Naval Facilities Engineering Command

Off-base Drinking Water Sample Results, Level 2 Laboratory Report, Level 4 Laboratory Report, Electronic Data Deliverable, Data Validation Report, and the Sample Location Figure, SDG 320-24637

Ault Field
Naval Air Station Whidbey Island
Oak Harbor, Washington

February 2019

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-24637-1
Client Project/Site: Whidbey Island

For:
CH2M Hill Constructors, Inc.
1100 NE Circle Blvd
Corvallis, Oregon 97330

Attn: Tiffany Hill

Authorized for release by:
1/4/2017 9:18:33 AM

Laura Turpen, Project Manager I
(916)374-4414
laura.turpen@testamericainc.com

Table of Contents

Definitions/Glossary

Client: CH2M Hill Constructors, Inc.
Project/Site: Whidbey Island

TestAmerica Job ID: 320-24637-1

Qualifiers

LCMS

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.
M	Manual integrated compound.

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, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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 ID: 320-24637-1

Laboratory: TestAmerica Sacramento

Narrative

CASE NARRATIVE

Client: CH2M Hill Constructors, Inc.

Project: Whidbey Island

Report Number: 320-24637-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica Sacramento attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the applicable methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

TestAmerica utilizes USEPA approved methods and DOD QSM, where applicable, in all analytical work. The samples presented in this report were analyzed for the parameter(s) listed on the analytical methods summary page in accordance with the method(s) indicated. A summary of QC data for these analyses is included at the back of the report.

All parameters for which TestAmerica Sacramento has certification were evaluated to the QSM specified reporting convention or to the client specified format if different from QSM. Parameters not certified under QSM, if any, were evaluated to the detection limit (DL) and include qualified results where applicable.

The sample(s) that contain constituents flagged with U are undetected. The result associated with this flag is the limit of detection (LOD).

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 12/23/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.6 C.

An extended TAT was requested by the client via an email on December 21. Samples results were requested to not be sent on December 29 or December 30.

PFOA/PFOS

Samples WI-AF-3RW36-1216 (320-24637-1), WI-AF-3FB36-1216 (320-24637-2), WI-AF-3RW37-1216 (320-24637-3) and WI-AF-3FB37-1216 (320-24637-4) were analyzed for PFOA/PFOS in accordance with 537. The samples were prepared on 12/23/2016 and analyzed on 01/03/2017.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 320-143781.

Job ID: 320-24637-1 (Continued)

Laboratory: TestAmerica Sacramento (Continued)

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

Detection Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: Whidbey Island

TestAmerica Job ID: 320-24637-1

Client Sample ID: WI-AF-3RW36-1216 — Lab Sample ID: 320-24637-1

No Detections.

Client Sample ID: WI-AF-3FB36-1216 — Lab Sample ID: 320-24637-2

No Detections.

Client Sample ID: WI-AF-3RW37-1216 — Lab Sample ID: 320-24637-3

No Detections.

Client Sample ID: WI-AF-3FB37-1216 — Lab Sample ID: 320-24637-4

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: WI-AF-3RW36-1216

Lab Sample ID: 320-24637-1
Date Collected: 12/20/16 09:01
Matrix: Water
Date Received: 12/23/16 10:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.045	U	0.056	0.015	ug/L		12/23/16 18:13	01/03/17 04:11	1
Perfluorooctanoic acid (PFOA)	0.022	U	0.028	0.0088	ug/L		12/23/16 18:13	01/03/17 04:11	1
Perfluorobutanesulfonic acid (PFBS)	0.10	U	0.13	0.045	ug/L		12/23/16 18:13	01/03/17 04:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*109*		*70 - 130*	*12/23/16 18:13*	*01/03/17 04:11*	*1*
13C2 PFDA	*103*		*70 - 130*	*12/23/16 18:13*	*01/03/17 04:11*	*1*

Client Sample ID: WI-AF-3FB36-1216

Lab Sample ID: 320-24637-2
Date Collected: 12/20/16 09:02
Matrix: Water
Date Received: 12/23/16 10:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.046	U	0.057	0.015	ug/L		12/23/16 18:13	01/03/17 04:41	1
Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.0090	ug/L		12/23/16 18:13	01/03/17 04:41	1
Perfluorobutanesulfonic acid (PFBS)	0.10	U	0.13	0.045	ug/L		12/23/16 18:13	01/03/17 04:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*112*		*70 - 130*	*12/23/16 18:13*	*01/03/17 04:41*	*1*
13C2 PFDA	*106*		*70 - 130*	*12/23/16 18:13*	*01/03/17 04:41*	*1*

Client Sample ID: WI-AF-3RW37-1216

Lab Sample ID: 320-24637-3
Date Collected: 12/20/16 18:12
Matrix: Water
Date Received: 12/23/16 10:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.044	U	0.056	0.014	ug/L		12/23/16 18:13	01/03/17 06:10	1
Perfluorooctanoic acid (PFOA)	0.022	U	0.028	0.0087	ug/L		12/23/16 18:13	01/03/17 06:10	1
Perfluorobutanesulfonic acid (PFBS)	0.10	U	0.13	0.044	ug/L		12/23/16 18:13	01/03/17 06:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*105*		*70 - 130*	*12/23/16 18:13*	*01/03/17 06:10*	*1*
13C2 PFDA	*114*		*70 - 130*	*12/23/16 18:13*	*01/03/17 06:10*	*1*

Client Sample ID: WI-AF-3FB37-1216

Lab Sample ID: 320-24637-4
Date Collected: 12/20/16 18:13
Matrix: Water
Date Received: 12/23/16 10:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.046	U	0.058	0.015	ug/L		12/23/16 18:13	01/03/17 06:39	1
Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.0091	ug/L		12/23/16 18:13	01/03/17 06:39	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.13	0.046	ug/L		12/23/16 18:13	01/03/17 06:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*104*		*70 - 130*	*12/23/16 18:13*	*01/03/17 06:39*	*1*
13C2 PFDA	*110*		*70 - 130*	*12/23/16 18:13*	*01/03/17 06:39*	*1*

Surrogate Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: Whidbey Island

TestAmerica Job ID: 320-24637-1

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)								
320-24637-1	WI-AF-3RW36-1216	109	103								
320-24637-2	WI-AF-3FB36-1216	112	106								
320-24637-3	WI-AF-3RW37-1216	105	114								
320-24637-4	WI-AF-3FB37-1216	104	110								
LCS 320-143781/2-A	Lab Control Sample	102	103								
LCSD 320-143781/3-A	Lab Control Sample Dup	103	108								
MB 320-143781/1-A	Method Blank	100	102								

Surrogate Legend

13C2 PFHxA = 13C2 PFHxA

13C2 PFDA = 13C2 PFDA

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

Lab Sample ID: MB 320-143781/1-A
Matrix: Water
Analysis Batch: 144610

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 143781

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.048	U M	0.060	0.016	ug/L		12/23/16 18:13	01/02/17 21:47	1
Perfluorooctanoic acid (PFOA)	0.024	U M	0.030	0.0094	ug/L		12/23/16 18:13	01/02/17 21:47	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		12/23/16 18:13	01/02/17 21:47	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*100*		*70 - 130*	*12/23/16 18:13*	*01/02/17 21:47*	*1*
13C2 PFDA	*102*		*70 - 130*	*12/23/16 18:13*	*01/02/17 21:47*	*1*

Lab Sample ID: LCS 320-143781/2-A
Matrix: Water
Analysis Batch: 144610

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 143781

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	0.160	0.129		ug/L		80	70 - 130
Perfluorooctanoic acid (PFOA)	0.0781	0.0750		ug/L		96	70 - 130
Perfluorobutanesulfonic acid (PFBS)	0.359	0.302		ug/L		84	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*102*		*70 - 130*
13C2 PFDA	*103*		*70 - 130*

Lab Sample ID: LCSD 320-143781/3-A
Matrix: Water
Analysis Batch: 144610

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 143781

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)	0.160	0.136		ug/L		85	70 - 130	6	30
Perfluorooctanoic acid (PFOA)	0.0781	0.0761		ug/L		97	70 - 130	1	30
Perfluorobutanesulfonic acid (PFBS)	0.359	0.311		ug/L		87	70 - 130	3	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFHxA	*103*		*70 - 130*
13C2 PFDA	*108*		*70 - 130*

QC Association Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: Whidbey Island

TestAmerica Job ID: 320-24637-1

LCMS

Prep Batch: 143781

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24637-1	WI-AF-3RW36-1216	Total/NA	Water	537	
320-24637-2	WI-AF-3FB36-1216	Total/NA	Water	537	
320-24637-3	WI-AF-3RW37-1216	Total/NA	Water	537	
320-24637-4	WI-AF-3FB37-1216	Total/NA	Water	537	
MB 320-143781/1-A	Method Blank	Total/NA	Water	537	
LCS 320-143781/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 320-143781/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 144610

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-143781/1-A	Method Blank	Total/NA	Water	537	143781
LCS 320-143781/2-A	Lab Control Sample	Total/NA	Water	537	143781
LCSD 320-143781/3-A	Lab Control Sample Dup	Total/NA	Water	537	143781

Analysis Batch: 144612

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24637-1	WI-AF-3RW36-1216	Total/NA	Water	537	143781
320-24637-2	WI-AF-3FB36-1216	Total/NA	Water	537	143781

Analysis Batch: 144614

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24637-3	WI-AF-3RW37-1216	Total/NA	Water	537	143781
320-24637-4	WI-AF-3FB37-1216	Total/NA	Water	537	143781

Lab Chronicle

Client: CH2M Hill Constructors, Inc.
Project/Site: Whidbey Island

TestAmerica Job ID: 320-24637-1

Client Sample ID: WI-AF-3RW36-1216
Date Collected: 12/20/16 09:01
Date Received: 12/23/16 10:50

Lab Sample ID: 320-24637-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			266.8 mL	1.00 mL	143781	12/23/16 18:13	JER	TAL SAC
Total/NA	Analysis	537		1			144612	01/03/17 04:11	JRB	TAL SAC

Client Sample ID: WI-AF-3FB36-1216
Date Collected: 12/20/16 09:02
Date Received: 12/23/16 10:50

Lab Sample ID: 320-24637-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			262.5 mL	1.00 mL	143781	12/23/16 18:13	JER	TAL SAC
Total/NA	Analysis	537		1			144612	01/03/17 04:41	JRB	TAL SAC

Client Sample ID: WI-AF-3RW37-1216
Date Collected: 12/20/16 18:12
Date Received: 12/23/16 10:50

Lab Sample ID: 320-24637-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			269.7 mL	1.00 mL	143781	12/23/16 18:13	JER	TAL SAC
Total/NA	Analysis	537		1			144614	01/03/17 06:10	JRB	TAL SAC

Client Sample ID: WI-AF-3FB37-1216
Date Collected: 12/20/16 18:13
Date Received: 12/23/16 10:50

Lab Sample ID: 320-24637-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			259.7 mL	1.00 mL	143781	12/23/16 18:13	JER	TAL SAC
Total/NA	Analysis	537		1			144614	01/03/17 06:39	JRB	TAL SAC

Laboratory References:

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

Certification Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: Whidbey Island

TestAmerica Job ID: 320-24637-1

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17

Analysis Method	Prep Method	Matrix	Analyte

Method Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: Whidbey Island

TestAmerica Job ID: 320-24637-1

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

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: Whidbey Island

TestAmerica Job ID: 320-24637-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-24637-1	WI-AF-3RW36-1216	Water	12/20/16 09:01	12/23/16 10:50
320-24637-2	WI-AF-3FB36-1216	Water	12/20/16 09:02	12/23/16 10:50
320-24637-3	WI-AF-3RW37-1216	Water	12/20/16 18:12	12/23/16 10:50
320-24637-4	WI-AF-3FB37-1216	Water	12/20/16 18:13	12/23/16 10:50

TestAmerica Sacramento
880 Riverside Parkway

West Sacramento, CA 95605
phone 916.373.5600 fax

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

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

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Katie Tippin	Site Contact: Eric Epple	Date: 12/21/2016	COC No: 10
Tiffany Hill	Tel/Fax: (757) 671-6258	Lab Contact: Laura Turpen	Carrier: FedEx	1 of 1 COCs
Project Chemist	Analysis Turnaround Time			Sampler:
1100 NE Circle Blvd Ste 300 Corvallis, OR 97330	☑CALENDAR DAYS ☐WORKING DAYS			For Lab Use Only:
(541) 768-3109	TAT if different from Below 7-Day			Walk-in Client:
(541) 908-3794	☐ 2 weeks			Lab Sampling:
Project Name: CTO-08	☐ 1 week			
Site: NAS Whidbey Island	☐ 2 days			Job / SDG No.:
P O #: 100067106050 - 679580.06.FI.FS	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	USEPA Method 537 (PFOA, PFOS, and PFBS)	Sample Specific Notes:
WI-AF-3RW36-1216	12/20/16	0901	G	DW	2	N	N	X	
WI-AF-3FB36-1216	12/20/16	0902	G	DW	2	N	N	X	
WI-AF-3RW37-1216	12/20/16	1812	G	DW	2	N	N	X	
WI-AF-3FB37-1216	12/20/16	1813	G	DW	2	N	N	X	
								6	

320-24637 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 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:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd:_____ Corr'd:_____ | Therm ID No.:_____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Eric Epple	CH2M	12-21-16/1600	J. Nhart	TAWS	12/23/16 1050
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. 4.3, dated 12/05/2013

0.6°C

1/4/2017

Login Sample Receipt Checklist

Client: CH2M Hill Constructors, Inc.

Job Number: 320-24637-1

Login Number: 24637
List Number: 1
Creator: Turpen, Troy

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	Seal
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?	N/A	
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	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

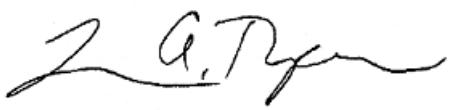
ANALYTICAL REPORT

Job Number: 320-24637-1

Job Description: Whidbey Island

For:
CH2M Hill Constructors, Inc.
1100 NE Circle Blvd
Corvallis, OR 97330

Attention: Tiffany Hill



Approved for release.
Laura Turpen
Project Manager I
1/4/2017 9:19 AM

Laura Turpen, Project Manager I
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4414
laura.turpen@testamericainc.com
01/04/2017

Table of Contents

Table of Contents

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LCMS

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M	Manual integrated compound.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
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CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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)

CASE NARRATIVE

Client: CH2M Hill Constructors, Inc.

Project: Whidbey Island

Report Number: 320-24637-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica Sacramento attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the applicable methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

TestAmerica utilizes USEPA approved methods and DOD QSM, where applicable, in all analytical work. The samples presented in this report were analyzed for the parameter(s) listed on the analytical methods summary page in accordance with the method(s) indicated. A summary of QC data for these analyses is included at the back of the report.

All parameters for which TestAmerica Sacramento has certification were evaluated to the QSM specified reporting convention or to the client specified format if different from QSM. Parameters not certified under QSM, if any, were evaluated to the detection limit (DL) and include qualified results where applicable.

The sample(s) that contain constituents flagged with U are undetected. The result associated with this flag is the limit of detection (LOD).

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 12/23/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.6 C.

An extended TAT was requested by the client via an email on December 21. Samples results were requested to not be sent on December 29 or December 30.

PFOA/PFOS

Samples WI-AF-3RW36-1216 (320-24637-1), WI-AF-3FB36-1216 (320-24637-2), WI-AF-3RW37-1216 (320-24637-3) and WI-AF-3FB37-1216 (320-24637-4) were analyzed for PFOA/PFOS in accordance with 537. The samples were prepared on 12/23/2016 and analyzed on 01/03/2017.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 320-143781.

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

Detection Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: Whidbey Island

TestAmerica Job ID: 320-24637-1

Client Sample ID: WI-AF-3RW36-1216 — Lab Sample ID: 320-24637-1

No Detections.

Client Sample ID: WI-AF-3FB36-1216 — Lab Sample ID: 320-24637-2

No Detections.

Client Sample ID: WI-AF-3RW37-1216 — Lab Sample ID: 320-24637-3

No Detections.

Client Sample ID: WI-AF-3FB37-1216 — Lab Sample ID: 320-24637-4

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: WI-AF-3RW36-1216

Lab Sample ID: 320-24637-1

Date Collected: 12/20/16 09:01

Matrix: Water

Date Received: 12/23/16 10:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.045	U	0.056	0.015	ug/L		12/23/16 18:13	01/03/17 04:11	1
Perfluorooctanoic acid (PFOA)	0.022	U	0.028	0.0088	ug/L		12/23/16 18:13	01/03/17 04:11	1
Perfluorobutanesulfonic acid (PFBS)	0.10	U	0.13	0.045	ug/L		12/23/16 18:13	01/03/17 04:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*109*		*70 - 130*	*12/23/16 18:13*	*01/03/17 04:11*	*1*
13C2 PFDA	*103*		*70 - 130*	*12/23/16 18:13*	*01/03/17 04:11*	*1*

Client Sample ID: WI-AF-3FB36-1216

Lab Sample ID: 320-24637-2

Date Collected: 12/20/16 09:02

Matrix: Water

Date Received: 12/23/16 10:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.046	U	0.057	0.015	ug/L		12/23/16 18:13	01/03/17 04:41	1
Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.0090	ug/L		12/23/16 18:13	01/03/17 04:41	1
Perfluorobutanesulfonic acid (PFBS)	0.10	U	0.13	0.045	ug/L		12/23/16 18:13	01/03/17 04:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*112*		*70 - 130*	*12/23/16 18:13*	*01/03/17 04:41*	*1*
13C2 PFDA	*106*		*70 - 130*	*12/23/16 18:13*	*01/03/17 04:41*	*1*

Client Sample ID: WI-AF-3RW37-1216

Lab Sample ID: 320-24637-3

Date Collected: 12/20/16 18:12

Matrix: Water

Date Received: 12/23/16 10:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.044	U	0.056	0.014	ug/L		12/23/16 18:13	01/03/17 06:10	1
Perfluorooctanoic acid (PFOA)	0.022	U	0.028	0.0087	ug/L		12/23/16 18:13	01/03/17 06:10	1
Perfluorobutanesulfonic acid (PFBS)	0.10	U	0.13	0.044	ug/L		12/23/16 18:13	01/03/17 06:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*105*		*70 - 130*	*12/23/16 18:13*	*01/03/17 06:10*	*1*
13C2 PFDA	*114*		*70 - 130*	*12/23/16 18:13*	*01/03/17 06:10*	*1*

Client Sample ID: WI-AF-3FB37-1216

Lab Sample ID: 320-24637-4

Date Collected: 12/20/16 18:13

Matrix: Water

Date Received: 12/23/16 10:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.046	U	0.058	0.015	ug/L		12/23/16 18:13	01/03/17 06:39	1
Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.0091	ug/L		12/23/16 18:13	01/03/17 06:39	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.13	0.046	ug/L		12/23/16 18:13	01/03/17 06:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*104*		*70 - 130*	*12/23/16 18:13*	*01/03/17 06:39*	*1*
13C2 PFDA	*110*		*70 - 130*	*12/23/16 18:13*	*01/03/17 06:39*	*1*

Default Detection Limits

Client: CH2M Hill Constructors, Inc.
Project/Site: Whidbey Island

TestAmerica Job ID: 320-24637-1

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

Prep: 537

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	0.14	0.048	ug/L	537
Perfluorooctanesulfonic acid (PFOS)	0.060	0.016	ug/L	537
Perfluorooctanoic acid (PFOA)	0.030	0.0094	ug/L	537

Surrogate Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: Whidbey Island

TestAmerica Job ID: 320-24637-1

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)								
320-24637-1	WI-AF-3RW36-1216	109	103								
320-24637-2	WI-AF-3FB36-1216	112	106								
320-24637-3	WI-AF-3RW37-1216	105	114								
320-24637-4	WI-AF-3FB37-1216	104	110								
LCS 320-143781/2-A	Lab Control Sample	102	103								
LCSD 320-143781/3-A	Lab Control Sample Dup	103	108								
MB 320-143781/1-A	Method Blank	100	102								

Surrogate Legend

13C2 PFHxA = 13C2 PFHxA

13C2 PFDA = 13C2 PFDA

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

Lab Sample ID: MB 320-143781/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 144610 — **Prep Batch: 143781**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.048	U M	0.060	0.016	ug/L		12/23/16 18:13	01/02/17 21:47	1
Perfluorooctanoic acid (PFOA)	0.024	U M	0.030	0.0094	ug/L		12/23/16 18:13	01/02/17 21:47	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		12/23/16 18:13	01/02/17 21:47	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*100*		*70 - 130*	*12/23/16 18:13*	*01/02/17 21:47*	*1*
13C2 PFDA	*102*		*70 - 130*	*12/23/16 18:13*	*01/02/17 21:47*	*1*

Lab Sample ID: LCS 320-143781/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 144610 — **Prep Batch: 143781**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	0.160	0.129		ug/L		80	70 - 130
Perfluorooctanoic acid (PFOA)	0.0781	0.0750		ug/L		96	70 - 130
Perfluorobutanesulfonic acid (PFBS)	0.359	0.302		ug/L		84	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*102*		*70 - 130*
13C2 PFDA	*103*		*70 - 130*

Lab Sample ID: LCSD 320-143781/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 144610 — **Prep Batch: 143781**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)	0.160	0.136		ug/L		85	70 - 130	6	30
Perfluorooctanoic acid (PFOA)	0.0781	0.0761		ug/L		97	70 - 130	1	30
Perfluorobutanesulfonic acid (PFBS)	0.359	0.311		ug/L		87	70 - 130	3	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFHxA	*103*		*70 - 130*
13C2 PFDA	*108*		*70 - 130*

LCMS

Prep Batch: 143781

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24637-1	WI-AF-3RW36-1216	Total/NA	Water	537	
320-24637-2	WI-AF-3FB36-1216	Total/NA	Water	537	
320-24637-3	WI-AF-3RW37-1216	Total/NA	Water	537	
320-24637-4	WI-AF-3FB37-1216	Total/NA	Water	537	
MB 320-143781/1-A	Method Blank	Total/NA	Water	537	
LCS 320-143781/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 320-143781/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 144610

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-143781/1-A	Method Blank	Total/NA	Water	537	143781
LCS 320-143781/2-A	Lab Control Sample	Total/NA	Water	537	143781
LCSD 320-143781/3-A	Lab Control Sample Dup	Total/NA	Water	537	143781

Analysis Batch: 144612

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24637-1	WI-AF-3RW36-1216	Total/NA	Water	537	143781
320-24637-2	WI-AF-3FB36-1216	Total/NA	Water	537	143781

Analysis Batch: 144614

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24637-3	WI-AF-3RW37-1216	Total/NA	Water	537	143781
320-24637-4	WI-AF-3FB37-1216	Total/NA	Water	537	143781

Lab Chronicle

Client: CH2M Hill Constructors, Inc.
Project/Site: Whidbey Island

TestAmerica Job ID: 320-24637-1

Client Sample ID: WI-AF-3RW36-1216
Lab Sample ID: 320-24637-1
Date Collected: 12/20/16 09:01
Matrix: Water
Date Received: 12/23/16 10:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			143781	12/23/16 18:13	JER	TAL SAC
Total/NA	Analysis	537		1	144612	01/03/17 04:11	JRB	TAL SAC

Client Sample ID: WI-AF-3FB36-1216
Lab Sample ID: 320-24637-2
Date Collected: 12/20/16 09:02
Matrix: Water
Date Received: 12/23/16 10:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			143781	12/23/16 18:13	JER	TAL SAC
Total/NA	Analysis	537		1	144612	01/03/17 04:41	JRB	TAL SAC

Client Sample ID: WI-AF-3RW37-1216
Lab Sample ID: 320-24637-3
Date Collected: 12/20/16 18:12
Matrix: Water
Date Received: 12/23/16 10:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			143781	12/23/16 18:13	JER	TAL SAC
Total/NA	Analysis	537		1	144614	01/03/17 06:10	JRB	TAL SAC

Client Sample ID: WI-AF-3FB37-1216
Lab Sample ID: 320-24637-4
Date Collected: 12/20/16 18:13
Matrix: Water
Date Received: 12/23/16 10:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			143781	12/23/16 18:13	JER	TAL SAC
Total/NA	Analysis	537		1	144614	01/03/17 06:39	JRB	TAL SAC

Laboratory References:

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

Certification Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: Whidbey Island

TestAmerica Job ID: 320-24637-1

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17

Analysis Method	Prep Method	Matrix	Analyte

Method Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: Whidbey Island

TestAmerica Job ID: 320-24637-1

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

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: Whidbey Island

TestAmerica Job ID: 320-24637-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-24637-1	WI-AF-3RW36-1216	Water	12/20/16 09:01	12/23/16 10:50
320-24637-2	WI-AF-3FB36-1216	Water	12/20/16 09:02	12/23/16 10:50
320-24637-3	WI-AF-3RW37-1216	Water	12/20/16 18:12	12/23/16 10:50
320-24637-4	WI-AF-3FB37-1216	Water	12/20/16 18:13	12/23/16 10:50

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 143828

Lab Sample ID: STD 320-143828/4 IC Client Sample ID:

Date Analyzed: 12/24/16 04:26 Lab File ID: 24DEC2016A6A_004.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.34	Baseline	phomsopha t	12/24/16 11:57
Perfluorooctanoic acid (PFOA)	20.00	Baseline	phomsopha t	12/24/16 11:57

Lab Sample ID: STD 320-143828/5 IC Client Sample ID:

Date Analyzed: 12/24/16 04:55 Lab File ID: 24DEC2016A6A_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	20.00	Baseline	phomsopha t	12/24/16 11:59

Lab Sample ID: STD 320-143828/6 IC Client Sample ID:

Date Analyzed: 12/24/16 05:25 Lab File ID: 24DEC2016A6A_006.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.34	Baseline	phomsopha t	12/24/16 12:04
Perfluorooctanoic acid (PFOA)	20.00	Baseline	phomsopha t	12/24/16 12:09

Lab Sample ID: STD 320-143828/7 ICISAV Client Sample ID:

Date Analyzed: 12/24/16 05:54 Lab File ID: 24DEC2016A6A_007.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.36	Baseline	phomsopha t	12/24/16 12:07

537

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 143828

Lab Sample ID: STD 320-143828/8 IC Client Sample ID:

Date Analyzed: 12/24/16 06:24 Lab File ID: 24DEC2016A6A_008.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.36	Baseline	phomsopha t	12/24/16 12:10

Lab Sample ID: STD 320-143828/9 IC Client Sample ID:

Date Analyzed: 12/24/16 06:54 Lab File ID: 24DEC2016A6A_009.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.36	Baseline	phomsopha t	12/24/16 12:11

Lab Sample ID: CCV 320-143828/11 CCVL Client Sample ID:

Date Analyzed: 12/24/16 07:53 Lab File ID: 24DEC2016A6A_011.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.36	Baseline	phomsopha t	12/24/16 12:19
Perfluorooctanoic acid (PFOA)	20.01	Baseline	phomsopha t	12/24/16 12:19

Lab Sample ID: ICV 320-143828/13 Client Sample ID:

Date Analyzed: 12/24/16 08:52 Lab File ID: 24DEC2016A6A_013.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.36	Baseline	phomsopha t	12/24/16 12:21

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 144608

Lab Sample ID: CCV 320-144608/2 CCVL Client Sample ID:

Date Analyzed: 01/02/17 10:56 Lab File ID: 02JAN2017A6A_002.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.34	Split Peak	barnettj	01/03/17 13:55

537

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 144610

Lab Sample ID: MB 320-143781/1-A Client Sample ID:

Date Analyzed: 01/02/17 21:47 Lab File ID: 02JAN2017A6A_024.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	20.00	Split Peak	barnettj	01/03/17 14:13
Perfluorooctanesulfonic acid (PFOS)	20.60	Missed Peak	barnettj	01/03/17 14:13

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-ICV_00019	03/01/17	12/20/16	MeOH/H2O, Lot 067374	10 mL	LC537-IS_00028	200 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
.LC537-IS_00028	06/19/17	12/19/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00005	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA_00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00018	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
LC537-ICV_00019	03/01/17	12/20/16	MeOH/H2O, Lot 067374	10 mL	LC537-SU_00027	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
					LC537ICIM_00014	25 uL	Perfluorobutanesulfonic acid (PFBS)	114.77 ng/mL
							Perfluorooctanoic acid (PFOA)	25.0232 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	27.2389 ng/mL
.LC537-SU_00027	06/19/17	12/19/16	Methanol, Lot 104453	20000 uL	LCMPFDA_00008	80 uL	13C2 PFDA	0.2 ug/mL
					LCMPFHxA_00009	80 uL	13C2 PFHxA	0.2 ug/mL
..LCMPFDA_00008	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00009	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LC537ICIM_00014	03/01/17	12/20/16	Methanol, Lot 090285	25 mL	LC537-PFBS2_00005	0.5 mL	Perfluorobutanesulfonic acid (PFBS)	45.908 ug/mL
					LC537-PFOA2_00008	0.142 mL	Perfluorooctanoic acid (PFOA)	10.0093 ug/mL
					LC537-PFOS2_00005	0.22 mL	Perfluorooctanesulfonic acid (PFOS)	10.8956 ug/mL
..LC537-PFBS2_00005	03/01/17	02/29/16	Methanol, Lot 090285	10 mL	LC537_PFBS2_00001	0.023 g	Perfluorobutanesulfonic acid (PFBS)	2295.4 ug/mL
...LC537_PFBS2_00001	08/09/17	Santa Cruz Biotechnology, Lot H0112			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	0.998 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_00005	03/01/17	02/29/16	Methanol, Lot 090285	10 mL	LC537_PFOS2_00001	0.0159 g	Perfluorooctanesulfonic acid (PFOS)	1238.13 ug/mL
...LC537_PFOS2_00001	07/26/17	Sigma, Lot BCBF5116V			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.7787 g/g
LC537-IS_00027	03/19/17	12/14/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00003	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL
.LCM2PFOA_00003	03/19/17	Wellington Laboratories, Lot M2PFOA0312			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCMPFOS_00018	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
LC537-L1_00017	06/14/17	12/23/16	MeOH/H2O, Lot 090285	5 mL	LC537-IS_00028	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-MSP_00017	25 uL	Perfluorobutanesulfonic acid (PFBS)	8.976 ng/mL
							Perfluoroheptanoic acid	0.99 ng/mL
							Perfluorohexanesulfonic acid	3.02582 ng/mL
							Perfluorononanoic acid	2.07415 ng/mL
							Perfluorooctanoic acid (PFOA)	1.95189 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.00664 ng/mL
					LC537-SU_00026	250 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LC537-IS_00028	06/19/17	12/19/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00005	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA_00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00018	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-MSP_00017	06/22/17	12/22/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00018	200 uL	Perfluorobutanesulfonic acid (PFBS)	1795.2 ng/mL
							Perfluoroheptanoic acid	198 ng/mL
							Perfluorohexanesulfonic acid	605.164 ng/mL
							Perfluorononanoic acid	414.831 ng/mL
							Perfluorooctanoic acid (PFOA)	390.378 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	801.328 ng/mL
..LC537SPIM_00018	06/22/17	12/22/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHpA_00013	100 uL	Perfluoroheptanoic acid	9.9 ug/mL
					LC537-PFHxS_00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA_00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL
					LC537-PFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL
					LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL
...LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00013	06/22/17	12/22/16	Methanol, Lot 090285	56.8 mL	LC537_PFHpA_00002	0.0568 g	Perfluoroheptanoic acid	990 ug/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g
...LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537_PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g
...LC537-PFNA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFNA_00002	0.007 g	Perfluorononanoic acid	1037.08 ug/mL
....LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
...LC537-PFOA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFOA_00002	0.0127 g	Perfluorooctanoic acid (PFOA)	1951.89 ug/mL
....LC537_PFOA_00002	11/04/18	Fluka, Lot SZBD308XV			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 ug/mL
....LC537_PFOS_00002	08/09/17	Fluka, Lot SZBC222XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-SU_00026	06/14/17	12/16/16	Methanol, Lot 104453	20000 uL	LC537-SU_00025	10000 uL	13C2 PFDA	0.2 ug/mL
							13C2 PFHxA	0.2 ug/mL
..LC537-SU_00025	06/14/17	12/14/16	Methanol, Lot 104453	10000 uL	LCMPFDA_00008	80 uL	13C2 PFDA	0.4 ug/mL
					LCMPFHxA_00009	80 uL	13C2 PFHxA	0.4 ug/mL
...LCMPFDA_00008	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
...LCMPFHxA_00009	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L2_00016	06/14/17	12/23/16	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00014	34 uL	Perfluorobutanesulfonic acid (PFBS)	22.8888 ng/mL
							Perfluoroheptanoic acid	2.5245 ng/mL
							Perfluorohexanesulfonic acid	7.71585 ng/mL
							Perfluorononanoic acid	5.28909 ng/mL
							Perfluorooctanoic acid (PFOA)	4.97733 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	10.2169 ng/mL
					LC537-IS_00028	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00026	250 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00014	06/22/17	12/22/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00018	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL
							Perfluoroheptanoic acid	371.25 ng/mL
							Perfluorohexanesulfonic acid	1134.68 ng/mL
							Perfluorononanoic acid	777.808 ng/mL
							Perfluorooctanoic acid (PFOA)	731.96 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL
..LC537SPIM_00018	06/22/17	12/22/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHpA_00013	100 uL	Perfluoroheptanoic acid	9.9 ug/mL
					LC537-PFHxS_00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA_00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL
					LC537-PFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL
					LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL
...LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00013	06/22/17	12/22/16	Methanol, Lot 090285	56.8 mL	LC537_PFHpA_00002	0.0568 g	Perfluoroheptanoic acid	990 ug/mL
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g
...LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537_PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g
...LC537-PFNA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFNA_00002	0.007 g	Perfluorononanoic acid	1037.08 ug/mL
....LC537_PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
...LC537-PFOA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFOA_00002	0.0127 g	Perfluorooctanoic acid (PFOA)	1951.89 ug/mL
....LC537_PFOA_00002	11/04/18		Fluka, Lot SZBD308XV		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 ug/mL
....LC537_PFOS_00002	08/09/17		Fluka, Lot SZBC222XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00028	06/19/17	12/19/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00005	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00018	08/03/21		Wellington Laboratories, Lot MPFOS0816		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00026	06/14/17	12/16/16	Methanol, Lot 104453	20000 uL	LC537-SU_00025	10000 uL	13C2 PFDA	0.2 ug/mL
							13C2 PFHxA	0.2 ug/mL
..LC537-SU_00025	06/14/17	12/14/16	Methanol, Lot 104453	10000 uL	LCMPFDA_00008	80 uL	13C2 PFDA	0.4 ug/mL
					LCMPFHxA_00009	80 uL	13C2 PFHxA	0.4 ug/mL
...LCMPFDA_00008	08/19/20		Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL
...LCMPFHxA_00009	04/09/20		Wellington Laboratories, Lot MPFHxA0415		(Purchased Reagent)		13C2 PFHxA	50 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-L3_00018	06/14/17	12/23/16	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00014	67 uL	Perfluorobutanesulfonic acid (PFBS)	45.1044 ng/mL
							Perfluoroheptanoic acid	4.97475 ng/mL
							Perfluorohexanesulfonic acid	15.2048 ng/mL
							Perfluorononanoic acid	10.4226 ng/mL
							Perfluorooctanoic acid (PFOA)	9.80826 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	20.1334 ng/mL
					LC537-IS_00028	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00026	250 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00014	06/22/17	12/22/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00018	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL
							Perfluoroheptanoic acid	371.25 ng/mL
							Perfluorohexanesulfonic acid	1134.68 ng/mL
							Perfluorononanoic acid	777.808 ng/mL
							Perfluorooctanoic acid (PFOA)	731.96 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL
..LC537SPIM_00018	06/22/17	12/22/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHpA_00013	100 uL	Perfluoroheptanoic acid	9.9 ug/mL
					LC537-PFHxS_00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA_00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL
					LC537-PFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL
					LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL
...LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00013	06/22/17	12/22/16	Methanol, Lot 090285	56.8 mL	LC537_PFHpA_00002	0.0568 g	Perfluoroheptanoic acid	990 ug/mL
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g
...LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537_PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g
...LC537-PFNA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFNA_00002	0.007 g	Perfluorononanoic acid	1037.08 ug/mL
....LC537_PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
...LC537-PFOA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFOA_00002	0.0127 g	Perfluorooctanoic acid (PFOA)	1951.89 ug/mL
....LC537_PFOA_00002	11/04/18		Fluka, Lot SZBD308XV		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 ug/mL
....LC537_PFOS_00002	08/09/17		Fluka, Lot SZBC222XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00028	06/19/17	12/19/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00005	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00018	08/03/21		Wellington Laboratories, Lot MPFOS0816		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00026	06/14/17	12/16/16	Methanol, Lot 104453	20000 uL	LC537-SU_00025	10000 uL	13C2 PFDA	0.2 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2 PFHxA	0.2 ug/mL
..LC537-SU_00025	06/14/17	12/14/16	Methanol, Lot 104453	10000 uL	LCMPFDA_00008	80 uL	13C2 PFDA	0.4 ug/mL
					LCMPFHxA_00009	80 uL	13C2 PFHxA	0.4 ug/mL
...LCMPFDA_00008	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
...LCMPFHxA_00009	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L4_00017	06/14/17	12/23/16	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00014	135 uL	Perfluorobutanesulfonic acid (PFBS)	90.882 ng/mL
							Perfluoroheptanoic acid	10.0238 ng/mL
							Perfluorohexanesulfonic acid	30.6364 ng/mL
							Perfluorononanoic acid	21.0008 ng/mL
							Perfluorooctanoic acid (PFOA)	19.7629 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	40.5672 ng/mL
					LC537-IS_00028	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00026	250 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00014	06/22/17	12/22/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00018	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL
							Perfluoroheptanoic acid	371.25 ng/mL
							Perfluorohexanesulfonic acid	1134.68 ng/mL
							Perfluorononanoic acid	777.808 ng/mL
							Perfluorooctanoic acid (PFOA)	731.96 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL
..LC537SPIM_00018	06/22/17	12/22/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHpA_00013	100 uL	Perfluoroheptanoic acid	9.9 ug/mL
					LC537-PFHxS_00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA_00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL
					LC537-PFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL
					LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL
...LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00013	06/22/17	12/22/16	Methanol, Lot 090285	56.8 mL	LC537_PFHpA_00002	0.0568 g	Perfluoroheptanoic acid	990 ug/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g
...LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537_PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g
...LC537-PFNA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFNA_00002	0.007 g	Perfluorononanoic acid	1037.08 ug/mL
....LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
...LC537-PFOA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFOA_00002	0.0127 g	Perfluorooctanoic acid (PFOA)	1951.89 ug/mL
....LC537_PFOA_00002	11/04/18	Fluka, Lot SZBD308XV			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 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.: 320-24637-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LC537-IS_00028	06/19/17	12/19/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00005	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA_00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00018	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00026	06/14/17	12/16/16	Methanol, Lot 104453	20000 uL	LC537-SU_00025	10000 uL	13C2 PFDA	0.2 ug/mL
							13C2 PFHxA	0.2 ug/mL
..LC537-SU_00025	06/14/17	12/14/16	Methanol, Lot 104453	10000 uL	LCMPFDA_00008	80 uL	13C2 PFDA	0.4 ug/mL
					LCMPFHxA_00009	80 uL	13C2 PFHxA	0.4 ug/mL
...LCMPFDA_00008	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
...LCMPFHxA_00009	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L5_00019	06/14/17	12/23/16	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00014	200 uL	Perfluorobutanesulfonic acid (PFBS)	134.64 ng/mL
							Perfluoroheptanoic acid	14.85 ng/mL
							Perfluorohexanesulfonic acid	45.3873 ng/mL
							Perfluorononanoic acid	31.1123 ng/mL
							Perfluorooctanoic acid (PFOA)	29.2784 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	60.0996 ng/mL
					LC537-IS_00028	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00026	250 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00014	06/22/17	12/22/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00018	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL
							Perfluoroheptanoic acid	371.25 ng/mL
							Perfluorohexanesulfonic acid	1134.68 ng/mL
							Perfluorononanoic acid	777.808 ng/mL
							Perfluorooctanoic acid (PFOA)	731.96 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL
..LC537SPIM_00018	06/22/17	12/22/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHpA_00013	100 uL	Perfluoroheptanoic acid	9.9 ug/mL
					LC537-PFHxS_00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA_00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL
					LC537-PFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL
					LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL
...LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00013	06/22/17	12/22/16	Methanol, Lot 090285	56.8 mL	LC537_PFHpA_00002	0.0568 g	Perfluoroheptanoic acid	990 ug/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g
...LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537_PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g
...LC537-PFNA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFNA_00002	0.007 g	Perfluorononanoic acid	1037.08 ug/mL
....LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC537-PFOA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFOA_00002	0.0127 g	Perfluorooctanoic acid (PFOA)	1951.89 ug/mL
....LC537_PFOA_00002	11/04/18		Fluka, Lot SZBD308XV		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 ug/mL
....LC537_PFOS_00002	08/09/17		Fluka, Lot SZBC222XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00028	06/19/17	12/19/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00005	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00018	08/03/21		Wellington Laboratories, Lot MPFOS0816		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00026	06/14/17	12/16/16	Methanol, Lot 104453	20000 uL	LC537-SU_00025	10000 uL	13C2 PFDA	0.2 ug/mL
							13C2 PFHxA	0.2 ug/mL
..LC537-SU_00025	06/14/17	12/14/16	Methanol, Lot 104453	10000 uL	LCMPFDA_00008	80 uL	13C2 PFDA	0.4 ug/mL
					LCMPFHxA_00009	80 uL	13C2 PFHxA	0.4 ug/mL
...LCMPFDA_00008	08/19/20		Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL
...LCMPFHxA_00009	04/09/20		Wellington Laboratories, Lot MPFHxA0415		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L6_00016	06/14/17	12/23/16	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00014	265 uL	Perfluorobutanesulfonic acid (PFBS)	178.398 ng/mL
							Perfluoroheptanoic acid	19.6763 ng/mL
							Perfluorohexanesulfonic acid	60.1382 ng/mL
							Perfluorononanoic acid	41.2238 ng/mL
							Perfluorooctanoic acid (PFOA)	38.7939 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	79.632 ng/mL
					LC537-IS_00028	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00026	250 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00014	06/22/17	12/22/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00018	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL
							Perfluoroheptanoic acid	371.25 ng/mL
							Perfluorohexanesulfonic acid	1134.68 ng/mL
							Perfluorononanoic acid	777.808 ng/mL
							Perfluorooctanoic acid (PFOA)	731.96 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL
..LC537SPIM_00018	06/22/17	12/22/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHpA_00013	100 uL	Perfluoroheptanoic acid	9.9 ug/mL
					LC537-PFHxS_00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA_00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL
					LC537-PFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL
					LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL
...LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00013	06/22/17	12/22/16	Methanol, Lot 090285	56.8 mL	LC537_PFHpA_00002	0.0568 g	Perfluoroheptanoic acid	990 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

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	0.99 g/g
...LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537_PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g
...LC537-PFNA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFNA_00002	0.007 g	Perfluorononanoic acid	1037.08 ug/mL
....LC537_PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
...LC537-PFOA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFOA_00002	0.0127 g	Perfluorooctanoic acid (PFOA)	1951.89 ug/mL
....LC537_PFOA_00002	11/04/18		Fluka, Lot SZBD308XV		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 ug/mL
....LC537_PFOS_00002	08/09/17		Fluka, Lot SZBC222XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00028	06/19/17	12/19/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00005	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00018	08/03/21		Wellington Laboratories, Lot MPFOS0816		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00026	06/14/17	12/16/16	Methanol, Lot 104453	20000 uL	LC537-SU_00025	10000 uL	13C2 PFDA	0.2 ug/mL
							13C2 PFHxA	0.2 ug/mL
..LC537-SU_00025	06/14/17	12/14/16	Methanol, Lot 104453	10000 uL	LCMPFDA_00008	80 uL	13C2 PFDA	0.4 ug/mL
					LCMPFHxA_00009	80 uL	13C2 PFHxA	0.4 ug/mL
...LCMPFDA_00008	08/19/20		Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL
...LCMPFHxA_00009	04/09/20		Wellington Laboratories, Lot MPFHxA0415		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-MSP_00016	05/21/17	12/16/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00017	200 uL	Perfluorobutane Sulfonate	1795.2 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	1795.2 ng/mL
							Perfluoroheptanoic acid	205.615 ng/mL
							Perfluorohexanesulfonic acid	605.164 ng/mL
							Perfluorononanoic acid	414.831 ng/mL
							Perfluorooctanoic acid (PFOA)	390.378 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	801.328 ng/mL
.LC537SPIM_00017	05/21/17	11/21/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutane Sulfonate	89.76 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHpA_00012	100 uL	Perfluoroheptanoic acid	10.2808 ug/mL
					LC537-PFHxS_00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA_00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL
					LC537-PFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL
					LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL
..LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutane Sulfonate	2040 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	2040 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_00012	11/04/17	11/18/16	Methanol, Lot 090285	13 mL	LC537_PFHpA_00002	0.0135 g	Perfluoroheptanoic acid	1028.08 ug/mL
...LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g
..LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537_PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g
..LC537-PFNA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFNA_00002	0.007 g	Perfluorononanoic acid	1037.08 ug/mL
...LC537_PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
..LC537-PFOA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFOA_00002	0.0127 g	Perfluorooctanoic acid (PFOA)	1951.89 ug/mL
...LC537_PFOA_00002	11/04/18		Fluka, Lot SZBD308XV		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
..LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 ug/mL
...LC537_PFOS_00002	08/09/17		Fluka, Lot SZBC222XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
LC537-SU_00027	06/19/17	12/19/16	Methanol, Lot 104453	20000 uL	LCMPFDA_00008	80 uL	13C2 PFDA	0.2 ug/mL
					LCMPFHxA_00009	80 uL	13C2 PFHxA	0.2 ug/mL
.LCMPFDA_00008	08/19/20		Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFHxA_00009	04/09/20		Wellington Laboratories, Lot MPFHxA0415		(Purchased Reagent)		13C2 PFHxA	50 ug/mL

Reagent

LC537_PFBS_00002

C: 4/1/15 SPV

SIGMA-ALDRICH®

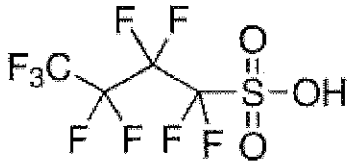
sigma-aldrich.com

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_PFHxS_00002

Y: 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

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

Purity = 90.94 % w/m.w correction

SKV 4/1/15

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_PFOA_00002

R: 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

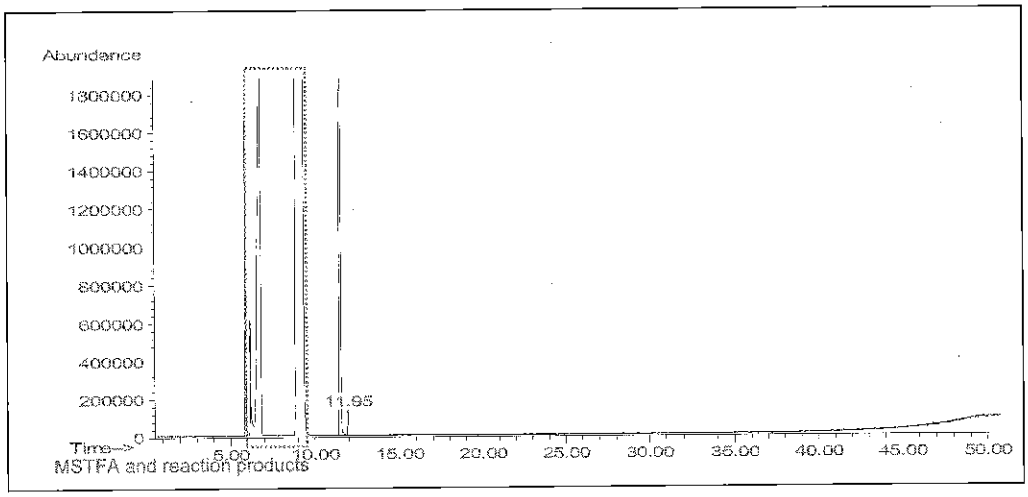
GC/MS-Method

Analytical Department

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

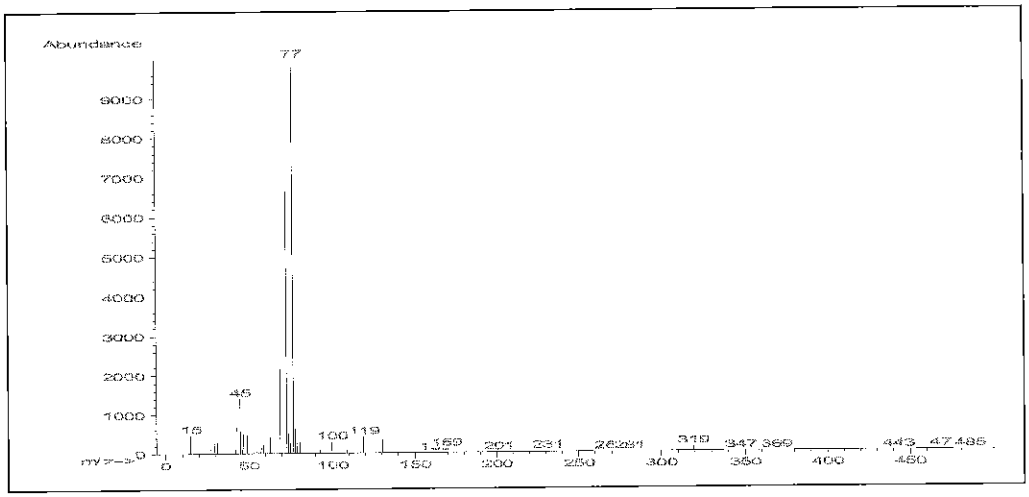
Column:	XTI-5 (Restek); 30 m; fs cap.; I.D.:0.25 mm; 1 µm df
Injector:	Split mode
Injection:	approx. 1 µl of reaction mixture with MSTFA (approx. 10 mg + 200 µl MSTFA)
Inj.-temp.:	280°C
Oven-temp.:	40°C (for 2 min) to 320°C (6°C/min) hold for 2 min
Split:	1:100
Flow:	1 ml He/min (Constant flow mode)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

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 = 91.66 %

3. Advice and Remarks

- The minimum shelf life is based on the current knowledge and holds only for proper storage conditions in the originally closed flasks/ packages.
- Whenever the container is opened for removal of 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

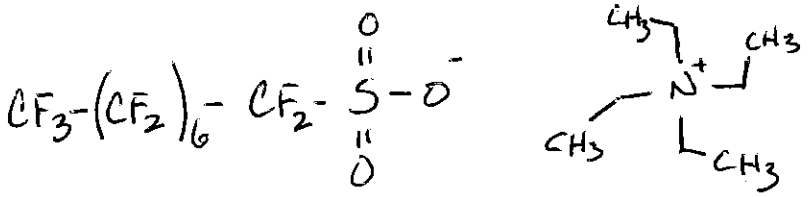
QC RELEASE DATE 13/APR/11

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.

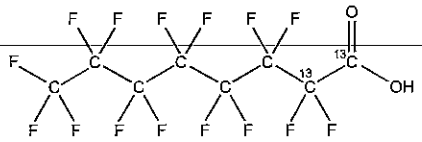
Reagent

LCM2PFOA_00003

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2PFOA	**LOT NUMBER:**	M2PFOA0312
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)	03/19/2012		
EXPIRY DATE: (mm/dd/yyyy)	03/19/2017		
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:** 01/09/2013 (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 $x_1, x_2, \ldots x_n$ 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 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:

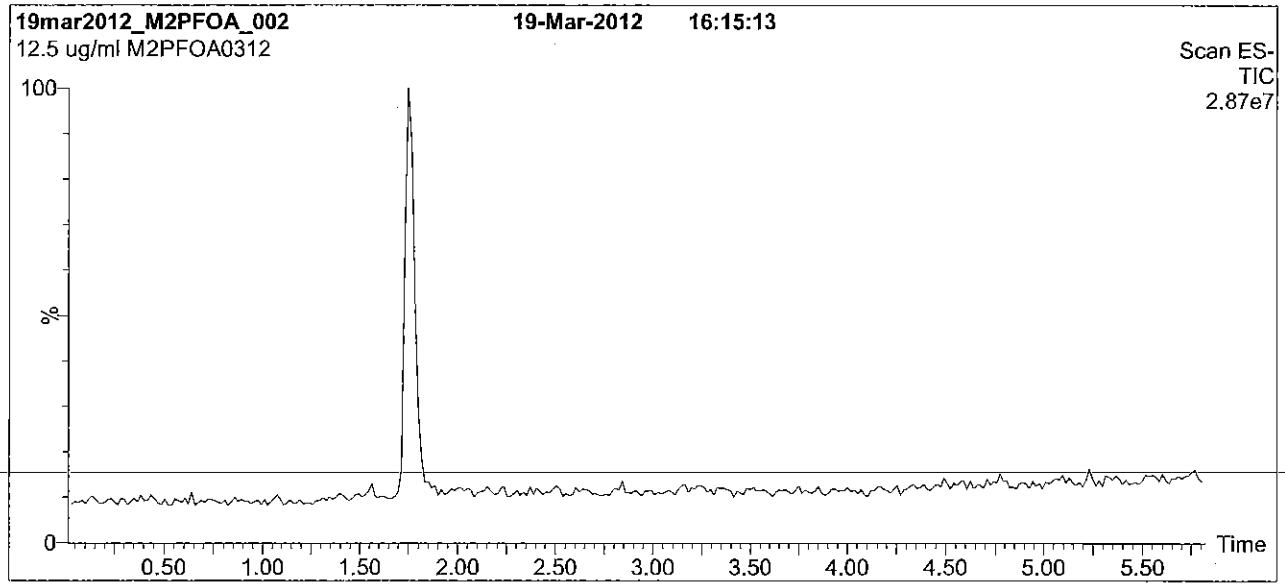
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

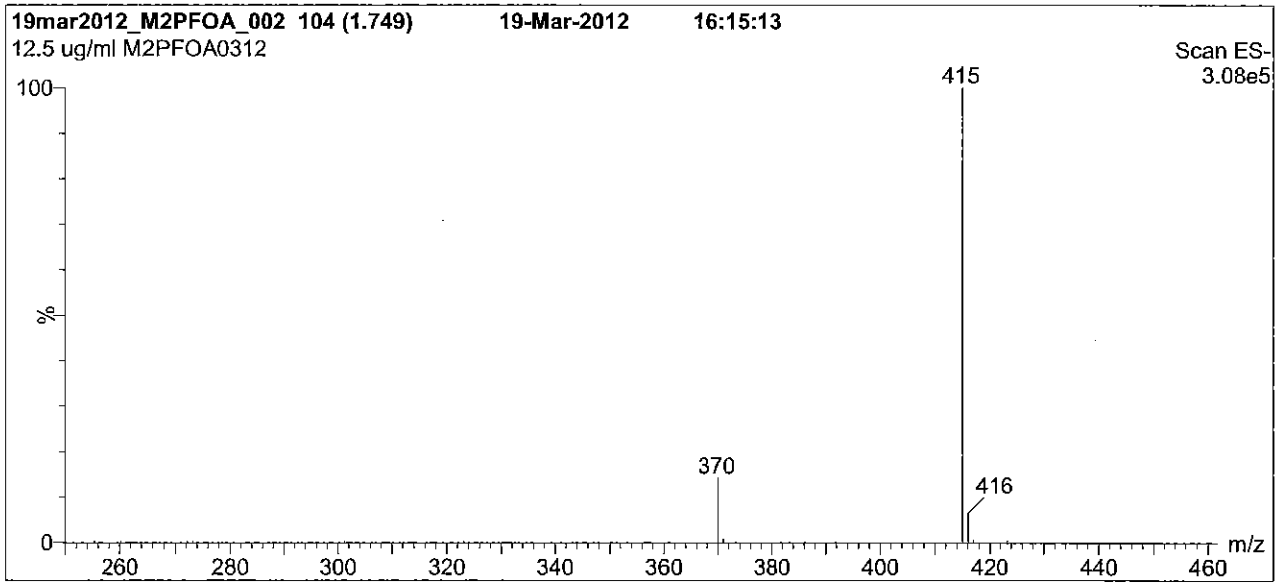
CALA Testing Accreditation No.: A1226

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: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 6.5 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

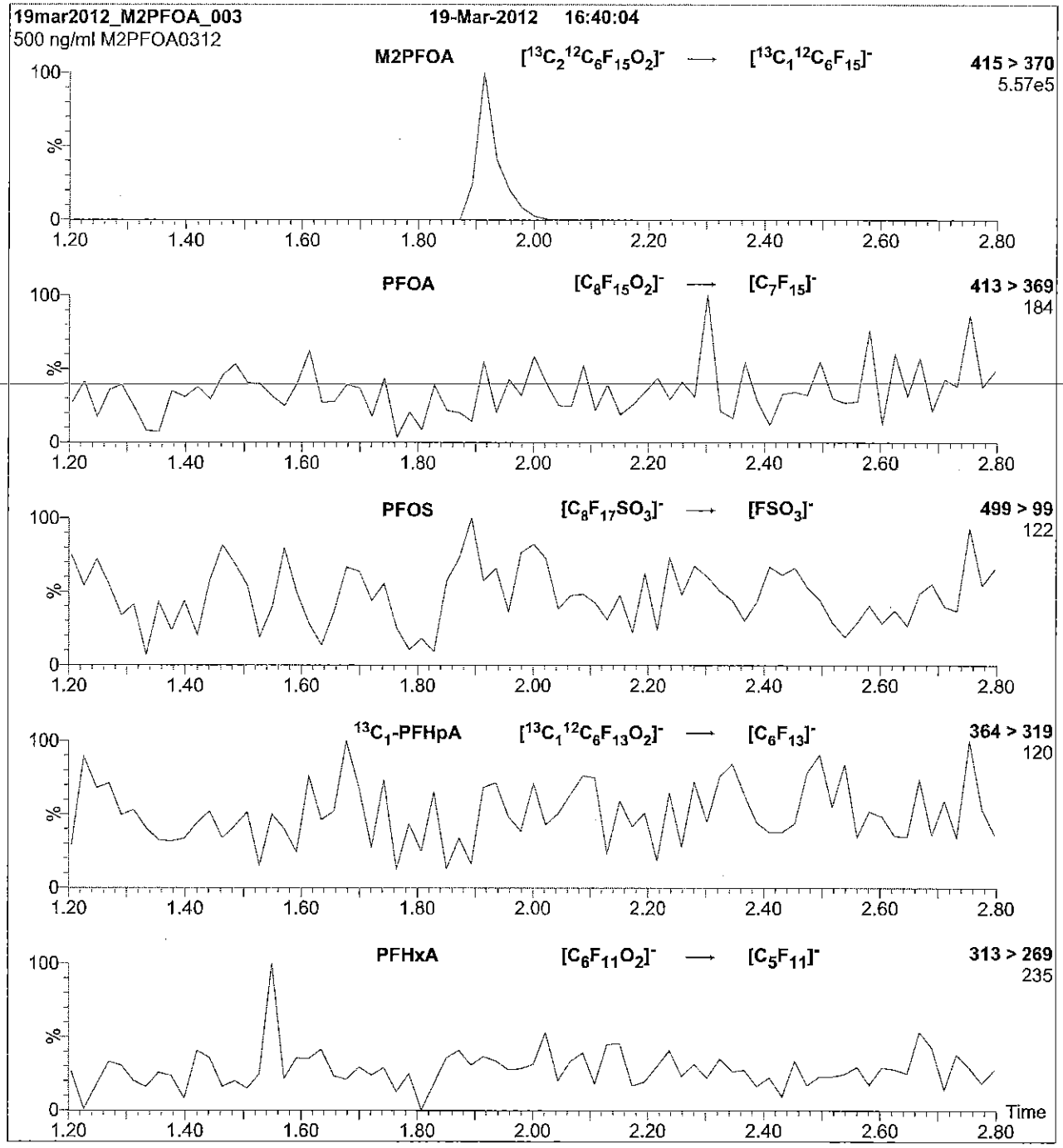
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 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 70% (80:20 MeOH:ACN) / 30% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 11

Reagent

LCM2PFOA_00005

Rec'd. 2/10/15 SV

WELLINGTON LABORATORIES

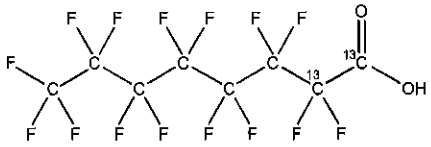
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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:

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The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2,...x_n$ 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.

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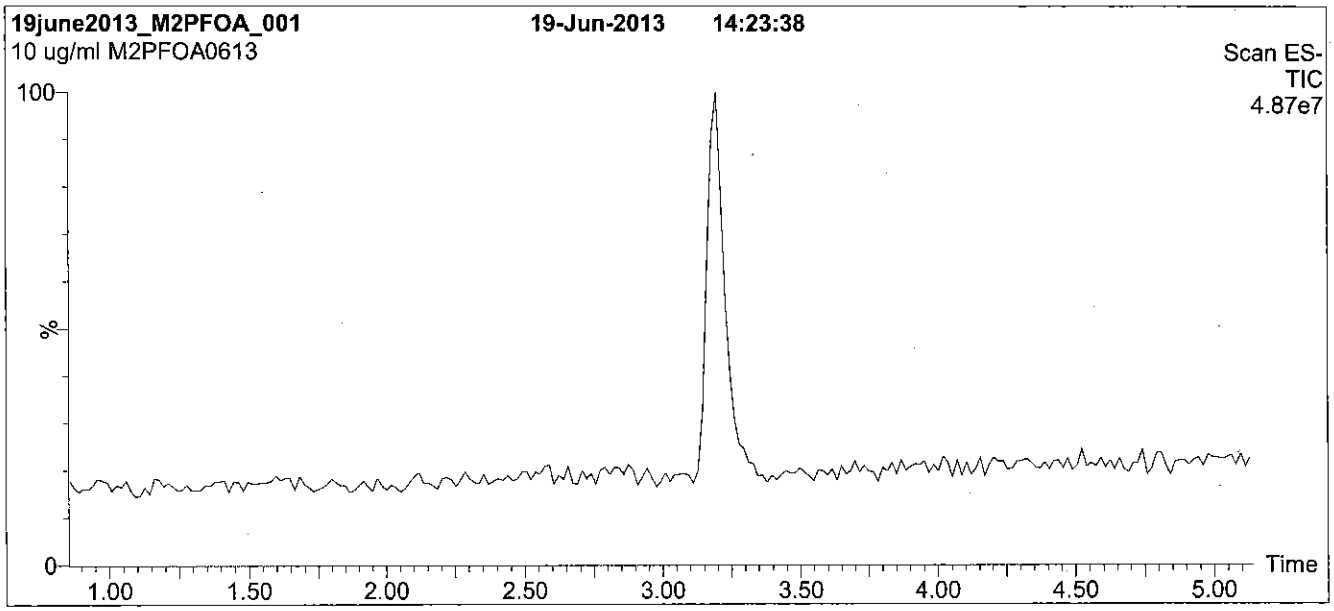
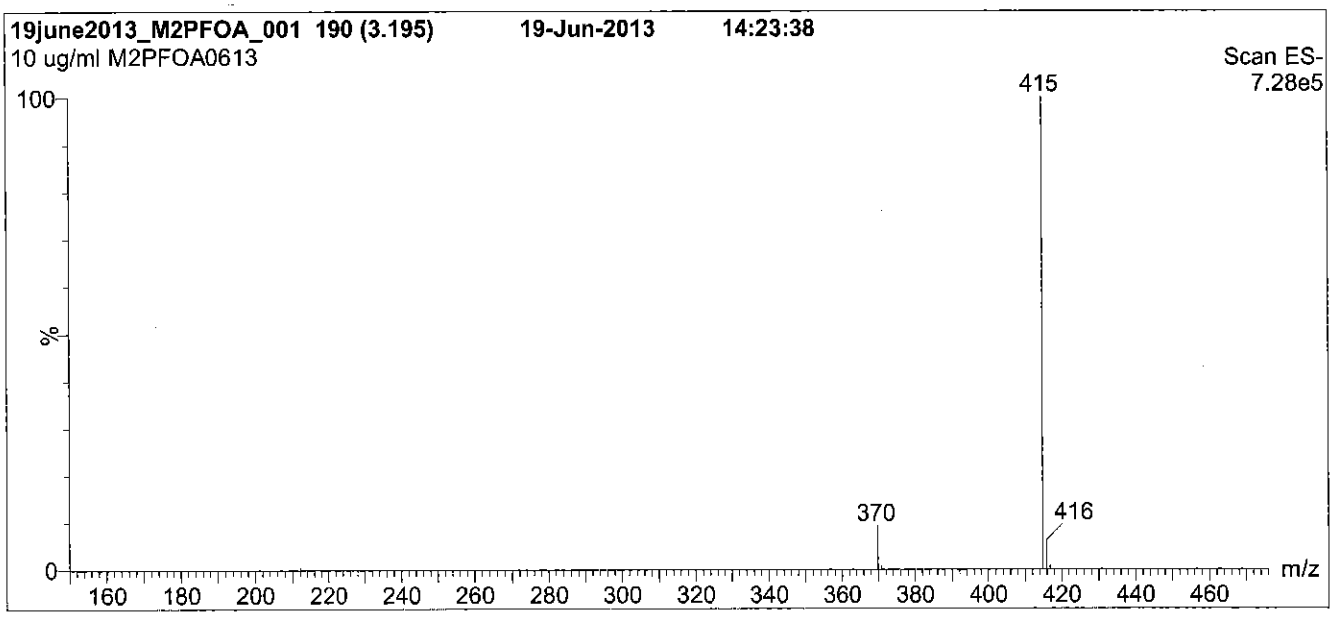
CALA Testing Accreditation No. A1226

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

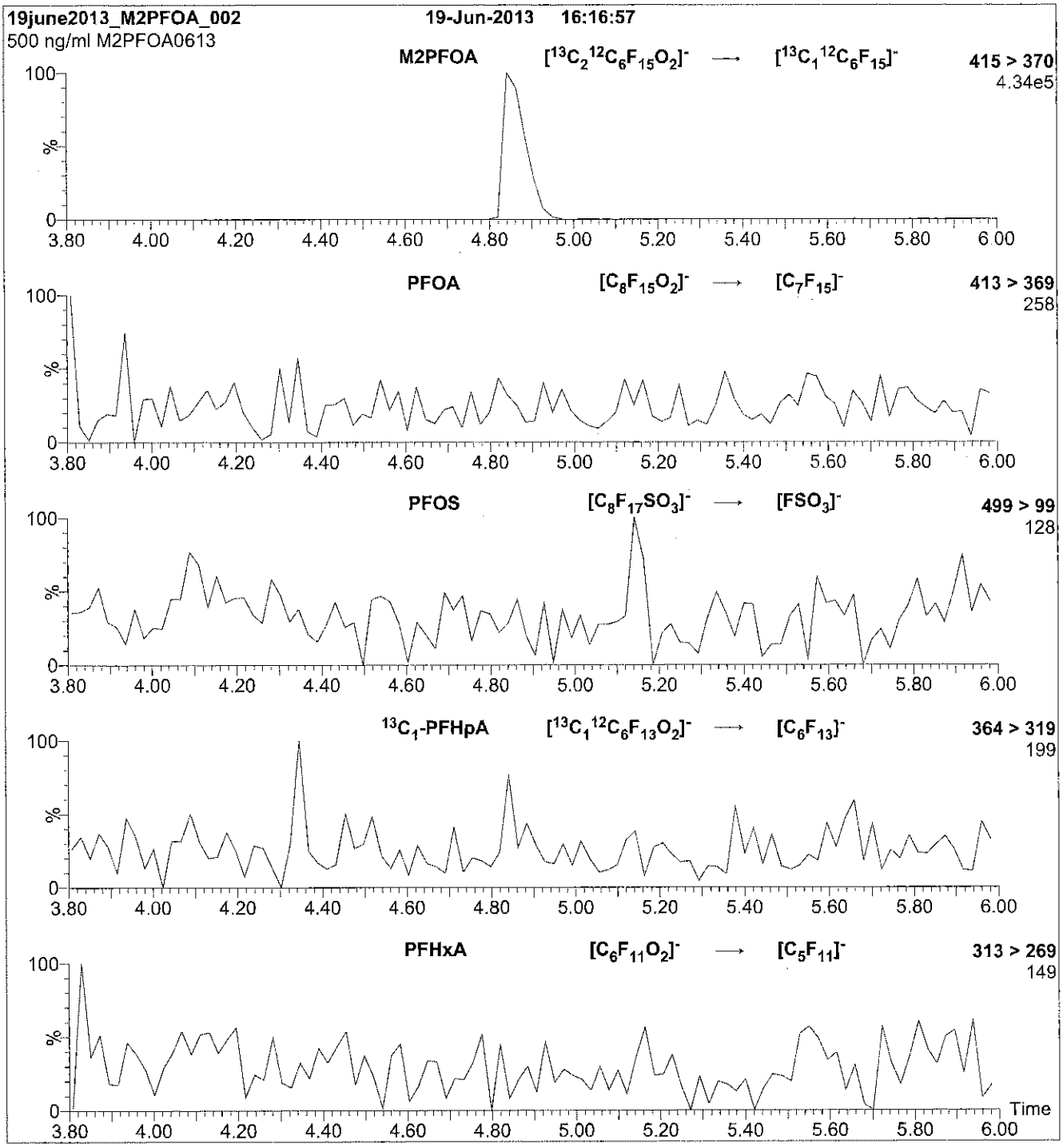
Flow: 300 µl/min

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

LCMPFDA_00008

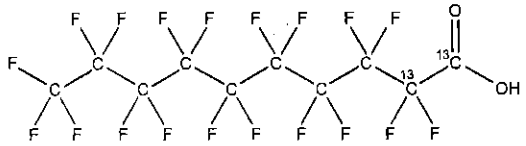
605243
ID: LCMPFDA_00008
Exp: 08/19/20 Prpd: CBW
13C2-Perfluorodecanoic a

Rec. 3/29/16 JRB ✓

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFDA	**LOT NUMBER:**	MPFDA0815
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)	08/19/2015		
EXPIRY DATE: (mm/dd/yyyy)	08/19/2020		
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:** 08/21/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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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.

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CALA Testing

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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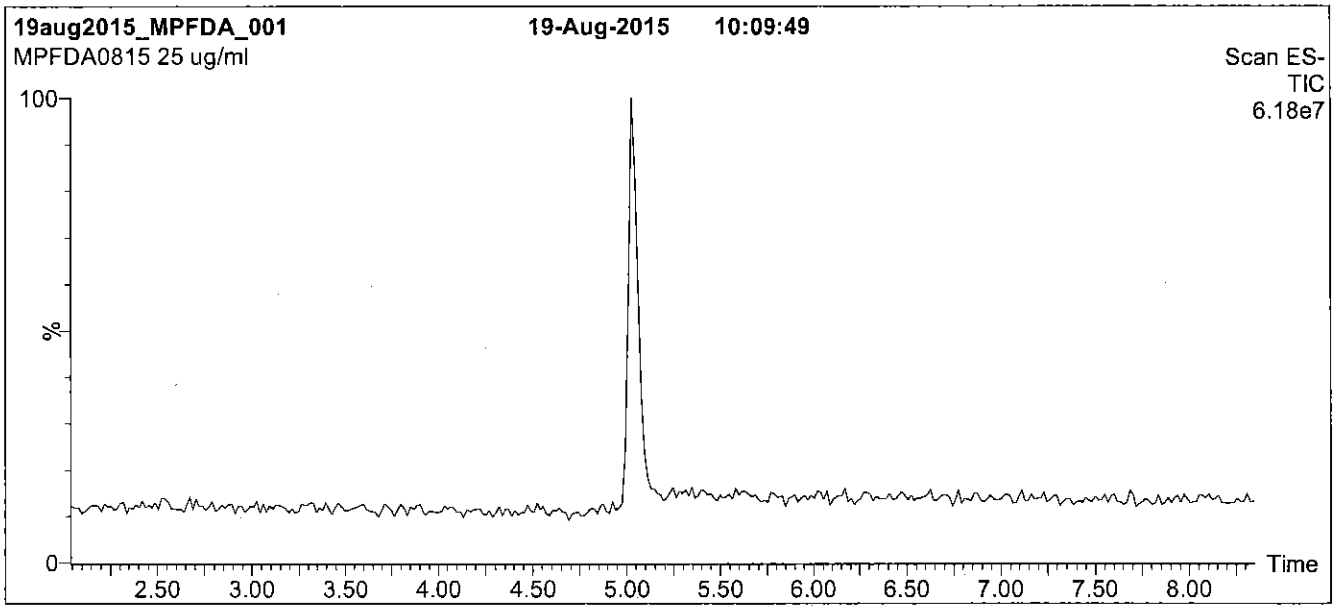
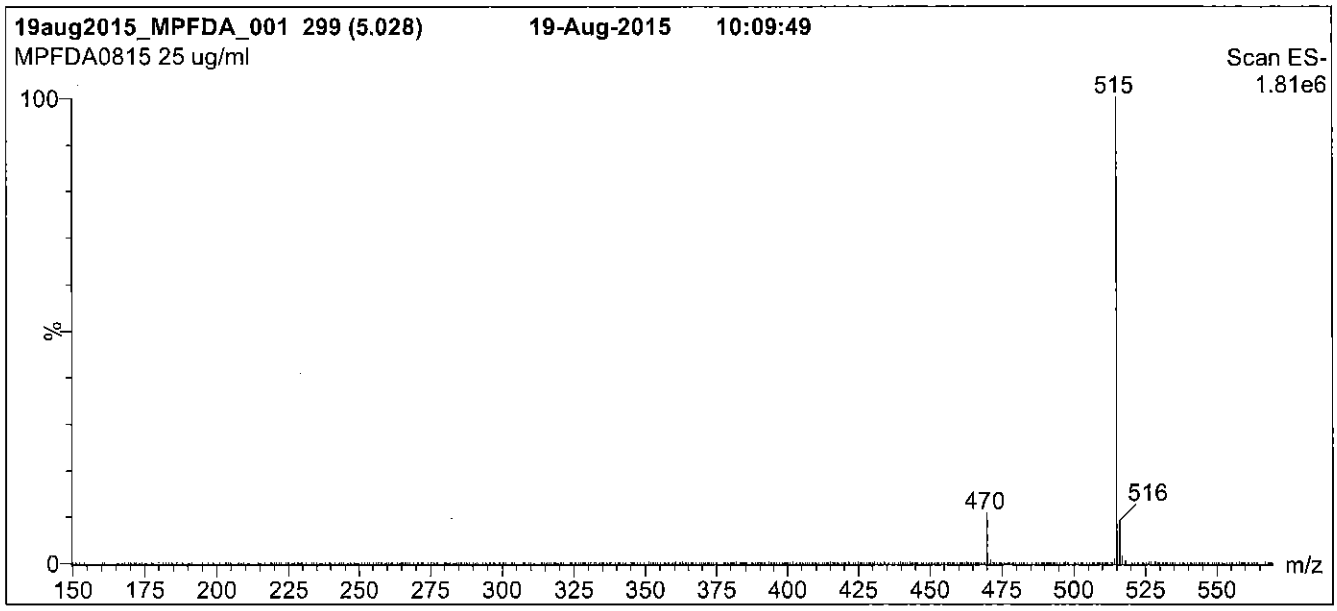
Figure 1: **MPFDA; LC/MS Data (TIC and Mass Spectrum)**





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 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

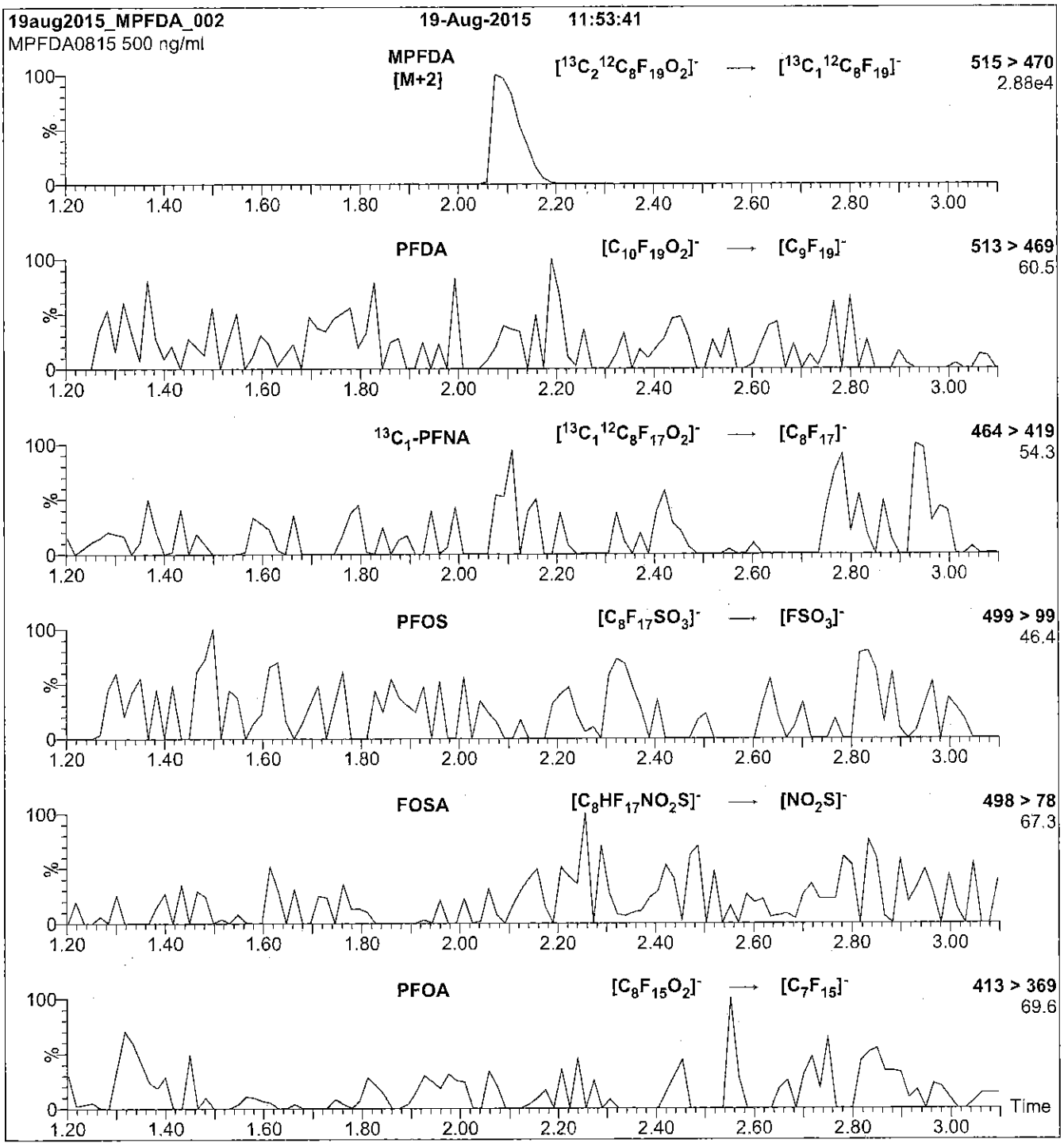
Flow: 300 µl/min

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) = 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) = 3.35e-3
Collision Energy (eV) = 13

Reagent

LCMPFHxA_00009

Rec. 3/29/16 JRB ✓

WELLINGTON LABORATORIES

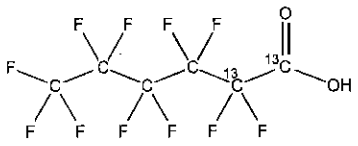
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFHxA0415

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)	04/09/2015		
EXPIRY DATE: (mm/dd/yyyy)	04/09/2020		
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:** 04/14/2015 (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.

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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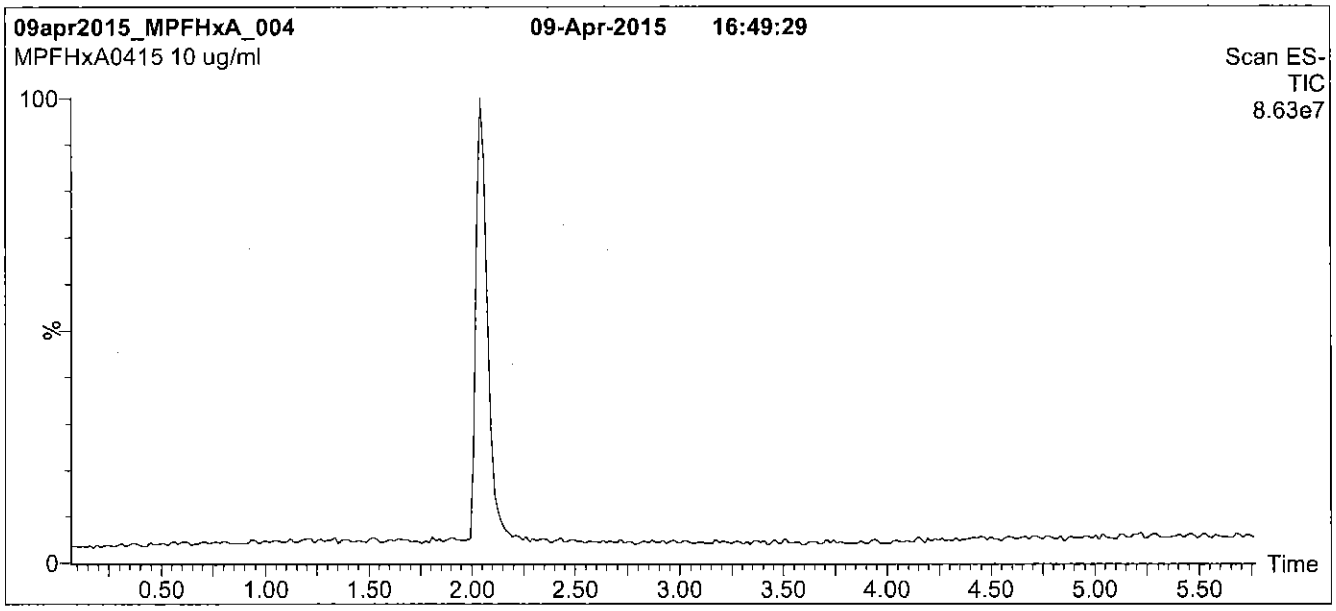
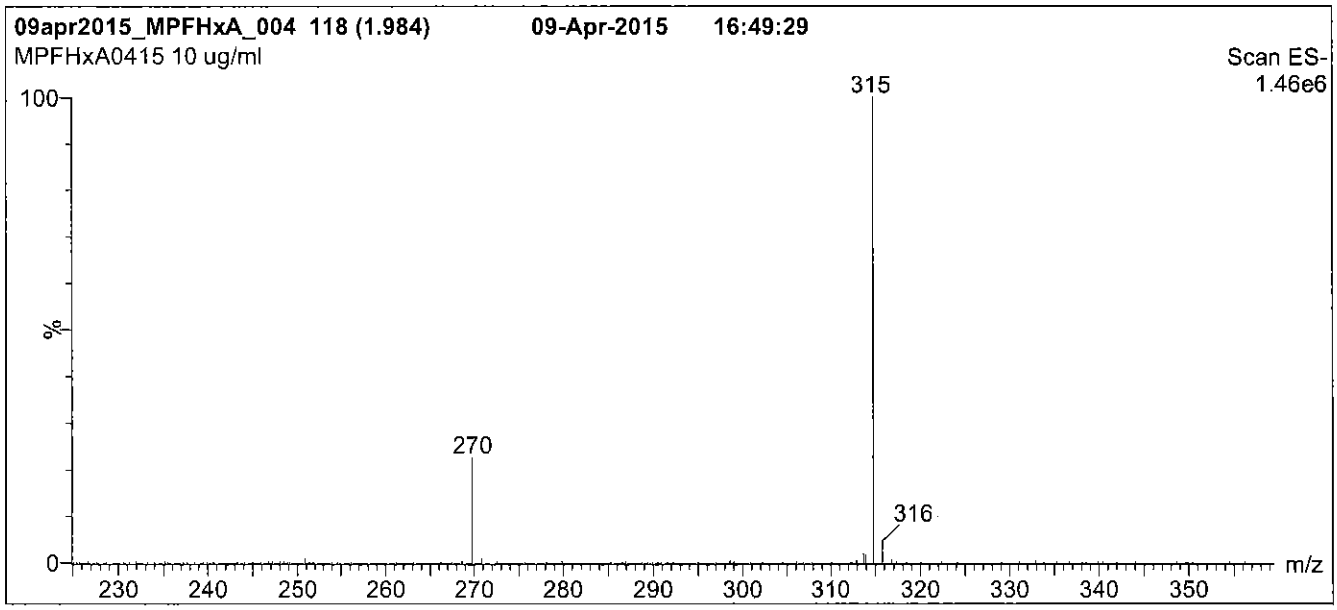
Figure 1: **MPFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{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 2 min
before returning to initial conditions over 0.5 min.
Time: 10 min

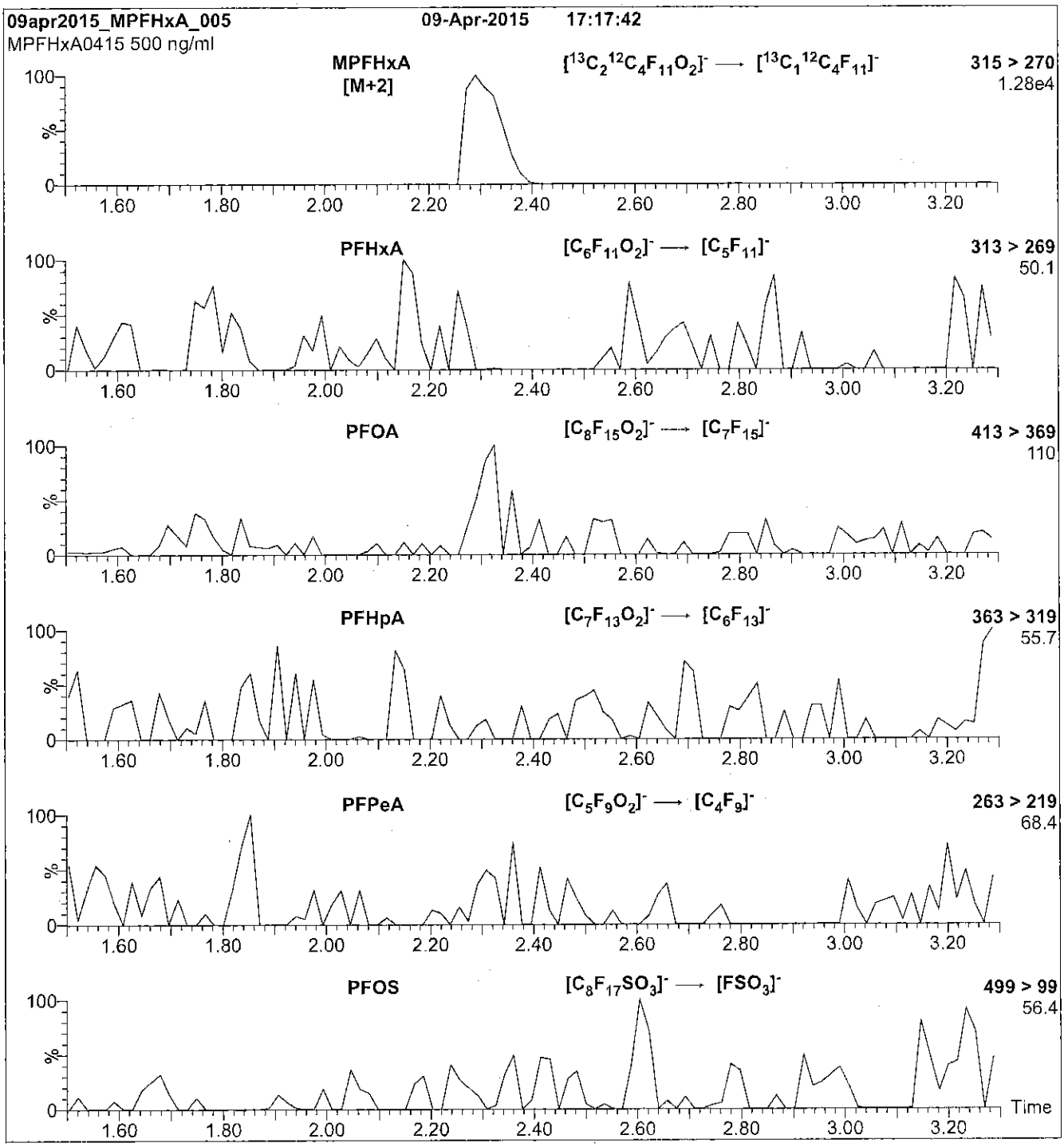
Flow: 300 µl/min

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) = 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) = 3.20e-3
Collision Energy (eV) = 10

Reagent

LCMPFOS_00018

R: SBC 9/22/16

738686
ID: LCMPFOS_00018
Exp: 08/03/21 Rpd: SBC
13C4-Perfluorooctanesulfo

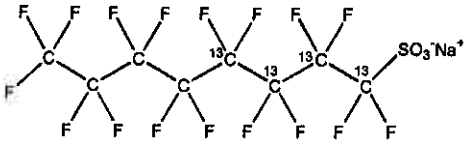
WELLINGTON LABORATORIES

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 ($1,2,3,4\text{-}^{13}C_4$)
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

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CALA

ANAB ACCREDITED

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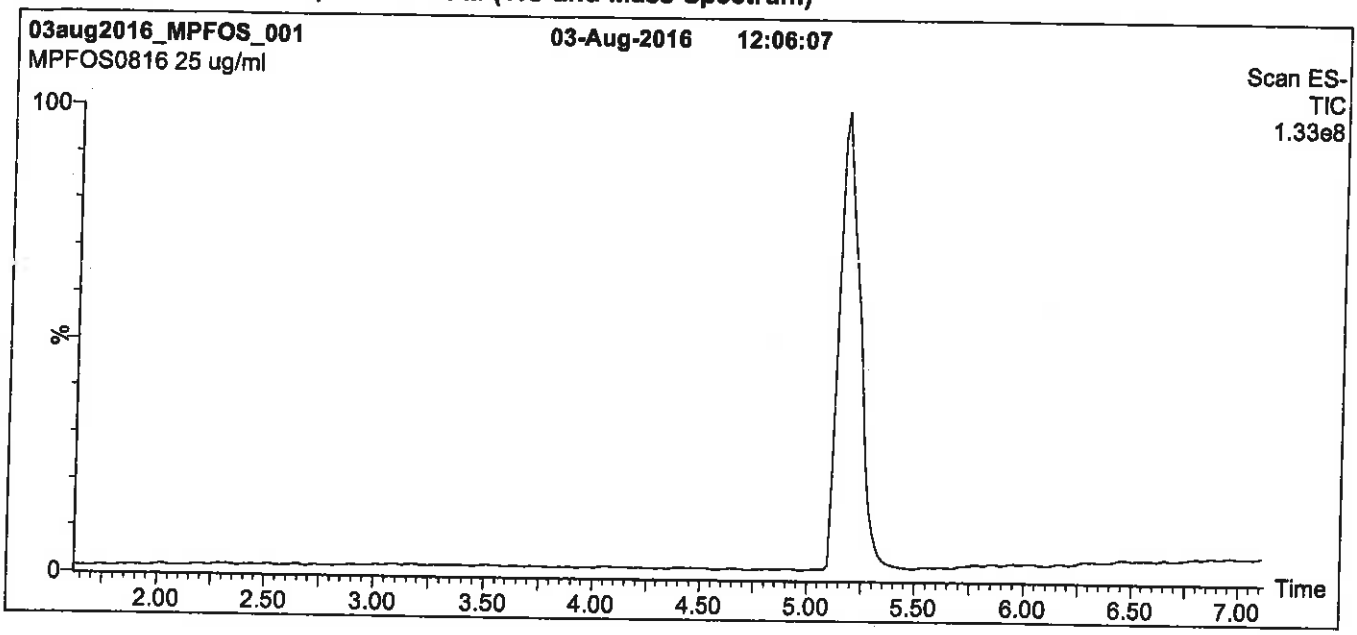

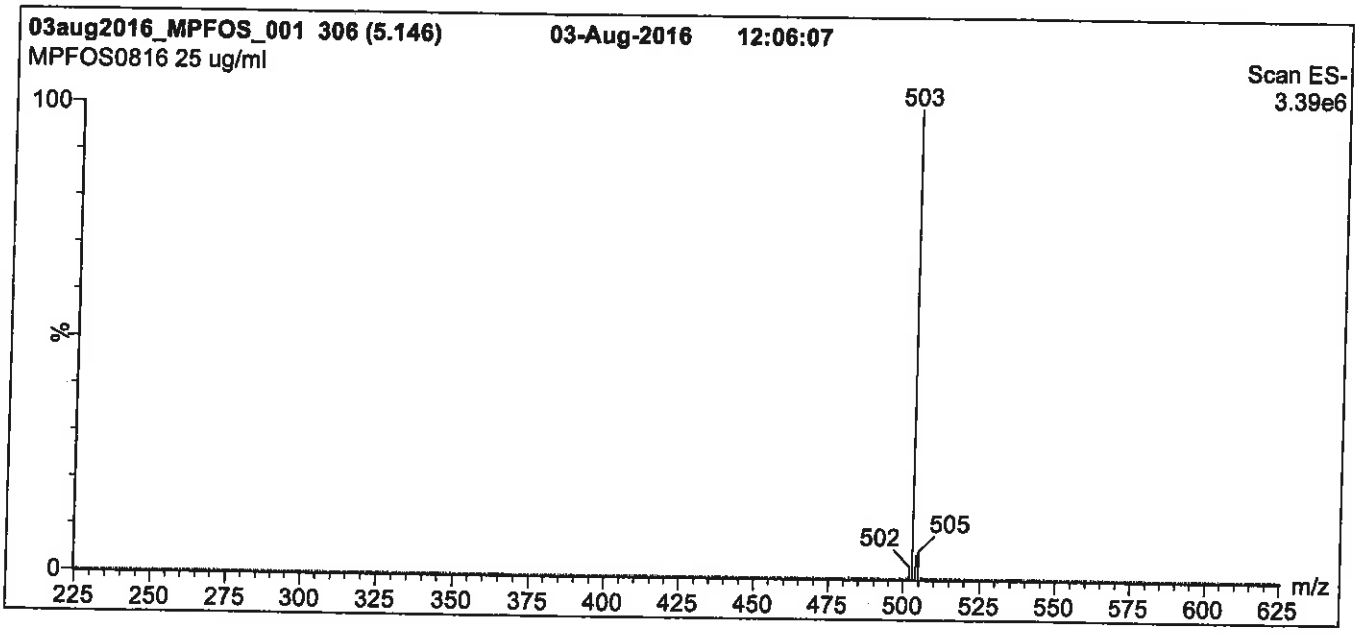

Conditions for Figure 1:

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

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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

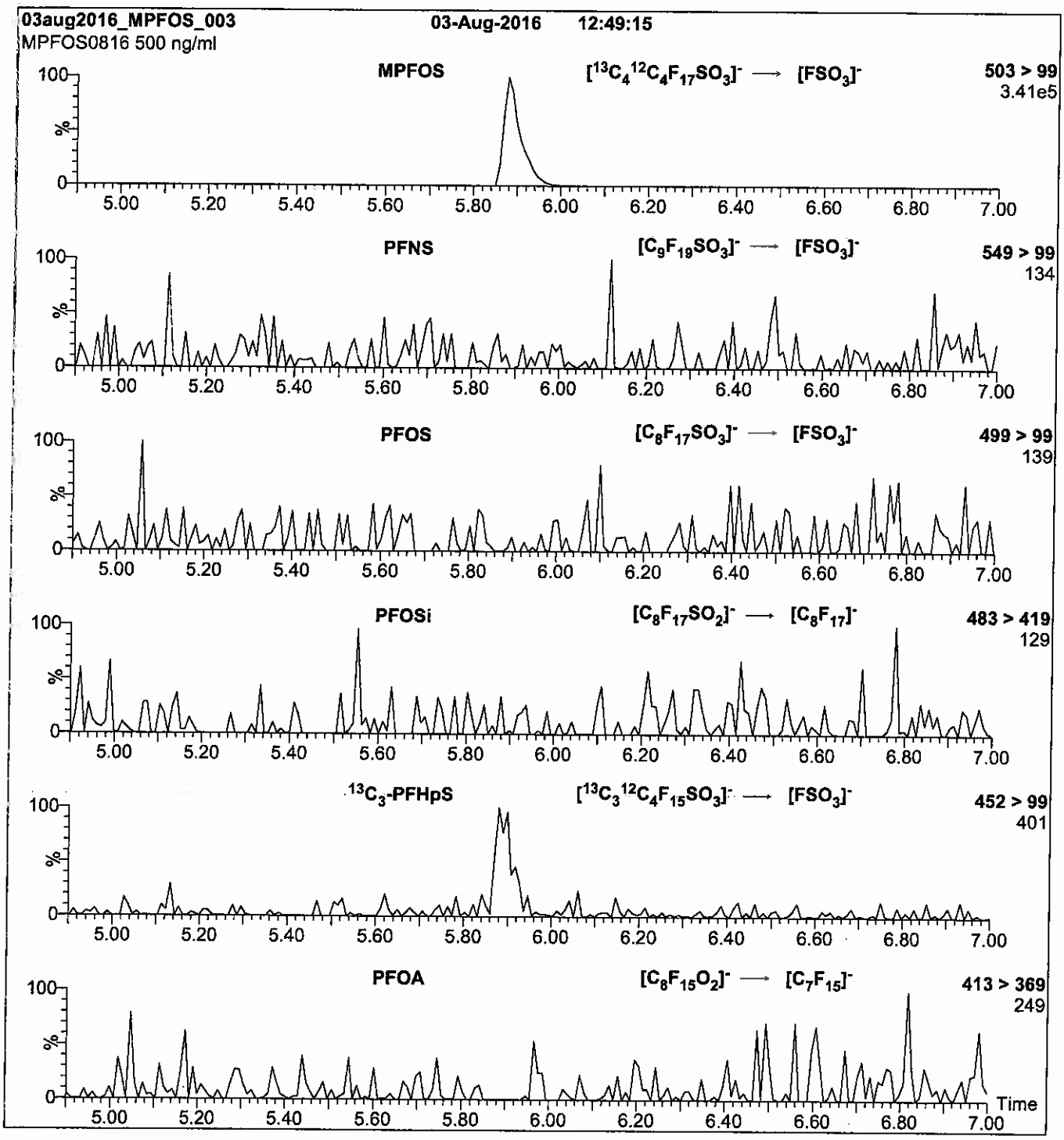
Flow: 300 µl/min

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.: 320-24637-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WI-AF-3RW36-1216	320-24637-1	109	103
WI-AF-3FB36-1216	320-24637-2	112	106
WI-AF-3RW37-1216	320-24637-3	105	114
WI-AF-3FB37-1216	320-24637-4	104	110
	MB 320-143781/1-A	100	102
	LCS 320-143781/2-A	102	103
	LCSD 320-143781/3-A	103	108

	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.: 320-24637-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 02JAN2017A6A_025.d

Lab ID: LCS 320-143781/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	0.160	0.129	80	70-130	
Perfluorooctanoic acid (PFOA)	0.0781	0.0750	96	70-130	
Perfluorobutanesulfonic acid (PFBS)	0.359	0.302	84	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.: 320-24637-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 02JAN2017A6A_026.d

Lab ID: LCSD 320-143781/3-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	0.160	0.136	85	6	30	70-130	
Perfluorooctanoic acid (PFOA)	0.0781	0.0761	97	1	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	0.359	0.311	87	3	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.: 320-24637-1

SDG No.:

Lab File ID: 02JAN2017A6A_024.d Lab Sample ID: MB 320-143781/1-A

Matrix: Water Date Extracted: 12/23/2016 18:13

Instrument ID: A6 Date Analyzed: 01/02/2017 21:47

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-143781/2-A	02JAN2017A6A_025.d	01/02/2017 22:16
	LCSD 320-143781/3-A	02JAN2017A6A_026.d	01/02/2017 22:46
WI-AF-3RW36-1216	320-24637-1	02JAN2017A6A_037.d	01/03/2017 04:11
WI-AF-3FB36-1216	320-24637-2	02JAN2017A6A_038.d	01/03/2017 04:41
WI-AF-3RW37-1216	320-24637-3	02JAN2017A6A_041.d	01/03/2017 06:10
WI-AF-3FB37-1216	320-24637-4	02JAN2017A6A_042.d	01/03/2017 06:39

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Instrument ID: A6 Calibration Start Date: 12/24/2016 04:26

GC Column: Acquity ID: 2.1(mm) Calibration End Date: 12/24/2016 06:54

Calibration ID: 27291

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		587721	20.01	1475089	20.62		
UPPER LIMIT		881582	20.51	2212634	21.12		
LOWER LIMIT		293861	19.51	737545	20.12		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCV 320-143828/11 CCVL		652887	20.01	1599599	20.62		
ICV 320-143828/13		590506	20.01	1587807	20.62		
CCV 320-144608/2 CCVL		608470	19.99	1539571	20.61		
CCV 320-144610/15 CCVIS		558059	19.99	1349410	20.61		
MB 320-143781/1-A		544185	20.00	1654409	20.61		
LCS 320-143781/2-A		532727	19.99	1588550	20.61		
LCSD 320-143781/3-A		536451	19.99	1525895	20.60		
CCV 320-144610/27 CCVIS		533787	19.99	1460847	20.60		
CCV 320-144612/27 CCVIS		533787	19.99	1460847	20.60		
320-24637-1	WI-AF-3RW36-1216	479378	19.93	1668991	20.54		
320-24637-2	WI-AF-3FB36-1216	495702	19.93	1691746	20.55		
CCV 320-144612/39 CCVIS		499397	19.95	1357134	20.55		
CCV 320-144614/39 CCVIS		499397	19.95	1357134	20.55		
320-24637-3	WI-AF-3RW37-1216	464629	19.95	1669024	20.55		
320-24637-4	WI-AF-3FB37-1216	515153	19.96	1598713	20.57		
CCV 320-144614/51 CCVIS		543781	19.96	1492186	20.57		

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.: 320-24637-1

SDG No.:

Sample No.: CCV 320-144610/15 Date Analyzed: 01/02/2017 17:20

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm)

Lab File ID (Standard): 02JAN2017A6A_015.d Heated Purge: (Y/N) N

Calibration ID: 27291

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		558059	19.99	1349410	20.61		
UPPER LIMIT		781283	20.49	1889174	21.11		
LOWER LIMIT		390641	19.49	944587	20.11		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-143781/1-A		544185	20.00	1654409	20.61		
LCS 320-143781/2-A		532727	19.99	1588550	20.61		
LCSD 320-143781/3-A		536451	19.99	1525895	20.60		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Sample No.: CCV 320-144610/27 Date Analyzed: 01/02/2017 23:15

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm)

Lab File ID (Standard): 02JAN2017A6A_027.d Heated Purge: (Y/N) N

Calibration ID: 27291

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		533787	19.99	1460847	20.60		
UPPER LIMIT		747302	20.49	2045186	21.10		
LOWER LIMIT		373651	19.49	1022593	20.10		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-143781/1-A		544185	20.00	1654409	20.61		
LCS 320-143781/2-A		532727	19.99	1588550	20.61		
LCSD 320-143781/3-A		536451	19.99	1525895	20.60		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Sample No.: CCV 320-144612/27 Date Analyzed: 01/02/2017 23:15

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm)

Lab File ID (Standard): 02JAN2017A6A_027.d Heated Purge: (Y/N) N

Calibration ID: 27291

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		533787	19.99	1460847	20.60		
UPPER LIMIT		747302	20.49	2045186	21.10		
LOWER LIMIT		373651	19.49	1022593	20.10		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-24637-1	WI-AF-3RW36-1216	479378	19.93	1668991	20.54		
320-24637-2	WI-AF-3FB36-1216	495702	19.93	1691746	20.55		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Sample No.: CCV 320-144612/39 Date Analyzed: 01/03/2017 05:11

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm)

Lab File ID (Standard): 02JAN2017A6A_039.d Heated Purge: (Y/N) N

Calibration ID: 27291

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		499397	19.95	1357134	20.55		
UPPER LIMIT		699156	20.45	1899988	21.05		
LOWER LIMIT		349578	19.45	949994	20.05		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-24637-1	WI-AF-3RW36-1216	479378	19.93	1668991	20.54		
320-24637-2	WI-AF-3FB36-1216	495702	19.93	1691746	20.55		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Sample No.: CCV 320-144614/39 Date Analyzed: 01/03/2017 05:11

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm)

Lab File ID (Standard): 02JAN2017A6A_039.d Heated Purge: (Y/N) N

Calibration ID: 27291

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		499397	19.95	1357134	20.55		
UPPER LIMIT		699156	20.45	1899988	21.05		
LOWER LIMIT		349578	19.45	949994	20.05		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-24637-3	WI-AF-3RW37-1216	464629	19.95	1669024	20.55		
320-24637-4	WI-AF-3FB37-1216	515153	19.96	1598713	20.57		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Sample No.: CCV 320-144614/51 Date Analyzed: 01/03/2017 11:03

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm)

Lab File ID (Standard): 02JAN2017A6A_051.d Heated Purge: (Y/N) N

Calibration ID: 27291

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		543781	19.96	1492186	20.57		
UPPER LIMIT		761293	20.46	2089060	21.07		
LOWER LIMIT		380647	19.46	1044530	20.07		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-24637-3	WI-AF-3RW37-1216	464629	19.95	1669024	20.55		
320-24637-4	WI-AF-3FB37-1216	515153	19.96	1598713	20.57		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Client Sample ID: WI-AF-3RW36-1216 Lab Sample ID: 320-24637-1

Matrix: Water Lab File ID: 02JAN2017A6A_037.d

Analysis Method: 537 Date Collected: 12/20/2016 09:01

Extraction Method: 537 Date Extracted: 12/23/2016 18:13

Sample wt/vol: 266.8(mL) Date Analyzed: 01/03/2017 04:11

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 144612 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.045	U	0.056	0.045	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.022	U	0.028	0.022	0.0088
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.10	U	0.13	0.10	0.045

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	109		70-130
STL00996	13C2 PFDA	103		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_037.d
Lims ID: 320-24637-A-1-A
Client ID: WI-AF-3RW36-1216
Sample Type: Client
Inject. Date: 03-Jan-2017 04:11:54 ALS Bottle#: 40 Worklist Smp#: 37
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 320-24637-a-1-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 15:11:58 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

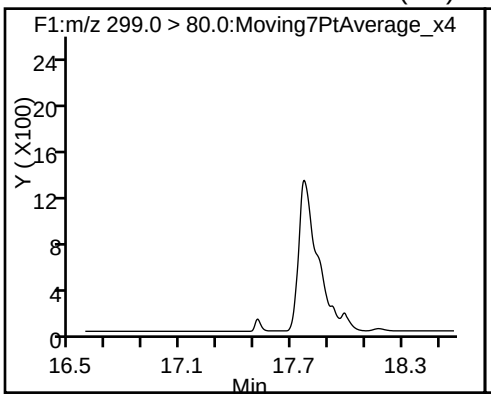
Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 03-Jan-2017 14:22:16

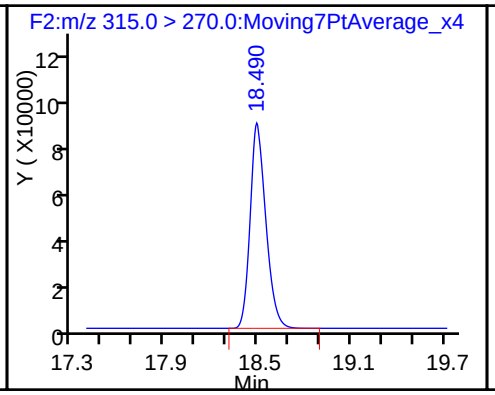
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
$ 2 13C2 PFHxA								
315.0 > 270.0	18.490	18.558	-0.068	1.000	624265	10.9	22115	
* 5 13C2-PFOA								
415.0 > 370.0	19.932	19.986	-0.054		479378	10.0	11874	
* 8 13C4 PFOS								
503.0 > 80.0	20.537	20.596	-0.059		1668991	28.7	25054	
$ 10 13C2 PFDA								
515.0 > 470.0	21.329	21.391	-0.062	1.000	496801	10.3	15895	

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_037.d
Injection Date: 03-Jan-2017 04:11:54 Instrument ID: A6
Lims ID: 320-24637-A-1-A Lab Sample ID: 320-24637-1
Client ID: WI-AF-3RW36-1216
Operator ID: CBW ALS Bottle#: 40 Worklist Smp#: 37
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

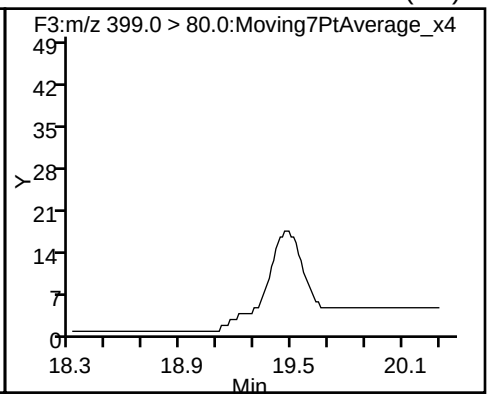
1 Perfluorobutanesulfonic acid (ND)



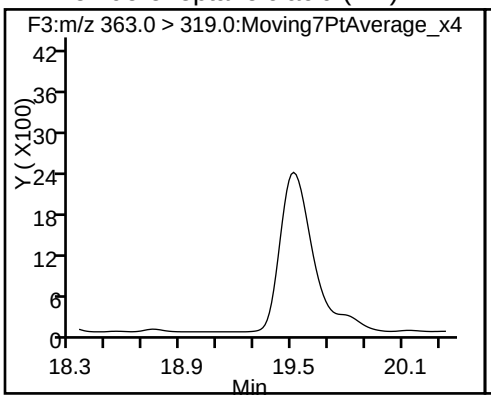
$ 2 13C2 PFHxA



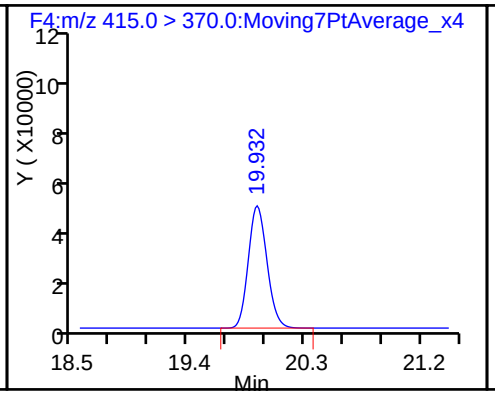
3 Perfluorohexanesulfonic acid (ND)



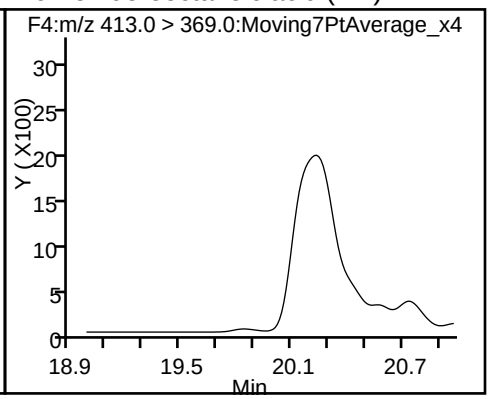
4 Perfluoroheptanoic acid (ND)



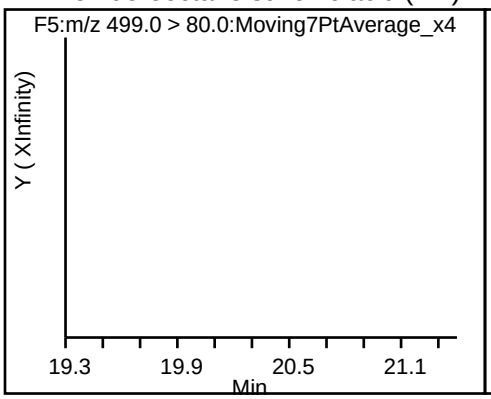
* 5 13C2-PFOA



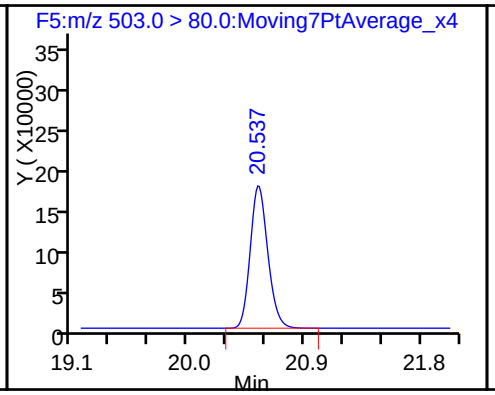
6 Perfluorooctanoic acid (ND)



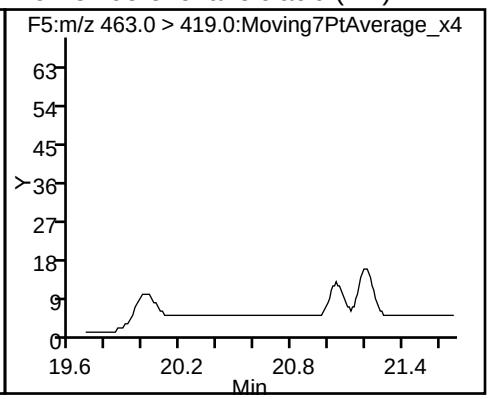
7 Perfluorooctane sulfonic acid (ND)



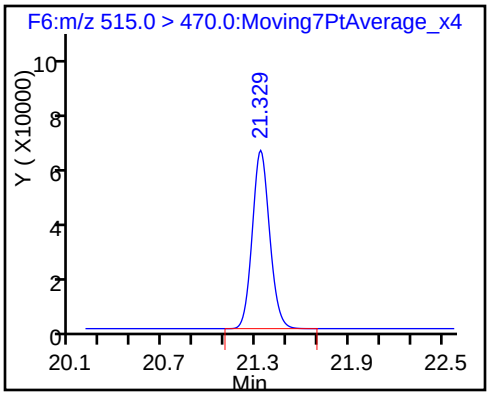
* 8 13C4 PFOS



9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_037.d
Lims ID: 320-24637-A-1-A
Client ID: WI-AF-3RW36-1216
Sample Type: Client
Inject. Date: 03-Jan-2017 04:11:54 ALS Bottle#: 40 Worklist Smp#: 37
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 320-24637-a-1-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 15:11:58 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 03-Jan-2017 14:22:16

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.9	109.15
$ 10 13C2 PFDA	10.0	10.3	102.78

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Client Sample ID: WI-AF-3FB36-1216 Lab Sample ID: 320-24637-2

Matrix: Water Lab File ID: 02JAN2017A6A_038.d

Analysis Method: 537 Date Collected: 12/20/2016 09:02

Extraction Method: 537 Date Extracted: 12/23/2016 18:13

Sample wt/vol: 262.5(mL) Date Analyzed: 01/03/2017 04:41

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 144612 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.046	U	0.057	0.046	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.023	0.0090
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.10	U	0.13	0.10	0.045

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	112		70-130
STL00996	13C2 PFDA	106		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_038.d
Lims ID: 320-24637-A-2-A
Client ID: WI-AF-3FB36-1216
Sample Type: Client
Inject. Date: 03-Jan-2017 04:41:31 ALS Bottle#: 41 Worklist Smp#: 38
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 320-24637-a-2-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 15:11:58 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 03-Jan-2017 14:22:25

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
$ 2 13C2 PFHxA								
315.0 > 270.0	18.490	18.558	-0.068	1.000	662868	11.2	19228	
* 5 13C2-PFOA								
415.0 > 370.0	19.932	19.986	-0.054		495702	10.0	12276	
* 8 13C4 PFOS								
503.0 > 80.0	20.548	20.596	-0.048		1691746	28.7	35366	
$ 10 13C2 PFDA								
515.0 > 470.0	21.338	21.391	-0.053	1.000	530335	10.6	16427	

Report Date: 03-Jan-2017 15:12:14 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_038.d

Injection Date: 03-Jan-2017 04:41:31 Instrument ID: A6

Lims ID: 320-24637-A-2-A Lab Sample ID: 320-24637-2

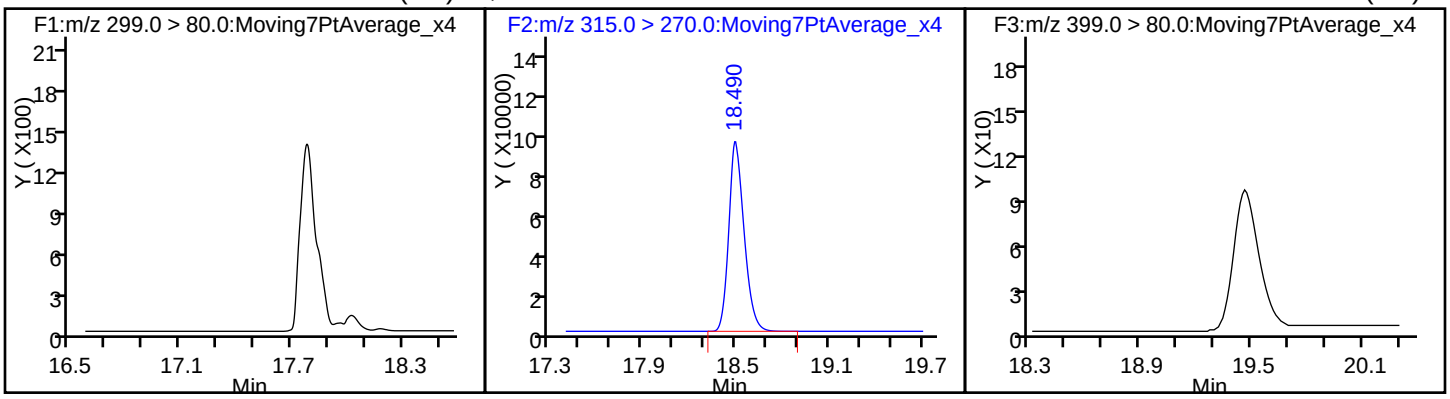
Client ID: WI-AF-3FB36-1216

Operator ID: CBW ALS Bottle#: 41 Worklist Smp#: 38

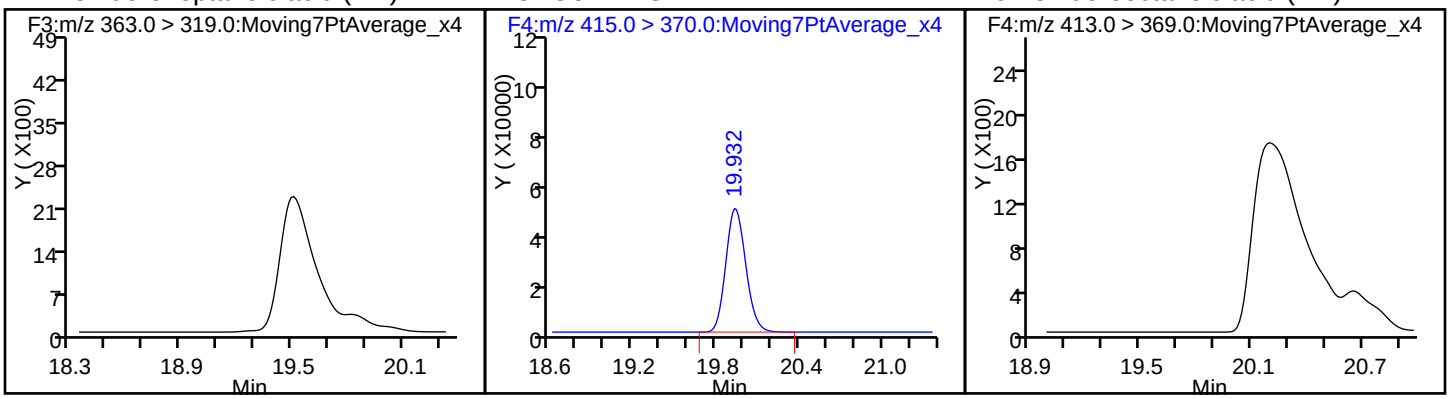
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

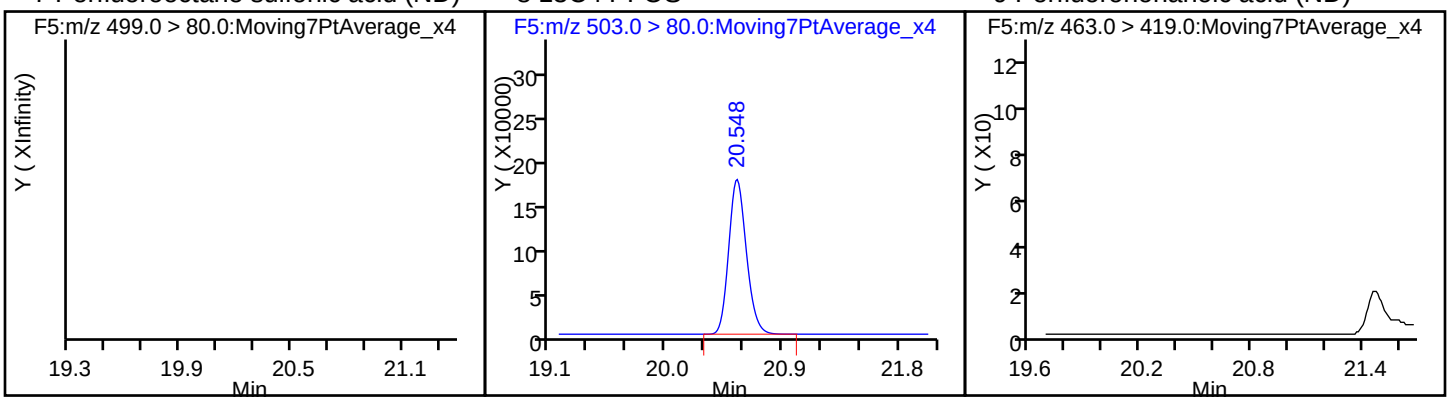
1 Perfluorobutanesulfonic acid (ND) $ 2 13C2 PFHxA 3 Perfluorohexanesulfonic acid (ND)



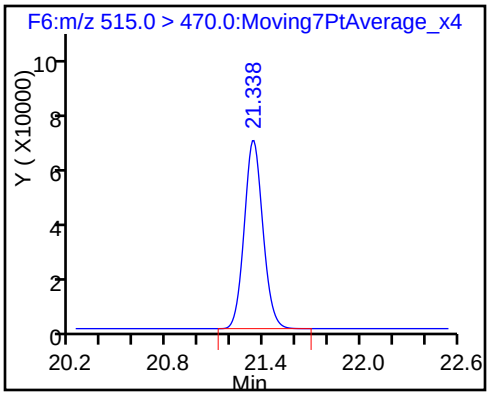
4 Perfluoroheptanoic acid (ND) * 5 13C2-PFOA 6 Perfluorooctanoic acid (ND)



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



$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_038.d
Lims ID: 320-24637-A-2-A
Client ID: WI-AF-3FB36-1216
Sample Type: Client
Inject. Date: 03-Jan-2017 04:41:31 ALS Bottle#: 41 Worklist Smp#: 38
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 320-24637-a-2-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 15:11:58 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 03-Jan-2017 14:22:25

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	11.2	112.08
$ 10 13C2 PFDA	10.0	10.6	106.11

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Client Sample ID: WI-AF-3RW37-1216 Lab Sample ID: 320-24637-3

Matrix: Water Lab File ID: 02JAN2017A6A_041.d

Analysis Method: 537 Date Collected: 12/20/2016 18:12

Extraction Method: 537 Date Extracted: 12/23/2016 18:13

Sample wt/vol: 269.7(mL) Date Analyzed: 01/03/2017 06:10

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 144614 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.044	U	0.056	0.044	0.014
335-67-1	Perfluorooctanoic acid (PFOA)	0.022	U	0.028	0.022	0.0087
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.10	U	0.13	0.10	0.044

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	105		70-130
STL00996	13C2 PFDA	114		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_041.d
Lims ID: 320-24637-B-3-A
Client ID: WI-AF-3RW37-1216
Sample Type: Client
Inject. Date: 03-Jan-2017 06:10:20 ALS Bottle#: 42 Worklist Smp#: 41
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 320-24637-b-3-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 15:16:18 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 03-Jan-2017 14:22:33

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.495	17.521	-0.026	1.000	2342	0.0531	3.3	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.496	18.496	0.0	1.000	582333	10.5	20325	
* 5 13C2-PFOA								
415.0 > 370.0	19.945	19.945	0.0		464629	10.0	11463	
* 8 13C4 PFOS								
503.0 > 80.0	20.548	20.548	0.0		1669024	28.7	43594	
$ 10 13C2 PFDA								
515.0 > 470.0	21.329	21.338	-0.009	1.000	534869	11.4	16977	

Report Date: 03-Jan-2017 15:16:37 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_041.d

Injection Date: 03-Jan-2017 06:10:20 Instrument ID: A6

Lims ID: 320-24637-B-3-A Lab Sample ID: 320-24637-3

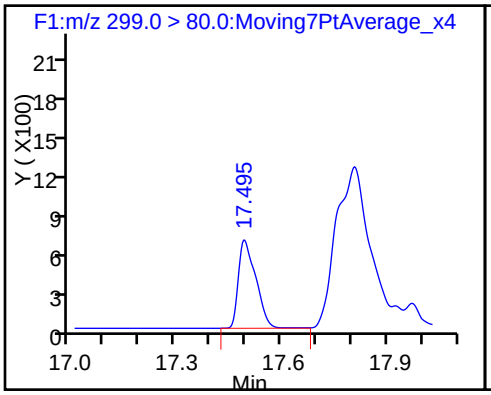
Client ID: WI-AF-3RW37-1216

Operator ID: CBW ALS Bottle#: 42 Worklist Smp#: 41

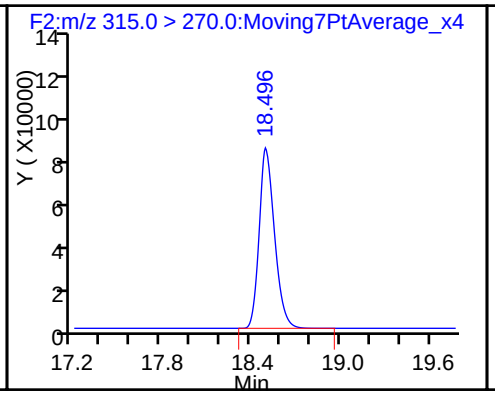
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

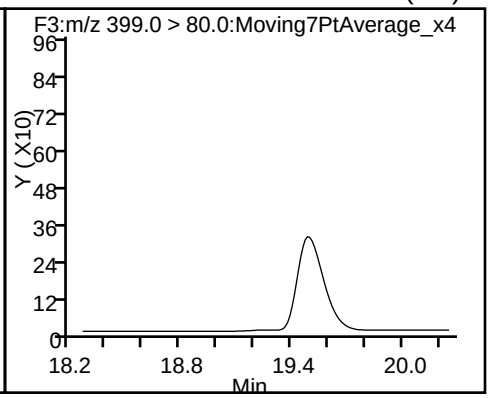
1 Perfluorobutanesulfonic acid



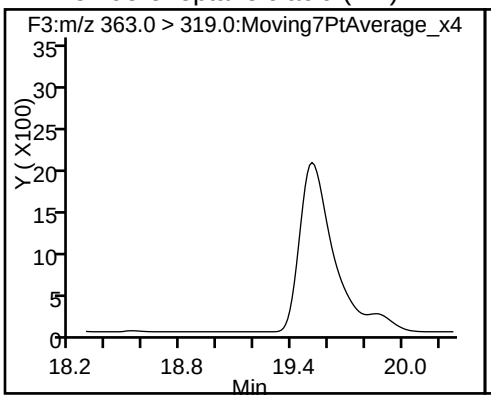
$ 2 13C2 PFHxA



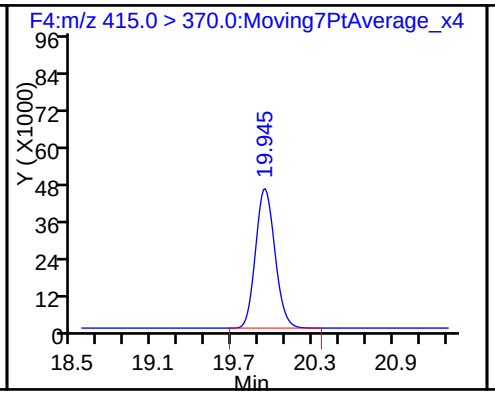
3 Perfluorohexanesulfonic acid (ND)



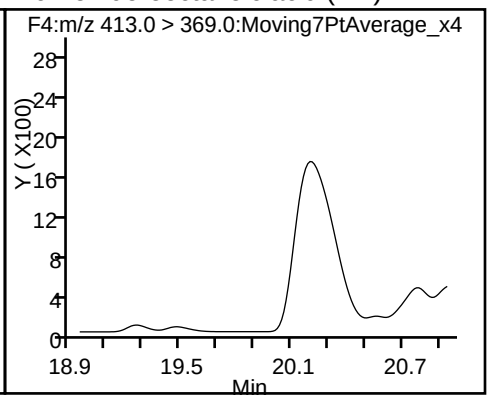
4 Perfluoroheptanoic acid (ND)



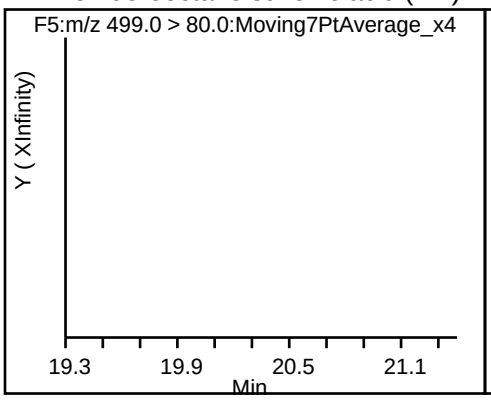
* 5 13C2-PFOA



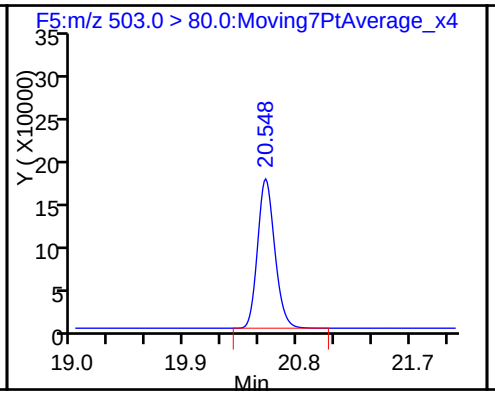
6 Perfluorooctanoic acid (ND)



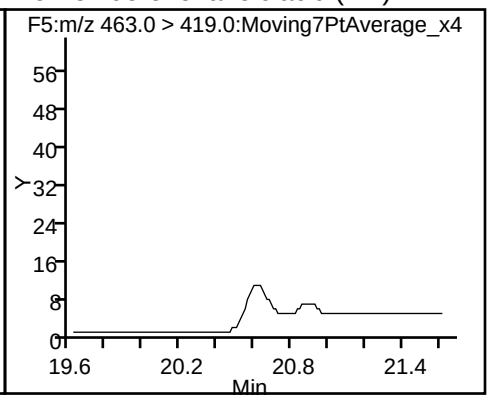
7 Perfluorooctane sulfonic acid (ND)



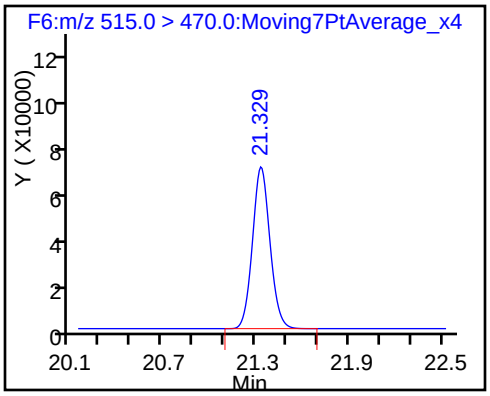
* 8 13C4 PFOS



9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_041.d
Lims ID: 320-24637-B-3-A
Client ID: WI-AF-3RW37-1216
Sample Type: Client
Inject. Date: 03-Jan-2017 06:10:20 ALS Bottle#: 42 Worklist Smp#: 41
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 320-24637-b-3-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 15:16:18 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 03-Jan-2017 14:22:33

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.5	105.05
$ 10 13C2 PFDA	10.0	11.4	114.17

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Client Sample ID: WI-AF-3FB37-1216 Lab Sample ID: 320-24637-4

Matrix: Water Lab File ID: 02JAN2017A6A_042.d

Analysis Method: 537 Date Collected: 12/20/2016 18:13

Extraction Method: 537 Date Extracted: 12/23/2016 18:13

Sample wt/vol: 259.7(mL) Date Analyzed: 01/03/2017 06:39

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 144614 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.046	U	0.058	0.046	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.023	0.0091
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.13	0.11	0.046

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	104		70-130
STL00996	13C2 PFDA	110		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_042.d
Lims ID: 320-24637-A-4-A
Client ID: WI-AF-3FB37-1216
Sample Type: Client
Inject. Date: 03-Jan-2017 06:39:56 ALS Bottle#: 43 Worklist Smp#: 42
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 320-24637-a-4-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 15:16:18 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

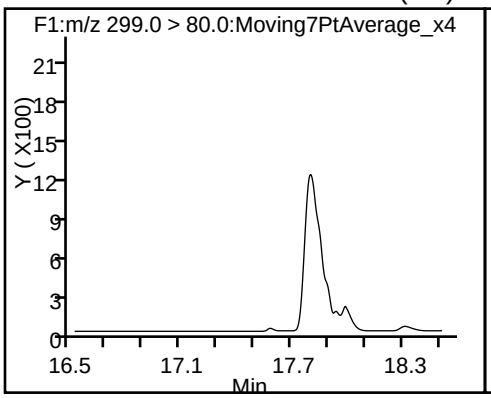
Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 03-Jan-2017 14:22:47

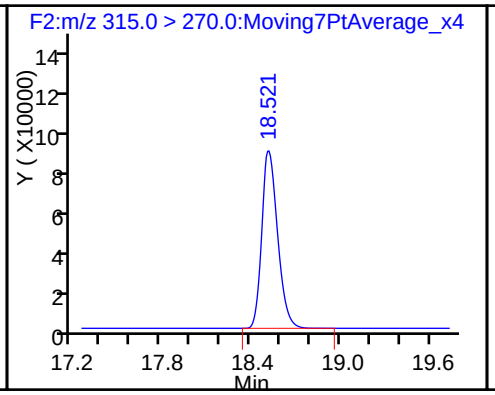
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
$ 2 13C2 PFHxA								
315.0 > 270.0	18.521	18.496	0.025	1.000	637286	10.4	21495	
* 5 13C2-PFOA								
415.0 > 370.0	19.959	19.945	0.014		515153	10.0	12805	
* 8 13C4 PFOS								
503.0 > 80.0	20.572	20.548	0.024		1598713	28.7	41754	
$ 10 13C2 PFDA								
515.0 > 470.0	21.347	21.338	0.009	1.000	569319	11.0	17929	

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_042.d
Injection Date: 03-Jan-2017 06:39:56 Instrument ID: A6
Lims ID: 320-24637-A-4-A Lab Sample ID: 320-24637-4
Client ID: WI-AF-3FB37-1216
Operator ID: CBW ALS Bottle#: 43 Worklist Smp#: 42
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

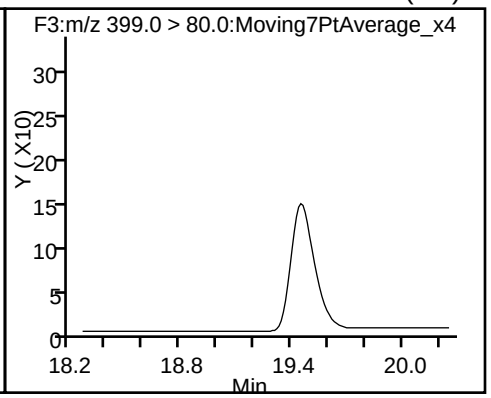
1 Perfluorobutanesulfonic acid (ND)



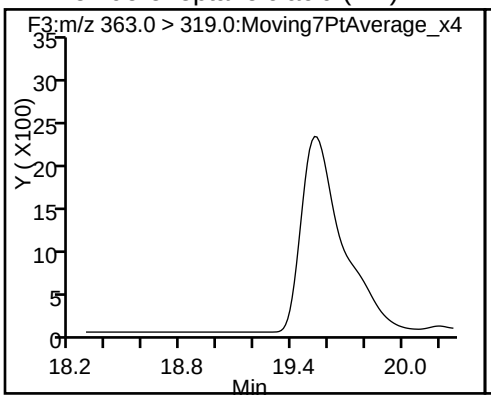
$ 2 13C2 PFHxA



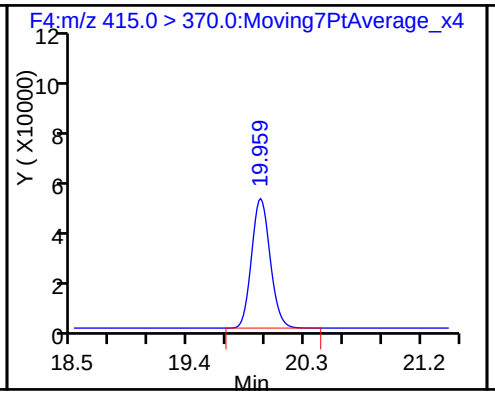
3 Perfluorohexanesulfonic acid (ND)



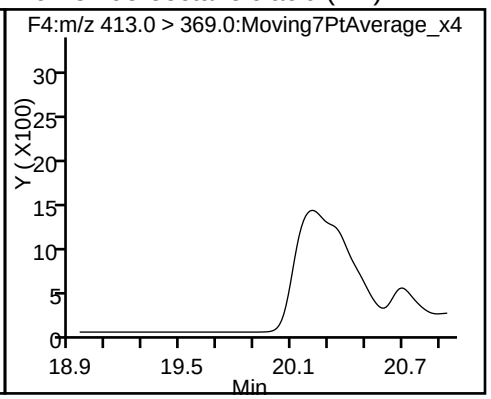
4 Perfluoroheptanoic acid (ND)



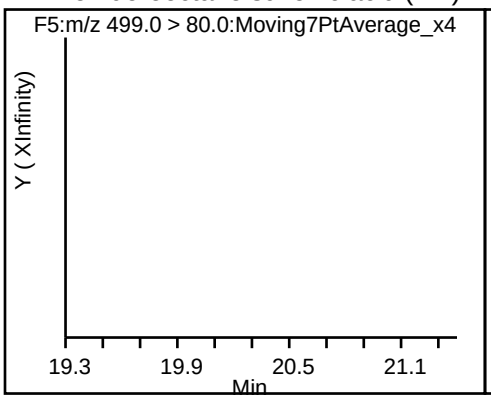
* 5 13C2-PFOA



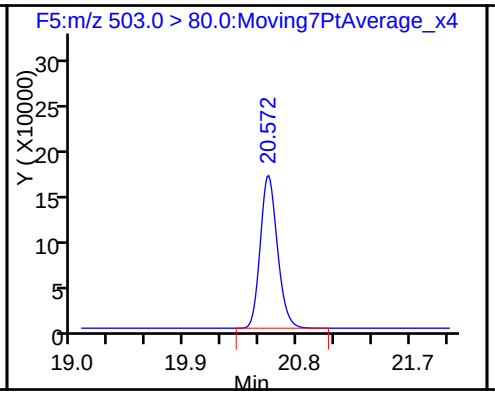
6 Perfluorooctanoic acid (ND)



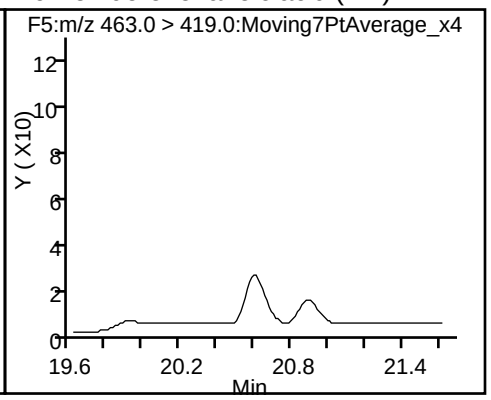
7 Perfluorooctane sulfonic acid (ND)



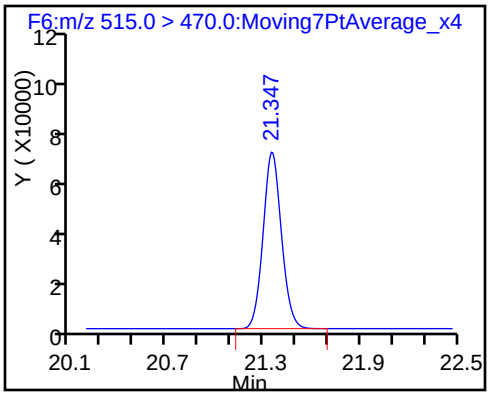
* 8 13C4 PFOS



9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_042.d
Lims ID: 320-24637-A-4-A
Client ID: WI-AF-3FB37-1216
Sample Type: Client
Inject. Date: 03-Jan-2017 06:39:56 ALS Bottle#: 43 Worklist Smp#: 42
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 320-24637-a-4-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 15:16:18 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 03-Jan-2017 14:22:47

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.4	103.68
$ 10 13C2 PFDA	10.0	11.0	109.61

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

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1 Analy Batch No.: 143828

SDG No.:

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/24/2016 04:26 Calibration End Date: 12/24/2016 06:54 Calibration ID: 27291

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-143828/4	24DEC2016A6A_004.d
Level 2	STD 320-143828/5	24DEC2016A6A_005.d
Level 3	STD 320-143828/6	24DEC2016A6A_006.d
Level 4	STD 320-143828/7	24DEC2016A6A_007.d
Level 5	STD 320-143828/8	24DEC2016A6A_008.d
Level 6	STD 320-143828/9	24DEC2016A6A_009.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid (PFBS)	0.7489 0.7091	0.7895	0.8086	0.7461	0.7483	Ave		0.7584				4.7		30.0			
Perfluorohexanesulfonic acid	0.7980 0.9951	0.9269	0.9870	0.9674	0.9683	Ave		0.9405				7.8		30.0			
Perfluoroheptanoic acid	1.0776 1.1996	1.3095	1.3597	1.2735	1.1115	Ave		1.2219				9.2		30.0			
Perfluorooctanoic acid (PFOA)	0.8779 1.1195	0.9865	1.0039	1.0531	0.9939	Ave		1.0058				8.0		30.0			
Perfluorooctanesulfonic acid (PFOS)	0.9077 1.1731	1.0347	1.1414	1.1293	1.2114	Ave		1.0996				10.1		30.0			
Perfluorononanoic acid	1.1003 1.2343	1.1975	1.1855	1.1319	1.0424	Ave		1.1487				6.2		30.0			
13C2 PFHxA	1.1206 1.3938	1.0547	1.1626	1.2662	1.1609	Ave		1.1931				10.1		30.0			
13C2 PFDA	0.9167 1.1683	0.9437	0.9678	1.0543	0.9989	Ave		1.0083				9.1		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.: 320-24637-1 Analy Batch No.: 143828

SDG No.:

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/24/2016 04:26 Calibration End Date: 12/24/2016 06:54 Calibration ID: 27291

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-143828/4	24DEC2016A6A_004.d
Level 2	STD 320-143828/5	24DEC2016A6A_005.d
Level 3	STD 320-143828/6	24DEC2016A6A_006.d
Level 4	STD 320-143828/7	24DEC2016A6A_007.d
Level 5	STD 320-143828/8	24DEC2016A6A_008.d
Level 6	STD 320-143828/9	24DEC2016A6A_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	Ave	384512 5939448	999960	1880513	3444375	4710266	8.98 178	22.9	45.1	90.9	135
Perfluorohexanesulfonic acid	PFOS	Ave	138107 2809913	395737	773860	1505450	2054618	3.03 60.1	7.72	15.2	30.6	45.4
Perfluoroheptanoic acid	13PFOA	Ave	65406 1230238	205998	407699	733295	976632	0.990 19.7	2.52	4.97	10.0	14.9
Perfluorooctanoic acid (PFOA)	13PFOA	Ave	105059 2263615	305974	593502	1195609	1721874	1.95 38.8	4.98	9.81	19.8	29.3
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	208018 4386351	584936	1184968	2327023	3403779	4.01 79.6	10.2	20.1	40.6	60.1
Perfluorononanoic acid	13PFOA	Ave	139923 2652055	394672	744764	1365537	1918933	2.07 41.2	5.29	10.4	21.0	31.1
13C2 PFHxA	13PFOA	Ave	687019 726485	657231	700737	727339	686886	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PFOA	Ave	561986 608935	588071	583365	605628	591036	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.: 320-24637-1 Analy Batch No.: 143828

SDG No.:

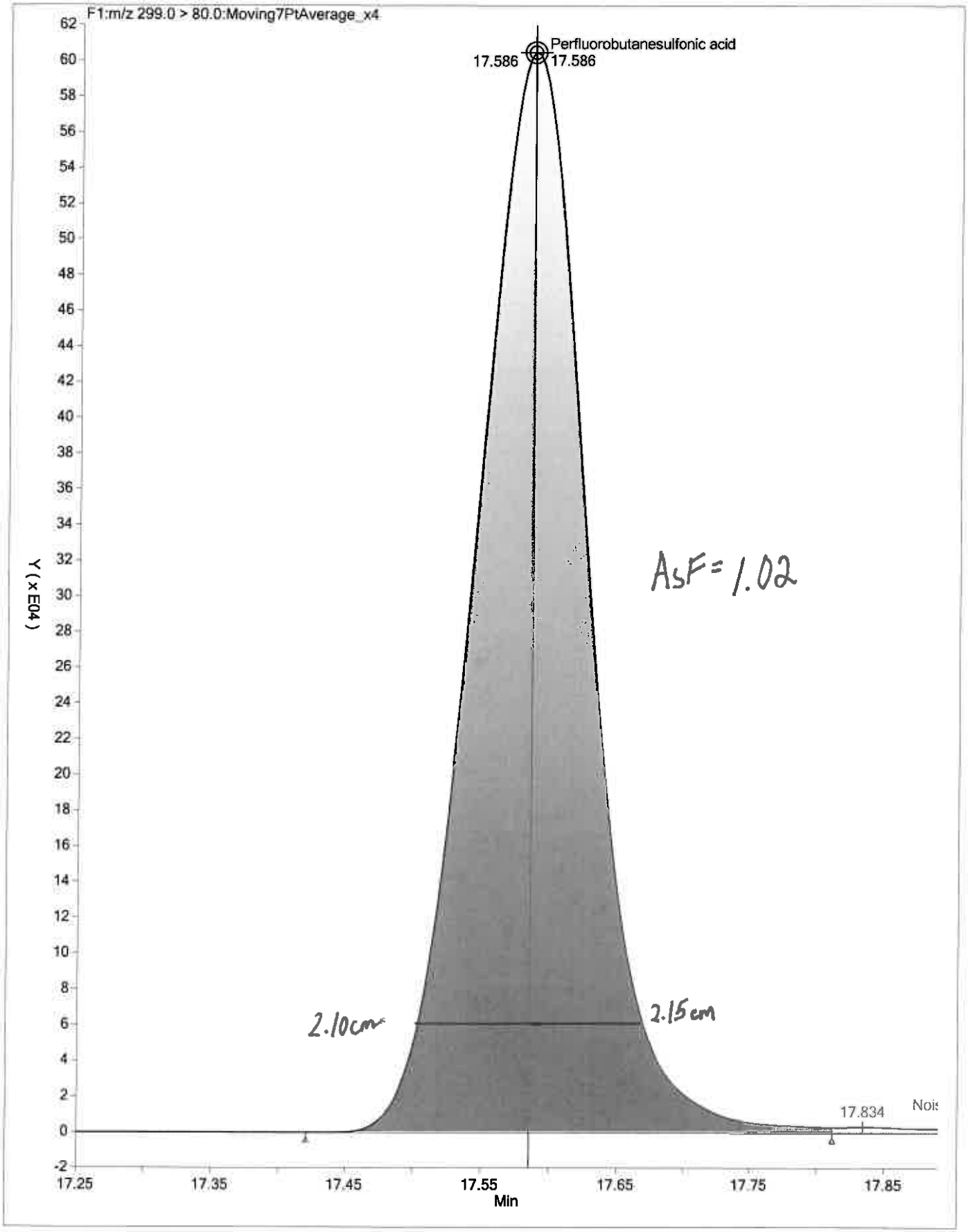
Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

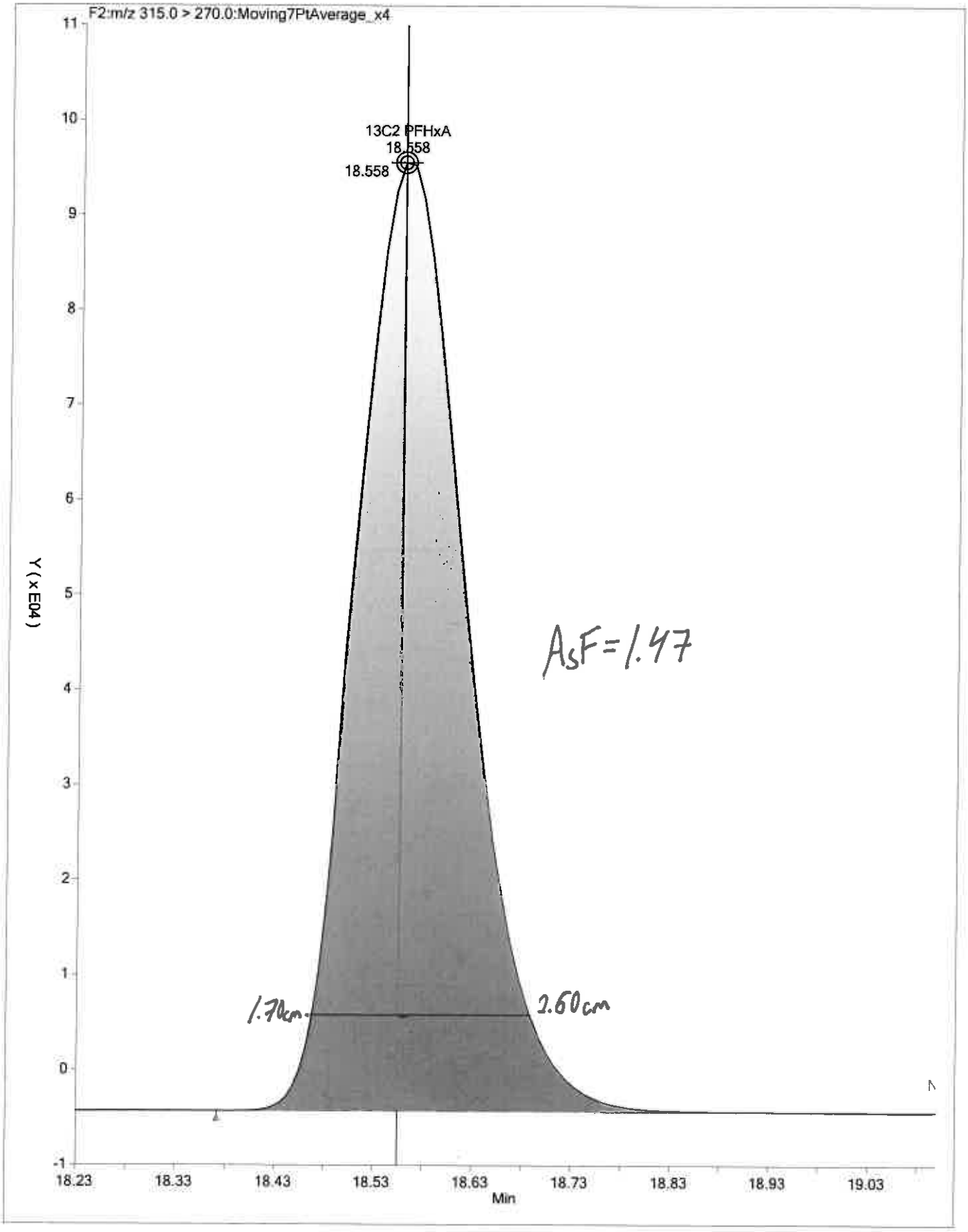
Calibration Start Date: 12/24/2016 04:26 Calibration End Date: 12/24/2016 06:54 Calibration ID: 27291

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-143828/4	24DEC2016A6A_004.d
Level 2	STD 320-143828/5	24DEC2016A6A_005.d
Level 3	STD 320-143828/6	24DEC2016A6A_006.d
Level 4	STD 320-143828/7	24DEC2016A6A_007.d
Level 5	STD 320-143828/8	24DEC2016A6A_008.d
Level 6	STD 320-143828/9	24DEC2016A6A_009.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid (PFBS)	-1.3	4.1	6.6	-1.6	-1.3	-6.5	50	50	50	50	50	50
Perfluorohexanesulfonic acid	-15.2	-1.4	5.0	2.9	3.0	5.8	50	50	50	50	50	50
Perfluoroheptanoic acid	-11.8	7.2	11.3	4.2	-9.0	-1.8	50	50	50	50	50	50
Perfluorooctanoic acid (PFOA)	-12.7	-1.9	-0.2	4.7	-1.2	11.3	50	50	50	50	50	50
Perfluorooctanesulfonic acid (PFOS)	-17.5	-5.9	3.8	2.7	10.2	6.7	50	50	50	50	50	50
Perfluorononanoic acid	-4.2	4.3	3.2	-1.5	-9.3	7.5	50	50	50	50	50	50
13C2 PFHxA	-6.1	-11.6	-2.6	6.1	-2.7	16.8	30	30	30	30	30	30
13C2 PFDA	-9.1	-6.4	-4.0	4.6	-0.9	15.9	30	30	30	30	30	30


F1:m/z 299.0 > 80.0:Moving7PtAverage_x4
Perfluorobutanesulfonic acid
17.586
17.586
AsF = 1.02
2.10cm
2.15cm
17.834
Nois
Y (x E04)
62
60
58
56
54
52
50
48
46
44
42
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
17.25
17.35
17.45
17.55
17.65
17.75
17.85
Min


F2:m/z 315.0 > 270.0:Moving7PtAverage_x4
13C2 PFHxA
18.558
18.558
Y (x E04)
11
10
9
8
7
6
5
4
3
2
1
0
-1
18.23
18.33
18.43
18.53
18.63
18.73
18.83
18.93
19.03
Min
AsF=1.47
1.70cm
2.60cm

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_004.d
Lims ID: STD L1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 24-Dec-2016 04:26:10 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: STD L1 L1
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6
Sublist: chrom-537__A6*sub3

Method: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 27-Dec-2016 10:54:51 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK031

First Level Reviewer: phomsophat Date: 24-Dec-2016 11:54:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.589	17.586	0.003	1.000	384512	8.86	135	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.558	18.558	0.0	1.000	687019	9.39	22481	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.320	19.318	0.002	1.000	138107	2.57	2684	
4 Perfluoroheptanoic acid								M
363.0 > 319.0	19.344	19.350	-0.006	1.000	65406	0.8731	6.0	M
* 5 13C2-PFOA								
415.0 > 370.0	19.999	20.005	-0.006		613085	10.0	15656	
6 Perfluorooctanoic acid								M
413.0 > 369.0	19.999	20.004	-0.005	1.000	105059	1.70	29.0	M
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.620	20.619	0.001	1.000	208018	3.31	3500	
* 8 13C4 PFOS								
503.0 > 80.0	20.620	20.619	0.001		1640498	28.7	42687	
9 Perfluorononanoic acid								
463.0 > 419.0	20.691	20.697	-0.006	1.000	139923	1.99	3701	
$ 10 13C2 PFDA								
515.0 > 470.0	21.418	21.416	0.002	1.000	561986	9.09	17453	

QC Flag Legend

Review Flags

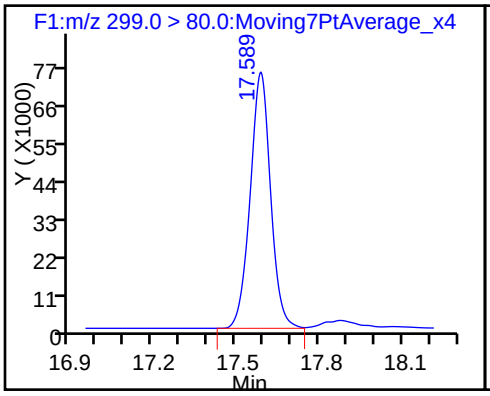
M - Manually Integrated

Reagents:

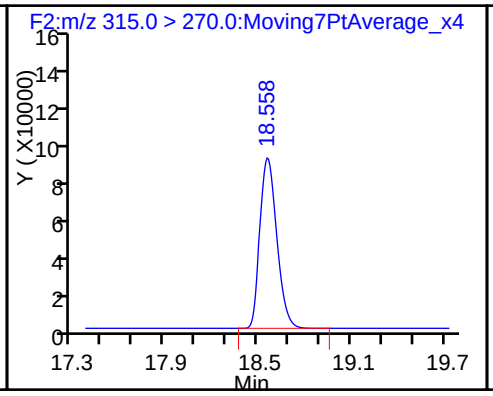
LC537-L1_00017 Amount Added: 1.00 Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_004.d
Injection Date: 24-Dec-2016 04:26:10 Instrument ID: A6
Lims ID: STD L1
Client ID:
Operator ID: CBW ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

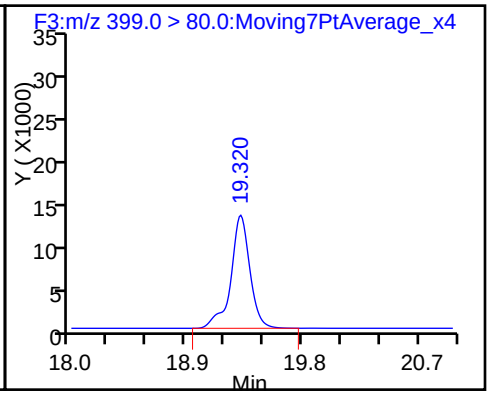
1 Perfluorobutanesulfonic acid



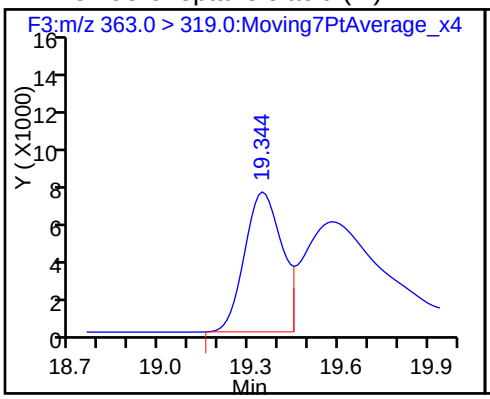
$ 2 13C2 PFHxA



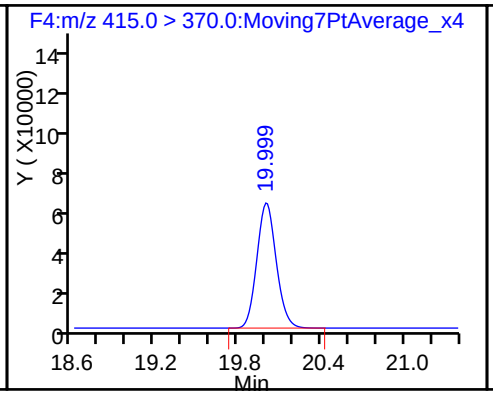
3 Perfluorohexanesulfonic acid



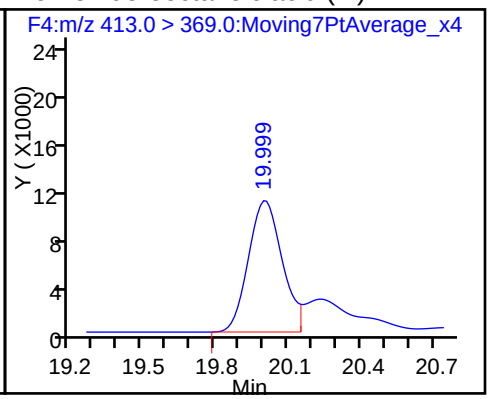
4 Perfluoroheptanoic acid (M)



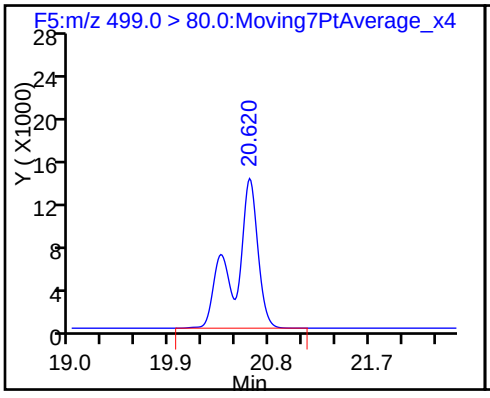
* 5 13C2-PFOA



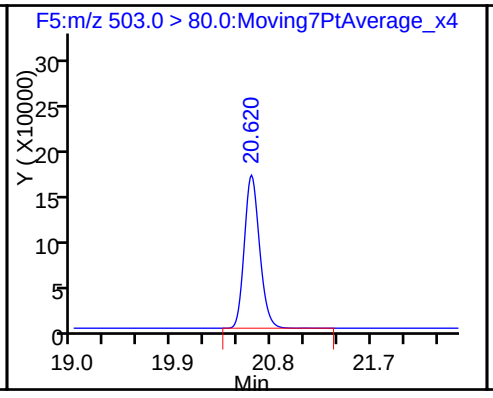
6 Perfluorooctanoic acid (M)



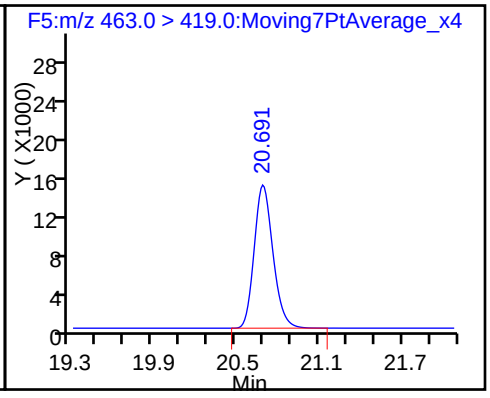
7 Perfluorooctane sulfonic acid



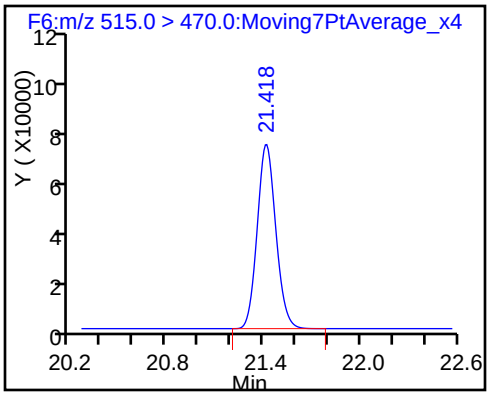
* 8 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

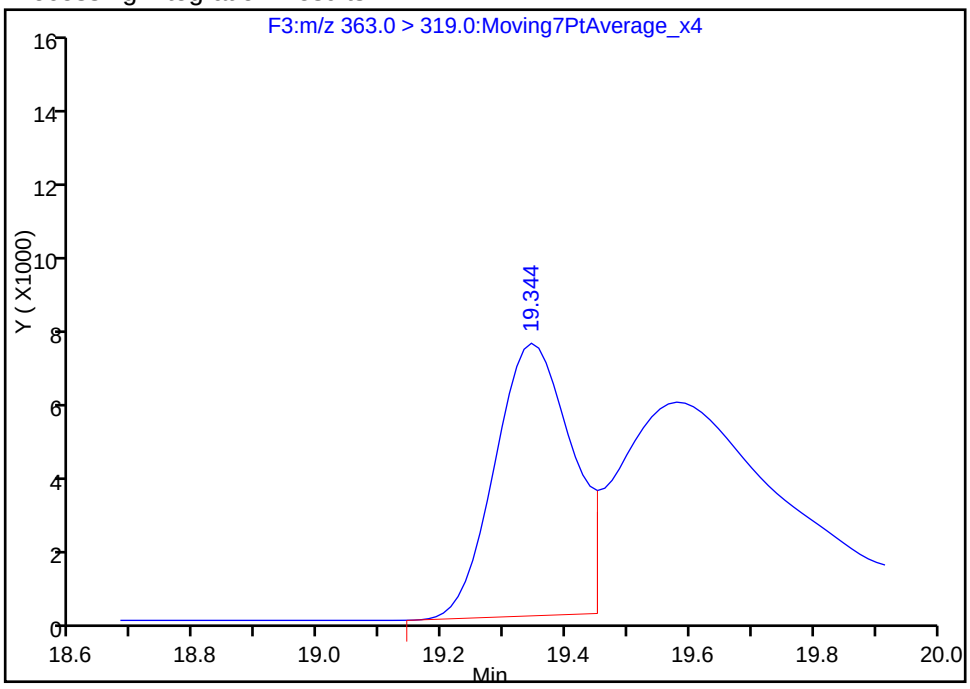
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_004.d
Injection Date: 24-Dec-2016 04:26:10 Instrument ID: A6
Lims ID: STD L1
Client ID:
Operator ID: CBW ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:MRM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

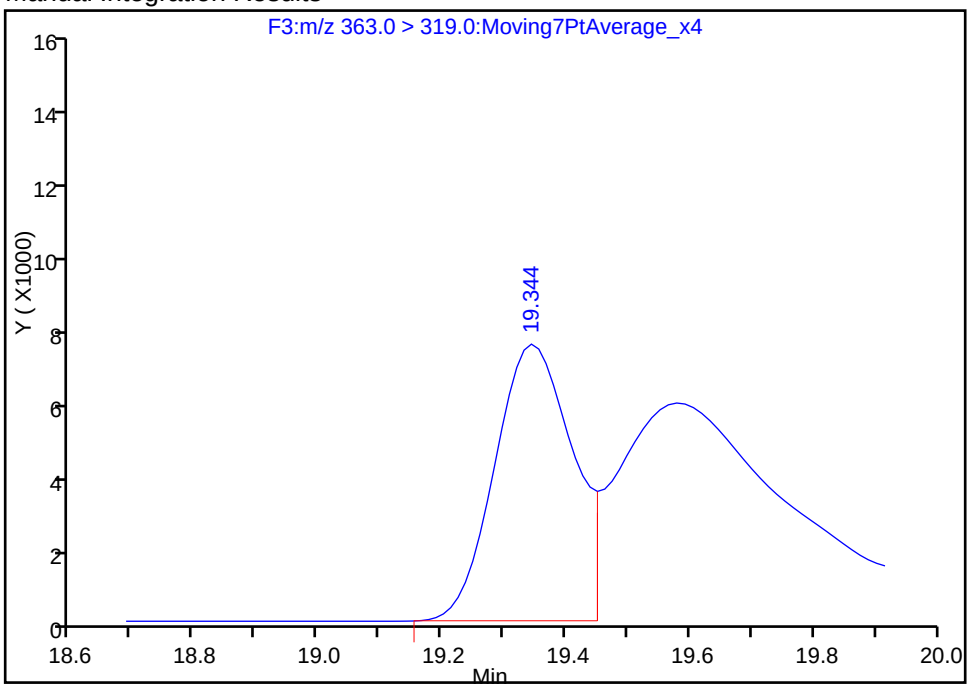
Processing Integration Results

RT: 19.34
Area: 63912
Amount: 0.784751
Amount Units: ng/ml



Manual Integration Results

RT: 19.34
Area: 65406
Amount: 0.873101
Amount Units: ng/ml



Reviewer: phomsophat, 24-Dec-2016 11:57:48
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

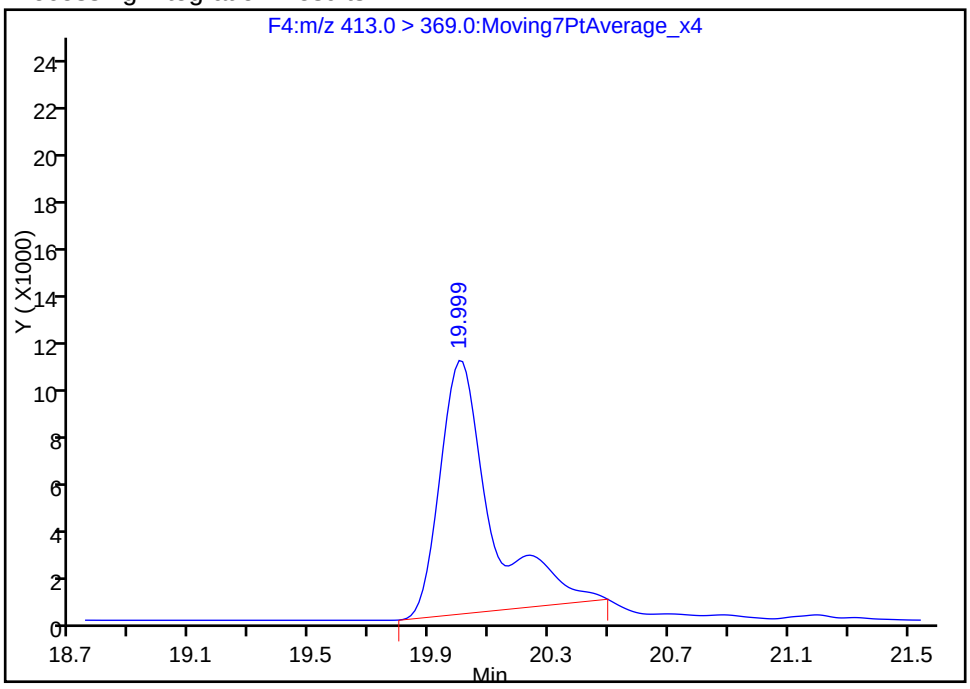
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_004.d
Injection Date: 24-Dec-2016 04:26:10 Instrument ID: A6
Lims ID: STD L1
Client ID:
Operator ID: CBW ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

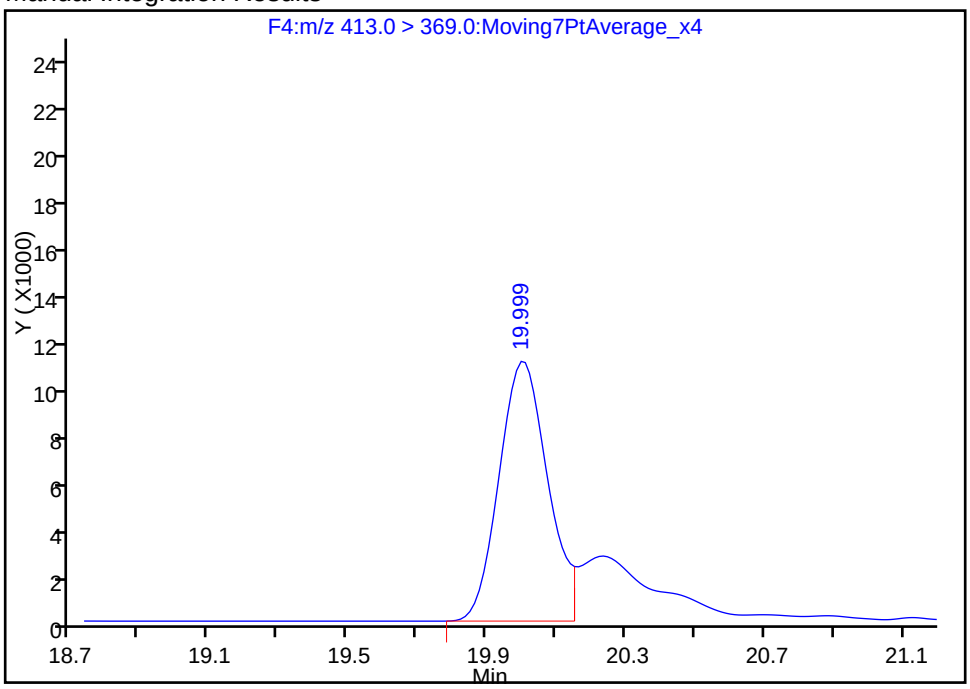
Processing Integration Results

RT: 20.00
Area: 124416
Amount: 1.917532
Amount Units: ng/ml



Manual Integration Results

RT: 20.00
Area: 105059
Amount: 1.703696
Amount Units: ng/ml



Reviewer: phomsophat, 24-Dec-2016 11:57:48
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_005.d
Lims ID: STD L2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 24-Dec-2016 04:55:44 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: STD L2 L2
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6
Sublist: chrom-537__A6*sub3

Method: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 27-Dec-2016 10:54:56 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK031

First Level Reviewer: phomsophat Date: 24-Dec-2016 11:59:47

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.586	17.586	0.0	1.000	999960	23.8	332	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.558	18.558	0.0	1.000	657231	8.84	21447	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.309	19.318	-0.009	1.000	395737	7.60	9507	
4 Perfluoroheptanoic acid								
363.0 > 319.0	19.344	19.350	-0.006	1.000	205998	2.71	17.1	
* 5 13C2-PFOA								
415.0 > 370.0	19.999	20.005	-0.006		623136	10.0	15732	
6 Perfluorooctanoic acid								M
413.0 > 369.0	19.999	20.005	-0.006	1.000	305974	4.88	76.0	M
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.620	20.619	0.001	1.000	584936	9.61	9904	
* 8 13C4 PFOS								
503.0 > 80.0	20.620	20.619	0.001		1586953	28.7	41115	
9 Perfluorononanoic acid								
463.0 > 419.0	20.691	20.697	-0.006	1.000	394672	5.51	8417	
$ 10 13C2 PFDA								
515.0 > 470.0	21.409	21.416	-0.007	1.000	588071	9.36	18601	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00016 Amount Added: 1.00 Units: mL

Report Date: 27-Dec-2016 10:54:57 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_005.d

Injection Date: 24-Dec-2016 04:55:44 Instrument ID: A6

Lims ID: STD L2

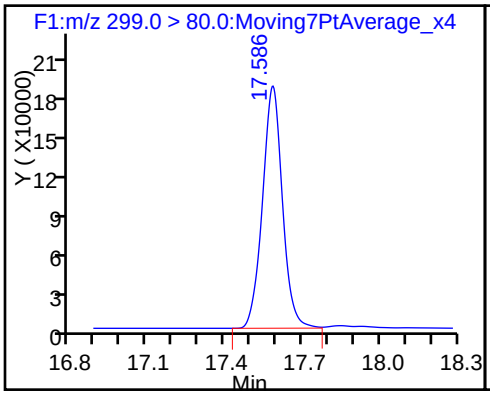
Client ID:

Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 5

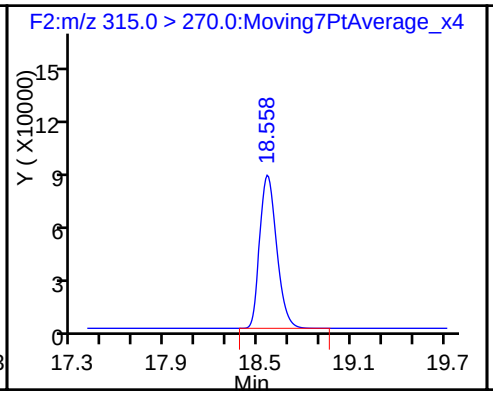
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

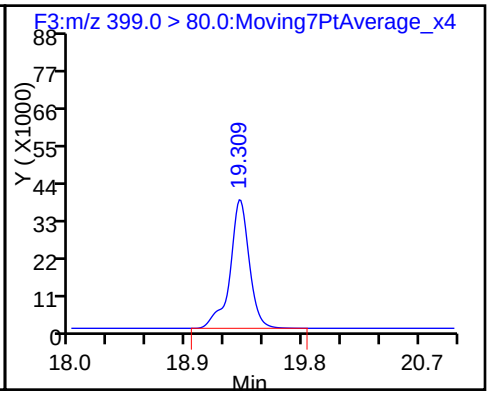
1 Perfluorobutanesulfonic acid



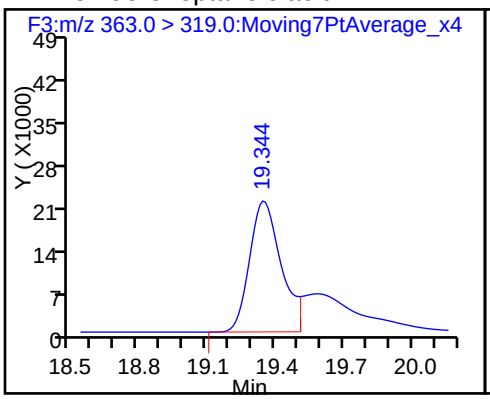
$ 2 13C2 PFHxA



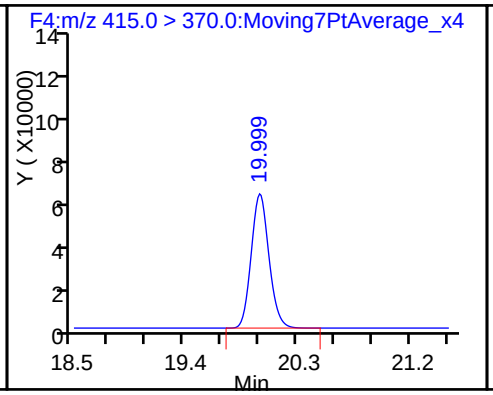
3 Perfluorohexanesulfonic acid



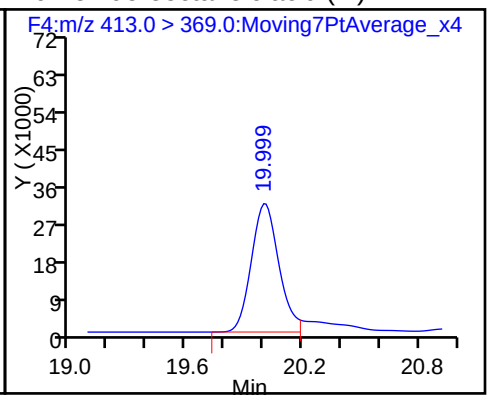
4 Perfluoroheptanoic acid



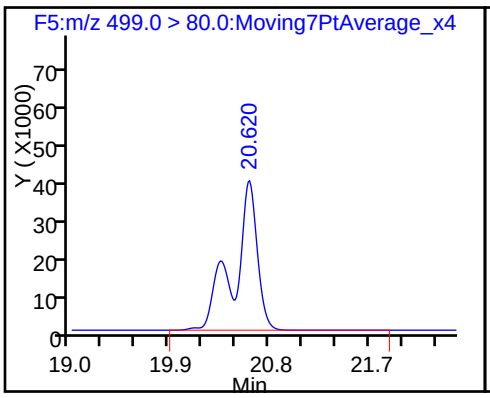
* 5 13C2-PFOA



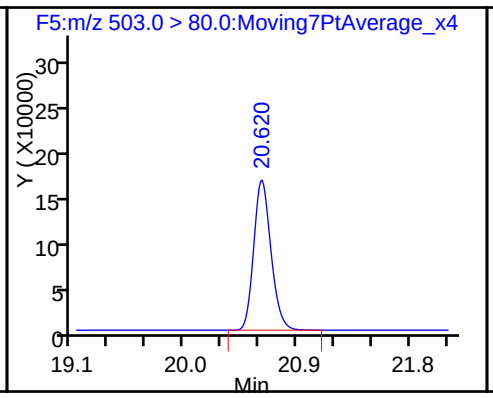
6 Perfluorooctanoic acid (M)



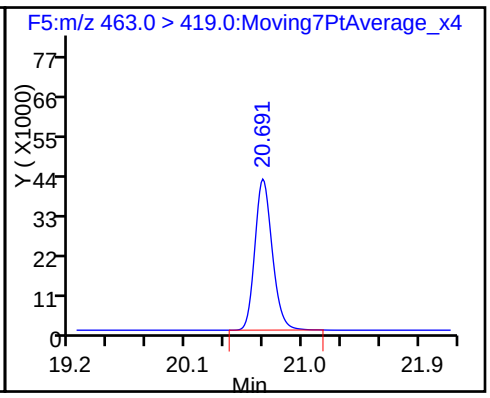
7 Perfluorooctane sulfonic acid



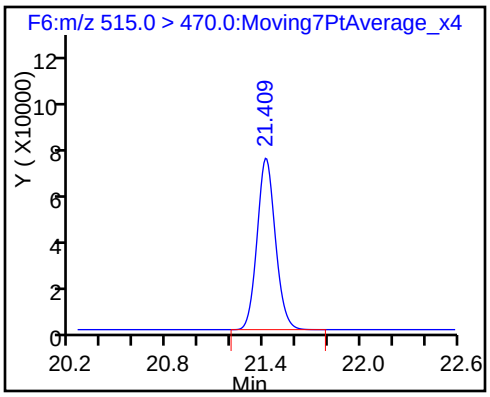
* 8 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

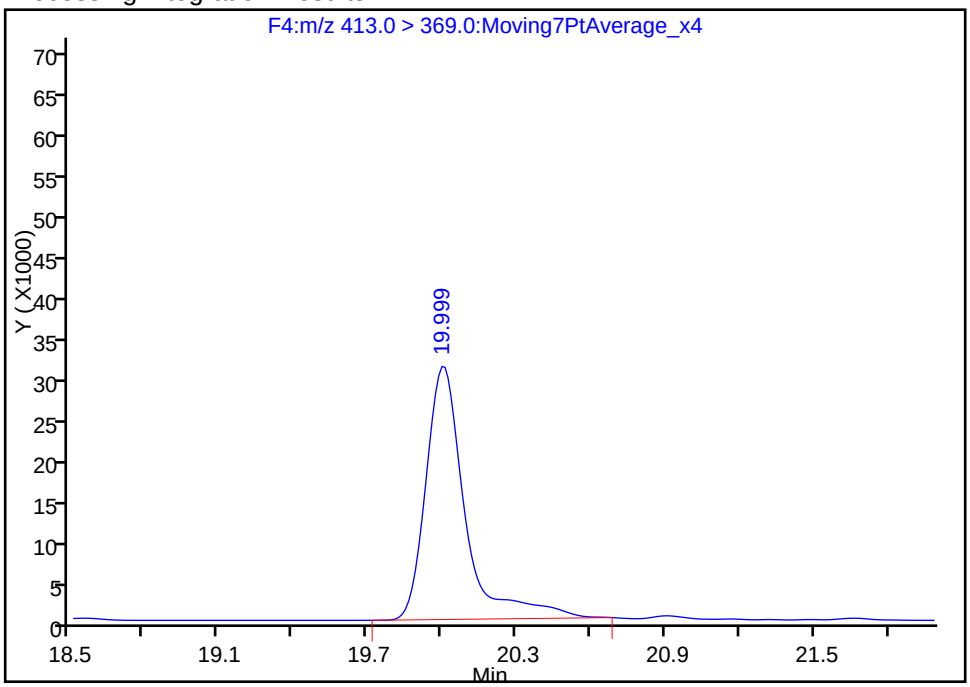
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_005.d
Injection Date: 24-Dec-2016 04:55:44 Instrument ID: A6
Lims ID: STD L2
Client ID:
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

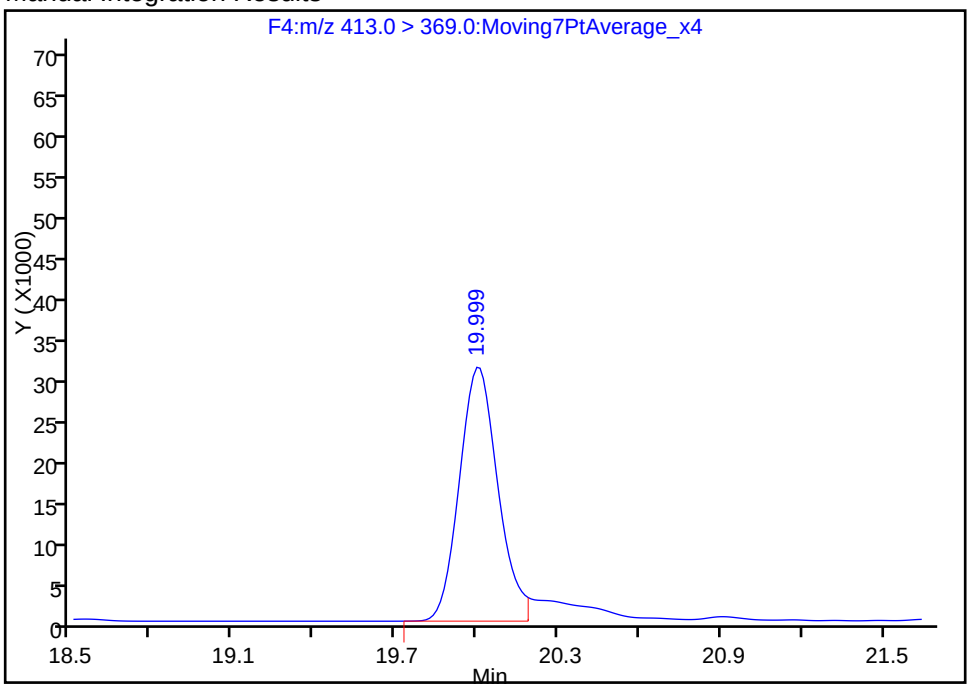
Processing Integration Results

RT: 20.00
Area: 340214
Amount: 5.293744
Amount Units: ng/ml



Manual Integration Results

RT: 20.00
Area: 305974
Amount: 4.881813
Amount Units: ng/ml



Reviewer: phomsophat, 24-Dec-2016 11:59:47
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_006.d
Lims ID: STD L3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 24-Dec-2016 05:25:20 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: STD L3 L3
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6
Sublist: chrom-537__A6*sub3

Method: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 27-Dec-2016 10:55:03 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK031

First Level Reviewer: phomsophat Date: 24-Dec-2016 12:04:18

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.586	17.586	0.0	1.000	1880513	48.1	564	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.558	18.558	0.0	1.000	700737	9.74	22761	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.320	19.318	0.002	1.000	773860	16.0	18225	
4 Perfluoroheptanoic acid								M
363.0 > 319.0	19.344	19.350	-0.006	1.000	407699	5.54	39.5	M
* 5 13C2-PFOA								
415.0 > 370.0	19.999	20.005	-0.006		602755	10.0	15228	
6 Perfluorooctanoic acid								M
413.0 > 369.0	19.999	20.005	-0.006	1.000	593502	9.79	208	M
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.619	20.619	0.0	1.000	1184968	20.9	19371	
* 8 13C4 PFOS								
503.0 > 80.0	20.619	20.619	0.0		1478857	28.7	38359	
9 Perfluorononanoic acid								
463.0 > 419.0	20.691	20.697	-0.006	1.000	744764	10.8	19653	
$ 10 13C2 PFDA								
515.0 > 470.0	21.418	21.416	0.002	1.000	583365	9.60	18358	

QC Flag Legend

Review Flags

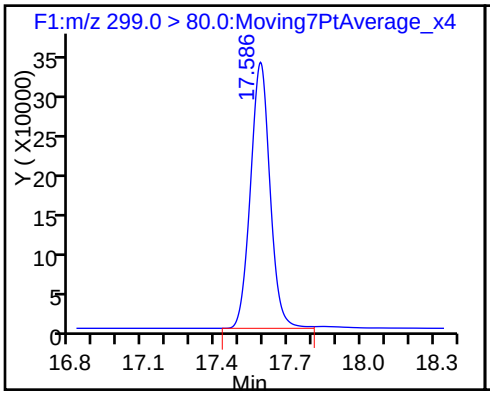
M - Manually Integrated

Reagents:

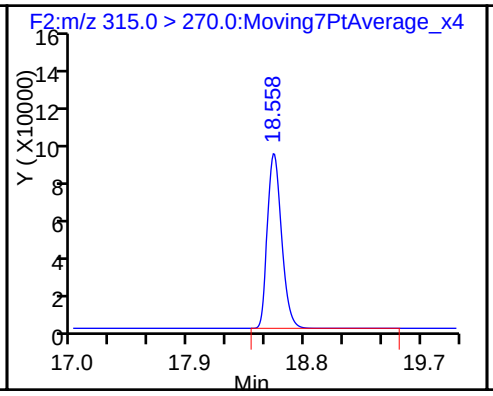
LC537-L3_00018 Amount Added: 1.00 Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_006.d
Injection Date: 24-Dec-2016 05:25:20 Instrument ID: A6
Lims ID: STD L3
Client ID:
Operator ID: CBW ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

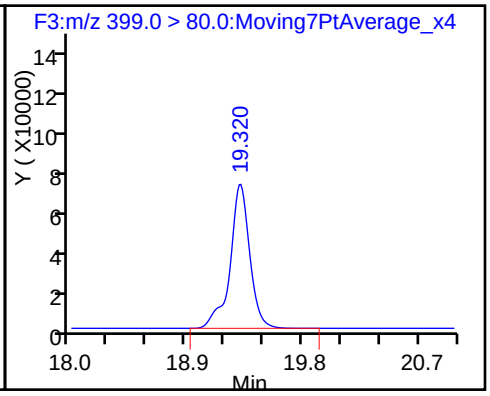
1 Perfluorobutanesulfonic acid



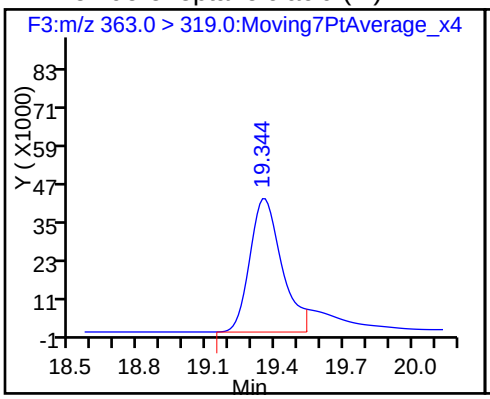
$ 2 13C2 PFHxA



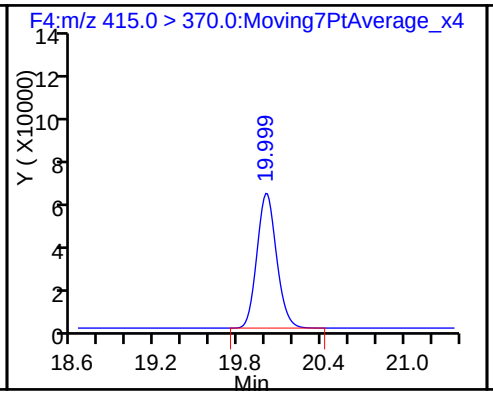
3 Perfluorohexanesulfonic acid



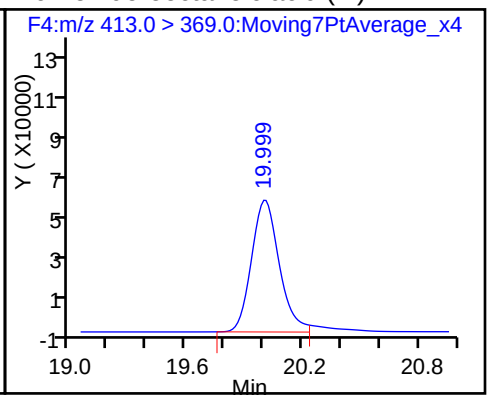
4 Perfluoroheptanoic acid (M)



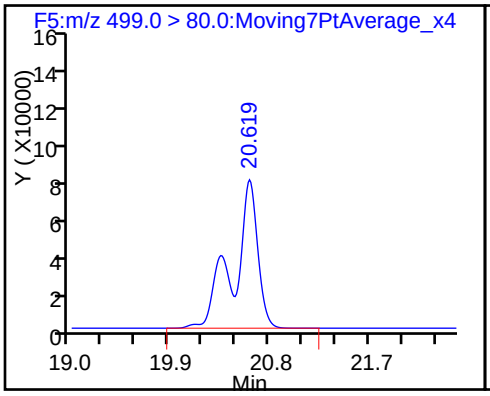
* 5 13C2-PFOA



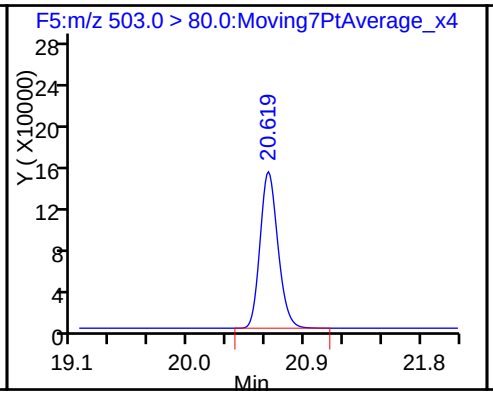
6 Perfluorooctanoic acid (M)



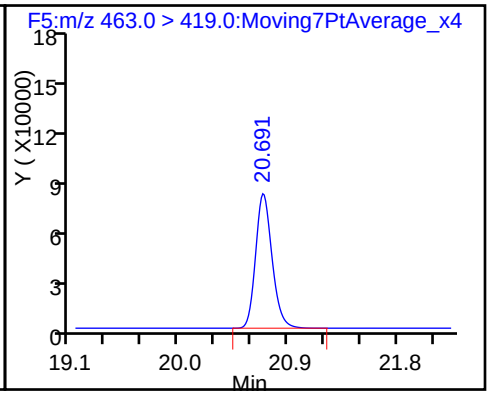
7 Perfluorooctane sulfonic acid



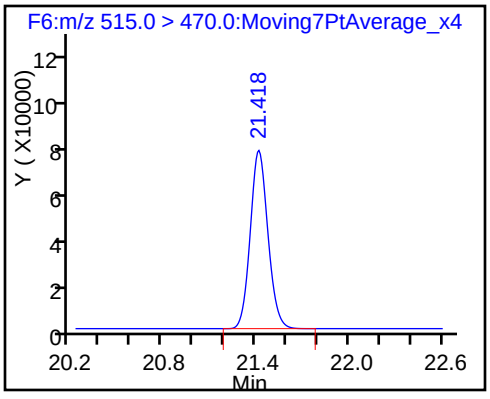
* 8 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

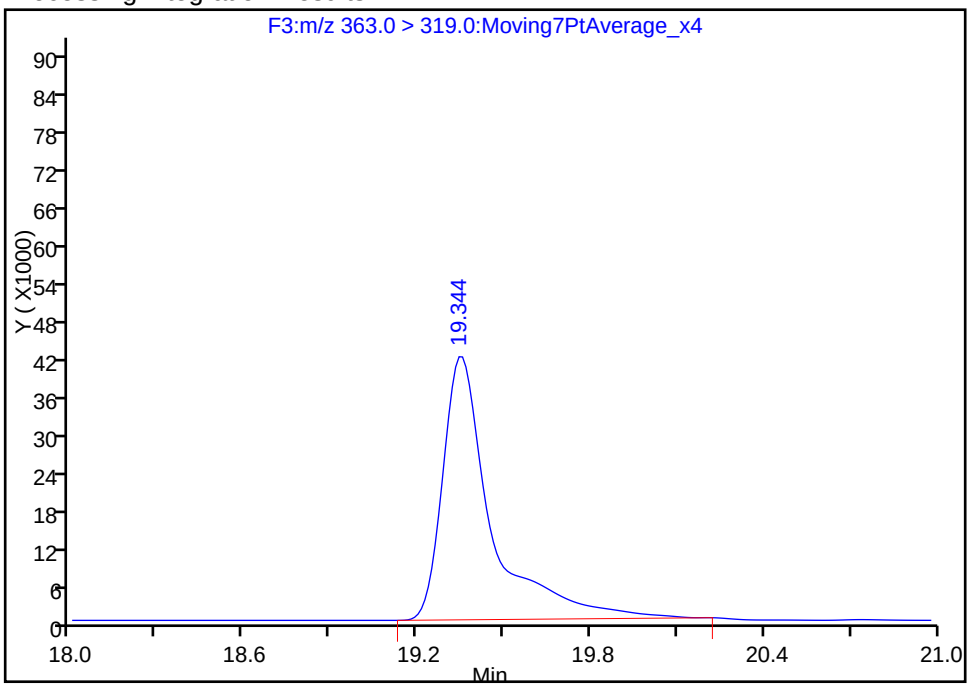
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_006.d
Injection Date: 24-Dec-2016 05:25:20 Instrument ID: A6
Lims ID: STD L3
Client ID:
Operator ID: CBW ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:MRM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

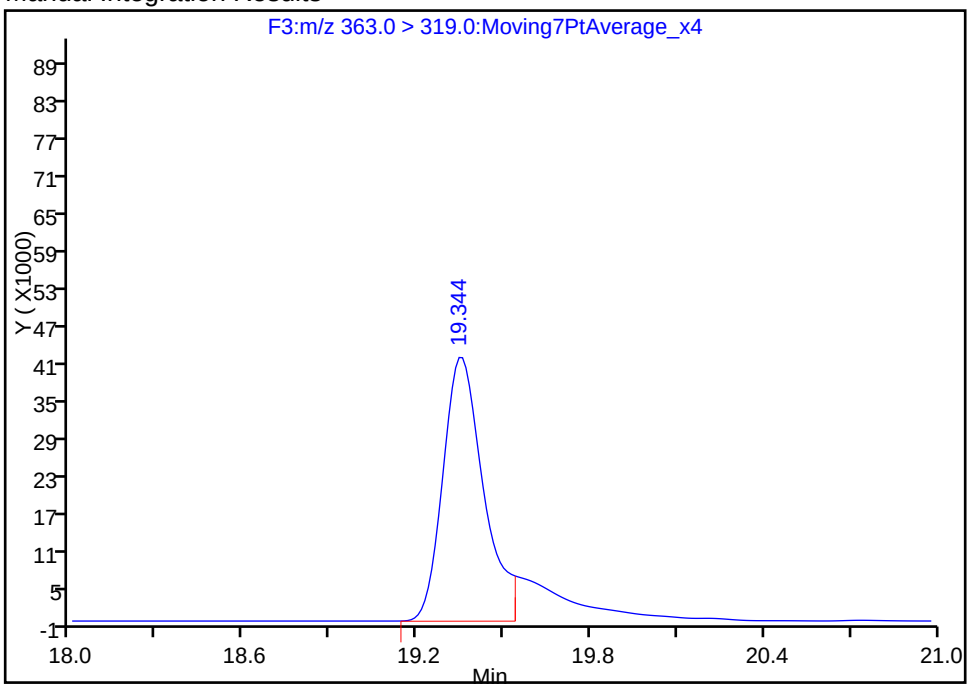
Processing Integration Results

RT: 19.34
Area: 491634
Amount: 6.121135
Amount Units: ng/ml



Manual Integration Results

RT: 19.34
Area: 407699
Amount: 5.535622
Amount Units: ng/ml



Reviewer: phomsophat, 24-Dec-2016 12:04:18
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

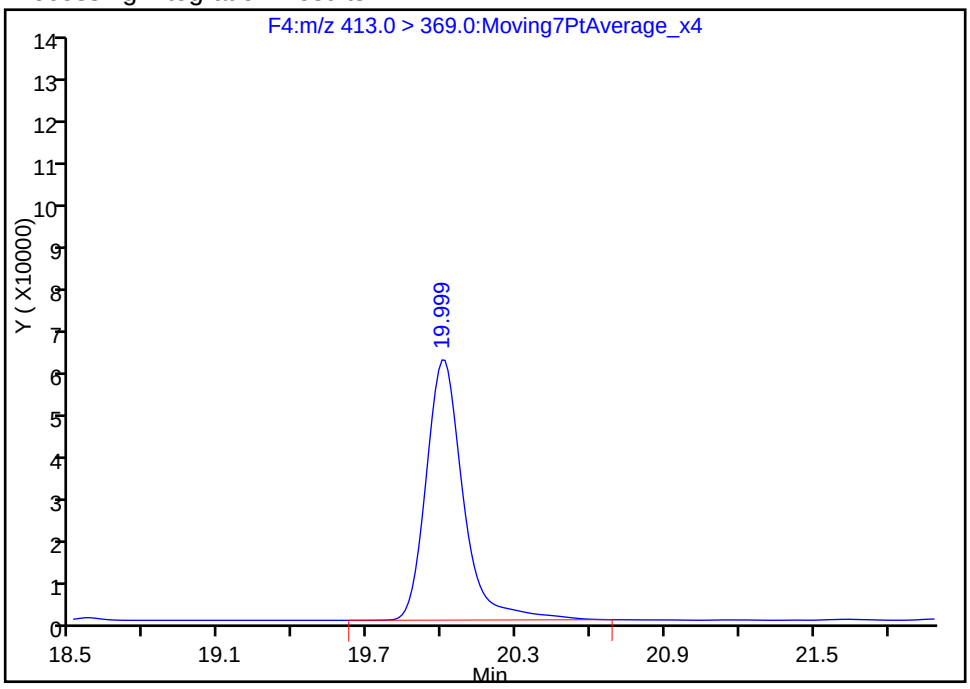
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_006.d
Injection Date: 24-Dec-2016 05:25:20 Instrument ID: A6
Lims ID: STD L3
Client ID:
Operator ID: CBW ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

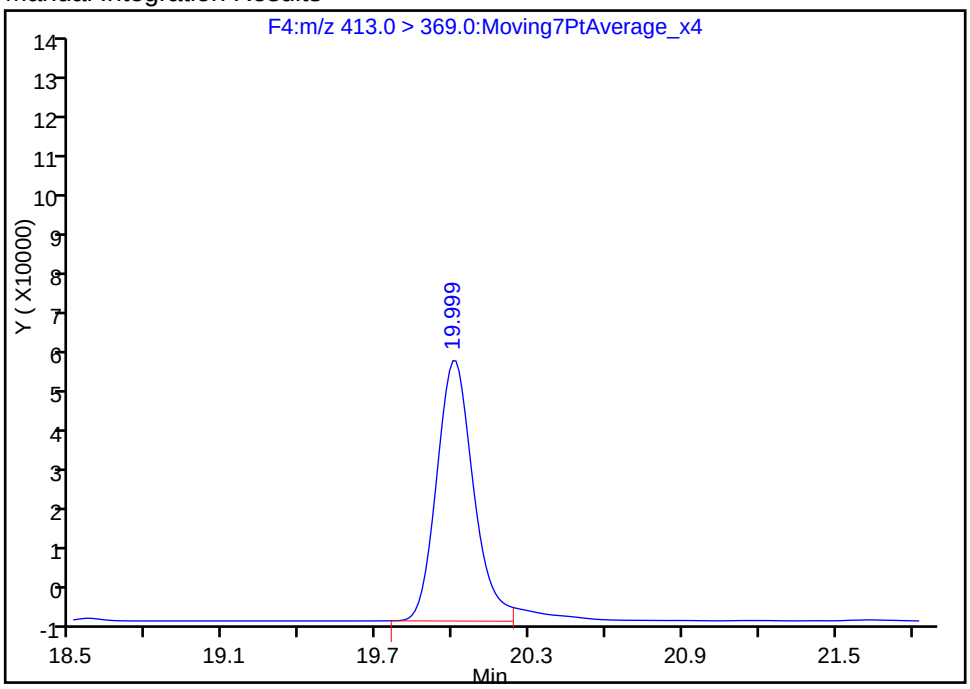
Processing Integration Results

RT: 20.00
Area: 618796
Amount: 10.134867
Amount Units: ng/ml



Manual Integration Results

RT: 20.00
Area: 593502
Amount: 9.789506
Amount Units: ng/ml



Reviewer: phomsophat, 24-Dec-2016 12:09:12
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_007.d
Lims ID: STD L4
Client ID:
Sample Type: ICISAV Calib Level: 4
Inject. Date: 24-Dec-2016 05:54:58 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: STD L4 L4
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6
Sublist: chrom-537__A6*sub3

Method: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 27-Dec-2016 10:55:08 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK031

First Level Reviewer: phomsophat Date: 24-Dec-2016 11:52:02

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.586	17.586	0.0	1.000	3444375	89.4	760	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.558	18.558	0.0	1.000	727339	10.6	23818	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.320	19.318	0.002	1.000	1505450	31.5	34932	
4 Perfluoroheptanoic acid								M
363.0 > 319.0	19.356	19.350	0.006	1.000	733295	10.4	79.4	M
* 5 13C2-PFOA								
415.0 > 370.0	20.011	20.005	0.006		574449	10.0	14462	
6 Perfluorooctanoic acid								
413.0 > 369.0	20.011	20.005	0.006	1.000	1195609	20.7	546	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.619	20.619	0.0	1.000	2327023	41.7	37125	
* 8 13C4 PFOS								
503.0 > 80.0	20.619	20.619	0.0		1456779	28.7	37378	
9 Perfluorononanoic acid								
463.0 > 419.0	20.702	20.697	0.005	1.000	1365537	20.7	20501	
$ 10 13C2 PFDA								
515.0 > 470.0	21.418	21.416	0.002	1.000	605628	10.5	19163	

QC Flag Legend

Review Flags

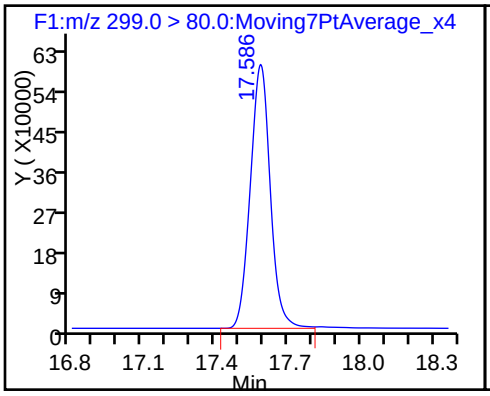
M - Manually Integrated

Reagents:

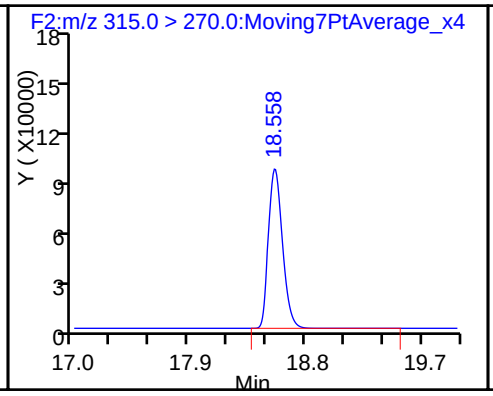
LC537-L4_00017 Amount Added: 1.00 Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_007.d
Injection Date: 24-Dec-2016 05:54:58 Instrument ID: A6
Lims ID: STD L4
Client ID:
Operator ID: CBW ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

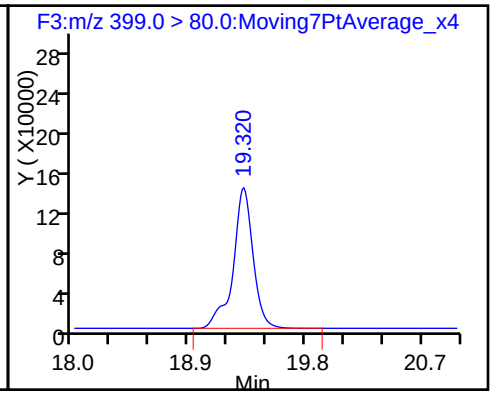
1 Perfluorobutanesulfonic acid



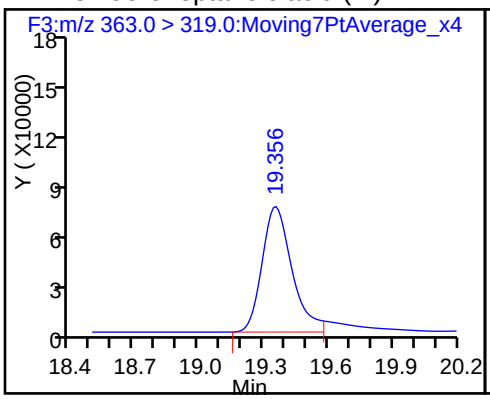
$ 2 13C2 PFHxA



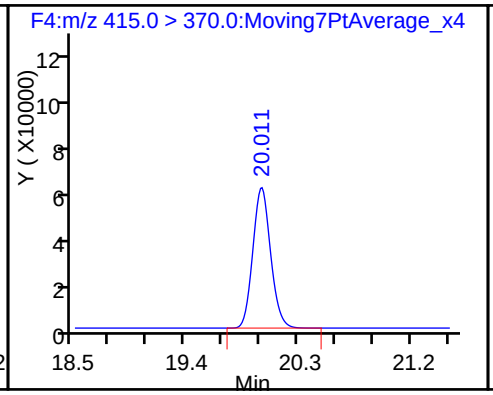
3 Perfluorohexanesulfonic acid



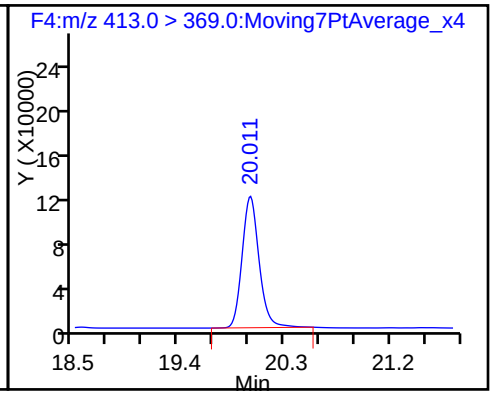
4 Perfluoroheptanoic acid (M)



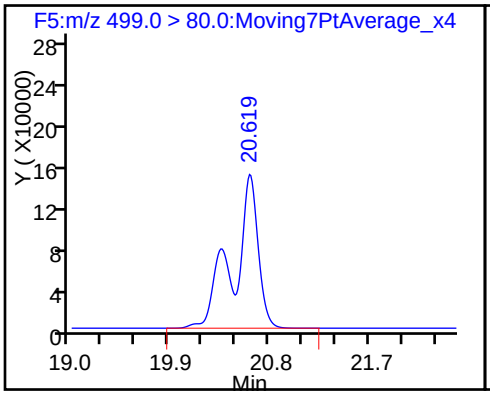
* 5 13C2-PFOA



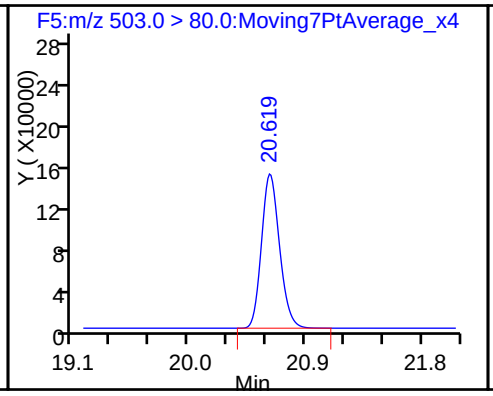
6 Perfluorooctanoic acid



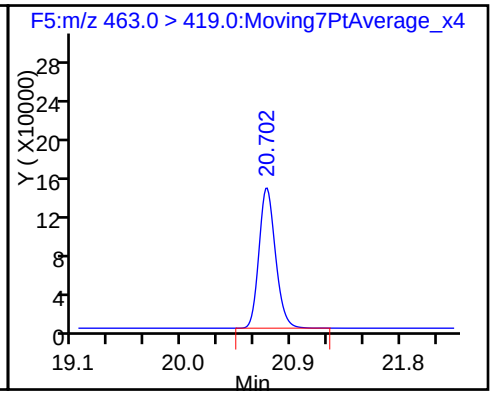
7 Perfluorooctane sulfonic acid



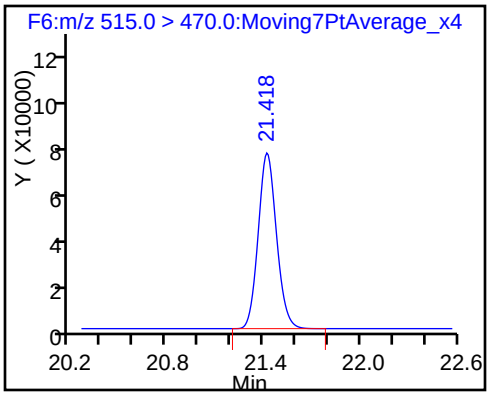
* 8 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

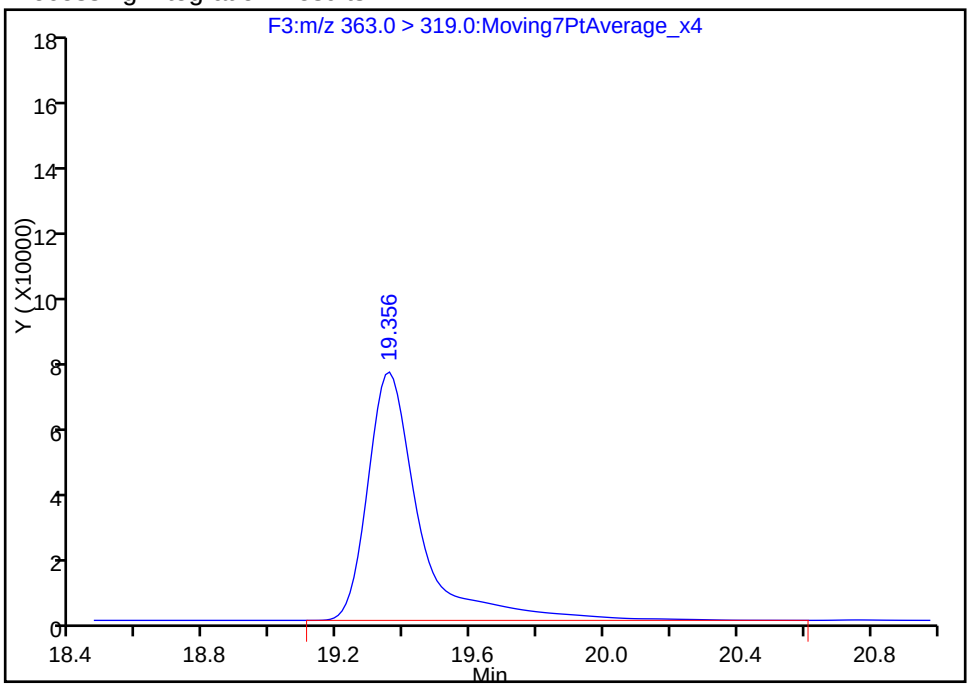
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_007.d
Injection Date: 24-Dec-2016 05:54:58 Instrument ID: A6
Lims ID: STD L4
Client ID:
Operator ID: CBW ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:MRM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

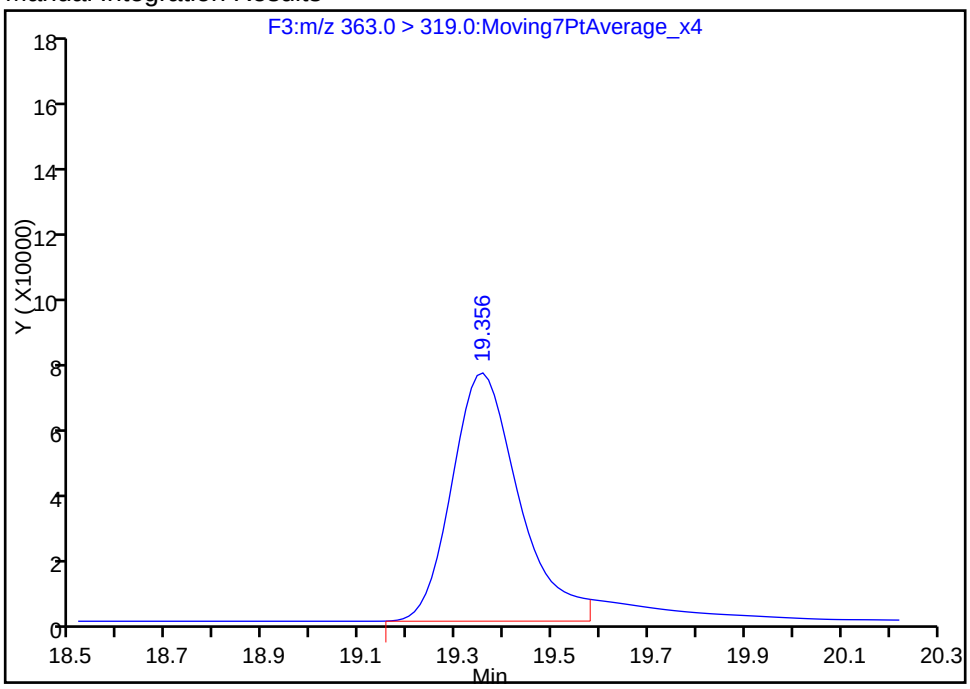
Processing Integration Results

RT: 19.36
Area: 824224
Amount: 11.158414
Amount Units: ng/ml



Manual Integration Results

RT: 19.36
Area: 733295
Amount: 10.447079
Amount Units: ng/ml



Reviewer: phomsophat, 24-Dec-2016 12:07:04
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_008.d
Lims ID: STD L5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 24-Dec-2016 06:24:33 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: STD L5 L5
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6
Sublist: chrom-537__A6*sub3

Method: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 27-Dec-2016 10:55:14 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK031

First Level Reviewer: phomsophat Date: 24-Dec-2016 12:10:47

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.582	17.586	-0.004	1.000	4710266	132.8	8284	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.558	18.558	0.0	1.000	686886	9.73	22056	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.320	19.318	0.002	1.000	2054618	46.7	46922	
4 Perfluoroheptanoic acid								M
363.0 > 319.0	19.356	19.350	0.006	1.000	976632	13.5	82.2	M
* 5 13C2-PFOA								
415.0 > 370.0	20.011	20.005	0.006		591689	10.0	15022	
6 Perfluorooctanoic acid								
413.0 > 369.0	20.011	20.005	0.006	1.000	1721874	28.9	1197	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.619	20.619	0.0	1.000	3403779	66.2	19341	
* 8 13C4 PFOS								
503.0 > 80.0	20.619	20.619	0.0		1340813	28.7	22935	
9 Perfluorononanoic acid								
463.0 > 419.0	20.702	20.697	0.005	1.000	1918933	28.2	14288	
$ 10 13C2 PFDA								
515.0 > 470.0	21.418	21.416	0.002	1.000	591036	9.91	18532	

QC Flag Legend

Review Flags

M - Manually Integrated

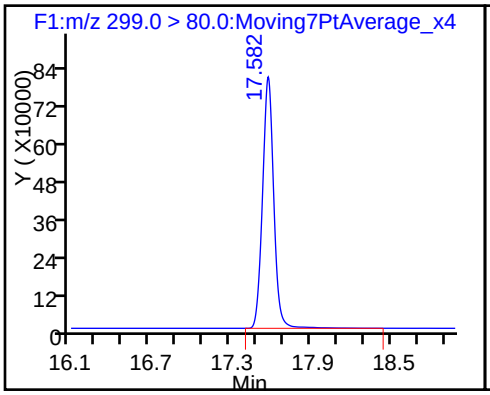
Reagents:

LC537-L5_00019 Amount Added: 1.00 Units: mL

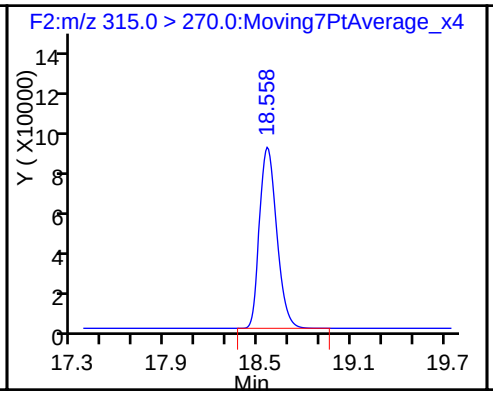
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_008.d
Injection Date: 24-Dec-2016 06:24:33 Instrument ID: A6
Lims ID: STD L5
Client ID:
Operator ID: CBW ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

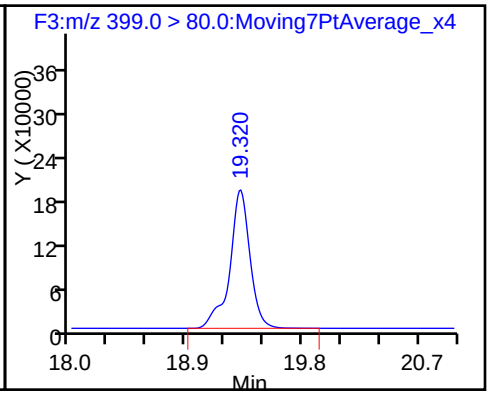
1 Perfluorobutanesulfonic acid



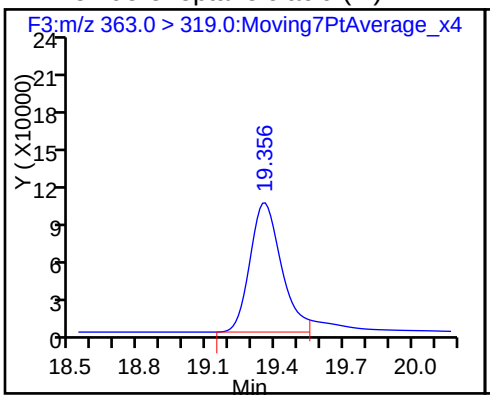
$ 2 13C2 PFHxA



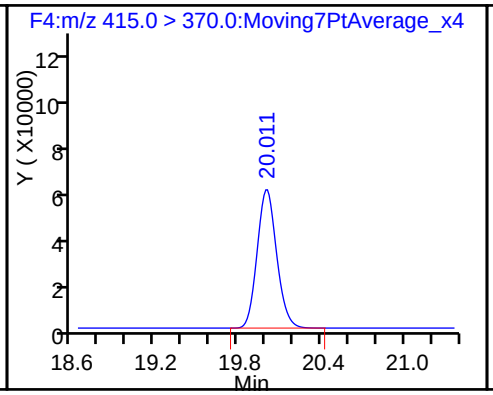
3 Perfluorohexanesulfonic acid



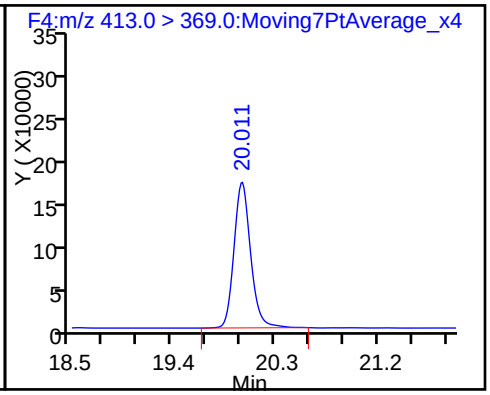
4 Perfluoroheptanoic acid (M)



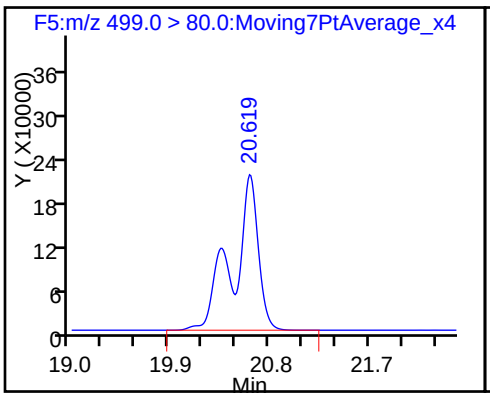
* 5 13C2-PFOA



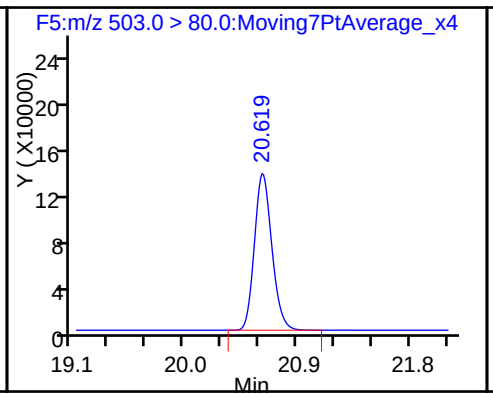
6 Perfluorooctanoic acid



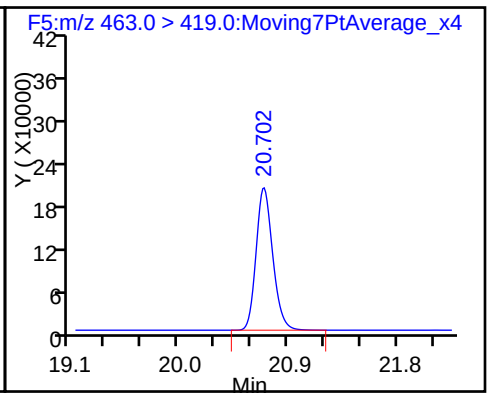
7 Perfluorooctane sulfonic acid



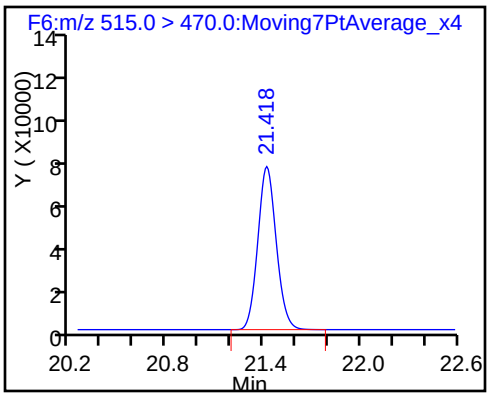
* 8 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

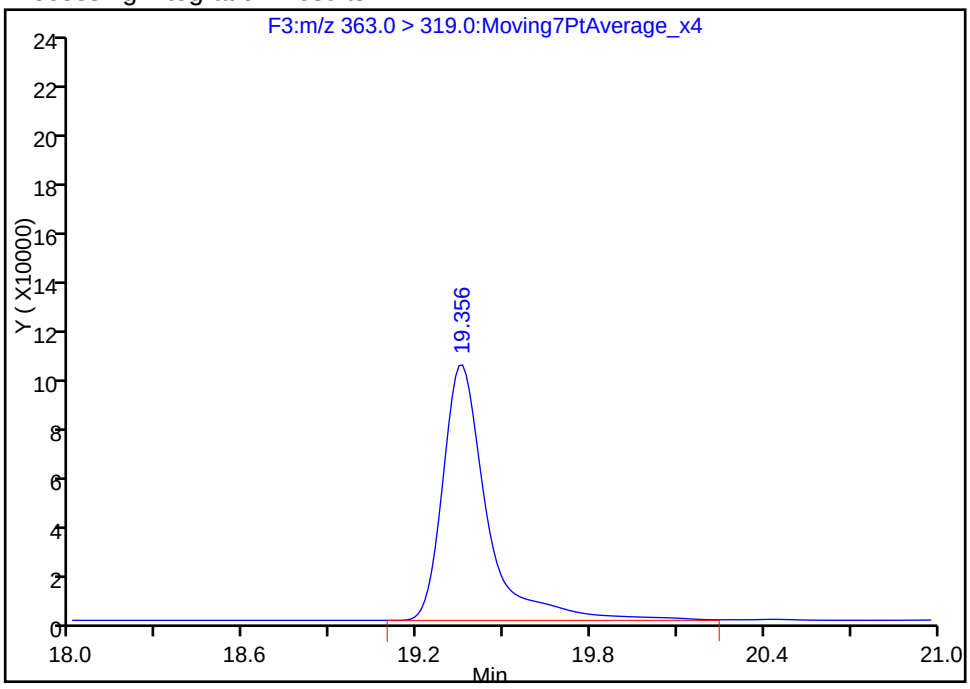
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_008.d
Injection Date: 24-Dec-2016 06:24:33 Instrument ID: A6
Lims ID: STD L5
Client ID:
Operator ID: CBW ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:MRM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

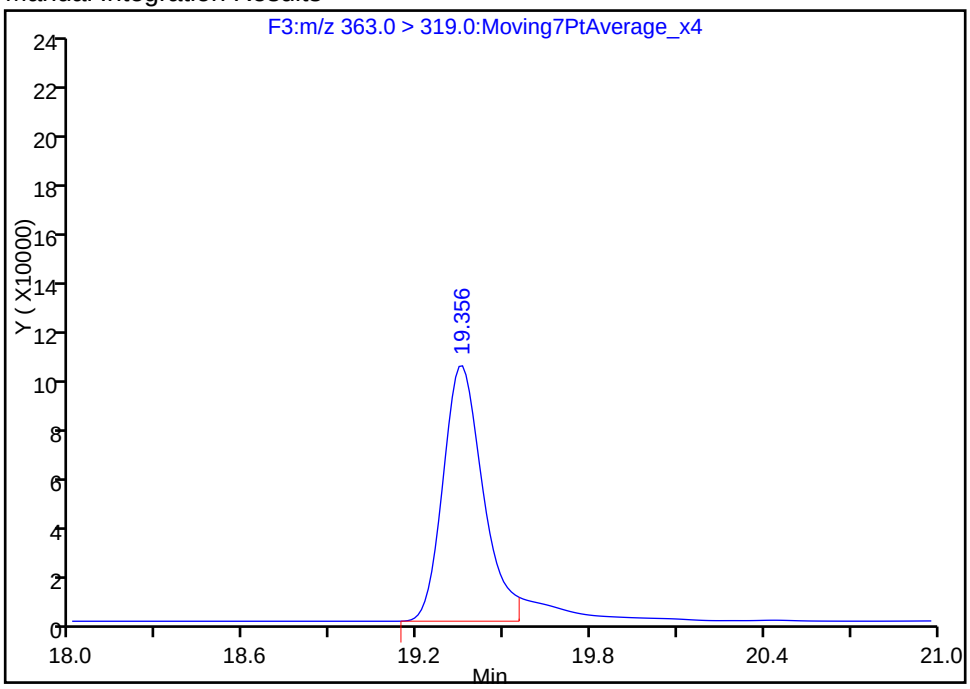
Processing Integration Results

RT: 19.36
Area: 1090608
Amount: 14.634076
Amount Units: ng/ml



Manual Integration Results

RT: 19.36
Area: 976632
Amount: 13.508437
Amount Units: ng/ml



Reviewer: phomsophat, 24-Dec-2016 12:10:47
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
Lims ID: STD L6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 24-Dec-2016 06:54:10 ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: STD L6 L6
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6
Sublist: chrom-537__A6*sub3

Method: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 27-Dec-2016 10:55:20 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK031

First Level Reviewer: phomsophat Date: 24-Dec-2016 12:11:59

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.586	17.586	0.0	1.000	5939448	166.8	2454	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.567	18.558	0.009	1.000	726485	11.7	23627	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.320	19.318	0.002	1.000	2809913	63.6	63277	
4 Perfluoroheptanoic acid								M
363.0 > 319.0	19.356	19.350	0.006	1.000	1230238	19.3	129	M
* 5 13C2-PFOA								
415.0 > 370.0	20.011	20.005	0.006		521213	10.0	13076	
6 Perfluorooctanoic acid								
413.0 > 369.0	20.011	20.005	0.006	1.000	2263615	43.2	940	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.619	20.619	0.0	1.000	4386351	85.0	67299	
* 8 13C4 PFOS								
503.0 > 80.0	20.619	20.619	0.0		1346636	28.7	34338	
9 Perfluorononanoic acid								
463.0 > 419.0	20.702	20.697	0.005	1.000	2652055	44.3	14613	
$ 10 13C2 PFDA								
515.0 > 470.0	21.418	21.416	0.002	1.000	608935	11.6	19393	

QC Flag Legend

Review Flags

M - Manually Integrated

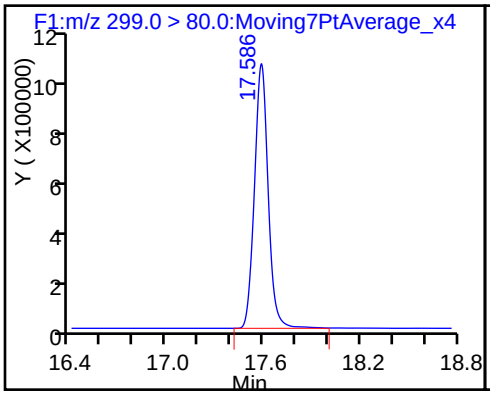
Reagents:

LC537-L6_00016 Amount Added: 1.00 Units: mL

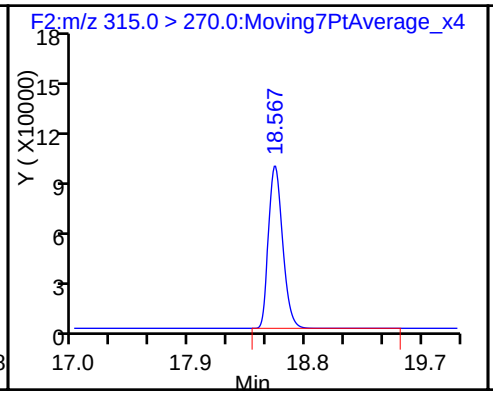
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
Injection Date: 24-Dec-2016 06:54:10 Instrument ID: A6
Lims ID: STD L6
Client ID:
Operator ID: CBW ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

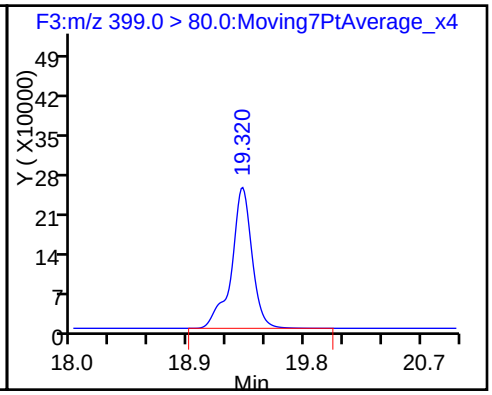
1 Perfluorobutanesulfonic acid



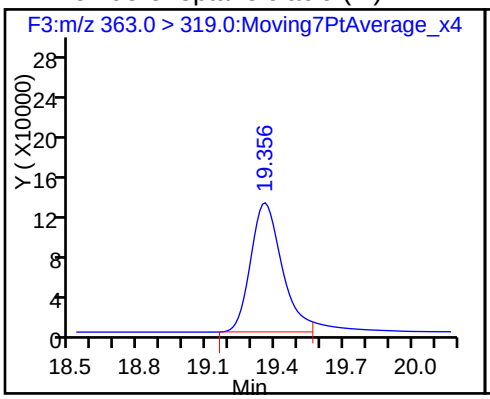
$ 2 13C2 PFHxA



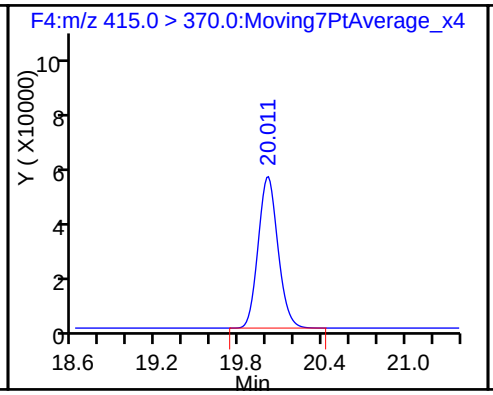
3 Perfluorohexanesulfonic acid



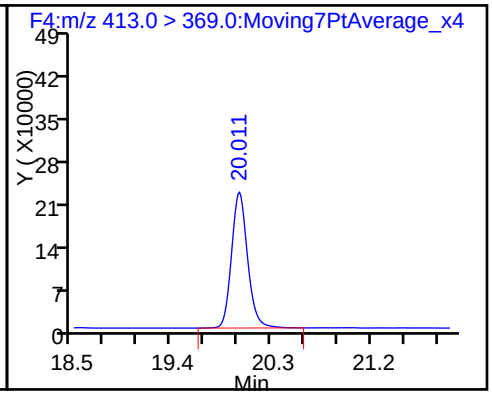
4 Perfluoroheptanoic acid (M)



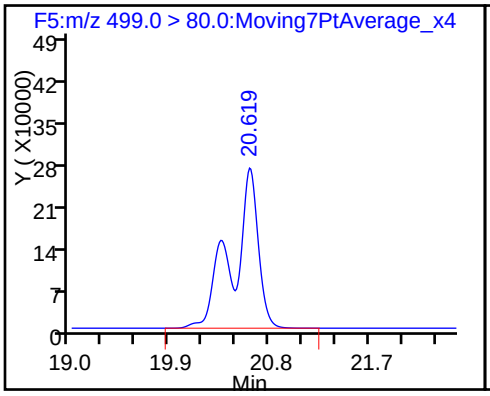
* 5 13C2-PFOA



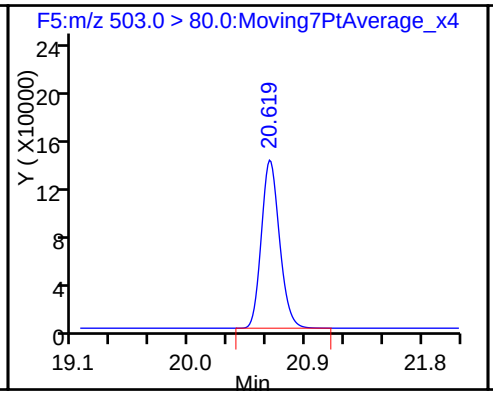
6 Perfluorooctanoic acid



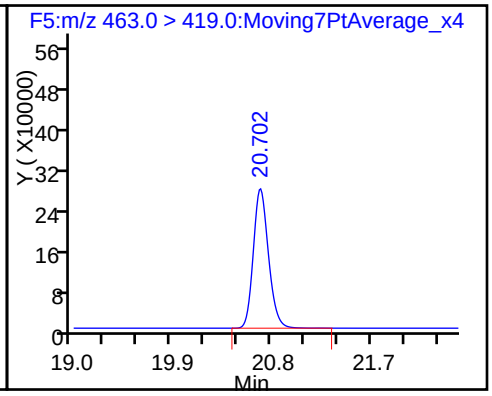
7 Perfluorooctane sulfonic acid



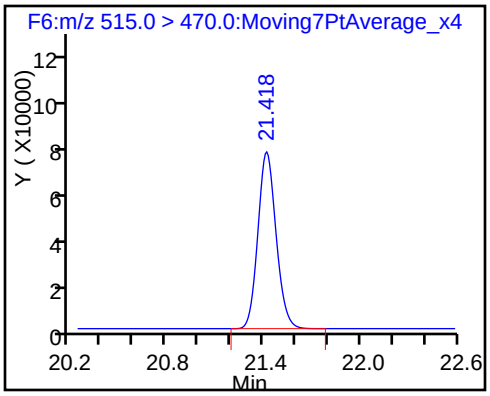
* 8 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA



TestAmerica Sacramento

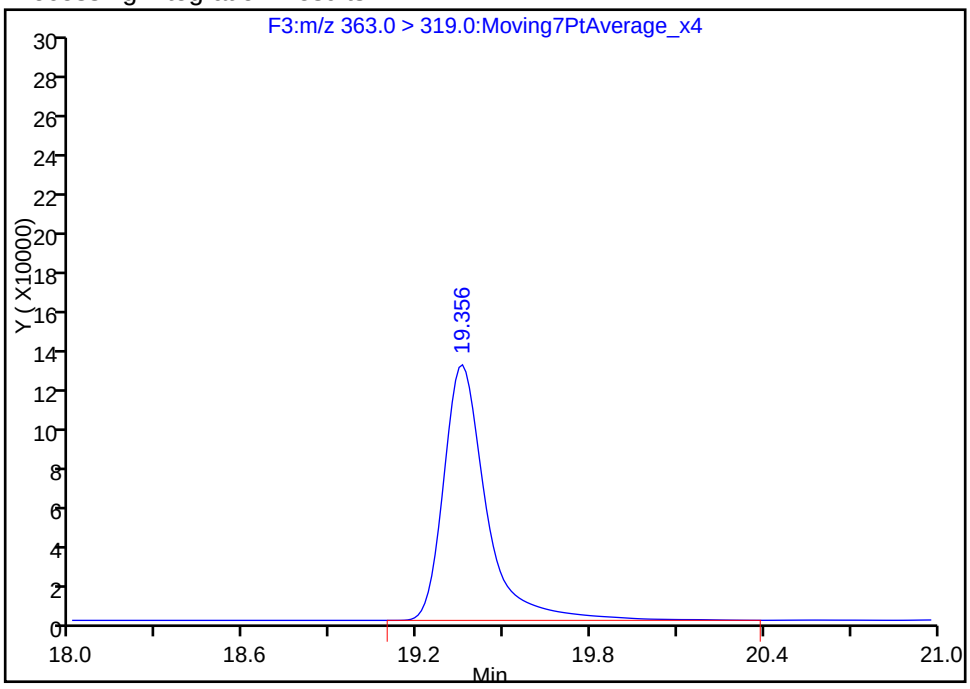
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
Injection Date: 24-Dec-2016 06:54:10 Instrument ID: A6
Lims ID: STD L6
Client ID:
Operator ID: CBW ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:MRM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

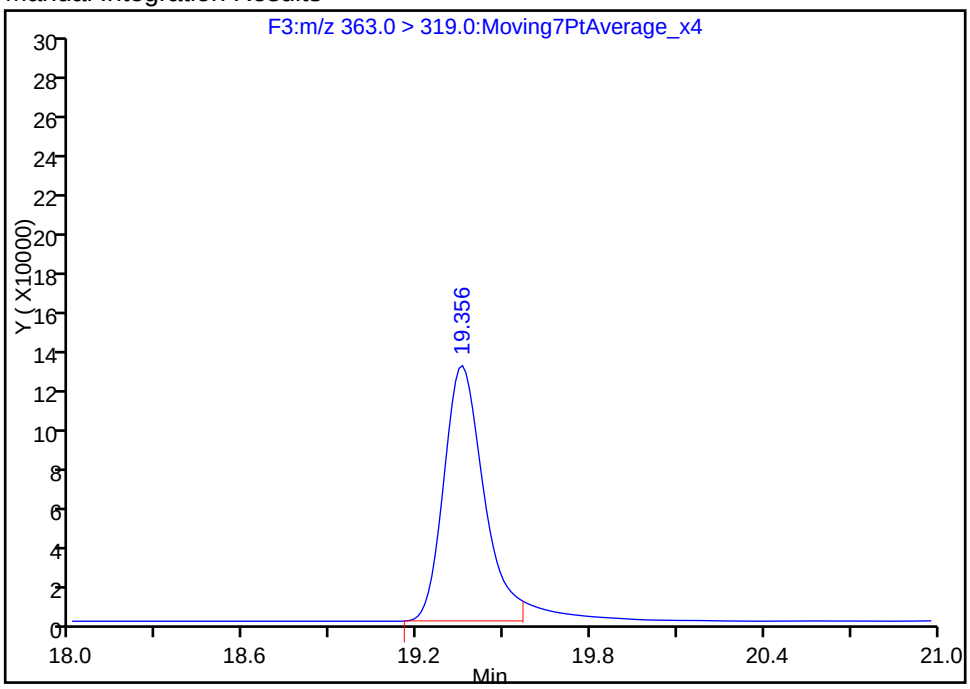
Processing Integration Results

RT: 19.36
Area: 1328838
Amount: 20.595205
Amount Units: ng/ml



Manual Integration Results

RT: 19.36
Area: 1230238
Amount: 19.317083
Amount Units: ng/ml



Reviewer: phomsophat, 24-Dec-2016 12:11:59
Audit Action: Manually Integrated Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Lab Sample ID: CCV 320-143828/11 Calibration Date: 12/24/2016 07:53

Instrument ID: A6 Calib Start Date: 12/24/2016 04:26

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/24/2016 06:54

Lab File ID: 24DEC2016A6A_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7584	0.8007		24.2	22.9	5.6	50.0
Perfluorohexanesulfonic acid	Ave	0.9405	0.9098		7.46	7.72	-3.3	50.0
Perfluoroheptanoic acid	Ave	1.222	1.308		2.70	2.52	7.0	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.006	1.037		5.13	4.98	3.1	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.100	1.106		10.3	10.2	0.5	50.0
Perfluorononanoic acid	Ave	1.149	1.267		5.83	5.29	10.3	50.0
13C2 PFHxA	Ave	1.193	1.160		9.72	10.0	-2.8	30.0
13C2 PFDA	Ave	1.008	0.9498		9.42	10.0	-5.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_011.d
Lims ID: CCV L2
Client ID:
Sample Type: CCVL
Inject. Date: 24-Dec-2016 07:53:20 ALS Bottle#: 2 Worklist Smp#: 11
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: CCV L2 CCV L2
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6
Sublist: chrom-537__A6*sub3

Method: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 27-Dec-2016 10:56:28 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK031

First Level Reviewer: phomsophat Date: 24-Dec-2016 12:19:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.586	17.586	0.0	1.000	1022169	24.2	348	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.558	18.559	-0.001	1.000	757155	9.72	24717	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.320	19.318	0.002	1.000	391515	7.46	9073	
4 Perfluoroheptanoic acid								M
363.0 > 319.0	19.356	19.350	0.006	1.000	215552	2.70	18.7	M
* 5 13C2-PFOA								
415.0 > 370.0	20.011	20.005	0.006		652887	10.0	16566	
6 Perfluorooctanoic acid								M
413.0 > 369.0	20.011	20.005	0.006	1.000	336982	5.13	120	M
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.620	20.619	0.001	1.000	629983	10.3	10166	
* 8 13C4 PFOS								
503.0 > 80.0	20.620	20.619	0.001		1599599	28.7	41464	
9 Perfluorononanoic acid								
463.0 > 419.0	20.691	20.697	-0.006	1.000	437409	5.83	9269	
$ 10 13C2 PFDA								
515.0 > 470.0	21.418	21.416	0.002	1.000	620121	9.42	19537	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00016 Amount Added: 1.00 Units: mL

Report Date: 27-Dec-2016 10:56:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_011.d

Injection Date: 24-Dec-2016 07:53:20 Instrument ID: A6

Lims ID: CCV L2

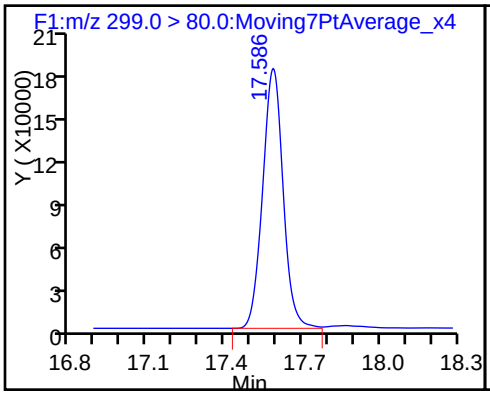
Client ID:

Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 11

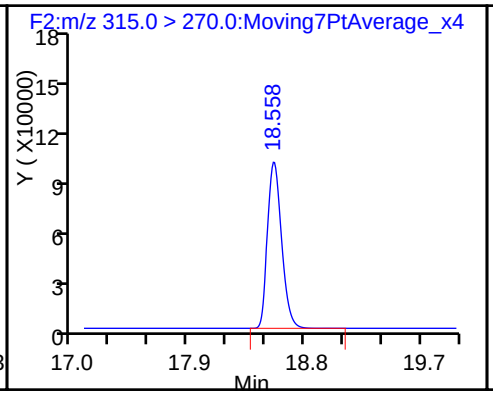
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

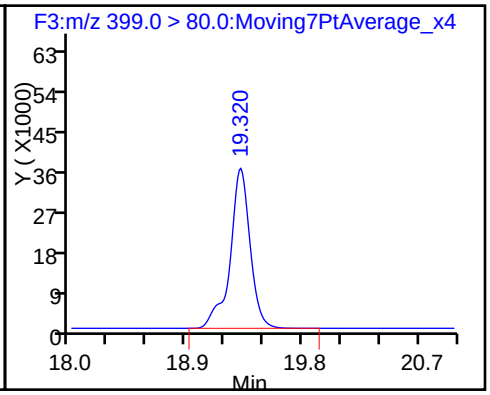
1 Perfluorobutanesulfonic acid



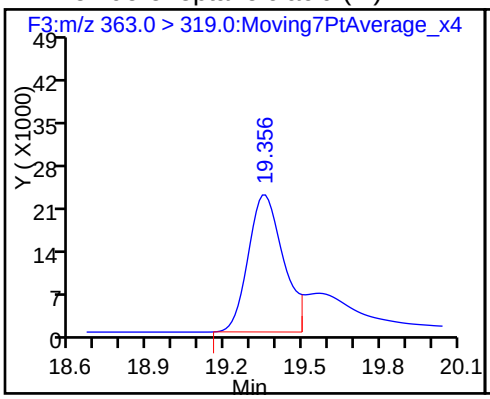
$ 2 13C2 PFHxA



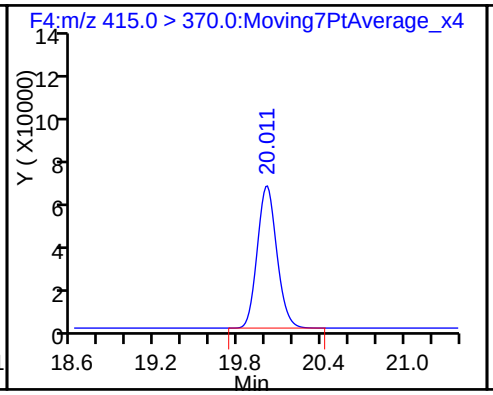
3 Perfluorohexanesulfonic acid



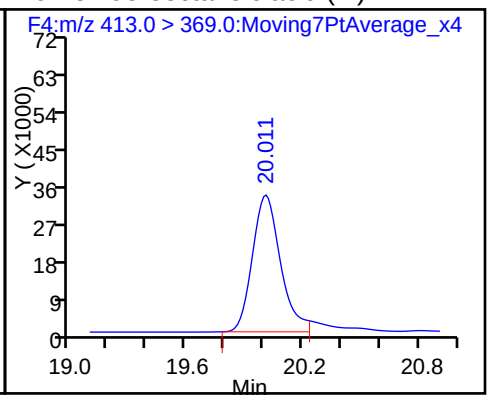
4 Perfluoroheptanoic acid (M)



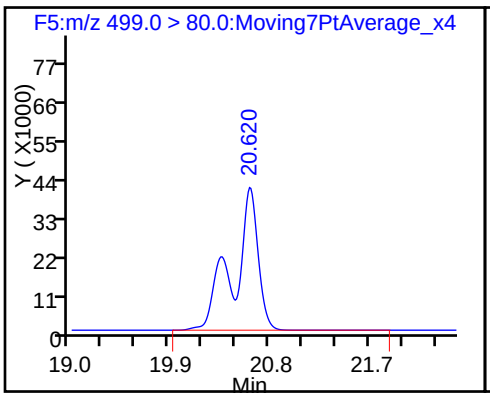
* 5 13C2-PFOA



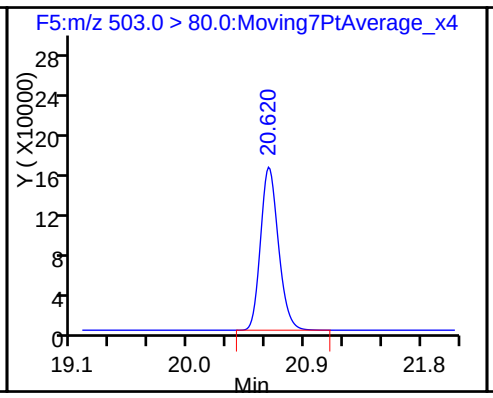
6 Perfluorooctanoic acid (M)



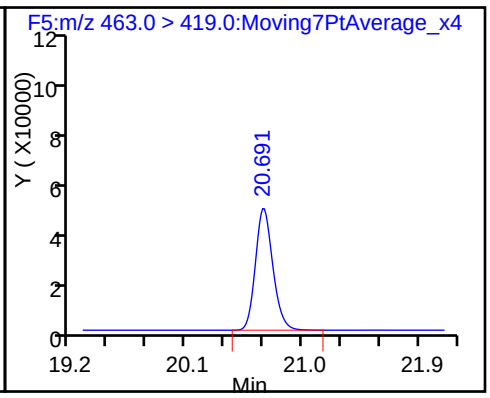
7 Perfluorooctane sulfonic acid



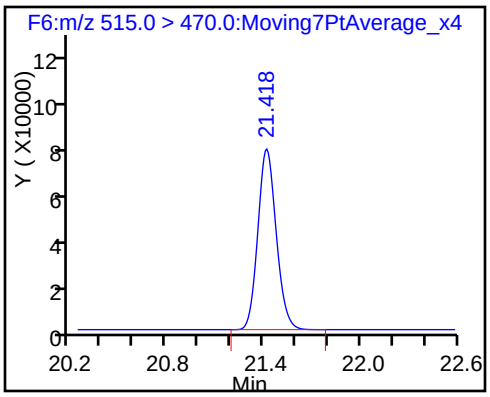
* 8 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

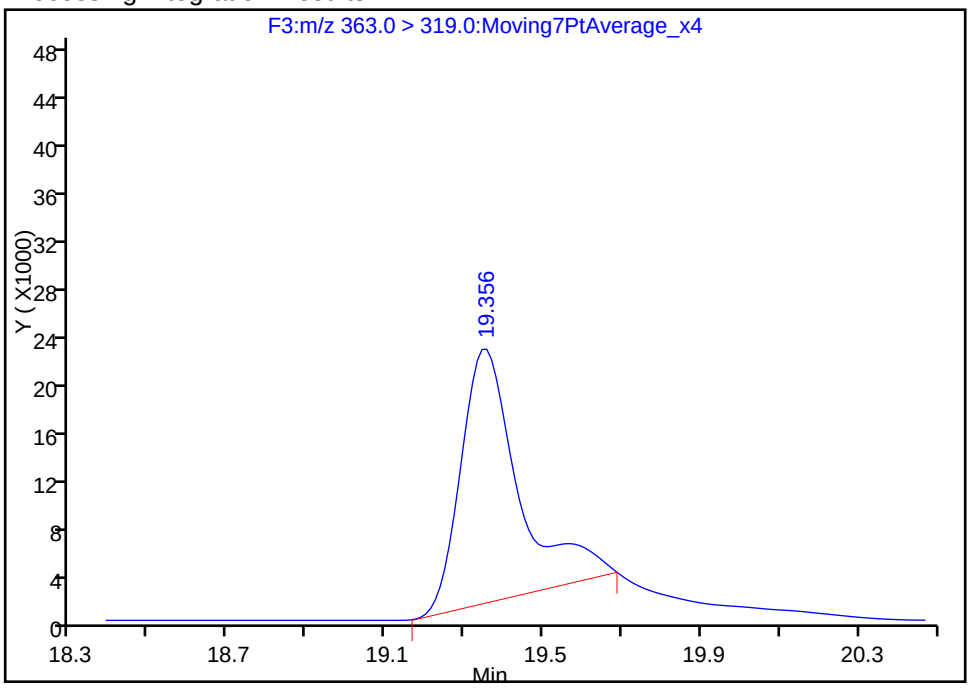
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_011.d
Injection Date: 24-Dec-2016 07:53:20 Instrument ID: A6
Lims ID: CCV L2
Client ID:
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 11
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:MRM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

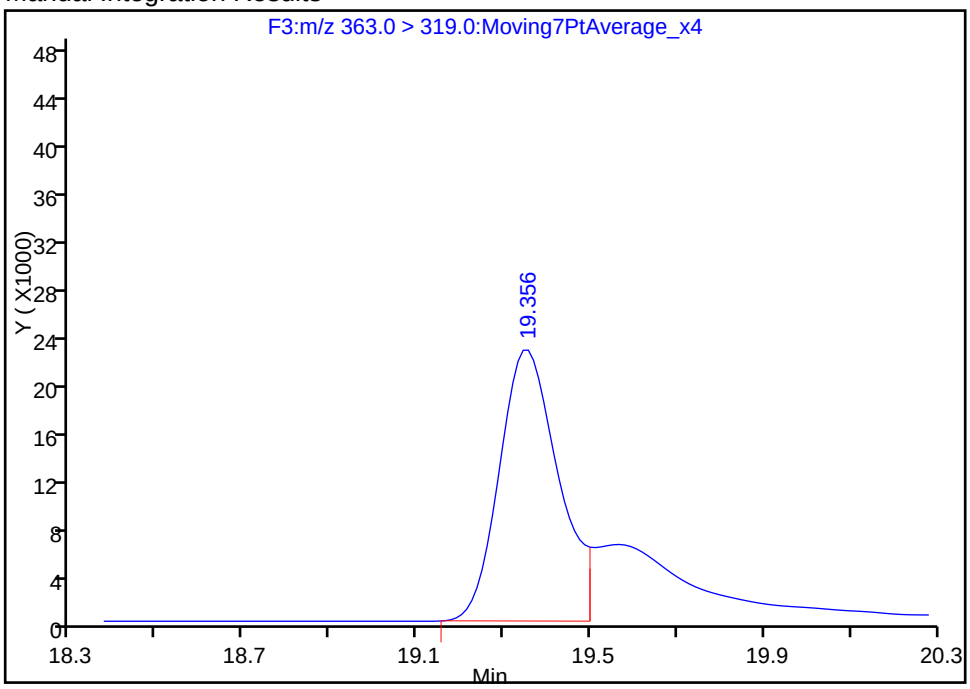
Processing Integration Results

RT: 19.36
Area: 218316
Amount: 2.736624
Amount Units: ng/ml



Manual Integration Results

RT: 19.36
Area: 215552
Amount: 2.701977
Amount Units: ng/ml



Reviewer: phomsophat, 24-Dec-2016 12:19:01
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento

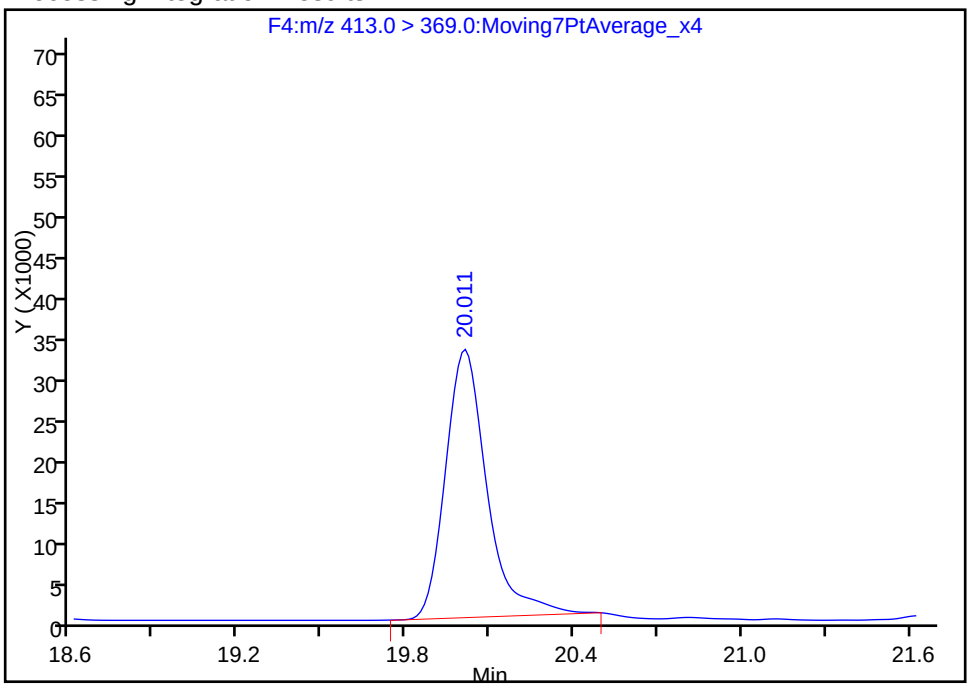
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_011.d
Injection Date: 24-Dec-2016 07:53:20 Instrument ID: A6
Lims ID: CCV L2
Client ID:
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 11
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

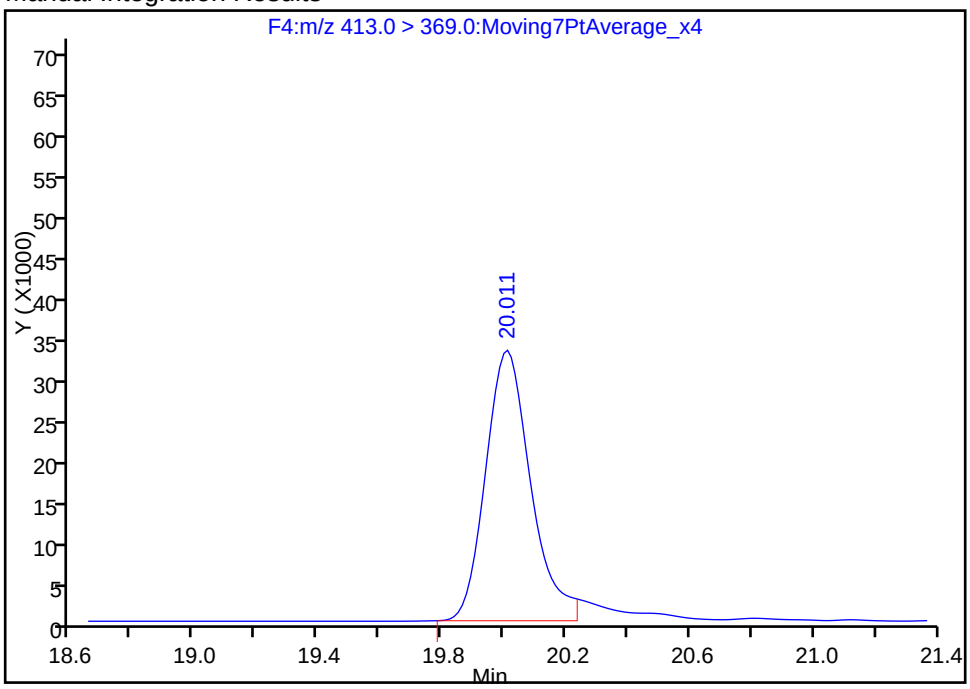
Processing Integration Results

RT: 20.01
Area: 341171
Amount: 5.195334
Amount Units: ng/ml



Manual Integration Results

RT: 20.01
Area: 336982
Amount: 5.131545
Amount Units: ng/ml



Reviewer: phomsophat, 24-Dec-2016 12:19:01
Audit Action: Manually Integrated Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Lab Sample ID: ICV 320-143828/13 Calibration Date: 12/24/2016 08:52

Instrument ID: A6 Calib Start Date: 12/24/2016 04:26

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/24/2016 06:54

Lab File ID: 24DEC2016A6A_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7584	0.5696		86.2	115	-24.9	30.0
Perfluorohexanesulfonic acid	Ave	0.9405	0.6887		19.4	26.5	-26.8	30.0
Perfluoroheptanoic acid	Ave	1.222	1.215		12.5	12.6	-0.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.006	1.023		25.5	25.0	1.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.100	0.8190		20.3	27.2	-25.5	30.0
Perfluorononanoic acid	Ave	1.149	1.056		23.0	25.0	-8.1	30.0
13C2 PFHxA	Ave	1.193	1.179		9.88	10.0	-1.2	30.0
13C2 PFDA	Ave	1.008	0.9390		9.31	10.0	-6.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_013.d
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 24-Dec-2016 08:52:30 ALS Bottle#: 7 Worklist Smp#: 13
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: ICV ICV
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6
Sublist:

Method: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 27-Dec-2016 10:56:38 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK031

First Level Reviewer: phomsophat Date: 24-Dec-2016 12:21:33

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.589	17.586	0.003	1.000	3619397	86.2	870	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.567	18.559	0.008	1.000	695964	9.88	22590	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.320	19.318	0.002	1.000	1009629	19.4	23583	
4 Perfluoroheptanoic acid								M
363.0 > 319.0	19.356	19.350	0.006	1.000	904351	12.5	87.5	M
* 5 13C2-PFOA								
415.0 > 370.0	20.011	20.005	0.006		590506	10.0	14954	
6 Perfluorooctanoic acid								
413.0 > 369.0	20.011	20.005	0.006	1.000	1511917	25.5	1505	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.631	20.619	0.012	1.000	1235004	20.3	19443	
* 8 13C4 PFOS								
503.0 > 80.0	20.620	20.619	0.001		1587807	28.7	41047	
9 Perfluorononanoic acid								
463.0 > 419.0	20.703	20.697	0.006	1.000	1559739	23.0	32800	
$ 10 13C2 PFDA								
515.0 > 470.0	21.418	21.416	0.002	1.000	554498	9.31	17342	

QC Flag Legend

Review Flags

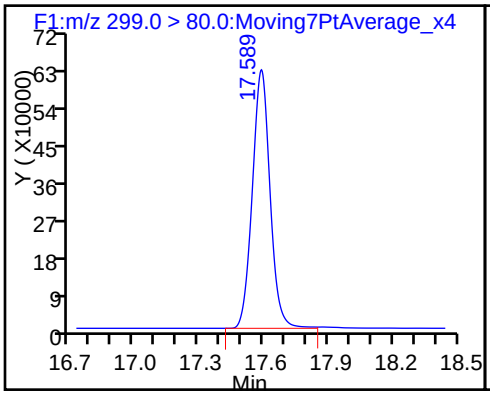
M - Manually Integrated

Reagents:

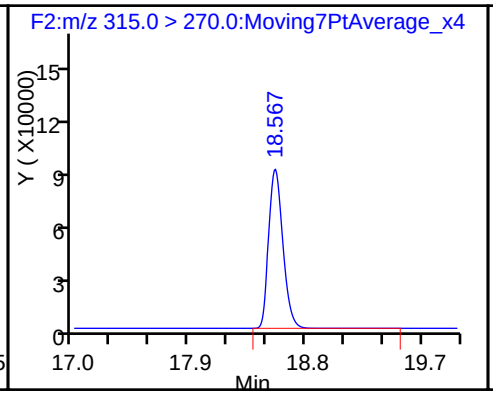
LC537-ICV_00019 Amount Added: 1.00 Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_013.d
Injection Date: 24-Dec-2016 08:52:30 Instrument ID: A6
Lims ID: ICV
Client ID:
Operator ID: CBW ALS Bottle#: 7 Worklist Smp#: 13
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

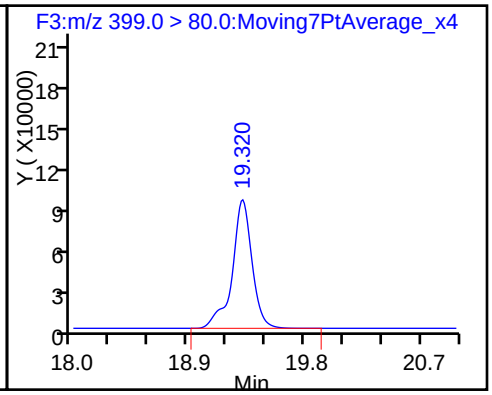
1 Perfluorobutanesulfonic acid



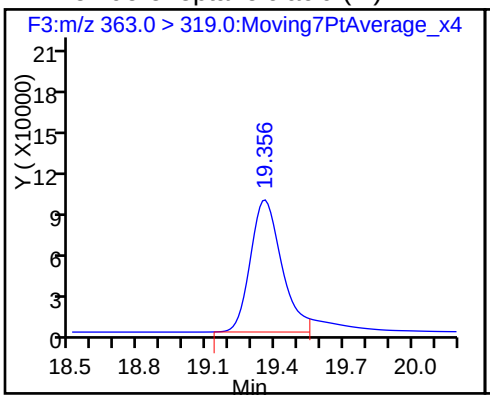
$ 2 13C2 PFHxA



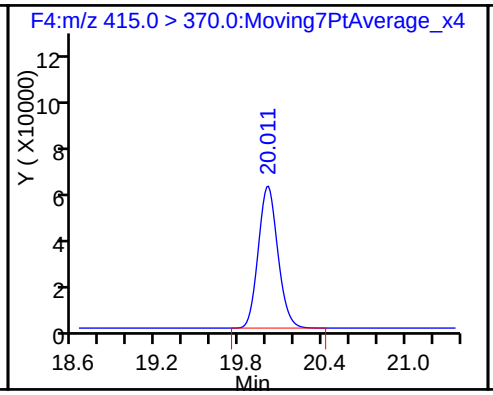
3 Perfluorohexanesulfonic acid



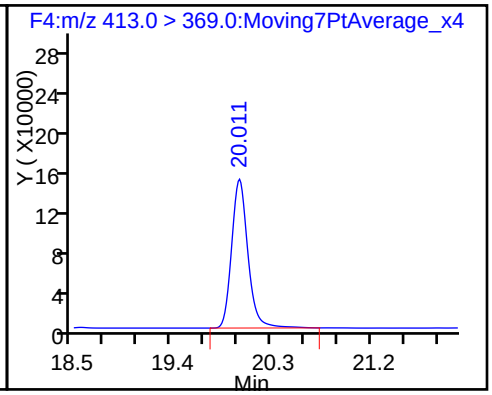
4 Perfluoroheptanoic acid (M)



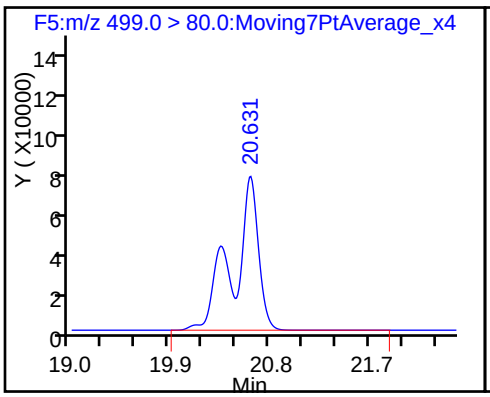
* 5 13C2-PFOA



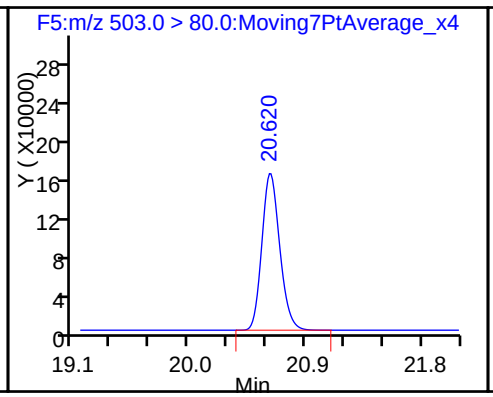
6 Perfluorooctanoic acid



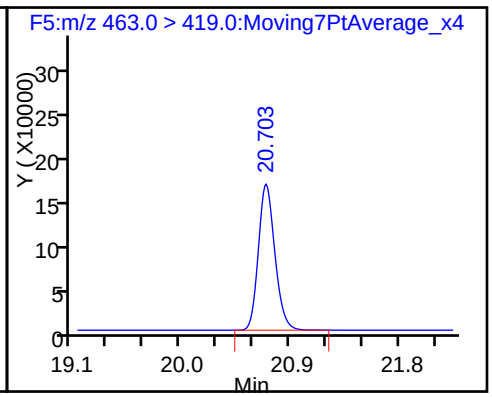
7 Perfluorooctane sulfonic acid



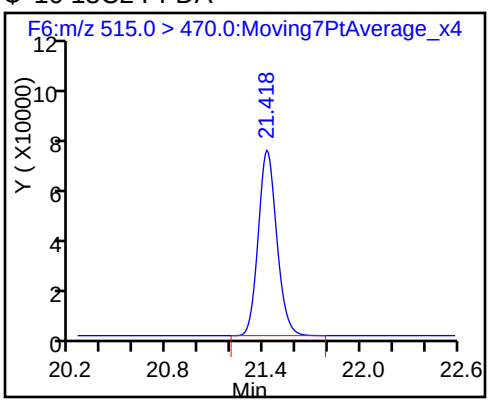
* 8 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

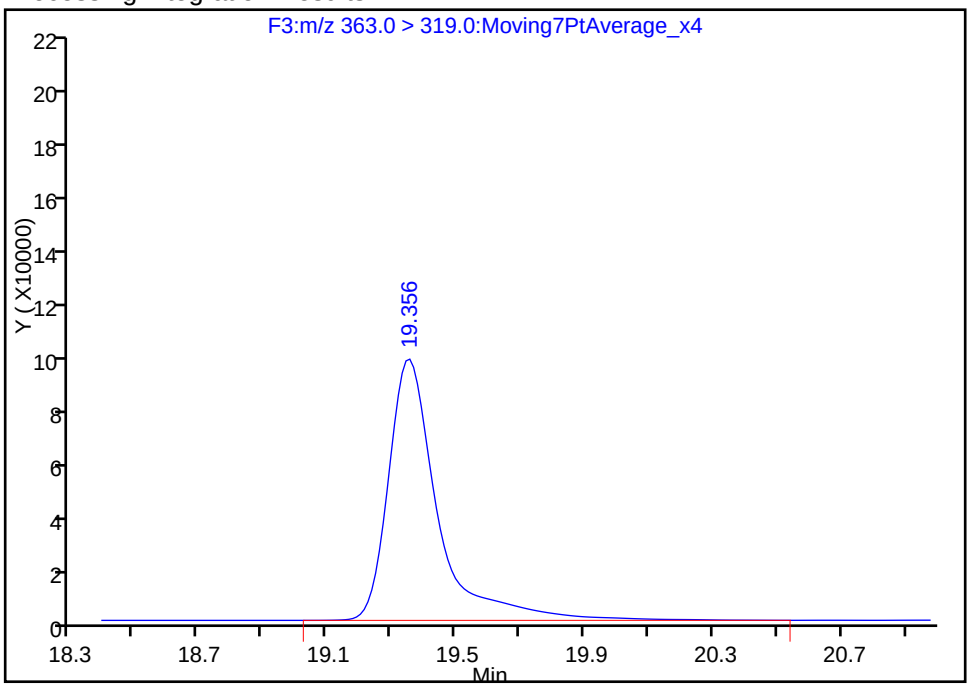
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_013.d
Injection Date: 24-Dec-2016 08:52:30 Instrument ID: A6
Lims ID: ICV
Client ID:
Operator ID: CBW ALS Bottle#: 7 Worklist Smp#: 13
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:MRM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

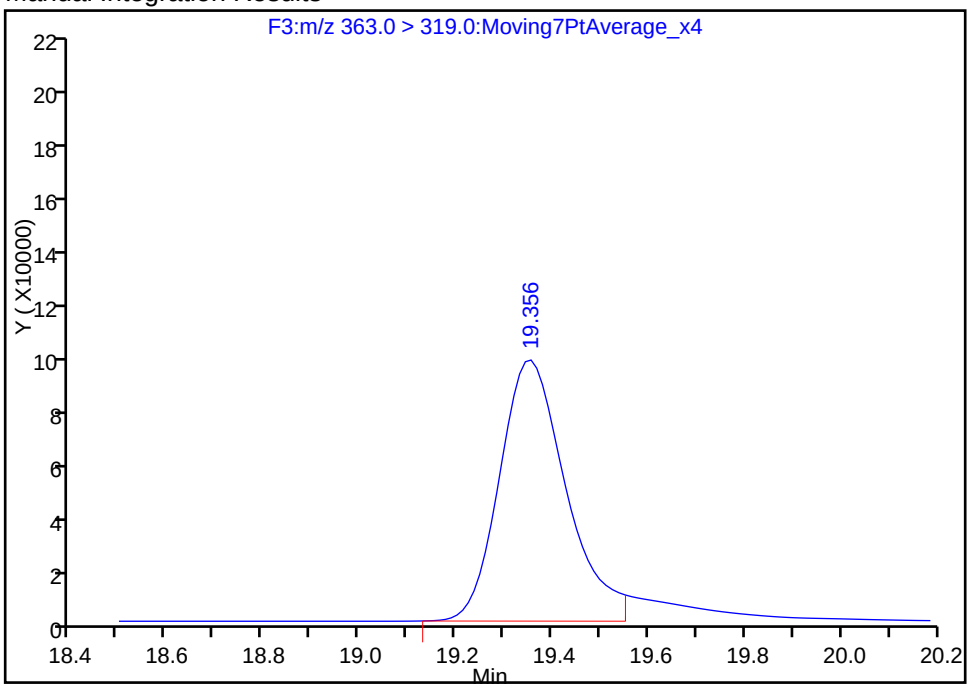
Processing Integration Results

RT: 19.36
Area: 1014586
Amount: 14.061517
Amount Units: ng/ml



Manual Integration Results

RT: 19.36
Area: 904351
Amount: 12.533730
Amount Units: ng/ml



Reviewer: phomsophat, 24-Dec-2016 12:21:33
Audit Action: Manually Integrated Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Lab Sample ID: CCV 320-144608/2 Calibration Date: 01/02/2017 10:56

Instrument ID: A6 Calib Start Date: 12/24/2016 04:26

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/24/2016 06:54

Lab File ID: 02JAN2017A6A_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7584	0.7947		24.0	22.9	4.8	50.0
Perfluorohexanesulfonic acid	Ave	0.9405	0.8573		7.03	7.72	-8.8	50.0
Perfluoroheptanoic acid	Ave	1.222	1.373		2.84	2.52	12.4	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.006	1.195		5.92	4.98	18.9	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.100	1.089		10.1	10.2	-1.0	50.0
Perfluorononanoic acid	Ave	1.149	1.261		5.81	5.29	9.8	50.0
13C2 PFHxA	Ave	1.193	1.143		9.58	10.0	-4.2	30.0
13C2 PFDA	Ave	1.008	1.003		9.94	10.0	-0.6	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_002.d
Lims ID: CCV L2
Client ID:
Sample Type: CCVL
Inject. Date: 02-Jan-2017 10:56:06 ALS Bottle#: 2 Worklist Smp#: 2
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: CCV L2 CCV L2
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6
Sublist: chrom-537__A6*sub3

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 14:46:49 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: phomsophat Date: 02-Jan-2017 12:26:04

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.582	17.582	0.0	1.000	976470	24.0	516	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.558	18.558	0.0	1.000	695267	9.58	22841	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.309	19.309	0.0	1.000	355087	7.03	8199	
4 Perfluoroheptanoic acid								M
363.0 > 319.0	19.344	19.344	0.0	1.000	210901	2.84	59.4	M
* 5 13C2-PFOA								
415.0 > 370.0	19.986	19.986	0.0		608470	10.0	15353	
6 Perfluorooctanoic acid								
413.0 > 369.0	19.986	19.986	0.0	1.000	362039	5.92	219	
* 8 13C4 PFOS								
503.0 > 80.0	20.608	20.608	0.0		1539571	28.7	40162	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.608	20.608	0.0	1.000	597238	10.1	10223	
9 Perfluorononanoic acid								
463.0 > 419.0	20.679	20.679	0.0	1.000	405842	5.81	3619	
$ 10 13C2 PFDA								
515.0 > 470.0	21.400	21.400	0.0	1.000	610113	9.94	19095	

QC Flag Legend

Review Flags

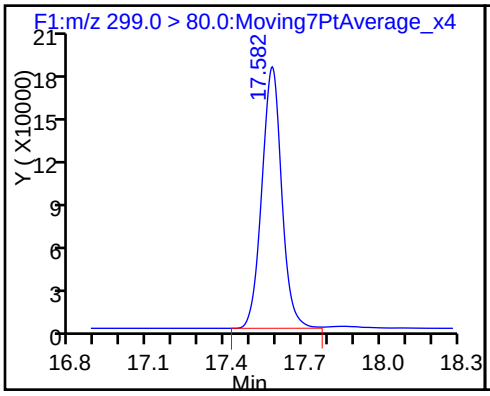
M - Manually Integrated

Reagents:

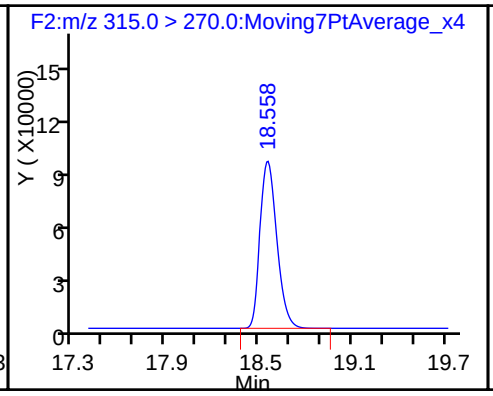
LC537-L2_00016 Amount Added: 1.00 Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_002.d
Injection Date: 02-Jan-2017 10:56:06 Instrument ID: A6
Lims ID: CCV L2
Client ID:
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 2
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

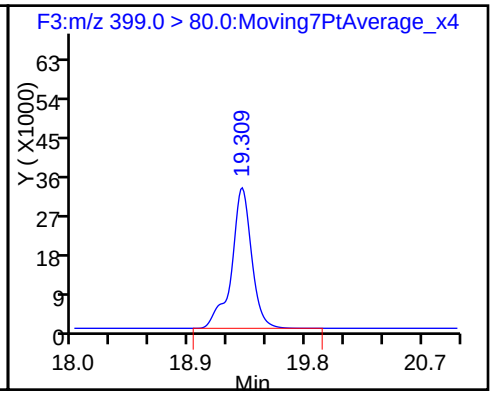
1 Perfluorobutanesulfonic acid



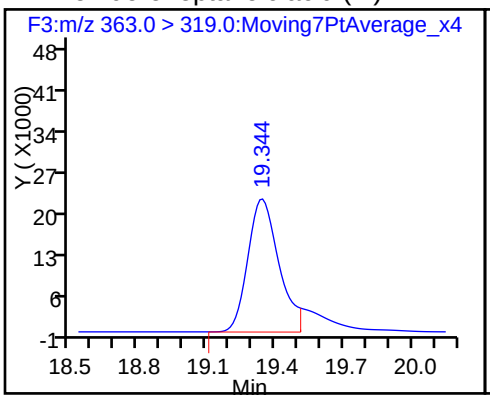
$ 2 13C2 PFHxA



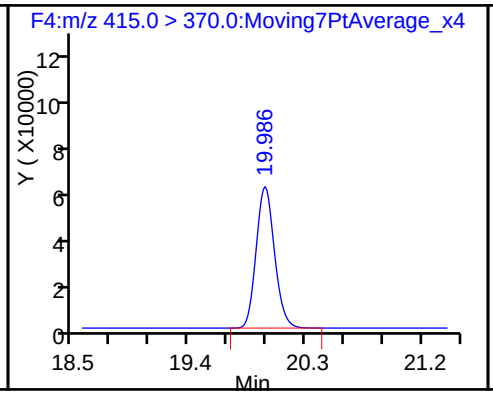
3 Perfluorohexanesulfonic acid



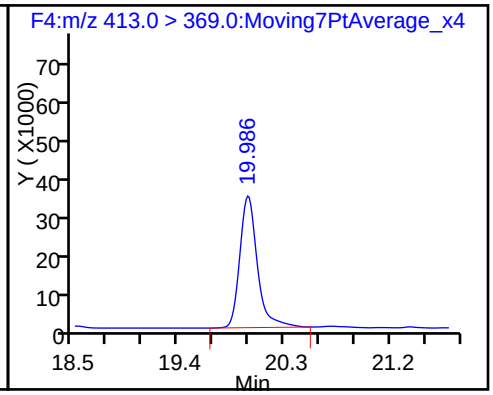
4 Perfluoroheptanoic acid (M)



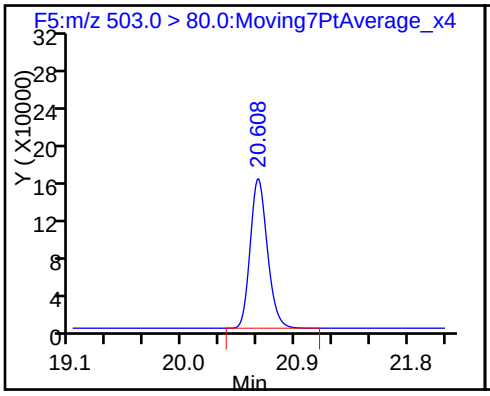
* 5 13C2-PFOA



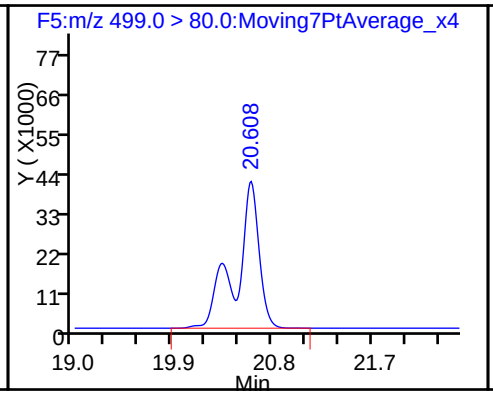
6 Perfluorooctanoic acid



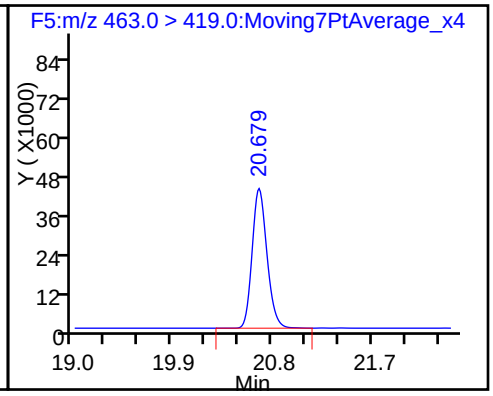
* 8 13C4 PFOS



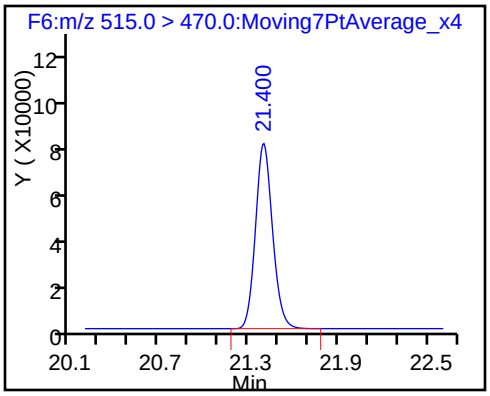
7 Perfluorooctane sulfonic acid



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

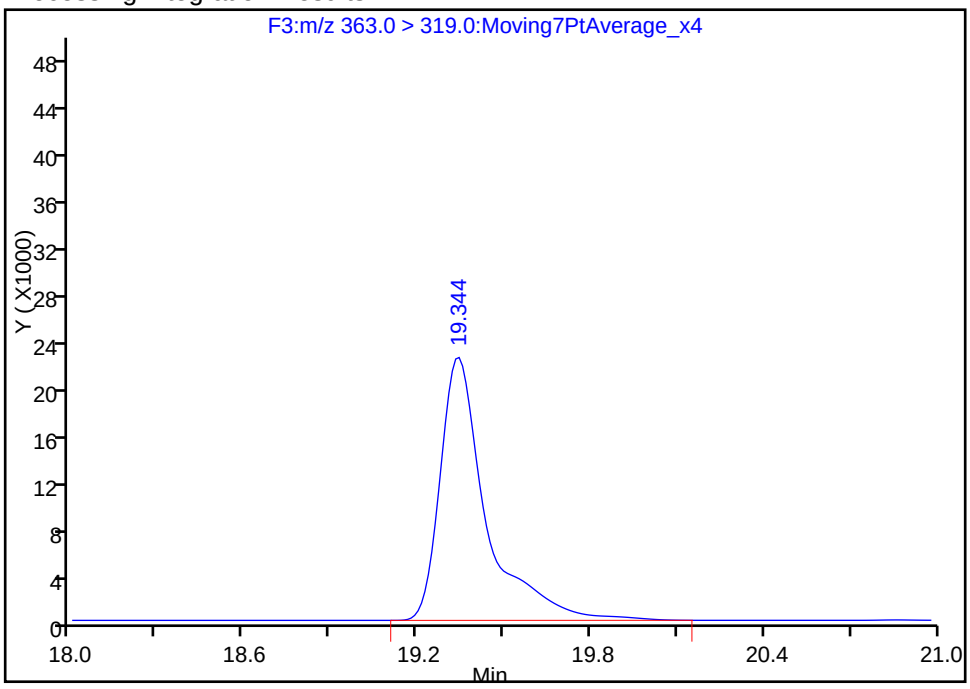
Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_002.d
Injection Date: 02-Jan-2017 10:56:06 Instrument ID: A6
Lims ID: CCV L2
Client ID:
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 2
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:MRM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

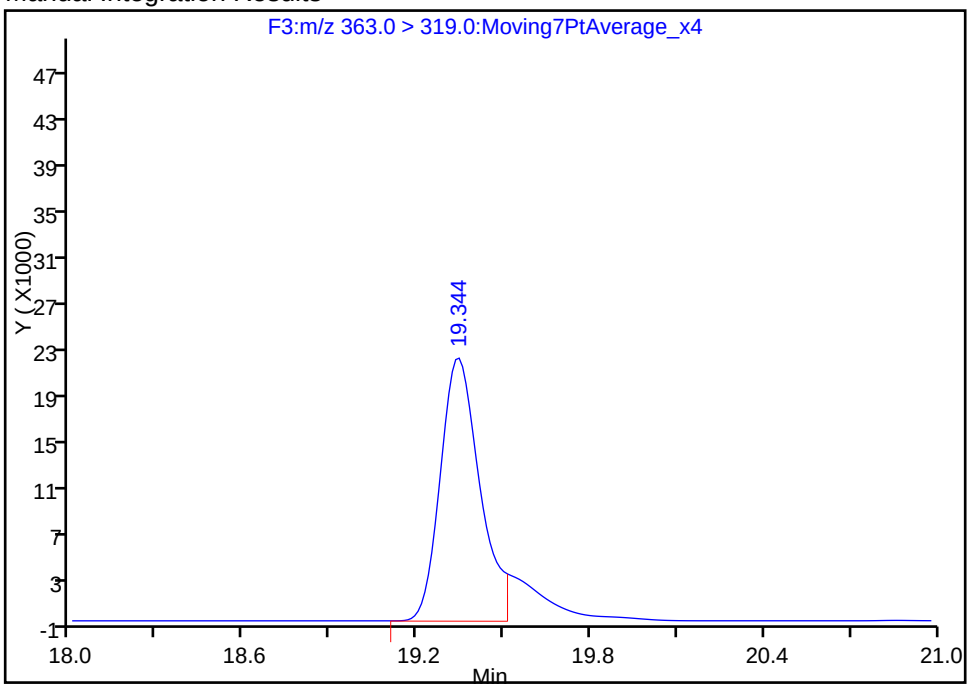
Processing Integration Results

RT: 19.34
Area: 247027
Amount: 3.322560
Amount Units: ng/ml



Manual Integration Results

RT: 19.34
Area: 210901
Amount: 2.836659
Amount Units: ng/ml



Reviewer: barnettj, 03-Jan-2017 13:55:22
Audit Action: Manually Integrated Audit Reason: Split Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Lab Sample ID: CCV 320-144610/15 Calibration Date: 01/02/2017 17:20

Instrument ID: A6 Calib Start Date: 12/24/2016 04:26

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/24/2016 06:54

Lab File ID: 02JAN2017A6A_015.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7584	0.7470		133	135	-1.5	30.0
Perfluorohexanesulfonic acid	Ave	0.9405	0.9878		47.7	45.4	5.0	30.0
Perfluoroheptanoic acid	Ave	1.222	1.179		14.3	14.9	-3.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.006	1.069		31.1	29.3	6.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.100	1.196		65.4	60.1	8.8	30.0
Perfluorononanoic acid	Ave	1.149	1.207		32.7	31.1	5.0	30.0
13C2 PFHxA	Ave	1.193	1.111		9.31	10.0	-6.9	30.0
13C2 PFDA	Ave	1.008	1.012		10.0	10.0	0.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_015.d
Lims ID: CCV L5
Client ID:
Sample Type: CCVIS
Inject. Date: 02-Jan-2017 17:20:51 ALS Bottle#: 5 Worklist Smp#: 15
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6
Sublist: chrom-537__A6*sub3

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 14:47:20 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.576	17.576	0.0	1.000	4731838	132.6	987	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.549	18.549	0.0	1.000	619886	9.31	20497	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.308	19.308	0.0	1.000	2109420	47.7	48601	
4 Perfluoroheptanoic acid								
363.0 > 319.0	19.344	19.344	0.0	1.000	977037	14.3	3588	
* 5 13C2-PFOA								
415.0 > 370.0	19.986	19.986	0.0		558059	10.0	14034	
6 Perfluorooctanoic acid								
413.0 > 369.0	19.999	19.999	0.0	1.000	1746516	31.1	915	
* 8 13C4 PFOS								
503.0 > 80.0	20.608	20.608	0.0		1349410	28.7	34991	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.608	20.608	0.0	1.000	3383090	65.4	11050	
9 Perfluorononanoic acid								
463.0 > 419.0	20.679	20.679	0.0	1.000	2094866	32.7	15710	
$ 10 13C2 PFDA								
515.0 > 470.0	21.409	21.409	0.0	1.000	564527	10.0	17711	

Reagents:

LC537-L5_00019 Amount Added: 1.00 Units: mL

Report Date: 03-Jan-2017 14:47:21 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_015.d

Injection Date: 02-Jan-2017 17:20:51 Instrument ID: A6

Lims ID: CCV L5

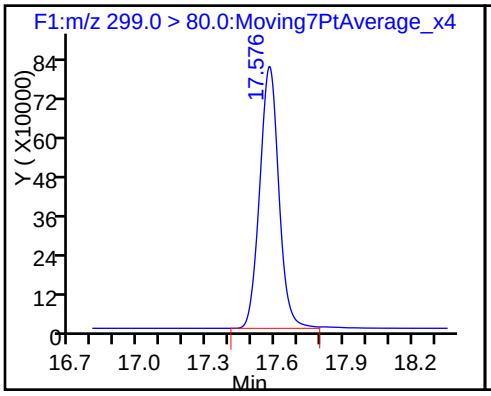
Client ID:

Operator ID: CBW ALS Bottle#: 5 Worklist Smp#: 15

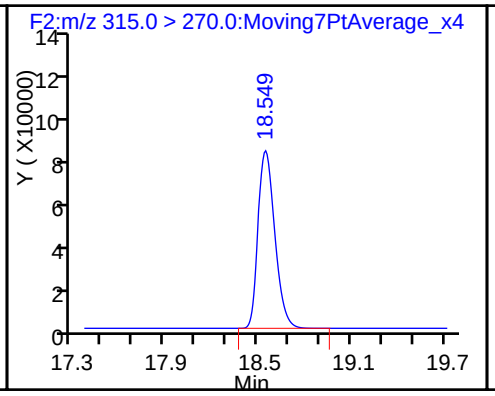
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

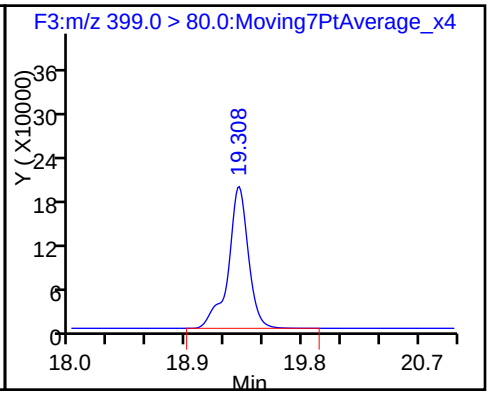
1 Perfluorobutanesulfonic acid



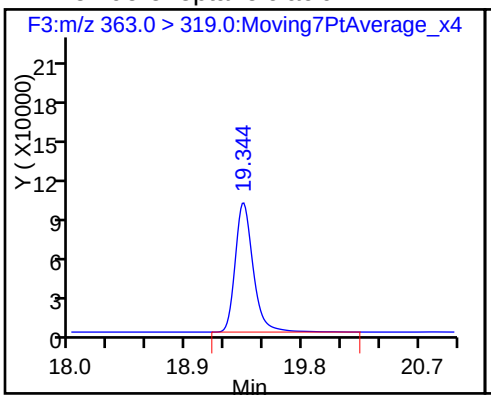
$ 2 13C2 PFHxA



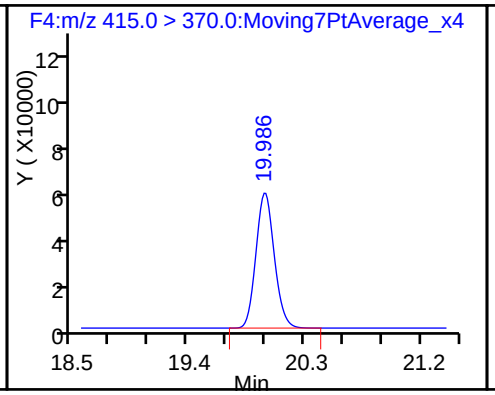
3 Perfluorohexanesulfonic acid



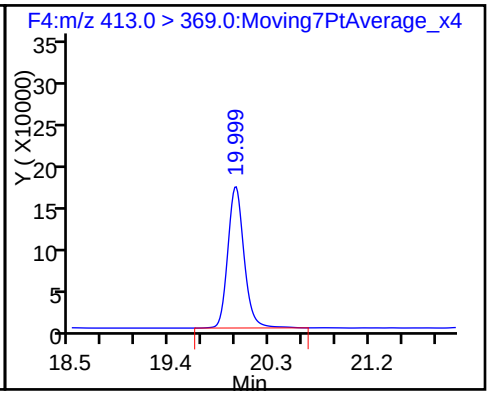
4 Perfluoroheptanoic acid



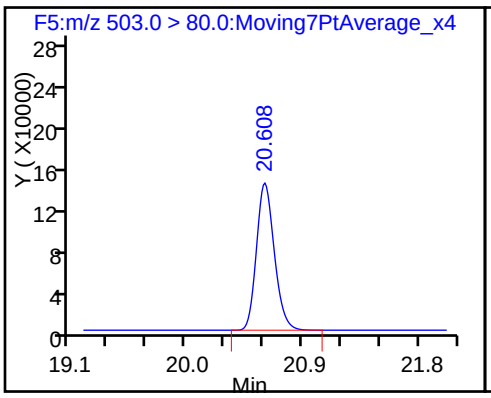
* 5 13C2-PFOA



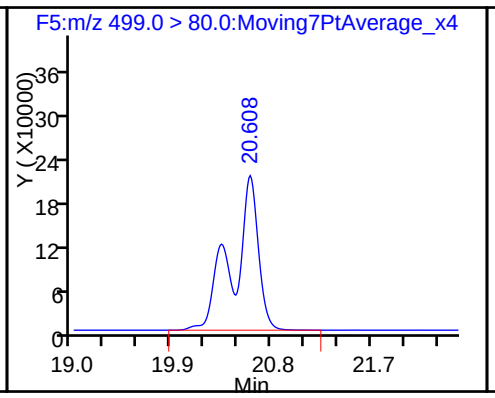
6 Perfluorooctanoic acid



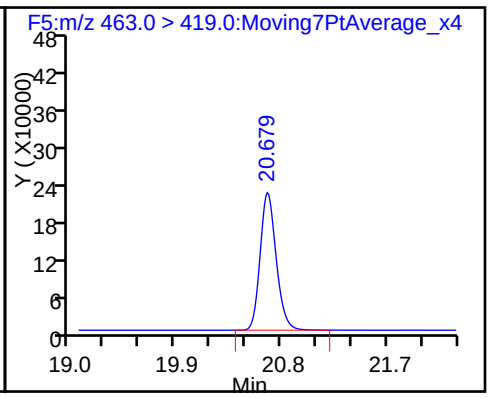
* 8 13C4 PFOS



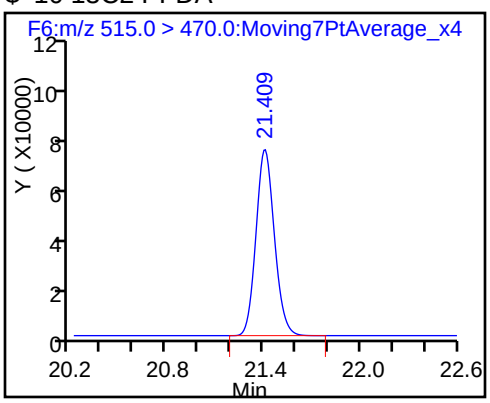
7 Perfluorooctane sulfonic acid



9 Perfluorononanoic acid



$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Lab Sample ID: CCV 320-144610/27 Calibration Date: 01/02/2017 23:15

Instrument ID: A6 Calib Start Date: 12/24/2016 04:26

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/24/2016 06:54

Lab File ID: 02JAN2017A6A_027.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7584	0.8100		48.2	45.1	6.8	30.0
Perfluorohexanesulfonic acid	Ave	0.9405	0.9291		15.0	15.2	-1.2	30.0
Perfluoroheptanoic acid	Ave	1.222	1.395		5.68	4.97	14.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.006	1.109		10.8	9.81	10.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.100	1.103		20.2	20.1	0.3	30.0
Perfluorononanoic acid	Ave	1.149	1.312		11.9	10.4	14.2	30.0
13C2 PFHxA	Ave	1.193	1.195		10.0	10.0	0.2	30.0
13C2 PFDA	Ave	1.008	1.036		10.3	10.0	2.7	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Lab Sample ID: CCV 320-144612/27 Calibration Date: 01/02/2017 23:15

Instrument ID: A6 Calib Start Date: 12/24/2016 04:26

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/24/2016 06:54

Lab File ID: 02JAN2017A6A_027.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7584	0.8100		48.2	45.1	6.8	30.0
Perfluorohexanesulfonic acid	Ave	0.9405	0.9291		15.0	15.2	-1.2	30.0
Perfluoroheptanoic acid	Ave	1.222	1.395		5.68	4.97	14.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.006	1.109		10.8	9.81	10.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.100	1.103		20.2	20.1	0.3	30.0
Perfluorononanoic acid	Ave	1.149	1.312		11.9	10.4	14.2	30.0
13C2 PFHxA	Ave	1.193	1.195		10.0	10.0	0.2	30.0
13C2 PFDA	Ave	1.008	1.036		10.3	10.0	2.7	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_027.d
Lims ID: CCV L3
Client ID:
Sample Type: CCVIS
Inject. Date: 02-Jan-2017 23:15:58 ALS Bottle#: 3 Worklist Smp#: 27
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: CCV L3
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6
Sublist: chrom-537__A6*sub3

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 14:57:22 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.579	17.579	0.0	1.000	1861018	48.2	663	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.558	18.558	0.0	1.000	637870	10.0	21098	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.308	19.308	0.0	1.000	719583	15.0	16805	
4 Perfluoroheptanoic acid								
363.0 > 319.0	19.344	19.344	0.0	1.000	370496	5.68	1217	
* 5 13C2-PFOA								
415.0 > 370.0	19.986	19.986	0.0		533787	10.0	13371	
6 Perfluorooctanoic acid								
413.0 > 369.0	19.986	19.986	0.0	1.000	580860	10.8	355	
* 8 13C4 PFOS								
503.0 > 80.0	20.596	20.596	0.0		1460847	28.7	38080	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.596	20.596	0.0	1.000	1131009	20.2	18651	
9 Perfluorononanoic acid								
463.0 > 419.0	20.679	20.679	0.0	1.000	729833	11.9	8515	
$ 10 13C2 PFDA								
515.0 > 470.0	21.391	21.391	0.0	1.000	552909	10.3	17606	

Reagents:

LC537-L3_00018 Amount Added: 1.00 Units: mL

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_027.d
Lims ID: CCV L3
Client ID:
Sample Type: CCVIS
Inject. Date: 02-Jan-2017 23:15:58 ALS Bottle#: 3 Worklist Smp#: 27
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: CCV L3
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6
Sublist: chrom-537__A6*sub3

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 14:57:22 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.579	17.579	0.0	1.000	1861018	48.2	663	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.558	18.558	0.0	1.000	637870	10.0	21098	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.308	19.308	0.0	1.000	719583	15.0	16805	
4 Perfluoroheptanoic acid								
363.0 > 319.0	19.344	19.344	0.0	1.000	370496	5.68	1217	
* 5 13C2-PFOA								
415.0 > 370.0	19.986	19.986	0.0		533787	10.0	13371	
6 Perfluorooctanoic acid								
413.0 > 369.0	19.986	19.986	0.0	1.000	580860	10.8	355	
* 8 13C4 PFOS								
503.0 > 80.0	20.596	20.596	0.0		1460847	28.7	38080	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.596	20.596	0.0	1.000	1131009	20.2	18651	
9 Perfluorononanoic acid								
463.0 > 419.0	20.679	20.679	0.0	1.000	729833	11.9	8515	
$ 10 13C2 PFDA								
515.0 > 470.0	21.391	21.391	0.0	1.000	552909	10.3	17606	

Reagents:

LC537-L3_00018 Amount Added: 1.00 Units: mL

Report Date: 03-Jan-2017 14:57:23 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_027.d

Injection Date: 02-Jan-2017 23:15:58 Instrument ID: A6

Lims ID: CCV L3

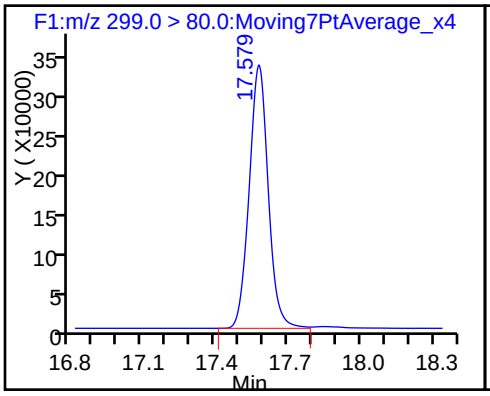
Client ID:

Operator ID: CBW ALS Bottle#: 3 Worklist Smp#: 27

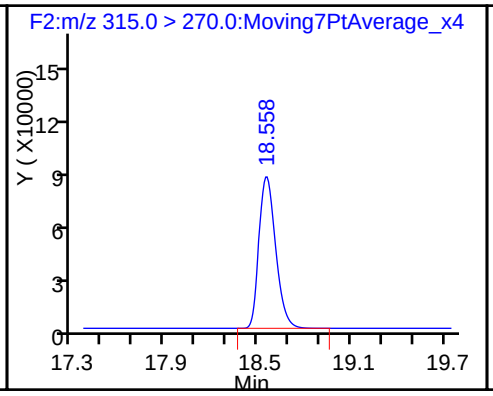
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

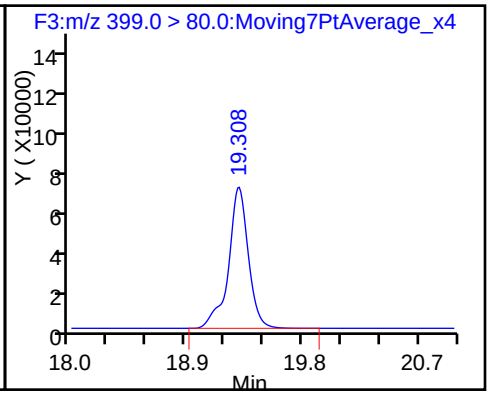
1 Perfluorobutanesulfonic acid



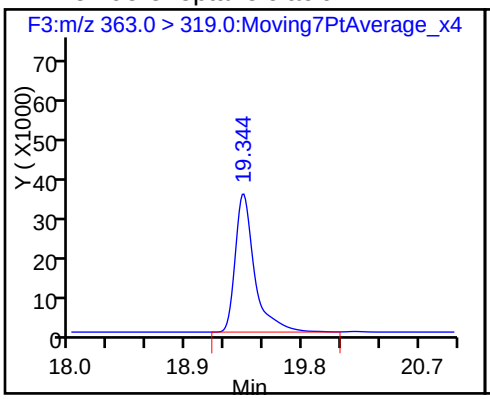
$ 2 13C2 PFHxA



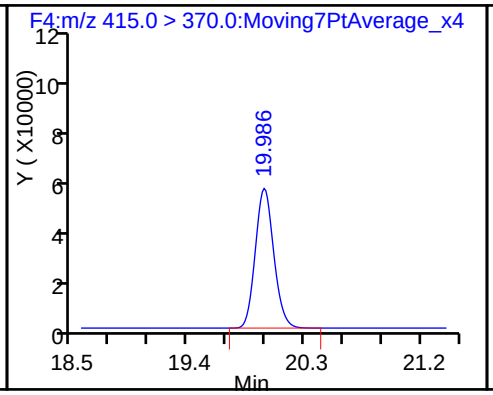
3 Perfluorohexanesulfonic acid



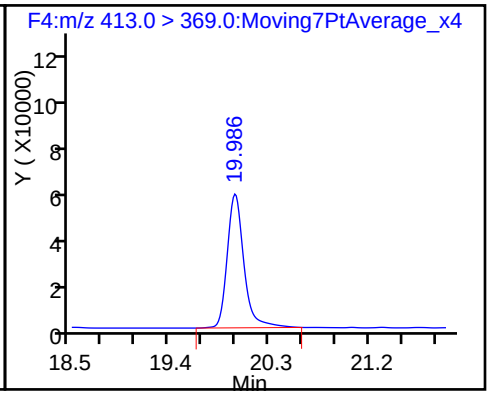
4 Perfluoroheptanoic acid



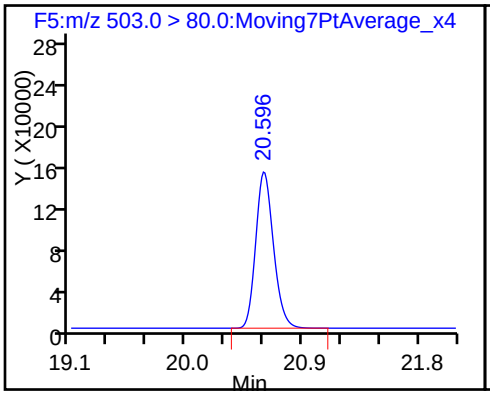
* 5 13C2-PFOA



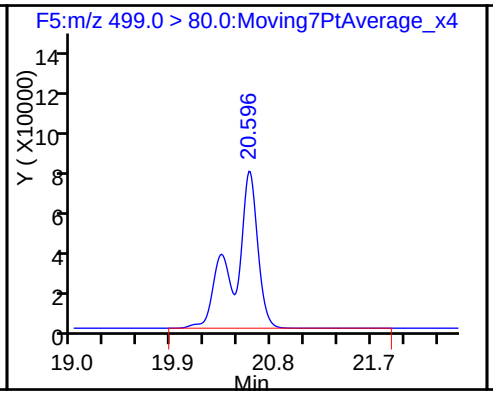
6 Perfluorooctanoic acid



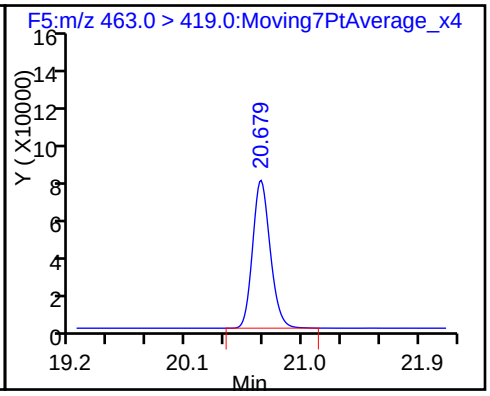
* 8 13C4 PFOS



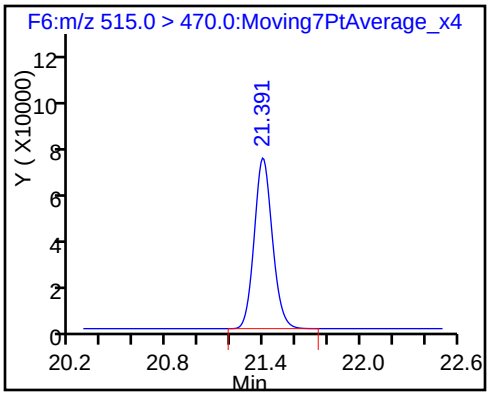
7 Perfluorooctane sulfonic acid



9 Perfluorononanoic acid

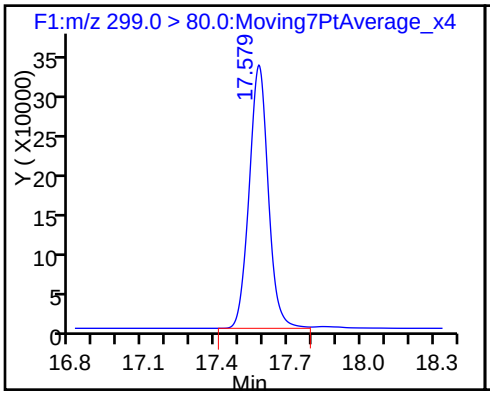


$ 10 13C2 PFDA

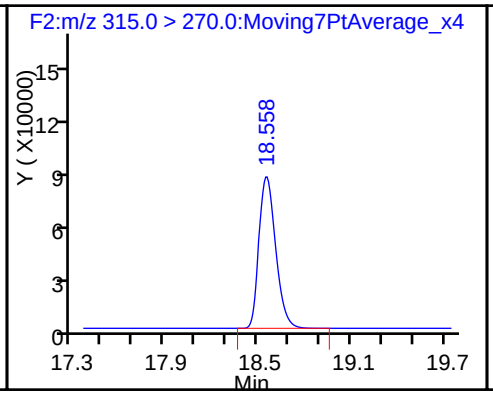


Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_027.d
Injection Date: 02-Jan-2017 23:15:58 Instrument ID: A6
Lims ID: CCV L3
Client ID:
Operator ID: CBW ALS Bottle#: 3 Worklist Smp#: 27
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

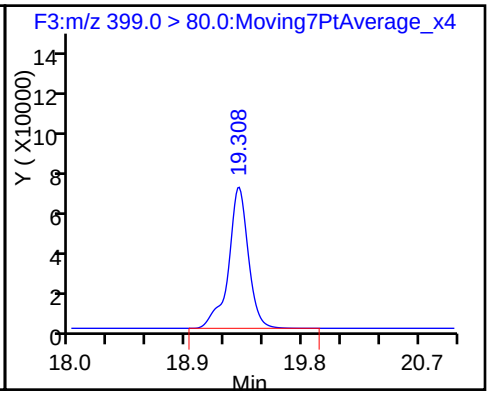
1 Perfluorobutanesulfonic acid



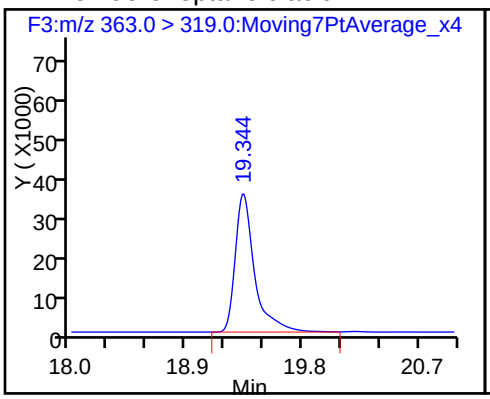
$ 2 13C2 PFHxA



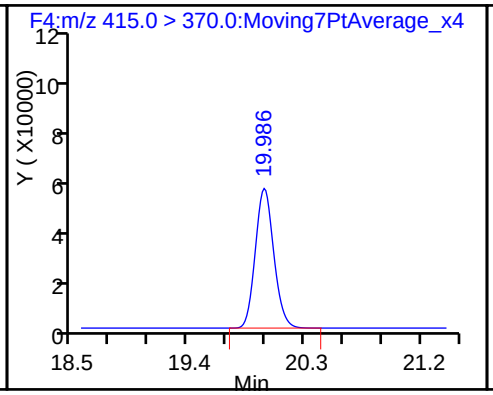
3 Perfluorohexanesulfonic acid



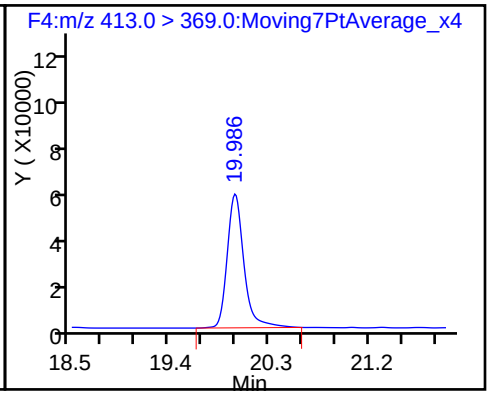
4 Perfluoroheptanoic acid



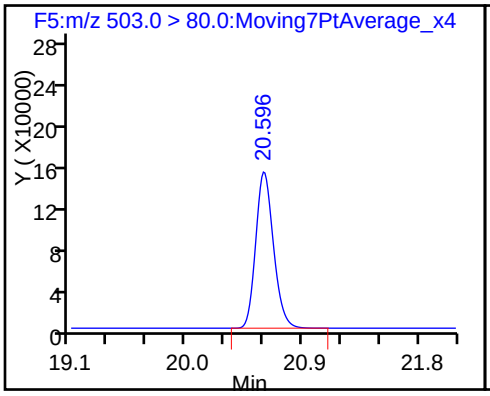
* 5 13C2-PFOA



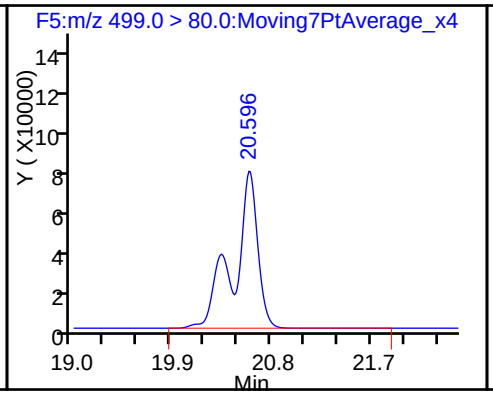
6 Perfluorooctanoic acid



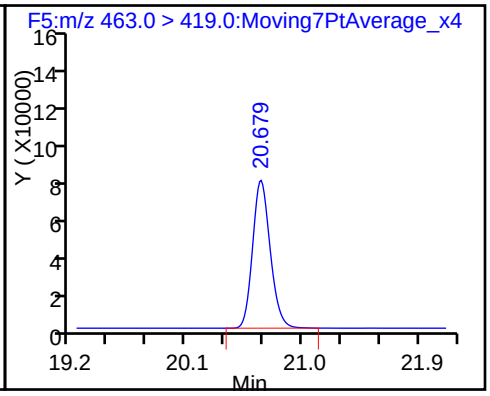
* 8 13C4 PFOS



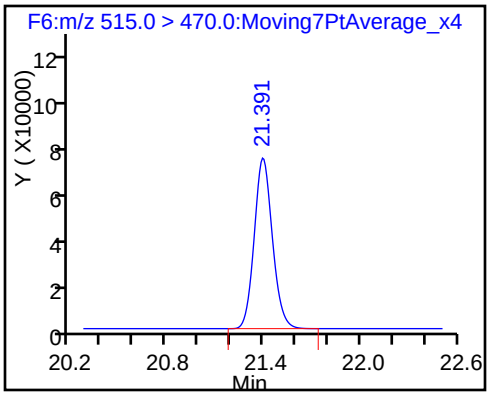
7 Perfluorooctane sulfonic acid



9 Perfluorononanoic acid



$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Lab Sample ID: CCV 320-144612/39 Calibration Date: 01/03/2017 05:11

Instrument ID: A6 Calib Start Date: 12/24/2016 04:26

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/24/2016 06:54

Lab File ID: 02JAN2017A6A_039.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7584	0.7517		133	135	-0.9	30.0
Perfluorohexanesulfonic acid	Ave	0.9405	0.9538		46.0	45.4	1.4	30.0
Perfluoroheptanoic acid	Ave	1.222	1.311		15.9	14.9	7.3	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.006	1.116		32.5	29.3	10.9	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.100	1.163		63.6	60.1	5.8	30.0
Perfluorononanoic acid	Ave	1.149	1.379		37.4	31.1	20.1	30.0
13C2 PFHxA	Ave	1.193	1.281		10.7	10.0	7.3	30.0
13C2 PFDA	Ave	1.008	1.147		11.4	10.0	13.7	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Lab Sample ID: CCV 320-144614/39 Calibration Date: 01/03/2017 05:11

Instrument ID: A6 Calib Start Date: 12/24/2016 04:26

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/24/2016 06:54

Lab File ID: 02JAN2017A6A_039.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7584	0.7517		133	135	-0.9	30.0
Perfluorohexanesulfonic acid	Ave	0.9405	0.9538		46.0	45.4	1.4	30.0
Perfluoroheptanoic acid	Ave	1.222	1.311		15.9	14.9	7.3	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.006	1.116		32.5	29.3	10.9	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.100	1.163		63.6	60.1	5.8	30.0
Perfluorononanoic acid	Ave	1.149	1.379		37.4	31.1	20.1	30.0
13C2 PFHxA	Ave	1.193	1.281		10.7	10.0	7.3	30.0
13C2 PFDA	Ave	1.008	1.147		11.4	10.0	13.7	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_039.d
Lims ID: CCV L5
Client ID:
Sample Type: CCVIS
Inject. Date: 03-Jan-2017 05:11:07 ALS Bottle#: 5 Worklist Smp#: 39
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6
Sublist: chrom-537__A6*sub3

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 15:12:15 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 03-Jan-2017 15:11:58

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.521	17.521	0.0	1.000	4788997	133.4	4652	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.496	18.496	0.0	1.000	639525	10.7	22536	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.261	19.261	0.0	1.000	2048412	46.0	37340	
4 Perfluoroheptanoic acid								
363.0 > 319.0	19.285	19.285	0.0	1.000	972321	15.9	1032	
* 5 13C2-PFOA								
415.0 > 370.0	19.945	19.945	0.0		499397	10.0	12258	
6 Perfluorooctanoic acid								
413.0 > 369.0	19.945	19.945	0.0	1.000	1631418	32.5	904	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.299	20.299	0.0	1.000	3308579	63.6	27098	
* 8 13C4 PFOS								
503.0 > 80.0	20.548	20.548	0.0		1357134	28.7	34646	
9 Perfluorononanoic acid								
463.0 > 419.0	20.619	20.619	0.0	1.000	2142896	37.4	20442	
$ 10 13C2 PFDA								
515.0 > 470.0	21.338	21.338	0.0	1.000	572634	11.4	17954	

Reagents:

LC537-L5_00019 Amount Added: 1.00 Units: mL

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_039.d
Lims ID: CCV L5
Client ID:
Sample Type: CCVIS
Inject. Date: 03-Jan-2017 05:11:07 ALS Bottle#: 5 Worklist Smp#: 39
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6
Sublist: chrom-537__A6*sub3

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 15:12:15 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 03-Jan-2017 15:11:58

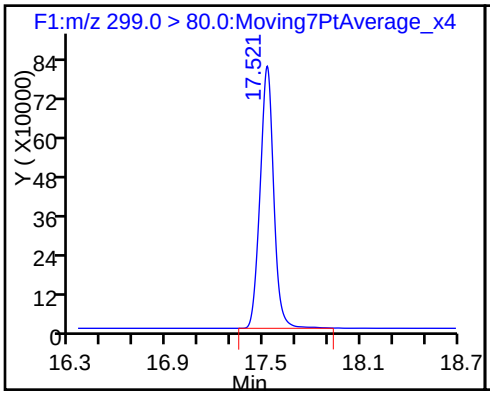
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.521	17.521	0.0	1.000	4788997	133.4	4652	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.496	18.496	0.0	1.000	639525	10.7	22536	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.261	19.261	0.0	1.000	2048412	46.0	37340	
4 Perfluoroheptanoic acid								
363.0 > 319.0	19.285	19.285	0.0	1.000	972321	15.9	1032	
* 5 13C2-PFOA								
415.0 > 370.0	19.945	19.945	0.0		499397	10.0	12258	
6 Perfluorooctanoic acid								
413.0 > 369.0	19.945	19.945	0.0	1.000	1631418	32.5	904	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.299	20.299	0.0	1.000	3308579	63.6	27098	
* 8 13C4 PFOS								
503.0 > 80.0	20.548	20.548	0.0		1357134	28.7	34646	
9 Perfluorononanoic acid								
463.0 > 419.0	20.619	20.619	0.0	1.000	2142896	37.4	20442	
$ 10 13C2 PFDA								
515.0 > 470.0	21.338	21.338	0.0	1.000	572634	11.4	17954	

Reagents:

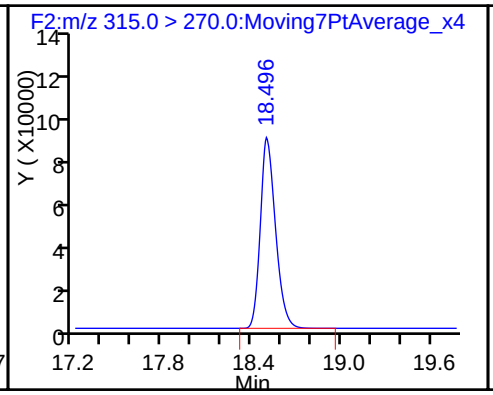
LC537-L5_00019 Amount Added: 1.00 Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_039.d
Injection Date: 03-Jan-2017 05:11:07 Instrument ID: A6
Lims ID: CCV L5
Client ID:
Operator ID: CBW ALS Bottle#: 5 Worklist Smp#: 39
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

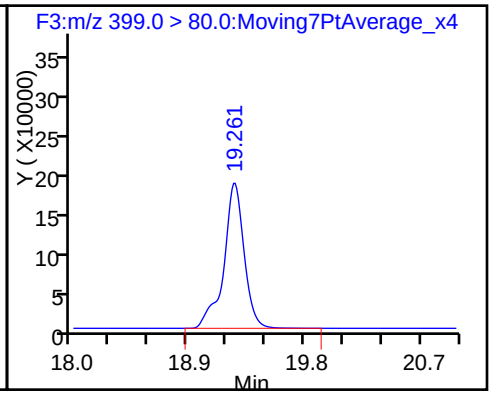
1 Perfluorobutanesulfonic acid



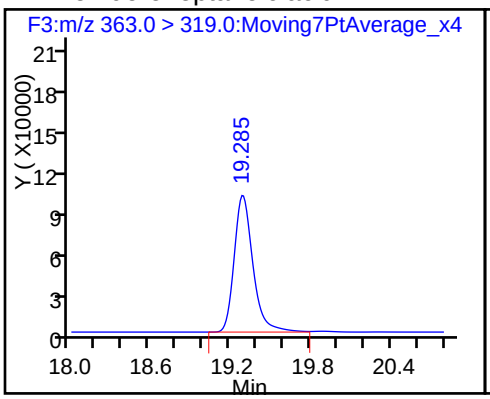
$ 2 13C2 PFHxA



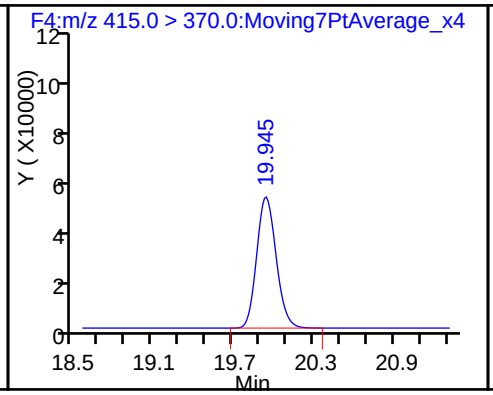
3 Perfluorohexanesulfonic acid



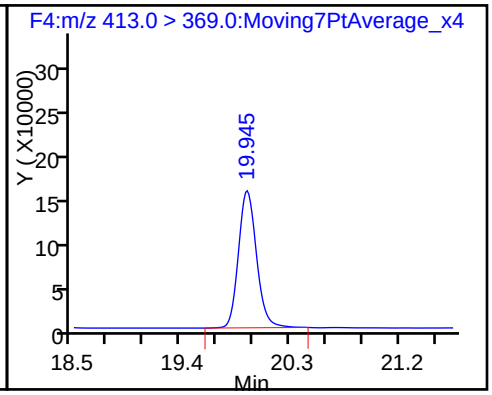
4 Perfluoroheptanoic acid



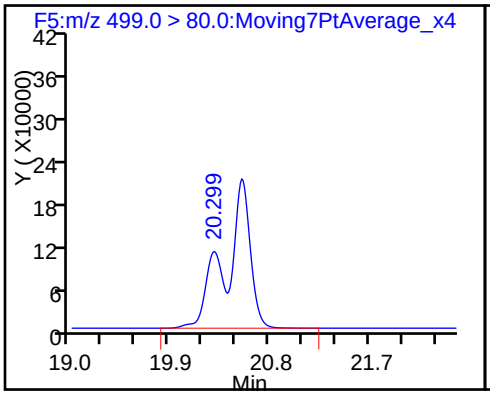
* 5 13C2-PFOA



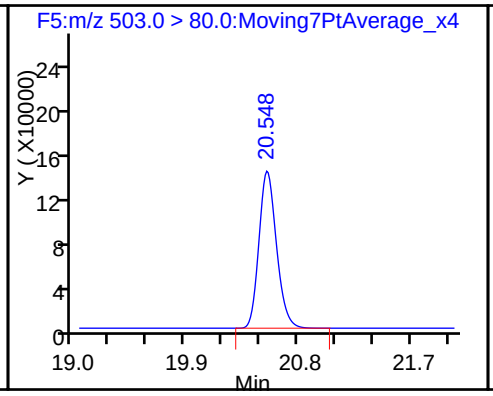
6 Perfluorooctanoic acid



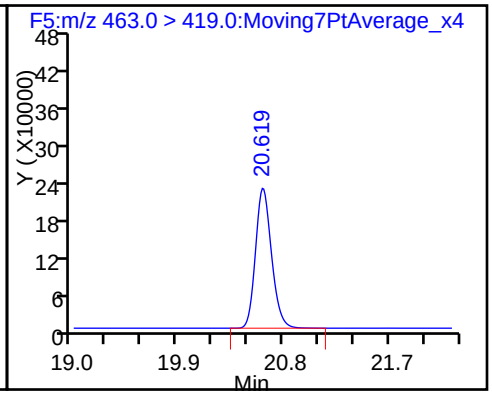
7 Perfluorooctane sulfonic acid



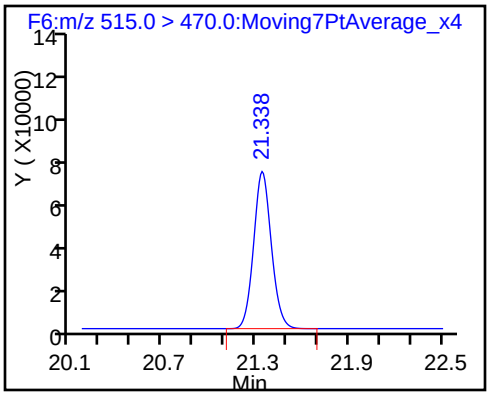
* 8 13C4 PFOS



9 Perfluorononanoic acid

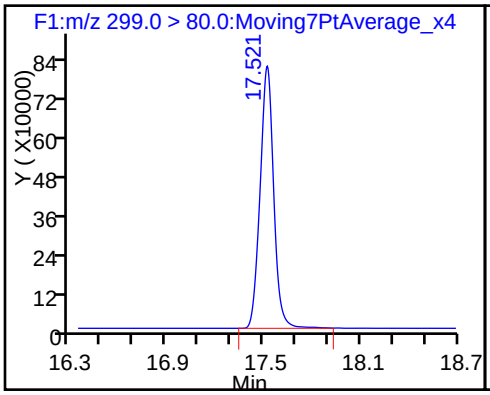


$ 10 13C2 PFDA

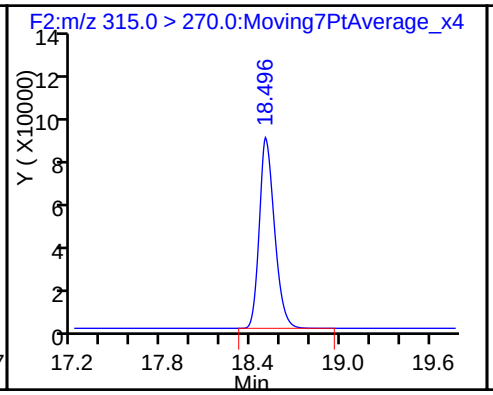


Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_039.d
Injection Date: 03-Jan-2017 05:11:07 Instrument ID: A6
Lims ID: CCV L5
Client ID:
Operator ID: CBW ALS Bottle#: 5 Worklist Smp#: 39
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

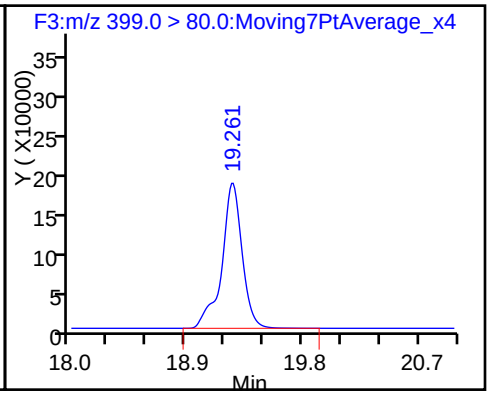
1 Perfluorobutanesulfonic acid



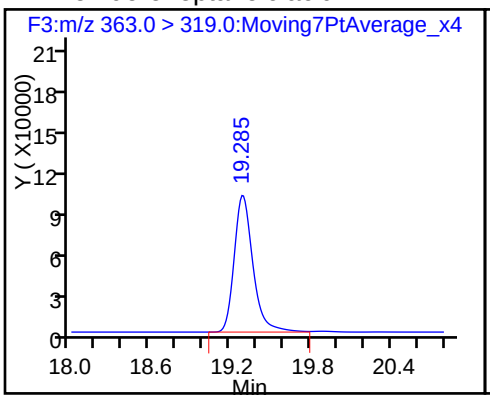
$ 2 13C2 PFHxA



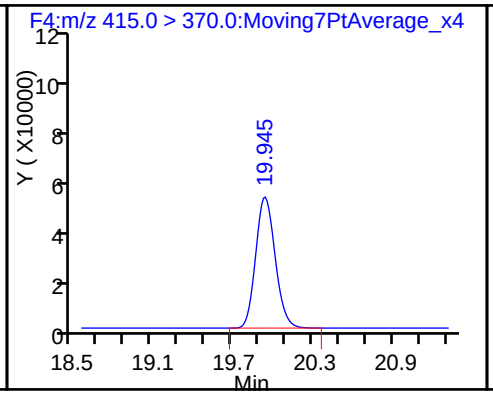
3 Perfluorohexanesulfonic acid



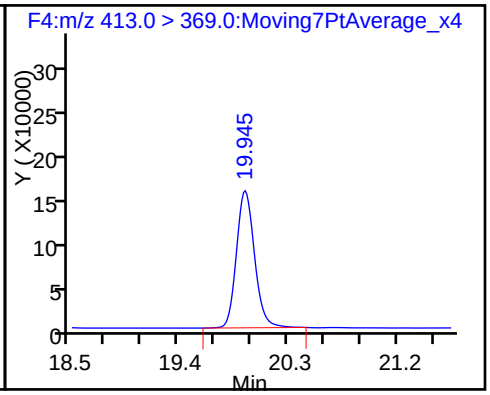
4 Perfluoroheptanoic acid



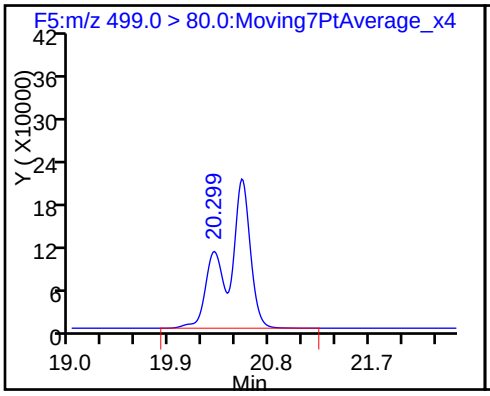
* 5 13C2-PFOA



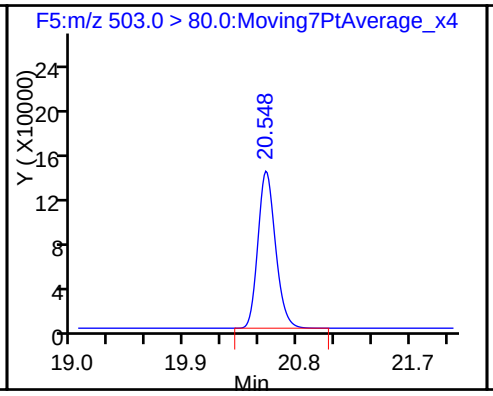
6 Perfluorooctanoic acid



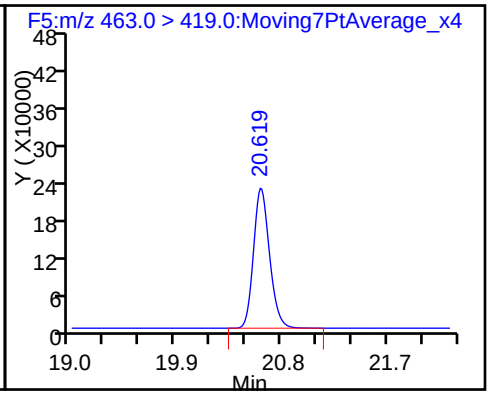
7 Perfluorooctane sulfonic acid



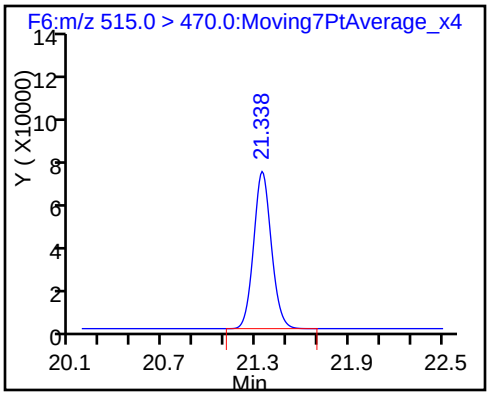
* 8 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Lab Sample ID: CCV 320-144614/51 Calibration Date: 01/03/2017 11:03

Instrument ID: A6 Calib Start Date: 12/24/2016 04:26

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/24/2016 06:54

Lab File ID: 02JAN2017A6A_051.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7584	0.7923		47.1	45.1	4.5	30.0
Perfluorohexanesulfonic acid	Ave	0.9405	0.9684		15.7	15.2	3.0	30.0
Perfluoroheptanoic acid	Ave	1.222	1.449		5.90	4.97	18.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.006	1.150		11.2	9.81	14.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.100	1.093		20.0	20.1	-0.6	30.0
Perfluorononanoic acid	Ave	1.149	1.383		12.5	10.4	20.4	30.0
13C2 PFHxA	Ave	1.193	1.163		9.75	10.0	-2.5	30.0
13C2 PFDA	Ave	1.008	1.056		10.5	10.0	4.7	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_051.d
Lims ID: CCV L3
Client ID:
Sample Type: CCVIS
Inject. Date: 03-Jan-2017 11:03:53 ALS Bottle#: 3 Worklist Smp#: 51
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: CCV L3
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6
Sublist: chrom-537__A6*sub3

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 04-Jan-2017 08:17:12 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK017

First Level Reviewer: westendorfc Date: 04-Jan-2017 08:17:12

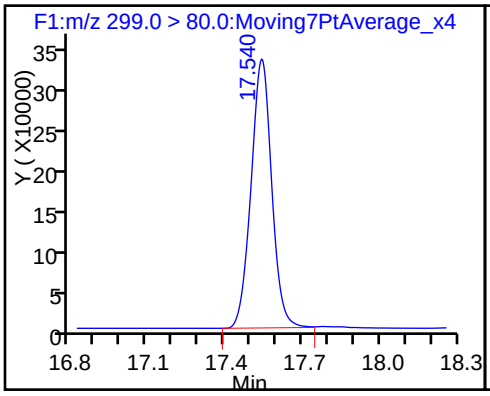
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.540	17.540	0.0	1.000	1859309	47.1	628	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.521	18.521	0.0	1.000	632377	9.75	21328	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.285	19.285	0.0	1.000	766060	15.7	18196	
4 Perfluoroheptanoic acid								
363.0 > 319.0	19.309	19.309	0.0	1.000	391863	5.90	4225	
* 5 13C2-PFOA								
415.0 > 370.0	19.959	19.959	0.0		543781	10.0	13527	
6 Perfluorooctanoic acid								
413.0 > 369.0	19.972	19.972	0.0	1.000	613292	11.2	411	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.323	20.323	0.0	1.000	1145183	20.0	7113	
* 8 13C4 PFOS								
503.0 > 80.0	20.572	20.572	0.0		1492186	28.7	12972	
9 Perfluorononanoic acid								
463.0 > 419.0	20.655	20.655	0.0	1.000	783674	12.5	7566	
$ 10 13C2 PFDA								
515.0 > 470.0	21.364	21.364	0.0	1.000	574227	10.5	18157	

Reagents:

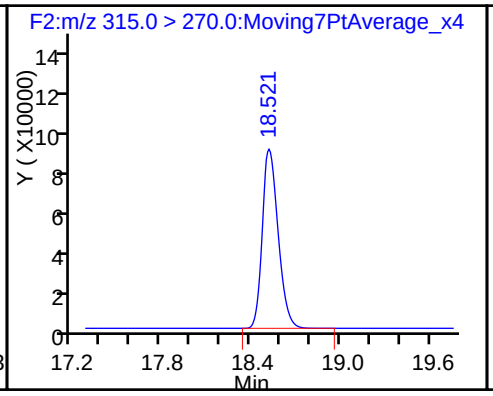
LC537-L3_00018 Amount Added: 1.00 Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_051.d
Injection Date: 03-Jan-2017 11:03:53 Instrument ID: A6
Lims ID: CCV L3
Client ID:
Operator ID: CBW ALS Bottle#: 3 Worklist Smp#: 51
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

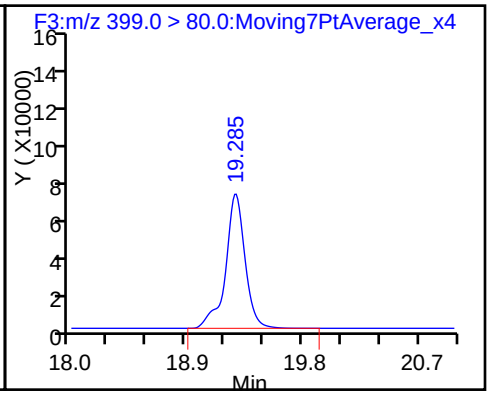
1 Perfluorobutanesulfonic acid



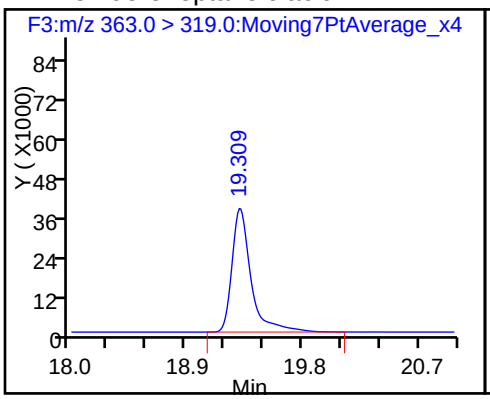
$ 2 13C2 PFHxA



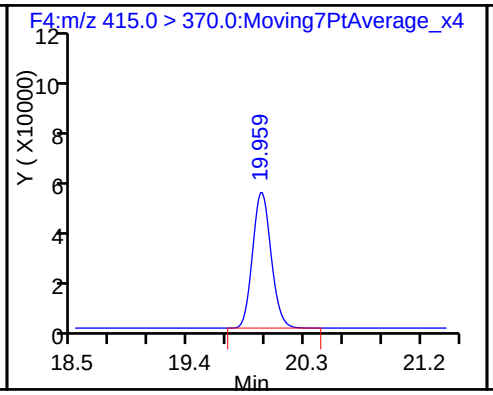
3 Perfluorohexanesulfonic acid



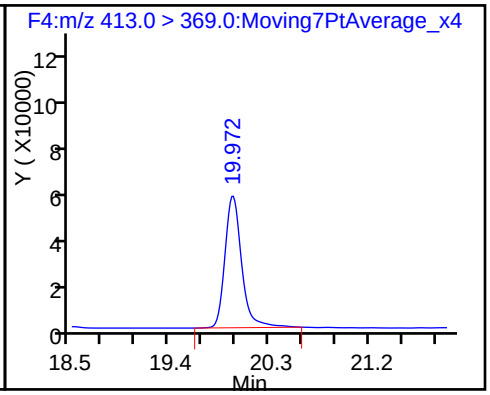
4 Perfluoroheptanoic acid



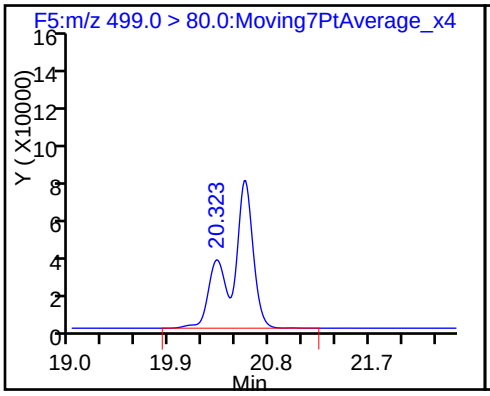
* 5 13C2-PFOA



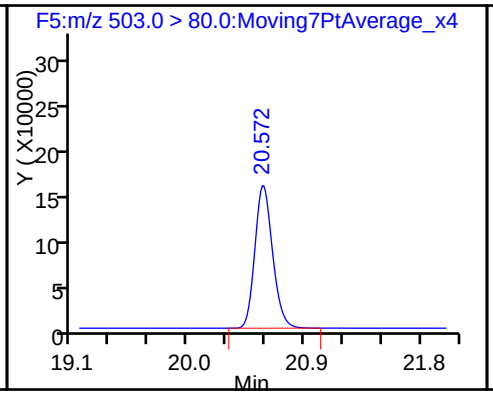
6 Perfluorooctanoic acid



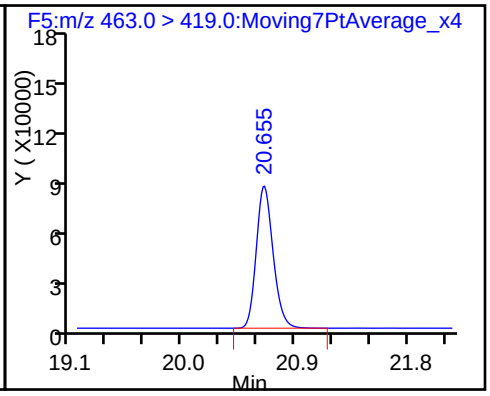
7 Perfluorooctane sulfonic acid



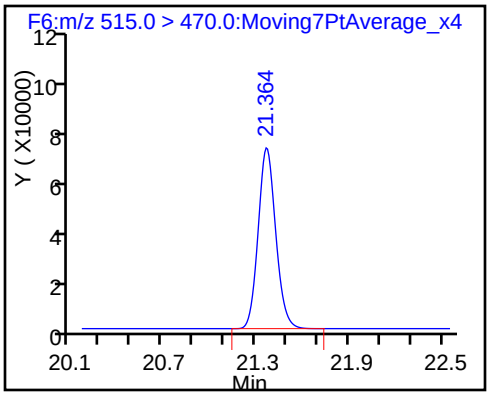
* 8 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 320-143781/1-A

Matrix: Water Lab File ID: 02JAN2017A6A_024.d

Analysis Method: 537 Date Collected:

Extraction Method: 537 Date Extracted: 12/23/2016 18:13

Sample wt/vol: 250.00(mL) Date Analyzed: 01/02/2017 21:47

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 144610 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.048	U M	0.060	0.048	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.024	U M	0.030	0.024	0.0094
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.11	0.048

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	102		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_024.d
Lims ID: MB 320-143781/1-A
Client ID:
Sample Type: MB
Inject. Date: 02-Jan-2017 21:47:09 ALS Bottle#: 29 Worklist Smp#: 24
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-143781/1-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 14:57:06 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 03-Jan-2017 14:13:49

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.576	17.576	0.0	1.000	3290	0.0752	3.4	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.548	18.549	-0.001	1.000	651359	10.0	21643	
3 Perfluorohexanesulfonic acid								M
399.0 > 80.0	19.297	19.308	-0.011	1.000	2914	0.0537	9.9	M
* 5 13C2-PFOA								
415.0 > 370.0	19.999	19.986	0.013		544185	10.0	13900	
6 Perfluorooctanoic acid								M
413.0 > 369.0	19.999	19.999	0.0	1.000	1627	0.0297	0.5	M
* 8 13C4 PFOS								
503.0 > 80.0	20.608	20.608	0.0		1654409	28.7	43345	
7 Perfluorooctane sulfonic acid								M
499.0 > 80.0	20.596	20.608	-0.012	1.000	2850	0.0449	78.3	M
9 Perfluorononanoic acid								M
463.0 > 419.0	20.702	20.679	0.023	1.000	577	0.009231	5.0	M
$ 10 13C2 PFDA								
515.0 > 470.0	21.400	21.409	-0.009	1.000	557499	10.2	17665	

QC Flag Legend

Review Flags
M - Manually Integrated

Report Date: 03-Jan-2017 14:57:18 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_024.d

Injection Date: 02-Jan-2017 21:47:09 Instrument ID: A6

Lims ID: MB 320-143781/1-A

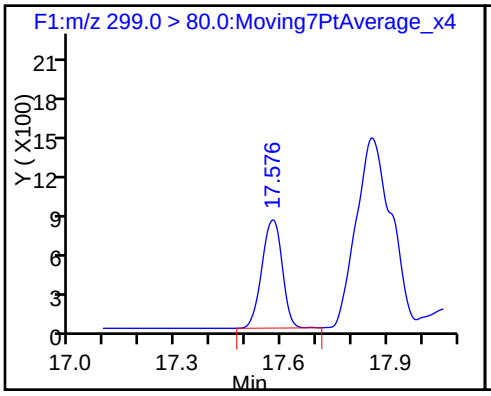
Client ID:

Operator ID: CBW ALS Bottle#: 29 Worklist Smp#: 24

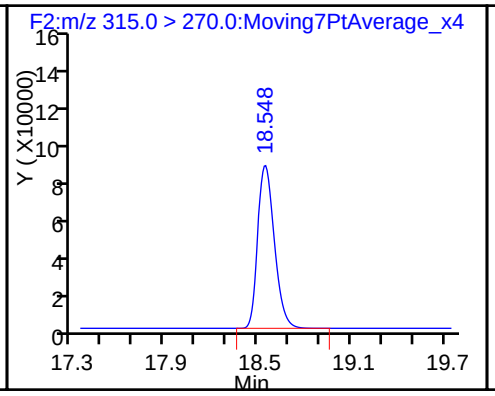
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

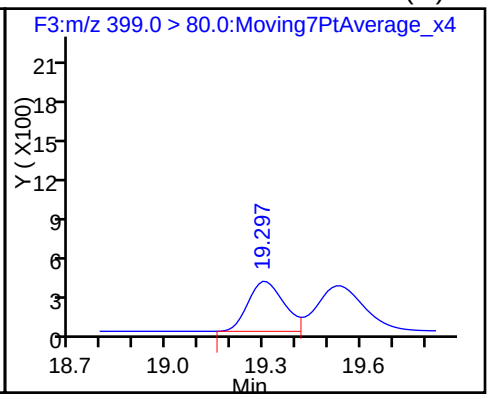
1 Perfluorobutanesulfonic acid



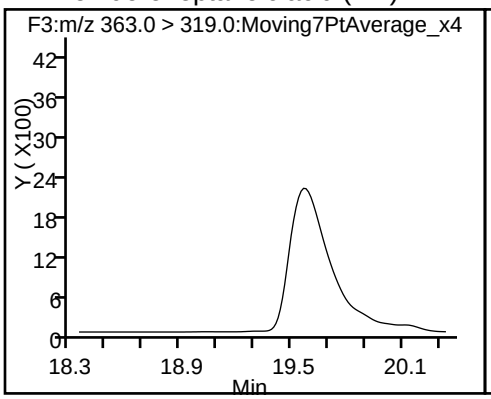
$ 2 13C2 PFHxA



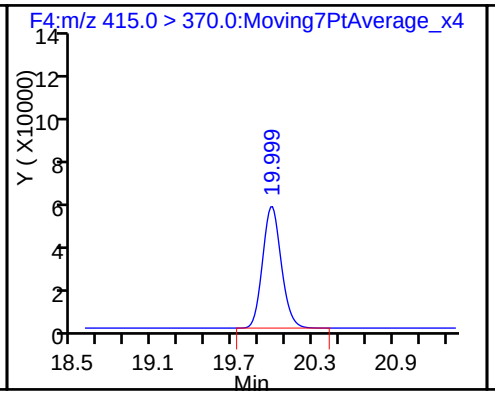
3 Perfluorohexanesulfonic acid (M)



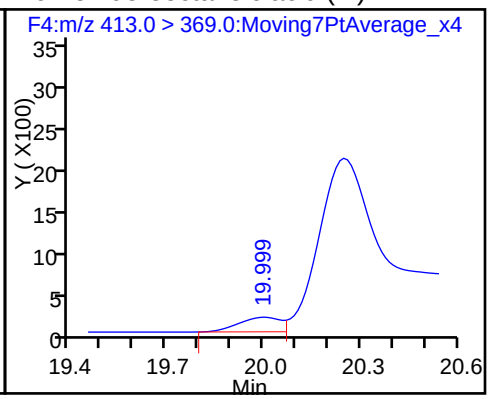
4 Perfluoroheptanoic acid (ND)



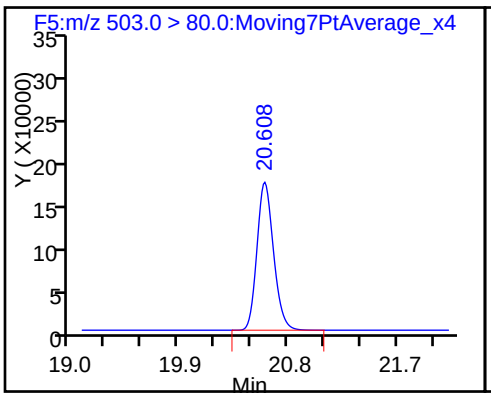
* 5 13C2-PFOA



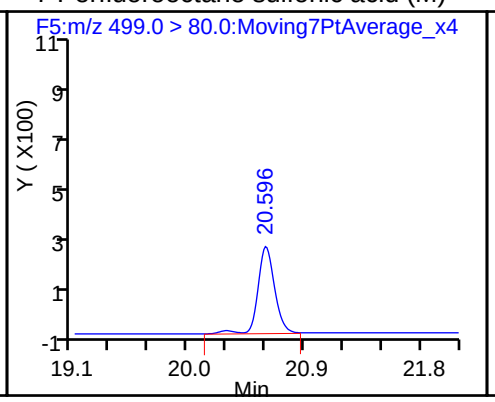
6 Perfluorooctanoic acid (M)



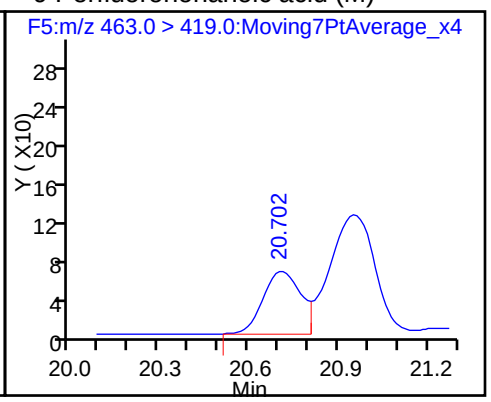
* 8 13C4 PFOS



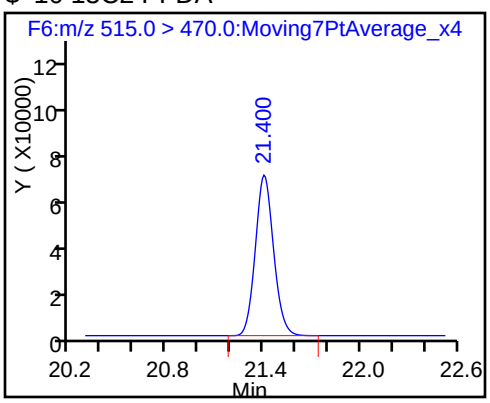
7 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid (M)



$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_024.d
Lims ID: MB 320-143781/1-A
Client ID:
Sample Type: MB
Inject. Date: 02-Jan-2017 21:47:09 ALS Bottle#: 29 Worklist Smp#: 24
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-143781/1-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 14:57:06 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 03-Jan-2017 14:13:49

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.0	100.32
$ 10 13C2 PFDA	10.0	10.2	101.61

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

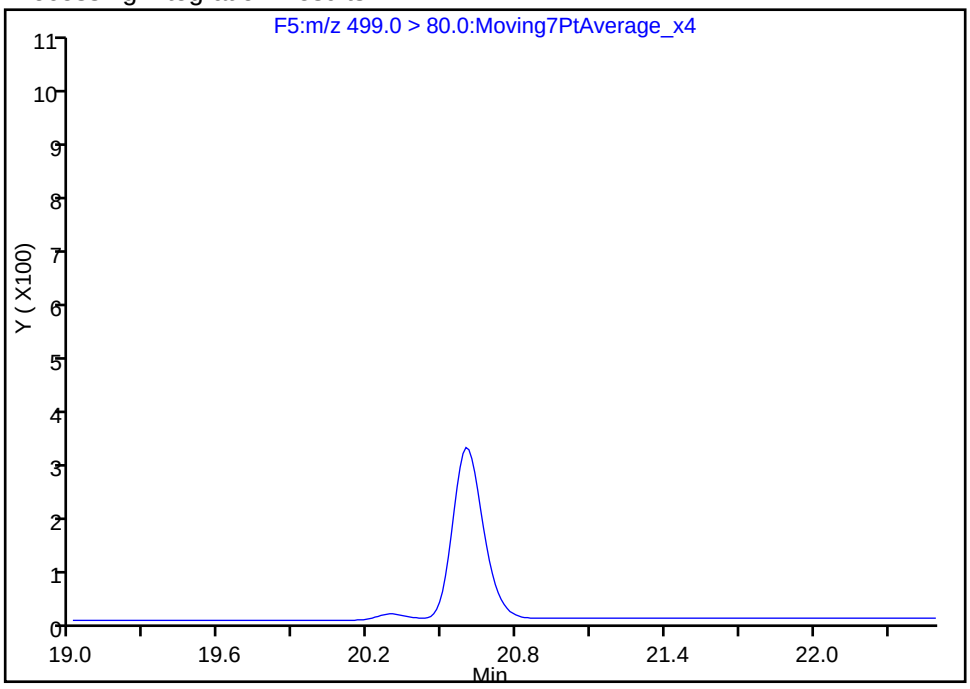
Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_024.d
Injection Date: 02-Jan-2017 21:47:09 Instrument ID: A6
Lims ID: MB 320-143781/1-A
Client ID:
Operator ID: CBW ALS Bottle#: 29 Worklist Smp#: 24
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

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

Signal: 1

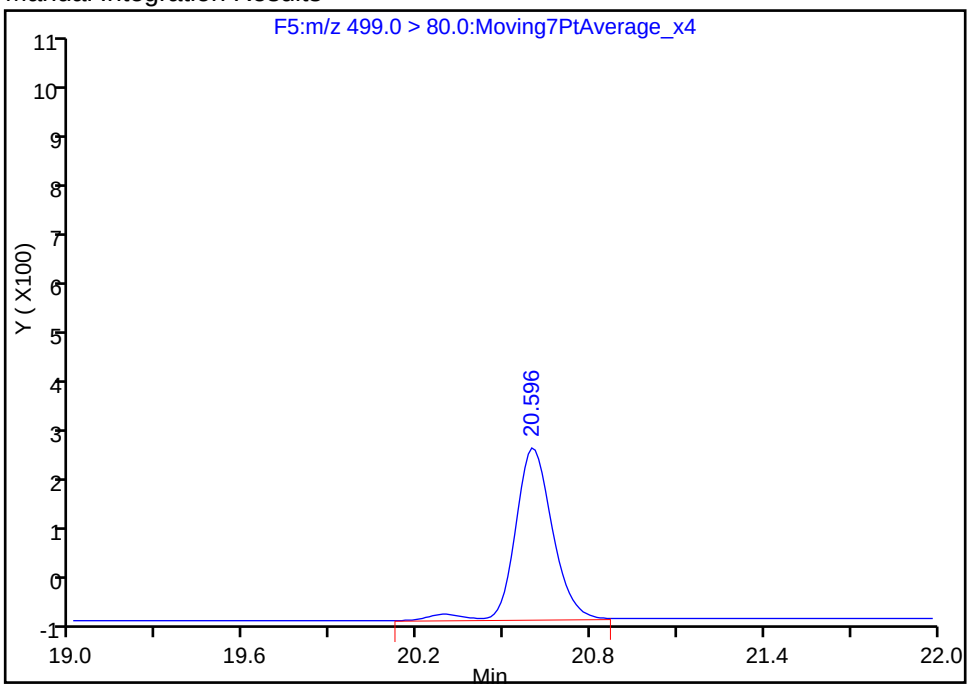
Not Detected
Expected RT: 20.61

Processing Integration Results



Manual Integration Results

RT: 20.60
Area: 2850
Amount: 0.044931
Amount Units: ng/ml



Reviewer: barnettj, 03-Jan-2017 14:13:49
Audit Action: Manually Integrated Audit Reason: Missed Peak

TestAmerica Sacramento

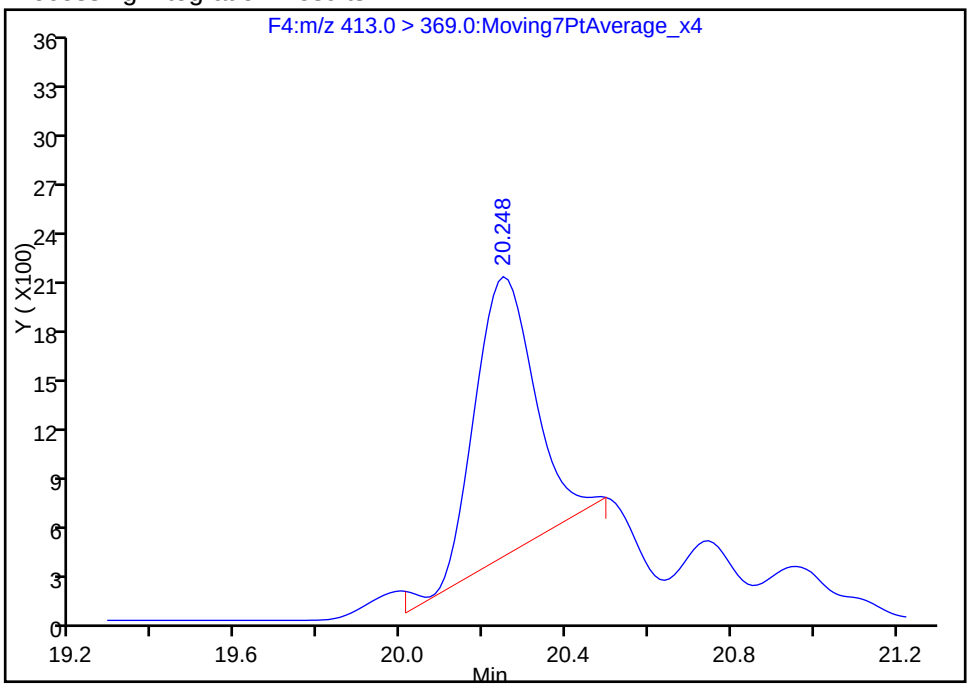
Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_024.d
Injection Date: 02-Jan-2017 21:47:09 Instrument ID: A6
Lims ID: MB 320-143781/1-A
Client ID:
Operator ID: CBW ALS Bottle#: 29 Worklist Smp#: 24
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

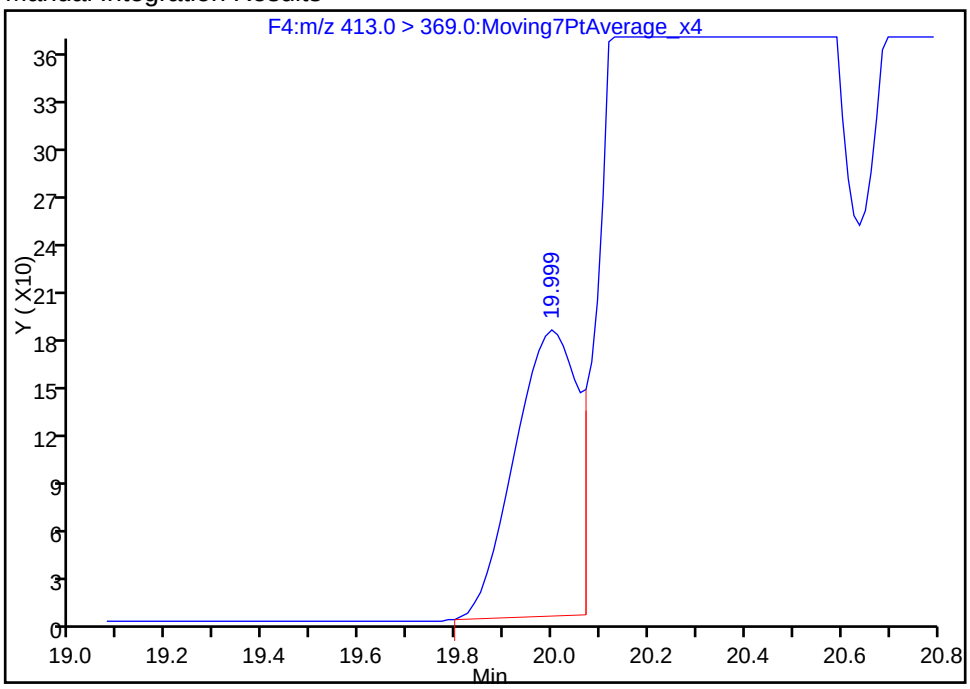
Processing Integration Results

RT: 20.25
Area: 17527
Amount: 0.320214
Amount Units: ng/ml



Manual Integration Results

RT: 20.00
Area: 1627
Amount: 0.029725
Amount Units: ng/ml



Reviewer: barnettj, 03-Jan-2017 14:13:49
Audit Action: Manually Integrated Audit Reason: Split Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Client Sample ID: Lab Sample ID: LCS 320-143781/2-A

Matrix: Water Lab File ID: 02JAN2017A6A_025.d

Analysis Method: 537 Date Collected:

Extraction Method: 537 Date Extracted: 12/23/2016 18:13

Sample wt/vol: 250.00(mL) Date Analyzed: 01/02/2017 22:16

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 144610 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.129		0.060	0.048	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.0750		0.030	0.024	0.0094
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.302		0.14	0.11	0.048

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	103		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_025.d
Lims ID: LCS 320-143781/2-A
Client ID:
Sample Type: LCS
Inject. Date: 02-Jan-2017 22:16:46 ALS Bottle#: 30 Worklist Smp#: 25
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-143781/2-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 14:57:06 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 03-Jan-2017 14:15:09

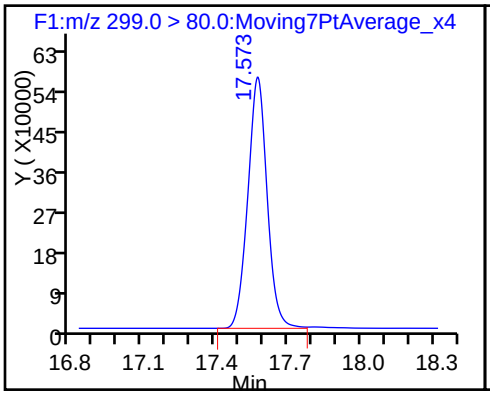
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.573	17.576	-0.003	1.000	3166868	75.4	911	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.549	18.549	0.0	1.000	648932	10.2	21441	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.297	19.308	-0.011	1.000	1282965	24.6	24036	
4 Perfluoroheptanoic acid								M
363.0 > 319.0	19.332	19.344	-0.012	1.000	866557	13.3	397	M
* 5 13C2-PFOA								
415.0 > 370.0	19.986	19.986	0.0		532727	10.0	13554	
6 Perfluorooctanoic acid								
413.0 > 369.0	19.986	19.999	-0.013	1.000	1004755	18.8	771	
* 8 13C4 PFOS								
503.0 > 80.0	20.608	20.608	0.0		1588550	28.7	27415	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.608	20.608	0.0	1.000	1958025	32.1	30583	
9 Perfluorononanoic acid								
463.0 > 419.0	20.679	20.679	0.0	1.000	1316847	21.5	19950	
$ 10 13C2 PFDA								
515.0 > 470.0	21.400	21.409	-0.009	1.000	552075	10.3	17315	

QC Flag Legend

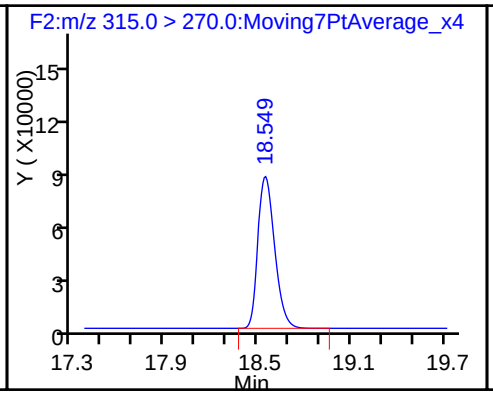
Review Flags
M - Manually Integrated

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_025.d
Injection Date: 02-Jan-2017 22:16:46 Instrument ID: A6
Lims ID: LCS 320-143781/2-A
Client ID:
Operator ID: CBW ALS Bottle#: 30 Worklist Smp#: 25
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

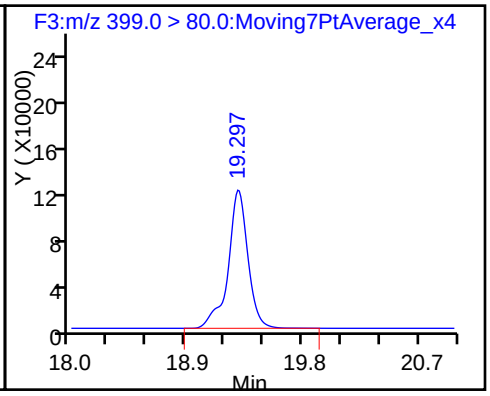
1 Perfluorobutanesulfonic acid



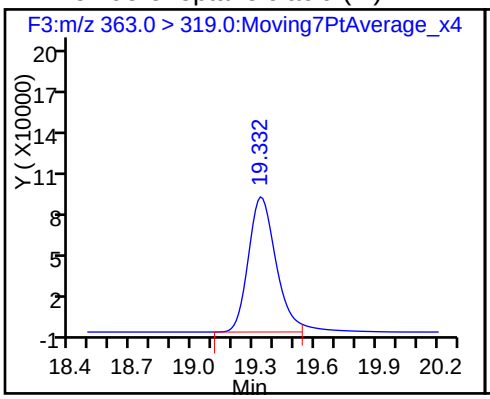
$ 2 13C2 PFHxA



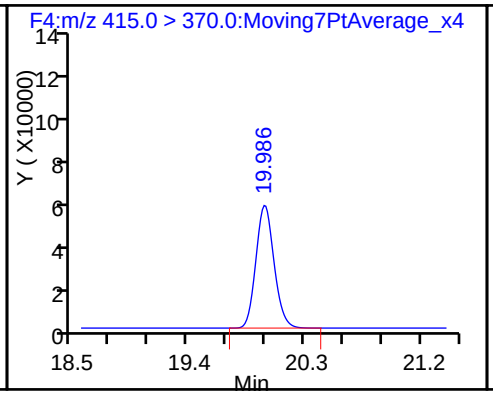
3 Perfluorohexanesulfonic acid



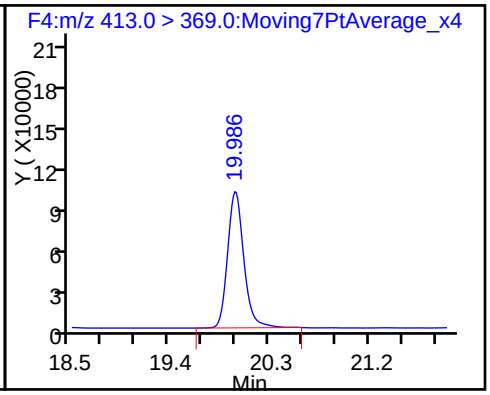
4 Perfluoroheptanoic acid (M)



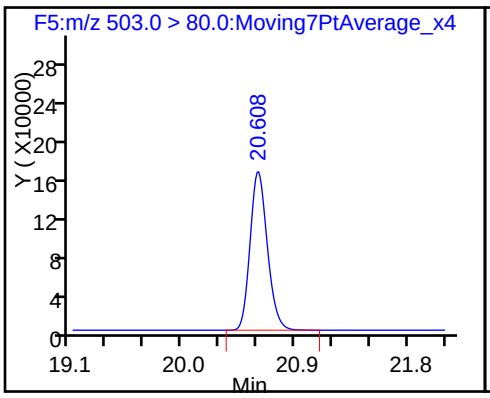
* 5 13C2-PFOA



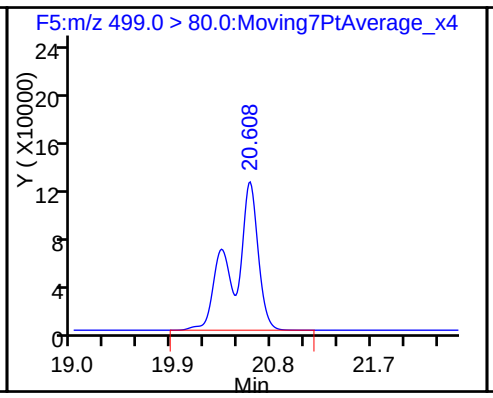
6 Perfluorooctanoic acid



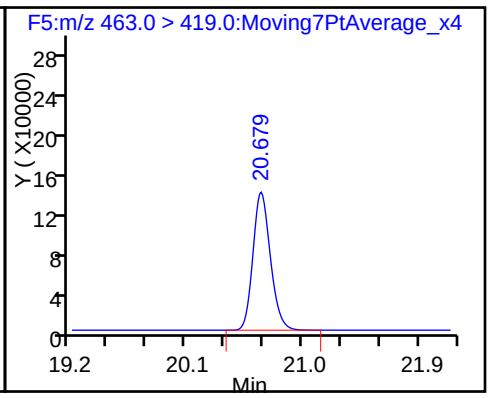
* 8 13C4 PFOS



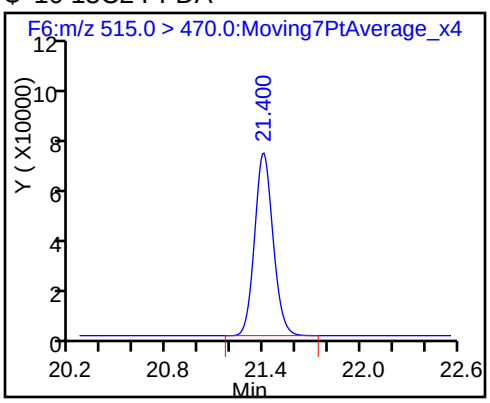
7 Perfluorooctane sulfonic acid



9 Perfluorononanoic acid



$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_025.d
Lims ID: LCS 320-143781/2-A
Client ID:
Sample Type: LCS
Inject. Date: 02-Jan-2017 22:16:46 ALS Bottle#: 30 Worklist Smp#: 25
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-143781/2-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 14:57:06 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 03-Jan-2017 14:15:09

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.2	102.10
$ 10 13C2 PFDA	10.0	10.3	102.78

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Client Sample ID: Lab Sample ID: LCSD 320-143781/3-A

Matrix: Water Lab File ID: 02JAN2017A6A_026.d

Analysis Method: 537 Date Collected:

Extraction Method: 537 Date Extracted: 12/23/2016 18:13

Sample wt/vol: 250.00(mL) Date Analyzed: 01/02/2017 22:46

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 144610 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.136		0.060	0.048	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.0761		0.030	0.024	0.0094
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.311		0.14	0.11	0.048

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	103		70-130
STL00996	13C2 PFDA	108		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_026.d
Lims ID: LCSD 320-143781/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 02-Jan-2017 22:46:23 ALS Bottle#: 31 Worklist Smp#: 26
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-143781/3-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 14:57:06 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 03-Jan-2017 14:17:10

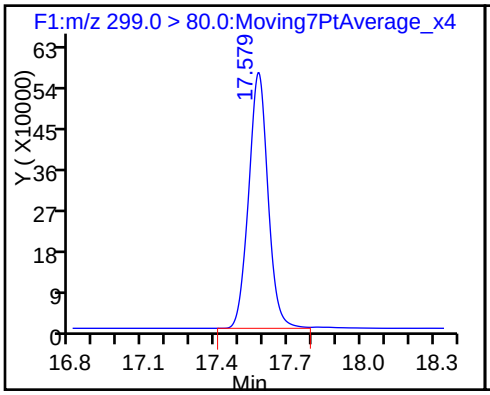
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.579	17.576	0.003	1.000	3141465	77.9	974	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.549	18.549	0.0	1.000	656446	10.3	21420	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.309	19.308	0.001	1.000	1282405	25.6	29548	
4 Perfluoroheptanoic acid								M
363.0 > 319.0	19.332	19.344	-0.012	1.000	911609	13.9	231	M
* 5 13C2-PFOA								
415.0 > 370.0	19.986	19.986	0.0		536451	10.0	13626	
6 Perfluorooctanoic acid								
413.0 > 369.0	19.986	19.999	-0.013	1.000	1026163	19.0	810	
* 8 13C4 PFOS								
503.0 > 80.0	20.596	20.608	-0.012		1525895	28.7	19845	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.596	20.608	-0.012	1.000	1987476	34.0	32021	
9 Perfluorononanoic acid								
463.0 > 419.0	20.667	20.679	-0.012	1.000	1311990	21.3	34789	
$ 10 13C2 PFDA								
515.0 > 470.0	21.391	21.409	-0.018	1.000	585209	10.8	18557	

QC Flag Legend

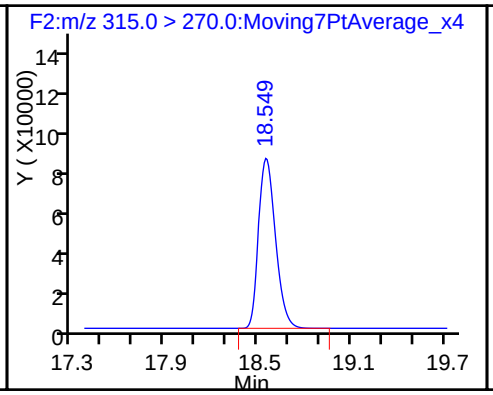
Review Flags
M - Manually Integrated

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_026.d
Injection Date: 02-Jan-2017 22:46:23 Instrument ID: A6
Lims ID: LCSD 320-143781/3-A
Client ID:
Operator ID: CBW ALS Bottle#: 31 Worklist Smp#: 26
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

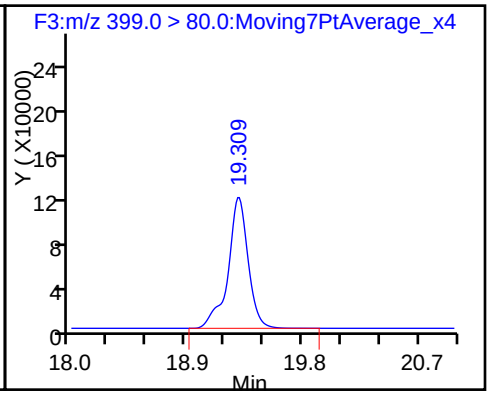
1 Perfluorobutanesulfonic acid



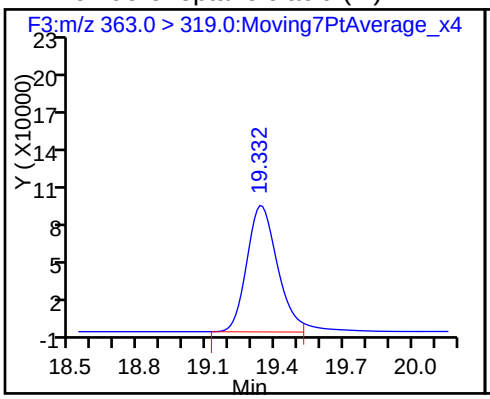
$ 2 13C2 PFHxA



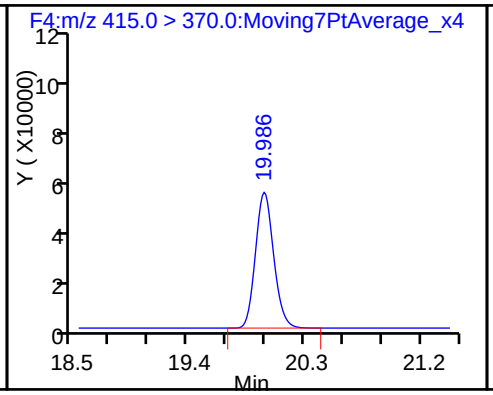
3 Perfluorohexanesulfonic acid



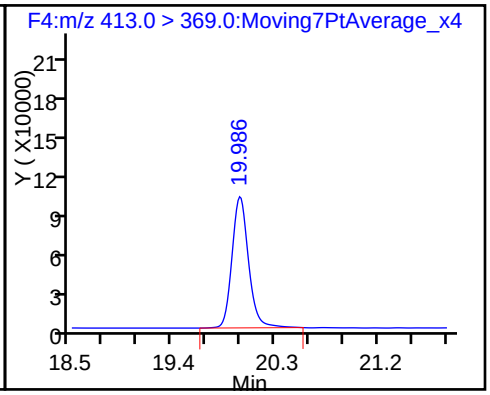
4 Perfluoroheptanoic acid (M)



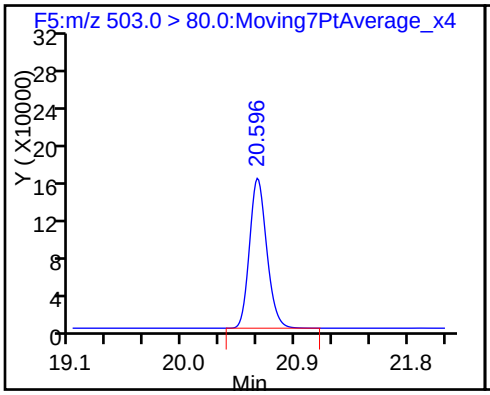
* 5 13C2-PFOA



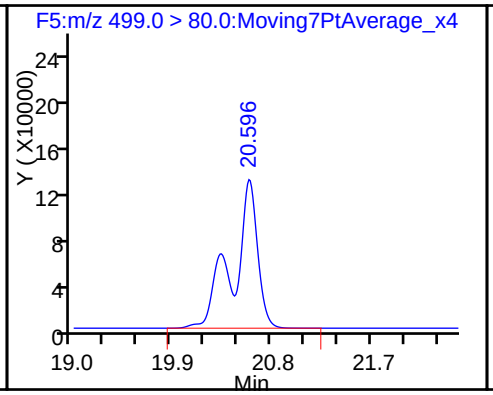
6 Perfluorooctanoic acid



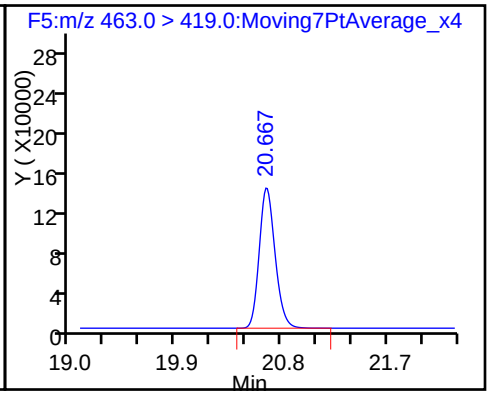
* 8 13C4 PFOS



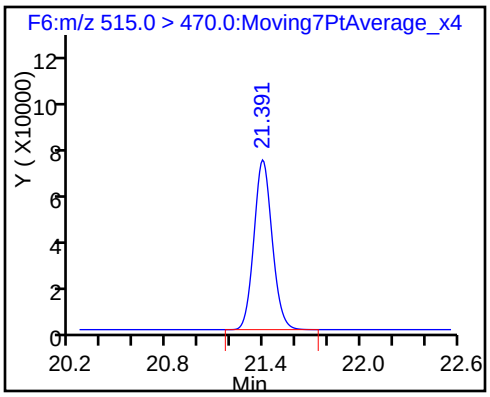
7 Perfluorooctane sulfonic acid



9 Perfluorononanoic acid



$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\02JAN2017A6A_026.d
Lims ID: LCSD 320-143781/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 02-Jan-2017 22:46:23 ALS Bottle#: 31 Worklist Smp#: 26
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-143781/3-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 03-Jan-2017 14:57:06 Calib Date: 24-Dec-2016 06:54:10
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 03-Jan-2017 14:17:10

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.3	102.56
$ 10 13C2 PFDA	10.0	10.8	108.19

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Instrument ID: A6 Start Date: 12/24/2016 03:26

Analysis Batch Number: 143828 End Date: 12/24/2016 15:56

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ZZZZZ		12/24/2016 03:26	1		Acquity 2.1(mm)
ZZZZZ		12/24/2016 03:56	1		Acquity 2.1(mm)
STD 320-143828/4 IC		12/24/2016 04:26	1	24DEC2016A6A_004.d	Acquity 2.1(mm)
STD 320-143828/5 IC		12/24/2016 04:55	1	24DEC2016A6A_005.d	Acquity 2.1(mm)
STD 320-143828/6 IC		12/24/2016 05:25	1	24DEC2016A6A_006.d	Acquity 2.1(mm)
STD 320-143828/7 ICISAV		12/24/2016 05:54	1	24DEC2016A6A_007.d	Acquity 2.1(mm)
STD 320-143828/8 IC		12/24/2016 06:24	1	24DEC2016A6A_008.d	Acquity 2.1(mm)
STD 320-143828/9 IC		12/24/2016 06:54	1	24DEC2016A6A_009.d	Acquity 2.1(mm)
ZZZZZ		12/24/2016 07:23	1		Acquity 2.1(mm)
CCV 320-143828/11 CCVL		12/24/2016 07:53	1	24DEC2016A6A_011.d	Acquity 2.1(mm)
ZZZZZ		12/24/2016 08:22	1		Acquity 2.1(mm)
ICV 320-143828/13		12/24/2016 08:52	1	24DEC2016A6A_013.d	Acquity 2.1(mm)
ZZZZZ		12/24/2016 09:22	1		Acquity 2.1(mm)
ZZZZZ		12/24/2016 11:00	1		Acquity 2.1(mm)
ZZZZZ		12/24/2016 11:29	1		Acquity 2.1(mm)
ZZZZZ		12/24/2016 11:59	1		Acquity 2.1(mm)
ZZZZZ		12/24/2016 12:29	1		Acquity 2.1(mm)
ZZZZZ		12/24/2016 12:58	1		Acquity 2.1(mm)
ZZZZZ		12/24/2016 13:28	1		Acquity 2.1(mm)
ZZZZZ		12/24/2016 13:57	1		Acquity 2.1(mm)
ZZZZZ		12/24/2016 14:27	1		Acquity 2.1(mm)
ZZZZZ		12/24/2016 14:57	1		Acquity 2.1(mm)
ZZZZZ		12/24/2016 15:26	1		Acquity 2.1(mm)
CCV 320-143828/26 CCVIS		12/24/2016 15:56	1		Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Instrument ID: A6 Start Date: 01/02/2017 10:56

Analysis Batch Number: 144608 End Date: 01/02/2017 17:20

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-144608/2 CCVL		01/02/2017 10:56	1	02JAN2017A6A_002.d	Acquity 2.1(mm)
CCV 320-144608/3 CCVIS		01/02/2017 11:25	1		Acquity 2.1(mm)
ZZZZZ		01/02/2017 11:55	1		Acquity 2.1(mm)
ZZZZZ		01/02/2017 12:24	1		Acquity 2.1(mm)
ZZZZZ		01/02/2017 12:54	1		Acquity 2.1(mm)
ZZZZZ		01/02/2017 13:24	1		Acquity 2.1(mm)
ZZZZZ		01/02/2017 13:53	1		Acquity 2.1(mm)
ZZZZZ		01/02/2017 14:23	1		Acquity 2.1(mm)
ZZZZZ		01/02/2017 14:52	1		Acquity 2.1(mm)
ZZZZZ		01/02/2017 15:22	1		Acquity 2.1(mm)
ZZZZZ		01/02/2017 15:52	1		Acquity 2.1(mm)
ZZZZZ		01/02/2017 16:21	1		Acquity 2.1(mm)
ZZZZZ		01/02/2017 16:51	1		Acquity 2.1(mm)
CCV 320-144608/15 CCVIS		01/02/2017 17:20	1		Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Instrument ID: A6 Start Date: 01/02/2017 17:20

Analysis Batch Number: 144610 End Date: 01/02/2017 23:15

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-144610/15 CCVIS		01/02/2017 17:20	1	02JAN2017A6A_015.d	Acquity 2.1(mm)
ZZZZZ		01/02/2017 17:50	1		Acquity 2.1(mm)
ZZZZZ		01/02/2017 18:20	1		Acquity 2.1(mm)
ZZZZZ		01/02/2017 18:49	1		Acquity 2.1(mm)
MB 320-143781/1-A		01/02/2017 21:47	1	02JAN2017A6A_024.d	Acquity 2.1(mm)
LCS 320-143781/2-A		01/02/2017 22:16	1	02JAN2017A6A_025.d	Acquity 2.1(mm)
LCSD 320-143781/3-A		01/02/2017 22:46	1	02JAN2017A6A_026.d	Acquity 2.1(mm)
CCV 320-144610/27 CCVIS		01/02/2017 23:15	1	02JAN2017A6A_027.d	Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Instrument ID: A6 Start Date: 01/02/2017 23:15

Analysis Batch Number: 144612 End Date: 01/03/2017 05:11

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-144612/27 CCVIS		01/02/2017 23:15	1	02JAN2017A6A_027.d	Acquity 2.1(mm)
ZZZZZ		01/02/2017 23:45	1		Acquity 2.1(mm)
ZZZZZ		01/03/2017 00:15	1		Acquity 2.1(mm)
ZZZZZ		01/03/2017 00:44	1		Acquity 2.1(mm)
ZZZZZ		01/03/2017 01:14	1		Acquity 2.1(mm)
ZZZZZ		01/03/2017 01:43	1		Acquity 2.1(mm)
ZZZZZ		01/03/2017 02:13	1		Acquity 2.1(mm)
ZZZZZ		01/03/2017 02:43	1		Acquity 2.1(mm)
ZZZZZ		01/03/2017 03:12	1		Acquity 2.1(mm)
ZZZZZ		01/03/2017 03:42	1		Acquity 2.1(mm)
320-24637-1		01/03/2017 04:11	1	02JAN2017A6A_037.d	Acquity 2.1(mm)
320-24637-2		01/03/2017 04:41	1	02JAN2017A6A_038.d	Acquity 2.1(mm)
CCV 320-144612/39 CCVIS		01/03/2017 05:11	1	02JAN2017A6A_039.d	Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Instrument ID: A6 Start Date: 01/03/2017 05:11

Analysis Batch Number: 144614 End Date: 01/03/2017 11:03

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-144614/39 CCVIS		01/03/2017 05:11	1	02JAN2017A6A_039.d	Acquity 2.1(mm)
ZZZZZ		01/03/2017 05:40	1		Acquity 2.1(mm)
320-24637-3		01/03/2017 06:10	1	02JAN2017A6A_041.d	Acquity 2.1(mm)
320-24637-4		01/03/2017 06:39	1	02JAN2017A6A_042.d	Acquity 2.1(mm)
ZZZZZ		01/03/2017 07:09	1		Acquity 2.1(mm)
ZZZZZ		01/03/2017 07:39	1		Acquity 2.1(mm)
ZZZZZ		01/03/2017 08:08	1		Acquity 2.1(mm)
ZZZZZ		01/03/2017 08:38	1		Acquity 2.1(mm)
ZZZZZ		01/03/2017 09:07	1		Acquity 2.1(mm)
ZZZZZ		01/03/2017 09:37	1		Acquity 2.1(mm)
ZZZZZ		01/03/2017 10:07	1		Acquity 2.1(mm)
ZZZZZ		01/03/2017 10:36	1		Acquity 2.1(mm)
CCV 320-144614/51 CCVIS		01/03/2017 11:03	1	02JAN2017A6A_051.d	Acquity 2.1(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Batch Number: 143781 Batch Start Date: 12/23/16 18:13 Batch Analyst: Reed, Jonathan E

Batch Method: 537 Batch End Date: 12/27/16 13:55

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00027
MB 320-143781/1		537, 537				250.00 mL	1.00 mL	7 SU	20 uL
LCS 320-143781/2		537, 537				250.00 mL	1.00 mL	7 SU	20 uL
LCSD 320-143781/3		537, 537				250.00 mL	1.00 mL	7 SU	20 uL
320-24637-A-1	WI-AF-3RW36-1216	537, 537	T	294.27 g	27.52 g	266.8 mL	1.00 mL	7 SU	20 uL
320-24637-A-2	WI-AF-3FB36-1216	537, 537	T	288.71 g	26.21 g	262.5 mL	1.00 mL	7 SU	20 uL
320-24637-B-3	WI-AF-3RW37-1216	537, 537	T	296.10 g	26.41 g	269.7 mL	1.00 mL	7 SU	20 uL
320-24637-A-4	WI-AF-3FB37-1216	537, 537	T	286.18 g	26.45 g	259.7 mL	1.00 mL	7 SU	20 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-MSP 00016	LC537-SU 00027	AnalysisComment			
MB 320-143781/1		537, 537			50 uL	Free Chlorine: ND			
LCS 320-143781/2		537, 537		50 uL	50 uL	Free Chlorine: ND			
LCSD 320-143781/3		537, 537		50 uL	50 uL	Free Chlorine: ND			
320-24637-A-1	WI-AF-3RW36-1216	537, 537	T		50 uL	Free Chlorine: ND			
320-24637-A-2	WI-AF-3FB36-1216	537, 537	T		50 uL	Free Chlorine: ND			
320-24637-B-3	WI-AF-3RW37-1216	537, 537	T		50 uL	Free Chlorine: ND			
320-24637-A-4	WI-AF-3FB37-1216	537, 537	T		50 uL	Free Chlorine: 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.: 320-24637-1

SDG No.:

Batch Number: 143781 Batch Start Date: 12/23/16 18:13 Batch Analyst: Reed, Jonathan E

Batch Method: 537 Batch End Date: 12/27/16 13:55

Batch Notes	
Manifold ID	7
Methanol ID	807182
Pipette ID	MD05306
Analyst ID - IS Reagent Drop	VPM
Analyst ID - IS Reagent Drop Witness	CCB
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	KMK
Analyst ID - TA Reagent Drop	JER
Analyst ID - TA Reagent Drop Witness	KMK
SPE Cartridge ID	6341059-01
Trizma ID	SLBR4303V
Reagent Water ID	12/23/16

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: 24636,24637 Instrument ID & Date: 1-3-16 ICAL Batch: 143828
Extraction Batch: 143781 Worklist #: 38388 TALS Batch: 144610, 144612, 144614

Review Items	Level 1 Yes	Level 1 No	Level 1 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 1-3-17 2nd Level Reviewer / Date: MKelly 1/4/2017

NCM # and Comments: _____

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento

Method 537 ICAL Checklist

Instrument ID & Date: A6 12/24/16 Worklist#: 38202

ICAL Batch: 143828, 143829 Calibration ID number: 27291, 27292

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: CBW 12/27/16 2nd Level Reviewer / Date: MWW 12/27/2016

NCM # and Comments: _____

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 02JAN2017A_A6 537 Worklist Number: 38388
Instrument Name: A6 Chrom Method: 537__A6
Data Directory: \\ChromNA\Sacramento\ChromData\A6\20170102-38388.b
QC Batching: Enabled Limit Group Batching: Enabled

QC Batch: 1	LC 537 ICAL Raw Batch: 144608	LC 537 CS ICAL Raw Batch: 144607
# 1 RB	# 1 RB	
# 2 CCV L2	# 2 CCV L2	# 2 CCV L2
# 3 CCV L3	# 3 CCV L3	
# 4 RB	# 4 RB	
# 5 MB 320-143783/1-A	# 5 MB 320-143783/1-A	
# 6 LCS 320-143783/2-A	# 6 LCS 320-143783/2-A	
# 7 LCSD 320-143783/3-A	# 7 LCSD 320-143783/3-A	
# 8 320-24648-A-1-A	# 8 320-24648-A-1-A	
# 9 320-24648-A-2-A	# 9 320-24648-A-2-A	
#10 320-24648-A-3-A	#10 320-24648-A-3-A	
#11 320-24648-A-4-A	#11 320-24648-A-4-A	
#12 320-24648-A-5-A	#12 320-24648-A-5-A	
#13 320-24648-A-6-A	#13 320-24648-A-6-A	
#14 320-24648-A-7-A	#14 320-24648-A-7-A	
#15 CCV L5	#15 CCV L5	#15 CCV L5

QC Batch: 2	LC 537 CS ICAL Raw Batch: 144609	LC 537 ICAL Raw Batch: 144610
#15 CCV L5	#15 CCV L5	#15 CCV L5
#16 RB	#16 RB	#16 RB
#17 320-24648-A-8-A		#17 320-24648-A-8-A
#18 320-24648-A-9-A		#18 320-24648-A-9-A
#19 MB 320-144356/1-A	#19 MB 320-144356/1-A	
#20 LCS 320-144356/2-A	#20 LCS 320-144356/2-A	
#21 280-91747-E-1-A	#21 280-91747-E-1-A	
#22 280-91747-B-1-A DU	#22 280-91747-B-1-A DU	
#23 280-91747-B-1-B MS	#23 280-91747-B-1-B MS	
#24 MB 320-143781/1-A		#24 MB 320-143781/1-A
#25 LCS 320-143781/2-A		#25 LCS 320-143781/2-A
#26 LCSD 320-143781/3-A		#26 LCSD 320-143781/3-A
#27 CCV L3	#27 CCV L3	#27 CCV L3

QC Batch: 3	LC 537 CS ICAL Raw Batch: 144611	LC 537 ICAL Raw Batch: 144612
#27 CCV L3	#27 CCV L3	#27 CCV L3
#28 RB		#28 RB
#29 320-24636-A-1-A		#29 320-24636-A-1-A
#30 320-24636-A-2-A		#30 320-24636-A-2-A
#31 320-24636-A-3-A		#31 320-24636-A-3-A
#32 320-24636-A-4-A		#32 320-24636-A-4-A
#33 320-24636-A-5-A		#33 320-24636-A-5-A
#34 320-24636-A-6-A		#34 320-24636-A-6-A
#35 320-24636-A-7-A		#35 320-24636-A-7-A
#36 320-24636-A-8-A		#36 320-24636-A-8-A
#37 320-24637-A-1-A		#37 320-24637-A-1-A
#38 320-24637-A-2-A		#38 320-24637-A-2-A
#39 CCV L5		#39 CCV L5

QC Batch: 4	LC 537 ICAL Raw Batch: 144614
#39 CCV L5	#39 CCV L5
#40 RB	#40 RB
#41 320-24637-B-3-A	#41 320-24637-B-3-A
#42 320-24637-A-4-A	#42 320-24637-A-4-A
#43 MB 320-144066/1-A	#43 MB 320-144066/1-A
#44 LCS 320-144066/2-A	#44 LCS 320-144066/2-A
#45 320-24673-A-1-A	#45 320-24673-A-1-A
#46 320-24673-A-2-A	#46 320-24673-A-2-A
#47 320-24673-A-3-A	#47 320-24673-A-3-A
#48 320-24673-A-4-A	#48 320-24673-A-4-A
#49 320-24673-A-5-A	#49 320-24673-A-5-A
#50 320-24673-A-6-A	#50 320-24673-A-6-A
#51 CCV L3	#51 CCV L3

QC Batch: 5	LC 537 ICAL Raw Batch: 144616	LC 537 CS ICAL Raw Batch: 144615
#51 CCV L3	#51 CCV L3	
#52 RB	#52 RB	
#61 QC LC537-SU_00028	#61 QC LC537-SU_00028	
#53 320-24673-A-7-A	#53 320-24673-A-7-A	
#54 320-24673-A-7-B MS	#54 320-24673-A-7-B MS	
#55 320-24673-A-7-C MSD	#55 320-24673-A-7-C MSD	
#56 320-24673-A-8-A	#56 320-24673-A-8-A	
#57 320-24673-A-9-A	#57 320-24673-A-9-A	
#58 320-24673-A-10-A	#58 320-24673-A-10-A	
#59 CCV L5	#59 CCV L5	#59 CCV L5

QC Batch: 6	LC 537 ICAL Raw Batch: 144764	LC 537 CS ICAL Raw Batch: 144714
#59 CCV L5	#59 CCV L5	#59 CCV L5
#60 RB		#60 RB
#62 320-24228-A-2-A		#62 320-24228-A-2-A
#63 320-24322-A-1-A		#63 320-24322-A-1-A
#64 320-24322-A-1-C DU		#64 320-24322-A-1-C DU
#65 320-24322-A-1-B MS		#65 320-24322-A-1-B MS
#66 320-24322-A-3-A		#66 320-24322-A-3-A
#67 320-24322-A-5-A		#67 320-24322-A-5-A
#68 CCV L3		#68 CCV L3
#69 RB		#69 RB

256 Push

Aqueous Extraction Analysis Sheet

AB 12/31/16

(To Accompany Samples to Instruments)

Batch Number: 320-143781

Analyst: Reed, Jonathan E

Batch Open: 12/23/2016 6:13:00PM

Batch End: 12/27/16 13:55
AG 1/02/17

Method Code: 320-537_Prep-320

Extraction of Perfluorinated Alkyl Acids

Due 1/3

	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~320-143781/1 N/A	N/A		250.00 mL	7			N/A	N/A	N/A	Free Chlorine: ND	MB 320-143781/1-A
				1.00 mL								
2	LCS~320-143781/2 N/A	N/A		250.00 mL	7			N/A	N/A	N/A		LCS 320-143781/2-A
				1.00 mL								
3	LCSD~320-143781/3 N/A	N/A		250.00 mL	7			N/A	N/A	N/A		LCSD 320-143781/3-A
				1.00 mL								
4	320-24636-A-1 (537_DOD5)	N/A (320-24636-1)	298.84 g	271.4 mL	7			12/28/16	8_Day_Rush	4		320-24636-A-1-A
			27.43 g	1.00 mL								
5	320-24636-A-2 (537_DOD5)	N/A (320-24636-1)	289.71 g	262.8 mL	7			12/28/16	8_Day_Rush	4		320-24636-A-2-A
			26.91 g	1.00 mL								
6	320-24636-A-3 (537_DOD5)	N/A (320-24636-1)	303.31 g	276.5 mL	7			12/28/16	8_Day_Rush	4		320-24636-A-3-A
			26.83 g	1.00 mL								
7	320-24636-A-4 (537_DOD5)	N/A (320-24636-1)	286.43 g	259.8 mL	7			12/28/16	8_Day_Rush	4		320-24636-A-4-A
			26.66 g	1.00 mL								
8	320-24636-A-5 (537_DOD5)	N/A (320-24636-1)	283.49 g	256.7 mL	7			12/28/16	8_Day_Rush	4		320-24636-A-5-A
			26.77 g	1.00 mL								
9	320-24636-A-6 (537_DOD5)	N/A (320-24636-1)	285.54 g	258.9 mL	7			12/28/16	8_Day_Rush	4		320-24636-A-6-A
			26.63 g	1.00 mL								
10	320-24636-A-7 (537_DOD5)	N/A (320-24636-1)	287.03 g	259.5 mL	7			12/28/16	8_Day_Rush	4		320-24636-A-7-A
			27.51 g	1.00 mL								

01/04/2017

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-143781

Analyst: Reed, Jonathan E

Batch Open: 12/23/2016 6:13:00PM

Method Code: 320-537_Prep-320

Batch End:

11	320-24636-A-8 (537_DOD5)	N/A (320-24636-1)	286.57 g / 26.55 g	260 mL / 1.00 mL	7			12/28/16	8_Day_Rush	4	Free Chlorine: ND 
12	320-24637-A-1 (537_DOD5)	N/A (320-24637-1)	294.27 g / 27.52 g	266.8 mL / 1.00 mL	7			12/28/16	8_Day_Rush	4	
13	320-24637-A-2 (537_DOD5)	N/A (320-24637-1)	288.71 g / 26.21 g	262.5 mL / 1.00 mL	7			12/28/16	8_Day_Rush	4	
14	320-24637-B-3 (537_DOD5)	N/A (320-24637-1)	296.10 g / 26.41 g	269.7 mL / 1.00 mL	7			12/28/16	8_Day_Rush	4	
15	320-24637-A-4 (537_DOD5)	N/A (320-24637-1)	286.18 g / 26.45 g	259.7 mL / 1.00 mL	7			12/28/16	8_Day_Rush	4	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-143781
Method Code: 320-537_Prep-320

Analyst: Reed, Jonathan E

Batch Open: 12/23/2016 6:13:00PM
Batch End:

Batch Notes

Manifold ID	7
Trizma ID	SLBR4303V
SPE Cartridge ID	6341059-01
Methanol ID	807182
Reagent Water ID	12/23/16
Pipette ID	MD05306
Analyst ID - TA Reagent Drop	JER
Analyst ID - TA Reagent Drop Witness	JER
Analyst ID - SU Reagent Drop	kmk
Analyst ID - SU Reagent Drop Witness	kmk
Analyst ID - IS Reagent Drop	VTM (808145)
Analyst ID - IS Reagent Drop Witness	CCB
Batch Comment	

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-143781
Method Code: 320-537_Prep-320

Analyst: Reed, Jonathan E

Batch Open: 12/23/2016 6:13:00PM
Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-143781/1	LC537-SU_00027	50 uL	1.00 mL	12/23/16	KMK 12-23-16
LCS 320-143781/2	LC537-MSP_00016	50 uL	1.00 mL		
LCS 320-143781/2	LC537-SU_00027	50 uL	1.00 mL		
LCSD 320-143781/3	LC537-MSP_00016	50 uL	1.00 mL		
LCSD 320-143781/3	LC537-SU_00027	50 uL	1.00 mL		
320-24636-A-1	LC537-SU_00027	50 uL	1.00 mL		
320-24636-A-2	LC537-SU_00027	50 uL	1.00 mL		
320-24636-A-3	LC537-SU_00027	50 uL	1.00 mL		
320-24636-A-4	LC537-SU_00027	50 uL	1.00 mL		
320-24636-A-5	LC537-SU_00027	50 uL	1.00 mL		
320-24636-A-6	LC537-SU_00027	50 uL	1.00 mL		
320-24636-A-7	LC537-SU_00027	50 uL	1.00 mL		
320-24636-A-8	LC537-SU_00027	50 uL	1.00 mL		
320-24637-A-1	LC537-SU_00027	50 uL	1.00 mL		
320-24637-A-2	LC537-SU_00027	50 uL	1.00 mL		
320-24637-B-3	LC537-SU_00027	50 uL	1.00 mL		
320-24637-A-4	LC537-SU_00027	50 uL	1.00 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-143781

Analyst: Reed, Jonathan E

Batch Open: 12/23/2016 6:13:00PM

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): 143781 Test: 537 - DOD05

Earliest Holding Time: 11/02/16

Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	✓	✓
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: [signature] Date: 12/27/16

2nd Level Reviewer: VM Date: 12/27/16

Comments:

Shipping and Receiving Documents

TestAmerica Sacramento
880 Riverside Parkway

West Sacramento, CA 95605
phone 916.373.5600 fax

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

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

Client Contact	Project Manager: Katie Tippin	Site Contact: Eric Epple	Date: 12/21/2016	COC No: 1
Tiffany Hill	Tel/Fax: (757) 671-6258	Lab Contact: Laura Turpen	Carrier: FedEx	1 of 1 COCs
Project Chemist	Analysis Turnaround Time			Sampler:
1100 NE Circle Blvd Ste 300 Corvallis, OR 97330	☑ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(541) 768-3109	TAT if different from Below 7-Day			Walk-in Client:
(541) 908-3794	☐ 2 weeks			Lab Sampling:
Project Name: CTO-08	☐ 1 week			
Site: NAS Whidbey Island	☐ 2 days			Job / SDG No.:
P O #: 100067106050 - 679580.06.FI.FS	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	USEPA Method 537 (PFOA, PFOS, and PFBS)	Sample Specific Notes:
WI-AF-3RW36-1216	12/20/16	0901	G	DW	2	N	N	X	
WI-AF-3FB36-1216	12/20/16	0902	G	DW	2	N	N	X	
WI-AF-3RW37-1216	12/20/16	1812	G	DW	2	N	N	X	
WI-AF-3FB37-1216	12/20/16	1813	G	DW	2	N	N	X	

320-24637 Chain of Custody

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

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:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd:_____ Corr'd:_____ Therm ID No.:_____

Relinquished by: Eric Epple	Company: CH2M	Date/Time: 12-21-16/1600	Received by: J. Nihart	Company: TAWS	Date/Time: 12/23/16 1650
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. 4.3, dated 12/05/2013

0.6°C

01/04/2017

Login Sample Receipt Checklist

Client: CH2M Hill Constructors, Inc.

Job Number: 320-24637-1

Login Number: 24637
List Number: 1
Creator: Turpen, Troy

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	Seal
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?	N/A	
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	

Lab_Sample_ID	Contract_ID	DO_CTO_ Number	Phase	Installation_ID	Sample_Name	CH2M_ Code	Analysis_ Group	Analytical_ Method	PRC_ Code	Lab_ Code	Lab_Name	Leachate_ Method	Sample_ Basis	Extraction_ Method	Result_ Type	Lab_QC_ Type	Sample_ Medium	QC_ Level	DateTime_ Collected	Date_ Received	Leachate_ Date	Leachate_ Time	Extraction_Date	Extraction_ Time	Analysis_ Date	Analysis_ Time	Lab_Sample_ID	Dilution	Run_ Number
320-24637-1	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW36-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 09:01	12/23/2016			20161223	18:13:00	20170103	04:11:00	320-24637-1	1	1
320-24637-1	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW36-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 09:01	12/23/2016			20161223	18:13:00	20170103	04:11:00	320-24637-1	1	1
320-24637-1	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW36-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 09:01	12/23/2016			20161223	18:13:00	20170103	04:11:00	320-24637-1	1	1
320-24637-1	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW36-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 09:01	12/23/2016			20161223	18:13:00	20170103	04:11:00	320-24637-1	1	1
320-24637-1	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW36-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 09:01	12/23/2016			20161223	18:13:00	20170103	04:11:00	320-24637-1	1	1
320-24637-2	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB36-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 09:02	12/23/2016			20161223	18:13:00	20170103	04:41:00	320-24637-2	1	1
320-24637-2	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB36-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 09:02	12/23/2016			20161223	18:13:00	20170103	04:41:00	320-24637-2	1	1
320-24637-2	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB36-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 09:02	12/23/2016			20161223	18:13:00	20170103	04:41:00	320-24637-2	1	1
320-24637-2	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB36-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 09:02	12/23/2016			20161223	18:13:00	20170103	04:41:00	320-24637-2	1	1
320-24637-2	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB36-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 09:02	12/23/2016			20161223	18:13:00	20170103	04:41:00	320-24637-2	1	1
320-24637-3	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW37-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 18:12	12/23/2016			20161223	18:13:00	20170103	06:10:00	320-24637-3	1	1
320-24637-3	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW37-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 18:12	12/23/2016			20161223	18:13:00	20170103	06:10:00	320-24637-3	1	1
320-24637-3	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW37-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 18:12	12/23/2016			20161223	18:13:00	20170103	06:10:00	320-24637-3	1	1
320-24637-3	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW37-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 18:12	12/23/2016			20161223	18:13:00	20170103	06:10:00	320-24637-3	1	1
320-24637-3	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW37-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 18:12	12/23/2016			20161223	18:13:00	20170103	06:10:00	320-24637-3	1	1
320-24637-4	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB37-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 18:13	12/23/2016			20161223	18:13:00	20170103	06:39:00	320-24637-4	1	1
320-24637-4	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB37-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 18:13	12/23/2016			20161223	18:13:00	20170103	06:39:00	320-24637-4	1	1
320-24637-4	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB37-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 18:13	12/23/2016			20161223	18:13:00	20170103	06:39:00	320-24637-4	1	1
320-24637-4	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB37-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 18:13	12/23/2016			20161223	18:13:00	20170103	06:39:00	320-24637-4	1	1
320-24637-4	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB37-1216	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	12/20/2016 18:13	12/23/2016			20161223	18:13:00	20170103	06:39:00	320-24637-4	1	1
LCS 320-143781/2-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-143781/2-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BS	W	4	12/23/2016 18:13	12/23/2016			20161223	18:13:00	20170102	22:16:00	LCS 320-143781/2-A	1	1
LCS 320-143781/2-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-143781/2-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BS	W	4	12/23/2016 18:13	12/23/2016			20161223	18:13:00	20170102	22:16:00	LCS 320-143781/2-A	1	1
LCS 320-143781/2-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-143781/2-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BS	W	4	12/23/2016 18:13	12/23/2016			20161223	18:13:00	20170102	22:16:00	LCS 320-143781/2-A	1	1
LCS 320-143781/2-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-143781/2-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BS	W	4	12/23/2016 18:13	12/23/2016			20161223	18:13:00	20170102	22:16:00	LCS 320-143781/2-A	1	1
LCS 320-143781/2-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-143781/2-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BS	W	4	12/23/2016 18:13	12/23/2016			20161223	18:13:00	20170102	22:16:00	LCS 320-143781/2-A	1	1
LCSD 320-143781/3-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-143781/3-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BSD	W	4	12/23/2016 18:13	12/23/2016			20161223	18:13:00	20170102	22:46:00	LCSD 320-143781/3-A	1	1
LCSD 320-143781/3-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-143781/3-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BSD	W	4	12/23/2016 18:13	12/23/2016			20161223	18:13:00	20170102	22:46:00	LCSD 320-143781/3-A	1	1
LCSD 320-143781/3-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-143781/3-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BSD	W	4	12/23/2016 18:13	12/23/2016			20161223	18:13:00	20170102	22:46:00	LCSD 320-143781/3-A	1	1
LCSD 320-143781/3-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-143781/3-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BSD	W	4	12/23/2016 18:13	12/23/2016			20161223	18:13:00	20170102	22:46:00	LCSD 320-143781/3-A	1	1
LCSD 320-143781/3-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-143781/3-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BSD	W	4	12/23/2016 18:13	12/23/2016			20161223	18:13:00	20170102	22:46:00	LCSD 320-143781/3-A	1	1
MB 320-143781/1-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-143781/1-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	LB1	W	4	12/23/2016 18:13	12/23/2016			20161223	18:13:00	20170102	21:47:00	MB 320-143781/1-A	1	1
MB 320-143781/1-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-143781/1-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	LB1	W	4	12/23/2016 18:13	12/23/2016			20161223	18:13:00	20170102	21:47:00	MB 320-143781/1-A	1	1
MB 320-143781/1-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-143781/1-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	LB1	W	4	12/23/2016 18:13	12/23/2016			20161223	18:13:00	20170102	21:47:00	MB 320-143781/1-A	1	1
MB 320-143781/1-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-143781/1-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	LB1	W	4	12/23/2016 18:13	12/23/2016			20161223	18:13:00	20170102	21:47:00	MB 320-143781/1-A	1	1
MB 320-143781/1-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-143781/1-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	LB1	W	4	12/23/2016 18:13	12/23/2016			20161223	18:13:00	20170102	21:47:00	MB 320-143781/1-A	1	1

Lab_Sample_ID	Contract_ID	DO_CTO_ Number	Phase	Installation_ID	Sample_Name	Percent_ Moisture	Percent_ Lipid	Chem_Name	Analyte_ID	Analyte_ Value	Original_ Analyte_Value	Result_ Units	Lab_ Qualifier	Validator_ Qualifier	GC_ Column_ Type	Analysis_ Result_Type	Result_ Narrative	QC_ Control_ Limit_Code	QC_ Accuracy_ Upper	QC_ Accuracy_ Lower	Control_ Limit_Date	QC_ Narrative	MDL	Detection_ Limit	QSM_ Version	DL	LOD	LOQ	SDG	Analysis_ Batch
320-24637-1	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW36-1216			Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.045	UG_L	U		PR	TRG					00000000				5.0	0.015	0.045	0.056	320-24637-1	320-144612
320-24637-1	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW36-1216			Perfluorooctanoic acid (PFOA)	335-67-1		0.022	UG_L	U		PR	TRG					00000000				5.0	0.0088	0.022	0.028	320-24637-1	320-144612
320-24637-1	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW36-1216			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.10	UG_L	U		PR	TRG					00000000				5.0	0.045	0.10	0.13	320-24637-1	320-144612
320-24637-1	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW36-1216			13C2 PFHXA	13C2 PFHXA		109	PCT_REC			PR	SURR		SLSA	130	70	00000000				5.0				320-24637-1	320-144612
320-24637-1	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW36-1216			13C2 PFDA	13C2 PFDA		103	PCT_REC			PR	SURR		SLSA	130	70	00000000				5.0				320-24637-1	320-144612
320-24637-2	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB36-1216			Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.046	UG_L	U		PR	TRG					00000000				5.0	0.015	0.046	0.057	320-24637-1	320-144612
320-24637-2	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB36-1216			Perfluorooctanoic acid (PFOA)	335-67-1		0.023	UG_L	U		PR	TRG					00000000				5.0	0.0090	0.023	0.029	320-24637-1	320-144612
320-24637-2	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB36-1216			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.10	UG_L	U		PR	TRG					00000000				5.0	0.045	0.10	0.13	320-24637-1	320-144612
320-24637-2	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB36-1216			13C2 PFHXA	13C2 PFHXA		112	PCT_REC			PR	SURR		SLSA	130	70	00000000				5.0				320-24637-1	320-144612
320-24637-2	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB36-1216			13C2 PFDA	13C2 PFDA		106	PCT_REC			PR	SURR		SLSA	130	70	00000000				5.0				320-24637-1	320-144612
320-24637-3	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW37-1216			Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.044	UG_L	U		PR	TRG					00000000				5.0	0.014	0.044	0.056	320-24637-1	320-144614
320-24637-3	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW37-1216			Perfluorooctanoic acid (PFOA)	335-67-1		0.022	UG_L	U		PR	TRG					00000000				5.0	0.0087	0.022	0.028	320-24637-1	320-144614
320-24637-3	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW37-1216			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.10	UG_L	U		PR	TRG					00000000				5.0	0.044	0.10	0.13	320-24637-1	320-144614
320-24637-3	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW37-1216			13C2 PFHXA	13C2 PFHXA		105	PCT_REC			PR	SURR		SLSA	130	70	00000000				5.0				320-24637-1	320-144614
320-24637-3	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3RW37-1216			13C2 PFDA	13C2 PFDA		114	PCT_REC			PR	SURR		SLSA	130	70	00000000				5.0				320-24637-1	320-144614
320-24637-4	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB37-1216			Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.046	UG_L	U		PR	TRG					00000000				5.0	0.015	0.046	0.058	320-24637-1	320-144614
320-24637-4	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB37-1216			Perfluorooctanoic acid (PFOA)	335-67-1		0.023	UG_L	U		PR	TRG					00000000				5.0	0.0091	0.023	0.029	320-24637-1	320-144614
320-24637-4	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB37-1216			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.11	UG_L	U		PR	TRG					00000000				5.0	0.046	0.11	0.13	320-24637-1	320-144614
320-24637-4	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB37-1216			13C2 PFHXA	13C2 PFHXA		104	PCT_REC			PR	SURR		SLSA	130	70	00000000				5.0				320-24637-1	320-144614
320-24637-4	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-AF-3FB37-1216			13C2 PFDA	13C2 PFDA		110	PCT_REC			PR	SURR		SLSA	130	70	00000000				5.0				320-24637-1	320-144614
LCS 320-143781/2-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-143781/2-A			Perfluorooctane Sulfonate (PFOS)	1763-23-1		80	PCT_REC			PR	TRG		LSA	130	70	00000000				5.0	0.016	0.048	0.060	320-24637-1	320-144610
LCS 320-143781/2-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-143781/2-A			Perfluorooctanoic acid (PFOA)	335-67-1		96	PCT_REC			PR	TRG		LSA	130	70	00000000				5.0	0.0094	0.024	0.030	320-24637-1	320-144610
LCS 320-143781/2-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-143781/2-A			Perfluorobutanesulfonic acid (PFBS)	375-73-5		84	PCT_REC			PR	TRG		LSA	130	70	00000000				5.0	0.048	0.11	0.14	320-24637-1	320-144610
LCS 320-143781/2-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-143781/2-A			13C2 PFHXA	13C2 PFHXA		102	PCT_REC			PR	SURR		SLSA	130	70	00000000				5.0				320-24637-1	320-144610
LCS 320-143781/2-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-143781/2-A			13C2 PFDA	13C2 PFDA		103	PCT_REC			PR	SURR		SLSA	130	70	00000000				5.0				320-24637-1	320-144610
LCSD 320-143781/3-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-143781/3-A			Perfluorooctane Sulfonate (PFOS)	1763-23-1		85	PCT_REC			PR	TRG		LSP	130	70	00000000				5.0	0.016	0.048	0.060	320-24637-1	320-144610
LCSD 320-143781/3-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-143781/3-A			Perfluorooctanoic acid (PFOA)	335-67-1		97	PCT_REC			PR	TRG		LSP	130	70	00000000				5.0	0.0094	0.024	0.030	320-24637-1	320-144610
LCSD 320-143781/3-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-143781/3-A			Perfluorobutanesulfonic acid (PFBS)	375-73-5		87	PCT_REC			PR	TRG		LSP	130	70	00000000				5.0	0.048	0.11	0.14	320-24637-1	320-144610
LCSD 320-143781/3-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-143781/3-A			13C2 PFHXA	13C2 PFHXA		103	PCT_REC			PR	SURR		SLSA	130	70	00000000				5.0				320-24637-1	320-144610
LCSD 320-143781/3-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-143781/3-A			13C2 PFDA	13C2 PFDA		108	PCT_REC			PR	SURR		SLSA	130	70	00000000				5.0				320-24637-1	320-144610
MB 320-143781/1-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-143781/1-A			Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.048	UG_L	U M		PR	TRG					00000000				5.0	0.016	0.048	0.060	320-24637-1	320-144610
MB 320-143781/1-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-143781/1-A			Perfluorooctanoic acid (PFOA)	335-67-1		0.024	UG_L	U M		PR	TRG					00000000				5.0	0.0094	0.024	0.030	320-24637-1	320-144610
MB 320-143781/1-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-143781/1-A			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.11	UG_L	U		PR	TRG					00000000				5.0	0.048	0.11	0.14	320-24637-1	320-144610
MB 320-143781/1-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-143781/1-A			13C2 PFHXA	13C2 PFHXA		100	PCT_REC			PR	SURR		SLSA	130	70	00000000				5.0				320-24637-1	320-144610
MB 320-143781/1-A	N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-143781/1-A			13C2 PFDA	13C2 PFDA		102	PCT_REC			PR	SURR		SLSA	130	70	00000000				5.0				320-24637-1	320-144610

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 320-24637-1
Laboratory: Test America, Sacramento, California
Site: Whidbey Island, CTO-0008, Washington
Date: January 13, 2017

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-AF-3RW36-1216	320-24637-1	Water
2	WI-AF-3FB36-1216	320-24637-2	Water
3	WI-AF-3RW37-1216	320-24637-3	Water
4	WI-AF-3FB37-1216	320-24637-4	Water

A full data validation was performed on the analytical data for two water samples and two aqueous field blank samples collected on December 20, 2016 by CH2M HILL at the Whidbey Island site in Washington. The samples were analyzed under the EPA Method "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)".

Specific method references are as follows:

Analysis	*Method References*
PFCs	USEPA Method 537 Rev 1.1 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM), Version 5.0 (DoD 2013) and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," August 2014;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning

- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data is acceptable for the intended purposes. There were no qualifications.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- The field blank samples were free of contamination.

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- A MS/MSD sample was not collected.

Laboratory Control Samples/Laboratory Control Sample Duplicates

- The LCS/LCSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 1/17/17

Nancy Weaver
Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24637-1

SDG No.:

Client Sample ID: WI-AF-3RW36-1216 | Lab Sample ID: 320-24637-1

Matrix: Water | Lab File ID: 02JAN2017A6A_037.d

Analysis Method: 537 | Date Collected: 12/20/2016 09:01

Extraction Method: 537 | Date Extracted: 12/23/2016 18:13

Sample wt/vol: 266.8(mL) | Date Analyzed: 01/03/2017 04:11

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 144612 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.045	U	0.056	0.045	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.022	U	0.028	0.022	0.0088
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.10	U	0.13	0.10	0.045

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	109		70-130
STL00996	13C2 PFDA	103		70-130

NW 1/13/17

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

2

Lab Name: TestAmerica Sacramento Job No.: 320-24637-1

SDG No.:

Client Sample ID: WI-AF-3FB36-1216 Lab Sample ID: 320-24637-2

Matrix: Water Lab File ID: 02JAN2017A6A_038.d

Analysis Method: 537 Date Collected: 12/20/2016 09:02

Extraction Method: 537 Date Extracted: 12/23/2016 18:13

Sample wt/vol: 262.5(mL) Date Analyzed: 01/03/2017 04:41

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 144612 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.046	U	0.057	0.046	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.023	0.0090
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.10	U	0.13	0.10	0.045

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	112		70-130
STL00996	13C2 PFDA	106		70-130

NW 1/13/17

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

3

Lab Name: TestAmerica Sacramento | Job No.: 320-24637-1

SDG No.:

Client Sample ID: WI-AF-3RW37-1216 | Lab Sample ID: 320-24637-3

Matrix: Water | Lab File ID: 02JAN2017A6A_041.d

Analysis Method: 537 | Date Collected: 12/20/2016 18:12

Extraction Method: 537 | Date Extracted: 12/23/2016 18:13

Sample wt/vol: 269.7(mL) | Date Analyzed: 01/03/2017 06:10

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 144614 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.044	U	0.056	0.044	0.014
335-67-1	Perfluorooctanoic acid (PFOA)	0.022	U	0.028	0.022	0.0087
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.10	U	0.13	0.10	0.044

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	105		70-130
STL00996	13C2 PFDA	114		70-130

MW 1/13/17

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

4

Lab Name: TestAmerica Sacramento | Job No.: 320-24637-1

SDG No.:

Client Sample ID: WI-AF-3FB37-1216 | Lab Sample ID: 320-24637-4

Matrix: Water | Lab File ID: 02JAN2017A6A_042.d

Analysis Method: 537 | Date Collected: 12/20/2016 18:13

Extraction Method: 537 | Date Extracted: 12/23/2016 18:13

Sample wt/vol: 259.7(mL) | Date Analyzed: 01/03/2017 06:39

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 144614 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.046	U	0.058	0.046	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.023	0.0091
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.13	0.11	0.046

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	104		70-130
STL00996	13C2 PFDA	110		70-130

MW 1/13/17

R:\ENBG\00_Proj\N\Navy\CLEAN\MULTI_REGION\PFC_679580\MapFiles\NW\Whidbey_NAS\TM\Draft\Figure_2_DW_Results_AF_Step_Out.mxd6/27/2018bmailhes

NUMBER OF SAMPLES COLLECTED: 12
NO DETECTIONS: 12
DETECTIONS LESS THAN LHA: 0
DETECTIONS GREATER THAN LHA: 0

NUMBER OF SAMPLES COLLECTED: 48
NO DETECTIONS: 46
DETECTIONS LESS THAN LHA: 2
DETECTIONS GREATER THAN LHA: 0

STRAIT OF JUAN DE FUCA

W Troxell Rd

Powell Rd

Area 31 – Former Runway Fire Training School

Area 16 – Ault Field Runway Ditches

Current Fire Fighting School

Jones Rd

DUGUALLA BAY

CLOVER VALLEY STREAM

CLOVER VALLEY LAGOON

Clover Valley

Dugualla

NUMBER OF SAMPLES COLLECTED: 2
NO DETECTIONS: 2
DETECTIONS LESS THAN LHA: 0
DETECTIONS GREATER THAN LHA: 0

Ault Field Rd

NUMBER OF SAMPLES COLLECTED: 8
NO DETECTIONS: 5
DETECTIONS LESS THAN LHA: 2
DETECTIONS GREATER THAN LHA: 1

Yates Rd

Oak Harbor Rd

Hunt Rd

Taylor Rd

Crosby Rd

NUMBER OF SAMPLES: 9
NO DETECTIONS: 9
DETECTIONS LESS THAN LHA: 0
DETECTIONS GREATER THAN LHA: 0

NUMBER OF SAMPLES COLLECTED: 27
NO DETECTIONS: 24
DETECTIONS LESS THAN LHA: 1
DETECTIONS GREATER THAN LHA: 2*

Legend

- 1 Mile Zone
- Surface Water
- Drainage Ditch
- Suspected Source Area
- Phase 1 Sampling Area
- Phase 2 Sampling Area
- Phase 3 Sampling Area
- Base Boundary
- Inferred Groundwater Flow Direction

Notes:
1. Results shown on this figure are for PFOA and PFOS. See text and Table 2 for PFBS results
2. * Both results above the LHA are from the same well; the second sample collected was a confirmation sample.

N

0 0.25 0.5 Miles

1 inch = 0.5 mile

Imagery Source: Esri

Figure 2
Results for Drinking Water Well Sampling
Near Ault Field
Naval Air Station Whidbey Island
Oak Harbor, Washington

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ch2m