UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 10/11/2018

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald
Region III ESAT RPO (3EA22)

TO: EDUARDO ROVIRA
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the PROCINO PLATING site for DAS# R35365; SDG# C0B49 completed by the Region III Environmental Services Assistance Team (ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

Attachment

cc: Ex. 4 CBI STON SOLUTIONS)
VESTON SOLUTIONS)

TO: #0002 TDF: #0818119

Printed on 100% recycled/recyclable paper with 100% post-consumer fiber and process chlorine free.
Customer Service Hotline: 1-800-438-2474

ICF
ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: October 4, 2018

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Ex. 4 CBI
Validator

Ex. 4 CBI
Reviewer

Subject: Organic Data Validation (S4VM)
Procino Plating
R35365 C0B49

Overview

This data package consisted of three (3) Field Reagent Blanks (FRBs) and three (3) potable water samples analyzed for perfluorinated alkyl acid compounds by Liquid Chromatography/Mass Spectrometry (LC/MS). This sample set included a field duplicate pair.

Analyses were performed by Test America Sacramento (TAMC). The samples were submitted to the laboratory directly by the sampling contractor. The laboratory indicated analyses were performed according to EPA Method 537 utilizing a quantitative isotope dilution-internal standard technique.

Data were validated according to the National Functional Guidelines for Organic Superfund Methods Data Review and applicable USEPA Region 3 modifications. The validation report has been assigned the Superfund Data Validation Label S4VM (Stage_4_Validation_Manual).

The following validation narrative is an evaluation of laboratory reported data based on the electronic data package received by Region 3 on August 17, 2018.

The laboratory did not provide sufficient data to determine if branched chain isomers of PFOA were included in the reporting of this analyte in field samples. No data were qualified based on this finding.

Summary

No significant data quality outliers or technical deficiencies were identified that would require rejection or estimation of sample results.

Notes

Accuracy and precision criteria were met by the laboratory in the initial and continuing calibration verification standard analyses associated with the samples in this Sample Data Group (SDG).

Analytes detected below RLs are estimated and have been qualified "J".

The method blank and FRBs associated with the samples in this SDG were free from contamination. No data were qualified based on blank contamination.

Percent recoveries for target analytes in the Laboratory Control Sample (LCS) analysis were within control limits. No field sample data were qualified based on LCS accuracy.

Percent recoveries and Relative Percent Differences (RPDs) for target analytes in the Matrix Spike/Matrix Spike Duplicate (MS/MSD) analyses of sample C0B54 were within control limits. No data were qualified based on MS/MSD precision or accuracy.

The laboratory noted sample C0B54 MSD was observed to be a yellow color prior to extraction. No data was qualified based on this finding.

Results reported for field duplicate pair C0B52/C0B53 were comparable. No data were qualified based on field duplicate precision.

The samples in this SDG were found to be free of residual chlorine at the time of sample preparation by the laboratory. No data were qualified based on this finding.

The samples in this SDG were preserved and reported pH within the optimum range. No data were qualified based on these findings.

Manual integrations were performed and identified by the laboratory. A subset of these was evaluated by the reviewer and found to be accurate and consistent. No action was taken by the reviewer based on manual integrations.

Glossary of Organic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
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 sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

Additional Qualifiers	Additional qualifiers may be combined with other qualifiers.
N	The analyte has been “tentatively identified” or “presumptively” as present.
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
C	The target Pesticide or Aroclor analyte identification has been confirmed by Gas Chromatography/Mass Spectrometry (GC/MS). This qualifier may be added to other qualifiers.
X	The target Pesticide or Aroclor analyte identification was not confirmed when GC/MS analysis was performed. This qualifier may be added to other qualifiers.

Analytical Data

Client: Weston Solutions, Inc.

Job Number: 320-41073-1

Client Sample ID: **C0B49**

Lab Sample ID: 320-41073-1
Client Matrix: Water

Date Sampled: 07/11/2018 0900
Date Received: 07/12/2018 0900

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-235788	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-234427	Lab File ID:	2018.07.23_537B_041
Dilution:	1.0			Initial Weight/Volume:	248.7 mL
Analysis Date:	07/24/2018 0607			Final Weight/Volume:	1.00 mL
Prep Date:	07/17/2018 0829			Injection Volume:	2 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctane sulfonic acid	ND		6.8	40
Perfluorooctanoic acid	ND		2.8	20
Perfluorononanoic acid	ND		8.0	20
Perfluorohexanesulfonic acid	ND		5.5	30
Perfluoroheptanoic acid	ND		1.9	10
Perfluorobutanesulfonic acid	ND		16	90

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	90		70 - 130
13C2 PFDA	99		70 - 130

Analytical Data

Client: Weston Solutions, Inc.

Job Number: 320-41073-1

Client Sample ID: **C0B50**

Lab Sample ID: 320-41073-2
Client Matrix: Water

Date Sampled: 07/11/2018 0900
Date Received: 07/12/2018 0900

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-235788	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-234427	Lab File ID:	2018.07.23_537B_042
Dilution:	1.0			Initial Weight/Volume:	257.5 mL
Analysis Date:	07/24/2018 0612			Final Weight/Volume:	1.00 mL
Prep Date:	07/17/2018 0829			Injection Volume:	2 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctane sulfonic acid	ND		6.6	39
Perfluorooctanoic acid	ND		2.7	19
Perfluorononanoic acid	ND		7.8	19
Perfluorohexanesulfonic acid	ND		5.3	29
Perfluoroheptanoic acid	ND		1.8	9.7
Perfluorobutanesulfonic acid	ND		16	87

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	95		70 - 130
13C2 PFDA	102		70 - 130

Client: Weston Solutions, Inc.

Job Number: 320-41073-1

Client Sample ID: **C0B51**

Lab Sample ID: 320-41073-3
Client Matrix: Water

Date Sampled: 07/11/2018 0950
Date Received: 07/12/2018 0900

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-235788	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-234427	Lab File ID:	2018.07.23_537B_043
Dilution:	1.0			Initial Weight/Volume:	254 mL
Analysis Date:	07/24/2018 0617			Final Weight/Volume:	1.00 mL
Prep Date:	07/17/2018 0829			Injection Volume:	2 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctane sulfonic acid	ND		6.7	39
Perfluorooctanoic acid	ND		2.8	20
Perfluorononanoic acid	ND		7.9	20
Perfluorohexanesulfonic acid	ND		5.4	30
Perfluoroheptanoic acid	ND		1.9	9.8
Perfluorobutanesulfonic acid	ND		16	89

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	86		70 - 130
13C2 PFDA	94		70 - 130

Client: Weston Solutions, Inc.

Job Number: 320-41073-1

Client Sample ID: **C0B52**

Lab Sample ID: 320-41073-4
Client Matrix: Water

Date Sampled: 07/11/2018 0900
Date Received: 07/12/2018 0900

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-235788	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-234427	Lab File ID:	2018.07.23_537B_044
Dilution:	1.0			Initial Weight/Volume:	258.4 mL
Analysis Date:	07/24/2018 0621			Final Weight/Volume:	1.00 mL
Prep Date:	07/17/2018 0829			Injection Volume:	2 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctane sulfonic acid	32	J	6.6	39
Perfluorooctanoic acid	40		2.7	19
Perfluorononanoic acid	ND		7.7	19
Perfluorohexanesulfonic acid	ND		5.3	29
Perfluoroheptanoic acid	12		1.8	9.7
Perfluorobutanesulfonic acid	ND		16	87

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	77		70 - 130
13C2 PFDA	106		70 - 130

Client: Weston Solutions, Inc.

Job Number: 320-41073-1

Client Sample ID: **C0B53**

Lab Sample ID: 320-41073-5
Client Matrix: Water

Date Sampled: 07/11/2018 0900
Date Received: 07/12/2018 0900

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-235788	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-234427	Lab File ID:	2018.07.23_537B_045
Dilution:	1.0			Initial Weight/Volume:	263.4 mL
Analysis Date:	07/24/2018 0626			Final Weight/Volume:	1.00 mL
Prep Date:	07/17/2018 0829			Injection Volume:	2 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctane sulfonic acid	32	J	6.5	38
Perfluorooctanoic acid	37		2.7	19
Perfluorononanoic acid	ND		7.6	19
Perfluorohexanesulfonic acid	ND		5.2	28
Perfluoroheptanoic acid	11		1.8	9.5
Perfluorobutanesulfonic acid	ND		15	85

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	77		70 - 130
13C2 PFDA	108		70 - 130

Client: Weston Solutions, Inc.

Job Number: 320-41073-1

Client Sample ID: **C0B54**

Lab Sample ID: 320-41073-6
Client Matrix: Water

Date Sampled: 07/11/2018 0950
Date Received: 07/12/2018 0900

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-235788	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-234427	Lab File ID:	2018.07.23_537B_046
Dilution:	1.0			Initial Weight/Volume:	259.4 mL
Analysis Date:	07/24/2018 0631			Final Weight/Volume:	1.00 mL
Prep Date:	07/17/2018 0829			Injection Volume:	2 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctane sulfonic acid	ND		6.6	39
Perfluorooctanoic acid	3.4	J	2.7	19
Perfluorononanoic acid	ND		7.7	19
Perfluorohexanesulfonic acid	ND		5.3	29
Perfluoroheptanoic acid	ND		1.8	9.6
Perfluorobutanesulfonic acid	ND		16	87

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	75		70 - 130
13C2 PFDA	100		70 - 130

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 320-41073-1

Job Description: DAS R35365, SDG C0B49

For:
Weston Solutions, Inc.
1400 Weston Way
PO BOX 2653
West Chester, PA 19380

Attention: Laura Mathew

Ex. 4 CBI

Ex. 4 CBI, Project Manager I
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4383
Ex. 4 CBI @testamericainc.com
07/27/2018

Table of Contents

Cover Title Page 1
Data Summaries 4
Report Narrative 4
Manual Integration Summary 5
Sample Summary 11
Executive Summary 12
Method Summary 13
Method / Analyst Summary 14
Sample Datasheets 15
Surrogate Summary 21
QC Data Summary 22
Data Qualifiers 24
QC Association Summary 25
Lab Chronicle 26
Reagent Traceability 28
COAs 34
Certification Summary 84
Organic Sample Data 85
LCMS 85
Method 537 85
Method 537 QC Summary 86
Method 537 Sample Data 97
Standards Data 125
Method 537 ICAL Data 125
Method 537 Resolution Data 161
Method 537 CCAL Data 164

Table of Contents

Raw QC Data 219

Method 537 Blank Data 219

Method 537 LCS/LCSD Data 223

Method 537 MS/MSD Data 229

Method 537 Run Logs 241

Method 537 Prep Data 246

Shipping and Receiving Documents 248

Client Chain of Custody 249

Sample Receipt Checklist 250

Job Narrative
320-41073-1

Receipt
The samples were received on 7/12/2018 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.5° C.

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

Organic Prep
Method(s) 537 DW: The following sample: C0B54 (320-41073-6[MSD]) in preparation batch 320-234427 was observed to be a yellow color prior to extraction.

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

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. In addition, I certify, that to the best of my knowledge and belief, the data as reported are true and accurate. Release of the data contained in this data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Ex. 4 CBI

7/27/18

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 235370

Lab Sample ID: IC 320-235370/3 Client Sample ID:

Date Analyzed: 07/21/18 12:21 Lab File ID: 2018.07.21_537CURVE_003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	1.62	Baseline	Ex. 4 CBI	07/21/18 12:57
Perfluorooctane sulfonic acid	2.06	Assign Peak		07/21/18 12:57

Lab Sample ID: IC 320-235370/4 Client Sample ID:

Date Analyzed: 07/21/18 12:26 Lab File ID: 2018.07.21_537CURVE_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	1.62	Baseline	Ex. 4 CBI	07/21/18 12:58
Perfluorooctane sulfonic acid	2.06	Assign Peak		07/21/18 12:58

Lab Sample ID: IC 320-235370/5 Client Sample ID:

Date Analyzed: 07/21/18 12:31 Lab File ID: 2018.07.21_537CURVE_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	1.62	Baseline	Ex. 4 CBI	07/21/18 12:59
Perfluorooctane sulfonic acid	2.06	Baseline		07/21/18 12:59

Lab Sample ID: IC 320-235370/6 ICISAV Client Sample ID:

Date Analyzed: 07/21/18 12:35 Lab File ID: 2018.07.21_537CURVE_006.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane sulfonic acid	2.05	Peak assignment corrected	Ex. 4 CBI	07/21/18 13:00

537 DW

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 235370

Lab Sample ID: IC 320-235370/7 Client Sample ID:

Date Analyzed: 07/21/18 12:40 Lab File ID: 2018.07.21_537CURVE_007.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane sulfonic acid	2.06	Peak assignment corrected	Ex. 4 CBI	07/21/18 13:00

Lab Sample ID: IC 320-235370/8 Client Sample ID:

Date Analyzed: 07/21/18 12:45 Lab File ID: 2018.07.21_537CURVE_008.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane sulfonic acid	2.06	Peak assignment corrected	Ex. 4 CBI	07/21/18 13:01

Lab Sample ID: CCVL 320-235370/11 Client Sample ID:

Date Analyzed: 07/21/18 12:54 Lab File ID: 2018.07.21_537CURVE_010.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	1.62	Baseline	Ex. 4 CBI	07/21/18 13:03
Perfluorooctane sulfonic acid	2.06	Peak assignment corrected		07/21/18 13:03

Lab Sample ID: ICV 320-235370/13 Client Sample ID:

Date Analyzed: 07/21/18 13:03 Lab File ID: 2018.07.21_537CURVE_012.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane sulfonic acid	2.06	Peak assignment corrected	Ex. 4 CBI	07/21/18 14:24

537 DW

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 235585

Lab Sample ID: CCVL 320-235585/2 Client Sample ID:

Date Analyzed: 07/23/18 12:06 Lab File ID: 2018.07.23_537A_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane sulfonic acid	2.03	Peak assignment corrected	Ex. 4 CBI	07/23/18 12:38

537 DW

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 235786

Lab Sample ID: CCV 320-235786/21 CCVIS Client Sample ID:

Date Analyzed: 07/24/18 04:43 Lab File ID: 2018.07.23_537B_023.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane sulfonic acid	2.01	Peak assignment corrected	Ex. 4 CBI	07/24/18 10:18

Lab Sample ID: LCS 320-234427/2-A Client Sample ID:

Date Analyzed: 07/24/18 04:57 Lab File ID: 2018.07.23_537B_026.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane sulfonic acid	2.01	Peak assignment corrected	Ex. 4 CBI	07/24/18 10:24

Lab Sample ID: CCV 320-235786/33 CCVIS Client Sample ID:

Date Analyzed: 07/24/18 05:39 Lab File ID: 2018.07.23_537B_035.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane sulfonic acid	2.02	Peak assignment corrected	Ex. 4 CBI	07/24/18 10:19

537 DW

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 235788

Lab Sample ID: CCV 320-235788/33 CCVIS Client Sample ID:

Date Analyzed: 07/24/18 05:39 Lab File ID: 2018.07.23_537B_035.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane sulfonic acid	2.02	Peak assignment corrected	Ex. 4 CBI	07/24/18 10:19

Lab Sample ID: 320-41073-4 Client Sample ID: C0B52

Date Analyzed: 07/24/18 06:21 Lab File ID: 2018.07.23_537B_044.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane sulfonic acid	1.91	Peak assignment corrected	Ex. 4 CBI	07/24/18 10:28

Lab Sample ID: 320-41073-5 Client Sample ID: C0B53

Date Analyzed: 07/24/18 06:26 Lab File ID: 2018.07.23_537B_045.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane sulfonic acid	1.92	Peak assignment corrected	Ex. 4 CBI	07/24/18 10:29

Lab Sample ID: CCV 320-235788/45 CCVIS Client Sample ID:

Date Analyzed: 07/24/18 06:35 Lab File ID: 2018.07.23_537B_047.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane sulfonic acid	2.01	Peak assignment corrected	Ex. 4 CBI	07/24/18 10:19

537 DW

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 235790

Lab Sample ID: CCV 320-235790/45 CCVIS Client Sample ID:

Date Analyzed: 07/24/18 06:35 Lab File ID: 2018.07.23_537B_047.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane sulfonic acid	2.01	Peak assignment corrected	Ex. 4 CBI	07/24/18 10:19

Lab Sample ID: 320-41073-6 MS Client Sample ID: C0B54 MS

Date Analyzed: 07/24/18 06:45 Lab File ID: 2018.07.23_537B_049.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane sulfonic acid	2.01	Peak assignment corrected	Ex. 4 CBI	07/24/18 10:29

Lab Sample ID: 320-41073-6 MSD Client Sample ID: C0B54 MSD

Date Analyzed: 07/24/18 06:49 Lab File ID: 2018.07.23_537B_050.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane sulfonic acid	2.00	Peak assignment corrected	Ex. 4 CBI	07/24/18 10:30

Lab Sample ID: CCV 320-235790/49 Client Sample ID:

Date Analyzed: 07/24/18 06:54 Lab File ID: 2018.07.23_537B_051.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane sulfonic acid	2.00	Peak assignment corrected	Ex. 4 CBI	07/24/18 10:19

537 DW

SAMPLE SUMMARY

Client: Weston Solutions, Inc.

Job Number: 320-41073-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
320-41073-1	C0B49	Water	07/11/2018 0900	07/12/2018 0900
320-41073-2	C0B50	Water	07/11/2018 0900	07/12/2018 0900
320-41073-3	C0B51	Water	07/11/2018 0950	07/12/2018 0900
320-41073-4	C0B52	Water	07/11/2018 0900	07/12/2018 0900
320-41073-5	C0B53	Water	07/11/2018 0900	07/12/2018 0900
320-41073-6	C0B54	Water	07/11/2018 0950	07/12/2018 0900
320-41073-6MS	C0B54	Water	07/11/2018 0950	07/12/2018 0900
320-41073-6MSD	C0B54	Water	07/11/2018 0950	07/12/2018 0900

EXECUTIVE SUMMARY - Detections

Client: Weston Solutions, Inc. Job Number: 320-41073-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
320-41073-4	**C0B52**					
Perfluorooctane sulfonic acid		32	J	39	ng/L	537 DW
Perfluorooctanoic acid		40		19	ng/L	537 DW
Perfluoroheptanoic acid		12		9.7	ng/L	537 DW
320-41073-5	**C0B53**					
Perfluorooctane sulfonic acid		32	J	38	ng/L	537 DW
Perfluorooctanoic acid		37		19	ng/L	537 DW
Perfluoroheptanoic acid		11		9.5	ng/L	537 DW
320-41073-6	**C0B54**					
Perfluorooctanoic acid		3.4	J	19	ng/L	537 DW

METHOD SUMMARY

Client: Weston Solutions, Inc. Job Number: 320-41073-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Perfluorinated Alkyl Acids (LC/MS)	TAL SAC	EPA 537 DW	
Extraction of Perfluorinated Alkyl Acids	TAL SAC		EPA 537 DW

Lab References:

TAL SAC = TestAmerica Sacramento

Method References:

EPA = US Environmental Protection Agency

METHOD / ANALYST SUMMARY

Client: Weston Solutions, Inc.

Job Number: 320-41073-1

Method	Analyst	Analyst ID
EPA 537 DW	Ex. 4 CBI	JRB

Client: Weston Solutions, Inc. Job Number: 320-41073-1

Client Sample ID: C0B49

Lab Sample ID: 320-41073-1 Date Sampled: 07/11/2018 0900
Client Matrix: Water Date Received: 07/12/2018 0900

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-235788	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-234427	Lab File ID:	2018.07.23_537B_041
Dilution:	1.0			Initial Weight/Volume:	248.7 mL
Analysis Date:	07/24/2018 0607			Final Weight/Volume:	1.00 mL
Prep Date:	07/17/2018 0829			Injection Volume:	2 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctane sulfonic acid	ND		6.8	40
Perfluorooctanoic acid	ND		2.8	20
Perfluorononanoic acid	ND		8.0	20
Perfluorohexanesulfonic acid	ND		5.5	30
Perfluoroheptanoic acid	ND		1.9	10
Perfluorobutanesulfonic acid	ND		16	90

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	90		70 - 130
13C2 PFDA	99		70 - 130

Client: Weston Solutions, Inc. Job Number: 320-41073-1

Client Sample ID: C0B50

Lab Sample ID: 320-41073-2 Date Sampled: 07/11/2018 0900
Client Matrix: Water Date Received: 07/12/2018 0900

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-235788	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-234427	Lab File ID:	2018.07.23_537B_042
Dilution:	1.0			Initial Weight/Volume:	257.5 mL
Analysis Date:	07/24/2018 0612			Final Weight/Volume:	1.00 mL
Prep Date:	07/17/2018 0829			Injection Volume:	2 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctane sulfonic acid	ND		6.6	39
Perfluorooctanoic acid	ND		2.7	19
Perfluorononanoic acid	ND		7.8	19
Perfluorohexanesulfonic acid	ND		5.3	29
Perfluoroheptanoic acid	ND		1.8	9.7
Perfluorobutanesulfonic acid	ND		16	87

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	95		70 - 130
13C2 PFDA	102		70 - 130

Client: Weston Solutions, Inc. Job Number: 320-41073-1

Client Sample ID: C0B51

Lab Sample ID: 320-41073-3 Date Sampled: 07/11/2018 0950
Client Matrix: Water Date Received: 07/12/2018 0900

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-235788	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-234427	Lab File ID:	2018.07.23_537B_043
Dilution:	1.0			Initial Weight/Volume:	254 mL
Analysis Date:	07/24/2018 0617			Final Weight/Volume:	1.00 mL
Prep Date:	07/17/2018 0829			Injection Volume:	2 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctane sulfonic acid	ND		6.7	39
Perfluorooctanoic acid	ND		2.8	20
Perfluorononanoic acid	ND		7.9	20
Perfluorohexanesulfonic acid	ND		5.4	30
Perfluoroheptanoic acid	ND		1.9	9.8
Perfluorobutanesulfonic acid	ND		16	89

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	86		70 - 130
13C2 PFDA	94		70 - 130

Client: Weston Solutions, Inc. Job Number: 320-41073-1

Client Sample ID: C0B52

Lab Sample ID: 320-41073-4 Date Sampled: 07/11/2018 0900
Client Matrix: Water Date Received: 07/12/2018 0900

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-235788	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-234427	Lab File ID:	2018.07.23_537B_044
Dilution:	1.0			Initial Weight/Volume:	258.4 mL
Analysis Date:	07/24/2018 0621			Final Weight/Volume:	1.00 mL
Prep Date:	07/17/2018 0829			Injection Volume:	2 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctane sulfonic acid	32	J	6.6	39
Perfluorooctanoic acid	40		2.7	19
Perfluorononanoic acid	ND		7.7	19
Perfluorohexanesulfonic acid	ND		5.3	29
Perfluoroheptanoic acid	12		1.8	9.7
Perfluorobutanesulfonic acid	ND		16	87

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	77		70 - 130
13C2 PFDA	106		70 - 130

Client: Weston Solutions, Inc. Job Number: 320-41073-1

Client Sample ID: **C0B53**

Lab Sample ID: 320-41073-5 Date Sampled: 07/11/2018 0900
Client Matrix: Water Date Received: 07/12/2018 0900

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-235788	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-234427	Lab File ID:	2018.07.23_537B_045
Dilution:	1.0			Initial Weight/Volume:	263.4 mL
Analysis Date:	07/24/2018 0626			Final Weight/Volume:	1.00 mL
Prep Date:	07/17/2018 0829			Injection Volume:	2 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctane sulfonic acid	32	J	6.5	38
Perfluorooctanoic acid	37		2.7	19
Perfluorononanoic acid	ND		7.6	19
Perfluorohexanesulfonic acid	ND		5.2	28
Perfluoroheptanoic acid	11		1.8	9.5
Perfluorobutanesulfonic acid	ND		15	85

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	77		70 - 130
13C2 PFDA	108		70 - 130

Client: Weston Solutions, Inc. Job Number: 320-41073-1

Client Sample ID: C0B54

Lab Sample ID: 320-41073-6 Date Sampled: 07/11/2018 0950
Client Matrix: Water Date Received: 07/12/2018 0900

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-235788	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-234427	Lab File ID:	2018.07.23_537B_046
Dilution:	1.0			Initial Weight/Volume:	259.4 mL
Analysis Date:	07/24/2018 0631			Final Weight/Volume:	1.00 mL
Prep Date:	07/17/2018 0829			Injection Volume:	2 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctane sulfonic acid	ND		6.6	39
Perfluorooctanoic acid	3.4	J	2.7	19
Perfluorononanoic acid	ND		7.7	19
Perfluorohexanesulfonic acid	ND		5.3	29
Perfluoroheptanoic acid	ND		1.8	9.6
Perfluorobutanesulfonic acid	ND		16	87

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	75		70 - 130
13C2 PFDA	100		70 - 130

Client: Weston Solutions, Inc.

Job Number: 320-41073-1

Surrogate Recovery Report

537 DW Perfluorinated Alkyl Acids (LC/MS)

Client Matrix: Water

Lab Sample ID	Client Sample ID	PFHxA %Rec	PFDA %Rec
320-41073-1	C0B49	90	99
320-41073-2	C0B50	95	102
320-41073-3	C0B51	86	94
320-41073-4	C0B52	77	106
320-41073-5	C0B53	77	108
320-41073-6	C0B54	75	100
MB 320-234427/1-A		92	97
LCS 320-234427/2-A		100	104
320-41073-6 MS	C0B54 MS	82	104
320-41073-6 MSD	C0B54 MSD	80	94

Surrogate	Acceptance Limits
PFHxA = 13C2 PFHxA	70-130
PFDA = 13C2 PFDA	70-130

Client: Weston Solutions, Inc. Job Number: 320-41073-1

Method Blank - Batch: 320-234427

Method: 537 DW
Preparation: 537 DW

Lab Sample ID:	MB 320-234427/1-A	Analysis Batch:	320-235786	Instrument ID:	A8_N
Client Matrix:	Water	Prep Batch:	320-234427	Lab File ID:	2018.07.23_537B_025.c
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	250 mL
Analysis Date:	07/24/2018 0452	Units:	ng/L	Final Weight/Volume:	1.00 mL
Prep Date:	07/17/2018 0723			Injection Volume:	2 uL
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Perfluorooctane sulfonic acid	ND		6.8	40
Perfluorooctanoic acid	ND		2.8	20
Perfluorononanoic acid	ND		8.0	20
Perfluorohexanesulfonic acid	ND		5.5	30
Perfluoroheptanoic acid	ND		1.9	10
Perfluorobutanesulfonic acid	ND		16	90

Surrogate	% Rec	Acceptance Limits
13C2 PFHxA	92	70 - 130
13C2 PFDA	97	70 - 130

Lab Control Sample - Batch: 320-234427

Method: 537 DW
Preparation: 537 DW

Lab Sample ID:	LCS 320-234427/2-A	Analysis Batch:	320-235786	Instrument ID:	A8_N
Client Matrix:	Water	Prep Batch:	320-234427	Lab File ID:	2018.07.23_537B_026.c
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	250 mL
Analysis Date:	07/24/2018 0457	Units:	ng/L	Final Weight/Volume:	1.00 mL
Prep Date:	07/17/2018 0723			Injection Volume:	2 uL
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Perfluorooctane sulfonic acid	220	240	109	70 - 130	
Perfluorooctanoic acid	110	113	103	70 - 130	
Perfluorononanoic acid	110	113	102	70 - 130	
Perfluorohexanesulfonic acid	168	181	108	70 - 130	
Perfluoroheptanoic acid	54.0	54.3	100	70 - 130	
Perfluorobutanesulfonic acid	500	505	101	70 - 130	

Surrogate	% Rec	Acceptance Limits
13C2 PFHxA	100	70 - 130
13C2 PFDA	104	70 - 130

Client: Weston Solutions, Inc. Job Number: 320-41073-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 320-234427

Method: 537 DW
Preparation: 537 DW

MS Lab Sample ID:	320-41073-6	Analysis Batch:	320-235790	Instrument ID:	A8_N
Client Matrix:	Water	Prep Batch:	320-234427	Lab File ID:	2018.07.23_537B_049.c
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	261 mL
Analysis Date:	07/24/2018 0645			Final Weight/Volume:	1.00 mL
Prep Date:	07/17/2018 0829			Injection Volume:	2 uL
Leach Date:	N/A				

MSD Lab Sample ID:	320-41073-6	Analysis Batch:	320-235790	Instrument ID:	A8_N
Client Matrix:	Water	Prep Batch:	320-234427	Lab File ID:	2018.07.23_537B_050.c
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	250 mL
Analysis Date:	07/24/2018 0649			Final Weight/Volume:	1.00 mL
Prep Date:	07/17/2018 0829			Injection Volume:	2 uL
Leach Date:	N/A				

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Perfluorooctane sulfonic acid	111	98	70 - 130	9	30		
Perfluorooctanoic acid	101	89	70 - 130	8	30		
Perfluorononanoic acid	109	90	70 - 130	14	30		
Perfluorohexanesulfonic acid	108	96	70 - 130	8	30		
Perfluoroheptanoic acid	93	84	70 - 130	6	30		
Perfluorobutanesulfonic acid	95	88	70 - 130	3	30		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
13C2 PFHxA	82	80	70 - 130
13C2 PFDA	104	94	70 - 130

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 320-234427

Method: 537 DW
Preparation: 537 DW

MS Lab Sample ID:	320-41073-6	Units:	ng/L	MSD Lab Sample ID:	320-41073-6
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	07/24/2018 0645			Analysis Date:	07/24/2018 0649
Prep Date:	07/17/2018 0829			Prep Date:	07/17/2018 0829
Leach Date:	N/A			Leach Date:	N/A

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Perfluorooctane sulfonic acid	ND		210	220	234	215
Perfluorooctanoic acid	3.4	J	105	110	110	102
Perfluorononanoic acid	ND		105	110	115	99.5
Perfluorohexanesulfonic acid	ND		161	168	175	161
Perfluoroheptanoic acid	ND		51.7	54.0	48.0	45.1
Perfluorobutanesulfonic acid	ND		479	500	454	439

DATA REPORTING QUALIFIERS

Client: Weston Solutions, Inc. Job Number: 320-41073-1

Lab Section	Qualifier	Description
LCMS		
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Quality Control Results

Client: Weston Solutions, Inc. Job Number: 320-41073-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
LCMS					
Prep Batch: 320-234427					
LCS 320-234427/2-A	Lab Control Sample	T	Water	537 DW	
MB 320-234427/1-A	Method Blank	T	Water	537 DW	
320-41073-1	C0B49	T	Water	537 DW	
320-41073-2	C0B50	T	Water	537 DW	
320-41073-3	C0B51	T	Water	537 DW	
320-41073-4	C0B52	T	Water	537 DW	
320-41073-5	C0B53	T	Water	537 DW	
320-41073-6	C0B54	T	Water	537 DW	
320-41073-6MS	Matrix Spike	T	Water	537 DW	
320-41073-6MSD	Matrix Spike Duplicate	T	Water	537 DW	
Analysis Batch:320-235786					
LCS 320-234427/2-A	Lab Control Sample	T	Water	537 DW	320-234427
MB 320-234427/1-A	Method Blank	T	Water	537 DW	320-234427
Analysis Batch:320-235788					
320-41073-1	C0B49	T	Water	537 DW	320-234427
320-41073-2	C0B50	T	Water	537 DW	320-234427
320-41073-3	C0B51	T	Water	537 DW	320-234427
320-41073-4	C0B52	T	Water	537 DW	320-234427
320-41073-5	C0B53	T	Water	537 DW	320-234427
320-41073-6	C0B54	T	Water	537 DW	320-234427
Analysis Batch:320-235790					
320-41073-6MS	Matrix Spike	T	Water	537 DW	320-234427
320-41073-6MSD	Matrix Spike Duplicate	T	Water	537 DW	320-234427

Report Basis
T = Total

Client: Weston Solutions, Inc. Job Number: 320-41073-1

Laboratory Chronicle

Lab ID: 320-41073-1 **Client ID: C0B49**

Sample Date/Time: 07/11/2018 09:00 Received Date/Time: 07/12/2018 09:00

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:537 DW	320-41073-A-1-A		320-235788	320-234427	07/17/2018 08:29	1	TAL SAC	SK
A:537 DW	320-41073-A-1-A		320-235788	320-234427	07/24/2018 06:07	1	TAL SAC	JRB

Lab ID: 320-41073-2 **Client ID: C0B50**

Sample Date/Time: 07/11/2018 09:00 Received Date/Time: 07/12/2018 09:00

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:537 DW	320-41073-A-2-A		320-235788	320-234427	07/17/2018 08:29	1	TAL SAC	SK
A:537 DW	320-41073-A-2-A		320-235788	320-234427	07/24/2018 06:12	1	TAL SAC	JRB

Lab ID: 320-41073-3 **Client ID: C0B51**

Sample Date/Time: 07/11/2018 09:50 Received Date/Time: 07/12/2018 09:00

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:537 DW	320-41073-A-3-A		320-235788	320-234427	07/17/2018 08:29	1	TAL SAC	SK
A:537 DW	320-41073-A-3-A		320-235788	320-234427	07/24/2018 06:17	1	TAL SAC	JRB

Lab ID: 320-41073-4 **Client ID: C0B52**

Sample Date/Time: 07/11/2018 09:00 Received Date/Time: 07/12/2018 09:00

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:537 DW	320-41073-A-4-A		320-235788	320-234427	07/17/2018 08:29	1	TAL SAC	SK
A:537 DW	320-41073-A-4-A		320-235788	320-234427	07/24/2018 06:21	1	TAL SAC	JRB

Lab ID: 320-41073-5 **Client ID: C0B53**

Sample Date/Time: 07/11/2018 09:00 Received Date/Time: 07/12/2018 09:00

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:537 DW	320-41073-A-5-A		320-235788	320-234427	07/17/2018 08:29	1	TAL SAC	SK
A:537 DW	320-41073-A-5-A		320-235788	320-234427	07/24/2018 06:26	1	TAL SAC	JRB

Lab ID: 320-41073-6 **Client ID: C0B54**

Sample Date/Time: 07/11/2018 09:50 Received Date/Time: 07/12/2018 09:00

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:537 DW	320-41073-A-6-A		320-235788	320-234427	07/17/2018 08:29	1	TAL SAC	SK
A:537 DW	320-41073-A-6-A		320-235788	320-234427	07/24/2018 06:31	1	TAL SAC	JRB

Client: Weston Solutions, Inc. Job Number: 320-41073-1

Laboratory Chronicle

Lab ID: 320-41073-6 **Client ID: C0B54**

Sample Date/Time: 07/11/2018 09:50 Received Date/Time: 07/12/2018 09:00

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:537 DW	320-41073-A-6-B MS		320-235790	320-234427	07/17/2018 08:29	1	TAL SAC	SK
A:537 DW	320-41073-A-6-B MS		320-235790	320-234427	07/24/2018 06:45	1	TAL SAC	JRB

Lab ID: 320-41073-6 **Client ID: C0B54**

Sample Date/Time: 07/11/2018 09:50 Received Date/Time: 07/12/2018 09:00

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:537 DW	320-41073-A-6-C MSD		320-235790	320-234427	07/17/2018 08:29	1	TAL SAC	SK
A:537 DW	320-41073-A-6-C MSD		320-235790	320-234427	07/24/2018 06:49	1	TAL SAC	JRB

Lab ID: MB **Client ID: N/A**

Sample Date/Time: N/A Received Date/Time: N/A

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:537 DW	MB 320-234427/1-A		320-235786	320-234427	07/17/2018 07:23	1	TAL SAC	SK
A:537 DW	MB 320-234427/1-A		320-235786	320-234427	07/24/2018 04:52	1	TAL SAC	JRB

Lab ID: LCS **Client ID: N/A**

Sample Date/Time: N/A Received Date/Time: N/A

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:537 DW	LCS 320-234427/2-A		320-235786	320-234427	07/17/2018 07:23	1	TAL SAC	SK
A:537 DW	LCS 320-234427/2-A		320-235786	320-234427	07/24/2018 04:57	1	TAL SAC	JRB

Lab References:
TAL SAC = TestAmerica Sacramento

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-HSP_00029	10/06/18	04/06/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid	1250.86 ng/mL
					LCPFHpA_00009	81 uL	Perfluoroheptanoic acid	135 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluorohexane Sulfonate	420.117 ng/mL
							Perfluorohexanesulfonic acid	420.117 ng/mL
					LCPFNA_00009	165 uL	Perfluorononanoic acid	275 ng/mL
					LCPFOA_00010	165 uL	Perfluorooctanoic acid	275 ng/mL
					LCPFOS-br_00005	355 uL	Perfluorooctane sulfonic acid	549.067 ng/mL
.LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid	44.2 ug/mL
.LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
.LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexane Sulfonate	45.5 ug/mL
							Perfluorohexanesulfonic acid	45.5 ug/mL
.LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
.LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid	50 ug/mL
.LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctane sulfonic acid	46.4 ug/mL
LC537-ICV_00032	08/15/18	06/23/18	MeOH/H2O, Lot 197626	10 mL	LC537-IS_00074	1000 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
.LC537-IS_00074	12/16/18	06/16/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
LC537-ICV_00032	08/15/18	06/23/18	MeOH/H2O, Lot 197626	10 mL	LC537-SU_00072	1000 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
					LC537ICIM2_00001	400 uL	Perfluorobutanesulfonic acid	100.092 ng/mL
							Perfluoroheptanoic acid	10 ng/mL
							Perfluorohexanesulfonic acid	20.1619 ng/mL
							Perfluorononanoic acid	20.1641 ng/mL
							Perfluorooctanoic acid	20.167 ng/mL
							Perfluorooctane sulfonic acid	20.1702 ng/mL
.LC537-SU_00072	12/16/18	06/16/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LC537ICIM2_00001	08/15/18	02/15/18	Methanol, Lot 090285	10 mL	LC537ICIM_00020	0.5 mL	Perfluorobutanesulfonic acid	2.5023 ug/mL
							Perfluoroheptanoic acid	0.25 ug/mL
							Perfluorohexanesulfonic acid	0.504047 ug/mL
							Perfluorononanoic acid	0.504103 ug/mL
							Perfluorooctanoic acid	0.504176 ug/mL
							Perfluorooctane sulfonic acid	0.504255 ug/mL
..LC537ICIM_00020	08/15/18	02/15/18	Methanol, Lot 090285	25 mL	LC537-PFBS2_00009	0.625 mL	Perfluorobutanesulfonic acid	50.0459 ug/mL
					LC537-PFHpA2_00012	0.0625 mL	Perfluoroheptanoic acid	5 ug/mL
					LC537-PFHxS2_00009	0.126 mL	Perfluorohexanesulfonic acid	10.0809 ug/mL
					LC537-PFNA2_00010	0.126 mL	Perfluorononanoic acid	10.0821 ug/mL
					LC537-PFOA2_00011	0.126 mL	Perfluorooctanoic acid	10.0835 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC537-PFOS2_00011	0.126 mL	Perfluorooctane sulfonic acid	10.0851 ug/mL
...LC537-PFBS2_00009	08/15/18	02/15/18	Methanol, Lot 090285	17.1 mL	LC537_PFBS2_00002	0.0343 g	Perfluorobutanesulfonic acid	2001.84 ug/mL
....LC537_PFBS2_00002	09/08/22	Santa Cruz Biotechnology, Lot F0917			(Purchased Reagent)		Perfluorobutanesulfonic acid	0.998 g/g
...LC537-PFHpA2_00012	08/15/18	02/15/18	Methanol, Lot 09092	23.95 mL	LC537_PFHpA2_00002	0.0479 g	Perfluoroheptanoic acid	2000 ug/mL
....LC537_PFHpA2_00002	06/13/22	Afla Aesar, Lot 10200390			(Purchased Reagent)		Perfluoroheptanoic acid	1 g/g
...LC537-PFHxS2_00009	08/15/18	02/15/18	Methanol, Lot 090285	25.87 mL	LC537_PFHxS2_00002	0.0569 g	Perfluorohexanesulfonic acid	2000.19 ug/mL
....LC537_PFHxS2_00002	06/08/22	Santa Cruz Biotechnology, Lot G2516			(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g
...LC537-PFNA2_00010	08/15/18	02/15/18	Methanol, Lot 090285	16.58 mL	LC537_PFNA2_00002	0.0333 g	Perfluorononanoic acid	2000.41 ug/mL
....LC537_PFNA2_00002	06/14/22	Aldrich, Lot MKCC0699			(Purchased Reagent)		Perfluorononanoic acid	0.996 g/g
...LC537-PFOA2_00011	08/15/18	02/15/18	Methanol, Lot 090285	22.96 mL	LC537_PFOA2_00002	0.0464 g	Perfluorooctanoic acid	2000.7 ug/mL
....LC537_PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid	0.99 g/g
...LC537-PFOS2_00011	08/15/18	02/15/18	Methanol, Lot 090285	14.71 mL	LC537_PFOS2_00002	0.0378 g	Perfluorooctane sulfonic acid	2001.01 ug/mL
....LC537_PFOS2_00002	06/14/22	Sigma, Lot BCBQ0108V			(Purchased Reagent)		Perfluorooctane sulfonic acid	0.7787 g/g
LC537-IS_00076	01/05/19	07/16/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
.LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
LC537-L1_00022	09/30/18	04/02/18	MeOH/H2O, Lot 090285	5 mL	LC537-IS_00065	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-MSP_00033	60 uL	Perfluorobutanesulfonic acid	8.99912 ng/mL
							Perfluoroheptanoic acid	0.96 ng/mL
							Perfluorohexanesulfonic acid	3.003 ng/mL
							Perfluorononanoic acid	1.98 ng/mL
							Perfluorooctanoic acid	1.98 ng/mL
							Perfluorooctane sulfonic acid	3.95328 ng/mL
					LC537-SU_00064	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-MSP_00033	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	509 uL	Perfluorobutanesulfonic acid	749.927 ng/mL
					LCPFHpA_00009	48 uL	Perfluoroheptanoic acid	80 ng/mL
					LCPFHxS-br_00005	165 uL	Perfluorohexanesulfonic acid	250.25 ng/mL
					LCPFNA_00009	99 uL	Perfluorononanoic acid	165 ng/mL
					LCPFOA_00010	99 uL	Perfluorooctanoic acid	165 ng/mL
					LCPFOS-br_00005	213 uL	Perfluorooctane sulfonic acid	329.44 ng/mL
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid	44.2 ug/mL
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid	50 ug/mL
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctane sulfonic acid	46.4 ug/mL
.LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-L2_00022	09/30/18	04/02/18	MeOH/H2O, Lot 090285	20 mL	LC537-HSP_00028	320 uL	Perfluorobutanesulfonic acid	20.0138 ng/mL
							Perfluoroheptanoic acid	2.16 ng/mL
							Perfluorohexanesulfonic acid	6.72187 ng/mL
							Perfluorononanoic acid	4.4 ng/mL
							Perfluorooctanoic acid	4.4 ng/mL
							Perfluorooctane sulfonic acid	8.78507 ng/mL
					LC537-IS_00065	2 mL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00064	2 mL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00028	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid	1250.86 ng/mL
					LCPFHpA_00009	81 uL	Perfluoroheptanoic acid	135 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid	420.117 ng/mL
					LCPFNA_00009	165 uL	Perfluorononanoic acid	275 ng/mL
					LCPFOA_00010	165 uL	Perfluorooctanoic acid	275 ng/mL
					LCPFOS-br_00005	355 uL	Perfluorooctane sulfonic acid	549.067 ng/mL
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid	44.2 ug/mL
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid	50 ug/mL
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctane sulfonic acid	46.4 ug/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L3_00025	09/30/18	04/02/18	MeOH/H2O, Lot 090285	20 mL	LC537-HSP_00028	720 uL	Perfluorobutanesulfonic acid	45.031 ng/mL
							Perfluoroheptanoic acid	4.86 ng/mL
							Perfluorohexanesulfonic acid	15.1242 ng/mL
							Perfluorononanoic acid	9.9 ng/mL
							Perfluorooctanoic acid	9.9 ng/mL
							Perfluorooctane sulfonic acid	19.7664 ng/mL
					LC537-IS_00065	2 mL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00064	2 mL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00028	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid	1250.86 ng/mL
					LCPFHpA_00009	81 uL	Perfluoroheptanoic acid	135 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid	420.117 ng/mL
					LCPFNA_00009	165 uL	Perfluorononanoic acid	275 ng/mL
					LCPFOA_00010	165 uL	Perfluorooctanoic acid	275 ng/mL
					LCPFOS-br_00005	355 uL	Perfluorooctane sulfonic acid	549.067 ng/mL
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid	44.2 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid	50 ug/mL
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctane sulfonic acid	46.4 ug/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L4_00022	09/30/18	04/02/18	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00028	360 uL	Perfluorobutanesulfonic acid	90.0619 ng/mL
							Perfluoroheptanoic acid	9.72 ng/mL
							Perfluorohexanesulfonic acid	30.2484 ng/mL
							Perfluorononanoic acid	19.8 ng/mL
							Perfluorooctanoic acid	19.8 ng/mL
							Perfluorooctane sulfonic acid	39.5328 ng/mL
					LC537-IS_00065	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00064	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00028	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid	1250.86 ng/mL
					LCPFHpA_00009	81 uL	Perfluoroheptanoic acid	135 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid	420.117 ng/mL
					LCPFNA_00009	165 uL	Perfluorononanoic acid	275 ng/mL
					LCPFOA_00010	165 uL	Perfluorooctanoic acid	275 ng/mL
					LCPFOS-br_00005	355 uL	Perfluorooctane sulfonic acid	549.067 ng/mL
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid	44.2 ug/mL
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid	50 ug/mL
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctane sulfonic acid	46.4 ug/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L5_00026	09/30/18	04/02/18	MeOH/H2O, Lot 090285	20 mL	LC537-HSP_00028	2160 uL	Perfluorobutanesulfonic acid	135.093 ng/mL
							Perfluoroheptanoic acid	14.58 ng/mL
							Perfluorohexanesulfonic acid	45.3726 ng/mL
							Perfluorononanoic acid	29.7 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanoic acid	29.7 ng/mL
							Perfluorooctane sulfonic acid	59.2992 ng/mL
					LC537-IS_00065	2 mL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00064	2 mL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00028	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid	1250.86 ng/mL
					LCPFHpA_00009	81 uL	Perfluoroheptanoic acid	135 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid	420.117 ng/mL
					LCPFNA_00009	165 uL	Perfluorononanoic acid	275 ng/mL
					LCPFOA_00010	165 uL	Perfluorooctanoic acid	275 ng/mL
					LCPFOS-br_00005	355 uL	Perfluorooctane sulfonic acid	549.067 ng/mL
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid	44.2 ug/mL
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid	50 ug/mL
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctane sulfonic acid	46.4 ug/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L6_00022	09/30/18	04/02/18	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00028	720 uL	Perfluorobutanesulfonic acid	180.124 ng/mL
							Perfluoroheptanoic acid	19.44 ng/mL
							Perfluorohexanesulfonic acid	60.4968 ng/mL
							Perfluorononanoic acid	39.6 ng/mL
							Perfluorooctanoic acid	39.6 ng/mL
							Perfluorooctane sulfonic acid	79.0656 ng/mL
					LC537-IS_00065	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00064	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00028	09/30/18	03/30/18	Methanol, Lot 104453	30 mL	LCPFBSA_00002	849 uL	Perfluorobutanesulfonic acid	1250.86 ng/mL
					LCPFHpA_00009	81 uL	Perfluoroheptanoic acid	135 ng/mL
					LCPFHxS-br_00005	277 uL	Perfluorohexanesulfonic acid	420.117 ng/mL
					LCPFNA_00009	165 uL	Perfluorononanoic acid	275 ng/mL
					LCPFOA_00010	165 uL	Perfluorooctanoic acid	275 ng/mL
					LCPFOS-br_00005	355 uL	Perfluorooctane sulfonic acid	549.067 ng/mL
..LCPFBSA_00002	12/02/21	Wellington Laboratories, Lot LPFBS1116			(Purchased Reagent)		Perfluorobutanesulfonic acid	44.2 ug/mL
..LCPFHpA_00009	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
..LCPFHxS-br_00005	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
..LCPFOA_00010	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFOS-br_00005	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctane sulfonic acid	46.4 ug/mL
.LC537-IS_00065	10/02/18	04/02/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00010	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00024	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00010	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00064	10/02/18	04/02/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-SU_00073	01/05/19	07/05/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
.LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL

CERTIFICATE OF ANALYSIS

The Power to Question

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

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

Santa Cruz Biotechnology, Inc. 800.457.3801 831.457.3800 fax 831.457.3801 Europe +00800 4573 8000 49 62221 4503 0 www.scbt.com

Certificate of analysis

r: 6.13.17 SW

PFHp A

Product No.: A12092

Product: Perfluoroheptanoic acid, 98+%

Lot No.: 10200390

Appearance: White fused solid

Water Content (Karl-Fischer): 0.30%

Melting Point: 32.0-34.3°C

Assay (Aqueous acid-base titration): 99.7%

Identification (FTIR): Conforms

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

Order our products online **www.alfa.com**

ThermoFisher SCIENTIFIC

CERTIFICATE OF ANALYSIS

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

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

PFH_xS-K

$C_6F_{13}SO_3K$ 438.201

$C_6F_{13}SO_3H$ 400.111

MW correction = $\frac{400.11}{438.201}$ = 0.91307 PFH_xS CasR 355-46-4

Purity & MW correction = 90.9%

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

SIGMA-ALDRICH

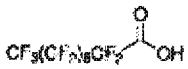
sigma-aldrich.com

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

Certificate of Analysis

Product Name:
Perfluorononanoic acid - 97%

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



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

Ex. 4 CBI

PFNA

Quality Control
Milwaukee, WI 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.

Version Number: 1

Certificate of analysis

P: 6/9/17 SK

PFOA

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

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

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

Order our products online **www.alfa.com**

ThermoFisher SCIENTIFIC

SIGMA-ALDRICH

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

Certificate of Analysis

Product Name:	HEPTADECAFLUOROOCTANESULFONIC ACID TETRAETHYLAMMONIUM SALT 98 %
Product Number:	365289
Batch Number:	BCBQ0108V
Brand:	Aldrich
CAS Number:	56773-42-3
Formula:	$CF_3(CF_2)_6CF_2SO_3N(C_2H_5)_4$
Formula Weight:	629.37
Quality Release Date:	11 JUN 2015

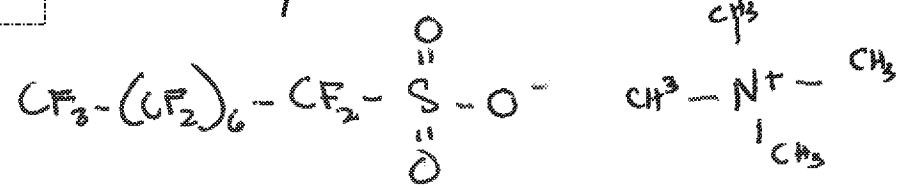
TEST	SPECIFICATION	RESULT
APPEARANCE (COLOR)	WHITE TO OFF WHITE	OFF-WHITE
APPEARANCE (FORM)	POWDER OR POWDER WITH CHUNK(S)	POWDER
CARBON CONTENT	29.77 % - 31.29 %	29.97 %
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS

Ex. 4 CBI

Manager Quality Control
Buchs, Switzerland

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

Purity & MW correction = 77.37%



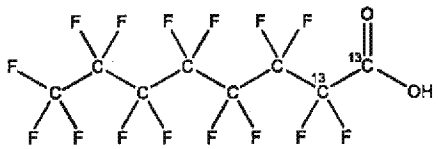
	$C_8F_{17}SO_3^-H$	$C_8H_{20}N$
C = 12.011	96.088	96.088
F = 18.998	322.966	—
S = 32.066	32.066	—
O = 15.999	47.997	—
H = 1.008	1.008	20.160
N = 14.007	—	14.007
	500.125	130.255

Sigma-Aldrich warrants that 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.

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_8HF_{15}O_2$
MOLECULAR WEIGHT: 416.05
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 02/12/2016
EXPIRY DATE: (mm/dd/yyyy) 02/12/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: Ex. 4 CBI **Date:** 02/24/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

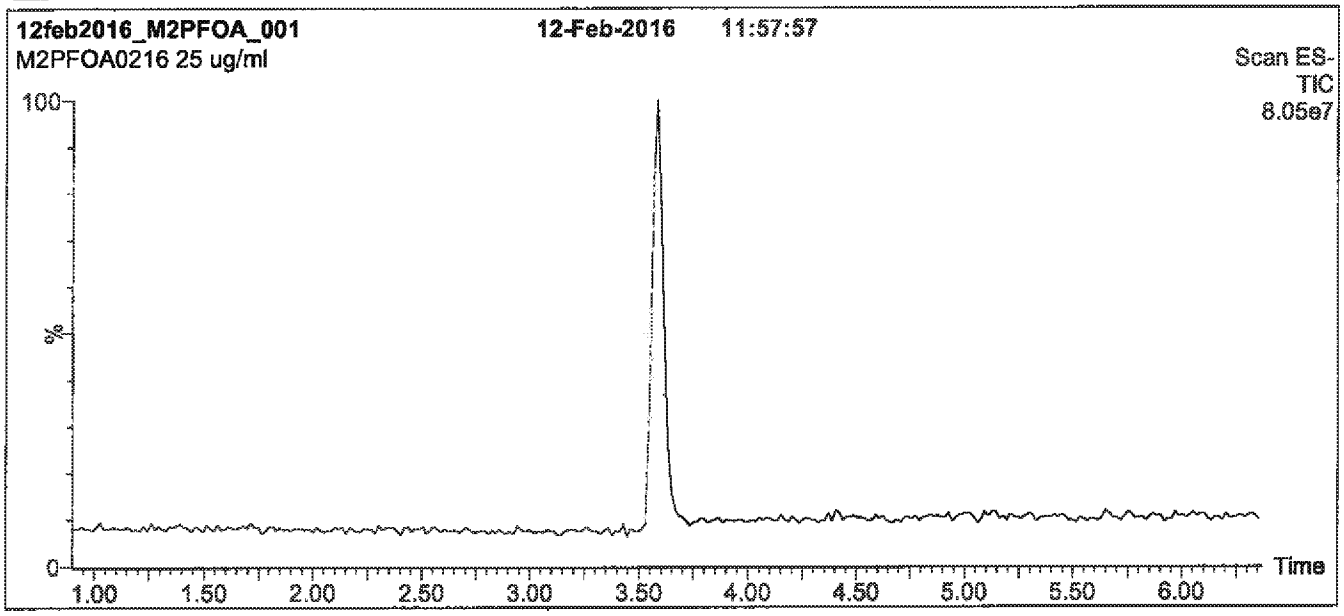
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

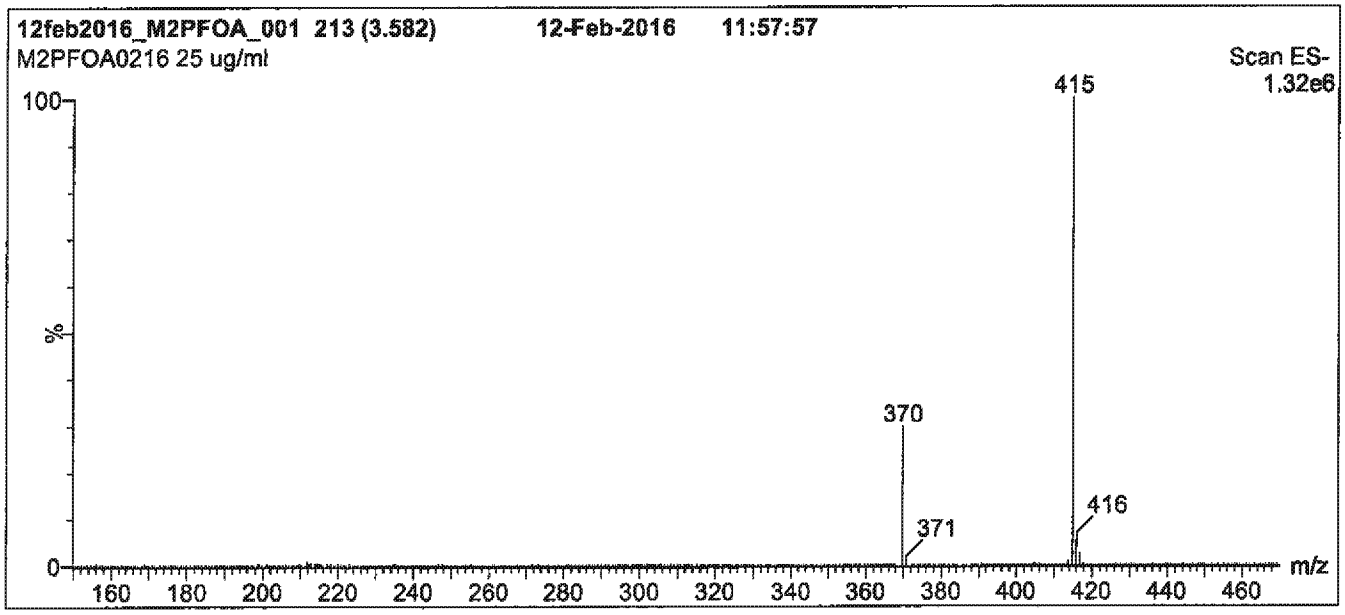
CALA

ANAB ACCREDITED

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

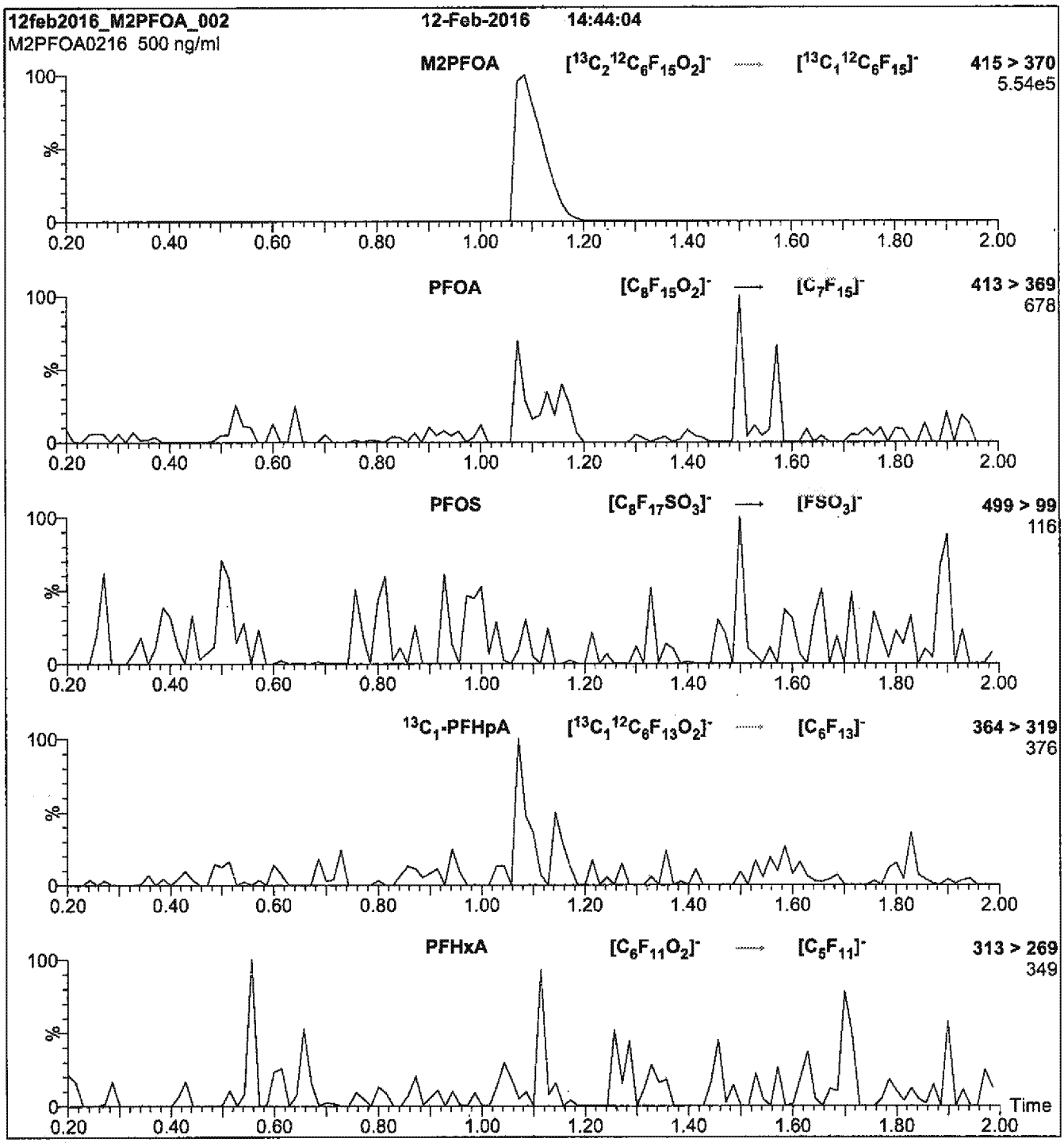
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% MeOH / 20% H_2O

Flow: 300 µl/min

MS Parameters

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

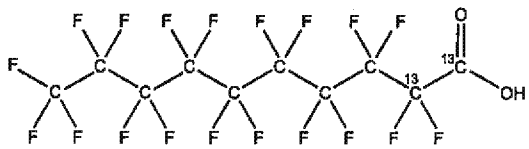
814255
ID: LCMPFDA_00012
Exp: 09/30/21 Prpd: SBC
13C2-Perfluorodecanoic a

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: Ex. 4 CBI **Date:** 10/07/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

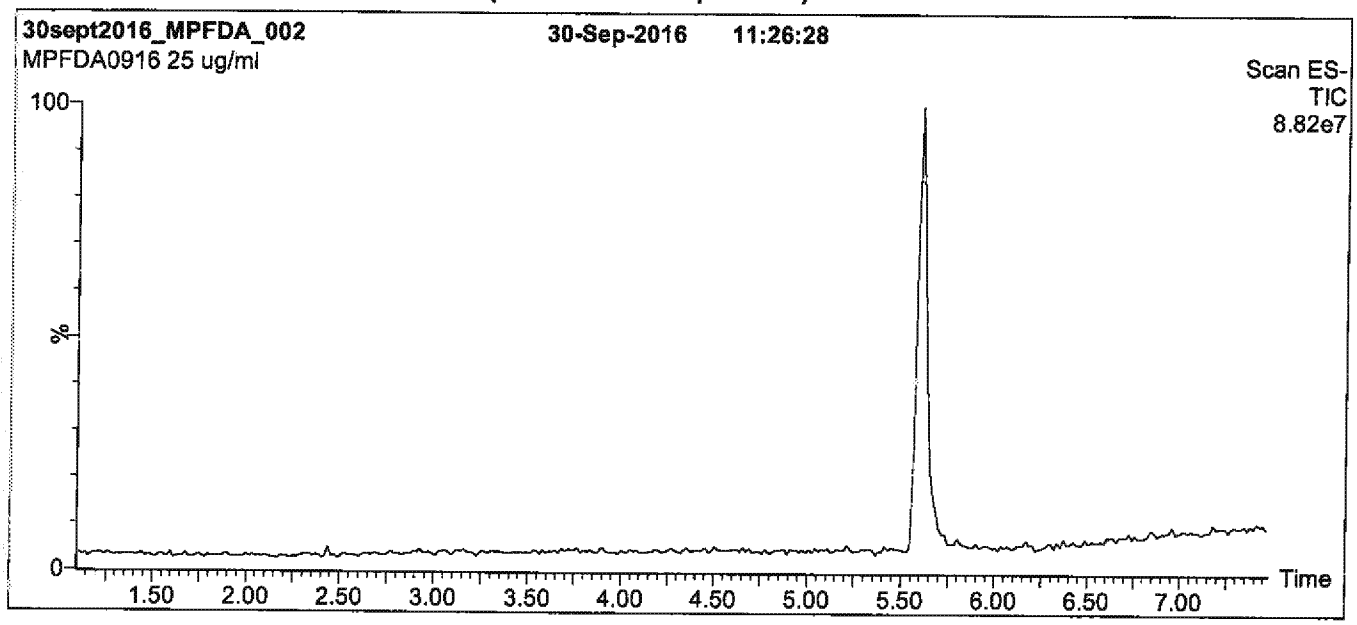
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

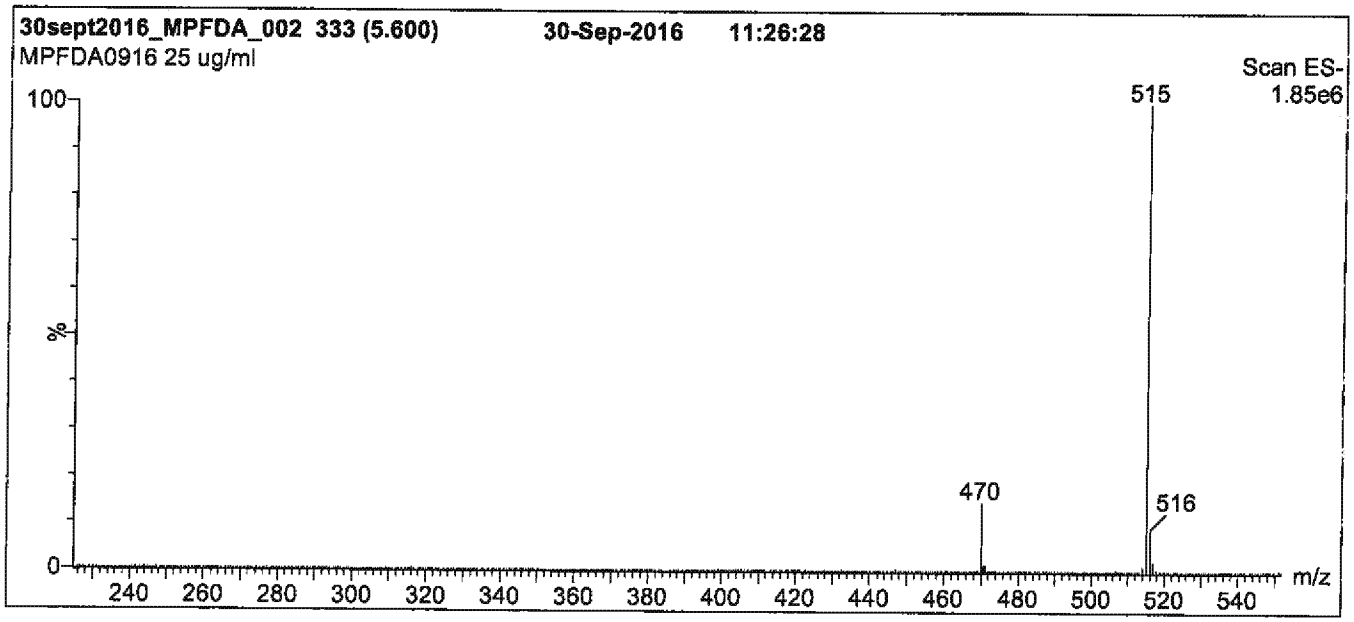
CALA

ANAB ACCREDITED

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

Figure 1: **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

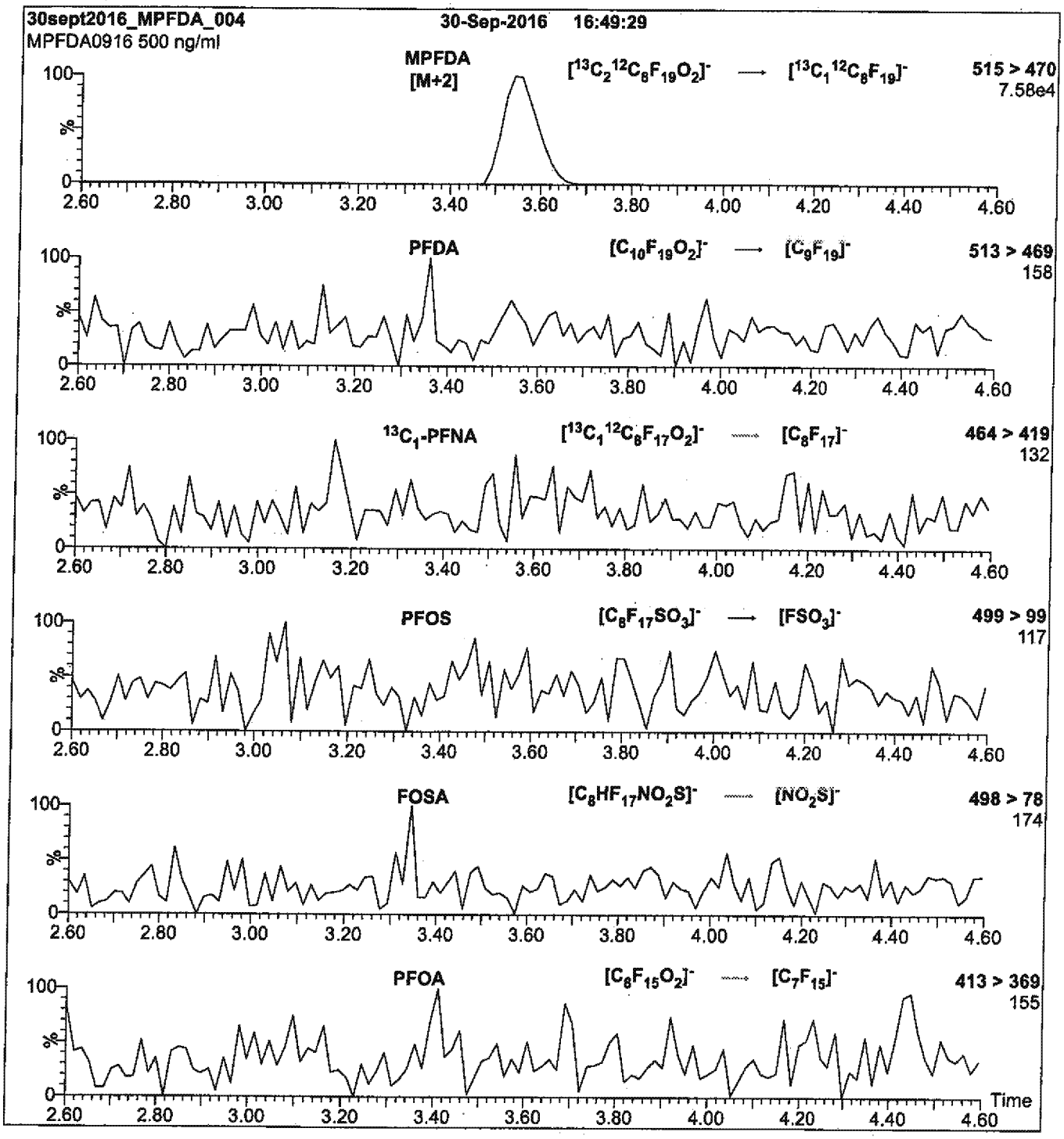
Flow: 300 µl/min

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

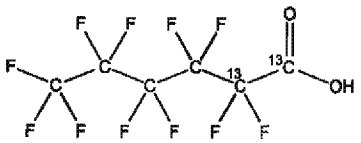
Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 13

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxA
LOT NUMBER: MPFHxA1116
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) 11/22/2016
EXPIRY DATE: (mm/dd/yyyy) 11/22/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: Ex. 4 CBI **Date:** 12/13/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

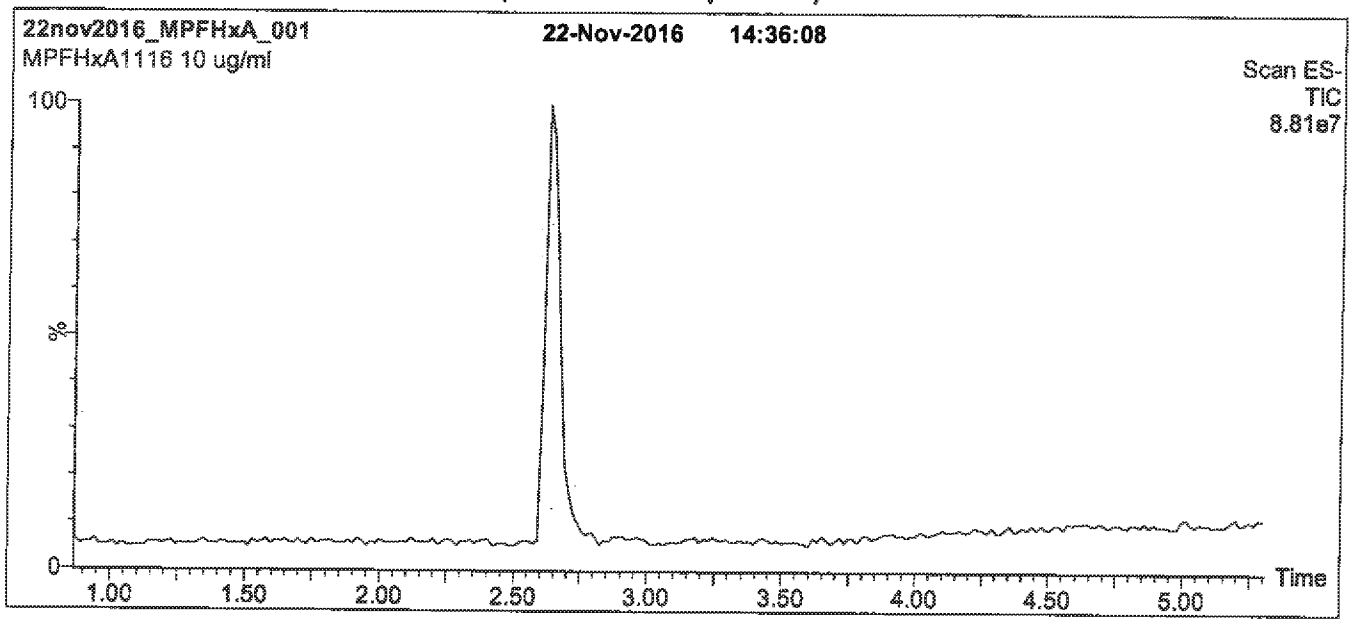
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

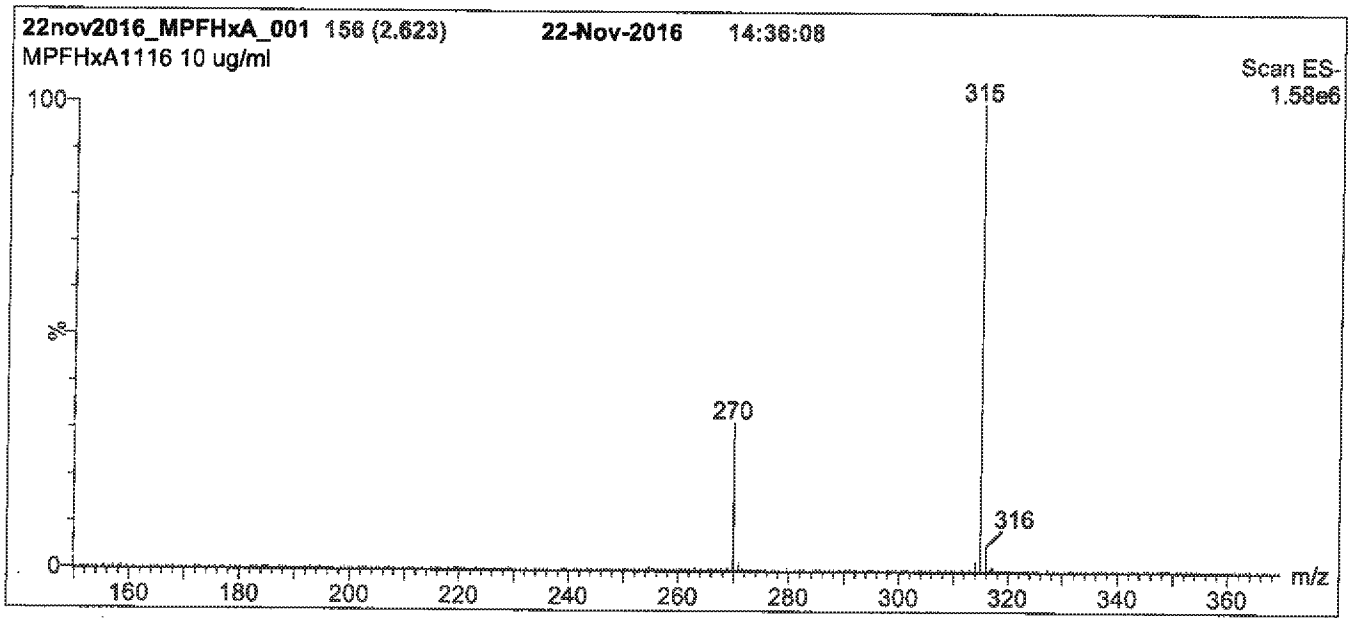
CALA

ANAB ACCREDITED

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% 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

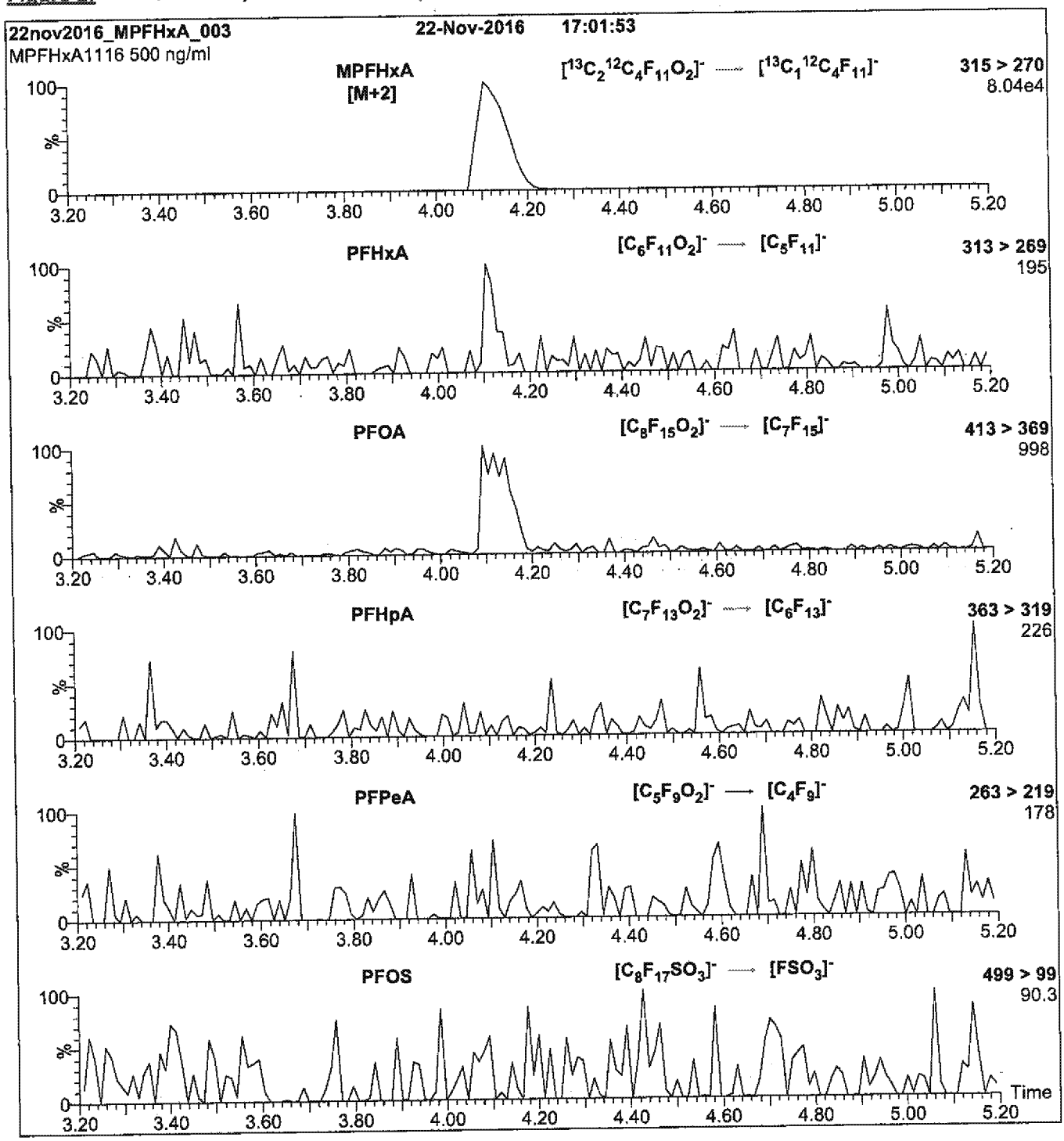
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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) = 3.46e-3
Collision Energy (eV) = 10

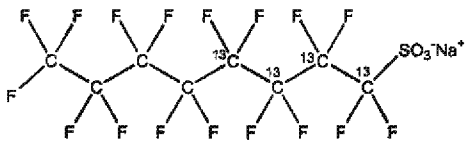
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0517

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) **SOLVENT(S):** Methanol

47.8 ± 2.4 µg/ml (MPFOS anion)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)

LAST TESTED: (mm/dd/yyyy) 05/19/2017

EXPIRY DATE: (mm/dd/yyyy) 05/19/2022

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: Ex. 4 CBI **Date:** 05/30/2017 (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. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

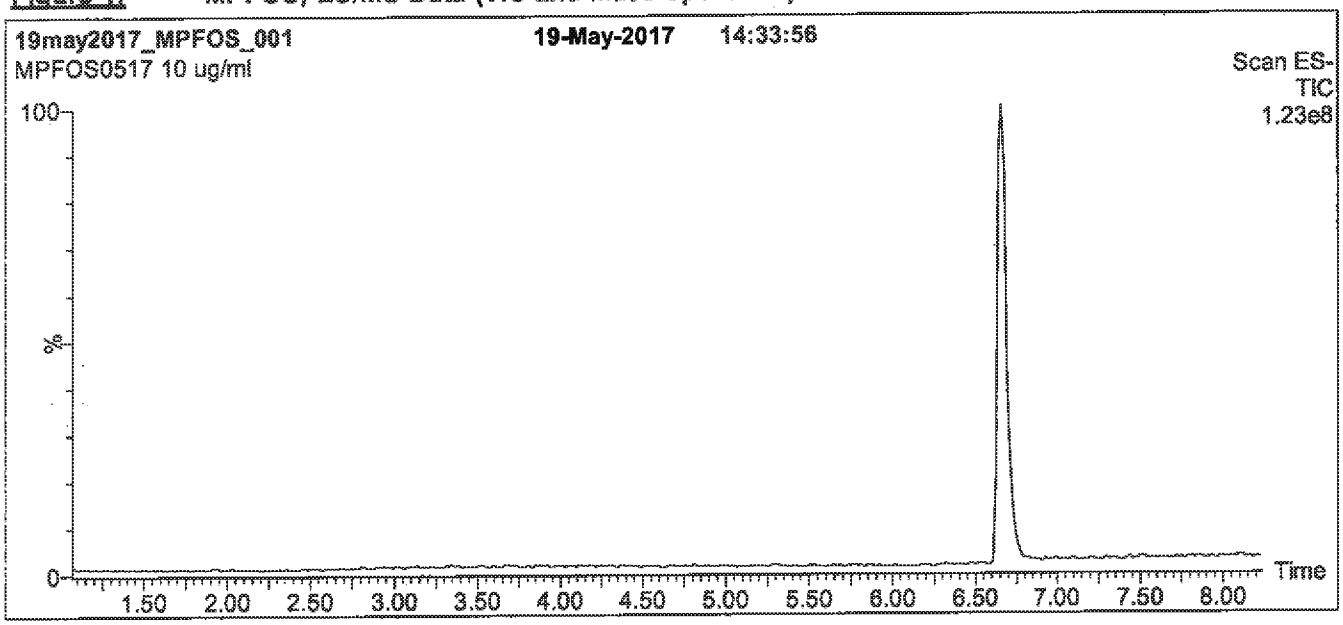
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

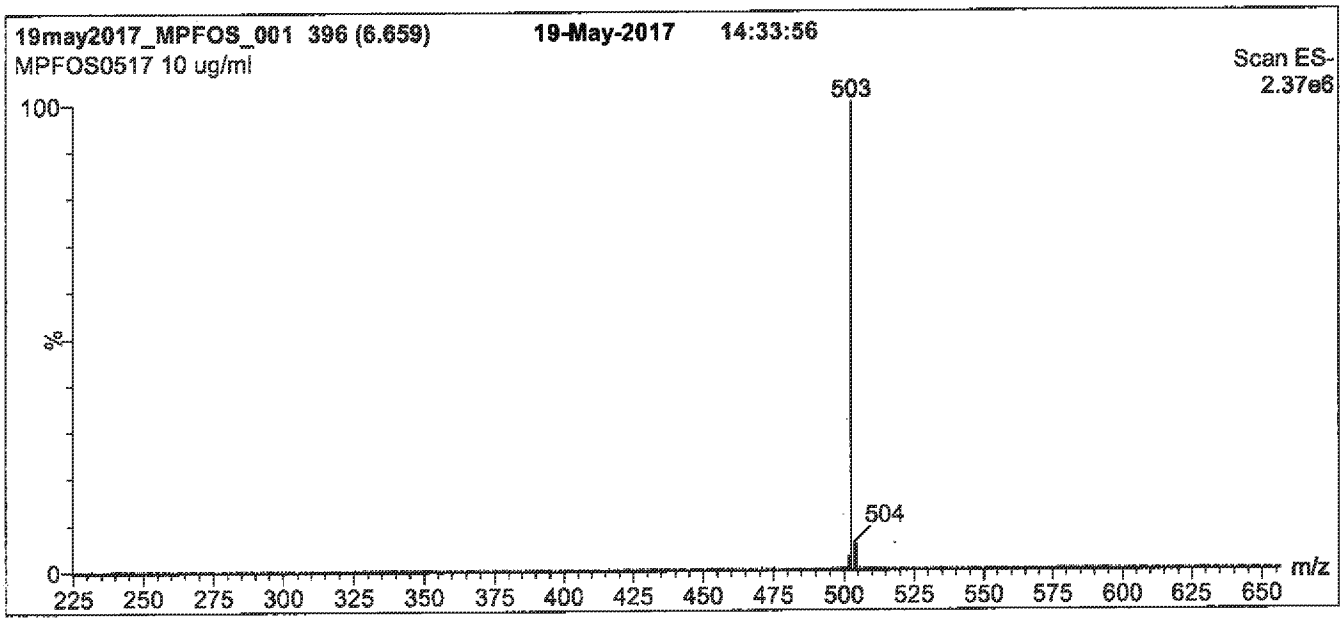
CALA

ANAB ACCREDITED

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

Figure 1: **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: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

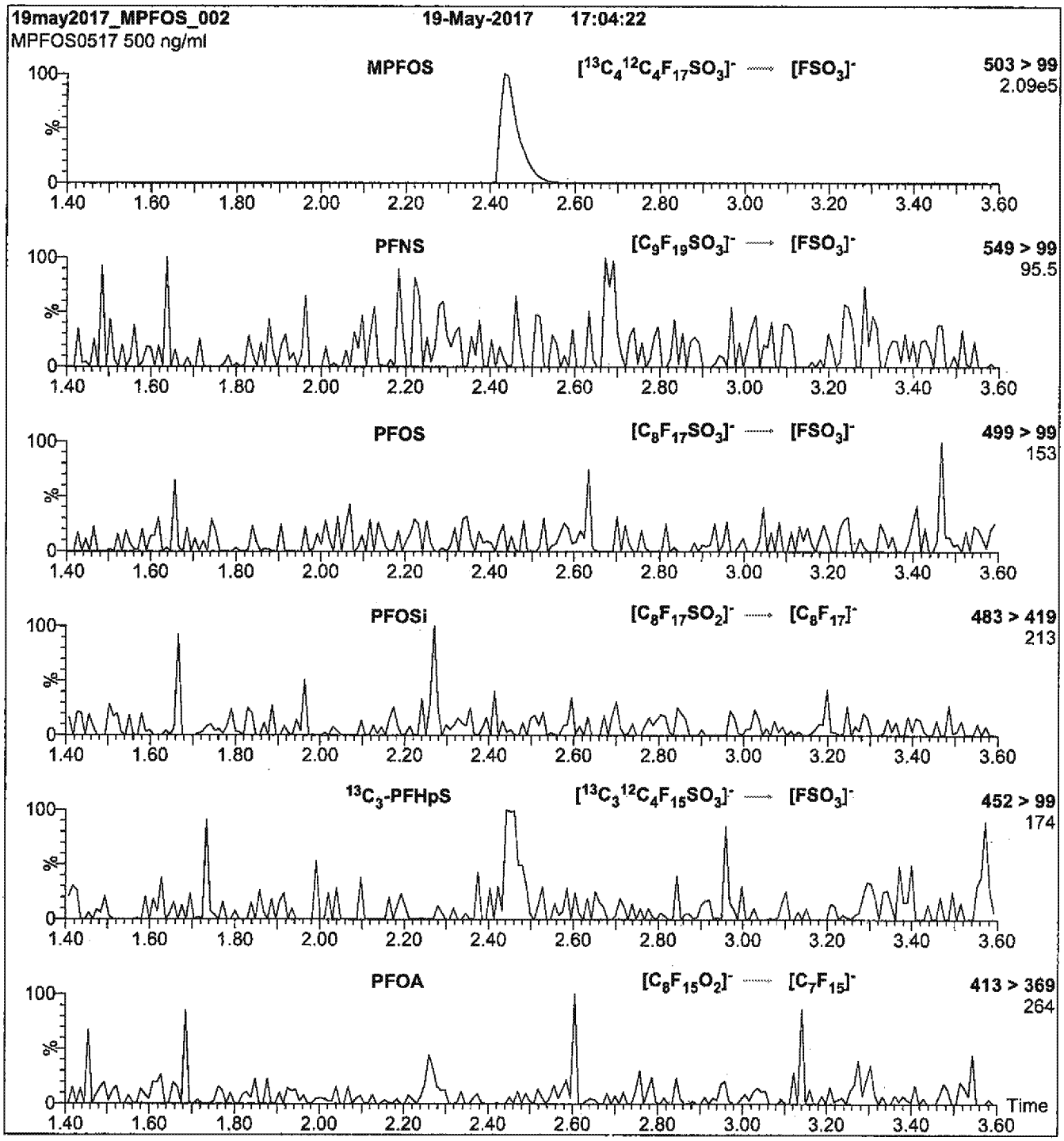
Flow: 300 µl/min

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

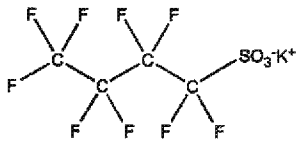
Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 40

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFBS
COMPOUND: Potassium perfluoro-1-butanesulfonate
LOT NUMBER: LPFBS1116
CAS #: 29420-49-3

STRUCTURE:



MOLECULAR FORMULA:	$C_4F_9SO_3K$	**MOLECULAR WEIGHT:**	338.19
CONCENTRATION:	50.0 ± 2.5 µg/ml (K salt) 44.2 ± 2.2 µg/ml (PFBS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	12/02/2016		
EXPIRY DATE: (mm/dd/yyyy)	12/02/2021		
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: Ex. 4 CBI **Date:** 12/05/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

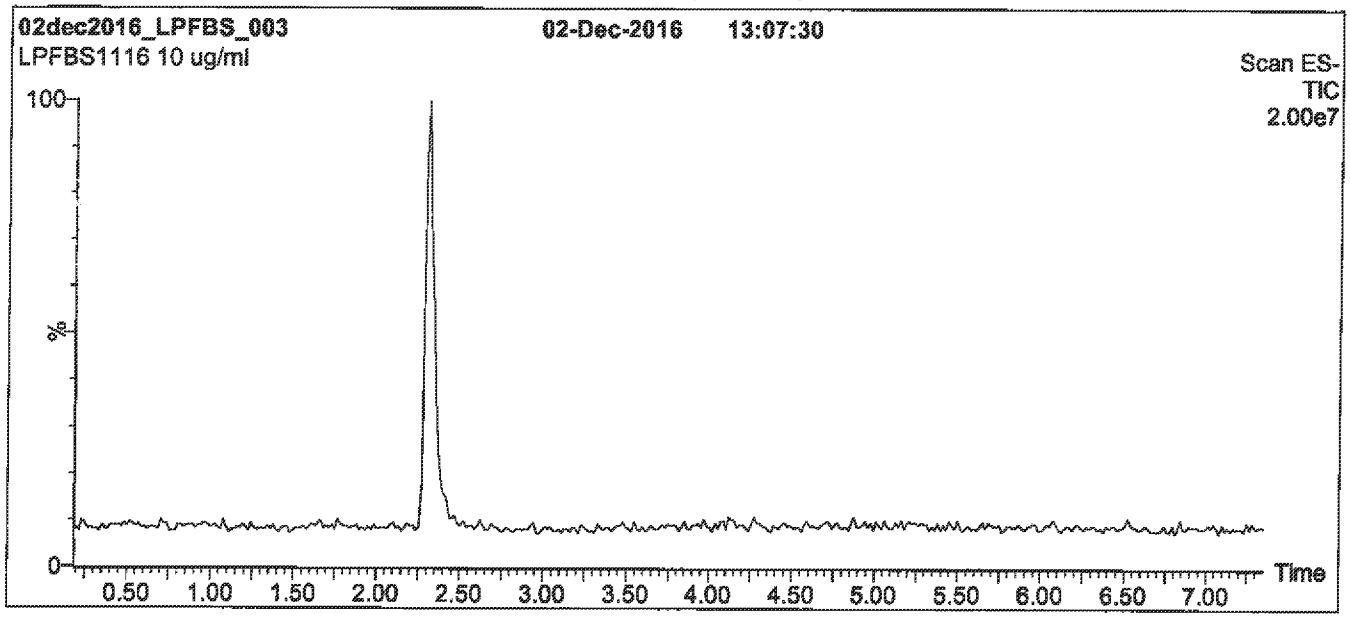
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

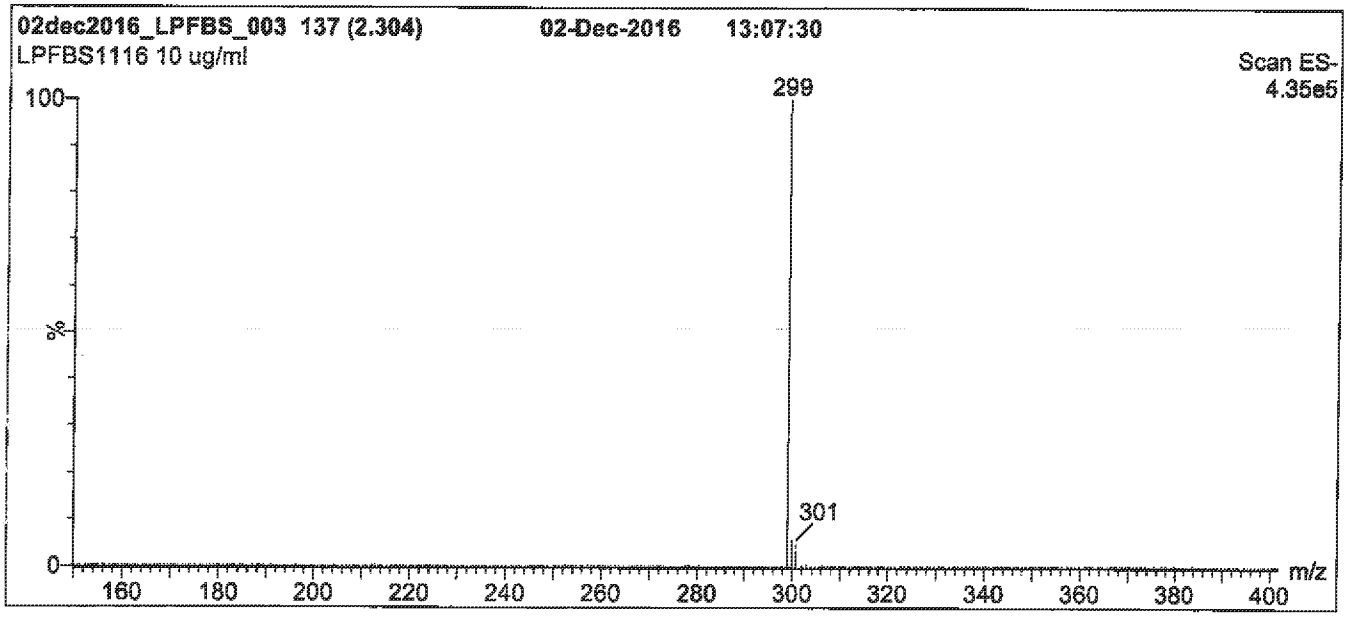
CALA

ANAB ACCREDITED

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

Figure 1: **L-PFBS; 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: 40% (80:20 MeOH:ACN) / 60% 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

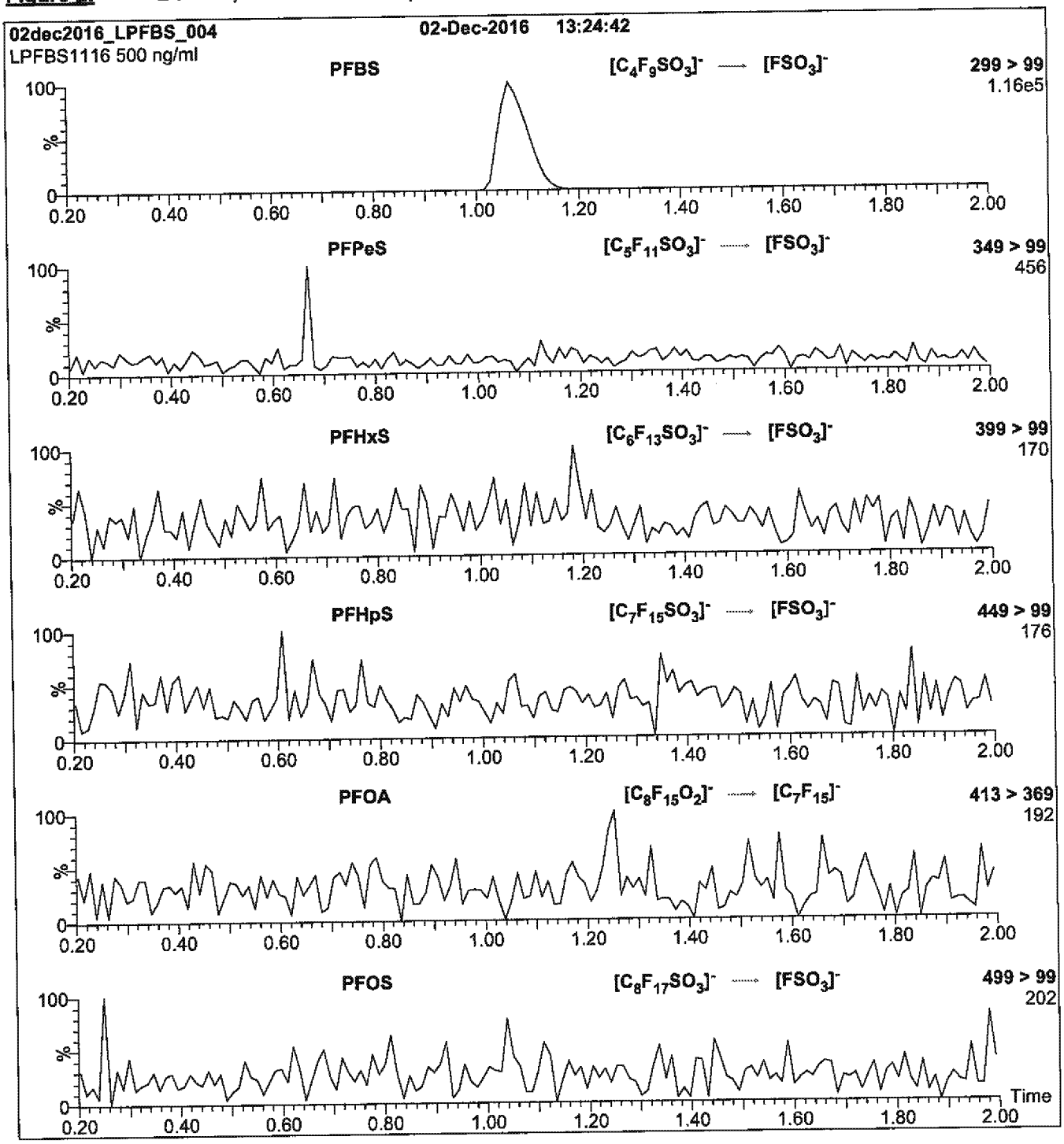
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **L-PFBS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFBS)

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

Flow: 300 µl/min

MS Parameters

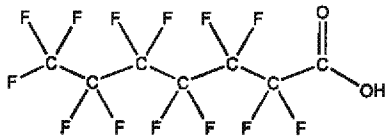
Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 25

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHpA
COMPOUND: Perfluoro-n-heptanoic acid
LOT NUMBER: PFHpA1216

STRUCTURE:
CAS #: 375-85-9



MOLECULAR FORMULA: $C_7HF_{13}O_2$
MOLECULAR WEIGHT: 364.06
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/02/2016
EXPIRY DATE: (mm/dd/yyyy) 12/02/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: Ex. 4 CBI **Date:** 12/12/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

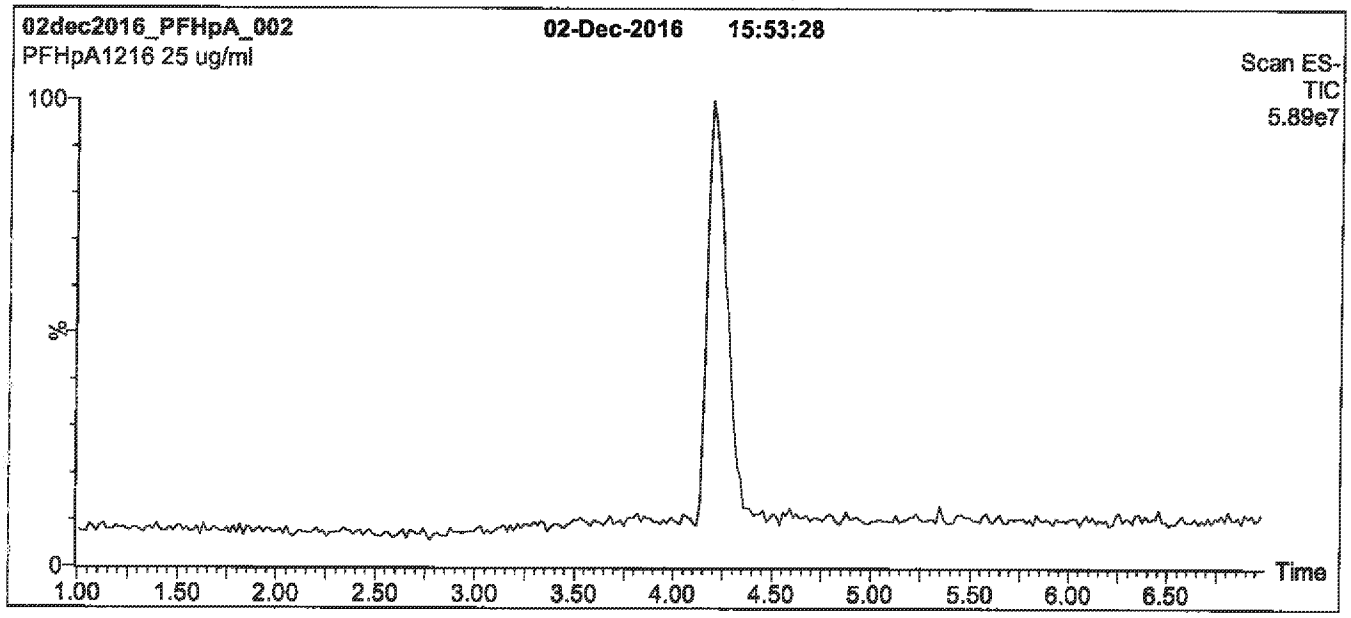
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

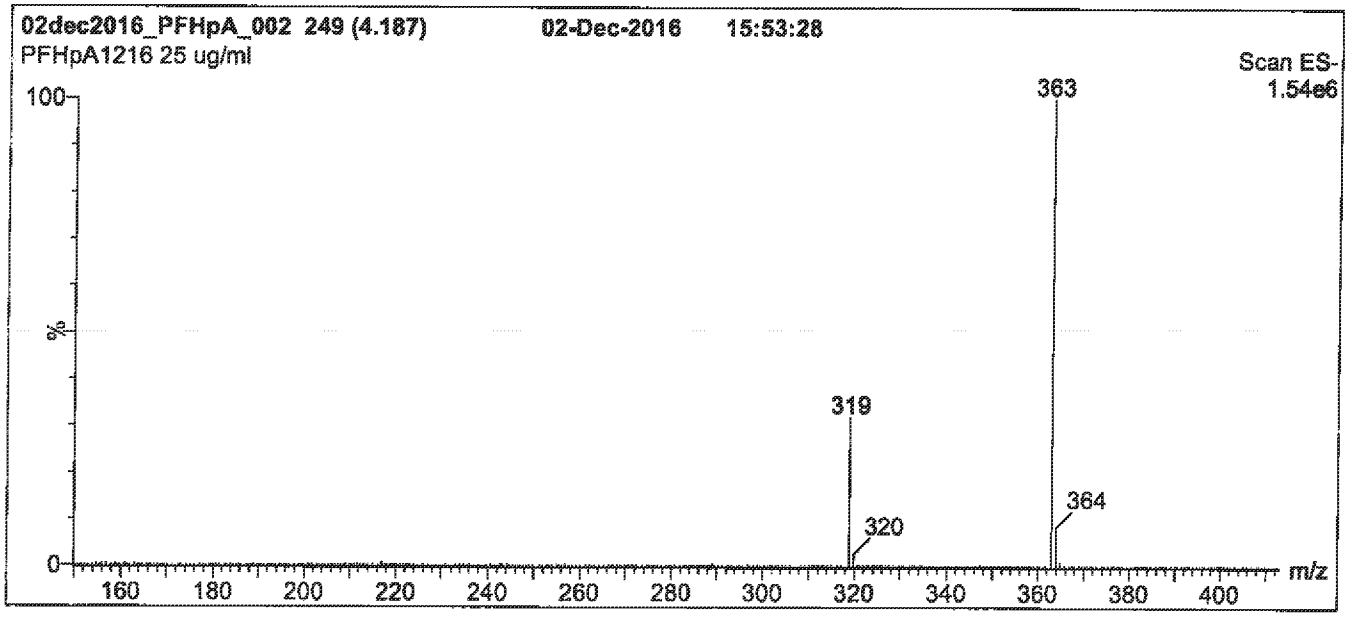
CALA

ANAB

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

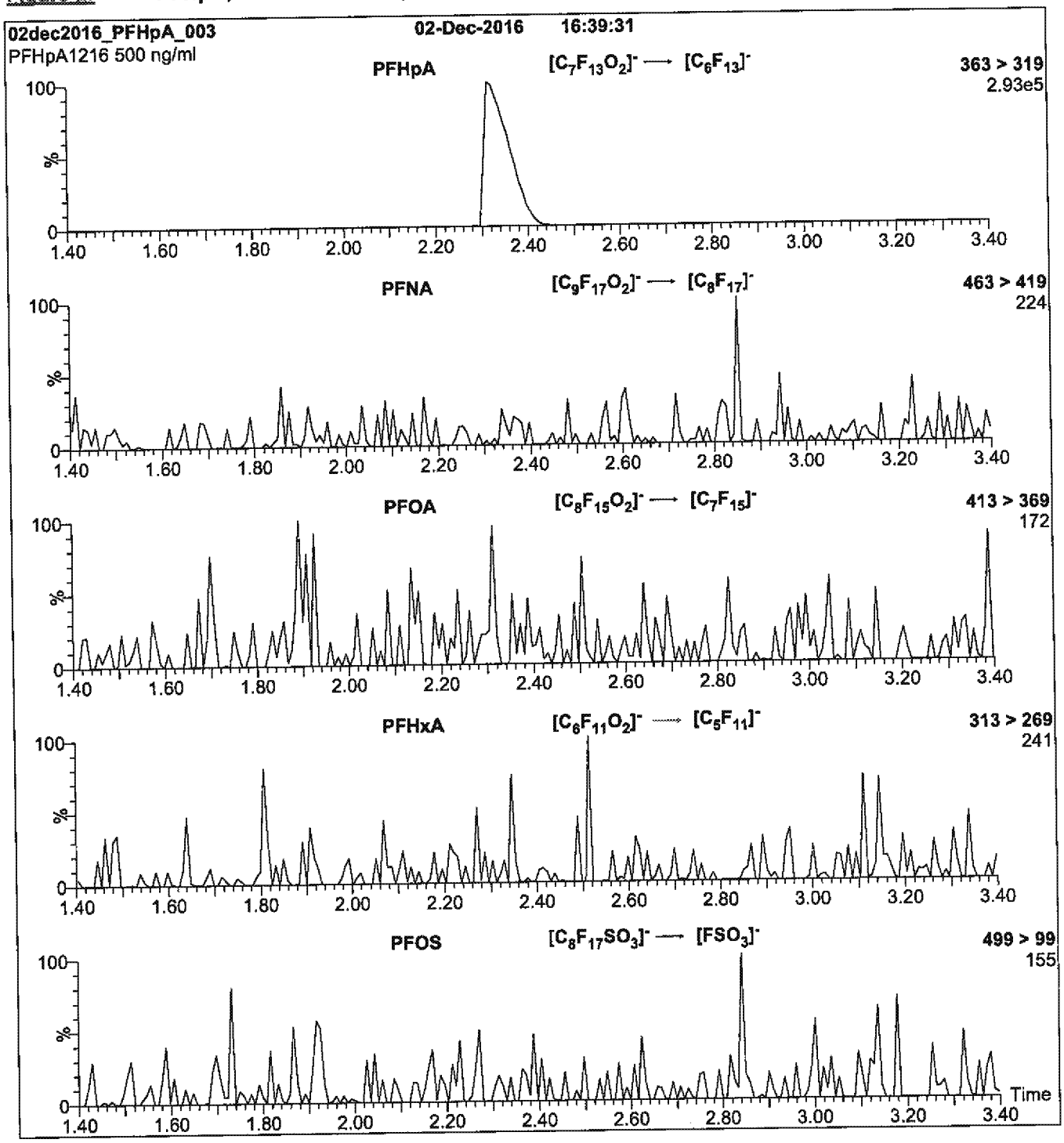
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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) = 3.50e-3
Collision Energy (eV) = 11

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFHxSK
LOT NUMBER:	brPFHxSK0117
CONCENTRATION:	50.0 ± 2.5 µg/ml (total potassium salt)
	45.5 ± 2.3 µg/ml (total PFHxS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	01/03/2017
LAST TESTED: (mm/dd/yyyy)	01/04/2017
EXPIRY DATE: (mm/dd/yyyy)	01/04/2022
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorohexanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% of perfluoro-1-pentanesulfonate and ~ 0.2% of perfluoro-1-octanesulfonate.
- CAS#: 3871-99-6 (for linear isomer; potassium salt).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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 compounds it contains.

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED

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

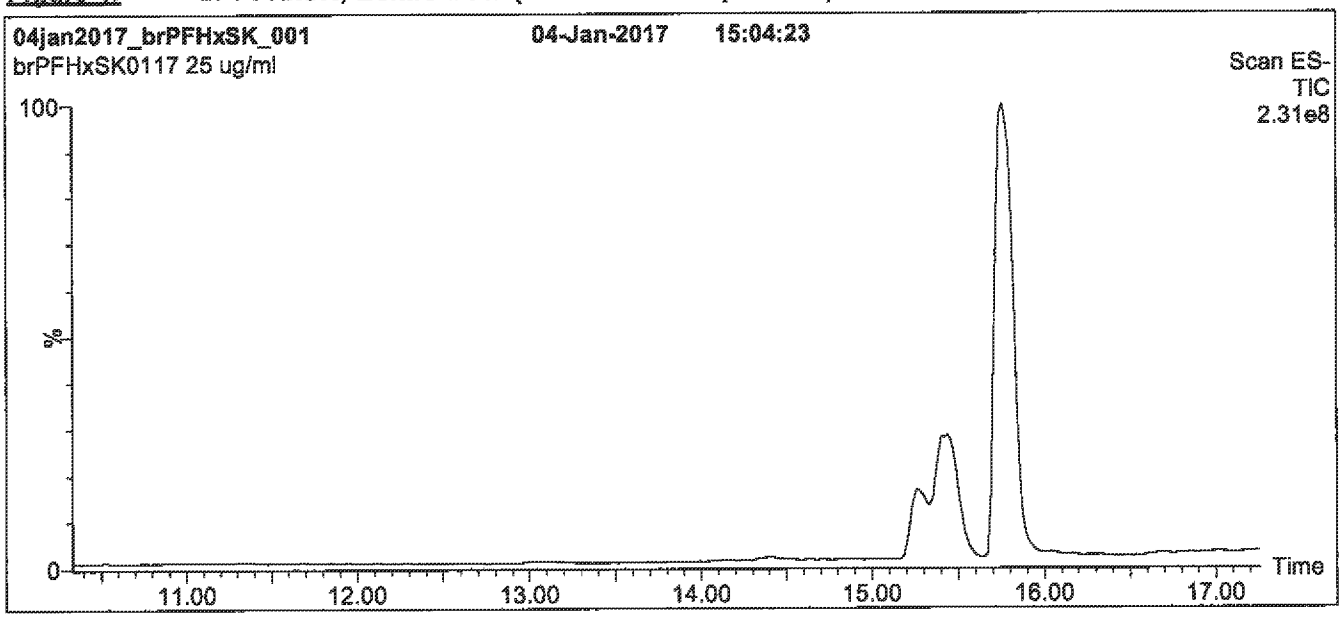
Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

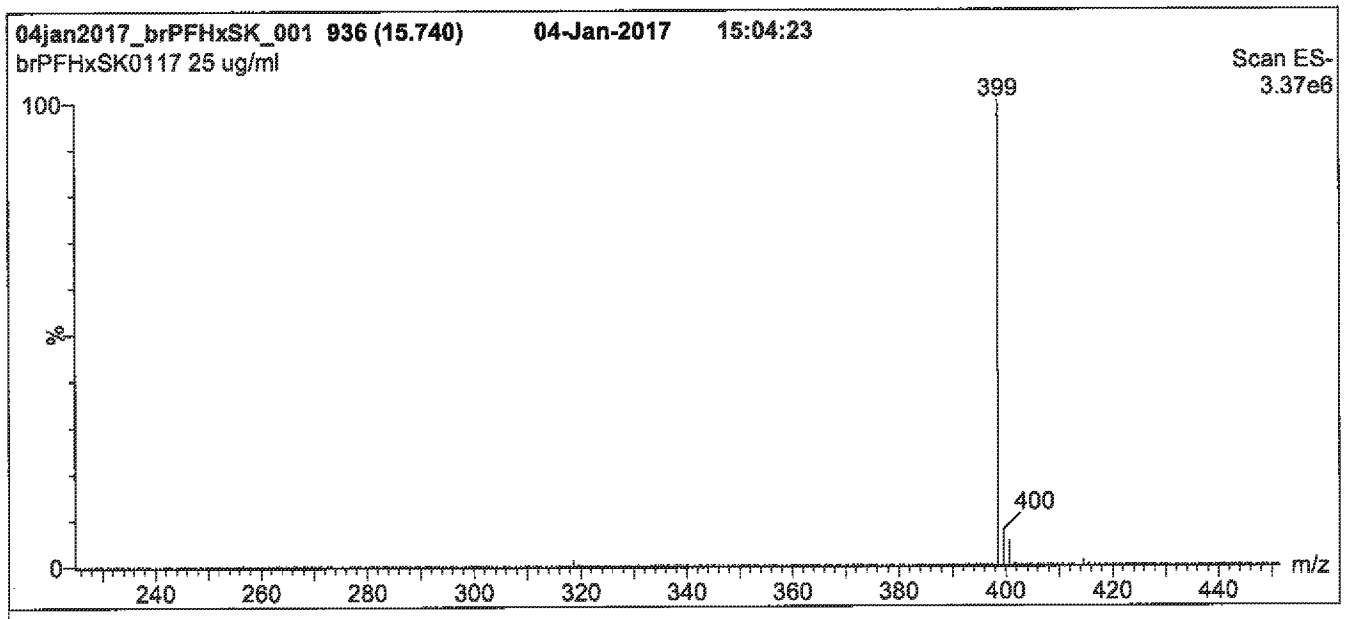
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)_2CF_2CF_2SO_3^-K^+$	0.2
7	Other Unidentified Isomers		0.5

* Percent of total perfluorohexanesulfonate isomers only.
** Systematic Name: Potassium perfluorohexane-2-sulfonate.

Certified By: Ex. 4 CBI Date: 01/20/2017 (mm/dd/yyyy)

Figure 1: **br-PFHxSK; 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: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

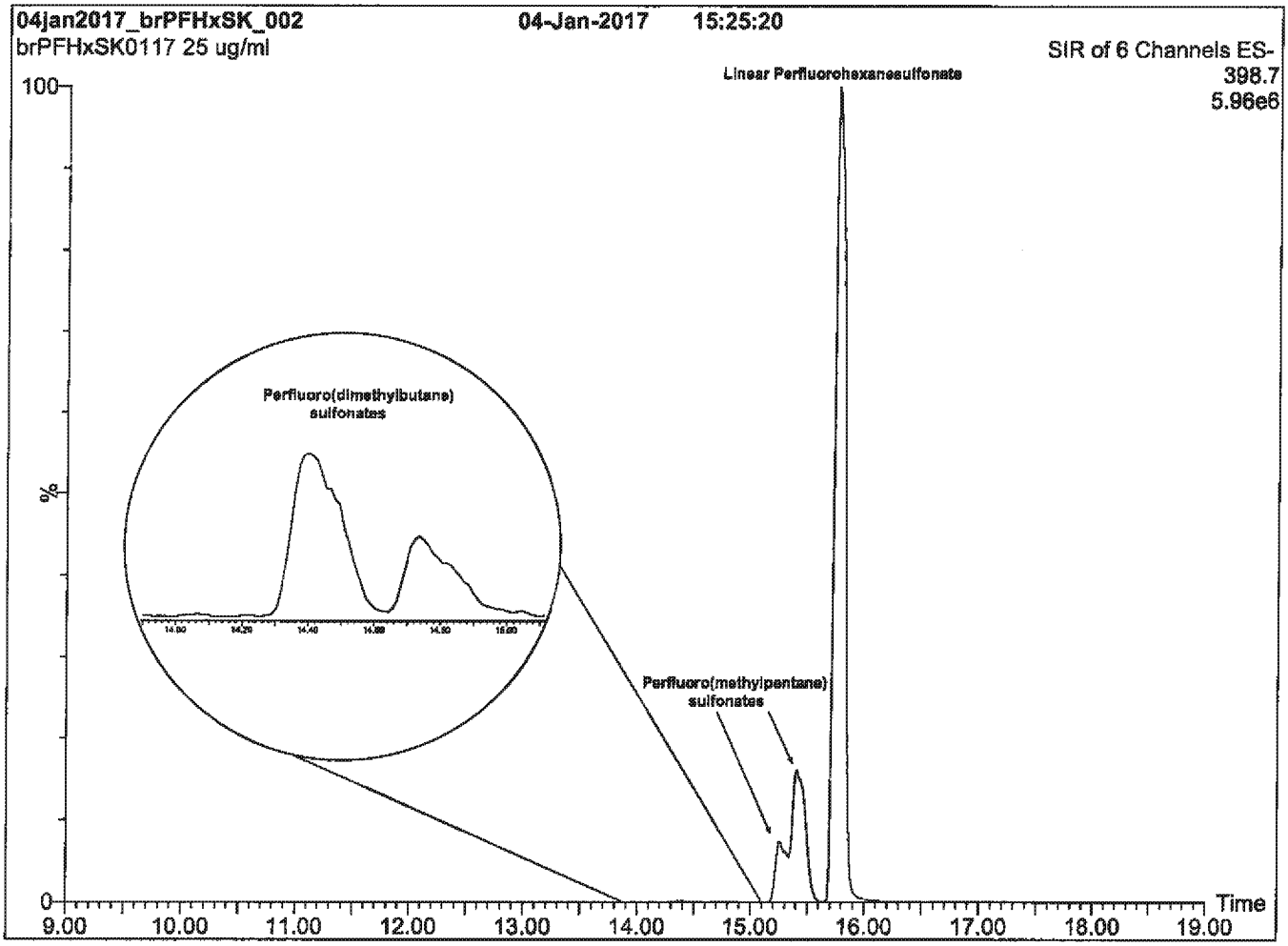
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-PFHxSK; LC/MS Data (SIR)**



Conditions for Figure 2:

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: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

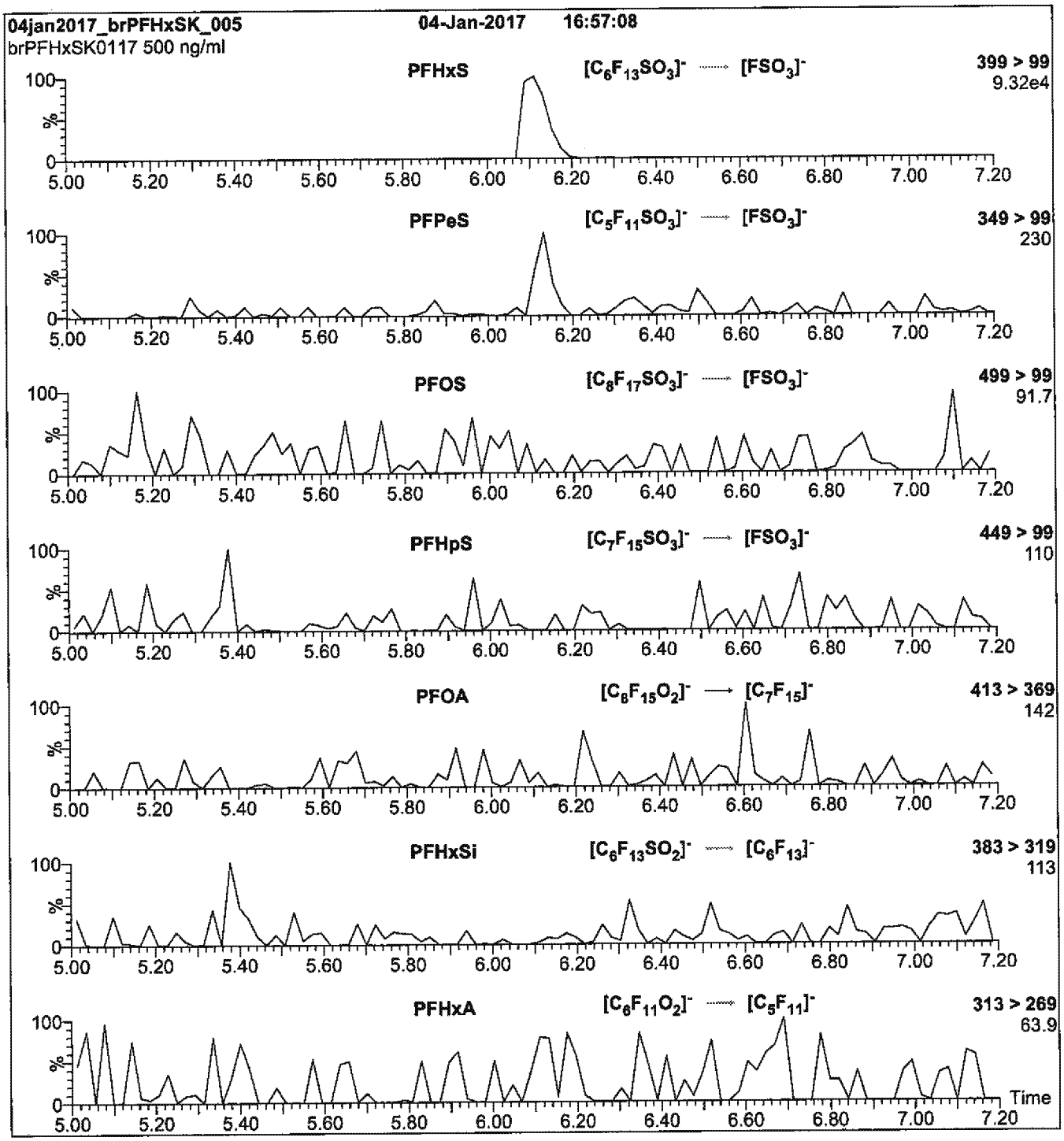
Flow: 300 µl/min

MS Parameters

Experiment: SIR (6 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = variable (15-62)
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 3: **br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: Direct loop injection
10 µl (500 ng/ml br-PFHxSK)

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

Flow: 300 µl/min

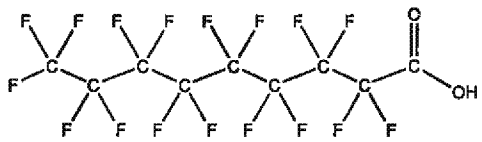
MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 30

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFNA	**LOT NUMBER:**	PFNA0717
COMPOUND:	Perfluoro-n-nonanoic acid		
STRUCTURE:		**CAS #:**	375-95-1



MOLECULAR FORMULA:	$C_9HF_{17}O_2$	**MOLECULAR WEIGHT:**	464.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/20/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/20/2022		
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-octanoic acid (PFOA), < 0.1% of perfluoro-n-heptanoic acid (PFHpA), and < 0.1% of perfluoro-n-undecanoic acid (PFUdA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: Ex. 4 CBI **Date:** 07/24/2017 (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. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

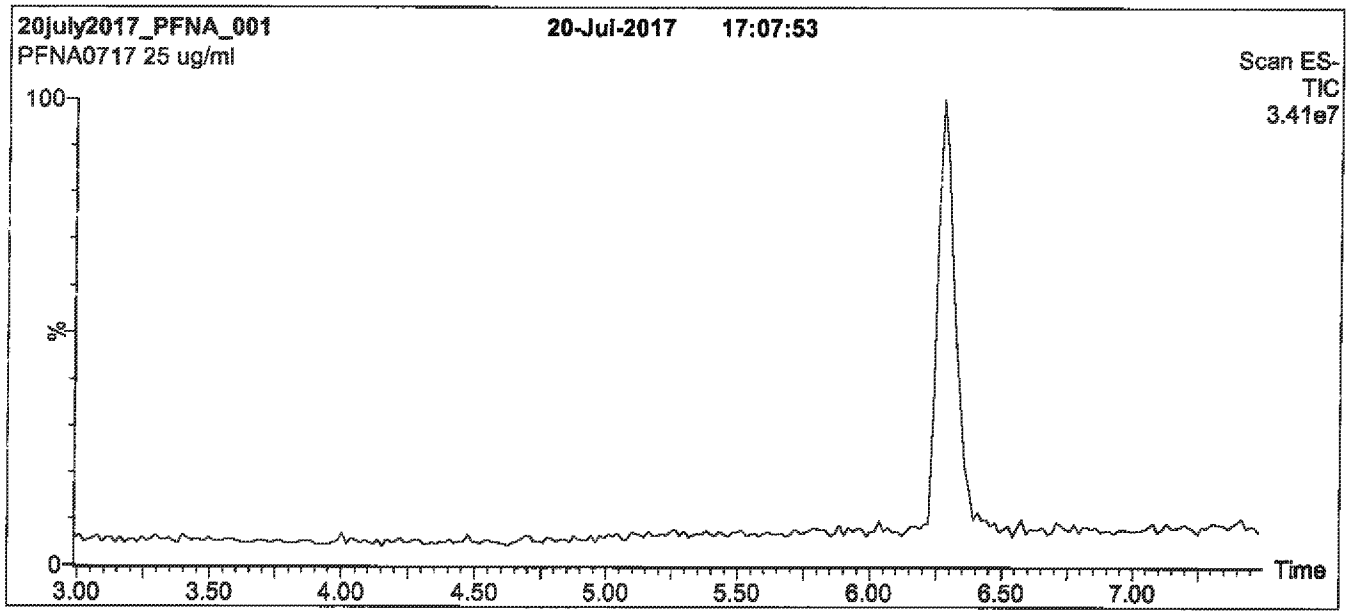
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

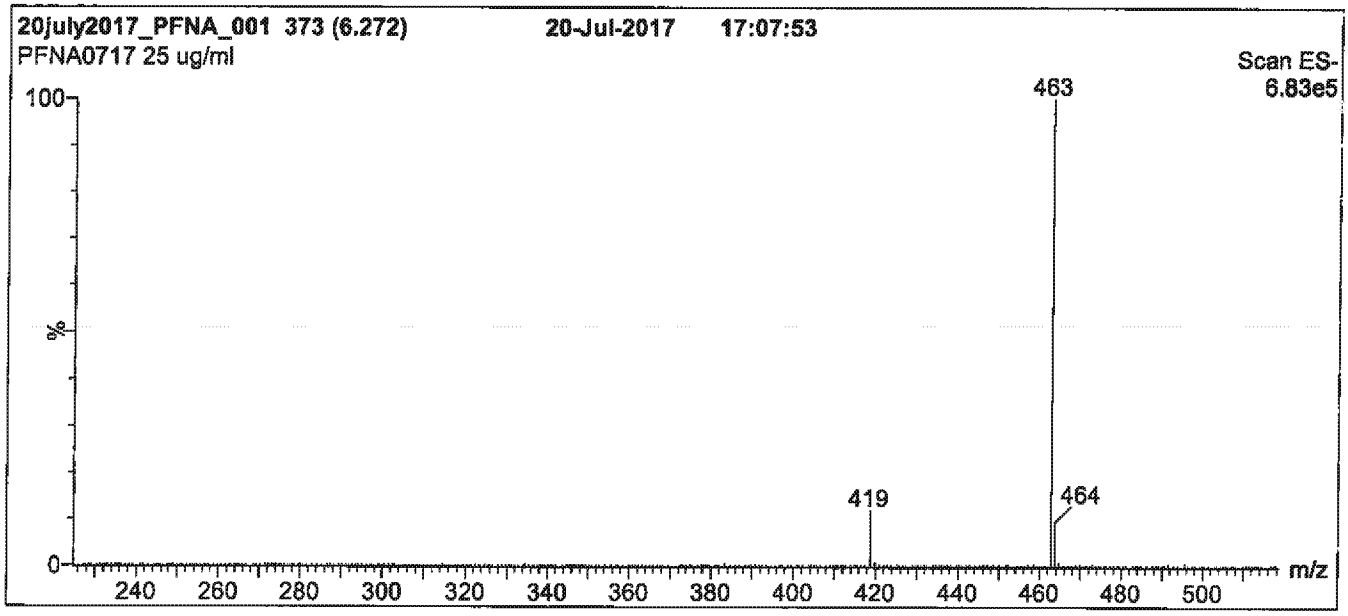
CALA

ANAB

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: **PFNA; 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)
Hold for 1 min. Ramp to 90% organic over 7 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

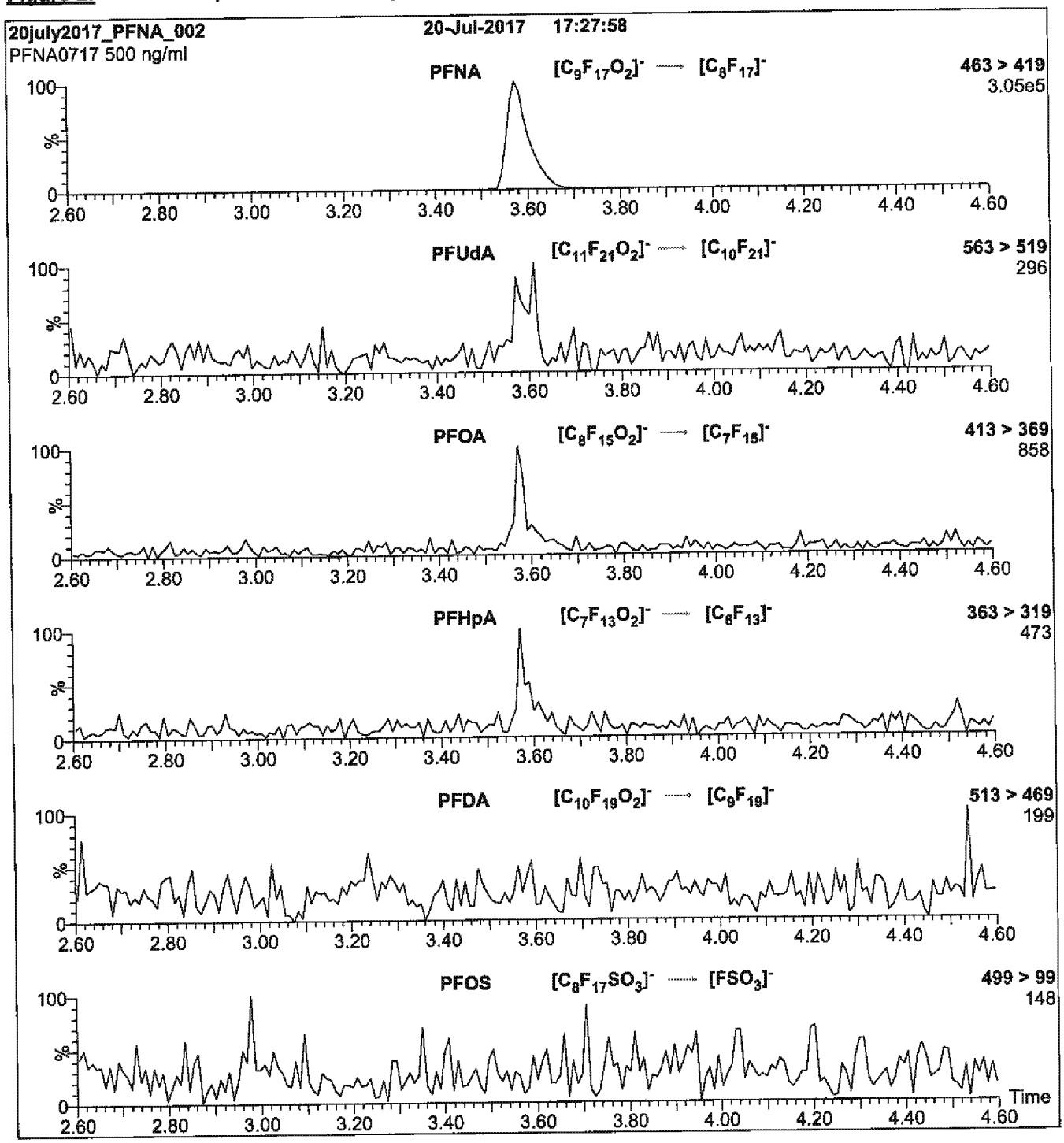
Flow: 300 µl/min

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: **PFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

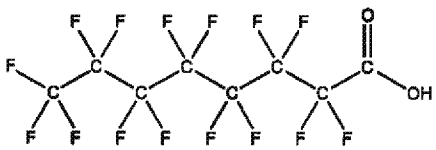
Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 11

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFOA
LOT NUMBER: PFOA0917
COMPOUND: Perfluoro-n-octanoic acid

STRUCTURE:
CAS #: 335-67-1



MOLECULAR FORMULA: $C_8HF_{15}O_2$
MOLECULAR WEIGHT: 414.07
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/27/2017
EXPIRY DATE: (mm/dd/yyyy) 09/27/2022
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: Ex. 4 CBI **Date:** 09/28/2017 (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. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

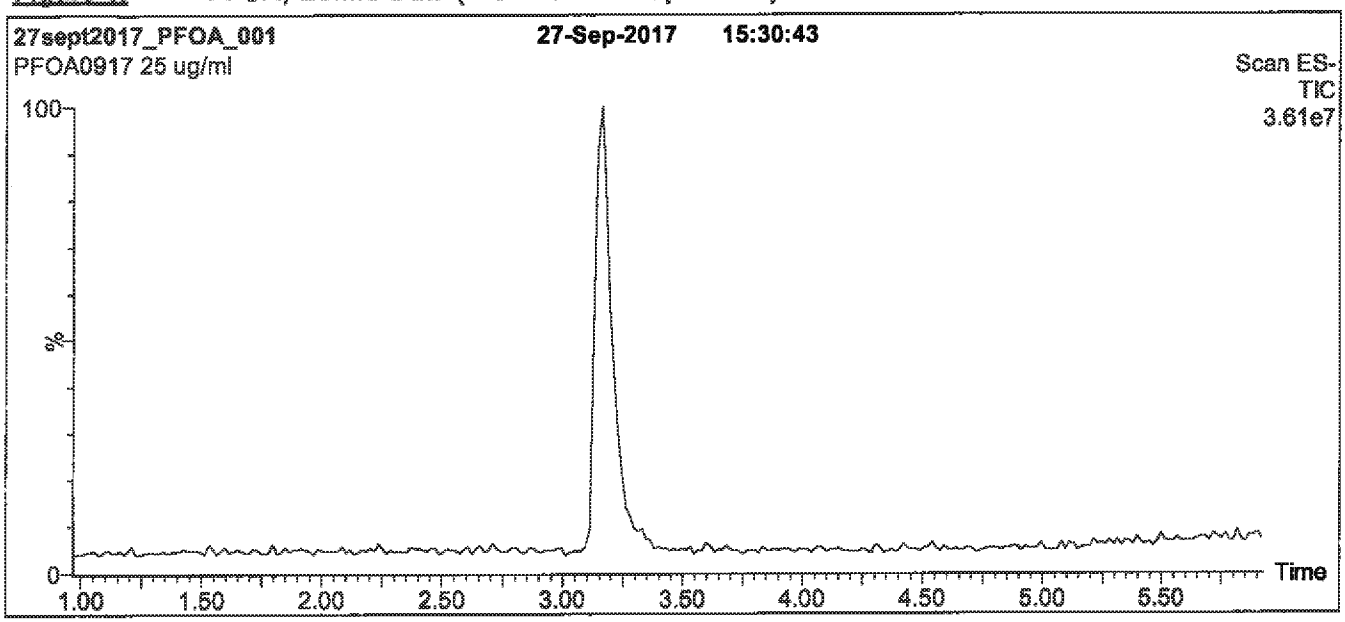
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

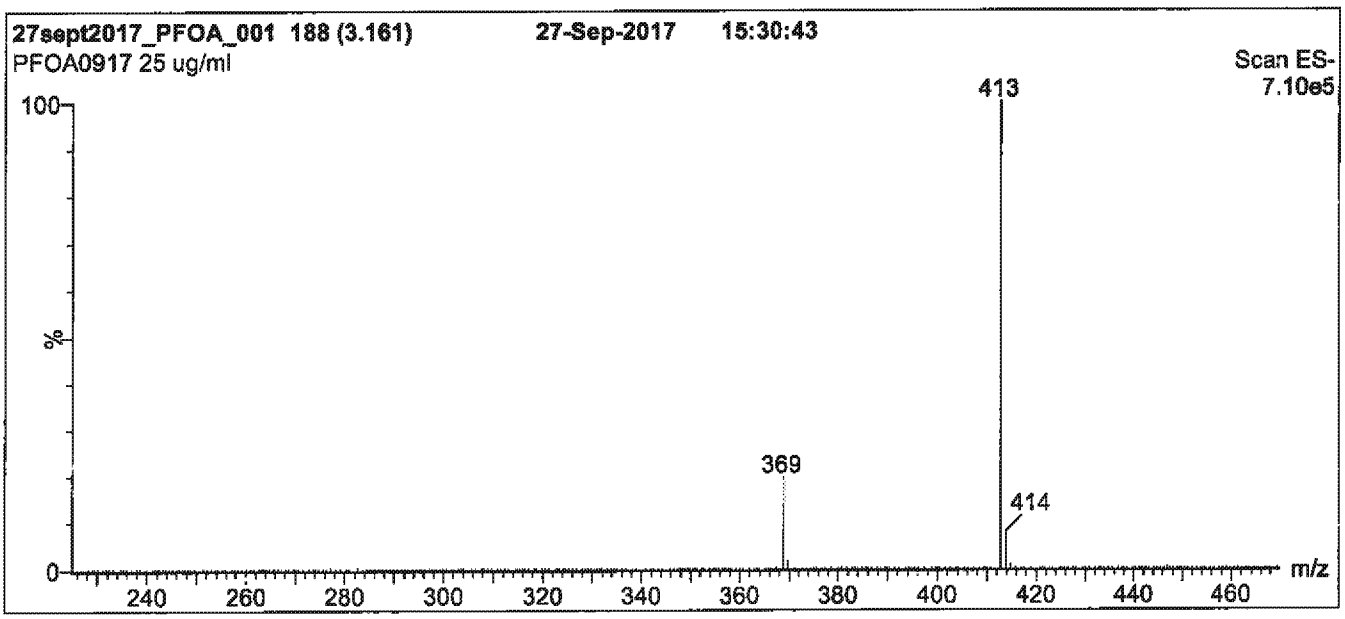
CALA

ANAB

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: **PFOA; 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

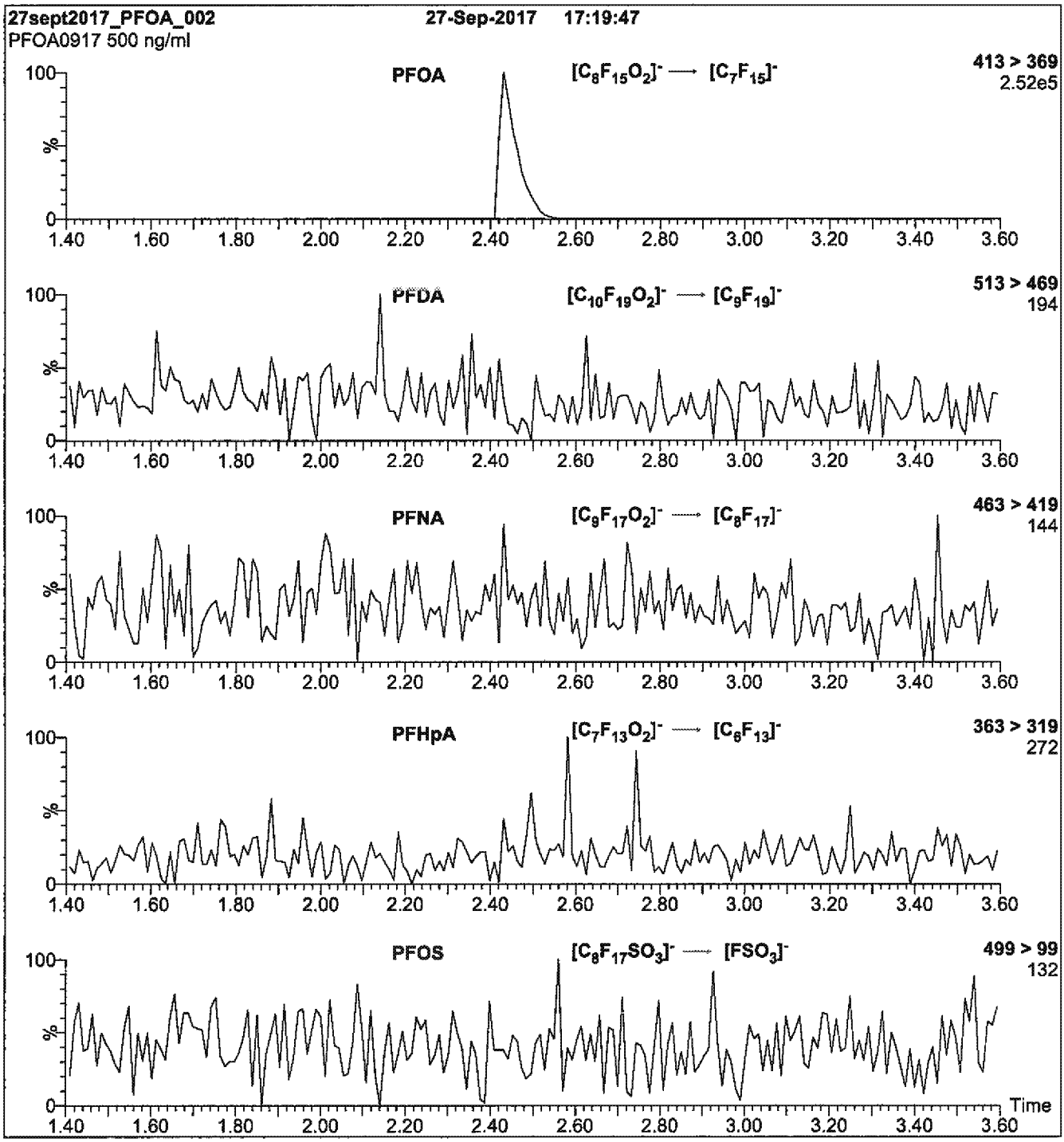
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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) = 11

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFOSK
LOT NUMBER:	brPFOSK0117
CONCENTRATION:	50 ± 2.5 µg/ml (total potassium salt)
	46.4 ± 2.3 µg/ml (total PFOS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	01/09/2017
LAST TESTED: (mm/dd/yyyy)	01/12/2017
EXPIRY DATE: (mm/dd/yyyy)	01/12/2022
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorooctanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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 compounds it contains.

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA

ANAB

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

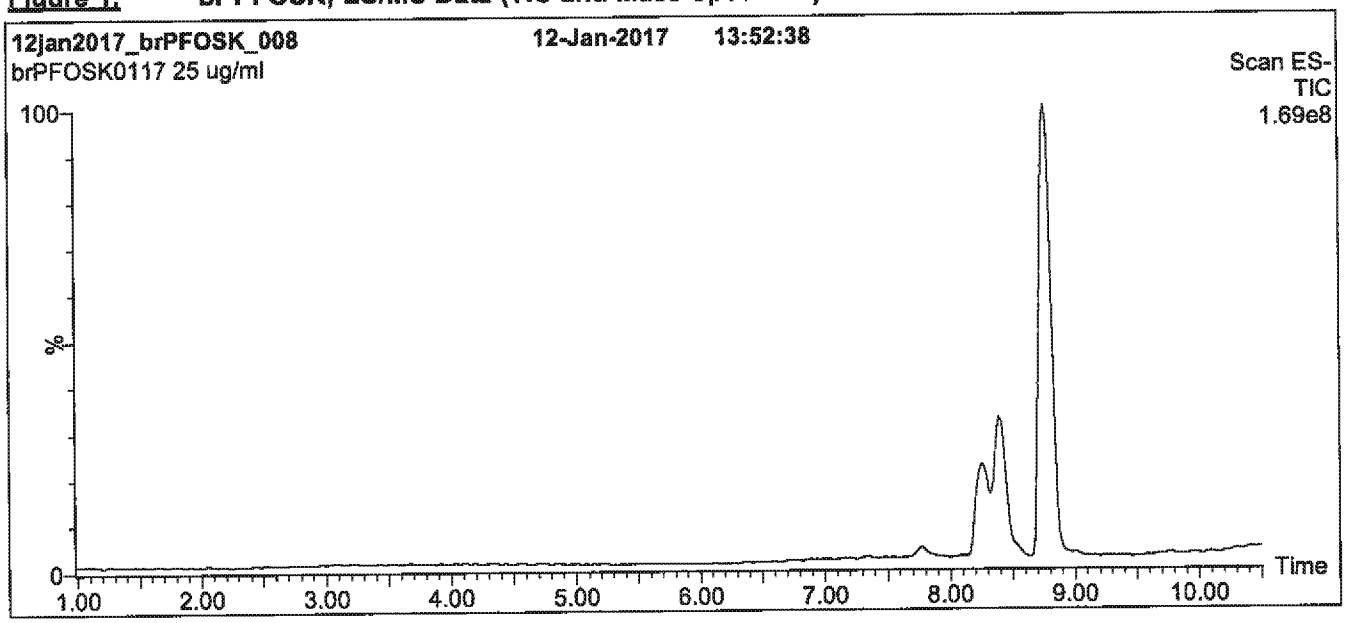
Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

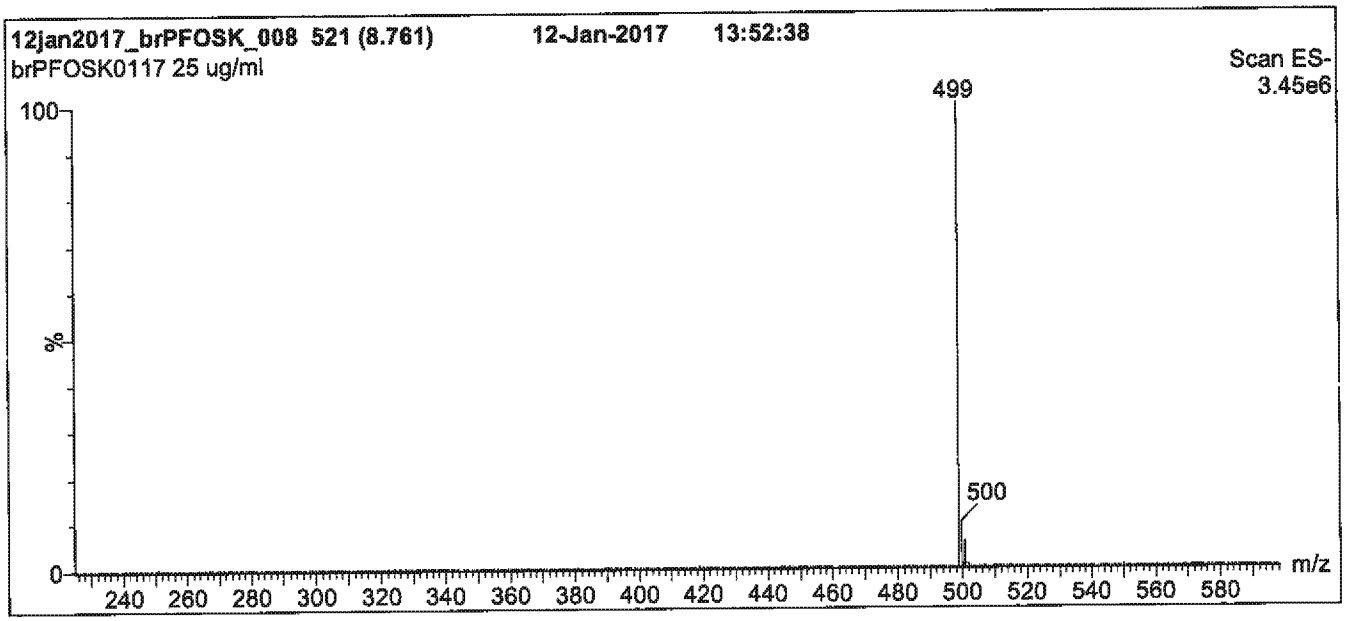
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3C(CF_3)(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2C(CF_3)(CF_3)CF_2CF_2CF_2SO_3^-K^+$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: Ex. 4 CBI **Date:** 01/20/2017 (mm/dd/yyyy)

Figure 1: **br-PFOSK; 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 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

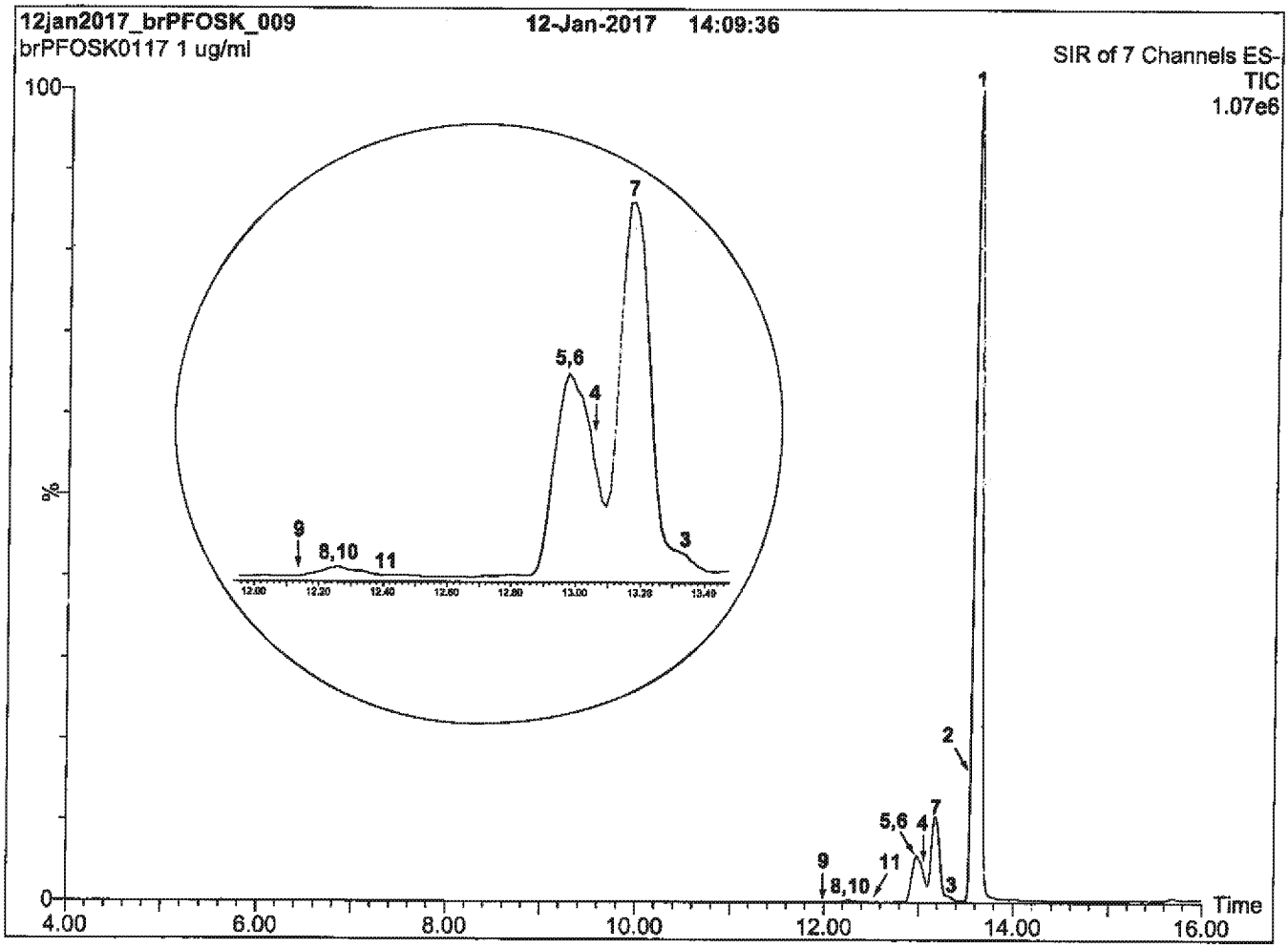
Flow: 300 µl/min

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: **br-PFOSK; LC/MS Data (SIR)**



Conditions for Figure 2:

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)

Injection: 1.0 µg/ml of br-PFOSK

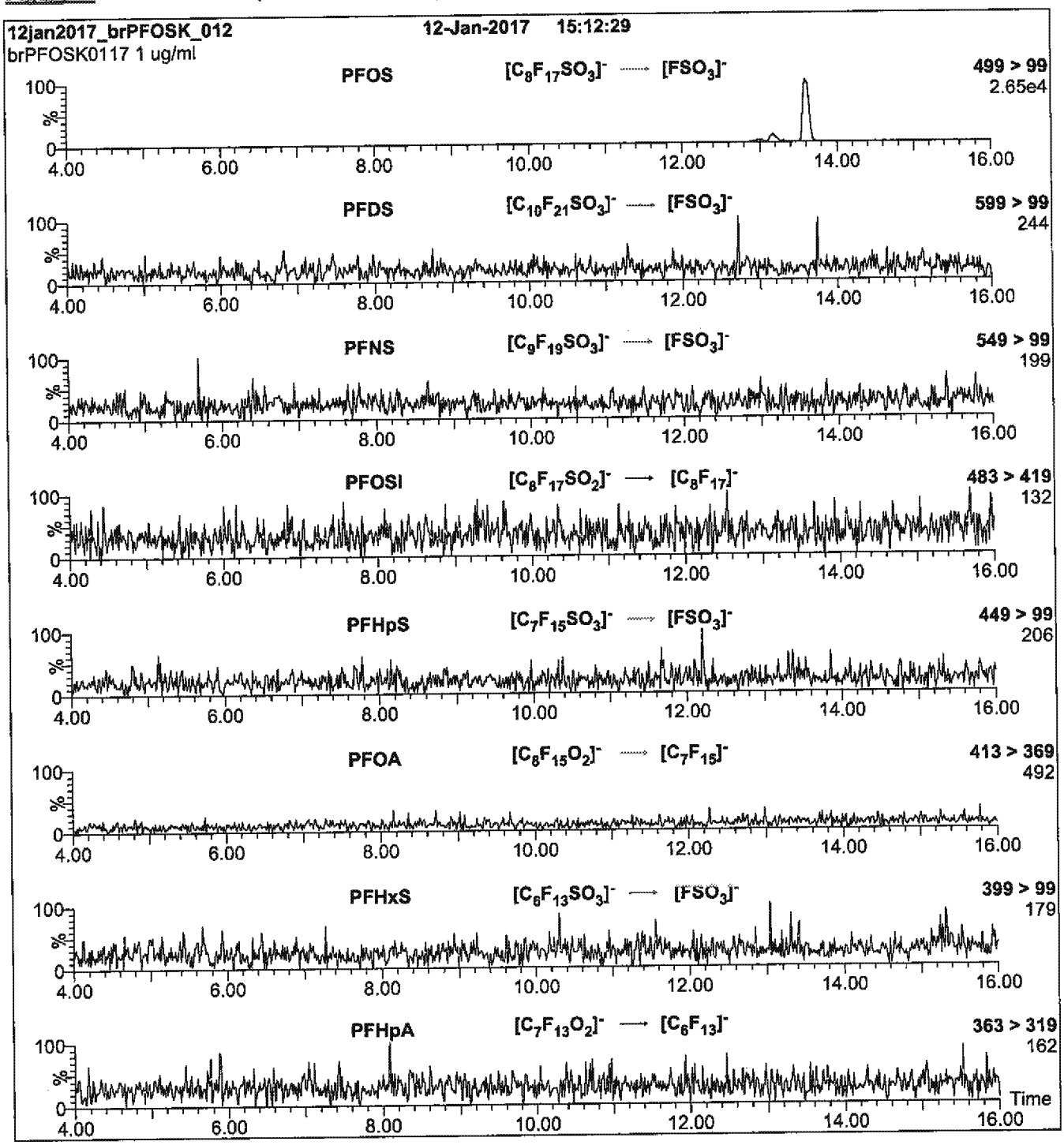
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

Flow: 300 µl/min

MS Conditions:

SIR (ES^-)
Source = 110 °C
Desolvation = 325 °C
Cone Voltage = 60V

Figure 3: **br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 11-50 (variable)

Certification Summary

Client: Weston Solutions, Inc.
Project/Site: DAS R35365, SDG C0B49

TestAmerica Job ID: 320-41073-1

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Sacramento	Alaska (UST)	State Program	10	17-020
TestAmerica Sacramento	ANAB	DoD ELAP		L2468
TestAmerica Sacramento	Arizona	State Program	9	AZ0708
TestAmerica Sacramento	Arkansas DEQ	State Program	6	88-0691
TestAmerica Sacramento	California	State Program	9	2897
TestAmerica Sacramento	Colorado	State Program	8	CA00044
TestAmerica Sacramento	Connecticut	State Program	1	PH-0691
TestAmerica Sacramento	Florida	NELAP	4	E87570
TestAmerica Sacramento	Georgia	State Program	4	N/A
TestAmerica Sacramento	Hawaii	State Program	9	N/A
TestAmerica Sacramento	Illinois	NELAP	5	200060
TestAmerica Sacramento	Kansas	NELAP	7	E-10375
TestAmerica Sacramento	Louisiana	NELAP	6	30612
TestAmerica Sacramento	Maine	State Program	1	CA0004
TestAmerica Sacramento	Michigan	State Program	5	9947
TestAmerica Sacramento	Nevada	State Program	9	CA00044
TestAmerica Sacramento	New Hampshire	NELAP	1	2997
TestAmerica Sacramento	New Jersey	NELAP	2	CA005
TestAmerica Sacramento	New York	NELAP	2	11666
TestAmerica Sacramento	Oregon	NELAP	10	4040
TestAmerica Sacramento	Pennsylvania	NELAP	3	68-01272
TestAmerica Sacramento	Texas	NELAP	6	T104704399
TestAmerica Sacramento	US Fish & Wildlife	Federal		LE148388-0
TestAmerica Sacramento	USDA	Federal		P330-11-00436
TestAmerica Sacramento	USEPA UCMR	Federal	1	CA00044
TestAmerica Sacramento	Utah	NELAP	8	CA00044
TestAmerica Sacramento	Vermont	State Program	1	VT-4040
TestAmerica Sacramento	Virginia	NELAP	3	460278
TestAmerica Sacramento	Washington	State Program	10	C581
TestAmerica Sacramento	West Virginia (DW)	State Program	3	9930C
TestAmerica Sacramento	Wyoming	State Program	8	8TMS-L

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

Method 537

Perfluorinated Alkyl Acids (LC/MS) by Method 537

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
C0B49	320-41073-1	90	99
C0B50	320-41073-2	95	102
C0B51	320-41073-3	86	94
C0B52	320-41073-4	77	106
C0B53	320-41073-5	77	108
C0B54	320-41073-6	75	100
	MB 320-234427/1-A	92	97
	LCS 320-234427/2-A	100	104
C0B54 MS	320-41073-6 MS	82	104
C0B54 MSD	320-41073-6 MSD	80	94

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

Column to be used to flag recovery values

FORM II 537 DW

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.07.23_537B_026.d

Lab ID: LCS 320-234427/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctane sulfonic acid	220	240	109	70-130	
Perfluorooctanoic acid	110	113	103	70-130	
Perfluorononanoic acid	110	113	102	70-130	
Perfluorohexanesulfonic acid	168	181	108	70-130	
Perfluoroheptanoic acid	54.0	54.3	100	70-130	
Perfluorobutanesulfonic acid	500	505	101	70-130	

Column to be used to flag recovery and RPD values

FORM III 537 DW

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.07.23_537B_049.d

Lab ID: 320-41073-6 MS Client ID: C0B54 MS

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC	QC LIMITS REC	#
Perfluorooctane sulfonic acid	210	ND	234	111	70-130	
Perfluorooctanoic acid	105	3.4 J	110	101	70-130	
Perfluorononanoic acid	105	ND	115	109	70-130	
Perfluorohexanesulfonic acid	161	ND	175	108	70-130	
Perfluoroheptanoic acid	51.7	ND	48.0	93	70-130	
Perfluorobutanesulfonic acid	479	ND	454	95	70-130	

Column to be used to flag recovery and RPD values

FORM III 537 DW

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.07.23_537B_050.d

Lab ID: 320-41073-6 MSD Client ID: C0B54 MSD

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctane sulfonic acid	220	215	98	9	30	70-130	
Perfluorooctanoic acid	110	102	89	8	30	70-130	
Perfluorononanoic acid	110	99.5	90	14	30	70-130	
Perfluorohexanesulfonic acid	168	161	96	8	30	70-130	
Perfluoroheptanoic acid	54.0	45.1	84	6	30	70-130	
Perfluorobutanesulfonic acid	500	439	88	3	30	70-130	

Column to be used to flag recovery and RPD values

FORM III 537 DW

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Lab File ID: 2018.07.23_537B_025.d Lab Sample ID: MB 320-234427/1-A

Matrix: Water Date Extracted: 07/17/2018 07:23

Instrument ID: A8_N Date Analyzed: 07/24/2018 04:52

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-234427/2-A	2018.07.23_537B_026.d	07/24/2018 04:57
C0B49	320-41073-1	2018.07.23_537B_041.d	07/24/2018 06:07
C0B50	320-41073-2	2018.07.23_537B_042.d	07/24/2018 06:12
C0B51	320-41073-3	2018.07.23_537B_043.d	07/24/2018 06:17
C0B52	320-41073-4	2018.07.23_537B_044.d	07/24/2018 06:21
C0B53	320-41073-5	2018.07.23_537B_045.d	07/24/2018 06:26
C0B54	320-41073-6	2018.07.23_537B_046.d	07/24/2018 06:31
C0B54 MS	320-41073-6 MS	2018.07.23_537B_049.d	07/24/2018 06:45
C0B54 MSD	320-41073-6 MSD	2018.07.23_537B_050.d	07/24/2018 06:49

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Instrument ID: A8_N Calibration Start Date: 07/21/2018 12:21

GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 07/21/2018 12:45

Calibration ID: 40229

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		1182254	1.80	2951502	2.06		
UPPER LIMIT		1773381	2.30	4427253	2.56		
LOWER LIMIT		591127	1.30	1475751	1.56		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 320-235370/11		1220813	1.80	2998753	2.05		
ICV 320-235370/13		1160905	1.81	2863082	2.06		
CCVL 320-235585/2		1174486	1.78	2956897	2.03		
CCV 320-235786/21 CCVIS		1194857	1.77	2850060	2.01		
MB 320-234427/1-A		1468577	1.77	3365410	2.01		
LCS 320-234427/2-A		1117957	1.77	2715962	2.00		
CCV 320-235786/33 CCVIS		1247739	1.77	2869987	2.01		
CCV 320-235788/33 CCVIS		1247739	1.77	2869987	2.01		
320-41073-1	C0B49	1362258	1.77	3115423	2.01		
320-41073-2	C0B50	1396403	1.77	3324665	2.01		
320-41073-3	C0B51	1444467	1.78	3194183	2.02		
320-41073-4	C0B52	1268511	1.77	3333153	2.01		
320-41073-5	C0B53	1339740	1.77	3486336	2.01		
320-41073-6	C0B54	1229470	1.77	3009364	2.01		
CCV 320-235788/45 CCVIS		1200268	1.77	2952012	2.00		
CCV 320-235790/45 CCVIS		1200268	1.77	2952012	2.00		
320-41073-6 MS	C0B54 MS	1037417	1.77	2550876	2.01		
320-41073-6 MSD	C0B54 MSD	1408973	1.76	3375528	2.00		
CCV 320-235790/49		1203134	1.77	2775939	2.00		

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 DW

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Sample No.: CCV 320-235786/21 Date Analyzed: 07/24/2018 04:43

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

Lab File ID (Standard): 2018.07.23_537B_023 Heated Purge: (Y/N) N

Calibration ID: 40229

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1194857	1.77	2850060	2.01		
UPPER LIMIT		1672800	2.27	3990084	2.51		
LOWER LIMIT		836400	1.27	1995042	1.51		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-234427/1-A		1468577	1.77	3365410	2.01		
LCS 320-234427/2-A		1117957	1.77	2715962	2.00		

13PFOA = 13C2-PFOA
13PFOA = 13C2-PFOA
PFOS = 13C4 PFOS
PFOS = 13C4 PFOS
Area Limit = 70%-140% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537 DW

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Sample No.: CCV 320-235786/33 Date Analyzed: 07/24/2018 05:39

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

Lab File ID (Standard): 2018.07.23_537B_035 Heated Purge: (Y/N) N

Calibration ID: 40229

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1247739	1.77	2869987	2.01		
UPPER LIMIT		1746835	2.27	4017982	2.51		
LOWER LIMIT		873417	1.27	2008991	1.51		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-234427/1-A		1468577	1.77	3365410	2.01		
LCS 320-234427/2-A		1117957	1.77	2715962	2.00		

13PFOA = 13C2-PFOA
13PFOA = 13C2-PFOA
PFOS = 13C4 PFOS
PFOS = 13C4 PFOS
Area Limit = 70%-140% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537 DW

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Sample No.: CCV 320-235788/33 Date Analyzed: 07/24/2018 05:39

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

Lab File ID (Standard): 2018.07.23_537B_035 Heated Purge: (Y/N) N

Calibration ID: 40229

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1247739	1.77	2869987	2.01		
UPPER LIMIT		1746835	2.27	4017982	2.51		
LOWER LIMIT		873417	1.27	2008991	1.51		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-41073-1	C0B49	1362258	1.77	3115423	2.01		
320-41073-2	C0B50	1396403	1.77	3324665	2.01		
320-41073-3	C0B51	1444467	1.78	3194183	2.02		
320-41073-4	C0B52	1268511	1.77	3333153	2.01		
320-41073-5	C0B53	1339740	1.77	3486336	2.01		
320-41073-6	C0B54	1229470	1.77	3009364	2.01		

13PFOA = 13C2-PFOA
13PFOA = 13C2-PFOA
PFOS = 13C4 PFOS
PFOS = 13C4 PFOS
Area Limit = 70%-140% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537 DW

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Sample No.: CCV 320-235788/45 Date Analyzed: 07/24/2018 06:35

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

Lab File ID (Standard): 2018.07.23_537B_047 Heated Purge: (Y/N) N

Calibration ID: 40229

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1200268	1.77	2952012	2.00		
UPPER LIMIT		1680375	2.27	4132817	2.50		
LOWER LIMIT		840188	1.27	2066408	1.50		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-41073-1	C0B49	1362258	1.77	3115423	2.01		
320-41073-2	C0B50	1396403	1.77	3324665	2.01		
320-41073-3	C0B51	1444467	1.78	3194183	2.02		
320-41073-4	C0B52	1268511	1.77	3333153	2.01		
320-41073-5	C0B53	1339740	1.77	3486336	2.01		
320-41073-6	C0B54	1229470	1.77	3009364	2.01		

13PFOA = 13C2-PFOA
13PFOA = 13C2-PFOA
PFOS = 13C4 PFOS
PFOS = 13C4 PFOS
Area Limit = 70%-140% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537 DW

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Sample No.: CCV 320-235790/45 Date Analyzed: 07/24/2018 06:35

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

Lab File ID (Standard): 2018.07.23_537B_047 Heated Purge: (Y/N) N

Calibration ID: 40229

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1200268	1.77	2952012	2.00		
UPPER LIMIT		1680375	2.27	4132817	2.50		
LOWER LIMIT		840188	1.27	2066408	1.50		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-41073-6 MS	C0B54 MS	1037417	1.77	2550876	2.01		
320-41073-6 MSD	C0B54 MSD	1408973	1.76	3375528	2.00		
CCV 320-235790/49		1203134	1.77	2775939	2.00		

13PFOA = 13C2-PFOA
13PFOA = 13C2-PFOA
PFOS = 13C4 PFOS
PFOS = 13C4 PFOS
Area Limit = 70%-140% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537 DW

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41073-1
SDG No.:
Client Sample ID: C0B49
Lab Sample ID: 320-41073-1
Matrix: Water
Lab File ID: 2018.07.23_537B_041.d
Analysis Method: 537 DW
Date Collected: 07/11/2018 09:00
Extraction Method: 537 DW
Date Extracted: 07/17/2018 08:29
Sample wt/vol: 248.7(mL)
Date Analyzed: 07/24/2018 06:07
Con. Extract Vol.: 1.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 235788
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctane sulfonic acid	ND		40	6.8
335-67-1	Perfluorooctanoic acid	ND		20	2.8
375-95-1	Perfluorononanoic acid	ND		20	8.0
355-46-4	Perfluorohexanesulfonic acid	ND		30	5.5
375-85-9	Perfluoroheptanoic acid	ND		10	1.9
375-73-5	Perfluorobutanesulfonic acid	ND		90	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	99		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_041.d
Lims ID: 320-41073-A-1-A
Client ID: C0B49
Sample Type: Client
Inject. Date: 24-Jul-2018 06:07:47 ALS Bottle#: 31 Worklist Smp#: 39
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41073-a-1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 24-Jul-2018 10:51:27 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

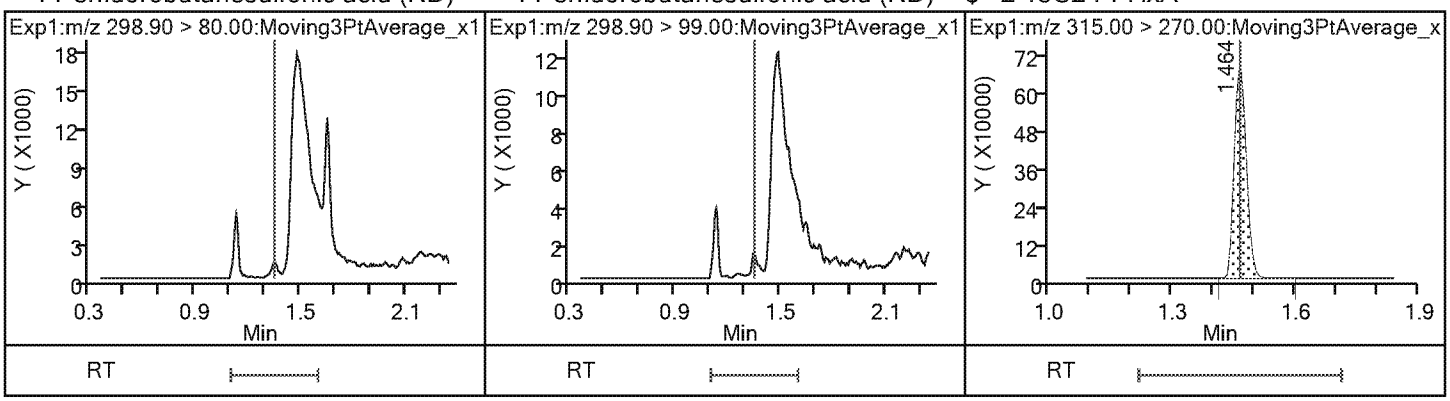
Column 1 : Det: EXP1
Process Host: XAWRK021

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1321926	9.02		16360	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.768	0.0		1362258	10.0		12067	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.011	0.0		3115423	28.7		4459	
$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.223	0.0	1.000	940559	9.93		7770	

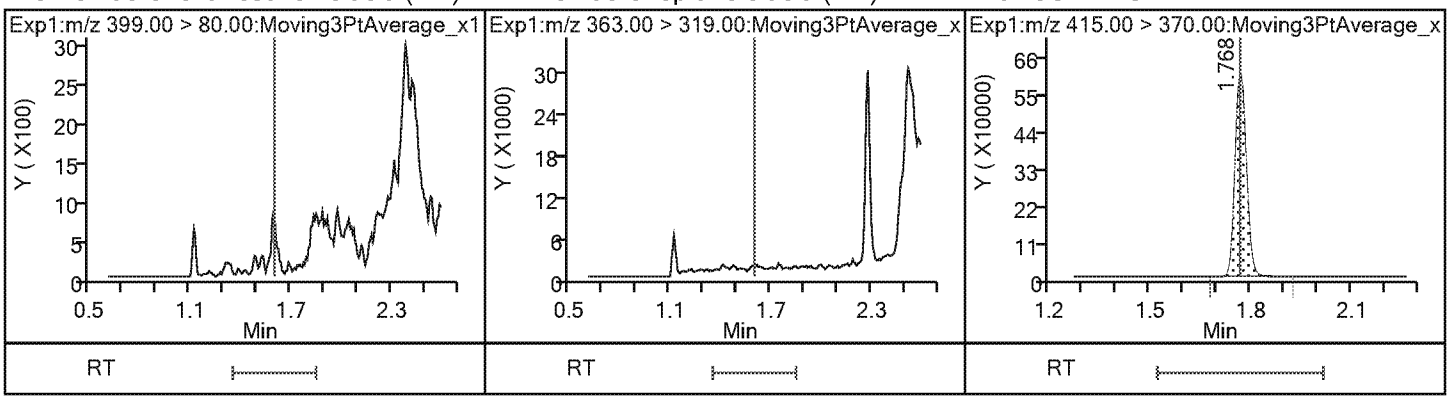
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_041.d				
Injection Date:	24-Jul-2018 06:07:47	Instrument ID:	A8_N		
Lims ID:	320-41073-A-1-A	Lab Sample ID:	320-41073-1		
Client ID:	C0B49				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	31	Worklist Smp#:	39
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		

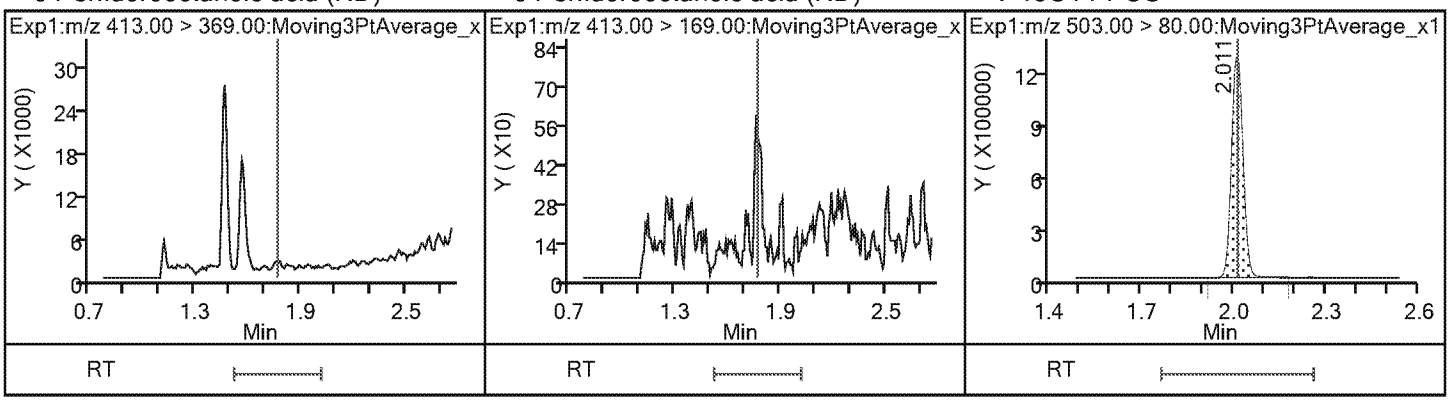
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) $ 2 13C2 PFHxA



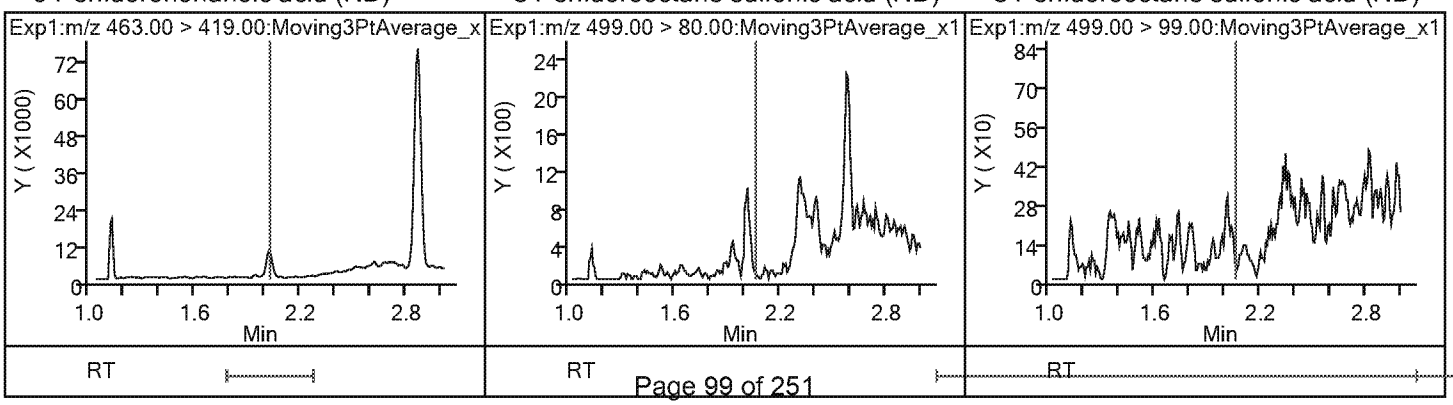
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



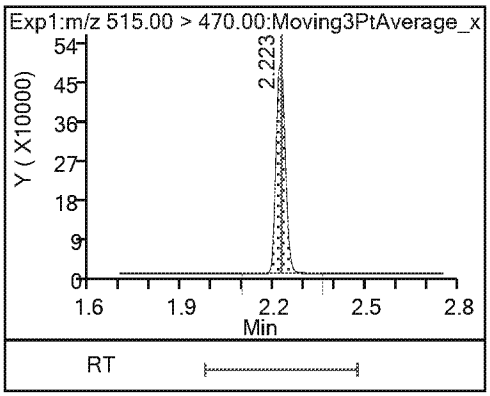
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) * 7 13C4 PFOS



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



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
54
45
36
27
18
9
0
2.223
1.6
1.9
2.2
2.5
2.8
Min
RT

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41073-1
SDG No.:
Client Sample ID: C0B50
Lab Sample ID: 320-41073-2
Matrix: Water
Lab File ID: 2018.07.23_537B_042.d
Analysis Method: 537 DW
Date Collected: 07/11/2018 09:00
Extraction Method: 537 DW
Date Extracted: 07/17/2018 08:29
Sample wt/vol: 257.5(mL)
Date Analyzed: 07/24/2018 06:12
Con. Extract Vol.: 1.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 235788
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctane sulfonic acid	ND		39	6.6
335-67-1	Perfluorooctanoic acid	ND		19	2.7
375-95-1	Perfluorononanoic acid	ND		19	7.8
355-46-4	Perfluorohexanesulfonic acid	ND		29	5.3
375-85-9	Perfluoroheptanoic acid	ND		9.7	1.8
375-73-5	Perfluorobutanesulfonic acid	ND		87	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	102		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_042.d
Lims ID: 320-41073-A-2-A
Client ID: C0B50
Sample Type: Client
Inject. Date: 24-Jul-2018 06:12:27 ALS Bottle#: 32 Worklist Smp#: 40
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41073-a-2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 24-Jul-2018 10:51:27 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

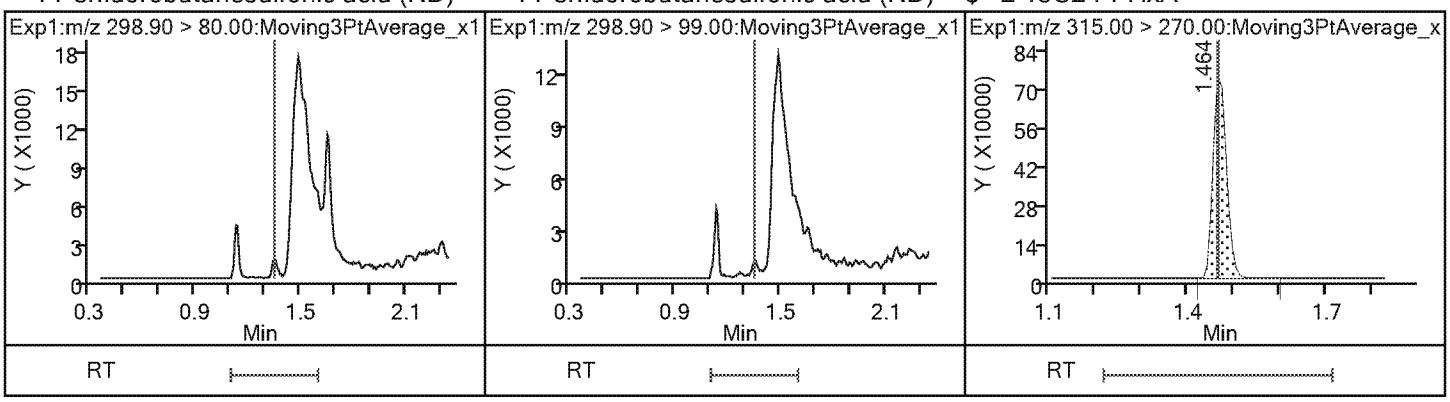
Column 1 : Det: EXP1
Process Host: XAWRK021

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1420198	9.45		14865	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.768	0.0		1396403	10.0		13557	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.011	0.0		3324665	28.7		4839	
$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.223	0.0	1.000	992819	10.2		8918	

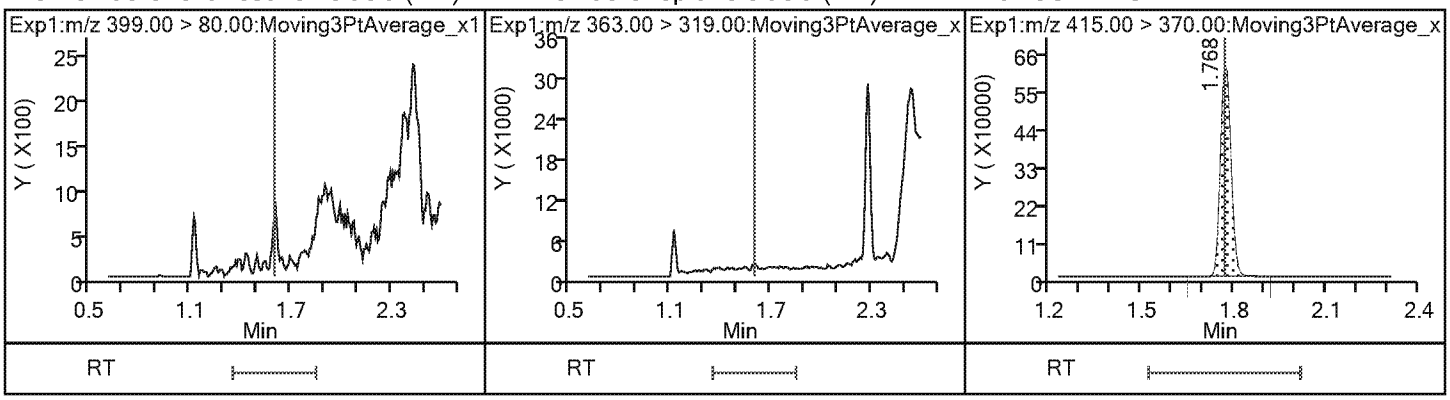
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_042.d				
Injection Date:	24-Jul-2018 06:12:27	Instrument ID:	A8_N		
Lims ID:	320-41073-A-2-A	Lab Sample ID:	320-41073-2		
Client ID:	C0B50				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	32	Worklist Smp#:	40
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		

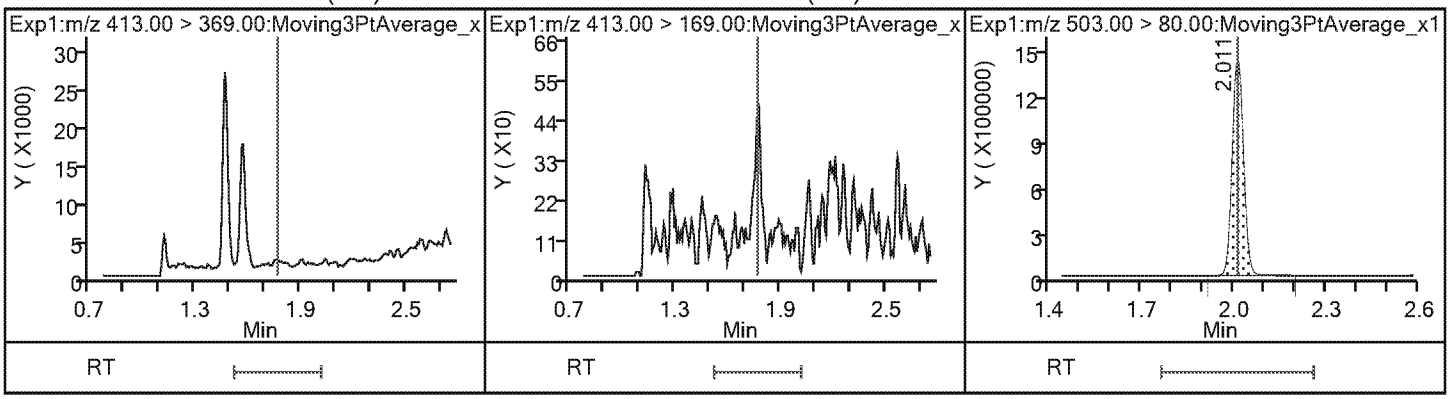
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) $ 2 13C2 PFHxA



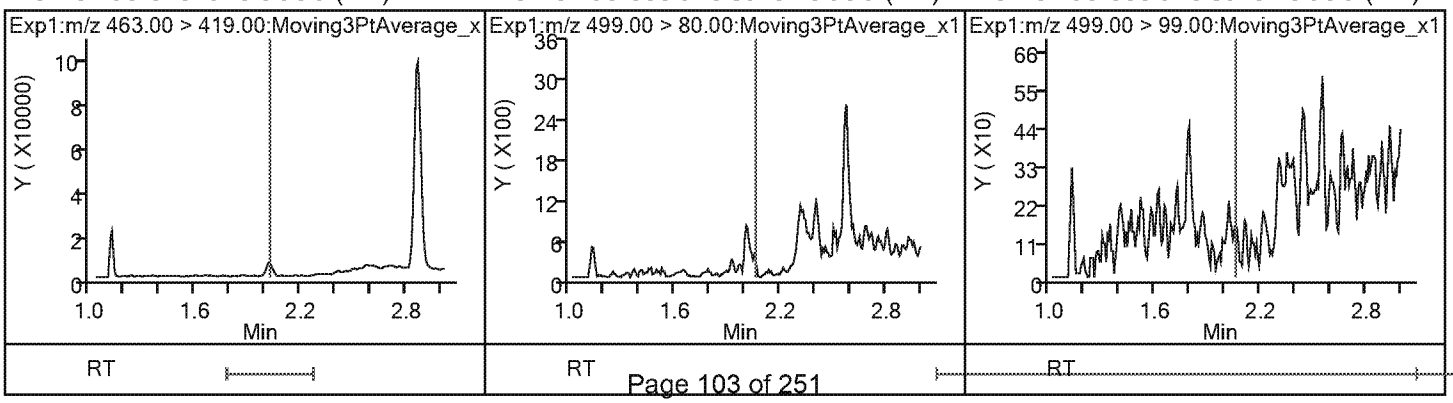
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



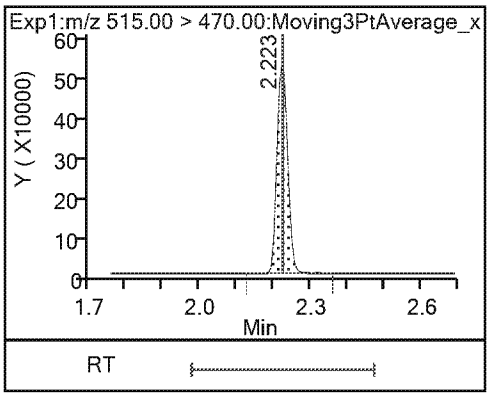
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) * 7 13C4 PFOS



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



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
60
50
40
30
20
10
0
2.223
1.7
2.0
2.3
2.6
Min
RT

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41073-1
SDG No.:
Client Sample ID: C0B51
Lab Sample ID: 320-41073-3
Matrix: Water
Lab File ID: 2018.07.23_537B_043.d
Analysis Method: 537 DW
Date Collected: 07/11/2018 09:50
Extraction Method: 537 DW
Date Extracted: 07/17/2018 08:29
Sample wt/vol: 254(mL)
Date Analyzed: 07/24/2018 06:17
Con. Extract Vol.: 1.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 235788
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctane sulfonic acid	ND		39	6.7
335-67-1	Perfluorooctanoic acid	ND		20	2.8
375-95-1	Perfluorononanoic acid	ND		20	7.9
355-46-4	Perfluorohexanesulfonic acid	ND		30	5.4
375-85-9	Perfluoroheptanoic acid	ND		9.8	1.9
375-73-5	Perfluorobutanesulfonic acid	ND		89	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	86		70-130
STL00996	13C2 PFDA	94		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_043.d
Lims ID: 320-41073-A-3-A
Client ID: C0B51
Sample Type: Client
Inject. Date: 24-Jul-2018 06:17:08 ALS Bottle#: 33 Worklist Smp#: 41
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41073-a-3-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 24-Jul-2018 10:51:27 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

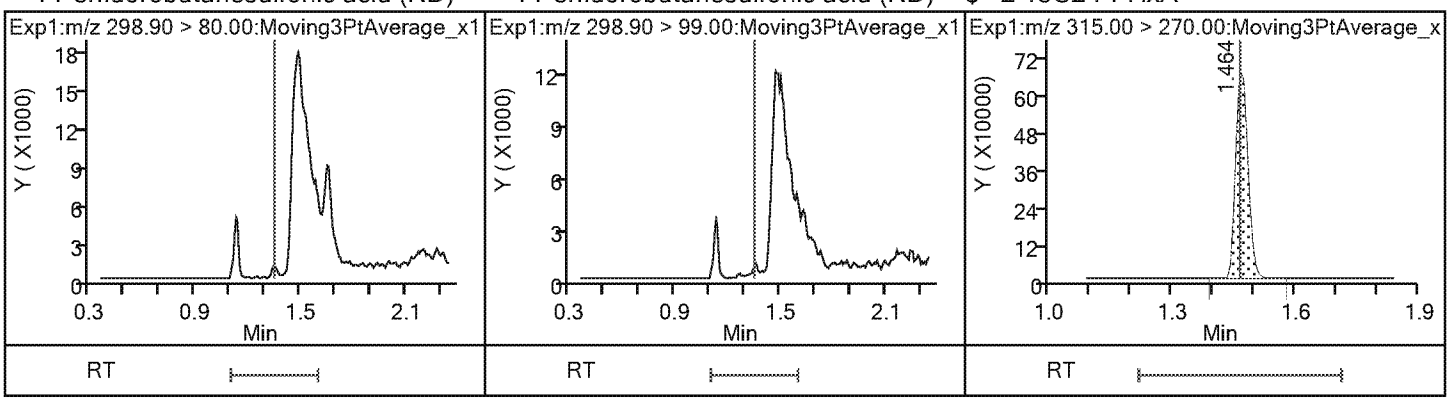
Column 1 : Det: EXP1
Process Host: XAWRK021

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1333573	8.58		14612	
* 6 13C2-PFOA									
415.00 > 370.00	1.775	1.768	0.007		1444467	10.0		11824	
* 7 13C4 PFOS									
503.00 > 80.00	2.018	2.011	0.007		3194183	28.7		4899	
$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.223	0.0	1.000	949048	9.44		7408	

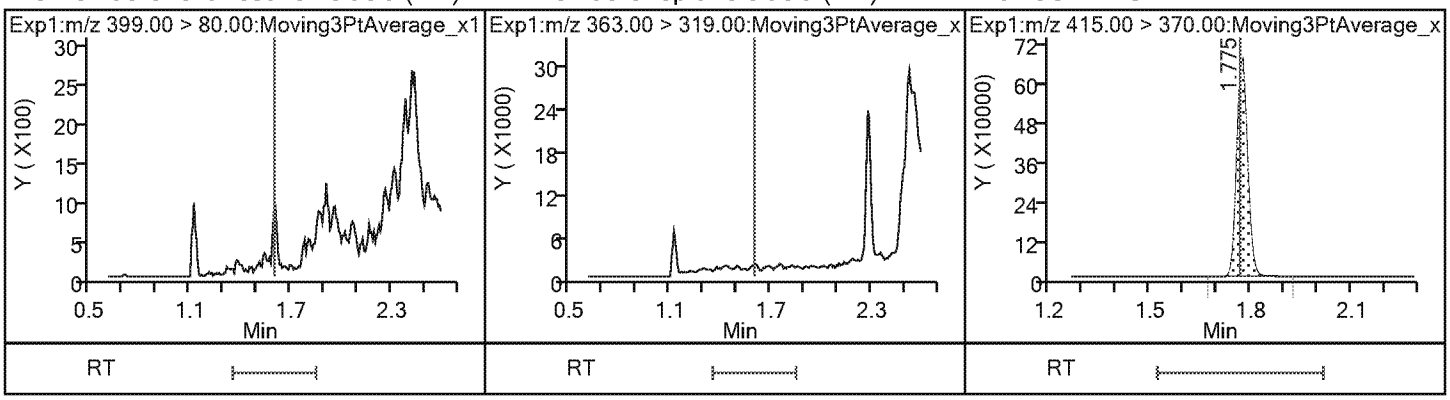
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_043.d				
Injection Date:	24-Jul-2018 06:17:08	Instrument ID:	A8_N		
Lims ID:	320-41073-A-3-A	Lab Sample ID:	320-41073-3		
Client ID:	C0B51				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	33	Worklist Smp#:	41
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		

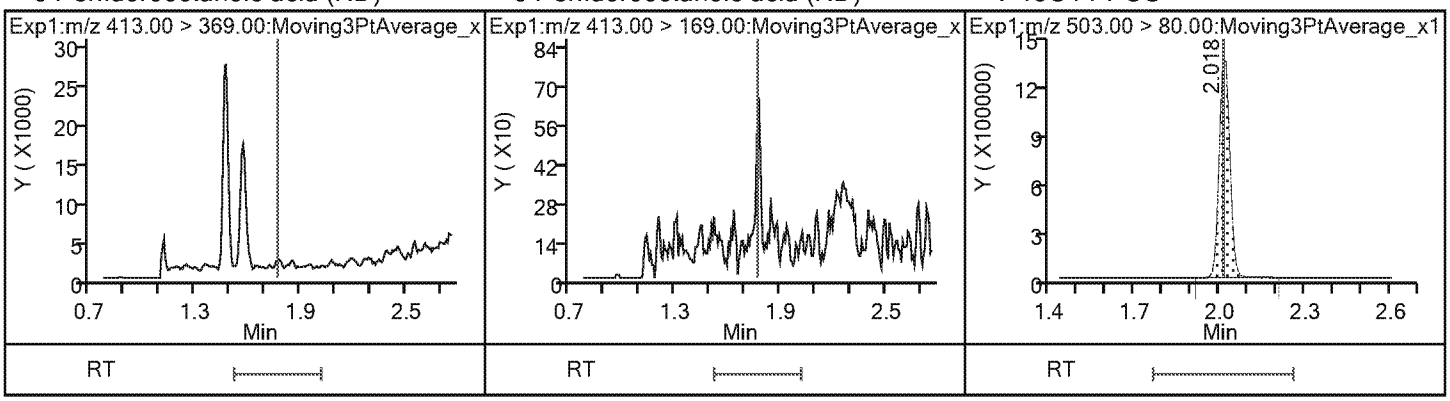
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) $ 2 13C2 PFHxA



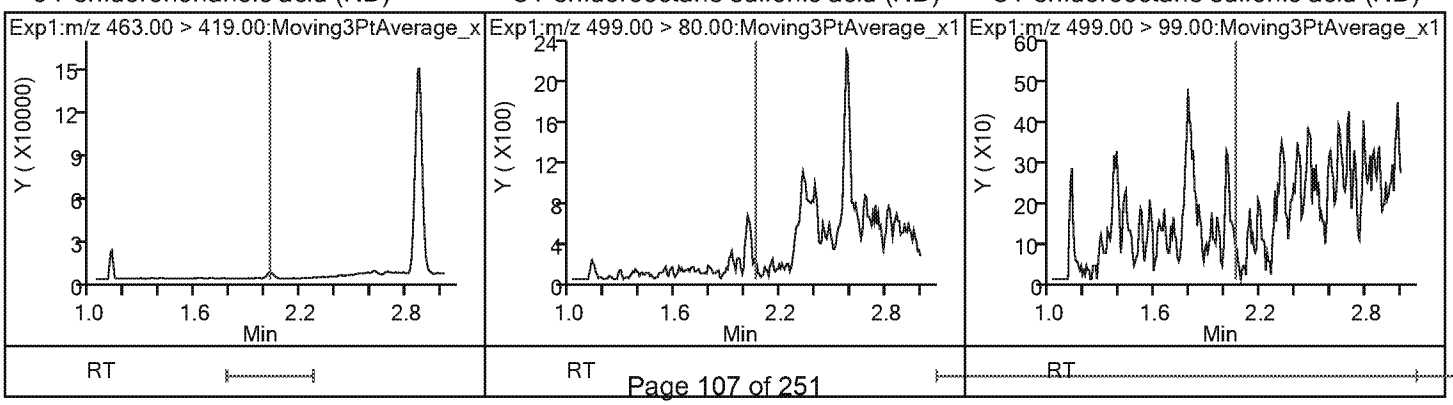
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



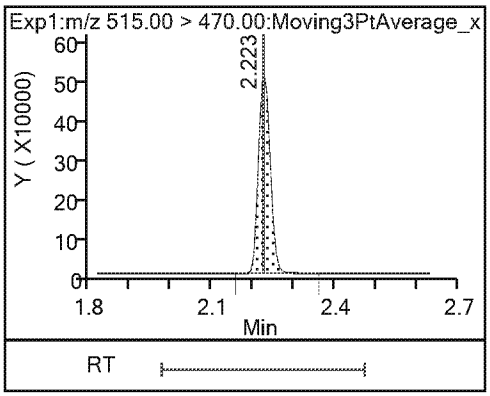
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) * 7 13C4 PFOS



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



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
60
50
40
30
20
10
0
2.223
1.8
2.1
2.4
2.7
Min
RT

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41073-1
SDG No.:
Client Sample ID: C0B52
Lab Sample ID: 320-41073-4
Matrix: Water
Lab File ID: 2018.07.23_537B_044.d
Analysis Method: 537 DW
Date Collected: 07/11/2018 09:00
Extraction Method: 537 DW
Date Extracted: 07/17/2018 08:29
Sample wt/vol: 258.4(mL)
Date Analyzed: 07/24/2018 06:21
Con. Extract Vol.: 1.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 235788
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctane sulfonic acid	32	J	39	6.6
335-67-1	Perfluorooctanoic acid	40		19	2.7
375-95-1	Perfluorononanoic acid	ND		19	7.7
355-46-4	Perfluorohexanesulfonic acid	ND		29	5.3
375-85-9	Perfluoroheptanoic acid	12		9.7	1.8
375-73-5	Perfluorobutanesulfonic acid	ND		87	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	77		70-130
STL00996	13C2 PFDA	106		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_044.d
Lims ID: 320-41073-A-4-A
Client ID: C0B52
Sample Type: Client
Inject. Date: 24-Jul-2018 06:21:49 ALS Bottle#: 34 Worklist Smp#: 42
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41073-a-4-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 24-Jul-2018 10:51:27 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: Ex. 4 CBI Date: 24-Jul-2018 10:29:07

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.343	1.350	-0.007	1.000	334775	2.45		69.5	
298.90 > 99.00	1.343	1.350	-0.007	1.000	219241		1.53(0.00-0.00)	76.3	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1052171	7.71		11824	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.601	-0.008	1.000	153267	0.7711		48.5	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.593	1.601	-0.008	1.000	430471	3.22		25.2	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.768	0.0		1268511	10.0		10805	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	1406989	10.3		118	
413.00 > 169.00	1.768	1.768	0.0	1.000	795104		1.77(0.00-0.00)	1379	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.011	0.0		3333153	28.7		2422	
9 Perfluorononanoic acid									
463.00 > 419.00	2.018	2.026	-0.008	1.000	128148	1.28		5.9	
8 Perfluorooctane sulfonic acid									a
499.00 > 80.00	1.912	2.056	-0.144	1.000	1019012	8.23		224	a
499.00 > 99.00	2.003	2.056	-0.053	1.048	153306		6.65(0.00-0.00)	67.6	
$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.223	-0.008	1.000	935462	10.6		8231	

QC Flag Legend

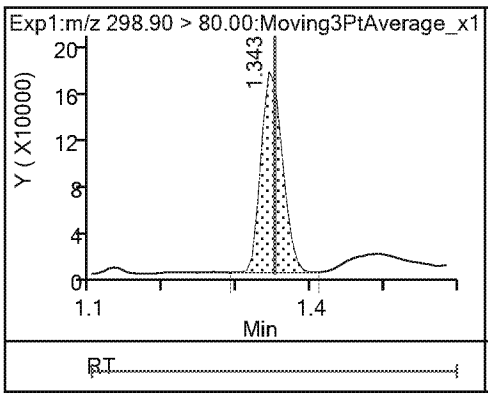
Review Flags

a - User Assigned ID

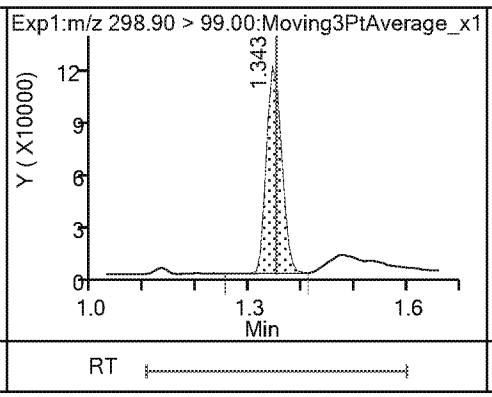
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_044.d				
Injection Date:	24-Jul-2018 06:21:49	Instrument ID:	A8_N		
Lims ID:	320-41073-A-4-A	Lab Sample ID:	320-41073-4		
Client ID:	C0B52				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	34	Worklist Smp#:	42
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		

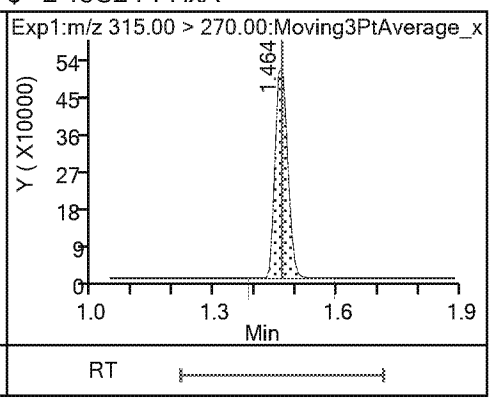
1 Perfluorobutanesulfonic acid



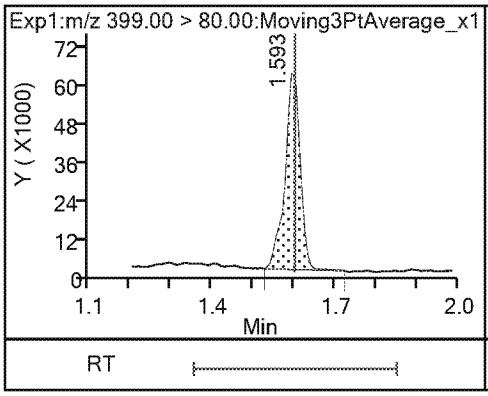
1 Perfluorobutanesulfonic acid



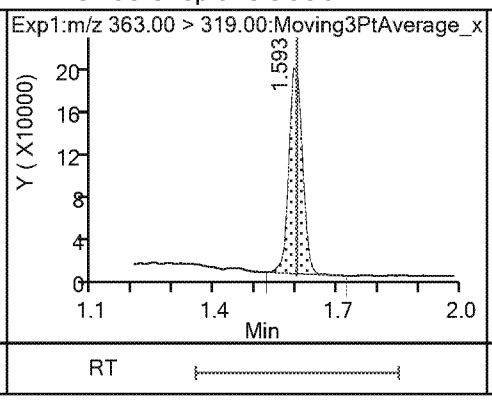
$ 2 13C2 PFHxA



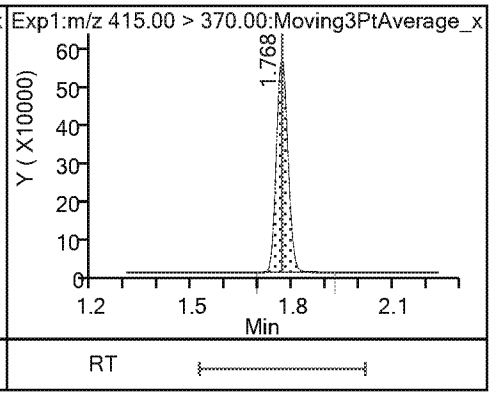
3 Perfluorohexanesulfonic acid



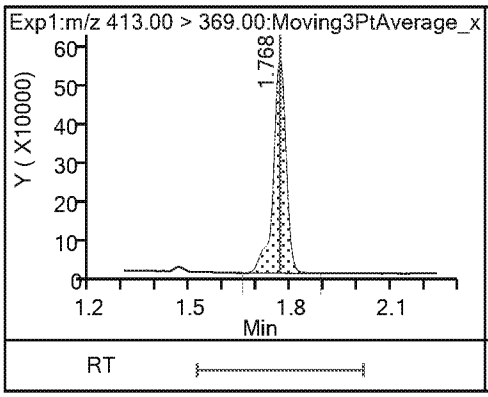
4 Perfluoroheptanoic acid



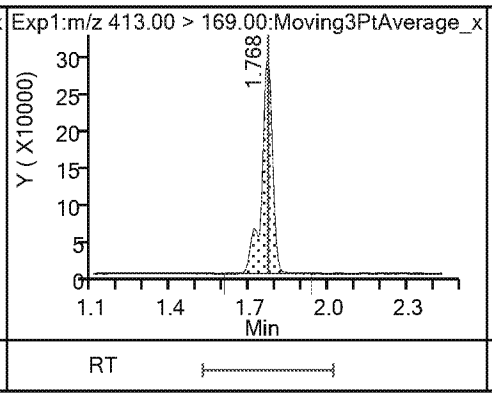
* 6 13C2-PFOA



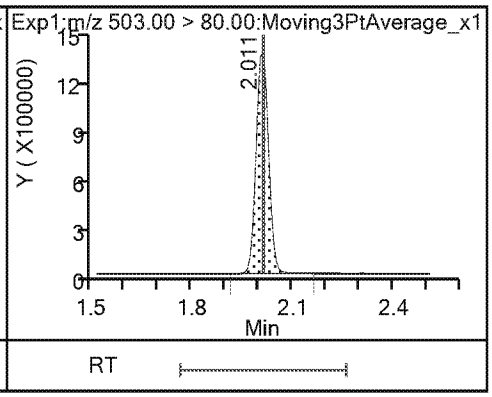
5 Perfluorooctanoic acid



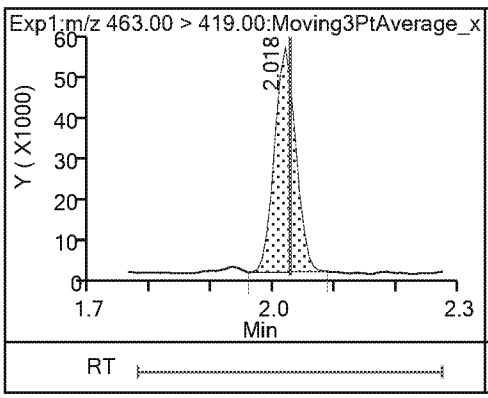
5 Perfluorooctanoic acid



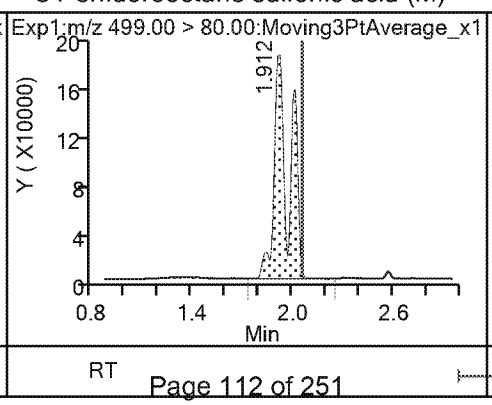
* 7 13C4 PFOS



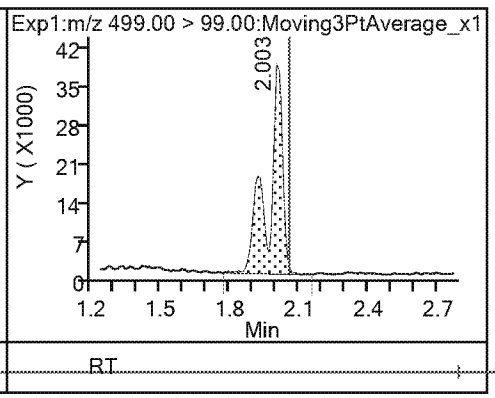
9 Perfluorononanoic acid



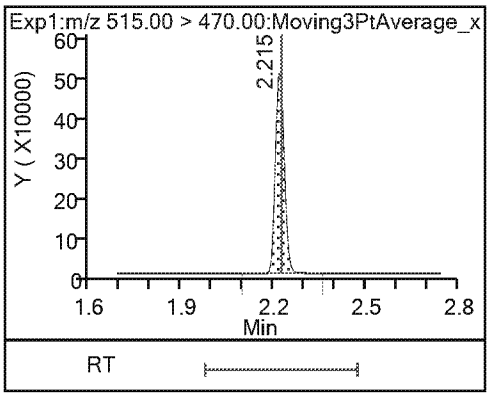
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
60
50
40
30
20
10
0
2.215
1.6
1.9
2.2
2.5
2.8
Min
RT

TestAmerica Sacramento

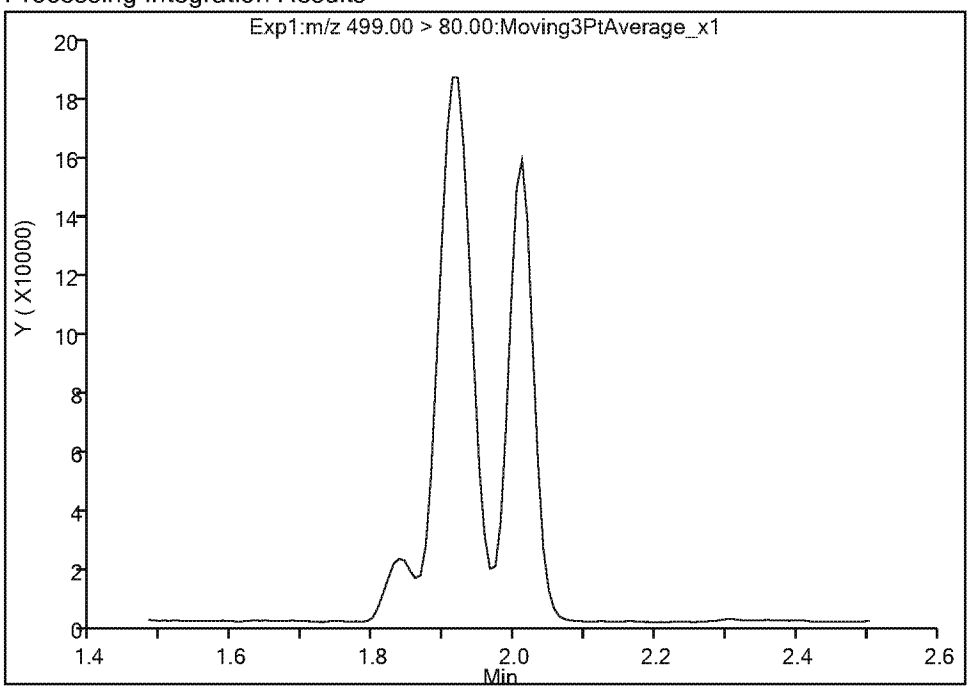
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_044.d				
Injection Date:	24-Jul-2018 06:21:49	Instrument ID:	A8_N		
Lims ID:	320-41073-A-4-A	Lab Sample ID:	320-41073-4		
Client ID:	C0B52				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	34	Worklist Smp#:	42
Injection Vol:	2.0 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

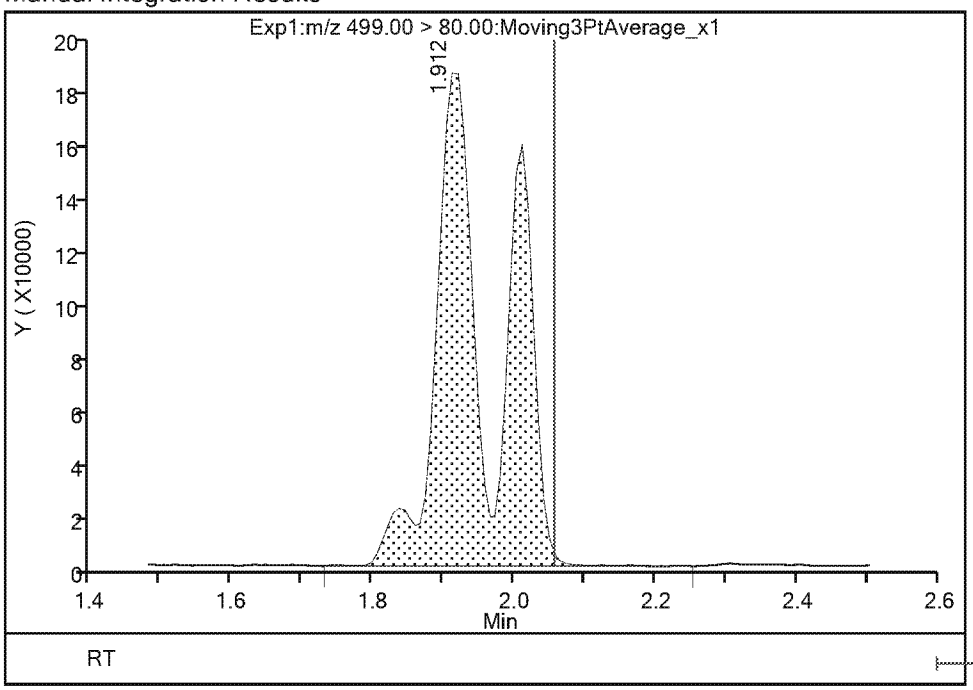
Processing Integration Results

Not Detected
Expected RT: 2.06



Manual Integration Results

RT: 1.91
Area: 1019012
Amount: 8.231359
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 24-Jul-2018 10:28:46
Audit Action: Assigned Compound ID Audit Reason: Peak assignment corrected

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41073-1
SDG No.:
Client Sample ID: C0B53
Lab Sample ID: 320-41073-5
Matrix: Water
Lab File ID: 2018.07.23_537B_045.d
Analysis Method: 537 DW
Date Collected: 07/11/2018 09:00
Extraction Method: 537 DW
Date Extracted: 07/17/2018 08:29
Sample wt/vol: 263.4(mL)
Date Analyzed: 07/24/2018 06:26
Con. Extract Vol.: 1.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 235788
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctane sulfonic acid	32	J	38	6.5
335-67-1	Perfluorooctanoic acid	37		19	2.7
375-95-1	Perfluorononanoic acid	ND		19	7.6
355-46-4	Perfluorohexanesulfonic acid	ND		28	5.2
375-85-9	Perfluoroheptanoic acid	11		9.5	1.8
375-73-5	Perfluorobutanesulfonic acid	ND		85	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	77		70-130
STL00996	13C2 PFDA	108		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_045.d
Lims ID: 320-41073-A-5-A
Client ID: C0B53
Sample Type: Client
Inject. Date: 24-Jul-2018 06:26:29 ALS Bottle#: 35 Worklist Smp#: 43
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41073-a-5-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 24-Jul-2018 10:51:27 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: Ex. 4 CBI Date: 24-Jul-2018 10:29:26

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	342343	2.39		72.5	
298.90 > 99.00	1.350	1.350	0.0	1.000	211115		1.62(0.00-0.00)	74.2	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1116480	7.74		15027	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.601	0.0	1.000	151686	0.7297		50.9	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.601	0.0	1.000	427144	3.02		27.1	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.768	0.0		1339740	10.0		9466	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	1402879	9.71		117	
413.00 > 169.00	1.768	1.768	0.0	1.000	800490		1.75(0.00-0.00)	1322	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.011	0.0		3486336	28.7		2374	
9 Perfluorononanoic acid									
463.00 > 419.00	2.018	2.026	-0.008	1.000	147035	1.39		5.6	
8 Perfluorooctane sulfonic acid									a
499.00 > 80.00	1.920	2.056	-0.136	1.000	1075226	8.30		217	a
499.00 > 99.00	2.011	2.056	-0.045	1.047	163313		6.58(0.00-0.00)	75.0	
$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.223	0.0	1.000	1007559	10.8		8276	

QC Flag Legend

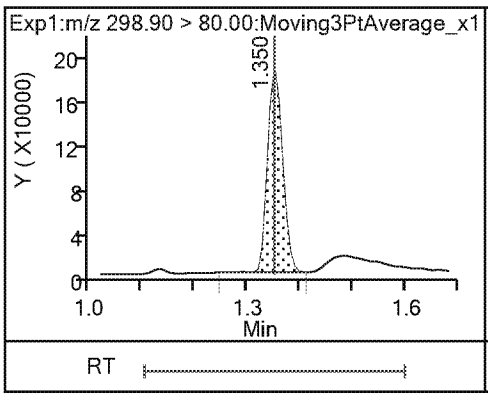
Review Flags

a - User Assigned ID

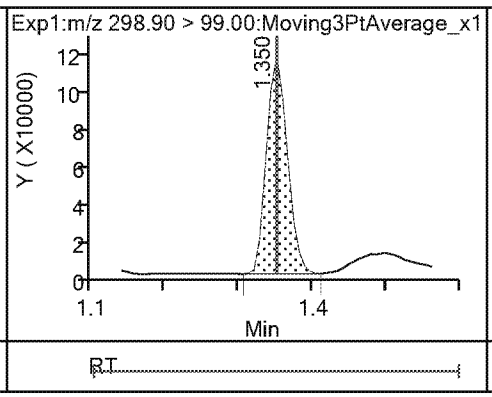
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_045.d				
Injection Date:	24-Jul-2018 06:26:29	Instrument ID:	A8_N		
Lims ID:	320-41073-A-5-A	Lab Sample ID:	320-41073-5		
Client ID:	C0B53				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	35	Worklist Smp#:	43
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		

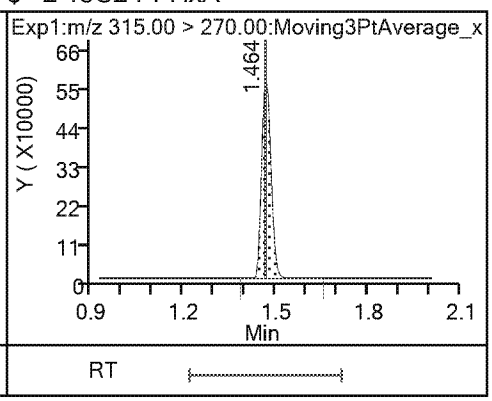
1 Perfluorobutanesulfonic acid



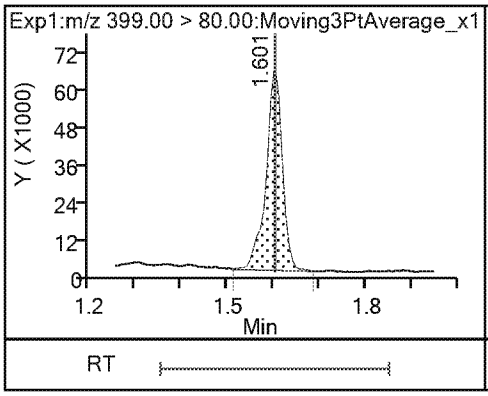
1 Perfluorobutanesulfonic acid



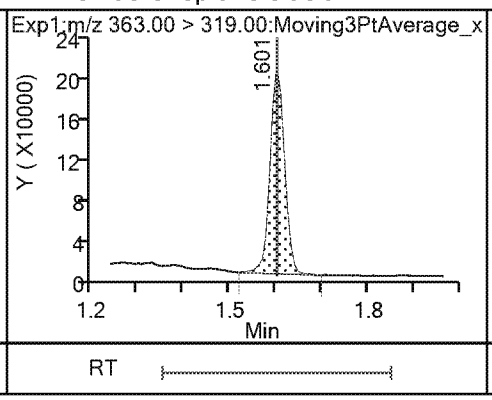
$ 2 13C2 PFHxA



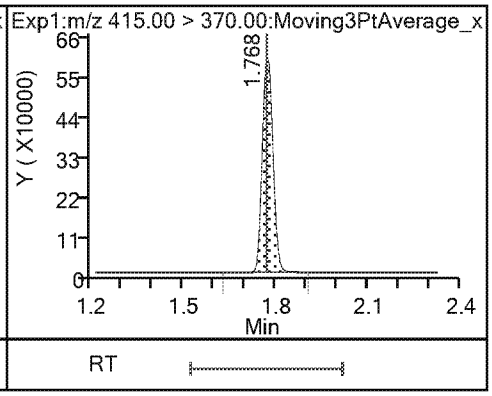
3 Perfluorohexanesulfonic acid



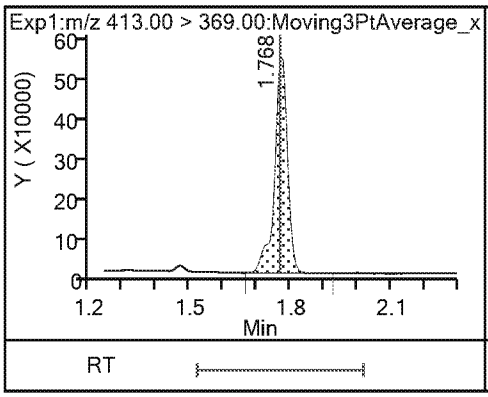
4 Perfluoroheptanoic acid



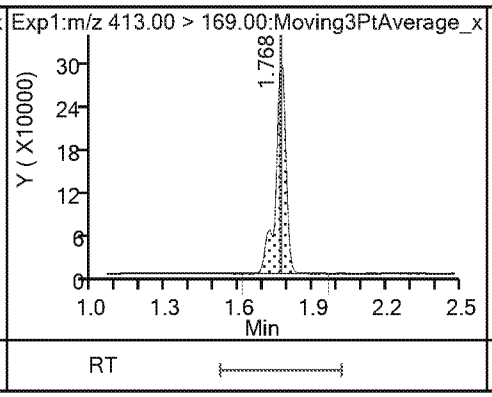
* 6 13C2-PFOA



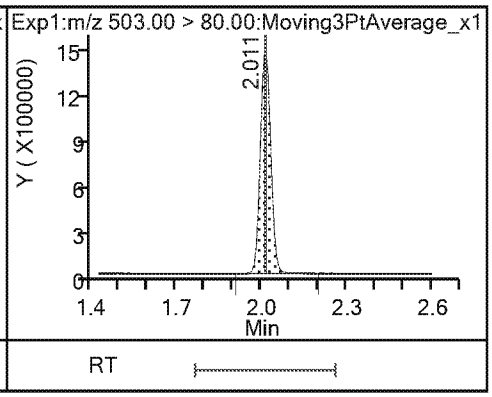
5 Perfluorooctanoic acid



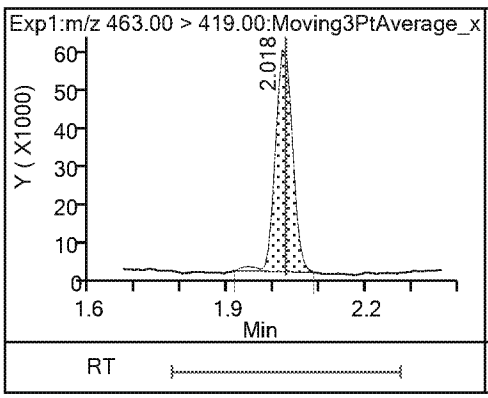
5 Perfluorooctanoic acid



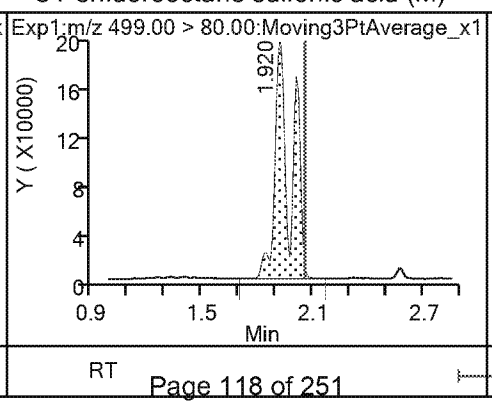
* 7 13C4 PFOS



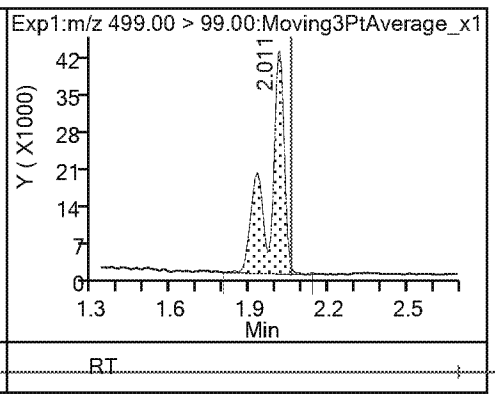
9 Perfluorononanoic acid



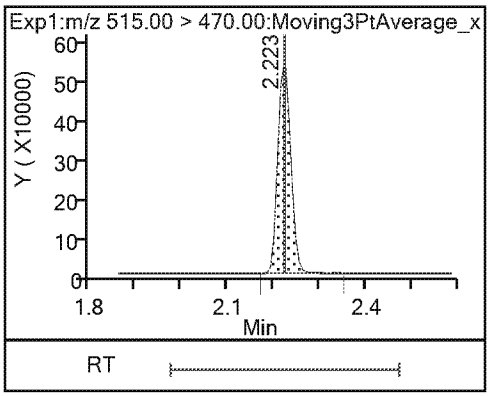
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
60
50
40
30
20
10
0
2.223
1.8
2.1
2.4
Min
RT

TestAmerica Sacramento

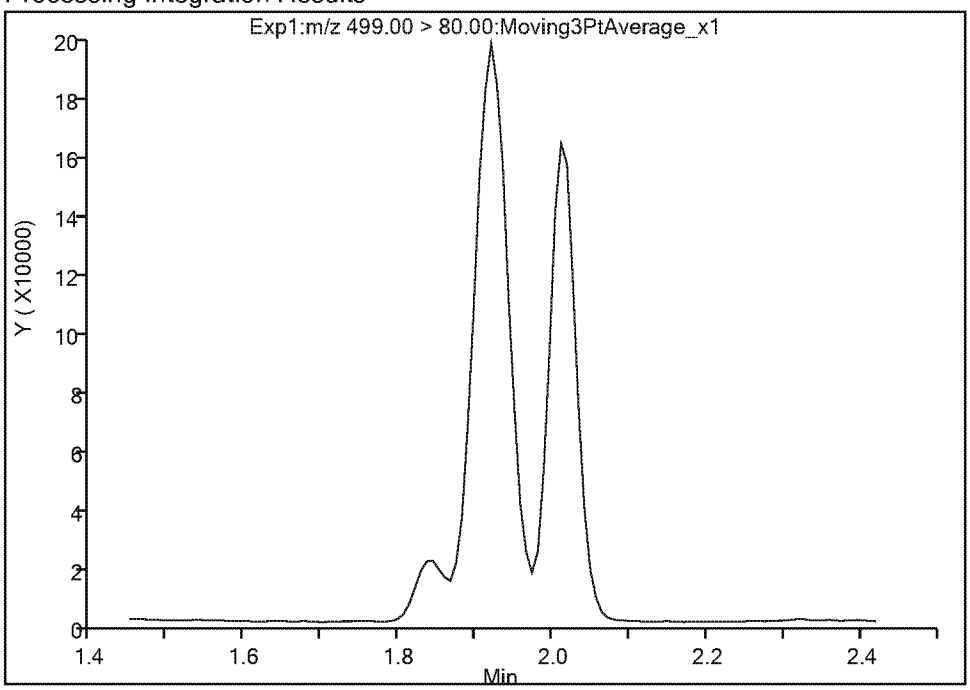
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_045.d				
Injection Date:	24-Jul-2018 06:26:29	Instrument ID:	A8_N		
Lims ID:	320-41073-A-5-A	Lab Sample ID:	320-41073-5		
Client ID:	C0B53				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	35	Worklist Smp#:	43
Injection Vol:	2.0 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

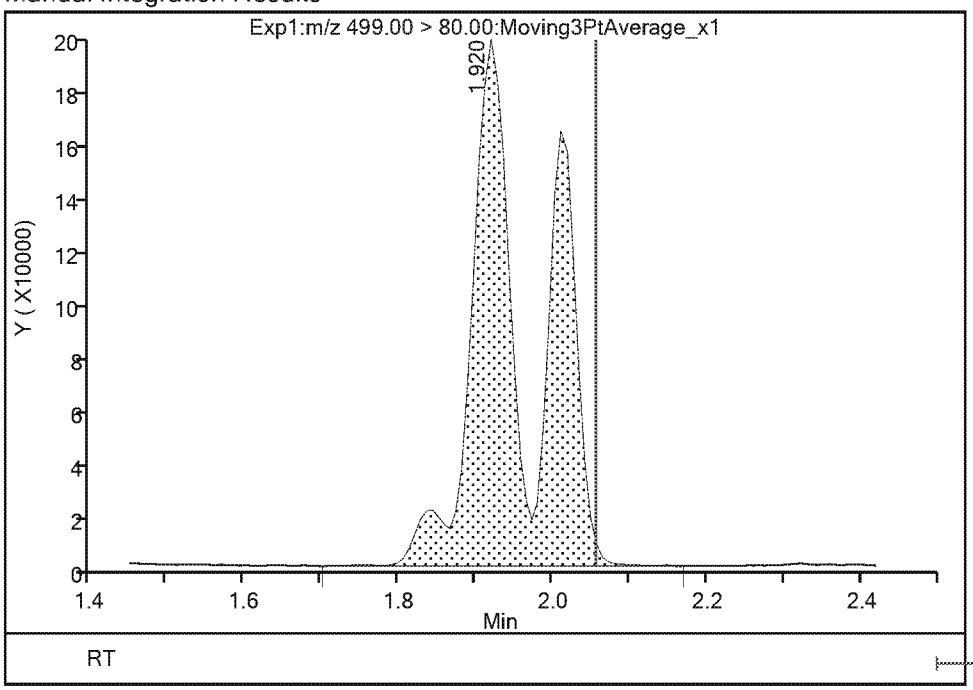
Processing Integration Results

Not Detected
Expected RT: 2.06



Manual Integration Results

RT: 1.92
Area: 1075226
Amount: 8.303822
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 24-Jul-2018 10:29:12
Audit Action: Assigned Compound ID Audit Reason: Peak assignment corrected

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41073-1
SDG No.:
Client Sample ID: C0B54
Lab Sample ID: 320-41073-6
Matrix: Water
Lab File ID: 2018.07.23_537B_046.d
Analysis Method: 537 DW
Date Collected: 07/11/2018 09:50
Extraction Method: 537 DW
Date Extracted: 07/17/2018 08:29
Sample wt/vol: 259.4(mL)
Date Analyzed: 07/24/2018 06:31
Con. Extract Vol.: 1.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 235788
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctane sulfonic acid	ND		39	6.6
335-67-1	Perfluorooctanoic acid	3.4	J	19	2.7
375-95-1	Perfluorononanoic acid	ND		19	7.7
355-46-4	Perfluorohexanesulfonic acid	ND		29	5.3
375-85-9	Perfluoroheptanoic acid	ND		9.6	1.8
375-73-5	Perfluorobutanesulfonic acid	ND		87	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	75		70-130
STL00996	13C2 PFDA	100		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_046.d
Lims ID: 320-41073-A-6-A
Client ID: C0B54
Sample Type: Client
Inject. Date: 24-Jul-2018 06:31:09 ALS Bottle#: 36 Worklist Smp#: 44
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41073-a-6-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 24-Jul-2018 10:51:27 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK021

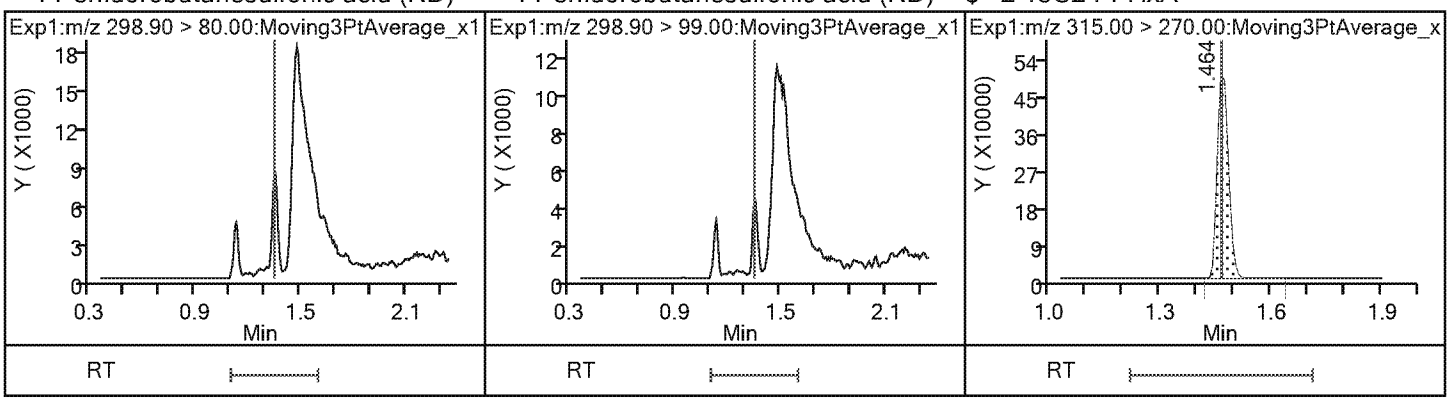
First Level Reviewer: Ex. 4 CBI Date: 24-Jul-2018 10:29:47

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	994807	7.52		14174	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.768	0.0		1229470	10.0		10116	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.775	1.768	0.007	1.000	117756	0.8885		11.3	
413.00 > 169.00	1.768	1.768	0.0	0.996	66038		1.78(0.00-0.00)	125	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.011	0.0		3009364	28.7		2998	
$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.223	0.0	1.000	857802	10.0		7303	

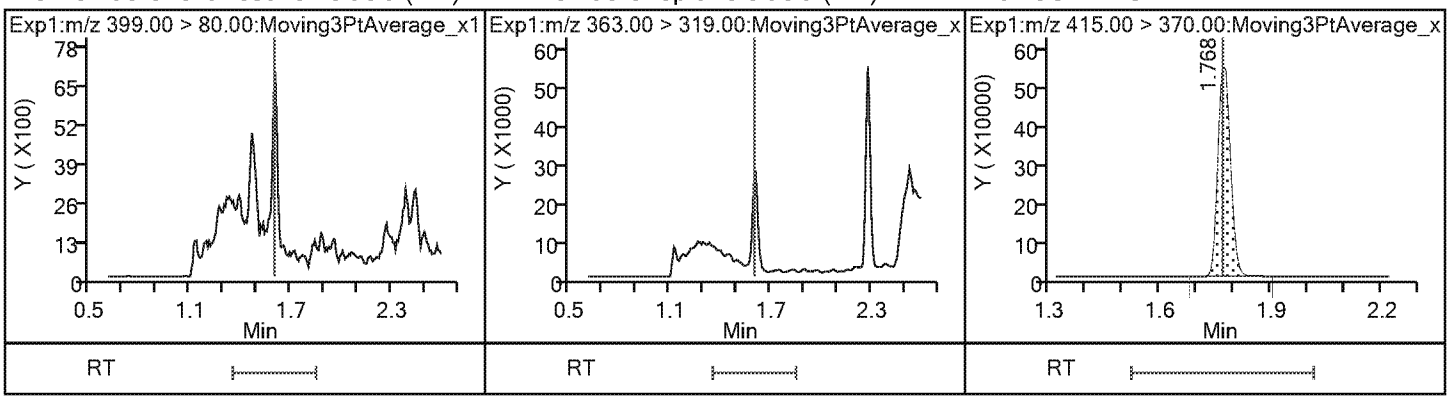
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_046.d				
Injection Date:	24-Jul-2018 06:31:09	Instrument ID:	A8_N		
Lims ID:	320-41073-A-6-A	Lab Sample ID:	320-41073-6		
Client ID:	C0B54				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	36	Worklist Smp#:	44
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		

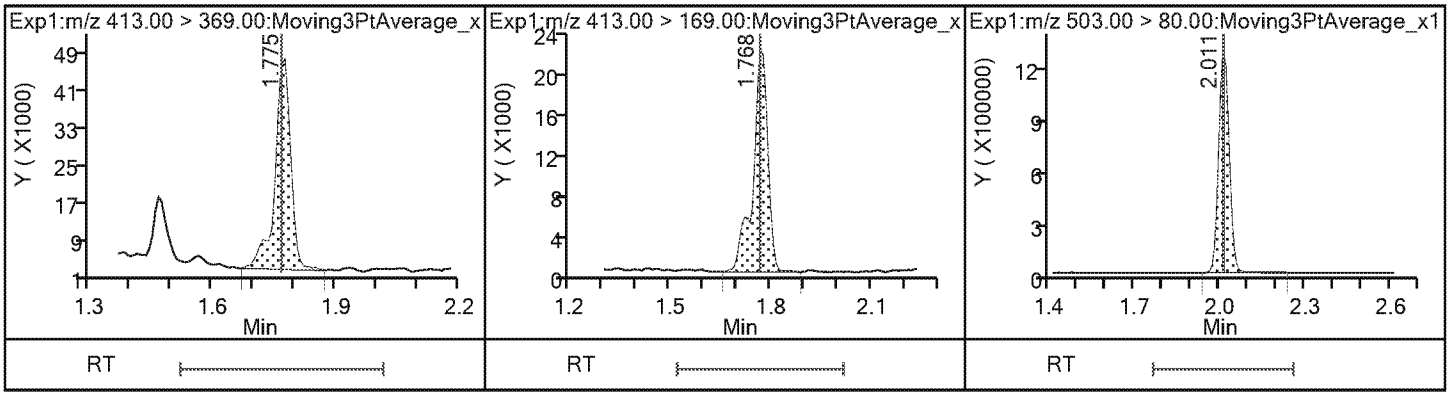
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) $ 2 13C2 PFHxA



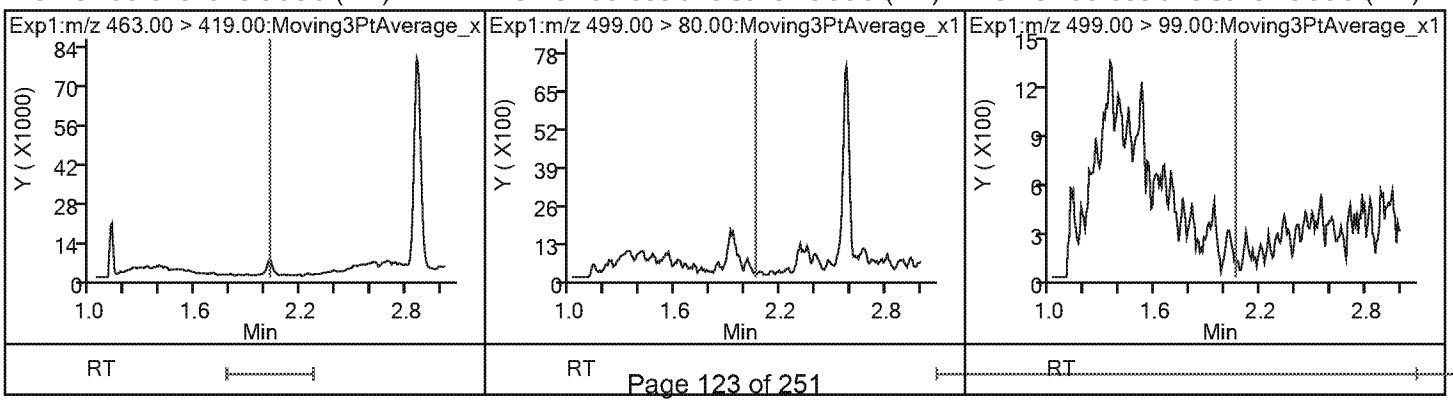
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



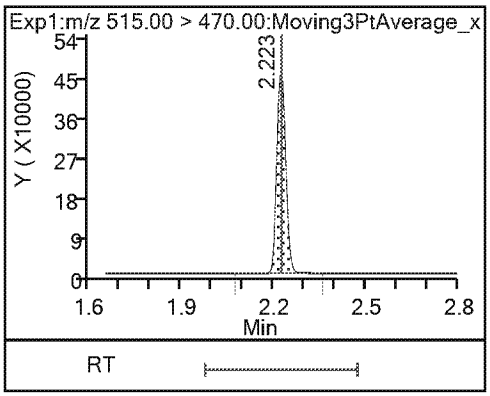
5 Perfluorooctanoic acid 5 Perfluorooctanoic acid * 7 13C4 PFOS



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



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
54
45
36
27
18
9
0
2.223
1.6
1.9
2.2
2.5
2.8
Min
RT

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

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1 Analy Batch No.: 235370

SDG No.:

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

Calibration Start Date: 07/21/2018 12:21 Calibration End Date: 07/21/2018 12:45 Calibration ID: 40229

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-235370/3	2018.07.21_537CURVE_003.d
Level 2	IC 320-235370/4	2018.07.21_537CURVE_004.d
Level 3	IC 320-235370/5	2018.07.21_537CURVE_005.d
Level 4	IC 320-235370/6	2018.07.21_537CURVE_006.d
Level 5	IC 320-235370/7	2018.07.21_537CURVE_007.d
Level 6	IC 320-235370/8	2018.07.21_537CURVE_008.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	1.2841 0.9803	1.2507	1.2835	1.1823	1.0785	Ave		1.1766				10.5		30.0			
Perfluorohexanesulfonic acid	1.7376 1.6801	1.6578	1.6904	1.7641	1.7310	Ave		1.7102				2.4		30.0			
Perfluoroheptanoic acid	1.0605 1.0815	1.0202	1.0617	1.0668	1.0373	Ave		1.0547				2.1		30.0			
Perfluorooctanoic acid	1.1368 1.0843	1.0080	1.0656	1.0950	1.0783	Ave		1.0780				3.9		30.0			
Perfluorooctane sulfonic acid	1.0575 1.0736	1.0083	1.0628	1.0977	1.0913	Ave		1.0652				3.0		30.0			
Perfluorononanoic acid	0.8343 0.7942	0.7572	0.7864	0.8079	0.7724	Ave		0.7921				3.4		30.0			
13C2 PFHxA	1.1056 1.1532	1.0045	1.0481	1.1035	1.0426	Ave		1.0762				5.0		30.0			
13C2 PFDA	0.7178 0.7112	0.6728	0.6860	0.7012	0.6847	Ave		0.6956				2.5		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.: 320-41073-1 Analy Batch No.: 235370

SDG No.:

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

Calibration Start Date: 07/21/2018 12:21 Calibration End Date: 07/21/2018 12:45 Calibration ID: 40229

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-235370/3	2018.07.21_537CURVE_003.d
Level 2	IC 320-235370/4	2018.07.21_537CURVE_004.d
Level 3	IC 320-235370/5	2018.07.21_537CURVE_005.d
Level 4	IC 320-235370/6	2018.07.21_537CURVE_006.d
Level 5	IC 320-235370/7	2018.07.21_537CURVE_007.d
Level 6	IC 320-235370/8	2018.07.21_537CURVE_008.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	PFOS	Ave	1132773 17778336	2723028	6349004	10832159	14336242	9.00 180	20.0	45.0	90.1	135
Perfluorohexanesulfonic acid	PFOS	Ave	511502 10233792	1212277	2808334	5428281	7728080	3.00 60.5	6.72	15.1	30.2	45.4
Perfluoroheptanoic acid	13PF OA	Ave	112443 2367732	282953	652127	1194139	1759394	0.960 19.4	2.16	4.86	9.72	14.6
Perfluorooctanoic acid	13PF OA	Ave	248606 4835518	569483	1333317	2496915	3725583	1.98 39.6	4.40	9.90	19.8	29.7
Perfluorooctane sulfonic acid	PFOS	Ave	409813 8546272	963630	2307715	4414336	6367762	3.95 79.1	8.79	19.8	39.5	59.3
Perfluorononanoic acid	13PF OA	Ave	182463 3541730	427768	984001	1842282	2668663	1.98 39.6	4.40	9.90	19.8	29.7
13C2 PFHxA	13PF OA	Ave	1221139 1298612	1289770	1324630	1270784	1212894	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	792860 800909	863900	867028	807504	796607	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:
Ave = Average ISTD

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_003.d
Lims ID: IC L1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 21-Jul-2018 12:21:44 ALS Bottle#: 1 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L1_537
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub9

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 21-Jul-2018 14:51:34 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: Ex. 4 CBI Date: 21-Jul-2018 12:58:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.358	1.357	0.001	1.000	1132773	9.82		1074	
298.90 > 99.00	1.358	1.357	0.001	1.000	782964		1.45(0.00-0.00)	1021	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.479	1.477	0.002	1.000	1221139	10.3		13523	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.620	0.004	1.000	511502	3.05		469	
4 Perfluoroheptanoic acid									M
363.00 > 319.00	1.624	1.621	0.003	1.000	112443	0.9653		13.0	M
* 6 13C2-PFOA									
415.00 > 370.00	1.806	1.803	0.003		1104504	10.0		8257	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.806	1.803	0.003	1.000	248606	2.09		31.1	
413.00 > 169.00	1.806	1.803	0.003	1.000	132166		1.88(0.00-0.00)	317	
8 Perfluorooctane sulfonic acid									Ma
499.00 > 80.00	2.064	2.056	0.008	1.000	409813	3.92		540	M
499.00 > 99.00	2.064	2.056	0.008	1.000	91353		4.49(0.00-0.00)	181	
* 7 13C4 PFOS									
503.00 > 80.00	2.064	2.056	0.008		2811428	28.7		5391	
9 Perfluorononanoic acid									
463.00 > 419.00	2.071	2.065	0.006	1.000	182463	2.09		38.2	
$ 10 13C2 PFDA									
515.00 > 470.00	2.253	2.247	0.006	1.000	792860	10.3		8101	

QC Flag Legend

Review Flags

M - Manually Integrated

a - User Assigned ID

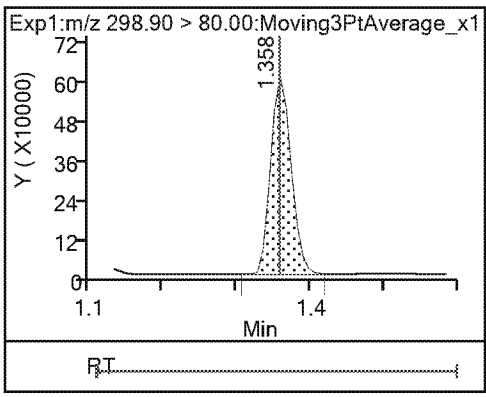
Reagents:

LC537-L1_00022 Amount Added: 1.00 Units: mL

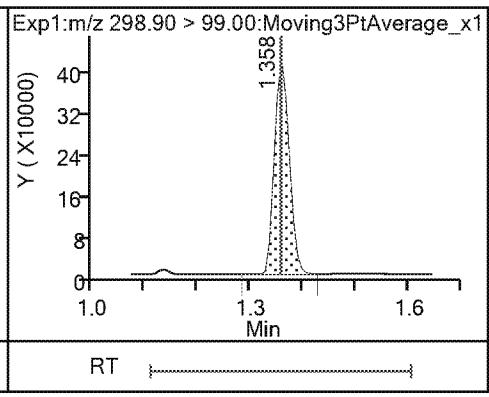
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_003.d
Injection Date: 21-Jul-2018 12:21:44 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

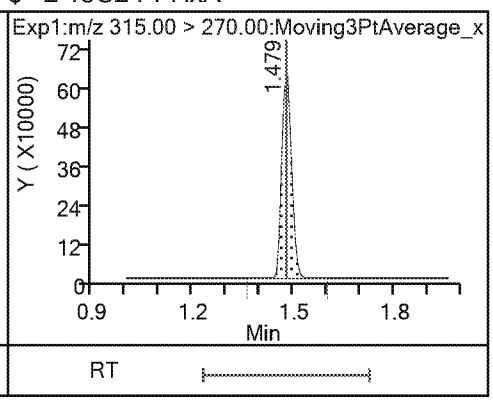
1 Perfluorobutanesulfonic acid



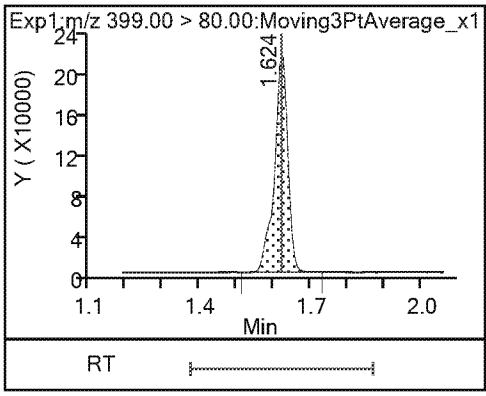
1 Perfluorobutanesulfonic acid



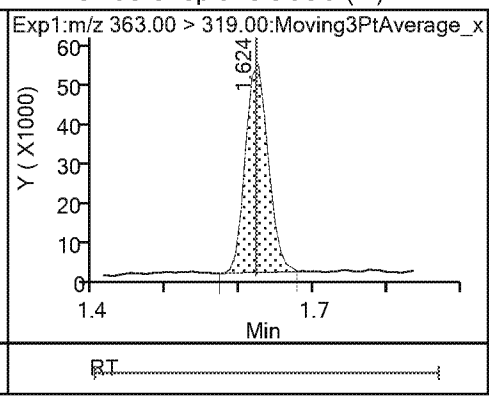
$ 2 13C2 PFHxA



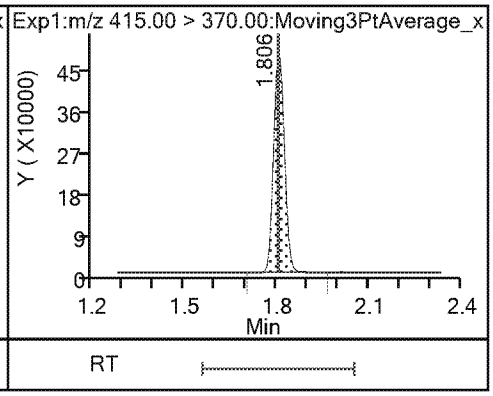
3 Perfluorohexanesulfonic acid



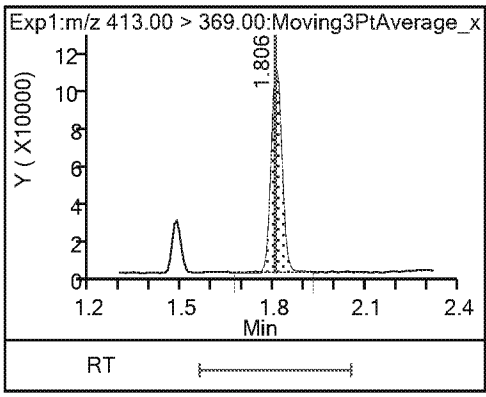
4 Perfluoroheptanoic acid (M)



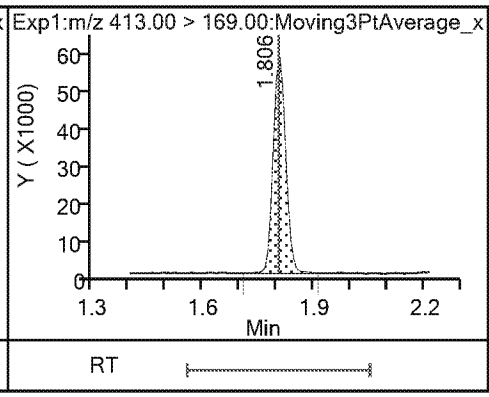
* 6 13C2-PFOA



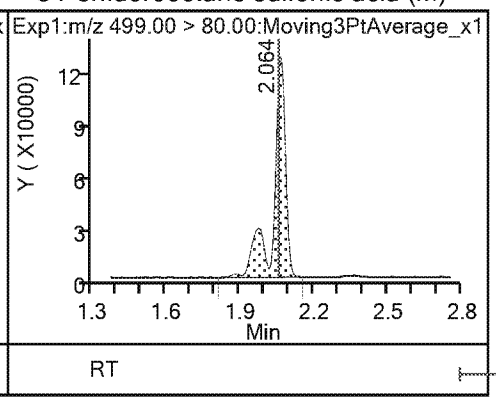
5 Perfluorooctanoic acid



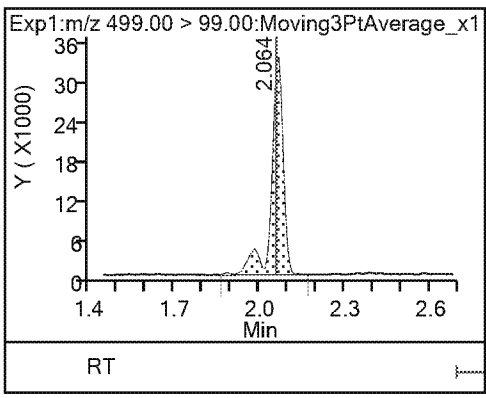
5 Perfluorooctanoic acid



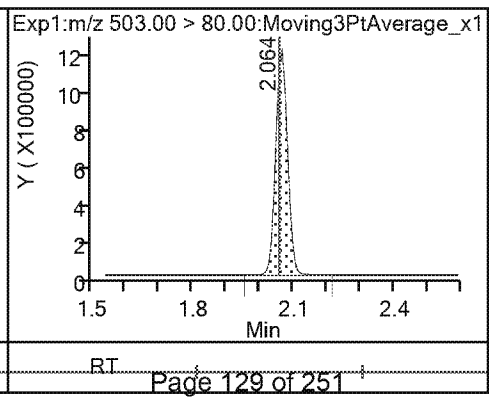
8 Perfluorooctane sulfonic acid (M)



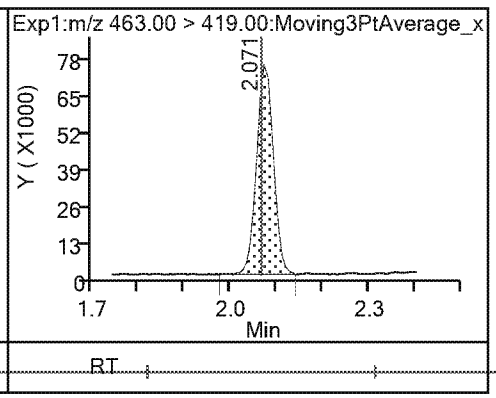
8 Perfluorooctane sulfonic acid



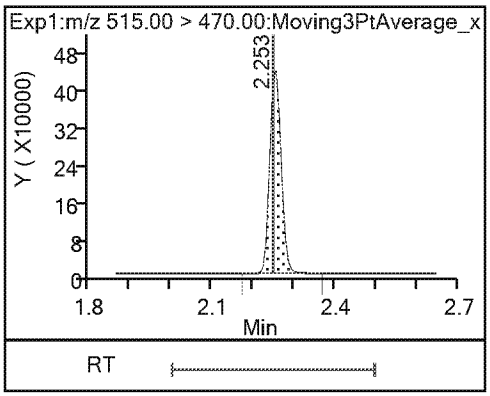
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.253
Y (X10000)
48
40
32
24
16
8
0
1.8
2.1
2.4
2.7
Min
RT

TestAmerica Sacramento

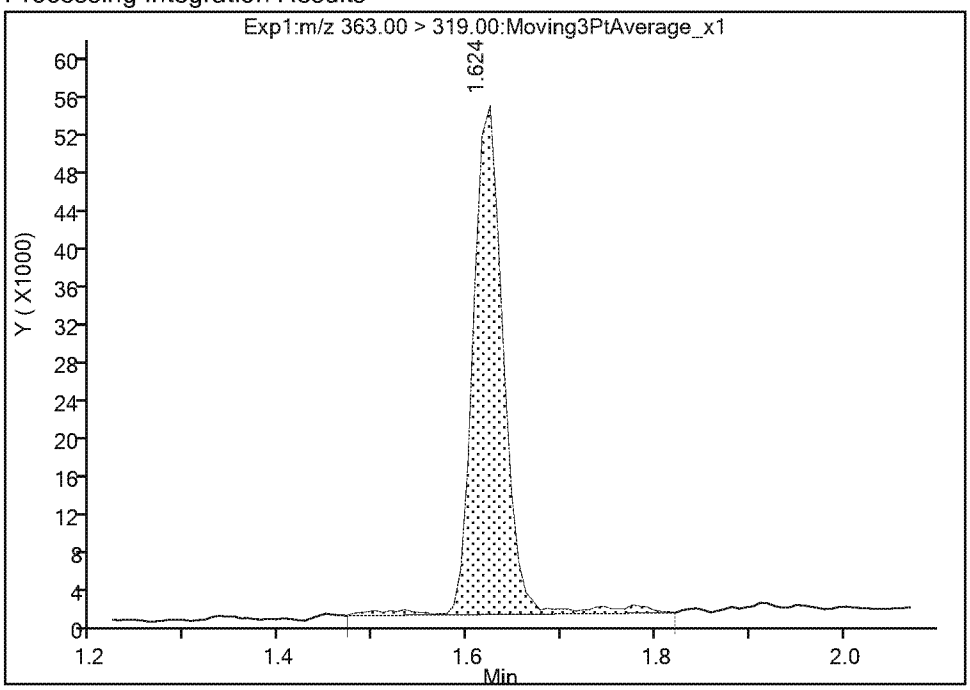
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_003.d				
Injection Date:	21-Jul-2018 12:21:44	Instrument ID:	A8_N		
Lims ID:	IC L1				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	1	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

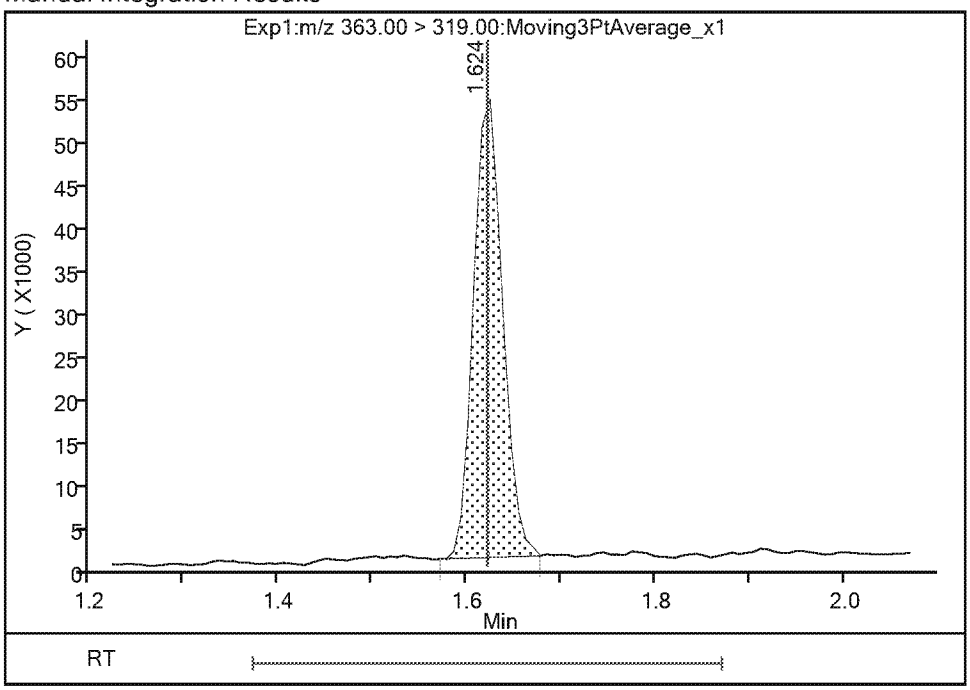
Processing Integration Results

RT: 1.62
Area: 119325
Amount: 1.005261
Amount Units: ng/ml



Manual Integration Results

RT: 1.62
Area: 112443
Amount: 0.965281
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 21-Jul-2018 12:57:31
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento

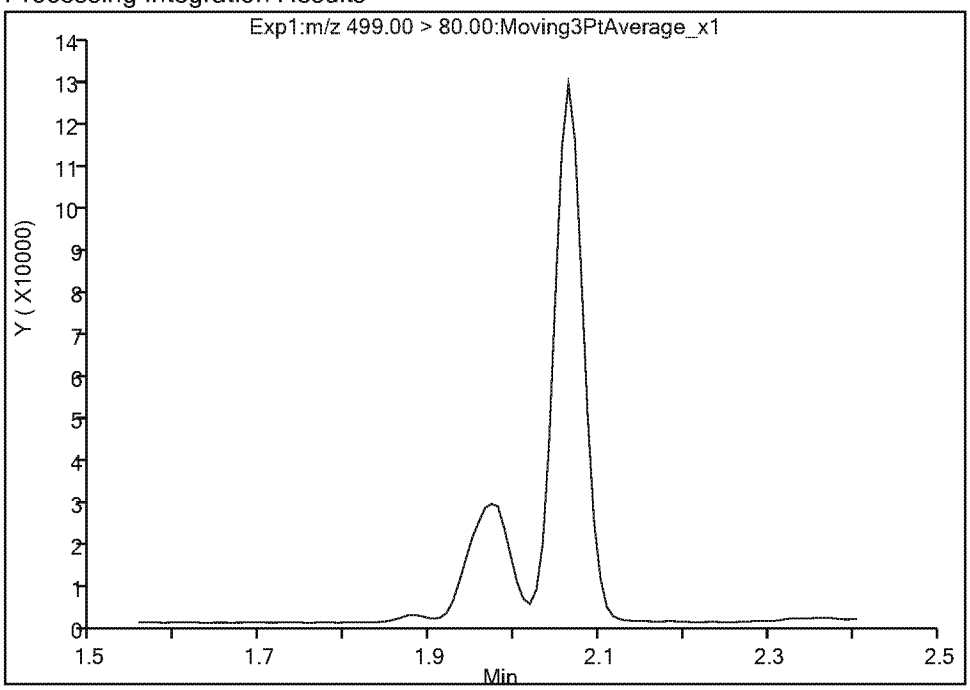
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_003.d				
Injection Date:	21-Jul-2018 12:21:44	Instrument ID:	A8_N		
Lims ID:	IC L1				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	1	Worklist Smp#:	3
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

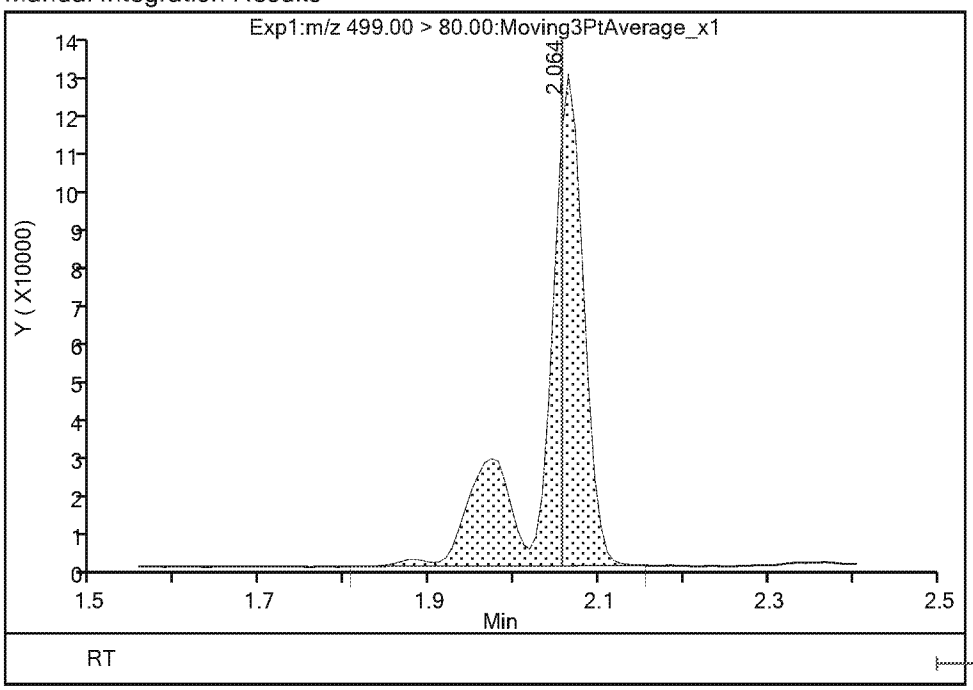
Processing Integration Results

Not Detected
Expected RT: 2.06



Manual Integration Results

RT: 2.06
Area: 409813
Amount: 3.924698
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 21-Jul-2018 12:57:44
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_004.d
Lims ID: IC L2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 21-Jul-2018 12:26:23 ALS Bottle#: 2 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L2_537
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub9

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 21-Jul-2018 14:51:36 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: Ex. 4 CBI Date: 21-Jul-2018 12:59:20

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.358	1.357	0.001	1.000	2723028	21.3		2456	
298.90 > 99.00	1.358	1.357	0.001	1.000	1840340		1.48(0.00-0.00)	2427	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.479	1.477	0.002	1.000	1289770	9.33		15656	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.616	1.620	-0.004	1.000	1212277	6.52		1123	
4 Perfluoroheptanoic acid									M
363.00 > 319.00	1.624	1.621	0.003	1.000	282953	2.09		31.9	M
* 6 13C2-PFOA									
415.00 > 370.00	1.806	1.803	0.003		1284004	10.0		11587	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.806	1.803	0.003	1.000	569483	4.11		74.7	
413.00 > 169.00	1.806	1.803	0.003	1.000	316179		1.80(0.00-0.00)	741	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.064	2.056	0.008	1.000	963630	8.32		1199	M
499.00 > 99.00	2.056	2.056	0.0	0.996	211829		4.55(0.00-0.00)	415	M
* 7 13C4 PFOS									
503.00 > 80.00	2.056	2.056	0.0		3120086	28.7		5853	
9 Perfluorononanoic acid									
463.00 > 419.00	2.064	2.065	-0.001	1.000	427768	4.21		87.9	
$ 10 13C2 PFDA									
515.00 > 470.00	2.246	2.247	-0.001	1.000	863900	9.67		8355	

QC Flag Legend

Review Flags

M - Manually Integrated

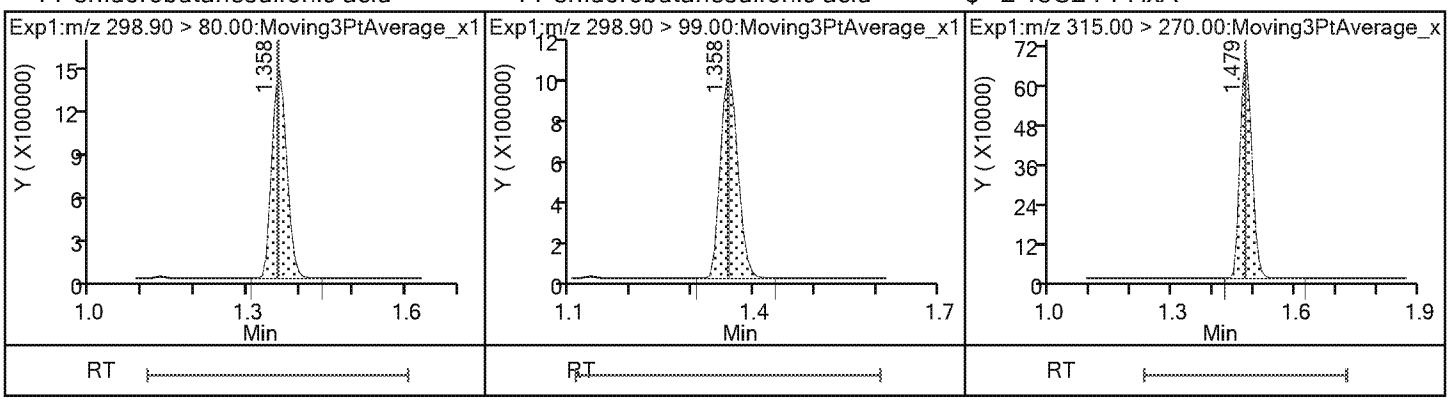
Reagents:

LC537-L2_00022 Amount Added: 1.00 Units: mL

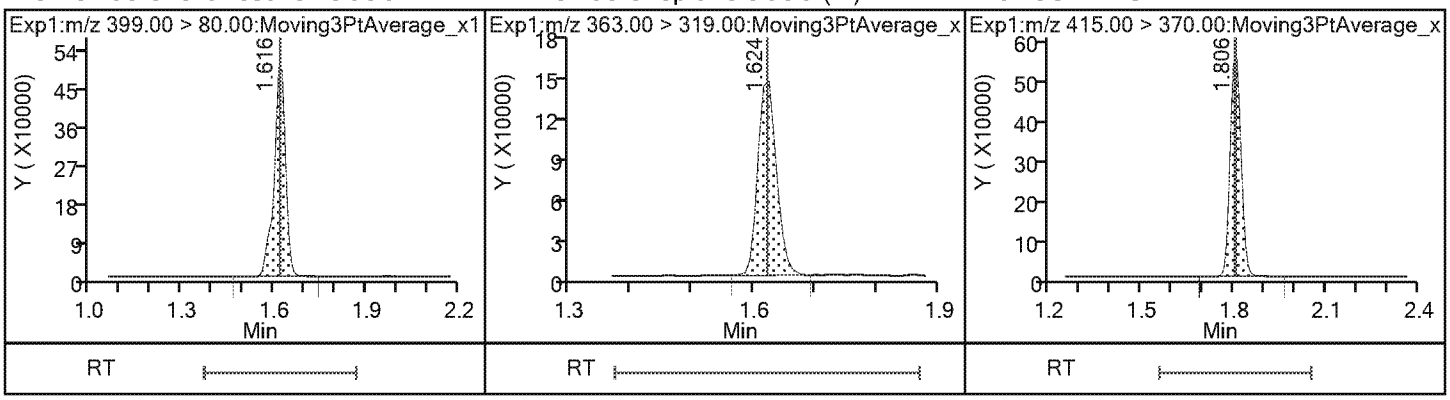
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_004.d
Injection Date: 21-Jul-2018 12:26:23 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

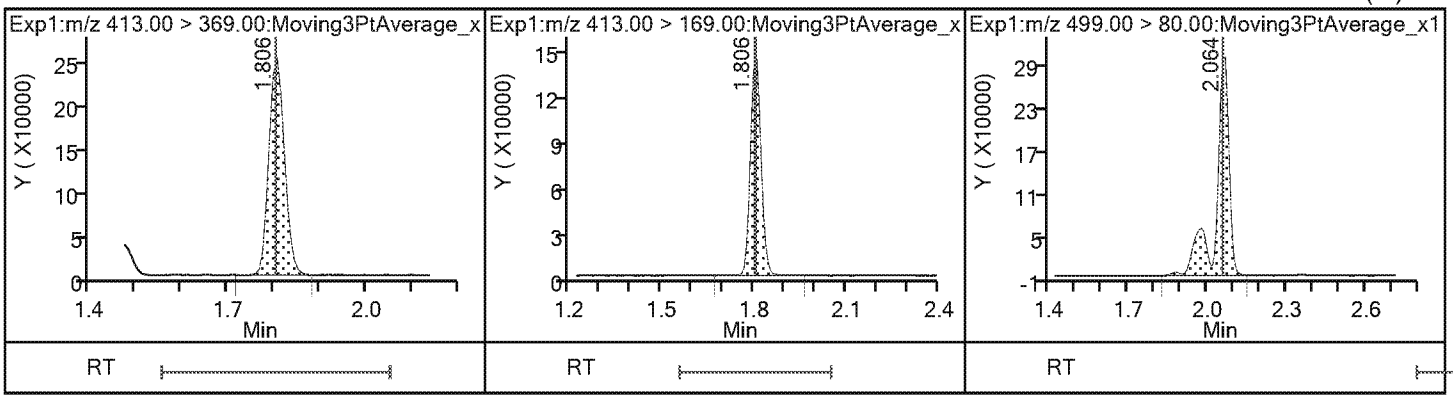
1 Perfluorobutanesulfonic acid | 1 Perfluorobutanesulfonic acid | $ 2 13C2 PFHxA



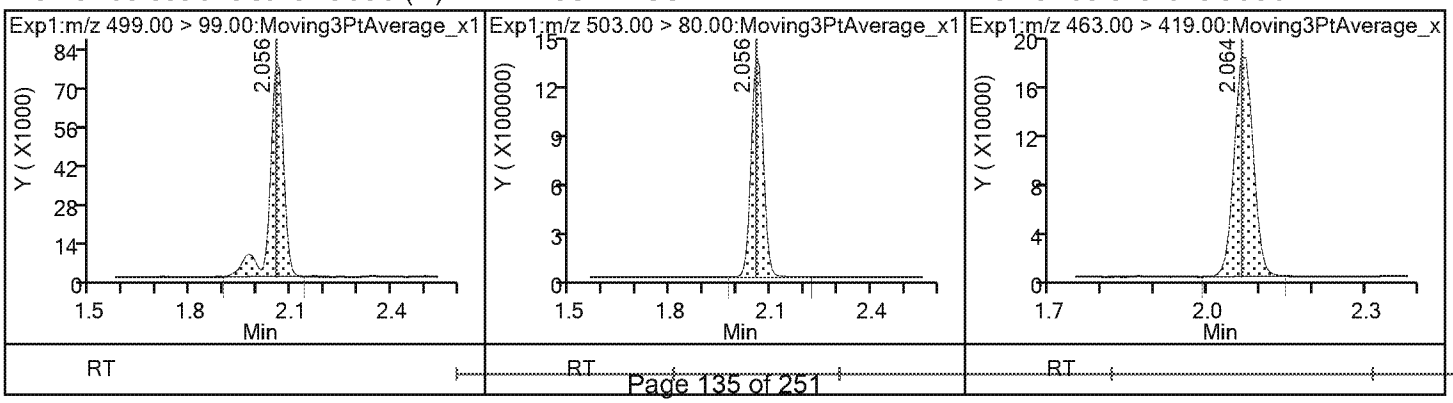
3 Perfluorohexanesulfonic acid | 4 Perfluoroheptanoic acid (M) | * 6 13C2-PFOA



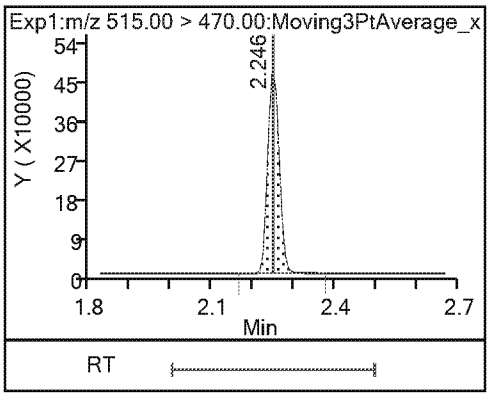
5 Perfluorooctanoic acid | 5 Perfluorooctanoic acid | 8 Perfluorooctane sulfonic acid (M)



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



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
54
45
36
27
18
9
0
2.246
1.8
2.1
2.4
2.7
Min
RT

TestAmerica Sacramento

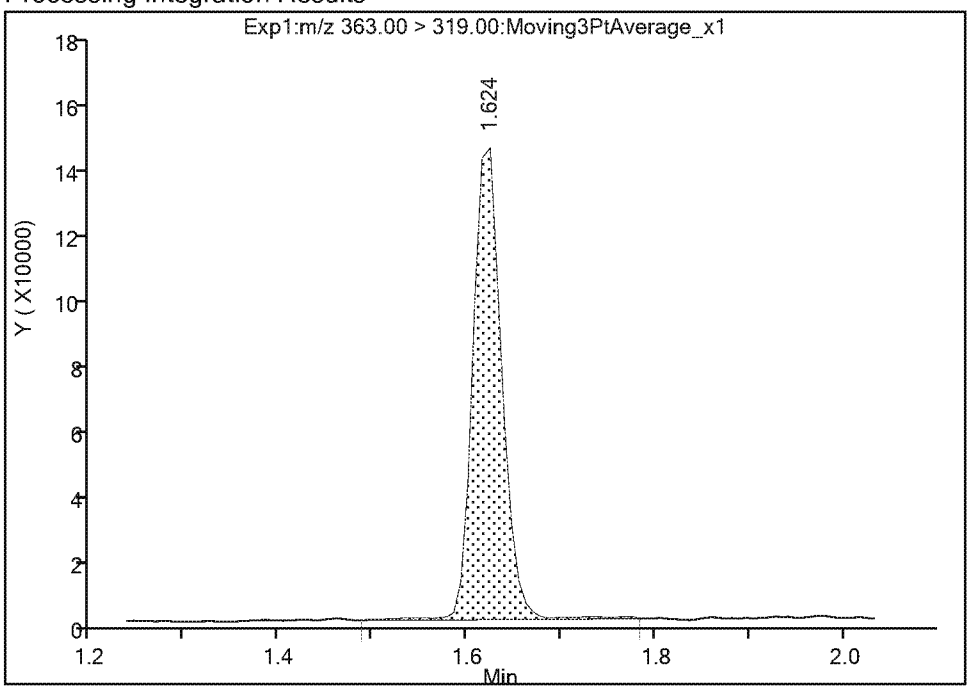
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_004.d				
Injection Date:	21-Jul-2018 12:26:23	Instrument ID:	A8_N		
Lims ID:	IC L2				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	2	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

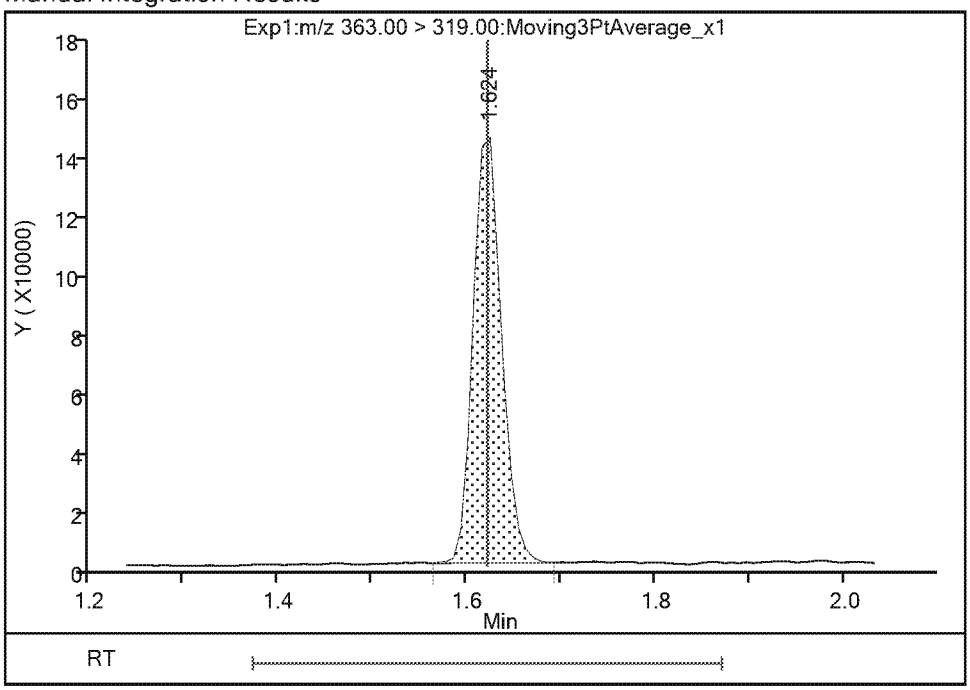
Processing Integration Results

RT: 1.62
Area: 289119
Amount: 2.120814
Amount Units: ng/ml



Manual Integration Results

RT: 1.62
Area: 282953
Amount: 2.089472
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 21-Jul-2018 12:58:16
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento

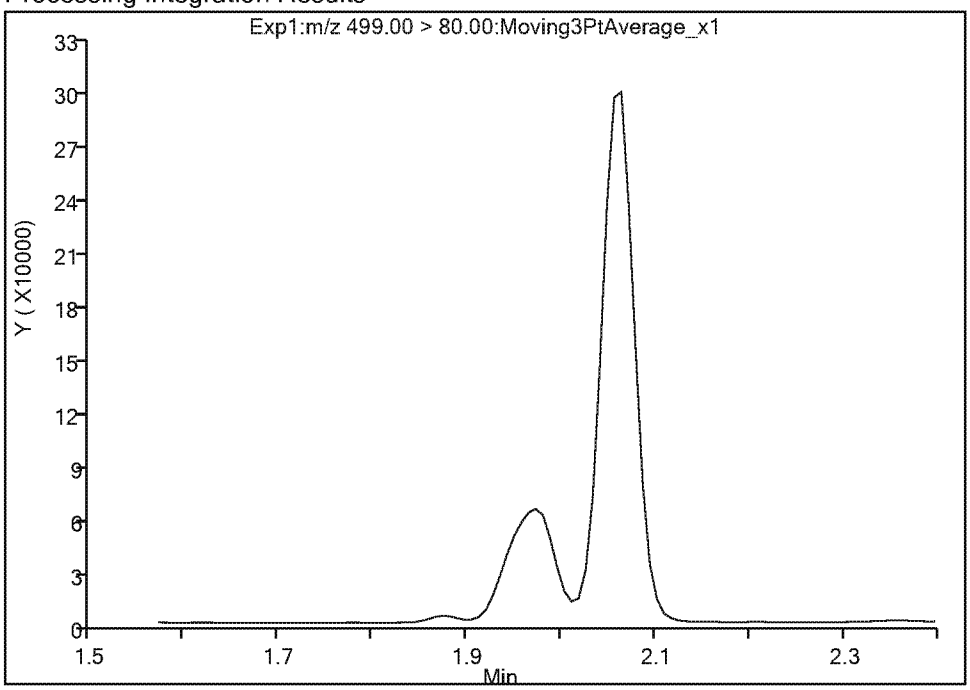
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_004.d				
Injection Date:	21-Jul-2018 12:26:23	Instrument ID:	A8_N		
Lims ID:	IC L2				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	2	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

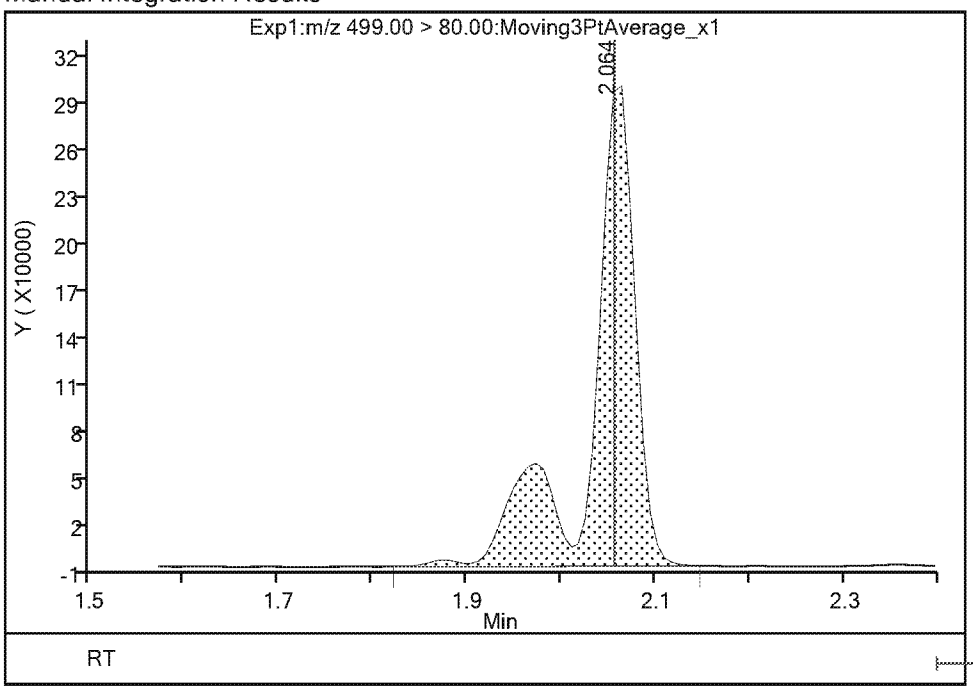
Processing Integration Results

Not Detected
Expected RT: 2.06



Manual Integration Results

RT: 2.06
Area: 963630
Amount: 8.315555
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 21-Jul-2018 12:58:27
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento

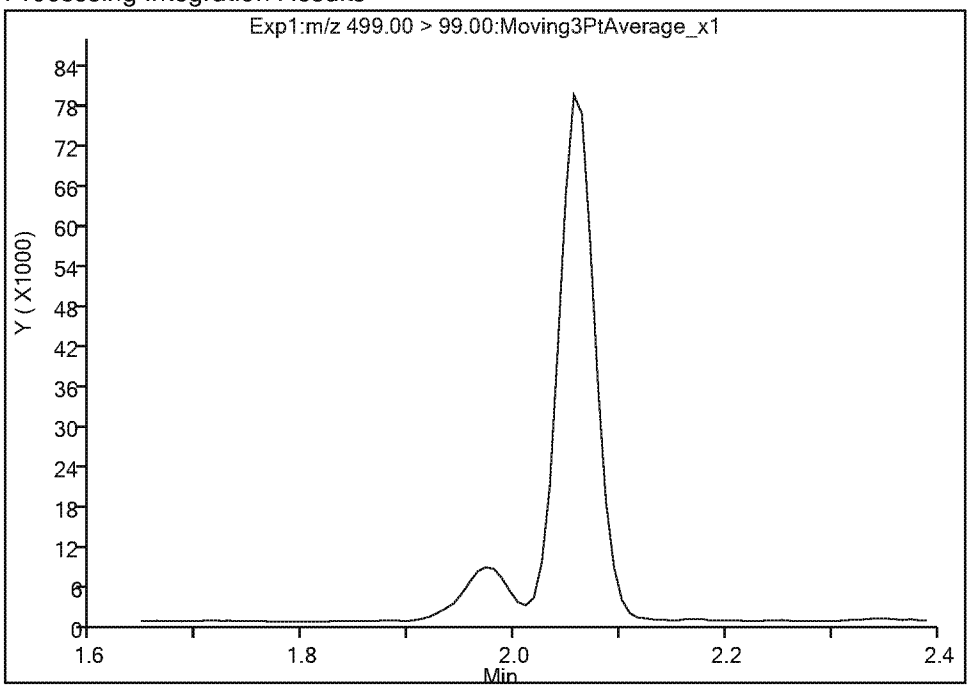
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_004.d
Injection Date: 21-Jul-2018 12:26:23 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

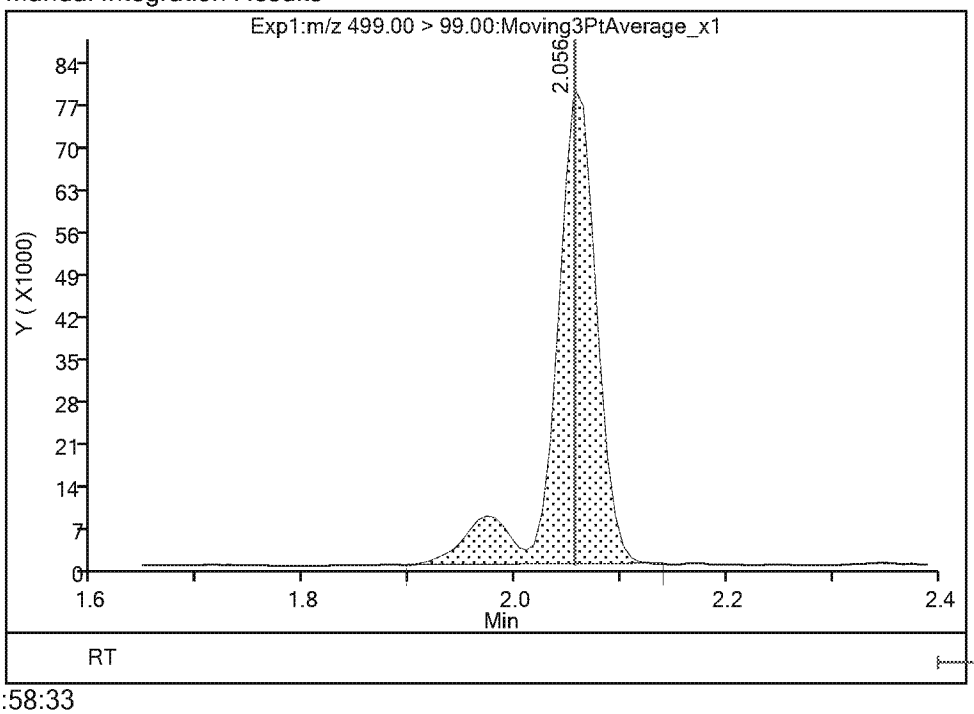
Processing Integration Results

Not Detected
Expected RT: 2.06



Manual Integration Results

RT: 2.06
Area: 211829
Amount: 8.315555
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 21-Jul-2018 12:58:33
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_005.d
Lims ID: IC L3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 21-Jul-2018 12:31:04 ALS Bottle#: 3 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L3_537
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub9

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 21-Jul-2018 14:51:37 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: Ex. 4 CBI Date: 21-Jul-2018 13:00:02

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.358	1.357	0.001	1.000	6349004	49.1		5603	
298.90 > 99.00	1.358	1.357	0.001	1.000	4286827		1.48(0.00-0.00)	5258	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.479	1.477	0.002	1.000	1324630	9.74		14446	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.620	0.004	1.000	2808334	14.9		2355	
4 Perfluoroheptanoic acid									M
363.00 > 319.00	1.624	1.621	0.003	1.000	652127	4.89		74.5	M
* 6 13C2-PFOA									
415.00 > 370.00	1.806	1.803	0.003		1263898	10.0		9936	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.806	1.803	0.003	1.000	1333317	9.79		169	
413.00 > 169.00	1.806	1.803	0.003	1.000	731504		1.82(0.00-0.00)	1602	
8 Perfluorooctane sulfonic acid									a
499.00 > 80.00	2.056	2.056	0.0	1.000	2307715	19.7		2607	a
499.00 > 99.00	2.056	2.056	0.0	1.000	510708		4.52(0.00-0.00)	925	
* 7 13C4 PFOS									
503.00 > 80.00	2.056	2.056	0.0		3150414	28.7		5700	
9 Perfluorononanoic acid									
463.00 > 419.00	2.071	2.065	0.006	1.000	984001	9.83		202	
$ 10 13C2 PFDA									
515.00 > 470.00	2.246	2.247	-0.001	1.000	867028	9.86		7559	

QC Flag Legend

Review Flags

M - Manually Integrated

a - User Assigned ID

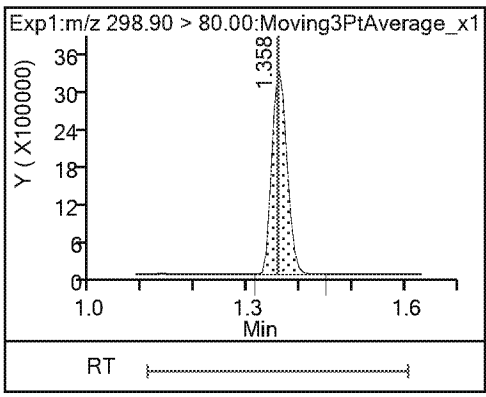
Reagents:

LC537-L3_00025 Amount Added: 1.00 Units: mL

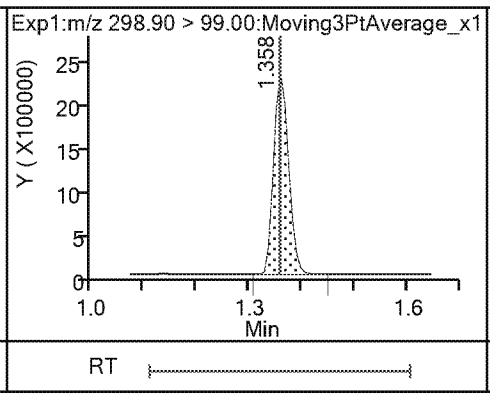
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_005.d
Injection Date: 21-Jul-2018 12:31:04 Instrument ID: A8_N
Lims ID: IC L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

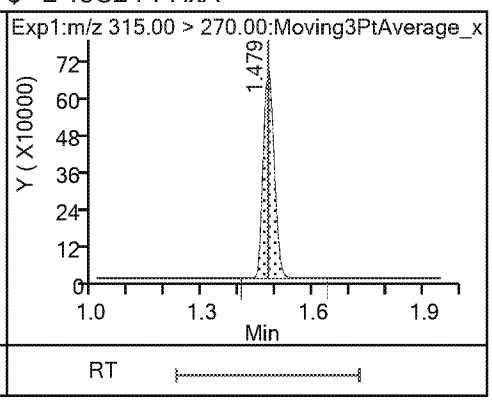
1 Perfluorobutanesulfonic acid



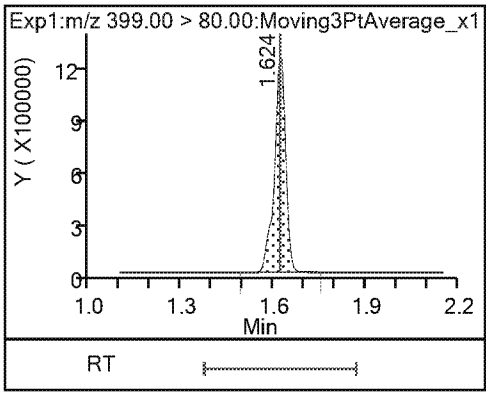
1 Perfluorobutanesulfonic acid



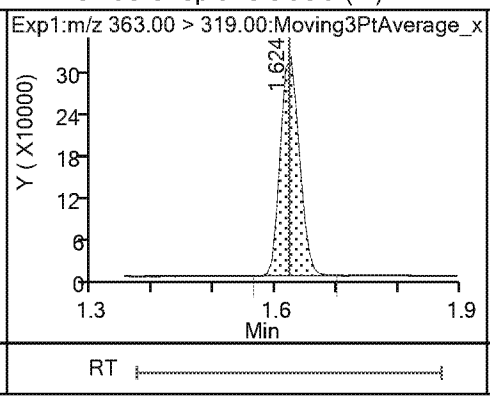
$ 2 13C2 PFHxA



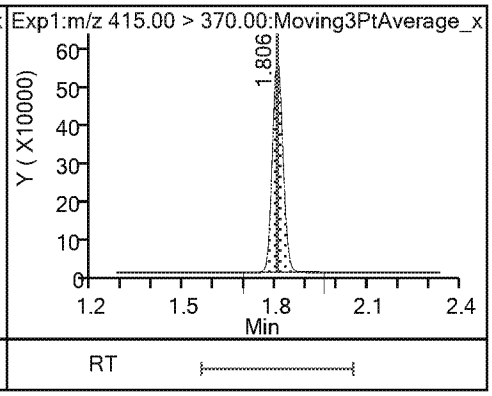
3 Perfluorohexanesulfonic acid



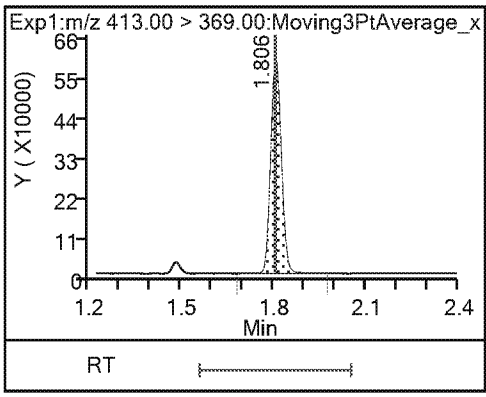
4 Perfluoroheptanoic acid (M)



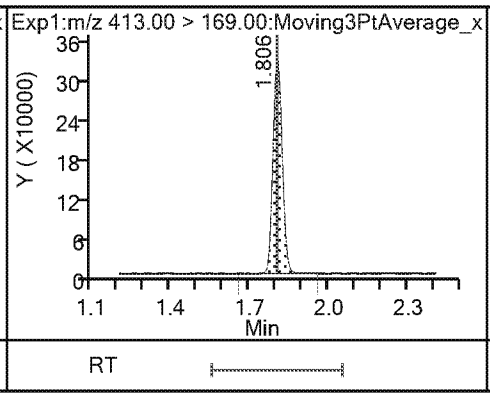
* 6 13C2-PFOA



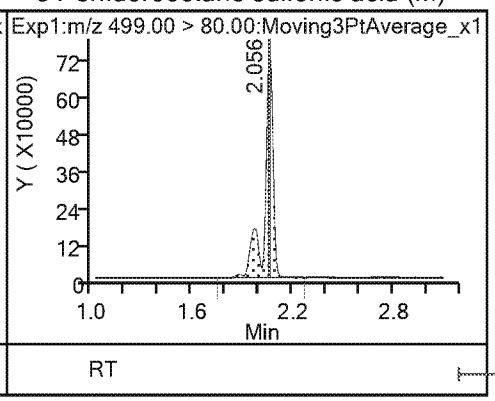
5 Perfluorooctanoic acid



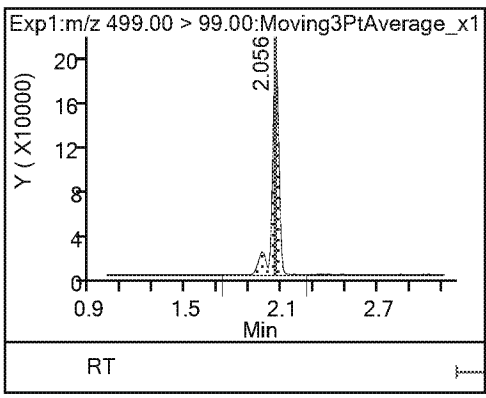
5 Perfluorooctanoic acid



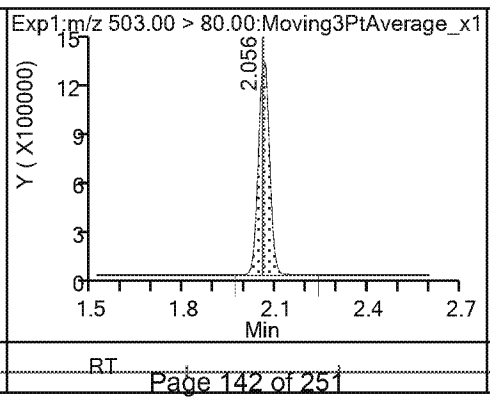
8 Perfluorooctane sulfonic acid (M)



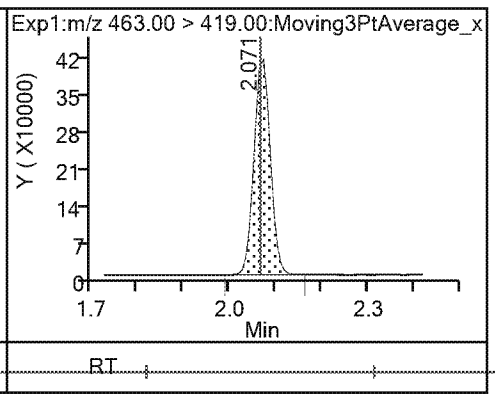
8 Perfluorooctane sulfonic acid



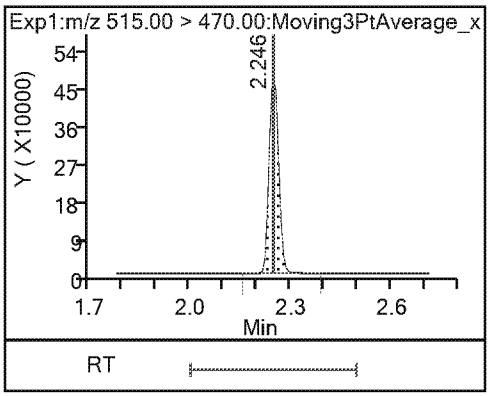
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
54
45
36
27
18
9
0
2.246
1.7
2.0
2.3
2.6
Min
RT

TestAmerica Sacramento

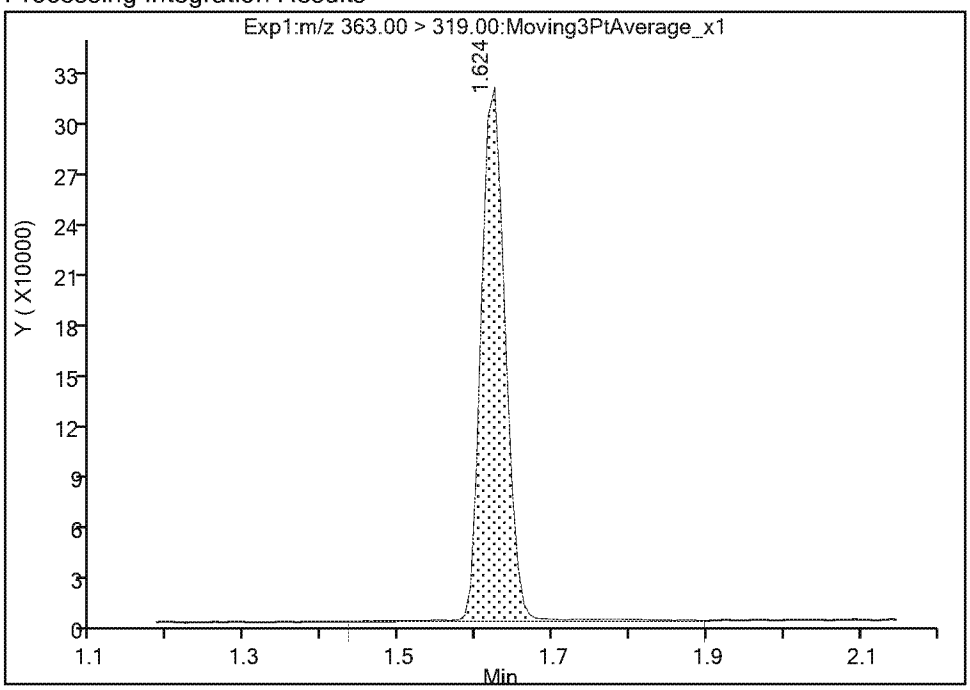
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_005.d				
Injection Date:	21-Jul-2018 12:31:04	Instrument ID:	A8_N		
Lims ID:	IC L3				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	3	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

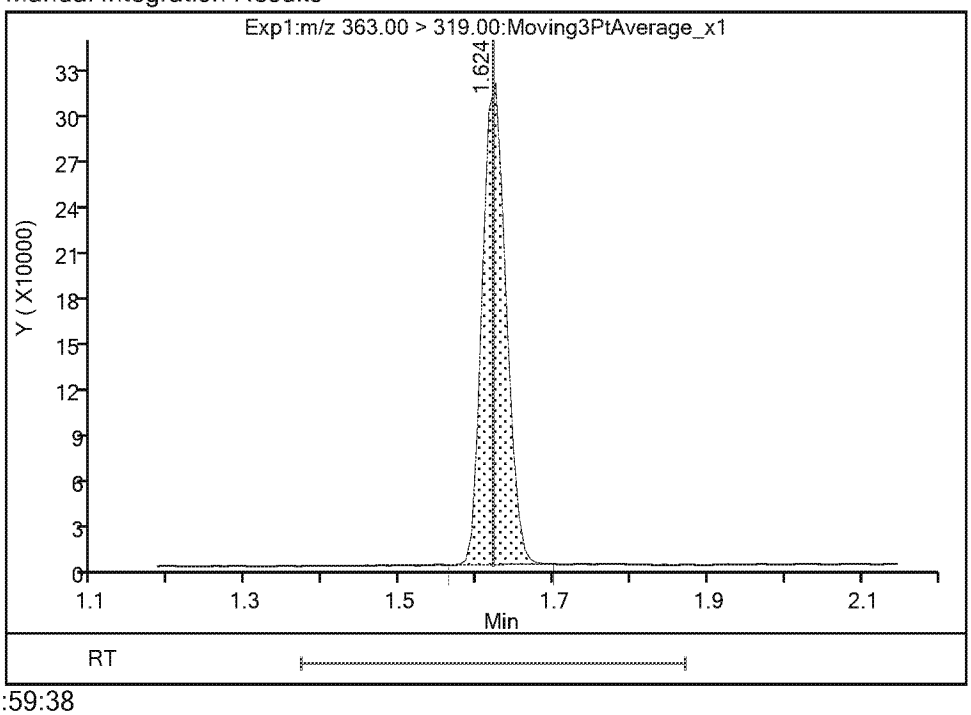
Processing Integration Results

RT: 1.62
Area: 667601
Amount: 4.995971
Amount Units: ng/ml



Manual Integration Results

RT: 1.62
Area: 652127
Amount: 4.892252
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 21-Jul-2018 12:59:38
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento

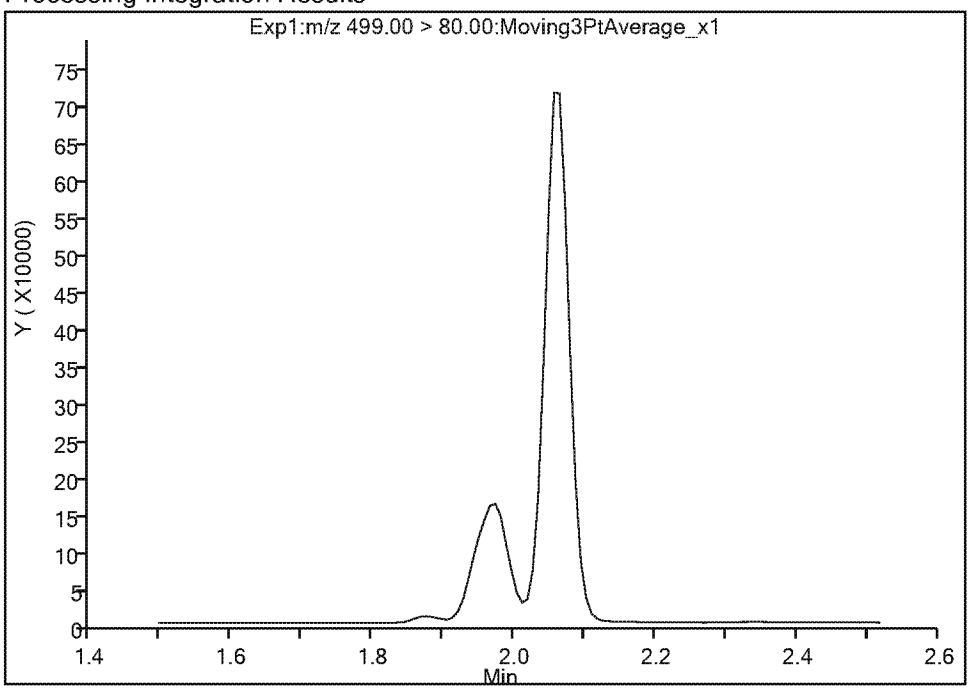
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_005.d				
Injection Date:	21-Jul-2018 12:31:04	Instrument ID:	A8_N		
Lims ID:	IC L3				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	3	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

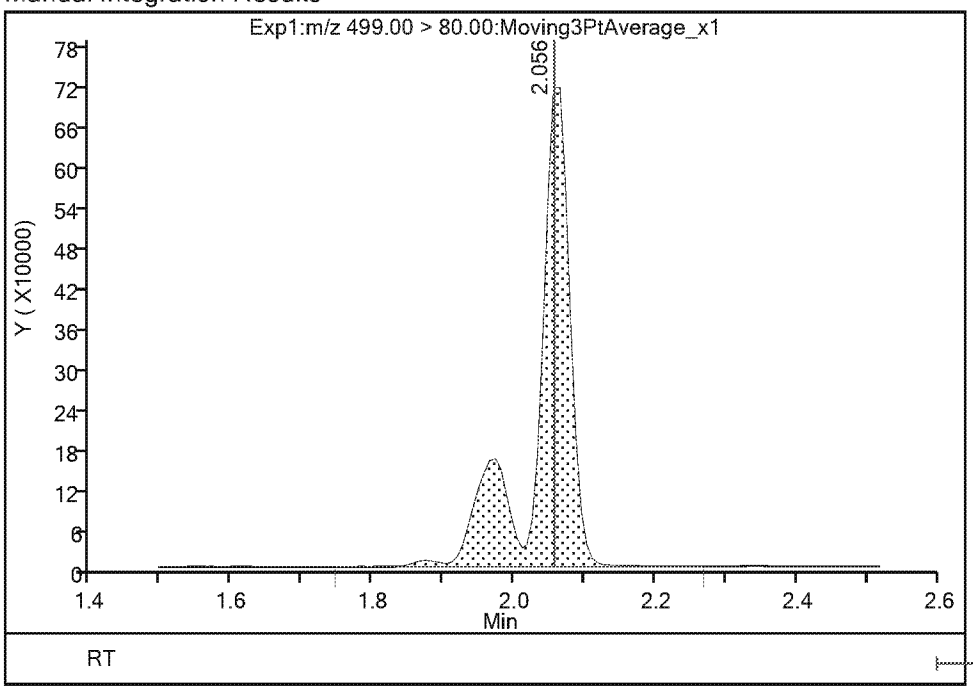
Processing Integration Results

Not Detected
Expected RT: 2.06



Manual Integration Results

RT: 2.06
Area: 2307715
Amount: 19.722503
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 21-Jul-2018 12:59:44
Audit Action: Assigned Compound ID Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_006.d
Lims ID: IC L4
Client ID:
Sample Type: ICISAV Calib Level: 4
Inject. Date: 21-Jul-2018 12:35:44 ALS Bottle#: 4 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L4_537
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub9

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 21-Jul-2018 14:51:32 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: Ex. 4 CBI Date: 21-Jul-2018 14:51:32

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.357	-0.007	1.000	10832159	90.5		8106	
298.90 > 99.00	1.350	1.357	-0.007	1.000	7783131		1.39(0.00-0.00)	8986	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.472	1.477	-0.005	1.000	1270784	10.3		14089	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.616	1.620	-0.004	1.000	5428281	31.2		4488	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.616	1.621	-0.005	1.000	1194139	9.83		129	
* 6 13C2-PFOA									
415.00 > 370.00	1.798	1.803	-0.005		1151615	10.0		8605	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.798	1.803	-0.005	1.000	2496915	20.1		324	
413.00 > 169.00	1.798	1.803	-0.005	1.000	1316711		1.90(0.00-0.00)	2664	
8 Perfluorooctane sulfonic acid									a
499.00 > 80.00	2.048	2.056	-0.008	1.000	4414336	40.7		5777	a
499.00 > 99.00	2.048	2.056	-0.008	1.000	942658		4.68(0.00-0.00)	1771	
* 7 13C4 PFOS									
503.00 > 80.00	2.048	2.056	-0.008		2917514	28.7		5274	
9 Perfluorononanoic acid									
463.00 > 419.00	2.056	2.065	-0.009	1.000	1842282	20.2		375	
$ 10 13C2 PFDA									
515.00 > 470.00	2.246	2.247	-0.001	1.000	807504	10.1		6189	

QC Flag Legend

Review Flags

a - User Assigned ID

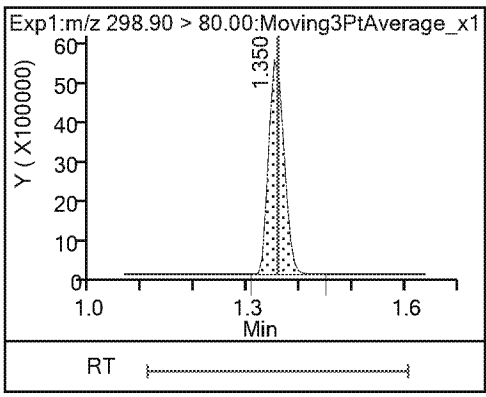
Reagents:

LC537-L4_00022 Amount Added: 1.00 Units: mL

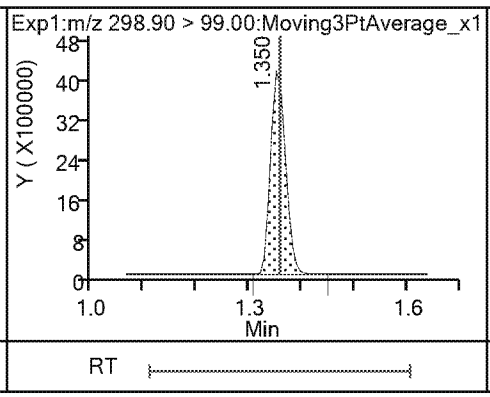
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_006.d
Injection Date: 21-Jul-2018 12:35:44 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

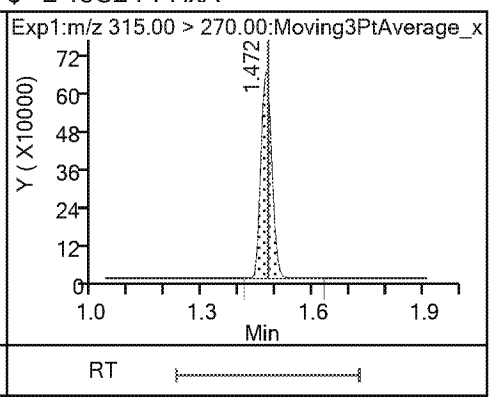
1 Perfluorobutanesulfonic acid



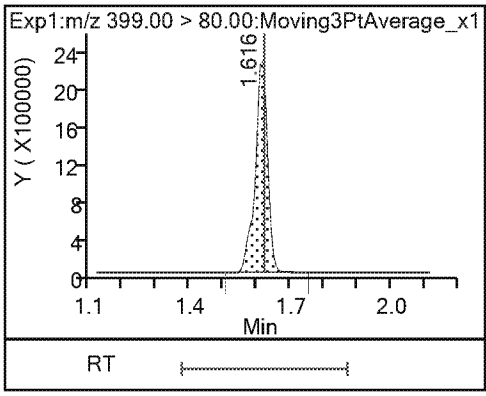
1 Perfluorobutanesulfonic acid



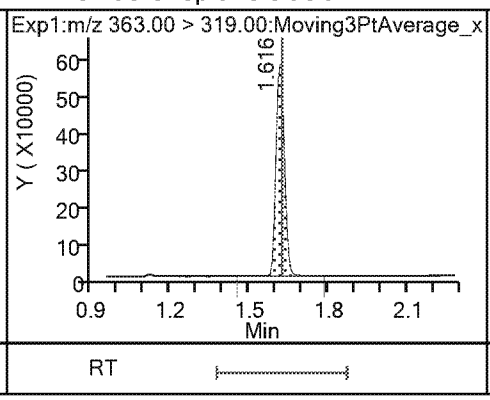
$ 2 13C2 PFHxA



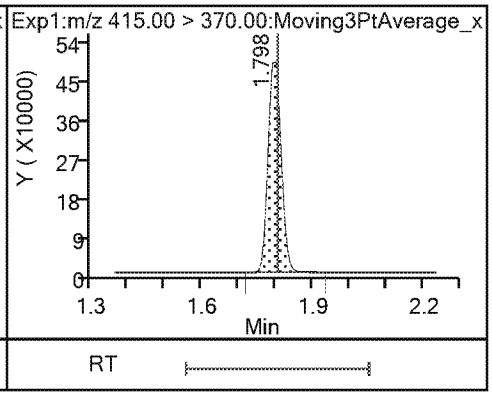
3 Perfluorohexanesulfonic acid



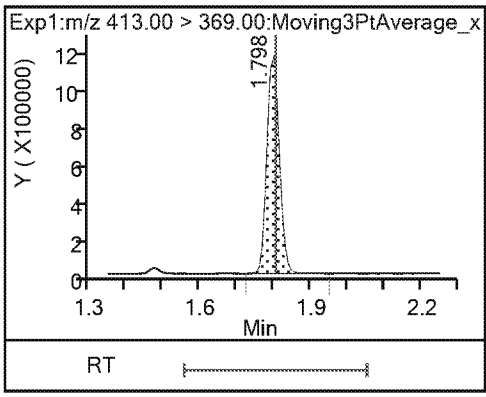
4 Perfluoroheptanoic acid



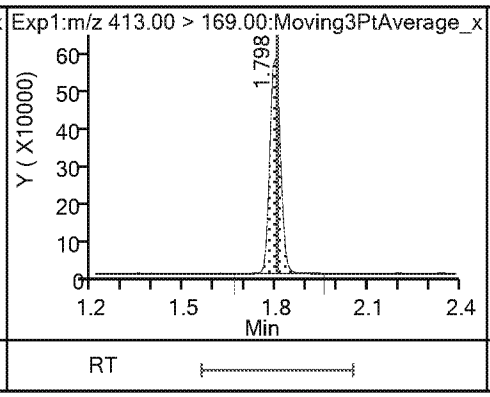
* 6 13C2-PFOA



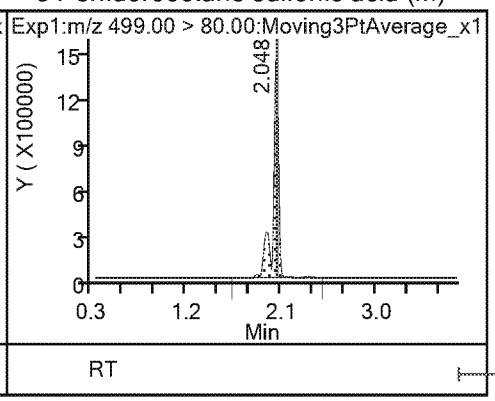
5 Perfluorooctanoic acid



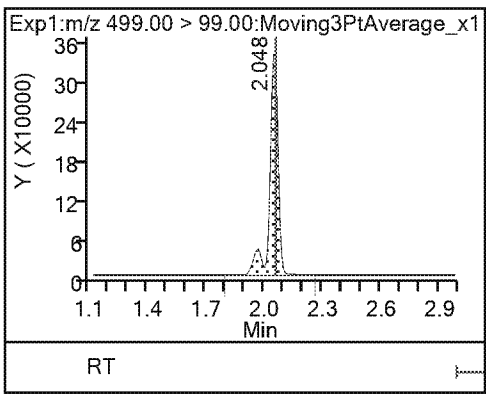
5 Perfluorooctanoic acid



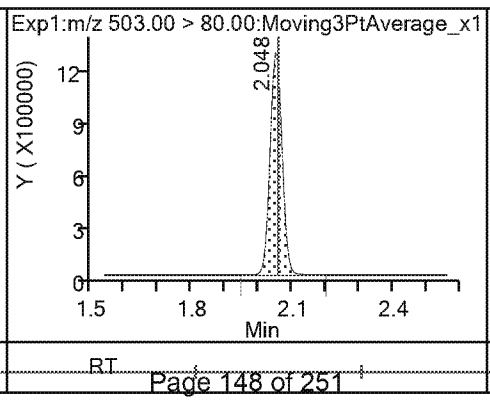
8 Perfluorooctane sulfonic acid (M)



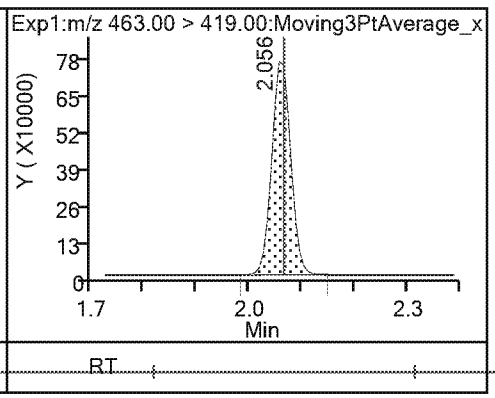
8 Perfluorooctane sulfonic acid



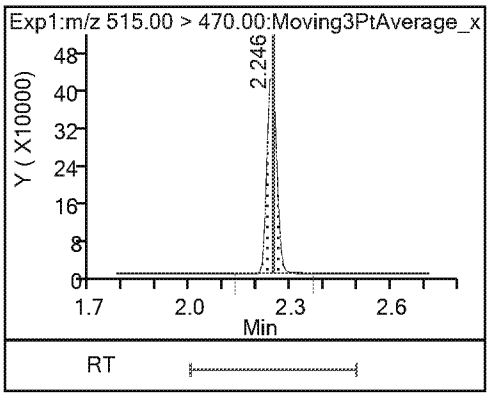
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
48
40
32
24
16
8
0
2.246
1.7
2.0
2.3
2.6
Min
RT

TestAmerica Sacramento

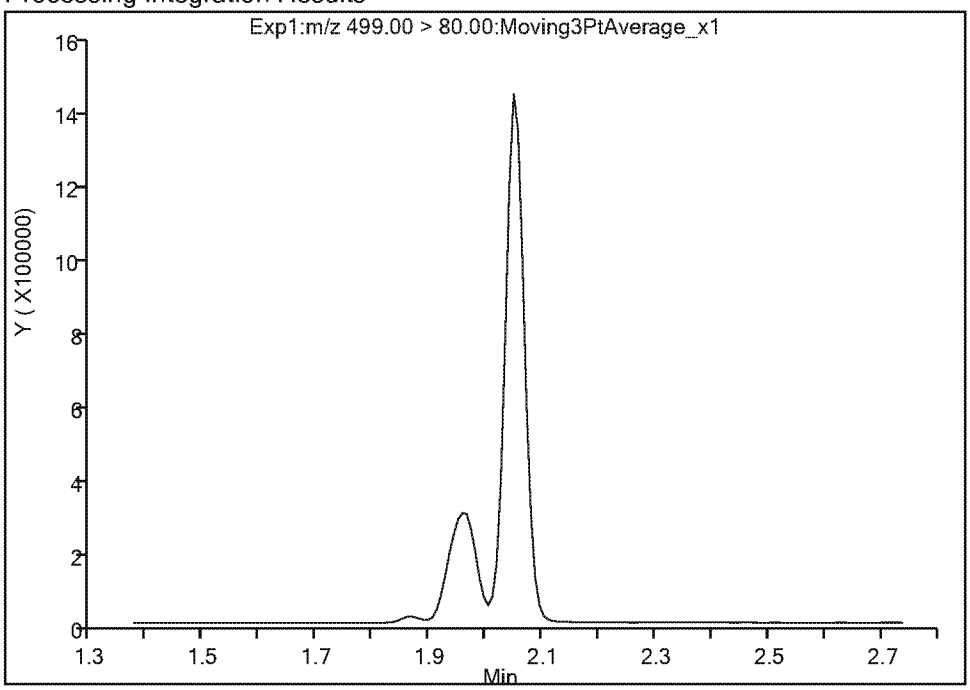
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_006.d				
Injection Date:	21-Jul-2018 12:35:44	Instrument ID:	A8_N		
Lims ID:	IC L4				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

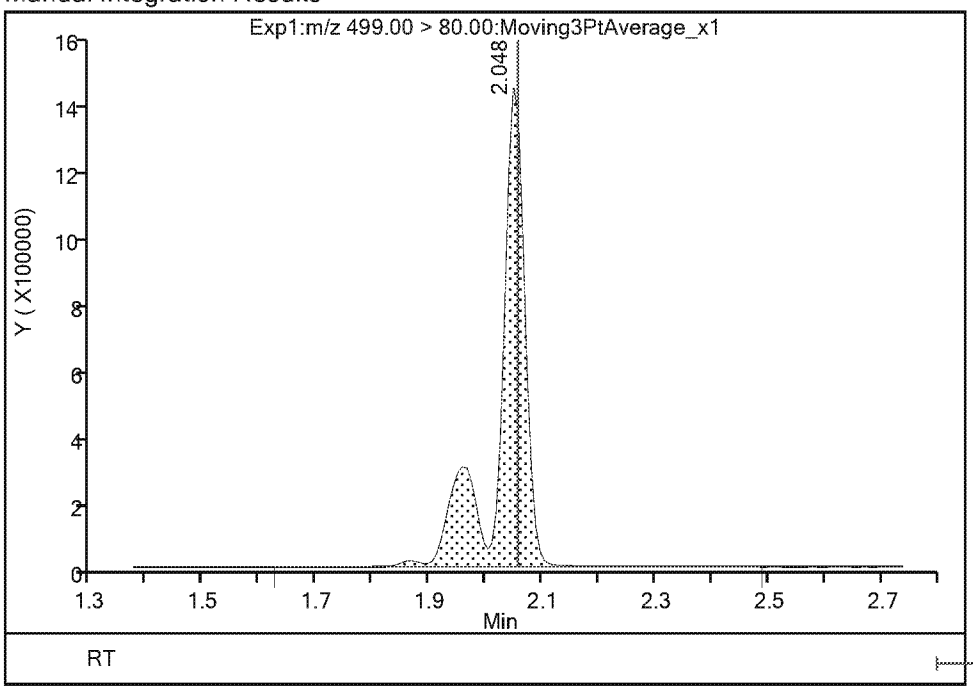
Not Detected
Expected RT: 2.06

Processing Integration Results



Manual Integration Results

RT: 2.05
Area: 4414336
Amount: 40.738022
Amount Units: ng/ml



Reviewer: roycea, 21-Jul-2018 13:00:12
Audit Action: Assigned Compound ID Audit Reason: Peak assignment corrected

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_007.d
Lims ID: IC L5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 21-Jul-2018 12:40:26 ALS Bottle#: 5 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L5_537
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub9

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 21-Jul-2018 14:51:38 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: Ex. 4 CBI Date: 21-Jul-2018 13:00:59

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.358	1.357	0.001	1.000	14336242	123.8		9919	
298.90 > 99.00	1.358	1.357	0.001	1.000	10389441		1.38(0.00-0.00)	10715	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.479	1.477	0.002	1.000	1212894	9.69		14230	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.620	0.004	1.000	7728080	45.9		6177	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.621	0.003	1.000	1759394	14.3		199	
* 6 13C2-PFOA									
415.00 > 370.00	1.806	1.803	0.003		1163367	10.0		10890	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.806	1.803	0.003	1.000	3725583	29.7		503	
413.00 > 169.00	1.806	1.803	0.003	1.000	1957436		1.90(0.00-0.00)	3998	
8 Perfluorooctane sulfonic acid									a
499.00 > 80.00	2.056	2.056	0.0	1.000	6367762	60.8		7602	a
499.00 > 99.00	2.056	2.056	0.0	1.000	1358795		4.69(0.00-0.00)	2425	
* 7 13C4 PFOS									
503.00 > 80.00	2.056	2.056	0.0		2821978	28.7		6075	
9 Perfluorononanoic acid									
463.00 > 419.00	2.064	2.065	-0.001	1.000	2668663	29.0		514	
$ 10 13C2 PFDA									
515.00 > 470.00	2.246	2.247	-0.001	1.000	796607	9.84		8285	

QC Flag Legend

Review Flags

a - User Assigned ID

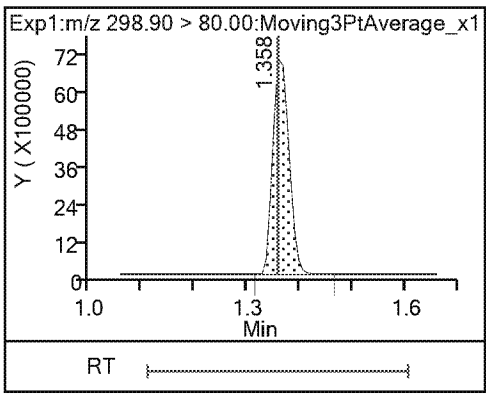
Reagents:

LC537-L5_00026 Amount Added: 1.00 Units: mL

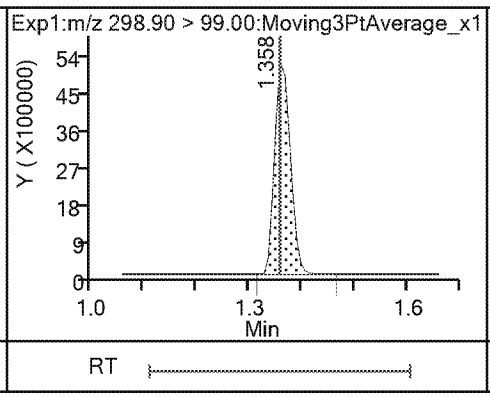
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_007.d
Injection Date: 21-Jul-2018 12:40:26 Instrument ID: A8_N
Lims ID: IC L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

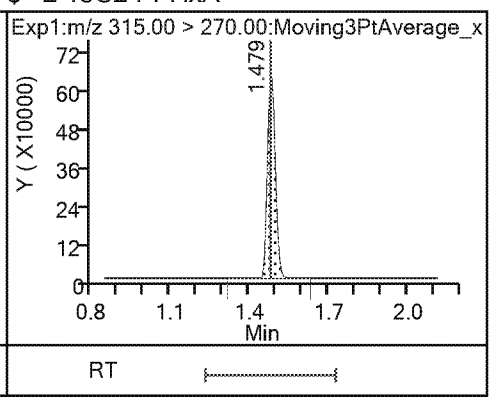
1 Perfluorobutanesulfonic acid



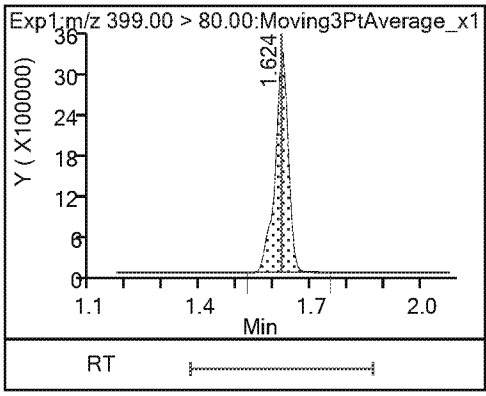
1 Perfluorobutanesulfonic acid



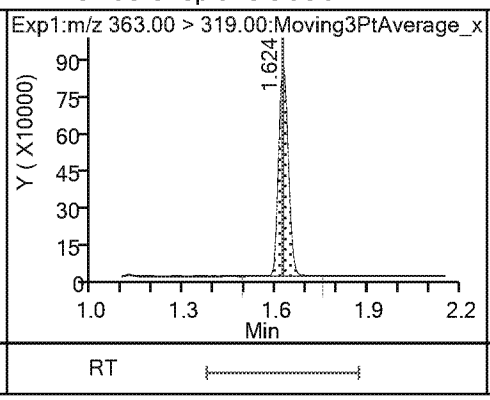
$ 2 13C2 PFHxA



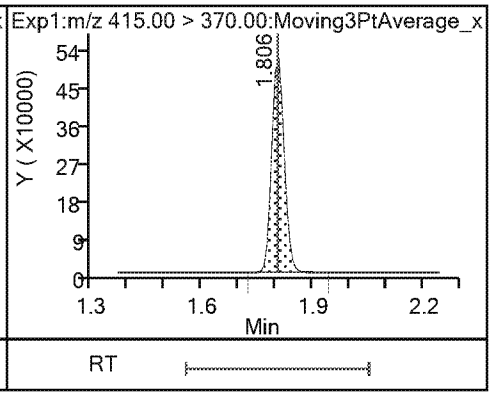
3 Perfluorohexanesulfonic acid



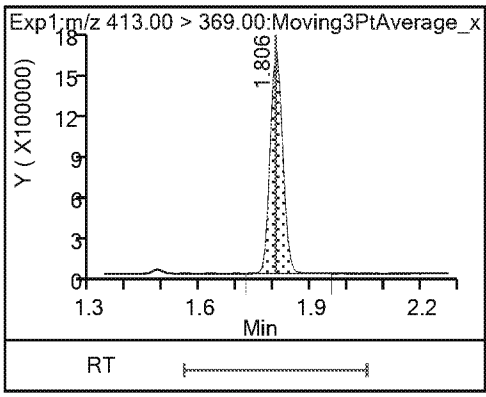
4 Perfluoroheptanoic acid



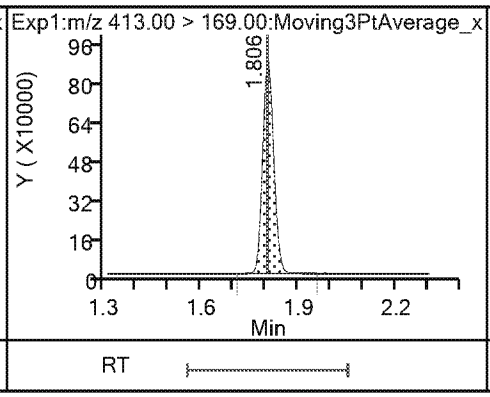
* 6 13C2-PFOA



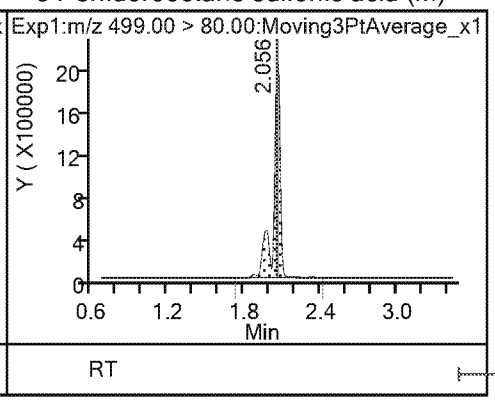
5 Perfluorooctanoic acid



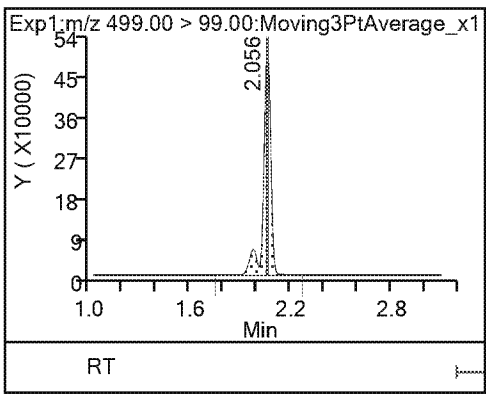
5 Perfluorooctanoic acid



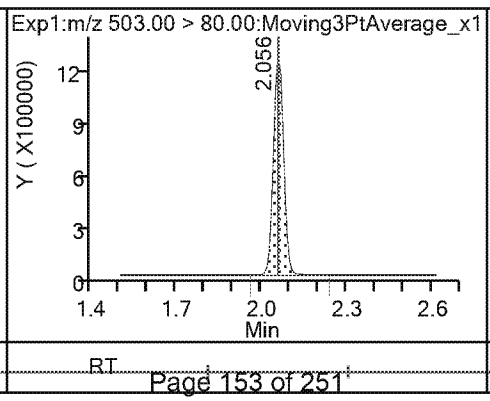
8 Perfluorooctane sulfonic acid (M)



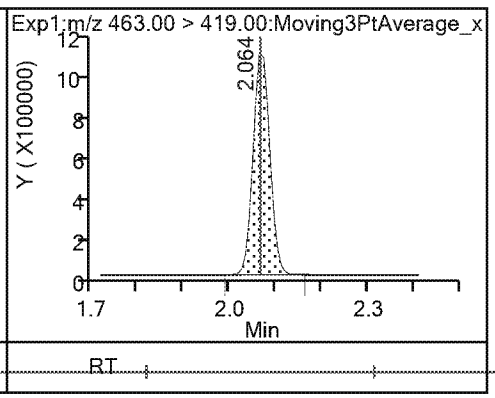
8 Perfluorooctane sulfonic acid



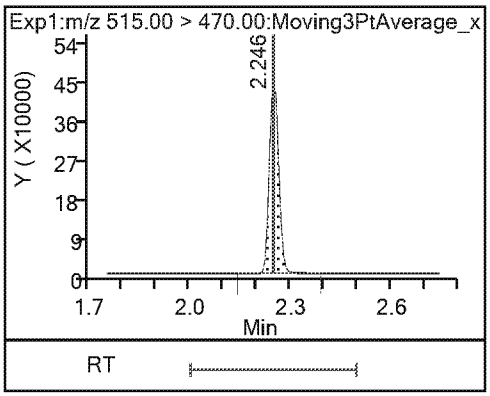
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
54
45
36
27
18
9
0
2.246
1.7
2.0
2.3
2.6
Min
RT

TestAmerica Sacramento

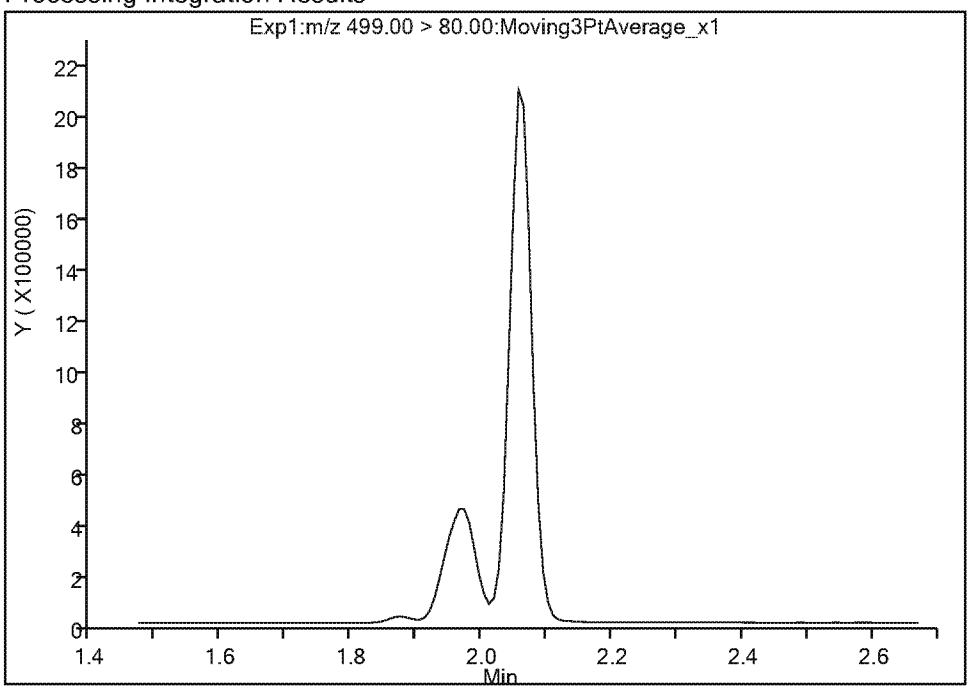
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_007.d				
Injection Date:	21-Jul-2018 12:40:26	Instrument ID:	A8_N		
Lims ID:	IC L5				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	5	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

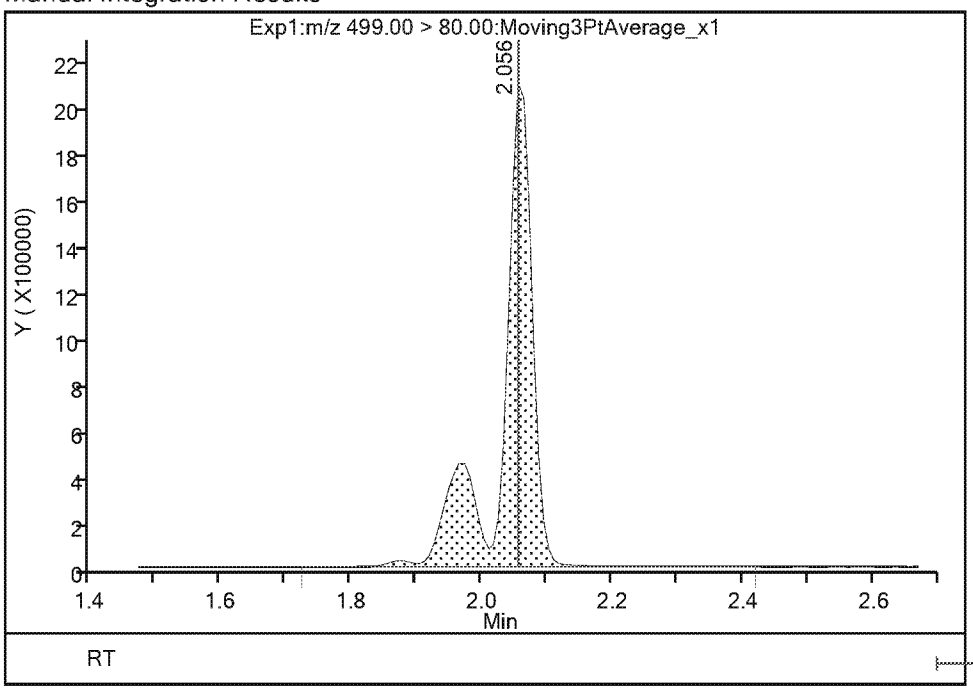
Processing Integration Results

Not Detected
Expected RT: 2.06



Manual Integration Results

RT: 2.06
Area: 6367762
Amount: 60.754814
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 21-Jul-2018 13:00:42
Audit Action: Assigned Compound ID Audit Reason: Peak assignment corrected

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d
Lims ID: IC L6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 21-Jul-2018 12:45:07 ALS Bottle#: 6 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L6_537
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub9

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 21-Jul-2018 14:51:39 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: Ex. 4 CBI Date: 21-Jul-2018 13:01:19

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.358	1.357	0.001	1.000	17778336	150.1		11741	
298.90 > 99.00	1.358	1.357	0.001	1.000	13154200		1.35(0.00-0.00)	12178	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.472	1.477	-0.005	1.000	1298612	10.7		14563	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.616	1.620	-0.004	1.000	10233792	59.4		7601	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.616	1.621	-0.005	1.000	2367732	19.9		259	
* 6 13C2-PFOA									
415.00 > 370.00	1.798	1.803	-0.005		1126134	10.0		9806	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.798	1.803	-0.005	1.000	4835518	39.8		675	
413.00 > 169.00	1.798	1.803	-0.005	1.000	2630066		1.84(0.00-0.00)	5843	
8 Perfluorooctane sulfonic acid									a
499.00 > 80.00	2.056	2.056	0.0	1.000	8546272	79.7		9451	a
499.00 > 99.00	2.056	2.056	0.0	1.000	1842612		4.64(0.00-0.00)	3404	
* 7 13C4 PFOS									
503.00 > 80.00	2.056	2.056	0.0		2887592	28.7		5453	
9 Perfluorononanoic acid									
463.00 > 419.00	2.064	2.065	-0.001	1.000	3541730	39.7		698	
$ 10 13C2 PFDA									
515.00 > 470.00	2.246	2.247	-0.001	1.000	800909	10.2		8580	

QC Flag Legend

Review Flags

a - User Assigned ID

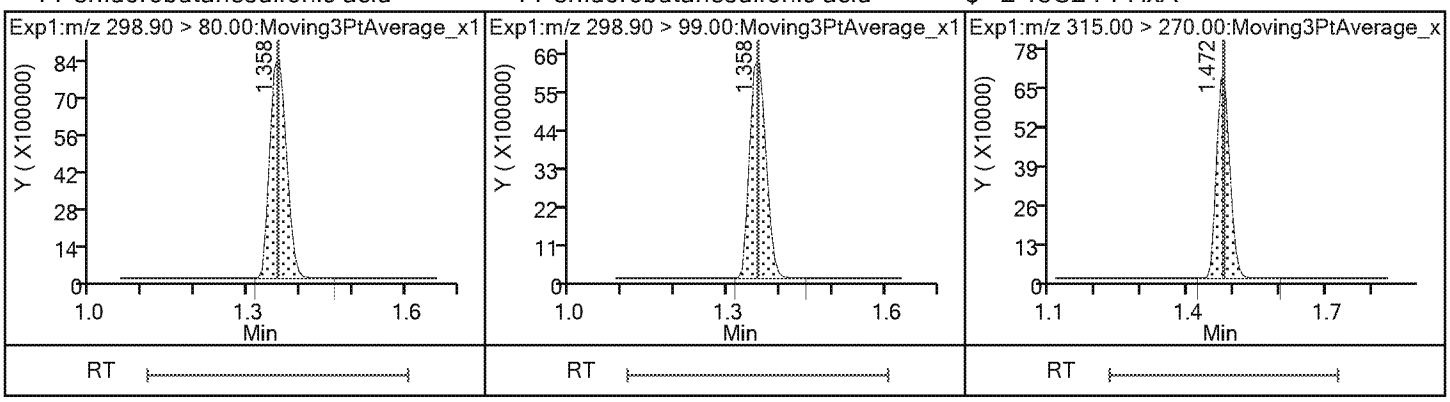
Reagents:

LC537-L6_00022 Amount Added: 1.00 Units: mL

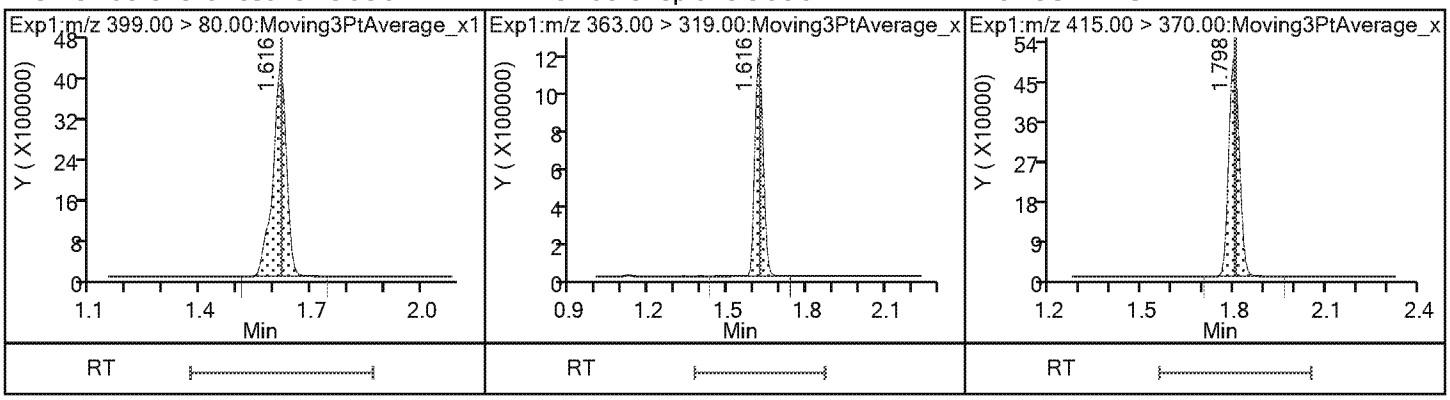
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d
Injection Date: 21-Jul-2018 12:45:07 Instrument ID: A8_N
Lims ID: IC L6
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 6 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

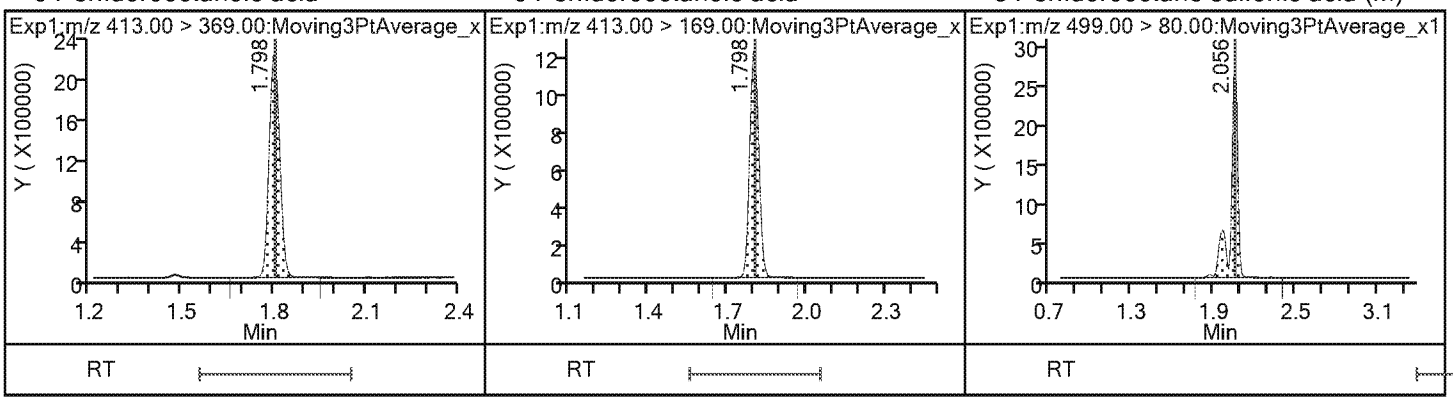
1 Perfluorobutanesulfonic acid | 1 Perfluorobutanesulfonic acid | $ 2 13C2 PFHxA



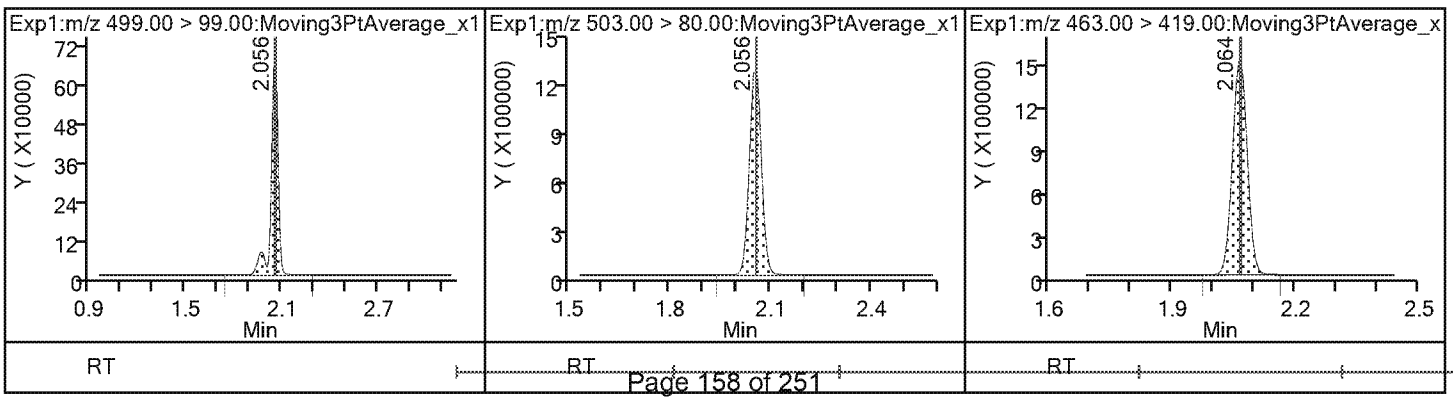
3 Perfluorohexanesulfonic acid | 4 Perfluoroheptanoic acid | * 6 13C2-PFOA



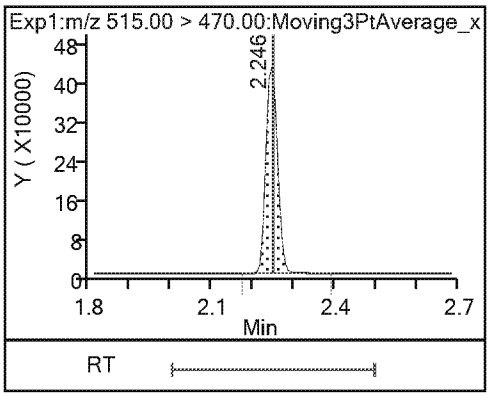
5 Perfluorooctanoic acid | 5 Perfluorooctanoic acid | 8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid | * 7 13C4 PFOS | 9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
48
40
32
24
16
8
0
2.246
1.8
2.1
2.4
2.7
Min
RT

TestAmerica Sacramento

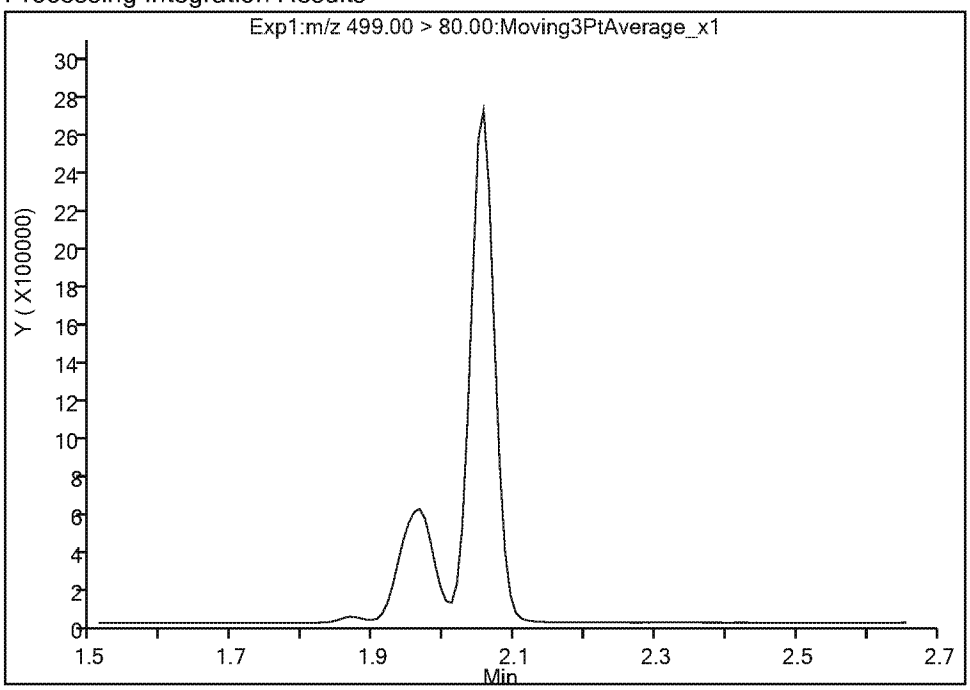
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d				
Injection Date:	21-Jul-2018 12:45:07	Instrument ID:	A8_N		
Lims ID:	IC L6				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

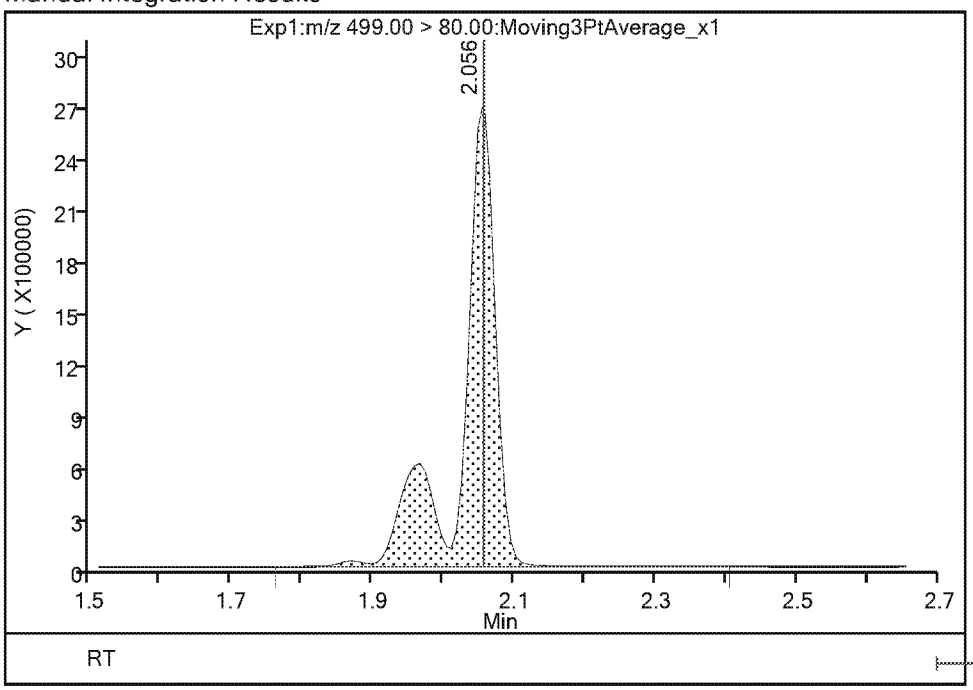
Processing Integration Results

Not Detected
Expected RT: 2.06



Manual Integration Results

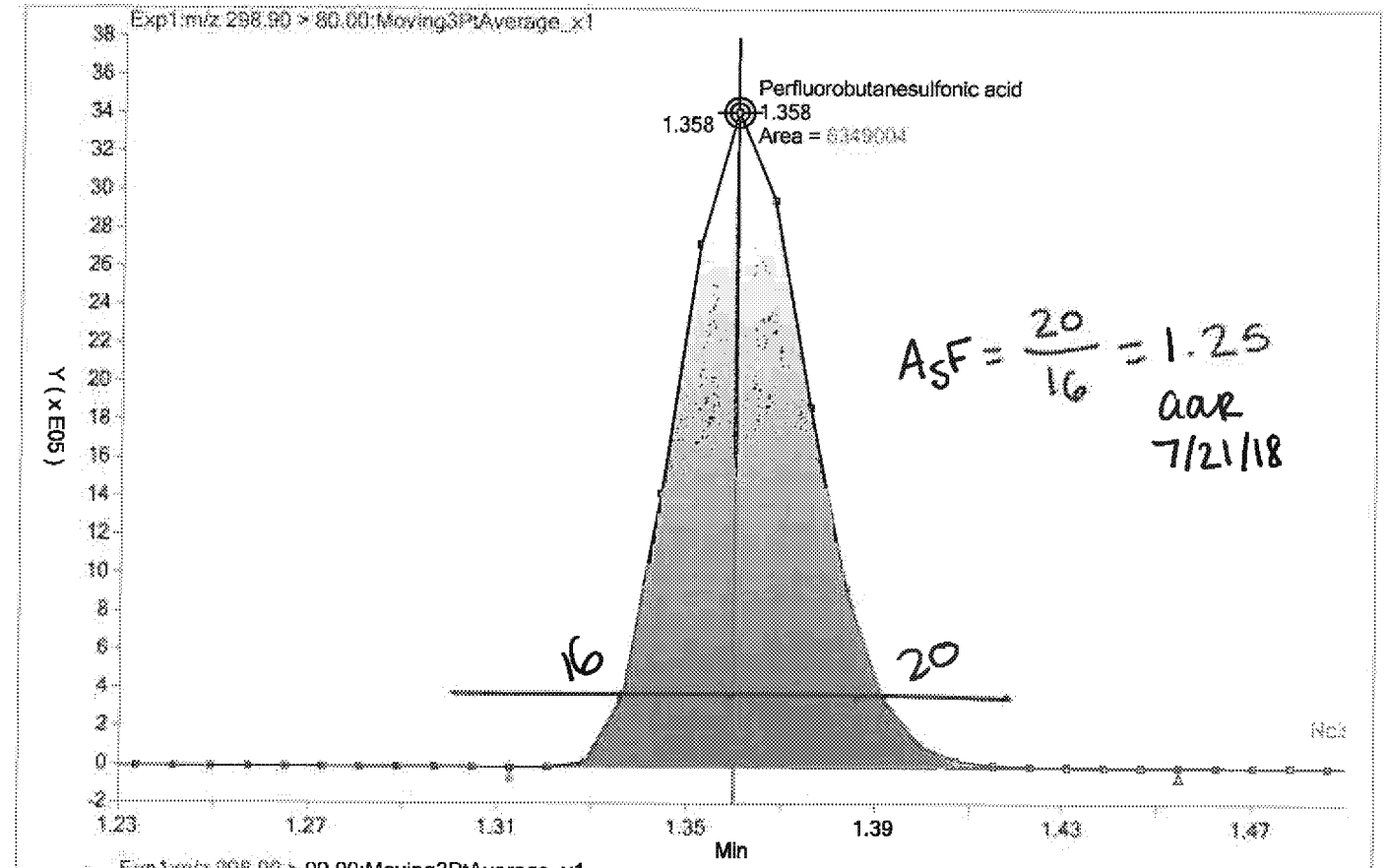
RT: 2.06
Area: 8546272
Amount: 79.687165
Amount Units: ng/ml



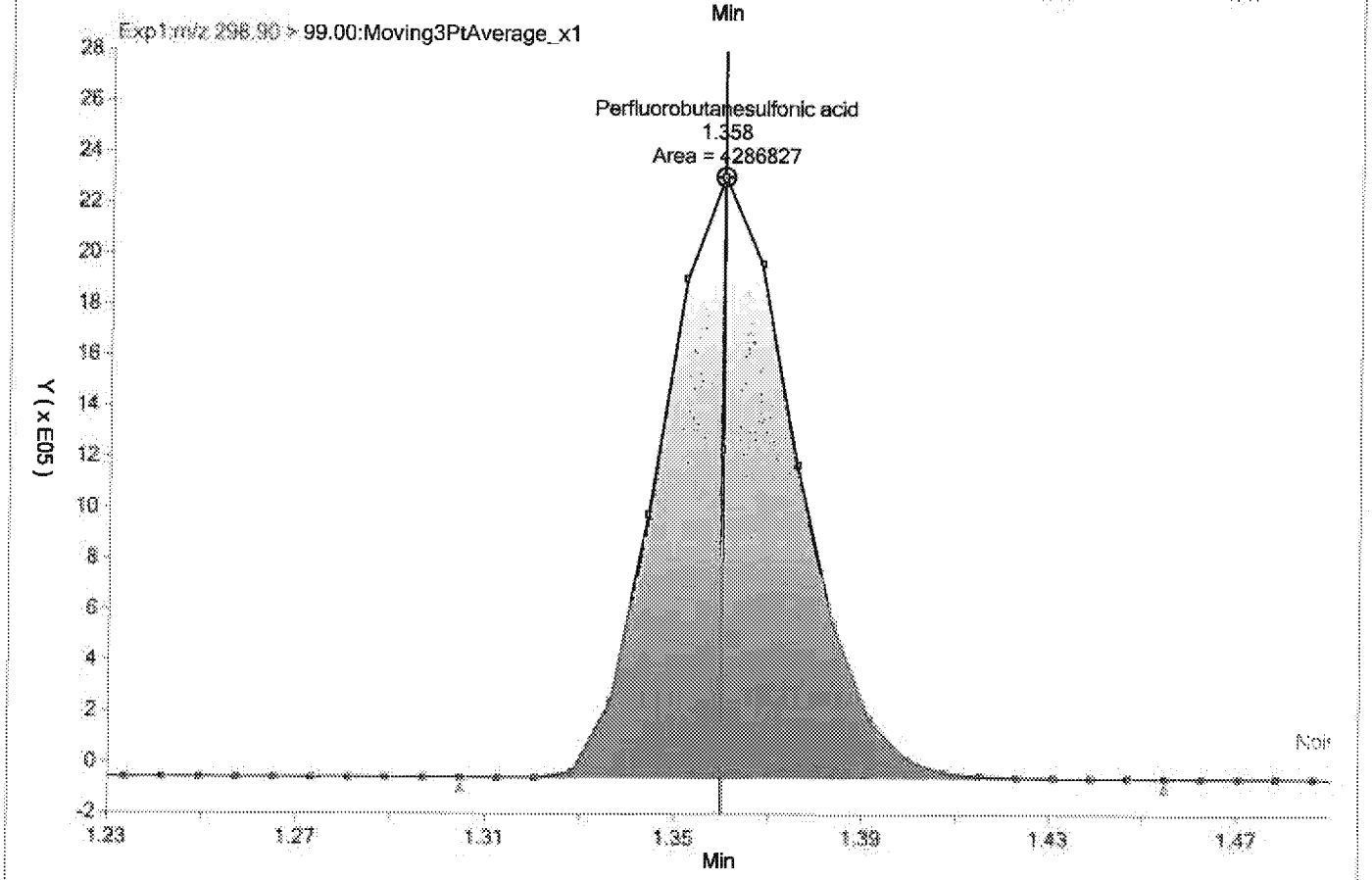
Reviewer: Ex. 4 CBI 21-Jul-2018 13:01:08
Audit Action: Assigned Compound ID Audit Reason: Peak assignment corrected

Chromatogram

IC L3 EXP1



$A_SF = \frac{20}{16} = 1.25$
aar
7/21/18

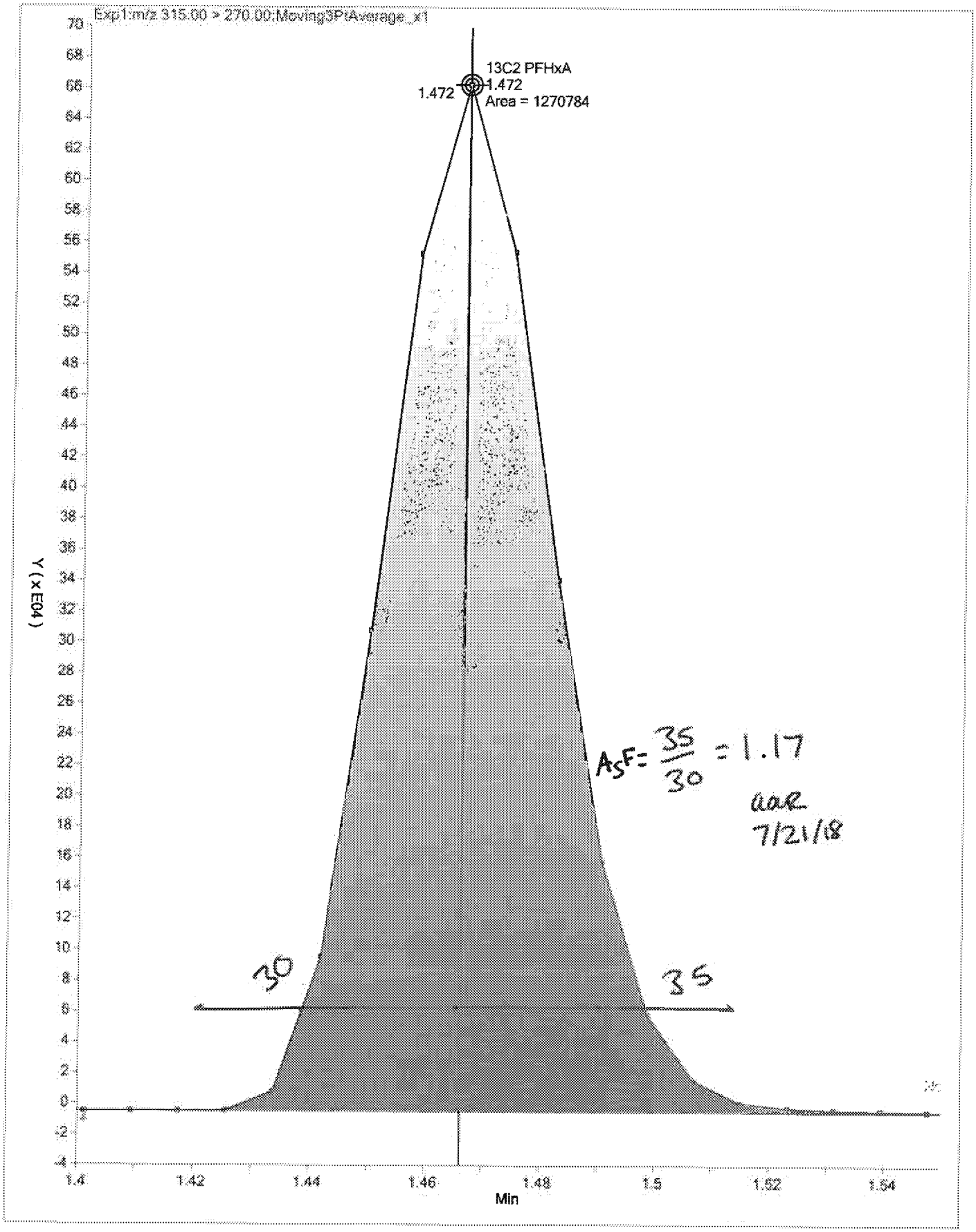


Chrom

Printed: 7/21/2018 2:37:59 PM

Chromatogram

IC L4 EXP1



Chrom

Printed: 7/21/2018 2:29:06 PM

Report Date: 21-Jul-2018 14:29:11 Chrom Revision: 2.3 19-Jul-2018 15:14:48

TestAmerica Laboratories
Istd/Surrogate Recovery Report

Worklist Name: 21JUL2018_537_ICAL Worklist Num: 61414
Instrument: A8_N Method: 537_A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b
Limit Group: LC 537 ICAL
Analysis Type: SemiVOA
Inj Volume: 2.00 Inj Vol Units: ul

Lims Batch: 235370
CCV IS Mode: Select Ical Level, Cal Level: 3
Non-Cal IS Mode: Last Ccal Sample

$ 2 13C2 PFHxA
$ 10 13C2 PFDA

Lab ID Inj Date	$ 2	$ 10	* 6 13C2-PFOA	* 7 13C4 PFOS
IS Std				
# 3 IC L1 21-Jul-2018 12:21:44	1.48 103.30	2.25 103.40	1.81 1104504> 100.0*	2.06 2811428> 100.0*
# 4 IC L2 21-Jul-2018 12:26:23	1.48 93.81	2.25 96.88	1.81 1284004> 116.3*	2.06 3120086> 111.0*
# 5 IC L3 21-Jul-2018 12:31:04	1.48 97.88	2.25 98.77	1.81 1263898> 114.4*	2.06 3150414> 112.1*
# 6 IC L4 21-Jul-2018 12:35:44	1.47 102.50	2.25 100.80	1.80 1151615> 104.3*	2.05 2917514> 103.8*
# 7 IC L5 21-Jul-2018 12:40:26	1.48 96.87	2.25 98.43	1.81 1163367> 105.3*	2.06 2821978> 100.4*
# 8 IC L6 21-Jul-2018 12:45:07	1.47 107.10	2.25 102.20	1.80 1126134> 102.0*	2.06 2887592> 102.7*
IS Std			1263898 1.81	3150414 2.06
#10 RB 21-Jul-2018 12:49:46			1.80 1225771 97.0	2.06 3347058 106.2
IS Std			1151615 1.80	2917514 2.05
#11 CCVL 21-Jul-2018 12:54:25	1.47 99.46	2.25 97.35	1.80 1220813 106.0	2.05 2998753 102.8
IS Std			1220813 1.80	2998753 2.05
#12 ICB 21-Jul-2018 12:59:06			1.80 1199738 98.3	2.05 3260483 108.7
IS Std			1151615 1.80	2917514 2.05
#13 ICV 21-Jul-2018 13:03:44	1.48 95.50	2.25 94.54	1.81 1160905 100.8	2.06 2863082 98.1

13C2 PFOA

$$RPD = \frac{1284004 - 1104504}{\left(\frac{1284004 + 1104504}{2}\right)} \times 100 = 15.0\%$$

13C4 PFOS

$$RPD = \frac{3150414 - 2811425}{\left(\frac{3150414 + 2811425}{2}\right)} \times 100 = 11.4\%$$

aar 7/21/18

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Lab Sample ID: CCVL 320-235370/11 Calibration Date: 07/21/2018 12:54

Instrument ID: A8_N Calib Start Date: 07/21/2018 12:21

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/21/2018 12:45

Lab File ID: 2018.07.21_537CURVE_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid	Ave	1.177	1.256		21.4	20.0	6.8	50.0
Perfluoroheptanoic acid	Ave	1.055	1.048		2.15	2.16	-0.6	50.0
Perfluorohexanesulfonic acid	Ave	1.710	1.662		6.53	6.72	-2.8	50.0
Perfluorooctanoic acid	Ave	1.078	1.024		4.18	4.40	-5.0	50.0
Perfluorooctane sulfonic acid	Ave	1.065	1.041		8.59	8.79	-2.2	50.0
Perfluorononanoic acid	Ave	0.7921	0.7981		4.43	4.40	0.8	50.0
13C2 PFHxA	Ave	1.076	1.070		9.95	10.0	-0.5	30.0
13C2 PFDA	Ave	0.6956	0.6772		9.73	10.0	-2.7	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_010.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 21-Jul-2018 12:54:25 ALS Bottle#: 2 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L2
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub9

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 21-Jul-2018 14:50:42 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: Ex. 4 CBI Date: 21-Jul-2018 13:03:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.358	1.357	0.001	1.000	2628791	21.4		2269	
298.90 > 99.00	1.358	1.357	0.001	1.000	1773254		1.48(0.00-0.00)	2231	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.472	1.478	-0.006	1.000	1306766	9.95		13318	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.616	1.621	-0.005	1.000	1167854	6.53		1057	
4 Perfluoroheptanoic acid									M
363.00 > 319.00	1.616	1.622	-0.006	1.000	276355	2.15		33.7	M
* 6 13C2-PFOA									
415.00 > 370.00	1.798	1.804	-0.006		1220813	10.0		10976	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.798	1.804	-0.006	1.000	549969	4.18		78.5	
413.00 > 169.00	1.798	1.804	-0.006	1.000	300739		1.83(0.00-0.00)	658	
8 Perfluorooctane sulfonic acid									a
499.00 > 80.00	2.056	2.056	0.0	1.000	956527	8.59		1209	a
499.00 > 99.00	2.048	2.056	-0.008	0.996	209061		4.58(0.00-0.00)	405	
* 7 13C4 PFOS									
503.00 > 80.00	2.048	2.056	-0.008		2998753	28.7		5853	
9 Perfluorononanoic acid									
463.00 > 419.00	2.064	2.065	-0.001	1.000	428712	4.43		87.7	
$ 10 13C2 PFDA									
515.00 > 470.00	2.246	2.247	-0.001	1.000	826714	9.73		8131	

QC Flag Legend

Review Flags

M - Manually Integrated

a - User Assigned ID

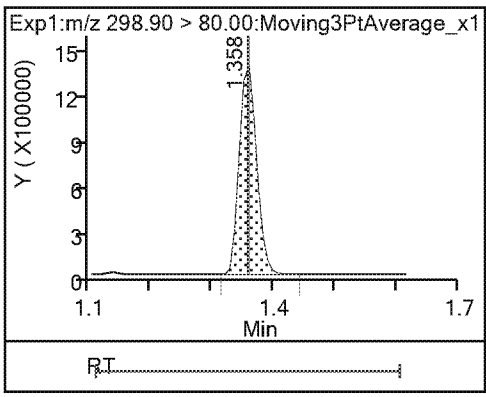
Reagents:

LC537-L2_00022 Amount Added: 1.00 Units: mL

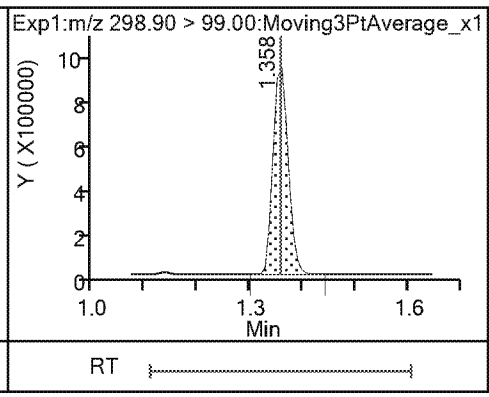
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_010.d
Injection Date: 21-Jul-2018 12:54:25 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

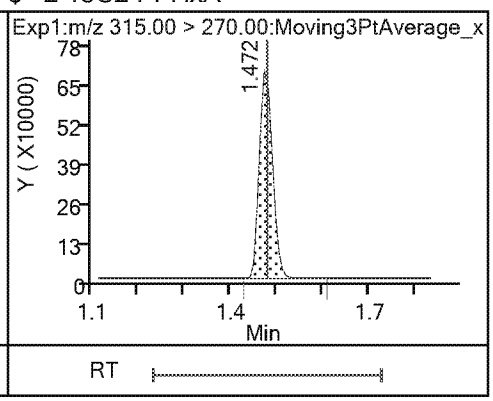
1 Perfluorobutanesulfonic acid



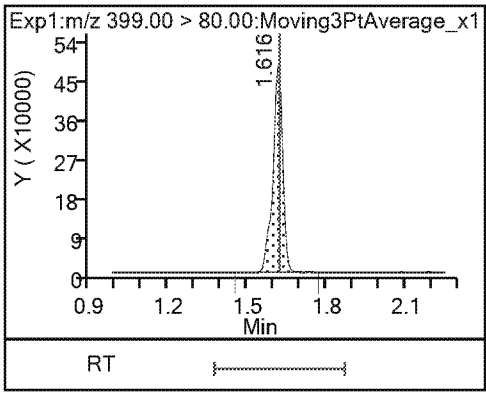
1 Perfluorobutanesulfonic acid



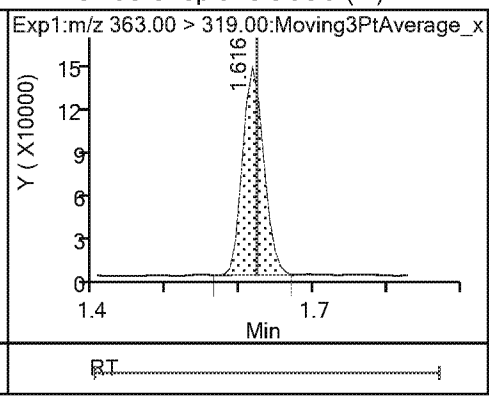
$ 2 13C2 PFHxA



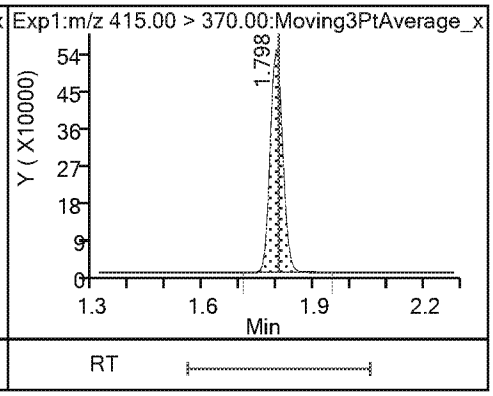
3 Perfluorohexanesulfonic acid



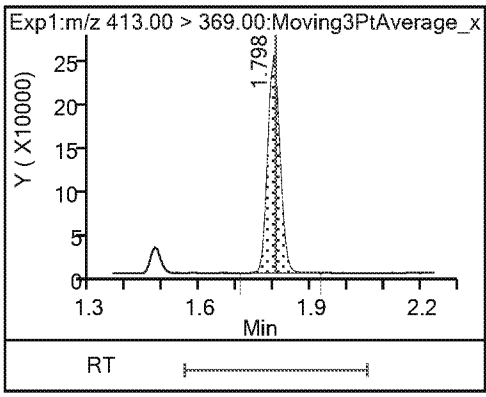
4 Perfluoroheptanoic acid (M)



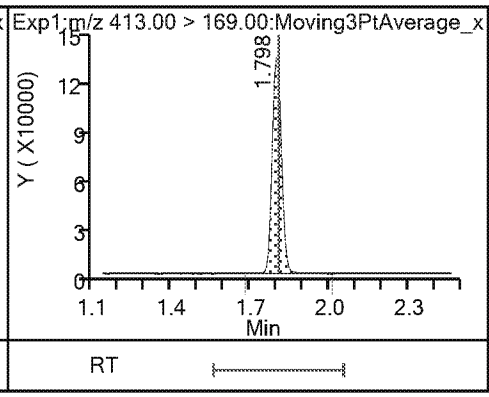
* 6 13C2-PFOA



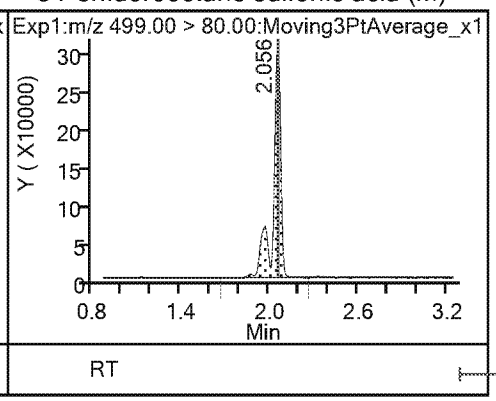
5 Perfluorooctanoic acid



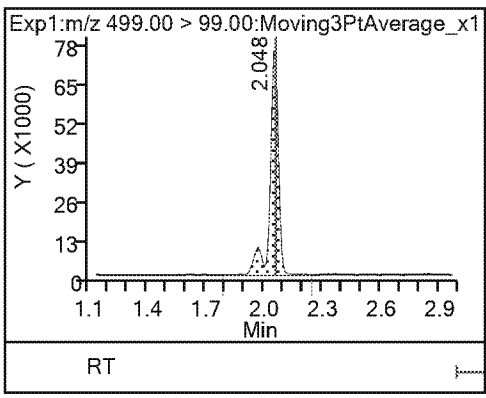
5 Perfluorooctanoic acid



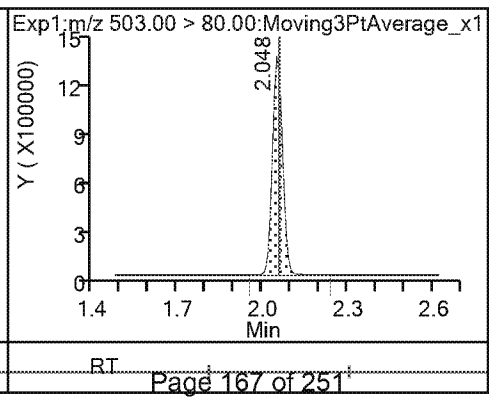
8 Perfluorooctane sulfonic acid (M)



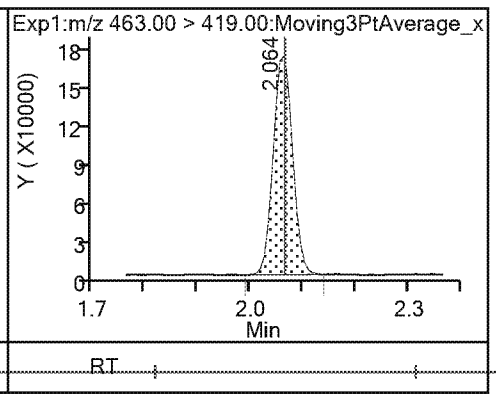
8 Perfluorooctane sulfonic acid



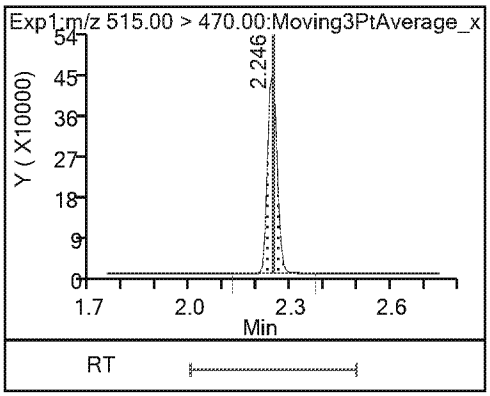
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
54
45
36
27
18
9
0
2.246
1.7
2.0
2.3
2.6
Min
RT

TestAmerica Sacramento

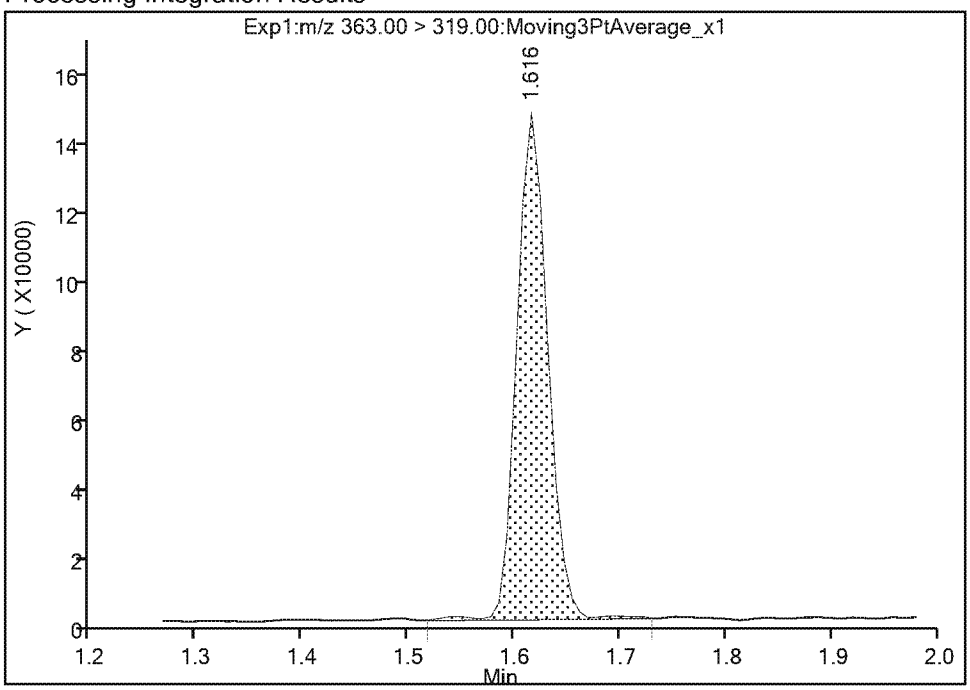
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_010.d				
Injection Date:	21-Jul-2018 12:54:25	Instrument ID:	A8_N		
Lims ID:	CCVL				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	2	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

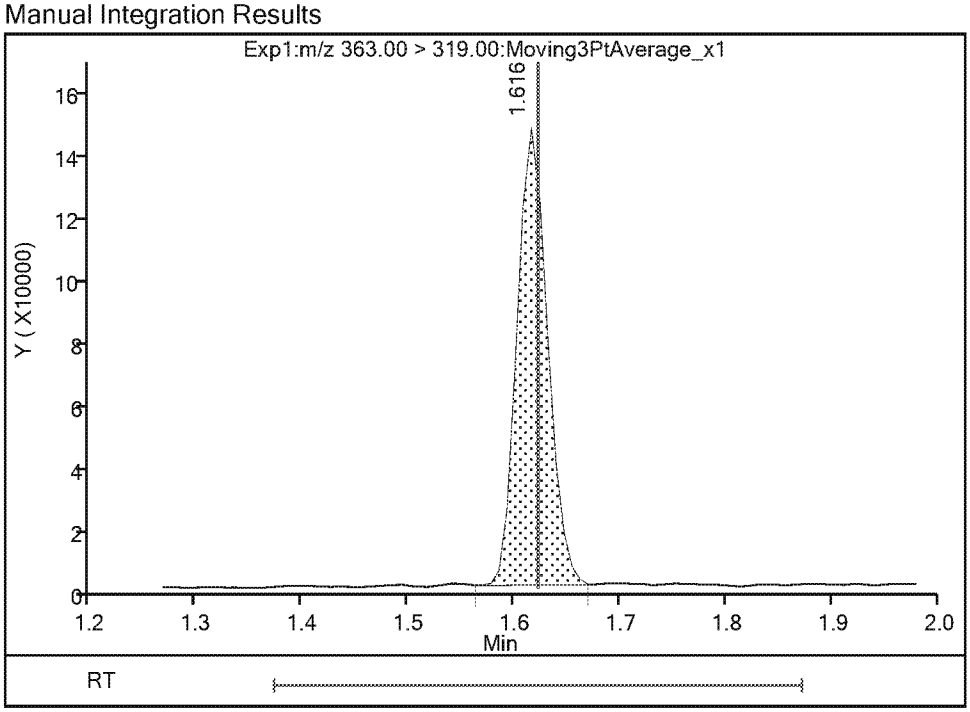
Processing Integration Results

RT: 1.62
Area: 281841
Amount: 2.188989
Amount Units: ng/ml



Manual Integration Results

RT: 1.62
Area: 276355
Amount: 2.146381
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 21-Jul-2018 13:03:24
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento

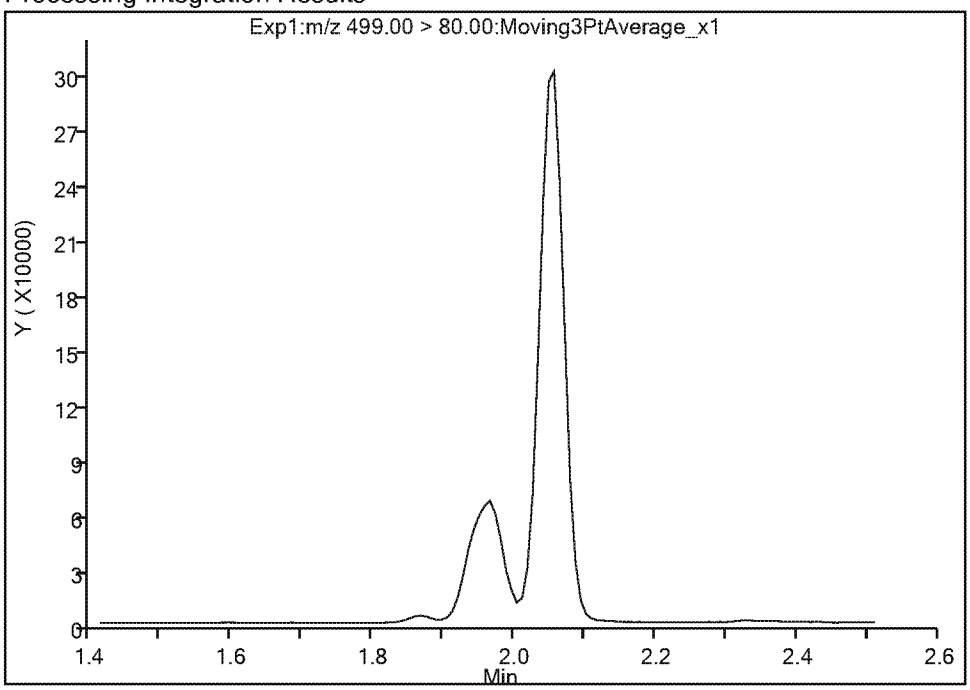
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_010.d				
Injection Date:	21-Jul-2018 12:54:25	Instrument ID:	A8_N		
Lims ID:	CCVL				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	2	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

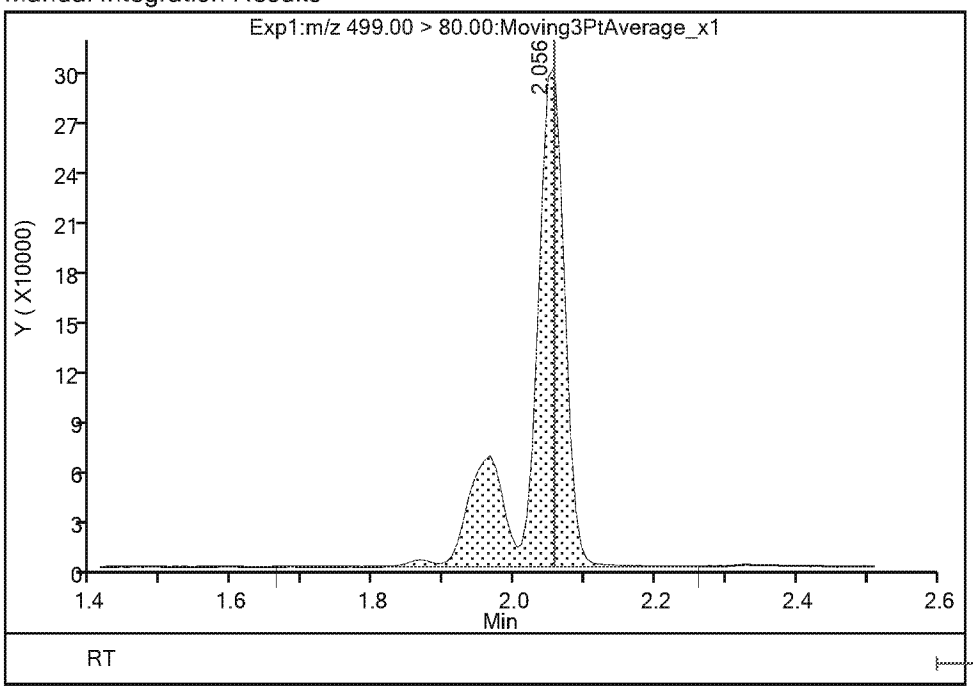
Not Detected
Expected RT: 2.06

Processing Integration Results



Manual Integration Results

RT: 2.06
Area: 956527
Amount: 8.588237
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 21-Jul-2018 13:03:07
Audit Action: Assigned Compound ID Audit Reason: Peak assignment corrected

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Lab Sample ID: ICV 320-235370/13 Calibration Date: 07/21/2018 13:03

Instrument ID: A8_N Calib Start Date: 07/21/2018 12:21

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/21/2018 12:45

Lab File ID: 2018.07.21_537CURVE_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid	Ave	1.177	1.013		86.2	100	-13.9	30.0
Perfluoroheptanoic acid	Ave	1.055	0.9445		8.96	10.0	-10.4	30.0
Perfluorohexanesulfonic acid	Ave	1.710	1.586		18.7	20.2	-7.3	30.0
Perfluorooctanoic acid	Ave	1.078	0.8738		16.3	20.2	-18.9	30.0
Perfluorooctane sulfonic acid	Ave	1.065	0.9567		18.1	20.2	-10.2	30.0
Perfluorononanoic acid	Ave	0.7921	0.7091		18.1	20.2	-10.5	30.0
13C2 PFHxA	Ave	1.076	1.028		9.55	10.0	-4.5	30.0
13C2 PFDA	Ave	0.6956	0.6576		9.45	10.0	-5.5	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_012.d
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 21-Jul-2018 13:03:44 ALS Bottle#: 7 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 21-Jul-2018 14:50:46 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK022

First Level Reviewer: Ex. 4 CBI Date: 21-Jul-2018 14:24:02

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.358	1.357	0.001	1.000	10122872	86.2		7855	
298.90 > 99.00	1.358	1.357	0.001	1.000	7344722		1.38(0.00-0.00)	7963	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.479	1.478	0.001	1.000	1193225	9.55		12137	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.624	1.621	0.003	1.000	3191227	18.7		3066	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.624	1.622	0.002	1.000	1096487	8.96		123	
* 6 13C2-PFOA									
415.00 > 370.00	1.806	1.804	0.002		1160905	10.0		9542	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.806	1.804	0.002	1.000	2045768	16.3		281	
413.00 > 169.00	1.806	1.804	0.002	1.000	1105368		1.85(0.00-0.00)	2191	
8 Perfluorooctane sulfonic acid									a
499.00 > 80.00	2.056	2.056	0.0	1.000	1926283	18.1		2387	a
499.00 > 99.00	2.056	2.056	0.0	1.000	378894		5.08(0.00-0.00)	684	
* 7 13C4 PFOS									
503.00 > 80.00	2.056	2.056	0.0		2863082	28.7		5307	
9 Perfluorononanoic acid									
463.00 > 419.00	2.064	2.065	-0.001	1.000	1659943	18.1		373	
$ 10 13C2 PFDA									
515.00 > 470.00	2.246	2.247	-0.001	1.000	763446	9.45		7318	

QC Flag Legend

Review Flags

a - User Assigned ID

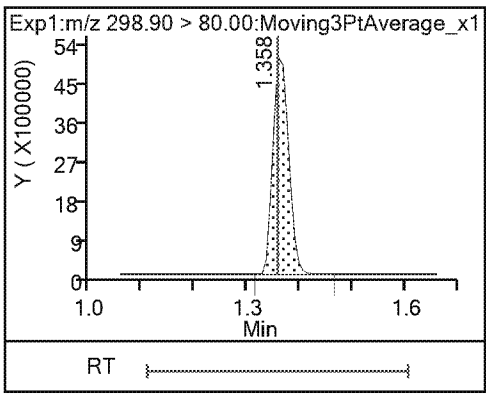
Reagents:

LC537-ICV_00032 Amount Added: 1.00 Units: mL

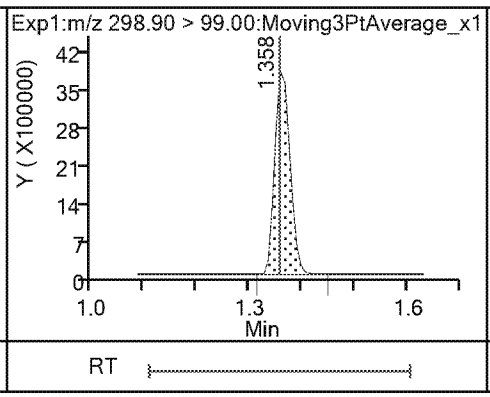
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_012.d
Injection Date: 21-Jul-2018 13:03:44 Instrument ID: A8_N
Lims ID: ICV
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 7 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

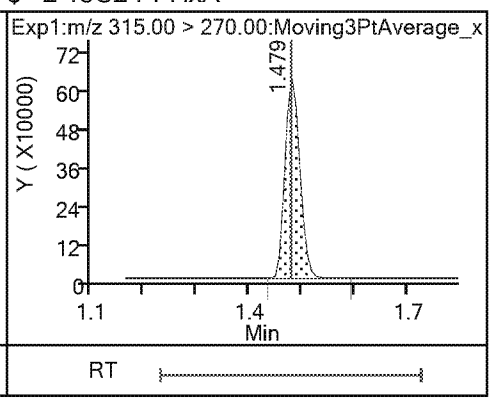
1 Perfluorobutanesulfonic acid



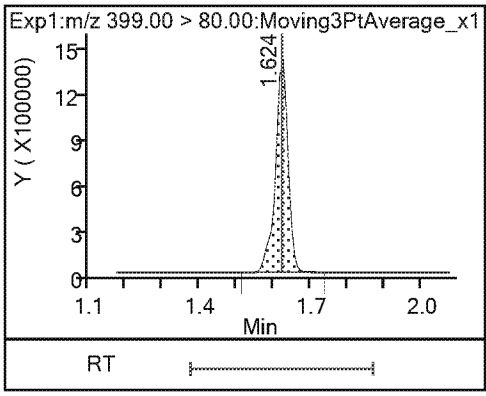
1 Perfluorobutanesulfonic acid



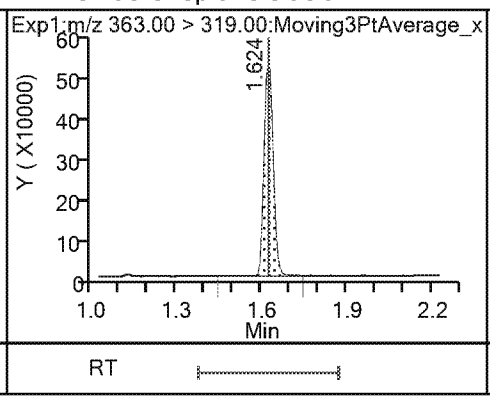
$ 2 13C2 PFHxA



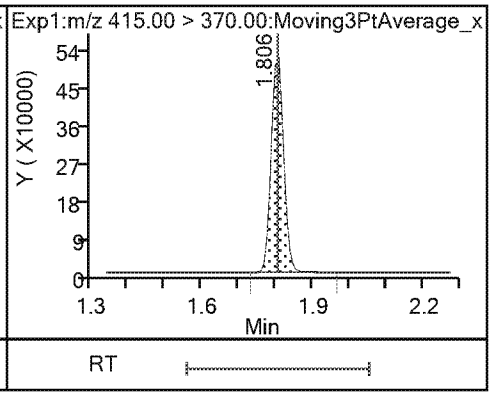
3 Perfluorohexanesulfonic acid



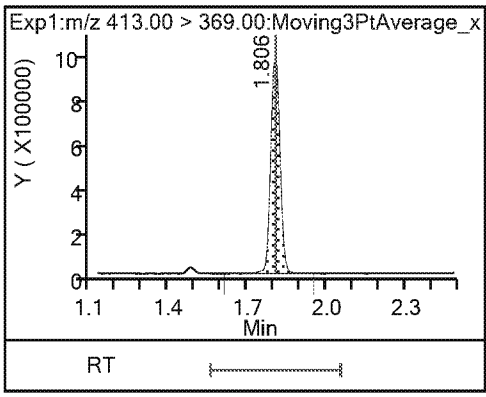
4 Perfluoroheptanoic acid



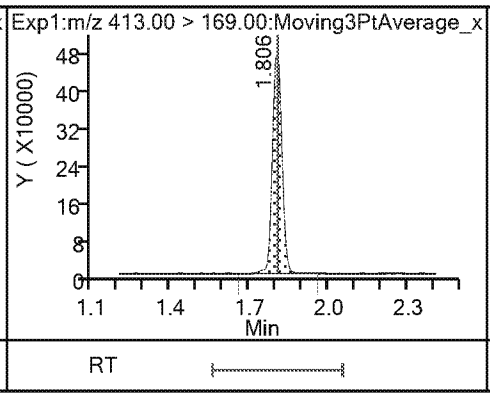
* 6 13C2-PFOA



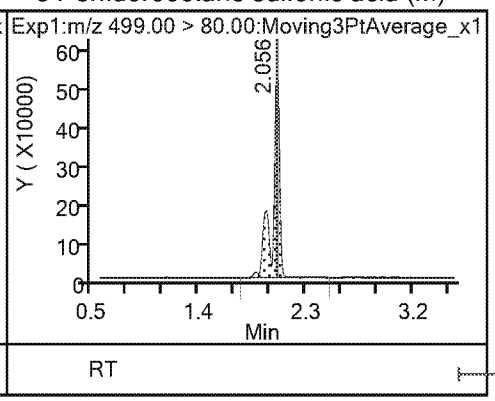
5 Perfluorooctanoic acid



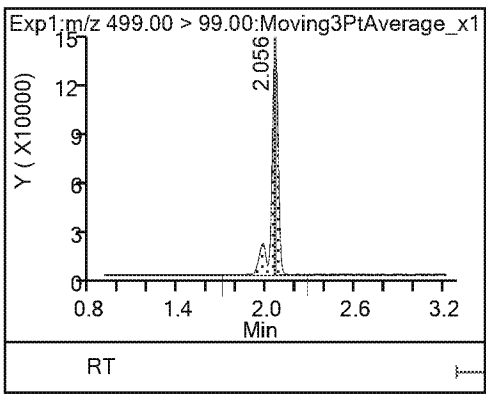
5 Perfluorooctanoic acid



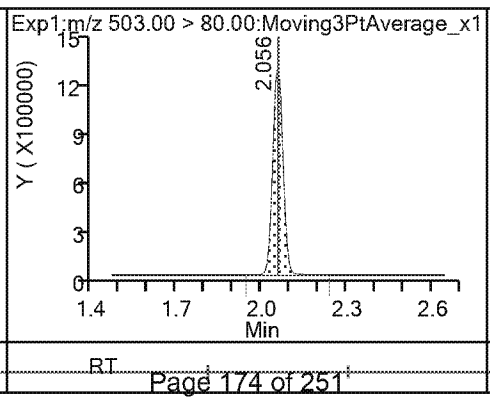
8 Perfluorooctane sulfonic acid (M)



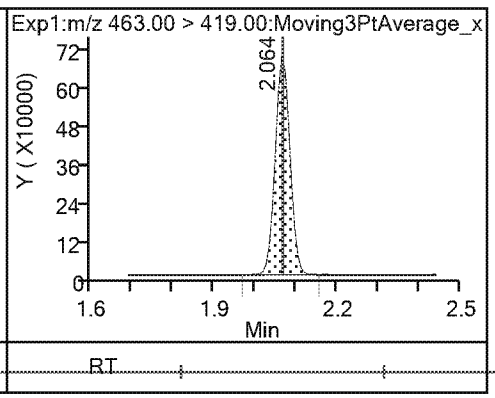
8 Perfluorooctane sulfonic acid



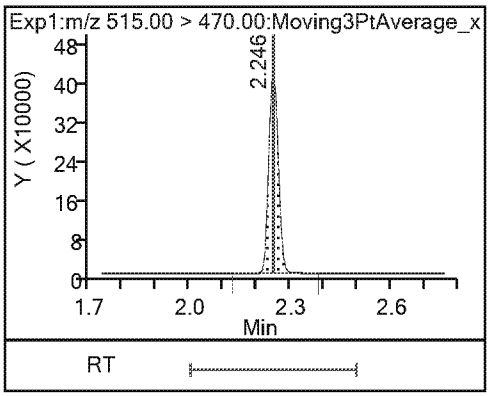
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
48
40
32
24
16
8
0
2.246
1.7
2.0
2.3
2.6
Min
RT

TestAmerica Sacramento

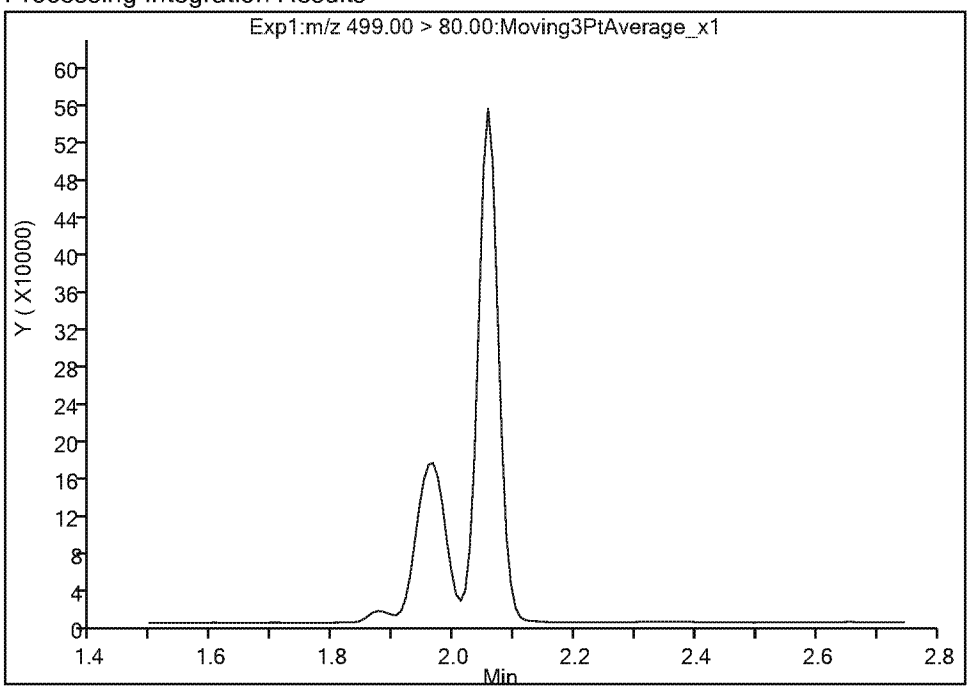
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_012.d				
Injection Date:	21-Jul-2018 13:03:44	Instrument ID:	A8_N		
Lims ID:	ICV				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	7	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

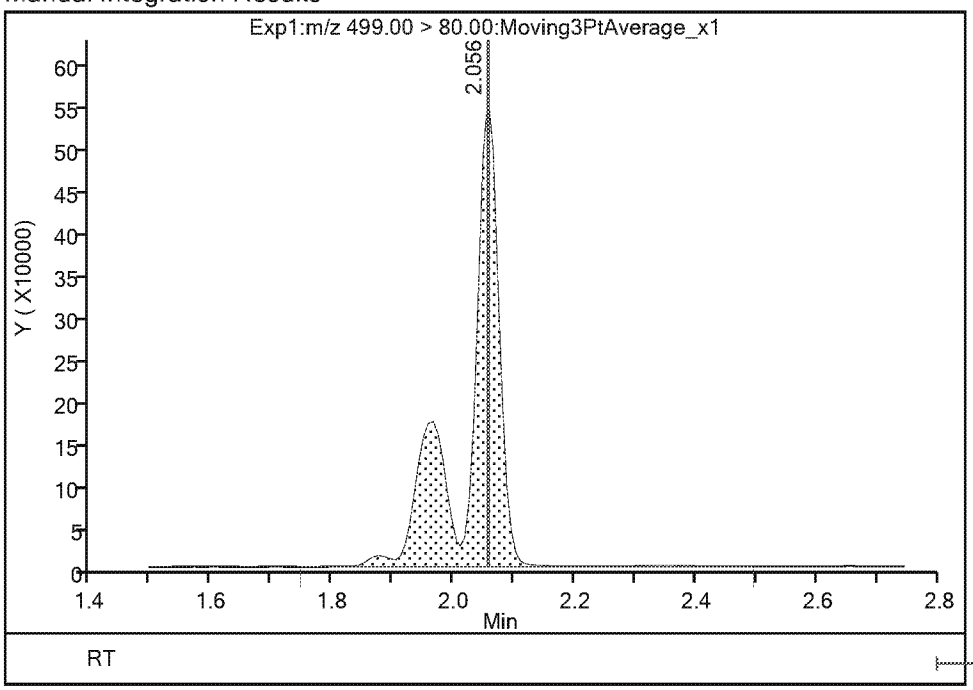
Processing Integration Results

Not Detected
Expected RT: 2.06



Manual Integration Results

RT: 2.06
Area: 1926283
Amount: 18.114811
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 21-Jul-2018 14:24:00
Audit Action: Assigned Compound ID Audit Reason: Peak assignment corrected

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Lab Sample ID: CCVL 320-235585/2 Calibration Date: 07/23/2018 12:06

Instrument ID: A8_N Calib Start Date: 07/21/2018 12:21

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/21/2018 12:45

Lab File ID: 2018.07.23_537A_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid	Ave	1.177	1.297		22.1	20.0	10.2	50.0
Perfluoroheptanoic acid	Ave	1.055	1.049		2.15	2.16	-0.6	50.0
Perfluorohexanesulfonic acid	Ave	1.710	1.654		6.50	6.72	-3.3	50.0
Perfluorooctanoic acid	Ave	1.078	1.042		4.25	4.40	-3.4	50.0
Perfluorooctane sulfonic acid	Ave	1.065	1.017		8.39	8.79	-4.5	50.0
Perfluorononanoic acid	Ave	0.7921	0.8630		4.79	4.40	9.0	50.0
13C2 PFHxA	Ave	1.076	1.026		9.53	10.0	-4.7	30.0
13C2 PFDA	Ave	0.6956	0.7018		10.1	10.0	0.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61475.b\2018.07.23_537A_004.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 23-Jul-2018 12:06:36 ALS Bottle#: 2 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L2
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub9

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61475.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 23-Jul-2018 12:54:45 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK012

First Level Reviewer: Ex. 4 CBI Date: 23-Jul-2018 12:38:53

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.358	1.357	0.001	1.000	2675849	22.1		631	
298.90 > 99.00	1.358	1.357	0.001	1.000	1763077		1.52(0.00-0.00)	656	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.472	1.477	-0.005	1.000	1205122	9.53		14573	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.608	1.620	-0.012	1.000	1146218	6.50		840	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.608	1.621	-0.013	1.000	266048	2.15		31.1	
* 6 13C2-PFOA									
415.00 > 370.00	1.783	1.803	-0.020		1174486	10.0		12009	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.783	1.803	-0.020	1.000	538265	4.25		94.8	
413.00 > 169.00	1.783	1.803	-0.020	1.000	289745		1.86(0.00-0.00)	796	
8 Perfluorooctane sulfonic acid									a
499.00 > 80.00	2.026	2.056	-0.030	1.000	921554	8.39		668	a
499.00 > 99.00	2.026	2.056	-0.030	1.000	203719		4.52(0.00-0.00)	320	
* 7 13C4 PFOS									
503.00 > 80.00	2.026	2.056	-0.030		2956897	28.7		5273	
9 Perfluorononanoic acid									
463.00 > 419.00	2.033	2.065	-0.032	1.000	445999	4.79		54.9	
$ 10 13C2 PFDA									
515.00 > 470.00	2.231	2.247	-0.016	1.000	824224	10.1		10425	

QC Flag Legend

Review Flags

a - User Assigned ID

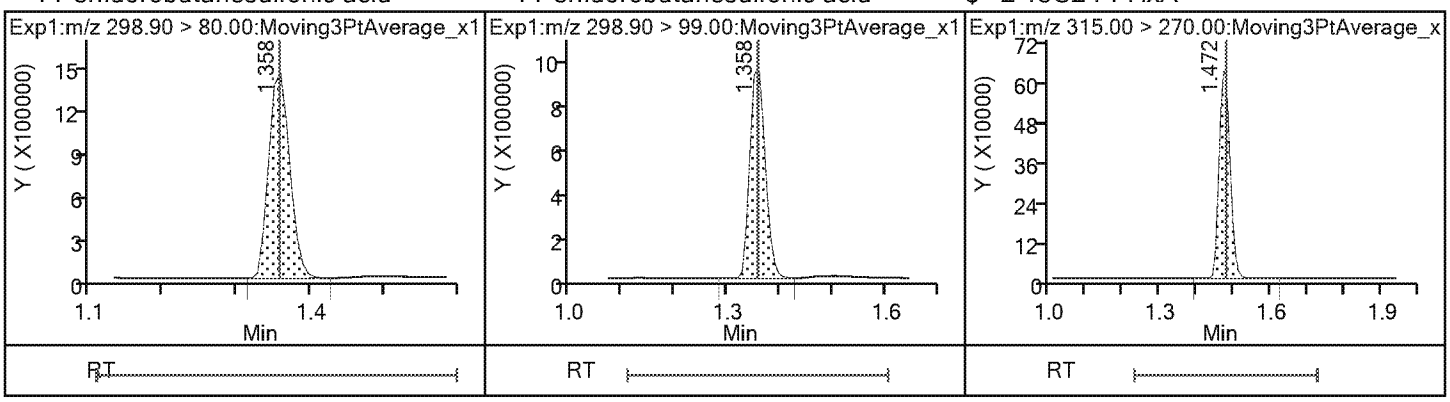
Reagents:

LC537-L2_00022 Amount Added: 1.00 Units: mL

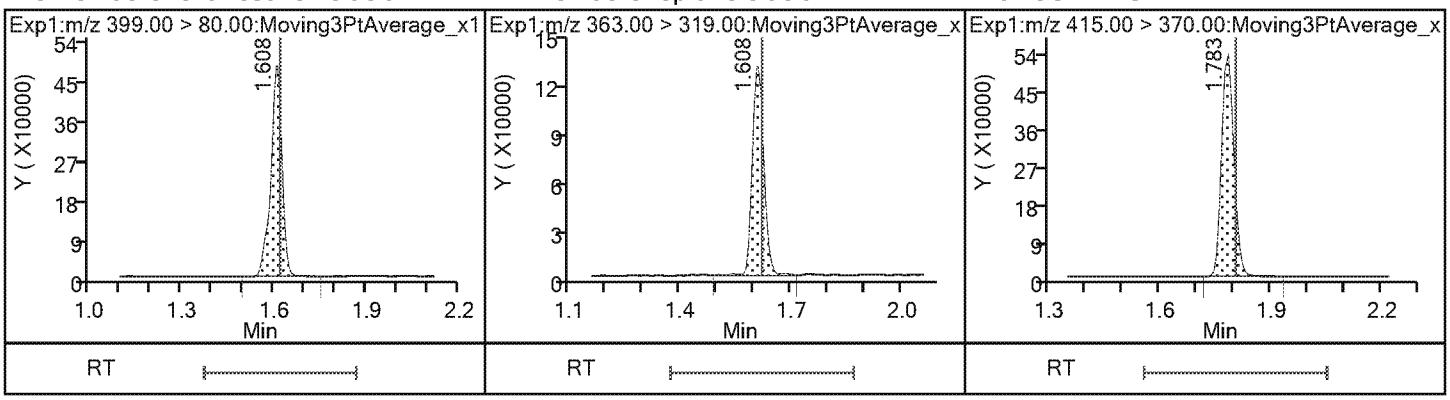
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180723-61475.b\2018.07.23_537A_004.d
Injection Date: 23-Jul-2018 12:06:36 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

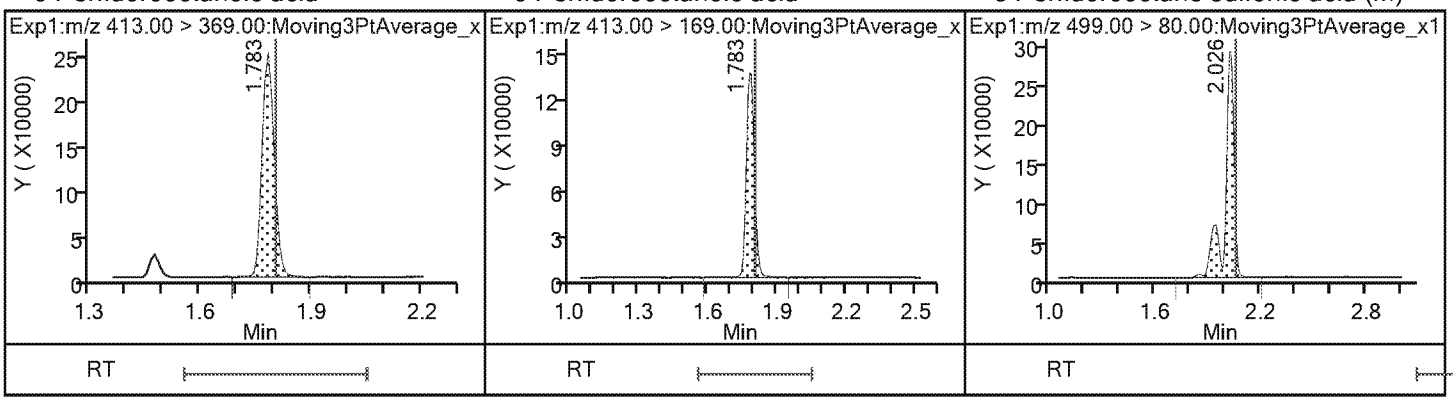
1 Perfluorobutanesulfonic acid | 1 Perfluorobutanesulfonic acid | $ 2 13C2 PFHxA



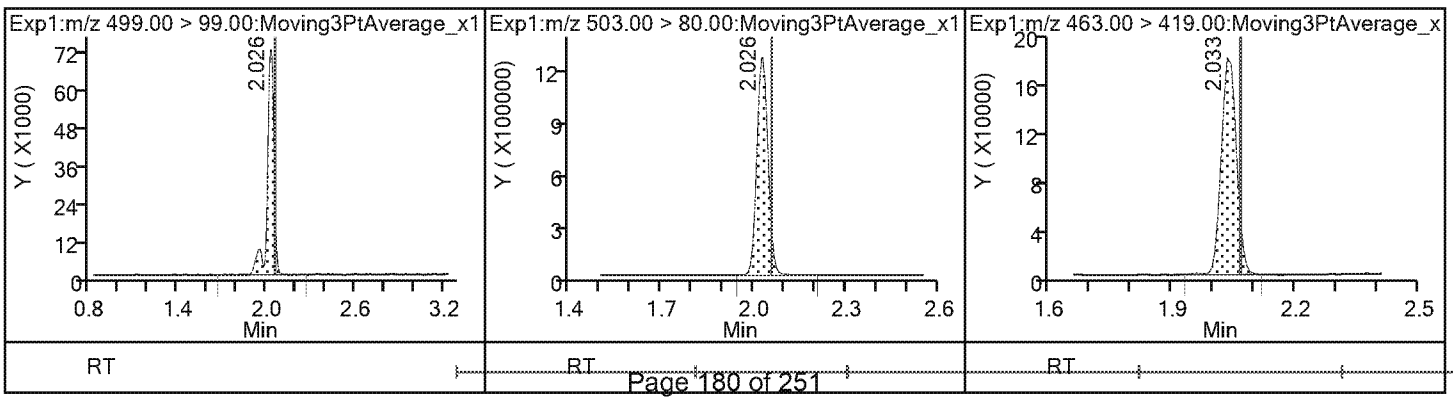
3 Perfluorohexanesulfonic acid | 4 Perfluoroheptanoic acid | * 6 13C2-PFOA



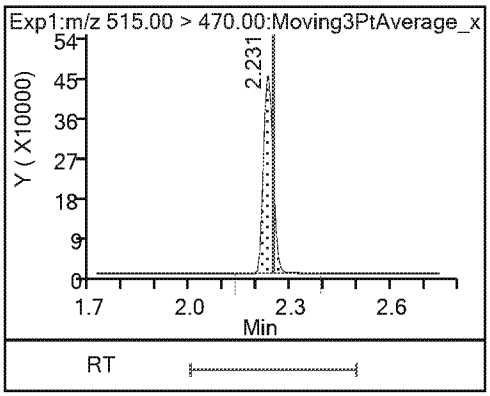
5 Perfluorooctanoic acid | 5 Perfluorooctanoic acid | 8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid | * 7 13C4 PFOS | 9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
54
45
36
27
18
9
0
2.231
1.7
2.0
2.3
2.6
Min
RT

TestAmerica Sacramento

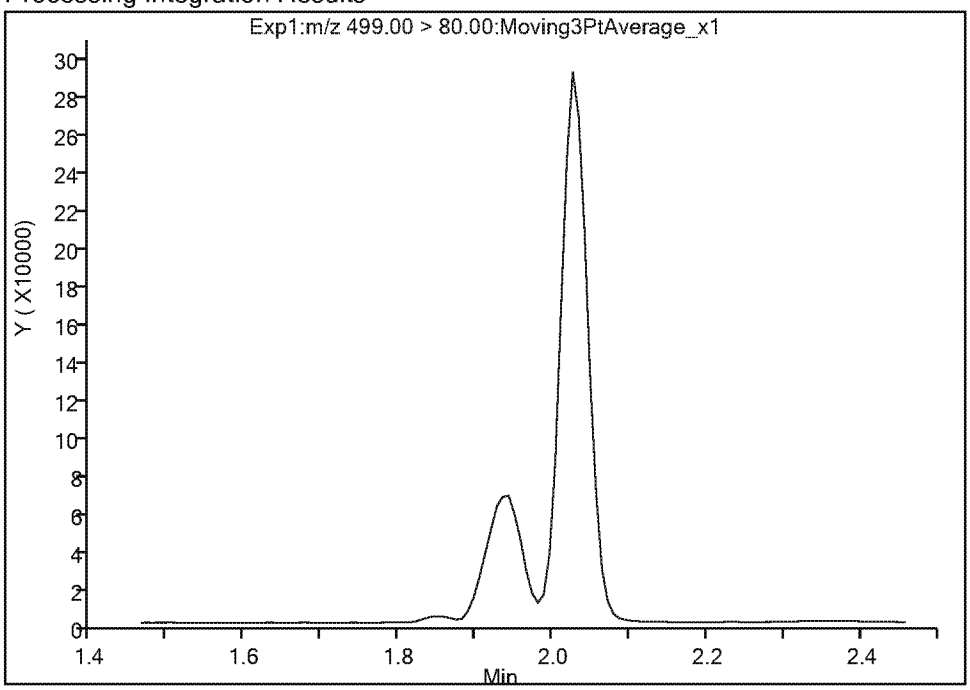
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180723-61475.b\2018.07.23_537A_004.d				
Injection Date:	23-Jul-2018 12:06:36	Instrument ID:	A8_N		
Lims ID:	CCVL				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	2	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

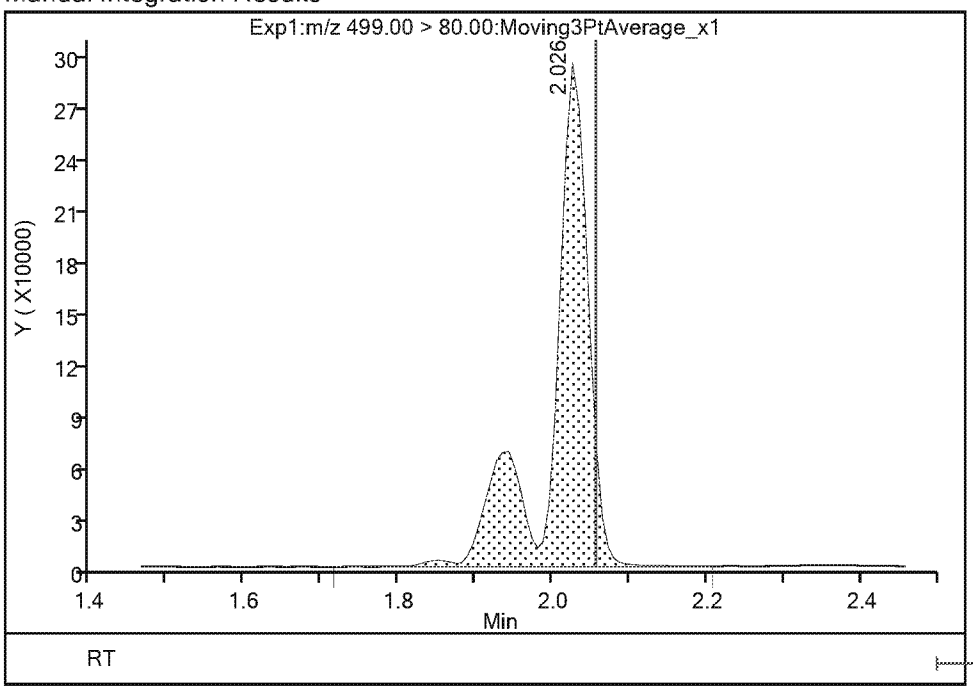
Processing Integration Results

Not Detected
Expected RT: 2.06



Manual Integration Results

RT: 2.03
Area: 921554
Amount: 8.391355
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 23-Jul-2018 12:38:33
Audit Action: Assigned Compound ID Audit Reason: Peak assignment corrected

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Lab Sample ID: CCV 320-235786/21 Calibration Date: 07/24/2018 04:43

Instrument ID: A8_N Calib Start Date: 07/21/2018 12:21

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/21/2018 12:45

Lab File ID: 2018.07.23_537B_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid	Ave	1.177	1.107		127	135	-5.9	30.0
Perfluoroheptanoic acid	Ave	1.055	1.069		14.8	14.6	1.3	30.0
Perfluorohexanesulfonic acid	Ave	1.710	1.764		46.8	45.4	3.2	30.0
Perfluorooctanoic acid	Ave	1.078	1.105		30.4	29.7	2.5	30.0
Perfluorooctane sulfonic acid	Ave	1.065	1.109		61.7	59.3	4.1	30.0
Perfluorononanoic acid	Ave	0.7921	0.8013		30.0	29.7	1.2	30.0
13C2 PFHxA	Ave	1.076	1.071		9.96	10.0	-0.4	30.0
13C2 PFDA	Ave	0.6956	0.7206		10.4	10.0	3.6	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_023.d
Lims ID: CCV L5
Client ID:
Sample Type: CCVIS
Inject. Date: 24-Jul-2018 04:43:37 ALS Bottle#: 5 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub9

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 24-Jul-2018 10:51:18 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: Ex. 4 CBI Date: 24-Jul-2018 10:18:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.343	1.343	0.0	1.000	14859123	127.1		2950	
298.90 > 99.00	1.343	1.343	0.0	1.000	10772739		1.38(0.00-0.00)	3529	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1280194	9.96		14513	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.601	0.0	1.000	7954178	46.8		3976	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.601	0.0	1.000	1861778	14.8		177	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.768	0.0		1194857	10.0		10365	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	3921208	30.4		504	
413.00 > 169.00	1.768	1.768	0.0	1.000	2015316		1.95(0.00-0.00)	5924	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.011	0.0		2850060	28.7		4865	
9 Perfluorononanoic acid									
463.00 > 419.00	2.018	2.018	0.0	1.000	2843656	30.0		182	
8 Perfluorooctane sulfonic acid									a
499.00 > 80.00	2.011	2.056	-0.045	1.000	6534220	61.7		4909	a
499.00 > 99.00	2.011	2.056	-0.045	1.000	1418044		4.61(0.00-0.00)	2132	
$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.215	0.0	1.000	860980	10.4		7429	

QC Flag Legend

Review Flags

a - User Assigned ID

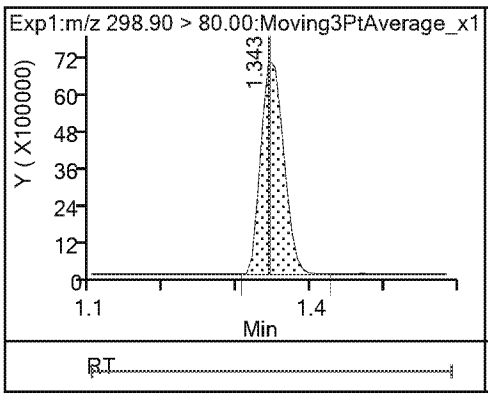
Reagents:

LC537-L5_00026 Amount Added: 1.00 Units: mL

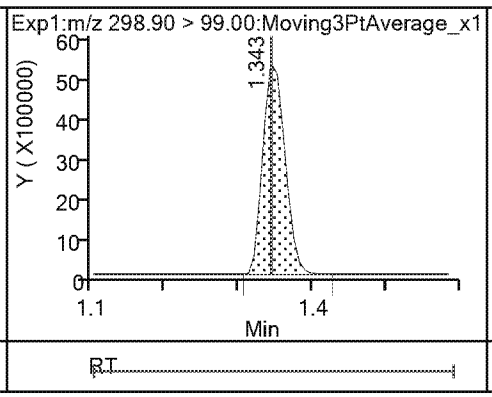
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_023.d
Injection Date: 24-Jul-2018 04:43:37 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

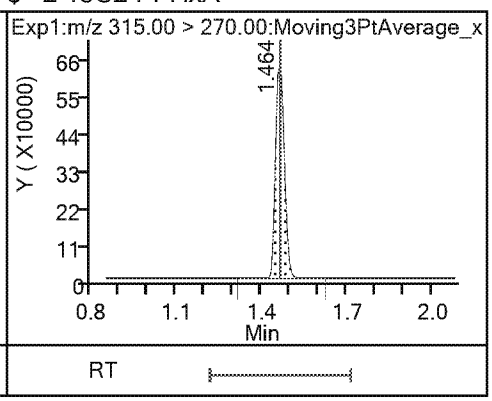
1 Perfluorobutanesulfonic acid



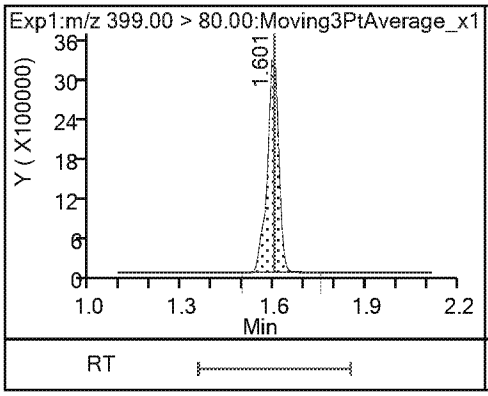
1 Perfluorobutanesulfonic acid



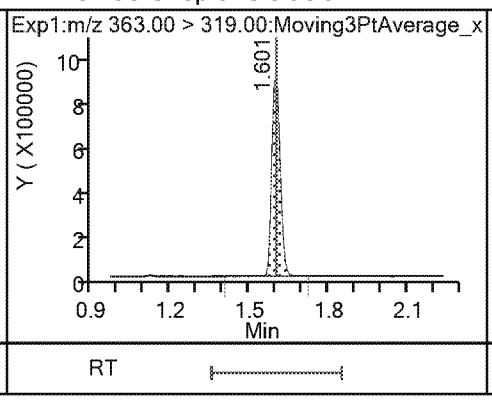
$ 2 13C2 PFHxA



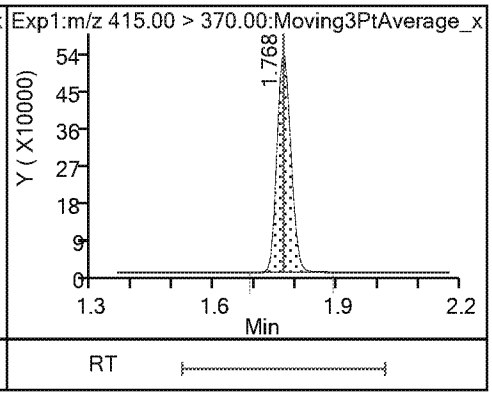
3 Perfluorohexanesulfonic acid



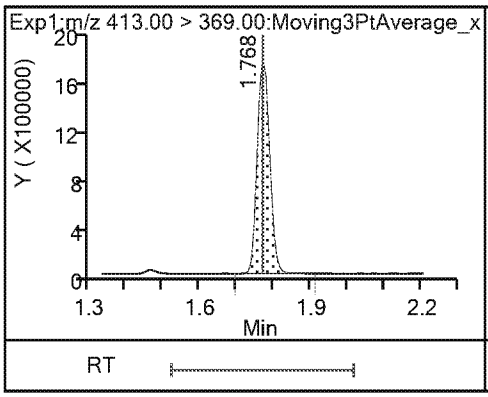
4 Perfluoroheptanoic acid



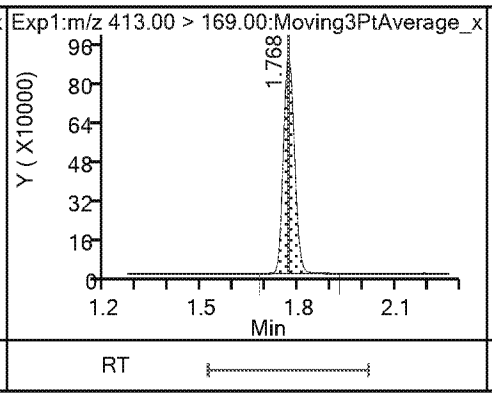
* 6 13C2-PFOA



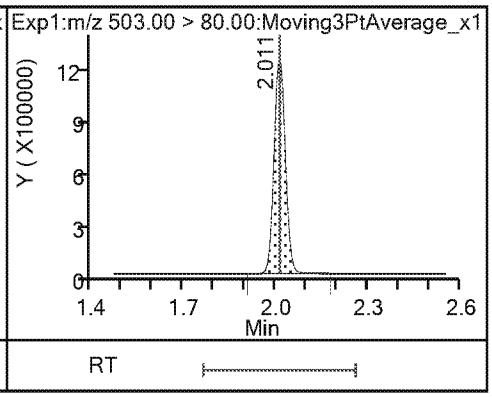
5 Perfluorooctanoic acid



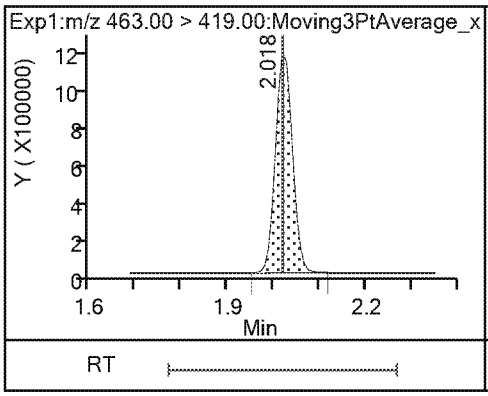
5 Perfluorooctanoic acid



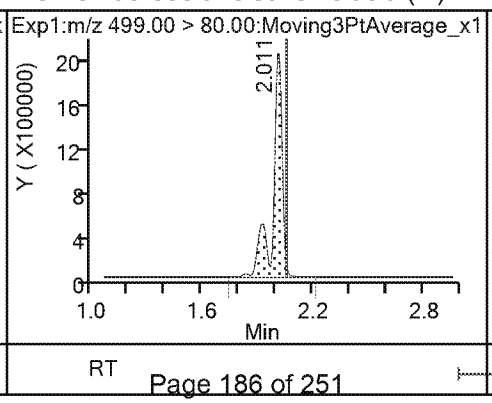
* 7 13C4 PFOS



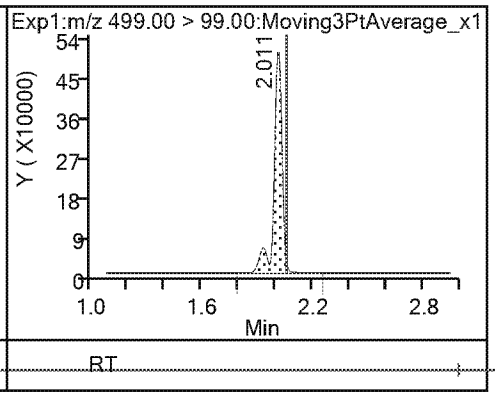
9 Perfluorononanoic acid



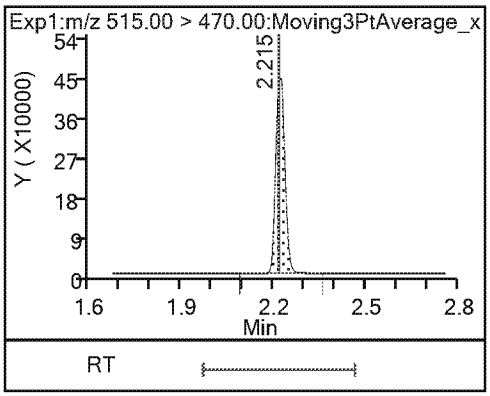
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
54
45
36
27
18
9
0
2.215
1.6
1.9
2.2
2.5
2.8
Min
RT

TestAmerica Sacramento

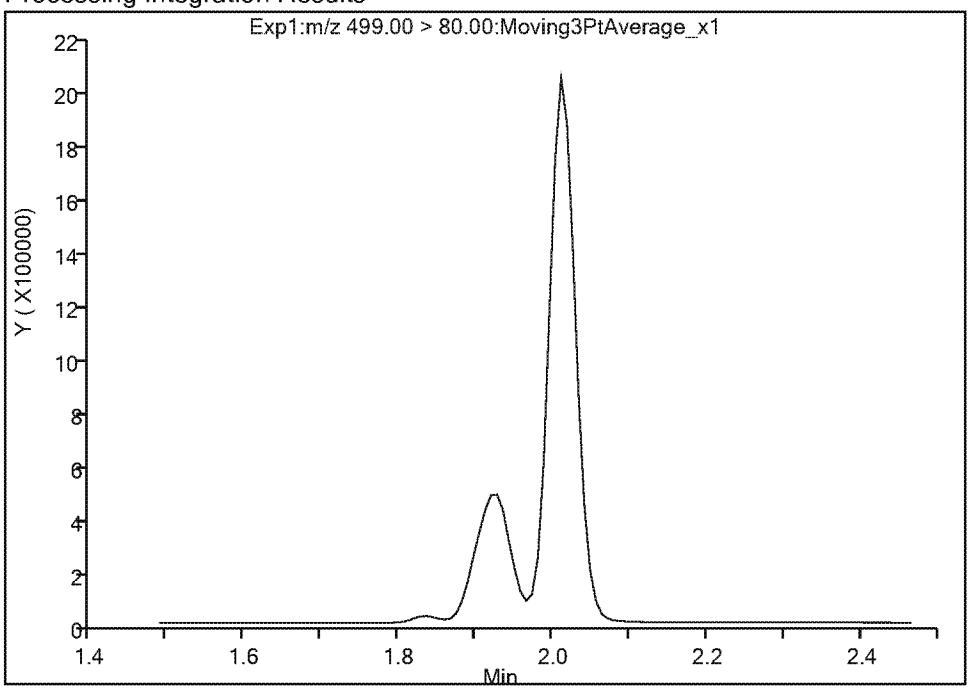
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_023.d				
Injection Date:	24-Jul-2018 04:43:37	Instrument ID:	A8_N		
Lims ID:	CCV L5				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	5	Worklist Smp#:	21
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

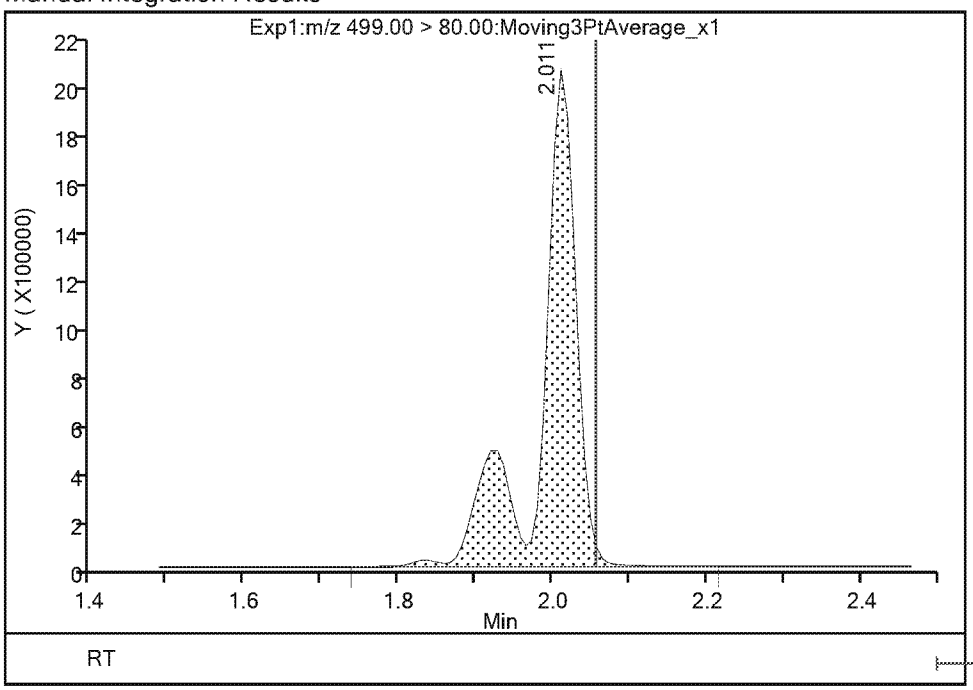
Processing Integration Results

Not Detected
Expected RT: 2.06



Manual Integration Results

RT: 2.01
Area: 6534220
Amount: 61.728716
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 24-Jul-2018 10:18:49
Audit Action: Assigned Compound ID Audit Reason: Peak assignment corrected

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Lab Sample ID: CCV 320-235786/33 Calibration Date: 07/24/2018 05:39

Instrument ID: A8_N Calib Start Date: 07/21/2018 12:21

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/21/2018 12:45

Lab File ID: 2018.07.23_537B_035.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid	Ave	1.177	1.285		49.2	45.0	9.2	30.0
Perfluoroheptanoic acid	Ave	1.055	1.031		4.75	4.86	-2.2	30.0
Perfluorohexanesulfonic acid	Ave	1.710	1.749		15.5	15.1	2.3	30.0
Perfluorooctanoic acid	Ave	1.078	1.046		9.61	9.90	-3.0	30.0
Perfluorooctane sulfonic acid	Ave	1.065	1.068		19.8	19.8	0.2	30.0
Perfluorononanoic acid	Ave	0.7921	0.7827		9.78	9.90	-1.2	30.0
13C2 PFHxA	Ave	1.076	1.012		9.41	10.0	-5.9	30.0
13C2 PFDA	Ave	0.6956	0.6729		9.67	10.0	-3.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Lab Sample ID: CCV 320-235788/33 Calibration Date: 07/24/2018 05:39

Instrument ID: A8_N Calib Start Date: 07/21/2018 12:21

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/21/2018 12:45

Lab File ID: 2018.07.23_537B_035.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid	Ave	1.177	1.285		49.2	45.0	9.2	30.0
Perfluoroheptanoic acid	Ave	1.055	1.031		4.75	4.86	-2.2	30.0
Perfluorohexanesulfonic acid	Ave	1.710	1.749		15.5	15.1	2.3	30.0
Perfluorooctanoic acid	Ave	1.078	1.046		9.61	9.90	-3.0	30.0
Perfluorooctane sulfonic acid	Ave	1.065	1.068		19.8	19.8	0.2	30.0
Perfluorononanoic acid	Ave	0.7921	0.7827		9.78	9.90	-1.2	30.0
13C2 PFHxA	Ave	1.076	1.012		9.41	10.0	-5.9	30.0
13C2 PFDA	Ave	0.6956	0.6729		9.67	10.0	-3.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_035.d
Lims ID: CCV L3
Client ID:
Sample Type: CCVIS
Inject. Date: 24-Jul-2018 05:39:44 ALS Bottle#: 3 Worklist Smp#: 33
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L3
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub9

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 24-Jul-2018 10:51:27 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: Ex. 4 CBI Date: 24-Jul-2018 10:19:11

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	5790833	49.2		1308	
298.90 > 99.00	1.350	1.350	0.0	1.000	4022152		1.44(0.00-0.00)	1435	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1263053	9.41		16926	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.601	0.0	1.000	2647160	15.5		1591	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.601	0.0	1.000	625368	4.75		58.3	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.768	0.0		1247739	10.0		10501	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	1292314	9.61		166	
413.00 > 169.00	1.768	1.768	0.0	1.000	668165		1.93(0.00-0.00)	2096	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.011	0.0		2869987	28.7		4492	
9 Perfluorononanoic acid									
463.00 > 419.00	2.026	2.026	0.0	1.000	966827	9.78		63.8	
8 Perfluorooctane sulfonic acid									a
499.00 > 80.00	2.018	2.056	-0.038	1.000	2111535	19.8		1697	a
499.00 > 99.00	2.011	2.056	-0.045	0.996	474774		4.45(0.00-0.00)	803	
$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.223	0.0	1.000	839650	9.67		7318	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

LC537-L3_00025 Amount Added: 1.00 Units: mL

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_035.d
Lims ID: CCV L3
Client ID:
Sample Type: CCVIS
Inject. Date: 24-Jul-2018 05:39:44 ALS Bottle#: 3 Worklist Smp#: 33
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L3
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub9

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 24-Jul-2018 10:51:27 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: Ex. 4 CBI Date: 24-Jul-2018 10:19:11

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	5790833	49.2		1308	
298.90 > 99.00	1.350	1.350	0.0	1.000	4022152		1.44(0.00-0.00)	1435	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1263053	9.41		16926	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.601	0.0	1.000	2647160	15.5		1591	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.601	0.0	1.000	625368	4.75		58.3	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.768	0.0		1247739	10.0		10501	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	1292314	9.61		166	
413.00 > 169.00	1.768	1.768	0.0	1.000	668165		1.93(0.00-0.00)	2096	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.011	0.0		2869987	28.7		4492	
9 Perfluorononanoic acid									
463.00 > 419.00	2.026	2.026	0.0	1.000	966827	9.78		63.8	
8 Perfluorooctane sulfonic acid									a
499.00 > 80.00	2.018	2.056	-0.038	1.000	2111535	19.8		1697	a
499.00 > 99.00	2.011	2.056	-0.045	0.996	474774		4.45(0.00-0.00)	803	
$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.223	0.0	1.000	839650	9.67		7318	

QC Flag Legend

Review Flags

a - User Assigned ID

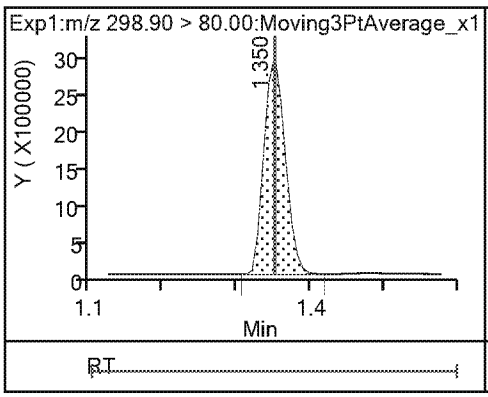
Reagents:

LC537-L3_00025 Amount Added: 1.00 Units: mL

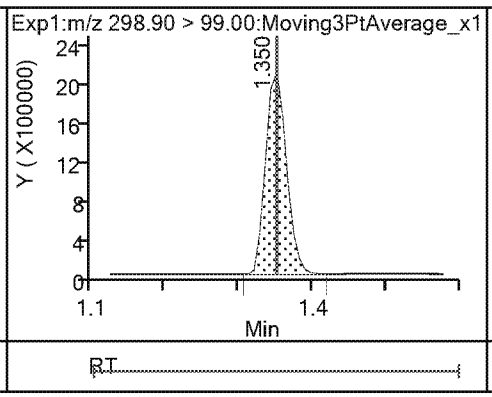
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_035.d
Injection Date: 24-Jul-2018 05:39:44 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 33
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

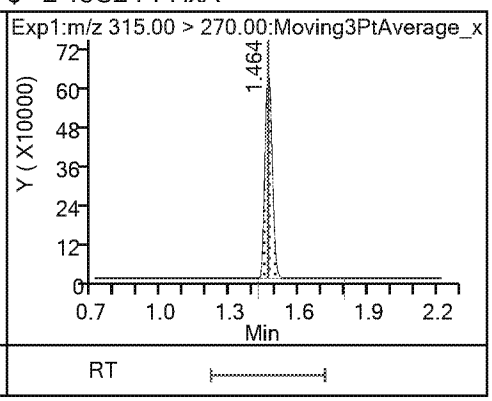
1 Perfluorobutanesulfonic acid



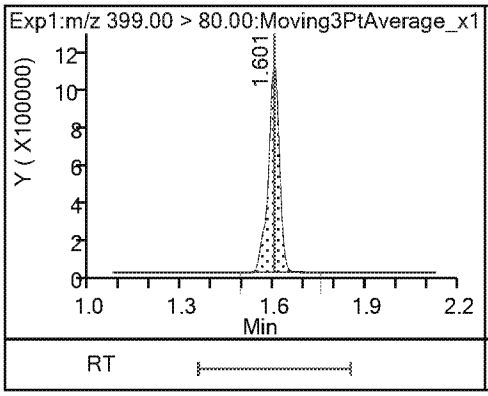
1 Perfluorobutanesulfonic acid



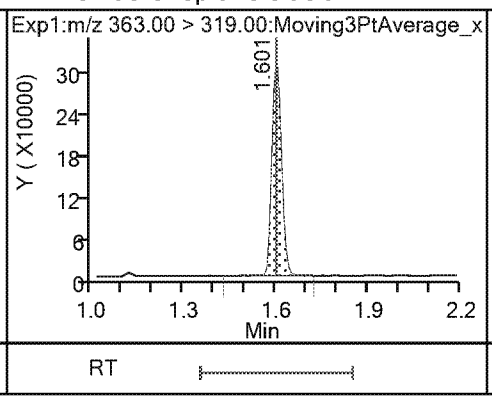
$ 2 13C2 PFHxA



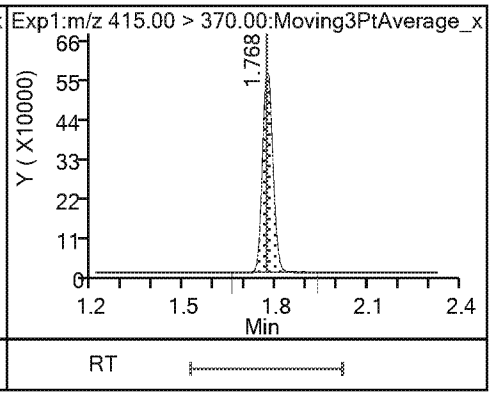
3 Perfluorohexanesulfonic acid



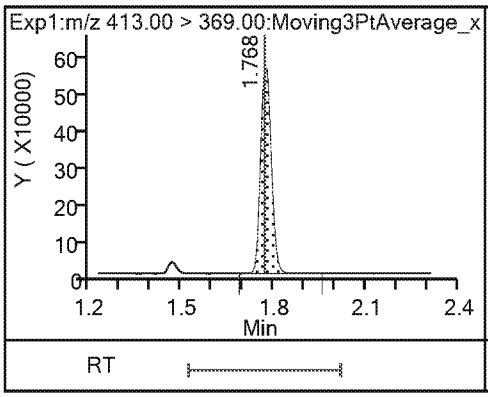
4 Perfluoroheptanoic acid



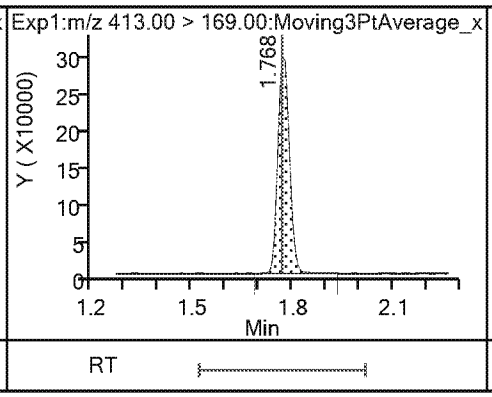
* 6 13C2-PFOA



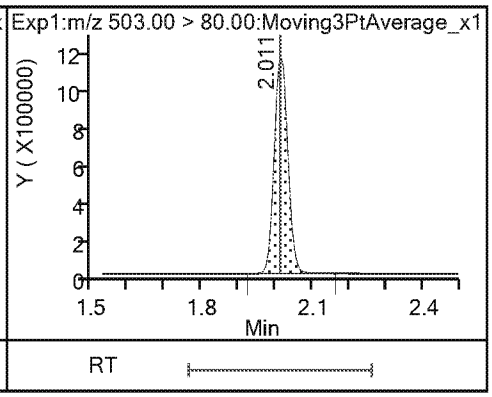
5 Perfluorooctanoic acid



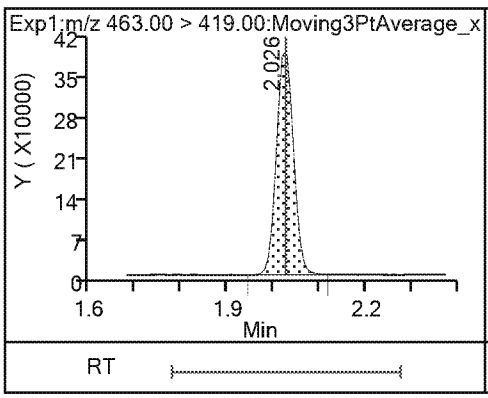
5 Perfluorooctanoic acid



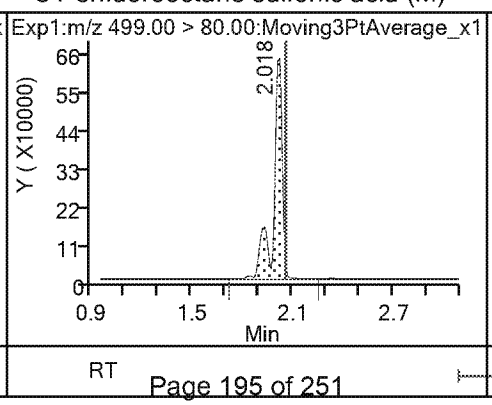
* 7 13C4 PFOS



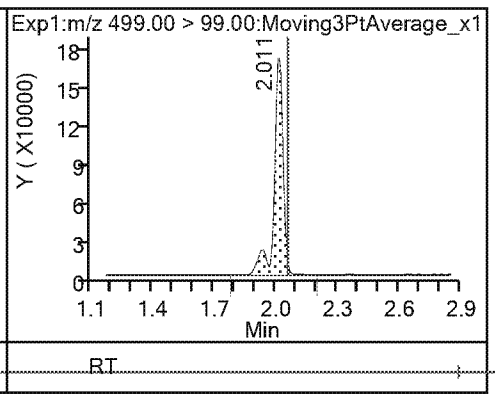
9 Perfluorononanoic acid



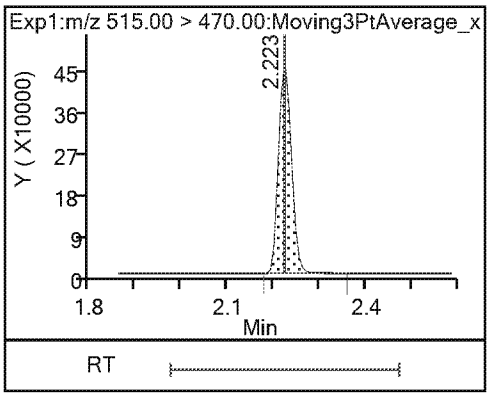
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid



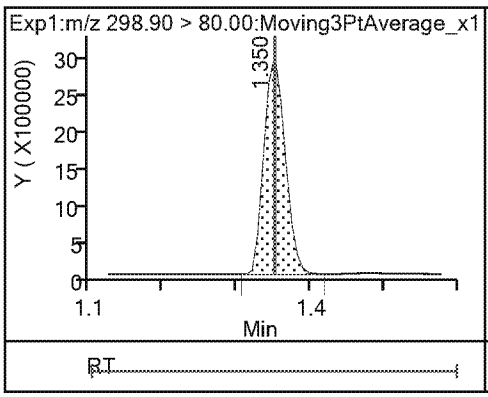
$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.223
Y (X10000)
45
36
27
18
9
0
1.8
2.1
2.4
Min
RT

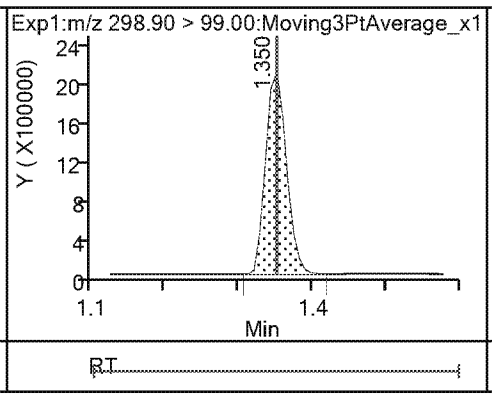
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_035.d
Injection Date: 24-Jul-2018 05:39:44 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 33
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

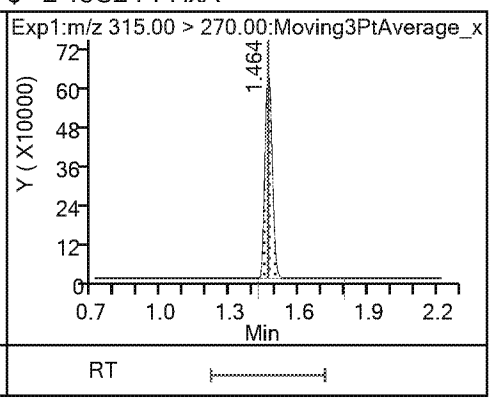
1 Perfluorobutanesulfonic acid



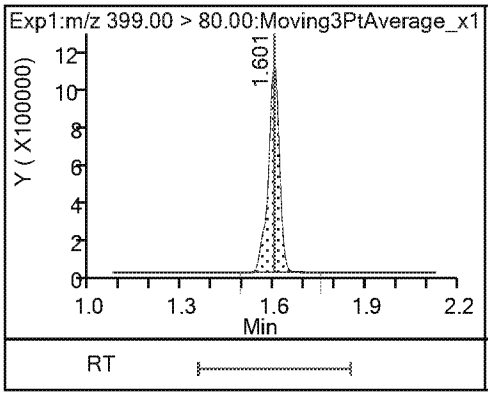
1 Perfluorobutanesulfonic acid



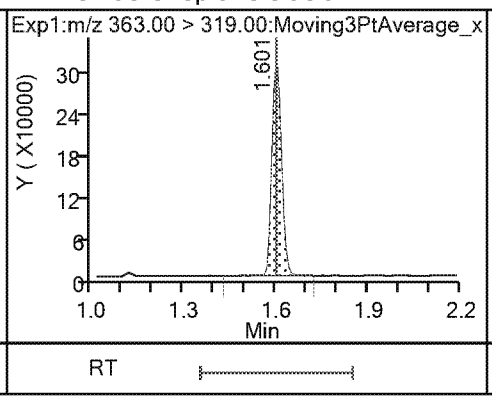
$ 2 13C2 PFHxA



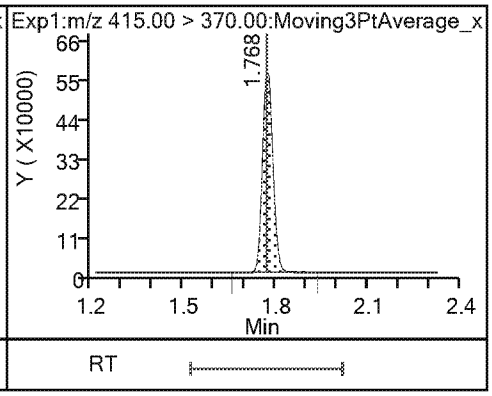
3 Perfluorohexanesulfonic acid



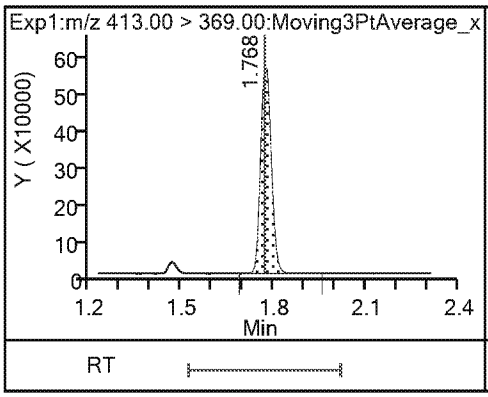
4 Perfluoroheptanoic acid



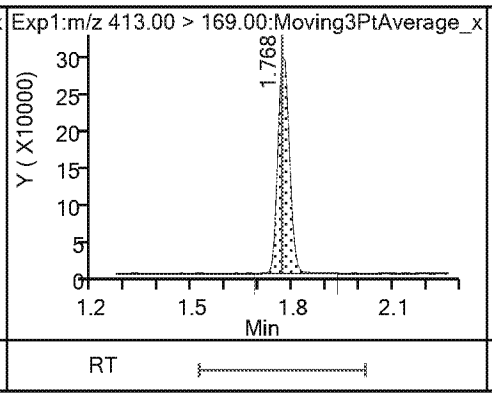
* 6 13C2-PFOA



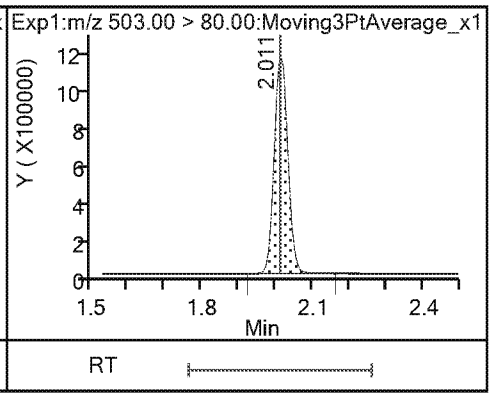
5 Perfluorooctanoic acid



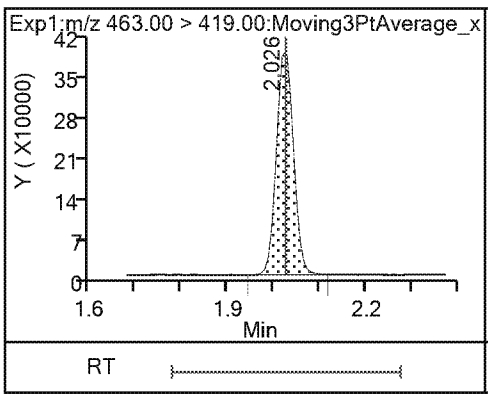
5 Perfluorooctanoic acid



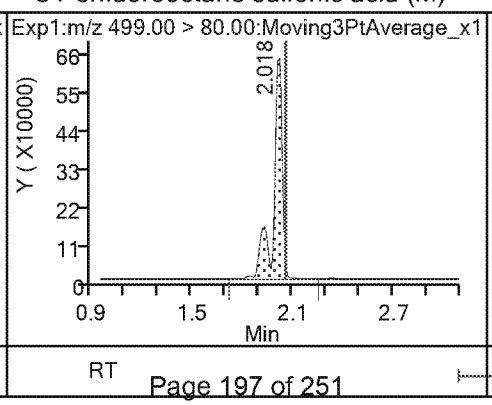
* 7 13C4 PFOS



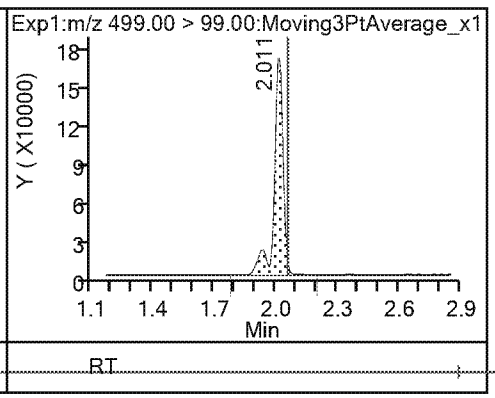
9 Perfluorononanoic acid



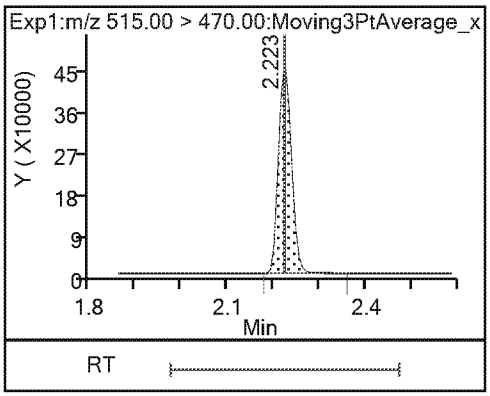
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.223
Y (X10000)
45
36
27
18
9
0
1.8
2.1
2.4
Min
RT

TestAmerica Sacramento

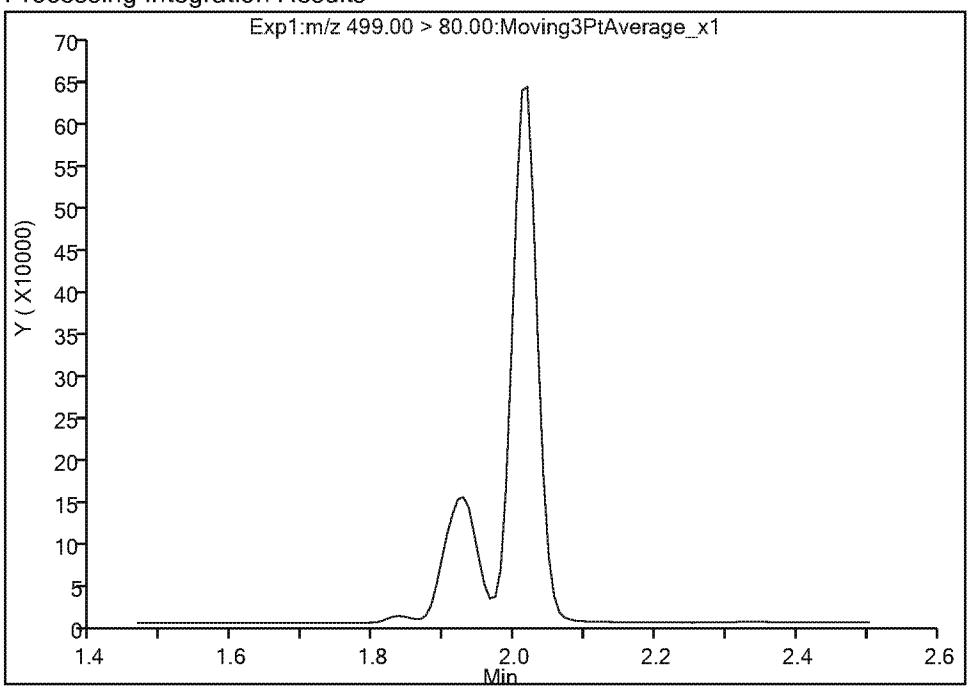
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_035.d				
Injection Date:	24-Jul-2018 05:39:44	Instrument ID:	A8_N		
Lims ID:	CCV L3				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	3	Worklist Smp#:	33
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

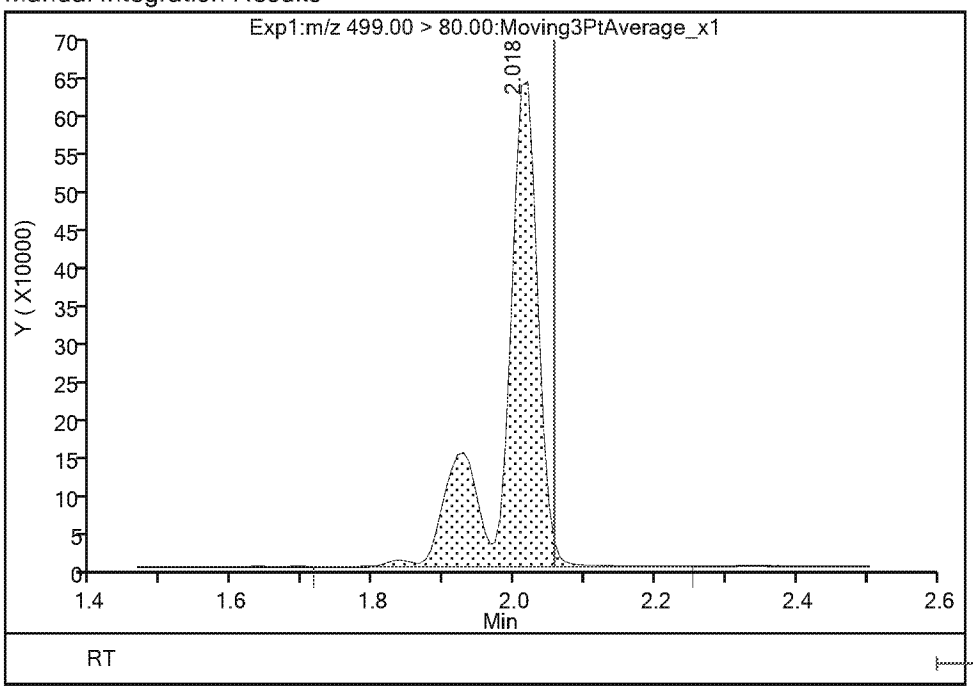
Not Detected
Expected RT: 2.06

Processing Integration Results



Manual Integration Results

RT: 2.02
Area: 2111535
Amount: 19.809151
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 24-Jul-2018 10:19:01
Audit Action: Assigned Compound ID Audit Reason: Peak assignment corrected

TestAmerica Sacramento

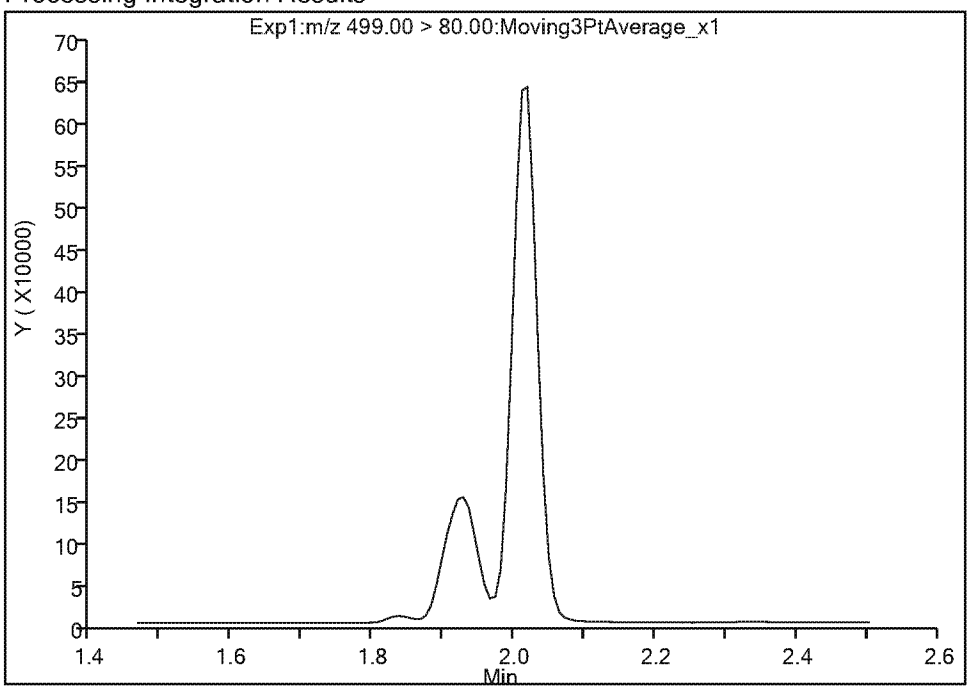
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_035.d				
Injection Date:	24-Jul-2018 05:39:44	Instrument ID:	A8_N		
Lims ID:	CCV L3				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	3	Worklist Smp#:	33
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

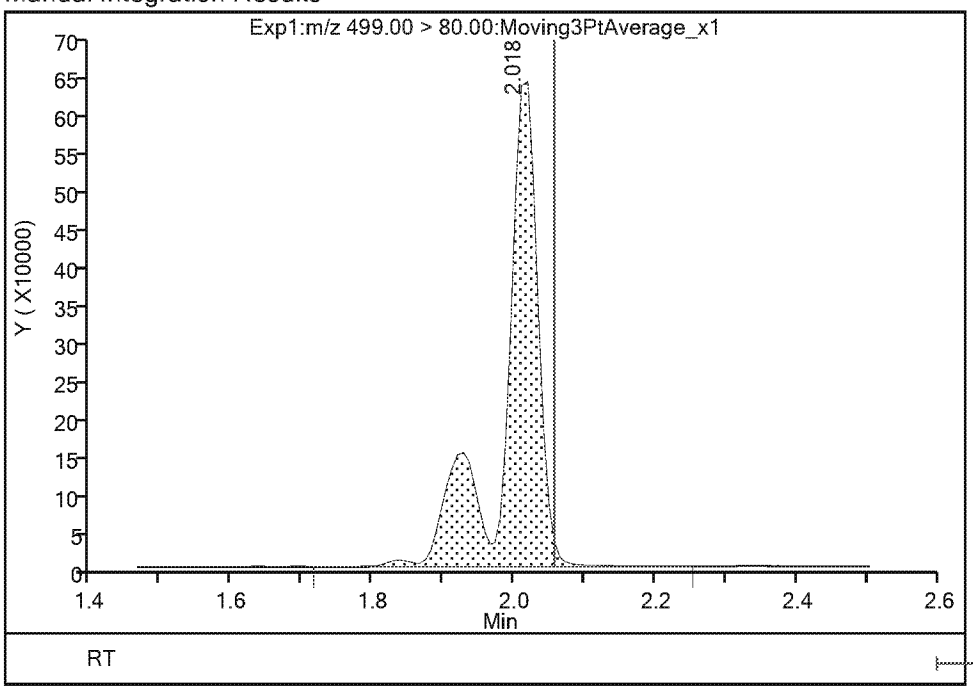
Processing Integration Results

Not Detected
Expected RT: 2.06



Manual Integration Results

RT: 2.02
Area: 2111535
Amount: 19.809151
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 24-Jul-2018 10:19:01
Audit Action: Assigned Compound ID Audit Reason: Peak assignment corrected

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Lab Sample ID: CCV 320-235788/45 Calibration Date: 07/24/2018 06:35

Instrument ID: A8_N Calib Start Date: 07/21/2018 12:21

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/21/2018 12:45

Lab File ID: 2018.07.23_537B_047.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid	Ave	1.177	1.077		124	135	-8.4	30.0
Perfluorohexanesulfonic acid	Ave	1.710	1.719		45.6	45.4	0.5	30.0
Perfluoroheptanoic acid	Ave	1.055	1.051		14.5	14.6	-0.3	30.0
Perfluorooctanoic acid	Ave	1.078	1.082		29.8	29.7	0.4	30.0
Perfluorooctane sulfonic acid	Ave	1.065	1.073		59.7	59.3	0.7	30.0
Perfluorononanoic acid	Ave	0.7921	0.7833		29.4	29.7	-1.1	30.0
13C2 PFHxA	Ave	1.076	1.082		10.1	10.0	0.6	30.0
13C2 PFDA	Ave	0.6956	0.7153		10.3	10.0	2.8	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Lab Sample ID: CCV 320-235790/45 Calibration Date: 07/24/2018 06:35

Instrument ID: A8_N Calib Start Date: 07/21/2018 12:21

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/21/2018 12:45

Lab File ID: 2018.07.23_537B_047.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid	Ave	1.177	1.077		124	135	-8.4	30.0
Perfluorohexanesulfonic acid	Ave	1.710	1.719		45.6	45.4	0.5	30.0
Perfluoroheptanoic acid	Ave	1.055	1.051		14.5	14.6	-0.3	30.0
Perfluorooctanoic acid	Ave	1.078	1.082		29.8	29.7	0.4	30.0
Perfluorooctane sulfonic acid	Ave	1.065	1.073		59.7	59.3	0.7	30.0
Perfluorononanoic acid	Ave	0.7921	0.7833		29.4	29.7	-1.1	30.0
13C2 PFHxA	Ave	1.076	1.082		10.1	10.0	0.6	30.0
13C2 PFDA	Ave	0.6956	0.7153		10.3	10.0	2.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_047.d
Lims ID: CCV L5
Client ID:
Sample Type: CCVIS
Inject. Date: 24-Jul-2018 06:35:49 ALS Bottle#: 5 Worklist Smp#: 45
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub9

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 24-Jul-2018 10:51:36 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: Ex. 4 CBI Date: 24-Jul-2018 10:19:25

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	14982263	123.7		2905	
298.90 > 99.00	1.343	1.350	-0.007	0.994	10851174		1.38(0.00-0.00)	3267	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1299207	10.1		15214	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.593	0.0	1.000	8029609	45.6		3966	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.601	0.0	1.000	1839709	14.5		157	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.768	0.0		1200268	10.0		10834	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	3857671	29.8		490	
413.00 > 169.00	1.768	1.768	0.0	1.000	2006756		1.92(0.00-0.00)	6194	
* 7 13C4 PFOS									
503.00 > 80.00	2.003	2.003	0.0		2952012	28.7		4540	
9 Perfluorononanoic acid									
463.00 > 419.00	2.018	2.018	0.0	1.000	2792378	29.4		177	
8 Perfluorooctane sulfonic acid									a
499.00 > 80.00	2.011	2.056	-0.045	1.000	6547692	59.7		5705	a
499.00 > 99.00	2.003	2.056	-0.053	0.996	1405760		4.66(0.00-0.00)	1994	
$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.215	0.0	1.000	858538	10.3		7348	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

LC537-L5_00026 Amount Added: 1.00 Units: mL

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_047.d
Lims ID: CCV L5
Client ID:
Sample Type: CCVIS
Inject. Date: 24-Jul-2018 06:35:49 ALS Bottle#: 5 Worklist Smp#: 45
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub9

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 24-Jul-2018 10:51:36 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: Ex. 4 CBI Date: 24-Jul-2018 10:19:25

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	14982263	123.7		2905	
298.90 > 99.00	1.343	1.350	-0.007	0.994	10851174		1.38(0.00-0.00)	3267	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1299207	10.1		15214	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.593	0.0	1.000	8029609	45.6		3966	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.601	0.0	1.000	1839709	14.5		157	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.768	0.0		1200268	10.0		10834	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	3857671	29.8		490	
413.00 > 169.00	1.768	1.768	0.0	1.000	2006756		1.92(0.00-0.00)	6194	
* 7 13C4 PFOS									
503.00 > 80.00	2.003	2.003	0.0		2952012	28.7		4540	
9 Perfluorononanoic acid									
463.00 > 419.00	2.018	2.018	0.0	1.000	2792378	29.4		177	
8 Perfluorooctane sulfonic acid									a
499.00 > 80.00	2.011	2.056	-0.045	1.000	6547692	59.7		5705	a
499.00 > 99.00	2.003	2.056	-0.053	0.996	1405760		4.66(0.00-0.00)	1994	
$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.215	0.0	1.000	858538	10.3		7348	

QC Flag Legend

Review Flags

a - User Assigned ID

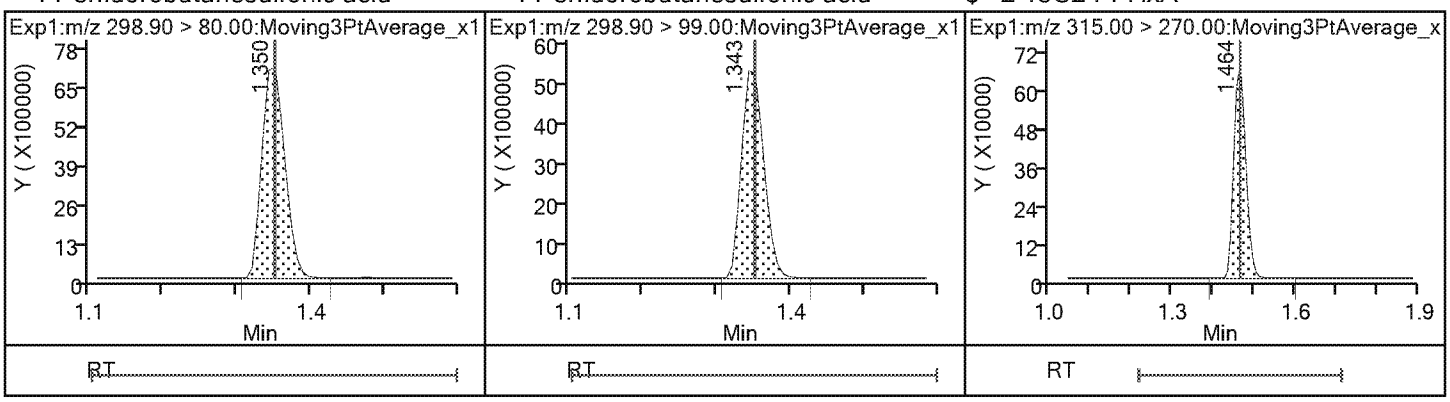
Reagents:

LC537-L5_00026 Amount Added: 1.00 Units: mL

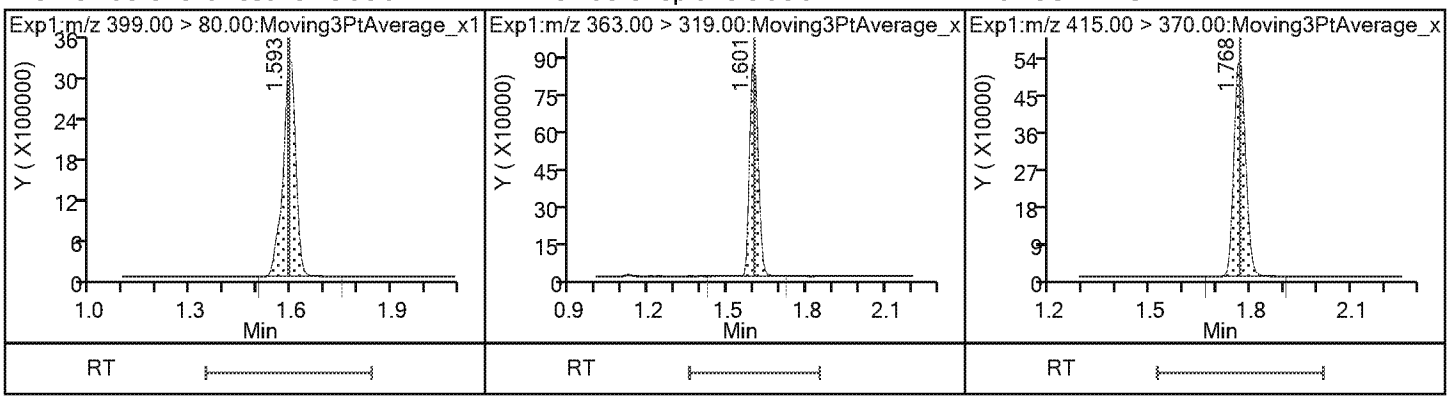
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_047.d
Injection Date: 24-Jul-2018 06:35:49 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 45
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

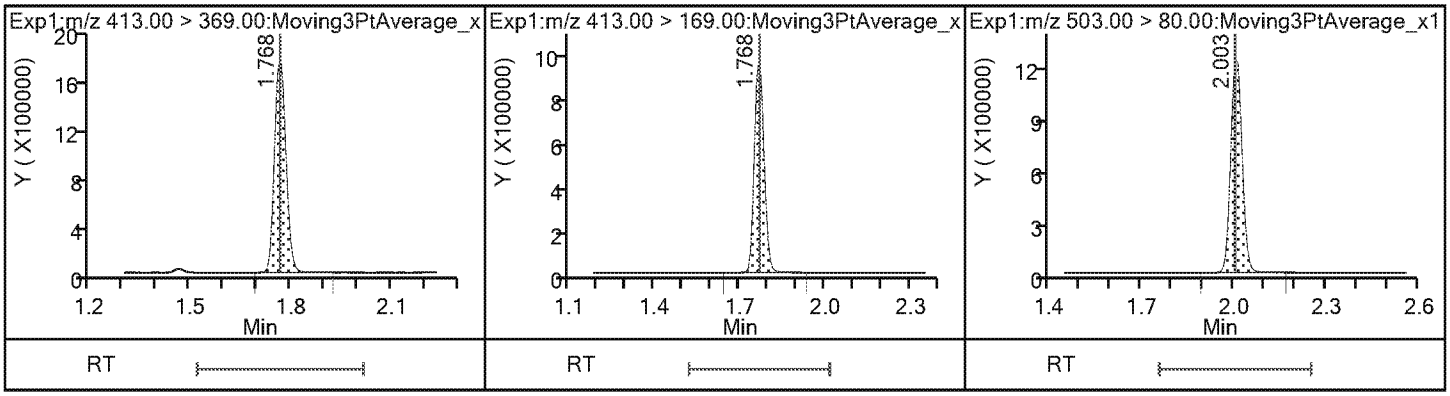
1 Perfluorobutanesulfonic acid | 1 Perfluorobutanesulfonic acid | $ 2 13C2 PFHxA



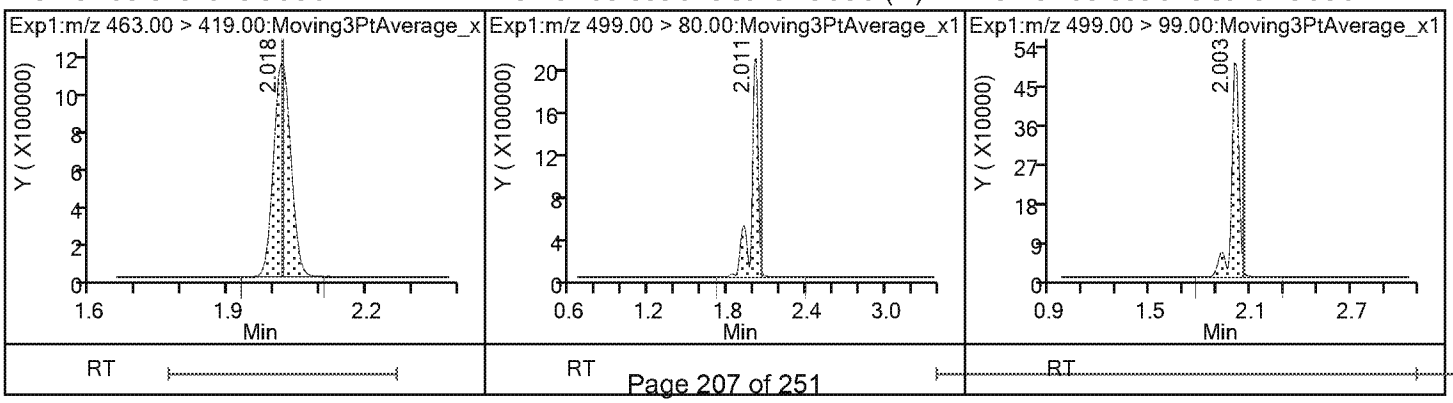
3 Perfluorohexanesulfonic acid | 4 Perfluoroheptanoic acid | * 6 13C2-PFOA



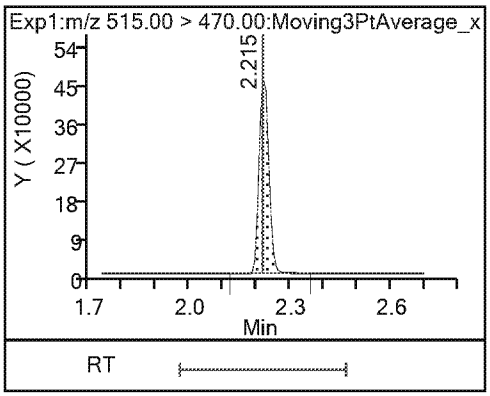
5 Perfluorooctanoic acid | 5 Perfluorooctanoic acid | * 7 13C4 PFOS



9 Perfluorononanoic acid | 8 Perfluorooctane sulfonic acid (M) | 8 Perfluorooctane sulfonic acid



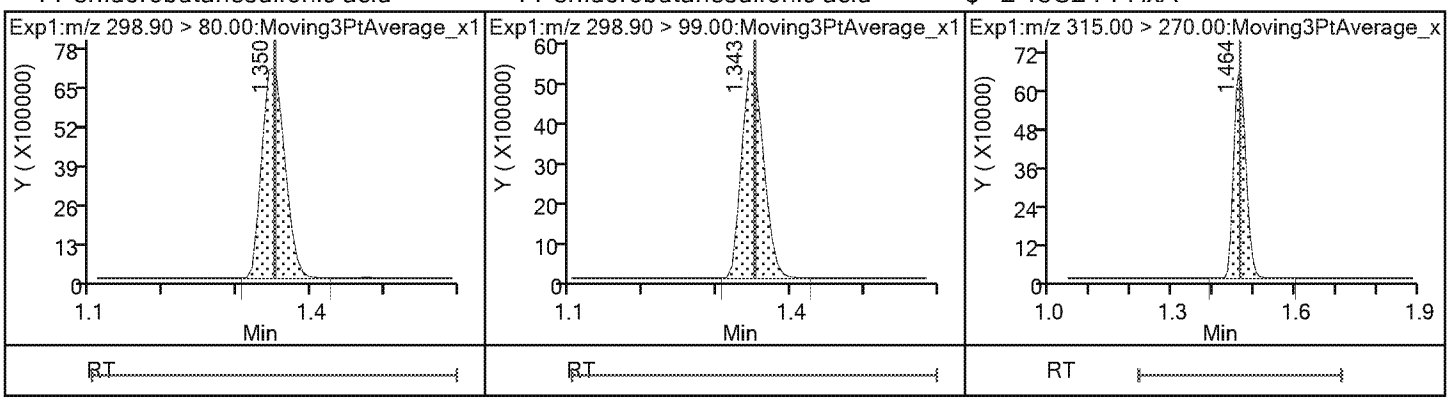
$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
54
45
36
27
18
9
0
2.215
1.7
2.0
2.3
2.6
Min
RT

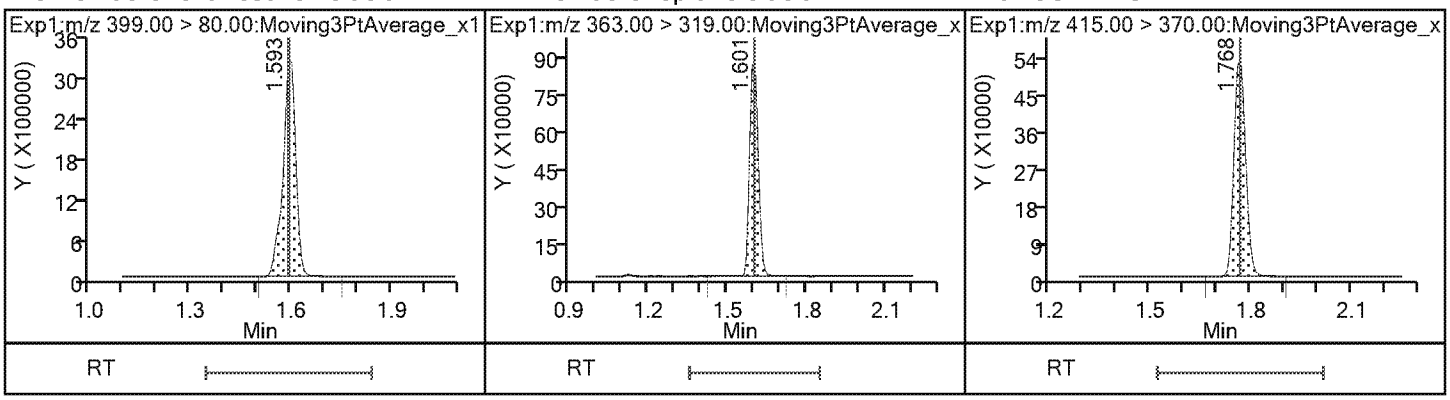
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_047.d
Injection Date: 24-Jul-2018 06:35:49 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 45
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

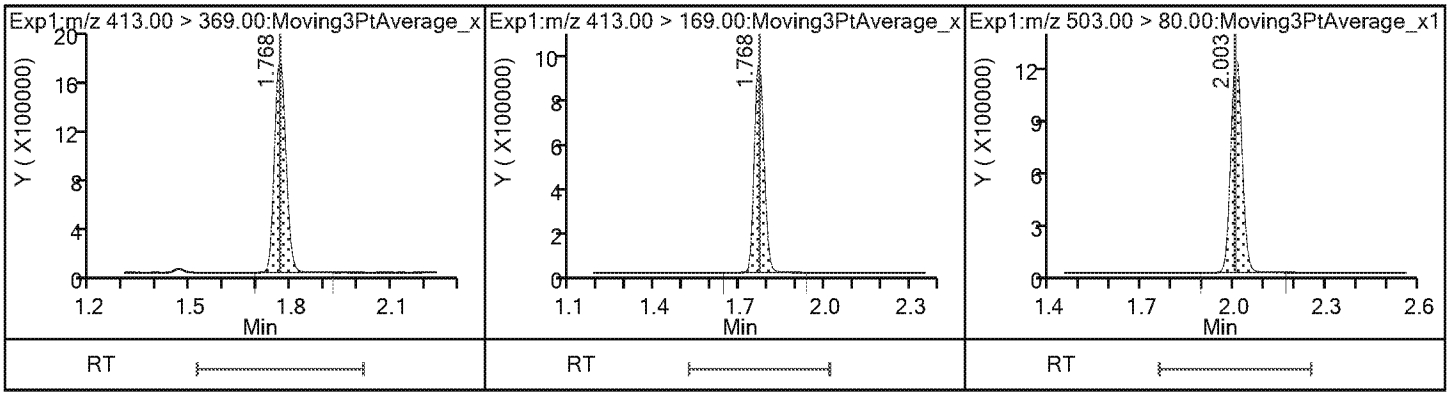
1 Perfluorobutanesulfonic acid | 1 Perfluorobutanesulfonic acid | $ 2 13C2 PFHxA



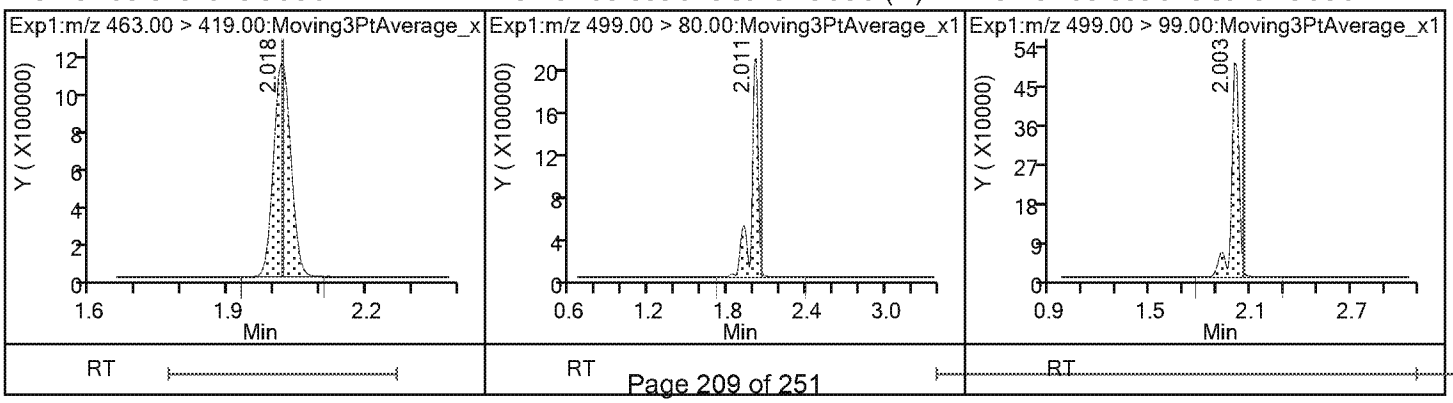
3 Perfluorohexanesulfonic acid | 4 Perfluoroheptanoic acid | * 6 13C2-PFOA



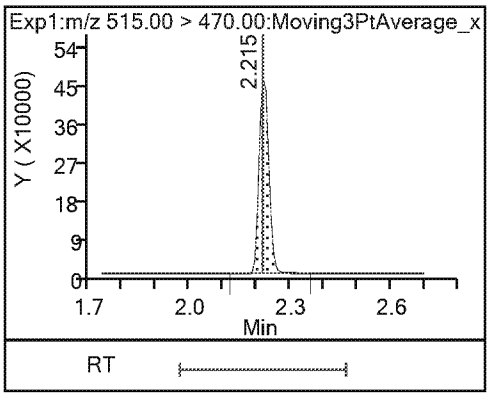
5 Perfluorooctanoic acid | 5 Perfluorooctanoic acid | * 7 13C4 PFOS



9 Perfluorononanoic acid | 8 Perfluorooctane sulfonic acid (M) | 8 Perfluorooctane sulfonic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
54
45
36
27
18
9
0
2.215
1.7
2.0
2.3
2.6
Min
RT

TestAmerica Sacramento

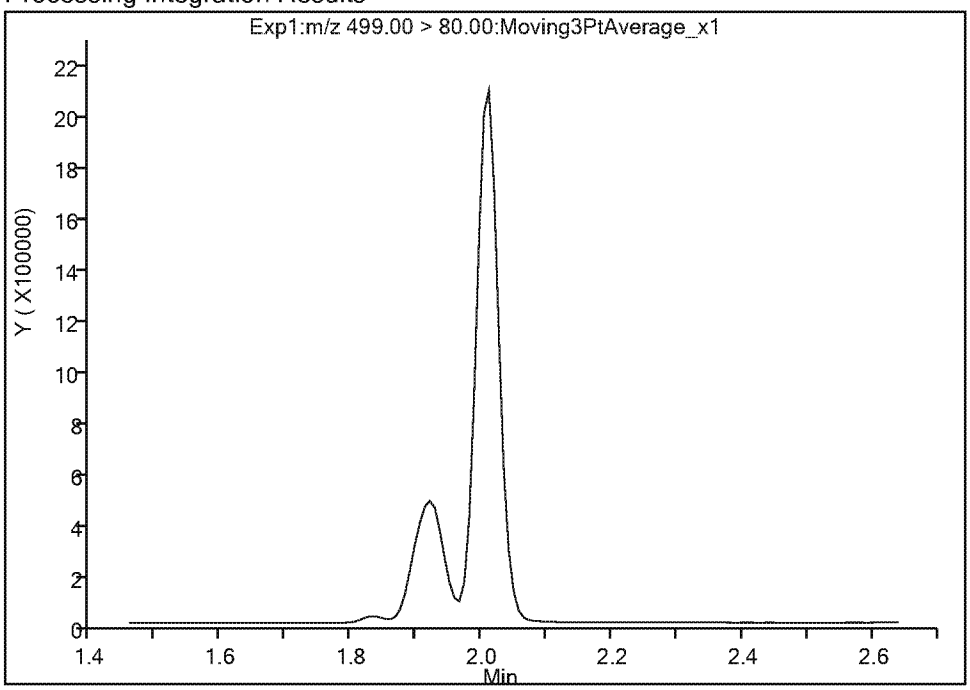
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_047.d				
Injection Date:	24-Jul-2018 06:35:49	Instrument ID:	A8_N		
Lims ID:	CCV L5				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	5	Worklist Smp#:	45
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

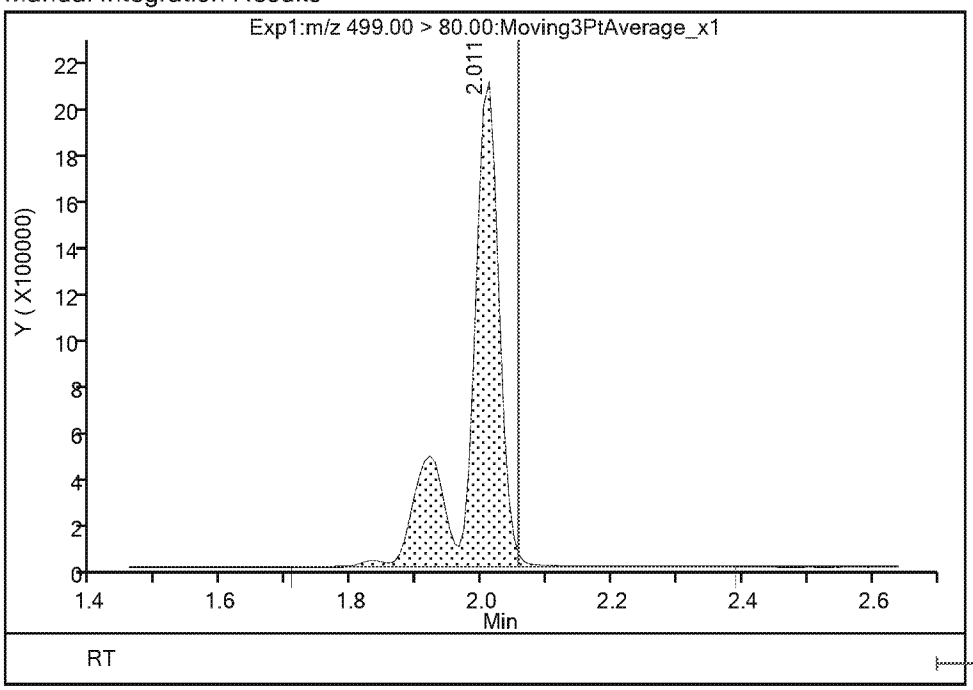
Processing Integration Results

Not Detected
Expected RT: 2.06



Manual Integration Results

RT: 2.01
Area: 6547692
Amount: 59.719700
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 24-Jul-2018 10:19:20
Audit Action: Assigned Compound ID Audit Reason: Peak assignment corrected

TestAmerica Sacramento

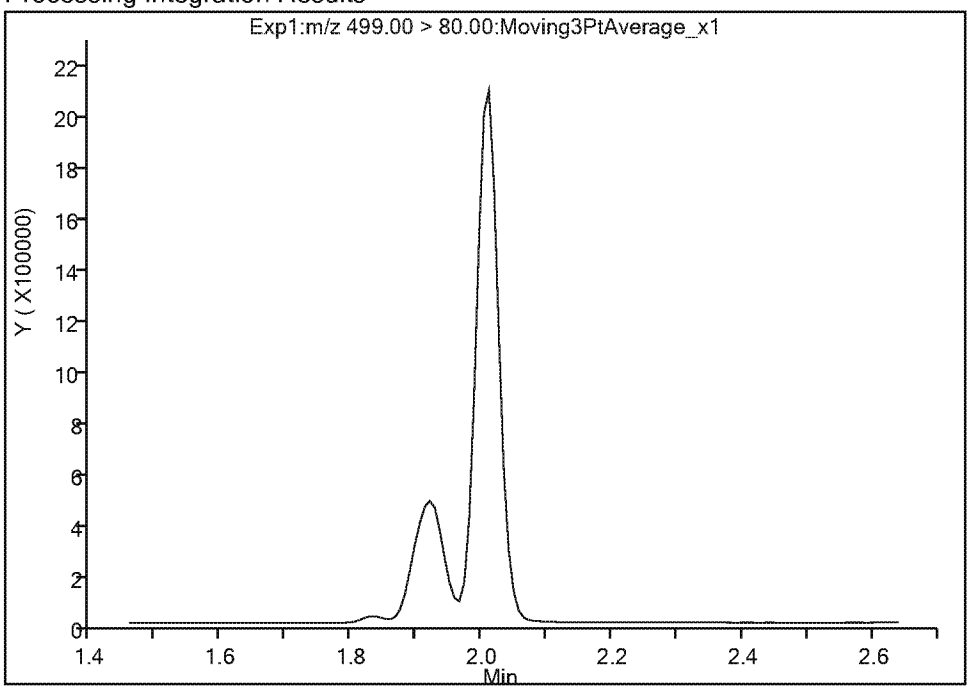
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_047.d				
Injection Date:	24-Jul-2018 06:35:49	Instrument ID:	A8_N		
Lims ID:	CCV L5				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	5	Worklist Smp#:	45
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

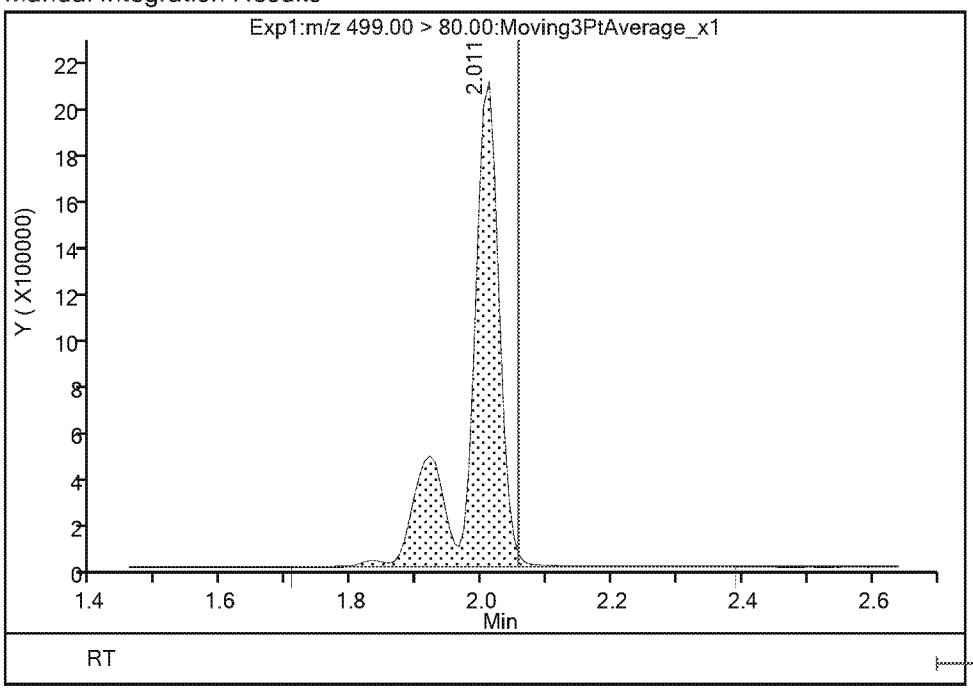
Processing Integration Results

Not Detected
Expected RT: 2.06



Manual Integration Results

RT: 2.01
Area: 6547692
Amount: 59.719700
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 24-Jul-2018 10:19:20
Audit Action: Assigned Compound ID Audit Reason: Peak assignment corrected

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Lab Sample ID: CCV 320-235790/49 Calibration Date: 07/24/2018 06:54

Instrument ID: A8_N Calib Start Date: 07/21/2018 12:21

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 07/21/2018 12:45

Lab File ID: 2018.07.23_537B_051.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid	Ave	1.177	1.314		50.3	45.0	11.6	30.0
Perfluoroheptanoic acid	Ave	1.055	1.072		4.94	4.86	1.7	30.0
Perfluorohexanesulfonic acid	Ave	1.710	1.766		15.6	15.1	3.3	30.0
Perfluorooctanoic acid	Ave	1.078	1.064		9.77	9.90	-1.3	30.0
Perfluorooctane sulfonic acid	Ave	1.065	1.102		20.5	19.8	3.5	30.0
Perfluorononanoic acid	Ave	0.7921	0.8111		10.1	9.90	2.4	30.0
13C2 PFHxA	Ave	1.076	1.036		9.63	10.0	-3.7	30.0
13C2 PFDA	Ave	0.6956	0.7204		10.4	10.0	3.6	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_051.d
Lims ID: CCV L3
Client ID:
Sample Type: CCV
Inject. Date: 24-Jul-2018 06:54:31 ALS Bottle#: 3 Worklist Smp#: 49
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L3
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub9

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 24-Jul-2018 10:51:40 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: Ex. 4 CBI Date: 24-Jul-2018 10:19:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.343	1.350	-0.007	1.000	5725548	50.3		1260	
298.90 > 99.00	1.343	1.350	-0.007	1.000	3955678		1.45(0.00-0.00)	1405	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1246545	9.63		17855	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.593	0.0	1.000	2585854	15.6		1495	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.593	1.601	-0.008	1.000	626896	4.94		58.2	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.768	0.0		1203134	10.0		11158	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	1267076	9.77		166	
413.00 > 169.00	1.768	1.768	0.0	1.000	660620		1.92(0.00-0.00)	2152	
* 7 13C4 PFOS									
503.00 > 80.00	2.003	2.003	0.0		2775939	28.7		4134	
9 Perfluorononanoic acid									
463.00 > 419.00	2.011	2.018	-0.007	1.000	966094	10.1		60.2	
8 Perfluorooctane sulfonic acid									a
499.00 > 80.00	2.003	2.056	-0.053	1.000	2109000	20.5		1850	a
499.00 > 99.00	2.003	2.056	-0.053	1.000	472710		4.46(0.00-0.00)	699	
$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.215	0.0	1.000	866788	10.4		7657	

QC Flag Legend

Review Flags

a - User Assigned ID

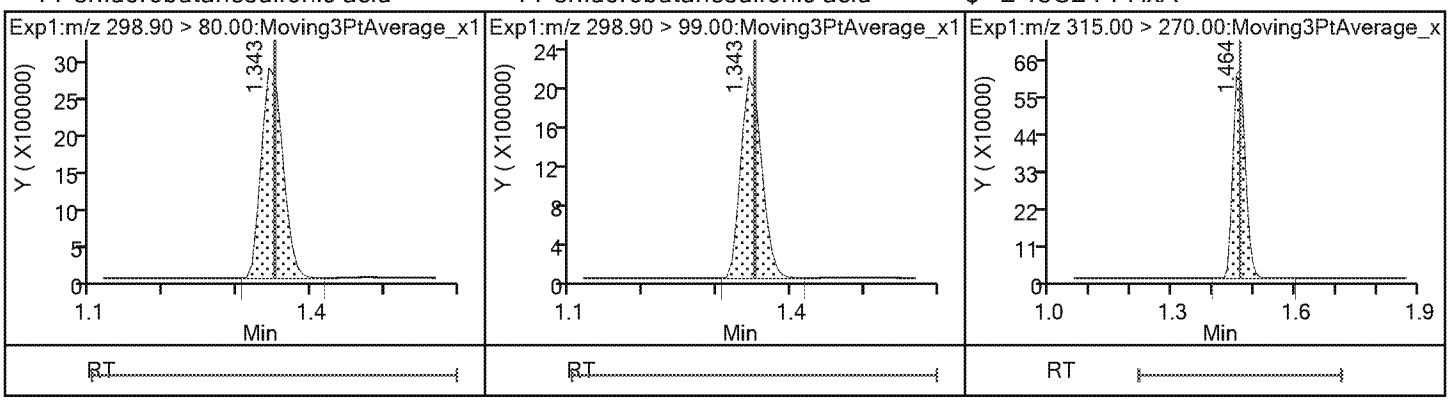
Reagents:

LC537-L3_00025 Amount Added: 1.00 Units: mL

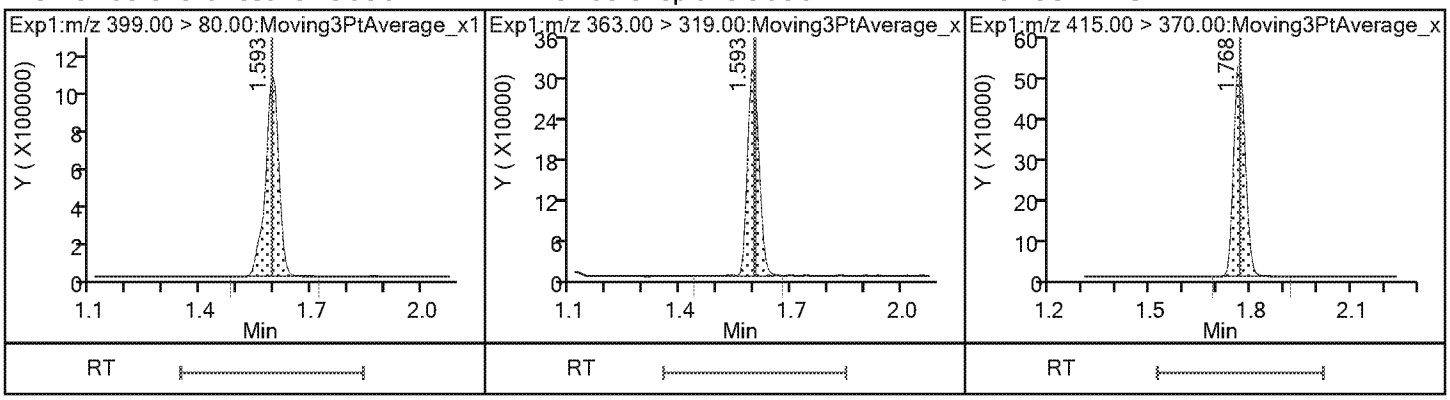
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_051.d
Injection Date: 24-Jul-2018 06:54:31 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 49
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

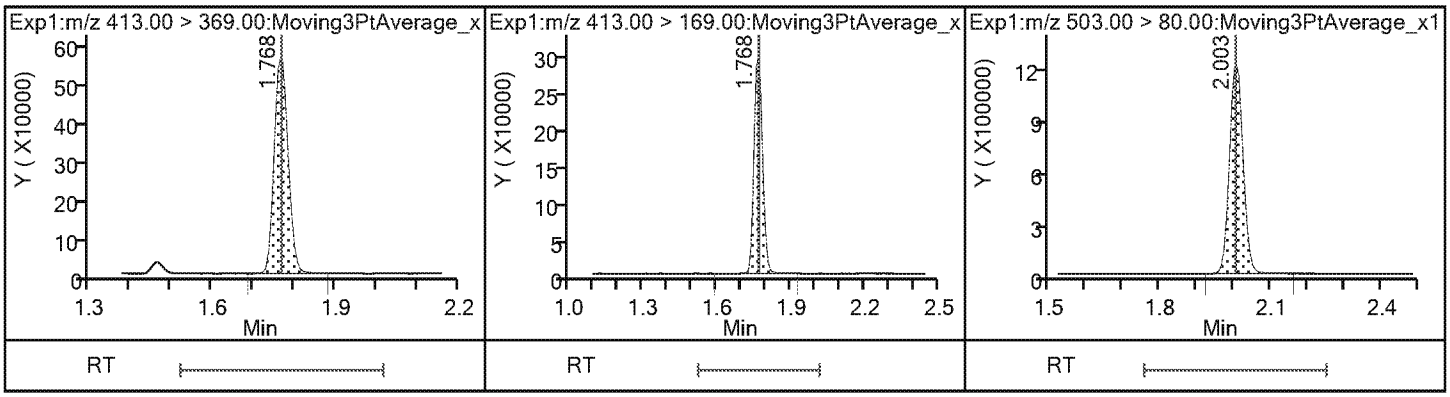
1 Perfluorobutanesulfonic acid | 1 Perfluorobutanesulfonic acid | $ 2 13C2 PFHxA



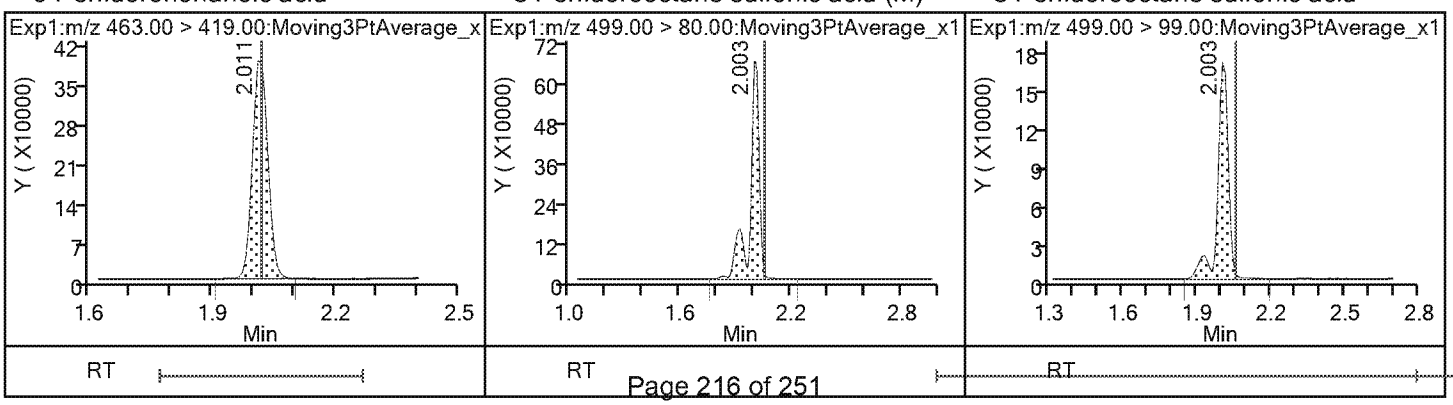
3 Perfluorohexanesulfonic acid | 4 Perfluoroheptanoic acid | * 6 13C2-PFOA



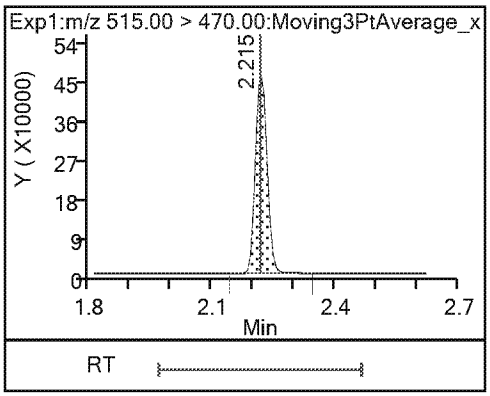
5 Perfluorooctanoic acid | 5 Perfluorooctanoic acid | * 7 13C4 PFOS



9 Perfluorononanoic acid | 8 Perfluorooctane sulfonic acid (M) | 8 Perfluorooctane sulfonic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
54
45
36
27
18
9
0
2.215
1.8
2.1
2.4
2.7
Min
RT

TestAmerica Sacramento

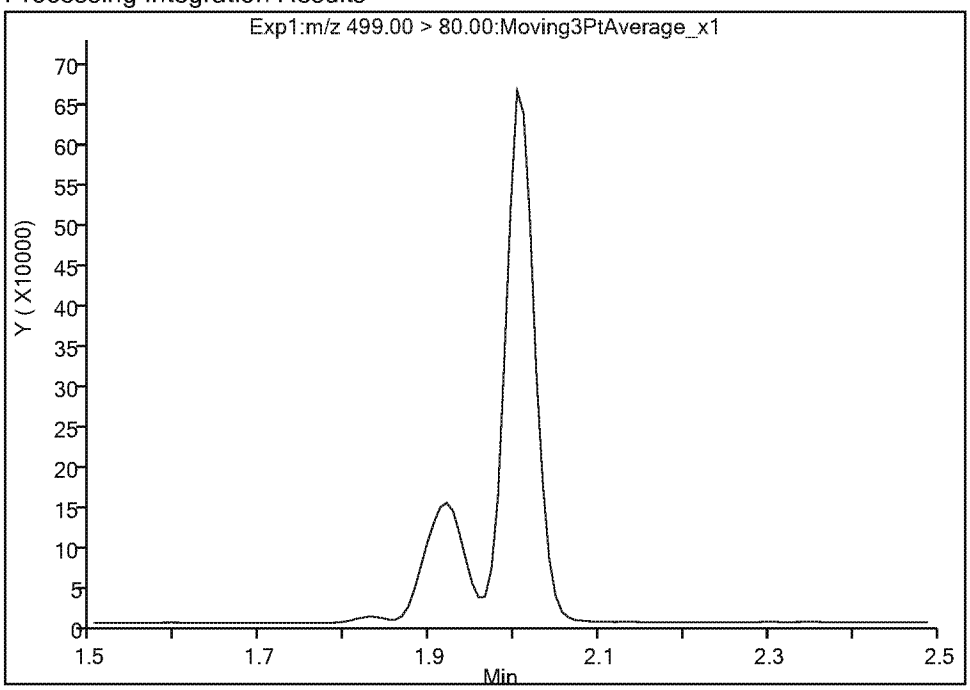
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_051.d				
Injection Date:	24-Jul-2018 06:54:31	Instrument ID:	A8_N		
Lims ID:	CCV L3				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	3	Worklist Smp#:	49
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

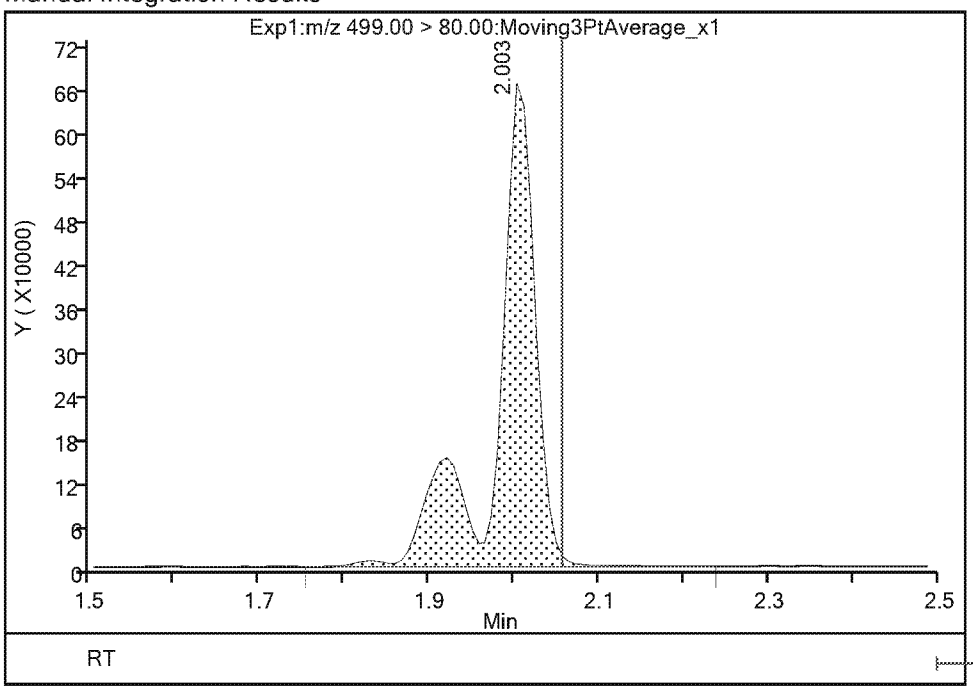
Processing Integration Results

Not Detected
Expected RT: 2.06



Manual Integration Results

RT: 2.00
Area: 2109000
Amount: 20.455691
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 24-Jul-2018 10:19:32
Audit Action: Assigned Compound ID Audit Reason: Peak assignment corrected

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41073-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 320-234427/1-A
Matrix: Water
Lab File ID: 2018.07.23_537B_025.d
Analysis Method: 537 DW
Date Collected:
Extraction Method: 537 DW
Date Extracted: 07/17/2018 07:23
Sample wt/vol: 250(mL)
Date Analyzed: 07/24/2018 04:52
Con. Extract Vol.: 1.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 235786
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctane sulfonic acid	ND		40	6.8
335-67-1	Perfluorooctanoic acid	ND		20	2.8
375-95-1	Perfluorononanoic acid	ND		20	8.0
355-46-4	Perfluorohexanesulfonic acid	ND		30	5.5
375-85-9	Perfluoroheptanoic acid	ND		10	1.9
375-73-5	Perfluorobutanesulfonic acid	ND		90	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	92		70-130
STL00996	13C2 PFDA	97		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_025.d
Lims ID: MB 320-234427/1-A
Client ID:
Sample Type: MB
Inject. Date: 24-Jul-2018 04:52:57 ALS Bottle#: 17 Worklist Smp#: 23
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-234427/1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 24-Jul-2018 10:51:18 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

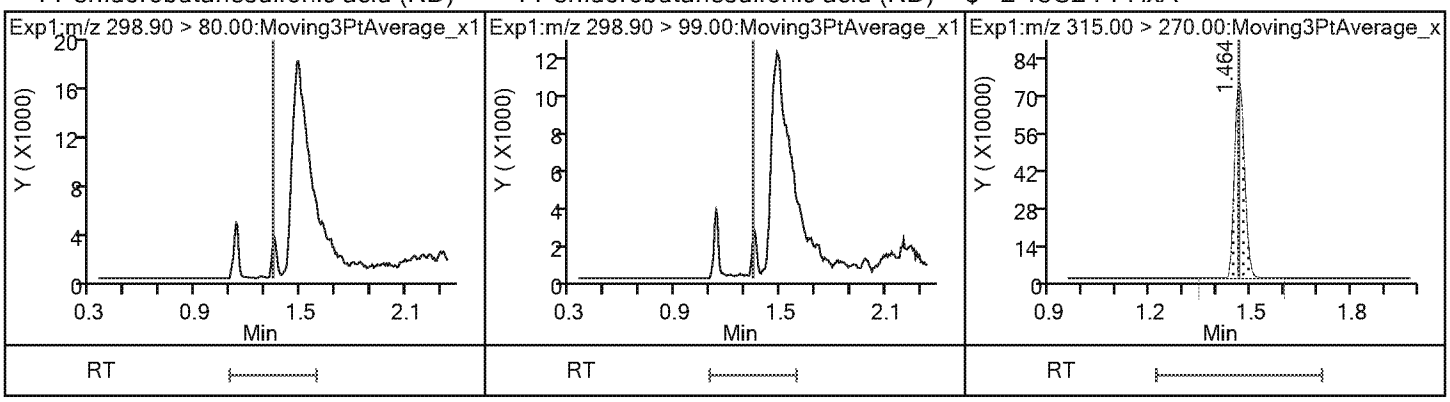
Column 1 : Det: EXP1
Process Host: XAWRK021

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1458686	9.23		16541	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.768	0.0		1468577	10.0		14387	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.011	0.0		3365410	28.7		5016	
$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.215	0.008	1.000	987179	9.66		8733	

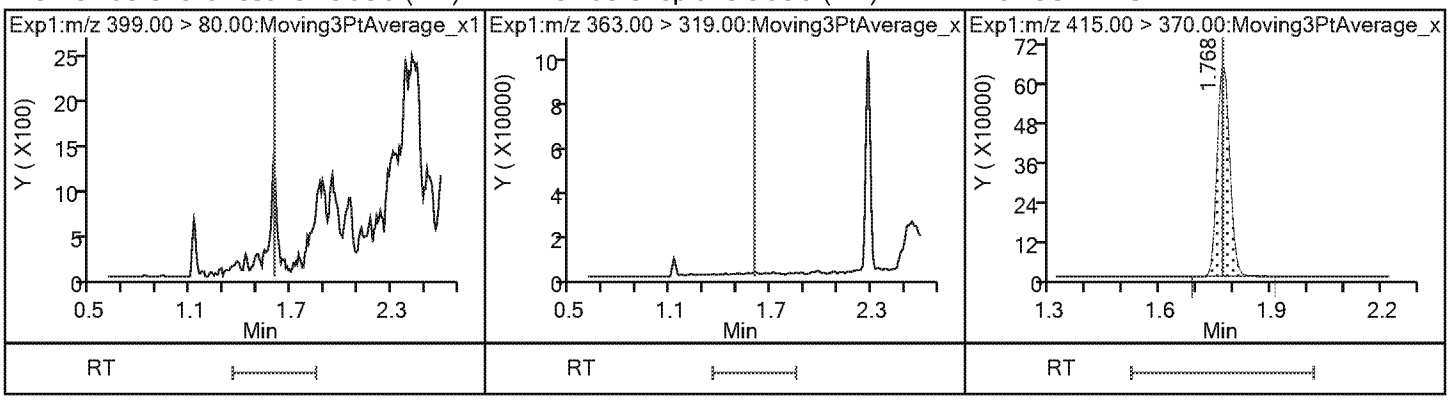
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_025.d
Injection Date: 24-Jul-2018 04:52:57 Instrument ID: A8_N
Lims ID: MB 320-234427/1-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 17 Worklist Smp#: 23
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

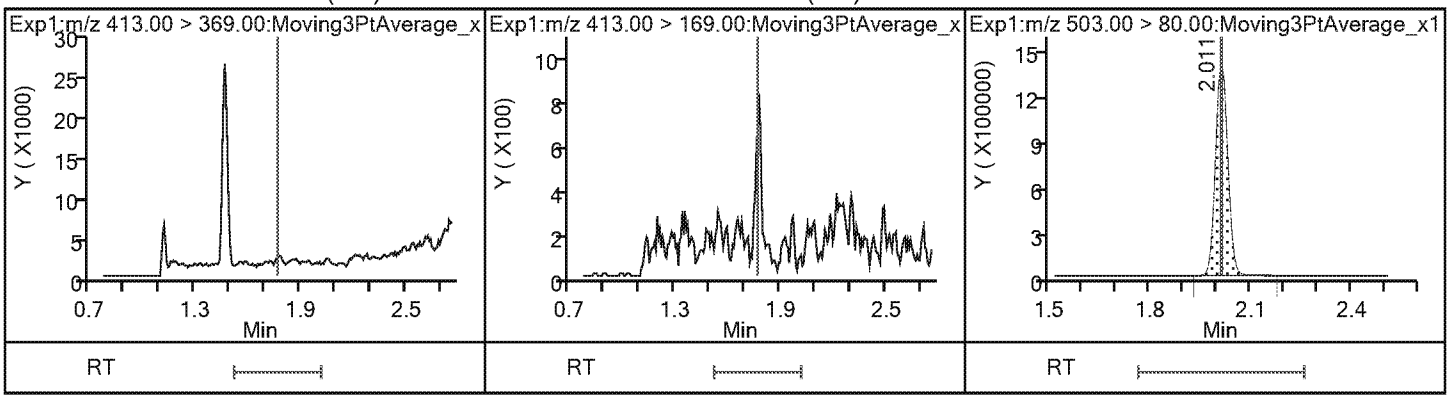
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) $ 2 13C2 PFHxA



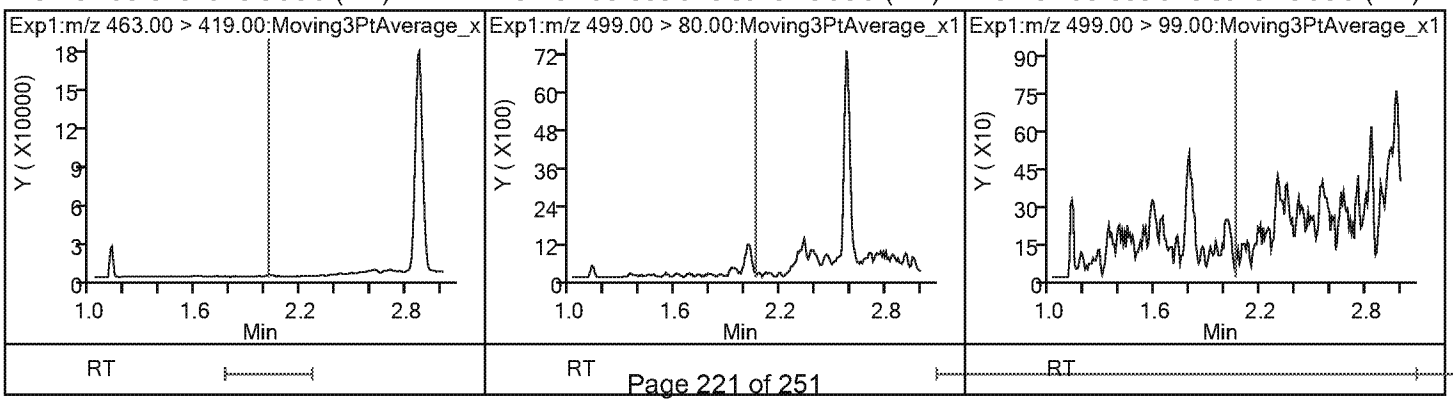
3 Perfluorohexanesulfonic acid (ND) 4 Perfluoroheptanoic acid (ND) * 6 13C2-PFOA



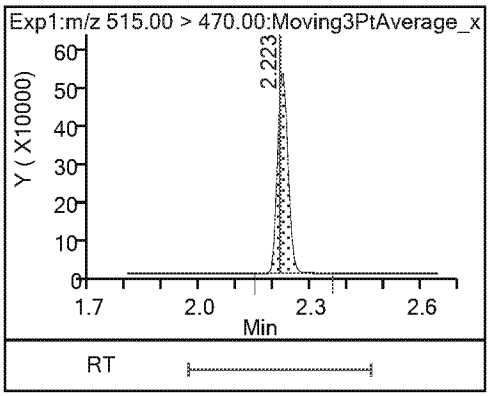
5 Perfluorooctanoic acid (ND) 5 Perfluorooctanoic acid (ND) * 7 13C4 PFOS



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



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
60
50
40
30
20
10
0
2.223
1.7
2.0
2.3
2.6
Min
RT

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41073-1
SDG No.:
Client Sample ID:
Lab Sample ID: LCS 320-234427/2-A
Matrix: Water
Lab File ID: 2018.07.23_537B_026.d
Analysis Method: 537 DW
Date Collected:
Extraction Method: 537 DW
Date Extracted: 07/17/2018 07:23
Sample wt/vol: 250(mL)
Date Analyzed: 07/24/2018 04:57
Con. Extract Vol.: 1.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 235786
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctane sulfonic acid	240		40	6.8
335-67-1	Perfluorooctanoic acid	113		20	2.8
375-95-1	Perfluorononanoic acid	113		20	8.0
355-46-4	Perfluorohexanesulfonic acid	181		30	5.5
375-85-9	Perfluoroheptanoic acid	54.3		10	1.9
375-73-5	Perfluorobutanesulfonic acid	505		90	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	104		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_026.d
Lims ID: LCS 320-234427/2-A
Client ID:
Sample Type: LCS
Inject. Date: 24-Jul-2018 04:57:37 ALS Bottle#: 18 Worklist Smp#: 24
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-234427/2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 24-Jul-2018 10:51:18 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: barnettj Date: 24-Jul-2018 10:24:50

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.343	1.343	0.0	1.000	14054575	126.1		2755	
298.90 > 99.00	1.343	1.343	0.0	1.000	9898918		1.42(0.00-0.00)	3045	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1198077	9.96		15876	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.601	-0.008	1.000	7343926	45.3		3964	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.593	1.601	-0.008	1.000	1599125	13.6		137	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.768	0.0		1117957	10.0		10851	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	3399814	28.2		440	
413.00 > 169.00	1.768	1.768	0.0	1.000	1793894		1.90(0.00-0.00)	5346	
* 7 13C4 PFOS									
503.00 > 80.00	2.003	2.011	-0.008		2715962	28.7		4179	
9 Perfluorononanoic acid									
463.00 > 419.00	2.018	2.018	0.0	1.000	2494727	28.2		113	
8 Perfluorooctane sulfonic acid									a
499.00 > 80.00	2.011	2.056	-0.045	1.000	6059767	60.1		4113	a
499.00 > 99.00	2.003	2.056	-0.053	0.996	1313679		4.61(0.00-0.00)	1822	
$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.215	0.0	1.000	806613	10.4		7684	

QC Flag Legend

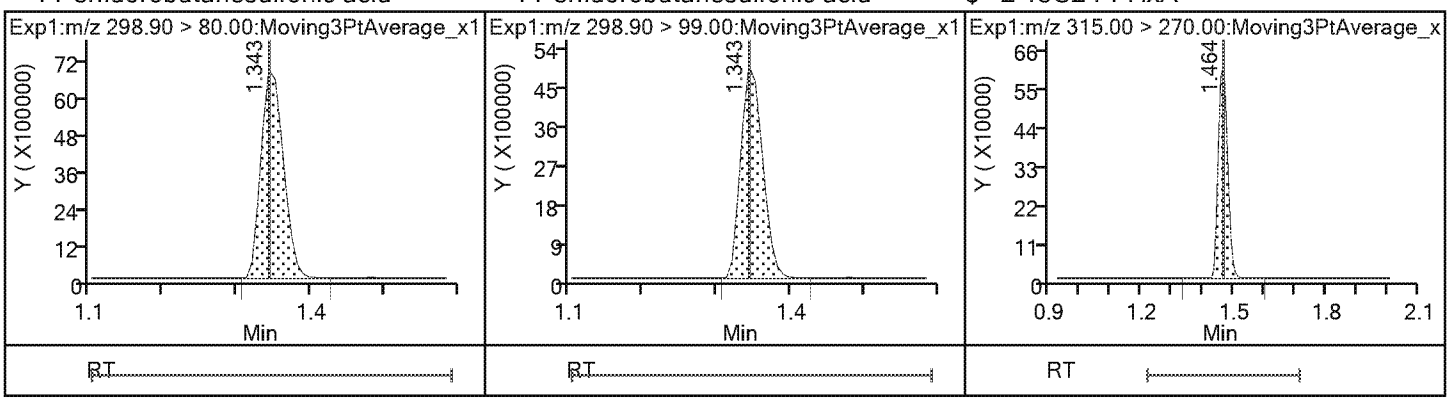
Review Flags

a - User Assigned ID

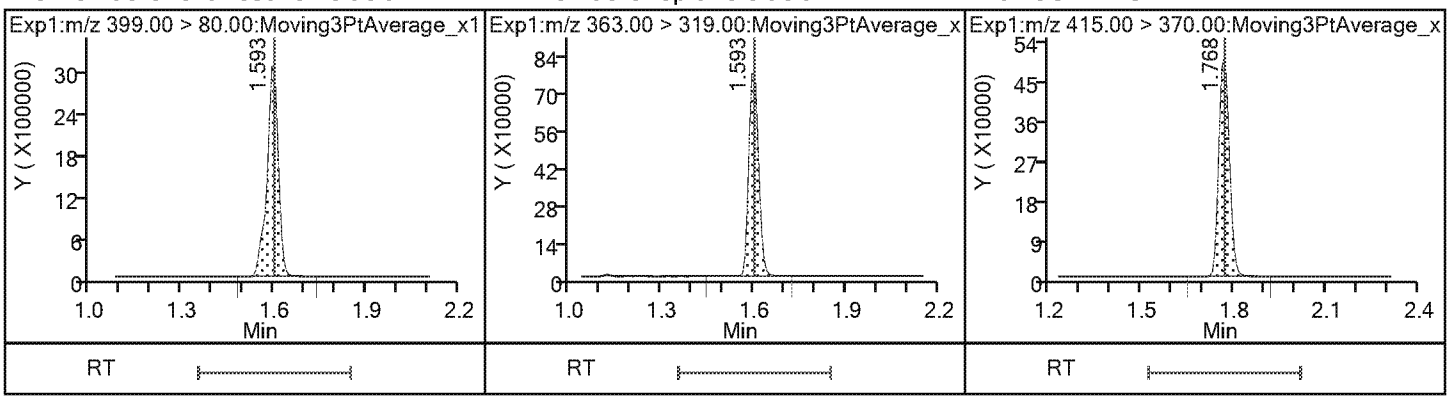
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_026.d
Injection Date: 24-Jul-2018 04:57:37 Instrument ID: A8_N
Lims ID: LCS 320-234427/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 18 Worklist Smp#: 24
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

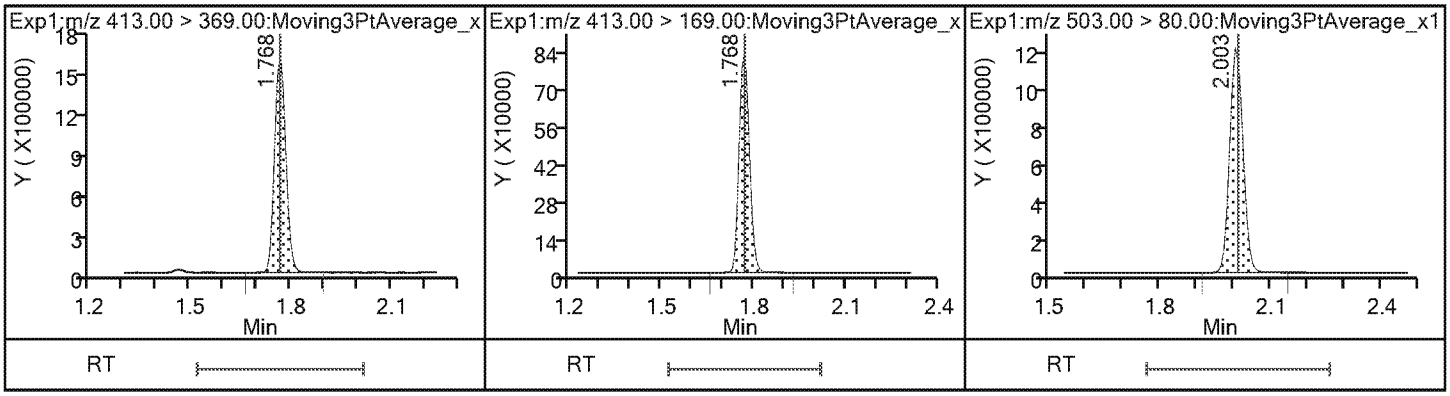
1 Perfluorobutanesulfonic acid | 1 Perfluorobutanesulfonic acid | $ 2 13C2 PFHxA



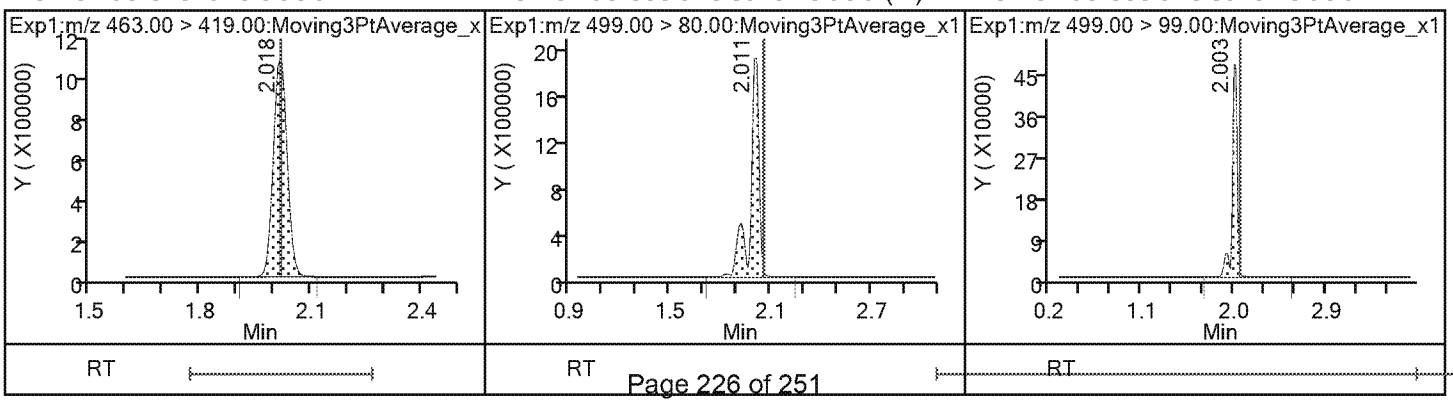
3 Perfluorohexanesulfonic acid | 4 Perfluoroheptanoic acid | * 6 13C2-PFOA



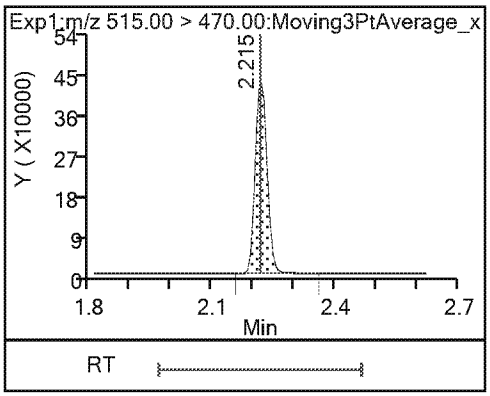
5 Perfluorooctanoic acid | 5 Perfluorooctanoic acid | * 7 13C4 PFOS



9 Perfluorononanoic acid | 8 Perfluorooctane sulfonic acid (M) | 8 Perfluorooctane sulfonic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
54
45
36
27
18
9
0
2.215
1.8
2.1
2.4
2.7
Min
RT

TestAmerica Sacramento

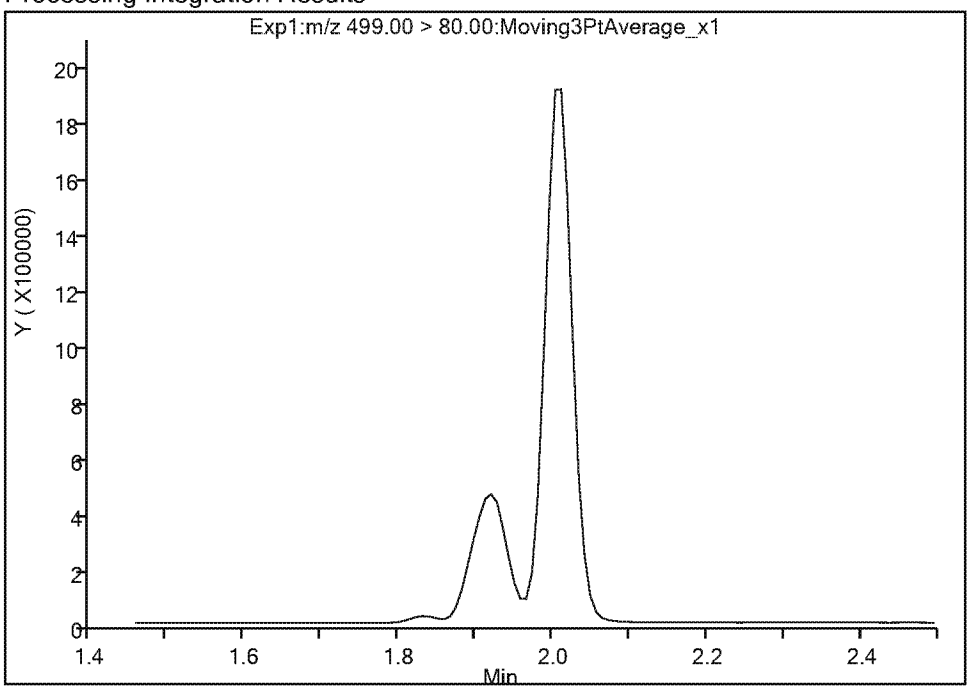
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_026.d				
Injection Date:	24-Jul-2018 04:57:37	Instrument ID:	A8_N		
Lims ID:	LCS 320-234427/2-A				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	18	Worklist Smp#:	24
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

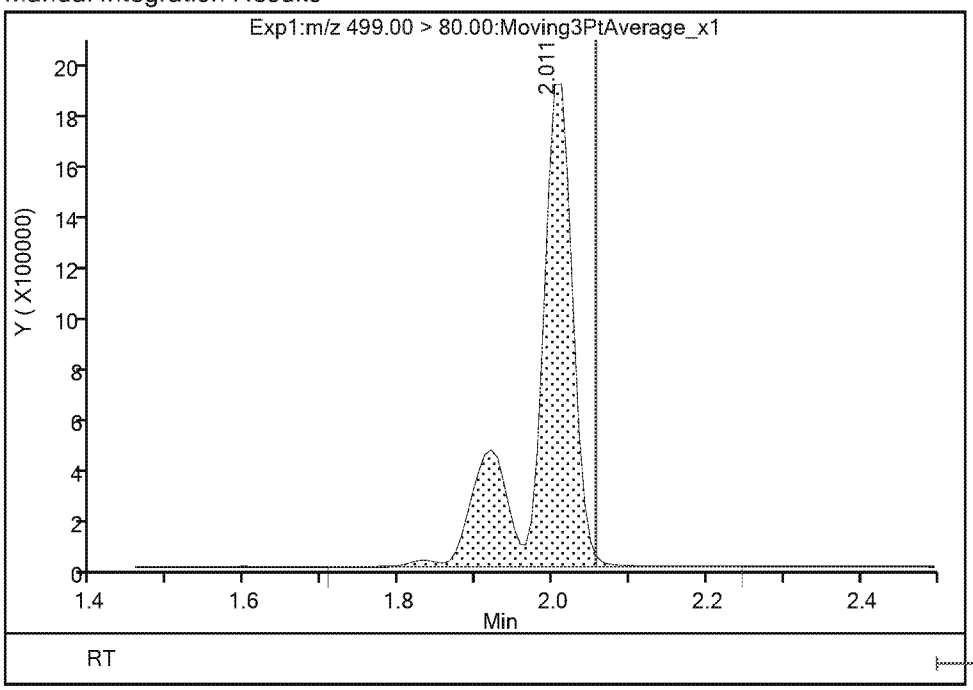
Processing Integration Results

Not Detected
Expected RT: 2.06



Manual Integration Results

RT: 2.01
Area: 6059767
Amount: 60.073057
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 24-Jul-2018 10:24:46
Audit Action: Assigned Compound ID Audit Reason: Peak assignment corrected

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41073-1
SDG No.:
Client Sample ID: C0B54 MS
Lab Sample ID: 320-41073-6 MS
Matrix: Water
Lab File ID: 2018.07.23_537B_049.d
Analysis Method: 537 DW
Date Collected: 07/11/2018 09:50
Extraction Method: 537 DW
Date Extracted: 07/17/2018 08:29
Sample wt/vol: 261(mL)
Date Analyzed: 07/24/2018 06:45
Con. Extract Vol.: 1.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 235790
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctane sulfonic acid	234		38	6.5
335-67-1	Perfluorooctanoic acid	110		19	2.7
375-95-1	Perfluorononanoic acid	115		19	7.7
355-46-4	Perfluorohexanesulfonic acid	175		29	5.3
375-85-9	Perfluoroheptanoic acid	48.0		9.6	1.8
375-73-5	Perfluorobutanesulfonic acid	454		86	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	82		70-130
STL00996	13C2 PFDA	104		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_049.d
Lims ID: 320-41073-A-6-B MS
Client ID: C0B54
Sample Type: MS
Inject. Date: 24-Jul-2018 06:45:09 ALS Bottle#: 37 Worklist Smp#: 47
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41073-a-6-b ms
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 24-Jul-2018 10:51:36 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: Ex. 4 CBI Date: 24-Jul-2018 10:30:12

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.350	1.350	0.0	1.000	12407789	118.6		2378	
298.90 > 99.00	1.350	1.350	0.0	1.000	8220715		1.51(0.00-0.00)	2677	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	911621	8.17		11362	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.601	1.593	0.008	1.000	6931014	45.6		2541	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.601	0.0	1.000	1369778	12.5		92.1	
* 6 13C2-PFOA									
415.00 > 370.00	1.768	1.768	0.0		1037417	10.0		10004	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	3217757	28.8		351	
413.00 > 169.00	1.768	1.768	0.0	1.000	1716834		1.87(0.00-0.00)	4254	
* 7 13C4 PFOS									
503.00 > 80.00	2.011	2.003	0.008		2550876	28.7		2755	
9 Perfluorononanoic acid									
463.00 > 419.00	2.018	2.018	0.0	1.000	2461815	30.0		110	
8 Perfluorooctane sulfonic acid									a
499.00 > 80.00	2.011	2.056	-0.045	1.000	5787199	61.1		2755	a
499.00 > 99.00	2.011	2.056	-0.045	1.000	1246468		4.64(0.00-0.00)	1002	
$ 10 13C2 PFDA									
515.00 > 470.00	2.223	2.215	0.008	1.000	748749	10.4		6212	

QC Flag Legend

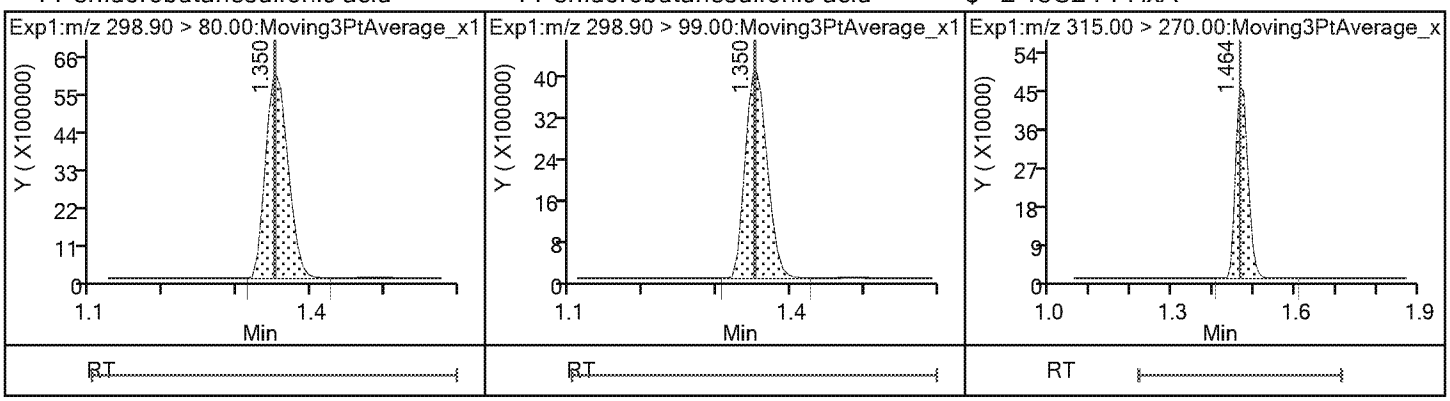
Review Flags

a - User Assigned ID

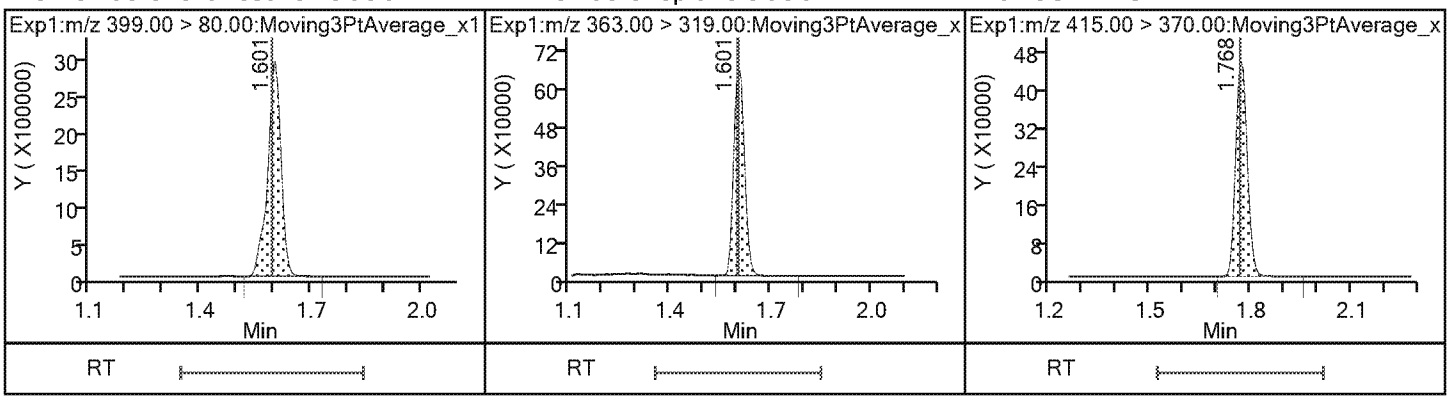
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_049.d
Injection Date: 24-Jul-2018 06:45:09 Instrument ID: A8_N
Lims ID: 320-41073-A-6-B MS
Client ID: C0B54
Operator ID: SACINSTLCMS01 ALS Bottle#: 37 Worklist Smp#: 47
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

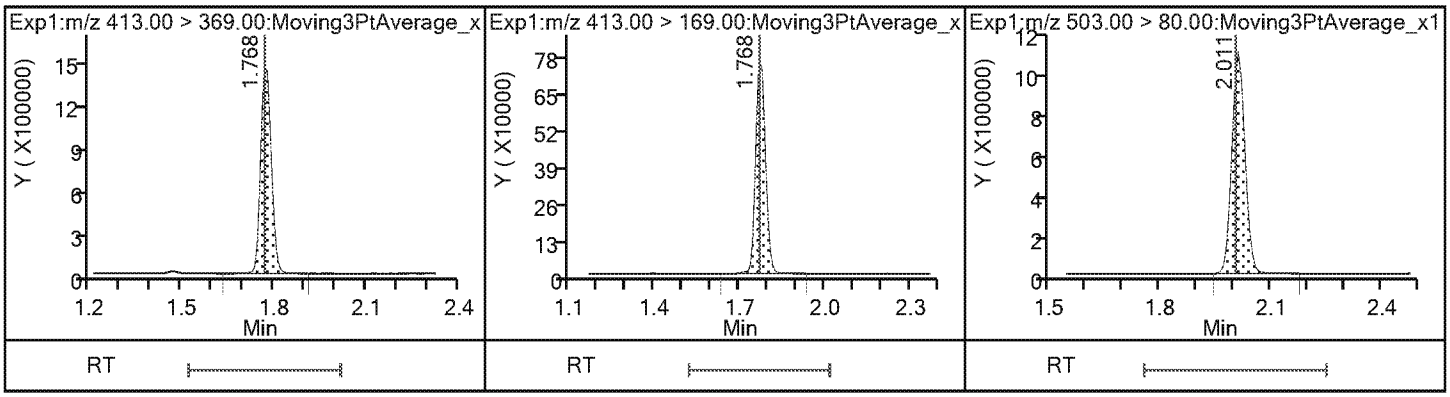
1 Perfluorobutanesulfonic acid | 1 Perfluorobutanesulfonic acid | $ 2 13C2 PFHxA



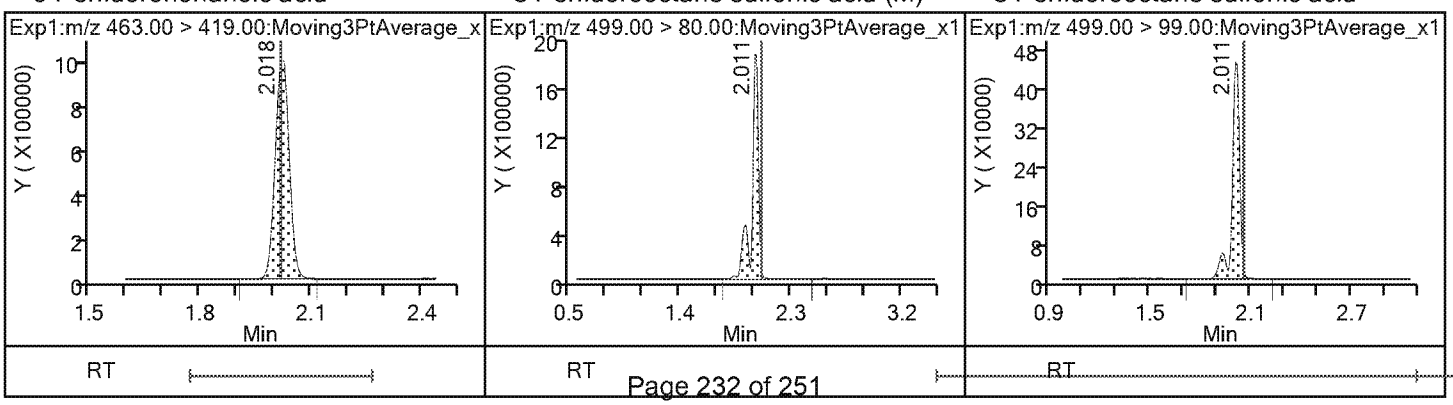
3 Perfluorohexanesulfonic acid | 4 Perfluoroheptanoic acid | * 6 13C2-PFOA



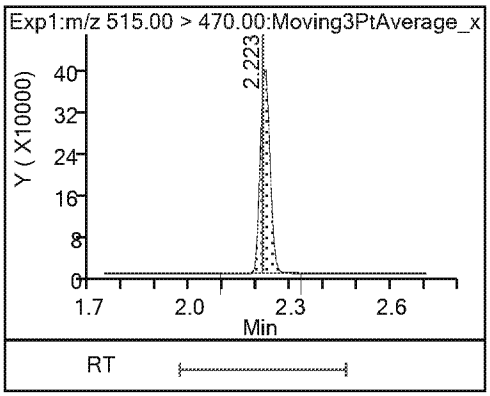
5 Perfluorooctanoic acid | 5 Perfluorooctanoic acid | * 7 13C4 PFOS



9 Perfluorononanoic acid | 8 Perfluorooctane sulfonic acid (M) | 8 Perfluorooctane sulfonic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.223
Y (X10000)
40
32
24
16
8
0
1.7
2.0
2.3
2.6
Min
RT

TestAmerica Sacramento

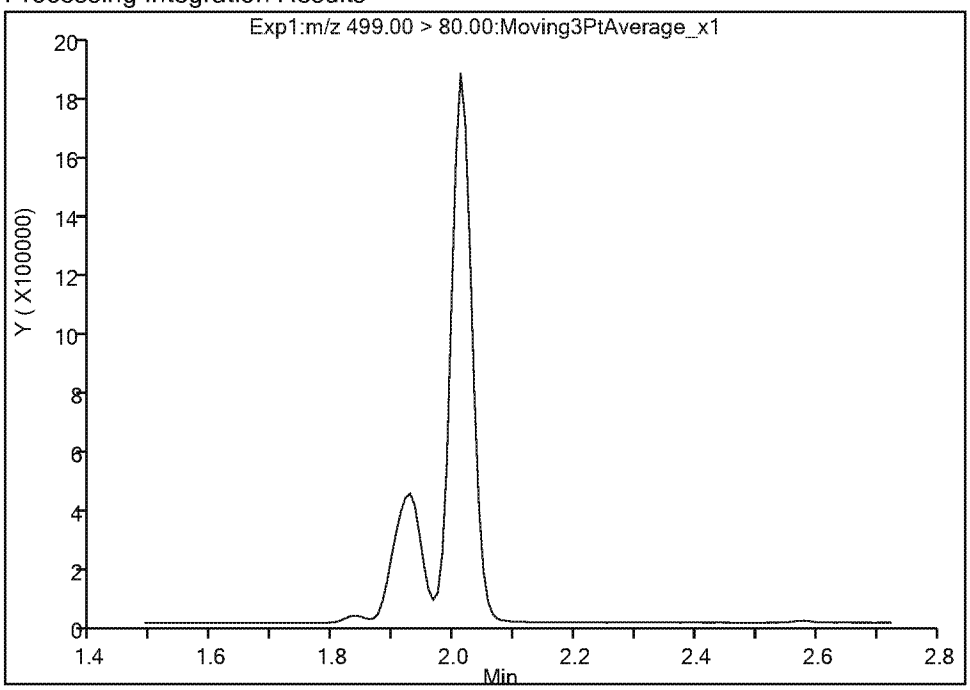
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_049.d				
Injection Date:	24-Jul-2018 06:45:09	Instrument ID:	A8_N		
Lims ID:	320-41073-A-6-B MS				
Client ID:	C0B54				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	37	Worklist Smp#:	47
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

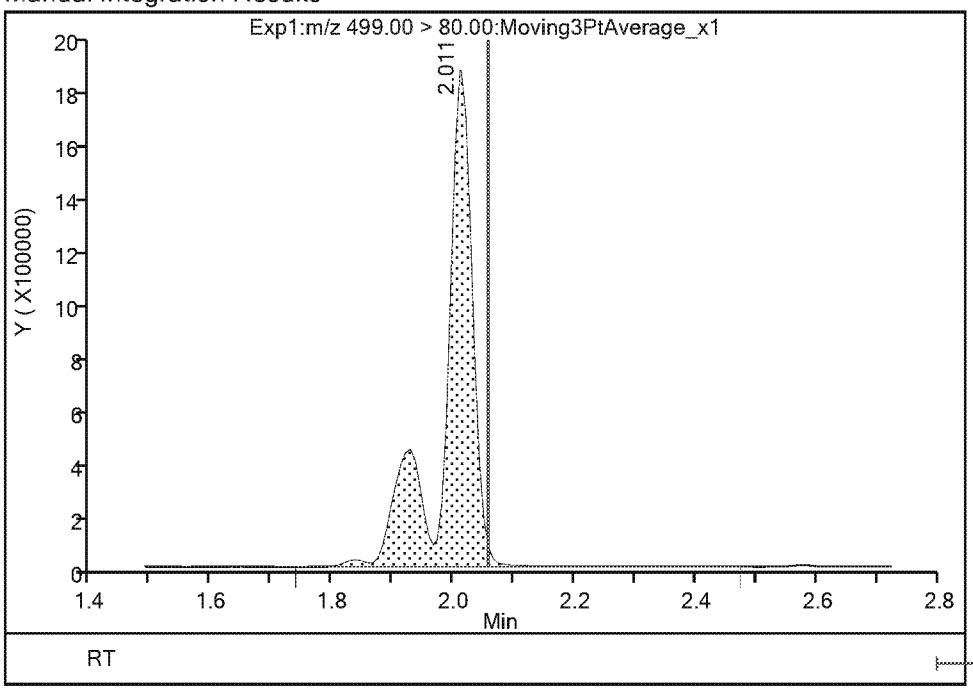
Processing Integration Results

Not Detected
Expected RT: 2.06



Manual Integration Results

RT: 2.01
Area: 5787199
Amount: 61.083873
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 24-Jul-2018 10:29:55
Audit Action: Assigned Compound ID Audit Reason: Peak assignment corrected

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-41073-1
SDG No.:
Client Sample ID: C0B54 MSD
Lab Sample ID: 320-41073-6 MSD
Matrix: Water
Lab File ID: 2018.07.23_537B_050.d
Analysis Method: 537 DW
Date Collected: 07/11/2018 09:50
Extraction Method: 537 DW
Date Extracted: 07/17/2018 08:29
Sample wt/vol: 250(mL)
Date Analyzed: 07/24/2018 06:49
Con. Extract Vol.: 1.00(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 235790
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctane sulfonic acid	215		40	6.8
335-67-1	Perfluorooctanoic acid	102		20	2.8
375-95-1	Perfluorononanoic acid	99.5		20	8.0
355-46-4	Perfluorohexanesulfonic acid	161		30	5.5
375-85-9	Perfluoroheptanoic acid	45.1		10	1.9
375-73-5	Perfluorobutanesulfonic acid	439		90	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	80		70-130
STL00996	13C2 PFDA	94		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_050.d
Lims ID: 320-41073-A-6-C MSD
Client ID: C0B54
Sample Type: MSD
Inject. Date: 24-Jul-2018 06:49:50 ALS Bottle#: 38 Worklist Smp#: 48
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-41073-a-6-c msd
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 24-Jul-2018 10:51:36 Calib Date: 21-Jul-2018 12:45:07
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180721-61414.b\2018.07.21_537CURVE_008.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: Ex. 4 CBI Date: 24-Jul-2018 10:30:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.343	1.350	-0.007	1.000	15209636	109.8		2799	
298.90 > 99.00	1.343	1.350	-0.007	1.000	10346020		1.47(0.00-0.00)	3199	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.464	1.464	0.0	1.000	1214746	8.01		13960	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.593	1.593	0.0	1.000	8094759	40.2		2666	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.601	1.601	0.0	1.000	1675355	11.3		98.1	
* 6 13C2-PFOA									
415.00 > 370.00	1.760	1.768	-0.008		1408973	10.0		12476	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.768	1.768	0.0	1.000	3856054	25.4		418	
413.00 > 169.00	1.768	1.768	0.0	1.000	2071991		1.86(0.00-0.00)	5005	
* 7 13C4 PFOS									
503.00 > 80.00	2.003	2.003	0.0		3375528	28.7		3413	
9 Perfluorononanoic acid									
463.00 > 419.00	2.018	2.018	0.0	1.000	2776892	24.9		125	
8 Perfluorooctane sulfonic acid									a
499.00 > 80.00	2.003	2.056	-0.053	1.000	6733891	53.7		2413	a
499.00 > 99.00	2.003	2.056	-0.053	1.000	1454186		4.63(0.00-0.00)	1188	
$ 10 13C2 PFDA									
515.00 > 470.00	2.215	2.215	0.0	1.000	921859	9.41		8684	

QC Flag Legend

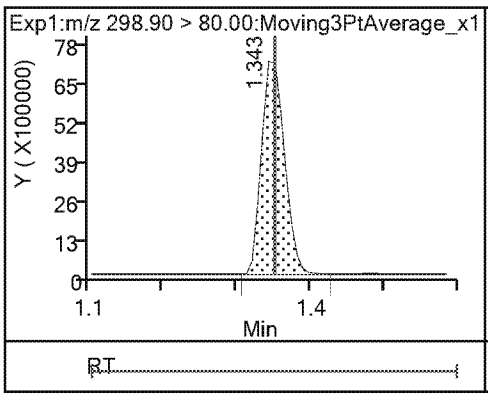
Review Flags

a - User Assigned ID

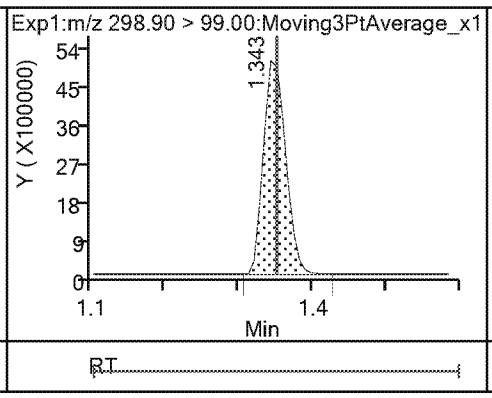
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_050.d
Injection Date: 24-Jul-2018 06:49:50 Instrument ID: A8_N
Lims ID: 320-41073-A-6-C MSD
Client ID: C0B54
Operator ID: SACINSTLCMS01 ALS Bottle#: 38 Worklist Smp#: 48
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL

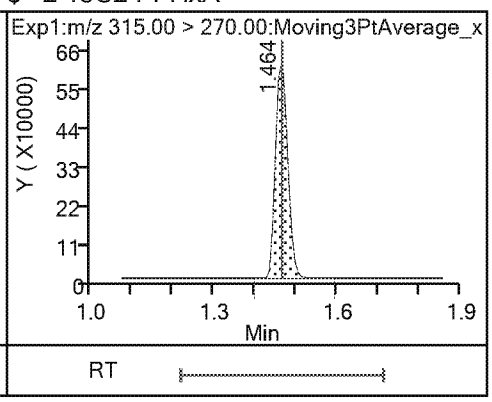
1 Perfluorobutanesulfonic acid



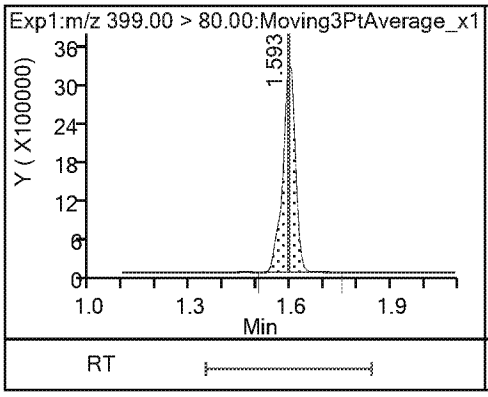
1 Perfluorobutanesulfonic acid



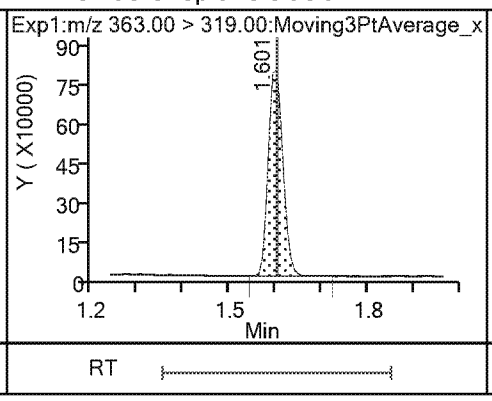
$ 2 13C2 PFHxA



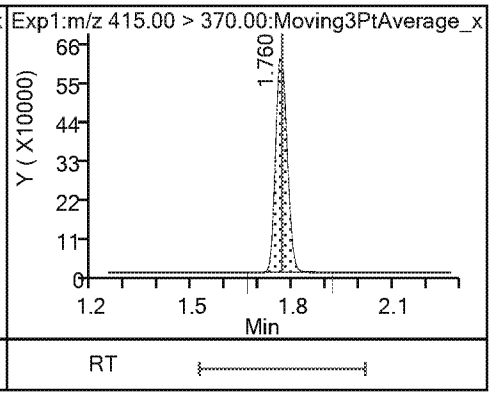
3 Perfluorohexanesulfonic acid



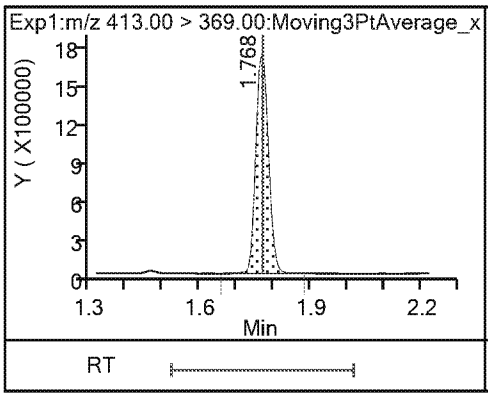
4 Perfluoroheptanoic acid



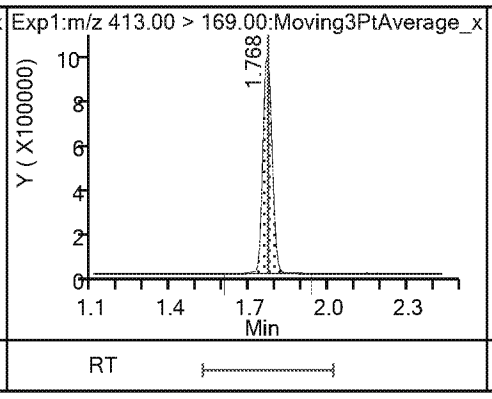
* 6 13C2-PFOA



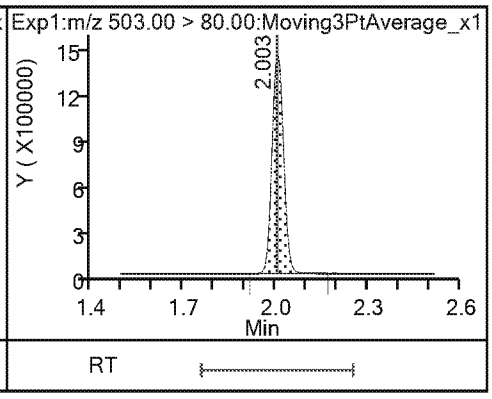
5 Perfluorooctanoic acid



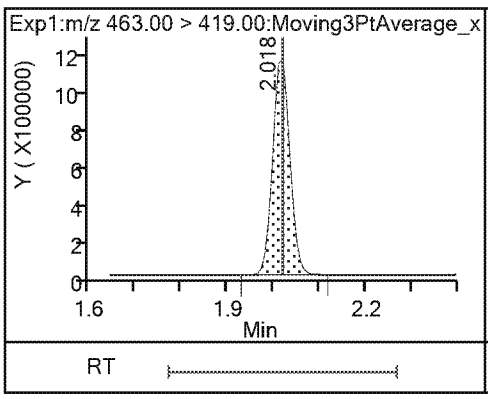
5 Perfluorooctanoic acid



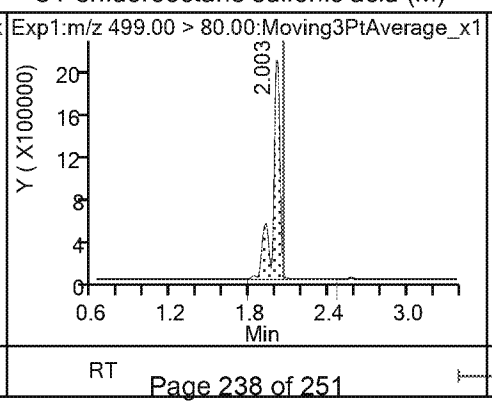
* 7 13C4 PFOS



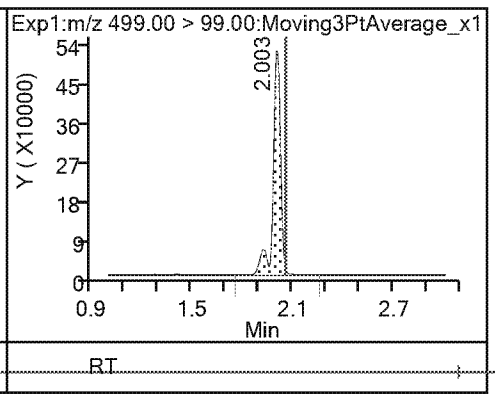
9 Perfluorononanoic acid



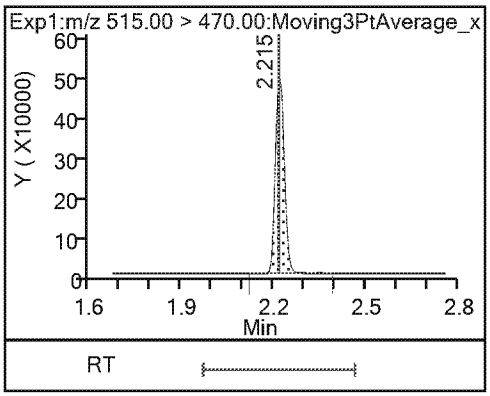
8 Perfluorooctane sulfonic acid (M)



8 Perfluorooctane sulfonic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
Y (X10000)
60
50
40
30
20
10
0
2.215
1.6
1.9
2.2
2.5
2.8
Min
RT

TestAmerica Sacramento

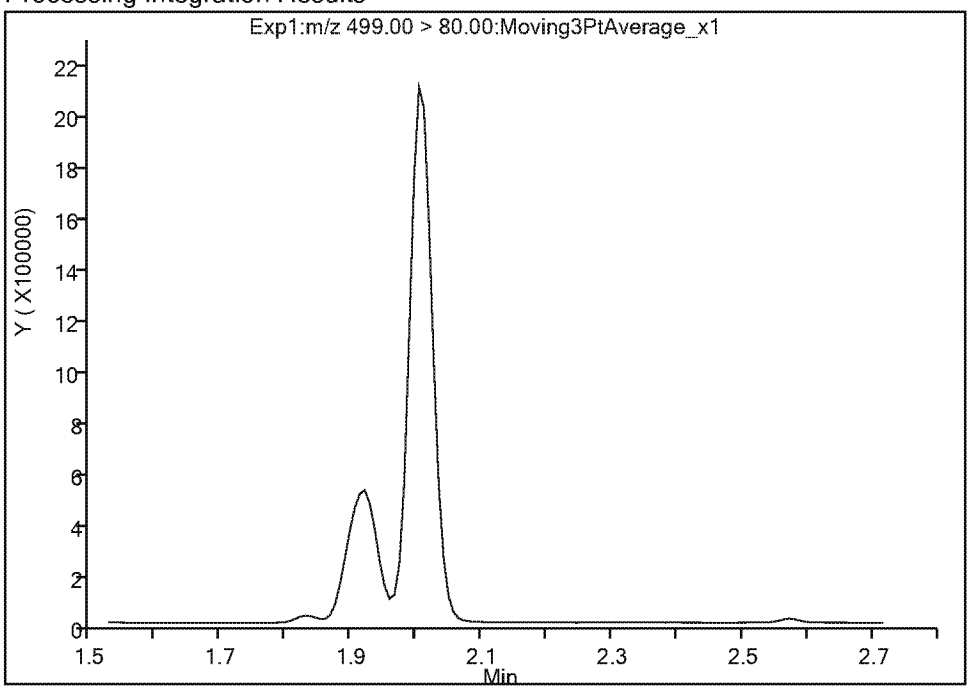
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180724-61536.b\2018.07.23_537B_050.d				
Injection Date:	24-Jul-2018 06:49:50	Instrument ID:	A8_N		
Lims ID:	320-41073-A-6-C MSD				
Client ID:	C0B54				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	38	Worklist Smp#:	48
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

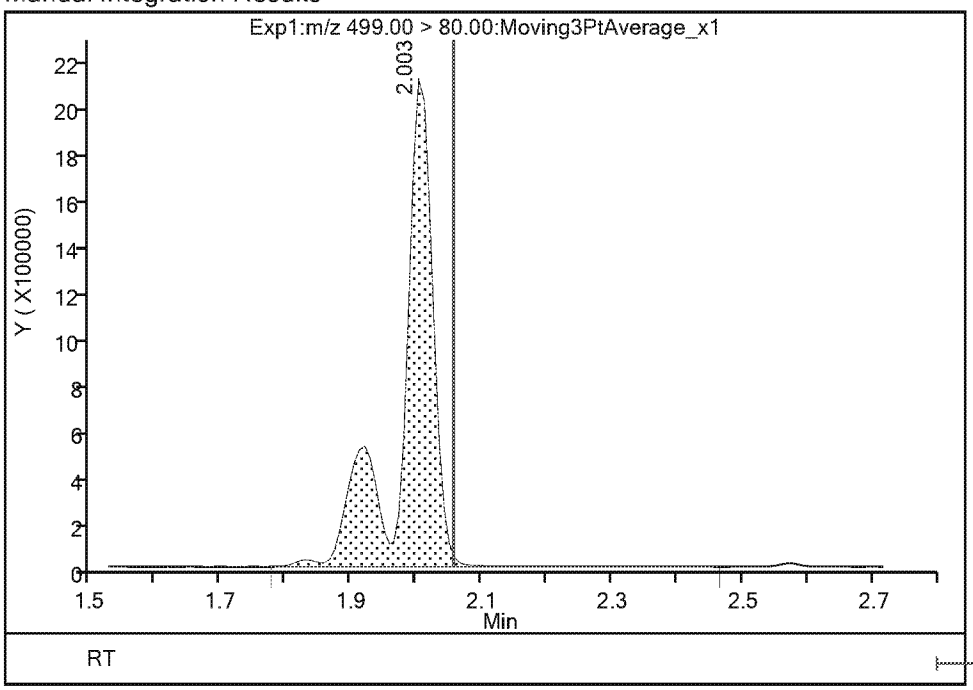
Processing Integration Results

Not Detected
Expected RT: 2.06



Manual Integration Results

RT: 2.00
Area: 6733891
Amount: 53.712067
Amount Units: ng/ml



Reviewer: Ex. 4 CBI 24-Jul-2018 10:30:20
Audit Action: Assigned Compound ID Audit Reason: Peak assignment corrected

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Instrument ID: A8_N Start Date: 07/21/2018 12:21

Analysis Batch Number: 235370 End Date: 07/21/2018 13:03

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-235370/3		07/21/2018 12:21	1	2018.07.21_537CURVE_003.d	GeminiC18 3x100 3(mm)
IC 320-235370/4		07/21/2018 12:26	1	2018.07.21_537CURVE_004.d	GeminiC18 3x100 3(mm)
IC 320-235370/5		07/21/2018 12:31	1	2018.07.21_537CURVE_005.d	GeminiC18 3x100 3(mm)
IC 320-235370/6 ICISAV		07/21/2018 12:35	1	2018.07.21_537CURVE_006.d	GeminiC18 3x100 3(mm)
IC 320-235370/7		07/21/2018 12:40	1	2018.07.21_537CURVE_007.d	GeminiC18 3x100 3(mm)
IC 320-235370/8		07/21/2018 12:45	1	2018.07.21_537CURVE_008.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/21/2018 12:49	1		GeminiC18 3x100 3(mm)
CCVL 320-235370/11		07/21/2018 12:54	1	2018.07.21_537CURVE_010.d	GeminiC18 3x100 3(mm)
ICB 320-235370/12		07/21/2018 12:59	1		GeminiC18 3x100 3(mm)
ICV 320-235370/13		07/21/2018 13:03	1	2018.07.21_537CURVE_012.d	GeminiC18 3x100 3(mm)

537 DW

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Instrument ID: A8_N Start Date: 07/23/2018 12:06

Analysis Batch Number: 235585 End Date: 07/23/2018 12:25

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-235585/2		07/23/2018 12:06	1	2018.07.23_537A_004.d	GeminiC18 3x100 3(mm)
CCVIS 320-235585/3		07/23/2018 12:11	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/23/2018 12:16	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/23/2018 12:20	10		GeminiC18 3x100 3(mm)
CCVIS 320-235585/6		07/23/2018 12:25	1		GeminiC18 3x100 3(mm)

537 DW

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Instrument ID: A8_N Start Date: 07/24/2018 04:43

Analysis Batch Number: 235786 End Date: 07/24/2018 05:39

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-235786/21 CCVIS		07/24/2018 04:43	1	2018.07.23_537B_023.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/24/2018 04:48	1		GeminiC18 3x100 3(mm)
MB 320-234427/1-A		07/24/2018 04:52	1	2018.07.23_537B_025.d	GeminiC18 3x100 3(mm)
LCS 320-234427/2-A		07/24/2018 04:57	1	2018.07.23_537B_026.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/24/2018 05:02	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/24/2018 05:07	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/24/2018 05:11	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/24/2018 05:16	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/24/2018 05:21	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/24/2018 05:25	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/24/2018 05:30	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/24/2018 05:35	1		GeminiC18 3x100 3(mm)
CCV 320-235786/33 CCVIS		07/24/2018 05:39	1	2018.07.23_537B_035.d	GeminiC18 3x100 3(mm)

537 DW

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Instrument ID: A8_N Start Date: 07/24/2018 05:39

Analysis Batch Number: 235788 End Date: 07/24/2018 06:35

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-235788/33 CCVIS		07/24/2018 05:39	1	2018.07.23_537B_035.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/24/2018 05:44	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/24/2018 05:49	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/24/2018 05:53	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/24/2018 05:58	1		GeminiC18 3x100 3(mm)
ZZZZZ		07/24/2018 06:03	1		GeminiC18 3x100 3(mm)
320-41073-1		07/24/2018 06:07	1	2018.07.23_537B_041.d	GeminiC18 3x100 3(mm)
320-41073-2		07/24/2018 06:12	1	2018.07.23_537B_042.d	GeminiC18 3x100 3(mm)
320-41073-3		07/24/2018 06:17	1	2018.07.23_537B_043.d	GeminiC18 3x100 3(mm)
320-41073-4		07/24/2018 06:21	1	2018.07.23_537B_044.d	GeminiC18 3x100 3(mm)
320-41073-5		07/24/2018 06:26	1	2018.07.23_537B_045.d	GeminiC18 3x100 3(mm)
320-41073-6		07/24/2018 06:31	1	2018.07.23_537B_046.d	GeminiC18 3x100 3(mm)
CCV 320-235788/45 CCVIS		07/24/2018 06:35	1	2018.07.23_537B_047.d	GeminiC18 3x100 3(mm)

537 DW

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Instrument ID: A8_N Start Date: 07/24/2018 06:35

Analysis Batch Number: 235790 End Date: 07/24/2018 06:54

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-235790/45 CCVIS		07/24/2018 06:35	1	2018.07.23_537B_047.d	GeminiC18 3x100 3(mm)
ZZZZZ		07/24/2018 06:40	1		GeminiC18 3x100 3(mm)
320-41073-6 MS		07/24/2018 06:45	1	2018.07.23_537B_049.d	GeminiC18 3x100 3(mm)
320-41073-6 MSD		07/24/2018 06:49	1	2018.07.23_537B_050.d	GeminiC18 3x100 3(mm)
CCV 320-235790/49		07/24/2018 06:54	1	2018.07.23_537B_051.d	GeminiC18 3x100 3(mm)

537 DW

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Batch Number: 234427 Batch Start Date: 07/17/18 07:23 Batch Analyst: Ex. 4 CBI

Batch Method: 537 DW Batch End Date: 07/18/18 16:40

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-HSP 00029
MB 320-234427/1		537 DW, 537 DW				250 mL	1.00 mL	7 SU	
LCS 320-234427/2		537 DW, 537 DW				250 mL	1.00 mL	7 SU	100 uL
320-41073-A-1	C0B49	537 DW, 537 DW	T	276.73 g	28.06 g	248.7 mL	1.00 mL	7 SU	
320-41073-A-2	C0B50	537 DW, 537 DW	T	287.09 g	29.60 g	257.5 mL	1.00 mL	7 SU	
320-41073-A-3	C0B51	537 DW, 537 DW	T	282.25 g	28.24 g	254 mL	1.00 mL	7 SU	
320-41073-A-4	C0B52	537 DW, 537 DW	T	286.94 g	28.51 g	258.4 mL	1.00 mL	7 SU	
320-41073-A-5	C0B53	537 DW, 537 DW	T	291.97 g	28.53 g	263.4 mL	1.00 mL	7 SU	
320-41073-A-6	C0B54	537 DW, 537 DW	T	287.74 g	28.30 g	259.4 mL	1.00 mL	7 SU	
320-41073-A-6 MS	C0B54	537 DW, 537 DW	T	289.94 g	28.97 g	261 mL	1.00 mL	7 SU	100 uL
320-41073-A-6 MSD	C0B54	537 DW, 537 DW	T	279.17 g	29.19 g	250 mL	1.00 mL	7 SU	100 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00076	LC537-SU 00073	AnalysisComment			
MB 320-234427/1		537 DW, 537 DW		100 uL	100 uL	Chlorine, ND			
LCS 320-234427/2		537 DW, 537 DW		100 uL	100 uL	Chlorine, ND			
320-41073-A-1	C0B49	537 DW, 537 DW	T	100 uL	100 uL	Chlorine, ND			
320-41073-A-2	C0B50	537 DW, 537 DW	T	100 uL	100 uL	Chlorine, ND			
320-41073-A-3	C0B51	537 DW, 537 DW	T	100 uL	100 uL	Chlorine, ND			
320-41073-A-4	C0B52	537 DW, 537 DW	T	100 uL	100 uL	Chlorine, ND			
320-41073-A-5	C0B53	537 DW, 537 DW	T	100 uL	100 uL	Chlorine, ND			
320-41073-A-6	C0B54	537 DW, 537 DW	T	100 uL	100 uL	Chlorine, ND			
320-41073-A-6 MS	C0B54	537 DW, 537 DW	T	100 uL	100 uL	Chlorine, ND			

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

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41073-1

SDG No.:

Batch Number: 234427 Batch Start Date: 07/17/18 07:23 Batch Analyst: Ex. 4 CBI

Batch Method: 537 DW Batch End Date: 07/18/18 16:40

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00076	LC537-SU 00073	AnalysisComment			
320-41073-A-6 MSD	C0B54	537 DW, 537 DW	T	100 uL	100 uL	Chlorine, ND, The following sample was observed to be a yellow color prior to extraction.			

Batch Notes	
Analyst ID - Aliquot Step	SKD
Batch Comment	Client labels match TA label, SKD 07/17/18
Analyst ID - Concentration	SKD
Analyst ID - Final Volume Step	SKD
Internal Standard ID#	1303557
Manifold ID	1, 3
Methanol ID	1300515
pH Indicator ID	1718
Pipette ID	R40536G, N32728F
Analyst ID - IS Reagent Drop	SKD
Analyst ID - IS Reagent Drop Witness	TWL
Analyst ID - SU Reagent Drop	SKD
Analyst ID - SU Reagent Drop Witness	HJA
Analyst ID - TA Reagent Drop	SKD
Analyst ID - TA Reagent Drop Witness	HJA
SPE Cartridge Lot ID	6390138-03
Trizma ID	SLBR5241V
Reagent Water ID	07/16/18

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.

Shipping and Receiving Documents

USEPA CLP COC (LAB

DateShipped: 7/11/2018

CarrierName: FedEx

AirBillNo: 772680624874

~~328-41673 Chain of Custody~~

CHAIN OF CUSTODY RECORD

DAS #: R35365

No: 3-071118-125722-0027

Lab: TestAmerica Laboratories, Inc. - Sacremento

Lab Contact: Ex. 4 CBI

Lab Phone: 916-374-4383

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	For Lab Use Only
PMW-07112018-FRB-0209	C0B49	Aqueous Blank/ START	Grab	PFCs(14 day)	1646 (trizma), 1647 (trizma) (2)	0209	07/11/2018 09:00	
PMW-07112018-FRB-0209D	C0B50	Aqueous Blank/ START	Grab	PFCs(14 day)	1648 (trizma), 1649 (trizma) (2)	0209	07/11/2018 09:00	
PMW-07112018-FRB-0323	C0B51	Aqueous Blank/ START	Grab	PFCs(14 day)	1650 (trizma), 1651 (trizma) (2)	0323	07/11/2018 09:50	
PMW-07112018-RW-0209	C0B52	Potable Water/ START	Grab	PFCs(14 day)	1652 (trizma), 1653 (trizma) (2)	0209	07/11/2018 09:00	
PMW-07112018-RW-0209D	C0B53	Potable Water/ START	Grab	PFCs(14 day)	1654 (trizma), 1655 (trizma) (2)	0209	07/11/2018 09:00	
PMW-07112018-RW-0323	C0B54	Potable Water/ START	Grab	PFCs(14 day)	1656 (trizma), 1657 (trizma), 1658 (trizma), 1659 (trizma), 1660 (trizma), 1661 (trizma) (6)	0323	07/11/2018 09:50	

Ex. 4 CBI

Sample(s) to be used for Lab QC: PMW-07112018-RW-0323 Tag 1658, PMW-07112018-RW-0323 Tag 1659, PMW-07112018-RW-0323 Tag 1660, PMW-07112018-RW-0323 Tag 1661 - Special Instructions: 14-day TAT for preliminary results/21 day TAT hard copy data package.

C0B49 is FRB for C0B52, C0B50 is FRB for C0B53, C0B51 is FRB for C0B54.

Shipment for Case Complete? N

Samples Transferred From Chain of Custody #

Analysis Key: PFCs=PFCs

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
All Samples for Analysis	Ex. 4 CBI Western Editions	7/11/18 1400	Ex. 4 CBI	7-12-18 900	1.5°C

Login Sample Receipt Checklist

Client: Weston Solutions, Inc.

Job Number: 320-41073-1

Login Number: 41073
List Number: 1
Creator: Ex. 4 CBI

List Source: TestAmerica Sacramento

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

SAMPLE LOG-IN SHEET
FORM DC-1

Lab Name	TestAmerica Sacramento			Page 1 of 1
Received By (Print Name)	Ex. 4 CBI			Log - in Date
				7/12/2018
Received By (Signature)	Ex. 4 CBI			
Case Number	R35365	Sample Delivery Group No.	C0B49	Mod. Ref. No.

Remarks:		EPA Sample #	Corresponding Sample Tag #	Corresponding Assigned Lab #	Remarks: Condition of Sample Shipment, etc.
1. Custody Seal (s)	Present	C0B49	1646, 1647	320-41073-1	
2. Custody Seal Nos.	Intact N/A	C0B50	1648, 1649	320-41073-2	
3. Traffic Reports/ Chain of Custody Records (TR/COCs) or Packing Lists	Present	C0B41	1650, 1651	320-41073-3	
		C0B52	1652, 1653	320-41073-4	
4. Airbill	Present Sticker	C0B53	1654, 1655	320-41073-5	
5. Airbill No.	772680624874	C0B54	1656, 1657	320-41073-6	
6. Sample Tags Sample Tags Numbers	Absent Listed on COC	C0B54	1658, 1659	320-41073-6MS	
		C0B54	1660, 1661	320-41073-6MSD	
7. Sample Condition	Intact				
8. Cooler Temperature Indicator Bottle	Absent				
9. Cooler Temperature	1.5 °C				
10. Does information on TR/COCs and sample tags agree?	Yes				
11. Date Received at Laboratory	7/12/2018				
12. Time Received	9:00				

Sample Transfer			
Fraction	SVOA/SVSIM/PEST/ARO	Fraction	TVOA/TVSIM
Area #	Walk-in	Area #	
By	KN	By	
On	7/12/2018	On	

* Contact SMO and attach record of resolution.

Reviewed By	Ex. 4 CBI	Logbook No.	
Date	11/7/18	Logbook Page No.	

SOM01.2 (4/2007)