



ANALYTICAL REPORT

Job Number: 320-38875-1

Job Description: Brunswick GWETS

For:

Tetra Tech, Inc. Foster Plaza VII 661 Anderson Drive Foster Plaza 7 Pittsburgh, PA 15220

Attention: Jeff Orient

Approved for release David R Alltucker Project Manager I 6/5/2018 3:02 PM

David R Alltucker, Project Manager I 880 Riverside Parkway, West Sacramento, CA, 95605 (916)374-4383 david.alltucker@testamericainc.com 06/05/2018



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Definitions/Glossary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-38875-1 Project/Site: Brunswick GWETS

Qualifiers

LCMS

Qualifier	Qualifier Description
M	Manual integrated compound.
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
E	Result exceeded calibration range.
D	The reported value is from a dilution.

Glossany

Glossary	
Abbreviation	These commonly used abbreviations may or may not be present in this report.
n 0/ D	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job Narrative 320-38875-1

Receipt

The samples were received on 5/4/2018 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 7.1° C.

Receipt Exceptions

The following samples were received at the laboratory outside the required temperature criteria at 7.1C, but under method 537's requirement that samples be received by the laboratory at 10.0° C or less. TP-PFC-029-TPI (320-38875-1), TP-PFC-029-MIDCARBON (320-38875-2), TP-PFC-029-TPE (320-38875-3) and TP-PFC-029-TPE-D (320-38875-4). The cooler was received with melted ice.

I CMS

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

Method(s) EPA 537 (Mod): The Isotope Dilution Analyte (IDA) recovery associated with the following sample is below the method recommended limit for 13C4 PFOS and 18O2 PFHxS: (320-38935-A-32-B MS). Matrix interference is suspected because these samples were diluted due to high target analytes and the IDA recoveries in the analysis of the diluted extract were within method recommended limits. Both sets of data have been reported. Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample.

Method(s) EPA 537 (Mod): The concentration of several analytes associated with the following samples exceeded the instrument calibration range: TP-PFC-029-TPI (320-38875-1). These analytes have been qualified; however, the peaks did not saturate the instrument detector. The samples were diluted to bring the concentrations of these analytes within the instrument calibration range and both sets of data have been reported.

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

Organic Prep

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

Detection Summary

Project/Site: Brunswick GWETS

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-38875-1

Client Sample ID: TP-PFC-029-TPI

Lab Sample	ID: 320-38875-1
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Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	74	M	1.7	0.51	ng/L		_	EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	200	M	1.7	0.37	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	360	EM	1.7	0.40	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	76	M	1.7	0.52	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1500	E	1.7	0.46	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	2.4		1.7	0.45	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.82	JM	1.7	0.41	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	49	M	1.7	0.40	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	400	E	1.7	0.33	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	7.7		1.7	0.32	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	330	E	3.4	0.95	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanoic acid (PFBA) - DL	81	D	17	5.1	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA) - DL	200	D	17	3.7	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	380	D	17	4.0	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	73	D	17	5.2	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	1700	D	17	4.6	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	50	D	17	4.0	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	410	D	17	3.3	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS) - DL	8.7	JD	17	3.2	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	330	D	34	9.5	ng/L	10		EPA 537 (Mod)	Total/NA

Client Sample ID: TP-PFC-029-MIDCARBON

Lab Sample ID: 320-38875-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	130		1.7	0.50	ng/L		_	EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	240	M	1.7	0.37	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	160	M	1.7	0.40	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.8		1.7	0.52	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	39	M	1.7	0.46	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	5.5		1.7	0.39	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.5		1.7	0.32	na/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: TP-PFC-029-TPE

Lab Sample ID: 320-38875-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	130		1.8	0.54	ng/L	1	_	EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	190	M	1.8	0.39	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	78		1.8	0.43	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.3	J	1.8	0.56	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	2.6	M	1.8	0.49	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.4	J	1.8	0.42	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.68	J	1.8	0.35	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.6	J M	3.7	1.0	ng/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: TP-PFC-029-TPE-D

Lab Sample ID: 320-38875-4

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Detection Summary

Client: Tetra Tech, Inc.

Project/Site: Brunswick GWETS

TestAmerica Job ID: 320-38875-1

Client Sample ID: TP-PFC-029-TPE-D (Continued)

Lab Sam	ple I	D: 32	0-388	75-4
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Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	130		1.9	0.56	ng/L		_	EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	190	M	1.9	0.41	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	80		1.9	0.44	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.0		1.9	0.58	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	3.5	M	1.9	0.51	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	2.2		1.9	0.44	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	7.0		1.9	0.36	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	9.2		3.8	1.0	ng/L	1		EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-38875-1

Project/Site: Brunswick GWETS

Perfluorododecanoic acid (PFDoA)

Perfluorotridecanoic Acid (PFTriA)

Perfluorotetradecanoic acid (PFTeA)

Client Sample ID: TP-PFC-029-TPI Lab Sample ID: 320-38875-1

Date Collected: 05/03/18 09:20 Matrix: Water Date Received: 05/04/18 09:30

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	74	M	1.7	0.51	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluoropentanoic acid (PFPeA)	200	M	1.7	0.37	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluorohexanoic acid (PFHxA)	360	EM	1.7	0.40	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluoroheptanoic acid (PFHpA)	76	M	1.7	0.52	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluorooctanoic acid (PFOA)	1500	E	1.7	0.46	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluorononanoic acid (PFNA)	2.4		1.7	0.45	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluorodecanoic acid (PFDA)	0.82	JM	1.7	0.41	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluoroundecanoic acid (PFUnA)	1.3	U M	1.7	0.62	ng/L		05/16/18 14:51	05/28/18 07:39	
Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	0.45	ng/L		05/16/18 14:51	05/28/18 07:39	
Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.4	0.65	ng/L		05/16/18 14:51	05/28/18 07:39	
Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.4	0.71	ng/L		05/16/18 14:51	05/28/18 07:39	
Perfluorobutanesulfonic acid (PFBS)	49	M	1.7	0.40	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluorohexanesulfonic acid (PFHxS)	400	E	1.7	0.33	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluoroheptanesulfonic Acid (PFHpS)	7.7		1.7	0.32	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluorooctanesulfonic acid (PFOS)	330	E	3.4	0.95	ng/L		05/16/18 14:51	05/28/18 07:39	•
Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	0.48	ng/L		05/16/18 14:51	05/28/18 07:39	
Perfluorooctane Sulfonamide (FOSA)	2.6	UM	3.4	1.1	ng/L		05/16/18 14:51	05/28/18 07:39	
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
13C8 FOSA	81		50 - 150				05/16/18 14:51	05/28/18 07:39	
13C4 PFBA	83		50 - 150				05/16/18 14:51	05/28/18 07:39	
13C5 PFPeA	97		50 - 150				05/16/18 14:51	05/28/18 07:39	
13C2 PFHxA	95		50 - 150				05/16/18 14:51	05/28/18 07:39	
13C4-PFHpA	91		50 - 150				05/16/18 14:51	05/28/18 07:39	
13C4 PFOA	85		50 - 150				05/16/18 14:51	05/28/18 07:39	
13C5 PFNA	102		50 - 150				05/16/18 14:51	05/28/18 07:39	
13C2 PFDA	96		50 - 150				05/16/18 14:51	05/28/18 07:39	
13C2 PFUnA	101		50 - 150				05/16/18 14:51	05/28/18 07:39	
13C2 PFDoA	89		50 - 150				05/16/18 14:51	05/28/18 07:39	
18O2 PFHxS	89		50 - 150				05/16/18 14:51	05/28/18 07:39	
13C2-PFTeDA	79		50 - 150				05/16/18 14:51	05/28/18 07:39	
13C4 PFOS	87		50 - 150				05/16/18 14:51	05/28/18 07:39	
13C3-PFBS	95		50 - 150				05/16/18 14:51	05/28/18 07:39	•
Method: EPA 537 (Mod) - PFA				DI	l lm:4		Prepared	Analysed	Dil Fo
Analyte Perfluorobutanoic acid (PFBA)	81	Qualifier	LOQ		Unit ng/L	D	05/16/18 14:51	Analyzed 05/29/18 00:09	Dil Fac
•			17		ng/L				10
Perfluoropentanoic acid (PFPeA)	200		17		•		05/16/18 14:51 05/16/18 14:51		10
Perfluorohexanoic acid (PFHxA)	380				ng/L				
Perfluoroheptanoic acid (PFHpA)	73		17		ng/L			05/29/18 00:09	10
Perfluorooctanoic acid (PFOA)	1700		17		ng/L			05/29/18 00:09	10
Perfluorononanoic acid (PFNA)	13		17		ng/L			05/29/18 00:09	10
Perfluorodecanoic acid (PFDA)	8.6		17		ng/L			05/29/18 00:09	10
Perfluoroundecanoic acid (PFUnA)	13	U	17	6.2	ng/L		05/16/18 14:51	05/29/18 00:09	10

10

10

10

05/16/18 14:51 05/29/18 00:09

05/16/18 14:51 05/29/18 00:09

05/16/18 14:51 05/29/18 00:09

17

34

34

4.5 ng/L

6.5 ng/L

7.1 ng/L

13 U

26 U

26 U

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-38875-1

Project/Site: Brunswick GWETS

Client Sample ID: TP-PFC-029-TPI

Lab Sample ID: 320-38875-1

Date Collected: 05/03/18 09:20 **Matrix: Water** Date Received: 05/04/18 09:30

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	50	D	17	4.0	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluorohexanesulfonic acid (PFHxS)	410	D	17	3.3	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluoroheptanesulfonic Acid (PFHpS)	8.7	J D	17	3.2	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluorooctanesulfonic acid (PFOS)	330	D	34	9.5	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluorodecanesulfonic acid (PFDS)	13	U	17	4.8	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluorooctane Sulfonamide (FOSA)	26	U	34	11	ng/L		05/16/18 14:51	05/29/18 00:09	10
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	73		50 - 150				05/16/18 14:51	05/29/18 00:09	10
13C4 PFBA	78		50 - 150				05/16/18 14:51	05/29/18 00:09	10
13C5 PFPeA	84		50 - 150				05/16/18 14:51	05/29/18 00:09	10
13C2 PFHxA	81		50 - 150				05/16/18 14:51	05/29/18 00:09	10
13C4-PFHpA	81		50 - 150				05/16/18 14:51	05/29/18 00:09	10
13C4 PFOA	87		50 - 150				05/16/18 14:51	05/29/18 00:09	10
13C5 PFNA	86		50 - 150				05/16/18 14:51	05/29/18 00:09	10
13C2 PFDA	83		50 - 150				05/16/18 14:51	05/29/18 00:09	10
13C2 PFUnA	90		50 - 150				05/16/18 14:51	05/29/18 00:09	10
13C2 PFDoA	87		50 - 150				05/16/18 14:51	05/29/18 00:09	10
1802 PFHxS	80		50 - 150				05/16/18 14:51	05/29/18 00:09	10
13C2-PFTeDA	69		50 - 150				05/16/18 14:51	05/29/18 00:09	10
13C4 PFOS	75		50 - 150				05/16/18 14:51	05/29/18 00:09	10
13C3-PFBS	76		50 ₋ 150				05/16/18 14:51	05/29/18 00:09	10

Client Sample ID: TP-PFC-029-MIDCARBON

Lab Sample ID: 320-38875-2 Date Collected: 05/03/18 09:25 **Matrix: Water** Date Received: 05/04/18 09:30

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	130		1.7	0.50	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluoropentanoic acid (PFPeA)	240	M	1.7	0.37	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorohexanoic acid (PFHxA)	160	M	1.7	0.40	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluoroheptanoic acid (PFHpA)	6.8		1.7	0.52	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorooctanoic acid (PFOA)	39	M	1.7	0.46	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorononanoic acid (PFNA)	1.3	U	1.7	0.44	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorodecanoic acid (PFDA)	0.85	U	1.7	0.41	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	0.61	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	0.44	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.4	0.65	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.4	0.71	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorobutanesulfonic acid (PFBS)	5.5		1.7	0.39	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorohexanesulfonic acid (PFHxS)	2.5		1.7	0.32	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.85	U	1.7	0.32	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorooctanesulfonic acid (PFOS)	2.6	U M	3.4	0.94	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	0.48	ng/L		05/16/18 14:51	05/28/18 07:47	1

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-38875-1

Project/Site: Brunswick GWETS

Client Sample ID: TP-PFC-029-MIDCARBON

Lab Sample ID: 320-38875-2 Date Collected: 05/03/18 09:25 **Matrix: Water**

Date Received: 05/04/18 09:30

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctane Sulfonamide (FOSA)	2.6	U	3.4	1.1	ng/L		05/16/18 14:51	05/28/18 07:47	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	67		50 - 150				05/16/18 14:51	05/28/18 07:47	1
13C4 PFBA	73		50 - 150				05/16/18 14:51	05/28/18 07:47	1
13C5 PFPeA	76		50 - 150				05/16/18 14:51	05/28/18 07:47	1
13C2 PFHxA	78		50 - 150				05/16/18 14:51	05/28/18 07:47	1
13C4-PFHpA	75		50 - 150				05/16/18 14:51	05/28/18 07:47	1
13C4 PFOA	78		50 - 150				05/16/18 14:51	05/28/18 07:47	1
13C5 PFNA	82		50 - 150				05/16/18 14:51	05/28/18 07:47	1
13C2 PFDA	77		50 - 150				05/16/18 14:51	05/28/18 07:47	1
13C2 PFUnA	74		50 - 150				05/16/18 14:51	05/28/18 07:47	1
13C2 PFDoA	66		50 - 150				05/16/18 14:51	05/28/18 07:47	1
1802 PFHxS	77		50 - 150				05/16/18 14:51	05/28/18 07:47	1
13C2-PFTeDA	60		50 - 150				05/16/18 14:51	05/28/18 07:47	1
13C4 PFOS	73		50 - 150				05/16/18 14:51	05/28/18 07:47	1
13C3-PFBS	72		50 - 150				05/16/18 14:51	05/28/18 07:47	1

Client Sample ID: TP-PFC-029-TPE

Lab Sample ID: 320-38875-3 Date Collected: 05/03/18 09:30 **Matrix: Water**

Date Received: 05/04/18 09:30

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	130		1.8	0.54	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluoropentanoic acid (PFPeA)	190	M	1.8	0.39	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorohexanoic acid (PFHxA)	78		1.8	0.43	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluoroheptanoic acid (PFHpA)	1.3	J	1.8	0.56	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorooctanoic acid (PFOA)	2.6	M	1.8	0.49	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorononanoic acid (PFNA)	1.4	U	1.8	0.48	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorodecanoic acid (PFDA)	0.92	U	1.8	0.44	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluoroundecanoic acid (PFUnA)	1.4	U	1.8	0.66	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorododecanoic acid (PFDoA)	1.4	U	1.8	0.48	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorotridecanoic Acid (PFTriA)	2.7	U	3.7	0.70	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorotetradecanoic acid (PFTeA)	2.7	U	3.7	0.76	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorobutanesulfonic acid (PFBS)	1.4	J	1.8	0.42	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorohexanesulfonic acid (PFHxS)	0.68	J	1.8	0.35	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.92	U	1.8	0.34	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorooctanesulfonic acid (PFOS)	2.6	J M	3.7	1.0	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorodecanesulfonic acid (PFDS)	1.4	U	1.8	0.51	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorooctane Sulfonamide (FOSA)	2.7	U	3.7	1.2	ng/L		05/16/18 14:51	05/28/18 07:55	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	64		50 - 150				05/16/18 14:51	05/28/18 07:55	1
13C4 PFBA	72		50 - 150				05/16/18 14:51	05/28/18 07:55	1
13C5 PFPeA	76		50 - 150				05/16/18 14:51	05/28/18 07:55	1
13C2 PFHxA	74		50 - 150				05/16/18 14:51	05/28/18 07:55	1
13C4-PFHpA	74		50 ₋ 150				05/16/18 14:51	05/28/18 07:55	1

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-38875-1

Project/Site: Brunswick GWETS

Client Sample ID: TP-PFC-029-TPE Lab Sample ID: 320-38875-3

Date Collected: 05/03/18 09:30 Matrix: Water Date Received: 05/04/18 09:30

Isotope Dilution	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	79	50 - 150	05/16/18 14:51	05/28/18 07:55	1
13C5 PFNA	81	50 - 150	05/16/18 14:51	05/28/18 07:55	1
13C2 PFDA	72	50 - 150	05/16/18 14:51	05/28/18 07:55	1
13C2 PFUnA	78	50 - 150	05/16/18 14:51	05/28/18 07:55	1
13C2 PFDoA	69	50 - 150	05/16/18 14:51	05/28/18 07:55	1
1802 PFHxS	73	50 - 150	05/16/18 14:51	05/28/18 07:55	1
13C2-PFTeDA	60	50 - 150	05/16/18 14:51	05/28/18 07:55	1
13C4 PFOS	73	50 - 150	05/16/18 14:51	05/28/18 07:55	1
13C3-PFBS	72	50 - 150	05/16/18 14:51	05/28/18 07:55	1

Client Sample ID: TP-PFC-029-TPE-D Lab Sample ID: 320-38875-4

Date Collected: 05/03/18 00:00 Matrix: Water Date Received: 05/04/18 09:30

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	130		1.9	0.56	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluoropentanoic acid (PFPeA)	190	M	1.9	0.41	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorohexanoic acid (PFHxA)	80		1.9	0.44	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluoroheptanoic acid (PFHpA)	2.0		1.9	0.58	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorooctanoic acid (PFOA)	3.5	M	1.9	0.51	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorononanoic acid (PFNA)	1.4	U	1.9	0.49	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorodecanoic acid (PFDA)	0.95	U	1.9	0.45	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluoroundecanoic acid (PFUnA)	1.4	U	1.9	0.68	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorododecanoic acid (PFDoA)	1.4	U	1.9	0.49	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorotridecanoic Acid (PFTriA)	2.8	U	3.8	0.72	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorotetradecanoic acid (PFTeA)	2.8	U	3.8	0.79	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorobutanesulfonic acid (PFBS)	2.2		1.9	0.44	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorohexanesulfonic acid (PFHxS)	7.0		1.9	0.36	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.95	UM	1.9	0.35	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorooctanesulfonic acid (PFOS)	9.2		3.8	1.0	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorodecanesulfonic acid (PFDS)	1.4	U	1.9	0.53	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorooctane Sulfonamide (FOSA)	2.8	U	3.8	1.2	ng/L		05/16/18 14:51	05/28/18 08:02	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	67		50 - 150				05/16/18 14:51	05/28/18 08:02	1
13C4 PFBA	75		50 - 150				05/16/18 14:51	05/28/18 08:02	1
13C5 PFPeA	80		50 - 150				05/16/18 14:51	05/28/18 08:02	1
13C2 PFHxA	76		50 - 150				05/16/18 14:51	05/28/18 08:02	1
13C4-PFHpA	78		50 - 150				05/16/18 14:51	05/28/18 08:02	1
13C4 PFOA	84		50 - 150				05/16/18 14:51	05/28/18 08:02	1
13C5 PFNA	91		50 - 150				05/16/18 14:51	05/28/18 08:02	1
13C2 PFDA	79		50 - 150				05/16/18 14:51	05/28/18 08:02	1
13C2 PFUnA	86		50 - 150				05/16/18 14:51	05/28/18 08:02	1
13C2 PFDoA	76		50 - 150				05/16/18 14:51	05/28/18 08:02	1
1802 PFHxS	78		50 - 150				05/16/18 14:51	05/28/18 08:02	1
13C2-PFTeDA	70		50 ₋ 150				05/16/18 14:51	05/28/18 08:02	1

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-38875-1

Project/Site: Brunswick GWETS

Client Sample ID: TP-PFC-029-TPE-D Lab Sample ID: 320-38875-4

Date Collected: 05/03/18 00:00 Matrix: Water

Date Received: 05/04/18 09:30

Method: EPA 537 (Mod) - PFAS	S for QSM 5.1	1, Table B-15 (Cont	tinued)		
Isotope Dilution	%Recovery Q	Qualifier Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	78	50 - 150	05/16/18 14:51	05/28/18 08:02	1
13C3-PFBS	78	50 - 150	05/16/18 14:51	05/28/18 08:02	1

Default Detection Limits

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-38875-1

Project/Site: Brunswick GWETS

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Prep: 3535

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	2.0	0.46	ng/L	EPA 537 (Mod)
Perfluorobutanoic acid (PFBA)	2.0	0.59	ng/L	EPA 537 (Mod)
Perfluorodecanesulfonic acid (PFDS)	2.0	0.56	ng/L	EPA 537 (Mod)
Perfluorodecanoic acid (PFDA)	2.0	0.48	ng/L	EPA 537 (Mod)
Perfluorododecanoic acid (PFDoA)	2.0	0.52	ng/L	EPA 537 (Mod)
Perfluoroheptanesulfonic Acid (PFHpS)	2.0	0.37	ng/L	EPA 537 (Mod)
Perfluoroheptanoic acid (PFHpA)	2.0	0.61	ng/L	EPA 537 (Mod)
Perfluorohexanesulfonic acid (PFHxS)	2.0	0.38	ng/L	EPA 537 (Mod)
Perfluorohexanoic acid (PFHxA)	2.0	0.47	ng/L	EPA 537 (Mod)
Perfluorononanoic acid (PFNA)	2.0	0.52	ng/L	EPA 537 (Mod)
Perfluorooctane Sulfonamide (FOSA)	4.0	1.3	ng/L	EPA 537 (Mod)
Perfluorooctanesulfonic acid (PFOS)	4.0	1.1	ng/L	EPA 537 (Mod)
Perfluorooctanoic acid (PFOA)	2.0	0.54	ng/L	EPA 537 (Mod)
Perfluoropentanoic acid (PFPeA)	2.0	0.43	ng/L	EPA 537 (Mod)
Perfluorotetradecanoic acid (PFTeA)	4.0	0.83	ng/L	EPA 537 (Mod)
Perfluorotridecanoic Acid (PFTriA)	4.0	0.76	ng/L	EPA 537 (Mod)
Perfluoroundecanoic acid (PFUnA)	2.0	0.72	ng/L	EPA 537 (Mod)

Isotope Dilution Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-38875-1

Project/Site: Brunswick GWETS

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Matrix: Water Prep Type: Total/NA

			Perce	ent Isotope	Dilution Re	covery (Ac	ceptance L	imits)	
		PFOSA	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA
Lab Sample ID	Client Sample ID	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)
320-38875-1	TP-PFC-029-TPI	81	83	97	95	91	85	102	96
320-38875-1 - DL	TP-PFC-029-TPI	73	78	84	81	81	87	86	83
320-38875-2	TP-PFC-029-MIDCARBON	67	73	76	78	75	78	82	77
320-38875-3	TP-PFC-029-TPE	64	72	76	74	74	79	81	72
320-38875-4	TP-PFC-029-TPE-D	67	75	80	76	78	84	91	79
LCS 320-223615/2-A	Lab Control Sample	69	80	87	86	85	90	90	86
MB 320-223615/1-A	Method Blank	71	79	85	85	84	93	94	86

Percent Isotope Dilution Recovery (Acceptance Limits)

		PFUnA	PFDoA	PFHxS	PFTDA	PFOS	3C3-PFB
Lab Sample ID	Client Sample ID	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)
320-38875-1	TP-PFC-029-TPI	101	89	89	79	87	95
320-38875-1 - DL	TP-PFC-029-TPI	90	87	80	69	75	76
320-38875-2	TP-PFC-029-MIDCARBON	74	66	77	60	73	72
320-38875-3	TP-PFC-029-TPE	78	69	73	60	73	72
320-38875-4	TP-PFC-029-TPE-D	86	76	78	70	78	78
LCS 320-223615/2-A	Lab Control Sample	94	82	80	82	86	78
MB 320-223615/1-A	Method Blank	90	85	85	84	81	80

Surrogate Legend

PFOSA = 13C8 FOSA

PFBA = 13C4 PFBA

PFPeA = 13C5 PFPeA

PFHxA = 13C2 PFHxA

PFHpA = 13C4-PFHpA

PFOA = 13C4 PFOA

PFNA = 13C5 PFNA

PFDA = 13C2 PFDA

PFUnA = 13C2 PFUnA

PFDoA = 13C2 PFDoA

PFHxS = 1802 PFHxS

PFTDA = 13C2-PFTeDA

PFOS = 13C4 PFOS

13C3-PFBS = 13C3-PFBS

QC Sample Results

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-38875-1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Matrix: Water

Analysis Batch: 225818

Project/Site: Brunswick GWETS

Lab Sample ID: MB 320-223615/1-A

	MB	MB						•	
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.5	U	2.0	0.59	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	0.43	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorohexanoic acid (PFHxA)	1.0	U	2.0	0.47	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluoroheptanoic acid (PFHpA)	1.5	U	2.0	0.61	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorooctanoic acid (PFOA)	1.5	U M	2.0	0.54	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorononanoic acid (PFNA)	1.5	U	2.0	0.52	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorodecanoic acid (PFDA)	1.0	U	2.0	0.48	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluoroundecanoic acid (PFUnA)	1.5	U	2.0	0.72	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorododecanoic acid (PFDoA)	1.5	U	2.0	0.52	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	0.76	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorotetradecanoic acid (PFTeA)	3.0	U	4.0	0.83	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	0.46	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	0.38	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	0.37	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	1.1	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorodecanesulfonic acid (PFDS)	1.5	U	2.0	0.56	ng/L		05/16/18 14:51	05/28/18 07:23	1

Perfluorooctane Sulfonamide (FOSA)	3.0	U	4.0	1.3 ng/L	05/16/18 14:51	05/28/18 07:23	1
	MB	MB					
Isotope Dilution	%Recovery	Qualifier	Limits		Prepared	Analyzed	Dil Fac
13C8 FOSA	71		50 - 150		05/16/18 14:51	05/28/18 07:23	1
13C4 PFBA	79		50 - 150		05/16/18 14:51	05/28/18 07:23	1
13C5 PFPeA	85		50 - 150		05/16/18 14:51	05/28/18 07:23	1
13C2 PFHxA	85		50 - 150		05/16/18 14:51	05/28/18 07:23	1
13C4-PFHpA	84		50 - 150		05/16/18 14:51	05/28/18 07:23	1
13C4 PFOA	93		50 - 150		05/16/18 14:51	05/28/18 07:23	1
13C5 PFNA	94		50 - 150		05/16/18 14:51	05/28/18 07:23	1

1802 PFHxS 85 50 - 150 05/16/18 14:51 05/28/18 07:23 13C2-PFTeDA 84 50 - 150 05/16/18 14:51 05/28/18 07:23 13C4 PFOS 81 50 - 150 05/16/18 14:51 05/28/18 07:23 13C3-PFBS 80 50 - 150 05/16/18 14:51 05/28/18 07:23

50 - 150

50 - 150

50 - 150

86

90

85

Analysis Batch: 225818

Lab Sample ID: LCS 320-223615/2-A

13C2 PFDA

13C2 PFUnA

13C2 PFDoA

Matrix: Water

Prep Batch: 223615 LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit Limits %Rec Perfluorobutanoic acid (PFBA) 40.0 41.6 ng/L 104 83 - 118 Perfluoropentanoic acid (PFPeA) 40.0 36.7 ng/L 92 83 - 108Perfluorohexanoic acid (PFHxA) 40.0 39.4 ng/L 98 83 - 109 Perfluoroheptanoic acid (PFHpA) 40.0 99 39.6 ng/L 80 - 113 Perfluorooctanoic acid (PFOA) 40.0 35.7 ng/L 80 - 107 Perfluorononanoic acid (PFNA) 40.0 37.6 ng/L 94 83 - 113 Perfluorodecanoic acid (PFDA) 40.0 42.6 ng/L 107 85 - 113 40.0 76 - 105 Perfluoroundecanoic acid 36.2 ng/L 91 (PFUnA)

TestAmerica Sacramento

Prep Type: Total/NA

05/16/18 14:51 05/28/18 07:23

05/16/18 14:51 05/28/18 07:23

05/16/18 14:51 05/28/18 07:23

Client Sample ID: Lab Control Sample

1

1

1

1

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 223615

QC Sample Results

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-38875-1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

82

86

78

Project/Site: Brunswick GWETS

13C2-PFTeDA

13C4 PFOS

13C3-PFBS

223615/2-A					Clie	ent Sample I		ntrol Sample pe: Total/NA
		Spike	LCS	LCS				atch: 223615
		Added			Unit	D %Rec		
		40.0	40.9	-	ng/L		87 - 116	·
		40.0	39.3		ng/L	98	75 - 129	
		40.0	36.7		ng/L	92	82 - 115	
		35.4	36.3		ng/L	103	87 - 120	
		36.4	35.0		ng/L	96	81 - 106	
		00.4	04.4			00	00 447	
		38.1	34.4		ng/L	90	80 - 117	
		27.1	22.5		na/l	00	02 112	
		37.1	33.3		rig/L	90	02 - 112	
		38.6	35.3		na/l	Q1	81 114	
		30.0	00.0		rig/L	31	01-114	
		40.0	40.5		na/l	101	85 - 114	
							00	
LCS	LCS							
%Recovery	Qualifier	Limits						
69		50 - 150						
80		50 ₋ 150						
87		50 ₋ 150						
86		50 - 150						
85		50 ₋ 150						
90		50 ₋ 150						
	%Recovery 69 80 87 86 85	LCS LCS %Recovery Qualifier 69 80 87 86 85 90 90 86 94 82	Spike Added 40.0 40.0 40.0 40.0 40.0 35.4 36.4 38.1 37.1 38.6 40.0	Spike Added Result 40.0 40.9 40.0 39.3 40.0 36.7 35.4 36.3 36.4 35.0 38.1 34.4 37.1 33.5 38.6 35.3 40.0 40.5	Spike LCS LCS Added Result Qualifier	Spike Added Result Qualifier Unit ng/L	Spike Added Result Qualifier Unit D %Rec Result Result	Spike Added Color Color

50 - 150

50 - 150

50 - 150

QC Association Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-38875-1

Project/Site: Brunswick GWETS

LCMS

Prep Batch: 223615

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-38875-1	TP-PFC-029-TPI	Total/NA	Water	3535	
320-38875-1 - DL	TP-PFC-029-TPI	Total/NA	Water	3535	
320-38875-2	TP-PFC-029-MIDCARBON	Total/NA	Water	3535	
320-38875-3	TP-PFC-029-TPE	Total/NA	Water	3535	
320-38875-4	TP-PFC-029-TPE-D	Total/NA	Water	3535	
MB 320-223615/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-223615/2-A	Lab Control Sample	Total/NA	Water	3535	

Analysis Batch: 225818

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-38875-1	TP-PFC-029-TPI	Total/NA	Water	EPA 537 (Mod)	223615
320-38875-2	TP-PFC-029-MIDCARBON	Total/NA	Water	EPA 537 (Mod)	223615
320-38875-3	TP-PFC-029-TPE	Total/NA	Water	EPA 537 (Mod)	223615
320-38875-4	TP-PFC-029-TPE-D	Total/NA	Water	EPA 537 (Mod)	223615
MB 320-223615/1-A	Method Blank	Total/NA	Water	EPA 537 (Mod)	223615
LCS 320-223615/2-A	Lab Control Sample	Total/NA	Water	EPA 537 (Mod)	223615

Analysis Batch: 225884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-38875-1 - DL	TP-PFC-029-TPI	Total/NA	Water	EPA 537 (Mod)	223615

Lab Chronicle

Client: Tetra Tech, Inc.

Project/Site: Brunswick GWETS

TestAmerica Job ID: 320-38875-1

Client Sample ID: TP-PFC-029-TPI Lab Sample ID: 320-38875-1

Date Collected: 05/03/18 09:20 **Matrix: Water**

Date Received: 05/04/18 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			223615	05/16/18 14:51	AME	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	225818	05/28/18 07:39	D1R	TAL SAC
Total/NA	Prep	3535	DL		223615	05/16/18 14:51	AME	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	10	225884	05/29/18 00:09	D1R	TAL SAC

Client Sample ID: TP-PFC-029-MIDCARBON

Lab Sample ID: 320-38875-2

Date Collected: 05/03/18 09:25 **Matrix: Water**

Date Received: 05/04/18 09:30

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			223615	05/16/18 14:51	AME	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	225818	05/28/18 07:47	D1R	TAL SAC

Client Sample ID: TP-PFC-029-TPE Lab Sample ID: 320-38875-3

Date Collected: 05/03/18 09:30 **Matrix: Water**

Date Received: 05/04/18 09:30

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			223615	05/16/18 14:51	AME	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	225818	05/28/18 07:55	D1R	TAL SAC

Client Sample ID: TP-PFC-029-TPE-D Lab Sample ID: 320-38875-4

Date Collected: 05/03/18 00:00 **Matrix: Water**

Date Received: 05/04/18 09:30

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			223615	05/16/18 14:51	AME	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	225818	05/28/18 08:02	D1R	TAL SAC

Laboratory References:

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

Accreditation/Certification Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-38875-1

Project/Site: Brunswick GWETS

Laboratory: TestAmerica Sacramento

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oregon	NELAP	10	4040	01-29-19

Method Summary

Client: Tetra Tech, Inc.

Project/Site: Brunswick GWETS

TestAmerica Job ID: 320-38875-1

Method	Method Description	Protocol	Laboratory
EPA 537 (Mod)	PFAS for QSM 5.1, Table B-15	DOD 5.1	TAL SAC
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC

Protocol References:

DOD 5.1 = Department of Defense Quality Systems Manual V5.1

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

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

Sample Summary

Client: Tetra Tech, Inc. Project/Site: Brunswick GWETS

TestAmerica Job ID: 320-38875-1

Lab Sample ID	Client Sample ID	Matrix	Collected Received
320-38875-1	TP-PFC-029-TPI	Water	05/03/18 09:20 05/04/18 09:30
320-38875-2	TP-PFC-029-MIDCARBON	Water	05/03/18 09:25 05/04/18 09:30
320-38875-3	TP-PFC-029-TPE	Water	05/03/18 09:30 05/04/18 09:30
320-38875-4	TP-PFC-029-TPE-D	Water	05/03/18 00:00 05/04/18 09:30

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 223413

Lab Sample ID: IC 320-223413/2 Client Sample ID:

Date Analyzed: 05/15/18 15:13 Lab File ID: 2017.05.15LLB ICAL 002.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION	MANUAL INTEGRATION				
	TIME	REASON	ANALYST	DATE		
Perfluorohexanoic acid (PFHxA)	2.05	Peak assignment corrected	westendor fc	05/15/18 16:30		
Perfluorononanoic acid (PFNA)	3.11	Split Peak	westendor fc	05/15/18 16:30		

Lab Sample ID: IC 320-223413/3 Client Sample ID:

Date Analyzed: 05/15/18 15:21 Lab File ID: 2017.05.15LLB_ICAL_003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION	MANUAL INTEGRATION				
	TIME	REASON	ANALYST	DATE		
Perfluorobutanoic acid (PFBA)	1.46	Baseline	westendor fc	05/15/18 16:30		
Perfluoropentanoic acid (PFPeA)	1.75	Baseline	westendor fc	05/15/18 16:31		
Perfluorohexanoic acid (PFHxA)	2.04	Baseline	westendor fc	05/15/18 16:31		
Perfluorooctanesulfonic acid (PFOS)	3.11	Baseline	westendor fc	05/15/18 16:31		

Lab Sample ID: ICB 320-223413/12 Client Sample ID:

Date Analyzed: 05/15/18 17:15 Lab File ID: 2018.05.15LLCC ICAL 009.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION	MANUAL INTE	GRATION	
	TIME	REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.75	Baseline	hannigana	05/16/18 08:05
Perfluorooctanoic acid (PFOA)	2.73	Assign Peak	hannigana	05/16/18 08:05
Perfluorononanoic acid (PFNA)		Invalid Compound ID	hannigana	05/16/18 08:05

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Instrument ID: A8 N Analysis Batch Number: 225818

Lab Sample ID: CCB 320-225818/1 Client Sample ID:

Date Analyzed: 05/28/18 07:00 Lab File ID: 2018.05.27LLADX 001.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION	MANUAL INTE	GRATION	
	TIME	REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.70	Assign Peak	ruangyots akuld	05/30/18 10:55
Perfluorononanoic acid (PFNA)		Invalid Compound ID	barnettj	05/29/18 18:24

Lab Sample ID: MB 320-223615/1-A Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.71	Isomers	ruangyots akuld	05/30/18 10:59

Lab Sample ID: 320-38875-1 Client Sample ID: TP-PFC-029-TPI

COMPOUND NAME	RETENTION	MANUAL INTE	GRATION	
	TIME	REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.46	Baseline	ruangyots akuld	05/30/18 11:02
Perfluoropentanoic acid (PFPeA)	1.73	Baseline	ruangyots akuld	05/30/18 11:02
Perfluorobutanesulfonic acid (PFBS)	1.77	Baseline	ruangyots akuld	05/30/18 11:02
Perfluorohexanoic acid (PFHxA)	2.01	Baseline	ruangyots akuld	05/30/18 11:02
Perfluoroheptanoic acid (PFHpA)	2.34	Baseline	ruangyots akuld	05/30/18 11:02
Perfluorooctane Sulfonamide (FOSA)	3.37	Wrong peak	ruangyots akuld	05/30/18 11:03
Perfluorodecanoic acid (PFDA)	3.44	Split Peak	ruangyots akuld	05/30/18 11:03
Perfluoroundecanoic acid (PFUnA)	3.76	Baseline	ruangyots akuld	05/30/18 11:03

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Instrument ID: A8 N Analysis Batch Number: 225818

Lab Sample ID: 320-38875-2 Client Sample ID: TP-PFC-029-MIDCARBON

COMPOUND NAME	RETENTION	MANUAL INTEGRATION				
	TIME	REASON	ANALYST	DATE		
Perfluoropentanoic acid (PFPeA)	1.73	Baseline	ruangyots akuld	05/30/18 11:05		
Perfluorohexanoic acid (PFHxA)	2.01	Baseline	ruangyots akuld	05/30/18 11:05		
Perfluorooctanoic acid (PFOA)	2.70	Isomers	ruangyots akuld	05/30/18 11:05		
Perfluorooctanesulfonic acid (PFOS)	2.95	Baseline	ruangyots akuld	05/30/18 11:06		

Lab Sample ID: 320-38875-3 Client Sample ID: TP-PFC-029-TPE

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.73	Baseline	akuld	05/30/18 11:07
Perfluorooctanoic acid (PFOA)	2.61	Baseline	ruangyots akuld	05/30/18 11:08
Perfluorooctanesulfonic acid (PFOS)	3.06	Baseline	ruangyots akuld	05/30/18 11:08

Lab Sample ID: 320-38875-4 Client Sample ID: TP-PFC-029-TPE-D

Date Analyzed: 05/28/18 08:02 Lab File ID: 2018.05.27LLADX 009.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.72	Baseline	akuld	05/30/18 11:09
Perfluorooctanoic acid (PFOA)	2.69	Isomers	ruangyots akuld	05/30/18 11:10
Perfluoroheptanesulfonic Acid (PFHpS)	2.70	Baseline	ruangyots akuld	05/30/18 11:10

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Instrument ID: A8 N Analysis Batch Number: 225873

Lab Sample ID: CCB 320-225873/1 Client Sample ID:

Date Analyzed: 05/28/18 17:14 Lab File ID: 2018.05.28LLA 003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION	MANUAL INTE	GRATION	
	TIME	REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)		Invalid Compound ID	mongkols	05/30/18 09:29

Lab Sample ID: CCVL 320-225873/2 Client Sample ID:

Date Analyzed: 05/28/18 17:22 Lab File ID: 2018.05.28LLA 004.d GC Column: GeminiC18 3x1 ID: 3(mm)

RETENTION	NTION MANUAL INTEGRATION				
TIME	REASON	ANALYST	DATE		
1.46	Baseline	mongkols	05/30/18 09:30		
2.01	Baseline	mongkols	05/30/18 09:30		
2.70	Baseline	mongkols	05/30/18 09:30		
3.06	Split Peak	mongkols	05/30/18 09:31		
3.06	Baseline	mongkols	05/30/18 09:30		
4.04	Baseline	mongkols	05/30/18 09:31		
	TIME 1.46 2.01 2.70 3.06 3.06	TIME REASON 1.46 Baseline 2.01 Baseline 2.70 Baseline 3.06 Split Peak 3.06 Baseline	TIME REASON ANALYST 1.46 Baseline mongkols 2.01 Baseline mongkols 2.70 Baseline mongkols 3.06 Split Peak mongkols 3.06 Baseline mongkols		

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
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					Reagent	Parent Reager	nt		
Reagent ID	Exp Date	Prep Date	D	ilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCMPFC_ALL_SU_00065	11/15/18	05/15/18	Methanol,	Lot Baker	200 mL	LCd3-NMeFOSAA_00006		d3-NMeFOSAA	0.05 ug/mL
			141039			LCd5-NEtFOSAA 00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
						LCM2-6:FTS 00006		M2-6:2FTS	0.0475 ug/mL
						LCM2-8:2FTS 00008	200 uL	M2-8:2FTS	0.0479 ug/mL
						LCM2PFHxDA 00013		13C2-PFHxDA	0.05 ug/mL
						LCM2PFTeDA 00012	200 uL	13C2-PFTeDA	0.05 ug/mL
						LCM3HFPO-DA 00002		13C3 HFPO-DA	0.05 ug/mL
						LCM4PFHPA 00012	200 uL	13C4-PFHpA	0.05 ug/mL
						LCM5PFPEA 00013	200 uL	13C5 PFPeA	0.05 ug/mL
						LCM8FOSA 00016		13C8 FOSA	0.05 ug/mL
						LCMPFBA 00013		13C4 PFBA	0.05 ug/mL
						LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
						LCMPFDA_00018		13C2 PFDA	0.05 ug/mL
						LCMPFDoA_00013		13C2 PFDoA	0.05 ug/mL
						LCMPFHxA 00019		13C2 PFHxA	0.05 ug/mL
						LCMPFHxS_00013		1802 PFHxS	0.0473 ug/mL
						LCMPFNA_00013		13C5 PFNA	0.05 ug/mL
						LCMPFOA_00017		13C4 PFOA	0.05 ug/mL
						LCMPFOS_00025		13C4 PFOS	0.0478 ug/mL
						LCMPFUdA_00014		13C2 PFUnA	0.05 ug/mL
.LCd3-NMeFOSAA_00006	05/19/22	WEI		Lot d3NMeFOSA		(Purchased Reag		d3-NMeFOSAA	50 ug/mL
.LCd5-NEtFOSAA 00006	11/08/22			Lot d5NEtFOSA		(Purchased Reag		d5-NEtFOSAA	50 ug/mL
.LCM2-6:FTS_00006	02/17/22			Lot M262FTS		(Purchased Reag		M2-6:2FTS	47.5 ug/mL
.LCM2-8:2FTS_00008	07/05/22			Lot M282FTS		(Purchased Reag		M2-8:2FTS	47.9 ug/mL
.LCM2PFHxDA 00013	07/13/22			ories, Lot M		(Purchased Reag		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA 00012	11/30/22			ories, Lot M		(Purchased Reag		13C2-PFTeDA	50 ug/mL
.LCM3HFPO-DA 00002	08/17/20			Lot M3HFPODA tories, Lot M		(Purchased Reag	ent)	13C3 HFPO-DA	50 ug/mL
.LCM4PFHPA 00012	05/03/22							13C4-PFHpA 13C5 PFPeA	50 ug/mL
.LCM5PFPEA_00013 .LCM8FOSA 00016	07/20/22 10/11/22			tories, Lot M tories, Lot M		(Purchased Reag		13C8 FOSA	50 ug/mL 50 ug/mL
.LCMPFBA 00013	04/12/22			atories, Lot M		(Purchased Reag		13C4 PFBA	50 ug/mL
.LCMPFBS 00006	05/24/22	Welling	ton Tabora	tories, Lot	M2DEDC001E	(Purchased Reag		13C4 PFBA 13C3-PFBS	46.5 ug/mL
.LCMPFBS 00006	07/13/22	Melling	TOUL Labora	atories, Lot i	MDELDONOTO	(Purchased Reag		13C2 PFDA	46.5 ug/mL 50 ug/mL
.LCMPFDoA 00013	05/23/22	Welling	ton Tabora	tories, Lot	MDFDOA0717	(Purchased Reag		13C2 FFDA 13C2 PFDoA	50 ug/mL
.LCMPFHxA 00019	10/27/22			tories, Lot		(Purchased Reag		13C2 PFHxA	50 ug/mL
.LCMPFHXS 00013	02/17/22			tories, Lot		(Purchased Reag		1802 PFHXS	47.3 ug/mL
.LCMPFNA 00013	09/30/21			atories, Lot		(Purchased Reag		13C5 PFNA	50 ug/mL
.LCMPFOA 00017	10/17/22	Welling	ston Labor	atories, Lot	MPFOA1017	(Purchased Reag		13C4 PFOA	50 ug/mL
.LCMPFOS 00025	10/17/22	Welling	ton Jahor	atories, Lot	MPFOS1017	(Purchased Reag		13C4 PFOS	47.8 ug/mL
.LCMPFUdA 00014	11/22/21	Welling	ton Labora	tories, Lot	MPFUdA1116	(Purchased Reag		13C2 PFUnA	50 ug/mL
-								13C2-PFOA	0.05 ug/mL
LCPFC-IS_00050 .LCM2PFOA 00008	11/15/18	U3/13/18	metnanol,	Lot 090285 tories, Lot	M2DEOX0216	LCM2PFOA_00008 (Purchased Reag		13C2-PFOA 13C2-PFOA	0.05 ug/mL 50 ug/mL
-						` ,			-
LCPFC_LL0_00006			141039	Lot Baker		LCMPFC_ALL_SU_00041		13C2-PFOA	2.5 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, 141039	Lot Baker	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL

ab Name: TestAmerica Sacramento	Job No.: 320-38875-1
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				Reagent	Parent Reage	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCM2PFOA 00008	02/12/21	Welling	L ton Laboratories, Lot M		(Purchased Read	rent)	13C2-PFOA	50 ug/mL
LCPFC_LL0_00006	08/20/18		MeOH/H2O, Lot Baker 141039	200 mL	LCMPFC_ALL_SU_00041		d3-NMeFOSAA	2.5 ng/mL
			111003				d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA 18O2 PFHxS	2.5 ng/mL
							13C5 PFNA	2.365 ng/mL 2.5 ng/mL
							13C4 PFOA	2.5 ng/mL 2.5 ng/mL
							13C4 PFOA 13C4 PFOS	2.3 ng/mL 2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
			141039		LCd5-NEtFOSAA 00006	2.00 11Tı	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS 00006		M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS 00008		M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA 00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA 00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA 00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016		13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013		13C4 PFBA	0.05 ug/mL
					LCMPFBS 00006		13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013		13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019		13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013		1802 PFHxS	0.0473 ug/mL
					LCMPFNA_00013		13C5 PFNA	0.05 ug/mL
					LCMPFOA 00017		13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025 LCMPFUdA 00014		13C4 PFOS 13C2 PFUnA	0.0478 ug/mL
LCd3-NMeFOSAA 00006	05/19/22	TATTO T	L LLINGTON, Lot d3NMeFOSAA	0517	(Purchased Read		d3-NMeFOSAA	0.05 ug/mL 50 ug/mL
LCd5-NMerOSAA_00006	11/08/22		LLINGTON, Lot d5NEtFOSAA		(Purchased Read		d5-NEtFOSAA	50 ug/mL 50 ug/mL
LCd5-NELFOSAA_00006	02/17/22		ELLINGTON, LOT M262FTS0.		(Purchased Read		M2-6:2FTS	47.5 ug/mL
LCM2-8:FIS 00008	07/05/22		ELLINGTON, Lot M282FTS0		(Purchased Read		M2-0:2F1S M2-8:2FTS	47.5 ug/mL
LCM2PFHxDA 00013	07/13/22		on Laboratories, Lot M2		(Purchased Read		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00013	11/30/22		on Laboratories, Lot M2		(Purchased Read	· · · · · · · · · · · · · · · · · · ·	13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00012	05/03/22		ton Laboratories, Lot M4		(Purchased Read		13C4-PFHpA	50 ug/mL

Lab Name: TestAmerica S	Sacramento	Job No.: 320-38875-1
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					Reagent	Parent Reager	ıt		
Reagent ID	Exp Date	Prep Date	Dilutant Used		Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCM5PFPEA 00013	07/20/22	Wellingt	on Laboratories,	Lot M5	PFPeA0717	(Purchased Reag	ent)	13C5 PFPeA	50 ug/mL
LCM8FOSA 00016	10/11/22		on Laboratories,			(Purchased Reag	ent)	13C8 FOSA	50 ug/mL
LCMPFBA 00013	04/12/22	Welling	gton Laboratories,	Lot M	IPFBA0417	(Purchased Reag	ent)	13C4 PFBA	50 ug/mL
LCMPFBS 00006	05/24/22		ton Laboratories,			(Purchased Reag	ent)	13C3-PFBS	46.5 ug/mL
LCMPFDA 00018	07/13/22	Welling	gton Laboratories,	Lot M	IPFDA0717	(Purchased Reag	ent)	13C2 PFDA	50 ug/mL
LCMPFDoA 00013	05/23/22	Welling	ton Laboratories,	Lot M	PFDoA0517	(Purchased Reag	ent)	13C2 PFDoA	50 ug/mL
LCMPFHxA 00019	10/27/22	Welling	ton Laboratories,	Lot M	PFHxA1017	(Purchased Reag	ent)	13C2 PFHxA	50 ug/mL
LCMPFHxS 00013	02/17/22	Welling	ton Laboratories,	Lot M	PFHxS0217	(Purchased Reag	ent)	1802 PFHxS	47.3 ug/mL
LCMPFNA 00013	09/30/21	Welling	gton Laboratories,	Lot M	IPFNA0916	(Purchased Reag	ent)	13C5 PFNA	50 ug/mL
LCMPFOA 00017	10/17/22	Welling	gton Laboratories,	Lot M	IPFOA1017	(Purchased Reag	ent)	13C4 PFOA	50 ug/mL
LCMPFOS 00025	10/17/22	Welling	gton Laboratories,	Lot M	IPFOS1017	(Purchased Reag	ent)	13C4 PFOS	47.8 ug/mL
LCMPFUdA 00014	11/22/21	Welling	ton Laboratories,	Lot M	PFUdA1116	(Purchased Reag	ent)	13C2 PFUnA	50 ug/mL
LCPFC LL1 00005	08/20/18	02/22/18	MeOH/H2O, Lot 902	285	200 mT.	LCMPFC ALL SU 00041	1.0 mT.	d3-NMeFOSAA	2.5 ng/mL
LEFFC_LLL_00003	00/20/10	02/22/10	14CO117 112O, 110C 302	200	200 11111	Hemre mil bo oodi	10 1111	d5-NEtFOSAA	2.5 ng/mL
								M2-6:2FTS	2.375 ng/mL
								M2-8:2FTS	2.395 ng/mL
								13C2-PFHxDA	2.5 ng/mL
								13C2-PFOA	2.5 ng/mL
								13C2-PFTeDA	2.5 ng/mL
								13C4-PFHpA	2.5 ng/mL
								13C5 PFPeA	2.5 ng/mL
								13C8 FOSA	2.5 ng/mL
								13C4 PFBA	2.5 ng/mL
								13C3-PFBS	2.325 ng/mL
								13C2 PFDA	2.5 ng/mL
								13C2 PFDoA	2.5 ng/mL
								13C2 PFHxA	2.5 ng/mL
								1802 PFHxS	2.365 ng/mL
								13C5 PFNA	2.5 ng/mL
								13C4 PFOA	2.5 ng/mL
								13C4 PFOS	2.39 ng/mL
								13C2 PFUnA	2.5 ng/mL
						LCPFCSP 00136	50 11T.	Sodium	0.02335 ng/mL
							00 42	1H, 1H, 2H, 2H-perfluorohexane	0.02000 1197 112
								sulfonate (4:2)	
								Sodium	0.0237 ng/mL
								1H, 1H, 2H, 2H-perfluorooctane	
								sulfonate (6:2)	
								Sodium	0.02395 ng/mL
								1H,1H,2H,2H-perfluorodecane	
								sulfonate (8:2)	
								N-ethyl perfluorooctane	0.025 ng/mL
								sulfonamidoacetic acid	
								N-methyl perfluorooctane sulfonamidoacetic acid	0.025 ng/mL
								Perfluorobutanoic acid (PFBA)	0.025 ng/mL
								Perfluorobutanesulfonic acid	0.0221 ng/mL
								(PFBS)	

Lab	Name:	TestAmerica	Sacramento	Job No.:	: 320-38875-1
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				Reagent	Parent Reagen	t		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
							Perfluorodecanoic acid (PFDA)	0.025 ng/mL
							Perfluorododecanoic acid	0.025 ng/mL
							(PFDoA)	
							Perfluorodecanesulfonic acid	0.0241 ng/mL
							(PFDS)	0.005/
							Perfluoroheptanoic acid (PFHpA)	0.025 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0238 ng/mL
							Perfluorohexanoic acid (PFHxA)	0.025 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.02275 ng/mL
							Perfluorononanoic acid (PFNA)	0.025 ng/mL
							Perfluorononanesulfonic acid	0.024 ng/mL
							Perfluorooctanoic acid (PFOA)	0.025 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0232 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.025 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.025 ng/mL
							Perfluoropentanesulfonic acid	0.02345 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.025 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.025 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.025 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
			111003		LCd5-NEtFOSAA 00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS 00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008		M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013		13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008		13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00012		13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012		13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013		13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016		13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013 LCMPFBS 00006		13C4 PFBA 13C3-PFBS	0.05 ug/mL 0.0465 ug/mL
					LCMPFBS_00006		13C2 PFDA	0.0465 ug/mL
					LCMPFDoA 00013		13C2 PFDOA	0.05 ug/mL
					LCMPFH×A 00019		13C2 PFHxA	0.05 ug/mL
					LCMPFHxS 00013		1802 PFHxS	0.0473 ug/mL
					LCMPFNA 00013		13C5 PFNA	0.05 ug/mL
					LCMPFOA 00017		13C4 PFOA	0.05 ug/mL
					LCMPFOS 00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL

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				Reagent	Parent Reage	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	- Analyte	Concentration
LCd3-NMeFOSAA 00006	05/19/22	WEL	LINGTON, Lot d3NMeFOSA	AA0517	(Purchased Rea	gent)	d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA 00006	11/08/22	WEL	LINGTON, Lot d5NEtFOSA	AA1117	(Purchased Rea	gent)	d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS 00006	02/17/22	WE	ELLINGTON, Lot M262FTS	0217	(Purchased Rea	gent)	M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS 00008	07/05/22	WE	ELLINGTON, Lot M282FTS	0717	(Purchased Rea	gent)	M2-8:2FTS	47.9 ug/mL
LCM2PFHxDA 00013	07/13/22		on Laboratories, Lot M		(Purchased Rea	gent)	13C2-PFHxDA	50 ug/mL
LCM2PFOA 00008	02/12/21	Wellingt	on Laboratories, Lot	M2PFOA0216	(Purchased Rea	gent)	13C2-PFOA	50 ug/mL
LCM2PFTeDA 00012	11/30/22	Wellingto	on Laboratories, Lot M	2PFTeDA1117	(Purchased Rea	gent)	13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00012	05/03/22		on Laboratories, Lot N		(Purchased Rea		13C4-PFHpA	50 ug/mL
LCM5PFPEA 00013	07/20/22	Wellingt	on Laboratories, Lot N	M5PFPeA0717	(Purchased Rea	gent)	13C5 PFPeA	50 ug/mL
LCM8FOSA 00016	10/11/22		on Laboratories, Lot N		(Purchased Rea		13C8 FOSA	50 ug/mL
LCMPFBA 00013	04/12/22		ton Laboratories, Lot		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFBS 00006	05/24/22		on Laboratories, Lot		(Purchased Rea		13C3-PFBS	46.5 ug/mL
LCMPFDA 00018	07/13/22		ton Laboratories, Lot		(Purchased Rea		13C2 PFDA	50 ug/mL
LCMPFDoA 00013	05/23/22		on Laboratories, Lot		(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFHxA 00019	10/27/22		on Laboratories, Lot		(Purchased Rea		13C2 PFHxA	50 ug/mL
LCMPFHxS 00013	02/17/22		on Laboratories, Lot		(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA 00013	09/30/21		ton Laboratories, Lot		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFOA 00017	10/17/22		ton Laboratories, Lot		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS 00025	10/17/22		ton Laboratories, Lot		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00014	11/22/21	Wellingt	ton Laboratories, Lot	MPFUdA1116	(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFCSP_00136			Methanol, Lot 090285	10000 uT	LCPFCSP 00132	<i></i>	Sodium	0.0934 ug/mL
		, , ,	, , , , , , , , , , , , , , , , , , , ,		_ · · · · - · · ·		1H, 1H, 2H, 2H-perfluorohexane	
							sulfonate (4:2)	
							Sodium	0.0948 ug/mL
							1H,1H,2H,2H-perfluorooctane	
							sulfonate (6:2)	
							Sodium	0.0958 ug/mL
							1H,1H,2H,2H-perfluorodecane	
							sulfonate (8:2)	
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							N-methyl perfluorooctane	0.1 ug/mL
							sulfonamidoacetic acid	
							Perfluorobutanoic acid (PFBA)	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							(PFDoA)	
							Perfluorodecanesulfonic acid	0.0964 ug/mL
							(PFDS)	
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexanesulfonic acid	0.091 ug/mL
							(PFHxS)	U.UJI UY/IIIL

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				Reagent	Parent Reage	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
							Perfluorononanesulfonic acid	0.096 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluoropentanesulfonic acid	0.0938 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
LCPFCSP_00132	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA 00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008		Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008		Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002		Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003		Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007		Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004		Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009		Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00003		Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA_00009		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004		Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL

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				Reagent	Parent Reage	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS 00003	200 uL	Perfluoropentanesulfonic acid	0.938 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006		Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
LC4:2FTS_00003	12/12/21		WELLINGTON, Lot 42FTS	1216	(Purchased Rea	gent)	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
LC6:2FTS_00003	06/25/21		WELLINGTON, Lot 62FTS	0616	(Purchased Rea	gent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
LC8:2FTS_00003	08/22/21		WELLINGTON, Lot 82FTS		(Purchased Rea		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
LCN-EtFOSAA_00004	09/30/21	M	ELLINGTON, Lot NEtFOSA	AA0916	(Purchased Rea	gent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSAA_00005	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Rea	gent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFBA_00007	05/27/21		gton Laboratories, Lo		(Purchased Rea	gent)	Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00008	03/15/21	Welling	gton Laboratories, Lot	LPFBS0316	(Purchased Rea	gent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA 00008	05/29/22		gton Laboratories, Lo		(Purchased Rea	gent)	Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Rea	gent)	Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDSA_00002	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Rea	gent)	Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00008	12/02/21		gton Laboratories, Lot	-	(Purchased Rea		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpSA_00003	09/01/22	Welling	ton Laboratories, Lot	LPFHpS0817	(Purchased Rea	gent)	Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
LCPFHxA_00007	12/22/20		gton Laboratories, Lot		(Purchased Rea		Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxS-br_00004	07/03/20	_	on Laboratories, Lot	(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL	
LCPFNA_00009	07/20/22		gton Laboratories, Lo		(Purchased Rea		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFNS_00003	09/27/22		gton Laboratories, Lot		(Purchased Rea		Perfluorononanesulfonic acid	48 ug/mL
LCPFOA_00009	09/27/22		gton Laboratories, Lo		(Purchased Rea		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFOS-br_00004	10/14/20		ton Laboratories, Lot		(Purchased Rea		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00010	09/30/21		gton Laboratories, Lot		(Purchased Rea		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00007	05/31/21		gton Laboratories, Lot		(Purchased Rea		Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFPeS_00003	01/11/22		ton Laboratories, Lot		(Purchased Rea		Perfluoropentanesulfonic acid	46.9 ug/mL
LCPFTeDA_00006	12/09/20	Welling	ton Laboratories, Lot	PFTeDA1215	(Purchased Rea	gent)	Perfluorotetradecanoic acid (PFTeA)	50 ug/mL

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Reagent ID		Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent			
	Exp Date				Reagent ID	Volume Added	Analyte	Concentration
LCPFTrDA_00006	02/12/21	Welling	ton Laboratories, Lot P	FTrDA0216	(Purchased Reag	ent)	Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFUdA_00007	10/18/21	Welling	gton Laboratories, Lot E	PFUdA1016	(Purchased Reage	ent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL2_00004	08/20/18	02/22/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00041	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							1802 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00136	100 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.0467 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0474 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.0479 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.05 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.05 ng/mL
							Perfluorobutanoic acid (PFBA)	0.05 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0442 ng/mL
							Perfluorodecanoic acid (PFDA)	0.05 ng/mL
							Perfluorododecanoic acid (PFDoA)	0.05 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.05 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0476 ng/mL

Lab Name:	TestAmerica	Sacramento	Job No.: 320-38875-1
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					Parent Reagent			
				Reagent		_		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorohexanoic acid (PFHxA)	0.05 ng/mL
							Perfluorohexanesulfonic acid	0.0455 ng/mL
							(PFHxS)	0.05 / -
							Perfluorononanoic acid (PFNA)	0.05 ng/mL
							Perfluorononanesulfonic acid	0.048 ng/mL
							Perfluorooctanoic acid (PFOA)	0.05 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0464 ng/mL
							Perfluorooctane Sulfonamide	0.05 ng/mL
							(FOSA)	0.05 Hg/III
							Perfluoropentanoic acid	0.05 ng/mL
							(PFPeA)	, , , , ,
							Perfluoropentanesulfonic acid	0.0469 ng/mL
							Perfluorotetradecanoic acid	0.05 ng/mL
							(PFTeA)	
							Perfluorotridecanoic Acid (PFTriA)	0.05 ng/mL
							Perfluoroundecanoic acid	0.05 ng/mL
							(PFUnA)	
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA 00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS 00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS 00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA 00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00012		13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012		13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013		13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016		13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013		13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006		13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018		13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013		13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019		13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013		1802 PFHxS	0.0473 ug/mL
					LCMPFNA_00013		13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017		13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025		13C4 PFOS	0.0478 ug/mL
	05/40/22				LCMPFUdA_00014		13C2 PFUnA	0.05 ug/mL
LCd3-NMeFOSAA_00006	05/19/22		LINGTON, Lot d3NMeFOSAAC		(Purchased Reage		d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA_00006	11/08/22		WELLINGTON, Lot d5NEtFOSAA1117		(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL	
LCM2-8:2FTS_00008	07/05/22		WELLINGTON, Lot M282FTS0717 Wellington Laboratories, Lot M2PFHxDA0717		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
LCM2PFHxDA_00013	07/13/22				(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
LCM2PFOA_00008	02/12/21		ton Laboratories, Lot M2		(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCM2PFTeDA_00012	11/30/22		on Laboratories, Lot M2P		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00012	05/03/22		ton Laboratories, Lot M4F		(Purchased Reage		13C4-PFHPA	50 ug/mL
LCM5PFPEA_00013	07/20/22	weilingt	ton Laboratories, Lot M5F	rreau/1/	(Purchased Reage	=11 L)	13C5 PFPeA	50 ug/mL

ab Name: TestAmerica Sacramento	Job No.: 320-38875-1
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					Reagent	Parent Reagent			
	Exp	Prep	Dilutant		Final		Volume		
Reagent ID	Date	Date	Used		Volume	Reagent ID	Added	Analyte	Concentration
LCM8FOSA 00016	10/11/22	Wellingt	on Laboratories,	Lot M8FO	SA1017I	(Purchased Read	gent)	13C8 FOSA	50 ug/mL
LCMPFBA 00013	04/12/22	Welling	ton Laboratories,	Lot MPF	BA0417	(Purchased Read	gent)	13C4 PFBA	50 ug/mL
LCMPFBS 00006	05/24/22	Welling	ton Laboratories,	Lot M3PF	BS0815	(Purchased Read	gent)	13C3-PFBS	46.5 ug/mL
LCMPFDA 00018	07/13/22	Welling	ton Laboratories,	Lot MPFI	DA0717	(Purchased Read	gent)	13C2 PFDA	50 ug/mL
LCMPFDoA 00013	05/23/22	Welling	ton Laboratories,	Lot MPFD	OoA0517	(Purchased Read	gent)	13C2 PFDoA	50 ug/mL
LCMPFHxA 00019	10/27/22		ton Laboratories,			(Purchased Read		13C2 PFHxA	50 ug/mL
LCMPFHxS 00013	02/17/22	Welling	ton Laboratories,	Lot MPFH	1xS0217	(Purchased Read		1802 PFHxS	47.3 ug/mL
LCMPFNA 00013	09/30/21		ton Laboratories,			(Purchased Read		13C5 PFNA	50 ug/mL
LCMPFOA 00017	10/17/22		ton Laboratories,			(Purchased Read		13C4 PFOA	50 ug/mL
LCMPFOS 00025	10/17/22		ton Laboratories,			(Purchased Read		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00014	11/22/21		ton Laboratories,			(Purchased Read		13C2 PFUnA	50 ug/mL
.LCPFCSP 00136		02/20/18	Methanol, Lot 090	285 1	10000 uT.	LCPFCSP 00132		Sodium	0.0934 ug/mL
		, .,	,					1H, 1H, 2H, 2H-perfluorohexane	
								sulfonate (4:2)	
								Sodium	0.0948 ug/mL
								1H,1H,2H,2H-perfluorooctane	
								sulfonate (6:2)	
								Sodium	0.0958 ug/mL
								1H,1H,2H,2H-perfluorodecane	
								sulfonate (8:2)	
								N-ethyl perfluorooctane	0.1 ug/mL
								sulfonamidoacetic acid	
								N-methyl perfluorooctane	0.1 ug/mL
								sulfonamidoacetic acid	
								Perfluorobutanoic acid (PFBA)	0.1 ug/mL
								Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
								Perfluorodecanoic acid (PFDA)	0.1 ug/mL
								Perfluorododecanoic acid	0.1 ug/mL
								(PFDoA)	
								Perfluorodecanesulfonic acid	0.0964 ug/mL
								(PFDS)	
								Perfluoroheptanoic acid	0.1 ug/mL
								(PFHpA)	
								Perfluoroheptanesulfonic Acid	0.0952 ug/mL
								(PFHpS)	0.1./-
								Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
								Perfluorohexanesulfonic acid	0.091 ug/mL
								(PFHxS) Perfluorononanoic acid (PFNA)	0 1 . /
								, ,	0.1 ug/mL
								Perfluorononanesulfonic acid Perfluorooctanoic acid (PFOA)	0.096 ug/mL 0.1 ug/mL
								Perfluorooctanoic acid (PFOA) Perfluorooctanesulfonic acid	0.1 ug/mL 0.0928 ug/mL
								(PFOS)	0.0928 ug/mL
								Perfluorooctane Sulfonamide	0.1 ug/mL
								(FOSA)	U.I ug/IIII
								Perfluoropentanoic acid	0.1 ug/mL
								(PFPeA)	0.1 49/1111
								Perfluoropentanesulfonic acid	0.0938 ug/mL

Lab	Name:	TestAmerica	Sacramento		320-3	388	/ 5 -	-1	

				Reagent	Parent Reage	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
LCPFCSP_00132	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004		N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005		N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007		Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008		Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008		Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002		Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003		Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007		Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004		Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009		Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00003		Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA 00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010		Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS_00003		Perfluoropentanesulfonic acid	0.938 ug/mL
					LCPFTeDA_00006		Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006		Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1	
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				Reagent	Parent Reag	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LC4:2FTS_00003	12/12/21		WELLINGTON, Lot 42FTS12	(Purchased Rea		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL	
LC6:2FTS_00003	06/25/21	,	WELLINGTON, Lot 62FTS0	(Purchased Rea		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL	
LC8:2FTS_00003	08/22/21	,	WELLINGTON, Lot 82FTS08	816	(Purchased Rea	agent)	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
LCN-EtFOSAA_00004	09/30/21	WE	ELLINGTON, Lot NETFOSAA	0916	(Purchased Rea	agent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSAA_00005	10/12/21		ELLINGTON, Lot NMeFOSAA		(Purchased Rea	agent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFBA_00007	05/27/21		gton Laboratories, Lot	PFBA0516	(Purchased Rea		Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00008	03/15/21		ton Laboratories, Lot		(Purchased Rea	agent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00008	05/29/22	Wellin	gton Laboratories, Lot	PFDA0517	(Purchased Rea		Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00008	05/29/22		ton Laboratories, Lot		(Purchased Rea		Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDSA_00002	05/24/21	_	ton Laboratories, Lot		_		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00008	12/02/21		ton Laboratories, Lot	-	(Purchased Rea		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpSA_00003	09/01/22		ton Laboratories, Lot 1		(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
LCPFHxA 00007	12/22/20	Welling	ston Laboratories, Lot	PFHxA1215	(Purchased Rea		Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxS-br_00004	07/03/20	_	on Laboratories, Lot b		(Purchased Rea	agent)	Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA_00009	07/20/22		gton Laboratories, Lot		(Purchased Rea		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFNS_00003	09/27/22		ton Laboratories, Lot		(Purchased Rea		Perfluorononanesulfonic acid	48 ug/mL
LCPFOA_00009	09/27/22	Wellin	gton Laboratories, Lot	PFOA0917	(Purchased Rea		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFOS-br_00004	10/14/20	_	con Laboratories, Lot b		(Purchased Rea	-	Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00010	09/30/21		ton Laboratories, Lot		(Purchased Rea	_	Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00007	05/31/21		ton Laboratories, Lot		(Purchased Rea	agent)	Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFPeS_00003	01/11/22	Welling	ton Laboratories, Lot l	LPFPeS0117	(Purchased Rea		Perfluoropentanesulfonic acid	46.9 ug/mL
LCPFTeDA_00006	12/09/20	_	ton Laboratories, Lot 1		(Purchased Rea	agent)	Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
LCPFTrDA_00006	02/12/21	_	ton Laboratories, Lot l		(Purchased Rea	-	Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFUdA_00007	10/18/21	Welling	ton Laboratories, Lot	PFUdA1016	(Purchased Rea	agent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC LL3 00004	08/20/18	02/22/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC ALL SU 00041	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
		1					13C2-PFOA	2.5 ng/mL

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				Reagent	Parent Read	gent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							1802 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00136	500 uL	Sodium	0.2335 ng/mL
							1H, 1H, 2H, 2H-perfluorohexane	
							sulfonate (4:2)	0.237 ng/mL
							1H,1H,2H,2H-perfluorooctane	0.23/ ng/mL
							sulfonate (6:2)	
							Sodium	0.2395 ng/mL
							1H,1H,2H,2H-perfluorodecane	0.2333 119/1111
							sulfonate (8:2)	
							N-ethyl perfluorooctane	0.25 ng/mL
							sulfonamidoacetic acid	
							N-methyl perfluorooctane	0.25 ng/mL
							sulfonamidoacetic acid	
							Perfluorobutanoic acid (PFBA)	0.25 ng/mL
							Perfluorobutanesulfonic acid	0.221 ng/mL
							(PFBS)	
							Perfluorodecanoic acid (PFDA)	0.25 ng/mL
							Perfluorododecanoic acid	0.25 ng/mL
							(PFDoA)	
							Perfluorodecanesulfonic acid	0.241 ng/mL
							(PFDS)	0.05/
							Perfluoroheptanoic acid	0.25 ng/mL
							(PFHpA) Perfluoroheptanesulfonic Acid	0.238 ng/mL
							(PFHpS)	0.230 Hg/IIIL
							Perfluorohexanoic acid (PFHxA)	0.25 ng/mL
							Perfluorohexanesulfonic acid	0.2275 ng/mL
							(PFHxS)	0.22/J 119/11LD
							Perfluorononanoic acid (PFNA)	0.25 ng/mL
							Perfluorononanesulfonic acid	0.24 ng/mL
							Perfluorooctanoic acid (PFOA)	0.25 ng/mL
							Perfluorooctanesulfonic acid	0.232 ng/mL
							(PFOS)	1122 119/1112
							Perfluorooctane Sulfonamide	0.25 ng/mL
							(FOSA)	

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				Reagent	Parent Reager	ıt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
							Perfluoropentanoic acid (PFPeA)	0.25 ng/mL
							Perfluoropentanesulfonic acid	0.2345 ng/mL
							Perfluorotetradecanoic acid	0.25 ng/mL
							(PFTeA)	_
							Perfluorotridecanoic Acid (PFTriA)	0.25 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.25 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA 00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS 00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA 00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA 00008		13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA 00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA 00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA 00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA 00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA 00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS 00006		13C3-PFBS	0.0465 ug/mL
					LCMPFDA 00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA 00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA 00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013		1802 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA 00017		13C4 PFOA	0.05 ug/mL
					LCMPFOS 00025		13C4 PFOS	0.0478 ug/mL
					LCMPFUdA 00014	200 uL	13C2 PFUnA	0.05 ug/mL
LCd3-NMeFOSAA 00006	05/19/22	WE	LINGTON, Lot d3NMeFOSAA)517	(Purchased Reag	ent)	d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA 00006	11/08/22		LLINGTON, Lot d5NEtFOSAA		(Purchased Reag		d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS_00006	02/17/22	W	ELLINGTON, Lot M262FTS02	17	(Purchased Reag	ent)	M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS_00008	07/05/22	W	ELLINGTON, Lot M282FTS07	17	(Purchased Reag		M2-8:2FTS	47.9 ug/mL
LCM2PFHxDA_00013	07/13/22	Wellingt	on Laboratories, Lot M2P	FHxDA0717	(Purchased Reag		13C2-PFHxDA	50 ug/mL
LCM2PFOA_00008	02/12/21	Welling	ton Laboratories, Lot M2	PFOA0216	(Purchased Reag	ent)	13C2-PFOA	50 ug/mL
LCM2PFTeDA_00012	11/30/22	Wellingt	on Laboratories, Lot M2P	FTeDA1117	(Purchased Reag	ent)	13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00012	05/03/22		ton Laboratories, Lot M41		(Purchased Reag	ent)	13C4-PFHpA	50 ug/mL
LCM5PFPEA_00013	07/20/22	Welling	on Laboratories, Lot M5	PFPeA0717	(Purchased Reag	ent)	13C5 PFPeA	50 ug/mL
LCM8FOSA_00016	10/11/22		on Laboratories, Lot M81		(Purchased Reag		13C8 FOSA	50 ug/mL
LCMPFBA_00013	04/12/22		gton Laboratories, Lot M		(Purchased Reag		13C4 PFBA	50 ug/mL
LCMPFBS_00006	05/24/22		ton Laboratories, Lot M3		(Purchased Reag		13C3-PFBS	46.5 ug/mL
LCMPFDA_00018	07/13/22		gton Laboratories, Lot M		(Purchased Reag		13C2 PFDA	50 ug/mL
LCMPFDoA_00013	05/23/22		ton Laboratories, Lot MP		(Purchased Reag		13C2 PFDoA	50 ug/mL
LCMPFHxA_00019	10/27/22	,	ton Laboratories, Lot MP		(Purchased Reag		13C2 PFHxA	50 ug/mL
LCMPFHxS_00013	02/17/22	,	ton Laboratories, Lot MP		(Purchased Reag		1802 PFHxS	47.3 ug/mL
LCMPFNA_00013	09/30/21		gton Laboratories, Lot M		(Purchased Reag		13C5 PFNA	50 ug/mL
LCMPFOA 00017	10/17/22	Welling	gton Laboratories, Lot M	PFOA1017	(Purchased Reag	ent)	13C4 PFOA	50 ug/mL

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				Peagant	Parent Reag	ent		
Reagent ID	Exp Date	Prep Date		Reagent . Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCMPFOS 00025	10/17/22		ton Laboratories, Lot N		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00014	11/22/21		ton Laboratories, Lot M		(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFCSP 00136			Methanol, Lot 090285		LCPFCSP 00132		Sodium	0.0934 ug/mL
.LCFFCSF_00136	08/20/18	02/20/18	methanol, Lot 090285	10000 uL	LCPFCSP_00132	1 1111	1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.0934 ug/mL
							Sodium	0.0948 ug/mL
							1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.0958 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							Perfluorobutanoic acid (PFBA)	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.1 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorononanesulfonic acid	0.096 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluoropentanesulfonic acid	0.0938 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
LCPFCSP_00132	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

				Reagent	Parent Reage	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
3					LC6:2FTS_00003		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005		N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA 00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	(PFDS)	0.964 ug/mL
					LCPFHpA_00008		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	,	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009		Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00003		Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA_00009		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004		Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	(FOSA)	1 ug/mL
					LCPFPeA_00007		Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS_00003	200 uL	1	0.938 ug/mL
					LCPFTeDA_00006		Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006		Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
LC4:2FTS_00003	12/12/21		WELLINGTON, Lot 42FTS121		(Purchased Read		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
LC6:2FTS_00003	06/25/21		WELLINGTON, Lot 62FTS061		(Purchased Read		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
LC8:2FTS_00003	08/22/21	,	WELLINGTON, Lot 82FTS081	.6	(Purchased Read	gent)	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
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				Reagent	Parent Reage	nt		
	Exp	Prep	Dilutant	Final		Volume	_	
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCN-EtFOSAA_00004	09/30/21 WELLINGTON, Lot NEtFOSAA0916				(Purchased Reag	gent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSAA_00005	10/12/21		LINGTON, Lot NMeFOSA		(Purchased Reag	gent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFBA_00007	05/27/21	Wellingt	on Laboratories, Lot	PFBA0516	(Purchased Reag	gent)	Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00008	03/15/21		on Laboratories, Lot		(Purchased Reag	gent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00008	05/29/22	Wellingt	on Laboratories, Lot	PFDA0517	(Purchased Reag		Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00008	05/29/22	_	on Laboratories, Lot		(Purchased Reag		Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDSA_00002	05/24/21	=	on Laboratories, Lot		(Purchased Reag	gent)	Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00008	12/02/21	_	on Laboratories, Lot	-	(Purchased Reag		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpSA_00003	09/01/22	_	n Laboratories, Lot	=	(Purchased Reag	gent)	Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
LCPFHxA_00007	12/22/20	Wellingto	on Laboratories, Lot	PFHxA1215	(Purchased Reag		Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxS-br_00004	07/03/20		Laboratories, Lot b		(Purchased Reag	gent)	Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA_00009	07/20/22		on Laboratories, Lot		(Purchased Reag		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFNS_00003	09/27/22		on Laboratories, Lot		(Purchased Reag		Perfluorononanesulfonic acid	48 ug/mL
LCPFOA_00009	09/27/22	Wellingt	on Laboratories, Lot	PFOA0917	(Purchased Reag		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFOS-br_00004	10/14/20	=	n Laboratories, Lot k		(Purchased Reag		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00010	09/30/21	_	on Laboratories, Lot		(Purchased Reag		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00007	05/31/21	=	on Laboratories, Lot		(Purchased Reag	•	Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFPeS_00003	01/11/22	Wellingto	n Laboratories, Lot	LPFPeS0117	(Purchased Reag		Perfluoropentanesulfonic acid	46.9 ug/mL
LCPFTeDA_00006	12/09/20	_	n Laboratories, Lot		(Purchased Reag		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
LCPFTrDA_00006	02/12/21	_	n Laboratories, Lot		(Purchased Reag		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFUdA_00007	10/18/21	Wellingto	on Laboratories, Lot	PFUdA1016	(Purchased Reag	gent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC LL4 00004	08/20/18	02/22/18 M	eOH/H2O, Lot 090285	200 mL	LCMPFC ALL SU 00041	10 mI	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
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				Reagent	Parent Reag	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							13C2 PFHxA	2.5 ng/mL
							1802 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00132	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane	0.934 ng/mL
							sulfonate (4:2)	
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane	0.958 ng/mL
							sulfonate (8:2) N-ethyl perfluorooctane	1 ng/mL
							sulfonamidoacetic acid	1 119/1111
							N-methyl perfluorooctane	1 ng/mL
							sulfonamidoacetic acid	1 119/11111
							Perfluorobutanoic acid (PFBA)	1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL
							Perfluorodecanoic acid (PFDA)	1 ng/mL
							Perfluorododecanoic acid (PFDoA)	1 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.964 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ng/mL
							Perfluorohexanoic acid (PFHxA)	1 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL
							Perfluorononanesulfonic acid	0.96 ng/mL
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.928 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	1 ng/mL
							Perfluoropentanoic acid (PFPeA)	1 ng/mL
							Perfluoropentanesulfonic acid	0.938 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	1 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	1 ng/mL
							Perfluoroundecanoic acid (PFUnA)	1 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1	
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				Reagent	Parent Reager	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA 00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS 00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS 00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA 00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA 00008	200 uL	13C2-PFOA	0.05 ug/mI
					LCM2PFTeDA 00012	200 uL	13C2-PFTeDA	0.05 ug/mI
					LCM4PFHPA 00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA 00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA 00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA 00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS 00006		13C3-PFBS	0.0465 ug/mL
					LCMPFDA 00018		13C2 PFDA	0.05 ug/mL
					LCMPFDoA 00013		13C2 PFDoA	0.05 ug/mL
					LCMPFHxA 00019		13C2 PFHxA	0.05 ug/mL
					LCMPFHxS 00013		1802 PFHxS	0.0473 ug/mL
					LCMPFNA 00013		13C5 PFNA	0.05 ug/mL
					LCMPFOA 00017		13C4 PFOA	0.05 ug/mL
					LCMPFOS 00025		13C4 PFOS	0.0478 ug/mL
					LCMPFUdA 00014		13C2 PFUnA	0.05 ug/mL
LCd3-NMeFOSAA 00006	05/19/22	WEI	LLINGTON, Lot d3NMeFOSA	10517	(Purchased Reag		d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA 00006	11/08/22		LLINGTON, Lot d5NEtFOSA		(Purchased Reag		d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS 00006	02/17/22		ELLINGTON, Lot M262FTS0		(Purchased Reag		M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS 00008	07/05/22		ELLINGTON, Lot M282FTS0		(Purchased Reag		M2-8:2FTS	47.9 ug/mI
LCM2PFHxDA 00013	07/13/22		on Laboratories, Lot M2		(Purchased Reag		13C2-PFHXDA	50 ug/mL
LCM2PFOA 00008	02/12/21		ton Laboratories, Lot M		(Purchased Reag		13C2-PFOA	50 ug/mL
LCM2PFTeDA 00012	11/30/22		on Laboratories, Lot M2		(Purchased Reag		13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00012	05/03/22		ton Laboratories, Lot Ma		(Purchased Reag		13C4-PFHpA	50 ug/mL
LCM5PFPEA 00013	07/20/22		ton Laboratories, Lot M		(Purchased Reag		13C5 PFPeA	50 ug/mL
LCM8FOSA 00016	10/11/22		ton Laboratories, Lot M		(Purchased Reag		13C8 FOSA	50 ug/mL
LCMPFBA 00013	04/12/22		ton Laboratories, Lot N		(Purchased Reag		13C4 PFBA	50 ug/mL
LCMPFBS 00006	05/24/22		ton Laboratories, Lot M		(Purchased Reag		13C3-PFBS	46.5 ug/mL
LCMPFDA 00018	07/13/22		ton Laboratories, Lot N		(Purchased Reag		13C2 PFDA	50 ug/mL
LCMPFDoA 00013	05/23/22		ton Laboratories, Lot M		(Purchased Reag		13C2 PFDoA	50 ug/mL
LCMPFHxA 00019	10/27/22		ton Laboratories, Lot M		(Purchased Reag		13C2 PFHXA	50 ug/mL
LCMPFHxS 00013	02/17/22		ton Laboratories, Lot M		(Purchased Reag		1802 PFHXS	47.3 ug/mL
LCMPFNA 00013	09/30/21		gton Laboratories, Lot M		(Purchased Reag		13C5 PFNA	50 ug/mL
LCMPFOA 00013	10/17/22		gton Laboratories, Lot M		(Purchased Reag		13C4 PFOA	50 ug/mL
LCMPFOS 00017	10/17/22		gton Laboratories, Lot M		(Purchased Reag		13C4 PFOS	47.8 ug/mL
LCMPFUGA 00014	11/22/21		ton Laboratories, Lot M		(Purchased Reag		13C4 PFUS	50 ug/mL
.LCPFCSP 00132	08/20/18		Methanol, Lot 090285	10000 uL	3	200 uL		0.934 ug/mL
.LCPFCSP_00132	08/20/18	02/20/18	methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 UL	1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL

Lab Name: TestAmerica Sacramento Job No.	: 320-38875-1
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				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	-	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LC8:2FTS 00003	200 uL	Sodium	0.958 ug/mL
					_		1H,1H,2H,2H-perfluorodecane	
							sulfonate (8:2)	
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane	1 ug/mL
					7 07 17 50 03 3 00005	000 -	sulfonamidoacetic acid	1 / -
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA 00007	200 117.	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008		Perfluorobutanesulfonic acid	0.884 ug/mL
					ECT1 D5_00000		(PFBS)	0.004 dg/MI
					LCPFDA_00008		Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid	1 ug/mL
							(PFDoA)	
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid	0.964 ug/mL
					T.CDEU-2 00000	200	(PFDS) Perfluoroheptanoic acid	1
					LCPFHpA_00008	200 UL	(PFHpA)	1 ug/mL
					LCPFHpSA 00003	200 117	Perfluoroheptanesulfonic Acid	0.952 ug/mL
						200 42	(PFHpS)	0.302 dg/2
					LCPFHxA 00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA 00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS 00003		Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA 00009		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004		Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010		Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007		Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS_00003		Perfluoropentanesulfonic acid	0.938 ug/mL
					LCPFTeDA_00006		Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006		Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007		Perfluoroundecanoic acid (PFUnA)	1 ug/mL
LC4:2FTS_00003	12/12/21	1	WELLINGTON, Lot 42FTS121	6	(Purchased Read	gent)	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
LC6:2FTS_00003	06/25/21	1	WELLINGTON, Lot 62FTS061	6	(Purchased Read	gent)	Sodium	47.4 ug/mL
_							1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	_
LC8:2FTS_00003	08/22/21	1	WELLINGTON, Lot 82FTS081	6	(Purchased Read	gent)	Sodium 1H,1H,2H,2H-perfluorodecane	47.9 ug/mL
TON BURGAS ASSOCIA	00/20/01		TTTNOWN TO VELOCITA	V1.C	(D)		sulfonate (8:2)	F 0 / -
LCN-EtFOSAA_00004	09/30/21	WE	ELLINGTON, Lot NETFOSAA09	116	(Purchased Read	gent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL

Lab Name: Testamerica Sacramento Job No.: 320-388/3-1	Job No.: 320-38875-1	b Name: TestAmerica Sacramento	Lab
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				Reagent	Parent Reagen	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCN-MeFOSAA_00005	10/12/21	WE	LLINGTON, Lot NMeFOSAA	0916	(Purchased Reage	ent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mI
LCPFBA 00007	05/27/21		gton Laboratories, Lot		(Purchased Reage		Perfluorobutanoic acid (PFBA)	50 ug/mI
LCPFBS_00008	03/15/21	_	ton Laboratories, Lot		(Purchased Reag	ent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mI
LCPFDA_00008	05/29/22		gton Laboratories, Lot		(Purchased Reage		Perfluorodecanoic acid (PFDA)	50 ug/mI
LCPFDoA_00008	05/29/22	_	ton Laboratories, Lot		(Purchased Reage		Perfluorododecanoic acid (PFDoA)	50 ug/mI
LCPFDSA_00002	05/24/21	_	ton Laboratories, Lot		(Purchased Reage	ent)	Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mI
LCPFHpA_00008	12/02/21	_	ton Laboratories, Lot	-	(Purchased Reag	ent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mI
LCPFHpSA_00003	09/01/22	Wellingt	on Laboratories, Lot I	LPFHpS0817	(Purchased Reag	ent)	Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mI
LCPFHxA_00007	12/22/20		ton Laboratories, Lot		(Purchased Reage		Perfluorohexanoic acid (PFHxA)	50 ug/mI
LCPFHxS-br_00004	07/03/20		on Laboratories, Lot br		(Purchased Reag		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mI
LCPFNA_00009	07/20/22		gton Laboratories, Lot		(Purchased Reage		Perfluorononanoic acid (PFNA)	50 ug/mI
LCPFNS_00003	09/27/22	Welling	ton Laboratories, Lot	LPFNS0917	(Purchased Reage		Perfluorononanesulfonic acid	48 ug/mI
LCPFOA_00009	09/27/22	Welling	gton Laboratories, Lot	PFOA0917	(Purchased Reage		Perfluorooctanoic acid (PFOA)	50 ug/mI
LCPFOS-br_00004	10/14/20		on Laboratories, Lot b		(Purchased Reag		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mI
LCPFOSA_00010	09/30/21	_	ton Laboratories, Lot		(Purchased Reag		Perfluorooctane Sulfonamide (FOSA)	50 ug/mI
LCPFPeA_00007	05/31/21	_	ton Laboratories, Lot		(Purchased Reag	ent)	Perfluoropentanoic acid (PFPeA)	50 ug/mI
LCPFPeS_00003	01/11/22	Wellingt	on Laboratories, Lot I	LPFPeS0117	(Purchased Reage		Perfluoropentanesulfonic acid	46.9 ug/mI
LCPFTeDA_00006	12/09/20	_	ton Laboratories, Lot E		(Purchased Reage		Perfluorotetradecanoic acid (PFTeA)	50 ug/mI
LCPFTrDA_00006	02/12/21		ton Laboratories, Lot F		(Purchased Reag	,	Perfluorotridecanoic Acid (PFTriA)	50 ug/mI
LCPFUdA_00007	10/18/21	Welling	ton Laboratories, Lot	PFUdA1016	(Purchased Reag	ent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mI
LCPFC LL5 00004	08/20/18	02/22/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC ALL SU 00041	10 mI	d3-NMeFOSAA	2.5 ng/mI
							d5-NEtFOSAA	2.5 ng/mI
							M2-6:2FTS	2.375 ng/mI
							M2-8:2FTS	2.395 ng/mI
							13C2-PFHxDA	2.5 ng/mI
							13C2-PFOA	2.5 ng/mI
							13C2-PFTeDA	2.5 ng/mI
							13C4-PFHpA	2.5 ng/mI
							13C5 PFPeA	2.5 ng/mI
							13C8 FOSA	2.5 ng/mI
							13C4 PFBA	2.5 ng/mI
							13C3-PFBS	2.325 ng/mI
							13C2 PFDA	2.5 ng/mI
							13C2 PFDoA	2.5 ng/mI
							13C2 PFHxA	2.5 ng/mI
							1802 PFHxS	2.365 ng/mI

Lab Name: Testamerica Sacramento Job No.: 320-388/3-1	Job No.: 320-38875-1	b Name: TestAmerica Sacramento	Lab
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				Reagent	Parent Reager	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
							13C5 PFNA	2.5 ng/m
							13C4 PFOA	2.5 ng/m
							13C4 PFOS	2.39 ng/ml
							13C2 PFUnA	2.5 ng/ml
					LCPFCSP_00132	500 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	2.335 ng/mI
							Sodium 1H,1H,2H,2H-perfluorooctane	2.37 ng/mI
							sulfonate (6:2) Sodium	2.395 ng/mI
							1H,1H,2H,2H-perfluorodecane sulfonate (8:2) N-ethyl perfluorooctane	2 5
							sulfonamidoacetic acid N-methyl perfluorooctane	2.5 ng/mI 2.5 ng/mI
							sulfonamidoacetic acid Perfluorobutanoic acid (PFBA)	2.5 ng/mI
							Perfluorobutanesulfonic acid (PFBS)	2.21 ng/mI
							Perfluorodecanoic acid (PFDA)	2.5 ng/mI
							Perfluorododecanoic acid (PFDoA)	2.5 ng/mI
							Perfluorodecanesulfonic acid (PFDS)	2.41 ng/mI
							Perfluoroheptanoic acid (PFHpA)	2.5 ng/mI
							Perfluoroheptanesulfonic Acid (PFHpS)	2.38 ng/mI
							Perfluorohexanoic acid (PFHxA)	2.5 ng/mI
							Perfluorohexanesulfonic acid (PFHxS)	2.275 ng/mI
							Perfluorononanoic acid (PFNA)	2.5 ng/mI
							Perfluorononanesulfonic acid	2.4 ng/mI
							Perfluorooctanoic acid (PFOA) Perfluorooctanesulfonic acid	2.5 ng/mI 2.32 ng/mI
							(PFOS) Perfluorooctane Sulfonamide (FOSA)	2.5 ng/mI
							Perfluoropentanoic acid (PFPeA)	2.5 ng/mI
							Perfluoropentanesulfonic acid	2.345 ng/mI
							Perfluorotetradecanoic acid (PFTeA)	2.5 ng/mI
							Perfluorotridecanoic Acid (PFTriA)	2.5 ng/mI
							Perfluoroundecanoic acid (PFUnA)	2.5 ng/mI
C ALL SU 00041	08/20/18	02/20/10	Methanol, Lot Baker	200 =	LCd3-NMeFOSAA 00006	200	d3-NMeFOSAA	0.05 ug/mI

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1	
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				Reagent	Parent Reager	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mI
					LCM2-6:FTS 00006	200 uL	M2-6:2FTS	0.0475 ug/mI
					LCM2-8:2FTS 00008	200 uL	M2-8:2FTS	0.0479 ug/ml
					LCM2PFHxDA_00013		13C2-PFHxDA	0.05 ug/mI
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mI
					LCM2PFTeDA 00012	200 uL	13C2-PFTeDA	0.05 ug/mI
					LCM4PFHPA_00012		13C4-PFHpA	0.05 ug/mI
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mI
					LCM8FOSA_00016		13C8 FOSA	0.05 ug/mI
					LCMPFBA 00013	200 uL	13C4 PFBA	0.05 ug/mI
					LCMPFBS 00006	200 uL	13C3-PFBS	0.0465 ug/mI
					LCMPFDA 00018	200 uL	13C2 PFDA	0.05 ug/mI
					LCMPFDoA_00013		13C2 PFDoA	0.05 ug/mI
					LCMPFHxA_00019		13C2 PFHxA	0.05 ug/mI
					LCMPFHxS 00013	200 uL	1802 PFHxS	0.0473 ug/mI
					LCMPFNA 00013	200 uL	13C5 PFNA	0.05 ug/mI
					LCMPFOA 00017	200 uL	13C4 PFOA	0.05 ug/mI
					LCMPFOS 00025	200 uL	13C4 PFOS	0.0478 ug/mI
					LCMPFUdA 00014	200 uL	13C2 PFUnA	0.05 ug/mI
LCd3-NMeFOSAA 00006	05/19/22	WEI	LINGTON, Lot d3NMeFOSAA)517	(Purchased Reag	ent)	d3-NMeFOSAA	50 ug/mI
LCd5-NEtFOSAA 00006	11/08/22	WEI	LINGTON, Lot d5NEtFOSAA1	L117	(Purchased Reag	ent)	d5-NEtFOSAA	50 ug/mI
LCM2-6:FTS 00006	02/17/22	W	ELLINGTON, Lot M262FTS02	17	(Purchased Reag	ent)	M2-6:2FTS	47.5 ug/mI
LCM2-8:2FTS 00008	07/05/22		ELLINGTON, Lot M282FTS07		(Purchased Reag	ent)	M2-8:2FTS	47.9 ug/mI
LCM2PFHxDA 00013	07/13/22	Wellingt	on Laboratories, Lot M2P	FHxDA0717	(Purchased Reag	ent)	13C2-PFHxDA	50 ug/mI
LCM2PFOA 00008	02/12/21	Welling	ton Laboratories, Lot M2	PFOA0216	(Purchased Reag	ent)	13C2-PFOA	50 ug/mI
LCM2PFTeDA 00012	11/30/22	Wellingt	on Laboratories, Lot M2P	FTeDA1117	(Purchased Reag	ent)	13C2-PFTeDA	50 ug/mI
LCM4PFHPA 00012	05/03/22	Wellingt	on Laboratories, Lot M41	PFHpA0517	(Purchased Reag	ent)	13C4-PFHpA	50 ug/mI
LCM5PFPEA 00013	07/20/22	Wellingt	on Laboratories, Lot M5	PFPeA0717	(Purchased Reag	ent)	13C5 PFPeA	50 ug/mI
LCM8FOSA 00016	10/11/22		on Laboratories, Lot M8H		(Purchased Reag	ent)	13C8 FOSA	50 ug/mI
LCMPFBA 00013	04/12/22	Welling	gton Laboratories, Lot Mi	PFBA0417	(Purchased Reag	ent)	13C4 PFBA	50 ug/mI
LCMPFBS 00006	05/24/22		ton Laboratories, Lot M3		(Purchased Reag	ent)	13C3-PFBS	46.5 ug/mI
LCMPFDA 00018	07/13/22	Welling	ton Laboratories, Lot M	PFDA0717	(Purchased Reag	ent)	13C2 PFDA	50 ug/mI
LCMPFDoA 00013	05/23/22	Welling	ton Laboratories, Lot MP	FDoA0517	(Purchased Reag	ent)	13C2 PFDoA	50 ug/mI
LCMPFHxA 00019	10/27/22	Welling	ton Laboratories, Lot MP	FHxA1017	(Purchased Reag	ent)	13C2 PFHxA	50 ug/mI
LCMPFHxS 00013	02/17/22		ton Laboratories, Lot MP		(Purchased Reag		1802 PFHxS	47.3 ug/mI
LCMPFNA 00013	09/30/21	Welling	ton Laboratories, Lot M	PFNA0916	(Purchased Reag	ent)	13C5 PFNA	50 ug/mI
LCMPFOA 00017	10/17/22	Welling	ton Laboratories, Lot M	PFOA1017	(Purchased Reag	ent)	13C4 PFOA	50 ug/mI
LCMPFOS 00025	10/17/22	Welling	ton Laboratories, Lot M	PFOS1017	(Purchased Reag	ent)	13C4 PFOS	47.8 ug/mI
LCMPFUdA 00014	11/22/21	Welling	ton Laboratories, Lot MP	FUdA1116	(Purchased Reag	ent)	13C2 PFUnA	50 ug/mI
.LCPFCSP_00132	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane	0.934 ug/mI
					LC6:2FTS_00003	200 uL	sulfonate (4:2) Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mI
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mI

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				Reagent	Parent Reage	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA 00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008		Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008		Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA 00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004		Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA 00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS 00003		Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA 00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS_00003	200 uL	Perfluoropentanesulfonic acid	0.938 ug/mL
					LCPFTeDA_00006		Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	,	1 ug/mL
LC4:2FTS_00003	12/12/21	V	WELLINGTON, Lot 42FTS121	6	(Purchased Read	gent)	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
LC6:2FTS_00003	06/25/21	V	WELLINGTON, Lot 62FTS061	6	(Purchased Read	gent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
LC8:2FTS_00003	08/22/21	V	WELLINGTON, Lot 82FTS081	6	(Purchased Read	gent)	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
LCN-EtFOSAA_00004	09/30/21	WE	LLINGTON, Lot NETFOSAA09	916	(Purchased Read	gent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSAA_00005	10/12/21	WE	LLINGTON, Lot NMeFOSAA09	916	(Purchased Read	gent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFBA 00007	05/27/21	Welling	gton Laboratories, Lot P	FBA0516	(Purchased Read	gent)	Perfluorobutanoic acid (PFBA)	50 ug/mL

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				Reagent	Parent Reage	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCPFBS_00008	03/15/21	Wellingt	ton Laboratories, Lot	LPFBS0316	(Purchased Reac	gent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA 00008	05/29/22	Welling	ton Laboratories, Lot	PFDA0517	(Purchased Read	gent)	Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00008	05/29/22	_	ton Laboratories, Lot		(Purchased Read		Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDSA_00002	05/24/21	_	ton Laboratories, Lot		(Purchased Read		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00008	12/02/21	_	ton Laboratories, Lot	_	(Purchased Read		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpSA_00003	09/01/22		on Laboratories, Lot 1		(Purchased Read		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
LCPFHxA_00007	12/22/20		ton Laboratories, Lot		(Purchased Read		Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxS-br_00004			n Laboratories, Lot b		(Purchased Read		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA_00009	07/20/22		ton Laboratories, Lot		(Purchased Read		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFNS_00003	09/27/22		ton Laboratories, Lot		(Purchased Read		Perfluorononanesulfonic acid	48 ug/mL
LCPFOA_00009	09/27/22		ton Laboratories, Lot		(Purchased Read		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFOS-br_00004	10/14/20	_	on Laboratories, Lot b		(Purchased Read		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00010	09/30/21	_	ton Laboratories, Lot		(Purchased Read		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00007	05/31/21		con Laboratories, Lot		(Purchased Read		Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFPeS_00003	01/11/22		on Laboratories, Lot 1		(Purchased Read		Perfluoropentanesulfonic acid	46.9 ug/mL
LCPFTeDA_00006	12/09/20	_	on Laboratories, Lot 1		(Purchased Read		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
LCPFTrDA_00006	02/12/21	_	on Laboratories, Lot 1		(Purchased Read		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFUdA_00007	10/18/21	Wellingt	ton Laboratories, Lot	PFUdA1016	(Purchased Read	gent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL6_00005	08/20/18	02/22/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00041	10 mI	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							1802 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
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				Reagent	Parent Reager	t		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP 00132	1 mL	Sodium	4.67 ng/mL
					_		1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	4.74 ng/mL
							Sodium	4.79 ng/mL
							1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	1.75 1197 1112
							N-ethyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							N-methyl perfluorooctane	5 ng/mL
							sulfonamidoacetic acid	
							Perfluorobutanoic acid (PFBA)	5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL
							Perfluorodecanoic acid (PFDA)	5 ng/mL
							Perfluorododecanoic acid (PFDoA)	5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	4.82 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	4.76 ng/mL
							Perfluorohexanoic acid (PFHxA)	5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	4.55 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorononanesulfonic acid	4.8 ng/mL
							Perfluorooctanoic acid (PFOA)	5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.64 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	5 ng/mL
							Perfluoropentanoic acid (PFPeA)	5 ng/mL
							Perfluoropentanesulfonic acid	4.69 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	5 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA 00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS 00006		M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS 00008	200 uL	M2-8:2FTS	0.0479 ug/mL

Lab	Name:	TestAmerica	Sacrament	to Job No.: 320-38875-1

				Reagent	Parent Reage	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
					LCM2PFHxDA 00013		13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA 00008		13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA 00012		13C2-PFTOA	0.05 ug/mL
					LCM4PFHPA 00012		13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013		13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016		13C8 FOSA	0.05 ug/mL
					LCMPFBA 00013		13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006		13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018		13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013		13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019		13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013		1802 PFHxS	0.0473 ug/mL
					LCMPFNA_00013		13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS 00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA 00014	200 uL	13C2 PFUnA	0.05 ug/mL
LCd3-NMeFOSAA 00006	05/19/22	WEI	LINGTON, Lot d3NMeFOSAAC	0517	(Purchased Rea	igent)	d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA 00006	11/08/22	WEL	LINGTON, Lot d5NEtFOSAA1	1117	(Purchased Rea	igent)	d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS 00006	02/17/22	WI	ELLINGTON, Lot M262FTS02	17	(Purchased Rea	igent)	M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS 00008	07/05/22		ELLINGTON, Lot M282FTS07	17	(Purchased Rea		M2-8:2FTS	47.9 ug/mL
LCM2PFHxDA 00013	07/13/22	Wellingto	on Laboratories, Lot M2P	FH×DA0717	(Purchased Rea		13C2-PFHxDA	50 ug/mL
LCM2PFOA 00008	02/12/21	Wellingt	ton Laboratories, Lot M2	PF0A0216	(Purchased Rea		13C2-PFOA	50 ug/mL
LCM2PFTeDA 00012	11/30/22		on Laboratories, Lot M2P		(Purchased Rea		13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00012	05/03/22		on Laboratories, Lot M4F		(Purchased Rea		13C4-PFHpA	50 ug/mL
LCM5PFPEA 00013	07/20/22		on Laboratories, Lot M5F		(Purchased Rea		13C5 PFPeA	50 ug/mL
LCM8FOSA 00016	10/11/22		on Laboratories, Lot M8F		(Purchased Rea		13C8 FOSA	50 ug/mL
LCMPFBA 00013	04/12/22		ton Laboratories, Lot ME		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFBS 00006	05/24/22		ton Laboratories, Lot M3		(Purchased Rea		13C3-PFBS	46.5 ug/mL
LCMPFDA 00018	07/13/22		ton Laboratories, Lot MS		(Purchased Rea		13C2 PFDA	50 ug/mL
LCMPFDOA 00013	05/23/22		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFDOA	50 ug/mL
LCMPFHXA 00019	10/27/22		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFHXA	50 ug/mL
LCMPFHXS 00013					*		1802 PFHxS	
	02/17/22		ton Laboratories, Lot MP		(Purchased Rea			47.3 ug/mL
LCMPFNA_00013	09/30/21		ton Laboratories, Lot ME		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFOA_00017	10/17/22		ton Laboratories, Lot ME		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS_00025	10/17/22		ton Laboratories, Lot ME		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA_00014	11/22/21		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFCSP_00132	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL		0.958 ug/mL
					LCN-EtFOSAA_00004		N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL

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				Reagent	Parent Reage			
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
					LCPFBA 00007	2.00 uTı	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS 00008		Perfluorobutanesulfonic acid	0.884 ug/mL
							(PFBS)	
					LCPFDA 00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA 00008		Perfluorododecanoic acid	1 ug/mL
					_		(PFDoA)	
					LCPFDSA_00002		Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	(PFHpS)	0.952 ug/mL
					LCPFHxA_00007		Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004		Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009		Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00003		Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA_00009		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004		Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010		Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS 00003	200 uL		0.938 ug/mL
					LCPFTeDA_00006		Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007		Perfluoroundecanoic acid (PFUnA)	1 ug/mL
LC4:2FTS_00003	12/12/21		WELLINGTON, Lot 42FTS121	6	(Purchased Read		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
LC6:2FTS_00003	06/25/21		WELLINGTON, Lot 62FTS061	6	(Purchased Rea	gent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
LC8:2FTS_00003	08/22/21		WELLINGTON, Lot 82FTS081		(Purchased Rea	-	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
LCN-EtFOSAA_00004	09/30/21	WI	ELLINGTON, Lot NEtFOSAA0	916	(Purchased Rea	gent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSAA_00005	10/12/21	W	ELLINGTON, Lot NMeFOSAA0	916	(Purchased Rea	gent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFBA_00007	05/27/21	Wellin	gton Laboratories, Lot F	FBA0516	(Purchased Rea		Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00008	03/15/21	Welling	gton Laboratories, Lot L	PFBS0316	(Purchased Rea	gent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00008	05/29/22		gton Laboratories, Lot F		(Purchased Rea		Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00008	05/29/22	Welling	gton Laboratories, Lot P	FDoA0517	(Purchased Read	gent)	Perfluorododecanoic acid (PFDoA)	50 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1	Lab	Name:	TestAmerica	Sacramento	Job No.: 320-	-38875-	1
	Lab	Name:	restamerica	Sacramento	JOD NO.: 320-	-300/3-	T

				Reagent	Parent Reagen	ıt		
Reagent ID	Exp Prep Date Date	Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCPFDSA_00002	05/24/21		ton Laboratories, Lot		(Purchased Reage	ent)	Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mI
LCPFHpA_00008	12/02/21	Welling	ton Laboratories, Lot	PFHpA1216	(Purchased Reage	ent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mI
LCPFHpSA_00003	09/01/22	_	ton Laboratories, Lot 1	-	(Purchased Reage		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mI
LCPFHxA_00007	12/22/20		ston Laboratories, Lot		(Purchased Reage	ent)	Perfluorohexanoic acid (PFHxA)	50 ug/mI
LCPFHxS-br_00004	07/03/20	2	on Laboratories, Lot b		(Purchased Reage		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mI
LCPFNA 00009	07/20/22	Wellin	gton Laboratories, Lot	PFNA0717	(Purchased Reage	ent)	Perfluorononanoic acid (PFNA)	50 ug/mI
LCPFNS 00003	09/27/22	Welling	ton Laboratories, Lot	LPFNS0917	(Purchased Reage	ent)	Perfluorononanesulfonic acid	48 ug/mI
LCPFOA 00009	09/27/22	Wellin	gton Laboratories, Lot	PFOA0917	(Purchased Reage	ent)	Perfluorooctanoic acid (PFOA)	50 ug/mI
LCPFOS-br_00004	10/14/20		con Laboratories, Lot b		(Purchased Reage	ent)	Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mI
LCPFOSA_00010	09/30/21	-	gton Laboratories, Lot		(Purchased Reage		Perfluorooctane Sulfonamide (FOSA)	50 ug/mI
LCPFPeA_00007	05/31/21	Welling	ton Laboratories, Lot	PFPeA0516	(Purchased Reage	ent)	Perfluoropentanoic acid (PFPeA)	50 ug/mI
LCPFPeS_00003	01/11/22		ton Laboratories, Lot 1		(Purchased Reage		Perfluoropentanesulfonic acid	46.9 ug/mI
LCPFTeDA_00006	12/09/20	_	ton Laboratories, Lot 1		(Purchased Reage	ent)	Perfluorotetradecanoic acid (PFTeA)	50 ug/mI
LCPFTrDA_00006	02/12/21		ton Laboratories, Lot 1		(Purchased Reage	ent)	Perfluorotridecanoic Acid (PFTriA)	50 ug/mI
LCPFUdA_00007	10/18/21	Welling	ton Laboratories, Lot	PFUdA1016	(Purchased Reage	ent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mI
LCPFC LL7 00004	08/20/18	02/22/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC ALL SU 00041	10 mI	d3-NMeFOSAA	2.5 ng/mI
							d5-NEtFOSAA	2.5 ng/mI
							M2-6:2FTS	2.375 ng/mI
							M2-8:2FTS	2.395 ng/mI
							13C2-PFHxDA	2.5 ng/mI
							13C2-PFOA	2.5 ng/mI
							13C2-PFTeDA	2.5 ng/mI
							13C4-PFHpA	2.5 ng/mI
							13C5 PFPeA	2.5 ng/mI
							13C8 FOSA	2.5 ng/mI
							13C4 PFBA	2.5 ng/mI
							13C3-PFBS	2.325 ng/mI
							13C2 PFDA	2.5 ng/mI
							13C2 PFDoA	2.5 ng/mI
							13C2 FFDOA 13C2 PFHXA	2.5 ng/mI
							1802 PFHXS	2.365 ng/mI
							13C5 PFNA	2.5 ng/mI
							13C4 PFOA	2.5 ng/mI
							13C4 PFOA 13C4 PFOS	2.39 ng/mI
							13C4 PFOS 13C2 PFUnA	
					LCDECCD 00122	2 T	Sodium	2.5 ng/mI
					LCPFCSP_00132	∠ m⊥	1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	9.34 ng/mI

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
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				Reagent	Parent Reagent	;		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
Reagent 1D	Date	Date	useu	VOI une	Reagent 1D	Added	=	
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	9.48 ng/mL
							Sodium	9.58 ng/mL
							1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	3.00 mg/ mz
							N-ethyl perfluorooctane sulfonamidoacetic acid	10 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	10 ng/mL
							Perfluorobutanoic acid (PFBA)	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	8.84 ng/mL
							Perfluorodecanoic acid (PFDA)	10 ng/mL
							Perfluorododecanoic acid (PFDoA)	10 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	9.64 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	9.52 ng/mL
							Perfluorohexanoic acid (PFHxA)	10 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	9.1 ng/mL
							Perfluorononanoic acid (PFNA)	10 ng/mL
							Perfluorononanesulfonic acid	9.6 ng/mL
							Perfluorooctanoic acid (PFOA)	10 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	9.28 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	10 ng/mL
							Perfluoropentanoic acid (PFPeA)	10 ng/mL
							Perfluoropentanesulfonic acid	9.38 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	10 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	10 ng/mL
							Perfluoroundecanoic acid (PFUnA)	10 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006		d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006		d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006		M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008		M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA 00013		13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008		13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00012		13C2-PFTeDA	0.05 ug/mL
	I		I	1	LCM4PFHPA_00012	∠00 uL	13C4-PFHpA	0.05 ug/mL

Lab Name: TestAmerica Sacramento J	Job No.: 320-38875-1
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LCM2PFOA 00008 02/12/21 LCM2PFTeDA 00012 11/30/22 W LCM4PFHPA 00012 05/03/22 V LCM5PFPEA 00013 07/20/22 V	Prep Date		Doogont	Parent Reage	nt		
Reagent ID Date LCd3-NMeFOSAA_00006 05/19/22LCd5-NEtFOSAA_00006 11/08/22LCM2-6:FTS_00006 02/17/22LCM2-8:2FTS_00008 07/05/22LCM2PFH2DA_00013 07/13/22 WLCM2PFOA_00008 02/12/21LCM2PFTeDA_00012 11/30/22 WLCM4PFHPA_00012 05/03/22 ULCM4PFPPA_00013 07/20/22 U	-	Dilutant	Reagent Final		Volume		
LCd5-NEtFOSAA 00006 11/08/22LCM2-6:FTS 00006 02/17/22LCM2-8:2FTS 00008 07/05/22LCM2PFHxDA 00013 07/13/22 WLCM2PFOA 00008 02/12/21LCM2PFTeDA 00012 11/30/22 WLCM2PFTeDA 00012 11/30/22 WLCM4PFHPA 00012 05/03/22 ULCM4PFPA 00013 07/20/22 ULCM5PFPEA 00013 07/20/22 U	-	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCd5-NEtFOSAA 00006 11/08/22LCM2-6:FTS 00006 02/17/22LCM2-8:2FTS 00008 07/05/22LCM2PFHXDA 00013 07/13/22 WLCM2PFOA 00008 02/12/21LCM2PFTDA 00012 11/30/22 WLCM2PFTDA 00012 11/30/22 WLCM4PFHPA 00012 05/03/22 ULCM4PFPA 00013 07/20/22 WLCM5PFPEA 00013 07/20/22 U				LCM5PFPEA 00013	200 uL	13C5 PFPeA	0.05 ug/mL
LCd5-NEtFOSAA 00006 11/08/22 LCM2-6:FTS 00006 02/17/22 LCM2-8:2FTS 00008 07/05/22 LCM2PFHXDA 00013 07/13/22 W LCM2PFOA 00008 02/12/21 LCM2PFTDA 00012 11/30/22 W LCM2PFHPA 00012 05/03/22 U LCM4PFHPA 00012 05/03/22 U				LCM8FOSA 00016	200 uL	13C8 FOSA	0.05 ug/mL
LCd5-NEtFOSAA 00006 11/08/22 LCM2-6:FTS 00006 02/17/22 LCM2-8:2FTS 00008 07/05/22 LCM2PFHXDA 00013 07/13/22 W LCM2PFOA 00008 02/12/21 LCM2PFTDA 00012 11/30/22 W LCM2PFHPA 00012 05/03/22 U LCM4PFHPA 00012 05/03/22 U				LCMPFBA 00013	200 uL	13C4 PFBA	0.05 ug/mL
LCd5-NEtFOSAA 00006 11/08/22 LCM2-6:FTS 00006 02/17/22 LCM2-8:2FTS 00008 07/05/22 LCM2PFHXDA 00013 07/13/22 W LCM2PFOA 00008 02/12/21 LCM2PFTDA 00012 11/30/22 W LCM2PFHPA 00012 05/03/22 U LCM4PFHPA 00012 05/03/22 U				LCMPFBS 00006		13C3-PFBS	0.0465 ug/mL
LCd5-NEtFOSAA 00006 11/08/22 LCM2-6:FTS 00006 02/17/22 LCM2-8:2FTS 00008 07/05/22 LCM2PFHxDA 00013 07/13/22 W LCM2PFOA 00008 02/12/21 LCM2PFTeDA 00012 11/30/22 W LCM2PFTPDA 00012 05/03/22 U LCM4PFHPA 00012 05/03/22 U LCM5PFPEA 00013 07/20/22 U				LCMPFDA 00018	200 uL	13C2 PFDA	0.05 ug/mL
LCd5-NEtFOSAA 00006 11/08/22 LCM2-6:FTS 00006 02/17/22 LCM2-8:2FTS 00008 07/05/22 LCM2PFHxDA 00013 07/13/22 W LCM2PFOA 00008 02/12/21 LCM2PFTeDA 00012 11/30/22 W LCM2PFTPDA 00012 05/03/22 U LCM4PFHPA 00012 05/03/22 U LCM5PFPEA 00013 07/20/22 U				LCMPFDoA 00013		13C2 PFDoA	0.05 ug/mL
LCd5-NEtFOSAA 00006 11/08/22 LCM2-6:FTS 00006 02/17/22 LCM2-8:2FTS 00008 07/05/22 LCM2PFHxDA 00013 07/13/22 W LCM2PFOA 00008 02/12/21 LCM2PFTeDA 00012 11/30/22 W LCM2PFTPDA 00012 05/03/22 U LCM4PFHPA 00012 05/03/22 U LCM5PFPEA 00013 07/20/22 U				LCMPFHxA 00019	200 uL	13C2 PFHxA	0.05 ug/mL
LCd5-NEtFOSAA 00006 11/08/22 LCM2-6:FTS 00006 02/17/22 LCM2-8:2FTS 00008 07/05/22 LCM2PFHxDA 00013 07/13/22 W LCM2PFOA 00008 02/12/21 LCM2PFTeDA 00012 11/30/22 W LCM2PFTPDA 00012 05/03/22 U LCM4PFHPA 00012 05/03/22 U LCM5PFPEA 00013 07/20/22 U				LCMPFHxS 00013	200 uL	1802 PFHxS	0.0473 ug/mL
LCd5-NEtFOSAA 00006 11/08/22LCM2-6:FTS 00006 02/17/22LCM2-8:2FTS 00008 07/05/22LCM2PFH2DA 00013 07/13/22 WLCM2PFOA 00008 02/12/21LCM2PFTeDA 00012 11/30/22 WLCM2PFTeDA 00012 05/03/22 ULCM4PFHPA 00012 05/03/22 ULCM5PFPEA 00013 07/20/22 U				LCMPFNA 00013		13C5 PFNA	0.05 ug/mL
LCd5-NEtFOSAA 00006 11/08/22LCM2-6:FTS 00006 02/17/22LCM2-8:2FTS 00008 07/05/22LCM2PFH2DA 00013 07/13/22 WLCM2PFOA 00008 02/12/21LCM2PFTeDA 00012 11/30/22 WLCM2PFTeDA 00012 05/03/22 ULCM4PFHPA 00012 05/03/22 ULCM5PFPEA 00013 07/20/22 U				LCMPFOA 00017		13C4 PFOA	0.05 ug/mL
LCd5-NEtFOSAA 00006 11/08/22 LCM2-6:FTS 00006 02/17/22 LCM2-8:2FTS 00008 07/05/22 LCM2PFHxDA 00013 07/13/22 W LCM2PFOA 00008 02/12/21 LCM2PFTeDA 00012 11/30/22 W LCM2PFTPDA 00012 05/03/22 U LCM4PFHPA 00012 05/03/22 U LCM5PFPEA 00013 07/20/22 U				LCMPFOS 00025		13C4 PFOS	0.0478 ug/mL
LCd5-NEtFOSAA 00006 11/08/22 LCM2-6:FTS 00006 02/17/22 LCM2-8:2FTS 00008 07/05/22 LCM2PFHxDA 00013 07/13/22 W LCM2PFOA 00008 02/12/21 LCM2PFTeDA 00012 11/30/22 W LCM2PFTPDA 00012 05/03/22 U LCM4PFHPA 00012 05/03/22 U LCM5PFPEA 00013 07/20/22 U				LCMPFUdA 00014		13C2 PFUnA	0.05 ug/mL
LCd5-NEtFOSAA 00006 11/08/22 LCM2-6:FTS 00006 02/17/22 LCM2-8:2FTS 00008 07/05/22 LCM2PFHxDA 00013 07/13/22 W LCM2PFOA 00008 02/12/21 LCM2PFTeDA 00012 11/30/22 W LCM2PFTPDA 00012 05/03/22 U LCM4PFHPA 00012 05/03/22 U LCM5PFPEA 00013 07/20/22 U	WELL	INGTON, Lot d3NMeFOSAA0)517	(Purchased Read		d3-NMeFOSAA	50 ug/mL
LCM2-6:FTS 00006 02/17/22LCM2-8:2FTS 00008 07/05/22LCM2PFHxDA 00013 07/13/22 WLCM2PFOA 00008 02/12/21LCM2PFTeDA 00012 11/30/22 WLCM4PFHPA 00012 05/03/22 ULCM5PFPEA 00013 07/20/22 U		INGTON, Lot d5NEtFOSAA1		(Purchased Read	, ,	d5-NEtFOSAA	50 ug/mL
LCM2-8:2FTS 00008 07/05/22 LCM2PFHxDA 00013 07/13/22 W LCM2PFOA 00008 02/12/21 LCM2PFTeDA 00012 11/30/22 W LCM4PFHPA 00012 05/03/22 U LCM5PFPEA 00013 07/20/22 U		LLINGTON, Lot M262FTS02		(Purchased Read		M2-6:2FTS	47.5 ug/mL
LCM2PFHxDA 00013 07/13/22 W LCM2PFOA 00008 02/12/21 LCM2PFTeDA 00012 11/30/22 W LCM4PFHPA 00012 05/03/22 U LCM5PFPEA 00013 07/20/22 U		LLINGTON, Lot M282FTS07		(Purchased Read		M2-8:2FTS	47.9 ug/mL
LCM2PFOA 00008 02/12/21LCM2PFTeDA 00012 11/30/22 WLCM4PFHPA 00012 05/03/22 ULCM5PFPEA 00013 07/20/22 U		n Laboratories, Lot M2P1		(Purchased Read		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00012 11/30/22 W LCM4PFHPA 00012 05/03/22 V LCM5PFPEA 00013 07/20/22 V		on Laboratories, Lot M21		(Purchased Read		13C2-PFOA	50 ug/mL
LCM4PFHPA 00012 05/03/22 0 LCM5PFPEA 00013 07/20/22 0		n Laboratories, Lot M2P		(Purchased Read		13C2-PFTeDA	50 ug/mL
LCM5PFPEA 00013 07/20/22 V		on Laboratories, Lot M4F		(Purchased Read		13C4-PFHpA	50 ug/mL
		on Laboratories, Lot M5F		(Purchased Read		13C5 PFPeA	50 ug/mL
LCM8FOSA 00016 10/11/22 V		n Laboratories, Lot M8F		(Purchased Read		13C8 FOSA	50 ug/mL
LCMPFBA 00013 04/12/22		on Laboratories, Lot MF		(Purchased Read		13C4 PFBA	50 ug/mL
		on Laboratories, Lot M3		(Purchased Read		13C3-PFBS	46.5 ug/mL
LCMPFDA 00018 07/13/22		on Laboratories, Lot MF		(Purchased Read		13C2 PFDA	50 ug/mL
		on Laboratories, Lot MP		(Purchased Read		13C2 PFDoA	50 ug/mL
		on Laboratories, Lot MP		(Purchased Read		13C2 PFHxA	50 ug/mL
		on Laboratories, Lot MP		(Purchased Read		1802 PFHxS	47.3 ug/mL
LCMPFNA 00013 09/30/21		on Laboratories, Lot MF		(Purchased Read		13C5 PFNA	50 ug/mL
LCMPFOA 00017 09/30/21		on Laboratories, Lot MF		(Purchased Read		13C4 PFOA	50 ug/mL
LCMPFOS 00025 10/17/22		on Laboratories, Lot MP		(Purchased Read		13C4 PFOS	47.8 ug/mL
_		on Laboratories, Lot MP		(Purchased Read		13C2 PFUNA	50 ug/mL
		Methanol, Lot 090285	10000 uL		200 uL		0.934 ug/mL
.LCFFCSF_00132 00/20/10 0.	2/20/10	Techanol, Lot 090203	10000 uL	LC4:2F15_00003	200 uL	1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/IIIL
				LC6:2FTS_00003		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
				LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
				LCN-EtFOSAA_00004		N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
				LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane	1 ug/mL
						sulfonamidoacetic acid	
				LCPFBA 00007 LCPFBS 00008		sulfonamidoacetic acid Perfluorobutanoic acid (PFBA) Perfluorobutanesulfonic acid	1 ug/mL 0.884 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1	
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				Reagent	Parent Reage	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA 00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004		Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA 00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS 00003		Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA 00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004		Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010		Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS 00003	200 uL	Perfluoropentanesulfonic acid	0.938 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006		Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
LC4:2FTS_00003	12/12/21		WELLINGTON, Lot 42FTS121	6	(Purchased Reac	gent)	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
LC6:2FTS_00003	06/25/21		WELLINGTON, Lot 62FTS061	6	(Purchased Read	gent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
LC8:2FTS_00003	08/22/21		WELLINGTON, Lot 82FTS081	6	(Purchased Read	gent)	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
LCN-EtFOSAA_00004	09/30/21	WE	CLLINGTON, Lot NETFOSAA09	916	(Purchased Reac	gent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSAA_00005	10/12/21	WE	CLLINGTON, Lot NMeFOSAA09	916	(Purchased Reac	gent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFBA 00007	05/27/21	Wellin	Wellington Laboratories, Lot PFBA0516		(Purchased Read	gent)	Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00008	03/15/21	Welling	Wellington Laboratories, Lot LPFBS0316		(Purchased Read	gent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00008	05/29/22		gton Laboratories, Lot P		(Purchased Read	gent)	Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00008	05/29/22	Welling	ton Laboratories, Lot PF	DoA0517	(Purchased Read	gent)	Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDSA_00002	05/24/21	Welling	ton Laboratories, Lot LE	PFDS0516	(Purchased Reac	gent)	Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00008	12/02/21	Welling	ton Laboratories, Lot PF	THpA1216	(Purchased Reac	gent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.:	320-38	875	-1
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				Reagent	Parent Reager	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCPFHpSA_00003	09/01/22	Welling	ton Laboratories, Lot	LPFHpS0817	(Purchased Reag	ent)	Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mI
LCPFHxA 00007	12/22/20	Welling	gton Laboratories, Lot	PFHxA1215	(Purchased Reag	ent)	Perfluorohexanoic acid (PFHxA)	50 ug/mI
LCPFHxS-br_00004		_	on Laboratories, Lot b		(Purchased Reag	ent)	Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mI
LCPFNA_00009	07/20/22		gton Laboratories, Lot		(Purchased Reag	ent)	Perfluorononanoic acid (PFNA)	50 ug/mI
LCPFNS_00003	09/27/22	Welling	gton Laboratories, Lot	LPFNS0917	(Purchased Reag		Perfluorononanesulfonic acid	48 ug/mI
LCPFOA_00009	09/27/22		gton Laboratories, Lot		(Purchased Reag		Perfluorooctanoic acid (PFOA)	50 ug/mI
LCPFOS-br_00004	10/14/20	_	ton Laboratories, Lot b		(Purchased Reag	ent)	Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mI
LCPFOSA_00010	09/30/21	•	gton Laboratories, Lot		(Purchased Reag		Perfluorooctane Sulfonamide (FOSA)	50 ug/mI
LCPFPeA_00007	05/31/21		gton Laboratories, Lot		(Purchased Reag	ent)	Perfluoropentanoic acid (PFPeA)	50 ug/mI
LCPFPeS_00003	01/11/22	Welling	ton Laboratories, Lot	LPFPeS0117	(Purchased Reag		Perfluoropentanesulfonic acid	46.9 ug/mI
LCPFTeDA_00006	12/09/20	_	ton Laboratories, Lot		(Purchased Reag		Perfluorotetradecanoic acid (PFTeA)	50 ug/mI
LCPFTrDA_00006	02/12/21	_	ton Laboratories, Lot		(Purchased Reag		Perfluorotridecanoic Acid (PFTriA)	50 ug/mI
LCPFUdA_00007	10/18/21	Welling	gton Laboratories, Lot	PFUdA1016	(Purchased Reag	ent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mI
LCPFCIC FULL 00011			MeOH/H2O, Lot 09285		LCMPFC ALL SU 00041	10 mL	13C2-PFOA	2.5 ng/mI
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mI
LCM2PFOA 00008	02/12/21		ton Laboratories, Lot		(Purchased Reag	ent)	13C2-PFOA	50 ug/mI
LCPFCIC_FULL_00011	07/02/18	02/22/18	MeOH/H2O, Lot 09285	200 mL	LCMPFC_ALL_SU_00041	10 mL	d3-NMeFOSAA	2.5 ng/mI
							d5-NEtFOSAA	2.5 ng/mI
							M2-6:2FTS	2.375 ng/mI
							M2-8:2FTS	2.395 ng/mI
							13C2-PFHxDA	2.5 ng/mI
							13C2-PFTeDA	2.5 ng/mI
							13C4-PFHpA	2.5 ng/mI
							13C5 PFPeA	2.5 ng/mI
							13C8 FOSA	2.5 ng/mI
							13C4 PFBA	2.5 ng/mI
							13C3-PFBS	2.325 ng/mI
							13C2 PFDA	2.5 ng/mI
							13C2 PFDoA	2.5 ng/mI
							13C2 PFHxA	2.5 ng/mI
							1802 PFHxS	2.365 ng/mI
							13C5 PFNA	2.5 ng/mI
							13C4 PFOA	2.5 ng/mI
							13C4 PFOS	2.39 ng/mI
							13C2 PFUnA	2.5 ng/mI
					LCPFAC-24PAR_00001	250 uL	Perfluorobutanesulfonic acid (PFBS)	2.2125 ng/mL
I							Perfluorobutanoic acid (PFBA)	2.5 ng/mI
							Perfluorodecanesulfonic acid (PFDS)	2.4125 ng/mI

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1	
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				Reagent	Parent Reagen	t		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorodecanoic acid (PFDA)	2.5 ng/mL
							Perfluorododecanoic acid	2.5 ng/mL
							(PFDoA)	
							Perfluoroheptanesulfonic Acid (PFHpS)	2.375 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	2.28 ng/mL
							Perfluorohexanoic acid (PFHxA)	2.5 ng/mL
							Perfluorononanoic acid (PFNA)	2.5 ng/mL
							Perfluorooctane Sulfonamide	2.5 ng/mL
							(FOSA)	
							Perfluorooctanesulfonic acid (PFOS)	2.31375 ng/mL
							Perfluorooctanoic acid (PFOA)	2.5 ng/mL
							Perfluoropentanoic acid	2.5 ng/mL
							(PFPeA)	2.0 119/112
							Perfluorotetradecanoic acid	2.5 ng/mL
							(PFTeA)	
							Perfluorotridecanoic Acid	2.5 ng/mL
							(PFTriA) Perfluoroundecanoic acid	2.5 ng/mL
							(PFUnA)	2.5 119/1111
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
			111000		LCd5-NEtFOSAA 00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS 00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS 00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA 00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012		13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013		13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016		13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013		13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006		13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018		13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013		13C2 PFDoA	0.05 ug/mL
					LCMPFHxA 00019		13C2 PFHxA 18O2 PFHxS	0.05 ug/mL
					LCMPFHxS_00013 LCMPFNA 00013		13C5 PFNA	0.0473 ug/mL 0.05 ug/mL
					LCMPFOA 00017		13C4 PFOA	0.05 ug/mL
					LCMPFOS 00025		13C4 PFOS	0.0478 ug/mL
					LCMPFUdA 00014		13C2 PFUnA	0.05 ug/mL
LCd3-NMeFOSAA 00006	05/19/22	WEI	LINGTON, Lot d3NMeFOSAA0	517	(Purchased Reage		d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA 00006	11/08/22		LINGTON, Lot d5NEtFOSAA1		(Purchased Reage		d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS 00006	02/17/22		ELLINGTON, Lot M262FTS021		(Purchased Reage		M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS 00008	07/05/22		ELLINGTON, Lot M282FTS071		(Purchased Reage		M2-8:2FTS	47.9 ug/mL
LCM2PFHxDA 00013	07/13/22	Wellingto	on Laboratories, Lot M2PE	HxDA0717	(Purchased Reage	ent)	13C2-PFHxDA	50 ug/mL

Lab Name:	TestAmerica	Sacramento	Job No.: 320-38875-1
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				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCM2PFTeDA 00012	11/30/22	Wellingt	on Laboratories, Lot M2P1	FTeDA1117	(Purchased Rea	gent)	13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00012	05/03/22	Wellingt	on Laboratories, Lot M4P	FHpA0517	(Purchased Rea	gent)	13C4-PFHpA	50 ug/mL
LCM5PFPEA 00013	07/20/22	Wellingt	on Laboratories, Lot M5P	FPeA0717	(Purchased Rea	gent)	13C5 PFPeA	50 ug/mL
LCM8FOSA_00016	10/11/22	Wellingt	on Laboratories, Lot M8F	OSA1017I	(Purchased Rea	gent)	13C8 FOSA	50 ug/mL
LCMPFBA_00013	04/12/22		ton Laboratories, Lot MP		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFBS_00006	05/24/22		ton Laboratories, Lot M3		(Purchased Rea		13C3-PFBS	46.5 ug/mL
LCMPFDA_00018	07/13/22		ton Laboratories, Lot MF		(Purchased Rea	gent)	13C2 PFDA	50 ug/mL
LCMPFDoA_00013	05/23/22		ton Laboratories, Lot MP1		(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFHxA_00019	10/27/22		ton Laboratories, Lot MP		(Purchased Rea	gent)	13C2 PFHxA	50 ug/mL
LCMPFHxS_00013	02/17/22	Welling	ton Laboratories, Lot MP	FHxS0217	(Purchased Rea	gent)	1802 PFHxS	47.3 ug/mL
LCMPFNA_00013	09/30/21		ton Laboratories, Lot MF		(Purchased Rea	gent)	13C5 PFNA	50 ug/mL
LCMPFOA 00017	10/17/22	Welling	ton Laboratories, Lot MF	FOA1017	(Purchased Rea	gent)	13C4 PFOA	50 ug/mL
LCMPFOS 00025	10/17/22	Welling	ton Laboratories, Lot MP	FOS1017	(Purchased Rea	gent)	13C4 PFOS	47.8 ug/mL
LCMPFUdA 00014	11/22/21	Welling	ton Laboratories, Lot MP	FUdA1116	(Purchased Rea	gent)	13C2 PFUnA	50 ug/mL
.LCPFAC-24PAR_00001	09/15/22	W∈	ellington Laboratories, I PFAC24PAR0917	ot	(Purchased Rea	gent)	Perfluorobutanesulfonic acid (PFBS)	1.77 ug/mL
							Perfluorobutanoic acid (PFBA)	2 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	1.93 ug/mL
							Perfluorodecanoic acid (PFDA)	2 ug/mL
							Perfluorododecanoic acid (PFDoA)	2 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	1.9 ug/mL
							Perfluoroheptanoic acid (PFHpA)	2 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	1.824 ug/mL
							Perfluorohexanoic acid (PFHxA)	2 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	2 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	1.851 ug/mL
							Perfluorooctanoic acid (PFOA)	2 ug/mL
							Perfluoropentanoic acid (PFPeA)	2 ug/mL
							Perfluorotetradecanoic acid	2 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	2 ug/mL
							Perfluoroundecanoic acid (PFUnA)	2 ug/mL
LCPFCSP_00144	11/15/18	05/15/18	Methanol, Lot 090285	250 mL	LC11CIPF3OUds_00001	100 uL	11-Chloroeicosafluoro-3-oxaund ecane-1-sulfonate	0.01884 ug/mL
					LC4:2FTS_00003	100 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.01868 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
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				Reagent	Parent Reagent			
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
iteagene 1D	Date	Date		VOTUNC			=	
					LC6:2FTS_00003	100 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.01896 ug/mL
					LC8:2FTS_00003	100 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.01916 ug/mL
					LC9CI-PF3ONS_00001	100 uL	9-Chlorohexadecafluoro-3-oxano nane-1-sulfonate	0.01864 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCDONA 00001	100 uL		0.02 ug/mL
					LCHFPO-DA_00001	100 uL	Perfluoro(2-propoxypropanoic) acid	0.02 ug/mL
					LCN-EtFOSA-M_00005	100 uL	N-ethylperfluoro-1-octanesulfo namide	0.02 ug/mL
					LCN-MeFOSA-M 00004	100 uL	MeFOSA	0.02 ug/mL
					LCPFBA_00007		Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00008	100 uL	Perfluorobutane Sulfonate	0.01768 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00007		Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00007		Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDSA_00002		Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00008		Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003		Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00007		Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxDA_00008		Perfluorohexadecanoic acid	0.02 ug/mL
					LCPFHxS-br_00004	100 uL	Perfluorohexane Sulfonate Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL 0.0182 ug/mL
					LCPFNA 00009	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
					LCPFNS 00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA 00008		Perfluorooctanoic acid (PFOA)	0.02 ug/mL
					LCPFODA 00008	100 uL	Perfluorooctadecanoic acid	0.02 ug/mL
					LCPFOS-br_00004	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00010		Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00007	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS 00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00007	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL

ab Name: TestAmerica Sacramento	Job No.: 320-38875-1
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				Deagant	Parent Reage	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Reagent ID	Volume Added	Analyte	Concentration
					LCPFTrDA_00007		Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL
					LCPFUdA_00007	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
.LC11CIPF3OUds_00001	09/30/21		gton Labs, Lot 11CIPF30		(Purchased Rea	gent)	11-Chloroeicosafluoro-3-oxaund ecane-1-sulfonate	
.LC4:2FTS_00003	12/12/21	2/21 WELLINGTON, Lot 42FTS1216		(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL	
.LC6:2FTS_00003	06/25/21	1	WELLINGTON, Lot 62FTS06	16	(Purchased Rea	gent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
.LC8:2FTS_00003	08/22/21		WELLINGTON, Lot 82FTS08		(Purchased Rea	-	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
.LC9CI-PF3ONS_00001	09/30/21	Welli	ngton Labs, Lot 9CIPF30	ONS0916	(Purchased Rea	_	9-Chlorohexadecafluoro-3-oxano nane-1-sulfonate	
.LCbr-NEtFOSAA_00001	01/17/23	WEI	LINGTON, Lot brNEtFOSA	A0118	(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCbr-NMeFOSAA_00001	01/17/23	7/23 WELLINGTON, Lot brNMeFOSAA0118		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL	
.LCDONA 00001	04/10/22	Ī/i	ELLINGTON, Lot NADONA04	117	(Purchased Rea	gent)	Adona	50 ug/mL
.LCHFPO-DA_00001	07/03/20			(Purchased Reagent)		Perfluoro(2-propoxypropanoic) acid	50 ug/mL	
.LCN-EtFOSA-M_00005	05/24/21	WE	LLINGTON, Lot NETFOSA05	516M	(Purchased Rea	gent)	N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
.LCN-MeFOSA-M 00004	05/24/21	WE	LLINGTON, Lot NMeFOSA05	516M	(Purchased Rea	gent)	MeFOSA	50 ug/mL
.LCPFBA 00007	05/27/21	Wellin	gton Laboratories, Lot	PFBA0516	(Purchased Rea	gent)	Perfluorobutanoic acid (PFBA)	50 ug/mL
.LCPFBS_00008	03/15/21	_	ton Laboratories, Lot I		(Purchased Reagent)		Perfluorobutane Sulfonate Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL 44.2 ug/mL
.LCPFDA_00007	05/31/21	Wellin	gton Laboratories, Lot	PFDA0516	(Purchased Rea		Perfluorodecanoic acid (PFDA)	50 ug/mL
.LCPFDoA_00007	05/31/21	_	ton Laboratories, Lot E		(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
.LCPFDSA_00002	05/24/21	_	ton Laboratories, Lot I		(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
.LCPFHpA_00008	12/02/21	_	ton Laboratories, Lot H	_	(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpSA_00003	09/01/22	_	ton Laboratories, Lot L	-	(Purchased Rea	_	Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
.LCPFHxA 00007	12/22/20		ton Laboratories, Lot E		(Purchased Rea	gent)	Perfluorohexanoic acid (PFHxA)	50 ug/mL
.LCPFHxDA 00008	05/25/21		ton Laboratories, Lot P		(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00004	07/03/20		on Laboratories, Lot br		(Purchased Rea	gent)	Perfluorohexane Sulfonate Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL 45.5 ug/mL
.LCPFNA 00009	07/20/22	Wellin	gton Laboratories, Lot	PFNA0717	(Purchased Rea	gent)	Perfluorononanoic acid (PFNA)	50 ug/mL
.LCPFNS 00003	09/27/22		ton Laboratories, Lot I		(Purchased Rea		Perfluorononanesulfonic acid	48 ug/mL
.LCPFOA 00008	08/02/21		gton Laboratories, Lot		(Purchased Rea		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA 00008	04/29/21		ton Laboratories, Lot E		(Purchased Rea	J '	Perfluorooctadecanoic acid	50 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.:	320-38875-1
SDG	No.:				

				Reagent	Parent Reagent			
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
.LCPFOS-br_00004	10/14/20	Wellingt	on Laboratories, Lot br	PFOSK1015	(Purchased Reage	ent)	Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LCPFOSA_00010	09/30/21	Welling	ton Laboratories, Lot FC	(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL	
.LCPFPeA_00007	05/31/21	Welling	gton Laboratories, Lot PFPeA0516		(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
.LCPFPeS_00003	01/11/22	Welling	ton Laboratories, Lot LP:	FPeS0117	(Purchased Reage	ent)	Perfluoropentanesulfonic acid	46.9 ug/mL
.LCPFTeDA_00007	09/30/21	Welling	ton Laboratories, Lot PF	TeDA0916	(Purchased Reage	ent)	Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
.LCPFTrDA_00007	02/12/21	Welling	ton Laboratories, Lot PFTrDA0216		(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
.LCPFUdA_00007	10/18/21	Welling	ton Laboratories, Lot PF	rudA1016	(Purchased Reage	ent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL

Reagent

LC11CIPF3OUds_00001



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

11CI-PF3OUdS

LOT NUMBER:

11CIPF3OUdS0916

COMPOUND:

Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate

STRUCTURE:

CAS #:

83329-89-9

MOLECULAR FORMULA:

C₁₀F₂₀CISO₄K

MOLECULAR WEIGHT:

670.69

CONCENTRATION:

 $50.0 \pm 2.5 \mu g/ml$ (K Salt)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

09/30/2016

EXPIRY DATE: (mm/dd/ww)

09/30/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

47.1 ± 2.4 µg/ml (11CI-PF3OUdS anion)

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.

This compound is a minor component of the commercial formulation known as F-53B.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

D.C. Partition

Date: 10/19/2016

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

INTENDED USE:

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

HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

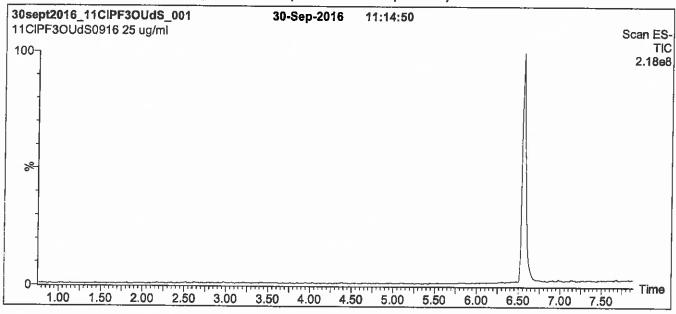
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

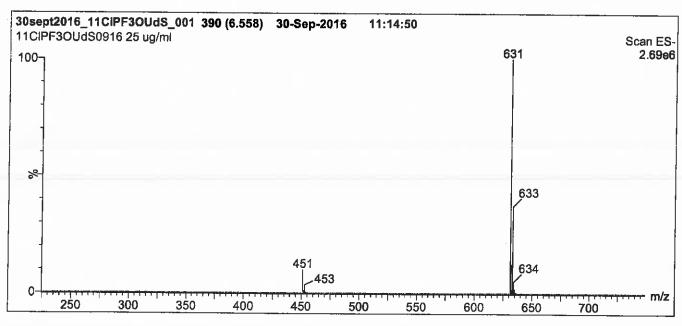




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Figure 1: 11CI-PF3OUdS; LC/MS Data (TIC and Mass Spectrum)





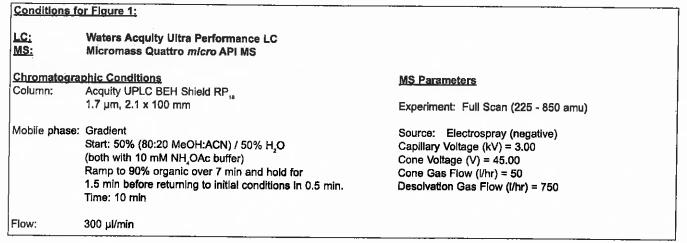
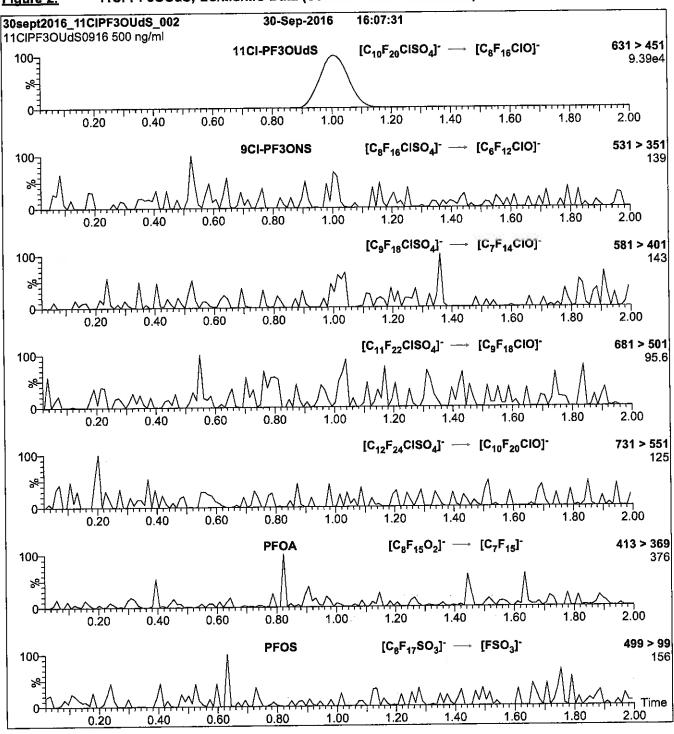
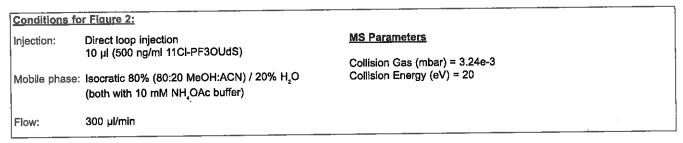


Figure 2: 11CI-PF3OUdS; LC/MS/MS Data (Selected MRM Transitions)





Reagent

LC4:2FTS_00003



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

4:2FTS

LOT NUMBER:

42FTS1216

COMPOUND:

Sodium 1H,1H,2H,2H-perfluorohexane sulfonate

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C,H,F,SO,Na

MOLECULAR WEIGHT:

350.13

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$

(Na salt) SOLVENT(S): Methanol

 $46.7 \pm 2.3 \,\mu g/ml$

(4:2FTS anion)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/12/2016

EXPIRY DATE: (mm/dd/yyyy)

12/12/2021

RECOMMENDED STORAGE:

Refrigerate ampoule

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:

Date: 12/21/2016

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

INTENDED USE:

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EXPIRY DATE / PERIOD OF VALIDITY:

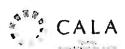
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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

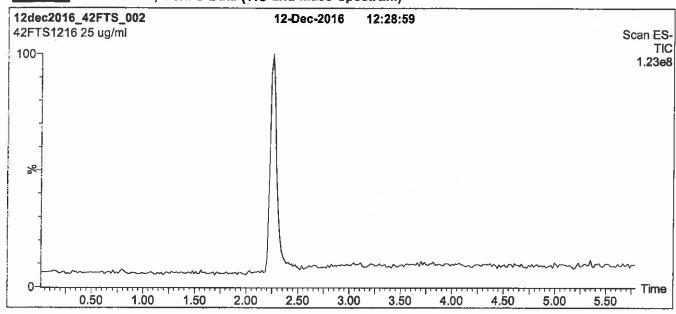
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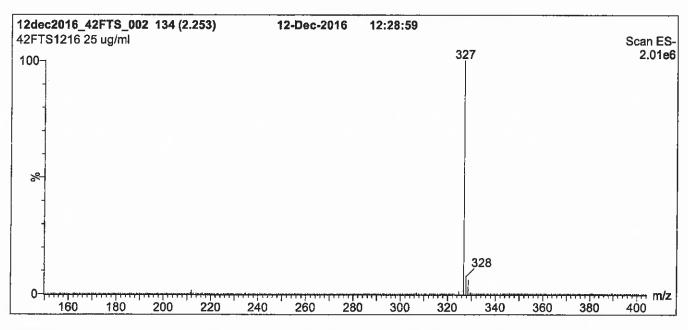




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Figure 1: 4:2FTS; LC/MS Data (TiC and Mass Spectrum)





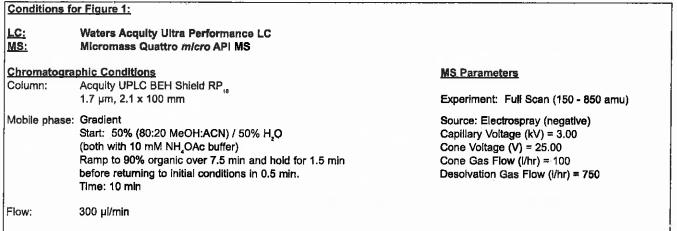
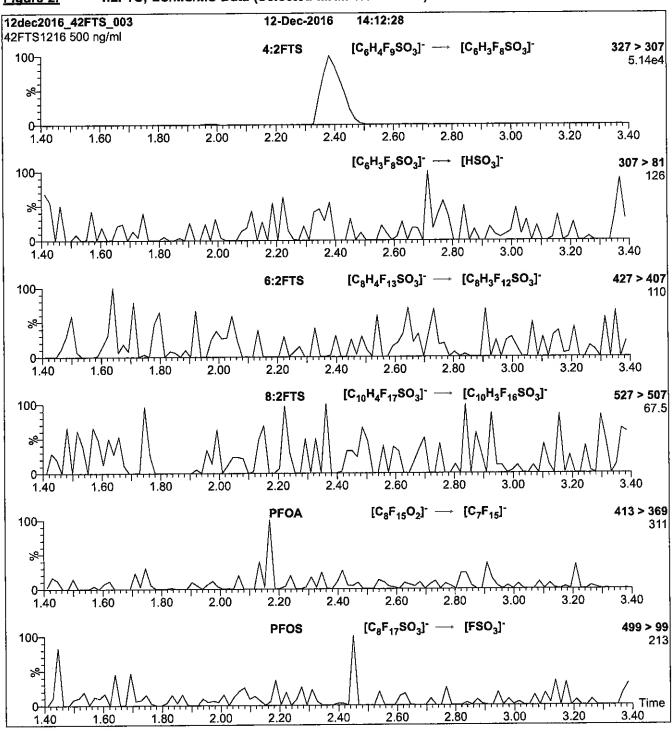
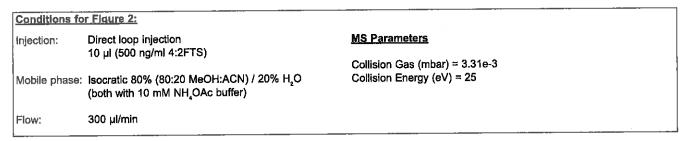


Figure 2: 4:2FTS; LC/MS/MS Data (Selected MRM Transitions)





LC6:2FTS_00003



PRODUCT CODE:

6:2FTS

LOT NUMBER:

62FTS0616

COMPOUND:

Sodium 1H,1H,2H,2H-perfluorooctane sulfonate

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C_BH₄F₁₃SO₃Na

MOLECULAR WEIGHT:

450.15

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$ 47.4 ± 2.4 µg/ml

(Na salt) (6:2FTS anion) SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

06/25/2016

EXPIRY DATE: (mm/dd/yyyy)

06/25/2021

RECOMMENDED STORAGE:

Refrigerate ampoule

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:

Date: 06/29/2016

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HAZARDS:

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EXPIRY DATE / PERIOD OF VALIDITY:

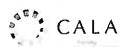
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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

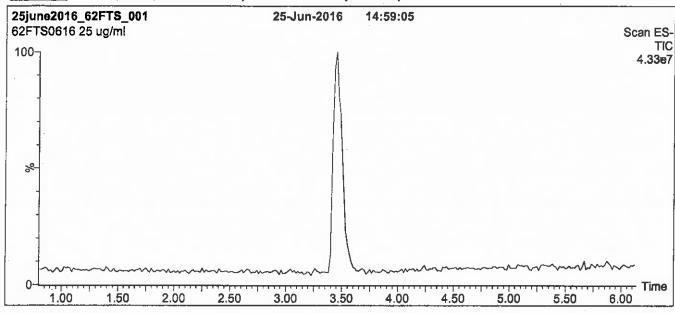
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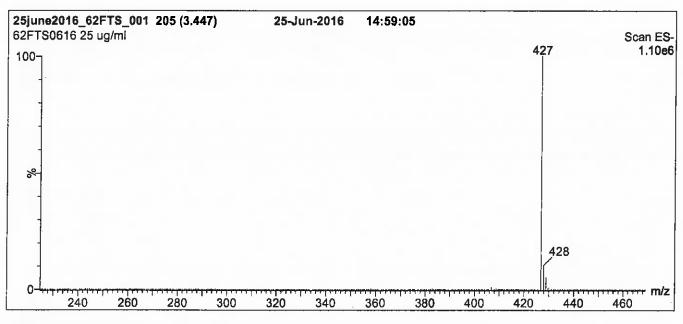




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Figure 1: 6:2FTS; LC/MS Data (TIC and Mass Spectrum)





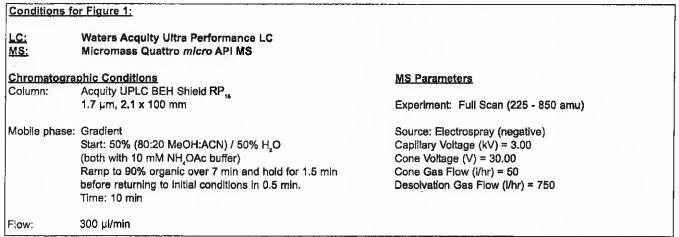
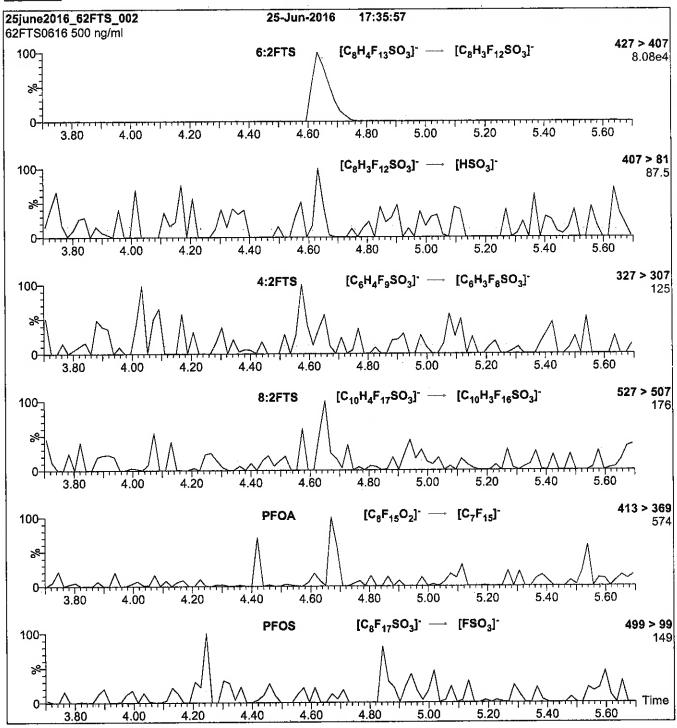
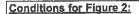


Figure 2: 6:2FTS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml 6:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3 Collision Energy (eV) = 25

Form#:27, Issued 2004-11-10 Revision#:3, Revised 2015-03-24

LC8:2FTS_00003



PRODUCT CODE:

8:2FTS

LOT NUMBER:

82FTS0816

COMPOUND:

-

Sodium 1H,1H,2H,2H-perfluorodecane sulfonate

STRUCTURE:

CAS #:

Not available

(8:2FTS anion)

MOLECULAR FORMULA:

C₁₀H₄F₁₇SO₃Na

47.9 ± 2.4 µg/ml

MOLECULAR WEIGHT:

550.16

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$ (Na salt) SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

08/22/2016

EXPIRY DATE: (mm/dd/yyyy)

08/22/2021

RECOMMENDED STORAGE:

Refrigerate ampoule

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:

Date: <u>08/25/2016</u> (mm/dd/yyyy)

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LIMITED WARRANTY;

Form#:27, Issued 2004-11-10 Revision#:3, Revised 2015-03-24

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QUALITY MANAGEMENT:

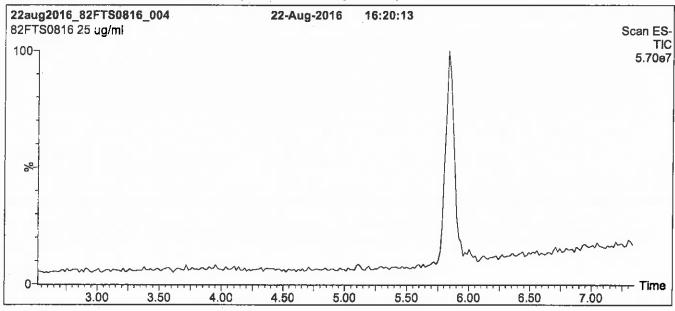
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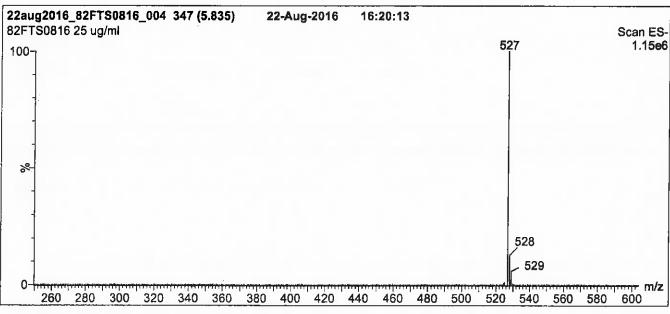




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Figure 1: 8:2FTS; LC/MS Data (TIC and Mass Spectrum)





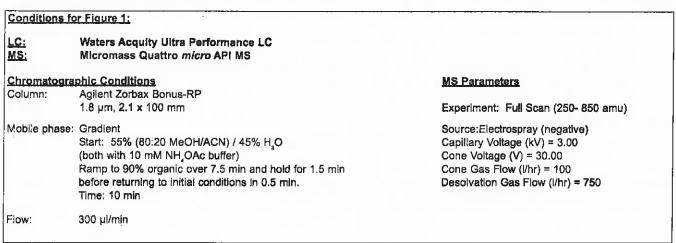
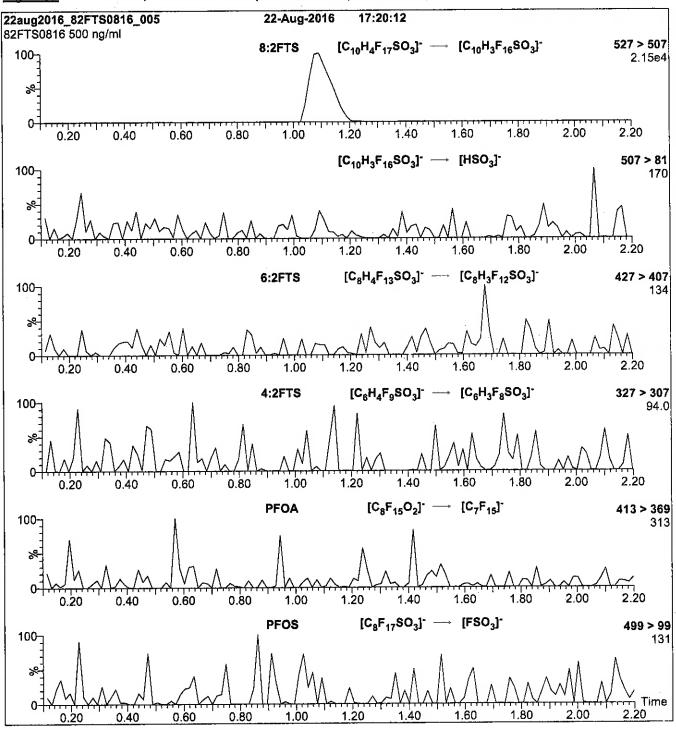
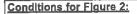


Figure 2: 8:2FTS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml 8:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

MS Parameters

Collision Gas (mbar) = 3.31e-3 Collision Energy (eV) = 30

Flow:

300 µl/min

LC9CI-PF3ONS_00001



PRODUCT CODE:

9CI-PF3ONS

LOT NUMBER:

9CIPF3ONS0916

COMPOUND:

Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate

STRUCTURE:

CAS #:

73606-19-6

MOLECULAR FORMULA:

C_BF₄₈CISO₄K

MOLECULAR WEIGHT:

570.67

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$ (K Salt)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

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

 $46.6 \pm 2.3 \,\mu g/ml$ (9CI-PF3ONS anion)

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.

This compound is the major component of the commercial formulation known as F-53B.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chiltim

Date: 🕑

<u>10/19/2010</u>

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

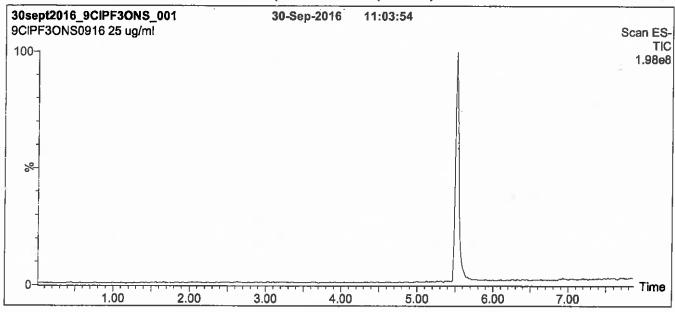
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

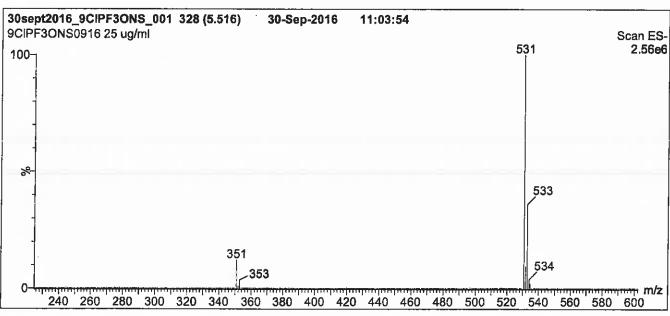




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: 9CI-PF3ONS; LC/MS Data (TIC and Mass Spectrum)





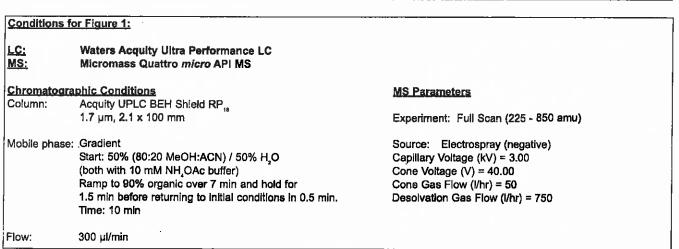
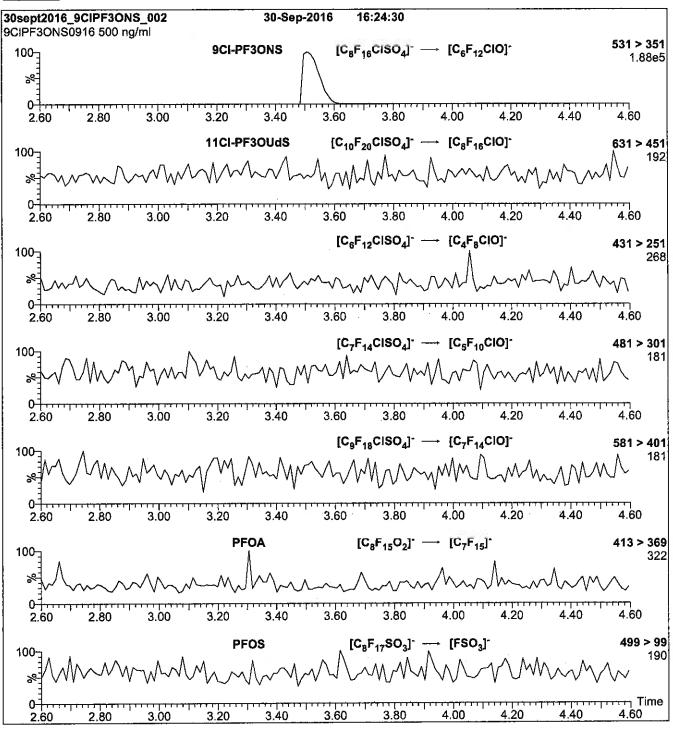
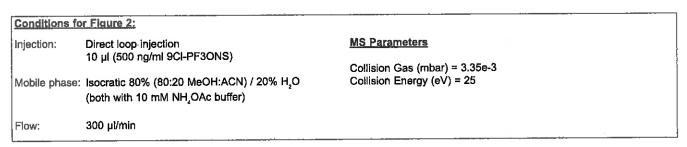


Figure 2: 9CI-PF3ONS; LC/MS/MS Data (Selected MRM Transitions)





LCbr-NEtFOSAA_00001



br-NEtFOSAA

N-Ethylperfluorooctanesulfonamidoacetic Acid Solution/Mixture of Linear and **Branched Isomers**

PRODUCT CODE:

br-NEtFOSAA

LOT NUMBER:

brNEtFOSAA0118

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$

SOLVENT(S):

Methanol/Water (<1%)

DATE PREPARED: (mm/dd/yyyy)

01/10/2018

LAST TESTED: (mm/dd/yyyy)

01/17/2018

EXPIRY DATE: (mm/dd/www)

01/17/2023

RECOMMENDED STORAGE:

Refrigerate ampoule

DESCRIPTION:

The chemical purity has been determined to be ≥98% N-ethylperfluorooctanesulfonamidoacetic acid (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 19F-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 4 mole eq. of NaOH to prevent conversion of the acetic acid moiety to its respective methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG 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.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This 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, $u_{p}(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1,x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y,x_i)^2}$$

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

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

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. 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 routing basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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Table A: br-NEtFOSAA; Isomeric Components and Percent Composition (by 19F-NMR)*

Isomer	Name	Structure	Percent Composition by "F-NMR
1	N-ethylperfluoro-1-octanesulfonamidoacetic acid	CF ₃ (CF ₂) ₇ SO ₂ NCH ₂ CO ₂ H C ₂ H ₅	77.5
2	N-ethylperfluoro-3-methylheptanesulfonamidoacetic acid	CF ₃ (CF ₂) ₃ CF(CF ₂) ₂ SO ₂ NCH ₂ CO ₂ H CF ₃ C ₂ H ₅	2.3
3	N-ethy/perfluoro-4-methy/heptanesu/fonamidoacetic acid	$\begin{array}{ccc} \operatorname{CF_3(CF_2)_2CF(CF_2)_3SO_2NCH_2CO_2H} \\ \operatorname{CF_3} & \operatorname{C_2H_5} \end{array}$	2.2
4	N-ethylperfluoro-5-methylheptanesulfonamidoacetic acid	CF ₃ CF ₂ CF(CF ₂) ₄ SO ₂ NCH ₂ CO ₂ H CF ₃ C ₂ H ₅	5.4
5	N-ethylperfluoro-6-methylheptanesulfonamidoacetic acid	$\begin{array}{ccc} \operatorname{CF_3CF(CF_2)_5SO_2NCH_2CO_2H} \\ \operatorname{CF_3} & \operatorname{C_2H_5} \end{array}$	10.4
6	N-ethylperfluoro-5,5-dimethylhexanesulfonamidoacetic acid	CF ₃ CF ₃ C(CF ₂) ₄ SO ₂ NCH ₂ CO ₂ H CF ₃ C ₂ H ₅	0.3
7	N-ethylperfluoro-4,5-dimethylhexanesulfonamidoacetic acid	CF ₃ CF ₃ CFCF(CF ₂) ₃ SO ₂ NCH ₂ CO ₂ H CF ₃ C ₂ H ₅	0.3
8	N-ethylperfluoro-3,5-dimethylhexanesulfonamidoacetic acid	$\begin{array}{c} CF_3 \\ CF_3CFCF_2CF(CF_2)_2SO_2NCH_2CO_2H \\ CF_3 \\ CF_3 \\ C_2H_5 \end{array}$	0.3
9	Other Unidentified Isomers		1.3

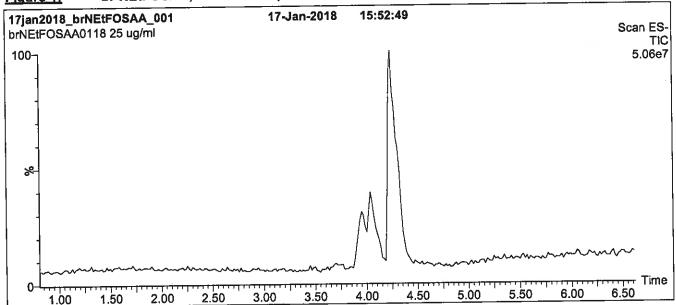
Percent of total N-ethylperfluorooctanesulfonamidoacetic acid isomers only.

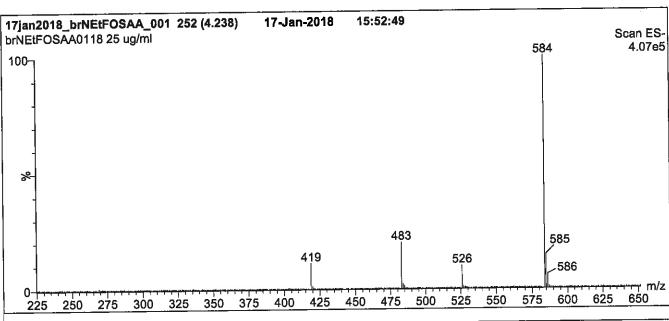
Certified By: ____

B.G. Chittim, General Manager

Date: 03/22/2018 (mm/dd/yyyy)

Figure 1: br-NEtFOSAA; LC/MS Data (TIC and Mass Spectrum)





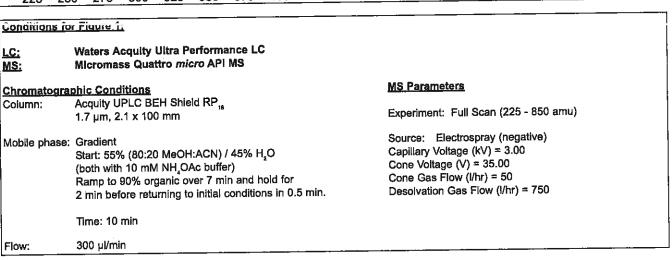
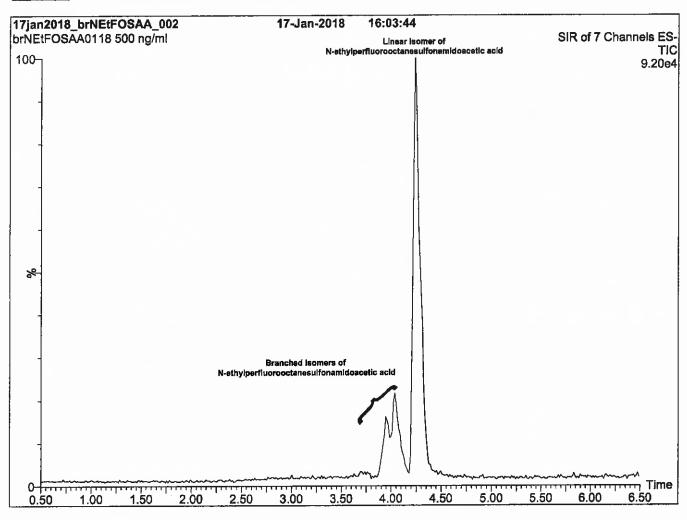


Figure 2: br-NEtFOSAA; LC/MS Data (SIR)



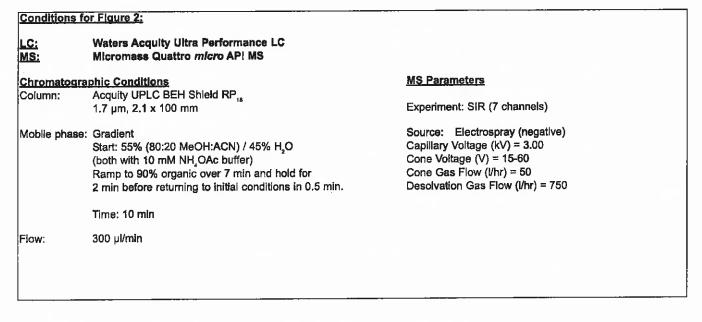
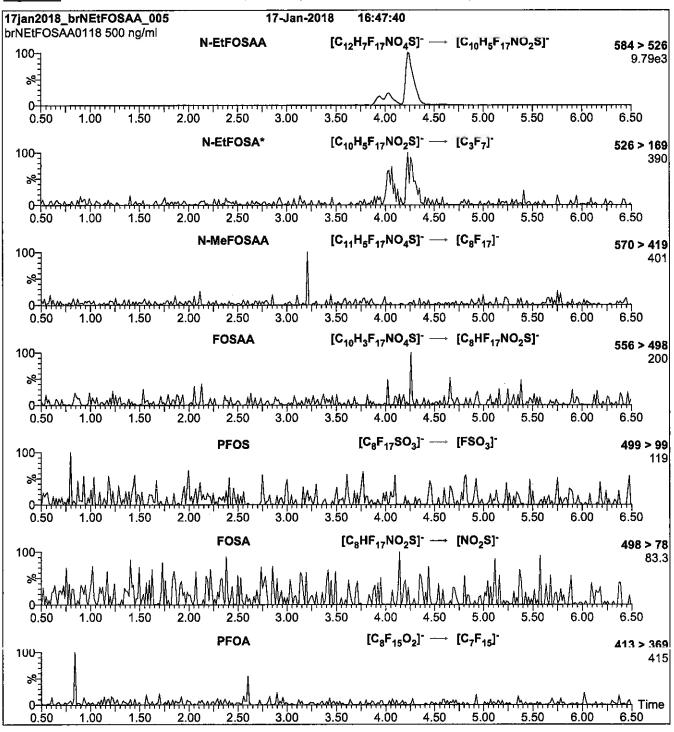


Figure 3: br-NEtFOSAA; LC/MS/MS Data (Selected MRM Transitions)



*Note: N-EtFOSA is formed by in-source fragmentation.				
Conditions for Figure 3:				
Injection:	On-column	MS Parameters		
Mobile phase:	Same as Figure 2	Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 11-40 (variable)		
Flow:	300 μl/min			

LCbr-NMeFOSAA_00001



br-NMeFOSAA

N-Methylperfluorooctanesulfonamidoacetic Acid Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:

br-NMeFOSAA

LOT NUMBER:

brNMeFOSAA0118

CONCENTRATION:

50.0 ± 2.5 µg/ml

SOLVENT(S):

Methanol/Water (<1%)

DATE PREPARED: (mm/dd/yyyy)

01/10/2018

LAST TESTED: (mm/dd/yyyy)

01/17/2018

EXPIRY DATE: (mm/dd/yyyy)

01/17/2023

RECOMMENDED STORAGE:

Refrigerate ampoule

DESCRIPTION:

The chemical purity has been determined to be ≥98% N-methylperfluorooctanesulfonamidoacetic acid (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 19F-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 4 mole eq. of NaOH to prevent conversion of the acetic acid molety to its respective methyl
 ester.

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

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.

HANDLING:

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 sultable 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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This 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:

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$$x_1, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1, x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

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

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TRACEABILITY:

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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 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





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

rev0

br-NMeFOSAA; Isomeric Components and Percent Composition (by 19F-NMR)* Table A:

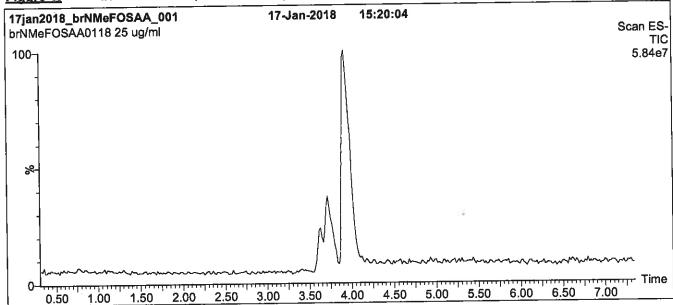
Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	N-methylperfluoro-1-octanesulfonamidoacetic acid	CF ₃ (CF ₂) ₇ SO ₂ NCH ₂ CO ₂ H CH ₃	76.0
2	N-methylperfluoro-3-methylheptanesulfonamidoacetic acid	CF ₃ (CF ₂) ₃ CF(CF ₂) ₂ SO ₂ NCH ₂ CO ₂ H CF ₃ CH ₃	0.7
3	N-methylperfluoro-4-methylheptanesulfonamidoacetic acid	CF ₃ (CF ₂) ₂ CF(CF ₂) ₃ SO ₂ NCH ₂ CO ₂ H CF ₃ CH ₃	2.0
4	N-methylperfluoro-5-methylheptanesulfonamidoacetic acid	CF ₃ CF ₂ CF(CF ₂) ₄ SO ₂ NCH ₂ CO ₂ H CF ₃ CH ₃	6.0
5	N-methylperfluoro-6-methylheptanesulfonamidoacetic acid	CF ₃ CF(CF ₂) ₅ SO ₂ NCH ₂ CO ₂ H CF ₃ CH ₃	14.0
6	N-methylperfluoro-5,5-dimethylhexanesulfonamidoacetic acid	CF ₃ CF ₃ C(CF ₂) ₄ SO ₂ NCH ₂ CO ₂ H CF ₃ CH ₃	0.2
7	Other Unidentified Isomers		1.1

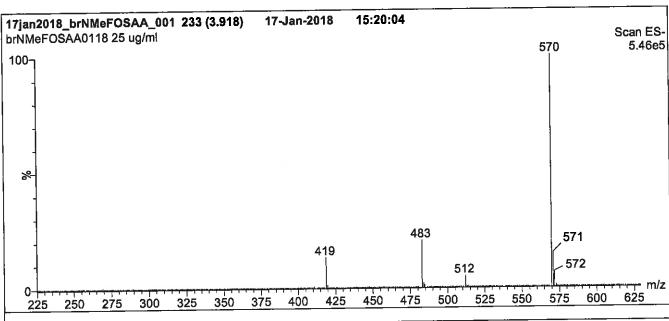
Percent of total N-methylperfluorooctanesulfonamidoacetic acid isomers only.

Certified By: B.G. Chittim, General Manager

Date: 03/22/2018 (mm/dd/yyyy)







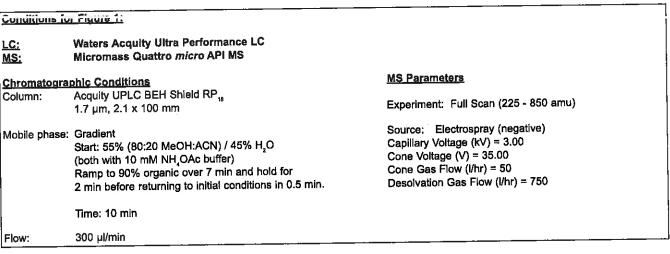
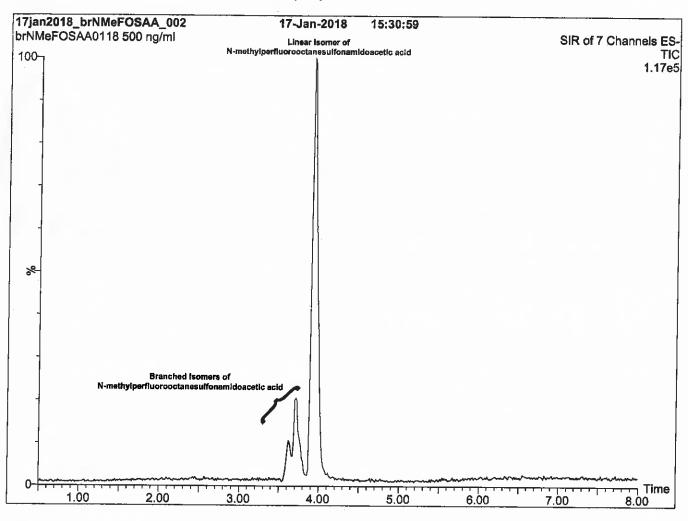
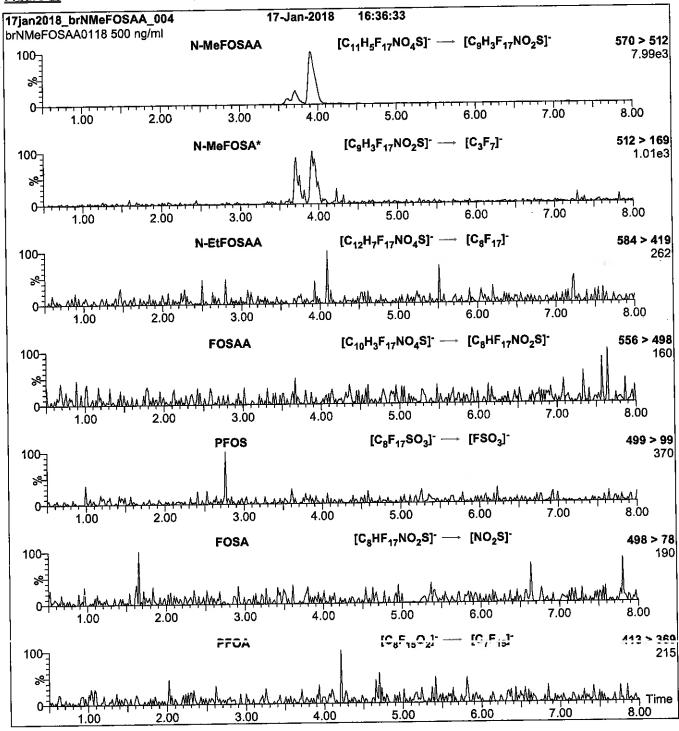


Figure 2: br-NMeFOSAA; LC/MS Data (SIR)



Conditions for Figure 2: LC: MS: Waters Acquity Ultra Performance LC Micromass Quattro micro API MS Chromatographic Conditions **MS Parameters** Acquity UPLC BEH Shield RP, Column: $1.7 \mu m$, $2.1 \times 100 mm$ Experiment: SIR (7 channels) Mobile phase: Gradient Source: Electrospray (negative) Start: 55% (80:20 MeOH:ACN) / 45% H,O Capillary Voltage (kV) = 3.00 (both with 10 mM NH_OAc buffer) Cone Voltage (V) = 15-60 Ramp to 90% organic over 7 min and hold for Cone Gas Flow (I/hr) = 50 2 min before returning to initial conditions in 0.5 min. Desolvation Gas Flow (I/hr) = 750 Time: 10 min Flow: 300 µl/min

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



*Note: N-MeFOSA is formed by in-source fragmentation.

11000.		
Conditions for	r Figure 3:	
Injection:	On-column	MS Parameters
Mobile phase:	Same as Figure 2	Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 11-40 (variable)
Flow:	300 μl/min	

LCd3-NMeFOSAA_00006



ID: LCd3-NMeFOSAA_00006 Exp: 05/19/22 Prpd; CCL d3-N-MeFOSAA





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

d3-N-MeFOSAA

LOT NUMBER:

d3NMeFOSAA0517

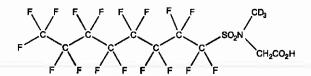
COMPOUND:

N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

C₁₁D₃H₃F₁₇NO₄S

MOLECULAR WEIGHT:

574.23

CONCENTRATION:

 $50 \pm 2.5 \, \mu g/ml$

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

Water (<1%) ≥98% ²H_a

LAST TESTED: (mm/dd/ywy)

EXPIRY DATE: (mm/dd/yyyy)

05/19/2017 05/19/2022

RECOMMENDED STORAGE:

Refrigerate ampoule

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 the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 05/31/2017

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

HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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$$x_n, x_2, ... x_n$$
 on which it depends is:
$$u_c(y(x_1, x_2, ... x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

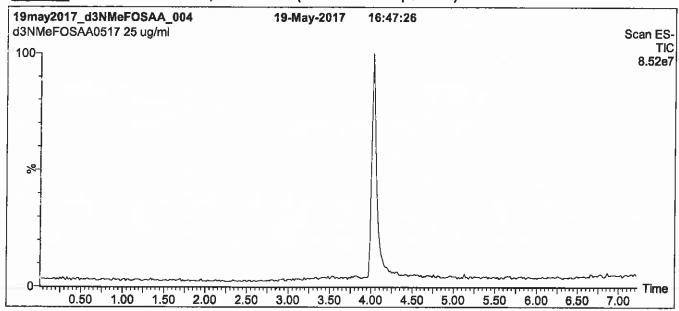
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

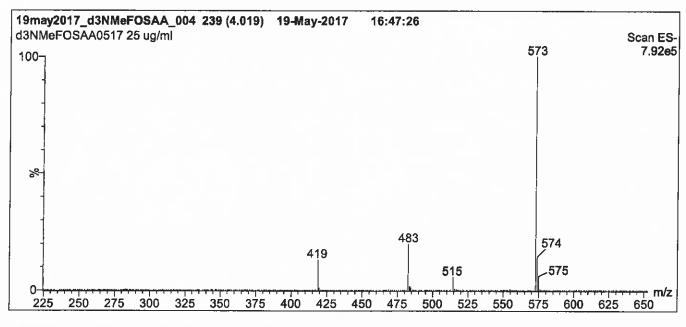


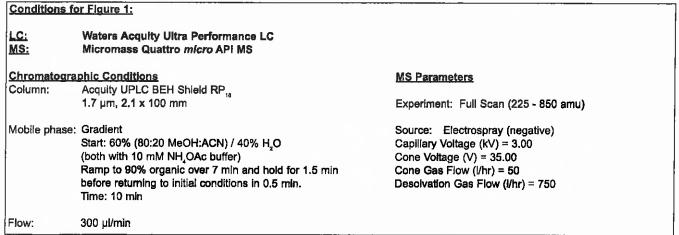


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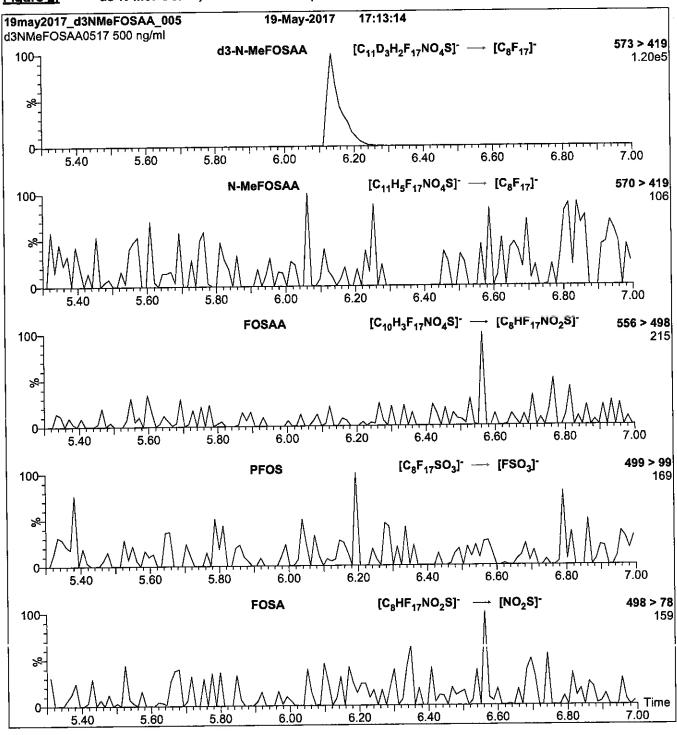
Figure 1: d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)

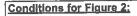






d3-N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions) Figure 2:





Injection:

Direct loop injection

10 µl (500 ng/ml d3-N-MeFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O (both with 10 mM NH₄OAc buffer)

Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 20

LCd5-NEtFOSAA_00006



ID: LCd5-NEtFOSAA_00006 Exp: 11/09/22 Pppd: CCL d5-N-EtFOSAA V: 12/4/17 cee



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

d5-N-EtFOSAA

LOT NUMBER:

d5NEtFOSAA1117

COMPOUND:

N-ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C₁₂D₅H₃F₁₇NO₄S

MOLECULAR WEIGHT:

590.26

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

≥98% ²H_e

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

LAST TESTED: (mm/dd/yyyy)

11/08/2017

EXPIRY DATE: (mm/dd/yyyy)

11/08/2022

RECOMMENDED STORAGE:

Refrigerate ampoule

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 the conversion of the acetic acid molety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 11/16/2017

(mm/dd/yyyy)

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

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

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

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

TRACEABILITY:

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

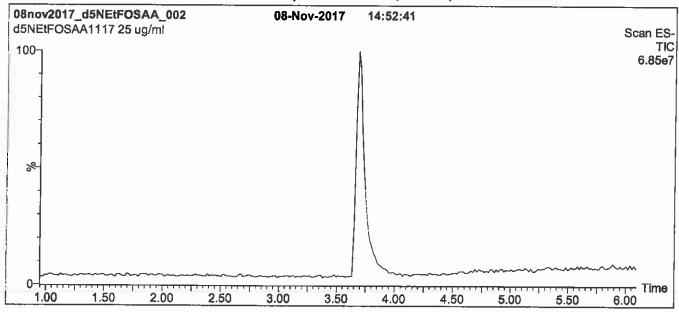
QUALITY MANAGEMENT:

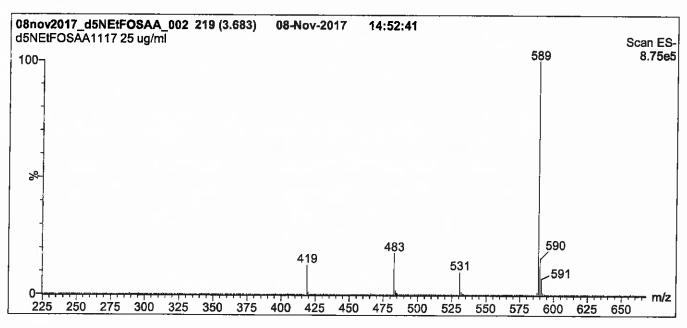
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





Figure 1: d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)





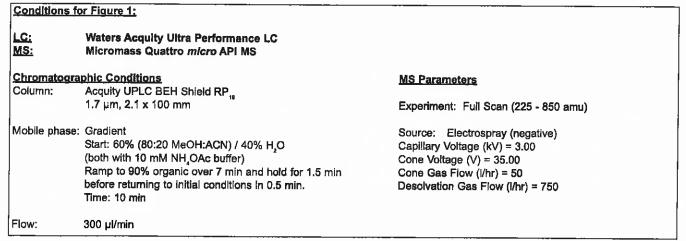
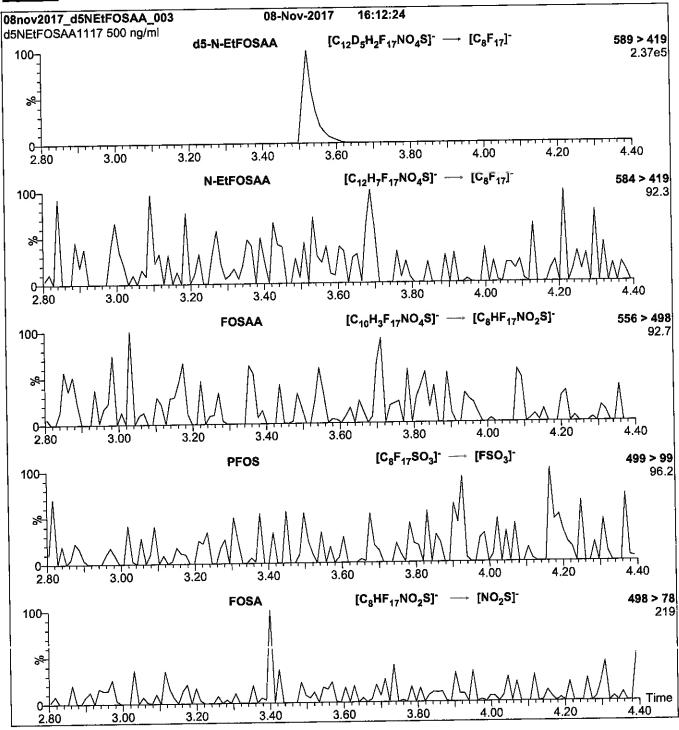
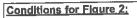


Figure 2: d5-N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml d5-N-EtFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow: 3

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3 Collision Energy (eV) = 20

LCDONA_00001



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

NaDONA

LOT NUMBER:

NaDONA0417

COMPOUND:

Sodium dodecafluoro-3H-4,8-dioxanonanoate

STRUCTURE:

CAS #:

958445-44-8

(ammonium salt)

F C O C C O C O O'Na'

MOLECULAR FORMULA:

C,HF,,O,Na

MOLECULAR WEIGHT:

400.05

CONCENTRATION:

 $50 \pm 2.5 \,\mu\text{g/ml}$ (Na Salt)

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

04/10/2017

EXPIRY DATE: (mm/dd/yyyy)

04/10/2022

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.

Product is commercially known as ADONA.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date:

4/12/2017

(mm/dd/yyyy)

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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$$x_1$$
, x_2 ,... x_n on which it depends is:
$$u_c(y(x_1,x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y,x_i)^2}$$

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

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

TRACEABILITY:

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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.

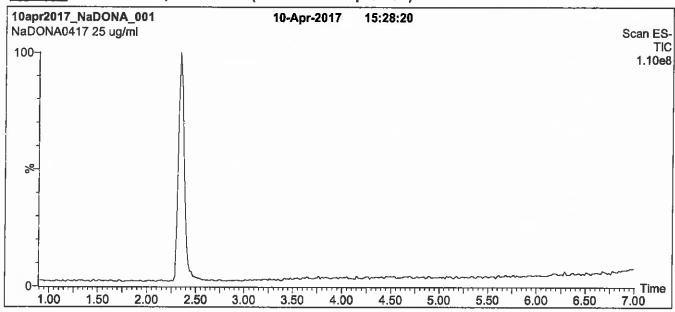
QUALITY MANAGEMENT:

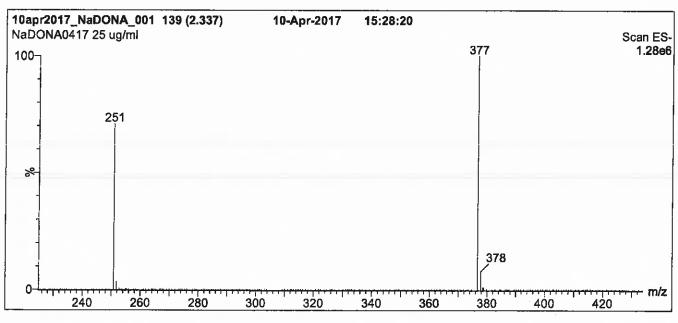
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





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





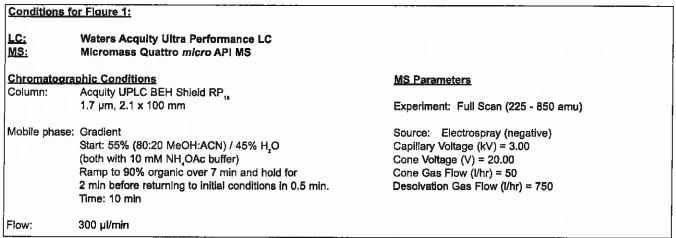
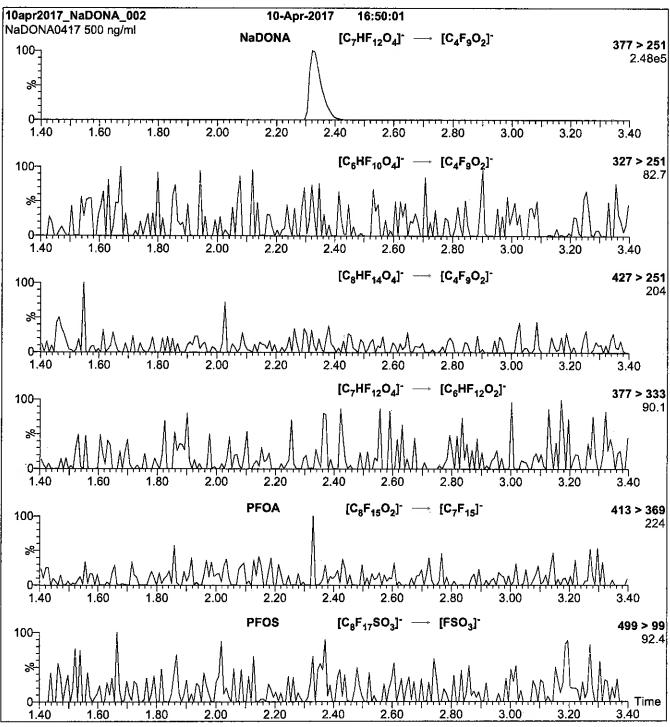


Figure 2: NaDONA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml NaDONA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3 Collision Energy (eV) = 10

LCHFPO-DA_00001



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

HFPO-DA

LOT NUMBER:

HFPODA0717

COMPOUND:

2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid

STRUCTURE:

CAS #:

13252-13-6

MOLECULAR FORMULA:

C,HF,O,

MOLECULAR WEIGHT:

330.05

CONCENTRATION:

 $50 \pm 2.5 \, \mu g/ml$

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

07/13/2017

EXPIRY DATE: (mm/dd/yyyy)

07/13/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

Product is commercially known as GenX.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date:

(/14/2017

(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

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

HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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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.

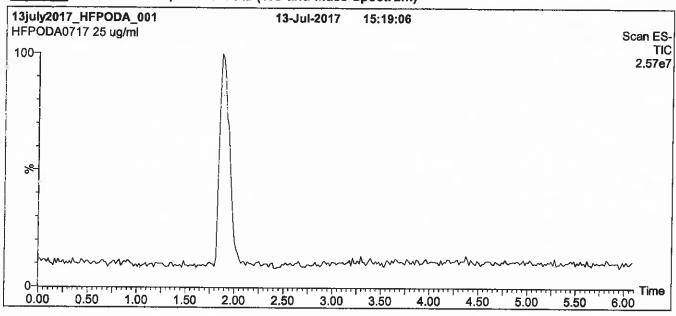
QUALITY MANAGEMENT:

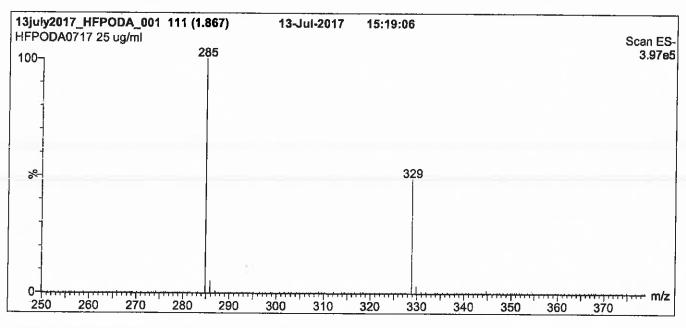
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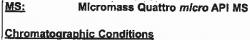




Figure 1: HFPO-DA; LC/MS Data (TIC and Mass Spectrum)







Conditions for Figure 1:

LC:

Column:

Acquity UPLC BEH Shield RP

Waters Acquity Ultra Performance LC

1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient

Start: 55% MeOH / 45% $\rm H_2O$ with 10 mM NH $_2O$ Ac 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 mln

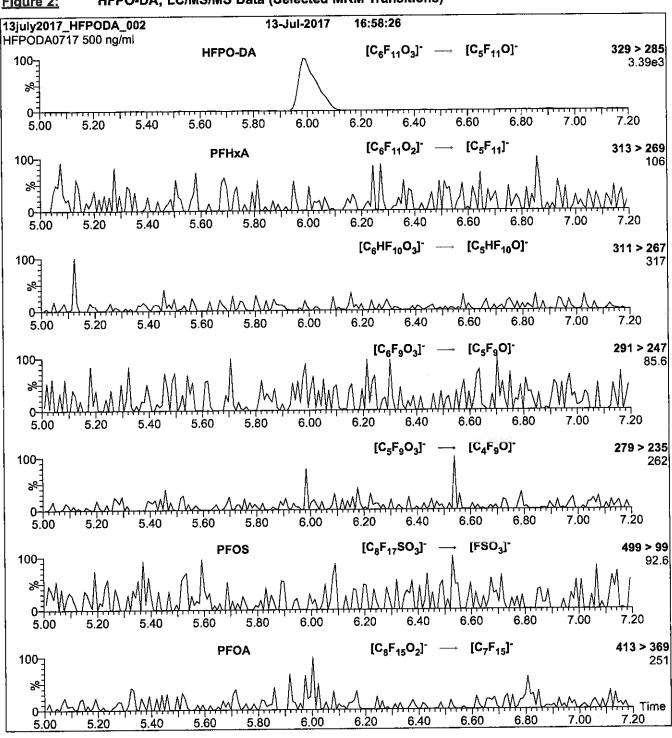
Flow: 300 µl/min

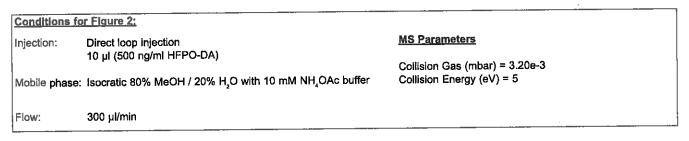
MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 10.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 700

Figure 2: HFPO-DA; LC/MS/MS Data (Selected MRM Transitions)





LCM2-6:FTS_00006



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2-6:2FTS

LOT NUMBER:

M262FTS0217

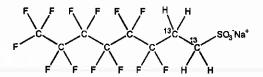
COMPOUND:

Sodium 1H,1H,2H,2H-perfluoro-[1,2-13C] octane sulfonate

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₆H₄F₁₃SO₃Na

MOLECULAR WEIGHT:

452.13

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$

SOLVENT(S):

Methanoi

 $47.5 \pm 2.4 \, \mu g/ml$

(M2-6:2FTS anion)

(Na salt)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% 13C

LAST TESTED: (mtm/dd/yyyy)

02/17/2017

(1,2-13C₂)

EXPIRY DATE: (mm/dd/yyyy)

02/17/2022

RECOMMENDED STORAGE:

Refrigerate ampoule

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.

The native 6:2FTS contains 4.22% of ³⁴S (due to natural isotopic abundance) therefore both native 6:2FTS and M2-6:2FTS will produce signals in the m/z 429 to m/z 409 channel during SRM analysis. We recommend using the m/z 429 to m/z 81 transition to monitor for M2-6:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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

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

HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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LIMITED WARRANTY:

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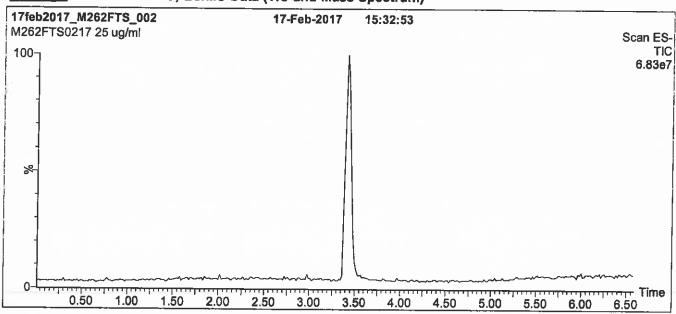
QUALITY MANAGEMENT:

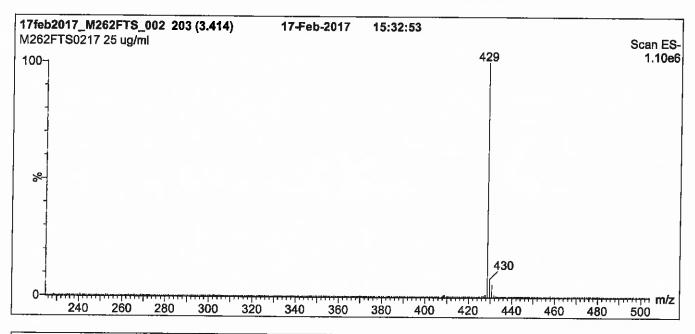
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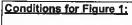




Figure 1: M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)







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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP,

1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient

Start: 50% (80:20 MeOH:ACN) / 50% H₂O

(both with 10 mM NH OAc 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

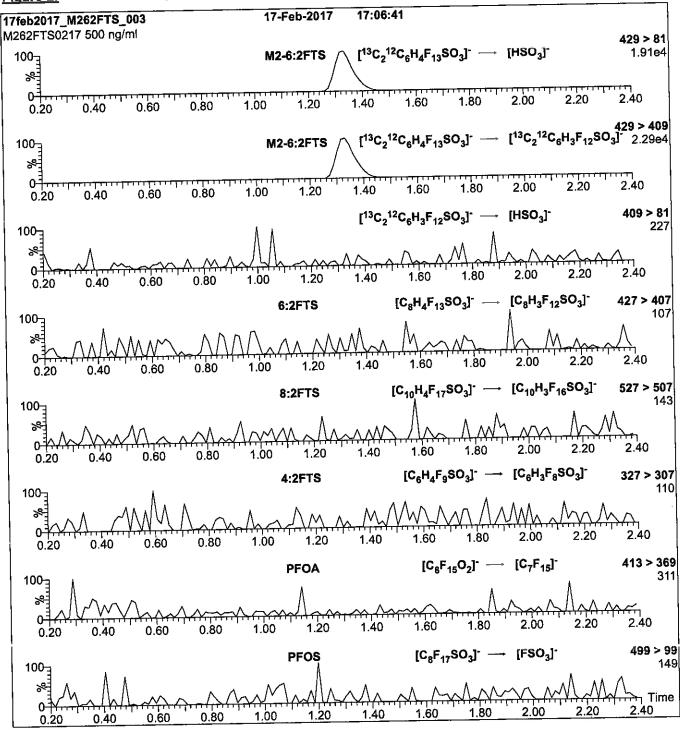
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

M2-6:2FTS; LC/MS/MS Data (Selected MRM Transitions) Figure 2:





Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H,O

(both with 10 mM NH₂OAc buffer)

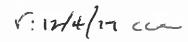
Collision Energy (eV) = 25

300 µl/min Flow:

LCM2-8:2FTS 00008



ID: LCM2-8:2FTS_00008 Exp: 67/05/22 Prpd; CCL M2-8:2FTS





CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

M2-8:2FTS

LOT NUMBER:

M282FTS0717

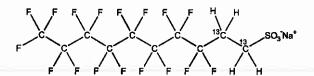
COMPOUND:

Sodium 1H,1H,2H,2H-perfluoro-[1,2-13C,]decane sulfonate

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂ ¹²C₃H₄F₁,SO₃Na

MOLECULAR WEIGHT:

552.15

CONCENTRATION:

50.0 ± 2.5 µg/ml (Na salt)

 $47.9 \pm 2.4 \, \mu g/ml$

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

>99% 13C

LAST TESTED: (mm/dd/yyyy)

(1,2-13C₂)

EXPIRY DATE: (mm/dd/yyyy)

07/05/2017

07/05/2022

RECOMMENDED STORAGE:

Refrigerate ampoule

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.

The native 8:2FTS contains 4.22% of 34S (due to natural isotopic abundance) therefore both native 8:2FTS and M2-8:2FTS will produce signals in the m/z 529 to m/z 509 channel during SRM analysis. We recommend using the m/z 529 to m/z 81 transition to monitor for M2-8:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

(M2-8:2FTS anion)

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: <u>07/07/2017</u>

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA

519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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

$$x_1, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1, x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

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

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

TRACEABILITY:

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

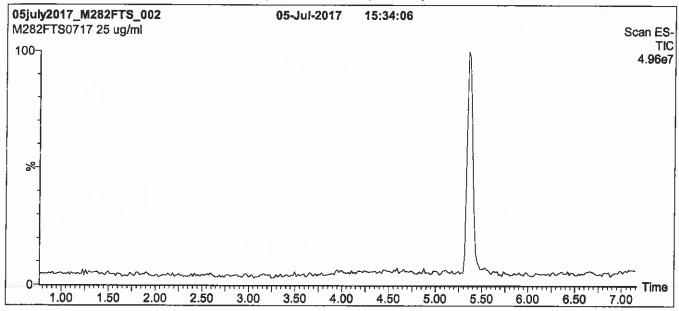
QUALITY MANAGEMENT:

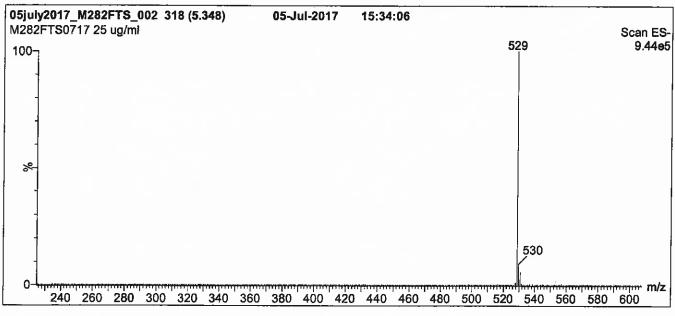
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





Figure 1: M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)





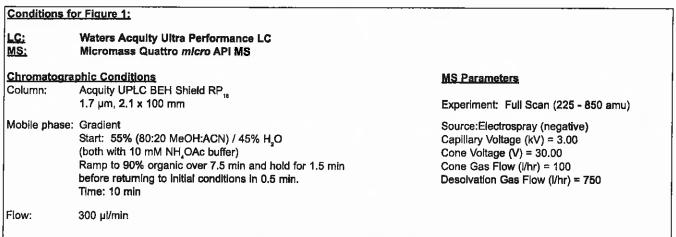
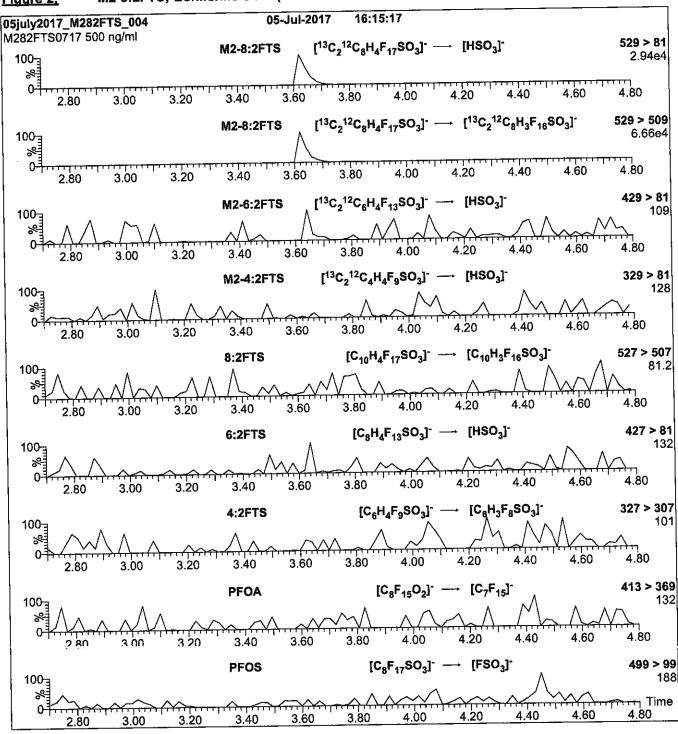
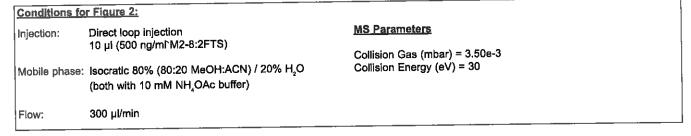


Figure 2: M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)

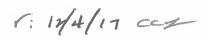




LCM2PFHxDA_00013



ID: LCM2PFHxDA_00013 Exp: 07/13/22 Prpd: CCL 13C2-PFHxDA at 50ug/mL





CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

M2PFHxDA

LOT NUMBER:

M2PFHxDA0717

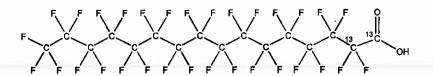
COMPOUND:

Perfluoro-n-[1,2-13C,]hexadecanolc acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₁₄HF₃₁O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

816.11

SOLVENT(S):

Methanol Water (<1%)

≥99% 13C

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

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

LAST TESTED: (mm/dd/yyyy)

07/13/2017

EXPIRY DATE: (mm/dd/yyyy)

07/13/2022

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 ~ 0.3% of native perfluoro-n-hexadecanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

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 famillar 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, $u_{\epsilon}(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2, ... x_n$$
 on which it depends is:
$$u_c(y(x_1, x_2, ... x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

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

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

TRACEABILITY:

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

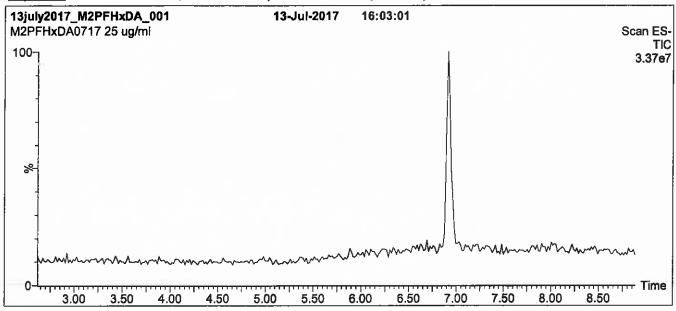
QUALITY MANAGEMENT:

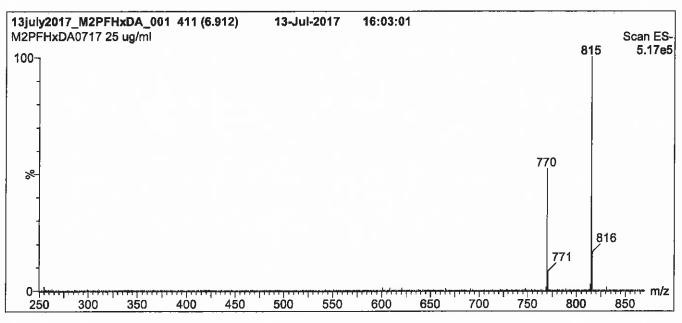
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





Figure 1: M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)





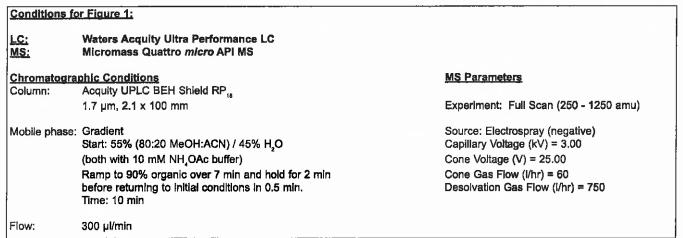
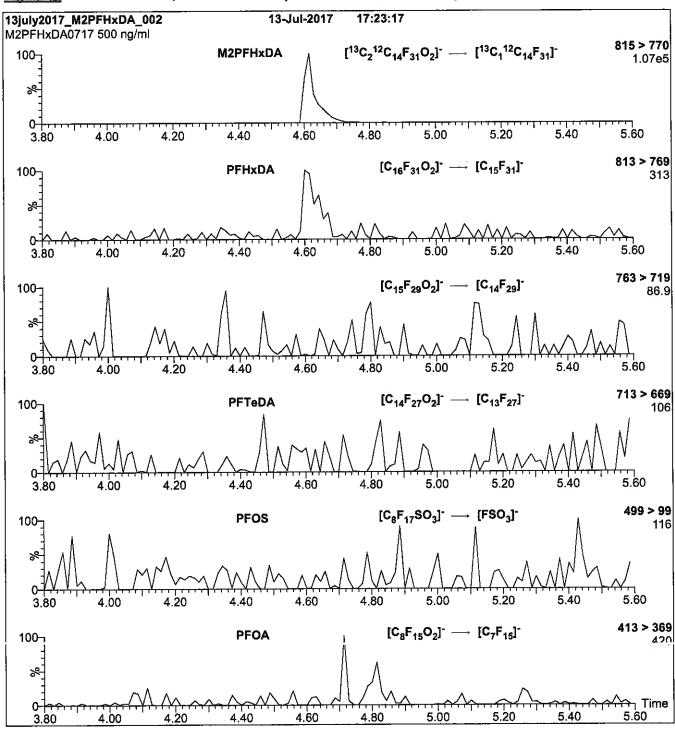
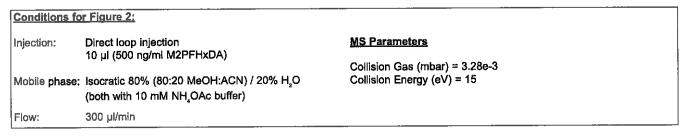


Figure 2: M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)





LCM2PFOA_00008



CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

M2PFOA

LOT NUMBER:

M2PFOA0216

COMPOUND:

Perfluoro-n-[1,2-13C2]octanoic acid

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

13C, 12C, HF, O,

MOLECULAR WEIGHT:

416.05

CONCENTRATION:

 $50 \pm 2.5 \, \mu g/ml$

SOLVENT(\$):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99%13C (1,2-13C₂)

LAST TESTED: (mm/dd/yyyy)

02/12/2016

02/12/2021

EXPIRY DATE: (mm/dd/yyyy) **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:

Date: 02/24/2016

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.

<u>HAZARDS:</u>

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

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 on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

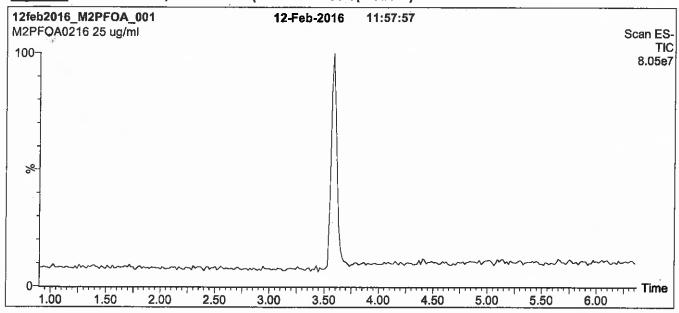
QUALITY MANAGEMENT:

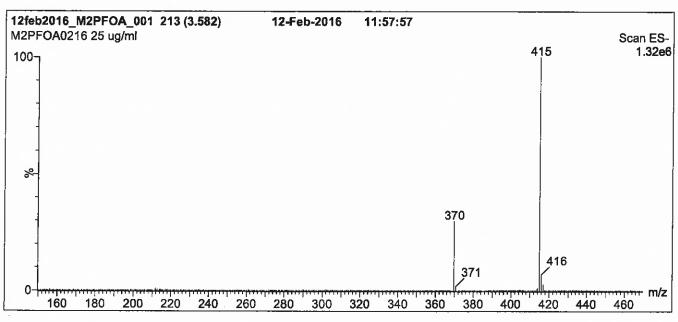
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





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





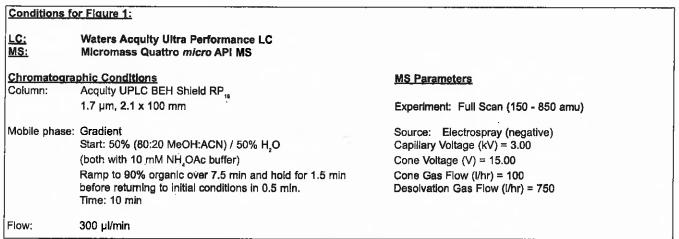
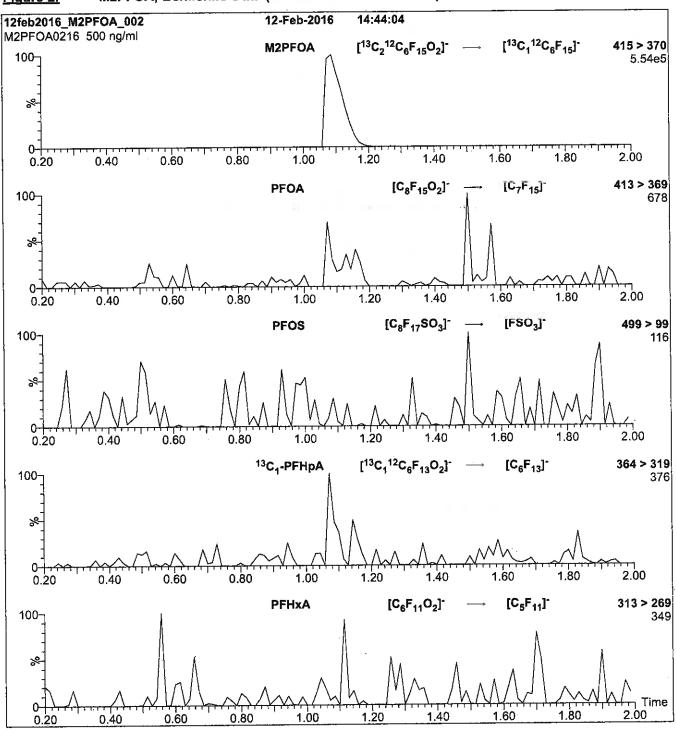
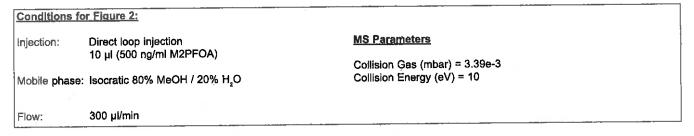


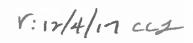
Figure 2: M2PFOA; LC/MS/MS Data (Selected MRM Transitions)





LCM2PFTeDA_00012







CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2PFTeDA

LOT NUMBER:

M2PFTeDA1117

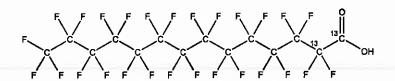
COMPOUND:

Perfluoro-n-[1,2-13C,]tetradecanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₁₂HF₂₇O₂

 $50 \pm 2.5 \,\mu g/ml$

MOLECULAR WEIGHT:

716.10

CONCENTRATION:

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

Water (<1%) ≥99% 13C (1,2-13C₂)

LAST TESTED: (mm/dd/yyyy)

11/30/2017

EXPIRY DATE: (mm/dd/yyyy)

11/30/2022

RECOMMENDED STORAGE:

Store ampoule in a cooi, 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:

Date: 12/01/2017

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:

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$$\mathbf{x}_{i}, \mathbf{x}_{2},...\mathbf{x}_{n}$$
 on which it depends is:
$$u_{c}(y(x_{i},x_{2},...x_{n})) = \sqrt{\sum_{i=1}^{n} u(y,x_{i})^{2}}$$

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

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

TRACEABILITY:

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

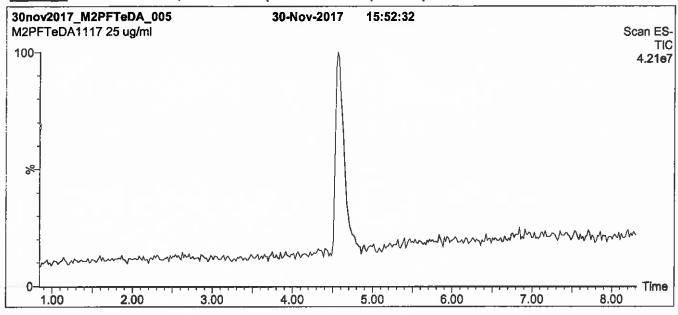


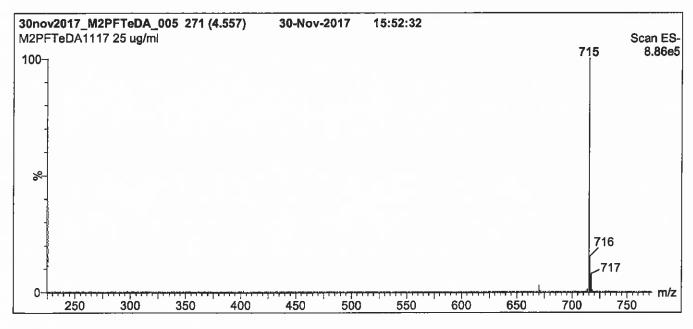


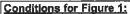
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com



M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)







LC:

Waters Acquity Ultra Performance LC

MS:

Micromass Quattro micro API MS

Chromatographic Conditions

Column:

Acquity UPLC BEH Shield RP,

1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient

Start: 65% (80:20 MeOH:ACN) / 35% H₂O

(both with 10 mM NH₂OAc buffer)

Ramp to 90% organic over 7.5 min and hold for 1.5 min

before returning to initial conditions in 0.5 mln.

Time: 10 min

Flow:

300 µl/min

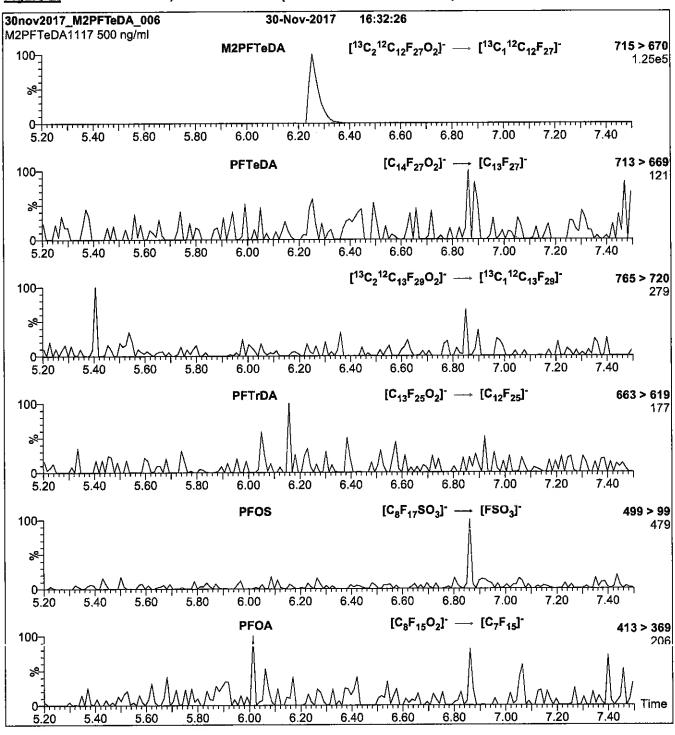
MS Parameters

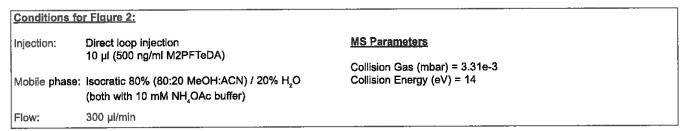
Experiment: Full Scan (225 - 850 amu)

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

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Figure 2: M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)





LCM3HFPO-DA_00002



CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

M3HFPO-DA

LOT NUMBER:

M3HFPODA0817

COMPOUND:

2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-13C3-propanoic acid

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₃¹²C₃HF₁₁O₃

MOLECULAR WEIGHT:

333.03

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

≥99% ¹³C

LAST TESTED: (mm/dd/yyyy)

08/17/2017

ISOTOPIC PURITY:

 $(^{13}C_3)$

EXPIRY DATE: (mm/dd/yyyy)

08/17/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains ~ 1.5% of two constitutional isomers.

Product is commercially known as GenX.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 08/25/2017

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

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

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

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

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

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

TRACEABILITY:

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

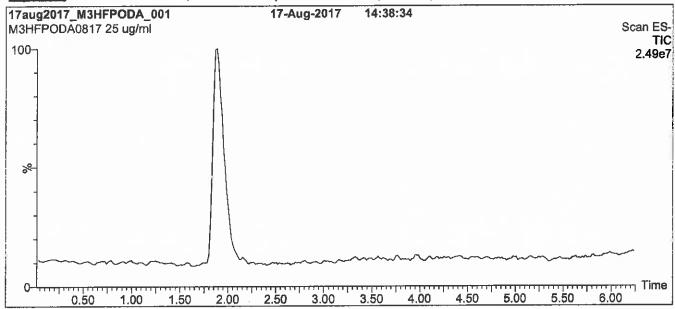
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

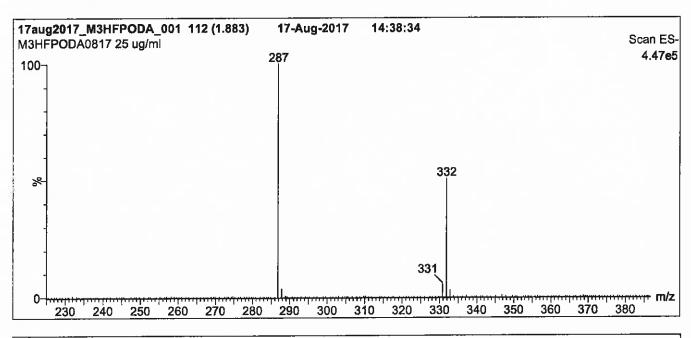




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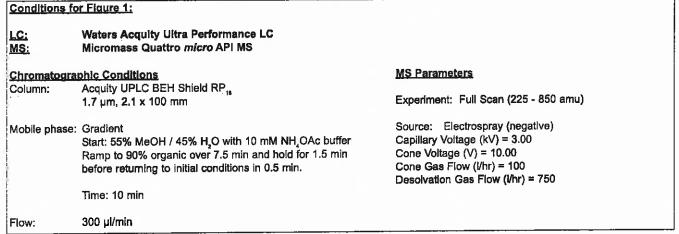
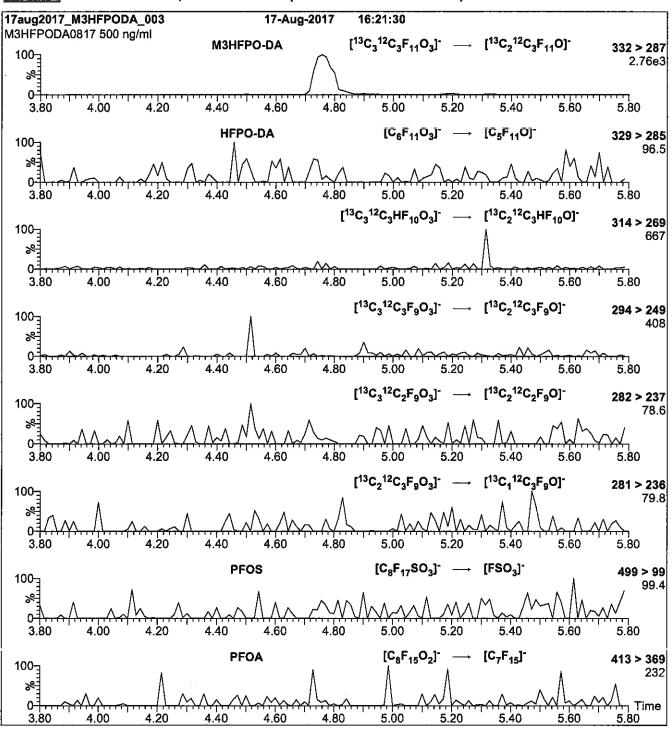
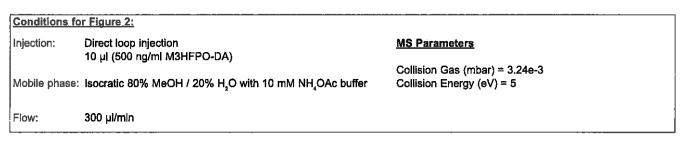


Figure 2: M3HFPO-DA; LC/MS/MS Data (Selected MRM Transitions)

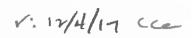




LCM4PFHPA_00012



ID: LCM4PFHPA_00012 Exp: 05/03/22 Prpd: CCL 13C4-Perfluoroheptanoic a





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M4PFHpA

Perfluoro-n-[1,2,3,4-13C] heptanoic acid

LOT NUMBER:

M4PFHpA0517

STRUCTURE:

COMPOUND:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₄¹²C₃HF₁₃O₃

CONCENTRATION:

 $50 \pm 2.5 \, \mu g/ml$

MOLECULAR WEIGHT:

368.03

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

05/03/2017

LAST TESTED: (mm/dd/yyyy) EXPIRY DATE: (mm/dd/yyyy)

RECOMMENDED STORAGE:

05/03/2022

Store ampoule in a cool, dark place

ISOTOPIC PURITY:

≥99%13C

(1,2,3,4-13C₄)

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 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:

Date: 05/11/2017

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

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:

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The combined relative standard uncertainty, $u_{\varepsilon}(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1,x_2,...x_n)) = \sqrt{\sum_{l=1}^n u(y,x_l)^2}$$

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

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

TRACEABILITY:

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

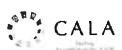
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis

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:

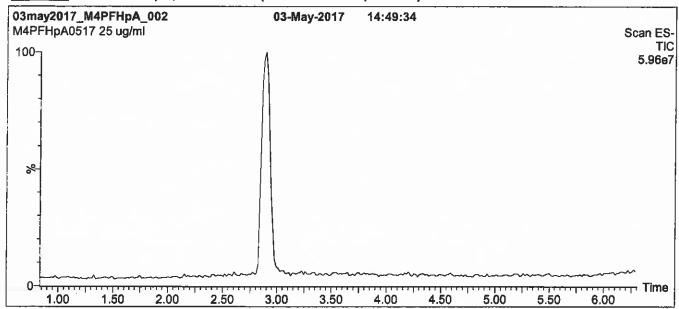
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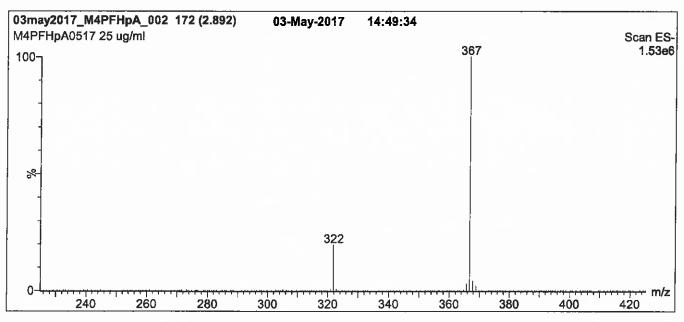




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: M4PFHpA; LC/MS Data (TIC and Mass Spectrum)





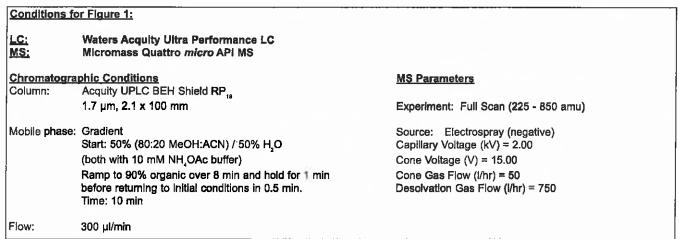
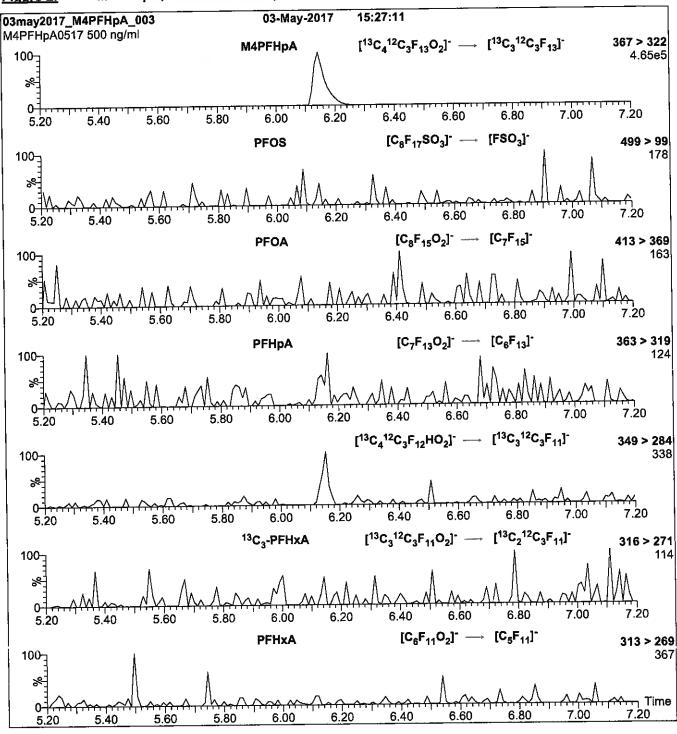
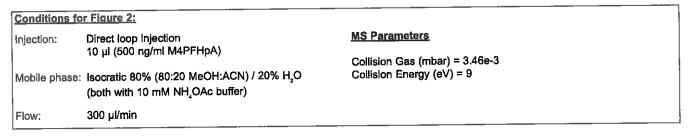


Figure 2: M4PFHpA; LC/MS/MS Data (Selected MRM Transitions)





LCM5PFPEA_00013



ID: LCM5PFPEA 00013 Exp: 07/20/22 Prpd: CCL 13C5-Perfluoropentanoic a V: 12/4/17 CCE



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M5PFPeA

COMPOUND:

Perfluoro-n-[13C]pentanoic acid

LOT NUMBER:

M5PFPeA0717

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

CONCENTRATION:

CHEMICAL PURITY:

LAST TESTED: (mm/dd/ywy)

13C_EHF_BO₂

 $50 \pm 2.5 \, \mu g/ml$

MOLECULAR WEIGHT:

SOLVENT(S):

269.01

Methanol

ISOTOPIC PURITY:

≥99% 13C

Water (<1%)

(13C₄)

>98%

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-pentanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

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

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 sultable 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, $u_{_{p}}(y)$, of a value y and the uncertainty of the independent parameters

$$x_1$$
, x_2 ,... x_n on which it depends is:
$$u_c(y(x_1, x_2, ... x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

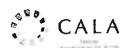
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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:

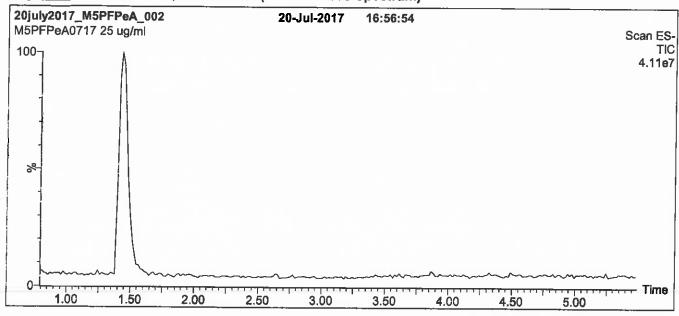
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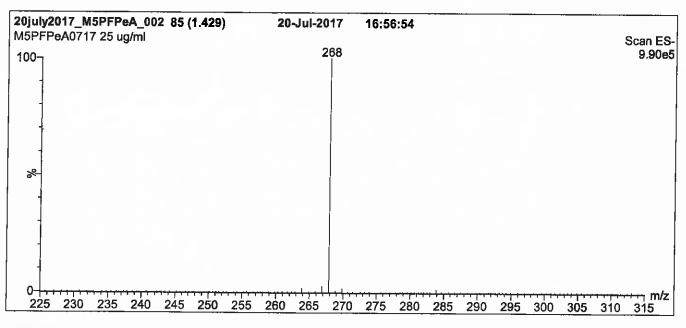




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: M5PFPeA; LC/MS Data (TIC and Mass Spectrum)





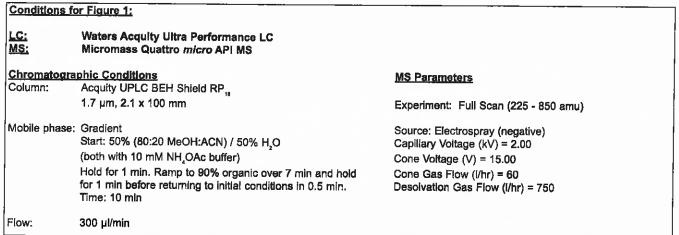
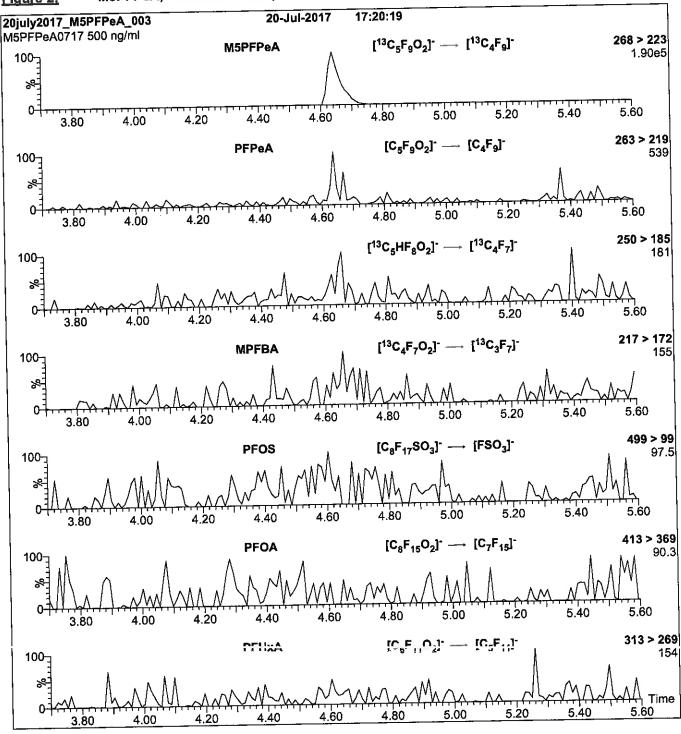
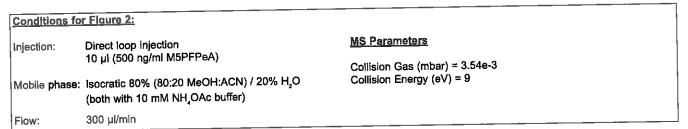


Figure 2: M5PFPeA; LC/MS/MS Data (Selected MRM Transitions)





LCM8FOSA_00016



ID: LCM8FOSA_00016 Exp: t0/11/22 Prpd: CCL 13C8-Perfluorocctanesulfo





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M8FOSA-I

LOT NUMBER:

M8FOSA1017I

COMPOUND:

Perfluoro-1-[13C_s]octanesulfonamide

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C,H,F,,NO,S

CONCENTRATION:

 $50 \pm 2.5 \,\mu g/ml$

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/11/2017

EXPIRY DATE: (mm/dd/yyyy)

10/11/2022

RECOMMENDED STORAGE:

Refrigerate ampoule

MOLECULAR WEIGHT:

SOLVENT(\$):

Isopropanol

507.09

ISOTOPIC PURITY:

≥99% ¹³C

(13C_a)

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 ~ 1.1% of perfluoro-1-[¹³C,]octanesulfonamide and ~ 0.01% of perfluoro-1-[¹³C,]heptanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manage

Date: 10/20/2017

The products prepared by Weilington 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:

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$$\mathbf{x}_1, \ \mathbf{x}_2, \dots \mathbf{x}_n$$
 on which it depends is:
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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

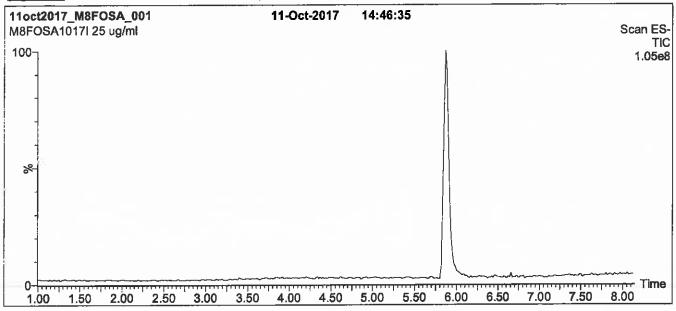
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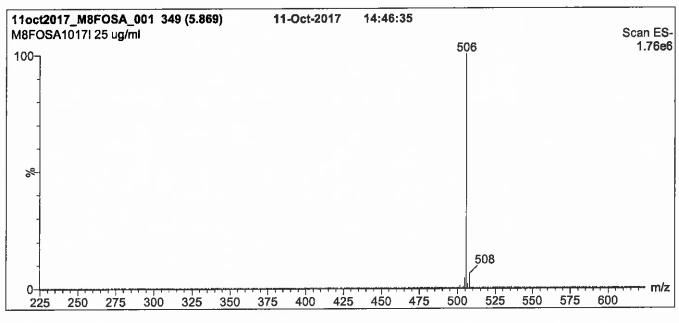




**For additional information or assistance concerning this or any other products from Wellington Laboratories Inc.,
please visit our website at www.weil-labs.com or contact us directly at info@well-labs.com**

Figure 1: M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)





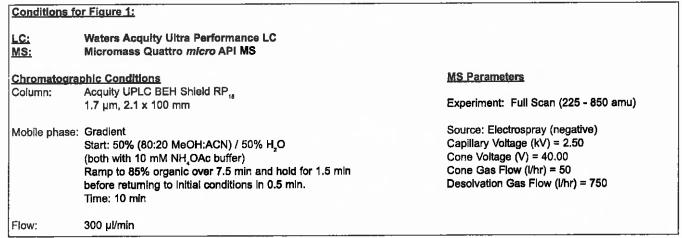
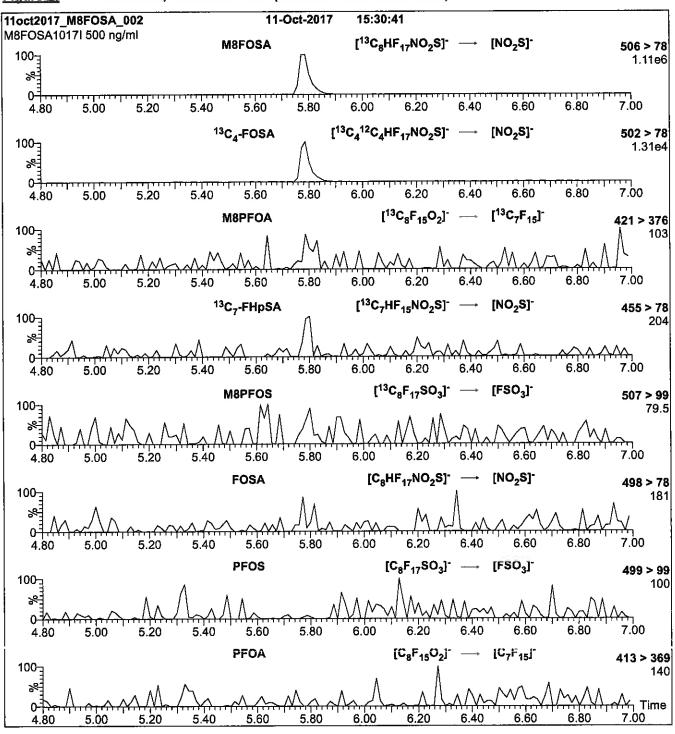
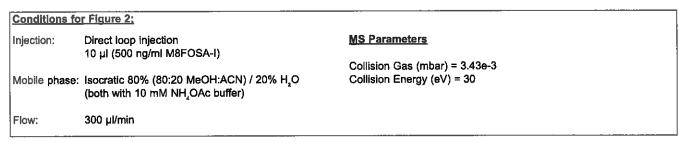


Figure 2: M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)

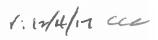




LCMPFBA_00013



ID: LCMPFBA_00013 Еф: 04/12/22 Prpd: CCL 13C4-Perfluorobutanoic ac





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFBA

COMPOUND:

Perfluoro-n-[1,2,3,4-13C] butanoic acid

STRUCTURE:

CAS #:

LOT NUMBER:

Not available

MPFBA0417

MOLECULAR FORMULA:

CONCENTRATION:

 $50 \pm 2.5 \,\mu g/ml$

MOLECULAR WEIGHT:

218.01

SOLVENT(S):

Methanol

ISOTOPIC PURITY:

Water (<1%) >99%13C

(1,2,3,4-13C₄)

CHEMICAL PURITY: LAST TESTED: (mm/dd/yyyy) >98%

04/12/2017

EXPIRY DATE: (mm/dd/yyyy)

RECOMMENDED STORAGE:

04/12/2022

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: _04/20/2017

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

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

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

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

TRACEABILITY:

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

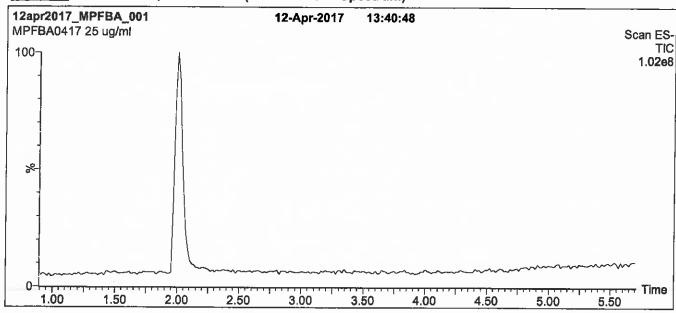


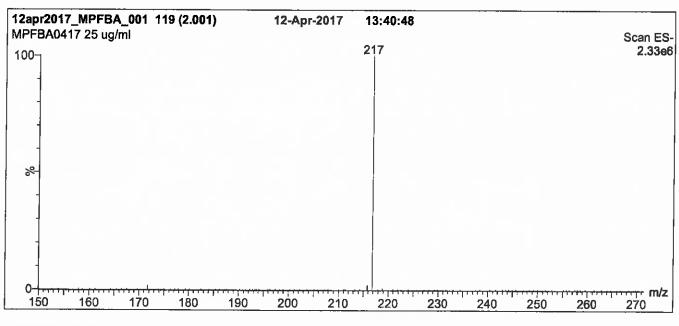


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rev0

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





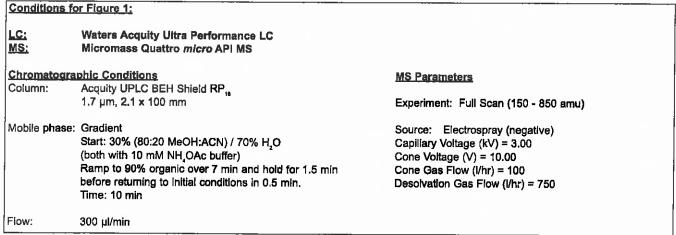
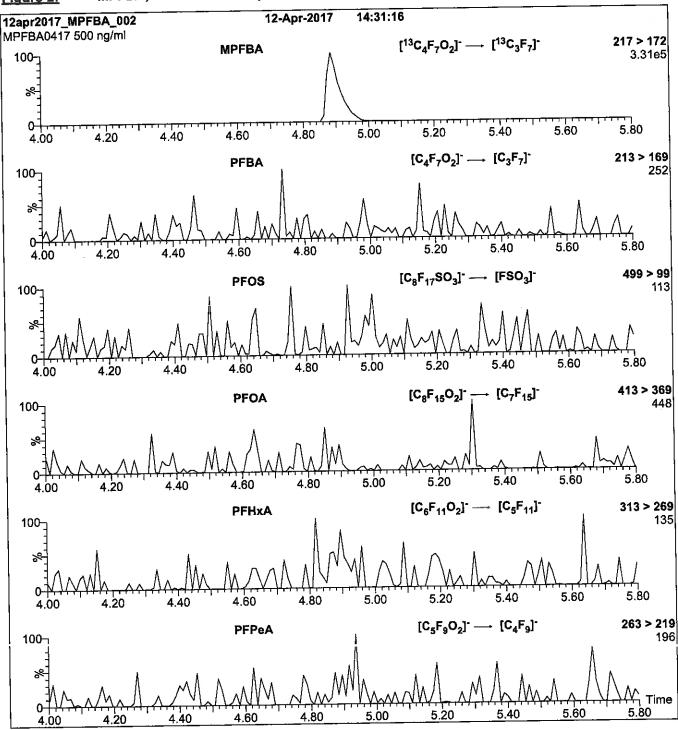


Figure 2: MPFBA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml MPFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H,O

(both with 10 mM NH₄OAc buffer)

200 ul/min

MS Parameters

Collision Gas (mbar) = 3.35e-3 Collision Energy (eV) = 10

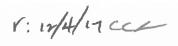
Flow:

300 µl/min

LCMPFBS_00006



D: LCMPFBS_00006 Exp: 06/24/22 Prpd: CCL 13C3-Perfluorobutanesuilo





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M3PFBS

LOT NUMBER:

M3PFBS0815

COMPOUND:

Sodium perfluoro-1-[2,3,4-13C,]butanesulfonate

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

13C, 12CF, SO, Na

MOLECULAR WEIGHT:

325.06

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$ (Na salt)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

LAST TESTED: (mm/dd/yyyy)

05/24/2017

(2,3,4-13C₃)

EXPIRY DATE: (mm/dd/yyyy)

05/24/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

 $46.5 \pm 2.3 \,\mu\text{g/ml}$ (M3PFBS anion)

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:

Date: _05/25/2017

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

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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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

$$x_1, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1,x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y,x_i)^2}$$

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

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

TRACEABILITY:

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

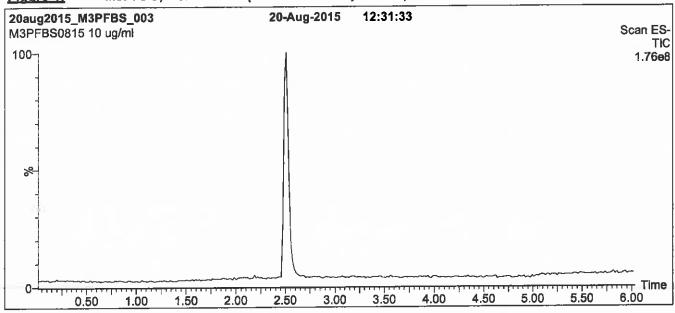
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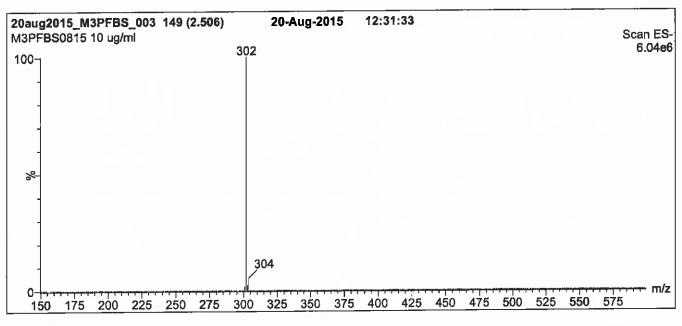




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Figure 1: M3PFBS; LC/MS Data (TIC and Mass Spectrum)





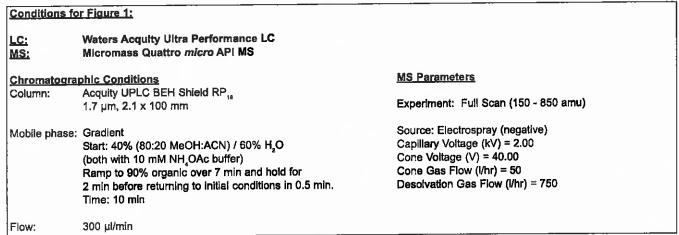
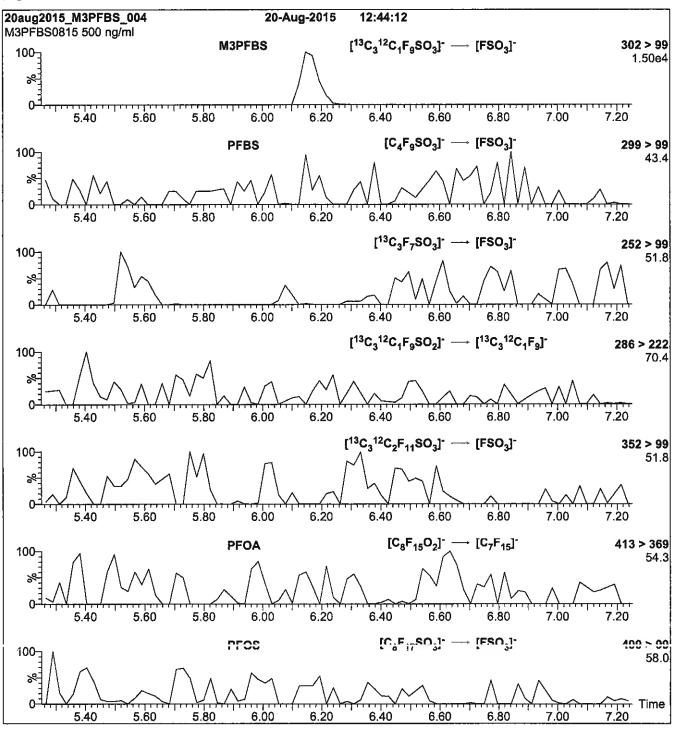
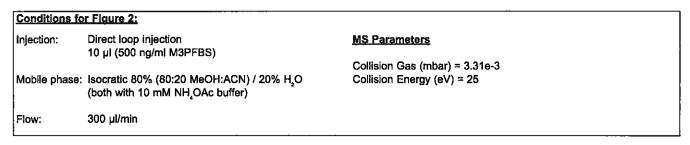


Figure 2: M3PFBS; LC/MS/MS Data (Selected MRM Transitions)





LCMPFDA_00018



ID: LCMPFDA_00018

Eqs: 87/13/22 Payd: CCL
13/C2-Perfluornodecanoic a

V:14/19 ce



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFDA

LOT NUMBER: MPFDA0717

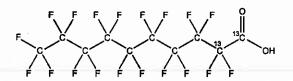
COMPOUND:

Perfluoro-n-[1,2-13C₂]decanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

13C

MOLECULAR WEIGHT:

516.07

CONCENTRATION:

¹³C₂¹²C₈HF₁₈O₂ 50 ± 2.5 μg/ml

SOLVENT(S): Methanol

ISOTOPIC PURITY:

Water (<1%) >99% ¹³C

(1,2-13C₂)

CHEMICAL PURITY:

>98%

- 00 /0

LAST TESTED: (mm/dd/yyyy)

07/13/2017

EXPIRY DATE: (mm/dd/yyyy)

07/13/2022

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 ¹³C₁-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 07/14/2017

(mm/dd/vvv)

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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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:

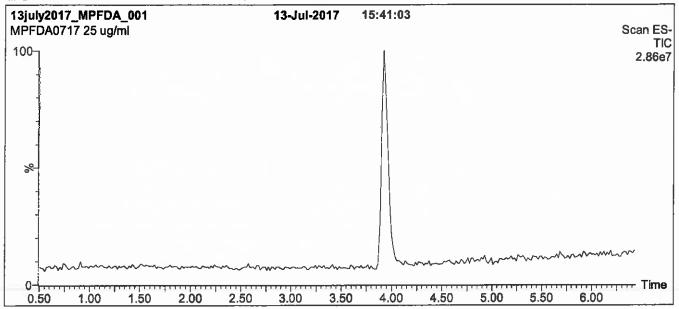
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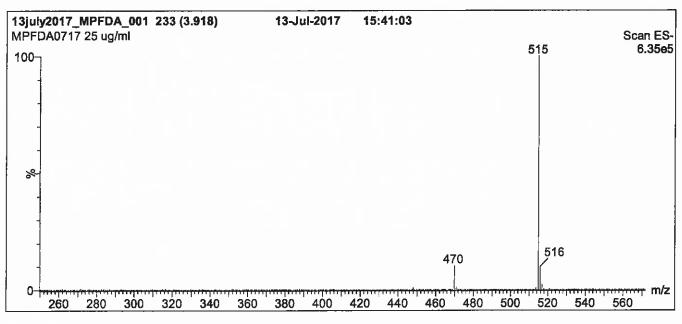




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Figure 1: MPFDA; LC/MS Data (TIC and Mass Spectrum)





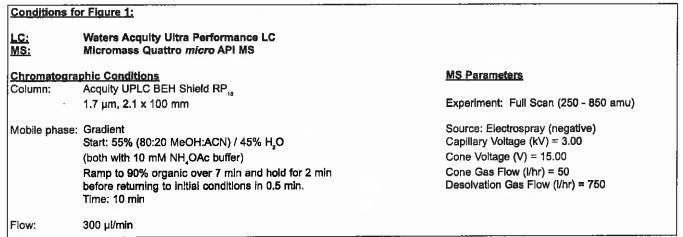
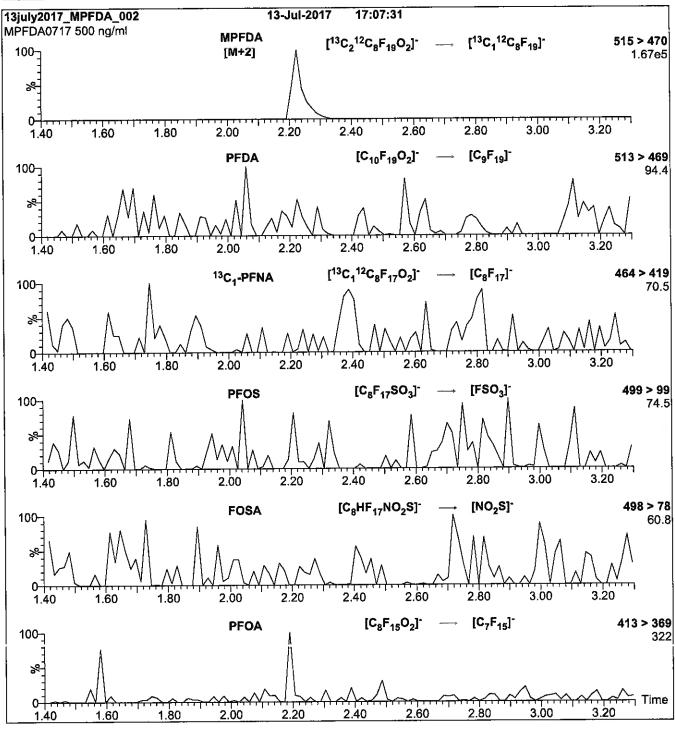
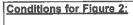


Figure 2: MPFDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml MPFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH₄OAc buffer)

Flow: 300 µl/min

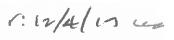
MS Parameters

Collision Gas (mbar) = 3.17e-3 Collision Energy (eV) = 13

LCMPFDoA_00013



ID: LCMPFDoA_00013 Exp: 06/23/22 Prod: CCL 13C2-Perfluornododecancic





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFDoA

COMPOUND:

Perfluoro-n-[1,2-13C,]dodecanoic acid

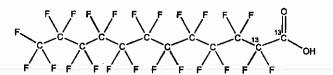
LOT NUMBER:

MPFDoA0517

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C, ¹²C, HF, O,

CONCENTRATION:

MOLECULAR WEIGHT:

616.08

 $50 \pm 2.5 \, \mu g/ml$

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/23/2017

EXPIRY DATE: (mm/dd/yyyy)

05/23/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

ISOTOPIC PURITY:

≥99% 13C

(1,2-13C₂)

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 acld to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: _ 05/26/2017

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.

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HOMOGENEITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

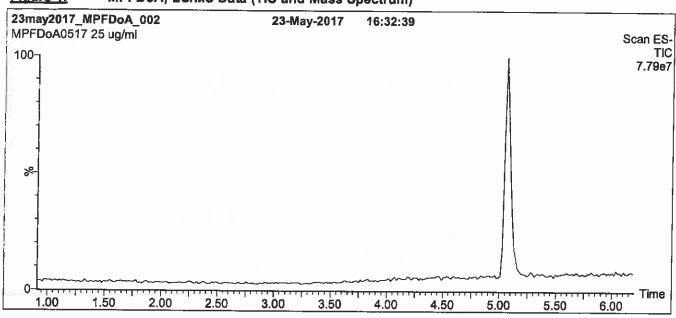
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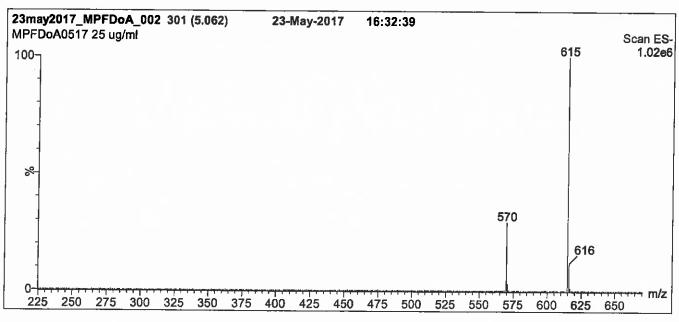




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Figure 1: MPFDoA; LC/MS Data (TIC and Mass Spectrum)





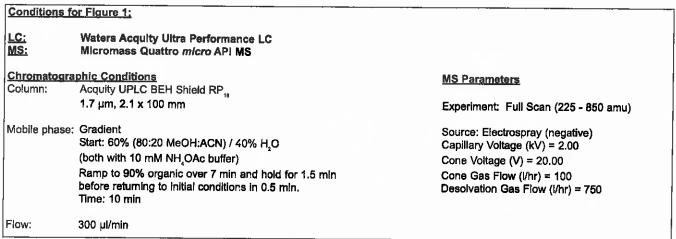
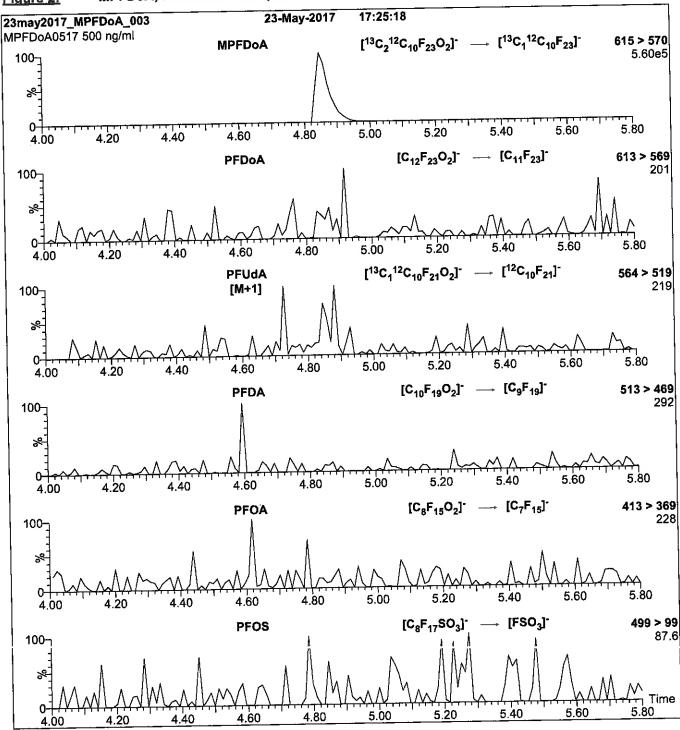
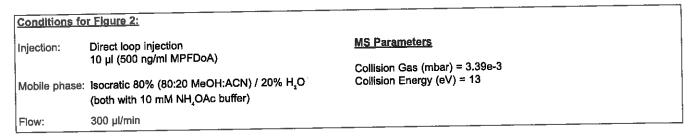


Figure 2: MPFDoA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFHxA_00019



CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

MPFHxA

MPFHxA1017

COMPOUND:

Perfluoro-n-[1,2-13C]hexanoic acid

STRUCTURE:

CAS #:

LOT NUMBER:

Not available

MOLECULAR FORMULA:

13C,12C4HF,1O,

CONCENTRATION:

 $50 \pm 2.5 \, \mu g/m!$

MOLECULAR WEIGHT:

316.04

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

Water (<1%) >99%13C (1,2-13C₂)

LAST TESTED: (mm/dd/yyyy)

10/27/2017

EXPIRY DATE: (mm/dd/yyyy)

10/27/2022

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.

Contains < 0.1% of perfluoro-n-hexanoic acid and < 0.3% of perfluoro-n-octanoic acid,

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

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

$$x_i, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1,x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y,x_i)^2}$$

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

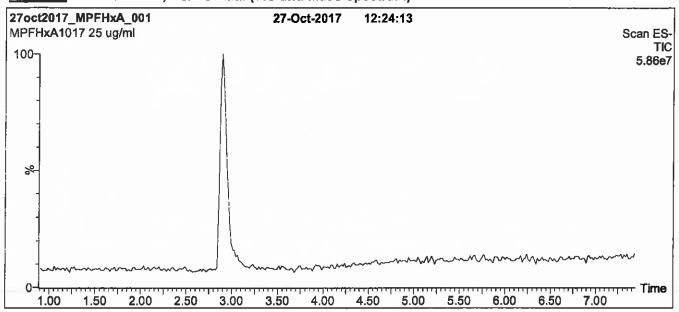
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

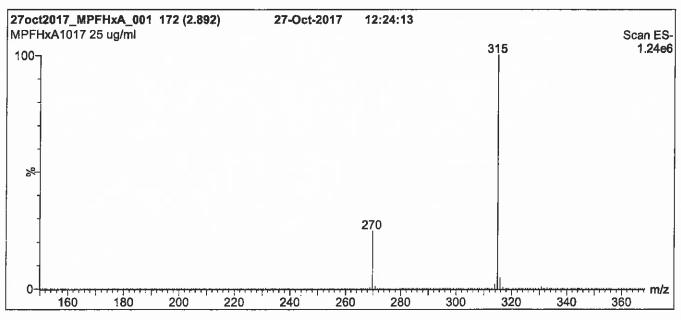




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Figure 1: MPFHxA; LC/MS Data (TIC and Mass Spectrum)





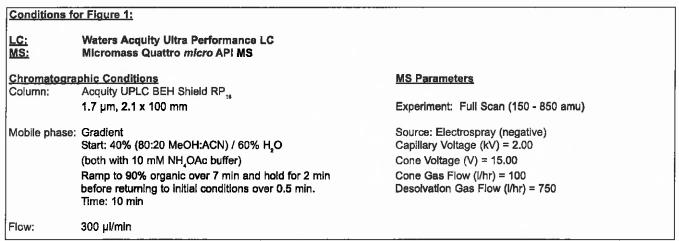
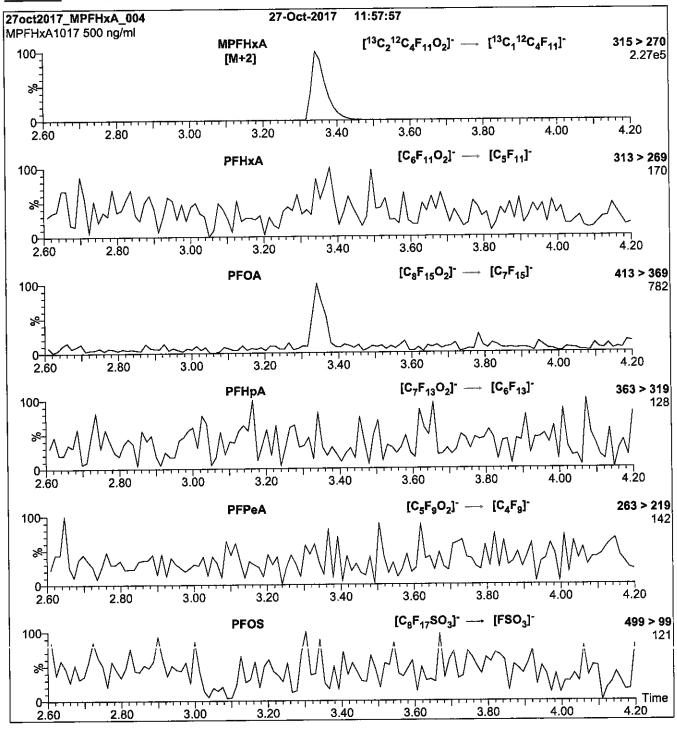
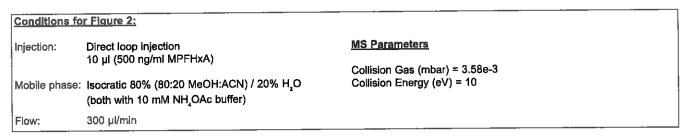


Figure 2: MPFHxA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFHxS_00013



1106238

ID: LCMPFHxS_00013 Exp: 02/17/22 Prpd: CCL 18O2-Perfluorohexanesutfo





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFHxS

LOT NUMBER:

MPFHxS0217

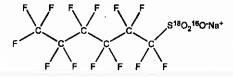
COMPOUND:

Sodium perfluoro-1-hexane[18O2]sulfonate

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

C₆F₁₃S¹⁸O₂¹⁶ONa

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

426.10

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$ (Na salt)

SOLVENT(S):

Methanoi

>94% (18O₂)

CHEMICAL PURITY: LAST TESTED: (mm/dd/yyw)

>98%

02/17/2017

EXPIRY DATE: (mm/dd/yyyy)

02/17/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

 $47.3 \pm 2.4 \mu g/ml$ (MPFHxS anion)

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.
- The response factor for MPFHxS (C₈F₁₃S¹⁸O₂¹⁸O⁻) has been observed to be up to 10% lower than for PFHxS (C₆F₁₃S¹⁶O₃) when both compounds are injected together. This difference may vary between instruments.
- Contains ~ 1.0% of sodium perfluoro-1-octane[18O₂]sulfonate (18O₂-PFOS).
- Due to the isotopic purity of the starting material (18O, >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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HAZARDS:

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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:

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UNCERTAINTY:

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The combined relative standard uncertainty, $u_{c}(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:

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

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

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TRACEABILITY:

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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:

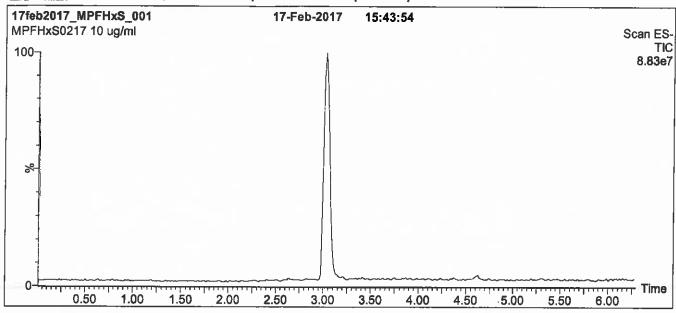
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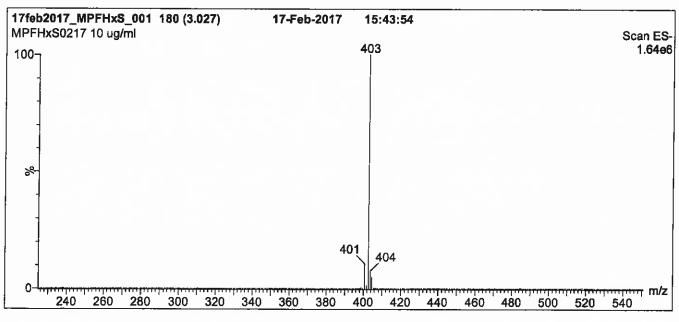




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Figure 1: MPFHxS; LC/MS Data (TIC and Mass Spectrum)





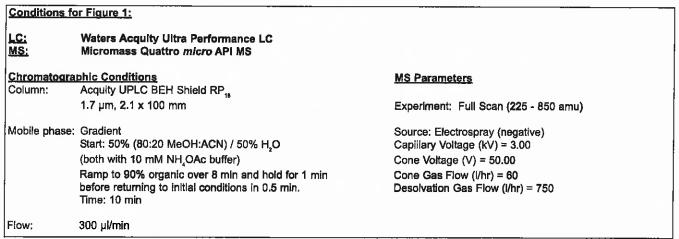
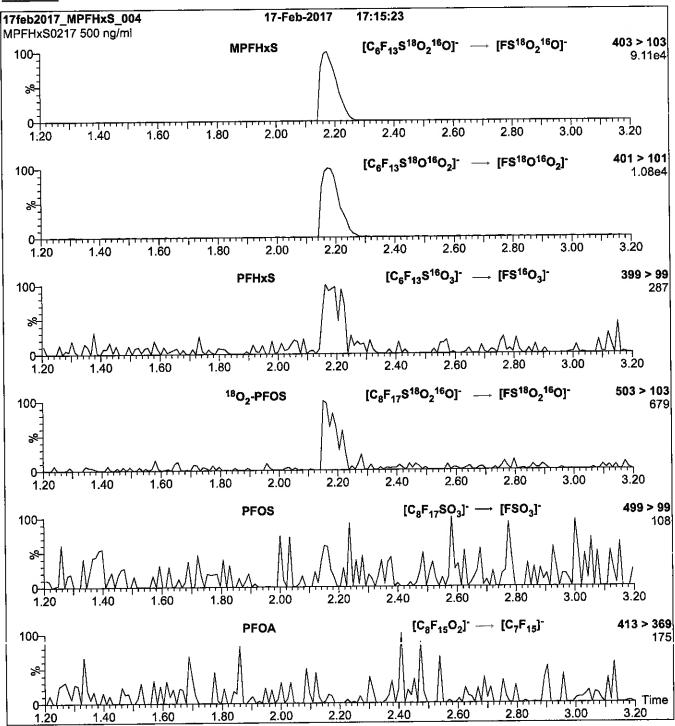
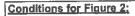


Figure 2: MPFHxS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml MPFHxS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H,O

(both with 10 mM NH₄OAc buffer)

Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) ≈ 3.43e-3 Collision Energy (eV) = 30

LCMPFNA_00013



D: LCMPFNA_00013 Exp: 09/30/21 Prpd: CCL 13C5-Perfluomonanoic aci 1:11/4/11 ac



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFNA

COMPOUND:

Perfluoro-n-[1,2,3,4,5-13C_s]nonanoic acid

STRUCTURE:

LOT NUMBER:

MPFNA0916

CAS #:

Not available

MOLECULAR FORMULA:

CONCENTRATION:

¹³C₅ ¹²C₄HF₁₇O₂

 $50 \pm 2.5 \, \mu g/ml$

CHEMICAL PURITY:

LAST TESTED: (mm/dd/yyyy)

EXPIRY DATE: (mm/dd/yyyy)

09/30/2021

>98%

09/30/2016

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

SOLVENT(S):

469.04 Methanol

Water (<1%)

ISOTOPIC PURITY:

MOLECULAR WEIGHT:

≥99%13C

(1,2,3,4,5-13C₅)

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:

Date: 10/11/2016

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HAZARDS:

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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:

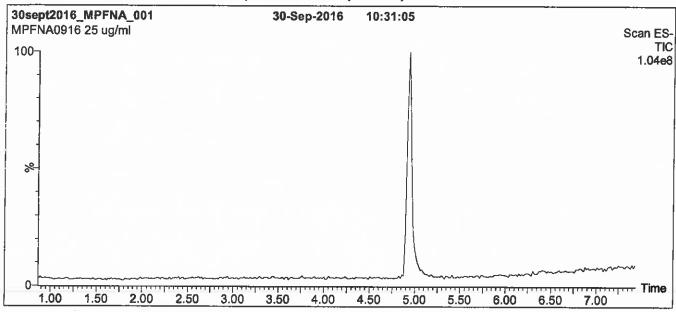
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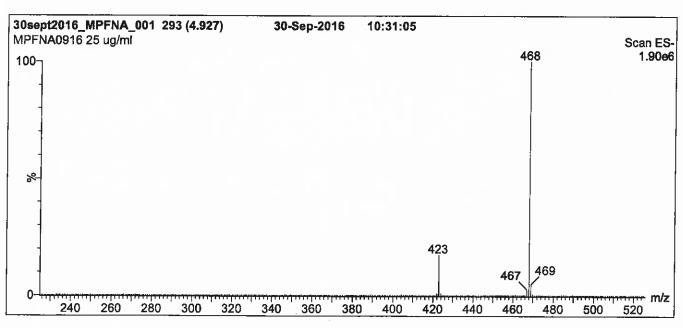




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Figure 1: MPFNA; LC/MS Data (TIC and Mass Spectrum)





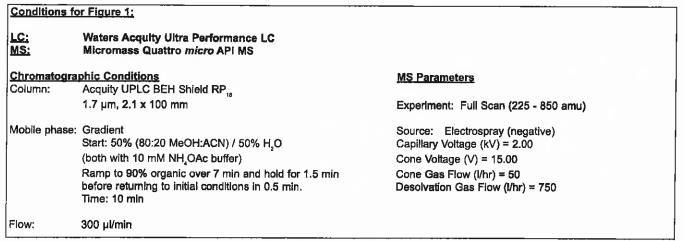
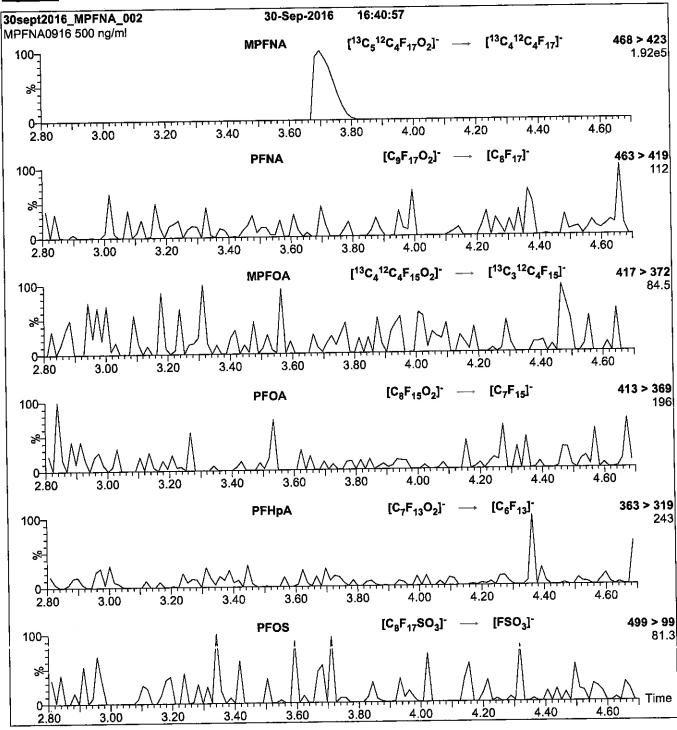
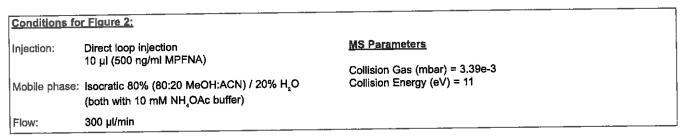


Figure 2: MPFNA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFOA_00017



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFOA

LOT NUMBER:

MPFOA1017

COMPOUND:

Perfluoro-n-[1,2,3,4-13C] octanoic acid

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₄¹²C₄HF₄O₉

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

418.04

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

>99% 13C (1,2,3,4-13C₄)

LAST TESTED: (mm/dd/yyyy)

10/17/2017

EXPIRY DATE: (mm/dd/yyyy)

10/17/2022

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 native perfluoro-n-octanoic acid (PFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified Bv:

B.G. Chittim, General Manager

Date: 10/19/2017

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

HAZARDS;

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

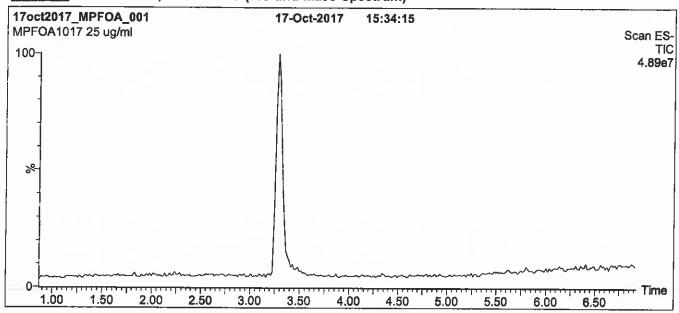
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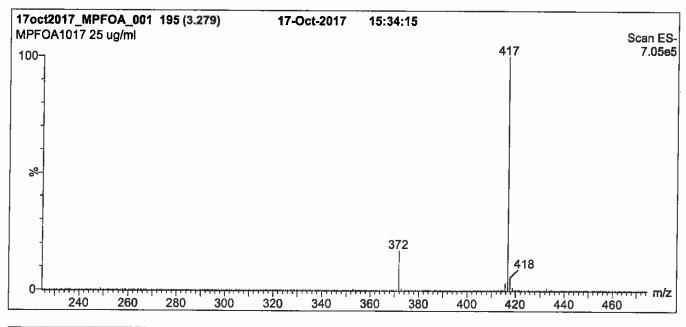


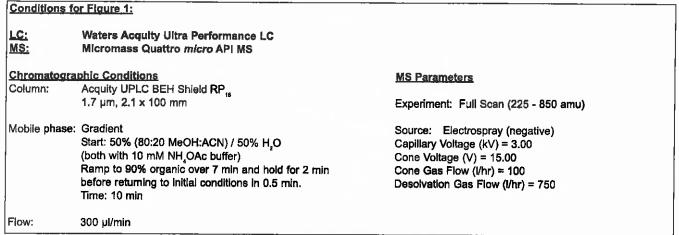


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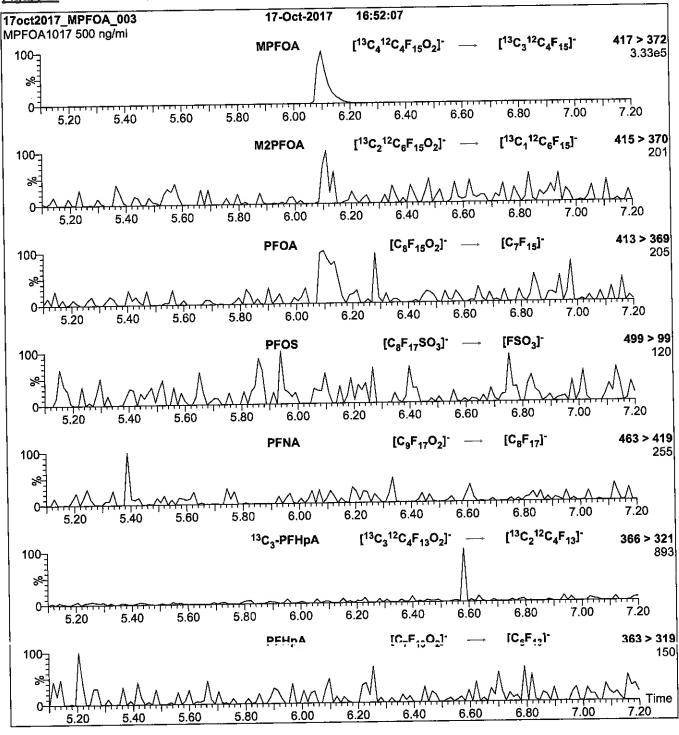
Figure 1: MPFOA; LC/MS Data (TIC and Mass Spectrum)

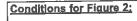






MPFOA; LC/MS/MS Data (Selected MRM Transitions) Figure 2:





Injection:

Flow:

Direct loop injection

10 μl (500 ng/ml MPFOA)

MS Parameters

Collision Gas (mbar) = 3.28e-3 Collision Energy (eV) = 11

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H,O

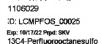
(both with 10 mM NH₄OAc buffer)

300 µl/min

LCMPFOS_00025



1: 12/4/17 CCL





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFOS

LOT NUMBER:

MPFOS1017

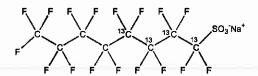
COMPOUND:

Sodium perfluoro-1-[1,2,3,4-13C,]octanesulfonate

STRUCTURE:

CAS #;

Not available



MOLECULAR FORMULA:

13C, 12C, F, SO, Na

MOLECULAR WEIGHT:

526.08

CONCENTRATION:

50.0 ± 2.5 μg/ml (Na salt)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

(1,2,3,4-13C₄)

LAST TESTED: (mm/dd/yyw)

10/17/2017

EXPIRY DATE: (mm/dd/yyyr)

10/17/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

 $47.8 \pm 2.4 \mu g/ml$ (MPFOS anion)

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 ~ 0.4% Sodium perfluoro-1-[1,2,3-13C,]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 10/18/2017

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:

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UNCERTAINTY:

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

The combined relative standard uncertainty, $u_{s}(y)$, of a value y and the uncertainty of the independent parameters

$$\mathbf{x_i}, \, \mathbf{x_2}, ... \mathbf{x_n}$$
 on which it depends is:
$$u_c(y(x_1, x_2, ... x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

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

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

TRACEABILITY:

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

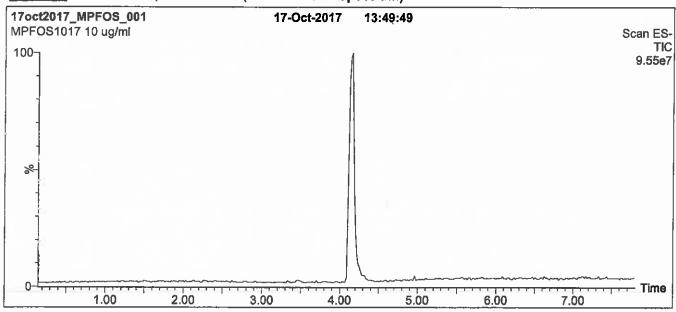
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

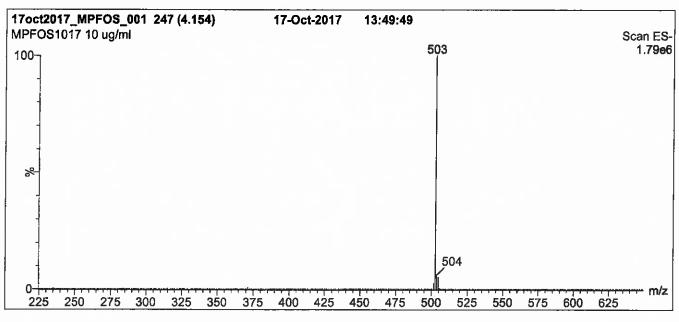




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at lnfo@well-labs.com

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





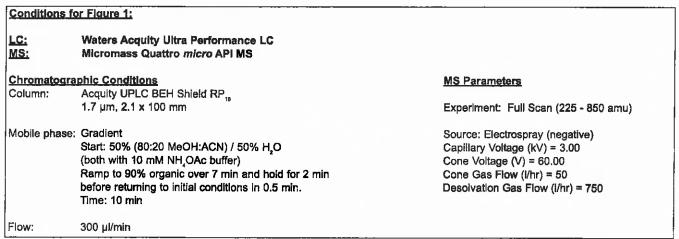
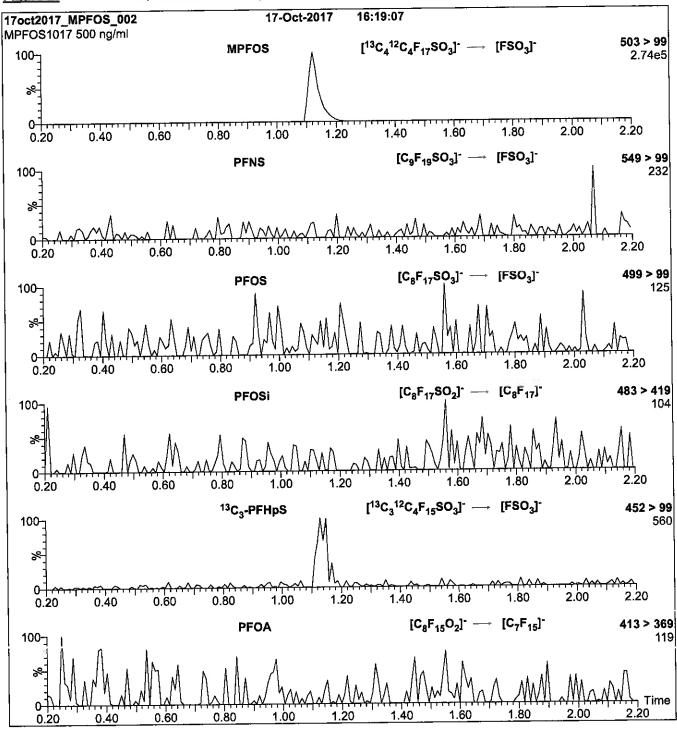
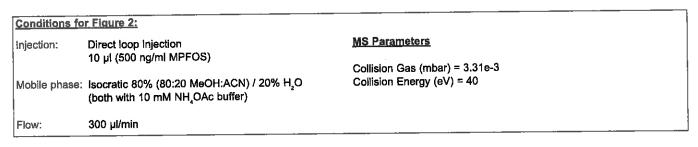


Figure 2: MPFOS; LC/MS/MS Data (Selected MRM Transitions)

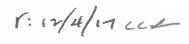




LCMPFUdA_00014



Exp: 11/22/21 Prpd: CCL 13C2-Perfluomoundecanoic





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFUdA

LOT NUMBER:

MPFUdA1116

COMPOUND:

Perfluoro-n-[1,2-13C]undecanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₈HF₂₁O₂

CONCENTRATION:

 $50 \pm 2.5 \,\mu g/ml$

MOLECULAR WEIGHT:

566,08

SOLVENT(S):

ISOTOPIC PURITY:

Methanol

Water (<1%) ≥99% ¹³C

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

CHEMICAL PURITY: LAST TESTED: (mm/dd/yyyy) >98%

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.

Presence of 1-13C,-PFUdA (~1%; see Figure 2), 2-13C,-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the 13C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date:

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HAZARDS:

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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:

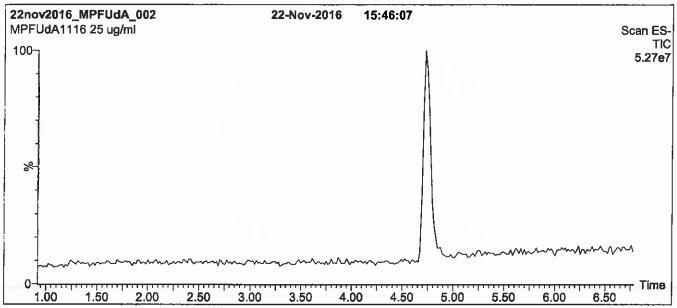
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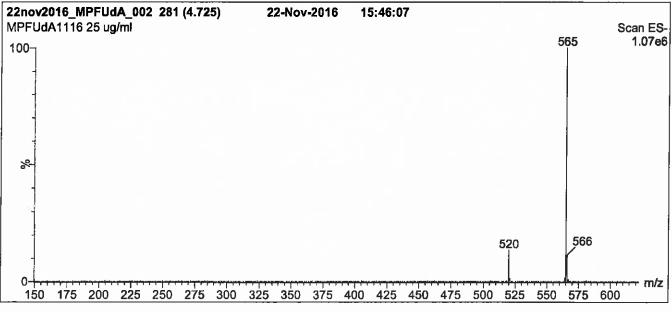




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Figure 1: MPFUdA; LC/MS Data (TIC and Mass Spectrum)





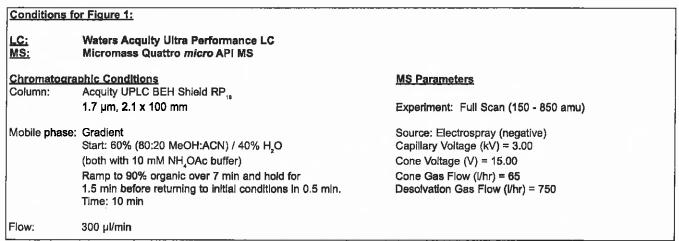
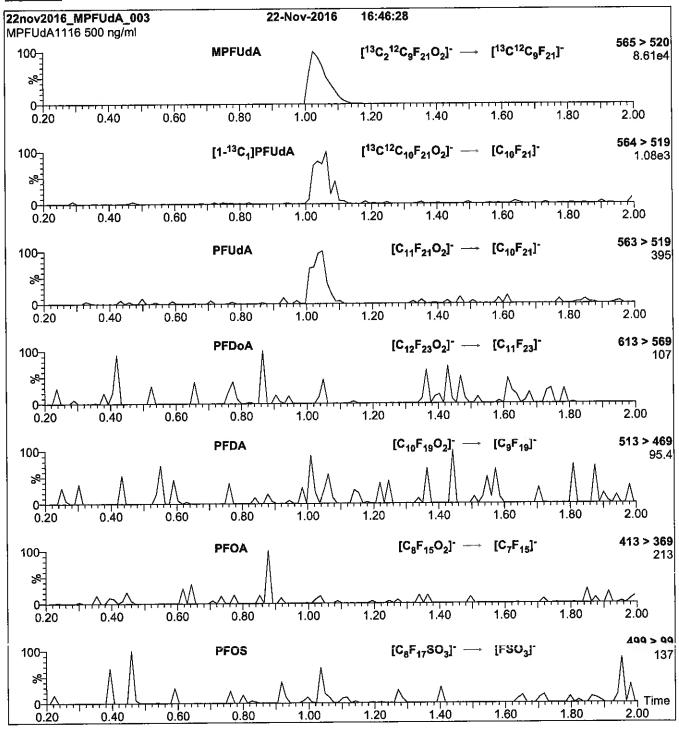
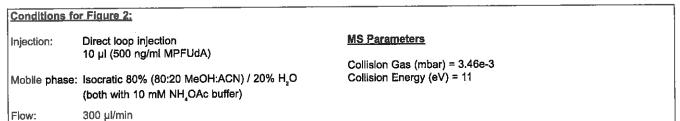


Figure 2: MPFUdA; LC/MS/MS Data (Selected MRM Transitions)





LCN-EtFOSA-M_00005



PRODUCT CODE:

N-EtFOSA-M

LOT NUMBER:

MOLECULAR WEIGHT:

SOLVENT(S):

NEtFOSA0516M

527.20

Methanol

COMPOUND:

N-ethylperfluoro-1-octanesulfonamide

STRUCTURE:

CAS #:

4151-50-2

MOLECULAR FORMULA:

C,H,F,NO2S

CONCENTRATION:

 $50 \pm 2.5 \,\mu g/ml$

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/24/2016

EXPIRY DATE: (mm/dd/yyyy)

05/24/2021

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:

Date: 05/27/2016

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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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:

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QUALITY MANAGEMENT:

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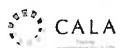
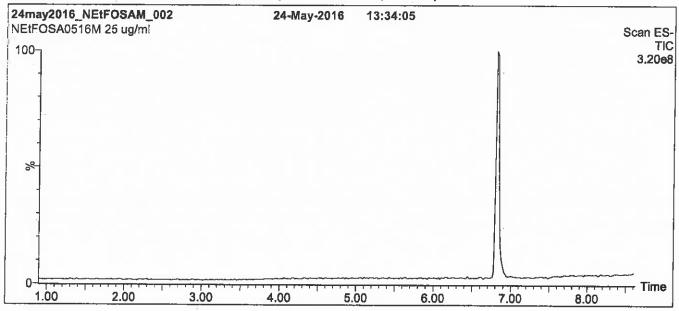
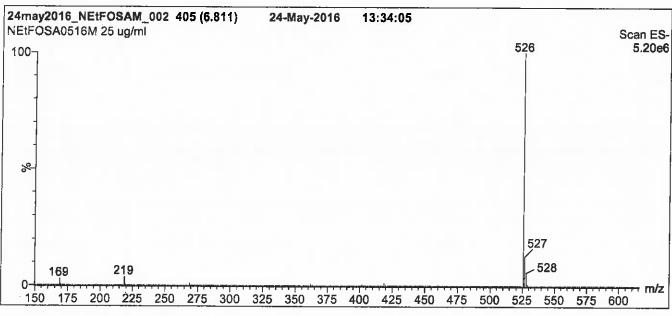
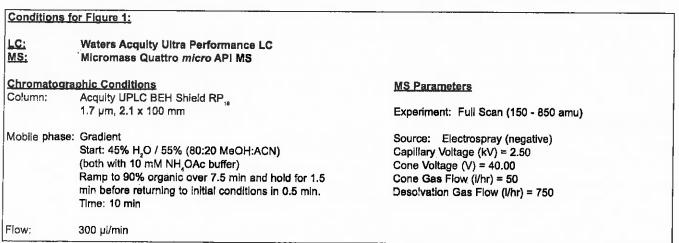




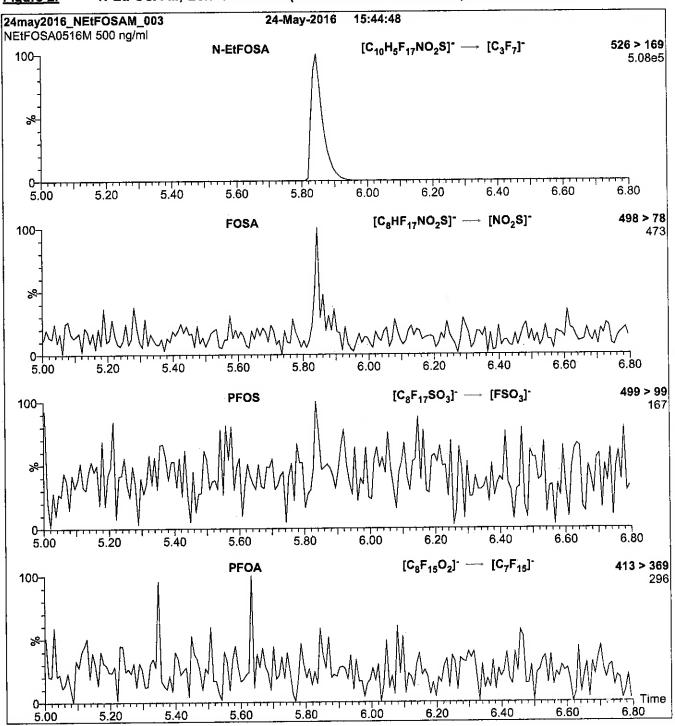
Figure 1: N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)

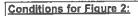






N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions) Figure 2:





Injection:

Direct loop injection

10 µl (500 ng/ml N-EtFOSA-M)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_oO

(both with 10 mM NH OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3

Collision Energy (eV) = 30

LCN-EtFOSAA_00004



PRODUCT CODE:

N-EtFOSAA

LOT NUMBER:

NEtFOSAA0916

COMPOUND:

N-ethylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

CAS #:

2991-50-6

MOLECULAR FORMULA:

C₁₂H_BF₁₇NO₄S

MOLECULAR WEIGHT:

585.23

CONCENTRATION:

 $50 \pm 2.5 \mu g/m!$

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

09/30/2016

EXPIRY DATE: (mm/dd/yyyy)

09/30/2021

RECOMMENDED STORAGE:

Refrigerate ampoule

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 the conversion of the acetic acid molety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 10/07/2016

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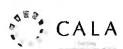
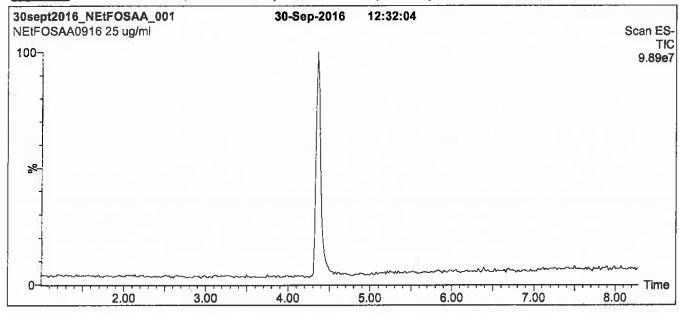
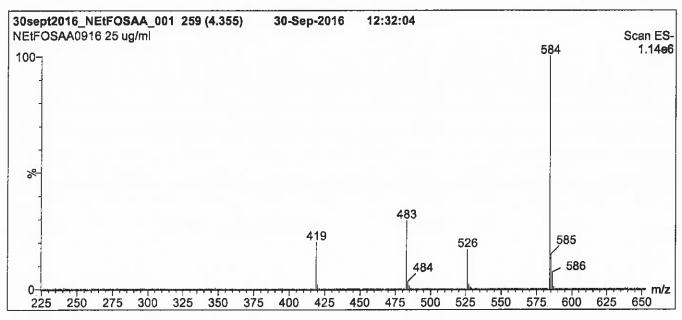
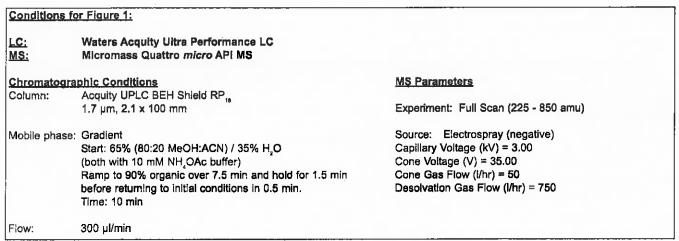




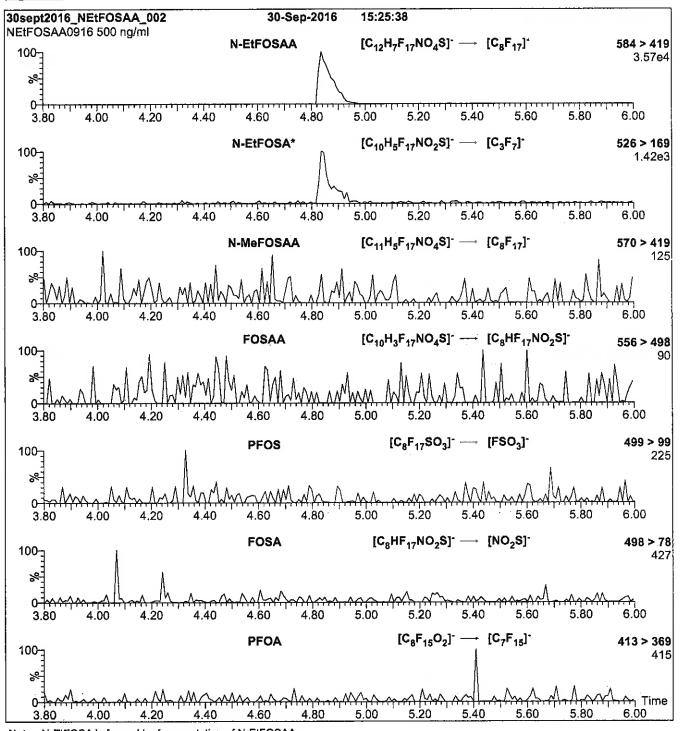
Figure 1: N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)



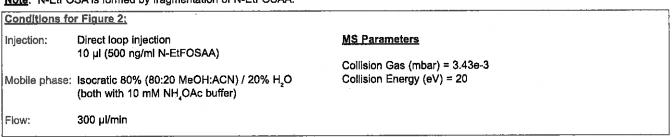




N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions) Figure 2:



Note: N-EtFOSA is formed by fragmentation of N-EtFOSAA.



LCN-MeFOSA-M_00004



PRODUCT CODE:

N-MeFOSA-M

N-methylperfluoro-1-octanesulfonamide

LOT NUMBER:

NMeFOSA0516M

STRUCTURE:

COMPOUND:

CAS #:

31506-32-8

MOLECULAR FORMULA:

CONCENTRATION:

C₈H₄F₁₇NO₂S 50 ± 2.5 µg/ml

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy) EXPIRY DATE: (mm/dd/ywy)

05/24/2016 05/24/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

MOLECULAR WEIGHT:

SOLVENT(S):

513.17

Methanol

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.

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Certified By:

Date: 05/26/2016

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

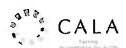
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

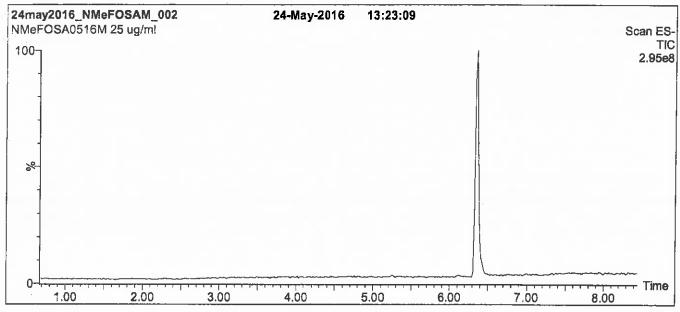
QUALITY MANAGEMENT:

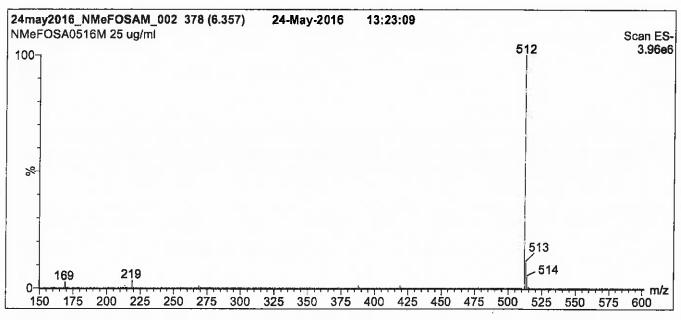
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

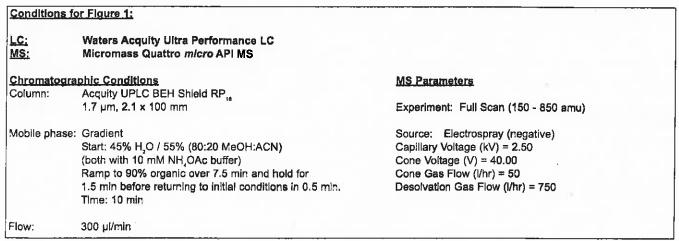




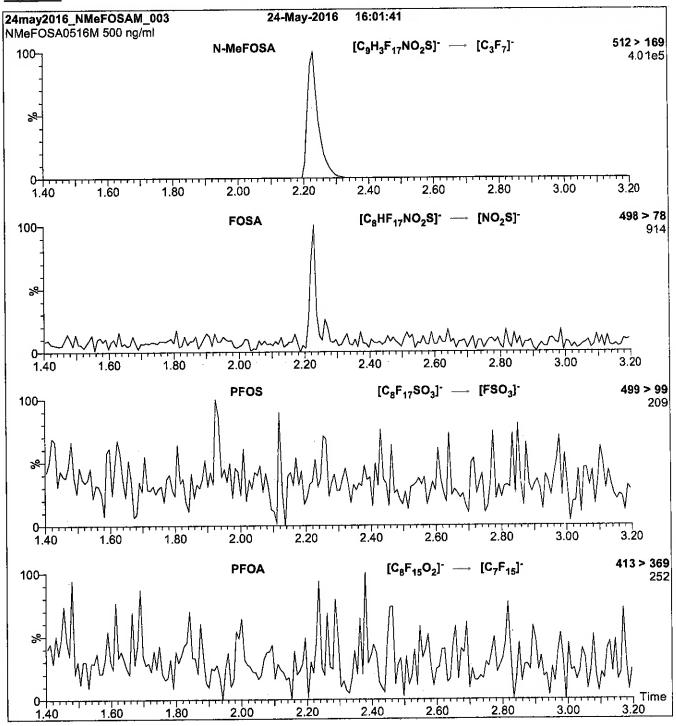


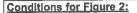






N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions) Figure 2:





Injection:

Direct loop injection

10 µl (500 ng/ml N-MeFOSA-M)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

300 µl/min Flow:

MS Parameters

Collision Gas (mbar) = 3.54e-3 Collision Energy (eV) = 30

LCN-MeFOSAA_00005



PRODUCT CODE:

N-MeFOSAA

LOT NUMBER:

NMeFOSAA0916

COMPOUND:

N-methylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

CAS #:

2355-31-9

MOLECULAR FORMULA:

C,H,F,,NO,S

MOLECULAR WEIGHT:

571.21

CONCENTRATION:

 $50 \pm 2.5 \, \mu g/ml$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/12/2016

EXPIRY DATE: (mm/dd/yyyy)

10/12/2021

RECOMMENDED STORAGE:

Refrigerate ampoule

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 the conversion of the acetic acid molety to the methyl ester,

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 10/25/2016

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

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, $u_{a}(y)$, of a value y and the uncertainty of the independent parameters

 $x_1, x_2, ..., x_n$ on which it depends is:

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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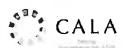
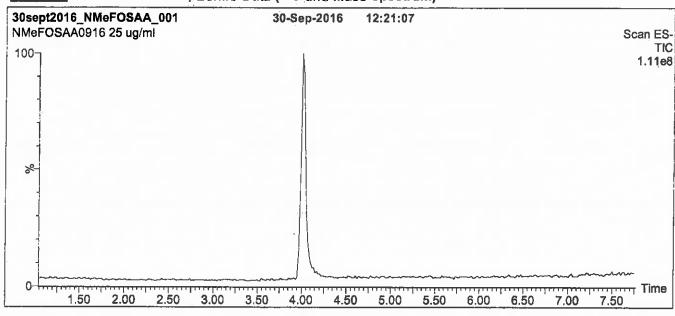
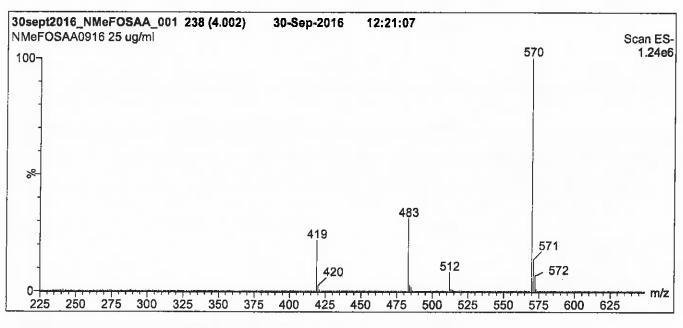




Figure 1: N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)





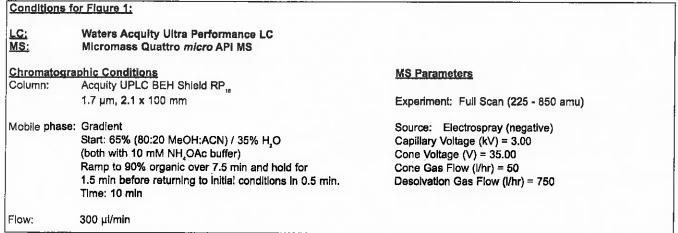
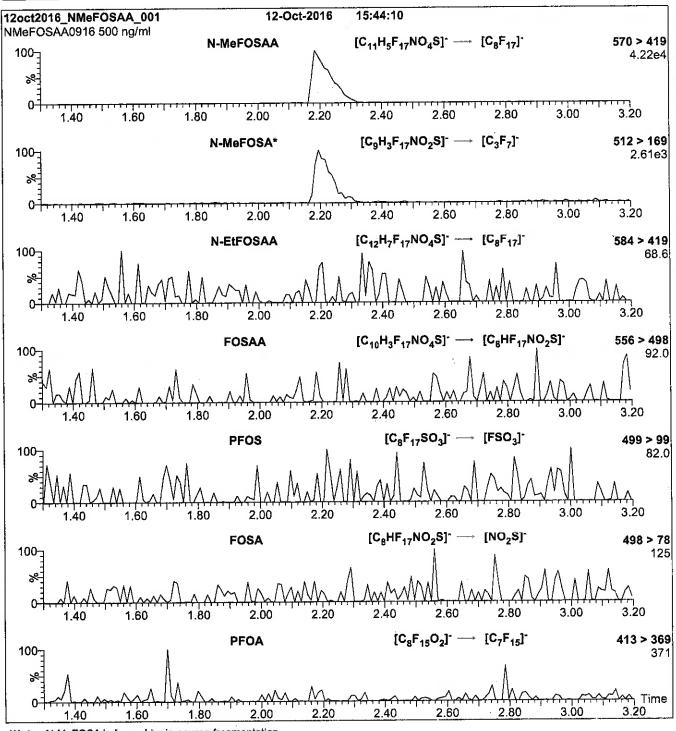
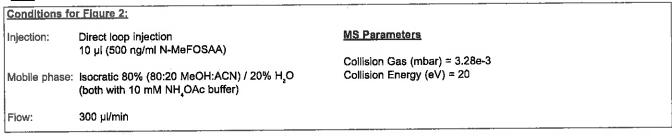


Figure 2: N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)



*Note: N-MeFOSA is formed by in-source fragmentation.



LCPFAC-24PAR_00001

PFAC-24PAR

Native Per- and Poly-fluoroalkyl Substance Precision and Recovery Standard Solution

PRODUCT CODE:

PFAC-24PAR

LOT NUMBER:

PFAC24PAR0917

SOLVENT(S):

Methano! / Isopropanoi (4%) / Water (<1%)

DATE PREPARED: (mm/dd/yyyy)

09/13/2017

LAST TESTED: (mm/dd/yyyy)

09/15/2017

EXPIRY DATE: (mm/dd/yyyy)

09/15/2022

RECOMMENDED STORAGE:

Refrigerate ampoule

DESCRIPTION:

PFAC-24PAR is a solution/mixture of eleven native linear perfluoroalkylcarboxylic acids (C_4 - C_{14}), seven native perfluoroalkylsulfonates (C_4 , C_5 , C_7 , C_9 , and C_{10} linear; C_8 and C_8 linear and branched), three native telomer sulfonates (4:2, 6:2, and 8:2), two native perfluorocatanesulfonamidoacetic acids, and perfluoro-1-octanesulfonamide. The components and their concentrations are given in Table A.

The individual native perfluoroalkylcarboxylic acids, native perfluoroalkylsulfonates, native telomer sulfonates, native perfluorooctanesulfonamidoacetic acids, and perfluoro-1-octanesulfonamide all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Table B: Isomeric Components and Percent Composition of PFHxSK
Table C: Isomeric Components and Percent Composition of PFOSK

Figure 1: LC/MS Data (SIR)

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 acids to their respective methyl esters.

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

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.

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HOMOGENEITY:

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UNCERTAINTY:

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$$x_1, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1, x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y,x_i)^2}$$

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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Table A: PFAC-24PAR; Components and Concentrations (ng/ml, ± 5% in Methanol / Isopropanol (4%) / Water (<1%))

Compound	Abbreviation	Concentration (ng/ml)		Peak Assignment in Figure 1	
Perfluoro-n-butanoic acid	PFBA	2000		Α	
Perfluoro-n-pentanoic acid	PFPeA	2000		В	
Perfluoro-n-hexanoic acid	PFHxA	2000		E	
Perfluoro-n-heptanoic acid	PFHpA	2000		G	
Perfluoro-n-octanoic acid	PFOA	2000		K	
Perfluoro-n-nonanoic acid	PFNA	2000		М	
Perfluoro-n-decanoic acid	PFDA	2000		Q	
Perfluoro-n-undecanoic acid	PFUdA	2000		V	
Perfluoro-n-dodecanoic acid	PFDoA	2000		X	
Perfluoro-n-tridecanoic acid	PFTrDA	2000		Y	
Perfluoro-n-tetradecanoic acid	PFTeDA	2000		Z	
Perfluoro-1-octanesulfonamide	FOSA	2000		Т	
N-methylperfluoro-1-octanesulfonamidoacetic acid	N-MeFOSAA	2000		S	
N-ethylperfluoro-1-octanesulfonamidoacetic acid	N-EtFOSAA	2000		U	
Compound	Abbreviation	Concentration (ng/ml)		Peak Assignment	
		as the salt	as the anion	In Figure 1	
Potassium perfluoro-1-butanesulfonate	L-PFBS	2000	1770	С	
Sodium perfluoro-1-pentanesulfonate	L-PFPeS	2000	1880	F	
	PFHxSK: linear isomer	1620	1480	1	
otassium perfluorohexanesulfonate*	PFHxSK: ∑ branched Isomers	378	344	Н	
Sodium perfluoro-1-heptanesulfonate	L-PFHpS	2000	1900	L	
	PFOSK: linear isomer	1580	1460	0	
Potassium perfluorooctanesulfonate**	PFOSK: ∑ branched isomers	422	391	N	
Sodium perfluoro-1-nonanesulfonate	L-PFNS	2000	1920	Ŕ	
Sodium perfluoro-1-decanesulfonate	L-PFDS	2000	1930	W	
Sodium 1H,1H,2H,2H-perfluoro-1-hexanesulfonate	4:2FTS	2000	1870	D	
Sodium 1H,1H,2H,2H-perfluoro-1-octanesulfonate	6:2FTS	2000	1900	J	
Sodium 1H,1H,2H,2H-perfluoro-1-decanesulfonate	8:2FTS	2000	1920	Р	

See Table B for percent composition of linear and branched PFHxSK isomers. See Table C for percent composition of linear and branched PFOSK isomers.

PFHxSK; Isomeric Components and Percent Composition (by 19F-NMR)* Table B:

Isomer	Name	Structure	Comp	cent osition NMR
1	Potassium perfluoro-1-hexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ -K+	81.1	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CFSO ₃ -K+ CF ₃	2.9	
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF ₂ CFCF ₂ SO ₃ -K ⁺ CF ₃	1,4	
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CFCF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	5.0	40.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	CF ₃ CFCF ₂ CF ₂ CF ₂ SO ₃ -K⁺ CF ₃	8.9	18.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	CF ₃ CF ₃ CCF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	0.2	
7	Other Unidentified Isomers		0.5	

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

<u>Table C:</u> PFOSK; Isomeric Components and Percent Composition (by ¹⁹F-NMR)*

Isomer	Name	Structure	Comp	cent osition F-NMR
1	Potassium perfluoro-1-octanesulfonate	CF ₃ CF ₂ SO ₃ -K+	78.8	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CFSO ₃ ·K ⁺ CF ₃	1.2	
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CFCF ₂ SO ₃ -K ⁺ CF ₃	0.6	
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CFCF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	1.9	
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	2.2	
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CFCF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	4.5	21.1
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	CF ₃ CFCF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	10.0	21.1
8	Potassium 5,5- di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ CCF ₂ CF ₂ CF ₂ SO ₃ *K [†] CF ₃	0.2	
9	Potassium 4,4- di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ CF ₂ CCF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	0.03	
10	Potassium 4,5- di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ CFCFCF ₂ CF ₂ CF ₂ SO ₃ ·K ⁺ CF ₃	0.4	
11	Potassium 3,5- di(trifluoromethy!)perfluorohexanesulfonate	CF ₃ CF ₃ CFCF ₂ CFCF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	0.07	

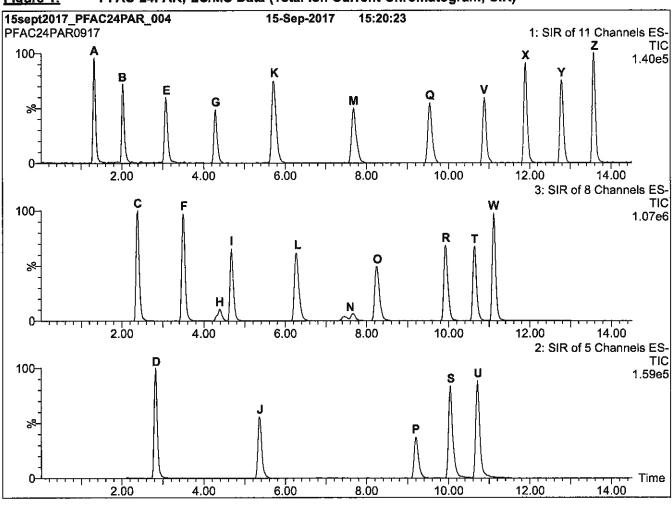
Percent of total perfluorooctanesulfonate isomers only.
 Systematic Name: Potassium perfluorooctane-2-sulfonate.

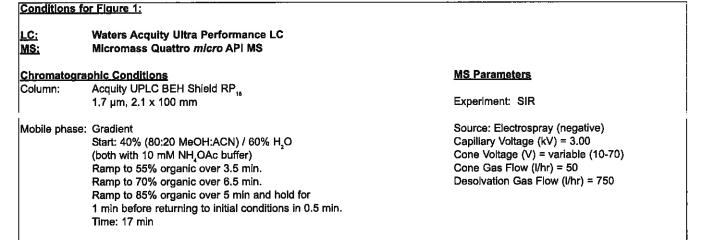
Certified By:

B.G. Chittim, General Manager

Date: 09/19/2017

Figure 1: PFAC-24PAR; LC/MS Data (Total Ion Current Chromatogram; SIR)





Flow:

300 µl/min

Figure 2: PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)

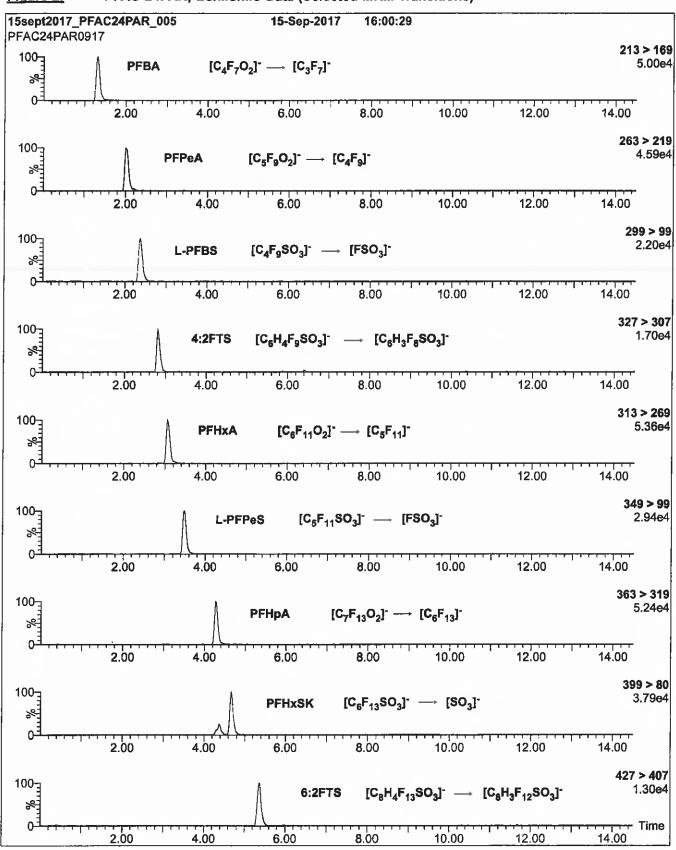
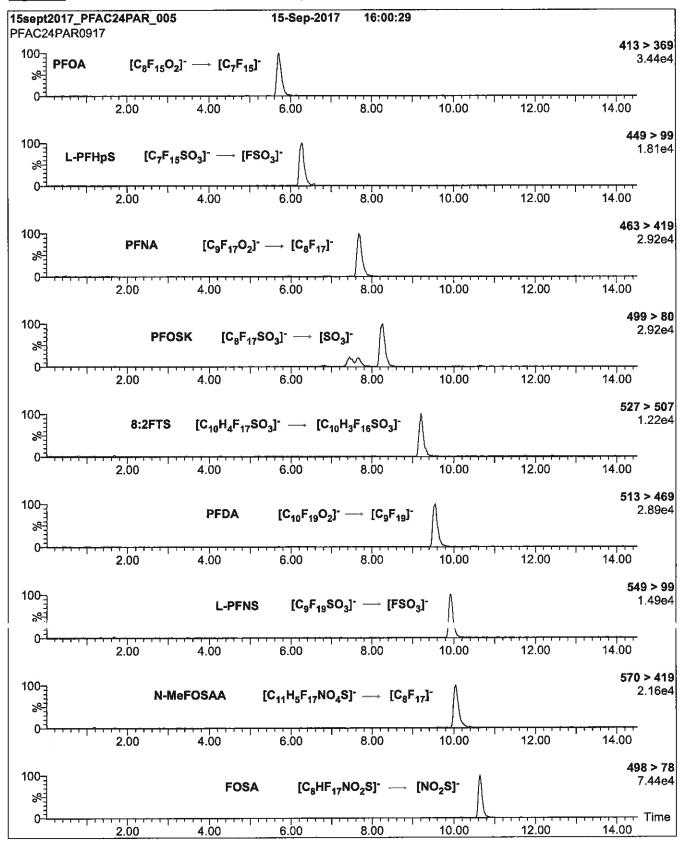
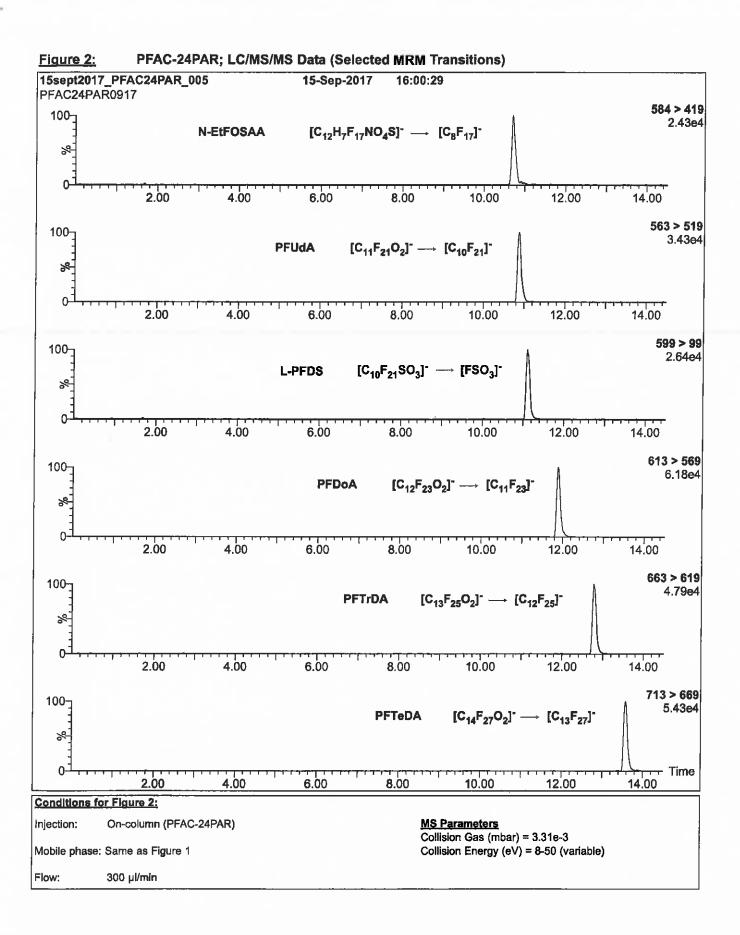


Figure 2: PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)





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LCPFBA 00007



PRODUCT CODE:

PFBA

LOT NUMBER:

PFBA0516

COMPOUND:

Perfluoro-n-butanoic acid

STRUCTURE:

CAS #:

375-22-4

F F F F

MOLECULAR FORMULA:

C,HF,O,

MOLECULAR WEIGHT:

214.04

CONCENTRATION:

 $50 \pm 2.5 \,\mu g/ml$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/odd/yyyy)

05/27/2016

EXPIRY DATE: (mmidd/yyyy)

05/27/2021

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:

Jull-

Date: 05/31/2016

(mm/dd/yyyy)

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

HAZARDS:

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QUALITY MANAGEMENT:

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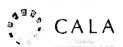
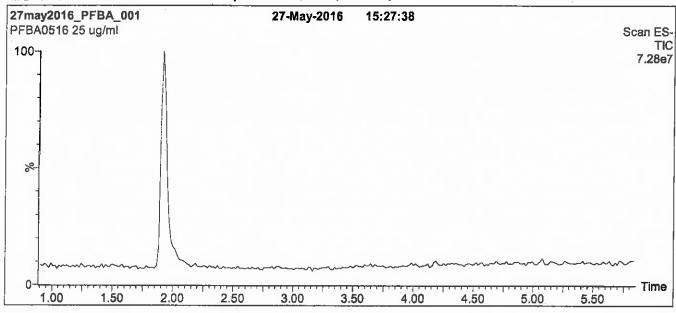
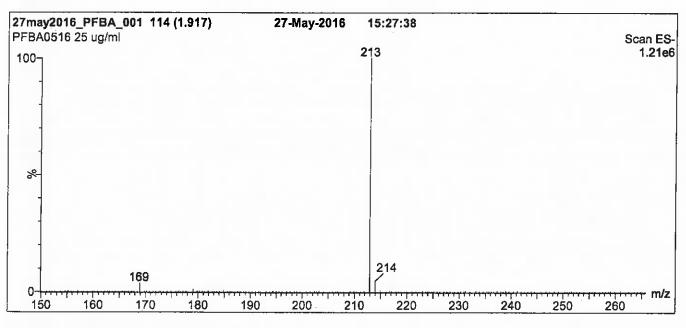




Figure 1: PFBA; LC/MS Data (TIC and Mass Spectrum)





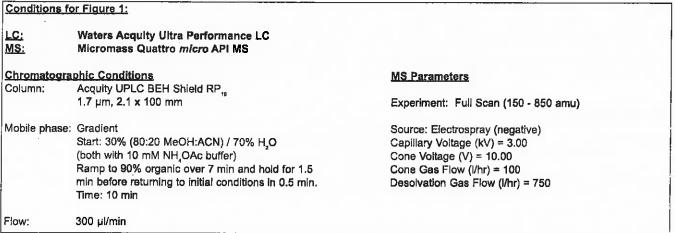
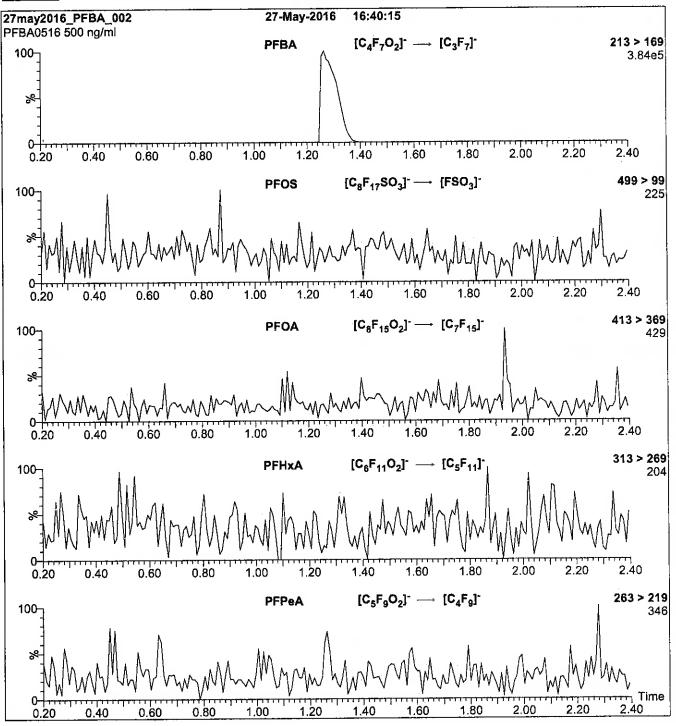
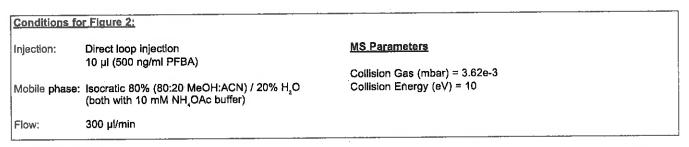


Figure 2: PFBA; LC/MS/MS Data (Selected MRM Transitions)





LCPFBS_00008

R: 8BC 9/13/16



ID: LCPFBS_00007 Exp: 03/15/21 Prpd: SBC PF-1-butanesulfonate K sa



ID: LCPFBS_00008 Exp: 03/15/21 Prpd: SBC PF-1-butanesulfonate K sa



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFBS

LOT NUMBER:

MOLECULAR WEIGHT:

SOLVENT(S):

LPFBS0316

COMPOUND:

Potassium perfluoro-1-butanesulfonate

CAS #:

29420-49-3

338.19

Methanol

STRUCTURE:

MOLECULAR FORMULA:

C,F,SO,K

CONCENTRATION:

50.0 ± 2.5 μg/ml (K salt)

 $44.2 \pm 2.2 \mu g/ml$ (PFBS anion)

CHEMICAL PURITY:

LAST TESTED: (mm/dd/yyyy)

03/15/2016

>98%

EXPIRY DATE: (mm/dd/yyyy)

03/15/2021

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:

Date: 03/21/2016

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

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

 $X_1, X_2, ..., X_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

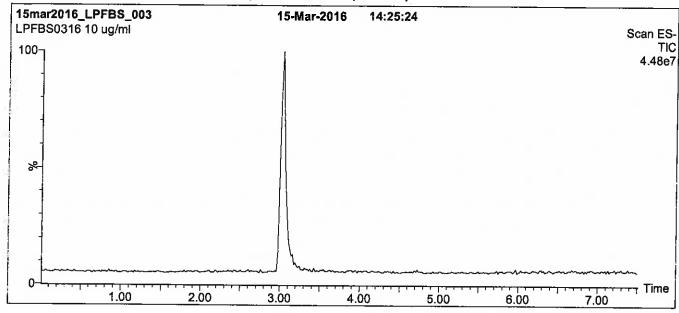
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

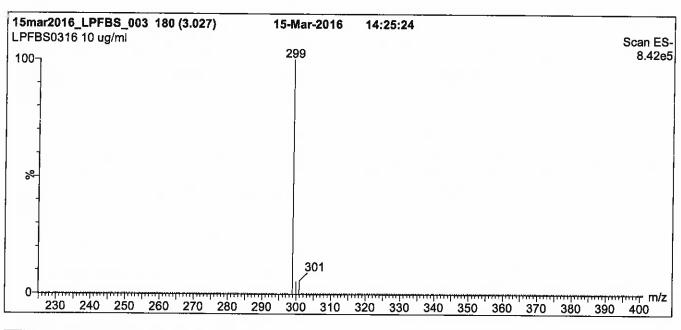




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Figure 1: L-PFBS; LC/MS Data (TIC and Mass Spectrum)





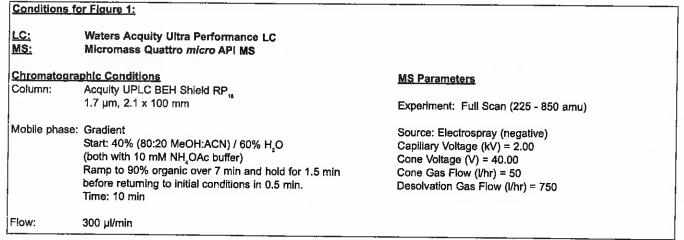
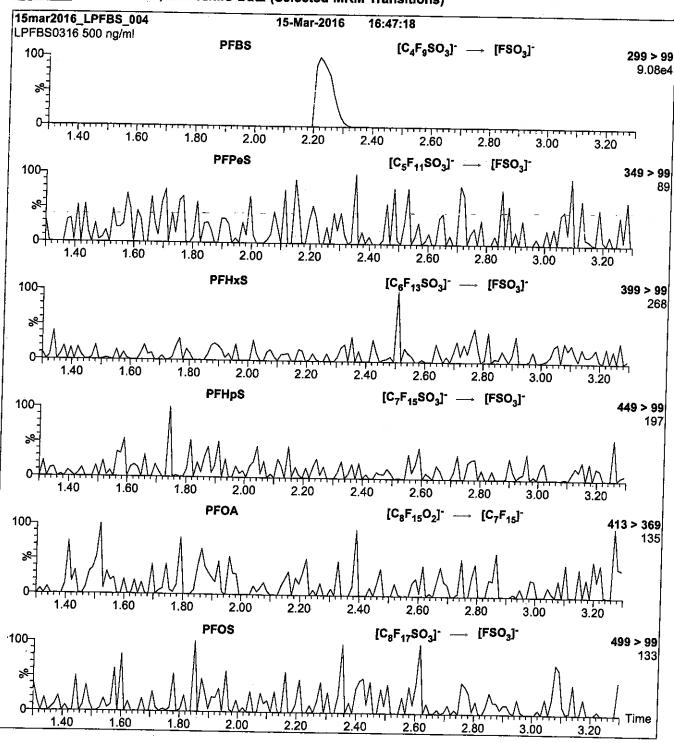
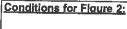


Figure 2: L-PFBS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml L-PFBS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H,O

(both with 10 mM NH,OAc buffer)

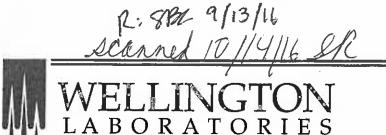
Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3 Collision Energy (eV) = 25

LCPFDA_00007







CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDA

LOT NUMBER:

PFDA0516

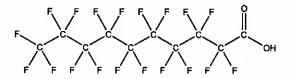
COMPOUND:

Perfluoro-n-decanoic acid

STRUCTURE:

CAS #:

335-76-2



MOLECULAR FORMULA:

C,HF,O,

MOLECULAR WEIGHT:

514.08

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/31/2016

EXPIRY DATE: (mrn/ad/yyyy)

05/31/2021

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 ~ 0.2% of Perfluoro-n-nonanoic acid (PFNA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: <u>06/13/2016</u>

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

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

HAZARDS:

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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:

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UNCERTAINTY:

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The combined relative standard uncertainty, $u_o(y)$, of a value y and the uncertainty of the independent parameters

 $X_1, X_2, ... X_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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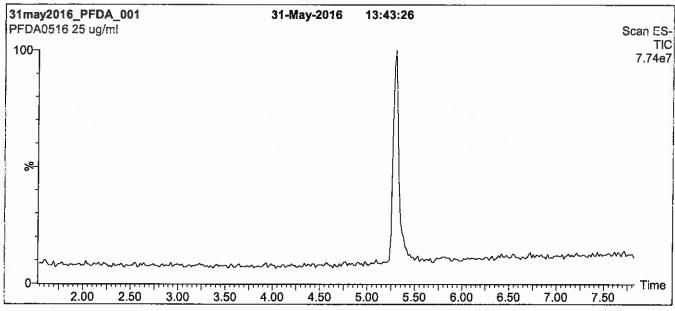


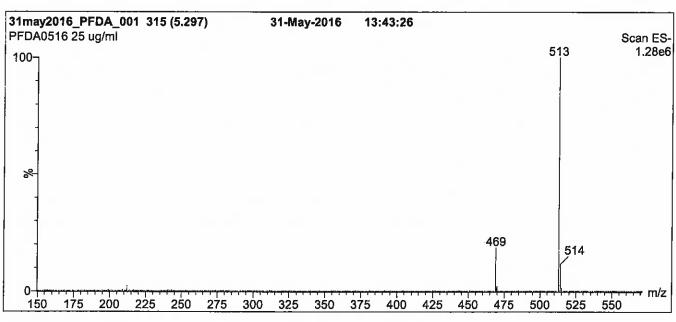


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Figure 1: PFDA; LC/MS Data (TIC and Mass Spectrum)





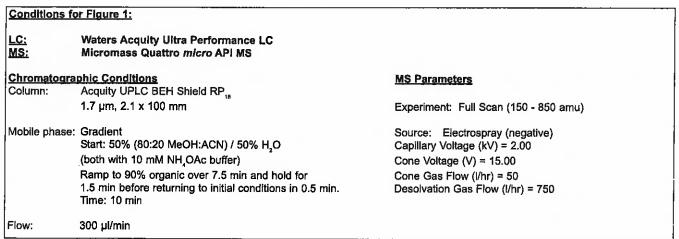
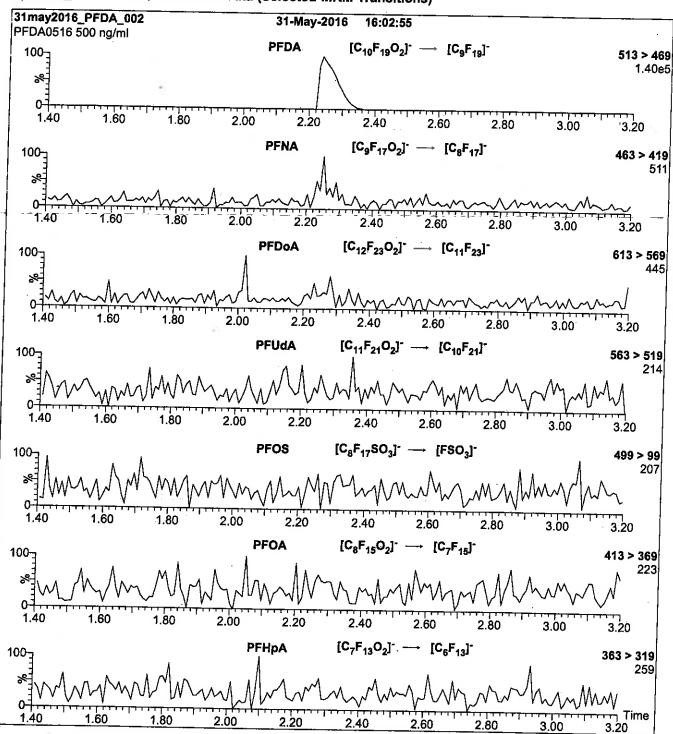


Figure 2; PFDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_sO

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 13

LCPFDA_00008



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDA

LOT NUMBER:

PFDA0517

COMPOUND:

Perfluoro-n-decanoic acid

STRUCTURE:

CAS #:

335-76-2

MOLECULAR FORMULA:

C,HF,O,

MOLECULAR WEIGHT:

514.08

CONCENTRATION:

 $50 \pm 2.5 \,\mu g/ml$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/29/2017

EXPIRY DATE: (mm/dd/yyyy)

05/29/2022

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 ~ 0.2% of perfluoro-n-nonanoic acid (PFNA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: <u>05/30/2017</u>

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

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SYNTHESIS / CHARACTERIZATION:

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UNCERTAINTY:

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

The combined relative standard uncertainty, $u_{o}(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2, ...x_n$$
 on which it depends is:
$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

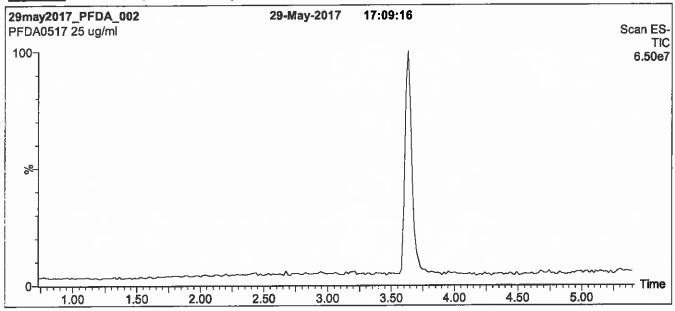
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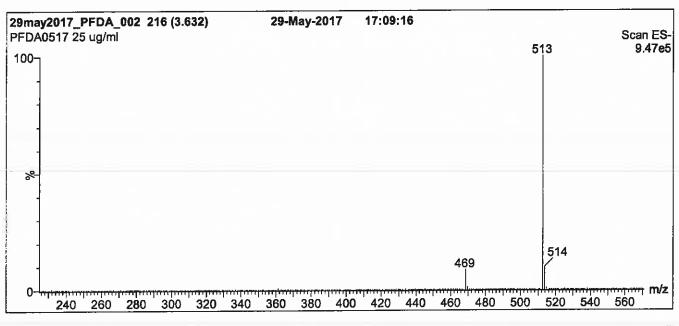




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Figure 1: PFDA; LC/MS Data (TIC and Mass Spectrum)





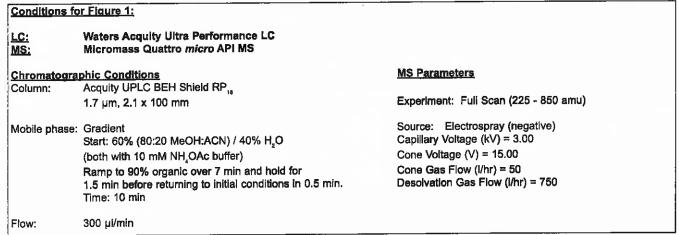
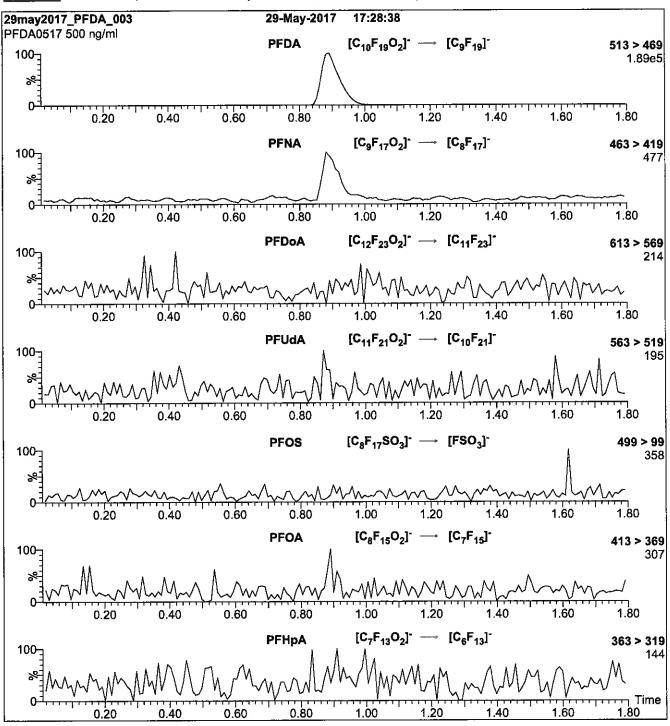


Figure 2: PFDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml PFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3 Collision Energy (eV) = 13

LCPFDoA_00007



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDoA

LOT NUMBER: PFDoA0516

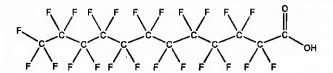
COMPOUND:

Perfluoro-n-dodecanoic acid

STRUCTURE:

CAS #:

307-55-1



MOLECULAR FORMULA:

C,HF,O,

MOLECULAR WEIGHT:

614,10

CONCENTRATION:

 $50 \pm 2.5 \, \mu g/ml$

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED; (mm/dd/yyyy)

05/31/2016

EXPIRY DATE: (mm/dd/yyy)

05/31/2021

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:

Date: 06/02/2016

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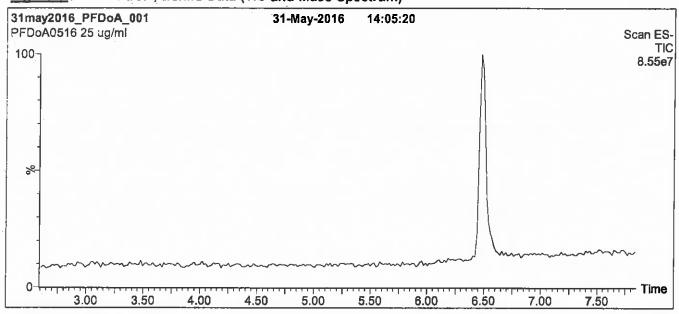


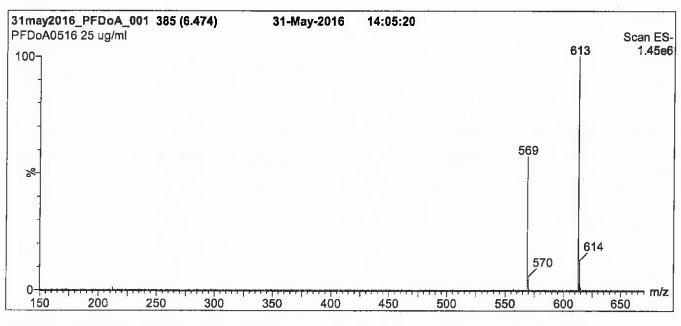


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Figure 1: PFDoA; LC/MS Data (TIC and Mass Spectrum)

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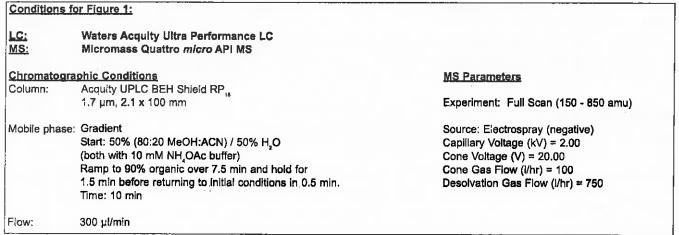
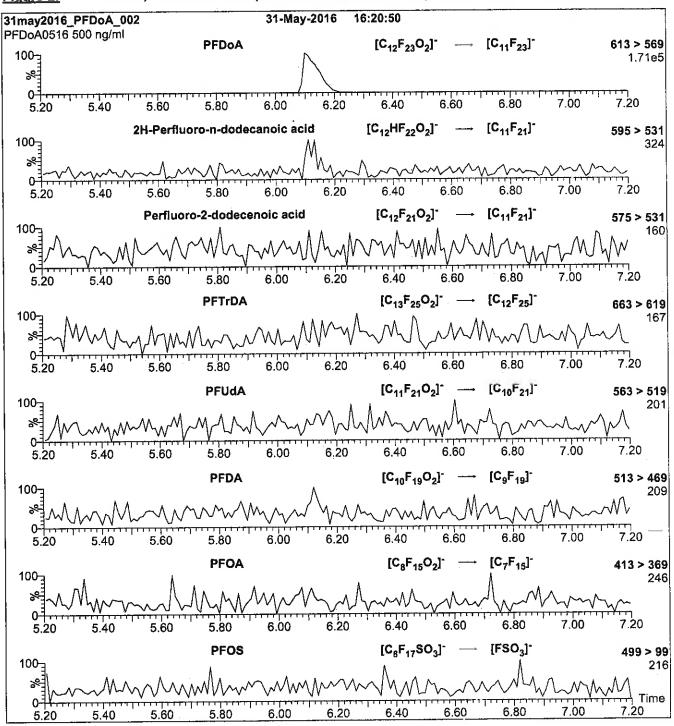
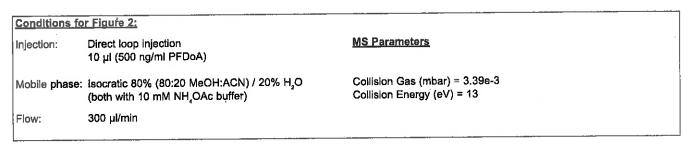


Figure 2: PFDoA; LC/MS/MS Data (Selected MRM Transitions)





LCPFDoA_00008



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDoA

LOT NUMBER:

PFDoA0517

COMPOUND:

Perfluoro-n-dodecanoic acid

STRUCTURE:

CAS #:

307-55-1

MOLECULAR FORMULA:

C, HF, O,

MOLECULAR WEIGHT:

614.10

CONCENTRATION:

 $50 \pm 2.5 \,\mu g/ml$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/29/2017

EXPIRY DATE; (mm/dd/yyyy)

05/29/2022

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:

B.G. Chittim, General Manager

Date: 05/30/2017

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

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(y), of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1,x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y,x_i)^2}$$

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

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

TRACEABILITY:

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

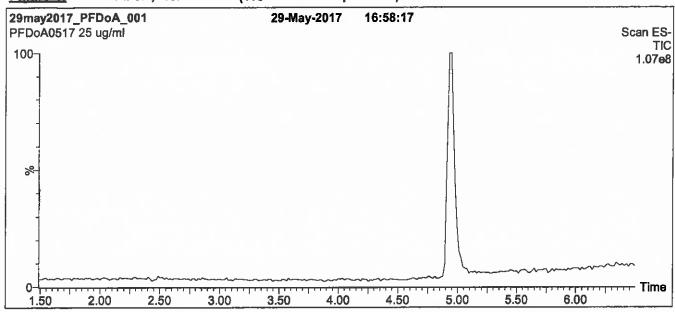
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

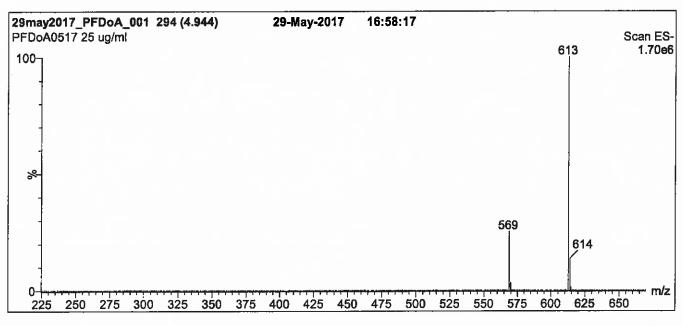




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Flaure 1: PFDoA; LC/MS Data (TIC and Mass Spectrum)





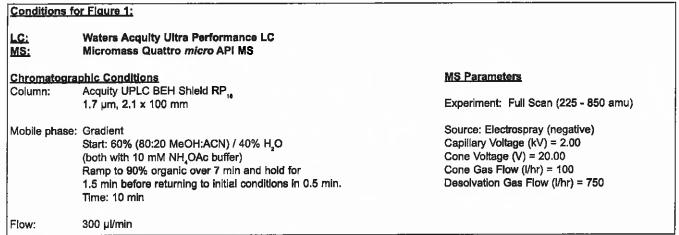
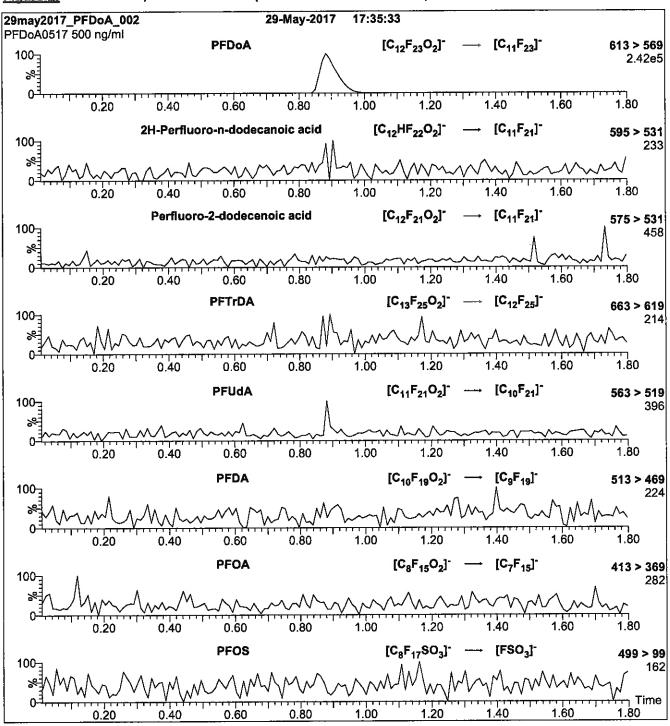
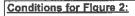


Figure 2: PFDoA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_oO

(both with 10 mM NH,OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 13

PFDoA0517 (4 of 4)

LCPFDSA_00002



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFDS

LOT NUMBER:

LPFDS0516

COMPOUND:

Sodium perfluoro-1-decanesulfonate

STRUCTURE:

CAS #:

2806-15-7

MOLECULAR FORMULA:

C₁₀F₂,SO₃Na

MOLECULAR WEIGHT:

622.13

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$ (Na salt)

 $48.2 \pm 2.4 \mu g/ml$ (PFDS anion)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/www)

05/24/2016

EXPIRY DATE: (mm/dd/yyyy)

05/24/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains ~ 0.9% of sodium perfluoro-1-dodecanesulfonate (L-PFDoS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 05/26/2016

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

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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

The combined relative standard uncertainty, $u_{\nu}(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2, ... x_n$$
 on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

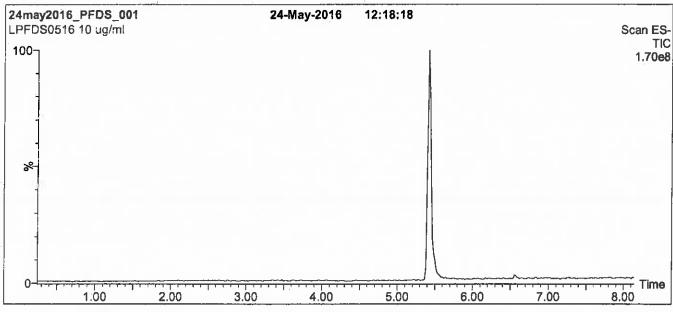


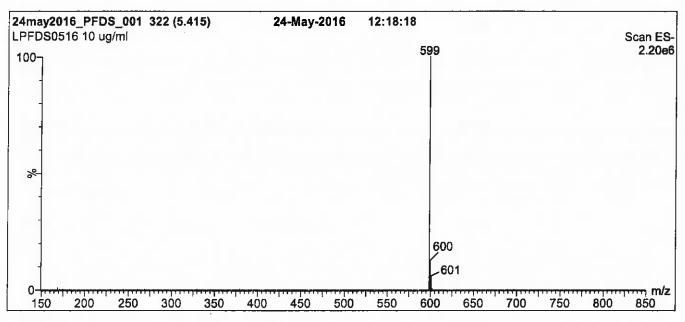


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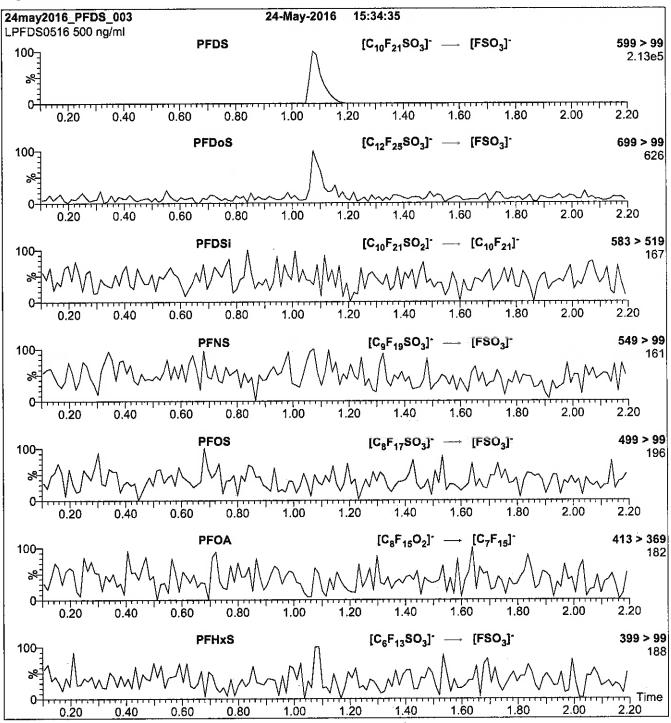
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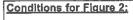




LC:	Waters Acquity Ultra Performance LC Micromass Quattro <i>micro</i> API MS	
MS:		
Chromatogra	phic Conditions	MS Parameters
Column:	Acquity UPLC BEH Shield RP.	
•	1.7 µm, 2.1 x 100 mm	Experiment: Full Scan (150 - 850 amu)
Mobile phase:	Gradient	Source: Electrospray (negative)
	Start: 55% (80:20 MeOH:ACN) / 45% H ₂ O	Capillary Voltage (kV) = 3.00
	(both with 10 mM NH ₂ OAc buffer)	Cone Voltage (V) = 70.00
	Ramp to 90% organic over 7.5 min and hold for	Cone Gas Flow (I/hr) = 50
	1.5 min before returning to initial conditions in 0.5 min.	Desolvation Gas Flow (I/hr) = 750
	Time: 10 min	
Flow:	300 µl/min	

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





Injection:

Direct loop injection

10 μl (500 ng/ml L-PFDS)

MS Parameters

Collision Gas (mbar) = 3.70e-3 Collision Energy (eV) = 50

Flow:

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

300. µl/min

LCPFHpA_00008



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFHpA

. . .

LOT NUMBER: PFHpA1216

COMPOUND:

Perfluoro-n-heptanoic acid

STRUCTURE:

CAS #:

375-85-9

F F F F F

MOLECULAR FORMULA:

C,HF,O,

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

SOLVENT(S):

364.06 Methanol

Water (<1%)

CHEMICAL PURITY:

CONCENTRATION:

>98%

LAST TESTED: (mm/dd/yyy)

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:

* Stalle

Date: 12/12/2016

(mm/dd/yyy)

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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EXPIRY DATE / PERIOD OF VALIDITY:

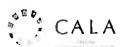
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

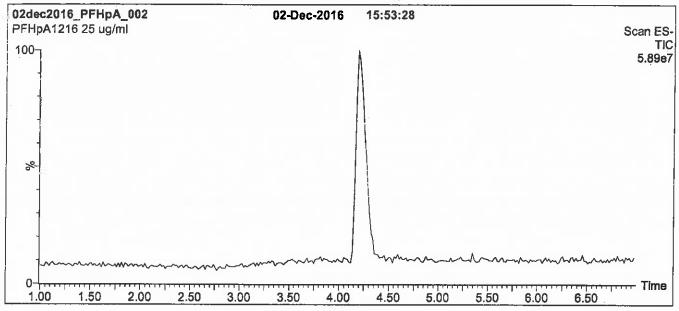
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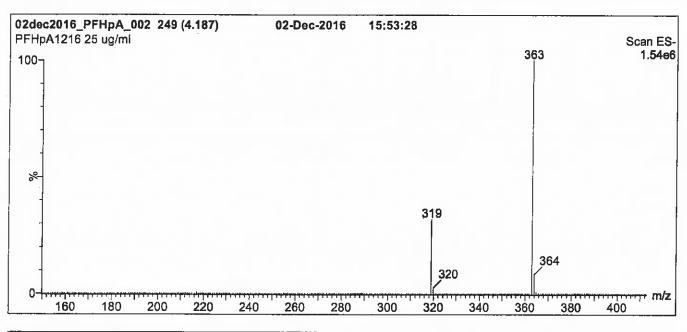




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





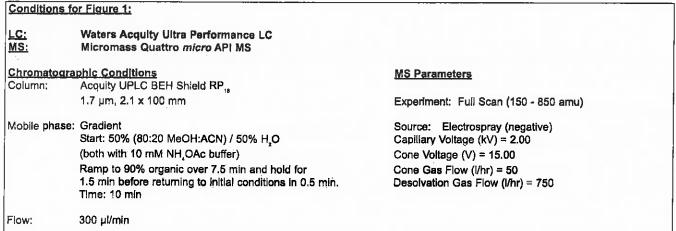
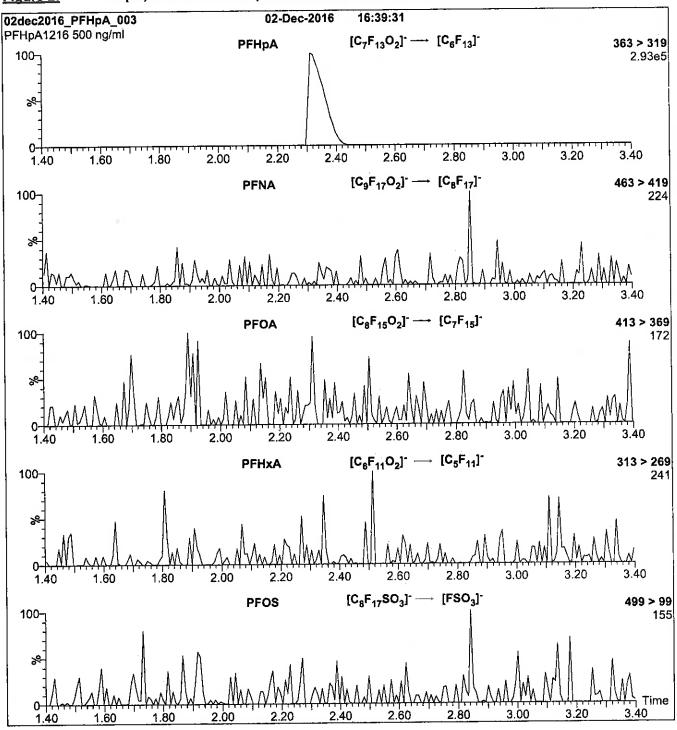
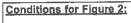


Figure 2: PFHpA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH₄OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCPFHpSA_00003



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFHpS

COMPOUND:

Sodium perfluoro-1-heptanesulfonate

LOT NUMBER:

MOLECULAR WEIGHT:

SOLVENT(S):

LPFHpS0817

STRUCTURE;

CAS #:

Not available

472.10

Methanol

MOLECULAR FORMULA:

C,F,SO,Na

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$ (Na salt)

 $47.6 \pm 2.4 \mu g/ml$ (PFHpS anion)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

09/01/2017

EXPIRY DATE: (mm/dd/yyyy)

09/01/2022

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 ~ 0.2% of L-PFHxS ($C_8F_{13}SO_3Na$) and ~ 0.1% of L-PFOS ($C_8F_{17}SO_3Na$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 09/07/2017

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

HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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$$x_i$$
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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

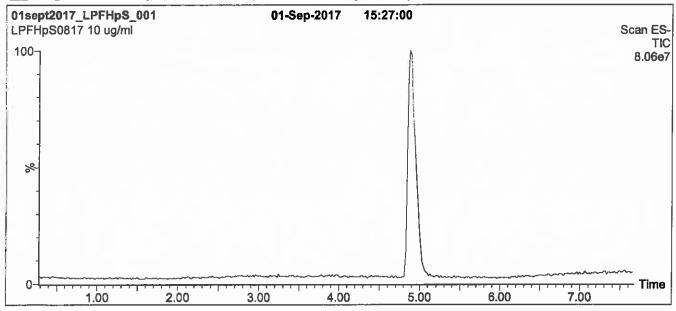
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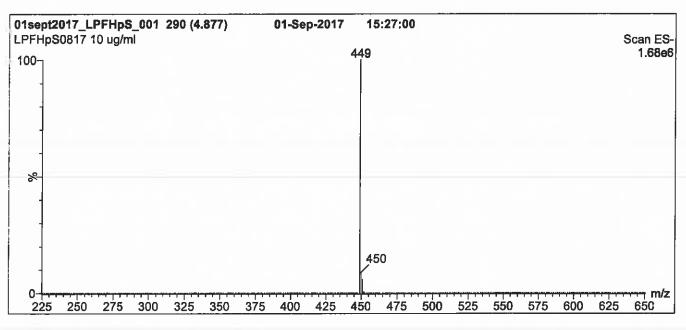


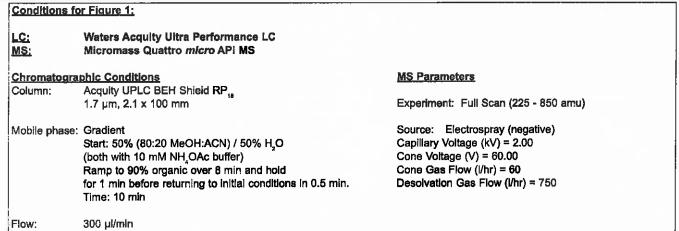


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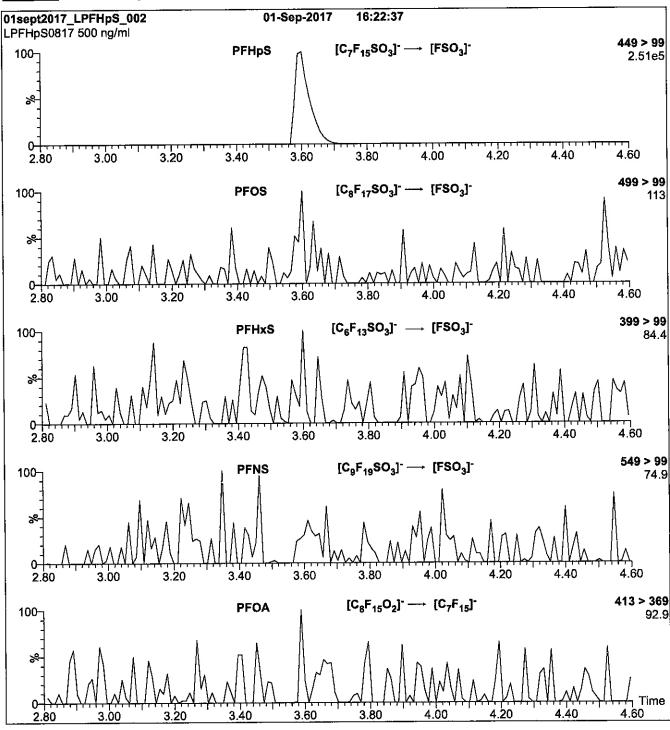
Figure 1: L-PFHpS; LC/MS Data (TIC and Mass Spectrum)







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





Injection:

Direct loop injection

10 µl (500 ng/ml L-PFHpS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH₄OAc buffer)

Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3 Collision Energy (eV) = 35

LCPFHxA 00007



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFHxA

LOT NUMBER:

PFHxA1215

COMPOUND:

Perfluoro-n-hexanoic acid

STRUCTURE:

CAS #:

307-24-4

MOLECULAR FORMULA:

CHF,O,

CONCENTRATION:

MOLECULAR WEIGHT:

314.05

 $50 \pm 2.5 \,\mu g/ml$

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/22/2015

EXPIRY DATE: (mm/dd/yyyy)

12/22/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

Contains ~ 0.2% of Perfluoro-n-pentanoic acid (PFPeA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 12/23/2015

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

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, $u_{x}(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

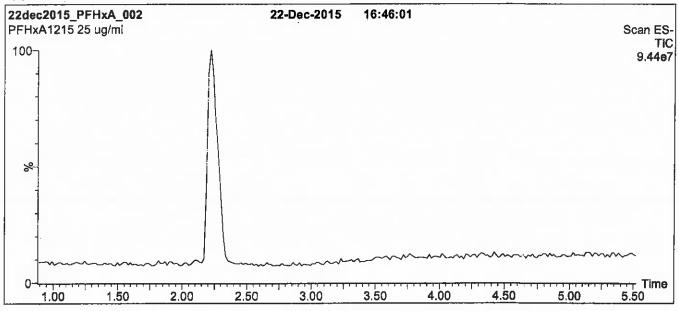
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

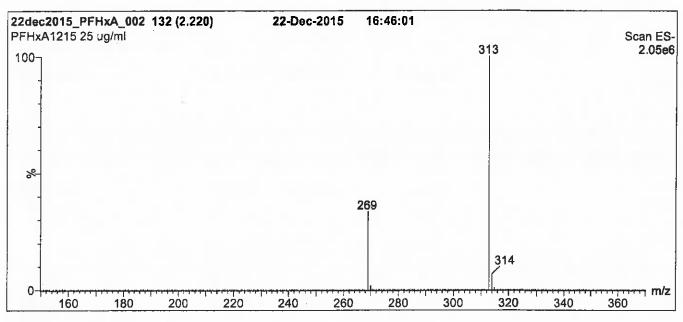




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Figure 1: PFHxA; LC/MS Data (TIC and Mass Spectrum)





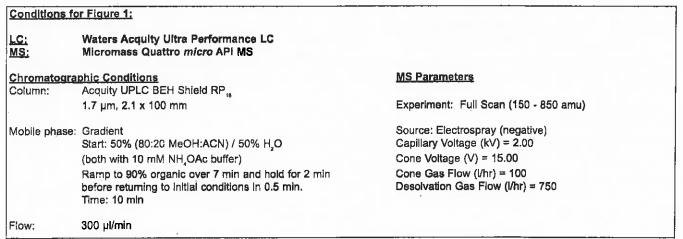
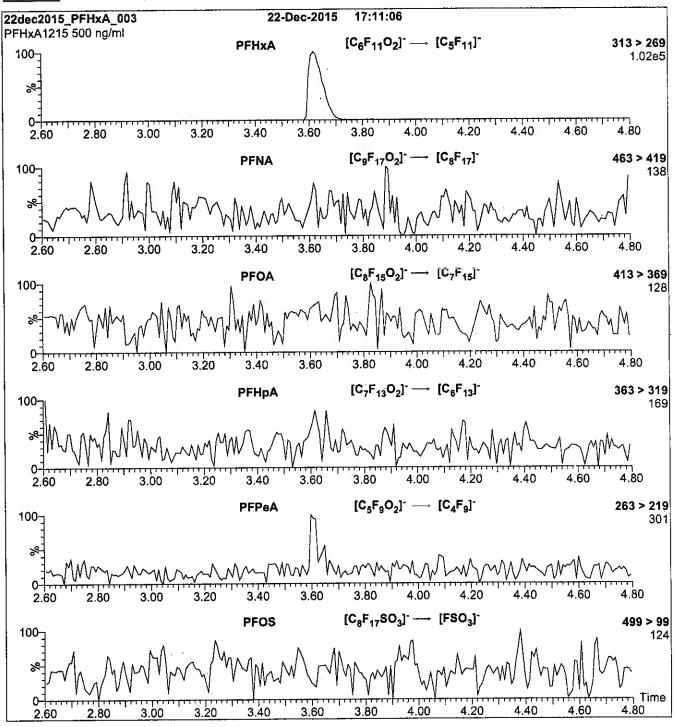


Figure 2: PFHxA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml PFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H,O

(both with 10 mM NH OAc buffer)

Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 10

LCPFHxDA_00008



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFHxDA

LOT NUMBER:

PFHxDA0516

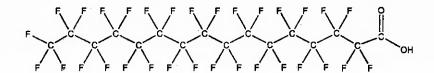
COMPOUND:

Perfluoro-n-hexadecanoic acid

STRUCTURE:

CAS #:

67905-19-5



MOLECULAR FORMULA:

C,,HF,,O,

MOLECULAR WEIGHT:

814.13

CONCENTRATION:

50 ± 2.5 μg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/25/2016

EXPIRY DATE: (mm/ed/yyyy)

05/25/2021

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 carboxyllc acid to the methyl ester.

Contains ~ 0.4% of PFODA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 05/27/2016

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HAZARDS:

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EXPIRY DATE / PERIOD OF VALIDITY:

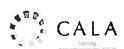
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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

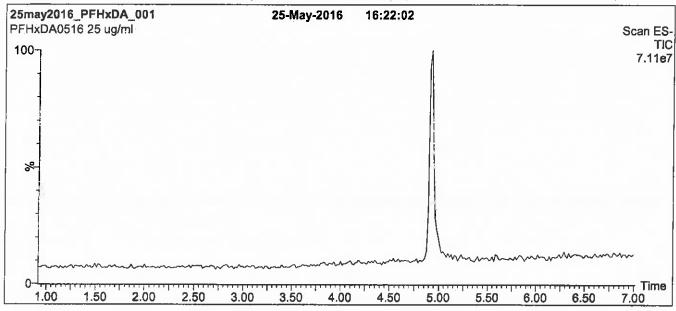
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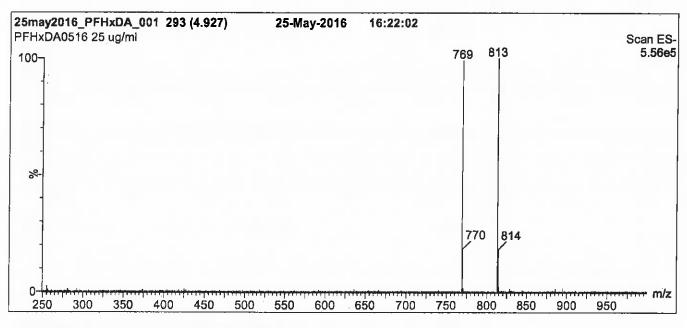




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Figure 1: PFHxDA; LC/MS Data (TIC and Mass Spectrum)





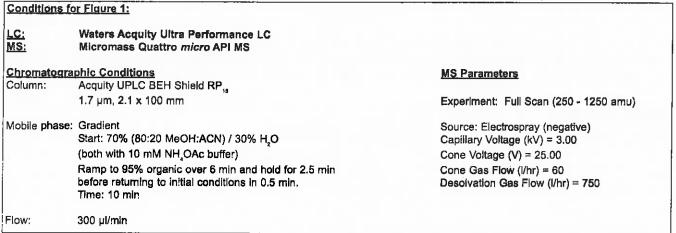
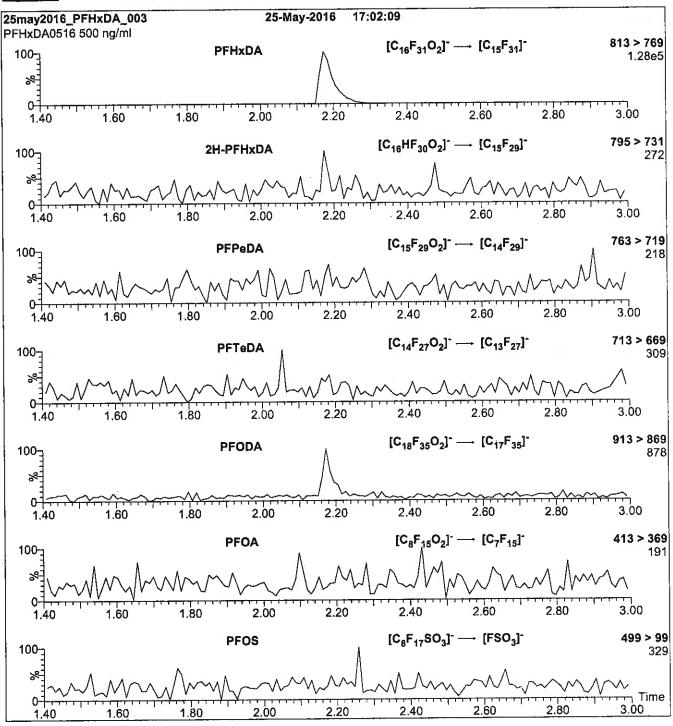
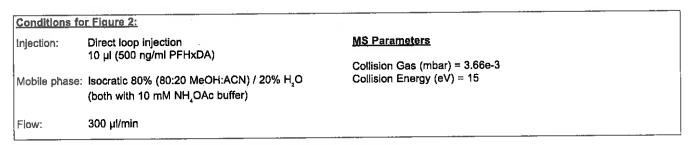


Figure 2: PFHxDA; LC/MS/MS Data (Selected MRM Transitions)





LCPFHxS-br_00004



CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:

br-PFHxSK

LOT NUMBER:

brPFHxSK0615

CONCENTRATION:

 $50.0 \pm 2.5 \mu g/ml$ (total potassium salt)

45.5 ± 2.3 µg/ml (total PFHxS anion)

SOLVENT(S):

Methanol

DATE PREPARED: (mm/dd/yyyy)

06/29/2015

LAST TESTED: (mm/dd/yyyy)

07/03/2015

EXPIRY DATE: (mm/dd/yyyy)

07/03/2020

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 19F-NMR

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

Figure 2: LC/MS Data

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).

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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<u>Table A:</u> br-PFHxSK; Isomeric Components and Percent Composition (by ¹⁹F-NMR)*

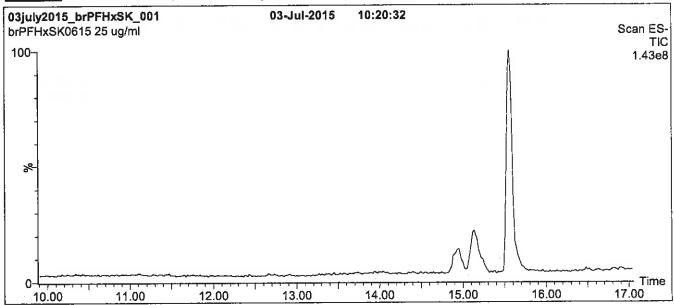
isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-hexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ -K ⁺	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CFSO ₃ -K ⁺ CF ₃	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF ₂ CFCF ₂ SO ₃ ·K ⁺ CF ₃	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CFCF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	CF ₃ CFCF ₂ CF ₂ CF ₂ SO ₃ ·K ⁺ CF ₃	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	CF ₃ CF ₃ CCF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	0.2
7	Other Unidentified Isomers		0.5

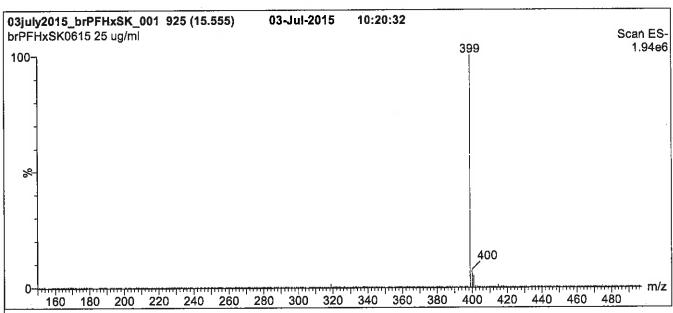
Percent of total perfluorohexanesulfonate isomers only.
 Systematic Name: Potassium perfluorohexane-2-sulfonate.

Certified By:

Date: 09/27/2016 (mm/dd/yyyy)

Figure 1: br-PFHxSK; LC/MS Data (TIC and Mass Spectrum)





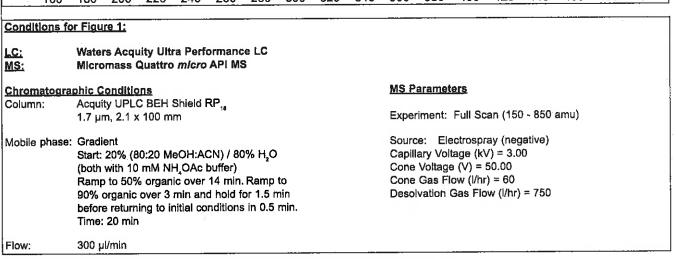
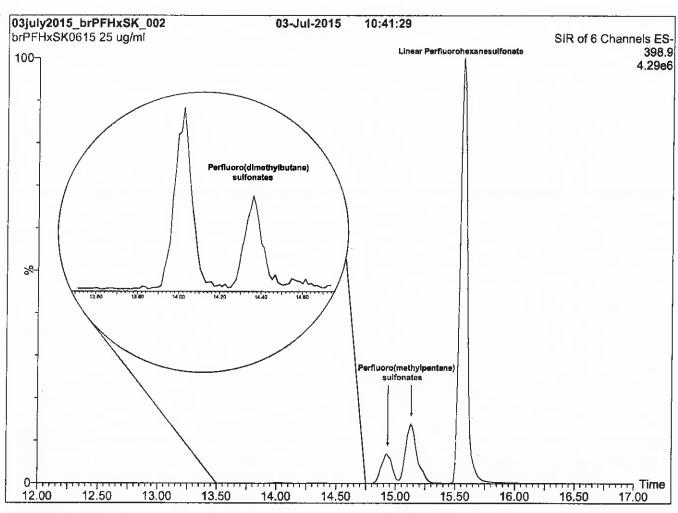


Figure 2: br-PFHxSK; LC/MS Data



Conditions for Figure 2:

LC: MS: Waters Acquity Ultra Performance LC

Micromass Quattro micro API MS

Chromatographic Conditions

Acquity UPLC BEH Shield RP18 Column:

1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient

Start: 20% (80:20 MeOH:ACN) / 80% H,O

(both with 10 mM NH OAc 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

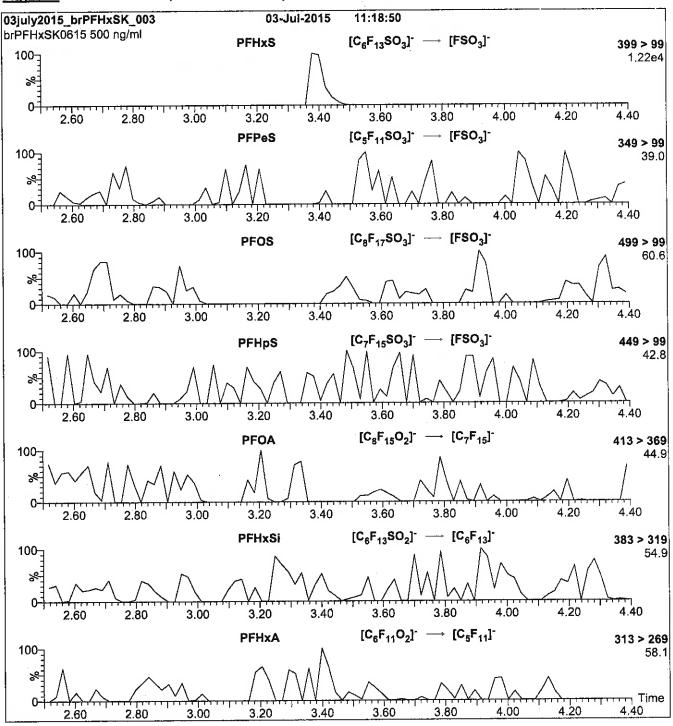
Flow: 300 µl/min

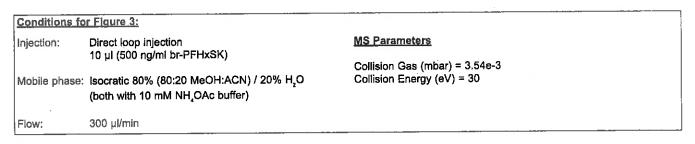
MS Parameters

Experiment: SIR (6 channels)

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

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





LCPFNA 00009



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFNA

LOT NUMBER:

PFNA0717

COMPOUND:

Perfluoro-n-nonanoic acid

STRUCTURE:

CAS #:

375-95-1

F C C C C OH

MOLECULAR FORMULA:

C_BHF₁₇O₂

CONCENTRATION:

MOLECULAR WEIGHT:

464.08

 $50 \pm 2.5 \, \mu g/ml$

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 carboxyllc 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).

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Certified By:

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UNCERTAINTY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

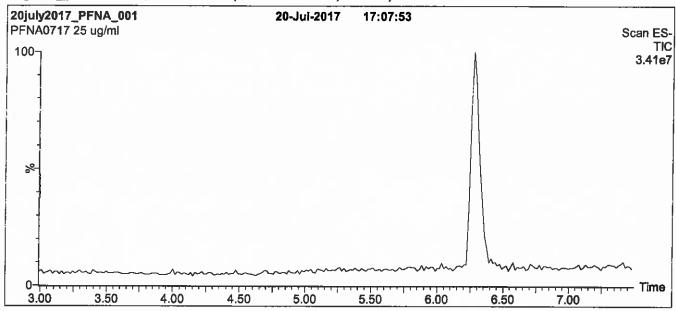
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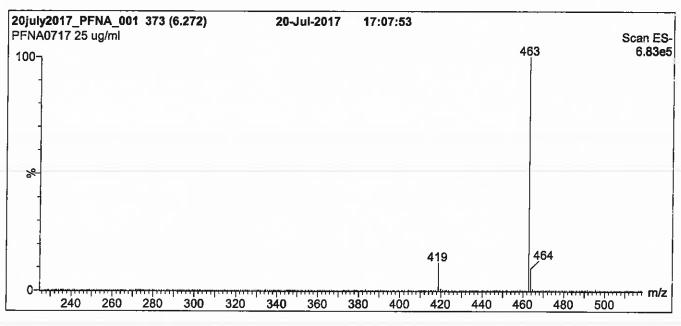




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Figure 1: PFNA; LC/MS Data (TIC and Mass Spectrum)





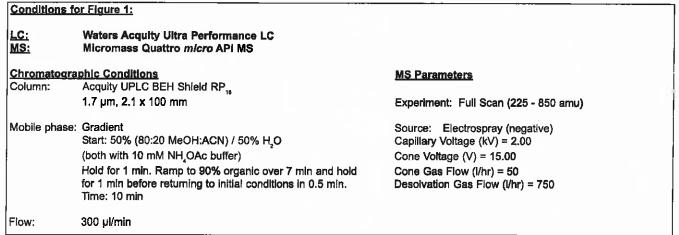
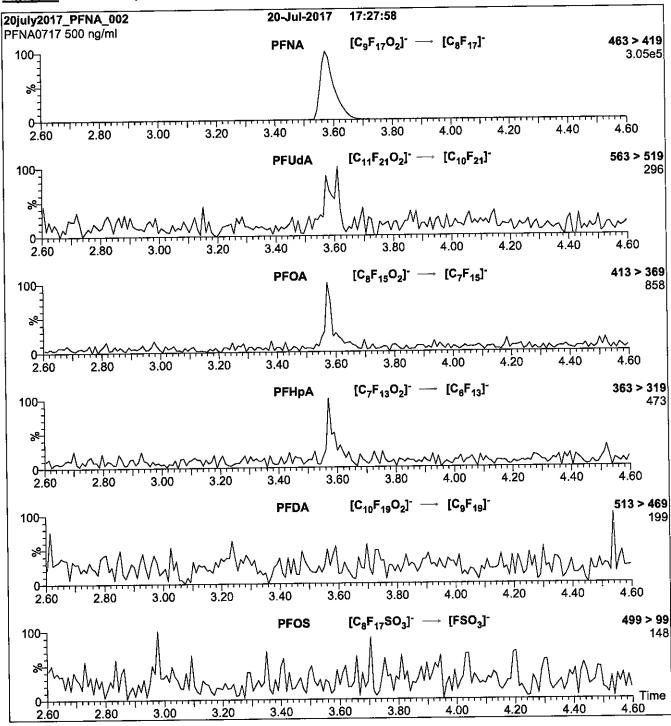
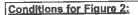


Figure 2: PFNA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml PFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH₄OAc buffer)

Flow:

300 µl/min

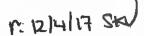
MS Parameters

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

LCPFNS_00003



ID: LCPFNS 00003 Exp: 09/27/22 Prod: SKV L-PFNS at 48.0ug/mL





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFNS

LOT NUMBER:

MOLECULAR WEIGHT:

SOLVENT(S):

LPFNS0917

COMPOUND:

Sodium perfluoro-1-nonanesulfonate

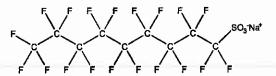
STRUCTURE:

CAS #:

98789-57-2

572.12

Methanol



MOLECULAR FORMULA:

C_aF_aSO_aNa

CONCENTRATION:

50.0 ± 2.5 µg/ml (Na salt)

 $48.0 \pm 2.4 \mu g/ml$ (PFNS anion)

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

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

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, $u_x(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1,x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y,x_i)^2}$$

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

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

TRACEABILITY:

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

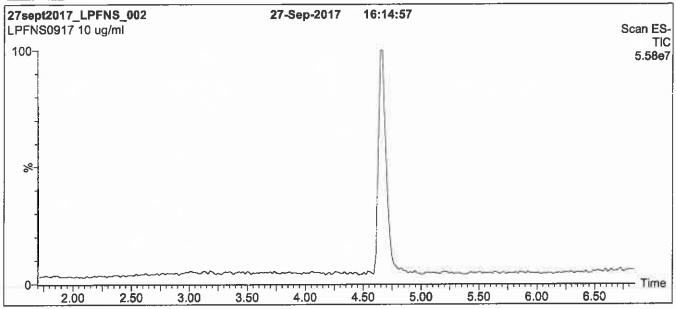
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadlan Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

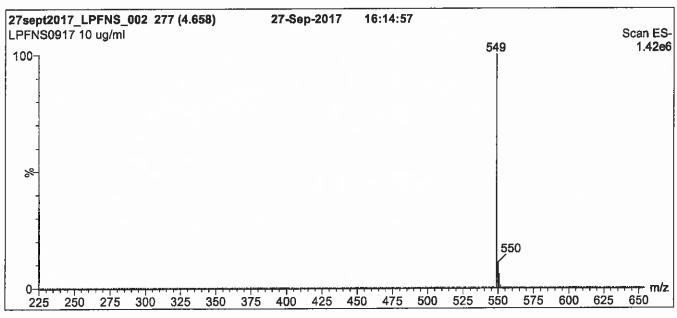




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com







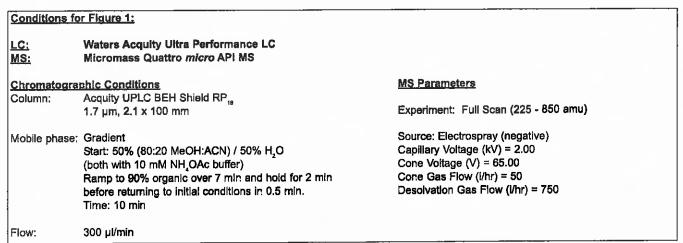
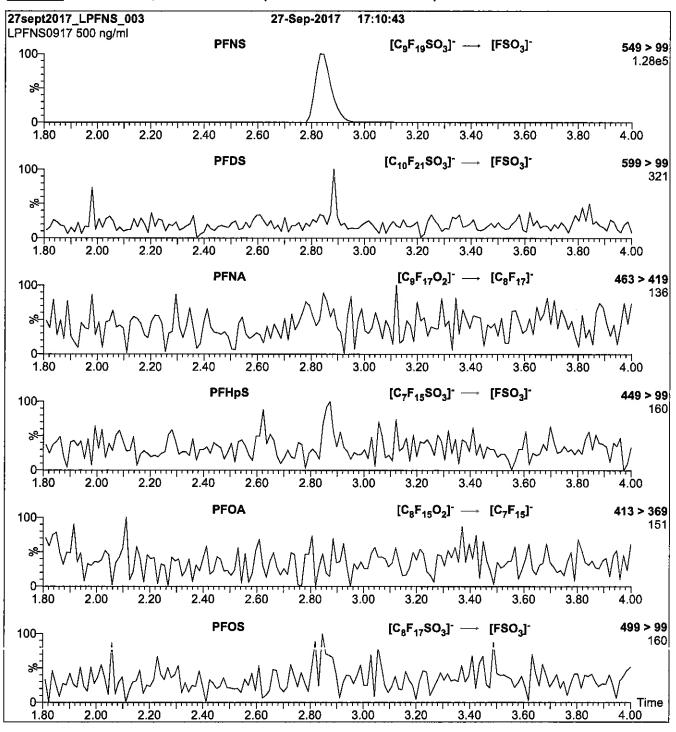


Figure 2: L-PFNS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml L-PFNS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH₄OAc buffer)

MS Parameters

Collision Gas (mbar) = 3.50e-3 Collision Energy (eV) = 45

Flow:

300 µl/min

LCPFOA_00008



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFOA

LOT NUMBER:

COMPOUND:

Perfluoro-n-octanoic acid

CAS #:

335-67-1

PFOA0716

STRUCTURE:

MOLECULAR FORMULA:

CaHFIGO,

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

SOLVENT(S):

414.07

Methanol

Water (<1%)

CHEMICAL PURITY:

CONCENTRATION:

>98%

LAST TESTED: (mm/dd/yyyy)

08/02/2016

EXPIRY DATE: (mm/dd/yyyy)

08/02/2021

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:

1 Juli

Date: 08/05/2016

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

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, $u_x(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2, ..., x_n$$
 on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

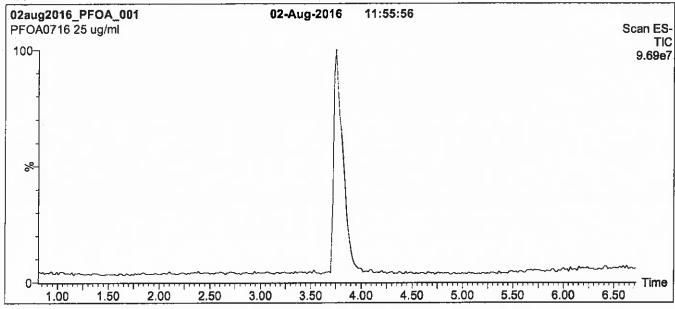
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

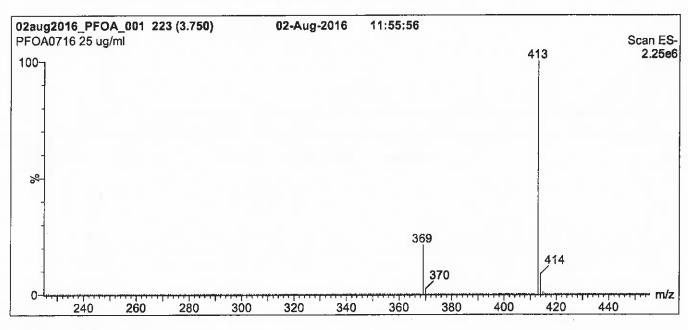




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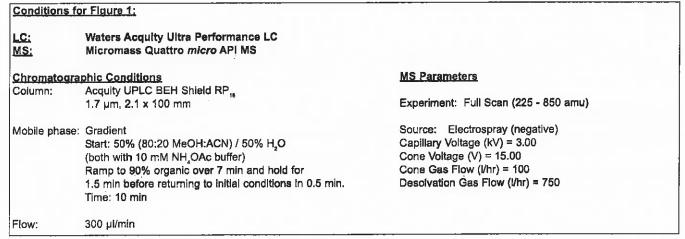
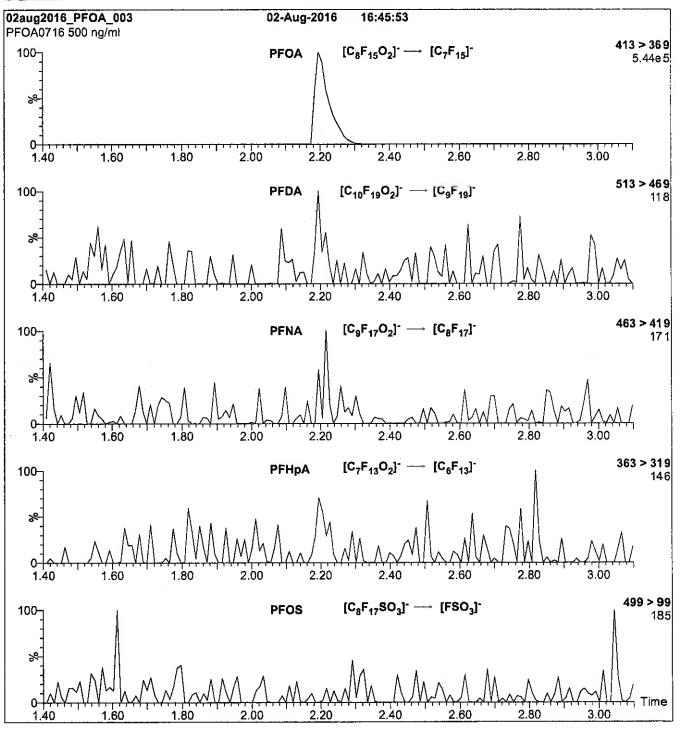


Figure 2: PFOA; LC/MS/MS Data (Selected MRM Transitions)





injection:

Direct loop injection

10 μl (500 ng/ml PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 10

LCPFOA_00009

P: 10/20/17 3/2/



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFOA

LOT NUMBER:

PFOA0917

COMPOUND:

Perfluoro-n-octanoic acid

STRUCTURE:

CAS #:

335-67-1

MOLECULAR FORMULA:

C,HF,O,

CONCENTRATION:

 $50 \pm 2.5 \, \mu g/ml$

MOLECULAR WEIGHT:

414.07

SOLVENT(S):

Methanoi

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

09/27/2017

EXPIRY DATE: (mrr/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:

B.G. Chittim, General Manager

Date: <u>09/28/2017</u>

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.

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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 on which it depends is:
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where x is expressed as a relative standard uncertainty of the individual parameter.

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EXPIRY DATE / PERIOD OF VALIDITY:

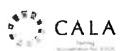
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

<u>LIMITED WARRANTY:</u>

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:

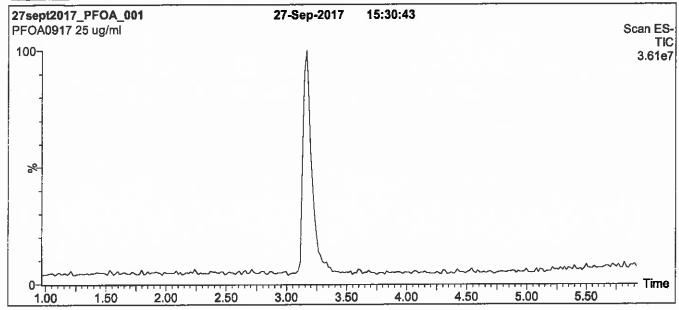
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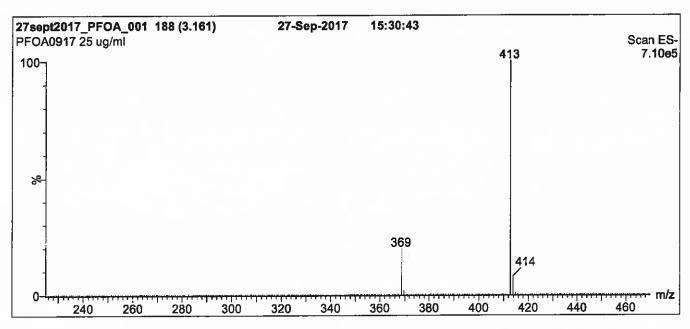




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





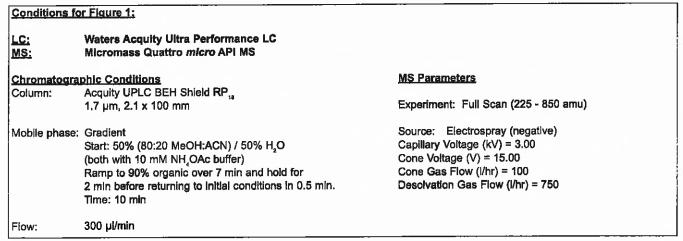
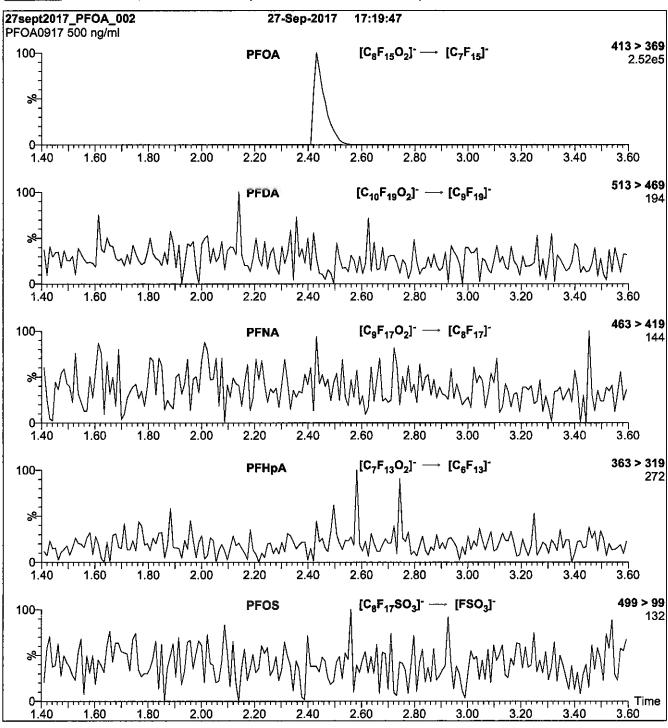
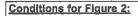


Figure 2: PFOA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H,O

(both with 10 mM NH,OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3 Collision Energy (eV) = 11

LCPFODA_00008



CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

PFODA

LOT NUMBER:

PFODA0416

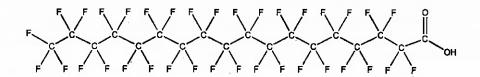
COMPOUND:

Perfluoro-n-octadecanoic acid

STRUCTURE:

CAS #:

16517-11-6



MOLECULAR FORMULA:

C, HF, O,

MOLECULAR WEIGHT:

914.14

CONCENTRATION:

 $50 \pm 2.5 \, \mu g/ml$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyw)

04/29/2016

EXPIRY DATE: (mm/dd/yyyy)

04/29/2021

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:

Date: 05/20/2016

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

The products prepared by Weilington 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.

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

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EXPIRY DATE / PERIOD OF VALIDITY:

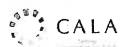
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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:

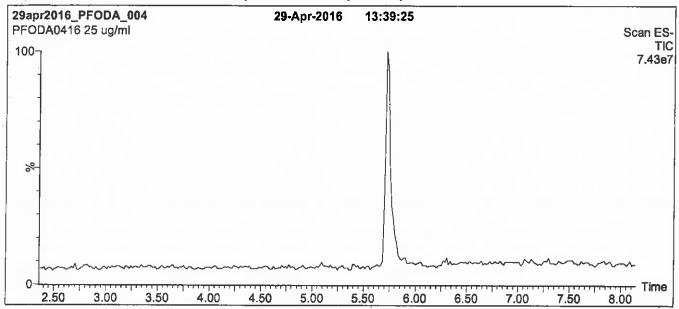
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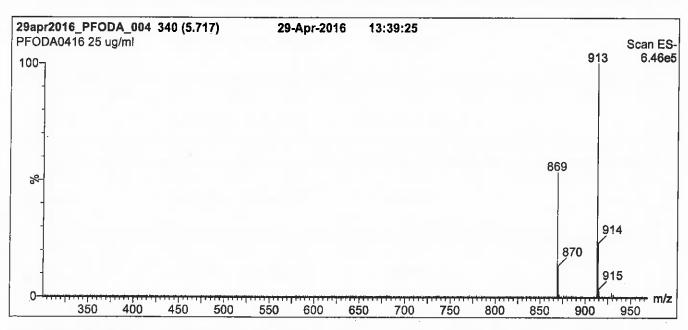




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





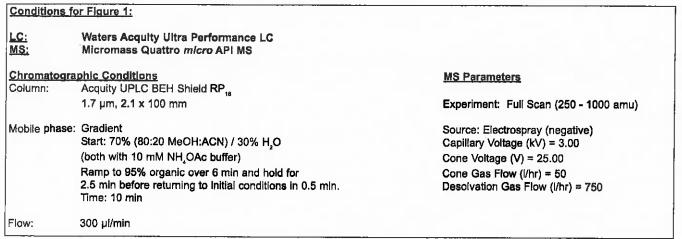
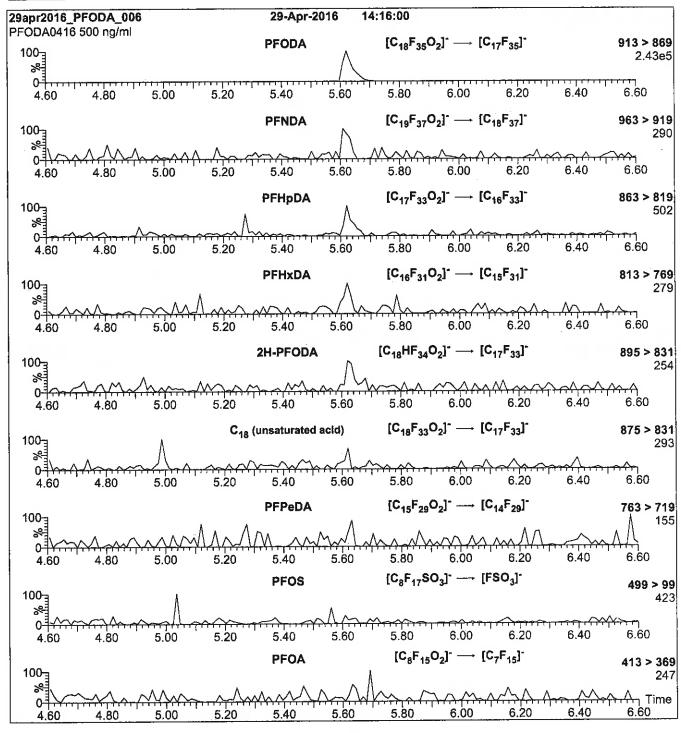
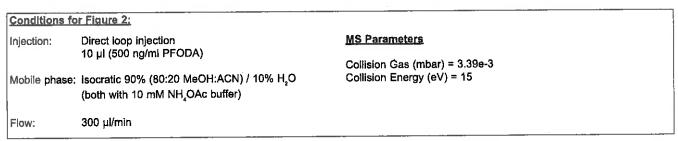


Figure 2: PFODA; LC/MS/MS Data (Selected MRM Transitions)





LCPFOS-br_00004



CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:

br-PFOSK

LOT NUMBER:

brPFOSK1015

CONCENTRATION:

50 ± 2.5 μg/ml (total potassium sait)

46.4 ± 2.3 µg/ml (total PFOS anion)

SOLVENT(S):

Methanol

DATE PREPARED: (mm/dd/yyyy)

10/13/2015

LAST TESTED: (mm/dd/yyyy)

10/14/2015

EXPIRY DATE: (mm/dd/yyyy)

10/14/2020

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 19F-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

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:

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UNCERTAINTY:

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

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

$$x_1, x_2,...x_n$$
 on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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





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

Table A: br-PFOSK; Isomeric Components and Percent Composition (by 1ºF-NMR)*

Isomer	Name	Structure	Percent Composition by "F-NMR
1	Potassium perfluoro-1-octanesulfonate	CF ₃ CF ₂ SO ₃ K ⁺	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CFSO ₃ K ⁺ CF ₃	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CFCF ₂ SO ₃ K ⁺ CF ₃	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K* CF ₃	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF _C F ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF _C CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	CF ₃ CFCF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ -CCF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K* CF ₃	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ -CF-CF-CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃ CF ₃	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesuifonate	CF ₃ CFCF ₂ CF ₂	0.07

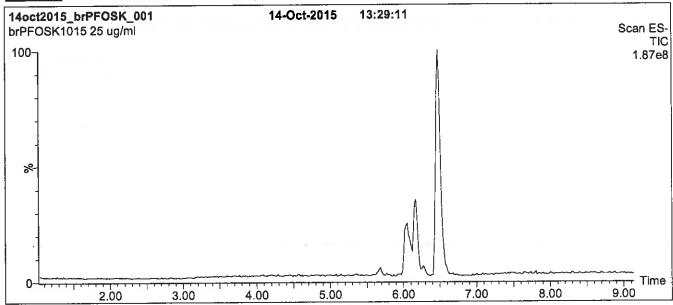
^{*} Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.

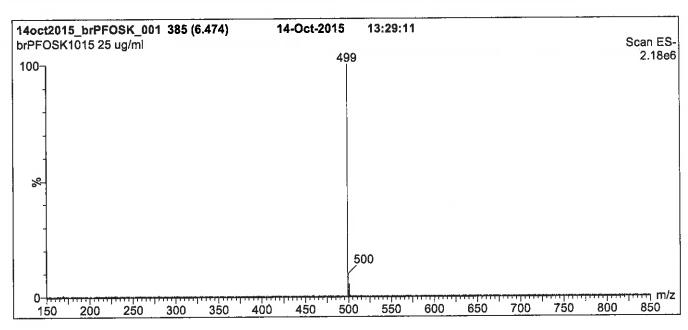
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: Date: 10/15/2015

B.G. Chittim (mm/dd/yyyy)

Figure 1: br-PFOSK; LC/MS Data (TIC and Mass Spectrum)





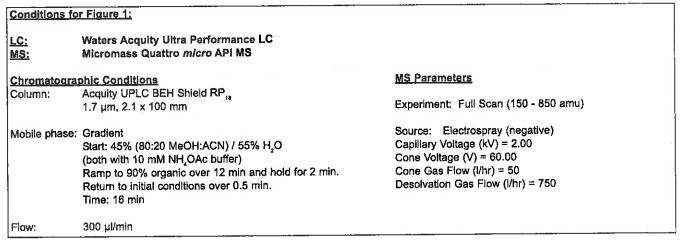
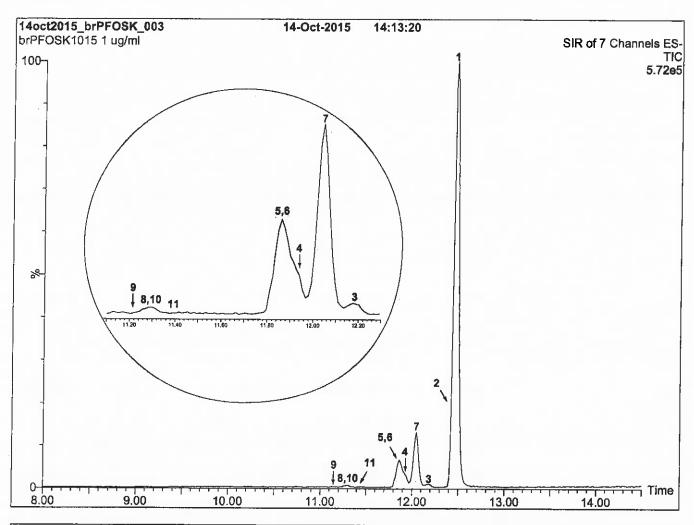


Figure 2: br-PFOSK; LC/MS Data (SIR)



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 $\mu m_{\rm r}$ 2.1 x 100 mm)

Injection:

1.0 µg/ml of br-PFOSK

Mobile Phase:

Gradient

45% (80:20 MeOH:ACN) / 55% $\rm{H_2O}$ (both with 10 mM $\rm{NH_4OAc}$ buffer)

Ramp to 90% organic over 15 min and hold for 3 min.

Return to initial conditions over 1 min.

Time: 20 min

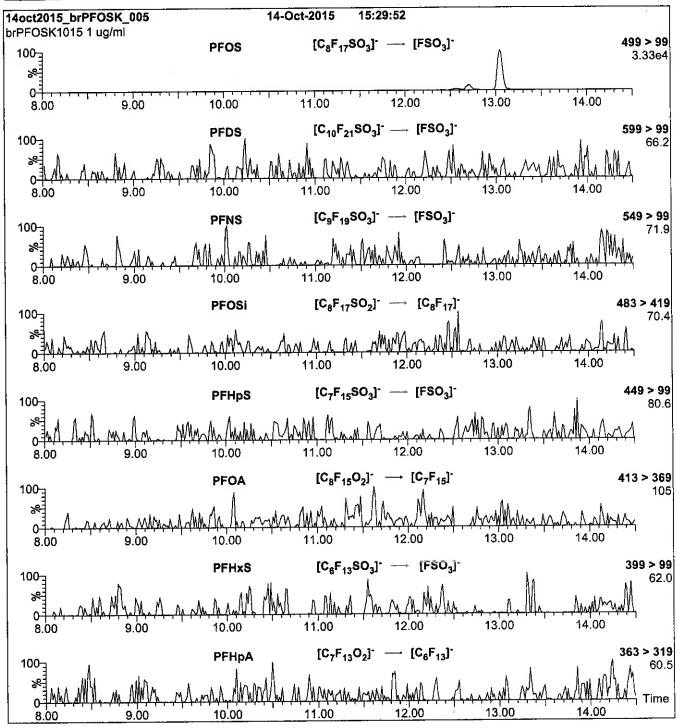
Flow:

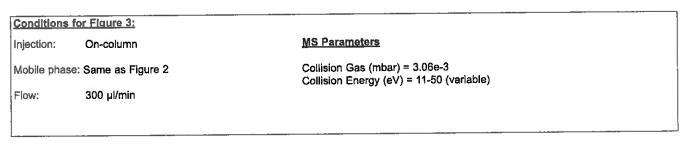
300 µl/min

MS Conditions:

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

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





LCPFOSA_00010



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

FOSA-I

Perfluoro-1-octanesulfonamide

LOT NUMBER: FOSA0916I

STRUCTURE:

COMPOUND:

CAS #:

754-91-6

MOLECULAR FORMULA:

CONCENTRATION:

CaHaFi,NO2S $50 \pm 2.5 \,\mu g/ml$

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

09/30/2016

EXPIRY DATE: (mm/dd/yyy)

09/30/2021

RECOMMENDED STORAGE:

Refrigerate ampoule

MOLECULAR WEIGHT:

SOLVENT(S):

499.14 Isopropano!

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:

Date: 10/07/2016

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HAZARDS:

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

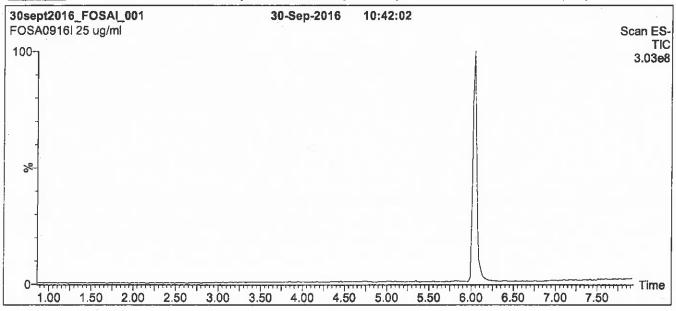
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

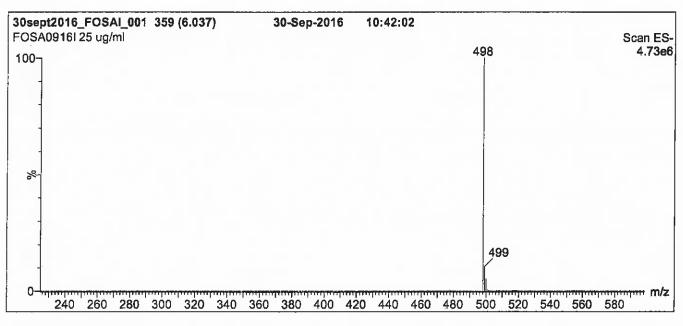


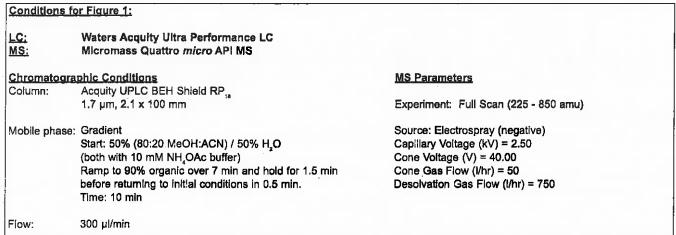


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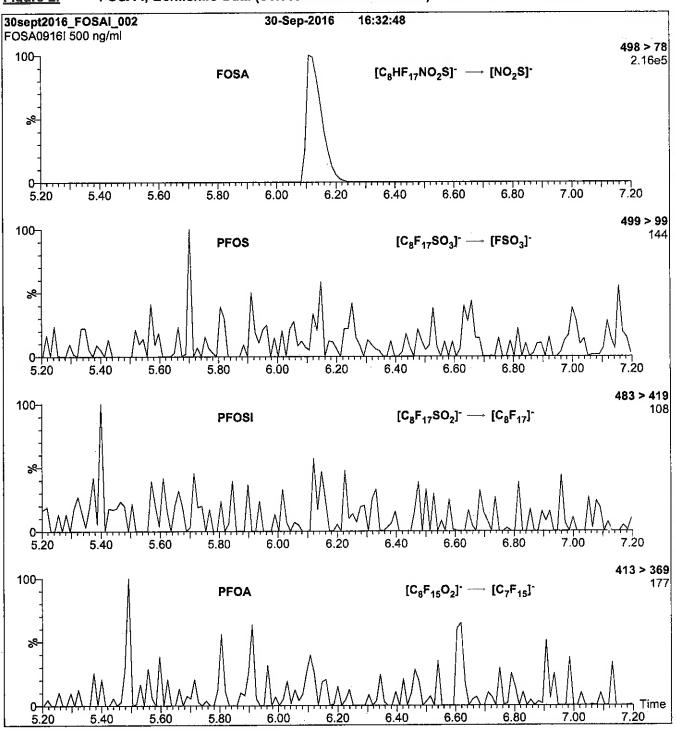
Figure 1: FOSA-I; LC/MS Data (TIC and Mass Spectrum)

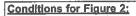






FOSA-I; LC/MS/MS Data (Selected MRM Transitions) Figure 2:





Injection:

Direct loop injection

10 μl (500 ng/ml FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O (both with 10 mM NH₂OAc buffer)

MS Parameters

Collision Gas (mbar) = 3.20e-3 Collision Energy (eV) = 30

Flow:

300 µl/min

LCPFPeA_00007



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

COMPOUND:

Perfluoro-n-pentanoic acid

STRUCTURE:

PFPeA

LOT NUMBER:

PFPeA0516

CAS #:

2706-90-3

MOLECULAR FORMULA:

CONCENTRATION:

C,HF,O,

 $50 \pm 2.5 \, \mu g/ml$

MOLECULAR WEIGHT:

SOLVENT(S):

264.05

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/ywy)

05/31/2016

EXPIRY DATE: (mm/dd/yyyy)

05/31/2021

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 ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of C₅H₂F₅O₃ (hydrido - derivative) as measured by 19F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 06/02/2016

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EXPIRY DATE / PERIOD OF VALIDITY:

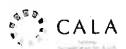
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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:

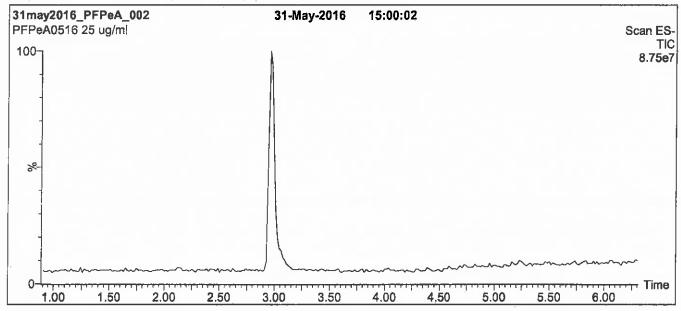
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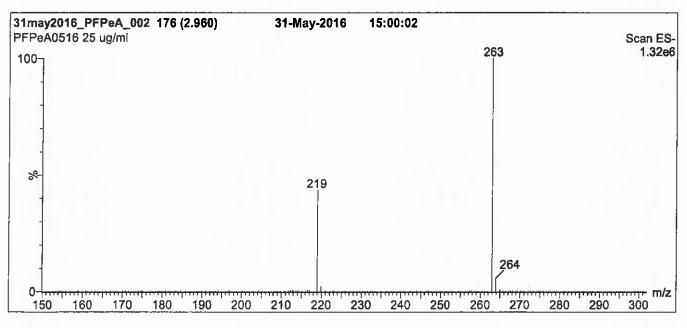




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Figure 1: PFPeA; LC/MS Data (TIC and Mass Spectrum)





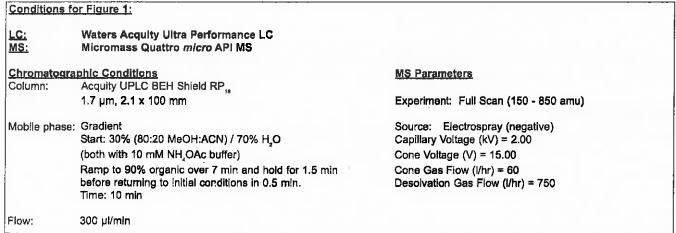
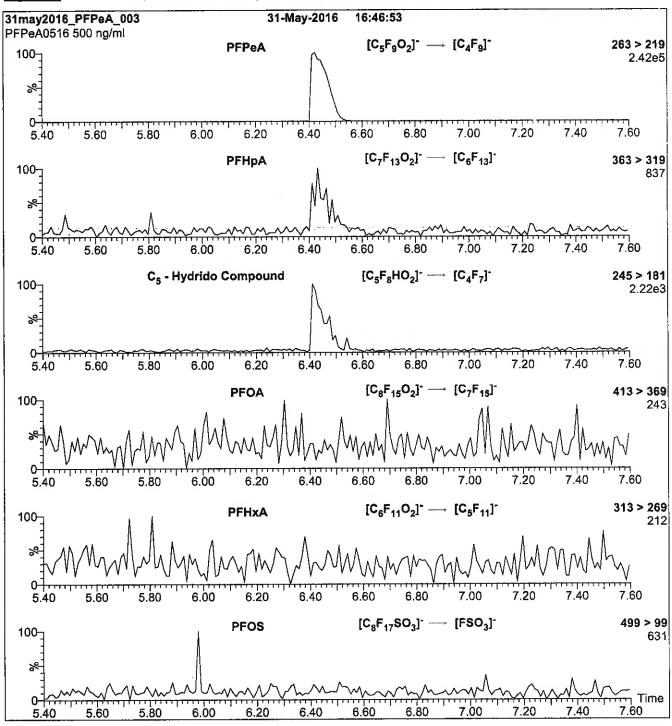
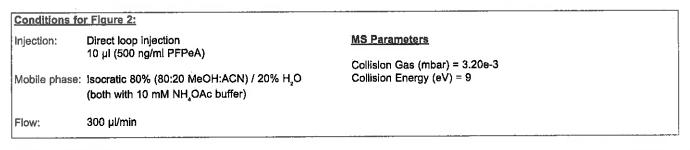


Figure 2: PFPeA; LC/MS/MS Data (Selected MRM Transitions)





LCPFPeS_00003



ID: LCPFPeS_00003 Exp: 01/11/22 Prpd: SKV PF-1-pentanesulfonate Na



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFPeS

LOT NUMBER:

CAS #:

LPFPeS0117

COMPOUND:

STRUCTURE:

Sodium perfluoro-1-pentanesulfonate

630402-22-1

MOLECULAR FORMULA:

C,F,SO,Na

MOLECULAR WEIGHT:

372.09

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$ (Na salt)

 $46.9 \pm 2.3 \,\mu\text{g/ml}$ (PFPeS anion)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/11/2017

EXPIRY DATE: (mm/dd/yyy)

01/11/2022

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 09/06/2017

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UNCERTAINTY:

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

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$$x_1$$
, x_2 ,... x_n on which it depends is:
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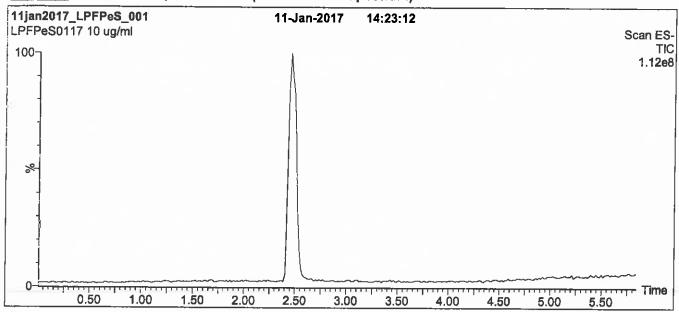
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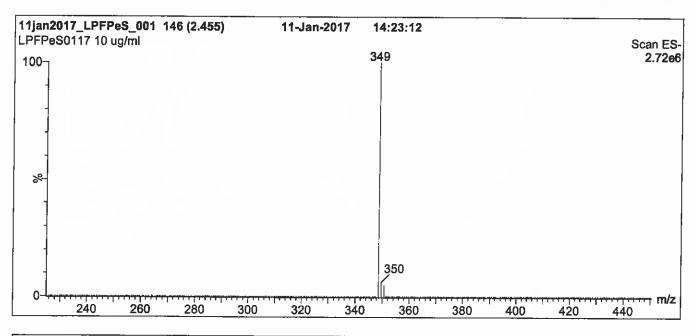




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Figure 1: L-PFPeS; LC/MS Data (TIC and Mass Spectrum)





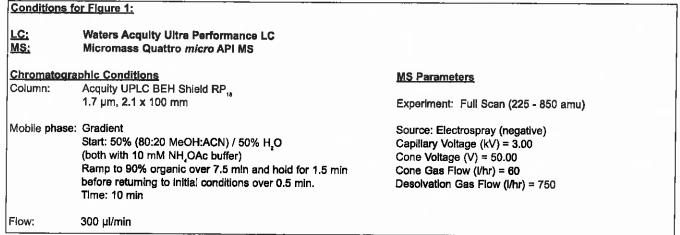
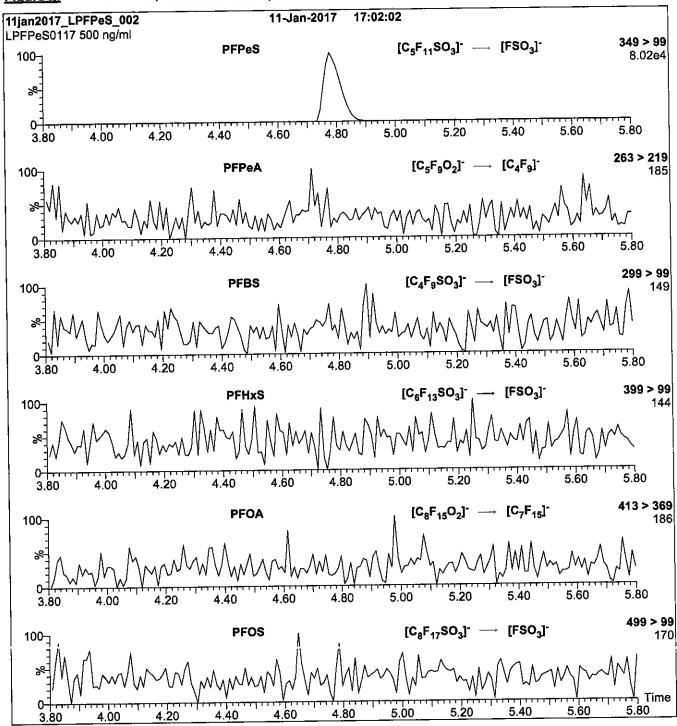
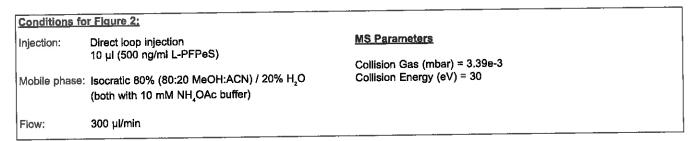


Figure 2: L-PFPeS; LC/MS/MS Data (Selected MRM Transitions)





LCPFTeDA_00006



ID: LCPFTeDA_00005 Exp: 12/09/20 Prpd: \$8C PF-n-tetradecanoic acid







VELLINGTON ABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFTeDA

LOT NUMBER:

PFTeDA1215

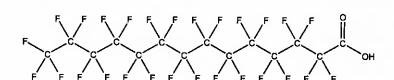
COMPOUND:

STRUCTURE:

Perfluoro-n-tetradecanoic acid

CAS #:

376-06-7



MOLECULAR FORMULA:

C, HF, O,

MOLECULAR WEIGHT:

714.11

CONCENTRATION:

 $50 \pm 2.5 \, \mu g/ml$

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

LAST TESTED: (mm/dd/yyyy)

>98%

12/09/2015

EXPIRY DATE: (mm/dd/yyyy)

12/09/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

Contains $\sim 0.2\%$ of PFDoA (C₁₅HF₂₈O₂) and $\sim 0.2\%$ of PFPeDA (C₁₅HF₂₈O₂).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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:

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The combined relative standard uncertainty, $u_{\epsilon}(y)$, of a value y and the uncertainty of the independent parameters

 $X_1, X_2, ..., X_n$ on which it depends is:

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

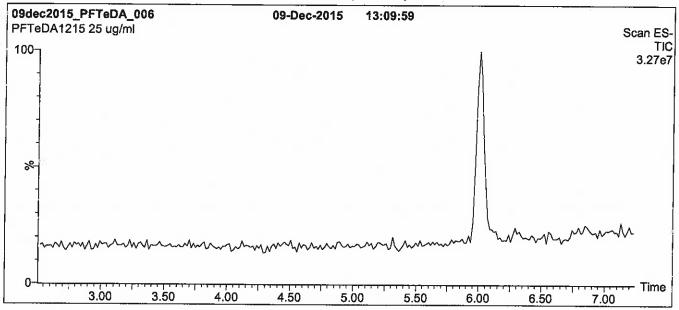
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

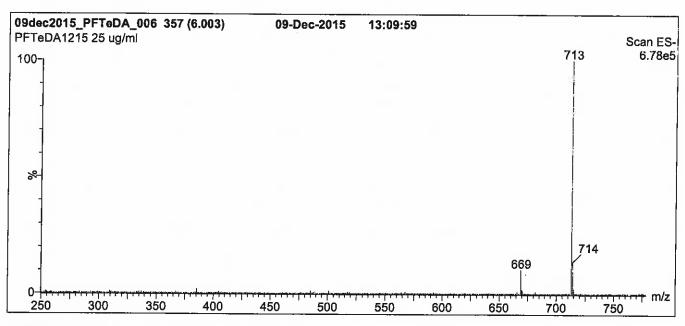




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Figure 1: PFTeDA; LC/MS Data (TIC and Mass Spectrum)





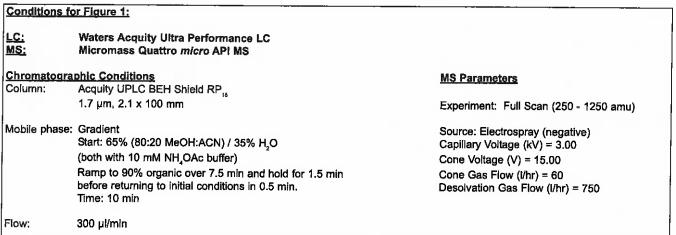
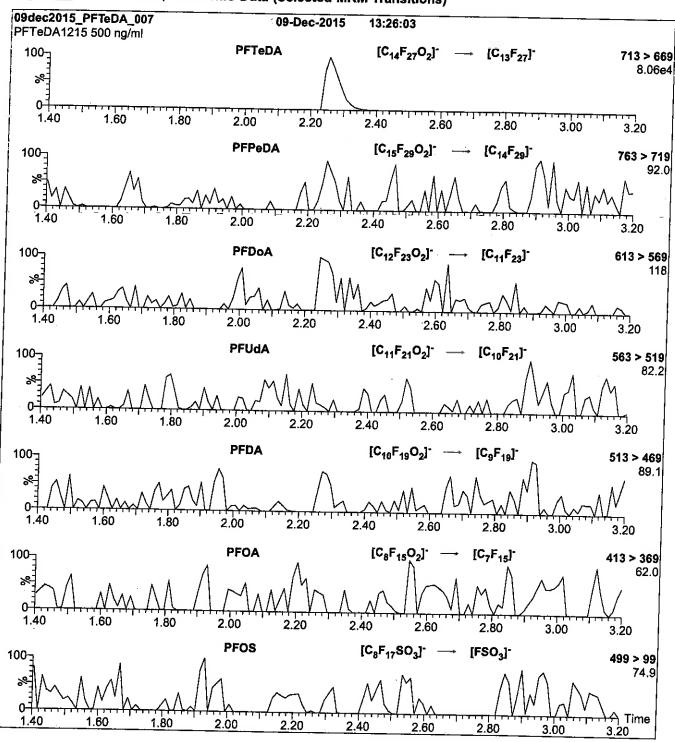
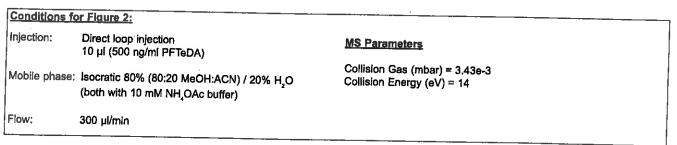


Figure 2: PFTeDA; LC/MS/MS Data (Selected MRM Transitions)





Reagent

LCPFTeDA_00007



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFTeDA

LOT NUMBER:

PFTeDA0916

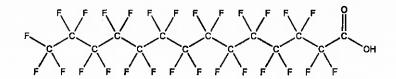
COMPOUND:

Perfluoro-n-tetradecanoic acid

STRUCTURE:

CAS #:

376-06-7



MOLECULAR FORMULA:

C14HF27O2

MOLECULAR WEIGHT:

714.11

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

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 $\sim 0.2\%$ of PFDoA (C₁₅HF₂₃O₂) and $\sim 0.2\%$ of PFPeDA (C₁₅HF₂₈O₂).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chillim

Date: 10/05/2016

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

INTENDED USE:

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HAZARDS:

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$$x_1, x_2,...x_n$$
 on which it depends is:

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

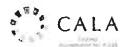
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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:

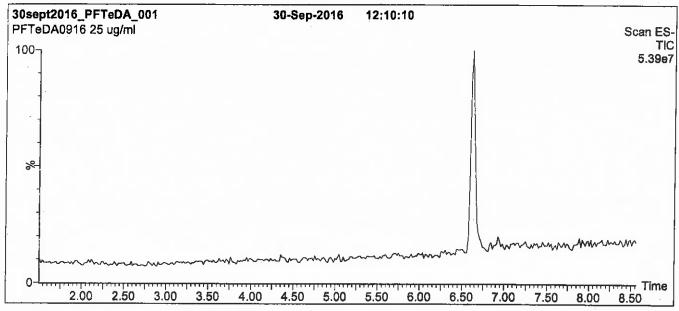
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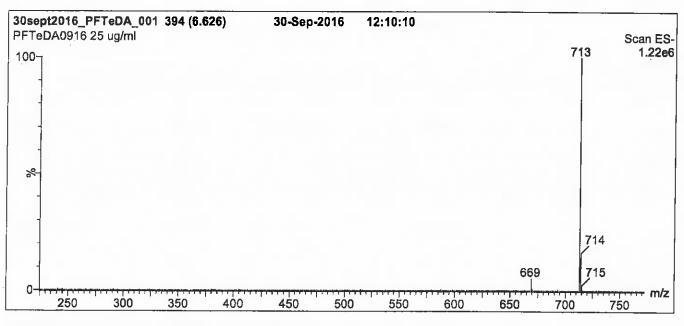




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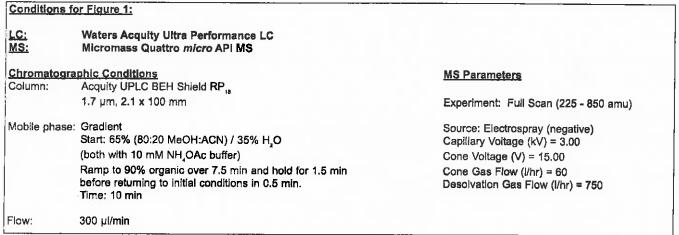
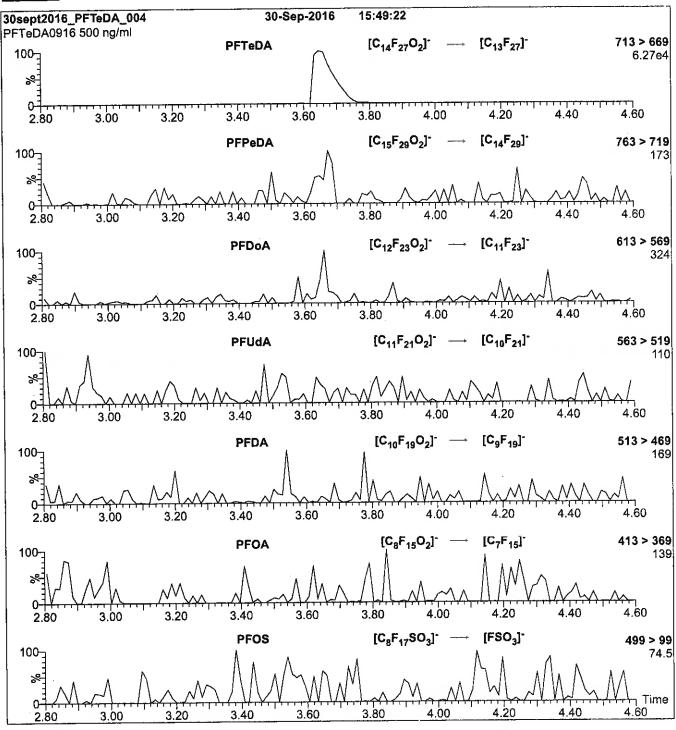
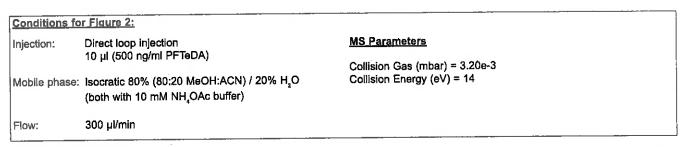


Figure 2: PFTeDA; LC/MS/MS Data (Selected MRM Transitions)





Reagent

LCPFTrDA_00006



ID: LCPFTrDA_00005 Exp: 02/12/21 Prpd: SBC PF-n-tridecanoic acid



ID: LCPFTrDA_00006 Exp: 02/12/21 Prpd: SBC PF-n-tridecanoic acid



VELLINGTON ABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFTrDA

LOT NUMBER:

PFTrDA0216

COMPOUND:

STRUCTURE:

Perfluoro-n-tridecanoic acid

CAS #:

72629-94-8

MOLECULAR FORMULA:

C13HF25O2

MOLECULAR WEIGHT:

664.11

CONCENTRATION:

 $50 \pm 2.5 \, \mu g/ml$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

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.

Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$), ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA (C₁₄HF₂₇O₂).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: <u>02/16/2016</u>

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

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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TRACEABILITY:

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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:

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QUALITY MANAGEMENT:

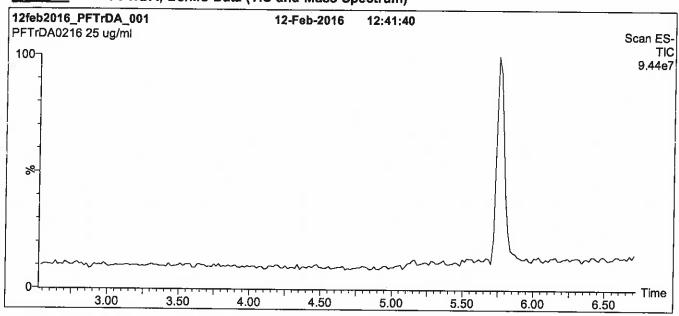
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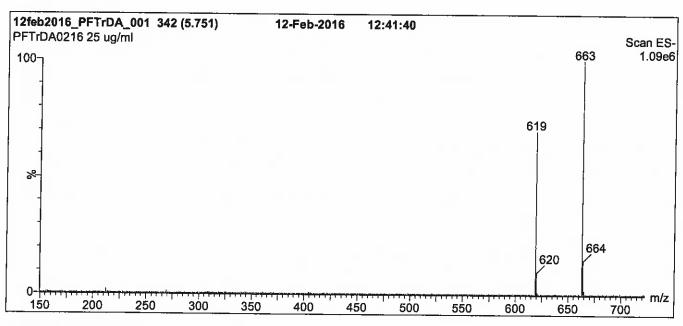




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Figure 1: PFTrDA; LC/MS Data (TIC and Mass Spectrum)





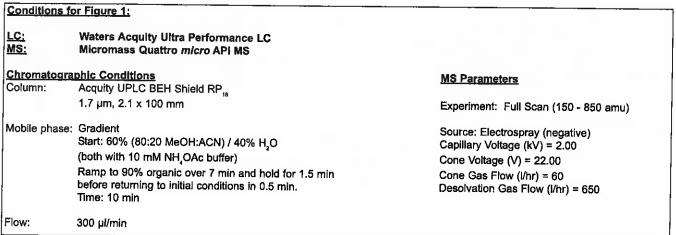
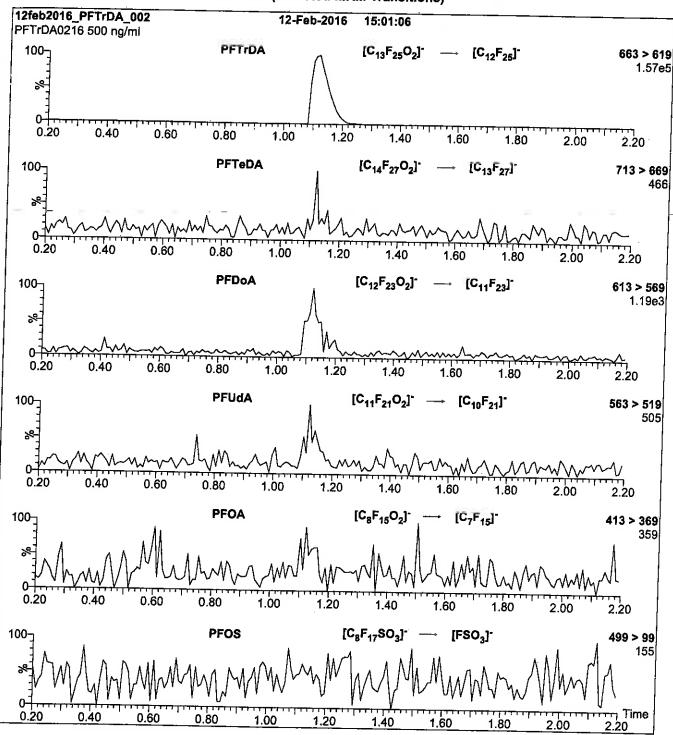


Figure 2: PFTrDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% MeOH / 20% H₂O

Flow:

300 µl/mln

MS Parameters

Collision Gas (mbar) = 3.35e-3 Collision Energy (eV) = 15

Reagent

LCPFTrDA_00007



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFTrDA

LOT NUMBER:

PFTrDA0216

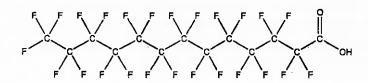
COMPOUND:

Perfluoro-n-tridecanoic acid

STRUCTURE:

CAS #:

72629-94-8



MOLECULAR FORMULA:

C, HF, O,

MOLECULAR WEIGHT:

664.11

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

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.

• Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_{2}$), ~ 0.4% of PFDoA ($C_{12}HF_{23}O_{2}$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_{2}$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

R.G. Chittim

Date: __

02/16/2016

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

INTENDED USE:

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SYNTHESIS / CHARACTERIZATION:

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EXPIRY DATE / PERIOD OF VALIDITY:

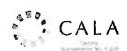
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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

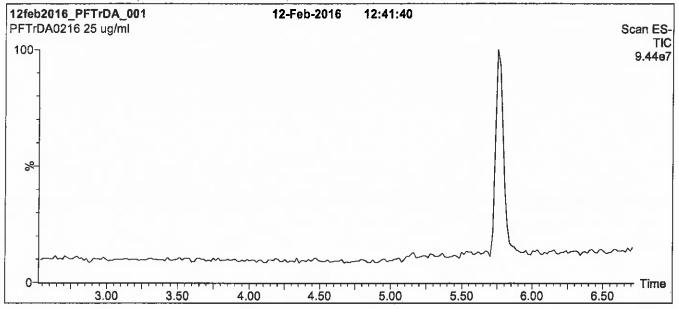
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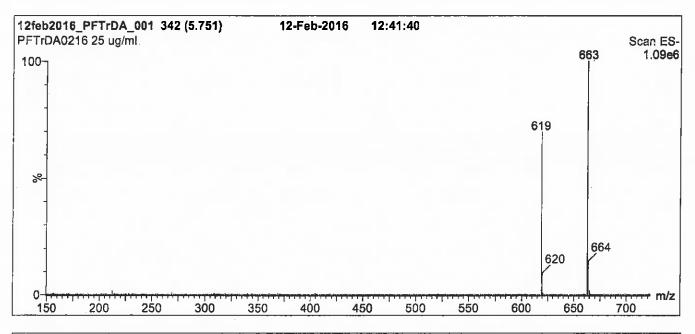




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Figure 1: PFTrDA; LC/MS Data (TIC and Mass Spectrum)





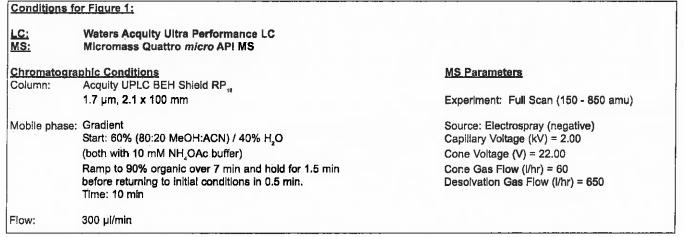
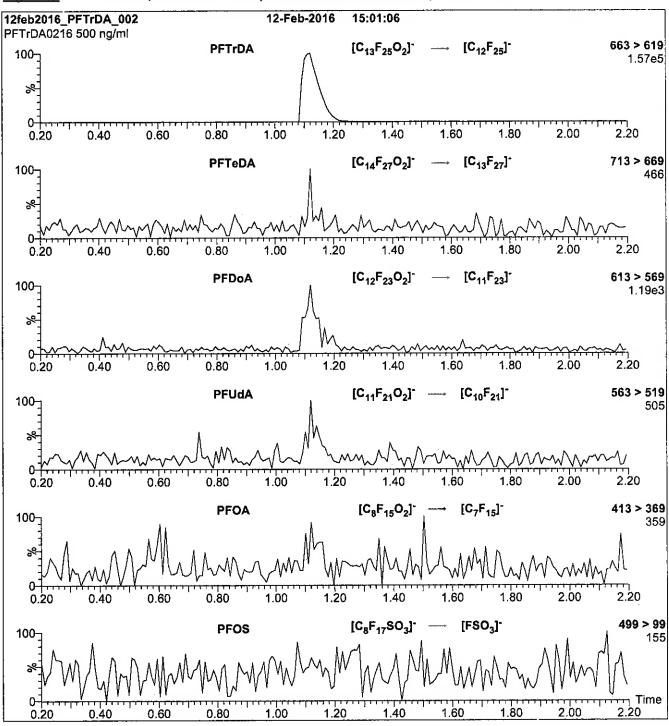
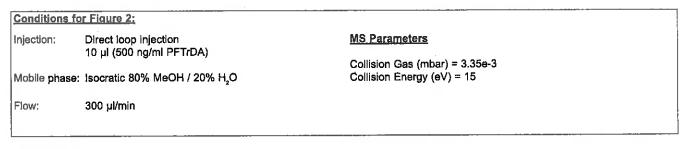


Figure 2: PFTrDA; LC/MS/MS Data (Selected MRM Transitions)





Reagent

LCPFUdA_00007



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFUdA

LOT NUMBER:

PFUdA1016

COMPOUND:

Perfluoro-n-undecanoic acid

STRUCTURE:

CAS#:

2058-94-8

MOLECULAR FORMULA:

C,HF,O,

MOLECULAR WEIGHT:

564.09

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/18/2016

EXPIRY DATE: (mm/dd/yyyy)

10/18/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 10/19/2010

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_{c}(y)$, of a value y and the uncertainty of the independent parameters

 $x_1, x_2, ... x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

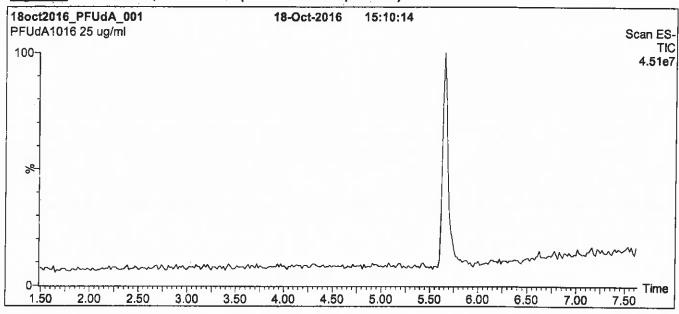
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

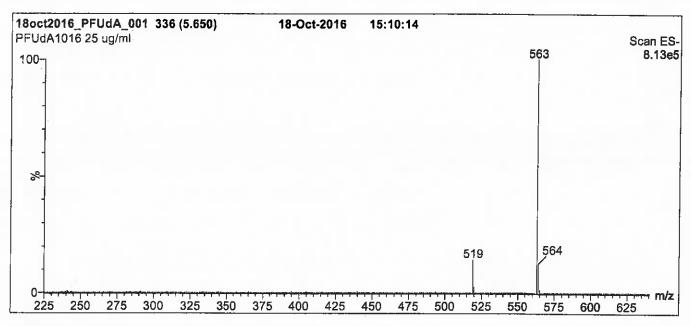




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





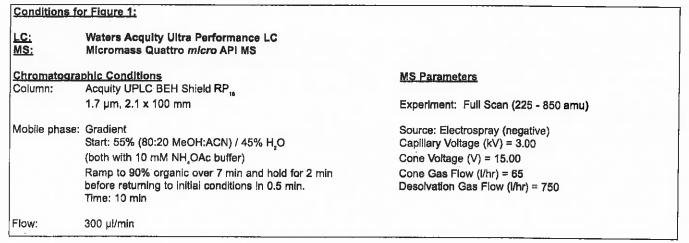
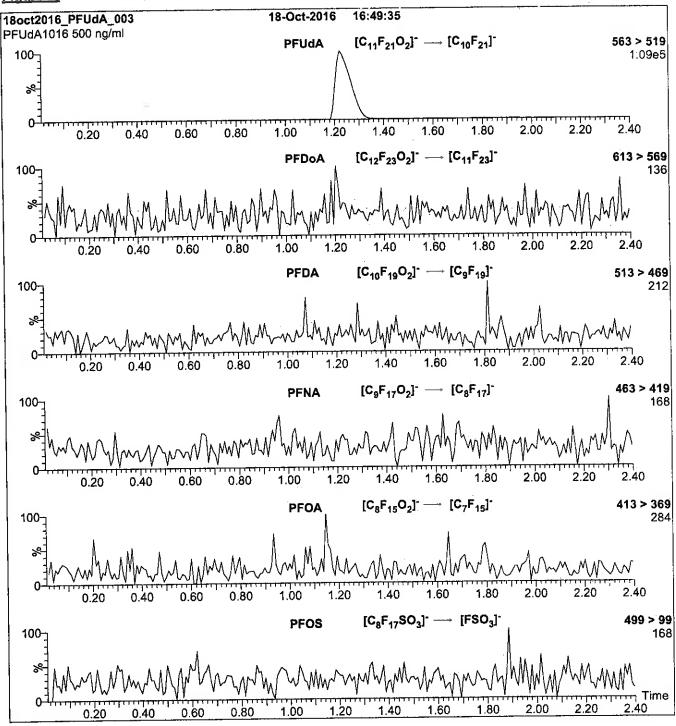
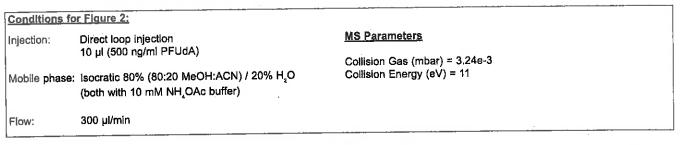


Figure 2: PFUdA; LC/MS/MS Data (Selected MRM Transitions)





Method PFC DOD

Fluorinated Hydrocarbons (LC/MS) by Method PFAS_DOD

FORM II LCMS SURROGATE RECOVERY

lab	Name:	TestAmerica	Sacramento	Job No.:	320-38875-1
-----	-------	-------------	------------	----------	-------------

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	PFBS #	PFHxA #	PFHpA #	PFHxS #	PFOA #	PFNA #
TP-PFC-029-TPI	320-38875-1	83	97	95	95	91	89	85	102
TP-PFC-029-TPI DL	320-38875-1 DL	78	84	76	81	81	80	87	86
TP-PFC-029-MIDCARB ON	320-38875-2	73	76	72	78	75	77	78	82
TP-PFC-029-TPE	320-38875-3	72	76	72	74	74	73	79	81
TP-PFC-029-TPE-D	320-38875-4	75	80	78	76	78	78	84	91
	MB 320-223615/1-A	79	85	80	85	84	85	93	94
	LCS 320-223615/2-A	80	87	78	86	85	80	90	90

	QC LIMITS
PFBA = 13C4 PFBA	50-150
PFPeA = 13C5 PFPeA	50-150
PFBS = 13C3-PFBS	50-150
PFHxA = 13C2 PFHxA	50-150
PFHpA = 13C4-PFHpA	50-150
PFHxS = 1802 PFHxS	50-150
PFOA = 13C4 PFOA	50-150
PFNA = 13C5 PFNA	50-150

Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM II LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-	38875-1
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SDG No.: ____

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFOS #	PFOSA #	PFDA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-029-TPI	320-38875-1	87	81	96	101	89	79
TP-PFC-029-TPI DL	320-38875-1 DL	75	73	83	90	87	69
TP-PFC-029-MIDCARB ON	320-38875-2	73	67	77	74	66	60
TP-PFC-029-TPE	320-38875-3	73	64	72	78	69	60
TP-PFC-029-TPE-D	320-38875-4	78	67	79	86	76	70
	MB 320-223615/1-A	81	71	86	90	85	84
	LCS 320-223615/2-A	86	69	86	94	82	82

	QC LIMITS
PFOS = 13C4 PFOS	50-150
PFOSA = 13C8 FOSA	50-150
PFDA = 13C2 PFDA	50-150
PFUnA = 13C2 PFUnA	50-150
PFDoA = 13C2 PFDoA	50-150
PFTDA = 13C2-PFTeDA	50-150

 $\ensuremath{\text{\#}}$ Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM III LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name	e: TestAmerica Sacra	amento	Job No.:	320-	-38875-1
SDG No.	:				
Matrix:	Water	Level: Low	Lab File	ID:	2018.05.27LLADX_005.d
Lab ID:	LCS 320-223615/2-A		Client II	D:	

	SPIKE	LCS	LCS	QC	
	ADDED	CONCENTRATION	용	LIMITS	#
COMPOUND	(ng/L)	(ng/L)	REC	REC	
Perfluorobutanoic acid (PFBA)	40.0	41.6	104	83-118	
Perfluoropentanoic acid	40.0	36.7	92	83-108	
(PFPeA)					
Perfluorohexanoic acid (PFHxA)	40.0	39.4	98	83-109	
Perfluoroheptanoic acid	40.0	39.6	99	80-113	
(PFHpA)					
Perfluorooctanoic acid (PFOA)	40.0	35.7	89		
Perfluorononanoic acid (PFNA)	40.0	37.6	94		
Perfluorodecanoic acid (PFDA)	40.0	42.6	107		
Perfluoroundecanoic acid	40.0	36.2	91	76-105	
(PFUnA)					
Perfluorododecanoic acid	40.0	40.9	102	87-116	
(PFDoA)	40.0	20.2	0.0	75 100	
Perfluorotridecanoic Acid	40.0	39.3	98	75-129	
(PFTriA) Perfluorotetradecanoic acid	40.0	36.7	92	82-115	
(PFTeA)	40.0	30.7	92	02-113	
Perfluorobutanesulfonic acid	35.4	36.3	103	87-120	
(PFBS)		30.5	100	0, 120	
Perfluorohexanesulfonic acid	36.4	35.0	96	81-106	
(PFHxS)					
Perfluoroheptanesulfonic Acid	38.1	34.4	90	80-117	
(PFHpS)					
Perfluorooctanesulfonic acid	37.1	33.5	90	82-112	
(PFOS)	20.6	25.2	0.1	01 114	
Perfluorodecanesulfonic acid (PFDS)	38.6	35.3	91	81-114	
Perfluorooctane Sulfonamide	40.0	40.5	101	85-114	
(FOSA)	40.0	40.5	101	05-114	
13C8 FOSA	100	69.4	69	50-150	
13C4 PFBA	100	80.1	80		
13C5 PFPeA	100	86.9	87		
13C2 PFHXA	100	86.4	86		
13C4-PFHpA	100	85.4	85		
13C4 PFOA	100	90.3	90		
13C4 PFOA 13C5 PFNA	100	90.0	90		
			1		
13C2 PFDA	100	85.8	86		
13C2 PFUnA	100	93.9	94		
13C2 PFDoA	100	82.4	82		
1802 PFHxS	94.6	75.6	80		
13C2-PFTeDA	100	82.0	82		
13C4 PFOS	95.6	81.8	86		
13C3-PFBS	93.0	73.0	78	50-150	

[#] Column to be used to flag recovery and RPD values FORM III EPA 537 (Mod)

FORM IV LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
SDG No.:	
Lab File ID: 2018.05.27LLADX_004.d	Lab Sample ID: MB 320-223615/1-A
Matrix: Water	Date Extracted: 05/16/2018 14:51
Instrument ID: A8_N	Date Analyzed: 05/28/2018 07:23
I.evel·(I.ow/Med) I.ow	

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

		LAB	
CLIENT SAMPLE ID	LAB SAMPLE ID	FILE ID	DATE ANALYZED
	LCS 320-223615/2-A	2018.05.27L	05/28/2018 07:31
		LADX 005.d	
TP-PFC-029-TPI	320-38875-1	2018.05.27L	05/28/2018 07:39
		LADX 006.d	
TP-PFC-029-MIDCARBON	320-38875-2	2018.05.27L	05/28/2018 07:47
		LADX 007.d	
TP-PFC-029-TPE	320-38875-3	2018.05.27L	05/28/2018 07:55
		LADX 008.d	
TP-PFC-029-TPE-D	320-38875-4	2018.05.27L	05/28/2018 08:02
		LADX 009.d	
TP-PFC-029-TPI DL	320-38875-1 DL	2018.05.28L	05/29/2018 00:09
		LA_056.d	

FORM VIII LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Sample No.: IC 320-223413/5 Date Analyzed: 05/15/2018 15:36

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

Lab File ID (Standard): 2017.05.15LLB_ICAL_ Heated Purge: (Y/N) N

Calibration ID: 39198

		13PF0	A				
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID	-POINT	4762237	2.73				
UPPER LIMIT		7143356	2.93				
LOWER LIMIT		2381119	2.53				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICB 320-223413/12		4812155	2.73				
ICV 320-223413/13		4485749	2.72				
CCV 320-225818/3 CCVIS		5150922	2.70				
CCV 320-225873/3 CCVIS		4833381	2.70				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area RT Limit = \pm 0.2 minutes of internal standard RT

 $\ensuremath{\text{\#}}$ Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Sample No.: CCV 320-225818/3 Date Analyzed: 05/28/2018 07:15

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

Lab File ID (Standard): $2018.05.27LLADX_003$ Heated Purge: (Y/N) N

Calibration ID: 39198

		13PF0	A				
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		5150922	2.70				
UPPER LIMIT		7726383	2.90				-
LOWER LIMIT		2575461	2.50				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-225818/1		4948330	2.70			İ	
CCVL 320-225818/2		4974159	2.70				
MB 320-223615/1-A		4525357	2.70				
LCS 320-223615/2-A		5050927	2.71				
320-38875-1	TP-PFC-029-TPI	3924419	2.70				
320-38875-2	TP-PFC-029-MIDCARBON	4817889	2.70				
320-38875-3	TP-PFC-029-TPE	5264580	2.70				
320-38875-4	TP-PFC-029-TPE-D	4741331	2.70				
CCV 320-225818/14		5195418	2.70				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area RT Limit = \pm 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Sample No.: CCV 320-225873/3 Date Analyzed: 05/28/2018 17:30

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

Lab File ID (Standard): $2018.05.28LLA_005.d$ Heated Purge: (Y/N) N

Calibration ID: 39198

		13PF0	A				
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	4833381	2.70					
UPPER LIMIT		7250072	2.90				
LOWER LIMIT		2416691	2.50				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-225873/1		4725130	2.69				
CCVL 320-225873/2		4921629	2.70				
CCV 320-225884/1		4945573	2.71				
320-38875-1 DL	TP-PFC-029-TPI DL	425723Q	2.71				
CCV 320-225884/11		4741080	2.71				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area RT Limit = \pm 0.2 minutes of internal standard RT

 $\ensuremath{\text{\#}}$ Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPI Lab Sample ID: 320-38875-1

Matrix: Water Lab File ID: 2018.05.27LLADX_006.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:20

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 290.5(mL) Date Analyzed: 05/28/2018 07:39

Con. Extract Vol.: 10 (mL) Dilution Factor: 1

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

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

Analysis Batch No.: 225818 Units: ng/L

		I				
CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	74	М	1.7	1.3	0.51
2706-90-3	Perfluoropentanoic acid (PFPeA)	200	М	1.7	0.86	0.37
307-24-4	Perfluorohexanoic acid (PFHxA)	360	E M	1.7	0.86	0.40
375-85-9	Perfluoroheptanoic acid (PFHpA)	76	М	1.7	1.3	0.52
335-67-1	Perfluorooctanoic acid (PFOA)	1500	E	1.7	1.3	0.46
375-95-1	Perfluorononanoic acid (PFNA)	2.4		1.7	1.3	0.45
335-76-2	Perfluorodecanoic acid (PFDA)	0.82	JМ	1.7	0.86	0.41
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U M	1.7	1.3	0.62
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.45
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.4	2.6	0.65
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.4	2.6	0.71
375-73-5	Perfluorobutanesulfonic acid (PFBS)	49	М	1.7	0.86	0.40
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	400	E	1.7	0.86	0.33
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	7.7		1.7	0.86	0.32
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	330	E	3.4	2.6	0.95
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.48
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.6	U M	3.4	2.6	1.1

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPI Lab Sample ID: 320-38875-1

Matrix: Water Lab File ID: 2018.05.27LLADX_006.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:20

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 290.5(mL) Date Analyzed: 05/28/2018 07:39

Con. Extract Vol.: 10 (mL) Dilution Factor: 1

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

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

Analysis Batch No.: 225818 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	81		50-150
STL00992	13C4 PFBA	83		50-150
STL01893	13C5 PFPeA	97		50-150
STL00993	13C2 PFHxA	95		50-150
STL01892	13C4-PFHpA	91		50-150
STL00990	13C4 PFOA	85		50-150
STL00995	13C5 PFNA	102		50-150
STL00996	13C2 PFDA	96		50-150
STL00997	13C2 PFUnA	101		50-150
STL00998	13C2 PFDoA	89		50-150
STL00994	1802 PFHxS	89		50-150
STL02116	13C2-PFTeDA	79		50-150
STL00991	13C4 PFOS	87		50-150
STL02337	13C3-PFBS	95		50-150

Report Date: 30-May-2018 11:04:55 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_006.d

Lims ID: 320-38875-A-1-A Client ID: TP-PFC-029-TPI

Sample Type: Client

Inject. Date: 28-May-2018 07:39:26 ALS Bottle#: 3 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-38875-a-1-a Misc. Info.: Plate: 1 Rack: 6

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 30-May-2018 11:04:54 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 11:04:53

First Level Reviewer: ruangyotsakuld					Date: 30-May-2018 11:04:53			13			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags	
2 Perfluorobuty 212.90 > 169.00 D 113C4 PFBA	1.461	1.452	0.009	1.000	3964404	2.14			1070	M M	
217.00 > 172.00	1.461	1.455	0.006	1.000	4973668	2.07		82.9	25766		
4 Perfluoropen 262.90 > 219.00	1.726	cid 1.720	0.006	1.000	10058089	5.70			2689	M M	
D 3 13C5-PFPe 267.90 > 223.00	1.726	1.725	0.001	0.561	3737827	2.43		97.2	24025		
5 Perfluorobuta 298.90 > 80.00 298.90 > 99.00		nic acid 1.756 1.756	0.015 0.006	1.005 1.000	3645364 1534230	1.42	2.38(1.25-3.74)		4340 3166	M M	
	1.762	1.761	0.001	1.000	76574	2.20		94.8	450		
D 7 13C2 PFHx 315.00 > 270.00		2.011	0.0	1.000	3879329	2.37		94.6	69806		
6 Perfluorohex 313.00 > 269.00 313.00 > 119.00	2.011	2.015 2.015	-0.004 0.007	1.000 1.006	16805071 1372335	10.5	12.25(5.03-15.10)		11898 16015	EM EM	
D 9 13C4-PFHp 367.00 > 322.00		2.342	0.013	1.000	3588033	2.28		91.3	46099		
10 Perfluoroher 363.00 > 319.00 363.00 > 169.00	2.342	acid 2.346 2.346	-0.004 -0.004	0.994 0.994	3326820 1284147	2.19	2.59(1.13-3.40)		3266 6925	M M	
D 11 18O2 PFHX 403.00 > 84.00	2.368	2.355	0.013	1.000	4094662	2.11		89.2	71310	_	
8 Perfluorohex 399.00 > 80.00 399.00 > 99.00		2.359 2.359 2.359	0.009	1.000 0.994	22403770 7262721	11.5	3.08(1.50-4.49)		31622 22525	E E	

Report Date: 30-May-2018 11:04:55 Chrom Revision: 2.2 11-May-2018 08:54:46

\\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_006.d Data File:

Data File.	NCIIIC	JIIINa\S	acramen	OCHIOIII	Dala\Ao_IN\201	00027-0003	3.0\2016.03.27LLAL	JA_006.	u	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFO	Δ									
417.00 > 372.00		2.695	0.008	1.000	3175517	2.14		85.5	48341	
15 Perfluorooc										E
413.00 > 369.00		2.698	0.005	1.000	63148695	42.2			17099	
413.00 > 169.00		2.698	0.005	1.000	42067563		1.50(0.84-2.52)		125353	
* 62 13C2-PFO	A									
415.00 > 370.00	2.703	2.698	0.005		3924419	2.50			51692	
16 Perfluorohe	ptanesul	fonic ac	id							
449.00 > 80.00	•	2.705	0.006	1.000	349223	0.2246			137	
449.00 > 99.00	2.711	2.705	0.006	1.000	109532		3.19(1.94-5.82)		314	
D 19 13C5 PFN	A									
468.00 > 423.00	3.074	3.063	0.011	1.000	3098062	2.55		102	71722	
D 18 13C4 PFO	S									
503.00 > 80.00	3.074	3.063	0.011	1.000	2790177	2.09		87.5	19653	
17 Perfluorooc	tane sulf	onic aci	d							E
499.00 > 80.00		3.070	0.004	1.000	13266857	9.67			30107	Е
499.00 > 99.00	3.074	3.070	0.004	1.000	2894860		4.58(2.31-6.93)		41876	
20 Perfluorono										
463.00 > 419.00		3.070	0.004	1.000	91929	0.0700	0.04/4.00.5.(0)		121	
463.00 > 169.00		3.070	0.004	1.000	23958		3.84(1.90-5.69)		98.5	
D 21 13C8 FOS		0.005	0.010	1 000	054/007	0.01		00.5	00111	
506.00 > 78.00		3.395	0.012	1.000	3516007	2.01		80.5	29416	
22 Perfluorooc				0.000	47//	0.000.404			10.0	M
498.00 > 78.00		3.402	-0.032	0.989	4766	0.003481			18.2	M
D 23 13C2 PFD		0.400	0.010	1 000	0.407000	0.44		04.0	10 (10	
515.00 > 470.00		3.422	0.013	1.000	2487082	2.41		96.2	43642	
24 Perfluorode			0.005	1 000	00475	0.0040				M
513.00 > 469.00		3.430	0.005	1.000	23175 4998	0.0240	4 4 4 (2 2 4 7 00)		63.1 35.2	N /I
513.00 > 169.00		3.430	0.014	1.003	4998		4.64(2.36-7.09)		33.2	M
D 30 13C2 PFU		2 740	0.014	1 000	2075004	2.54		101	42204	
565.00 > 520.00		3.748	0.014	1.000	2075894	2.54		101	42286	D. 4
31 Perfluoroun			0.000	1 000	2/05	0.002757			10.4	RM
563.00 > 519.00 563.00 > 169.00		3.753 3.753	0.009 0.009	1.000 1.000	2605 1502	0.003756	1.73(2.12-6.36)		13.4 61.2	RM
		3.733	0.009	1.000	1302		1.73(2.12-0.30)		01.2	
D 36 13C2 PFD 615.00 > 570.00		4.048	0.003	1.000	1959551	2.22		89.0	16691	
		7.040	0.003	1.000	1737331	۷.۷		07.0	10071	
D 43 13C2-PFT 715.00 > 670.00		4.542	0.010	1.000	2126513	1.97		78.6	11460	
113.00 > 010.00	4.002	4.342	0.010	1.000	2120010	1.7/		70.0	11400	

QC Flag Legend Processing Flags

R - Failed Signal Ratio Test

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 30-May-2018 11:04:55 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento Data File: \\ChromNa\\Sacramento\\ChromData\\A8_N\\20180527-58835.b\\2018.05.27LLADX_006.d **Injection Date:** 28-May-2018 07:39:26 Instrument ID: A8_N Lims ID: 320-38875-A-1-A Lab Sample ID: 320-38875-1 TP-PFC-029-TPI Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6 Dil. Factor: Injection Vol: 2.0 ul 1.0000 LC PFC_QSM5-1 ICAL Method: $A8_N$ Limit Group: 2 Perfluorobutyric acid (M) D 113C4 PFBA 4 Perfluoropentanoic acid (M) Exp1;m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x 24 Y (X100000) 75 20 60 45- 30 0.9 1.5 1.8 1.1 1.4 1.7 1.2 1.8 8.0 2.0 1.5 2.1 Min Min Min RT RT RT D 3 13C5-PFPeA 5 Perfluorobutanesulfonic acid (M) 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x 10 Y (X100000) Y (X100000) Y (X10000) 28 21 1.8 2.1 1.9 1.2 1.5 2.4 1.2 1.5 1.8 2.1 2.4 1.0 1.3 2.2 2.5 Min Min RT RT RT D 47 13C3-PFBS 7 13C2 PFHxA 6 Perfluorohexanoic acid (M) Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x 20 10 Y (X100000) (X100000) 35 16- Y (X1000) 28 12 21 2.3 2.0 2.6 2.6 1.4 17 2.0 1.7 1.7 2.0 1.1 1.4 2.3 1.4 2.3 Min RT RT RT 6 Perfluorohexanoic acid 9 13C4-PFHpA 10 Perfluoroheptanoic acid (M) Exp1:m/z 363.00 > 319.00:Moving5PtAverage_x Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 367.00 > 322.00:Moving5PtAverage_x 10 72 (X100000) 35 Y (X10000) Y (X10000) 60 28 48 21 36 24 2.4 1.7 2.0 2.4 1.4 2.3 2.6 1.5 1.8 2.1 2.7 1.8 2.1 2.7 Min RT RT RT Page 395 of 728

Chrom Revision: 2.2 11-May-2018 08:54:46

Report Date: 30-May-2018 11:04:55

Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 Y (X10000) Y (X10) Y (X10) 48 24 30 18 36 20 12 24 12 0 3.6 <u>Min</u> 3.3 3.9 4.5 3.3 3.9 4.5 3.9 2.7 2.7 3.3 4.2 4.5 Min Min RT RT RT

4.1

3.5

RT

4.7

Min

5.3

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_006.d

Client ID: TP-PFC-029-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

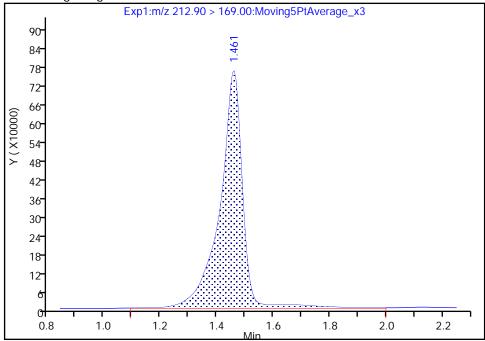
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

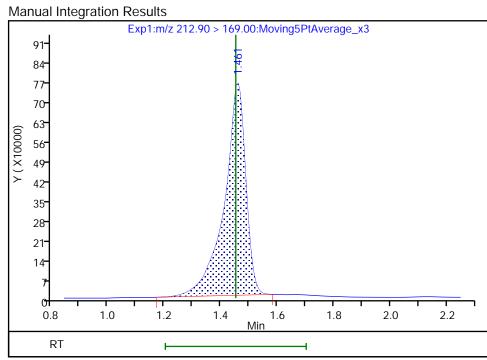
2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

RT: 1.46 Area: 4323660 Amount: 2.337276 Amount Units: ng/ml **Processing Integration Results**



RT: 1.46
Area: 3964404
Amount: 2.143070
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:02:04

Audit Action: Manually Integrated Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_006.d

Client ID: TP-PFC-029-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

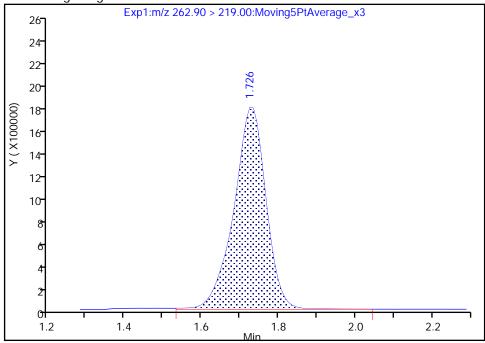
Column: Detector EXP1

4 Perfluoropentanoic acid, CAS: 2706-90-3

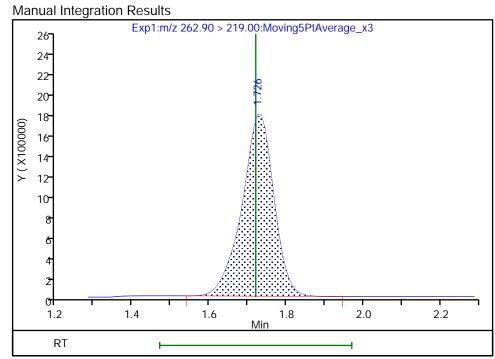
Signal: 1

RT: 1.73
Area: 10224040
Amount: 5.792621
Amount Units: ng/ml

Processing Integration Results



RT: 1.73
Area: 10058089
Amount: 5.698599
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:02:14

Audit Action: Manually Integrated Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_006.d

Client ID: TP-PFC-029-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

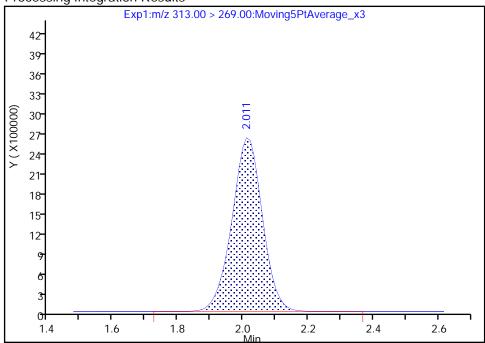
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

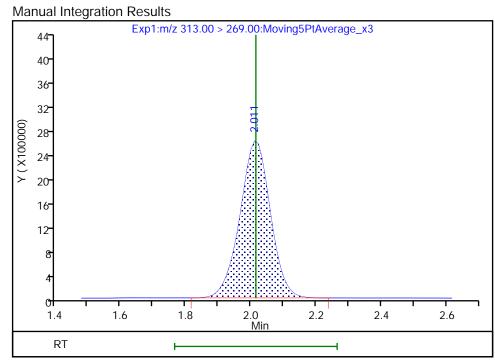
6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

RT: 2.01 Area: 16889018 Amount: 10.586014 Amount Units: ng/ml **Processing Integration Results**



RT: 2.01 Area: 16805071 Amount: 10.533396 Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:02:36

Audit Action: Manually Integrated

Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_006.d

Injection Date: 28-May-2018 07:39:26 Instrument ID: A8_N

Lims ID: 320-38875-A-1-A Lab Sample ID: 320-38875-1

Client ID: TP-PFC-029-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

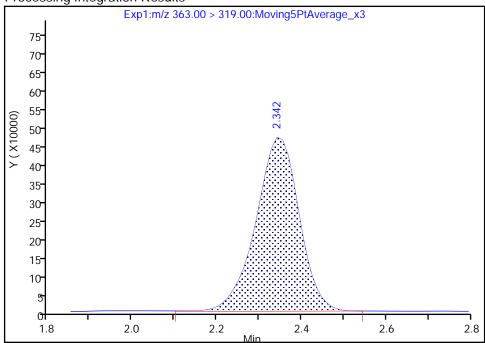
Column: Detector EXP1

10 Perfluoroheptanoic acid, CAS: 375-85-9

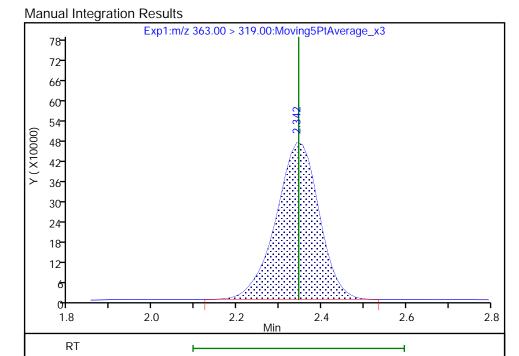
Signal: 1

RT: 2.34
Area: 3345829
Amount: 2.206951
Amount Units: ng/ml

Processing Integration Results



RT: 2.34
Area: 3326820
Amount: 2.194413
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:02:46

Audit Action: Manually Integrated Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_006.d

Client ID: TP-PFC-029-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

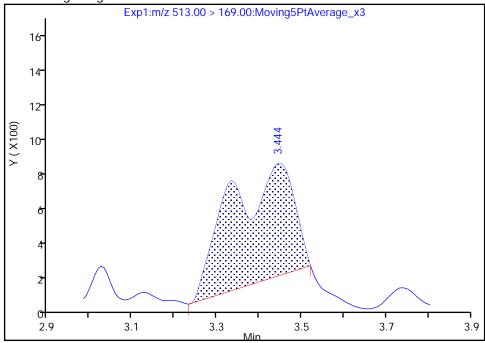
Column: Detector EXP1

24 Perfluorodecanoic acid, CAS: 335-76-2

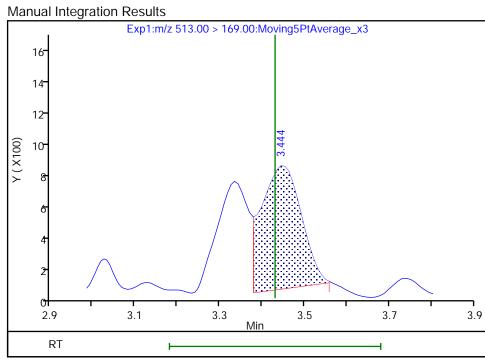
Signal: 2

RT: 3.44
Area: 6816
Amount: 0.023961
Amount Units: ng/ml

Processing Integration Results



RT: 3.44
Area: 4998
Amount: 0.023961
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:03:32

Audit Action: Manually Integrated

Audit Reason: Split Peak

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_006.d

Injection Date: 28-May-2018 07:39:26 Instrument ID: A8_N

Lims ID: 320-38875-A-1-A Lab Sample ID: 320-38875-1

Client ID: TP-PFC-029-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

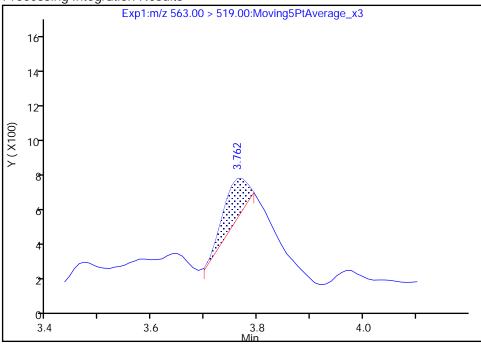
Column: Detector EXP1

31 Perfluoroundecanoic acid, CAS: 2058-94-8

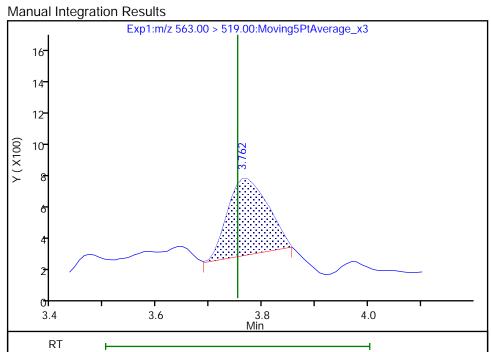
Signal: 1

RT: 3.76 Area: 733 Amount: 0.001

Amount: 0.001057 Amount Units: ng/ml Processing Integration Results



RT: 3.76
Area: 2605
Amount: 0.003756
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:03:48

Audit Action: Manually Integrated

Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \\ChromNa\\Sacramento\\ChromData\\A8_N\\20180527-58835.b\\2018.05.27LLADX_006.d

Injection Date: 28-May-2018 07:39:26 Instrument ID: $A8_N$ Lims ID: 320-38875-A-1-A Lab Sample ID: 320-38875-1

Client ID: TP-PFC-029-TPI

SACINSTLCMS01 ALS Bottle#: Operator ID: 3 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

LC PFC_QSM5-1 ICAL Method: A8_N Limit Group:

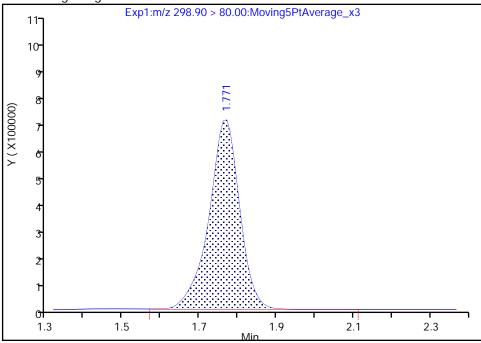
Column: Detector EXP1

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

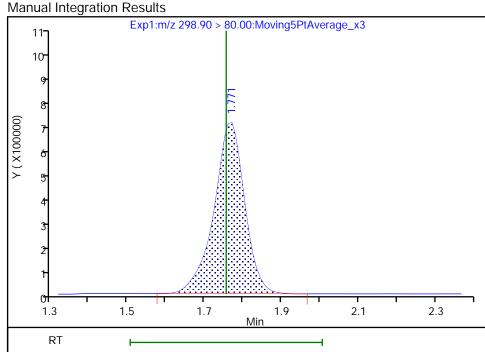
Signal: 1

RT: 1.77 Area: 3675805 Amount: 1.429191 Amount Units: ng/ml

Processing Integration Results



RT: 1.77 Area: 3645364 Amount: 1.417355 Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:02:25

Audit Action: Manually Integrated

Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_006.d

Client ID: TP-PFC-029-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

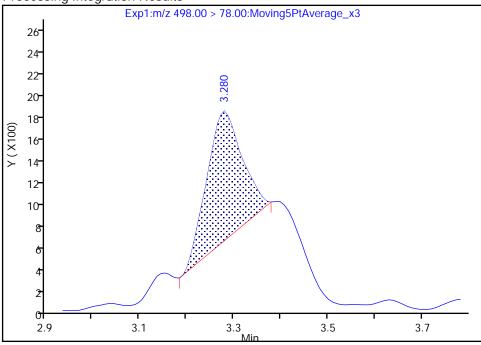
Column: Detector EXP1

22 Perfluorooctane Sulfonamide, CAS: 754-91-6

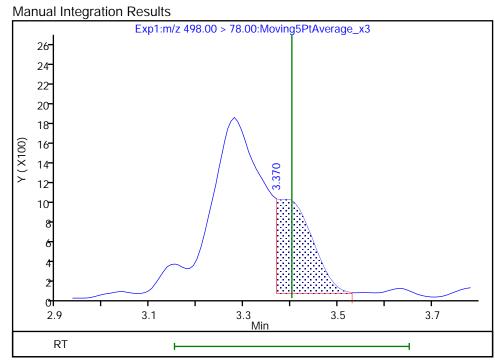
Signal: 1

RT: 3.28
Area: 6138
Amount: 0.004483
Amount Units: ng/ml

Processing Integration Results



RT: 3.37
Area: 4766
Amount: 0.003481
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:03:16

Audit Action: Manually Integrated

Audit Reason: Wrong peak

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPI DL Lab Sample ID: 320-38875-1 DL

Matrix: Water Lab File ID: 2018.05.28LLA_056.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:20

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 290.5(mL) Date Analyzed: 05/29/2018 00:09

Con. Extract Vol.: 10 (mL) Dilution Factor: 10

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

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

Analysis Batch No.: 225884 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	81	D	17	13	5.1
2706-90-3	Perfluoropentanoic acid (PFPeA)	200	D	17	8.6	3.7
307-24-4	Perfluorohexanoic acid (PFHxA)	380	D	17	8.6	4.0
375-85-9	Perfluoroheptanoic acid (PFHpA)	73	D	17	13	5.2
335-67-1	Perfluorooctanoic acid (PFOA)	1700	D	17	13	4.6
375-95-1	Perfluorononanoic acid (PFNA)	13	U	17	13	4.5
335-76-2	Perfluorodecanoic acid (PFDA)	8.6	U	17	8.6	4.1
2058-94-8	Perfluoroundecanoic acid (PFUnA)	13	U	17	13	6.2
307-55-1	Perfluorododecanoic acid (PFDoA)	13	U	17	13	4.5
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	26	U	34	26	6.5
376-06-7	Perfluorotetradecanoic acid (PFTeA)	26	U	34	26	7.1
375-73-5	Perfluorobutanesulfonic acid (PFBS)	50	D	17	8.6	4.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	410	D	17	8.6	3.3
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	8.7	JD	17	8.6	3.2
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	330	D	34	26	9.5
335-77-3	Perfluorodecanesulfonic acid (PFDS)	13	U	17	13	4.8
754-91-6	Perfluorooctane Sulfonamide (FOSA)	26	U	34	26	11

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPI DL Lab Sample ID: 320-38875-1 DL

Matrix: Water Lab File ID: 2018.05.28LLA_056.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:20

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 290.5(mL) Date Analyzed: 05/29/2018 00:09

Con. Extract Vol.: 10 (mL) Dilution Factor: 10

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

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

Analysis Batch No.: 225884 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	73		50-150
STL00992	13C4 PFBA	78		50-150
STL01893	13C5 PFPeA	84		50-150
STL00993	13C2 PFHxA	81		50-150
STL01892	13C4-PFHpA	81		50-150
STL00990	13C4 PFOA	87		50-150
STL00995	13C5 PFNA	86		50-150
STL00996	13C2 PFDA	83		50-150
STL00997	13C2 PFUnA	90		50-150
STL00998	13C2 PFDoA	87		50-150
STL00994	1802 PFHxS	80		50-150
STL02116	13C2-PFTeDA	69		50-150
STL00991	13C4 PFOS	75		50-150
STL02337	13C3-PFBS	76		50-150

Report Date: 30-May-2018 13:12:41 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\2018.05.28LLA_056.d

Lims ID: 320-38875-A-1-A Client ID: TP-PFC-029-TPI

Sample Type: Client

Inject. Date: 29-May-2018 00:09:41 ALS Bottle#: 39 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 10.0000

Sample Info: 320-38875-a-1-a 10X (#223615)

Misc. Info.: Plate: 1 Rack: 3

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 30-May-2018 13:11:52 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 13:12:40

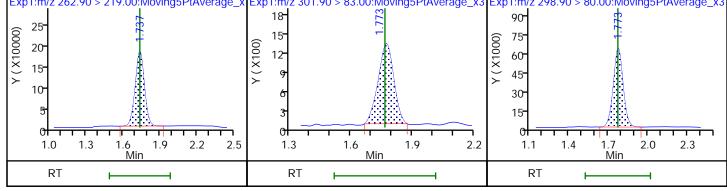
First Level Revie	ewer: rua	ngyotsal	Kuld	Date: 30-May-2018 13:12:40						
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFB	Δ									
217.00 > 172.00		1.458	0.005	1.000	510148	0.1960		78.4	3528	
2 Perfluorobu	tyric acid									
212.90 > 169.00	,	1.461	0.002	1.000	443786	0.2339			194	
D 3 13C5-PFP	eA									
267.90 > 223.00	0 1.737	1.730	0.007	0.563	348559	0.2089		83.6	5310	
4 Perfluorope	ntanoic a	cid								
262.90 > 219.00	0 1.737	1.734	0.003	1.000	950047	0.5772			541	
D 47 13C3-PFE										
301.90 > 83.00	1.773	1.766	0.007	1.000	6644	0.1762		75.8	65.6	
5 Perfluorobu										
298.90 > 80.00		1.770	0.003	1.000	326750	0.1464	2 21/1 25 2 74)		1291	
298.90 > 99.00		1.770	0.003	1.000	141213		2.31(1.25-3.74)		1019	
D 7 13C2 PFH 315.00 > 270.00		2.016	0.009	1.000	360061	0.2024		81.0	8842	
6 Perfluorohe			0.009	1.000	300001	0.2024		01.0	0042	
313.00 > 269.00		2.022	0.003	1.000	1641512	1.11			2527	
313.00 > 119.00		2.022	0.003	1.000	130014		12.63(5.03-15.10)		1850	
D 913C4-PFH	Aq						, ,			
367.00 > 322.00	•	2.347	0.011	1.000	345963	0.2030		81.2	8041	
10 Perfluorohe	eptanoic a	acid								
363.00 > 319.00	2.358	2.355	0.003	1.000	311364	0.2130			395	
363.00 > 169.00	2.358	2.355	0.003	1.000	128082		2.43(1.13-3.40)		764	
D 11 1802 PFF	lxS									
403.00 > 84.00	2.371	2.360	0.011	1.000	397005	0.1885		79.7	9407	
8 Perfluorohe										
399.00 > 80.00		2.368	0.003	1.000	2225980	1.18	0.44(4.50.4.40)		7347	
399.00 > 99.00	2.371	2.368	0.003	1.000	708688		3.14(1.50-4.49)		3134	

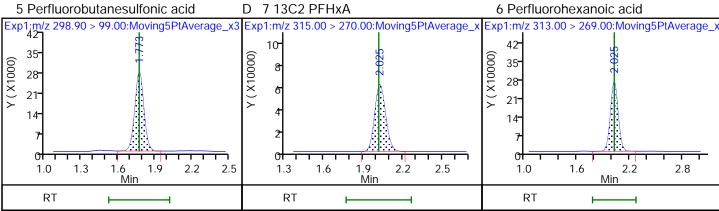
Data File:	\\Chr	omNa\Sa	acrament	:o\Chrom	Data\A8_N\201	80529-58849	9.b\2018.05.28LLA_	_056.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFO	^		•						•	
417.00 > 372.00		2.706	0.006	1.000	350956	0.2177		87.1	8255	
15 Perfluorooct										
413.00 > 369.00		2.711	0.001	1.000	8390762	5.08			3247	
413.00 > 169.00	2.712	2.711	0.001	1.000	4826560		1.74(0.84-2.52)		15312	
* 62 13C2-PFOA	١									
415.00 > 370.00	2.712	2.711	0.001		425723	0.2500			9942	
16 Perfluoroher	otanesul	fonic aci	d							
449.00 > 80.00		2.718	0.001	1.000	36400	0.0253			118	
449.00 > 99.00		2.718	0.001	1.000	13104		2.78(1.94-5.82)		155	
D 19 13C5 PFNA										
468.00 > 423.00		3.076	0.008	1.000	282433	0.2142		85.7	8409	
D 18 13C4 PFOS		0.07/	0.000	1 000	050400	0.4707			0111	
503.00 > 80.00		3.076	0.008	1.000	258620	0.1786		74.7	2661	
17 Perfluorooct				1 000	1225221	0.0/21			4407	
499.00 > 80.00 499.00 > 99.00	3.084	3.079 3.079	0.005 0.005	1.000 1.000	1225321 281337	0.9631	4.36(2.31-6.93)		4427 2912	
20 Perfluoronor			0.000	1.000	201007		4.00(2.01 0.70)		2712	R
463.00 > 419.00		3.079	0.005	1.000	11744	0.009814			26.6	R
463.00 > 169.00		3.079	0.005	1.000	1105	0.007011	10.63(1.90-5.69)		22.6	
D 21 13C8 FOSA	Д						,			
506.00 > 78.00		3.411	0.009	1.000	346362	0.1828		73.1	6753	
D 23 13C2 PFDA	4									
515.00 > 470.00	3.448	3.439	0.009	1.000	232085	0.2069		82.8	7540	
D 30 13C2 PFUr	nΑ									
565.00 > 520.00	3.774	3.763	0.011	1.000	199622	0.2247		89.9	7504	
D 36 13C2 PFD	ρA									
615.00 > 570.00	4.061	4.051	0.010	1.000	208972	0.2186		87.4	2498	
D 43 13C2-PFTe	eDA									
715.00 > 670.00	4.562	4.553	0.009	1.000	201434	0.1717		68.7	1412	

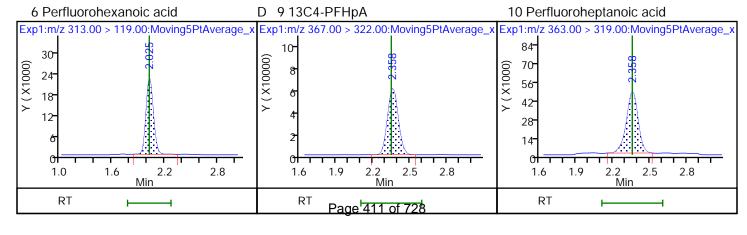
QC Flag Legend Processing Flags

R - Failed Signal Ratio Test

Report Date: 30-May-2018 13:12:41 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento \ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\2018.05.28LLA_056.d Data File: **Injection Date:** 29-May-2018 00:09:41 Instrument ID: A8_N Lims ID: 320-38875-A-1-A Lab Sample ID: 320-38875-1 TP-PFC-029-TPI Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 39 Worklist Smp#: 2 Injection Vol: Dil. Factor: 2.0 ul 10.0000 Method: LC PFC_QSM5-1 ICAL $A8_N$ Limit Group: D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA Exp1;m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x Exp1;m/z 217.00 > 172.00:Moving5PtAverage_x Y (X10000) Y (X10000) 1.2 1.5 1.8 1.1 1.4 1.7 2.0 1.4 2.0 2.3 Min Min Min RT RT RT 4 Perfluoropentanoic acid D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 18 90 Y (X10000) 20 12 60 15 45- 10 30 15-







Chrom Revision: 2.2 11-May-2018 08:54:46

Report Date: 30-May-2018 13:12:41

3.3

3.9

Min

4.5

14

2.7

RT

3.3

3.9

Min

4.5

10

2.7

RT

3.3

2.7

RT

3.9

Min

4.5

4.1

3.5

RT

4.7

Min

5.3

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-MIDCARBON Lab Sample ID: 320-38875-2

Matrix: Water Lab File ID: 2018.05.27LLADX_007.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:25

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 292.8(mL) Date Analyzed: 05/28/2018 07:47

Con. Extract Vol.: 10 (mL) Dilution Factor: 1

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

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

Analysis Batch No.: 225818 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.7	1.3	0.50
2706-90-3	Perfluoropentanoic acid (PFPeA)	240	М	1.7	0.85	0.37
307-24-4	Perfluorohexanoic acid (PFHxA)	160	М	1.7	0.85	0.40
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.8		1.7	1.3	0.52
335-67-1	Perfluorooctanoic acid (PFOA)	39	М	1.7	1.3	0.46
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.7	1.3	0.44
335-76-2	Perfluorodecanoic acid (PFDA)	0.85	U	1.7	0.85	0.41
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	1.3	0.61
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.44
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.4	2.6	0.65
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.4	2.6	0.71
375-73-5	Perfluorobutanesulfonic acid (PFBS)	5.5		1.7	0.85	0.39
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.5		1.7	0.85	0.32
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.85	U	1.7	0.85	0.32
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	U M	3.4	2.6	0.94
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.48
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.6	U	3.4	2.6	1.1

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-MIDCARBON Lab Sample ID: 320-38875-2

Matrix: Water Lab File ID: 2018.05.27LLADX_007.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:25

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 292.8(mL) Date Analyzed: 05/28/2018 07:47

Con. Extract Vol.: 10 (mL) Dilution Factor: 1

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

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

Analysis Batch No.: 225818 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	67		50-150
STL00992	13C4 PFBA	73		50-150
STL01893	13C5 PFPeA	76		50-150
STL00993	13C2 PFHxA	78		50-150
STL01892	13C4-PFHpA	75		50-150
STL00990	13C4 PFOA	78		50-150
STL00995	13C5 PFNA	82		50-150
STL00996	13C2 PFDA	77		50-150
STL00997	13C2 PFUnA	74		50-150
STL00998	13C2 PFDoA	66		50-150
STL00994	1802 PFHxS	77		50-150
STL02116	13C2-PFTeDA	60		50-150
STL00991	13C4 PFOS	73		50-150
STL02337	13C3-PFBS	72		50-150

Report Date: 30-May-2018 11:07:15 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_007.d

Lims ID: 320-38875-A-2-A

Client ID: TP-PFC-029-MIDCARBON

Sample Type: Client

Inject. Date: 28-May-2018 07:47:16 ALS Bottle#: 4 Worklist Smp#: 7

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-38875-a-2-a Misc. Info.: Plate: 1 Rack: 6

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 30-May-2018 11:07:14 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 11:07:14

FIRST Level Reviewer: ruangyotsakuld					Date:	3	Ю-мау-2018 11:07:1	ı 4		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	-									
212.90 > 169.00		1.452	0.003	1.000	7410550	3.72			3460	
D 113C4 PFBA 217.00 > 172.00		1.455	0.0	1.000	5356174	1.82		72.7	33115	
4 Perfluoroper			0.0	1.000	3330174	1.02		12.1	33113	M
262.90 > 219.00		1.720	0.005	1.000	12044749	7.14			7484	M
D 3 13C5-PFPe	eΑ									
267.90 > 223.00		1.725	0.0	0.561	3571036	1.89		75.6	41636	
5 Perfluorobut			0.014	1 005	20000	0.1/12			2110	
298.90 > 80.00 298.90 > 99.00		1.756 1.756	0.014 0.005	1.005 1.000	388995 182540	0.1613	2.13(1.25-3.74)		2119 1946	
D 47 13C3-PFB							,			
301.90 > 83.00	1.761	1.761	0.0	1.000	71798	1.68		72.4	627	
D 7 13C2 PFHx										
315.00 > 270.00		2.011	0.011	1.000	3930160	1.95		78.1	79178	N 4
6 Perfluorohex 313.00 > 269.00		2.015	-0.005	0.994	7386047	4.57			11803	M M
313.00 > 119.00		2.015	0.007	1.000	515060	1.07	14.34(5.03-15.10)		5509	
D 913C4-PFHp										
367.00 > 322.00		2.342	0.013	1.000	3622705	1.88		75.1	60085	
10 Perfluorohe 363.00 > 319.00	•	acid 2.346	-0.004	0.994	306721	0.2004			355	
363.00 > 319.00 363.00 > 169.00		2.346	-0.004	0.994	124433	0.2004	2.46(1.13-3.40)		355 478	
D 11 18O2 PFH							,			
403.00 > 84.00	2.368	2.355	0.013	1.000	4354232	1.83		77.2	82258	
8 Perfluorohex										
399.00 > 80.00 399.00 > 99.00	2.355 2.355	2.359 2.359	-0.004 -0.004	0.994 0.994	154309 46222	0.0744	3.34(1.50-4.49)		726 321	
377.00 > 77.00	2.000	2.007	0.004	5.774	70222		3.34(1.30-4.47)		JZ 1	

Report Date: 30-May-2018 11:07:15 Chrom Revision: 2.2 11-May-2018 08:54:46

Report Bate. 00 Ma	19 2010 11.07.10	Official Revision, 2.2	Way 2010 00.01.10
Data File:	\\ChromNa\Sacramento\ChromData	\A8_N\20180527-58835.b	\2018.05.27LLADX_007.d

<u> </u>	,,,,,,,,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				0002. 0000	31.0 (20 1010012 122 12			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFO	Д									
417.00 > 372.00	2.703	2.695	0.008	1.000	3553006	1.95		77.9	51728	
15 Perfluorooct			0.005	1 000	1001050				4.40	M
413.00 > 369.00 413.00 > 169.00		2.698 2.698	0.005 0.005	1.000 1.000	1904959 1281257	1.14	1.49(0.84-2.52)		468 2476	M
* 62 13C2-PFOA		2.070	0.003	1.000	1201257		1.49(0.04-2.32)		2470	
415.00 > 370.00		2.698	0.005		4817889	2.50			65421	
D 19 13C5 PFNA										
468.00 > 423.00		3.063	0.010	1.000	3069445	2.06		82.3	67768	
D 18 13C4 PFOS	S									
503.00 > 80.00	3.073	3.063	0.010	1.000	2860842	1.75		73.1	23775	
17 Perfluorooct										М
499.00 > 80.00 499.00 > 99.00	2.951		-0.119 -0.004	0.960 0.998	31021 7385	0.0220	4.20(2.31-6.93)		115 64.2	M M
D 21 13C8 FOSA		3.070	-0.004	0.996	7365		4.20(2.31-0.93)		04.2	IVI
506.00 > 78.00		3.395	0.012	1.000	3597538	1.68		67.1	51353	
22 Perfluorooct										
498.00 > 78.00	3.407	3.402	0.005	1.000	3263	0.002329			73.5	
D 23 13C2 PFD	4									
515.00 > 470.00	3.435	3.422	0.013	1.000	2429082	1.91		76.5	40350	
D 30 13C2 PFUr										
565.00 > 520.00		3.748	0.012	1.000	1864328	1.85		74.2	49729	
D 36 13C2 PFDc		4.040	0.010	1 000	1701402	1 / 5		/ F 0	15005	
615.00 > 570.00		4.048	0.012	1.000	1781483	1.65		65.9	15025	Б
37 Perfluorodoo 613.00 > 569.00		4.051	0.009	1.000	2204	0.002964			3.2	R R
613.00 > 169.00		4.051	0.009	1.000	1504	0.002701	1.47(2.13-6.40)		20.9	
D 43 13C2-PFTe	eDA						•			
715.00 > 670.00	4.552	4.542	0.010	1.000	2000859	1.51		60.3	12665	

QC Flag Legend Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 30-May-2018 11:07:15 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_007.d Data File: **Injection Date:** 28-May-2018 07:47:16 Instrument ID: A8_N Lims ID: 320-38875-A-2-A Lab Sample ID: 320-38875-2 TP-PFC-029-MIDCARBON Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: Worklist Smp#: 7 Injection Vol: Dil. Factor: 2.0 ul 1.0000 Method: LC PFC_QSM5-1 ICAL $A8_N$ Limit Group: 2 Perfluorobutyric acid D 113C4 PFBA 4 Perfluoropentanoic acid (M) Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x 20 Y (X100000) Y (X100000) Y (X100000) 30 12 16 24 12 18 1.1 1.7 2.0 0.9 1.2 1.5 1.8 1.3 1.9 2.2 2.5 Min Min Min RT RT RT 5 Perfluorobutanesulfonic acid D 3 13C5-PFPeA 5 Perfluorobutanesulfonic acid Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x Exp1;m/z 298.90 > 80.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 54 Y (X100000) Y (X10000) 45 36 18 2.3 2.0 1.7 2.0 1.9 1.1 1.4 1.7 1.1 1.4 2.3 1.0 1.3 1.6 2.2 2.5 Min Min RT RT RT D 47 13C3-PFBS 7 13C2 PFHxA 6 Perfluorohexanoic acid (M) Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Y (X100000) Y (X100000) 15 10 Y (X1000 16- 12 2.1 1.8 1.5 1.8 2.1 1.5 1.8 2.1 2.4 1.5 2.4 2.7 2.4 1.2 2.7 Min RT RT RT 6 Perfluorohexanoic acid 9 13C4-PFHpA 10 Perfluoroheptanoic acid Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1;m/z 367.00 > 322.00:Moving5PtAverage_> Exp1:m/z 363.00 > 319.00:Moving5PtAverage_x 60 (X100000) Y (X10000) 50 Y (X1000) 12 40 30 20 1.9 2.4 1.8 2.2 2.8 1.8 2.1 2.1 2.7 1.3 1.6 2.5 1.5 2.7 1.5 2.4 3.0 Min Min

RT

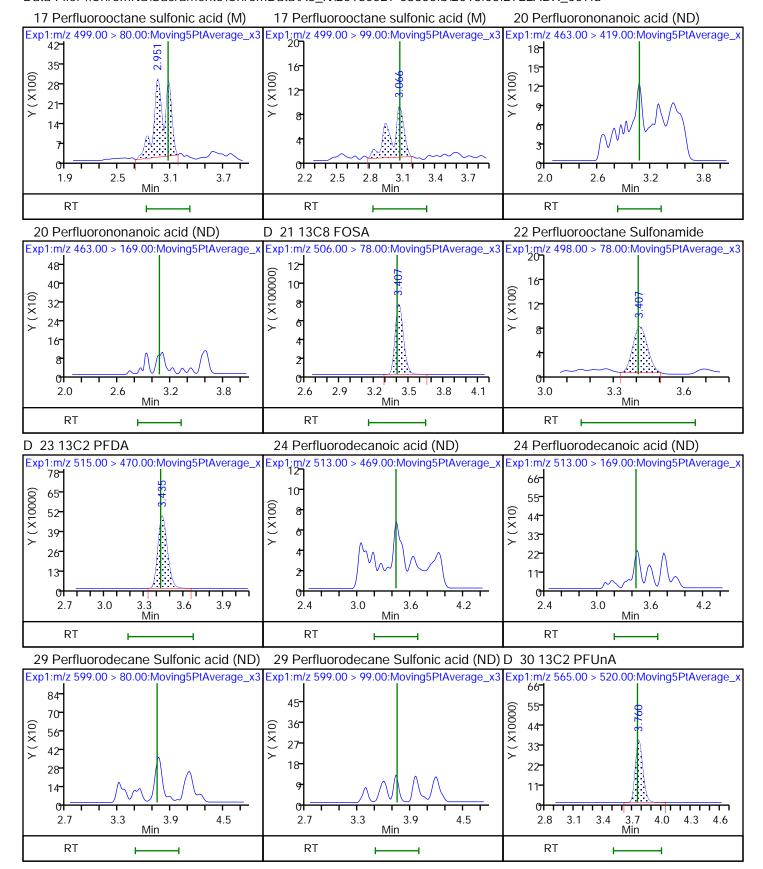
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RT

RT

Chrom Revision: 2.2 11-May-2018 08:54:46

Report Date: 30-May-2018 11:07:15



4.1

3.5

RT

4.7

Min

5.3

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_007.d

Injection Date: 28-May-2018 07:47:16 Instrument ID: A8_N

Lims ID: 320-38875-A-2-A Lab Sample ID: 320-38875-2

Client ID: TP-PFC-029-MIDCARBON

Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7

Injection Vol: 2.0 ul Dil. Factor: 1.0000

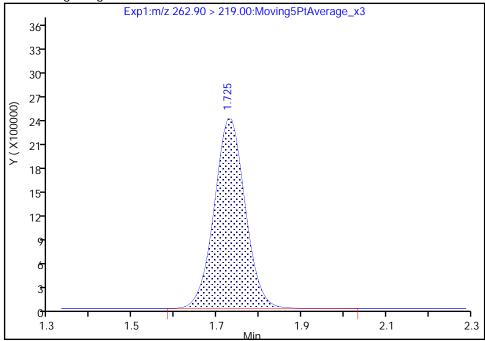
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

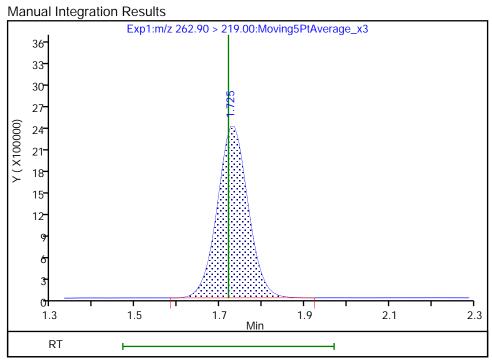
4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

RT: 1.73 Area: 12076036 Amount: 7.161467 Amount Units: ng/ml **Processing Integration Results**



RT: 1.73
Area: 12044749
Amount: 7.142912
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:05:27

Audit Action: Manually Integrated Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_007.d

Injection Date: 28-May-2018 07:47:16 Instrument ID: A8_N

Lims ID: 320-38875-A-2-A Lab Sample ID: 320-38875-2

Client ID: TP-PFC-029-MIDCARBON

Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7

Injection Vol: 2.0 ul Dil. Factor: 1.0000

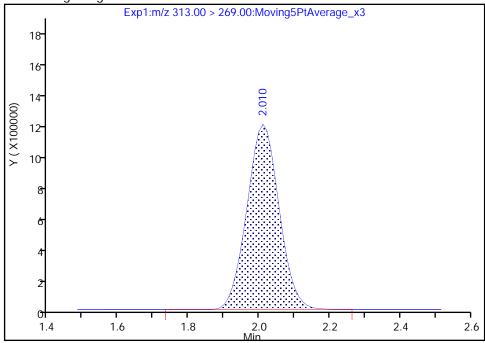
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

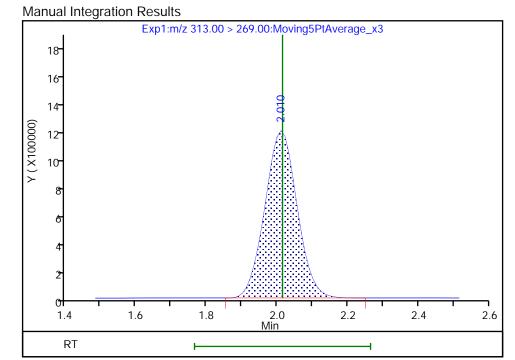
6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

RT: 2.01 Area: 7403512 Amount: 4.580493 Amount Units: ng/ml **Processing Integration Results**



RT: 2.01 Area: 7386047 Amount: 4.569687 Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:05:42

Audit Action: Manually Integrated

Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_007.d

Injection Date: 28-May-2018 07:47:16 Instrument ID: A8_N

Lims ID: 320-38875-A-2-A Lab Sample ID: 320-38875-2

Client ID: TP-PFC-029-MIDCARBON

Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7

Injection Vol: 2.0 ul Dil. Factor: 1.0000

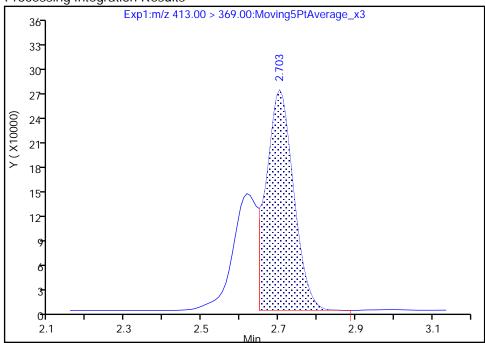
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

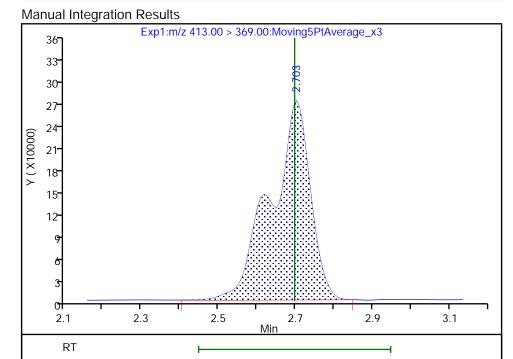
15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

RT: 2.70 Area: 1283939 Amount: 0.767540 Amount Units: ng/ml **Processing Integration Results**



RT: 2.70 Area: 1904959 Amount: 1.138786 Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:05:59

Audit Action: Manually Integrated Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_007.d

Injection Date: 28-May-2018 07:47:16 Instrument ID: A8_N

Lims ID: 320-38875-A-2-A Lab Sample ID: 320-38875-2

Client ID: TP-PFC-029-MIDCARBON

Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7

Injection Vol: 2.0 ul Dil. Factor: 1.0000

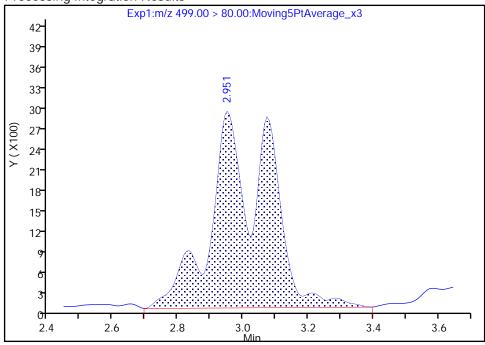
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

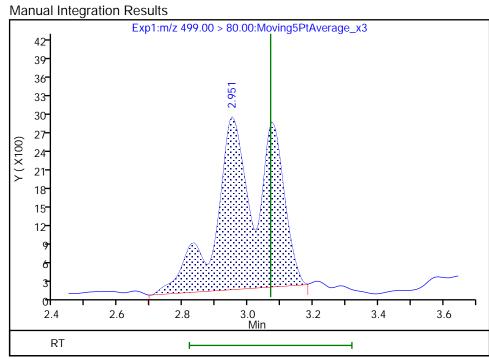
17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

RT: 2.95 Area: 34559 Amount: 0.024555 Amount Units: ng/ml **Processing Integration Results**



RT: 2.95
Area: 31021
Amount: 0.022041
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:06:18

Audit Action: Manually Integrated Audit Reason: Baseline

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Chrom Revision: 2.2 11-May-2018 08:54:46 Report Date: 30-May-2018 11:07:15 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

\\ChromNa\\Sacramento\\ChromData\\A8_N\\20180527-58835.b\\2018.05.27LLADX_007.d Data File:

Injection Date: 28-May-2018 07:47:16 Instrument ID: $A8_N$

Lims ID: 320-38875-A-2-A Lab Sample ID: 320-38875-2

TP-PFC-029-MIDCARBON Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: Worklist Smp#: 7

Injection Vol: Dil. Factor: 1.0000 2.0 ul

LC PFC_QSM5-1 ICAL Method: A8 N Limit Group:

Column: Detector EXP1

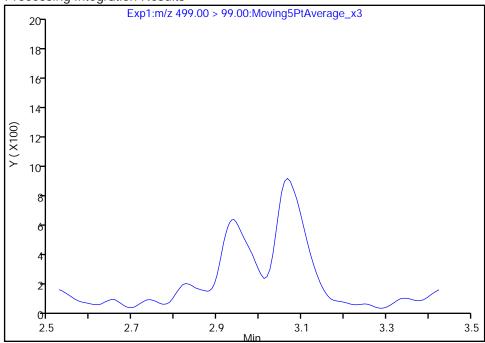
17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

RT: 3.07 Area: 0

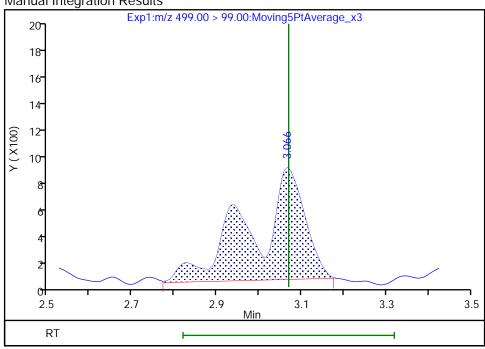
Amount: 0.024555 Amount Units: ng/ml

Processing Integration Results



RT: 3.07 Area: 7385 0.022041 Amount: Amount Units: ng/ml





Reviewer: ruangyotsakuld, 30-May-2018 11:06:26

Audit Action: Manually Integrated

Audit Reason: Assign Peak

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPE Lab Sample ID: 320-38875-3

Matrix: Water Lab File ID: 2018.05.27LLADX_008.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:30

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 272.9(mL) Date Analyzed: 05/28/2018 07:55

Con. Extract Vol.: 10 (mL) Dilution Factor: 1

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

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

Analysis Batch No.: 225818 Units: ng/L

		I	1			
CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.8	1.4	0.54
2706-90-3	Perfluoropentanoic acid (PFPeA)	190	М	1.8	0.92	0.39
307-24-4	Perfluorohexanoic acid (PFHxA)	78		1.8	0.92	0.43
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.3	J	1.8	1.4	0.56
335-67-1	Perfluorooctanoic acid (PFOA)	2.6	М	1.8	1.4	0.49
375-95-1	Perfluorononanoic acid (PFNA)	1.4	U	1.8	1.4	0.48
335-76-2	Perfluorodecanoic acid (PFDA)	0.92	Ū	1.8	0.92	0.44
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.4	Ū	1.8	1.4	0.66
307-55-1	Perfluorododecanoic acid (PFDoA)	1.4	Ū	1.8	1.4	0.48
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.7	Ū	3.7	2.7	0.70
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.7	U	3.7	2.7	0.76
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.4	J	1.8	0.92	0.42
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.68	J	1.8	0.92	0.35
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.92	Ū	1.8	0.92	0.34
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	J M	3.7	2.7	1.0
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.4	U	1.8	1.4	0.51
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.7	U	3.7	2.7	1.2

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

 SDG No.:
 Client Sample ID: TP-PFC-029-TPE
 Lab Sample ID: 320-38875-3

 Matrix: Water
 Lab File ID: 2018.05.27LLADX_008.d

 Analysis Method: EPA 537 (Mod)
 Date Collected: 05/03/2018 09:30

Dilution Factor: 1

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 272.9(mL) Date Analyzed: 05/28/2018 07:55

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

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

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

Analysis Batch No.: 225818 Units: ng/L

Con. Extract Vol.: 10 (mL)

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	64		50-150
STL00992	13C4 PFBA	72		50-150
STL01893	13C5 PFPeA	76		50-150
STL00993	13C2 PFHxA	74		50-150
STL01892	13C4-PFHpA	74		50-150
STL00990	13C4 PFOA	79		50-150
STL00995	13C5 PFNA	81		50-150
STL00996	13C2 PFDA	72		50-150
STL00997	13C2 PFUnA	78		50-150
STL00998	13C2 PFDoA	69		50-150
STL00994	1802 PFHxS	73		50-150
STL02116	13C2-PFTeDA	60		50-150
STL00991	13C4 PFOS	73		50-150
STL02337	13C3-PFBS	72		50-150

Report Date: 30-May-2018 11:09:04 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_008.d

Lims ID: 320-38875-A-3-A Client ID: TP-PFC-029-TPE

Sample Type: Client

Inject. Date: 28-May-2018 07:55:06 ALS Bottle#: 5 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-38875-a-3-a Misc. Info.: Plate: 1 Rack: 6

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 30-May-2018 11:09:04 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 11:09:04

First Level Reviewer: ruangyotsakuld						Date:	3	iu-may-2018 11:09:0)4		
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	2 Perfluorobuty	yric acid									
	212.90 > 169.00		1.452	0.0	1.000	7812741	3.63			3920	
	D 113C4 PFBA		4.55	0.000	1 000	5702000	1.00		70.0	21/40	
	217.00 > 172.00		1.455	-0.003	1.000	5793990	1.80		72.0	31649	N //
	4 Perfluoropen 262.90 > 219.00		1.720	0.009	1.000	9526856	5.15			6272	M M
	D 3 13C5-PFPe										
	267.90 > 223.00	1.729	1.725	0.004	0.563	3915452	1.90		75.9	52708	
	5 Perfluorobuta										
	298.90 > 80.00 298.90 > 99.00		1.756 1.756	0.0	1.000 1.000	102294 51850	0.0389	1 07/1 25 2 74)		549	
	D 47 13C3-PFB		1.750	0.0	1.000	51850		1.97(1.25-3.74)		416	
	301.90 > 83.00		1.761	-0.005	1.000	78366	1.68		72.3	835	
	D 7 13C2 PFHx										
	315.00 > 270.00	2.014	2.011	0.003	1.000	4069089	1.85		74.0	65929	
	6 Perfluorohex										R
	313.00 > 269.00 313.00 > 119.00		2.015 2.015	-0.012 -0.001	0.994 1.000	3550551 197568	2.12	17.97(5.03-15.10)		6288 2922	R
	D 9 13C4-PFHp		2.013	-0.001	1.000	177300		17.77(3.03-13.10)		2722	
	367.00 > 322.00		2.342	0.003	1.000	3884067	1.84		73.7	58259	
	10 Perfluorohe	ptanoic a	acid								
	363.00 > 319.00		2.346	-0.040	0.983	56629	0.0345	0.00(4.40.0.40)		49.5	
	363.00 > 169.00		2.346	-0.079	0.967	24429		2.32(1.13-3.40)		88.9	
	D 11 18O2 PFH: 403.00 > 84.00		2.355	0.003	1.000	4467450	1.71		72.5	92832	
	8 Perfluorohex				1.000	4407430	1.7 1		72.0	72002	
	399.00 > 80.00		2.359	-0.001	1.000	39572	0.0186			185	
	399.00 > 99.00	2.345	2.359	-0.014	0.994	10664		3.71(1.50-4.49)		61.3	

Report Date: 30-May-2018 11:09:04 Chrom Revision: 2.2 11-May-2018 08:54:46

Report Bate. 00 Ma	y 2010 11.07.01	Onioni Revision. 2.2	May 2010 00.01.10
Data File:	\\ChromNa\Sacramento\ChromData\	A8_N\20180527-58835.b	\2018.05.27LLADX_008.d

	2414 1 1101	1,0	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	a 01 a 111 0 1 11		<u> </u>	00027 0000	0101201010121211				
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags	
D 14 13C4 PFOA												
	417.00 > 372.00		2.695	0.002	1.000	3952940	1.98		79.3	94476		
											М	
	413.00 > 369.00	2.612	2.698	-0.086	0.968	131672	0.0707			23.4	M	
	413.00 > 169.00	2.596	2.698	-0.102	0.963	98328		1.34(0.84-2.52)		194	M	
	* 62 13C2-PFOA	A										
	415.00 > 370.00	2.697	2.698	-0.001		5264580	2.50			54431		
	D 19 13C5 PFN	Д										
	468.00 > 423.00	3.070	3.063	0.007	1.000	3297817	2.02		80.9	60236		
	D 18 13C4 PFO	S										
	503.00 > 80.00	3.063	3.063	0.0	1.000	3109593	1.74		72.7	21016		
	17 Perfluorooct	ane sulf	onic acid	d							M	
	499.00 > 80.00	3.063	3.070	-0.007	1.000	108954	0.0712			642		
	499.00 > 99.00		3.070	0.0	1.002	27407		3.98(2.31-6.93)		349	M	
	D 21 13C8 FOS											
	506.00 > 78.00		3.395	0.007	1.000	3760370	1.60		64.2	37254		
22 Perfluorooctane Sulfonamide												
	498.00 > 78.00		3.402	0.010	1.003	3305	0.002257			72.7		
	D 23 13C2 PFD											
	515.00 > 470.00		3.422	0.008	1.000	2495297	1.80		72.0	54536		
	D 30 13C2 PFUr											
	565.00 > 520.00	3.753	3.748	0.005	1.000	2149223	1.96		78.3	50205		
31 Perfluoroundecanoic acid												
	563.00 > 519.00		3.753	0.0	1.000	3080	0.004290	1 00/0 10 / 0/)		17.9	R	
	563.00 > 169.00		3.753	0.032	1.008	1620		1.90(2.12-6.36)		45.1		
	D 36 13C2 PFD											
	615.00 > 570.00		4.048	0.003	1.000	2025849	1.71		68.6	16732		
	D 43 13C2-PFT6			0.615	4.055	040====	,			4-7		
	715.00 > 670.00	4.552	4.542	0.010	1.000	2187528	1.51		60.3	15458		

QC Flag Legend Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 30-May-2018 11:09:04 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento \\ChromNa\\Sacramento\\ChromData\\A8_N\\20180527-58835.b\\2018.05.27LLADX_008.d Data File: **Injection Date:** 28-May-2018 07:55:06 Instrument ID: A8_N Lims ID: 320-38875-A-3-A Lab Sample ID: 320-38875-3 Client ID: TP-PFC-029-TPE Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 8 Injection Vol: Dil. Factor: 2.0 ul 1.0000 Method: LC PFC_QSM5-1 ICAL $A8_N$ Limit Group: 2 Perfluorobutyric acid D 113C4 PFBA 4 Perfluoropentanoic acid (M) Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x 25 20 Y (X100000) Y (X100000) Y (X100000) 20 12 16 12 10 0.9 1.5 1.8 8.0 1.1 1.4 1.7 2.0 1.2 1.5 1.8 2.1 1.2 Min Min Min RT RT RT 5 Perfluorobutanesulfonic acid D 3 13C5-PFPeA 5 Perfluorobutanesulfonic acid Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x Exp1:m/z 298.90 > 80.00:Moving5PtAverage x3Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 15- 30 Y (X100000) 10 25- Y (X1000) 20 15- 10 1.9 2.2 1.7 2.0 1.0 1.3 2.5 1.1 1.4 2.3 1.2 1.5 1.8 2.1 2.4 Min Min Min RT RT RT D 47 13C3-PFBS 7 13C2 PFHxA 6 Perfluorohexanoic acid D Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Y (X100000) Y (X10000) 60 Y (X1000) 16- 48 12 36 24 1.8 2.1 1.2 1.5 1.8 2.1 2.4 1.5 2.4 1.6 2.2 2.8 1.2 1.0 Min Min RT RT RT 6 Perfluorohexanoic acid 9 13C4-PFHpA 10 Perfluoroheptanoic acid Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 367.00 > 322.00:Moving5PtAverage_x Exp1:m/z 363.00 > 319.00:Moving5PtAverage_> 54 (X100000) Y (X1000) Y (X1000) 36- 27 18 0.9 1.5 2.1 2.7 1.8 2.1 2.4 2.7 1.9 2.2 2.5 2.8 1.5 1.6 Min Min

RT

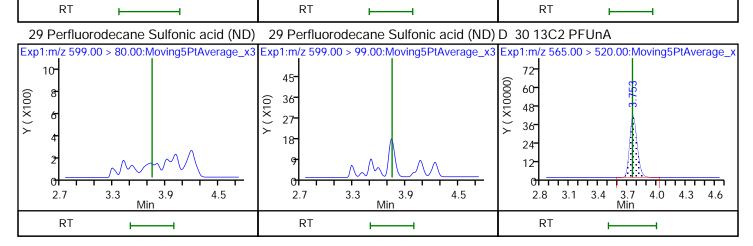
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RT

RT

Chrom Revision: 2.2 11-May-2018 08:54:46

Report Date: 30-May-2018 11:09:04



4.1

3.5

RT

4.7

Min

5.3

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_008.d

Injection Date: 28-May-2018 07:55:06 Instrument ID: A8_N

Lims ID: 320-38875-A-3-A Lab Sample ID: 320-38875-3

Client ID: TP-PFC-029-TPE

Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

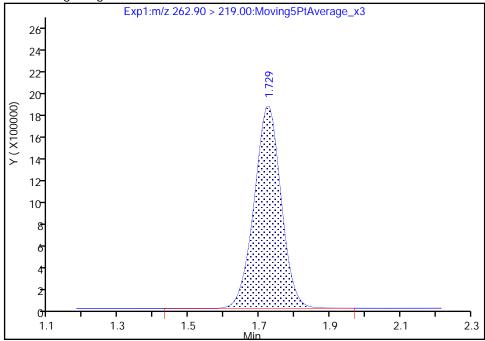
Column: Detector EXP1

4 Perfluoropentanoic acid, CAS: 2706-90-3

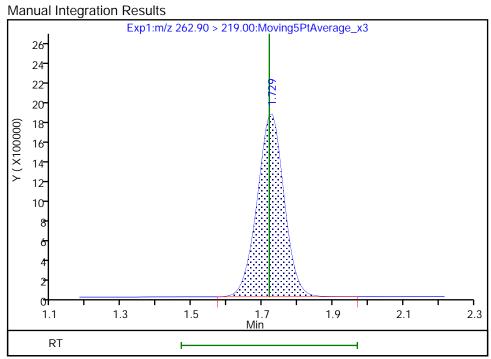
Signal: 1

RT: 1.73
Area: 9558839
Amount: 5.170053
Amount Units: ng/ml

Processing Integration Results



RT: 1.73
Area: 9526856
Amount: 5.152755
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:07:42

Audit Action: Manually Integrated Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_008.d

Injection Date: 28-May-2018 07:55:06 Instrument ID: A8_N

Lims ID: 320-38875-A-3-A Lab Sample ID: 320-38875-3

Client ID: TP-PFC-029-TPE

Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

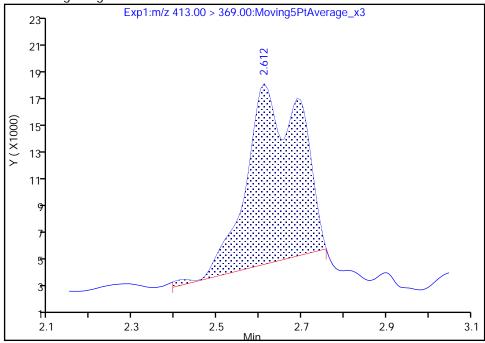
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

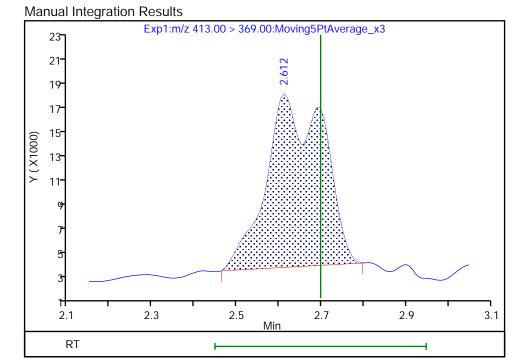
15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

RT: 2.61 Area: 117089 Amount: 0.062914 Amount Units: ng/ml **Processing Integration Results**



RT: 2.61
Area: 131672
Amount: 0.070750
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:08:04

Audit Action: Manually Integrated

Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_008.d

Injection Date: 28-May-2018 07:55:06 Instrument ID: A8_N

Lims ID: 320-38875-A-3-A Lab Sample ID: 320-38875-3

Client ID: TP-PFC-029-TPE

Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

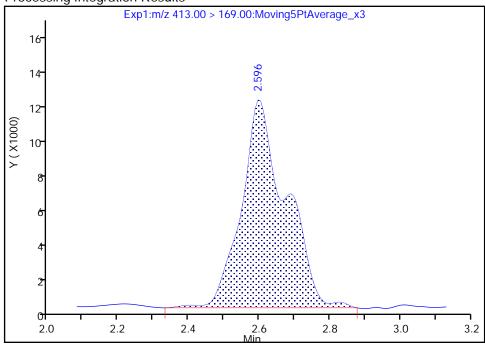
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

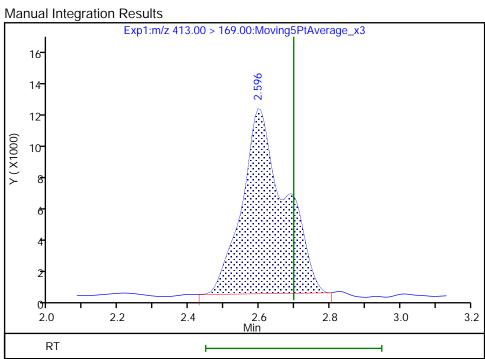
15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

RT: 2.60 Area: 103925 Amount: 0.062914 Amount Units: ng/ml **Processing Integration Results**



RT: 2.60
Area: 98328
Amount: 0.070750
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:08:11

Audit Action: Manually Integrated

Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_008.d

Injection Date: 28-May-2018 07:55:06 Instrument ID: A8_N

Lims ID: 320-38875-A-3-A Lab Sample ID: 320-38875-3

Client ID: TP-PFC-029-TPE

Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

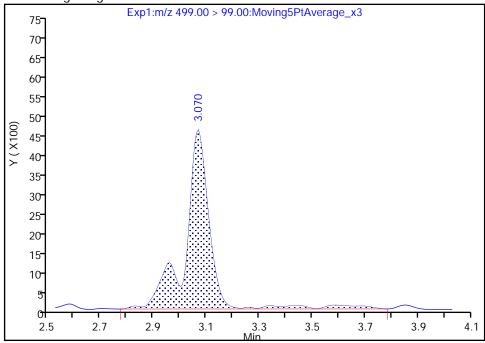
17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

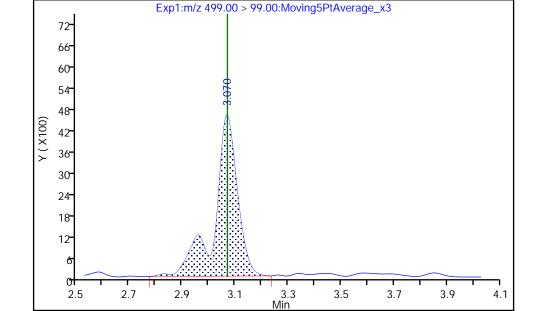
RT: 3.07 Area: 29414 Amount: 0.071221 Amount Units: ng/ml **Processing Integration Results**

Manual Integration Results

RT



RT: 3.07
Area: 27407
Amount: 0.071221
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:08:24

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 439 of 728

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPE-D Lab Sample ID: 320-38875-4

Matrix: Water Lab File ID: 2018.05.27LLADX_009.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 00:00

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 264.2(mL) Date Analyzed: 05/28/2018 08:02

Con. Extract Vol.: 10 (mL) Dilution Factor: 1

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

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

Analysis Batch No.: 225818 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOO	LOD	DL
0710 110.	COIN COND MINE	THEOTE	~	100	202	25
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.9	1.4	0.56
2706-90-3	Perfluoropentanoic acid (PFPeA)	190	М	1.9	0.95	0.41
307-24-4	Perfluorohexanoic acid (PFHxA)	80		1.9	0.95	0.44
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.0		1.9	1.4	0.58
335-67-1	Perfluorooctanoic acid (PFOA)	3.5	M	1.9	1.4	0.51
375-95-1	Perfluorononanoic acid (PFNA)	1.4	U	1.9	1.4	0.49
335-76-2	Perfluorodecanoic acid (PFDA)	0.95	U	1.9	0.95	0.45
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.4	U	1.9	1.4	0.68
307-55-1	Perfluorododecanoic acid (PFDoA)	1.4	U	1.9	1.4	0.49
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.8	U	3.8	2.8	0.72
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.8	U	3.8	2.8	0.79
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.2		1.9	0.95	0.44
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.0		1.9	0.95	0.36
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.95	U M	1.9	0.95	0.35
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	9.2		3.8	2.8	1.0
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.4	U	1.9	1.4	0.53
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.8	Ū	3.8	2.8	1.2

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

 SDG No.:
 Client Sample ID: TP-PFC-029-TPE-D
 Lab Sample ID: 320-38875-4

 Matrix: Water
 Lab File ID: 2018.05.27LLADX_009.d

 Analysis Method: EPA 537 (Mod)
 Date Collected: 05/03/2018 00:00

 Extraction Method: 3535
 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 264.2(mL) Date Analyzed: 05/28/2018 08:02

Con. Extract Vol.: 10 (mL) Dilution Factor: 1

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

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

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

Analysis Batch No.: 225818 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	67		50-150
STL00992	13C4 PFBA	75		50-150
STL01893	13C5 PFPeA	80		50-150
STL00993	13C2 PFHxA	76		50-150
STL01892	13C4-PFHpA	78		50-150
STL00990	13C4 PFOA	84		50-150
STL00995	13C5 PFNA	91		50-150
STL00996	13C2 PFDA	79		50-150
STL00997	13C2 PFUnA	86		50-150
STL00998	13C2 PFDoA	76		50-150
STL00994	1802 PFHxS	78		50-150
STL02116	13C2-PFTeDA	70		50-150
STL00991	13C4 PFOS	78		50-150
STL02337	13C3-PFBS	78		50-150

Report Date: 30-May-2018 11:10:54 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_009.d

Lims ID: 320-38875-A-4-A Client ID: TP-PFC-029-TPE-D

Sample Type: Client

Inject. Date: 28-May-2018 08:02:55 ALS Bottle#: 6 Worklist Smp#: 9

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-38875-a-4-a Misc. Info.: Plate: 1 Rack: 6

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 30-May-2018 11:10:54 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 11:10:54

FIRST Level Revie	wer: rua	ngyotsai	Kula		Date:	3	30-May-2018 11:10:5	<u>,4</u>		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	yric acid									
212.90 > 169.00	1.452	1.452	0.0	1.000	7127207	3.52			3621	
D 113C4 PFBA										
217.00 > 172.00		1.455	-0.003	1.000	5451422	1.88		75.2	31314	
4 Perfluoroper			0.001	1 000	0001502	F 02			E 477	M
262.90 > 219.00		1.720	-0.001	1.000	8881503	5.03			5476	M
D 3 13C5-PFP6 267.90 > 223.00		1.725	-0.006	0.561	3736306	2.01		80.4	46081	
5 Perfluorobut			0.000	0.001	0700000	2.01		00.1	10001	
298.90 > 80.00		1.756	-0.001	1.000	151298	0.0594			779	
298.90 > 99.00	1.755	1.756	-0.001	1.000	69010		2.19(1.25-3.74)		543	
D 47 13C3-PFB										
301.90 > 83.00		1.761	-0.006	1.000	75861	1.81		77.7	598	
D 7 13C2 PFHx		0.044	0.000	4 000	07//000	4.00		7.0	/ F F O O	
315.00 > 270.00		2.011	0.003	1.000	3766333	1.90		76.0	65529	
6 Perfluorohex 313.00 > 269.00		2.015	-0.024	0.989	3284613	2.12			4591	R R
313.00 > 207.00		2.015	-0.024	1.000	171804	2.12	19.12(5.03-15.10)		2278	IX.
D 9 13C4-PFHp	А						,			
367.00 > 322.00	2.345	2.342	0.003	1.000	3714272	1.96		78.3	60084	
10 Perfluorohe	•									
363.00 > 319.00		2.346	-0.014	0.994	84446	0.0538	0.04/4.40.0.40		83.6	
363.00 > 169.00		2.346	-0.014	0.994	29559		2.86(1.13-3.40)		148	
D 11 18O2 PFH 403.00 > 84.00		2.355	0.003	1.000	4351901	1.85		78.4	71027	
8 Perfluorohex				1.000	4331901	1.00		70.4	/102/	
399.00 > 80.00		2.359	-0.001	1.000	385704	0.1860			1877	
399.00 > 99.00	2.358	2.359	-0.001	1.000	119320		3.23(1.50-4.49)		882	

Report Date: 30-May-2018 11:10:54 Chrom Revision: 2.2 11-May-2018 08:54:46

\\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_009.d Data File:

Data File.	NCIII	JIIINa	acramen	OCHIOIII	Dala (Ao_IN/201	00027-0000	3.0\2016.03.27LLAL	JA_009.	u	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
J						J	, ,			
D 14 13C4 PFO										
417.00 > 372.00		2.695	0.001	1.000	3772836	2.10		84.0	80493	
15 Perfluorooct										M
413.00 > 369.00			-0.009	0.997	162468	0.0915			33.2	M
413.00 > 169.00		2.698	-0.102	0.963	120406		1.35(0.84-2.52)		257	
* 62 13C2-PFOA										
415.00 > 370.00	2.696	2.698	-0.002		4741331	2.50			67409	
16 Perfluorohe	•	fonic ac	id							M
449.00 > 80.00			-0.001	1.000	11962	0.007185			85.6	
449.00 > 99.00	2.704	2.705	-0.001	1.000	3275		3.65(1.94-5.82)		67.6	M
D 19 13C5 PFN	A									
468.00 > 423.00	3.062	3.063	-0.001	1.000	3345013	2.28		91.1	82323	
D 18 13C4 PFO	S									
503.00 > 80.00	3.062	3.063	-0.001	1.000	2987333	1.85		77.5	28851	
17 Perfluorooct	tane sulf	onic acid	d							
499.00 > 80.00	3.062	3.070	-0.008	1.000	357770	0.2434			1900	
499.00 > 99.00	3.062	3.070	-0.008	1.000	80347		4.45(2.31-6.93)		1113	
20 Perfluorono	nanoic a	cid								
463.00 > 419.00	3.062	3.070	-0.008	1.000	1393	0.000983			4.4	
463.00 > 169.00	3.041	3.070	-0.029	0.993	351		3.97(1.90-5.69)		14.9	
D 21 13C8 FOS	A									
506.00 > 78.00	3.402	3.395	0.007	1.000	3549577	1.68		67.3	33071	
22 Perfluorooct	tane Sulf	fonamid	е							
498.00 > 78.00		3.402		1.000	3955	0.002861			62.4	
D 23 13C2 PFD/										
515.00 > 470.00		3.422	-0.002	1.000	2464015	1.97		78.9	36498	
D 30 13C2 PFUr					_,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
565.00 > 520.00		3.748	0.005	1.000	2127015	2.15		86.0	39532	
31 Perfluoround			0.000	1.000	2127013	2.10		00.0	37332	D
563.00 > 519.00		3.753	0.0	1.000	5095	0.007170			28.2	R R
563.00 > 169.00		3.753	-0.011	0.997	2518	0.007170	2.02(2.12-6.36)		107	K
D 36 13C2 PFD		5.755	0.011	5.771	2010		2.02(2.12 0.00)		107	
615.00 > 570.00		4.048	0.003	1.000	2018355	1.90		75.8	15450	
		4.040	0.003	1.000	2010300	1.70		75.0	15450	
D 43 13C2-PFT6		4 5 4 0	0.010	1 000	2204575	1 75		/ 0.0	15001	
715.00 > 670.00	4.552	4.542	0.010	1.000	2281575	1.75		69.8	15231	

QC Flag Legend Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 30-May-2018 11:10:54 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento \\ChromNa\\Sacramento\\ChromData\\A8_N\\20180527-58835.b\\2018.05.27LLADX_009.d Data File: **Injection Date:** 28-May-2018 08:02:55 Instrument ID: A8_N Lims ID: 320-38875-A-4-A Lab Sample ID: 320-38875-4 Client ID: TP-PFC-029-TPE-D Operator ID: SACINSTLCMS01 ALS Bottle#: Worklist Smp#: 9 Injection Vol: Dil. Factor: 2.0 ul 1.0000 Method: LC PFC_QSM5-1 ICAL $A8_N$ Limit Group: 2 Perfluorobutyric acid D 113C4 PFBA 4 Perfluoropentanoic acid (M) Exp1;m/z 262.90 > 219.00:Moving5PtAverage_x Y (X100000) 15- 16 12 1.0 1.6 2.2 1.0 1.6 1.9 1.2 1.5 1.8 2.1 Min Min Min RT RT RT 5 Perfluorobutanesulfonic acid D 3 13C5-PFPeA 5 Perfluorobutanesulfonic acid Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 42 Y (X100000) 35 Y (X1000) 28 21 14 1.9 2.2 1.7 2.0 2.0 1.0 1.3 2.5 1.1 1.4 2.3 1.1 1.4 2.3 Min Min Min RT RT RT D 47 13C3-PFBS 7 13C2 PFHxA 6 Perfluorohexanoic acid Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x 60 10 20 Y (X100000) Y (X10000) 50 Y (X1000) 16- 40 12 30 20 2.1 1.7 1.8 1.4 2.0 2.3 1.5 2.4 1.7 2.0 1.1 1.4 2.3 RT RT RT 6 Perfluorohexanoic acid 9 13C4-PFHpA 10 Perfluoroheptanoic acid Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 367.00 > 322.00:Moving5PtAverage_x Exp1;m/z 363.00 > 319.00:Moving5PtAverage_x (X100000) 10 (X1000) 32 24 16 2.2 Min 0.9 2.4 1.5 2.1 2.7 1.8 2.1 1.9 2.5 2.8 1.5 2.7 1.6 Min

RT

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RT

RT

Chrom Revision: 2.2 11-May-2018 08:54:46

Report Date: 30-May-2018 11:10:54

Y (X10000) Y (X100) Y (X10) 30 33 20 22 10 3.3 3.9 4.5 3.3 3.9 4.5 3.9 4.2 2.7 2.7 3.3 4.5 Min Min RT RT RT

4.1

3.5

RT

4.7

Min

5.3

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_009.d

Injection Date: 28-May-2018 08:02:55 Instrument ID: A8_N

Lims ID: 320-38875-A-4-A Lab Sample ID: 320-38875-4

Client ID: TP-PFC-029-TPE-D

Operator ID: SACINSTLCMS01 ALS Bottle#: 6 Worklist Smp#: 9

Injection Vol: 2.0 ul Dil. Factor: 1.0000

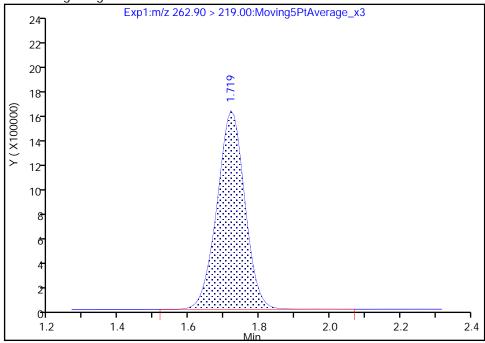
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

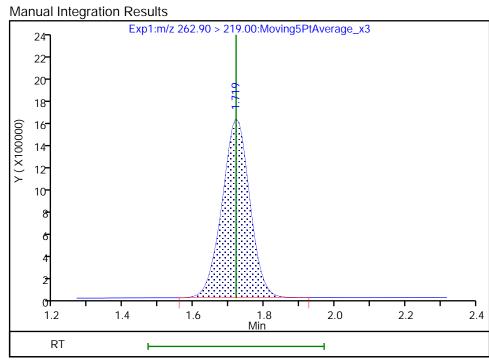
4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

RT: 1.72 Area: 8926118 Amount: 5.059318 Amount Units: ng/ml **Processing Integration Results**



RT: 1.72 Area: 8881503 Amount: 5.034030 Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:09:33

Audit Action: Manually Integrated Audit

Audit Reason: Baseline

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_009.d

Injection Date: 28-May-2018 08:02:55 Instrument ID: A8_N

Lims ID: 320-38875-A-4-A Lab Sample ID: 320-38875-4

Client ID: TP-PFC-029-TPE-D

Operator ID: SACINSTLCMS01 ALS Bottle#: 6 Worklist Smp#: 9

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

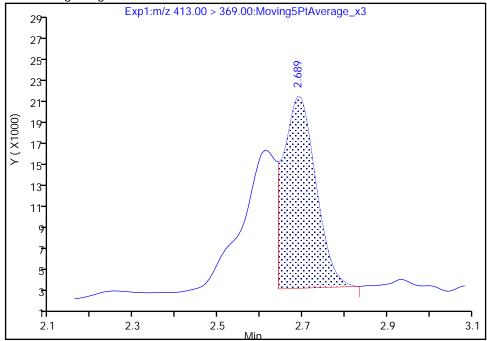
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

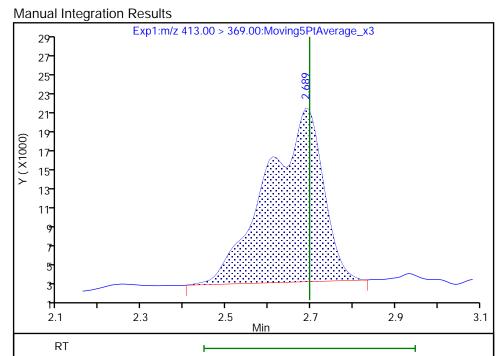
Signal: 1

RT: 2.69
Area: 90478
Amount: 0.050936
Amount Units: ng/ml

Processing Integration Results



RT: 2.69
Area: 162468
Amount: 0.091464
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:10:00

Audit Action: Manually Integrated Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_009.d

Injection Date: 28-May-2018 08:02:55 Instrument ID: A8_N

Lims ID: 320-38875-A-4-A Lab Sample ID: 320-38875-4

Client ID: TP-PFC-029-TPE-D

Operator ID: SACINSTLCMS01 ALS Bottle#: 6 Worklist Smp#: 9

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

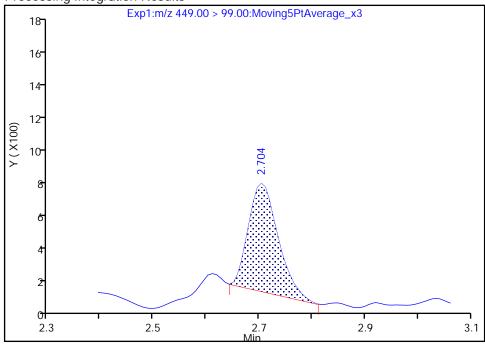
Column: Detector EXP1

16 Perfluoroheptanesulfonic acid, CAS: 375-92-8

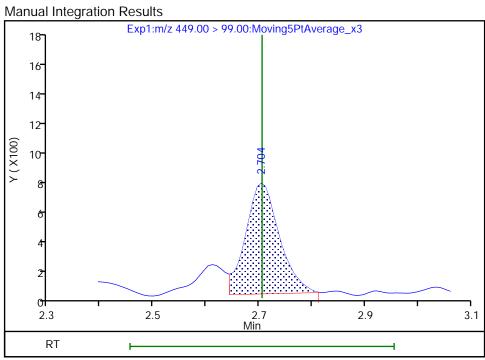
Signal: 2

RT: 2.70
Area: 2583
Amount: 0.007185
Amount Units: ng/ml

Processing Integration Results



RT: 2.70
Area: 3275
Amount: 0.007185
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:10:15

Audit Action: Manually Integrated

Audit Reason: Baseline

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FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:	
Level 1	IC 320-223413/2	2017.05.15LLB ICAL 002.d	
Level 2	IC 320-223413/3	2017.05.15LLB ICAL 003.d	
Level 3	IC 320-223413/4	2017.05.15LLB ICAL 004.d	
Level 4	IC 320-223413/5	2017.05.15LLB ICAL 005.d	
Level 5	IC 320-223413/7	2017.05.15LLB ICAL 007.d	
Level 6	IC 320-223413/8	2017.05.15LLB_ICAL_008.d	
Level 7	IC 320-223413/11	2018.05.15LLC ICAL 006.d	

ANALYTE			RRF			CURVE		COEFFICIE	NT	# MIN RRF	%RSD	 MAX	R^2	#	MIN R^2
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	TYPE	В	M1	M2			RSD	OR COD		OR COD
Perfluorobutanoic acid (PFBA)	0.9241 0.8957	0.9313 0.9561	0.9225	0.9212	0.9579	AveID		0.9298			2.3	20.0			
Perfluoropentanoic acid (PFPeA)	1.2625 1.1540	1.2317 1.1953	1.1470	1.1005	1.1726	AveID		1.1805			4.6	20.0			
Perfluorobutanesulfonic acid (PFBS)	73.379 74.326	78.361 80.657	79.854	76.421	83.642	AveID		78.092			4.7	20.0			
4:2 FTS	16.107 15.923	17.745 16.756	15.595	16.119	17.773	AveID		16.574			5.3	20.0			
Perfluorohexanoic acid (PFHxA)	1.0080 1.0775	1.1481 0.9470	0.9804	0.9949	1.0411	AveID		1.0281			6.6	20.0			
Perfluoropentanesulfonic acid	70.536 63.954	69.604 69.356	70.709	68.100	74.560	AveID		69.545			4.6	20.0			
Perfluoroheptanoic acid (PFHpA)	1.1170 1.0467	1.0612 1.0839	1.0572	0.9754	1.0529	AveID		1.0563			4.1	20.0			
Perfluorohexanesulfonic acid (PFHxS)	1.2868 1.0806	1.1929 1.0961	1.1199	1.0451	1.0663	AveID		1.1268			7.6	20.0			
6:2FTS	2.5480 1.8029	2.0146 1.7196	2.1352	1.5658	1.7441	L2ID	0.0180	1.7550					0.9900		0.9900
Perfluorooctanoic acid (PFOA)	1.2824 1.1018	1.3066 1.0898	1.1380	1.1380	1.1826	AveID		1.1770			7.3	20.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.1977 1.2900	1.4162 1.3580	1.3092	1.3585	1.3942	AveID		1.3320			5.5	20.0			
Perfluorooctanesulfonic acid (PFOS)	1.3297 1.1063	1.2627 1.0707	1.2157	1.0803	1.1653	AveID		1.1758			8.4	20.0			
Perfluorononanoic acid (PFNA)	1.1029 1.0898	1.0209 1.0772	1.0536	1.0094	1.0606	AveID		1.0592			3.3	20.0			
Perfluorooctane Sulfonamide (FOSA)	0.8770 0.9485		1.0064	0.9683	1.0413	AveID		0.9736			6.1	20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

ANALYTE			RRF			CURVE		COEFFICIE	ENT	# MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	TYPE	В	M1	M2				*KSD	OR COD		OR COD
	LVL 6	LVL 7														
Perfluorononanesulfonic acid	0.7875	0.6822	0.7467	0.7538	0.8013	AveID		0.7575			5.1		20.0			
	0.7778															
8:2FTS	1.3186		1.3462	1.3265	1.4577	AveID		1.3495			4.3		20.0			
	1.2726															
Perfluorodecanoic acid (PFDA)	0.8867		0.9707	0.9794	1.0214	AveID		0.9722			4.5		20.0			
	0.9744															
N-methyl perfluorooctane	0.9856			1.0424	1.0502	AveID		1.0148			4.8		20.0			
sulfonamidoacetic acid (NMeFOSAA)	1.0154															
Perfluorodecanesulfonic acid (PFDS)	0.6317		0.6836	0.6304	0.7056	AveID		0.6714			4.8		20.0			
	0.6583															
N-ethyl perfluorooctane	1.0524		0.9620	0.9003	1.0388	AveID		0.9400			10.3		20.0			
sulfonamidoacetic acid (NEtFOSAA)	0.9642															
Perfluoroundecanoic acid (PFUnA)	0.9516			0.7312	0.8215	AveID		0.8352			10.9		20.0			
	0.9130															
Perfluorododecanoic acid (PFDoA)	1.0219		1.1136	1.0306	1.0427	AveID		1.0436			3.4		20.0			
	1.0283															
Perfluorotridecanoic Acid (PFTriA)	1.1692		1.1780	1.1305	1.1573	AveID		1.1439			3.7		20.0			
	1.0949															
Perfluorotetradecanoic acid (PFTeA)	0.2622		0.2270	0.2438	0.2525	AveID		0.2525			5.3		20.0			
	0.2644															
13C4 PFBA	1.4654		1.5804	1.4802	1.5540	Ave		1.5285			3.3		20.0			
	1.5642															
13C5 PFPeA	0.9578			0.9890	0.9962	Ave		0.9798			1.9		20.0			
	0.9717															
13C3-PFBS	0.0218		0.0227	0.0222	0.0216	Ave		0.0221			2.1		20.0			
	0.0222															
13C2 PFHxA	1.0307			1.0193	1.0550	Ave		1.0448			3.4		20.0			
	0.9826															
13C4-PFHpA	1.0218	1.0396	1.0651	0.9899	0.9939	Ave		1.0010			4.4		20.0			
	0.9433															
1802 PFHxS	1.2582		1.2691	1.2355	1.2631	Ave		1.2371			2.8		20.0			
	1.1763															
M2-6:2FTS	0.2275			0.2273	0.2103	Ave		0.2210			5.9		20.0			
	0.2007															
13C4 PFOA	0.9457		0.9743	0.9365	0.9390	Ave		0.9468			1.5		20.0			
	0.9318			1												
13C4 PFOS	0.8656	0.8315	0.8880	0.8302	0.8476	Ave		0.8503			2.4		20.0			
	0.8371	0.8519		1												
13C5 PFNA	0.7820	0.8107	0.8055	0.7560	0.7732	Ave		0.7745			3.5		20.0			
	0.7385	0.7553		1												

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

ANALYTE			RRF			CURVE		COEFFICI	ENT	#	MIN RRF	%RSD		R^2	# MIN R^2
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	TYPE	В	M1	M2				%RSD	OR COD	OR COD
	LVL 6	LVL 7													
13C8 FOSA	1.0913	1.0548	1.1529	1.1228	1.1455	Ave		1.1128				3.0	20.0		
	1.1170	1.1055													
M2-8:2FTS	0.2728	0.2681	0.2615	0.2403	0.2336	Ave		0.2515				6.2	20.0		
	0.2412	0.2427													
13C2 PFDA	0.6586	0.6755	0.6955	0.6477	0.6472	Ave		0.6587				3.0	20.0		
	0.6466	0.6399													
d3-NMeFOSAA	0.3554	0.3709	0.3911	0.3502	0.3593	Ave		0.3634				5.5	20.0		
	0.3833	0.3334													
d5-NEtFOSAA	0.3882	0.3862	0.3918	0.3798	0.3469	Ave		0.3729				5.8	20.0		
	0.3379	0.3795													
13C2 PFUnA	0.5204	0.5248	0.5435	0.5432	0.5208	Ave		0.5216				4.3	20.0		
	0.4762	0.5225													
13C2 PFDoA	0.5424	0.5507	0.5780	0.5627	0.5857	Ave		0.5613				3.3	20.0		
	0.5733	0.5366													
13C2-PFTeDA	0.6921	0.5915	0.7584	0.7128	0.7166	Ave		0.6891				7.5	20.0		
	0.6818	0.6707													
13C2-PFHxDA	1.2461	0.8066	1.2363	1.2369	1.1633	Ave		1.1695				13.9	20.0		
	1.2600	1.2373													

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI

LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:	
Level 1	IC 320-223413/2	2017.05.15LLB ICAL 002.d	
Level 2	IC 320-223413/3	2017.05.15LLB ICAL 003.d	
Level 3	IC 320-223413/4	2017.05.15LLB ICAL 004.d	
Level 4	IC 320-223413/5	2017.05.15LLB ICAL 005.d	
Level 5	IC 320-223413/7	2017.05.15LLB ICAL 007.d	
Level 6	IC 320-223413/8	2017.05.15LLB ICAL 008.d	
Level 7	IC 320-223413/11	2018.05.15LLC ICAL 006.d	

ANALYTE	IS CURV			RESPONSE				CONCEN	TRATION (N	G/ML)	
	REF TYPE	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)	AveI	73922	162647 6642110	691256	2597444	12934647	0.0250	0.0500 2.50	0.250	1.00	5.00
Perfluoropentanoic acid (PFPeA)	AveI	66005 21497034	135647 5339518	543378	2073422	10150448	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorobutanesulfonic acid (PFBS)	AveI	77106 28014178	175383 7259728	758816	2858265	13863265	0.0221 8.84	0.0442 2.21	0.221	0.884	4.42
4:2 FTS	AveI	17882 6341030	41962 1593481	156576	636977	3112425	0.0234 9.34	0.0467 2.34	0.234	0.934	4.67
Perfluorohexanoic acid (PFHxA)	AveI	56711 20297289	135987 4776223	503450	1931731	9544553	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluoropentanesulfonic acid	AveIl	78646 25577332	165299 6623884	712963	2702610	13112812	0.0235 9.38	0.0469 2.35	0.235	0.938	4.69
Perfluoroheptanoic acid (PFHpA)	AveIl	62298 18928350	122556 4839723	533908	1839273	9093863	0.0250 10.0	0.0500	0.250	1.00	5.00
Perfluorohexanesulfonic acid (PFHxS)	AveI	80424 22174743	151043 5630297	613254	2238132	10650638	0.0228	0.0455 2.28	0.228	0.910	4.55
6:2FTS	L2ID	29994 6574970	48326 1635620	229440	642687	3021313	0.0237 9.48	0.0474	0.237	0.948	4.74
Perfluorooctanoic acid (PFOA)	AveI	66199 19682065	137784 4857127	525683	2030259	9649258	0.0250	0.0500 2.50	0.250	1.00	5.00
Perfluoroheptanesulfonic Acid (PFHpS)	AveI	53872 19707477	124538 5160059	524732	2045093	9775395	0.0238 9.52	0.0476 2.38	0.238	0.952	4.76
Perfluorooctanesulfonic acid (PFOS)	AveI	58301 16474463	108239 3965534	474971	1585297	7964833	0.0232 9.28	0.0464 2.32	0.232	0.928	4.64
Perfluorononanoic acid (PFNA)	AveI	47076 15430529	91933 3811509	402423	1453651	7125949	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorooctane Sulfonamide (FOSA)	AveI	52238 20311842	109720 5372059	550166	2070950	10364812	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorononanesulfonic acid	AveI		60494 2885064	301811	1144412	5665707	0.0240	0.0480	0.240	0.960	4.80

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

ANALYTE	IS	CURVE			RESPONSE				CONCEN	TRATION (N	G/ML)	
	REF	TYPE	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
8:2FTS		AveID	18812 5636776	39540 1458360	159889	581733	2834764	0.0240 9.58	0.0479	0.240	0.958	4.79
Perfluorodecanoic acid (PFDA)		AveID	31877 12079263	72253 3028523	320077	1208399	5744357	0.0250	0.0500	0.250	1.00	5.00
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	19122 7460336	38494 1690352	184250	695308	3278986	0.0250 10.0	0.0500	0.250	1.00	5.00
Perfluorodecanesulfonic acid (PFDS)		AveID	28773 10184141	63027 2626191	277428	961059	5009746	0.0241 9.64	0.0482 2.41	0.241	0.964	4.82
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	22302 6246594	32956 1590051	178736	651368	3130989	0.0250 10.0	0.0500	0.250	1.00	5.00
Perfluoroundecanoic acid (PFUnA)		AveID	27031 8334466	53273 1802433	200746	756677	3717634	0.0250	0.0500	0.250	1.00	5.00
Perfluorododecanoic acid (PFDoA)		AveID	30254 11301274	61418 2676169	305166	1104651	5307128	0.0250	0.0500	0.250	1.00	5.00
Perfluorotridecanoic Acid (PFTriA)		AveID	34616 12033356	66337 2999335	322826	1211735	5890114	0.0250	0.0500	0.250	1.00	5.00
Perfluorotetradecanoic acid (PFTeA)		AveID	9904 3455816	16854 821303	81619	331048	1571970	0.0250	0.0500	0.250	1.00	5.00
13C4 PFBA	13PF OA	Ave	7998943 7496989	8732721 6946962	7493234	7049149	6751655	2.50 2.50	2.50	2.50	2.50	2.50
13C5 PFPeA	13PF OA	Ave	5228218 4657025	5506602 4467248	4737268	4710025	4328345	2.50 2.50	2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	110547 99131	117730 94691	99970	98369	87185	2.33	2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	5626147 4709249	5922451 5043564	5134906	4854075	4583820	2.50 2.50	2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	5577473 4521122	5774309 4465208	5050240	4714171	4318388	2.50 2.50	2.50	2.50	2.50	2.50
1802 PFHxS	13PF OA	Ave	6497213 5333305	6581524 5339851	5692452	5565884	5191664	2.37	2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	1179634 913641	1201925 953169	1076802	1028277	867962	2.38	2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	5162191 4465836	5272655 4456920	4619416	4460027	4079623	2.50	2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	4516956 3835347	4415247 3815593	4024927	3779459	3520558	2.39	2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	4268517 3539647	4502703 3538499	3819382	3600246	3359491	2.50	2.50	2.50	2.50	2.50
13C8 FOSA	13PF OA	Ave	5956672 5353791	5858621 5178962	5466463	5346931	4976852	2.50	2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	1426703 1107332	1426640 1089191	1187676	1096366	972368	2.40	2.40	2.40	2.40	2.40

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

Instrument ID: A8 N GC Column: GeminiC18 3 ID: 3 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

ANALYTE	IS	CURVE			RESPONSE				CONCEN	NTRATION (N	IG/ML)	
	REF	TYPE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7				LVL 6	LVL 7			
13C2 PFDA	13PF	Ave	3594922	3752181	3297462	3084670	2812041	2.50	2.50	2.50	2.50	2.50
	OA		3099083	2997952				2.50	2.50			
d3-NMeFOSAA	13PF	Ave	1940146	2060337	1854527	1667566	1561125	2.50	2.50	2.50	2.50	2.50
	OA		1836867	1561957				2.50	2.50			
d5-NEtFOSAA	13PF	Ave	2119254	2144987	1857905	1808821	1507014	2.50	2.50	2.50	2.50	2.50
	OA		1619647	1777821				2.50	2.50			
13C2 PFUnA	13PF	Ave	2840675	2914989	2576940	2587053	2262574	2.50	2.50	2.50	2.50	2.50
	OA		2282286	2447962				2.50	2.50			
13C2 PFDoA	13PF	Ave	2960567	3058640	2740425	2679695	2544838	2.50	2.50	2.50	2.50	2.50
	OA		2747572	2514089				2.50	2.50			
13C2-PFTeDA	13PF	Ave	3777870	3285420	3595983	3394312	3113223	2.50	2.50	2.50	2.50	2.50
	OA		3267831	3141974				2.50	2.50			
13C2-PFHxDA	13PF	Ave	6801656	4480419	5862077	5890266	5054291	2.50	2.50	2.50	2.50	2.50
	OA		6039184	5796576				2.50	2.50			

Curve Type Legend:

Ave = Average ISTD

AveID = Average isotope dilution

L2ID = Linear 1/conc^2 IsoDil

FORM VI

LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:	
Level 1	IC 320-223413/2	2017.05.15LLB ICAL 002.d	
Level 2	IC 320-223413/3	2017.05.15LLB ICAL 003.d	
Level 3	IC 320-223413/4	2017.05.15LLB ICAL 004.d	
Level 4	IC 320-223413/5	2017.05.15LLB ICAL 005.d	
Level 5	IC 320-223413/7	2017.05.15LLB ICAL 007.d	
Level 6	IC 320-223413/8	2017.05.15LLB ICAL 008.d	
Level 7	IC 320-223413/11	2018.05.15LLC ICAL 006.d	

ANALYTE			PERCEN'	r error	PERCENT ERROR LIMIT							
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanoic acid (PFBA)	-0.6 2.8	0.2	-0.8	-0.9	3.0	-3.7	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	6.9 1.2	4.3	-2.8	-6.8	-0.7	-2.2	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	-6.0 3.3	0.3	2.3	-2.1	7.1	-4.8	30 30	30	30	30	30	30
4:2 FTS	-2.8 1.1	7.1	-5.9	-2.7	7.2	-3.9	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	-2.0 -7.9	11.7	-4.6	-3.2	1.3	4.8	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	1.4 -0.3	0.1	1.7	-2.1	7.2	-8.0	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	5.7 2.6	0.5	0.1	-7.7	-0.3	-0.9	30 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	14.2 -2.7	5.9	-0.6	-7.3	-5.4	-4.1	30 30	30	30	30	30	30
6:2FTS	2.0 -2.5	-6.8	17.3	-11.9	-0.8	2.6	30 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	9.0 -7.4	11.0	-3.3	-3.3	0.5	-6.4	30 30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	-10.1 2.0	6.3	-1.7	2.0	4.7	-3.2	30 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	13.1 -8.9	7.4	3.4	-8.1	-0.9	-5.9	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	4.1 1.7	-3.6	-0.5	-4.7	0.1	2.9	30 30	30	30	30	30	30
Perfluorooctane Sulfonamide (FOSA)	-9.9 6.5	-3.8	3.4	-0.5	7.0	-2.6	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	4.0 -0.6	-9.9	-1.4	-0.5	5.8	2.7	30 30	30	30	30	30	30

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

ANALYTE			PERCENT	PERCENT ERROR LIMIT								
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
	LVL 7 #						LVL 7					
8:2FTS	-2.3	2.7	-0.2	-1.7	8.0	-5.7	30	30	30	30	30	30
	-0.8						30					
Perfluorodecanoic acid (PFDA)	-8.8	-1.0	-0.2	0.7	5.1	0.2	30	30	30	30	30	30
	3.9						30					
N-methyl perfluorooctane	-2.9	-7.9	-2.1	2.7	3.5	0.1	30	30	30	30	30	30
sulfonamidoacetic acid (NMeFOSAA)	6.6						30					
Perfluorodecanesulfonic acid (PFDS)	-5.9	5.4	1.8	-6.1	5.1	-2.0	30	30	30	30	30	30
	1.7						30					
N-ethyl perfluorooctane	11.9	-18.3	2.3	-4.2	10.5	2.6	30	30	30	30	30	30
sulfonamidoacetic acid (NEtFOSAA)	-4.9						30					
Perfluoroundecanoic acid (PFUnA)	13.9	9.4	-6.7	-12.4	-1.6	9.3	30	30	30	30	30	30
	-11.8						30					
Perfluorododecanoic acid (PFDoA)	-2.1	-3.8	6.7	-1.3	-0.1	-1.5	30	30	30	30	30	30
	2.0						30					
Perfluorotridecanoic Acid (PFTriA)	2.2	-5.2	3.0	-1.2	1.2	-4.3	30	30	30	30	30	30
	4.3						30					
Perfluorotetradecanoic acid (PFTeA)	3.8	1.6	-10.1	-3.4	0.0	4.7	30	30	30	30	30	30
	3.5						30					

Report Date: 16-May-2018 09:19:52 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_002.d

Lims ID: IC L1 Full

Client ID:

Sample Type: IC Calib Level: 1

Inject. Date: 15-May-2018 15:13:31 ALS Bottle#: 10 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L1-FULL

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub32

Method: \ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 16-May-2018 09:19:50 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK037

First Level Reviewer: hannigana Date: 16-May-2018 08:31:58

First Level Review	st Level Reviewer: hannigana				Date:	1	16-May-2018 08:31:58					
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags		
2 Perfluorobuty 212.90 > 169.00	,	1.462	-0.001	1.000	73922	0.0248		99.4	28.8			
D 113C4 PFBA 217.00 > 172.00	ı		-0.001	1.000	7998943	2.40		95.9	49727			
D 3 13C5-PFPe 267.90 > 223.00	Α		-0.001	0.560	5228218	2.44		97.8	84850			
4 Perfluoropen 262.90 > 219.00	tanoic a			1.000	66005	0.0267		107				
D 47 13C3-PFBS	5		-0.002						33.2			
301.90 > 83.00 5 Perfluorobuta	anesulfo		-0.001	1.000	110547	2.29		98.3	732			
	1.788 1.788	1.783 1.783	0.005 0.005	1.005 1.005	77106 35336	0.0208	2.18(1.25-3.74)	94.0 94.0	369 183			
D 60 M2-4:2FTS 329.00 > 81.00		1.999	0.0	1.000	858664	NC			9883			
61 Sodium 1H, 327.00 > 307.00		H-perflu 2.000		ne 1.000	17882	0.0227		97.2	804			
D 7 13C2 PFHx 315.00 > 270.00		2.037	0.008	1.000	5626147	2.47		98.7	120947			
6 Perfluorohex 313.00 > 269.00		eid 2.037	0.008	1.000	56711	0.0245		98.0	74.3	М		
313.00 > 119.00 70 Perfluoroper	2.045	2.037	0.008	1.000	4387		12.93(5.03-15.10)	98.0	58.7	М		
349.00 > 80.00	2.067 2.067	2.059 2.059	0.008	1.000 1.000	78646 30425	0.0238	2.58(1.36-4.07)	101 101	963 298			
D 64 13C3 HFP0 332.10 > 287.00	O-DA	2.134	0.012	1.000	272111	NC	(4220			
332.10 / 207.00	۷. ۱۳۵	2.104	0.012	1.000	212111	INC			7220			

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_002.d											
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags	
67 Perfluoro(2-	nropoxy	propano	ic) acid								
329.10 > 285.00		2.134	0.012	1.000	6740	NC			44.3		
10 Perfluorohe	ptanoic a	acid									
363.00 > 319.00	•	2.374	0.007	1.000	62298	0.0264		106	88.9		
363.00 > 169.00	2.381	2.374	0.007	1.000	26606		2.34(1.13-3.40)	106	147		
D 913C4-PFHp	Α										
367.00 > 322.00	2.381	2.374	0.007	1.000	5577473	2.55		102	93695		
D 11 18O2 PFH	xS										
403.00 > 84.00	2.392	2.386	0.006	1.000	6497213	2.41		102	91954		
8 Perfluorohex											
399.00 > 80.00		2.386	0.006	1.000	80424	0.0260	0.04/4.50.4.40	114	621		
399.00 > 99.00	2.392	2.386	0.006	1.000	26456		3.04(1.50-4.49)	114	109		
65 Adona	0.407	0.440	0.000	1 000	454.470	NO			0700		
377.00 > 251.00		2.418 2.418	0.008	1.000 1.000	151478 90196	NC	1 40(0 04 2 52)		3788		
377.00 > 85.00		2.418	0.008	1.000	90196		1.68(0.84-2.53)		1217		
D 12 M2-6:2FTS 429.00 > 81.00		2.707	0.004	1.000	1179634	2.45		103	15821		
					1177034	2.43		103	13021		
13 Sodium 1H, 427.00 > 407.00		:н-репіи 2.707	oroocian 0.004	e 1.000	29994	0.0242		102	323		
		2.707	0.004	1.000	27774	0.0242		102	323		
D 14 13C4 PFO 417.00 > 372.00		2.731	0.010	1.000	5162191	2.50		99.9	49724		
* 62 13C2-PFO		2.731	0.010	1.000	3102171	2.50		77.7	47724		
415.00 > 370.00		2.734	0.007		5458542	2.50			68226		
15 Perfluorooc			0.007		3430342	2.50			00220		
413.00 > 369.00		2.734	0.007	1.000	66199	0.0272		109	24.6		
413.00 > 169.00		2.734	0.007	1.000	38085	0.0272	1.74(0.84-2.52)	109	123		
16 Perfluorohe							,				
449.00 > 80.00	•	2.739	0.010	1.000	53872	0.0214		89.9	1195		
449.00 > 99.00	2.749	2.739	0.010	1.000	16570		3.25(1.94-5.82)	89.9	211		
D 18 13C4 PFO	S										
503.00 > 80.00	3.114	3.104	0.010	1.000	4516956	2.43		102	46480		
17 Perfluorooc	tane sulf	onic acid	b								
499.00 > 80.00	3.114	3.105	0.009	1.000	58301	0.0262		113	426		
499.00 > 99.00	3.114	3.105	0.009	1.000	13705		4.25(2.31-6.93)	113	145		
D 19 13C5 PFN	A										
468.00 > 423.00	3.114	3.107	0.007	1.000	4268517	2.52		101	101008		
20 Perfluorono	nanoic a	icid								M	
463.00 > 419.00	3.114	3.107	0.007	1.000	47076	0.0260		104	62.4	M	
463.00 > 169.00	3.114	3.107	0.007	1.000	10259		4.59(1.90-5.69)	104	219		
69 9-Chlorohex	kadecaflı	uoro-3-o	xanonan	е							
531.00 > 351.00	3.325	3.316	0.009	1.000	71678	NC			897		
D 21 13C8 FOS											
506.00 > 78.00	3.424	3.420	0.004	1.000	5956672	2.45		98.1	62035		
22 Perfluorooc	tane Sul	fonamide	е								
498.00 > 78.00	3.424	3.422	0.002	1.000	52238	0.0225		90.1	1147		
68 Perfluorono	nanesulf	fonic acid	d								
549.00 > 80.00		3.455	0.006	1.000	35719	0.0250		104	1022		
549.00 > 99.00	3.471	3.455	0.016	1.003	12559		2.84(1.33-3.97)	104	198		
					Dogo 460 of	720					

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Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_002.d											
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags	
25 Sodium 1H,	1H 2H 2	H-nerflu	orodecar	10							
527.00 > 507.00		3.458		0.997	18812	0.0234		97.7	268		
D 26 M2-8:2FTS											
529.00 > 81.00		3.459	0.012	1.000	1426703	2.60		108	21876		
D 23 13C2 PFD											
515.00 > 470.00		3.468	0.012	1.000	3594922	2.50		100.0	47114		
24 Perfluorode	canoic a	cid									
513.00 > 469.00		3.468	0.012	1.000	31877	0.0228		91.2	175		
513.00 > 169.00	3.471	3.468	0.003	0.997	5046		6.32(2.36-7.09)	91.2	103		
D 27 d3-NMeFO	SAA										
573.00 > 419.00	3.637	3.624	0.013	1.000	1940146	2.45		97.8	44718		
28 N-methyl pe	erfluoroo	ctane su	lfonami								
570.00 > 419.00	3.637	3.631	0.006	1.000	19122	0.0243		97.1	205		
29 Perfluorode	cane Su	lfonic ac	id								
599.00 > 80.00	3.791	3.781	0.010	1.000	28773	0.0227		94.1	551		
599.00 > 99.00	3.791	3.781	0.010	1.000	9859		2.92(1.39-4.16)	94.1	266		
D 32 d5-NEtFOS	SAA										
589.00 > 419.00	3.802	3.794	0.008	1.000	2119254	2.60		104	14171		
D 30 13C2 PFU	nA										
565.00 > 520.00	3.812	3.800	0.012	1.000	2840675	2.49		99.8	58088		
31 Perfluoroun	decanoi	c acid									
563.00 > 519.00		3.800	0.012	1.000	27031	0.0285		114	108		
563.00 > 169.00	3.802	3.800	0.002	0.997	5801		4.66(2.12-6.36)	114	153		
33 N-ethyl perf											
584.00 > 419.00	3.812	3.800	0.012	1.003	22302	0.0280		112	444		
66 11-Chloroei											
631.00 > 451.00	3.968	3.958	0.010	1.000	111283	NC			1681		
D 36 13C2 PFD											
615.00 > 570.00	4.112	4.099	0.013	1.000	2960567	2.42		96.6	20988		
37 Perfluorodo	decanoid	c acid									
613.00 > 569.00		4.100	0.012	1.000	30254	0.0245		97.9	24.6		
613.00 > 169.00	4.102	4.100	0.002	0.997	7125		4.25(2.13-6.40)	97.9	113		
41 Perfluorotric											
663.00 > 619.00		4.368	0.015	1.000	34616	0.0256		102	19.2		
663.00 > 169.00		4.368	0.015	1.000	9792		3.54(1.25-3.76)	102	109		
D 43 13C2-PFT6											
715.00 > 670.00	4.623	4.608	0.015	1.000	3777870	2.51		100	19057		
42 Perfluoroteti											
713.00 > 169.00		4.608	0.015	1.000	9904	0.0260	4 00/0 74 0 40	104	117		
713.00 > 219.00		4.608	0.005	0.998	7478		1.32(0.71-2.13)	104	135		
D 44 13C2-PFH:			: -						40-5-		
815.00 > 770.00		5.030	0.013	1.000	6801656	2.66		107	18783		
45 Perfluorohe											
813.00 > 769.00		5.031	0.012	1.000	121507	NC	(00/0 0 (0 = 5)		29.9		
813.00 > 169.00		5.031	0.012	1.000	19020		6.39(2.86-8.58)		156		
46 Perfluorooct											
913.00 > 869.00		5.408	0.021	1.000	69164	NC	7 51/0 00 44 40		12.6		
913.00 > 169.00	5.429	5.408	0.021	1.000	9204	700	7.51(3.83-11.48)		107		

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Report Date: 16-May-2018 09:19:52 Chrom Revision: 2.2 11-May-2018 08:54:46

OC Flag Legend Processing Flags NC - Not Calibrated **Review Flags**

M - Manually Integrated

Reagents:

LCPFC_LL1_00005 Amount Added: 1.00 Units: mL

Report Date: 16-May-2018 09:19:52 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_002.d Data File: **Injection Date:** 15-May-2018 15:13:31 Instrument ID: A8_N Lims ID: IC L1 Full Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_QSM5-1 ICAL $A8_N$ 2 Perfluorobutyric acid D 113C4 PFBA D 3 13C5-PFPeA Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x 20 Y (X100000) Y (X100000) 20 16 16 12 12 1.6 Min 1.0 1.3 1.6 0.8 1.1 1.7 2.0 1.3 1.9 2.2 2.5 Min Min RT RT RT 5 Perfluorobutanesulfonic acid D 47 13C3-PFBS 4 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 30 24 20 25 20 Y (X1000) Y (X1000) 20 16 15- 12 10 1.7 Min 2.0 2.0 1.4 2.3 1.8 1.1 1.4 1.7 2.3 1.1 1.2 1.5 2.1 Min Min RT RT RT 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexaDe 7 13C2 PFHxA Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 60 (X100000) 50 Y (X1000) Y (X100) 40 30 20 1.5 1.8 1.9 2.5 1.8 2.1 1.2 2.1 2.4 1.6 2.2 1.5 2.4 2.7 1.3 Min RT RT RT 6 Perfluorohexanoic acid (M) 6 Perfluorohexanoic acid (M) 70 Perfluoropentanesulfonic acid Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 349.00 > 80.00:Moving5PtAverage_x3 20 20 20 16- Y (X1000) Y (X1000) Y (X100) 16 16 12 12 O 01.8 1.8 2.0 1.5 2.1 2.4 1.5 2.1 2.4 1.7 2.3 1.4 2.6 Min Min Min RT RT RT Page 463 of 728

2.6 Min 2.9

3.2

3.5

2.3

2.0

RT

2.4

2.1

RT

3.0

3.3

2.7 Min 3.0

3.3

2.4

2.1

RT

2.9

RT

3.2

3.5

Min

3.8

3.1

2.8

RT

3.7

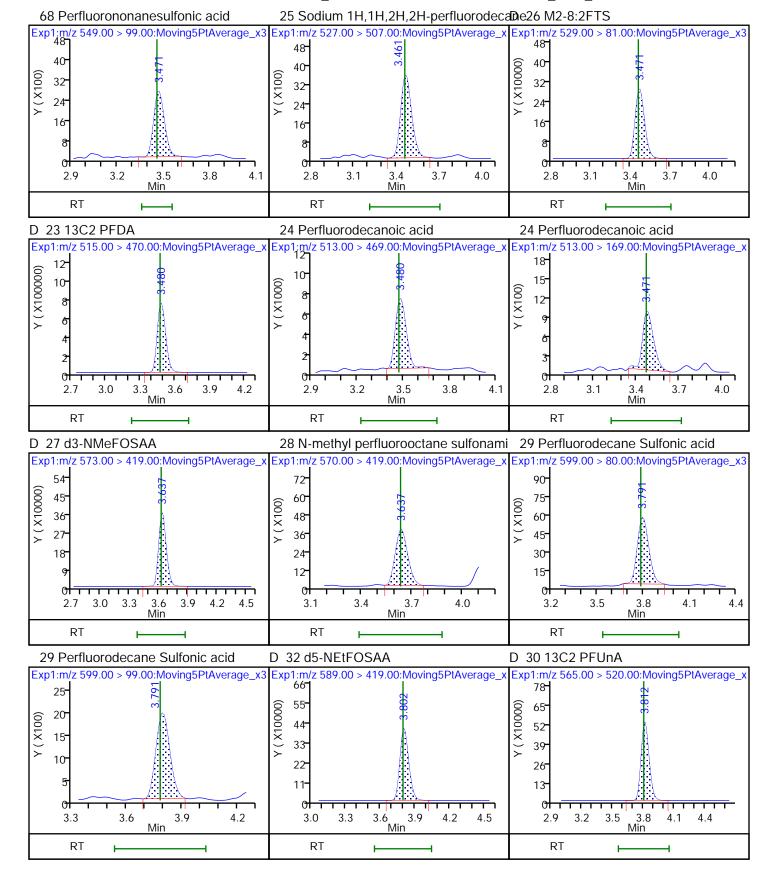
4.0

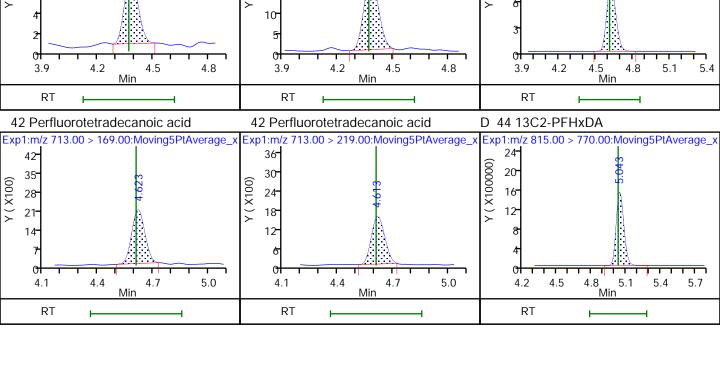
3.5 Min 3.8

3.2

2.9

RT





TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_002.d

Injection Date: 15-May-2018 15:13:31 Instrument ID: A8_N

Lims ID: IC L1 Full

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

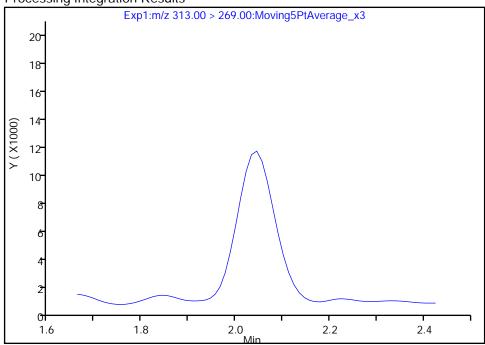
6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

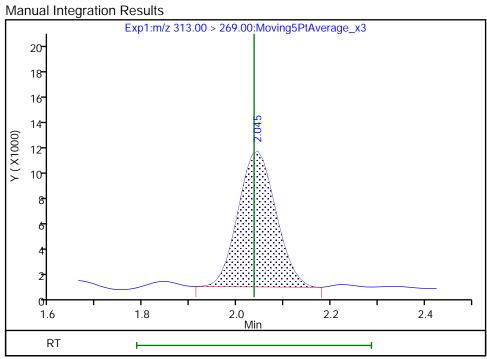
Not Detected

Expected RT: 2.04

Processing Integration Results



RT: 2.04
Area: 56711
Amount: 0.024510
Amount Units: ng/ml



Reviewer: westendorfc, 15-May-2018 16:30:15

Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected

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TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_002.d

Injection Date: 15-May-2018 15:13:31 Instrument ID: A8_N

Lims ID: IC L1 Full

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

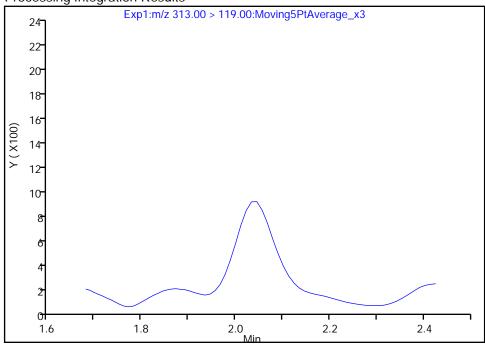
6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 2

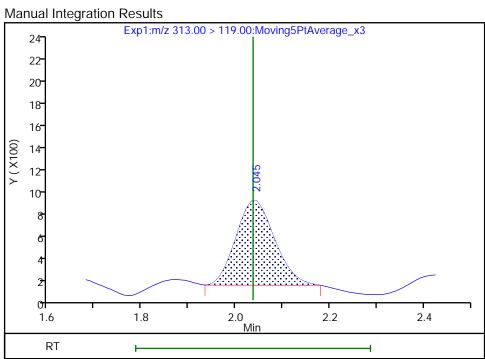
Not Detected

Expected RT: 2.04

Processing Integration Results



RT: 2.04 Area: 4387 Amount: 0.024510 Amount Units: ng/ml



Reviewer: westendorfc, 15-May-2018 16:30:21

Audit Action: Manually Integrated

Audit Reason: Assign Peak

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_002.d

Injection Date: 15-May-2018 15:13:31 Instrument ID: A8_N

Lims ID: IC L1 Full

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

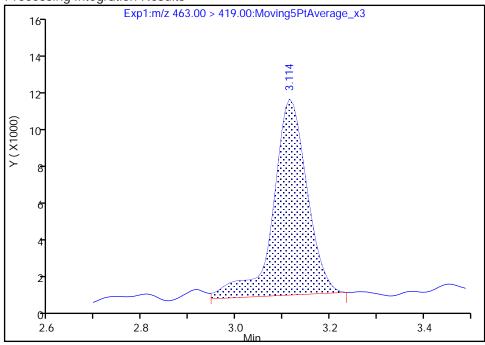
Column: Detector EXP1

20 Perfluorononanoic acid, CAS: 375-95-1

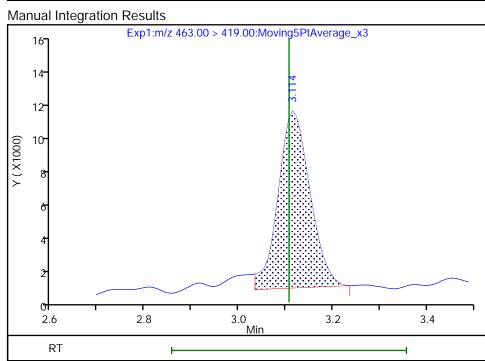
Signal: 1

RT: 3.11
Area: 50653
Amount: 0.027722
Amount Units: ng/ml

Processing Integration Results



RT: 3.11
Area: 47076
Amount: 0.026031
Amount Units: ng/ml



Reviewer: westendorfc, 15-May-2018 16:30:34

Audit Action: Manually Integrated

Audit Reason: Split Peak

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Report Date: 16-May-2018 09:19:56 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_003.d

Lims ID: IC L2 Full

Client ID:

Sample Type: IC Calib Level: 2

Inject. Date: 15-May-2018 15:21:19 ALS Bottle#: 11 Worklist Smp#: 3

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L2-FULL

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub32

Method: \ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 16-May-2018 09:19:54 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK037

First Level Reviewer: westendorfc Date: 15-May-2018 16:29:16

FIIST LEVEL REVIE	wei. wes	steriuori			Date.		13-181ay-2016 10.29.1	0		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA	1									
217.00 > 172.00	1.463	1.462	0.001	1.000	8732721	2.57		103	57344	
2 Perfluorobut	•	4.446	0.004	1 000	4/0/47	0.0504		400	<i>,</i> = .	M
212.90 > 169.00		1.462	0.001	1.000	162647	0.0501		100	65.4	M
D 3 13C5-PFPe 267.90 > 223.00		1.744	0.002	0.561	5506602	2.53		101	97404	
4 Perfluoroper			0.002	0.501	3300002	2.55		101	77404	M
262.90 > 219.00		1.745	0.001	1.000	135647	0.0522		104	65.4	M
D 47 13C3-PFB	S									
301.90 > 83.00	1.782	1.780	0.002	1.000	117730	2.39		103	2547	
5 Perfluorobut										
298.90 > 80.00 298.90 > 99.00	1.782 1.782	1.783 1.783	-0.001 -0.001	1.000 1.000	175383 76550	0.0444	2.29(1.25-3.74)	100 100	775 467	
D 60 M2-4:2FTS		1.700	0.001	1.000	70000		2.27(1.20 0.74)	100	407	
329.00 > 81.00		1.999	0.003	1.000	848063	NC			10296	
61 Sodium 1H,		H-perflu	orohexar	ne						
327.00 > 307.00	2.002	2.000	0.002	1.000	41962	0.0500		107	2461	
6 Perfluorohex			0.004	1 000	105007	0.0550		440	100	M
313.00 > 269.00 313.00 > 119.00		2.037 2.037	-0.001 -0.001	1.000 1.000	135987 11233	0.0558	12.11(5.03-15.10)	112 112	199 137	M
D 7 13C2 PFHx		2.007	0.001	1.000	11200		12.11(3.03 13.10)	112	137	
315.00 > 270.00		2.037	-0.001	1.000	5922451	2.55		102	127595	
70 Perfluorope	ntanesul	fonic ac	id							
349.00 > 80.00		2.059		1.000	165299	0.0469	0.57/4.0/.4.07	100	2551	
	2.059	2.059	0.0	1.000	64244		2.57(1.36-4.07)	100	692	
67 Perfluoro(2- 329.10 > 285.00		propano 2.134	0.004	0.995	18129	NC			131	
527110 7 200.000		2	0.001	0.,,0	10127	140				

Data File:	\\Chr	omNa\Sa	acramen	to\Chrom	Data\A8_N\201	80515-5821	7.b\2017.05.15LLB	_ICAL_0	03.d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFP	O-DA									
332.10 > 287.00		2.134	0.015	1.000	290745	NC			6092	
D 9 13C4-PFHp		2.101	0.010	1.000	270710	110			0072	
367.00 > 322.00		2.374	0.009	1.000	5774309	2.60		104	73220	
10 Perfluorohe			0.007		0,,,,,,,,,	2.00			. 5225	
363.00 > 319.00	•	2.374	0.009	1.000	122556	0.0502		100	194	
363.00 > 169.00		2.374	0.009	1.000	52048	0.0002	2.35(1.13-3.40)	100	301	
8 Perfluorohex	anesulfo	onic acid					, ,			
399.00 > 80.00		2.386	0.009	1.000	151043	0.0482		106	916	
399.00 > 99.00	2.395	2.386	0.009	1.000	49925		3.03(1.50-4.49)	106	207	
D 11 1802 PFH	xS									
403.00 > 84.00	2.395	2.386	0.009	1.000	6581524	2.39		101	55650	
65 Adona										
377.00 > 251.00	2.417	2.418	-0.001	1.000	351664	NC			8730	
377.00 > 85.00	2.417	2.418	-0.001	1.000	188630		1.86(0.84-2.53)		2054	
13 Sodium 1H,	1H,2H,2	H-perflu	orooctan	ie						
427.00 > 407.00	2.712	2.707	0.005	1.000	48326	0.0442		93.2	358	
D 12 M2-6:2FTS	5									
429.00 > 81.00	2.712	2.707	0.005	1.000	1201925	2.45		103	16809	
D 14 13C4 PFO	Α									
417.00 > 372.00	2.734	2.731	0.003	1.000	5272655	2.51		100	53605	
15 Perfluorooc	tanoic ad	cid								
413.00 > 369.00	2.742	2.734	0.008	1.003	137784	0.0555		111	49.4	
413.00 > 169.00	2.742	2.734	0.008	1.003	70311		1.96(0.84-2.52)	111	252	
* 62 13C2-PFO	A									
415.00 > 370.00	2.742	2.734	0.008		5554381	2.50			58494	
16 Perfluorohe	ptanesul	lfonic ac	id							
449.00 > 80.00	2.742	2.739	0.003	1.000	124538	0.0506		106	2139	
449.00 > 99.00	2.742	2.739	0.003	1.000	34411		3.62(1.94-5.82)	106	369	
D 18 13C4 PFO	S									
503.00 > 80.00	3.107	3.104	0.003	1.000	4415247	2.34		97.8	28897	
17 Perfluorooc	tane sulf	onic acid	b							M
499.00 > 80.00	3.107	3.105	0.002	1.000	108239	0.0498		107	943	
499.00 > 99.00	3.115	3.105	0.010	1.002	22995		4.71(2.31-6.93)	107	171	M
20 Perfluorono	nanoic a	ıcid								
463.00 > 419.00		3.107	0.008	1.000	91933	0.0482		96.4	143	
463.00 > 169.00	3.115	3.107	0.008	1.000	22431		4.10(1.90-5.69)	96.4	461	
D 19 13C5 PFN	A									
468.00 > 423.00	3.115	3.107	0.008	1.000	4502703	2.62		105	106819)
69 9-Chlorohex	kadecaflı	uoro-3-o	xanonan	е						
531.00 > 351.00	3.325	3.316	0.009	1.000	153727	NC			2147	
D 21 13C8 FOS	A									
506.00 > 78.00	3.415	3.420	-0.005	1.000	5858621	2.37		94.8	55649	
22 Perfluorooc	tane Sul	fonamid	е							
498.00 > 78.00	3.424	3.422	0.002	1.003	109720	0.0481		96.2	2692	
68 Perfluorono	nanesulf	fonic aci	d							
549.00 > 80.00	3.462	3.455	0.007	1.000	60494	0.0432		90.1	1653	
549.00 > 99.00	3.462	3.455	0.007	1.000	27746		2.18(1.33-3.97)	90.1	427	
					Daga 470 of	700				

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Data File:	\\Chr	omNa\Sa	acrament	o\Chrom	Data\A8_N\201	80515-5821	7.b\2017.05.15LLB_	_ICAL_0	03.d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,	1H 2H 2	H-nerflu	orodecar	ne						
527.00 > 507.00		•	0.004	1.000	39540	0.0492		103	808	
D 26 M2-8:2FTS										
529.00 > 81.00		3.459	0.003	1.000	1426640	2.55		107	16789	
24 Perfluorode		cid								
513.00 > 469.00		3.468	0.003	1.000	72253	0.0495		99.0	348	
513.00 > 169.00	3.481	3.468	0.013	1.003	14509		4.98(2.36-7.09)	99.0	293	
D 23 13C2 PFD	Α									
515.00 > 470.00	3.471	3.468	0.003	1.000	3752181	2.56		103	53196	
D 27 d3-NMeFC	SAA									
573.00 > 419.00	3.627	3.624	0.003	1.000	2060337	2.55		102	42793	
28 N-methyl pe	erfluoroo	ctane su	lfonami							
570.00 > 419.00	3.636	3.631	0.005	1.003	38494	0.0460		92.1	315	
29 Perfluorode	cane Su	lfonic ac	id							
599.00 > 80.00	3.791	3.781	0.010	1.000	63027	0.0508		105	830	
599.00 > 99.00	3.791	3.781	0.010	1.000	17448		3.61(1.39-4.16)	105	404	
D 32 d5-NEtFOS	SAA									
589.00 > 419.00	3.802	3.794	0.008	1.000	2144987	2.59		104	10654	
33 N-ethyl perf	luoroocta	ane sulfo	onamid							
584.00 > 419.00	3.812	3.800	0.012	1.003	32956	0.0409		81.7	755	
31 Perfluoroun	decanoi	c acid								
563.00 > 519.00		3.800	0.012	1.000	53273	0.0547		109	249	
563.00 > 169.00	3.802	3.800	0.002	0.997	11551		4.61(2.12-6.36)	109	528	
D 30 13C2 PFU										
565.00 > 520.00	3.812	3.800	0.012	1.000	2914989	2.52		101	41631	
66 11-Chloroei										
631.00 > 451.00	3.967	3.958	0.009	1.000	235156	NC			4558	
D 36 13C2 PFD										
615.00 > 570.00	4.102	4.099	0.003	1.000	3058640	2.45		98.1	25211	
37 Perfluorodo	decanoi	c acid								
613.00 > 569.00		4.100	0.002	1.000	61418	0.0481		96.2	48.0	
613.00 > 169.00	4.102	4.100	0.002	1.000	16003		3.84(2.13-6.40)	96.2	234	
41 Perfluorotrio										
663.00 > 619.00		4.368	0.004	1.000	66337	0.0474	/	94.8	33.3	
663.00 > 169.00		4.368	0.004	1.000	21987		3.02(1.25-3.76)	94.8	323	
42 Perfluorotet										
713.00 > 169.00		4.608	0.005	1.000	16854	0.0508	4.0//0.74.0.40\	102	219	
713.00 > 219.00		4.608	0.005	1.000	13370		1.26(0.71-2.13)	102	243	
D 43 13C2-PFT6		4 (00	0.005	4 000	0005400	0.45		05.0	4/07/	
715.00 > 670.00		4.608	0.005	1.000	3285420	2.15		85.8	16076	
D 44 13C2-PFH										
815.00 > 770.00		5.030	0.013	1.000	4480419	1.72		69.0	12223	
45 Perfluorohe										
813.00 > 769.00		5.031	0.012	1.000	125967	NC	(47/0 0 / 0 70)		34.8	
813.00 > 169.00		5.031	0.012	1.000	20431		6.17(2.86-8.58)		163	
46 Perfluorooci										
913.00 > 869.00		5.408	0.008	1.000	84461	NC	0.00/0.00.44.46		21.5	
913.00 > 169.00	5.416	5.408	0.008	1.000	10263	700	8.23(3.83-11.48)		114	

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Report Date: 16-May-2018 09:19:56 Chrom Revision: 2.2 11-May-2018 08:54:46

OC Flag Legend
Processing Flags
NC - Not Calibrated
Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00004 Amount Added: 1.00 Units: mL

Report Date: 16-May-2018 09:19:56 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_003.d **Injection Date:** 15-May-2018 15:21:19 Instrument ID: A8_N Lims ID: IC L2 Full Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: LC PFC_QSM5-1 ICAL $A8_N$ Limit Group: D 113C4 PFBA 2 Perfluorobutyric acid (M) D 313C5-PFPeA Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x 20 Y (X100000) Y (X100000) 40 Y (X1000) 16 32 12 24 16- 1.1 1.7 2.0 0.9 1.2 1.5 1.8 1.3 1.9 2.2 2.5 Min Min Min RT RT RT 5 Perfluorobutanesulfonic acid 4 Perfluoropentanoic acid (M) D 47 13C3-PFBS Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 48 35 30 40 Y (X1000) Y (X1000) 28 24 32 21 18 24 14 12 16 2.0 1.2 1.5 1.8 2.1 1.1 1.4 1.7 2.3 1.2 1.5 1.8 2.1 2.4 Min Min Min RT RT RT 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexan& Perfluorohexanoic acid (M) Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x 24 20 Y (X1000) Y (X1000) Y (X1000) 24 16 18 12 2.0 2.6 1.8 2.1 1.4 2.3 1.7 2.3 1.5 2.4 2.7 2.0 1.4 RT RT RT 6 Perfluorohexanoic acid 7 13C2 PFHxA 70 Perfluoropentanesulfonic acid Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1;m/z 349.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 315.00 > 270.00:Moving5PtAverage_> (X100000) 30 Y (X1000) 12 24 32 18 24 12 16 0 1.7 1.4 2.0 2.3 2.6 2.3 2.6 1.7 2.3 1.4 2.0 1.4 2.0 2.6 Min Min RT RT RT Page 476 of 728

3.3

3.0

2.3

2.0

RT

2.9

3.2

3.5

2.4

2.1

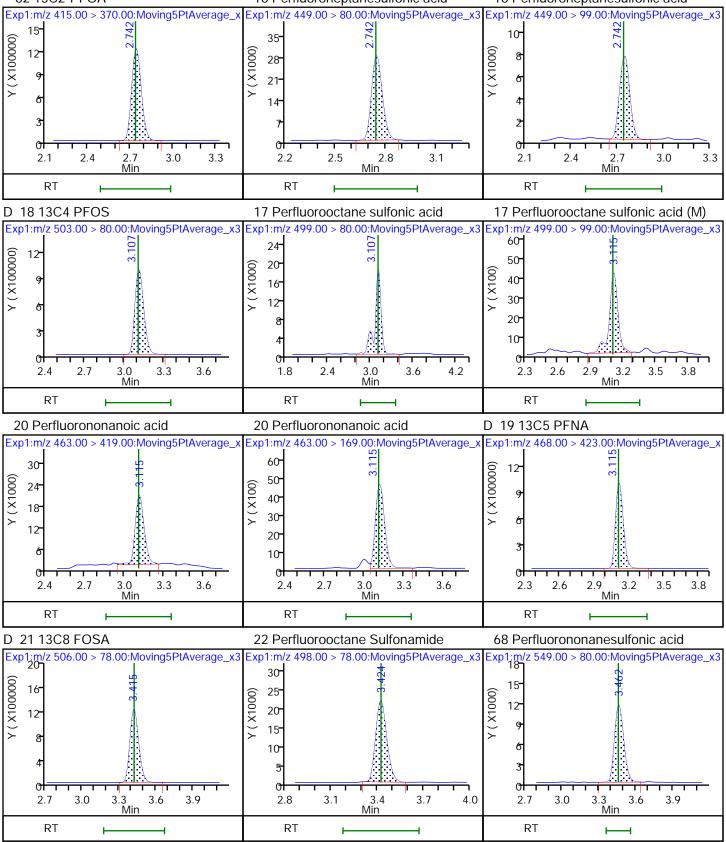
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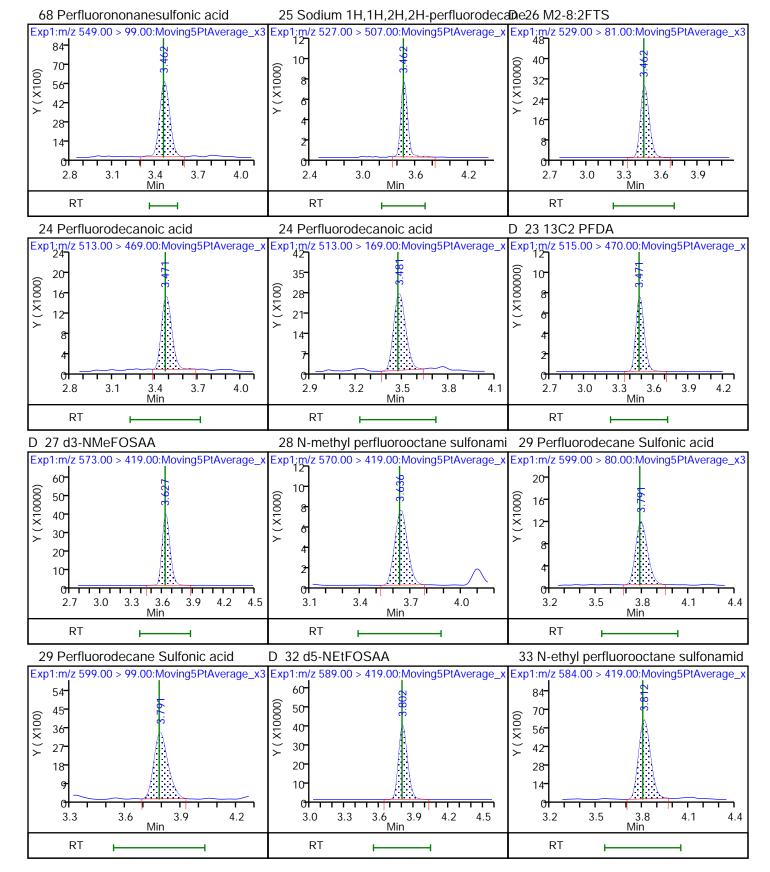
2.3

RT

3.2

2.9





4.7

Min

5.0

5.3

4.1

RT

4.7

Min

4.4

RT

5.0

4.9 Min 5.2

5.5

4.6

4.3

RT

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_003.d

Injection Date: 15-May-2018 15:21:19 Instrument ID: A8_N

Lims ID: IC L2 Full

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

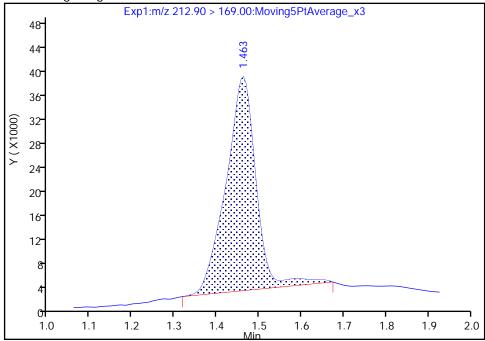
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

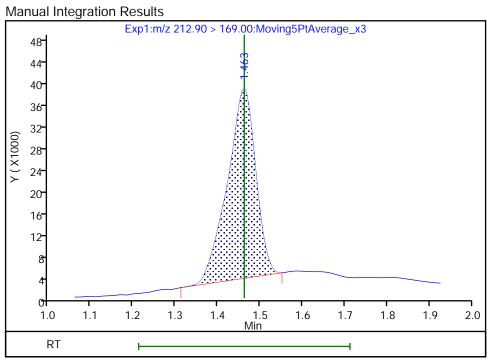
Signal: 1

RT: 1.46
Area: 175954
Amount: 0.053585
Amount Units: ng/ml

Processing Integration Results



RT: 1.46 Area: 162647 Amount: 0.050076 Amount Units: ng/ml



Reviewer: westendorfc, 15-May-2018 16:30:59

Audit Action: Manually Integrated

Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_003.d

Injection Date: 15-May-2018 15:21:19 Instrument ID: A8_N

Lims ID: IC L2 Full

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

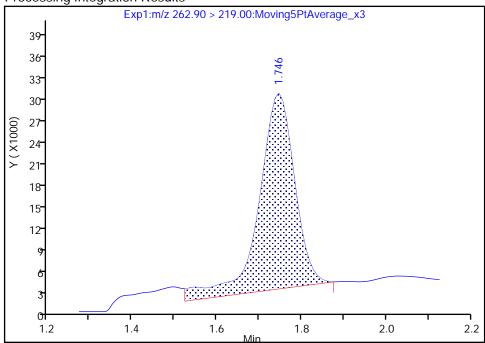
Column: Detector EXP1

4 Perfluoropentanoic acid, CAS: 2706-90-3

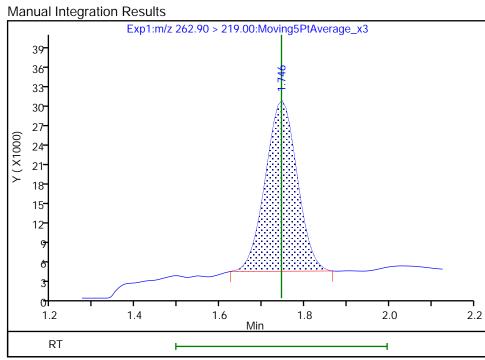
Signal: 1

RT: 1.75
Area: 159724
Amount: 0.060141
Amount Units: ng/ml

Processing Integration Results



RT: 1.75
Area: 135647
Amount: 0.052167
Amount Units: ng/ml



Reviewer: westendorfc, 15-May-2018 16:31:05

Audit Action: Manually Integrated

Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_003.d

Injection Date: 15-May-2018 15:21:19 Instrument ID: A8_N

Lims ID: IC L2 Full

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3

Injection Vol: 2.0 ul Dil. Factor: 1.0000

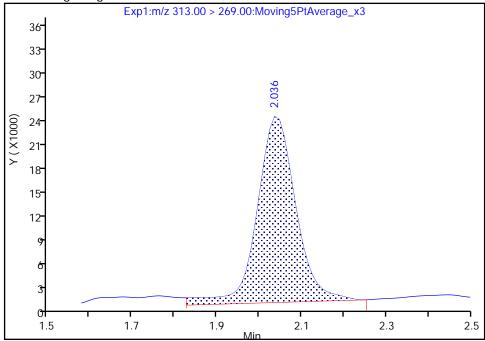
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

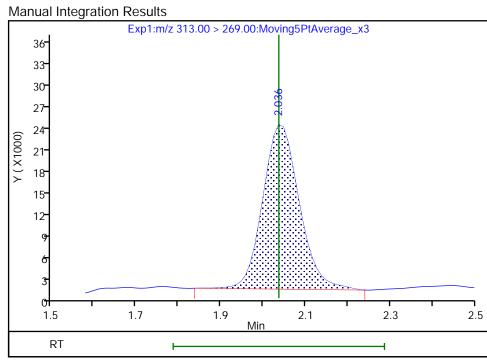
6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

RT: 2.04 Area: 147805 Amount: 0.059147 Amount Units: ng/ml **Processing Integration Results**



RT: 2.04 Area: 135987 Amount: 0.055832 Amount Units: ng/ml



Reviewer: westendorfc, 15-May-2018 16:31:10

Audit Action: Manually Integrated

Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_003.d

Injection Date: 15-May-2018 15:21:19 Instrument ID: A8_N

Lims ID: IC L2 Full

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3

Injection Vol: 2.0 ul Dil. Factor: 1.0000

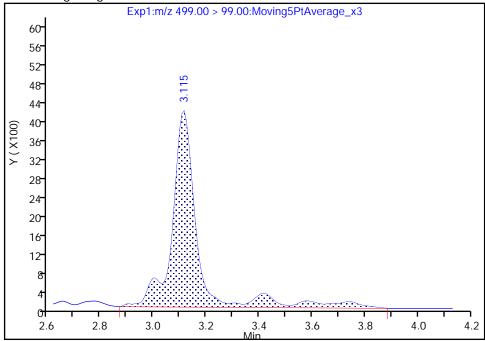
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

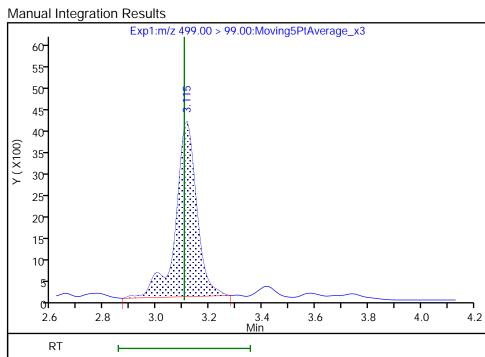
17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

RT: 3.12 Area: 27789 Amount: 0.049099 Amount Units: ng/ml **Processing Integration Results**



RT: 3.12
Area: 22995
Amount: 0.049830
Amount Units: ng/ml



Reviewer: westendorfc, 15-May-2018 16:31:21

Audit Action: Manually Integrated

Audit Reason: Baseline

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Report Date: 16-May-2018 09:20:01 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_004.d

Lims ID: IC L3 Full

Client ID:

Sample Type: IC Calib Level: 3

Inject. Date: 15-May-2018 15:29:08 ALS Bottle#: 12 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L3-FULL

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub32

Method: \ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 16-May-2018 09:19:58 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK037

First Level Reviewer: westendorfc Date: 15-May-2018 16:31:49

First Level Revie	wer: wes	stendoric	;	Date:			5-May-2018 16:31:49			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	vric acid									
212.90 > 169.00	,	1.462	0.001	1.000	691256	0.2480		99.2	322	
D 113C4 PFBA										
217.00 > 172.00	1.463	1.462	0.001	1.000	7493234	2.58		103	50123	
D 3 13C5-PFPe										
267.90 > 223.00	1.748	1.744	0.004	0.562	4737268	2.55		102	69659	
4 Perfluoropen										
262.90 > 219.00		1.745	0.003	1.000	543378	0.2429		97.2	275	
D 47 13C3-PFB		1 700	0.004	1 000	00070	2.20		100	/10	
301.90 > 83.00		1.780	0.004	1.000	99970	2.38		102	619	
5 Perfluorobuta 298.90 > 80.00	anesuiro 1.784	1.783	0.001	1.000	758816	0.2260		102	3639	
	1.784	1.783	0.001	1.000	311895	0.2200	2.43(1.25-3.74)	102	2331	
D 60 M2-4:2FTS							,			
329.00 > 81.00		1.999	0.005	1.000	706801	NC			8517	
61 Sodium 1H,	1H,2H,2	H-perflu	orohexar	ne						
327.00 > 307.00	2.004	2.000	0.004	1.000	156576	0.2197		94.1	6561	
D 7 13C2 PFHx	Α									
315.00 > 270.00	2.038	2.037	0.001	1.000	5134906	2.59		104	125259	
6 Perfluorohex										
313.00 > 269.00		2.037	0.001	1.000	503450	0.2384	10 (0/5 00 15 10)	95.4	778	
313.00 > 119.00		2.037	0.001	1.000	47401		10.62(5.03-15.10)	95.4	559	
70 Perfluoropei 349.00 > 80.00	ntanesul 2.061	tonic aci 2.059	d 0.002	1.000	712963	0.2384		102	9397	
349.00 > 99.00 349.00 > 99.00	2.061	2.059	0.002	1.000	712903 264857	0.2304	2.69(1.36-4.07)	102	2639	
D 64 13C3 HFP		2.007	3.002		201007		2.07(1.00 1.07)	102	2007	
332.10 > 287.00		2.134	0.006	1.000	260002	NC			4919	

Data File:	\\Chr	omNa\S	acrament	to\Chrom	Data\A8_N\201	80515-5821	7.b\2017.05.15LLB_	_ICAL_0	04.d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-	nronoxy	nropano	nic) acid							
329.10 > 285.00			0.006	1.000	75752	NC			658	
10 Perfluorohe	ptanoic	acid								
363.00 > 319.00	•	2.374	-0.001	1.000	533908	0.2502		100	871	
363.00 > 169.00	2.373	2.374	-0.001	1.000	205760		2.59(1.13-3.40)	100	1440	
D 913C4-PFH _k										
367.00 > 322.00	2.373	2.374	-0.001	1.000	5050240	2.66		106	104242	
D 11 1802 PFH										
403.00 > 84.00	2.385	2.386	-0.001	1.000	5692452	2.43		103	49448	
8 Perfluorohex										
399.00 > 80.00		2.386	-0.001	1.000	613254	0.2261	2.07/1.50.4.40\	99.4	3758	
399.00 > 99.00	2.385	2.386	-0.001	1.000	206507		2.97(1.50-4.49)	99.4	799	
65 Adona	2 410	2 /10	0.001	1 000	1414054	NC			40E2E	
377.00 > 251.00 377.00 > 85.00		2.418 2.418	0.001	1.000 1.000	1414956 889140	NC	1.59(0.84-2.53)		40535 9606	
D 12 M2-6:2FTS		2.410	0.001	1.000	007140		1.57(0.04-2.55)		7000	
429.00 > 81.00		2.707	0.007	1.000	1076802	2.57		108	20482	
13 Sodium 1H,					1070002	2.07		100	20102	
427.00 > 407.00		2.707	0.007	1.000	229440	0.2781		117	1932	
D 14 13C4 PFO		2.707	0.007	1.000	227110	0.2701		,	1702	
417.00 > 372.00		2.731	0.006	1.000	4619416	2.57		103	75506	
* 62 13C2-PFO										
415.00 > 370.00		2.734	0.003		4741445	2.50			54856	
15 Perfluorooc	tanoic a	cid								
413.00 > 369.00		2.734	0.003	1.000	525683	0.2417		96.7	189	
413.00 > 169.00	2.737	2.734	0.003	1.000	266346		1.97(0.84-2.52)	96.7	902	
16 Perfluorohe	ptanesu	lfonic ac	id							
449.00 > 80.00		2.739	0.005	1.000	524732	0.2339		98.3	7416	
449.00 > 99.00	2.744	2.739	0.005	1.000	144198		3.64(1.94-5.82)	98.3	1659	
D 18 13C4 PFO										
503.00 > 80.00	3.110	3.104	0.006	1.000	4024927	2.50		104	31109	
17 Perfluorooc										
499.00 > 80.00		3.105	0.005	1.000	474971	0.2399	(103	4702	
499.00 > 99.00		3.105	0.005	1.000	113620		4.18(2.31-6.93)	103	2518	
D 19 13C5 PFN		0.407	0.000	4 000	0040000	0.70		404	F7007	
468.00 > 423.00		3.107	0.003	1.000	3819382	2.60		104	57297	
20 Perfluorono			0.000	4 000	100100	0.0407		00.5	/54	
463.00 > 419.00		3.107	0.003	1.000 1.000	402423 98302	0.2487	4.09(1.90-5.69)	99.5 99.5	651 1897	
463.00 > 169.00		3.107			90302		4.09(1.90-5.09)	99.0	1097	
69 9-Chlorohex 531.00 > 351.00		uoro-3-o 3.316	xanonan 0.002	e 1.000	687137	NC			9753	
		3.310	0.002	1.000	00/13/	NC			9733	
D 21 13C8 FOS		2 420	0.004	1 000	544442	2 50		104	1102E	
506.00 > 78.00			-0.004	1.000	5466463	2.59		104	44835	
22 Perfluorooc				1 000	5E0144	0.2504		102	15271	
498.00 > 78.00			-0.006	1.000	550166	0.2584		103	15371	
68 Perfluorono 549.00 > 80.00	nanesuli 3.463	fonic aci 3.455	d 0.008	1.000	301811	0.2366		98.6	5939	
		3.455	0.008	1.000	113569	0.2300	2.66(1.33-3.97)	98.6 98.6	5939 1592	
J77.00 / 77.00	5.705	5.455	0.000	1.000	Page 487 of 3	720	2.00(1.00-0.71)	70.0	1372	

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Data File:	\\Chr	omNa\Sa	acrament	o\Chrom	Data\A8_N\201	80515-5821	7.b\2017.05.15LLB_	ICAL_0	04.d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,	1H 2H 2	H-nerflu	orodecar	16						
527.00 > 507.00	3.463	•	0.005	1.000	159889	0.2389		99.8	2540	
D 26 M2-8:2FTS		0.450		4 000	4407/7/	0.40		101	17010	
529.00 > 81.00		3.459	0.004	1.000	1187676	2.49		104	17819	
D 23 13C2 PFD 515.00 > 470.00		3.468	0.004	1.000	3297462	2.64		106	36473	
24 Perfluorode		cid								
513.00 > 469.00		3.468	0.004	1.000	320077	0.2496		99.8	1743	
513.00 > 169.00		3.468	0.004	1.000	65839		4.86(2.36-7.09)	99.8	1158	
D 27 d3-NMeFO		2 (24	0.000	1 000	1054507	2.70		100	F0007	
573.00 > 419.00		3.624	0.003	1.000	1854527	2.69		108	58327	
28 N-methyl pe				4 000	404050	0.0440		07.0	4700	
570.00 > 419.00		3.631	0.006	1.003	184250	0.2448		97.9	1723	
29 Perfluorode				4 000	077400	0.0454		100	4007	
599.00 > 80.00		3.781	0.001	1.000 1.003	277428	0.2454	2 21/1 20 4 14\	102	4027	
599.00 > 99.00		3.781	0.011	1.003	86380		3.21(1.39-4.16)	102	2334	
D 32 d5-NEtFOS		2 704	0.000	1 000	1057005	2.42		10E	12001	
589.00 > 419.00		3.794	0.008	1.000	1857905	2.63		105	12991	
D 30 13C2 PFU		2 000	0.000	1 000	257/040	2.70		104	F0004	
565.00 > 520.00		3.800	0.002	1.000	2576940	2.60		104	59924	
31 Perfluoroun			0.000	1 000	20074/	0.0000		00.0	010	
563.00 > 519.00 563.00 > 169.00		3.800 3.800	0.002 0.002	1.000 1.000	200746 51912	0.2332	3.87(2.12-6.36)	93.3 93.3	918 1560	
				1.000	31712		3.07(2.12-0.30)	73.3	1300	
33 N-ethyl perfl 584.00 > 419.00		ane suito 3.800	0.002	1.000	178736	0.2558		102	3652	
66 11-Chloroei					170700	0.2000		102	0002	
631.00 > 451.00		3.958	0.001	1.000	1057887	NC			20496	
		3.730	0.001	1.000	1037007	NO			20470	
D 36 13C2 PFD6 615.00 > 570.00		/ NOO	0 003	1 000	2740425	2.57		103	24900	
			0.003	1.000	2740423	2.57		103	24700	
37 Perfluorodo 613.00 > 569.00		4.100	0.002	1.000	305166	0.2667		107	260	
613.00 > 169.00		4.100	0.002	1.000	69161	0.2007	4.41(2.13-6.40)	107	929	
41 Perfluorotrio			0.002	1.000	07101		(2.10 0.10)	107	,_,	
663.00 > 619.00		4.368	0.004	1.000	322826	0.2575		103	180	
663.00 > 169.00		4.368	0.004	1.000	114369	0.2373	2.82(1.25-3.76)	103	1366	
D 43 13C2-PFT			0.00.				2.02(20 00)		.000	
715.00 > 670.00		4.608	0.005	1.000	3595983	2.75		110	17498	
42 Perfluoroteti			0.000	1.000	0070700	2.70			17170	
713.00 > 169.00		4.608	0.005	1.000	81619	0.2247		89.9	939	
713.00 > 219.00		4.608	-0.005	0.998	63777	0.2217	1.28(0.71-2.13)	89.9	1518	
D 44 13C2-PFH							,			
815.00 > 770.00		5.030	0.005	1.000	5862077	2.64		106	14450	
45 Perfluorohe:						,				
813.00 > 769.00		5.031	0.004	1.000	592774	NC			150	
813.00 > 169.00		5.031	0.004	1.000	95796	140	6.19(2.86-8.58)		795	
46 Perfluorooct							(3.00)		. 2	
913.00 > 869.00		5.408	0.009	1.000	647584	NC			124	
913.00 > 169.00		5.408	0.009	1.000	84829		7.63(3.83-11.48)		912	
					Daga 400 of 7	700	,		=	

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Report Date: 16-May-2018 09:20:01 Chrom Revision: 2.2 11-May-2018 08:54:46

OC Flag Legend Processing Flags NC - Not Calibrated

Reagents:

LCPFC_LL3_00004 Amount Added: 1.00 Units: mL

Report Date: 16-May-2018 09:20:01 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento Data File: \\ChromNa\\Sacramento\\ChromData\\A8_N\\20180515-58217.b\\2017.05.15LLB_ICAL_004.d **Injection Date:** 15-May-2018 15:29:08 Instrument ID: A8_N Lims ID: IC L3 Full Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 12 Worklist Smp#: Dil. Factor: Injection Vol: 2.0 ul 1.0000 LC PFC_QSM5-1 ICAL Method: $A8_N$ Limit Group: 2 Perfluorobutyric acid D 113C4 PFBA D 3 13C5-PFPeA Exp1;m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x Y (X100000) Y (X10000) 12 12 0.9 1.5 1.8 1.0 1.6 1.9 1.3 1.9 2.2 1.2 2.5 Min Min RT RT RT D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid 4 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 15- 20 Y (X10000) Y (X10000) 12 20 15 10 1.3 1.1 1.4 1.7 2.0 2.3 1.2 1.5 1.8 2.1 2.4 1.0 1.6 1.9 2.2 2.5 Min Min Min RT RT RT 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexaDe 7 13C2 PFHxA Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 78 (X100000 65- Y (X1000) Y (X1000) 32 52 24 39 16 26 2.1 1.3 1.9 2.5 1.8 1.7 2.0 2.3 2.6 0.7 1.5 2.4 2.7 1.4 Min RT RT RT 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid 70 Perfluoropentanesulfonic acid Exp1:m/z 349.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x 20 15- Y (X10000) (X10000) 16 (X1000 12 1.9 2.2 2.8 1.8 2.1 1.3 1.6 2.5 2.8 1.3 1.6 2.2 2.5 1.2 1.5 2.4 Min Min RT RT RT Page 490 of 728

2.9

3.2

3.5

2.2

RT

2.5

2.8

Min

3.1

2.3

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RT

2.4

RT

3.0

3.3

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RT

RT

Report Date: 16-May-2018 09:20:01 Chrom Revision: 2.2 11-May-2018 08:54:46 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_004.d

25 Sodium 1H,1H,2H,2H-perfluorodecabe26 M2-8:2FTS

68 Perfluorononanesulfonic acid

Exp1:m/z 549.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 527.00 > 507.00:Moving5PtAverage_x Exp1:m/z 529.00 > 81.00:Moving5PtAverage_x3 36- 30 Y (X10000) 35 30 Y (X1000) Y (X1000) 24 28 24 18 21 18 12 3.7 4.0 2.9 3.5 3.8 3.0 3.6 3.9 2.8 3.1 3.2 2.7 3.3 4.2 Min Min Min RT RT RT D 23 13C2 PFDA 24 Perfluorodecanoic acid 24 Perfluorodecanoic acid Exp1:m/z 515.00 > 470.00:Moving5PtAverage_x Exp1;m/z 513.00 > 469.00:Moving5PtAverage_x Exp1:m/z 513.00 > 169.00:Moving5PtAverage_x 20 Y (X100000) Y (X10000) Y (X1000) 16 3.0 3.6 3.9 3.0 3.6 3.9 3.0 3.6 3.9 Min RT RT RT D 27 d3-NMeFOSAA 28 N-methyl perfluorooctane sulfonami 29 Perfluorodecane Sulfonic acid Exp1:m/z 573.00 > 419.00:Moving5PtAverage_x Exp1:m/z 570.00 > 419.00:Moving5PtAverage_x Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 60 84 50 50 Y (X1000) 40 56 40 30 30 20 20 28 10 3.3 3.3 3.9 3.0 3.6 3.9 4.2 3.0 3.6 4.2 3.1 3.4 3.7 4.0 4.3 Min Min Min RT RT RT D 30 13C2 PFUnA 29 Perfluorodecane Sulfonic acid D 32 d5-NEtFOSAA Exp1:m/z 599.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 589.00 > 419.00:Moving5PtAverage_x Exp1:m/z 565.00 > 520.00:Moving5PtAverage_) 78 54 25 Y (X10000) Y (X10000) 45- 65 Y (X1000 20 36- 52 15- 39 27 10 18 26 13 3.8 Min 3.8 Min 3.5 4.1 4.4 3.5 4.4 3.4 4.0 4.6 3.2 3.2 4.1 2.8 Min RT RT RT

4.9

5.2

4.6

Min

4.3

4.0

RT

4.9 Min 5.2

5.5

4.6

4.3

RT

0

4.0

RT

4.6 Min 4.9

5.2

4.3

Report Date: 16-May-2018 09:20:05 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_005.d

Lims ID: IC L4 Full

Client ID:

Sample Type: ICIS Calib Level: 4

Inject. Date: 15-May-2018 15:36:58 ALS Bottle#: 13 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L4-FULL

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub32

Method: \ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 16-May-2018 09:20:03 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK037

First Level Reviewer: hannigana Date: 16-May-2018 08:01:39

First Level Revie	wei. Hai	ii iiyana			Date.	ı	10-101ay-2016 06.01.3	9		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA										
217.00 > 172.00		1.462	-0.001	1.000	7049149	2.42		96.8	46136	
2 Perfluorobut	vric acid									
212.90 > 169.00		1.462	-0.001	1.000	2597444	0.99		99.1	1318	
D 3 13C5-PFPe	eΑ									
267.90 > 223.00	1.743	1.744	-0.001	0.561	4710025	2.52		101	87673	
4 Perfluoroper	ntanoic a									
262.90 > 219.00	1.743	1.745	-0.002	1.000	2073422	0.9323		93.2	1140	
D 47 13C3-PFB										
301.90 > 83.00		1.780	-0.001	1.000	98369	2.33		100	653	
5 Perfluorobut			0.004	1 000	0050075	0.0/54		07.0	44404	
	1.779 1.779	1.783 1.783	-0.004 -0.004	1.000 1.000	2858265 1207235	0.8651	2.37(1.25-3.74)	97.9 97.9	14624 7612	
D 60 M2-4:2FTS		1.703	-0.004	1.000	1207233		2.37(1.23-3.74)	71.7	7012	
329.00 > 81.00		1.999	0.0	1.000	757382	NC			9845	
61 Sodium 1H,									70.0	
327.00 > 307.00		2.000		1.000	636977	0.9084		97.3	35258	
6 Perfluorohex	canoic ac	cid								
313.00 > 269.00	2.033	2.037	-0.004	1.000	1931731	0.9677		96.8	2942	
313.00 > 119.00	2.033	2.037	-0.004	1.000	169446		11.40(5.03-15.10)	96.8	2297	
D 7 13C2 PFHx										
315.00 > 270.00	2.033	2.037	-0.004	1.000	4854075	2.44		97.6	80326	
70 Perfluorope										
349.00 > 80.00		2.059		1.000	2702610	0.9185	2 70(1 27 4 07)	97.9	30039	
	2.056		-0.003	1.000	1001761		2.70(1.36-4.07)	97.9	9135	
67 Perfluoro(2- 329.10 > 285.00		propano 2.134	-	1.000	301290	NC			2693	
329.1U > 285.UU	2.133	2.134	0.001	1.000	301290	NC			2093	

Data File:	\\Chr	omNa\S	acrament	to\Chrom	Data\A8_N\201	80515-5821	7.b\2017.05.15LLB ₋	_ICAL_0	05.d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFP	O-DA									
332.10 > 287.00	2.135	2.134	0.001	1.000	238512	NC			4336	
D 9 13C4-PFH _p 367.00 > 322.00		2.374	-0.006	1.000	4714171	2.47		98.9	75030	
			-0.006	1.000	4/141/1	2.47		90.9	75050	
10 Perfluorohe 363.00 > 319.00		2.374	-0.006	1.000	1839273	0.9234		92.3	2776	
363.00 > 169.00		2.374	-0.006	1.000	750283	0.7234	2.45(1.13-3.40)	92.3	4821	
8 Perfluorohex							(,			
399.00 > 80.00			-0.006	1.000	2238132	0.8440		92.7	14277	
399.00 > 99.00	2.381	2.386	-0.006	1.000	758974		2.95(1.50-4.49)	92.7	2596	
D 11 18O2 PFH	xS									
403.00 > 84.00	2.381	2.386	-0.006	1.000	5565884	2.36		99.9	50235	
65 Adona										
377.00 > 251.00		2.418		1.000	6019764	NC			85325	
377.00 > 85.00	2.414	2.418	-0.004	1.000	3416928		1.76(0.84-2.53)		41481	
13 Sodium 1H,		•								
427.00 > 407.00	2.703	2.707	-0.004	1.000	642687	0.8356		88.1	4840	
D 12 M2-6:2FTS										
429.00 > 81.00		2.707	-0.004	1.000	1028277	2.44		103	17698	
D 14 13C4 PFO										
417.00 > 372.00		2.731	-0.005	1.000	4460027	2.47		98.9	53300	
15 Perfluorooc										
413.00 > 369.00		2.734	-0.001	1.003	2030259	0.9669	0.00(0.04.0.50)	96.7	774	
413.00 > 169.00		2.734	-0.001	1.003	1016402		2.00(0.84-2.52)	96.7	3648	
* 62 13C2-PFO		0.704	0.001		47/0007	0.50			F7/40	
415.00 > 370.00			-0.001		4762237	2.50			57613	
16 Perfluorohe	-			1 000	2045002	0.0700		100	22752	
449.00 > 80.00 449.00 > 99.00			-0.006	1.000 1.000	2045093 547456	0.9709	3.74(1.94-5.82)	102	23753 6229	
		2.739	-0.000	1.000	547450		3.74(1.94-3.02)	102	0229	
D 18 13C4 PFO 503.00 > 80.00		2 104	-0.007	1.000	3779459	2.33		97.6	24139	
				1.000	3779439	2.33		97.0	24139	
17 Perfluorooc 499.00 > 80.00		onic aci 3.105		1.002	1585297	0.8526		91.9	11307	
499.00 > 80.00 499.00 > 99.00		3.105	0.0	1.002	364451	0.6320	4.35(2.31-6.93)	91.9	4761	
			0.0	1.002	304431		4.55(2.51-0.75)	71.7	4701	
20 Perfluorono 463.00 > 419.00		3.107	-0.002	1.000	1453651	0.9530		95.3	2199	
463.00 > 169.00			-0.002	1.000	348207	0.7550	4.17(1.90-5.69)	95.3	7960	
D 19 13C5 PFN		0.107	0.002	1.000	0.10207		,(,6 6.6,7)	70.0	,,,,	
468.00 > 423.00		3 107	-0.002	1.000	3600246	2.44		97.6	50324	
69 9-Chlorohe					0000210	2		77.0	00021	
531.00 > 351.00			-0.003	1.000	2728187	NC			29405	
D 21 13C8 FOS		0.010	0.000		2,2310,	110			_,,,,,	
506.00 > 78.00		3 420	-0.001	1.000	5346931	2.52		101	38654	
22 Perfluorooc				1.000	3370731	2.02		101	30034	
498.00 > 78.00			e -0.003	1.000	2070950	0.99		99.5	25217	
				1.000	2070730	0.77		77.5	ZUZ 1 /	
68 Perfluorono 549.00 > 80.00		3.455	a 0.001	1.000	1144412	0.9554		99.5	17278	
549.00 > 60.00 549.00 > 99.00		3.455	-0.001	0.997	454699	0.7004	2.52(1.33-3.97)	99.5 99.5	8974	
517.00 / 77.00	J. 177	0. 100	0.000	0.771	Page 407 of ⁻	720	2.02(1.00 0.71)	, ,	5777	

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Data File:	\\Chr	omNa\S	acrament	o\Chrom	Data\A8_N\201	80515-5821	7.b\2017.05.15LLB_	ICAL_0	05.d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,	1H 2H 2	H-perflu	orodecar	ne						
527.00 > 507.00		•		1.000	581733	0.9417		98.3	11450	
D 26 M2-8:2FTS	5									
529.00 > 81.00		3.459	-0.003	1.000	1096366	2.29		95.6	13992	
24 Perfluorode	canoic a	cid								
513.00 > 469.00		3.468	-0.003	1.000	1208399	1.01		101	5917	
513.00 > 169.00		3.468	-0.003	1.000	230921		5.23(2.36-7.09)	101	5650	
D 23 13C2 PFD		0.440	0.000	4 000	0004/70	0.47		00.0	75.400	
515.00 > 470.00		3.468	-0.003	1.000	3084670	2.46		98.3	75429	
D 27 d3-NMeFC 573.00 > 419.00		2 424	0.004	1.000	1667566	2.41		04.4	23781	
			-0.004	1.000	100/300	2.41		96.4	23/81	
28 N-methyl pe 570.00 > 419.00			-0.001	1.003	695308	1.03		103	6776	
29 Perfluorode				1.003	073300	1.03		103	0770	
599.00 > 80.00	3.784	3.781	0.003	1.000	961059	0.9051		93.9	13697	
599.00 > 99.00		3.781	0.003	1.000	339652	0.700.	2.83(1.39-4.16)	93.9	7908	
D 32 d5-NEtFOS	SAA									
589.00 > 419.00	3.794	3.794	0.0	1.000	1808821	2.55		102	9758	
33 N-ethyl perf	luorooct	ane sulfo	onamid							
584.00 > 419.00	3.794	3.800	-0.006	1.000	651368	0.9577		95.8	11982	
31 Perfluoroun	decanoi	c acid								
563.00 > 519.00		3.800	-0.006	1.000	756677	0.8755		87.6	4657	
563.00 > 169.00		3.800	-0.006	1.000	202483		3.74(2.12-6.36)	87.6	7412	
D 30 13C2 PFU		0.000	0.007	4 000	0507050	0.40		101	40500	
565.00 > 520.00		3.800	-0.006	1.000	2587053	2.60		104	43529	
66 11-Chloroei					4150140	NC			44274	
631.00 > 451.00		3.958	0.002	1.000	4159140	NC			44374	
D 36 13C2 PFD 615.00 > 570.00		4 000	0.007	1.000	2679695	2.51		100	17510	
37 Perfluorodo			-0.007	1.000	2077075	2.31		100	17310	
613.00 > 569.00		4.100	0.002	1.003	1104651	0.9875		98.7	918	
613.00 > 169.00		4.100	-0.008	1.000	275338	0.7073	4.01(2.13-6.40)	98.7	2899	
41 Perfluorotrio							, ,			
663.00 > 619.00		4.368	-0.006	1.000	1211735	0.9883		98.8	636	
663.00 > 169.00	4.362	4.368	-0.006	1.000	378967		3.20(1.25-3.76)	98.8	5472	
42 Perfluorotet	radecan	oic acid								
713.00 > 169.00	4.605	4.608	-0.003	1.000	331048	0.9655		96.6	4238	
713.00 > 219.00	4.595	4.608	-0.013	0.998	234322		1.41(0.71-2.13)	96.6	3434	
D 43 13C2-PFT										
715.00 > 670.00		4.608	-0.003	1.000	3394312	2.59		103	16978	
D 44 13C2-PFH										
815.00 > 770.00		5.030	-0.002	1.000	5890266	2.64		106	15198	
45 Perfluorohe			0.005	4 00-	000/555				E. (C	
813.00 > 769.00		5.031	-0.003	1.000	2236578	NC	4 02/2 07 0 50		560	
813.00 > 169.00		5.031	-0.003	1.000	371148		6.03(2.86-8.58)		2763	
46 Perfluorooc			0.000	1 000	2574004	NIC			A = A	
913.00 > 869.00 913.00 > 169.00		5.408 5.408	-0.002 -0.002	1.000 1.000	2576884 319419	NC	8.07(3.83-11.48)		454 2706	
713.00 / 109.00	J.400	5.400	-0.002	1.000	319419 Page 408 of 3	720	0.07 (3.03-11.40)		2100	

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Report Date: 16-May-2018 09:20:05 Chrom Revision: 2.2 11-May-2018 08:54:46

OC Flag Legend Processing Flags NC - Not Calibrated

Reagents:

LCPFC_LL4_00004 Amount Added: 1.00 Units: mL

Report Date: 16-May-2018 09:20:05 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_005.d **Injection Date:** 15-May-2018 15:36:58 Instrument ID: A8_N Lims ID: IC L4 Full Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 5 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_QSM5-1 ICAL $A8_N$ 2 Perfluorobutyric acid D 313C5-PFPeA D 113C4 PFBA Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x Y (X100000) Y (X100000) 50 40 30 20 1.0 1.6 1.9 0.4 1.0 1.6 2.2 1.3 1.9 2.2 2.5 Min Min RT RT RT 5 Perfluorobutanesulfonic acid D 47 13C3-PFBS 4 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 72 25- Y (X10000) Y (X10000) 60 Y (X1000) 20 36 48 15- 27 36 10 18 24 1.9 1.9 2.2 1.0 1.3 2.2 2.5 1.2 1.5 1.8 2.1 2.4 1.0 1.3 2.5 Min Min RT RT RT 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexan@ Perfluorohexanoic acid Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x 30 15- Y (X10000) 25 Y (X10000) Y (X10000) 40 12 20 32 15 10 1.8 2.0 2.6 2.6 1.5 2.1 2.4 1.7 2.3 1.7 2.0 1.2 1.4 1.4 2.3 RT RT RT 6 Perfluorohexanoic acid 7 13C2 PFHxA 70 Perfluoropentanesulfonic acid Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 349.00 > 80.00:Moving5PtAverage_x3 42 72 (X100000) 60 35 Y (X10000) 10 Y (X1000) 48 28 36 21 24 14 2.0 2.3 2.0 1.8 2.1 1.4 1.7 2.6 2.3 2.6 1.2 1.5 2.4 Min RT RT RT Page 500 of 728

2.6 <u>Min</u>

2.9

3.2

3.5

2.4

RT

3.3

3.0

2.3

RT

2.3

RT

2.9

3.2

Report Date: 16-May-2018 09:20:05 Chrom Revision: 2.2 11-May-2018 08:54:46 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_005.d 16 Perfluoroheptanesulfonic acid 16 Perfluoroheptanesulfonic acid Exp1:m/z 449.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3 Y (X100000) Y (X10000) 40 30 20 2.3 2.6 2.9 3.2 2.3 2.6 Min 2.9 3.2 2.8 3.1 2.0 3.5 2.0 3.5 2.2 2.5 3.4 Min Min RT RT RT D 18 13C4 PFOS 17 Perfluorooctane sulfonic acid 17 Perfluorooctane sulfonic acid Exp1;m/z 503.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 499.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 499.00 > 99.00:Moving5PtAverage_x3 78 30 Y (X100000) Y (X10000) 65 24 52 18 39 26 13 3.3 2.7 3.3 3.6 3.4 4.0 4.2 Min RT RT RT 20 Perfluorononanoic acid 20 Perfluorononanoic acid D 19 13C5 PFNA Exp1:m/z 463.00 > 419.00:Moving5PtAverage_x Exp1:m/z 463.00 > 169.00:Moving5PtAverage_> Exp1:m/z 468.00 > 423.00:Moving5PtAverage_x 90 (X100000) 35 75 Y (X1000) 28 60 21 45- 30 0 0 2.8 3.4 3.3 2.5 2.8 3.1 3.4 3.7 2.5 3.1 3.7 2.4 2.7 3.0 3.6 Min Min Min RT RT RT D 21 13C8 FOSA 22 Perfluorooctane Sulfonamide 68 Perfluorononanesulfonic acid Exp1:m/z 506.00 > 78.00:Moving5PtAverage_x3 Exp1:m/z 498.00 > 78.00:Moving5PtAverage_x3 Exp1:m/z 549.00 > 80.00:Moving5PtAverage_x3 35 Y (X100000) 50 Y (X10000) Y (X10000) 12 28 40 30 20

3.4 Min 4.0

3.7

3.1

2.8

RT

3.6

3.0

RT

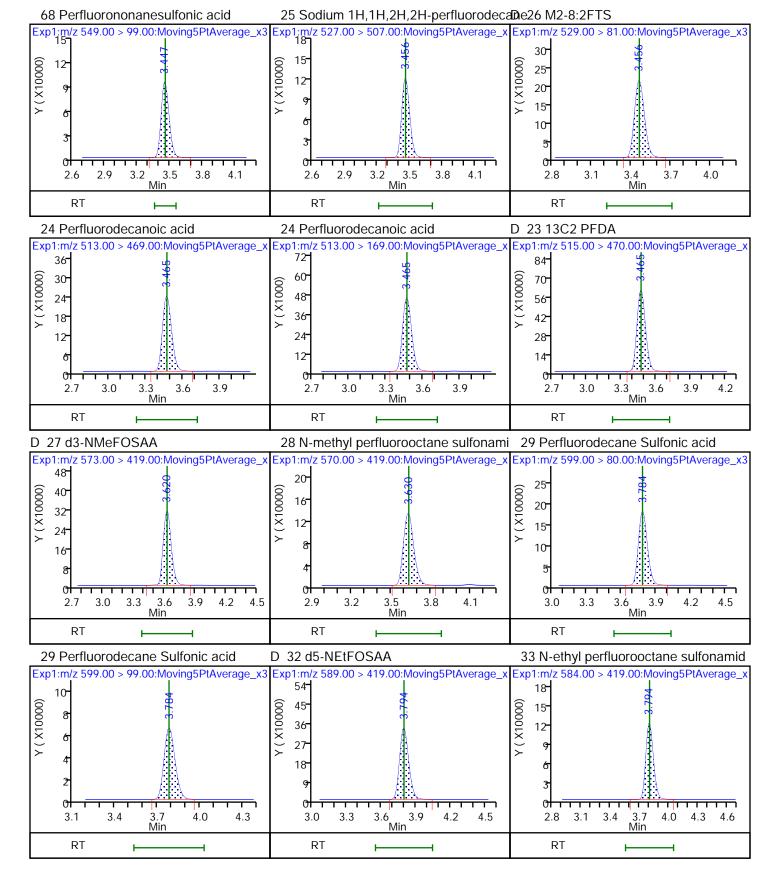
3.9

3.9

3.6

3.0

RT



4.7

Min

5.0

5.3

4.1

RT

4.2

RT

5.1

4.8

4.9 Min 5.2

4.6

4.3

RT

5.5

5.8

Report Date: 16-May-2018 09:20:16 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_007.d

Lims ID: IC L6 Full

Client ID:

Sample Type: IC Calib Level: 6

Inject. Date: 15-May-2018 15:52:36 ALS Bottle#: 15 Worklist Smp#: 7

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L6-FULL

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub32

Method: \ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 16-May-2018 09:20:14 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK037

First Level Reviewer: hannigana Date: 16-May-2018 08:02:38

1 113t Eevel Neviewer: Harringaria					Date.		0 May 2010 00.02.0				
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	2 Perfluorobuty	yric acid									
	212.90 > 169.00		1.462	0.001	1.000	12934647	5.15		103	7697	
	D 1 13C4 PFBA 217.00 > 172.00		1.462	0.001	1.000	6751655	2.54		102	43716	
	D 3 13C5-PFPe		1.402	0.001	1.000	0731033	2.04		102	43710	
	267.90 > 223.00		1.744	0.003	0.563	4328345	2.54		102	61811	
	4 Perfluoropen				1 000	10150110	4.07			5.40.4	
	262.90 > 219.00 D 47 13C3-PFBS		1.745	0.002	1.000	10150448	4.97		99.3	5494	
	301.90 > 83.00		1.780	0.003	1.000	87185	2.27		97.4	537	
	5 Perfluorobuta	anesulfo	nic acid								
		1.783 1.783	1.783 1.783	0.0	1.000 1.000	13863265 5921678	4.73	2.34(1.25-3.74)	107 107	62707 33570	
	298.90 > 99.00 D 60 M2-4:2FTS		1.783	0.0	1.000	3921078		2.34(1.25-3.74)	107	33570	
	329.00 > 81.00		1.999	0.004	1.000	667183	NC			8785	
	61 Sodium 1H,										
	327.00 > 307.00		2.000	0.003	1.000	3112425	5.01		107	179105	
	D 7 13C2 PFHx 315.00 > 270.00		2.037	0.0	1.000	4583820	2.52		101	77348	
	6 Perfluorohex										
	313.00 > 269.00		2.037	0.0	1.000	9544553	5.06		101	17429	
	313.00 > 119.00		2.037	0.0	1.000	864980		11.03(5.03-15.10)	101	12137	
	70 Perfluoropei 349.00 > 80.00	ntanesui 2.060	2.059	0.001	1.000	13112812	5.03		107	135793	
	349.00 > 99.00	2.060	2.059	0.001	1.000	4899363		2.68(1.36-4.07)	107	39200	
	D 64 13C3 HFP0		0.404	0.005	1 000	000407	N 10			4744	
	332.10 > 287.00	2.139	2.134	0.005	1.000	229197	NC			4744	

Data File:	\\Chr	omNa\S	acrament	o\Chrom	Data\A8_N\201	80515-5821	7.b\2017.05.15LLB	_ICAL_0	07.d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-	vxoqorq	propanc	oic) acid							
329.10 > 285.00			0.005	1.000	1471265	NC			11755	
10 Perfluorohe	ptanoic a	acid								
363.00 > 319.00		2.374	-0.002	1.000	9093863	4.98		99.7	11594	
363.00 > 169.00		2.374	-0.002	1.000	3608375		2.52(1.13-3.40)	99.7	18118	
D 9 13C4-PFHp		0.074	0.000	1 000	4240200	0.40		00.0	70007	
367.00 > 322.00		2.374	-0.002	1.000	4318388	2.48		99.3	70096	
D 11 1802 PFH: 403.00 > 84.00		2 226	-0.001	1.000	5191664	2.41		102	44906	
8 Perfluorohex				1.000	3191004	2.41		102	44900	
399.00 > 80.00		2.386	ı -0.001	1.000	10650638	4.31		94.6	33451	
399.00 > 99.00		2.386	-0.001	1.000	3614555	1.01	2.95(1.50-4.49)	94.6	11846	
65 Adona										
377.00 > 251.00	2.418	2.418	0.0	1.000	25273614	NC			98920	
377.00 > 85.00	2.418	2.418	0.0	1.000	15668730		1.61(0.84-2.53)		80776	
D 12 M2-6:2FTS										
429.00 > 81.00	2.705	2.707	-0.002	1.000	867962	2.26		95.2	14854	
13 Sodium 1H,		•								
427.00 > 407.00		2.707	-0.002	1.000	3021313	4.70		99.2	17776	
D 14 13C4 PFO		0.704	0.000	1 000	4070/00	0.40		00.0	(00//	
417.00 > 372.00		2.731	-0.003	1.000	4079623	2.48		99.2	69266	
* 62 13C2-PFOA 415.00 > 370.00		2.734	0.002		4344720	2.50			52764	
			0.002		4344720	2.30			32704	
15 Perfluorooct 413.00 > 369.00		2.734	0.002	1.003	9649258	5.02		100	3647	
413.00 > 169.00		2.734	-0.006	1.000	4988335	5.02	1.93(0.84-2.52)	100	15918	
16 Perfluorohe							,			
449.00 > 80.00			-0.003	1.000	9775395	4.98		105	59538	
449.00 > 99.00	2.736	2.739	-0.003	1.000	2650153		3.69(1.94-5.82)	105	23801	
D 18 13C4 PFO	S									
503.00 > 80.00	3.100	3.104	-0.004	1.000	3520558	2.38		99.7	21492	
17 Perfluorooct	ane sulf	onic aci	d							
499.00 > 80.00			-0.005	1.000	7964833	4.60		99.1	40574	
499.00 > 99.00		3.105	-0.005	1.000	1714762		4.64(2.31-6.93)	99.1	16094	
D 19 13C5 PFN/		0.407	0.007	1 000	0050404	0.50			50004	
468.00 > 423.00		3.107	-0.007	1.000	3359491	2.50		99.8	58281	
20 Perfluorono			0.007	1 000	7105040	F 01		100	0/2/	
463.00 > 419.00 463.00 > 169.00		3.107	-0.007 -0.007	1.000 1.000	7125949 1697389	5.01	4.20(1.90-5.69)	100 100	9626 38936	
69 9-Chlorohex					1077307		4.20(1.70-3.07)	100	30730	
531.00 > 351.00				e 1.000	13260701	NC			75928	
D 21 13C8 FOS		0.010	0.000	1.000	10200701	110			,0,20	
506.00 > 78.00		3.420	-0.005	1.000	4976852	2.57		103	44899	
22 Perfluorooct					3002					
498.00 > 78.00		3.422		1.000	10364812	5.35		107	72768	
68 Perfluorono										
549.00 > 80.00		3.455	-0.003	1.000	5665707	5.08		106	58348	
549.00 > 99.00	3.452	3.455	-0.003	1.000	2073279		2.73(1.33-3.97)	106	26932	
					Page 507 of 7	728				

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Data File:	\\Chr	omNa\S	acrament	to\Chrom	Data\A8_N\201	80515-5821	7.b\2017.05.15LLB_	_ICAL_0	07.d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,	1H 2H 2	H-nerflu	orodecar	1 0						
527.00 > 507.00	3.452	-		1.000	2834764	5.17		108	68462	
D 26 M2-8:2FTS 529.00 > 81.00		3.459	-0.007	1.000	972368	2.23		92.9	15318	
D 23 13C2 PFD										
515.00 > 470.00 24 Perfluorode		3.468	-0.006	1.000	2812041	2.46		98.3	45289	
513.00 > 469.00		3.468	-0.006	1.000	5744357	5.25		105	23436	
513.00 > 169.00	3.462	3.468	-0.006	1.000	1030600	0.20	5.57(2.36-7.09)	105	28166	
D 27 d3-NMeFC 573.00 > 419.00		3.624	-0.006	1.000	1561125	2.47		98.9	24281	
28 N-methyl pe	erfluoroo	ctane su	ılfonami							
570.00 > 419.00	3.628	3.631	-0.003	1.003	3278986	5.17		103	22410	
29 Perfluorode				1 000	5000747	F 0.7		405	100/1	
599.00 > 80.00 599.00 > 99.00	3.772 3.772	3.781 3.781	-0.009 -0.009	1.000 1.000	5009746 1665176	5.07	3.01(1.39-4.16)	105 105	48361 27808	
		3.701	-0.009	1.000	1005170		3.01(1.39-4.10)	103	27000	
D 32 d5-NEtFOS 589.00 > 419.00		3.794	-0.011	1.000	1507014	2.33		93.0	7190	
D 30 13C2 PFU 565.00 > 520.00		3.800	-0.006	1.000	2262574	2.50		99.8	34652	
31 Perfluoroun										
563.00 > 519.00		3.800	-0.006	1.000	3717634	4.92		98.4	15246	
563.00 > 169.00	3.794	3.800	-0.006	1.000	938877		3.96(2.12-6.36)	98.4	21508	
33 N-ethyl perf 584.00 > 419.00	3.794	3.800	-0.006	1.003	3130989	5.53		111	62545	
66 11-Chloroei					2022/205	NC			1224/0	
631.00 > 451.00		3.958	-0.006	1.000	20326205	NC			133460	
D 36 13C2 PFD 615.00 > 570.00		4.099	-0.002	1.000	2544838	2.61		104	17180	
37 Perfluorodo	decanoi	c acid								
613.00 > 569.00		4.100	-0.003	1.000	5307128	5.00		99.9	4236	
613.00 > 169.00		4.100	-0.003	1.000	1355731		3.91(2.13-6.40)	99.9	14317	
41 Perfluorotrio				1 000	5000111	5 0 /		404	00.14	
663.00 > 619.00		4.368	-0.008	1.000	5890114	5.06	2 20/1 25 2 7/)	101	3241	
663.00 > 169.00		4.368	-0.008	1.000	1785642		3.30(1.25-3.76)	101	15812	
D 43 13C2-PFT 715.00 > 670.00		1 600	0.004	1 000	2112222	2.60		104	13682	
		4.608	-0.004	1.000	3113223	2.60		104	13082	
42 Perfluorotet 713.00 > 169.00		4.608	-0.004	1.000	1571970	5.00		100.0	14331	
713.00 > 109.00		4.608	-0.004	0.998	1080602	5.00	1.45(0.71-2.13)	100.0	15785	
D 44 13C2-PFH		1.000	0.010	0.770	1000002		1.10(0.71 2.10)	100.0	10700	
815.00 > 770.00		5.030	-0.003	1.000	5054291	2.49		99.5	12467	
45 Perfluorohe										
813.00 > 769.00		5.031	-0.004	1.000	9889936	NC	/ 00/0 0 / 5 =5°		2174	
813.00 > 169.00		5.031	-0.004	1.000	1647631		6.00(2.86-8.58)		8949	
46 Perfluorooc			0.05:	4 00-	40704575				47	
913.00 > 869.00		5.408	-0.006	1.000	10791279	NC	0 22/2 02 11 40\		1744 6452	
913.00 > 169.00	0.402	5.408	-0.006	1.000	1312233 Page 508 of 3	728	8.22(3.83-11.48)		6453	

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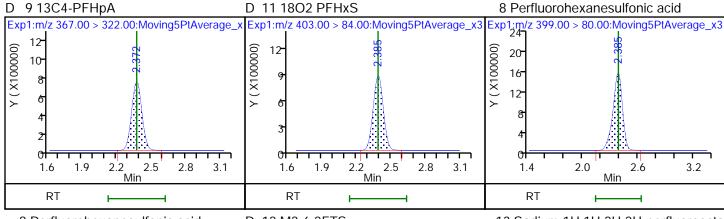
Report Date: 16-May-2018 09:20:16 Chrom Revision: 2.2 11-May-2018 08:54:46

OC Flag Legend Processing Flags NC - Not Calibrated

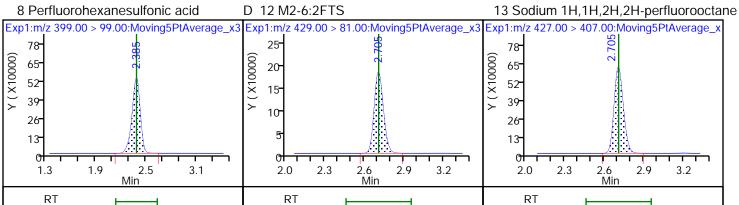
Reagents:

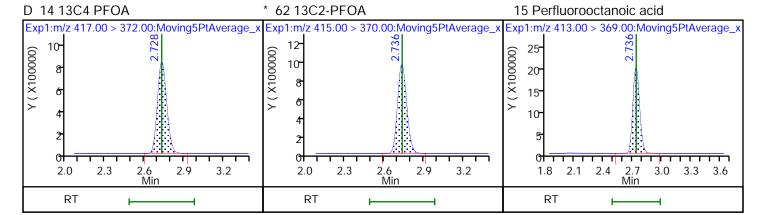
LCPFC_LL6_00005 Amount Added: 1.00 Units: mL

Report Date: 16-May-2018 09:20:16 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento Data File: \\ChromNa\\Sacramento\\ChromData\\A8_N\\20180515-58217.b\\2017.05.15LLB_ICAL_007.d **Injection Date:** 15-May-2018 15:52:36 Instrument ID: A8_N Lims ID: IC L6 Full Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 15 Worklist Smp#: 7 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_QSM5-1 ICAL $A8_N$ D 313C5-PFPeA 2 Perfluorobutyric acid D 113C4 PFBA Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x 25 20 15 10 0.9 1.8 2.7 1.0 1.6 1.9 1.3 1.9 2.2 2.5 Min Min Min RT RT RT 5 Perfluorobutanesulfonic acid D 47 13C3-PFBS 4 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 36 Y (X100000) 20 30 20 16 24 15- 12 18 10 1.9 2.0 2.1 2.4 1.0 1.3 2.2 2.5 1.1 1.4 1.7 2.3 1.2 1.5 1.8 2.7 Min Min RT RT RT 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexaDe 7 13C2 PFHxA Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x (X100000) Y (X100000 Y (X10000) 75 10 12 60 45- 30 1.8 0.9 2.0 1.5 2.1 1.5 2.1 2.7 1.7 2.3 2.6 1.2 1.4 Min RT RT RT 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid 70 Perfluoropentanesulfonic acid Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 349.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x 24 (X100000) Y (X100000) 20 24 16 16- 18 12 12 0.9 1.5 2.1 2.7 1.5 1.8 2.1 0.9 1.5 2.1 2.7 1.2 2.4 Min Min RT RT RT Page 510 of 728



3.1





Report Date: 16-May-2018 09:20:16 Chrom Revision: 2.2 11-May-2018 08:54:46 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_007.d 15 Perfluorooctanoic acid 16 Perfluoroheptanesulfonic acid 16 Perfluoroheptanesulfonic acid Exp1:m/z 413.00 > 169.00:Moving5PtAverage_x Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 449.00 > 99.00:Moving5PtAverage_x3 72 Y (X100000) Y (X100000) Y (X10000) 60 20 48 15- 36 10 2.2 2.8 3.4 2.7 3.0 3.3 2.8 3.1 1.6 2.1 2.4 2.2 2.5 3.4 Min Min Min RT RT RT D 18 13C4 PFOS 17 Perfluorooctane sulfonic acid 17 Perfluorooctane sulfonic acid Exp1;m/z 499.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 503.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 499.00 > 99.00:Moving5PtAverage_x3 42 Y (X100000) (X100000) Y (X10000) 35 28 3.3 3.3 2.7 3.3 3.6 1.5 2.4 4.2 4.2 Min Min RT RT RT D 19 13C5 PFNA 20 Perfluorononanoic acid 20 Perfluorononanoic acid Exp1:m/z 463.00 > 419.00:Moving5PtAverage_x Exp1:m/z 468.00 > 423.00:Moving5PtAverage_> Exp1:m/z 463.00 > 169.00:Moving5PtAverage_x 90 (X100000) 75 Y (X10000) 32 60 12 24 45- 30 2.6 3.2 2.8 3.7 2.9 3.5 3.8 2.4 2.7 3.0 3.3 3.6 2.5 3.1 3.4 Min Min RT RT RT D 21 13C8 FOSA 22 Perfluorooctane Sulfonamide 68 Perfluorononanesulfonic acid Exp1:m/z 506.00 > 78.00:Moving5PtAverage_x3 Exp1:m/z 498.00 > 78.00:Moving5PtAverage_x3 Exp1:m/z 549.00 > 80.00:Moving5PtAverage_x3 30 Y (X100000) (X100000) Y (X100000) 25 12 20 15- 10

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RT

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RT

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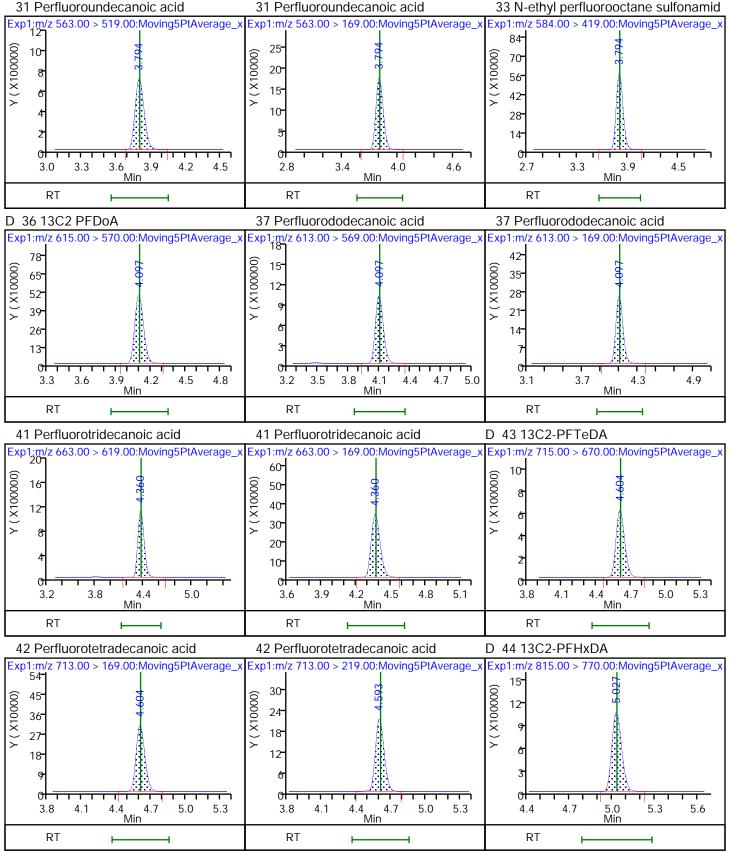
RT

3.5

Min

3.8

68 Perfluorononanesulfonic acid 25 Sodium 1H,1H,2H,2H-perfluorodecabe26 M2-8:2FTS Exp1:m/z 549.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 527.00 > 507.00:Moving5PtAverage_x Exp1:m/z 529.00 > 81.00:Moving5PtAverage_x3 60 25 Y (X10000) 50 Y (X10000) 65- Y (X10000) 20 52 40 15 39 30 20 26 10 3.0 3.6 4.2 2.9 3.5 4.1 3.0 3.3 3.6 3.9 2.4 2.3 2.7 Min Min Min RT RT RT \mathbf{H} D 23 13C2 PFDA 24 Perfluorodecanoic acid 24 Perfluorodecanoic acid Exp1:m/z 515.00 > 470.00:Moving5PtAverage_x Exp1:m/z 513.00 > 469.00:Moving5PtAverage_x Exp1:m/z 513.00 > 169.00:Moving5PtAverage_x 30 90 15 (X100000) Y (X10000) 25 Y (X10000) 75 12 20 60 15 45 30 15 3.0 3.6 3.9 3.5 3.8 3.0 3.6 4.2 Min RT RT RT 28 N-methyl perfluorooctane sulfonami D 27 d3-NMeFOSAA 29 Perfluorodecane Sulfonic acid Exp1:m/z 573.00 > 419.00:Moving5PtAverage_x Exp1:m/z 570.00 > 419.00:Moving5PtAverage_x Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 15 84 (X10000) 70 32 56- 24 42 16 28 3.7 3.7 3.1 3.4 4.0 3.1 3.4 4.0 3.2 3.5 3.8 4.1 Min RT RT RT D 30 13C2 PFUnA 29 Perfluorodecane Sulfonic acid D 32 d5-NEtFOSAA 42 48 Y (X10000) Y (X10000) Y (X10000) 40 28 44 32 24 22 16 3.6 <u>Min</u> 3.9 3.9 3.9 3.3 4.2 4.5 3.3 4.2 3.3 4.2 4.5 Min RT RT RT



Report Date: 16-May-2018 09:20:19 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_008.d

Lims ID: IC L7 Full

Client ID:

Sample Type: IC Calib Level: 7

Inject. Date: 15-May-2018 16:00:25 ALS Bottle#: 16 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L7-FULL

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub32

Method: \ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 16-May-2018 09:20:17 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK037

First Level Reviewer: hannigana Date: 16-May-2018 08:03:15

FIIST LEVEL REVIE	iriiyaria			Date.	l l	10-181ay-2016 06.03. I	3			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00		1.462	0.001	1.000	7496989	2.56		102	45156	
2 Perfluorobut	yric acid									
212.90 > 169.00	1.463	1.462	0.001	1.000	26861072	9.63		96.3	10837	
D 3 13C5-PFPe	eΑ									
267.90 > 223.00	1.747	1.744	0.003	0.563	4657025	2.48		99.2	88540	
4 Perfluoroper										
262.90 > 219.00		1.745	0.002	1.000	21497034	9.78		97.8	12049	
D 47 13C3-PFB		4 700	0.000	4 000	004.04	0.04		400		
301.90 > 83.00		1.780	0.003	1.000	99131	2.34		100	680	
5 Perfluorobuta 298.90 > 80.00		nic acid 1.783	0.0	1.000	28014178	8.41		95.2	105824	
	1.783	1.783	0.0	1.000	12761331	0.41	2.20(1.25-3.74)	95.2 95.2	86489	
D 60 M2-4:2FTS							_:_:(::_: ::: :,			
329.00 > 81.00		1.999	-0.008	1.000	711767	NC			9363	
61 Sodium 1H,	1H,2H,2	H-perflu	orohexar	ne						
327.00 > 307.00	1.991	2.000	-0.009	1.000	6341030	8.97		96.1	269024	
6 Perfluorohex	anoic ac	id								
313.00 > 269.00		2.037	0.0	1.000	20297289	10.5		105	27327	
313.00 > 119.00		2.037	0.0	1.000	1901738		10.67(5.03-15.10)	105	32214	
D 7 13C2 PFHx		0.007	0.0	1 000	4700040	0.05		04.0	110100	
315.00 > 270.00		2.037		1.000	4709249	2.35		94.0	113102	
70 Perfluorope 349.00 > 80.00		tonic ac 2.059		1.000	25577332	8.63		92.0	129323	
	2.059	2.059	0.0	1.000	10408450	0.03	2.46(1.36-4.07)	92.0 92.0	84074	
67 Perfluoro(2-					. 0 . 0 0 . 0 0		25(1.00 1.07)	, 2.0	21071	
329.10 > 285.00		2.134	0.004	1.005	3404733	NC			25152	

Data File:	\\Chr	omNa\S	acrament	to\Chrom	Data\A8_N\201	80515-5821	7.b\2017.05.15LLB	_ICAL_0	08.d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFP	O-DA									
332.10 > 287.00		2.134	-0.007	1.000	259760	NC			4872	
D 913C4-PFHp										
367.00 > 322.00	2.372	2.374	-0.002	1.000	4521122	2.36		94.2	103832	
10 Perfluorohe	•									
363.00 > 319.00		2.374	-0.002	1.000	18928350	9.91	2 4//1 12 2 40)	99.1	24502	
363.00 > 169.00		2.374	-0.002	1.000	7698081		2.46(1.13-3.40)	99.1	38789	
8 Perfluorohex 399.00 > 80.00			ı -0.002	1.000	22174743	8.73		95.9	50739	
399.00 > 99.00		2.386	-0.002	1.000	7625236	0.73	2.91(1.50-4.49)	95.9	19325	
D 11 1802 PFH		2.000	0.002	1.000	, 020200		2.71(1.00 1.17)	, 0.,	17020	
403.00 > 84.00		2.386	-0.002	1.000	5333305	2.25		95.1	51552	
65 Adona										
377.00 > 251.00	2.418	2.418	0.0	1.000	45699176	NC			247060	
377.00 > 85.00	2.418	2.418	0.0	1.000	30434458		1.50(0.84-2.53)		136808	
13 Sodium 1H,	1H,2H,2	:H-perflu	orooctan	е						
427.00 > 407.00		•	-0.003	1.000	6574970	9.73		103	33349	
D 12 M2-6:2FTS	5									
429.00 > 81.00	2.704	2.707	-0.003	1.000	913641	2.16		90.8	12419	
D 14 13C4 PFO	Α									
417.00 > 372.00	2.727	2.731	-0.004	1.000	4465836	2.46		98.4	66165	
15 Perfluorooc	tanoic a	cid								
413.00 > 369.00		2.734	-0.007	1.000	19682065	9.36		93.6	6951	
413.00 > 169.00	2.727	2.734	-0.007	1.000	10699568		1.84(0.84-2.52)	93.6	26447	
* 62 13C2-PFO										
415.00 > 370.00	2.727	2.734	-0.007		4792823	2.50			55635	
16 Perfluorohe	-									
449.00 > 80.00			-0.004	1.000	19707477	9.22	0.50(4.04.5.00)	96.8	154276	
449.00 > 99.00		2.739	-0.004	1.000	5631991		3.50(1.94-5.82)	96.8	51101	
D 18 13C4 PFO		2.104	0.000	1 000	2025247	2.25		00.4	14077	
503.00 > 80.00			-0.002	1.000	3835347	2.35		98.4	14077	
17 Perfluorooc				1 000	1/4744/2	0.72		04.1	/0171	
499.00 > 80.00 499.00 > 99.00		3.105	-0.003 -0.003	1.000 1.000	16474463 3644418	8.73	4.52(2.31-6.93)	94.1 94.1	62171 38943	
20 Perfluorono			-0.003	1.000	3044410		4.32(2.31-0.73)	74.1	30743	
463.00 > 419.00		3.107	-0.005	1.000	15430529	10.3		103	35152	
463.00 > 169.00			-0.005	1.000	3742679	10.5	4.12(1.90-5.69)	103	86988	
D 19 13C5 PFN		0	0.000		07.12077		=(,		00700	
468.00 > 423.00		3.107	-0.005	1.000	3539647	2.38		95.4	67016	
69 9-Chlorohe										
531.00 > 351.00			-0.003	1.000	27038736	NC			151536	
D 21 13C8 FOS										
506.00 > 78.00		3.420	-0.001	1.000	5353791	2.51		100	42855	
22 Perfluorooc						·				
498.00 > 78.00			-0.003	1.000	20311842	9.74		97.4	92159	
68 Perfluorono								·		
549.00 > 80.00			-0.008	1.000	11982938	9.86		103	129081	
549.00 > 99.00		3.455	-0.008	1.000	4517536	.	2.65(1.33-3.97)	103	36734	
					Page 517 of 7	720	. ,			

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Data File:	\\Chr	omNa\S	acrament	o\Chrom	Data\A8_N\201	80515-5821	7.b\2017.05.15LLB_	_ICAL_0	08.d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,	1H 2H 2	H-perflu	orodecar	ne						
527.00 > 507.00		•		1.000	5636776	9.03		94.3	96836	
D 26 M2-8:2FTS	5									
529.00 > 81.00		3.459	-0.003	1.000	1107332	2.30		95.9	17230	
24 Perfluorode	canoic a	cid								
513.00 > 469.00		3.468	-0.003	1.000	12079263	10.0		100	50962	
513.00 > 169.00		3.468	-0.003	1.000	2195345		5.50(2.36-7.09)	100	53198	
D 23 13C2 PFD		0.440	0.000	4 000	000000	0.45		00.0	75.400	
515.00 > 470.00		3.468	-0.003	1.000	3099083	2.45		98.2	75403	
D 27 d3-NMeFC 573.00 > 419.00		2 424	0.003	1.000	1836867	2.64		105	26085	
			-0.003	1.000	1830807	2.04		105	20083	
28 N-methyl pe 570.00 > 419.00		ctane su 3.631		1.003	7460336	10.0		100	34337	
29 Perfluorode				1.003	7400330	10.0		100	34337	
599.00 > 80.00	3.776	3.781	-0.005	1.000	10184141	9.45		98.0	62249	
599.00 > 99.00		3.781	-0.005	1.000	3433819	76	2.97(1.39-4.16)	98.0	52416	
D 32 d5-NEtFOS	SAA									
589.00 > 419.00	3.787	3.794	-0.007	1.000	1619647	2.27		90.6	6610	
33 N-ethyl perf	luorooct	ane sulfo	onamid							
584.00 > 419.00	3.797	3.800	-0.003	1.003	6246594	10.3		103	48696	
31 Perfluoroun	decanoi	c acid								
563.00 > 519.00		3.800	-0.003	1.000	8334466	10.9		109	30519	
563.00 > 169.00		3.800	-0.003	1.000	2023681		4.12(2.12-6.36)	109	46537	
D 30 13C2 PFU		0.000	0.000	4 000	0000001	0.00		04.0	4/500	
565.00 > 520.00		3.800	-0.003	1.000	2282286	2.28		91.3	46508	
66 11-Chloroei					27717270	NC			220700	
631.00 > 451.00		3.958	-0.002	1.000	37717270	NC			230708	
D 36 13C2 PFD 615.00 > 570.00		4 000	0.007	1.000	2747572	2.55		102	16845	
			-0.007	1.000	2141312	2.55		102	10043	
37 Perfluorodo 613.00 > 569.00		4.100	-0.008	1.000	11301274	9.85		98.5	8337	
613.00 > 169.00		4.100	-0.008	1.000	2859090	7.03	3.95(2.13-6.40)	98.5	24321	
41 Perfluorotrio							,			
663.00 > 619.00		4.368	0.001	1.000	12033356	9.57		95.7	5602	
663.00 > 169.00	4.369	4.368	0.001	1.000	3833274		3.14(1.25-3.76)	95.7	21634	
42 Perfluorotet	radecan	oic acid								
713.00 > 169.00	4.602	4.608	-0.006	1.000	3455816	10.5		105	20553	
713.00 > 219.00	4.602	4.608	-0.006	1.000	2590223		1.33(0.71-2.13)	105	24606	
D 43 13C2-PFT										
715.00 > 670.00	4.602	4.608	-0.006	1.000	3267831	2.47		98.9	13292	
D 44 13C2-PFH										
815.00 > 770.00		5.030	-0.004	1.000	6039184	2.69		108	15019	
45 Perfluorohe			0.00=	4 00-	00054555				1015	
813.00 > 769.00		5.031	-0.005	1.000	20254827	NC	E 27/2 0/ 0.50\		4013	
813.00 > 169.00		5.031	-0.005	1.000	3770206		5.37(2.86-8.58)		15174	
46 Perfluorooc 913.00 > 869.00		5.408	0.004	1 000	24654022	NC			3137	
913.00 > 869.00		5.408	-0.004 -0.011	1.000 0.999	24654923 3221223	NC	7.65(3.83-11.48)		9462	
/10.00 / 107.00	0.071	5.700	0.011	0.777	Dage 518 of 7	728	,.oo(o.oo-11.40)		/-TUZ	

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Report Date: 16-May-2018 09:20:19 Chrom Revision: 2.2 11-May-2018 08:54:46

OC Flag Legend Processing Flags NC - Not Calibrated

Reagents:

LCPFC_LL7_00004 Amount Added: 1.00 Units: mL

Report Date: 16-May-2018 09:20:19 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_008.d **Injection Date:** 15-May-2018 16:00:25 Instrument ID: A8_N Lims ID: IC L7 Full Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 16 Worklist Smp#: 8 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Limit Group: LC PFC_QSM5-1 ICAL Method: $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 3 13C5-PFPeA Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Y (X100000) Y (X100000) Y (X100000) 50 15- 10 40 12 30 20 10 1.1 1.7 2.0 0.3 0.9 1.5 2.1 1.2 1.5 1.8 2.1 Min Min Min RT RT RT 4 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid D 47 13C3-PFBS Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 66- 54 25 Y (X100000) Y (X100000) 55 45- Y (X1000) 20 44 36 15- 27 33 10 22 18 2.0 2.3 1.8 2.1 2.4 1.1 1.4 1.7 1.2 1.5 2.1 2.4 1.2 1.5 1.8 2.7 Min Min Min RT RT RT 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexan@ Perfluorohexanoic acid Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x 15 Y (X100000) Y (X100000) 30 Y (X100000) 12 24 36 18 27 12 18 2.2 1.3 1.9 2.5 1.0 1.6 2.2 2.8 2.8 0.7 1.0 1.6 Min Min Min RT RT RT 6 Perfluorohexanoic acid 7 13C2 PFHxA 70 Perfluoropentanesulfonic acid Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x 54**1** I Exp1:m/z 349.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 315.00 > 270.00:Moving5PtAverage_> 60 (X100000) Y (X100000) 45 Y (X10000) 10 50 36 40 27 30 18 20 10 02.8 0.9 1.6 2.2 1.5 1.8 2.1 2.4 1.5 2.1 2.7 1.0 1.2 2.7 Min Min RT RT RT

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2.4

2.1

RT

3.3

3.0

2.3

RT

2.9

3.2

2.9

Min

3.5

2.3

1.7

RT

Report Date: 16-May-2018 09:20:19 Chrom Revision: 2.2 11-May-2018 08:54:46 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_008.d 16 Perfluoroheptanesulfonic acid 16 Perfluoroheptanesulfonic acid Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 449.00 > 99.00:Moving5PtAverage_x3 15- Y (X100000) Y (X100000) Y (X100000) 40 32 24 16 2.0 2.3 2.6 2.9 3.2 1.5 2.1 2.7 3.3 3.9 1.7 2.3 2.9 3.5 Min Min Min RT RT RT D 18 13C4 PFOS 17 Perfluorooctane sulfonic acid 17 Perfluorooctane sulfonic acid Exp1;m/z 503.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 499.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 499.00 > 99.00:Moving5PtAverage_x3 Y (X100000) Y (X100000) 30 Y (X10000) 75 24 18 45 12 30 15 2.2 2.7 3.3 3.6 1.4 2.3 3.2 4.1 4.0 4.9 Min Min RT RT RT 20 Perfluorononanoic acid 20 Perfluorononanoic acid D 19 13C5 PFNA Exp1;m/z 463.00 > 419.00:Moving5PtAverage_x Exp1:m/z 463.00 > 169.00:Moving5PtAverage_> Exp1:m/z 468.00 > 423.00:Moving5PtAverage_x 90 (X100000) 35 Y (X10000) 75 28 60 21 45 14 30 0 3.9 3.0 3.6 2.7 3.3 3.3 1.8 2.4 4.2 2.1 2.4 2.7 3.0 3.6 Min Min Min RT RT RT D 21 13C8 FOSA 22 Perfluorooctane Sulfonamide 68 Perfluorononanesulfonic acid Exp1:m/z 506.00 > 78.00:Moving5PtAverage_x3 Exp1:m/z 498.00 > 78.00:Moving5PtAverage_x3 Exp1:m/z 549.00 > 80.00:Moving5PtAverage_x3 Y (X100000) Y (X100000) 30 Y (X100000) 24 40 12 18 30 20 12 10

3.0

2.4

RT

3.6

Min

4.2

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2.1

RT

3.9

4.5

2.9

RT

3.5

Min

3.8

68 Perfluorononanesulfonic acid

25 Sodium 1H,1H,2H,2H-perfluorodecane26 M2-8:2FTS

Exp1;m/z 527.00 > 507.00:Moving5PtAverage_x Exp1:m/z 529.00 > 81.00:Moving5PtAverage_x3 Exp1:m/z 549.00 > 99.00:Moving5PtAverage_x3 Y (X100000) Y (X100000) 18 2.9 3.5 3.8 2.7 3.3 3.9 4.5 3.0 3.3 3.6 3.9 3.2 2.1 2.7 Min Min Min RT RT RT 24 Perfluorodecanoic acid 24 Perfluorodecanoic acid D 23 13C2 PFDA Exp1:m/z 513.00 > 469.00:Moving5PtAverage_x Exp1:m/z 513.00 > 169.00:Moving5PtAverage_x Exp1:m/z 515.00 > 470.00:Moving5PtAverage_x 66- 96 Y (X100000) Y (X10000) Y (X10000) 80 55- 24 44 64 18 33 48 12 22 32 3.0 3.6 4.2 2.8 3.4 4.0 4.6 2.8 3.1 3.7 4.0 4.3 Min Min RT RT RT 29 Perfluorodecane Sulfonic acid D 27 d3-NMeFOSAA 28 N-methyl perfluorooctane sulfonami Exp1:m/z 573.00 > 419.00:Moving5PtAverage_x Exp1:m/z 570.00 > 419.00:Moving5PtAverage_x Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 20 30 (X100000) 16- 36- 20 12 27 18 3.7 4.0 4.3 3.1 3.4 4.0 3.0 3.3 3.6 3.9 4.2 3.1 3.4 3.7 Min Min RT RT RT 29 Perfluorodecane Sulfonic acid D 32 d5-NEtFOSAA 33 N-ethyl perfluorooctane sulfonamid Exp1:m/z 584.00 > 419.00:Moving5PtAverage_x 48-(X100000) Y (X100000) 40 Y (X10000) 32 24 3.8 Min 3.9 4.5 3.2 3.5 3.3 4.2 3.3 3.9 4.1 2.7 Min Min RT RT RT

5.1

4.8

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3.9

RT

4.3

4.0

RT

4.9

5.2

4.9 Min 5.2

5.5

4.6

4.3

RT

Report Date: 16-May-2018 09:20:24 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Lims ID: IC L5 Full

Client ID:

Sample Type: IC Calib Level: 5

Inject. Date: 15-May-2018 16:39:20 ALS Bottle#: 14 Worklist Smp#: 11

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L5-FULL

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub32

Method: \ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 16-May-2018 09:20:21 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK037

First Level Reviewer: hannigana Date: 15-May-2018 17:02:24

Til St Eevel Neviewer: Harringana				Date.	'	3 May 2010 17.02.2	. 7				
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	2 Perfluorobuty	yric acid									
	212.90 > 169.00		1.462	-0.002	1.000	6642110	2.57		103	3522	
	D 1 13C4 PFBA 217.00 > 172.00		1 162	-0.002	1.000	6946962	2.43		97.0	48779	
	D 3 13C5-PFPe		1.402	-0.002	1.000	0740702	2.43		77.0	40777	
	267.90 > 223.00		1.744	-0.002	0.562	4467248	2.43		97.3	62925	
	4 Perfluoropen										
	262.90 > 219.00		1.745	-0.003	1.000	5339518	2.53		101	2721	
	D 47 13C3-PFB: 301.90 > 83.00		1.780	-0.011	1.000	94691	2.28		98.2	560	
	5 Perfluorobuta	anesulfo	nic acid								
		1.778	1.783	-0.005	1.005	7259728	2.28	0.44/4.05.0.74\	103	29926	
	298.90 > 99.00 D 60 M2-4:2FTS		1.783	-0.005	1.005	2969623		2.44(1.25-3.74)	103	17715	
	329.00 > 81.00		1.999	-0.002	1.000	671442	NC			7829	
	61 Sodium 1H,	1H,2H,2	H-perflu	orohexar	ne						
	327.00 > 307.00		2.000	-0.003	1.000	1593481	2.36		101	66177	
	D 7 13C2 PFHx 315.00 > 270.00		2 037	-0.006	1.000	5043564	2.58		103	120426	
	6 Perfluorohex			0.000	1.000	0010001	2.00		100	120120	
	313.00 > 269.00	2.031	2.037	-0.006	1.000	4776223	2.30		92.1	8080	
	313.00 > 119.00		2.037		1.000	454875		10.50(5.03-15.10)	92.1	5745	
	70 Perfluoropei 349.00 > 80.00		tonic ac 2.059		1.000	6623884	2.34		99.7	60833	
	349.00 > 99.00		2.059		1.000	2517632	2.01	2.63(1.36-4.07)	99.7	18835	
	D 64 13C3 HFP0										
	332.10 > 287.00	2.133	2.134	-0.001	1.000	223493	NC			4741	

Data File:	\\Chr	omNa\S	acrament	to\Chrom	Data\A8_N\201	80515-5821	7.b\2018.05.15LLC	_ICAL_0	06.d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-	vxoqorq	propano	oic) acid							
329.10 > 285.00				1.000	725223	NC			6005	
10 Perfluorohe	ptanoic a	acid								
363.00 > 319.00	-	2.374	-0.008	1.000	4839723	2.57		103	7018	
363.00 > 169.00	2.366	2.374	-0.008	1.000	1886033		2.57(1.13-3.40)	103	9727	
D 913C4-PFHp										
367.00 > 322.00	2.366	2.374	-0.008	1.000	4465208	2.38		95.2	79790	
D 11 1802 PFH:										
403.00 > 84.00		2.386		1.000	5339851	2.30		97.4	57465	
8 Perfluorohex				1 000	F. (0 0 0 0 7	0.01		07.0		
399.00 > 80.00		2.386	-0.008	1.000	5630297	2.21	2.0/(1.50.4.40)	97.3	22030	
399.00 > 99.00	2.378	2.386	-0.008	1.000	1904888		2.96(1.50-4.49)	97.3	6814	
65 Adona	2 412	2 410	0.005	1 000	14000104	NC			00/07	
377.00 > 251.00 377.00 > 85.00		2.418 2.418	-0.005 -0.005	1.000 1.000	14089104 8375544	NC	1.68(0.84-2.53)		89697 55492	
D 12 M2-6:2FTS		2.410	-0.003	1.000	0373344		1.00(0.04-2.55)		33472	
429.00 > 81.00		2 707	-0.006	1.000	953169	2.30		96.9	17534	
					733107	2.30		70.7	17554	
13 Sodium 1H, 427.00 > 407.00		•	-0.006	e 1.000	1635620	2.31		97.5	9167	
D 14 13C4 PFO		2.707	-0.000	1.000	1033020	2.51		77.5	7107	
417.00 > 372.00		2.731	-0.007	1.000	4456920	2.51		100	62304	
* 62 13C2-PFO		2.751	-0.007	1.000	4430720	2.51		100	02304	
415.00 > 370.00		2 734	-0.010		4684803	2.50			69393	
15 Perfluorooct			0.010		100 1000	2.00			0,0,0	
413.00 > 369.00		2.734	-0.010	1.000	4857127	2.31		92.6	1728	
413.00 > 169.00			-0.010	1.000	2639966		1.84(0.84-2.52)	92.6	10891	
16 Perfluorohe	ptanesul	lfonic ac	id				, ,			
449.00 > 80.00	•		-0.008	1.000	5160059	2.43		102	33696	
449.00 > 99.00	2.731	2.739	-0.008	1.000	1350563		3.82(1.94-5.82)	102	21055	
D 18 13C4 PFO	S									
503.00 > 80.00	3.094	3.104	-0.010	1.000	3815593	2.39		100	27877	
17 Perfluorooct	tane sulf	onic aci	d							
499.00 > 80.00	3.094	3.105	-0.011	1.000	3965534	2.11		91.1	24321	
499.00 > 99.00	3.094	3.105	-0.011	1.000	911395		4.35(2.31-6.93)	91.1	8420	
D 19 13C5 PFN	A									
468.00 > 423.00	3.102	3.107	-0.005	1.000	3538499	2.44		97.5	67448	
20 Perfluorono	nanoic a	cid								
463.00 > 419.00		3.107	-0.005	1.000	3811509	2.54		102	5907	
463.00 > 169.00	3.102	3.107	-0.005	1.000	903128		4.22(1.90-5.69)	102	31191	
69 9-Chlorohex										
531.00 > 351.00	3.310	3.316	-0.006	1.000	6694592	NC			42297	
D 21 13C8 FOS	A									
506.00 > 78.00	3.415	3.420	-0.005	1.000	5178962	2.48		99.3	42716	
22 Perfluorooct	tane Sul	fonamid	е							
498.00 > 78.00	3.415	3.422	-0.007	1.000	5372059	2.66		107	66457	
68 Perfluorono	nanesulf	onic aci	d							
549.00 > 80.00			-0.012	1.000	2885064	2.39		99.4	38099	
549.00 > 99.00	3.443	3.455	-0.012	1.000	1131430		2.55(1.33-3.97)	99.4	20200	
					Page 527 of 7	700				

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Data File:	\\Chr	omNa\Sa	acrament	o\Chrom	Data\A8_N\201	80515-5821	7.b\2018.05.15LLC_	_ICAL_0	06.d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,	1H 2H 2	H-nerflu	orodecar	16						
527.00 > 507.00		•		1.000	1458360	2.38		99.2	28234	
D 26 M2-8:2FTS										
529.00 > 81.00	3.452	3.459	-0.007	1.000	1089191	2.31		96.5	19371	
D 23 13C2 PFD/ 515.00 > 470.00		3.468	-0.006	1.000	2997952	2.43		97.1	44831	
24 Perfluorode	canoic a	cid								
513.00 > 469.00	3.462	3.468	-0.006	1.000	3028523	2.60		104	16268	
513.00 > 169.00	3.462	3.468	-0.006	1.000	523942		5.78(2.36-7.09)	104	12814	
D 27 d3-NMeFO										
573.00 > 419.00	3.616	3.624	-0.008	1.000	1561957	2.29		91.8	35761	
28 N-methyl pe										
570.00 > 419.00	3.626	3.631	-0.005	1.003	1690352	2.67		107	9358	
29 Perfluorode										
599.00 > 80.00		3.781	-0.010	1.000	2626191	2.45	/	102	48906	
599.00 > 99.00		3.781	-0.010	1.000	877720		2.99(1.39-4.16)	102	16087	
D 32 d5-NEtFOS										
589.00 > 419.00		3.794	-0.002	1.000	1777821	2.54		102	10004	
D 30 13C2 PFUr										
565.00 > 520.00		3.800	-0.008	1.000	2447962	2.50		100	55931	
31 Perfluoround										
563.00 > 519.00		3.800	-0.008	1.000	1802433	2.20	2 (4(2 12 (2()	88.2	8412	
563.00 > 169.00		3.800	-0.008	1.000	494938		3.64(2.12-6.36)	88.2	22587	
33 N-ethyl perfl				1 000	1500051	0.00		05.4	00770	
584.00 > 419.00		3.800		1.000	1590051	2.38		95.1	28778	
66 11-Chloroei					1100/570	NO			/7501	
631.00 > 451.00		3.958	-0.008	1.000	11086572	NC			67521	
D 36 13C2 PFD		4 000	0.007	4 000	0544000	0.00		05 (100/1	
615.00 > 570.00			-0.006	1.000	2514089	2.39		95.6	19064	
37 Perfluorodo			0.007	4 000	0/7/4/0	0.55		100	00/0	
613.00 > 569.00 613.00 > 169.00		4.100	-0.007	1.000 1.000	2676169	2.55	4.04/2.12.4.40\	102	2268	
		4.100	-0.007	1.000	658572		4.06(2.13-6.40)	102	10193	
41 Perfluorotrid			0.005	1 000	2000225	2 / 1		104	1570	
663.00 > 619.00 663.00 > 169.00		4.368 4.368	-0.005 -0.005	1.000 1.000	2999335 941505	2.61	3.19(1.25-3.76)	104 104	1572 10269	
		4.300	-0.005	1.000	941505		3.19(1.25-3.70)	104	10209	
D 43 13C2-PFT6 715.00 > 670.00		4 400	0.012	1 000	21/107/	2.42		07.2	12002	
		4.608	-0.012	1.000	3141974	2.43		97.3	13003	
42 Perfluoroteti			0.010	1 000	001202	2.50		104	0707	
713.00 > 169.00 713.00 > 219.00		4.608 4.608	-0.012 -0.012	1.000 1.000	821303 611068	2.59	1.34(0.71-2.13)	104 104	8787 11665	
		4.000	-0.012	1.000	011000		1.34(0.71-2.13)	104	11005	
D 44 13C2-PFH: 815.00 > 770.00		E 020	O O10	1.000	5704574	2.64		104	14652	
		5.030	-0.018	1.000	5796576	2.04		106	14002	
45 Perfluorohe			0.010	1 002	ESESSOE	NC			1220	
813.00 > 769.00 813.00 > 169.00		5.031 5.031	-0.010 -0.010	1.002 1.002	5252895 870423	NC	6.03(2.86-8.58)		1229 5354	
			-0.010	1.002	070423		0.03(2.00-0.30)		5554	
46 Perfluorooct 913.00 > 869.00		5.408	0.010	1 000	6240510	NC			1014	
913.00 > 869.00 913.00 > 169.00		5.408	-0.019 -0.019	1.000 1.000	6240519 788129	INC	7.92(3.83-11.48)		1014 4740	
/13.00 / 107.00	J.JU7	5.400	0.017	1.000	700127	700	1.72(3.03-11.40)		4740	

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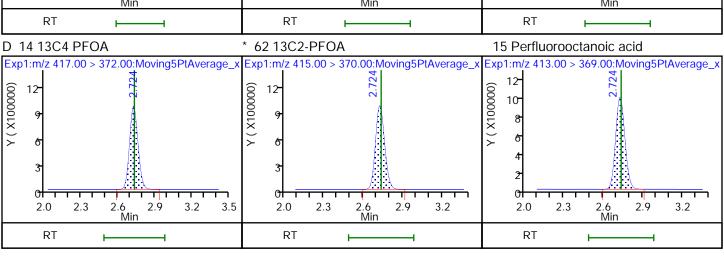
Report Date: 16-May-2018 09:20:24 Chrom Revision: 2.2 11-May-2018 08:54:46

OC Flag Legend Processing Flags NC - Not Calibrated

Reagents:

LCPFC_LL5_00004 Amount Added: 1.00 Units: mL

Report Date: 16-May-2018 09:20:24 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d **Injection Date:** 15-May-2018 16:39:20 Instrument ID: A8_N Lims ID: IC L5 Full Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 11 Injection Vol: Dil. Factor: 2.0 ul 1.0000 Method: LC PFC_QSM5-1 ICAL $A8_N$ Limit Group: 2 Perfluorobutyric acid D 113C4 PFBA D 3 13C5-PFPeA Exp1;m/z 217.00 > 172.00:Moving5PtAverage_x Exp1;m/z 267.90 > 223.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Y (X100000) Y (X100000 Y (X100000) 1.0 1.6 2.2 1.0 1.6 1.9 1.2 1.5 1.8 2.1 Min Min Min RT RT RT D 47 13C3-PFBS 4 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1;m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 24 Y (X100000) 20 Y (X1000) 16 12 1.7 2.0 1.9 2.2 1.0 1.3 1.9 2.2 1.1 1.4 2.3 1.0 1.3 2.5 Min Min Min RT RT RT 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexaDe 7 13C2 PFHxA Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x 78 (X100000 65- Y (X10000) 35 Y (X10000) 52 28 39 21 26- 1.9 1.0 2.2 2.8 1.0 2.2 2.8 1.3 1.6 2.2 1.6 1.6 Min Min RT RT RT 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid 70 Perfluoropentanesulfonic acid Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1;m/z 349.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x 12 Y (X100000) (X100000) (X10000) 10 10 2.8 1.6 2.2 1.5 1.8 2.1 2.0 2.3 1.0 1.2 2.4 1.4 1.7 2.6 Min RT RT RT Page 530 of 728



3.0

2.4

RT

3.6

Min

4.2

3.6

3.0

RT

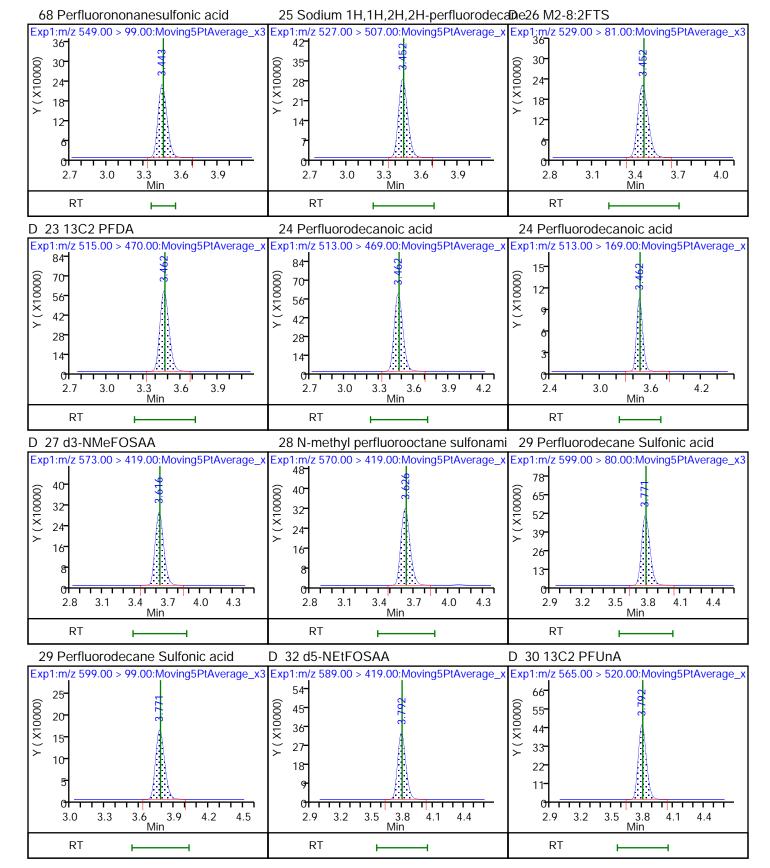
3.9

3.5 Min 3.8

3.2

2.9

RT



4.7

Min

5.0

5.3

4.6

RT

5.2

5.5

5.8

4.1

RT

4.7

5.0

5.3

4.1

RT

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base:

0

RF Rounding:

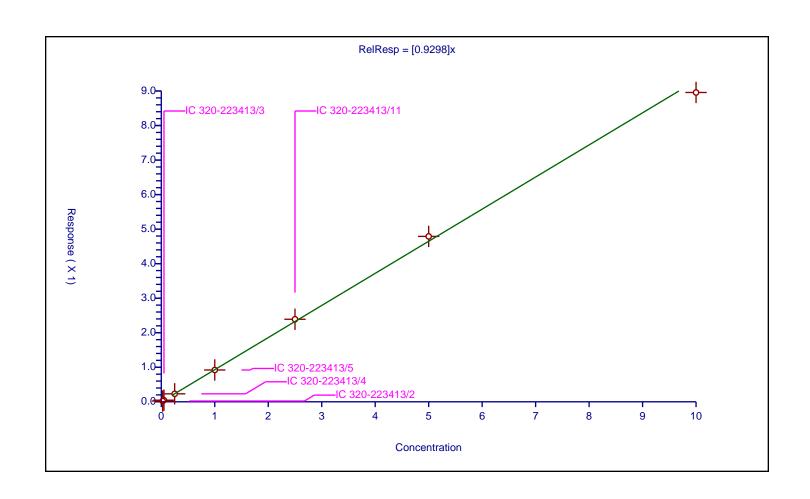
Intercept:	0
Slope:	0.9298

Curve Coefficients

Error Coefficients

Standard Error:12500000Relative Standard Error:2.3Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.023104	2.5	7998943.0	0.924147	Υ
2	IC 320-223413/3	0.05	0.046563	2.5	8732721.0	0.93125	Υ
3	IC 320-223413/4	0.25	0.230627	2.5	7493234.0	0.922507	Υ
4	IC 320-223413/5	1.0	0.921191	2.5	7049149.0	0.921191	Υ
5	IC 320-223413/11	2.5	2.390293	2.5	6946962.0	0.956117	Υ
6	IC 320-223413/7	5.0	4.789436	2.5	6751655.0	0.957887	Υ
7	IC 320-223413/8	10.0	8.957287	2.5	7496989.0	0.895729	Υ



Calibration

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base:

0

RF Rounding:

 Intercept:
 0

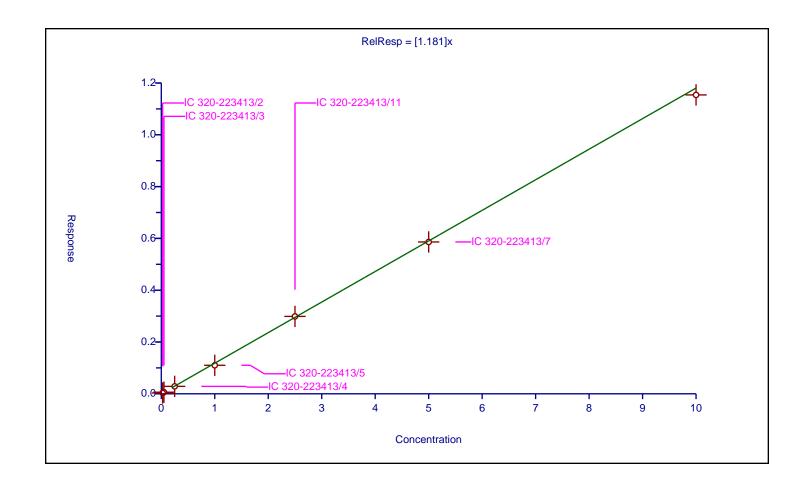
 Slope:
 1.181

Curve Coefficients

Error Coefficients

Standard Error:9990000Relative Standard Error:4.6Correlation Coefficient:0.999Coefficient of Determination (Adjusted):0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.031562	2.5	5228218.0	1.262476	Υ
2	IC 320-223413/3	0.05	0.061584	2.5	5506602.0	1.231676	Υ
3	IC 320-223413/4	0.25	0.286757	2.5	4737268.0	1.147028	Υ
4	IC 320-223413/5	1.0	1.100537	2.5	4710025.0	1.100537	Υ
5	IC 320-223413/11	2.5	2.988147	2.5	4467248.0	1.195259	Υ
6	IC 320-223413/7	5.0	5.862777	2.5	4328345.0	1.172555	Υ
7	IC 320-223413/8	10.0	11.540111	2.5	4657025.0	1.154011	Υ



Calibration

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

Response Base: RF Rounding: 0

Curve Coefficients

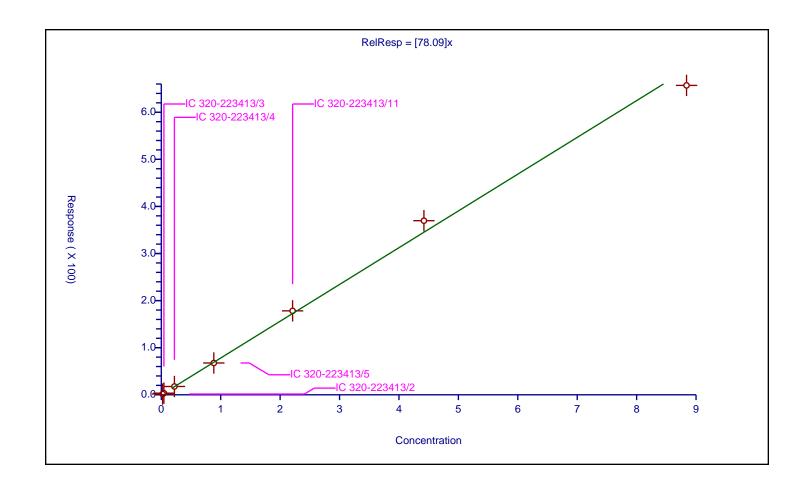
 Intercept:
 0

 Slope:
 78.09

Error Coefficients

Standard Error:13200000Relative Standard Error:4.7Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0221	1.621676	2.325	110547.0	73.379018	Υ
2	IC 320-223413/3	0.0442	3.463565	2.325	117730.0	78.361193	Υ
3	IC 320-223413/4	0.221	17.647766	2.325	99970.0	79.854146	Υ
4	IC 320-223413/5	0.884	67.556508	2.325	98369.0	76.421389	Υ
5	IC 320-223413/11	2.21	178.252079	2.325	94691.0	80.657049	Υ
6	IC 320-223413/7	4.42	369.697667	2.325	87185.0	83.642006	Υ
7	IC 320-223413/8	8.84	657.03931	2.325	99131.0	74.325714	Υ



/ Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

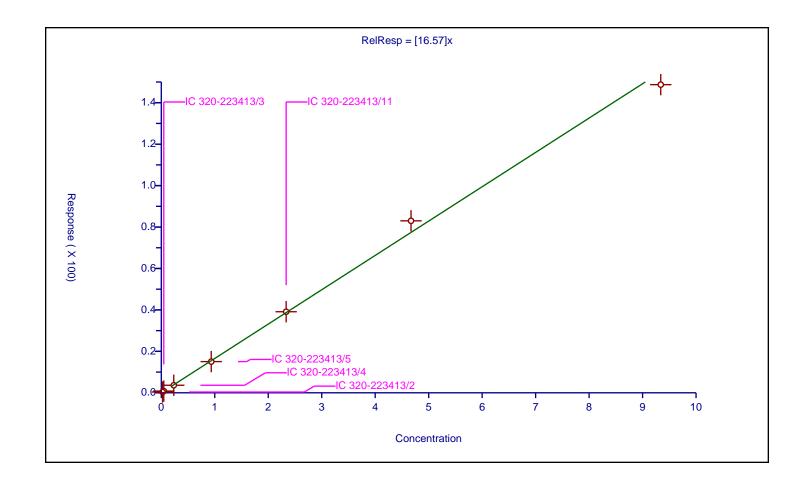
Response Base:
RF Rounding: 0

Curve	Coefficients
Intercept:	0
Slope:	16.57

Error Coefficients

Standard Error:2970000Relative Standard Error:5.3Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.02335	0.37609	2.325	110547.0	16.106649	Υ
2	IC 320-223413/3	0.0467	0.82869	2.325	117730.0	17.744964	Υ
3	IC 320-223413/4	0.2335	3.641484	2.325	99970.0	15.595222	Υ
4	IC 320-223413/5	0.934	15.055267	2.325	98369.0	16.119129	Υ
5	IC 320-223413/11	2.335	39.125612	2.325	94691.0	16.756151	Υ
6	IC 320-223413/7	4.67	83.00038	2.325	87185.0	17.773101	Υ
7	IC 320-223413/8	9.34	148.721336	2.325	99131.0	15.923055	Υ



Calibration / Perfluorohexanoic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base:

0

RF Rounding:

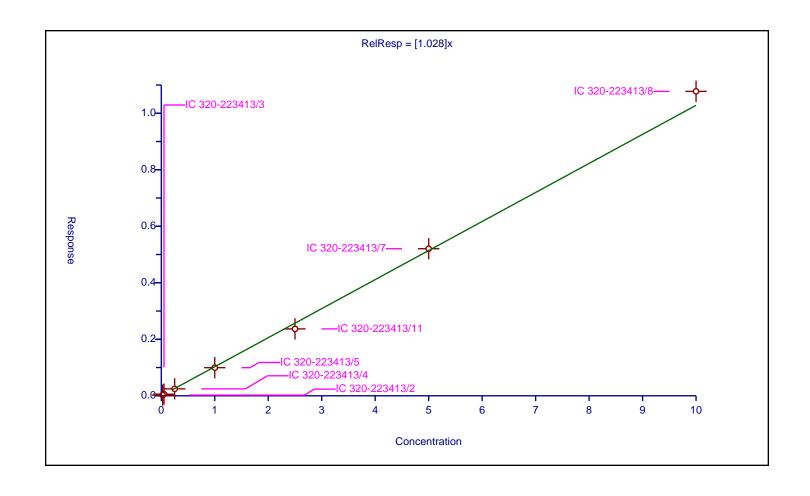
Intercept:	0
Slope:	1.028

Curve Coefficients

Error Coefficients

Standard Error:9400000Relative Standard Error:6.6Correlation Coefficient:0.999Coefficient of Determination (Adjusted):0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.0252	2.5	5626147.0	1.00799	Υ
2	IC 320-223413/3	0.05	0.057403	2.5	5922451.0	1.148064	Υ
3	IC 320-223413/4	0.25	0.245112	2.5	5134906.0	0.980446	Υ
4	IC 320-223413/5	1.0	0.994902	2.5	4854075.0	0.994902	Υ
5	IC 320-223413/11	2.5	2.367484	2.5	5043564.0	0.946994	Υ
6	IC 320-223413/7	5.0	5.205567	2.5	4583820.0	1.041113	Υ
7	IC 320-223413/8	10.0	10.775226	2.5	4709249.0	1.077523	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

Response Base: RF Rounding: 0

Curve Coefficients

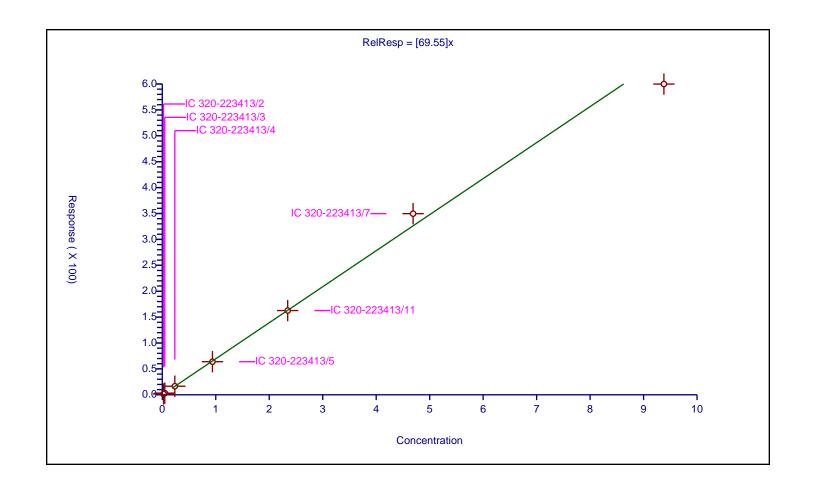
 Intercept:
 0

 Slope:
 69.55

Error Coefficients

Standard Error:12100000Relative Standard Error:4.6Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.02345	1.654065	2.325	110547.0	70.535831	Υ
2	IC 320-223413/3	0.0469	3.26442	2.325	117730.0	69.603839	Υ
3	IC 320-223413/4	0.2345	16.581364	2.325	99970.0	70.709442	Υ
4	IC 320-223413/5	0.938	63.877525	2.325	98369.0	68.099707	Υ
5	IC 320-223413/11	2.345	162.639853	2.325	94691.0	69.356014	Υ
6	IC 320-223413/7	4.69	349.685013	2.325	87185.0	74.559704	Υ
7	IC 320-223413/8	9.38	599.885978	2.325	99131.0	63.953729	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

Response Base: RF Rounding: 0

Curve Coefficients

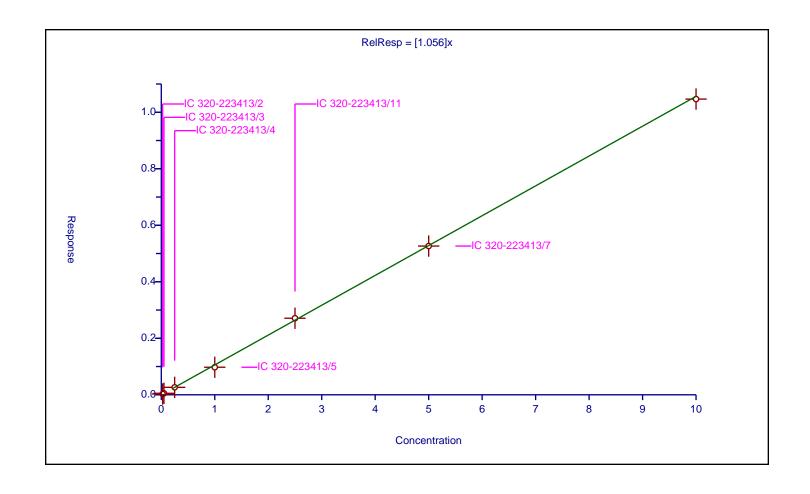
 Intercept:
 0

 Slope:
 1.056

Error Coefficients

Standard Error:8830000Relative Standard Error:4.1Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.027924	2.5	5577473.0	1.116957	Υ
2	IC 320-223413/3	0.05	0.053061	2.5	5774309.0	1.061218	Υ
3	IC 320-223413/4	0.25	0.264298	2.5	5050240.0	1.057193	Υ
4	IC 320-223413/5	1.0	0.975396	2.5	4714171.0	0.975396	Υ
5	IC 320-223413/11	2.5	2.709685	2.5	4465208.0	1.083874	Υ
6	IC 320-223413/7	5.0	5.264617	2.5	4318388.0	1.052923	Υ
7	IC 320-223413/8	10.0	10.466622	2.5	4521122.0	1.046662	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

Response Base:
RF Rounding: 0

Curve Coefficients

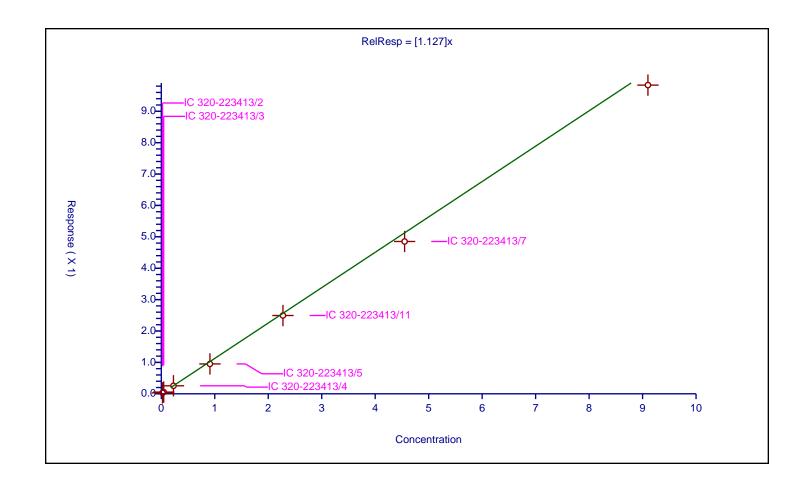
 Intercept:
 0

 Slope:
 1.127

Error Coefficients

Standard Error:10300000Relative Standard Error:7.6Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.992

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.02275	0.029275	2.365	6497213.0	1.286792	Υ
2	IC 320-223413/3	0.0455	0.054276	2.365	6581524.0	1.192872	Υ
3	IC 320-223413/4	0.2275	0.254784	2.365	5692452.0	1.11993	Υ
4	IC 320-223413/5	0.91	0.951005	2.365	5565884.0	1.04506	Υ
5	IC 320-223413/11	2.275	2.493637	2.365	5339851.0	1.096104	Υ
6	IC 320-223413/7	4.55	4.85177	2.365	5191664.0	1.066323	Υ
7	IC 320-223413/8	9.1	9.833165	2.365	5333305.0	1.080568	Υ



/ Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)

Curve Type: Linear
Weighting: Conc_Sq
Origin: None
Dependency: Response
Calib Mode: IsoDil

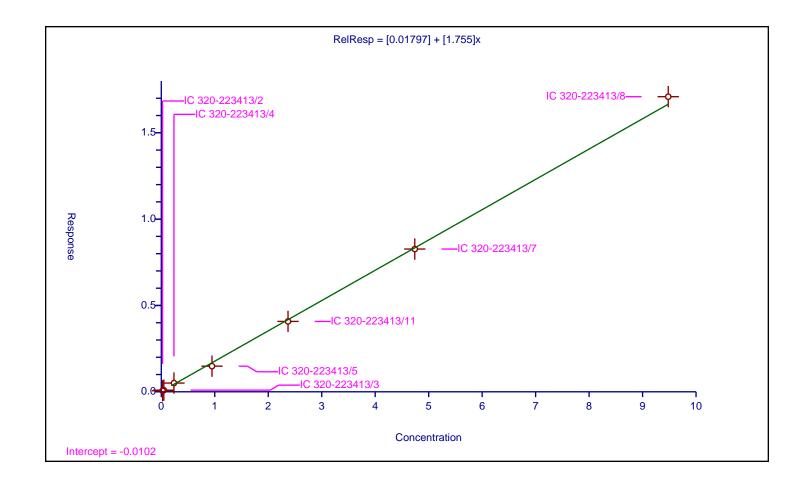
Response Base: RF Rounding: 0

Curve Coefficients	
Intercept:	0.01797
Slope:	1.755

Error Coefficients

Standard Error:3330000Relative Standard Error:10.1Correlation Coefficient:0.998Coefficient of Determination (Adjusted):0.990

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0237	0.060388	2.375	1179634.0	2.548017	Υ
2	IC 320-223413/3	0.0474	0.095492	2.375	1201925.0	2.0146	Υ
3	IC 320-223413/4	0.237	0.506054	2.375	1076802.0	2.135249	Υ
4	IC 320-223413/5	0.948	1.484407	2.375	1028277.0	1.56583	Υ
5	IC 320-223413/11	2.37	4.075455	2.375	953169.0	1.719601	Υ
6	IC 320-223413/7	4.74	8.267203	2.375	867962.0	1.744136	Υ
7	IC 320-223413/8	9.48	17.091564	2.375	913641.0	1.802908	Υ



Calibration / Perfluorooctanoic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base:

0

RF Rounding:

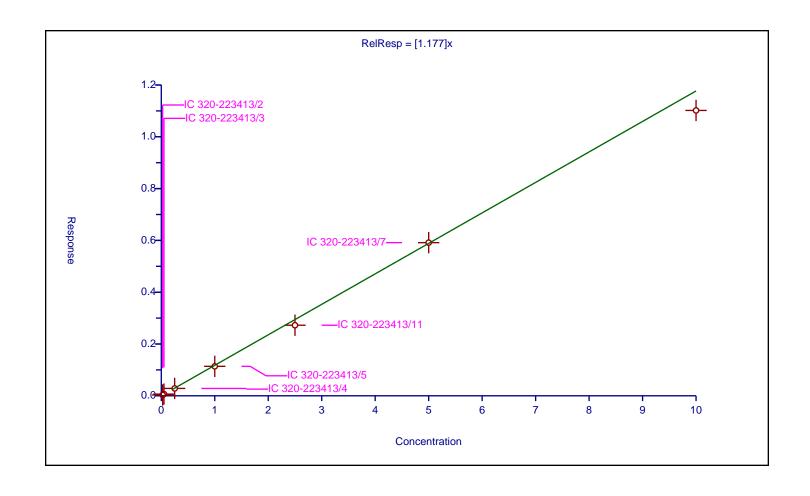
Intercept:	0
Slope:	1.177

Curve Coefficients

Error Coefficients

Standard Error:9210000Relative Standard Error:7.3Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.03206	2.5	5162191.0	1.282382	Υ
2	IC 320-223413/3	0.05	0.06533	2.5	5272655.0	1.30659	Υ
3	IC 320-223413/4	0.25	0.284496	2.5	4619416.0	1.137986	Υ
4	IC 320-223413/5	1.0	1.138031	2.5	4460027.0	1.138031	Υ
5	IC 320-223413/11	2.5	2.724486	2.5	4456920.0	1.089795	Υ
6	IC 320-223413/7	5.0	5.913082	2.5	4079623.0	1.182616	Υ
7	IC 320-223413/8	10.0	11.01813	2.5	4465836.0	1.101813	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

Response Base: RF Rounding: 0

Curve Coefficients

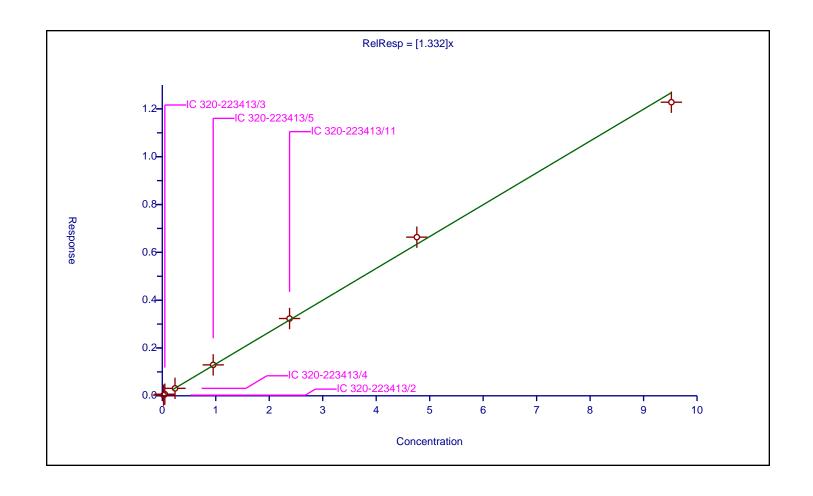
 Intercept:
 0

 Slope:
 1.332

Error Coefficients

Standard Error:9270000Relative Standard Error:5.5Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0238	0.028505	2.39	4516956.0	1.197673	Υ
2	IC 320-223413/3	0.0476	0.067413	2.39	4415247.0	1.416243	Υ
3	IC 320-223413/4	0.238	0.311586	2.39	4024927.0	1.309183	Υ
4	IC 320-223413/5	0.952	1.293247	2.39	3779459.0	1.358452	Υ
5	IC 320-223413/11	2.38	3.232143	2.39	3815593.0	1.358043	Υ
6	IC 320-223413/7	4.76	6.636219	2.39	3520558.0	1.394164	Υ
7	IC 320-223413/8	9.52	12.280732	2.39	3835347.0	1.289993	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base:

0

RF Rounding:

 Intercept:
 0

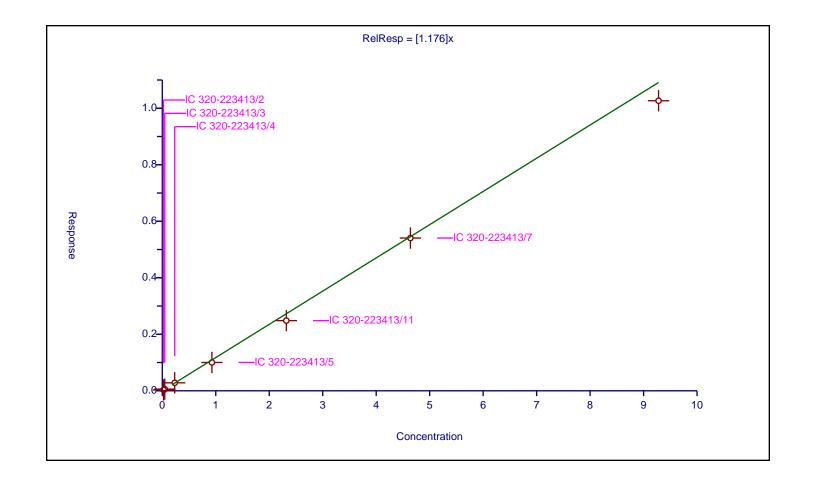
 Slope:
 1.176

Curve Coefficients

Error Coefficients

Standard Error:7670000Relative Standard Error:8.4Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.991

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0232	0.030848	2.39	4516956.0	1.329658	Υ
2	IC 320-223413/3	0.0464	0.05859	2.39	4415247.0	1.262725	Υ
3	IC 320-223413/4	0.232	0.282038	2.39	4024927.0	1.215679	Υ
4	IC 320-223413/5	0.928	1.002487	2.39	3779459.0	1.080267	Υ
5	IC 320-223413/11	2.32	2.48392	2.39	3815593.0	1.070655	Υ
6	IC 320-223413/7	4.64	5.407083	2.39	3520558.0	1.16532	Υ
7	IC 320-223413/8	9.28	10.266077	2.39	3835347.0	1.106258	Υ



Calibration / Perfluorononanoic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base:

0

RF Rounding:

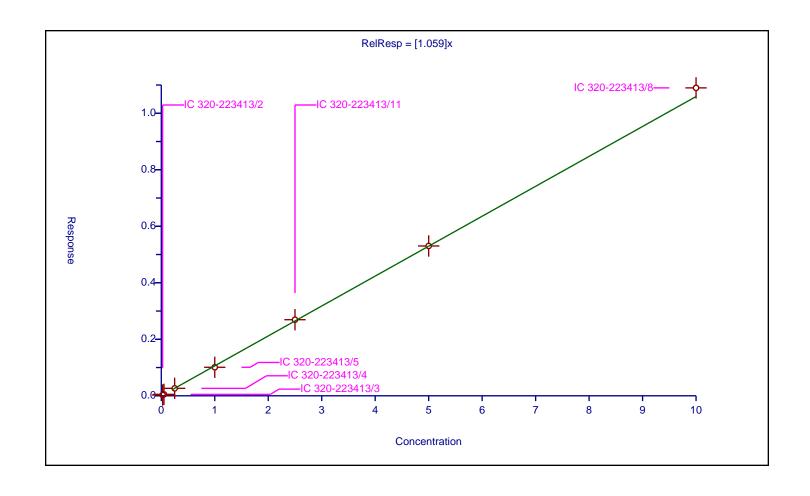
Intercept:	0
Slope:	1.059

Curve Coefficients

Error Coefficients

Standard Error:7140000Relative Standard Error:3.3Correlation Coefficient:0.999Coefficient of Determination (Adjusted):0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.027572	2.5	4268517.0	1.102865	Υ
2	IC 320-223413/3	0.05	0.051043	2.5	4502703.0	1.020865	Υ
3	IC 320-223413/4	0.25	0.263408	2.5	3819382.0	1.053634	Υ
4	IC 320-223413/5	1.0	1.009411	2.5	3600246.0	1.009411	Υ
5	IC 320-223413/11	2.5	2.692885	2.5	3538499.0	1.077154	Υ
6	IC 320-223413/7	5.0	5.302849	2.5	3359491.0	1.06057	Υ
7	IC 320-223413/8	10.0	10.898353	2.5	3539647.0	1.089835	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

Response Base: RF Rounding: 0

Curve Coefficients

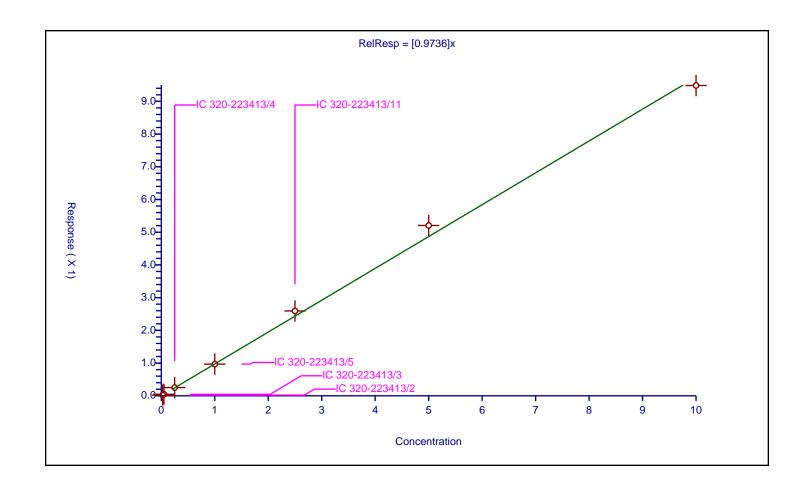
 Intercept:
 0

 Slope:
 0.9736

Error Coefficients

Standard Error:9600000Relative Standard Error:6.1Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.021924	2.5	5956672.0	0.876966	Υ
2	IC 320-223413/3	0.05	0.04682	2.5	5858621.0	0.936398	Υ
3	IC 320-223413/4	0.25	0.25161	2.5	5466463.0	1.006439	Υ
4	IC 320-223413/5	1.0	0.968289	2.5	5346931.0	0.968289	Υ
5	IC 320-223413/11	2.5	2.593212	2.5	5178962.0	1.037285	Υ
6	IC 320-223413/7	5.0	5.20651	2.5	4976852.0	1.041302	Υ
7	IC 320-223413/8	10.0	9.484794	2.5	5353791.0	0.948479	Υ



Curve Type:AverageWeighting:Conc_SqOrigin:ForceDependency:ResponseCalib Mode:IsoDil

0

Response Base:

RF Rounding:

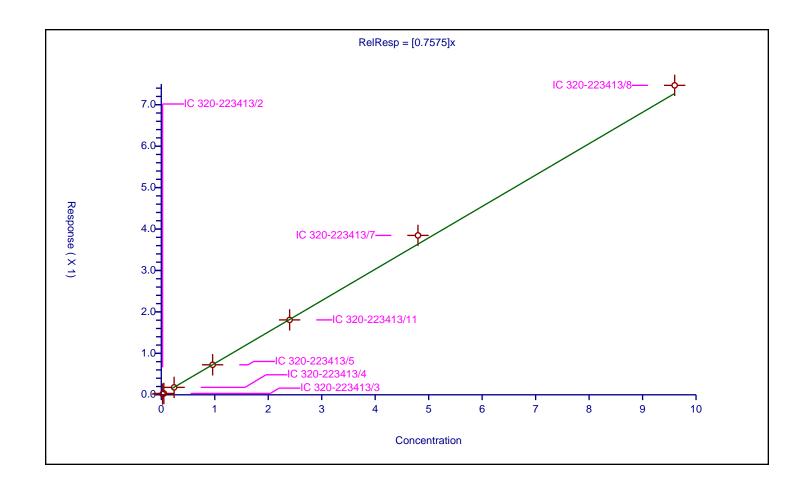
Intercept:	0
Slope:	0.7575

Curve Coefficients

Error Coefficients

Standard Error:5560000Relative Standard Error:5.1Correlation Coefficient:0.999Coefficient of Determination (Adjusted):0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.024	0.0189	2.39	4516956.0	0.787481	Υ
2	IC 320-223413/3	0.048	0.032746	2.39	4415247.0	0.682204	Υ
3	IC 320-223413/4	0.24	0.179215	2.39	4024927.0	0.74673	Υ
4	IC 320-223413/5	0.96	0.723687	2.39	3779459.0	0.75384	Υ
5	IC 320-223413/11	2.4	1.807138	2.39	3815593.0	0.752974	Υ
6	IC 320-223413/7	4.8	3.846277	2.39	3520558.0	0.801308	Υ
7	IC 320-223413/8	9.6	7.467179	2.39	3835347.0	0.777831	Υ



/ Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

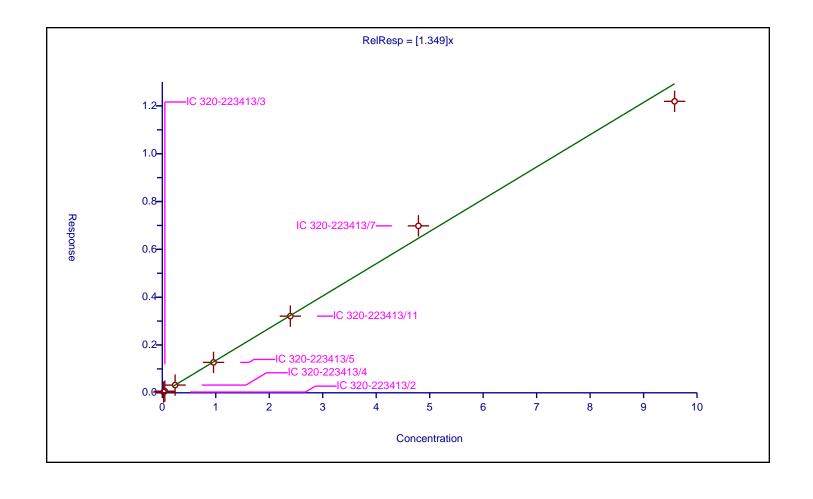
Response Base:
RF Rounding: 0

Curve Coefficients	
Intercept:	0
Slope:	1.349

Error Coefficients

Standard Error:2660000Relative Standard Error:4.3Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.02395	0.03158	2.395	1426703.0	1.318565	Υ
2	IC 320-223413/3	0.0479	0.066379	2.395	1426640.0	1.385774	Υ
3	IC 320-223413/4	0.2395	0.322423	2.395	1187676.0	1.346234	Υ
4	IC 320-223413/5	0.958	1.27079	2.395	1096366.0	1.326503	Υ
5	IC 320-223413/11	2.395	3.206758	2.395	1089191.0	1.338939	Υ
6	IC 320-223413/7	4.79	6.982192	2.395	972368.0	1.45766	Υ
7	IC 320-223413/8	9.58	12.191537	2.395	1107332.0	1.272603	Υ



Calibration / Perfluorodecanoic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

Response Base: RF Rounding: 0

Curve C	Coefficients
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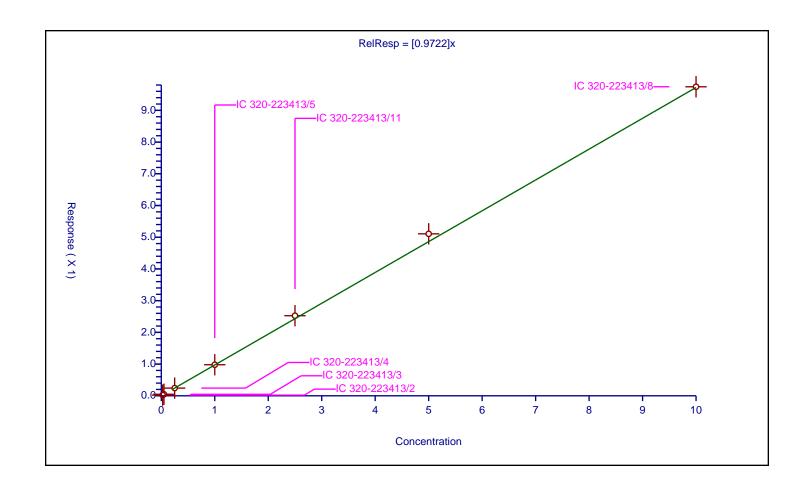
 Intercept:
 0

 Slope:
 0.9722

Error Coefficients

Standard Error:5620000Relative Standard Error:4.5Correlation Coefficient:0.999Coefficient of Determination (Adjusted):0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.022168	2.5	3594922.0	0.886723	Υ
2	IC 320-223413/3	0.05	0.048141	2.5	3752181.0	0.962813	Υ
3	IC 320-223413/4	0.25	0.242669	2.5	3297462.0	0.970677	Υ
4	IC 320-223413/5	1.0	0.979358	2.5	3084670.0	0.979358	Υ
5	IC 320-223413/11	2.5	2.525493	2.5	2997952.0	1.010197	Υ
6	IC 320-223413/7	5.0	5.106929	2.5	2812041.0	1.021386	Υ
7	IC 320-223413/8	10.0	9.744224	2.5	3099083.0	0.974422	Υ



/ N-methyl perfluorooctane sulfonamidoacetic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base:

0

RF Rounding:

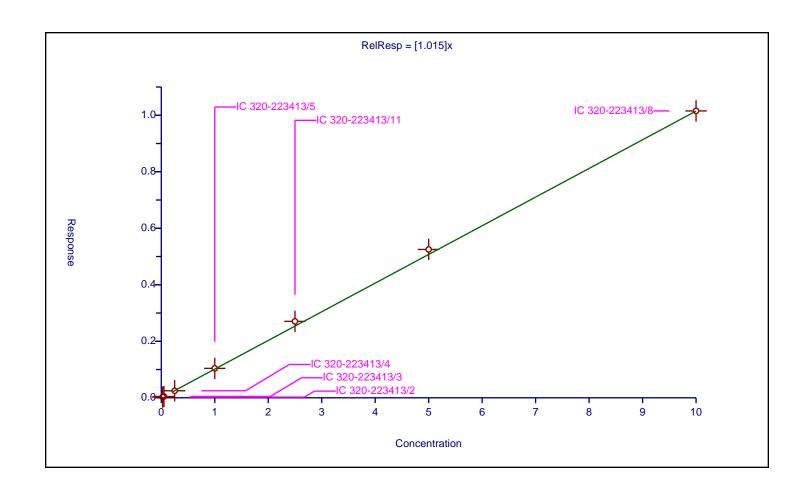
Intercept:	0
Slope:	1.015

Curve Coefficients

Error Coefficients

Standard Error:3410000Relative Standard Error:4.8Correlation Coefficient:0.996Coefficient of Determination (Adjusted):0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.02464	2.5	1940146.0	0.985596	Υ
2	IC 320-223413/3	0.05	0.046708	2.5	2060337.0	0.934168	Υ
3	IC 320-223413/4	0.25	0.248379	2.5	1854527.0	0.993515	Υ
4	IC 320-223413/5	1.0	1.0424	2.5	1667566.0	1.0424	Υ
5	IC 320-223413/11	2.5	2.705503	2.5	1561957.0	1.082201	Υ
6	IC 320-223413/7	5.0	5.250998	2.5	1561125.0	1.0502	Υ
7	IC 320-223413/8	10.0	10.153615	2.5	1836867.0	1.015361	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

0

Response Base:

RF Rounding:

 Intercept:
 0

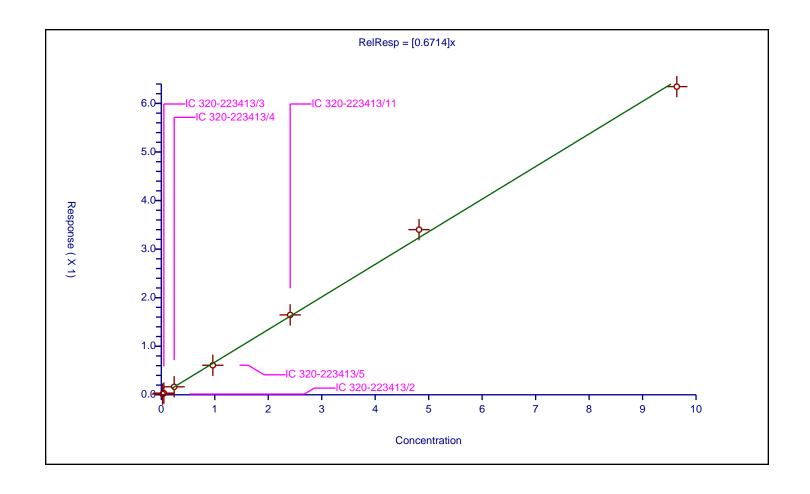
 Slope:
 0.6714

Curve Coefficients

Error Coefficients

Standard Error:4770000Relative Standard Error:4.8Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0241	0.015224	2.39	4516956.0	0.631713	Υ
2	IC 320-223413/3	0.0482	0.034117	2.39	4415247.0	0.707819	Υ
3	IC 320-223413/4	0.241	0.164737	2.39	4024927.0	0.683554	Υ
4	IC 320-223413/5	0.964	0.607741	2.39	3779459.0	0.630436	Υ
5	IC 320-223413/11	2.41	1.644986	2.39	3815593.0	0.682567	Υ
6	IC 320-223413/7	4.82	3.400965	2.39	3520558.0	0.705594	Υ
7	IC 320-223413/8	9.64	6.346257	2.39	3835347.0	0.658325	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

0

Response Base:

RF Rounding:

 Intercept:
 0

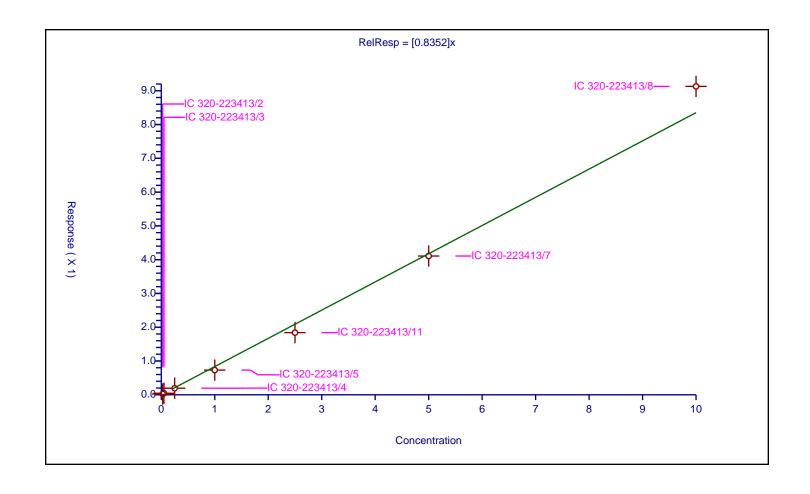
 Slope:
 0.8352

Curve Coefficients

Error Coefficients

Standard Error:3810000Relative Standard Error:10.9Correlation Coefficient:0.997Coefficient of Determination (Adjusted):0.984

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.023789	2.5	2840675.0	0.95157	Υ
2	IC 320-223413/3	0.05	0.045689	2.5	2914989.0	0.913777	Υ
3	IC 320-223413/4	0.25	0.194752	2.5	2576940.0	0.779009	Υ
4	IC 320-223413/5	1.0	0.731215	2.5	2587053.0	0.731215	Υ
5	IC 320-223413/11	2.5	1.840749	2.5	2447962.0	0.736299	Υ
6	IC 320-223413/7	5.0	4.107749	2.5	2262574.0	0.82155	Υ
7	IC 320-223413/8	10.0	9.129515	2.5	2282286.0	0.912952	Υ



/ N-ethyl perfluorooctane sulfonamidoacetic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

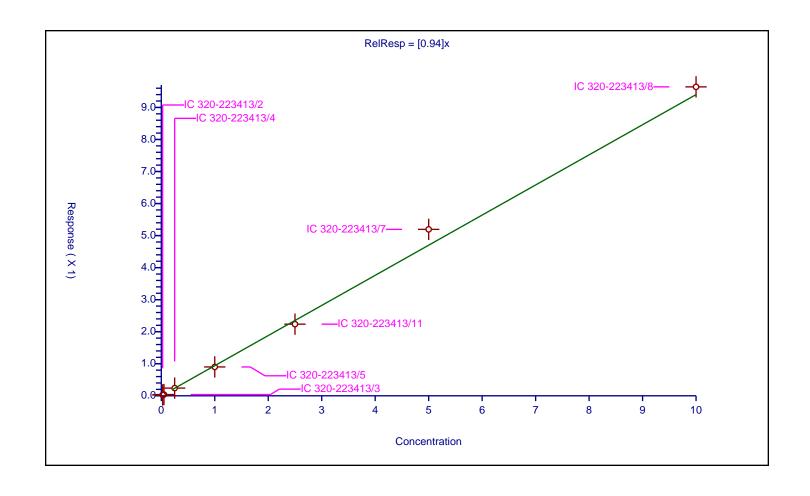
Response Base: RF Rounding: 0

Curve Coe	efficients
Intercept: Slope:	0 0,94
·	

Error Coefficients

Standard Error:2940000Relative Standard Error:10.3Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.987

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.026309	2.5	2119254.0	1.052351	Υ
2	IC 320-223413/3	0.05	0.03841	2.5	2144987.0	0.76821	Υ
3	IC 320-223413/4	0.25	0.240507	2.5	1857905.0	0.96203	Υ
4	IC 320-223413/5	1.0	0.900266	2.5	1808821.0	0.900266	Υ
5	IC 320-223413/11	2.5	2.235955	2.5	1777821.0	0.894382	Υ
6	IC 320-223413/7	5.0	5.194028	2.5	1507014.0	1.038806	Υ
7	IC 320-223413/8	10.0	9.641907	2.5	1619647.0	0.964191	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

Response Base: RF Rounding: 0

Curve Coefficients

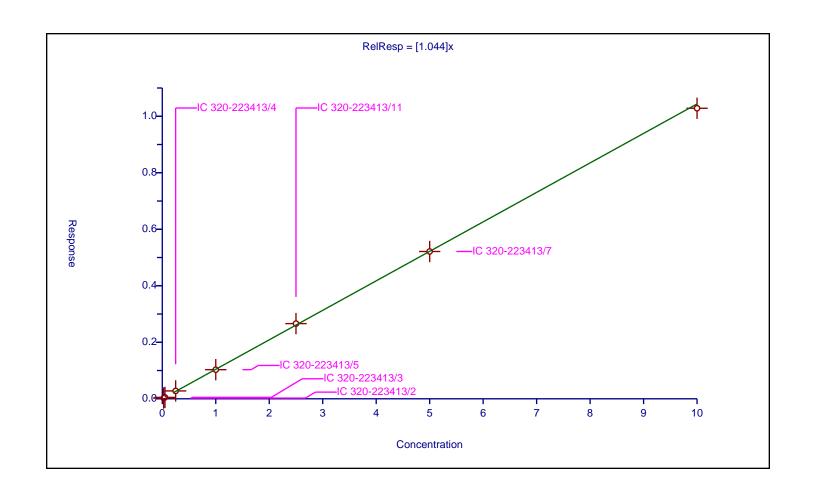
 Intercept:
 0

 Slope:
 1.044

Error Coefficients

Standard Error:5230000Relative Standard Error:3.4Correlation Coefficient:0.999Coefficient of Determination (Adjusted):0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.025547	2.5	2960567.0	1.021899	Υ
2	IC 320-223413/3	0.05	0.0502	2.5	3058640.0	1.004008	Υ
3	IC 320-223413/4	0.25	0.278393	2.5	2740425.0	1.113572	Υ
4	IC 320-223413/5	1.0	1.030575	2.5	2679695.0	1.030575	Υ
5	IC 320-223413/11	2.5	2.661172	2.5	2514089.0	1.064469	Υ
6	IC 320-223413/7	5.0	5.213621	2.5	2544838.0	1.042724	Υ
7	IC 320-223413/8	10.0	10.282964	2.5	2747572.0	1.028296	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base:

0

RF Rounding:

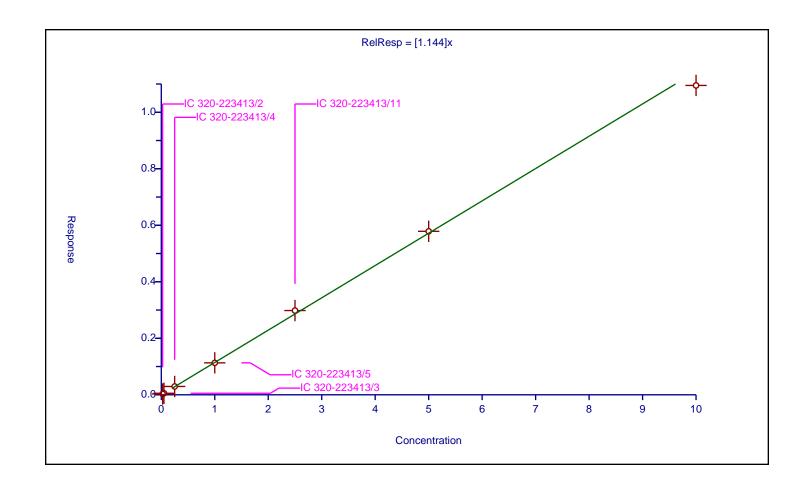
Intercept:	0
Slope:	1.144

Curve Coefficients

Error Coefficients

Standard Error:5630000Relative Standard Error:3.7Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.998

Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
IC 320-223413/2	0.025	0.029231	2.5	2960567.0	1.169235	Υ
IC 320-223413/3	0.05	0.054221	2.5	3058640.0	1.08442	Υ
IC 320-223413/4	0.25	0.294504	2.5	2740425.0	1.178014	Υ
IC 320-223413/5	1.0	1.130478	2.5	2679695.0	1.130478	Υ
IC 320-223413/11	2.5	2.982527	2.5	2514089.0	1.193011	Υ
IC 320-223413/7	5.0	5.786335	2.5	2544838.0	1.157267	Υ
IC 320-223413/8	10.0	10.949082	2.5	2747572.0	1.094908	Υ
	IC 320-223413/2 IC 320-223413/3 IC 320-223413/4 IC 320-223413/5 IC 320-223413/11 IC 320-223413/7	IC 320-223413/2 0.025 IC 320-223413/3 0.05 IC 320-223413/4 0.25 IC 320-223413/5 1.0 IC 320-223413/11 2.5 IC 320-223413/7 5.0	IC 320-223413/2 0.025 0.029231 IC 320-223413/3 0.05 0.054221 IC 320-223413/4 0.25 0.294504 IC 320-223413/5 1.0 1.130478 IC 320-223413/11 2.5 2.982527 IC 320-223413/7 5.0 5.786335	IC 320-223413/2 0.025 0.029231 2.5 IC 320-223413/3 0.05 0.054221 2.5 IC 320-223413/4 0.25 0.294504 2.5 IC 320-223413/5 1.0 1.130478 2.5 IC 320-223413/11 2.5 2.982527 2.5 IC 320-223413/7 5.0 5.786335 2.5	IC 320-223413/2 0.025 0.029231 2.5 2960567.0 IC 320-223413/3 0.05 0.054221 2.5 3058640.0 IC 320-223413/4 0.25 0.294504 2.5 2740425.0 IC 320-223413/5 1.0 1.130478 2.5 2679695.0 IC 320-223413/11 2.5 2.982527 2.5 2514089.0 IC 320-223413/7 5.0 5.786335 2.5 2544838.0	IC 320-223413/2 0.025 0.029231 2.5 2960567.0 1.169235 IC 320-223413/3 0.05 0.054221 2.5 3058640.0 1.08442 IC 320-223413/4 0.25 0.294504 2.5 2740425.0 1.178014 IC 320-223413/5 1.0 1.130478 2.5 2679695.0 1.130478 IC 320-223413/11 2.5 2.982527 2.5 2514089.0 1.193011 IC 320-223413/7 5.0 5.786335 2.5 2544838.0 1.157267



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base:

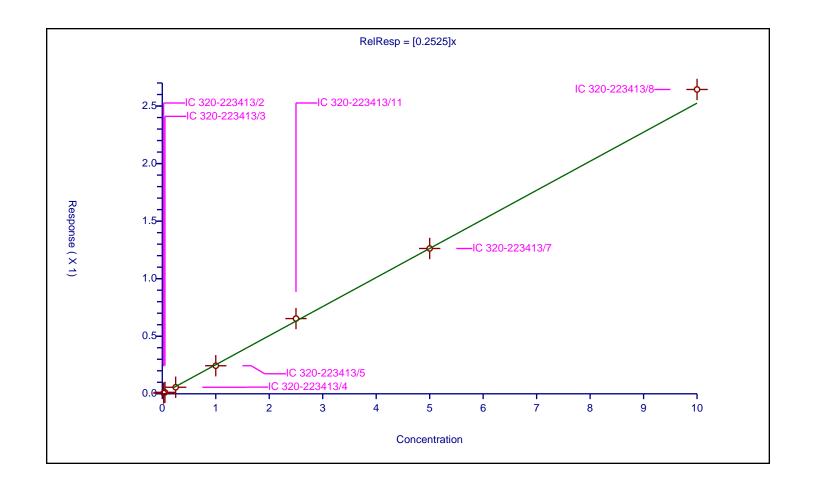
0

RF Rounding:

Error Coefficients

Standard Error:1590000Relative Standard Error:5.3Correlation Coefficient:0.998Coefficient of Determination (Adjusted):0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.006554	2.5	3777870.0	0.262158	Υ
2	IC 320-223413/3	0.05	0.012825	2.5	3285420.0	0.256497	Υ
3	IC 320-223413/4	0.25	0.056743	2.5	3595983.0	0.226973	Υ
4	IC 320-223413/5	1.0	0.243826	2.5	3394312.0	0.243826	Υ
5	IC 320-223413/11	2.5	0.653493	2.5	3141974.0	0.261397	Υ
6	IC 320-223413/7	5.0	1.262333	2.5	3113223.0	0.252467	Υ
7	IC 320-223413/8	10.0	2.643815	2.5	3267831.0	0.264381	Υ



FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: ICV 320-223413/13 Calibration Date: 05/15/2018 17:23

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.15LLCC_ICAL_010.d Conc. Units: ng/mL

						I I		
ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9298	0.9503		2.55	2.50	2.2	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.167		2.47	2.50	-1.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	82.15		2.33	2.21	5.2	30.0
4:2 FTS	AveID	16.57	18.05		2.55	2.34	8.9	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.004		2.44	2.50	-2.3	30.0
Perfluoropentanesulfonic acid	AveID	69.55	71.81		2.43	2.35	3.3	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.142		2.70	2.50	8.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.055		2.14	2.28	-6.3	30.0
6:2FTS	L2ID		1.554		2.09	2.38	-11.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.151		2.44	2.50	-2.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.351		2.41	2.38	1.4	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.072		2.53	2.50	1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.149		2.26	2.31	-2.3	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9902		2.54	2.50	1.7	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7598		2.41	2.40	0.3	30.0
8:2FTS	AveID	1.349	1.309		2.33	2.40	-3.0	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.037		2.67	2.50	6.7	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.021		2.52	2.50	0.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.7025		2.52	2.41	4.6	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9652		2.57	2.50	2.7	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.7177		2.15	2.50	-14.1	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	0.996		2.39	2.50	-4.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.104		2.41	2.50	-3.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2469		2.44	2.50	-2.2	30.0
13C4 PFBA	Ave	1.528	1.462		2.39	2.50	-4.3	30.0
13C5 PFPeA	Ave	0.9798	0.9296		2.37	2.50	-5.1	30.0
13C3-PFBS	Ave	0.0221	0.0208		2.18	2.33	-6.0	30.0
13C2 PFHxA	Ave	1.045	0.998		2.39	2.50	-4.5	30.0
13C4-PFHpA	Ave	1.001	0.9156		2.29	2.50	-8.5	30.0
1802 PFHxS	Ave	1.237	1.175		2.25	2.37	-5.0	30.0
M2-6:2FTS	Ave	0.2210	0.2207		2.37	2.38	-0.1	30.0

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: <u>ICV 320-223413/13</u> Calibration Date: <u>05/15/2018</u> 17:23

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.15LLCC_ICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.8898		2.35	2.50	-6.0	30.0
13C4 PFOS	Ave	0.8503	0.8094		2.28	2.39	-4.8	30.0
13C5 PFNA	Ave	0.7745	0.7379		2.38	2.50	-4.7	30.0
13C8 FOSA	Ave	1.113	1.119		2.51	2.50	0.6	30.0
M2-8:2FTS	Ave	0.2515	0.2407		2.29	2.40	-4.3	30.0
13C2 PFDA	Ave	0.6587	0.6073		2.30	2.50	-7.8	30.0
d3-NMeFOSAA	Ave	0.3634	0.3568		2.45	2.50	-1.8	30.0
d5-NEtFOSAA	Ave	0.3729	0.3488		2.34	2.50	-6.5	30.0
13C2 PFUnA	Ave	0.5216	0.4944		2.37	2.50	-5.2	30.0
13C2 PFDoA	Ave	0.5613	0.5571		2.48	2.50	-0.8	30.0
13C2-PFTeDA	Ave	0.6891	0.6919		2.51	2.50	0.4	30.0
13C2-PFHxDA	Ave	1.170	1.171		2.50	2.50	0.1	30.0

Report Date: 16-May-2018 09:20:44 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLCC_ICAL_010.d

Lims ID: ICV Full

Client ID:

Sample Type: ICV

Inject. Date: 15-May-2018 17:23:06 ALS Bottle#: 18 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\20180515-58217.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 16-May-2018 09:20:42 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK037

First Level Reviewer: hannigana Date: 15-May-2018 17:33:11

FIIST LEVEL REVIE	wei. Hai	iriiyaria			Date.	ı	13-181ay-2016 17.33.1	I		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA										
217.00 > 172.00		1.462	-0.010	1.000	6558644	2.39		95.7	44583	
2 Perfluorobuty	,									
212.90 > 169.00		1.462	-0.004	1.004	6232384	2.55			3830	
D 3 13C5-PFPe		1 744	0.014	0.570	44 / 0055	0.07		04.0	740/4	
267.90 > 223.00			-0.014	0.560	4169955	2.37		94.9	71064	
4 Perfluoropen 262.90 > 219.00			-0.006	1.005	4867541	2.47			2619	
D 47 13C3-PFBS		1.740	0.000	1.000	4007341	2.77			2017	
301.90 > 83.00		1.780	-0.014	1.000	86804	2.18		94.0	672	
5 Perfluorobuta	anesulfo	nic acid								
	1.775	1.783	-0.008	1.005	6786179	2.33			32587	
	1.775	1.783	-0.008	1.005	2714789		2.50(1.25-3.74)		20109	
D 60 M2-4:2FTS 329.00 > 81.00		1.999	0.017	1.000	647709	NC			9057	
61 Sodium 1H,					047709	NC			9037	
327.00 > 307.00		•	-0.007	1.000	1575421	2.55			89480	
6 Perfluorohex		id								
313.00 > 269.00		2.037	-0.010	1.000	4497390	2.44			7112	
313.00 > 119.00		2.037	-0.010	1.000	434640		10.35(5.03-15.10)		6592	
D 7 13C2 PFHx		0.007	0.010	4 000	4477040	0.00		05.5	005/7	
315.00 > 270.00			-0.010	1.000	4477812	2.39		95.5	93567	
70 Perfluoropei 349.00 > 80.00			.0.010	1.000	6300178	2.43			66597	
	2.049		-0.010	1.000	2290834	2.70	2.75(1.36-4.07)		32182	
67 Perfluoro(2-							,			
329.10 > 285.00			-0.005	1.000	637807	NC			5920	

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLCC_ICAL_010.d										
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFP	O-DA									
332.10 > 287.00		2.134	-0.005	1.000	203771	NC			3726	
D 913C4-PFHp	Α									
367.00 > 322.00		2.374	-0.014	1.000	4107005	2.29		91.5	82212	
10 Perfluorohe	ptanoic a	acid								
363.00 > 319.00	2.360	2.374	-0.014	1.000	4689174	2.70			6790	
363.00 > 169.00	2.360	2.374	-0.014	1.000	1789663		2.62(1.13-3.40)		10179	
8 Perfluorohex										
399.00 > 80.00		2.386	-0.013	1.000	5072324	2.14	0.00(4.50.4.40)		23515	
399.00 > 99.00		2.386	-0.013	1.000	1702243		2.98(1.50-4.49)		6349	
D 11 18O2 PFH:		0.007	0.010	1 000	4005700	0.05		05.0	F0/01	
403.00 > 84.00	2.3/3	2.386	-0.013	1.000	4985793	2.25		95.0	50631	
65 Adona	2.400	2 410	0.010	1 000	12010240	NO			1//540	
377.00 > 251.00 377.00 > 85.00		2.418 2.418	-0.010 -0.010	1.000 1.000	12919348 7441901	NC	1.74(0.84-2.53)		166549 56906	
					7441701		1.74(0.04-2.55)		30700	
13 Sodium 1H, 427.00 > 407.00		•	-0.016	e 1.000	1461549	2.09			9568	
D 12 M2-6:2FTS		2.707	0.010	1.000	1401047	2.07			7500	
429.00 > 81.00		2 707	-0.016	1.000	940677	2.37		99.9	19507	
D 14 13C4 PFO		2.707	0.010	1.000	710077	2.07		,,.,	17007	
417.00 > 372.00		2.731	-0.010	1.000	3991539	2.35		94.0	60154	
15 Perfluorooct			0.010	1.000	0,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	2.00		,	00101	
413.00 > 369.00		2.734	-0.013	1.000	4593918	2.44			2031	
413.00 > 169.00			-0.013	1.000	2532726		1.81(0.84-2.52)		10558	
* 62 13C2-PFO	Ą						, ,			
415.00 > 370.00		2.734	-0.013		4485749	2.50			73224	
16 Perfluorohe	ptanesul	fonic ac	id							
449.00 > 80.00	•		-0.010	1.000	4660030	2.41			28740	
449.00 > 99.00	2.721	2.739	-0.018	0.997	1234090		3.78(1.94-5.82)		21469	
D 18 13C4 PFO	S									
503.00 > 80.00	3.091	3.104	-0.013	1.000	3470981	2.28		95.2	22643	
17 Perfluorooct	tane sulf	onic aci	d							
499.00 > 80.00	3.091		-0.014	1.000	3860176	2.26			30403	
499.00 > 99.00	3.091	3.105	-0.014	1.000	819041		4.71(2.31-6.93)		8926	
20 Perfluorono										
463.00 > 419.00		3.107		1.000	3549673	2.53	4.07(4.00.5.(0)		6315	
463.00 > 169.00		3.107	-0.016	1.000	831344		4.27(1.90-5.69)		24932	
D 19 13C5 PFN/		0.407	0.017	4 000	0010010	0.00		05.0		
468.00 > 423.00				1.000	3310210	2.38		95.3	54117	
69 9-Chlorohex					(4074 (0	NO			45054	
531.00 > 351.00		3.316	-0.017	1.000	6187168	NC			45851	
D 21 13C8 FOS		0.455	0.000	4 00-	F000015	0.51		40-	47/	
506.00 > 78.00			-0.009	1.000	5020010	2.51		101	47676	
22 Perfluorooct				4 000	4070000	0.5.			E40//	
498.00 > 78.00				1.000	4970983	2.54			51844	
68 Perfluorono				4 00-	0/1005	0.4.5			1000=	
549.00 > 80.00				1.000	2648226	2.41	2 57/1 22 2 07\		40237	
549.00 > 99.00	3.439	3.455	-0.016	1.000	1029286	700	2.57(1.33-3.97)		18505	

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Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLCC_ICAL_010.d										
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,	1H 2H 2	H-nerflu	orodecar	16						
527.00 > 507.00		•		1.000	1356197	2.33			23529	
D 26 M2-8:2FTS										
529.00 > 81.00		3.459	-0.010	1.000	1034203	2.29		95.7	24982	
24 Perfluorode	canoic a	cid								
513.00 > 469.00		3.468	-0.010	1.000	2825404	2.67			13587	
513.00 > 169.00	3.458	3.468	-0.010	1.000	488632		5.78(2.36-7.09)		13700	
D 23 13C2 PFD	A									
515.00 > 470.00	3.458	3.468	-0.010	1.000	2724371	2.30		92.2	41092	
D 27 d3-NMeFO	SAA									
573.00 > 419.00	3.611	3.624	-0.013	1.000	1600454	2.45		98.2	21404	
28 N-methyl pe		ctane su	ılfonami							
570.00 > 419.00	3.611	3.631	-0.020	1.000	1634540	2.52			10505	
29 Perfluorode		lfonic ac	id							
599.00 > 80.00		3.781	-0.017	1.000	2461174	2.52			34940	
599.00 > 99.00	3.764	3.781	-0.017	1.000	854811		2.88(1.39-4.16)		19804	
D 32 d5-NEtFOS										
589.00 > 419.00	3.775	3.794	-0.019	1.000	1564712	2.34		93.5	7242	
33 N-ethyl perf										
584.00 > 419.00	3.786	3.800	-0.014	1.003	1510273	2.57			19551	
31 Perfluoroun										
563.00 > 519.00		3.800	-0.014	1.000	1591556	2.15			6601	
563.00 > 169.00		3.800	-0.014	1.000	437354		3.64(2.12-6.36)		16106	
D 30 13C2 PFUi			0.011	4 000	0047474	0.07		0.4.0	44054	
565.00 > 520.00			-0.014	1.000	2217674	2.37		94.8	41351	
66 11-Chloroei					07/4400	NO			04004	
631.00 > 451.00		3.958	-0.015	1.000	9764129	NC			81201	
D 36 13C2 PFD			0.010	4 000	0.4007.47	0.40		00.0	00/00	
615.00 > 570.00			-0.013	1.000	2498767	2.48		99.2	20633	
37 Perfluorodo										
613.00 > 569.00		4.100	-0.014	1.000	2489518	2.39	2 77/2 12 / 40)		2192	
613.00 > 169.00		4.100	-0.014	1.000	660158		3.77(2.13-6.40)		9524	
41 Perfluorotrio			0.001	1 000	2757022	0.44			1.400	
663.00 > 619.00		4.368 4.368	-0.021 -0.021	1.000 1.000	2757903	2.41	2 22/1 25 2 7/)		1498	
663.00 > 169.00			-0.021	1.000	830586		3.32(1.25-3.76)		8581	
42 Perfluoroteti			0.01/	1 000	7//202	2.44			0070	
713.00 > 169.00 713.00 > 219.00		4.608 4.608	-0.016 -0.026	1.000 0.998	766392 552064	2.44	1.39(0.71-2.13)		8270 8171	
		4.000	-0.020	0.770	332004		1.37(0.71-2.13)		0171	
D 43 13C2-PFT6 715.00 > 670.00		4.608	-0.016	1.000	3103625	2.51		100	14331	
		4.006	-0.010	1.000	3103025	2.31		100	14331	
D 44 13C2-PFH:		E 020	0.022	1 000	E2E1102	2.50		100	12440	
815.00 > 770.00		5.030	-0.022	1.000	5251192	2.50		100	12649	
45 Perfluorohe:			0.000	1 000	E1FF170	NIC			1000	
813.00 > 769.00 813.00 > 169.00		5.031	-0.023	1.000	5155170 944334	NC	6 11/2 06 0 E0\		1223	
813.00 > 169.00		5.031	-0.023	1.000	844334		6.11(2.86-8.58)		6207	
46 Perfluorooct			0.022	1 000	E2041F0	NIC			025	
913.00 > 869.00 913.00 > 169.00		5.408 5.408	-0.022	1.000 1.000	5286159 634791	NC	0 22/2 02 11 40\		935 4660	
713.00 > 109.00	0.380	5.408	-0.022	1.000	034/91	700	8.33(3.83-11.48)		4000	

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Report Date: 16-May-2018 09:20:44 Chrom Revision: 2.2 11-May-2018 08:54:46

OC Flag Legend Processing Flags NC - Not Calibrated

Reagents:

LCPFCIC_FULL_00011 Amount Added: 1.00 Units: mL

Report Date: 16-May-2018 09:20:44 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento Data File: \\ChromNa\\Sacramento\\ChromData\\A8_N\\20180515-58217.b\\2018.05.15LLCC_ICAL_010.d **Injection Date:** 15-May-2018 17:23:06 Instrument ID: A8_N Lims ID: ICV Full Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 18 Worklist Smp#: 13 Dil. Factor: Injection Vol: 2.0 ul 1.0000 LC PFC_QSM5-1 ICAL Method: $A8_N$ Limit Group: 2 Perfluorobutyric acid D 113C4 PFBA D 3 13C5-PFPeA Exp1;m/z 212.90 > 169.00:Moving5PtAverage_x Exp1;m/z 267.90 > 223.00:Moving5PtAverage_x Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Y (X100000) 1.0 1.6 1.9 1.1 1.4 1.7 2.0 1.3 1.9 2.2 8.0 2.5 Min Min RT RT RT D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid 4 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 18 Y (X100000) 20 15- 10 16 12 1.2 2.0 1.5 1.8 2.1 2.4 1.1 1.4 1.7 2.3 1.2 1.5 1.8 2.1 2.4 Min Min RT RT RT 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexan@ Perfluorohexanoic acid Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 72 40 Y (X10000) (X100000 Y (X10000) 60 32 48 24 36 16 24 1.8 2.0 1.5 2.1 2.4 0.9 1.5 2.1 2.7 1.7 2.3 2.6 1.2 1.4 Min RT RT RT 6 Perfluorohexanoic acid 7 13C2 PFHxA 70 Perfluoropentanesulfonic acid Exp1;m/z 313.00 > 119.00:Moving5PtAverage_x Exp1;m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 349.00 > 80.00:Moving5PtAverage_x3 18 (X100000) (X100000) Y (X10000) 15 2.0 2.3 0.9 1.5 2.7 1.8 2.1 1.4 1.7 2.6 2.1 1.2 1.5 2.4 Min Min RT RT RT Page 566 of 728

2.4

2.1

RT

3.3

3.0

2.3

RT

2.9

3.2

2.7 Min

2.1

RT

3.9

3.3

Report Date: 16-May-2018 09:20:44 Chrom Revision: 2.2 11-May-2018 08:54:46 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLCC_ICAL_010.d 16 Perfluoroheptanesulfonic acid 16 Perfluoroheptanesulfonic acid Exp1;m/z 449.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3 Y (X100000) Y (X100000) 24 18 2.6 2.9 3.2 1.9 2.8 3.1 2.4 2.7 3.0 3.3 2.0 2.3 3.5 2.2 2.5 2.1 Min Min Min RT RT RT D 18 13C4 PFOS 17 Perfluorooctane sulfonic acid 17 Perfluorooctane sulfonic acid Exp1:m/z 499.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 503.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 499.00 > 80.00:Moving5PtAverage_x3 78 Y (X100000) 65- 52 39 26 13 3.9 3.0 2.7 3.3 3.6 2.1 4.8 2.3 3.5 4.1 Min RT RT RT 20 Perfluorononanoic acid 20 Perfluorononanoic acid D 19 13C5 PFNA Exp1;m/z 463.00 > 169.00:Moving5PtAverage_x Exp1:m/z 463.00 > 419.00:Moving5PtAverage_> Exp1:m/z 468.00 > 423.00:Moving5PtAverage_x (X100000) 20 (X10000) 16- 2.9 2.6 3.2 2.7 3.9 3.3 3.5 3.8 2.1 3.3 2.4 2.7 3.0 3.6 Min Min Min RT RT RT D 21 13C8 FOSA 22 Perfluorooctane Sulfonamide 68 Perfluorononanesulfonic acid Exp1:m/z 498.00 > 78.00:Moving5PtAverage_x3 Exp1:m/z 506.00 > 78.00:Moving5PtAverage_x3 Exp1:m/z 549.00 > 80.00:Moving5PtAverage_x3 Y (X100000) Y (X100000) Y (X10000) 60 12 36 24

3.4 Min 3.7

4.0

2.8

RT

3.1

3.7

4.0

3.1

2.8

RT

2.9

RT

3.5

Min

3.8

68 Perfluorononanesulfonic acid 25 Sodium 1H,1H,2H,2H-perfluorodecabe26 M2-8:2FTS Exp1:m/z 549.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 527.00 > 507.00:Moving5PtAverage_x Exp1:m/z 529.00 > 81.00:Moving5PtAverage_x3 36 30 25 Y (X10000) Y (X10000) 30 Y (X10000 25 20 24 20 15- 18 15 10 3.0 3.3 3.6 3.9 2.9 3.5 3.8 3.1 3.4 3.7 4.0 2.7 3.2 2.8 Min Min RT RT RT 24 Perfluorodecanoic acid 24 Perfluorodecanoic acid D 23 13C2 PFDA Exp1:m/z 513.00 > 469.00:Moving5PtAverage_x Exp1:m/z 513.00 > 169.00:Moving5PtAverage_x Exp1:m/z 515.00 > 470.00:Moving5PtAverage_x 84 78 65- Y (X10000) Y (X10000) 70 56 39 42 28 26 13 3.0 3.6 3.9 3.5 3.8 3.0 3.6 3.9 Min RT RT RT D 27 d3-NMeFOSAA 28 N-methyl perfluorooctane sulfonami 29 Perfluorodecane Sulfonic acid Exp1:m/z 573.00 > 419.00:Moving5PtAverage_> Exp1:m/z 570.00 > 419.00:Moving5PtAverage_x Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 48 48 72 (X10000) 40 60 40 32 32 48 24 24 36 16 24 16 0 3.7 3.8 4.0 3.1 3.4 4.0 2.9 3.2 3.5 4.1 4.4 3.1 3.4 3.7 4.3 Min Min RT RT RT 29 Perfluorodecane Sulfonic acid D 32 d5-NEtFOSAA 33 N-ethyl perfluorooctane sulfonamid Exp1:m/z 599.00 > 99.00:Moving5PtAverage_x3 Exp1;m/z 589.00 > 419.00:Moving5PtAverage_x Exp1:m/z 584.00 > 419.00:Moving5PtAverage x25 Y (X10000) Y (X10000) Y (X10000) 35 20 32 28 15- 24 21 10 16 3.6 Min 3.9 4.2 3.4 4.3 3.3 4.5 3.2 3.5 3.8 4.4 4.0 RT RT RT

Report Date: 16-May-2018 09:20:44 Chrom Revision: 2.2 11-May-2018 08:54:46 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLCC_ICAL_010.d 31 Perfluoroundecanoic acid 31 Perfluoroundecanoic acid D 30 13C2 PFUnA Exp1:m/z 563.00 > 169.00:Moving5PtAverage_x Exp1:m/z 565.00 > 520.00:Moving5PtAverage_x Exp1:m/z 563.00 > 519.00:Moving5PtAverage_x Y (X10000) Y (X10000) Y (X10000) 32 24 33 22 3.9 4.2 3.9 4.2 3.5 3.8 3.0 3.3 3.6 3.0 3.3 3.6 3.2 4.1 Min Min Min RT RT RT D 36 13C2 PFDoA 37 Perfluorododecanoic acid 37 Perfluorododecanoic acid Exp1:m/z 615.00 > 570.00:Moving5PtAverage_x Exp1:m/z 613.00 > 569.00:Moving5PtAverage_x Exp1:m/z 613.00 > 169.00:Moving5PtAverage_x 84 72 20 Y (X10000) Y (X10000) Y (X10000) 60 16 56 48 42 36- 28 24 4.2 3.6 4.2 4.5 3.6 4.5 3.4 3.7 4.0 4.3 4.6 Min RT RT RT 41 Perfluorotridecanoic acid 41 Perfluorotridecanoic acid 42 Perfluorotetradecanoic acid Exp1:m/z 663.00 > 619.00:Moving5PtAverage_x Exp1:m/z 663.00 > 169.00:Moving5PtAverage_x Exp1:m/z 713.00 > 169.00:Moving5PtAverage_x 24 84 25 (X10000) 20 Y (X10000) 70 20 56 15- 42 10 28 ot 4.2 Min 4.8 3.8 4.1 4.4 4.7 5.0 3.6 3.9 4.5 5.1 3.9 4.2 4.8 5.1 Min Min RT RT RT D 43 13C2-PFTeDA D 44 13C2-PFHxDA 42 Perfluorotetradecanoic acid 18 Y (X100000) Y (X100000) Y (X10000 15- 12

4.7

Min

5.0

5.3

4.3

RT

4.6

4.1

3.8

RT

4.7

5.0

5.3

4.1

RT

4.9 Min 5.2

5.5

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCVL 320-225818/2 Calibration Date: 05/28/2018 07:08

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9298	1.012		0.0544	0.0500	8.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.288		0.0545	0.0500	9.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	79.49		0.0450	0.0442	1.8	30.0
4:2 FTS	AveID	16.57	19.27		0.400	0.0467	16.3	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.040		0.0506	0.0500	1.2	30.0
Perfluoropentanesulfonic acid	AveID	69.55	70.14		0.0473	0.0469	0.9	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.146		0.0543	0.0500	8.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.182		0.0477	0.0455	4.9	30.0
6:2FTS	L2ID		1.719		0.400	0.0474	-23.7	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.274		0.0541	0.0500	8.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.308		0.0468	0.0476	-1.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	0.9395		0.0444	0.0500	-11.3	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.117		0.0441	0.0464	-5.0	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.030		0.0529	0.0500	5.8	30.0
8:2FTS	AveID	1.349	1.417		0.0503	0.0479	5.0	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7926		0.0502	0.0480	4.6	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.103		0.0567	0.0500	13.5	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.056		0.400	0.0500	4.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.7927		0.0569	0.0482	18.1	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9911		0.0527	0.0500	5.4	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.8276		0.0495	0.0500	-0.9	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.031		0.0494	0.0500	-1.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.310		0.0573	0.0500	14.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2293		0.0454	0.0500	-9.2	30.0
13C4 PFBA	Ave	1.528	1.372		2.24	2.50	-10.2	30.0
13C5 PFPeA	Ave	0.9798	0.9936		2.54	2.50	1.4	30.0
13C3-PFBS	Ave	0.0221	0.0202		2.12	2.33	-8.8	30.0
13C2 PFHxA	Ave	1.045	1.043		2.50	2.50	-0.1	30.0
13C4-PFHpA	Ave	1.001	0.9269		2.31	2.50	-7.4	30.0
1802 PFHxS	Ave	1.237	1.166		2.23	2.37	-5.7	30.0
M2-6:2FTS	Ave	0.2210	0.2443		2.63	2.38	10.5	30.0

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCVL 320-225818/2 Calibration Date: 05/28/2018 07:08

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9576		2.53	2.50	1.1	30.0
13C4 PFOS	Ave	0.8503	0.7883		2.22	2.39	-7.3	30.0
13C5 PFNA	Ave	0.7745	0.8026		2.59	2.50	3.6	30.0
13C8 FOSA	Ave	1.113	0.999		2.24	2.50	-10.2	30.0
M2-8:2FTS	Ave	0.2515	0.2504		2.39	2.40	-0.4	30.0
13C2 PFDA	Ave	0.6587	0.6778		2.57	2.50	2.9	30.0
d3-NMeFOSAA	Ave	0.3634	0.4035		2.78	2.50	11.0	30.0
d5-NEtFOSAA	Ave	0.3729	0.4189		2.81	2.50	12.3	30.0
13C2 PFUnA	Ave	0.5216	0.5244		2.51	2.50	0.5	30.0
13C2 PFDoA	Ave	0.5613	0.5893		2.62	2.50	5.0	30.0
13C2-PFTeDA	Ave	0.6891	0.7280		2.64	2.50	5.6	30.0
13C2-PFHxDA	Ave	1.170	1.325		2.83	2.50	13.3	30.0

Report Date: 30-May-2018 10:57:43 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_002.d

Lims ID: CCVL

Client ID:

Sample Type: CCVL

Inject. Date: 28-May-2018 07:08:03 ALS Bottle#: 21 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCVL

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub32

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 30-May-2018 10:57:42 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 10:57:42

FIIST LEVEL REVIE	wei. iua	rigyutsa	Kulu		Date.	<u> </u>	00-101ay-2016 10.37.2	+2		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA										
217.00 > 172.00		1.455	-0.003	1.000	6826300	2.24		89.8	36220	
2 Perfluorobut	•									
212.90 > 169.00		1.463	-0.011	1.000	138212	0.0544		109	66.8	
D 3 13C5-PFPe 267.90 > 223.00		1.725	-0.005	0.562	4942428	2.54		101	56013	
4 Perfluoroper			-0.005	0.502	4942420	2.54		101	30013	
262.90 > 219.00		1.728	0.001	1.005	127310	0.0545		109	85.0	
D 47 13C3-PFB	S									
301.90 > 83.00	1.756	1.761	-0.005	1.000	93435	2.12		91.2	884	
5 Perfluorobut										
298.90 > 80.00 298.90 > 99.00	1.756 1.756	1.764 1.764	-0.008 -0.008	1.000 1.000	141197 62282	0.0450	2.27(1.25-3.74)	102	694 734	
D 60 M2-4:2FTS		1.704	-0.008	1.000	02262		2.27(1.25-3.74)		734	
329.00 > 81.00		1.977	-0.007	1.000	801467	NC			8721	
61 Sodium 1H,	1H,2H,2	H-perflu	orohexar	ne						
327.00 > 307.00	1.970	1.980	-0.010	1.000	36163	0.0543		116	2176	
D 7 13C2 PFHx										
315.00 > 270.00		2.011	-0.008	1.000	5190130	2.50		99.9	88393	
6 Perfluorohex 313.00 > 269.00		2.014	0.0	1.006	107959	0.0506		101	229	
313.00 > 209.00		2.014	0.0	1.006	11706	0.0300	9.22(5.03-15.10)	101	135	
70 Perfluorope	ntanesul	fonic ac	id				,			
349.00 > 80.00	2.025	2.036	-0.011	1.000	132196	0.0473		101	1492	
	2.025	2.036	-0.011	1.000	52946		2.50(1.36-4.07)		1014	
D 64 13C3 HFP		0 110	0.007	1 000	220442	NC			4750	
332.10 > 287.00	2.105	2.112	-0.007	1.000	229443	NC			4753	

Data File:	\\Chr	omNa\S	acrament	io\Chrom	Data\A8_N\201	80527-5883	5.b\2018.05.27LLAI	DX_002.	a	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-	propoxy	propano	oic) acid							
329.10 > 285.00			0.001	1.005	16918	NC			99.3	
D 913C4-PFHp	Α									
367.00 > 322.00		2.342	0.003	1.000	4610526	2.31		92.6	51749	
10 Perfluoroher	otanoic a	acid								
363.00 > 319.00	2.345	2.345	0.0	1.000	105700	0.0543		109	141	
363.00 > 169.00	2.332	2.345	-0.013	0.994	41185		2.57(1.13-3.40)		225	
D 11 1802 PFH										
403.00 > 84.00	2.358	2.355	0.003	1.000	5488462	2.23		94.3	55166	
8 Perfluorohex				0.004	101001	0.0477		405		
399.00 > 80.00		2.358	-0.013	0.994	124834	0.0477	2.00/1.50.4.40\	105	604	
399.00 > 99.00	2.358	2.358	0.0	1.000	40438		3.09(1.50-4.49)		248	
65 Adona	2 204	2 205	0.011	1 000	201442	NC			4040	
377.00 > 251.00 377.00 > 85.00		2.395 2.395	-0.011 -0.011	1.000 1.000	301463 174376	NC	1.73(0.84-2.53)		4969 3225	
D 12 M2-6:2FTS		2.373	-0.011	1.000	174370		1.73(0.04-2.55)		3223	
429.00 > 81.00		2.665	0.002	1.000	1154234	2.63		111	16033	
13 Sodium 1H,					1101201	2.00			10000	
427.00 > 407.00		•		1.000	39596	0.0362		76.3	1217	
D 14 13C4 PFO										
417.00 > 372.00		2.695	0.002	1.000	4763005	2.53		101	47496	
15 Perfluorooct										
413.00 > 369.00		2.704	-0.007	1.000	121325	0.0541		108	39.9	
413.00 > 169.00	2.697	2.704	-0.007	1.000	57885		2.10(0.84-2.52)		212	
* 62 13C2-PFOA	\									
415.00 > 370.00	2.697	2.704	-0.007		4974159	2.50			57719	
16 Perfluoroher	otanesul	fonic ac	id							
449.00 > 80.00	2.705	2.712	-0.007	1.000	97676	0.0468		98.2	1318	
449.00 > 99.00	2.697	2.712	-0.015	0.997	27914		3.50(1.94-5.82)		615	
D 19 13C5 PFNA										
468.00 > 423.00	3.063	3.063	0.0	1.000	3992452	2.59		104	57713	
D 18 13C4 PFOS										
503.00 > 80.00	3.063	3.063	0.0	1.000	3748344	2.22		92.7	22009	
17 Perfluorooct										
499.00 > 80.00			-0.006	1.000	81296	0.0441	1.00(0.01.(.00)	95.0	640	
499.00 > 99.00			-0.006	1.000	19013		4.28(2.31-6.93)		295	
20 Perfluoronor			0.010	1 000	75004	0.0444		00.7	001	
463.00 > 419.00		3.076		1.000	75021	0.0444	2 22(1 00 5 (0)	88.7	206	
463.00 > 169.00			-0.013	1.000	22506		3.33(1.90-5.69)		418	
69 9-Chlorohex					122554	NIC			2/1/	
531.00 > 351.00		ა.283	-0.007	1.000	133551	NC			2416	
D 21 13C8 FOSA		2 205	0.000	1 000	40/0107	2.24		00.0	24041	
506.00 > 78.00				1.000	4968127	2.24		89.8	36041	
22 Perfluorooct				1 002	102202	0.0500		10/	104/	
498.00 > 78.00		5.411	-0.009	1.003	102392	0.0529		106	1846	
D 26 M2-8:2FTS		2 442	0.001	1 000	1102210	2.20		00 /	14574	
529.00 > 81.00	3.412	3.413	-U.UU I	1.000	1193319	2.39		99.6	16574	

Data File.	NOTIL	Jiliya	cramen	to Chilom	Dala (Ao_IN)20 I	100327-3003	3.0\2016.03.27LLAL	JA_002.0	u	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorono	nanaculf	onic acid	1							
549.00 > 80.00		3.421		1.000	59665	0.0502		105	1170	
			-0.009			0.0502	0.04/4.00.0.07\	105	1178	
549.00 > 99.00	3.412	3.421	-0.009	1.000	20980		2.84(1.33-3.97)		613	
D 23 13C2 PFD	A									
515.00 > 470.00	3.421	3.422	-0.001	1.000	3371365	2.57		103	47058	
25 Sodium 1H,	1H 2H 2	H-nerflu	orodecar	1 e						
527.00 > 507.00		•		1.000	33830	0.0503		105	1450	
			-0.010	1.000	33030	0.0303		103	1430	
24 Perfluorode										
513.00 > 469.00				1.000	74372	0.0567		113	357	
513.00 > 169.00	3.430	3.439	-0.009	1.003	11171		6.66(2.36-7.09)		407	
D 27 d3-NMeFO	SAA									
573.00 > 419.00		3.572	0.007	1.000	2006970	2.78		111	33636	
					2000770	2.70			00000	
28 N-methyl pe				4 000	10.101	0.0500		404	400	
570.00 > 419.00	3.579	3.590	-0.011	1.000	42401	0.0520		104	423	
29 Perfluorode	cane Sul	lfonic ac	id							
599.00 > 80.00	3.733	3.743	-0.010	1.000	59926	0.0569		118	598	
599.00 > 99.00			-0.010	1.000	21221		2.82(1.39-4.16)		828	
		0.7.10	0.0.0				2.02()		020	
D 32 d5-NEtFOS		0 7 40		4 000	0000/50	0.01		440	005/4	
589.00 > 419.00	3.743	3.748	-0.005	1.000	2083653	2.81		112	23564	
D 30 13C2 PFU	nA									
565.00 > 520.00	3.753	3.748	0.005	1.000	2608525	2.51		101	43446	
33 N-ethyl perfl				1 000	41204	0.0507		105	007	
584.00 > 419.00	3.753	3.764	-0.011	1.003	41304	0.0527		105	937	
31 Perfluoroun	decanoio	c acid								
563.00 > 519.00	3.753	3.764	-0.011	1.000	43178	0.0495		99.1	286	
563.00 > 169.00	3.753	3.764	-0.011	1.000	12141		3.56(2.12-6.36)		287	
66 11-Chloroei	cocafluo	ro 2 ova	undocan	,			, ,			
		3.920			215405	NC			4470	
631.00 > 451.00	3.910	3.920	-0.010	1.000	215695	NC			4478	
D 36 13C2 PFD	Ac									
615.00 > 570.00	4.041	4.048	-0.007	1.000	2931279	2.62		105	23784	
37 Perfluorodo	decanoid	acid								
613.00 > 569.00		4.061	-0.020	1.000	60433	0.0494		98.8	74.9	
			-0.020			0.0474	4 24/2 12 4 40\	70.0		
613.00 > 169.00		4.061	-0.010	1.003	13931		4.34(2.13-6.40)		234	
41 Perfluorotric	lecanoic	acid								
663.00 > 619.00	4.308	4.319	-0.011	1.000	76787	0.0573		115	78.1	
663.00 > 169.00	4.308	4.319	-0.011	1.000	20723		3.71(1.25-3.76)		326	
D 43 13C2-PFT	۰۵۸						, ,			
715.00 > 670.00		4 5 40	0.0	1 000	2/21212	2/4		10/	10015	
/15.00 > 6/0.00	4.542	4.542	0.0	1.000	3621313	2.64		106	18015	
42 Perfluorotet	radecand	oic acid								
713.00 > 169.00	4.552	4.554	-0.002	1.002	16610	0.0454		90.8	207	
713.00 > 219.00	4.542	4.554	-0.012	1.000	14295		1.16(0.71-2.13)		306	
D 44 13C2-PFH							. ,			
		40//	0.004	1 000	/ 504 / 04	2.02		440	1 4 4 0 0	
815.00 > 770.00	4.965	4.966	-0.001	1.000	6591601	2.83		113	14420	
45 Perfluorohe	xadecan	oic acid								
813.00 > 769.00	4.965	4.976	-0.011	1.000	176830	NC			74.9	
813.00 > 169.00	4.965	4.976	-0.011	1.000	30342		5.83(2.86-8.58)		262	

	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
,	46 Perfluorooct	tadecand	oic acid								
	913.00 > 869.00	5.320	5.336	-0.016	1.000	145803	NC			43.7	
	913.00 > 169.00	5.320	5.336	-0.016	1.000	17864		8.16(3.83-11.48)		243	

OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL2_00004 Amount Added: 1.00 Units: mL

Report Date: 30-May-2018 10:57:43 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_002.d Data File: **Injection Date:** 28-May-2018 07:08:03 Instrument ID: A8_N Lims ID: **CCVL** Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 2 Injection Vol: Dil. Factor: 1.0000 2.0 ul Method: Limit Group: LC PFC_QSM5-1 ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 3 13C5-PFPeA Exp1;m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x Exp1;m/z 217.00 > 172.00:Moving5PtAverage_x Y (X100000) 30 Y (X100000) Y (X1000) 24 12 18 12 1.0 1.6 1.9 0.8 1.1 1.4 1.7 2.0 1.2 1.5 1.8 2.1 Min Min Min RT RT RT 4 Perfluoropentanoic acid D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid Exp1;m/z 298.90 > 80.00:Moving5PtAverage_x3 Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 24 35- 20 Y (X1000) Y (X1000) Y (X1000 28 28 16 21 21 12 1.6 Min 1.9 1.4 1.7 2.0 2.0 1.0 1.3 2.2 2.5 1.1 2.3 1.1 1.4 1.7 2.3 Min Min RT RT RT 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexaDe 7 13C2 PFHxA Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x 20 15- 12 (X100000 10 16 Y (X1000) Y (X1000) 12 2.0 2.6 1.4 2.3 1.6 2.2 2.5 1.7 2.3 2.0 1.3 1.4 RT RT RT 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid 70 Perfluoropentanesulfonic acid Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 313.00 > 119.00:Moving5PtAverage_> Exp1:m/z 349.00 > 80.00:Moving5PtAverage_x3 36- 30 45- 30 25 Y (X1000) Y (X1000) Y (X100) 36 24 20 27 18 15- 18 10 0 0.9 1.5 2.1 2.7 1.7 2.0 2.3 2.6 1.9 2.2 2.5 1.4 1.3 1.6 2.8 Min Min Min RT RT RT Page 578 of 728

RT

RT

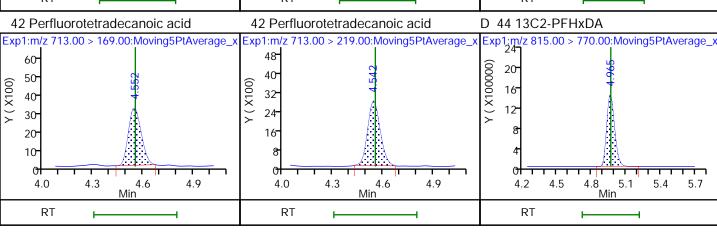
Report Date: 30-May-2018 10:57:43 Chrom Revision: 2.2 11-May-2018 08:54:46 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_002.d 16 Perfluoroheptanesulfonic acid 16 Perfluoroheptanesulfonic acid Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 449.00 > 99.00:Moving5PtAverage_x3 30 90-Y (X100000) 25 75- Y (X1000) Y (X100) 20 60 15- 45 10 30 15 2.8 3.1 2.5 2.8 3.1 2.5 2.8 3.1 1.9 2.2 2.5 2.2 2.2 Min Min Min RT RT RT D 19 13C5 PFNA D 18 13C4 PFOS 17 Perfluorooctane sulfonic acid Exp1:m/z 468.00 > 423.00:Moving5PtAverage_x Exp1:m/z 503.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 499.00 > 80.00:Moving5PtAverage_x3 15- (X100000) Y (X100000) 10 3.0 2.6 3.2 3.5 2.7 3.3 3.6 3.4 4.0 RT RT RT 17 Perfluorooctane sulfonic acid 20 Perfluorononanoic acid 20 Perfluorononanoic acid Exp1;m/z 463.00 > 419.00:Moving5PtAverage_x Exp1:m/z 499.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 463.00 > 169.00:Moving5PtAverage_x 54 55- 45- Y (X1000) 16- 36- 33 27 22 18 3.1 2.9 3.2 3.5 2.5 2.8 3.4 3.7 2.6 2.9 3.2 3.5 2.3 2.6 3.8 Min Min RT RT RT D 21 13C8 FOSA 22 Perfluorooctane Sulfonamide D 26 M2-8:2FTS Exp1:m/z 506.00 > 78.00:Moving5PtAverage_x3 30 35 Y (X100000) Y (X10000) 12 Y (X1000 24 28 18 12 3.4 Min 2.9 3.5 3.1 3.9 3.8 3.7 4.0 3.0 3.6 2.8 Min

RT

RT

RT

RT



FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225818/3 Calibration Date: 05/28/2018 07:15

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9298	0.9291		0.999	1.00	-0.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.119		0.948	1.00	-5.2	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	76.60		0.867	0.884	-1.9	30.0
4:2 FTS	AveID	16.57	18.15		1.02	0.934	9.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.019		0.991	1.00	-0.9	30.0
Perfluoropentanesulfonic acid	AveID	69.55	69.26		0.934	0.938	-0.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.035		0.980	1.00	-2.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.042		0.841	0.910	-7.6	30.0
6:2FTS	L2ID		1.642		0.877	0.948	-7.5	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.048		0.891	1.00	-10.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.298		0.928	0.952	-2.5	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	0.9653		0.911	1.00	-8.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.061		0.838	0.928	-9.7	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9937		1.02	1.00	2.1	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7865		0.997	0.960	3.8	30.0
8:2FTS	AveID	1.349	1.230		0.873	0.958	-8.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.011		1.04	1.00	4.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.011		0.996	1.00	-0.4	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.6428		0.923	0.964	-4.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9432		1.00	1.00	0.3	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.7734		0.926	1.00	-7.4	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.048		1.00	1.00	0.4	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.210		1.06	1.00	5.8	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2496		0.988	1.00	-1.2	30.0
13C4 PFBA	Ave	1.528	1.354		2.21	2.50	-11.4	30.0
13C5 PFPeA	Ave	0.9798	0.9501		2.42	2.50	-3.0	30.0
13C3-PFBS	Ave	0.0221	0.0199		2.09	2.33	-10.0	30.0
13C2 PFHxA	Ave	1.045	0.996		2.38	2.50	-4.6	30.0
13C4-PFHpA	Ave	1.001	0.9333		2.33	2.50	-6.8	30.0
1802 PFHxS	Ave	1.237	1.097		2.10	2.37	-11.3	30.0
M2-6:2FTS	Ave	0.2210	0.2283		2.45	2.38	3.3	30.0

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: <u>CCV 320-225818/3</u> Calibration Date: <u>05/28/2018</u> 07:15

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9588		2.53	2.50	1.3	30.0
13C4 PFOS	Ave	0.8503	0.7852		2.21	2.39	-7.6	30.0
13C5 PFNA	Ave	0.7745	0.8005		2.58	2.50	3.4	30.0
13C8 FOSA	Ave	1.113	0.9489		2.13	2.50	-14.7	30.0
M2-8:2FTS	Ave	0.2515	0.2409		2.29	2.40	-4.2	30.0
13C2 PFDA	Ave	0.6587	0.6306		2.39	2.50	-4.3	30.0
d3-NMeFOSAA	Ave	0.3634	0.4027		2.77	2.50	10.8	30.0
13C2 PFUnA	Ave	0.5216	0.5248		2.51	2.50	0.6	30.0
d5-NEtFOSAA	Ave	0.3729	0.3926		2.63	2.50	5.3	30.0
13C2 PFDoA	Ave	0.5613	0.5473		2.44	2.50	-2.5	30.0
13C2-PFTeDA	Ave	0.6891	0.6769		2.46	2.50	-1.8	30.0
13C2-PFHxDA	Ave	1.170	1.212		2.59	2.50	3.6	30.0

Report Date: 30-May-2018 10:58:18 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_003.d

Lims ID: CCV L4

Client ID:

Sample Type: CCVIS

Inject. Date: 28-May-2018 07:15:55 ALS Bottle#: 37 Worklist Smp#: 3

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L4

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub32

Method: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 30-May-2018 10:58:18 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 10:58:17

<u> </u>	ist Level Revie	wei. iua	ngyutsa	Kulu		Date.	3	00-101ay-2016 10.36. i	/		
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D	1 13C4 PFBA										
	17.00 > 172.00		1.455	-0.003	1.000	6974118	2.21		88.6	34206	
	2 Perfluorobuty	,									
	12.90 > 169.00		1.452	0.0	1.000	2591838	1.00		99.9	1500	
	3 13C5-PFPe 67.90 > 223.00		1.725	-0.005	0.560	4894111	2.42		97.0	67211	
2	4 Perfluoropen			-0.003	0.500	4074111	2.42		77.0	0/211	
2	62.90 > 219.00		1.720	0.0	1.000	2189779	0.9475		94.8	1420	
D	47 13C3-PFB	S									
3	01.90 > 83.00	1.756	1.761	-0.005	1.000	95437	2.09		90.0	955	
	5 Perfluorobuta										
		1.756 1.756	1.756 1.756	0.0	1.000 1.000	2779725 1165470	0.8672	2.39(1.25-3.74)	98.1	13003 14882	
	60 M2-4:2FTS		1.750	0.0	1.000	1105470		2.37(1.23-3.74)		14002	
	29.00 > 81.00		1.977	-0.007	1.000	779142	NC			8008	
	61 Sodium 1H,	1H,2H,2	H-perflu	orohexar	ne						
3	27.00 > 307.00	1.970	1.970	0.0	1.000	695708	1.02		109	40243	
	7 13C2 PFHx		0.044		1 000	5400457	0.00		05.4	0/4/4	
3	15.00 > 270.00		2.011	-0.007	1.000	5132156	2.38		95.4	96461	
3	6 Perfluorohex 13.00 > 269.00		2.015	0.0	1.006	2091143	0.99		99.1	3831	
	13.00 > 119.00		2.015	-0.011	1.000	191022	0.77	10.95(5.03-15.10)	, , , ,	2330	
	70 Perfluoropei	ntanesul	fonic ac	id							
	49.00 > 80.00		2.026		1.000	2666587	0.9341		99.6	25260	
		2.026	2.026	0.0	1.000	991133		2.69(1.36-4.07)		18576	
	64 13C3 HFP0 32.10 > 287.00		2.112	-0.007	1.000	281722	NC			6870	
3	32.10 / 207.00	2.103	۷.۱۱۷	-0.007	1.000	201722	NC			0070	

Data File.	\\CIIIC	JIIIVa	icianneni		iDala (A6_IV)20 I	100027-0003	3.D\2016.03.27LLAL	JA_003.0	J	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-	nronoxvi	oropano	ic) acid							
329.10 > 285.00		2.105		1.000	299591	NC			1755	
D 913C4-PFHp	Α									
367.00 > 322.00	2.346	2.342	0.004	1.000	4807564	2.33		93.2	54193	
10 Perfluoroher	otanoic a	acid								
363.00 > 319.00			0.0	1.000	1989745	0.9795		98.0	2567	
363.00 > 169.00		2.346	0.0	1.000	783489		2.54(1.13-3.40)		4831	
D 11 1802 PFH										
403.00 > 84.00		2.355	0.004	1.000	5345335	2.10		88.7	45086	
8 Perfluorohex			0.0	4 000	04.40007	0.0440		00.4	0404	
399.00 > 80.00 399.00 > 99.00	2.359	2.359 2.359	0.0	1.000 1.000	2142296 737456	0.8412	2.00(1.50.4.40)	92.4	8191 4506	
	2.339	2.339	0.0	1.000	737430		2.90(1.50-4.49)		4506	
65 Adona 377.00 > 251.00	2 205	2.385	0.0	1.000	6062609	NC			56027	
377.00 > 251.00 377.00 > 85.00			0.0	1.000	3439303	NC	1.76(0.84-2.53)		38028	
D 12 M2-6:2FTS		2.000	0.0	1.000	0107000		1.70(0.01 2.00)		00020	
429.00 > 81.00		2.665	0.010	1.000	1117005	2.45		103	17882	
13 Sodium 1H,										
427.00 > 407.00		2.675		1.000	732093	0.8767		92.5	17139	
D 14 13C4 PFO										
417.00 > 372.00		2.695	0.003	1.000	4938707	2.53		101	49367	
15 Perfluorooct	anoic ac									
413.00 > 369.00			0.0	1.000	2071167	0.8907		89.1	857	
413.00 > 169.00	2.698	2.698	0.0	1.000	1072996		1.93(0.84-2.52)		4839	
* 62 13C2-PFOA										
415.00 > 370.00	2.698	2.698	0.0		5150922	2.50			57320	
16 Perfluoroher	otanesul	fonic aci	d							
449.00 > 80.00	2.705	2.705	0.0	1.000	1999338	0.9278		97.5	15785	
449.00 > 99.00	2.705	2.705	0.0	1.000	538940		3.71(1.94-5.82)		8819	
D 19 13C5 PFNA										
468.00 > 423.00	3.070	3.063	0.007	1.000	4123402	2.58		103	98138	
D 18 13C4 PFOS										
503.00 > 80.00	3.070	3.063	0.007	1.000	3866673	2.21		92.4	18810	
17 Perfluorooct										
499.00 > 80.00	3.070	3.070		1.000	1593564	0.8377	. == (= = 1	90.3	8891	
	3.070	3.070	0.0	1.000	348538		4.57(2.31-6.93)		5679	
20 Perfluoronor				1 000	4500407	0.0111		0.1.1	10/5	
463.00 > 419.00		3.070		1.000	1592127	0.9114	4 11(1 00 E (0)	91.1	4865	
463.00 > 169.00		3.070		1.000	387123		4.11(1.90-5.69)		13791	
69 9-Chlorohex					2710040	NIC			40/2/	
531.00 > 351.00		3.276	U.U	1.000	2710849	NC			49626	
D 21 13C8 FOSA		2 205	0.007	1 000	4007704	0.40		05.0	25502	
506.00 > 78.00		3.395	0.007	1.000	4887724	2.13		85.3	35503	
22 Perfluorooct				1 000	1040707	1.00		100	47000	
498.00 > 78.00		3.402	U.U	1.000	1942707	1.02		102	47920	
D 26 M2-8:2FTS		2 412	0.000	1 000	1100741	2.20		05.0	17/11	
529.00 > 81.00	3.421	3.413	0.008	1.000	1188741	2.29		95.8	17641	

Report Date: 30-May-2018 10:58:18

Data File:

Data File.	NOTIF	JIIIVa	icianneni		Dala (Ao_IN)20 I	00027-0003	3.D\2016.03.27LLAL	JN_003.0	<u> </u>	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Dorfluoropo	nanaculf	onic oci	1							
68 Perfluoronoi				1 000	1001407	1.00		104	04700	
549.00 > 80.00		3.412		1.000	1221497	1.00		104	21708	
549.00 > 99.00	3.412	3.412	0.0	1.000	457909		2.67(1.33-3.97)		11198	
D 23 13C2 PFD/	4									
515.00 > 470.00		3.422	0.008	1.000	3247997	2.39		95.7	42049	
					02	,		,	0.,	
25 Sodium 1H,		•			505000	0.0704		04.0	15001	
527.00 > 507.00	3.421	3.421	0.0	1.000	585008	0.8734		91.2	15891	
24 Perfluorodeo	canoic a	cid								
513.00 > 469.00	3.430	3.430	0.0	1.000	1313904	1.04		104	6225	
513.00 > 169.00		3.430	0.0	1.000	219405		5.99(2.36-7.09)		5299	
		0.100	0.0	1.000	217100		0.77(2.00 7.07)		02//	
D 27 d3-NMeFO										
573.00 > 419.00	3.579	3.572	0.007	1.000	2074054	2.77		111	16324	
28 N-methyl pe	rfluorood	ctane su	lfonami							
570.00 > 419.00	3.590	3.590	0.0	1.003	838929	1.00		99.6	5187	
29 Perfluorode										
				4 000	4000507	0.0000		05.7	4.4400	
	3.743	3.743	0.0	1.000	1002506	0.9229	,	95.7	14103	
599.00 > 99.00	3.743	3.743	0.0	1.000	351550		2.85(1.39-4.16)		10896	
D 32 d5-NEtFOS	SAA									
589.00 > 419.00		3.748	0.005	1.000	2022109	2.63		105	19051	
		0.7.10	0.000			2.00			. ,	
D 30 13C2 PFUr		0 7 40		1 000	070007	0.54		404	45400	
565.00 > 520.00	3.753	3.748	0.005	1.000	2702997	2.51		101	45103	
33 N-ethyl perfl	uoroocta	ane sulfo	namid							
584.00 > 419.00	3.753	3.753	0.0	1.000	762926	1.00		100	15240	
31 Perfluoround	docanoic	s acid								
			0.0	1.000	024145	0.9260		02.4	4E40	
563.00 > 519.00		3.753	0.0		836165	0.9260	1.00(0.10 (.01)	92.6	4569	
563.00 > 169.00	3.753	3.753	0.0	1.000	207308		4.03(2.12-6.36)		7407	
66 11-Chloroeid	cosafluoi	ro-3-oxa	undecan	1						
631.00 > 451.00	3.910	3.910	0.0	1.000	4197243	NC			46675	
D 36 13C2 PFD	۰,۸									
		4.040	0.000	1 000	2010201	2.44		07.5	20004	
615.00 > 570.00	4.051	4.048	0.003	1.000	2819291	2.44		97.5	20984	
37 Perfluorodo	decanoio	acid								
613.00 > 569.00	4.051	4.051	0.0	1.000	1181822	1.00		100	1500	
613.00 > 169.00	4.051	4.051	0.0	1.000	282809		4.18(2.13-6.40)		4109	
							,			
41 Perfluorotrid				4 000	10/1071	4.07		407	4000	
663.00 > 619.00		4.308	0.0	1.000	1364274	1.06		106	1299	
663.00 > 169.00	4.308	4.308	0.0	1.000	409249		3.33(1.25-3.76)		5954	
D 43 13C2-PFT6	eDA									
715.00 > 670.00		4.542	0.012	1.000	3486518	2.46		98.2	16886	
			0.012	1.000	0100010	2.10		70.2	10000	
42 Perfluorotetr			0.0		0.55			00 -	4.4.5=	
713.00 > 169.00		4.554	0.0	1.000	348018	0.9882		98.8	4105	
713.00 > 219.00	4.544	4.554	-0.010	0.998	254835		1.37(0.71-2.13)		5379	
D 44 13C2-PFH	xDA									
815.00 > 770.00		4.966	0.001	1.000	6242783	2.59		104	12879	
			5.001		02 12 700	2.07		10 T	. 20, ,	
45 Perfluorohex										
813.00 > 769.00		4.967	0.0	1.000	2264676	NC			878	
813.00 > 169.00	4.967	4.967	0.0	1.000	380452		5.95(2.86-8.58)		2890	

Report Date: 30-May-2018 10:58:18 Chrom Revision: 2.2 11-May-2018 08:54:46

\\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_003.d Data File:

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooct	adecano	oic acid								
913.00 > 869.00	5.329	5.329	0.0	1.000	2568923	NC			725	
913.00 > 169.00	5.329	5.329	0.0	1.000	303213		8.47(3.83-11.48)		2544	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00004 Amount Added: 1.00 Units: mL

Report Date: 30-May-2018 10:58:18 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento Data File: \\ChromNa\\Sacramento\\ChromData\\A8_N\\20180527-58835.b\\2018.05.27LLADX_003.d **Injection Date:** 28-May-2018 07:15:55 Instrument ID: A8_N Lims ID: CCV L4 Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 37 Worklist Smp#: 3 Dil. Factor: Injection Vol: 2.0 ul 1.0000 LC PFC_QSM5-1 ICAL Method: $A8_N$ Limit Group: 2 Perfluorobutyric acid D 113C4 PFBA D 3 13C5-PFPeA Exp1;m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x Y (X100000) Y (X100000) 55 Y (X10000) 12 44 33 22 1.0 1.6 1.9 0.3 0.9 1.5 2.1 1.3 1.9 2.2 2.5 Min Min Min RT RT RT 5 Perfluorobutanesulfonic acid D 47 13C3-PFBS 4 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 60 78 25 50 Y (X10000) 65- Y (X1000) 20 40 52 15- 30 39 10 20 26 10 2.0 1.9 1.2 1.8 2.1 1.1 1.4 1.7 2.3 1.0 1.3 2.2 2.5 Min Min Min RT RT RT 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexaDe 7 13C2 PFHxA Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 30-(X100000 Y (X10000) Y (X10000) 16 24 12 18 12 1.8 2.0 2.3 1.5 2.1 2.4 1.7 1.7 2.0 2.6 1.2 1.4 2.3 1.4 RT RT RT 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid 70 Perfluoropentanesulfonic acid Exp1:m/z 349.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 313.00 > 119.00:Moving5PtAverage_> 60 72 50 Y (X10000) Y (X10000) 50 60 Y (X1000) 40 40 48 30 30 36 20 20 24 0 1.8 2.1 2.2 2.5 1.8 2.1 1.5 2.4 1.3 1.6 1.2 1.5 2.4 Min Min RT RT RT Page 590 of 728

RT

RT

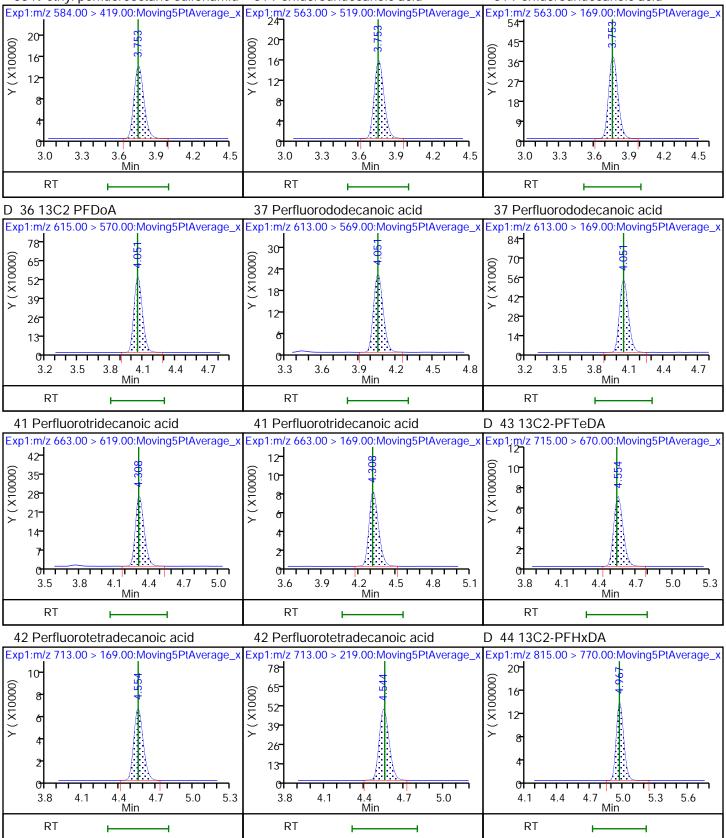
Report Date: 30-May-2018 10:58:18 Chrom Revision: 2.2 11-May-2018 08:54:46 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_003.d 16 Perfluoroheptanesulfonic acid 16 Perfluoroheptanesulfonic acid Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 449.00 > 99.00:Moving5PtAverage_x3 Y (X100000) Y (X10000) 45- 36 27 18 2.5 2.8 3.1 2.3 2.9 3.2 2.4 2.7 3.0 3.3 1.9 2.2 2.0 2.1 Min Min Min RT RT RT D 19 13C5 PFNA D 18 13C4 PFOS 17 Perfluorooctane sulfonic acid Exp1;m/z 499.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 468.00 > 423.00:Moving5PtAverage_x Exp1:m/z 503.00 > 80.00:Moving5PtAverage_x3 Y (X100000) (X100000) Y (X10000) 10 24 18 3.0 2.6 3.2 3.5 2.7 3.3 3.6 1.5 2.4 3.3 4.2 Min RT RT RT 17 Perfluorooctane sulfonic acid 20 Perfluorononanoic acid 20 Perfluorononanoic acid Exp1;m/z 463.00 > 169.00;Moving5PtAverage_x Exp1:m/z 499.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 463.00 > 419.00:Moving5PtAverage_> 42 78 Y (X10000) 35 65- Y (X1000) 28 52 39 21 26- 0 0 3.2 3.3 4.2 2.9 3.2 3.5 2.6 2.9 3.5 1.5 2.4 2.3 2.6 3.8 2.3 3.8 Min Min Min RT RT RT D 21 13C8 FOSA 22 Perfluorooctane Sulfonamide D 26 M2-8:2FTS Exp1:m/z 506.00 > 78.00:Moving5PtAverage_x3 Exp1:m/z 498.00 > 78.00:Moving5PtAverage_x3 Exp1:m/z 529.00 > 81.00:Moving5PtAverage_x3 54 Y (X100000 Y (X10000) Y (X10000) 45- 24 36- 18 27 18 12 2.9 3.5 2.9 3.5 3.9 3.8 3.8 3.0 Min Min

RT

RT

RT

RT



FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225818/14 Calibration Date: 05/28/2018 08:42

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: <u>GeminiC18 3x100</u> ID: <u>3.00(mm)</u> Calib End Date: <u>05/15/2018 16:39</u>

Lab File ID: 2018.05.27LLADX_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid	AveID	0.9298	0.9726		2.61	2.50	4.6	30.0
(PFBA) Perfluoropentanoic acid	AveID	1.181	1.175		2.49	2.50	-0.4	30.0
(PFFPeA) Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	80.78		2.29	2.21	3.4	30.0
4:2 FTS	AveID	16.57	18.52		2.61	2.34	11.7	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.016		2.47	2.50	-1.2	30.0
Perfluoropentanesulfonic acid	AveID	69.55	72.10		2.43	2.35	3.7	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.031		2.44	2.50	-2.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.047		2.11	2.28	-7.1	30.0
6:2FTS	L2ID		1.633		2.19	2.37	-7.4	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.131		2.40	2.50	-3.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.349		2.41	2.38	1.3	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.047		2.47	2.50	-1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.111		2.19	2.32	-5.5	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.048		2.69	2.50	7.7	30.0
8:2FTS	AveID	1.349	1.223		2.17	2.40	-9.4	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.8135		2.58	2.40	7.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	0.9761		2.51	2.50	0.4	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.071		2.64	2.50	5.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.6547		2.35	2.41	-2.5	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9594		2.55	2.50	2.1	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.8086		2.42	2.50	-3.2	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.043		2.50	2.50	-0.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.164		2.54	2.50	1.8	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2482		2.46	2.50	-1.7	30.0
13C4 PFBA	Ave	1.528	1.383		2.26	2.50	-9.5	30.0
13C5 PFPeA	Ave	0.9798	0.9537		2.43	2.50	-2.7	30.0
13C3-PFBS	Ave	0.0221	0.0203		2.13	2.33	-8.3	30.0
13C2 PFHxA	Ave	1.045	1.035		2.48	2.50	-1.0	30.0
13C4-PFHpA	Ave	1.001	0.9774		2.44	2.50	-2.4	30.0
1802 PFHxS	Ave	1.237	1.160		2.22	2.37	-6.2	30.0
M2-6:2FTS	Ave	0.2210	0.2320		2.49	2.38	5.0	30.0

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225818/14 Calibration Date: 05/28/2018 08:42

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9508		2.51	2.50	0.4	30.0
13C4 PFOS	Ave	0.8503	0.7945		2.23	2.39	-6.6	30.0
13C5 PFNA	Ave	0.7745	0.7916		2.56	2.50	2.2	30.0
13C8 FOSA	Ave	1.113	0.9755		2.19	2.50	-12.3	30.0
M2-8:2FTS	Ave	0.2515	0.2576		2.45	2.40	2.4	30.0
13C2 PFDA	Ave	0.6587	0.6660		2.53	2.50	1.1	30.0
d3-NMeFOSAA	Ave	0.3634	0.4033		2.77	2.50	11.0	30.0
13C2 PFUnA	Ave	0.5216	0.5372		2.57	2.50	3.0	30.0
d5-NEtFOSAA	Ave	0.3729	0.3995		2.68	2.50	7.1	30.0
13C2 PFDoA	Ave	0.5613	0.5817		2.59	2.50	3.6	30.0
13C2-PFTeDA	Ave	0.6891	0.7079		2.57	2.50	2.7	30.0
13C2-PFHxDA	Ave	1.170	1.392		2.98	2.50	19.0	30.0

Report Date: 30-May-2018 11:15:35 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_014.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 28-May-2018 08:42:10 ALS Bottle#: 38 Worklist Smp#: 14

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-A8_N*sub32

Method: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 30-May-2018 11:15:35 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 11:15:35

First Level Reviewer: ruangyotsakuld					Date: 30-May-2018 11:15:35					
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	vric acid									
212.90 > 169.00	,	1.457	0.0	1.000	6989458	2.61		105	4321	
D 113C4 PFBA	4									
217.00 > 172.00		1.455	0.002	1.000	7186475	2.26		90.5	36124	
4 Perfluoroper	ntanoic a	cid								
262.90 > 219.00	1.728	1.728	0.0	1.000	5823630	2.49		99.6	4314	
D 3 13C5-PFPe	eΑ									
267.90 > 223.00	1.728	1.725	0.003	0.564	4954961	2.43		97.3	59648	
5 Perfluorobut	anesulfo	nic acid								
298.90 > 80.00		1.765	0.0	1.000	7536460	2.29		103	41645	
298.90 > 99.00		1.765	0.0	1.000	3155802		2.39(1.25-3.74)		35878	
D 47 13C3-PFB										
301.90 > 83.00		1.761	0.004	1.000	98150	2.13		91.7	900	
61 Sodium 1H,		•			40050//	0.74		440	700/0	
327.00 > 307.00		1.980	0.0	1.000	1825366	2.61		112	79263	
D 60 M2-4:2FTS		1 077	0.000	1 000	7/1/00	NO			(004	
329.00 > 81.00		1.977	0.003	1.000	761400	NC			6904	
D 7 13C2 PFHx		2.011	0.003	1 000	F27F2F0	2.40		00.0	0.407.2	
315.00 > 270.00		2.011	0.003	1.000	5375250	2.48		99.0	84963	
6 Perfluorohex 313.00 > 269.00		2.014	0.0	1.000	5462587	2.47		98.8	10059	
313.00 > 269.00		2.014		1.000	484961	2.47	11.26(5.03-15.10)	90.0	6354	
70 Perfluorope				1.000	101701		11.20(0.00 10.10)		0001	
349.00 > 80.00		2.036		1.000	7137208	2.43		104	55944	
349.00 > 99.00		2.036		1.000	2615194		2.73(1.36-4.07)		37262	
67 Perfluoro(2-	propoxv	propand	oic) acid				,			
329.10 > 285.00		2.115	-	1.000	865450	NC			4935	

Report Date: 30-May-2018 11:15:35 ay-2018 11:15:35 Chrom Revision: 2.2 11-May-2018 08:54:46 \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_014.d Data File:

Data File.	NOTIL	niiva\3c	ici allielli	UCHION	Dala MO_ 1 2 1	00027-0000	3.D\2U16.U3.27LLA	UA_U14.0	J.	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFP0	O-DA									
332.10 > 287.00		2.112	0.003	1.000	288714	NC			5541	
D 913C4-PFHp										
367.00 > 322.00		2.342	0.003	1.000	5078118	2.44		97.6	63006	
10 Perfluorohe	-		0.0	1 000	E227240	2.44		07.4	4 E 7 O	
363.00 > 319.00 363.00 > 169.00		2.345 2.345	0.0	1.000 1.000	5237348 2051281	2.44	2.55(1.13-3.40)	97.6	6579 11770	
D 11 1802 PFH:		2.010	0.0	1.000	2001201		2.00(1.10 0.10)		11770	
403.00 > 84.00		2.355	0.003	1.000	5703440	2.22		93.8	57697	
8 Perfluorohex	anesulfo	nic acid								
	2.358	2.358	0.0	1.000	5741524	2.11		92.9	16263	
	2.358	2.358	0.0	1.000	1906077		3.01(1.50-4.49)		9180	
65 Adona										
377.00 > 251.00		2.384 2.384	0.0	1.000 1.000	15531381 9811723	NC	1 50/0 04 2 52)		113014	
377.00 > 85.00		2.384	0.0	1.000	9811723		1.58(0.84-2.53)		91227	
D 12 M2-6:2FTS 429.00 > 81.00		2.665	0.009	1.000	1144904	2.49		105	16047	
13 Sodium 1H,					,	2.17		100	10017	
427.00 > 407.00		2.674		1.000	1865662	2.19		92.6	35940	
D 14 13C4 PFO	A									
417.00 > 372.00	2.697	2.695	0.002	1.000	4939823	2.51		100	48053	
15 Perfluorooct	tanoic ac	id								
413.00 > 369.00		2.697	0.0	1.000	5587606	2.40		96.1	2050	
413.00 > 169.00		2.697	0.0	1.000	2861512		1.95(0.84-2.52)		10088	
* 62 13C2-PFOA		0.407	0.0		E40E440	0.50			47074	
415.00 > 370.00		2.697			5195418	2.50			47874	
16 Perfluorohe _l 449.00 > 80.00	•	tonic aci 2.704	d 0.0	1.000	5300300	2.41		101	24747	
449.00 > 99.00	2.704	2.704		1.000	1455705	2.41	3.64(1.94-5.82)	101	30653	
D 19 13C5 PFN/		2.701	0.0	1.000	1100700		0.01(1.71 0.02)		00000	
468.00 > 423.00		3.063	0.001	1.000	4112817	2.56		102	63909	
D 18 13C4 PFO	S									
503.00 > 80.00		3.063	0.001	1.000	3946255	2.23		93.4	20385	
17 Perfluorooct	tane sulf	onic acid	k							
499.00 > 80.00	3.064	3.064	0.0	1.000	4255349	2.19		94.5	28089	
499.00 > 99.00	3.064	3.064	0.0	1.000	929782		4.58(2.31-6.93)		28913	
20 Perfluoronoi										
463.00 > 419.00		3.064	0.0	1.000	4304613	2.47	4 22/1 00 F (0)	98.8	10330	
463.00 > 169.00		3.064		1.000	995680		4.32(1.90-5.69)		19322	
69 9-Chlorohex 531.00 > 351.00		ioro-3-o: 3.271		e 1.000	7212139	NC			56208	
		3.271	0.0	1.000	7212139	NC			30200	
D 21 13C8 FOSA 506.00 > 78.00		3.395	0.001	1.000	5068186	2.19		87.7	41396	
22 Perfluorooct				1.000	5555166	2.1/		57.7	11070	
498.00 > 78.00		3.405		1.003	5313503	2.69		108	45390	
68 Perfluoronoi									-	
549.00 > 80.00	3.415		0.0	1.000	3223652	2.58		107	25121	
549.00 > 99.00	3.415	3.415	0.0	1.000	1152682		2.80(1.33-3.97)		18860	
					Page 500 of 1	728				

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Data File:	\\Chr	omNa\S	acrament	o\Chrom	Data\A8_N\201	80527-5883	5.b\2018.05.27LLAI	DX_014.	d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 26 M2-8:2FTS										
529.00 > 81.00	3.415	3.413	0.002	1.000	1282109	2.45		102	20721	
25 Sodium 1H,		•								
527.00 > 507.00		3.415	0.0	1.000	1567718	2.17		90.6	37185	
D 23 13C2 PFD. 515.00 > 470.00		3.422	0.002	1.000	3460096	2.53		101	48308	
24 Perfluorode	canoic a	cid								
513.00 > 469.00		3.424	0.0	1.000	3377242	2.51		100	13070	
513.00 > 169.00	3.424	3.424	0.0	1.000	605819		5.57(2.36-7.09)		11671	
D 27 d3-NMeFO										
573.00 > 419.00	3.573	3.572	0.001	1.000	2095239	2.77		111	22819	
28 N-methyl pe										
570.00 > 419.00		3.584		1.003	2243093	2.64		105	13436	
29 Perfluorode										
599.00 > 80.00			0.0	1.000	2605356	2.35	0.00(4.00.4.47)	97.5	27964	
599.00 > 99.00		3.738	0.0	1.000	847119		3.08(1.39-4.16)		17044	
D 32 d5-NEtFOS		0.740	0.004	4 000	0075704	0.70		407	00740	
589.00 > 419.00		3.748	0.001	1.000	2075734	2.68		107	20740	
D 30 13C2 PFU		0.740	0.004	4 000	0704470	0.57		100	04000	
565.00 > 520.00		3.748	0.001	1.000	2791162	2.57		103	31080	
33 N-ethyl perfl				4 000	1001157	0.55		100	00447	
584.00 > 419.00			0.0	1.000	1991457	2.55		102	32117	
31 Perfluoroun			0.0	1 000	225/242	0.40		0/.0	10010	
563.00 > 519.00 563.00 > 169.00		3.749 3.749	0.0	1.000 1.000	2256849 546497	2.42	1 12/2 12 6 26\	96.8	10313 12579	
					546497		4.13(2.12-6.36)		12379	
66 11-Chloroei		ro-3-oxa 3.907			11051124	NC			62881	
631.00 > 451.00		3.907	0.0	1.000	11051134	NC			02001	
D 36 13C2 PFD		4.040	0.000	1 000	2021072	2.50		104	10/10	
615.00 > 570.00			0.002	1.000	3021973	2.59		104	19610	
37 Perfluorodo			0.0	1 000	2151422	2.50		00.0	2504	
613.00 > 569.00 613.00 > 169.00		4.050 4.050	0.0	1.000 1.000	3151432 713614	2.50	4.42(2.13-6.40)	99.9	3584 9407	
			0.0	1.000	713014		4.42(2.13-0.40)		7407	
41 Perfluorotric 663.00 > 619.00		4.307	0.0	1.000	3518728	2.54		102	3376	
663.00 > 169.00		4.307	0.0	1.000	1076002	2.54	3.27(1.25-3.76)	102	10199	
D 43 13C2-PFT		1.007	0.0	1.000	1070002		0.27(1.20 0.70)		10177	
715.00 > 670.00		4.542	0.010	1.000	3677976	2.57		103	14923	
42 Perfluoroteti			0.010	1.000	3077770	2.07		100	14725	
713.00 > 169.00		4.552	0.0	1.000	912725	2.46		98.3	9493	
713.00 > 107.00		4.552	-0.010	0.998	653194	2.40	1.40(0.71-2.13)	70.5	10190	
D 44 13C2-PFH			0.010	0.770	000171				10170	
815.00 > 770.00		4.966	0.0	1.000	7232730	2.98		119	15297	
45 Perfluorohe:			0.0		, 202, 00	2.70		,	.0271	
813.00 > 769.00		4.966	0.0	1.000	6725362	NC			2460	
813.00 > 169.00		4.966	0.0	1.000	1090785	IVO	6.17(2.86-8.58)		6584	
46 Perfluorooct			5.5		. 2 / 3 / 30		3(2.00 0.00)		2301	
913.00 > 869.00		5.328	0.0	1.000	7656217	NC			1765	
913.00 > 169.00		5.328	0.0	1.000	903674	140	8.47(3.83-11.48)		4983	
					Dogo 600 of -	700	3 (3.00 11110)			

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Report Date: 30-May-2018 11:15:35 Chrom Revision: 2.2 11-May-2018 08:54:46

OC Flag Legend Processing Flags NC - Not Calibrated

Reagents:

LCPFC_LL5_00004 Amount Added: 1.00 Units: mL

Report Date: 30-May-2018 11:15:36 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento Data File: \\ChromNa\\Sacramento\\ChromData\\A8_N\\20180527-58835.b\\2018.05.27LLADX_014.d **Injection Date:** 28-May-2018 08:42:10 Instrument ID: A8_N Lims ID: CCV L5 Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 38 Worklist Smp#: 14 Injection Vol: Dil. Factor: 2.0 ul 1.0000 Method: Limit Group: LC PFC_QSM5-1 ICAL $A8_N$ 2 Perfluorobutyric acid D 113C4 PFBA 4 Perfluoropentanoic acid Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x 18 Y (X100000) 15- 15- 12 12 0.7 1.3 1.9 2.5 1.1 1.7 2.0 1.7 2.0 2.3 1.1 1.4 Min Min Min RT RT RT 5 Perfluorobutanesulfonic acid D 3 13C5-PFPeA 5 Perfluorobutanesulfonic acid Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x Exp1:m/z 298.90 > 80.00:Moving5PtAverage x3 Exp1:m/z 298.90 > 99.00:Moving5PtAverage x3 90-20 Y (X100000) Y (X100000) Y (X10000) 16 60 12 45 30 15 1.9 2.2 2.0 2.3 1.8 2.1 1.0 1.3 2.5 1.1 1.4 1.7 1.2 1.5 2.4 Min Min RT RT RT D 47 13C3-PFBS 61 Sodium 1H,1H,2H,2H-perfluorohexaDe 7 13C2 PFHxA Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x 45 (X100000 Y (X10000) Y (X1000) 20 36- 15- 27 10 18 1.9 2.0 2.6 1.5 1.8 2.1 2.4 1.6 2.2 2.5 1.7 2.3 1.2 1.3 1.4 Min RT RT RT 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid 70 Perfluoropentanesulfonic acid Exp1;m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 349.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x 20 (X100000) Y (X100000) (X10000) 16 12 2.2 2.8 1.0 1.6 2.2 2.8 1.0 2.8 1.0 1.6 2.2 1.6 Min Min Min RT RT RT Page 602 of 728

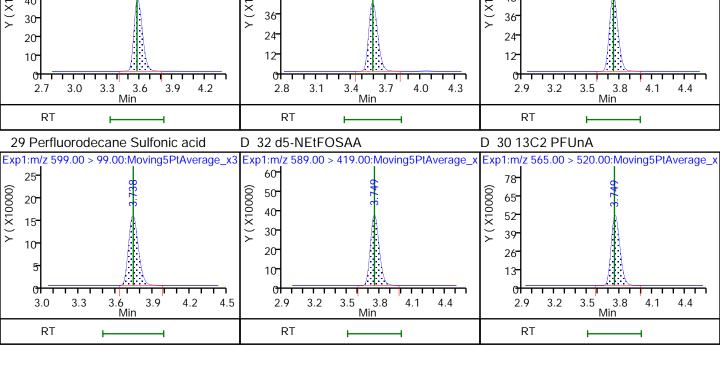
RT

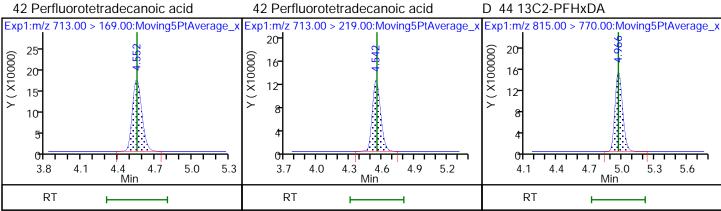
RT

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_014.d 16 Perfluoroheptanesulfonic acid 16 Perfluoroheptanesulfonic acid Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 449.00 > 99.00:Moving5PtAverage_x3 Y (X100000) Y (X100000) 35 Y (X10000) 28 21 2.3 2.9 3.2 1.9 2.2 2.8 3.1 2.2 2.8 3.4 2.0 2.5 1.6 Min Min Min RT RT RT D 19 13C5 PFNA D 18 13C4 PFOS 17 Perfluorooctane sulfonic acid Exp1:m/z 468.00 > 423.00:Moving5PtAverage_x Exp1:m/z 503.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 499.00 > 80.00:Moving5PtAverage_x3 90 Y (X100000) (X100000) Y (X10000) 10 75 60 45 30 15 3.0 3.0 2.7 3.3 3.6 2.7 3.3 3.6 2.2 4.0 4.9 Min RT RT RT 17 Perfluorooctane sulfonic acid 20 Perfluorononanoic acid 20 Perfluorononanoic acid Exp1:m/z 499.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 463.00 > 419.00:Moving5PtAverage_x Exp1:m/z 463.00 > 169.00:Moving5PtAverage_x 25 (X100000) (X10000) (X10000) 10 20 16- 15 12 ot 2.9 1.9 4.3 3.2 3.5 2.8 3.1 0.7 3.1 5.5 2.3 2.6 3.8 2.2 2.5 3.4 3.7 Min Min Min RT RT RT D 21 13C8 FOSA 22 Perfluorooctane Sulfonamide 68 Perfluorononanesulfonic acid Exp1:m/z 506.00 > 78.00:Moving5PtAverage_x3 Exp1:m/z 498.00 > 78.00:Moving5PtAverage_x3 Exp1:m/z 549.00 > 80.00:Moving5PtAverage_x3 90 Y (X100000) Y (X100000) Y (X10000) 12 12 60 45 30 15 3.4 Min 2.9 3.5 3.9 3.8 2.8 3.1 3.7 4.0 3.0 3.6 Min RT RT RT

Chrom Revision: 2.2 11-May-2018 08:54:46

Report Date: 30-May-2018 11:15:36





FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCVL 320-225873/2 Calibration Date: 05/28/2018 17:22

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_004.d Conc. Units: ng/mL

					T			
ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid	AveID	0.9298	1.009		0.0543	0.0500	8.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.249		0.0529	0.0500	5.8	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	82.26		0.0466	0.0442	5.3	30.0
4:2 FTS	AveID	16.57	18.32		0.400	0.0467	10.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.025		0.0498	0.0500	-0.3	30.0
Perfluoropentanesulfonic acid	AveID	69.55	69.25		0.0467	0.0469	-0.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	0.9483		0.0449	0.0500	-10.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.249		0.0504	0.0455	10.8	30.0
6:2FTS	L2ID		1.655		0.400	0.0474	-27.3	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.275		0.0456	0.0476	-4.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.261		0.0536	0.0500	7.1	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.097		0.0518	0.0500	3.6	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.130		0.0446	0.0464	-3.9	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7594		0.0481	0.0480	0.3	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9560		0.0491	0.0500	-1.8	30.0
8:2FTS	AveID	1.349	1.380		0.400	0.0479	2.3	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.048		0.0539	0.0500	7.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	0.9473		0.400	0.0500	-6.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.5872		0.0422	0.0482	-12.5	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9778		0.0520	0.0500	4.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.9397		0.0563	0.0500	12.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.182		0.0566	0.0500	13.3	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.300		0.0568	0.0500	13.7	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2783		0.0551	0.0500	10.2	30.0
13C4 PFBA	Ave	1.528	1.350		2.21	2.50	-11.7	30.0
13C5 PFPeA	Ave	0.9798	0.9386		2.39	2.50	-4.2	30.0
13C3-PFBS	Ave	0.0221	0.0196		2.06	2.33	-11.6	30.0
13C2 PFHxA	Ave	1.045	1.023		2.45	2.50	-2.1	30.0
13C4-PFHpA	Ave	1.001	0.9885		2.47	2.50	-1.2	30.0
1802 PFHxS	Ave	1.237	1.153		2.20	2.37	-6.8	30.0
M2-6:2FTS	Ave	0.2210	0.2325		2.50	2.38	5.2	30.0

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCVL 320-225873/2 Calibration Date: 05/28/2018 17:22

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9417		2.49	2.50	-0.5	30.0
13C4 PFOS	Ave	0.8503	0.8013		2.25	2.39	-5.8	30.0
13C5 PFNA	Ave	0.7745	0.7749		2.50	2.50	0.0	30.0
13C8 FOSA	Ave	1.113	0.9836		2.21	2.50	-11.6	30.0
M2-8:2FTS	Ave	0.2515	0.2452		2.34	2.40	-2.5	30.0
13C2 PFDA	Ave	0.6587	0.6390		2.42	2.50	-3.0	30.0
d3-NMeFOSAA	Ave	0.3634	0.4219		2.90	2.50	16.1	30.0
13C2 PFUnA	Ave	0.5216	0.5307		2.54	2.50	1.7	30.0
d5-NEtFOSAA	Ave	0.3729	0.4045		2.71	2.50	8.5	30.0
13C2 PFDoA	Ave	0.5613	0.5296		2.36	2.50	-5.7	30.0
13C2-PFTeDA	Ave	0.6891	0.6803		2.47	2.50	-1.3	30.0
13C2-PFHxDA	Ave	1.170	1.257		2.69	2.50	7.5	30.0

Report Date: 30-May-2018 09:32:28 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d

Lims ID: CCVL

Client ID:

Sample Type: CCVL

Inject. Date: 28-May-2018 17:22:11 ALS Bottle#: 21 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCVL

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub32

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 30-May-2018 09:32:27 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK014

First Level Reviewer: mongkols Date: 30-May-2018 09:32:27

riist Level Reviewel. Horigkois					Date.	30-141ay-2010 09.32.21				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA										
217.00 > 172.00		1.458	-0.008	1.000	6643975	2.21		88.3	39175	
2 Perfluorobut 212.90 > 169.00	,	1 464	-0.008	1.004	134081	0.0543		109	60.0	M M
D 3 13C5-PFP6			0.000	1.001	101001	0.0010		107	00.0	
267.90 > 223.00		1.730	-0.014	0.561	4619488	2.39		95.8	73967	
4 Perfluoroper			0.014	1 005	445404	0.0500		10/	74.4	
262.90 > 219.00 D 47 13C3-PFB		1.739	-0.014	1.005	115421	0.0529		106	71.4	
301.90 > 83.00		1.766	-0.013	1.000	89626	2.06		88.4	767	
5 Perfluorobut	anesulfo	nic acid								
298.90 > 80.00 298.90 > 99.00	1.762 1.762	1.775 1.775	-0.013 -0.013	1.005 1.005	140159 59342	0.0466	2.36(1.25-3.74)	105	829 483	
61 Sodium 1H,					39342		2.30(1.23-3.74)		403	
327.00 > 307.00		•		1.000	32979	0.0516		111	1953	
D 60 M2-4:2FTS										
329.00 > 81.00		1.982	-0.012	1.000	754406	NC			8155	
D 7 13C2 PFHx 315.00 > 270.00		2.015	-0.012	1.000	5032671	2.45		97.9	86273	
6 Perfluorohex										M
313.00 > 269.00		2.027		1.006	103162	0.0498		99.7	148	M
313.00 > 119.00		2.027	-0.013	1.006	10090		10.22(5.03-15.10)		89.5	
70 Perfluorope 349.00 > 80.00			-0.024	1.000	125191	0.0467		99.6	1528	
349.00 > 99.00	2.025	2.049	-0.024	1.000	51132		2.45(1.36-4.07)		788	
D 64 13C3 HFP		0 117	0.004	1 000	22222	N. I.O.			2017	
332.10 > 287.00	2.116	2.11/	-0.001	1.000	233089	NC			3867	

Data File:	\\Cnr	omiva\5a	acrameni	10/Chrom	Data\A8_N\201	80529-5884	4.D\2018.05.28LLA_	_004.0		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-	nronovy	nronano	ic) acid							
329.10 > 285.00	2.104		-0.013	0.995	14040	NC			82.0	
D 9 13C4-PFHp 367.00 > 322.00		2.347	-0.015	1.000	4865020	2.47		98.8	70196	
10 Perfluorohe 363.00 > 319.00		acid 2.360	-0.015	1.006	92273	0.0449		89.8	118	
363.00 > 319.00		2.360		1.006	35638	0.0449	2.59(1.13-3.40)	07.0	211	
D 11 1802 PFH		2.242	0.000	1 000	F2//027	2.22		00.0	F0074	
403.00 > 84.00		2.360	-0.002	1.000	5366037	2.20		93.2	50271	
8 Perfluorohex				0.004	400005	0.0504		444	474	
399.00 > 80.00			-0.028	0.994	128925	0.0504	2 22/1 EO 4 40\	111	461 107	
399.00 > 99.00	2.345	2.373	-0.028	0.994	39957		3.23(1.50-4.49)		197	
65 Adona	2.204	2 207	0.012	1 000	2000/7	NC			4270	
377.00 > 251.00 377.00 > 85.00		2.397 2.397	-0.013 -0.013	1.000 1.000	289867 159105	NC	1.82(0.84-2.53)		4378 3755	
					139103		1.02(0.04-2.33)		3733	
13 Sodium 1H, 427.00 > 407.00		н-репіи 2.683		e 1.003	35918	0.0345		72.7	734	
		2.083	-0.009	1.003	33918	0.0345		12.1	734	
D 12 M2-6:2FTS		2 (02	0.017	1 000	10071/0	2.50		105	205.42	
429.00 > 81.00		2.683	-0.016	1.000	1087163	2.50		105	20542	
D 14 13C4 PFO										
417.00 > 372.00		2.706	-0.017	1.000	4634918	2.49		99.5	53963	
* 62 13C2-PFOA										
415.00 > 370.00	2.697	2.713	-0.016		4921629	2.50			45281	
15 Perfluorooct										M
413.00 > 369.00		2.713	-0.016	1.003	116905	0.0536		107	41.5	
413.00 > 169.00	2.697	2.713	-0.016	1.003	58580		2.00(0.84-2.52)		178	M
16 Perfluorohe		fonic aci	id							
449.00 > 80.00		2.721	-0.024	1.000	95767	0.0456		95.8	1356	
449.00 > 99.00	2.704	2.721	-0.017	1.003	24126		3.97(1.94-5.82)		427	
D 19 13C5 PFN/	Д									
468.00 > 423.00	3.062	3.074	-0.012	1.000	3813830	2.50		100	63430	
D 18 13C4 PFO	S									
503.00 > 80.00	3.062	3.074	-0.012	1.000	3770022	2.25		94.2	26768	
17 Perfluorooct	ane sulf	onic acid	b							М
499.00 > 80.00			-0.014	1.000	82675	0.0446		96.1	313	M
499.00 > 99.00	3.062	3.076	-0.014	1.000	17296		4.78(2.31-6.93)		161	M
20 Perfluorono	nanoic a	cid								M
463.00 > 419.00		3.084	-0.022	1.000	83703	0.0518		104	199	M
463.00 > 169.00	3.062	3.084	-0.022	1.000	20826		4.02(1.90-5.69)		380	
69 9-Chlorohex	adecaflı	J0r0-3-0	xanonan	e						
531.00 > 351.00			-0.022	1.000	137652	NC			3097	
D 21 13C8 FOS										
506.00 > 78.00		3.412	-0.010	1.000	4841027	2.21		88.4	45479	
22 Perfluorooct				1.000	1071021	۷.۷۱		50.4	10777	
				1 000	02550	0.0491		00.2	1195	
498.00 > 78.00		3.420		1.000	92559	0.0471		98.2	1170	
68 Perfluoronoi				1 000	E7E00	0.0401		100	1120	
549.00 > 80.00 549.00 > 99.00		3.430	-0.028 -0.019	1.000 1.003	57502 17670	0.0481	3.25(1.33-3.97)	100	1130 437	
J47.UU > 77.UU	J.411	3.430	-0.019	1.003	Page 611 of	728	3.23(1.33-3.97)		437	
					rayeoiioi	1 20				

Data File:	\\Chr	omNa\Sa	acrament	o\Chrom	Data\A8_N\201	80529-5884	4.b\2018.05.28LLA_	_004.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,	1⊔ ว⊔ ว	⊔ norflu	orodocar	20						
527.00 > 507.00	3.411	•	-0.019		31907	0.0490		102	905	
D 26 M2-8:2FTS 529.00 > 81.00		3.430	-0.019	1.000	1155950	2.34		97.5	16076	
24 Perfluorode	canoic a	cid								
513.00 > 469.00 513.00 > 169.00		3.439 3.439	-0.018 -0.018	1.000 1.000	65931 10860	0.0539	6.07(2.36-7.09)	108	319 209	
D 23 13C2 PFD/	Α									
515.00 > 470.00	3.421	3.439	-0.018	1.000	3144729	2.42		97.0	47491	
D 27 d3-NMeFO		0.500		1 000	007/00/	0.00			00440	
573.00 > 419.00 28 N-methyl pe			-0.020 Ilfonami	1.000	2076286	2.90		116	20469	
570.00 > 419.00	3.579	3.600	-0.021	1.003	39338	0.0467		93.4	302	
29 Perfluorode										
599.00 > 80.00 599.00 > 99.00		3.753 3.753	-0.021 -0.021	1.000 1.000	44644 14907	0.0422	2.99(1.39-4.16)	87.5	688 483	
D 32 d5-NEtFOS	SAA									
589.00 > 419.00		3.754	-0.011	1.000	1990962	2.71		108	23854	
31 Perfluoround		3.764	0.021	1 000	40000	0.0543		112	247	
563.00 > 519.00 563.00 > 169.00		3.764	-0.021 -0.011	1.000 1.003	49088 12872	0.0563	3.81(2.12-6.36)	113	267 398	
33 N-ethyl perfl	luorooct	ane sulfo	onamid							
584.00 > 419.00		3.764	-0.021	1.000	38934	0.0520		104	695	
D 30 13C2 PFU ₁ 565.00 > 520.00		3.765	-0.022	1.000	2611946	2.54		102	48708	
66 11-Chloroei	cosafluo	ro-3-oxa	undecan	1						
631.00 > 451.00	3.899	3.922	-0.023	1.000	219253	NC			4229	
D 36 13C2 PFD	Ac									
615.00 > 570.00	4.041	4.055	-0.014	1.000	2606447	2.36		94.3	20282	
37 Perfluorodo	decanoi	c acid								M
613.00 > 569.00	4.041	4.065	-0.024	1.000	61630	0.0566		113	72.2	
613.00 > 169.00	4.041	4.065	-0.024	1.000	13082		4.71(2.13-6.40)		170	M
41 Perfluorotrio										
663.00 > 619.00		4.325	-0.026	1.000	67780	0.0568		114	67.8	
663.00 > 169.00		4.325	-0.026	1.000	21846		3.10(1.25-3.76)		284	
D 43 13C2-PFT6 715.00 > 670.00		4.550	-0.019	1.000	3348355	2.47		98.7	16370	
42 Perfluoroteti	radecan									
713.00 > 169.00		4.560	-0.029	1.000	18638	0.0551		110	250	
713.00 > 219.00		4.560	-0.029	1.000	11517		1.62(0.71-2.13)		333	
D 44 13C2-PFH	xDA									
815.00 > 770.00		4.964	-0.016	1.000	6187658	2.69		108	12992	
45 Perfluorohe			0.024	1 000	1727/0	NIC			72.0	
813.00 > 769.00 813.00 > 169.00		4.972 4.972	-0.024 -0.024	1.000 1.000	173769 27203	NC	6.39(2.86-8.58)		72.9 345	
46 Perfluorooct							2 (2.22 2.33)		3	
913.00 > 869.00		5.326	-0.028	1.000	127008	NC			39.8	
913.00 > 169.00		5.326	-0.028	1.000	15733		8.07(3.83-11.48)		234	
					Page 612 of 7	728				

Page 612 of 728

Report Date: 30-May-2018 09:32:28 Chrom Revision: 2.2 11-May-2018 08:54:46

OC Flag Legend
Processing Flags
NC - Not Calibrated
Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00004 Amount Added: 1.00 Units: mL

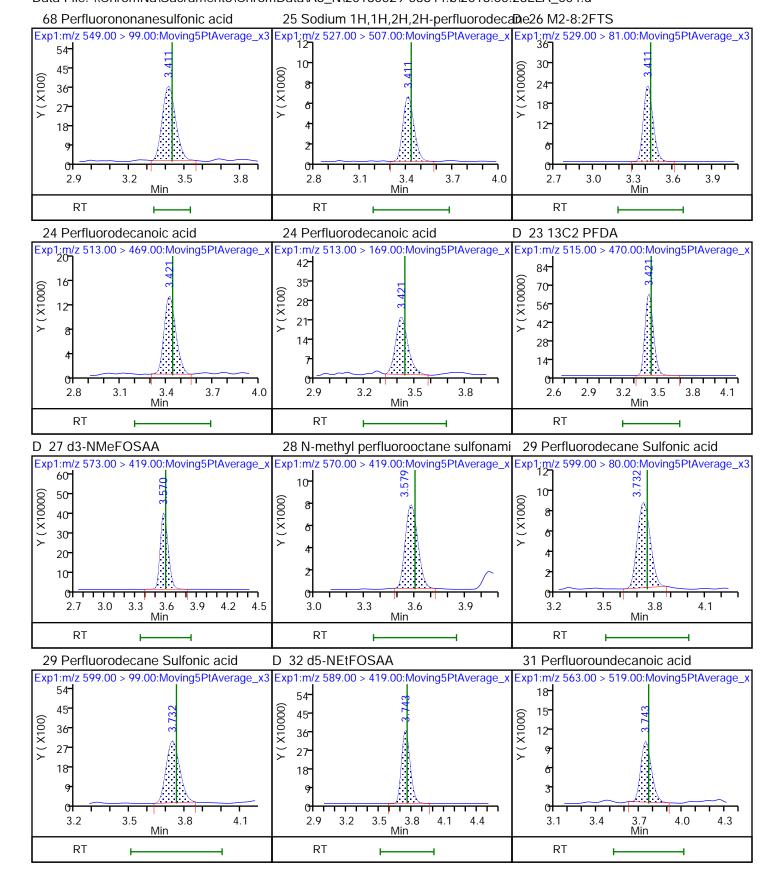
Report Date: 30-May-2018 09:32:29 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d **Injection Date:** 28-May-2018 17:22:11 Instrument ID: A8_N Lims ID: **CCVL** Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 2 Injection Vol: Dil. Factor: 1.0000 2.0 ul Method: Limit Group: LC PFC_QSM5-1 ICAL $A8_N$ D 313C5-PFPeA D 113C4 PFBA 2 Perfluorobutyric acid (M) Exp1;m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x 36 Y (X100000) Y (X100000) 30 12 24 18 12 1.0 1.6 1.9 0.9 1.2 1.5 1.8 1.2 1.5 1.8 2.1 Min Min Min RT RT RT 4 Perfluoropentanoic acid D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid Exp1;m/z 298.90 > 80.00:Moving5PtAverage_x3 Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 24 35- 20 Y (X1000) Y (X1000 28 28 16 21 21 12 1.7 1.4 2.0 1.9 1.1 1.4 1.7 2.0 2.3 1.1 2.3 1.0 1.3 1.6 2.2 2.5 Min Min Min RT RT RT 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexaDe 7 13C2 PFHxA Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x (X100000 Y (X1000) Y (X1000 1.7 2.1 2.0 2.6 1.4 2.0 2.3 1.5 1.8 2.4 2.7 1.4 1.7 2.3 1.1 1.2 Min Min RT RT RT 6 Perfluorohexanoic acid (M) 6 Perfluorohexanoic acid 70 Perfluoropentanesulfonic acid Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 349.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 313.00 > 119.00:Moving5PtAverage_> 30 36 30 25 30 Y (X1000) 24 Y (X100) 20 24 18 15- 18 12 10 0 ol 2.2 2.5 1.5 1.8 2.1 2.4 1.9 2.2 2.5 1.3 1.6 1.3 1.6 2.8 Min Min Min RT RT RT Page 614 of 728

Chrom Revision: 2.2 11-May-2018 08:54:46

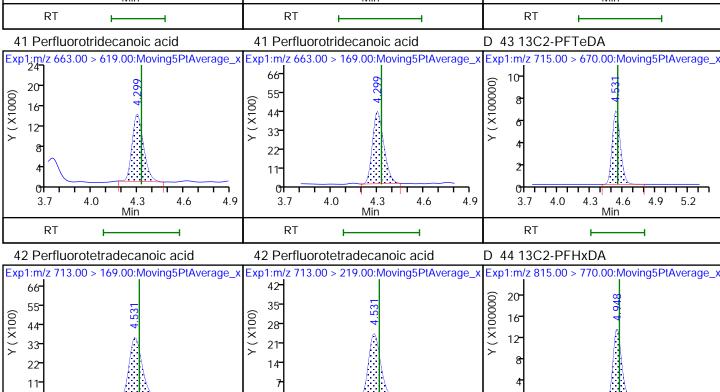
Report Date: 30-May-2018 09:32:29

Chrom Revision: 2.2 11-May-2018 08:54:46

Report Date: 30-May-2018 09:32:29



Report Date: 30-May-2018 09:32:29 Chrom Revision: 2.2 11-May-2018 08:54:46 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d 31 Perfluoroundecanoic acid 33 N-ethyl perfluorooctane sulfonamid D 30 13C2 PFUnA Exp1;m/z 584.00 > 419.00:Moving5PtAverage_x | Exp1:m/z 565.00 > 520.00:Moving5PtAverage_x Exp1:m/z 563.00 > 169.00:Moving5PtAverage_x 78 40 Y (X10000) 65 Y (X1000) Y (X100) 32 52 39 24 16 26 13 3.4 3.7 4.0 4.3 3.4 3.7 4.0 4.3 3.1 3.4 3.7 4.0 4.3 3.1 3.1 Min Min Min RT RT RT D 36 13C2 PFDoA 37 Perfluorododecanoic acid 37 Perfluorododecanoic acid (M) Exp1:m/z 615.00 > 570.00:Moving5PtAverage_x Exp1;m/z 613.00 > 569.00:Moving5PtAverage_x Exp1:m/z 613.00 > 169.00:Moving5PtAverage_x 78 42 Y (X10000) 65- 35 Y (X1000) 12 52 28 39 21 26 13 3.8 4.1 4.4 3.5 4.1 4.4 3.5 3.8 4.1 4.4 Min Min RT RT RT



4.3

4.6

Min

4.0

RT

4.9

4.5

RT

5.1

5.4

5.7

4.3

4.0

RT

4.6

Min

4.9

Report Date: 30-May-2018 09:32:29 Chrom Revision: 2.2 11-May-2018 08:54:46

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d

Injection Date: 28-May-2018 17:22:11 Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

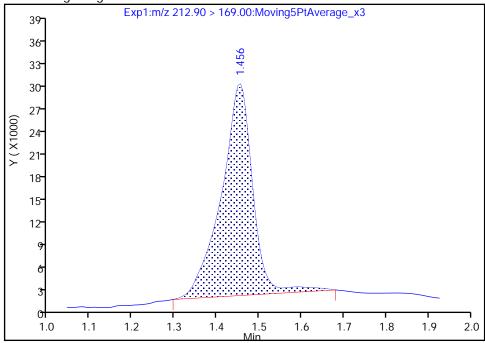
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

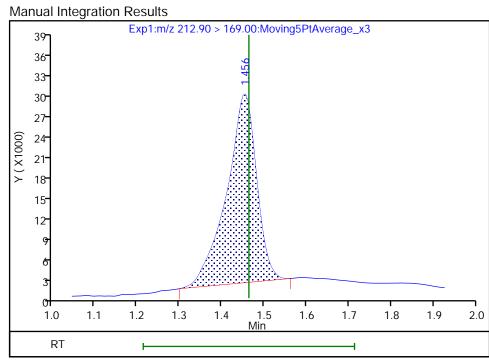
2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

RT: 1.46 Area: 142442 Amount: 0.057643 Amount Units: ng/ml **Processing Integration Results**



RT: 1.46
Area: 134081
Amount: 0.054259
Amount Units: ng/ml



Reviewer: mongkols, 30-May-2018 09:30:15

Audit Action: Manually Integrated

Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d

Injection Date: 28-May-2018 17:22:11 Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

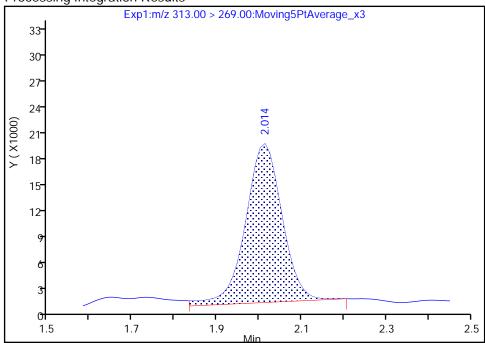
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

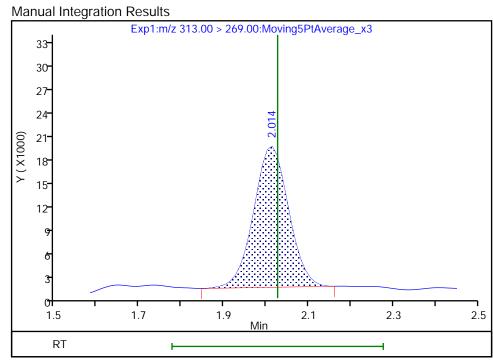
6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

RT: 2.01 Area: 110046 Amount: 0.053169 Amount Units: ng/ml **Processing Integration Results**



RT: 2.01 Area: 103162 Amount: 0.049843 Amount Units: ng/ml



Reviewer: mongkols, 30-May-2018 09:30:25

Audit Action: Manually Integrated

Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d

Injection Date: 28-May-2018 17:22:11 Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

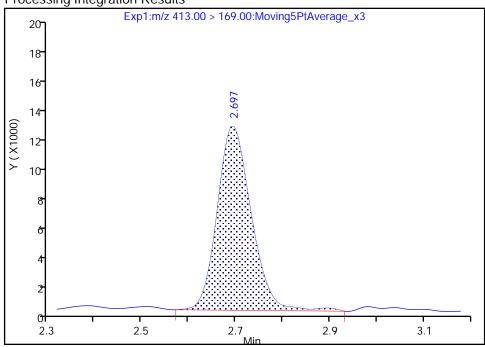
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

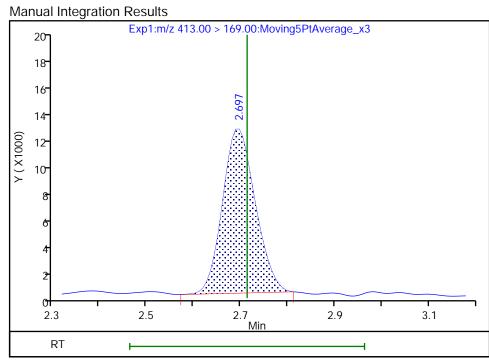
Signal: 2

RT: 2.70
Area: 61619
Amount: 0.053573
Amount Units: ng/ml

Processing Integration Results



RT: 2.70
Area: 58580
Amount: 0.053573
Amount Units: ng/ml



Reviewer: mongkols, 30-May-2018 09:30:42

Audit Action: Manually Integrated

Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d

Injection Date: 28-May-2018 17:22:11 Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

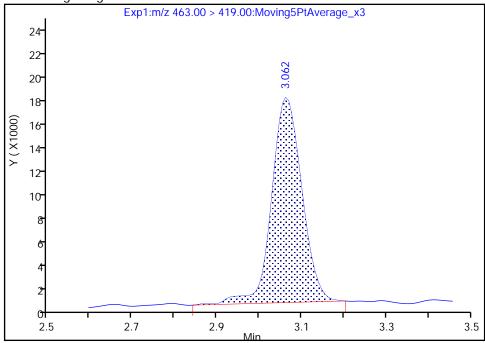
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

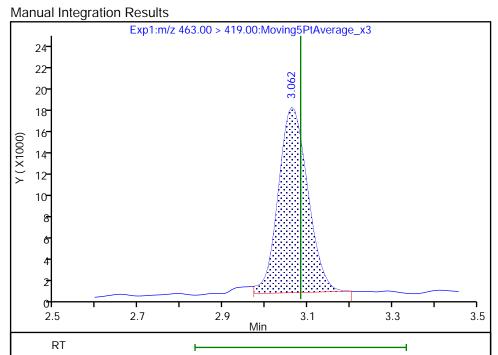
20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

RT: 3.06 Area: 86156 Amount: 0.053320 Amount Units: ng/ml **Processing Integration Results**



RT: 3.06
Area: 83703
Amount: 0.051802
Amount Units: ng/ml



Reviewer: mongkols, 30-May-2018 09:31:22

Audit Action: Manually Integrated

Audit Reason: Split Peak

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d

Injection Date: 28-May-2018 17:22:11 Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

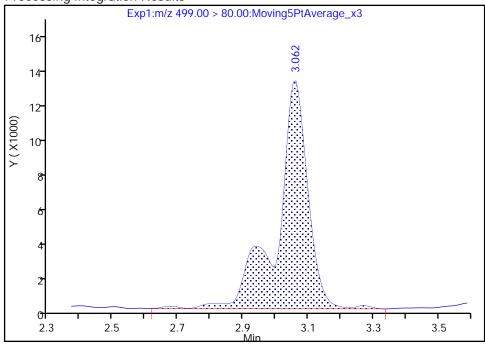
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

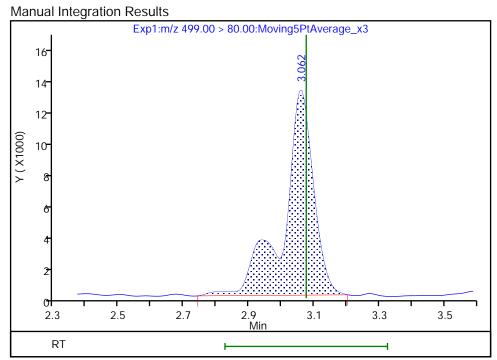
17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

RT: 3.06 Area: 85540 Amount: 0.046120 Amount Units: ng/ml **Processing Integration Results**



RT: 3.06
Area: 82675
Amount: 0.044576
Amount Units: ng/ml



Reviewer: mongkols, 30-May-2018 09:30:51

Audit Action: Manually Integrated

Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d

Injection Date: 28-May-2018 17:22:11 Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

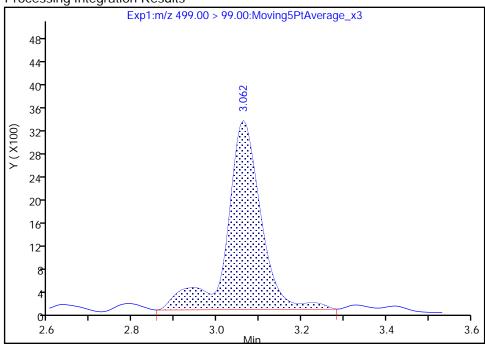
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

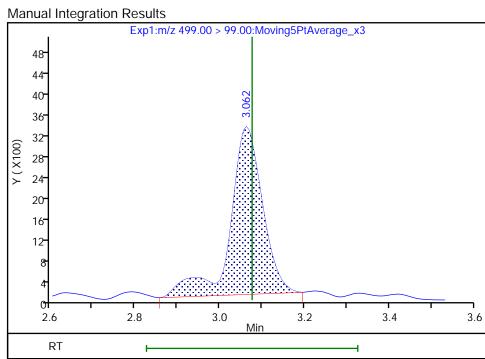
17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

RT: 3.06 Area: 18650 Amount: 0.046120 Amount Units: ng/ml **Processing Integration Results**



RT: 3.06
Area: 17296
Amount: 0.044576
Amount Units: ng/ml



Reviewer: mongkols, 30-May-2018 09:31:10

Audit Action: Manually Integrated

Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d

Injection Date: 28-May-2018 17:22:11 Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

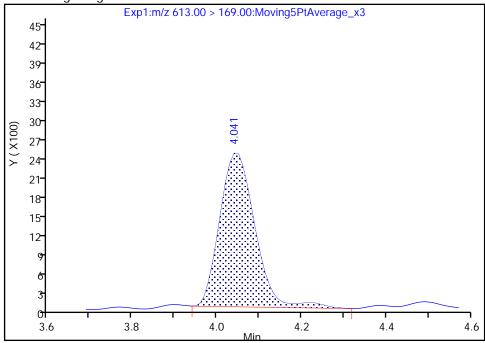
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

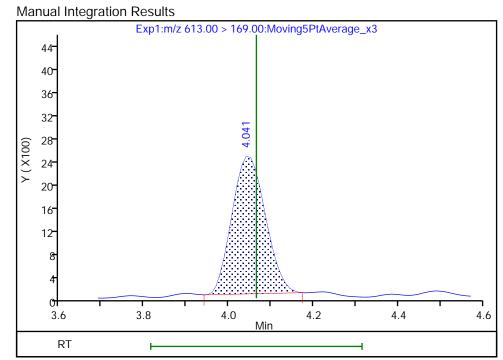
37 Perfluorododecanoic acid, CAS: 307-55-1

Signal: 2

RT: 4.04 Area: 13902 Amount: 0.056641 Amount Units: ng/ml **Processing Integration Results**



RT: 4.04 Area: 13082 Amount: 0.056641 Amount Units: ng/ml



Reviewer: mongkols, 30-May-2018 09:31:48

Audit Action: Manually Integrated

Audit Reason: Baseline

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FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225873/3 Calibration Date: 05/28/2018 17:30

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: <u>GeminiC18 3x100</u> ID: <u>3.00(mm)</u> Calib End Date: <u>05/15/2018 16:39</u>

Lab File ID: 2018.05.28LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid	AveID	0.9298	0.9419		1.01	1.00	1.3	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.125		0.953	1.00	-4.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	78.42		0.888	0.884	0.4	30.0
4:2 FTS	AveID	16.57	18.56		1.05	0.934	12.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	0.997		0.970	1.00	-3.0	30.0
Perfluoropentanesulfonic acid	AveID	69.55	67.96		0.917	0.938	-2.3	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.039		0.984	1.00	-1.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.043		0.842	0.910	-7.4	30.0
6:2FTS	L2ID		1.647		0.879	0.948	-7.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.057		0.898	1.00	-10.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.295		0.926	0.952	-2.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.055		0.996	1.00	-0.4	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.048		0.827	0.928	-10.9	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7578		0.960	0.960	0.0	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9707		0.997	1.00	-0.3	30.0
8:2FTS	AveID	1.349	1.236		0.878	0.958	-8.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	0.9747		1.00	1.00	0.3	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.055		1.04	1.00	4.0	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.6091		0.874	0.964	-9.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9258		0.985	1.00	-1.5	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.7741		0.927	1.00	-7.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.077		1.03	1.00	3.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.288		1.13	1.00	12.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2313		0.916	1.00	-8.4	30.0
13C4 PFBA	Ave	1.528	1.413		2.31	2.50	-7.6	30.0
13C5 PFPeA	Ave	0.9798	0.9888		2.52	2.50	0.9	30.0
13C3-PFBS	Ave	0.0221	0.0206		2.16	2.33	-7.0	30.0
13C2 PFHxA	Ave	1.045	1.053		2.52	2.50	0.8	30.0
13C4-PFHpA	Ave	1.001	0.9608		2.40	2.50	-4.0	30.0
1802 PFHxS	Ave	1.237	1.167		2.23	2.37	-5.6	30.0
M2-6:2FTS	Ave	0.2210	0.2323		2.50	2.38	5.1	30.0

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225873/3 Calibration Date: 05/28/2018 17:30

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9838		2.60	2.50	3.9	30.0
13C4 PFOS	Ave	0.8503	0.8097		2.28	2.39	-4.8	30.0
13C5 PFNA	Ave	0.7745	0.8005		2.58	2.50	3.4	30.0
13C8 FOSA	Ave	1.113	1.014		2.28	2.50	-8.9	30.0
M2-8:2FTS	Ave	0.2515	0.2620		2.50	2.40	4.2	30.0
13C2 PFDA	Ave	0.6587	0.6601		2.51	2.50	0.2	30.0
d3-NMeFOSAA	Ave	0.3634	0.3955		2.72	2.50	8.8	30.0
d5-NEtFOSAA	Ave	0.3729	0.4156		2.79	2.50	11.4	30.0
13C2 PFUnA	Ave	0.5216	0.5467		2.62	2.50	4.8	30.0
13C2 PFDoA	Ave	0.5613	0.5482		2.44	2.50	-2.3	30.0
13C2-PFTeDA	Ave	0.6891	0.7248		2.63	2.50	5.2	30.0
13C2-PFHxDA	Ave	1.170	1.213		2.59	2.50	3.7	30.0

Report Date: 30-May-2018 09:33:13 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_005.d

Lims ID: CCV L4

Client ID:

Sample Type: CCVIS

Inject. Date: 28-May-2018 17:30:02 ALS Bottle#: 13 Worklist Smp#: 3

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L4

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub32

Method: \ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 30-May-2018 09:33:11 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK014

First Level Reviewer: mongkols Date: 30-May-2018 09:33:11

FIIST Level Revie	wei. mo	rigkuis			Date.		00-101ay-2016 09.33. 1	I		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA										
217.00 > 172.00		1.458	-0.001	1.000	6827808	2.31		92.4	38154	
2 Perfluorobut	yric acid									
212.90 > 169.00	1.457	1.457	0.0	1.000	2572522	1.01		101	1289	
D 3 13C5-PFPe										
267.90 > 223.00		1.730	-0.002	0.563	4779432	2.52		101	76809	
4 Perfluoroper			0.0	1 000	2150/10	0.0530		05.3	12/0	
262.90 > 219.00		1.728	0.0	1.000	2150619	0.9529		95.3	1368	
D 47 13C3-PFB9 301.90 > 83.00		1 766	-0.011	1.000	92543	2.16		93.0	847	
5 Perfluorobut				1.000	72040	2.10		73.0	047	
298.90 > 80.00		1.764	0.0	1.005	2759239	0.8877		100	15237	
298.90 > 99.00	1.764	1.764	0.0	1.005	1134064		2.43(1.25-3.74)		9456	
61 Sodium 1H,		•								
327.00 > 307.00		1.970	0.0	1.000	690010	1.05		112	29668	
D 60 M2-4:2FTS		4 000	0.010	4 000	700/00	NO			0450	
329.00 > 81.00		1.982	-0.012	1.000	799629	NC			8150	
D 7 13C2 PFHx 315.00 > 270.00		2.015	-0.001	1.000	5091151	2.52		101	79485	
6 Perfluorohex			-0.001	1.000	3071131	2.52		101	77403	
313.00 > 269.00		2.014	0.0	1.000	2030297	0.9697		97.0	3597	
313.00 > 119.00		2.014	0.0	1.000	185451		10.95(5.03-15.10)		2377	
70 Perfluorope	ntanesul	fonic ac	id							
349.00 > 80.00		2.036	0.0	1.000	2537180	0.9166		97.7	28997	
	2.036	2.036	0.0	1.000	967884		2.62(1.36-4.07)		13736	
D 64 13C3 HFP		2 117	0.012	1 000	242010	NC			E100	
332.10 > 287.00	2.104	2.117	-0.013	1.000	242918	NC			5108	

Data File:	\\Cnr	omiva\S	acramen	:o\Cnrom	Data\A8_IN\201	80529-5884	4.D\2018.05.28LLA_	_005.a		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-	nronovy	nronano	ic) acid							
329.10 > 285.00	2.104	2.104	-	1.000	323920	NC			1744	
D 9 13C4-PFHp 367.00 > 322.00		2.347	-0.002	1.000	4644037	2.40		96.0	57061	
10 Perfluorohe		acid								
363.00 > 319.00		2.345	0.0	1.000	1930601	0.9839	2.50/1.12.2.40)	98.4	2768	
363.00 > 169.00		2.345	0.0	1.000	749041		2.58(1.13-3.40)		5002	
D 11 18O2 PFH: 403.00 > 84.00		2.360	-0.002	1.000	5336916	2.23		94.4	57080	
8 Perfluorohex				1.000	0000710	2.20		71.1	07000	
399.00 > 80.00		2.358	0.0	1.000	2141728	0.8423		92.6	6573	
399.00 > 99.00		2.358	0.0	1.000	730067	0.0.20	2.93(1.50-4.49)	72.0	3685	
65 Adona										
377.00 > 251.00	2.383	2.383	0.0	1.000	5756713	NC			68115	
377.00 > 85.00	2.383	2.383	0.0	1.000	3446016		1.67(0.84-2.53)		44428	
13 Sodium 1H,	1H,2H,2	H-perflu	orooctan	е						
427.00 > 407.00	2.674	2.674	0.0	1.000	701116	0.8793		92.8	13156	
D 12 M2-6:2FTS	5									
429.00 > 81.00	2.674	2.683	-0.009	1.000	1066622	2.50		105	14684	
D 14 13C4 PFO	A									
417.00 > 372.00	2.697	2.706	-0.009	1.000	4755028	2.60		104	52989	
* 62 13C2-PFOA	A									
415.00 > 370.00	2.697	2.697	0.0		4833381	2.50			53307	
15 Perfluorooct		cid								
413.00 > 369.00		2.697	0.0	1.000	2010729	0.8982		89.8	764	
413.00 > 169.00	2.697	2.697	0.0	1.000	1058378		1.90(0.84-2.52)		3483	
16 Perfluorohe										
449.00 > 80.00		2.704	0.0	1.000	1929987	0.9256	0 (0(1 0 1 5 00)	97.2	17549	
449.00 > 99.00	2.704	2.704	0.0	1.000	523743		3.68(1.94-5.82)		9102	
D 19 13C5 PFN/		0.074	0.005	4 000	00/0400	0.50		100	50070	
468.00 > 423.00		3.074	-0.005	1.000	3869198	2.58		103	52873	
D 18 13C4 PFO		0.074	0.040	4 000	074444	0.00		05.0	0.4075	
503.00 > 80.00			-0.012	1.000	3741444	2.28		95.2	24065	
17 Perfluorooct				4 000	4500400	0.0070		00.4	7400	
	3.069	3.069		1.002	1522193	0.8270	1 27/2 21 4 02\	89.1	7139	
	3.062	3.069	-0.007	1.000	348134		4.37(2.31-6.93)		3996	
20 Perfluoronoi 463.00 > 419.00			0.0	1.000	1422007	1.00		99.6	4536	
463.00 > 419.00 463.00 > 169.00		3.069 3.069		1.000	1632987 378569	1.00	4.31(1.90-5.69)	99.0	9153	
69 9-Chlorohex					370309		4.31(1.70-3.07)		7133	
531.00 > 351.00		3.276		e 1.000	2617428	NC			27622	
D 21 13C8 FOS		5.270	0.0	1.000	2017420	110			27022	
506.00 > 78.00		3 /112	-0.001	1.000	4900493	2.28		91.1	50730	
22 Perfluorooct				1.000	4700473	2.20		71.1	30730	
498.00 > 78.00		3.411		1.000	1902843	1.00		99.7	18644	
				1.000	1702043	1.00		, , . 1	10044	
68 Perfluoronoi 549.00 > 80.00		3.411	u 0.0	1.000	1138899	0.9604		100	22417	
	3.411	3.411	0.0	1.000	421640	0.7004	2.70(1.33-3.97)	100	7522	
					Page 630 of	728	= (///35/3////			
						-				

Data File:	\\Chr	omNa\S	acrament	o\Chrom	Data\A8_N\201	80529-5884	4.b\2018.05.28LLA_	_005.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,	1H 2H 2	H-nerflu	ıorodecar	ne						
527.00 > 507.00		3.420		1.003	599899	0.8777		91.6	16466	
D 26 M2-8:2FTS	S									
529.00 > 81.00		3.430	-0.019	1.000	1213076	2.50		104	16586	
24 Perfluorode	canoic a	cid								
513.00 > 469.00	3.430	3.430	0.0	1.000	1243818	1.00		100	6493	
513.00 > 169.00	3.430	3.430	0.0	1.000	208117		5.98(2.36-7.09)		3598	
D 23 13C2 PFD										
515.00 > 470.00		3.439	-0.009	1.000	3190268	2.51		100	34451	
D 27 d3-NMeFC		0.500	0.010	4 000	4044000	0.70		100	40/70	
573.00 > 419.00			-0.012	1.000	1911393	2.72		109	18679	
28 N-methyl pe				1 000	00/712	1.04		104	0.410	
570.00 > 419.00		3.578		1.000	806713	1.04		104	8410	
29 Perfluorode 599.00 > 80.00		3.732		1.000	919131	0.8745		90.7	9978	
599.00 > 80.00 599.00 > 99.00		3.732		1.000	344722	0.6743	2.67(1.39-4.16)	90.7	9042	
D 32 d5-NEtFOS		0.702	0.0	1.000	011722		2.07(1.07 1.10)		7012	
589.00 > 419.00		3.754	-0.012	1.000	2008526	2.79		111	15766	
31 Perfluoroun										
563.00 > 519.00		3.753	0.0	1.000	818060	0.9268		92.7	4761	
563.00 > 169.00	3.753	3.753	0.0	1.000	200856		4.07(2.12-6.36)		7438	
33 N-ethyl perf	luoroocta	ane sulfe	onamid							
584.00 > 419.00	3.753	3.753	0.0	1.003	743801	0.9849		98.5	13660	
D 30 13C2 PFU										
565.00 > 520.00			-0.012	1.000	2642154	2.62		105	48919	
66 11-Chloroei										
631.00 > 451.00		3.909	0.0	1.000	4095519	NC			51780	
D 36 13C2 PFD			0.015	4 000	0/100/0	0.44		07.7	0070/	
615.00 > 570.00			-0.015	1.000	2649868	2.44		97.7	20786	
37 Perfluorodo			0.0	1 000	1111175	1.00		100	110/	
613.00 > 569.00 613.00 > 169.00		4.040 4.040	0.0	1.000 1.000	1141175 277090	1.03	4.12(2.13-6.40)	103	1196 4779	
41 Perfluorotrio			0.0	1.000	277070		4.12(2.13-0.40)		4///	
663.00 > 619.00		4.299	0.0	1.000	1364928	1.13		113	1322	
663.00 > 169.00		4.299	0.0	1.000	404751	1.10	3.37(1.25-3.76)	110	5981	
D 43 13C2-PFT	eDA						, ,			
715.00 > 670.00		4.550	-0.007	1.000	3503125	2.63		105	16732	
42 Perfluorotet	radecan	oic acid								
713.00 > 169.00		4.543	0.0	1.000	324081	0.9159		91.6	3577	
713.00 > 219.00	4.533	4.543	-0.010	0.998	231668		1.40(0.71-2.13)		5523	
D 44 13C2-PFH	xDA									
815.00 > 770.00	4.949	4.964	-0.015	1.000	5861738	2.59		104	13990	
45 Perfluorohe	xadecan	oic acid								
813.00 > 769.00		4.949	0.0	1.000	2271567	NC			883	
813.00 > 169.00		4.949	0.0	1.000	345920		6.57(2.86-8.58)		3425	
46 Perfluorooc			_							
913.00 > 869.00		5.307	0.0	1.000	2308953	NC	0.14/0.00.44.40		628	
913.00 > 169.00	5.307	5.307	0.0	1.000	283754	700	8.14(3.83-11.48)		2557	

Page 631 of 728

Report Date: 30-May-2018 09:33:13 Chrom Revision: 2.2 11-May-2018 08:54:46

OC Flag Legend Processing Flags NC - Not Calibrated

Reagents:

LCPFC_LL4_00004 Amount Added: 1.00 Units: mL

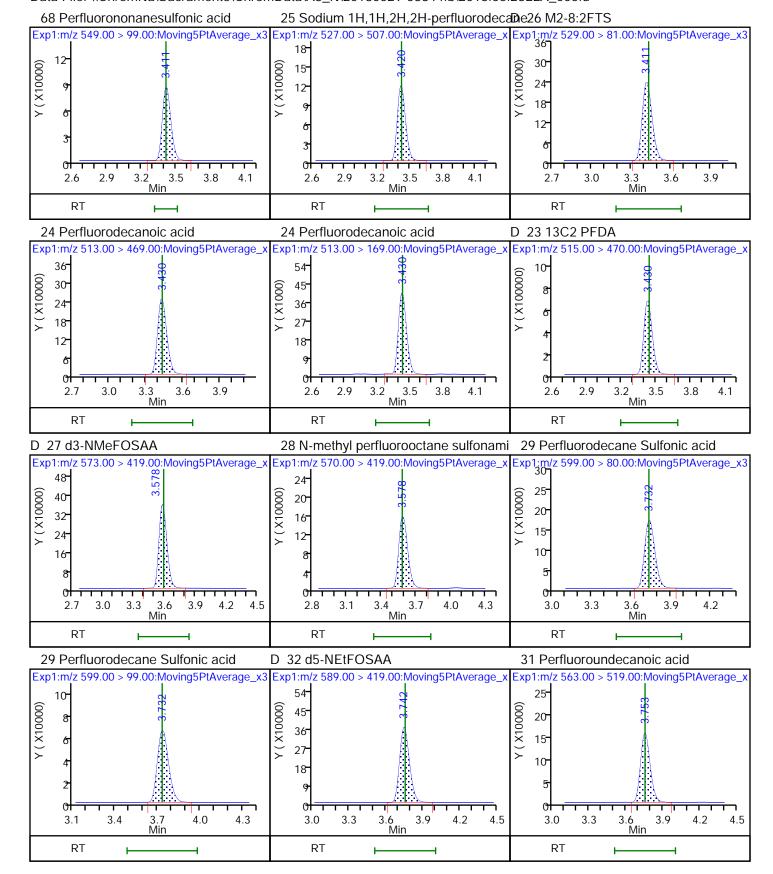
Report Date: 30-May-2018 09:33:13 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_005.d **Injection Date:** 28-May-2018 17:30:02 Instrument ID: A8_N Lims ID: CCV L4 Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 3 Dil. Factor: Injection Vol: 2.0 ul 1.0000 LC PFC_QSM5-1 ICAL Method: $A8_N$ Limit Group: D 113C4 PFBA 2 Perfluorobutyric acid D 3 13C5-PFPeA Exp1;m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1;m/z 267.90 > 223.00:Moving5PtAverage_x 66 Y (X100000) Y (X10000) 55- 12 44 33 22 1.0 1.6 1.9 0.9 1.5 1.8 1.3 1.9 2.2 1.2 2.5 Min Min Min RT RT RT 4 Perfluoropentanoic acid D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 60 25 Y (X10000) 50 60 20 40 48 15- 30 36 10 20 24 10 1.9 1.7 2.0 1.9 1.3 2.2 2.5 1.1 1.4 2.3 1.0 1.3 2.2 2.5 Min Min RT RT RT 61 Sodium 1H,1H,2H,2H-perfluorohexande 7 13C2 PFHxA 5 Perfluorobutanesulfonic acid Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 $Exp1:\underline{m}/z$ 315.00 > 270.00:Moving5PtAverage_x 30 (X100000 Y (X10000) Y (X10000) 25 20 15 10 2.0 1.9 2.2 2.5 1.7 2.0 2.6 1.3 1.4 1.7 2.3 2.6 1.4 2.3 RT RT RT 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid 70 Perfluoropentanesulfonic acid Exp1:m/z 349.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1;m/z 313.00 > 119.00:Moving5PtAverage_x 60 (X10000) Y (X10000) 50 Y (X1000) 32 48 40 24 36 30 16 24 20 1.7 2.0 2.1 1.4 2.3 2.6 2.0 2.3 2.6 1.2 1.5 1.8 2.4 Min RT RT RT Page 633 of 728

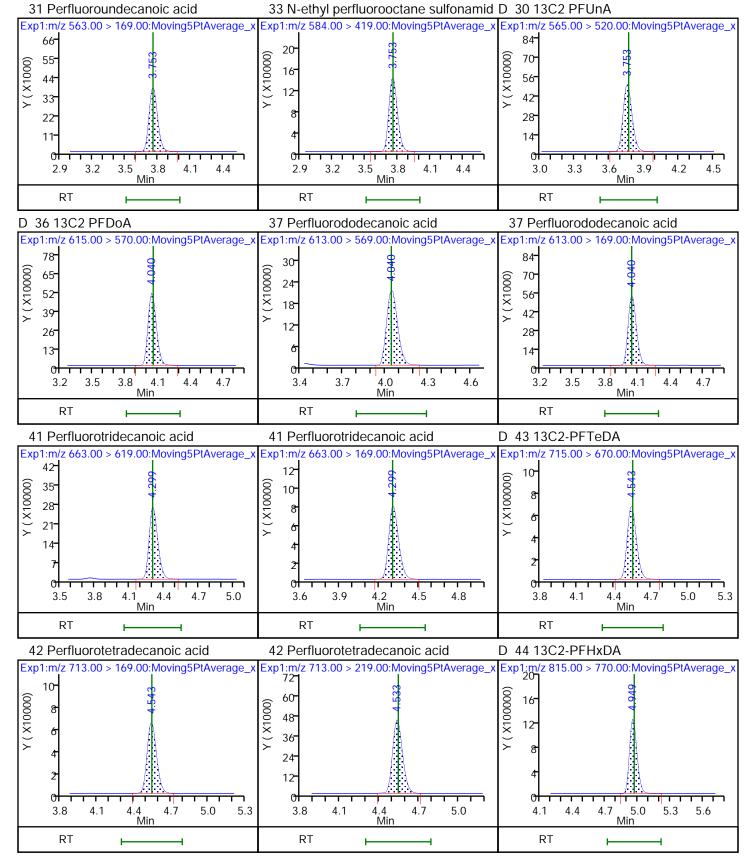
Chrom Revision: 2.2 11-May-2018 08:54:46

Report Date: 30-May-2018 09:33:13

Chrom Revision: 2.2 11-May-2018 08:54:46

Report Date: 30-May-2018 09:33:13





Report Date: 30-May-2018 09:33:13 Chrom Revision: 2.2 11-May-2018 08:54:46

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_005.d

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225884/1 Calibration Date: 05/29/2018 00:01

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: <u>GeminiC18 3x100</u> ID: <u>3.00(mm)</u> Calib End Date: <u>05/15/2018</u> 16:39

Lab File ID: 2018.05.28LLA_055.d Conc. Units: ng/mL

					T			
ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9298	0.9565		1.03	1.00	2.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.147		0.971	1.00	-2.9	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	73.68		0.834	0.884	-5.6	30.0
4:2 FTS	AveID	16.57	19.15		1.08	0.934	15.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	0.9800		0.953	1.00	-4.7	30.0
Perfluoropentanesulfonic acid	AveID	69.55	69.76		0.941	0.938	0.3	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.049		0.993	1.00	-0.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.002		0.809	0.910	-11.1	30.0
6:2FTS	L2ID		1.642		0.877	0.948	-7.5	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.113		0.946	1.00	-5.4	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.308		0.935	0.952	-1.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	0.9645		0.911	1.00	-8.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.076		0.849	0.928	-8.5	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.009		1.04	1.00	3.7	30.0
8:2FTS	AveID	1.349	1.249		0.887	0.958	-7.4	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7708		0.977	0.960	1.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	0.9118		0.938	1.00	-6.2	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.034		1.02	1.00	1.9	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.6548		0.940	0.964	-2.5	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.8038		0.962	1.00	-3.8	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9143		0.973	1.00	-2.7	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.055		1.01	1.00	1.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.156		1.01	1.00	1.0	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2414		0.956	1.00	-4.4	30.0
13C4 PFBA	Ave	1.528	1.377		2.25	2.50	-9.9	30.0
13C5 PFPeA	Ave	0.9798	0.9409		2.40	2.50	-4.0	30.0
13C3-PFBS	Ave	0.0221	0.0203		2.13	2.33	-8.4	30.0
13C2 PFHxA	Ave	1.045	1.017		2.43	2.50	-2.7	30.0
13C4-PFHpA	Ave	1.001	0.9614		2.40	2.50	-4.0	30.0
1802 PFHxS	Ave	1.237	1.175		2.25	2.37	-5.0	30.0
M2-6:2FTS	Ave	0.2210	0.2395		2.57	2.38	8.4	30.0

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225884/1 Calibration Date: 05/29/2018 00:01

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_055.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9386		2.48	2.50	-0.9	30.0
13C4 PFOS	Ave	0.8503	0.7858		2.21	2.39	-7.6	30.0
13C5 PFNA	Ave	0.7745	0.8153		2.63	2.50	5.3	30.0
13C8 FOSA	Ave	1.113	0.9580		2.15	2.50	-13.9	30.0
M2-8:2FTS	Ave	0.2515	0.2458		2.34	2.40	-2.3	30.0
13C2 PFDA	Ave	0.6587	0.6764		2.57	2.50	2.7	30.0
d3-NMeFOSAA	Ave	0.3634	0.3927		2.70	2.50	8.1	30.0
d5-NEtFOSAA	Ave	0.3729	0.3996		2.68	2.50	7.2	30.0
13C2 PFUnA	Ave	0.5216	0.5328		2.55	2.50	2.1	30.0
13C2 PFDoA	Ave	0.5613	0.5535		2.47	2.50	-1.4	30.0
13C2-PFTeDA	Ave	0.6891	0.6894		2.50	2.50	0.0	30.0
13C2-PFHxDA	Ave	1.170	1.238		2.65	2.50	5.9	30.0

Report Date: 30-May-2018 13:11:54 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\2018.05.28LLA_055.d

Lims ID: CCV L4

Client ID:

Sample Type: CCV

Inject. Date: 29-May-2018 00:01:52 ALS Bottle#: 13 Worklist Smp#: 1

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L4

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub32

Method: \ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 30-May-2018 13:11:52 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 13:11:52

First Level Rev	riewer: rua	ingyotsa	Kula		Date: 30-May-2018 13:1					
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFI	ВА									
217.00 > 172.		1.458	0.003	1.000	6808272	2.25		90.1	39049	
2 Perfluorob	,									
212.90 > 169.		1.461	0.0	1.000	2604755	1.03		103	1349	
4 Perfluorop										
262.90 > 219.0	00 1.734	1.734	0.0	1.000	2134251	0.9713		97.1	1461	
D 3 13C5-PF	PeA									
267.90 > 223.	00 1.734	1.730	0.004	0.563	4653193	2.40		96.0	63750	
D 47 13C3-PF	BS									
301.90 > 83.00	1.770	1.766	0.004	1.000	93299	2.13		91.6	841	
5 Perfluorob	utanesulfo	nic acid								
298.90 > 80.0	1.770	1.770	0.0	1.000	2613858	0.8341		94.4	13117	
298.90 > 99.0	1.770	1.770	0.0	1.000	1096532		2.38(1.25-3.74)		9497	
61 Sodium 1	H,1H,2H,2	•		ne						
327.00 > 307.0	00 1.988	1.988	0.0	1.000	717824	1.08		116	30924	
D 60 M2-4:2F	ΓS									
329.00 > 81.00	1.988	1.982	0.006	1.000	766148	NC			7751	
D 7 13C2 PFI	AxH									
315.00 > 270.0	00 2.022	2.016	0.006	1.000	5027977	2.43		97.3	86309	
6 Perfluoroh	exanoic a	cid								
313.00 > 269.0	00 2.022	2.022	0.0	1.000	1970994	0.9532		95.3	3474	
313.00 > 119.0	00 2.022	2.022	0.0	1.000	178443		11.05(5.03-15.10)		2550	
70 Perfluoro	entanesu	lfonic ac	id							
349.00 > 80.00		2.045	0.0	1.000	2625755	0.9409		100	24949	
349.00 > 99.00	2.045	2.045	0.0	1.000	956084		2.75(1.36-4.07)		16209	
D 64 13C3 HF										
332.10 > 287.0	00 2.124	2.117	0.007	1.000	294004	NC			5578	

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\2018.05.28LLA_055.d										
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-	vxoqorq	propanc	oic) acid							
329.10 > 285.00		2.124	•	1.000	307284	NC			2161	
D 913C4-PFHp	Α									
367.00 > 322.00		2.347	0.008	1.000	4754752	2.40		96.0	76864	
10 Perfluorohe	ptanoic a	acid								
363.00 > 319.00		2.355	0.0	1.000	1994713	0.99		99.3	2805	
363.00 > 169.00	2.355	2.355	0.0	1.000	769272		2.59(1.13-3.40)		3888	
D 11 1802 PFH										
403.00 > 84.00		2.360	0.008	1.000	5497098	2.25		95.0	47408	
8 Perfluorohex										
399.00 > 80.00		2.368	0.0	1.000	2119256	0.8092	2 01/1 50 4 40\	88.9	8360	
	2.368	2.368	0.0	1.000	727179		2.91(1.50-4.49)		3697	
65 Adona	2.402	2.402	0.0	1 000	F741070	NC			10010	
377.00 > 251.00 377.00 > 85.00		2.403 2.403	0.0	1.000 1.000	5741970 3506476	NC	1.64(0.84-2.53)		48040 49032	
					3300470		1.04(0.04-2.55)		47032	
13 Sodium 1H, 427.00 > 407.00		2.688		1.000	737661	0.8768		92.5	17062	
D 12 M2-6:2FTS		2.000	0.0	1.000	737001	0.0700		72.5	17002	
429.00 > 81.00		2.684	0.004	1.000	1125410	2.57		108	19800	
D 14 13C4 PFO		2.001	0.001	1.000	1120110	2.07		100	17000	
417.00 > 372.00		2.706	0.005	1.000	4642112	2.48		99.1	75065	
15 Perfluorooct			0.000	1.000	10 12 1 12	2.10		, , , ,	70000	
413.00 > 369.00		2.711	0.0	1.000	2067132	0.9458		94.6	712	
413.00 > 169.00		2.711	0.0	1.000	1094334	0.7.00	1.89(0.84-2.52)	76	4540	
* 62 13C2-PFOA	A						,			
415.00 > 370.00		2.711	0.0		4945573	2.50			47596	
16 Perfluorohe	otanesul	lfonic ac	id							
449.00 > 80.00		2.718		1.000	1936300	0.9352		98.2	16321	
449.00 > 99.00	2.718	2.718	0.0	1.000	516311		3.75(1.94-5.82)		9754	
17 Perfluorooct	ane sulf	onic aci	d							
499.00 > 80.00	3.079	3.079	0.0	1.000	1552710	0.8495		91.5	7247	
499.00 > 99.00	3.079	3.079	0.0	1.000	329107		4.72(2.31-6.93)		5086	
D 19 13C5 PFN										
468.00 > 423.00	3.079	3.076	0.003	1.000	4032071	2.63		105	56049	
D 18 13C4 PFO										
503.00 > 80.00	3.079	3.076	0.003	1.000	3715300	2.21		92.4	20131	
20 Perfluoronoi										
463.00 > 419.00		3.079		1.000	1555517	0.9106	4 04 (4 00 5 (0)	91.1	4480	
463.00 > 169.00		3.079		1.000	369102		4.21(1.90-5.69)		12595	
69 9-Chlorohex					0.400.400	NO			05004	
531.00 > 351.00		3.286	0.0	1.000	2692693	NC			35091	
D 21 13C8 FOSA		0.444	0.005	4 000	470705 *	0.45		04.1	4/4::	
506.00 > 78.00		3.411	0.005	1.000	4737854	2.15		86.1	46144	
22 Perfluorooct				4 22-	404075:				0/555	
498.00 > 78.00				1.000	1912734	1.04		104	26587	
25 Sodium 1H,		•			F04070	0.0070		00 1	400/1	
527.00 > 507.00	3.425	3.425	0.0	1.000	581972	0.8870		92.6	12361	

Data File:	\\Chr	omNa\S	acrament	to\Chrom	Data\A8_N\201	80529-5884	9.b\2018.05.28LLA	_055.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorono	nanesulf	fonic aci	d							
549.00 > 80.00	3.425	3.425		1.000	1150241	0.9768		102	14148	
549.00 > 99.00	3.425	3.425	0.0	1.000	429761		2.68(1.33-3.97)		14156	
D 26 M2-8:2FTS	5									
529.00 > 81.00	3.425	3.430	-0.005	1.000	1164451	2.34		97.7	18354	
24 Perfluorode										
513.00 > 469.00		3.444		1.000	1220073	0.9378	(,)	93.8	6547	
513.00 > 169.00		3.444	0.0	1.000	212785		5.73(2.36-7.09)		5181	
D 23 13C2 PFD/		2.420	0.005	1 000	2245200	2.57		100	F0077	
515.00 > 470.00		3.439	0.005	1.000	3345399	2.57		103	59277	
D 27 d3-NMeFO 573.00 > 419.00		3.589	0.007	1.000	1941966	2.70		108	23509	
				1.000	1941900	2.70		100	23309	
28 N-methyl pe 570.00 > 419.00				1.000	803200	1.02		102	6677	
29 Perfluorode				1.000	003200	1.02		102	0077	
599.00 > 80.00		3.750		1.000	981230	0.9401		97.5	16515	
599.00 > 99.00		3.750		1.000	321894	0.7101	3.05(1.39-4.16)	77.0	6634	
D 32 d5-NEtFOS	SAA						, ,			
589.00 > 419.00		3.753	0.007	1.000	1976246	2.68		107	16263	
33 N-ethyl perfl	luoroocta	ane sulfo	onamid							
584.00 > 419.00		3.771		1.003	722754	0.9726		97.3	14787	
D 30 13C2 PFU	nΑ									
565.00 > 520.00	3.771	3.763	0.007	1.000	2635220	2.55		102	53476	
31 Perfluoround		c acid								
563.00 > 519.00		3.760	0.0	0.997	847301	0.9624		96.2	5328	
563.00 > 169.00		3.760	0.010	1.000	205447		4.12(2.12-6.36)		6258	
66 11-Chloroei					00/0047	NO			44407	
631.00 > 451.00		3.917	0.0	1.000	3960347	NC			41126	
D 36 13C2 PFD		4.051	0.000	1 000	2727202	2.47		00.7	22075	
615.00 > 570.00		4.051	0.009	1.000	2737282	2.47		98.6	22075	
37 Perfluorodo 613.00 > 569.00		4.060	0.0	1.000	1155469	1.01		101	1281	
613.00 > 169.00		4.060	0.0	1.000	264416	1.01	4.37(2.13-6.40)	101	4495	
41 Perfluorotrid			0.0	1.000	201110		1.07(2.10 0.10)		1170	
663.00 > 619.00		4.318	0.0	1.000	1265443	1.01		101	1199	
663.00 > 169.00		4.318	0.0	1.000	380706		3.32(1.25-3.76)		5092	
42 Perfluoroteti	radecan	oic acid								
713.00 > 169.00	4.563	4.563	0.0	1.000	329182	0.9558		95.6	4450	
713.00 > 219.00	4.553	4.563	-0.010	0.998	224208		1.47(0.71-2.13)		4262	
D 43 13C2-PFT	eDA									
715.00 > 670.00	4.563	4.553	0.010	1.000	3409395	2.50		100	17348	
D 44 13C2-PFH										
815.00 > 770.00	4.974	4.967	0.007	1.000	6123706	2.65		106	13418	
45 Perfluorohe										
813.00 > 769.00		4.974	0.0	1.000	2365433	NC	(10/0.0/ 0.50)		943	
813.00 > 169.00	4.9/4	4.974	0.0	1.000	382866		6.18(2.86-8.58)		3396	

2444	,,,,,,,,,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		0,0		0002; 000.	,			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooct	adecand	oic acid								
913.00 > 869.00	5.336	5.336	0.0	1.000	2453320	NC			730	
913.00 > 169.00	5.328	5.336	-0.008	0.999	288188		8.51(3.83-11.48)		2869	

OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00004 Amount Added: 1.00 Units: mL

Report Date: 30-May-2018 13:11:54 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\2018.05.28LLA_055.d **Injection Date:** 29-May-2018 00:01:52 Instrument ID: A8_N Lims ID: CCV L4 Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: Dil. Factor: Injection Vol: 2.0 ul 1.0000 LC PFC_QSM5-1 ICAL Method: $A8_N$ Limit Group: 2 Perfluorobutyric acid D 113C4 PFBA 4 Perfluoropentanoic acid Exp1;m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x 66- Y (X100000) 55 Y (X10000) 55 12 44 44 33 33 22 1.0 1.6 1.9 1.1 1.4 1.7 2.0 1.3 1.9 2.2 8.0 2.5 Min Min RT RT RT D 3 13C5-PFPeA D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 72 24 Y (X100000) Y (X10000) 60 10 20 48 16 12 36 24 1.9 2.0 1.9 2.2 1.0 1.3 2.2 2.5 1.1 1.4 1.7 2.3 1.0 1.3 2.5 Min Min Min RT RT RT 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexaDe 7 13C2 PFHxA Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 30 (X100000 Y (X10000) Y (X10000) 25- 16 20 12 15- 10 2.1 0.9 1.9 2.2 2.5 1.5 2.1 2.7 1.8 1.3 1.6 1.5 2.4 2.7 Min RT RT RT 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid 70 Perfluoropentanesulfonic acid Exp1;m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 349.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x 72 50 60 Y (X10000) Y (X10000) Y (X1000) 36 40 48 27 30 36 18 20 24 2.0 2.3 2.0 1.8 2.1 1.4 1.7 2.6 2.3 2.6 1.2 1.5 2.4 Min

RT

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RT

RT

Chrom Revision: 2.2 11-May-2018 08:54:46

Report Date: 30-May-2018 13:11:54

Report Date: 30-May-2018 13:11:54 Chrom Revision: 2.2 11-May-2018 08:54:46 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\2018.05.28LLA_055.d 16 Perfluoroheptanesulfonic acid 16 Perfluoroheptanesulfonic acid Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 449.00 > 99.00:Moving5PtAverage_x3 Y (X100000) Y (X10000) Y (X10000) 36 27 2.8 3.1 2.3 2.9 3.2 1.9 2.2 2.5 2.8 3.1 1.9 2.2 2.5 2.0 3.4 Min Min Min RT RT RT 17 Perfluorooctane sulfonic acid 17 Perfluorooctane sulfonic acid D 19 13C5 PFNA Exp1;m/z 499.00 > 80.00:Moving5PtAverage_x3 Exp1;m/z 468.00 > 423.00:Moving5PtAverage_x Exp1:m/z 499.00 > 99.00:Moving5PtAverage_x3 84 Y (X100000) Y (X10000) 70 24 56- 18 42 28 14 3.0 3.4 4.0 2.3 4.1 2.7 3.3 3.6 Min Min RT RT RT D 18 13C4 PFOS 20 Perfluorononanoic acid 20 Perfluorononanoic acid Exp1:m/z 503.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 463.00 > 419.00:Moving5PtAverage_> Exp1:m/z 463.00 > 169.00:Moving5PtAverage_x (X100000) (X10000) (X10000) 32 24 16 2.9 2.7 2.9 3.2 3.5 3.2 3.5 3.0 3.3 3.6 2.3 2.6 3.8 2.3 2.6 3.8 Min Min Min RT RT RT D 21 13C8 FOSA 22 Perfluorooctane Sulfonamide 25 Sodium 1H,1H,2H,2H-perfluorodecane Exp1:m/z 506.00 > 78.00:Moving5PtAverage_x3 Exp1:m/z 527.00 > 507.00:Moving5PtAverage_x Exp1:m/z 498.00 > 78.00:Moving5PtAverage_x3 Y (X100000) 50 Y (X10000) Y (X10000) 40 30 20 3.2 <u>Min</u> 2.9 3.5 2.9 3.5 2.9 3.5 3.8 3.2 3.8 3.8 4.1 Min Min RT RT RT

RT

RT

RT

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\2018.05.28LLA_055.d D 30 13C2 PFUnA 31 Perfluoroundecanoic acid 31 Perfluoroundecanoic acid Exp1:m/z 563.00 > 519.00:Moving5PtAverage_x Exp1:m/z 565.00 > 520.00:Moving5PtAverage_x Exp1:m/z 563.00 > 169.00:Moving5PtAverage_x 60 Y (X10000) Y (X10000) 65 Y (X1000) 50 20 52 40 15- 39 30 10 26 20 13 10 3.8 4.1 3.4 3.7 4.0 4.3 3.9 4.2 3.2 3.5 3.1 3.3 3.6 4.5 3.0 Min Min Min RT RT RT D 36 13C2 PFDoA 37 Perfluorododecanoic acid 37 Perfluorododecanoic acid Exp1:m/z 615.00 > 570.00:Moving5PtAverage_x Exp1;m/z 613.00 > 569.00:Moving5PtAverage_x Exp1:m/z 613.00 > 169.00:Moving5PtAverage_x 78 84 30 Y (X10000) Y (X10000) 70 Y (X1000) 24 52 56- 18 39 42 26 28 3.6 4.2 4.5 3.6 4.2 4.5 3.8 Min RT RT RT 41 Perfluorotridecanoic acid 41 Perfluorotridecanoic acid 42 Perfluorotetradecanoic acid Exp1:m/z 663.00 > 169.00:Moving5PtAverage_x Exp1:m/z 663.00 > 619.00:Moving5PtAverage_> Exp1:m/z 713.00 > 169.00:Moving5PtAverage_x 10 30 (X10000) (X10000) 24 18 12 ot 4.8 3.8 4.1 4.4 4.7 5.0 3.6 3.9 4.2 4.5 5.1 3.9 4.2 4.8 5.1 Min Min RT RT RT D 43 13C2-PFTeDA 42 Perfluorotetradecanoic acid D 44 13C2-PFHxDA 66- 20 Y (X100000) Y (X100000) 55 Y (X1000 16 33 22 4.7 4.7 4.1 5.0 5.3 4.1 5.0 5.3 4.6 5.2 5.5 3.8 4.3 Min RT RT RT

Chrom Revision: 2.2 11-May-2018 08:54:46

Report Date: 30-May-2018 13:11:54

Chrom Revision: 2.2 11-May-2018 08:54:46

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225884/11 Calibration Date: 05/29/2018 01:27

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_066.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid	AveID	0.9298	0.9792		2.63	2.50	5.3	30.0
(PFBA) Perfluoropentanoic acid	AveID	1.181	1.153		2.44	2.50	-2.3	30.0
(PFPeA) Perfluorobutanesulfonic acid	AveID	78.09	81.38		2.30	2.21	4.2	30.0
(PFBS) 4:2 FTS	AveID	16.57	18.34		2.58	2.34	10.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.024		2.49	2.50	-0.4	30.0
Perfluoropentanesulfonic acid	AveID	69.55	72.75		2.45	2.35	4.6	30.0
Perfluoroheptanoic acid	AveID	1.056	1.058		2.50	2.50	0.2	30.0
(PFHpA) Perfluorohexanesulfonic acid	AveID	1.127	1.073		2.17	2.28	-4.8	30.0
(PFHxS) 6:2FTS	L2ID		1.644		2.21	2.37	-6.8	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.195		2.54	2.50	1.6	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.389		2.48	2.38	4.3	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.123		2.22	2.32	-4.5	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.047		2.47	2.50	-1.2	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.039		2.67	2.50	6.7	30.0
8:2FTS	AveID	1.349	1.235		2.19	2.40	-8.5	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.8107		2.57	2.40	7.0	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.096		2.82	2.50	12.7	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.009		2.49	2.50	-0.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.7001		2.51	2.41	4.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9396		2.50	2.50	-0.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.8391		2.51	2.50	0.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.056		2.53	2.50	1.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.171		2.56	2.50	2.4	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2391		2.37	2.50	-5.3	30.0
13C4 PFBA	Ave	1.528	1.376		2.25	2.50	-10.0	30.0
13C5 PFPeA	Ave	0.9798	0.9493		2.42	2.50	-3.1	30.0
13C3-PFBS	Ave	0.0221	0.0195		2.05	2.33	-12.0	30.0
13C2 PFHxA	Ave	1.045	1.004		2.40	2.50	-3.9	30.0
13C4-PFHpA	Ave	1.001	0.9637		2.41	2.50	-3.7	30.0
1802 PFHxS	Ave	1.237	1.140		2.18	2.37	-7.9	30.0
M2-6:2FTS	Ave	0.2210	0.2280		2.45	2.38	3.2	30.0

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225884/11 Calibration Date: 05/29/2018 01:27

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_066.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9013		2.38	2.50	-4.8	30.0
13C4 PFOS	Ave	0.8503	0.7672		2.16	2.39	-9.8	30.0
13C5 PFNA	Ave	0.7745	0.7702		2.49	2.50	-0.5	30.0
13C8 FOSA	Ave	1.113	0.9678		2.17	2.50	-13.0	30.0
M2-8:2FTS	Ave	0.2515	0.2453		2.34	2.40	-2.5	30.0
13C2 PFDA	Ave	0.6587	0.6107		2.32	2.50	-7.3	30.0
d3-NMeFOSAA	Ave	0.3634	0.3927		2.70	2.50	8.1	30.0
13C2 PFUnA	Ave	0.5216	0.5033		2.41	2.50	-3.5	30.0
d5-NEtFOSAA	Ave	0.3729	0.3922		2.63	2.50	5.2	30.0
13C2 PFDoA	Ave	0.5613	0.5486		2.44	2.50	-2.3	30.0
13C2-PFTeDA	Ave	0.6891	0.6997		2.54	2.50	1.5	30.0
13C2-PFHxDA	Ave	1.170	1.218		2.60	2.50	4.1	30.0

Report Date: 30-May-2018 13:20:50 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\2018.05.28LLA_066.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 29-May-2018 01:27:44 ALS Bottle#: 14 Worklist Smp#: 11

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-A8_N*sub32

Method: \ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 30-May-2018 13:20:49 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 13:20:49

<u> </u>	21 rever kevie	er Reviewer, ruarigyotsakulu				Date.	30-101ay-2016 13.20.49				
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D	1 13C4 PFBA										
	7.00 > 172.00		1.458	0.003	1.000	6521458	2.25		90.0	37878	
	2 Perfluorobuty	vric acid									
	2.90 > 169.00	,	1.461	0.0	1.000	6385838	2.63		105	4168	
D	3 13C5-PFPe	eΑ									
26	57.90 > 223.00	1.725	1.730	-0.005	0.560	4500685	2.42		96.9	61188	
	4 Perfluoropen										
	52.90 > 219.00		1.725	0.0	1.000	5189816	2.44		97.7	3631	
	47 13C3-PFB										
)1.90 > 83.00			-0.005	1.000	85890	2.05		88.0	706	
	5 Perfluorobuta				1 005	// // 100	2.20		104	22011	
		1.770 1.770	1.770 1.770	0.0	1.005 1.005	6644383 2727269	2.30	2.44(1.25-3.74)	104	33011 23185	
	60 M2-4:2FTS		1.770	0.0	1.000	2,2,20,		2.11(1.20 0.7 1)		20.00	
	29.00 > 81.00		1.982	-0.005	1.000	722812	NC			7240	
6	51 Sodium 1H,	1H,2H,2	H-perflu	orohexar	ne						
	27.00 > 307.00		1.977		1.000	1581606	2.58		111	89292	
D	7 13C2 PFHx	Α									
31	5.00 > 270.00	2.022	2.016	0.006	1.000	4759314	2.40		96.1	80807	
	6 Perfluorohex		cid								
	3.00 > 269.00		2.022		1.000	4873940	2.49	11 05/5 00 15 10)	99.6	13401	
	3.00 > 119.00		2.022		1.000	433262		11.25(5.03-15.10)		6096	
	70 Perfluoropei 19.00 > 80.00		fonic ac 2.044		1.000	6302680	2.45		105	43964	
		2.044	2.044		1.000	2375629	2.43	2.65(1.36-4.07)	103	33253	
	64 13C3 HFP(2.511	0.0		20.0027		,		30200	
	32.10 > 287.00		2.117	-0.005	1.000	219395	NC			4530	

Data File:	\\Chr	omNa\S	acrament	:o\Chrom	Data\A8_N\201	80529-5884	9.b\2018.05.28LLA	_066.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-r	oropoxv	propano	oic) acid							
329.10 > 285.00		2.123	•	1.005	750702	NC			4634	
D 9 13C4-PFHp	A									
367.00 > 322.00		2.347	0.007	1.000	4569170	2.41		96.3	55672	
10 Perfluorohep	tanoic a	acid								
363.00 > 319.00		2.354	0.0	1.000	4833952	2.50		100	6400	
363.00 > 169.00		2.354	0.0	1.000	1805913		2.68(1.13-3.40)		11541	
D 11 18O2 PFHx										
403.00 > 84.00		2.360	0.008	1.000	5112884	2.18		92.1	45880	
8 Perfluorohexa				4 000	5070/57	0.47		05.0	45474	
	2.368	2.368	0.0	1.000 1.000	5278657 1775174	2.17	2 07/1 EO 4 40\	95.2	15474 8653	
	2.368	2.368	0.0	1.000	1775174		2.97(1.50-4.49)		8003	
65 Adona 377.00 > 251.00	2 202	2.392	0.0	1.000	14162253	NC			91197	
377.00 > 251.00 377.00 > 85.00		2.392		1.000	8333623	NC	1.70(0.84-2.53)		77526	
D 12 M2-6:2FTS	2.072	2.072	0.0	1.000	0000020		1.70(0.01 2.00)		77020	
429.00 > 81.00	2.680	2.684	-0.004	1.000	1026767	2.45		103	21210	
13 Sodium 1H,1										
427.00 > 407.00		2.680		1.000	1684338	2.21		93.2	28867	
D 14 13C4 PFOA										
417.00 > 372.00		2.706	0.004	1.000	4272909	2.38		95.2	39430	
15 Perfluoroocta	anoic ac	cid								
413.00 > 369.00		2.710	0.0	1.000	5107560	2.54		102	1812	
413.00 > 169.00	2.710	2.710	0.0	1.000	2576255		1.98(0.84-2.52)		9640	
* 62 13C2-PFOA										
415.00 > 370.00	2.710	2.710	0.0		4741080	2.50			54274	
16 Perfluorohep	tanesul	fonic ac	id							
449.00 > 80.00		2.718		1.000	4809475	2.48		104	29656	
449.00 > 99.00	2.718	2.718	0.0	1.000	1311141		3.67(1.94-5.82)		18087	
D 19 13C5 PFNA										
468.00 > 423.00	3.079	3.076	0.003	1.000	3651618	2.49		99.5	59282	
D 18 13C4 PFOS										
503.00 > 80.00	3.071	3.076	-0.005	1.000	3477407	2.16		90.2	19056	
17 Perfluoroocta										
499.00 > 80.00		3.071		1.000	3790824	2.22	4 50/0 04 / 00)	95.5	17374	
499.00 > 99.00		3.071	0.0	1.000	828097		4.58(2.31-6.93)		11754	
20 Perfluoronor			0.0	1 000	2022272	0.47		00.0	11/00	
463.00 > 419.00		3.079		1.000 1.000	3822272	2.47	4 24/1 00 E 40\	98.8	11629	
463.00 > 169.00		3.079			900446		4.24(1.90-5.69)		46763	
69 9-Chlorohex		3.286		e 1.000	4522015	NC			71510	
531.00 > 351.00		5.200	0.0	1.000	6532915	NC			/ 1310	
D 21 13C8 FOSA 506.00 > 78.00		3.411	0.004	1.000	1500101	2.17		87.0	63333	
				1.000	4588424	2.17		07.0	63333	
22 Perfluoroocta 498.00 > 78.00		onamid 3.415		1.000	4768664	2.67		107	34300	
					4700004	2.07		107	34300	
25 Sodium 1H,1 527.00 > 507.00				ne 1.000	1376215	2.19		91.5	43046	
JZ1.00 > 301.00	J.4Z4	5.424	0.0	1.000	13/02/13	۷.17		71.0	43040	

Report Date: 30-May-2018 13:20:50 ChromNa\Sacramento\ChromData\A8 Chrom Revision: 2.2 11-May-2018 08:54:46

Data File:	\\Chr	omNa\S	acrament	o\Chrom	Data\A8_N\201	80529-5884	9.b\2018.05.28LLA_	_066.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorono	nanesulf	onic aci	d							
549.00 > 80.00		3.424		1.000	2831081	2.57		107	26493	
549.00 > 99.00		3.424	0.0	1.000	1031578		2.74(1.33-3.97)		25150	
D 26 M2-8:2FTS		2.420	0.007	1 000	111111	0.04		07.5	1 (100	
529.00 > 81.00		3.430	-0.006	1.000	1114116	2.34		97.5	16492	
D 23 13C2 PFD, 515.00 > 470.00		3 / 30	-0.006	1.000	2895204	2.32		92.7	32593	
24 Perfluorode			-0.000	1.000	2073204	2.32		72.1	32373	
513.00 > 469.00		3.433	0.0	1.000	3172262	2.82		113	16693	
513.00 > 169.00		3.433		1.000	557303	2.02	5.69(2.36-7.09)		11957	
D 27 d3-NMeFO	SAA									
573.00 > 419.00	3.595	3.589	0.006	1.000	1861994	2.70		108	22674	
28 N-methyl pe	rfluoroo	ctane su	ılfonami							
570.00 > 419.00	3.595	3.595	0.0	1.000	1879152	2.49		99.5	11124	
29 Perfluorode										
599.00 > 80.00		3.749		1.000	2454950	2.51	0.04/4.00.4.4/\	104	32170	
599.00 > 99.00		3.749	0.0	1.000	807337		3.04(1.39-4.16)		14792	
D 32 d5-NEtFOS		2.752	0.007	1 000	1050202	2/2		105	22/22	
589.00 > 419.00		3.753	0.007	1.000	1859293	2.63		105	23633	
31 Perfluoroung 563.00 > 519.00		3.770	0.0	1.003	2002450	2.51		100	8822	
563.00 > 169.00			-0.010	1.003	474996	2.51	4.22(2.12-6.36)	100	17081	
D 30 13C2 PFU		0.770	0.0.0				(0.00)		.,	
565.00 > 520.00		3.763	-0.003	1.000	2386311	2.41		96.5	48118	
33 N-ethyl perfl		ane sulfo	onamid							
584.00 > 419.00		3.760		1.000	1746935	2.50		100.0	25747	
66 11-Chloroei	cosafluo	ro-3-oxa	aundecan	1						
631.00 > 451.00	3.918	3.918	0.0	1.000	9983733	NC			81896	
D 36 13C2 PFD	AC									
615.00 > 570.00	4.061	4.051	0.010	1.000	2600908	2.44		97.7	21695	
37 Perfluorodo		c acid								
613.00 > 569.00		4.061	0.0	1.000	2746796	2.53		101	3265	
613.00 > 169.00		4.061	0.0	1.000	653860		4.20(2.13-6.40)		6712	
41 Perfluorotrid			0.0	4 000	004/400	0.57		100	00.40	
663.00 > 619.00 663.00 > 169.00		4.318 4.318	0.0	1.000 1.000	3046189 987950	2.56	3.08(1.25-3.76)	102	2843 11678	
		4.310	0.0	1.000	907930		3.06(1.25-3.70)		11076	
D 43 13C2-PFT6 715.00 > 670.00		4.553	0.0	1.000	3317479	2.54		102	19748	
42 Perfluoroteti			0.0	1.000	3317477	2.54		102	17740	
713.00 > 169.00		4.553	0.0	1.000	793241	2.37		94.7	8288	
713.00 > 219.00		4.553	0.0	1.000	593369	2.07	1.34(0.71-2.13)	,	10253	
D 44 13C2-PFH							• -/			
815.00 > 770.00		4.967	-0.001	1.000	5773780	2.60		104	13746	
45 Perfluorohe										
813.00 > 769.00		4.975	0.0	1.002	5776493	NC			2212	
813.00 > 169.00	4.966	4.975	-0.009	1.000	951041		6.07(2.86-8.58)		6915	

2414 1 1101	,,,,,,,,,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		0,0	2 ata :: 10_: 1120 :	0002; 000.	, 110 12 0 1 0 1 0 0 1 2 0 2 2 1 1 <u> </u>			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooct 913.00 > 869.00		oic acid	0.0	1.000	6432979	NC			1689	
913.00 > 169.00		5.329	0.0	1.000	766120	NO	8.40(3.83-11.48)		5159	

OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00004 Amount Added: 1.00 Units: mL

Report Date: 30-May-2018 13:20:50 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\2018.05.28LLA_066.d **Injection Date:** 29-May-2018 01:27:44 Instrument ID: A8_N Lims ID: CCV L5 Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 11 Dil. Factor: Injection Vol: 2.0 ul 1.0000 LC PFC_QSM5-1 ICAL Method: $A8_N$ Limit Group: D 313C5-PFPeA D 113C4 PFBA 2 Perfluorobutyric acid Exp1;m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x Y (X100000) Y (X100000 12 1.0 1.6 1.9 0.6 1.8 2.4 1.2 1.5 1.8 2.1 Min Min Min RT RT RT D 47 13C3-PFBS 4 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1;m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 24 18 Y (X100000) 20 15 16- 12 2.0 2.0 1.2 2.4 1.1 1.4 1.7 2.3 1.1 1.4 1.7 2.3 1.5 1.8 2.1 2.7 Min Min RT RT RT 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexaDe 7 13C2 PFHxA Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 72 (X100000 60 Y (X10000) 35 Y (X10000) 48 28 36 21 24 2.1 1.8 1.5 2.1 1.4 2.3 3.2 1.8 1.2 0.5 1.5 2.4 2.7 Min RT RT RT 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid 70 Perfluoropentanesulfonic acid Exp1;m/z 349.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x 12 Y (X100000) (X100000) Y (X10000) 10 ol 2.6 1.8 1.0 2.8 2.0 2.3 0.6 1.2 2.4 3.0 1.6 2.2 1.4 1.7 Min Min RT RT RT Page 657 of 728

Chrom Revision: 2.2 11-May-2018 08:54:46

Report Date: 30-May-2018 13:20:50

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\2018.05.28LLA_066.d 16 Perfluoroheptanesulfonic acid 16 Perfluoroheptanesulfonic acid Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 449.00 > 99.00:Moving5PtAverage_x3 36 Y (X100000) Y (X100000) Y (X10000) 30 24 18 2.3 2.6 2.9 3.2 2.2 2.8 3.1 2.8 3.1 2.0 3.5 1.9 2.5 1.9 2.2 2.5 3.4 Min Min Min_ RT RT RT D 19 13C5 PFNA D 18 13C4 PFOS 17 Perfluorooctane sulfonic acid Exp1:m/z 468.00 > 423.00:Moving5PtAverage_x Exp1:m/z 503.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 499.00 > 80.00:Moving5PtAverage_x3 78 Y (X100000) Y (X100000) Y (X10000) 65 52 39 26 13 3.0 2.7 3.3 3.6 2.7 3.3 3.6 3.3 4.2 Min RT RT RT 17 Perfluorooctane sulfonic acid 20 Perfluorononanoic acid 20 Perfluorononanoic acid Exp1:m/z 499.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 463.00 > 419.00:Moving5PtAverage_x Exp1:m/z 463.00 > 169.00:Moving5PtAverage_x 20 24 (X100000) (X10000 20 16- 12 2.4 4.2 2.8 3.1 2.5 1.5 3.3 2.5 3.4 3.7 1.9 3.1 3.7 4.3 Min Min Min RT RT RT D 21 13C8 FOSA 22 Perfluorooctane Sulfonamide 25 Sodium 1H,1H,2H,2H-perfluorodecane Exp1:m/z 527.00 > 507.00:Moving5PtAverage_x Exp1:m/z 498.00 > 78.00:Moving5PtAverage_x3 Exp1:m/z 506.00 > 78.00:Moving5PtAverage_x3 42 Y (X100000) Y (X100000 Y (X10000) 28 3.2 <u>Min</u> 2.9 3.5 2.9 3.5 2.8 3.1 3.7 4.0 3.2 3.8 3.8 4.1 RT RT RT

Chrom Revision: 2.2 11-May-2018 08:54:46

Report Date: 30-May-2018 13:20:50

Chrom Revision: 2.2 11-May-2018 08:54:46

Report Date: 30-May-2018 13:20:50

Report Date: 30-May-2018 13:20:50 Chrom Revision: 2.2 11-May-2018 08:54:46

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\2018.05.28LLA_066.d

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: <u>320-38875-1</u>
SDG No.:	
Client Sample ID:	Lab Sample ID: MB 320-223615/1-A
Matrix: Water	Lab File ID: 2018.05.27LLADX_004.d
Analysis Method: EPA 537 (Mod)	Date Collected:
Extraction Method: 3535	Date Extracted: 05/16/2018 14:51
Sample wt/vol: 250(mL)	Date Analyzed: 05/28/2018 07:23
Con. Extract Vol.: 10 (mL)	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup:(Y/N) N
Analysis Batch No · 225818	Units: na/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	1.5	Ū	2.0	1.5	0.59
2706-90-3	Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	1.0	0.43
307-24-4	Perfluorohexanoic acid (PFHxA)	1.0	Ū	2.0	1.0	0.47
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.5	Ū	2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	1.5	U M	2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	1.5	U	2.0	1.5	0.52
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	U	2.0	1.0	0.48
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.5	Ū	2.0	1.5	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	1.5	Ū	2.0	1.5	0.52
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	Ū	4.0	3.0	0.76
376-06-7	Perfluorotetradecanoic acid (PFTeA)	3.0	Ū	4.0	3.0	0.83
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	1.0	0.38
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	1.0	0.37
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	3.0	1.1
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.5	U	2.0	1.5	0.56
754-91-6	Perfluorooctane Sulfonamide (FOSA)	3.0	U	4.0	3.0	1.3

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
SDG No.:	
Client Sample ID:	Lab Sample ID: MB 320-223615/1-A
Matrix: Water	Lab File ID: 2018.05.27LLADX_004.d
Analysis Method: EPA 537 (Mod)	Date Collected:
Extraction Method: 3535	Date Extracted: 05/16/2018 14:51
Sample wt/vol: 250(mL)	Date Analyzed: 05/28/2018 07:23
Con. Extract Vol.: 10(mL)	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup:(Y/N) N
Analysis Batch No.: 225818	Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	71		50-150
STL00992	13C4 PFBA	79		50-150
STL01893	13C5 PFPeA	85		50-150
STL00993	13C2 PFHxA	85		50-150
STL01892	13C4-PFHpA	84		50-150
STL00990	13C4 PFOA	93		50-150
STL00995	13C5 PFNA	94		50-150
STL00996	13C2 PFDA	86		50-150
STL00997	13C2 PFUnA	90		50-150
STL00998	13C2 PFDoA	85		50-150
STL00994	1802 PFHxS	85		50-150
STL02116	13C2-PFTeDA	84		50-150
STL00991	13C4 PFOS	81		50-150
STL02337	13C3-PFBS	80		50-150

Report Date: 30-May-2018 10:59:37 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_004.d

Lims ID: MB 320-223615/1-A

Client ID:

Sample Type: MB

Inject. Date: 28-May-2018 07:23:46 ALS Bottle#: 1 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: mb 320-223615/1-a Misc. Info.: Plate: 1 Rack: 6

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 30-May-2018 10:59:36 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 10:59:36

First Level Revie	First Level Reviewer: ruangyotsakuld					30-May-2018 10:59:36				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	vric acid									
212.90 > 169.00	,	1.452	0.011	1.004	29821	0.0147			11.7	
D 113C4 PFBA										
217.00 > 172.00		1.455	0.003	1.000	5446526	1.97		78.7	28350	
4 Perfluoroper	ntanoic a	cid								
262.90 > 219.00		1.720	0.018	1.005	10871	0.006141			4.1	
D 3 13C5-PFPe	eΑ									
267.90 > 223.00	1.729	1.725	0.004	0.563	3748838	2.11		84.5	37599	
D 47 13C3-PFB	S									
301.90 > 83.00	1.765	1.761	0.004	1.000	74788	1.87		80.3	840	
D 7 13C2 PFHx	Α									
315.00 > 270.00	2.015	2.011	0.004	1.000	4009692	2.12		84.8	76016	
D 64 13C3 HFP	O-DA									
332.10 > 287.00	2.117	2.112	0.005	1.000	199498	NC			4104	
D 913C4-PFHp										
367.00 > 322.00	2.346	2.342	0.004	1.000	3785753	2.09		83.6	60854	
D 11 18O2 PFH	xS									
403.00 > 84.00	2.359	2.355	0.004	1.000	4507323	2.01		85.1	91466	
8 Perfluorohex			I							
399.00 > 80.00		2.359	0.0	1.000	17519	0.008158			93.9	
399.00 > 99.00		2.359	0.0	1.000	5314		3.30(1.50-4.49)		34.8	
D 12 M2-6:2FTS										
429.00 > 81.00		2.665	0.010	1.000	978985	2.45		103	14567	
13 Sodium 1H,		•			4400	0.004555				
427.00 > 407.00		2.675	0.0	1.000	4109	-0.004558			146	
D 14 13C4 PFO										
417.00 > 372.00	2.698	2.695	0.003	1.000	3979429	2.32		92.9	76933	

Data File:	\\Chr	omNa\S	acrament	to\Chrom	Data\A8_N\201	80527-58835	5.b\2018.05.27LLA[OX_004.	d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooc	tanoic ac	cid								М
413.00 > 369.00		2.698	0.007	1.003	11374	0.006071			2.8	M
413.00 > 169.00	2.698	2.698	0.0	1.000	6506		1.75(0.84-2.52)		21.7	
* 62 13C2-PFO	Д									
415.00 > 370.00	2.698	2.698	0.0		4525357	2.50			58203	
D 19 13C5 PFN	Α									
468.00 > 423.00	3.070	3.063	0.007	1.000	3277082	2.34		93.5	102219	
D 18 13C4 PFO										
503.00 > 80.00	3.070	3.063	0.007	1.000	2993992	1.95		81.4	23297	
D 21 13C8 FOS										
506.00 > 78.00	3.404	3.395	0.009	1.000	3590420	1.78		71.3	37045	
D 26 M2-8:2FTS										
529.00 > 81.00		3.413	0.009	1.000	924759	2.03		84.8	25929	
D 23 13C2 PFD										
515.00 > 470.00		3.422	0.010	1.000	2571191	2.16		86.3	55931	
D 27 d3-NMeFC										
573.00 > 419.00		3.572	0.010	1.000	1392614	2.12		84.7	18390	
D 32 d5-NEtFO										
589.00 > 419.00		3.748	-0.001	1.000	1467729	2.17		87.0	18902	
D 30 13C2 PFU										
565.00 > 520.00		3.748	0.009	1.000	2117558	2.24		89.7	39149	
33 N-ethyl perf										
584.00 > 419.00		3.753	0.004	1.003	1532	0.002776			51.0	
66 11-Chloroei										
631.00 > 451.00		3.910	0.004	1.000	1885	NC			36.8	
D 36 13C2 PFD		4.0.15	0.001	4 000	0455047	0.10		0.4.0	47000	
615.00 > 570.00		4.048	-0.001	1.000	2155347	2.12		84.8	17383	
D 43 13C2-PFT			0.005	1 000	0.400475	0.40		0.1.1	4.4005	
715.00 > 670.00		4.542	0.008	1.000	2623175	2.10		84.1	14303	
D 44 13C2-PFH	xDA									

QC Flag Legend

815.00 > 770.00 4.964

813.00 > 769.00 4.972

813.00 > 169.00 4.972

45 Perfluorohexadecanoic acid

4.966 -0.002

4.967 0.005

0.005

4.967

1.000

1.002

1.002

3463314

34450

5849

1.64

NC

5.89(2.86-8.58)

65.4

9434

16.3

56.0

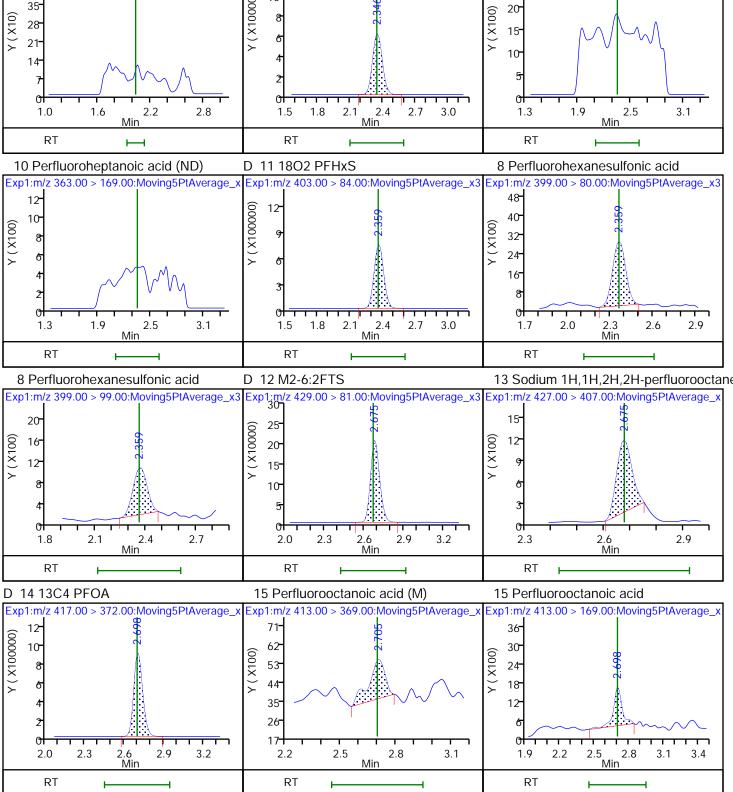
Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 30-May-2018 10:59:37 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento \\ChromNa\\Sacramento\\ChromData\\A8_N\\20180527-58835.b\\2018.05.27LLADX_004.d Data File: **Injection Date:** 28-May-2018 07:23:46 Instrument ID: A8_N Lims ID: MB 320-223615/1-A Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: Worklist Smp#: Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_QSM5-1 ICAL $A8_N$ 2 Perfluorobutyric acid D 113C4 PFBA 4 Perfluoropentanoic acid Y (X100000) 50 Y (X1000) 40 30 20 10 1.2 1.5 1.8 1.0 1.3 1.6 1.9 1.2 1.5 1.8 2.1 Min Min Min RT RT RT D 3 13C5-PFPeA 5 Perfluorobutanesulfonic acid (ND) 5 Perfluorobutanesulfonic acid (ND) Exp1;m/z 267.90 > 223.00:Moving5PtAverage_x Exp1:m/z 298.90 > 80.00:Moving5PtAverage x3 Exp1:m/z 298.90 > 99.00:Moving5PtAverage x3 10 Y (X100000) 55- Y (X100) 33 22 1.9 1.3 1.3 2.2 2.5 1.3 1.9 1.0 1.6 Min 0.7 1.9 2.5 0.7 2.5 Min Min RT RT RT 61 Sodium 1H,1H,2H,2H-perfluorohexadae (NIC)C2 PFHxA D 47 13C3-PFBS Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 327.00 > 307.00:Moving5PtAverage x20 20 (X100000 16 Y (X1000) 16- Y (X10) 12 12 1.7 2.6 0.9 1.5 2.1 2.7 1.7 2.0 2.3 1.4 2.0 2.3 1.4 Min RT RT RT 6 Perfluorohexanoic acid (ND) 6 Perfluorohexanoic acid (ND) 70 Perfluoropentanesulfonic acid (ND) Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 313.00 > 119.00:Moving5PtAverage_> Exp1:m/z 349.00 > 80.00:Moving5PtAverage_x3 54 78 25 65- 45- 20 52 36- 15- 27 39 10 26 13 0ol 1.0 1.6 2.2 2.8 1.0 1.6 2.8 1.0 1.6 2.2 2.8 2.2 Min Min Min RT RT RT Page 667 of 728



3.0

3.6

Min

4.2

3.0

2.4

RT

3.6

Min

4.2

15

2.4

RT

3.4 Min 3.7

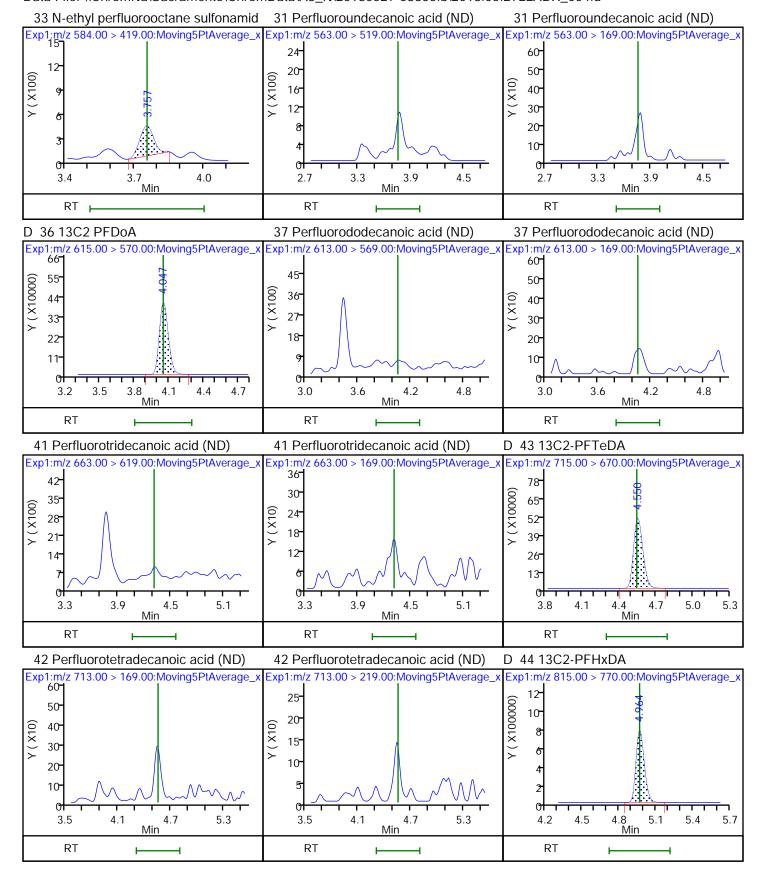
4.0

3.1

2.8

RT

68 Perfluorononanesulfonic acid (ND) D 26 M2-8:2FTS 25 Sodium 1H,1H,2H,2H-perfluorodecane (ND) Exp1:m/z 549.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 529.00 > 81.00:Moving5PtAverage_x3 Exp1:m/z 527.00 > 507.00:Moving5PtAverage_x 40 Y (X10000) 35 20 32 28 15 21 10 14 3.3 Min 3.0 3.6 4.2 3.0 3.6 3.9 3.0 4.2 2.4 2.7 2.4 3.6 Min Min RT RT RT D 23 13C2 PFDA 24 Perfluorodecanoic acid (ND) 24 Perfluorodecanoic acid (ND) Exp1;m/z 513.00 > 169.00:Moving5PtAverage_x Exp1:m/z 515.00 > 470.00:Moving5PtAverage_x Exp1;m/z 513.00 > 469.00:Moving5PtAverage_x 72 Y (X10000) 60 Y (X100) 32 48 24 36 16 24 12 3.9 3.0 3.6 3.0 3.6 4.2 3.0 3.6 4.2 Min Min RT RT RT D 27 d3-NMeFOSAA 28 N-methyl perfluorooctane sulfonami (ND)Perfluorodecane Sulfonic acid (ND) Exp1:m/z 570.00 > 419.00:Moving5PtAverage_x Exp1:m/z 573.00 > 419.00:Moving5PtAverage_x Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 60 30 35 Y (X10000) 50 28 Y (X100) 24 40 21 18 30 20 0 3.7 3.1 3.7 3.3 3.1 3.4 4.0 4.3 2.5 4.3 2.7 3.9 4.5 Min Min Min RT RT RT 29 Perfluorodecane Sulfonic acid (ND) D 32 d5-NEtFOSAA D 30 13C2 PFUnA Exp1:m/z 599.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 589.00 > 419.00:Moving5PtAverage_x Exp1:m/z 565.00 > 520.00:Moving5PtAverage_x Y (X10000) Y (X10000) 55- 36 28 Y (X10) 27 21 33 18 22 3.3 3.9 4.5 3.6 Min 3.9 4.2 3.5 2.7 3.3 4.5 3.2 4.1 4.4 Min RT RT RT



Report Date: 30-May-2018 10:59:37 Chrom Revision: 2.2 11-May-2018 08:54:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_004.d

Injection Date: 28-May-2018 07:23:46 Instrument ID: A8_N

Lims ID: MB 320-223615/1-A

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

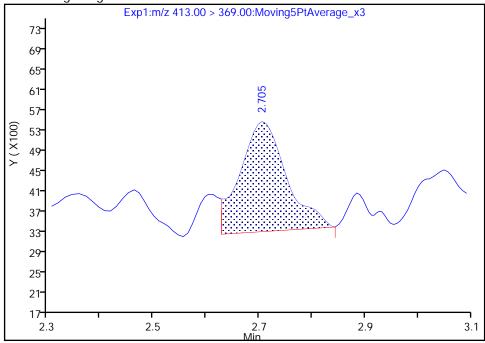
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

Column: Detector EXP1

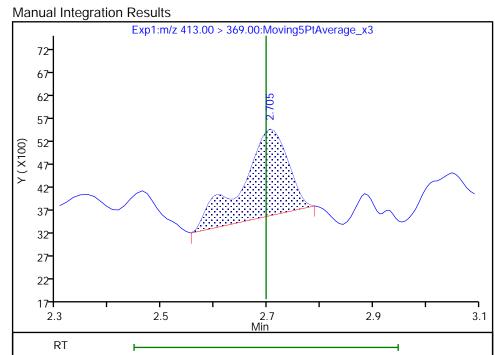
15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

RT: 2.71 Area: 12892 Amount: 0.006881 Amount Units: ng/ml **Processing Integration Results**



RT: 2.71
Area: 11374
Amount: 0.006071
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 10:59:10

Audit Action: Manually Integrated Audit Reason: Isomers

Page 673 of 728

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
SDG No.:	
Client Sample ID:	Lab Sample ID: CCB 320-225818/1
Matrix: Water	Lab File ID: 2018.05.27LLADX_001.d
Analysis Method: EPA 537 (Mod)	Date Collected:
Extraction Method:	Date Extracted:
Sample wt/vol: 1(mL)	Date Analyzed: 05/28/2018 07:00
Con. Extract Vol.:	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup:(Y/N) N
Analysis Batch No.: 225818	Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT Q		LOQ	LOD	DL	
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	Ū	0.050	0.040	0.0088	
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012	
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	Ū	0.050	0.040	0.015	
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063	
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U M	0.050	0.040	0.021	
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U M	0.050	0.040	0.0068	
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U	0.050	0.040	0.0078	
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U	0.050	0.040	0.028	
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014	
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033	
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.040	U	0.050	0.040	0.0073	
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050	
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00664	J	0.050	0.040	0.0043	
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048	
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014	
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080	
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088	

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: <u>320-38875-1</u>
SDG No.:	
Client Sample ID:	Lab Sample ID: CCB 320-225818/1
Matrix: Water	Lab File ID: 2018.05.27LLADX_001.d
Analysis Method: EPA 537 (Mod)	Date Collected:
Extraction Method:	Date Extracted:
Sample wt/vol: 1(mL)	Date Analyzed: 05/28/2018 07:00
Con. Extract Vol.:	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup:(Y/N) N
Analysis Batch No.: 225818	Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	87		50-150
STL00992	13C4 PFBA	90		50-150
STL01893	13C5 PFPeA	98		50-150
STL00993	13C2 PFHxA	95		50-150
STL01892	13C4-PFHpA	96		50-150
STL00990	13C4 PFOA	101		50-150
STL00995	13C5 PFNA	100		50-150
STL00996	13C2 PFDA	98		50-150
STL00997	13C2 PFUnA	97		50-150
STL00998	13C2 PFDoA	97		50-150
STL00994	1802 PFHxS	92		50-150
STL02116	13C2-PFTeDA	99		50-150
STL00991	13C4 PFOS	92		50-150
STL02337	13C3-PFBS	92		50-150

Report Date: 30-May-2018 10:56:58 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_001.d

Lims ID: CCB

Client ID:

Sample Type: CCB

Inject. Date: 28-May-2018 07:00:13 ALS Bottle#: 20 Worklist Smp#: 1

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCB

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 30-May-2018 10:56:57 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 10:56:57

i iisi Levei Keviewei, tuarigyotsakulu				Date. 30-Way-2016 10.30.31						
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA	4									
217.00 > 172.00	1.457	1.455	0.002	1.000	6789729	2.24		89.8	33546	
2 Perfluorobut	•									
212.90 > 169.00		1.463	0.0	1.004	6151	0.002436			2.7	
D 3 13C5-PFPe 267.90 > 223.00		1.725	0.004	0.563	4745420	2.45		97.9	57286	
4 Perfluoropei			0.004	0.505	4745420	2.40		91.9	37200	
262.90 > 219.00		1.728	0.001	1.000	5819	0.002597			3.3	
D 47 13C3-PFB	S									
301.90 > 83.00	1.765	1.761	0.004	1.000	93713	2.14		92.0	894	
D 60 M2-4:2FTS										
329.00 > 81.00		1.977	0.003	1.000	771982	NC			7061	
D 7 13C2 PFHx 315.00 > 270.00		2.011	0.003	1.000	4892166	2.37		94.6	84058	
D 64 13C3 HFP		2.011	0.003	1.000	4072100	2.57		74.0	04030	
332.10 > 287.00		2.112	0.003	1.000	258797	NC			5700	
D 9 13C4-PFH _I	οΑ									
367.00 > 322.00	2.345	2.342	0.003	1.000	4771178	2.41		96.3	63959	
D 11 1802 PFH										
403.00 > 84.00		2.355	0.003	1.000	5325795	2.18		92.0	45402	
8 Perfluorohex 399.00 > 80.00		onic acid 2.358	I 0.0	1.000	16851	0.006641			92.7	
399.00 > 99.00		2.358	0.0	1.000	5748	0.000041	2.93(1.50-4.49)		41.5	
D 12 M2-6:2FT	5						,			
429.00 > 81.00	2.682	2.665	0.017	1.000	1126259	2.58		108	18147	
D 14 13C4 PFO										
417.00 > 372.00	2.704	2.695	0.009	1.000	4719368	2.52		101	58239	

Report Date: 30-May-2018 10:56:58 Chrom Revision: 2.2 11-May-2018 08:54:46

\\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_001.d Data File:

Data File.	WCIIIC	JIIIVa	acramen		Dala (Ao_IV\201	00027-00000	0.012016.03.27LLAL	JA_001.	u	
		EXP	DLT	REL		Amount				
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooct	anoic ac	cid								М
413.00 > 369.00	2.704	2.704	0.0	1.000	9792	0.004407			2.9	
413.00 > 169.00	2.697	2.704	-0.007	0.997	2116		4.63(0.84-2.52)		9.7	M
* 62 13C2-PFOA										
415.00 > 370.00		2.704	0.0		4948330	2.50			41670	
D 19 13C5 PFN/		20/2	0.007	1 000	2020212	2.40		00.7	F2007	
468.00 > 423.00		3.063	0.006	1.000	3820313	2.49		99.7	53887	
D 18 13C4 PFOS 503.00 > 80.00		3.063	0.006	1.000	3705227	2.20		92.1	25095	
D 21 13C8 FOSA		3.003	0.000	1.000	3703227	2.20		7Z. I	23073	
506.00 > 78.00		3.395	0.016	1.000	4807546	2.18		87.3	41098	
22 Perfluorooct					.0070.0	20		07.10		
498.00 > 78.00			-0.009	0.997	2664	0.001423			53.4	
D 26 M2-8:2FTS	;									
529.00 > 81.00	3.420	3.413	0.007	1.000	1176486	2.36		98.7	17617	
D 23 13C2 PFD	4									
515.00 > 470.00	3.430	3.422	0.008	1.000	3208441	2.46		98.4	56815	
D 27 d3-NMeFO										
573.00 > 419.00		3.572	0.007	1.000	2037250	2.83		113	20933	
D 32 d5-NEtFOS										
589.00 > 419.00		3.748	0.005	1.000	2054569	2.78		111	21879	
D 30 13C2 PFUr		2.740	0.015	1 000	250/201	2.42		07.1	F00//	
565.00 > 520.00		3.748	0.015	1.000	2506391	2.43		97.1	50866	
33 N-ethyl perfl 584.00 > 419.00			onamid -0.001	1.003	1440	0.001864			28.1	
D 36 13C2 PFDc		3.704	-0.001	1.003	1440	0.001004			20.1	
615.00 > 570.00		4.048	0.003	1.000	2700937	2.43		97.2	19389	
D 43 13C2-PFTe			0.000	1.000	2,00,0,	2.10		,,	17007	
715.00 > 670.00		4.542	0.010	1.000	3384862	2.48		99.3	12591	
D 44 13C2-PFH)										
815.00 > 770.00		4.966	-0.001	1.000	6276492	2.71		108	12749	
45 Perfluorohex	kadecan	oic acid								
813.00 > 769.00	4.965	4.976	-0.011	1.000	54340	NC			22.7	
813.00 > 169.00	4.974	4.976	-0.002	1.002	9124		5.96(2.86-8.58)		77.8	

OC Flag Legend Processing Flags

NC - Not Calibrated

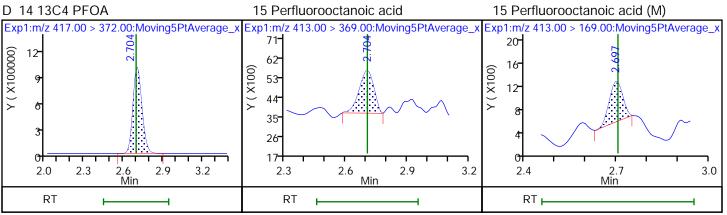
Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL0_00006 Amount Added: 1.00 Units: mL

Report Date: 30-May-2018 10:56:58 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento \\ChromNa\\Sacramento\\ChromData\\A8_N\\20180527-58835.b\\2018.05.27LLADX_001.d Data File: **Injection Date:** 28-May-2018 07:00:13 Instrument ID: A8_N Lims ID: CCB Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 1 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_QSM5-1 ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 3 13C5-PFPeA Exp1;m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x Y (X100000) Y (X100000) 40 Y (X100) 12 33 26- 19 12 1.0 1.6 1.9 1.0 1.3 1.6 1.9 1.0 1.3 1.9 2.2 2.5 Min Min Min RT RT RT 4 Perfluoropentanoic acid D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid (ND) Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 Exp1:m/z 262.90 > 219.00:Moving5PtAverage x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 66- 25 10 57 Y (X1000) 20 48- 15- 39 10 30 21 1.6 <u>Min</u> 1.3 1.9 1.4 1.7 2.0 1.9 1.3 1.1 2.3 0.7 2.5 Min Min RT RT RT 5 Perfluorobutanesulfonic acid (ND) 61 Sodium 1H,1H,2H,2H-perfluorohexable (NIC)C2 PFHxA Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x Exp1:m/z 298.90 > 99.00:Moving5PtAverage x3 78 35 (X100000 65 Y (X10) Y (X10) 28 52 21 39 14 26 13 2.6 0.9 1.5 2.1 2.7 1.7 2.0 1.3 1.9 2.5 1.4 2.3 0.7 Min Min RT RT RT 6 Perfluorohexanoic acid (ND) 6 Perfluorohexanoic acid (ND) 70 Perfluoropentanesulfonic acid (ND) Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 313.00 > 119.00:Moving5PtAverage_ Exp1:m/z 349.00 > 80.00:Moving5PtAverage_x3 60 30 55- 50 25 Y (X100) Y (X10) 44 40 20 33 30 15- 22 10 20 10 ol 0 2.2 2.8 1.0 1.6 2.2 2.8 1.0 2.2 2.8 1.6 1.6 1.0 Min Min Min RT RT RT Page 678 of 728



3.3 <u>Min</u>

3.0

RT

3.6

3.0

RT

3.9

3.6

2.9

RT

3.5

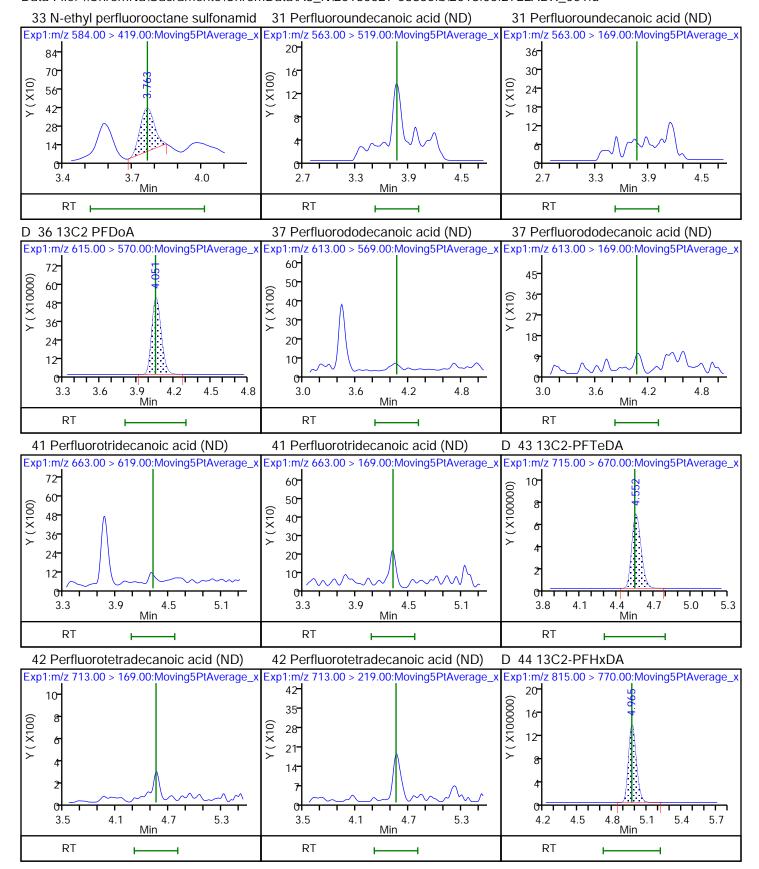
Min

3.8

68 Perfluorononanesulfonic acid (ND)

68 Perfluorononanesulfonic acid (ND) D 23 13C2 PFDA

Exp1:m/z 549.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 549.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 515.00 > 470.00:Moving5PtAverage_x 90 65- 55- Y (X10000) 75 Y (X10) 52 44 60 39 33 45- 22 26- 30 13 15 3.0 3.6 4.2 3.0 3.6 4.2 2.6 2.9 3.2 3.5 3.8 2.4 2.4 4.1 Min Min Min RT RT RT \mathbf{H} 25 Sodium 1H,1H,2H,2H-perfluorodecan@4(MPD)fluorodecanoic acid (ND) 24 Perfluorodecanoic acid (ND) Exp1:m/z 513.00 > 169.00:Moving5PtAverage_x 90 66- 12 75 10 55 Y (X100) 60 44 45- 33 30 22 15- 4.2 3.0 3.6 2.4 3.0 3.6 4.2 3.0 3.6 4.2 Min Min Min RT RT RT D 27 d3-NMeFOSAA 28 N-methyl perfluorooctane sulfonami (ND)Perfluorodecane Sulfonic acid (ND) Exp1:m/z 573.00 > 419.00:Moving5PtAverage_x Exp1:m/z 570.00 > 419.00:Moving5PtAverage_x Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 54 20 Y (X10000) 45- 60 Y (X100) 16 36- 48 12 27 36 24 18 0 3.6 3.3 3.9 3.1 3.7 3.3 3.0 2.5 4.3 2.7 3.9 4.5 Min Min Min RT RT RT 29 Perfluorodecane Sulfonic acid (ND) D 32 d5-NEtFOSAA D 30 13C2 PFUnA Exp1:m/z 599.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 589.00 > 419.00:Moving5PtAverage_x Exp1:m/z 565.00 > 520.00:Moving5PtAverage_x 60 36- 66- Y (X10000) 50 Y (X10000) 30 55- Y (X10) 40 24 44 30 18 33 20 12 22 0 3.6 <u>Min</u> 3.3 3.9 4.5 3.3 3.9 4.2 2.7 4.5 3.4 4.0 4.3 3.1 Min RT RT RT



Report Date: 30-May-2018 10:56:58 Chrom Revision: 2.2 11-May-2018 08:54:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_001.d

Injection Date: 28-May-2018 07:00:13 Instrument ID: A8_N

Lims ID: CCB

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 1

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

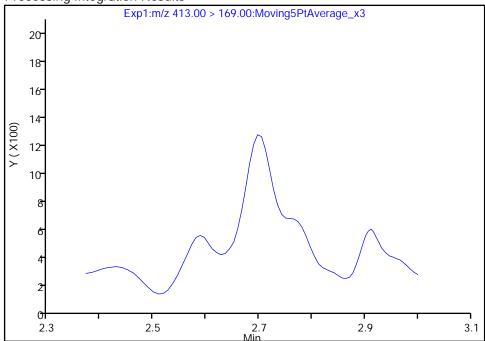
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

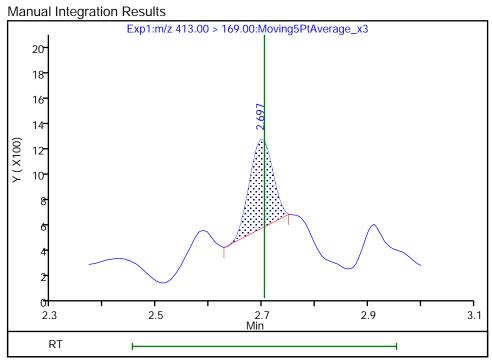
Signal: 2

RT: 2.70 Area: 0

Amount: 0.004407 Amount Units: ng/ml **Processing Integration Results**



RT: 2.70
Area: 2116
Amount: 0.004407
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 10:55:04

Audit Action: Manually Integrated

Audit Reason: Assign Peak

Page 684 of 728

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
SDG No.:	
Client Sample ID:	Lab Sample ID: <u>CCB 320-225873/1</u>
Matrix: Water	Lab File ID: 2018.05.28LLA_003.d
Analysis Method: EPA 537 (Mod)	Date Collected:
Extraction Method:	Date Extracted:
Sample wt/vol: 1(mL)	Date Analyzed: 05/28/2018 17:14
Con. Extract Vol.:	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup: (Y/N) N
Analysis Batch No.: 225873	Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOO	LOD	DL
C110 110 .	COIII COND WILL	RECOLI	2	ПОФ	HOD	
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	Ū	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U M	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	Ū	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	Ū	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	Ū	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.040	Ū	0.050	0.040	0.0073
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	Ū	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00671	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	Ū	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	Ū	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
SDG No.:	
Client Sample ID:	Lab Sample ID: <u>CCB 320-225873/1</u>
Matrix: Water	Lab File ID: 2018.05.28LLA_003.d
Analysis Method: EPA 537 (Mod)	Date Collected:
Extraction Method:	Date Extracted:
Sample wt/vol: 1(mL)	Date Analyzed: 05/28/2018 17:14
Con. Extract Vol.:	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3 (mm)
% Moisture:	GPC Cleanup: (Y/N) N
Analysis Batch No.: 225873	Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	91		50-150
STL00992	13C4 PFBA	92		50-150
STL01893	13C5 PFPeA	102		50-150
STL00993	13C2 PFHxA	98		50-150
STL01892	13C4-PFHpA	99		50-150
STL00990	13C4 PFOA	104		50-150
STL00995	13C5 PFNA	104		50-150
STL00996	13C2 PFDA	102		50-150
STL00997	13C2 PFUnA	103		50-150
STL00998	13C2 PFDoA	105		50-150
STL00994	1802 PFHxS	98		50-150
STL02116	13C2-PFTeDA	101		50-150
STL00991	13C4 PFOS	95		50-150
STL02337	13C3-PFBS	89		50-150

Report Date: 30-May-2018 09:29:53 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_003.d

Lims ID: CCB

Client ID:

Sample Type: CCB

Inject. Date: 28-May-2018 17:14:20 ALS Bottle#: 20 Worklist Smp#: 1

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCB

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 30-May-2018 09:29:52 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK014

First Level Reviewer: mongkols Date: 30-May-2018 09:29:52

First Leve	-irst Level Reviewer: mongkols Date: 30-May-2018 09:29:52										
Sigr	nal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C	4 PFBA										
217.00 >			1.458	-0.008	1.000	6623088	2.29		91.7	35908	
2 Perflu	uorobut	yric acid									
212.90 >	-	•	1.464	-0.014	1.000	3722	0.001511			1.5	
D 313C	5-PFPe	A									
267.90 >	223.00	1.716	1.730	-0.014	0.562	4719436	2.55		102	65588	
4 Perflu	uoropen	itanoic a	cid								
262.90 >	219.00	1.707	1.739	-0.032	0.995	5660	0.002540			3.1	
D 47 130	C3-PFBS	S									
301.90 >	83.00	1.752	1.766	-0.014	1.000	86157	2.06		88.5	714	
D 60 M2	-4:2FTS	;									
329.00 >	81.00	1.967	1.982	-0.015	1.000	772053	NC			8943	
D 713C											
315.00 >	270.00	2.011	2.015	-0.004	1.000	4825710	2.44		97.8	117484	
D 64 130											
332.10 >	287.00	2.101	2.117	-0.016	1.000	226766	NC			3802	
D 913C											
367.00 >	322.00	2.329	2.347	-0.018	1.000	4705920	2.49		99.5	62242	
D 11 180											
403.00 >	84.00	2.355	2.360	-0.005	1.000	5401518	2.31		97.7	45376	
		anesulfo									
399.00 >			2.373	-0.018	1.000	17257	0.006705			64.9	
399.00 >			2.373	-0.018	1.000	4789		3.60(1.50-4.49)		25.9	
D 12 M2			0.400	0.010	1 000	1100000	0.74			45700	
429.00 >			2.683	-0.018	1.000	1129938	2.71		114	15729	
D 14 130											
417.00 >			2.706	-0.018	1.000	4650909	2.60		104	62361	
* 62 13C			0.746			1705106	0.50			47707	
415.00 >	3/0.00	2.688	2.713	-0.025		P4365689 of 7	728 2.50			47727	

Report Date: 30-May-2018 09:29:53 Chrom Revision: 2.2 11-May-2018 08:54:46 \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_003.d Data File:

Data i ile.	WOTH	minas	acrament	OCHION	Data A6_N\201	00327-30044	1.012010.05.20LLA_	_003.u		
		EXP	DLT	REL		Amount				
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooct	anoic ac	id:								
413.00 > 369.00		2.713	-0.033	0.997	12741	0.005819			4.9	
413.00 > 169.00		2.713	-0.018	1.003	6150		2.07(0.84-2.52)		18.2	
D 19 13C5 PFNA	4									
468.00 > 423.00	3.053	3.074	-0.021	1.000	3806995	2.60		104	68907	
D 18 13C4 PFOS	S									
503.00 > 80.00	3.053	3.074	-0.021	1.000	3630380	2.26		94.5	28456	
D 21 13C8 FOSA	Д									
506.00 > 78.00	3.398	3.412	-0.014	1.000	4802336	2.28		91.3	47786	
D 26 M2-8:2FTS	;									
529.00 > 81.00		3.430	-0.023	1.000	1218459	2.56		107	18380	
D 23 13C2 PFD/	4									
515.00 > 470.00		3.439	-0.023	1.000	3183003	2.56		102	41692	
D 27 d3-NMeFO	SAA									
573.00 > 419.00		3.590	-0.025	1.000	1930964	2.81		112	24483	
D 32 d5-NEtFOS	SAA									
589.00 > 419.00		3.754	-0.025	1.000	2014117	2.86		114	15763	
31 Perfluoround	decanoio	acid								R
563.00 > 519.00		3.764	-0.014	1.003	3099	0.003649			18.2	R
563.00 > 169.00	3.750	3.764	-0.014	1.003	2869		1.08(2.12-6.36)		64.3	
33 N-ethyl perfl	uoroocta	ane sulfo	onamid							
584.00 > 419.00	3.729	3.764	-0.035	1.000	1758	0.002321			36.3	
D 30 13C2 PFUr	nΑ									
565.00 > 520.00	3.740	3.765	-0.025	1.000	2542433	2.58		103	52042	
D 36 13C2 PFD	ρA									
615.00 > 570.00		4.055	-0.026	1.000	2783322	2.62		105	19313	
D 43 13C2-PFTe	eDA									
715.00 > 670.00		4.550	-0.019	1.000	3279832	2.52		101	19970	
D 44 13C2-PFH)	хDА									
815.00 > 770.00		4.964	-0.025	1.000	6102863	2.76		110	14996	
45 Perfluorohex		oic acid								
813.00 > 769.00		4.972	-0.033	1.000	51325	NC			22.1	
813.00 > 169.00			-0.025	1.002	7838		6.55(2.86-8.58)		90.8	

QC Flag Legend Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL0_00006 Amount Added: 1.00 Units: mL

Report Date: 30-May-2018 09:29:53 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento \ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_003.d Data File: **Injection Date:** 28-May-2018 17:14:20 Instrument ID: A8_N Lims ID: **CCB** Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 1 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_QSM5-1 ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 3 13C5-PFPeA Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1;m/z 267.90 > 223.00:Moving5PtAverage_x Y (X100000) Y (X100000 Y (X100) 12 34 27 20 13 1.4 Min 1.0 1.6 1.9 1.1 1.7 1.2 1.5 1.8 2.1 Min Min RT RT RT 4 Perfluoropentanoic acid D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid (ND) Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 24 90 49 20 75 Y (X1000) 41 16- 60 33 12 45 25 30 17 15- 1.6 <u>Min</u> 1.7 Min 1.9 1.4 2.0 1.3 1.9 1.3 1.1 2.3 0.7 2.5 Min RT RT RT 5 Perfluorobutanesulfonic acid (ND) 61 Sodium 1H,1H,2H,2H-perfluorohexaDe (NID)C2 PFHxA Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 60 30 Y (X100000 50 24 Y (X10) Y (X10) 40 18 30 12 20 10 1.3 0.9 1.5 2.1 2.7 2.2 1.9 2.5 1.0 1.6 2.8 0.7 Min Min Min RT RT RT 6 Perfluorohexanoic acid (ND) 6 Perfluorohexanoic acid (ND) 70 Perfluoropentanesulfonic acid (ND) Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 313.00 > 119.00:Moving5PtAverage_ Exp1:m/z 349.00 > 80.00:Moving5PtAverage_x3 78 30 65- 65- 25 Y (X100) 52 Y (X10) 52 20 39 39 15- 26 10 26 13 13 ol 002.2 1.0 1.6 2.2 2.8 1.0 2.8 1.0 1.6 2.2 2.8 1.6 Min Min Min RT RT RT Page 689 of 728

2.8

Min

3.1

3.4

2.2

RT

2.2

RT

2.8

3.1

3.4

28

2.3

RT

2.6 <u>Min</u>

2.9

3.0

3.6

Min

4.2

3.0

3.6

Min

2.4

RT

4.2

13

2.4

RT

4.2

3.0

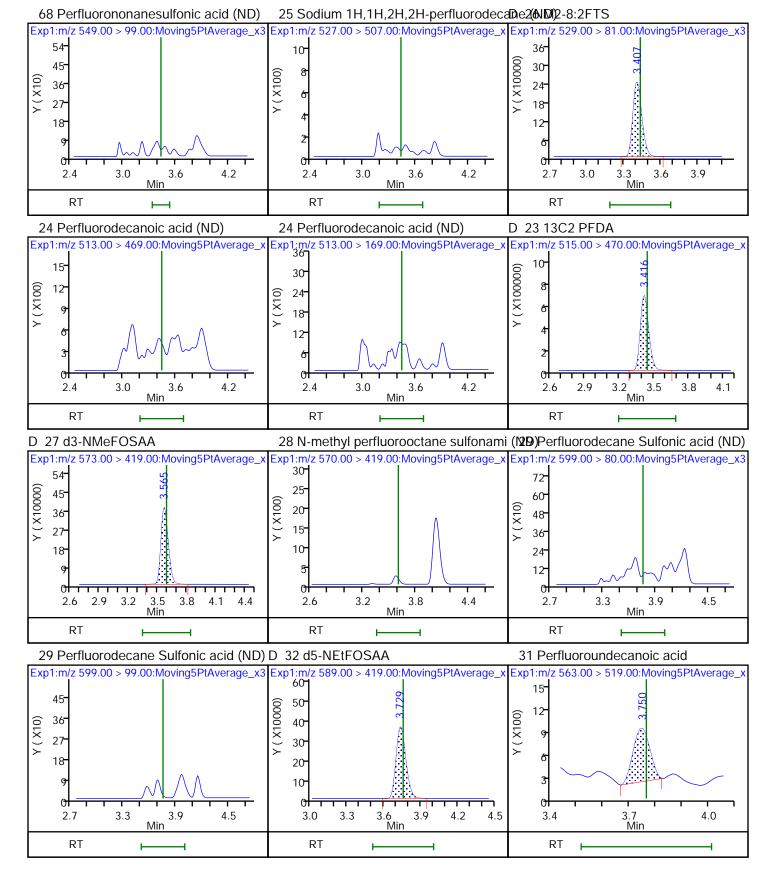
3.6

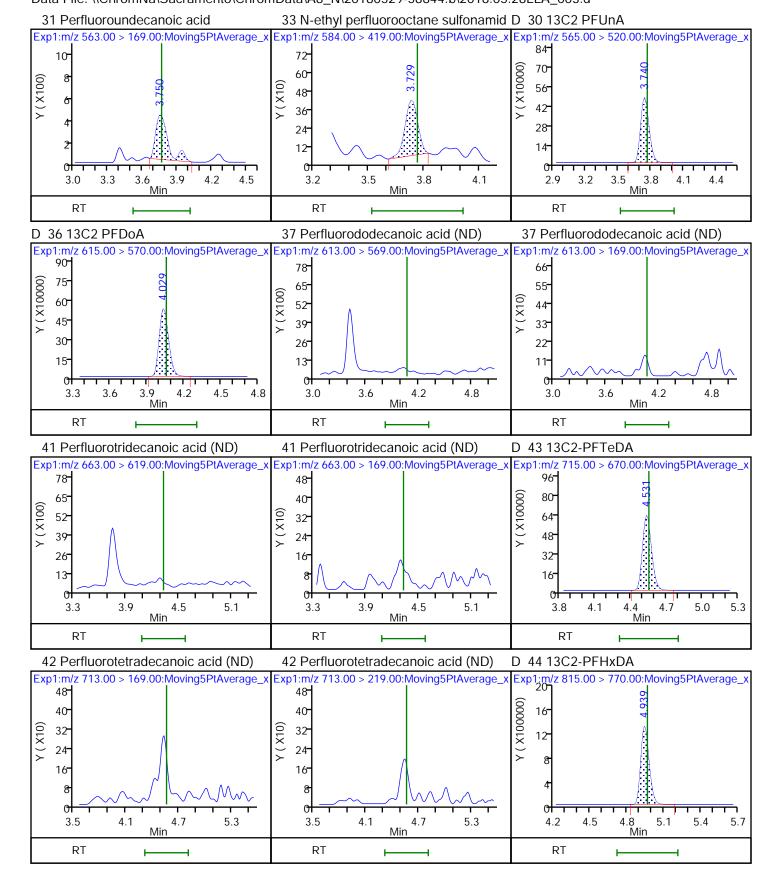
Min

2.4

RT

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_003.d





Report Date: 30-May-2018 09:29:53 Chrom Revision: 2.2 11-May-2018 08:54:46

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_003.d

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
SDG No.:	
Client Sample ID:	Lab Sample ID: <u>ICB 320-223413/12</u>
Matrix: Water	Lab File ID: 2018.05.15LLCC_ICAL_009.d
Analysis Method: EPA 537 (Mod)	Date Collected:
Extraction Method:	Date Extracted:
Sample wt/vol: 1(mL)	Date Analyzed: 05/15/2018 17:15
Con. Extract Vol.:	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup:(Y/N) N
Analysis Batch No.: 223413	Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	Ū	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U M	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U M	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U M	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.040	U	0.050	0.040	0.0073
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00611	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: <u>320-388/5-1</u>
SDG No.:	
Client Sample ID:	Lab Sample ID: ICB 320-223413/12
Matrix: Water	Lab File ID: 2018.05.15LLCC_ICAL_009.d
Analysis Method: EPA 537 (Mod)	Date Collected:
Extraction Method:	Date Extracted:
Sample wt/vol: 1(mL)	Date Analyzed: 05/15/2018 17:15
Con. Extract Vol.:	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup:(Y/N) N
Analysis Batch No.: 223413	Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	99		50-150
STL00992	13C4 PFBA	93		50-150
STL01893	13C5 PFPeA	97		50-150
STL00993	13C2 PFHxA	97		50-150
STL01892	13C4-PFHpA	99		50-150
STL00990	13C4 PFOA	97		50-150
STL00995	13C5 PFNA	96		50-150
STL00996	13C2 PFDA	98		50-150
STL00997	13C2 PFUnA	101		50-150
STL00998	13C2 PFDoA	98		50-150
STL00994	1802 PFHxS	99		50-150
STL02116	13C2-PFTeDA	102		50-150
STL00991	13C4 PFOS	95		50-150
STL02337	13C3-PFBS	93		50-150

Report Date: 16-May-2018 09:20:40 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLCC_ICAL_009.d

Lims ID: ICB

Client ID:

Sample Type: ICB

Inject. Date: 15-May-2018 17:15:15 ALS Bottle#: 20 Worklist Smp#: 12

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: ICB

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 16-May-2018 09:20:35 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK037

First Level Reviewer: hannigana Date: 15-May-2018 17:27:45

I II St Level Kevie	wei. Hali	iriiyaria			Date.	13	3-101ay-2010 17.27.4	10		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA 217.00 > 172.00	1.461	1.462	-0.001	1.000	6834002	2.32		92.9	44424	
2 Perfluorobuty 212.90 > 169.00	1.428	1.462	-0.034	0.977	1934	0.000761			1.1	
D 3 13C5-PFPe 267.90 > 223.00	1.735	1.744	-0.009	0.560	4554901	2.42		96.6	70172	
4 Perfluoropen 262.90 > 219.00	1.753	cid 1.745	0.008	1.010	3325	0.001546			2.0	M M
D 47 13C3-PFBS 301.90 > 83.00	1.771	1.780	-0.009	1.000	91731	2.15		92.6	637	
D 60 M2-4:2FTS 329.00 > 81.00	1.988	1.999	-0.011	1.000	682133	NC			10323	
D 7 13C2 PFHx. 315.00 > 270.00	2.034	2.037	-0.003	1.000	4878847	2.43		97.0	80794	
D 64 13C3 HFP0 332.10 > 287.00	2.135	2.134	0.001	1.000	218558	NC			3998	
D 9 13C4-PFHp 367.00 > 322.00	2.369			1.000	4755233	2.47		98.7	85391	
8 Perfluorohex 399.00 > 80.00 399.00 > 99.00	2.381	onic acid 2.386 2.386	-0.005 0.006	1.000 1.005	16271 5655	0.006109	2.88(1.50-4.49)		134 29.1	
D 11 18O2 PFHX 403.00 > 84.00	2.381	2.386	-0.005	1.000	5590477	2.35		99.3	65287	
D 12 M2-6:2FTS 429.00 > 81.00	2.703	2.707	-0.004	1.000	956734	2.25		94.7	16650	
D 14 13C4 PFOA 417.00 > 372.00		2.731	-0.005	1.000	4440901	2.44		97.5	70177	

Report Date: 16-May-2018 09:20:40 Chrom Revision: 2.2 11-May-2018 08:54:46

\\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLCC_ICAL_009.d Data File:

Data File:	WCHIC	minasa	acrament	OCHION	Data (A8_IN\201	80515-5821	7.D\2018.05.15LLC	J_ICAL_	<u>.009.u</u>	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooct	anoic ac	id								М
413.00 > 369.00			-0.008	1.000	10716	0.005125			3.8	
413.00 > 169.00	2.734	2.734	0.0	1.003	4691		2.28(0.84-2.52)		17.4	M
* 62 13C2-PFOA										
415.00 > 370.00		2.734	-0.008		4812155	2.50			53339	
D 18 13C4 PFOS		0.404	0.007	4 000	070/04/	0.07		0.4.0	01/01	
503.00 > 80.00		3.104	-0.006	1.000	3706216	2.26		94.8	31694	
D 19 13C5 PFNA 468.00 > 423.00		3.107	-0.009	1.000	3591643	2.41		96.4	63691	
D 21 13C8 FOSA		3.107	-0.009	1.000	3391043	2.41		90.4	03091	
506.00 > 78.00		3.420	-0.002	1.000	5286237	2.47		98.7	45431	
D 26 M2-8:2FTS		00	0.002		0200207			70.7		
529.00 > 81.00		3.459	-0.004	1.000	1260135	2.60		109	22405	
D 23 13C2 PFD	4									
515.00 > 470.00	3.464	3.468	-0.004	1.000	3105206	2.45		98.0	43198	
D 27 d3-NMeFO	SAA									
573.00 > 419.00	3.619	3.624	-0.005	1.000	1696051	2.42		97.0	26254	
D 32 d5-NEtFOS										
589.00 > 419.00		3.794	-0.011	1.000	1827491	2.55		102	9869	
D 30 13C2 PFUr		0.000	0.007	4 000	0500004	0.50		404	50747	
565.00 > 520.00		3.800	-0.007	1.000	2538884	2.53		101	59716	
D 36 13C2 PFDc 615.00 > 570.00		4 000	-0.007	1.000	2646709	2.45		98.0	20316	
D 43 13C2-PFTe		4.099	-0.007	1.000	2040709	2.43		90.0	20310	
715.00 > 670.00		4 608	-0.004	1.000	3368294	2.54		102	17469	
D 44 13C2-PFH)		1.000	0.001	1.000	0000271	2.01		102	17107	
815.00 > 770.00		5.030	-0.012	1.000	5921904	2.63		105	13794	
45 Perfluorohex										
813.00 > 769.00		5.031	-0.013	1.000	54017	NC			13.7	
813.00 > 169.00	5.018	5.031	-0.013	1.000	8963		6.03(2.86-8.58)		81.6	

QC Flag Legend Processing Flags

NC - Not Calibrated

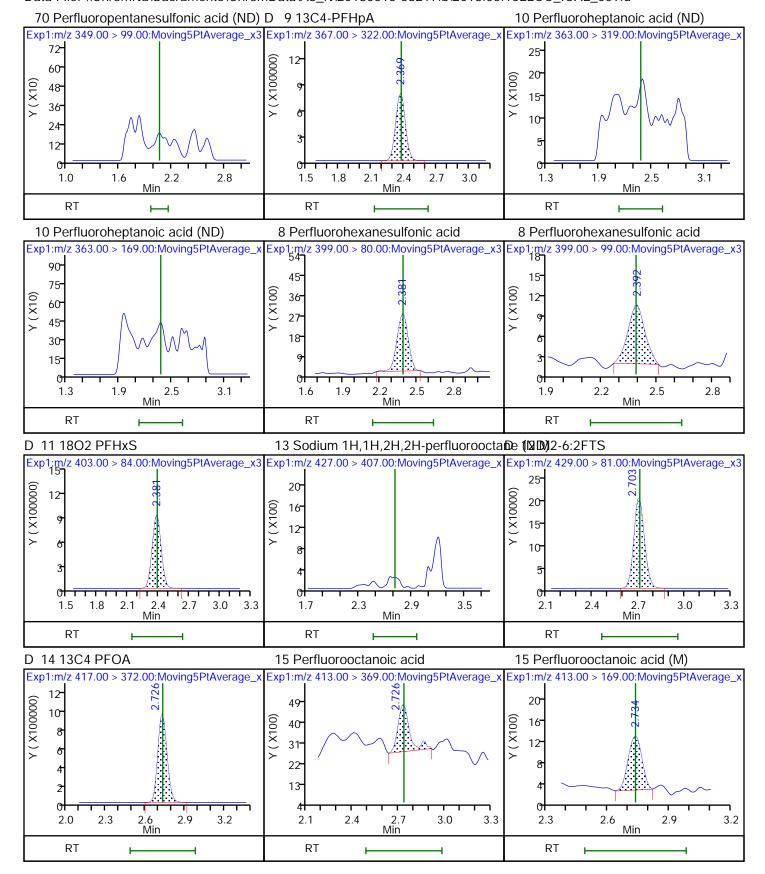
Review Flags

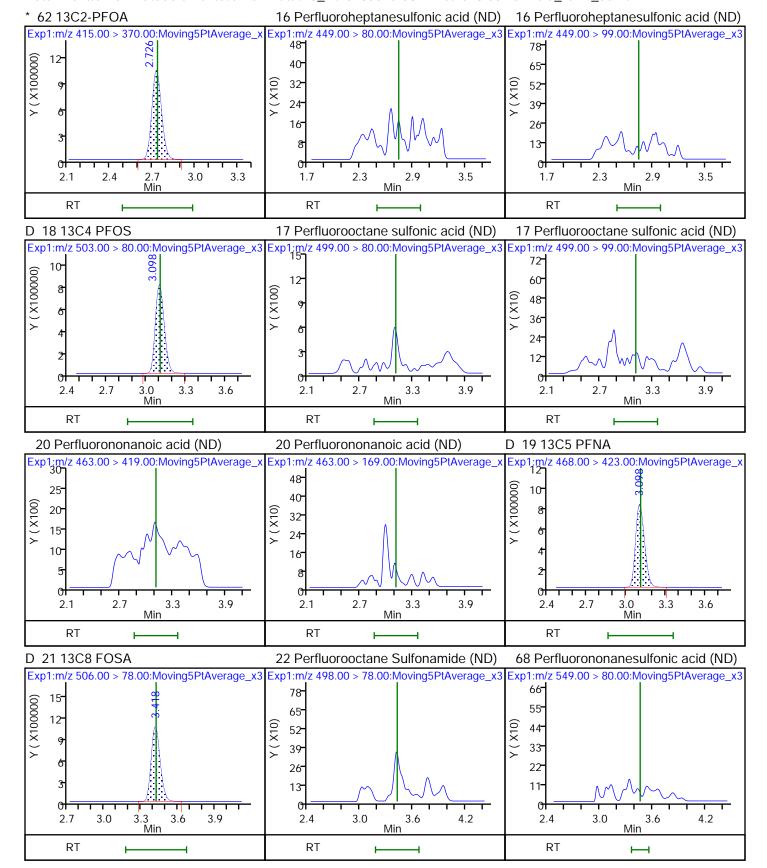
M - Manually Integrated

Reagents:

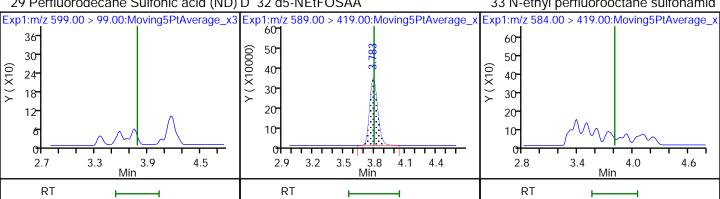
LCPFC_LL0_00006 Units: mL Amount Added: 1.00

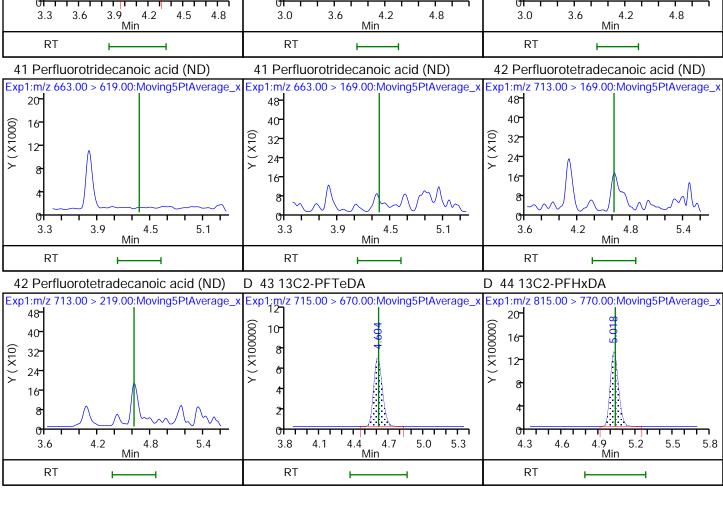
Report Date: 16-May-2018 09:20:40 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento \\ChromNa\\Sacramento\\ChromData\\A8_N\\20180515-58217.b\\2018.05.15LLCC_ICAL_009.d Data File: **Injection Date:** 15-May-2018 17:15:15 Instrument ID: A8_N Lims ID: **ICB** Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 12 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_QSM5-1 ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 3 13C5-PFPeA Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x 43 Y (X100000) Y (X100000) 37 10 12 31 25 19 13 1.0 1.6 1.9 1.2 1.5 1.2 1.5 1.8 2.1 Min Min Min RT ŖŢ RT 4 Perfluoropentanoic acid (M) D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid (ND) Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 Exp1:m/z 262.90 > 219.00:Moving5PtAverage x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 66- 10 59 Y (X1000) 16- 52 12 45 38 31 1.8 1.4 1.7 2.0 1.3 1.5 1.1 2.3 0.7 1.9 2.5 Min Min Min RI RT RT 5 Perfluorobutanesulfonic acid (ND) 61 Sodium 1H,1H,2H,2H-perfluorohexane6(Re)fluorohexanoic acid (ND) Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 90 30 75 Y (X100) 24 Y (X10) Y (X10) 24 60 18 18 45- 12 12 30 0.9 1.5 2.1 1.3 1.9 2.5 2.7 1.0 1.6 2.2 2.8 0.7 Min Min Min RT RT RT 6 Perfluorohexanoic acid (ND) 7 13C2 PFHxA 70 Perfluoropentanesulfonic acid (ND) Exp1;m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 349.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 315.00 > 270.00:Moving5PtAverage_ (X100000) 30 50 10 24 40 18 30 12 20 02.8 2.4 2.2 2.8 1.0 1.6 2.2 1.5 1.8 2.1 1.6 1.2 2.7 1.0 Min Min RT RT RT Page 699 of 728





Chrom Revision: 2.2 11-May-2018 08:54:46 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLCC_ICAL_009.d 25 Sodium 1H,1H,2H,2H-perfluorodecabe261012-8:2FTS 68 Perfluorononanesulfonic acid (ND) Exp1:m/z 549.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 527.00 > 507.00:Moving5PtAverage_x Exp1:m/z 529.00 > 81.00:Moving5PtAverage_x3 66 78 30 55 65 Y (X10000) Y (X10) 24 44 52 39 18 33 12 22 26 11 13 3.0 3.6 4.2 2.4 3.0 3.6 4.2 3.0 3.3 3.6 3.9 2.4 2.7 Min Min Min RT RT RT 24 Perfluorodecanoic acid (ND) 24 Perfluorodecanoic acid (ND) D 23 13C2 PFDA Exp1:m/z 513.00 > 469.00:Moving5PtAverage_x Exp1:m/z 513.00 > 169.00:Moving5PtAverage_x Exp1:m/z 515.00 > 470.00:Moving5PtAverage_x 18 84 54 Y (X10000) 70 45- 12 36 56 27 42 18 28 3.6 3.0 3.6 4.2 2.4 3.0 3.6 4.2 3.0 3.9 Min Min Min RT RT RT D 27 d3-NMeFOSAA 28 N-methyl perfluorooctane sulfonami (ND)Perfluorodecane Sulfonic acid (ND) Exp1:m/z 570.00 > 419.00:Moving5PtAverage_x Exp1:m/z 573.00 > 419.00:Moving5PtAverage_x Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 48 20 84 Y (X10000) 40 70 16 Y (X100) 32 56 12 24 42 16 28 3.2 3.7 3.8 3.3 3.1 3.4 4.0 2.6 4.4 2.7 3.9 4.5 Min Min Min RT RT RT 29 Perfluorodecane Sulfonic acid (ND) D 32 d5-NEtFOSAA 33 N-ethyl perfluorooctane sulfonamid (ND) Exp1:m/z 599.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 589.00 > 419.00:Moving5PtAverage_x Exp1:m/z 584.00 > 419.00:Moving5PtAverage x 36- 60 50 30 50





 Report Date: 16-May-2018 09:20:40 Chrom Revision: 2.2 11-May-2018 08:54:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLCC_ICAL_009.d

Injection Date: 15-May-2018 17:15:15 Instrument ID: A8_N

Lims ID: ICB

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 12

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

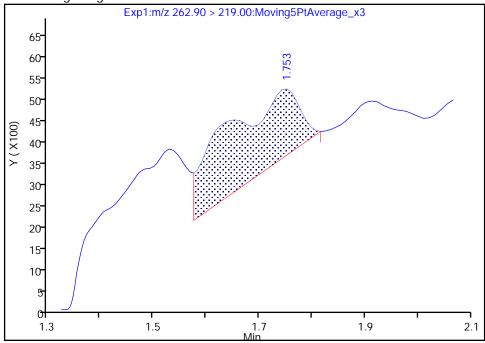
Column: Detector EXP1

4 Perfluoropentanoic acid, CAS: 2706-90-3

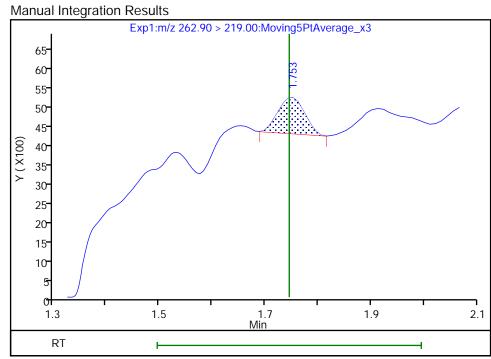
Signal: 1

RT: 1.75
Area: 18320
Amount: 0.008518
Amount Units: ng/ml

Processing Integration Results



RT: 1.75
Area: 3325
Amount: 0.001546
Amount Units: ng/ml



Reviewer: hannigana, 16-May-2018 08:05:33

Audit Action: Manually Integrated

Audit Reason: Baseline

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Report Date: 16-May-2018 09:20:40 Chrom Revision: 2.2 11-May-2018 08:54:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLCC_ICAL_009.d

Injection Date: 15-May-2018 17:15:15 Instrument ID: A8_N

Lims ID: ICB

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 12

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

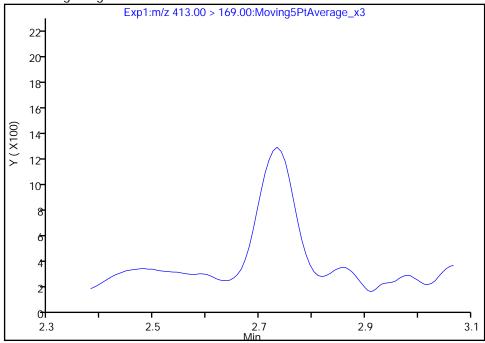
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

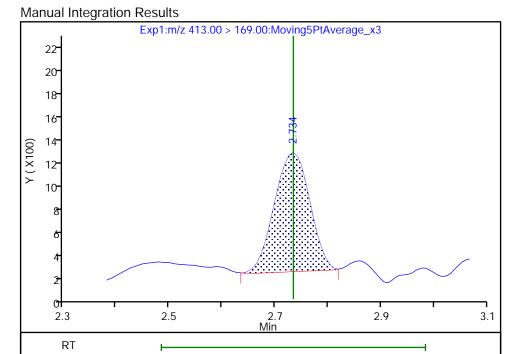
Signal: 2

RT: 2.73 Area: 0

Amount: 0.005125 Amount Units: ng/ml **Processing Integration Results**



RT: 2.73
Area: 4691
Amount: 0.005125
Amount Units: ng/ml



Reviewer: hannigana, 16-May-2018 08:05:49

Audit Action: Manually Integrated

Audit Reason: Assign Peak

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1					
SDG No.:						
Client Sample ID:	Lab Sample ID: LCS 320-223615/2-A					
Matrix: Water	Lab File ID: 2018.05.27LLADX_005.d					
Analysis Method: EPA 537 (Mod)	Date Collected:					
Extraction Method: 3535	Date Extracted: 05/16/2018 14:51					
Sample wt/vol: 250(mL)	Date Analyzed: 05/28/2018 07:31					
Con. Extract Vol.: 10(mL)	Dilution Factor: 1					
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)					
% Moisture:	GPC Cleanup:(Y/N) N					
Analysis Batch No · 225818	Units: na/L					

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	41.6		2.0	1.5	0.59
2706-90-3	Perfluoropentanoic acid (PFPeA)	36.7		2.0	1.0	0.43
307-24-4	Perfluorohexanoic acid (PFHxA)	39.4		2.0	1.0	0.47
375-85-9	Perfluoroheptanoic acid (PFHpA)	39.6		2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	35.7		2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	37.6		2.0	1.5	0.52
335-76-2	Perfluorodecanoic acid (PFDA)	42.6		2.0	1.0	0.48
2058-94-8	Perfluoroundecanoic acid (PFUnA)	36.2		2.0	1.5	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	40.9		2.0	1.5	0.52
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	39.3		4.0	3.0	0.76
376-06-7	Perfluorotetradecanoic acid (PFTeA)	36.7		4.0	3.0	0.83
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36.3		2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	35.0		2.0	1.0	0.38
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	34.4		2.0	1.0	0.37
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	33.5		4.0	3.0	1.1
335-77-3	Perfluorodecanesulfonic acid (PFDS)	35.3		2.0	1.5	0.56
754-91-6	Perfluorooctane Sulfonamide (FOSA)	40.5		4.0	3.0	1.3

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1					
SDG No.:						
Client Sample ID:	Lab Sample ID: LCS 320-223615/2-A					
Matrix: Water	Lab File ID: 2018.05.27LLADX_005.d					
Analysis Method: EPA 537 (Mod)	Date Collected:					
Extraction Method: 3535	Date Extracted: 05/16/2018 14:51					
Sample wt/vol: 250(mL)	Date Analyzed: 05/28/2018 07:31					
Con. Extract Vol.: 10(mL)	Dilution Factor: 1					
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)					
% Moisture:	GPC Cleanup:(Y/N) N					
Analysis Batch No.: 225818	Units: ng/L					

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	69		50-150
STL00992	13C4 PFBA	80		50-150
STL01893	13C5 PFPeA	87		50-150
STL00993	13C2 PFHxA	86		50-150
STL01892	13C4-PFHpA	85		50-150
STL00990	13C4 PFOA	90		50-150
STL00995	13C5 PFNA	90		50-150
STL00996	13C2 PFDA	86		50-150
STL00997	13C2 PFUnA	94		50-150
STL00998	13C2 PFDoA	82		50-150
STL00994	1802 PFHxS	80		50-150
STL02116	13C2-PFTeDA	82		50-150
STL00991	13C4 PFOS	86		50-150
STL02337	13C3-PFBS	78		50-150

Report Date: 01-Jun-2018 12:10:14 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_005.d

Lims ID: LCS 320-223615/2-A

Client ID:

Sample Type: LCS

Inject. Date: 28-May-2018 07:31:36 ALS Bottle#: 2 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: lcs 320-223615/2-a Misc. Info.: Plate: 1 Rack: 6

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 01-Jun-2018 12:10:13 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK040

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 12:53:57

First Level Revie	wer: rua	ngyotsal	kuld		Date:	3	30-May-2018 12:53:5	7				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags		
D 113C4 PFBA	1											
217.00 > 172.00		1.455	0.003	1.000	6184751	2.00		80.1	33462			
2 Perfluorobut												
212.90 > 169.00	•	1.456	0.007	1.004	2393097	1.04		104	1220			
D 3 13C5-PFPe	eΑ											
267.90 > 223.00		1.725	0.005	0.563	4302905	2.17		86.9	51735			
4 Perfluoroper	ntanoic a	cid										
262.90 > 219.00		1.725	0.005	1.000	1863912	0.9174		91.7	1220			
D 47 13C3-PFB	S											
301.90 > 83.00	1.766	1.761	0.005	1.000	81646	1.83		78.5	1045			
5 Perfluorobut	anesulfo	nic acid										
	1.775	1.761	0.014	1.005	2490362	0.9081		103	13305			
298.90 > 99.00	1.766	1.761	0.005	1.000	1028710		2.42(1.25-3.74)		10893			
61 Sodium 1H,		•										
327.00 > 307.00		1.977	0.005	1.000	627526	1.08		115	37532			
D 7 13C2 PFHx												
315.00 > 270.00	2.027	2.011	0.016	1.000	4560037	2.16		86.4	89406			
6 Perfluorohex												
313.00 > 269.00		2.011	0.016	1.000	1845682	0.9842	10.75/5.00.15.10\	98.4	3273			
313.00 > 119.00		2.011	0.016	1.000	171631		10.75(5.03-15.10)		2533			
70 Perfluorope				4 000	005///7	0.0/50		400	04/74			
349.00 > 80.00 349.00 > 99.00		2.033 2.033	0.005 0.005	1.000 1.000	2356667 897037	0.9650	2.63(1.36-4.07)	103	24674 17767			
		2.033	0.003	1.000	097037		2.03(1.30-4.07)		17707			
D 64 13C3 HFP0 332.10 > 287.00		2.112	0.005	1.000	209076	NC			5364			
				1.000	209070	NC			5504			
67 Perfluoro(2- 329.10 > 285.00			-	1.000	282185	NC			1931			
		Z. 1 1 Z	0.005	1.000	202100	NC			1731			
D 9 13C4-PFHp 367.00 > 322.00		2.342	0.004	1.000	/310/O1	2 14		85.4	71243			
307.00 > 322.00	2.340	2.342	0.004	1.000	Page 709 of	728 ^{2.14}		00.4	11243			

Report Date: 01-Jun-2018 12:10:14

Data File:

Data File:	\\Chr	omNa\Sa	acramen	io\Chrom	Data\A8_N\201	80527-5883	5.b\2018.05.27LLA	DX_005.	d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluorohe	ntanoic :	acid								
363.00 > 319.00		2.342	0.004	1.000	1806467	0.9898		99.0	2361	
363.00 > 169.00		2.342	0.004	1.000	698183	0.7070	2.59(1.13-3.40)	77.0	4616	
D 11 1802 PFH:										
403.00 > 84.00		2.355	0.018	1.000	4726614	1.89		80.0	70878	
8 Perfluorohex					.,			00.0	, , , ,	
399.00 > 80.00		2.355	0.005	0.994	1972515	0.8759		96.3	8542	
399.00 > 99.00		2.355	0.005	0.994	655694	0.0707	3.01(1.50-4.49)	70.0	5455	
65 Adona							, , ,			
377.00 > 251.00	2.397	2.392	0.005	1.000	5449573	NC			59288	
377.00 > 85.00		2.392	0.005	1.000	3283038		1.66(0.84-2.53)		57122	
D 12 M2-6:2FTS							,			
429.00 > 81.00		2.665	0.018	1.000	980081	2.20		92.4	16329	
13 Sodium 1H,										
427.00 > 407.00		•	-0.004		646545	0.8825		93.1	14137	
D 14 13C4 PFO		2.000	0.001	0.777	0 100 10	0.0020		70.1	11107	
417.00 > 372.00		2.695	0.011	1.000	4317464	2.26		90.3	103696	
15 Perfluorooct			0.011	1.000	4317404	2.20		70.5	103070	
413.00 > 369.00		2.703	0.003	1.000	1813677	0.8922		89.2	688	
413.00 > 169.00		2.703	0.003	1.000	991733	0.0922	1.83(0.84-2.52)	09.2	3890	
		2.703	0.003	1.000	771733		1.03(0.04-2.32)		3070	
* 62 13C2-PFOA 415.00 > 370.00		2.703	0.003		5050927	2.50			77040	
					3030727	2.50			77040	
16 Perfluorohe 449.00 > 80.00		2.711	0.003	1.000	1685141	0.8604		90.4	19092	
449.00 > 99.00		2.711	0.003	1.000	452417	0.0004	3.72(1.94-5.82)	90.4	9711	
D 19 13C5 PFN		2.711	0.003	1.000	432417		3.72(1.74-3.02)		7711	
468.00 > 423.00		3.063	0.011	1.000	3519957	2.25		90.0	54144	
		3.003	0.011	1.000	3317737	2.25		90.0	34144	
D 18 13C4 PFO		20/2	0.004	1 000	2514250	2.05		05 /	25512	
503.00 > 80.00				1.000	3514259	2.05		85.6	25513	
17 Perfluorooct				1 000	1440500	0.0270		00.2	0771	
499.00 > 80.00			-0.005	1.000	1448509	0.8378	4 20/2 21 4 02)	90.3	8771	
499.00 > 99.00		3.072	-0.005	1.000	330014		4.39(2.31-6.93)		6268	
20 Perfluorono			0.005	1 000	1400450	0.0004		00.0	4000	
463.00 > 419.00		3.079		1.000	1400459	0.9391	4.00/1.00 F./0\	93.9	4290	
463.00 > 169.00				1.000	350272		4.00(1.90-5.69)		7492	
69 9-Chlorohex					000000	NO			40007	
531.00 > 351.00		3.286	-0.006	1.000	2222338	NC			40927	
D 21 13C8 FOS										
506.00 > 78.00	3.408	3.395	0.013	1.000	3903222	1.74		69.4	38587	
D 26 M2-8:2FTS	;									
529.00 > 81.00	3.417	3.413	0.004	1.000	1013035	1.99		83.3	12541	
22 Perfluorooct	ane Sul	fonamid	Э							
498.00 > 78.00	3.408	3.415	-0.007	1.000	1538119	1.01		101	27662	
D 23 13C2 PFD	Д									
515.00 > 470.00		3.422	0.004	1.000	2854366	2.14		85.8	55808	
68 Perfluorono	nanesulf	onic aci	d							
549.00 > 80.00				1.000	1000385	0.8982		93.6	15354	
549.00 > 99.00	3.417	3.424	-0.007	1.000	380497		2.63(1.33-3.97)		9320	

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Report Date: 01-Jun-2018 12:10:14

Data File:

Data File:	\\Cnrc	<u>)miva\5a</u>	acrament	O/Cnrom	Data\A8_IN\201	80527-5883	5.D\2U18.U5.27LLAL	JX_005.0	<u> </u>	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,	111 211 2	H_narflu	orodocar	10						
527.00 > 507.00		•		1.000	546497	0.9574		99.9	13160	
24 Perfluorode			0.007	1.000	010177	0.7071		,,,,	10100	
513.00 > 469.00		3.434	-0.008	1.000	1182892	1.07		107	6406	
513.00 > 169.00		3.434	0.002	1.003	212243	1.07	5.57(2.36-7.09)	107	2273	
D 27 d3-NMeFO		00.	0.002				0.07 (2.00 7.07)			
573.00 > 419.00		3.572	0.014	1.000	1610238	2.19		87.7	12860	
28 N-methyl pe				1.000	1010200	2.17		07.7	12000	M
570.00 > 419.00			-0.009	1.000	618005	0.9455		94.6	4053	M
D 32 d5-NEtFOS		3.373	-0.007	1.000	010005	0.7433		74.0	4000	IVI
589.00 > 419.00		3.748	0.003	1.000	1632063	2.17		86.6	15578	
		3.740	0.003	1.000	1032003	2.17		00.0	13370	
D 30 13C2 PFUr		3.748	0.012	1 000	2472751	2.25		02.0	E0471	
565.00 > 520.00			0.013	1.000	2472751	2.35		93.9	50471	
29 Perfluorodeo				1 000	070017	0.0000		01.5	10500	
599.00 > 80.00 599.00 > 99.00		3.749 3.749	-0.009 -0.009	1.000 1.000	870816 294873	0.8820	2.95(1.39-4.16)	91.5	12590 6833	
				1.000	294073		2.93(1.39-4.10)		0033	
33 N-ethyl perfl				1 000	E 427.02	0.0050		00.7	10005	M
584.00 > 419.00		3.760	0.001	1.003	543683	0.8859		88.6	10235	M
31 Perfluoround			0.004	4 000	7.10.17.0	0.00/0		00.4	4070	
563.00 > 519.00		3.760	0.001	1.000	748469	0.9060	4 10(0 10 / 0/)	90.6	4070	
563.00 > 169.00	3.751	3.760	-0.009	0.997	181540		4.12(2.12-6.36)		6623	
35 MeFOSA	0.007	0.075	0.000		0/5/00	NO			4.400	
512.00 > 169.00		3.875	0.032		265628	NC			1403	
66 11-Chloroeid										
631.00 > 451.00		3.918	0.0	1.000	3562228	NC			67359	
D 36 13C2 PFD										
615.00 > 570.00	4.050	4.048	0.002	1.000	2335857	2.06		82.4	17969	
37 Perfluorodoo										
613.00 > 569.00					997972	1.02		102	1287	
613.00 > 169.00	4.050	4.061	-0.011	1.000	242607		4.11(2.13-6.40)		4492	
41 Perfluorotrid										
663.00 > 619.00			-0.011	1.000	1050111	0.9825		98.3	1104	
663.00 > 169.00	4.307	4.318	-0.011	1.000	313780		3.35(1.25-3.76)		3907	
D 43 13C2-PFT6										
715.00 > 670.00	4.553	4.542	0.011	1.000	2853866	2.05		82.0	15472	
42 Perfluorotetr	radecan	oic acid								
713.00 > 169.00	4.553	4.559	-0.006	1.000	264556	0.9177		91.8	3088	
713.00 > 219.00	4.542	4.559	-0.017	0.998	196982		1.34(0.71-2.13)		6197	
D 44 13C2-PFH	xDA									
815.00 > 770.00	4.966	4.966	0.0	1.000	3483700	1.47		59.0	9316	
45 Perfluorohex	xadecan	oic acid								
813.00 > 769.00		4.971	-0.005	1.000	1339208	NC			611	
813.00 > 169.00		4.971	-0.005	1.000	221697		6.04(2.86-8.58)		1721	
46 Perfluorooct	adecano	oic acid								
913.00 > 869.00		5.333	-0.005	1.000	802928	NC			335	
913.00 > 169.00		5.333	-0.005	1.000	100065		8.02(3.83-11.48)		1145	

Report Date: 01-Jun-2018 12:10:14

OC Flag Legend
Processing Flags
NC - Not Calibrated
Review Flags

M - Manually Integrated

Chrom Revision: 2.2 11-May-2018 08:54:46

Report Date: 01-Jun-2018 12:10:14 Chrom Revision: 2.2 11-May-2018 08:54:46 TestAmerica Sacramento Data File: \\ChromNa\\Sacramento\\ChromData\\A8_N\\20180527-58835.b\\2018.05.27LLADX_005.d **Injection Date:** 28-May-2018 07:31:36 Instrument ID: A8_N Lims ID: LCS 320-223615/2-A Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5 Dil. Factor: 1.0000 Injection Vol: 2.0 ul LC PFC_QSM5-1 ICAL Method: $A8_N$ Limit Group: D 113C4 PFBA 2 Perfluorobutyric acid D 3 13C5-PFPeA Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1;m/z 267.90 > 223.00:Moving5PtAverage_x Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x 60 Y (X100000) 50 40 30 20 1.7 2.0 1.5 1.8 1.3 1.9 2.2 1.2 2.5 Min Min RT RT RT 5 Perfluorobutanesulfonic acid 4 Perfluoropentanoic acid D 47 13C3-PFBS Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 78 60 25 50 Y (X1000) 20 40 52 15- 39 30 10 20 26 10 13 1.9 1.9 1.3 2.2 2.5 1.2 1.5 1.8 2.1 2.4 1.3 2.2 2.5 Min Min RT RT RT 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexaDe 7 13C2 PFHxA Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x Exp1;m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 30 (X100000 Y (X10000) Y (X10000) 25- 20 15 10 1.9 2.1 2.2 2.5 1.2 1.8 1.3 1.6 0.6 2.4 3.0 1.5 2.4 2.7 Min RT RT RT 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid 70 Perfluoropentanesulfonic acid Exp1:m/z 349.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 313.00 > 119.00:Moving5PtAverage_> 54 50 (X10000) Y (X10000) 45 40 48 36 30 36 27 20 24 1.8 2.1 1.8 2.1 1.8 2.1 1.5 2.4 1.5 2.4 1.2 1.5 2.4 2.7 Min Min RT RT RT Page 713 of 728

RT

RT

RT

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_005.d 62 13C2-PFOA 16 Perfluoroheptanesulfonic acid 16 Perfluoroheptanesulfonic acid Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 449.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x Y (X100000) Y (X10000) Y (X10000) 12 36 27 18 2.6 Min 2.3 2.6 2.9 3.2 2.3 2.9 3.2 2.0 2.3 2.6 2.9 3.2 2.0 3.5 2.0 Min Min RT RT RT D 19 13C5 PFNA D 18 13C4 PFOS 17 Perfluorooctane sulfonic acid Exp1;m/z 468.00 > 423.00:Moving5PtAverage_x Exp1;m/z 503.00 > 80.00:Moving5PtAverage_x3 Exp1;m/z 499.00 > 80.00:Moving5PtAverage_x3 Y (X100000) Y (X100000) Y (X10000) 24 18 3.0 3.3 3.0 2.9 2.7 3.6 2.7 3.3 3.6 2.3 3.5 4.1 Min RT RT RT 17 Perfluorooctane sulfonic acid 20 Perfluorononanoic acid 20 Perfluorononanoic acid Exp1:m/z 499.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 463.00 > 419.00:Moving5PtAverage_x Exp1:m/z 463.00 > 169.00:Moving5PtAverage_x 78 10 35 (X10000) (X10000) 65 Y (X1000) 28 52 21 39 14 26 0 0 2.4 3.3 4.2 2.8 2.8 1.5 2.5 3.1 3.4 3.7 2.5 3.1 3.4 3.7 Min Min Min RT RT RT D 21 13C8 FOSA D 26 M2-8:2FTS 22 Perfluorooctane Sulfonamide Exp1:m/z 506.00 > 78.00:Moving5PtAverage_x3 Exp1:m/z 529.00 > 81.00:Moving5PtAverage_x3 Exp1:m/z 498.00 > 78.00:Moving5PtAverage_x3 30 42 Y (X100000) Y (X10000) Y (X10000) 10 25 35 20 28 15 21 10 3.2 <u>Min</u> 2.9 3.5 3.0 3.9 2.9 3.5 3.8 3.6 3.8 4.1 Min RT RT RT

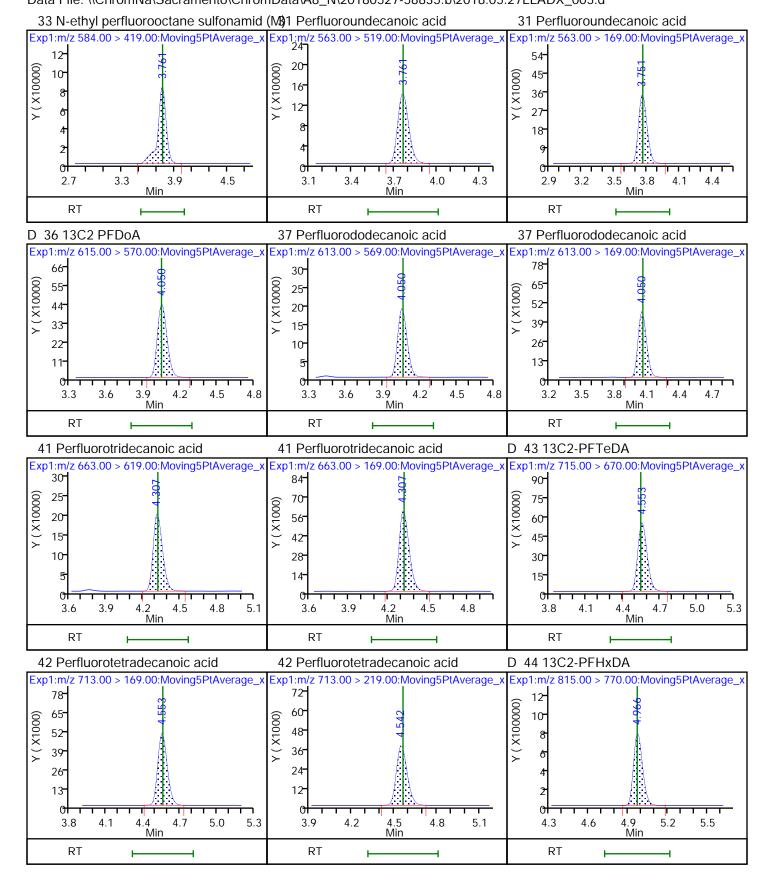
Report Date: 01-Jun-2018 12:10:14

Chrom Revision: 2.2 11-May-2018 08:54:46

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_005.d D 23 13C2 PFDA 68 Perfluorononanesulfonic acid 68 Perfluorononanesulfonic acid Exp1:m/z 515.00 > 470.00:Moving5PtAverage_x Exp1:m/z 549.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 549.00 > 99.00:Moving5PtAverage_x3 12 Y (X10000) Y (X10000) 25 Y (X10000) 65- 20 52 15- 39 10 26 13 3.3 3.6 3.9 3.0 3.3 3.6 3.9 3.0 3.6 3.9 2.7 3.0 2.7 2.7 3.3 Min Min Min RT RT RT 25 Sodium 1H,1H,2H,2H-perfluorodecan@4 Perfluorodecanoic acid 24 Perfluorodecanoic acid Exp1:m/z 513.00 > 169.00:Moving5PtAverage_x 18 50 Y (X10000) Y (X10000) 15 7 (X1000) 24 40 12 18 30 20 10 3.0 3.6 3.9 3.0 3.6 3.9 3.5 3.8 RT RT RT D 27 d3-NMeFOSAA 28 N-methyl perfluorooctane sulfonami (M) 2 d5-NEtFOSAA Exp1:m/z 573.00 > 419.00:Moving5PtAverage_x Exp1:m/z 570.00 > 419.00:Moving5PtAverage_x Exp1:m/z 589.00 > 419.00:Moving5PtAverage_x 15 (X10000) (X10000) Y (X10000) 35 12 32 28 24 21 16 0 3.5 3.8 2.9 3.2 3.5 3.8 4.1 2.9 3.2 3.5 3.8 4.1 3.2 4.1 Min Min RT RT RT D 30 13C2 PFUnA 29 Perfluorodecane Sulfonic acid 29 Perfluorodecane Sulfonic acid Exp1:m/z 599.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 565.00 > 520.00:Moving5PtAverage_x Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 90 30 72 25 Y (X10000) Y (X10000) 60 Y (X1000) 20 60 48 15- 45 36 10 30 24 15 3.6 <u>Min</u> 3.8 Min 3.9 4.2 3.2 3.5 4.1 3.3 4.5 3.3 3.9 4.2 3.0 RT RT RT

Chrom Revision: 2.2 11-May-2018 08:54:46

Report Date: 01-Jun-2018 12:10:14



LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
SDG No.:	
Instrument ID: A8_N	Start Date: 05/15/2018 15:13
Analysis Batch Number: 223413	End Date: 05/15/2018 17:23

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-223413/2		05/15/2018 15:13	1	2017.05.15LLB_I CAL 002.d	GeminiC18 3x100 3(mm)
IC 320-223413/3		05/15/2018 15:21	1	2017.05.15LLB_I CAL 003.d	GeminiC18 3x100 3(mm)
IC 320-223413/4		05/15/2018 15:29	1	2017.05.15LLB_I CAL 004.d	GeminiC18 3x100 3(mm)
IC 320-223413/5 ICIS		05/15/2018 15:36	1	2017.05.15LLB_I CAL 005.d	GeminiC18 3x100 3(mm)
IC 320-223413/7		05/15/2018 15:52	1	2017.05.15LLB_I CAL 007.d	GeminiC18 3x100 3(mm)
IC 320-223413/8		05/15/2018 16:00	1	2017.05.15LLB_I CAL 008.d	GeminiC18 3x100 3(mm)
IC 320-223413/11		05/15/2018 16:39	1	2018.05.15LLC_I CAL 006.d	GeminiC18 3x100 3(mm)
ICB 320-223413/12		05/15/2018 17:15	1	2018.05.15LLCC_ ICAL 009.d	GeminiC18 3x100 3(mm)
ICV 320-223413/13		05/15/2018 17:23	1	2018.05.15LLCC_ ICAL 010.d	GeminiC18 3x100 3 (mm)

LCMS ANALYSIS RUN LOG

Lab Name:	TestAmerica Sacramento	Job No.: 320-38875-1
SDG No.:		
Instrumen	t ID: A8_N	Start Date: 05/28/2018 07:00

Analysis Batch Number: 225818 End Date: 05/28/2018 10:47

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-225818/1		05/28/2018 07:00	1	2018.05.27LLADX 001.d	GeminiC18 3x100 3(mm)
CCVL 320-225818/2		05/28/2018 07:08	1	2018.05.27LLADX 002.d	GeminiC18 3x100 3(mm)
CCV 320-225818/3 CCVIS		05/28/2018 07:15	1	2018.05.27LLADX 003.d	GeminiC18 3x100 3(mm)
MB 320-223615/1-A		05/28/2018 07:23	1	2018.05.27LLADX 004.d	GeminiC18 3x100 3(mm)
LCS 320-223615/2-A		05/28/2018 07:31	1	2018.05.27LLADX 005.d	GeminiC18 3x100 3(mm)
320-38875-1		05/28/2018 07:39	1	2018.05.27LLADX 006.d	GeminiC18 3x100 3(mm)
320-38875-2		05/28/2018 07:47	1	2018.05.27LLADX 007.d	GeminiC18 3x100 3(mm)
320-38875-3		05/28/2018 07:55	1	2018.05.27LLADX 008.d	GeminiC18 3x100 3 (mm)
320-38875-4		05/28/2018 08:02	1	2018.05.27LLADX 009.d	GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:10	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:18	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:26	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:34	1		GeminiC18 3x100 3(mm)
CCV 320-225818/14		05/28/2018 08:42	1	2018.05.27LLADX 014.d	GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:50	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:57	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:05	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:13	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:21	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:29	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:37	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:44	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:52	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:00	1		GeminiC18 3x100 3(mm)
CCV 320-225818/25		05/28/2018 10:08	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:16	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:24	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:31	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:39	1		GeminiC18 3x100 3(mm)
CCV 320-225818/30		05/28/2018 10:47	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
SDG No.:	
Instrument ID: A8_N	Start Date: 05/28/2018 17:14
Analysis Batch Number: 225873	End Date: 05/28/2018 20:22

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANAL	YZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-225873/1		05/28/2018	17:14	1	2018.05.28LLA_0 03.d	GeminiC18 3x100 3(mm)
CCVL 320-225873/2		05/28/2018	17:22	1	2018.05.28LLA_0 04.d	GeminiC18 3x100 3(mm)
CCV 320-225873/3 CCVIS		05/28/2018	17:30	1	2018.05.28LLA_0 05.d	GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018	17:37	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018	17:45	50		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018	17:53	50		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018	18:01	20		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018	18:09	100		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018	18:16	100		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018	18:24	100		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018	18:32	5		GeminiC18 3x100 3(mm)
CCV 320-225873/14		05/28/2018	18:56	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018	19:03	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018	19:11	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018	19:19	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018	19:27	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018	19:35	5		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018	19:43	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018	19:51	50		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018	19:58	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018	20:06	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018	20:14	1		GeminiC18 3x100 3(mm)
CCV 320-225873/25		05/28/2018	20:22	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
SDG No.:	
Instrument ID: A8_N	Start Date: 05/29/2018 00:01
Analysis Batch Number: 225884	End Date: 05/29/2018 02:06

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION	LAB FILE ID	COLUMN ID
			FACTOR		
CCV 320-225884/1		05/29/2018 00:01	1	2018.05.28LLA_0 55.d	GeminiC18 3x100 3(mm)
320-38875-1 DL		05/29/2018 00:09	10	2018.05.28LLA_0 56.d	GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:17	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:25	5		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:33	5		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:40	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:48	100		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:04	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:12	20		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:19	20		GeminiC18 3x100 3(mm)
CCV 320-225884/11		05/29/2018 01:27	1	2018.05.28LLA_0 66.d	GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:35	20		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:43	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:51	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:58	1		GeminiC18 3x100 3(mm)
CCV 320-225884/16		05/29/2018 02:06	1		GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Batch Number: 223615 Batch Start Date: 05/16/18 14:50 Batch Analyst: Epstein, Anya M

Batch Method: 3535 Batch End Date: 05/17/18 18:00

Batch Method: 3535			В	atch End Date:	: 05/1//18 1	8:00			
Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00065	LCPFC-IS 00050
MB 320-223615/1		3535, EPA 537 (Mod)				250 mL	10 mL	500 uL	500 uL
LCS 320-223615/2		3535, EPA 537 (Mod)				250 mL	10 mL	500 uL	500 uL
320-38875-A-1	TP-PFC-029-TPI	3535, EPA 537 (Mod)	Т	319.27 g	28.82 g	290.5 mL	10 mL	500 uL	500 uL
320-38875-A-2	TP-PFC-029-MIDCA RBON	3535, EPA 537 (Mod)	Т	321.32 g	28.50 g	292.8 mL	10 mL	500 uL	500 uL
320-38875-A-3	TP-PFC-029-TPE	3535, EPA 537 (Mod)	Т	302.29 g	29.37 g	272.9 mL	10 mL	500 uL	500 uL
320-38875-A-4	TP-PFC-029-TPE-D	3535, EPA 537 (Mod)	Т	292.05 g	27.82 g	264.2 mL	10 mL	500 uL	500 uL
Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00144					
MB 320-223615/1		3535, EPA 537 (Mod)							
LCS 320-223615/2		3535, EPA 537 (Mod)		500 uL					

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00144			
MB 320-223615/1		3535, EPA					
		537 (Mod)					
LCS		3535, EPA		500 uL			
320-223615/2		537 (Mod)					
320-38875-A-1	TP-PFC-029-TPI	3535, EPA	Т				
		537 (Mod)					
320-38875-A-2	TP-PFC-029-MIDCA	3535, EPA	T				
	RBON	537 (Mod)					
320-38875-A-3	TP-PFC-029-TPE	3535, EPA	T				
		537 (Mod)					
320-38875-A-4	TP-PFC-029-TPE-D	3535, EPA	Т				
		537 (Mod)					

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.

EPA 537 (Mod)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Batch Number: 223615 Batch Start Date: 05/16/18 14:50 Batch Analyst: Epstein, Anya M

Batch Method: 3535 Batch End Date: 05/17/18 18:00

Batch Notes					
Analyst ID - Aliquot Step	VPM				
Balance ID	QA-078				
Batch Comment	Sample labels match client IDs: AME. Envi-Carb: 97225.				
Analyst ID - Final Volume Step	AME -Water/VPM				
H2O ID	5/14/18				
Hexane ID	1242583				
Internal Standard ID#	1245322				
Manifold ID	10, 21				
Methanol ID	1236570				
Sodium Hydroxide ID	1241145				
Pipette ID	I46345G				
Analyst ID - Reagent Drop	TWL				
Analyst ID - IS Reagent Drop	VPM				
Analyst ID - IS Reagent Drop Witness	ER				
Analyst ID - SU Reagent Drop	TWL				
Analyst ID - SU Reagent Drop Witness	KMK				
Solvent Lot #	1237547				
Solvent Name	0.3% NH4OH/MeOH				
SOP Number	WS-LC-0025				
SPE Cartridge Type	WAX 500mg				
Solid Phase Extraction Disk ID	003337157A				

Basis	Basis Description
Т	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.



Test America – Sacramento Sample Dilution Record

Method ID_PFC-1DA	
Analyst (Print Name) Awari Rayce	Reagent ID <u>LC-80:20_00005</u>
Date 5/28//8	

	Job#	Sample #	Original F.V.	Aliquot (uL)	Dilution F.V.	Dilution Factor			
			(uL)		(uL)				
8	320-38871	6	10,000	60	780	5x			
	<u> </u>	7		IS		20x			
14	320-39043	8		30		10%			
29	480-135867	}		60		5x			
18	480-139967 320-38935	3		1		5x			
		13		15	 	20x			
		13MS		I		20%			
		13 MSD							
		14		60		5X			
		15		1		- 51/			
L		160							
L		24							
12	320-38875			30		lox			
Ľ	320-38935	18		(00		5x			
L		P		1					
Ľ	320-38935	30		IS	1500	100 X			
		30 31		30	300				
L		32		is		10x 20x			
		32 MS							
	V	32M5D	V						
			GOVE 5/28/	18		*			
	2 100110								

Comments:				
		 	 	
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Shipping and Receiving Documents

TestAmerica Sacramento 880 Riverside Parkway

Nest Sacramento, CA 95605 Phone: 916.373.5600 Fax: **Chain of Custody Record**

Regulatory Program: DW NPDES RCRA Other:

228168

TestAmerica

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THE LEADER IN ENVIRONMENTAL TESTING TestAmerica Laboratories, Inc.

TAL-8210 (0713)

Client Contact	Project N	lanager: V	EFFO	RIEA	/T	Site	Cont	tact: DANG	riber	Date:	51	3/18	,	COC No: 228168
Company Name: TETRATE & H	Tel/Fax:	412-01	II- 26	550		Lab	Cont	tact: DQV.D	Altur	Carri	er: FE	DEX		of COCs
Address: 891 AND ERSONDE, FOSTER PL, City/State/Zip: PTTTS BVRGH / PA/ 0 5910 Phone: 412-921-8650		Analysis T	urnaround	Time				VIII			TT			Sampler:
City/State/Zip: PITTS BURGH / PA/ 015210	CALE!	NDAR DAYS	wor	RKING DAY	'S		-			1.1	3 11			For Lab Use Only:
Phone: 412-021-8650	TA	AT if different fro	om Below			2	175							Walk-in Client:
Fax:		2	weeks			2 3	1,5		VI					Lab Sampling:
Project Name: BRUNSWICK GWETS		1	week				1=							
Site: FORMENAS BRUNGWICK		2	days			e (FULL							Job / SDG No.:
Site: FORMENAS BRUNGWICK PO# 112 0-08005-WE21		1	day			du S	0 9			1	1 1			
			Sample			Sa						111		
	Sample	Sample	Type		# of	or or	F							10 700 10
Sample Identification	Date	Time	(C=Comp, G=Grab)	Matrix	Cont.	Filtered Sample (Y/N) Perform MS / MSD (Y/N)						1		Sample Specific Notes:
TO OFC ODD TOT	5/3/18	mna	G	1.1	4	A / A					7			
TP-PFC-029-TPI	12/10			W		10/10					-	+		Name of the latest the
TP-PFL-029-MIDCARBON		0925	6	W	4	NA	ZΥ							
TP-PFC-029-TPE		0930	G	W	4	VN	ľΧ							
TP-PFL-029-TPE-D ge 772		0000	G-	w	4	NN	ľΧ							
ge														
7	-					+	+		-					
107				-		-				++	1		++	-
O T														
of 728		-									++	++-		
_ α										1	00000	II HIII HIII I		
						+	\vdash		\rightarrow		HIMI			
	_									_				
	-										320-38	3875 Cha	in of Cust	ody
							+				-			
											1 1	1 1	111	
Preservation Used: 1= Ice, 2= HCI; 3= H2SO4; 4=HNO3;	5=NaOH;	6= Other _												
Possible Hazard Identification:						S	ampl	le Disposal (A	fee may	be asses	ssed if s	amples	are retain	ed longer than 1 month)
Are any samples from a listed EPA Hazardous Waste? Pleas	se List any	EPA Waste	Codes for	the samp	ole in the	3								
Comments Section if the lab is to dispose of the sample.	F1	_	771	Total Marie		-			>			-		
Non-Hazard Flammable Skin Irritant	Poisor	18	Unkno	own		ᆚ	R	Return to Client	\nearrow	Disposal b	y Lab		Archive for_	Months
Special Instructions/QC Requirements & Comments:														
										_	2-1	_	-1	11.5
Custody Seals Intact: Yes No	Custody 9	Seal No.:						Cooler Tem	p. (°C): (Obs'd:	Til	Corr'd:	च	Therm ID No .: Mile wolfed to
Relinquished by	Company	2		Date/Ti	me: 143	OR	Receiv	red by:			Comp	any:	M -	Date/Time:
2 En	T+			4/5/	18.	-	m	12 2~	_		7	A . 8	AC	5-4-18 0930
Relinquished by:	Company			Date/Ti				ed by:			Comp	any:		Date/Time:
									0.4000					
Relinquished by:	Company			Date/Ti	me:	R	Receiv	ed in Laborator	y by:		Comp	any:		Date/Time:

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-38875-1

Login Number: 38875 List Source: TestAmerica Sacramento

List Number: 1

Creator: Nelson, Kym D

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

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"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid
(PFOS)","330","ng/L","D","9.5","DL","","TRG","","","34","LOQ","YES","-99","","290.5","10","26",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "2058-94-8", "Perfluoroundecanoic acid
(PFUnA)","13","ng/L","U","6.2","DL","","TRG","","17","LOQ","NO","-99","","290.5","10","13",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "2706-90-3", "Perfluoropentanoic acid
(PFPeA)","200","ng/L","D","3.7","DL","","TRG","","17","LOQ","NO","-99","","290.5","10","8.6",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "307-24-4", "Perfluorohexanoic acid
(PFHxA)", "380", "ng/L", "D", "4.0", "DL", "", "TRG", "", "17", "LOQ", "YES", "-99", "", "290.5", "10", "8.6", ""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "307-55-1", "Perfluorododecanoic acid
(PFDoA)","13","ng/L","U","4.5","DL","","TRG","","","17","LOQ","NO","-99","","290.5","10","13",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "335-67-1", "Perfluorooctanoic acid
(PFOA)","1700","ng/L","D","4.6","DL","","TRG","","17","LOQ","YES","-99","","290.5","10","13",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "335-76-2", "Perfluorodecanoic acid
(PFDA)","8.6","ng/L","U","4.1","DL","","TRG","","17","LOQ","NO","-99","","290.5","10","8.6",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "335-77-3", "Perfluorodecanesulfonic acid
(PFDS)","13","ng/L","U","4.8","DL","","TRG","","17","LOQ","NO","-99","","290.5","10","13",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid
(PFHxS)","410","ng/L","D","3.3","DL","","TRG","","17","LOQ","YES","-99","","290.5","10","8.6",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "375-22-4", "Perfluorobutanoic acid
(PFBA)","81","ng/L","D","5.1","DL","","TRG","","17","LOQ","NO","-99","","290.5","10","13",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)","50","ng/L","D","4.0","DL","","TRG","","17","LOQ","NO","-99","","290.5","10","8.6",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "375-85-9", "Perfluoroheptanoic acid
(PFHpA)","73","ng/L","D","5.2","DL","","TRG","","17","LOQ","NO","-99","","290.5","10","13",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "375-92-8", "Perfluoroheptanesulfonic Acid
(PFHpS)","8.7","ng/L","J D","3.2","DL","","TRG","","17","LOQ","NO","-99","","290.5","10","8.6",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "375-95-1", "Perfluorononanoic acid
(PFNA)","13","ng/L","U","4.5","DL","","TRG","","17","LOQ","NO","-99","","290.5","10","13",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "376-06-7", "Perfluorotetradecanoic acid
(PFTeA)","26","ng/L","U","7.1","DL","","TRG","","","34","LOQ","NO","-99","","290.5","10","26",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "72629-94-8", "Perfluorotridecanoic Acid
(PFTriA)","26","ng/L","U","6.5","DL","","TRG","","","34","LOQ","NO","-99","","290.5","10","26",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "754-91-6", "Perfluorooctane Sulfonamide"
(FOSA)","26","ng/L","U","11","DL","","TRG","","","34","LOQ","NO","-99","","290.5","10","26",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "STL00990", "13C4
PFOA","75","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","86.1","","290.5","10","860",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "STL00991", "13C4
PFOS","61","ng/L","","-99","DL","","TRG","75","","-99","LOQ","YES","82.3","","290.5","10","860",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "STL00992", "13C4
PFBA", "67", "ng/L", "", "-99", "DL", "", "TRG", "78", "", "-99", "LOQ", "YES", "86.1", "", "290.5", "10", "860", ""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "STL00993", "13C2
PFHxA","70","ng/L","","-99","DL","","TRG","81","","-99","LOQ","YES","86.1","","290.5","10","860",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "STL00994", "18O2
PFHxS","65","ng/L","","-99","DL","","TRG","80","","-99","LOQ","YES","81.4","","290.5","10","860",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "STL00995", "13C5
PFNA","74","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","86.1","","290.5","10","860",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "STL00996", "13C2
PFDA","71","ng/L","","-99","DL","","TRG","83","","-99","LOQ","YES","86.1","","290.5","10","860",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "STL00997", "13C2
PFUnA","77","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","86.1","","290.5","10","860",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "STL00998", "13C2
PFDoA","75","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","86.1","","290.5","10","860",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "STL01056", "13C8
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FOSA", "63", "ng/L", "", "-99", "DL", "", "TRG", "73", "", "-99", "LOQ", "YES", "86.1", "", "290.5", "10", "860", ""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "STL01892", "13C4-
PFHpA","70","ng/L","","-99","DL","","TRG","81","","-99","LOQ","YES","86.1","","290.5","10","860",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "STL01893", "13C5
PFPeA","72","ng/L","","-99","DL","","TRG","84","","-99","LOQ","YES","86.1","","290.5","10","860",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "STL02116", "13C2-
PFTeDA", "59", "ng/L", "", "-99", "DL", "", "TRG", "69", "", "-99", "LOQ", "YES", "86.1", "", "290.5", "10", "860", "", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10", "10"
"TP-PFC-029-TPI", "EPA 537 (Mod)", "DL", "320-38875-1", "TALSAC", "STL02337", "13C3-
PFBS","61","ng/L","","-99","DL","","TRG","76","","-99","LOQ","YES","80.0","","290.5","10","860",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid
(PFOS)","330","ng/L","E","0.95","DL","","TRG","","","3.4","LOQ","NO","-99","","290.5","10","2.6",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "2058-94-8", "Perfluoroundecanoic acid
(PFUnA)","1.3","ng/L","U M","0.62","DL","","TRG","","1.7","LOQ","YES","-99","","290.5","10","1.3",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "2706-90-3", "Perfluoropentanoic acid
(PFPeA)","200","ng/L","M","0.37","DL","","TRG","","1.7","LOQ","YES","-99","","290.5","10","0.86",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "307-24-4", "Perfluorohexanoic acid
(PFHxA)","360","ng/L","E M","0.40","DL","","TRG","","1.7","LOQ","NO","-99","","290.5","10","0.86",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "307-55-1", "Perfluorododecanoic acid
(PFDoA)","1.3","ng/L","U","0.45","DL","","TRG","","1.7","LOQ","YES","-99","","290.5","10","1.3",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "335-67-1", "Perfluorooctanoic acid
(PFOA)","1500","ng/L","E","0.46","DL","","TRG","","1.7","LOQ","NO","-99","","290.5","10","1.3",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "335-76-2", "Perfluorodecanoic acid
(PFDA)","0.82","ng/L","J M","0.41","DL","","TRG","","","1.7","LOQ","YES","-99","","290.5","10","0.86",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "335-77-3", "Perfluorodecanesulfonic acid
(PFDS)","1.3","ng/L","U","0.48","DL","","TRG","","1.7","LOQ","YES","-99","","290.5","10","1.3",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid
(PFHxS)","400","ng/L","E","0.33","DL","","TRG","","1.7","LOQ","NO","-99","","290.5","10","0.86",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "375-22-4", "Perfluorobutanoic acid
(PFBA)","74","ng/L","M","0.51","DL","","TRG","","1.7","LOQ","YES","-99","","290.5","10","1.3",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)","49","ng/L","M","0.40","DL","","TRG","","","1.7","LOQ","YES","-99","","290.5","10","0.86",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "375-85-9", "Perfluoroheptanoic acid
(PFHpA)","76","ng/L","M","0.52","DL","","TRG","","1.7","LOQ","YES","-99","","290.5","10","1.3",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "375-92-8", "Perfluoroheptanesulfonic Acid
(PFHpS)","7.7","ng/L","","0.32","DL","","TRG","","","1.7","LOQ","YES","-99","","290.5","10","0.86",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "375-95-1", "Perfluorononanoic acid
(PFNA)","2.4","ng/L","","0.45","DL","","TRG","","1.7","LOQ","YES","-99","","290.5","10","1.3",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "376-06-7", "Perfluorotetradecanoic acid
(PFTeA)","2.6","ng/L","U","0.71","DL","","TRG","","","3.4","LOQ","YES","-99","","290.5","10","2.6",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "72629-94-8", "Perfluorotridecanoic Acid
(PFTriA)","2.6","ng/L","U","0.65","DL","","TRG","","","3.4","LOQ","YES","-99","","290.5","10","2.6",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "754-91-6", "Perfluorooctane Sulfonamide"
(FOSA)","2.6","ng/L","U M","1.1","DL","","TRG","","3.4","LOQ","YES","-99","","290.5","10","2.6",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "STL00990", "13C4
PFOA","74","ng/L","","-99","DL","","TRG","85","","-99","LOQ","YES","86.1","","290.5","10","86",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "STL00991", "13C4
PFOS","72","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","82.3","","290.5","10","86",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "STL00992", "13C4
PFBA","71","ng/L","","-99","DL","","TRG","83","","-99","LOQ","YES","86.1","","290.5","10","86",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "STL00993", "13C2
PFHxA","81","ng/L","","-99","DL","","TRG","95","","-99","LOQ","YES","86.1","","290.5","10","86",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "STL00994", "1802
PFHxS","73","ng/L","","-99","DL","","TRG","89","","-99","LOQ","YES","81.4","","290.5","10","86",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "STL00995", "13C5
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PFNA","88","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","86.1","","290.5","10","86",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "STL00996", "13C2
PFDA","83","ng/L","","-99","DL","","TRG","96","","-99","LOQ","YES","86.1","","290.5","10","86",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "STL00997", "13C2
PFUnA", "87", "ng/L", "", "-99", "DL", "", "TRG", "101", "", "-99", "LOQ", "YES", "86.1", "", "290.5", "10", "86", ""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "STL00998", "13C2
PFDoA","77","ng/L","","-99","DL","","TRG","89","","-99","LOQ","YES","86.1","","290.5","10","86",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "STL01056", "13C8
FOSA","69","ng/L","","-99","DL","","TRG","81","","-99","LOQ","YES","86.1","","290.5","10","86",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "STL01892", "13C4-
PFHpA","79","ng/L","","-99","DL","","TRG","91","","-99","LOQ","YES","86.1","","290.5","10","86","" "TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","STL01893","13C5
PFPeA", "84", "ng/L", "", "-99", "DL", "", "TRG", "97", "", "-99", "LOQ", "YES", "86.1", "", "290.5", "10", "86", ""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "STL02116", "13C2-
PFTeDA","68","ng/L","","-99","DL","","TRG","79","","-99","LOQ","YES","86.1","","290.5","10","86",""
"TP-PFC-029-TPI", "EPA 537 (Mod)", "RES", "320-38875-1", "TALSAC", "STL02337", "13C3-
PFBS","76","ng/L","","-99","DL","","TRG","95","","-99","LOQ","YES","80.0","","290.5","10","86",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "1763-23-
1","Perfluorooctanesulfonic acid (PFOS)","2.6","ng/L","U
M","0.94","DL","","TRG","","3.4","LOQ","YES","-99","","292.8","10","2.6",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "2058-94-8", "Perfluoroundecanoic
acid (PFUnA)","1.3","ng/L","U","0.61","DL","","TRG","","1.7","LOQ","YES","-99","","292.8","10","1.3",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "2706-90-3", "Perfluoropentanoic
acid (PFPeA)","240","ng/L","M","0.37","DL","","TRG","","1.7","LOQ","YES","-99","","292.8","10","0.85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","307-24-4","Perfluorohexanoic
acid (PFHxA)","160","ng/L","M","0.40","DL","","TRG","","1.7","LOQ","YES","-99","","292.8","10","0.85",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "307-55-1", "Perfluorododecanoic
acid (PFDoA)","1.3","ng/L","U","0.44","DL","","TRG","","1.7","LOQ","YES","-99","","292.8","10","1.3",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "335-67-1", "Perfluorooctanoic
acid (PFOA)","39","ng/L","M","0.46","DL","","TRG","","1.7","LOQ","YES","-99","","292.8","10","1.3",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","335-76-2","Perfluorodecanoic
acid (PFDA)","0.85","ng/L","U","0.41","DL","","TRG","","1.7","LOQ","YES","-99","","292.8","10","0.85",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "335-77-
3", "Perfluorodecanesulfonic acid
(PFDS)","1.3","ng/L","U","0.48","DL","","TRG","","1.7","LOQ","YES","-99","","292.8","10","1.3",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "355-46-
4"."Perfluorohexanesulfonic acid
(PFHxS)","2.5","ng/L","","0.32","DL","","TRG","","1.7","LOQ","YES","-99","","292.8","10","0.85",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "375-22-4", "Perfluorobutanoic
acid (PFBA)","130","ng/L","","0.50","DL","","TRG","","1.7","LOQ","YES","-99","","292.8","10","1.3",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "375-73-
5"."Perfluorobutanesulfonic acid
(PFBS)", "5.5", "ng/L", "", "0.39", "DL", "", "TRG", "", "1.7", "LOQ", "YES", "-99", "", "292.8", "10", "0.85", ""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","375-85-9","Perfluoroheptanoic
acid (PFHpA)","6.8","ng/L","","0.52","DL","","TRG","","","1.7","LOQ","YES","-99","","292.8","10","1.3",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "375-92-
8", "Perfluoroheptanesulfonic Acid
(PFHpS)","0.85","ng/L","U","0.32","DL","","TRG","","1.7","LOQ","YES","-99","","292.8","10","0.85",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "375-95-1", "Perfluorononanoic
acid (PFNA)","1.3","ng/L","U","0.44","DL","","TRG","","1.7","LOQ","YES","-99","","292.8","10","1.3",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "376-06-
7", "Perfluorotetradecanoic acid
(PFTeA)","2.6","ng/L","U","0.71","DL","","TRG","","","3.4","LOQ","YES","-99","","292.8","10","2.6",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "72629-94-
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8", "Perfluorotridecanoic Acid
(PFTriA)","2.6","ng/L","U","0.65","DL","","TRG","","","3.4","LOQ","YES","-99","","292.8","10","2.6",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "754-91-6", "Perfluorooctane"
Sulfonamide (FOSA)", "2.6", "ng/L", "U", "1.1", "DL", "", "TRG", "", "3.4", "LOQ", "YES", "-99", "", "292.8", "10", "2.6", ""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "STL00990", "13C4
PFOA", "67", "ng/L", "", "-99", "DL", "", "TRG", "78", "", "-99", "LOQ", "YES", "85.4", "", "292.8", "10", "85", ""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "STL00991", "13C4
PFOS","60","ng/L","","-99","DL","","TRG","73","","-99","LOQ","YES","81.6","","292.8","10","85",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "STL00992", "13C4"
PFBA", "62", "ng/L", "", "-99", "DL", "", "TRG", "73", "", "-99", "LOO", "YES", "85.4", "", "292.8", "10", "85", ""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "STL00993", "13C2
PFHxA", "67", "ng/L", "", "-99", "DL", "", "TRG", "78", "", "-99", "LOQ", "YES", "85.4", "", "292.8", "10", "85", ""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "STL00994", "18O2
PFHxS","62","ng/L","","-99","DL","","TRG","77","","-99","LOQ","YES","80.8","","292.8","10","85",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "STL00995", "13C5
PFNA","70","ng/L","","-99","DL","","TRG","82","","-99","LOQ","YES","85.4","","292.8","10","85",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "STL00996", "13C2
PFDA","65","ng/L","","-99","DL","","TRG","77","","-99","LOQ","YES","85.4","","292.8","10","85",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "STL00997", "13C2
PFUnA","63","ng/L","","-99","DL","","TRG","74","","-99","LOQ","YES","85.4","","292.8","10","85",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "STL00998", "13C2
PFDoA","56","ng/L","","-99","DL","","TRG","66","","-99","LOQ","YES","85.4","","292.8","10","85",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "STL01056", "13C8
FOSA", "57", "ng/L", "", "-99", "DL", "", "TRG", "67", "", "-99", "LOQ", "YES", "85.4", "", "292.8", "10", "85", ""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "STL01892", "13C4-
PFHpA","64","ng/L","","-99","DL","","TRG","75","","-99","LOQ","YES","85.4","","292.8","10","85",""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "STL01893", "13C5"
PFPeA", "65", "ng/L", "", "-99", "DL", "", "TRG", "76", "", "-99", "LOQ", "YES", "85.4", "", "292.8", "10", "85", ""
"TP-PFC-029-MIDCARBON", "EPA 537 (Mod)", "RES", "320-38875-2", "TALSAC", "STL02116", "13C2-
PFTeDA", "51", "ng/L", "", "-99", "DL", "", "TRG", "60", "", "-99", "LOQ", "YES", "85.4", "", "292.8", "10", "85", ""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","STL02337","13C3-
PFBS","57","ng/L","","-99","DL","","TRG","72","","-99","LOQ","YES","79.4","","292.8","10","85",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid
(PFOS)","2.6","ng/L","J M","1.0","DL","","TRG","","","3.7","LOQ","YES","-99","","272.9","10","2.7",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "2058-94-8", "Perfluoroundecanoic acid
(PFUnA)","1.4","ng/L","U","0.66","DL","","TRG","","1.8","LOQ","YES","-99","","272.9","10","1.4",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "2706-90-3", "Perfluoropentanoic acid
(PFPeA)","190","ng/L","M","0.39","DL","","TRG","","1.8","LOQ","YES","-99","","272.9","10","0.92",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "307-24-4", "Perfluorohexanoic acid
(PFHxA)","78","ng/L","","0.43","DL","","TRG","","1.8","LOQ","YES","-99","","272.9","10","0.92",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "307-55-1", "Perfluorododecanoic acid
(PFDoA)","1.4","ng/L","U","0.48","DL","","TRG","","1.8","LOQ","YES","-99","","272.9","10","1.4",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "335-67-1", "Perfluorooctanoic acid
(PFOA)","2.6","ng/L","M","0.49","DL","","TRG","","1.8","LOQ","YES","-99","","272.9","10","1.4",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "335-76-2", "Perfluorodecanoic acid
(PFDA)","0.92","ng/L","U","0.44","DL","","TRG","","1.8","LOQ","YES","-99","","272.9","10","0.92",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "335-77-3", "Perfluorodecanesulfonic acid
(PFDS)","1.4","ng/L","U","0.51","DL","","TRG","","1.8","LOQ","YES","-99","","272.9","10","1.4",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid
(PFHxS)","0.68","ng/L","J","0.35","DL","","TRG","","1.8","LOQ","YES","-99","","272.9","10","0.92",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "375-22-4", "Perfluorobutanoic acid
(PFBA)","130","ng/L","","0.54","DL","","TRG","","1.8","LOQ","YES","-99","","272.9","10","1.4",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)","1.4","ng/L","J","0.42","DL","","TRG","","1.8","LOQ","YES","-99","","272.9","10","0.92",""
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"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "375-85-9", "Perfluoroheptanoic acid
(PFHpA)","1.3","ng/L","J","0.56","DL","","TRG","","1.8","LOQ","YES","-99","","272.9","10","1.4",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "375-92-8", "Perfluoroheptanesulfonic Acid
(PFHpS)","0.92","ng/L","U","0.34","DL","","TRG","","1.8","LOQ","YES","-99","","272.9","10","0.92",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "375-95-1", "Perfluorononanoic acid
(PFNA)","1.4","ng/L","U","0.48","DL","","TRG","","1.8","LOQ","YES","-99","","272.9","10","1.4",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "376-06-7", "Perfluorotetradecanoic acid
(PFTeA)","2.7","ng/L","U","0.76","DL","","TRG","","","3.7","LOQ","YES","-99","","272.9","10","2.7",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "72629-94-8", "Perfluorotridecanoic Acid
(PFTriA)", "2.7", "ng/L", "U", "0.70", "DL", "", "TRG", "", "", "3.7", "LOQ", "YES", "-99", "", "272.9", "10", "2.7", ""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "754-91-6", "Perfluorooctane Sulfonamide"
(FOSA)","2.7","ng/L","U","1.2","DL","","TRG","","","3.7","LOQ","YES","-99","","272.9","10","2.7",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "STL00990", "13C4"
PFOA","73","ng/L","","-99","DL","","TRG","79","","-99","LOQ","YES","91.6","","272.9","10","92",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "STL00991", "13C4
PFOS","64","ng/L","","-99","DL","","TRG","73","","-99","LOQ","YES","87.6","","272.9","10","92",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "STL00992", "13C4
PFBA","66","ng/L","","-99","DL","","TRG","72","","-99","LOQ","YES","91.6","","272.9","10","92",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "STL00993", "13C2
PFHxA","68","ng/L","","-99","DL","","TRG","74","","-99","LOQ","YES","91.6","","272.9","10","92",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "STL00994", "1802
PFHxS","63","ng/L","","-99","DL","","TRG","73","","-99","LOQ","YES","86.7","","272.9","10","92",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "STL00995", "13C5
PFNA","74","ng/L","","-99","DL","","TRG","81","","-99","LOQ","YES","91.6","","272.9","10","92",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "STL00996", "13C2
PFDA", "66", "ng/L", "", "-99", "DL", "", "TRG", "72", "", "-99", "LOQ", "YES", "91.6", "", "272.9", "10", "92", ""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "STL00997", "13C2
PFUnA","72","ng/L","","-99","DL","","TRG","78","","-99","LOQ","YES","91.6","","272.9","10","92",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "STL00998", "13C2
PFDoA","63","ng/L","","-99","DL","","TRG","69","","-99","LOQ","YES","91.6","","272.9","10","92",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "STL01056", "13C8
FOSA", "59", "ng/L", "", "-99", "DL", "", "TRG", "64", "", "-99", "LOQ", "YES", "91.6", "", "272.9", "10", "92", ""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "STL01892", "13C4-
PFHpA","68","ng/L","","-99","DL","","TRG","74","","-99","LOQ","YES","91.6","","272.9","10","92",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "STL01893", "13C5
PFPeA", "70", "ng/L", "", "-99", "DL", "", "TRG", "76", "", "-99", "LOQ", "YES", "91.6", "", "272.9", "10", "92", "", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "10", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", "92", 
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "STL02116", "13C2-
PFTeDA","55","ng/L","","-99","DL","","TRG","60","","-99","LOQ","YES","91.6","","272.9","10","92",""
"TP-PFC-029-TPE", "EPA 537 (Mod)", "RES", "320-38875-3", "TALSAC", "STL02337", "13C3-
PFBS","62","ng/L","","-99","DL","","TRG","72","","-99","LOQ","YES","85.2","","272.9","10","92",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid
(PFOS)","9.2","ng/L","","1.0","DL","","TRG","","","3.8","LOQ","YES","-99","","264.2","10","2.8",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "2058-94-8", "Perfluoroundecanoic acid
(PFUnA)","1.4","ng/L","U","0.68","DL","","TRG","","1.9","LOQ","YES","-99","","264.2","10","1.4",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "2706-90-3", "Perfluoropentanoic acid
(PFPeA)","190","ng/L","M","0.41","DL","","TRG","","1.9","LOQ","YES","-99","","264.2","10","0.95",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "307-24-4", "Perfluorohexanoic acid
(PFHxA)","80","ng/L","","0.44","DL","","TRG","","1.9","LOO","YES","-99","","264.2","10","0.95",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "307-55-1", "Perfluorododecanoic acid
(PFDoA)","1.4","ng/L","U","0.49","DL","","TRG","","1.9","LOQ","YES","-99","","264.2","10","1.4",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "335-67-1", "Perfluorooctanoic acid
(PFOA)","3.5","ng/L","M","0.51","DL","","TRG","","1.9","LOQ","YES","-99","","264.2","10","1.4",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "335-76-2", "Perfluorodecanoic acid
(PFDA)","0.95","ng/L","U","0.45","DL","","TRG","","1.9","LOQ","YES","-99","","264.2","10","0.95",""
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"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "335-77-3", "Perfluorodecanesulfonic acid
(PFDS)","1.4","ng/L","U","0.53","DL","","TRG","","","1.9","LOQ","YES","-99","","264.2","10","1.4",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid
(PFHxS)","7.0","ng/L","","0.36","DL","","TRG","","1.9","LOQ","YES","-99","","264.2","10","0.95",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "375-22-4", "Perfluorobutanoic acid
(PFBA)","130","ng/L","","0.56","DL","","TRG","","1.9","LOQ","YES","-99","","264.2","10","1.4",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)","2.2","ng/L","","0.44","DL","","TRG","","","1.9","LOQ","YES","-99","","264.2","10","0.95",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "375-85-9", "Perfluoroheptanoic acid
(PFHpA)","2.0","ng/L","","0.58","DL","","TRG","","1.9","LOQ","YES","-99","","264.2","10","1.4",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "375-92-8", "Perfluoroheptanesulfonic
Acid (PFHpS)","0.95","ng/L","U M","0.35","DL","","TRG","","1.9","LOQ","YES","-99","","264.2","10","0.95",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "375-95-1", "Perfluorononanoic acid
(PFNA)","1.4","ng/L","U","0.49","DL","","TRG","","","1.9","LOQ","YES","-99","","264.2","10","1.4",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "376-06-7", "Perfluorotetradecanoic acid
(PFTeA)","2.8","ng/L","U","0.79","DL","","TRG","","","3.8","LOQ","YES","-99","","264.2","10","2.8",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "72629-94-8", "Perfluorotridecanoic Acid
(PFTriA)","2.8","ng/L","U","0.72","DL","","TRG","","","3.8","LOQ","YES","-99","","264.2","10","2.8",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "754-91-6", "Perfluorooctane Sulfonamide
(FOSA)","2.8","ng/L","U","1.2","DL","","TRG","","","3.8","LOQ","YES","-99","","264.2","10","2.8",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "STL00990", "13C4
PFOA", "80", "ng/L", "", "-99", "DL", "", "TRG", "84", "", "-99", "LOQ", "YES", "94.6", "", "264.2", "10", "95", ""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "STL00991", "13C4
PFOS","70","ng/L","","-99","DL","","TRG","78","","-99","LOQ","YES","90.5","","264.2","10","95",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "STL00992", "13C4"
PFBA", "71", "ng/L", "", "-99", "DL", "", "TRG", "75", "", "-99", "LOO", "YES", "94.6", "", "264.2", "10", "95", ""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "STL00993", "13C2
PFHxA","72","ng/L","","-99","DL","","TRG","76","","-99","LOQ","YES","94.6","","264.2","10","95",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "STL00994", "18O2
PFHxS","70","ng/L","","-99","DL","","TRG","78","","-99","LOQ","YES","89.5","","264.2","10","95",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "STL00995", "13C5
PFNA", "86", "ng/L", "", "-99", "DL", "", "TRG", "91", "", "-99", "LOQ", "YES", "94.6", "", "264.2", "10", "95", ""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "STL00996", "13C2
PFDA","75","ng/L","","-99","DL","","TRG","79","","-99","LOQ","YES","94.6","","264.2","10","95",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "STL00997", "13C2
PFUnA", "81", "ng/L", "", "-99", "DL", "", "TRG", "86", "", "-99", "LOQ", "YES", "94.6", "", "264.2", "10", "95", ""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "STL00998", "13C2
PFDoA","72","ng/L","","-99","DL","","TRG","76","","-99","LOQ","YES","94.6","","264.2","10","95",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "STL01056", "13C8
FOSA", "64", "ng/L", "", "-99", "DL", "", "TRG", "67", "", "-99", "LOQ", "YES", "94.6", "", "264.2", "10", "95", ""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "STL01892", "13C4-
PFHpA","74","ng/L","","-99","DL","","TRG","78","","-99","LOQ","YES","94.6","","264.2","10","95",""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "STL01893", "13C5"
PFPeA", "76", "ng/L", "", "-99", "DL", "", "TRG", "80", "", "-99", "LOQ", "YES", "94.6", "", "264.2", "10", "95", ""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "STL02116", "13C2-
PFTeDA", "66", "ng/L", "", "-99", "DL", "", "TRG", "70", "", "-99", "LOQ", "YES", "94.6", "", "264.2", "10", "95", ""
"TP-PFC-029-TPE-D", "EPA 537 (Mod)", "RES", "320-38875-4", "TALSAC", "STL02337", "13C3-
PFBS","68","ng/L","","-99","DL","","TRG","78","","-99","LOQ","YES","88.0","","264.2","10","95",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "1763-23-
1"."Perfluorooctanesulfonic acid
(PFOS)","33.5","ng/L","","1.1","DL","","SPK","90","","4.0","LOQ","YES","37.1","","250","10","3.0",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "2058-94-
8", "Perfluoroundecanoic acid
(PFUnA)","36.2","ng/L","","0.72","DL","","SPK","91","","2.0","LOQ","YES","40.0","","250","10","1.5",""
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"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "2706-90-3", "Perfluoropentanoic
acid (PFPeA)","36.7","ng/L","","0.43","DL","","SPK","92","","2.0","LOQ","YES","40.0","","250","10","1.0",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "307-24-4", "Perfluorohexanoic
acid (PFHxA)","39.4","ng/L","","0.47","DL","","SPK","98","","2.0","LOQ","YES","40.0","","250","10","1.0",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "307-55-
1","Perfluorododecanoic acid
(PFDoA)","40.9","ng/L","","0.52","DL","","SPK","102","","2.0","LOQ","YES","40.0","","250","10","1.5",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "335-67-1", "Perfluorooctanoic
acid (PFOA)", "35.7", "ng/L", "", "0.54", "DL", "", "SPK", "89", "", "2.0", "LOQ", "YES", "40.0", "", "250", "10", "1.5", ""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "335-76-2", "Perfluorodecanoic
acid (PFDA)","42.6","ng/L","","0.48","DL","","SPK","107","","2.0","LOQ","YES","40.0","","250","10","1.0",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "335-77-
3"."Perfluorodecanesulfonic acid
(PFDS)", "35.3", "ng/L", "", "0.56", "DL", "", "SPK", "91", "", "2.0", "LOQ", "YES", "38.6", "", "250", "10", "1.5", ""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "355-46-
4"."Perfluorohexanesulfonic acid
(PFHxS)","35.0","ng/L","","0.38","DL","","SPK","96","","2.0","LOQ","YES","36.4","","250","10","1.0",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "375-22-4", "Perfluorobutanoic
acid (PFBA)","41.6","ng/L","","0.59","DL","","SPK","104","","2.0","LOQ","YES","40.0","","250","10","1.5",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "375-73-
5", "Perfluorobutanesulfonic acid
(PFBS)", "36.3", "ng/L", "", "0.46", "DL", "", "SPK", "103", "", "2.0", "LOQ", "YES", "35.4", "", "250", "10", "1.0", "", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "375-85-9", "Perfluoroheptanoic
acid (PFHpA)","39.6","ng/L","","0.61","DL","","SPK","99","","2.0","LOQ","YES","40.0","","250","10","1.5",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "375-92-
8"."Perfluoroheptanesulfonic Acid
(PFHpS)", "34.4", "ng/L", "", "0.37", "DL", "", "SPK", "90", "", "2.0", "LOQ", "YES", "38.1", "", "250", "10", "1.0", "", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0", "1.0
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "375-95-1", "Perfluorononanoic
acid (PFNA)","37.6","ng/L","","0.52","DL","","SPK","94","","2.0","LOQ","YES","40.0","","250","10","1.5",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "376-06-
7"."Perfluorotetradecanoic acid
(PFTeA)", "36.7", "ng/L", "", "0.83", "DL", "", "SPK", "92", "", "4.0", "LOQ", "YES", "40.0", "", "250", "10", "3.0", ""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "72629-94-
8"."Perfluorotridecanoic Acid
(PFTriA)", "39.3", "ng/L", "", "0.76", "DL", "", "SPK", "98", "", "4.0", "LOQ", "YES", "40.0", "", "250", "10", "3.0", ""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "754-91-6", "Perfluorooctane"
Sulfonamide
(FOSA)","40.5","ng/L","","1.3","DL","","SPK","101","","4.0","LOQ","YES","40.0","","250","10","3.0",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "STL00990", "13C4
PFOA","90.3","ng/L","","-99","DL","","SPK","90","","-99","LOQ","YES","100","","250","10","100",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "STL00991", "13C4
PFOS","81.8","ng/L","","-99","DL","","SPK","86","","-99","LOQ","YES","95.6","","250","10","100",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "STL00992", "13C4
PFBA","80.1","ng/L","","-99","DL","","SPK","80","","-99","LOQ","YES","100","","250","10","100",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "STL00993", "13C2
PFHxA", "86.4", "ng/L", "", "-99", "DL", "", "SPK", "86", "", "-99", "LOQ", "YES", "100", "", "250", "10", "100", ""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "STL00994", "18O2
PFHxS","75.6","ng/L","","-99","DL","","SPK","80","","-99","LOQ","YES","94.6","","250","10","100",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "STL00995", "13C5
PFNA","90.0","ng/L","","-99","DL","","SPK","90","","-99","LOQ","YES","100","","250","10","100",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "STL00996", "13C2
PFDA", "85.8", "ng/L", "", "-99", "DL", "", "SPK", "86", "", "-99", "LOQ", "YES", "100", "", "250", "10", "100", ""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "STL00997", "13C2
```

PFUnA","93.9","ng/L","","-99","DL","","SPK","94","","-99","LOQ","YES","100","","250","10","100",""

```
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "STL00998", "13C2
PFDoA","82.4","ng/L","","-99","DL","","SPK","82","","-99","LOQ","YES","100","","250","10","100",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "STL01056", "13C8
FOSA","69.4","ng/L","","-99","DL","","SPK","69","","-99","LOQ","YES","100","","250","10","100",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "STL01892", "13C4-
PFHpA","85.4","ng/L","","-99","DL","","SPK","85","","-99","LOQ","YES","100","","250","10","100",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "STL01893", "13C5
PFPeA", "86.9", "ng/L", "", "-99", "DL", "", "SPK", "87", "", "-99", "LOQ", "YES", "100", "", "250", "10", "100", ""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "STL02116", "13C2-
PFTeDA","82.0","ng/L","","-99","DL","","SPK","82","","-99","LOQ","YES","100","","250","10","100",""
"LCS 320-223615/2-A", "EPA 537 (Mod)", "RES", "LCS 320-223615/2-A", "TALSAC", "STL02337", "13C3-
PFBS","73.0","ng/L","","-99","DL","","SPK","78","","-99","LOQ","YES","93.0","","250","10","100",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "1763-23-
1", "Perfluorooctanesulfonic acid
(PFOS)","3.0","ng/L","U","1.1","DL","","TRG","","4.0","LOQ","YES","-99","","250","10","3.0",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "2058-94-
8"."Perfluoroundecanoic acid
(PFUnA)","1.5","ng/L","U","0.72","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.5",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "2706-90-3", "Perfluoropentanoic
acid (PFPeA)","1.0","ng/L","U","0.43","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.0",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "307-24-4", "Perfluorohexanoic
acid (PFHxA)","1.0","ng/L","U","0.47","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.0",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "307-55-1", "Perfluorododecanoic
acid (PFDoA)","1.5","ng/L","U","0.52","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.5",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "335-67-1", "Perfluorooctanoic
acid (PFOA)","1.5","ng/L","U M","0.54","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.5",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "335-76-2", "Perfluorodecanoic
acid (PFDA)", "1.0", "ng/L", "U", "0.48", "DL", "", "TRG", "", "", "2.0", "LOQ", "YES", "-99", "", "250", "10", "1.0", ""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "335-77-
3"."Perfluorodecanesulfonic acid
(PFDS)","1.5","ng/L","U","0.56","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.5",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "355-46-
4"."Perfluorohexanesulfonic acid
(PFHxS)","1.0","ng/L","U","0.38","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.0",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "375-22-4", "Perfluorobutanoic
acid (PFBA)","1.5","ng/L","U","0.59","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.5",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "375-73-
5","Perfluorobutanesulfonic acid
(PFBS)","1.0","ng/L","U","0.46","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.0",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "375-85-9", "Perfluoroheptanoic
acid (PFHpA)","1.5","ng/L","U","0.61","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.5",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "375-92-
8", "Perfluoroheptanesulfonic Acid
(PFHpS)","1.0","ng/L","U","0.37","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.0",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "375-95-1", "Perfluorononanoic
acid (PFNA)", "1.5", "ng/L", "U", "0.52", "DL", "", "TRG", "", "", "2.0", "LOQ", "YES", "-99", "", "250", "10", "1.5", ""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "376-06-
7"."Perfluorotetradecanoic acid
(PFTeA)","3.0","ng/L","U","0.83","DL","","TRG","","4.0","LOQ","YES","-99","","250","10","3.0",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "72629-94-
8", "Perfluorotridecanoic Acid
(PFTriA)", "3.0", "ng/L", "U", "0.76", "DL", "", "TRG", "", "4.0", "LOQ", "YES", "-99", "", "250", "10", "3.0", ""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "754-91-6", "Perfluorooctane"
Sulfonamide (FOSA)", "3.0", "ng/L", "U", "1.3", "DL", "", "TRG", "", "4.0", "LOQ", "YES", "-99", "", "250", "10", "3.0", "", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20", "1.20",
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"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "STL00990", "13C4
PFOA","92.9","ng/L","","-99","DL","","TRG","93","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "STL00991", "13C4
PFOS","77.8","ng/L","","-99","DL","","TRG","81","","-99","LOQ","YES","95.6","","250","10","100",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "STL00992", "13C4
PFBA","78.7","ng/L","","-99","DL","","TRG","79","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "STL00993", "13C2
PFHxA","84.8","ng/L","","-99","DL","","TRG","85","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "STL00994", "18O2
PFHxS","80.5","ng/L","","-99","DL","","TRG","85","","-99","LOQ","YES","94.6","","250","10","100",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "STL00995", "13C5
PFNA", "93.5", "ng/L", "", "-99", "DL", "", "TRG", "94", "", "-99", "LOQ", "YES", "100", "", "250", "10", "100", ""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "STL00996", "13C2
PFDA", "86.3", "ng/L", "", "-99", "DL", "", "TRG", "86", "", "-99", "LOQ", "YES", "100", "", "250", "10", "100", ""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "STL00997", "13C2
PFUnA","89.7","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "STL00998", "13C2
PFDoA","84.8","ng/L","","-99","DL","","TRG","85","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "STL01056", "13C8
FOSA","71.3","ng/L","","-99","DL","","TRG","71","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "STL01892", "13C4-
PFHpA","83.6","ng/L","","-99","DL","","TRG","84","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "STL01893", "13C5
PFPeA","84.5","ng/L","","-99","DL","","TRG","85","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "STL02116", "13C2-
PFTeDA","84.1","ng/L","","-99","DL","","TRG","84","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A", "EPA 537 (Mod)", "RES", "MB 320-223615/1-A", "TALSAC", "STL02337", "13C3-
PFBS","74.6","ng/L","","-99","DL","","TRG","80","","-99","LOQ","YES","93.0","","250","10","100",""
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07:47", "TALSAC", "COA", "WET", "NA", "1", "NA", "NA", "1, "100", "320-223615", "320-223615", "NA", "320-
225818","320-38875-1","05/04/2018 09:30","05/07/2018 08:45",""
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225818","320-38875-1","05/04/2018 09:30","05/07/2018 08:45",""
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INTERNAL CORRESPONDENCE

TO: J. ORIENT DATE: JULY 11, 2018

FROM: MICHELLE L. WOEBER COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION – POLYFLUOROALKYL SUBSTANCES (PFAS)

FORMER NAVAL AIR STATION (NAS) BRUNSWICK, BRUNSWICK, ME

CTO WE21 PFC ASSESSMENT

SAMPLE DELIVERY GROUP (SDG) 320-38875-1

SAMPLES: 4/Aqueous/PFAS

TP-PFC-029-MIDCARBON TP-PFC-029-TPE TP-PFC-029-TPE-D

TP-PFC-029-TPI

Overview

The sample set for former NAS Brunswick, SDG 320-38875-1 consisted of four (4) aqueous environmental samples. All four (4) aqueous samples were analyzed for Polyfluoroalkyl Substances (PFAS). One field duplicate pair was included in these Sample Delivery Groups (SDGs): TP-PFC-029-TPE/TP-PFC-029-TPE-D.

The samples were collected by Tetra Tech, Inc. on May 3, 2018 and analyzed by Test America, Inc. The analyses were conducted using EPA Method 537 (Modified) analytical and reporting protocols. The data was evaluated based on the following parameters:

- Data completeness
- Hold times/Sample Preservation
- Mass Calibration
- LC/MS/MS System Tuning and Performance
- Mass Spectral Acquisition Rate
- Instrument Sensitivity Check
- Ion Transition Check
- * Initial/Continuing Calibrations
 - Laboratory Method/Preparation Blank Results
- Extraction Internal Standard (Surrogate) Recoveries
 - Injection Internal Standard Recoveries
- Laboratory Control Sample Recoveries
 - Field Duplicate Precision
- Compound Identification
- Compound Quantitation
- Detection Limits

The asterisk (*) indicates that all quality control criteria were met for this parameter. Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B, and Appendix C contains the documentation to support the findings as discussed in this data validation report. An EPA Region 1 tier II validation was performed on the data in this SDG. The text of this report has been formulated to address only those areas affecting data quality.

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SDGs: 320-38875-1

<u>PFAS</u>

The following compound was detected in the Initial/Continuing Calibration Blanks (ICB/CCBs) at the following maximum concentration affecting all samples:

Maximum Action Level

<u>Analyte</u> <u>Concentration (ng/ml)</u> <u>Limit of Quantitation (LOQ) > or <</u>

Perfluorohexanesulfonic acid (PFHxS) 0.00671 < LOQ

The detected result reported for PFHxS reported below the Limit of Detection (LOD) was raised to LOD and qualified as non-detected, (U).

The difference between the detected and non-detected results reported for PFHxS in the field duplicate pair, TP-PFC-029-TPE/TP-PFC-029-TPE-D, exceeded 2X the LOQ. The detected result reported for this compound in the duplicate sample was qualified as estimated, (J). No action was taken for the non-detected result in the original sample because this result was qualified for blank contamination.

The injected internal standard compound, 13C2-perfluorooctanoic acid (13C2-PFOA), had an area below the 50% quality control limit in the diluted analysis of sample TP-PFC-029-TPI. Detected results in the affected dilution analysis were qualified as estimated, (J).

NOTES

The samples were received at the laboratory above 6°C (7.1°C) but less than 10.0°C. Evidence of melted ice was in the cooler. No action was taken.

Field Reagent Blanks (FRBs) were not provided with the environmental samples.

The concentrations of pentadecafluorooctanoic acid (perfluorooctanoic acid (PFOA)), perfluorohexanoic acid (PFHxA), perfluorohexanesulfonic acid (PFHxS), and perfluorooctanesulfonic acid (PFOS) exceeded the instrument calibration range in sample TP-PFC-029-TPI. The sample was reanalyzed at a 10X dilution. The results for these compounds from the dilution were used in the data validation.

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

EXECUTIVE SUMMARY

Laboratory Performance: A contaminant was detected in the ICB and CCBs. The injected internal standard area was low in the diluted sample.

Other Factors Affecting Data Quality: Field duplicate imprecision was noted for one compound. One sample was further diluted. Detected results below the LOQ were estimated.

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SDGs: 320-38875-1

The data for these analyses were reviewed with reference to the EPA New England Environmental Data Review Supplement for Regional Data Review Elements Superfund Guidance/Procedures (April 2013), National Functional Guidelines for Organic Data Validation (January 2017), and the Department of Defense (DoD) document entitled, "Quality Systems Manual (QSM) for Environmental Laboratories" (July 2013). The text of this report has been formulated to address only those areas affecting data quality.

Tetra Tech, Inc. Michelle L. Woeber Environmental Chemist

Michelle Fr. Woeber

Tetra Tech, Inc. Joseph A. Samchuck Data Validation Manager

Attachments:

Appendix A - Qualified Analytical Results

Appendix B - Results as reported by the Laboratory

Appendix C - Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted detection limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
х	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team, but exclusion of the data is recommended.

APPENDIX A QUALIFIED LABORATORY RESULTS

Qualifier Codes:

A = Lab Blank Contamination

B = Field Blank Contamination

C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)

C01 = GC/MS Tuning Noncompliance

D = MS/MSD Recovery Noncompliance

E = LCS/LCSD Recovery Noncompliance

F = Lab Duplicate Imprecision

G = Field Duplicate Imprecision

H = Holding Time Exceedance

I = ICP Serial Dilution Noncompliance

J = ICP PDS Recovery Noncompliance; MSA's r < 0.995

K = ICP Interference - includes ICS % R Noncompliance

L = Instrument Calibration Range Exceedance

M = Sample Preservation Noncompliance

N = Internal Standard Noncompliance

N01 = Internal Standard Recovery Noncompliance Dioxins

N02 = Recovery Standard Noncompliance Dioxins

N03 = Clean-up Standard Noncompliance Dioxins

O = Poor Instrument Performance (i.e., base-time drifting)

P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)

Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)

R = Surrogates Recovery Noncompliance

S = Pesticide/PCB Resolution

T = % Breakdown Noncompliance for DDT and Endrin

U = RPD between columns/detectors >40% for positive results determined via GC/HPLC

V = Non-linear calibrations; correlation coefficient r < 0.995

W = EMPC result

X = Signal to noise response drop

Y = Percent solids <30%

Z = Uncertainty at 2 standard deviations is greater than sample activity

Z1 = Tentatively Identified Compound considered presumptively present

Z2 = Tentatively Identified Compound column bleed

Z3 = Tentatively Identified Compound aldol condensate

Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC

Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE21	NSAMPLE	TP-PFC-029-1	MIDCAF	RBON	TP-PFC-029-	TPE		TP-PFC-029-	TPE-D		TP-PFC-029	-TPI	
SDG: 320-38875-1	LAB_ID	320-38875-2			320-38875-3			320-38875-4			320-38875-1		
FRACTION: PFAS	SAMP_DATE	5/3/2018			5/3/2018			5/3/2018			5/3/2018		
MEDIA: WATER	QC_TYPE	NM		NM			FD	FD		NM			
	UNITS	NG/L			NG/L			NG/L	NG/L			NG/L	
	PCT_SOLIDS	0.0			0.0	0.0					0.0		
	DUP_OF							TP-PFC-029-	TPE				
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCT (PFOA)	TANOIC ACID	39			2.6	6		3.5	5				
PERFLUOROBUTANESUL (PFBS)	FONIC ACID	5.5			1.4	4 J	Р	2.2	2		4	19	
PERFLUOROBUTANOIC A	ACID (PFBA)	130			130)		130)		7	74	
PERFLUORODECANESUL (PFDS)	FONIC ACID	1.3	U		1.4 U		1.4 U		1.3 U				
PERFLUORODECANOIC A	ACID (PFDA)	0.85	U		0.92	2 U		0.95	U		0.0	32 J	Р
PERFLUORODODECANO (PFDOA)	IC ACID	1.3	U		1.4	4 U		1.4	U		1	.3 U	
PERFLUOROHEPTANESU	JLFONIC ACID	0.85	U		0.92	2 U		0.95	U		7	.7	
PERFLUOROHEPTANOIC	ACID (PFHPA)	6.8			1.3	3 J	Р	2	2		7	' 6	
PERFLUOROHEXANESUL (PFHXS)	FONIC ACID	2.5			0.92	2 U	Α		J	G			
PERFLUOROHEXANOIC A	ACID (PFHXA)	160			78	3		80)				
PERFLUORONONANOIC A	ACID (PFNA)	1.3	U		1.4	4 U		1.4	U		2	.4	
PERFLUOROOCTANE SU (FOSA)	LFONAMIDE	2.6	U		2.7	7 U		2.8	U		2	.6 U	
PERFLUOROOCTANESUL (PFOS)	FONIC ACID	2.6	U		2.6	3 J	Р	9.2	2				
PERFLUOROPENTANOIC	ACID (PFPEA)	240			190)		190)		20	00	
PERFLUOROTETRADECA (PFTEA)	NOIC ACID	2.6	U		2.7	7 U		2.8	U		2	.6 U	
PERFLUOROTRIDECANO (PFTRIA)	IC ACID	2.6	U		2.7	7 U		2.8	U		2	.6 U	
PERFLUOROUNDECANO (PFUNA)	IC ACID	1.3	U		1.4	4 U		1.4	U		1	.3 U	

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PROJ_NO: 08005-WE21	NSAMPLE	TP-PFC-029-TPI-DL						
SDG: 320-38875-1	LAB_ID	320-38875-1						
FRACTION: PFAS	SAMP_DATE	5/3/2018						
MEDIA: WATER	QC_TYPE	NM						
	UNITS	NG/L						
	PCT_SOLIDS	0.0						
	DUP_OF							
PARAMETER		RESULT	VQL	QLCD				
PENTADECAFLUOROOCT (PFOA)	ANOIC ACID	1700	J	N				
PERFLUOROBUTANESULI (PFBS)	FONIC ACID							
PERFLUOROBUTANOIC A	CID (PFBA)							
PERFLUORODECANESUL (PFDS)	FONIC ACID							
PERFLUORODECANOIC A	CID (PFDA)							
PERFLUORODODECANOI (PFDOA)	C ACID							
PERFLUOROHEPTANESU	LFONIC ACID							
PERFLUOROHEPTANOIC	ACID (PFHPA)							
PERFLUOROHEXANESUL (PFHXS)	FONIC ACID	410	J	N				
PERFLÚOROHEXANOIC A	CID (PFHXA)	380	J	N				
PERFLUORONONANOIC A	CID (PFNA)							
PERFLUOROOCTANE SUL (FOSA)	FONAMIDE							
PERFLUOROOCTANESUL (PFOS)	FONIC ACID	330	J	N				
PERFLUOROPENTANOIC	ACID (PFPEA)							
PERFLUOROTETRADECA (PFTEA)								
PERFLUOROTRIDECANOI (PFTRIA)	C ACID							
PERFLUOROUNDECANOI((PFUNA)	C ACID							

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APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPI Lab Sample ID: 320-38875-1

Matrix: Water Lab File ID: 2018.05.27LLADX_006.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:20

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 290.5(mL) Date Analyzed: 05/28/2018 07:39

Con. Extract Vol.: 10 (mL) Dilution Factor: 1

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

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

		ı				
CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	74	М	1.7	1.3	0.51
2706-90-3	Perfluoropentanoic acid (PFPeA)	200	М	1.7	0.86	0.37
307-24-4	Perfluorohexanoic acid (PFHxA)	360	E M	1.7	0.86	0.40
375-85-9	Perfluoroheptanoic acid (PFHpA)	76	М	1.7	1.3	0.52
335-67-1	Perfluorooctanoic acid (PFOA)	1500	E	1.7	1.3	0.46
375-95-1	Perfluorononanoic acid (PFNA)	2.4		1.7	1.3	0.45
335-76-2	Perfluorodecanoic acid (PFDA)	0.82	JМ	1.7	0.86	0.41
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U M	1.7	1.3	0.62
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.45
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.4	2.6	0.65
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.4	2.6	0.71
375-73-5	Perfluorobutanesulfonic acid (PFBS)	49	М	1.7	0.86	0.40
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	400	E	1.7	0.86	0.33
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	7.7		1.7	0.86	0.32
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	330	E	3.4	2.6	0.95
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.48
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.6	U M	3.4	2.6	1.1

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPI Lab Sample ID: 320-38875-1

Matrix: Water Lab File ID: 2018.05.27LLADX_006.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:20

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 290.5(mL) Date Analyzed: 05/28/2018 07:39

Con. Extract Vol.: 10 (mL) Dilution Factor: 1

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

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

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	81		50-150
STL00992	13C4 PFBA	83		50-150
STL01893	13C5 PFPeA	97		50-150
STL00993	13C2 PFHxA	95		50-150
STL01892	13C4-PFHpA	91		50-150
STL00990	13C4 PFOA	85		50-150
STL00995	13C5 PFNA	102		50-150
STL00996	13C2 PFDA	96		50-150
STL00997	13C2 PFUnA	101		50-150
STL00998	13C2 PFDoA	89		50-150
STL00994	1802 PFHxS	89		50-150
STL02116	13C2-PFTeDA	79		50-150
STL00991	13C4 PFOS	87		50-150
STL02337	13C3-PFBS	95		50-150

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPI DL Lab Sample ID: 320-38875-1 DL

Matrix: Water Lab File ID: 2018.05.28LLA_056.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:20

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 290.5(mL) Date Analyzed: 05/29/2018 00:09

Con. Extract Vol.: 10 (mL) Dilution Factor: 10

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

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

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	81	D	17	13	5.1
2706-90-3	Perfluoropentanoic acid (PFPeA)	200	D	17	8.6	3.7
307-24-4	Perfluorohexanoic acid (PFHxA)	380	D	17	8.6	4.0
375-85-9	Perfluoroheptanoic acid (PFHpA)	73	D	17	13	5.2
335-67-1	Perfluorooctanoic acid (PFOA)	1700	D	17	13	4.6
375-95-1	Perfluorononanoic acid (PFNA)	13	U	17	13	4.5
335-76-2	Perfluorodecanoic acid (PFDA)	8.6	U	17	8.6	4.1
2058-94-8	Perfluoroundecanoic acid (PFUnA)	13	U	17	13	6.2
307-55-1	Perfluorododecanoic acid (PFDoA)	13	U	17	13	4.5
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	26	U	34	26	6.5
376-06-7	Perfluorotetradecanoic acid (PFTeA)	26	U	34	26	7.1
375-73-5	Perfluorobutanesulfonic acid (PFBS)	50	D	17	8.6	4.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	410	D	17	8.6	3.3
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	8.7	JD	17	8.6	3.2
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	330	D	34	26	9.5
335-77-3	Perfluorodecanesulfonic acid (PFDS)	13	U	17	13	4.8
754-91-6	Perfluorooctane Sulfonamide (FOSA)	26	U	34	26	11

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPI DL Lab Sample ID: 320-38875-1 DL

Matrix: Water Lab File ID: 2018.05.28LLA_056.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:20

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 290.5(mL) Date Analyzed: 05/29/2018 00:09

Con. Extract Vol.: 10 (mL) Dilution Factor: 10

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

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

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	73		50-150
STL00992	13C4 PFBA	78		50-150
STL01893	13C5 PFPeA	84		50-150
STL00993	13C2 PFHxA	81		50-150
STL01892	13C4-PFHpA	81		50-150
STL00990	13C4 PFOA	87		50-150
STL00995	13C5 PFNA	86		50-150
STL00996	13C2 PFDA	83		50-150
STL00997	13C2 PFUnA	90		50-150
STL00998	13C2 PFDoA	87		50-150
STL00994	1802 PFHxS	80		50-150
STL02116	13C2-PFTeDA	69		50-150
STL00991	13C4 PFOS	75		50-150
STL02337	13C3-PFBS	76		50-150

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-MIDCARBON Lab Sample ID: 320-38875-2

Matrix: Water Lab File ID: 2018.05.27LLADX_007.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:25

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 292.8(mL) Date Analyzed: 05/28/2018 07:47

Con. Extract Vol.: 10 (mL) Dilution Factor: 1

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

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

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.7	1.3	0.50
2706-90-3	Perfluoropentanoic acid (PFPeA)	240	М	1.7	0.85	0.37
307-24-4	Perfluorohexanoic acid (PFHxA)	160	М	1.7	0.85	0.40
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.8		1.7	1.3	0.52
335-67-1	Perfluorooctanoic acid (PFOA)	39	М	1.7	1.3	0.46
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.7	1.3	0.44
335-76-2	Perfluorodecanoic acid (PFDA)	0.85	U	1.7	0.85	0.41
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	1.3	0.61
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.44
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.4	2.6	0.65
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.4	2.6	0.71
375-73-5	Perfluorobutanesulfonic acid (PFBS)	5.5		1.7	0.85	0.39
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.5		1.7	0.85	0.32
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.85	U	1.7	0.85	0.32
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	U M	3.4	2.6	0.94
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.48
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.6	U	3.4	2.6	1.1

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-MIDCARBON Lab Sample ID: 320-38875-2

Matrix: Water Lab File ID: 2018.05.27LLADX_007.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:25

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 292.8(mL) Date Analyzed: 05/28/2018 07:47

Con. Extract Vol.: 10 (mL) Dilution Factor: 1

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

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

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	67		50-150
STL00992	13C4 PFBA	73		50-150
STL01893	13C5 PFPeA	76		50-150
STL00993	13C2 PFHxA	78		50-150
STL01892	13C4-PFHpA	75		50-150
STL00990	13C4 PFOA	78		50-150
STL00995	13C5 PFNA	82		50-150
STL00996	13C2 PFDA	77		50-150
STL00997	13C2 PFUnA	74		50-150
STL00998	13C2 PFDoA	66		50-150
STL00994	1802 PFHxS	77		50-150
STL02116	13C2-PFTeDA	60		50-150
STL00991	13C4 PFOS	73		50-150
STL02337	13C3-PFBS	72		50-150

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPE Lab Sample ID: 320-38875-3

Matrix: Water Lab File ID: 2018.05.27LLADX_008.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:30

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 272.9(mL) Date Analyzed: 05/28/2018 07:55

Con. Extract Vol.: 10 (mL) Dilution Factor: 1

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

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

		I	1			
CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.8	1.4	0.54
2706-90-3	Perfluoropentanoic acid (PFPeA)	190	М	1.8	0.92	0.39
307-24-4	Perfluorohexanoic acid (PFHxA)	78		1.8	0.92	0.43
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.3	J	1.8	1.4	0.56
335-67-1	Perfluorooctanoic acid (PFOA)	2.6	М	1.8	1.4	0.49
375-95-1	Perfluorononanoic acid (PFNA)	1.4	U	1.8	1.4	0.48
335-76-2	Perfluorodecanoic acid (PFDA)	0.92	Ū	1.8	0.92	0.44
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.4	Ū	1.8	1.4	0.66
307-55-1	Perfluorododecanoic acid (PFDoA)	1.4	Ū	1.8	1.4	0.48
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.7	Ū	3.7	2.7	0.70
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.7	U	3.7	2.7	0.76
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.4	J	1.8	0.92	0.42
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.68	J	1.8	0.92	0.35
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.92	Ū	1.8	0.92	0.34
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	J M	3.7	2.7	1.0
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.4	U	1.8	1.4	0.51
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.7	U	3.7	2.7	1.2

 SDG No.:
 Client Sample ID: TP-PFC-029-TPE
 Lab Sample ID: 320-38875-3

 Matrix: Water
 Lab File ID: 2018.05.27LLADX_008.d

 Analysis Method: EPA 537 (Mod)
 Date Collected: 05/03/2018 09:30

Dilution Factor: 1

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 272.9(mL) Date Analyzed: 05/28/2018 07:55

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

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

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

Analysis Batch No.: 225818 Units: ng/L

Con. Extract Vol.: 10(mL)

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	64		50-150
STL00992	13C4 PFBA	72		50-150
STL01893	13C5 PFPeA	76		50-150
STL00993	13C2 PFHxA	74		50-150
STL01892	13C4-PFHpA	74		50-150
STL00990	13C4 PFOA	79		50-150
STL00995	13C5 PFNA	81		50-150
STL00996	13C2 PFDA	72		50-150
STL00997	13C2 PFUnA	78		50-150
STL00998	13C2 PFDoA	69		50-150
STL00994	1802 PFHxS	73		50-150
STL02116	13C2-PFTeDA	60		50-150
STL00991	13C4 PFOS	73		50-150
STL02337	13C3-PFBS	72		50-150

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPE-D Lab Sample ID: 320-38875-4

Matrix: Water Lab File ID: 2018.05.27LLADX_009.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 00:00

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 264.2(mL) Date Analyzed: 05/28/2018 08:02

Con. Extract Vol.: 10 (mL) Dilution Factor: 1

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

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

Analysis Batch No.: 225818 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOO	LOD	DL
0710 110.	COIN COND MINE	THEOTE	~	100	202	25
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.9	1.4	0.56
2706-90-3	Perfluoropentanoic acid (PFPeA)	190	М	1.9	0.95	0.41
307-24-4	Perfluorohexanoic acid (PFHxA)	80		1.9	0.95	0.44
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.0		1.9	1.4	0.58
335-67-1	Perfluorooctanoic acid (PFOA)	3.5	M	1.9	1.4	0.51
375-95-1	Perfluorononanoic acid (PFNA)	1.4	U	1.9	1.4	0.49
335-76-2	Perfluorodecanoic acid (PFDA)	0.95	U	1.9	0.95	0.45
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.4	U	1.9	1.4	0.68
307-55-1	Perfluorododecanoic acid (PFDoA)	1.4	U	1.9	1.4	0.49
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.8	U	3.8	2.8	0.72
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.8	U	3.8	2.8	0.79
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.2		1.9	0.95	0.44
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.0		1.9	0.95	0.36
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.95	U M	1.9	0.95	0.35
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	9.2		3.8	2.8	1.0
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.4	U	1.9	1.4	0.53
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.8	Ū	3.8	2.8	1.2

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

 SDG No.:
 Client Sample ID: TP-PFC-029-TPE-D
 Lab Sample ID: 320-38875-4

 Matrix: Water
 Lab File ID: 2018.05.27LLADX_009.d

 Analysis Method: EPA 537 (Mod)
 Date Collected: 05/03/2018 00:00

 Extraction Method: 3535
 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 264.2(mL) Date Analyzed: 05/28/2018 08:02

Con. Extract Vol.: 10 (mL) Dilution Factor: 1

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

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

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

Analysis Batch No.: 225818 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	67		50-150
STL00992	13C4 PFBA	75		50-150
STL01893	13C5 PFPeA	80		50-150
STL00993	13C2 PFHxA	76		50-150
STL01892	13C4-PFHpA	78		50-150
STL00990	13C4 PFOA	84		50-150
STL00995	13C5 PFNA	91		50-150
STL00996	13C2 PFDA	79		50-150
STL00997	13C2 PFUnA	86		50-150
STL00998	13C2 PFDoA	76		50-150
STL00994	1802 PFHxS	78		50-150
STL02116	13C2-PFTeDA	70		50-150
STL00991	13C4 PFOS	78		50-150
STL02337	13C3-PFBS	78		50-150

APPENDIX C SUPPORT DOCUMENTATION

NAS BRUNSWICK SDG 320-38875-1

SAMPLE IDENTIFICATION TP-PFC-029-TPI

COMPOUND PENTADECAFLUOROOCTANOIC ACID

COMPOUND AREA	1225321
INTERNAL STANDARD AMOUNT (ng/ml)	2.39
DILUTION FACTOR	10
INTERNAL STANDARD AREA	258620
AVERAGE RRF	1.1758
SAMPLE VOLUME (ml)	290.5
VOLUME EXTRACT (ml)	10
VOLUME INJECTED (μΙ)	2
ml to L	1000

CONCENTRATION = 1657.59 ng/L

1225321 x 2.39ng/ml x 1000ml x 10ml x 10/(258620 x 1.1758 x 290.5ml x 2µl x 1L)

Report Date: 30-May-2018 13:12:41 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\2018.05.28LLA_056.d

Lims ID: 320-38875-A-1-A Client ID: TP-PFC-029-TPI

Sample Type: Client

Inject. Date: 29-May-2018 00:09:41 ALS Bottle#: 39 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 10.0000

Sample Info: 320-38875-a-1-a 10X (#223615)

Misc. Info.: Plate: 1 Rack: 3

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\A8_N.m

Limit Group: LC PFC_QSM5-1 ICAL

Last Update: 30-May-2018 13:11:52 Calib Date: 15-May-2018 16:39:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: Det: EXP1

Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 13:12:40

First Level Revie	ewer: rua	ngyotsal	Kuld		Date:	3	30-May-2018 13:12:40					
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags		
D 113C4 PFB	Δ											
217.00 > 172.00		1.458	0.005	1.000	510148	0.1960		78.4	3528			
2 Perfluorobu	tyric acid											
212.90 > 169.00	,	1.461	0.002	1.000	443786	0.2339			194			
D 3 13C5-PFP	eA											
267.90 > 223.00	0 1.737	1.730	0.007	0.563	348559	0.2089		83.6	5310			
4 Perfluorope	ntanoic a	cid										
262.90 > 219.00	0 1.737	1.734	0.003	1.000	950047	0.5772			541			
D 47 13C3-PFE												
301.90 > 83.00	1.773	1.766	0.007	1.000	6644	0.1762		75.8	65.6			
5 Perfluorobu												
298.90 > 80.00		1.770	0.003	1.000	326750	0.1464	2 21/1 25 2 74)		1291			
298.90 > 99.00		1.770	0.003	1.000	141213		2.31(1.25-3.74)		1019			
D 7 13C2 PFH 315.00 > 270.00		2.016	0.009	1.000	360061	0.2024		81.0	8842			
6 Perfluorohe			0.009	1.000	300001	0.2024		01.0	0042			
313.00 > 269.00		2.022	0.003	1.000	1641512	1.11			2527			
313.00 > 119.00		2.022	0.003	1.000	130014		12.63(5.03-15.10)		1850			
D 913C4-PFH	Aq						, ,					
367.00 > 322.00	•	2.347	0.011	1.000	345963	0.2030		81.2	8041			
10 Perfluorohe	eptanoic a	acid										
363.00 > 319.00	2.358	2.355	0.003	1.000	311364	0.2130			395			
363.00 > 169.00	2.358	2.355	0.003	1.000	128082		2.43(1.13-3.40)		764			
D 11 1802 PFF	lxS											
403.00 > 84.00	2.371	2.360	0.011	1.000	397005	0.1885		79.7	9407			
8 Perfluorohe												
399.00 > 80.00		2.368	0.003	1.000	2225980	1.18	0.44(4.50.4.40)		7347			
399.00 > 99.00	2.371	2.368	0.003	1.000	708688		3.14(1.50-4.49)		3134			

Data File:	\\Chr	omNa\Sa	acrament	:o\Chrom	Data\A8_N\201	80529-58849	9.b\2018.05.28LLA_	_056.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFO	^		•						•	
417.00 > 372.00		2.706	0.006	1.000	350956	0.2177		87.1	8255	
15 Perfluorooct										
413.00 > 369.00		2.711	0.001	1.000	8390762	5.08			3247	
413.00 > 169.00	2.712	2.711	0.001	1.000	4826560		1.74(0.84-2.52)		15312	
* 62 13C2-PFOA	١									
415.00 > 370.00	2.712	2.711	0.001		425723	0.2500			9942	
16 Perfluoroher	otanesul	fonic aci	d							
449.00 > 80.00		2.718	0.001	1.000	36400	0.0253			118	
449.00 > 99.00		2.718	0.001	1.000	13104		2.78(1.94-5.82)		155	
D 19 13C5 PFNA										
468.00 > 423.00		3.076	0.008	1.000	282433	0.2142		85.7	8409	
D 18 13C4 PFOS		0.07/	0.000	1 000	050400	0.4707			0111	
503.00 > 80.00		3.076	0.008	1.000	258620	0.1786		74.7	2661	
17 Perfluorooct				1 000	1225221	0.0/21			4407	
499.00 > 80.00 499.00 > 99.00	3.084	3.079 3.079	0.005 0.005	1.000 1.000	1225321 281337	0.9631	4.36(2.31-6.93)		4427 2912	
20 Perfluoronor			0.000	1.000	201007		4.00(2.01 0.70)		2712	R
463.00 > 419.00		3.079	0.005	1.000	11744	0.009814			26.6	R
463.00 > 169.00		3.079	0.005	1.000	1105	0.007011	10.63(1.90-5.69)		22.6	
D 21 13C8 FOSA	Д						,			
506.00 > 78.00		3.411	0.009	1.000	346362	0.1828		73.1	6753	
D 23 13C2 PFDA	4									
515.00 > 470.00	3.448	3.439	0.009	1.000	232085	0.2069		82.8	7540	
D 30 13C2 PFUr	nΑ									
565.00 > 520.00	3.774	3.763	0.011	1.000	199622	0.2247		89.9	7504	
D 36 13C2 PFD	ρA									
615.00 > 570.00	4.061	4.051	0.010	1.000	208972	0.2186		87.4	2498	
D 43 13C2-PFTe	eDA									
715.00 > 670.00	4.562	4.553	0.009	1.000	201434	0.1717		68.7	1412	

QC Flag Legend Processing Flags

R - Failed Signal Ratio Test

ANALYTE	ORIGINAL DUI	PLICATE	RL	RPD	RPD > 30%
PENTADECAFLUOROOCTANOIC ACID (PFOA)	2.6	3.5	1.9	29.51	FALSE
PERFLUOROBUTANESULFONIC ACID (PFBS)	1.4	2.2	1.9	44.44	TRUE
PERFLUOROBUTANOIC ACID (PFBA)	130	130	1.9	0.00	FALSE
PERFLUOROHEPTANOIC ACID (PFHPA)	1.3	2	1.9	42.42	TRUE
PERFLUOROHEXANESULFONIC ACID (PFHXS)	0.92	7	1.9	153.54	TRUE
PERFLUOROHEXANOIC ACID (PFHXA)	78	80	1.9	2.53	FALSE
PERFLUOROOCTANESULFONIC ACID (PFOS)	2.6	9.2	3.8	111.86	TRUE
PERFLUOROPENTANOIC ACID (PFPEA)	190	190	1.9	0.00	FALSE

ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2xRL
FALSE	FALSE	FALSE
FALSE	FALSE	FALSE
TRUE	TRUE	FALSE
FALSE	FALSE	FALSE
FALSE	TRUE	TRUE
TRUE	TRUE	FALSE
FALSE	TRUE	FALSE
TRUE	TRUE	FALSE

SDG 320-378938-1 TP-PFC-029-TPE/TP-PFC-029-TPE-D

TestAmerica Sacramento 880 Riverside Parkway

Nest Sacramento, CA 95605 Phone: 916.373.5600 Fax:

Chain of Custody Record

228168

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

rnone: 316.373.5600 Fax:	Regu	latory Pro	gram:	DW [NPDES	[RCR	A Other:								TAL-82	210 (0713)
Client Contact	Project M	lanager: U	EFFC	RIEA			Cont	tact: DAN 6	ribp	△ Da	ate: C	5/3	118		COC No: 2		
Company Name: TETRATECH	Tel/Fax:	412-01	21-20	550				tact: Dav.T							of	COCs	
Address: 8 81 AND ERSONDK, FOSTERPL, City/State/Zip: PTCTS BVR/6H/PA/015910		Analysis T	urnaround	Time		П		VII							Sampler:		
City/State/Zip: PITTS BVR/6H/PA/015210	CALEN	IDAR DAYS	☐ WO	RKING DAY	/ S		5								For Lab Use		
Phone: 412-021-8650	TA	T if different fr	rom Below _			2	57		1						Walk-in Client		
Fax:		2	2 weeks			Sample (Y/N)	1/2		1						Lab Sampling		
Project Name: BRUNSWICK GWETS			I week			2	2 =										
Site: FORMENAS BRUNGWICK PO# 112 0-08005-WE21			2 days			9 8	FULL			1					Job / SDG No	:	
112 0-08002 - NEGI		- 1	day			am											
			Sample Type			Sp	F				1			- (
	Sample	Sample	(C=Comp,	AMON TOTAL	# of	tere	PFC				`						
Sample Identification	Date	Time	G=Grab)	Matrix	Cont.	i à	1 1								Sample	Specific Notes	3.
TP-PFC-029-TPI	5/3/18	0920	6	W	4	MA	ИX										
TP-PFL-029-MIDCARBON		0925	6	W	4	NA	ИX							1			
TP-PFC-029-TPE		0930	G	W	4	11/1	ľΧ								1		
TP-PFC-029-TPE-D		0000	G-	w	4	NA	ľΧ										
ge						H	F		-	-						7	
727												+					
of 728				1		\vdash			1								
72						\perp				-	\perp			\dashv			
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											- 1			N. O.			
				-		\vdash				-	320	0-3887	5 Chai	n of Cust	tody		
											1						=
											1	11					
Preservation Used: 1= Ice, 2= HCI; 3= H2SO4; 4=HNO3;	5=NaOH;	6= Other _	Maria Barata			-											
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Pleas	e List any I	EPΔ Waste	Codes for	the same	nle in th		Sampl	le Disposal (A	tee ma	ay be as	sessed	if sam	ples a	re retain	ed longer than 1	month)	
Comments Section if the lab is to dispose of the sample.	de List arry i	LI A Waste	Oodes for	ine sam	DIC III III					-							
Non-Hazard	Poisor	1 B	Unkn	own			☐ R	Return to Client		Dispos	sal by Lab			Archive for_	Months		
Special Instructions/QC Requirements & Comments:									,								
											7-1	,	-	-1		11.5	1
Custody Seals Intact; Yes No	Custody S							Cooler Ter	mp. (°C): Obs'd:	Til	Co	rr'd: 1	4	_ Therm ID No.:_		Had re
Relinquished by	Company:			Date/Ti	me: 143	POR	Receiv	red by:			Co	mpany	. 0	AC	Date/Time:	0630	
Relinquished by:	T+			Date/Ti				ed by:						110	Date/Time:	01/0	
ixomiquisieu by.	Company			Date/11	ine.	1	ecery	red by. /			100	mpany			Date/Time:		
Relinquished by:	Company			Date/Ti	me:	R	Receiv	ed in Laborato	ry by:		Co	mpany	r:		Date/Time:		

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-38875-1

Login Number: 38875 List Source: TestAmerica Sacramento

List Number: 1

Creator: Nelson, Kym D

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

Job Narrative 320-38875-1

Receipt

The samples were received on 5/4/2018 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 7.1° C.

Receipt Exceptions

The following samples were received at the laboratory outside the required temperature criteria at 7.1C, but under method 537's requirement that samples be received by the laboratory at 10.0° C or less. TP-PFC-029-TPI (320-38875-1), TP-PFC-029-MIDCARBON (320-38875-2), TP-PFC-029-TPE (320-38875-3) and TP-PFC-029-TPE-D (320-38875-4). The cooler was received with melted ice.

I CMS

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

Method(s) EPA 537 (Mod): The Isotope Dilution Analyte (IDA) recovery associated with the following sample is below the method recommended limit for 13C4 PFOS and 18O2 PFHxS: (320-38935-A-32-B MS). Matrix interference is suspected because these samples were diluted due to high target analytes and the IDA recoveries in the analysis of the diluted extract were within method recommended limits. Both sets of data have been reported. Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample.

Method(s) EPA 537 (Mod): The concentration of several analytes associated with the following samples exceeded the instrument calibration range: TP-PFC-029-TPI (320-38875-1). These analytes have been qualified; however, the peaks did not saturate the instrument detector. The samples were diluted to bring the concentrations of these analytes within the instrument calibration range and both sets of data have been reported.

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

Organic Prep

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

Definitions/Glossary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-38875-1 Project/Site: Brunswick GWETS

Qualifiers

LCMS

Qualifier	Qualifier Description
M	Manual integrated compound.
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
E	Result exceeded calibration range.
D	The reported value is from a dilution.

Glossany

Glossary	
Abbreviation	These commonly used abbreviations may or may not be present in this report.
m o/ D	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Tetra Tech, Inc. Project/Site: Brunswick GWETS

TestAmerica Job ID: 320-38875-1

Lab Sample ID	Client Sample ID	Matrix	Collected Received
320-38875-1	TP-PFC-029-TPI	Water	05/03/18 09:20 05/04/18 09:30
320-38875-2	TP-PFC-029-MIDCARBON	Water	05/03/18 09:25 05/04/18 09:30
320-38875-3	TP-PFC-029-TPE	Water	05/03/18 09:30 05/04/18 09:30
320-38875-4	TP-PFC-029-TPE-D	Water	05/03/18 00:00 05/04/18 09:30

Method Summary

Client: Tetra Tech, Inc.

Project/Site: Brunswick GWETS

TestAmerica Job ID: 320-38875-1

Method	Method Description	Protocol	Laboratory
EPA 537 (Mod)	PFAS for QSM 5.1, Table B-15	DOD 5.1	TAL SAC
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC

Protocol References:

DOD 5.1 = Department of Defense Quality Systems Manual V5.1

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

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

FORM II LCMS SURROGATE RECOVERY

Lab	Name:	TestAmerica	Sacramento	Job No.:	320-38875-1
-----	-------	-------------	------------	----------	-------------

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	PFBS #	PFHxA #	PFHpA #	PFHxS #	PFOA #	PFNA #
TP-PFC-029-TPI	320-38875-1	83	97	95	95	91	89	85	102
TP-PFC-029-TPI DL	320-38875-1 DL	78	84	76	81	81	80	87	86
TP-PFC-029-MIDCARB ON	320-38875-2	73	76	72	78	75	77	78	82
TP-PFC-029-TPE	320-38875-3	72	76	72	74	74	73	79	81
TP-PFC-029-TPE-D	320-38875-4	75	80	78	76	78	78	84	91
	MB 320-223615/1-A	79	85	80	85	84	85	93	94
	LCS 320-223615/2-A	80	87	78	86	85	80	90	90

	QC LIMITS
PFBA = 13C4 PFBA	50-150
PFPeA = 13C5 PFPeA	50-150
PFBS = 13C3-PFBS	50-150
PFHxA = 13C2 PFHxA	50-150
PFHpA = 13C4-PFHpA	50-150
PFHxS = 1802 PFHxS	50-150
PFOA = 13C4 PFOA	50-150
PFNA = 13C5 PFNA	50-150

Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM II LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-	38875-1
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SDG No.: ____

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFOS #	PFOSA #	PFDA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-029-TPI	320-38875-1	87	81	96	101	89	79
TP-PFC-029-TPI DL	320-38875-1 DL	75	73	83	90	87	69
TP-PFC-029-MIDCARB ON	320-38875-2	73	67	77	74	66	60
TP-PFC-029-TPE	320-38875-3	73	64	72	78	69	60
TP-PFC-029-TPE-D	320-38875-4	78	67	79	86	76	70
	MB 320-223615/1-A	81	71	86	90	85	84
	LCS 320-223615/2-A	86	69	86	94	82	82

	QC LIMITS
PFOS = 13C4 PFOS	50-150
PFOSA = 13C8 FOSA	50-150
PFDA = 13C2 PFDA	50-150
PFUnA = 13C2 PFUnA	50-150
PFDoA = 13C2 PFDoA	50-150
PFTDA = 13C2-PFTeDA	50-150

 $\ensuremath{\text{\#}}$ Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM VIII LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Sample No.: IC 320-223413/5 Date Analyzed: 05/15/2018 15:36

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

Lab File ID (Standard): 2017.05.15LLB_ICAL_ Heated Purge: (Y/N) N

Calibration ID: 39198

		13PF0	A				
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID	-POINT	4762237	2.73				
UPPER LIMIT		7143356	2.93				
LOWER LIMIT		2381119	2.53				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICB 320-223413/12		4812155	2.73				
ICV 320-223413/13		4485749	2.72				
CCV 320-225818/3 CCVIS		5150922	2.70				
CCV 320-225873/3 CCVIS		4833381	2.70				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area RT Limit = \pm 0.2 minutes of internal standard RT

 $\ensuremath{\text{\#}}$ Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Sample No.: CCV 320-225818/3 Date Analyzed: 05/28/2018 07:15

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

Lab File ID (Standard): $2018.05.27LLADX_003$ Heated Purge: (Y/N) N

Calibration ID: 39198

		13PF0	A				
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		5150922	2.70				
UPPER LIMIT		7726383	2.90				-
LOWER LIMIT		2575461	2.50				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-225818/1		4948330	2.70			İ	
CCVL 320-225818/2		4974159	2.70				
MB 320-223615/1-A		4525357	2.70				
LCS 320-223615/2-A		5050927	2.71				
320-38875-1	TP-PFC-029-TPI	3924419	2.70				
320-38875-2	TP-PFC-029-MIDCARBON	4817889	2.70				
320-38875-3	TP-PFC-029-TPE	5264580	2.70				
320-38875-4	TP-PFC-029-TPE-D	4741331	2.70				
CCV 320-225818/14		5195418	2.70				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area RT Limit = \pm 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Sample No.: CCV 320-225873/3 Date Analyzed: 05/28/2018 17:30

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

Lab File ID (Standard): $2018.05.28LLA_005.d$ Heated Purge: (Y/N) N

Calibration ID: 39198

		13PFO.	A				
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		4833381	2.70				
UPPER LIMIT		7250072	2.90				
LOWER LIMIT		2416691	2.50				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-225873/1		4725130	2.69				
CCVL 320-225873/2		4921629	2.70				
CCV 320-225884/1		4945573	2.71				
320-38875-1 DL	TP-PFC-029-TPI DL	425723Q	2.71				
CCV 320-225884/11		4741080	2.71				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area RT Limit = \pm 0.2 minutes of internal standard RT

 $\ensuremath{\text{\#}}$ Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM IV LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
SDG No.:	
Lab File ID: 2018.05.27LLADX_004.d	Lab Sample ID: MB 320-223615/1-A
Matrix: Water	Date Extracted: 05/16/2018 14:51
Instrument ID: A8_N	Date Analyzed: 05/28/2018 07:23
I.evel·(I.ow/Med) I.ow	

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

		LAB	
CLIENT SAMPLE ID	LAB SAMPLE ID	FILE ID	DATE ANALYZED
	LCS 320-223615/2-A	2018.05.27L	05/28/2018 07:31
		LADX 005.d	
TP-PFC-029-TPI	320-38875-1	2018.05.27L	05/28/2018 07:39
		LADX 006.d	
TP-PFC-029-MIDCARBON	320-38875-2	2018.05.27L	05/28/2018 07:47
		LADX 007.d	
TP-PFC-029-TPE	320-38875-3	2018.05.27L	05/28/2018 07:55
		LADX 008.d	
TP-PFC-029-TPE-D	320-38875-4	2018.05.27L	05/28/2018 08:02
		LADX 009.d	
TP-PFC-029-TPI DL	320-38875-1 DL	2018.05.28L	05/29/2018 00:09
		LA_056.d	

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: <u>320-38875-1</u>
SDG No.:	
Client Sample ID:	Lab Sample ID: MB 320-223615/1-A
Matrix: Water	Lab File ID: 2018.05.27LLADX_004.d
Analysis Method: EPA 537 (Mod)	Date Collected:
Extraction Method: 3535	Date Extracted: 05/16/2018 14:51
Sample wt/vol: 250(mL)	Date Analyzed: 05/28/2018 07:23
Con. Extract Vol.: 10 (mL)	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup:(Y/N) N
Analysis Batch No · 225818	Units: na/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	1.5	Ū	2.0	1.5	0.59
2706-90-3	Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	1.0	0.43
307-24-4	Perfluorohexanoic acid (PFHxA)	1.0	Ū	2.0	1.0	0.47
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.5	Ū	2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	1.5	U M	2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	1.5	U	2.0	1.5	0.52
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	U	2.0	1.0	0.48
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.5	Ū	2.0	1.5	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	1.5	Ū	2.0	1.5	0.52
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	Ū	4.0	3.0	0.76
376-06-7	Perfluorotetradecanoic acid (PFTeA)	3.0	Ū	4.0	3.0	0.83
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	1.0	0.38
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	1.0	0.37
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	3.0	1.1
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.5	U	2.0	1.5	0.56
754-91-6	Perfluorooctane Sulfonamide (FOSA)	3.0	U	4.0	3.0	1.3

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
SDG No.:	
Client Sample ID:	Lab Sample ID: MB 320-223615/1-A
Matrix: Water	Lab File ID: 2018.05.27LLADX_004.d
Analysis Method: EPA 537 (Mod)	Date Collected:
Extraction Method: 3535	Date Extracted: 05/16/2018 14:51
Sample wt/vol: 250(mL)	Date Analyzed: 05/28/2018 07:23
Con. Extract Vol.: 10(mL)	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup:(Y/N) N
Analysis Batch No.: 225818	Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	71		50-150
STL00992	13C4 PFBA	79		50-150
STL01893	13C5 PFPeA	85		50-150
STL00993	13C2 PFHxA	85		50-150
STL01892	13C4-PFHpA	84		50-150
STL00990	13C4 PFOA	93		50-150
STL00995	13C5 PFNA	94		50-150
STL00996	13C2 PFDA	86		50-150
STL00997	13C2 PFUnA	90		50-150
STL00998	13C2 PFDoA	85		50-150
STL00994	1802 PFHxS	85		50-150
STL02116	13C2-PFTeDA	84		50-150
STL00991	13C4 PFOS	81		50-150
STL02337	13C3-PFBS	80		50-150

FORM III LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name	e: TestAmerica Sacra	amento	Job No.:	320-	-38875-1
SDG No.	:				
Matrix:	Water	Level: Low	Lab File	ID:	2018.05.27LLADX_005.d
Lab ID:	LCS 320-223615/2-A		Client II	D:	

	SPIKE	LCS	LCS	QC	
	ADDED	CONCENTRATION	용	LIMITS	#
COMPOUND	(ng/L)	(ng/L)	REC	REC	
Perfluorobutanoic acid (PFBA)	40.0	41.6	104	83-118	
Perfluoropentanoic acid	40.0	36.7	92	83-108	
(PFPeA)					
Perfluorohexanoic acid (PFHxA)	40.0	39.4	98	83-109	
Perfluoroheptanoic acid	40.0	39.6	99	80-113	
(PFHpA)					
Perfluorooctanoic acid (PFOA)	40.0	35.7	89		
Perfluorononanoic acid (PFNA)	40.0	37.6	94		
Perfluorodecanoic acid (PFDA)	40.0	42.6	107		
Perfluoroundecanoic acid	40.0	36.2	91	76-105	
(PFUnA)					
Perfluorododecanoic acid	40.0	40.9	102	87-116	
(PFDoA)	40.0	20.2	0.0	75 100	
Perfluorotridecanoic Acid	40.0	39.3	98	75-129	
(PFTriA) Perfluorotetradecanoic acid	40.0	36.7	92	82-115	
(PFTeA)	40.0	30.7	92	02-113	
Perfluorobutanesulfonic acid	35.4	36.3	103	87-120	
(PFBS)		30.5	100	0, 120	
Perfluorohexanesulfonic acid	36.4	35.0	96	81-106	
(PFHxS)					
Perfluoroheptanesulfonic Acid	38.1	34.4	90	80-117	
(PFHpS)					
Perfluorooctanesulfonic acid	37.1	33.5	90	82-112	
(PFOS)	20.6	25.2	0.1	01 114	
Perfluorodecanesulfonic acid (PFDS)	38.6	35.3	91	81-114	
Perfluorooctane Sulfonamide	40.0	40.5	101	85-114	
(FOSA)	40.0	40.5	101	05-114	
13C8 FOSA	100	69.4	69	50-150	
13C4 PFBA	100	80.1	80		
13C5 PFPeA	100	86.9	87		
13C2 PFHXA	100	86.4	86		
13C4-PFHpA	100	85.4	85		
13C4 PFOA	100	90.3	90		
13C4 PFOA 13C5 PFNA	100	90.0	90		
			1		
13C2 PFDA	100	85.8	86		
13C2 PFUnA	100	93.9	94		
13C2 PFDoA	100	82.4	82		
1802 PFHxS	94.6	75.6	80		
13C2-PFTeDA	100	82.0	82		
13C4 PFOS	95.6	81.8	86		
13C3-PFBS	93.0	73.0	78	50-150	

[#] Column to be used to flag recovery and RPD values FORM III EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
SDG No.:	
Instrument ID: A8_N	Start Date: 05/15/2018 15:13
Analysis Batch Number: 223413	End Date: 05/15/2018 17:23

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-223413/2		05/15/2018 15:13	1	2017.05.15LLB_I CAL 002.d	GeminiC18 3x100 3(mm)
IC 320-223413/3		05/15/2018 15:21	1	2017.05.15LLB_I CAL 003.d	GeminiC18 3x100 3(mm)
IC 320-223413/4		05/15/2018 15:29	1	2017.05.15LLB_I CAL 004.d	GeminiC18 3x100 3(mm)
IC 320-223413/5 ICIS		05/15/2018 15:36	1	2017.05.15LLB_I CAL 005.d	GeminiC18 3x100 3(mm)
IC 320-223413/7		05/15/2018 15:52	1	2017.05.15LLB_I CAL 007.d	GeminiC18 3x100 3(mm)
IC 320-223413/8		05/15/2018 16:00	1	2017.05.15LLB_I CAL 008.d	GeminiC18 3x100 3(mm)
IC 320-223413/11		05/15/2018 16:39	1	2018.05.15LLC_I CAL 006.d	GeminiC18 3x100 3(mm)
ICB 320-223413/12		05/15/2018 17:15	1	2018.05.15LLCC_ ICAL 009.d	GeminiC18 3x100 3(mm)
ICV 320-223413/13		05/15/2018 17:23	1	2018.05.15LLCC_ ICAL 010.d	GeminiC18 3x100 3 (mm)

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:	
Level 1	IC 320-223413/2	2017.05.15LLB ICAL 002.d	
Level 2	IC 320-223413/3	2017.05.15LLB ICAL 003.d	
Level 3	IC 320-223413/4	2017.05.15LLB ICAL 004.d	
Level 4	IC 320-223413/5	2017.05.15LLB ICAL 005.d	
Level 5	IC 320-223413/7	2017.05.15LLB ICAL 007.d	
Level 6	IC 320-223413/8	2017.05.15LLB_ICAL_008.d	
Level 7	IC 320-223413/11	2018.05.15LLC ICAL 006.d	

ANALYTE			RRF			CURVE		COEFFICIE	NT	# MIN RRF	%RSD	 MAX	R^2	#	MIN R^2
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	TYPE	В	M1	M2			RSD	OR COD		OR COD
Perfluorobutanoic acid (PFBA)	0.9241 0.8957	0.9313 0.9561	0.9225	0.9212	0.9579	AveID		0.9298			2.3	20.0			
Perfluoropentanoic acid (PFPeA)	1.2625 1.1540	1.2317 1.1953	1.1470	1.1005	1.1726	AveID		1.1805			4.6	20.0			
Perfluorobutanesulfonic acid (PFBS)	73.379 74.326	78.361 80.657	79.854	76.421	83.642	AveID		78.092			4.7	20.0			
4:2 FTS	16.107 15.923	17.745 16.756	15.595	16.119	17.773	AveID		16.574			5.3	20.0			
Perfluorohexanoic acid (PFHxA)	1.0080 1.0775	1.1481 0.9470	0.9804	0.9949	1.0411	AveID		1.0281			6.6	20.0			
Perfluoropentanesulfonic acid	70.536 63.954	69.604 69.356	70.709	68.100	74.560	AveID		69.545			4.6	20.0			
Perfluoroheptanoic acid (PFHpA)	1.1170 1.0467	1.0612 1.0839	1.0572	0.9754	1.0529	AveID		1.0563			4.1	20.0			
Perfluorohexanesulfonic acid (PFHxS)	1.2868 1.0806	1.1929 1.0961	1.1199	1.0451	1.0663	AveID		1.1268			7.6	20.0			
6:2FTS	2.5480 1.8029	2.0146 1.7196	2.1352	1.5658	1.7441	L2ID	0.0180	1.7550					0.9900		0.9900
Perfluorooctanoic acid (PFOA)	1.2824 1.1018	1.3066 1.0898	1.1380	1.1380	1.1826	AveID		1.1770			7.3	20.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.1977 1.2900	1.4162 1.3580	1.3092	1.3585	1.3942	AveID		1.3320			5.5	20.0			
Perfluorooctanesulfonic acid (PFOS)	1.3297 1.1063	1.2627 1.0707	1.2157	1.0803	1.1653	AveID		1.1758			8.4	20.0			
Perfluorononanoic acid (PFNA)	1.1029 1.0898	1.0209 1.0772	1.0536	1.0094	1.0606	AveID		1.0592			3.3	20.0			
Perfluorooctane Sulfonamide (FOSA)	0.8770 0.9485		1.0064	0.9683	1.0413	AveID		0.9736			6.1	20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

ANALYTE			RRF			CURVE		COEFFICIE	ENT	# MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	TYPE	В	M1	M2				*KSD	OR COD		OR COD
	LVL 6	LVL 7														
Perfluorononanesulfonic acid	0.7875	0.6822	0.7467	0.7538	0.8013	AveID		0.7575			5.1		20.0			
	0.7778															
8:2FTS	1.3186		1.3462	1.3265	1.4577	AveID		1.3495			4.3		20.0			
	1.2726															
Perfluorodecanoic acid (PFDA)	0.8867		0.9707	0.9794	1.0214	AveID		0.9722			4.5		20.0			
	0.9744															
N-methyl perfluorooctane	0.9856			1.0424	1.0502	AveID		1.0148			4.8		20.0			
sulfonamidoacetic acid (NMeFOSAA)	1.0154															
Perfluorodecanesulfonic acid (PFDS)	0.6317		0.6836	0.6304	0.7056	AveID		0.6714			4.8		20.0			
	0.6583															
N-ethyl perfluorooctane	1.0524		0.9620	0.9003	1.0388	AveID		0.9400			10.3		20.0			
sulfonamidoacetic acid (NEtFOSAA)	0.9642															
Perfluoroundecanoic acid (PFUnA)	0.9516			0.7312	0.8215	AveID		0.8352			10.9		20.0			
	0.9130															
Perfluorododecanoic acid (PFDoA)	1.0219		1.1136	1.0306	1.0427	AveID		1.0436			3.4		20.0			
	1.0283															
Perfluorotridecanoic Acid (PFTriA)	1.1692		1.1780	1.1305	1.1573	AveID		1.1439			3.7		20.0			
	1.0949															
Perfluorotetradecanoic acid (PFTeA)	0.2622		0.2270	0.2438	0.2525	AveID		0.2525			5.3		20.0			
	0.2644															
13C4 PFBA	1.4654		1.5804	1.4802	1.5540	Ave		1.5285			3.3		20.0			
	1.5642															
13C5 PFPeA	0.9578			0.9890	0.9962	Ave		0.9798			1.9		20.0			
	0.9717															
13C3-PFBS	0.0218		0.0227	0.0222	0.0216	Ave		0.0221			2.1		20.0			
	0.0222															
13C2 PFHxA	1.0307			1.0193	1.0550	Ave		1.0448			3.4		20.0			
	0.9826															
13C4-PFHpA	1.0218	1.0396	1.0651	0.9899	0.9939	Ave		1.0010			4.4		20.0			
	0.9433															
1802 PFHxS	1.2582		1.2691	1.2355	1.2631	Ave		1.2371			2.8		20.0			
	1.1763															
M2-6:2FTS	0.2275			0.2273	0.2103	Ave		0.2210			5.9		20.0			
	0.2007															
13C4 PFOA	0.9457		0.9743	0.9365	0.9390	Ave		0.9468			1.5		20.0			
	0.9318			1												
13C4 PFOS	0.8656	0.8315	0.8880	0.8302	0.8476	Ave		0.8503			2.4		20.0			
	0.8371	0.8519		1												
13C5 PFNA	0.7820	0.8107	0.8055	0.7560	0.7732	Ave		0.7745			3.5		20.0			
	0.7385	0.7553		1												

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

ANALYTE		RRF						COEFFICIENT			MIN RRF	%RSD		R^2	# MIN R^2
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	TYPE	В	M1	M2				%RSD	OR COD	OR COD
	LVL 6	LVL 7													
13C8 FOSA	1.0913	1.0548	1.1529	1.1228	1.1455	Ave		1.1128				3.0	20.0		
	1.1170	1.1055													
M2-8:2FTS	0.2728	0.2681	0.2615	0.2403	0.2336	Ave		0.2515				6.2	20.0		
	0.2412	0.2427													
13C2 PFDA	0.6586	0.6755	0.6955	0.6477	0.6472	Ave		0.6587				3.0	20.0		
	0.6466	0.6399													
d3-NMeFOSAA	0.3554	0.3709	0.3911	0.3502	0.3593	Ave		0.3634				5.5	20.0		
	0.3833	0.3334													
d5-NEtFOSAA	0.3882	0.3862	0.3918	0.3798	0.3469	Ave		0.3729				5.8	20.0		
	0.3379	0.3795													
13C2 PFUnA	0.5204	0.5248	0.5435	0.5432	0.5208	Ave		0.5216				4.3	20.0		
	0.4762	0.5225													
13C2 PFDoA	0.5424	0.5507	0.5780	0.5627	0.5857	Ave		0.5613				3.3	20.0		
	0.5733	0.5366													
13C2-PFTeDA	0.6921	0.5915	0.7584	0.7128	0.7166	Ave		0.6891				7.5	20.0		
	0.6818	0.6707													
13C2-PFHxDA	1.2461	0.8066	1.2363	1.2369	1.1633	Ave		1.1695				13.9	20.0		
	1.2600	1.2373													

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI

LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:	
Level 1	IC 320-223413/2	2017.05.15LLB ICAL 002.d	
Level 2	IC 320-223413/3	2017.05.15LLB ICAL 003.d	
Level 3	IC 320-223413/4	2017.05.15LLB ICAL 004.d	
Level 4	IC 320-223413/5	2017.05.15LLB ICAL 005.d	
Level 5	IC 320-223413/7	2017.05.15LLB ICAL 007.d	
Level 6	IC 320-223413/8	2017.05.15LLB ICAL 008.d	
Level 7	IC 320-223413/11	2018.05.15LLC ICAL 006.d	

ANALYTE	IS CURV			RESPONSE				CONCEN	TRATION (N	G/ML)	
	REF TYPE	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)	AveI	73922	162647 6642110	691256	2597444	12934647	0.0250	0.0500 2.50	0.250	1.00	5.00
Perfluoropentanoic acid (PFPeA)	AveI	66005 21497034	135647 5339518	543378	2073422	10150448	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorobutanesulfonic acid (PFBS)	AveI	77106 28014178	175383 7259728	758816	2858265	13863265	0.0221 8.84	0.0442 2.21	0.221	0.884	4.42
4:2 FTS	AveI	17882 6341030	41962 1593481	156576	636977	3112425	0.0234 9.34	0.0467 2.34	0.234	0.934	4.67
Perfluorohexanoic acid (PFHxA)	AveI	56711 20297289	135987 4776223	503450	1931731	9544553	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluoropentanesulfonic acid	AveI	78646 25577332	165299 6623884	712963	2702610	13112812	0.0235 9.38	0.0469 2.35	0.235	0.938	4.69
Perfluoroheptanoic acid (PFHpA)	AveIl	62298 18928350	122556 4839723	533908	1839273	9093863	0.0250	0.0500	0.250	1.00	5.00
Perfluorohexanesulfonic acid (PFHxS)	AveI	80424 22174743	151043 5630297	613254	2238132	10650638	0.0228	0.0455 2.28	0.228	0.910	4.55
6:2FTS	L2ID	29994 6574970	48326 1635620	229440	642687	3021313	0.0237 9.48	0.0474	0.237	0.948	4.74
Perfluorooctanoic acid (PFOA)	AveI	66199 19682065	137784 4857127	525683	2030259	9649258	0.0250	0.0500 2.50	0.250	1.00	5.00
Perfluoroheptanesulfonic Acid (PFHpS)	AveI	53872 19707477	124538 5160059	524732	2045093	9775395	0.0238 9.52	0.0476 2.38	0.238	0.952	4.76
Perfluorooctanesulfonic acid (PFOS)	AveI	58301 16474463	108239 3965534	474971	1585297	7964833	0.0232 9.28	0.0464 2.32	0.232	0.928	4.64
Perfluorononanoic acid (PFNA)	AveI	47076 15430529	91933 3811509	402423	1453651	7125949	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorooctane Sulfonamide (FOSA)	AveI	52238 20311842	109720 5372059	550166	2070950	10364812	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorononanesulfonic acid	AveI		60494 2885064	301811	1144412	5665707	0.0240	0.0480	0.240	0.960	4.80

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

ANALYTE	IS	CURVE			RESPONSE				CONCEN	TRATION (N	G/ML)	
	REF	TYPE	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
8:2FTS		AveID	18812 5636776	39540 1458360	159889	581733	2834764	0.0240 9.58	0.0479	0.240	0.958	4.79
Perfluorodecanoic acid (PFDA)		AveID	31877 12079263	72253 3028523	320077	1208399	5744357	0.0250	0.0500	0.250	1.00	5.00
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	19122 7460336	38494 1690352	184250	695308	3278986	0.0250 10.0	0.0500	0.250	1.00	5.00
Perfluorodecanesulfonic acid (PFDS)		AveID	28773 10184141	63027 2626191	277428	961059	5009746	0.0241 9.64	0.0482 2.41	0.241	0.964	4.82
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	22302 6246594	32956 1590051	178736	651368	3130989	0.0250 10.0	0.0500	0.250	1.00	5.00
Perfluoroundecanoic acid (PFUnA)		AveID	27031 8334466	53273 1802433	200746	756677	3717634	0.0250	0.0500	0.250	1.00	5.00
Perfluorododecanoic acid (PFDoA)		AveID	30254 11301274	61418 2676169	305166	1104651	5307128	0.0250	0.0500	0.250	1.00	5.00
Perfluorotridecanoic Acid (PFTriA)		AveID	34616 12033356	66337 2999335	322826	1211735	5890114	0.0250	0.0500	0.250	1.00	5.00
Perfluorotetradecanoic acid (PFTeA)		AveID	9904 3455816	16854 821303	81619	331048	1571970	0.0250	0.0500	0.250	1.00	5.00
13C4 PFBA	13PF OA	Ave	7998943 7496989	8732721 6946962	7493234	7049149	6751655	2.50 2.50	2.50	2.50	2.50	2.50
13C5 PFPeA	13PF OA	Ave	5228218 4657025	5506602 4467248	4737268	4710025	4328345	2.50 2.50	2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	110547 99131	117730 94691	99970	98369	87185	2.33	2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	5626147 4709249	5922451 5043564	5134906	4854075	4583820	2.50 2.50	2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	5577473 4521122	5774309 4465208	5050240	4714171	4318388	2.50 2.50	2.50	2.50	2.50	2.50
1802 PFHxS	13PF OA	Ave	6497213 5333305	6581524 5339851	5692452	5565884	5191664	2.37	2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	1179634 913641	1201925 953169	1076802	1028277	867962	2.38	2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	5162191 4465836	5272655 4456920	4619416	4460027	4079623	2.50	2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	4516956 3835347	4415247 3815593	4024927	3779459	3520558	2.39	2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	4268517 3539647	4502703 3538499	3819382	3600246	3359491	2.50	2.50	2.50	2.50	2.50
13C8 FOSA	13PF OA	Ave	5956672 5353791	5858621 5178962	5466463	5346931	4976852	2.50	2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	1426703 1107332	1426640 1089191	1187676	1096366	972368	2.40	2.40	2.40	2.40	2.40

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

Instrument ID: A8 N GC Column: GeminiC18 3 ID: 3 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

ANALYTE	IS	CURVE			RESPONSE				CONCEN	NTRATION (N	IG/ML)	
	REF	TYPE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7				LVL 6	LVL 7			
13C2 PFDA	13PF	Ave	3594922	3752181	3297462	3084670	2812041	2.50	2.50	2.50	2.50	2.50
	OA		3099083	2997952				2.50	2.50			
d3-NMeFOSAA	13PF	Ave	1940146	2060337	1854527	1667566	1561125	2.50	2.50	2.50	2.50	2.50
	OA		1836867	1561957				2.50	2.50			
d5-NEtFOSAA	13PF	Ave	2119254	2144987	1857905	1808821	1507014	2.50	2.50	2.50	2.50	2.50
	OA		1619647	1777821				2.50	2.50			
13C2 PFUnA	13PF	Ave	2840675	2914989	2576940	2587053	2262574	2.50	2.50	2.50	2.50	2.50
	OA		2282286	2447962				2.50	2.50			
13C2 PFDoA	13PF	Ave	2960567	3058640	2740425	2679695	2544838	2.50	2.50	2.50	2.50	2.50
	OA		2747572	2514089				2.50	2.50			
13C2-PFTeDA	13PF	Ave	3777870	3285420	3595983	3394312	3113223	2.50	2.50	2.50	2.50	2.50
	OA		3267831	3141974				2.50	2.50			
13C2-PFHxDA	13PF	Ave	6801656	4480419	5862077	5890266	5054291	2.50	2.50	2.50	2.50	2.50
	OA		6039184	5796576				2.50	2.50			

Curve Type Legend:

Ave = Average ISTD

AveID = Average isotope dilution

L2ID = Linear 1/conc^2 IsoDil

FORM VI

LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:	
Level 1	IC 320-223413/2	2017.05.15LLB ICAL 002.d	
Level 2	IC 320-223413/3	2017.05.15LLB ICAL 003.d	
Level 3	IC 320-223413/4	2017.05.15LLB ICAL 004.d	
Level 4	IC 320-223413/5	2017.05.15LLB ICAL 005.d	
Level 5	IC 320-223413/7	2017.05.15LLB ICAL 007.d	
Level 6	IC 320-223413/8	2017.05.15LLB_ICAL_008.d	
Level 7	IC 320-223413/11	2018.05.15LLC ICAL 006.d	

ANALYTE			PERCEN'	r error				PI	ERCENT EF	RROR LIMI	Т	
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanoic acid (PFBA)	-0.6 2.8	0.2	-0.8	-0.9	3.0	-3.7	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	6.9 1.2	4.3	-2.8	-6.8	-0.7	-2.2	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	-6.0 3.3	0.3	2.3	-2.1	7.1	-4.8	30 30	30	30	30	30	30
4:2 FTS	-2.8 1.1	7.1	-5.9	-2.7	7.2	-3.9	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	-2.0 -7.9	11.7	-4.6	-3.2	1.3	4.8	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	1.4 -0.3	0.1	1.7	-2.1	7.2	-8.0	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	5.7 2.6	0.5	0.1	-7.7	-0.3	-0.9	30 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	14.2 -2.7	5.9	-0.6	-7.3	-5.4	-4.1	30 30	30	30	30	30	30
6:2FTS	2.0 -2.5	-6.8	17.3	-11.9	-0.8	2.6	30 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	9.0 -7.4	11.0	-3.3	-3.3	0.5	-6.4	30 30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	-10.1 2.0	6.3	-1.7	2.0	4.7	-3.2	30 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	13.1 -8.9	7.4	3.4	-8.1	-0.9	-5.9	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	4.1 1.7	-3.6	-0.5	-4.7	0.1	2.9	30 30	30	30	30	30	30
Perfluorooctane Sulfonamide (FOSA)	-9.9 6.5	-3.8	3.4	-0.5	7.0	-2.6	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	4.0 -0.6	-9.9	-1.4	-0.5	5.8	2.7	30 30	30	30	30	30	30

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

ANALYTE			PERCENT	r error				Pl	ERCENT E	RROR LIMI	Т	
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
	LVL 7 #						LVL 7					
8:2FTS	-2.3	2.7	-0.2	-1.7	8.0	-5.7	30	30	30	30	30	30
	-0.8						30					
Perfluorodecanoic acid (PFDA)	-8.8	-1.0	-0.2	0.7	5.1	0.2	30	30	30	30	30	30
	3.9						30					
N-methyl perfluorooctane	-2.9	-7.9	-2.1	2.7	3.5	0.1	30	30	30	30	30	30
sulfonamidoacetic acid (NMeFOSAA)	6.6						30					
Perfluorodecanesulfonic acid (PFDS)	-5.9	5.4	1.8	-6.1	5.1	-2.0	30	30	30	30	30	30
	1.7						30					
N-ethyl perfluorooctane	11.9	-18.3	2.3	-4.2	10.5	2.6	30	30	30	30	30	30
sulfonamidoacetic acid (NEtFOSAA)	-4.9						30					
Perfluoroundecanoic acid (PFUnA)	13.9	9.4	-6.7	-12.4	-1.6	9.3	30	30	30	30	30	30
	-11.8						30					
Perfluorododecanoic acid (PFDoA)	-2.1	-3.8	6.7	-1.3	-0.1	-1.5	30	30	30	30	30	30
	2.0						30					
Perfluorotridecanoic Acid (PFTriA)	2.2	-5.2	3.0	-1.2	1.2	-4.3	30	30	30	30	30	30
	4.3						30					
Perfluorotetradecanoic acid (PFTeA)	3.8	1.6	-10.1	-3.4	0.0	4.7	30	30	30	30	30	30
	3.5						30					

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base:

0

RF Rounding:

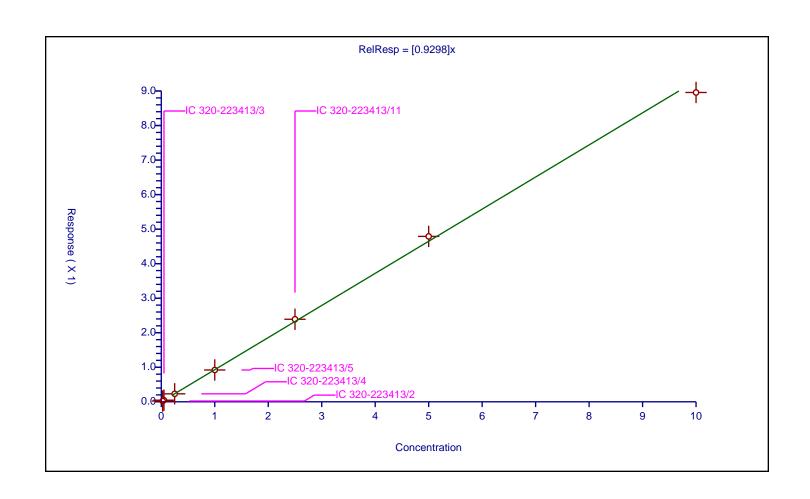
Intercept:	0
Slope:	0.9298

Curve Coefficients

Error Coefficients

Standard Error:12500000Relative Standard Error:2.3Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.023104	2.5	7998943.0	0.924147	Υ
2	IC 320-223413/3	0.05	0.046563	2.5	8732721.0	0.93125	Υ
3	IC 320-223413/4	0.25	0.230627	2.5	7493234.0	0.922507	Υ
4	IC 320-223413/5	1.0	0.921191	2.5	7049149.0	0.921191	Υ
5	IC 320-223413/11	2.5	2.390293	2.5	6946962.0	0.956117	Υ
6	IC 320-223413/7	5.0	4.789436	2.5	6751655.0	0.957887	Υ
7	IC 320-223413/8	10.0	8.957287	2.5	7496989.0	0.895729	Υ



Calibration

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base:

0

RF Rounding:

 Intercept:
 0

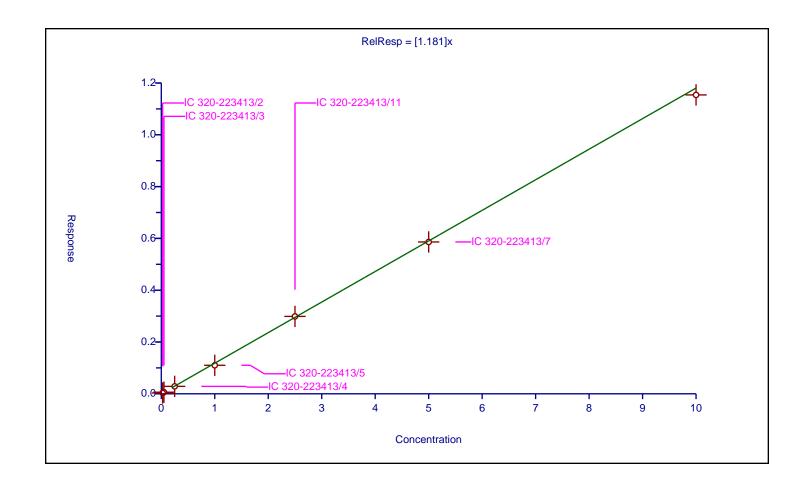
 Slope:
 1.181

Curve Coefficients

Error Coefficients

Standard Error:9990000Relative Standard Error:4.6Correlation Coefficient:0.999Coefficient of Determination (Adjusted):0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.031562	2.5	5228218.0	1.262476	Υ
2	IC 320-223413/3	0.05	0.061584	2.5	5506602.0	1.231676	Υ
3	IC 320-223413/4	0.25	0.286757	2.5	4737268.0	1.147028	Υ
4	IC 320-223413/5	1.0	1.100537	2.5	4710025.0	1.100537	Υ
5	IC 320-223413/11	2.5	2.988147	2.5	4467248.0	1.195259	Υ
6	IC 320-223413/7	5.0	5.862777	2.5	4328345.0	1.172555	Υ
7	IC 320-223413/8	10.0	11.540111	2.5	4657025.0	1.154011	Υ



Calibration

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

Response Base: RF Rounding: 0

Curve Coefficients

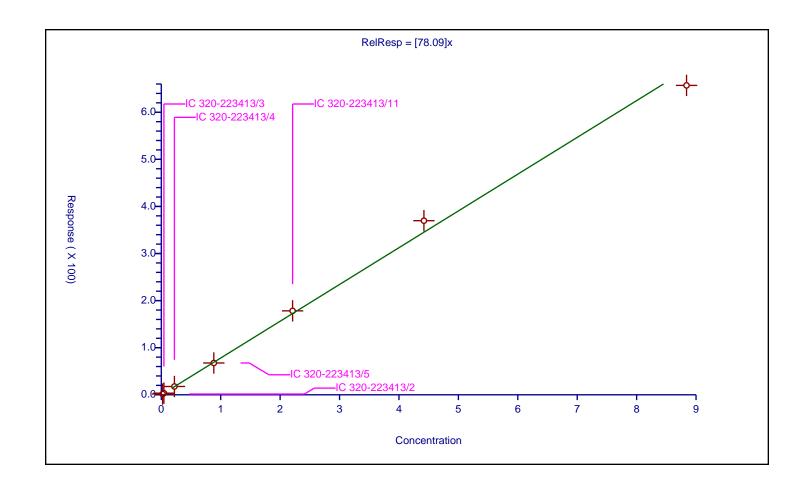
 Intercept:
 0

 Slope:
 78.09

Error Coefficients

Standard Error:13200000Relative Standard Error:4.7Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0221	1.621676	2.325	110547.0	73.379018	Υ
2	IC 320-223413/3	0.0442	3.463565	2.325	117730.0	78.361193	Υ
3	IC 320-223413/4	0.221	17.647766	2.325	99970.0	79.854146	Υ
4	IC 320-223413/5	0.884	67.556508	2.325	98369.0	76.421389	Υ
5	IC 320-223413/11	2.21	178.252079	2.325	94691.0	80.657049	Υ
6	IC 320-223413/7	4.42	369.697667	2.325	87185.0	83.642006	Υ
7	IC 320-223413/8	8.84	657.03931	2.325	99131.0	74.325714	Υ



/ Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

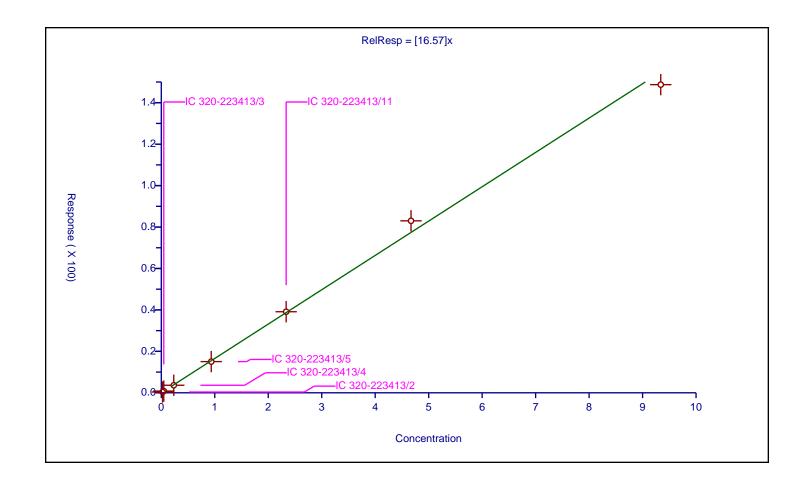
Response Base:
RF Rounding: 0

Curve	Coefficients
Intercept:	0
Slope:	16.57

Error Coefficients

Standard Error:2970000Relative Standard Error:5.3Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.02335	0.37609	2.325	110547.0	16.106649	Υ
2	IC 320-223413/3	0.0467	0.82869	2.325	117730.0	17.744964	Υ
3	IC 320-223413/4	0.2335	3.641484	2.325	99970.0	15.595222	Υ
4	IC 320-223413/5	0.934	15.055267	2.325	98369.0	16.119129	Υ
5	IC 320-223413/11	2.335	39.125612	2.325	94691.0	16.756151	Υ
6	IC 320-223413/7	4.67	83.00038	2.325	87185.0	17.773101	Υ
7	IC 320-223413/8	9.34	148.721336	2.325	99131.0	15.923055	Υ



Calibration / Perfluorohexanoic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base:

0

RF Rounding:

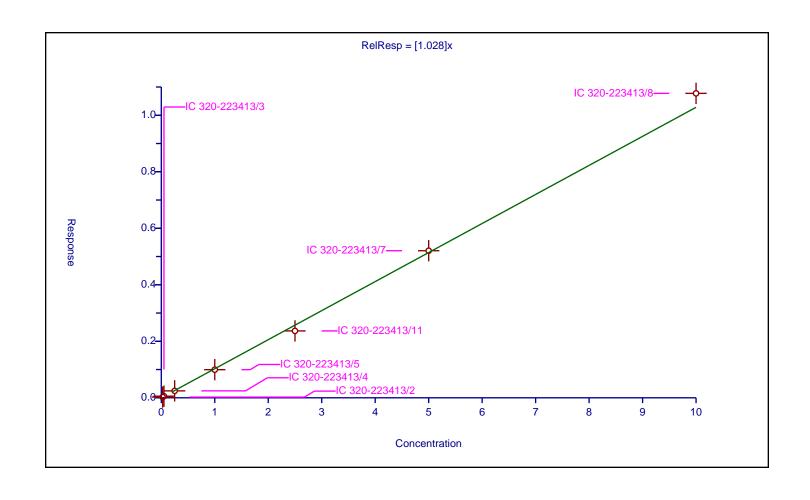
Intercept:	0
Slope:	1.028

Curve Coefficients

Error Coefficients

Standard Error:9400000Relative Standard Error:6.6Correlation Coefficient:0.999Coefficient of Determination (Adjusted):0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.0252	2.5	5626147.0	1.00799	Υ
2	IC 320-223413/3	0.05	0.057403	2.5	5922451.0	1.148064	Υ
3	IC 320-223413/4	0.25	0.245112	2.5	5134906.0	0.980446	Υ
4	IC 320-223413/5	1.0	0.994902	2.5	4854075.0	0.994902	Υ
5	IC 320-223413/11	2.5	2.367484	2.5	5043564.0	0.946994	Υ
6	IC 320-223413/7	5.0	5.205567	2.5	4583820.0	1.041113	Υ
7	IC 320-223413/8	10.0	10.775226	2.5	4709249.0	1.077523	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

Response Base: RF Rounding: 0

Curve Coefficients

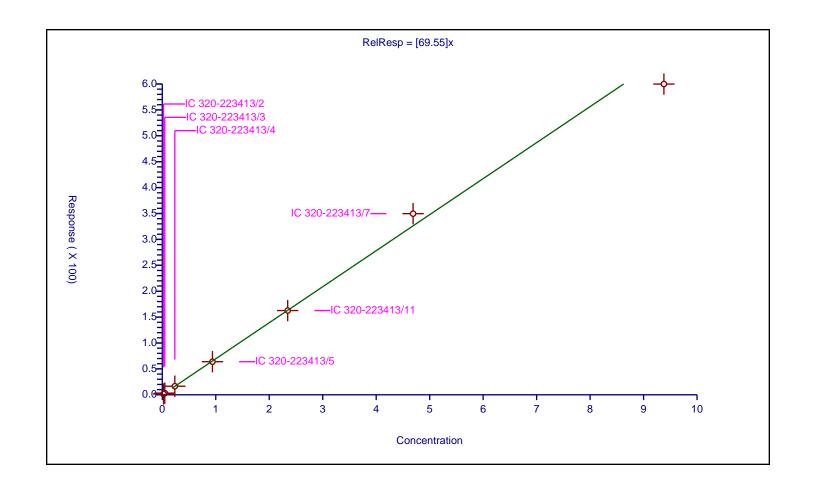
 Intercept:
 0

 Slope:
 69.55

Error Coefficients

Standard Error:12100000Relative Standard Error:4.6Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.02345	1.654065	2.325	110547.0	70.535831	Υ
2	IC 320-223413/3	0.0469	3.26442	2.325	117730.0	69.603839	Υ
3	IC 320-223413/4	0.2345	16.581364	2.325	99970.0	70.709442	Υ
4	IC 320-223413/5	0.938	63.877525	2.325	98369.0	68.099707	Υ
5	IC 320-223413/11	2.345	162.639853	2.325	94691.0	69.356014	Υ
6	IC 320-223413/7	4.69	349.685013	2.325	87185.0	74.559704	Υ
7	IC 320-223413/8	9.38	599.885978	2.325	99131.0	63.953729	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

Response Base: RF Rounding: 0

Curve Coefficients

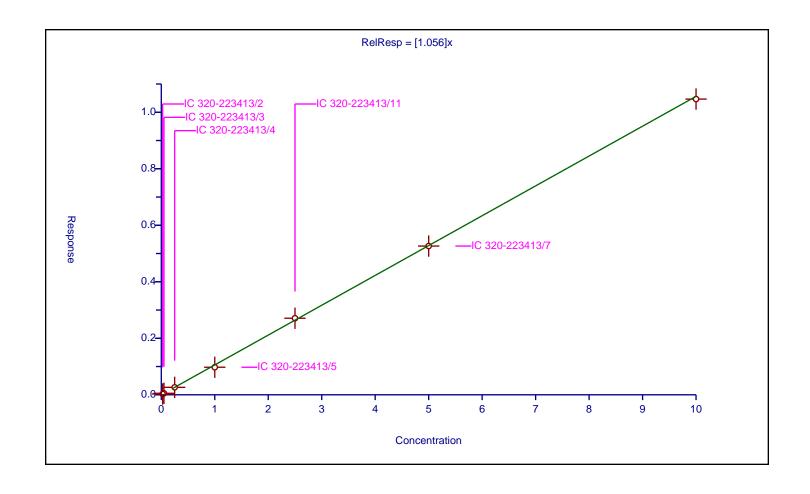
 Intercept:
 0

 Slope:
 1.056

Error Coefficients

Standard Error:8830000Relative Standard Error:4.1Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.027924	2.5	5577473.0	1.116957	Υ
2	IC 320-223413/3	0.05	0.053061	2.5	5774309.0	1.061218	Υ
3	IC 320-223413/4	0.25	0.264298	2.5	5050240.0	1.057193	Υ
4	IC 320-223413/5	1.0	0.975396	2.5	4714171.0	0.975396	Υ
5	IC 320-223413/11	2.5	2.709685	2.5	4465208.0	1.083874	Υ
6	IC 320-223413/7	5.0	5.264617	2.5	4318388.0	1.052923	Υ
7	IC 320-223413/8	10.0	10.466622	2.5	4521122.0	1.046662	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

Response Base:
RF Rounding: 0

Curve Coefficients

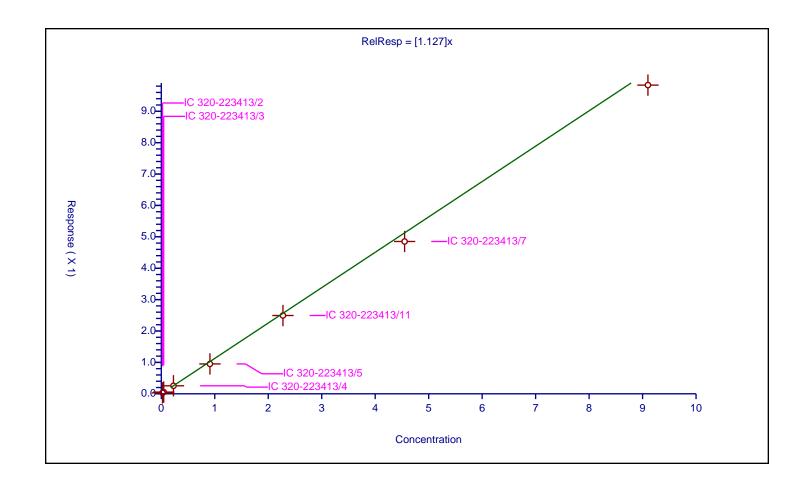
 Intercept:
 0

 Slope:
 1.127

Error Coefficients

Standard Error:10300000Relative Standard Error:7.6Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.992

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.02275	0.029275	2.365	6497213.0	1.286792	Υ
2	IC 320-223413/3	0.0455	0.054276	2.365	6581524.0	1.192872	Υ
3	IC 320-223413/4	0.2275	0.254784	2.365	5692452.0	1.11993	Υ
4	IC 320-223413/5	0.91	0.951005	2.365	5565884.0	1.04506	Υ
5	IC 320-223413/11	2.275	2.493637	2.365	5339851.0	1.096104	Υ
6	IC 320-223413/7	4.55	4.85177	2.365	5191664.0	1.066323	Υ
7	IC 320-223413/8	9.1	9.833165	2.365	5333305.0	1.080568	Υ



/ Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)

Curve Type: Linear
Weighting: Conc_Sq
Origin: None
Dependency: Response
Calib Mode: IsoDil

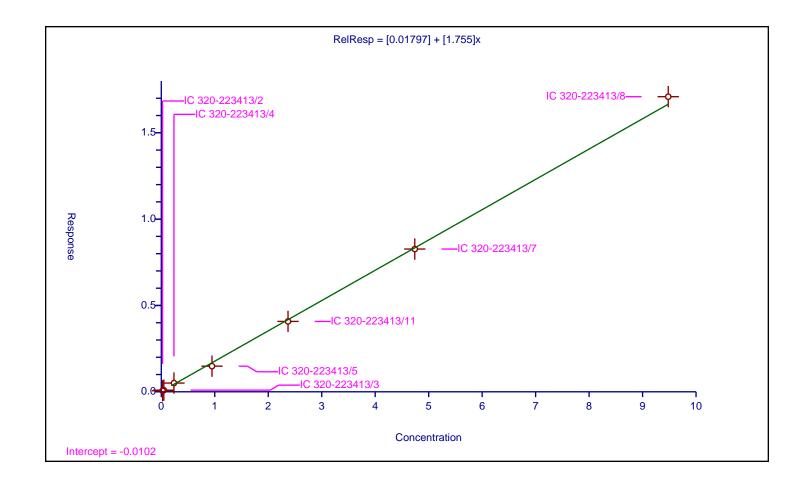
Response Base: RF Rounding: 0

Curve Coefficients	
Intercept:	0.01797
Slope:	1.755

Error Coefficients

Standard Error:3330000Relative Standard Error:10.1Correlation Coefficient:0.998Coefficient of Determination (Adjusted):0.990

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0237	0.060388	2.375	1179634.0	2.548017	Υ
2	IC 320-223413/3	0.0474	0.095492	2.375	1201925.0	2.0146	Υ
3	IC 320-223413/4	0.237	0.506054	2.375	1076802.0	2.135249	Υ
4	IC 320-223413/5	0.948	1.484407	2.375	1028277.0	1.56583	Υ
5	IC 320-223413/11	2.37	4.075455	2.375	953169.0	1.719601	Υ
6	IC 320-223413/7	4.74	8.267203	2.375	867962.0	1.744136	Υ
7	IC 320-223413/8	9.48	17.091564	2.375	913641.0	1.802908	Υ



Calibration / Perfluorooctanoic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base:

0

RF Rounding:

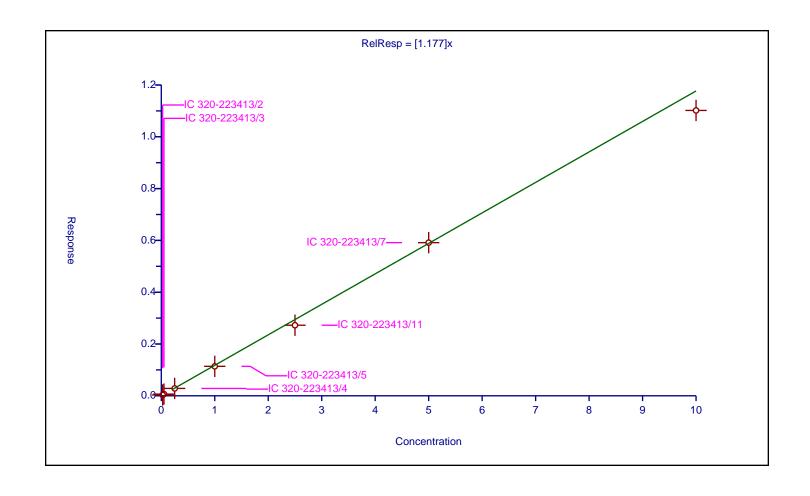
Intercept:	0
Slope:	1.177

Curve Coefficients

Error Coefficients

Standard Error:9210000Relative Standard Error:7.3Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.03206	2.5	5162191.0	1.282382	Υ
2	IC 320-223413/3	0.05	0.06533	2.5	5272655.0	1.30659	Υ
3	IC 320-223413/4	0.25	0.284496	2.5	4619416.0	1.137986	Υ
4	IC 320-223413/5	1.0	1.138031	2.5	4460027.0	1.138031	Υ
5	IC 320-223413/11	2.5	2.724486	2.5	4456920.0	1.089795	Υ
6	IC 320-223413/7	5.0	5.913082	2.5	4079623.0	1.182616	Υ
7	IC 320-223413/8	10.0	11.01813	2.5	4465836.0	1.101813	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

Response Base: RF Rounding: 0

Curve Coefficients

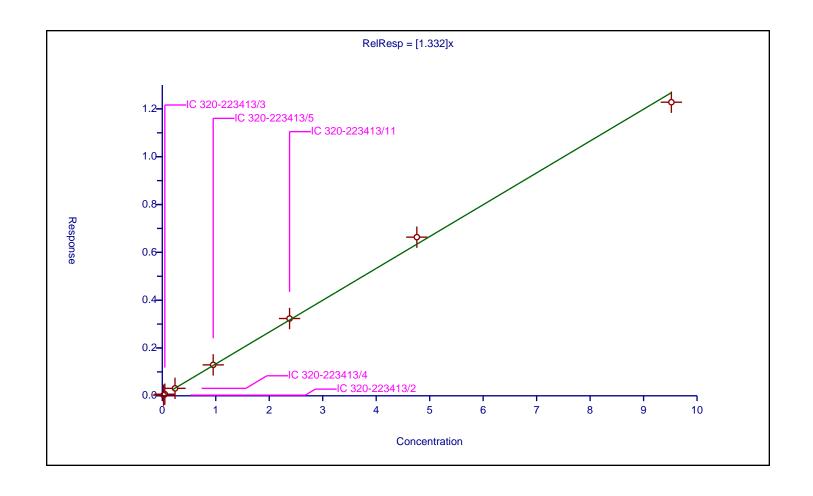
 Intercept:
 0

 Slope:
 1.332

Error Coefficients

Standard Error:9270000Relative Standard Error:5.5Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0238	0.028505	2.39	4516956.0	1.197673	Υ
2	IC 320-223413/3	0.0476	0.067413	2.39	4415247.0	1.416243	Υ
3	IC 320-223413/4	0.238	0.311586	2.39	4024927.0	1.309183	Υ
4	IC 320-223413/5	0.952	1.293247	2.39	3779459.0	1.358452	Υ
5	IC 320-223413/11	2.38	3.232143	2.39	3815593.0	1.358043	Υ
6	IC 320-223413/7	4.76	6.636219	2.39	3520558.0	1.394164	Υ
7	IC 320-223413/8	9.52	12.280732	2.39	3835347.0	1.289993	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base:

0

RF Rounding:

 Intercept:
 0

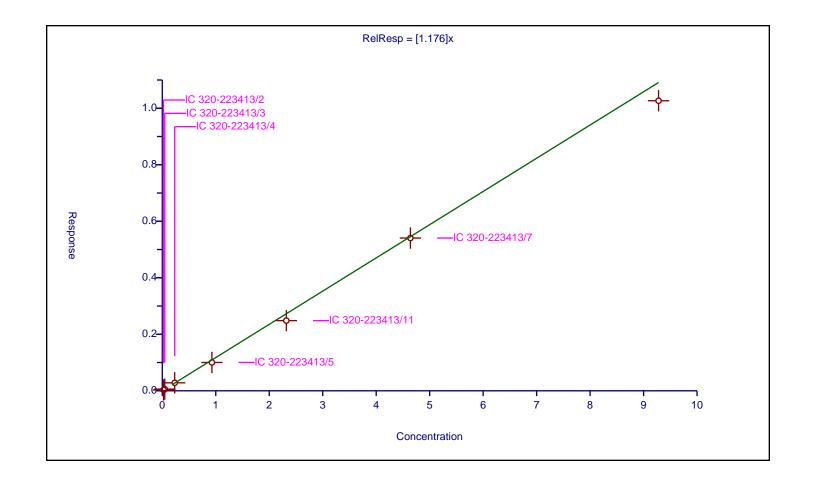
 Slope:
 1.176

Curve Coefficients

Error Coefficients

Standard Error:7670000Relative Standard Error:8.4Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.991

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0232	0.030848	2.39	4516956.0	1.329658	Υ
2	IC 320-223413/3	0.0464	0.05859	2.39	4415247.0	1.262725	Υ
3	IC 320-223413/4	0.232	0.282038	2.39	4024927.0	1.215679	Υ
4	IC 320-223413/5	0.928	1.002487	2.39	3779459.0	1.080267	Υ
5	IC 320-223413/11	2.32	2.48392	2.39	3815593.0	1.070655	Υ
6	IC 320-223413/7	4.64	5.407083	2.39	3520558.0	1.16532	Υ
7	IC 320-223413/8	9.28	10.266077	2.39	3835347.0	1.106258	Υ



Calibration / Perfluorononanoic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base:

0

RF Rounding:

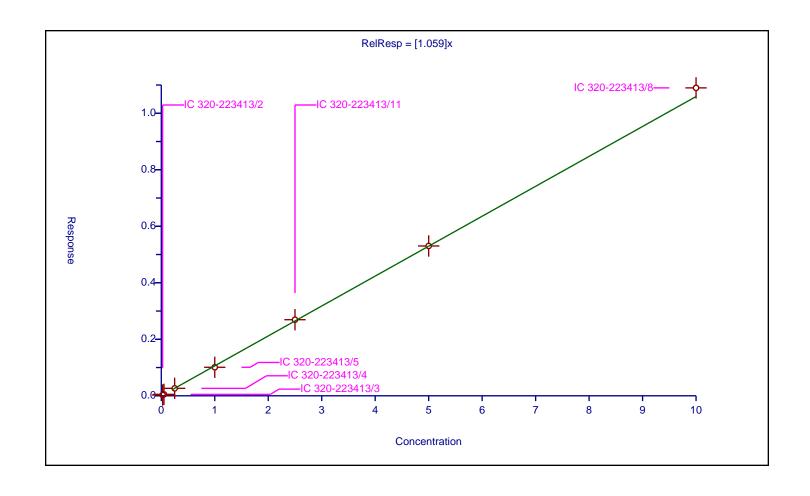
Intercept:	0
Slope:	1.059

Curve Coefficients

Error Coefficients

Standard Error:7140000Relative Standard Error:3.3Correlation Coefficient:0.999Coefficient of Determination (Adjusted):0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.027572	2.5	4268517.0	1.102865	Υ
2	IC 320-223413/3	0.05	0.051043	2.5	4502703.0	1.020865	Υ
3	IC 320-223413/4	0.25	0.263408	2.5	3819382.0	1.053634	Υ
4	IC 320-223413/5	1.0	1.009411	2.5	3600246.0	1.009411	Υ
5	IC 320-223413/11	2.5	2.692885	2.5	3538499.0	1.077154	Υ
6	IC 320-223413/7	5.0	5.302849	2.5	3359491.0	1.06057	Υ
7	IC 320-223413/8	10.0	10.898353	2.5	3539647.0	1.089835	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

Response Base: RF Rounding: 0

Curve Coefficients

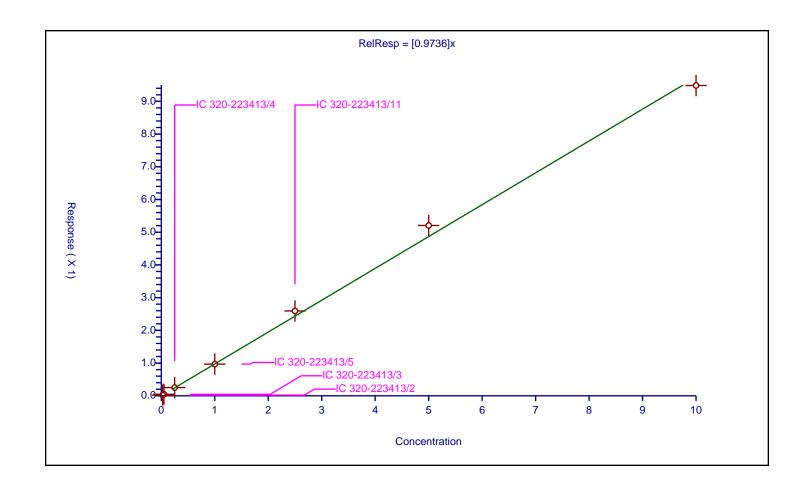
 Intercept:
 0

 Slope:
 0.9736

Error Coefficients

Standard Error:9600000Relative Standard Error:6.1Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.021924	2.5	5956672.0	0.876966	Υ
2	IC 320-223413/3	0.05	0.04682	2.5	5858621.0	0.936398	Υ
3	IC 320-223413/4	0.25	0.25161	2.5	5466463.0	1.006439	Υ
4	IC 320-223413/5	1.0	0.968289	2.5	5346931.0	0.968289	Υ
5	IC 320-223413/11	2.5	2.593212	2.5	5178962.0	1.037285	Υ
6	IC 320-223413/7	5.0	5.20651	2.5	4976852.0	1.041302	Υ
7	IC 320-223413/8	10.0	9.484794	2.5	5353791.0	0.948479	Υ



Curve Type:AverageWeighting:Conc_SqOrigin:ForceDependency:ResponseCalib Mode:IsoDil

0

Response Base:

RF Rounding:

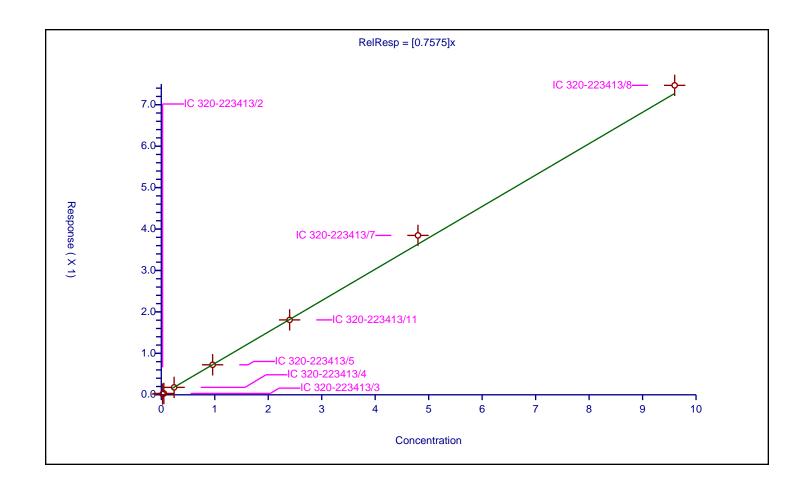
Intercept:	0
Slope:	0.7575

Curve Coefficients

Error Coefficients

Standard Error:5560000Relative Standard Error:5.1Correlation Coefficient:0.999Coefficient of Determination (Adjusted):0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.024	0.0189	2.39	4516956.0	0.787481	Υ
2	IC 320-223413/3	0.048	0.032746	2.39	4415247.0	0.682204	Υ
3	IC 320-223413/4	0.24	0.179215	2.39	4024927.0	0.74673	Υ
4	IC 320-223413/5	0.96	0.723687	2.39	3779459.0	0.75384	Υ
5	IC 320-223413/11	2.4	1.807138	2.39	3815593.0	0.752974	Υ
6	IC 320-223413/7	4.8	3.846277	2.39	3520558.0	0.801308	Υ
7	IC 320-223413/8	9.6	7.467179	2.39	3835347.0	0.777831	Υ



/ Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

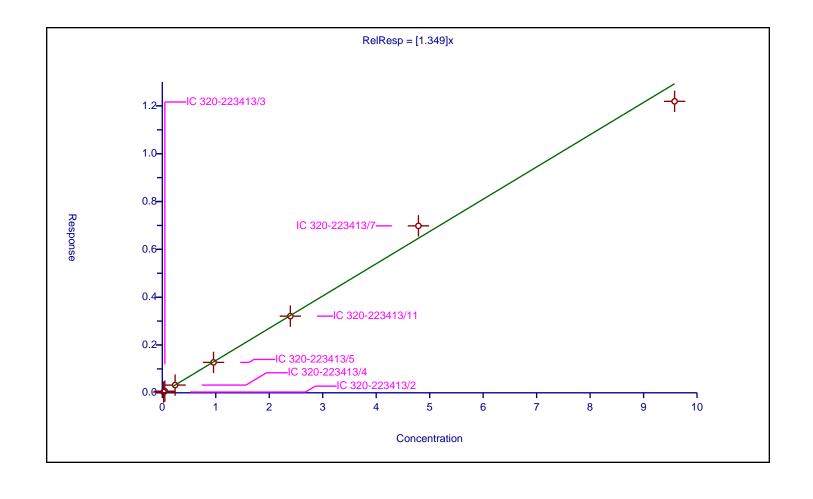
Response Base:
RF Rounding: 0

Curve Coefficients	
Intercept:	0
Slope:	1.349

Error Coefficients

Standard Error:2660000Relative Standard Error:4.3Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.02395	0.03158	2.395	1426703.0	1.318565	Υ
2	IC 320-223413/3	0.0479	0.066379	2.395	1426640.0	1.385774	Υ
3	IC 320-223413/4	0.2395	0.322423	2.395	1187676.0	1.346234	Υ
4	IC 320-223413/5	0.958	1.27079	2.395	1096366.0	1.326503	Υ
5	IC 320-223413/11	2.395	3.206758	2.395	1089191.0	1.338939	Υ
6	IC 320-223413/7	4.79	6.982192	2.395	972368.0	1.45766	Υ
7	IC 320-223413/8	9.58	12.191537	2.395	1107332.0	1.272603	Υ



Calibration / Perfluorodecanoic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

Response Base: RF Rounding: 0

Curve C	Coefficients
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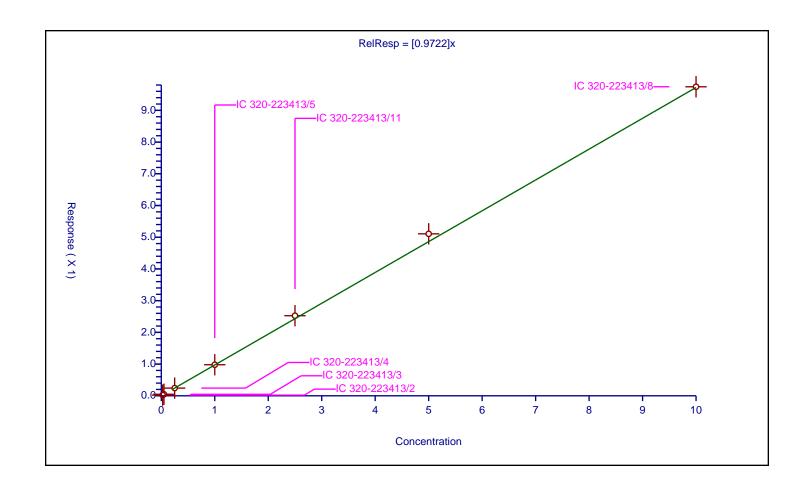
 Intercept:
 0

 Slope:
 0.9722

Error Coefficients

Standard Error:5620000Relative Standard Error:4.5Correlation Coefficient:0.999Coefficient of Determination (Adjusted):0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.022168	2.5	3594922.0	0.886723	Υ
2	IC 320-223413/3	0.05	0.048141	2.5	3752181.0	0.962813	Υ
3	IC 320-223413/4	0.25	0.242669	2.5	3297462.0	0.970677	Υ
4	IC 320-223413/5	1.0	0.979358	2.5	3084670.0	0.979358	Υ
5	IC 320-223413/11	2.5	2.525493	2.5	2997952.0	1.010197	Υ
6	IC 320-223413/7	5.0	5.106929	2.5	2812041.0	1.021386	Υ
7	IC 320-223413/8	10.0	9.744224	2.5	3099083.0	0.974422	Υ



/ N-methyl perfluorooctane sulfonamidoacetic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base:

0

RF Rounding:

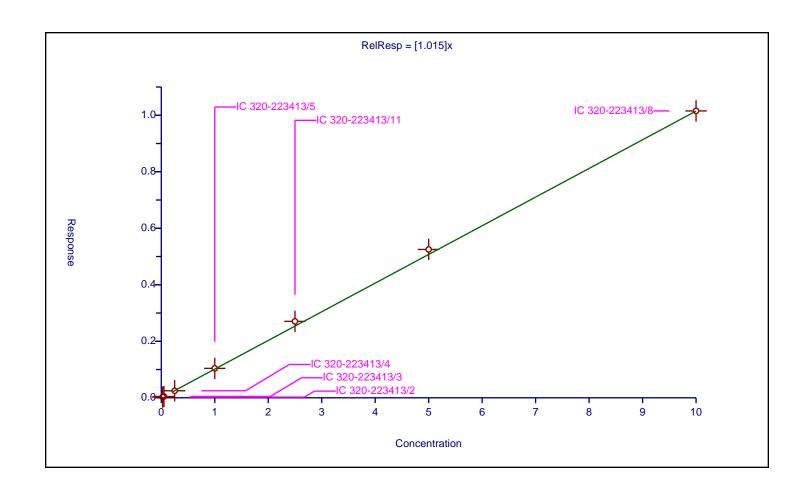
Intercept:	0
Slope:	1.015

Curve Coefficients

Error Coefficients

Standard Error:3410000Relative Standard Error:4.8Correlation Coefficient:0.996Coefficient of Determination (Adjusted):0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.02464	2.5	1940146.0	0.985596	Υ
2	IC 320-223413/3	0.05	0.046708	2.5	2060337.0	0.934168	Υ
3	IC 320-223413/4	0.25	0.248379	2.5	1854527.0	0.993515	Υ
4	IC 320-223413/5	1.0	1.0424	2.5	1667566.0	1.0424	Υ
5	IC 320-223413/11	2.5	2.705503	2.5	1561957.0	1.082201	Υ
6	IC 320-223413/7	5.0	5.250998	2.5	1561125.0	1.0502	Υ
7	IC 320-223413/8	10.0	10.153615	2.5	1836867.0	1.015361	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

0

Response Base:

RF Rounding:

 Intercept:
 0

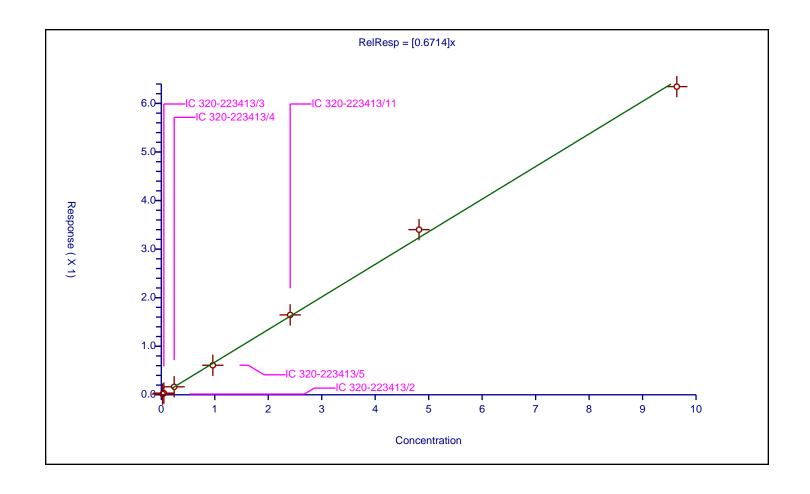
 Slope:
 0.6714

Curve Coefficients

Error Coefficients

Standard Error:4770000Relative Standard Error:4.8Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0241	0.015224	2.39	4516956.0	0.631713	Υ
2	IC 320-223413/3	0.0482	0.034117	2.39	4415247.0	0.707819	Υ
3	IC 320-223413/4	0.241	0.164737	2.39	4024927.0	0.683554	Υ
4	IC 320-223413/5	0.964	0.607741	2.39	3779459.0	0.630436	Υ
5	IC 320-223413/11	2.41	1.644986	2.39	3815593.0	0.682567	Υ
6	IC 320-223413/7	4.82	3.400965	2.39	3520558.0	0.705594	Υ
7	IC 320-223413/8	9.64	6.346257	2.39	3835347.0	0.658325	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

0

Response Base:

RF Rounding:

 Intercept:
 0

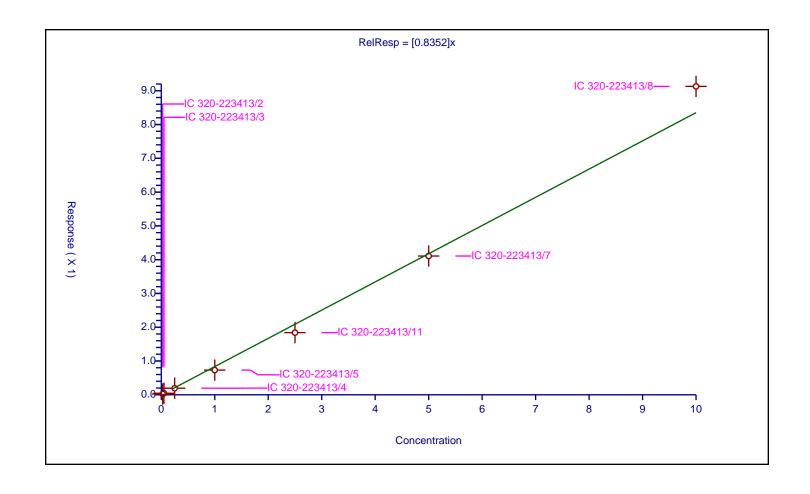
 Slope:
 0.8352

Curve Coefficients

Error Coefficients

Standard Error:3810000Relative Standard Error:10.9Correlation Coefficient:0.997Coefficient of Determination (Adjusted):0.984

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.023789	2.5	2840675.0	0.95157	Υ
2	IC 320-223413/3	0.05	0.045689	2.5	2914989.0	0.913777	Υ
3	IC 320-223413/4	0.25	0.194752	2.5	2576940.0	0.779009	Υ
4	IC 320-223413/5	1.0	0.731215	2.5	2587053.0	0.731215	Υ
5	IC 320-223413/11	2.5	1.840749	2.5	2447962.0	0.736299	Υ
6	IC 320-223413/7	5.0	4.107749	2.5	2262574.0	0.82155	Υ
7	IC 320-223413/8	10.0	9.129515	2.5	2282286.0	0.912952	Υ



/ N-ethyl perfluorooctane sulfonamidoacetic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

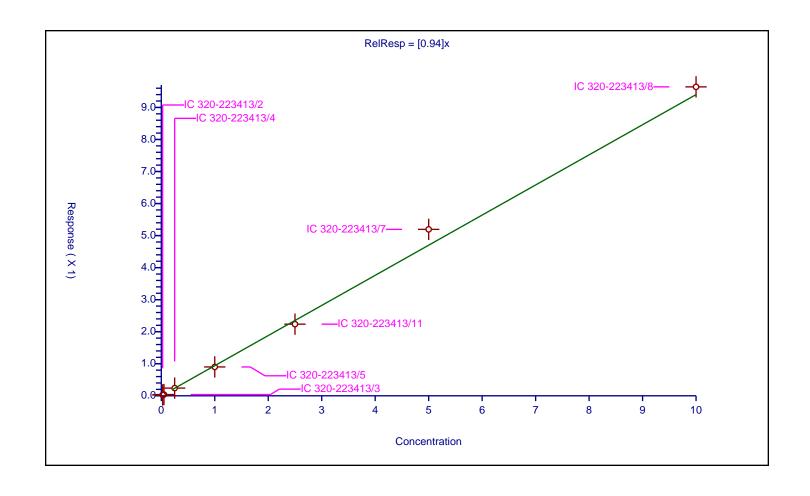
Response Base: RF Rounding: 0

Curve Coefficients					
Intercept: Slope:	0 0,94				
·					

Error Coefficients

Standard Error:2940000Relative Standard Error:10.3Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.987

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.026309	2.5	2119254.0	1.052351	Υ
2	IC 320-223413/3	0.05	0.03841	2.5	2144987.0	0.76821	Υ
3	IC 320-223413/4	0.25	0.240507	2.5	1857905.0	0.96203	Υ
4	IC 320-223413/5	1.0	0.900266	2.5	1808821.0	0.900266	Υ
5	IC 320-223413/11	2.5	2.235955	2.5	1777821.0	0.894382	Υ
6	IC 320-223413/7	5.0	5.194028	2.5	1507014.0	1.038806	Υ
7	IC 320-223413/8	10.0	9.641907	2.5	1619647.0	0.964191	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil

Response Base: RF Rounding: 0

Curve Coefficients

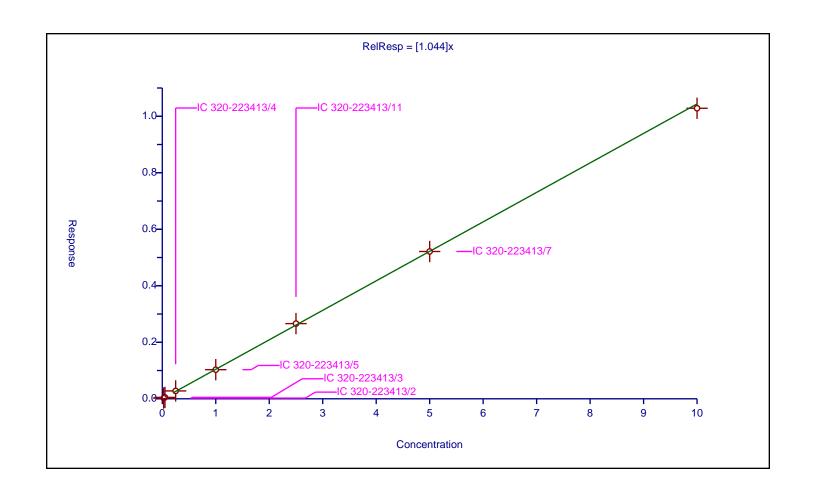
 Intercept:
 0

 Slope:
 1.044

Error Coefficients

Standard Error:5230000Relative Standard Error:3.4Correlation Coefficient:0.999Coefficient of Determination (Adjusted):0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.025547	2.5	2960567.0	1.021899	Υ
2	IC 320-223413/3	0.05	0.0502	2.5	3058640.0	1.004008	Υ
3	IC 320-223413/4	0.25	0.278393	2.5	2740425.0	1.113572	Υ
4	IC 320-223413/5	1.0	1.030575	2.5	2679695.0	1.030575	Υ
5	IC 320-223413/11	2.5	2.661172	2.5	2514089.0	1.064469	Υ
6	IC 320-223413/7	5.0	5.213621	2.5	2544838.0	1.042724	Υ
7	IC 320-223413/8	10.0	10.282964	2.5	2747572.0	1.028296	Υ



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base:

0

RF Rounding:

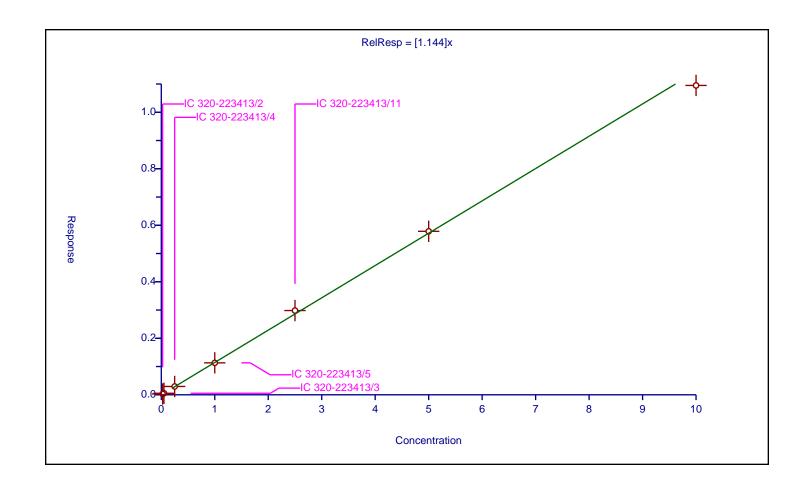
Intercept:	0
Slope:	1.144

Curve Coefficients

Error Coefficients

Standard Error:5630000Relative Standard Error:3.7Correlation Coefficient:1.000Coefficient of Determination (Adjusted):0.998

Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
IC 320-223413/2	0.025	0.029231	2.5	2960567.0	1.169235	Υ
IC 320-223413/3	0.05	0.054221	2.5	3058640.0	1.08442	Υ
IC 320-223413/4	0.25	0.294504	2.5	2740425.0	1.178014	Υ
IC 320-223413/5	1.0	1.130478	2.5	2679695.0	1.130478	Υ
IC 320-223413/11	2.5	2.982527	2.5	2514089.0	1.193011	Υ
IC 320-223413/7	5.0	5.786335	2.5	2544838.0	1.157267	Υ
IC 320-223413/8	10.0	10.949082	2.5	2747572.0	1.094908	Υ
	IC 320-223413/2 IC 320-223413/3 IC 320-223413/4 IC 320-223413/5 IC 320-223413/11 IC 320-223413/7	IC 320-223413/2 0.025 IC 320-223413/3 0.05 IC 320-223413/4 0.25 IC 320-223413/5 1.0 IC 320-223413/11 2.5 IC 320-223413/7 5.0	IC 320-223413/2 0.025 0.029231 IC 320-223413/3 0.05 0.054221 IC 320-223413/4 0.25 0.294504 IC 320-223413/5 1.0 1.130478 IC 320-223413/11 2.5 2.982527 IC 320-223413/7 5.0 5.786335	IC 320-223413/2 0.025 0.029231 2.5 IC 320-223413/3 0.05 0.054221 2.5 IC 320-223413/4 0.25 0.294504 2.5 IC 320-223413/5 1.0 1.130478 2.5 IC 320-223413/11 2.5 2.982527 2.5 IC 320-223413/7 5.0 5.786335 2.5	IC 320-223413/2 0.025 0.029231 2.5 2960567.0 IC 320-223413/3 0.05 0.054221 2.5 3058640.0 IC 320-223413/4 0.25 0.294504 2.5 2740425.0 IC 320-223413/5 1.0 1.130478 2.5 2679695.0 IC 320-223413/11 2.5 2.982527 2.5 2514089.0 IC 320-223413/7 5.0 5.786335 2.5 2544838.0	IC 320-223413/2 0.025 0.029231 2.5 2960567.0 1.169235 IC 320-223413/3 0.05 0.054221 2.5 3058640.0 1.08442 IC 320-223413/4 0.25 0.294504 2.5 2740425.0 1.178014 IC 320-223413/5 1.0 1.130478 2.5 2679695.0 1.130478 IC 320-223413/11 2.5 2.982527 2.5 2514089.0 1.193011 IC 320-223413/7 5.0 5.786335 2.5 2544838.0 1.157267



Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base:

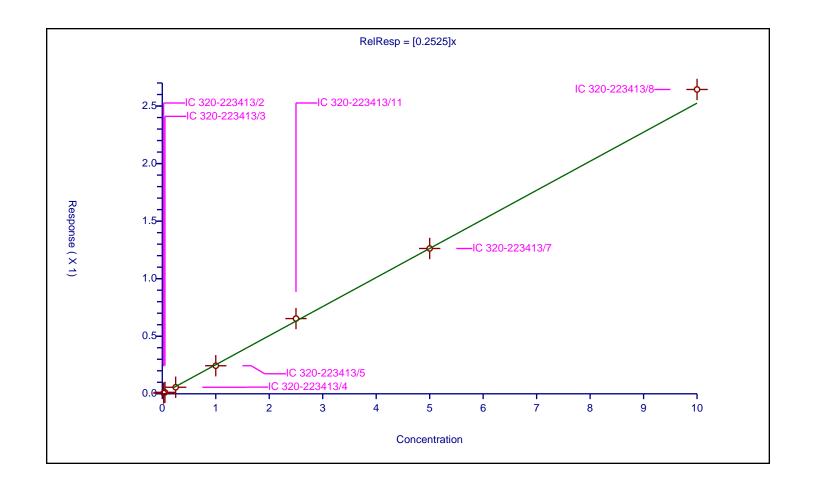
0

RF Rounding:

Error Coefficients

Standard Error:1590000Relative Standard Error:5.3Correlation Coefficient:0.998Coefficient of Determination (Adjusted):0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.006554	2.5	3777870.0	0.262158	Υ
2	IC 320-223413/3	0.05	0.012825	2.5	3285420.0	0.256497	Υ
3	IC 320-223413/4	0.25	0.056743	2.5	3595983.0	0.226973	Υ
4	IC 320-223413/5	1.0	0.243826	2.5	3394312.0	0.243826	Υ
5	IC 320-223413/11	2.5	0.653493	2.5	3141974.0	0.261397	Υ
6	IC 320-223413/7	5.0	1.262333	2.5	3113223.0	0.252467	Υ
7	IC 320-223413/8	10.0	2.643815	2.5	3267831.0	0.264381	Υ



Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: ICV 320-223413/13 Calibration Date: 05/15/2018 17:23

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.15LLCC_ICAL_010.d Conc. Units: ng/mL

						I I		
ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9298	0.9503		2.55	2.50	2.2	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.167		2.47	2.50	-1.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	82.15		2.33	2.21	5.2	30.0
4:2 FTS	AveID	16.57	18.05		2.55	2.34	8.9	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.004		2.44	2.50	-2.3	30.0
Perfluoropentanesulfonic acid	AveID	69.55	71.81		2.43	2.35	3.3	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.142		2.70	2.50	8.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.055		2.14	2.28	-6.3	30.0
6:2FTS	L2ID		1.554		2.09	2.38	-11.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.151		2.44	2.50	-2.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.351		2.41	2.38	1.4	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.072		2.53	2.50	1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.149		2.26	2.31	-2.3	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9902		2.54	2.50	1.7	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7598		2.41	2.40	0.3	30.0
8:2FTS	AveID	1.349	1.309		2.33	2.40	-3.0	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.037		2.67	2.50	6.7	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.021		2.52	2.50	0.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.7025		2.52	2.41	4.6	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9652		2.57	2.50	2.7	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.7177		2.15	2.50	-14.1	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	0.996		2.39	2.50	-4.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.104		2.41	2.50	-3.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2469		2.44	2.50	-2.2	30.0
13C4 PFBA	Ave	1.528	1.462		2.39	2.50	-4.3	30.0
13C5 PFPeA	Ave	0.9798	0.9296		2.37	2.50	-5.1	30.0
13C3-PFBS	Ave	0.0221	0.0208		2.18	2.33	-6.0	30.0
13C2 PFHxA	Ave	1.045	0.998		2.39	2.50	-4.5	30.0
13C4-PFHpA	Ave	1.001	0.9156		2.29	2.50	-8.5	30.0
1802 PFHxS	Ave	1.237	1.175		2.25	2.37	-5.0	30.0
M2-6:2FTS	Ave	0.2210	0.2207		2.37	2.38	-0.1	30.0

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: <u>ICV 320-223413/13</u> Calibration Date: <u>05/15/2018</u> 17:23

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.15LLCC_ICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.8898		2.35	2.50	-6.0	30.0
13C4 PFOS	Ave	0.8503	0.8094		2.28	2.39	-4.8	30.0
13C5 PFNA	Ave	0.7745	0.7379		2.38	2.50	-4.7	30.0
13C8 FOSA	Ave	1.113	1.119		2.51	2.50	0.6	30.0
M2-8:2FTS	Ave	0.2515	0.2407		2.29	2.40	-4.3	30.0
13C2 PFDA	Ave	0.6587	0.6073		2.30	2.50	-7.8	30.0
d3-NMeFOSAA	Ave	0.3634	0.3568		2.45	2.50	-1.8	30.0
d5-NEtFOSAA	Ave	0.3729	0.3488		2.34	2.50	-6.5	30.0
13C2 PFUnA	Ave	0.5216	0.4944		2.37	2.50	-5.2	30.0
13C2 PFDoA	Ave	0.5613	0.5571		2.48	2.50	-0.8	30.0
13C2-PFTeDA	Ave	0.6891	0.6919		2.51	2.50	0.4	30.0
13C2-PFHxDA	Ave	1.170	1.171		2.50	2.50	0.1	30.0

LCMS ANALYSIS RUN LOG

Lab Name:	TestAmerica Sacramento	Job No.: 320-38875-1
SDG No.:		
Instrumen	t ID: A8_N	Start Date: 05/28/2018 07:00

Analysis Batch Number: 225818 End Date: 05/28/2018 10:47

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-225818/1		05/28/2018 07:00	1	2018.05.27LLADX 001.d	GeminiC18 3x100 3(mm)
CCVL 320-225818/2		05/28/2018 07:08	1	2018.05.27LLADX 002.d	GeminiC18 3x100 3(mm)
CCV 320-225818/3 CCVIS		05/28/2018 07:15	1	2018.05.27LLADX 003.d	GeminiC18 3x100 3(mm)
MB 320-223615/1-A		05/28/2018 07:23	1	2018.05.27LLADX 004.d	GeminiC18 3x100 3(mm)
LCS 320-223615/2-A		05/28/2018 07:31	1	2018.05.27LLADX 005.d	GeminiC18 3x100 3(mm)
320-38875-1		05/28/2018 07:39	1	2018.05.27LLADX 006.d	GeminiC18 3x100 3(mm)
320-38875-2		05/28/2018 07:47	1	2018.05.27LLADX 007.d	GeminiC18 3x100 3(mm)
320-38875-3		05/28/2018 07:55	1	2018.05.27LLADX 008.d	GeminiC18 3x100 3 (mm)
320-38875-4		05/28/2018 08:02	1	2018.05.27LLADX 009.d	GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:10	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:18	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:26	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:34	1		GeminiC18 3x100 3(mm)
CCV 320-225818/14		05/28/2018 08:42	1	2018.05.27LLADX 014.d	GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:50	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:57	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:05	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:13	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:21	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:29	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:37	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:44	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:52	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:00	1		GeminiC18 3x100 3(mm)
CCV 320-225818/25		05/28/2018 10:08	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:16	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:24	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:31	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:39	1		GeminiC18 3x100 3(mm)
CCV 320-225818/30		05/28/2018 10:47	1		GeminiC18 3x100 3(mm)

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCVL 320-225818/2 Calibration Date: 05/28/2018 07:08

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9298	1.012		0.0544	0.0500	8.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.288		0.0545	0.0500	9.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	79.49		0.0450	0.0442	1.8	30.0
4:2 FTS	AveID	16.57	19.27		0.400	0.0467	16.3	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.040		0.0506	0.0500	1.2	30.0
Perfluoropentanesulfonic acid	AveID	69.55	70.14		0.0473	0.0469	0.9	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.146		0.0543	0.0500	8.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.182		0.0477	0.0455	4.9	30.0
6:2FTS	L2ID		1.719		0.400	0.0474	-23.7	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.274		0.0541	0.0500	8.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.308		0.0468	0.0476	-1.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	0.9395		0.0444	0.0500	-11.3	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.117		0.0441	0.0464	-5.0	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.030		0.0529	0.0500	5.8	30.0
8:2FTS	AveID	1.349	1.417		0.0503	0.0479	5.0	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7926		0.0502	0.0480	4.6	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.103		0.0567	0.0500	13.5	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.056		0.400	0.0500	4.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.7927		0.0569	0.0482	18.1	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9911		0.0527	0.0500	5.4	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.8276		0.0495	0.0500	-0.9	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.031		0.0494	0.0500	-1.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.310		0.0573	0.0500	14.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2293		0.0454	0.0500	-9.2	30.0
13C4 PFBA	Ave	1.528	1.372		2.24	2.50	-10.2	30.0
13C5 PFPeA	Ave	0.9798	0.9936		2.54	2.50	1.4	30.0
13C3-PFBS	Ave	0.0221	0.0202		2.12	2.33	-8.8	30.0
13C2 PFHxA	Ave	1.045	1.043		2.50	2.50	-0.1	30.0
13C4-PFHpA	Ave	1.001	0.9269		2.31	2.50	-7.4	30.0
1802 PFHxS	Ave	1.237	1.166		2.23	2.37	-5.7	30.0
M2-6:2FTS	Ave	0.2210	0.2443		2.63	2.38	10.5	30.0

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCVL 320-225818/2 Calibration Date: 05/28/2018 07:08

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9576		2.53	2.50	1.1	30.0
13C4 PFOS	Ave	0.8503	0.7883		2.22	2.39	-7.3	30.0
13C5 PFNA	Ave	0.7745	0.8026		2.59	2.50	3.6	30.0
13C8 FOSA	Ave	1.113	0.999		2.24	2.50	-10.2	30.0
M2-8:2FTS	Ave	0.2515	0.2504		2.39	2.40	-0.4	30.0
13C2 PFDA	Ave	0.6587	0.6778		2.57	2.50	2.9	30.0
d3-NMeFOSAA	Ave	0.3634	0.4035		2.78	2.50	11.0	30.0
d5-NEtFOSAA	Ave	0.3729	0.4189		2.81	2.50	12.3	30.0
13C2 PFUnA	Ave	0.5216	0.5244		2.51	2.50	0.5	30.0
13C2 PFDoA	Ave	0.5613	0.5893		2.62	2.50	5.0	30.0
13C2-PFTeDA	Ave	0.6891	0.7280		2.64	2.50	5.6	30.0
13C2-PFHxDA	Ave	1.170	1.325		2.83	2.50	13.3	30.0

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225818/3 Calibration Date: 05/28/2018 07:15

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9298	0.9291		0.999	1.00	-0.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.119		0.948	1.00	-5.2	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	76.60		0.867	0.884	-1.9	30.0
4:2 FTS	AveID	16.57	18.15		1.02	0.934	9.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.019		0.991	1.00	-0.9	30.0
Perfluoropentanesulfonic acid	AveID	69.55	69.26		0.934	0.938	-0.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.035		0.980	1.00	-2.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.042		0.841	0.910	-7.6	30.0
6:2FTS	L2ID		1.642		0.877	0.948	-7.5	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.048		0.891	1.00	-10.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.298		0.928	0.952	-2.5	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	0.9653		0.911	1.00	-8.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.061		0.838	0.928	-9.7	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9937		1.02	1.00	2.1	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7865		0.997	0.960	3.8	30.0
8:2FTS	AveID	1.349	1.230		0.873	0.958	-8.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.011		1.04	1.00	4.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.011		0.996	1.00	-0.4	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.6428		0.923	0.964	-4.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9432		1.00	1.00	0.3	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.7734		0.926	1.00	-7.4	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.048		1.00	1.00	0.4	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.210		1.06	1.00	5.8	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2496		0.988	1.00	-1.2	30.0
13C4 PFBA	Ave	1.528	1.354		2.21	2.50	-11.4	30.0
13C5 PFPeA	Ave	0.9798	0.9501		2.42	2.50	-3.0	30.0
13C3-PFBS	Ave	0.0221	0.0199		2.09	2.33	-10.0	30.0
13C2 PFHxA	Ave	1.045	0.996		2.38	2.50	-4.6	30.0
13C4-PFHpA	Ave	1.001	0.9333		2.33	2.50	-6.8	30.0
1802 PFHxS	Ave	1.237	1.097		2.10	2.37	-11.3	30.0
M2-6:2FTS	Ave	0.2210	0.2283		2.45	2.38	3.3	30.0

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: <u>CCV 320-225818/3</u> Calibration Date: <u>05/28/2018</u> 07:15

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9588		2.53	2.50	1.3	30.0
13C4 PFOS	Ave	0.8503	0.7852		2.21	2.39	-7.6	30.0
13C5 PFNA	Ave	0.7745	0.8005		2.58	2.50	3.4	30.0
13C8 FOSA	Ave	1.113	0.9489		2.13	2.50	-14.7	30.0
M2-8:2FTS	Ave	0.2515	0.2409		2.29	2.40	-4.2	30.0
13C2 PFDA	Ave	0.6587	0.6306		2.39	2.50	-4.3	30.0
d3-NMeFOSAA	Ave	0.3634	0.4027		2.77	2.50	10.8	30.0
13C2 PFUnA	Ave	0.5216	0.5248		2.51	2.50	0.6	30.0
d5-NEtFOSAA	Ave	0.3729	0.3926		2.63	2.50	5.3	30.0
13C2 PFDoA	Ave	0.5613	0.5473		2.44	2.50	-2.5	30.0
13C2-PFTeDA	Ave	0.6891	0.6769		2.46	2.50	-1.8	30.0
13C2-PFHxDA	Ave	1.170	1.212		2.59	2.50	3.6	30.0

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225818/14 Calibration Date: 05/28/2018 08:42

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: <u>GeminiC18 3x100</u> ID: <u>3.00(mm)</u> Calib End Date: <u>05/15/2018 16:39</u>

Lab File ID: 2018.05.27LLADX_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid	AveID	0.9298	0.9726		2.61	2.50	4.6	30.0
(PFBA) Perfluoropentanoic acid	AveID	1.181	1.175		2.49	2.50	-0.4	30.0
(PFFPeA) Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	80.78		2.29	2.21	3.4	30.0
4:2 FTS	AveID	16.57	18.52		2.61	2.34	11.7	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.016		2.47	2.50	-1.2	30.0
Perfluoropentanesulfonic acid	AveID	69.55	72.10		2.43	2.35	3.7	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.031		2.44	2.50	-2.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.047		2.11	2.28	-7.1	30.0
6:2FTS	L2ID		1.633		2.19	2.37	-7.4	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.131		2.40	2.50	-3.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.349		2.41	2.38	1.3	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.047		2.47	2.50	-1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.111		2.19	2.32	-5.5	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.048		2.69	2.50	7.7	30.0
8:2FTS	AveID	1.349	1.223		2.17	2.40	-9.4	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.8135		2.58	2.40	7.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	0.9761		2.51	2.50	0.4	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.071		2.64	2.50	5.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.6547		2.35	2.41	-2.5	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9594		2.55	2.50	2.1	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.8086		2.42	2.50	-3.2	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.043		2.50	2.50	-0.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.164		2.54	2.50	1.8	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2482		2.46	2.50	-1.7	30.0
13C4 PFBA	Ave	1.528	1.383		2.26	2.50	-9.5	30.0
13C5 PFPeA	Ave	0.9798	0.9537		2.43	2.50	-2.7	30.0
13C3-PFBS	Ave	0.0221	0.0203		2.13	2.33	-8.3	30.0
13C2 PFHxA	Ave	1.045	1.035		2.48	2.50	-1.0	30.0
13C4-PFHpA	Ave	1.001	0.9774		2.44	2.50	-2.4	30.0
1802 PFHxS	Ave	1.237	1.160		2.22	2.37	-6.2	30.0
M2-6:2FTS	Ave	0.2210	0.2320		2.49	2.38	5.0	30.0

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225818/14 Calibration Date: 05/28/2018 08:42

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9508		2.51	2.50	0.4	30.0
13C4 PFOS	Ave	0.8503	0.7945		2.23	2.39	-6.6	30.0
13C5 PFNA	Ave	0.7745	0.7916		2.56	2.50	2.2	30.0
13C8 FOSA	Ave	1.113	0.9755		2.19	2.50	-12.3	30.0
M2-8:2FTS	Ave	0.2515	0.2576		2.45	2.40	2.4	30.0
13C2 PFDA	Ave	0.6587	0.6660		2.53	2.50	1.1	30.0
d3-NMeFOSAA	Ave	0.3634	0.4033		2.77	2.50	11.0	30.0
13C2 PFUnA	Ave	0.5216	0.5372		2.57	2.50	3.0	30.0
d5-NEtFOSAA	Ave	0.3729	0.3995		2.68	2.50	7.1	30.0
13C2 PFDoA	Ave	0.5613	0.5817		2.59	2.50	3.6	30.0
13C2-PFTeDA	Ave	0.6891	0.7079		2.57	2.50	2.7	30.0
13C2-PFHxDA	Ave	1.170	1.392		2.98	2.50	19.0	30.0

NO SAMPLES ASSOCIATED

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento	Job No.: <u>320-38875-1</u>					
SDG No.:						
Instrument ID: A8_N	Start Date: 05/28/2018 17:14					
Analysis Batch Number: 225873	End Date: 05/28/2018 20:22					

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-225873/1		05/28/2018 17:14	1	2018.05.28LLA_0	GeminiC18 3x100 3(mm)
CCVL 320-225873/2		05/28/2018 17:22	1	2018.05.28LLA_0 04.d	GeminiC18 3x100 3(mm)
CCV 320-225873/3 CCVIS		05/28/2018 17:30	1	2018.05.28LLA_0 05.d	GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 17:37	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 17:45	50		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 17:53	50		GeminiC18 3x100 3 (mm)
ZZZZZ		05/28/2018 18:01	20		GeminiC18 3x100 3 (mm)
ZZZZZ		05/28/2018 18:09	100		GeminiC18 3x100 3 (mm)
ZZZZZ		05/28/2018 18:16	100		GeminiC18 3x100 3 (mm)
ZZZZZ		05/28/2018 18:24	100		GeminiC18 3x100 3 (mm)
ZZZZZ		05/28/2018 18:32	5		GeminiC18 3x100 3 (mm)
CCV 320-225873/14		05/28/2018 18:56	1		GeminiC18 3x100 3 (mm)
ZZZZZ		05/28/2018 19:03	10		GeminiC18 3x100 3 (mm)
ZZZZZ		05/28/2018 19:11	10		GeminiC18 3x100 3 (mm)
ZZZZZ		05/28/2018 19:19	10		GeminiC18 3x100 3 (mm)
ZZZZZ		05/28/2018 19:27	1		GeminiC18 3x100 3 (mm)
ZZZZZ		05/28/2018 19:35	5		GeminiC18 3x100 3 (mm)
ZZZZZ		05/28/2018 19:43	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 19:51	50		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 19:58	1		GeminiC18 3x100 3 (mm)
ZZZZZ		05/28/2018 20:06	10		GeminiC18 3x100 3 (mm)
ZZZZZ		05/28/2018 20:14	1		GeminiC18 3x100 3 (mm)
CCV 320-225873/25		05/28/2018 20:22	1		GeminiC18 3x100 3 (mm)

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCVL 320-225873/2 Calibration Date: 05/28/2018 17:22

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_004.d Conc. Units: ng/mL

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ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid	AveID	0.9298	1.009		0.0543	0.0500	8.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.249		0.0529	0.0500	5.8	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	82.26		0.0466	0.0442	5.3	30.0
4:2 FTS	AveID	16.57	18.32		0.400	0.0467	10.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.025		0.0498	0.0500	-0.3	30.0
Perfluoropentanesulfonic acid	AveID	69.55	69.25		0.0467	0.0469	-0.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	0.9483		0.0449	0.0500	-10.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.249		0.0504	0.0455	10.8	30.0
6:2FTS	L2ID		1.655		0.400	0.0474	-27.3	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.275		0.0456	0.0476	-4.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.261		0.0536	0.0500	7.1	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.097		0.0518	0.0500	3.6	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.130		0.0446	0.0464	-3.9	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7594		0.0481	0.0480	0.3	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9560		0.0491	0.0500	-1.8	30.0
8:2FTS	AveID	1.349	1.380		0.400	0.0479	2.3	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.048		0.0539	0.0500	7.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	0.9473		0.400	0.0500	-6.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.5872		0.0422	0.0482	-12.5	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9778		0.0520	0.0500	4.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.9397		0.0563	0.0500	12.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.182		0.0566	0.0500	13.3	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.300		0.0568	0.0500	13.7	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2783		0.0551	0.0500	10.2	30.0
13C4 PFBA	Ave	1.528	1.350		2.21	2.50	-11.7	30.0
13C5 PFPeA	Ave	0.9798	0.9386		2.39	2.50	-4.2	30.0
13C3-PFBS	Ave	0.0221	0.0196		2.06	2.33	-11.6	30.0
13C2 PFHxA	Ave	1.045	1.023		2.45	2.50	-2.1	30.0
13C4-PFHpA	Ave	1.001	0.9885		2.47	2.50	-1.2	30.0
1802 PFHxS	Ave	1.237	1.153		2.20	2.37	-6.8	30.0
M2-6:2FTS	Ave	0.2210	0.2325		2.50	2.38	5.2	30.0

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCVL 320-225873/2 Calibration Date: 05/28/2018 17:22

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9417		2.49	2.50	-0.5	30.0
13C4 PFOS	Ave	0.8503	0.8013		2.25	2.39	-5.8	30.0
13C5 PFNA	Ave	0.7745	0.7749		2.50	2.50	0.0	30.0
13C8 FOSA	Ave	1.113	0.9836		2.21	2.50	-11.6	30.0
M2-8:2FTS	Ave	0.2515	0.2452		2.34	2.40	-2.5	30.0
13C2 PFDA	Ave	0.6587	0.6390		2.42	2.50	-3.0	30.0
d3-NMeFOSAA	Ave	0.3634	0.4219		2.90	2.50	16.1	30.0
13C2 PFUnA	Ave	0.5216	0.5307		2.54	2.50	1.7	30.0
d5-NEtFOSAA	Ave	0.3729	0.4045		2.71	2.50	8.5	30.0
13C2 PFDoA	Ave	0.5613	0.5296		2.36	2.50	-5.7	30.0
13C2-PFTeDA	Ave	0.6891	0.6803		2.47	2.50	-1.3	30.0
13C2-PFHxDA	Ave	1.170	1.257		2.69	2.50	7.5	30.0

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225873/3 Calibration Date: 05/28/2018 17:30

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: <u>GeminiC18 3x100</u> ID: <u>3.00(mm)</u> Calib End Date: <u>05/15/2018 16:39</u>

Lab File ID: 2018.05.28LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid	AveID	0.9298	0.9419		1.01	1.00	1.3	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.125		0.953	1.00	-4.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	78.42		0.888	0.884	0.4	30.0
4:2 FTS	AveID	16.57	18.56		1.05	0.934	12.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	0.997		0.970	1.00	-3.0	30.0
Perfluoropentanesulfonic acid	AveID	69.55	67.96		0.917	0.938	-2.3	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.039		0.984	1.00	-1.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.043		0.842	0.910	-7.4	30.0
6:2FTS	L2ID		1.647		0.879	0.948	-7.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.057		0.898	1.00	-10.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.295		0.926	0.952	-2.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.055		0.996	1.00	-0.4	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.048		0.827	0.928	-10.9	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7578		0.960	0.960	0.0	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9707		0.997	1.00	-0.3	30.0
8:2FTS	AveID	1.349	1.236		0.878	0.958	-8.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	0.9747		1.00	1.00	0.3	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.055		1.04	1.00	4.0	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.6091		0.874	0.964	-9.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9258		0.985	1.00	-1.5	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.7741		0.927	1.00	-7.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.077		1.03	1.00	3.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.288		1.13	1.00	12.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2313		0.916	1.00	-8.4	30.0
13C4 PFBA	Ave	1.528	1.413		2.31	2.50	-7.6	30.0
13C5 PFPeA	Ave	0.9798	0.9888		2.52	2.50	0.9	30.0
13C3-PFBS	Ave	0.0221	0.0206		2.16	2.33	-7.0	30.0
13C2 PFHxA	Ave	1.045	1.053		2.52	2.50	0.8	30.0
13C4-PFHpA	Ave	1.001	0.9608		2.40	2.50	-4.0	30.0
1802 PFHxS	Ave	1.237	1.167		2.23	2.37	-5.6	30.0
M2-6:2FTS	Ave	0.2210	0.2323		2.50	2.38	5.1	30.0

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225873/3 Calibration Date: 05/28/2018 17:30

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9838		2.60	2.50	3.9	30.0
13C4 PFOS	Ave	0.8503	0.8097		2.28	2.39	-4.8	30.0
13C5 PFNA	Ave	0.7745	0.8005		2.58	2.50	3.4	30.0
13C8 FOSA	Ave	1.113	1.014		2.28	2.50	-8.9	30.0
M2-8:2FTS	Ave	0.2515	0.2620		2.50	2.40	4.2	30.0
13C2 PFDA	Ave	0.6587	0.6601		2.51	2.50	0.2	30.0
d3-NMeFOSAA	Ave	0.3634	0.3955		2.72	2.50	8.8	30.0
d5-NEtFOSAA	Ave	0.3729	0.4156		2.79	2.50	11.4	30.0
13C2 PFUnA	Ave	0.5216	0.5467		2.62	2.50	4.8	30.0
13C2 PFDoA	Ave	0.5613	0.5482		2.44	2.50	-2.3	30.0
13C2-PFTeDA	Ave	0.6891	0.7248		2.63	2.50	5.2	30.0
13C2-PFHxDA	Ave	1.170	1.213		2.59	2.50	3.7	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
SDG No.:	
Instrument ID: A8_N	Start Date: 05/29/2018 00:01
Analysis Batch Number: 225884	End Date: 05/29/2018 02:06

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-225884/1		05/29/2018 00:01	1	2018.05.28LLA_0 55.d	GeminiC18 3x100 3 (mm)
320-38875-1 DL		05/29/2018 00:09	10	2018.05.28LLA_0 56.d	GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:17	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:25	5		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:33	5		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:40	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:48	100		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:04	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:12	20		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:19	20		GeminiC18 3x100 3(mm)
CCV 320-225884/11		05/29/2018 01:27	1	2018.05.28LLA_0 66.d	GeminiC18 3x100 3 (mm)
ZZZZZ		05/29/2018 01:35	20		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:43	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:51	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:58	1		GeminiC18 3x100 3(mm)
CCV 320-225884/16		05/29/2018 02:06	1		GeminiC18 3x100 3(mm)

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225884/1 Calibration Date: 05/29/2018 00:01

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: <u>GeminiC18 3x100</u> ID: <u>3.00(mm)</u> Calib End Date: <u>05/15/2018</u> 16:39

Lab File ID: 2018.05.28LLA_055.d Conc. Units: ng/mL

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ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9298	0.9565		1.03	1.00	2.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.147		0.971	1.00	-2.9	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	73.68		0.834	0.884	-5.6	30.0
4:2 FTS	AveID	16.57	19.15		1.08	0.934	15.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	0.9800		0.953	1.00	-4.7	30.0
Perfluoropentanesulfonic acid	AveID	69.55	69.76		0.941	0.938	0.3	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.049		0.993	1.00	-0.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.002		0.809	0.910	-11.1	30.0
6:2FTS	L2ID		1.642		0.877	0.948	-7.5	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.113		0.946	1.00	-5.4	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.308		0.935	0.952	-1.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	0.9645		0.911	1.00	-8.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.076		0.849	0.928	-8.5	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.009		1.04	1.00	3.7	30.0
8:2FTS	AveID	1.349	1.249		0.887	0.958	-7.4	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7708		0.977	0.960	1.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	0.9118		0.938	1.00	-6.2	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.034		1.02	1.00	1.9	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.6548		0.940	0.964	-2.5	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.8038		0.962	1.00	-3.8	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9143		0.973	1.00	-2.7	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.055		1.01	1.00	1.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.156		1.01	1.00	1.0	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2414		0.956	1.00	-4.4	30.0
13C4 PFBA	Ave	1.528	1.377		2.25	2.50	-9.9	30.0
13C5 PFPeA	Ave	0.9798	0.9409		2.40	2.50	-4.0	30.0
13C3-PFBS	Ave	0.0221	0.0203		2.13	2.33	-8.4	30.0
13C2 PFHxA	Ave	1.045	1.017		2.43	2.50	-2.7	30.0
13C4-PFHpA	Ave	1.001	0.9614		2.40	2.50	-4.0	30.0
1802 PFHxS	Ave	1.237	1.175		2.25	2.37	-5.0	30.0
M2-6:2FTS	Ave	0.2210	0.2395		2.57	2.38	8.4	30.0

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225884/1 Calibration Date: 05/29/2018 00:01

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_055.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9386		2.48	2.50	-0.9	30.0
13C4 PFOS	Ave	0.8503	0.7858		2.21	2.39	-7.6	30.0
13C5 PFNA	Ave	0.7745	0.8153		2.63	2.50	5.3	30.0
13C8 FOSA	Ave	1.113	0.9580		2.15	2.50	-13.9	30.0
M2-8:2FTS	Ave	0.2515	0.2458		2.34	2.40	-2.3	30.0
13C2 PFDA	Ave	0.6587	0.6764		2.57	2.50	2.7	30.0
d3-NMeFOSAA	Ave	0.3634	0.3927		2.70	2.50	8.1	30.0
d5-NEtFOSAA	Ave	0.3729	0.3996		2.68	2.50	7.2	30.0
13C2 PFUnA	Ave	0.5216	0.5328		2.55	2.50	2.1	30.0
13C2 PFDoA	Ave	0.5613	0.5535		2.47	2.50	-1.4	30.0
13C2-PFTeDA	Ave	0.6891	0.6894		2.50	2.50	0.0	30.0
13C2-PFHxDA	Ave	1.170	1.238		2.65	2.50	5.9	30.0

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225884/11 Calibration Date: 05/29/2018 01:27

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_066.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid	AveID	0.9298	0.9792		2.63	2.50	5.3	30.0
(PFBA) Perfluoropentanoic acid	AveID	1.181	1.153		2.44	2.50	-2.3	30.0
(PFPeA) Perfluorobutanesulfonic acid	AveID	78.09	81.38		2.30	2.21	4.2	30.0
(PFBS) 4:2 FTS	AveID	16.57	18.34		2.58	2.34	10.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.024		2.49	2.50	-0.4	30.0
Perfluoropentanesulfonic acid	AveID	69.55	72.75		2.45	2.35	4.6	30.0
Perfluoroheptanoic acid	AveID	1.056	1.058		2.50	2.50	0.2	30.0
(PFHpA) Perfluorohexanesulfonic acid	AveID	1.127	1.073		2.17	2.28	-4.8	30.0
(PFHxS) 6:2FTS	L2ID		1.644		2.21	2.37	-6.8	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.195		2.54	2.50	1.6	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.389		2.48	2.38	4.3	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.123		2.22	2.32	-4.5	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.047		2.47	2.50	-1.2	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.039		2.67	2.50	6.7	30.0
8:2FTS	AveID	1.349	1.235		2.19	2.40	-8.5	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.8107		2.57	2.40	7.0	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.096		2.82	2.50	12.7	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.009		2.49	2.50	-0.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.7001		2.51	2.41	4.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9396		2.50	2.50	-0.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.8391		2.51	2.50	0.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.056		2.53	2.50	1.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.171		2.56	2.50	2.4	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2391		2.37	2.50	-5.3	30.0
13C4 PFBA	Ave	1.528	1.376		2.25	2.50	-10.0	30.0
13C5 PFPeA	Ave	0.9798	0.9493		2.42	2.50	-3.1	30.0
13C3-PFBS	Ave	0.0221	0.0195		2.05	2.33	-12.0	30.0
13C2 PFHxA	Ave	1.045	1.004		2.40	2.50	-3.9	30.0
13C4-PFHpA	Ave	1.001	0.9637		2.41	2.50	-3.7	30.0
1802 PFHxS	Ave	1.237	1.140		2.18	2.37	-7.9	30.0
M2-6:2FTS	Ave	0.2210	0.2280		2.45	2.38	3.2	30.0

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225884/11 Calibration Date: 05/29/2018 01:27

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_066.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9013		2.38	2.50	-4.8	30.0
13C4 PFOS	Ave	0.8503	0.7672		2.16	2.39	-9.8	30.0
13C5 PFNA	Ave	0.7745	0.7702		2.49	2.50	-0.5	30.0
13C8 FOSA	Ave	1.113	0.9678		2.17	2.50	-13.0	30.0
M2-8:2FTS	Ave	0.2515	0.2453		2.34	2.40	-2.5	30.0
13C2 PFDA	Ave	0.6587	0.6107		2.32	2.50	-7.3	30.0
d3-NMeFOSAA	Ave	0.3634	0.3927		2.70	2.50	8.1	30.0
13C2 PFUnA	Ave	0.5216	0.5033		2.41	2.50	-3.5	30.0
d5-NEtFOSAA	Ave	0.3729	0.3922		2.63	2.50	5.2	30.0
13C2 PFDoA	Ave	0.5613	0.5486		2.44	2.50	-2.3	30.0
13C2-PFTeDA	Ave	0.6891	0.6997		2.54	2.50	1.5	30.0
13C2-PFHxDA	Ave	1.170	1.218		2.60	2.50	4.1	30.0

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
SDG No.:	
Client Sample ID:	Lab Sample ID: <u>ICB 320-223413/12</u>
Matrix: Water	Lab File ID: 2018.05.15LLCC_ICAL_009.d
Analysis Method: EPA 537 (Mod)	Date Collected:
Extraction Method:	Date Extracted:
Sample wt/vol: 1(mL)	Date Analyzed: 05/15/2018 17:15
Con. Extract Vol.:	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup:(Y/N) N
Analysis Batch No.: 223413	Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U M	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U M	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U M	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.040	U	0.050	0.040	0.0073
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00611	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

Lab Name: TestAmerica Sacramento	Job No.: <u>320-38875-1</u>
SDG No.:	
Client Sample ID:	Lab Sample ID: ICB 320-223413/12
Matrix: Water	Lab File ID: 2018.05.15LLCC_ICAL_009.d
Analysis Method: EPA 537 (Mod)	Date Collected:
Extraction Method:	Date Extracted:
Sample wt/vol: 1(mL)	Date Analyzed: 05/15/2018 17:15
Con. Extract Vol.:	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup:(Y/N) N
Analysis Batch No.: 223413	Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	99		50-150
STL00992	13C4 PFBA	93		50-150
STL01893	13C5 PFPeA	97		50-150
STL00993	13C2 PFHxA	97		50-150
STL01892	13C4-PFHpA	99		50-150
STL00990	13C4 PFOA	97		50-150
STL00995	13C5 PFNA	96		50-150
STL00996	13C2 PFDA	98		50-150
STL00997	13C2 PFUnA	101		50-150
STL00998	13C2 PFDoA	98		50-150
STL00994	1802 PFHxS	99		50-150
STL02116	13C2-PFTeDA	102		50-150
STL00991	13C4 PFOS	95		50-150
STL02337	13C3-PFBS	93		50-150

Lab Name: TestAmerica Sacramento	Job No.: <u>320-38875-1</u>
SDG No.:	
Client Sample ID:	Lab Sample ID: CCB 320-225818/1
Matrix: Water	Lab File ID: 2018.05.27LLADX_001.d
Analysis Method: EPA 537 (Mod)	Date Collected:
Extraction Method:	Date Extracted:
Sample wt/vol: 1(mL)	Date Analyzed: 05/28/2018 07:00
Con. Extract Vol.:	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup: (Y/N) N
Analysis Batch No.: 225818	Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	Ū	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	Ū	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	Ū	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U M	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U M	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	Ū	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	Ū	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.040	Ū	0.050	0.040	0.0073
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00664	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	Ū	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	Ū	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	Ū	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	Ū	0.050	0.040	0.0088

Lab Name: TestAmerica Sacramento	Job No.: <u>320-38875-1</u>
SDG No.:	
Client Sample ID:	Lab Sample ID: CCB 320-225818/1
Matrix: Water	Lab File ID: 2018.05.27LLADX_001.d
Analysis Method: EPA 537 (Mod)	Date Collected:
Extraction Method:	Date Extracted:
Sample wt/vol: 1(mL)	Date Analyzed: 05/28/2018 07:00
Con. Extract Vol.:	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup:(Y/N) N
Analysis Batch No.: 225818	Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	87		50-150
STL00992	13C4 PFBA	90		50-150
STL01893	13C5 PFPeA	98		50-150
STL00993	13C2 PFHxA	95		50-150
STL01892	13C4-PFHpA	96		50-150
STL00990	13C4 PFOA	101		50-150
STL00995	13C5 PFNA	100		50-150
STL00996	13C2 PFDA	98		50-150
STL00997	13C2 PFUnA	97		50-150
STL00998	13C2 PFDoA	97		50-150
STL00994	1802 PFHxS	92		50-150
STL02116	13C2-PFTeDA	99		50-150
STL00991	13C4 PFOS	92		50-150
STL02337	13C3-PFBS	92		50-150

Lab Name: TestAmerica Sacramento	Job No.: <u>320-38875-1</u>
SDG No.:	
Client Sample ID:	Lab Sample ID: CCB 320-225873/1
Matrix: Water	Lab File ID: 2018.05.28LLA_003.d
Analysis Method: EPA 537 (Mod)	Date Collected:
Extraction Method:	Date Extracted:
Sample wt/vol: 1(mL)	Date Analyzed: 05/28/2018 17:14
Con. Extract Vol.:	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup:(Y/N) N
Analysis Batch No.: 225873	Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	Ū	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U M	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.040	U	0.050	0.040	0.0073
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00671	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	Ū	0.050	0.040	0.0088

Lab Name: TestAmerica Sacramento	Job No.: 320-38875-1
SDG No.:	
Client Sample ID:	Lab Sample ID: <u>CCB 320-225873/1</u>
Matrix: Water	Lab File ID: 2018.05.28LLA_003.d
Analysis Method: EPA 537 (Mod)	Date Collected:
Extraction Method:	Date Extracted:
Sample wt/vol: 1(mL)	Date Analyzed: 05/28/2018 17:14
Con. Extract Vol.:	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup: (Y/N) N
Analysis Batch No.: 225873	Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	91		50-150
STL00992	13C4 PFBA	92		50-150
STL01893	13C5 PFPeA	102		50-150
STL00993	13C2 PFHxA	98		50-150
STL01892	13C4-PFHpA	99		50-150
STL00990	13C4 PFOA	104		50-150
STL00995	13C5 PFNA	104		50-150
STL00996	13C2 PFDA	102		50-150
STL00997	13C2 PFUnA	103		50-150
STL00998	13C2 PFDoA	105		50-150
STL00994	1802 PFHxS	98		50-150
STL02116	13C2-PFTeDA	101		50-150
STL00991	13C4 PFOS	95		50-150
STL02337	13C3-PFBS	89		50-150

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Batch Number: 223615 Batch Start Date: 05/16/18 14:50 Batch Analyst: Epstein, Anya M

Batch Method: 3535 Batch End Date: 05/17/18 18:00

200011 1100110u.					00/2//20 2				
Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00065	LCPFC-IS 00050
MB 320-223615/1		3535, EPA 537 (Mod)				250 mL	10 mL	500 uL	500 uL
LCS 320-223615/2		3535, EPA 537 (Mod)				250 mL	10 mL	500 uL	500 uL
320-38875-A-1	TP-PFC-029-TPI	3535, EPA 537 (Mod)	Т	319.27 g	28.82 g	290.5 mL	10 mL	500 uL	500 uL
320-38875-A-2	TP-PFC-029-MIDCA RBON	3535, EPA 537 (Mod)	T	321.32 g	28.50 g	292.8 mL	10 mL	500 uL	500 uL
320-38875-A-3	TP-PFC-029-TPE	3535, EPA 537 (Mod)	T	302.29 g	29.37 g	272.9 mL	10 mL	500 uL	500 uL
320-38875-A-4	TP-PFC-029-TPE-D	3535, EPA 537 (Mod)	Т	292.05 g	27.82 g	264.2 mL	10 mL	500 uL	500 uL
Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00144					
MB 320-223615/1		3535, EPA 537 (Mod)							
		0505		E 0 0 -					

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00144			
MB 320-223615/1		3535, EPA					
		537 (Mod)					
LCS		3535, EPA		500 uL			
320-223615/2		537 (Mod)					
320-38875-A-1	TP-PFC-029-TPI	3535, EPA	Т				
		537 (Mod)					
320-38875-A-2	TP-PFC-029-MIDCA	3535, EPA	Т				
	RBON	537 (Mod)					
320-38875-A-3	TP-PFC-029-TPE	3535, EPA	Т				
		537 (Mod)					
320-38875-A-4	TP-PFC-029-TPE-D	3535, EPA	Т				
		537 (Mod)					

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.: 320-38875-1

SDG No.:

Batch Number: 223615 Batch Start Date: 05/16/18 14:50 Batch Analyst: Epstein, Anya M

Batch Method: 3535 Batch End Date: 05/17/18 18:00

Batch Notes						
Analyst ID - Aliquot Step	VPM					
Balance ID	QA-078					
Batch Comment	Sample labels match client IDs: AME. Envi-Carb: 97225.					
Analyst ID - Final Volume Step	AME -Water/VPM					
H2O ID	5/14/18					
Hexane ID	1242583					
Internal Standard ID#	1245322					
Manifold ID	10, 21					
Methanol ID	1236570					
Sodium Hydroxide ID	1241145					
Pipette ID	I46345G					
Analyst ID - Reagent Drop	TWL					
Analyst ID - IS Reagent Drop	VPM					
Analyst ID - IS Reagent Drop Witness	ER					
Analyst ID - SU Reagent Drop	TWL					
Analyst ID - SU Reagent Drop Witness	KMK					
Solvent Lot #	1237547					
Solvent Name	0.3% NH4OH/MeOH					
SOP Number	WS-LC-0025					
SPE Cartridge Type	WAX 500mg					
Solid Phase Extraction Disk ID	003337157A					

Basis	Basis Description
Т	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.



Test America – Sacramento Sample Dilution Record

Method ID_PFC-1DA	
Analyst (Print Name) Awari Rayce	Reagent ID <u>LC-80:20_00005</u>
Date 5/28/18	

	<u>Job #</u>	Sample #	Original F.V.	Aliquot (uL)	Dilution F.V.	Dilution Factor
~			(uL)		(uL)	PHENOE A RECOI
8	320-38871	<u> </u>	10,000	60	380	5x
14	777			IS		20x
•	320-39043	8		30		3,01
29	480-135867)		60		5χ
18	320-38935	3				6X
				4		<u> </u>
		13		15		20x
ł		13MS				
ŀ		13 MSD		↓		
}		14		60		6X
}		15				
H		16				
, a	20 a 10075	24				
12	320-38875			30		iox
-	320-38935	18		60		Sx
	700-70075	<u> </u>			V	- L
F	320-38935	30		LS	ISOO	100 X
-		31	_	30	300	10×
F		32		is		20x
\vdash		37 MS		_		
-		32M5D		A	V	
<u>_</u>			GOLD 5/281	18		

Comments:			
	 	 	

DODCMD_ID	INSTALLATION_ID SDG	SITE_NAME NORM_SITE_NAME	LOCATION_NAME	LOCATION_TYPE_DESC	COORD_X (COORD_Y	CONTRACT_ID	DO_CTO_NUMBER	CONTR_NAME	SAMPLE_NAME	SAMPLE_MATRIX_DESC	SAMPLE_TYPE_DESC	COLLECT_DATE	ANALYTICAL_METHOD	ANALYTICAL_METHOD_GRP_DESC
MID_ATLANTIC	BRUNSWICK_NAS 320-3887	75-1 SITE 00011 SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D900	08 WE21	TETRA TECH, INC.	TP-PFC-029-TPE	Ground water	Normal (Regular)	3-May-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS 320-3887	75-1 SITE 00011 SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D900	08 WE21	TETRA TECH, INC.	TP-PFC-029-TPE-D	Ground water	Field duplicate	3-May-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS 320-3887	75-1 SITE 00011 SITE 00011	TP-PFC-INFLUENT	Monitoring well	3015831.52	384866.155	N6247016D900	08 WE21	TETRA TECH, INC.	TP-PFC-029-TPI	Ground water	Normal (Regular)	3-May-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS 320-3887	75-1 SITE 00011 SITE 00011	TP-PFC-MIDPOINT	Monitoring well	3015831.52	384866.155	N6247016D900	08 WE21	TETRA TECH, INC.	TP-PFC-029-MIDCARBON	Ground water	Normal (Regular)	3-May-18	537	Perfluoroalkyl Compounds