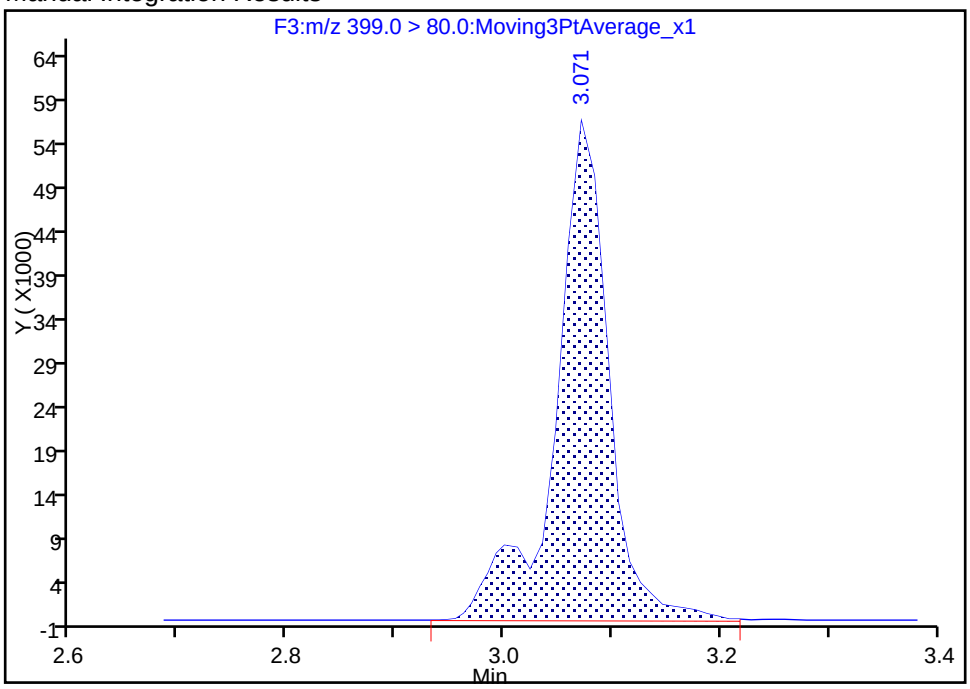
Processing Integration Results

RT: 3.00
Area: 21096
Amount: 3.201099
Amount Units: ng/ml



Manual Integration Results

RT: 3.07
Area: 193156
Amount: 7.307991
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:20:04
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

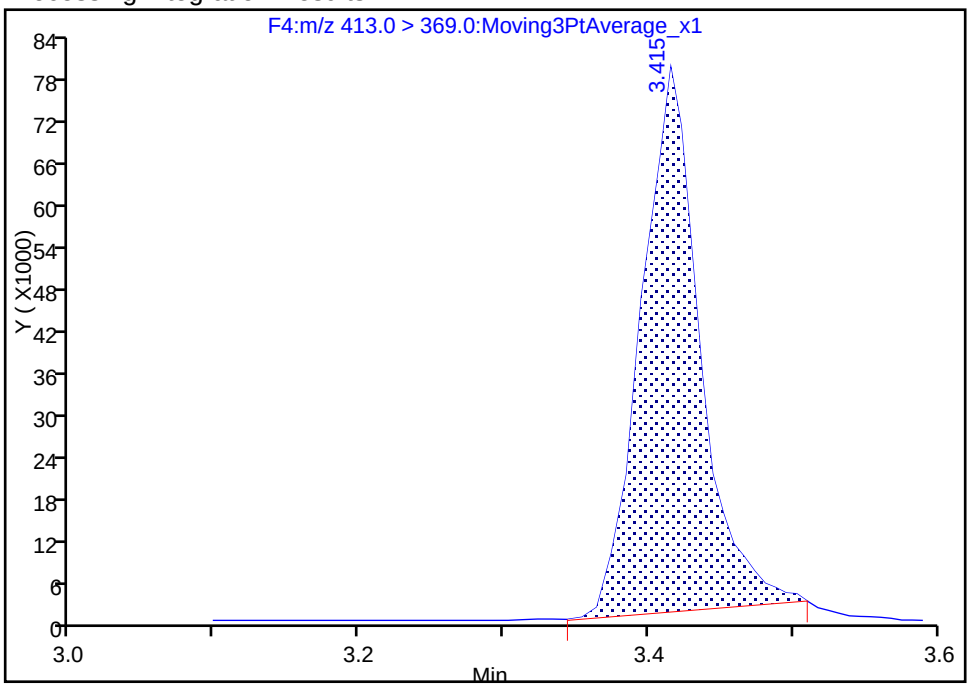
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_008.d
Injection Date: 11-Jul-2017 14:29:14 Instrument ID: A6
Lims ID: STD L2
Client ID:
Operator ID: JRB ALS Bottle#: 2 Worklist Smp#: 8
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F4:MRM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

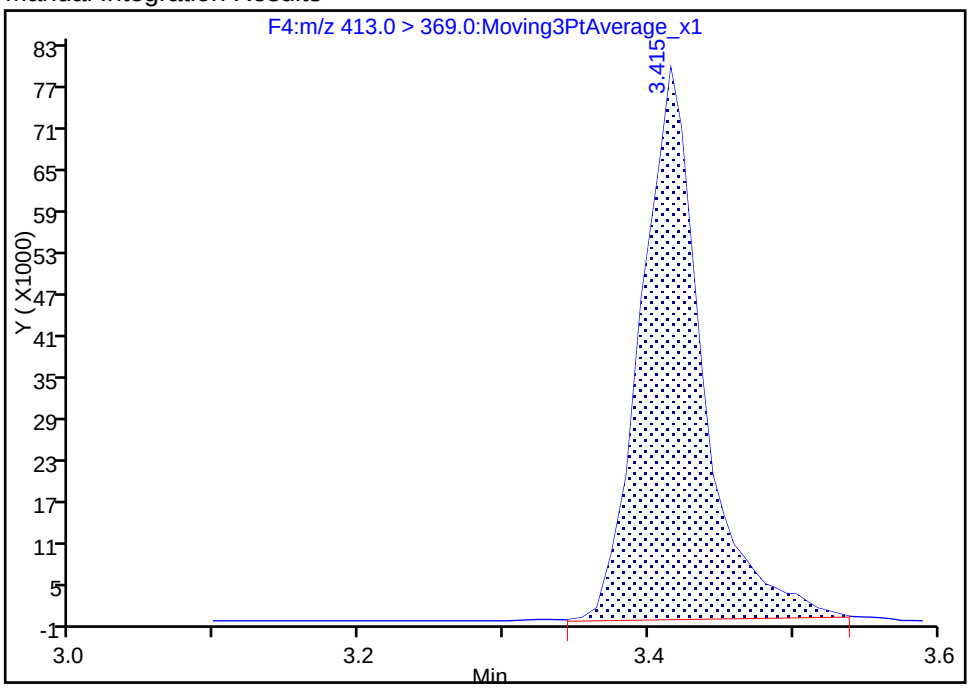
Processing Integration Results

RT: 3.42
Area: 218948
Amount: 4.440333
Amount Units: ng/ml



Manual Integration Results

RT: 3.42
Area: 232563
Amount: 4.671616
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:20:36
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

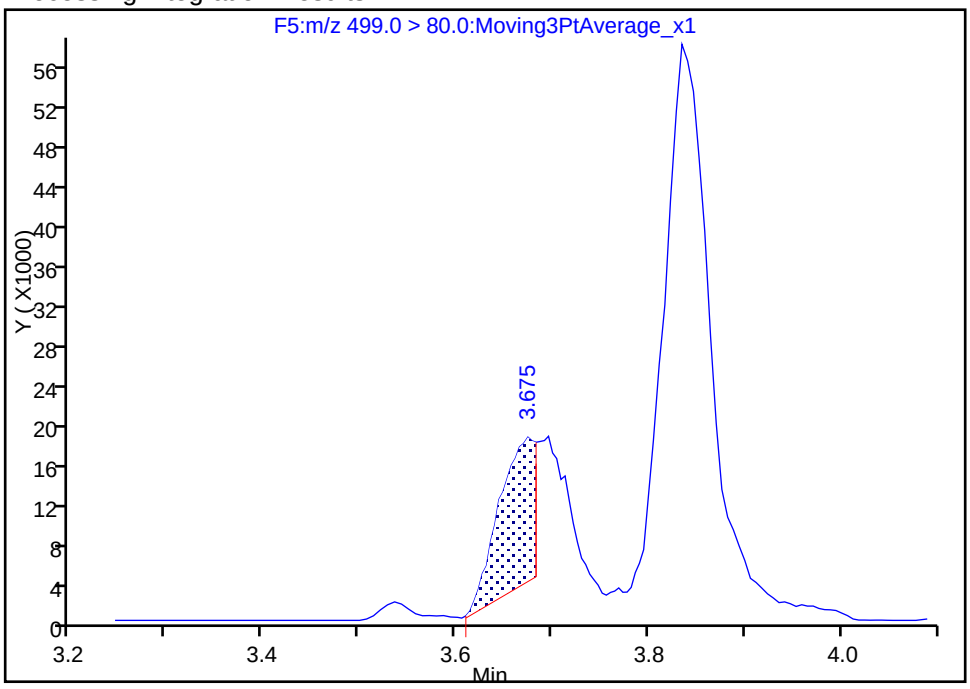
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_008.d
Injection Date: 11-Jul-2017 14:29:14 Instrument ID: A6
Lims ID: STD L2
Client ID:
Operator ID: JRB ALS Bottle#: 2 Worklist Smp#: 8
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F5:MRM

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

Signal: 1

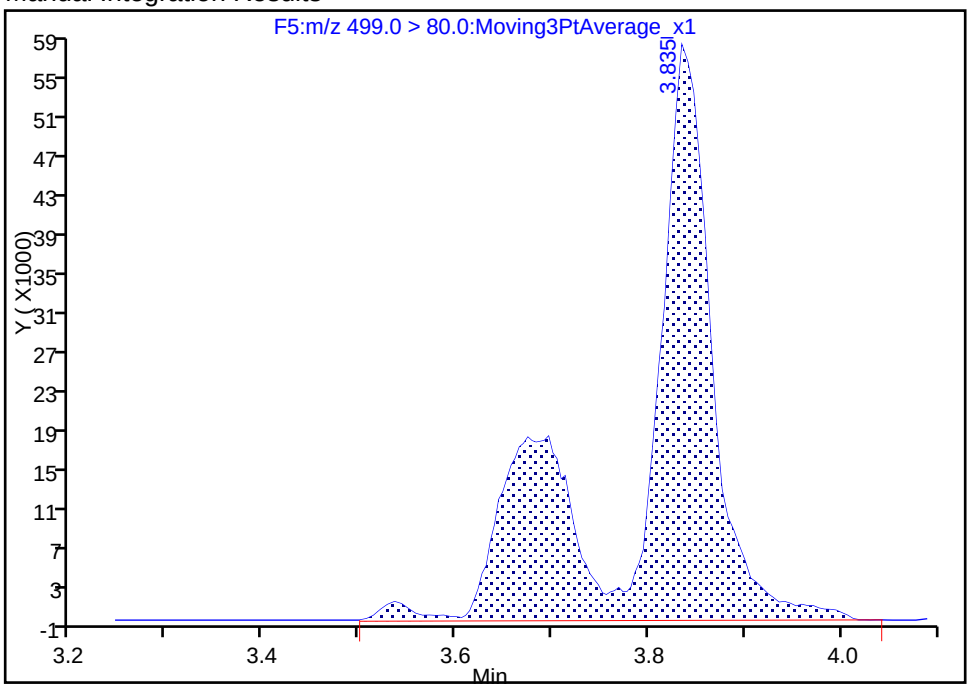
RT: 3.67
Area: 37973
Amount: 3.520461
Amount Units: ng/ml

Processing Integration Results



RT: 3.83
Area: 311845
Amount: 9.313968
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 11-Jul-2017 15:20:22
Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_009.d
Lims ID: STD L3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 11-Jul-2017 14:38:19 ALS Bottle#: 3 Worklist Smp#: 9
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: L3_537
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\20170711-45298.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 11-Jul-2017 15:53:31 Calib Date: 11-Jul-2017 15:05:33
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK020

First Level Reviewer: barnettj Date: 11-Jul-2017 15:22:02

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								M
299.0 > 80.0	2.439	2.442	-0.003	1.000	1163511	42.1	238	M
$ 2 13C2 PFHxA								
315.0 > 270.0	2.732	2.733	-0.001	1.000	663271	10.5	1743	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.060	3.060	0.0	1.000	257968	4.93	874	
3 Perfluorohexanesulfonic acid								M
399.0 > 80.0	3.071	3.071	0.0	1.000	358215	13.0	274	M
* 5 13C2-PFOA								
415.0 > 370.0	3.408	3.411	-0.003		449621	10.0	132	
6 Perfluorooctanoic acid								
413.0 > 369.0	3.416	3.413	0.003	1.000	499953	10.2	601	
* 8 13C4 PFOS								
503.0 > 80.0	3.829	3.830	-0.001		989876	28.7	483	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.835	3.835	0.0	1.000	694018	19.8	1090	M
9 Perfluorononanoic acid								
463.0 > 419.0	3.841	3.842	-0.001	1.000	557035	10.1	3648	
$ 10 13C2 PFDA								
515.0 > 470.0	4.463	4.465	-0.002	1.000	484590	10.5	510	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00022 Amount Added: 1.00 Units: mL

Report Date: 11-Jul-2017 15:53:32 Chrom Revision: 2.2 26-Jun-2017 08:09:44

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_009.d

Injection Date: 11-Jul-2017 14:38:19 Instrument ID: A6

Lims ID: STD L3

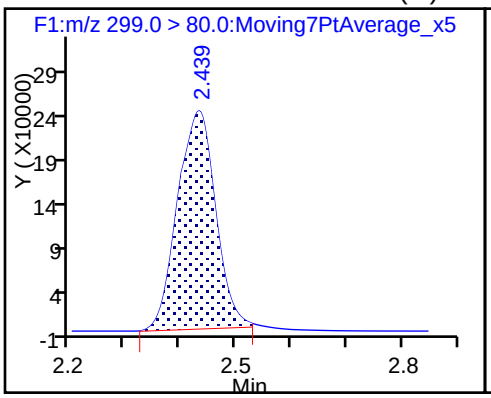
Client ID:

Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 9

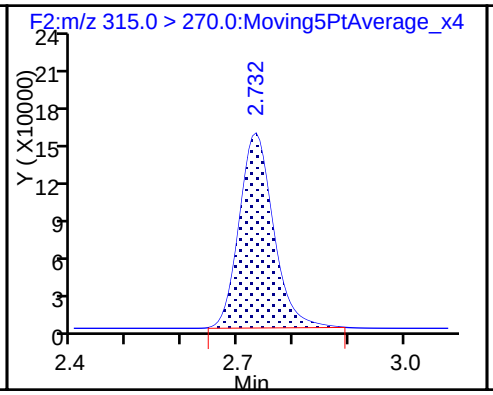
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

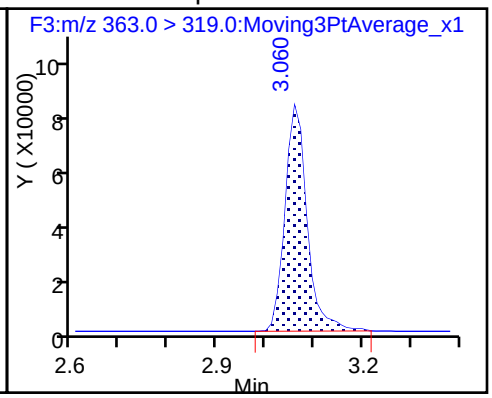
1 Perfluorobutanesulfonic acid (M)



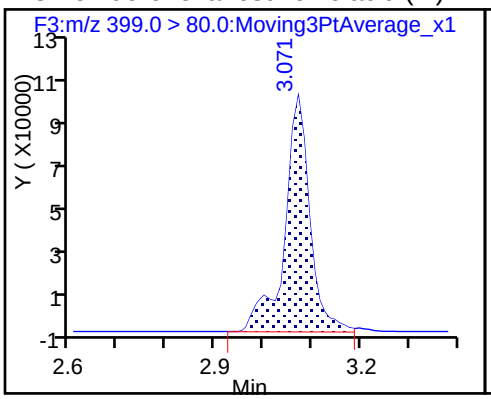
$ 2 13C2 PFHxA



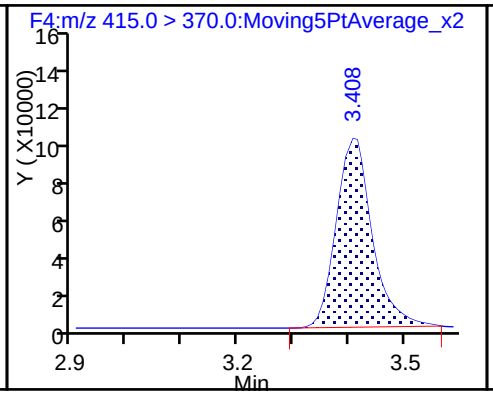
4 Perfluoroheptanoic acid



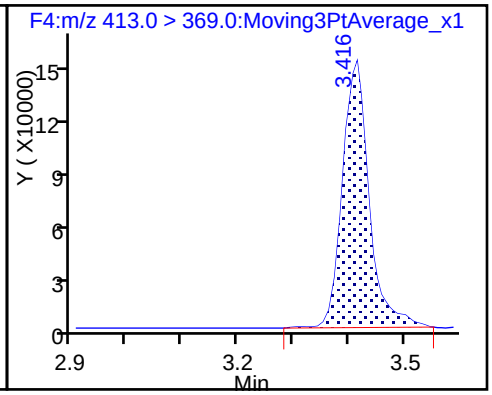
3 Perfluorohexanesulfonic acid (M)



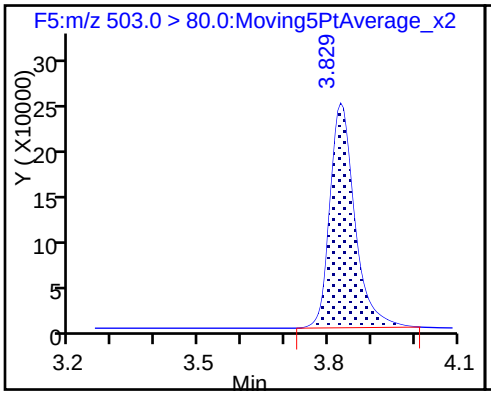
* 5 13C2-PFOA



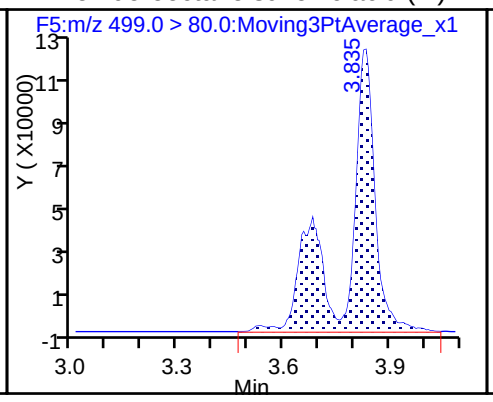
6 Perfluorooctanoic acid



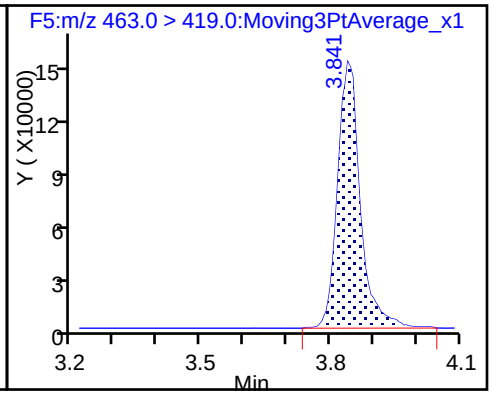
* 8 13C4 PFOS



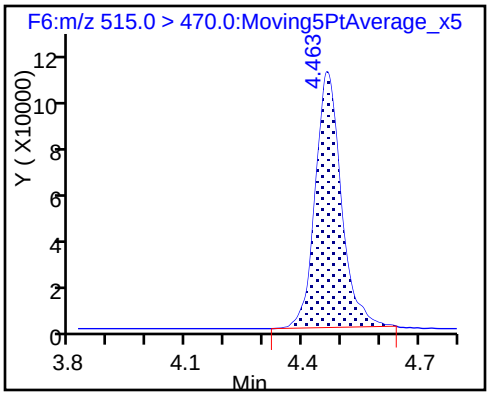
7 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

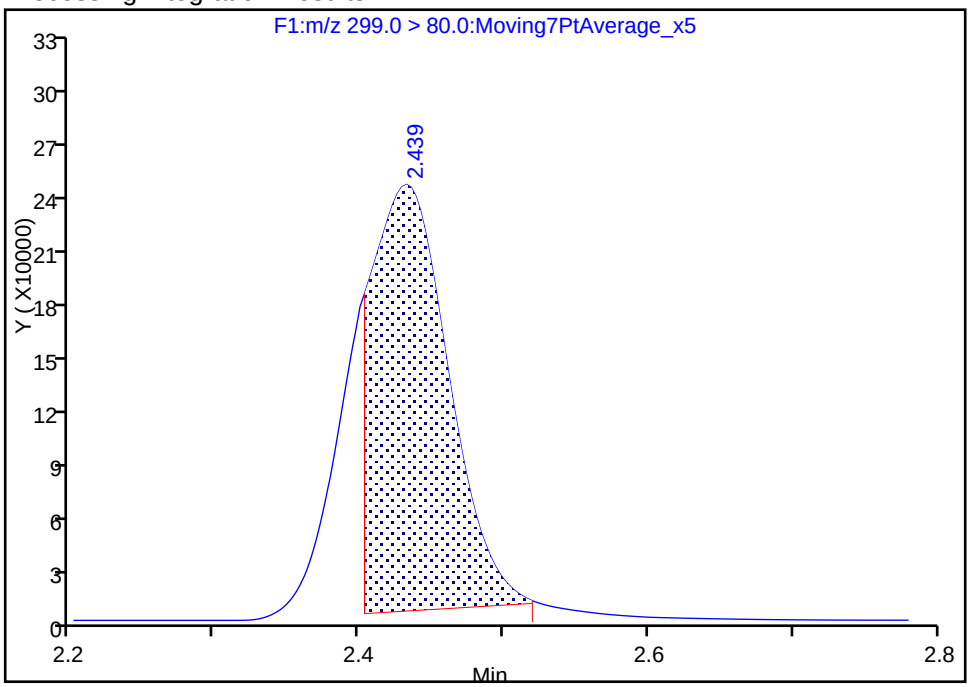
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_009.d
Injection Date: 11-Jul-2017 14:38:19 Instrument ID: A6
Lims ID: STD L3
Client ID:
Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 9
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F1:MRM

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

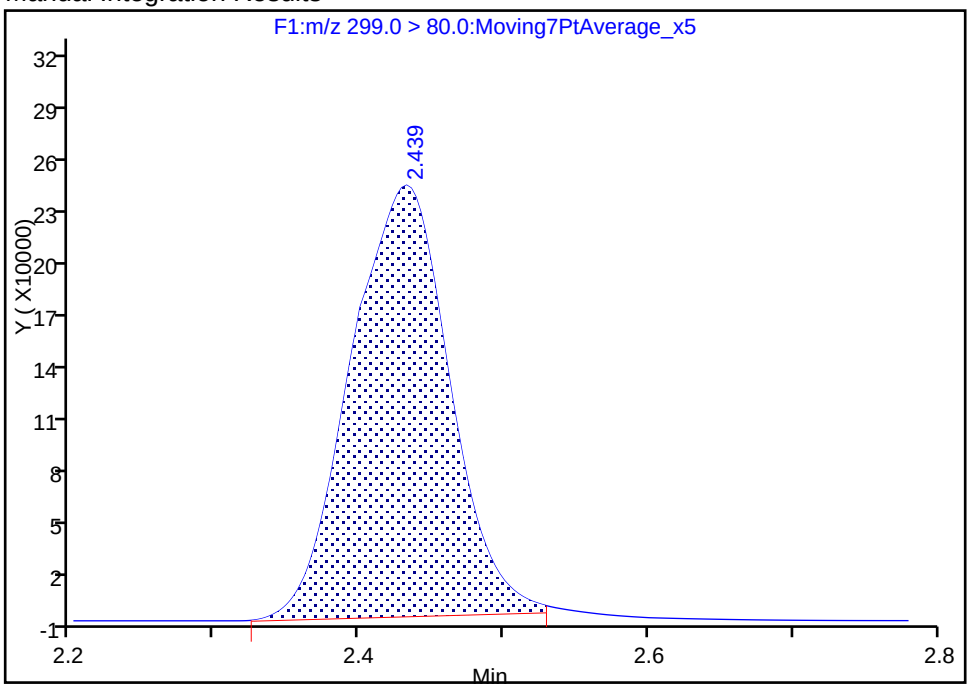
Processing Integration Results

RT: 2.44
Area: 884462
Amount: 35.614669
Amount Units: ng/ml



Manual Integration Results

RT: 2.44
Area: 1163511
Amount: 42.086248
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:21:01
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

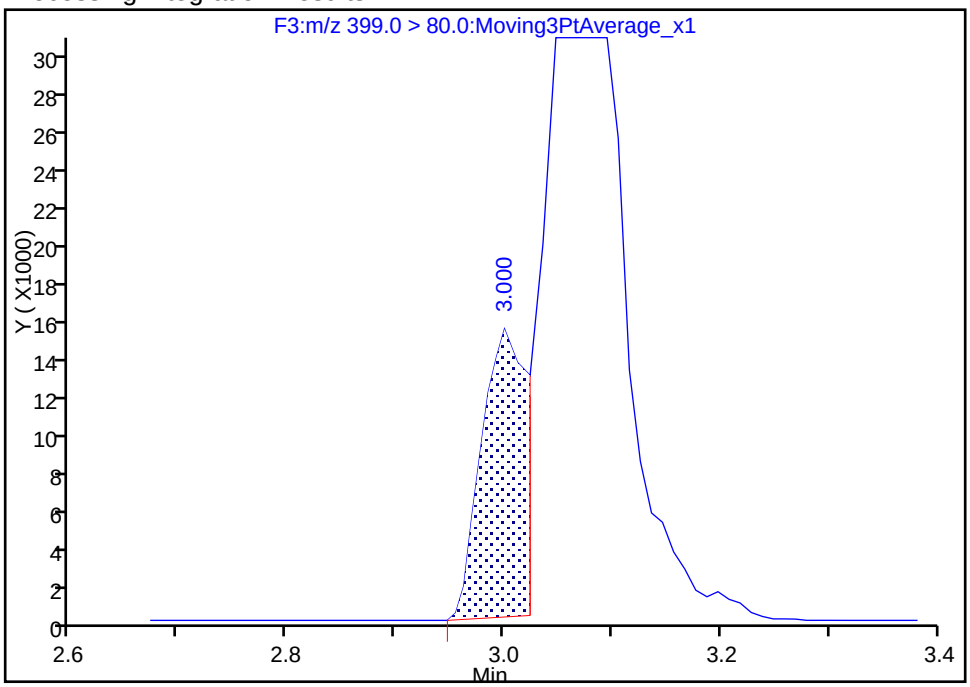
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_009.d
Injection Date: 11-Jul-2017 14:38:19 Instrument ID: A6
Lims ID: STD L3
Client ID:
Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 9
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F3:MRM

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

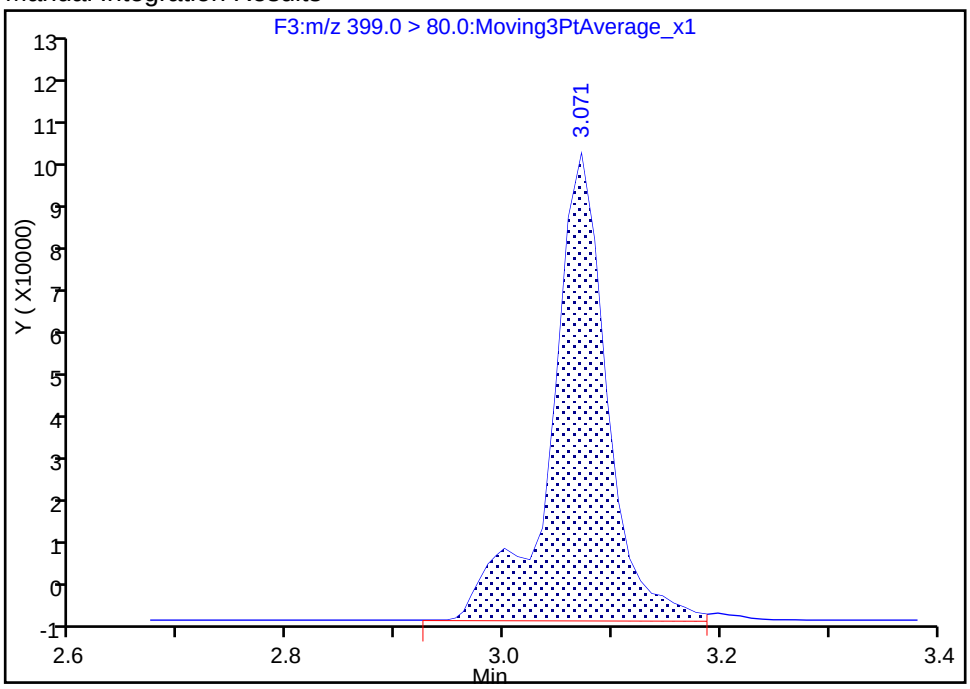
Processing Integration Results

RT: 3.00
Area: 41284
Amount: 3.734891
Amount Units: ng/ml



Manual Integration Results

RT: 3.07
Area: 358215
Amount: 12.953936
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:21:25
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

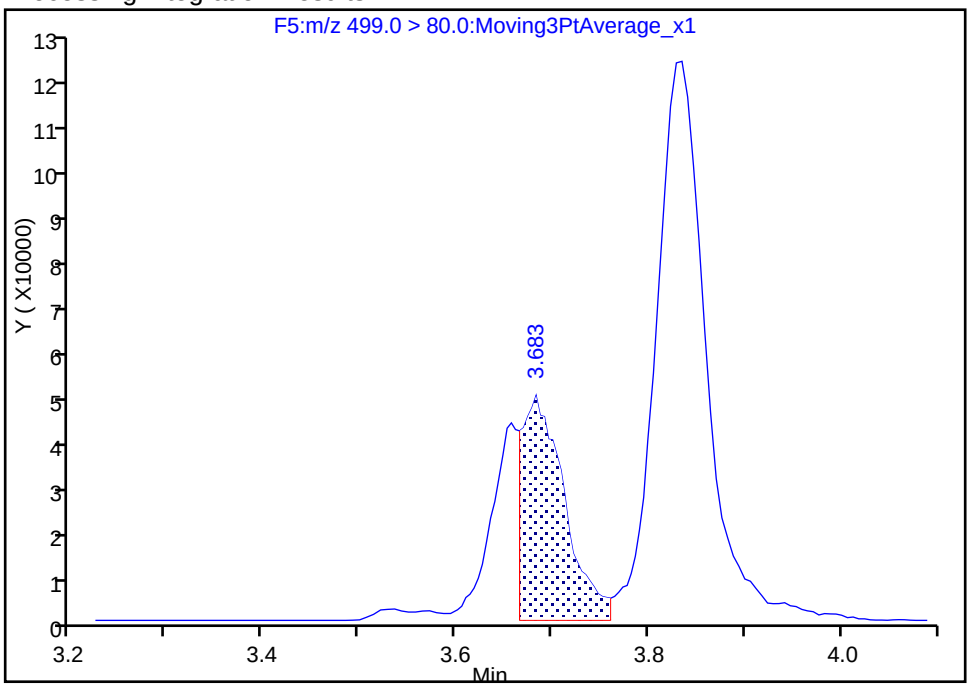
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_009.d
Injection Date: 11-Jul-2017 14:38:19 Instrument ID: A6
Lims ID: STD L3
Client ID:
Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 9
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F5:MRM

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

Signal: 1

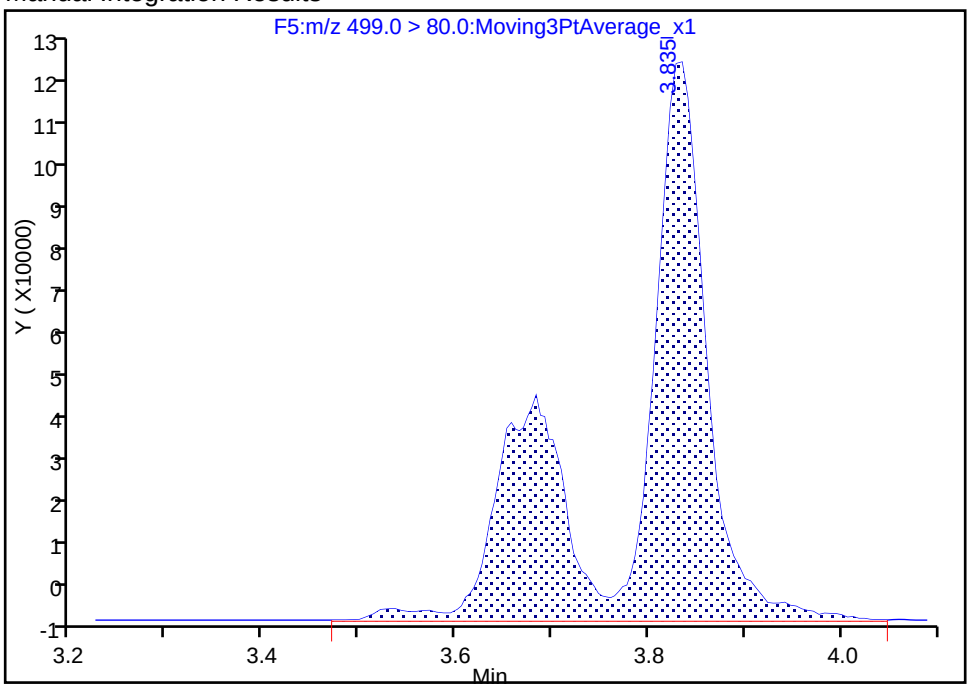
Processing Integration Results

RT: 3.68
Area: 146525
Amount: 6.374180
Amount Units: ng/ml



Manual Integration Results

RT: 3.83
Area: 694018
Amount: 19.812300
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:27:24
Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_010.d
Lims ID: STD L4
Client ID:
Sample Type: ICISAV Calib Level: 4
Inject. Date: 11-Jul-2017 14:47:23 ALS Bottle#: 4 Worklist Smp#: 10
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: L4_537
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\20170711-45298.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 11-Jul-2017 15:53:33 Calib Date: 11-Jul-2017 15:05:33
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK020

First Level Reviewer: barnettj Date: 11-Jul-2017 15:23:05

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	2.436	2.442	-0.006	1.000	2360302	90.1	1505	
$ 2 13C2 PFHxA								
315.0 > 270.0	2.732	2.733	-0.001	1.000	618332	10.1	662	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.060	3.060	0.0	1.000	551247	10.8	783	
3 Perfluorohexanesulfonic acid								M
399.0 > 80.0	3.072	3.071	0.001	1.000	791471	30.2	16276	M
* 5 13C2-PFOA								
415.0 > 370.0	3.408	3.411	-0.003		437474	10.0	134	
6 Perfluorooctanoic acid								
413.0 > 369.0	3.416	3.413	0.003	1.000	988038	20.7	166	
* 8 13C4 PFOS								
503.0 > 80.0	3.829	3.830	-0.001		937482	28.7	432	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.835	3.835	0.0	1.000	1321595	39.8	370	M
9 Perfluorononanoic acid								M
463.0 > 419.0	3.841	3.842	-0.001	1.000	1068968	19.9	647	M
$ 10 13C2 PFDA								
515.0 > 470.0	4.459	4.465	-0.006	1.000	466074	10.4	1137	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L4_00019 Amount Added: 1.00 Units: mL

Report Date: 11-Jul-2017 15:53:33 Chrom Revision: 2.2 26-Jun-2017 08:09:44

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_010.d

Injection Date: 11-Jul-2017 14:47:23 Instrument ID: A6

Lims ID: STD L4

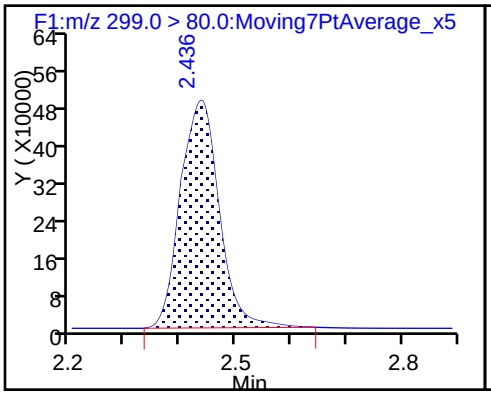
Client ID:

Operator ID: JRB ALS Bottle#: 4 Worklist Smp#: 10

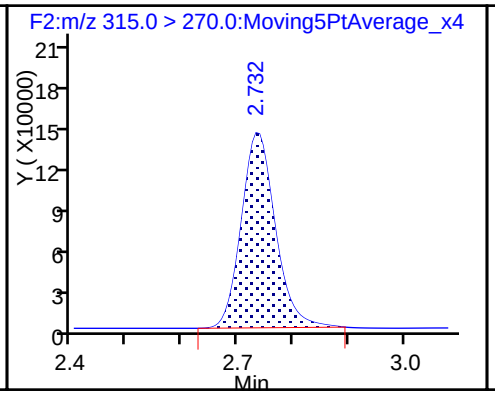
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

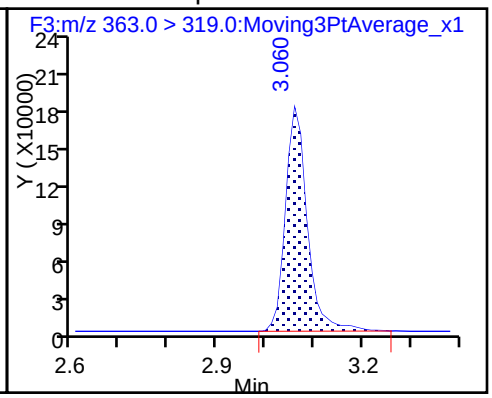
1 Perfluorobutanesulfonic acid



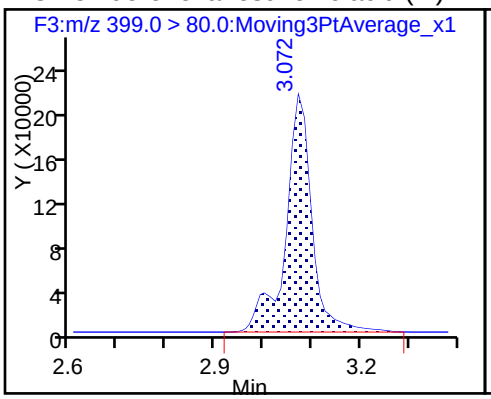
$ 2 13C2 PFHxA



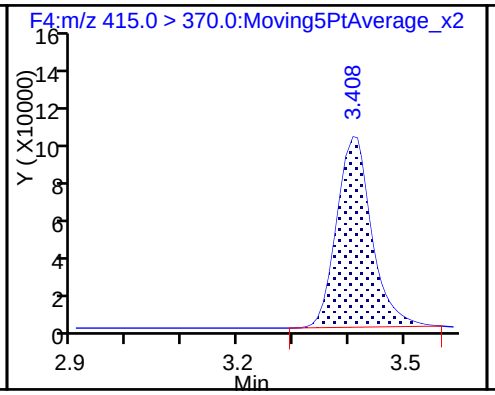
4 Perfluoroheptanoic acid



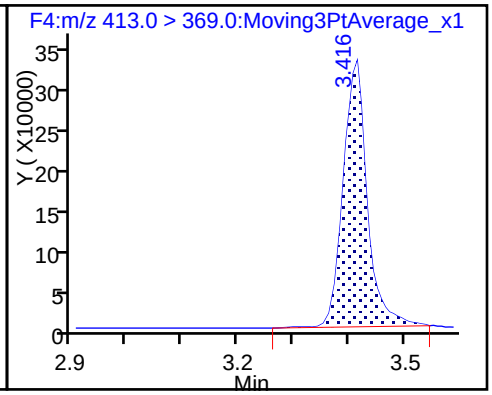
3 Perfluorohexanesulfonic acid (M)



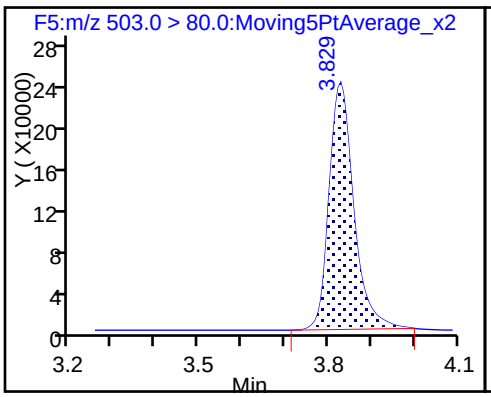
* 5 13C2-PFOA



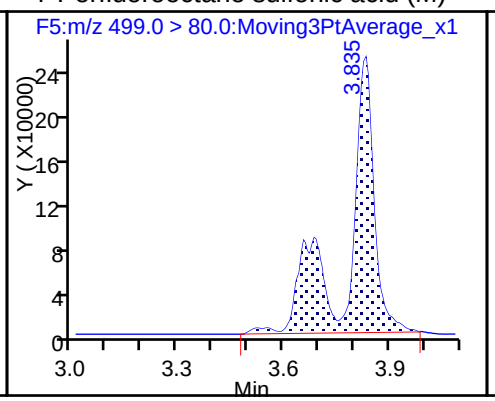
6 Perfluorooctanoic acid



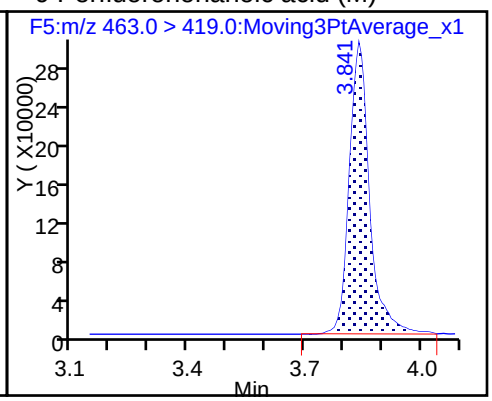
* 8 13C4 PFOS



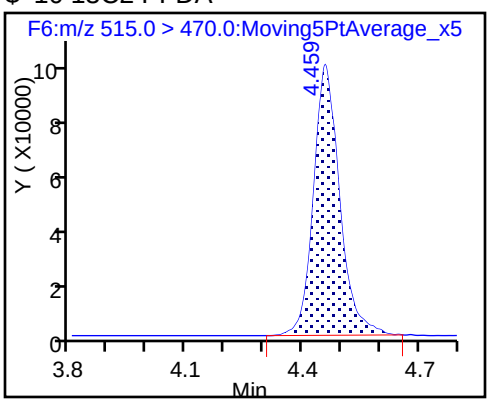
7 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid (M)



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

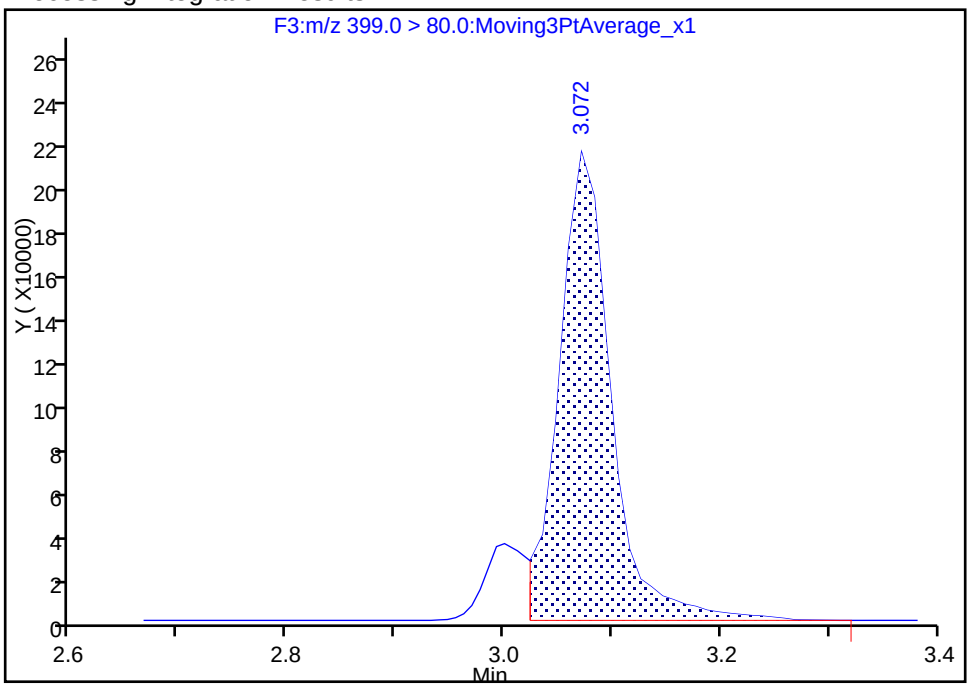
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_010.d
Injection Date: 11-Jul-2017 14:47:23 Instrument ID: A6
Lims ID: STD L4
Client ID:
Operator ID: JRB ALS Bottle#: 4 Worklist Smp#: 10
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F3:MRM

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

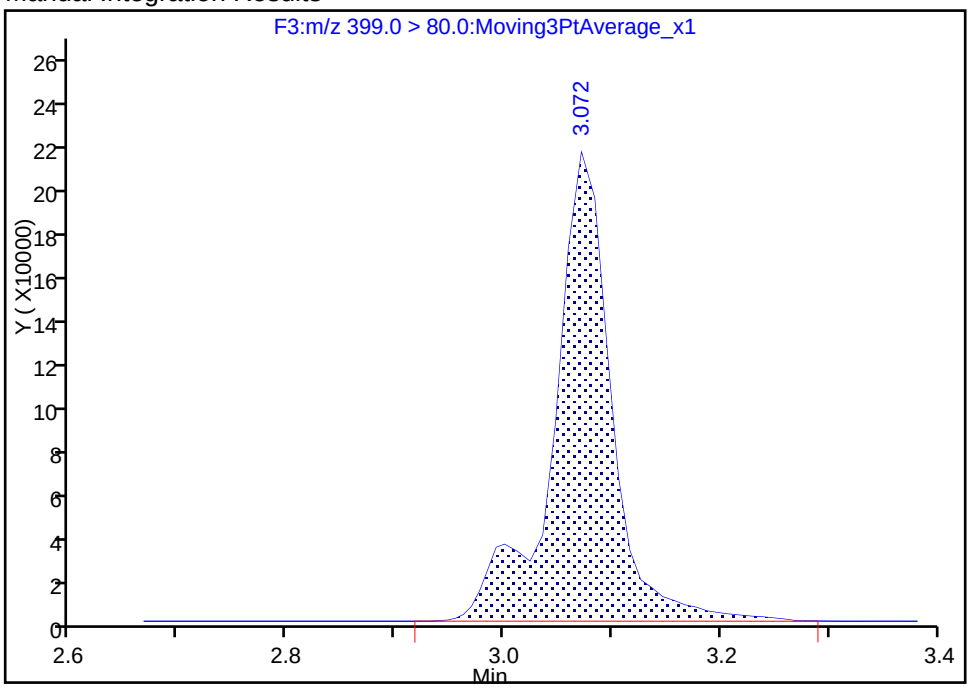
Processing Integration Results

RT: 3.07
Area: 702877
Amount: 27.344847
Amount Units: ng/ml



Manual Integration Results

RT: 3.07
Area: 791471
Amount: 30.221141
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:41:27
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

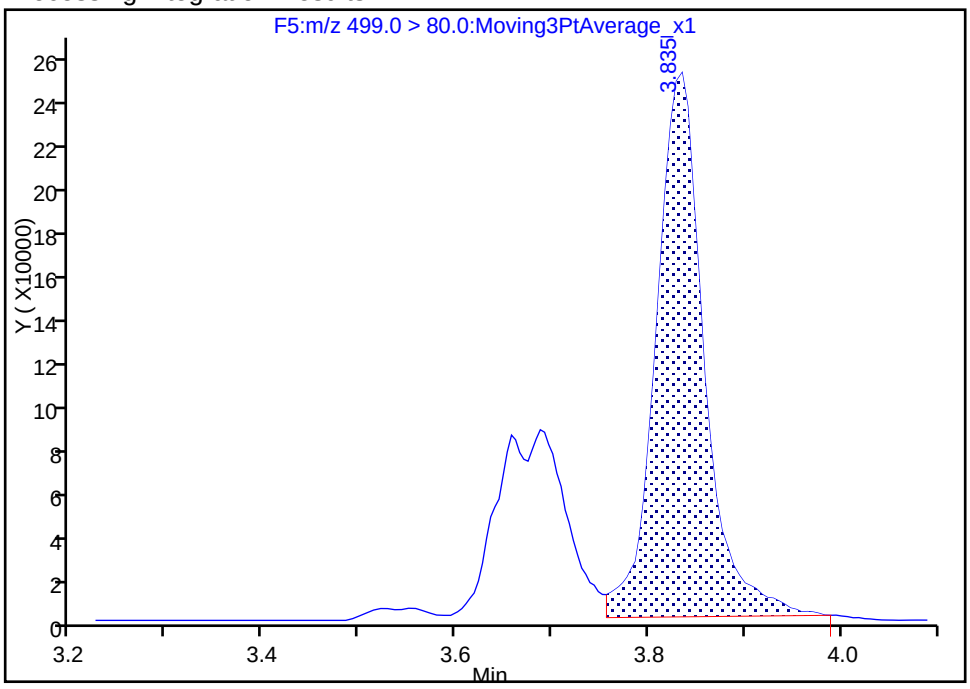
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_010.d
Injection Date: 11-Jul-2017 14:47:23 Instrument ID: A6
Lims ID: STD L4
Client ID:
Operator ID: JRB ALS Bottle#: 4 Worklist Smp#: 10
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F5:MRM

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

Signal: 1

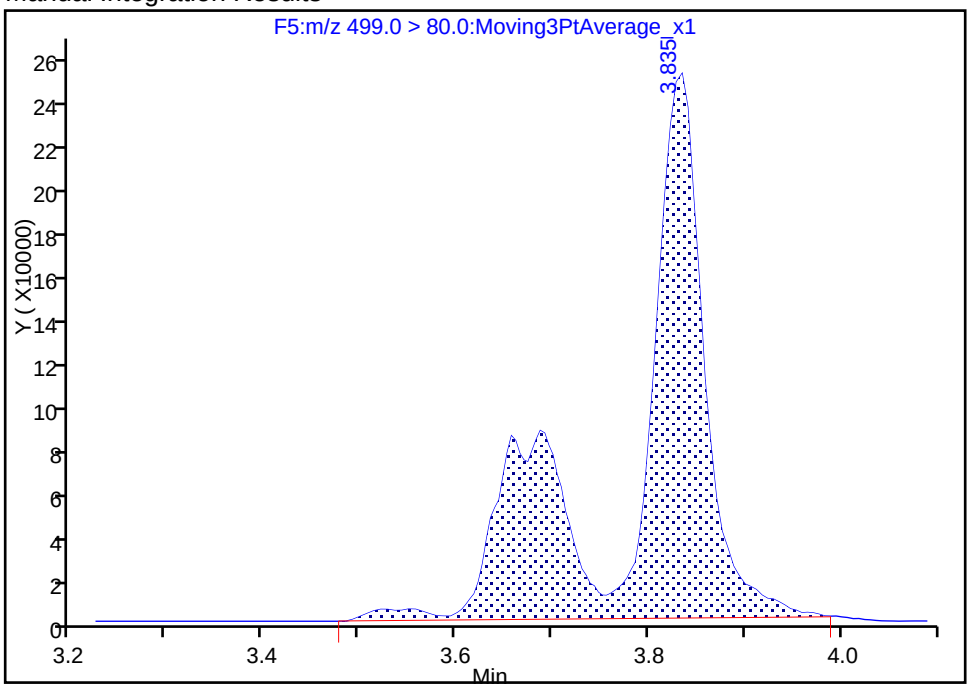
Processing Integration Results

RT: 3.83
Area: 865594
Amount: 27.654288
Amount Units: ng/ml



Manual Integration Results

RT: 3.83
Area: 1321595
Amount: 39.836429
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:48:46
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

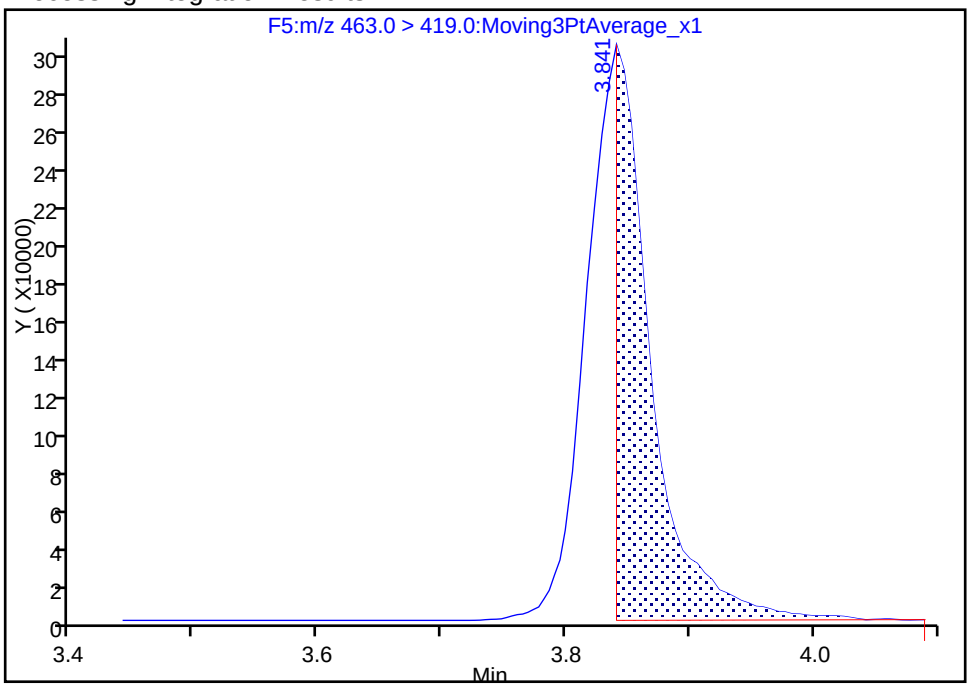
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_010.d
Injection Date: 11-Jul-2017 14:47:23 Instrument ID: A6
Lims ID: STD L4
Client ID:
Operator ID: JRB ALS Bottle#: 4 Worklist Smp#: 10
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm) Detector F5:MRM

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

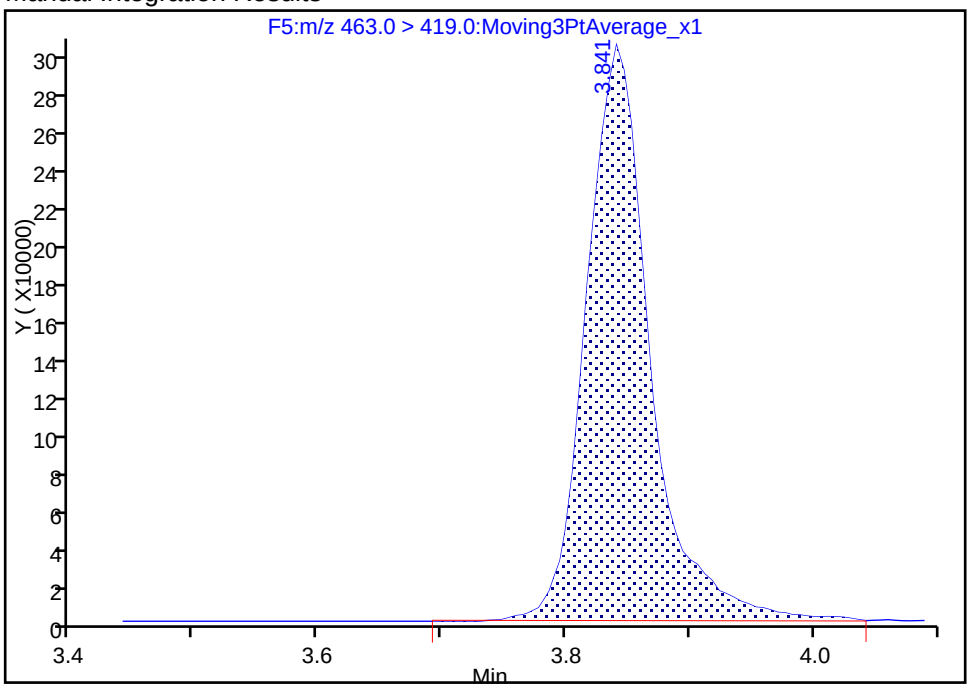
Processing Integration Results

RT: 3.84
Area: 578321
Amount: 11.680128
Amount Units: ng/ml



Manual Integration Results

RT: 3.84
Area: 1068968
Amount: 19.903832
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:49:01
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_011.d
Lims ID: STD L5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 11-Jul-2017 14:56:28 ALS Bottle#: 5 Worklist Smp#: 11
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: L5_537
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\20170711-45298.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 11-Jul-2017 15:53:34 Calib Date: 11-Jul-2017 15:05:33
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK020

First Level Reviewer: barnettj Date: 11-Jul-2017 15:24:07

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	2.448	2.442	0.006	1.000	3579670	136.6	1616	
$ 2 13C2 PFHxA								
315.0 > 270.0	2.732	2.733	-0.001	1.000	613307	9.22	840	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.060	3.060	0.0	1.000	847873	15.3	6607	
3 Perfluorohexanesulfonic acid								M
399.0 > 80.0	3.072	3.071	0.001	1.000	1199989	45.8	1173	M
* 5 13C2-PFOA								
415.0 > 370.0	3.408	3.411	-0.003		474775	10.0	311	
6 Perfluorooctanoic acid								
413.0 > 369.0	3.408	3.413	-0.005	1.000	1525464	29.5	381	
* 8 13C4 PFOS								
503.0 > 80.0	3.823	3.830	-0.007		938030	28.7	657	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.829	3.835	-0.006	1.000	2120345	63.9	420	M
9 Perfluorononanoic acid								M
463.0 > 419.0	3.835	3.842	-0.007	1.000	1629901	28.0	741	M
$ 10 13C2 PFDA								
515.0 > 470.0	4.459	4.465	-0.006	1.000	467617	9.61	544	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L5_00023 Amount Added: 1.00 Units: mL

Report Date: 11-Jul-2017 15:53:35 Chrom Revision: 2.2 26-Jun-2017 08:09:44

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_011.d

Injection Date: 11-Jul-2017 14:56:28 Instrument ID: A6

Lims ID: STD L5

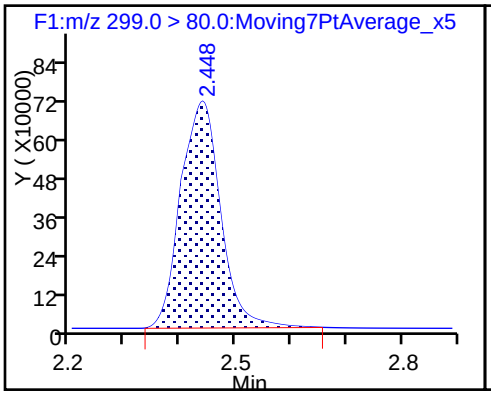
Client ID:

Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 11

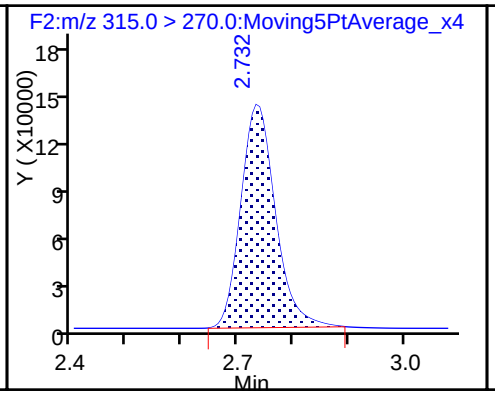
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

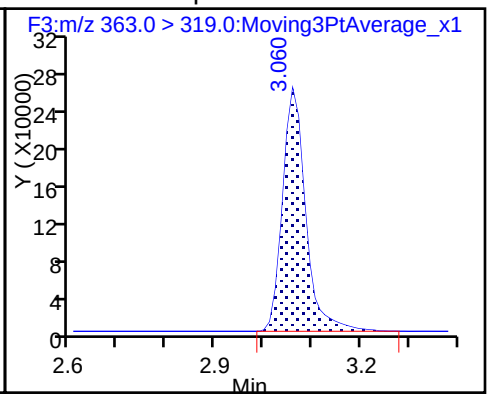
1 Perfluorobutanesulfonic acid



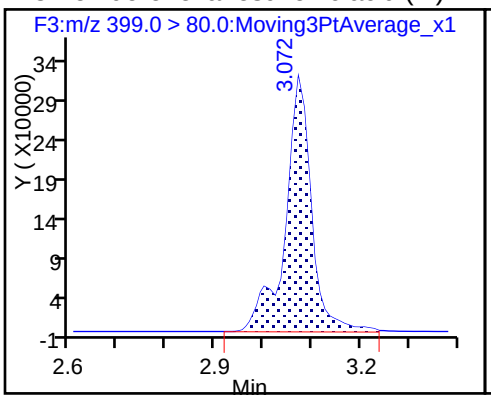
$ 2 13C2 PFHxA



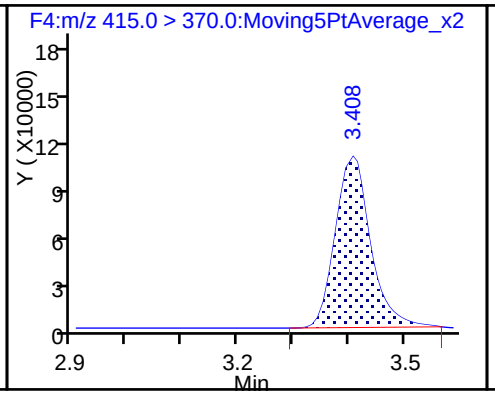
4 Perfluoroheptanoic acid



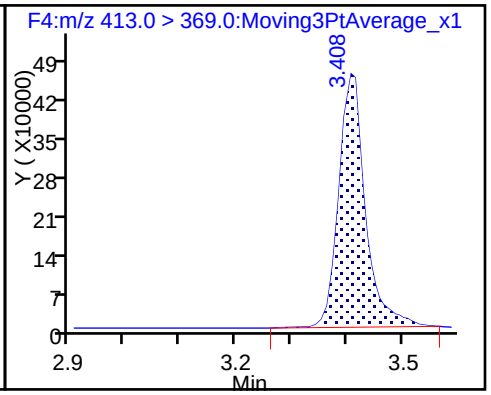
3 Perfluorohexanesulfonic acid (M)



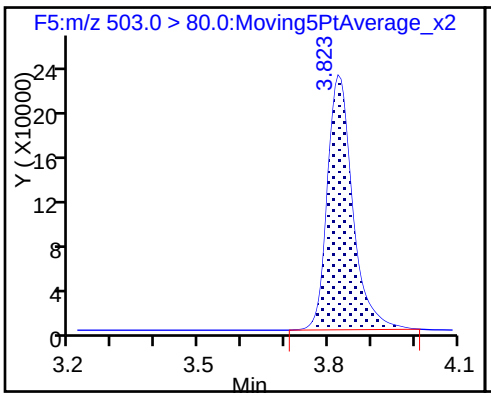
* 5 13C2-PFOA



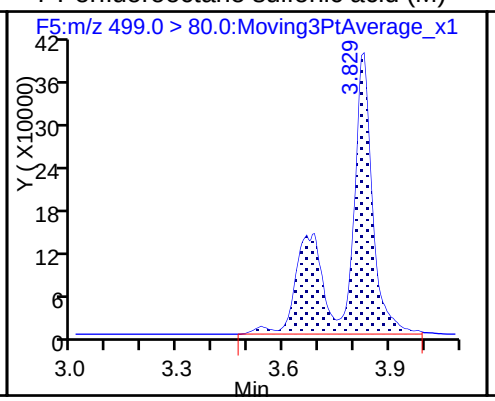
6 Perfluorooctanoic acid



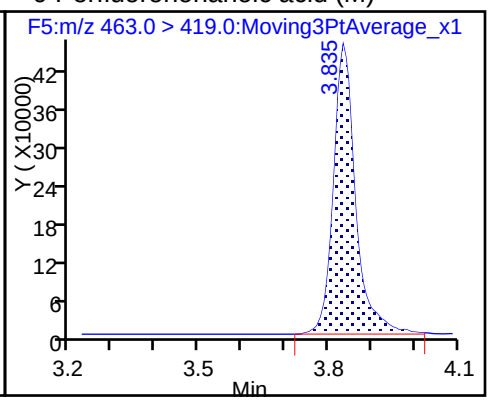
* 8 13C4 PFOS



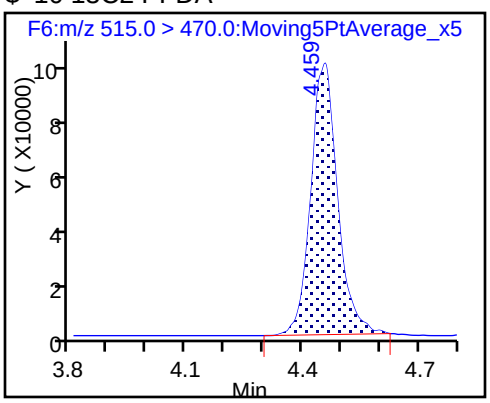
7 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid (M)



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

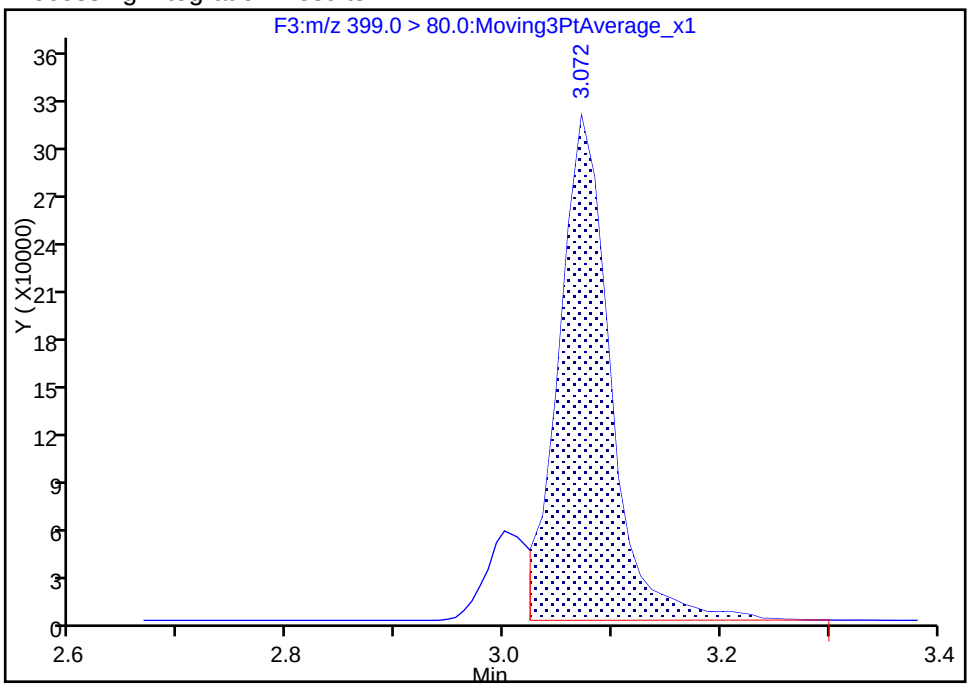
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_011.d
Injection Date: 11-Jul-2017 14:56:28 Instrument ID: A6
Lims ID: STD L5
Client ID:
Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 11
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F3:MRM

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

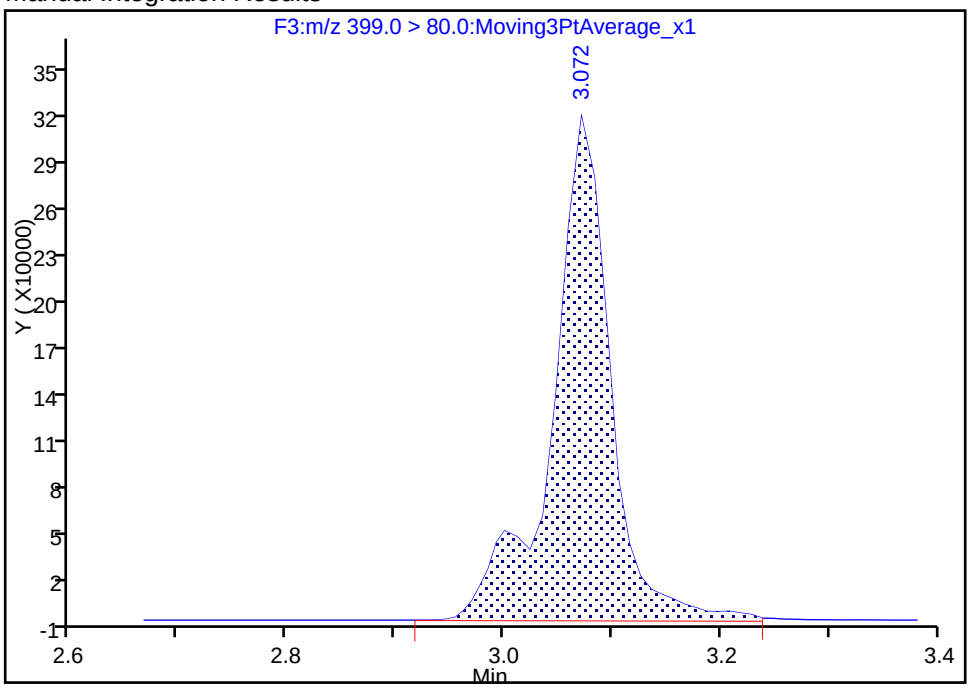
Processing Integration Results

RT: 3.07
Area: 1048365
Amount: 41.849197
Amount Units: ng/ml



Manual Integration Results

RT: 3.07
Area: 1199989
Amount: 45.793024
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:23:25
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

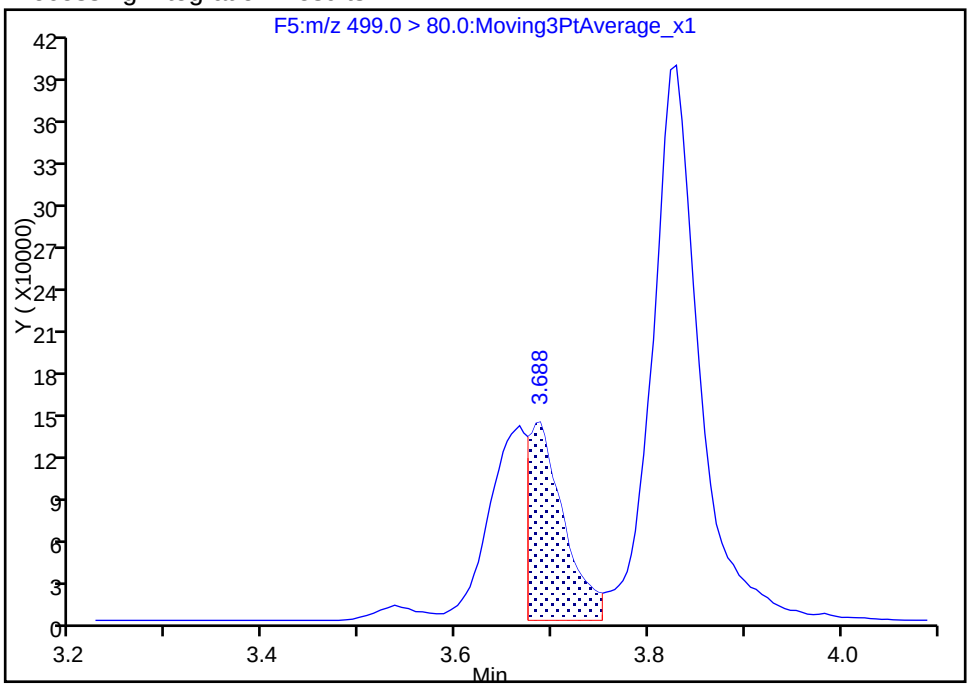
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_011.d
Injection Date: 11-Jul-2017 14:56:28 Instrument ID: A6
Lims ID: STD L5
Client ID:
Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 11
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F5:MRM

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

Signal: 1

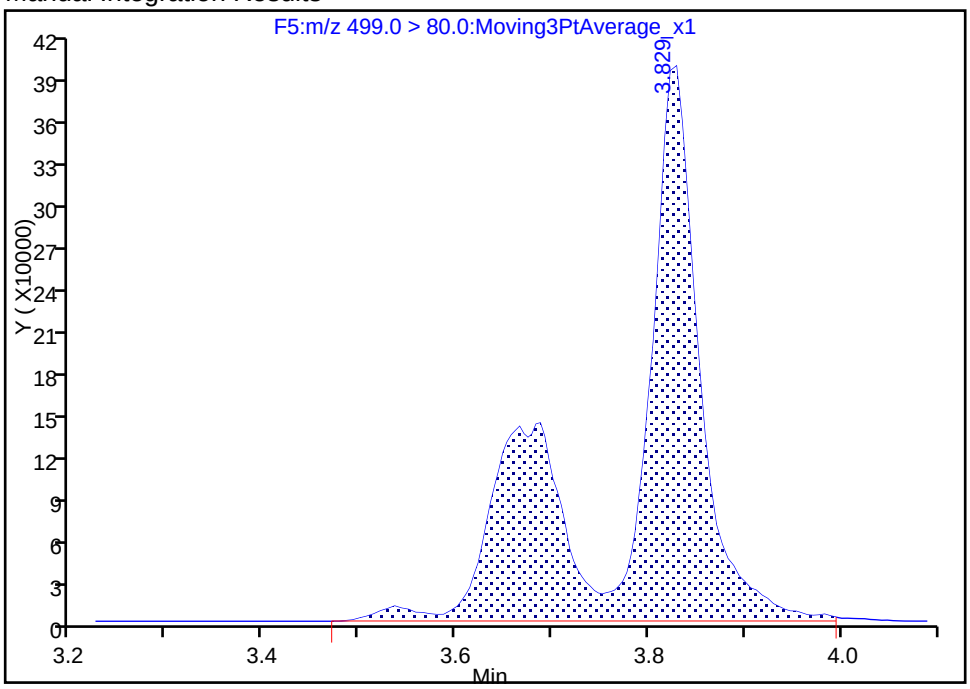
Processing Integration Results

RT: 3.69
Area: 348404
Amount: 17.393123
Amount Units: ng/ml



Manual Integration Results

RT: 3.83
Area: 2120345
Amount: 63.875565
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:23:36
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

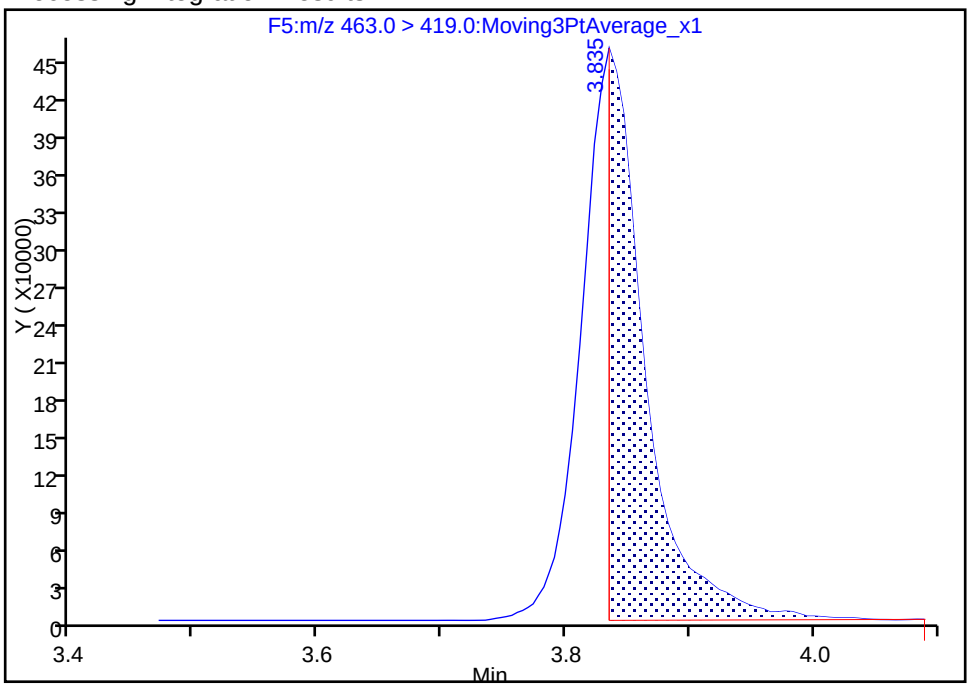
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_011.d
Injection Date: 11-Jul-2017 14:56:28 Instrument ID: A6
Lims ID: STD L5
Client ID:
Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 11
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F5:MRM

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

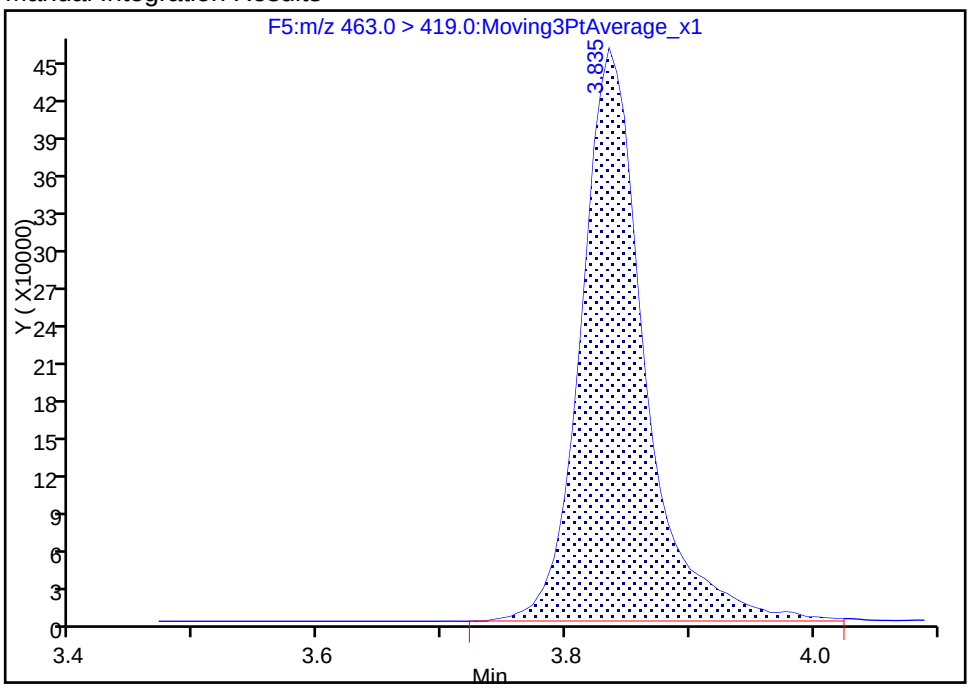
Processing Integration Results

RT: 3.83
Area: 923222
Amount: 16.986939
Amount Units: ng/ml



Manual Integration Results

RT: 3.83
Area: 1629901
Amount: 27.963892
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:24:00
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d
Lims ID: STD L6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 11-Jul-2017 15:05:33 ALS Bottle#: 6 Worklist Smp#: 12
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: L6_537
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\20170711-45298.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 11-Jul-2017 15:53:36 Calib Date: 11-Jul-2017 15:05:33
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK020

First Level Reviewer: barnettj Date: 11-Jul-2017 15:25:18

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								M
299.0 > 80.0	2.452	2.442	0.010	1.000	4732899	188.9	704	M
$ 2 13C2 PFHxA								
315.0 > 270.0	2.738	2.733	0.005	1.000	676347	10.3	897	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.060	3.060	0.0	1.000	1046972	19.2	1502	
3 Perfluorohexanesulfonic acid								M
399.0 > 80.0	3.071	3.071	0.0	1.000	1802638	71.9	1963	M
* 5 13C2-PFOA								
415.0 > 370.0	3.408	3.411	-0.003		469312	10.0	533	
6 Perfluorooctanoic acid								
413.0 > 369.0	3.408	3.413	-0.005	1.000	2219289	43.4	82.9	
* 8 13C4 PFOS								
503.0 > 80.0	3.823	3.830	-0.007		897051	28.7	473	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.829	3.835	-0.006	1.000	2845332	89.6	464	M
9 Perfluorononanoic acid								
463.0 > 419.0	3.835	3.842	-0.007	1.000	2033486	35.3	9504	
$ 10 13C2 PFDA								
515.0 > 470.0	4.451	4.465	-0.014	1.000	490441	10.2	1016	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L6_00018 Amount Added: 1.00 Units: mL

Report Date: 11-Jul-2017 15:53:36 Chrom Revision: 2.2 26-Jun-2017 08:09:44

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Injection Date: 11-Jul-2017 15:05:33 Instrument ID: A6

Lims ID: STD L6

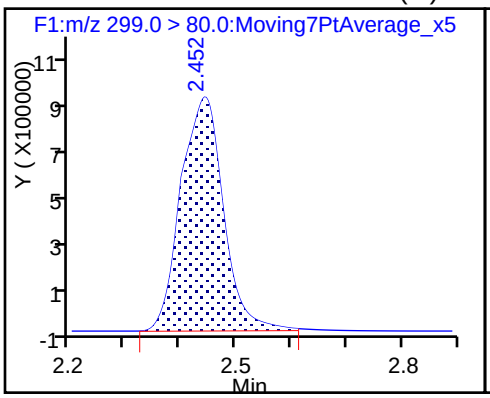
Client ID:

Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 12

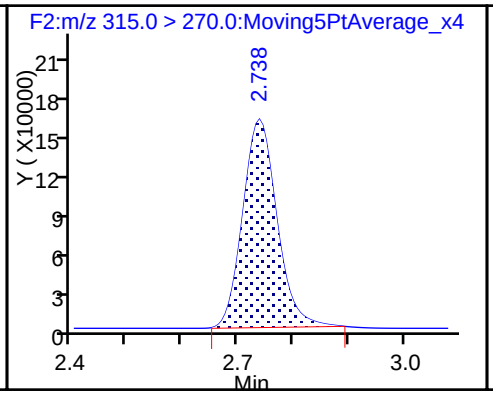
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

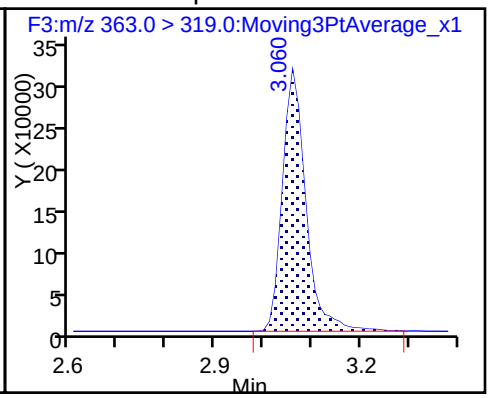
1 Perfluorobutanesulfonic acid (M)



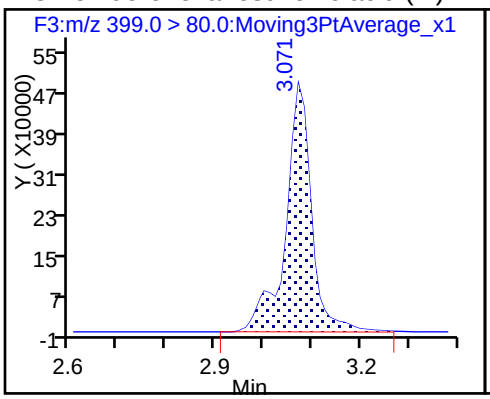
$ 2 13C2 PFHxA



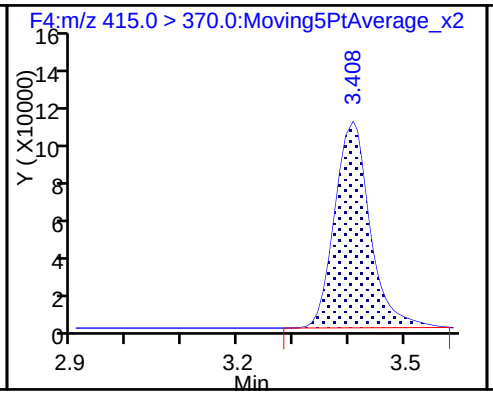
4 Perfluoroheptanoic acid



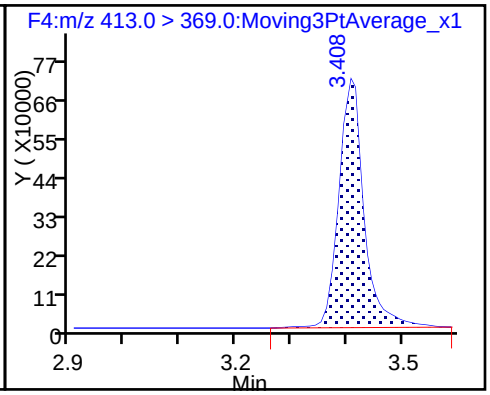
3 Perfluorohexanesulfonic acid (M)



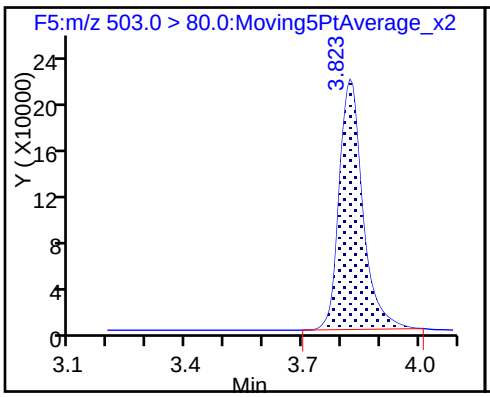
* 5 13C2-PFOA



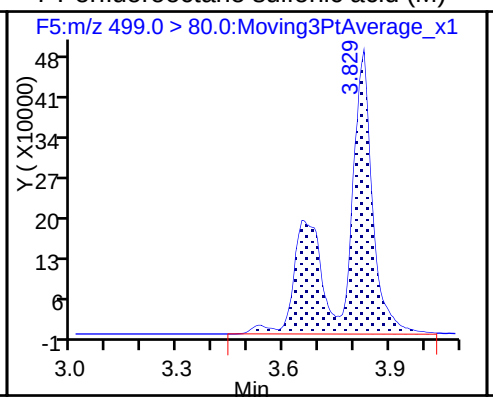
6 Perfluorooctanoic acid



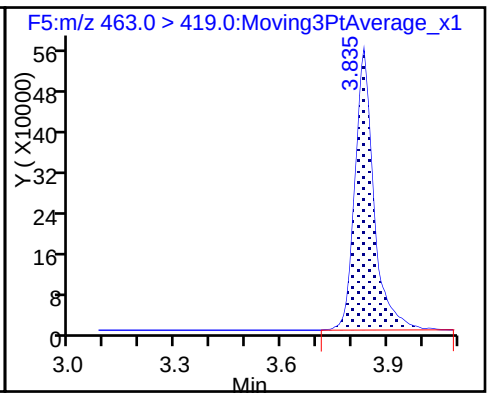
* 8 13C4 PFOS



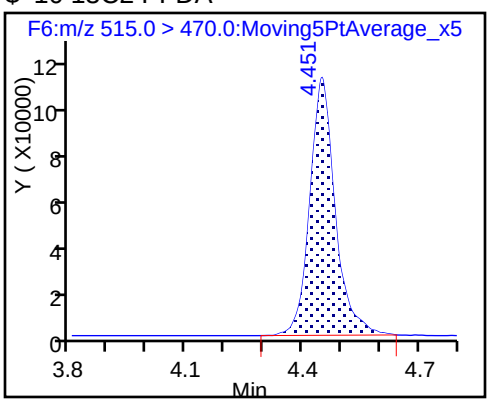
7 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

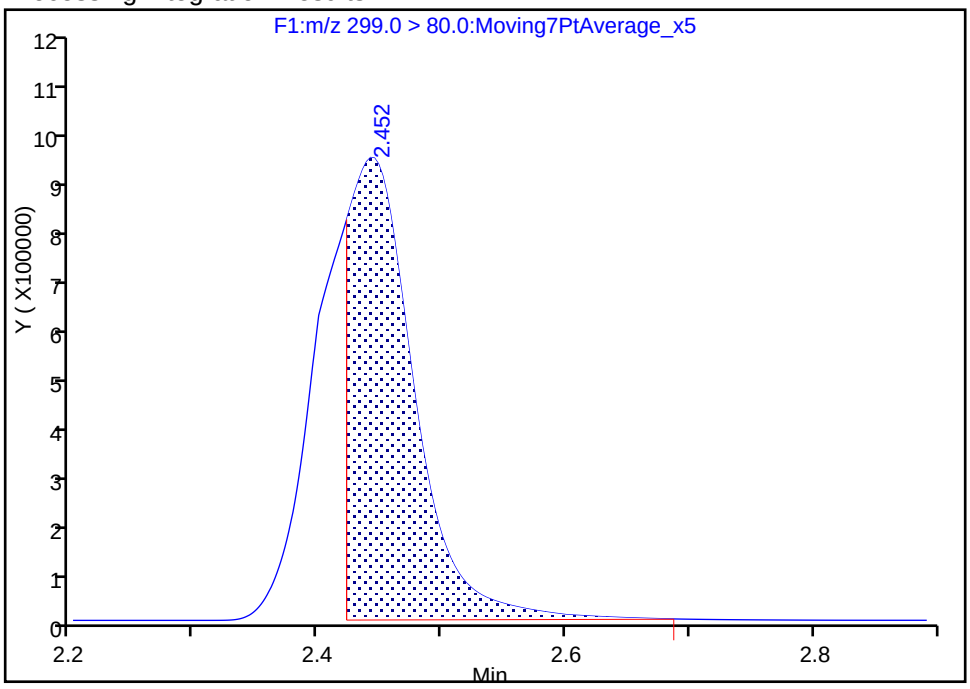
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d
Injection Date: 11-Jul-2017 15:05:33 Instrument ID: A6
Lims ID: STD L6
Client ID:
Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 12
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm) Detector F1:MRM

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

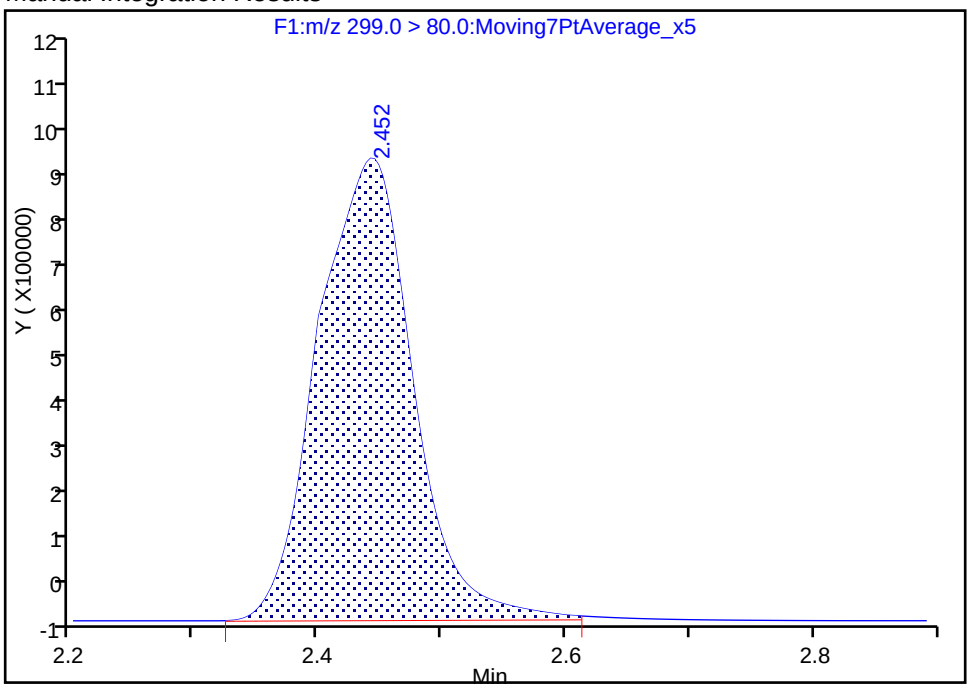
Processing Integration Results

RT: 2.45
Area: 3182709
Amount: 135.6953
Amount Units: ng/ml



Manual Integration Results

RT: 2.45
Area: 4732899
Amount: 188.9125
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:24:20
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

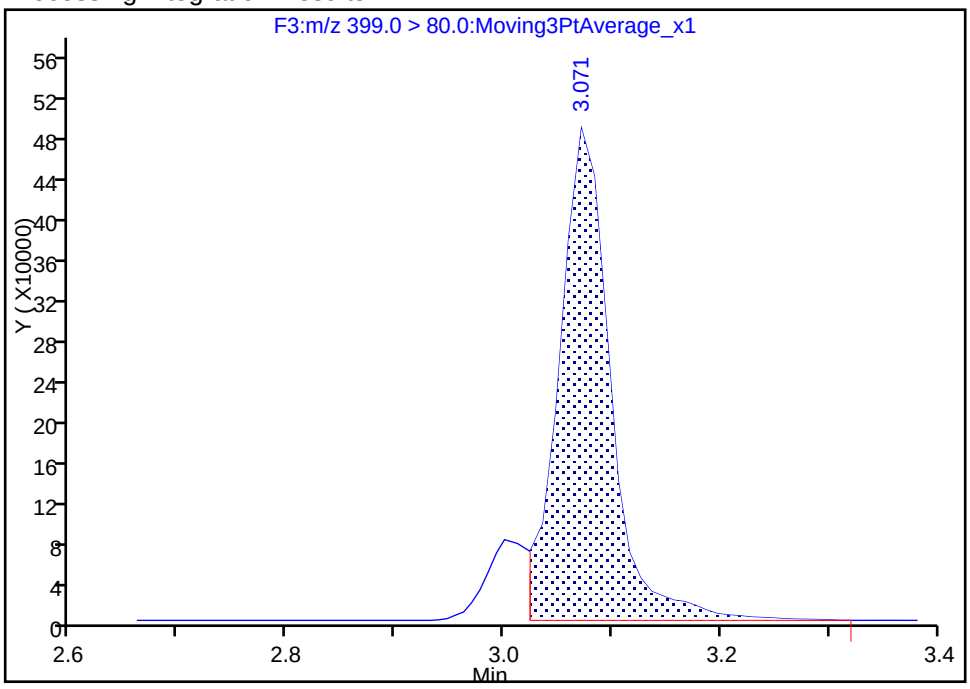
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d
Injection Date: 11-Jul-2017 15:05:33 Instrument ID: A6
Lims ID: STD L6
Client ID:
Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 12
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm) Detector F3:MRM

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

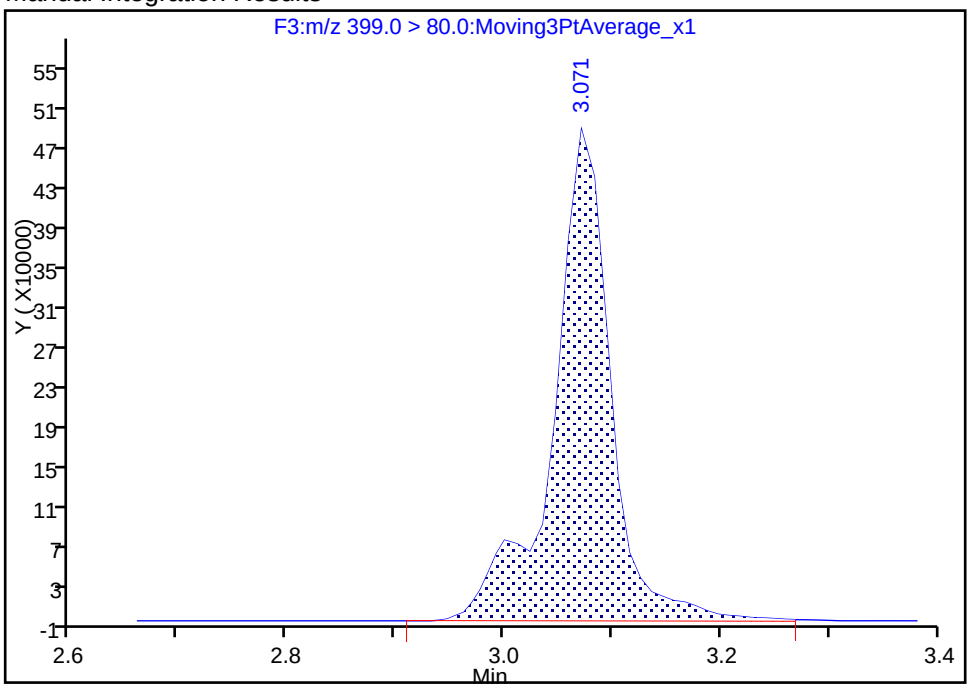
Processing Integration Results

RT: 3.07
Area: 1596855
Amount: 65.197484
Amount Units: ng/ml



Manual Integration Results

RT: 3.07
Area: 1802638
Amount: 71.933332
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:24:50
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

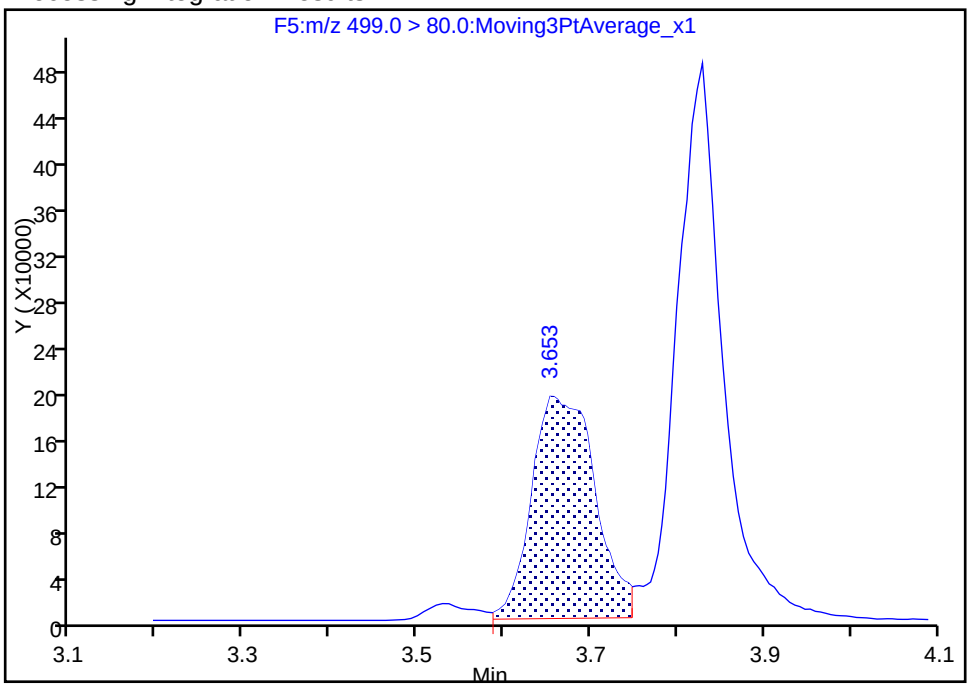
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d
Injection Date: 11-Jul-2017 15:05:33 Instrument ID: A6
Lims ID: STD L6
Client ID:
Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 12
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F5:MRM

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

Signal: 1

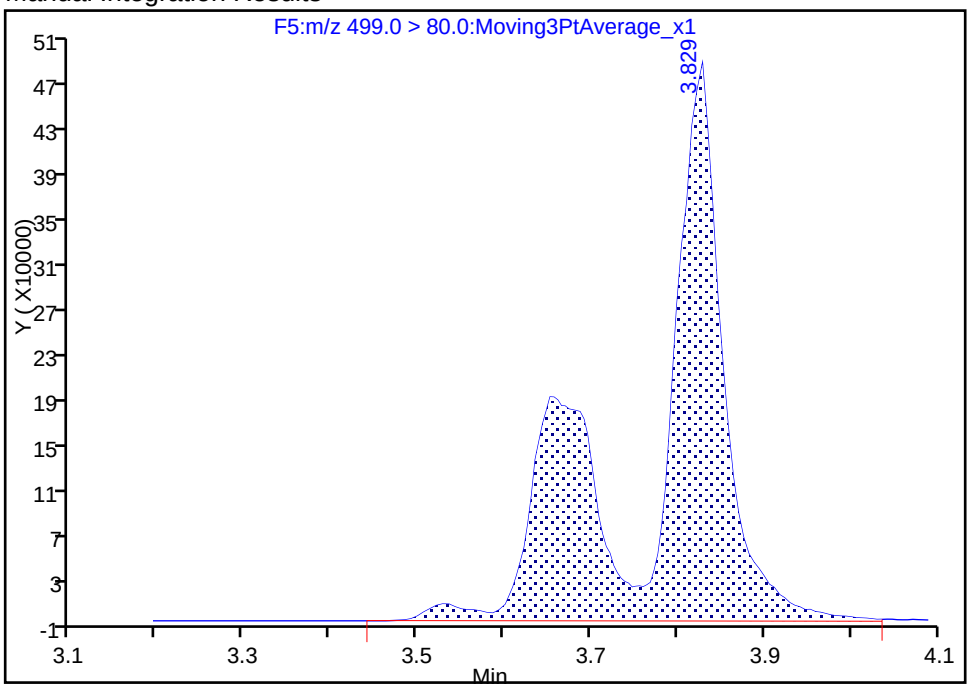
Processing Integration Results

RT: 3.65
Area: 974180
Amount: 40.830350
Amount Units: ng/ml



Manual Integration Results

RT: 3.83
Area: 2845332
Amount: 89.631520
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:25:02
Audit Action: Manually Integrated Audit Reason: Isomers

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Lab Sample ID: CCVL 320-173534/14 Calibration Date: 07/11/2017 15:23

Instrument ID: A6 Calib Start Date: 07/11/2017 14:18

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/11/2017 15:05

Lab File ID: 11JUL2017A6B_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8010	0.7561		20.0	21.2	-5.6	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.164	1.314		2.68	2.38	12.8	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8012	0.8160		7.35	7.21	1.8	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.129		4.97	4.80	3.6	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.015	1.070		10.1	9.61	5.5	50.0
Perfluorononanoic acid (PFNA)	Ave	1.228	1.385		5.22	4.62	12.8	50.0
13C2 PFHxA	Ave	1.402	1.345		9.60	10.0	-4.0	30.0
13C2 PFDA	Ave	1.025	1.068		10.4	10.0	4.2	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_014.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 11-Jul-2017 15:23:46 ALS Bottle#: 2 Worklist Smp#: 14
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: CCVL
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\20170711-45298.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 11-Jul-2017 15:53:39 Calib Date: 11-Jul-2017 15:05:33
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK020

First Level Reviewer: barnettj Date: 11-Jul-2017 15:53:21

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	2.445	2.442	0.003	1.000	541619	20.0	216	
$ 2 13C2 PFHxA								
315.0 > 270.0	2.738	2.733	0.005	1.000	575433	9.60	914	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.060	3.060	0.0	1.000	133527	2.68	106	
3 Perfluorohexanesulfonic acid								M
399.0 > 80.0	3.071	3.071	0.0	1.000	198894	7.35	162	M
* 5 13C2-PFOA								
415.0 > 370.0	3.408	3.411	-0.003		427789	10.0	252	
6 Perfluorooctanoic acid								
413.0 > 369.0	3.408	3.413	-0.005	1.000	231537	4.97	131	
* 8 13C4 PFOS								
503.0 > 80.0	3.817	3.830	-0.013		968938	28.7	712	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.817	3.835	-0.018	1.000	347469	10.1	2102	M
9 Perfluorononanoic acid								
463.0 > 419.0	3.829	3.842	-0.013	1.000	273921	5.22	310	
$ 10 13C2 PFDA								
515.0 > 470.0	4.446	4.465	-0.019	1.000	456803	10.4	882	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00019 Amount Added: 1.00 Units: mL

Report Date: 11-Jul-2017 15:53:39 Chrom Revision: 2.2 26-Jun-2017 08:09:44

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_014.d

Injection Date: 11-Jul-2017 15:23:46 Instrument ID: A6

Lims ID: CCVL

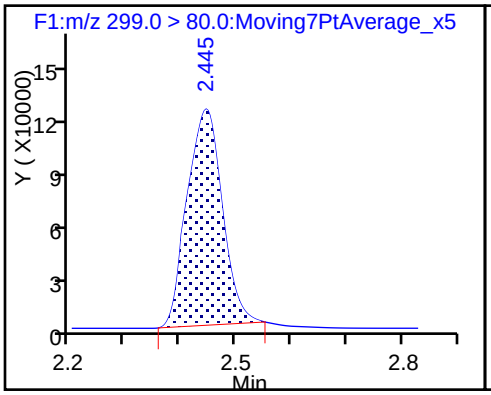
Client ID:

Operator ID: JRB ALS Bottle#: 2 Worklist Smp#: 14

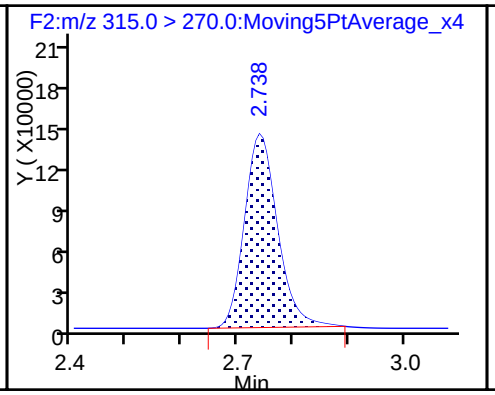
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

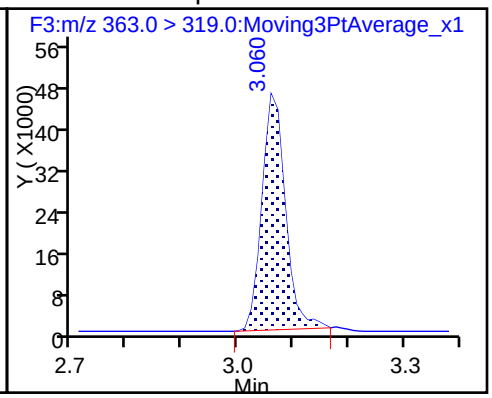
1 Perfluorobutanesulfonic acid



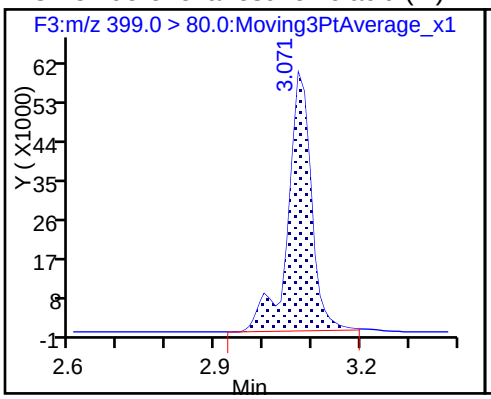
$ 2 13C2 PFHxA



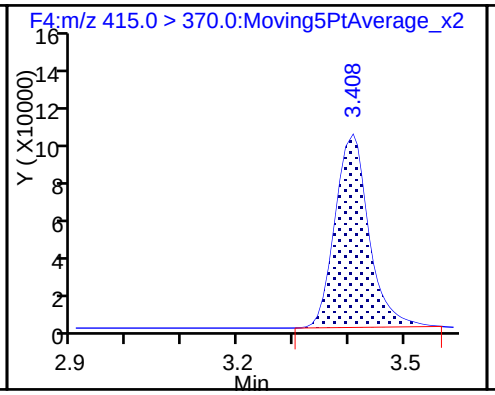
4 Perfluoroheptanoic acid



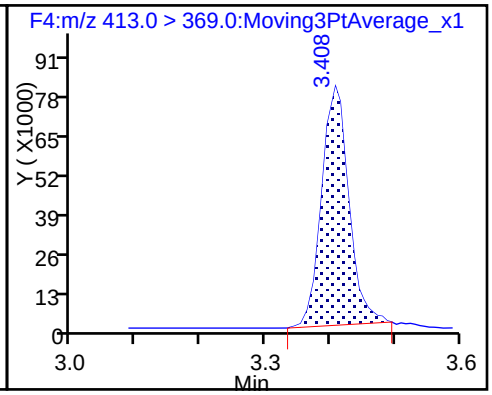
3 Perfluorohexanesulfonic acid (M)



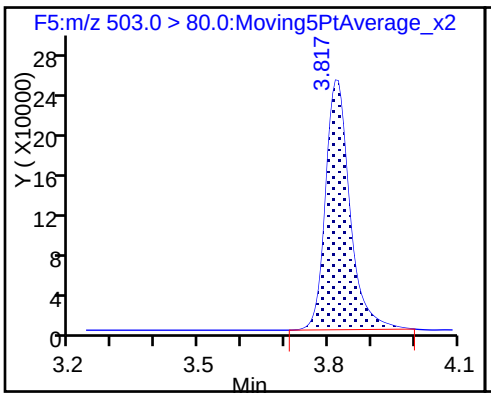
* 5 13C2-PFOA



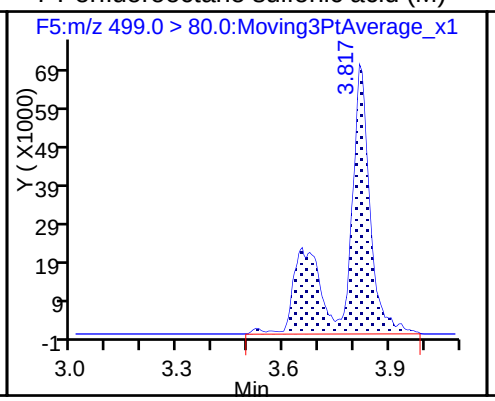
6 Perfluorooctanoic acid



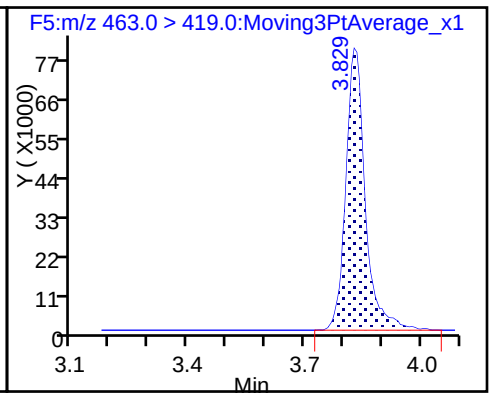
* 8 13C4 PFOS



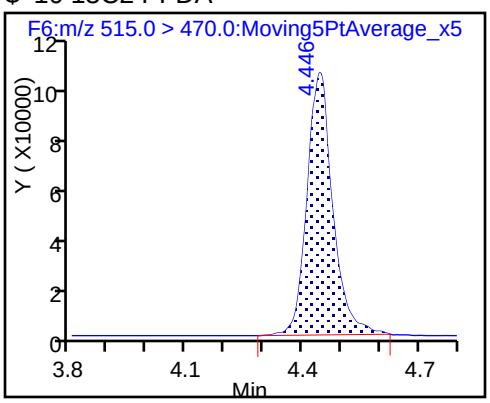
7 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

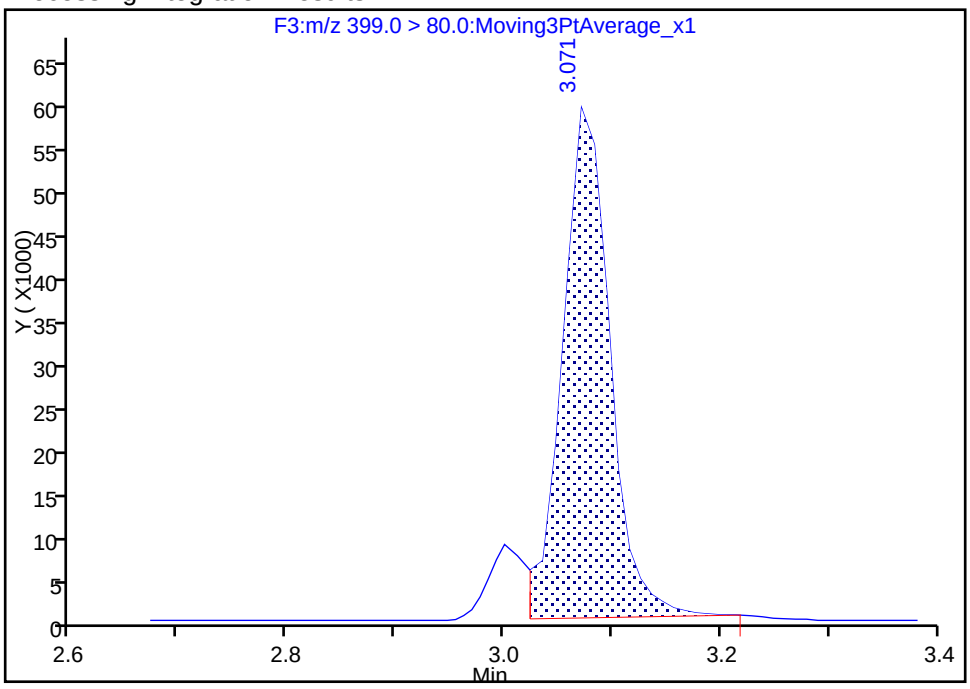
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_014.d
Injection Date: 11-Jul-2017 15:23:46 Instrument ID: A6
Lims ID: CCVL
Client ID:
Operator ID: JRB ALS Bottle#: 2 Worklist Smp#: 14
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm) Detector F3:MRM

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

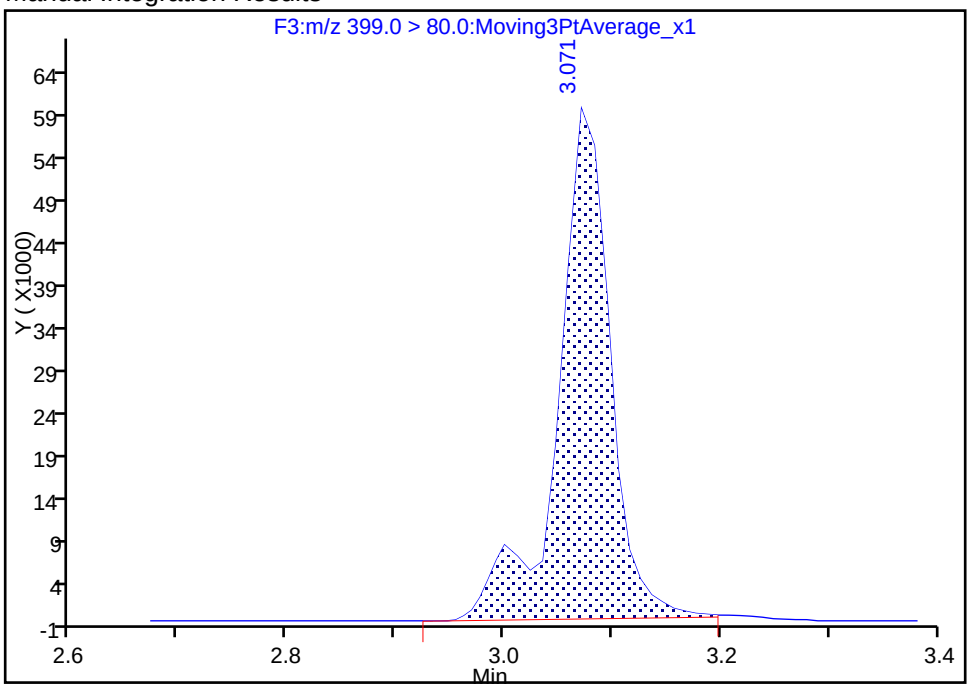
Processing Integration Results

RT: 3.07
Area: 178345
Amount: 6.588761
Amount Units: ng/ml



Manual Integration Results

RT: 3.07
Area: 198894
Amount: 7.347921
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:52:04
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

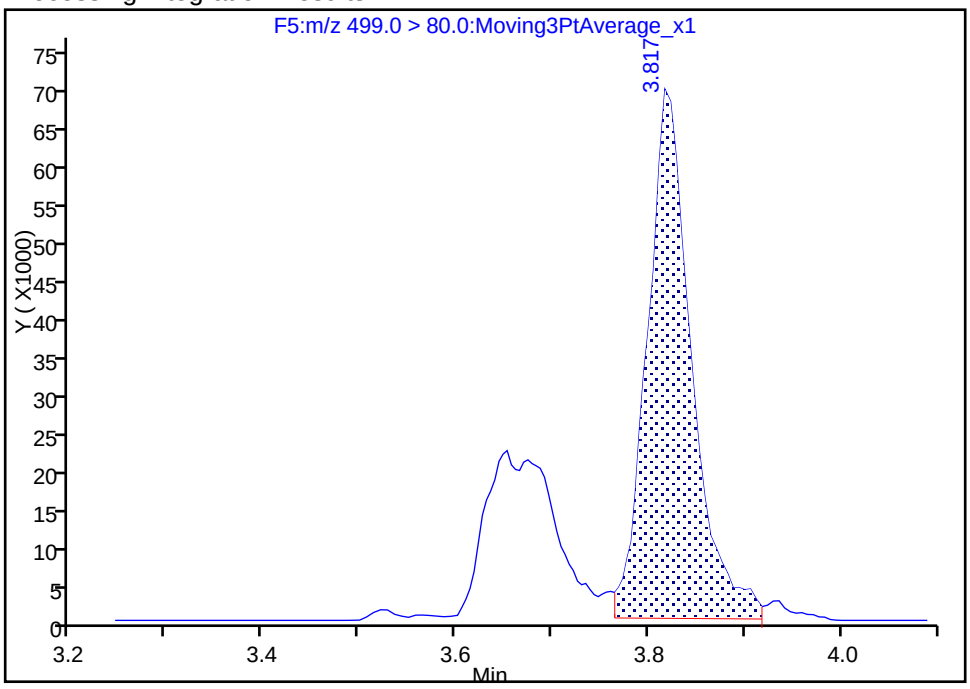
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_014.d
Injection Date: 11-Jul-2017 15:23:46 Instrument ID: A6
Lims ID: CCVL
Client ID:
Operator ID: JRB ALS Bottle#: 2 Worklist Smp#: 14
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F5:MRM

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

Signal: 1

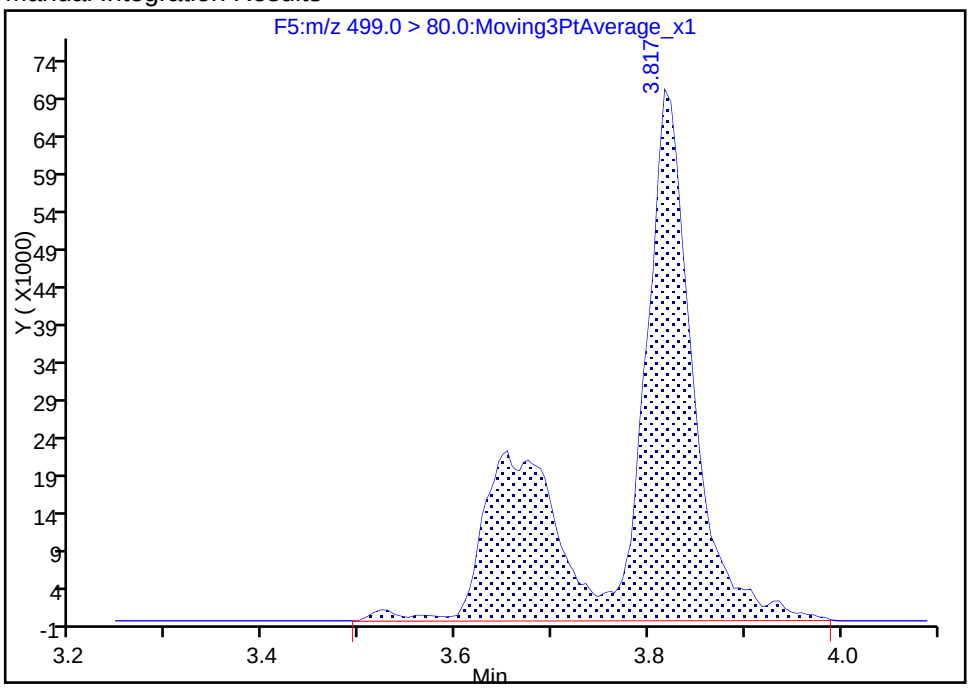
Processing Integration Results

RT: 3.82
Area: 219785
Amount: 6.409837
Amount Units: ng/ml



Manual Integration Results

RT: 3.82
Area: 347469
Amount: 10.133630
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:52:17
Audit Action: Manually Integrated Audit Reason: Isomers

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Lab Sample ID: ICV 320-173534/16 Calibration Date: 07/11/2017 15:42

Instrument ID: A6 Calib Start Date: 07/11/2017 14:18

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/11/2017 15:05

Lab File ID: 11JUL2017A6B_016.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8010	0.7916		99.5	101	-1.2	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.164	1.071		9.27	10.1	-8.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8012	0.8072		21.3	21.2	0.8	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.062		19.5	20.0	-2.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.015	1.017		20.7	20.7	0.2	30.0
Perfluorononanoic acid (PFNA)	Ave	1.228	1.264		20.6	20.0	2.9	30.0
13C2 PFHxA	Ave	1.402	1.297		9.25	10.0	-7.5	30.0
13C2 PFDA	Ave	1.025	0.997		9.73	10.0	-2.7	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_016.d
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 11-Jul-2017 15:42:00 ALS Bottle#: 7 Worklist Smp#: 16
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: Gemini C18, 3um, 2X50mm , T=35*C
Operator ID: JRB Instrument ID: A6
Sublist:

Method: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 11-Jul-2017 16:21:43 Calib Date: 11-Jul-2017 15:05:33
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK020

First Level Reviewer: barnettj Date: 11-Jul-2017 16:13:21

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	2.445	2.442	0.003	1.000	2737453	99.5	1412	
$ 2 13C2 PFHxA								
315.0 > 270.0	2.738	2.733	0.005	1.000	603752	9.25	681	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.060	3.060	0.0	1.000	502622	9.27	1098	
3 Perfluorohexanesulfonic acid								M
399.0 > 80.0	3.071	3.071	0.0	1.000	587410	21.3	715	M
* 5 13C2-PFOA								
415.0 > 370.0	3.408	3.411	-0.003		465673	10.0	378	
6 Perfluorooctanoic acid								
413.0 > 369.0	3.408	3.413	-0.005	1.000	990048	19.5	342	
* 8 13C4 PFOS								
503.0 > 80.0	3.811	3.830	-0.019		985132	28.7	597	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.817	3.835	-0.018	1.000	722733	20.7	1109	M
9 Perfluorononanoic acid								
463.0 > 419.0	3.823	3.842	-0.019	1.000	1177250	20.6	6685	
$ 10 13C2 PFDA								
515.0 > 470.0	4.443	4.465	-0.022	1.000	464251	9.73	825	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-ICV_00020 Amount Added: 1.00 Units: mL

Report Date: 11-Jul-2017 16:21:43 Chrom Revision: 2.2 26-Jun-2017 08:09:44

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_016.d

Injection Date: 11-Jul-2017 15:42:00 Instrument ID: A6

Lims ID: ICV

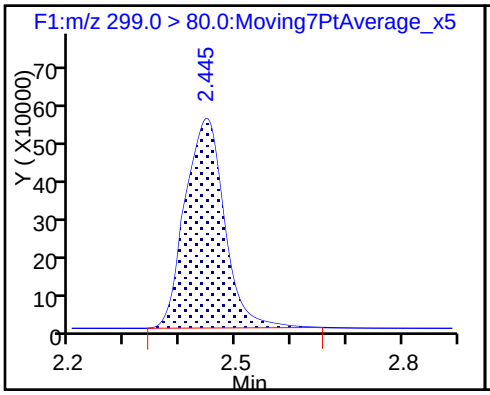
Client ID:

Operator ID: JRB ALS Bottle#: 7 Worklist Smp#: 16

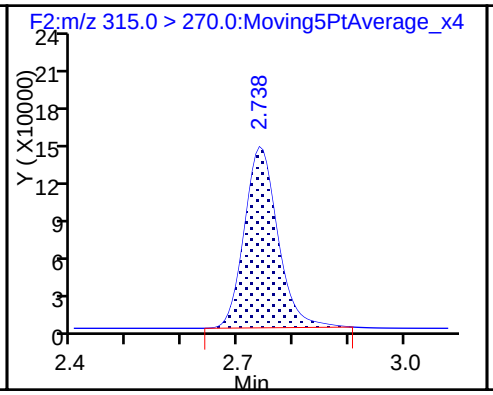
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

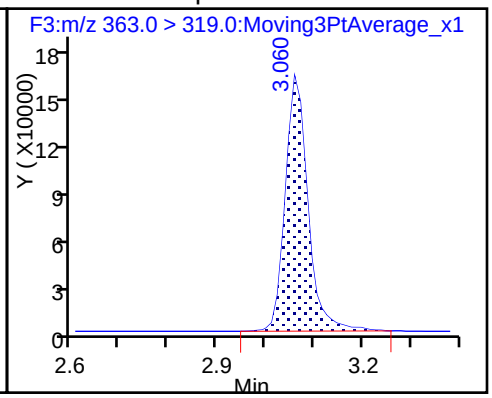
1 Perfluorobutanesulfonic acid



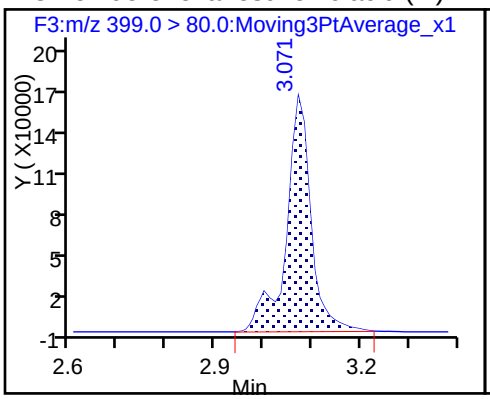
$ 2 13C2 PFHxA



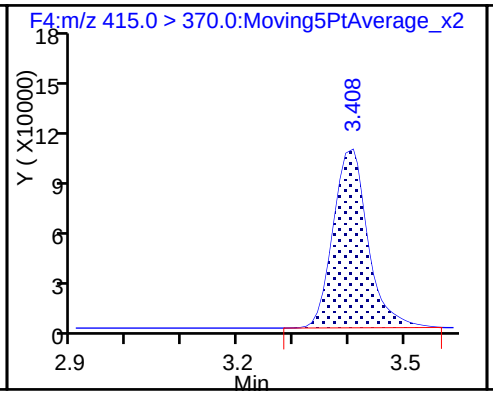
4 Perfluoroheptanoic acid



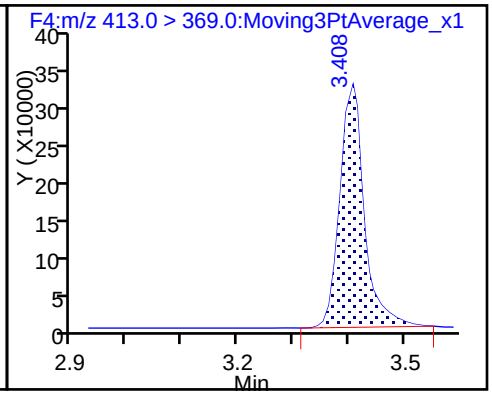
3 Perfluorohexanesulfonic acid (M)



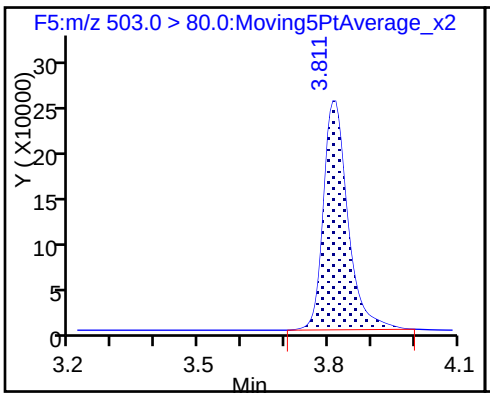
* 5 13C2-PFOA



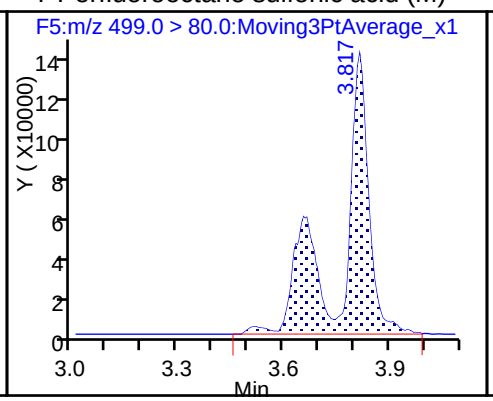
6 Perfluorooctanoic acid



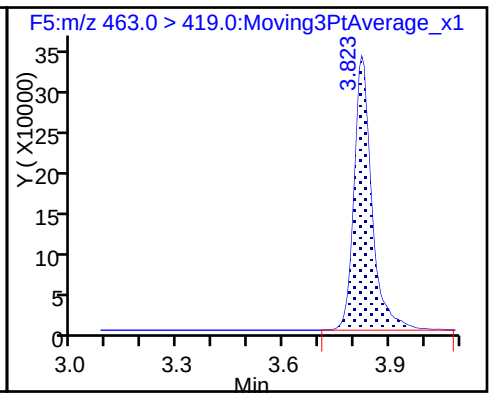
* 8 13C4 PFOS



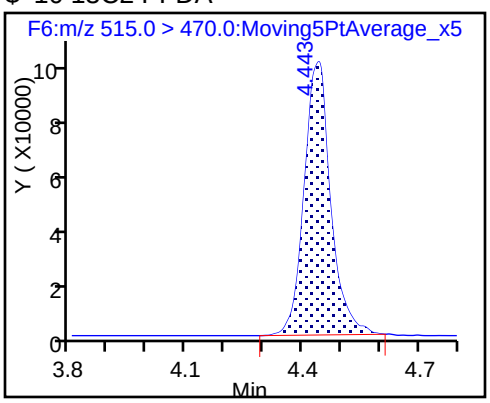
7 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

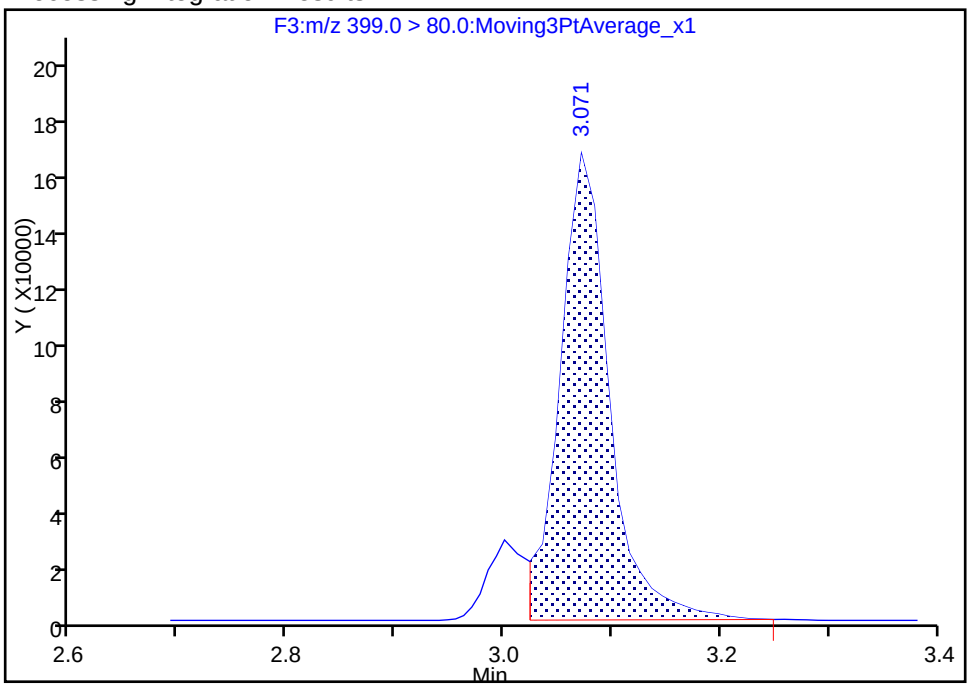
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_016.d
Injection Date: 11-Jul-2017 15:42:00 Instrument ID: A6
Lims ID: ICV
Client ID:
Operator ID: JRB ALS Bottle#: 7 Worklist Smp#: 16
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm) Detector F3:MRM

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

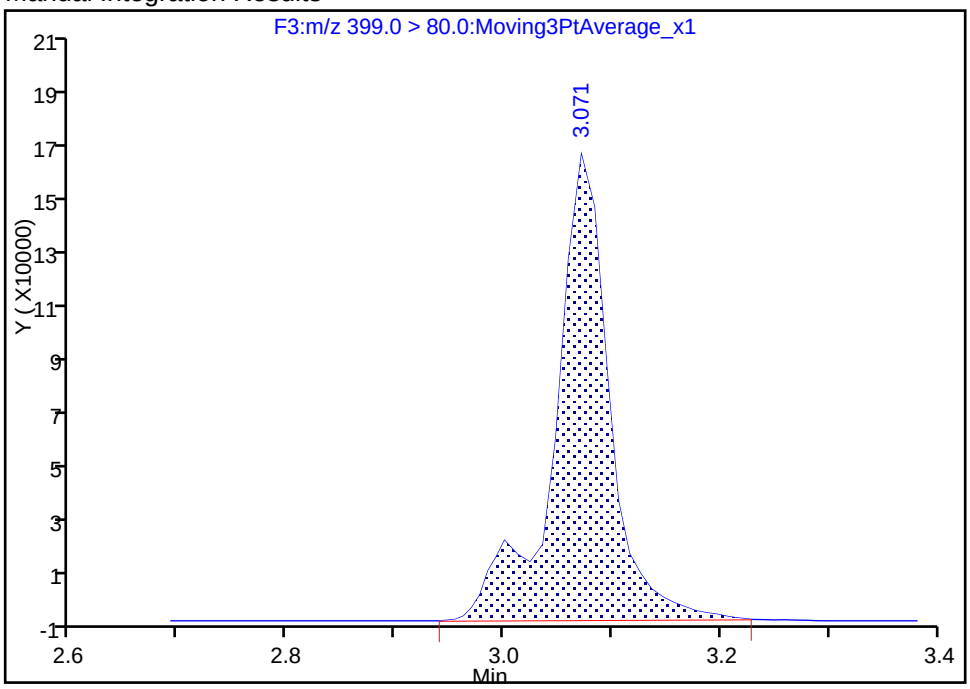
Processing Integration Results

RT: 3.07
Area: 520262
Amount: 18.904555
Amount Units: ng/ml



Manual Integration Results

RT: 3.07
Area: 587410
Amount: 21.344486
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:57:50
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

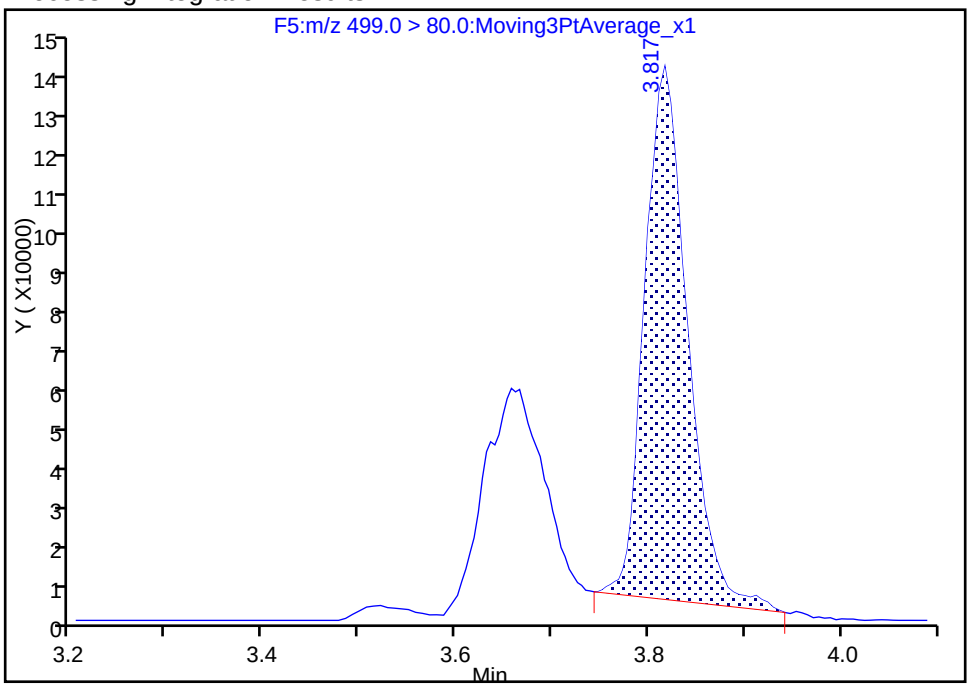
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_016.d
Injection Date: 11-Jul-2017 15:42:00 Instrument ID: A6
Lims ID: ICV
Client ID:
Operator ID: JRB ALS Bottle#: 7 Worklist Smp#: 16
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F5:MRM

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

Signal: 1

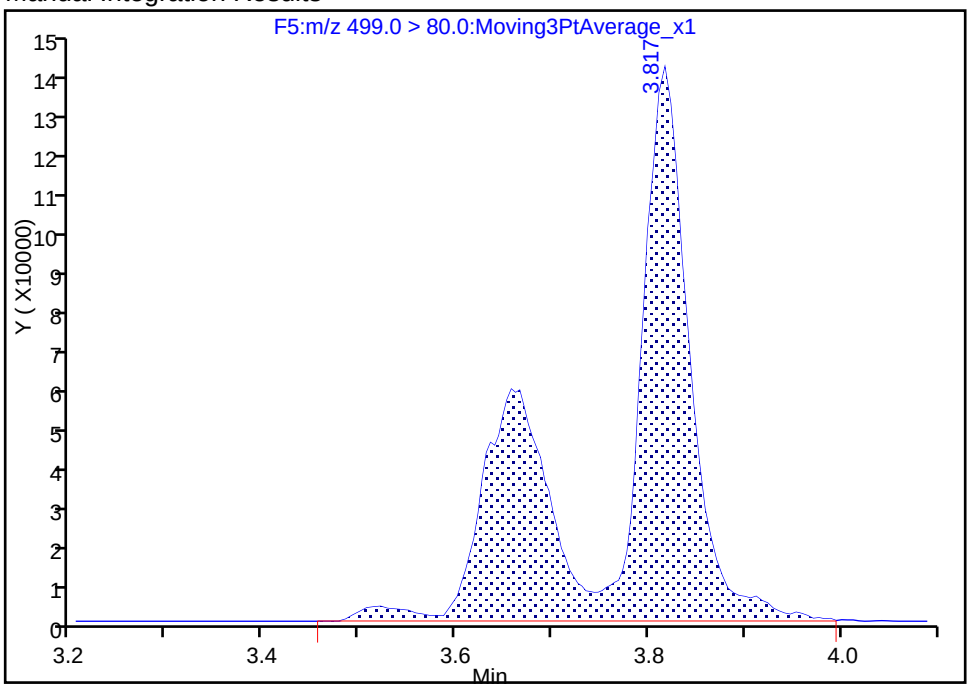
Processing Integration Results

RT: 3.82
Area: 396134
Amount: 11.362990
Amount Units: ng/ml



Manual Integration Results

RT: 3.82
Area: 722733
Amount: 20.731389
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 15:58:06
Audit Action: Manually Integrated Audit Reason: Isomers

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Lab Sample ID: CCV 320-173554/24 Calibration Date: 07/11/2017 16:54

Instrument ID: A6 Calib Start Date: 07/11/2017 14:18

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/11/2017 15:05

Lab File ID: 11JUL2017A6B_024.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8010	0.8057		133	133	0.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.164	1.185		15.1	14.9	1.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8012	0.8288		46.6	45.1	3.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.160		31.9	30.0	6.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.015	1.035		61.2	60.0	2.0	30.0
Perfluorononanoic acid (PFNA)	Ave	1.228	1.247		29.3	28.9	1.5	30.0
13C2 PFHxA	Ave	1.402	1.309		9.34	10.0	-6.6	30.0
13C2 PFDA	Ave	1.025	1.073		10.5	10.0	4.7	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_024.d
Lims ID: CCV L5
Client ID:
Sample Type: CCVIS
Inject. Date: 11-Jul-2017 16:54:52 ALS Bottle#: 5 Worklist Smp#: 24
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 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\20170711-45298.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 11-Jul-2017 17:26:51 Calib Date: 11-Jul-2017 15:05:33
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK020

First Level Reviewer: barnettj Date: 11-Jul-2017 17:22:22

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	2.448	2.442	0.006	1.000	3736174	133.3	1981	
$ 2 13C2 PFHxA								
315.0 > 270.0	2.738	2.733	0.005	1.000	617726	9.34	505	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.060	3.060	0.0	1.000	830944	15.1	1707	
3 Perfluorohexanesulfonic acid								M
399.0 > 80.0	3.072	3.071	0.001	1.000	1307683	46.6	1354	M
* 5 13C2-PFOA								
415.0 > 370.0	3.395	3.411	-0.016		472036	10.0	348	
6 Perfluorooctanoic acid								
413.0 > 369.0	3.408	3.413	-0.005	1.000	1641125	31.9	254	
* 8 13C4 PFOS								
503.0 > 80.0	3.805	3.830	-0.025		1003613	28.7	1061	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.811	3.835	-0.024	1.000	2174385	61.2	434	M
9 Perfluorononanoic acid								
463.0 > 419.0	3.817	3.842	-0.025	1.000	1699901	29.3	4932	
$ 10 13C2 PFDA								
515.0 > 470.0	4.425	4.465	-0.040	1.000	506398	10.5	958	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L5_00023 Amount Added: 1.00 Units: mL

Report Date: 11-Jul-2017 17:26:52 Chrom Revision: 2.2 26-Jun-2017 08:09:44

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_024.d

Injection Date: 11-Jul-2017 16:54:52 Instrument ID: A6

Lims ID: CCV L5

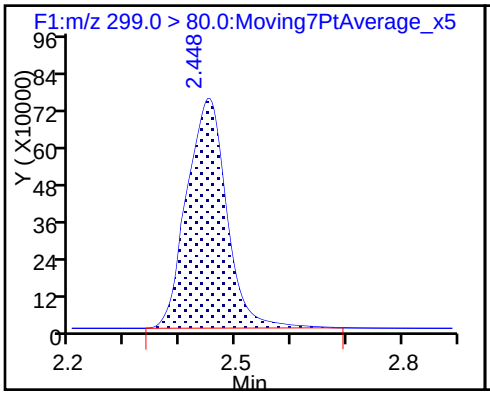
Client ID:

Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 24

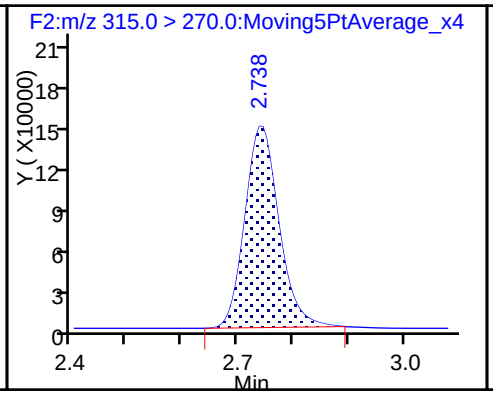
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

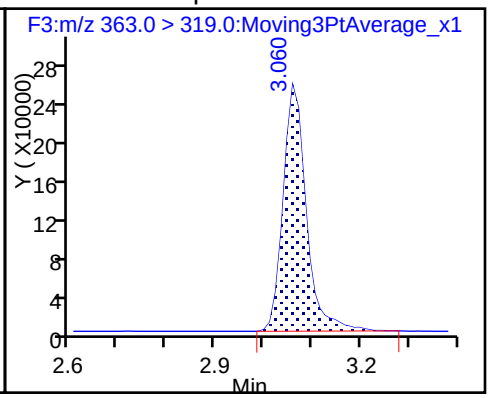
1 Perfluorobutanesulfonic acid



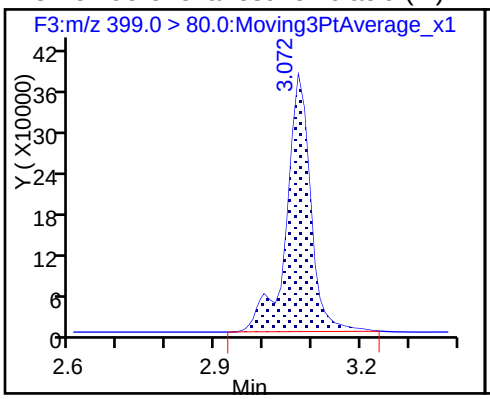
$ 2 13C2 PFHxA



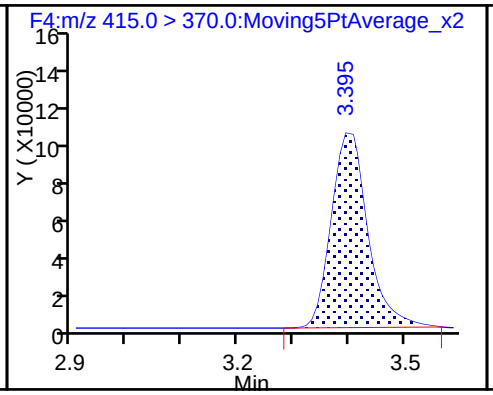
4 Perfluoroheptanoic acid



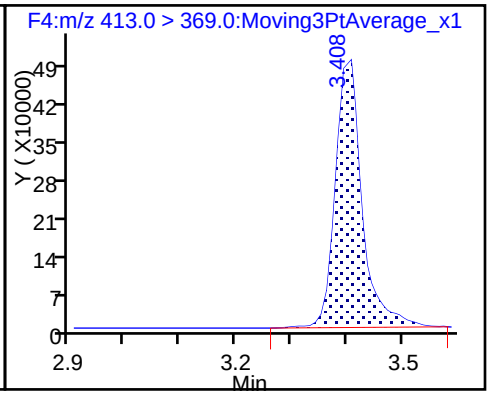
3 Perfluorohexanesulfonic acid (M)



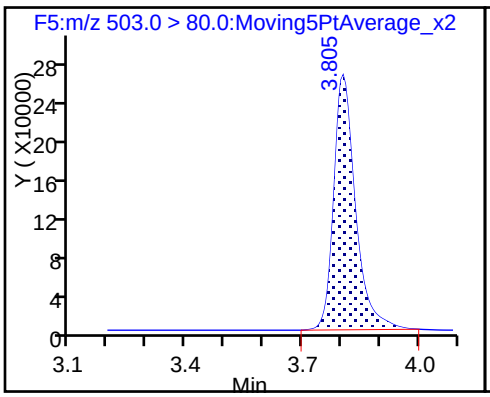
* 5 13C2-PFOA



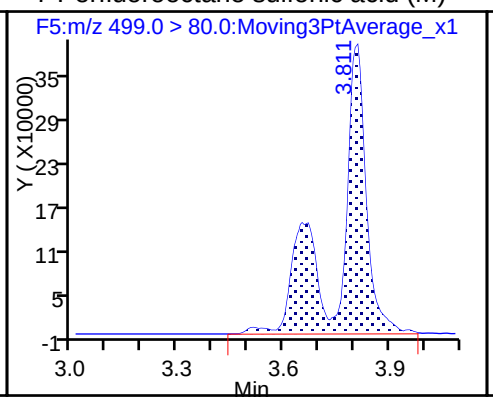
6 Perfluorooctanoic acid



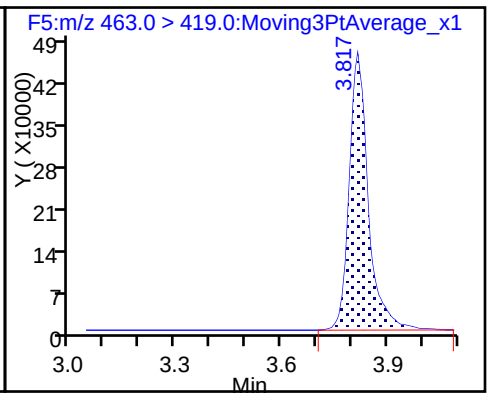
* 8 13C4 PFOS



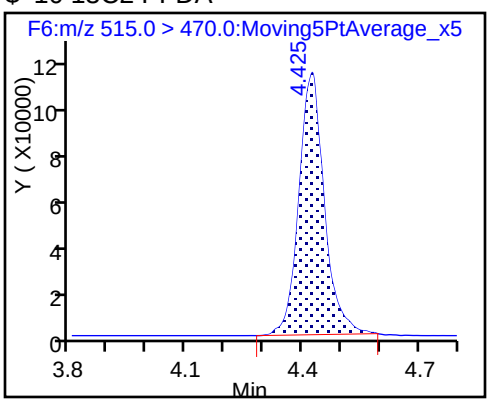
7 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

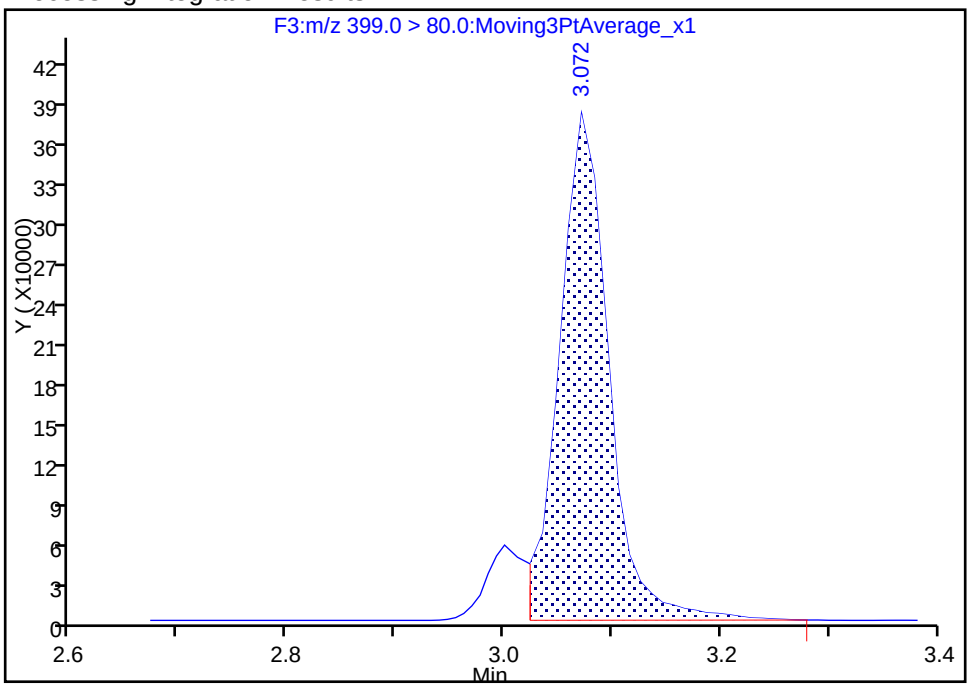
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_024.d
Injection Date: 11-Jul-2017 16:54:52 Instrument ID: A6
Lims ID: CCV L5
Client ID:
Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 24
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F3:MRM

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

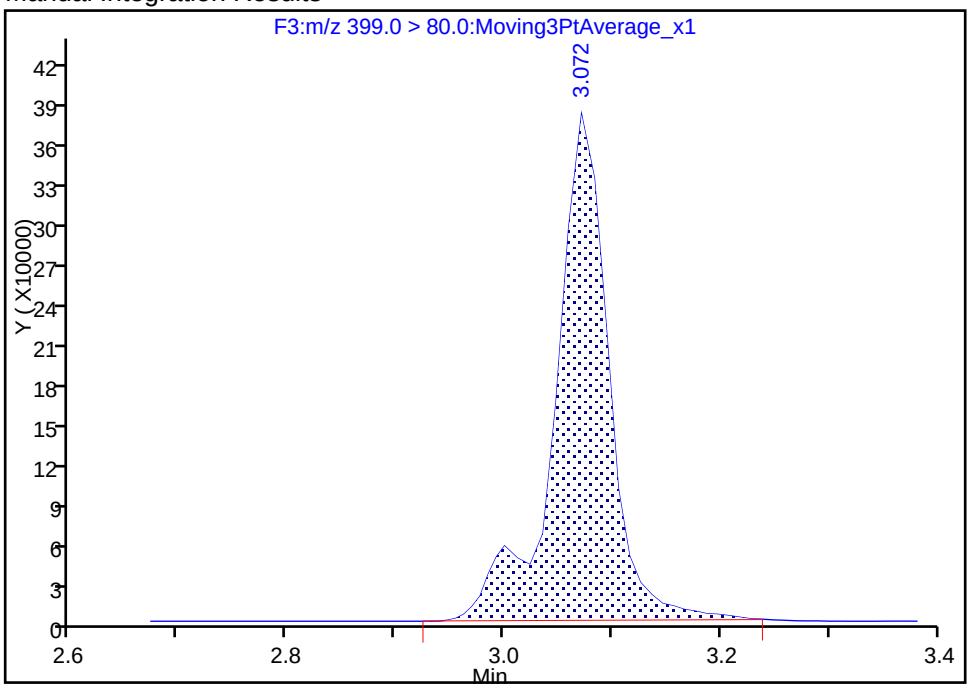
Processing Integration Results

RT: 3.07
Area: 1185126
Amount: 42.270466
Amount Units: ng/ml



Manual Integration Results

RT: 3.07
Area: 1307683
Amount: 46.641766
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 17:21:49
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

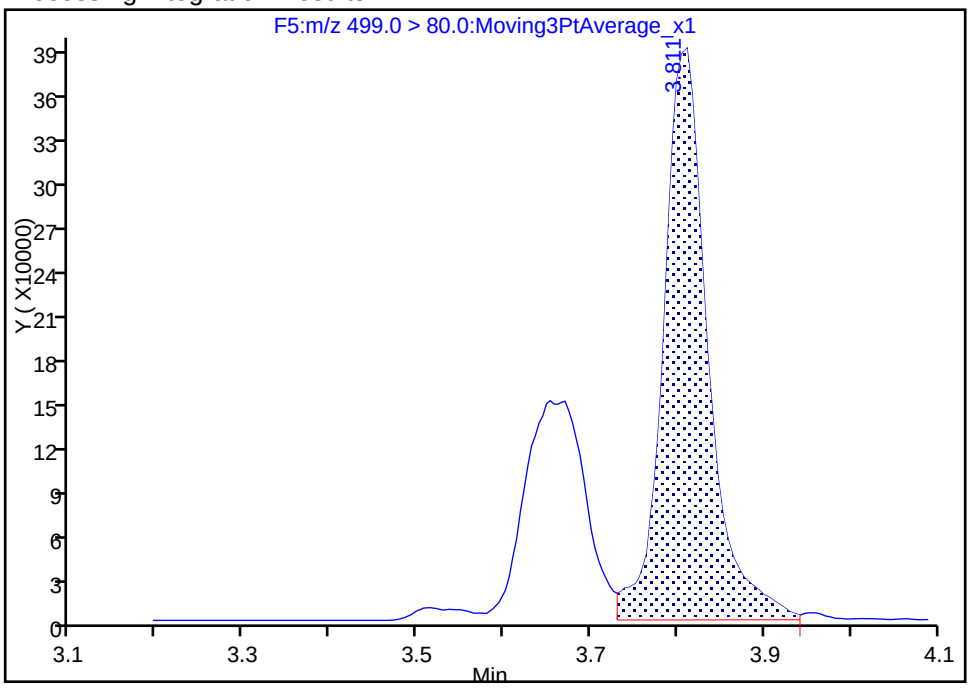
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_024.d
Injection Date: 11-Jul-2017 16:54:52 Instrument ID: A6
Lims ID: CCV L5
Client ID:
Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 24
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm) Detector F5:MRM

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

Signal: 1

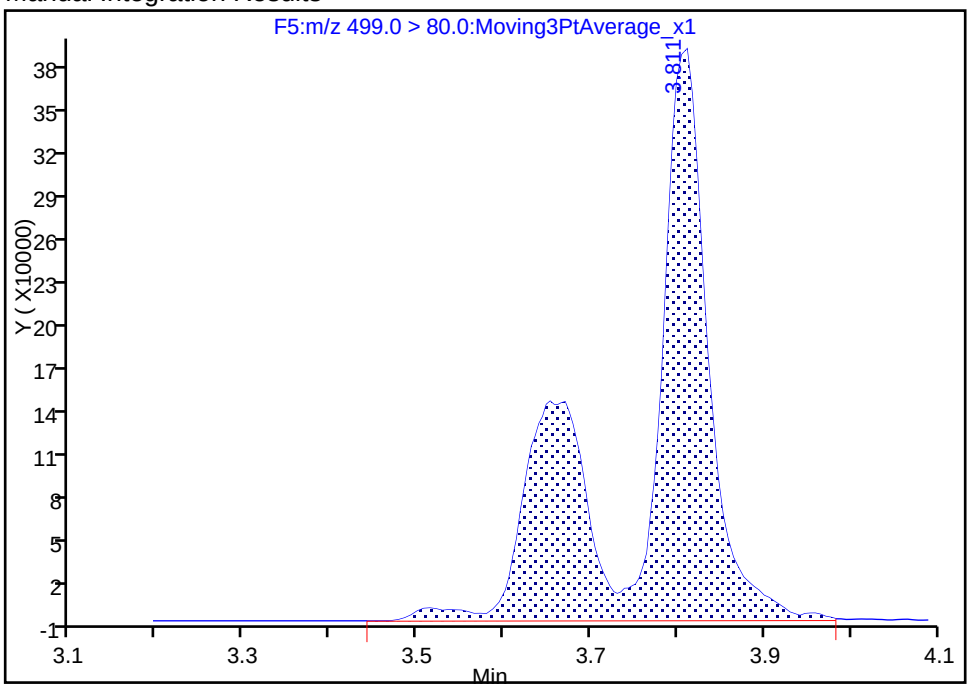
Processing Integration Results

RT: 3.81
Area: 1391523
Amount: 39.180418
Amount Units: ng/ml



Manual Integration Results

RT: 3.81
Area: 2174385
Amount: 61.223072
Amount Units: ng/ml



Reviewer: barnettj, 11-Jul-2017 17:22:06
Audit Action: Manually Integrated Audit Reason: Isomers

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Lab Sample ID: CCV 320-173554/34 Calibration Date: 07/11/2017 18:25

Instrument ID: A6 Calib Start Date: 07/11/2017 14:18

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/11/2017 15:05

Lab File ID: 11JUL2017A6B_034.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8010	0.6803		37.7	44.4	-15.1	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.164	1.073		4.59	4.97	-7.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8012	0.6952		13.1	15.1	-13.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.020		9.40	10.0	-6.4	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.015	0.9529		18.9	20.1	-6.1	30.0
Perfluorononanoic acid (PFNA)	Ave	1.228	1.242		9.79	9.68	1.1	30.0
13C2 PFHxA	Ave	1.402	1.348		9.62	10.0	-3.8	30.0
13C2 PFDA	Ave	1.025	1.008		9.84	10.0	-1.6	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_034.d
Lims ID: CCV L3
Client ID:
Sample Type: CCVIS
Inject. Date: 11-Jul-2017 18:25:52 ALS Bottle#: 3 Worklist Smp#: 34
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 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\20170711-45298.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 12-Jul-2017 10:04:15 Calib Date: 11-Jul-2017 15:05:33
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK019

First Level Reviewer: barnettj Date: 12-Jul-2017 09:53:13

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	2.448	2.442	0.006	1.000	1099515	37.7	255	
$ 2 13C2 PFHxA								
315.0 > 270.0	2.744	2.733	0.011	1.000	645974	9.62	573	
4 Perfluoroheptanoic acid								
363.0 > 319.0	3.071	3.060	0.011	1.000	255855	4.59	858	
3 Perfluorohexanesulfonic acid								M
399.0 > 80.0	3.083	3.071	0.012	1.000	382328	13.1	3094	M
* 5 13C2-PFOA								
415.0 > 370.0	3.408	3.411	-0.003		479097	10.0	243	
6 Perfluorooctanoic acid								
413.0 > 369.0	3.408	3.413	-0.005	1.000	490708	9.40	92.1	
* 8 13C4 PFOS								
503.0 > 80.0	3.811	3.830	-0.019		1044247	28.7	1006	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.811	3.835	-0.024	1.000	697963	18.9	484	M
9 Perfluorononanoic acid								
463.0 > 419.0	3.817	3.842	-0.025	1.000	575750	9.79	414	
$ 10 13C2 PFDA								
515.0 > 470.0	4.417	4.465	-0.048	1.000	483031	9.84	655	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00022 Amount Added: 1.00 Units: mL

Report Date: 12-Jul-2017 10:04:16 Chrom Revision: 2.2 26-Jun-2017 08:09:44

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_034.d

Injection Date: 11-Jul-2017 18:25:52 Instrument ID: A6

Lims ID: CCV L3

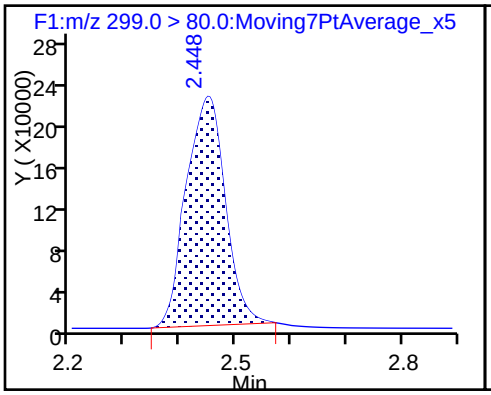
Client ID:

Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 34

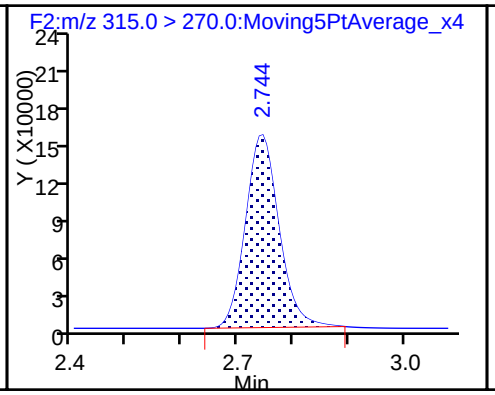
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

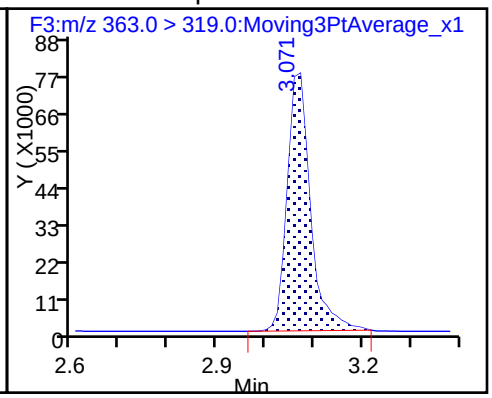
1 Perfluorobutanesulfonic acid



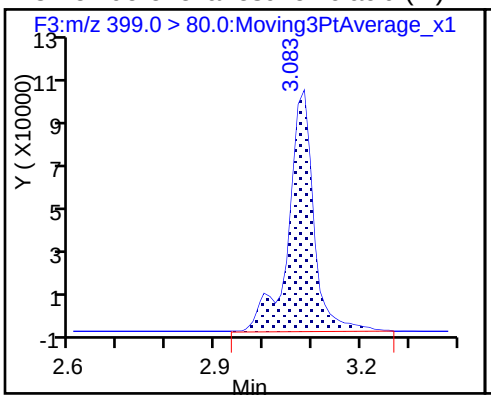
$ 2 13C2 PFHxA



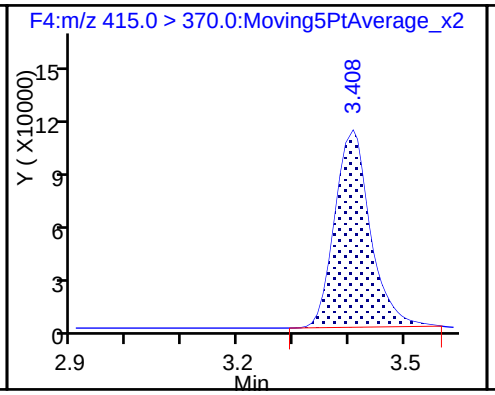
4 Perfluoroheptanoic acid



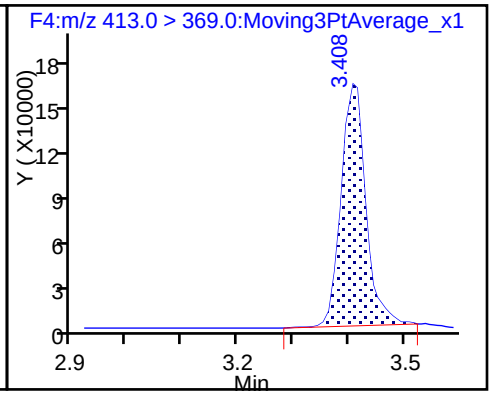
3 Perfluorohexanesulfonic acid (M)



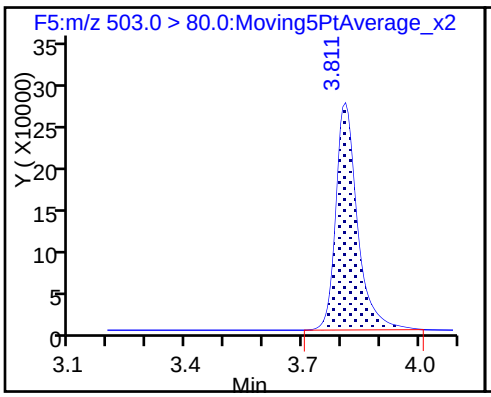
* 5 13C2-PFOA



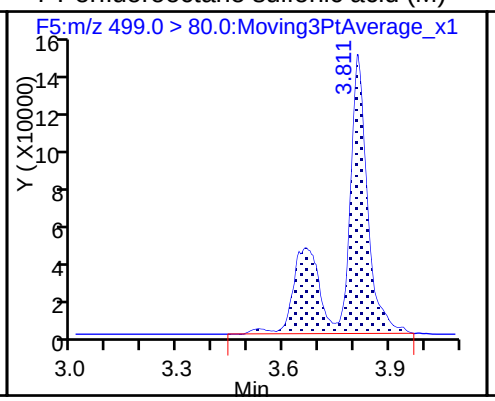
6 Perfluorooctanoic acid



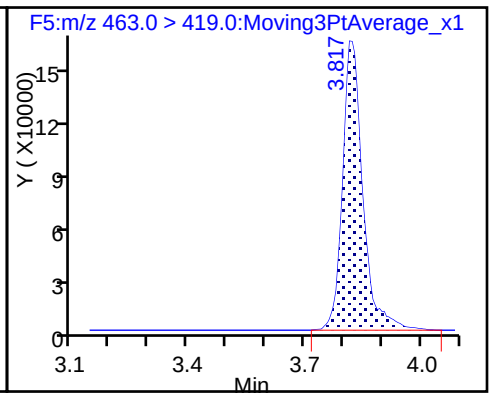
* 8 13C4 PFOS



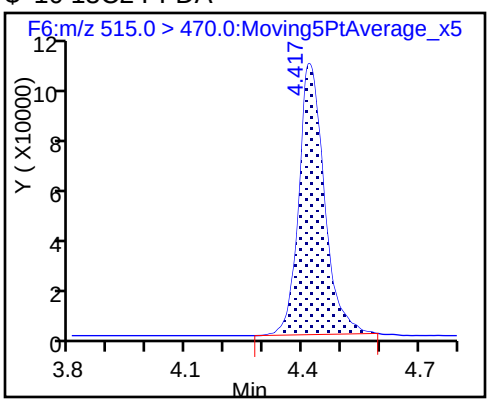
7 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

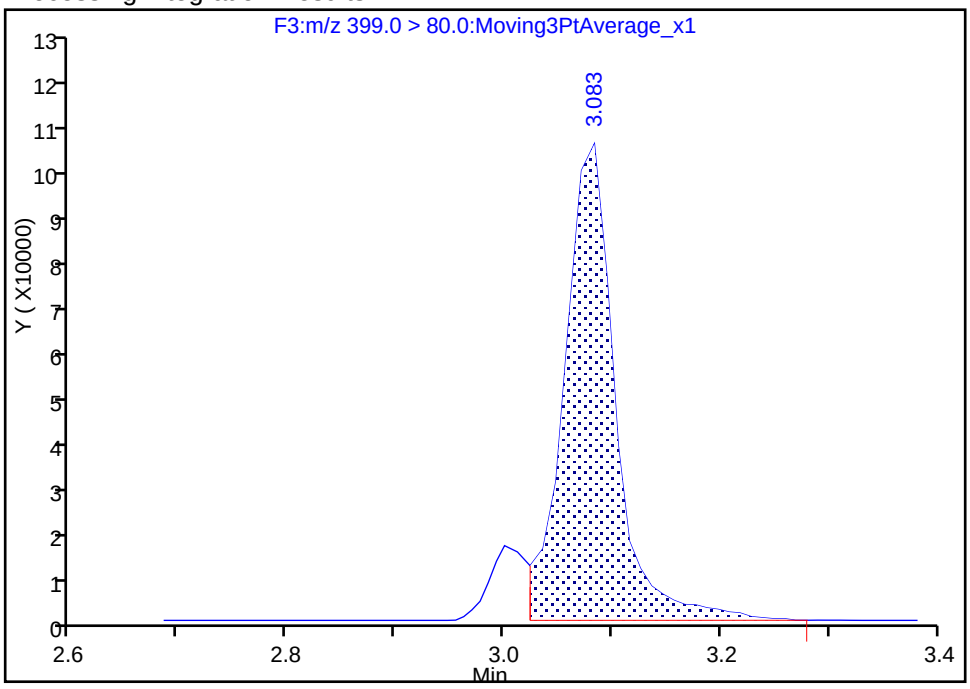
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_034.d
Injection Date: 11-Jul-2017 18:25:52 Instrument ID: A6
Lims ID: CCV L3
Client ID:
Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 34
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm) Detector F3:MRM

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

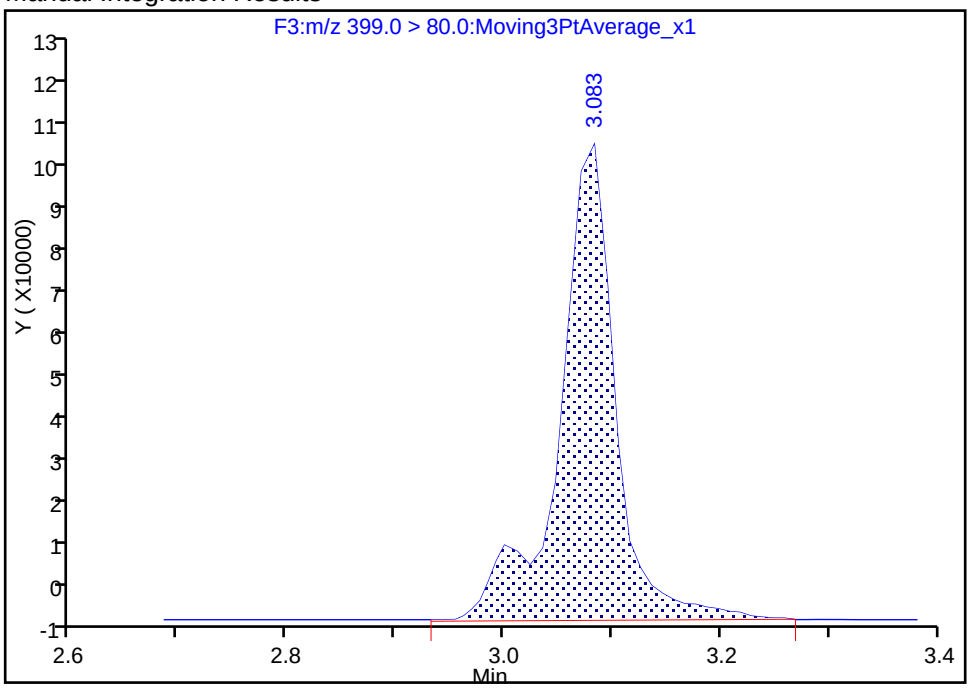
Processing Integration Results

RT: 3.08
Area: 342193
Amount: 11.730234
Amount Units: ng/ml



Manual Integration Results

RT: 3.08
Area: 382328
Amount: 13.106045
Amount Units: ng/ml



Reviewer: barnettj, 12-Jul-2017 09:52:55
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

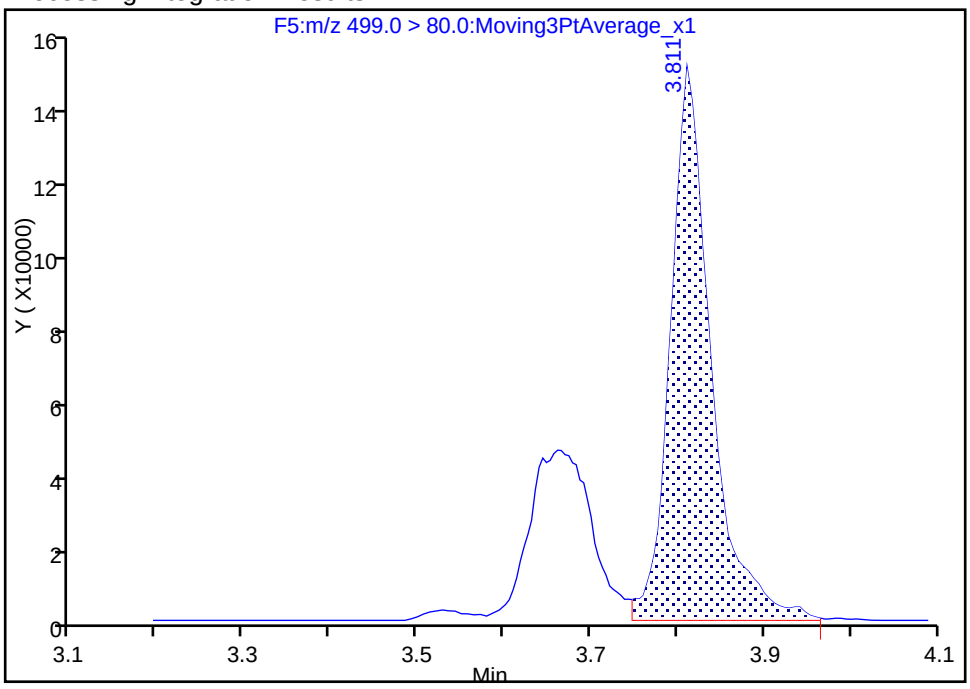
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_034.d
Injection Date: 11-Jul-2017 18:25:52 Instrument ID: A6
Lims ID: CCV L3
Client ID:
Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 34
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm ID) Detector F5:MRM

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

Signal: 1

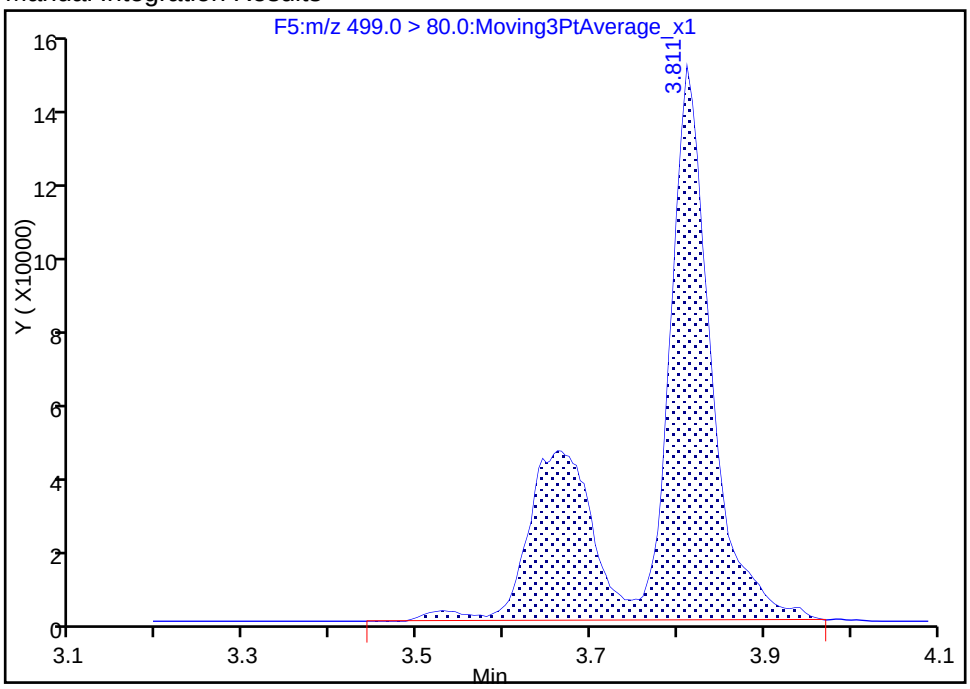
Processing Integration Results

RT: 3.81
Area: 473640
Amount: 12.817109
Amount Units: ng/ml



Manual Integration Results

RT: 3.81
Area: 697963
Amount: 18.887484
Amount Units: ng/ml



Reviewer: barnettj, 12-Jul-2017 09:52:33
Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-29503-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-173098/1-A

Matrix: Water | Lab File ID: 11JUL2017A6B_026.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 07/08/2017 09:00

Sample wt/vol: 250(mL) | Date Analyzed: 07/11/2017 17:12

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.: 173554 | 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	94		70-130
STL00996	13C2 PFDA	99		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_026.d
Lims ID: MB 320-173098/1-A
Client ID:
Sample Type: MB
Inject. Date: 11-Jul-2017 17:12:59 ALS Bottle#: 5 Worklist Smp#: 26
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-173098/1-a
Misc. Info.: Gemini C18, 3um, 2X50mm , T=35*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 12-Jul-2017 10:03:53 Calib Date: 11-Jul-2017 15:05:33
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK019

First Level Reviewer: barnettj Date: 12-Jul-2017 09:46:33

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
$ 2 13C2 PFHxA								
315.0 > 270.0	2.744	2.733	0.011	1.000	624209	9.44	577	
* 5 13C2-PFOA								
415.0 > 370.0	3.395	3.411	-0.016		471647	10.0	391	
* 8 13C4 PFOS								
503.0 > 80.0	3.805	3.830	-0.025		1099502	28.7	740	
$ 10 13C2 PFDA								
515.0 > 470.0	4.419	4.465	-0.046	1.000	478909	9.91	735	

Report Date: 12-Jul-2017 10:04:06 Chrom Revision: 2.2 26-Jun-2017 08:09:44

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_026.d

Injection Date: 11-Jul-2017 17:12:59 Instrument ID: A6

Lims ID: MB 320-173098/1-A

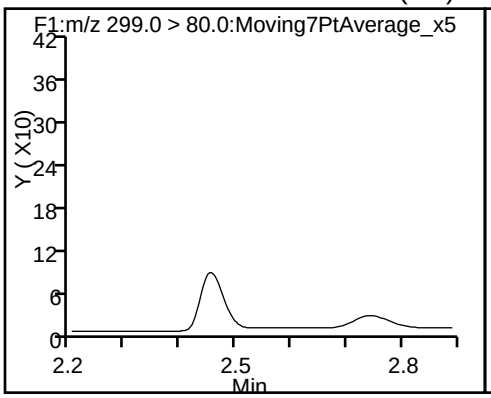
Client ID:

Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 26

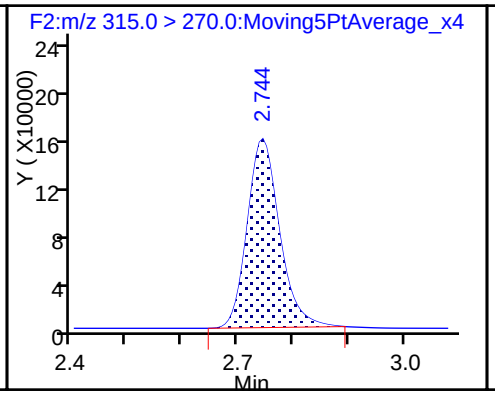
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

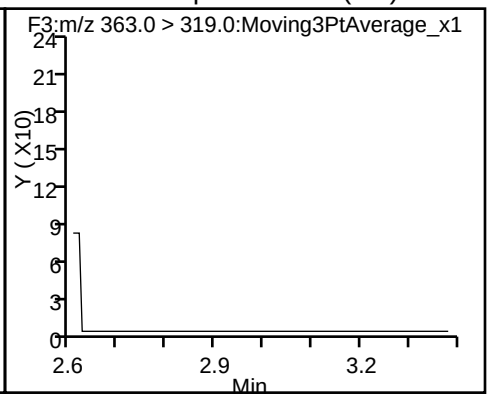
1 Perfluorobutanesulfonic acid (ND)



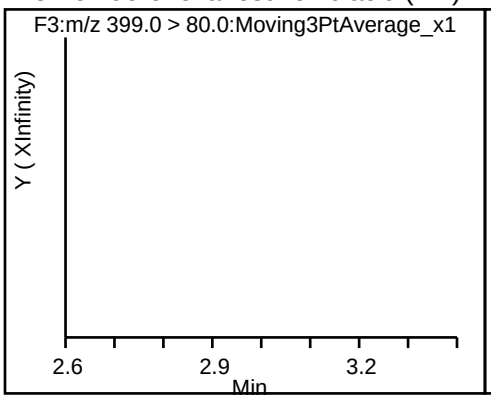
$ 2 13C2 PFHxA



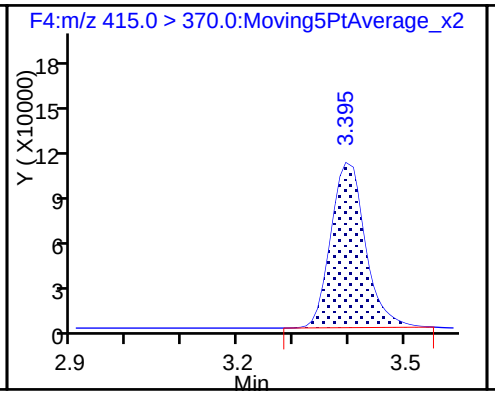
4 Perfluoroheptanoic acid (ND)



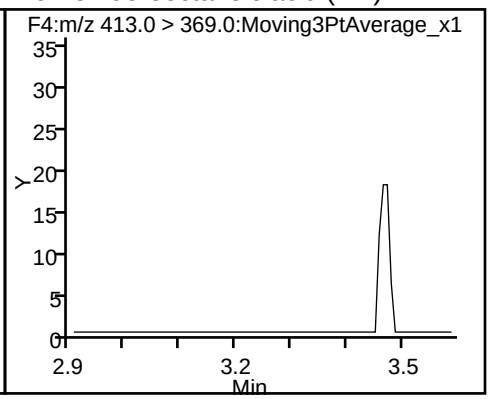
3 Perfluorohexanesulfonic acid (ND)



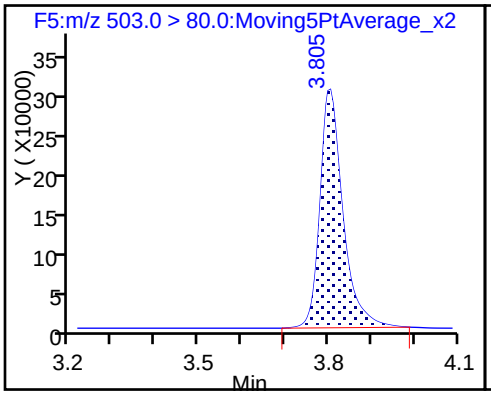
* 5 13C2-PFOA



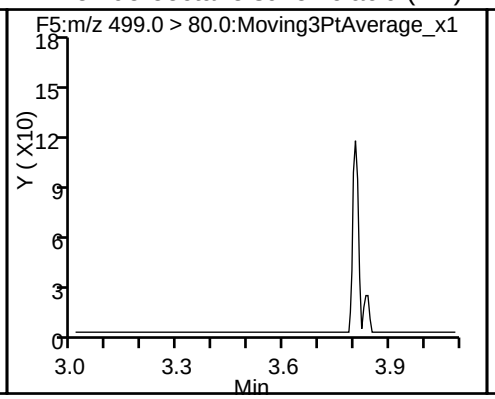
6 Perfluorooctanoic acid (ND)



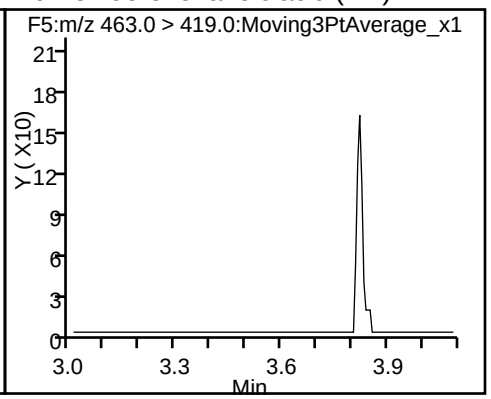
* 8 13C4 PFOS



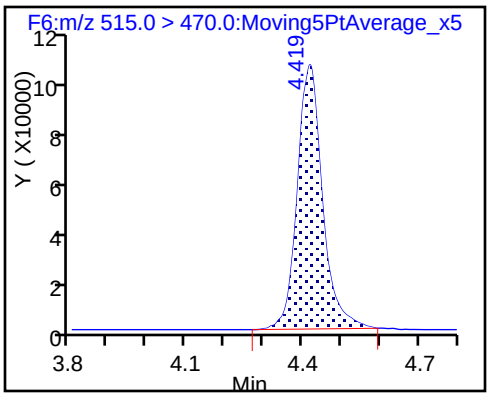
7 Perfluorooctane sulfonic acid (ND)



9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_026.d
Lims ID: MB 320-173098/1-A
Client ID:
Sample Type: MB
Inject. Date: 11-Jul-2017 17:12:59 ALS Bottle#: 5 Worklist Smp#: 26
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-173098/1-a
Misc. Info.: Gemini C18, 3um, 2X50mm , T=35*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 12-Jul-2017 10:03:53 Calib Date: 11-Jul-2017 15:05:33
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK019

First Level Reviewer: barnettj Date: 12-Jul-2017 09:46:33

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	9.44	94.41
$ 10 13C2 PFDA	10.0	9.91	99.06

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-29503-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-173098/2-A

Matrix: Water | Lab File ID: 11JUL2017A6B_027.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 07/08/2017 09:00

Sample wt/vol: 250(mL) | Date Analyzed: 07/11/2017 17:22

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.: 173554 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	297	M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	145		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	133		24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	215	M	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	82.6	E	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	631		90	36	16

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

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_027.d
Lims ID: LCS 320-173098/2-A
Client ID:
Sample Type: LCS
Inject. Date: 11-Jul-2017 17:22:05 ALS Bottle#: 6 Worklist Smp#: 27
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-173098/2-a
Misc. Info.: Gemini C18, 3um, 2X50mm , T=35*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 12-Jul-2017 10:03:53 Calib Date: 11-Jul-2017 15:05:33
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK019

First Level Reviewer: barnettj Date: 12-Jul-2017 09:47:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	2.448	2.442	0.006	1.000	4376909	157.7	1627	
$ 2 13C2 PFHxA								
315.0 > 270.0	2.744	2.733	0.011	1.000	650317	9.95	2073	
4 Perfluoroheptanoic acid								E
363.0 > 319.0	3.060	3.060	0.0	1.000	1120769	20.6	4060	E
3 Perfluorohexanesulfonic acid								M
399.0 > 80.0	3.071	3.071	0.0	1.000	1491401	53.7	1096	M
* 5 13C2-PFOA								
415.0 > 370.0	3.395	3.411	-0.016		466257	10.0	631	
6 Perfluorooctanoic acid								
413.0 > 369.0	3.408	3.413	-0.005	1.000	1845091	36.3	301	
* 8 13C4 PFOS								
503.0 > 80.0	3.805	3.830	-0.025		993569	28.7	480	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.805	3.835	-0.030	1.000	2606760	74.1	1101	M
9 Perfluorononanoic acid								
463.0 > 419.0	3.823	3.842	-0.019	1.000	1906945	33.3	385	
$ 10 13C2 PFDA								
515.0 > 470.0	4.423	4.465	-0.042	1.000	471338	9.86	845	

QC Flag Legend

Processing Flags
E - Exceeded Maximum Amount
Review Flags
M - Manually Integrated

Report Date: 12-Jul-2017 10:04:07 Chrom Revision: 2.2 26-Jun-2017 08:09:44

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_027.d

Injection Date: 11-Jul-2017 17:22:05 Instrument ID: A6

Lims ID: LCS 320-173098/2-A

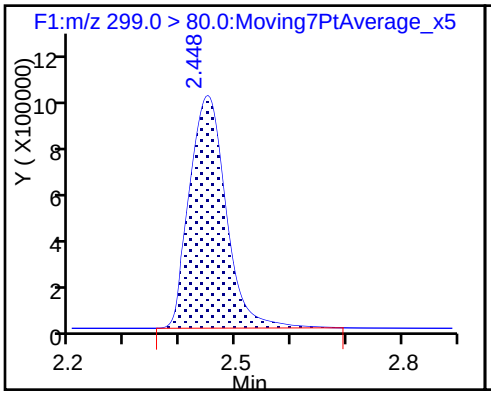
Client ID:

Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 27

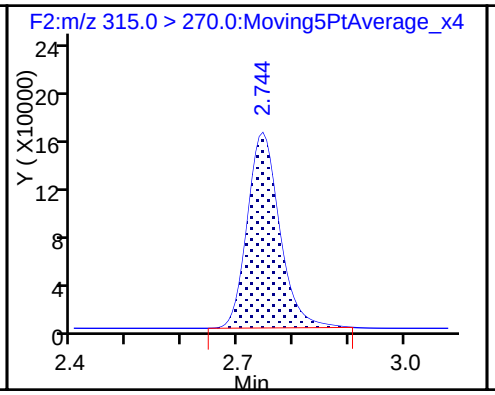
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

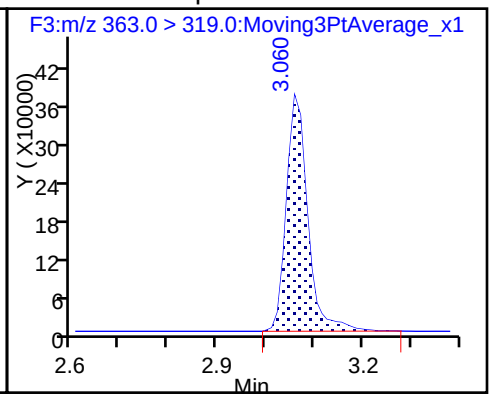
1 Perfluorobutanesulfonic acid



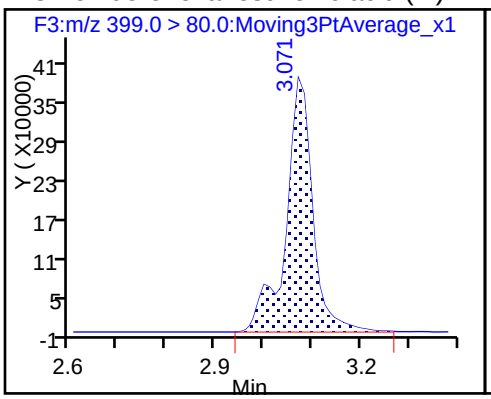
$ 2 13C2 PFHxA



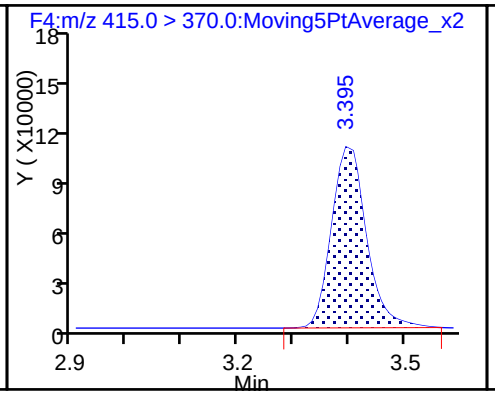
4 Perfluoroheptanoic acid



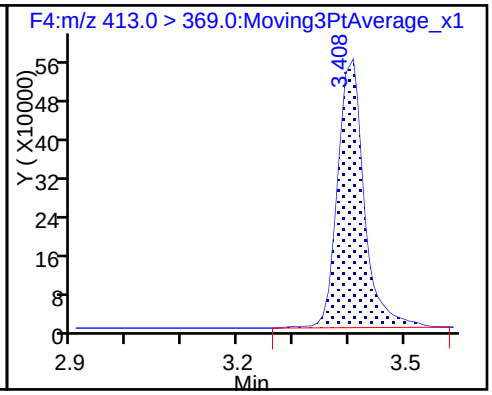
3 Perfluorohexanesulfonic acid (M)



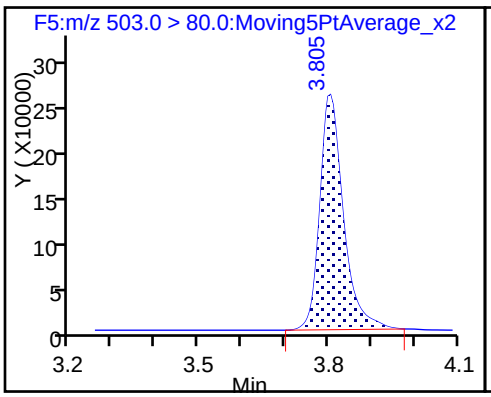
* 5 13C2-PFOA



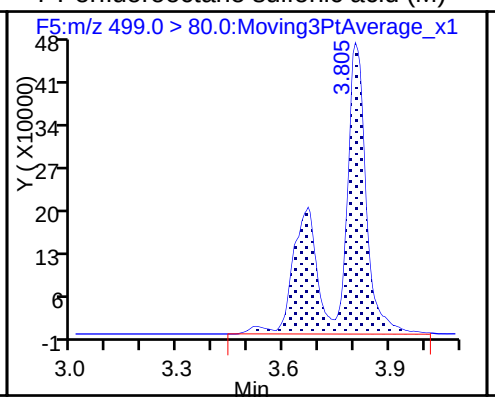
6 Perfluorooctanoic acid



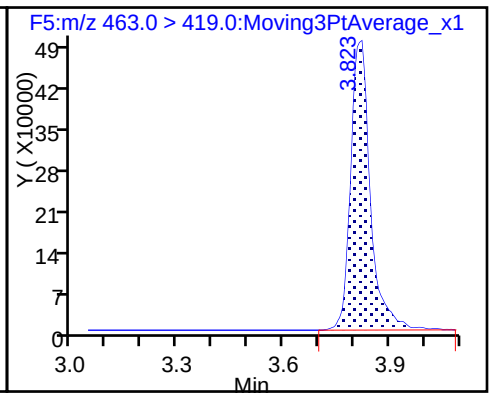
* 8 13C4 PFOS



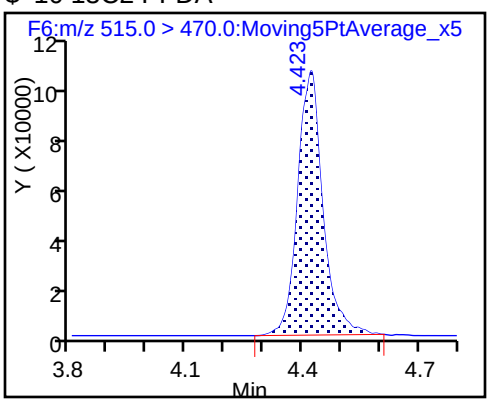
7 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid



$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_027.d
Lims ID: LCS 320-173098/2-A
Client ID:
Sample Type: LCS
Inject. Date: 11-Jul-2017 17:22:05 ALS Bottle#: 6 Worklist Smp#: 27
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-173098/2-a
Misc. Info.: Gemini C18, 3um, 2X50mm , T=35*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 12-Jul-2017 10:03:53 Calib Date: 11-Jul-2017 15:05:33
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK019

First Level Reviewer: barnettj Date: 12-Jul-2017 09:47:45

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	9.95	99.50
$ 10 13C2 PFDA	10.0	9.86	98.62

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

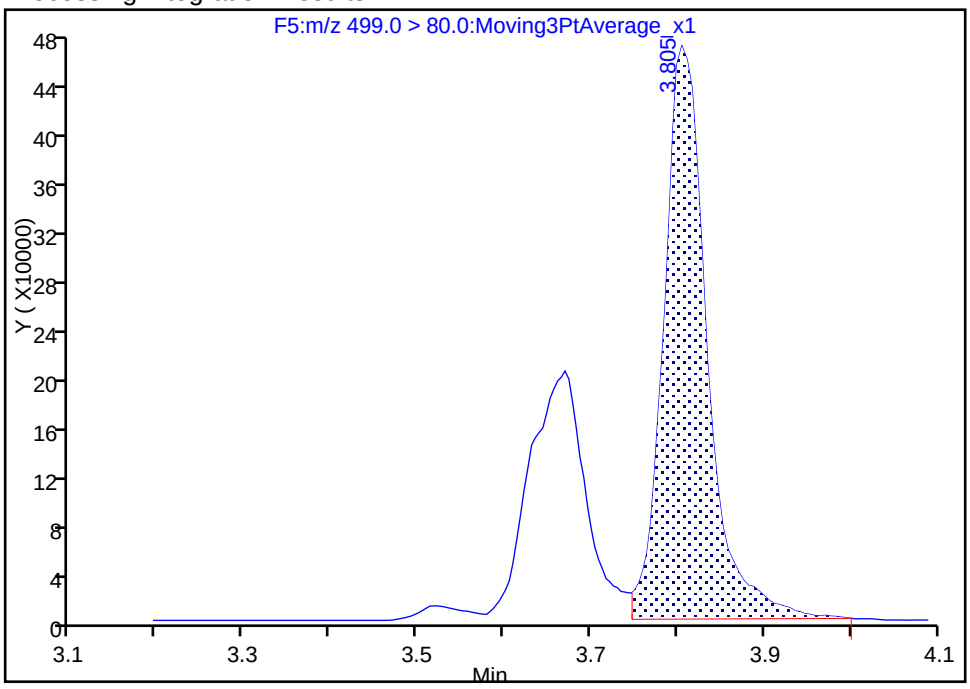
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_027.d
Injection Date: 11-Jul-2017 17:22:05 Instrument ID: A6
Lims ID: LCS 320-173098/2-A
Client ID:
Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 27
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 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

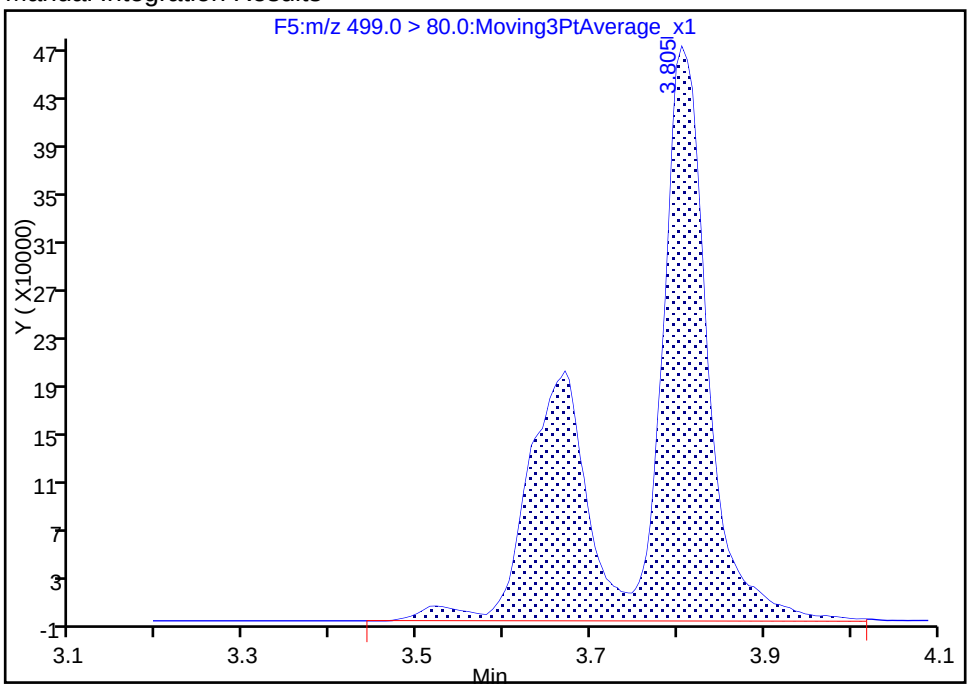
Processing Integration Results

RT: 3.81
Area: 1618816
Amount: 46.040964
Amount Units: ng/ml



Manual Integration Results

RT: 3.81
Area: 2606760
Amount: 74.139212
Amount Units: ng/ml



Reviewer: barnettj, 12-Jul-2017 09:47:00
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

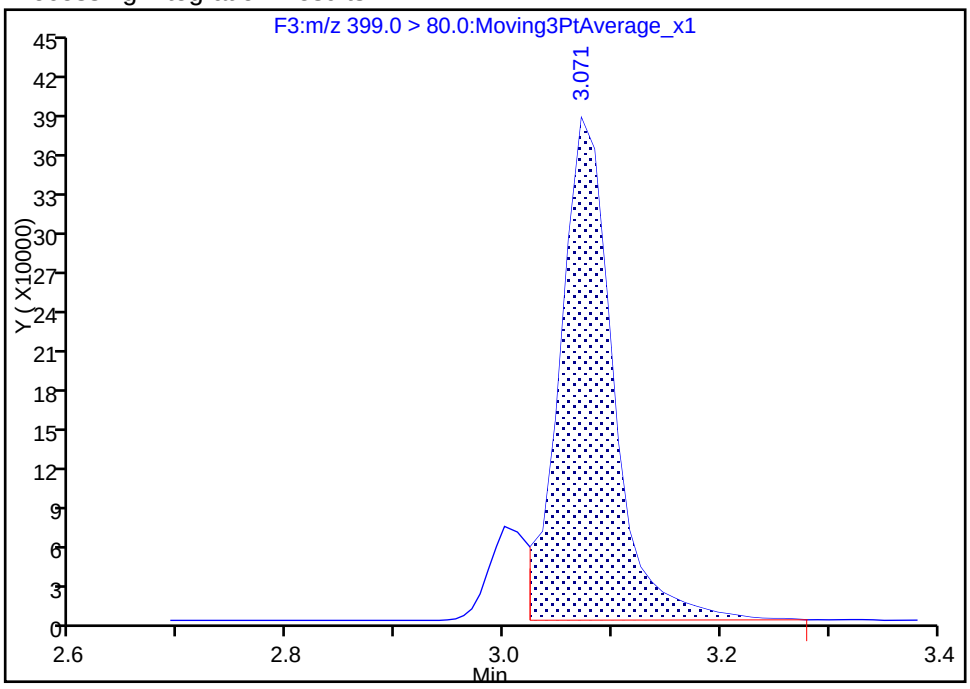
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_027.d
Injection Date: 11-Jul-2017 17:22:05 Instrument ID: A6
Lims ID: LCS 320-173098/2-A
Client ID:
Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 27
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm) Detector F3:MRM

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

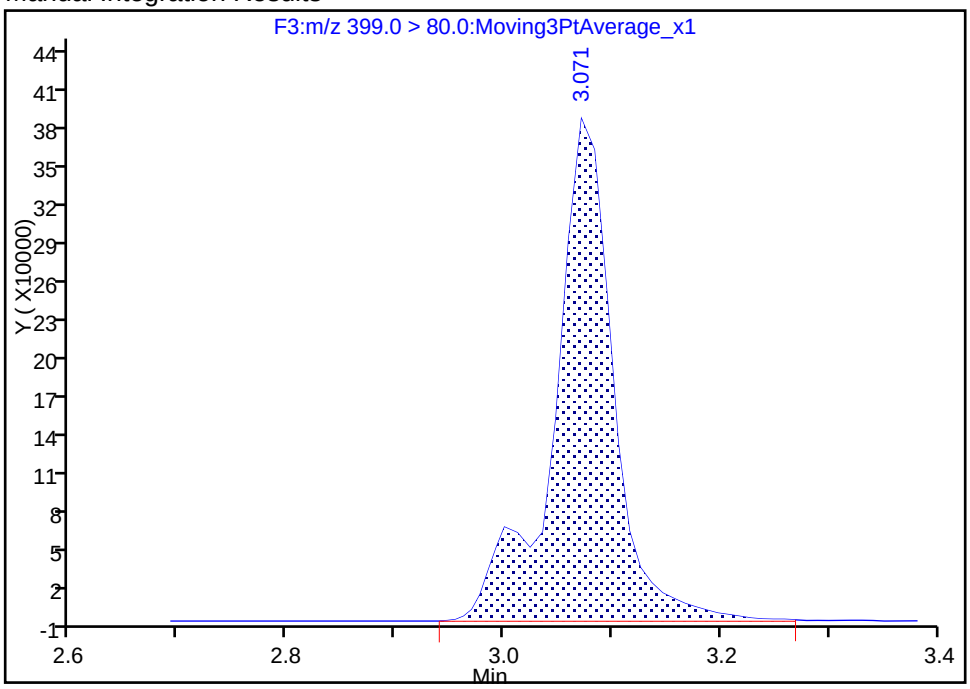
Processing Integration Results

RT: 3.07
Area: 1315006
Amount: 47.377102
Amount Units: ng/ml



Manual Integration Results

RT: 3.07
Area: 1491401
Amount: 53.732270
Amount Units: ng/ml



Reviewer: barnettj, 12-Jul-2017 09:47:17
Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-29503-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCSD 320-173098/3-A

Matrix: Water | Lab File ID: 11JUL2017A6B_028.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 07/08/2017 09:00

Sample wt/vol: 250(mL) | Date Analyzed: 07/11/2017 17:31

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.: 173554 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	303	M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	153		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	144	M	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	214	M	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	83.0	E	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	657		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	92		70-130
STL00996	13C2 PFDA	103		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_028.d
Lims ID: LCSD 320-173098/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 11-Jul-2017 17:31:13 ALS Bottle#: 7 Worklist Smp#: 28
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-173098/3-a
Misc. Info.: Gemini C18, 3um, 2X50mm , T=35*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 12-Jul-2017 10:03:53 Calib Date: 11-Jul-2017 15:05:33
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK019

First Level Reviewer: barnettj Date: 12-Jul-2017 09:49:05

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	2.448	2.442	0.006	1.000	4428952	164.4	2555	
$ 2 13C2 PFHxA								
315.0 > 270.0	2.738	2.733	0.005	1.000	569641	9.21	426	
4 Perfluoroheptanoic acid								E
363.0 > 319.0	3.060	3.060	0.0	1.000	1066068	20.8	1423	E
3 Perfluorohexanesulfonic acid								M
399.0 > 80.0	3.071	3.071	0.0	1.000	1443299	53.5	1174	M
* 5 13C2-PFOA								
415.0 > 370.0	3.395	3.411	-0.016		441160	10.0	107	
6 Perfluorooctanoic acid								
413.0 > 369.0	3.408	3.413	-0.005	1.000	1837164	38.2	274	
* 8 13C4 PFOS								
503.0 > 80.0	3.799	3.830	-0.031		964865	28.7	1117	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	3.805	3.835	-0.030	1.000	2589400	75.8	493	M
9 Perfluorononanoic acid								M
463.0 > 419.0	3.817	3.842	-0.025	1.000	1947510	36.0	561	M
$ 10 13C2 PFDA								
515.0 > 470.0	4.416	4.465	-0.049	1.000	466508	10.3	547	

QC Flag Legend

Processing Flags
E - Exceeded Maximum Amount
Review Flags
M - Manually Integrated

Report Date: 12-Jul-2017 10:04:08 Chrom Revision: 2.2 26-Jun-2017 08:09:44

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_028.d

Injection Date: 11-Jul-2017 17:31:13 Instrument ID: A6

Lims ID: LCSD 320-173098/3-A

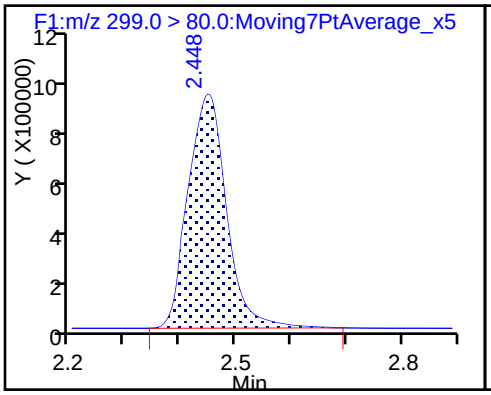
Client ID:

Operator ID: JRB ALS Bottle#: 7 Worklist Smp#: 28

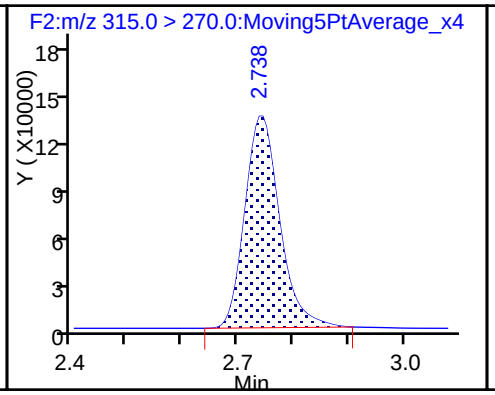
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

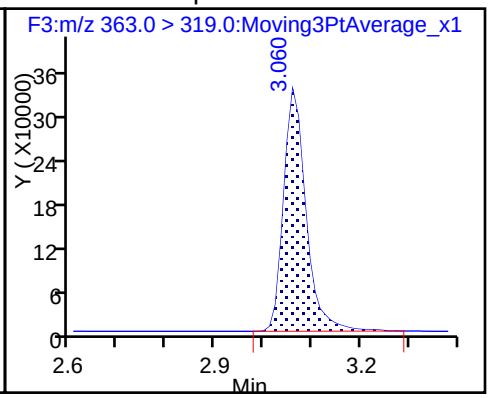
1 Perfluorobutanesulfonic acid



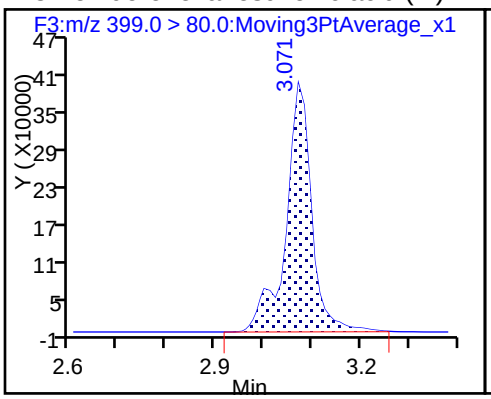
$ 2 13C2 PFHxA



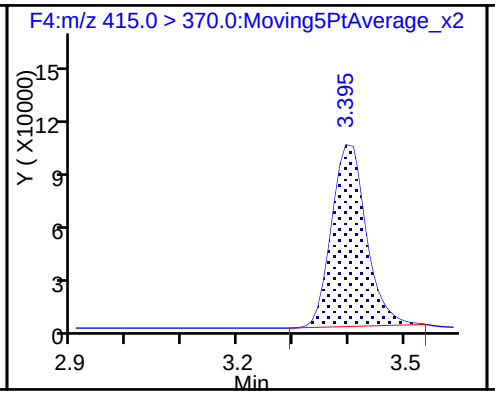
4 Perfluoroheptanoic acid



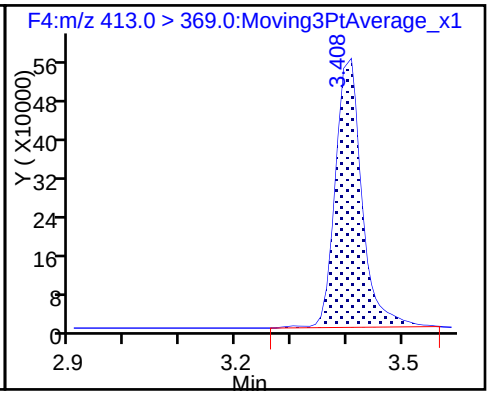
3 Perfluorohexanesulfonic acid (M)



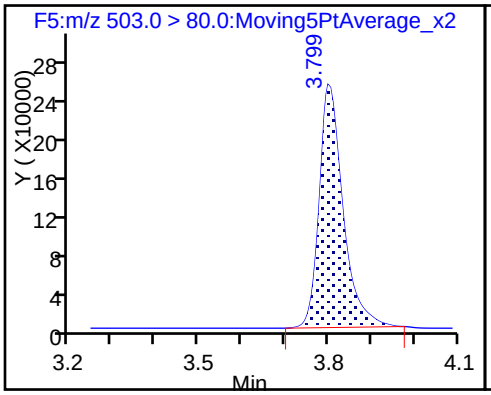
* 5 13C2-PFOA



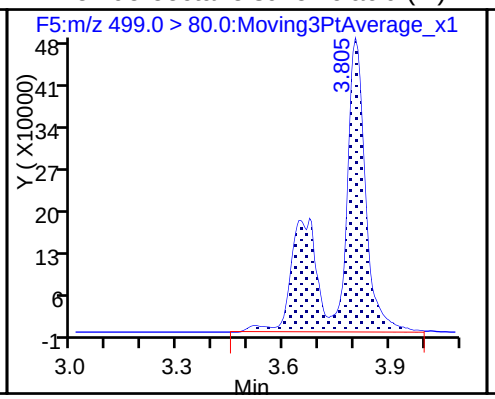
6 Perfluorooctanoic acid



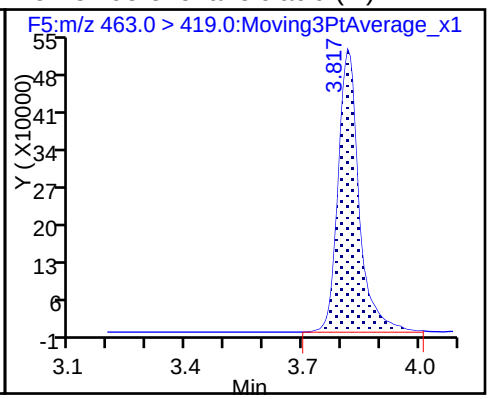
* 8 13C4 PFOS



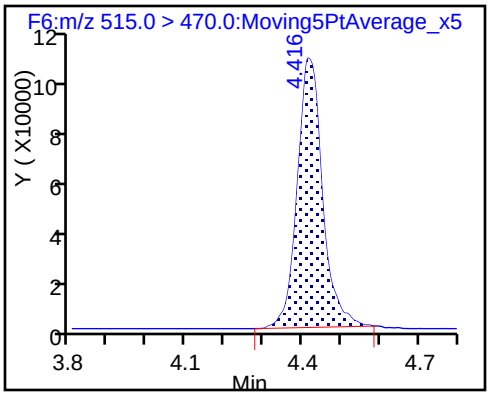
7 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid (M)



$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_028.d
Lims ID: LCSD 320-173098/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 11-Jul-2017 17:31:13 ALS Bottle#: 7 Worklist Smp#: 28
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-173098/3-a
Misc. Info.: Gemini C18, 3um, 2X50mm , T=35*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 12-Jul-2017 10:03:53 Calib Date: 11-Jul-2017 15:05:33
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_012.d

Column 1 : Gemini C18 3um 3 x 100mm (3.00 mm) Det: F1:MRM
Process Host: XAWRK019

First Level Reviewer: barnettj Date: 12-Jul-2017 09:49:05

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	9.21	92.11
$ 10 13C2 PFDA	10.0	10.3	103.17

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

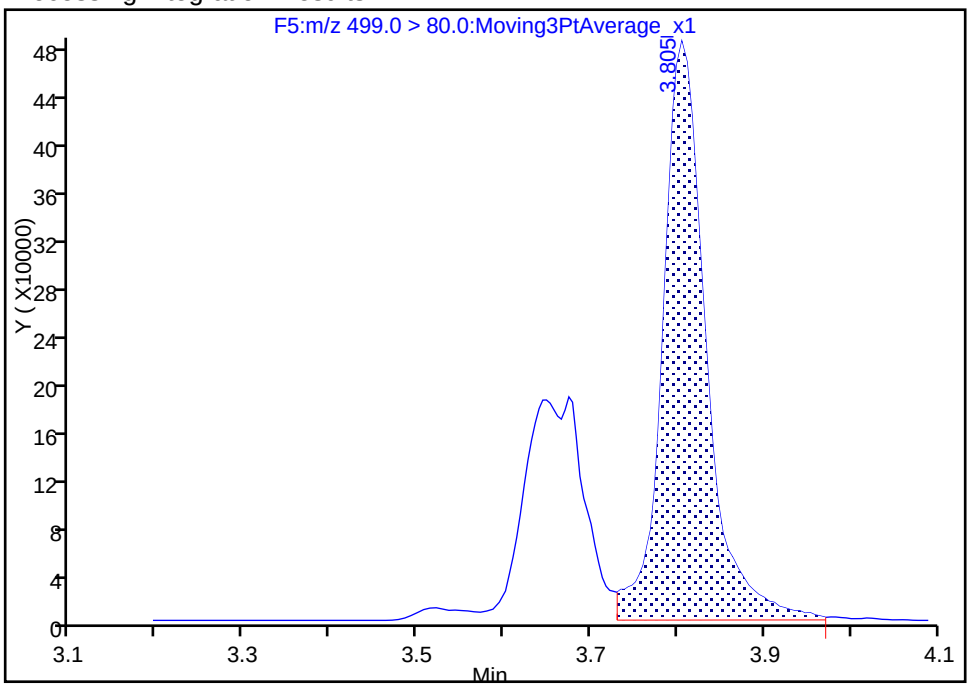
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_028.d
Injection Date: 11-Jul-2017 17:31:13 Instrument ID: A6
Lims ID: LCSD 320-173098/3-A
Client ID:
Operator ID: JRB ALS Bottle#: 7 Worklist Smp#: 28
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 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

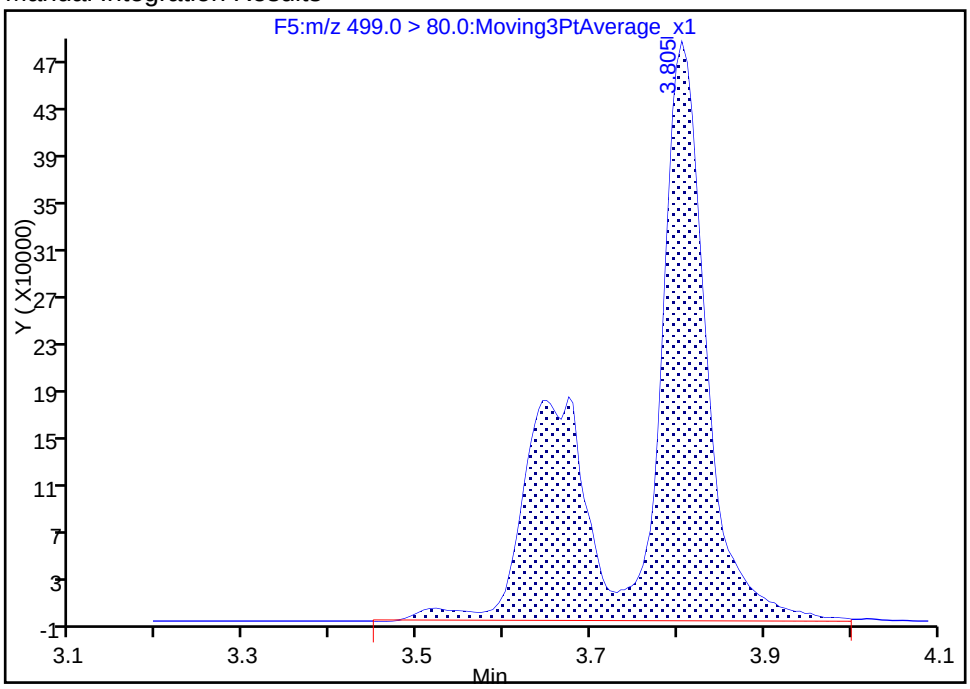
RT: 3.81
Area: 1664420
Amount: 48.746262
Amount Units: ng/ml

Processing Integration Results



RT: 3.81
Area: 2589400
Amount: 75.836371
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 12-Jul-2017 09:48:26
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

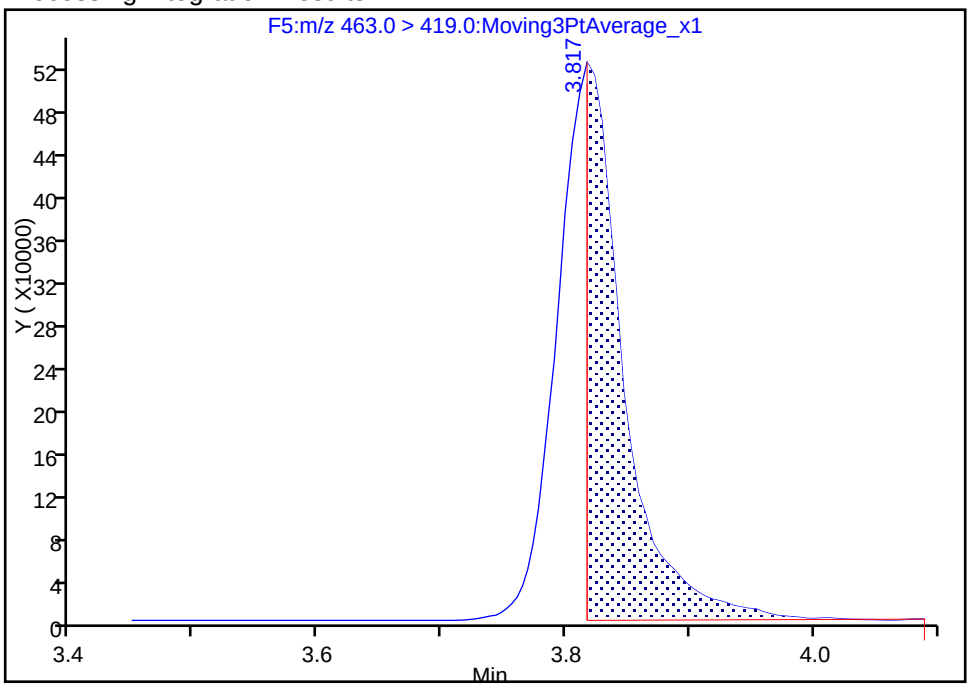
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_028.d
Injection Date: 11-Jul-2017 17:31:13 Instrument ID: A6
Lims ID: LCSD 320-173098/3-A
Client ID:
Operator ID: JRB ALS Bottle#: 7 Worklist Smp#: 28
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm) Detector F5:MRM

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

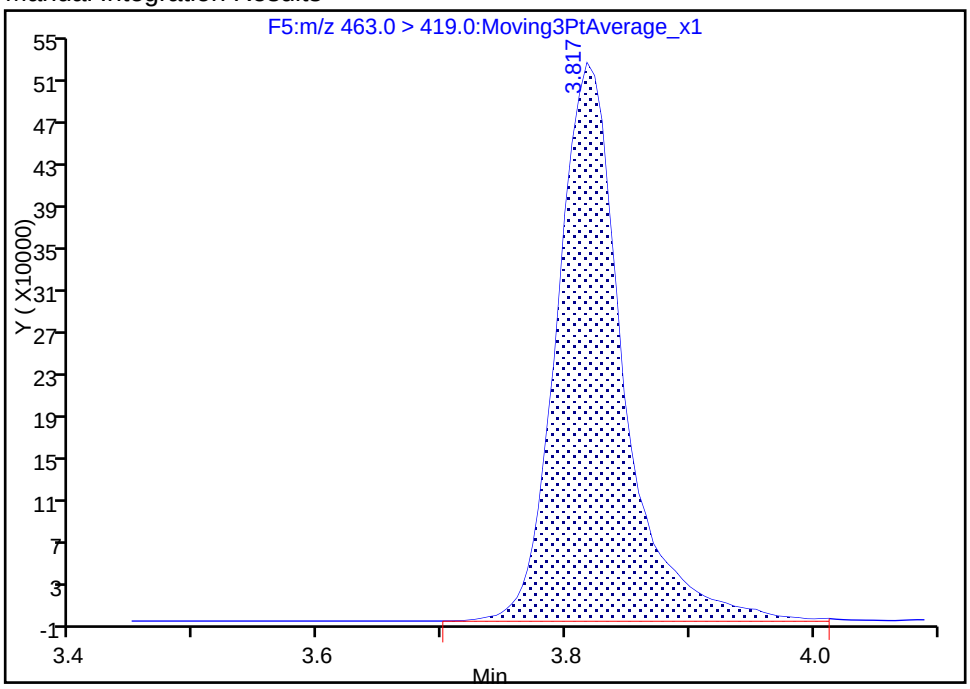
Processing Integration Results

RT: 3.82
Area: 1072046
Amount: 19.794363
Amount Units: ng/ml



Manual Integration Results

RT: 3.82
Area: 1947510
Amount: 35.959016
Amount Units: ng/ml



Reviewer: barnettj, 12-Jul-2017 09:48:47
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

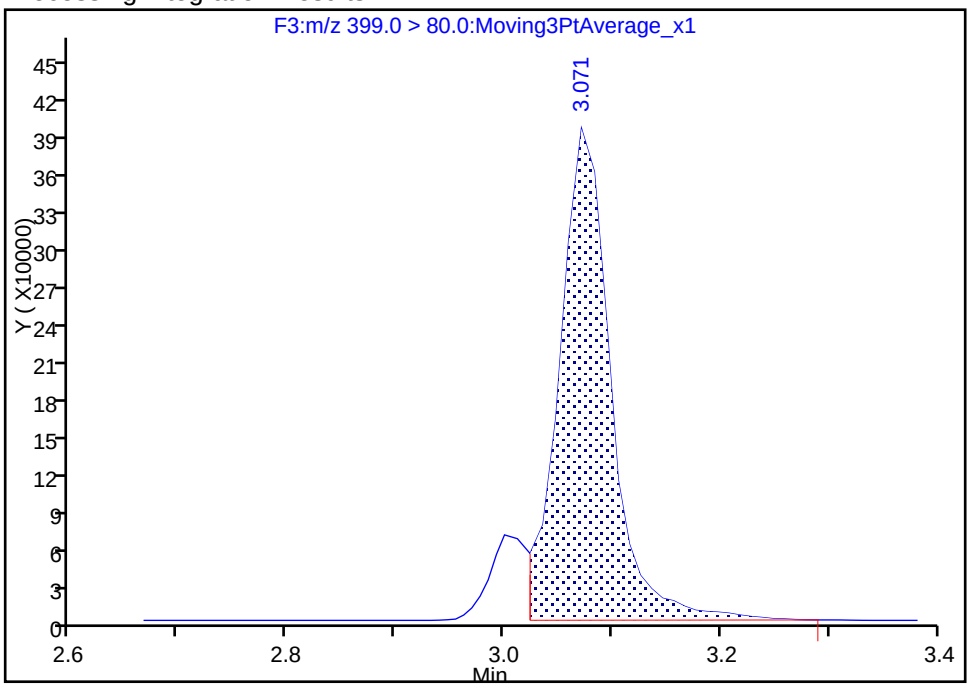
Data File: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b\11JUL2017A6B_028.d
Injection Date: 11-Jul-2017 17:31:13 Instrument ID: A6
Lims ID: LCSD 320-173098/3-A
Client ID:
Operator ID: JRB ALS Bottle#: 7 Worklist Smp#: 28
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Gemini C18 3um 3 x 100mm (3.00 mm) Detector F3:MRM

3 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

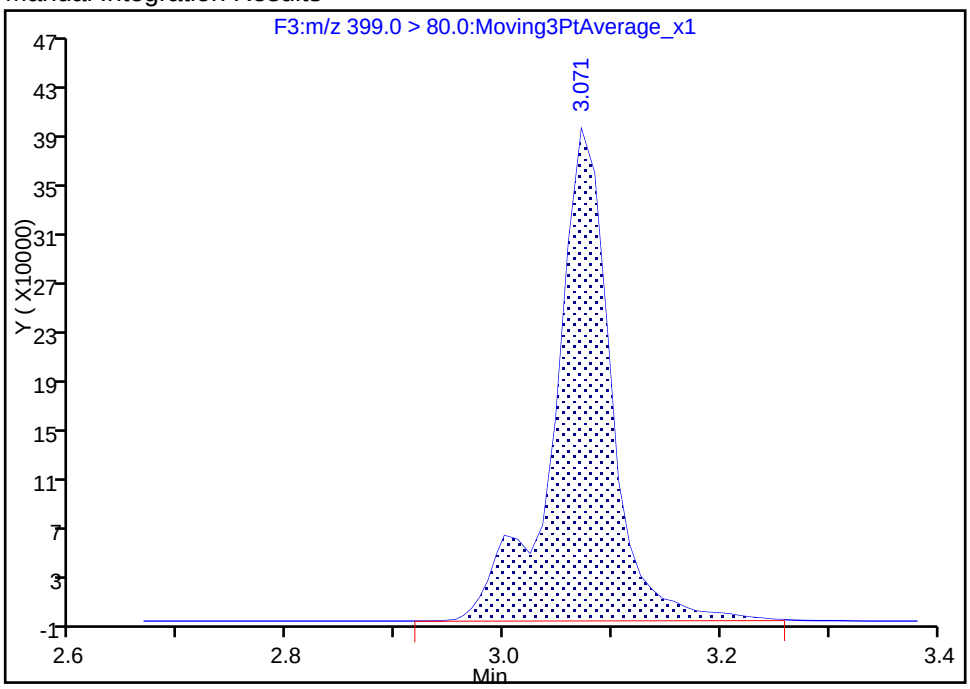
Processing Integration Results

RT: 3.07
Area: 1284203
Amount: 47.643748
Amount Units: ng/ml



Manual Integration Results

RT: 3.07
Area: 1443299
Amount: 53.546187
Amount Units: ng/ml



Reviewer: barnettj, 12-Jul-2017 09:48:10
Audit Action: Manually Integrated Audit Reason: Isomers

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Instrument ID: A6 Start Date: 07/11/2017 14:18

Analysis Batch Number: 173534 End Date: 07/11/2017 16:54

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD 320-173534/7 IC		07/11/2017 14:18	1	11JUL2017A6B_007.d	GeminiC18 3x100 3(mm)
STD 320-173534/8 IC		07/11/2017 14:29	1	11JUL2017A6B_008.d	GeminiC18 3x100 3(mm)
STD 320-173534/9 IC		07/11/2017 14:38	1	11JUL2017A6B_009.d	GeminiC18 3x100 3(mm)
STD 320-173534/10 ICISAV		07/11/2017 14:47	1	11JUL2017A6B_010.d	GeminiC18 3x100 3(mm)
STD 320-173534/11 IC		07/11/2017 14:56	1	11JUL2017A6B_011.d	GeminiC18 3x100 3(mm)
STD 320-173534/12 IC		07/11/2017 15:05	1	11JUL2017A6B_012.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 15:14	1		GeminiC18 3x100 3(mm)
CCVL 320-173534/14		07/11/2017 15:23	1	11JUL2017A6B_014.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 15:32	1		GeminiC18 3x100 3(mm)
ICV 320-173534/16		07/11/2017 15:42	1	11JUL2017A6B_016.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 15:51	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 15:59	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 16:09	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 16:18	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 16:27	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 16:36	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 16:45	1		GeminiC18 3x100 3(mm)
CCV 320-173534/24 CCVIS		07/11/2017 16:54	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Instrument ID: A6 Start Date: 07/11/2017 16:54

Analysis Batch Number: 173554 End Date: 07/11/2017 18:25

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-173554/24 CCVIS		07/11/2017 16:54	1	11JUL2017A6B_024.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 17:03	1		GeminiC18 3x100 3(mm)
MB 320-173098/1-A		07/11/2017 17:12	1	11JUL2017A6B_026.d	GeminiC18 3x100 3(mm)
LCS 320-173098/2-A		07/11/2017 17:22	1	11JUL2017A6B_027.d	GeminiC18 3x100 3(mm)
LCSD 320-173098/3-A		07/11/2017 17:31	1	11JUL2017A6B_028.d	GeminiC18 3x100 3(mm)
320-29503-1		07/11/2017 17:40	1	11JUL2017A6B_029.d	GeminiC18 3x100 3(mm)
320-29503-2		07/11/2017 17:49	1	11JUL2017A6B_030.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 17:58	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 18:07	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 18:16	1		GeminiC18 3x100 3(mm)
CCV 320-173554/34 CCVIS		07/11/2017 18:25	1	11JUL2017A6B_034.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Batch Number: 173098 Batch Start Date: 07/08/17 09:00 Batch Analyst: Sharifi, Nooshin

Batch Method: 537 Batch End Date: 07/10/17 21:25

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-HSP 00017
MB 320-173098/1		537, 537				250 mL	1.00 mL	7 SU	
LCS 320-173098/2		537, 537				250 mL	1.00 mL	7 SU	100 uL
LCSD 320-173098/3		537, 537				250 mL	1.00 mL	7 SU	100 uL
320-29503-A-1	NAWC-062617-RW-032	537, 537	T	286.01 g	27.25 g	258.8 mL	1.00 mL	7 SU	
320-29503-B-2	NAWC-062617-FRB-032	537, 537	T	298.21 g	26.79 g	271.4 mL	1.00 mL	7 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00043	LC537-SU 00044	AnalysisComment			
MB 320-173098/1		537, 537		100 uL	100 uL	CH ND			
LCS 320-173098/2		537, 537		100 uL	100 uL	CH ND			
LCSD 320-173098/3		537, 537		100 uL	100 uL	CH ND			
320-29503-A-1	NAWC-062617-RW-032	537, 537	T	100 uL	100 uL	CH ND			
320-29503-B-2	NAWC-062617-FRB-032	537, 537	T	100 uL	100 uL	CH ND			

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

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Batch Number: 173098 Batch Start Date: 07/08/17 09:00 Batch Analyst: Sharifi, Nooshin

Batch Method: 537 Batch End Date: 07/10/17 21:25

Batch Notes	
Batch Comment	IS:960784
Manifold ID	4
Methanol ID	973181
Pipette ID	MD05306
Analyst ID - IS Reagent Drop	VPM
Analyst ID - IS Reagent Drop Witness	TN
Analyst ID - SU Reagent Drop	NSH
Analyst ID - SU Reagent Drop Witness	HJA
Analyst ID - TA Reagent Drop	NSH
Analyst ID - TA Reagent Drop Witness	HJA
SPE Cartridge ID	6357081-01
Trizma ID	SLBR4303V
Reagent Water ID	7-05-17

Basis	Basis Description
T	Total/NA

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento

Method 537 CCV/Data Review Checklist

A6

Job No: 29503,29547 Instrument ID & Date: 7-11-17 ICAL Batch: 173534
Extraction Batch: 173098 Worklist #: 45298 TALS Batch: 173554, 173556

Review Items	--- Level 1 --- Yes	No	N/A	Level 2
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 7-12-17 2nd Level Reviewer / Date: [illegible] 7/12/17

NCM # and Comments: 29547-3 is on hold, NCMs - 93562, 93563

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento

Method 537 ICAL Checklist

Instrument ID & Date: A6 7-11-17 Worklist#: 45298

ICAL Batch: 173534, 173535 Calibration ID number: 32318, 32319

Review Items	— Level 1 — Yes	No	N/A	Level 2
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): (Average) Linear (1/x²)Linear Quadratic (6 points minimum)				
4. Meets fit criteria? Intercept ≤ ½ RL RSD ≤ 30% for Average $R^2 \geq 0.990$ for Linear $R^2 \geq 0.990$ 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 (2nd source) ± 30% of true value?	✓			✓
11. Is ICV (2nd 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 7-12-17 2nd Level Reviewer / Date: 7/12/2017

NCM # and Comments: _____

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 11JUL2017A_537_ICAL Worklist Number: 45298
Instrument Name: A6 Chrom Method: 537__A6
Data Directory: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b
QC Batching: Enabled Limit Group Batching: Enabled

QC Batch: 1	LC 537 ICAL Raw Batch: 173534	LC 537 CS ICAL Raw Batch: 173535
# 1 RINSE	# 1 RINSE	# 1 RINSE
# 2 RINSE	# 2 RINSE	# 2 RINSE
# 3 RINSE	# 3 RINSE	
# 4 PRIMER L5	# 4 PRIMER L5	
# 5 RINSE	# 5 RINSE	# 5 RINSE
# 6 RB	# 6 RB	# 6 RB
# 7 STD L1	# 7 STD L1	# 7 STD L1
# 8 STD L2	# 8 STD L2	# 8 STD L2
# 9 STD L3	# 9 STD L3	# 9 STD L3
#10 STD L4	#10 STD L4	#10 STD L4
#11 STD L5	#11 STD L5	#11 STD L5
#12 STD L6	#12 STD L6	#12 STD L6
#13 RB	#13 RB	#13 RB
#14 CCVL	#14 CCVL	#14 CCVL
#15 ICB	#15 ICB	#15 ICB
#16 ICV	#16 ICV	#16 ICV
#17 RB	#17 RB	
#18 320-29346-A-3-A	#18 320-29346-A-3-A	
#19 320-29346-B-4-A	#19 320-29346-B-4-A	
#20 MB 320-172894/1-A	#20 MB 320-172894/1-A	
#21 LCS 320-172894/2-A	#21 LCS 320-172894/2-A	
#22 LCSD 320-172894/3-A	#22 LCSD 320-172894/3-A	
#23 280-98736-E-11-A	#23 280-98736-E-11-A	
#24 CCV L5	#24 CCV L5	

QC Batch: 2	LC 537 ICAL Raw Batch: 173554
#24 CCV L5	#24 CCV L5
#25 RB	#25 RB
#26 MB 320-173098/1-A	#26 MB 320-173098/1-A
#27 LCS 320-173098/2-A	#27 LCS 320-173098/2-A
#28 LCSD 320-173098/3-A	#28 LCSD 320-173098/3-A
#29 320-29503-A-1-A	#29 320-29503-A-1-A
#30 320-29503-B-2-A	#30 320-29503-B-2-A
#31 320-29547-A-3-A	#31 320-29547-A-3-A
#32 320-29547-A-1-A	#32 320-29547-A-1-A
#33 320-29547-A-2-A	#33 320-29547-A-2-A
#34 CCV L3	#34 CCV L3

QC Batch: 3	LC 537 ICAL Raw Batch: 173555
#34 CCV L3	#34 CCV L3
#35 RB	#35 RB
#36 MB 320-172894/1-A	#36 MB 320-172894/1-A
#37 LCS 320-172894/2-A	#37 LCS 320-172894/2-A
#38 LCSD 320-172894/3-A	#38 LCSD 320-172894/3-A
#39 280-98736-E-11-A	#39 280-98736-E-11-A
#40 CCV L5	#40 CCV L5

QC Batch: 4	LC 537 ICAL Raw Batch: 173556
#40 CCV L5	#40 CCV L5
#41 RB	#41 RB
#42 MB 320-173098/1-A	#42 MB 320-173098/1-A
#43 LCS 320-173098/2-A	#43 LCS 320-173098/2-A
#44 LCSD 320-173098/3-A	#44 LCSD 320-173098/3-A
#45 320-29503-A-1-A	#45 320-29503-A-1-A
#46 320-29503-B-2-A	#46 320-29503-B-2-A
#47 320-29547-A-3-A	#47 320-29547-A-3-A
#48 320-29547-A-1-A	#48 320-29547-A-1-A
#49 320-29547-A-2-A	#49 320-29547-A-2-A
#50 CCV L3	#50 CCV L3
#51 RB	#51 RB

42

Aqueous Extraction Analysis Sheet

AB 7/10/17

(To Accompany Samples to Instruments)

Batch Number: 320-173098 Analyst: Sharifi, Nooshin Batch Open: 7/8/2017 9:00:00AM

Method Code: 320-537_Prep-320 Batch End: 7/10/2017 9:25:00PM

Extraction of Perfluorinated Alkyl Acids

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB-320-173098/1 N/A	N/A		250 mL	7			N/A	N/A	N/A	CH ND	
				1.00 mL								
2	LCS-320-173098/2 N/A	N/A		250 mL	7			N/A	N/A	N/A	CH ND	
				1.00 mL								
3	LCSD-320-173098/3 N/A	N/A		250 mL	7			N/A	N/A	N/A	CH ND	
				1.00 mL								
4	320-29503-A-1 (537_DOD5)	N/A (320-29503-1)	286.01 g	258.8 mL	7			7/5/17	16_Days	4	CH ND	
			27.25 g	1.00 mL								
5	320-29503-B-2 (537_DOD5)	N/A (320-29503-1)	298.21 g	271.4 mL	7			7/5/17	16_Days	4	CH ND	
			26.79 g	1.00 mL								
6	320-29547-A-3 (537_DOD5)	N/A (320-29547-1)	296.49 g	269.1 mL	7			7/5/17	12_Days	4	CH ND	
			27.41 g	1.00 mL								
7	320-29547-A-1 (537_DOD5)	N/A (320-29547-1)	288.97 g	261 mL	7			7/5/17	12_Days	4	CH ND	
			27.95 g	1.00 mL								
8	320-29547-A-2 (537_DOD5)	N/A (320-29547-1)	276.81 g	249.1 mL	7			7/5/17	12_Days	4	CH ND	
			27.67 g	1.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-173098 Analyst: Sharifi, Nooshin Batch Open: 7/8/2017 9:00:00AM

Method Code: 320-537_Prep-320 Batch End:

Batch Notes

Manifold ID	4
Trizma ID	SLBR4303V
SPE Cartridge ID	6357081-01
Methanol ID	973181
Reagent Water ID	7-05-17
Pipette ID	MD05306
Analyst ID - TA Reagent Drop	NSH
Analyst ID - TA Reagent Drop Witness	HJA
Analyst ID - SU Reagent Drop	NSH
Analyst ID - SU Reagent Drop Witness	HJA
Analyst ID - IS Reagent Drop	VPM
Analyst ID - IS Reagent Drop Witness	TN
Batch Comment	IS: 960784

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-173098 Analyst: Sharifi, Nooshin Batch Open: 7/8/2017 9:00:00AM

Method Code: 320-537_Prep-320 Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-173098/1	LC537-SU_00044	100 uL	1.00 mL	NSH 7-8-17	HJA 7-8-17
LCS 320-173098/2	LC537-HSP_00017	100 uL	1.00 mL		
LCS 320-173098/2	LC537-SU_00044	100 uL	1.00 mL		
LCSD 320-173098/3	LC537-HSP_00017	100 uL	1.00 mL		
LCSD 320-173098/3	LC537-SU_00044	100 uL	1.00 mL		
320-29503-A-1	LC537-SU_00044	100 uL	1.00 mL		
320-29503-B-2	LC537-SU_00044	100 uL	1.00 mL		
320-29547-A-3	LC537-SU_00044	100 uL	1.00 mL		
320-29547-A-1	LC537-SU_00044	100 uL	1.00 mL		
320-29547-A-2	LC537-SU_00044	100 uL	1.00 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-173098 Analyst: Sharifi, Nooshin Batch Open: 7/8/2017 9:00:00AM

Method Code: 320-537_Prep-320 Batch End:

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 173098 Test: 537

Earliest Holding Time: 7-11-17

Sample List Tab	1st Level Reviewer	2nd 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	**1st Level Reviewer**	**2nd 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 Cl 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	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and entered into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Batch Information	**1st Level Reviewer**	**2nd Level Reviewer**
Date and time accurate and entered into TALS correctly	✓	✓
All necessary 'batch information' complete and entered into TALS correctly	✓	✓

1st Level Reviewer: TN Date: 07/10/17

2nd Level Reviewer: VPM Date: 7/10/17

Comments: _____

Shipping and Receiving Documents

TestAmerica Sacramento
880 Riverside Parkway

West Sacramento, CA 95605-1500
phone 916.373.5600 fax 303.467.7248

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

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

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Andy Frebowitz	Site Contact: Mary Kay Bond	Date: 6/27/2017	COC No:
TetraTech	Tel/Fax:	Lab Contact: Dave Alltucker	Carrier:Fed Ex	1 of 1 COCs
234 Mall Boulevard Suite 260	Analysis Turnaround Time			Sampler: Andy Frebowitz, Mary Kay Bond
King of Prussia, PA 19406	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
610-382-1174	TAT if different from Below _____			Walk-in Client:
610-491-9688	☐ 2 weeks			Lab Sampling:
Project Name: WGNA Willow Grove	☐ 1 week			
Site: Willow Grove	☐ 2 days			Job / SDG No.:
P O # 112G08005-WE04	☐ 1 day			

320-29503 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	EPA 537 UCMR3	Sample Specific Notes:
NAWC-062717-RW-032	6/27/2017	9:15	G	DW	2	N		Y	
NAWC-062717-FRB-032	6/27/2017	9:10	G	BLK	2	N		Y	Field Reagent Blank

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

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

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

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

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: FedEx 6612 1992 6121

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:		Cooler Temp. (°C): Obs'd: 0.7 Corr'd: —		Therm ID No.: AK
Relinquished by: MK Bond	Company: Tetra Tech	Date/Time: 6/27/17 17:00	Received by:	Company: TAL	Date/Time: 6/28/17 9:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.11, dated 1/24/2017

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-29503-1

Login Number: 29503
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

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

"NAWC-062617-RW-032","537","RES","320-29503-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","19","ng/L","J M","6.6","DL","","TRG","","","39","LOQ","YES","-99","","258.8","1.00","15",""
"NAWC-062617-RW-032","537","RES","320-29503-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","16","ng/L","J M","2.7","DL","","TRG","","","19","LOQ","YES","-99","","258.8","1.00","7.7",""
"NAWC-062617-RW-032","537","RES","320-29503-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","13","ng/L","J M","5.3","DL","","TRG","","","29","LOQ","YES","-99","","258.8","1.00","12",""
"NAWC-062617-RW-032","537","RES","320-29503-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35","ng/L","U M","16","DL","","TRG","","","87","LOQ","YES","-99","","258.8","1.00","35",""
"NAWC-062617-RW-032","537","RES","320-29503-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","5.4","ng/L","J","1.8","DL","","TRG","","","9.7","LOQ","YES","-99","","258.8","1.00","3.9",""
"NAWC-062617-RW-032","537","RES","320-29503-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","19","ng/L","U","7.7","DL","","TRG","","","23","LOQ","YES","-99","","258.8","1.00","19",""
"NAWC-062617-RW-032","537","RES","320-29503-1","TALSAC","STL00993","13C2 PFHxA","25","ng/L","Q","-99","DL","","SURR","64","","-99","LOQ","YES","38.6","","258.8","1.00","0",""
"NAWC-062617-RW-032","537","RES","320-29503-1","TALSAC","STL00996","13C2 PFDA","38","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","38.6","","258.8","1.00","0",""
"NAWC-062617-FRB-032","537","RES","320-29503-2","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","15","ng/L","U","6.3","DL","","TRG","","","37","LOQ","YES","-99","","271.4","1.00","15",""
"NAWC-062617-FRB-032","537","RES","320-29503-2","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.4","ng/L","U","2.6","DL","","TRG","","","18","LOQ","YES","-99","","271.4","1.00","7.4",""
"NAWC-062617-FRB-032","537","RES","320-29503-2","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","11","ng/L","U","5.1","DL","","TRG","","","28","LOQ","YES","-99","","271.4","1.00","11",""
"NAWC-062617-FRB-032","537","RES","320-29503-2","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","33","ng/L","U","15","DL","","TRG","","","83","LOQ","YES","-99","","271.4","1.00","33",""
"NAWC-062617-FRB-032","537","RES","320-29503-2","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.7","ng/L","U","1.8","DL","","TRG","","","9.2","LOQ","YES","-99","","271.4","1.00","3.7",""
"NAWC-062617-FRB-032","537","RES","320-29503-2","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","18","ng/L","U","7.4","DL","","TRG","","","22","LOQ","YES","-99","","271.4","1.00","18",""
"NAWC-062617-FRB-032","537","RES","320-29503-2","TALSAC","STL00993","13C2 PFHxA","34","ng/L","","-99","DL","","SURR","93","","-99","LOQ","YES","36.8","","271.4","1.00","0",""
"NAWC-062617-FRB-032","537","RES","320-29503-2","TALSAC","STL00996","13C2 PFDA","33","ng/L","","-99","DL","","SURR","90","","-99","LOQ","YES","36.8","","271.4","1.00","0",""
"LCS 320-173098/2-A","537","RES","LCS 320-173098/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","297","ng/L","M","6.8","DL","","SPK","99","","40","LOQ","YES","300","","250","1.00","16",""
"LCS 320-173098/2-A","537","RES","LCS 320-173098/2-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","145","ng/L","","2.8","DL","","SPK","97","","20","LOQ","YES","150","","250","1.00","8.0",""
"LCS 320-173098/2-A","537","RES","LCS 320-173098/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","215","ng/L","M","5.5","DL","","SPK","95","","30","LOQ","YES","225","","250","1.00","12",""
"LCS 320-173098/2-A","537","RES","LCS 320-173098/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","631","ng/L","","16","DL","","SPK","95","","90","LOQ","YES","663","","250","1.00","36",""
"LCS 320-173098/2-A","537","RES","LCS 320-173098/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","82.6","ng/L","E","1.9","DL","","SPK","111","","10","LOQ","YES","74.3","","250","1.00","4.0",""
"LCS 320-173098/2-A","537","RES","LCS 320-173098/2-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","133","ng/L","","8.0","DL","","SPK","92","","24","LOQ","YES","144","","250","1.00","20",""
"LCS 320-173098/2-A","537","RES","LCS 320-173098/2-A","TALSAC","STL00993","13C2 PFHxA","39.8","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","40.0","","250","1.00","0",""
"LCS 320-173098/2-A","537","RES","LCS 320-173098/2-A","TALSAC","STL00996","13C2 PFDA","39.4","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","40.0","","250","1.00","0",""
"LCSD 320-173098/3-A","537","RES","LCSD 320-173098/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","303","ng/L","M","6.8","DL","","SPK","101","2","40","LOQ","YES","300","LCS 320-173098/2-A","250","1.00","16",""
"LCSD 320-173098/3-A","537","RES","LCSD 320-173098/3-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","153","ng/L","","2.8","DL","","SPK","102","5","20","LOQ","YES","150","LCS 320-173098/2-

A","250","1.00","8.0",""
"LCSD 320-173098/3-A","537","RES","LCSD 320-173098/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","214","ng/L","M","5.5","DL","","SPK","95","0","30","LOQ","YES","225","LCS 320-173098/2-A","250","1.00","12",""
"LCSD 320-173098/3-A","537","RES","LCSD 320-173098/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","657","ng/L","","16","DL","","SPK","99","4","90","LOQ","YES","663","LCS 320-173098/2-A","250","1.00","36",""
"LCSD 320-173098/3-A","537","RES","LCSD 320-173098/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","83.0","ng/L","E","1.9","DL","","SPK","112","1","10","LOQ","YES","74.3","LCS 320-173098/2-A","250","1.00","4.0",""
"LCSD 320-173098/3-A","537","RES","LCSD 320-173098/3-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","144","ng/L","M","8.0","DL","","SPK","100","8","24","LOQ","YES","144","LCS 320-173098/2-A","250","1.00","20",""
"LCSD 320-173098/3-A","537","RES","LCSD 320-173098/3-A","TALSAC","STL00993","13C2 PFHxA","36.8","ng/L","","-99","DL","","SURR","92","","-99","LOQ","YES","40.0","LCS 320-173098/2-A","250","1.00","0",""
"LCSD 320-173098/3-A","537","RES","LCSD 320-173098/3-A","TALSAC","STL00996","13C2 PFDA","41.3","ng/L","","-99","DL","","SURR","103","","-99","LOQ","YES","40.0","LCS 320-173098/2-A","250","1.00","0",""
"MB 320-173098/1-A","537","RES","MB 320-173098/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","250","1.00","16",""
"MB 320-173098/1-A","537","RES","MB 320-173098/1-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","250","1.00","8.0",""
"MB 320-173098/1-A","537","RES","MB 320-173098/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","250","1.00","12",""
"MB 320-173098/1-A","537","RES","MB 320-173098/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250","1.00","36",""
"MB 320-173098/1-A","537","RES","MB 320-173098/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","250","1.00","4.0",""
"MB 320-173098/1-A","537","RES","MB 320-173098/1-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","250","1.00","20",""
"MB 320-173098/1-A","537","RES","MB 320-173098/1-A","TALSAC","STL00993","13C2 PFHxA","37.8","ng/L","","-99","DL","","SURR","94","","-99","LOQ","YES","40.0","","250","1.00","0",""
"MB 320-173098/1-A","537","RES","MB 320-173098/1-A","TALSAC","STL00996","13C2 PFDA","39.6","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","40.0","","250","1.00","0",""
"Unknown","Unknown","NAWC-062617-RW-032","06/27/2017 09:15","AQ","320-29503-1","NM","","0.70","537","METHOD","RES","07/08/2017 09:00","07/11/2017 17:40","TALSAC","COA","WET","NA","1","NA","NA","","100","320-173098","320-173098","NA","320-173554","320-29503-1","06/28/2017 09:30","06/29/2017 08:40",""
"Unknown","Unknown","NAWC-062617-FRB-032","06/27/2017 09:10","AQ","320-29503-2","FB","","0.70","537","METHOD","RES","07/08/2017 09:00","07/11/2017 17:49","TALSAC","COA","WET","NA","1","NA","NA","","100","320-173098","320-173098","NA","320-173554","320-29503-1","06/28/2017 09:30","06/29/2017 08:40",""
"Unknown","Unknown","LCS 320-173098/2-A","","AQ","LCS 320-173098/2-A","LCS","","-99","537","METHOD","RES","07/08/2017 09:00","07/11/2017 17:22","TALSAC","COA","WET","NA","1","NA","NA","","100","320-173098","320-173098","NA","320-173554","320-29503-1","07/08/2017 09:00","06/29/2017 08:40",""
"Unknown","Unknown","LCSD 320-173098/3-A","","AQ","LCSD 320-173098/3-A","LCSD","","-99","537","METHOD","RES","07/08/2017 09:00","07/11/2017 17:31","TALSAC","COA","WET","NA","1","NA","NA","","100","320-173098","320-173098","NA","320-173554","320-29503-1","07/08/2017 09:00","06/29/2017 08:40",""
"Unknown","Unknown","MB 320-173098/1-A","","AQ","MB 320-173098/1-A","MB","","-99","537","METHOD","RES","07/08/2017 09:00","07/11/2017 17:12","TALSAC","COA","WET","NA","1","NA","NA","","100","320-173098","320-173098","NA","320-

173554","320-29503-1","07/08/2017 09:00","06/29/2017 08:40",""

TETRA TECH

INTERNAL CORRESPONDENCE

TO: **ANDY FREBOWITZ** **DATE:** **JULY 24, 2017**

FROM: **MEGAN RITCHIE** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – POLYFLUOROALKYL SUBSTANCES (PFAS)**
NAS JRB WILLOW GROVE
SAMPLE DELIVERY GROUP (SDG) 320-29503-1

SAMPLES: 2/Aqueous/PFAS

NAWC-062617-RW-032 NAWC-062617-FRB-032

Overview

The sample set for NAS JRB Willow Grove, SDG 320-29503-1 consisted of one (1) drinking water sample (designated -RW-) and one (1) field reagent blank (designated -FRB-). All samples were analyzed for polyfluoroalkyl substances (PFAS).

The samples were collected by Tetra Tech, Inc. on June 26, 2017 and analyzed by Test America, Inc. All analyses were conducted in accordance with EPA Method 537 analytical and reporting protocols. The data contained in this SDG was validated with regard to the following parameters:

The data contained in this SDG were validated with regard to the following parameters: data completeness, holding times, LC/MS/MS tuning, initial/continuing calibrations, laboratory method/preparation/field blanks, surrogate spike recoveries, laboratory control sample / laboratory control sample duplicate recoveries, internal standard areas and recoveries, matrix spike / matrix spike duplicate results, chromatographic resolution, analyte identification, analyte quantitation, and detection limits. Areas of concern are listed below.

Major

None.

Minor

- The surrogate recovery for 13C2-PFHxA was below the lower QC limit of 70% for sample NAWC-062617-RW-032. The detected and non-detected results for this sample were qualified as estimated (J/UJ).

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

Additional Comments

PFAS compounds were not detected in the FRB contained in this SDG.

Detected results reported below the LOQ but above the Method Detection Limit (MDL) were qualified as estimated, (J). Non-detected results were reported to the LOD.

Executive Summary

Laboratory Performance Issues: One surrogate recovery fell below the lower quality control limit in sample NAWC-062617-RW-032.

Other Factors Affecting Data Quality: Detected results below the LOQ were estimated.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Superfund Methods Data Review" (January 2017) and EPA Method 537. The text of this report has been formulated to address only those areas affecting data quality.

Megan N. Ritchie

Tetra Tech, Inc.
Megan Ritchie
Chemist/Data Validator

Joseph A. Samchuck

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

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

PROJ_NO: 08005-WE04	NSAMPLE	NAWC-062617-FRB-032			NAWC-062617-RW-032		
SDG: 320-29503-1	LAB_ID	320-29503-2			320-29503-1		
FRACTION: PFAS	SAMP_DATE	6/27/2017			6/27/2017		
MEDIA: WATER	QC_TYPE	FB			NM		
	UNITS	NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		7.4	U		16	J	PR
PERFLUOROBUTANE SULFONATE		33	U		35	UJ	R
PERFLUOROHEPTANOIC ACID		3.7	U		5.4	J	PR
PERFLUOROHEXANESULFONIC ACID		11	U		13	J	PR
PERFLUORONONANOIC ACID		18	U		19	UJ	R
PERFLUOROOCTANE SULFONIC ACID		15	U		19	J	PR

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Client Sample ID: NAWC-062617-RW-032 Lab Sample ID: 320-29503-1

Matrix: Water Lab File ID: 11JUL2017A6B_029.d

Analysis Method: 537 Date Collected: 06/27/2017 09:15

Extraction Method: 537 Date Extracted: 07/08/2017 09:00

Sample wt/vol: 258.8(mL) Date Analyzed: 07/11/2017 17:40

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.: 173554 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J M	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	16	J M	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	13	J M	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.4	J	9.7	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U M	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	64	Q	70-130
STL00996	13C2 PFDA	98		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-29503-1

SDG No.:

Client Sample ID: NAWC-062617-FRB-032 | Lab Sample ID: 320-29503-2

Matrix: Water | Lab File ID: 11JUL2017A6B_030.d

Analysis Method: 537 | Date Collected: 06/27/2017 09:10

Extraction Method: 537 | Date Extracted: 07/08/2017 09:00

Sample wt/vol: 271.4(mL) | Date Analyzed: 07/11/2017 17:49

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.: 173554 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	37	15	6.3
335-67-1	Perfluorooctanoic acid (PFOA)	7.4	U	18	7.4	2.6
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.4
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.7	U	9.2	3.7	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33	U	83	33	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	90		70-130

APPENDIX C

SUPPORT DOCUMENTATION

TestAmerica Sacramento
880 Riverside Parkway

West Sacramento, CA 95605-1500
phone 916.373.5600 fax 303.467.7248

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

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

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Andy Frebowitz	Site Contact: Mary Kay Bond	Date: 6/27/2017	COC No:
TetraTech	Tel/Fax:	Lab Contact: Dave Alltucker	Carrier:Fed Ex	1 of 1 COCs
234 Mall Boulevard Suite 260	Analysis Turnaround Time			Sampler: Andy Frebowitz, Mary Kay Bond
King of Prussia, PA 19406	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
610-382-1174	TAT if different from Below _____			Walk-in Client:
610-491-9688	☐ 2 weeks			Lab Sampling:
Project Name: WGNA Willow Grove	☐ 1 week			
Site: Willow Grove	☐ 2 days			Job / SDG No.:
P O # 112G08005-WE04	☐ 1 day			

320-29503 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	EPA 537 UCMR3	Sample Specific Notes:
NAWC-062717-RW-032	6/27/2017	9:15	G	DW	2	N		Y	
NAWC-062717-FRB-032	6/27/2017	9:10	G	BLK	2	N		Y	Field Reagent Blank

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

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

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

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

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: FedEx 6612 1992 6121

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:		Cooler Temp. (°C): Obs'd: 0.7 Corr'd: —		Therm ID No.: AK
Relinquished by: MK Bond	Company: Tetra Tech	Date/Time: 6/27/17 17:00	Received by:	Company: TAL	Date/Time: 6/28/17 9:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.11, dated 1/24/2017

Job Narrative
320-29503-1

Receipt
The samples were received on 6/28/2017 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.7º C.

LCMS
Method(s) 537: Surrogate recovery for the following sample was outside control limits: NAWC-062617-RW-032 (320-29503-1). Re-analysis was performed with concurring results. The original analysis has been reported.

Method(s) 537: The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) have E flags because they are spiked at the upper level of the calibration curve as specified in the method. (LCS 320-173098/2-A) and (LCSD 320-173098/3-A)

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

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

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

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-062617-RW-032	320-29503-1	64 Q	98
NAWC-062617-FRB-032	320-29503-2	93	90
	MB 320-173098/1-A	94	99
	LCS 320-173098/2-A	99	99
	LCSD 320-173098/3-A	92	103

	QC LIMITS
PFHxA = 13C2 PFHxA	70-130
PFDA = 13C2 PFDA	70-130

Column to be used to flag recovery values

FORM II 537

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 11JUL2017A6B_027.d

Lab ID: LCS 320-173098/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	300	297	99	70-130	M
Perfluorooctanoic acid (PFOA)	150	145	97	70-130	
Perfluorononanoic acid (PFNA)	144	133	92	70-130	
Perfluorohexanesulfonic acid (PFHxS)	225	215	95	70-130	M
Perfluoroheptanoic acid (PFHpA)	74.3	82.6	111	70-130	E
Perfluorobutanesulfonic acid (PFBS)	663	631	95	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 11JUL2017A6B_028.d

Lab ID: LCSD 320-173098/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	300	303	101	2	30	70-130	M
Perfluorooctanoic acid (PFOA)	150	153	102	5	30	70-130	
Perfluorononanoic acid (PFNA)	144	144	100	8	30	70-130	M
Perfluorohexanesulfonic acid (PFHxS)	225	214	95	0	30	70-130	M
Perfluoroheptanoic acid (PFHpA)	74.3	83.0	112	1	30	70-130	E
Perfluorobutanesulfonic acid (PFBS)	663	657	99	4	30	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Lab File ID: 11JUL2017A6B_026.d Lab Sample ID: MB 320-173098/1-A

Matrix: Water Date Extracted: 07/08/2017 09:00

Instrument ID: A6 Date Analyzed: 07/11/2017 17:12

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-173098/2-A	11JUL2017A6B_027.d	07/11/2017 17:22
	LCSD 320-173098/3-A	11JUL2017A6B_028.d	07/11/2017 17:31
NAWC-062617-RW-032	320-29503-1	11JUL2017A6B_029.d	07/11/2017 17:40
NAWC-062617-FRB-032	320-29503-2	11JUL2017A6B_030.d	07/11/2017 17:49

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Instrument ID: A6 Calibration Start Date: 07/11/2017 14:18

GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 07/11/2017 15:05

Calibration ID: 32318

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		450436	3.41	941742	3.83		
UPPER LIMIT		675654	3.91	1412613	4.33		
LOWER LIMIT		225218	2.91	470871	3.33		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 320-173534/14		427789	3.41	968938	3.82		
ICV 320-173534/16		465673	3.41	985132	3.81		
CCV 320-173554/24 CCVIS		472036	3.40	1003613	3.81		
MB 320-173098/1-A		471647	3.40	1099502	3.81		
LCS 320-173098/2-A		466257	3.40	993569	3.81		
LCSD 320-173098/3-A		441160	3.40	964865	3.80		
320-29503-1	NAWC-062617-RW-032	426700	3.41	1051478	3.81		
320-29503-2	NAWC-062617-FRB-032	479570	3.41	1083101	3.81		
CCV 320-173554/34 CCVIS		479097	3.41	1044247	3.81		

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

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Sample No.: CCV 320-173554/24 Date Analyzed: 07/11/2017 16:54

Instrument ID: A6 GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 11JUL2017A6B_024.d Heated Purge: (Y/N) N

Calibration ID: 32318

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		472036	3.40	1003613	3.81		
UPPER LIMIT		660850	3.90	1405058	4.31		
LOWER LIMIT		330425	2.90	702529	3.31		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-173098/1-A		471647	3.40	1099502	3.81		
LCS 320-173098/2-A		466257	3.40	993569	3.81		
LCSD 320-173098/3-A		441160	3.40	964865	3.80		
320-29503-1	NAWC-062617-RW-032	426700	3.41	1051478	3.81		
320-29503-2	NAWC-062617-FRB-032	479570	3.41	1083101	3.81		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Sample No.: CCV 320-173554/34 Date Analyzed: 07/11/2017 18:25

Instrument ID: A6 GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 11JUL2017A6B_034.d Heated Purge: (Y/N) N

Calibration ID: 32318

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		479097	3.41	1044247	3.81		
UPPER LIMIT		670736	3.91	1461946	4.31		
LOWER LIMIT		335368	2.91	730973	3.31		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-173098/1-A		471647	3.40	1099502	3.81		
LCS 320-173098/2-A		466257	3.40	993569	3.81		
LCSD 320-173098/3-A		441160	3.40	964865	3.80		
320-29503-1	NAWC-062617-RW-032	426700	3.41	1051478	3.81		
320-29503-2	NAWC-062617-FRB-032	479570	3.41	1083101	3.81		

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

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

Column used to flag values outside QC limits

FORM VIII 537

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

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1 Analy Batch No.: 173534

SDG No.:

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

Calibration Start Date: 07/11/2017 14:18 Calibration End Date: 07/11/2017 15:05 Calibration ID: 32318

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-173534/7	11JUL2017A6B_007.d
Level 2	STD 320-173534/8	11JUL2017A6B_008.d
Level 3	STD 320-173534/9	11JUL2017A6B_009.d
Level 4	STD 320-173534/10	11JUL2017A6B_010.d
Level 5	STD 320-173534/11	11JUL2017A6B_011.d
Level 6	STD 320-173534/12	11JUL2017A6B_012.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)	0.7749 0.8618	0.7766	0.7594	0.8073	0.8259	Ave		0.8010				4.8		30.0			
Perfluoroheptanoic acid (PFHpA)	1.1363 1.1338	1.1029	1.1533	1.2571	1.2026	Ave		1.1643				4.8		30.0			
Perfluorohexanesulfonic acid (PFHxS)	0.7347 0.9646	0.8116	0.6871	0.7955	0.8137	Ave		0.8012				11.8		30.0			
Perfluorooctanoic acid (PFOA)	0.9900 1.1908	1.0617	1.1075	1.1164	1.0721	Ave		1.0898				6.1		30.0			
Perfluorooctanesulfonic acid (PFOS)	0.8857 1.1433	0.9839	0.9996	0.9975	1.0796	Ave		1.0149				8.7		30.0			
Perfluorononanoic acid (PFNA)	1.2732 1.1319	1.2394	1.2801	1.2530	1.1883	Ave		1.2277				4.7		30.0			
13C2 PFHxA	1.4739 1.4411	1.3152	1.4752	1.4134	1.2918	Ave		1.4018				5.7		30.0			
13C2 PFDA	1.0447 1.0450	0.9322	1.0778	1.0654	0.9849	Ave		1.0250				5.4		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.: 320-29503-1 Analy Batch No.: 173534

SDG No.:

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

Calibration Start Date: 07/11/2017 14:18 Calibration End Date: 07/11/2017 15:05 Calibration ID: 32318

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-173534/7	11JUL2017A6B_007.d
Level 2	STD 320-173534/8	11JUL2017A6B_008.d
Level 3	STD 320-173534/9	11JUL2017A6B_009.d
Level 4	STD 320-173534/10	11JUL2017A6B_010.d
Level 5	STD 320-173534/11	11JUL2017A6B_011.d
Level 6	STD 320-173534/12	11JUL2017A6B_012.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	224824 4732899	543185	1163511	2360302	3579670	8.83 176	21.2	44.4	89.4	133
Perfluoroheptanoic acid (PFHpA)	13PFOA	Ave	46641 1046972	119710	257968	551247	847873	0.990 19.7	2.38	4.97	10.0	14.9
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	72532 1802638	193156	358215	791471	1199989	3.01 59.7	7.21	15.1	30.4	45.1
Perfluorooctanoic acid (PFOA)	13PFOA	Ave	82014 2219289	232563	499953	988038	1525464	2.00 39.7	4.80	10.0	20.2	30.0
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	116446 2845332	311845	694018	1321595	2120345	4.00 79.6	9.61	20.1	40.5	60.0
Perfluorononanoic acid (PFNA)	13PFOA	Ave	101669 2033486	261713	557035	1068968	1629901	1.93 38.3	4.62	9.68	19.5	28.9
13C2 PFHxA	13PFOA	Ave	611112 676347	600819	663271	618332	613307	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PFOA	Ave	433139 490441	425840	484590	466074	467617	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.: 320-29503-1 Analy Batch No.: 173534

SDG No.:

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

Calibration Start Date: 07/11/2017 14:18 Calibration End Date: 07/11/2017 15:05 Calibration ID: 32318

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-173534/7	11JUL2017A6B_007.d
Level 2	STD 320-173534/8	11JUL2017A6B_008.d
Level 3	STD 320-173534/9	11JUL2017A6B_009.d
Level 4	STD 320-173534/10	11JUL2017A6B_010.d
Level 5	STD 320-173534/11	11JUL2017A6B_011.d
Level 6	STD 320-173534/12	11JUL2017A6B_012.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)	-3.3	-3.0	-5.2	0.8	3.1	7.6	50	50	50	50	50	50
Perfluoroheptanoic acid (PFHpA)	-2.4	-5.3	-0.9	8.0	3.3	-2.6	50	50	50	50	50	50
Perfluorohexanesulfonic acid (PFHxS)	-8.3	1.3	-14.2	-0.7	1.6	20.4	50	50	50	50	50	50
Perfluorooctanoic acid (PFOA)	-9.2	-2.6	1.6	2.4	-1.6	9.3	50	50	50	50	50	50
Perfluorooctanesulfonic acid (PFOS)	-12.7	-3.1	-1.5	-1.7	6.4	12.7	50	50	50	50	50	50
Perfluorononanoic acid (PFNA)	3.7	1.0	4.3	2.1	-3.2	-7.8	50	50	50	50	50	50
13C2 PFHxA	5.1	-6.2	5.2	0.8	-7.8	2.8	30	30	30	30	30	30
13C2 PFDA	1.9	-9.1	5.1	3.9	-3.9	2.0	30	30	30	30	30	30

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Lab Sample ID: CCVL 320-173534/14 Calibration Date: 07/11/2017 15:23

Instrument ID: A6 Calib Start Date: 07/11/2017 14:18

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/11/2017 15:05

Lab File ID: 11JUL2017A6B_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8010	0.7561		20.0	21.2	-5.6	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.164	1.314		2.68	2.38	12.8	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8012	0.8160		7.35	7.21	1.8	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.129		4.97	4.80	3.6	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.015	1.070		10.1	9.61	5.5	50.0
Perfluorononanoic acid (PFNA)	Ave	1.228	1.385		5.22	4.62	12.8	50.0
13C2 PFHxA	Ave	1.402	1.345		9.60	10.0	-4.0	30.0
13C2 PFDA	Ave	1.025	1.068		10.4	10.0	4.2	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Lab Sample ID: ICV 320-173534/16 Calibration Date: 07/11/2017 15:42

Instrument ID: A6 Calib Start Date: 07/11/2017 14:18

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/11/2017 15:05

Lab File ID: 11JUL2017A6B_016.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8010	0.7916		99.5	101	-1.2	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.164	1.071		9.27	10.1	-8.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8012	0.8072		21.3	21.2	0.8	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.062		19.5	20.0	-2.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.015	1.017		20.7	20.7	0.2	30.0
Perfluorononanoic acid (PFNA)	Ave	1.228	1.264		20.6	20.0	2.9	30.0
13C2 PFHxA	Ave	1.402	1.297		9.25	10.0	-7.5	30.0
13C2 PFDA	Ave	1.025	0.997		9.73	10.0	-2.7	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Lab Sample ID: CCV 320-173554/24 Calibration Date: 07/11/2017 16:54

Instrument ID: A6 Calib Start Date: 07/11/2017 14:18

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/11/2017 15:05

Lab File ID: 11JUL2017A6B_024.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8010	0.8057		133	133	0.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.164	1.185		15.1	14.9	1.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8012	0.8288		46.6	45.1	3.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.160		31.9	30.0	6.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.015	1.035		61.2	60.0	2.0	30.0
Perfluorononanoic acid (PFNA)	Ave	1.228	1.247		29.3	28.9	1.5	30.0
13C2 PFHxA	Ave	1.402	1.309		9.34	10.0	-6.6	30.0
13C2 PFDA	Ave	1.025	1.073		10.5	10.0	4.7	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Lab Sample ID: CCV 320-173554/34 Calibration Date: 07/11/2017 18:25

Instrument ID: A6 Calib Start Date: 07/11/2017 14:18

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/11/2017 15:05

Lab File ID: 11JUL2017A6B_034.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8010	0.6803		37.7	44.4	-15.1	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.164	1.073		4.59	4.97	-7.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	0.8012	0.6952		13.1	15.1	-13.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.090	1.020		9.40	10.0	-6.4	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.015	0.9529		18.9	20.1	-6.1	30.0
Perfluorononanoic acid (PFNA)	Ave	1.228	1.242		9.79	9.68	1.1	30.0
13C2 PFHxA	Ave	1.402	1.348		9.62	10.0	-3.8	30.0
13C2 PFDA	Ave	1.025	1.008		9.84	10.0	-1.6	30.0

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-29503-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-173098/1-A

Matrix: Water | Lab File ID: 11JUL2017A6B_026.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 07/08/2017 09:00

Sample wt/vol: 250(mL) | Date Analyzed: 07/11/2017 17:12

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.: 173554 | 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	94		70-130
STL00996	13C2 PFDA	99		70-130

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Instrument ID: A6 Start Date: 07/11/2017 14:18

Analysis Batch Number: 173534 End Date: 07/11/2017 16:54

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD 320-173534/7 IC		07/11/2017 14:18	1	11JUL2017A6B_007.d	GeminiC18 3x100 3(mm)
STD 320-173534/8 IC		07/11/2017 14:29	1	11JUL2017A6B_008.d	GeminiC18 3x100 3(mm)
STD 320-173534/9 IC		07/11/2017 14:38	1	11JUL2017A6B_009.d	GeminiC18 3x100 3(mm)
STD 320-173534/10 ICISAV		07/11/2017 14:47	1	11JUL2017A6B_010.d	GeminiC18 3x100 3(mm)
STD 320-173534/11 IC		07/11/2017 14:56	1	11JUL2017A6B_011.d	GeminiC18 3x100 3(mm)
STD 320-173534/12 IC		07/11/2017 15:05	1	11JUL2017A6B_012.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 15:14	1		GeminiC18 3x100 3(mm)
CCVL 320-173534/14		07/11/2017 15:23	1	11JUL2017A6B_014.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 15:32	1		GeminiC18 3x100 3(mm)
ICV 320-173534/16		07/11/2017 15:42	1	11JUL2017A6B_016.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 15:51	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 15:59	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 16:09	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 16:18	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 16:27	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 16:36	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 16:45	1		GeminiC18 3x100 3(mm)
CCV 320-173534/24 CCVIS		07/11/2017 16:54	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Instrument ID: A6 Start Date: 07/11/2017 16:54

Analysis Batch Number: 173554 End Date: 07/11/2017 18:25

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-173554/24 CCVIS		07/11/2017 16:54	1	11JUL2017A6B_024.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 17:03	1		GeminiC18 3x100 3(mm)
MB 320-173098/1-A		07/11/2017 17:12	1	11JUL2017A6B_026.d	GeminiC18 3x100 3(mm)
LCS 320-173098/2-A		07/11/2017 17:22	1	11JUL2017A6B_027.d	GeminiC18 3x100 3(mm)
LCSD 320-173098/3-A		07/11/2017 17:31	1	11JUL2017A6B_028.d	GeminiC18 3x100 3(mm)
320-29503-1		07/11/2017 17:40	1	11JUL2017A6B_029.d	GeminiC18 3x100 3(mm)
320-29503-2		07/11/2017 17:49	1	11JUL2017A6B_030.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 17:58	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 18:07	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/11/2017 18:16	1		GeminiC18 3x100 3(mm)
CCV 320-173554/34 CCVIS		07/11/2017 18:25	1	11JUL2017A6B_034.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Batch Number: 173098 Batch Start Date: 07/08/17 09:00 Batch Analyst: Sharifi, Nooshin

Batch Method: 537 Batch End Date: 07/10/17 21:25

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-HSP 00017
MB 320-173098/1		537, 537				250 mL	1.00 mL	7 SU	
LCS 320-173098/2		537, 537				250 mL	1.00 mL	7 SU	100 uL
LCSD 320-173098/3		537, 537				250 mL	1.00 mL	7 SU	100 uL
320-29503-A-1	NAWC-062617-RW-032	537, 537	T	286.01 g	27.25 g	258.8 mL	1.00 mL	7 SU	
320-29503-B-2	NAWC-062617-FRB-032	537, 537	T	298.21 g	26.79 g	271.4 mL	1.00 mL	7 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00043	LC537-SU 00044	AnalysisComment			
MB 320-173098/1		537, 537		100 uL	100 uL	CH ND			
LCS 320-173098/2		537, 537		100 uL	100 uL	CH ND			
LCSD 320-173098/3		537, 537		100 uL	100 uL	CH ND			
320-29503-A-1	NAWC-062617-RW-032	537, 537	T	100 uL	100 uL	CH ND			
320-29503-B-2	NAWC-062617-FRB-032	537, 537	T	100 uL	100 uL	CH ND			

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

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-29503-1

SDG No.:

Batch Number: 173098 Batch Start Date: 07/08/17 09:00 Batch Analyst: Sharifi, Nooshin

Batch Method: 537 Batch End Date: 07/10/17 21:25

Batch Notes	
Batch Comment	IS:960784
Manifold ID	4
Methanol ID	973181
Pipette ID	MD05306
Analyst ID - IS Reagent Drop	VPM
Analyst ID - IS Reagent Drop Witness	TN
Analyst ID - SU Reagent Drop	NSH
Analyst ID - SU Reagent Drop Witness	HJA
Analyst ID - TA Reagent Drop	NSH
Analyst ID - TA Reagent Drop Witness	HJA
SPE Cartridge ID	6357081-01
Trizma ID	SLBR4303V
Reagent Water ID	7-05-17

Basis	Basis Description
T	Total/NA

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento

Method 537 CCV/Data Review Checklist

A6

Job No: 29503,29547 Instrument ID & Date: 7-11-17 ICAL Batch: 173534
Extraction Batch: 173098 Worklist #: 45298 TALS Batch: 173554, 173556

Review Items	--- Level 1 --- Yes	No	N/A	Level 2
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 7-12-17 2nd Level Reviewer / Date: [illegible] 7/12/17

NCM # and Comments: 29547-3 is on hold, NCMs - 93562, 93563

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento

Method 537 ICAL Checklist

Instrument ID & Date: A6 7-11-17 Worklist#: 45298

ICAL Batch: 173534, 173535 Calibration ID number: 32318, 32319

Review Items	— Level 1 — Yes	No	N/A	Level 2
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): (Average) Linear (1/x²)Linear Quadratic (6 points minimum)				
4. Meets fit criteria? Intercept ≤ ½ RL RSD ≤ 30% for Average $R^2 \geq 0.990$ for Linear $R^2 \geq 0.990$ 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 (2nd source) ± 30% of true value?	✓			✓
11. Is ICV (2nd 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 7-12-17 2nd Level Reviewer / Date: 7/12/2017

NCM # and Comments: _____

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 11JUL2017A_537_ICAL Worklist Number: 45298
Instrument Name: A6 Chrom Method: 537__A6
Data Directory: \\ChromNA\Sacramento\ChromData\A6\20170711-45298.b
QC Batching: Enabled Limit Group Batching: Enabled

QC Batch: 1	LC 537 ICAL Raw Batch: 173534	LC 537 CS ICAL Raw Batch: 173535
# 1 RINSE	# 1 RINSE	# 1 RINSE
# 2 RINSE	# 2 RINSE	# 2 RINSE
# 3 RINSE	# 3 RINSE	
# 4 PRIMER L5	# 4 PRIMER L5	
# 5 RINSE	# 5 RINSE	# 5 RINSE
# 6 RB	# 6 RB	# 6 RB
# 7 STD L1	# 7 STD L1	# 7 STD L1
# 8 STD L2	# 8 STD L2	# 8 STD L2
# 9 STD L3	# 9 STD L3	# 9 STD L3
#10 STD L4	#10 STD L4	#10 STD L4
#11 STD L5	#11 STD L5	#11 STD L5
#12 STD L6	#12 STD L6	#12 STD L6
#13 RB	#13 RB	#13 RB
#14 CCVL	#14 CCVL	#14 CCVL
#15 ICB	#15 ICB	#15 ICB
#16 ICV	#16 ICV	#16 ICV
#17 RB	#17 RB	
#18 320-29346-A-3-A	#18 320-29346-A-3-A	
#19 320-29346-B-4-A	#19 320-29346-B-4-A	
#20 MB 320-172894/1-A	#20 MB 320-172894/1-A	
#21 LCS 320-172894/2-A	#21 LCS 320-172894/2-A	
#22 LCSD 320-172894/3-A	#22 LCSD 320-172894/3-A	
#23 280-98736-E-11-A	#23 280-98736-E-11-A	
#24 CCV L5	#24 CCV L5	

QC Batch: 2	LC 537 ICAL Raw Batch: 173554
#24 CCV L5	#24 CCV L5
#25 RB	#25 RB
#26 MB 320-173098/1-A	#26 MB 320-173098/1-A
#27 LCS 320-173098/2-A	#27 LCS 320-173098/2-A
#28 LCSD 320-173098/3-A	#28 LCSD 320-173098/3-A
#29 320-29503-A-1-A	#29 320-29503-A-1-A
#30 320-29503-B-2-A	#30 320-29503-B-2-A
#31 320-29547-A-3-A	#31 320-29547-A-3-A
#32 320-29547-A-1-A	#32 320-29547-A-1-A
#33 320-29547-A-2-A	#33 320-29547-A-2-A
#34 CCV L3	#34 CCV L3

QC Batch: 3	LC 537 ICAL Raw Batch: 173555
#34 CCV L3	#34 CCV L3
#35 RB	#35 RB
#36 MB 320-172894/1-A	#36 MB 320-172894/1-A
#37 LCS 320-172894/2-A	#37 LCS 320-172894/2-A
#38 LCSD 320-172894/3-A	#38 LCSD 320-172894/3-A
#39 280-98736-E-11-A	#39 280-98736-E-11-A
#40 CCV L5	#40 CCV L5

QC Batch: 4	LC 537 ICAL Raw Batch: 173556
#40 CCV L5	#40 CCV L5
#41 RB	#41 RB
#42 MB 320-173098/1-A	#42 MB 320-173098/1-A
#43 LCS 320-173098/2-A	#43 LCS 320-173098/2-A
#44 LCSD 320-173098/3-A	#44 LCSD 320-173098/3-A
#45 320-29503-A-1-A	#45 320-29503-A-1-A
#46 320-29503-B-2-A	#46 320-29503-B-2-A
#47 320-29547-A-3-A	#47 320-29547-A-3-A
#48 320-29547-A-1-A	#48 320-29547-A-1-A
#49 320-29547-A-2-A	#49 320-29547-A-2-A
#50 CCV L3	#50 CCV L3
#51 RB	#51 RB

42

Aqueous Extraction Analysis Sheet

AB 7/10/17

(To Accompany Samples to Instruments)

Batch Number: 320-173098

Analyst: Sharifi, Nooshin

Batch Open: 7/8/2017 9:00:00AM

Method Code: 320-537_Prep-320

Batch End: 7/10/2017 9:25:00PM

Extraction of Perfluorinated Alkyl Acids

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-173098/1 N/A	N/A		250 mL	7			N/A	N/A	N/A	CH ND	MB 320-173098/1-A
				1.00 mL								
2	LCS~320-173098/2 N/A	N/A		250 mL	7			N/A	N/A	N/A	CH ND	LCS 320-173098/2-A
				1.00 mL								
3	LCSD~320-173098/3 N/A	N/A		250 mL	7			N/A	N/A	N/A	CH ND	LCSD 320-173098/3-A
				1.00 mL								
4	320-29503-A-1 (537_DOD5)	N/A (320-29503-1)	286.01 g	258.8 mL	7			7/5/17	16_Days	4	CH ND	320-29503-A-1-A
			27.25 g	1.00 mL								
5	320-29503-B-2 (537_DOD5)	N/A (320-29503-1)	298.21 g	271.4 mL	7			7/5/17	16_Days	4	CH ND	320-29503-B-2-A
			26.79 g	1.00 mL								
6	320-29547-A-3 (537_DOD5)	N/A (320-29547-1)	296.49 g	269.1 mL	7			7/5/17	12_Days	4	CH ND	320-29547-A-3-A
			27.41 g	1.00 mL								
7	320-29547-A-1 (537_DOD5)	N/A (320-29547-1)	288.97 g	261 mL	7			7/5/17	12_Days	4	CH ND	320-29547-A-1-A
			27.95 g	1.00 mL								
8	320-29547-A-2 (537_DOD5)	N/A (320-29547-1)	276.81 g	249.1 mL	7			7/5/17	12_Days	4	CH ND	320-29547-A-2-A
			27.67 g	1.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-173098

Method Code: 320-537_Prep-320

Analyst: Sharifi, Nooshin

Batch Open: 7/8/2017 9:00:00AM

Batch End:

Batch Notes

Manifold ID	4
Trizma ID	SLBR4303V
SPE Cartridge ID	6357081-01
Methanol ID	973181
Reagent Water ID	7-05-17
Pipette ID	MD05306
Analyst ID - TA Reagent Drop	NSH
Analyst ID - TA Reagent Drop Witness	HJA
Analyst ID - SU Reagent Drop	NSH
Analyst ID - SU Reagent Drop Witness	HJA
Analyst ID - IS Reagent Drop	VPM
Analyst ID - IS Reagent Drop Witness	TN
Batch Comment	IS: 960784

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-173098

Method Code: 320-537_Prep-320

Analyst: Sharifi, Nooshin

Batch Open: 7/8/2017 9:00:00AM

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-173098/1	LC537-SU_00044	100 uL	1.00 mL	NSH 7-8-17	HSA 7-8-17
LCS 320-173098/2	LC537-HSP_00017	100 uL	1.00 mL		
LCS 320-173098/2	LC537-SU_00044	100 uL	1.00 mL		
LCSD 320-173098/3	LC537-HSP_00017	100 uL	1.00 mL		
LCSD 320-173098/3	LC537-SU_00044	100 uL	1.00 mL		
320-29503-A-1	LC537-SU_00044	100 uL	1.00 mL		
320-29503-B-2	LC537-SU_00044	100 uL	1.00 mL		
320-29547-A-3	LC537-SU_00044	100 uL	1.00 mL		
320-29547-A-1	LC537-SU_00044	100 uL	1.00 mL		
320-29547-A-2	LC537-SU_00044	100 uL	1.00 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-173098

Analyst: Sharifi, Nooshin

Batch Open: 7/8/2017 9:00:00AM

Method Code: 320-537_Prep-320

Batch End:

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 173098 Test: 537

Earliest Holding Time: 7-11-17

Sample List Tab	1st Level Reviewer	2nd 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	**1st Level Reviewer**	**2nd 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	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and entered into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Batch Information	**1st Level Reviewer**	**2nd Level Reviewer**
Date and time accurate and entered into TALS correctly	✓	✓
All necessary 'batch information' complete and entered into TALS correctly	✓	✓

1st Level Reviewer: TN Date: 07/10/17

2nd Level Reviewer: VPM Date: 7/10/17

Comments:

C:\All_Projects\112G08005\WE04\FS.DR.03\NAWC_201901.mxd MKB 1/24/2019

N

WARRINGTON

WARWICK

NORTHAMPTON

IVYLAND

WARMINSTER

HAGS

NASJRB
Willow Grove

HORSHAM

HATBORO

UPPER SOUTHAMPTON

UPPER MORELAND

LEGEND

- PFOA & PFOS BELOW DETECTION LIMITS
- SUM OF PFOA & PFOS CONCENTRATIONS AT OR BELOW 40 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS BETWEEN 40 PPT AND 70 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS ABOVE 70 PPT
- PUBLIC WATER CONNECTION (SOME NOT BY NAVY)
- SAMPLING AREA
- FORMER NAWC WARMINSTER
- TOWNSHIP BOUNDARY

3,000 1,500 0 3,000 6,000
Feet

NAVFAC

PFC SAMPLE RESULTS MAP
FORMER NAWC WAMINSTER
MONTGOMERY COUNTY, PENNSYLVANIA

SCALE	AS NOTED
FILE	NAWC
REV	0
DATE	01/24/19
FIGURE NUMBER	FIGURE 1