001 9000 Lab Cover GBC

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 320-25386

Outlying Landing Field Coupeville
Naval Air Station Whidbey Island
Coupeville, Washington

February 2019

Approved for public release: distribution unlimited

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: 320-25386-1
Client Project/Site: Whidbey Island

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

Attn: Tiffany Hill

Authorized for release by:
2/6/2017 9:01:31 AM

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

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

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

TestAmerica Job ID: 320-25386-1

Qualifiers

LCMS

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.

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: 320-25386-1

Laboratory: TestAmerica Sacramento

Narrative

CASE NARRATIVE

Client: CH2M Hill Constructors, Inc.

Project: Whidbey Island

Report Number: 320-25386-1

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 01/31/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.8 C.

PFOA/PFOS

Samples WI-CV-1RW72-0117 (320-25386-1) and WI-CV-1FB72-0117 (320-25386-2) were analyzed for PFOA/PFOS in accordance with 537. The samples were prepared on 02/01/2017 and analyzed on 02/02/2017.

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

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-148547.

Job ID: 320-25386-1 (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: 320-25386-1

Client Sample ID: WI-CV-1RW72-0117 **Lab Sample ID: 320-25386-1**

No Detections.

Client Sample ID: WI-CV-1FB72-0117 **Lab Sample ID: 320-25386-2**

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: WI-CV-1RW72-0117

Lab Sample ID: 320-25386-1
Date Collected: 01/28/17 10:02
Matrix: Water
Date Received: 01/31/17 10:00

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.056	U	0.070	0.018	ug/L		02/01/17 11:04	02/02/17 15:47	1
Perfluorooctanoic acid (PFOA)	0.028	U	0.035	0.011	ug/L		02/01/17 11:04	02/02/17 15:47	1
Perfluorobutanesulfonic acid (PFBS)	0.13	U	0.16	0.055	ug/L		02/01/17 11:04	02/02/17 15:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*85*		*70 - 130*	*02/01/17 11:04*	*02/02/17 15:47*	*1*
13C2 PFDA	*89*		*70 - 130*	*02/01/17 11:04*	*02/02/17 15:47*	*1*

Client Sample ID: WI-CV-1FB72-0117

Lab Sample ID: 320-25386-2
Date Collected: 01/28/17 10:03
Matrix: Water
Date Received: 01/31/17 10:00

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	0.014	ug/L		02/01/17 11:04	02/02/17 15:52	1
Perfluorooctanoic acid (PFOA)	0.022	U	0.028	0.0088	ug/L		02/01/17 11:04	02/02/17 15:52	1
Perfluorobutanesulfonic acid (PFBS)	0.10	U	0.13	0.045	ug/L		02/01/17 11:04	02/02/17 15:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*86*		*70 - 130*	*02/01/17 11:04*	*02/02/17 15:52*	*1*
13C2 PFDA	*89*		*70 - 130*	*02/01/17 11:04*	*02/02/17 15:52*	*1*

Surrogate Summary

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

TestAmerica Job ID: 320-25386-1

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

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

		Percent Surrogate Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	3C2 PFHx (70-130)	3C2 PFDA (70-130)								
320-25386-1	WI-CV-1RW72-0117	85	89								
320-25386-2	WI-CV-1FB72-0117	86	89								
LCS 320-148547/2-A	Lab Control Sample	89	95								
LCSD 320-148547/3-A	Lab Control Sample Dup	90	93								
MB 320-148547/1-A	Method Blank	82	92								

Surrogate Legend

13C2 PFHxA = 13C2 PFHxA

13C2 PFDA = 13C2 PFDA

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

Lab Sample ID: MB 320-148547/1-A
Matrix: Water
Analysis Batch: 148790

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 148547

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.060	0.016	ug/L		02/01/17 11:04	02/02/17 15:34	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0094	ug/L		02/01/17 11:04	02/02/17 15:34	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		02/01/17 11:04	02/02/17 15:34	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*82*		*70 - 130*	*02/01/17 11:04*	*02/02/17 15:34*	*1*
13C2 PFDA	*92*		*70 - 130*	*02/01/17 11:04*	*02/02/17 15:34*	*1*

Lab Sample ID: LCS 320-148547/2-A
Matrix: Water
Analysis Batch: 148790

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 148547

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	0.160	0.151		ug/L		94	70 - 130
Perfluorooctanoic acid (PFOA)	0.0781	0.0717		ug/L		92	70 - 130
Perfluorobutanesulfonic acid (PFBS)	0.359	0.368		ug/L		102	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*89*		*70 - 130*
13C2 PFDA	*95*		*70 - 130*

Lab Sample ID: LCSD 320-148547/3-A
Matrix: Water
Analysis Batch: 148790

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 148547

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)	0.160	0.147		ug/L		92	70 - 130	2	30
Perfluorooctanoic acid (PFOA)	0.0781	0.0699		ug/L		90	70 - 130	3	30
Perfluorobutanesulfonic acid (PFBS)	0.359	0.355		ug/L		99	70 - 130	4	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFHxA	*90*		*70 - 130*
13C2 PFDA	*93*		*70 - 130*

QC Association Summary

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

TestAmerica Job ID: 320-25386-1

LCMS

Prep Batch: 148547

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-25386-1	WI-CV-1RW72-0117	Total/NA	Water	537	
320-25386-2	WI-CV-1FB72-0117	Total/NA	Water	537	
MB 320-148547/1-A	Method Blank	Total/NA	Water	537	
LCS 320-148547/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 320-148547/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 148790

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-25386-1	WI-CV-1RW72-0117	Total/NA	Water	537	148547
320-25386-2	WI-CV-1FB72-0117	Total/NA	Water	537	148547
MB 320-148547/1-A	Method Blank	Total/NA	Water	537	148547
LCS 320-148547/2-A	Lab Control Sample	Total/NA	Water	537	148547
LCSD 320-148547/3-A	Lab Control Sample Dup	Total/NA	Water	537	148547

Lab Chronicle

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

TestAmerica Job ID: 320-25386-1

Client Sample ID: WI-CV-1RW72-0117

Lab Sample ID: 320-25386-1

Date Collected: 01/28/17 10:02

Matrix: Water

Date Received: 01/31/17 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			215.8 mL	1.0 mL	148547	02/01/17 11:04	NS1	TAL SAC
Total/NA	Analysis	537		1			148790	02/02/17 15:47	JRB	TAL SAC

Client Sample ID: WI-CV-1FB72-0117

Lab Sample ID: 320-25386-2

Date Collected: 01/28/17 10:03

Matrix: Water

Date Received: 01/31/17 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			267.3 mL	1.0 mL	148547	02/01/17 11:04	NS1	TAL SAC
Total/NA	Analysis	537		1			148790	02/02/17 15:52	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: 320-25386-1

Laboratory: TestAmerica Sacramento

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska (UST)	State Program	10	UST-055	12-18-17
Arizona	State Program	9	AZ0708	08-11-17
Arkansas DEQ	State Program	6	88-0691	06-17-17
California	State Program	9	2897	01-31-18
Colorado	State Program	8	CA00044	08-31-17
Connecticut	State Program	1	PH-0691	06-30-17
Florida	NELAP	4	E87570	06-30-17
Hawaii	State Program	9	N/A	01-31-17 *
Illinois	NELAP	5	200060	03-17-17
Kansas	NELAP	7	E-10375	10-31-17
L-A-B	DoD ELAP		L2468	01-20-18
Louisiana	NELAP	6	30612	06-30-17
Maine	State Program	1	CA0004	04-18-18
Michigan	State Program	5	9947	01-31-18
Nevada	State Program	9	CA00044	07-31-17
New Jersey	NELAP	2	CA005	06-30-17
New York	NELAP	2	11666	04-01-17
Oregon	NELAP	10	4040	01-28-18
Pennsylvania	NELAP	3	68-01272	03-31-17
Texas	NELAP	6	T104704399	07-31-17
US Fish & Wildlife	Federal		LE148388-0	10-31-17
USDA	Federal		P330-11-00436	12-30-17
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-17
Virginia	NELAP	3	460278	03-14-17
Washington	State Program	10	C581	05-05-17
West Virginia (DW)	State Program	3	9930C	12-31-17
Wyoming	State Program	8	8TMS-L	01-29-17 *

* Certification renewal pending - certification considered valid.

Method Summary

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

TestAmerica Job ID: 320-25386-1

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: 320-25386-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-25386-1	WI-CV-1RW72-0117	Water	01/28/17 10:02	01/31/17 10:00
320-25386-2	WI-CV-1FB72-0117	Water	01/28/17 10:03	01/31/17 10:00

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: 1/30/2017	COC No: 1
Tiffany Hill	Tel/Fax: (757) 671-6258	Lab Contact: Laura Turpen	Carrier: FedEx	_____ of _____ 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: OLF Coupeville	☐ 2 days			Job / SDG No.:
P O #: 100067106050 - 679580.09.FI.FS	☐ 1 day			

320-25386 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	USEPA Method 537 (PFOA, PFOS, and PFBS)	Sample Specific Notes:
WI-CV-1RW72-0117	1/28/17	1002	G	DW	2	N	N	X	
WI-CV-1FB72-0117	1/28/17	1003	G	DW	2	N	N	X	
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: 2.1 Corr'd: 1.8 Therm ID No.: 12		
Relinquished by: Eric Epple	Company: CH2M	Date/Time: 1-30-17/1600	Received by:	Company: JAWS	Date/Time: 1/31/17 1000
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

Login Sample Receipt Checklist

Client: CH2M Hill Constructors, Inc.

Job Number: 320-25386-1

Login Number: 25386
List Number: 1
Creator: Edman, Connor M

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
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	

ANALYTICAL REPORT

Job Number: 320-25386-1

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
2/6/2017 9:03 AM

Laura Turpen, Project Manager I
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4414
laura.turpen@testamericainc.com
02/06/2017

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Qualifiers

LCMS

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.

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)

CASE NARRATIVE

Client: CH2M Hill Constructors, Inc.

Project: Whidbey Island

Report Number: 320-25386-1

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.

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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 01/31/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.8 C.

PFOA/PFOS

Samples WI-CV-1RW72-0117 (320-25386-1) and WI-CV-1FB72-0117 (320-25386-2) were analyzed for PFOA/PFOS in accordance with 537. The samples were prepared on 02/01/2017 and analyzed on 02/02/2017.

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

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-148547.

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: 320-25386-1

Client Sample ID: WI-CV-1RW72-0117 — Lab Sample ID: 320-25386-1

No Detections.

Client Sample ID: WI-CV-1FB72-0117 — Lab Sample ID: 320-25386-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: WI-CV-1RW72-0117

Lab Sample ID: 320-25386-1

Date Collected: 01/28/17 10:02

Matrix: Water

Date Received: 01/31/17 10:00

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.056	U	0.070	0.018	ug/L		02/01/17 11:04	02/02/17 15:47	1
Perfluorooctanoic acid (PFOA)	0.028	U	0.035	0.011	ug/L		02/01/17 11:04	02/02/17 15:47	1
Perfluorobutanesulfonic acid (PFBS)	0.13	U	0.16	0.055	ug/L		02/01/17 11:04	02/02/17 15:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*85*		*70 - 130*	*02/01/17 11:04*	*02/02/17 15:47*	*1*
13C2 PFDA	*89*		*70 - 130*	*02/01/17 11:04*	*02/02/17 15:47*	*1*

Client Sample ID: WI-CV-1FB72-0117

Lab Sample ID: 320-25386-2

Date Collected: 01/28/17 10:03

Matrix: Water

Date Received: 01/31/17 10:00

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	0.014	ug/L		02/01/17 11:04	02/02/17 15:52	1
Perfluorooctanoic acid (PFOA)	0.022	U	0.028	0.0088	ug/L		02/01/17 11:04	02/02/17 15:52	1
Perfluorobutanesulfonic acid (PFBS)	0.10	U	0.13	0.045	ug/L		02/01/17 11:04	02/02/17 15:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*86*		*70 - 130*	*02/01/17 11:04*	*02/02/17 15:52*	*1*
13C2 PFDA	*89*		*70 - 130*	*02/01/17 11:04*	*02/02/17 15:52*	*1*

Default Detection Limits

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

TestAmerica Job ID: 320-25386-1

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: 320-25386-1

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)								
320-25386-1	WI-CV-1RW72-0117	85	89								
320-25386-2	WI-CV-1FB72-0117	86	89								
LCS 320-148547/2-A	Lab Control Sample	89	95								
LCSD 320-148547/3-A	Lab Control Sample Dup	90	93								
MB 320-148547/1-A	Method Blank	82	92								

Surrogate Legend

13C2 PFHxA = 13C2 PFHxA

13C2 PFDA = 13C2 PFDA

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

Lab Sample ID: MB 320-148547/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 148790 — **Prep Batch: 148547**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.060	0.016	ug/L		02/01/17 11:04	02/02/17 15:34	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0094	ug/L		02/01/17 11:04	02/02/17 15:34	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		02/01/17 11:04	02/02/17 15:34	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*82*		*70 - 130*	*02/01/17 11:04*	*02/02/17 15:34*	*1*
13C2 PFDA	*92*		*70 - 130*	*02/01/17 11:04*	*02/02/17 15:34*	*1*

Lab Sample ID: LCS 320-148547/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 148790 — **Prep Batch: 148547**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	0.160	0.151		ug/L		94	70 - 130
Perfluorooctanoic acid (PFOA)	0.0781	0.0717		ug/L		92	70 - 130
Perfluorobutanesulfonic acid (PFBS)	0.359	0.368		ug/L		102	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*89*		*70 - 130*
13C2 PFDA	*95*		*70 - 130*

Lab Sample ID: LCSD 320-148547/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 148790 — **Prep Batch: 148547**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)	0.160	0.147		ug/L		92	70 - 130	2	30
Perfluorooctanoic acid (PFOA)	0.0781	0.0699		ug/L		90	70 - 130	3	30
Perfluorobutanesulfonic acid (PFBS)	0.359	0.355		ug/L		99	70 - 130	4	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFHxA	*90*		*70 - 130*
13C2 PFDA	*93*		*70 - 130*

LCMS

Prep Batch: 148547

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-25386-1	WI-CV-1RW72-0117	Total/NA	Water	537	
320-25386-2	WI-CV-1FB72-0117	Total/NA	Water	537	
MB 320-148547/1-A	Method Blank	Total/NA	Water	537	
LCS 320-148547/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 320-148547/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 148790

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-25386-1	WI-CV-1RW72-0117	Total/NA	Water	537	148547
320-25386-2	WI-CV-1FB72-0117	Total/NA	Water	537	148547
MB 320-148547/1-A	Method Blank	Total/NA	Water	537	148547
LCS 320-148547/2-A	Lab Control Sample	Total/NA	Water	537	148547
LCSD 320-148547/3-A	Lab Control Sample Dup	Total/NA	Water	537	148547

Lab Chronicle

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

TestAmerica Job ID: 320-25386-1

Client Sample ID: WI-CV-1RW72-0117

Lab Sample ID: 320-25386-1

Date Collected: 01/28/17 10:02

Matrix: Water

Date Received: 01/31/17 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			148547	02/01/17 11:04	NS1	TAL SAC
Total/NA	Analysis	537		1	148790	02/02/17 15:47	JRB	TAL SAC

Client Sample ID: WI-CV-1FB72-0117

Lab Sample ID: 320-25386-2

Date Collected: 01/28/17 10:03

Matrix: Water

Date Received: 01/31/17 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			148547	02/01/17 11:04	NS1	TAL SAC
Total/NA	Analysis	537		1	148790	02/02/17 15:52	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: 320-25386-1

Laboratory: TestAmerica Sacramento

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska (UST)	State Program	10	UST-055	12-18-17
Arizona	State Program	9	AZ0708	08-11-17
Arkansas DEQ	State Program	6	88-0691	06-17-17
California	State Program	9	2897	01-31-18
Colorado	State Program	8	CA00044	08-31-17
Connecticut	State Program	1	PH-0691	06-30-17
Florida	NELAP	4	E87570	06-30-17
Hawaii	State Program	9	N/A	01-31-17 *
Illinois	NELAP	5	200060	03-17-17
Kansas	NELAP	7	E-10375	10-31-17
L-A-B	DoD ELAP		L2468	01-20-18
Louisiana	NELAP	6	30612	06-30-17
Maine	State Program	1	CA0004	04-18-18
Michigan	State Program	5	9947	01-31-18
Nevada	State Program	9	CA00044	07-31-17
New Jersey	NELAP	2	CA005	06-30-17
New York	NELAP	2	11666	04-01-17
Oregon	NELAP	10	4040	01-28-18
Pennsylvania	NELAP	3	68-01272	03-31-17
Texas	NELAP	6	T104704399	07-31-17
US Fish & Wildlife	Federal		LE148388-0	10-31-17
USDA	Federal		P330-11-00436	12-30-17
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-17
Virginia	NELAP	3	460278	03-14-17
Washington	State Program	10	C581	05-05-17
West Virginia (DW)	State Program	3	9930C	12-31-17
Wyoming	State Program	8	8TMS-L	01-29-17 *

* Certification renewal pending - certification considered valid.

Method Summary

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

TestAmerica Job ID: 320-25386-1

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: 320-25386-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-25386-1	WI-CV-1RW72-0117	Water	01/28/17 10:02	01/31/17 10:00
320-25386-2	WI-CV-1FB72-0117	Water	01/28/17 10:03	01/31/17 10:00

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 147939

Lab Sample ID: IC 320-147939/4 Client Sample ID:

Date Analyzed: 01/26/17 11:03 Lab File ID: 2017.01.26_537_CURVE_004. GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.22	Assign Peak	chandrasenas	01/26/17 12:09

Lab Sample ID: IC 320-147939/5 Client Sample ID:

Date Analyzed: 01/26/17 11:07 Lab File ID: 2017.01.26_537_CURVE_005. GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.22	Assign Peak	chandrasenas	01/26/17 12:10

Lab Sample ID: IC 320-147939/6 Client Sample ID:

Date Analyzed: 01/26/17 11:11 Lab File ID: 2017.01.26_537_CURVE_006. GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.22	Assign Peak	chandrasenas	01/26/17 12:10

Lab Sample ID: IC 320-147939/7 ICISAV Client Sample ID:

Date Analyzed: 01/26/17 11:16 Lab File ID: 2017.01.26_537_CURVE_007. GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.22	Isomers	chandrasenas	01/26/17 12:08

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 147939

Lab Sample ID: IC 320-147939/8 Client Sample ID:

Date Analyzed: 01/26/17 11:20 Lab File ID: 2017.01.26_537_CURVE_008. GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.22	Assign Peak	chandrasenas	01/26/17 12:11

Lab Sample ID: IC 320-147939/9 Client Sample ID:

Date Analyzed: 01/26/17 11:25 Lab File ID: 2017.01.26_537_CURVE_009. GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.22	Assign Peak	chandrasenas	01/26/17 12:11

Lab Sample ID: CCVL 320-147939/11 Client Sample ID:

Date Analyzed: 01/26/17 11:33 Lab File ID: 2017.01.26_537_CURVE_011. GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.22	Assign Peak	chandrasenas	01/26/17 12:15

Lab Sample ID: ICV 320-147939/13 Client Sample ID:

Date Analyzed: 01/26/17 11:42 Lab File ID: 2017.01.26_537_CURVE_013. GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.22	Assign Peak	chandrasenas	01/26/17 12:16

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 148790

Lab Sample ID: CCV 320-148790/15 CCVIS Client Sample ID:

Date Analyzed: 02/02/17 16:14 Lab File ID: 2017.02.02B_537_015.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.22	Isomers	barnettj	02/02/17 16:30

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

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_00030	07/17/17	01/17/17	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-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.: 320-25386-1

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_00015	05/21/17	12/19/16	MeOH/H2O, Lot 090285	5 mL	LC537-IS_00028	100 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

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-L2_00015	05/21/17	12/19/16	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00013	34 uL	Perfluorobutanesulfonic acid (PFBS)	22.8888 ng/mL
							Perfluorooctanoic acid (PFOA)	4.97733 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	10.2169 ng/mL
					LC537-SU_00026	250 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00013	05/21/17	11/21/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00017	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL
							Perfluorooctanoic acid (PFOA)	731.96 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL
..LC537SPIM_00017	05/21/17	11/21/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutanesulfonic acid (PFBS)	89.76 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-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
							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

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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
LC537-L3_00019	06/14/17	01/20/17	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_00030	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00029	250 uL	13C2 PFDA	10 ng/mL

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SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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_00030	07/17/17	01/17/17	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_00029	07/17/17	01/17/17	Methanol, Lot 104453	20000 uL	LCMPFDA_00012	80 uL	13C2 PFDA	0.2 ug/mL
					LCMPFHxA_00013	80 uL	13C2 PFHxA	0.2 ug/mL
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC537-IS_00028	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
LC537-L5_00020	06/14/17	01/20/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00014	200 uL	Perfluorobutanesulfonic acid (PFBS)	134.64 ng/mL
							Perfluoroheptanoic acid	14.85 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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_00030	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00029	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_00030	07/17/17	01/17/17	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_00029	07/17/17	01/17/17	Methanol, Lot 104453	20000 uL	LCMPFDA_00012	80 uL	13C2 PFDA	0.2 ug/mL
					LCMPFHxA_00013	80 uL	13C2 PFHxA	0.2 ug/mL
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFHxA	50 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
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
....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

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

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-MSP_00017	06/22/17	12/22/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00018	200 uL	Perfluorobutane Sulfonate	1795.2 ng/mL
							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	Perfluorobutane Sulfonate	89.76 ug/mL
							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	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_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_00030	07/31/17	01/31/17	Methanol, Lot 104453	20000 uL	LCMPFDA_00012	80 uL	13C2 PFDA	0.2 ug/mL
					LCMPFHxA_00013	80 uL	13C2 PFHxA	0.2 ug/mL
.LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL

Reagent

LC537_PFBS_00002

R: 4/1/15 SPV

SIGMA-ALDRICH®

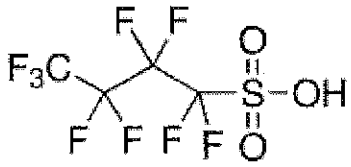
sigma-aldrich.com

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

Certificate of Analysis

Product Name:
Nonafluorobutane-1-sulfonic acid - 97%

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



PFBS

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

Jamie Gleason

Jamie Gleason, Manager
Quality Control
Milwaukee, Wisconsin US

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

Reagent

LC537_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 Index: n20/D

Reagent

LC537_PFHpA_00002

Y: 4/1/15 SRV

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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

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

Reagent

LC537_PFHxS_00002

R: 4/1/15 SKV

SIGMA-ALDRICH®

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

Certificate of Analysis

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

PFH_xS-K

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

Claudia Geitner

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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

Purity = 90.94 % w/m.w correction

SKV 4/1/15

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

Reagent

LC537_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

P: 3/26/15 RV

SIGMA-ALDRICH®

CERTIFICATE OF ANALYSIS

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

Seelze, 13.11.2013/505378/13/24029

Order-No.:
Customer-No.:

Order-Code:

Quantity:

Production Date: 04.Nov.2013
Expiry Date: 04.Nov.2018

Article/Product: 33824 Batch : SZBD308XV

PFOA

Pentadecafluorooctanoic acid OEKANAL®

Reference Material (RM)

1. General Information

Formula: C8HF15O2
CAS-No.: [335-67-1]
Usage : PFOA

Molar mass: 414.07 g/Mole
Recomm. storage temp.: roomtemp.

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

2. Batch Analysis

identiy (GC-MS)	complying
Assay (GCMS)	99.4 %
Date of Analysis	13.Nov.2013

3. Advice and Remarks

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

Sigma-Aldrich Laborchemikalien GmbH
Quality Management SA-LC

This document was produced electronically and is valid without a signature

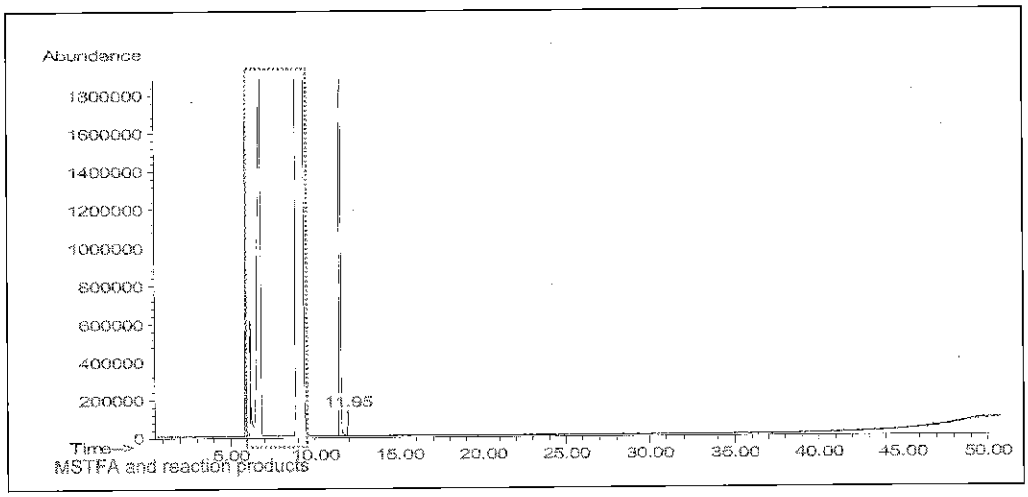
GC/MS-Method

Analytical Department

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

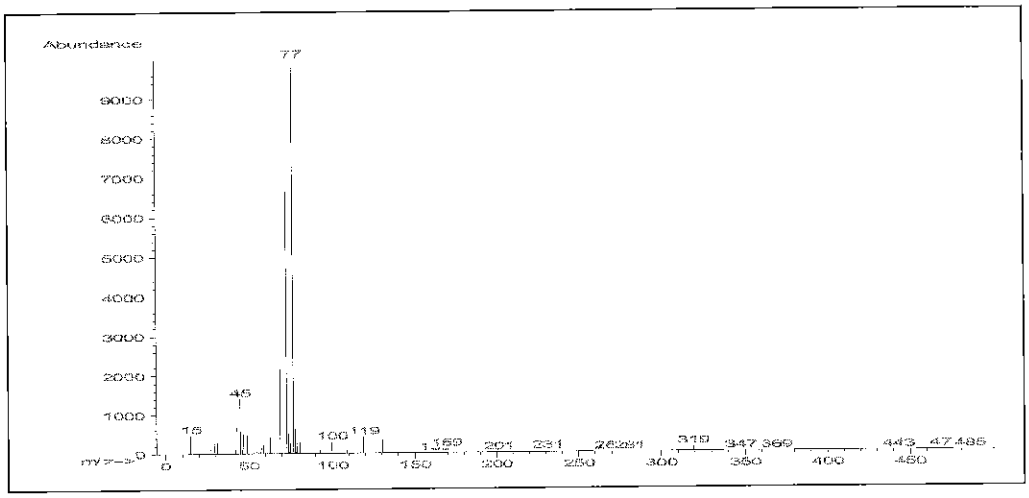
Column:	XTI-5 (Restek); 30 m; fs cap.; I.D.:0.25 mm; 1 µm df
Injector:	Split mode
Injection:	approx. 1 µl of reaction mixture with MSTFA (approx. 10 mg + 200 µl MSTFA)
Inj.-temp.:	280°C
Oven-temp.:	40°C (for 2 min) to 320°C (6°C/min) hold for 2 min
Split:	1:100
Flow:	1 ml He/min (Constant flow mode)
Detector:	MSD
Mass range:	10-600 amu (Scan mode)
Evaluation:	Purity: Total Ion Chromatogram (MSTFA and reaction products blinded out in report) Identity: Mass spectrum complies
Operator:	Ahrens / 2013-11-13

Total Ion Chromatogram:



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

Mass spectrum (rt = 11.54 min):



Reagent

LC537_PFOA2_00001

Certificate of Analysis

Alfa Aesar
A Johnson Matthey Company

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

PFOA

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

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

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

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

Purity = 91.06 %

3. Advice and Remarks

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

Sigma-Aldrich Laborchemikalien GmbH
Quality Management SA-LC

This document was produced electronically and is valid without a signature

Reagent

LC537_PFOS2_00001

SIGMA-ALDRICH

ALDRICH

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

INV 820
12LCMS 0579

Certificate of Analysis

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

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

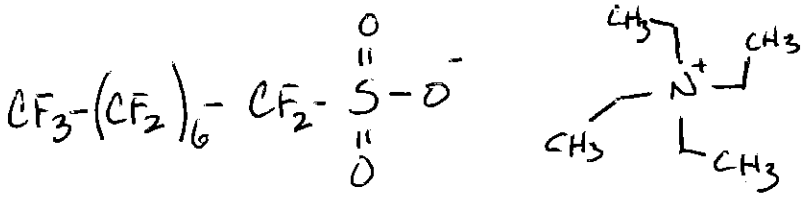
QC RELEASE DATE 13/APR/11

MW correction = $\frac{500.125}{629.37}$ = 0.7946 ~~H20 = 94.167~~ 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 warrants, that its products conform to the information contained in this and other Sigma-Aldrich publications. Purchaser must determine the suitability of the product for its particular use. See reverse side of invoice for additional terms and conditions of sale. The values given on the 'Certificate of Analysis' are the results determined at the time of analysis.

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.

This information is to be used for the purpose of determining animal or other biological origin only and not to be confused with "Country of Origin" for import/export purposes. Data provided on this document are property of Sigma-Aldrich.

This information is considered accurate and reliable as of the date appearing on the document and is presented in good faith.

Sigma-Aldrich shall not be held liable for any damage resulting from handling or from processing the above product(s). This document does not make any warranty, express or implied, of fitness for any particular use of the product(s). Purchaser must determine the suitability of the product(s) for its use under the applicable law and regulations.

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

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

Reagent

LCM2PFOA_00005

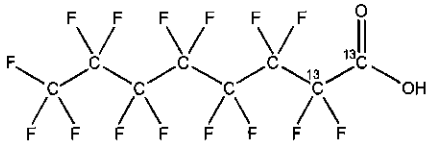
Rec'd. 2/10/15 SV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFOA
LOT NUMBER: M2PFOA0613
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 ($1,2\text{-}^{13}C_2$)
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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/16/2013 (mm/dd/yyyy)

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

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

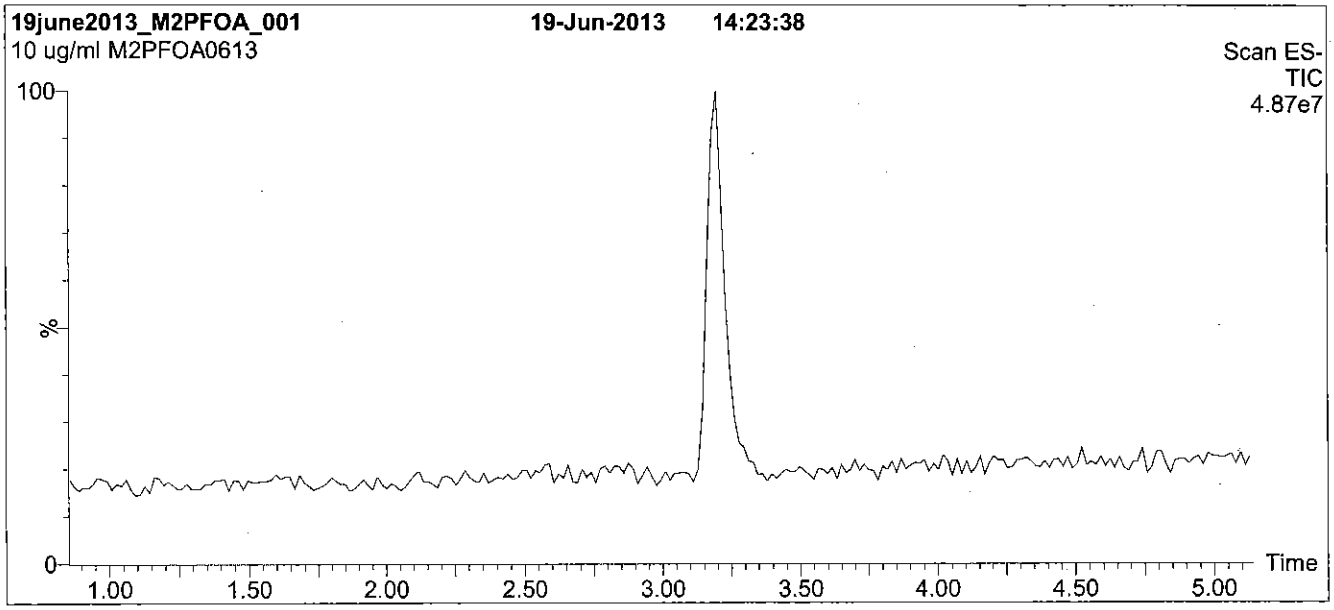
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

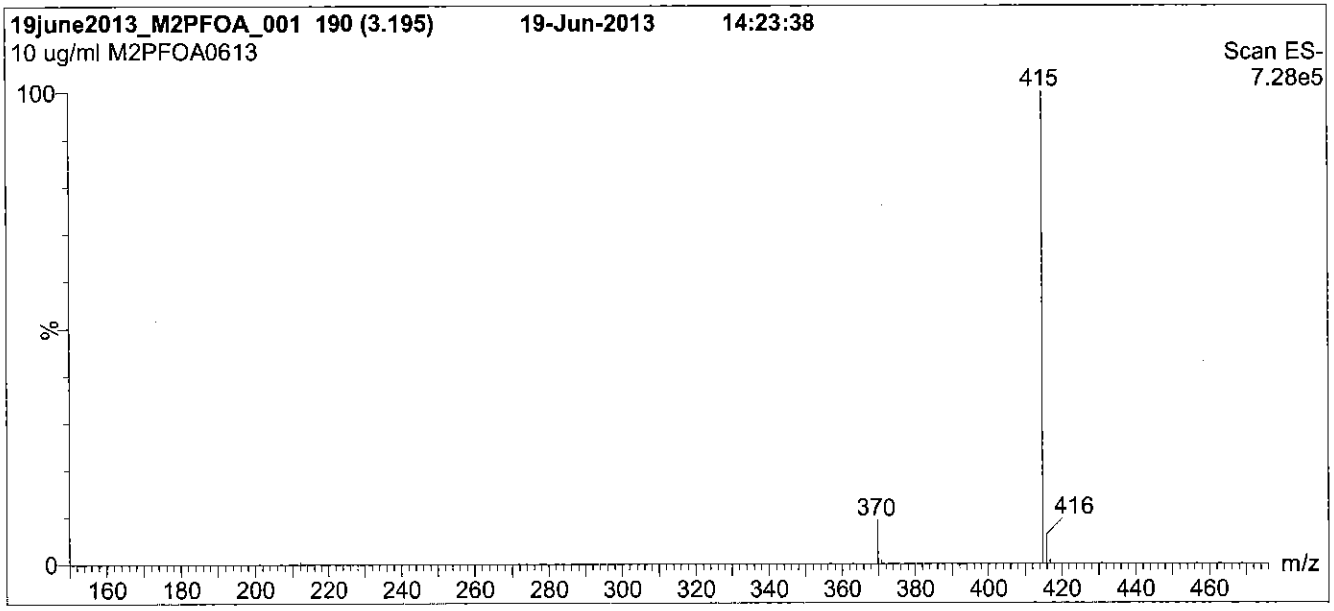
CALA Testing Accreditation No. A 1226

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

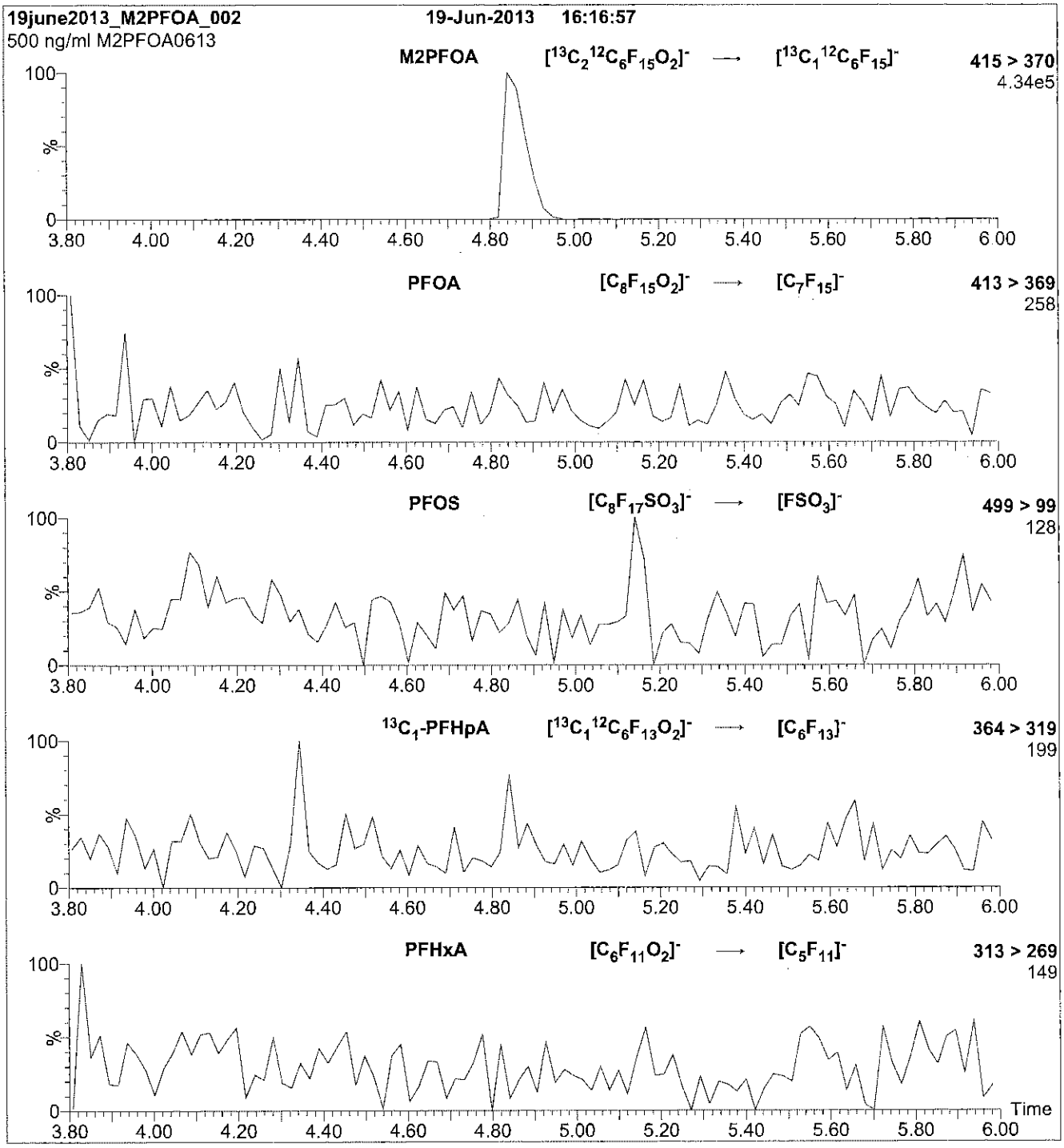
Flow: 300 µl/min

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-Perfluorndecanoic a

Rec. 3/29/16 JRB ✓

WELLINGTON LABORATORIES

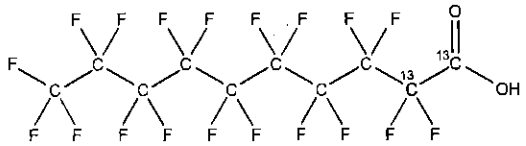
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFDA0815

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 ($1,2\text{-}^{13}C_2$)
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:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

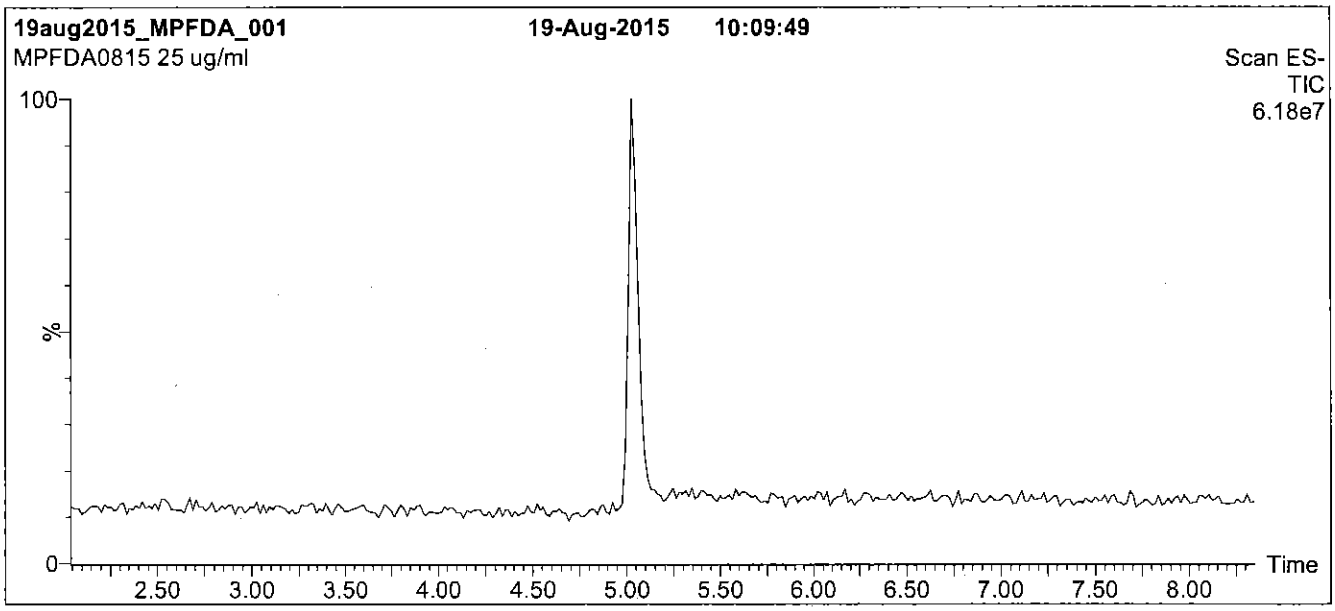
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

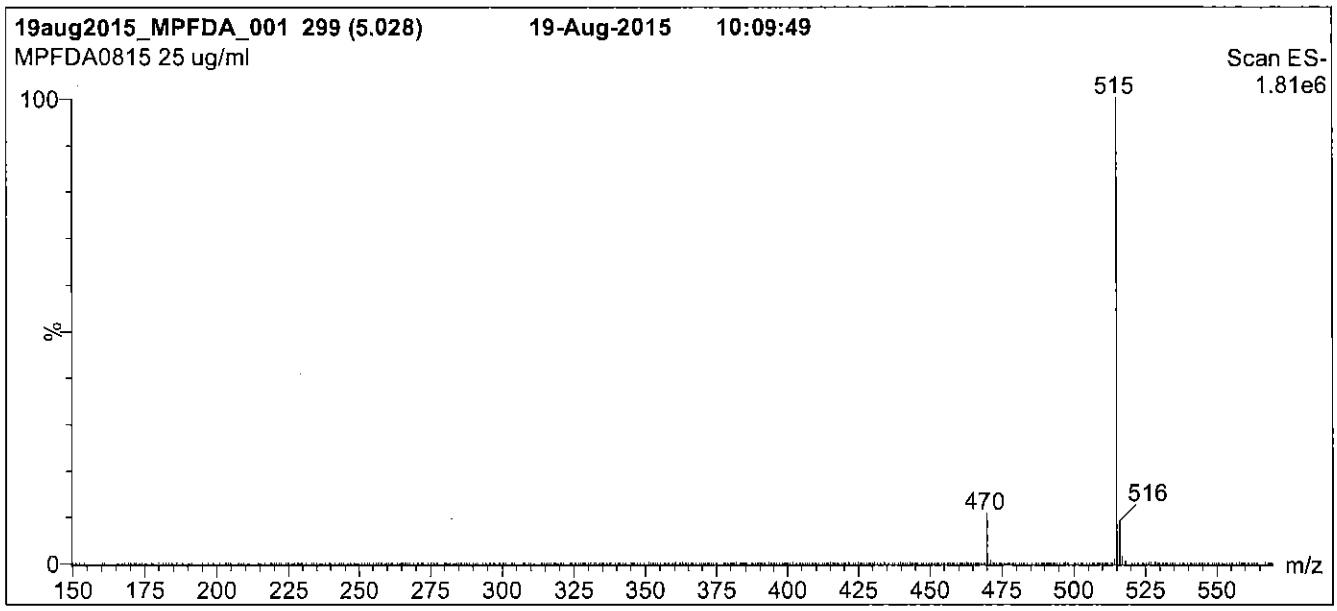
CALA Testing

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

Figure 1: **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

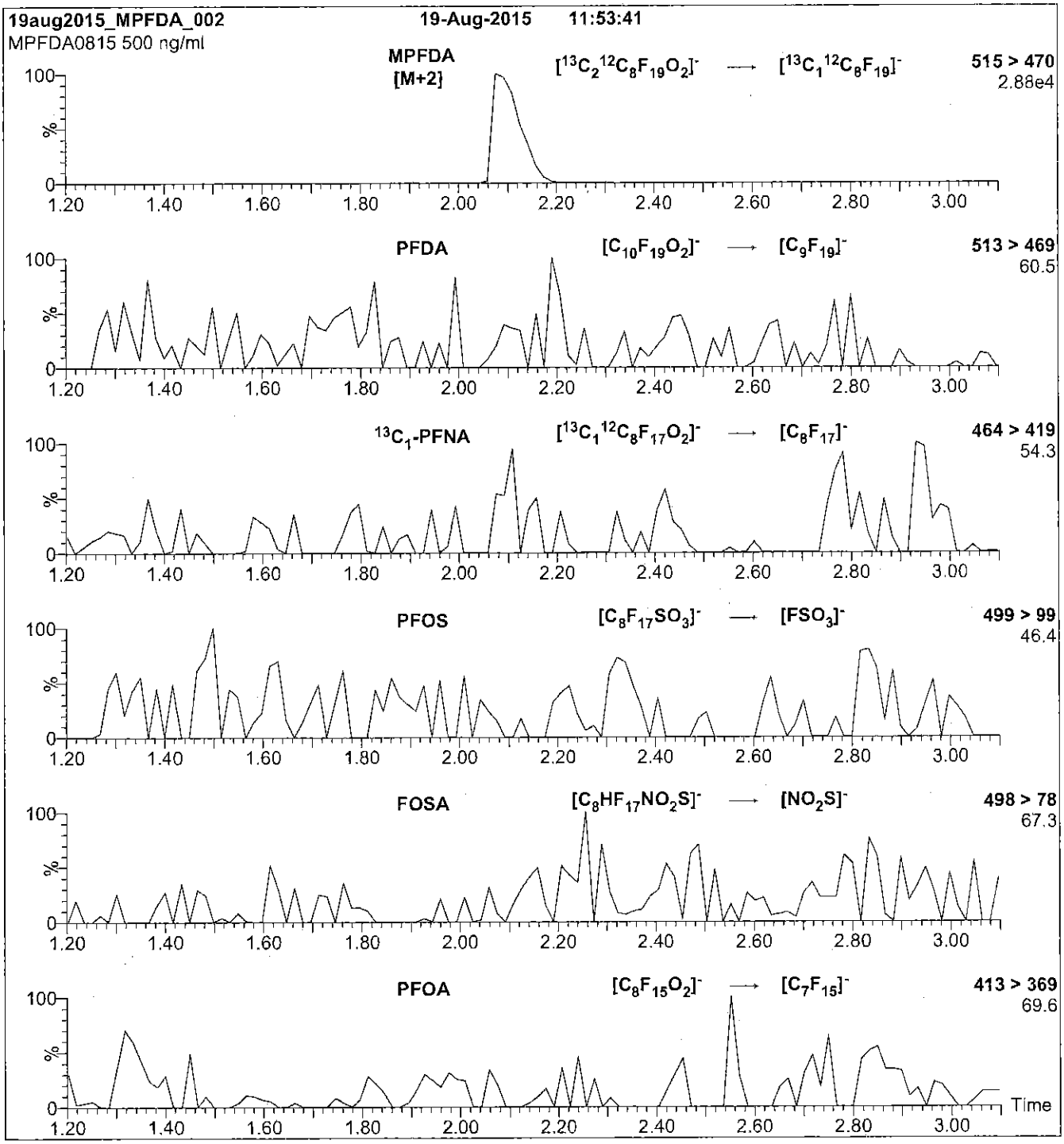
Flow: 300 µl/min

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

LCMPFDA_00012

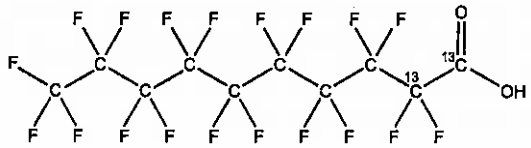
R: SBC 12/21/16

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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.

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No.: A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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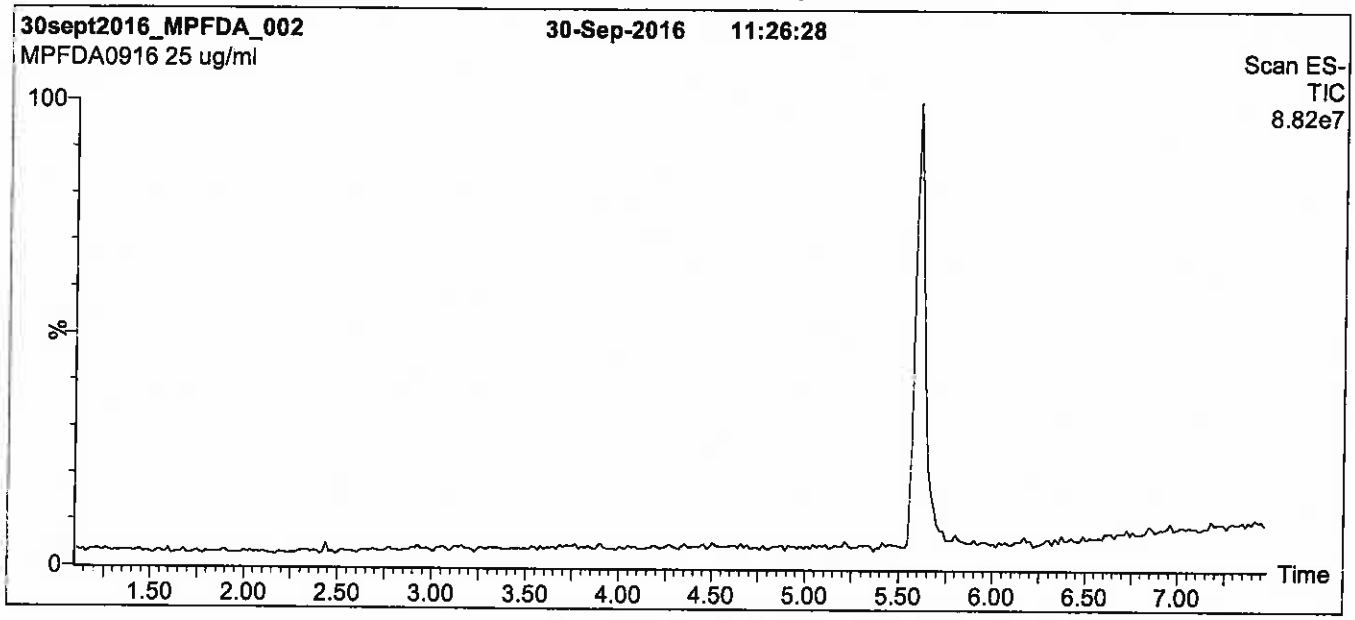
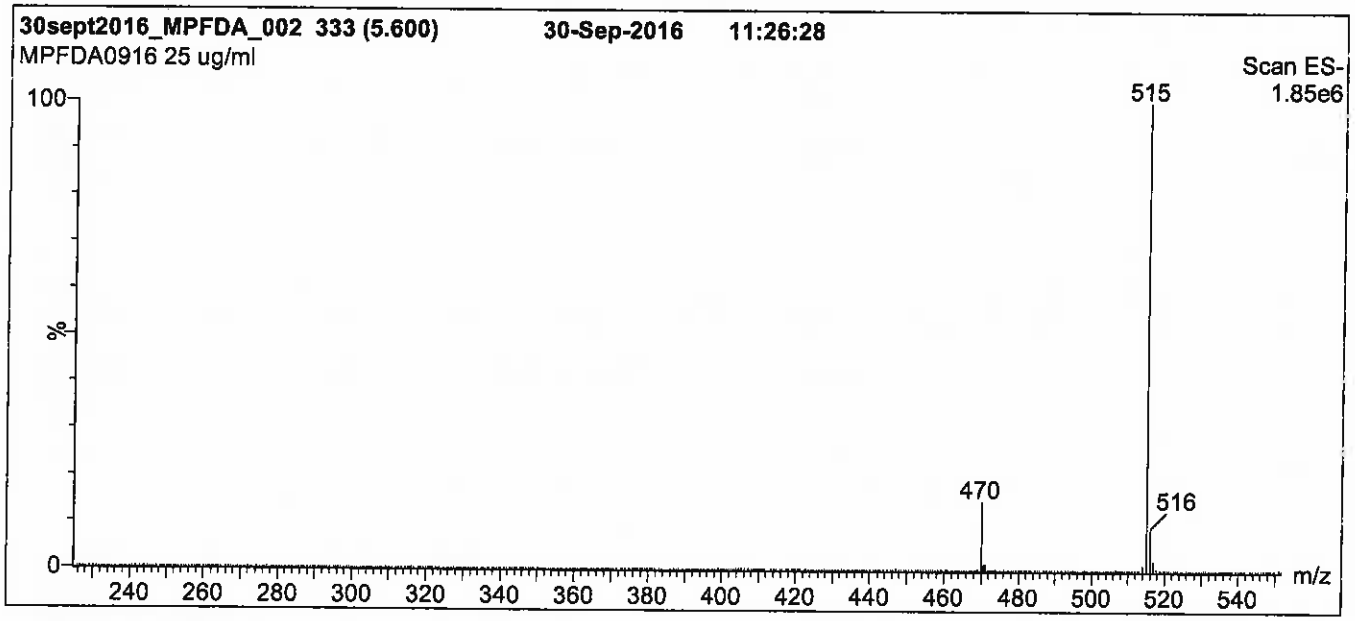
Figure 1: **MPFDA; LC/MS Data (TIC and Mass Spectrum)**





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

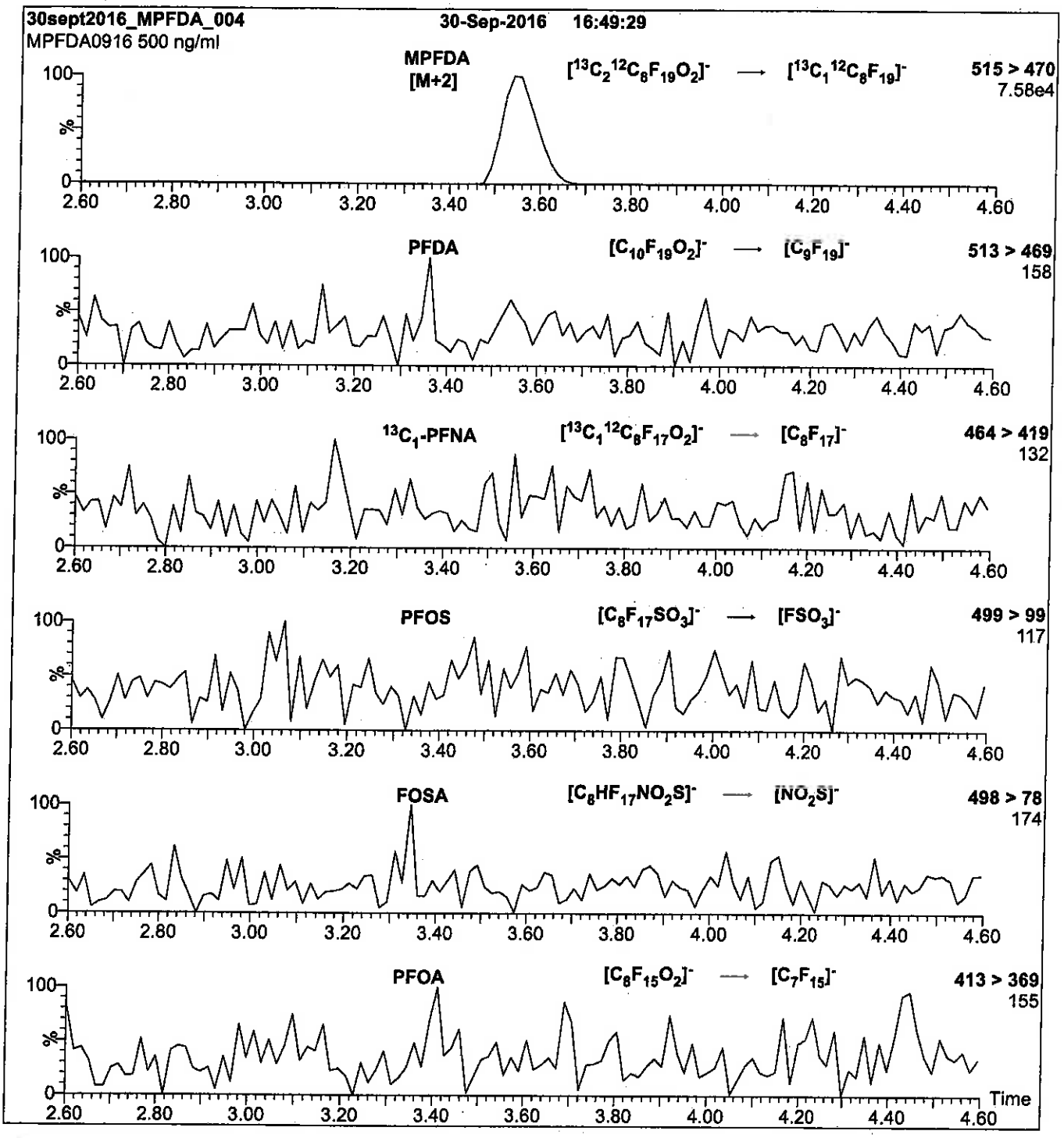
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFHxA_00009

605244
ID: LCMPFHxA_00009
Exp: 04/09/20 Prpd: CBW
13C2-Perfluorohexanoic ac

Rec. 3/29/16 JRB ✓

WELLINGTON LABORATORIES

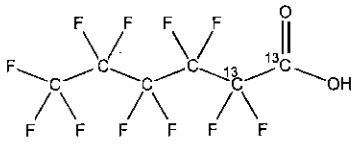
CERTIFICATE OF ANALYSIS DOCUMENTATION

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:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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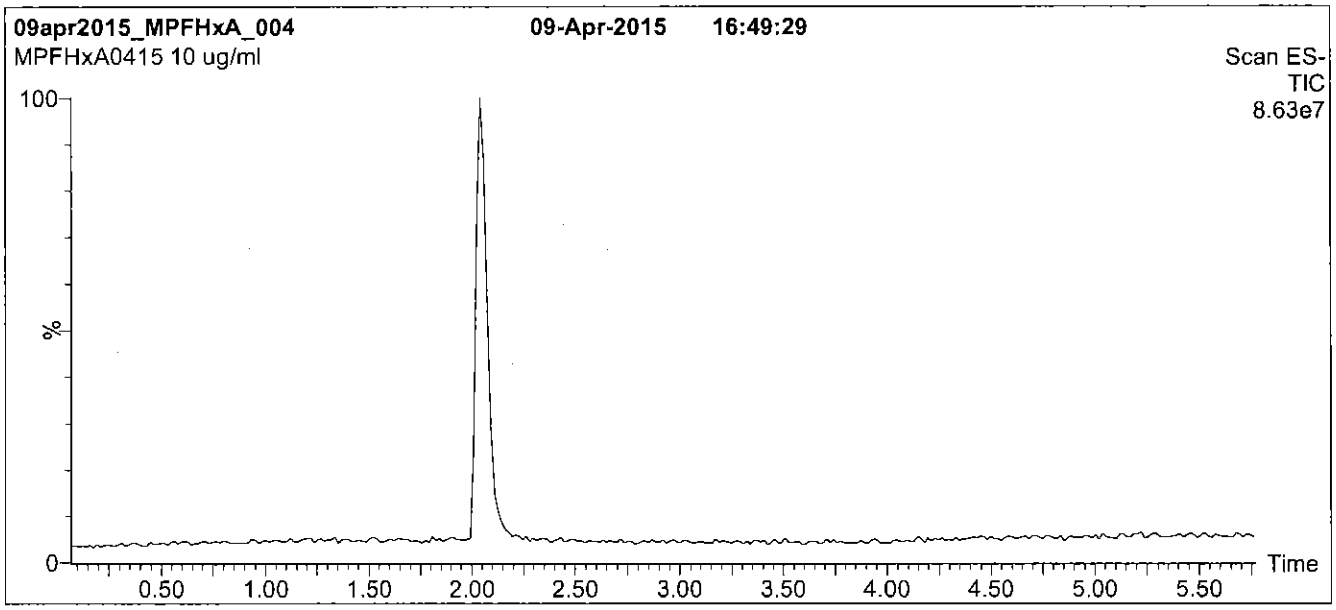
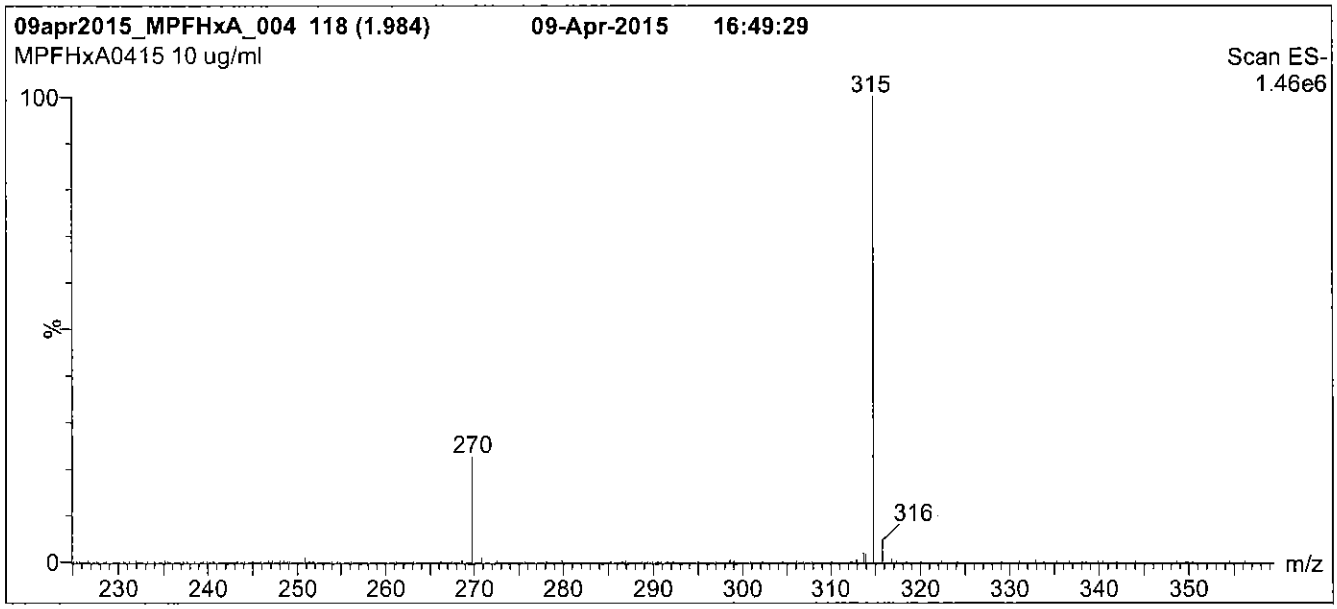




Conditions for Figure 1:

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

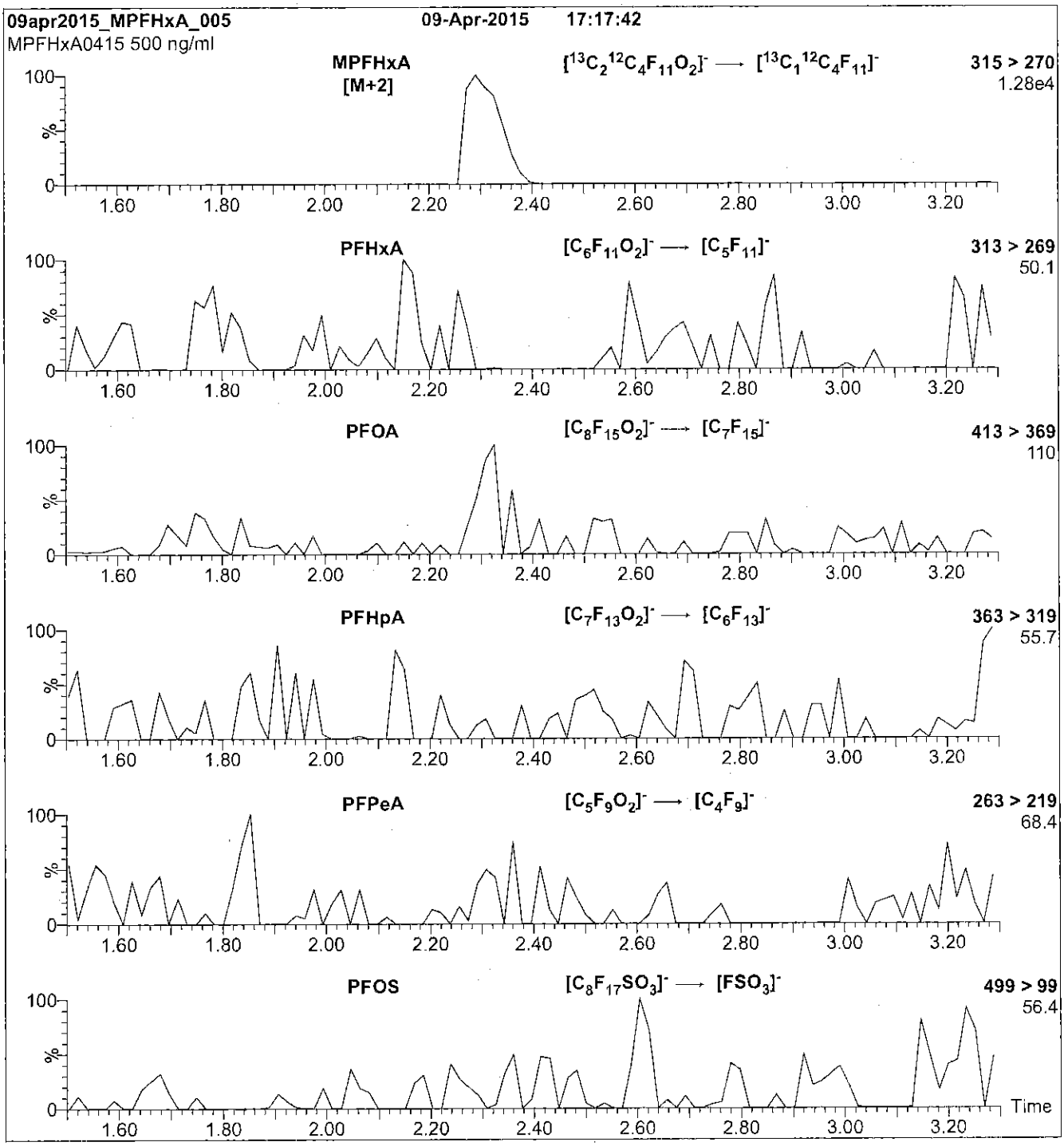
Flow: 300 µl/min

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

LCMPFHxA_00013

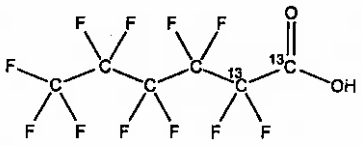
R: SBC 12/21/16

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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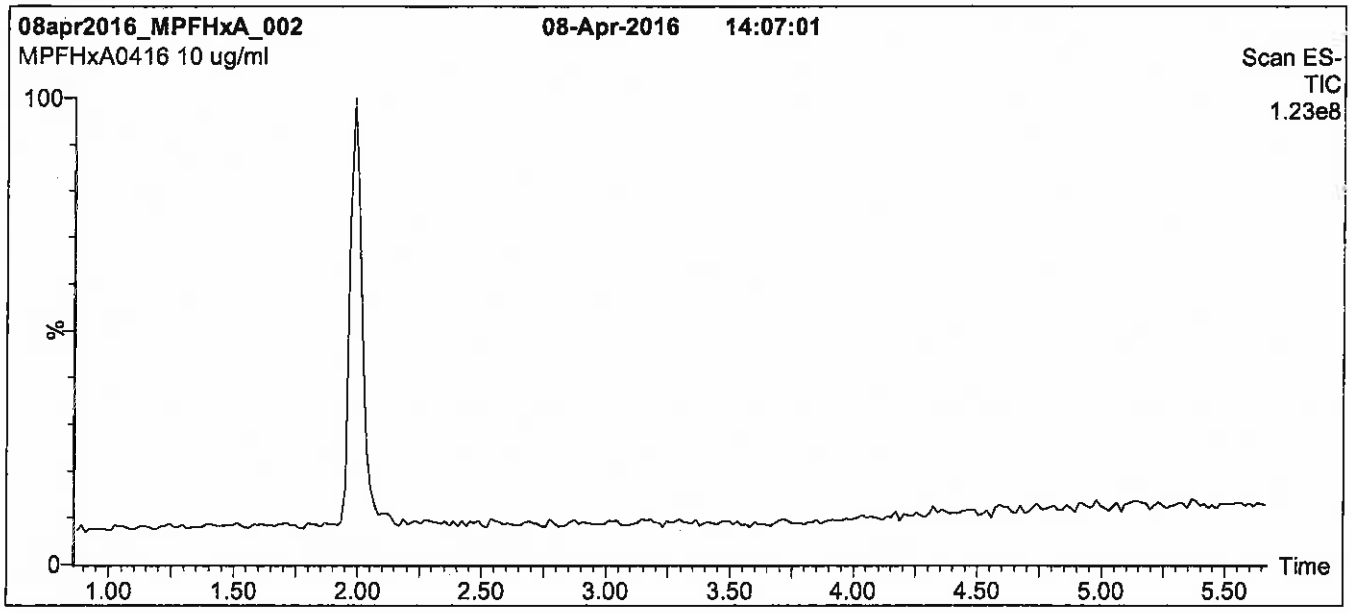
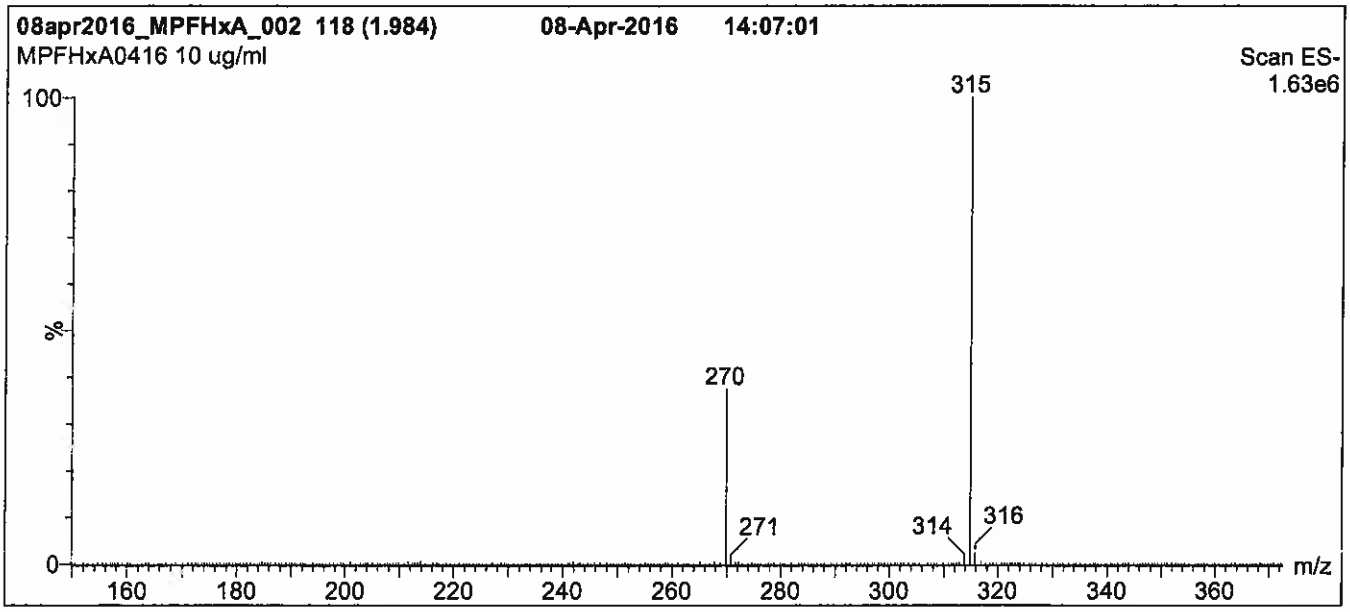




Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions over 0.5 min.
Time: 10 min

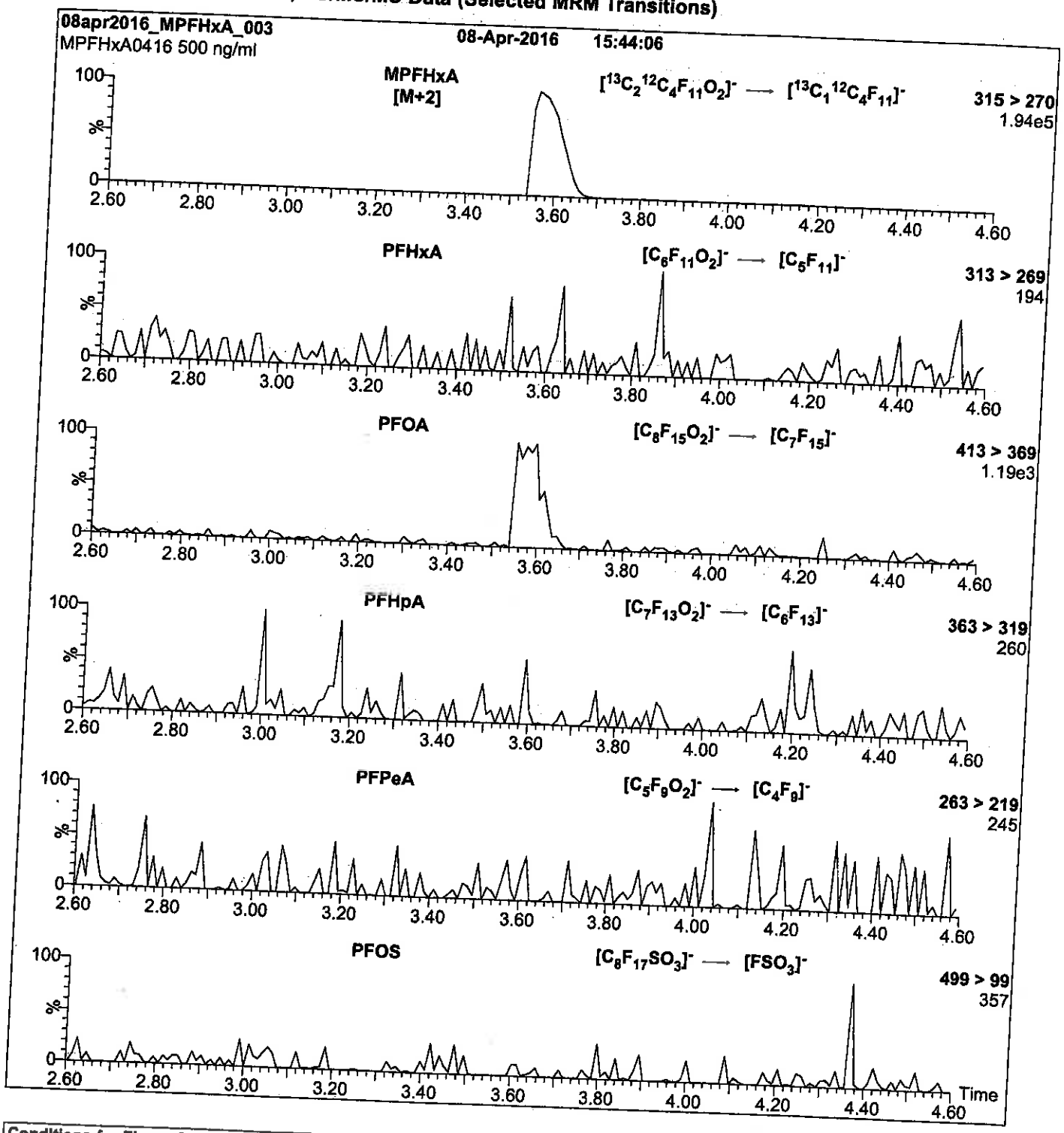
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFOS_00018

R: SBC 9/22/16

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

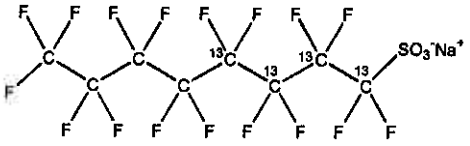
WELLINGTON LABORATORIES

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
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CALA

ANAB ACCREDITED

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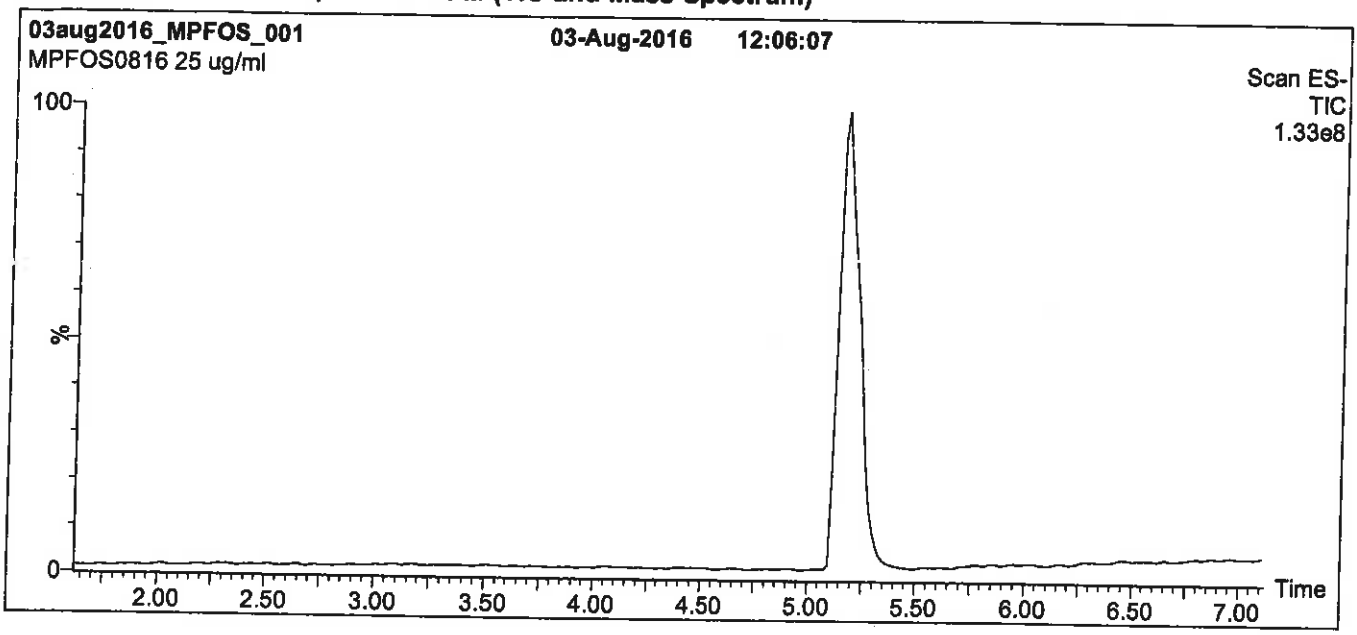
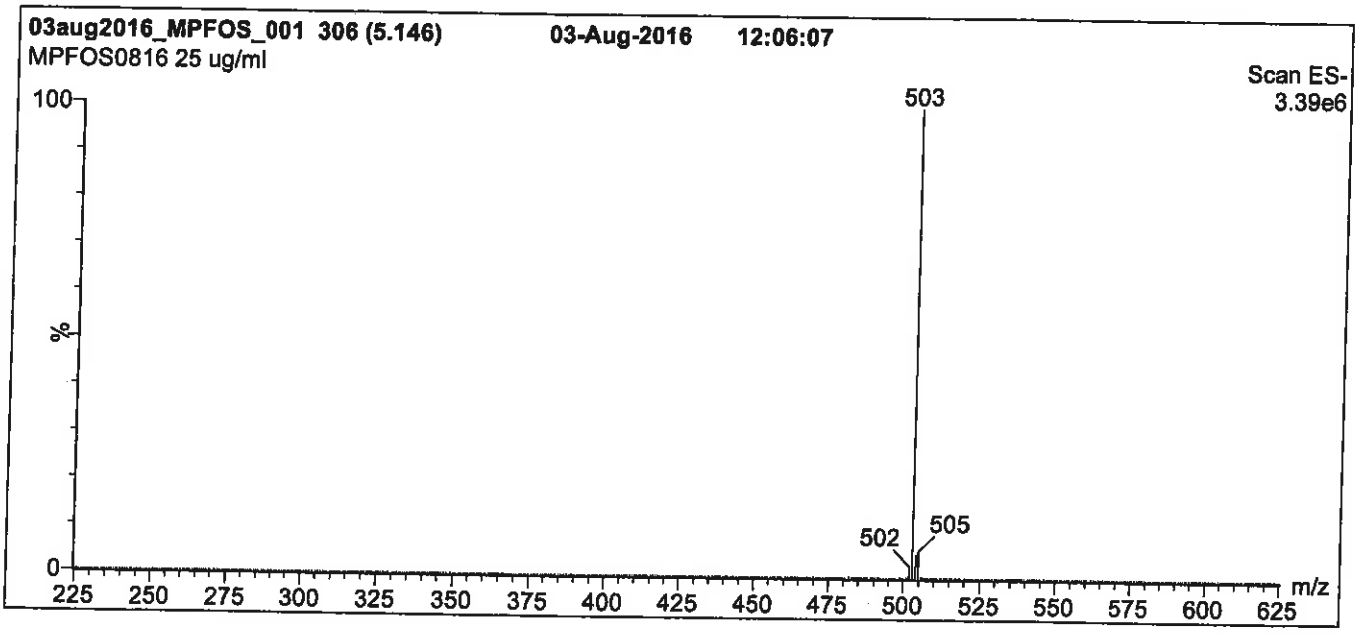
Figure 1: **MPFOS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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

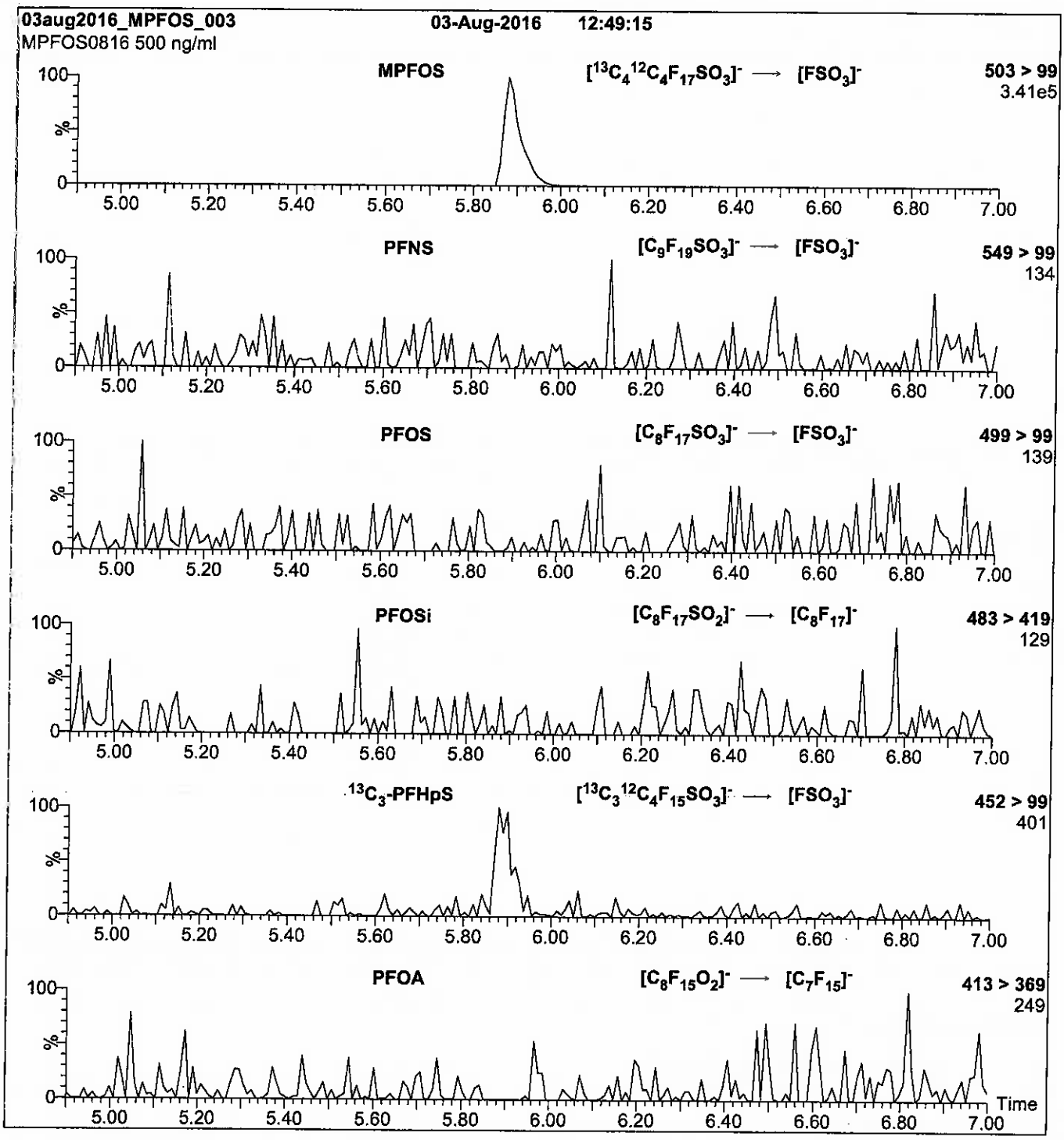
Flow: 300 µl/min

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.: 320-25386-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WI-CV-1RW72-0117	320-25386-1	85	89
WI-CV-1FB72-0117	320-25386-2	86	89
	MB 320-148547/1-A	82	92
	LCS 320-148547/2-A	89	95
	LCSD 320-148547/3-A	90	93

	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.: 320-25386-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2017.02.02B_537_007.d

Lab ID: LCS 320-148547/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	0.160	0.151	94	70-130	
Perfluorooctanoic acid (PFOA)	0.0781	0.0717	92	70-130	
Perfluorobutanesulfonic acid (PFBS)	0.359	0.368	102	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.: 320-25386-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2017.02.02B_537_008.d

Lab ID: LCSD 320-148547/3-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	0.147	92	2	30	70-130	
Perfluorooctanoic acid (PFOA)	0.0781	0.0699	90	3	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	0.359	0.355	99	4	30	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Lab File ID: 2017.02.02B_537_006.d Lab Sample ID: MB 320-148547/1-A

Matrix: Water Date Extracted: 02/01/2017 11:04

Instrument ID: A8_N Date Analyzed: 02/02/2017 15:34

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-148547/2-A	2017.02.02B_537_007.d	02/02/2017 15:38
	LCSD 320-148547/3-A	2017.02.02B_537_008.d	02/02/2017 15:43
WI-CV-1RW72-0117	320-25386-1	2017.02.02B_537_009.d	02/02/2017 15:47
WI-CV-1FB72-0117	320-25386-2	2017.02.02B_537_010.d	02/02/2017 15:52

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Instrument ID: A8_N Calibration Start Date: 01/26/2017 11:03

GC Column: Acquity ID: 2.1(mm) Calibration End Date: 01/26/2017 11:25

Calibration ID: 27929

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		2538555	1.98	6895045	2.22		
UPPER LIMIT		3807833	2.48	10342568	2.72		
LOWER LIMIT		1269278	1.48	3447523	1.72		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 320-147939/11		2492054	1.98	6749200	2.22		
ICV 320-147939/13		2273215	1.97	6260544	2.22		
CCV 320-148790/3 CCVIS		2475219	1.99	6469541	2.24		
MB 320-148547/1-A		2736309	1.99	6493740	2.23		
LCS 320-148547/2-A		2586358	1.98	6118574	2.23		
LCSD 320-148547/3-A		2533101	1.98	6229038	2.23		
320-25386-1	WI-CV-1RW72-0117	2740599	1.98	6278027	2.23		
320-25386-2	WI-CV-1FB72-0117	2741082	1.98	6403607	2.23		
CCV 320-148790/15 CCVIS		2504200	1.98	6574053	2.22		

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.: 320-25386-1

SDG No.:

Sample No.: CCV 320-148790/3 Date Analyzed: 02/02/2017 15:21

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2017.02.02B_537_003 Heated Purge: (Y/N) N

Calibration ID: 27929

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		2475219	1.99	6469541	2.24		
UPPER LIMIT		3465307	2.49	9057357	2.74		
LOWER LIMIT		1732653	1.49	4528679	1.74		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-148547/1-A		2736309	1.99	6493740	2.23		
LCS 320-148547/2-A		2586358	1.98	6118574	2.23		
LCSD 320-148547/3-A		2533101	1.98	6229038	2.23		
320-25386-1	WI-CV-1RW72-0117	2740599	1.98	6278027	2.23		
320-25386-2	WI-CV-1FB72-0117	2741082	1.98	6403607	2.23		

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.: 320-25386-1

SDG No.:

Sample No.: CCV 320-148790/15 Date Analyzed: 02/02/2017 16:14

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2017.02.02B_537_015 Heated Purge: (Y/N) N

Calibration ID: 27929

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		2504200	1.98	6574053	2.22		
UPPER LIMIT		3505880	2.48	9203674	2.72		
LOWER LIMIT		1752940	1.48	4601837	1.72		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-148547/1-A		2736309	1.99	6493740	2.23		
LCS 320-148547/2-A		2586358	1.98	6118574	2.23		
LCSD 320-148547/3-A		2533101	1.98	6229038	2.23		
320-25386-1	WI-CV-1RW72-0117	2740599	1.98	6278027	2.23		
320-25386-2	WI-CV-1FB72-0117	2741082	1.98	6403607	2.23		

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.: 320-25386-1

SDG No.:

Client Sample ID: WI-CV-1RW72-0117 | Lab Sample ID: 320-25386-1

Matrix: Water | Lab File ID: 2017.02.02B_537_009.d

Analysis Method: 537 | Date Collected: 01/28/2017 10:02

Extraction Method: 537 | Date Extracted: 02/01/2017 11:04

Sample wt/vol: 215.8(mL) | Date Analyzed: 02/02/2017 15:47

Con. Extract Vol.: 1.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 148790 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.056	U	0.070	0.056	0.018
335-67-1	Perfluorooctanoic acid (PFOA)	0.028	U	0.035	0.028	0.011
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.13	U	0.16	0.13	0.055

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	85		70-130
STL00996	13C2 PFDA	89		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_009.d
Lims ID: 320-25386-A-1-A
Client ID: WI-CV-1RW72-0117
Sample Type: Client
Inject. Date: 02-Feb-2017 15:47:45 ALS Bottle#: 35 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-25386-a-1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 02-Feb-2017 16:34:40 Calib Date: 26-Jan-2017 11:25:03
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d

Column 1 : Det: EXP1
Process Host: XAWRK034

First Level Reviewer: barnettj Date: 02-Feb-2017 16:34:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.510	1.510	0.0	1.000	173457	0.4167		20.3	
298.90 > 99.00	1.510	1.510	0.0	1.000	78111		2.22(0.00-0.00)	18.8	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.639	1.638	0.001	1.000	2517193	8.51		6451	
3 Perfluorohexanesulfonic acid									M
399.00 > 80.00	1.783	1.787	-0.004	1.000	140663	0.3817		32.8	M
* 6 13C2-PFOA									
415.00 > 370.00	1.980	1.979	0.001		2740599	10.0		6715	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.980	1.980	0.0	1.000	107647	0.4248		8.0	
413.00 > 169.00	1.980	1.980	0.0	1.000	77735		1.38(0.00-0.00)	72.2	
* 7 13C4 PFOS									
503.00 > 80.00	2.231	2.220	0.011		6278027	28.7		5476	
$ 10 13C2 PFDA									
515.00 > 470.00	2.390	2.384	0.006	1.000	1571067	8.88		3467	

QC Flag Legend

Review Flags
M - Manually Integrated

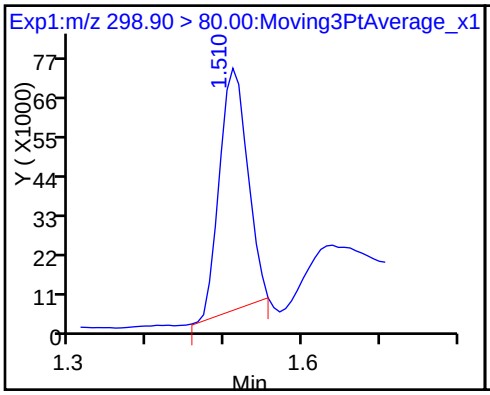
Report Date: 02-Feb-2017 16:35:16 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

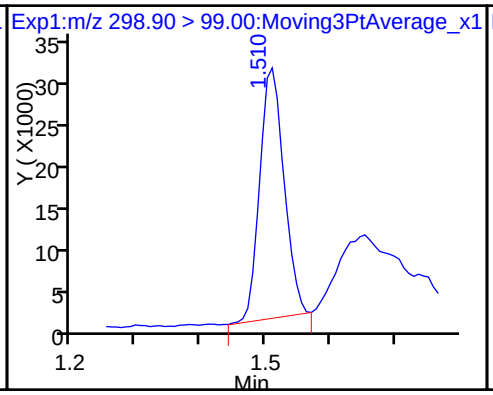
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_009.d

Injection Date:	02-Feb-2017 15:47:45	Instrument ID:	A8_N		
Lims ID:	320-25386-A-1-A	Lab Sample ID:	320-25386-1		
Client ID:	WI-CV-1RW72-0117				
Operator ID:	A8-PC\A8	ALS Bottle#:	35	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		

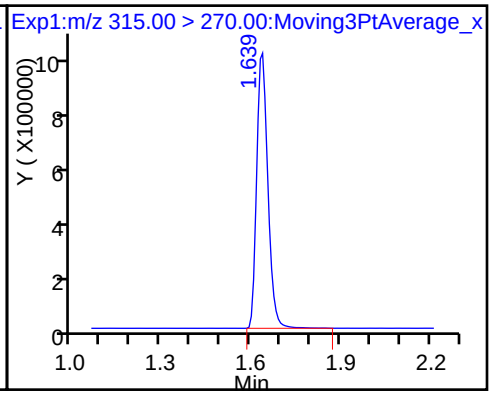
1 Perfluorobutanesulfonic acid



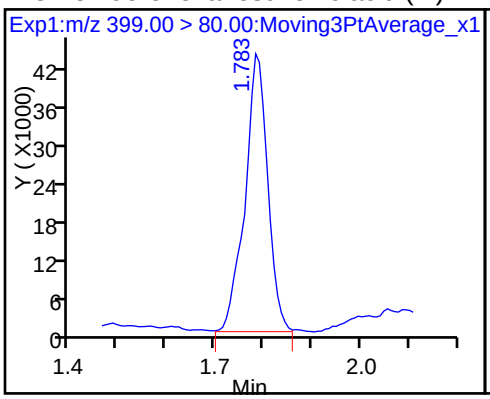
1 Perfluorobutanesulfonic acid



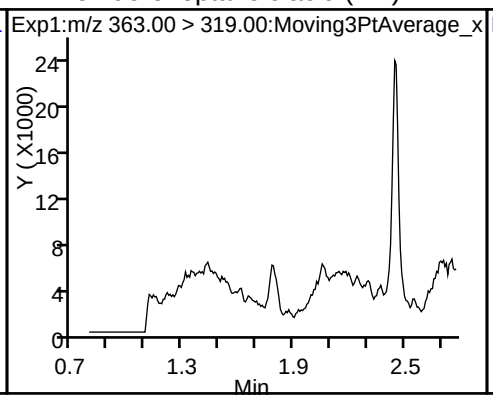
$ 2 13C2 PFHxA



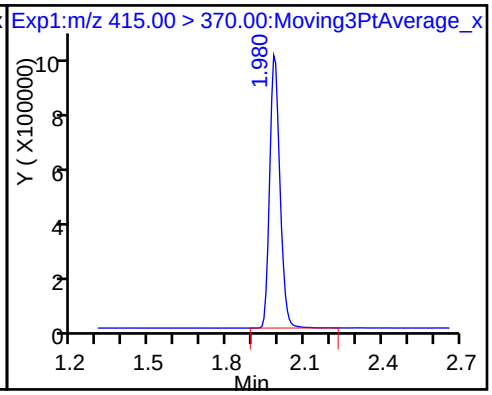
3 Perfluorohexanesulfonic acid (M)



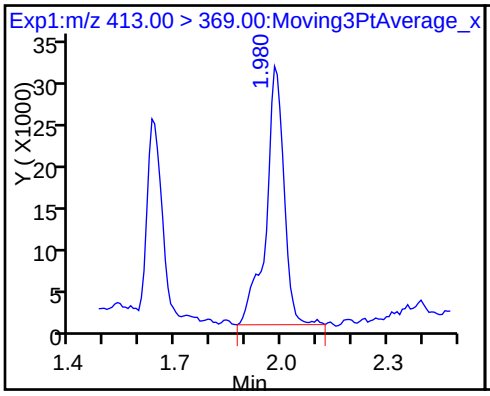
4 Perfluoroheptanoic acid (ND)



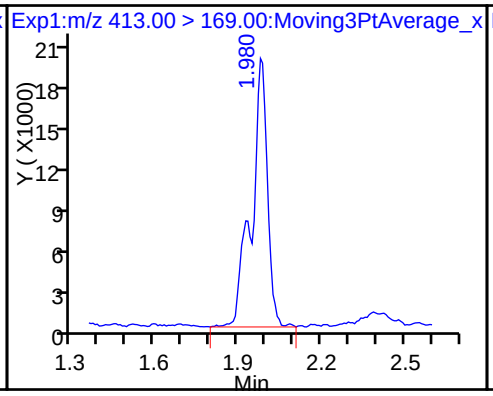
* 6 13C2-PFOA



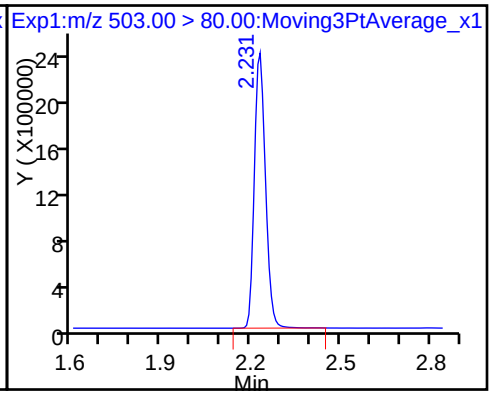
5 Perfluorooctanoic acid



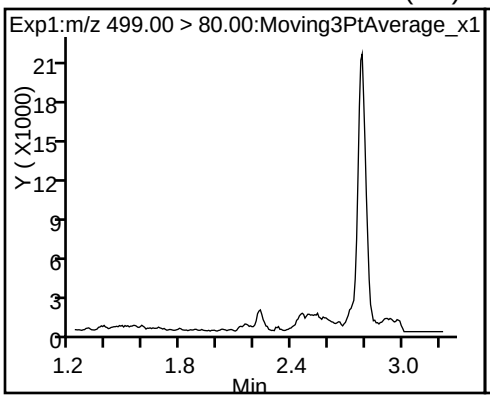
5 Perfluorooctanoic acid



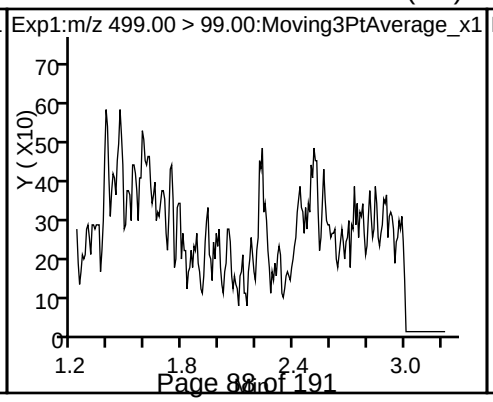
* 7 13C4 PFOS



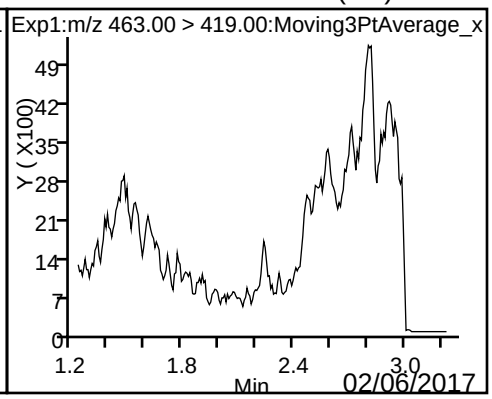
8 Perfluorooctane sulfonic acid (ND)



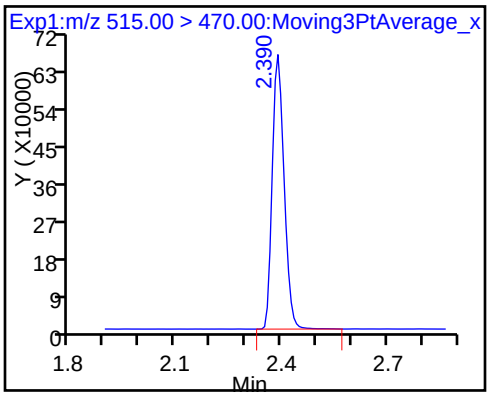
8 Perfluorooctane sulfonic acid (ND)



9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.390
Y (X10000)
72
63
54
45
36
27
18
9
0
1.8
2.1
2.4
2.7
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_009.d				
Lims ID:	320-25386-A-1-A				
Client ID:	WI-CV-1RW72-0117				
Sample Type:	Client				
Inject. Date:	02-Feb-2017 15:47:45	ALS Bottle#:	35	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-25386-a-1-a				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	A8-PC\A8	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	02-Feb-2017 16:34:40	Calib Date:	26-Jan-2017 11:25:03		
Integrator:	Picker				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK034				
First Level Reviewer: barnettj		Date:	02-Feb-2017 16:34:40		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	8.51	85.11
$ 10 13C2 PFDA	10.0	8.88	88.79

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-25386-1

SDG No.:

Client Sample ID: WI-CV-1FB72-0117 | Lab Sample ID: 320-25386-2

Matrix: Water | Lab File ID: 2017.02.02B_537_010.d

Analysis Method: 537 | Date Collected: 01/28/2017 10:03

Extraction Method: 537 | Date Extracted: 02/01/2017 11:04

Sample wt/vol: 267.3(mL) | Date Analyzed: 02/02/2017 15:52

Con. Extract Vol.: 1.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 148790 | 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	0.014
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	86		70-130
STL00996	13C2 PFDA	89		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_010.d
Lims ID: 320-25386-A-2-A
Client ID: WI-CV-1FB72-0117
Sample Type: Client
Inject. Date: 02-Feb-2017 15:52:08 ALS Bottle#: 36 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-25386-a-2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 02-Feb-2017 16:34:40 Calib Date: 26-Jan-2017 11:25:03
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d

Column 1 : Det: EXP1
Process Host: XAWRK034

First Level Reviewer: barnettj Date: 02-Feb-2017 16:34:57

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.639	1.638	0.001	1.000	2548881	8.62		5769	
* 6 13C2-PFOA									
415.00 > 370.00	1.980	1.979	0.001		2741082	10.0		5547	
* 7 13C4 PFOS									
503.00 > 80.00	2.231	2.220	0.011		6403607	28.7		6093	
$ 10 13C2 PFDA									
515.00 > 470.00	2.390	2.384	0.006	1.000	1576655	8.91		3078	

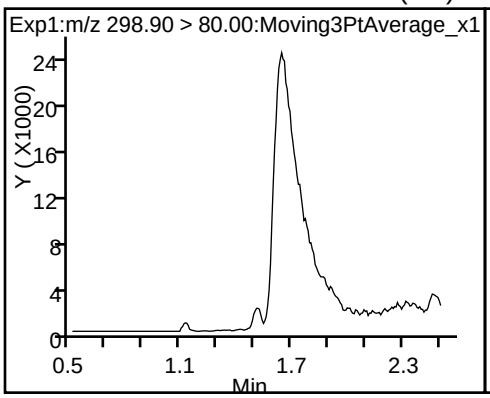
Report Date: 02-Feb-2017 16:35:16 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

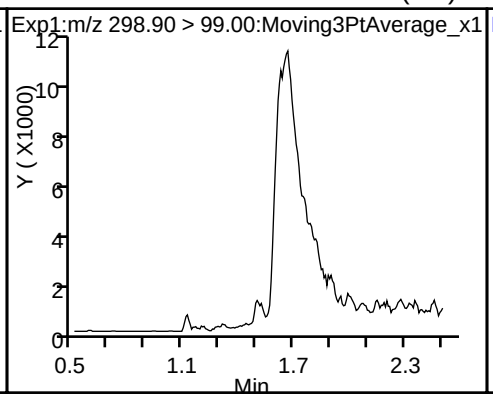
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_010.d

Injection Date:	02-Feb-2017 15:52:08	Instrument ID:	A8_N		
Lims ID:	320-25386-A-2-A	Lab Sample ID:	320-25386-2		
Client ID:	WI-CV-1FB72-0117				
Operator ID:	A8-PC\A8	ALS Bottle#:	36	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		

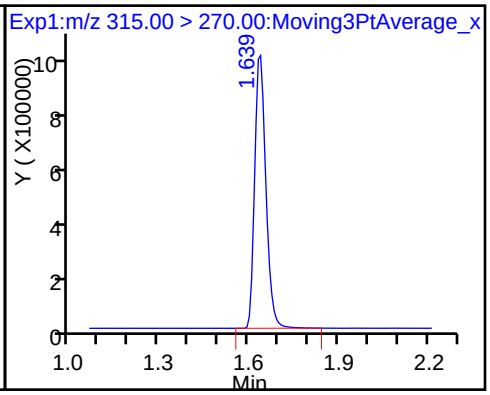
1 Perfluorobutanesulfonic acid (ND)



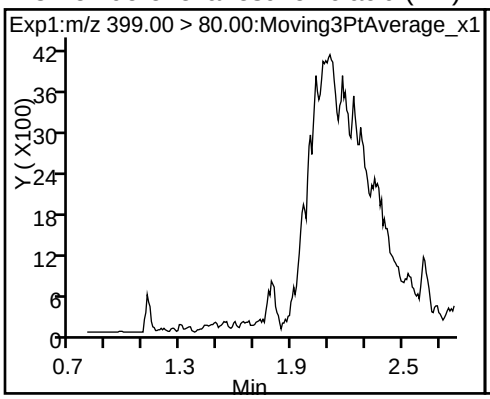
1 Perfluorobutanesulfonic acid (ND)



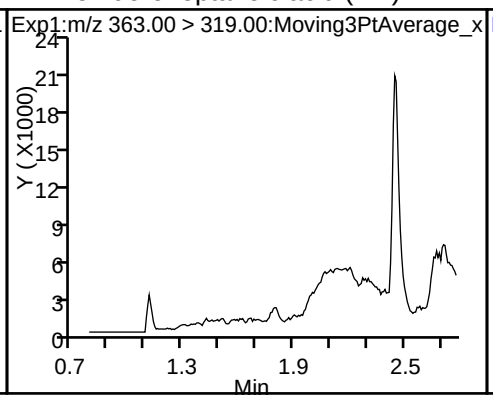
$ 2 13C2 PFHxA



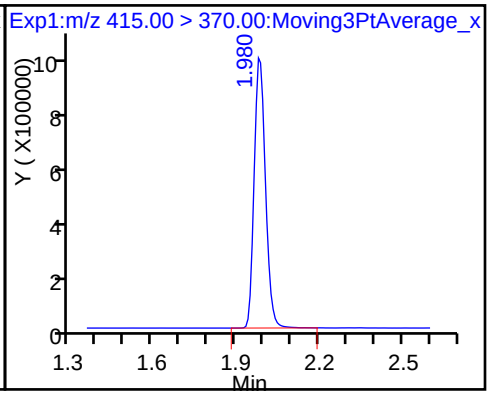
3 Perfluorohexanesulfonic acid (ND)



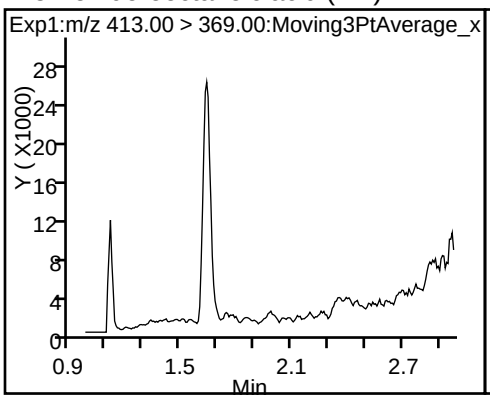
4 Perfluoroheptanoic acid (ND)



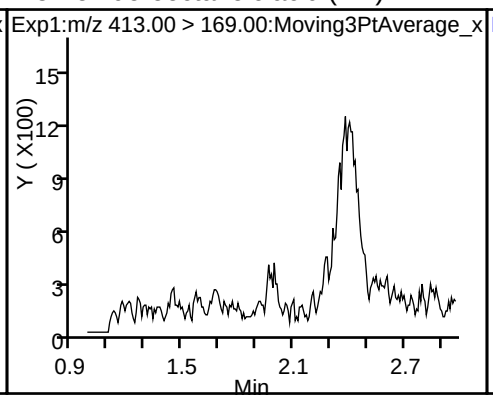
* 6 13C2-PFOA



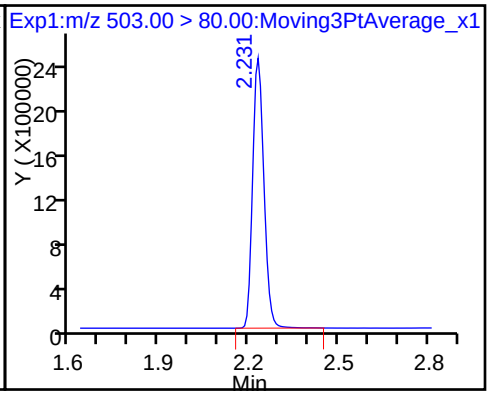
5 Perfluorooctanoic acid (ND)



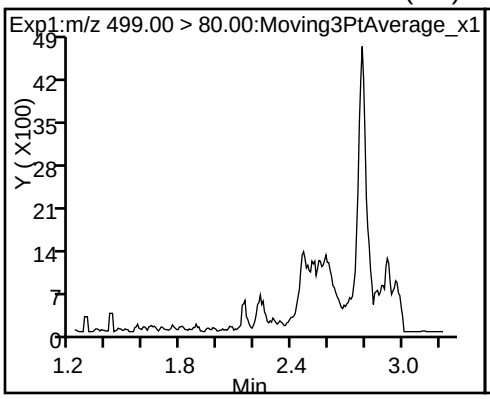
5 Perfluorooctanoic acid (ND)



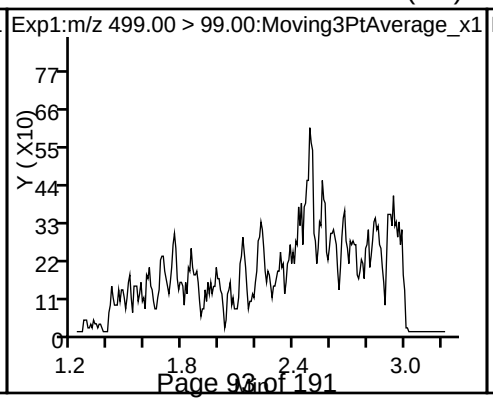
* 7 13C4 PFOS



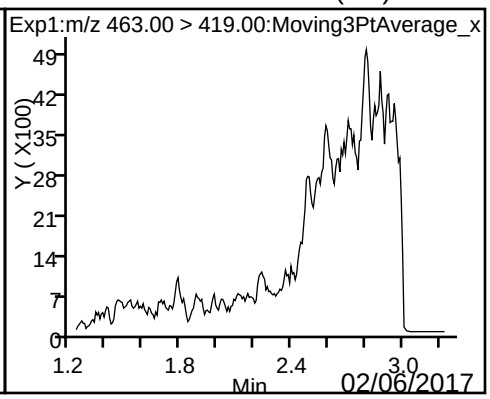
8 Perfluorooctane sulfonic acid (ND)



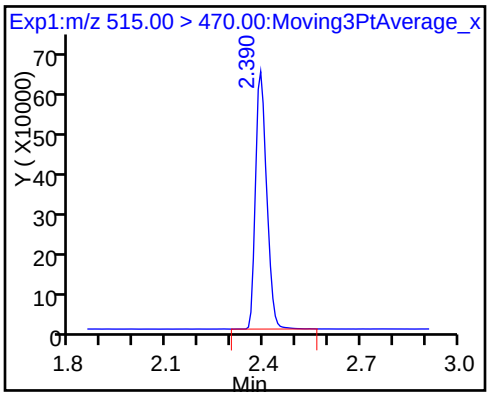
8 Perfluorooctane sulfonic acid (ND)



9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.390
Y (X10000)
70
60
50
40
30
20
10
0
1.8
2.1
2.4
2.7
3.0
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_010.d				
Lims ID:	320-25386-A-2-A				
Client ID:	WI-CV-1FB72-0117				
Sample Type:	Client				
Inject. Date:	02-Feb-2017 15:52:08	ALS Bottle#:	36	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-25386-a-2-a				
Misc. Info.:	Plate: 1 Rack: 2				
Operator ID:	A8-PC\A8	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	02-Feb-2017 16:34:40	Calib Date:	26-Jan-2017 11:25:03		
Integrator:	Picker				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK034				
First Level Reviewer: barnettj		Date:	02-Feb-2017 16:34:57		

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	8.62	86.17
$ 10 13C2 PFDA	10.0	8.91	89.09

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

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1 Analy Batch No.: 147939

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/26/2017 11:03 Calibration End Date: 01/26/2017 11:25 Calibration ID: 27929

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-147939/4	2017.01.26_537_CURVE_004.d
Level 2	IC 320-147939/5	2017.01.26_537_CURVE_005.d
Level 3	IC 320-147939/6	2017.01.26_537_CURVE_006.d
Level 4	IC 320-147939/7	2017.01.26_537_CURVE_007.d
Level 5	IC 320-147939/8	2017.01.26_537_CURVE_008.d
Level 6	IC 320-147939/9	2017.01.26_537_CURVE_009.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid (PFBS)	1.9734 1.2846	2.1200	1.9155	1.5235	1.3756	QuaF		1.9030	-0.003592						0.9940		0.9600
Perfluorohexanesulfonic acid	1.6352 1.6362	1.7760	1.7293	1.7290	1.5957	Ave		1.6836				4.2		30.0			
Perfluoroheptanoic acid	0.9573 0.9336	1.0304	0.9596	0.9932	0.9117	Ave		0.9643				4.4		30.0			
Perfluorooctanoic acid (PFOA)	0.9250 0.9675	1.0010	0.8570	0.9604	0.8375	Ave		0.9247				7.0		30.0			
Perfluorooctanesulfonic acid (PFOS)	1.0972 1.1381	1.1350	1.1095	1.1438	1.0749	Ave		1.1164				2.4		30.0			
Perfluorononanoic acid	0.7119 0.6901	0.7252	0.6648	0.6872	0.6088	Ave		0.6813				6.1		30.0			
13C2 PFHxA	1.0229 1.1123	1.0615	1.0571	1.1311	1.0902	Ave		1.0792				3.7		30.0			
13C2 PFDA	0.6004 0.6781	0.6484	0.6293	0.6610	0.6565	Ave		0.6456				4.2		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.: 320-25386-1 Analy Batch No.: 147939

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/26/2017 11:03 Calibration End Date: 01/26/2017 11:25 Calibration ID: 27929

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-147939/4	2017.01.26_537_CURVE_004.d
Level 2	IC 320-147939/5	2017.01.26_537_CURVE_005.d
Level 3	IC 320-147939/6	2017.01.26_537_CURVE_006.d
Level 4	IC 320-147939/7	2017.01.26_537_CURVE_007.d
Level 5	IC 320-147939/8	2017.01.26_537_CURVE_008.d
Level 6	IC 320-147939/9	2017.01.26_537_CURVE_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	QuaF	4091129 51739348	10992329	20307189	40111981	43425035	8.98 178	22.9	45.1	90.9	135
Perfluorohexanesulfonic acid	PFOS	Ave	1142790 22216101	3104280	6180212	15346095	16980909	3.03 60.1	7.72	15.2	30.6	45.4
Perfluoroheptanoic acid	13PFOA	Ave	226942 4381381	616263	1202991	3062534	3366172	0.990 19.7	2.52	4.97	10.0	14.9
Perfluorooctanoic acid (PFOA)	13PFOA	Ave	432317 8951805	1180376	2118361	5838940	6096769	1.95 38.8	4.98	9.81	19.8	29.3
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	1015341 20461190	2626980	5250567	13442641	15146387	4.01 79.6	10.2	20.1	40.6	60.1
Perfluorononanoic acid	13PFOA	Ave	353574 6784989	908738	1746263	4439886	4708932	2.07 41.2	5.29	10.4	21.0	31.1
13C2 PFHxA	13PFOA	Ave	2449365 2652857	2514804	2663857	3479578	2710579	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PFOA	Ave	1437714 1617282	1536073	1585927	2033318	1632201	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD
QuaF = Quadratic ISTD forced zero

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

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1 Analy Batch No.: 147939

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/26/2017 11:03 Calibration End Date: 01/26/2017 11:25 Calibration ID: 27929

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-147939/4	2017.01.26_537_CURVE_004.d
Level 2	IC 320-147939/5	2017.01.26_537_CURVE_005.d
Level 3	IC 320-147939/6	2017.01.26_537_CURVE_006.d
Level 4	IC 320-147939/7	2017.01.26_537_CURVE_007.d
Level 5	IC 320-147939/8	2017.01.26_537_CURVE_008.d
Level 6	IC 320-147939/9	2017.01.26_537_CURVE_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)	5.6	17.4	11.2	-4.2	-4.6	3.7	50	50	50	50	50	50
Perfluorohexanesulfonic acid	-2.9	5.5	2.7	2.7	-5.2	-2.8	50	50	50	50	50	50
Perfluoroheptanoic acid	-0.7	6.9	-0.5	3.0	-5.5	-3.2	50	50	50	50	50	50
Perfluorooctanoic acid (PFOA)	0.0	8.2	-7.3	3.9	-9.4	4.6	50	50	50	50	50	50
Perfluorooctanesulfonic acid (PFOS)	-1.7	1.7	-0.6	2.5	-3.7	1.9	50	50	50	50	50	50
Perfluorononanoic acid	4.5	6.4	-2.4	0.9	-10.7	1.3	50	50	50	50	50	50
13C2 PFHxA	-5.2	-1.6	-2.0	4.8	1.0	3.1	30	30	30	30	30	30
13C2 PFDA	-7.0	0.4	-2.5	2.4	1.7	5.0	30	30	30	30	30	30

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_004.d
Lims ID: IC L1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 26-Jan-2017 11:03:01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L1_537
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 30-Jan-2017 11:47:39 Calib Date: 26-Jan-2017 11:25:03
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: chandrasenas Date: 26-Jan-2017 12:09:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.510	1.510	0.0	1.000	4091129	9.48		351	
298.90 > 99.00	1.510	1.510	0.0	1.000	1798096		2.28(0.00-0.00)	466	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.639	1.638	0.001	1.000	2449365	9.48		6519	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.791	1.787	0.004	1.000	1142790	2.94		285	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.791	1.788	0.003	1.000	226942	0.9828		31.9	
* 6 13C2-PFOA									
415.00 > 370.00	1.980	1.979	0.001		2394556	10.0		5310	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.988	1.980	0.008	1.000	432317	1.95		33.3	
413.00 > 169.00	1.980	1.980	0.0	0.996	250514		1.73(0.00-0.00)	213	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.223	2.140	0.083	1.000	1015341	3.94		504	M
499.00 > 99.00	2.223	2.140	0.083	1.000	244165		4.16(0.00-0.00)	190	M
* 7 13C4 PFOS									
503.00 > 80.00	2.223	2.220	0.003		6623994	28.7		7372	
9 Perfluorononanoic acid									
463.00 > 419.00	2.231	2.229	0.002	1.000	353574	2.17		87.2	
$ 10 13C2 PFDA									
515.00 > 470.00	2.390	2.384	0.006	1.000	1437714	9.30		2384	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L1_00017 Amount Added: 1.00 Units: mL

Report Date: 30-Jan-2017 11:47:40 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_004.d

Injection Date: 26-Jan-2017 11:03:01 Instrument ID: A8_N

Lims ID: IC L1

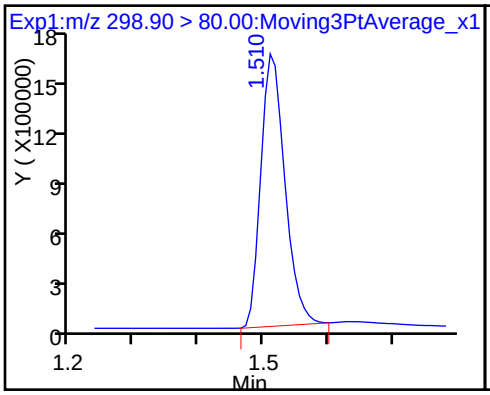
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 1 Worklist Smp#: 4

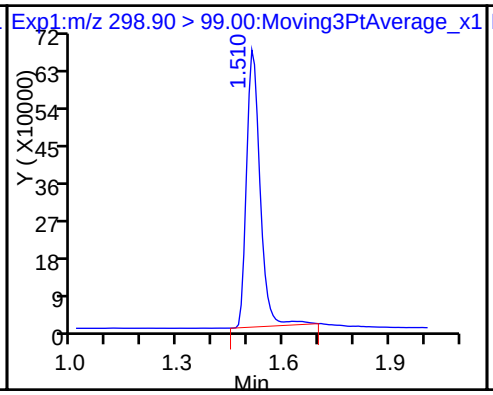
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

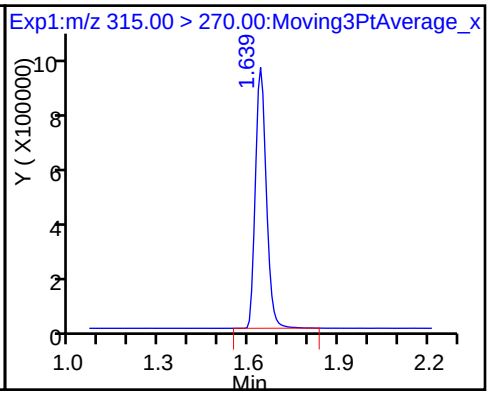
1 Perfluorobutanesulfonic acid



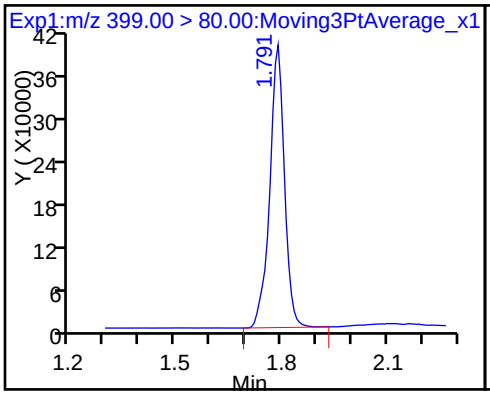
1 Perfluorobutanesulfonic acid



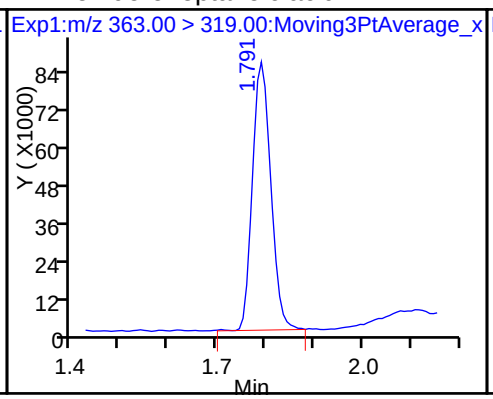
$ 2 13C2 PFHxA



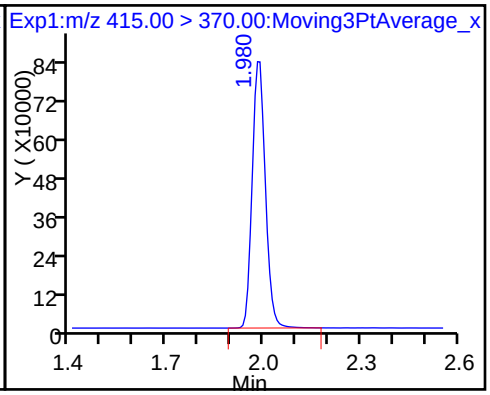
3 Perfluorohexanesulfonic acid



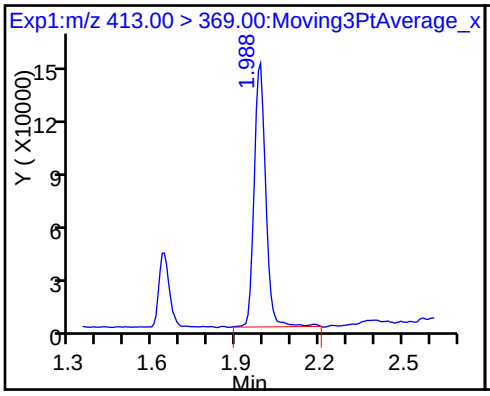
4 Perfluoroheptanoic acid



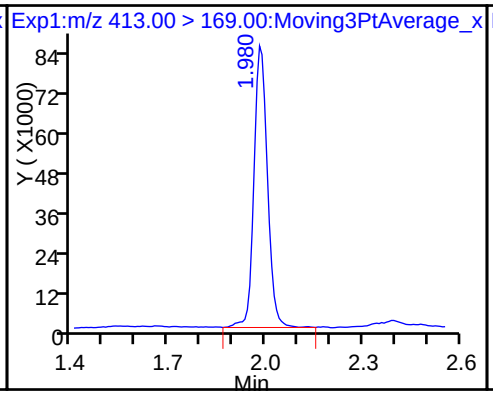
* 6 13C2-PFOA



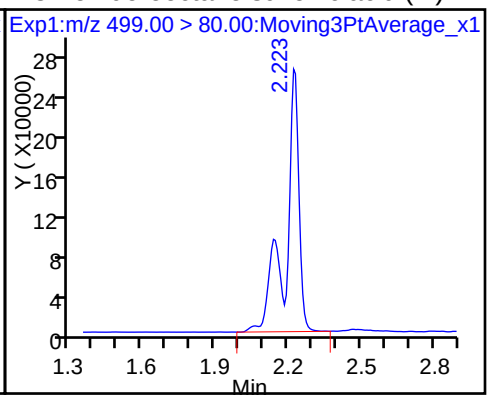
5 Perfluorooctanoic acid



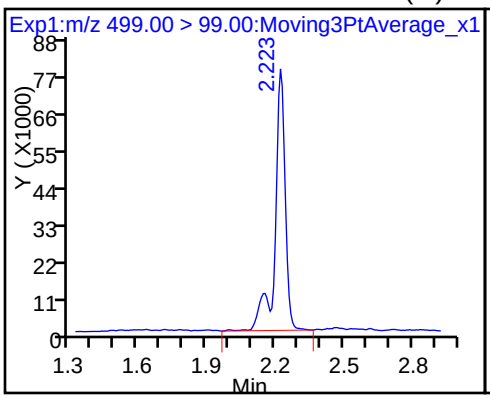
5 Perfluorooctanoic acid



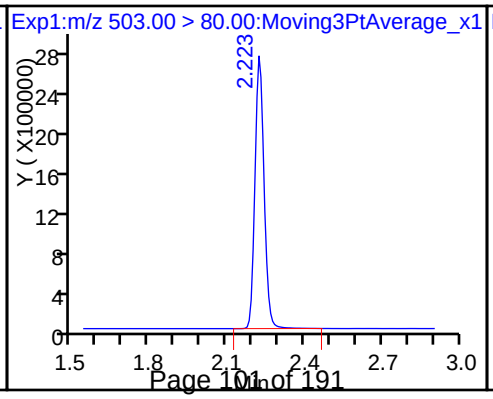
8 Perfluorooctane sulfonic acid (M)



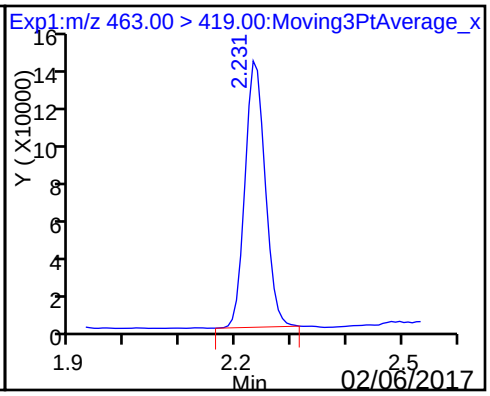
8 Perfluorooctane sulfonic acid (M)



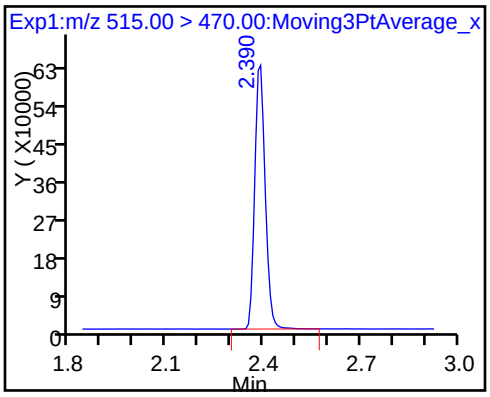
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.390
Y (X10000)
63
54
45
36
27
18
9
0
1.8
2.1
2.4
2.7
3.0
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

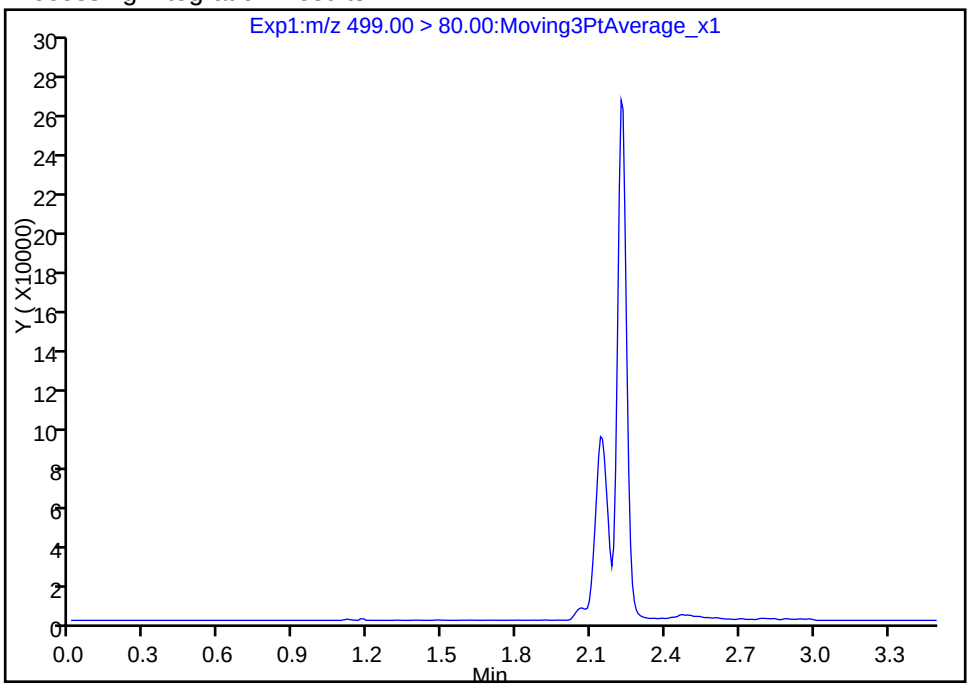
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_004.d
Injection Date: 26-Jan-2017 11:03:01 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

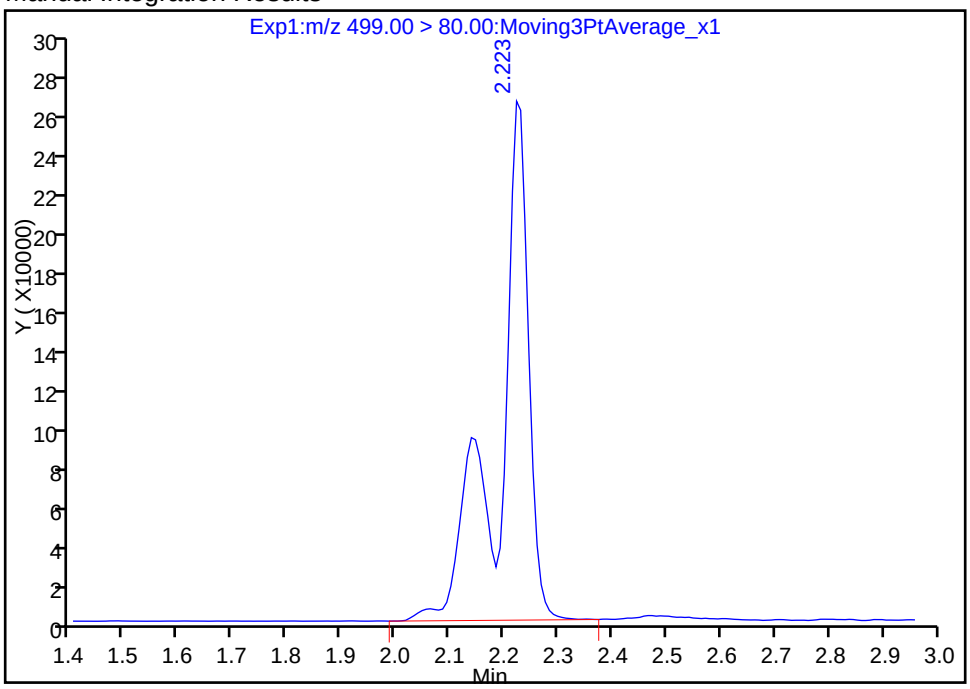
Not Detected
Expected RT: 2.14

Processing Integration Results



Manual Integration Results

RT: 2.22
Area: 1015341
Amount: 3.937687
Amount Units: ng/ml



Reviewer: chandrasenas, 26-Jan-2017 12:09:36
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

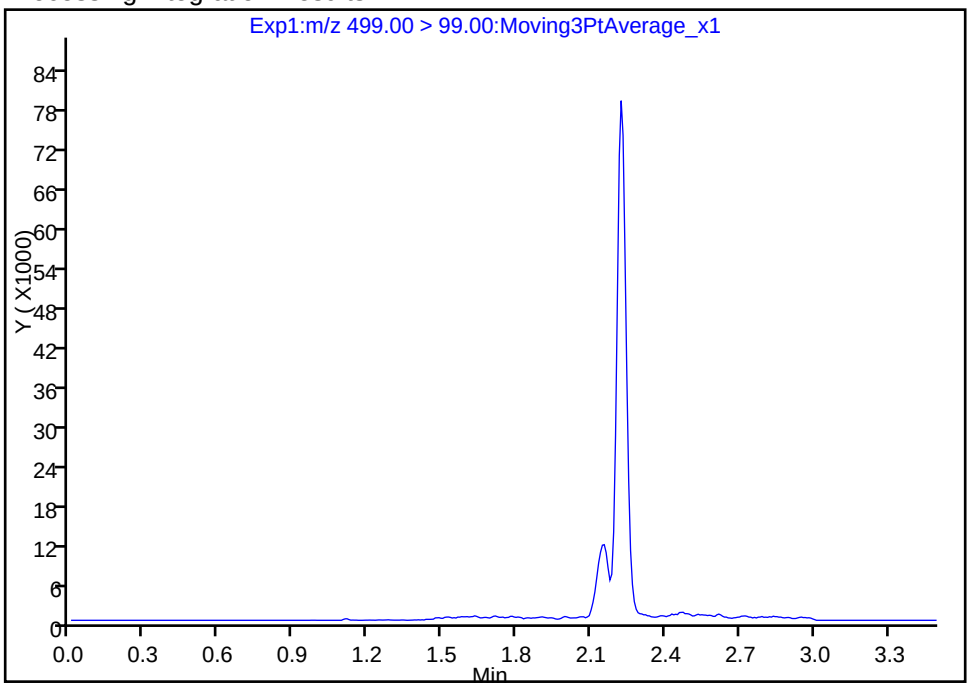
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_004.d
Injection Date: 26-Jan-2017 11:03:01 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

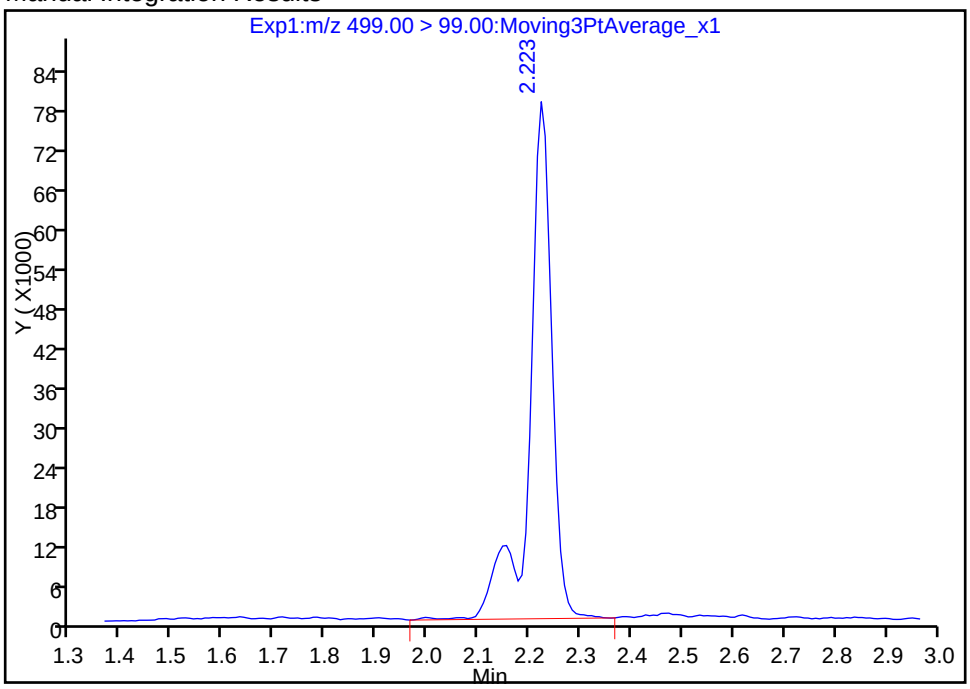
Not Detected
Expected RT: 2.14

Processing Integration Results



Manual Integration Results

RT: 2.22
Area: 244165
Amount: 3.937687
Amount Units: ng/ml



Reviewer: chandrasenas, 26-Jan-2017 12:09:36
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_005.d
Lims ID: IC L2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 26-Jan-2017 11:07:28 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L2_537
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 30-Jan-2017 11:47:41 Calib Date: 26-Jan-2017 11:25:03
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: chandrasenas Date: 26-Jan-2017 12:10:13

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.510	1.510	0.0	1.000	10992329	26.9		802	
298.90 > 99.00	1.510	1.510	0.0	1.000	4687208		2.35(0.00-0.00)	866	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.639	1.638	0.001	1.000	2514804	9.84		6701	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.791	1.787	0.004	1.000	3104280	8.14		670	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.791	1.788	0.003	1.000	616263	2.70		90.7	
* 6 13C2-PFOA									
415.00 > 370.00	1.980	1.979	0.001		2369193	10.0		5564	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.980	1.980	0.0	1.000	1180376	5.39		87.8	
413.00 > 169.00	1.980	1.980	0.0	1.000	670918		1.76(0.00-0.00)	562	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.223	2.140	0.083	1.000	2626980	10.4		1151	M
499.00 > 99.00	2.223	2.140	0.083	1.000	641268		4.10(0.00-0.00)	512	M
* 7 13C4 PFOS									
503.00 > 80.00	2.223	2.220	0.003		6496935	28.7		7906	
9 Perfluorononanoic acid									
463.00 > 419.00	2.231	2.229	0.002	1.000	908738	5.63		219	
$ 10 13C2 PFDA									
515.00 > 470.00	2.382	2.384	-0.002	1.000	1536073	10.0		2442	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00016 Amount Added: 1.00 Units: mL

Report Date: 30-Jan-2017 11:47:41 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_005.d

Injection Date: 26-Jan-2017 11:07:28 Instrument ID: A8_N

Lims ID: IC L2

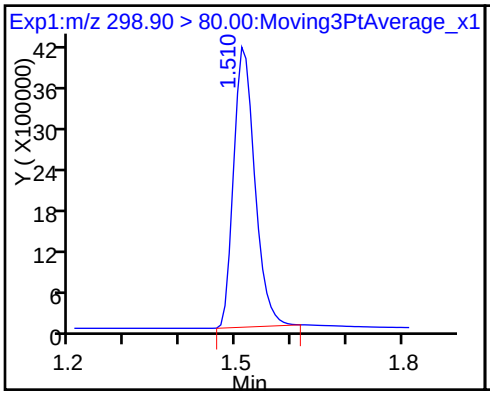
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 2 Worklist Smp#: 5

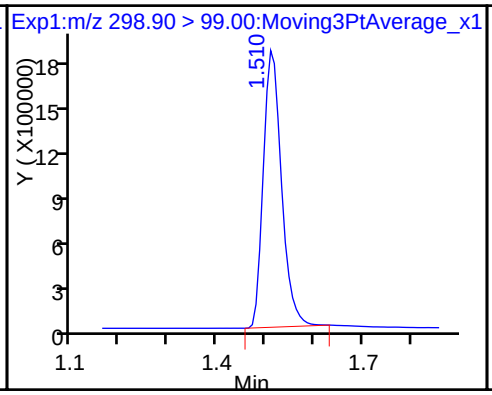
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

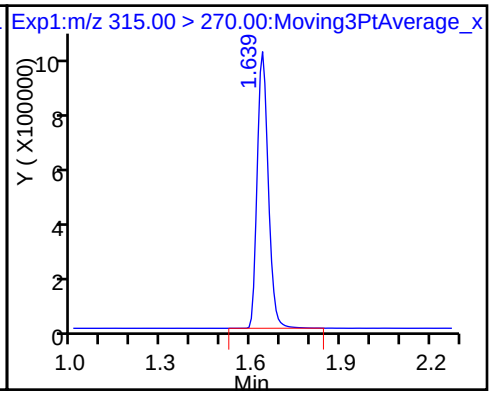
1 Perfluorobutanesulfonic acid



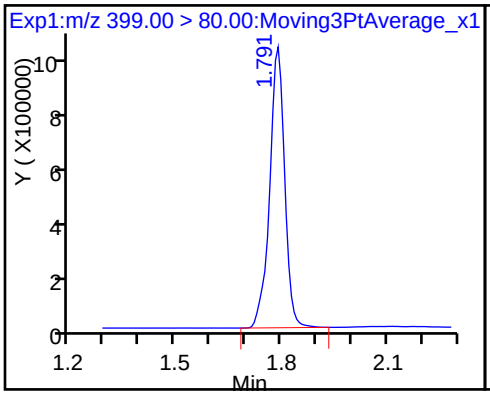
1 Perfluorobutanesulfonic acid



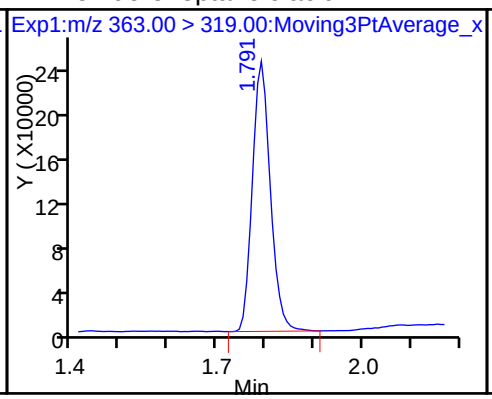
$ 2 13C2 PFHxA



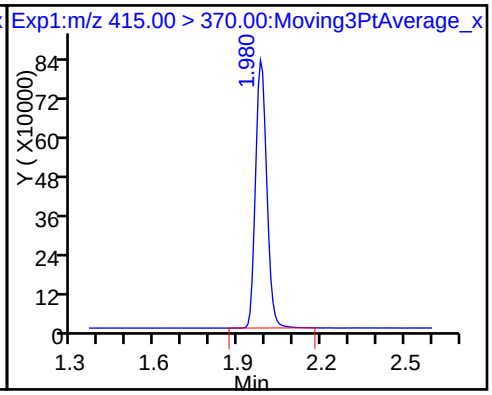
3 Perfluorohexanesulfonic acid



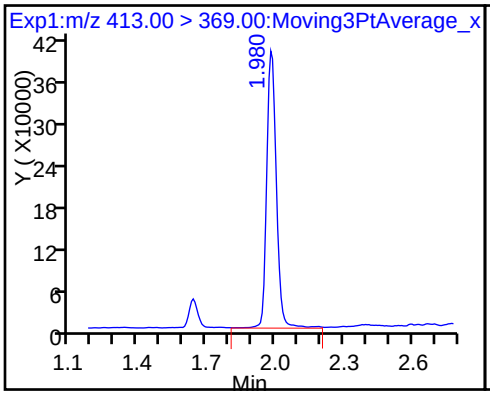
4 Perfluoroheptanoic acid



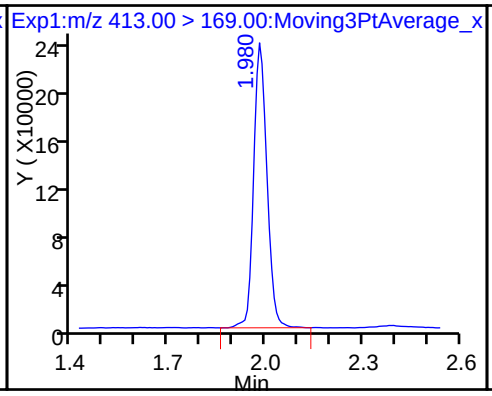
* 6 13C2-PFOA



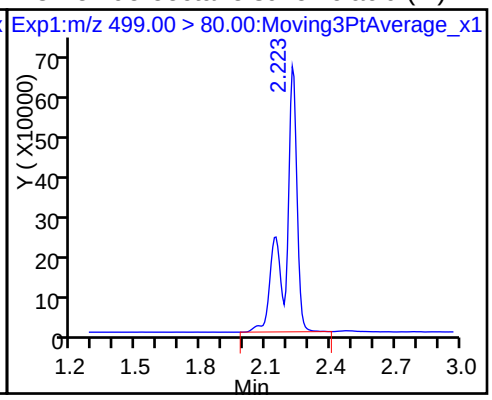
5 Perfluorooctanoic acid



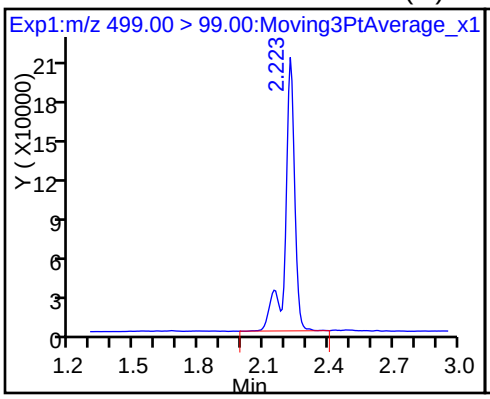
5 Perfluorooctanoic acid



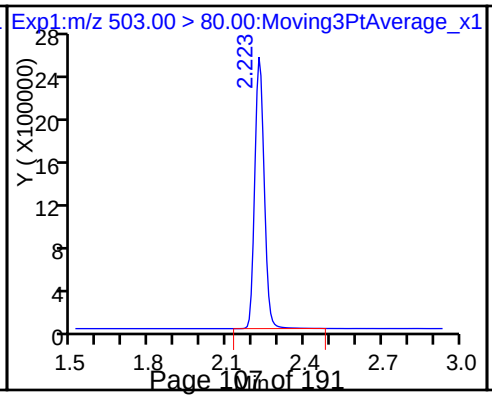
8 Perfluorooctane sulfonic acid (M)



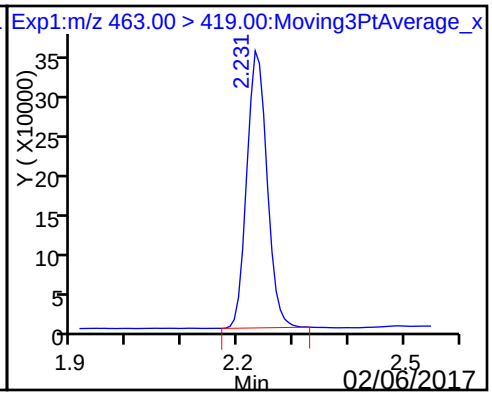
8 Perfluorooctane sulfonic acid (M)



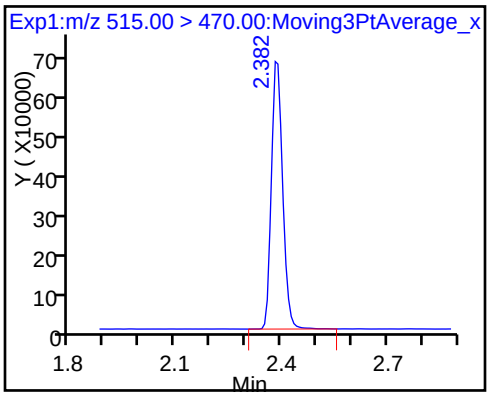
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.382
Y (X10000)
70
60
50
40
30
20
10
0
1.8
2.1
2.4
2.7
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

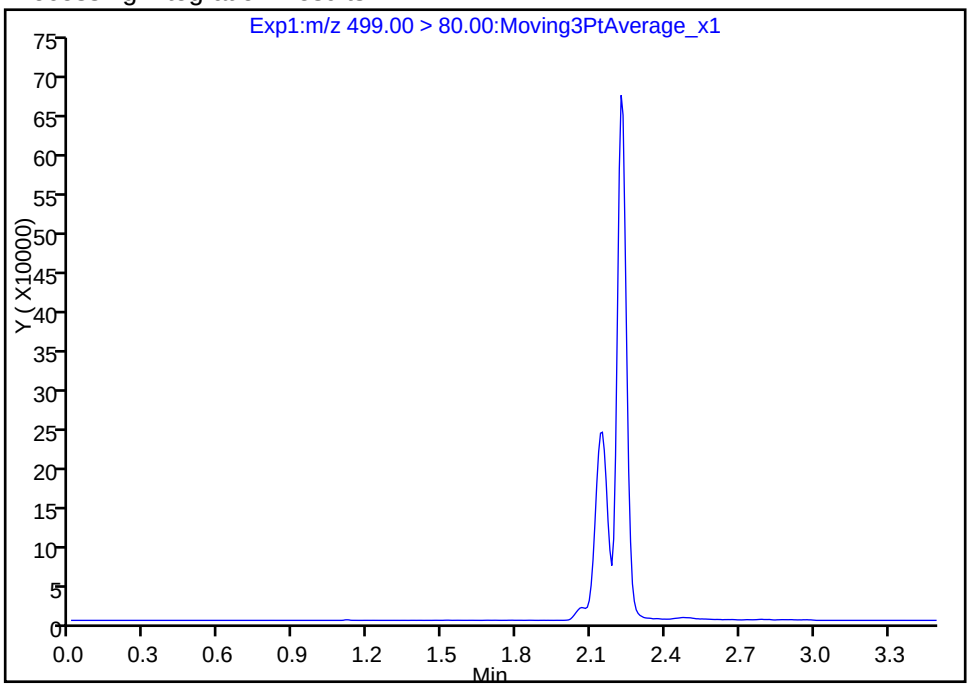
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_005.d
Injection Date: 26-Jan-2017 11:07:28 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

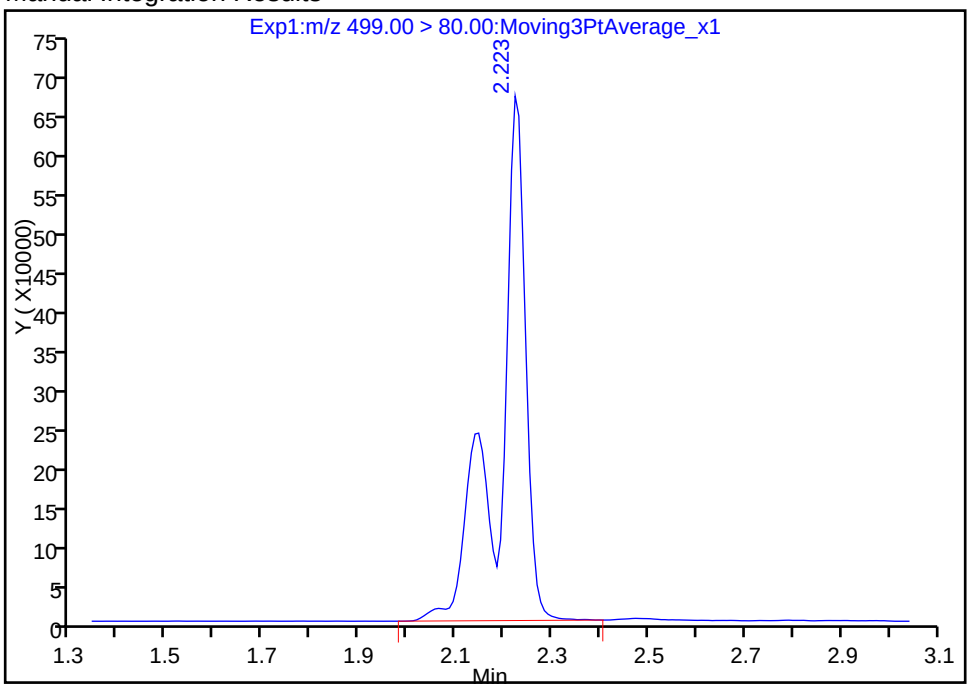
Not Detected
Expected RT: 2.14

Processing Integration Results



Manual Integration Results

RT: 2.22
Area: 2626980
Amount: 10.387175
Amount Units: ng/ml



Reviewer: chandrasenas, 26-Jan-2017 12:10:13
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

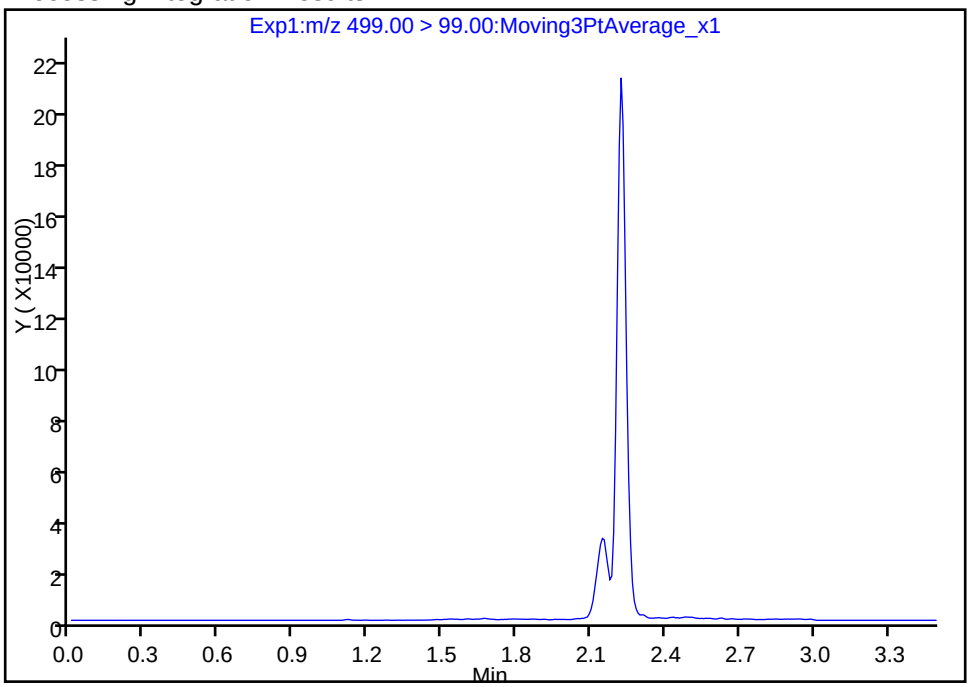
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_005.d
Injection Date: 26-Jan-2017 11:07:28 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

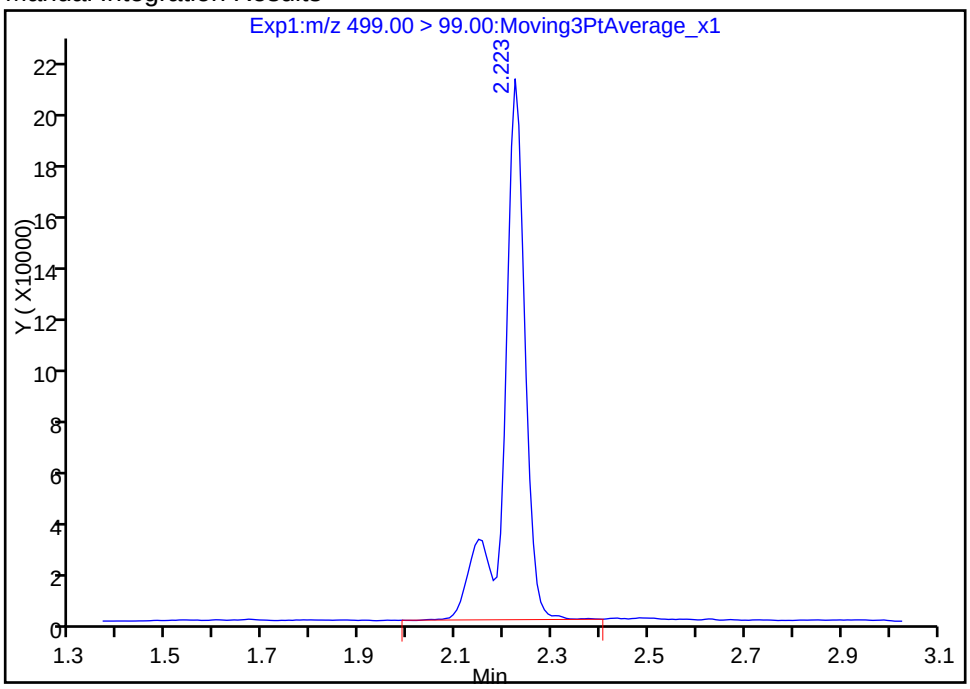
Not Detected
Expected RT: 2.14

Processing Integration Results



Manual Integration Results

RT: 2.22
Area: 641268
Amount: 10.387175
Amount Units: ng/ml



Reviewer: chandrasenas, 26-Jan-2017 12:10:13
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_006.d
Lims ID: IC L3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 26-Jan-2017 11:11:53 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L3_537
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 30-Jan-2017 11:47:42 Calib Date: 26-Jan-2017 11:25:03
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: chandrasenas Date: 26-Jan-2017 12:10:41

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.510	1.510	0.0	1.000	20307189	50.1		1251	
298.90 > 99.00	1.510	1.510	0.0	1.000	9133177		2.22(0.00-0.00)	1402	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.639	1.638	0.001	1.000	2663857	9.80		5739	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.783	1.787	-0.004	1.000	6180212	15.6		1126	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.791	1.788	0.003	1.000	1202991	4.95		163	
* 6 13C2-PFOA									
415.00 > 370.00	1.980	1.979	0.001		2520070	10.0		5579	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.980	1.980	0.0	1.000	2118361	9.09		164	
413.00 > 169.00	1.980	1.980	0.0	1.000	1215745		1.74(0.00-0.00)	978	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.223	2.140	0.083	1.000	5250567	20.0		1734	M
499.00 > 99.00	2.223	2.140	0.083	1.000	1270578		4.13(0.00-0.00)	868	M
* 7 13C4 PFOS									
503.00 > 80.00	2.223	2.220	0.003		6741021	28.7		5703	
9 Perfluorononanoic acid									
463.00 > 419.00	2.231	2.229	0.002	1.000	1746263	10.2		386	
$ 10 13C2 PFDA									
515.00 > 470.00	2.382	2.384	-0.002	1.000	1585927	9.75		2596	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00019 Amount Added: 1.00 Units: mL

Report Date: 30-Jan-2017 11:47:43 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_006.d

Injection Date: 26-Jan-2017 11:11:53 Instrument ID: A8_N

Lims ID: IC L3

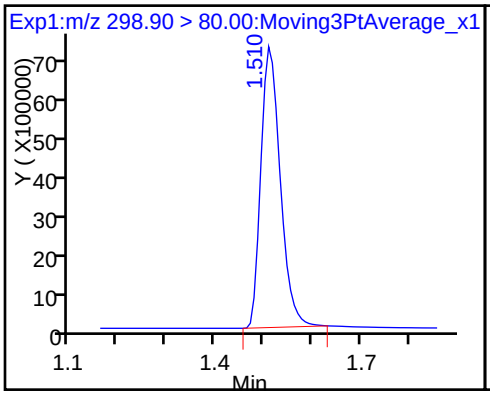
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 3 Worklist Smp#: 6

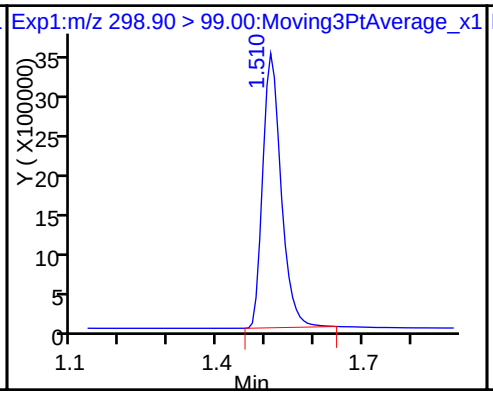
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

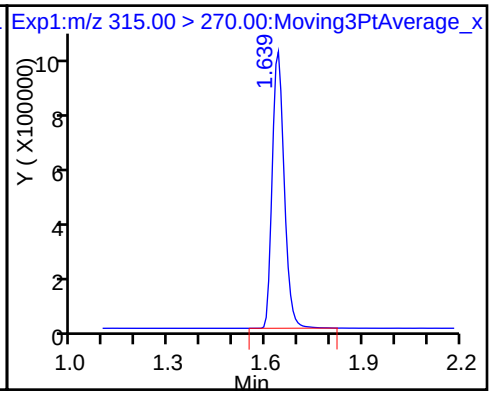
1 Perfluorobutanesulfonic acid



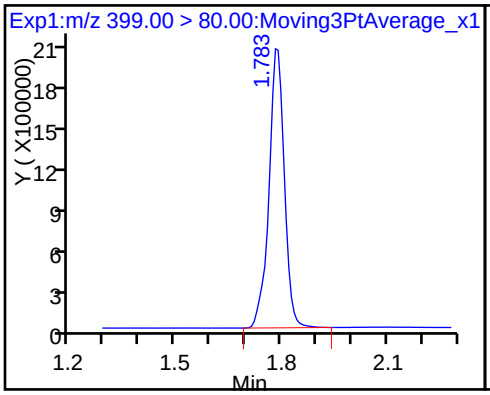
1 Perfluorobutanesulfonic acid



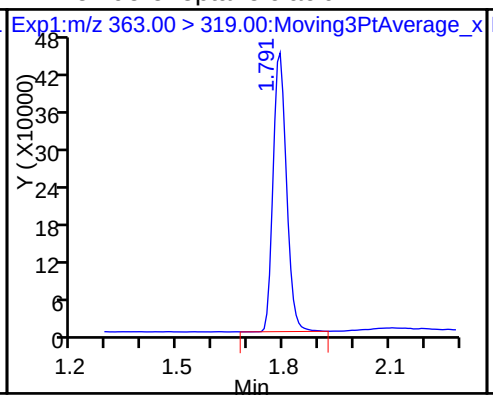
$ 2 13C2 PFHxA



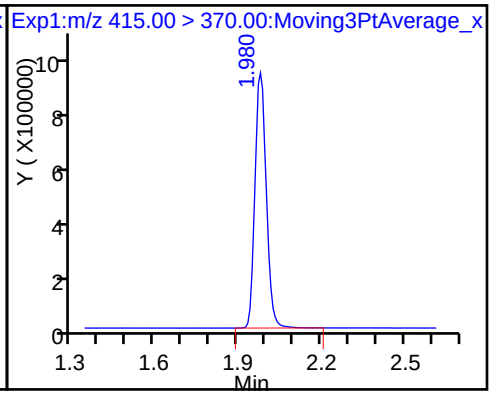
3 Perfluorohexanesulfonic acid



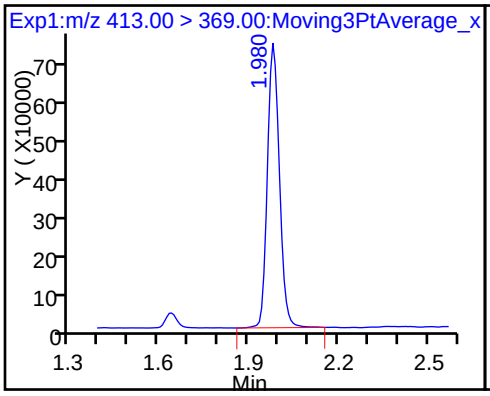
4 Perfluoroheptanoic acid



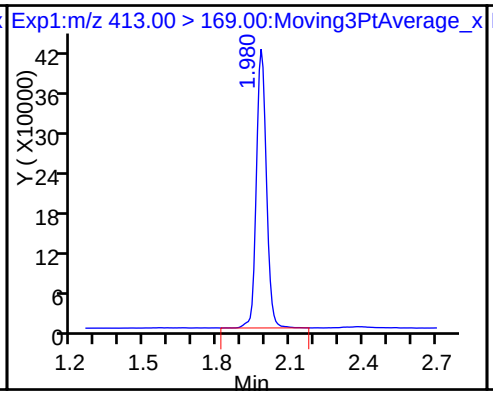
* 6 13C2-PFOA



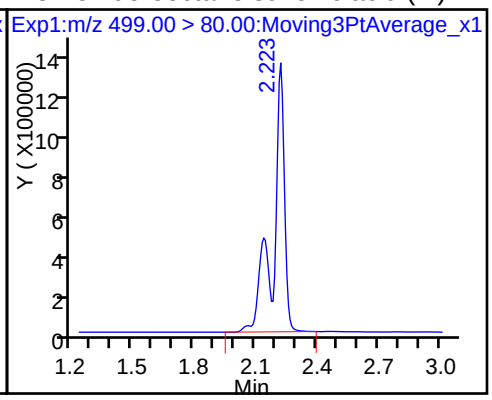
5 Perfluorooctanoic acid



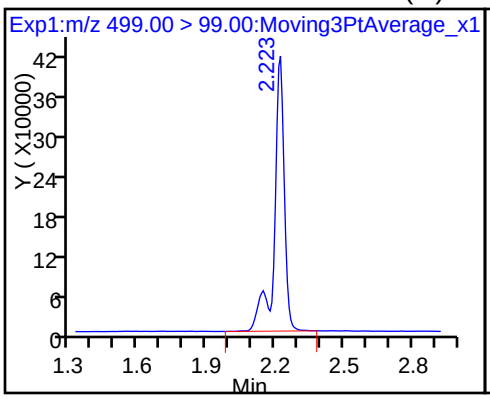
5 Perfluorooctanoic acid



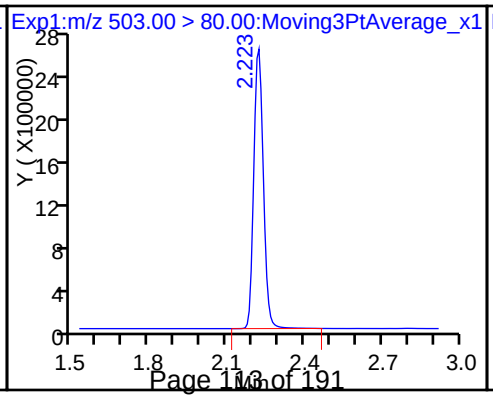
8 Perfluorooctane sulfonic acid (M)



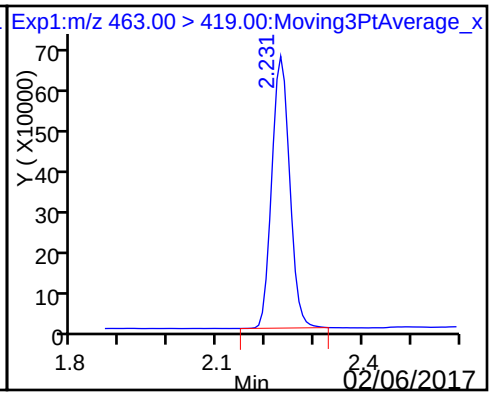
8 Perfluorooctane sulfonic acid (M)



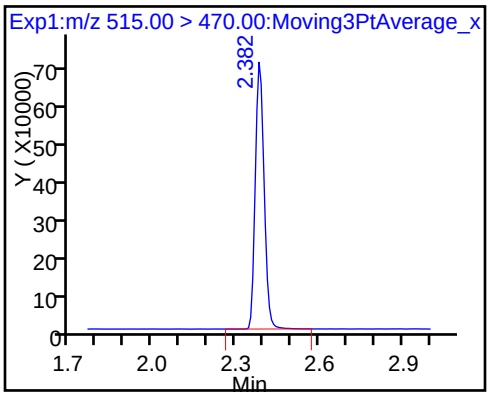
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.382
Y (X10000)
70
60
50
40
30
20
10
0
1.7
2.0
2.3
2.6
2.9
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

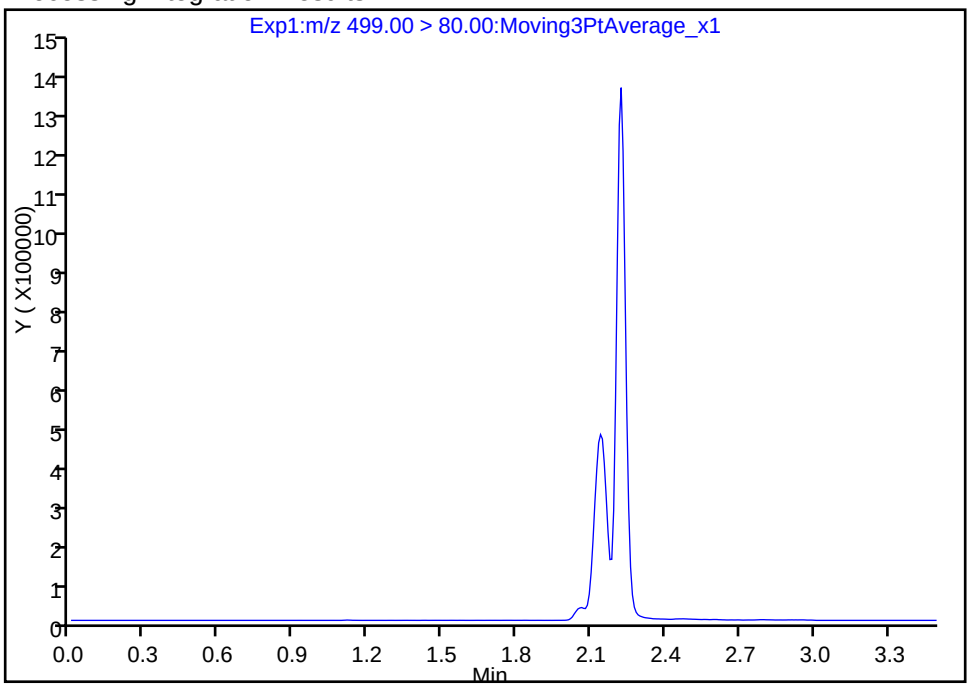
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_006.d
Injection Date: 26-Jan-2017 11:11:53 Instrument ID: A8_N
Lims ID: IC L3
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

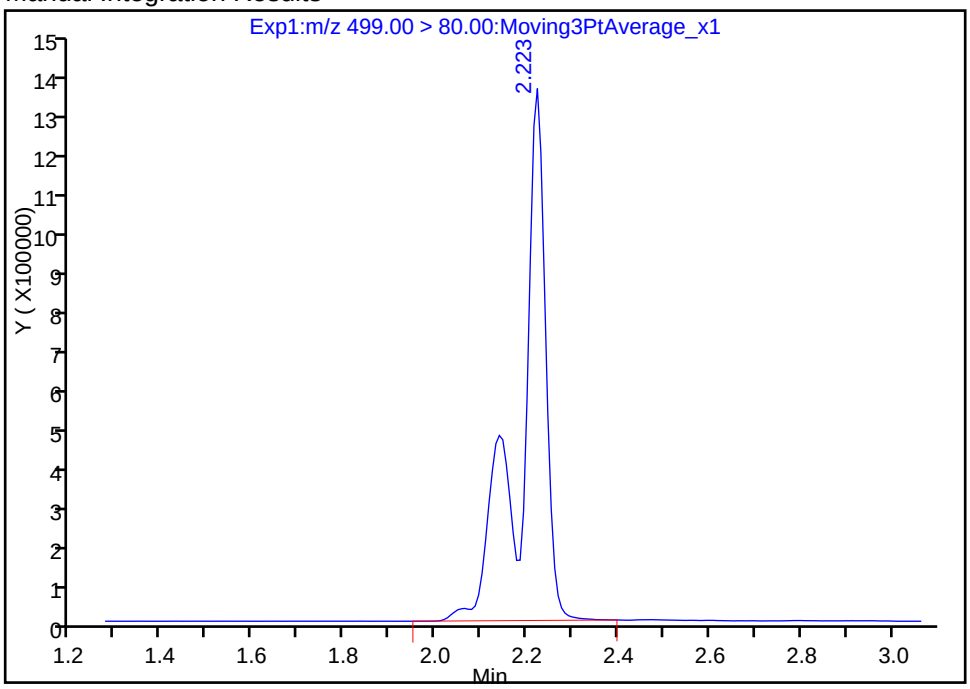
Not Detected
Expected RT: 2.14

Processing Integration Results



Manual Integration Results

RT: 2.22
Area: 5250567
Amount: 20.009200
Amount Units: ng/ml



Reviewer: chandrasenas, 26-Jan-2017 12:10:41
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

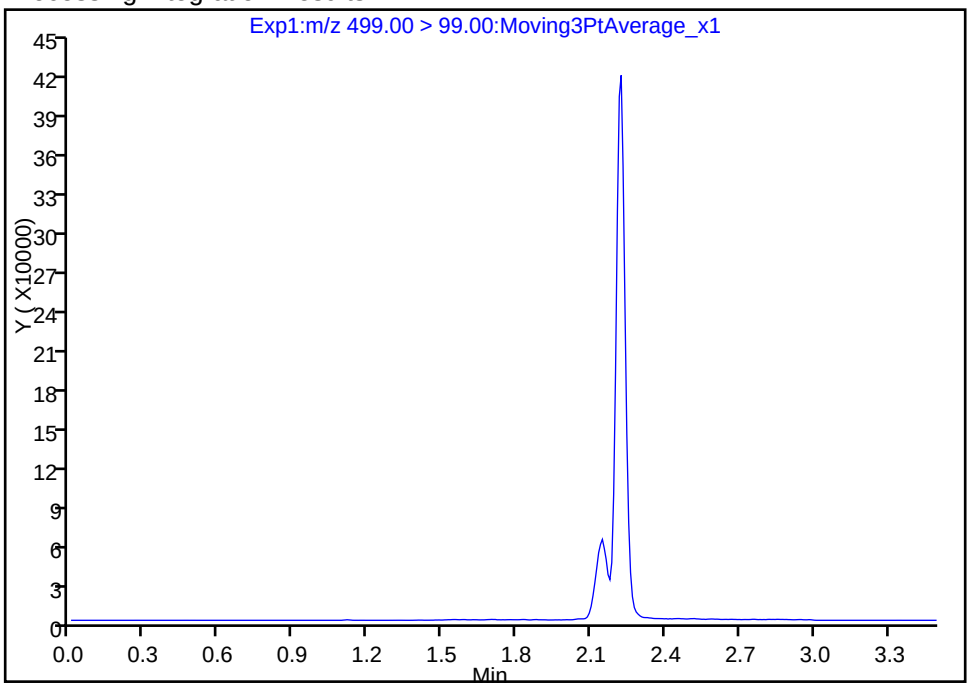
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_006.d
Injection Date: 26-Jan-2017 11:11:53 Instrument ID: A8_N
Lims ID: IC L3
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

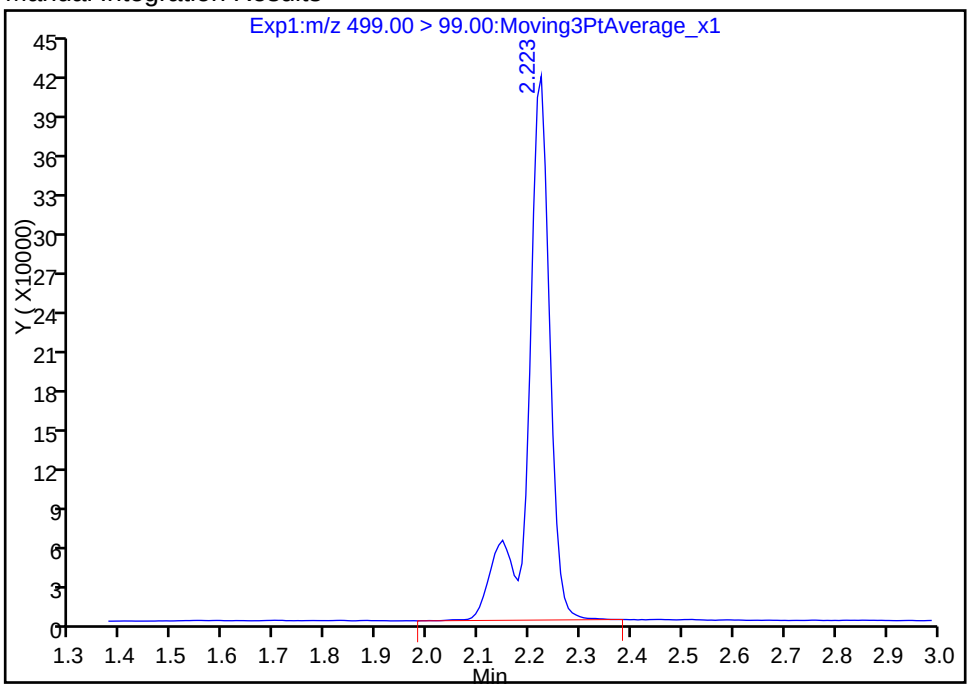
Processing Integration Results

Not Detected
Expected RT: 2.14



Manual Integration Results

RT: 2.22
Area: 1270578
Amount: 20.009200
Amount Units: ng/ml



Reviewer: chandrasenas, 26-Jan-2017 12:10:41
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_007.d
Lims ID: IC L4
Client ID:
Sample Type: ICISAV Calib Level: 4
Inject. Date: 26-Jan-2017 11:16:16 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L4_537
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 30-Jan-2017 11:47:44 Calib Date: 26-Jan-2017 11:25:03
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: chandrasenas Date: 26-Jan-2017 12:08:59

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.510	1.510	0.0	1.000	40111981	87.1		1617	
298.90 > 99.00	1.510	1.510	0.0	1.000	20577220		1.95(0.00-0.00)	2167	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.639	1.638	0.001	1.000	3479578	10.5		6594	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.791	1.787	0.004	1.000	15346095	31.5		2118	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.791	1.788	0.003	1.000	3062534	10.3		405	
* 6 13C2-PFOA									
415.00 > 370.00	1.980	1.979	0.001		3076249	10.0		5651	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.980	1.980	0.0	1.000	5838940	20.5		395	
413.00 > 169.00	1.980	1.980	0.0	1.000	3484590		1.68(0.00-0.00)	2208	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.223	2.140	0.083	1.000	13442641	41.6		2970	M
499.00 > 99.00	2.223	2.140	0.083	1.000	3300271		4.07(0.00-0.00)	2000	M
* 7 13C4 PFOS									
503.00 > 80.00	2.223	2.220	0.003		8308914	28.7		8294	
9 Perfluorononanoic acid									
463.00 > 419.00	2.231	2.229	0.002	1.000	4439886	21.2		932	
$ 10 13C2 PFDA									
515.00 > 470.00	2.382	2.384	-0.002	1.000	2033318	10.2		3084	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L4_00017 Amount Added: 1.00 Units: mL

Report Date: 30-Jan-2017 11:47:44 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_007.d

Injection Date: 26-Jan-2017 11:16:16 Instrument ID: A8_N

Lims ID: IC L4

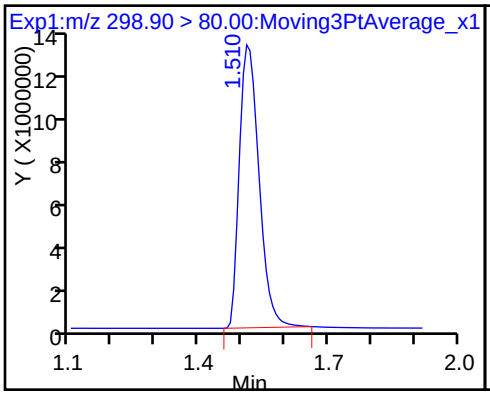
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 4 Worklist Smp#: 7

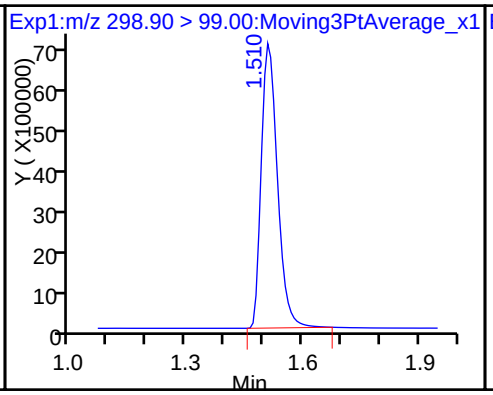
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

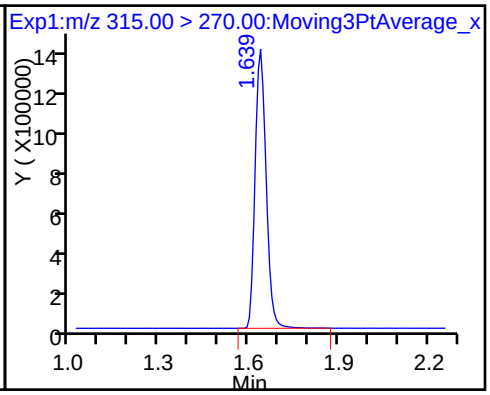
1 Perfluorobutanesulfonic acid



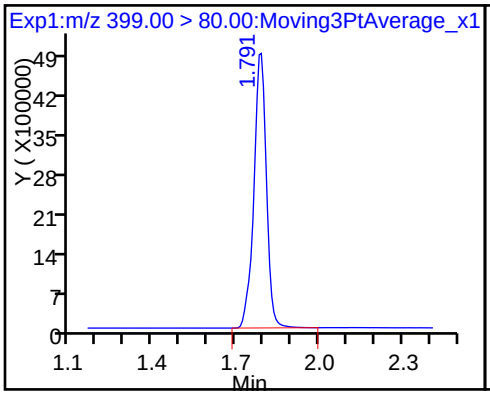
1 Perfluorobutanesulfonic acid



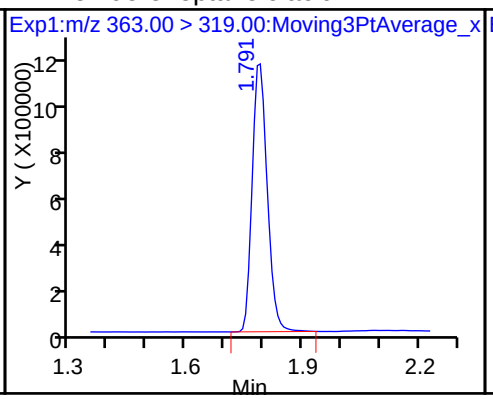
$ 2 13C2 PFHxA



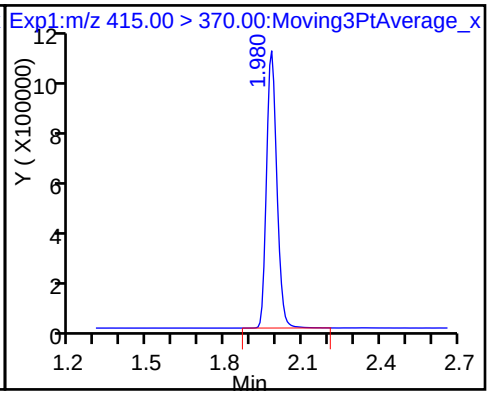
3 Perfluorohexanesulfonic acid



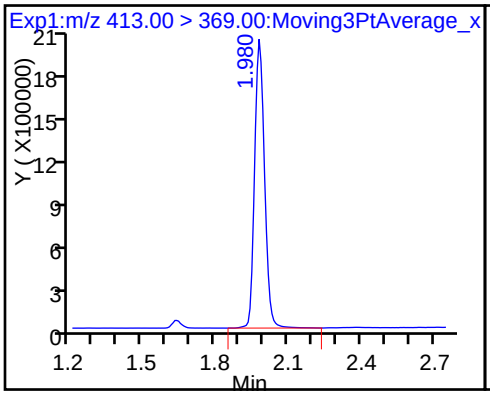
4 Perfluoroheptanoic acid



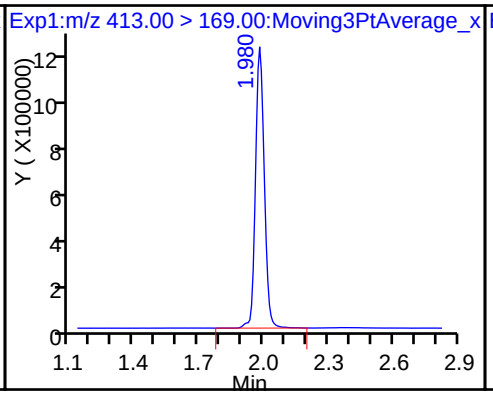
* 6 13C2-PFOA



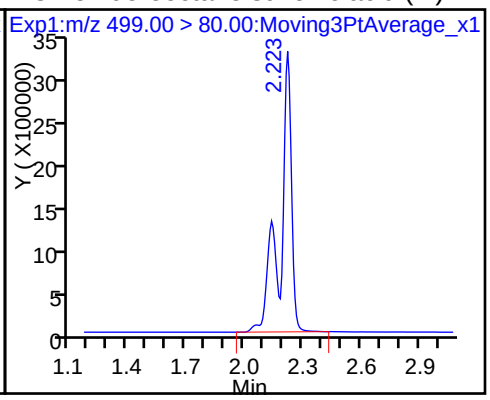
5 Perfluorooctanoic acid



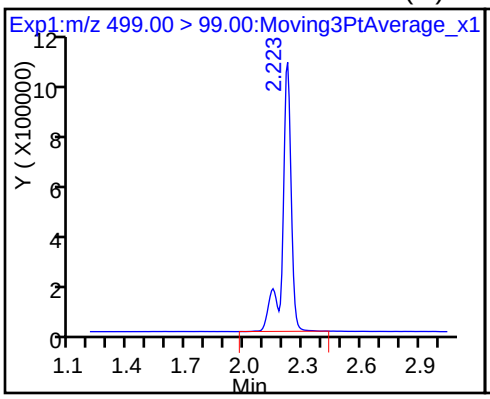
5 Perfluorooctanoic acid



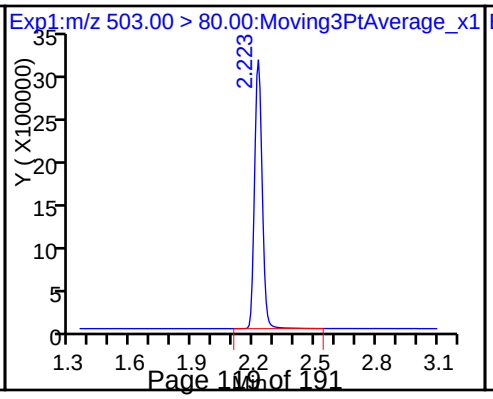
8 Perfluorooctane sulfonic acid (M)



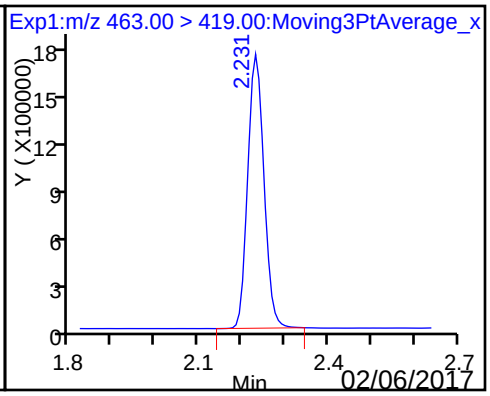
8 Perfluorooctane sulfonic acid (M)



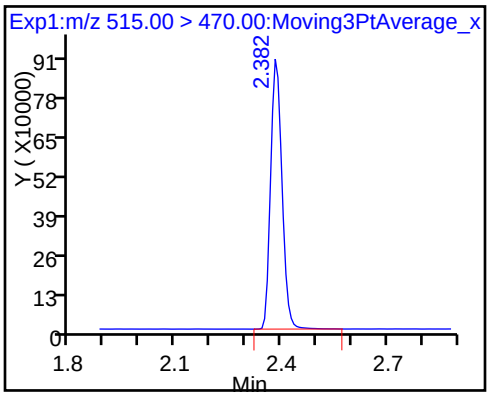
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.382
Y (X10000)
91
78
65
52
39
26
13
0
1.8
2.1
2.4
2.7
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

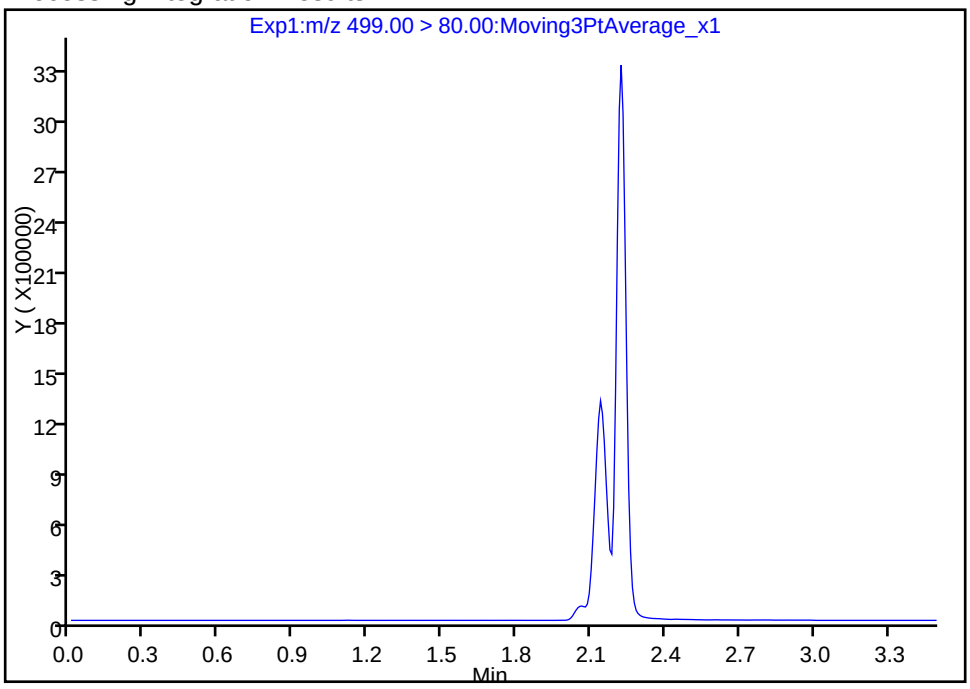
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_007.d
Injection Date: 26-Jan-2017 11:16:16 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

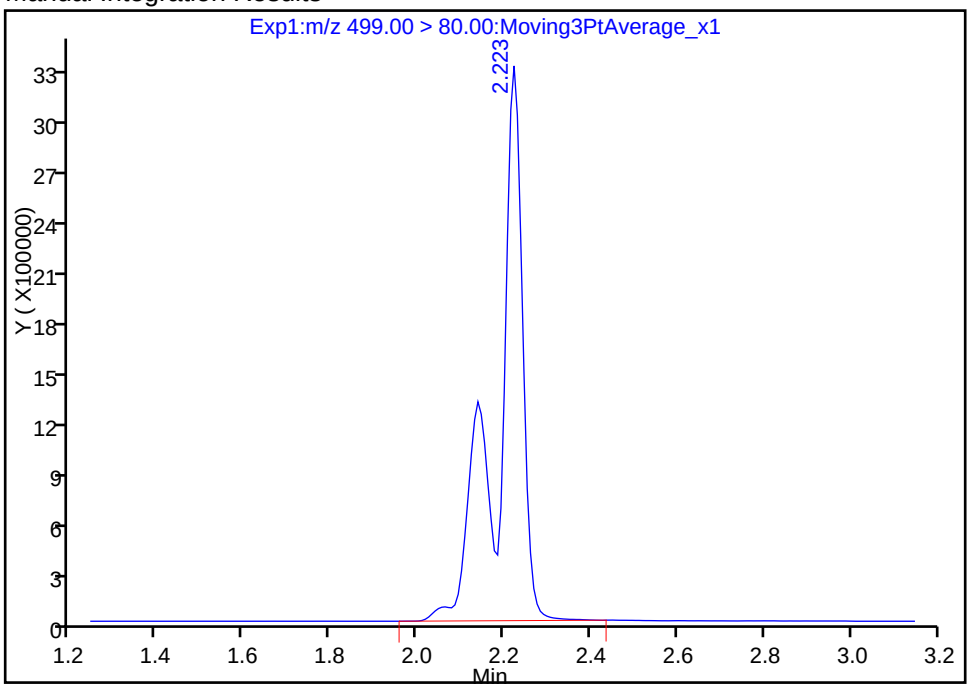
Not Detected
Expected RT: 2.14

Processing Integration Results



Manual Integration Results

RT: 2.22
Area: 13442641
Amount: 41.561339
Amount Units: ng/ml



Reviewer: chandrasenas, 26-Jan-2017 12:08:59
Audit Action: Assigned Compound ID Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

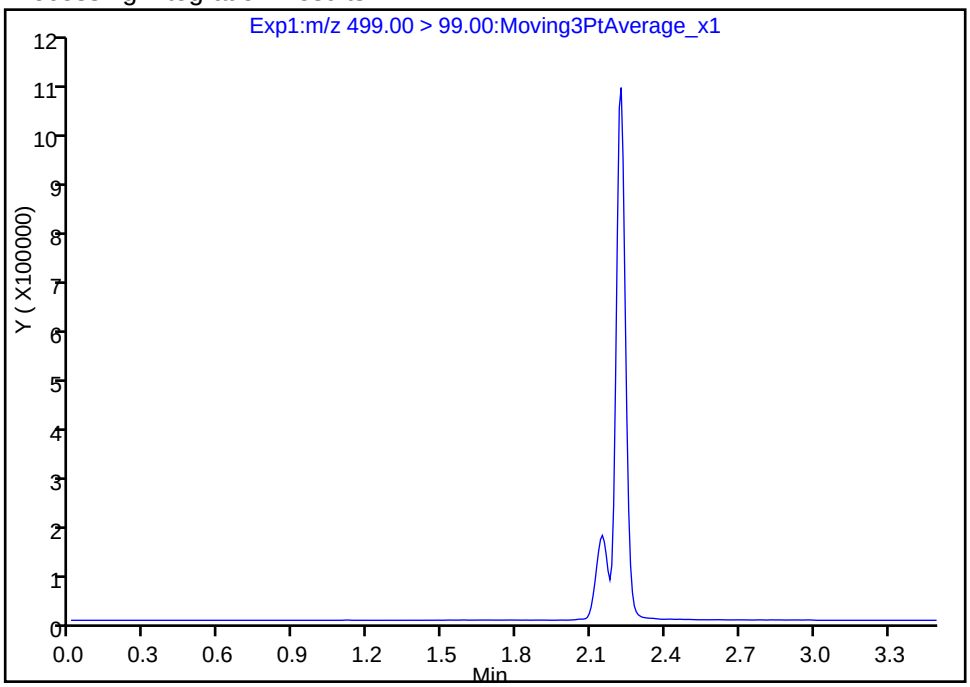
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_007.d
Injection Date: 26-Jan-2017 11:16:16 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

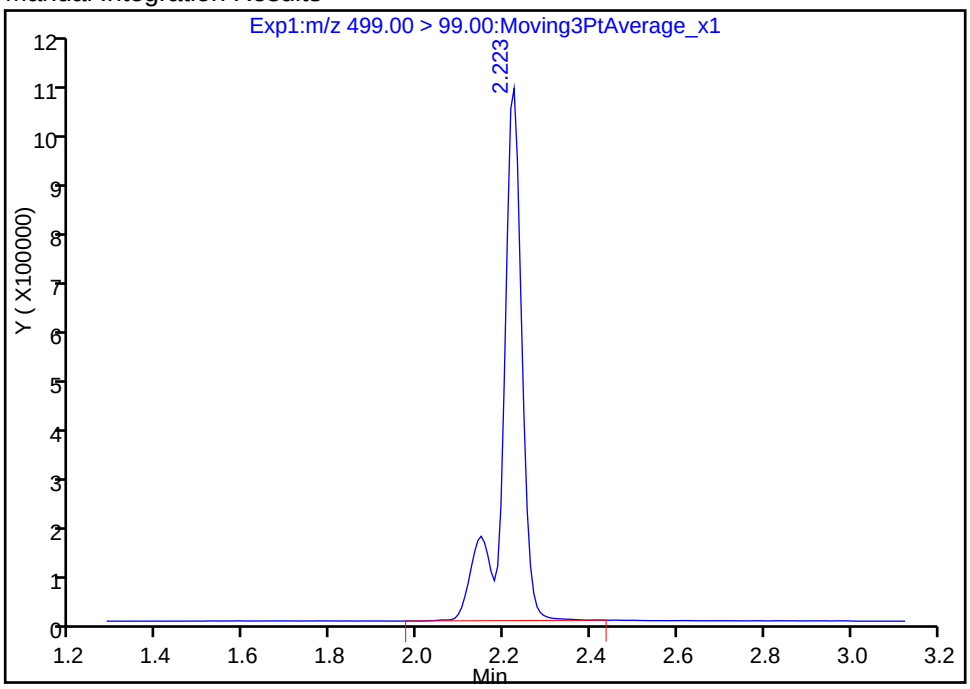
Not Detected
Expected RT: 2.14

Processing Integration Results



Manual Integration Results

RT: 2.22
Area: 3300271
Amount: 41.561339
Amount Units: ng/ml



Reviewer: chandrasenas, 26-Jan-2017 12:08:59
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

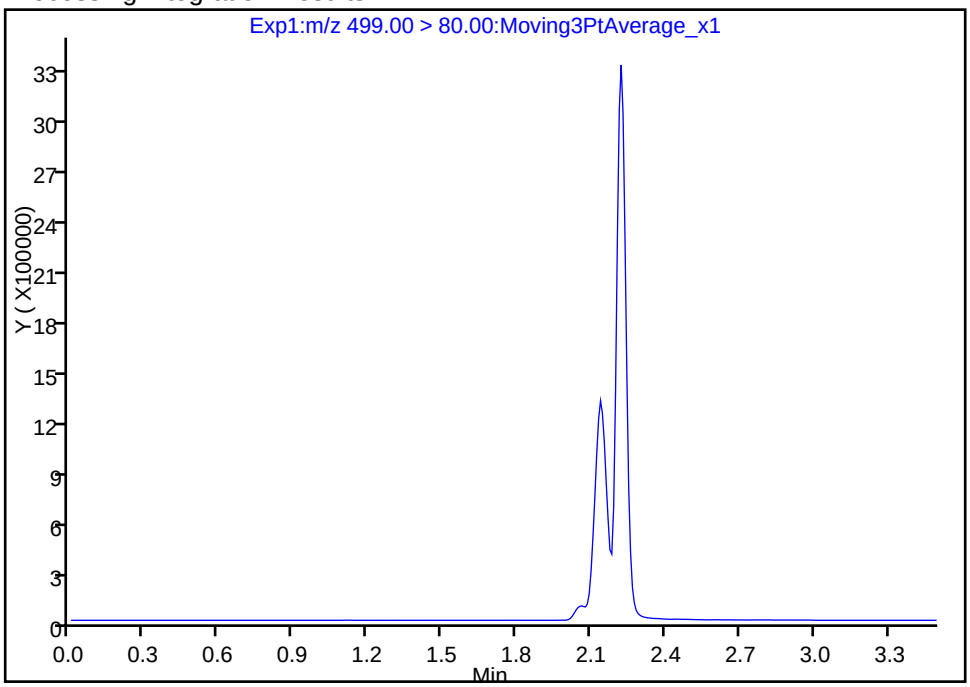
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_007.d
Injection Date: 26-Jan-2017 11:16:16 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

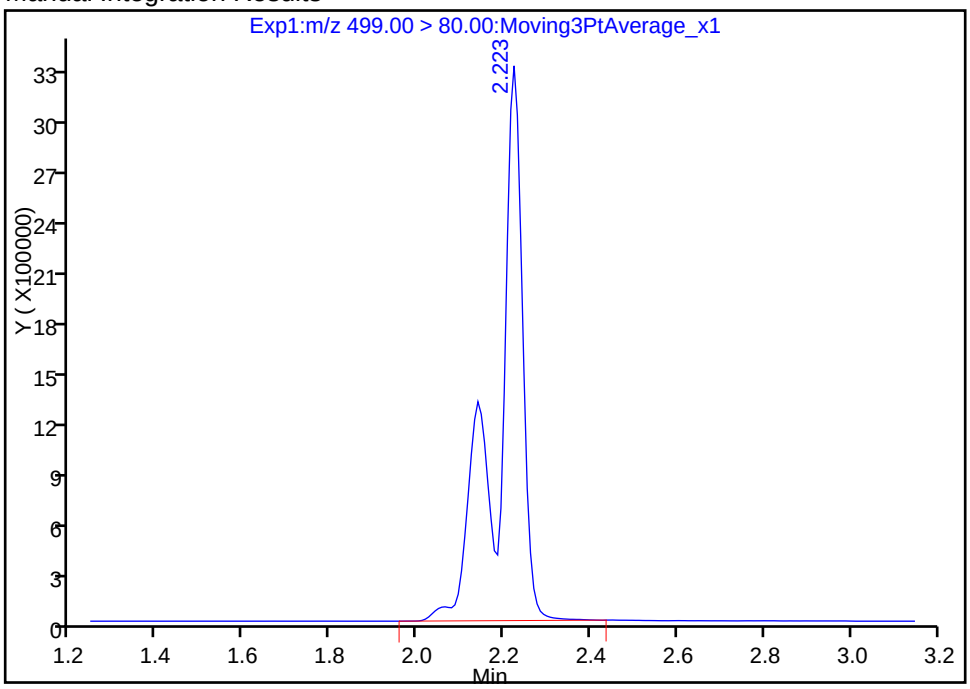
Not Detected
Expected RT: 2.14

Processing Integration Results



Manual Integration Results

RT: 2.22
Area: 13442641
Amount: 41.561339
Amount Units: ng/ml



Reviewer: chandrasenas, 26-Jan-2017 12:08:59
Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_008.d
Lims ID: IC L5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 26-Jan-2017 11:20:39 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L5_537
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 30-Jan-2017 11:47:45 Calib Date: 26-Jan-2017 11:25:03
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: chandrasenas Date: 26-Jan-2017 12:11:18

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.510	1.510	0.0	1.000	43425035	128.5		1570	
298.90 > 99.00	1.510	1.510	0.0	1.000	22582383		1.92(0.00-0.00)	2218	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.631	1.638	-0.007	1.000	2710579	10.1		6365	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.783	1.787	-0.004	1.000	16980909	43.0		2291	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.783	1.788	-0.005	1.000	3366172	14.0		430	
* 6 13C2-PFOA									
415.00 > 370.00	1.973	1.979	-0.006		2486274	10.0		5087	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.973	1.980	-0.007	1.000	6096769	26.5		406	
413.00 > 169.00	1.973	1.980	-0.007	1.000	3583679		1.70(0.00-0.00)	2082	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.215	2.140	0.075	1.000	15146387	57.9		3248	M
499.00 > 99.00	2.215	2.140	0.075	1.000	3738939		4.05(0.00-0.00)	2370	M
* 7 13C4 PFOS									
503.00 > 80.00	2.215	2.220	-0.005		6724206	28.7		7121	
9 Perfluorononanoic acid									
463.00 > 419.00	2.223	2.229	-0.006	1.000	4708932	27.8		956	
$ 10 13C2 PFDA									
515.00 > 470.00	2.382	2.384	-0.002	1.000	1632201	10.2		2499	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L5_00020 Amount Added: 1.00 Units: mL

Report Date: 30-Jan-2017 11:47:45 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_008.d

Injection Date: 26-Jan-2017 11:20:39 Instrument ID: A8_N

Lims ID: IC L5

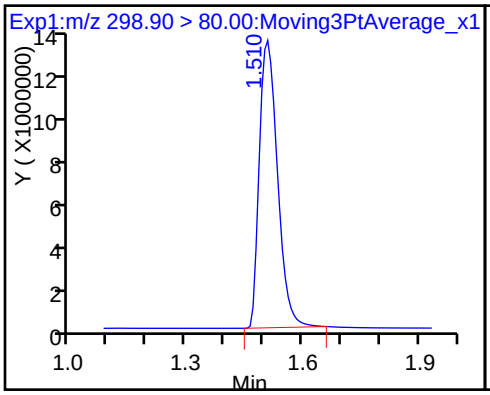
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 5 Worklist Smp#: 8

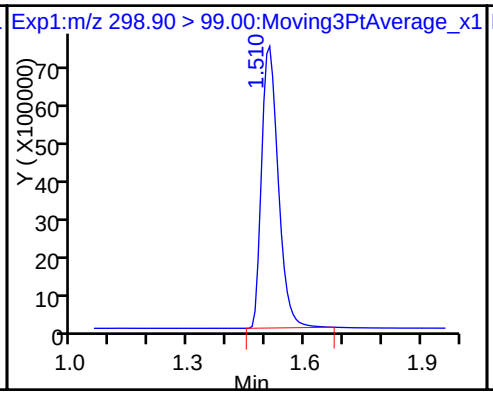
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

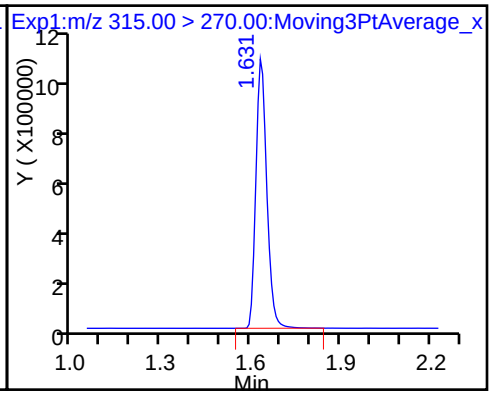
1 Perfluorobutanesulfonic acid



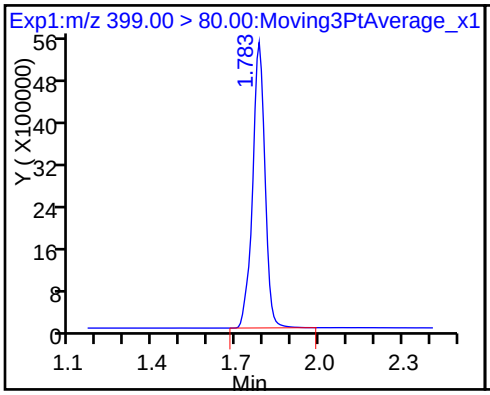
1 Perfluorobutanesulfonic acid



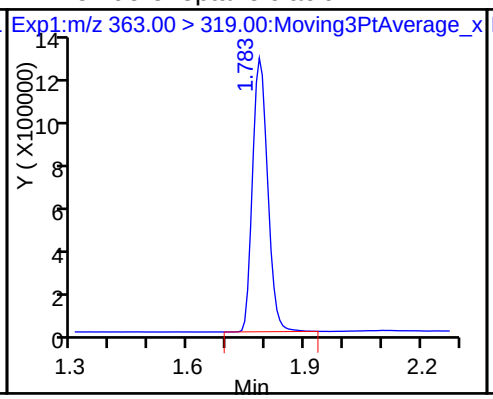
$ 2 13C2 PFHxA



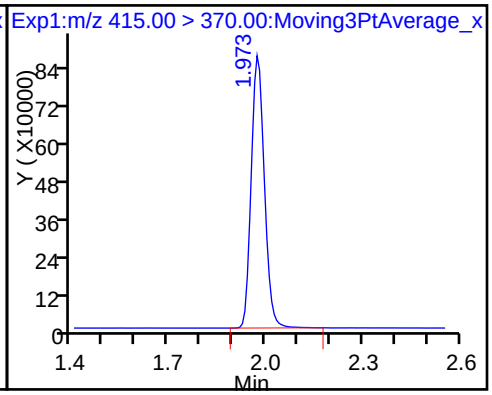
3 Perfluorohexanesulfonic acid



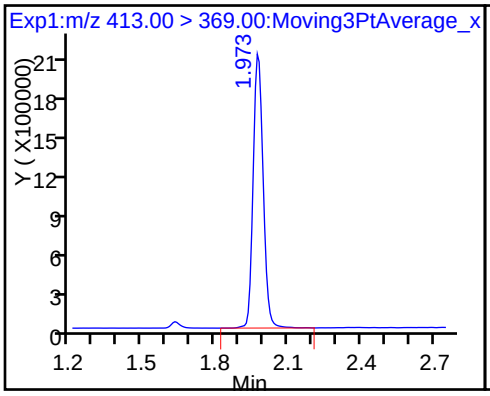
4 Perfluoroheptanoic acid



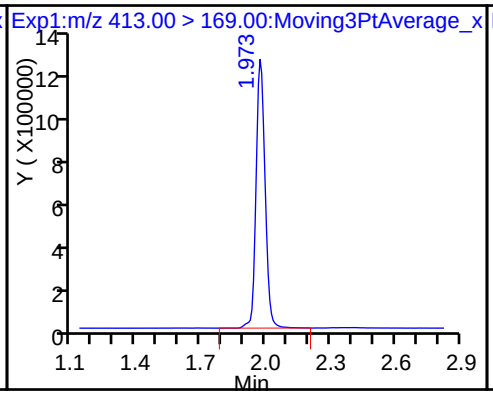
* 6 13C2-PFOA



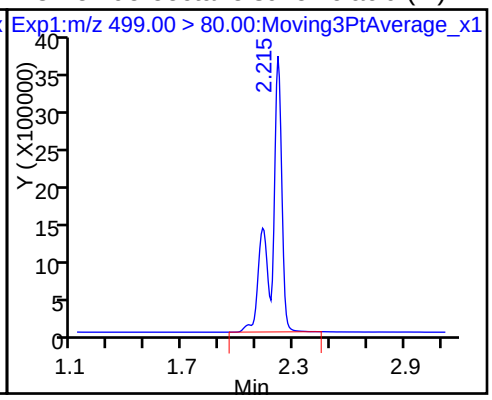
5 Perfluorooctanoic acid



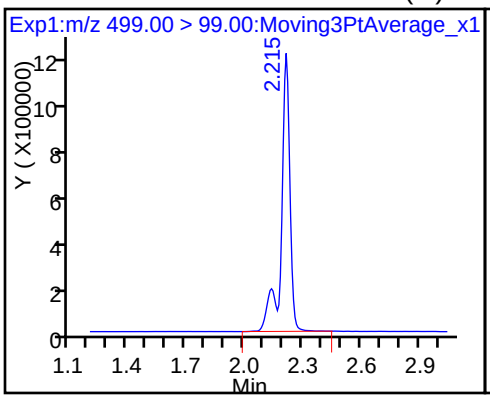
5 Perfluorooctanoic acid



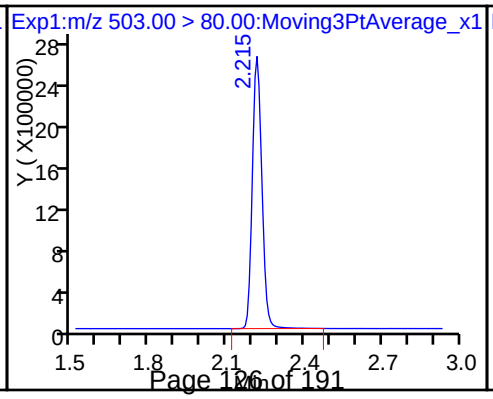
8 Perfluorooctane sulfonic acid (M)



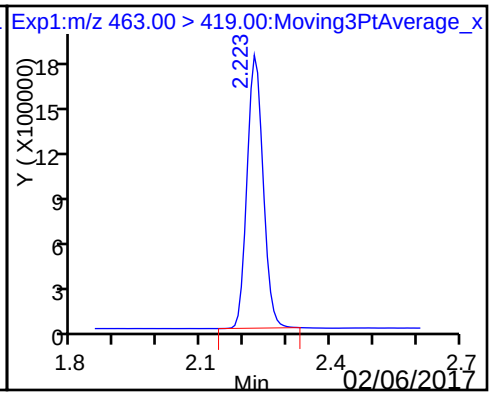
8 Perfluorooctane sulfonic acid (M)



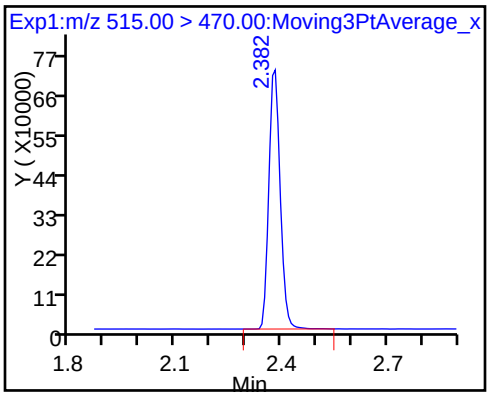
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.382
Y (X10000)
77
66
55
44
33
22
11
0
1.8
2.1
2.4
2.7
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

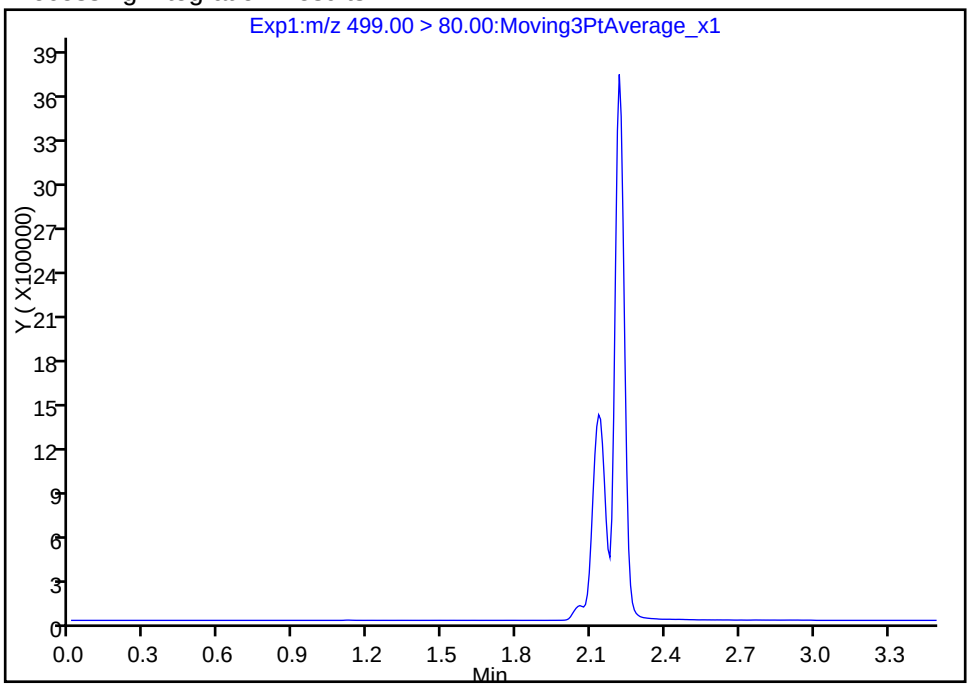
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_008.d
Injection Date: 26-Jan-2017 11:20:39 Instrument ID: A8_N
Lims ID: IC L5
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

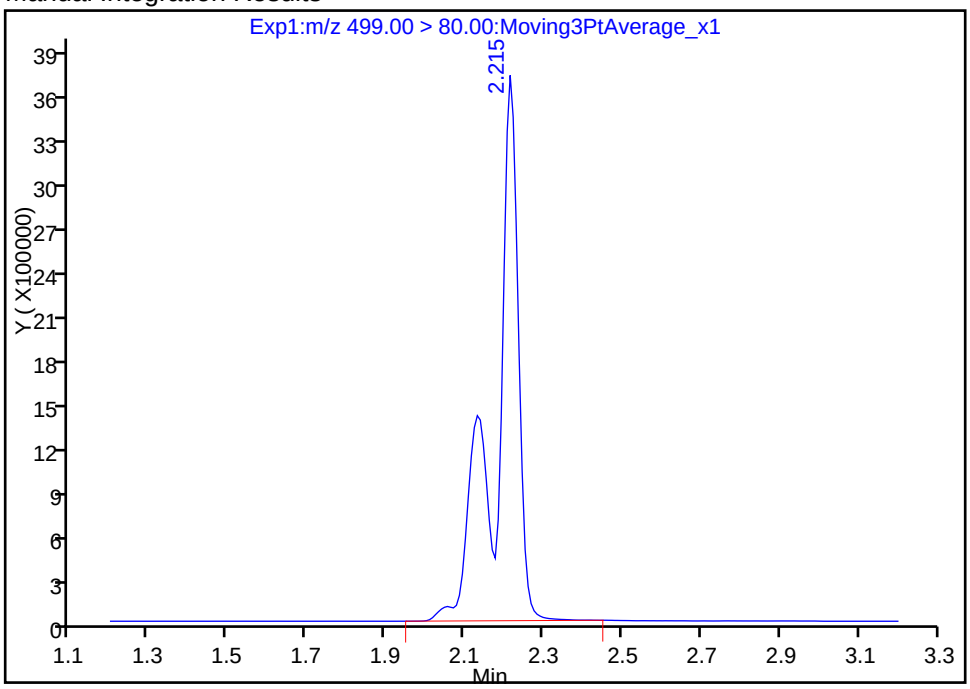
Not Detected
Expected RT: 2.14

Processing Integration Results



Manual Integration Results

RT: 2.22
Area: 15146387
Amount: 57.865170
Amount Units: ng/ml



Reviewer: chandrasenas, 26-Jan-2017 12:11:18
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

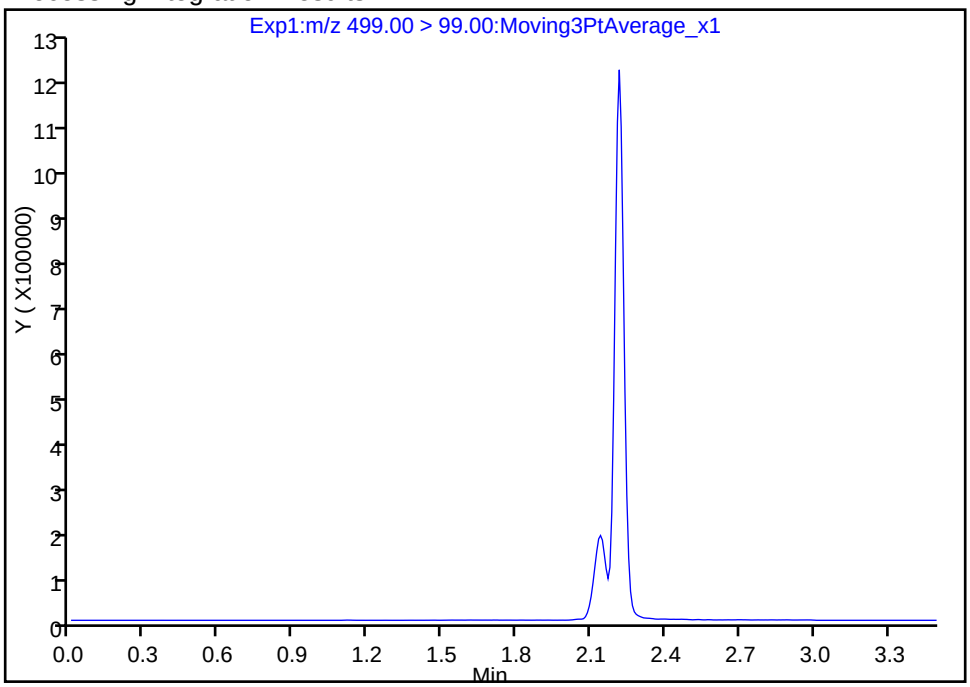
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_008.d
Injection Date: 26-Jan-2017 11:20:39 Instrument ID: A8_N
Lims ID: IC L5
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

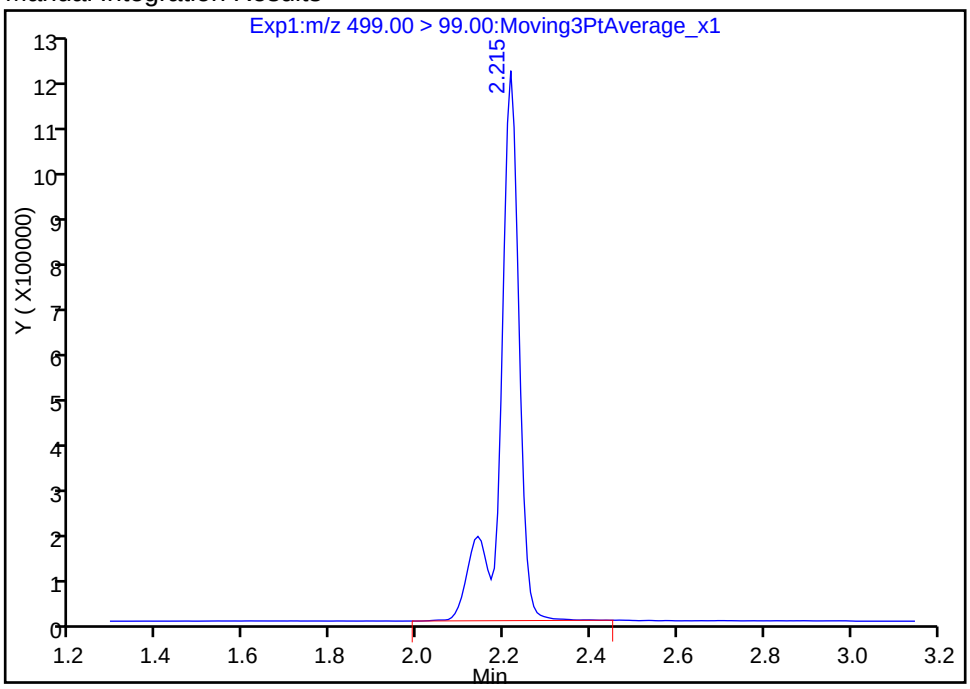
Not Detected
Expected RT: 2.14

Processing Integration Results



Manual Integration Results

RT: 2.22
Area: 3738939
Amount: 57.865170
Amount Units: ng/ml



Reviewer: chandrasenas, 26-Jan-2017 12:11:18
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d
Lims ID: IC L6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 26-Jan-2017 11:25:03 ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L6_537
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 30-Jan-2017 11:47:46 Calib Date: 26-Jan-2017 11:25:03
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: chandrasenas Date: 26-Jan-2017 12:11:59

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.510	1.510	0.0	1.000	51739348	185.1		1516	
298.90 > 99.00	1.510	1.510	0.0	1.000	28204946		1.83(0.00-0.00)	2196	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.639	1.638	0.001	1.000	2652857	10.3		6185	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.783	1.787	-0.004	1.000	22216101	58.4		2524	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.783	1.788	-0.005	1.000	4381381	19.1		512	
* 6 13C2-PFOA									
415.00 > 370.00	1.980	1.979	0.001		2384986	10.0		5263	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.980	1.980	0.0	1.000	8951805	40.6		583	
413.00 > 169.00	1.980	1.980	0.0	1.000	5271680		1.70(0.00-0.00)	2903	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.215	2.140	0.075	1.000	20461190	81.2		3203	M
499.00 > 99.00	2.215	2.140	0.075	1.000	5166933		3.96(0.00-0.00)	2729	M
* 7 13C4 PFOS									
503.00 > 80.00	2.215	2.220	-0.005		6475201	28.7		7455	
9 Perfluorononanoic acid									
463.00 > 419.00	2.231	2.229	0.002	1.000	6784989	41.8		1253	
$ 10 13C2 PFDA									
515.00 > 470.00	2.382	2.384	-0.002	1.000	1617282	10.5		2359	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L6_00016 Amount Added: 1.00 Units: mL

Report Date: 30-Jan-2017 11:47:46 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d

Injection Date: 26-Jan-2017 11:25:03 Instrument ID: A8_N

Lims ID: IC L6

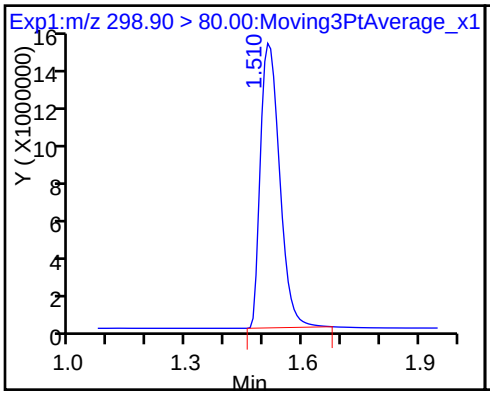
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 6 Worklist Smp#: 9

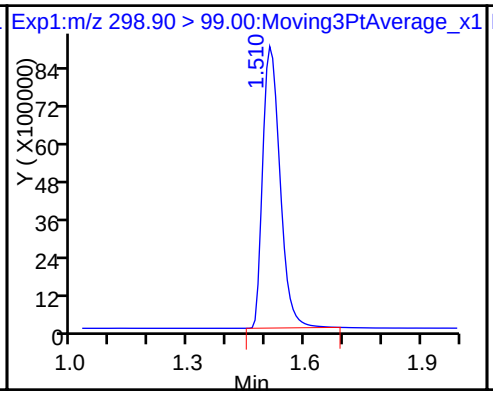
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

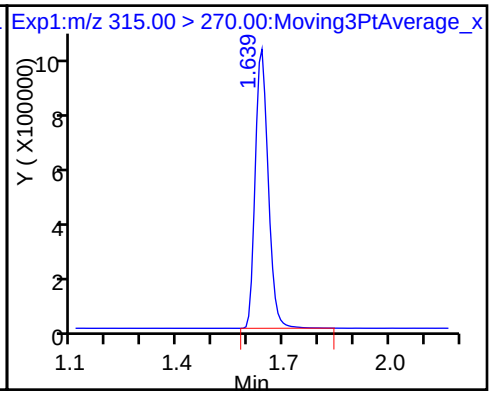
1 Perfluorobutanesulfonic acid



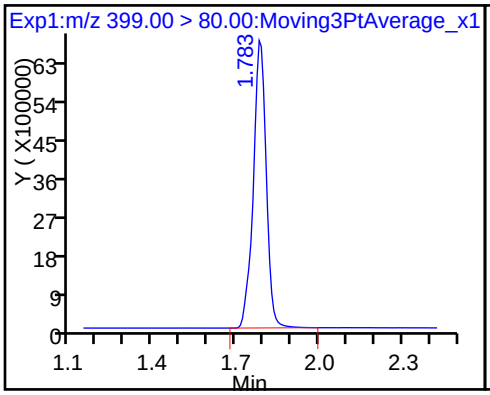
1 Perfluorobutanesulfonic acid



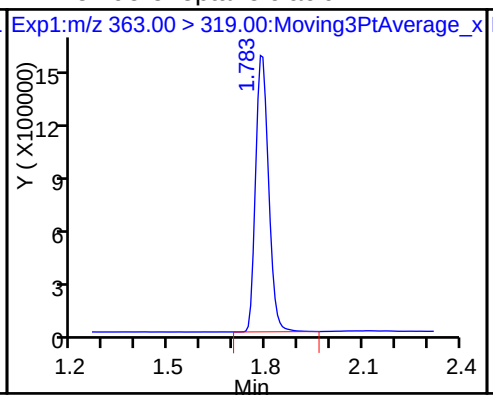
$ 2 13C2 PFHxA



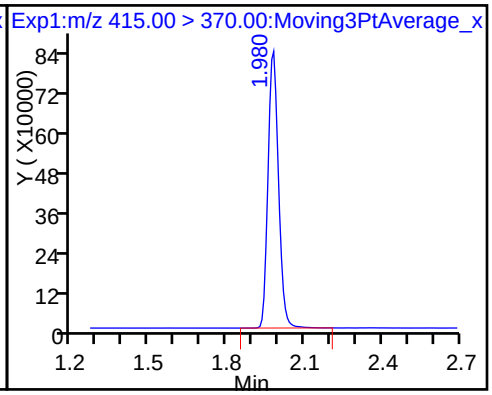
3 Perfluorohexanesulfonic acid



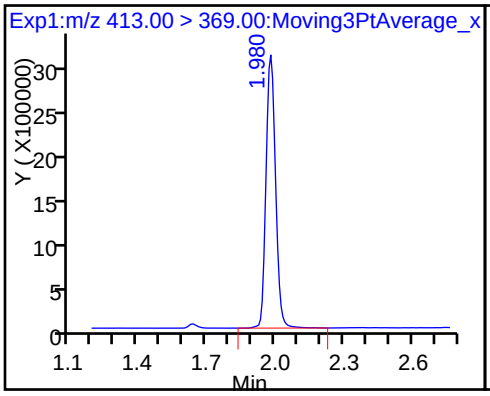
4 Perfluoroheptanoic acid



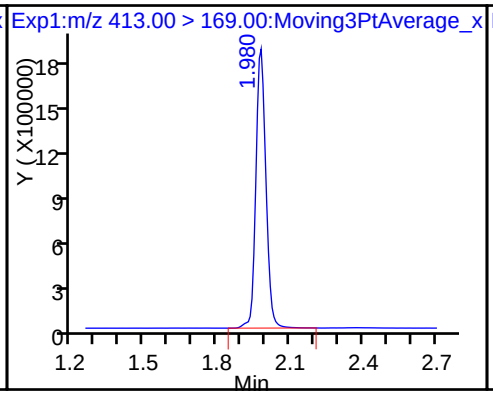
* 6 13C2-PFOA



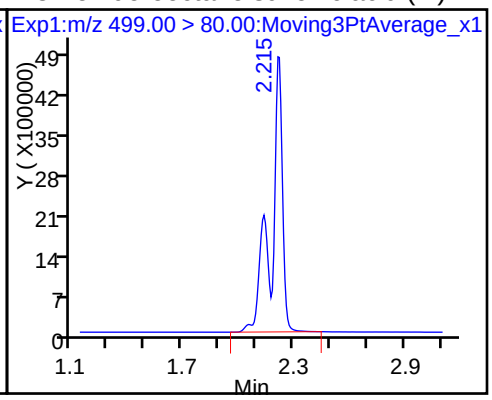
5 Perfluorooctanoic acid



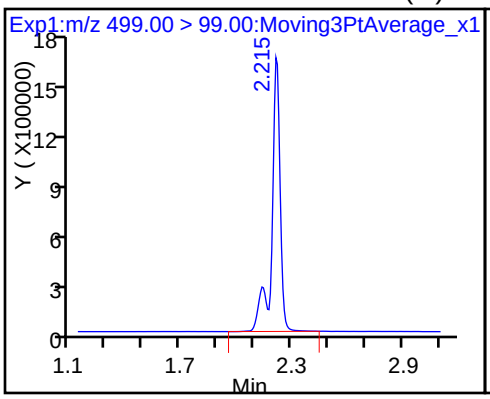
5 Perfluorooctanoic acid



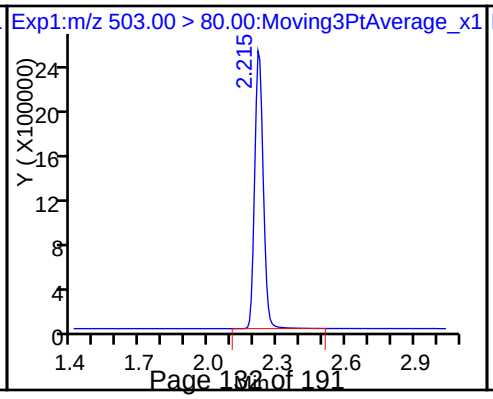
8 Perfluorooctane sulfonic acid (M)



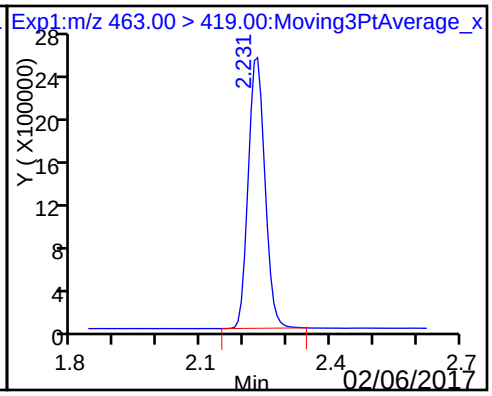
8 Perfluorooctane sulfonic acid (M)



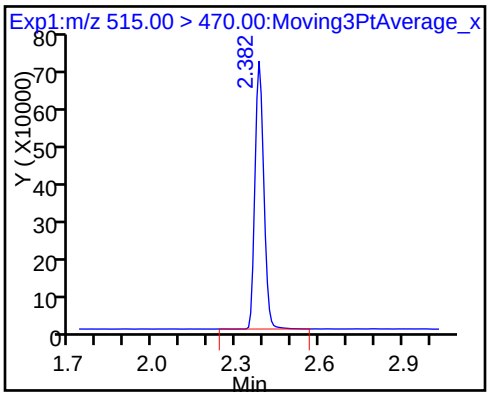
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.382
Y (X10000)
80
70
60
50
40
30
20
10
0
1.7
2.0
2.3
2.6
2.9
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

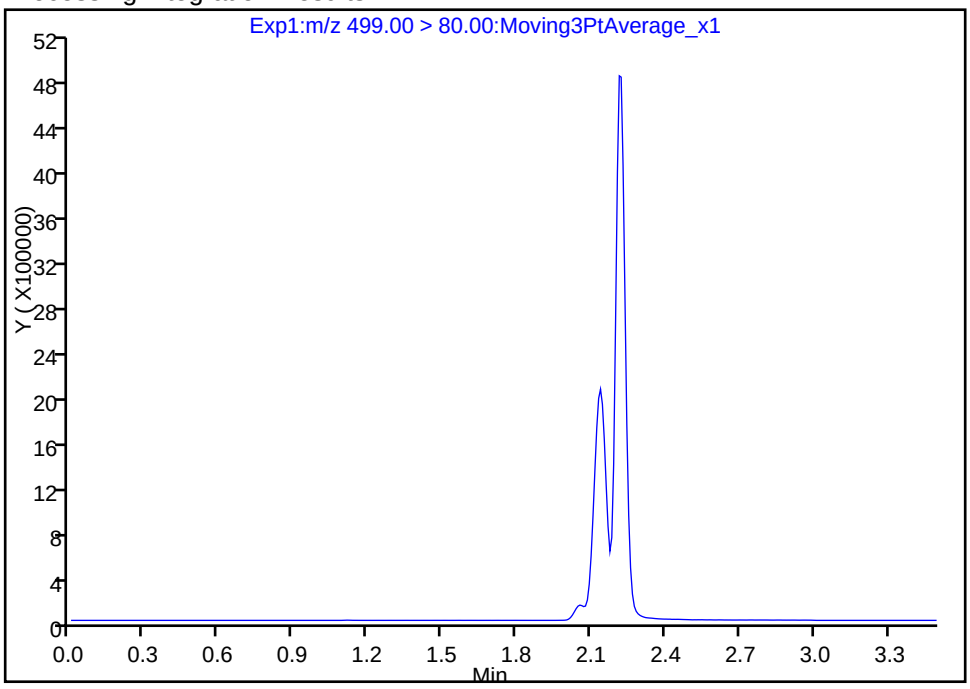
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d
Injection Date: 26-Jan-2017 11:25:03 Instrument ID: A8_N
Lims ID: IC L6
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

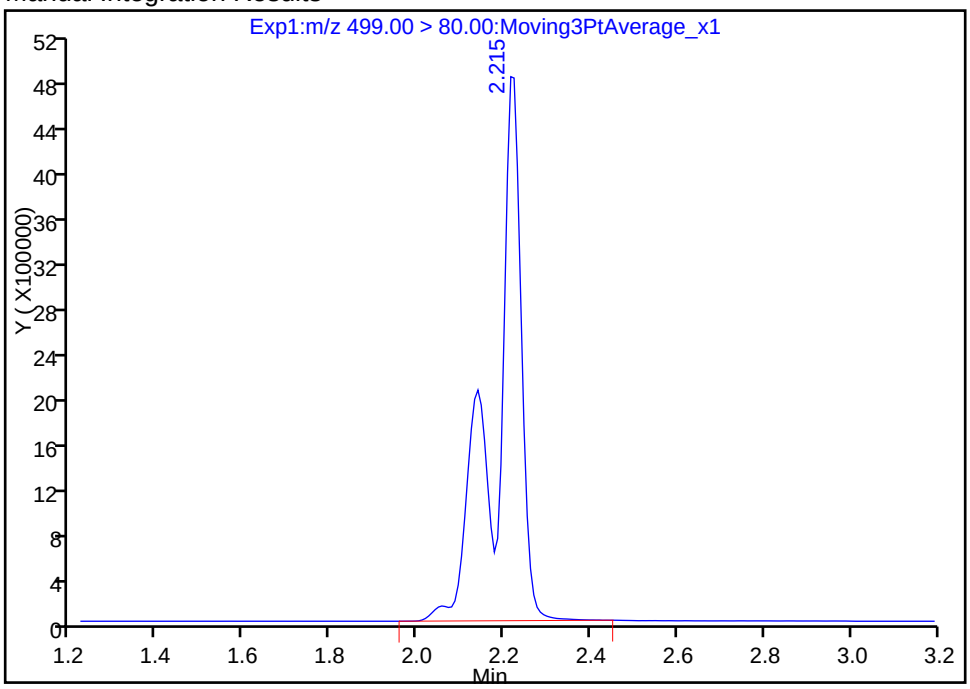
Not Detected
Expected RT: 2.14

Processing Integration Results



Manual Integration Results

RT: 2.22
Area: 20461190
Amount: 81.175847
Amount Units: ng/ml



Reviewer: chandrasenas, 26-Jan-2017 12:11:59
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

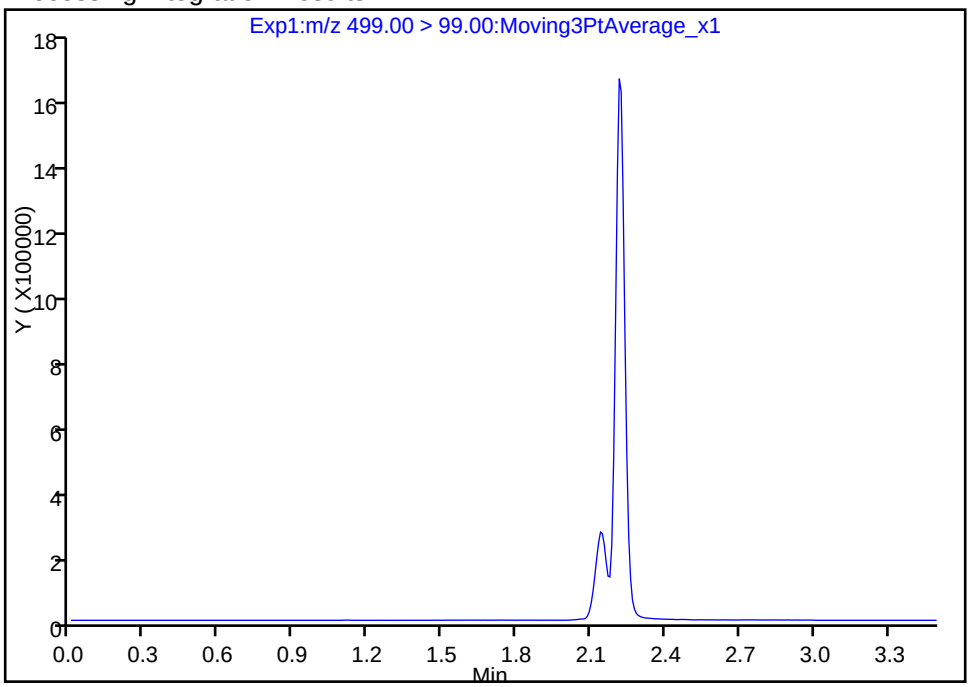
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d
Injection Date: 26-Jan-2017 11:25:03 Instrument ID: A8_N
Lims ID: IC L6
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

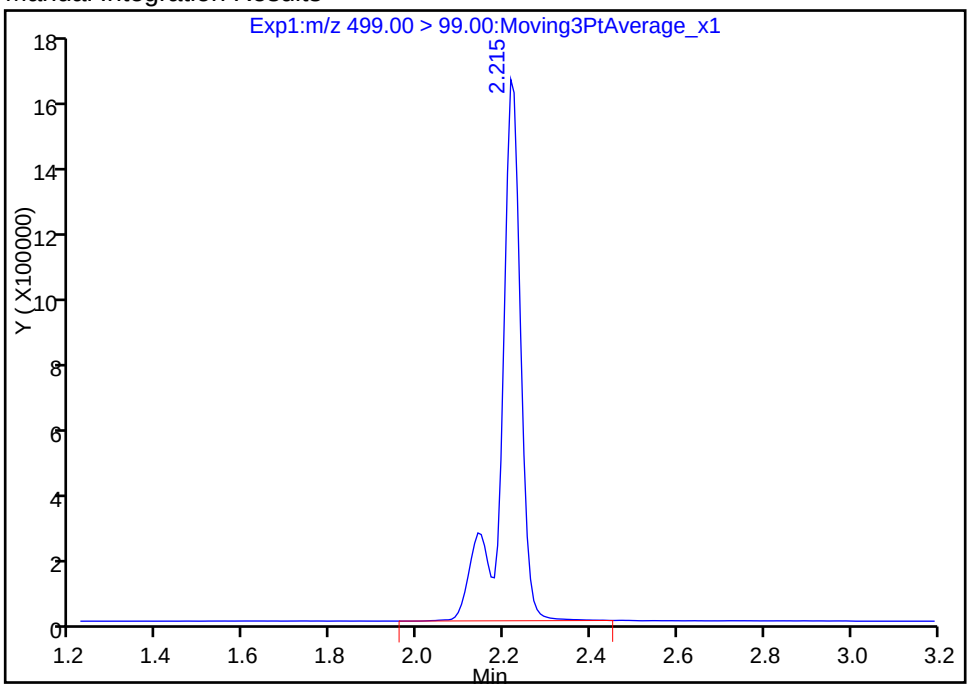
Not Detected
Expected RT: 2.14

Processing Integration Results



Manual Integration Results

RT: 2.22
Area: 5166933
Amount: 81.175847
Amount Units: ng/ml



Reviewer: chandrasenas, 26-Jan-2017 12:11:59
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Lab Sample ID: CCVL 320-147939/11 Calibration Date: 01/26/2017 11:33

Instrument ID: A8_N Calib Start Date: 01/26/2017 11:03

GC Column: Acquity ID: 2.10(mm) Calib End Date: 01/26/2017 11:25

Lab File ID: 2017.01.26_537_CURVE_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		2.084		26.4	22.9	15.3	50.0
Perfluorohexanesulfonic acid	Ave	1.684	1.742		7.98	7.72	3.5	50.0
Perfluoroheptanoic acid	Ave	0.9643	0.9585		2.61	2.62	-0.6	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9247	0.9721		5.23	4.98	5.1	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.116	1.104		10.1	10.2	-1.1	50.0
Perfluorononanoic acid	Ave	0.6813	0.7122		5.53	5.29	4.5	50.0
13C2 PFHxA	Ave	1.079	1.049		9.72	10.0	-2.8	30.0
13C2 PFDA	Ave	0.6456	0.6245		9.67	10.0	-3.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_011.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 26-Jan-2017 11:33:50 ALS Bottle#: 2 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L2
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 30-Jan-2017 11:49:21 Calib Date: 26-Jan-2017 11:25:03
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: chandrasenas Date: 26-Jan-2017 12:15:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.510	1.510	0.0	1.000	11225610	26.4		808	
298.90 > 99.00	1.510	1.510	0.0	1.000	4847404		2.32(0.00-0.00)	871	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.639	1.638	0.001	1.000	2615322	9.72		6771	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.783	1.787	-0.004	1.000	3162827	7.98		664	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.791	1.788	0.003	1.000	626193	2.61		83.3	
* 6 13C2-PFOA									
415.00 > 370.00	1.980	1.979	0.001		2492054	10.0		5184	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.980	1.980	0.0	1.000	1205723	5.23		86.3	
413.00 > 169.00	1.980	1.980	0.0	1.000	693020		1.74(0.00-0.00)	561	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.223	2.140	0.083	1.000	2653811	10.1		1097	M
499.00 > 99.00	2.215	2.140	0.075	0.997	652679		4.07(0.00-0.00)	489	M
* 7 13C4 PFOS									
503.00 > 80.00	2.215	2.220	-0.005		6749200	28.7		8408	
9 Perfluorononanoic acid									
463.00 > 419.00	2.231	2.229	0.002	1.000	938665	5.53		233	
$ 10 13C2 PFDA									
515.00 > 470.00	2.382	2.384	-0.002	1.000	1556265	9.67		2401	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00015 Amount Added: 1.00 Units: mL

Report Date: 30-Jan-2017 11:49:21 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_011.d

Injection Date: 26-Jan-2017 11:33:50 Instrument ID: A8_N

Lims ID: CCVL

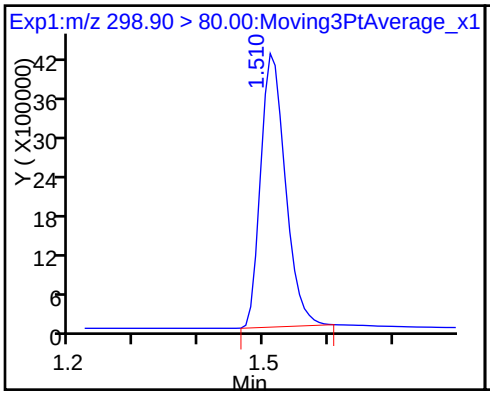
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 2 Worklist Smp#: 11

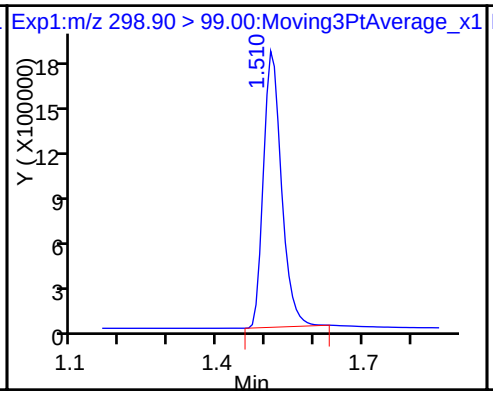
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

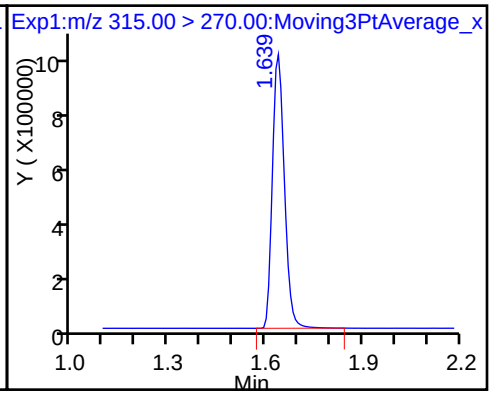
1 Perfluorobutanesulfonic acid



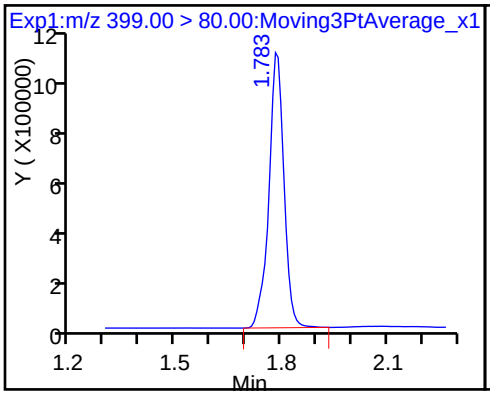
1 Perfluorobutanesulfonic acid



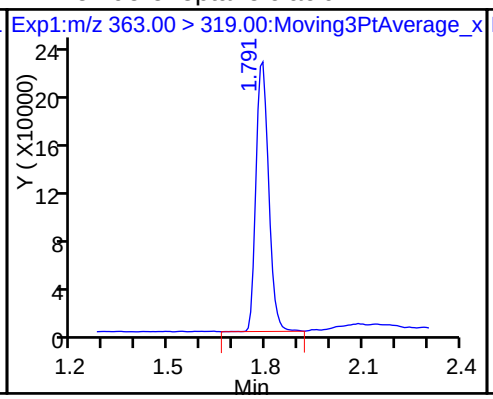
$ 2 13C2 PFHxA



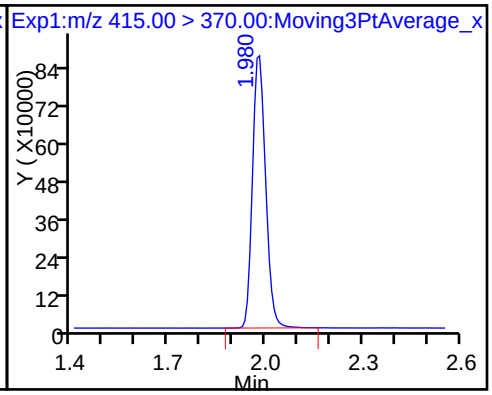
3 Perfluorohexanesulfonic acid



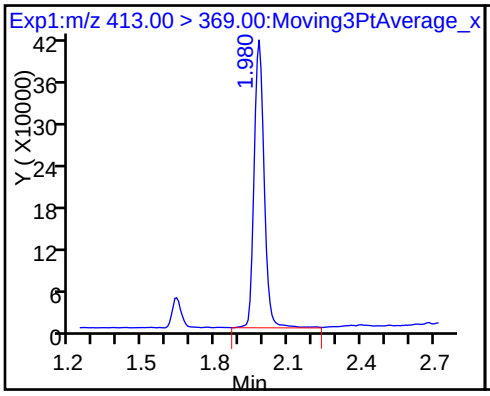
4 Perfluoroheptanoic acid



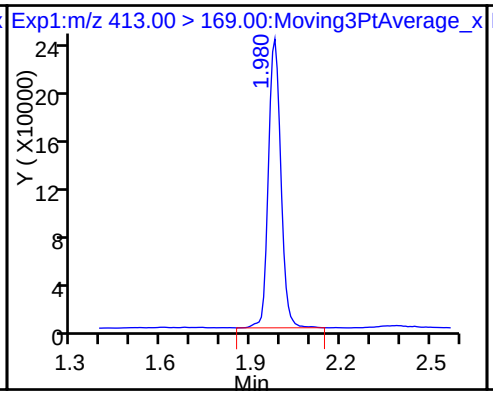
* 6 13C2-PFOA



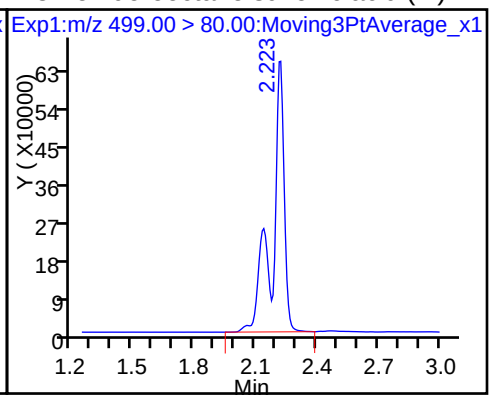
5 Perfluorooctanoic acid



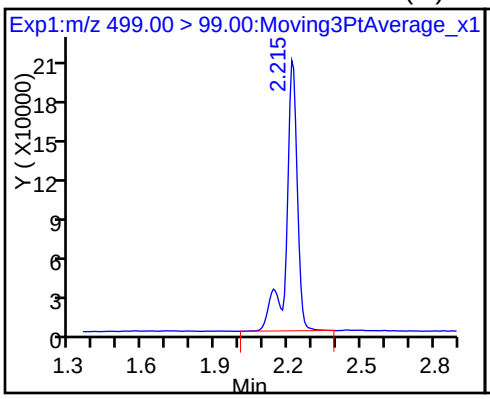
5 Perfluorooctanoic acid



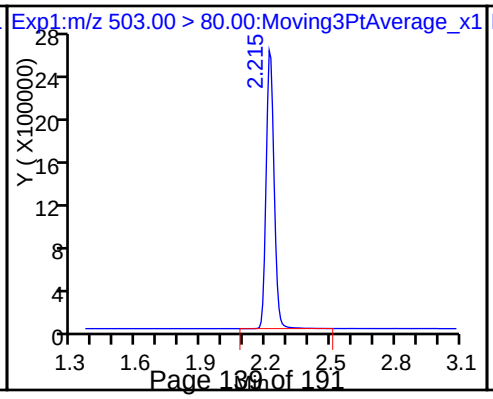
8 Perfluorooctane sulfonic acid (M)



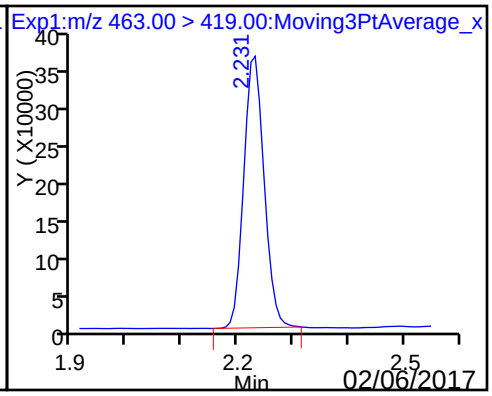
8 Perfluorooctane sulfonic acid (M)



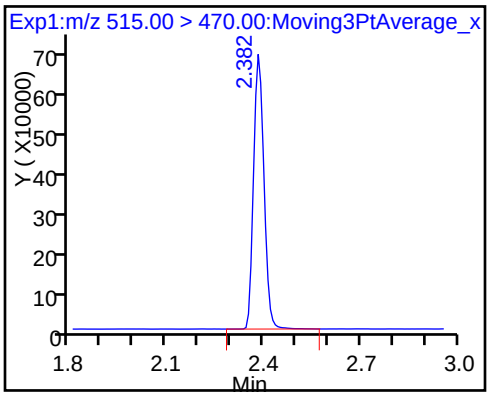
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.382
Y (X10000)
70
60
50
40
30
20
10
0
1.8
2.1
2.4
2.7
3.0
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

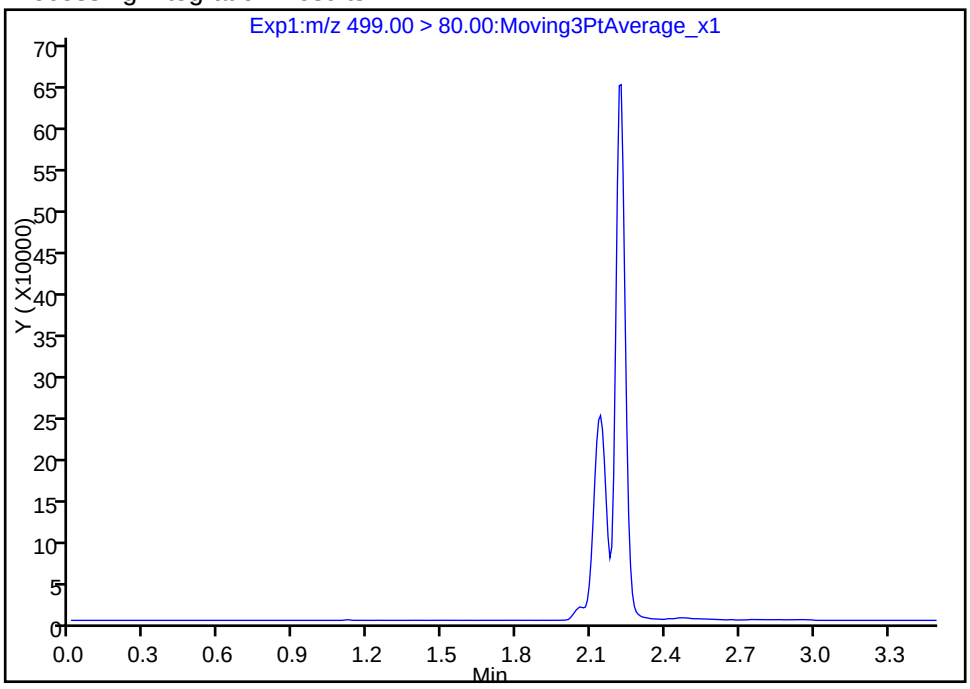
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_011.d
Injection Date: 26-Jan-2017 11:33:50 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 2 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

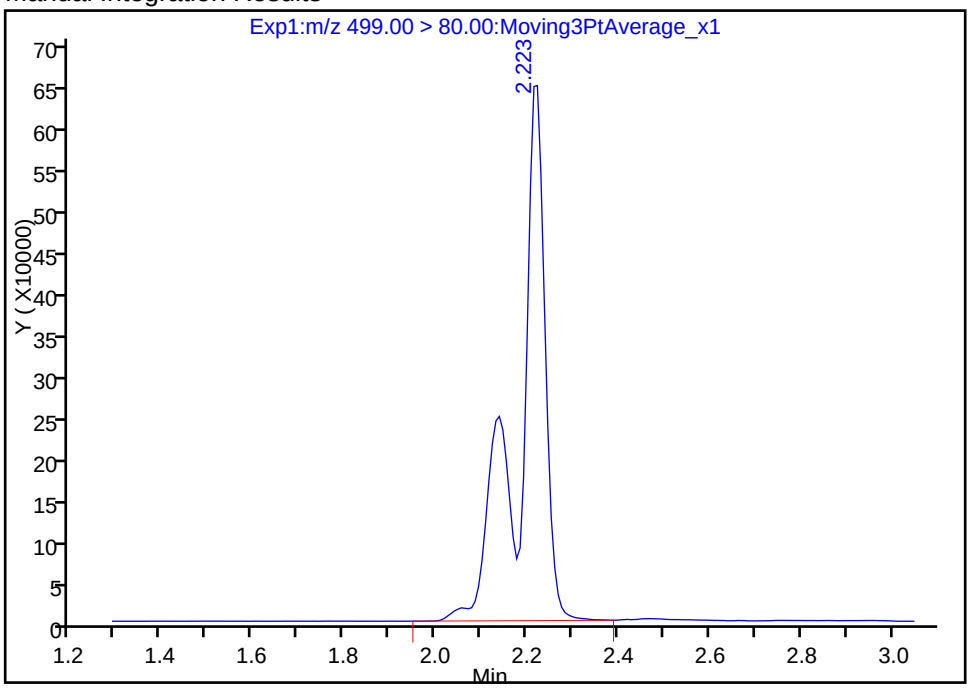
Not Detected
Expected RT: 2.14

Processing Integration Results



Manual Integration Results

RT: 2.22
Area: 2653811
Amount: 10.101058
Amount Units: ng/ml



Reviewer: chandrasenas, 26-Jan-2017 12:15:17
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

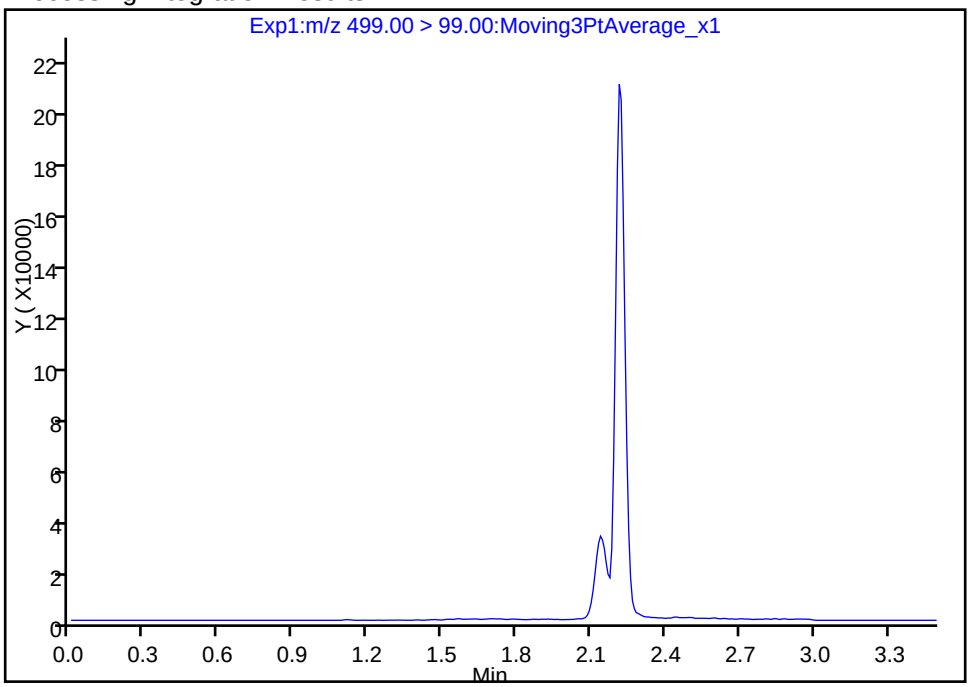
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_011.d
Injection Date: 26-Jan-2017 11:33:50 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 2 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

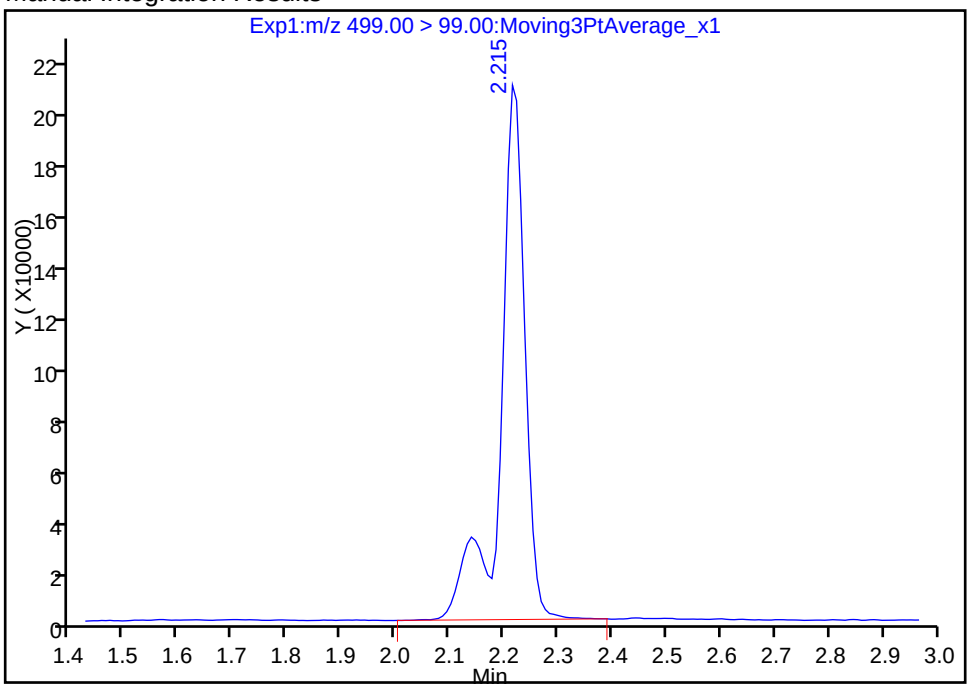
Not Detected
Expected RT: 2.14

Processing Integration Results



Manual Integration Results

RT: 2.22
Area: 652679
Amount: 10.101058
Amount Units: ng/ml



Reviewer: chandrasenas, 26-Jan-2017 12:15:17
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Lab Sample ID: ICV 320-147939/13 Calibration Date: 01/26/2017 11:42

Instrument ID: A8_N Calib Start Date: 01/26/2017 11:03

GC Column: Acquity ID: 2.10(mm) Calib End Date: 01/26/2017 11:25

Lab File ID: 2017.01.26_537_CURVE_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.349		100	115	-12.5	30.0
Perfluoroheptanoic acid	Ave	0.9643	0.8903		11.6	12.6	-7.7	30.0
Perfluorohexanesulfonic acid	Ave	1.684	1.363		21.4	26.5	-19.0	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9247	0.8195		22.2	25.0	-11.4	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.116	0.8801		21.5	27.2	-21.2	30.0
Perfluorononanoic acid	Ave	0.6813	0.6118		22.5	25.0	-10.2	30.0
13C2 PFHxA	Ave	1.079	1.180		10.9	10.0	9.4	30.0
13C2 PFDA	Ave	0.6456	0.6736		10.4	10.0	4.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_013.d
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 26-Jan-2017 11:42:36 ALS Bottle#: 7 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 30-Jan-2017 11:49:24 Calib Date: 26-Jan-2017 11:25:03
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: chandrasenas Date: 26-Jan-2017 12:16:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.510	1.510	0.0	1.000	33808700	100.4		1738	
298.90 > 99.00	1.510	1.510	0.0	1.000	16544440		2.04(0.00-0.00)	1886	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.631	1.638	-0.007	1.000	2683454	10.9		6152	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.783	1.787	-0.004	1.000	7879031	21.4		1437	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.783	1.788	-0.005	1.000	2549950	11.6		335	
* 6 13C2-PFOA									
415.00 > 370.00	1.973	1.979	-0.006		2273215	10.0		4649	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.973	1.980	-0.007	1.000	4661444	22.2		343	
413.00 > 169.00	1.973	1.980	-0.007	1.000	2649388		1.76(0.00-0.00)	1872	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.215	2.140	0.075	1.000	5233022	21.5		1657	M
499.00 > 99.00	2.215	2.140	0.075	1.000	1038329		5.04(0.00-0.00)	732	M
* 7 13C4 PFOS									
503.00 > 80.00	2.215	2.220	-0.005		6260544	28.7		6453	
9 Perfluorononanoic acid									
463.00 > 419.00	2.223	2.229	-0.006	1.000	3478258	22.5		767	
$ 10 13C2 PFDA									
515.00 > 470.00	2.375	2.384	-0.009	1.000	1531279	10.4		2302	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-ICV_00019 Amount Added: 1.00 Units: mL

Report Date: 30-Jan-2017 11:49:24 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_013.d

Injection Date: 26-Jan-2017 11:42:36 Instrument ID: A8_N

Lims ID: ICV

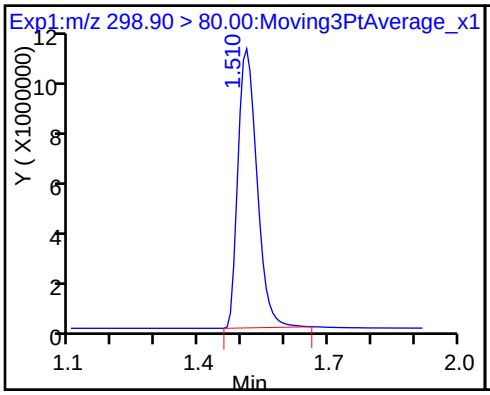
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 7 Worklist Smp#: 13

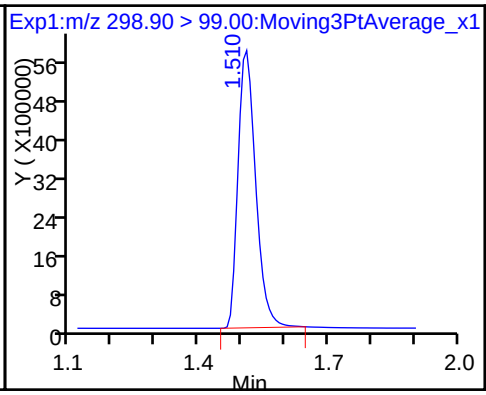
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

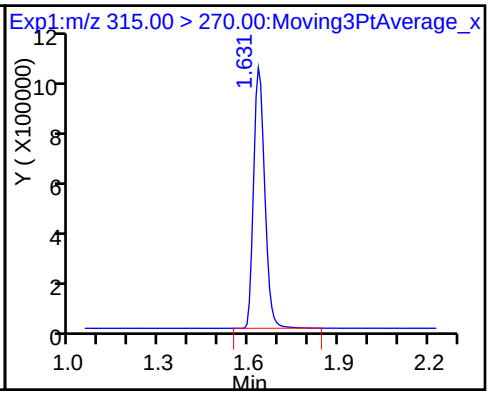
1 Perfluorobutanesulfonic acid



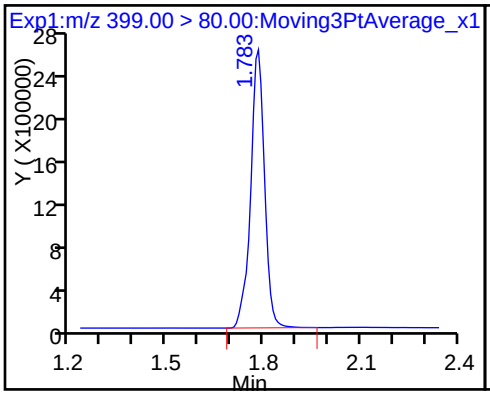
1 Perfluorobutanesulfonic acid



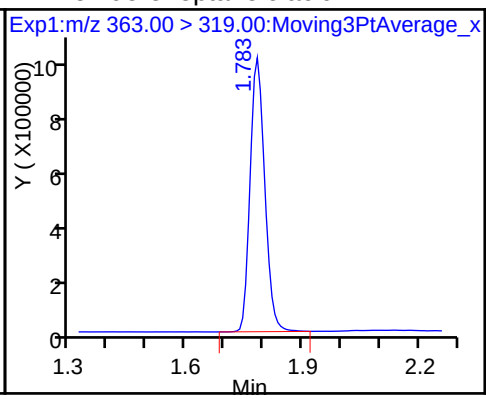
$ 2 13C2 PFHxA



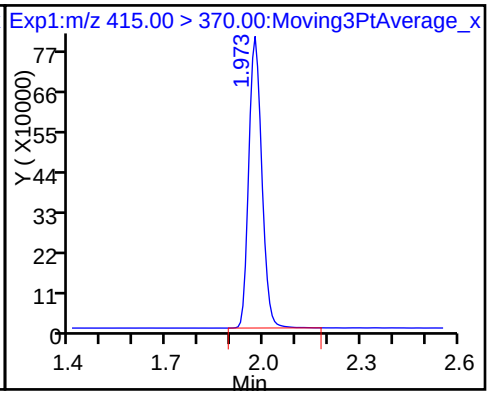
3 Perfluorohexanesulfonic acid



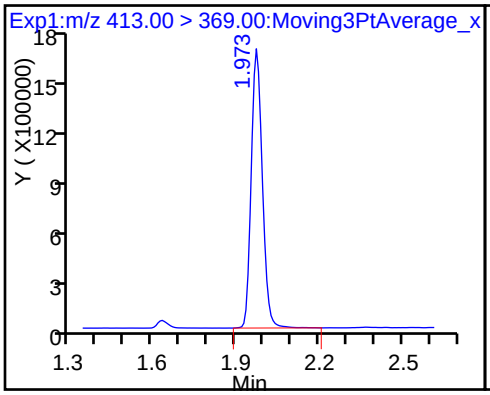
4 Perfluoroheptanoic acid



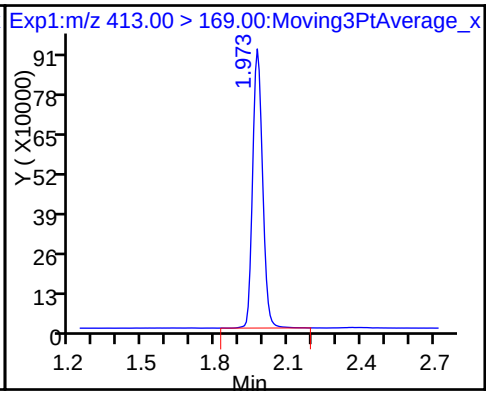
* 6 13C2-PFOA



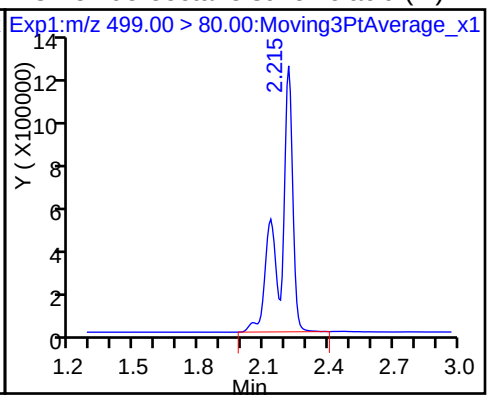
5 Perfluorooctanoic acid



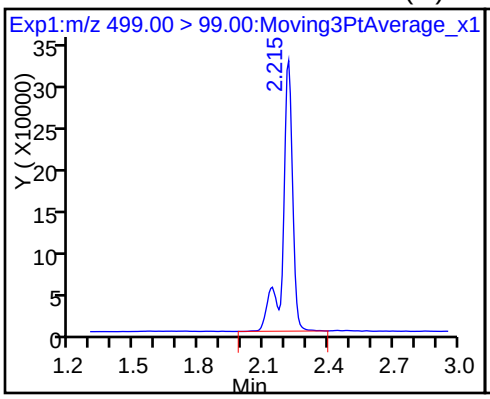
5 Perfluorooctanoic acid



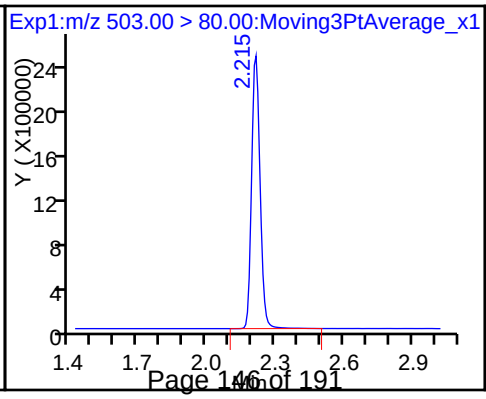
8 Perfluorooctane sulfonic acid (M)



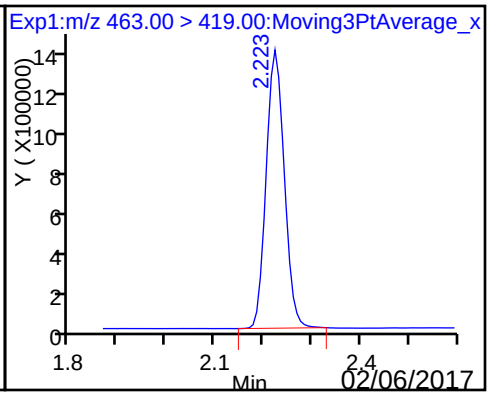
8 Perfluorooctane sulfonic acid (M)



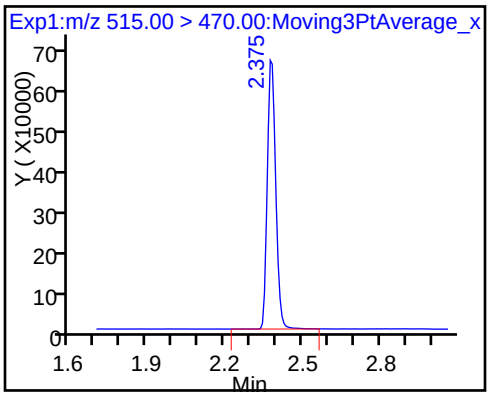
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.375
Y (X10000)
70
60
50
40
30
20
10
0
1.6
1.9
2.2
2.5
2.8
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

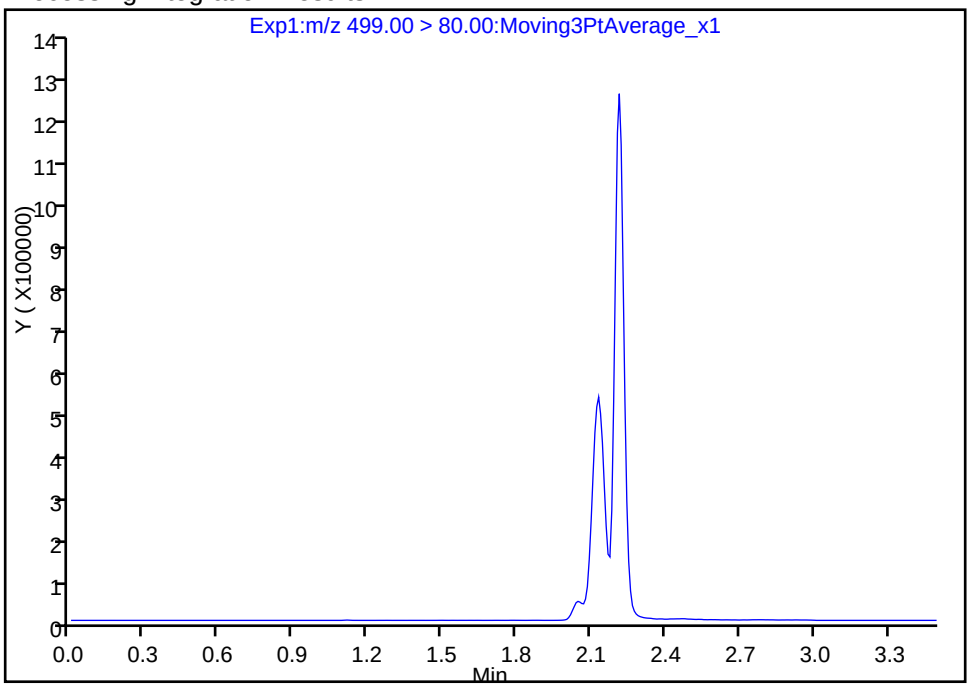
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_013.d
Injection Date: 26-Jan-2017 11:42:36 Instrument ID: A8_N
Lims ID: ICV
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 7 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

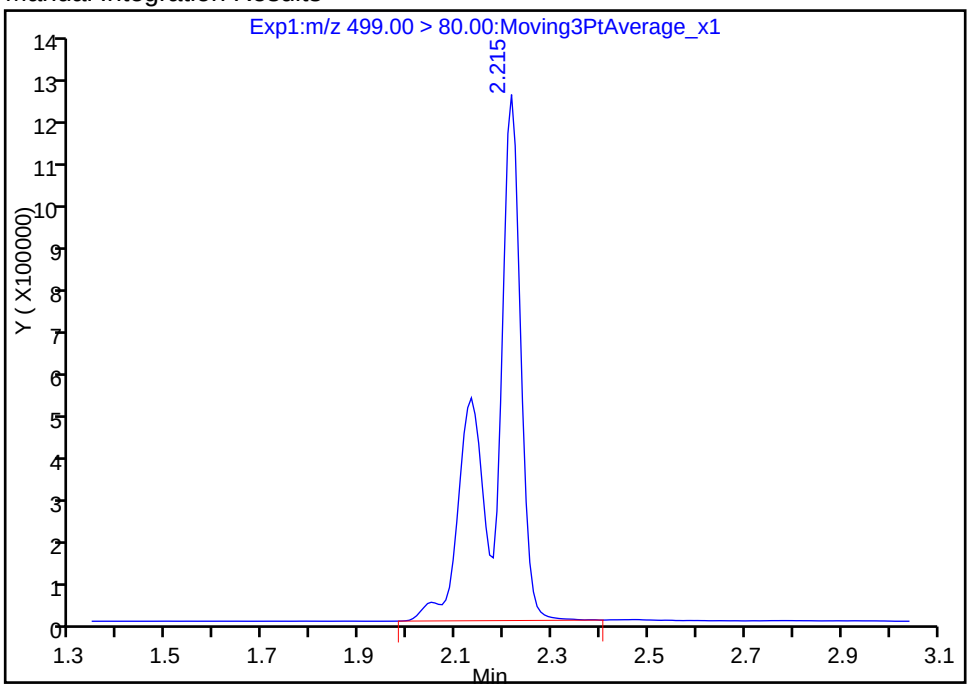
Not Detected
Expected RT: 2.14

Processing Integration Results



Manual Integration Results

RT: 2.22
Area: 5233022
Amount: 21.472850
Amount Units: ng/ml



Reviewer: chandrasenas, 26-Jan-2017 12:16:45
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

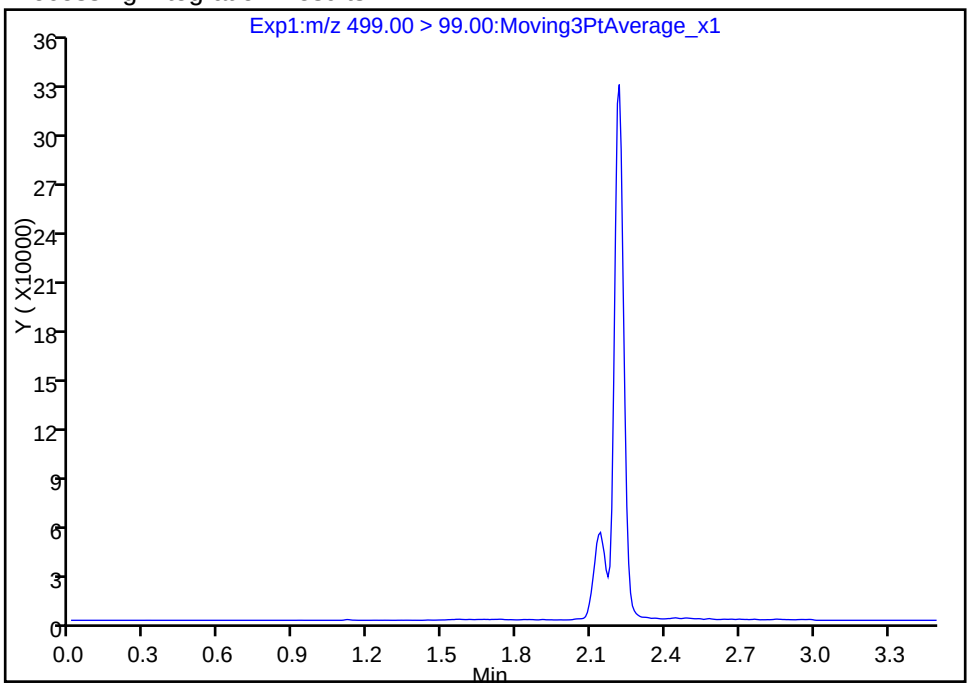
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_013.d
Injection Date: 26-Jan-2017 11:42:36 Instrument ID: A8_N
Lims ID: ICV
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 7 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

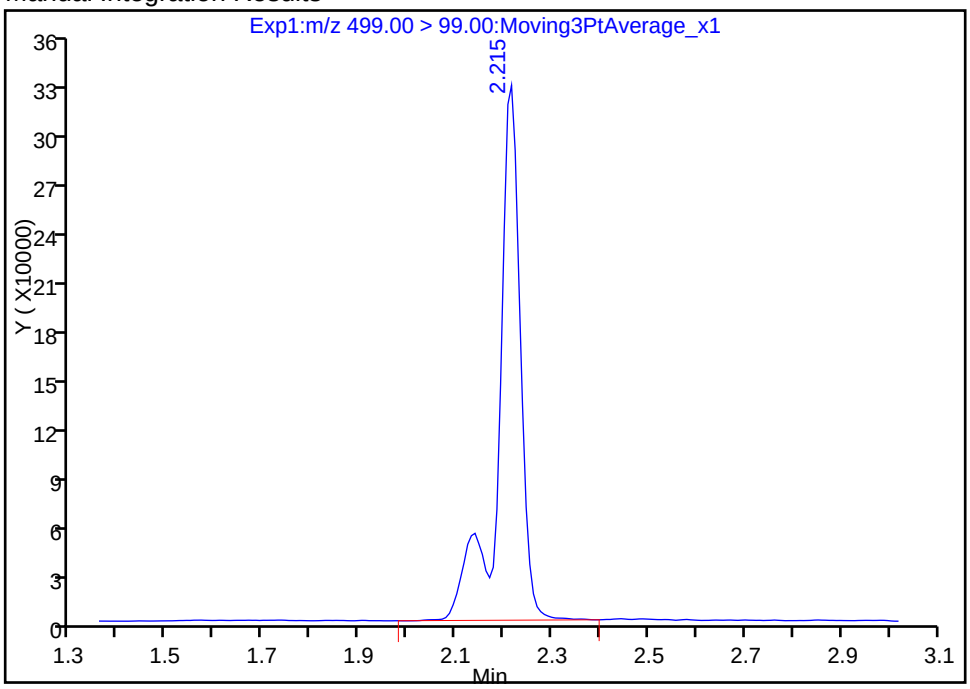
Processing Integration Results

Not Detected
Expected RT: 2.14



Manual Integration Results

RT: 2.22
Area: 1038329
Amount: 21.472850
Amount Units: ng/ml



Reviewer: chandrasenas, 26-Jan-2017 12:16:45
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Lab Sample ID: CCV 320-148790/3 Calibration Date: 02/02/2017 15:21

Instrument ID: A8_N Calib Start Date: 01/26/2017 11:03

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/26/2017 11:25

Lab File ID: 2017.02.02B_537_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.368		127	135	-5.4	30.0
Perfluoroheptanoic acid	Ave	0.9643	0.9293		14.3	14.9	-3.6	30.0
Perfluorohexanesulfonic acid	Ave	1.684	1.633		44.0	45.4	-3.0	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9247	0.8627		27.3	29.3	-6.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.116	1.088		58.6	60.1	-2.5	30.0
Perfluorononanoic acid	Ave	0.6813	0.6699		30.6	31.1	-1.7	30.0
13C2 PFHxA	Ave	1.079	1.066		9.88	10.0	-1.2	30.0
13C2 PFDA	Ave	0.6456	0.7144		11.1	10.0	10.7	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_003.d
Lims ID: CCV L5
Client ID:
Sample Type: CCVIS
Inject. Date: 02-Feb-2017 15:21:20 ALS Bottle#: 5 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 02-Feb-2017 15:56:02 Calib Date: 26-Jan-2017 11:25:03
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d

Column 1 : Det: EXP1
Process Host: XAWRK034

First Level Reviewer: barnettj Date: 02-Feb-2017 15:46:12

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.510	1.510	0.0	1.000	41543271	127.4		1777	
298.90 > 99.00	1.510	1.510	0.0	1.000	21682669		1.92(0.00-0.00)	2721	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.639	1.638	0.001	1.000	2639455	9.88		6617	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.791	1.787	0.004	1.000	16714096	44.0		2706	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.791	1.788	0.003	1.000	3415870	14.3		423	
* 6 13C2-PFOA									
415.00 > 370.00	1.988	1.979	0.009		2475219	10.0		5149	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.988	1.980	0.008	1.000	6251740	27.3		510	
413.00 > 169.00	1.988	1.980	0.008	1.000	3732696		1.67(0.00-0.00)	3331	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.155	2.155	0.0	1.000	14754992	58.6		1115	
499.00 > 99.00	2.208	2.155	0.053	1.025	3540934		4.17(0.00-0.00)	714	
* 7 13C4 PFOS									
503.00 > 80.00	2.238	2.220	0.018		6469541	28.7		7265	
9 Perfluorononanoic acid									
463.00 > 419.00	2.246	2.229	0.017	1.000	5159133	30.6		1257	
$ 10 13C2 PFDA									
515.00 > 470.00	2.397	2.384	0.013	1.000	1768375	11.1		3122	

Reagents:

LC537-L5_00020 Amount Added: 1.00 Units: mL

Report Date: 02-Feb-2017 15:56:03 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_003.d

Injection Date: 02-Feb-2017 15:21:20 Instrument ID: A8_N

Lims ID: CCV L5

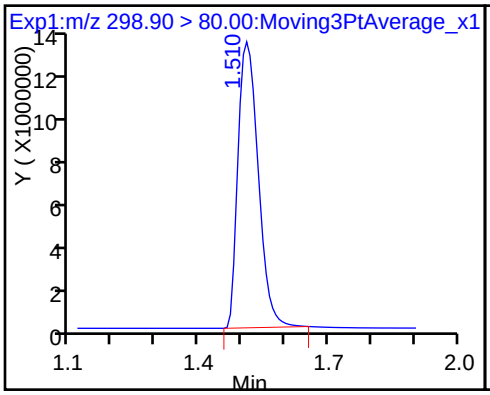
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 5 Worklist Smp#: 3

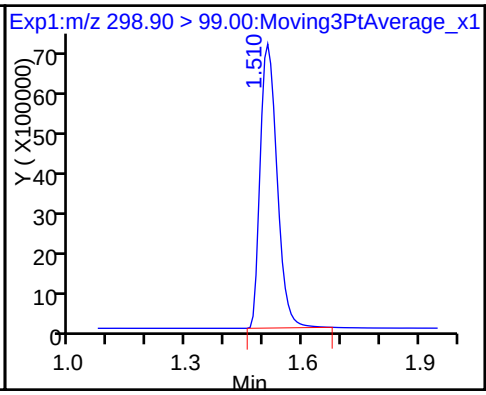
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

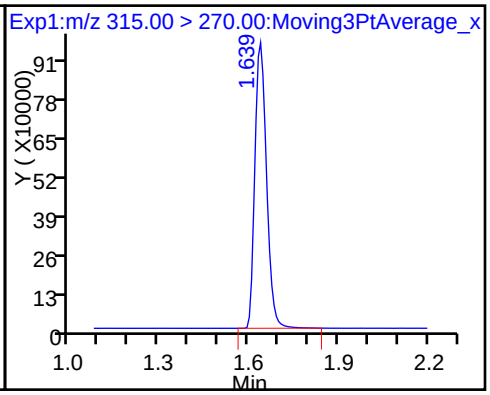
1 Perfluorobutanesulfonic acid



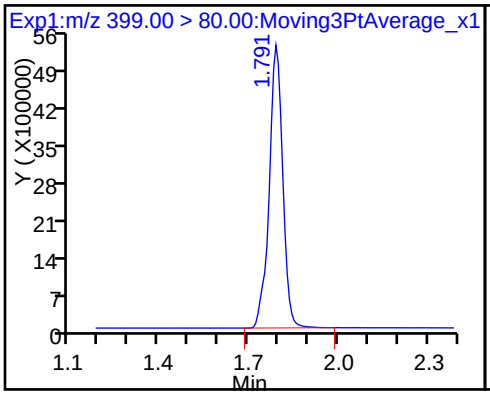
1 Perfluorobutanesulfonic acid



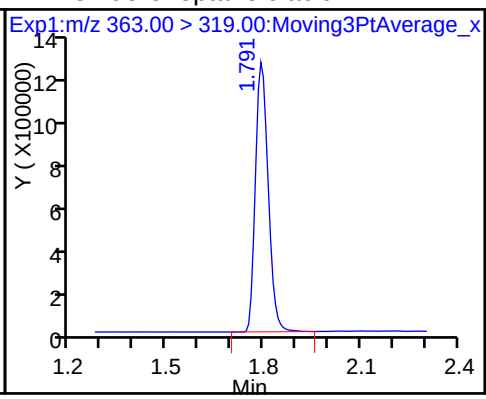
$ 2 13C2 PFHxA



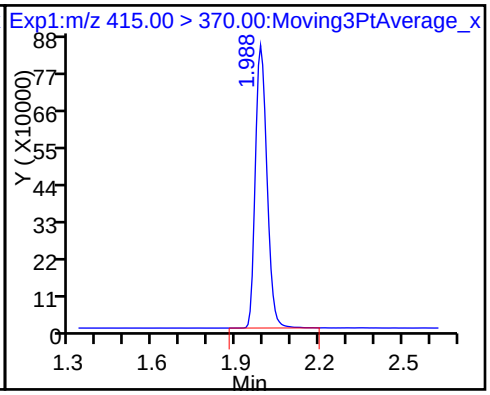
3 Perfluorohexanesulfonic acid



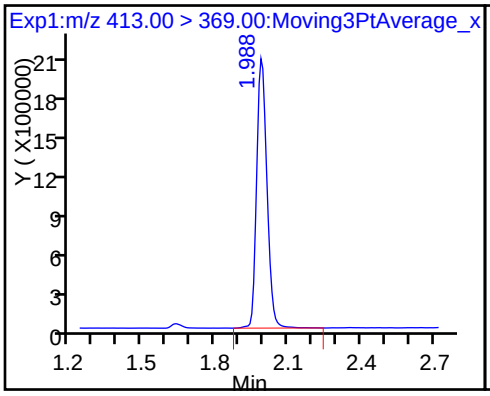
4 Perfluoroheptanoic acid



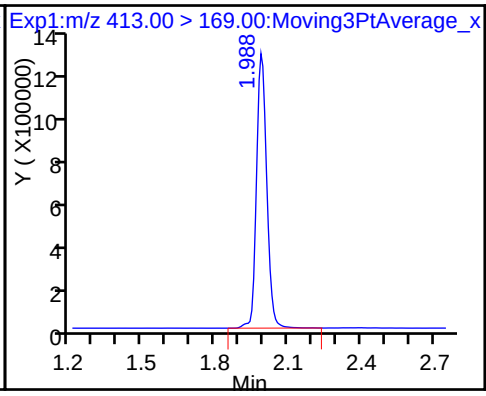
* 6 13C2-PFOA



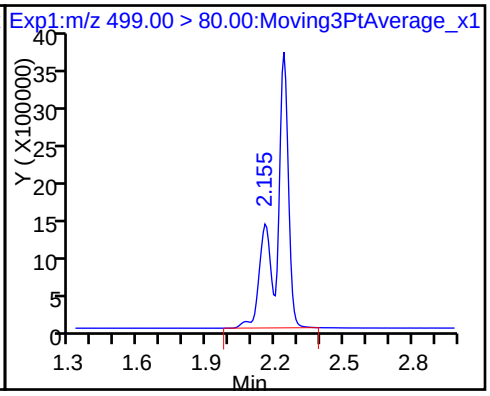
5 Perfluorooctanoic acid



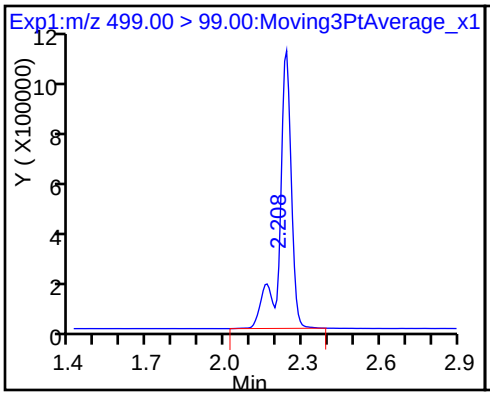
5 Perfluorooctanoic acid



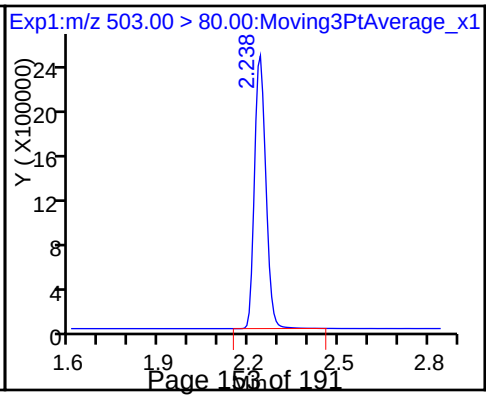
8 Perfluorooctane sulfonic acid



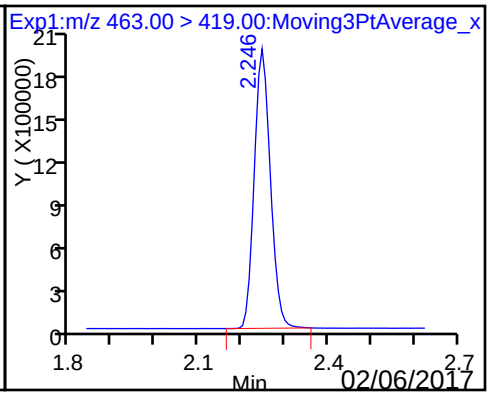
8 Perfluorooctane sulfonic acid



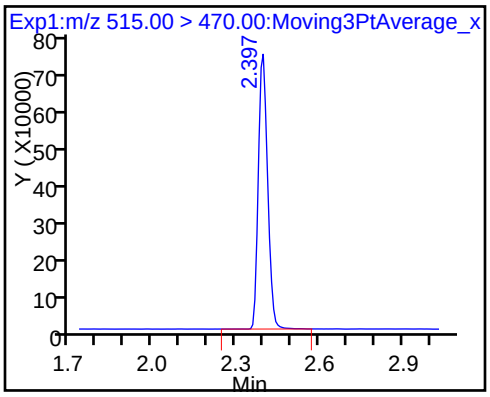
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.397
Y (X10000)
80
70
60
50
40
30
20
10
0
1.7
2.0
2.3
2.6
2.9
Min

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Lab Sample ID: CCV 320-148790/15 Calibration Date: 02/02/2017 16:14

Instrument ID: A8_N Calib Start Date: 01/26/2017 11:03

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/26/2017 11:25

Lab File ID: 2017.02.02B_537_015.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.817		47.3	45.1	4.8	30.0
Perfluoroheptanoic acid	Ave	0.9643	0.9575		4.94	4.97	-0.7	30.0
Perfluorohexanesulfonic acid	Ave	1.684	1.679		15.2	15.2	-0.3	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9247	0.8844		9.38	9.81	-4.4	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.116	1.077		19.4	20.1	-3.6	30.0
Perfluorononanoic acid	Ave	0.6813	0.6780		10.4	10.4	-0.5	30.0
13C2 PFHxA	Ave	1.079	1.030		9.55	10.0	-4.5	30.0
13C2 PFDA	Ave	0.6456	0.6643		10.3	10.0	2.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_015.d
Lims ID: CCV L3
Client ID:
Sample Type: CCVIS
Inject. Date: 02-Feb-2017 16:14:08 ALS Bottle#: 3 Worklist Smp#: 15
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L3
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 02-Feb-2017 16:35:20 Calib Date: 26-Jan-2017 11:25:03
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d

Column 1 : Det: EXP1
Process Host: XAWRK034

First Level Reviewer: barnettj Date: 02-Feb-2017 16:30:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.502	1.510	-0.008	1.000	18780686	47.3		1454	
298.90 > 99.00	1.502	1.510	-0.008	1.000	8455110		2.22(0.00-0.00)	1644	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.631	1.638	-0.007	1.000	2580207	9.55		5923	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.783	1.787	-0.004	1.000	5850455	15.2		1373	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.783	1.788	-0.005	1.000	1192865	4.94		165	
* 6 13C2-PFOA									
415.00 > 370.00	1.980	1.979	0.001		2504200	10.0		5288	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.973	1.980	-0.007	1.000	2172121	9.38		193	
413.00 > 169.00	1.973	1.980	-0.007	1.000	1274705		1.70(0.00-0.00)	1379	
* 7 13C4 PFOS									
503.00 > 80.00	2.223	2.220	0.003		6574053	28.7		6623	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.223	2.223	0.0	1.000	4968687	19.4		1886	M
499.00 > 99.00	2.223	2.223	0.0	1.000	1164323		4.27(0.00-0.00)	1407	M
9 Perfluorononanoic acid									
463.00 > 419.00	2.231	2.229	0.002	1.000	1769579	10.4		435	
$ 10 13C2 PFDA									
515.00 > 470.00	2.382	2.384	-0.002	1.000	1663506	10.3		2752	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00019 Amount Added: 1.00 Units: mL

Report Date: 02-Feb-2017 16:35:21 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_015.d

Injection Date: 02-Feb-2017 16:14:08 Instrument ID: A8_N

Lims ID: CCV L3

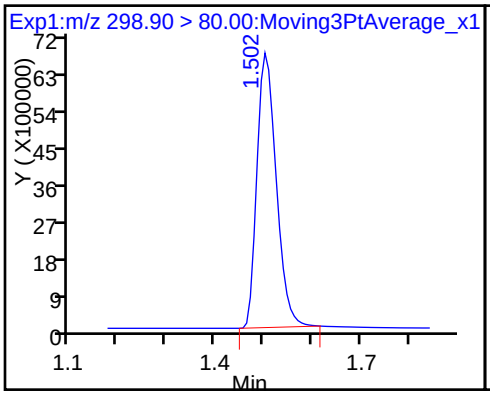
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 3 Worklist Smp#: 15

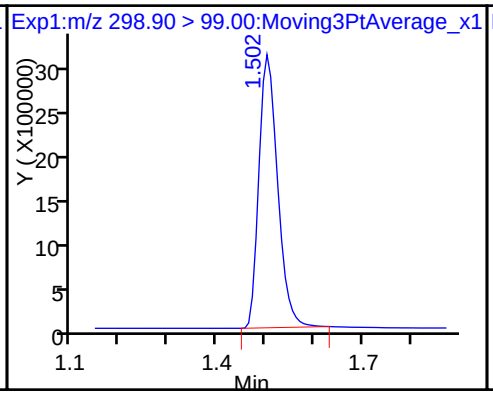
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

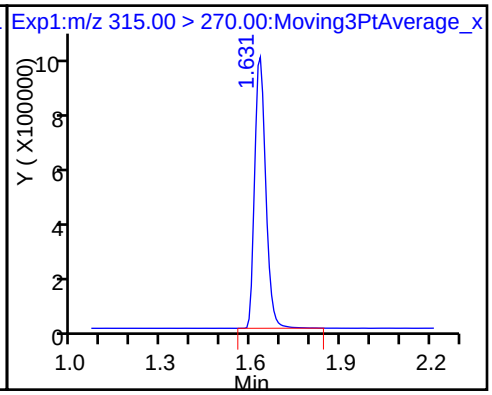
1 Perfluorobutanesulfonic acid



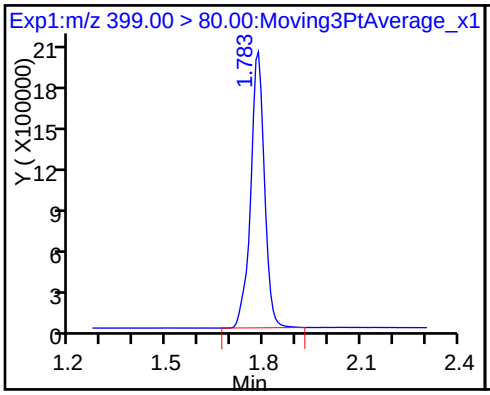
1 Perfluorobutanesulfonic acid



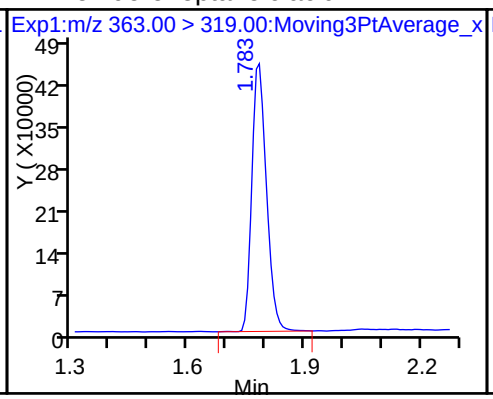
$ 2 13C2 PFHxA



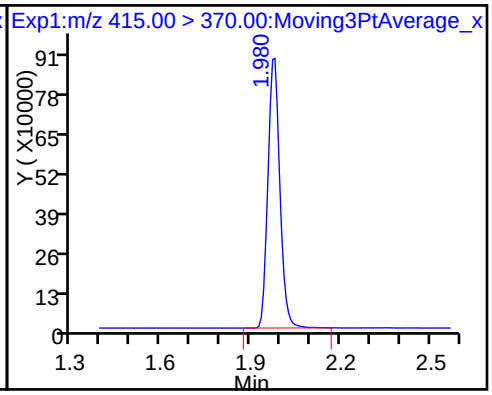
3 Perfluorohexanesulfonic acid



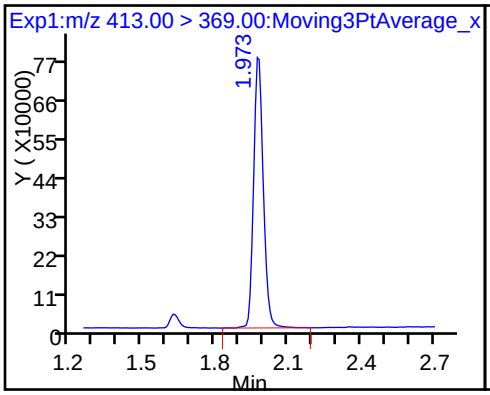
4 Perfluoroheptanoic acid



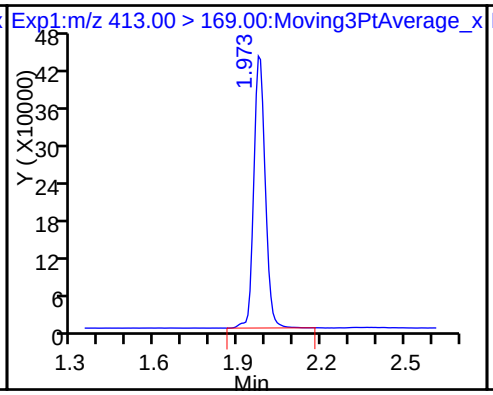
* 6 13C2-PFOA



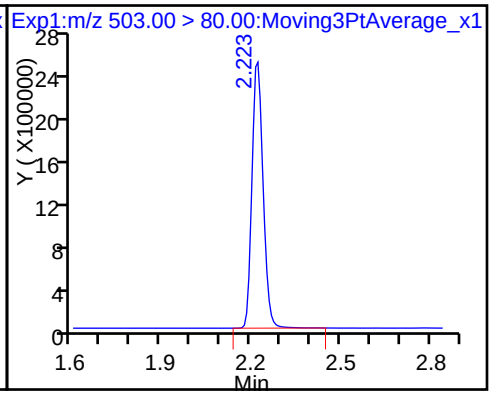
5 Perfluorooctanoic acid



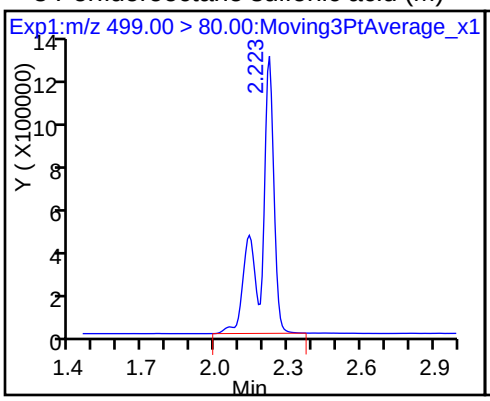
5 Perfluorooctanoic acid



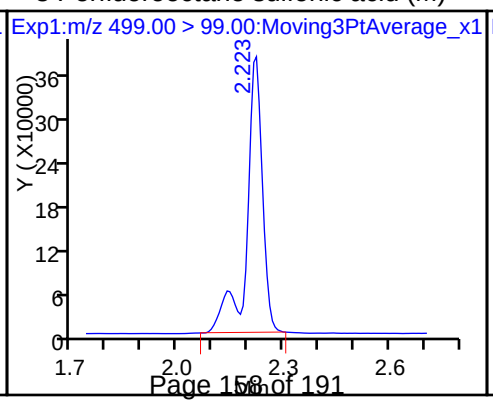
* 7 13C4 PFOS



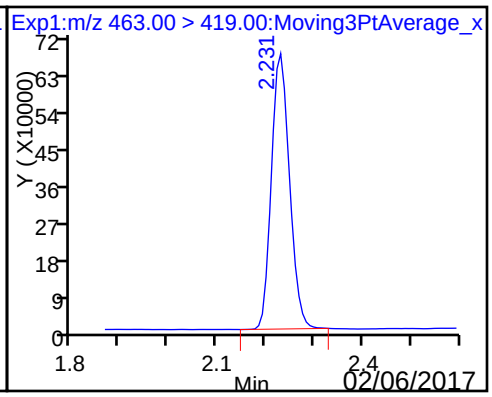
8 Perfluorooctane sulfonic acid (M)



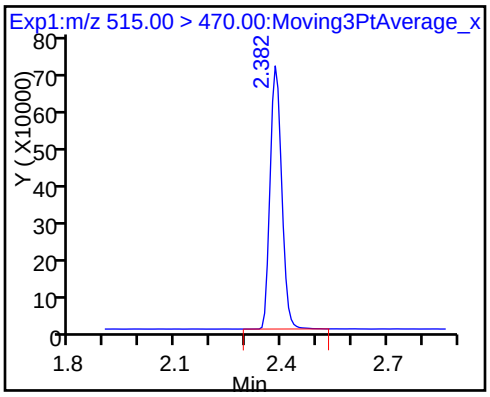
8 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.382
Y (X10000)
80
70
60
50
40
30
20
10
0
1.8
2.1
2.4
2.7
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

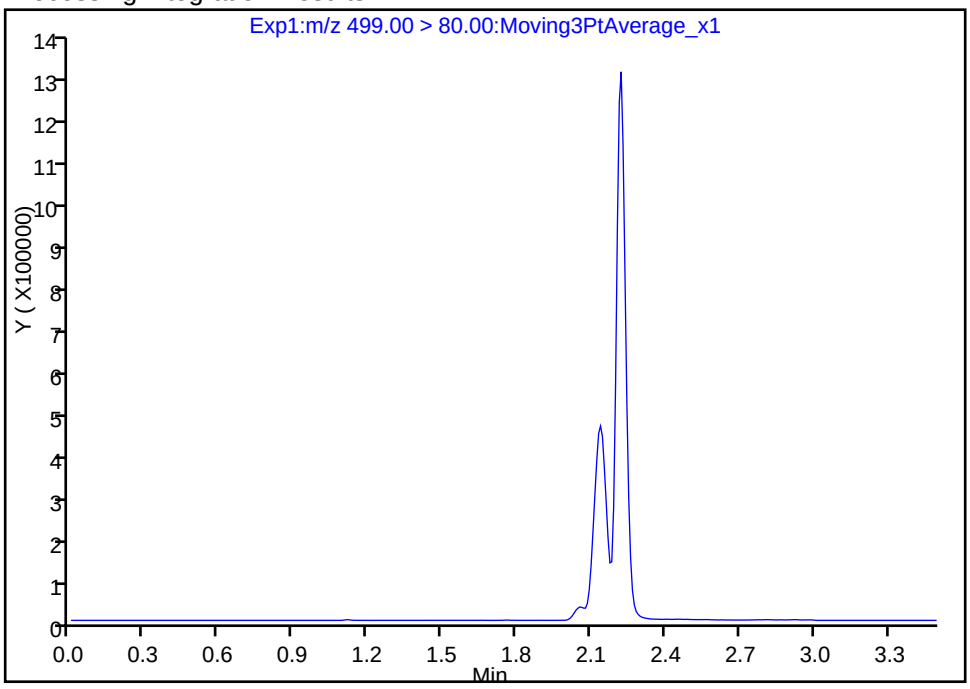
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_015.d
Injection Date: 02-Feb-2017 16:14:08 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 3 Worklist Smp#: 15
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

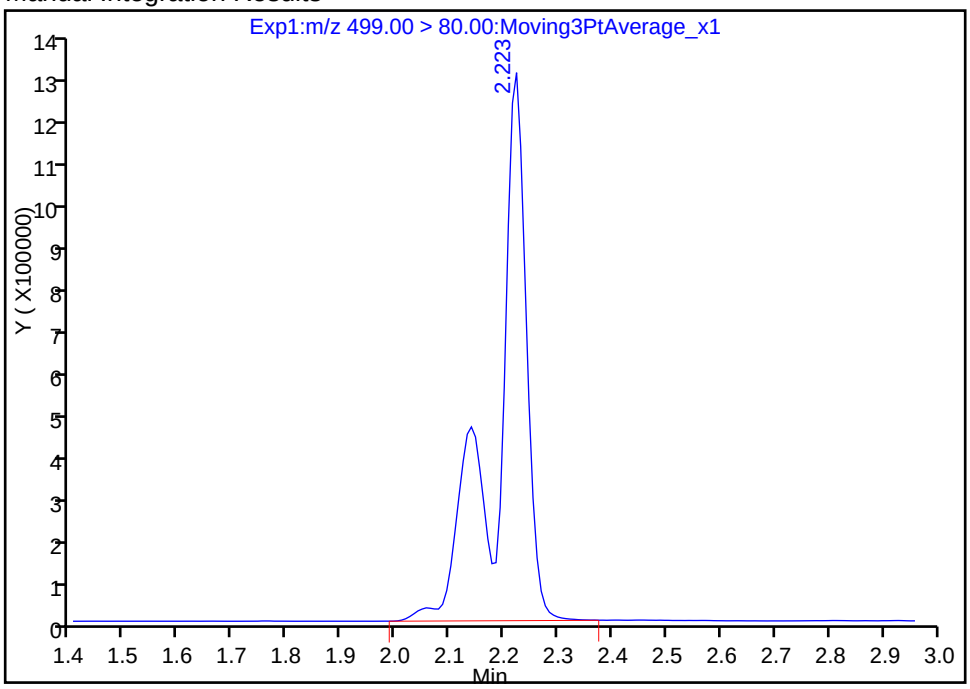
Not Detected
Expected RT: 2.22

Processing Integration Results



Manual Integration Results

RT: 2.22
Area: 4968687
Amount: 19.415905
Amount Units: ng/ml



Reviewer: barnettj, 02-Feb-2017 16:30:39
Audit Action: Assigned Compound ID Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

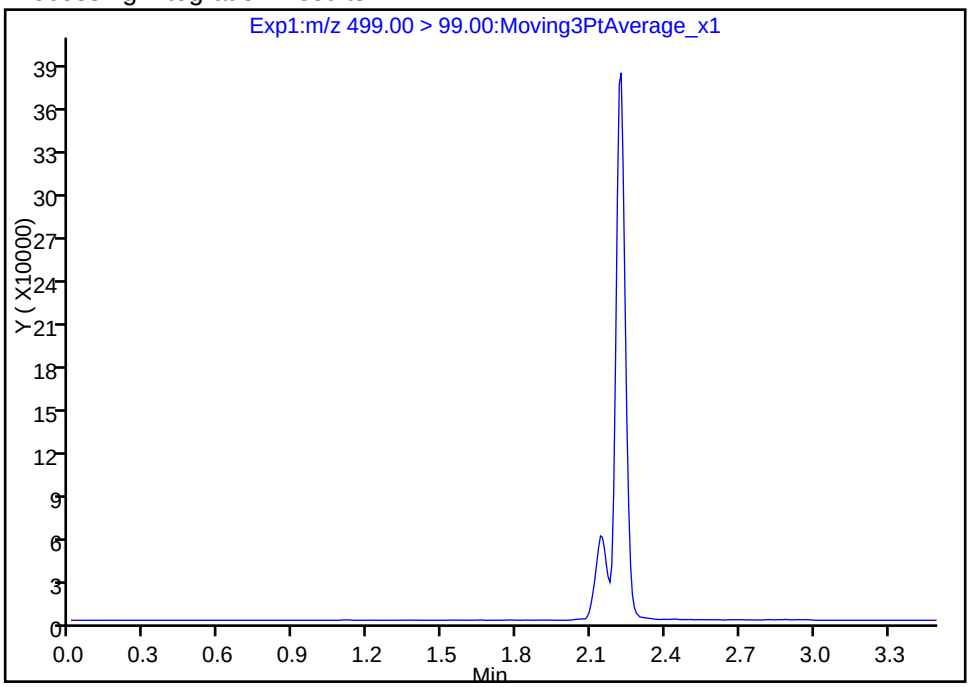
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_015.d
Injection Date: 02-Feb-2017 16:14:08 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 3 Worklist Smp#: 15
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

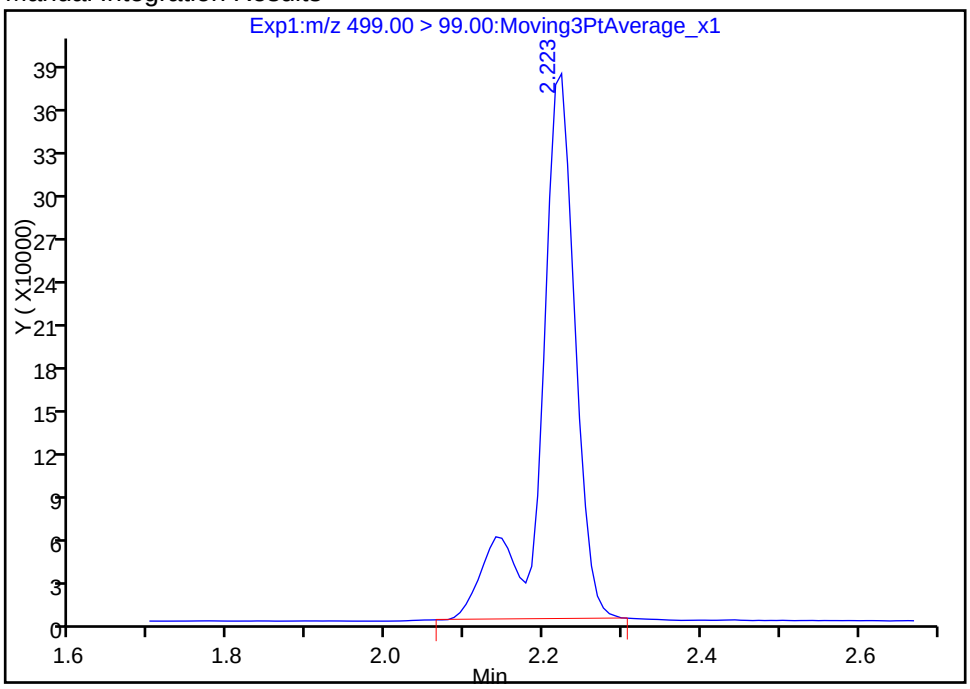
Not Detected
Expected RT: 2.22

Processing Integration Results



Manual Integration Results

RT: 2.22
Area: 1164323
Amount: 19.415905
Amount Units: ng/ml



Reviewer: barnettj, 02-Feb-2017 16:30:39
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

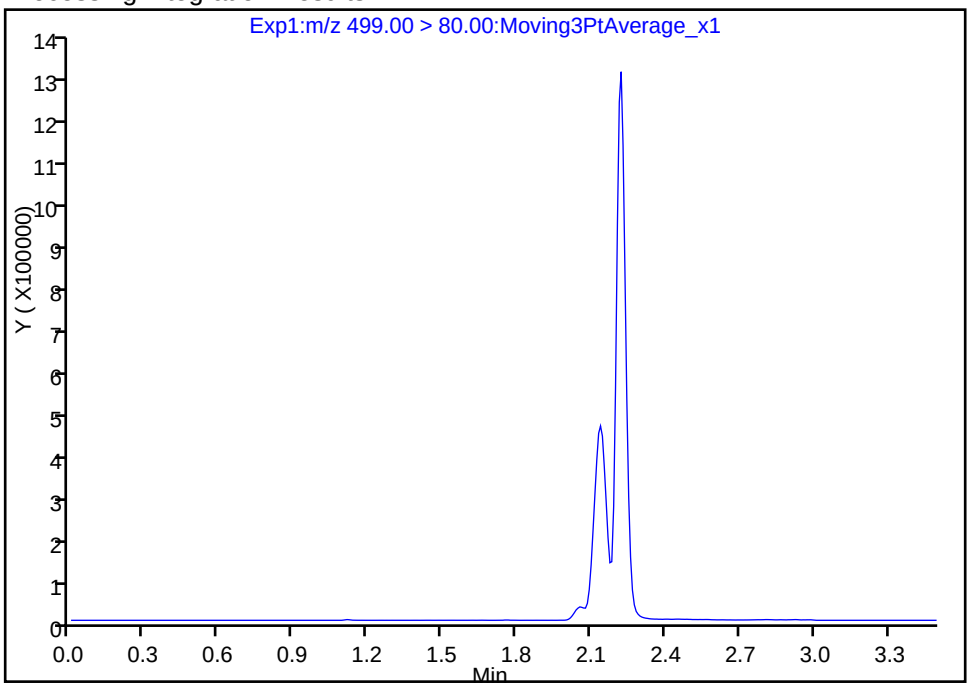
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_015.d
Injection Date: 02-Feb-2017 16:14:08 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 3 Worklist Smp#: 15
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

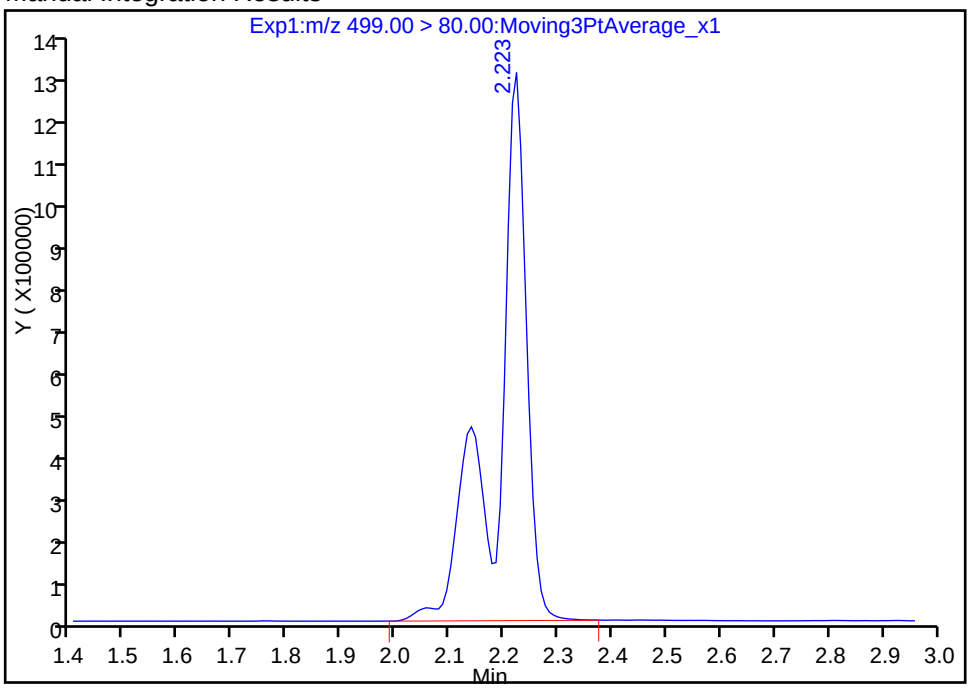
Not Detected
Expected RT: 2.22

Processing Integration Results



Manual Integration Results

RT: 2.22
Area: 4968687
Amount: 19.415905
Amount Units: ng/ml



Reviewer: barnettj, 02-Feb-2017 16:30:39
Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-25386-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-148547/1-A

Matrix: Water | Lab File ID: 2017.02.02B_537_006.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 02/01/2017 11:04

Sample wt/vol: 250(mL) | Date Analyzed: 02/02/2017 15:34

Con. Extract Vol.: 1.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 148790 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.060	0.048	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.024	U	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	82		70-130
STL00996	13C2 PFDA	92		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_006.d
Lims ID: MB 320-148547/1-A
Client ID:
Sample Type: MB
Inject. Date: 02-Feb-2017 15:34:34 ALS Bottle#: 32 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-148547/1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 02-Feb-2017 16:34:40 Calib Date: 26-Jan-2017 11:25:03
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d

Column 1 : Det: EXP1
Process Host: XAWRK034

First Level Reviewer: barnettj Date: 02-Feb-2017 15:56:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.639	1.638	0.001	1.000	2422513	8.20		5020	
* 6 13C2-PFOA									
415.00 > 370.00	1.988	1.979	0.009		2736309	10.0		5703	
* 7 13C4 PFOS									
503.00 > 80.00	2.231	2.220	0.011		6493740	28.7		5229	
$ 10 13C2 PFDA									
515.00 > 470.00	2.390	2.384	0.006	1.000	1616428	9.15		3491	

Report Date: 02-Feb-2017 16:35:14 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_006.d

Injection Date: 02-Feb-2017 15:34:34 Instrument ID: A8_N

Lims ID: MB 320-148547/1-A

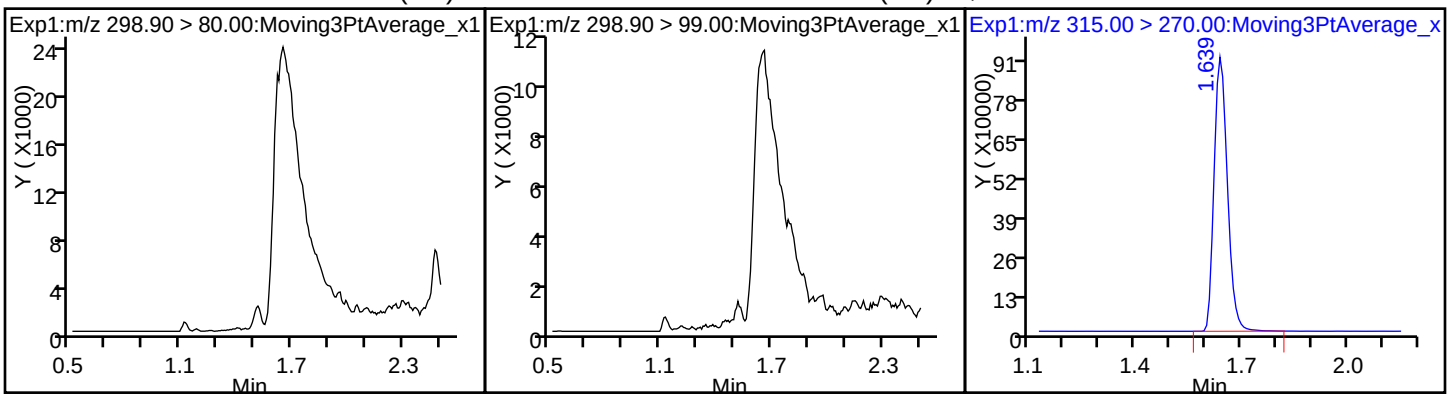
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 32 Worklist Smp#: 6

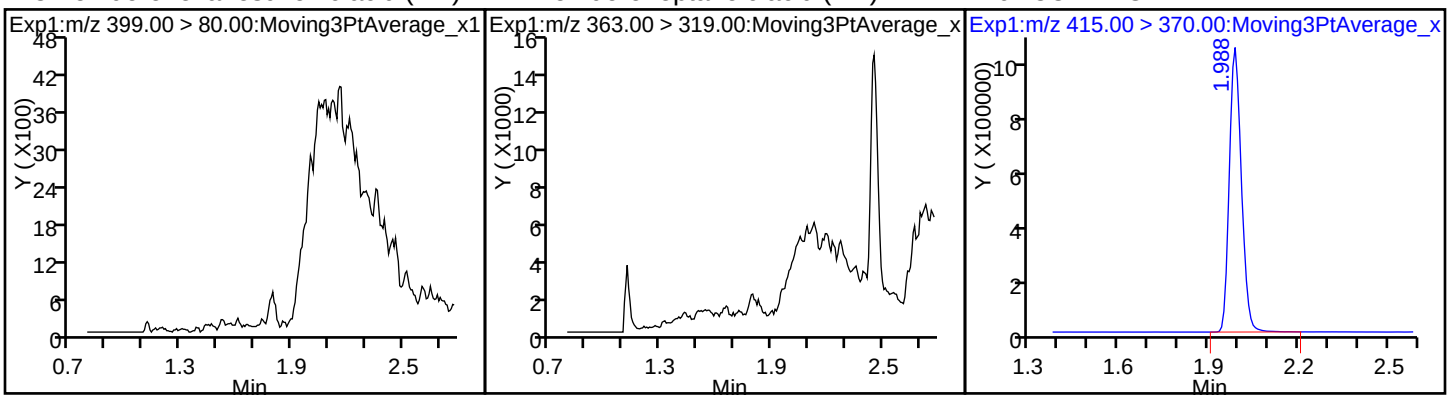
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

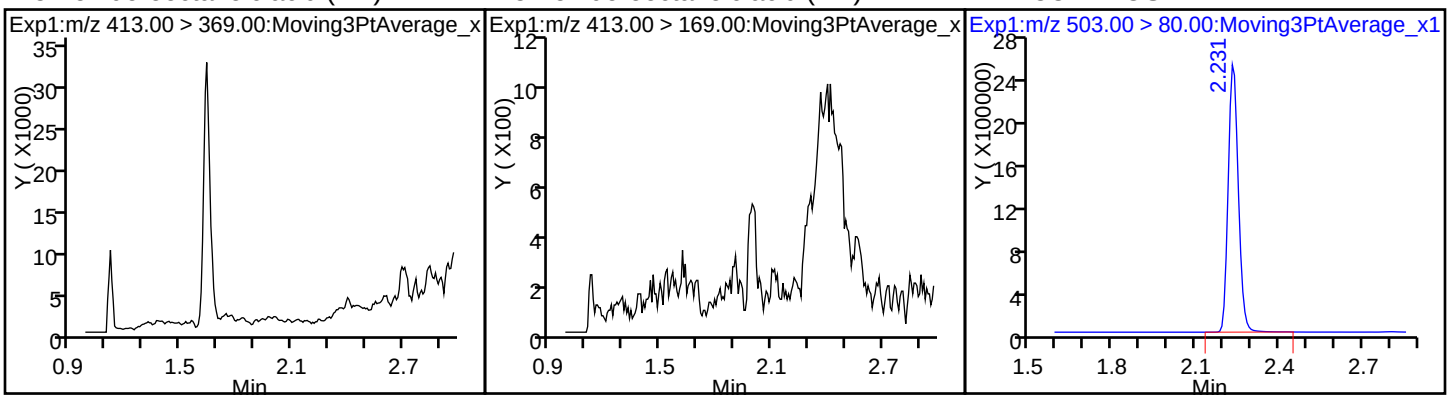
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) $ 2 13C2 PFHxA



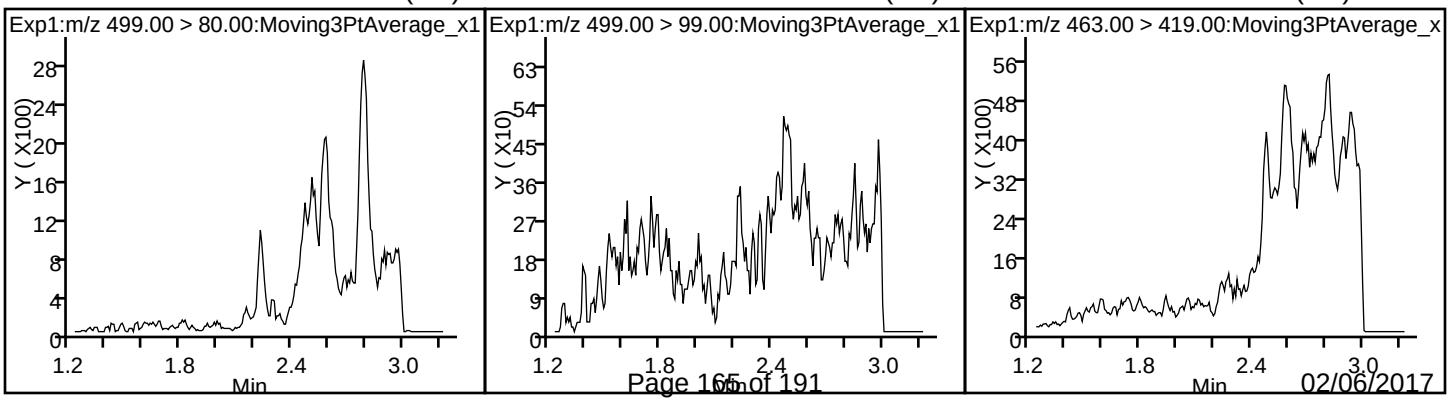
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



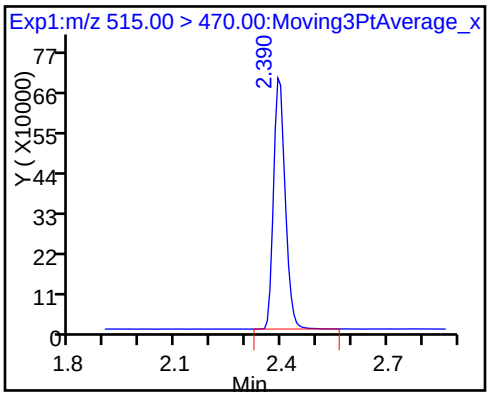
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) * 7 13C4 PFOS



8 Perfluorooctane sulfonic acid (ND) 8 Perfluorooctane sulfonic acid (ND) 9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.390
Y (X10000)
77
66
55
44
33
22
11
0
1.8
2.1
2.4
2.7
Min

TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_006.d
Lims ID: MB 320-148547/1-A
Client ID:
Sample Type: MB
Inject. Date: 02-Feb-2017 15:34:34 ALS Bottle#: 32 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-148547/1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 02-Feb-2017 16:34:40 Calib Date: 26-Jan-2017 11:25:03
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d

Column 1 : Det: EXP1
Process Host: XAWRK034

First Level Reviewer: barnettj Date: 02-Feb-2017 15:56:01

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	8.20	82.04
$ 10 13C2 PFDA	10.0	9.15	91.50

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Client Sample ID: Lab Sample ID: LCS 320-148547/2-A

Matrix: Water Lab File ID: 2017.02.02B_537_007.d

Analysis Method: 537 Date Collected:

Extraction Method: 537 Date Extracted: 02/01/2017 11:04

Sample wt/vol: 250(mL) Date Analyzed: 02/02/2017 15:38

Con. Extract Vol.: 1.0(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 148790 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.151		0.060	0.048	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.0717		0.030	0.024	0.0094
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.368		0.14	0.11	0.048

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

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_007.d
Lims ID: LCS 320-148547/2-A
Client ID:
Sample Type: LCS
Inject. Date: 02-Feb-2017 15:38:58 ALS Bottle#: 33 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-148547/2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 02-Feb-2017 16:34:40 Calib Date: 26-Jan-2017 11:25:03
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d

Column 1 : Det: EXP1
Process Host: XAWRK034

First Level Reviewer: barnettj Date: 02-Feb-2017 16:17:53

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.510	1.510	0.0	1.000	30839516	91.9		1694	
298.90 > 99.00	1.502	1.510	-0.008	0.995	15057062		2.05(0.00-0.00)	2116	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.631	1.638	-0.007	1.000	2473908	8.86		5696	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.783	1.787	-0.004	1.000	10509654	29.3		2082	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.791	1.788	0.003	1.000	2228704	8.94		287	
* 6 13C2-PFOA									
415.00 > 370.00	1.980	1.979	0.001		2586358	10.0		4871	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.980	1.980	0.0	1.000	4290121	17.9		376	
413.00 > 169.00	1.980	1.980	0.0	1.000	2396068		1.79(0.00-0.00)	2146	
* 7 13C4 PFOS									
503.00 > 80.00	2.231	2.220	0.011		6118574	28.7		6967	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.147	2.223	-0.076	1.000	8980859	37.7		888	
499.00 > 99.00	2.231	2.223	0.008	1.039	2034734		4.41(0.00-0.00)	2287	
9 Perfluorononanoic acid									
463.00 > 419.00	2.238	2.229	0.009	1.000	3411184	19.4		848	
$ 10 13C2 PFDA									
515.00 > 470.00	2.390	2.384	0.006	1.000	1594470	9.55		3626	

Report Date: 02-Feb-2017 16:35:15 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_007.d

Injection Date: 02-Feb-2017 15:38:58 Instrument ID: A8_N

Lims ID: LCS 320-148547/2-A

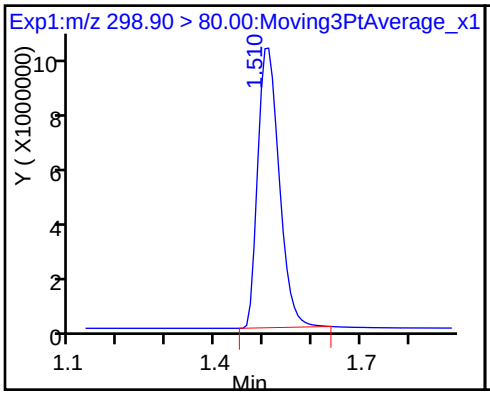
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 33 Worklist Smp#: 7

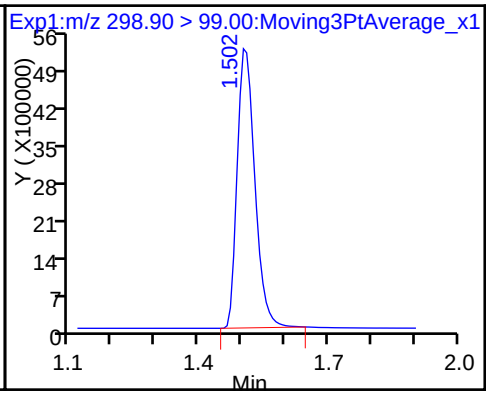
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

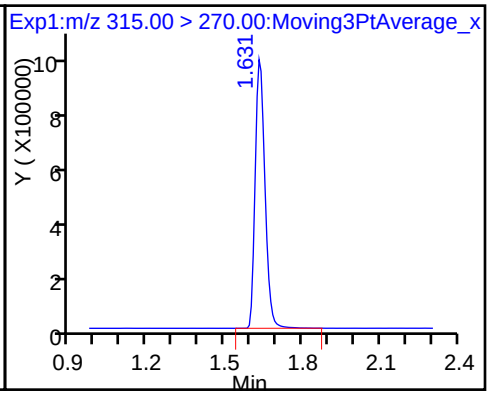
1 Perfluorobutanesulfonic acid



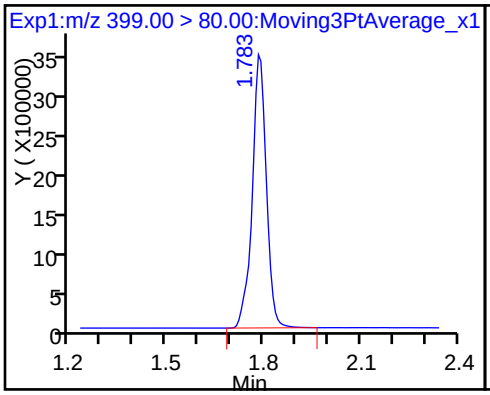
1 Perfluorobutanesulfonic acid



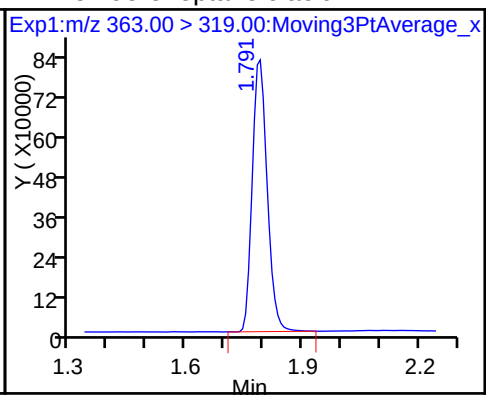
$ 2 13C2 PFHxA



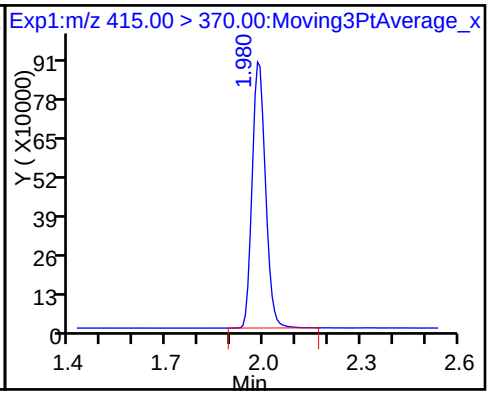
3 Perfluorohexanesulfonic acid



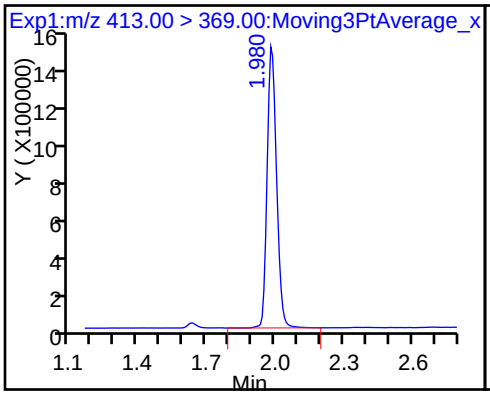
4 Perfluoroheptanoic acid



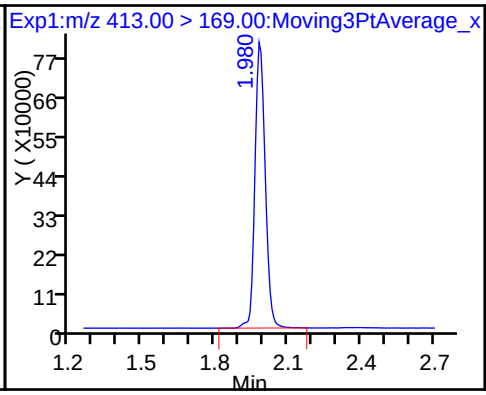
* 6 13C2-PFOA



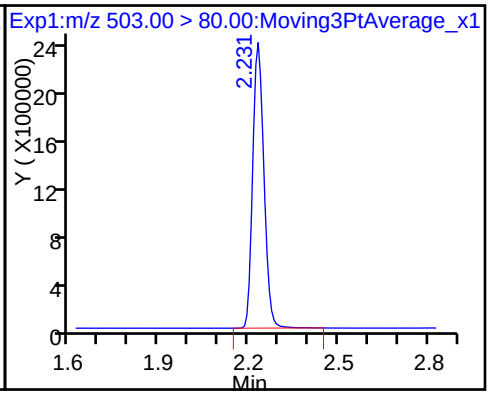
5 Perfluorooctanoic acid



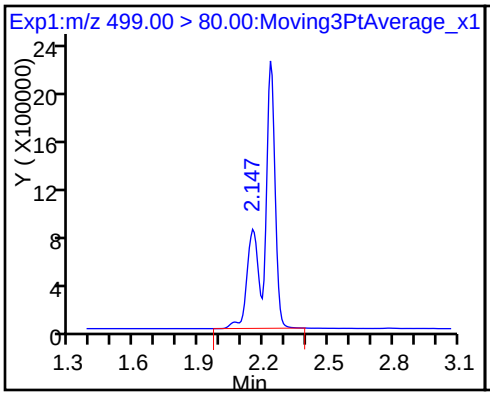
5 Perfluorooctanoic acid



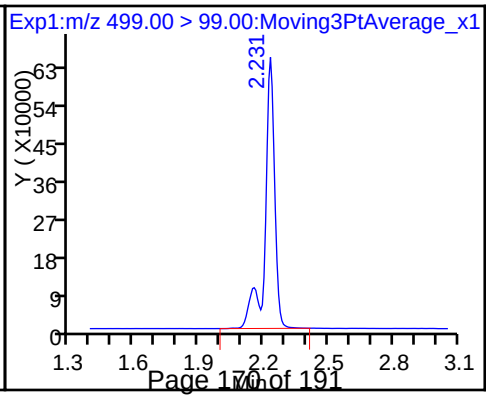
* 7 13C4 PFOS



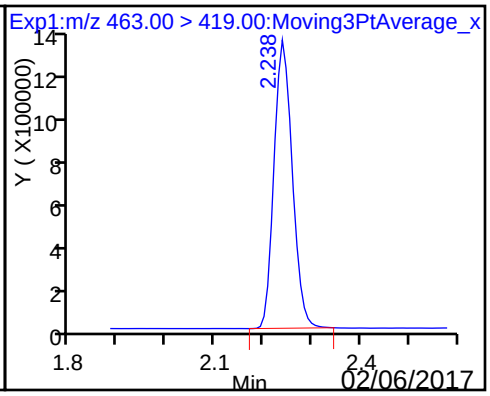
8 Perfluorooctane sulfonic acid



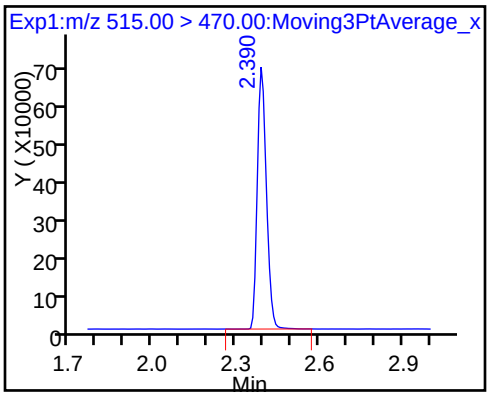
8 Perfluorooctane sulfonic acid



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.390
Y (X10000)
70
60
50
40
30
20
10
0
1.7
2.0
2.3
2.6
2.9
Min

TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_007.d
Lims ID: LCS 320-148547/2-A
Client ID:
Sample Type: LCS
Inject. Date: 02-Feb-2017 15:38:58 ALS Bottle#: 33 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-148547/2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 02-Feb-2017 16:34:40 Calib Date: 26-Jan-2017 11:25:03
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d

Column 1 : Det: EXP1
Process Host: XAWRK034

First Level Reviewer: barnettj Date: 02-Feb-2017 16:17:53

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	8.86	88.63
$ 10 13C2 PFDA	10.0	9.55	95.49

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-25386-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCSD 320-148547/3-A

Matrix: Water | Lab File ID: 2017.02.02B_537_008.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 02/01/2017 11:04

Sample wt/vol: 250(mL) | Date Analyzed: 02/02/2017 15:43

Con. Extract Vol.: 1.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 148790 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.147		0.060	0.048	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.0699		0.030	0.024	0.0094
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.355		0.14	0.11	0.048

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

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_008.d
Lims ID: LCSD 320-148547/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 02-Feb-2017 15:43:21 ALS Bottle#: 34 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-148547/3-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 02-Feb-2017 16:34:40 Calib Date: 26-Jan-2017 11:25:03
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d

Column 1 : Det: EXP1
Process Host: XAWRK034

First Level Reviewer: barnettj Date: 02-Feb-2017 16:21:47

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.510	1.510	0.0	1.000	30517156	88.7		1669	
298.90 > 99.00	1.510	1.510	0.0	1.000	14849679		2.06(0.00-0.00)	2278	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.631	1.638	-0.007	1.000	2449692	8.96		5774	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.791	1.787	0.004	1.000	10250272	28.0		2144	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.791	1.788	0.003	1.000	2217708	9.08		311	
* 6 13C2-PFOA									
415.00 > 370.00	1.980	1.979	0.001		2533101	10.0		5478	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.988	1.980	0.008	1.000	4092501	17.5		361	
413.00 > 169.00	1.988	1.980	0.008	1.000	2388891		1.71(0.00-0.00)	2134	
* 7 13C4 PFOS									
503.00 > 80.00	2.231	2.220	0.011		6229038	28.7		6355	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.147	2.223	-0.076	1.000	8936916	36.9		905	
499.00 > 99.00	2.231	2.223	0.008	1.039	2047536		4.36(0.00-0.00)	2184	
9 Perfluorononanoic acid									
463.00 > 419.00	2.238	2.229	0.009	1.000	3425658	19.8		837	
$ 10 13C2 PFDA									
515.00 > 470.00	2.390	2.384	0.006	1.000	1522240	9.31		2916	

Report Date: 02-Feb-2017 16:35:15 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_008.d

Injection Date: 02-Feb-2017 15:43:21 Instrument ID: A8_N

Lims ID: LCSD 320-148547/3-A

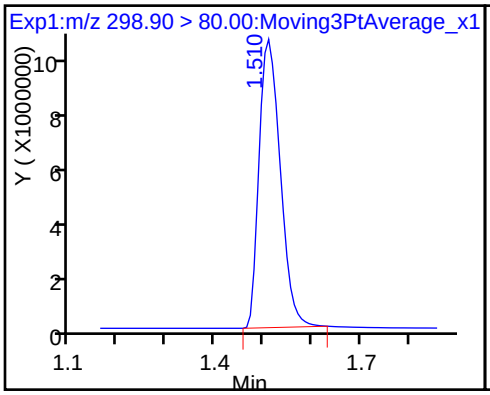
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 34 Worklist Smp#: 8

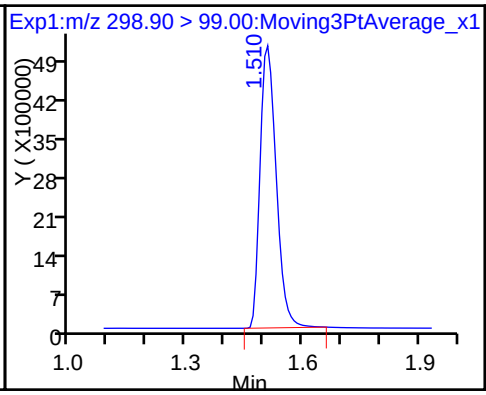
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

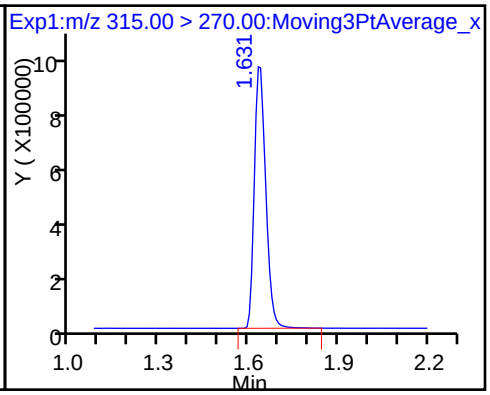
1 Perfluorobutanesulfonic acid



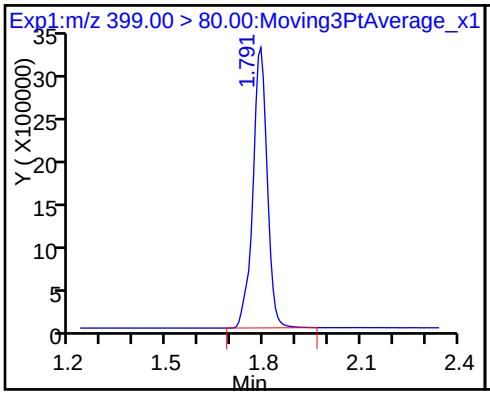
1 Perfluorobutanesulfonic acid



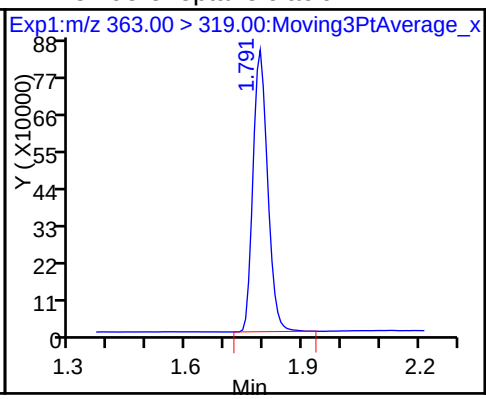
$ 2 13C2 PFHxA



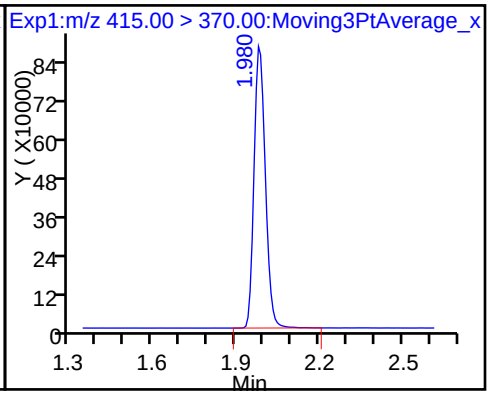
3 Perfluorohexanesulfonic acid



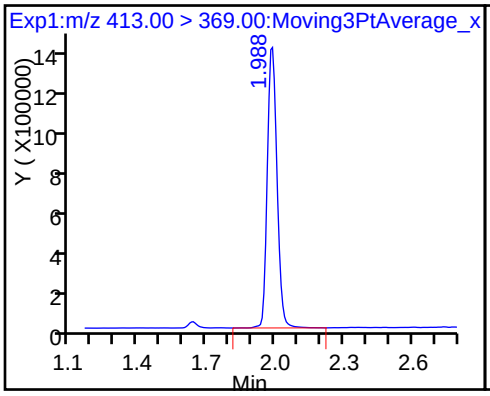
4 Perfluoroheptanoic acid



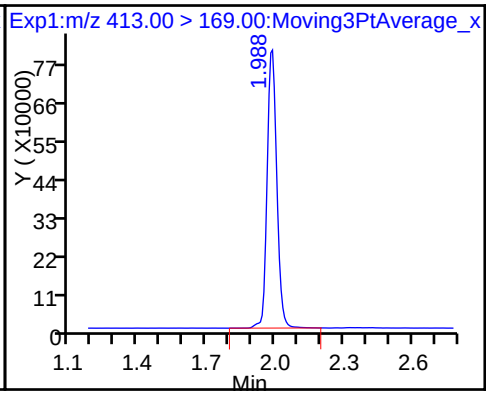
* 6 13C2-PFOA



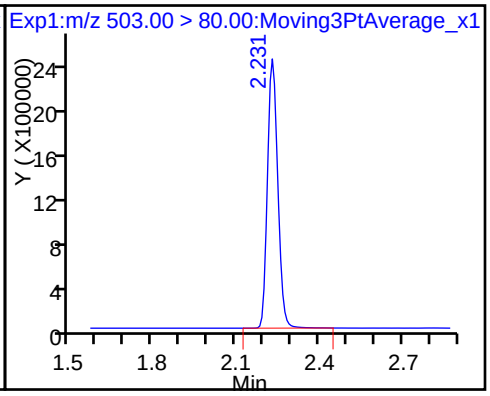
5 Perfluorooctanoic acid



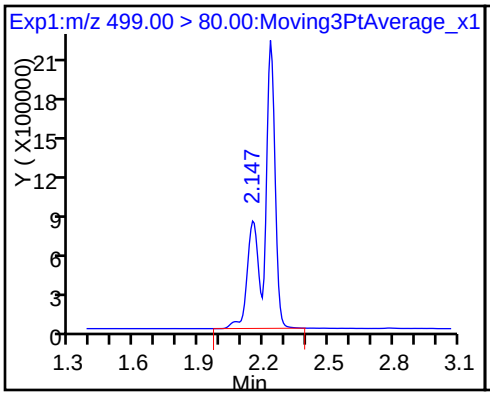
5 Perfluorooctanoic acid



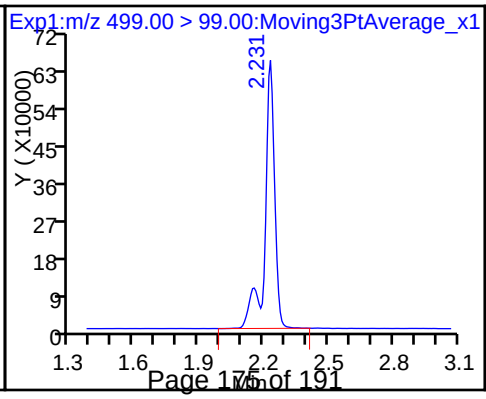
* 7 13C4 PFOS



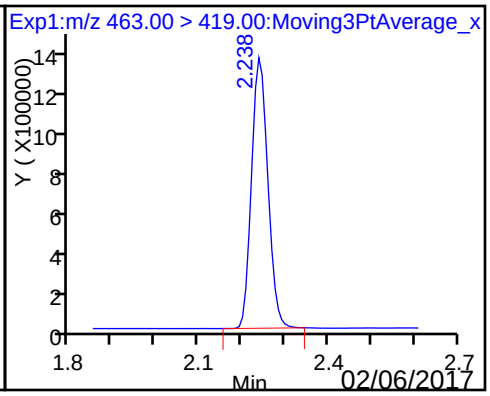
8 Perfluorooctane sulfonic acid



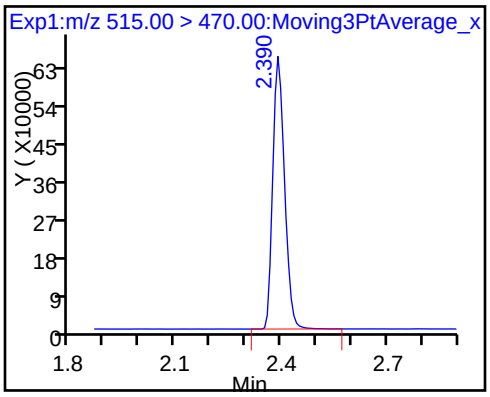
8 Perfluorooctane sulfonic acid



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.390
Y (X10000)
63
54
45
36
27
18
9
0
1.8
2.1
2.4
2.7
Min

TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\2017.02.02B_537_008.d
Lims ID: LCSD 320-148547/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 02-Feb-2017 15:43:21 ALS Bottle#: 34 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-148547/3-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 02-Feb-2017 16:34:40 Calib Date: 26-Jan-2017 11:25:03
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170126-39222.b\2017.01.26_537_CURVE_009.d

Column 1 : Det: EXP1
Process Host: XAWRK034

First Level Reviewer: barnettj Date: 02-Feb-2017 16:21:47

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	8.96	89.61
$ 10 13C2 PFDA	10.0	9.31	93.08

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Instrument ID: A8_N Start Date: 01/26/2017 11:03

Analysis Batch Number: 147939 End Date: 01/26/2017 11:46

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-147939/4		01/26/2017 11:03	1	2017.01.26_537_CURVE_004.d	Acquity 2.1(mm)
IC 320-147939/5		01/26/2017 11:07	1	2017.01.26_537_CURVE_005.d	Acquity 2.1(mm)
IC 320-147939/6		01/26/2017 11:11	1	2017.01.26_537_CURVE_006.d	Acquity 2.1(mm)
IC 320-147939/7 ICISAV		01/26/2017 11:16	1	2017.01.26_537_CURVE_007.d	Acquity 2.1(mm)
IC 320-147939/8		01/26/2017 11:20	1	2017.01.26_537_CURVE_008.d	Acquity 2.1(mm)
IC 320-147939/9		01/26/2017 11:25	1	2017.01.26_537_CURVE_009.d	Acquity 2.1(mm)
ZZZZZ		01/26/2017 11:29	1		Acquity 2.1(mm)
CCVL 320-147939/11		01/26/2017 11:33	1	2017.01.26_537_CURVE_011.d	Acquity 2.1(mm)
ZZZZZ		01/26/2017 11:38	1		Acquity 2.1(mm)
ICV 320-147939/13		01/26/2017 11:42	1	2017.01.26_537_CURVE_013.d	Acquity 2.1(mm)
ZZZZZ		01/26/2017 11:46	1		Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Instrument ID: A8_N Start Date: 02/02/2017 15:21

Analysis Batch Number: 148790 End Date: 02/02/2017 16:14

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-148790/3 CCVIS		02/02/2017 15:21	1	2017.02.02B_537 003.d	GeminiC18 3x100 3(mm)
ZZZZZ		02/02/2017 15:25	1		GeminiC18 3x100 3(mm)
ZZZZZ		02/02/2017 15:30	1		GeminiC18 3x100 3(mm)
MB 320-148547/1-A		02/02/2017 15:34	1	2017.02.02B_537 006.d	GeminiC18 3x100 3(mm)
LCS 320-148547/2-A		02/02/2017 15:38	1	2017.02.02B_537 007.d	GeminiC18 3x100 3(mm)
LCSD 320-148547/3-A		02/02/2017 15:43	1	2017.02.02B_537 008.d	GeminiC18 3x100 3(mm)
320-25386-1		02/02/2017 15:47	1	2017.02.02B_537 009.d	GeminiC18 3x100 3(mm)
320-25386-2		02/02/2017 15:52	1	2017.02.02B_537 010.d	GeminiC18 3x100 3(mm)
ZZZZZ		02/02/2017 15:56	1		GeminiC18 3x100 3(mm)
ZZZZZ		02/02/2017 16:00	1		GeminiC18 3x100 3(mm)
ZZZZZ		02/02/2017 16:05	1		GeminiC18 3x100 3(mm)
ZZZZZ		02/02/2017 16:09	1		GeminiC18 3x100 3(mm)
CCV 320-148790/15 CCVIS		02/02/2017 16:14	1	2017.02.02B_537 015.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Batch Number: 148547 Batch Start Date: 02/01/17 11:04 Batch Analyst: Sharifi, Nooshin

Batch Method: 537 Batch End Date: 02/02/17 13:00

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00030
MB 320-148547/1		537, 537				250 mL	1.0 mL	7 SU	20 uL
LCS 320-148547/2		537, 537				250 mL	1.0 mL	7 SU	20 uL
LCSD 320-148547/3		537, 537				250 mL	1.0 mL	7 SU	20 uL
320-25386-A-1	WI-CV-1RW72-0117	537, 537	T	243.70 g	27.92 g	215.8 mL	1.0 mL	7 SU	20 uL
320-25386-A-2	WI-CV-1FB72-0117	537, 537	T	293.90 g	26.65 g	267.3 mL	1.0 mL	7 SU	20 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-MSP 00017	LC537-SU 00030	AnalysisComment			
MB 320-148547/1		537, 537			50 uL	Chlorine ND			
LCS 320-148547/2		537, 537		50 uL	50 uL	Chlorine ND			
LCSD 320-148547/3		537, 537		50 uL	50 uL	Chlorine ND			
320-25386-A-1	WI-CV-1RW72-0117	537, 537	T		50 uL	Chlorine ND			
320-25386-A-2	WI-CV-1FB72-0117	537, 537	T		50 uL	Chlorine ND			

Batch Notes	
Manifold ID	1,4
Methanol ID	827183
Pipette ID	MD05306
Analyst ID - IS Reagent Drop	VPM
Analyst ID - IS Reagent Drop Witness	CCB
Analyst ID - SU Reagent Drop	NSH
Analyst ID - SU Reagent Drop Witness	HJA
Analyst ID - TA Reagent Drop	NSH
Analyst ID - TA Reagent Drop Witness	HJA
SPE Cartridge ID	6341059-03
Trizma ID	SLBR4303V
Reagent Water ID	1/24/17

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

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Batch Number: 148547 Batch Start Date: 02/01/17 11:04 Batch Analyst: Sharifi, Nooshin

Batch Method: 537 Batch End Date: 02/02/17 13:00

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

A8

Job No: 25386 Instrument ID & Date: 2-2-17 ICAL Batch: 147939
Extraction Batch: 148547 Worklist #: 39457 TALS Batch: 148790

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 2-3-17 2nd Level Reviewer / Date: 2/6/2017

NCM # and Comments: _____

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Sacramento

Method 537 ICAL Checklist

A8

Instrument ID & Date: 1-26-17 Worklist#: 39222

ICAL Batch: 147939, 147974 Calibration ID number: 27929, 27930

Review Items	--- Level 1 --- Yes	No	N/A	Level 2
Initial Calibration				
1. Mass calibration, as needed, verified by full scan of PFC stock standard. All PFC ions used for quantitation are within 0.3 m/z of true mass?	✓			✓
2. Responses increase with increasing concentration?	✓			✓
3. Fit used (circle): (Average) Linear (1/x²)Linear (Quadratic) (6 points minimum)				✓
4. Meets fit criteria? Intercept ≤ ½ RL RSD ≤ 30% for Average $R^2 \geq 0.990$ for Linear $R^2 \geq 0.990$ for Quadratic NOTE: "Force through Zero" must be used and weighted if needed	✓			✓
5. If quadratic fit used the curve does not "bend over".	✓			✓
6. Feed calibration points into the calculated curve. Are points ≤MRL within ±50% of true value? Are points >MRL within ±30% of true value?	✓			✓
7. Any carryover from the high calibration point must be < 1/3 RL	✓			✓
8. Asymmetry check meets criteria for the first two eluting peaks?.(0.8 - 1.5).	✓			✓
9. is the asymmetry check scanned and linked in TALS to the calibration point?	✓			✓
10. Is ICV (2nd source) ± 30% of true value?	✓			✓
11. Is ICV (2nd source) internal standards ±50% of average area of the ICAL?	✓			✓
12. ICal locked in Chrom and uploaded to TALS?	✓			
13. ICal locked in TALS and scanned?				✓

1st Level Reviewer / Date: JRB 1-26-17 2nd Level Reviewer / Date: MWM 1/27/2017

NCM # and Comments: _____

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 02FEB2017B_537 Worklist Number: 39457
Instrument Name: A8_N Chrom Method: 537_A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20170202-39457.b
QC Batching: Enabled Limit Group Batching: Enabled

QC Batch: 1	LC 537 ICAL Raw Batch: 148790
# 1 RB	# 1 RB
# 2 RB	# 2 RB
# 3 CCV L5	# 3 CCV L5
# 4 RB	# 4 RB
# 5 320-25430-A-1-A	# 5 320-25430-A-1-A
# 6 MB 320-148547/1-A	# 6 MB 320-148547/1-A
# 7 LCS 320-148547/2-A	# 7 LCS 320-148547/2-A
# 8 LCSD 320-148547/3-A	# 8 LCSD 320-148547/3-A
# 9 320-25386-A-1-A	# 9 320-25386-A-1-A
#10 320-25386-A-2-A	#10 320-25386-A-2-A
#11 MB 320-148601/1-A	#11 MB 320-148601/1-A
#12 LLCS 320-148601/2-A	#12 LLCS 320-148601/2-A
#13 LLCSD 320-148601/3-A	#13 LLCSD 320-148601/3-A
#14 320-24955-A-1-C	#14 320-24955-A-1-C
#15 CCV L3	#15 CCV L3

QC Batch: 2	LC 537 ICAL Raw Batch: 148791
#15 CCV L3	#15 CCV L3
#16 RB	#16 RB
#17 320-24955-A-2-C	#17 320-24955-A-2-C
#18 320-24955-B-3-C	#18 320-24955-B-3-C
#19 320-24955-A-4-C	#19 320-24955-A-4-C
#20 CCV L5	#20 CCV L5
#21 RB	#21 RB

02

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-148547

Method Code: 320-537_Prep-320

Analyst: Sharifi, Nooshin

Batch Open: 2/1/2017 11:04:00AM

Batch End: 2/2/17 13:06

AB 2/2/17

Extraction of Perfluorinated Alkyl Acids

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-148547/1 N/A	N/A		250 mL 1.0 mL	7			N/A	N/A	N/A	Chlorine ND	MB 320-148547/1-A
2	LCS~320-148547/2 N/A	N/A		250 mL 1.0 mL	7			N/A	N/A	N/A	Chlorine ND	LCS 320-148547/2-A
3	LCSD~320-148547/3 N/A	N/A		250 mL 1.0 mL	7			N/A	N/A	N/A	Chlorine ND	LCSD 320-148547/3-A
4	320-25386-A-1 (537_DOD5)	N/A (320-25386-1)	243.70 g 27.92 g	215.8 mL 1.0 mL	7			2/4/17	5_Days	4	Chlorine ND	320-25386-A-1-A
5	320-25386-A-2 (537_DOD5)	N/A (320-25386-1)	293.90 g 26.65 g	267.3 mL 1.0 mL	7			2/4/17	5_Days	4	Chlorine ND	320-25386-A-2-A

02/06/2017

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-148547

Method Code: 320-537_Prep-320

Analyst: Sharifi, Nooshin

Batch Open: 2/1/2017 11:04:00AM

Batch End:

Batch Notes

Manifold ID	1,4
Trizma ID	SLBR4303V
SPE Cartridge ID	6341059-03
Methanol ID	827183
Reagent Water ID	1/24/17
Pipette ID	MD05306
Analyst ID - TA Reagent Drop	NSH
Analyst ID - TA Reagent Drop Witness	HJA
Analyst ID - SU Reagent Drop	NSH
Analyst ID - SU Reagent Drop Witness	HJA
Analyst ID - IS Reagent Drop	VPM
Analyst ID - IS Reagent Drop Witness	CB
Batch Comment	819947 827698 2/2/17

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-148547

Method Code: 320-537_Prep-320

Analyst: Sharifi, Nooshin

Batch Open: 2/1/2017 11:04:00AM

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-148547/1	LC537-SU_00030	50 uL	1.0 mL	NSH 2-1-17	HSA 2/1/17
LCS 320-148547/2	LC537-MSP_00017	50 uL	1.0 mL		
LCS 320-148547/2	LC537-SU_00030	50 uL	1.0 mL		
LCSD 320-148547/3	LC537-MSP_00017	50 uL	1.0 mL		
LCSD 320-148547/3	LC537-SU_00030	50 uL	1.0 mL		
320-25386-A-1	LC537-SU_00030	50 uL	1.0 mL		
320-25386-A-2	LC537-SU_00030	50 uL	1.0 mL		

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 320-148547 Test: 537-DOD

Earliest Holding Time: 2-11-17

Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	NA	NA
Method/sample/login/QAS checked and correct	✓	✓

cs 2-4-17 vpm 2/2/17

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: CS Date: 2-2-17

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

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: 1/30/2017	COC No: 1
Tiffany Hill	Tel/Fax: (757) 671-6258	Lab Contact: Laura Turpen	Carrier: FedEx	_____ of _____ 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: OLF Coupeville	☐ 2 days			Job / SDG No.:
P O #: 100067106050 - 679580.09.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-CV-1RW72-0117	1/28/17	1002	G	DW	2	N	N	X	
WI-CV-1FB72-0117	1/28/17	1003	G	DW	2	N	N	X	
								6	

320-25386 Chain of Custody

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

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

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

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

☐Return to Client ☑Disposal by Lab ☐Archive for_____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: 2.1 Corr'd: 1.8 Therm ID No.: 12

Relinquished by: Eric Epple	Company: CH2M	Date/Time: 1-30-17/1600	Received by:	Company: JAWS	Date/Time: 1/31/17 1000
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

Login Sample Receipt Checklist

Client: CH2M Hill Constructors, Inc.

Job Number: 320-25386-1

Login Number: 25386
List Number: 1
Creator: Edman, Connor M

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
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	

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
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	01/28/2017 10:02
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	01/28/2017 10:02
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	01/28/2017 10:02
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	01/28/2017 10:02
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	01/28/2017 10:02
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	01/28/2017 10:03
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	01/28/2017 10:03
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	01/28/2017 10:03
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	01/28/2017 10:03
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	REG	W	4	01/28/2017 10:03
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BS	W	4	02/01/2017 11:04
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BS	W	4	02/01/2017 11:04
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BS	W	4	02/01/2017 11:04
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BS	W	4	02/01/2017 11:04
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BS	W	4	02/01/2017 11:04
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BSD	W	4	02/01/2017 11:04
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BSD	W	4	02/01/2017 11:04
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BSD	W	4	02/01/2017 11:04
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BSD	W	4	02/01/2017 11:04
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	BSD	W	4	02/01/2017 11:04
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	LB1	W	4	02/01/2017 11:04
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	LB1	W	4	02/01/2017 11:04
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	LB1	W	4	02/01/2017 11:04
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	LB1	W	4	02/01/2017 11:04
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A	NONE		537	ORG	TAMER	Test America	NONE	NA	METHOD	000	LB1	W	4	02/01/2017 11:04

Contract_ID	DO_CTO_ Number	Phase	Installation_ID	Sample_Name	Date_Received	Leachate_Date	Leachate_Time	Extraction_Date	Extraction_Time	Analysis_Date	Analysis_Time	Lab_Sample_ID	Dilution	Run_Number	Percent_ Moisture	Percent_ Lipid
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117	01/31/2017			20170201	11:04:00	20170202	15:47:00	320-25386-1	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117	01/31/2017			20170201	11:04:00	20170202	15:47:00	320-25386-1	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117	01/31/2017			20170201	11:04:00	20170202	15:47:00	320-25386-1	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117	01/31/2017			20170201	11:04:00	20170202	15:47:00	320-25386-1	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117	01/31/2017			20170201	11:04:00	20170202	15:47:00	320-25386-1	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117	01/31/2017			20170201	11:04:00	20170202	15:52:00	320-25386-2	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117	01/31/2017			20170201	11:04:00	20170202	15:52:00	320-25386-2	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117	01/31/2017			20170201	11:04:00	20170202	15:52:00	320-25386-2	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117	01/31/2017			20170201	11:04:00	20170202	15:52:00	320-25386-2	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117	01/31/2017			20170201	11:04:00	20170202	15:52:00	320-25386-2	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	02/01/2017			20170201	11:04:00	20170202	15:38:00	LCS 320-148547/2-A	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	02/01/2017			20170201	11:04:00	20170202	15:38:00	LCS 320-148547/2-A	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	02/01/2017			20170201	11:04:00	20170202	15:38:00	LCS 320-148547/2-A	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	02/01/2017			20170201	11:04:00	20170202	15:38:00	LCS 320-148547/2-A	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	02/01/2017			20170201	11:04:00	20170202	15:38:00	LCS 320-148547/2-A	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	02/01/2017			20170201	11:04:00	20170202	15:43:00	LCSD 320-148547/3-A	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	02/01/2017			20170201	11:04:00	20170202	15:43:00	LCSD 320-148547/3-A	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	02/01/2017			20170201	11:04:00	20170202	15:43:00	LCSD 320-148547/3-A	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	02/01/2017			20170201	11:04:00	20170202	15:43:00	LCSD 320-148547/3-A	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	02/01/2017			20170201	11:04:00	20170202	15:43:00	LCSD 320-148547/3-A	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A	02/01/2017			20170201	11:04:00	20170202	15:34:00	MB 320-148547/1-A	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A	02/01/2017			20170201	11:04:00	20170202	15:34:00	MB 320-148547/1-A	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A	02/01/2017			20170201	11:04:00	20170202	15:34:00	MB 320-148547/1-A	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A	02/01/2017			20170201	11:04:00	20170202	15:34:00	MB 320-148547/1-A	1	1		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A	02/01/2017			20170201	11:04:00	20170202	15:34:00	MB 320-148547/1-A	1	1		

Contract_ID	DO_CTO_ Number	Phase	Installation_ID	Sample_Name	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
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117	Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.056	UG_L	U		PR	TRG			
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117	Perfluorooctanoic acid (PFOA)	335-67-1		0.028	UG_L	U		PR	TRG			
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117	Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.13	UG_L	U		PR	TRG			
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117	13C2 PFHXA	13C2 PFHXA		85	PCT_REC			PR	SURR		SLSA	130
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117	13C2 PFDA	13C2 PFDA		89	PCT_REC			PR	SURR		SLSA	130
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117	Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.045	UG_L	U		PR	TRG			
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117	Perfluorooctanoic acid (PFOA)	335-67-1		0.022	UG_L	U		PR	TRG			
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117	Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.10	UG_L	U		PR	TRG			
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117	13C2 PFHXA	13C2 PFHXA		86	PCT_REC			PR	SURR		SLSA	130
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117	13C2 PFDA	13C2 PFDA		89	PCT_REC			PR	SURR		SLSA	130
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	Perfluorooctane Sulfonate (PFOS)	1763-23-1		94	PCT_REC			PR	TRG		LSA	130
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	Perfluorooctanoic acid (PFOA)	335-67-1		92	PCT_REC			PR	TRG		LSA	130
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	Perfluorobutanesulfonic acid (PFBS)	375-73-5		102	PCT_REC			PR	TRG		LSA	130
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	13C2 PFHXA	13C2 PFHXA		89	PCT_REC			PR	SURR		SLSA	130
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	13C2 PFDA	13C2 PFDA		95	PCT_REC			PR	SURR		SLSA	130
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	Perfluorooctane Sulfonate (PFOS)	1763-23-1		92	PCT_REC			PR	TRG		LSP	130
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	Perfluorooctanoic acid (PFOA)	335-67-1		90	PCT_REC			PR	TRG		LSP	130
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	Perfluorobutanesulfonic acid (PFBS)	375-73-5		99	PCT_REC			PR	TRG		LSP	130
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	13C2 PFHXA	13C2 PFHXA		90	PCT_REC			PR	SURR		SLSA	130
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	13C2 PFDA	13C2 PFDA		93	PCT_REC			PR	SURR		SLSA	130
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A	Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.048	UG_L	U		PR	TRG			
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A	Perfluorooctanoic acid (PFOA)	335-67-1		0.024	UG_L	U		PR	TRG			
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A	Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.11	UG_L	U		PR	TRG			
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A	13C2 PFHXA	13C2 PFHXA		82	PCT_REC			PR	SURR		SLSA	130
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A	13C2 PFDA	13C2 PFDA		92	PCT_REC			PR	SURR		SLSA	130

Contract_ID	DO_CTO_ Number	Phase	Installation_ID	Sample_Name	QC_Accuracy_ Lower	Control_Limit_ Date	QC_Narrative	MDL	Detection_Limit	QSM_Version	DL	LOD	LOQ	SDG	Analysis_Batch	Validator_Name	Val_Date
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117		00000000				5.0	0.018	0.056	0.070	320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117		00000000				5.0	0.011	0.028	0.035	320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117		00000000				5.0	0.055	0.13	0.16	320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117	70	00000000				5.0				320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW72-0117	70	00000000				5.0				320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117		00000000				5.0	0.014	0.045	0.056	320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117		00000000				5.0	0.0088	0.022	0.028	320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117		00000000				5.0	0.045	0.10	0.13	320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117	70	00000000				5.0				320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB72-0117	70	00000000				5.0				320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	70	00000000				5.0	0.016	0.048	0.060	320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	70	00000000				5.0	0.0094	0.024	0.030	320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	70	00000000				5.0	0.048	0.11	0.14	320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	70	00000000				5.0				320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-148547/2-A	70	00000000				5.0				320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	70	00000000				5.0	0.016	0.048	0.060	320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	70	00000000				5.0	0.0094	0.024	0.030	320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	70	00000000				5.0	0.048	0.11	0.14	320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	70	00000000				5.0				320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-148547/3-A	70	00000000				5.0				320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A		00000000				5.0	0.016	0.048	0.060	320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A		00000000				5.0	0.0094	0.024	0.030	320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A		00000000				5.0	0.048	0.11	0.14	320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A	70	00000000				5.0				320-25386-1	320-148790		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-148547/1-A	70	00000000				5.0				320-25386-1	320-148790		

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 320-25386-1
Laboratory: Test America, Sacramento, California
Site: Whidbey Island, CTO-0008, Washington
Date: February 14, 2017

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-CV-1RW72-0117	320-25386-1	Water
2	WI-CV-1FB72-0117	320-25386-2	Water

A full data validation was performed on the analytical data for one water sample and one aqueous field blank sample collected on January 28, 2017 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: 2/15/17

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.: 320-25386-1

SDG No.:

Client Sample ID: WI-CV-1RW72-0117 | Lab Sample ID: 320-25386-1

Matrix: Water | Lab File ID: 2017.02.02B_537_009.d

Analysis Method: 537 | Date Collected: 01/28/2017 10:02

Extraction Method: 537 | Date Extracted: 02/01/2017 11:04

Sample wt/vol: 215.8(mL) | Date Analyzed: 02/02/2017 15:47

Con. Extract Vol.: 1.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 148790 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.056	U	0.070	0.056	0.018
335-67-1	Perfluorooctanoic acid (PFOA)	0.028	U	0.035	0.028	0.011
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.13	U	0.16	0.13	0.055

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	85		70-130
STL00996	13C2 PFDA	89		70-130

NW 2/14/17

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

2

Lab Name: TestAmerica Sacramento Job No.: 320-25386-1

SDG No.:

Client Sample ID: WI-CV-1FB72-0117 Lab Sample ID: 320-25386-2

Matrix: Water Lab File ID: 2017.02.02B_537_010.d

Analysis Method: 537 Date Collected: 01/28/2017 10:03

Extraction Method: 537 Date Extracted: 02/01/2017 11:04

Sample wt/vol: 267.3(mL) Date Analyzed: 02/02/2017 15:52

Con. Extract Vol.: 1.0(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

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

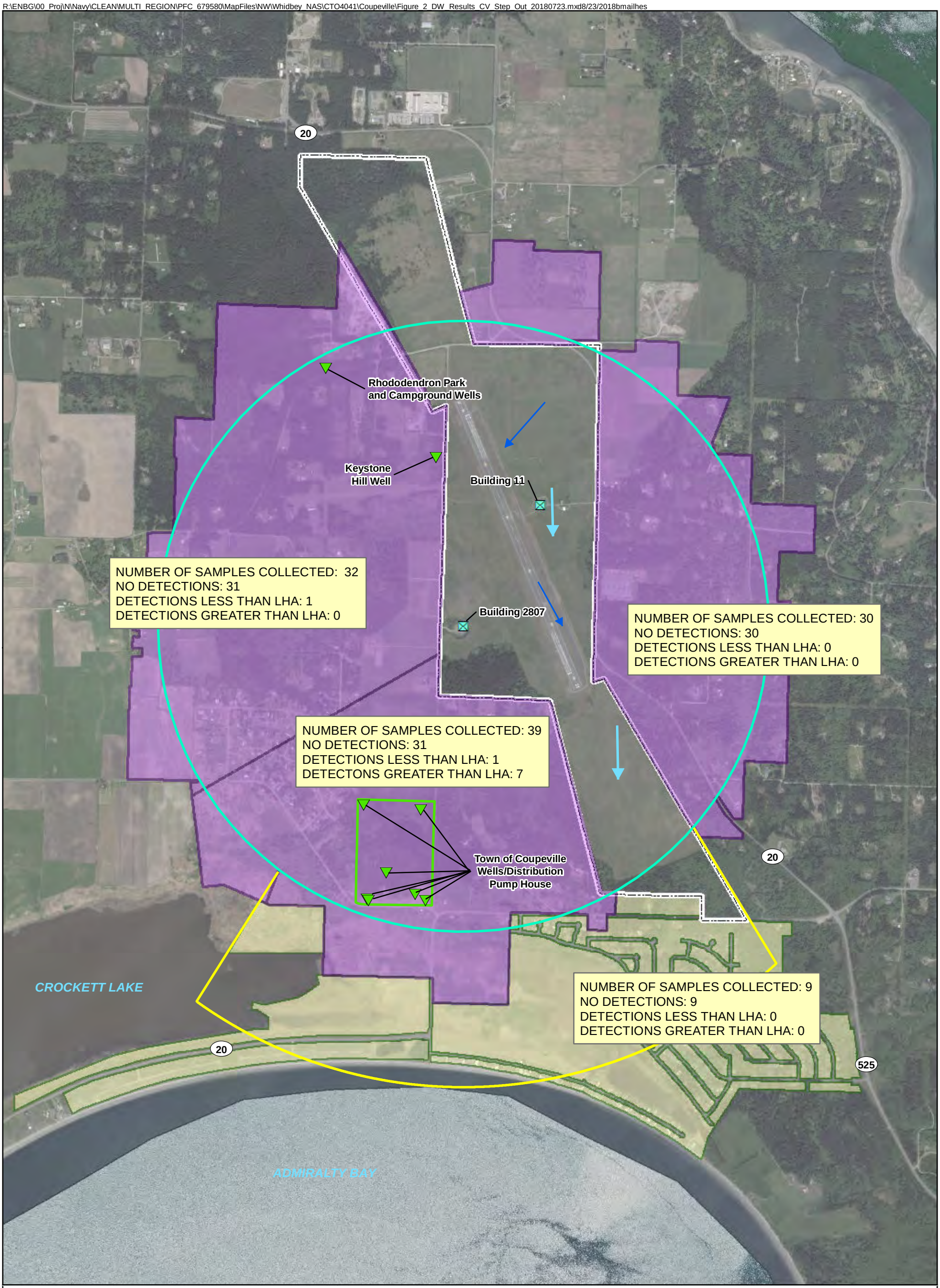
Analysis Batch No.: 148790 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.045	U	0.056	0.045	0.014
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	86		70-130
STL00996	13C2 PFDA	89		70-130

MW 2/14/17

R:\ENBG\00_Proj\N\Navy\CLEAN\MULTI_REGION\PFC_679580\MapFiles\NW\Whidbey_NAS\CTO4041\Coupeville\Figure_2_DW_Results_CV_Step_Out_20180723.mxd8/23/2018bmailhes



Legend

- Direction of Middle Zone Groundwater Flow
- Direction of Deep Zone Groundwater Flow
- Municipal Well
- Base Supply Well
- Fort Casey Well Field
- 1-mile zone
- Phase 1 Sampling Area
- Phase 2 Sampling Area
- Half-mile Step-out Downgradient
- Base Boundary

Note:
One parcel outside the Phase 1 and Phase 2 sampling areas was sampled, and PFOA and PFOS were detected less than the LHA. This sample is not included in the sample counts shown on the figure.

N

0 0.15 0.3 Miles

1 inch = 0.3 mile

Imagery Source: Esri

Figure 2
Results for Drinking Water Well Sampling
Outlying Landing Field Coupeville
Coupeville, Washington

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