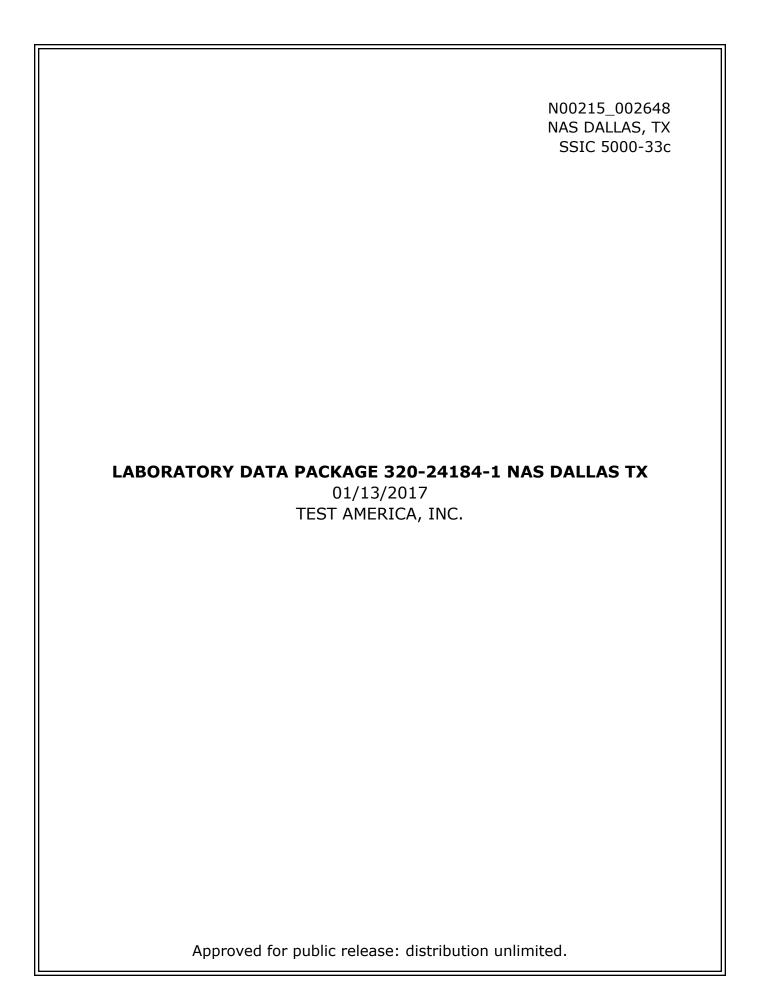


Groundwater Sample Results,
Combined Level 2 and Level 4 Laboratory Report,
and the Sample Location Report, SDG 320-24184-1

Naval Air Station Dallas Dallas, Texas

July 2019





ANALYTICAL REPORT

Job Number: 320-24184-1

Job Description: PFAS, NAS Dallas

For: EnSafe, Inc. 4545 Fuller Drive Suite 342 Irving, TX 75038

Attention: Thomas Wiberg

Approved for release David R Alltucker Project Manager I 1/13/2017 12:33 PM

Designee for
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01/13/2017



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Definitions/Glossary

Toxicity Equivalent Quotient (Dioxin)

Client: EnSafe, Inc.

TestAmerica Job ID: 320-24184-1

Project/Site: PFAS, NAS Dallas

Qualifiers

LCMS

Qualifier	Qualifier Description
Q	One or more quality control criteria failed.
E	Result exceeded calibration range.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.
В	Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
D	The reported value is from a dilution.
Н	Sample was prepped or analyzed beyond the specified holding time

Glossary

TEQ

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

CASE NARRATIVE

Client: EnSafe, Inc.

Project: PFAS, NAS Dallas

Report Number: 320-24184-1

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

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

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

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

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

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

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

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

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

RECEIPT

The samples were received on 12/08/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 3.4 C.

PFAS

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.

The continuing calibration verification (CCV) associated with batch 320-144253 recovered above the upper control limit for Perfluorooctanesulfonic acid (PFOS). The sample FSS3TMW-1216 (320-24184-3) associated with this CCV was greater than the calibration range. The sample was analyzed at a dilution and reported from a analytical batch 320-145022.

Perfluorohexanesulfonic acid (PFHxS) and Perfluorooctanoic acid (PFOA) were detected in method blank MB 320-142967/1-A at levels that were above the method detection limit but below ½ the reporting limit. The values should be considered estimates, and have been flagged.

The method blank for preparation batch 320-142967 and analytical batch 320-144253 contained Perfluorohexanoic acid (PFHxA) above half the reporting limit (1/2RL). Any samples that were either greater than 10X the value found in the method blank or not detected were reported with no further corrective action. Any sample with a detection less than 10x the level found in the method blank were re-extracted outside of holding time and both sets of data reported..

The Isotope Dilution Analyte (IDA) recoveries for several analytes in the following samples is below the method recommended limit: 308A51MW-LF-1216 (320-24184-1), SWMU1-01-1216 (320-24184-2), FSS3TMW-1216 (320-24184-3), and SWMU1-02-1216 (320-24184-4). 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 samples.

The following samples were diluted to bring the concentration of target analytes within the calibration range: 308A51MW-LF-1216 (320-24184-1), FSS3TMW-1216 (320-24184-3), and SWMU1-02-1216 (320-24184-4. Elevated reporting limits (RLs) are provided.

The following samples (FSS3TMW-1216 (320-24184-3)) required complex dilutions in order for the target analyte concentrations to be within the calibration range. Due to software limitations the complex dilution samples will have a dilution factor of 1.0 in the dilution factor field and a DL2 suffix. The complex dilution factors are as follows. FSS3TMW-1216 (320-24184-3) - 2000X dilution

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

Organic Prep

The following sample was a cloudy white color after adding the methanol and water for the final volume. 308A51MW-LF-1216 (320-24184-1)

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 320-144971.

The following sample was re-prepared outside of preparation holding time because the Method Blank was above 1/2 the reporting limit for PFHxA:SWMU1-01-1216 (320-24184-2) and SWMU1-02-1216 (320-24184-4).

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

Detection Summary

Client: EnSafe, Inc.

Project/Site: PFAS, NAS Dallas

TestAmerica Job ID: 320-24184-1

Client Sample ID: 308A51MW-LF-1216

Lab Sample ID: 320-24184-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.9	E	0.0023	0.00042	ug/L		537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	1.6	E	0.0023	0.00091	ug/L	1	537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	1.4	ΕB	0.0023	0.00073	ug/L	1	537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.3	E	0.0023	0.00074	ug/L	1	537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.6	EM	0.0023	0.00069	ug/L	1	537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.13		0.0023	0.00060	ug/L	1	537 (Modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.0027		0.0023	0.00041	ug/L	1	537 (Modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.00047	J	0.0023	0.00037	ug/L	1	537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.6	EM	0.0023	0.00085	ug/L	1	537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	4.9	Ε	0.0023	0.00080	ug/L	1	537 (Modified)	Total/NA
Perfluorooctane Sulfonamide (FOSA)	0.0021	J	0.0023	0.00059	ug/L	1	537 (Modified)	Total/NA
Perfluorobutanoic acid (PFBA) - DL	5.3	D	0.12	0.021	ug/L	50	537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA) - DL	9.1	D	0.12	0.046	ug/L	50	537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	11	DB	0.12	0.036	ug/L	50	537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	4.3	D	0.12	0.037	ug/L	50	537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	2.6	DM	0.12	0.035	ug/L	50	537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA) - DL	0.13	D	0.12	0.030	ug/L	50	537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) -	4.3	D	0.12	0.042	ug/L	50	537 (Modified)	Total/NA
DL Perfluorohexanesulfonic acid (PFHxS) - DL	17	D	0.12	0.040	ug/L	50	537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	11	D	0.18	0.059	ug/L	50	537 (Modified)	Total/NA

Client Sample ID: SWMU1-01-1216

Lab Sample ID: 320-24184-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac I	Method	Prep Type
Perfluorobutanoic acid (PFBA)	0.020	M	0.0025	0.00045	ug/L		537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	0.0039	M	0.0025	0.00098	ug/L	1	537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	0.0057	В	0.0025	0.00078	ug/L	1	537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.0028		0.0025	0.00074	ug/L	1	537 (Modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.0011	J	0.0025	0.00039	ug/L	1	537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.00092	J	0.0025	0.00091	ug/L	1	537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.0034		0.0025	0.00086	ug/L	1	537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - RE	0.0057	Н	0.0024	0.00074	ug/L	1	537 (Modified)	Total/NA

Client Sample ID: FSS3TMW-1216

Lab Sample ID: 320-24184-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	1.6	E	0.0022	0.00041	ug/L		_	537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	1.4	E	0.0022	0.00088	ug/L	1		537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	3.4	ΕB	0.0022	0.00070	ug/L	1		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.2	E	0.0022	0.00071	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	6.9	E	0.0022	0.00067	ug/L	1		537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.19		0.0022	0.00058	ug/L	1		537 (Modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.067		0.0022	0.00039	ug/L	1		537 (Modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.0021	J	0.0022	0.00067	ug/L	1		537 (Modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.00042	J	0.0022	0.00036	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	4.4	EM	0.0022	0.00082	ug/L	1		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	9.6	E	0.0022	0.00077	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	21	EQ	0.0036	0.0011	ug/L	1		537 (Modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: EnSafe, Inc.

Project/Site: PFAS, NAS Dallas

TestAmerica Job ID: 320-24184-1

Client Sample ID: FSS3TMW-1216 (Continued)

Lab Sample	ID: 320-24184-3
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Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorodecanesulfonic acid (PFDS)	0.51	E	0.0036	0.0011	ug/L	1	_	537 (Modified)	Total/NA
Perfluorooctane Sulfonamide (FOSA)	0.61	E	0.0022	0.00057	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanoic acid (PFBA) - DL	8.6	D	0.45	0.082	ug/L	200		537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA) - DL	12	D	0.45	0.18	ug/L	200		537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	38	DB	0.45	0.14	ug/L	200		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	4.0	D	0.45	0.14	ug/L	200		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	13	DM	0.45	0.13	ug/L	200		537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA) - DL	0.16	JD	0.45	0.12	ug/L	200		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	19	D	0.45	0.16	ug/L	200		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	61	D	0.45	0.15	ug/L	200		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	260	E D	0.71	0.23	ug/L	200		537 (Modified)	Total/NA
Perfluorooctane Sulfonamide (FOSA) - DL	0.63	D	0.45	0.11	ug/L	200		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL2	300		7.1	2.3	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: SWMU1-02-1216

Lab Sample ID: 320-24184-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	0.016	M	0.0022	0.00041	ug/L		537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	0.0049	M	0.0022	0.00088	ug/L	1	537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	0.012	В	0.0022	0.00070	ug/L	1	537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.00081	J	0.0022	0.00072	ug/L	1	537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.0047	M	0.0022	0.00067	ug/L	1	537 (Modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.00072	J	0.0022	0.00039	ug/L	1	537 (Modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.00044	J	0.0022	0.00036	ug/L	1	537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.010		0.0022	0.00082	ug/L	1	537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.033	M	0.0022	0.00078	ug/L	1	537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.99	E	0.0036	0.0011	ug/L	1	537 (Modified)	Total/NA
Perfluorodecanesulfonic acid (PFDS)	0.0064		0.0036	0.0011	ug/L	1	537 (Modified)	Total/NA
Perfluorooctane Sulfonamide (FOSA)	0.018		0.0022	0.00057	ug/L	1	537 (Modified)	Total/NA
Perfluorobutanoic acid (PFBA) - DL	0.016	JDM	0.022	0.0041	ug/L	10	537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	0.011	JDB	0.022	0.0070	ug/L	10	537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	0.0095	JD	0.022	0.0082	•	10	537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	0.030	D	0.022	0.0078	ug/L	10	537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	1.2	D	0.036	0.011	ug/L	10	537 (Modified)	Total/NA
Perfluorooctane Sulfonamide (FOSA) - DL	0.017	JD	0.022	0.0057	ug/L	10	537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - RE	0.0081	НМ	0.0023	0.00072	ug/L	1	537 (Modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client: EnSafe, Inc.

TestAmerica Job ID: 320-24184-1

Project/Site: PFAS, NAS Dallas

Date Collected: 12/07/16 13:40

Date Received: 12/08/16 10:00

Matrix: Water

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fa
Perfluorobutanoic acid (PFBA)	2.9	E	0.0023	0.00042	ug/L		12/19/16 14:38	12/29/16 00:52	
Perfluoropentanoic acid (PFPeA)	1.6	E	0.0023	0.00091	ug/L		12/19/16 14:38	12/29/16 00:52	
Perfluorohexanoic acid (PFHxA)	1.4	EB	0.0023	0.00073	ug/L		12/19/16 14:38	12/29/16 00:52	
Perfluoroheptanoic acid (PFHpA)	2.3	E	0.0023	0.00074	ug/L		12/19/16 14:38	12/29/16 00:52	
Perfluorooctanoic acid (PFOA)	1.6	EM	0.0023	0.00069	ug/L		12/19/16 14:38	12/29/16 00:52	
Perfluorononanoic acid (PFNA)	0.13		0.0023	0.00060	ug/L		12/19/16 14:38	12/29/16 00:52	
Perfluorodecanoic acid (PFDA)	0.0027		0.0023	0.00041	ug/L		12/19/16 14:38	12/29/16 00:52	
Perfluoroundecanoic acid (PFUnA)	0.0018	U	0.0023	0.00069	ug/L		12/19/16 14:38	12/29/16 00:52	
Perfluorododecanoic acid (PFDoA)	0.0018	U	0.0023	0.00054	ug/L		12/19/16 14:38	12/29/16 00:52	
Perfluorotridecanoic Acid (PFTriA)	0.0018	U	0.0023	0.00051	ug/L		12/19/16 14:38	12/29/16 00:52	
Perfluorotetradecanoic acid (PFTeA)	0.00047	J	0.0023	0.00037	ug/L		12/19/16 14:38	12/29/16 00:52	
Perfluorobutanesulfonic acid (PFBS)	1.6	EM	0.0023	0.00085				12/29/16 00:52	
Perfluorohexanesulfonic acid (PFHxS)	4.9		0.0023	0.00080				12/29/16 00:52	
Perfluorodecanesulfonic acid (PFDS)	0.0028	U	0.0037	0.0011	•			12/29/16 00:52	
Perfluorooctane Sulfonamide (FOSA)	0.0021	J	0.0023	0.00059	ug/L		12/19/16 14:38	12/29/16 00:52	
Isotope Dilution	%Recovery		Limits				Prepared	Analyzed	Dil Fa
13C8 FOSA	10		25 - 150					12/29/16 00:52	
13C4 PFBA		-•	25 - 150					12/29/16 00:52	
13C5-PFPeA	24	Q	25 - 150				12/19/16 14:38	12/29/16 00:52	
13C2 PFHxA	31		25 - 150				12/19/16 14:38	12/29/16 00:52	
13C4-PFHpA	23	Q	25 - 150				12/19/16 14:38	12/29/16 00:52	
13C4 PFOA	49		25 - 150				12/19/16 14:38	12/29/16 00:52	
13C5 PFNA	39		25 - 150				12/19/16 14:38	12/29/16 00:52	
13C2 PFDA	117		25 - 150				12/19/16 14:38	12/29/16 00:52	
13C2 PFUnA	121		25 - 150				12/19/16 14:38	12/29/16 00:52	
13C2 PFDoA	110		25 - 150				12/19/16 14:38	12/29/16 00:52	
1802 PFHxS	20	Q	25 - 150				12/19/16 14:38	12/29/16 00:52	
13C4 PFOS	38		25 - 150				12/19/16 14:38	12/29/16 00:52	
Method: 537 (Modified) - Perflu	uorinated H	lydrocarbo	ons - DL						
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil F
Perfluorobutanoic acid (PFBA)	5.3	D	0.12	0.021	ug/L		12/19/16 14:38	12/30/16 13:33	
Perfluoropentanoic acid (PFPeA)	9.1	D	0.12	0.046	ug/L		12/19/16 14:38	12/30/16 13:33	į
Perfluorohexanoic acid (PFHxA)	11	DB	0.12	0.036	ug/L		12/19/16 14:38	12/30/16 13:33	į
Perfluoroheptanoic acid (PFHpA)	4.3	D	0.12	0.037	ug/L		12/19/16 14:38	12/30/16 13:33	
Perfluorooctanoic acid (PFOA)	2.6	D M	0.12	0.035	ug/L		12/19/16 14:38	12/30/16 13:33	į
Perfluorononanoic acid (PFNA)	0.13	D	0.12	0.030	ug/L		12/19/16 14:38	12/30/16 13:33	Ę
Perfluorodecanoic acid (PFDA)	0.046		0.12	0.020	ug/L		12/19/16 14:38	12/30/16 13:33	
Perfluoroundecanoic acid (PFUnA)	0.092	U	0.12	0.035	ug/L		12/19/16 14:38	12/30/16 13:33	į
Perfluorododecanoic acid (PFDoA)	0.092	U	0.12	0.027	ug/L		12/19/16 14:38	12/30/16 13:33	į
Perfluorotridecanoic Acid (PFTriA)	0.092		0.12	0.025	ug/L		12/19/16 14:38	12/30/16 13:33	
Perfluorotetradecanoic acid (PFTeA)	0.046		0.12	0.018	ug/L		12/19/16 14:38	12/30/16 13:33	!
Perfluorobutanesulfonic acid	4.3	D	0.12	0.042	-			12/30/16 13:33	
Perfluorohexanesulfonic acid (PFHxS)	17	D	0.12	0.040	ug/L		12/19/16 14:38	12/30/16 13:33	

Client: EnSafe, Inc.

TestAmerica Job ID: 320-24184-1

Project/Site: PFAS, NAS Dallas

Date Collected: 12/07/16 13:40 Matrix: Water

Date Received: 12/08/16 10:00

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	11	D	0.18	0.059	ug/L		12/19/16 14:38	12/30/16 13:33	50
Perfluorodecanesulfonic acid (PFDS)	0.14	U	0.18	0.056	ug/L		12/19/16 14:38	12/30/16 13:33	50
Perfluorooctane Sulfonamide (FOSA)	0.092	U	0.12	0.029	ug/L		12/19/16 14:38	12/30/16 13:33	50
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	11	Q	25 - 150				12/19/16 14:38	12/30/16 13:33	50
13C4 PFBA	117		25 - 150				12/19/16 14:38	12/30/16 13:33	50
13C5-PFPeA	130		25 - 150				12/19/16 14:38	12/30/16 13:33	50
13C2 PFHxA	118		25 - 150				12/19/16 14:38	12/30/16 13:33	50
13C4-PFHpA	98		25 - 150				12/19/16 14:38	12/30/16 13:33	50
13C4 PFOA	140		25 - 150				12/19/16 14:38	12/30/16 13:33	50
13C5 PFNA	120		25 - 150				12/19/16 14:38	12/30/16 13:33	50
13C2 PFDA	122		25 - 150				12/19/16 14:38	12/30/16 13:33	50
13C2 PFUnA	124		25 - 150				12/19/16 14:38	12/30/16 13:33	50
13C2 PFDoA	126		25 - 150				12/19/16 14:38	12/30/16 13:33	50
1802 PFHxS	112		25 - 150				12/19/16 14:38	12/30/16 13:33	50
13C4 PFOS	125		25 - 150				12/19/16 14:38	12/30/16 13:33	50

Client Sample ID: SWMU1-01-1216 Lab Sample ID: 320-24184-2

Date Collected: 12/07/16 14:45 Matrix: Water Date Received: 12/08/16 10:00

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.020	M	0.0025	0.00045	ug/L		12/19/16 14:38	12/30/16 13:41	1
Perfluoropentanoic acid (PFPeA)	0.0039	M	0.0025	0.00098	ug/L		12/19/16 14:38	12/30/16 13:41	1
Perfluorohexanoic acid (PFHxA)	0.0057	В	0.0025	0.00078	ug/L		12/19/16 14:38	12/30/16 13:41	1
Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.00079	ug/L		12/19/16 14:38	12/30/16 13:41	1
Perfluorooctanoic acid (PFOA)	0.0028		0.0025	0.00074	ug/L		12/19/16 14:38	12/30/16 13:41	1
Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.00064	ug/L		12/19/16 14:38	12/30/16 13:41	1
Perfluorodecanoic acid (PFDA)	0.00099	U	0.0025	0.00043	ug/L		12/19/16 14:38	12/30/16 13:41	1
Perfluoroundecanoic acid (PFUnA)	0.0020	U	0.0025	0.00074	ug/L		12/19/16 14:38	12/30/16 13:41	1
Perfluorododecanoic acid (PFDoA)	0.0020	U	0.0025	0.00058	ug/L		12/19/16 14:38	12/30/16 13:41	1
Perfluorotridecanoic Acid (PFTriA)	0.0020	U	0.0025	0.00054	ug/L		12/19/16 14:38	12/30/16 13:41	1
Perfluorotetradecanoic acid (PFTeA)	0.0011	J	0.0025	0.00039	ug/L		12/19/16 14:38	12/30/16 13:41	1
Perfluorobutanesulfonic acid (PFBS)	0.00092	J	0.0025	0.00091	ug/L		12/19/16 14:38	12/30/16 13:41	1
Perfluorohexanesulfonic acid (PFHxS)	0.0034		0.0025	0.00086	ug/L		12/19/16 14:38	12/30/16 13:41	1
Perfluorooctanesulfonic acid (PFOS)	0.0030	U	0.0039	0.0013	ug/L		12/19/16 14:38	12/30/16 13:41	1
Perfluorodecanesulfonic acid (PFDS)	0.0030	U	0.0039	0.0012	ug/L		12/19/16 14:38	12/30/16 13:41	1
Perfluorooctane Sulfonamide (FOSA)	0.0020	U	0.0025	0.00063	ug/L		12/19/16 14:38	12/30/16 13:41	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	7	Q	25 - 150				12/19/16 14:38	12/30/16 13:41	1
13C4 PFBA	37		25 - 150				12/19/16 14:38	12/30/16 13:41	1
13C5-PFPeA	93		25 - 150				12/19/16 14:38	12/30/16 13:41	1
13C2 PFHxA	113		25 - 150				12/19/16 14:38	12/30/16 13:41	1
13C4-PFHpA	106		25 - 150				12/19/16 14:38	12/30/16 13:41	1
13C4 PFOA	100		25 - 150				12/19/16 14:38	12/30/16 13:41	1

Client: EnSafe, Inc.

TestAmerica Job ID: 320-24184-1

Project/Site: PFAS, NAS Dallas

Date Collected: 12/07/16 14:45 Matrix: Water

Date Received: 12/08/16 10:00

Method: 537 (Modified) -	Perfluorinated Hydrocarb	ons (Continued)			
Isotope Dilution	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFNA	95	25 - 150	12/19/16 14:38	12/30/16 13:41	1
13C2 PFDA	96	25 - 150	12/19/16 14:38	12/30/16 13:41	1
13C2 PFUnA	103	25 - 150	12/19/16 14:38	12/30/16 13:41	1
13C2 PFDoA	104	25 - 150	12/19/16 14:38	12/30/16 13:41	1
1802 PFHxS	118	25 - 150	12/19/16 14:38	12/30/16 13:41	1
13C4 PFOS	116	25 - 150	12/19/16 14:38	12/30/16 13:41	1

Method: 537 (Modified) - Perfl	uorinated H	ydrocarbo	ns - RE						
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.0057	Н	0.0024	0.00074	ug/L	 _	01/04/17 16:57	01/05/17 15:38	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	116		25 - 150				01/04/17 16:57	01/05/17 15:38	1

Client Sample ID: FSS3TMW-1216 Lab Sample ID: 320-24184-3

Date Collected: 12/07/16 08:55

Date Received: 12/08/16 10:00

Matrix: Water

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.6	E	0.0022	0.00041	ug/L		12/19/16 14:38	12/29/16 01:07	1
Perfluoropentanoic acid (PFPeA)	1.4	E	0.0022	0.00088	ug/L		12/19/16 14:38	12/29/16 01:07	1
Perfluorohexanoic acid (PFHxA)	3.4	EB	0.0022	0.00070	ug/L		12/19/16 14:38	12/29/16 01:07	1
Perfluoroheptanoic acid (PFHpA)	3.2	E	0.0022	0.00071	ug/L		12/19/16 14:38	12/29/16 01:07	1
Perfluorooctanoic acid (PFOA)	6.9	E	0.0022	0.00067	ug/L		12/19/16 14:38	12/29/16 01:07	1
Perfluorononanoic acid (PFNA)	0.19		0.0022	0.00058	ug/L		12/19/16 14:38	12/29/16 01:07	1
Perfluorodecanoic acid (PFDA)	0.067		0.0022	0.00039	ug/L		12/19/16 14:38	12/29/16 01:07	1
Perfluoroundecanoic acid (PFUnA)	0.0021	J	0.0022	0.00067	ug/L		12/19/16 14:38	12/29/16 01:07	1
Perfluorododecanoic acid (PFDoA)	0.0018	U	0.0022	0.00052	ug/L		12/19/16 14:38	12/29/16 01:07	1
Perfluorotridecanoic Acid (PFTriA)	0.0018	U	0.0022	0.00049	ug/L		12/19/16 14:38	12/29/16 01:07	1
Perfluorotetradecanoic acid (PFTeA)	0.00042	J	0.0022	0.00036	ug/L		12/19/16 14:38	12/29/16 01:07	1
Perfluorobutanesulfonic acid (PFBS)	4.4	E M	0.0022	0.00082	ug/L		12/19/16 14:38	12/29/16 01:07	1
Perfluorohexanesulfonic acid (PFHxS)	9.6	E	0.0022	0.00077	ug/L		12/19/16 14:38	12/29/16 01:07	1
Perfluorooctanesulfonic acid (PFOS)	21	E Q	0.0036	0.0011	ug/L		12/19/16 14:38	12/29/16 01:07	1
Perfluorodecanesulfonic acid (PFDS)	0.51	E	0.0036	0.0011	ug/L		12/19/16 14:38	12/29/16 01:07	1
Perfluorooctane Sulfonamide (FOSA)	0.61	E	0.0022	0.00057	ug/L		12/19/16 14:38	12/29/16 01:07	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	32		25 - 150				12/19/16 14:38	12/29/16 01:07	1
13C4 PFBA	25		25 - 150				12/19/16 14:38	12/29/16 01:07	1
13C5-PFPeA	22	Q	25 - 150				12/19/16 14:38	12/29/16 01:07	1
13C2 PFHxA	17	Q	25 - 150				12/19/16 14:38	12/29/16 01:07	1
13C4-PFHpA	9	Q	25 - 150				12/19/16 14:38	12/29/16 01:07	1
13C4 PFOA	12	Q	25 - 150				12/19/16 14:38	12/29/16 01:07	1
13C5 PFNA	9	Q	25 - 150				12/19/16 14:38	12/29/16 01:07	1
13C2 PFDA	46	•	25 - 150				12/19/16 14:38	12/20/16 01:07	1

Client: EnSafe, Inc. TestAmerica Job ID: 320-24184-1

Project/Site: PFAS, NAS Dallas

Isotope Dilution

13C4 PFOS

Client Sample ID: FSS3TMW-1216

Lab Sample ID: 320-24184-3 Date Collected: 12/07/16 08:55

Matrix: Water

Method: 537 (Modified) - Perf				ed)			D	A t t	D:// E
Isotope Dilution 13C2 PFUnA	%Recovery	Qualifier	Limits 25 - 150				Prepared	Analyzed 12/29/16 01:07	Dil Fac
13C2 PFDoA	113							12/29/16 01:07	
1802 PFHxS		Q	25 ₋ 150 25 - 150					12/29/16 01:07	1
13C4 PFOS		Q	25 - 150 25 - 150					12/29/16 01:07	1 1
1304 PFOS	6	Q	25 - 150				12/19/10 14.30	12/29/16 01.07	,
Method: 537 (Modified) - Perf	luorinated H	lydrocarbo	ns - DL						
Analyte		Qualifier	LOQ		Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	8.6	D	0.45	0.082	ug/L		12/19/16 14:38	12/30/16 12:41	200
Perfluoropentanoic acid (PFPeA)	12	D	0.45	0.18	ug/L		12/19/16 14:38	12/30/16 12:41	200
Perfluorohexanoic acid (PFHxA)	38	DB	0.45	0.14	ug/L		12/19/16 14:38	12/30/16 12:41	200
Perfluoroheptanoic acid (PFHpA)	4.0	D	0.45	0.14	ug/L		12/19/16 14:38	12/30/16 12:41	200
Perfluorooctanoic acid (PFOA)	13	D M	0.45	0.13	ug/L		12/19/16 14:38	12/30/16 12:41	200
Perfluorononanoic acid (PFNA)	0.16	J D	0.45	0.12	ug/L		12/19/16 14:38	12/30/16 12:41	200
Perfluorodecanoic acid (PFDA)	0.18	U	0.45	0.078	ug/L		12/19/16 14:38	12/30/16 12:41	200
Perfluoroundecanoic acid (PFUnA)	0.36	U	0.45	0.13	ug/L		12/19/16 14:38	12/30/16 12:41	200
Perfluorododecanoic acid (PFDoA)	0.36	U	0.45	0.10	ug/L		12/19/16 14:38	12/30/16 12:41	200
Perfluorotridecanoic Acid (PFTriA)	0.36	U	0.45	0.098	ug/L		12/19/16 14:38	12/30/16 12:41	200
Perfluorotetradecanoic acid (PFTeA)	0.18	U	0.45	0.071	ug/L		12/19/16 14:38	12/30/16 12:41	200
Perfluorobutanesulfonic acid (PFBS)	19	D	0.45	0.16	ug/L		12/19/16 14:38	12/30/16 12:41	200
Perfluorohexanesulfonic acid (PFHxS)	61	D	0.45		ug/L		12/19/16 14:38	12/30/16 12:41	200
Perfluorooctanesulfonic acid (PFOS)		ED	0.71		ug/L		12/19/16 14:38		200
Perfluorodecanesulfonic acid (PFDS)	0.53	U	0.71		ug/L		12/19/16 14:38	12/30/16 12:41	200
Perfluorooctane Sulfonamide (FOSA)	0.63	D	0.45	0.11	ug/L		12/19/16 14:38	12/30/16 12:41	200
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	73		25 - 150				12/19/16 14:38	12/30/16 12:41	200
13C4 PFBA	105		25 - 150				12/19/16 14:38	12/30/16 12:41	200
13C5-PFPeA	103		25 - 150				12/19/16 14:38	12/30/16 12:41	200
13C2 PFHxA	108		25 - 150				12/19/16 14:38	12/30/16 12:41	200
13C4-PFHpA	73		25 - 150				12/19/16 14:38	12/30/16 12:41	200
13C4 PFOA	91		25 - 150				12/19/16 14:38	12/30/16 12:41	200
13C5 PFNA	66		25 - 150				12/19/16 14:38	12/30/16 12:41	200
13C2 PFDA	106		25 - 150				12/19/16 14:38	12/30/16 12:41	200
13C2 PFUnA	105		25 - 150				12/19/16 14:38	12/30/16 12:41	200
13C2 PFDoA	117		25 - 150				12/19/16 14:38	12/30/16 12:41	200
1802 PFHxS	124		25 - 150				12/19/16 14:38	12/30/16 12:41	200
13C4 PFOS	71		25 - 150				12/19/16 14:38	12/30/16 12:41	200
: Method: 537 (Modified) - Perf	luorinated H	vdrocarbo	ons - DL2						
Analyte		Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	300		7.1		ug/L		12/19/16 14:38		1
(PFOS)	550			2.0	~g, =		, 10, 10 14.00	5.75 17 17 21.00	

Analyzed

12/19/16 14:38 01/04/17 21:33

Prepared

Limits

25 - 150

%Recovery Qualifier

Client: EnSafe, Inc.

TestAmerica Job ID: 320-24184-1

Project/Site: PFAS, NAS Dallas

Client Sample ID: SWMU1-02-1216 Lab Sample ID: 320-24184-4

Date Collected: 12/07/16 12:00 Matrix: Water

Date Received: 12/08/16 10:00

Perfluorobutanesulfonic acid

(PFBS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.016	M	0.0022	0.00041	ug/L		12/19/16 14:38	12/30/16 14:11	
Perfluoropentanoic acid (PFPeA)	0.0049	M	0.0022	0.00088	ug/L		12/19/16 14:38	12/30/16 14:11	•
Perfluorohexanoic acid (PFHxA)	0.012	В	0.0022	0.00070	ug/L		12/19/16 14:38	12/30/16 14:11	1
Perfluoroheptanoic acid (PFHpA)	0.00081	J	0.0022	0.00072	ug/L		12/19/16 14:38	12/30/16 14:11	1
Perfluorooctanoic acid (PFOA)	0.0047	M	0.0022	0.00067	ug/L		12/19/16 14:38	12/30/16 14:11	1
Perfluorononanoic acid (PFNA)	0.0018	U	0.0022	0.00058	ug/L		12/19/16 14:38	12/30/16 14:11	1
Perfluorodecanoic acid (PFDA)	0.00072	J	0.0022	0.00039	ug/L		12/19/16 14:38	12/30/16 14:11	1
Perfluoroundecanoic acid (PFUnA)	0.0018	U	0.0022	0.00067	ug/L		12/19/16 14:38	12/30/16 14:11	1
Perfluorododecanoic acid (PFDoA)	0.0018	U	0.0022	0.00052	ug/L		12/19/16 14:38	12/30/16 14:11	1
Perfluorotridecanoic Acid (PFTriA)	0.0018	U	0.0022	0.00049	ug/L		12/19/16 14:38	12/30/16 14:11	1
Perfluorotetradecanoic acid (PFTeA)	0.00044	J	0.0022	0.00036	ug/L		12/19/16 14:38	12/30/16 14:11	1
Perfluorobutanesulfonic acid (PFBS)	0.010		0.0022	0.00082	ug/L		12/19/16 14:38	12/30/16 14:11	1
Perfluorohexanesulfonic acid (PFHxS)	0.033	M	0.0022	0.00078	ug/L		12/19/16 14:38	12/30/16 14:11	1
Perfluorooctanesulfonic acid (PFOS)	0.99	E	0.0036	0.0011	ug/L		12/19/16 14:38	12/30/16 14:11	1
Perfluorodecanesulfonic acid (PFDS)	0.0064		0.0036	0.0011	ug/L		12/19/16 14:38	12/30/16 14:11	1
Perfluorooctane Sulfonamide (FOSA)	0.018		0.0022	0.00057	ug/L		12/19/16 14:38	12/30/16 14:11	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
13C8 FOSA	12	Q	25 - 150				12/19/16 14:38	12/30/16 14:11	
13C4 PFBA	31		25 - 150				12/19/16 14:38	12/30/16 14:11	1
13C5-PFPeA	91		25 - 150				12/19/16 14:38	12/30/16 14:11	•
13C2 PFHxA	115		25 - 150				12/19/16 14:38	12/30/16 14:11	
13C4-PFHpA	116		25 - 150				12/19/16 14:38	12/30/16 14:11	
13C4 PFOA	110		25 - 150				12/19/16 14:38	12/30/16 14:11	
13C5 PFNA	62		25 - 150				12/19/16 14:38	12/30/16 14:11	
13C2 PFDA	104		25 - 150				12/19/16 14:38	12/30/16 14:11	•
13C2 PFUnA	112		25 - 150				12/19/16 14:38	12/30/16 14:11	
13C2 PFDoA	109		25 - 150				12/19/16 14:38	12/30/16 14:11	
1802 PFHxS	118		25 - 150				12/19/16 14:38	12/30/16 14:11	•
13C4 PFOS	80		25 - 150				12/19/16 14:38	12/30/16 14:11	1
Method: 537 (Modified) - Perfl Analyte		lydrocarbo Qualifier	ons - DL LOQ	DI	Unit	D	Propared	Analyzod	Dil Fac
<u> </u>		J D M	0.022	0.0041			Prepared 12/19/16 14:38	Analyzed 12/30/16 14:03	10 Tac
Perfluorobutanoic acid (PFBA)	0.016 0.018				-				
Perfluoropentanoic acid (PFPeA)			0.022	0.0088	Ū		12/19/16 14:38		10
Perfluorohexanoic acid (PFHxA)		JDB	0.022	0.0070				12/30/16 14:03	10
Perfluoroheptanoic acid (PFHpA)	0.018		0.022	0.0072	Ū			12/30/16 14:03	10
Perfluorooctanoic acid (PFOA)	0.018		0.022	0.0067	•			12/30/16 14:03	1(
Perfluorononanoic acid (PFNA)	0.018		0.022	0.0058				12/30/16 14:03	10
Perfluorodecanoic acid (PFDA)	0.0089		0.022	0.0039	-			12/30/16 14:03	10
Perfluoroundecanoic acid (PFUnA)	0.018		0.022	0.0067	-			12/30/16 14:03	10
Perfluorododecanoic acid (PFDoA)	0.018		0.022	0.0052				12/30/16 14:03	10
Perfluorotridecanoic Acid (PFTriA)	0.018		0.022	0.0049	•			12/30/16 14:03	10
Perfluorotetradecanoic acid (PFTeA)	0.0089	U	0.022	0.0036	Ū			12/30/16 14:03	10
	0.000=	LD	0.000	0 0000	110/		10/10/10 11:00	10/20/16 14:02	

10

12/19/16 14:38 12/30/16 14:03

0.022

0.0095 JD

0.0082 ug/L

Client: EnSafe, Inc.

TestAmerica Job ID: 320-24184-1

Project/Site: PFAS, NAS Dallas

Client Sample ID: SWMU1-02-1216 Lab Sample ID: 320-24184-4

Date Collected: 12/07/16 12:00 Matrix: Water Date Received: 12/08/16 10:00

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	0.030	D	0.022	0.0078	ug/L		12/19/16 14:38	12/30/16 14:03	10
Perfluorooctanesulfonic acid (PFOS)	1.2	D	0.036	0.011	ug/L		12/19/16 14:38	12/30/16 14:03	10
Perfluorodecanesulfonic acid (PFDS)	0.027	U	0.036	0.011	ug/L		12/19/16 14:38	12/30/16 14:03	10
Perfluorooctane Sulfonamide (FOSA)	0.017	JD	0.022	0.0057	ug/L		12/19/16 14:38	12/30/16 14:03	10
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	12	Q	25 - 150				12/19/16 14:38	12/30/16 14:03	10
13C4 PFBA	93		25 - 150				12/19/16 14:38	12/30/16 14:03	10
13C5-PFPeA	148		25 - 150				12/19/16 14:38	12/30/16 14:03	10
13C2 PFHxA	125		25 - 150				12/19/16 14:38	12/30/16 14:03	10
13C4-PFHpA	123		25 - 150				12/19/16 14:38	12/30/16 14:03	10
13C4 PFOA	114		25 - 150				12/19/16 14:38	12/30/16 14:03	10
13C5 PFNA	96		25 - 150				12/19/16 14:38	12/30/16 14:03	10
13C2 PFDA	98		25 - 150				12/19/16 14:38	12/30/16 14:03	10
13C2 PFUnA	99		25 - 150				12/19/16 14:38	12/30/16 14:03	10
13C2 PFDoA	101		25 - 150				12/19/16 14:38	12/30/16 14:03	10
1802 PFHxS	139		25 - 150				12/19/16 14:38	12/30/16 14:03	10
13C4 PFOS	123		25 - 150				12/19/16 14:38	12/30/16 14:03	10
Method: 537 (Modified) - Perfl	uorinated H	ydrocarbo	ons - RE						
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.0081	H M	0.0023	0.00072	ug/L		01/04/17 16:57	01/05/17 15:45	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	108		25 - 150				01/04/17 16:57	01/05/17 15:45	1

Default Detection Limits

Client: EnSafe, Inc.

TestAmerica Job ID: 320-24184-1

Project/Site: PFAS, NAS Dallas

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Prep: 3535

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	0.0025	0.00092	ug/L	537 (Modified)
Perfluorobutanoic acid (PFBA)	0.0025	0.00046	ug/L	537 (Modified)
Perfluorodecanesulfonic acid (PFDS)	0.0040	0.0012	ug/L	537 (Modified)
Perfluorodecanoic acid (PFDA)	0.0025	0.00044	ug/L	537 (Modified)
Perfluorododecanoic acid (PFDoA)	0.0025	0.00058	ug/L	537 (Modified)
Perfluoroheptanoic acid (PFHpA)	0.0025	0.00080	ug/L	537 (Modified)
Perfluorohexanesulfonic acid (PFHxS)	0.0025	0.00087	ug/L	537 (Modified)
Perfluorohexanoic acid (PFHxA)	0.0025	0.00079	ug/L	537 (Modified)
Perfluorononanoic acid (PFNA)	0.0025	0.00065	ug/L	537 (Modified)
Perfluorooctane Sulfonamide (FOSA)	0.0025	0.00064	ug/L	537 (Modified)
Perfluorooctanesulfonic acid (PFOS)	0.0040	0.0013	ug/L	537 (Modified)
Perfluorooctanoic acid (PFOA)	0.0025	0.00075	ug/L	537 (Modified)
Perfluoropentanoic acid (PFPeA)	0.0025	0.00099	ug/L	537 (Modified)
Perfluorotetradecanoic acid (PFTeA)	0.0025	0.00040	ug/L	537 (Modified)
Perfluorotridecanoic Acid (PFTriA)	0.0025	0.00055	ug/L	537 (Modified)
Perfluoroundecanoic acid (PFUnA)	0.0025	0.00075	ug/L	537 (Modified)

Isotope Dilution Summary

Client: EnSafe, Inc.

Project/Site: PFAS, NAS Dallas

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Matrix: Water Prep Type: Total/NA

				•		ecovery (Ac	•	•	
		3C8 FOS/	3C4 PFB/	3C5-PFPe	3C2 PFHx	3C4-PFHp	3C4 PFO	3C5 PFN/	3C2 PFD
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)
320-24184-1	308A51MW-LF-1216	10 Q	15 Q	24 Q	31	23 Q	49	39	117
320-24184-1 - DL	308A51MW-LF-1216	11 Q	117	130	118	98	140	120	122
320-24184-2	SWMU1-01-1216	7 Q	37	93	113	106	100	95	96
320-24184-2 - RE	SWMU1-01-1216				116				
320-24184-3	FSS3TMW-1216	32	25	22 Q	17 Q	9 Q	12 Q	9 Q	46
320-24184-3 - DL	FSS3TMW-1216	73	105	103	108	73	91	66	106
320-24184-3 - DL2	FSS3TMW-1216								
320-24184-4 - DL	SWMU1-02-1216	12 Q	93	148	125	123	114	96	98
320-24184-4	SWMU1-02-1216	12 Q	31	91	115	116	110	62	104
320-24184-4 - RE	SWMU1-02-1216				108				
LCS 320-142967/2-A	Lab Control Sample	62	131	132	126	128	127	123	127
LCS 320-142967/2-A - RA	Lab Control Sample								
LCS 320-144971/2-A	Lab Control Sample				109				
LCSD 320-144971/3-A	Lab Control Sample Dup				117				
MB 320-142967/1-A	Method Blank	64	131	137	131	132	133	126	130
MB 320-142967/1-A - RA	Method Blank					102		120	
MB 320-144971/1-A	Method Blank				139				
WID 320-14437 171-A	Wethod Blank								
						covery (Ac	ceptance L	imits)	
					3C4 PFOS				
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)				
320-24184-1	308A51MW-LF-1216	121	110	20 Q	38				
320-24184-1 - DL	308A51MW-LF-1216	124	126	112	125				
320-24184-2	SWMU1-01-1216	103	104	118	116				
320-24184-2 - RE	SWMU1-01-1216								
320-24184-3	FSS3TMW-1216	119	113	9 Q	6 Q				
320-24184-3 - DL	FSS3TMW-1216	105	117	124	71				
320-24184-3 - DL2	FSS3TMW-1216				105				
320-24184-4 - DL	SWMU1-02-1216	99	101	139	123				
320-24184-4	SWMU1-02-1216	112	109	118	80				
320-24184-4 - RE	SWMU1-02-1216								
LCS 320-142967/2-A	Lab Control Sample	119	114	128	128				
LCS 320-142967/2-A - RA	Lab Control Sample				126				
LCS 320-144971/2-A	Lab Control Sample								
LCSD 320-144971/3-A	Lab Control Sample Dup								
MB 320-142967/1-A	Method Blank	127	112	130	126				
MB 320-142967/1-A - RA	Method Blank				113				
MB 320-144971/1-A	Method Blank								
Surrogate Legend									
13C8 FOSA = 13C8 FOS	SA								
13C4 PFBA = 13C4 PFB	SA .								
13C5-PFPeA = 13C5-PF	PeA								
13C2 PFHxA = 13C2 PF	HxA								

13C2 PFHxA = 13C2 PFHxA

13C4-PFHpA = 13C4-PFHpA

13C4 PFOA = 13C4 PFOA

13C5 PFNA = 13C5 PFNA 13C2 PFDA = 13C2 PFDA

13C2 PFUnA = 13C2 PFUnA

13C2 PFDoA = 13C2 PFDoA

TestAmerica Job ID: 320-24184-1

Isotope Dilution Summary

Client: EnSafe, Inc.

Project/Site: PFAS, NAS Dallas

1802 PFHxS = 1802 PFHxS 13C4 PFOS = 13C4 PFOS TestAmerica Job ID: 320-24184-1

QC Sample Results

Client: EnSafe, Inc.

TestAmerica Job ID: 320-24184-1

Project/Site: PFAS, NAS Dallas

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-142967/1-A

Matrix: Water

Analysis Batch: 144253

Client Sample ID: Method Blank Prep Type: Total/NA Prep Batch: 142967

	MB	MB							
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.0010	U	0.0025	0.00046	ug/L	 _	12/19/16 14:38	12/29/16 00:06	1
Perfluoropentanoic acid (PFPeA)	0.0020	U	0.0025	0.00099	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorohexanoic acid (PFHxA)	0.00147	J	0.0025	0.00079	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.00080	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorooctanoic acid (PFOA)	0.00116	J	0.0025	0.00075	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.00065	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorodecanoic acid (PFDA)	0.0010	U	0.0025	0.00044	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluoroundecanoic acid (PFUnA)	0.0020	U	0.0025	0.00075	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorododecanoic acid (PFDoA)	0.0020	U	0.0025	0.00058	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorotridecanoic Acid (PFTriA)	0.0020	U	0.0025	0.00055	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorotetradecanoic acid (PFTeA)	0.0010	U	0.0025	0.00040	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorohexanesulfonic acid (PFHxS)	0.000944	J	0.0025	0.00087	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorodecanesulfonic acid (PFDS)	0.0030	U	0.0040	0.0012	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorooctane Sulfonamide (FOSA)	0.0020	U	0.0025	0.00064	ug/L		12/19/16 14:38	12/29/16 00:06	1
	MB	MB							

	MB	MB				
Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	64		25 - 150	12/19/16 14:38	12/29/16 00:06	1
13C4 PFBA	131		25 - 150	12/19/16 14:38	12/29/16 00:06	1
13C5-PFPeA	137		25 - 150	12/19/16 14:38	12/29/16 00:06	1
13C2 PFHxA	131		25 - 150	12/19/16 14:38	12/29/16 00:06	1
13C4-PFHpA	132		25 - 150	12/19/16 14:38	12/29/16 00:06	1
13C4 PFOA	133		25 - 150	12/19/16 14:38	12/29/16 00:06	1
13C5 PFNA	126		25 - 150	12/19/16 14:38	12/29/16 00:06	1
13C2 PFDA	130		25 - 150	12/19/16 14:38	12/29/16 00:06	1
13C2 PFUnA	127		25 - 150	12/19/16 14:38	12/29/16 00:06	1
13C2 PFDoA	112		25 - 150	12/19/16 14:38	12/29/16 00:06	1
1802 PFHxS	130		25 - 150	12/19/16 14:38	12/29/16 00:06	1
13C4 PFOS	126		25 - 150	12/19/16 14:38	12/29/16 00:06	1

Lab Sample ID: LCS 320-142967/2-A

Matrix: Water

Analysis Batch: 144253

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 142967

	Spike	LCS LCS				%Rec.	
Analyte	Added	Result Qualifie	r Unit	D	%Rec	Limits	
Perfluorobutanoic acid (PFBA)	0.0400	0.0441	ug/L		110	60 - 140	
Perfluoropentanoic acid (PFPeA)	0.0400	0.0422	ug/L		105	60 - 140	
Perfluorohexanoic acid (PFHxA)	0.0400	0.0413	ug/L		103	60 - 140	
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0418	ug/L		104	60 - 140	
Perfluorooctanoic acid (PFOA)	0.0400	0.0406	ug/L		101	60 - 140	
Perfluorononanoic acid (PFNA)	0.0400	0.0384	ug/L		96	60 - 140	
Perfluorodecanoic acid (PFDA)	0.0400	0.0399	ug/L		100	60 - 140	
Perfluoroundecanoic acid (PFUnA)	0.0400	0.0382	ug/L		95	60 - 140	
Perfluorododecanoic acid (PFDoA)	0.0400	0.0386	ug/L		96	60 - 140	
Perfluorotridecanoic Acid (PFTriA)	0.0400	0.0384	ug/L		96	50 - 150	

QC Sample Results

Client: EnSafe, Inc.

TestAmerica Job ID: 320-24184-1

Project/Site: PFAS, NAS Dallas

Method: 537 (Modified) - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCS 320-1 Matrix: Water Analysis Batch: 144253	42967/2-A					Clier	nt Sar		Lab Control Prep Type: To Prep Batch:	otal/N <i>A</i>
Alialysis Balcii. 144255			Spike	1.00	LCS				%Rec.	14290
Analyta			Added		Qualifier	Unit	D	%Rec	%Rec.	
Analyte					Quaimer					
Perfluorotetradecanoic acid			0.0400	0.0478		ug/L		120	50 - 150	
(PFTeA) Perfluorobutanesulfonic acid			0.0354	0.0432		ug/L		122	50 - 150	
(PFBS)			0.0004	0.0402		ug/L		122	00 - 100	
Perfluorohexanesulfonic acid			0.0364	0.0397		ug/L		109	60 - 140	
(PFHxS)						· ·				
Perfluorodecanesulfonic acid			0.0386	0.0385		ug/L		100	50 - 150	
(PFDS)										
Perfluorooctane Sulfonamide			0.0400	0.0384		ug/L		96	60 - 140	
(FOSA)										
	LCS									
Isotope Dilution	%Recovery	Qualifier	Limits							
13C8 FOSA	62		25 - 150							
13C4 PFBA	131		25 - 150							
13C5-PFPeA	132		25 - 150							
13C2 PFHxA	126		25 - 150							
13C4-PFHpA	128		25 - 150							
13C4 PFOA	127		25 - 150							
13C5 PFNA	123		25 - 150							
13C2 PFDA	127		25 - 150							
13C2 PFUnA	119		25 - 150							
13C2 PFDoA	114		25 - 150							
1802 PFHxS	128		25 - 150							
13C4 PFOS	128		25 - 150							
Lab Sample ID: MB 320-14	14971/1-A						Clie		ole ID: Metho	
Matrix: Water									Prep Type: T	
Analysis Batch: 145242									Prep Batch:	14497
		MB MB								
Analyte		ult Qualifier	LOQ		DL Unit			repared	Analyzed	Dil Fa
Perfluorohexanoic acid (PFHxA)	0.0	020 U	0.0025	0.00	0079 ug/L		01/0	4/17 16:57	01/05/17 15:15	
		MB MB								
Isotope Dilution	%Recov	ery Qualifier	Limits				P	repared	Analyzed	Dil Fa
13C2 PFHxA		139	25 - 150				01/0	4/17 16:57	01/05/17 15:15	
Lab Sample ID: LCS 320-1	449/1/2-A					Clier	nt Sar		Lab Control	
Matrix: Water									Prep Type: T	
Analysis Batch: 145242			0 "						Prep Batch:	14497
-			Spike		LCS				%Rec.	
Analyte			Added		Qualifier	Unit	_ D	%Rec	Limits	
Perfluorohexanoic acid (PFHxA)			0.0400	0.0402		ug/L		101	60 - 140	
	LCS	LCS								
Isotope Dilution	%Recovery	Qualifier	Limits							
13C2 PFHxA	109		25 - 150							

QC Sample Results

Client: EnSafe, Inc. TestAmerica Job ID: 320-24184-1

Project/Site: PFAS, NAS Dallas

Method: 537 ((Modified)) - Perfluorinated Hy	ydrocarbons (Continued)	
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Lab Sample ID: LCSD 320-144971/3-A Client Sample ID: Lab Control Sample Dup

Matrix: Water

Prep Type: Total/NA **Prep Batch: 144971 Analysis Batch: 145242 Spike** LCSD LCSD %Rec. **RPD**

Added %Rec Limit Analyte Result Qualifier Unit Limits RPD 60 - 140 Perfluorohexanoic acid (PFHxA) 0.0400 0.0424 ug/L 106 5 30

LCSD LCSD

Isotope Dilution %Recovery Qualifier Limits 117 13C2 PFHxA 25 - 150

Method: 537 (Modified) - Perfluorinated Hydrocarbons - RA

Lab Sample ID: MB 320-142967/1-A **Client Sample ID: Method Blank**

Matrix: Water

Analysis Batch: 144510

MB MB Dil Fac Analyte Result Qualifier LOQ DL Unit D **Prepared** Analyzed 0.0040 0.0030 U 0.0013 ug/L <u>12/19/16 14:38</u> <u>12/30/16 16:11</u>

Perfluorooctanesulfonic acid (PFOS) -

MB MB

%Recovery Qualifier Isotope Dilution Limits Analyzed Dil Fac Prepared 13C4 PFOS - RA 25 - 150 12/19/16 14:38 12/30/16 16:11 113

Lab Sample ID: LCS 320-142967/2-A

Matrix: Water

Prep Type: Total/NA **Analysis Batch: 144510** Prep Batch: 142967

0.0511

ug/L

LCS LCS Spike %Rec. Added Result Qualifier Limits Analyte Unit %Rec 0.0371 60 - 140

Perfluorooctanesulfonic acid

(PFOS) - RA

LCS LCS

Isotope Dilution %Recovery Qualifier Limits 13C4 PFOS - RA 25 - 150 126

Prep Type: Total/NA

Prep Batch: 142967

Client Sample ID: Lab Control Sample

QC Association Summary

QC ASSOCIATION Summa

Client: EnSafe, Inc.

TestAmerica Job ID: 320-24184-1

Project/Site: PFAS, NAS Dallas

LCMS

Pre	рΒ	atcl	h: 1	429	67
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Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24184-1 - DL	308A51MW-LF-1216	Total/NA	Water	3535	
320-24184-1	308A51MW-LF-1216	Total/NA	Water	3535	
320-24184-2	SWMU1-01-1216	Total/NA	Water	3535	
320-24184-3	FSS3TMW-1216	Total/NA	Water	3535	
320-24184-3 - DL2	FSS3TMW-1216	Total/NA	Water	3535	
320-24184-3 - DL	FSS3TMW-1216	Total/NA	Water	3535	
320-24184-4 - DL	SWMU1-02-1216	Total/NA	Water	3535	
320-24184-4	SWMU1-02-1216	Total/NA	Water	3535	
MB 320-142967/1-A - RA	Method Blank	Total/NA	Water	3535	
MB 320-142967/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-142967/2-A	Lab Control Sample	Total/NA	Water	3535	
LCS 320-142967/2-A - RA	Lab Control Sample	Total/NA	Water	3535	

Analysis Batch: 144253

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24184-1	308A51MW-LF-1216	Total/NA	Water	537 (Modified)	142967
320-24184-3	FSS3TMW-1216	Total/NA	Water	537 (Modified)	142967
MB 320-142967/1-A	Method Blank	Total/NA	Water	537 (Modified)	142967
LCS 320-142967/2-A	Lab Control Sample	Total/NA	Water	537 (Modified)	142967

Analysis Batch: 144510

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24184-1 - DL	308A51MW-LF-1216	Total/NA	Water	537 (Modified)	142967
320-24184-2	SWMU1-01-1216	Total/NA	Water	537 (Modified)	142967
320-24184-3 - DL	FSS3TMW-1216	Total/NA	Water	537 (Modified)	142967
320-24184-4 - DL	SWMU1-02-1216	Total/NA	Water	537 (Modified)	142967
320-24184-4	SWMU1-02-1216	Total/NA	Water	537 (Modified)	142967
MB 320-142967/1-A - RA	Method Blank	Total/NA	Water	537 (Modified)	142967
LCS 320-142967/2-A - RA	Lab Control Sample	Total/NA	Water	537 (Modified)	142967

Prep Batch: 144971

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24184-2 - RE	SWMU1-01-1216	Total/NA	Water	3535	
320-24184-4 - RE	SWMU1-02-1216	Total/NA	Water	3535	
MB 320-144971/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-144971/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-144971/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 145022

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24184-3 - DL2	FSS3TMW-1216	Total/NA	Water	537 (Modified)	145739

Analysis Batch: 145242

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24184-2 - RE	SWMU1-01-1216	Total/NA	Water	537 (Modified)	144971
320-24184-4 - RE	SWMU1-02-1216	Total/NA	Water	537 (Modified)	144971
MB 320-144971/1-A	Method Blank	Total/NA	Water	537 (Modified)	144971
LCS 320-144971/2-A	Lab Control Sample	Total/NA	Water	537 (Modified)	144971
LCSD 320-144971/3-A	Lab Control Sample Dup	Total/NA	Water	537 (Modified)	144971

QC Association Summary

Client: EnSafe, Inc.

TestAmerica Job ID: 320-24184-1

Project/Site: PFAS, NAS Dallas

LCMS (Continued)

Cleanup Batch: 145739

Lab Sample ID Client Sample ID Prep Type Matrix Method Prep Batch

320-24184-3 - DL2 FSS3TMW-1216 Total/NA Water Dilution 142967

Lab Chronicle

Client: EnSafe, Inc.

Project/Site: PFAS, NAS Dallas

Lab Sample ID: 320-24184-1

TestAmerica Job ID: 320-24184-1

Client Sample ID: 308A51MW-LF-1216

Date Collected: 12/07/16 13:40 Matrix: Water

Date Received: 12/08/16 10:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			142967	12/19/16 14:38	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		1	144253	12/29/16 00:52	TTP	TAL SAC
Total/NA	Prep	3535	DL		142967	12/19/16 14:38	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	50	144510	12/30/16 13:33	CBW	TAL SAC

Client Sample ID: SWMU1-01-1216 Lab Sample ID: 320-24184-2

Date Collected: 12/07/16 14:45

Date Received: 12/08/16 10:00

•	Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			142967	12/19/16 14:38	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		1	144510	12/30/16 13:41	CBW	TAL SAC
Total/NA	Prep	3535	RE		144971	01/04/17 16:57	JER	TAL SAC
Total/NA	Analysis	537 (Modified)	RE	1	145242	01/05/17 15:38	SBC	TAL SAC

Client Sample ID: FSS3TMW-1216

Date Collected: 12/07/16 08:55 Date Received: 12/08/16 10:00 Lab Sample ID: 320-24184-3 Matrix: Water

Batch Batch Dilution Batch Prepared Method Number Prep Type Type Run **Factor** or Analyzed Analyst Lab TAL SAC Total/NA Prep 3535 142967 12/19/16 14:38 VPM Total/NA Analysis 537 (Modified) 1 144253 12/29/16 01:07 TTP TAL SAC TAL SAC Total/NA Prep 3535 DL 142967 12/19/16 14:38 VPM Total/NA 537 (Modified) DL 200 144510 12/30/16 12:41 CBW TAL SAC Analysis Total/NA 3535 DL2 TAL SAC Prep 142967 12/19/16 14:38 VPM Total/NA Dilution DL2 145739 12/19/16 14:38 TTP TAL SAC Cleanup Total/NA Analysis 537 (Modified) DL2 1 145022 01/04/17 21:33 SBC TAL SAC

Client Sample ID: SWMU1-02-1216

Date Collected: 12/07/16 12:00

Date Received: 12/08/16 10:00

SWMU1-02-1216 Lab Sample ID: 320-24184-4 Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535	DL		142967	12/19/16 14:38	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	10	144510	12/30/16 14:03	CBW	TAL SAC
Total/NA	Prep	3535			142967	12/19/16 14:38	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		1	144510	12/30/16 14:11	CBW	TAL SAC
Total/NA	Prep	3535	RE		144971	01/04/17 16:57	JER	TAL SAC
Total/NA	Analysis	537 (Modified)	RE	1	145242	01/05/17 15:45	SBC	TAL SAC

Laboratory References:

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

Certification Summary

Client: EnSafe, Inc. TestAmerica Job ID: 320-24184-1

Project/Site: PFAS, NAS Dallas

Laboratory: TestAmerica Sacramento The certifications listed below are applicable to this report.

uthority	Program		EPA Region	Certification ID	Expiration Date	
2LA	DoD ELA	P		2928-01	01-31-17	
regon	NELAP		10	4040	01-28-18	
The following analytes	s are included in this repo	ort, but certification is	s not offered by the go	overning authority:		
Analysis Method	Prep Method	Matrix	Analyt	e		
537 (Modified)	3535	Water	Perflu	orobutanesulfonic acid	(PFBS)	
537 (Modified)	3535	Water	Perflu	orobutanoic acid (PFBA	۸)	
537 (Modified)	3535	Water	Perflu	orodecanesulfonic acid	(PFDS)	
537 (Modified)	3535	3535 Water		Perfluorodecanoic acid (PFDA)		
537 (Modified)	3535	3535 Water		Perfluorododecanoic acid (PFDoA)		
537 (Modified)	3535	3535 Water		Perfluoroheptanoic acid (PFHpA)		
537 (Modified)	3535	Water	Perflu	orohexanesulfonic acid	(PFHxS)	
537 (Modified)	3535	Water	Perflu	orohexanoic acid (PFH)	κA)	
537 (Modified)	3535	Water	Perflu	orononanoic acid (PFN/	A)	
537 (Modified)	3535	Water	Perflu	orooctane Sulfonamide	(FOSA)	
537 (Modified)	3535	Water	Perflu	orooctanesulfonic acid ((PFOS)	
537 (Modified)	3535	Water	Perflu	orooctanoic acid (PFOA	۸)	
537 (Modified)	3535	Water	Perflu	oropentanoic acid (PFP	eA)	
537 (Modified)	3535	Water	Perflu	orotetradecanoic acid (F	PFTeA)	
537 (Modified)	3535	Water	Perflu	orotridecanoic Acid (PF	TriA)	
537 (Modified)	3535	Water	Perflu	oroundecanoic acid (PF	UnA)	

Method Summary

Client: EnSafe, Inc.

Project/Site: PFAS, NAS Dallas

TestAmerica Job ID: 320-24184-1

Method	Method Description	Protocol	Laboratory
537 (Modified)	Perfluorinated Hydrocarbons	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

Client: EnSafe, Inc.

Project/Site: PFAS, NAS Dallas

TestAmerica Job ID: 320-24184-1

Lab Sample ID	Client Sample ID	Matrix	Collected Received
320-24184-1	308A51MW-LF-1216	Water	<u>12/07/16 13:40</u> <u>12/08/16 10:00</u>
320-24184-2	SWMU1-01-1216	Water	12/07/16 14:45 12/08/16 10:00
320-24184-3	FSS3TMW-1216	Water	12/07/16 08:55 12/08/16 10:00
320-24184-4	SWMU1-02-1216	Water	12/07/16 12:00 12/08/16 10:00

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Instrument ID: A8 N Analysis Batch Number: 142379

Lab Sample ID: IC 320-142379/4 Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTE	GRATION	
	TIME	REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.43	Assign Peak	chandrase	12/15/16 13:48
			nas	
Perfluorohexanesulfonic acid	2.44	Assign Peak	chandrase	12/15/16 13:48
(PFHxS)			nas	
Perfluorooctanesulfonic acid	3.15	Assign Peak	chandrase	12/15/16 13:48
(PFOS)			nas	
Perfluorododecanoic acid (PFDoA)	4.14	Incomplete Integration	chandrase	12/15/16 13:48
			nas	

Lab Sample ID: IC 320-142379/5 Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorooctanesulfonic acid	3.15	Assign Peak	chandrase	12/15/16 13:50
(PFOS)			nas	

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Analysis Batch Number: 144213 Instrument ID: A8 N

Lab Sample ID: CCV 320-144213/5 CCVL Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTE	GRATION	
	TIME	REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.21	Baseline	phomsopha t	12/29/16 08:10

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Instrument ID: A8 N Analysis Batch Number: 144253

Lab Sample ID: 320-24184-1

Client Sample ID: 308A51MW-LF-1216

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.88	Incomplete Integration	phomsopha t	01/06/17 09:10
Perfluorooctanoic acid (PFOA)	2.78	Incomplete Integration	phomsopha t	12/29/16 17:38

Lab Sample ID: 320-24184-3 Client Sample ID: FSS3TMW-1216

COMPOUND NAME	RETENTION	MANUAL INTEGRATION			
	TIME	REASON	ANALYST	DATE	
Perfluorobutanesulfonic acid (PFBS)	1.89	Incomplete Integration	phomsopha t	01/06/17 09:11	

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1 SDG No.: Analysis Batch Number: 144510 Instrument ID: A8 N Lab Sample ID: CCV 320-144510/5 CCVL Client Sample ID: Date Analyzed: 12/30/16 11:26 Lab File ID: 30DEC2016A 005.d GC Column: Acquity ID: 2.1 (mm) COMPOUND NAME RETENTION MANUAL INTEGRATION TIME REASON ANALYST DATE chandrase 01/03/17 10:09 Perfluorohexanesulfonic acid 2.46 Assign Peak (PFHxS) nas Perfluorooctanesulfonic acid 3.17 Assign Peak chandrase 01/03/17 10:09 (PFOS) Lab Sample ID: 320-24184-3 DL Client Sample ID: FSS3TMW-1216 DL Lab File ID: 30DEC2016B_004.d GC Column: Acquity Date Analyzed: 12/30/16 12:41 ID: 2.1 (mm)COMPOUND NAME MANUAL INTEGRATION RETENTION REASON TIME ANALYST DATE 2.79 Incomplete Integration phomsopha 01/03/17 13:48 Perfluorooctanoic acid (PFOA) Lab Sample ID: 320-24184-1 DL Client Sample ID: 308A51MW-LF-1216 DL Date Analyzed: 12/30/16 13:33 Lab File ID: 30DEC2016B 011.d GC Column: Acquity ID: 2.1 (mm) COMPOUND NAME RETENTION MANUAL INTEGRATION REASON DATE ANALYST TIME 2.79 Incomplete Integration phomsopha 01/03/17 13:53 Perfluorooctanoic acid (PFOA) Lab Sample ID: 320-24184-2 Client Sample ID: SWMU1-01-1216 Lab File ID: 30DEC2016B_012.d GC Column: Acquity ID: 2.1(mm) Date Analyzed: 12/30/16 13:41 MANUAL INTEGRATION
REASON ANATYS COMPOUND NAME RETENTION DATE TIME ANALYST phomsopha | 01/03/17 13:55 Perfluorobutanoic acid (PFBA) 1.53 Incomplete Integration Perfluoropentanoic acid (PFPeA) 1.81 Incomplete Integration phomsopha 01/03/17 13:55

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Instrument ID: A8 N Analysis Batch Number: 144510

Lab Sample ID: 320-24184-4 DL Client Sample ID: SWMU1-02-1216 DL

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.53	Baseline	phomsopha t	01/03/17 13:59
Perfluoropentanoic acid (PFPeA)	1.81	Baseline	phomsopha t	01/03/17 13:59

Lab Sample ID: 320-24184-4 Client Sample ID: SWMU1-02-1216

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.53	Incomplete Integration	phomsopha t	01/03/17 14:01
Perfluoropentanoic acid (PFPeA)	1.81	Incomplete Integration	phomsopha t	01/03/17 14:01
Perfluorohexanesulfonic acid (PFHxS)	2.45	Incomplete Integration	phomsopha t	01/03/17 14:01
Perfluorooctanoic acid (PFOA)	2.78	Incomplete Integration	phomsopha t	01/03/17 14:01

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Instrument ID: A8 N

Analysis Batch Number: 145022

Lab Sample ID: CCV 320-145022/5 CCVL Client Sample ID:

COMPOUND NAME	RETENTION	ETENTION MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.31	Assign Peak	chandrase nas	01/05/17 09:05

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 145242

Lab Sample ID: 320-24184-4 RE

Client Sample ID: SWMU1-02-1216 RE

COMPOUND NAME	RETENTION	MANUAL INTEGRATION				
	TIME	REASON	ANALYST	DATE		
Perfluorohexanoic acid (PFHxA)	2.19	Baseline	chandrase	01/06/17 09:55		
			nas			

REAGENT TRACEABILITY SUMMARY

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-24184-1
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SDG No.:

			Re	Reagent	Parent Reagent			
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCMPFCSU_00046	03/01/17	11/03/16	Methanol, Lot Bakes	r 50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00007	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00007		13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00008		13C5-PFPeA	1 ug/mL
					LCM8FOSA 00011		13C8 FOSA	1 ug/mL
					LCMPFBA_00008		13C4 PFBA	1 ug/mL
					LCMPFDA_00011		13C2 PFDA	1 ug/mL
					LCMPFDoA_00008		13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00008		13C5 PFNA	1 ug/mL
					LCMPFOA_00012		13C4 PFOA	1 ug/mL
					LCMPFOS_00017		13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00009		13C2 PFUnA	1 ug/mL
.LCM2PFHxDA_00008			on Laboratories, Lo		(Purchased Rea		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA_00007	12/07/20		on Laboratories, Lo		(Purchased Rea		13C2-PFTeDA	50 ug/mL
.LCM4PFHPA_00007	05/27/21		ton Laboratories, Lo		(Purchased Rea		13C4-PFHpA	50 ug/mL
.LCM5PFPEA_00008	05/22/20		ton Laboratories, Lo		(Purchased Rea	-	13C5-PFPeA	50 ug/mL
.LCM8FOSA_00011	12/22/17		ton Laboratories, Lo		(Purchased Rea		13C8 FOSA	50 ug/mL
.LCMPFBA_00008	05/24/21		gton Laboratories, I		(Purchased Rea		13C4 PFBA	50 ug/mL
.LCMPFDA_00011	08/19/20		gton Laboratories, I		(Purchased Rea		13C2 PFDA	50 ug/mL
.LCMPFDoA_00008	04/08/21		ton Laboratories, L		(Purchased Rea	-	13C2 PFDoA	50 ug/mL
.LCMPFHxA_00012	04/08/21		ton Laboratories, L		(Purchased Rea		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00008	10/23/20		ton Laboratories, L		(Purchased Rea		1802 PFHxS	47.3 ug/mL
.LCMPFNA_00008	04/13/19		gton Laboratories, I		(Purchased Rea		13C5 PFNA	50 ug/mL
.LCMPFOA_00012	01/22/21		gton Laboratories, L		(Purchased Rea		13C4 PFOA	50 ug/mL
.LCMPFOS_00017	08/03/21		gton Laboratories, L		(Purchased Rea		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00009	02/12/21	Welling	ton Laboratories, L	ot MPFUdA0216	(Purchased Rea	gent)	13C2 PFUnA	50 ug/mL
LCPFC-L1_00022	05/15/17	12/15/16	MeOH/H2O, Lot 90285	5 5 mL	LCMPFCSU 00047	250 uL	13C2-PFHxDA	50 ng/mL
_					_		13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
I							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							1802 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP 00071	25 uL	Perfluorobutanoic acid (PFBA)	
						1 22 42	Perfluorobutanesulfonic acid	0.442 ng/mL
I							(PFBS)	0.5 / 5
			I				Perfluorodecanoic acid (PFDA)	0.5 ng/mL

Lab	Name:	TestAmerica	Sacrament	o Jo	0.:		
					_		

				Reagent	Parent Reage	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorododecanoic acid (PFDoA)	0.5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.5 ng/mL
							Perfluoroheptanesulfonic Acid	0.476 ng/mL
							Perfluorohexanoic acid (PFHxA)	0.5 ng/mL
							Perfluorohexadecanoic acid	0.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.455 ng/mL
							Perfluorononanoic acid (PFNA)	0.5 ng/mL
							Perfluorooctanoic acid (PFOA)	0.5 ng/mL
							Perfluorooctadecanoic acid	0.5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.464 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.5 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.5 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.5 ng/mL
.LCMPFCSU_00047	06/14/17	12/14/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA 00007	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00007	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00008		13C4 PFBA	1 ug/mL
					LCMPFDA_00011		13C2 PFDA	1 ug/mL
					LCMPFDoA_00008		13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00008		13C5 PFNA	1 ug/mL
					LCMPFOA_00012		13C4 PFOA	1 ug/mL
					LCMPFOS_00017		13C4 PFOS	0.956 ug/mL
	0.1 /0= /01				LCMPFUdA_00009		13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00008			on Laboratories, Lot M2P1		(Purchased Read		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00007			on Laboratories, Lot M2Pl		(Purchased Read		13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00007	05/27/21		con Laboratories, Lot M4F		(Purchased Read		13C4-PFHpA	50 ug/mL
LCM5PFPEA_00008	05/22/20		ton Laboratories, Lot M5F		(Purchased Read		13C5-PFPeA	50 ug/mL
LCM8FOSA 00011	12/22/17		ton Laboratories, Lot M8F		(Purchased Read		13C8 FOSA	50 ug/mL
LCMPFBA_00008	05/24/21		gton Laboratories, Lot MF		(Purchased Read		13C4 PFBA	50 ug/mL
LCMPFDA 00011	08/19/20		gton Laboratories, Lot MP		(Purchased Read		13C2 PFDA	50 ug/mL
LCMPFDoA_00008	04/08/21	welling	ton Laboratories, Lot MP	r DOAU416	(Purchased Read	gent)	13C2 PFDoA	50 ug/mL

 Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

				Reagent	Parent Reager	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCMPFHxA_00012	04/08/21	Welling	ton Laboratories, Lot MP	FHxA0416	(Purchased Reag	ent)	13C2 PFHxA	50 ug/mL
LCMPFHxS 00008	10/23/20	Welling	ton Laboratories, Lot MP:	FHxS1015	(Purchased Reag	ent)	1802 PFHxS	47.3 ug/mL
LCMPFNA 00008	04/13/19	Welling	ton Laboratories, Lot MF	FNA0414	(Purchased Reag	ent)	13C5 PFNA	50 ug/mL
LCMPFOA 00012	01/22/21	Welling	ton Laboratories, Lot MF	FOA0116	(Purchased Reag	ent)	13C4 PFOA	50 ug/mL
LCMPFOS 00017	08/03/21	Welling	ton Laboratories, Lot MF	PFOS0816	(Purchased Reag	ent)	13C4 PFOS	47.8 ug/mL
LCMPFUdA 00009	02/12/21	Welling	ton Laboratories, Lot MP:		(Purchased Reag	ent)	13C2 PFUnA	50 ug/mL
.LCPFCSP_00071	05/15/17	11/10/16	Methanol, Lot 090285	10000 uL	LCPFCSP_00070	2000 uL	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	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	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
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
LCPFCSP_00070	05/15/17	11/15/16	Methanol, Lot 090285	10000 uL	LCPFBA_00005		Perfluorobutanoic acid (PFBA)	0.5 ug/mL
					LCPFBS_00005		Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00005		Perfluorodecanoic acid (PFDA)	0.5 ug/mL
					LCPFDoA_00005		Perfluorododecanoic acid (PFDoA)	0.5 ug/mL
					LCPFDS_00006		Perfluorodecanesulfonic acid (PFDS)	0.482 ug/mL
					LCPFHpA_00005		Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpS_00009		Perfluoroheptanesulfonic Acid	0.476 ug/mL
					LCPFHxA_00004		Perfluorohexanoic acid (PFHxA)	0.5 ug/mL
					LCPFHxDA 00006		Perfluorohexadecanoic acid	0.5 ug/mL

b Name: TestAmerica Sacramento	Job No.: 320-24184-1
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				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
Reagent 1D	Date	Date		VOTUME	1		_	
					LCPFHxS-br_00002		Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00005		Perfluorononanoic acid (PFNA)	0.5 ug/mL
					LCPFOA_00006		Perfluorooctanoic acid (PFOA)	0.5 ug/mL
					LCPFODA_00005		Perfluorooctadecanoic acid	0.5 ug/mL
					LCPFOS-br_00002		Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00006		Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00005		Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
					LCPFTeDA_00004		Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL
					LCPFTrDA_00004		Perfluorotridecanoic Acid (PFTriA)	0.5 ug/mL
					LCPFUdA_00005		Perfluoroundecanoic acid (PFUnA)	0.5 ug/mL
LCPFBA_00005	05/27/21		gton Laboratories, Lot E		(Purchased Rea	J /	Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00005	03/15/21	_	ton Laboratories, Lot L		(Purchased Rea	igent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA 00005	07/02/20	Welling	gton Laboratories, Lot F	PFDA0615	(Purchased Rea	igent)	Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00005	01/30/20		ton Laboratories, Lot P		(Purchased Rea	igent)	Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDS_00006	05/24/21	_	ton Laboratories, Lot L		(Purchased Rea	igent)	Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00005	01/22/21	Welling	ton Laboratories, Lot P	FHpA0116	(Purchased Rea	igent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpS_00009	11/06/20	Wellingt	on Laboratories, Lot LE	PFHpS1115	(Purchased Rea		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00004	12/22/20		ton Laboratories, Lot P		(Purchased Rea	igent)	Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxDA_00006	05/25/21	Wellingt	on Laboratories, Lot PE	FHxDA0516	(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00002	07/03/20	Wellingto	on Laboratories, Lot br	PFHxSK0615	(Purchased Rea		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA_00005	10/23/20		gton Laboratories, Lot E		(Purchased Rea	igent)	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00006	11/06/20	Welling	gton Laboratories, Lot E	PFOA1115	(Purchased Rea		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00005	01/30/20	Welling	ton Laboratories, Lot P	FODA0115	(Purchased Rea	igent)	Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00002	10/14/20		on Laboratories, Lot br		(Purchased Rea		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00006	09/02/17	_	ton Laboratories, Lot F		(Purchased Rea	igent)	Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00005	01/30/20	_	ton Laboratories, Lot P		(Purchased Rea	igent)	Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFTeDA_00004	12/09/20	_	con Laboratories, Lot PE		(Purchased Rea		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
LCPFTrDA_00004	12/10/18	_	on Laboratories, Lot PF		(Purchased Rea	igent)	Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFUdA_00005	08/19/20	Welling	ton Laboratories, Lot P	FUdA0815	(Purchased Rea	igent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC-L2_00023	05/15/17	12/15/16	MeOH/H2O, Lot 090285	5 mT.	LCMPFCSU 00047	250 יוו	13C2-PFHxDA	50 ng/mL
	,,	, _ ,	, .,				13C2-PFTeDA	50 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

				Reagent	Parent Reag	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							1802 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
					T GD T GG T A A A A A A A A A A A A A A A A	F.O. 7	13C2 PFUnA	50 ng/mL
					LCPFCSP_00071	50 uL	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	1 ng/mL
							(PFHpA) Perfluoroheptanesulfonic Acid	0.952 ng/mL
							Perfluoroneptanesulionic Acid Perfluoronexanoic acid (PFHxA)	1 ng/mL
							Perfluorohexadecanoic acid	1 ng/mL
							Perfluorohexanesulfonic acid	0.91 ng/mL
							(PFHxS)	
							Perfluorononanoic acid (PFNA)	1 ng/mL
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctadecanoic acid	1 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.928 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	1 ng/mL
							Perfluoropentanoic acid (PFPeA)	1 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	1 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	1 ng/mL
							Perfluoroundecanoic acid	1 ng/mL
.LCMPFCSU_00047	06/14/17	12/14/16	Methanol, Lot Baker	50000 uL	LCM2PFHxDA_00008	1000 uL	(PFUnA) 13C2-PFHxDA	1 ug/mL
			144541		LCM2PFTeDA 00007	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00007		13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00008		13C5-PFPeA	1 ug/mL
					LCM8FOSA 00011		13C8 FOSA	1 ug/mL
					LCMPFBA_00008	1000 uL	13C4 PFBA	1 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-24184-1
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				Reagent	Parent Re	agent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCMPFDA 00011	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA 00008	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00012	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00008	1000 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA 00008	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00012	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00017	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00009	1000 uL	13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00008			on Laboratories, Lot M2P		(Purchased F		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00007	12/07/20		on Laboratories, Lot M2P		(Purchased F		13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00007	05/27/21	Wellingt	on Laboratories, Lot M4E	PFHpA0516	(Purchased F	Reagent)	13C4-PFHpA	50 ug/mL
LCM5PFPEA 00008	05/22/20	Wellingt	on Laboratories, Lot M5E	PFPeA0515	(Purchased F	Reagent)	13C5-PFPeA	50 ug/mL
LCM8FOSA 00011	12/22/17	Wellingt	on Laboratories, Lot M8E	OSA1215I	(Purchased F	Reagent)	13C8 FOSA	50 ug/mL
LCMPFBA 00008	05/24/21	Welling	ton Laboratories, Lot ME	PFBA0516	(Purchased F	Reagent)	13C4 PFBA	50 ug/mL
LCMPFDA 00011	08/19/20	Welling	ton Laboratories, Lot ME	PFDA0815	(Purchased F	Reagent)	13C2 PFDA	50 ug/mL
LCMPFDoA 00008	04/08/21	Welling	ton Laboratories, Lot MP	FDoA0416	(Purchased F		13C2 PFDoA	50 ug/mL
LCMPFHxA 00012	04/08/21	Welling	ton Laboratories, Lot MP	FHxA0416	(Purchased F	Reagent)	13C2 PFHxA	50 ug/mL
LCMPFHxS 00008	10/23/20	Welling	ton Laboratories, Lot MP	FHxS1015	(Purchased F	Reagent)	1802 PFHxS	47.3 ug/mL
LCMPFNA 00008	04/13/19	Welling	ton Laboratories, Lot ME	FNA0414	(Purchased F	Reagent)	13C5 PFNA	50 ug/mL
LCMPFOA 00012	01/22/21	Welling	ton Laboratories, Lot ME	PFOA0116	(Purchased F	Reagent)	13C4 PFOA	50 ug/mL
LCMPFOS 00017	08/03/21	Welling	ton Laboratories, Lot ME	FOS0816	(Purchased F	Reagent)	13C4 PFOS	47.8 ug/mL
LCMPFUdA 00009	02/12/21	Welling	ton Laboratories, Lot MP	FUdA0216	(Purchased F	Reagent)	13C2 PFUnA	50 ug/mL
.LCPFCSP 00071	05/15/17	11/10/16	Methanol, Lot 090285	10000 uI	LCPFCSP 00070	2000 uL	Perfluorobutanoic acid (PFBA)	0.1 ug/mL
_					_		Perfluorobutanesulfonic acid	0.0884 ug/mL
							(PFBS)	
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.1 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
							Perfluoroheptanoic acid	0.1 ug/mL
							(PFHpA)	
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	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
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL

Lab Name: '	TestAmerica	Sacramento	Job No.: 320-24184-1
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	Poggant				Parent Reage	nt		
	_	_		Reagent		T		Concentration
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	
Reagent ID	Date	Date	used	vorune	Reagent 1D	Added		
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
						Perfluoroundecanoic acid	0.1 ug/mL	
							(PFUnA)	0.1 ug/mii
LCPFCSP 00070	05/15/17	11/15/16	Methanol, Lot 090285	10000 uL	LCPFBA 00005	100 uL	Perfluorobutanoic acid (PFBA)	0.5 ug/mL
_					LCPFBS_00005		Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00005		Perfluorodecanoic acid (PFDA)	0.5 ug/mL
					LCPFDoA_00005	100 uL	Perfluorododecanoic acid (PFDoA)	0.5 ug/mL
					LCPFDS_00006	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.482 ug/mL
					LCPFHpA_00005		Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpS_00009	100 uL	Perfluoroheptanesulfonic Acid	0.476 ug/mL
					LCPFHxA_00004		Perfluorohexanoic acid (PFHxA)	0.5 ug/mL
					LCPFHxDA_00006		Perfluorohexadecanoic acid	0.5 ug/mL
					LCPFHxS-br_00002		Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA 00005	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
				LCPFOA 00006	100 uL	Perfluorooctanoic acid (PFOA)	0.5 ug/mL	
				LCPFODA_00005		Perfluorooctadecanoic acid	0.5 ug/mL	
					LCPFOS-br_00002		Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00006		Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00005	100 uL	Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
				LCPFTeDA_00004	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL	
					LCPFTrDA_00004		Perfluorotridecanoic Acid (PFTriA)	0.5 ug/mL
					_		Perfluoroundecanoic acid (PFUnA)	0.5 ug/mL
LCPFBA_00005	05/27/21		gton Laboratories, Lot P		(Purchased Read		Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00005	03/15/21	Welling	gton Laboratories, Lot LE	PFBS0316	(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00005	07/02/20		gton Laboratories, Lot P		(Purchased Read		Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00005	01/30/20	Welling	gton Laboratories, Lot PI	FDoA0115	(Purchased Read	gent)	Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDS_00006	05/24/21	Welling	gton Laboratories, Lot LE	PFDS0516	(Purchased Read	gent)	Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00005	01/22/21	Welling	gton Laboratories, Lot Ph	FHpA0116	(Purchased Read	gent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpS_00009	11/06/20		ton Laboratories, Lot LP		(Purchased Read	gent)	Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00004	12/22/20	Welling	gton Laboratories, Lot PI	FHxA1215	(Purchased Read	gent)	Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxDA_00006	05/25/21		ton Laboratories, Lot PF		(Purchased Read		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00002	07/03/20	Wellingt	on Laboratories, Lot brP	FHxSK0615	(Purchased Read	gent)	Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA_00005	10/23/20	Wellin	gton Laboratories, Lot P	FNA1015	(Purchased Read	gent)	Perfluorononanoic acid (PFNA)	50 ug/mL

Lab Name	e: TestAmerica :	Sacramento	Job No.:	320-24184-1

				Reagent	Parent Reager	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCPFOA 00006	11/06/20		gton Laboratories, Lot P		(Purchased Reag	ent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA 00005	01/30/20	Welling	ton Laboratories, Lot Pl	FODA0115	(Purchased Reag	ent)	Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00002	10/14/20	_	on Laboratories, Lot br		(Purchased Reag	ent)	Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00006	09/02/17	_	ton Laboratories, Lot F		(Purchased Reag	ent)	Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00005	01/30/20	_	ton Laboratories, Lot Pl		(Purchased Reag	ent)	Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFTeDA_00004	12/09/20	_	ton Laboratories, Lot PF		(Purchased Reag	ent)	Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
LCPFTrDA_00004	12/10/18		ton Laboratories, Lot PF		(Purchased Reag	ent)	Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFUdA_00005	08/19/20	Welling	ton Laboratories, Lot Pl	FUdA0815	(Purchased Reag	ent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC-L3_00020	05/15/17	12/15/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU 00047	250 uL	13C2-PFHxDA	50 ng/mL
			,		_		13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							1802 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP 00071	250 uL	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	4.76 ng/mL
							Perfluorohexanoic acid (PFHxA)	5 ng/mL
							Perfluorohexadecanoic acid	5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	4.55 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5 ng/mL
							Perfluorooctadecanoic acid	5 ng/mL
							Perfluorooctanesulfonic acid	4.64 ng/mL
							(PFOS)	

Lab	Name:	TestAmerica	Sacramento	20-24184-1	

				Reagent	Parent Reag	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorooctane Sulfonamide (FOSA)	5 ng/mL
							Perfluoropentanoic acid (PFPeA)	5 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	5 ng/mL
.LCMPFCSU_00047	06/14/17	12/14/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008		13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00007		13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00007		13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00008		13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011		13C8 FOSA	1 ug/mL
					LCMPFBA_00008		13C4 PFBA	1 ug/mL
					LCMPFDA_00011		13C2 PFDA	1 ug/mL
					LCMPFDoA_00008		13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00008		13C5 PFNA	1 ug/mL
					LCMPFOA_00012		13C4 PFOA	1 ug/mL
					LCMPFOS_00017		13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00009		13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00008	01/07/21	Wellingt	on Laboratories, Lot M2P	FHxDA1112	(Purchased Rea	agent)	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00007			on Laboratories, Lot M2P		(Purchased Rea		13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00007	05/27/21		on Laboratories, Lot M4F		(Purchased Rea		13C4-PFHpA	50 ug/mL
LCM5PFPEA_00008	05/22/20		on Laboratories, Lot M5E		(Purchased Rea		13C5-PFPeA	50 ug/mL
LCM8FOSA_00011	12/22/17		on Laboratories, Lot M8F		(Purchased Rea		13C8 FOSA	50 ug/mL
LCMPFBA_00008	05/24/21		ton Laboratories, Lot ME		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFDA_00011	08/19/20		ton Laboratories, Lot ME		(Purchased Rea		13C2 PFDA	50 ug/mL
LCMPFDoA_00008	04/08/21		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFHxA_00012	04/08/21		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFHxA	50 ug/mL
LCMPFHxS_00008	10/23/20		ton Laboratories, Lot MP		(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA_00008	04/13/19		ton Laboratories, Lot ME		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFOA_00012	01/22/21		ton Laboratories, Lot ME		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS_00017	08/03/21		ton Laboratories, Lot ME		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA_00009	02/12/21		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFCSP_00071	05/15/17	11/10/16	Methanol, Lot 090285	10000 uL	LCPFCSP_00070	2000 uL	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

Eab Name: Tebermerrea bacramento	Lab Name: TestAmerica Sacramento Job No.: 320-24184-1
	200 11011 010 011101 100 000101100

				Reagent	Parent Reag	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid	0.091 ug/mL
							(PFHxS)	
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid	0.0928 ug/mL
							(PFOS) Perfluorooctane Sulfonamide	0 1/mT
							(FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid	0.1 ug/mL
							(PFTriA) Perfluoroundecanoic acid	0.1 ug/mL
							(PFUnA)	U.I ug/IIII
LCPFCSP 00070	05/15/17	11/15/16	Methanol, Lot 090285	10000 uL	LCPFBA 00005	100 uL	Perfluorobutanoic acid (PFBA)	0.5 ug/mL
_			·		LCPFBS_00005		Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA 00005	100 117	Perfluorodecanoic acid (PFDA)	0.5 ug/mL
					LCPFDoA 00005		Perfluorododecanoic acid	0.5 ug/mL
					_		(PFDoA)	
					LCPFDS_00006	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.482 ug/mL
					LCPFHpA_00005		Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpS 00009	100 uL	Perfluoroheptanesulfonic Acid	0.476 ug/mL
					LCPFHxA 00004		Perfluorohexanoic acid (PFHxA)	0.5 ug/mL
					LCPFHxDA_00006		Perfluorohexadecanoic acid	0.5 ug/mL
					LCPFHxS-br_00002	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00005		Perfluorononanoic acid (PFNA)	0.5 ug/mL
					LCPFOA_00006		Perfluorooctanoic acid (PFOA)	0.5 ug/mL
					LCPFODA_00005		Perfluorooctadecanoic acid	0.5 ug/mL
					LCPFOS-br_00002	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00006	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00005	100 uL	Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
					LCPFTeDA_00004	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL
					LCPFTrDA_00004	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.5 ug/mL
					LCPFUdA_00005	100 uL	Perfluoroundecanoic acid (PFUnA)	0.5 ug/mL

Lab Name: '	TestAmerica	Sacramento	Job No.: 320-24184-1
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					Reagent	Parent Reage	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used		Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCPFBA 00005	05/27/21	Welling	gton Laboratories,	Lot I	PFBA0516	(Purchased Rea	gent)	Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00005	03/15/21	Welling	ton Laboratories,	Lot L	PFBS0316	(Purchased Rea	gent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA 00005	07/02/20		gton Laboratories,			(Purchased Rea	gent)	Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00005	01/30/20	_	ton Laboratories,			(Purchased Rea	gent)	Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDS_00006	05/24/21		ton Laboratories,			(Purchased Rea	· .	Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00005	01/22/21		ton Laboratories,			(Purchased Rea	_	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpS_00009	11/06/20		ton Laboratories,			(Purchased Rea		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00004	12/22/20		ton Laboratories,			(Purchased Rea		Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxDA_00006	05/25/21		on Laboratories,			(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00002	07/03/20		on Laboratories, L			(Purchased Rea		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA_00005	10/23/20		gton Laboratories,			(Purchased Rea		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00006	11/06/20		gton Laboratories,			(Purchased Rea		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00005	01/30/20		ton Laboratories,			(Purchased Rea		Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00002	10/14/20	_	on Laboratories, I			(Purchased Rea	· .	Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00006	09/02/17	_	ton Laboratories,			(Purchased Rea	gent)	Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00005	01/30/20	_	ton Laboratories,			(Purchased Rea	gent)	Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFTeDA_00004	12/09/20	_	ton Laboratories,			(Purchased Rea	gent)	Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
LCPFTrDA_00004	12/10/18	Wellingt	ton Laboratories,	Lot PE	FTrDA1213	(Purchased Rea	gent)	Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFUdA_00005	08/19/20	Welling	ton Laboratories,	Lot P	FUdA0815	(Purchased Rea	gent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC-L4 00024	06/14/17	12/15/16	MeOH/H2O, Lot 090	285	5 mL	LCMPFCSU 00047	250 uL	13C2-PFHxDA	50 ng/mL
_			· ·			_		13C2-PFTeDA	50 ng/mL
								13C4-PFHpA	50 ng/mL
								13C5-PFPeA	50 ng/mL
								13C8 FOSA	50 ng/mL
								13C4 PFBA	50 ng/mL
								13C2 PFDA	50 ng/mL
								13C2 PFDoA	50 ng/mL
								13C2 PFHxA	50 ng/mL
								1802 PFHxS	47.3 ng/mL
								13C5 PFNA	50 ng/mL
								13C4 PFOA	50 ng/mL
								13C4 PFOS	47.8 ng/mL
								13C2 PFUnA	50 ng/mL
						LCPFCSP_00074	100 uL	Perfluorobutanoic acid (PFBA)	20 ng/mL
								Perfluorobutanesulfonic acid (PFBS)	17.68 ng/mL
								Perfluorodecanoic acid (PFDA)	20 ng/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
							Perfluorododecanoic acid (PFDoA)	20 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	19.28 ng/mL
							Perfluoroheptanoic acid (PFHpA)	20 ng/mL
							Perfluoroheptanesulfonic Acid	19.04 ng/mL
							Perfluorohexanoic acid (PFHxA)	20 ng/mL
							Perfluorohexadecanoic acid	20 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	18.2 ng/mL
							Perfluorononanoic acid (PFNA)	20 ng/mL
							Perfluorooctanoic acid (PFOA)	20 ng/mL
							Perfluorooctadecanoic acid	20 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	18.56 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	20 ng/mL
							Perfluoropentanoic acid (PFPeA)	20 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	20 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	20 ng/mL
							Perfluoroundecanoic acid (PFUnA)	20 ng/mL
.LCMPFCSU_00047	06/14/17 12	2/14/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA 00007		13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00007	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011		13C8 FOSA	1 ug/mL
					LCMPFBA_00008		13C4 PFBA	1 ug/mL
					LCMPFDA_00011		13C2 PFDA	1 ug/mL
					LCMPFDoA_00008	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00008		13C5 PFNA	1 ug/mL
					LCMPFOA_00012		13C4 PFOA	1 ug/mL
					LCMPFOS_00017		13C4 PFOS	0.956 ug/mL
T 01/07 77 00000	01/07/01				LCMPFUdA_00009		13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00008			on Laboratories, Lot M2P		(Purchased Read		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00007			on Laboratories, Lot M2Pl		(Purchased Read		13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00007			ton Laboratories, Lot M4F		(Purchased Read		13C4-PFHpA	50 ug/mL
LCM5PFPEA_00008			ton Laboratories, Lot MSF		(Purchased Read		13C5-PFPeA	50 ug/mL
LCM8FOSA 00011	12/22/17 V 05/24/21		ton Laboratories, Lot M8F		(Purchased Read		13C8 FOSA 13C4 PFBA	50 ug/mL
LCMPFBA_00008			gton Laboratories, Lot ME		(Purchased Read			50 ug/mL
LCMPFDA 00011			gton Laboratories, Lot MP		(Purchased Read		13C2 PFDA	50 ug/mL
LCMPFDoA_00008	04/08/21	weiling	ton Laboratories, Lot MP	DOAU410	(Purchased Read	gent)	13C2 PFDoA	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
LCMPFHxA 00012	04/08/21 Welling	ton Laboratories, Lot M	PFHxA0416	(Purchased Read	gent)	13C2 PFHxA	50 ug/mL
LCMPFHxS 00008	10/23/20 Welling	ton Laboratories, Lot M	PFHxS1015	(Purchased Read	gent)	1802 PFHxS	47.3 ug/mL
LCMPFNA 00008	04/13/19 Welling	ton Laboratories, Lot M	MPFNA0414	(Purchased Read	gent)	13C5 PFNA	50 ug/mL
LCMPFOA 00012	01/22/21 Welling	ton Laboratories, Lot M	MPFOA0116	(Purchased Read		13C4 PFOA	50 ug/mL
LCMPFOS 00017	08/03/21 Welling	ton Laboratories, Lot M	MPFOS0816	(Purchased Read	gent)	13C4 PFOS	47.8 ug/mL
LCMPFUdA 00009	02/12/21 Welling	ton Laboratories, Lot M	PFUdA0216	(Purchased Read	gent)	13C2 PFUnA	50 ug/mL
.LCPFCSP_00074	06/14/17 12/14/16	Methanol, Lot 090285	10000 uL	LCPFBA_00005	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
				LCPFBS_00005		Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
				LCPFDA 00005	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
				LCPFDoA_00005		Perfluorododecanoic acid (PFDoA)	1 ug/mL
				LCPFDS_00006		Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
				LCPFHpA_00006		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
				LCPFHpS_00009		Perfluoroheptanesulfonic Acid	0.952 ug/mL
				LCPFHxA_00005		Perfluorohexanoic acid (PFHxA)	1 ug/mL
				LCPFHxDA_00006		Perfluorohexadecanoic acid	1 ug/mL
				LCPFHxS-br_00002		Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
				LCPFNA_00006		Perfluorononanoic acid (PFNA)	1 ug/mL
				LCPFOA_00006		Perfluorooctanoic acid (PFOA)	1 ug/mL
				LCPFODA_00006		Perfluorooctadecanoic acid	1 ug/mL
				LCPFOS-br_00002		Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
				LCPFOSA_00008		Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
				LCPFPeA_00005		Perfluoropentanoic acid (PFPeA)	1 ug/mL
				LCPFTeDA_00005		Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
				LCPFTrDA_00005		Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
				LCPFUdA_00005		Perfluoroundecanoic acid (PFUnA)	1 ug/mL
LCPFBA_00005		gton Laboratories, Lot		(Purchased Read		Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00005		ton Laboratories, Lot I	LPFBS0316	(Purchased Reac	gent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00005		gton Laboratories, Lot		(Purchased Read		Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00005		ton Laboratories, Lot F		(Purchased Reac		Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDS_00006		ton Laboratories, Lot I		(Purchased Read	gent)	Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00006		ton Laboratories, Lot F		(Purchased Reac	gent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpS_00009		ton Laboratories, Lot L		(Purchased Read		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00005	12/22/20 Welling	gton Laboratories, Lot E	PFHxA1215	(Purchased Read	gent)	Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxDA_00006	05/25/21 Welling	ton Laboratories, Lot P	FHxDA0516	(Purchased Read	gent)	Perfluorohexadecanoic acid	50 ug/mL

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				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCPFHxS-br_00002	07/03/20	Wellingt	on Laboratories, Lot b	rPFHxSK0615	(Purchased Rea	gent)	Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA 00006	10/23/20	Wellin	gton Laboratories, Lot	PFNA1015	(Purchased Rea	gent)	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA 00006	11/06/20	Wellin	gton Laboratories, Lot	PFOA1115	(Purchased Rea		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00006	04/29/21		ton Laboratories, Lot		(Purchased Rea		Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00002	10/14/20	_	on Laboratories, Lot b		(Purchased Rea		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00008	09/02/17	_	ton Laboratories, Lot		(Purchased Rea		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00005	01/30/20		ton Laboratories, Lot		(Purchased Rea	· .	Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFTeDA_00005	12/09/20		ton Laboratories, Lot 1		(Purchased Rea		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
LCPFTrDA_00005	02/12/21		ton Laboratories, Lot 1		(Purchased Rea		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFUdA_00005	08/19/20	Welling	ston Laboratories, Lot	PFUdA0815	(Purchased Rea	gent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC-L5 00022	06/14/17	12/15/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU 00047	250 uI	13C2-PFHxDA	50 ng/mL
_					_		13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							1802 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
					LCPFCSP 00074	250 7	13C2 PFUnA Perfluorobutanoic acid (PFBA)	50 ng/mL
					LCPFCSP_000/4	250 uL	Perfluorobutanesulfonic acid	50 ng/mL 44.2 ng/mL
							(PFBS)	
							Perfluorodecanoic acid (PFDA) Perfluorododecanoic acid	50 ng/mL
							(PFDoA)	50 ng/mL
							Perfluorodecanesulfonic acid	48.2 ng/mL
							(PFDS)	40.2 119/1111
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL
							Perfluoroheptanesulfonic Acid	47.6 ng/mL
							Perfluorohexanoic acid (PFHxA)	50 ng/mL
							Perfluorohexadecanoic acid	50 ng/mL
							Perfluorohexanesulfonic acid	45.5 ng/mL
							(PFHxS)	
							Perfluorononanoic acid (PFNA)	50 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
							Perfluorooctadecanoic acid	50 ng/mL

Lab N	ame:	TestAmerica	Sacramento	Job No.:	: 320-24184-1
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				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added		Concentration
							Perfluorooctanesulfonic acid (PFOS)	46.4 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	50 ng/mL
							Perfluoropentanoic acid (PFPeA)	50 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	50 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	50 ng/mL
							Perfluoroundecanoic acid (PFUnA)	50 ng/mL
.LCMPFCSU_00047	06/14/17	12/14/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008		13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00007		13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00007		13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00008		13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011		13C8 FOSA	1 ug/mL
					LCMPFBA_00008		13C4 PFBA	1 ug/mL
					LCMPFDA_00011	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00008		13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00008		13C5 PFNA	1 ug/mL
					LCMPFOA 00012		13C4 PFOA	1 ug/mL
					LCMPFOS_00017		13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00009		13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00008			on Laboratories, Lot M2P		(Purchased Rea		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00007	12/07/20		on Laboratories, Lot M2P		(Purchased Rea		13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00007	05/27/21		on Laboratories, Lot M4F		(Purchased Rea		13C4-PFHpA	50 ug/mL
LCM5PFPEA_00008	05/22/20		on Laboratories, Lot M5E		(Purchased Rea		13C5-PFPeA	50 ug/mL
LCM8FOSA_00011	12/22/17		on Laboratories, Lot M8E	OSA1215I	(Purchased Rea		13C8 FOSA	50 ug/mL
LCMPFBA_00008	05/24/21		ton Laboratories, Lot ME		(Purchased Rea	J '	13C4 PFBA	50 ug/mL
LCMPFDA_00011	08/19/20		ton Laboratories, Lot ME		(Purchased Rea		13C2 PFDA	50 ug/mL
LCMPFDoA_00008	04/08/21		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFHxA_00012	04/08/21		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFHxA	50 ug/mL
LCMPFHxS_00008	10/23/20		ton Laboratories, Lot MP		(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA_00008	04/13/19		ton Laboratories, Lot MI	FNA0414	(Purchased Rea	gent)	13C5 PFNA	50 ug/mL
LCMPFOA 00012	01/22/21	Welling	ton Laboratories, Lot ME	PFOAU116	(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS 00017	08/03/21		ton Laboratories, Lot ME		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00009	02/12/21		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFCSP_00074	06/14/17	12/14/16	Methanol, Lot 090285	10000 uL	LCPFBS_00005 LCPFBS_00005	200 uL 200 uL	Perfluorobutanoic acid (PFBA) Perfluorobutanesulfonic acid	1 ug/mL 0.884 ug/mL
					ICDEDA 0000E	200	(PFBS) Perfluorodecanoic acid (PFDA)	1/
					LCPFDA 00005 LCPFDoA 00005	200 uL	Perfluorodecanoic acid (PFDA) Perfluorododecanoic acid	1 ug/mL
					_		(PFDoA)	1 ug/mL
					LCPFDS_00006	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL

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				Doogont	Parent Reage	ent		
	Exp	Prep	Dilutant	Reagent Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCPFHpA_00006	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS 00009	200 ut.	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00005	200 ub	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA 00006		Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00002		Perfluorohexanesulfonic acid	0.91 ug/mL
					LCPFNA 00006	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00006		Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00002		Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00008		Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00005	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00005		Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00005		Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00005	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
LCPFBA 00005	05/27/21	Welling	gton Laboratories, Lot P	FBA0516	(Purchased Read	gent)	Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00005	03/15/21	_	ton Laboratories, Lot L		(Purchased Read	gent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00005	07/02/20		gton Laboratories, Lot P		(Purchased Read		Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00005	01/30/20	_	ton Laboratories, Lot Pl		(Purchased Read		Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDS_00006	05/24/21	_	ton Laboratories, Lot L		(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00006	01/22/21	_	ton Laboratories, Lot Pl	_	(Purchased Read	· .	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpS_00009	11/06/20		ton Laboratories, Lot LP		(Purchased Read	-	Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00005	12/22/20		ton Laboratories, Lot Pl		(Purchased Read		Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxDA_00006 LCPFHxS-br_00002	05/25/21 07/03/20		ton Laboratories, Lot PF on Laboratories, Lot brF		(Purchased Read		Perfluorohexadecanoic acid Perfluorohexanesulfonic acid (PFHxS)	50 ug/mL 45.5 ug/mL
LCPFNA 00006	10/23/20	Wellin	gton Laboratories, Lot P	FNA1015	(Purchased Read	gent)	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA 00006	11/06/20		gton Laboratories, Lot F		(Purchased Read	,	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA 00006	04/29/21	Welling	ton Laboratories, Lot Pl	TODA0416	(Purchased Read		Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00002	10/14/20	Wellingt	on Laboratories, Lot bri	PFOSK1015	(Purchased Read		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00008	09/02/17	Welling	ton Laboratories, Lot F	DSA0815I	(Purchased Read	gent)	Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00005	01/30/20	_	ton Laboratories, Lot P		(Purchased Read	gent)	Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFTeDA_00005	12/09/20	Wellingt	ton Laboratories, Lot PF	TeDA1215	(Purchased Read	gent)	Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
LCPFTrDA_00005	02/12/21	Wellingt	ton Laboratories, Lot PF	TrDA0216	(Purchased Read	gent)	Perfluorotridecanoic Acid (PFTriA)	50 ug/mL

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				Boa cont	Parent Reag	ent		
Reagent ID	-	rep ate		Reagent Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCPFUdA 00005			 gton Laboratories, Lot		(Purchased Rea		Perfluoroundecanoic acid	50 ug/mI
_					·		(PFUnA)	
LCPFC-L6_00020	06/14/17 12/	15/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU 00047	250 uL	13C2-PFHxDA	50 ng/ml
_					_		13C2-PFTeDA	50 ng/m
							13C4-PFHpA	50 ng/ml
							13C5-PFPeA	50 ng/m
							13C8 FOSA	50 ng/m
							13C4 PFBA	50 ng/m
							13C2 PFDA	50 ng/m
							13C2 PFDoA	50 ng/m
							13C2 PFHxA	50 ng/m
							1802 PFHxS	47.3 ng/ml
							13C5 PFNA	50 ng/ml
							13C4 PFOA	50 ng/ml
							13C4 PFOS	47.8 ng/ml
							13C2 PFUnA	50 ng/ml
					LCPFCSP 00074	1000 uL		200 ng/ml
					Herrest_000/4	1000 41	Perfluorobutanesulfonic acid	176.8 ng/ml
							(PFBS)	170.0 1197111
							Perfluorodecanoic acid (PFDA)	200 ng/ml
							Perfluorododecanoic acid	200 ng/ml
							(PFDoA)	200 119/1111
							Perfluorodecanesulfonic acid	192.8 ng/mI
							(PFDS)	20210 1197 1112
							Perfluoroheptanoic acid	200 ng/mI
							(PFHpA)	200 1197 1112
							Perfluoroheptanesulfonic Acid	190.4 ng/mI
							Perfluorohexanoic acid (PFHxA)	200 ng/mI
							Perfluorohexadecanoic acid	200 ng/ml
							Perfluorohexanesulfonic acid	182 ng/ml
							(PFHxS)	
							Perfluorononanoic acid (PFNA)	200 ng/ml
							Perfluorooctanoic acid (PFOA)	200 ng/ml
							Perfluorooctadecanoic acid	200 ng/mI
							Perfluorooctanesulfonic acid	185.6 ng/ml
							(PFOS)]
							Perfluorooctane Sulfonamide	200 ng/mI
							(FOSA)	J.
							Perfluoropentanoic acid	200 ng/mI
							(PFPeA)	
							Perfluorotetradecanoic acid	200 ng/mI
							(PFTeA)	
							Perfluorotridecanoic Acid	200 ng/mI
							(PFTriA)	
							Perfluoroundecanoic acid	200 ng/mI
							(PFUnA)	
.LCMPFCSU_00047	06/14/17 12/	14/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mI
			1 T T T J T L	1	LCM2PFTeDA 00007	1	I .	1

Lab Name: TestAmerica Sacramento	Job No.: 320-24184-1
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				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID		Date	Used	Volume	Reagent ID		Analyte	Concentration
					LCM4PFHPA_00007		13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA 00011	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA 00008	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA 00011	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA 00008	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00012	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00008	1000 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA 00008	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00012	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00017	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00009	1000 uL	13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00008	01/07/21	Wellingt	on Laboratories, Lot M21	PFHxDA1112	(Purchased Rea	gent)	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00007	12/07/20		on Laboratories, Lot M21		(Purchased Rea		13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00007	05/27/21	Wellingt	on Laboratories, Lot M4	PFHpA0516	(Purchased Rea	gent)	13C4-PFHpA	50 ug/mL
LCM5PFPEA 00008	05/22/20	Wellingt	on Laboratories, Lot M5	PFPeA0515	(Purchased Rea	gent)	13C5-PFPeA	50 ug/mL
LCM8FOSA 00011	12/22/17		on Laboratories, Lot M8		(Purchased Rea		13C8 FOSA	50 ug/mL
LCMPFBA 00008	05/24/21		gton Laboratories, Lot M		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFDA 00011	08/19/20		ton Laboratories, Lot M		(Purchased Rea		13C2 PFDA	50 ug/mL
LCMPFDoA 00008	04/08/21		ton Laboratories, Lot MI		(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFHxA 00012	04/08/21		ton Laboratories, Lot MI		(Purchased Rea		13C2 PFHxA	50 ug/mL
LCMPFHxS 00008	10/23/20		ton Laboratories, Lot MI		(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA 00008	04/13/19		ton Laboratories, Lot M		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFOA 00012	01/22/21		gton Laboratories, Lot M		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS 00017	08/03/21		ton Laboratories, Lot M		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00009	02/12/21		ton Laboratories, Lot MI		(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFCSP 00074	06/14/17		Methanol, Lot 090285		LCPFBA 00005		Perfluorobutanoic acid (PFBA)	1 ug/mL
_			,		LCPFBS_00005		Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00005	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00005	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00006		Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00006		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS 00009	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00005	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA 00006	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00002		Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00006		Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00006		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00006		Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00002		Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00008	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-24184-1

				Reagent	Parent Reag	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCPFPeA_00005		Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00005		Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00005		Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00005		Perfluoroundecanoic acid (PFUnA)	1 ug/mL
LCPFBA_00005	05/27/21	Welling	gton Laboratories, Lot	PFBA0516	(Purchased Rea		Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00005	03/15/21		ton Laboratories, Lot I		(Purchased Rea		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00005	07/02/20	Welling	gton Laboratories, Lot	PFDA0615	(Purchased Rea		Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00005	01/30/20	_	ton Laboratories, Lot I		(Purchased Rea		Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDS_00006	05/24/21	_	ton Laboratories, Lot I		(Purchased Rea		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00006	01/22/21	_	ton Laboratories, Lot I	-	(Purchased Rea		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpS_00009	11/06/20		ton Laboratories, Lot L		(Purchased Rea		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00005	12/22/20		ton Laboratories, Lot H		(Purchased Rea		Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxDA_00006	05/25/21		ton Laboratories, Lot P		(Purchased Rea	,	Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00002	07/03/20	_	on Laboratories, Lot br		(Purchased Rea	· .	Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA_00006	10/23/20		gton Laboratories, Lot		(Purchased Rea		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00006	11/06/20		gton Laboratories, Lot		(Purchased Rea		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00006	04/29/21	Welling	ton Laboratories, Lot I	PFODA0416	(Purchased Rea		Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00002	10/14/20		on Laboratories, Lot b		(Purchased Rea		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00008	09/02/17	_	ton Laboratories, Lot I		(Purchased Rea		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00005	01/30/20	_	ton Laboratories, Lot H		(Purchased Rea	_	Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFTeDA_00005	12/09/20	_	ton Laboratories, Lot P		(Purchased Rea		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
LCPFTrDA_00005	02/12/21	_	on Laboratories, Lot P		(Purchased Rea		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFUdA_00005	08/19/20	Welling	ton Laboratories, Lot I	PFUdA0815	(Purchased Rea	agent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC2-L1 00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU 00005	250 uL	d-N-EtFOSA-M	50 ng/mL
_			·		_		d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
					LCPFC2SP_00014	25 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.474 ng/mL

Lab	Name:	TestAmerica	Sacramento	Job No.:	320-24184-1
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				Reagent	Parent Reager	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.479 ng/mL
							N-ethylperfluoro-1-octanesulfo namide	0.5 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ng/mL
							MeFOSA	0.5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ng/mL
.LCMPFC2SU 00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M 00001	200 uL	d-N-EtFOSA-M	1 ug/mL
_					LCd-NMeFOSA-M 00001	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA 00001	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA 00001	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS 00001	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS 00001	200 uL	M2-8:2FTS	0.958 ug/mL
LCd-NEtFOSA-M 00001	03/10/19	WE:	LLINGTON, Lot dNEtFOSA03	14M	(Purchased Reag	ent)	d-N-EtFOSA-M	50 ug/mL
LCd-NMeFOSA-M 00001	01/28/19		LLINGTON, Lot dNMeFOSA01	14M	(Purchased Reag	ent)	d-N-MeFOSA-M	50 ug/mL
LCd3-NMeFOSAA 00001	01/31/18		LINGTON, Lot d3NMeFOSAAC		(Purchased Reag		d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA 00001	05/08/20	WEI	LINGTON, Lot d5NEtFOSAAC)515	(Purchased Reag		d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS 00001	07/15/17		ELLINGTON, Lot M262FTS07		(Purchased Reag		M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS 00001	04/13/17		ELLINGTON, Lot M282FTS04		(Purchased Reag		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP 00014	01/20/17		Methanol, Lot 104453		LCPFC2SP 00013	500 uL		0.0948 ug/mL
			,				1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	, , , , , , , , , , , , , , , , , , , ,
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.0958 ug/mL
							N-ethylperfluoro-1-octanesulfo namide	0.1 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002		N-ethylperfluoro-1-octanesulfo namide	1 ug/mL
					LCN-EtFOSAA_00001		N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00001		MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-24184-1

				Reagent	Parent Reager	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LC6:2FTS_00001	10/03/17		WELLINGTON, Lot 62FTS10	14	(Purchased Reag	ent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
LC8:2FTS_00001	10/03/17		WELLINGTON, Lot 82FTS10	14	(Purchased Reag	ent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
LCN-EtFOSA-M_00002	07/14/19	WI	ELLINGTON, Lot NETFOSA07	14M	(Purchased Reag	ent)	N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
LCN-EtFOSAA_00001	01/29/18	WI	ELLINGTON, Lot NETFOSAAO	113	(Purchased Reag	ent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSA-M 00001	07/15/19		ELLINGTON, Lot NMeFOSA07		(Purchased Reag	ent)	MeFOSA	50 ug/mL
LCN-MeFOSAA_00001	12/09/19	WI	ELLINGTON, Lot NMeFOSAA1	214	(Purchased Reag	ent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L2 00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU 00005	250 uL	d-N-EtFOSA-M	50 ng/mL
_					_		d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
					LCPFC2SP_00014	50 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ng/mL
							N-ethylperfluoro-1-octanesulfo namide	1 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							MeFOSA	1 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
.LCMPFC2SU_00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M_00001		d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00001		d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00001		d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00001		d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00001		M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00001		M2-8:2FTS	0.958 ug/mL
LCd-NEtFOSA-M_00001	03/10/19		LLINGTON, Lot dNEtFOSA0		(Purchased Reag	ent)	d-N-EtFOSA-M	50 ug/mL
LCd-NMeFOSA-M_00001	01/28/19		LLINGTON, Lot dNMeFOSA0		(Purchased Reag		d-N-MeFOSA-M	50 ug/mL
LCd3-NMeFOSAA_00001	01/31/18		LLINGTON, Lot d3NMeFOSAA		(Purchased Reag		d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA_00001	05/08/20		LLINGTON, Lot d5NEtFOSAA		(Purchased Reag		d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS_00001	07/15/17		ELLINGTON, Lot M262FTS0		(Purchased Reag		M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS_00001	04/13/17		ELLINGTON, Lot M282FTSO		(Purchased Reag		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00014	01/20/17	07/20/16	Methanol, Lot 104453	5000 uL	LCPFC2SP_00013	500 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job 1	No.:	320-	2418	34-	-1

				Reagent	Parent Reager	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					3		Sodium	0.0958 ug/mL
							1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.0550 ag/mi
							N-ethylperfluoro-1-octanesulfo namide	0.1 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00001		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002	200 uL	N-ethylperfluoro-1-octanesulfo namide	1 ug/mL
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M 00001	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
LC6:2FTS_00001	10/03/17	1	WELLINGTON, Lot 62FTS101	4	(Purchased Reag	rent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
LC8:2FTS_00001	10/03/17	Ī	WELLINGTON, Lot 82FTS101	4	(Purchased Reag	ent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
LCN-EtFOSA-M_00002	07/14/19	WE	LLINGTON, Lot NEtFOSA071	L4M	(Purchased Reag	ent)	N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
LCN-EtFOSAA_00001	01/29/18	WE	LLINGTON, Lot NETFOSAA0	113	(Purchased Reag	rent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSA-M_00001	07/15/19		LLINGTON, Lot NMeFOSA071		(Purchased Reag	ent)	MeFOSA	50 ug/mL
LCN-MeFOSAA_00001	12/09/19	WE	LLINGTON, Lot NMeFOSAA12	214	(Purchased Reag	ent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L3_00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU 00005	250 uL	d-N-EtFOSA-M	50 ng/mL
					_		d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
					LCPFC2SP_00014	250 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	4.74 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	4.79 ng/mL
							N-ethylperfluoro-1-octanesulfo namide	5 ng/mL

Lab	Name:	TestAmerica	Sacramento	Job No.:	320-24184-1

					Parent Reagen	†		
				Reagent	rarene neagen			
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							N-ethyl perfluorooctane	5 ng/mL
							sulfonamidoacetic acid	
							MeFOSA	5 ng/mL
							N-methyl perfluorooctane	5 ng/mL
							sulfonamidoacetic acid	
.LCMPFC2SU_00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M_00001		d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00001		d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00001		d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00001		d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS 00001	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS 00001	200 uL	M2-8:2FTS	0.958 ug/mL
LCd-NEtFOSA-M 00001	03/10/19	WE	LLINGTON, Lot dNEtFOSA03	14M	(Purchased Reage	ent)	d-N-EtFOSA-M	50 ug/mL
LCd-NMeFOSA-M 00001	01/28/19	WE	LLINGTON, Lot dNMeFOSA01:	14M	(Purchased Reage	ent)	d-N-MeFOSA-M	50 ug/mL
LCd3-NMeFOSAA 00001	01/31/18	WEI	LINGTON, Lot d3NMeFOSAA0	113	(Purchased Reage	ent)	d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA 00001	05/08/20		LINGTON, Lot d5NEtFOSAA0	515	(Purchased Reage		d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS 00001	07/15/17		ELLINGTON, Lot M262FTS07		(Purchased Reage	ent)	M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS 00001	04/13/17		ELLINGTON, Lot M282FTS04		(Purchased Reage		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP 00014	01/20/17	07/20/16	Methanol, Lot 104453	5000 uL	LCPFC2SP 00013	500 uL	Sodium	0.0948 ug/mL
	, , ,		,				1H,1H,2H,2H-perfluorooctane	
							sulfonate (6:2)	
							Sodium	0.0958 ug/mL
							1H, 1H, 2H, 2H-perfluorooctane	
							sulfonate (8:2)	
							N-ethylperfluoro-1-octanesulfo	0.1 ug/mL
							namide	
							N-ethyl perfluorooctane	0.1 ug/mL
							sulfonamidoacetic acid	
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane	0.1 ug/mL
							sulfonamidoacetic acid	
LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001	200 uL		0.948 ug/mL
							1H,1H,2H,2H-perfluorooctane	
					T CO. O.T. C. O.O.O.1	000 -	sulfonate (6:2)	0.050 / 7
					LC8:2FTS_00001	200 uL	Sodium	0.958 ug/mL
							1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	
					LCN-EtFOSA-M 00002	200 117	N-ethylperfluoro-1-octanesulfo	1 ug/mL
					_		namide	_
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane	1 ug/mL
					_		sulfonamidoacetic acid	
					LCN-MeFOSA-M_00001		MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
LC6:2FTS 00001	10/03/17		WELLINGTON, Lot 62FTS101	4	(Purchased Reage	ent)	Sodium	47.4 ug/mL
			. ,		, , , , , , , , , , , , , , , , , , , ,	- /	1H,1H,2H,2H-perfluorooctane	4.5, 11.2
							sulfonate (6:2)	
LC8:2FTS 00001	10/03/17		WELLINGTON, Lot 82FTS101	4	(Purchased Reage	ent)	Sodium	47.9 ug/mL
_							1H,1H,2H,2H-perfluorooctane	
	1						sulfonate (8:2)	

Lab	Name:	TestAmerica	Sacramento	Job No.	: 320-24184-1

				Doogent	Parent Reager	nt		
	Exp	Prep	Dilutant	Reagent Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCN-EtFOSA-M 00002	07/14/19	MET.	LINGTON, Lot NEtFOSA	0714M	(Purchased Reag	 entl	N-ethylperfluoro-1-octanesulfo	
ICN ECFOSA M_00002	07/14/13	WED.	DINGION, DOC NECTOSE	1071411	(Turchased Keag	enc)	namide	30 dg/1111
LCN-EtFOSAA 00001	01/29/18	WEL:	LINGTON, Lot NETFOSA	A0113	(Purchased Reag	ent)	N-ethyl perfluorooctane	50 ug/mL
							sulfonamidoacetic acid	
LCN-MeFOSA-M_00001	07/15/19		LINGTON, Lot NMeFOSA		(Purchased Reag		MeFOSA	50 ug/mL
LCN-MeFOSAA_00001	12/09/19	WEL:	LINGTON, Lot NMeFOSA	AA1214	(Purchased Reag	ent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L4_00003	02/26/17	09/22/16 M	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU 00008	250 uL	d-N-EtFOSA-M	50 ng/mL
_					_		d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
					LCPFC2SP 00017	200 uL	Sodium	18.96 ng/mL
					_		1H,1H,2H,2H-perfluorooctane	_
							sulfonate (6:2)	
							Sodium	19.16 ng/mL
							1H,1H,2H,2H-perfluorooctane	
							sulfonate (8:2)	
							N-ethylperfluoro-1-octanesulfo	20 ng/mL
							namide	
							N-ethyl perfluorooctane	20 ng/mL
							sulfonamidoacetic acid	00 / 7
							MeFOSA	20 ng/mL
							N-methyl perfluorooctane	20 ng/mL
.LCMPFC2SU 00008	02/26/17	00/26/16 M	Methanol, Lot 104453	10000 117	LCd-NEtFOSA-M 00002	200 117	sulfonamidoacetic acid d-N-EtFOSA-M	1 ug/mL
.LCMPFC250_00000	02/20/1/	00/20/10	lethanor, Lot 104453	10000 uL	LCd-NMeFOSA-M_00002		d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA 00002		d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00002		d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS 00002		M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS 00002		M2-8:2FTS	0.958 ug/mL
LCd-NEtFOSA-M 00002	03/10/19	WETT	LINGTON, Lot dNEtFOS	7.031.4M	(Purchased Reag		d-N-EtFOSA-M	50 ug/mL
LCd-NMeFOSA-M 00002	06/10/21		LINGTON, Lot dNMeFOS		(Purchased Reag		d-N-MeFOSA-M	50 ug/mL
LCd3-NMeFOSAA 00002	01/20/21		INGTON, Lot d3NMeFOS		(Purchased Reag		d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA 00002	12/07/20	WEI.I.	INGTON, Lot d5NEtFOS	ΔΔ1115	(Purchased Reag		d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS 00002	01/08/21		LINGTON, Lot M262FT		(Purchased Reag		M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS 00002	01/08/21		LINGTON, Lot M282FT		(Purchased Reag		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP 00017			Methanol, Lot 104453		LC6:2FTS 00002		Sodium	0.474 ug/mL
. 10110101_00017	00,02,1,	03,02,10		10000 42	200.2110_00002	100 42	1H,1H,2H,2H-perfluorooctane	0.1/1 09/112
							sulfonate (6:2)	
					LC8:2FTS 00002	100 uL	Sodium	0.479 ug/mL
					_		1H,1H,2H,2H-perfluorooctane	
							sulfonate (8:2)	
					LCN-EtFOSA-M_00003	100 uL	N-ethylperfluoro-1-octanesulfo	0.5 ug/mL
					_		namide	
					LCN-EtFOSAA_00002	100 uL	N-ethyl perfluorooctane	0.5 ug/mL
					TON MAROOR M. COCCO	100 -	sulfonamidoacetic acid MeFOSA	0 - / -
					LCN-MeFOSA-M_00002	l TOO ur	Merosa	0.5 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.:	320-24184-1

				Reagent	Parent Reager	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
					LCN-MeFOSAA_00003	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mI
LC6:2FTS_00002	06/25/21		WELLINGTON, Lot 62FTS06	16	(Purchased Reag	ent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mI
LC8:2FTS_00002	10/23/20		WELLINGTON, Lot 82FTS101	15	(Purchased Reag	ent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mI
LCN-EtFOSA-M_00003	05/24/21	WE	ELLINGTON, Lot NETFOSA05	16M	(Purchased Reag	ent)	N-ethylperfluoro-1-octanesulfo namide	50 ug/mI
LCN-EtFOSAA_00002	01/20/21	WE	ELLINGTON, Lot NETFOSAA0	116	(Purchased Reag	ent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mI
LCN-MeFOSA-M 00002	05/24/21	WE	ELLINGTON, Lot NMeFOSA07	14M	(Purchased Reag	ent)	MeFOSA	50 ug/mI
LCN-MeFOSAA_00003	01/20/21	WE	ELLINGTON, Lot NMeFOSAA0	116	(Purchased Reag	ent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mI
LCPFC2-L5 00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mT.	LCMPFC2SU 00005	250 u.T.	d-N-EtFOSA-M	50 ng/mI
100002	01/00/1/	07/20/10	Heon/ 1120 ,	9 1111		250 41	d-N-MeFOSA-M	50 ng/mI
							d3-NMeFOSAA	50 ng/mI
							d5-NetFOSAA d5-NetFOSAA	50 ng/mI
							M2-6:2FTS	47.5 ng/mI
					TODEGOOD 00013	250 7	M2-8:2FTS	47.9 ng/mI
					LCPFC2SP_00013	250 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ng/mI
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ng/mI
							N-ethylperfluoro-1-octanesulfo	50 ng/mI
							N-ethyl perfluorooctane sulfonamidoacetic acid	50 ng/mI
I							MeFOSA	50 ng/mI
							N-methyl perfluorooctane sulfonamidoacetic acid	50 ng/mI
.LCMPFC2SU_00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M_00001	200 uL	d-N-EtFOSA-M	1 ug/mI
					LCd-NMeFOSA-M_00001		d-N-MeFOSA-M	1 ug/mI
					LCd3-NMeFOSAA_00001	200 uL	d3-NMeFOSAA	1 ug/mI
					LCd5-NEtFOSAA 00001	200 uL	d5-NEtFOSAA	1 ug/mI
					LCM2-6:FTS 00001	200 uL	M2-6:2FTS	0.95 ug/mI
					LCM2-8:2FTS 00001	200 uL	M2-8:2FTS	0.958 ug/mI
LCd-NEtFOSA-M 00001	03/10/19	WE	LLINGTON, Lot dNEtFOSA03	314M	(Purchased Reag	ent)	d-N-EtFOSA-M	50 ug/mI
LCd-NMeFOSA-M 00001	01/28/19		LLINGTON, Lot dNMeFOSA01		(Purchased Reag		d-N-MeFOSA-M	50 ug/mI
LCd3-NMeFOSAA 00001	01/31/18		LINGTON, Lot d3NMeFOSAA		(Purchased Reag		d3-NMeFOSAA	50 ug/mI
LCd5-NEtFOSAA 00001	05/08/20		LINGTON, Lot d5NEtFOSAA		(Purchased Reag		d5-NEtFOSAA	50 ug/mI
LCM2-6:FTS 00001	07/15/17	W	ELLINGTON, Lot M262FTS0	714	(Purchased Reag		M2-6:2FTS	47.5 ug/mI
LCM2-8:2FTS 00001	04/13/17		ELLINGTON, Lot M282FTS04		(Purchased Reag		M2-8:2FTS	47.9 ug/mI
.LCPFC2SP_00013			Methanol, Lot 104453		LC6:2FTS_00001		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL

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				Reagent	Parent Reager	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
					LC8:2FTS_00001		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002		N-ethylperfluoro-1-octanesulfo namide	1 ug/mL
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M 00001		MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
LC6:2FTS_00001	10/03/17		WELLINGTON, Lot 62FTS101	4	(Purchased Reag		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
LC8:2FTS_00001	10/03/17		WELLINGTON, Lot 82FTS101		(Purchased Reag		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
LCN-EtFOSA-M_00002	07/14/19		ELLINGTON, Lot NEtFOSA07	L4M	(Purchased Reag	ent)	N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
LCN-EtFOSAA_00001	01/29/18	W	ELLINGTON, Lot NEtFOSAA0	113	(Purchased Reag	ent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSA-M 00001	07/15/19	WI	ELLINGTON, Lot NMeFOSA07	L4M	(Purchased Reag	ent)	MeFOSA	50 ug/mL
LCN-MeFOSAA_00001	12/09/19	W	ELLINGTON, Lot NMeFOSAA12	214	(Purchased Reag	ent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L6 00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU 00005	250 uL	d-N-EtFOSA-M	50 ng/mL
_							d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
					LCPFC2SP 00013	1000 uL		189.6 ng/mL
						1000 42	1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	103 . 0 11g/
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	191.6 ng/mL
							N-ethylperfluoro-1-octanesulfo	200 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	200 ng/mL
							MeFOSA	200 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	200 ng/mL
.LCMPFC2SU 00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M 00001	200 uL	d-N-EtFOSA-M	1 ug/mL
_			,		LCd-NMeFOSA-M 00001		d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA 00001		d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA 00001		d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS 00001		M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS 00001		M2-8:2FTS	0.958 ug/mL
		1	1					

Lab	Name:	TestAmerica	Sacramento	20-24184-1	

				Reagent	Parent Reage	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCd-NMeFOSA-M 00001	01/28/19	WELLI	NGTON, Lot dNMeFOSAC)114M	(Purchased Read	rent)	d-N-MeFOSA-M	50 ug/mL
LCd3-NMeFOSAA 00001	01/31/18	WELLIN	NGTON, Lot d3NMeFOSA	A0113	(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA 00001	05/08/20	WELLIN	NGTON, Lot d5NEtFOSA	A0515	(Purchased Read	gent)	d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS 00001	07/15/17	WELL	INGTON, Lot M262FTS0	714	(Purchased Read	gent)	M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS 00001	04/13/17	WELL	INGTON, Lot M282FTSO)414	(Purchased Read	gent)	M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00013	01/20/17 07	7/20/16 Me	thanol, Lot 104453	10000 uL	LC6:2FTS_00001		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00001		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002		N-ethylperfluoro-1-octanesulfo namide	
					LCN-EtFOSAA_00001		N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00001		MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
LC6:2FTS_00001	10/03/17	WEL	LINGTON, Lot 62FTS10)14	(Purchased Read	gent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
LC8:2FTS_00001	10/03/17	WEL	LINGTON, Lot 82FTS10)14	(Purchased Read	gent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
LCN-EtFOSA-M_00002	07/14/19	WELL]	INGTON, Lot NETFOSAO	714M	(Purchased Reac	gent)	N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
LCN-EtFOSAA_00001	01/29/18	WELL]	INGTON, Lot NETFOSAA	0113	(Purchased Reac	gent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSA-M 00001	07/15/19	WELLI	INGTON, Lot NMeFOSAO	714M	(Purchased Read	gent)	MeFOSA	50 ug/mL
LCN-MeFOSAA_00001	12/09/19	WELL	INGTON, Lot NMeFOSAA	1214	(Purchased Read	gent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFCIC 00020	03/01/17 12	2/01/16 Me	OH/H2O, Lot 09285	5 mI	LCMPFCSU 00046	250 uL	13C2-PFHxDA	50 ng/mL
_					_		13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							1802 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFACMXB_00007	125 uL	Perfluorobutanesulfonic acid (PFBS)	44.25 ng/mL
							Perfluorobutanoic acid (PFBA)	50 ng/mL

Lab N	ame:	TestAmerica	Sacramento	Job No.:	: 320-24184-1
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				Reagent	Parent Reag	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
							Perfluorodecanesulfonic acid (PFDS)	48.25 ng/ml
							Perfluorodecanoic acid (PFDA)	50 ng/ml
							Perfluorododecanoic acid (PFDoA)	50 ng/ml
							Perfluoroheptanoic acid (PFHpA)	50 ng/ml
							Perfluorohexanesulfonic acid (PFHxS)	47.25 ng/ml
							Perfluorohexanoic acid (PFHxA)	50 ng/ml
							Perfluorononanoic acid (PFNA)	50 ng/ml
							Perfluorooctanesulfonic acid (PFOS)	47.75 ng/ml
							Perfluorooctanoic acid (PFOA)	50 ng/ml
							Perfluoropentanoic acid (PFPeA)	50 ng/ml
							Perfluorotetradecanoic acid (PFTeA)	50 ng/ml
							Perfluorotridecanoic Acid (PFTriA)	50 ng/mi
					- appa371/ 00005	050 7	Perfluoroundecanoic acid (PFUnA)	50 ng/ml
					LCPFC3IM_00005	250 uL	Perfluorooctane Sulfonamide (FOSA)	50 ng/ml
LCMPFCSU_00046	03/01/17	11/03/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/ml
					LCM2PFTeDA_00007		13C2-PFTeDA	1 ug/ml
					LCM4PFHPA_00007		13C4-PFHpA	1 ug/ml
					LCM5PFPEA_00008		13C5-PFPeA	1 ug/ml
					LCM8FOSA_00011 LCMPFBA 00008		13C8 FOSA	1 ug/m
					LCMPFBA_00008		13C4 PFBA 13C2 PFDA	1 ug/m 1 ug/m
		:			LCMPFDoA 00008		13C2 PFDoA	1 ug/ml
					LCMPFHxA 00012		13C2 PFHxA	1 ug/m
					LCMPFHxS 00008		1802 PFHxS	0.946 ug/ml
					LCMPFNA 00008		13C5 PFNA	1 ug/ml
					LCMPFOA 00012	1000 uL	13C4 PFOA	1 ug/m]
					LCMPFOS 00017	1000 uL	13C4 PFOS	0.956 ug/ml
					LCMPFUdA_00009	1000 uL	13C2 PFUnA	1 ug/ml
.LCM2PFHxDA_00008			on Laboratories, Lot M2P:		(Purchased Rea	<i></i>	13C2-PFHxDA	50 ug/m
.LCM2PFTeDA_00007			on Laboratories, Lot M2P		(Purchased Rea		13C2-PFTeDA	50 ug/m
.LCM4PFHPA_00007	05/27/21		ton Laboratories, Lot M4F		(Purchased Rea		13C4-PFHpA	50 ug/m
.LCM5PFPEA 00008	05/22/20		ton Laboratories, Lot M5F		(Purchased Rea		13C5-PFPeA	50 ug/mi
.LCM8FOSA_00011	12/22/17		ton Laboratories, Lot M8F		(Purchased Rea		13C8 FOSA	50 ug/m
.LCMPFBA_00008	05/24/21 08/19/20	Welling	gton Laboratories, Lot MF gton Laboratories, Lot MF		(Purchased Rea		13C4 PFBA 13C2 PFDA	50 ug/m
.LCMPFDA_00011	08/19/20		gton Laboratories, Lot MF ton Laboratories, Lot MP:		(Purchased Rea (Purchased Rea		13C2 PFDA 13C2 PFDoA	50 ug/m. 50 ug/m.
.LCMPFHxA 00012	04/08/21		ton Laboratories, Lot MP:		(Purchased Rea		13C2 PFHXA	50 ug/m
.LCMPFHxS 00008	10/23/20		ton Laboratories, Lot MP:		(1 41 01140 04 1100	igent)	1802 PFHxS	47.3 ug/ml

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Lab Name: lestAmerica sacramento Job No.: 320-24104-1

				Reagent	Parent Reage	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCMPFNA 00008	04/13/19	Welling	ton Laboratories, Lo	t MPFNA0414	(Purchased Rea	agent)	13C5 PFNA	50 ug/mL
LCMPFOA 00012	01/22/21	Welling	gton Laboratories, Lo	t MPFOA0116	(Purchased Rea	agent)	13C4 PFOA	50 ug/mL
LCMPFOS 00017	08/03/21		gton Laboratories, Lo		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00009	02/12/21		ton Laboratories, Lo		(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFACMXB_00007	11/06/20		on Laboratories, Lot		(Purchased Rea		Perfluorobutanesulfonic acid	1.77 ug/mL
							(PFBS)	
							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
							Perfluoroheptanoic acid	2 ug/mL
							(PFHpA) Perfluorohexanesulfonic acid (PFHxS)	1.89 ug/mL
							Perfluorohexanoic acid (PFHxA)	2 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctanesulfonic acid	1.91 ug/mL
							(PFOS)	
							Perfluorooctanoic acid (PFOA)	2 ug/mL
							Perfluoropentanoic acid (PFPeA)	2 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	2 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	2 ug/mL
							Perfluoroundecanoic acid (PFUnA)	2 ug/mL
.LCPFC3IM_00005	06/01/17	12/01/16	Methanol, Lot 09028	5 5 mL	LCPFOSA_00008	0.1 mL	Perfluorooctane Sulfonamide (FOSA)	1000 ng/mL
LCPFOSA_00008	09/02/17	Welling	gton Laboratories, Lo	t FOSA0815I	(Purchased Rea	ngent)	Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFCSP 00073	05/28/17	11/28/16	Methanol, Lot 09028	5 10000 uL	LCPFBA 00005	100 uL	Perfluorobutanoic acid (PFBA)	0.5 ug/mL
_					LCPFBS 00005	100 uL	Perfluorobutane Sulfonate	0.442 ug/mL
					_		Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA 00005	100	Perfluorodecanoic acid (PFDA)	0.5 ug/mL
							Perfluorododecanoic acid	
					LCPFDoA_00005		(PFDoA)	0.5 ug/mL
					LCPFDS_00006	100 uL	Perfluorodecane Sulfonate	0.482 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.482 ug/mL
					LCPFHpA_00006	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpS_00009	100 uL	Perfluoroheptane Sulfonate	0.476 ug/mL
							Perfluoroheptanesulfonic Acid	0.476 ug/mL
					LCPFHxA_00005		Perfluorohexanoic acid (PFHxA)	0.5 ug/mL
					LCPFHxDA_00006	100 uL	Perfluorohexadecanoic acid	0.5 ug/mL

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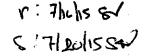
				Reagent	Parent Reage	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCPFHxS-br 00002	100 uL	Perfluorohexane Sulfonate	0.455 ug/mL
					_		Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA 00006	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
					LCPFOA 00006		Perfluorooctanoic acid (PFOA)	0.5 ug/mL
					LCPFODA 00006	100 uL	Perfluorooctadecanoic acid	0.5 ug/mL
					LCPFOS-br_00002		Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00008		Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00005		Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
					LCPFTeDA_00005		Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL
					LCPFTrDA_00005	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.5 ug/mL
					LCPFUdA_00005	100 uL	Perfluoroundecanoic acid (PFUnA)	0.5 ug/mL
.LCPFBA 00005	05/27/21		gton Laboratories, Lot P		(Purchased Read	gent)	Perfluorobutanoic acid (PFBA)	50 ug/mL
.LCPFBS 00005	03/15/21	Welling	ton Laboratories, Lot LE	PFBS0316	(Purchased Read	gent)	Perfluorobutane Sulfonate	44.2 ug/mL
_							Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA 00005	07/02/20	Welling	gton Laboratories, Lot P	FDA0615	(Purchased Read	gent)	Perfluorodecanoic acid (PFDA)	50 ug/mL
.LCPFDoA_00005	01/30/20	Welling	ton Laboratories, Lot PE	FDoA0115	(Purchased Reac	gent)	Perfluorododecanoic acid (PFDoA)	50 ug/mL
.LCPFDS 00006	05/24/21	Welling	ton Laboratories, Lot LE	PFDS0516	(Purchased Read	gent)	Perfluorodecane Sulfonate	48.2 ug/mL
_							Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
.LCPFHpA_00006	01/22/21	_	ton Laboratories, Lot PE	_	(Purchased Reac	gent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpS_00009	11/06/20	Wellingt	ton Laboratories, Lot LP	FHpS1115	(Purchased Read	gent)	Perfluoroheptane Sulfonate	47.6 ug/mL
_							Perfluoroheptanesulfonic Acid	47.6 ug/mL
.LCPFHxA_00005	12/22/20	Welling	ton Laboratories, Lot PE	HxA1215	(Purchased Read		Perfluorohexanoic acid (PFHxA)	50 ug/mL
.LCPFHxDA_00006	05/25/21	Wellingt	ton Laboratories, Lot PF	HxDA0516	(Purchased Read	gent)	Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00002	07/03/20	Wellingto	on Laboratories, Lot brP	FHxSK0615	(Purchased Reac	gent)	Perfluorohexane Sulfonate Perfluorohexanesulfonic acid	45.5 ug/mL 45.5 ug/mL
							(PFHxS)	
.LCPFNA_00006	10/23/20		gton Laboratories, Lot P		(Purchased Read		Perfluorononanoic acid (PFNA)	50 ug/mL
.LCPFOA_00006	11/06/20	Welling	gton Laboratories, Lot P	FOA1115	(Purchased Read		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00006	04/29/21	Welling	ton Laboratories, Lot PE	FODA0416	(Purchased Read		Perfluorooctadecanoic acid	50 ug/mL
.LCPFOS-br_00002	10/14/20	_	on Laboratories, Lot br		(Purchased Read		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LCPFOSA_00008	09/02/17		ton Laboratories, Lot FC		(Purchased Reac	gent)	Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
.LCPFPeA_00005	01/30/20	_	ton Laboratories, Lot PE		(Purchased Reac	gent)	Perfluoropentanoic acid (PFPeA)	50 ug/mL
.LCPFTeDA_00005	12/09/20	_	ton Laboratories, Lot PF		(Purchased Reac	gent)	Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
.LCPFTrDA_00005	02/12/21	Wellingt	ton Laboratories, Lot PF	TrDA0216	(Purchased Read	gent)	Perfluorotridecanoic Acid (PFTriA)	50 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-24184-1	
SDG No.:		_

				Reagent	Parent Reager	ıt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
.LCPFUdA_00005	08/19/20	Welling	ton Laboratories, Lot PF	UdA0815	(Purchased Reag	ent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL

Reagent

LC6:2FTS_00001





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

6:2FTS

LOT NUMBER:

62FTS1014

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C_aH₄F₁₃SO₃Na

47.4 ± 2.4 µg/ml

MOLECULAR WEIGHT:

450.15

CONCENTRATION:

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

Methanol

>98%

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

10/03/2014

EXPIRY DATE: (mm/dd/yyyy)

10/03/2017

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

(6:2FTS anion)

Certified By:

B.G. Chittim

Date: 03/27/2015

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, $u_x(y)$, 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:

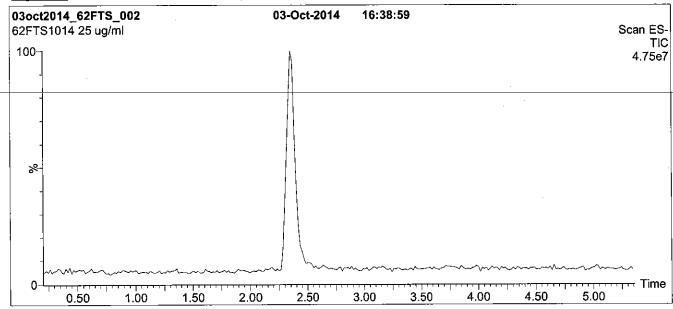
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

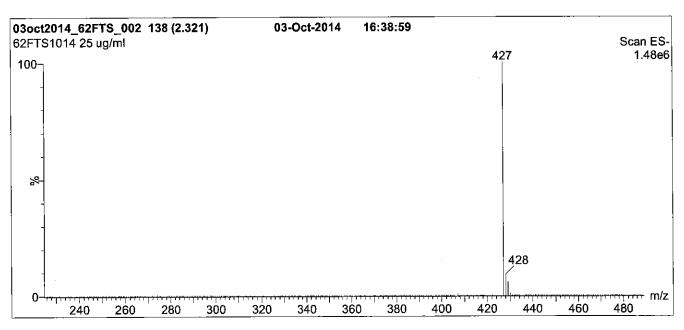




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





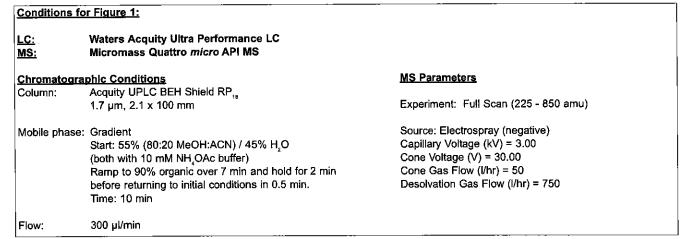
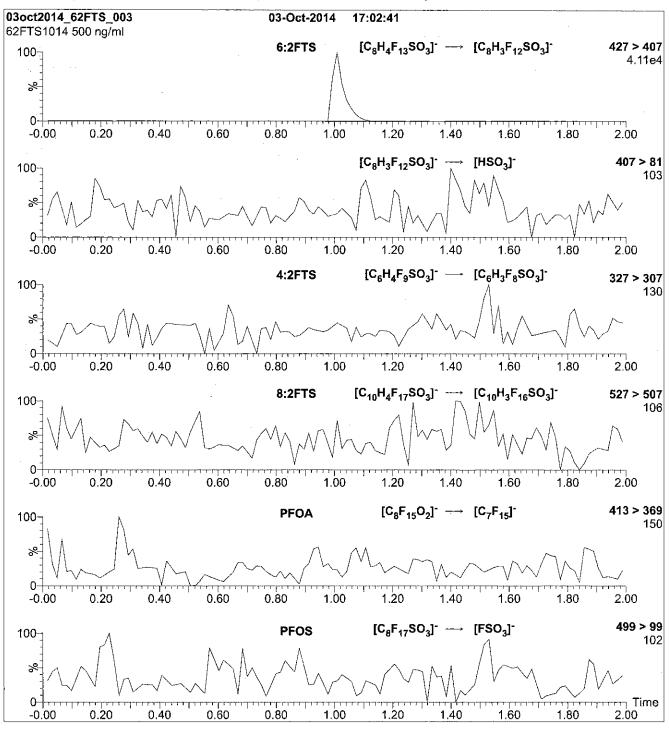
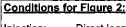


Figure 2: 6:2FTS; LC/MS/MS Data (Selected MRM Transitions)





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)

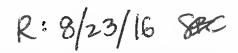
Flow:

300 µl/min

Collision Gas (mbar) = 3.50e-3 Collision Energy (eV) = 25

Reagent

LC6:2FTS_00002





Exp: 05/25/21 Prpd; SBC



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

6:2FTS

LOT NUMBER:

62FTS0616

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C_aH₄F₁₃SO₃Na

MOLECULAR WEIGHT:

450.15

CONCENTRATION:

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

47.4 ± 2.4 µg/ml

(Na salt) SOLVENT(S):

(6:2FTS anion)

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

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

x., x.,...x. on which it depends is:

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

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.

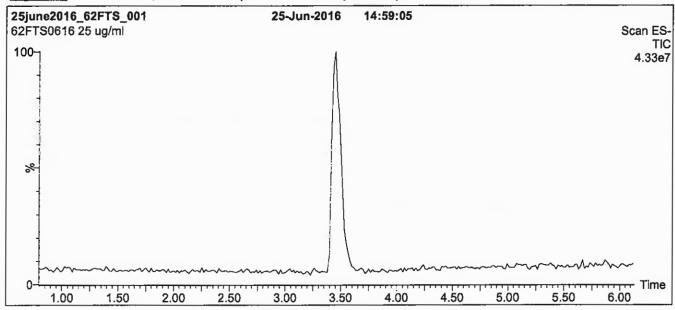
QUALITY MANAGEMENT:

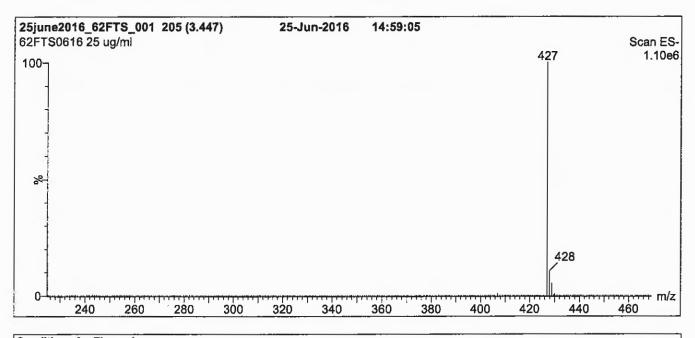
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Figure 1: 6:2FTS; LC/MS Data (TIC and Mass Spectrum)





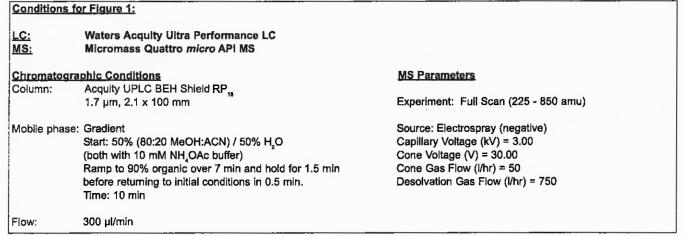
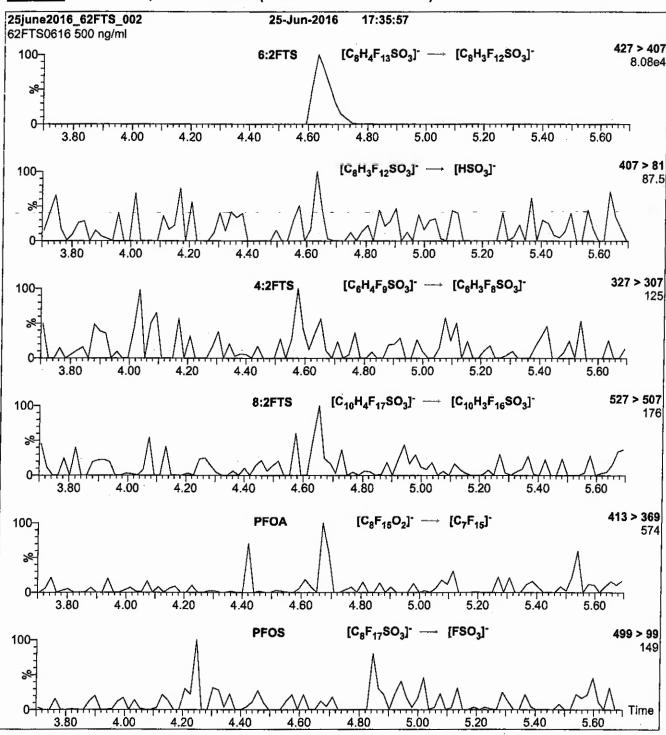
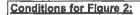


Figure 2: 6:2FTS; LC/MS/MS Data (Selected MRM Transitions)





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 NH₄OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LC8:2FTS_00001

7: 711611587 5:71241557



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

8:2FTS

LOT NUMBER:

82FTS1014

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

F F F F F F F H H

MOLECULAR FORMULA:

C,,H,F,,SO,Na

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

MOLECULAR WEIGHT:

550.16

CONCENTRATION:

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

SOLVENT(S):

Methanol

CHEMICAL PURITY:

•

LAST TESTED: (mm/dd/yyyy)

10/03/2014

EXPIRY DATE: (mm/dd/yyyy)

10/03/2017

>98%

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

(8:2FTS anion)

Certified By:

D C Shrittim

Date:

<u>03/27/2015</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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$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

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:

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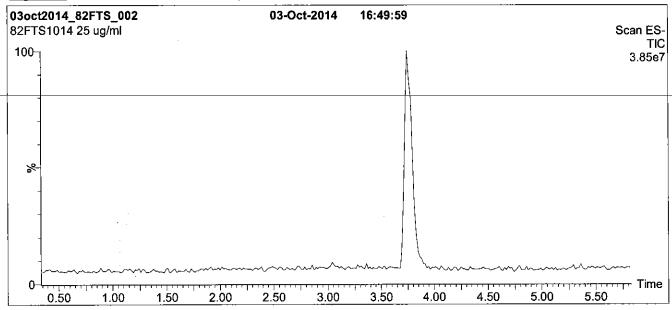
QUALITY MANAGEMENT:

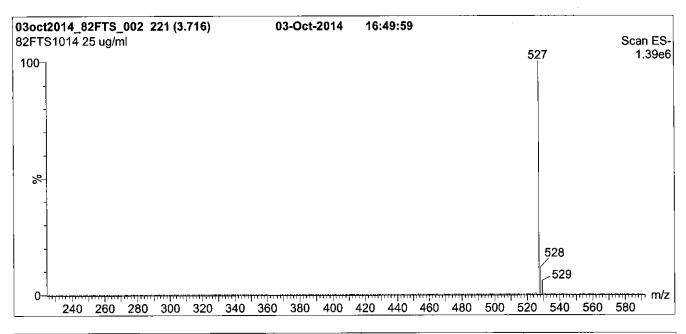
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





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





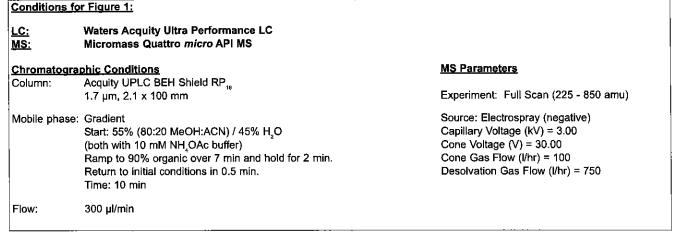
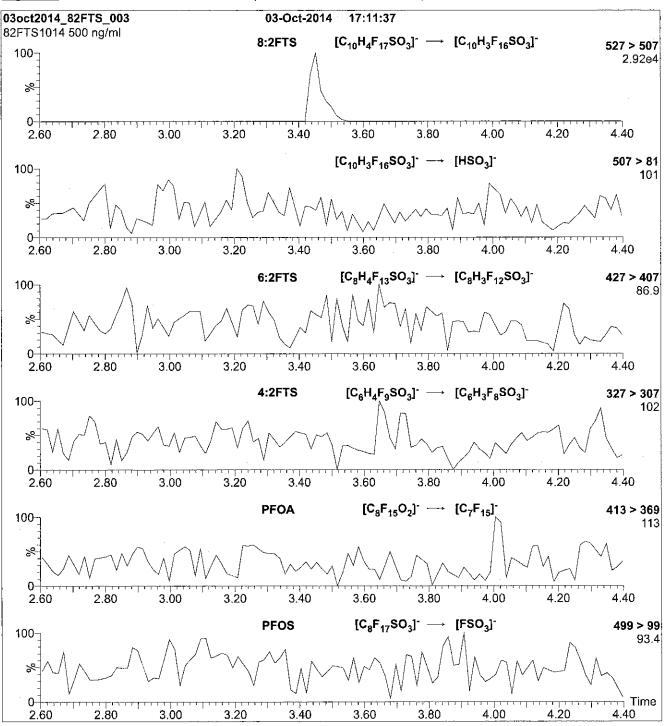
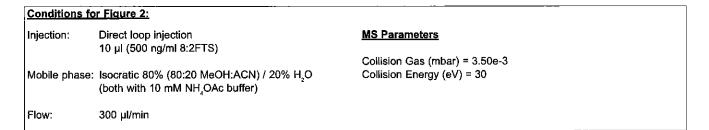


Figure 2: 8:2FTS; LC/MS/MS Data (Selected MRM Transitions)





LC8:2FTS_00002

R: 8/23/16 880





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

8:2FTS

LOT NUMBER:

82FTS1015

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

 $\begin{array}{c|cccccccccccccccccso_3^{\mathsf{Na^+}}\end{array}$

MOLECULAR FORMULA:

C₁₀H₄F₁₇SO₃Na

MOLECULAR WEIGHT:

550.16

CONCENTRATION:

50.0 ± 2.5 μg/ml 47.9 ± 2.4 μg/ml

(Na salt) SOLVENT(S):

(8:2FTS anion)

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/23/2015

EXPIRY DATE: (mm/dd/yyyy)

10/23/2020

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:

D.C. Chittim

Date:

<u>10/27/2015 </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.

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

$$x_{*}, x_{*},...x_{*}$$
 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.

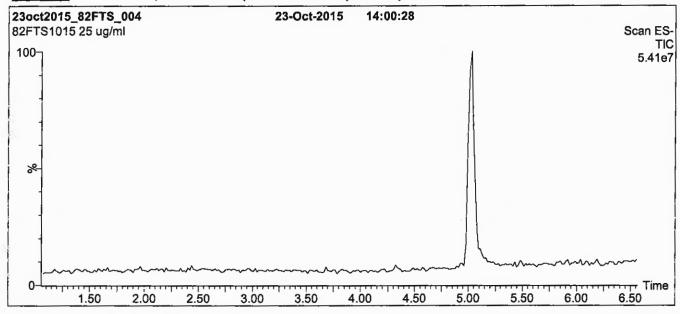
QUALITY MANAGEMENT:

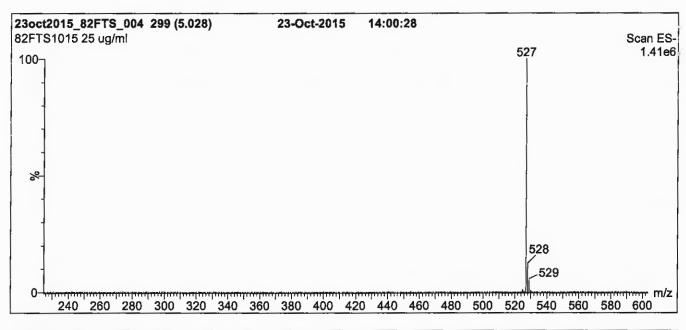
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Figure 1: 8:2FTS; LC/MS Data (TIC and Mass Spectrum)





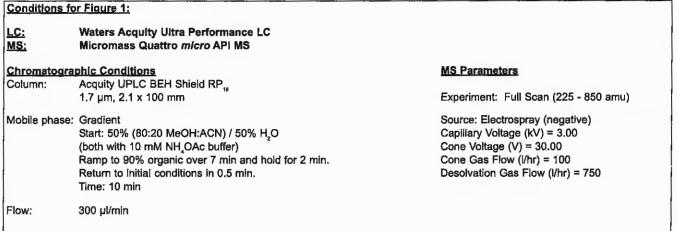
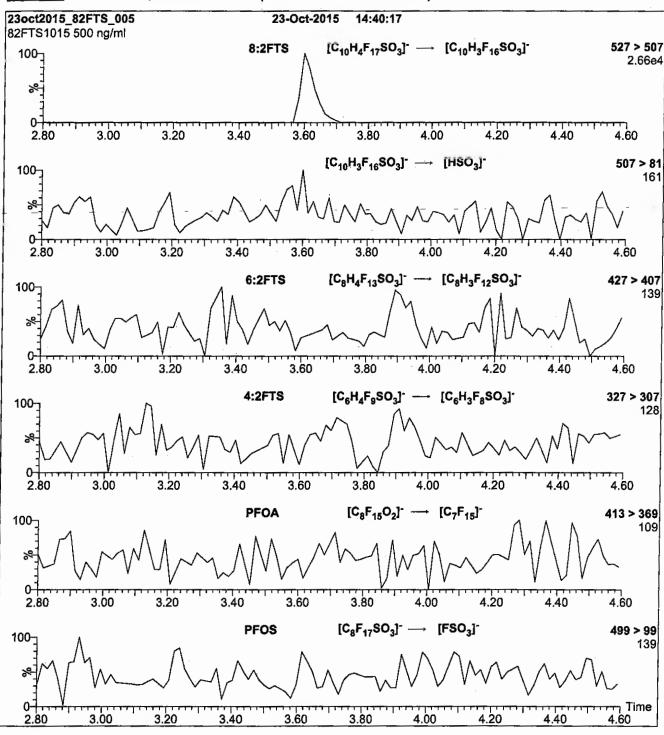
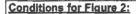


Figure 2: 8:2FTS; LC/MS/MS Data (Selected MRM Transitions)





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) = 3.28e-3 Collision Energy (eV) = 30

Flow:

300 µl/min

LCd-NEtFOSA-M_00001



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

d-N-EtFOSA-M

LOT NUMBER:

dNEtFOSA0314M

COMPOUND:

N-ethyl-d_e-perfluoro-1-octanesulfonamide

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C₁₀D₅HF₁₇NO₂S

CONCENTRATION:

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

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

03/10/2014

EXPIRY DATE: (mm/dd/yyyy)

03/10/2019

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

MOLECULAR WEIGHT: SOLVENT(S):

532.23

Methanol

ISOTOPIC PURITY:

≥98% ²H₅

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: 04/01/2015

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LIMITED WARRANTY:

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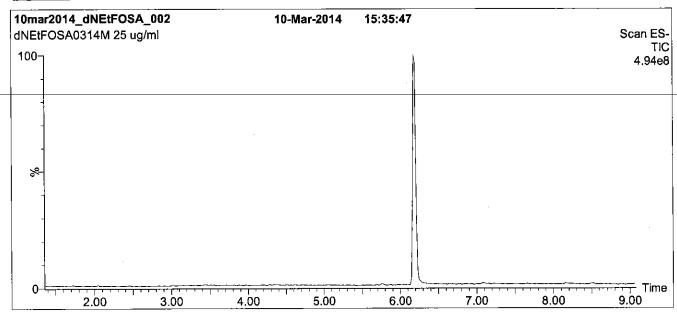
QUALITY MANAGEMENT:

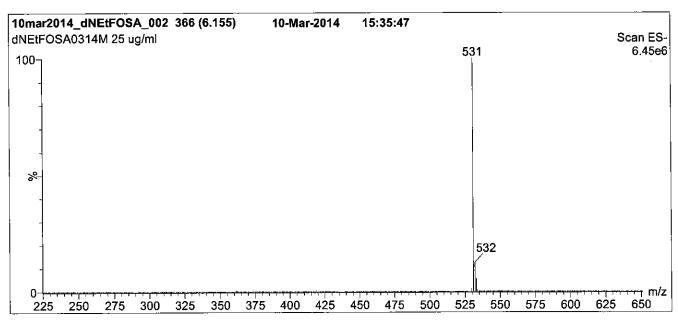
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Figure 1: d-N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)





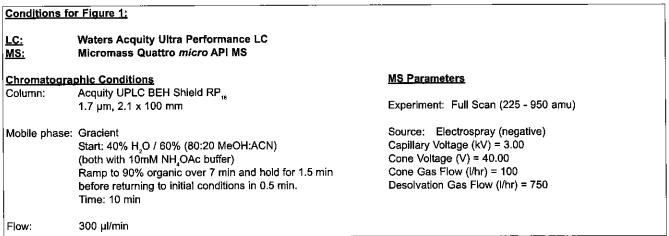
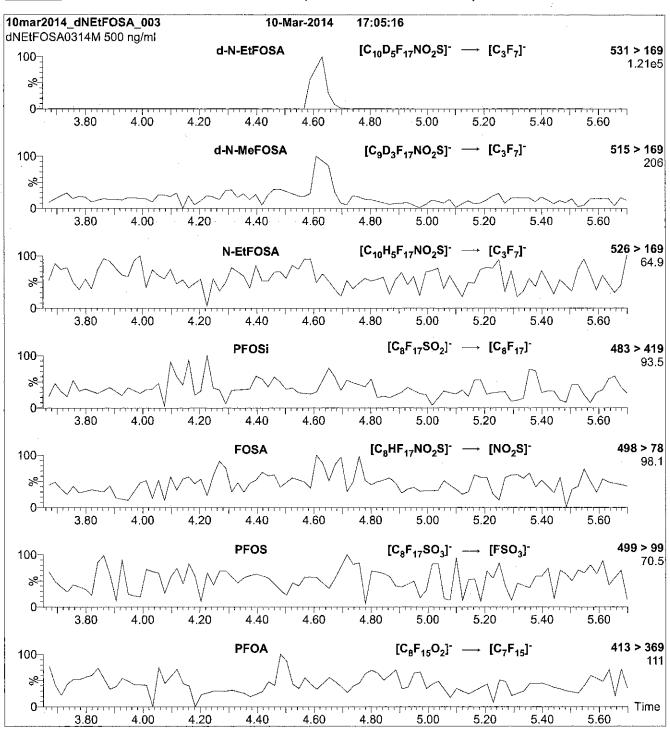
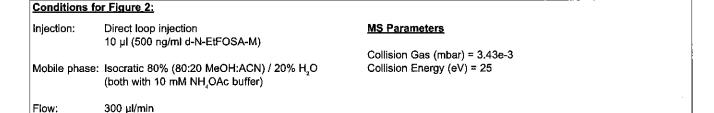


Figure 2: d-N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





LCd-NEtFOSA-M_00002



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

d-N-EtFOSA-M

LOT NUMBER:

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

SOLVENT(S):

dNEtFOSA0314M

532.23

Methanol

≥98% ²H₅

COMPOUND:

N-ethyl-d_x-perfluoro-1-octanesulfonamide

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C₁₀D₅HF₁₇NO₂S

CONCENTRATION:

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

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

03/10/2014

EXPIRY DATE: (mm/dd/yyyy)

03/10/2019

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: 04/01/2015

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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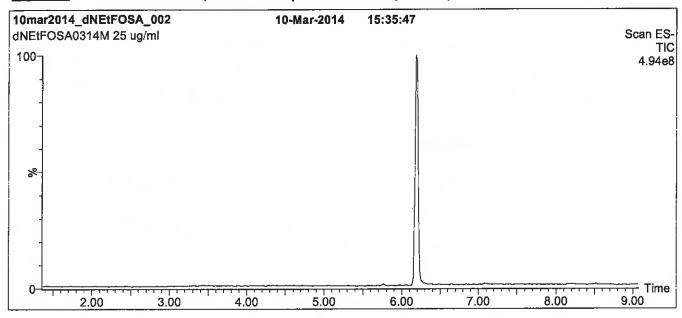
QUALITY MANAGEMENT:

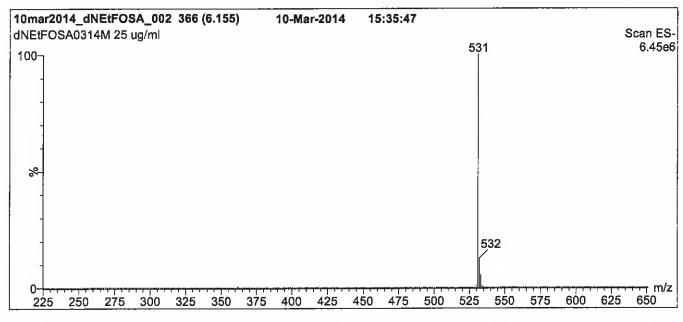
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Figure 1: d-N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)





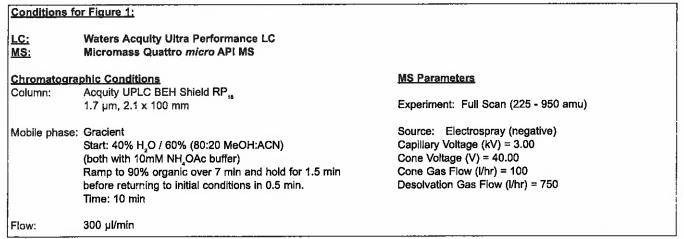
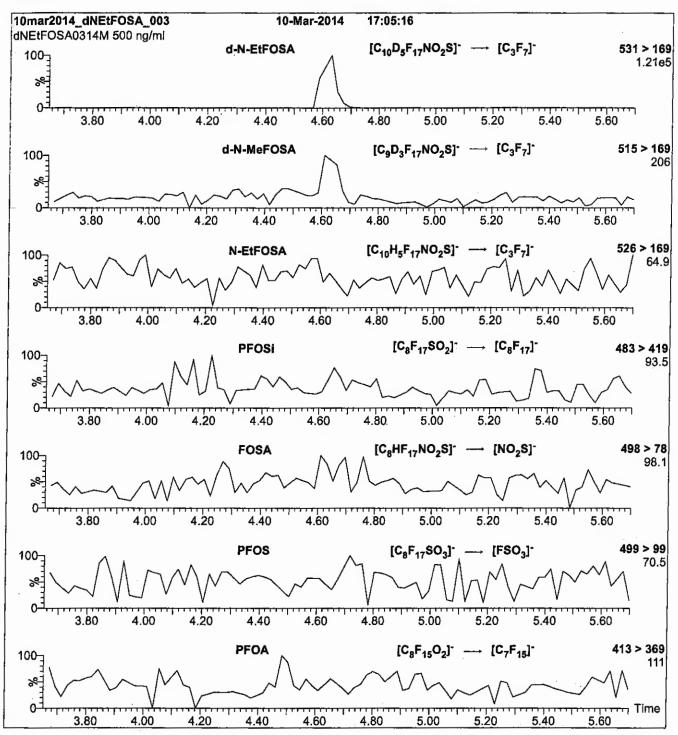
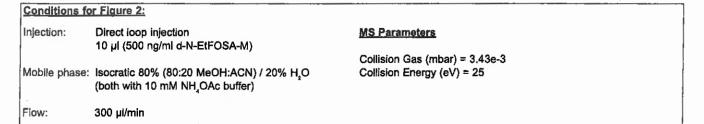


Figure 2: d-N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





LCd-NMeFOSA-M_00001



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

d-N-MeFOSA-M

LOT NUMBER:

MOLECULAR WEIGHT:

SOLVENT(S):

ISOTOPIC PURITY:

dNMeFOSA0114M

516.19

Methanol

≥98% 2H,

COMPOUND:

N-methyl-d,-perfluoro-1-octanesulfonamide

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C₉D₃HF₁₇NO₂S

CONCENTRATION:

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

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/28/2014

EXPIRY DATE: (mm/dd/yyyy)

01/28/2019

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

Date: 04/01/2015

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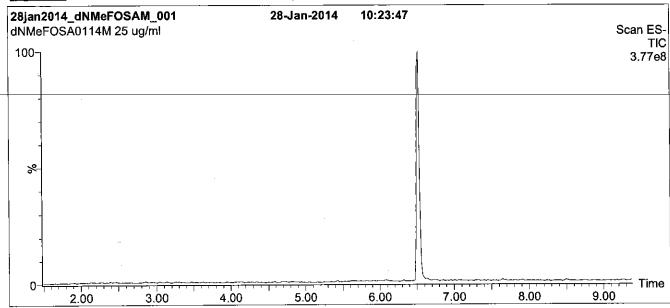
QUALITY MANAGEMENT:

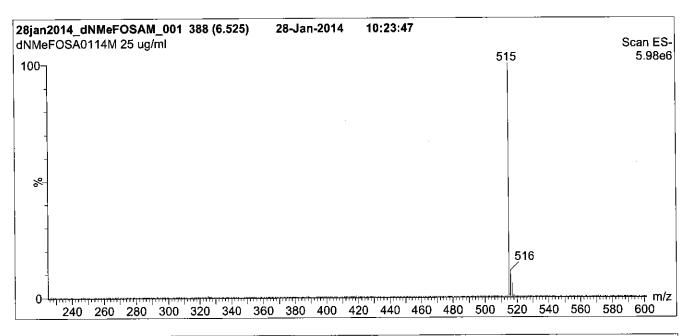
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Figure 1: d-N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)





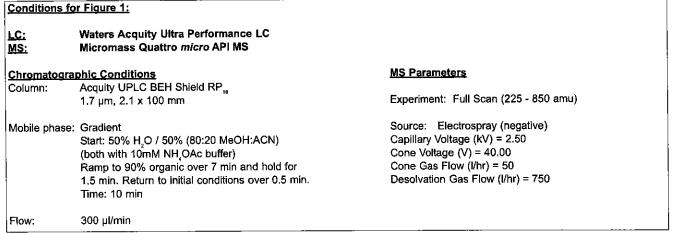
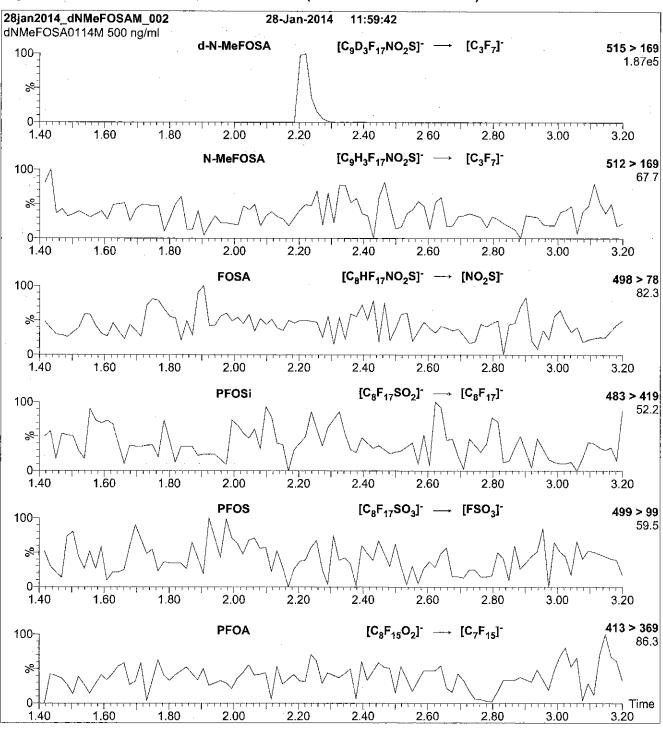
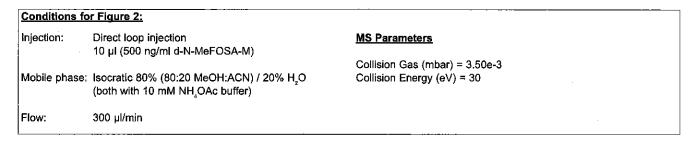


Figure 2: d-N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





LCd-NMeFOSA-M_00002

R: +16/16 CBW



ID: LCd-NMeFOSA-M 00002 m: 06/13/21 Prod: CB d-N-MeFOSA-M



CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

d-N-MeFOSA-M

LOT NUMBER:

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

SOLVENT(S):

dNMeFOSA0616M

516.19

Methanol

≥98% 2H,

COMPOUND:

N-methyl-d₃-perfluoro-1-octanesulfonamide

CAS #:

Not available

STRUCTURE:

MOLECULAR FORMULA:

C₀D₃HF₁₇NO₂S

CONCENTRATION:

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

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/eid/yyyy)

06/10/2016

EXPIRY DATE: (mm/dd/yyyy)

06/10/2021

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: 06/16/2016

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SYNTHESIS / CHARACTERIZATION;

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

$$x_i, x_i...x_i$$
 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.

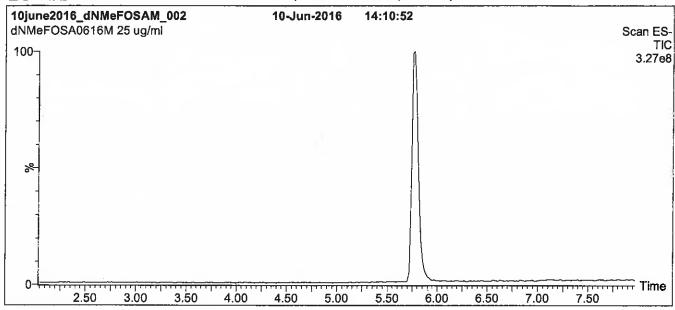
QUALITY MANAGEMENT:

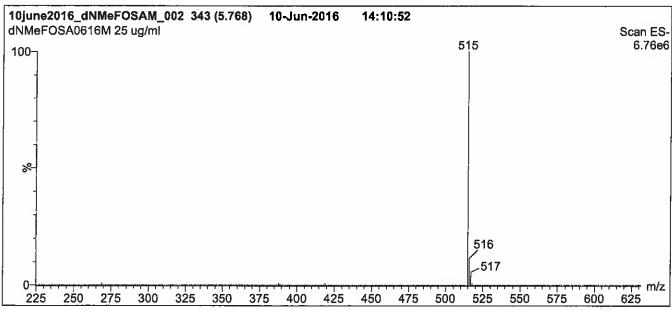
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





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





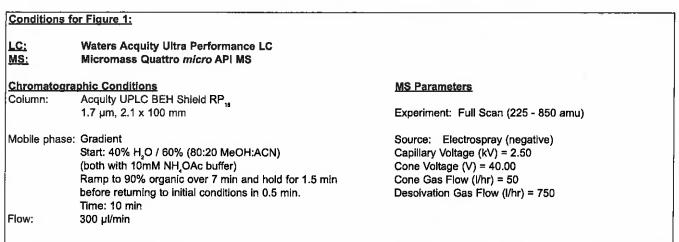
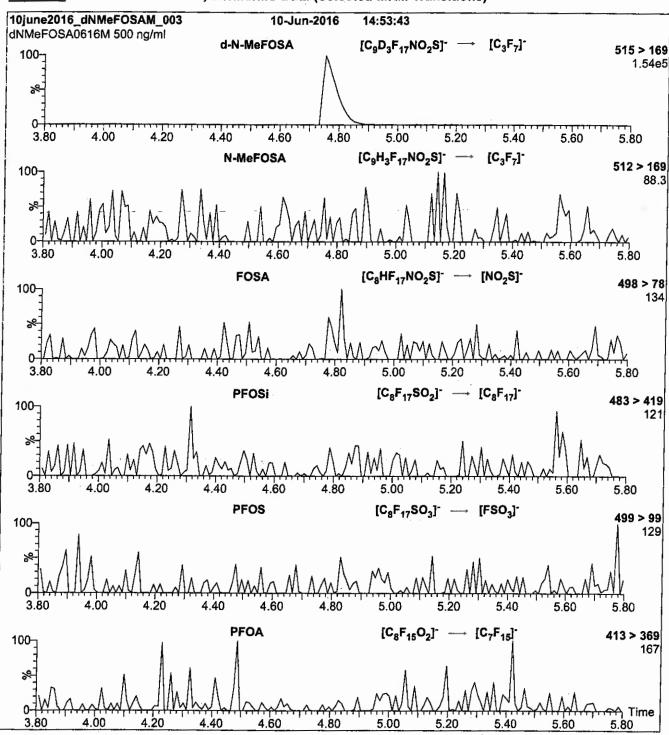


Figure 2: d-N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μi (500 ng/ml d-N-MeFOSA-M)

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) = 3.39e-3 Collision Energy (eV) = 25

LCd3-NMeFOSAA_00001



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

d3-N-MeFOSAA

LOT NUMBER:

d3NMeFOSAA0113

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

 $C_{11}D_3H_3F_{17}NO_4S$

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

574.23

CONCENTRATION:

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

SOLVENT(S):

Methanol

Water (<1%) ≥98% ²H,

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/31/2013

EXPIRY DATE: (mm/dd/yyyy)

01/31/2018

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

Date:

<u>04/06/2015</u>

(mm/dd/yyyy)

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UNCERTAINTY:

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$$x_{i}, x_{j},...x_{n}$$
 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:

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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:

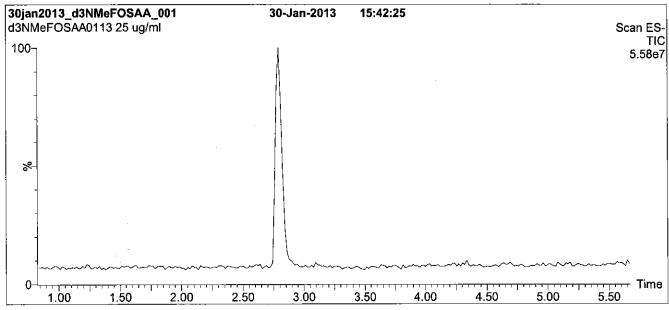
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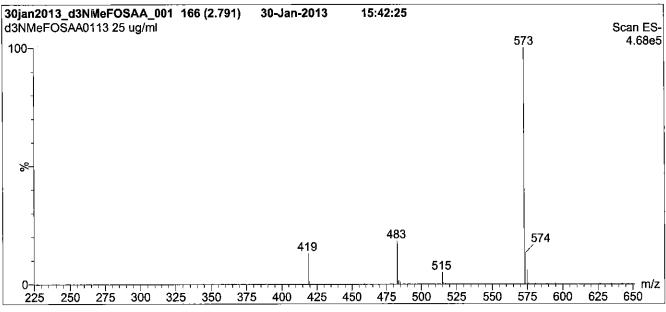




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Figure 1: d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)





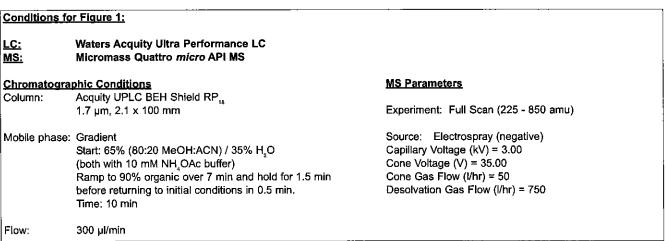
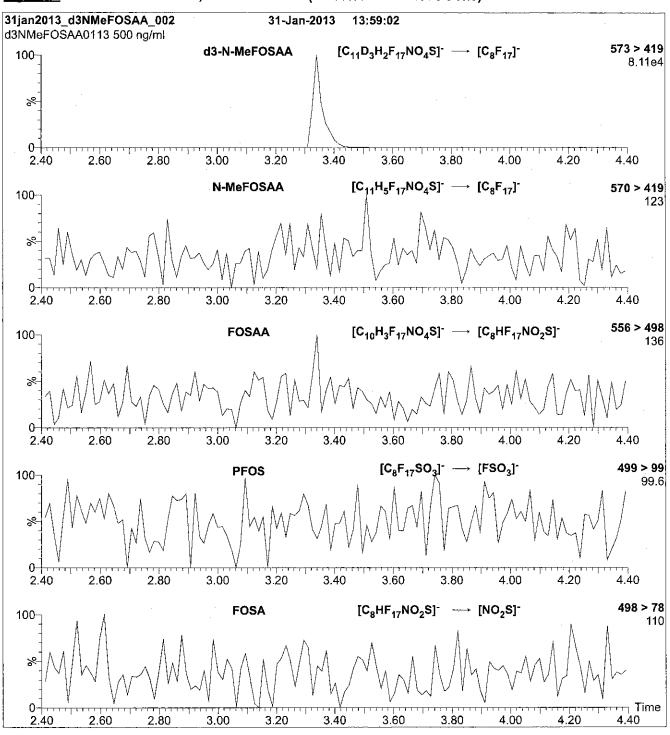


Figure 2: d3-N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)





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 NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3 Collision Energy (eV) = 25

LCd3-NMeFOSAA_00002

PRODUCT CODE:

d3-N-MeFOSAA

LOT NUMBER:

d3NMeFOSAA0116

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):

ISOTOPIC PURITY:

Methanol

≥98% 2H,

Water (<1%)

CHEMICAL PURITY:

LAST TESTED: (mm/dd/yyyy)

>98%

>90%

01/20/2016

EXPIRY DATE: (mm/dd/yyyy)

01/20/2021

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 moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

<u>01/25/2016</u>

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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:

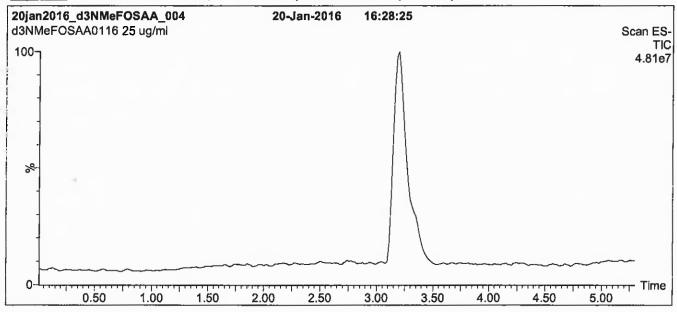
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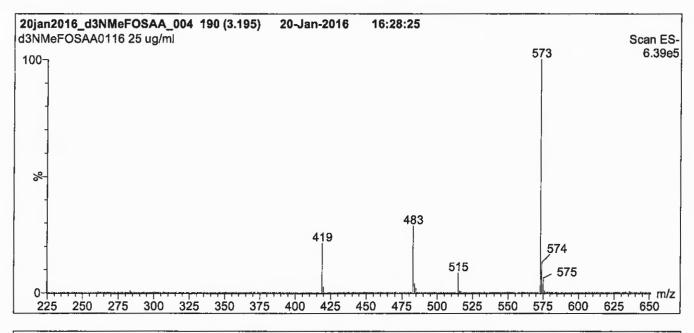


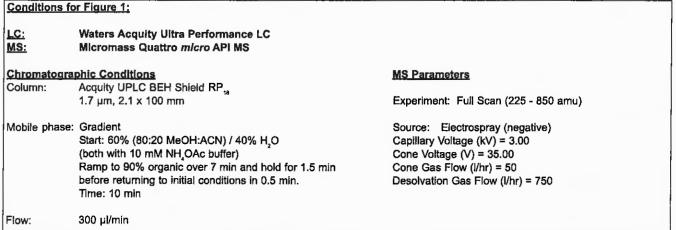


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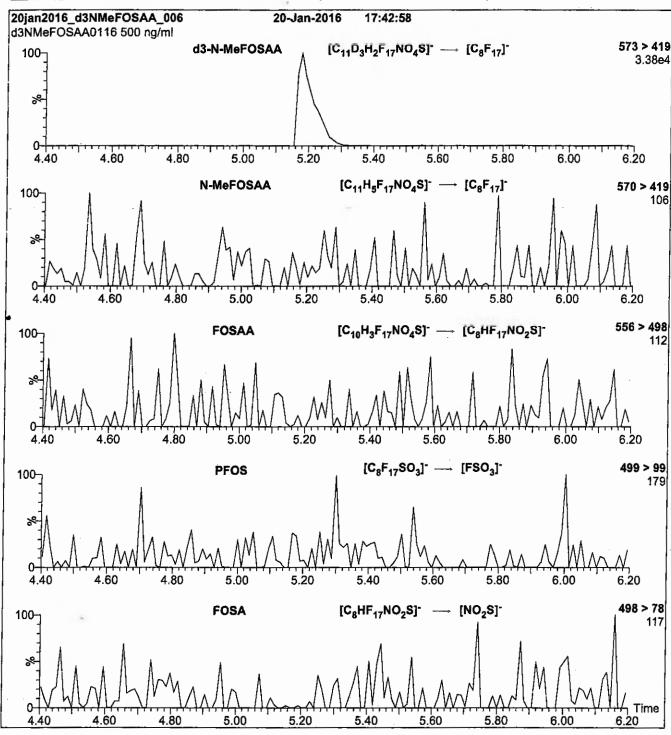
Figure 1: d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)







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% H,O

(both with 10 mM NH,OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.66e-3 Collision Energy (eV) = 25

LCd5-NEtFOSAA_00001



PRODUCT CODE:

d5-N-EtFOSAA

LOT NUMBER:

d5NEtFOSAA0515

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C,,D,H,F,,NO,S

MOLECULAR WEIGHT:

590.27

CONCENTRATION:

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

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥98% ²H_E

LAST TESTED: (mm/dd/yyyy)

EXPIRY DATE: (mm/dd/yyyy)

05/08/2015 05/08/2020

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:

Date: 05/11/2015

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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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:

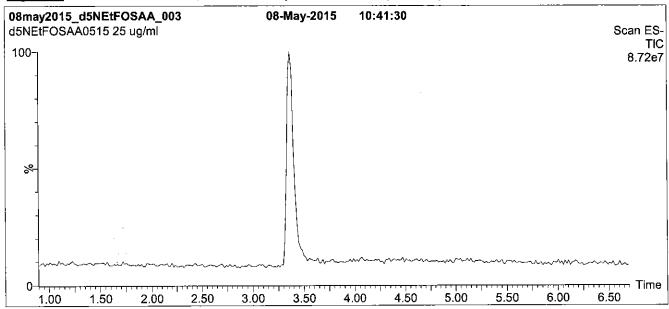
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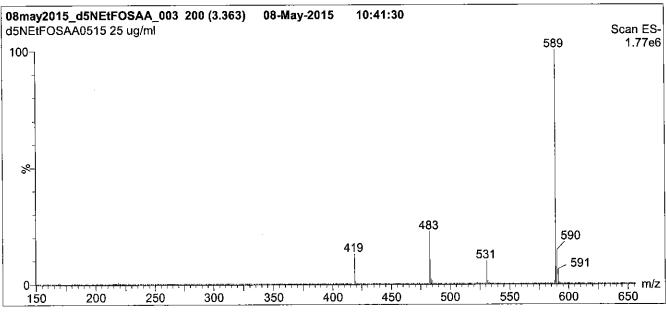




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Figure 1: d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)





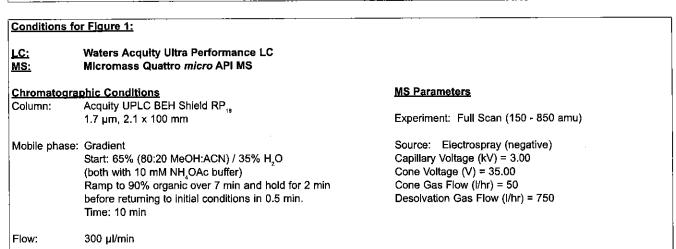
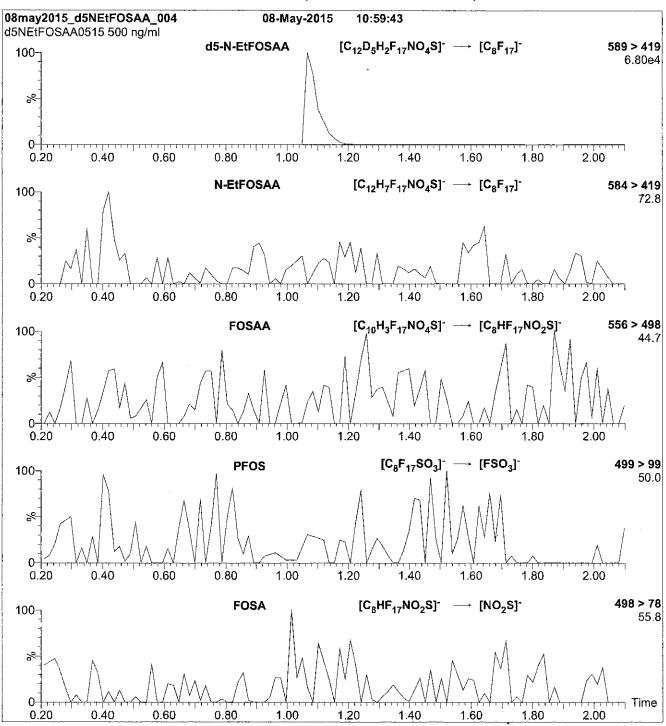
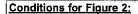


Figure 2: d5-N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)





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)

MS Parameters

Collision Gas (mbar) = 3.24e-3 Collision Energy (eV) = 25

Flow:

300 µl/min

LCd5-NEtFOSAA_00002



PRODUCT CODE:

d5-N-EtFOSAA

LOT NUMBER:

d5NEtFOSAA1115

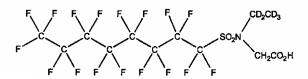
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

C,2D,H3F,7NO,S

MOLECULAR WEIGHT:

590.27

CONCENTRATION:

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

SOLVENT(S):

Methano!

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

Water (<1%) ≥98% ²H_e

LAST TESTED: (mm/dd/yyyy)

12/07/2015

EXPIRY DATE: (mm/dd/yyyy)

12/07/2020

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:

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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EXPIRY DATE / PERIOD OF VALIDITY:

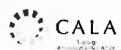
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

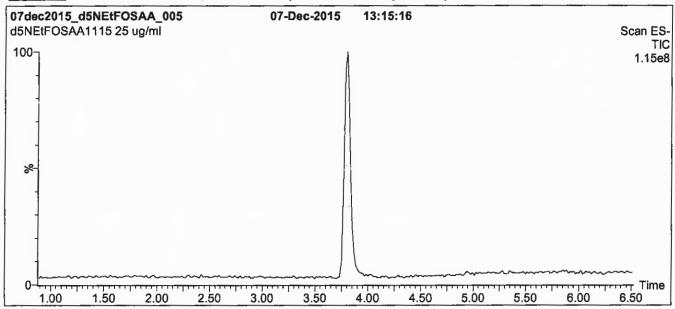
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

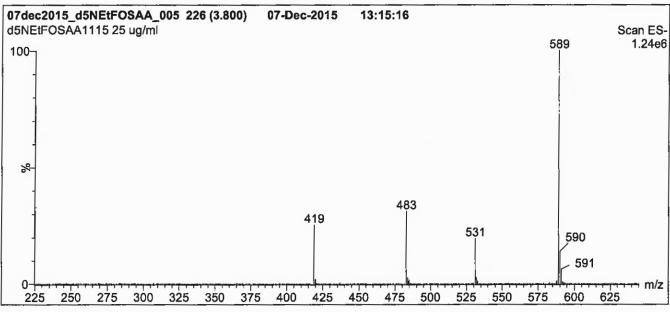




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Figure 1: d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)





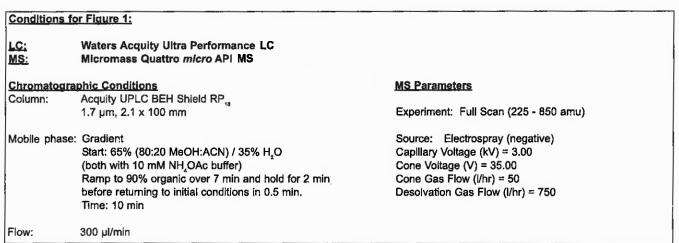
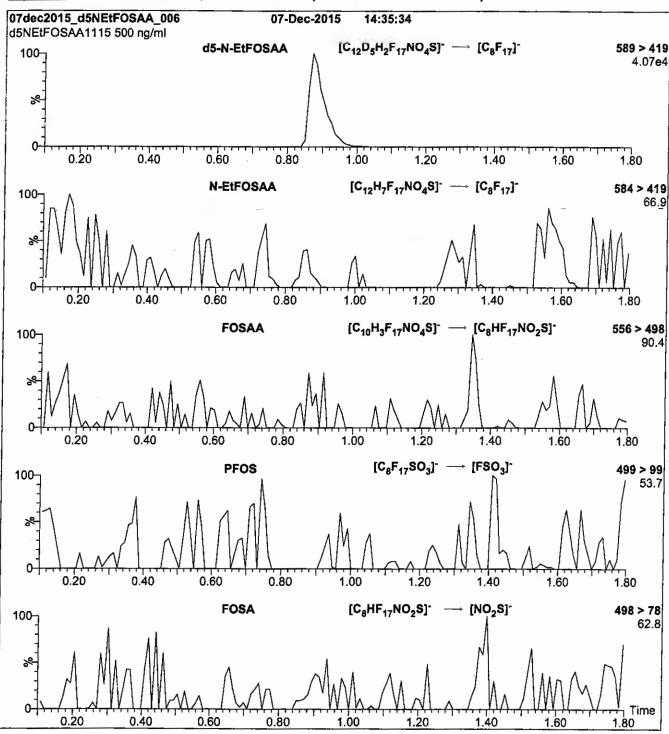
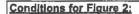


Figure 2: d5-N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)





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)

MS Parameters

Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 25

Flow:

300 µl/min

LCM2-6:FTS_00001



PRODUCT CODE:

M2-6:2FTS

LOT NUMBER:

M262FTS0714

COMPOUND:

Sodium 1H,1H,2H,2H-perfluoro-[1,2-13C, Joctane sulfonate

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₂¹²C₆H₄F₁₃SO₃Na

MOLECULAR WEIGHT:

452.13

CONCENTRATION:

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

Methanol

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

(M2-6:2FTS anion)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

>99% 13C

LAST TESTED: (mm/dd/yyyy)

07/15/2014

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

EXPIRY DATE: (mm/dd/yyyy)

07/15/2017

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 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 furne 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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$$x_i, x_0,...x_1$$
 on which it depends is:

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

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

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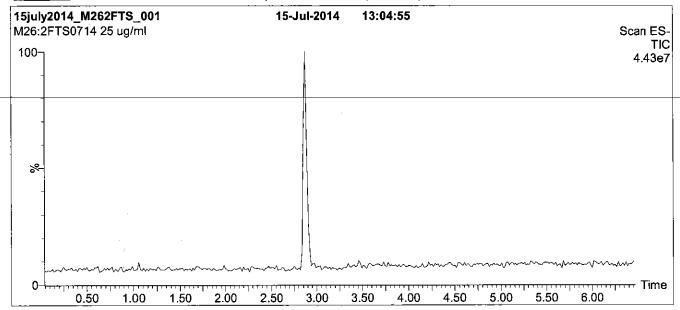
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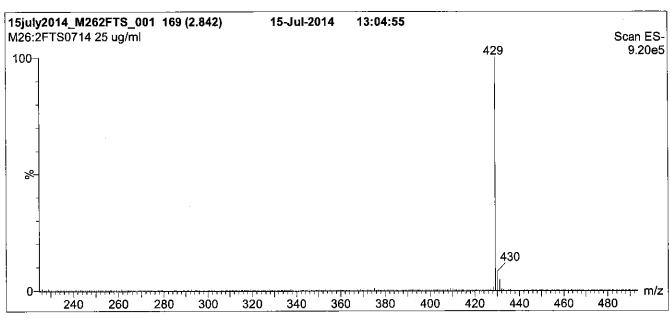




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Figure 1: M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)





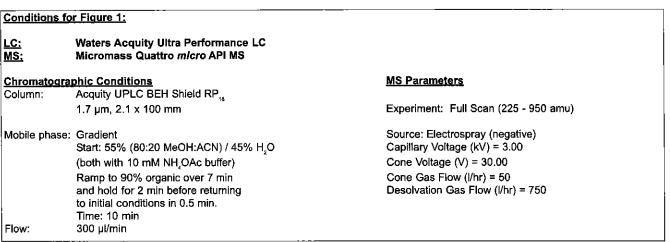
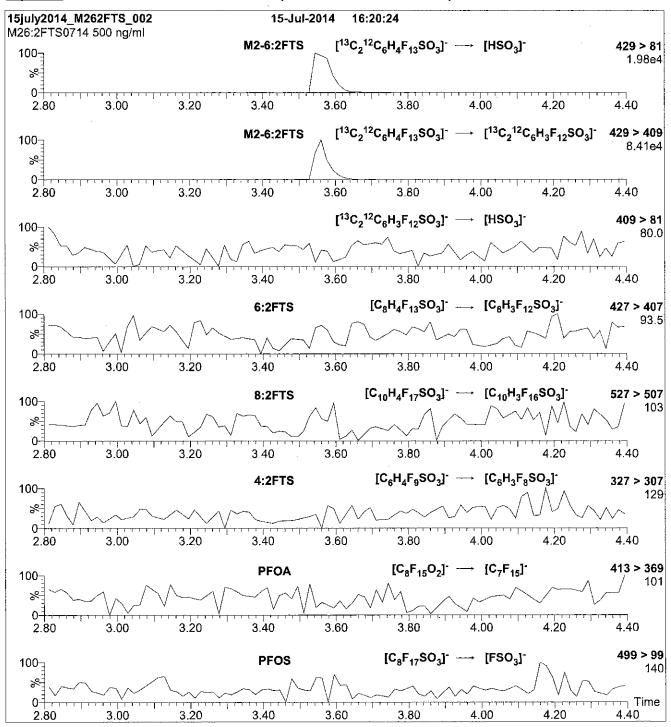
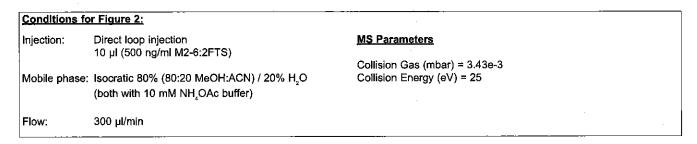


Figure 2: M2-6:2FTS; LC/MS/MS Data (Selected MRM Transitions)





LCM2-6:FTS_00002



PRODUCT CODE:

M2-6:2FTS

LOT NUMBER:

M262FTS0116

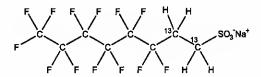
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



 $47.5 \pm 2.4 \,\mu g/ml$ (M2-6:2FTS anion)

MOLECULAR FORMULA:

¹³C, ¹²C, H, F, SO, Na

MOLECULAR WEIGHT:

452.13

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)

(1,2-13C₂)

01/08/2016

EXPIRY DATE: (mm/dd/yyyy)

01/08/2021

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.

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).

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QUALITY MANAGEMENT:

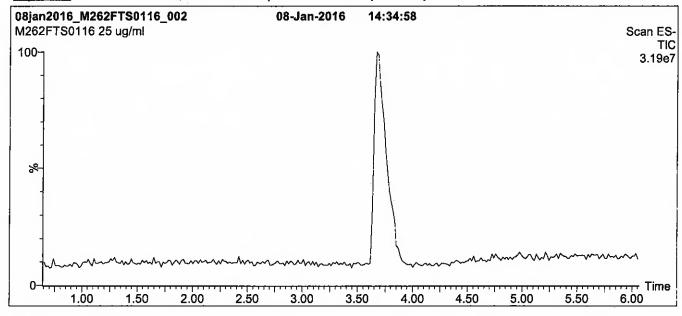
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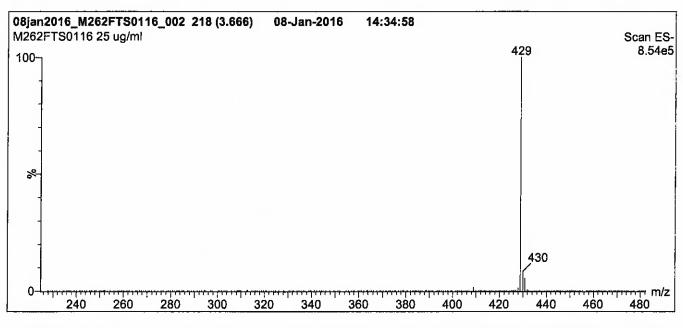




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Figure 1: M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)





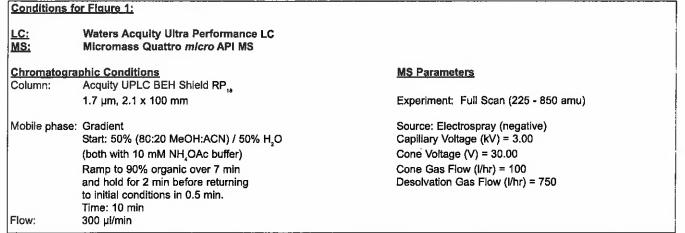
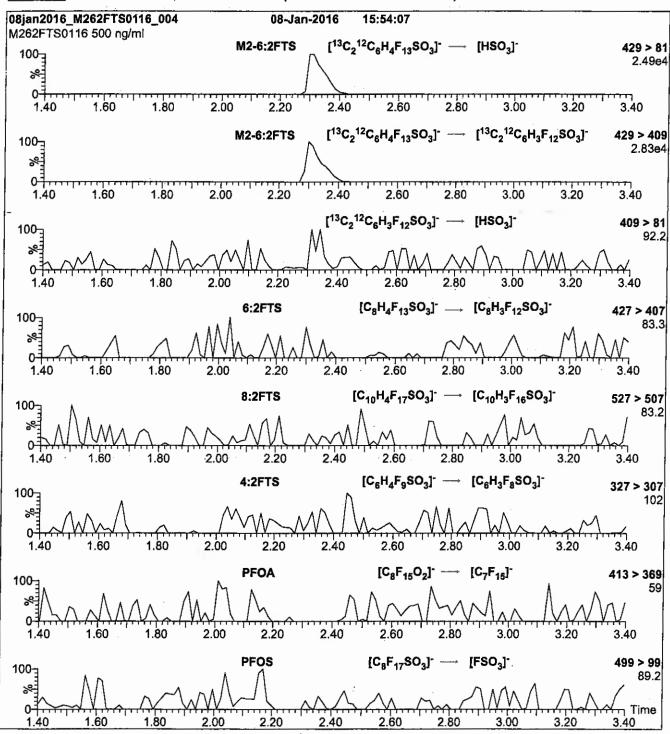
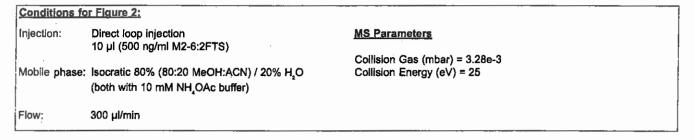


Figure 2: M2-6:2FTS; LC/MS/MS Data (Selected MRM Transitions)





LCM2-8:2FTS_00001



PRODUCT CODE:

M2-8:2FTS

LOT NUMBER:

M282FTS0414

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₂¹²C₈H₄F₁₇SO₃Na

MOLECULAR WEIGHT:

552.15

CONCENTRATION:

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

Methanol

 $47.9 \pm 2.4 \,\mu g/ml$ (M2-8:2FTS anion)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% 13C

LAST TESTED: (mm/dd/yyyy)

04/13/2014

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

EXPIRY DATE: (mm/dd/yyyy)

04/13/2017

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).

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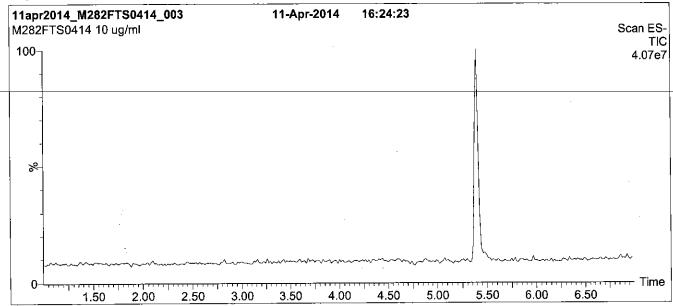
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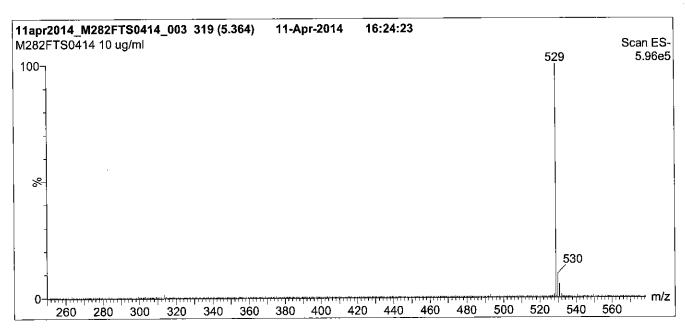




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Figure 1: M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)





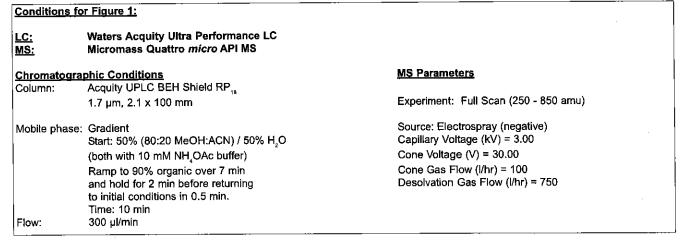
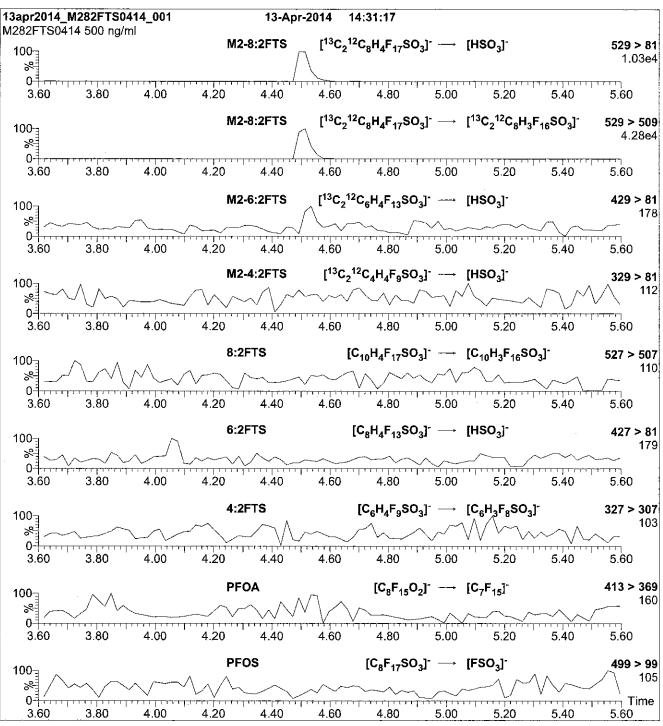
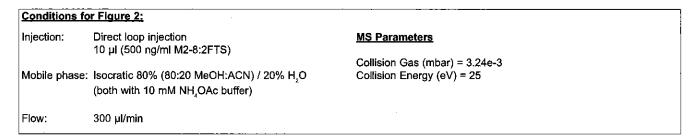


Figure 2: M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)





LCM2-8:2FTS_00002



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2-8:2FTS

LOT NUMBER:

M282FTS0116

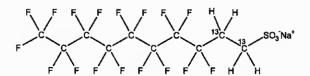
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C, ¹²C, H, F, SO, Na

MOLECULAR WEIGHT:

552.15

CONCENTRATION:

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

SOLVENT(S):

Methanol

 $47.9 \pm 2.4 \,\mu g/ml$ (M2-8:2FTS anion)

≥99% ¹³C

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

(1,2-13C_o)

LAST TESTED: (mm/dd/yyyy)

01/08/2016

EXPIRY DATE: (mm/dd/yyyy)

01/08/2021

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.

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Certified By:

Date: 01/18/2016

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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:

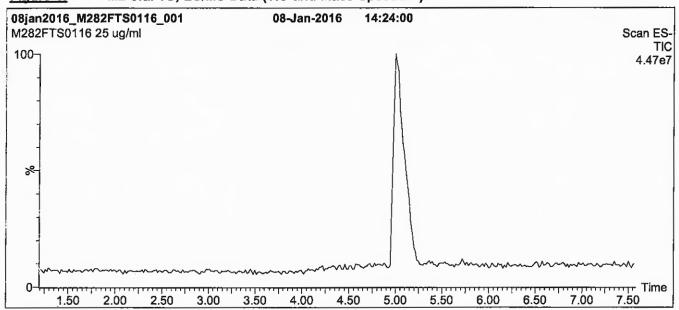
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

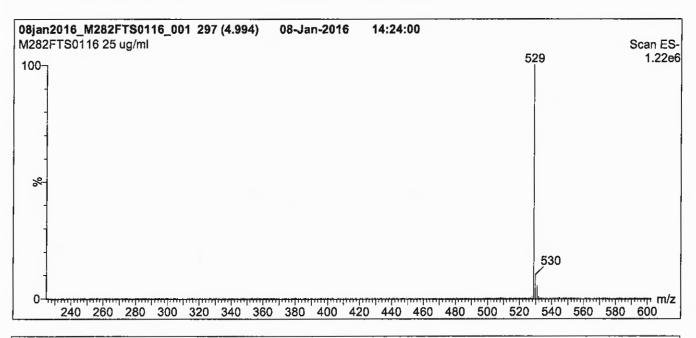




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





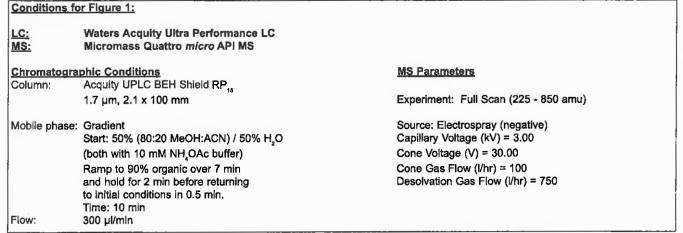
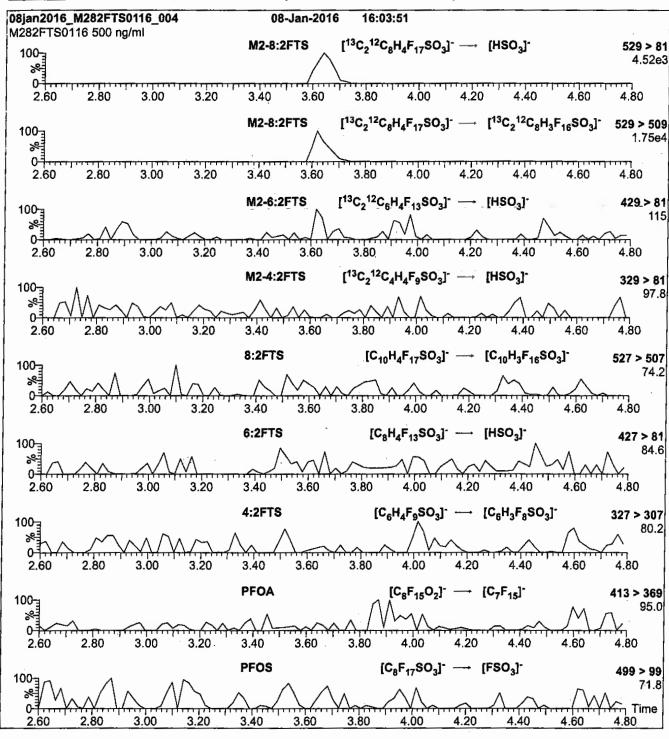
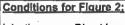


Figure 2: M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)





Injection: Di

Direct loop injection

10 µl (500 ng/ml M2-8:2FTS)

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

(both with 10 mM NH,OAc buffer)

MS Parameters

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

Flow: 300 µi/min

LCM2PFHxDA_00008

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2PFHxDA

LOT NUMBER:

M2PFHxDA1112

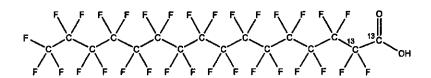
COMPOUND:

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

STRUCTURE:

CAS#:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₁₄HF₃₁O₂

MOLECULAR WEIGHT: 816

816.11

CONCENTRATION:

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

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C (1,2-¹³C₃)

LAST TESTED: (mm/dd/yyyy)

01/07/2016

EXPIRY DATE: (mm/dd/yyyy)

01/07/2021

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 native perfluoro-n-hexadecanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

01/11/2016

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.

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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:

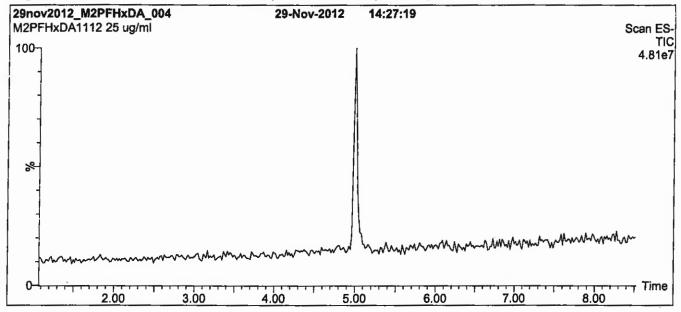
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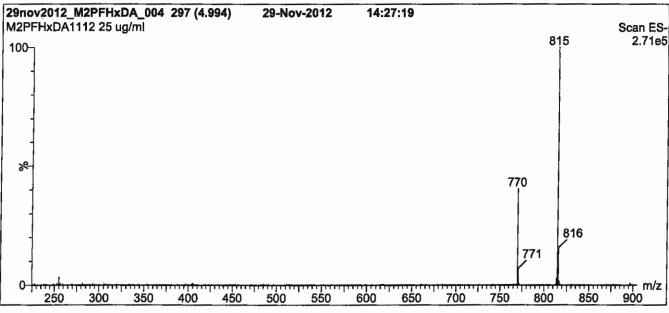




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Figure 1: M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)





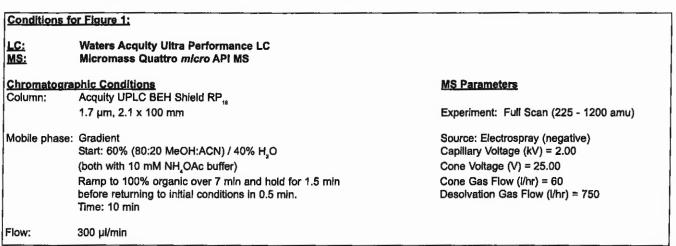
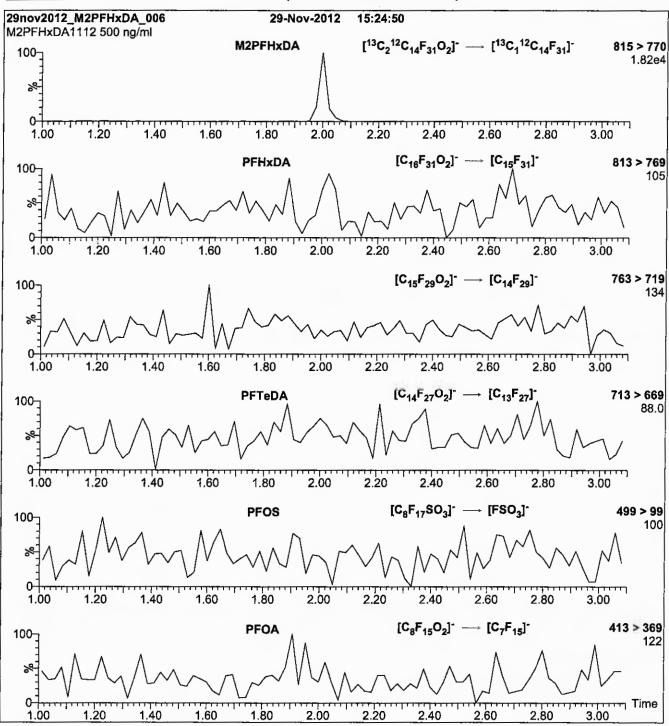


Figure 2: M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml M2PFHxDA)

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) = 15

LCM2PFTeDA_00007





Exp: 12/07/20 Prpd: SBC 13C2-PFTeDA at 50ug/n

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2PFTeDA

LOT NUMBER:

M2PFTeDA1115

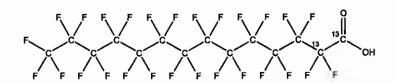
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

13C, 12C, HF,,O,

MOLECULAR WEIGHT:

716.10

CONCENTRATION:

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

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

LAST TESTED: (mm/dd/yyyy)

(1,2-13C₂)

EXPIRY DATE: (mm/dd/yyyy)

12/07/2015

12/07/2020

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.

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

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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.

UNCERTAINTY:

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

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:

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QUALITY MANAGEMENT:

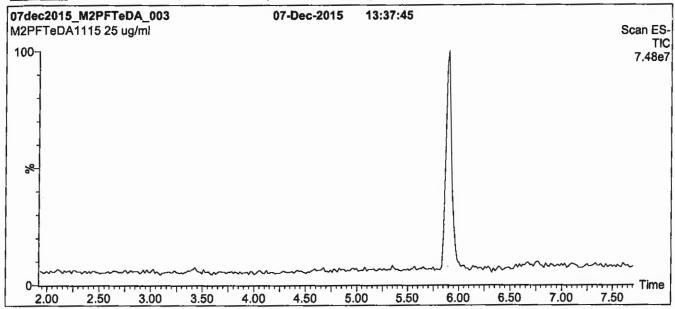
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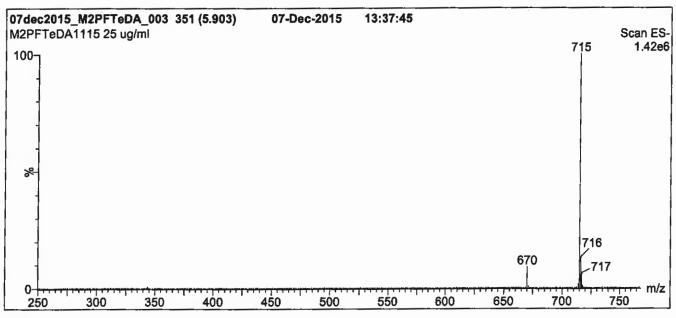




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Figure 1: M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)





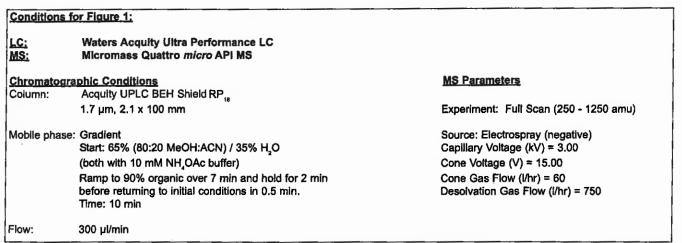
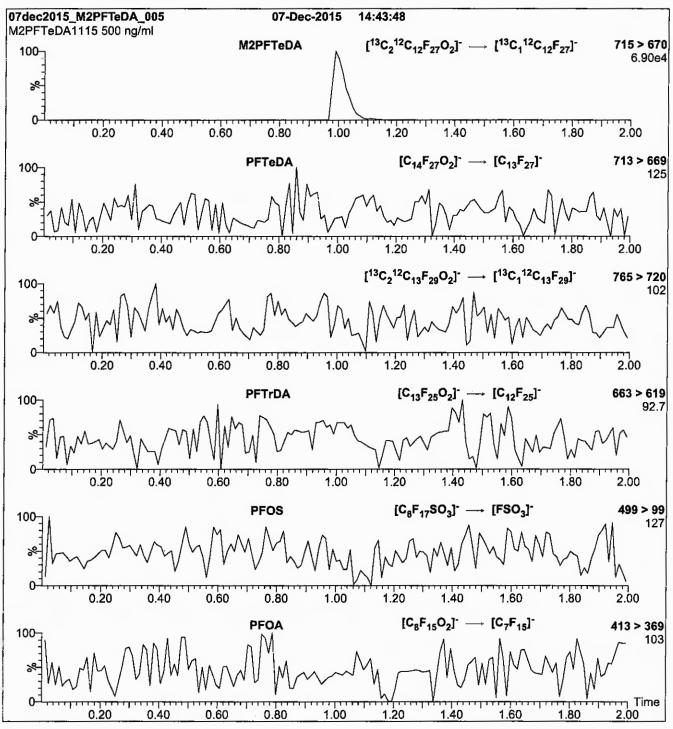
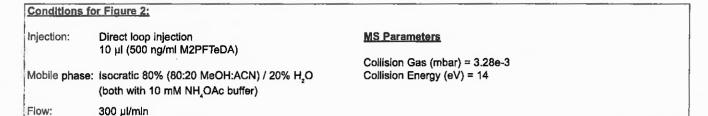


Figure 2: M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)





LCM4PFHPA 00007

P: SBC 0/22/16



ID: LCM4PFHPA_00007 Exp: 05/27/21 Prpd: SBC 13C4-Perfluoroheptanoic 8



WELLINGTON

CERTIFICATE OF ANALYSIS

DOCUMENTATION

PRODUCT CODE:

M4PFHpA

LOT NUMBER:

M4PFHpA0516

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

F F F F F F

MOLECULAR FORMULA:

¹³C₄¹²C₃HF₁₃O₂

MOLECULAR WEIGHT:

368.03

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

Water (<1%) >99%13C

(1,2,3,4-13C₄)

LAST TESTED: (mm/dd/yyyy)

- 30 /0

05/27/2016

EXPIRY DATE: (mm/dd/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:

B.G. Chillim

Date:

<u>07/05/2016</u>

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

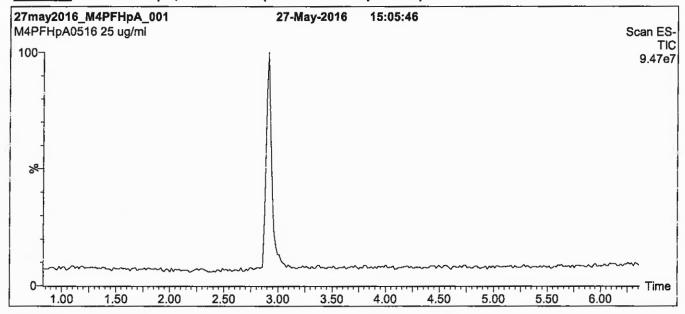
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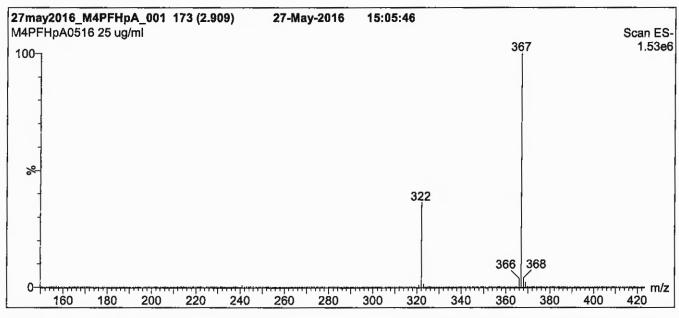




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Figure 1: M4PFHpA; LC/MS Data (TIC and Mass Spectrum)





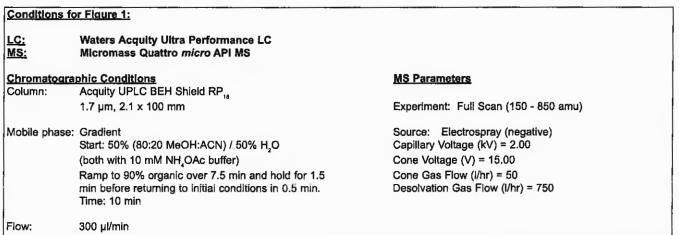
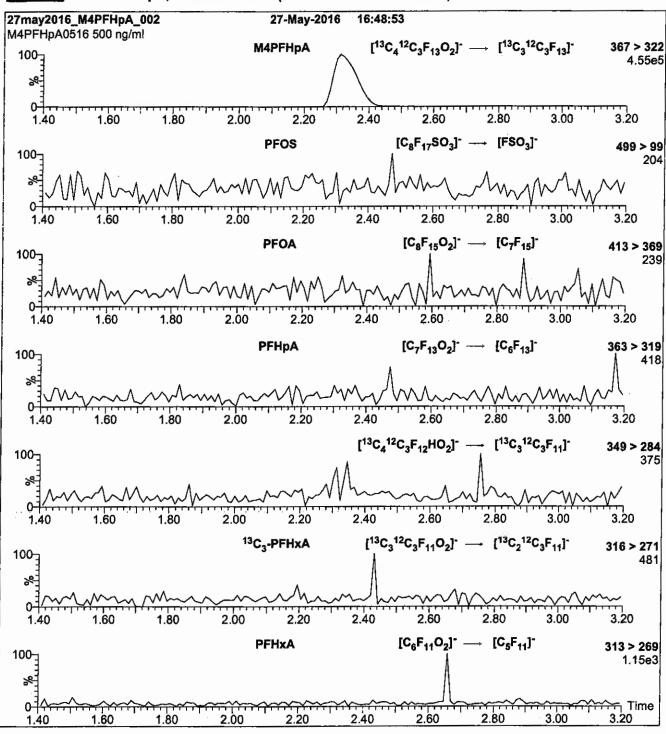
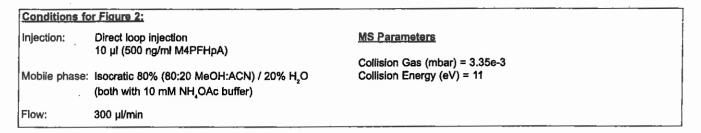


Figure 2: M4PFHpA; LC/MS/MS Data (Selected MRM Transitions)





LCM5PFPEA_00008



ID: LCM5PFPEA_00008 Exp: 05/22/20 Prpd: SBC 13C5-Perfluoropentanoic a



CERTIFICATE OF ANALYSIS

DOCUMENTATION

PRODUCT CODE:

M5PFPeA

LOT NUMBER:

M5PFPeA0515

COMPOUND:

Perfluoro-n-[13C]pentanoic acid

CAS #:

Not available

STRUCTURE:

MOLECULAR FORMULA:

¹³C₂HF₀O₂

MOLECULAR WEIGHT:

269.01

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

Water (<1%) >99% 13C

(13C_e)

LAST TESTED: (mm/dd/yyyy)

05/22/2015

EXPIRY DATE: (mm/dd/yyyy)

05/22/2020

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 < 0.1% of perfluoro-n-pentanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: <u>05/25/2015</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.

HAZARDS:

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HOMOGENEITY:

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QUALITY MANAGEMENT:

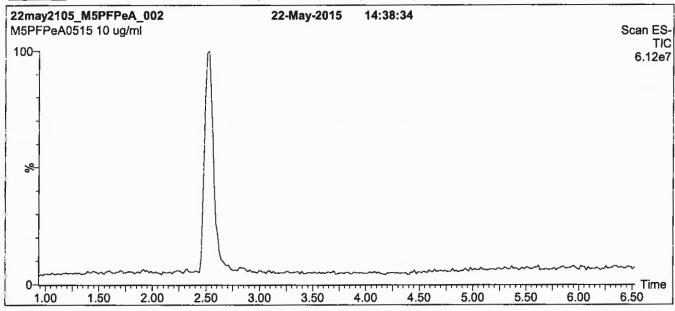
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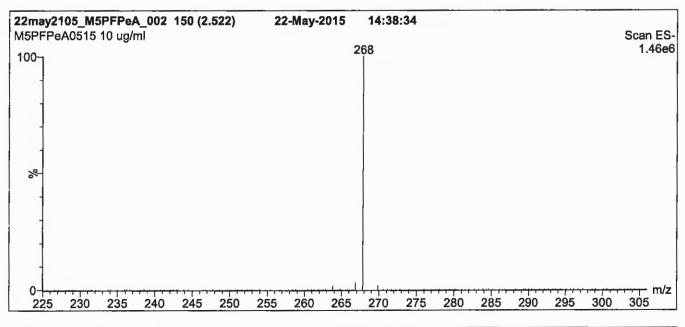




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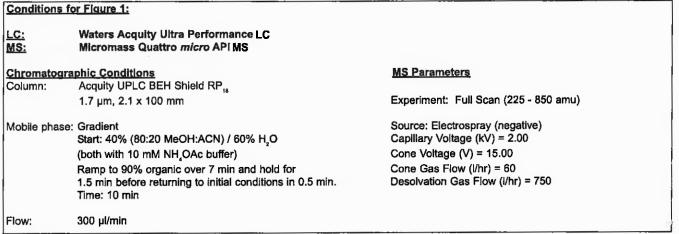
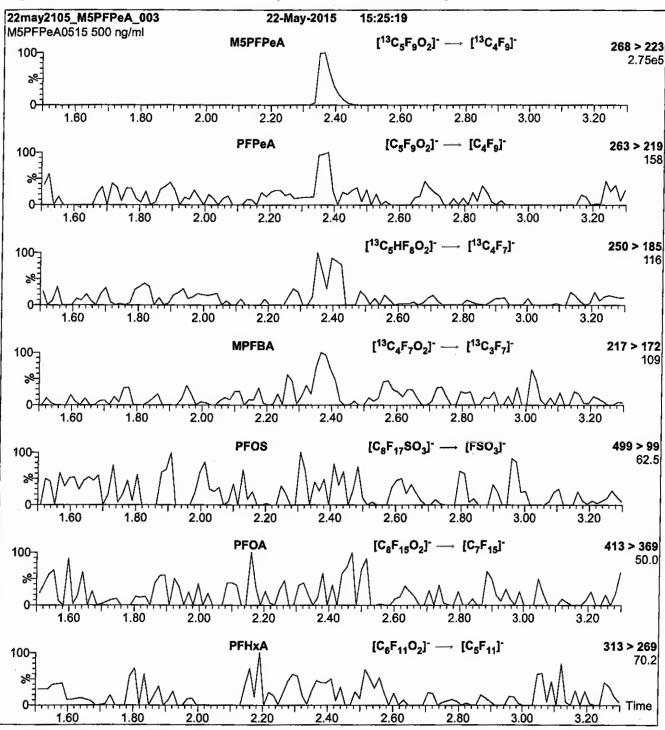
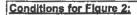


Figure 2: M5PFPeA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml M5PFPeA)

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

(both with 10 mM NH,OAc buffer)

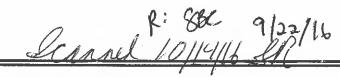
Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3

LCM8FOSA_00011





ID: LCM8FOSA_00011 E:p: 12/22/17 Prpd: SBC 13C8-Perfluorooctanesulfo



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M8FOSA-I

LOT NUMBER:

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

SOLVENT(S):

M8FOSA1215I

COMPOUND:

Perfluoro-1-[13C_]octanesulfonamide

STRUCTURE:

CAS #:

Not available

507.09

(13C_a)

Isopropanol

≥99% ¹³C

MOLECULAR FORMULA:

¹³C₈H₂F₁₂NO₂S

CONCENTRATION:

50 ± 2.5 μg/ml

CHEMICAL PURITY:

>98%

LAST TESTED: (mrr/dd/yyyy)

12/22/2015

EXPIRY DATE: (mm/dd/yyyy)

12/22/2017

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: 01/14/2016

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:

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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:

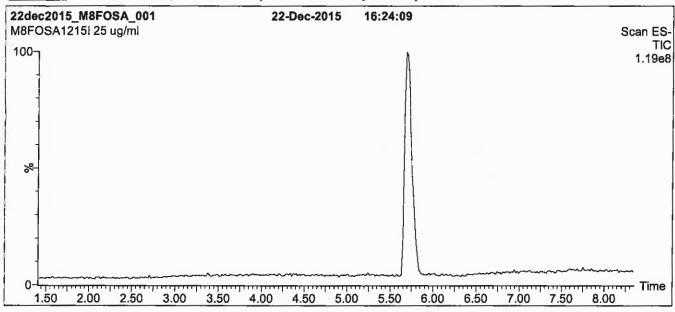
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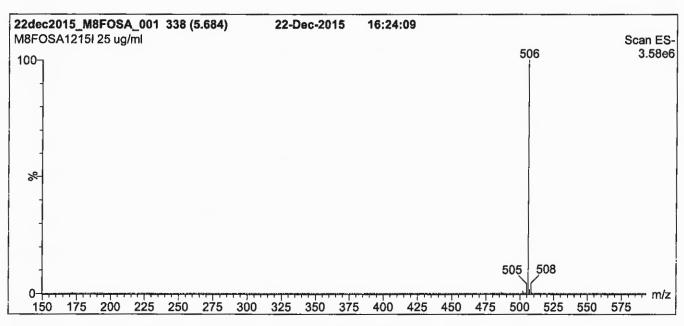




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Figure 1: M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)





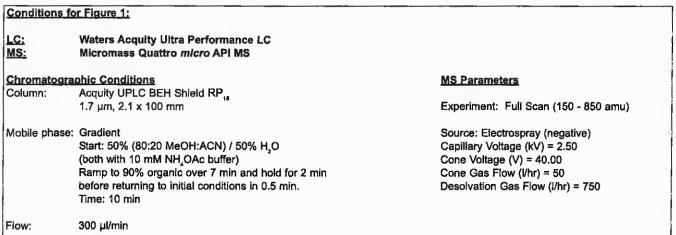
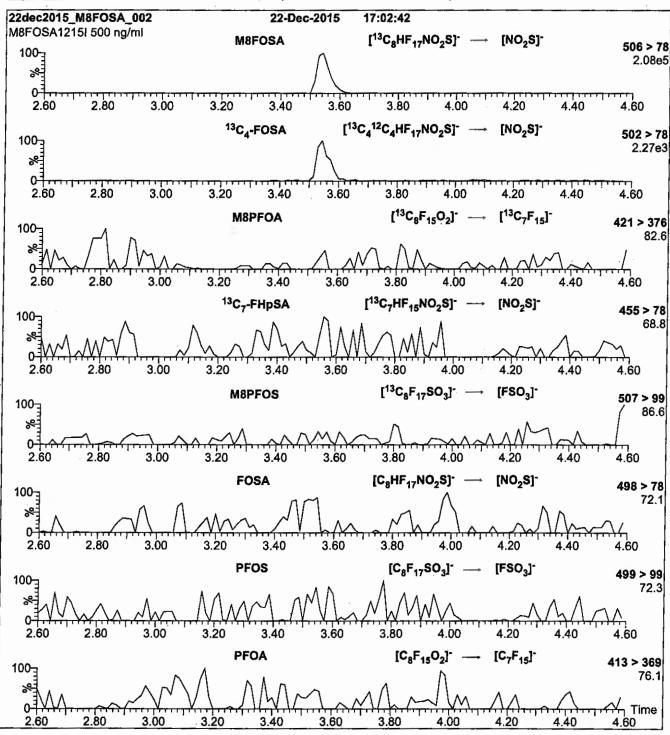
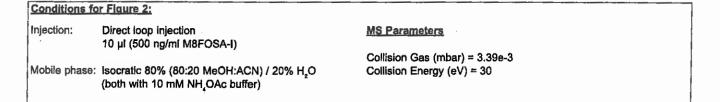


Figure 2: M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)





300 µl/min

Flow:

LCMPFBA_00008



739593

ID: LCMPFBA_00008

Exp: 05/24/21 Prpd: SBC
13C4-Perfluorobutanoic ac



CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16

PRODUCT CODE:

MPFBA

Perfluoro-n-[1,2,3,4-13C₄]butanoic acid

LOT NUMBER:

MPFBA0516

STRUCTURE:

COMPOUND:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₄HF₇O₂

50 + 2 5 yesteel

MOLECULAR WEIGHT:

218.01

 $50 \pm 2.5 \,\mu\text{g/ml}$ SOLVENT(S):

Methanol

Water (<1%)

(1,2,3,4-13C₄)

ISOTOPIC PURITY:

≥99%¹³C

LAST TESTED: (mm/dd/yyyy)

>98%

05/24/2016

EXPIRY DATE: (m:m/dd/yyyy)

CONCENTRATION:

CHEMICAL PURITY:

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 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:

<u> 15/30/2016</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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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:

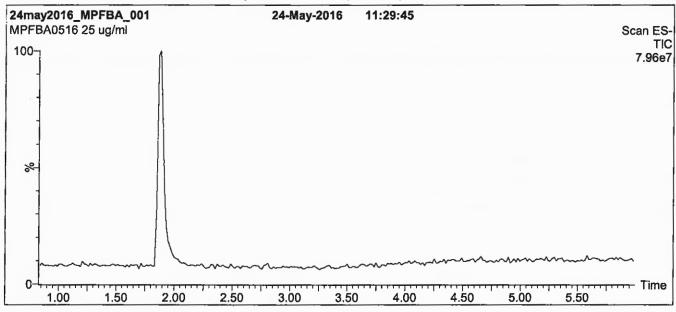
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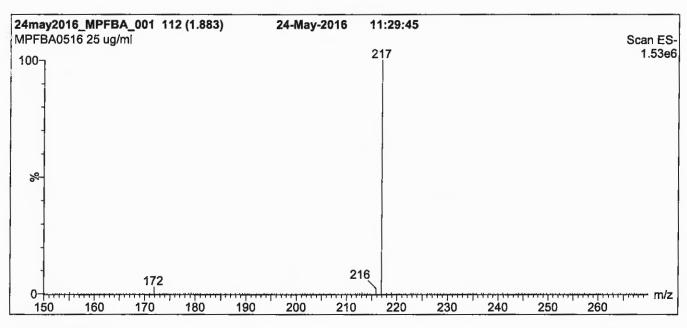




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Figure 1: MPFBA; LC/MS Data (TIC and Mass Spectrum)





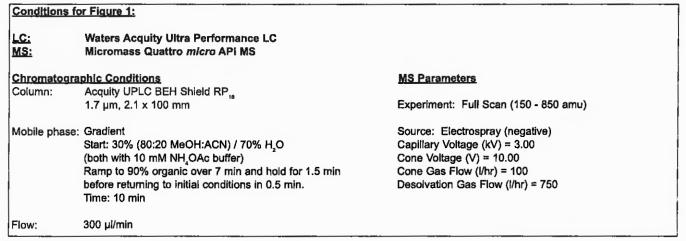
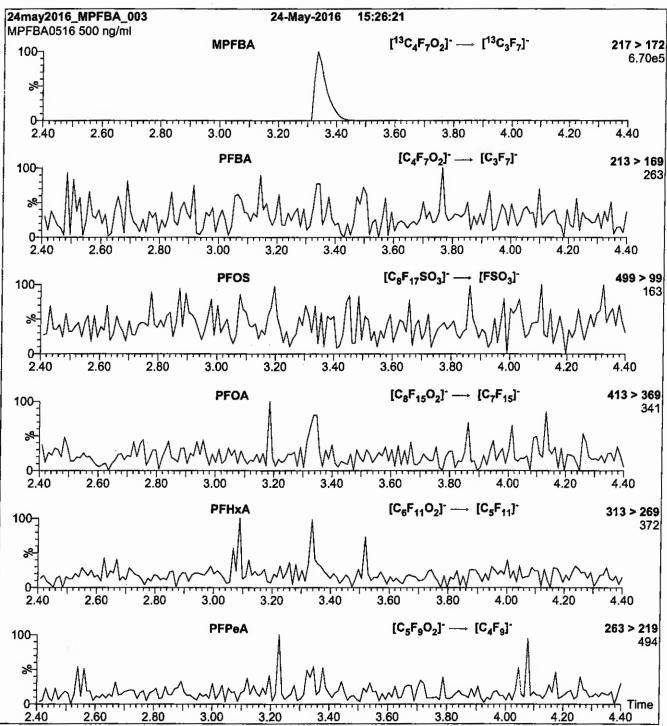


Figure 2: MPFBA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop Injection

10 μl (500 ng/ml MPFBA)

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

(both with 10 mM NH,OAc buffer)

Flow: 300 µI/min

MS Parameters

Collision Gas (mbar) = 3.50e-3 Collision Energy (eV) = 10

LCMPFDA_00011



ID: LCMPFDA_00011 Exp: 08/19/20 Prpd: SBC 13C2-Perfluormodecariok:

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFDA

LOT NUMBER:

MPFDA0815

COMPOUND:

Perfluoro-n-[1,2-13C₃]decanoic acid

STRUCTURE:

CAS #:

Not available

F C C C C C C C 13 13 C OH

MOLECULAR FORMULA:

¹³C₂¹²C₈HF₁₉O₂

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

516.07

CONCENTRATION:

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

SOLVENT(S):

Methanol

>99% 13C

(1,2-13C₂)

Water (<1%)

CHEMICAL PURITY:

>98%

08/19/2015

LAST TESTED: (mm/dd/yyyy)

EXPIRY DATE: (mm/dd/yyyy)

08/19/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

Contains < 0.1% of ¹³C₁-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B C Phittim

Date: __(

(mm/dd/www)

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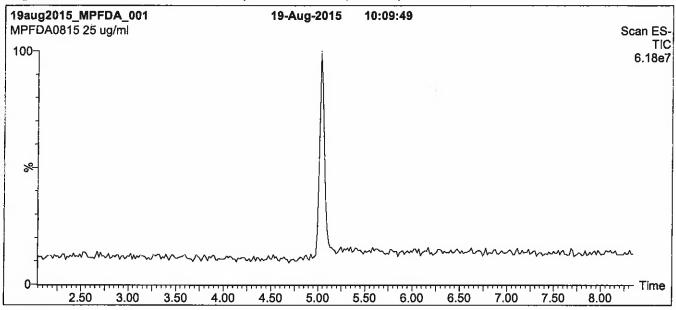
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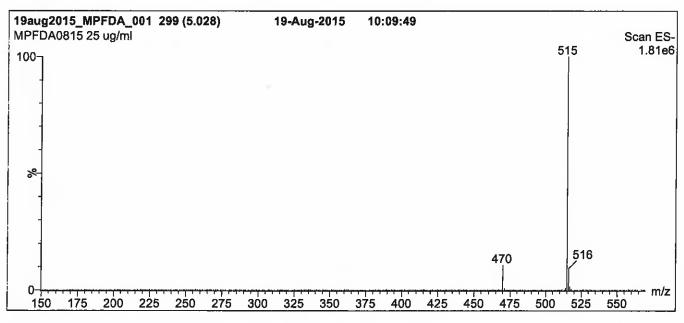




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Figure 1: MPFDA; LC/MS Data (TIC and Mass Spectrum)





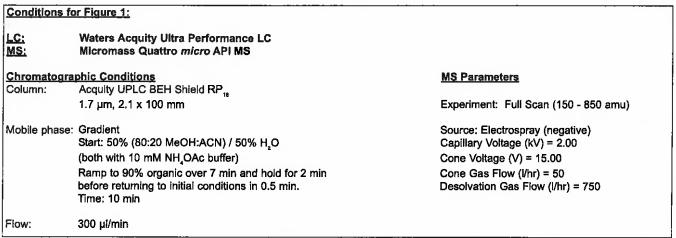
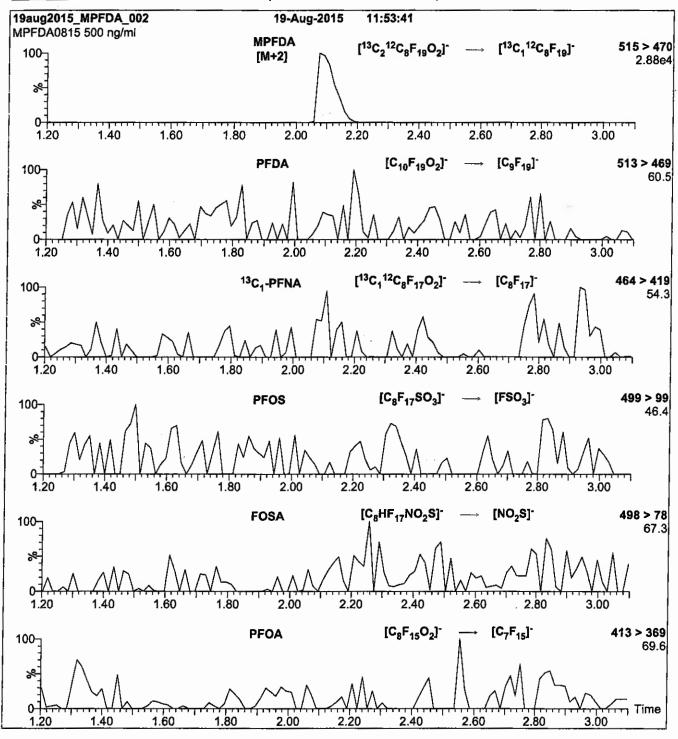


Figure 2: MPFDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml MPFDA)

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

(both with 10 mM NH OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3 Collision Energy (eV) ≈ 13

LCMPFDoA_00008



ID: LCMPFDoA_00008 13C2-Perfluornocodecanoic



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFDoA

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

10/14/16 SR LOT NUMBER:

CAS #:

MPFDoA0416

STRUCTURE:

COMPOUND:

Not available

MOLECULAR FORMULA:

¹³C₂¹²C₁₀HF₂₃O₂

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

616.08

SOLVENT(S):

Methanol

(1,2-13C₂)

Water (<1%) >99% 13C ISOTOPIC PURITY:

CHEMICAL PURITY:

CONCENTRATION:

>98%

LAST TESTED: (mm/dd/yyyy)

04/08/2016

EXPIRY DATE: (mm/dd/yyyy)

04/08/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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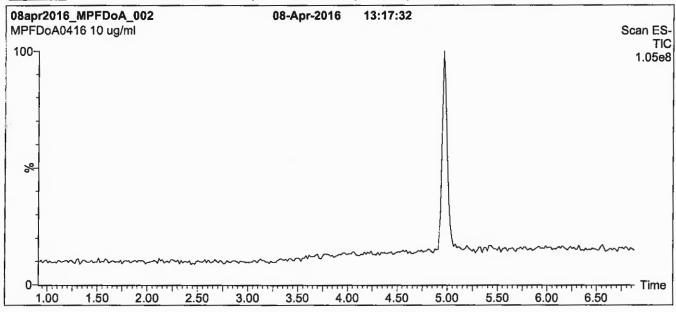
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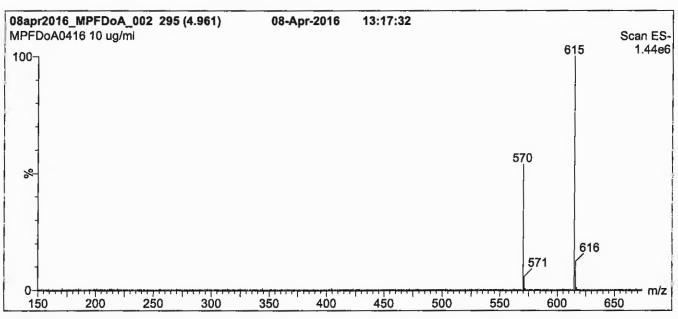




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Figure 1: MPFDoA; LC/MS Data (TIC and Mass Spectrum)





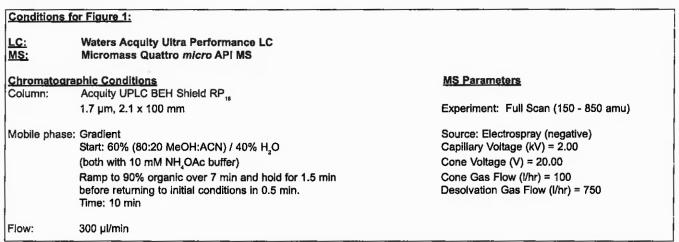
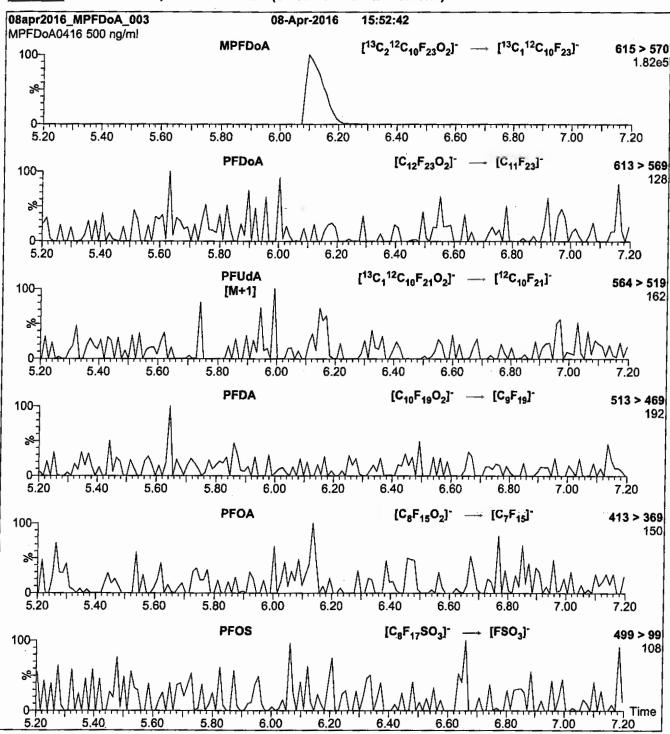
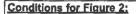


Figure 2: MPFDoA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml MPFDoA)

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) = 3.24e-3 Collision Energy (eV) = 13

LCMPFHxA_00012





ID: LCMPFHxA_00012 Exp: 04/08/21 Prpd: SBC 13C2-Perfluorohexanoic ad



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFHxA

LOT NUMBER:

MPFHxA0416

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₂¹²C₄HF₄O₂

MOLECULAR WEIGHT:

316.04

CONCENTRATION:

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

SOLVENT(S):

Methanol Water (<1%)

≥99%¹³C

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

(1,2-13C₂)

LAST TESTED: (mm/dd/yyyy)

04/08/2016

EXPIRY DATE: (mm/dd/yyyy)

04/08/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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:

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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:

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:

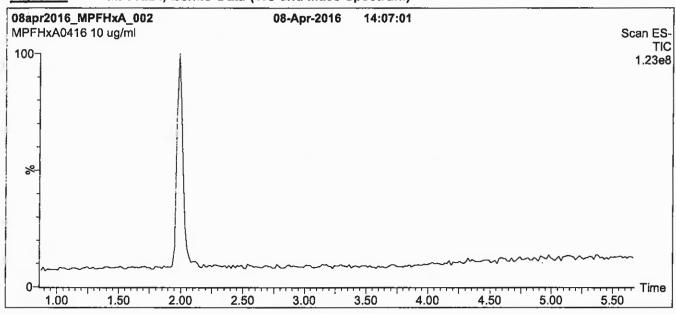
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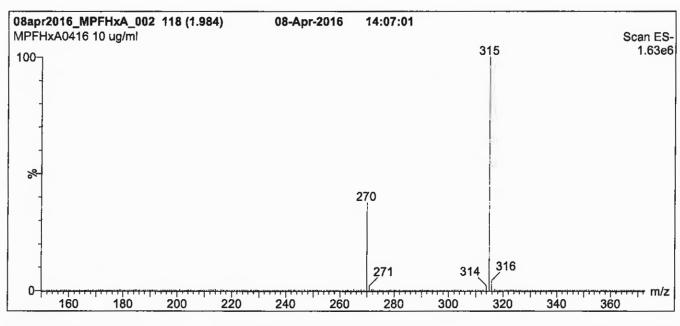




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Figure 1: MPFHxA; LC/MS Data (TIC and Mass Spectrum)





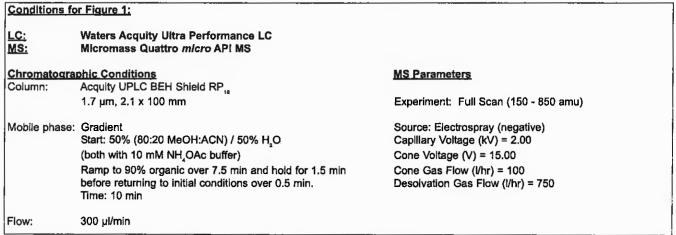
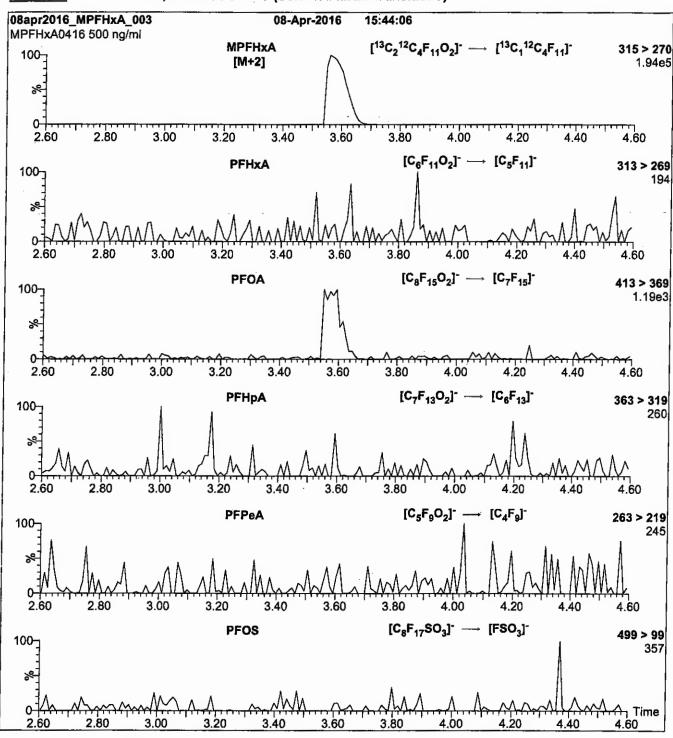
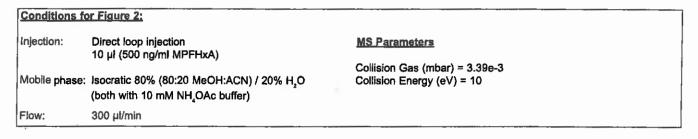


Figure 2: MPFHxA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFHxS_00008



CERTIFICATE OF ANALYSIS

DOCUMENTATION

PRODUCT CODE:

MPFHxS

LOT NUMBER:

MPFHxS1015

COMPOUND:

Sodium perfluoro-1-hexane[18O2]sulfonate

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C₆F₁₃S¹⁸O₂¹⁶ONa

MOLECULAR WEIGHT:

426.10

CONCENTRATION:

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

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

>94% (18O₂)

LAST TESTED: (mm/dd/yyyy)

10/23/2015

EXPIRY DATE: (mm/dd/yyyy)

10/23/2020

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 (C₆F₁₃S¹⁸O₂¹⁶O⁻) 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.

Due to the isotopic purity of the starting material (180, >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:

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HOMOGENEITY:

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UNCERTAINTY:

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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:

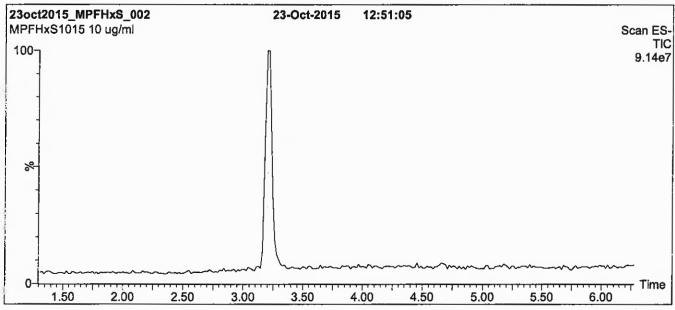
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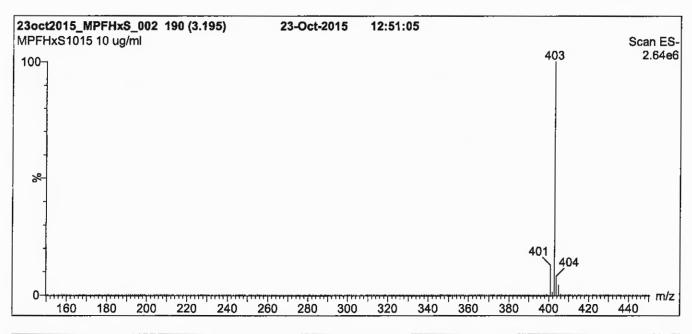




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Figure 1: MPFHxS; LC/MS Data (TIC and Mass Spectrum)





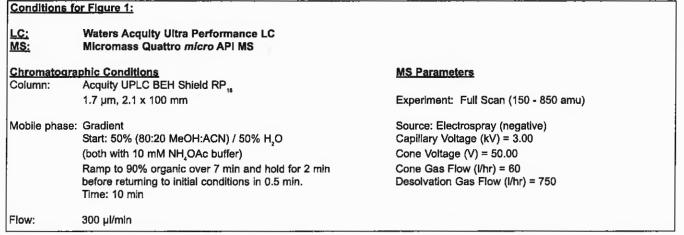
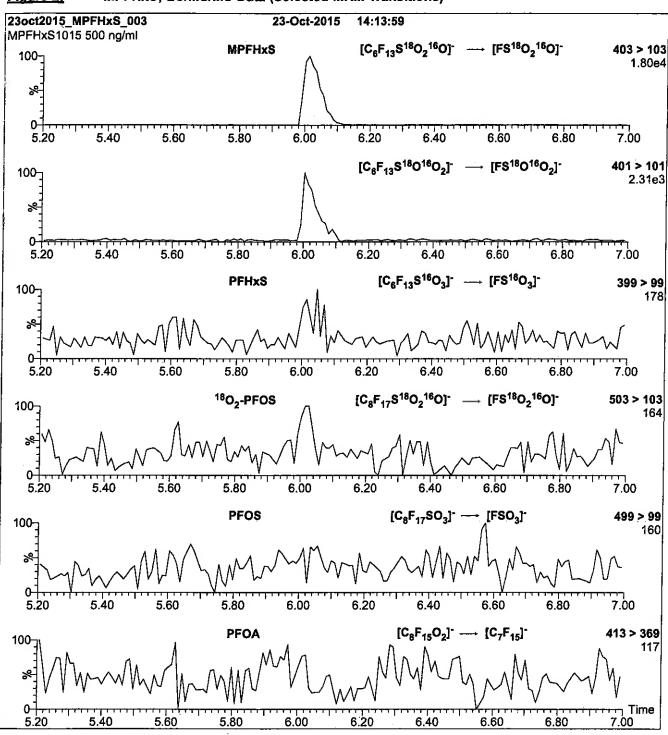
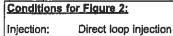


Figure 2: MPFHxS; LC/MS/MS Data (Selected MRM Transitions)





10 µl (500 ng/ml MPFHxS)

MS Parameters

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

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

Flow: 300 µl/min

LCMPFNA_00008

PRODUCT CODE:

MPFNA

LOT NUMBER:

MPFNA0414

COMPOUND:

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

CAS #:

Not available

STRUCTURE:

MOLECULAR FORMULA:

13C, 12C, HF,,O,

MOLECULAR WEIGHT:

469.04

 $50 \pm 2.5 \, \mu g/ml$ SOLVENT(S): Methanoi

 $(1,2,3,4,5^{-13}C_{s})$

Water (<1%) **ISOTOPIC PURITY:** ≥99%13C

CHEMICAL PURITY:

CONCENTRATION:

>98%

LAST TESTED: (mm/dd/yyyy)

04/13/2014

EXPIRY DATE: (mm/dd/yyyy)

04/13/2019

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:

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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:

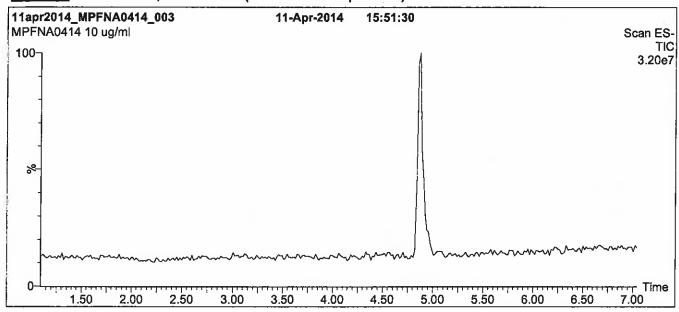
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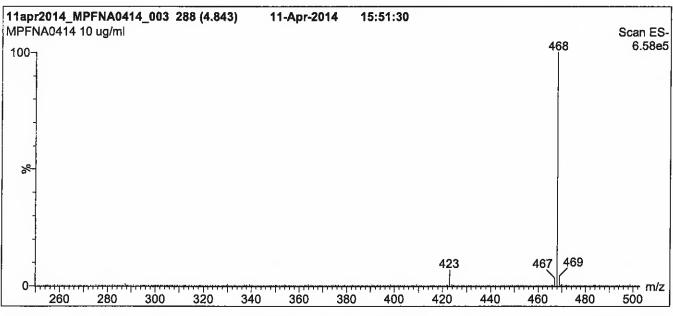




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Figure 1: MPFNA; LC/MS Data (TIC and Mass Spectrum)





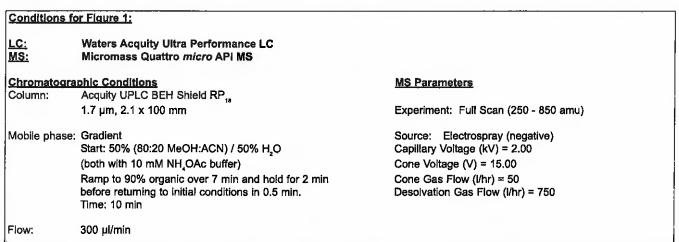
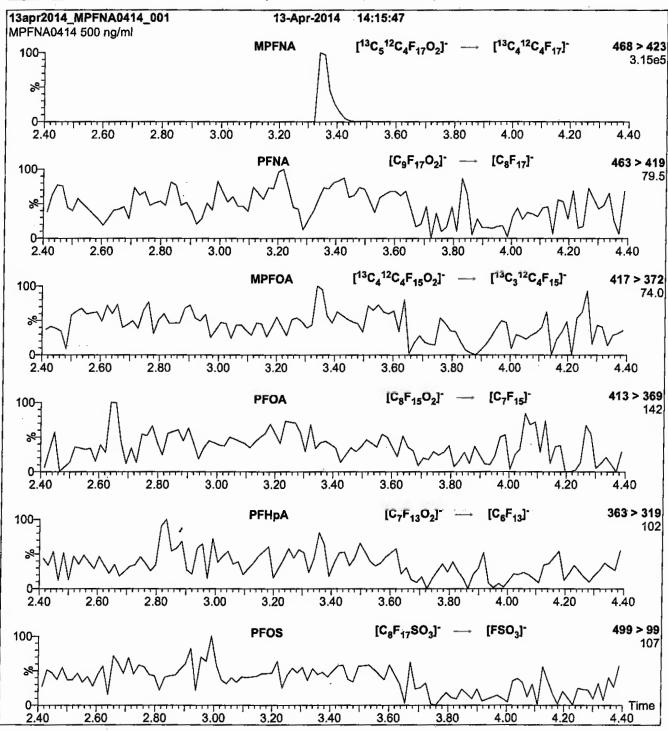
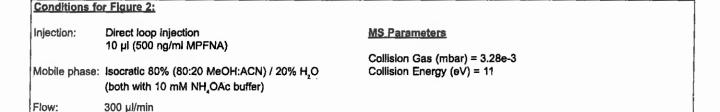


Figure 2: MPFNA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFOA_00012



ID: LCMPFOA_00012 Exp: 01/22/21 Prpd: SBC 13C4-Perfluorooctanoic ac



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFOA

LOT NUMBER:

MPFOA0116

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

13C₄12C₄HF₁₅O₂

MOLECULAR WEIGHT:

418.04

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

ISOTOPIC PURITY:

>99% 13C

Water (<1%)

(1,2,3,4-13C,)

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

01/22/2016

EXPIRY DATE: (mm/dd/yyyy)

01/22/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

Contains ~ 0.1% of native perfluoro-n-octanoic acid (PFOA).

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

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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:

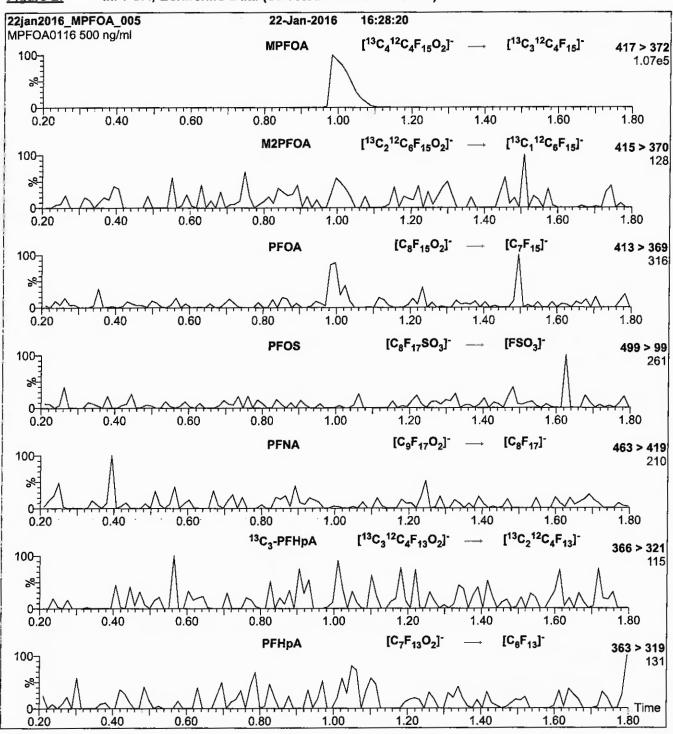
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Figure 2: MPFOA; LC/MS/MS Data (Selected MRM Transitions)



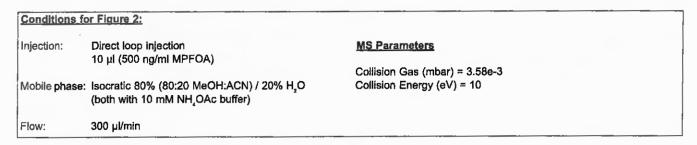
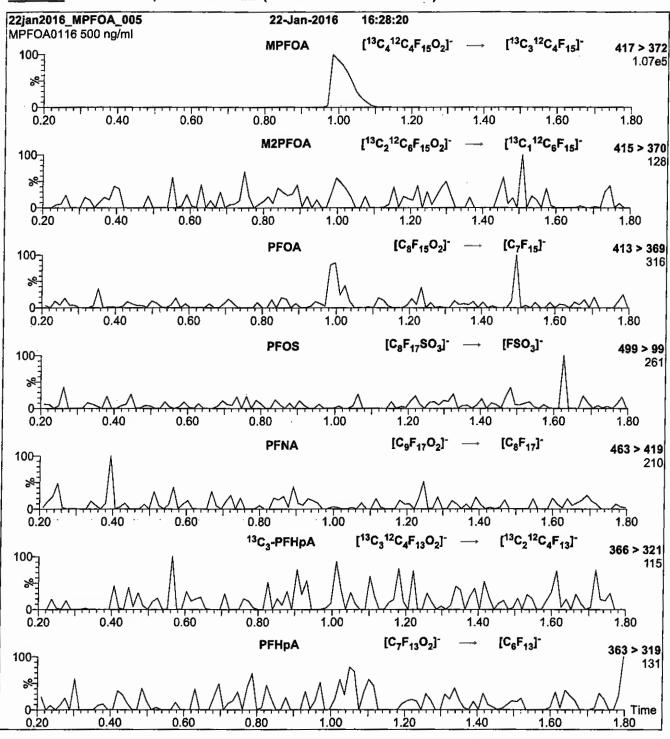
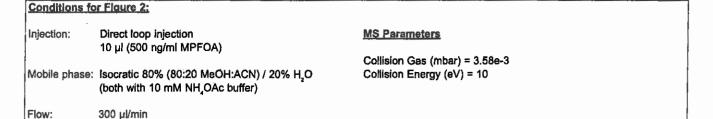


Figure 2: MPFOA; LC/MS/MS Data (Selected MRM Transitions)





Flow:

LCMPFOS_00017

R: 9/9/16 8BC





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFOS

LOT NUMBER:

MPFOS0816

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₄¹²C₄F₁₇SO₃Na

MOLECULAR WEIGHT:

526.08

CONCENTRATION:

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

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

LAST TESTED: (mm/dd/yyyy)

08/03/2016

(1,2,3,4-13C₄)

EXPIRY DATE: (mm/dd/yyyy)

08/03/2021

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 ~ 0.8% Sodium perfluoro-1-[1,2,3-13C]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 08/05/2016

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:

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(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:

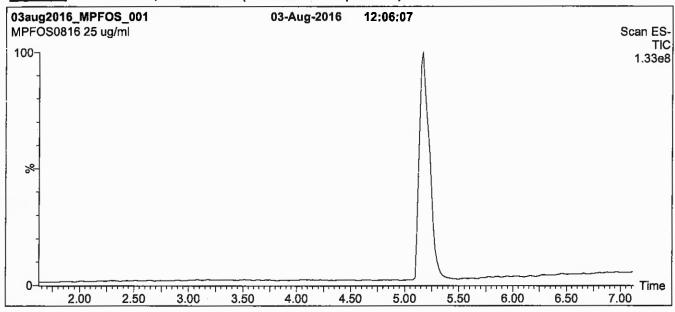
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

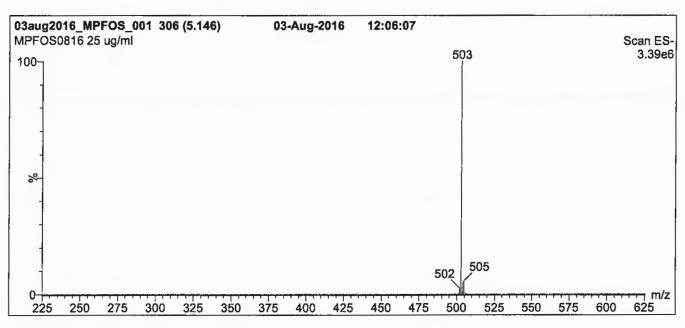




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





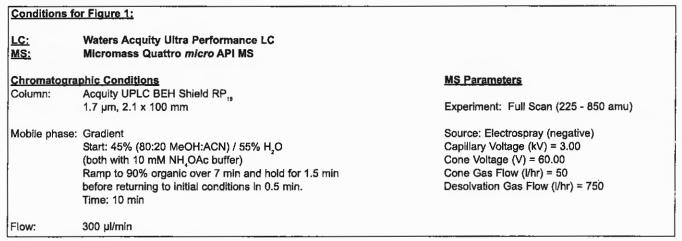
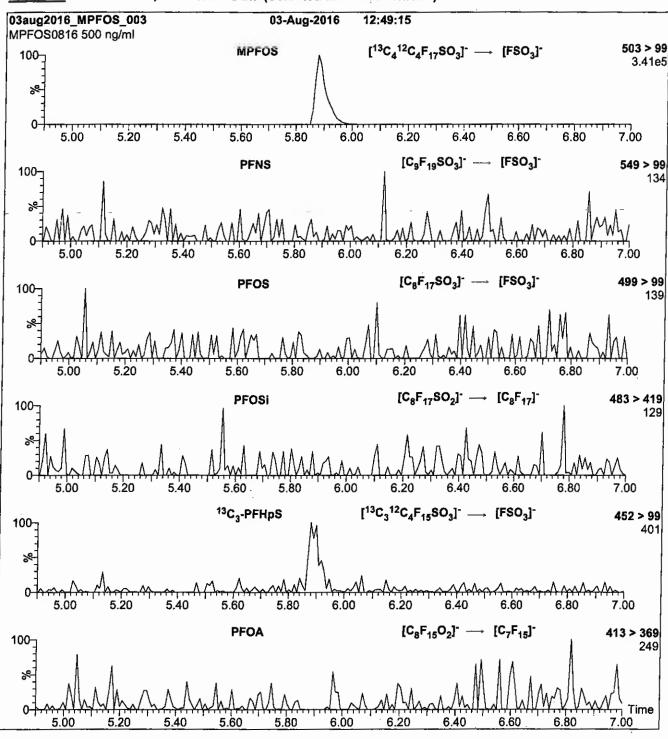


Figure 2: MPFOS; LC/MS/MS Data (Selected MRM Transitions)





Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O Collision Energy (eV) = 40

(both with 10 mM NH₄OAc buffer)

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

Flow:

300 µl/min

LCMPFUdA_00009

CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16 SR

PRODUCT CODE:

MPFUdA

LOT NUMBER:

MPFUdA0216

COMPOUND:

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

STRUCTURE:

CAS#:

Not available

MOLECULAR FORMULA:

¹³C₂¹²C₉HF₂₁O₂

MOLECULAR WEIGHT:

566.08

CONCENTRATION:

50 ± 2.5 μg/ml

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

Water (<1%) ≥99% ¹³C (1,2-¹³C₂)

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.

• Presence of 1-13C₁-PFUdA (~1%; see Figure 2), 2-13C₁-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 Bv:

B.G. Chittim

Date:

02/24/2016

(mm/dd/yy

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QUALITY MANAGEMENT:

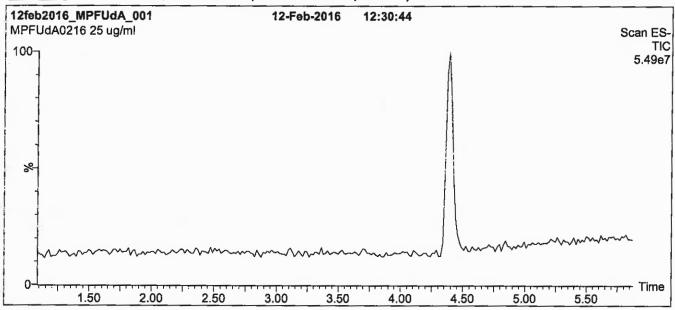
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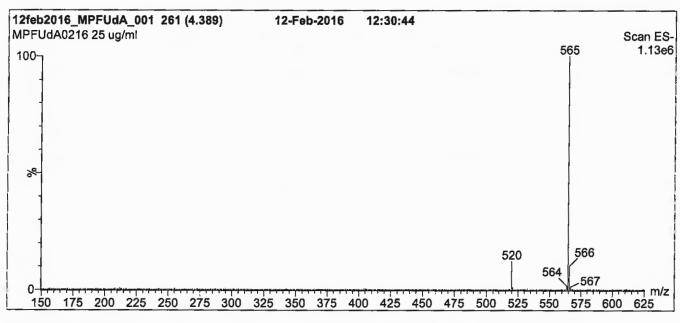




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Figure 1: MPFUdA; LC/MS Data (TIC and Mass Spectrum)





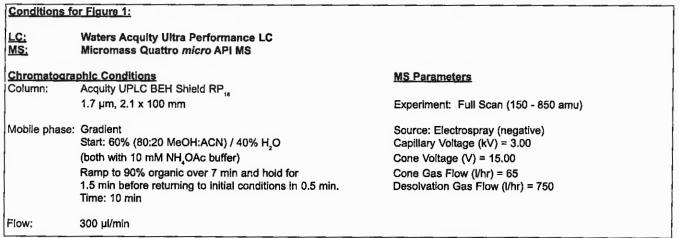
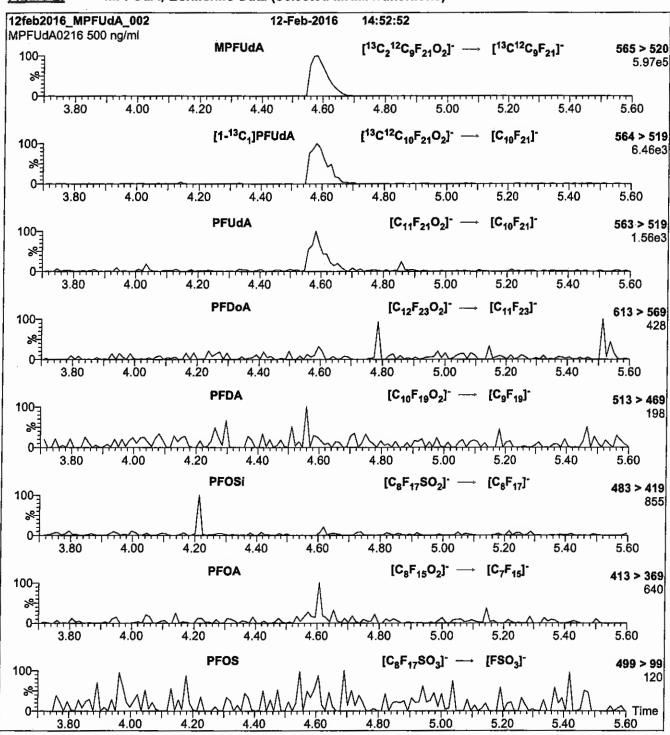
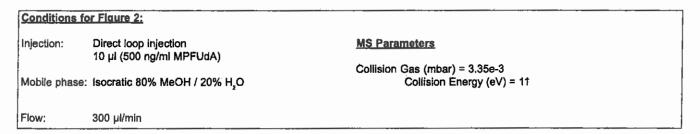


Figure 2: MPFUdA; LC/MS/MS Data (Selected MRM Transitions)





LCN-EtFOSA-M_00002



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

N-EtFOSA-M

LOT NUMBER:

MOLECULAR WEIGHT:

SOLVENT(S):

NEtFQSA0714M

527.20

Methanol

COMPOUND:

N-ethylperfluoro-1-octanesulfonamide

STRUCTURE:

CAS #:

4151-50-2

MOLECULAR FORMULA:

C₁₀H₈F₁₇NO₂S

CONCENTRATION:

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

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

07/14/2014

EXPIRY DATE: (mm/dd/yyyy)

07/14/2019

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: 04/01/2015

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:

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SYNTHESIS / CHARACTERIZATION:

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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:

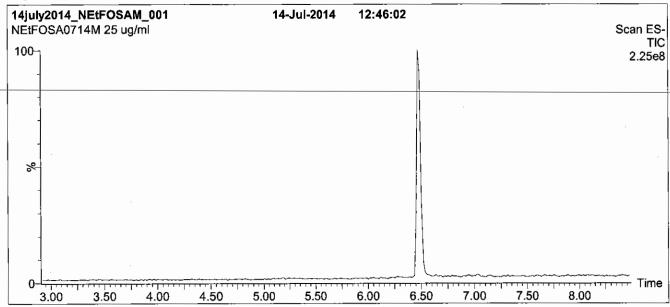
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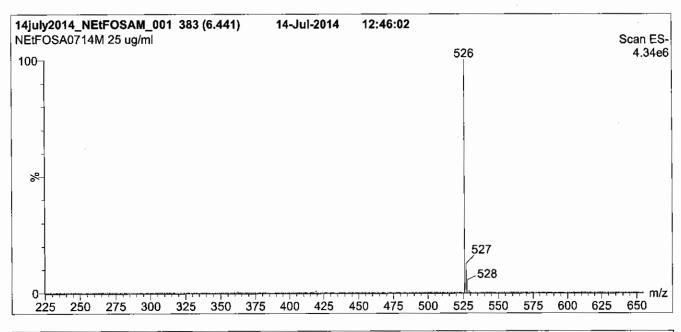




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Figure 1: N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)





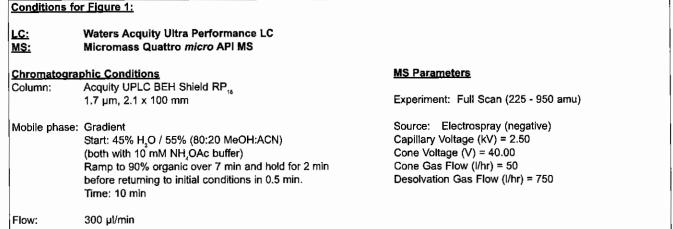
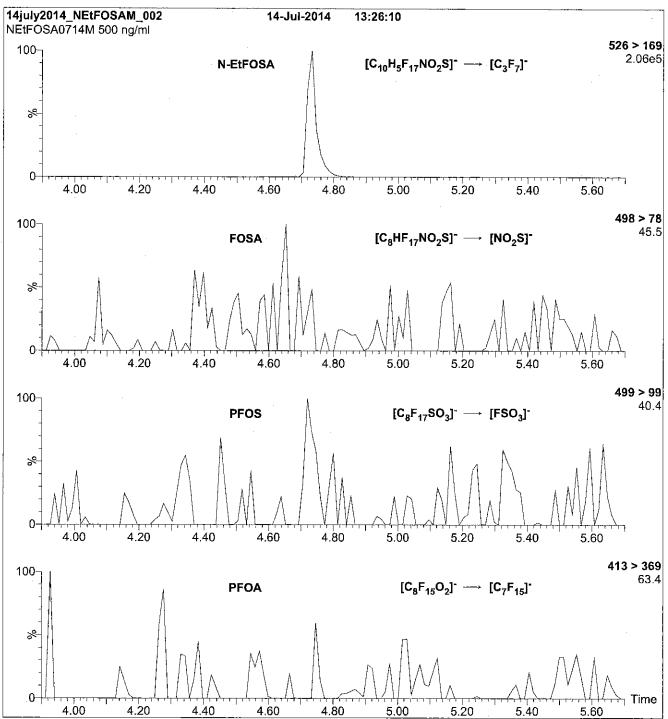


Figure 2: N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Flow:

Direct loop injection

10 μl (500 ng/ml N-EtFOSA-M)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% $\rm H_2O$

(both with 10 mM NH,OAc buffer)

,

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3 Collision Energy (eV) = 30

LCN-EtFOSA-M_00003

R: 8/23/16 SEC



N-EtFOSA-M



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

N-EtFOSA-M

LOT NUMBER:

MOLECULAR WEIGHT:

SOLVENT(S):

NEtFOSA0516M

527.20

Methanol

COMPOUND:

N-ethylperfluoro-1-octanesulfonamide

CAS #:

4151-50-2

STRUCTURE:

MOLECULAR FORMULA:

C,H,F,NO,S

CONCENTRATION:

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

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/24/2016

EXPIRY DATE: (mm/dd/yyy)

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:

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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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_4 , 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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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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QUALITY MANAGEMENT:

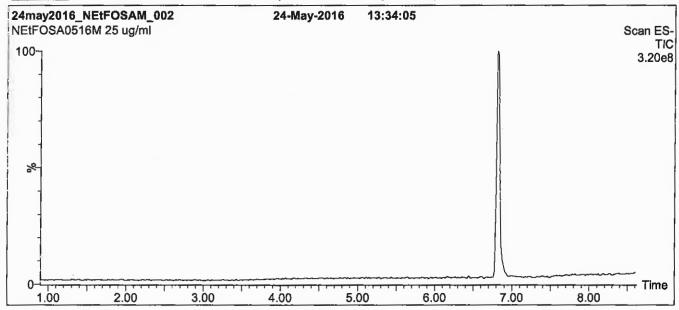
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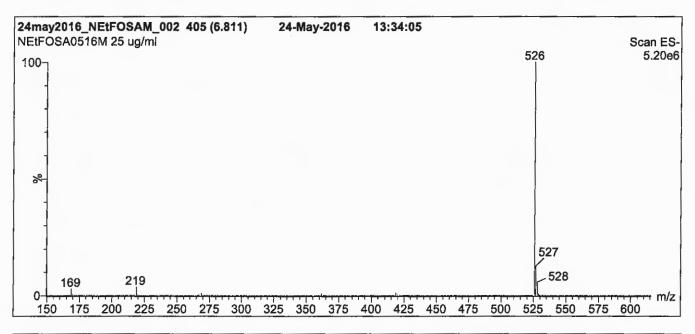




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Figure 1: N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)





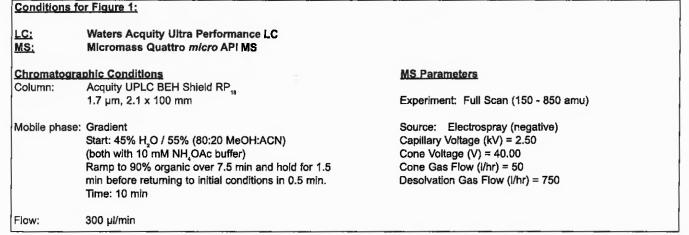
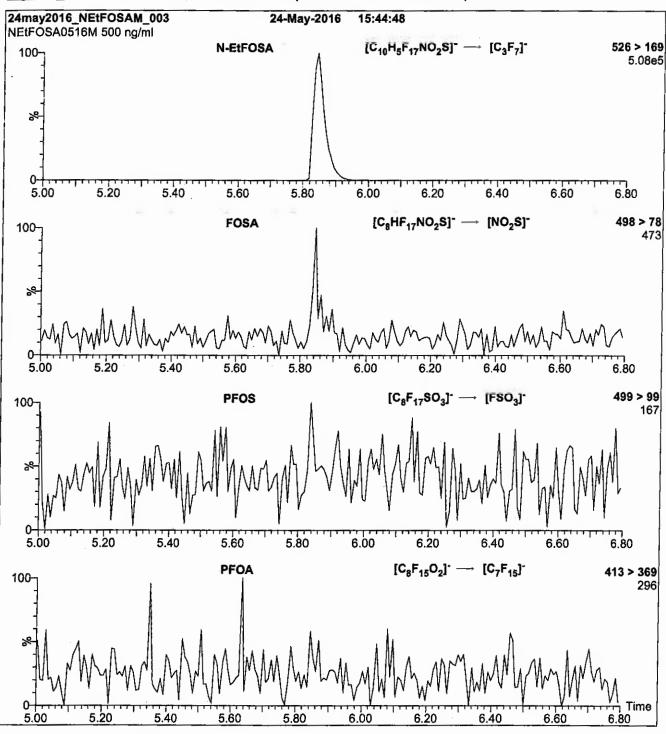


Figure 2: N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Flow:

Direct loop Injection

10 µl (500 ng/ml N-EtFOSA-M)

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

(both with 10 mM NH OAc buffer)

300 µl/min

MS Parameters

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

LCN-EtFOSAA_00001



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

N-EtFOSAA

LOT NUMBER:

NEtFOSAA0113

COMPOUND:

N-ethylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

CAS #:

2991-50-6

ÇH₂CH₃

MOLECULAR FORMULA:

C₁₂H₈F₁₇NO₄S

MOLECULAR WEIGHT:

585.23

CONCENTRATION:

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

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/29/2013

EXPIRY DATE: (mm/dd/yyyy)

01/29/2018

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.

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Certified By:

Date: 04/06/2015

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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:

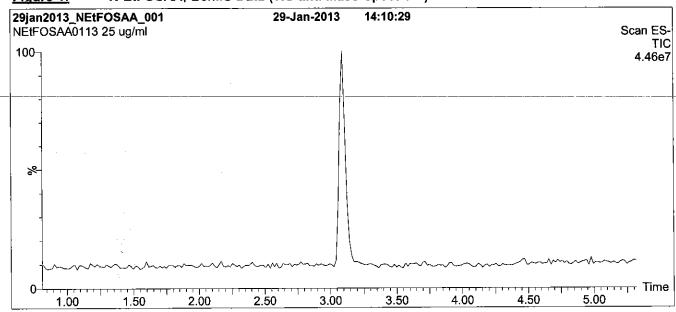
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

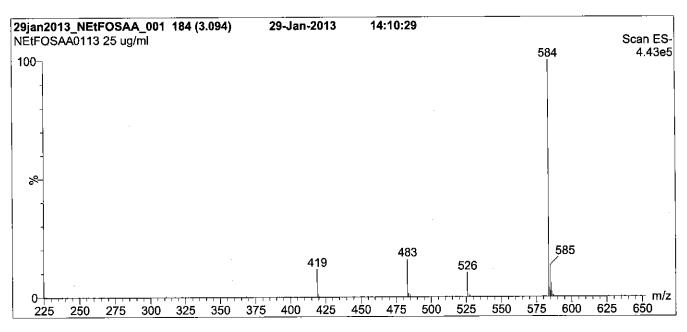




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Figure 1: N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)





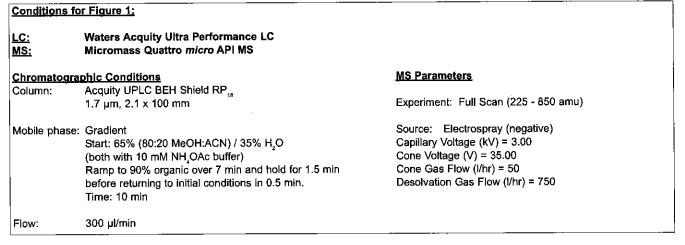
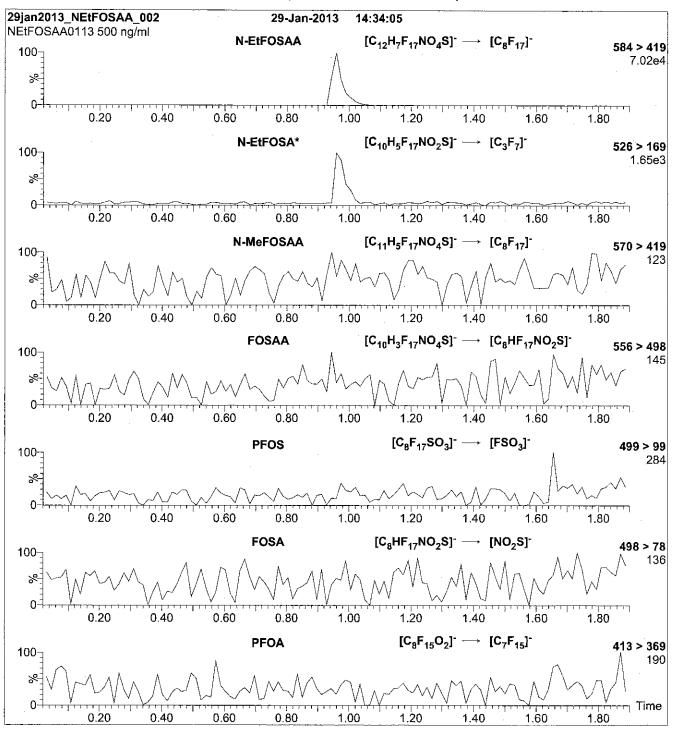
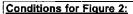


Figure 2: N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)



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



Injection:

Direct loop injection

10 µl (500 ng/ml N-EtFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% $\rm H_2O$

(both with 10 mM NH₄OAc buffer)

Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 25

LCN-EtFOSAA_00002





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

N-EtFOSAA

LOT NUMBER:

NEtFOSAA0116

COMPOUND:

N-ethylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

ÇAS #:

2991-50-6

F C C C C C SO₂N CH₂CO₂H

MOLECULAR FORMULA:

C₁₂H_BF₁₇NO₄S

MOLECULAR WEIGHT:

585.23

CONCENTRATION:

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

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/20/2016

EXPIRY DATE: (mm/dd/yyyy)

01/20/2021

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:

B.G. Chittim

Date:

) 1/2 1/20 10

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

x., x....x. 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:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

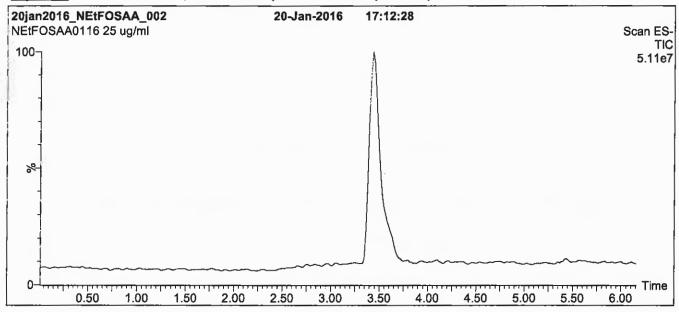
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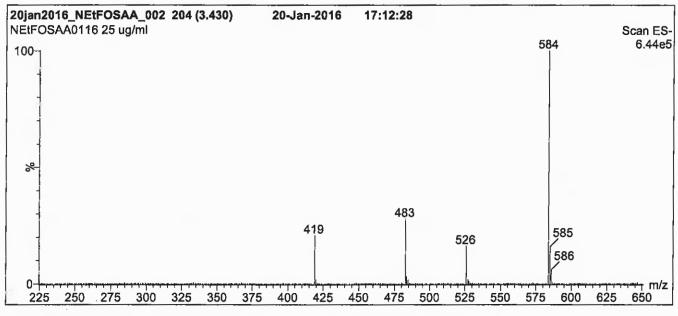




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Figure 1: N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)





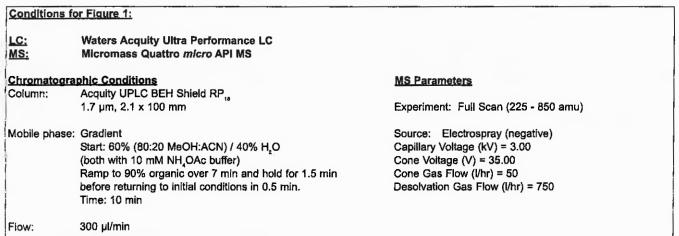
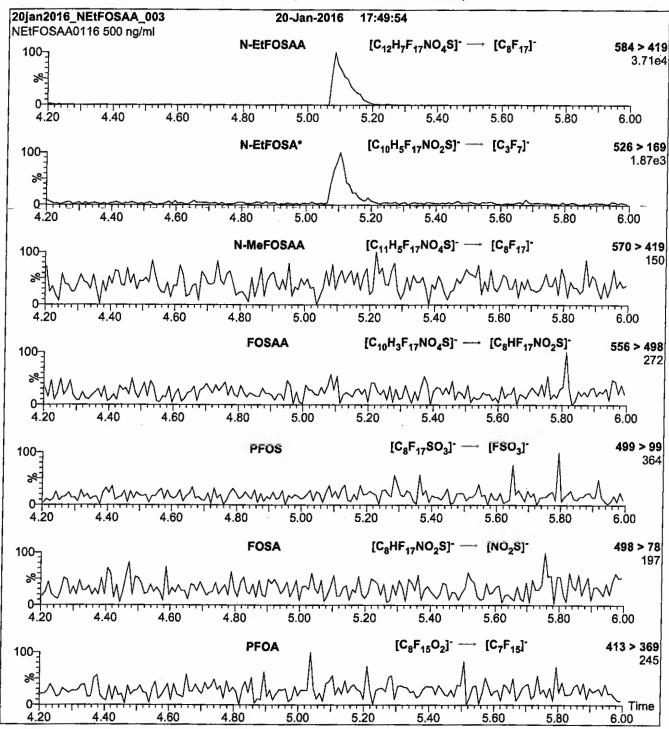
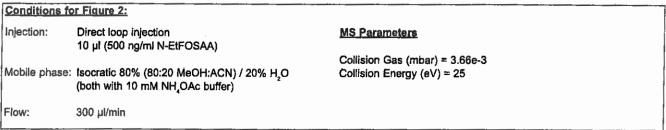


Figure 2: N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)



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



LCN-MeFOSA-M_00001



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

N-MeFOSA-M

LOT NUMBER:

MOLECULAR WEIGHT:

SOLVENT(S):

NMeFOSA0714M

513.17

Methanol

COMPOUND:

N-methylperfluoro-1-octanesulfonamide

CAS #:

31506-32-8

STRUCTURE:

MOLECULAR FORMULA:

C₂H₄F₁₇NO₂S

CONCENTRATION:

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

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

07/15/2014

EXPIRY DATE: (mm/dd/yyyy)

07/15/2019

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: _ 04/01/2015

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HAZARDS:

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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:

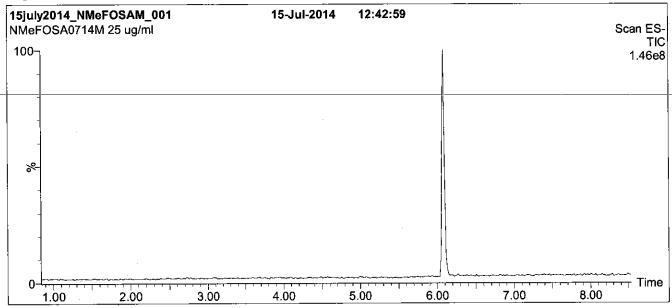
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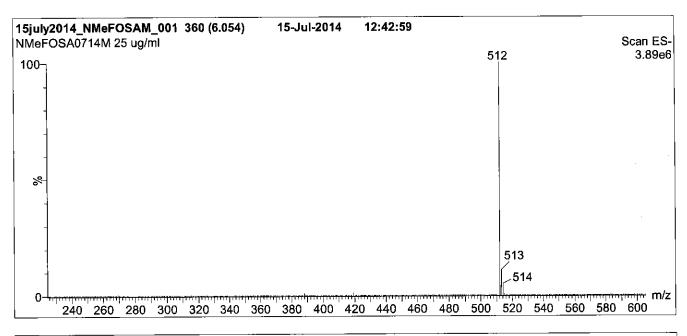




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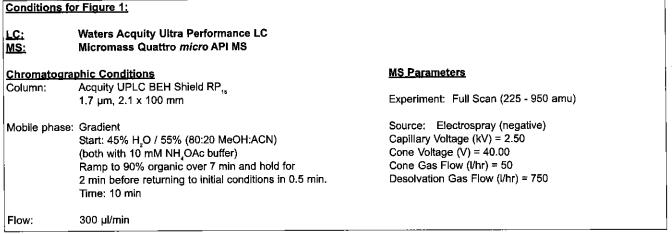
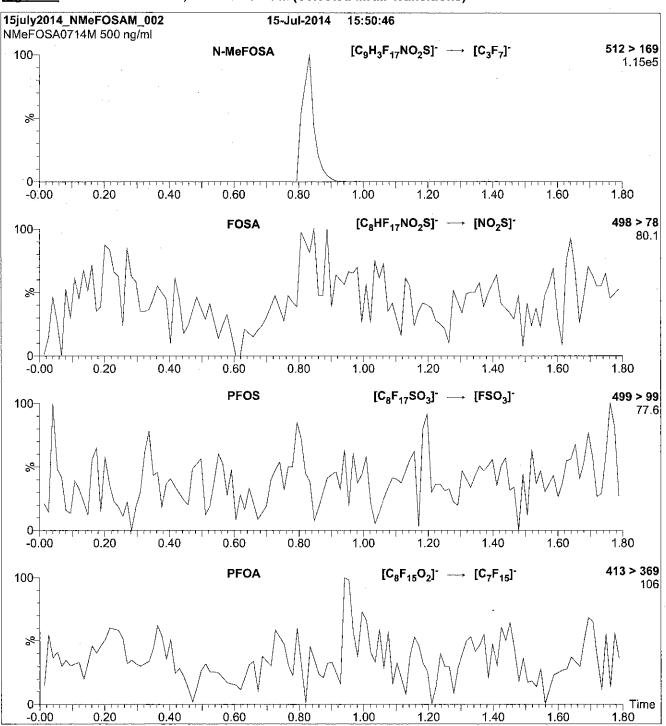
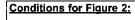


Figure 2: N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml N-MeFOSA-M)

Flow:

300 µl/min

MS Parameters

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

LCN-MeFOSA-M_00002



VELLINGTON ABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

N-MeFOSA-M

LOT NUMBER:

MOLECULAR WEIGHT:

SOLVENT(S):

NMeFOSA0516M

513.17

Methanol

COMPOUND:

N-methylperfluoro-1-octanesulfonamide

CAS #:

31506-32-8

STRUCTURE:

MOLECULAR FORMULA:

C₉H₄F₁₇NO₂S

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: 05/26/2016

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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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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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 explry 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:

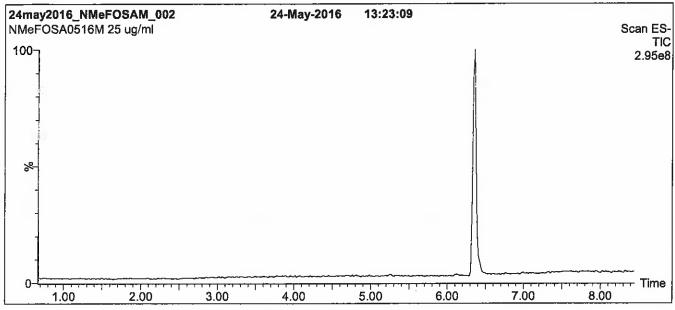
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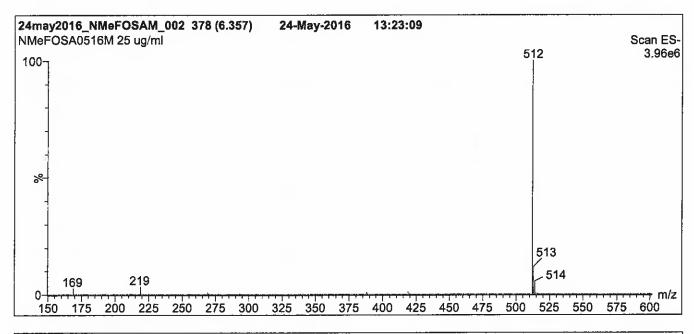




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Figure 1: N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)





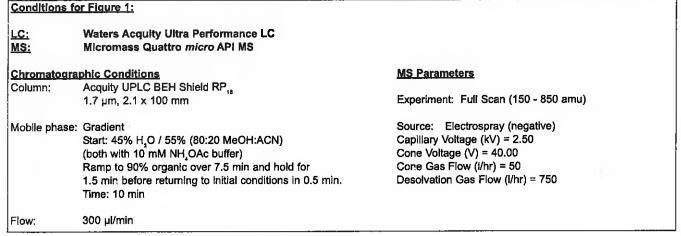
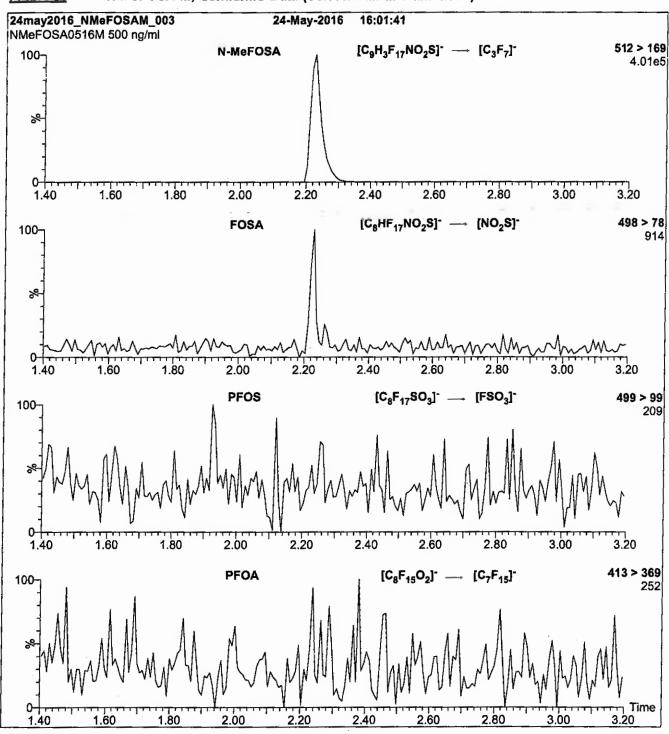


Figure 2: N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml N-MeFOSA-M)

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

LCN-MeFOSAA_00001



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

N-MeFOSAA

LOT NUMBER:

NMeFOSAA1214

COMPOUND:

N-methylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

CAS #:

2355-31-9

MOLECULAR FORMULA:

C₁₁H₆F₁₇NO₄S

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)

12/09/2014

EXPIRY DATE: (mm/dd/yyyy)

12/09/2019

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:

Date: 04/06/2015

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

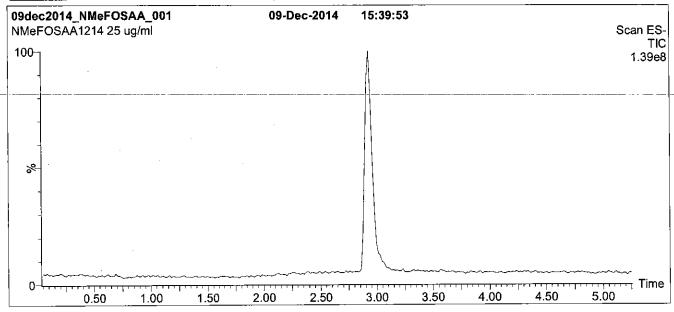
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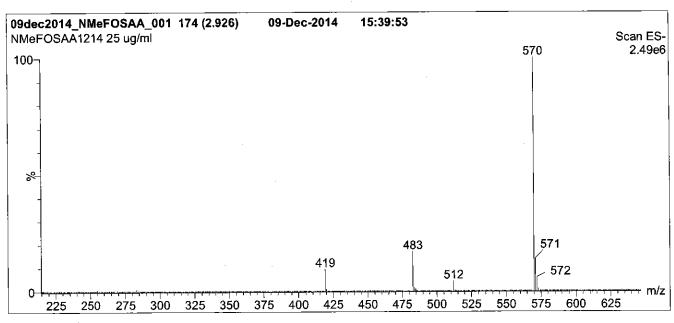




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Figure 1: N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)





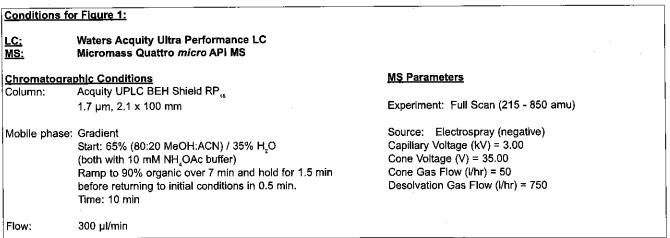
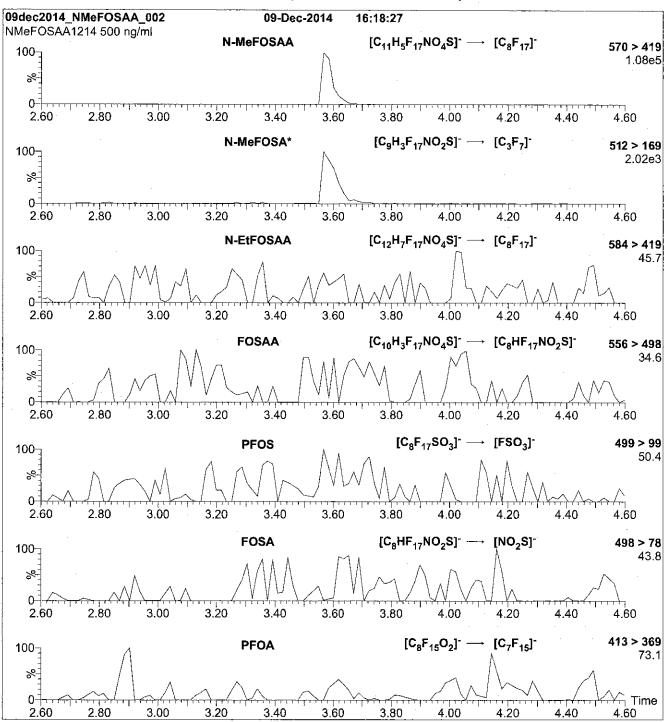
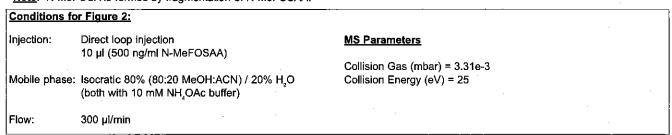


Figure 2: N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)



*Note: N-MeFOSA is formed by fragmentation of N-MeFOSAA.



LCN-MeFOSAA_00003



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

N-MeFOSAA

LOT NUMBER:

NMeFOSAA0116

COMPOUND:

N-methylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

CAS #:

2355-31-9

MOLECULAR FORMULA:

C₁₁H₆F₁₇NO₄S

MOLECULAR WEIGHT:

571.21

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/20/2016

EXPIRY DATE: (mm/dd/yyyy)

01/20/2021

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 moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

(mm/ddbase)

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

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

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

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:

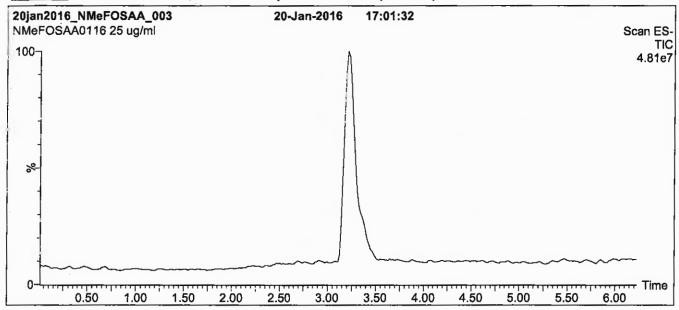
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

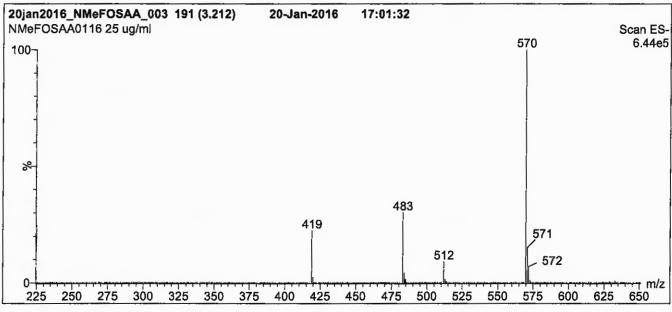




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Figure 1: N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)





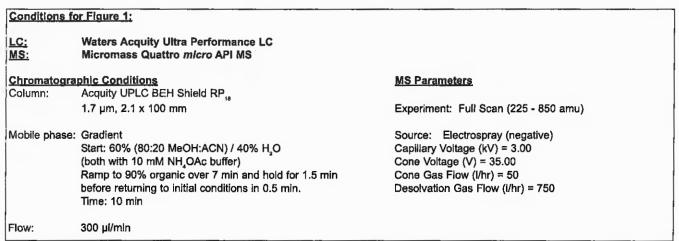
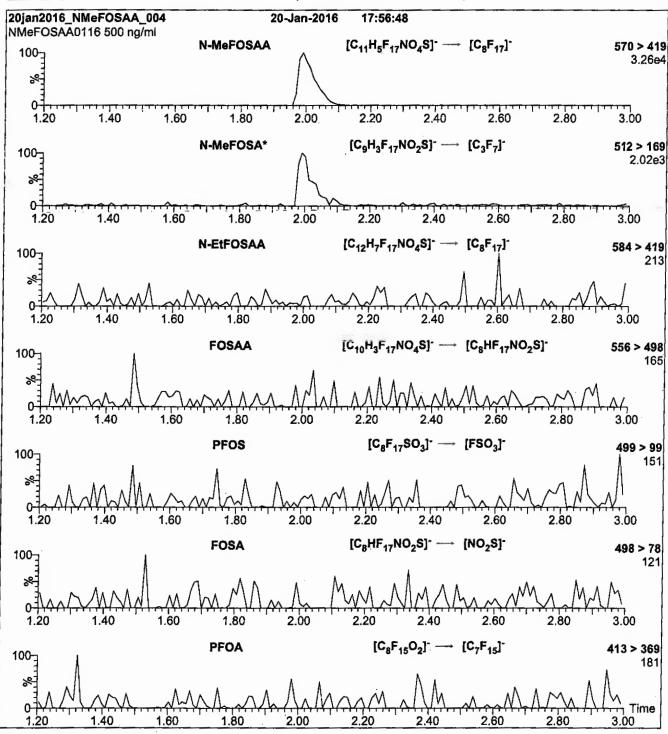
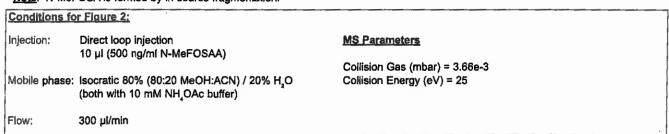


Figure 2: N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)



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



LCPFACMXB_00007



CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXB

Solution/Mixture of Native
Perfluoroalkylcarboxylic Acids and
Native Perfluoroalkylsulfonates

PRODUCT CODE:

PFAC-MXB

LOT NUMBER:

PFACMXB1115

SOLVENT(S):

Methanol / Water (<1%)

DATE PREPARED: (mm/dd/yyyy)

11/04/2015

LAST TESTED: (mm/dd/yyyy)

11/06/2015

EXPIRY DATE: (mm/dd/yyyy)

11/06/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXB is a solution/mixture of thirteen native perfluoroalkylcarboxylic acids (C_4 - C_{14} , C_{16} , and C_{18}) and four native perfluoroalkylsulfonates (C_4 , C_8 , C_8 and C_{10}). The full name, abbreviation and concentration for each of the components are given in Table A.

The individual perfluoroalkylcarboxylic acids and perfluoroalkylsulfonates all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture

Figure 1: LC/MS Data (SIR)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)
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 carboxylic acids to their respective methyl esters.

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

$$x_{ij} x_{ij} ... x_{ij}$$
 on which it depends is:

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

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:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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

Name	Abbreviation	Concentration (ng/ml)		Peak Assignment In Figure 1
Perfluoro-n-butanoic acid	PFBA	2000		A
Perfluoro-n-pentanoic acid	PFPeA	2000		В
Perfluoro-n-hexanoic acid	PFHxA	2000		D
Perfluoro-n-heptanoic acid	PFHpA	2000		E
Perfluoro-n-octanoic acid	PFOA	2000		G
Perfluoro-n-nonanoic acid	PFNA	2000		н
Perfluoro-n-decanoic acid	PFDA	2000		J
Perfluoro-n-undecanoic acid	PFUdA	2000		К
Perfluoro-n-dodecanoic acid	PFDoA	2000		М
Perfluoro-n-tridecanoic acid	PFTrDA	2000		N
Perfluoro-n-tetradecanoic acid	PFTeDA	2000		0
Perfluoro-n-hexadecanoic acid	PFHxDA	2000		Р
Perfluoro-n-octadecanoic acid	PFODA	2000		Q
Name	Abbreviation	Concentration (ng/ml)		Peak
		as the	as the anion	Assignment in Figure 1
Potassium perfluoro-1-butanesulfonate	L-PFBS	2000	1770	С
Sodium perfluoro-1-hexanesulfonate	L-PFHxS	2000	1890	F
Sodium perfluoro-1-octanesulfonate	L-PFOS	2000	1910	ı
Sodium perfluoro-1-decanesulfonate	L-PFDS	2000	1930	L

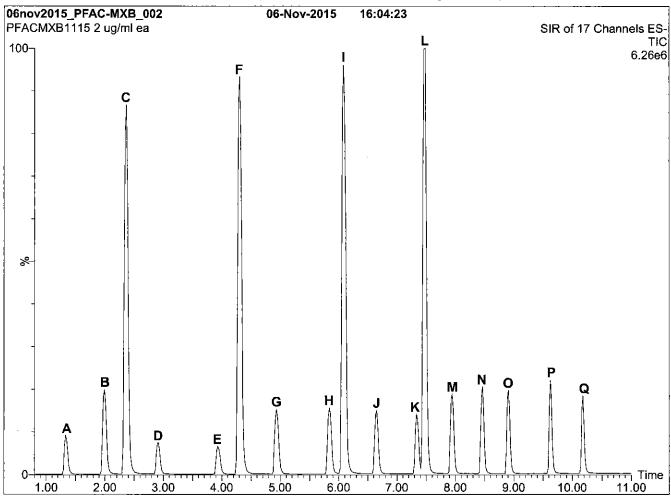
Certified By:

B.G. Chittim

Date: <u>11/11/2015</u>

mm/dd/yyyy)

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





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

Chromatographic Conditions

Column:

Acquity UPLC BEH Shield RP,18

1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient

Start: 55% H₂O / 45% (80:20 MeOH:ACN)

(both with 10 mM NH, OAc buffer)

Ramp to 95% organic over 10 min and hold for 1 min

before returning to initial conditions in 0.5 min.

Time: 12 min

Flow:

300 µl/min

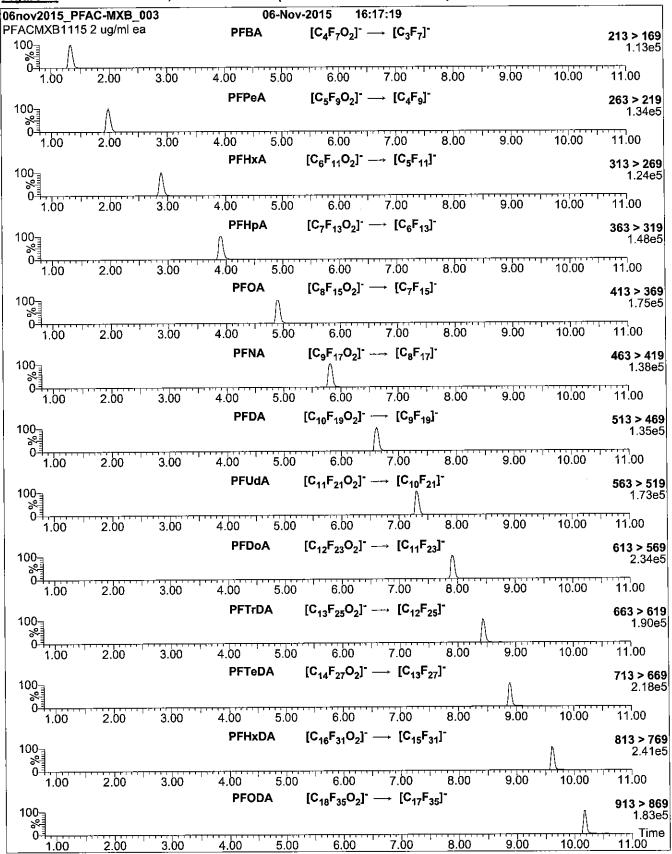
MS Parameters

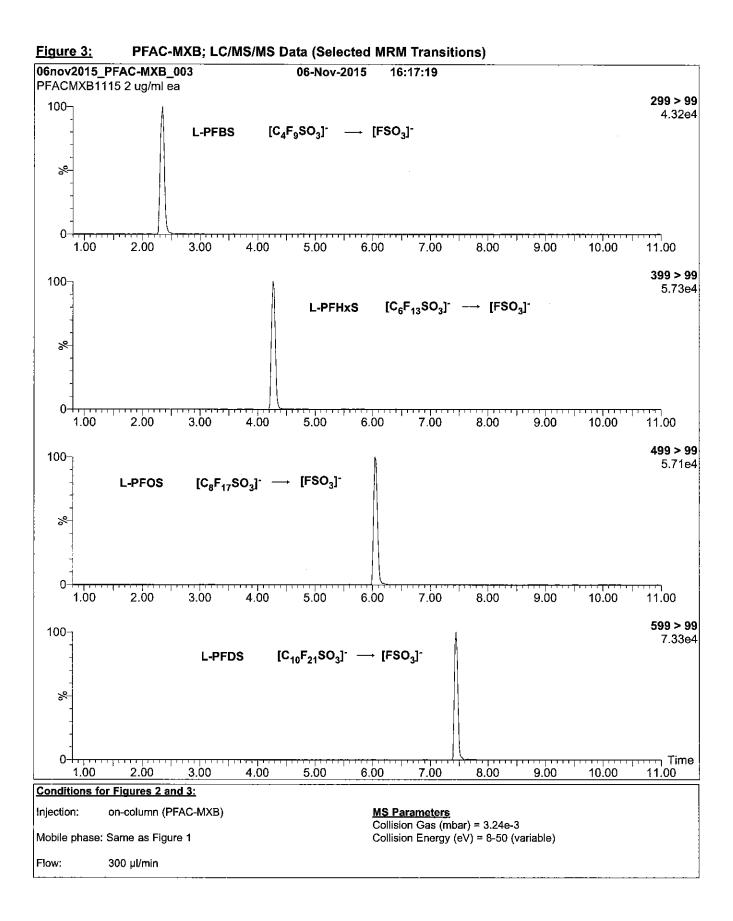
Experiment: SIR of 17 Channels

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = variable (10-70)
Cone Gas Flow (l/hr) = 50

Desolvation Gas Flow (I/hr) = 750

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





LCPFBA_00005

P:8BC 9/13/16

ID: LCPFBA_00005 Exp: 05/27/21 Prpd: SBC

ID: LCPFBA_00006 Exp: 05/27/21 Prod: SBC PF-n-butanoic acid



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFBA

LOT NUMBER:

PFBA0516

COMPOUND:

Perfluoro-n-butanoic acid

STRUCTURE:

CAS #:

375-22-4

MOLECULAR FORMULA:

C₄HF₂O₂

MOLECULAR WEIGHT:

214.04

CONCENTRATION:

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

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/27/2016

EXPIRY DATE: (mm/dd/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:

Date: 05/31/2016

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

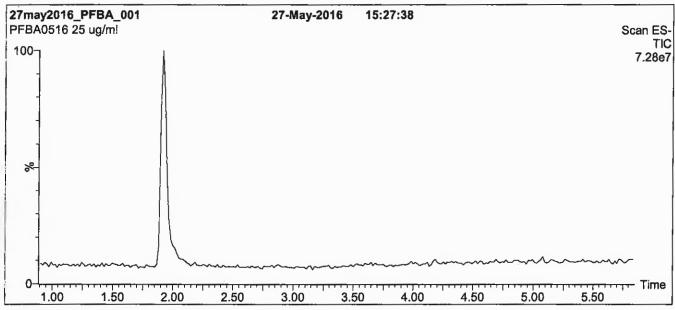
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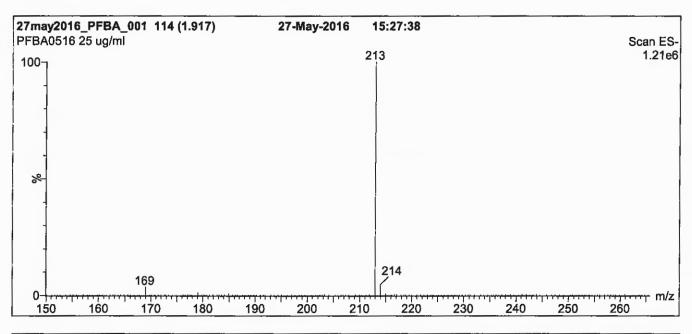




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Figure 1: PFBA; LC/MS Data (TIC and Mass Spectrum)





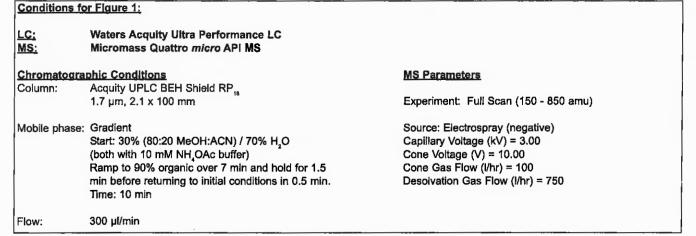
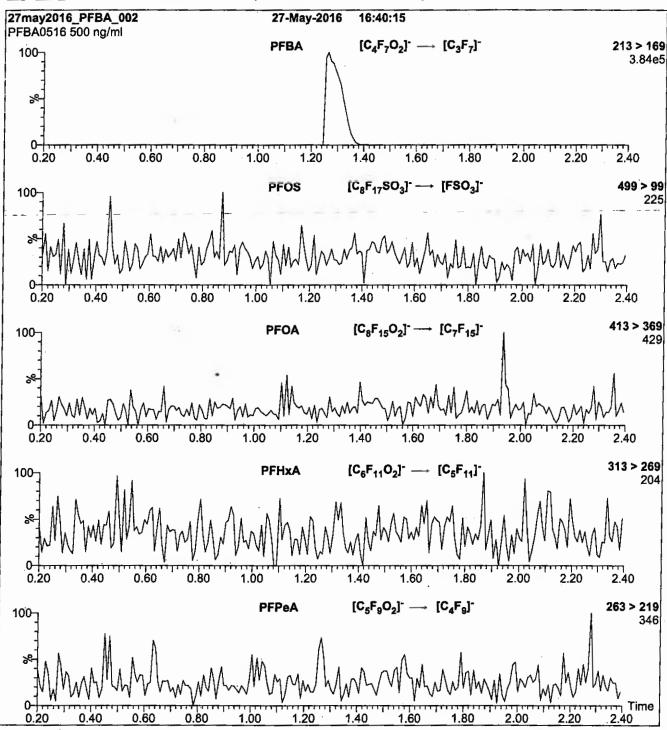
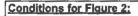


Figure 2: PFBA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Flow:

Direct loop injection

10 µl (500 ng/ml PFBA)

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

(both with 10 mM NH,OAc buffer)

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.62e-3 Collision Energy (eV) = 10

LCPFBS 00005



VELLINGTON ABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2-8:2FTS

LOT NUMBER:

M282FTS0116

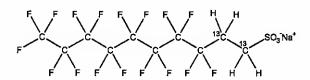
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₈H₄F₁₇SO₃Na

MOLECULAR WEIGHT:

552.15

CONCENTRATION:

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

SOLVENT(S):

Methanol

47.9 ± 2.4 µg/ml

(M2-8:2FTS anion)

(Na salt)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C (1,2-13C_n)

LAST TESTED: (mm/dd/yyyy)

01/08/2016

EXPIRY DATE: (mm/dd/yyyy)

01/08/2021

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.

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).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 01/18/2016

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:

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HOMOGENEITY:

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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:

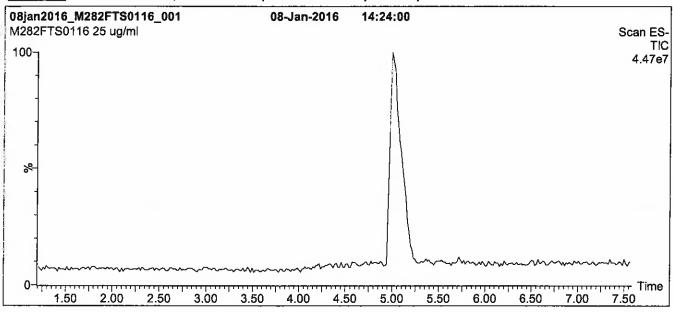
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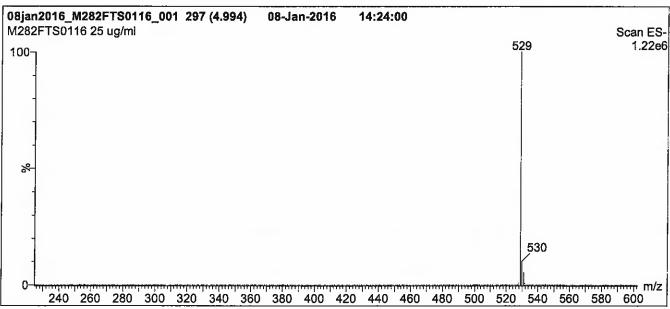




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Figure 1: M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)





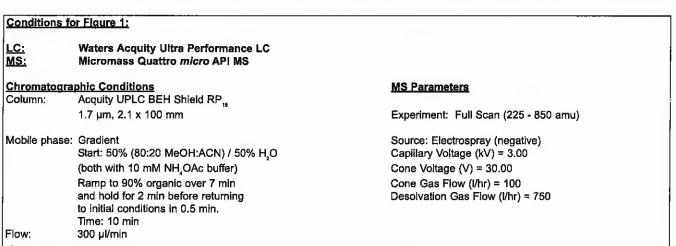
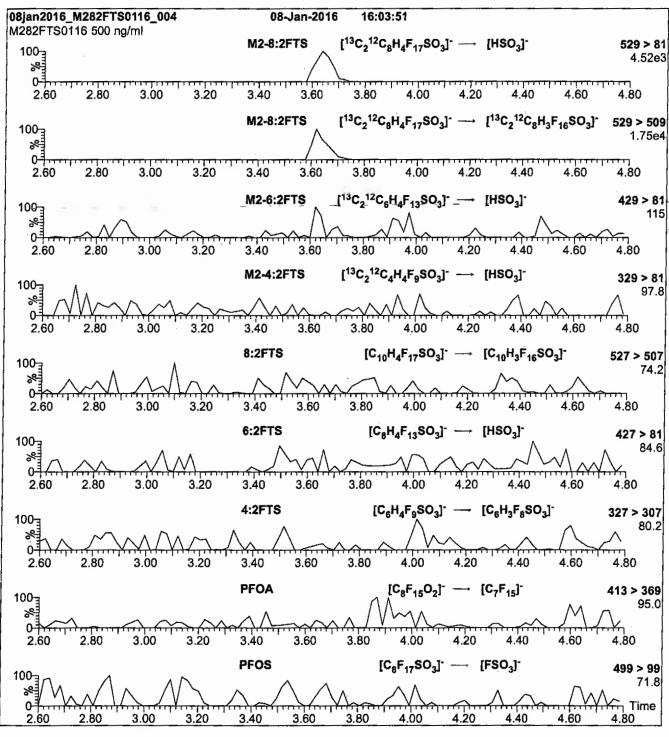
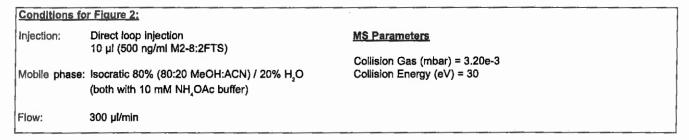


Figure 2: M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)

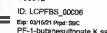






Exp: 03/15/21 Prpd: SBC







CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFBS

LOT NUMBER:

MOLECULAR WEIGHT:

SOLVENT(S):

LPFBS0316

COMPOUND:

Potassium perfluoro-1-butanesulfonate

STRUCTURE:

CAS #:

29420-49-3

338.19

Methanol

MOLECULAR FORMULA:

C₄F₆SO₃K

50.0 ± 2.5 μg/ml (K salt)

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

CHEMICAL PURITY:

CONCENTRATION:

>98%

LAST TESTED: (mm/dd/yyyy)

03/15/2016

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: <u>03/21/2016</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.

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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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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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:

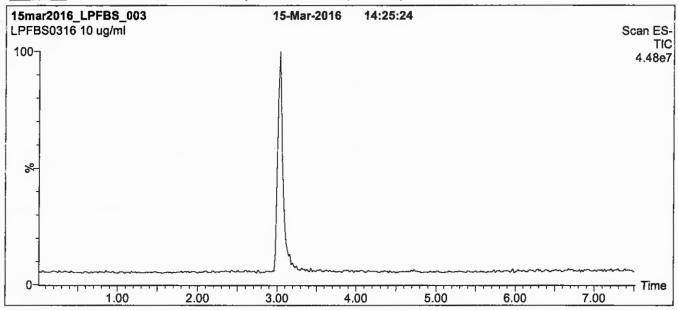
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

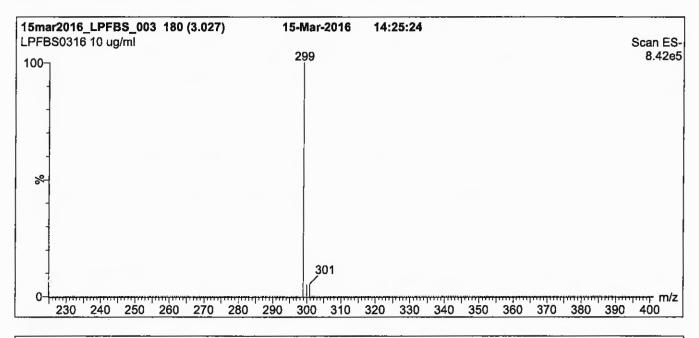


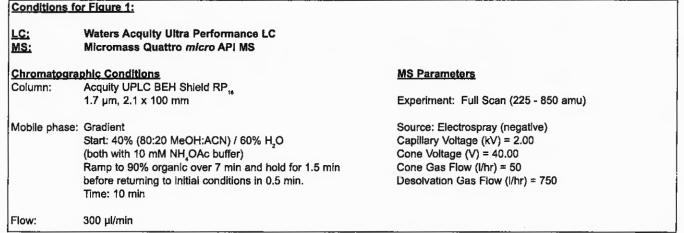


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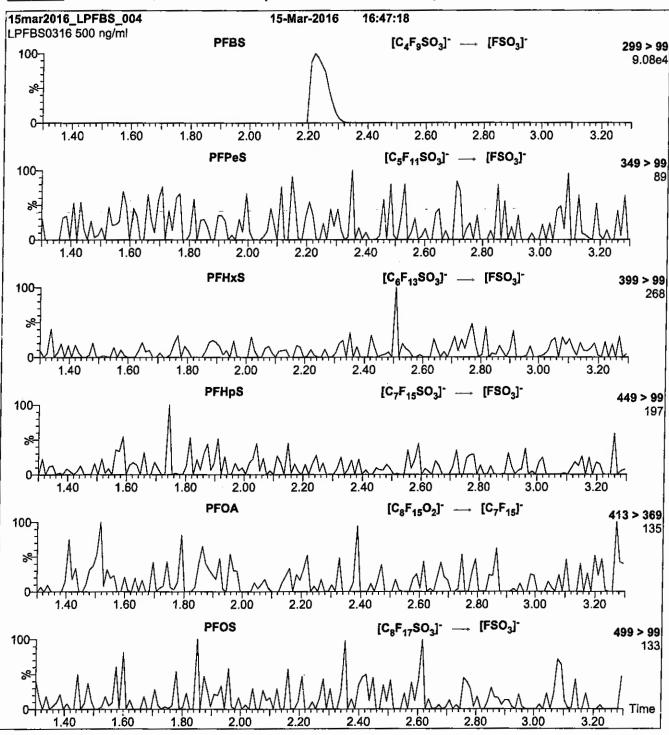
Figure 1: L-PFBS; LC/MS Data (TIC and Mass Spectrum)

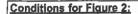






L-PFBS; LC/MS/MS Data (Selected MRM Transitions) Figure 2:





Injection:

Direct loop injection

10 µl (500 ng/ml L-PFBS)

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

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

MS Parameters

(both with 10 mM NH₄OAc buffer)

Flow:

300 µl/min

LCPFDA_00005







CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDA

LOT NUMBER:

PFDA0615

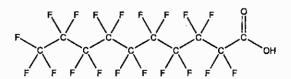
COMPOUND:

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)

07/02/2015

EXPIRY DATE: (mm/dd/yyyy)

07/02/2020

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 ~ 0.6% PFNA and ~ 0.3% PFOA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 07/24/2015

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:

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HOMOGENEITY:

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UNCERTAINTY:

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

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:

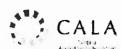
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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:

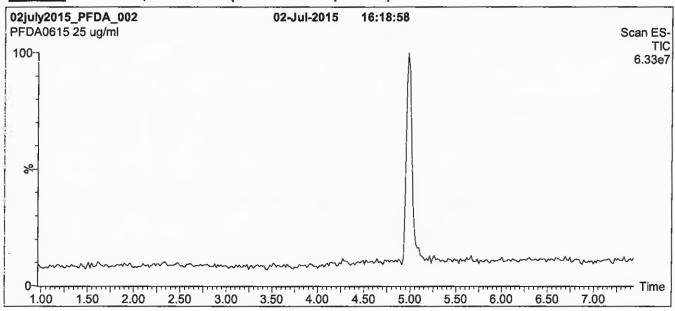
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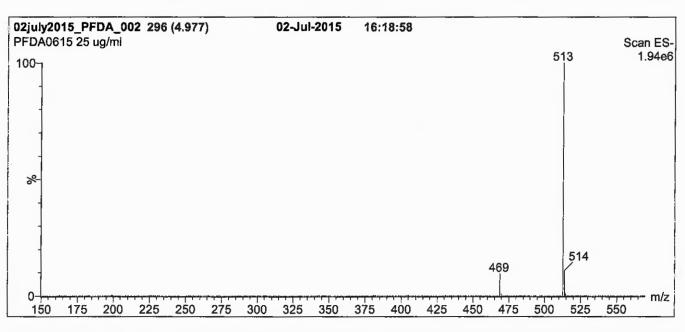




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Figure 1: PFDA; LC/MS Data (TIC and Mass Spectrum)





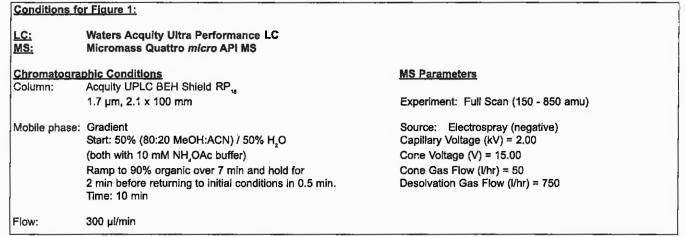
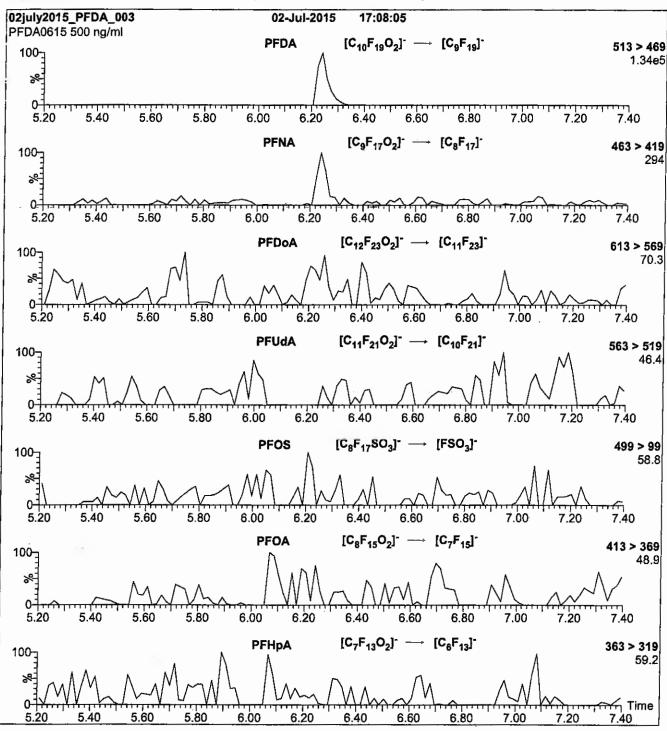
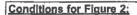


Figure 2: PFDA; LC/MS/MS Data (Selected MRM Transitions)





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)

(555) 11161 15 11111

one pridoc. A

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.62e-3 Collision Energy (eV) = 13

LCPFDoA_00005



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDoA

LOT NUMBER:

PFDoA0115

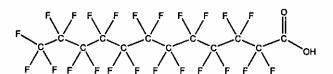
COMPOUND:

Perfluoro-n-dodecanoic acid

STRUCTURE:

CAS #:

307-55-1



MOLECULAR FORMULA:

C₁₂HF₂₃O₂

MOLECULAR WEIGHT:

614.10

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/30/2015

EXPIRY DATE: (mm/dd/yyyy)

01/30/2020

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

R C Chittim

Date:

<u>03/25/2015</u>

(mm/dd/yyy

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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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

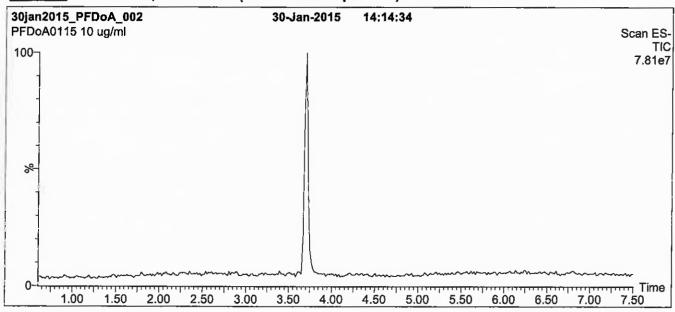
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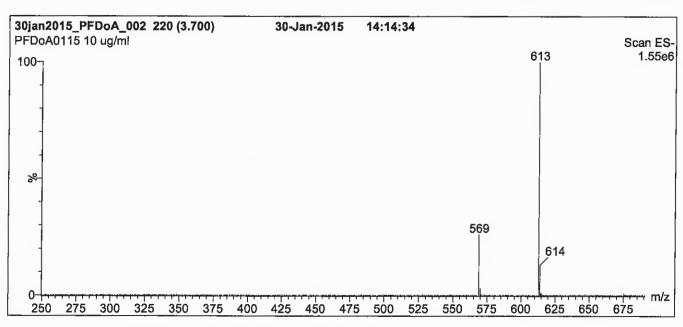




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Figure 1: PFDoA; LC/MS Data (TIC and Mass Spectrum)





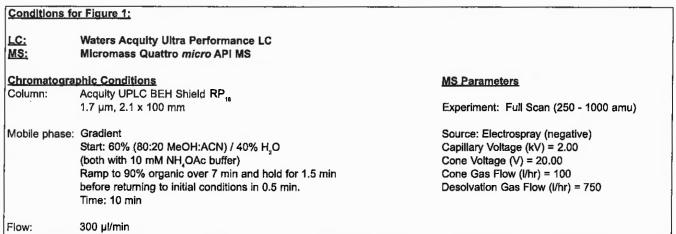
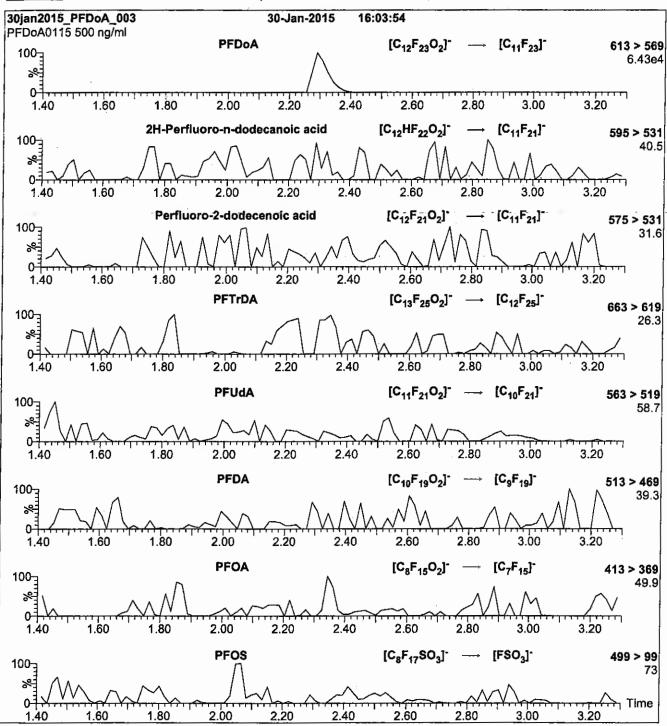
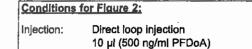


Figure 2: PFDoA; LC/MS/MS Data (Selected MRM Transitions)





MS Parameters

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

Collision Gas (mbar) = 3.28e-3 Collision Energy (eV) = 13

Flow: 300 µl/min

LCPFHpA_00005



ID: LCPFHpA_00005 Exp: 01/22/21 Prpd: CBW PF-n-heptanoic acid

R: 4/7/16 CBW



CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

PFHpA

LOT NUMBER:

PFHpA0116

COMPOUND:

Perfluoro-n-heptanoic acid

CAS #:

375-85-9

STRUCTURE:

MOLECULAR FORMULA:

C,HF,O2

CONCENTRATION:

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

MOLECULAR WEIGHT:

364.06

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/22/2016

EXPIRY DATE: (mm/dd/yyyy)

01/22/2021

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 02/02/2016

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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QUALITY MANAGEMENT:

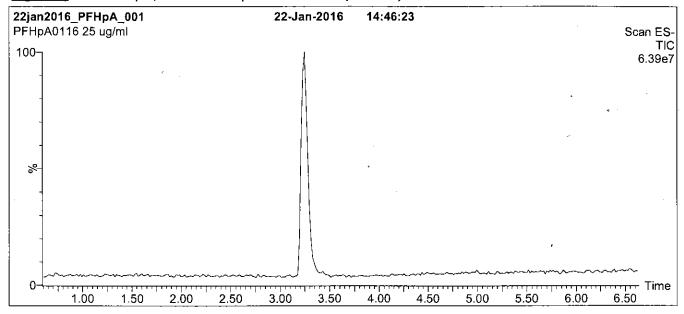
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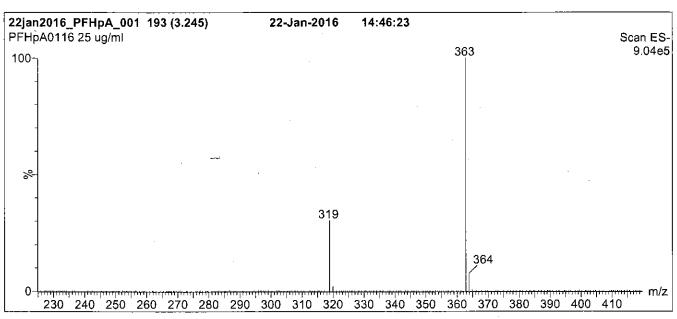




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Figure 1: PFHpA; LC/MS Data (TIC and Mass Spectrum)





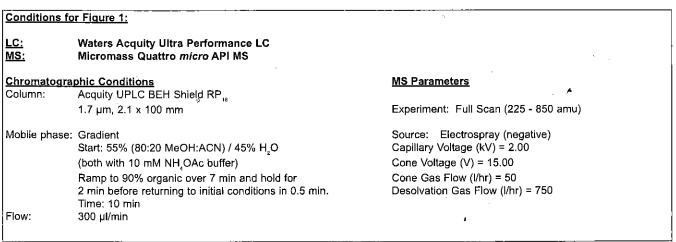
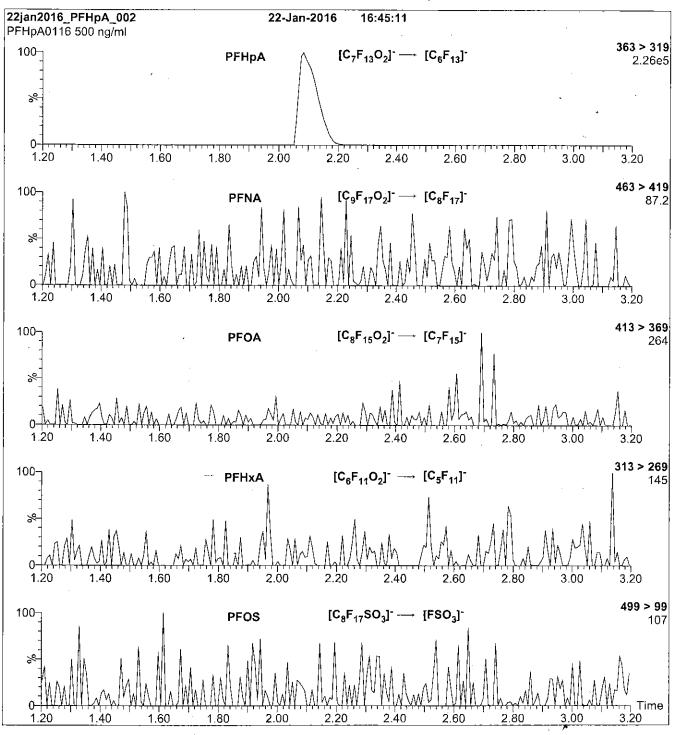
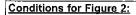


Figure 2: PFHpA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFHpA)

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

(both with 10 mM NH,OAc buffer)

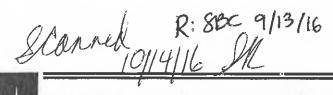
Flow:

300 µl/min

MS Parameters

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

LCPFHpA_00006





ID: LCPFHpA_00006 Exp: 01/22/21 Prpd: SBC PF-n-heptanoic acid



ID: LCPFHpA_00007 Exp: 01/22/21 Prpd: SBC PF-n-heptanoic acid



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFHpA

LOT NUMBER:

PFHpA0116

COMPOUND:

Perfluoro-n-heptanoic acid

STRUCTURE:

CAS #:

375-85-9

MOLECULAR FORMULA:

C,HF,O,

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

364.06

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/22/2016

EXPIRY DATE: (mm/dd/yyyy)

01/22/2021

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.

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 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, $u_i(y)$, 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:

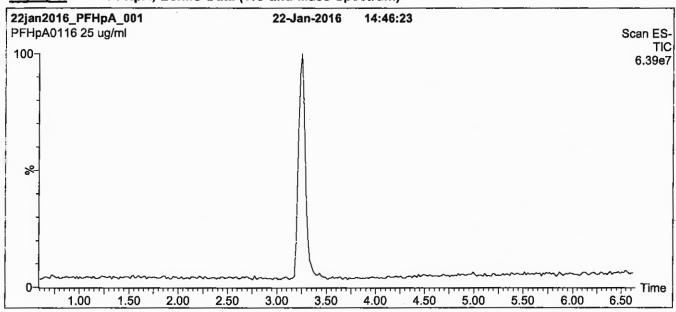
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

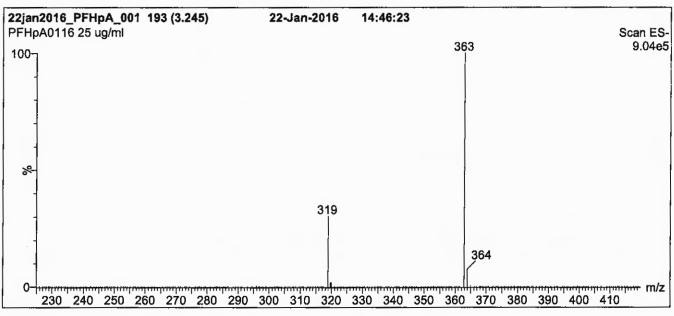




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Figure 1: PFHpA; LC/MS Data (TIC and Mass Spectrum)





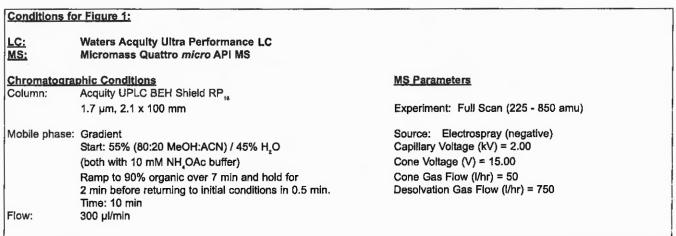
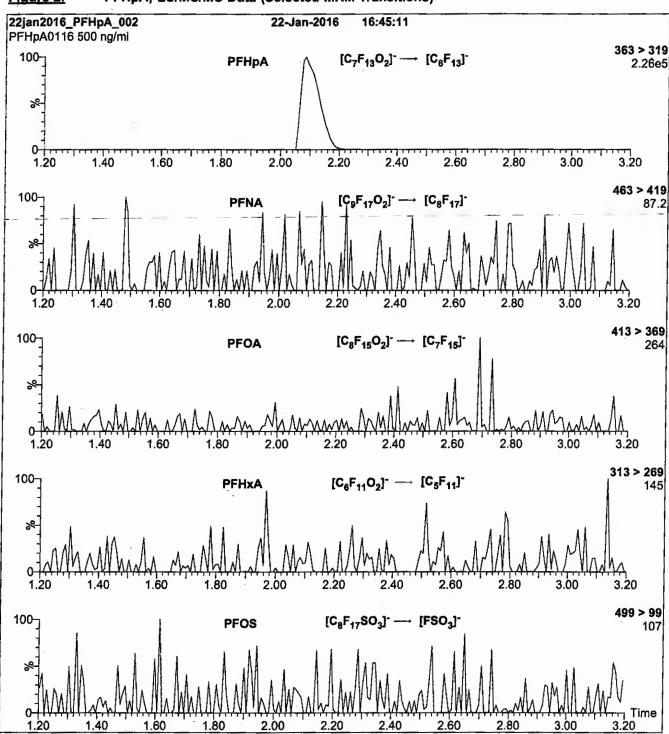


Figure 2: PFHpA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml PFHpA)

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

(both with 10 mM NH,OAc buffer)

Flow: 300 µl/min

MS Parameters

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

LCPFHpS_00009

Scarred R: 8BC 9/13/16







CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFHpS

LOT NUMBER:

MOLECULAR WEIGHT:

SOLVENT(S):

LPFHpS1115

COMPOUND:

Sodium perfluoro-1-heptanesulfonate

STRUCTURE:

CAS #:

Not available

472.10

Methanol

F F F F F F F F

MOLECULAR FORMULA:

C₇F₁₅SO₃Na

50.0 ± 2.5 μg/ml (Na salt)

47.6 ± 2.4 µg/ml (DEHnS onion)

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

CHEMICAL PURITY:

CONCENTRATION:

>98%

LAST TESTED: (m:n/dd/yyyy)

11/06/2015

EXPIRY DATE: (mm/dal/yyyy)

11/06/2020

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 ~ 0.1% of L-PFHxS ($C_6F_{13}SO_3Na$) and ~ 0.2% of L-PFOS ($C_8F_{17}SO_3Na$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.C. Chiftim

Date:

<u>11/09/2015</u>

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

 $x_1, x_2, \dots x_n$ 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:

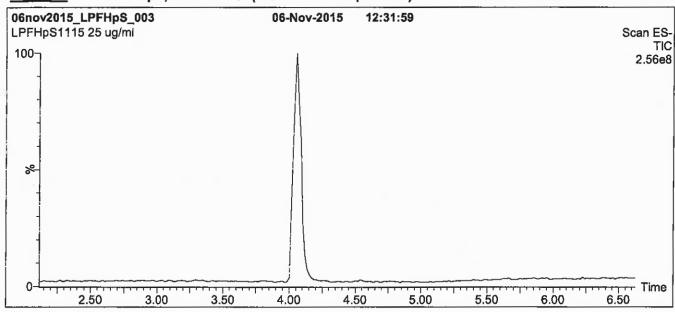
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

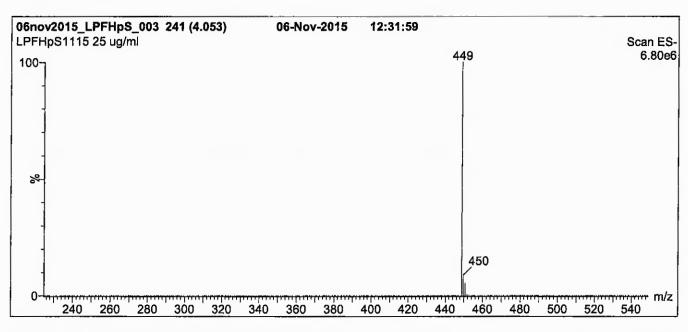




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





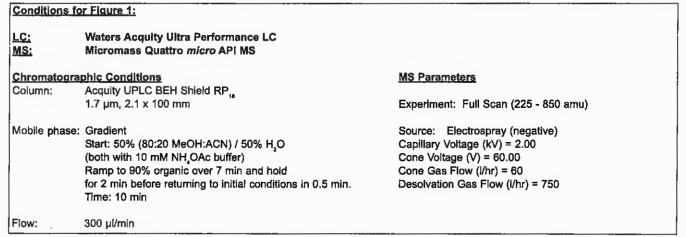
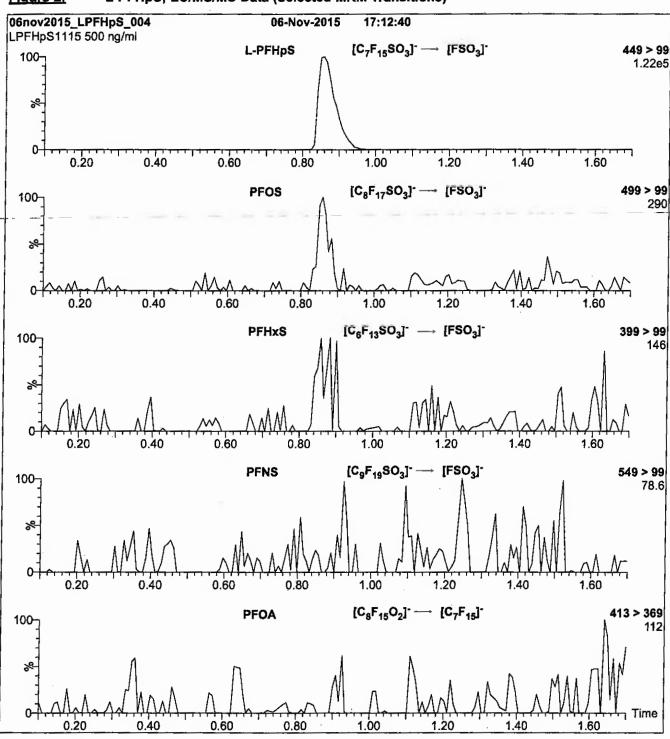
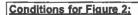


Figure 2: L-PFHpS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Flow:

Direct loop injection

10 µl (500 ng/ml L-PFHpS)

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

(both with 10 mM NH OAc buffer)

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3 Collision Energy (eV) = 35

LCPFHxA_00004

PF-n-hexanoic acid



ELLINGTON BORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFHxA

LOT NUMBER:

PFHxA1215

COMPOUND:

Perfluoro-n-hexanoic acid

STRUCTURE:

CAS #:

307-24-4

C,HF,O,

MOLECULAR WEIGHT:

314.05

CONCENTRATION:

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

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:

MOLECULAR FORMULA:

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

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.

UNCERTAINTY:

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$$x_1, x_2,...x_n$$
 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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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:

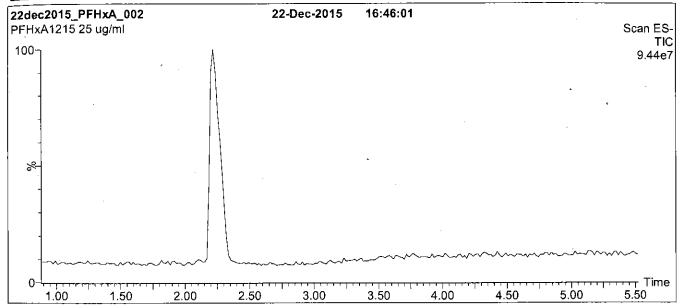
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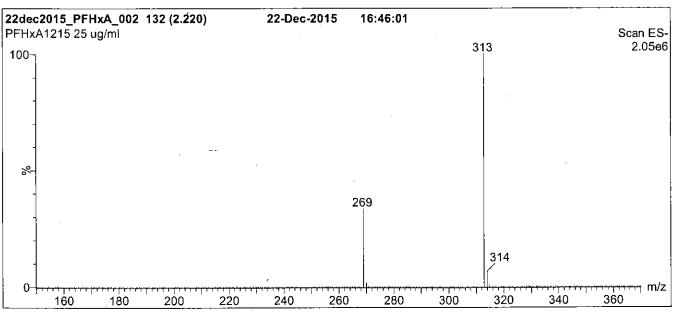




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Figure 1: PFHxA; LC/MS Data (TIC and Mass Spectrum)





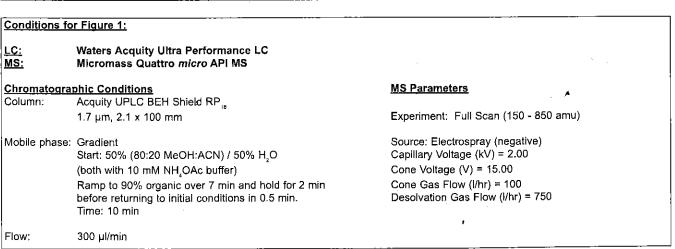
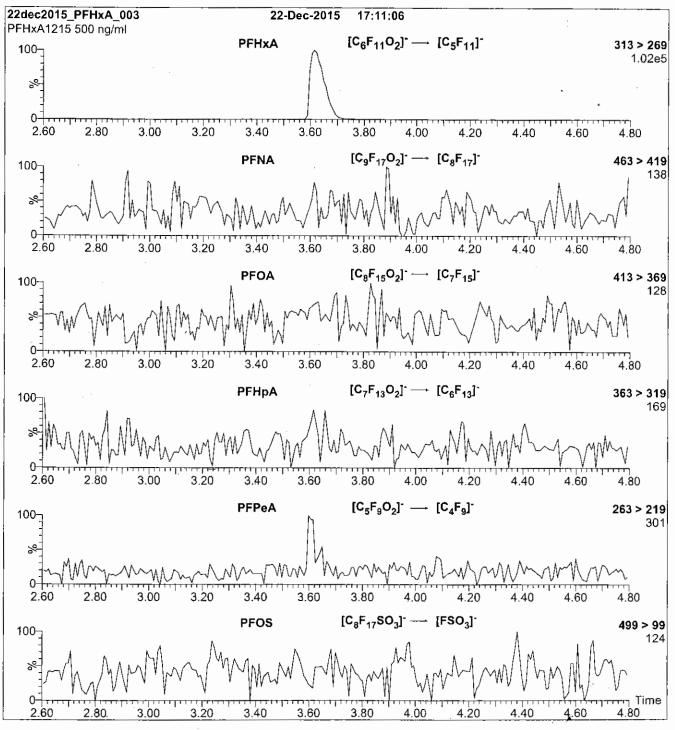
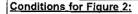


Figure 2: PFHxA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFHxA)

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

(both with 10 mM NH, OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCPFHxA_00005

R: 8Be 9/13/16



iD: LCPFHxA_00005 Exp: 12/22/20 Prpd: SBC PF-n-hexanoic acid





WELLINGTON

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:

PFHxA

LOT NUMBER:

PFHxA1215

COMPOUND:

Perfluoro-n-hexanoic acid

STRUCTURE:

CAS #:

307-24-4

F C C C C C OH

MOLECULAR FORMULA:

C,HF,O,

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

314.05

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:

B.G. Chittim

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

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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x,, x,...x, on which it depends is:

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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:

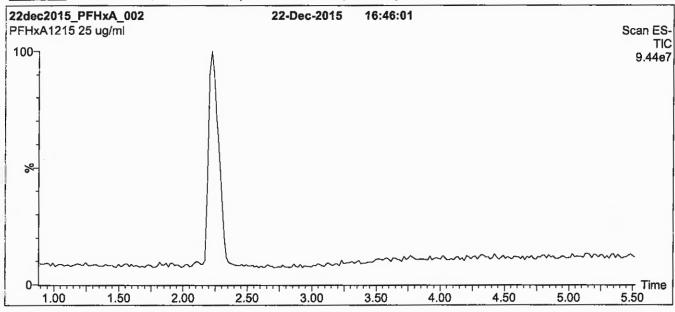
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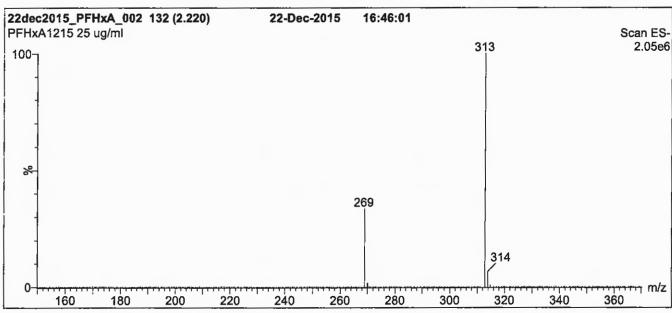




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Figure 1: PFHxA; LC/MS Data (TIC and Mass Spectrum)





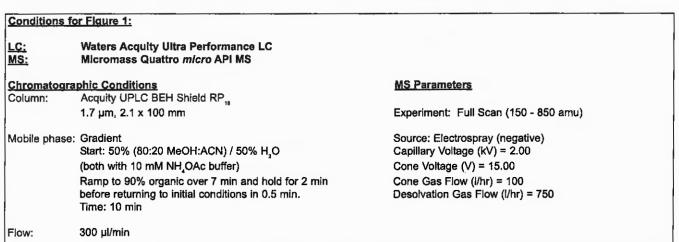
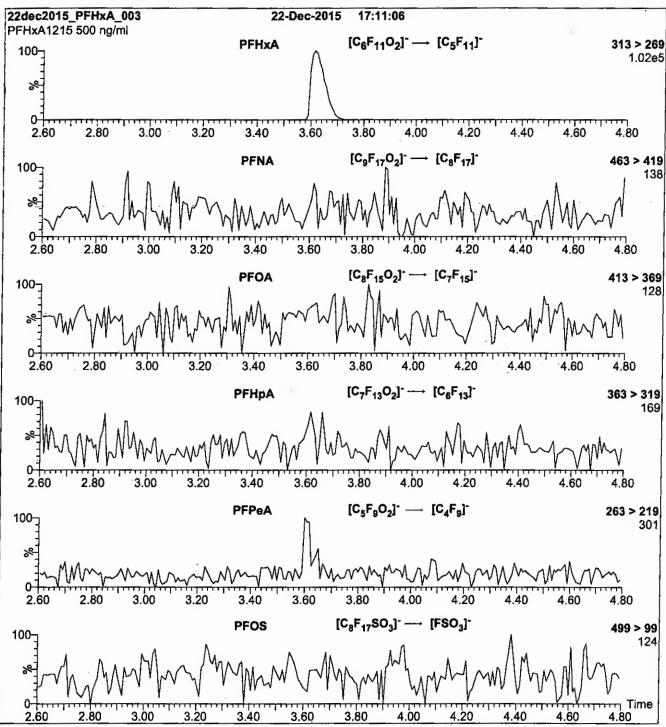
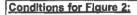


Figure 2: PFHxA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFHxA)

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

(both with 10 mM NH,OAc buffer)

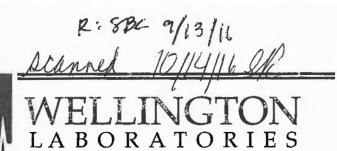
Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) = 3,43e-3 Collision Energy (eV) = 10

LCPFHxDA_00006







CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFHxDA

LOT NUMBER:

PFHxDA0516

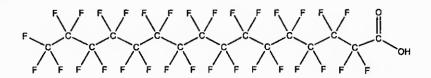
COMPOUND:

Perfluoro-n-hexadecanoic acid

STRUCTURE:

CAS #:

67905-19-5



MOLECULAR FORMULA:

C, HF, O,

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

814.13

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

CONCENTRATION:

>98%

LAST TESTED: (mm/dd/yyyy)

05/25/2016

EXPIRY DATE: (mm/dd/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 carboxylic acid to the methyl ester.

Contains ~ 0.4% of PFODA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

05/27/2016

(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:

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.

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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, $u_i(y)$, 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:

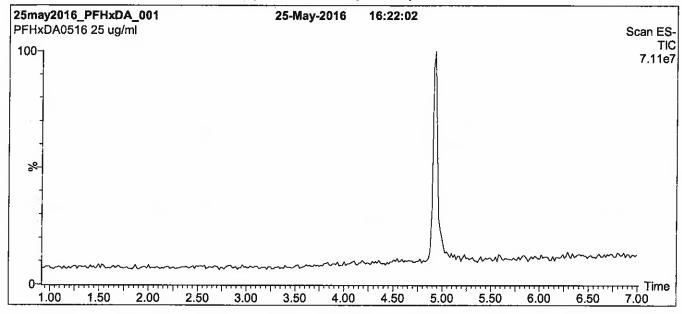
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

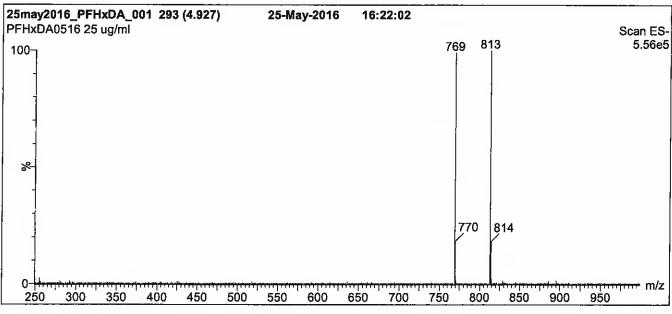




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Figure 1: PFHxDA; LC/MS Data (TIC and Mass Spectrum)





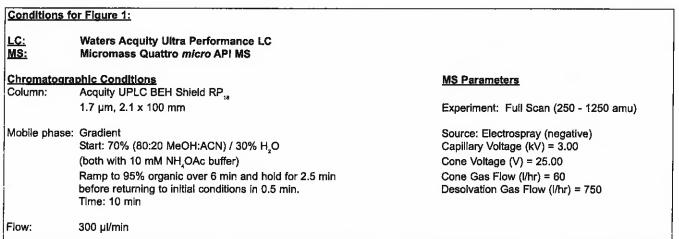
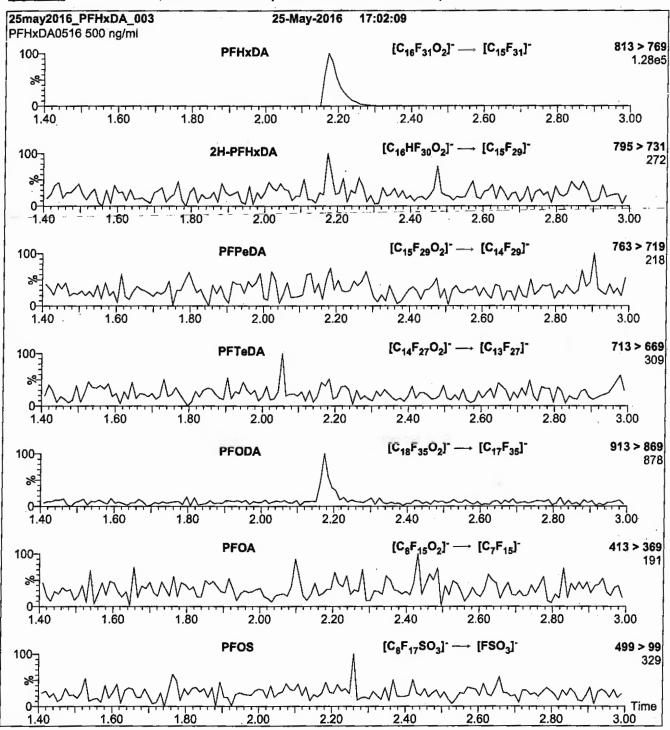
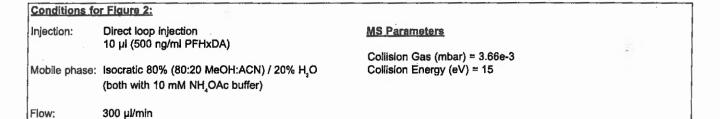
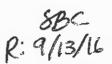


Figure 2: PFHxDA; LC/MS/MS Data (Selected MRM Transitions)





LCPFHxS-br_00002





ID: LCPFHxS-br_00002

Exp: 07/03/20 Prpd: SBC
Potassium Perfluorchexane



ID: LCPFHxS-br_00003

Exp: 07/03/20 Prpd: SBC

Potassium Perfluorohexane



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:

br-PFHxSK

LOT NUMBER:

brPFHxSK0615

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu\text{g/ml}$ (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: (mrv/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).

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

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QUALITY MANAGEMENT:

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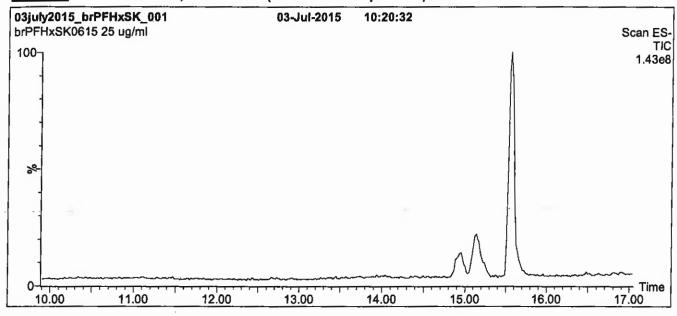
Table A: br-PFHxSK; Isomeric Components and Percent Composition (by 19F-NMR)*

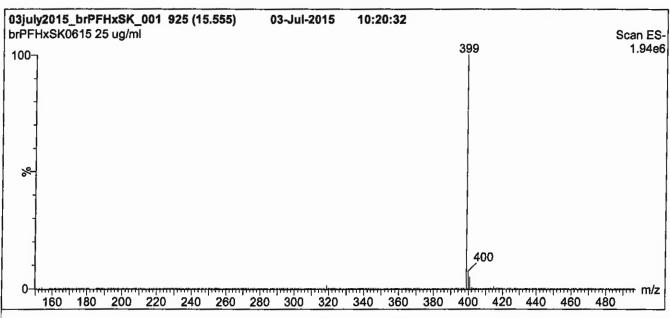
Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-hexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ -K ⁺	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ -K+ CF ₃	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ *K* CF ₃	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF 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: 07/15/2015

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





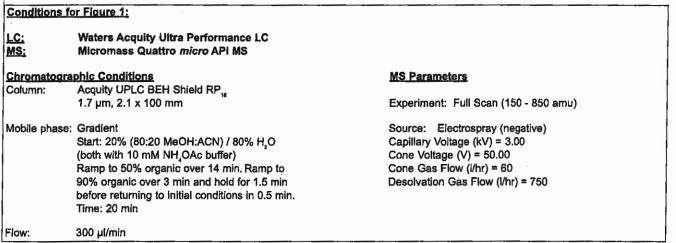
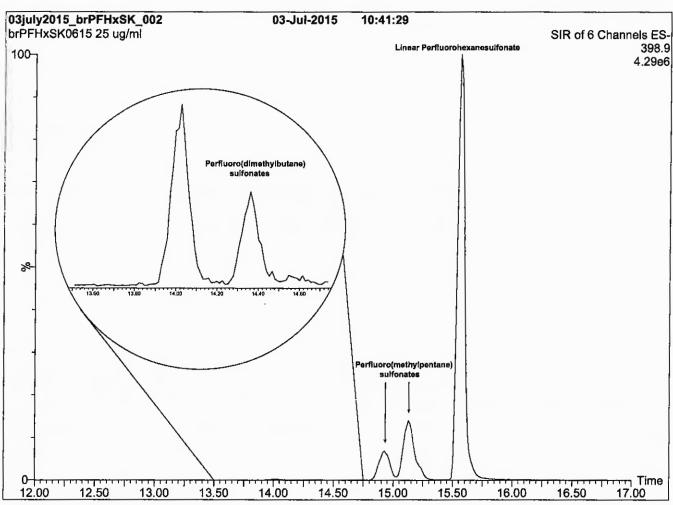
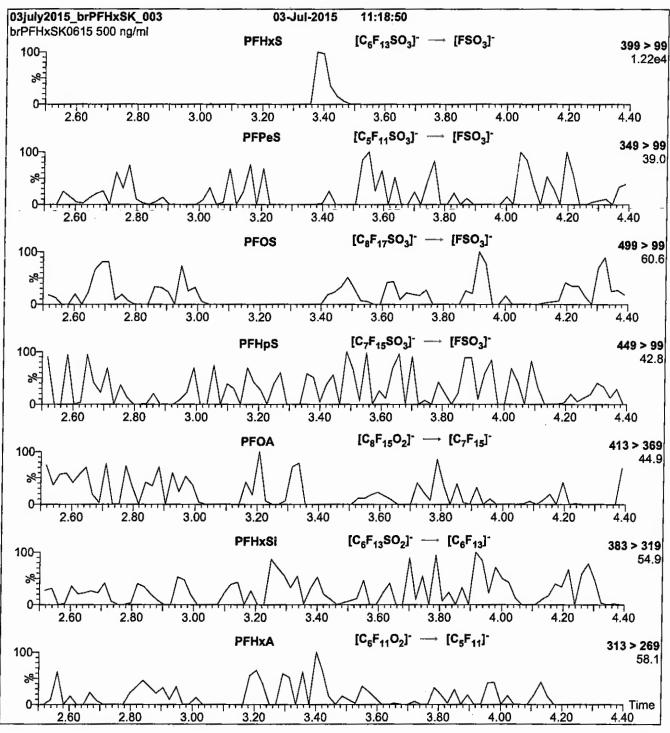


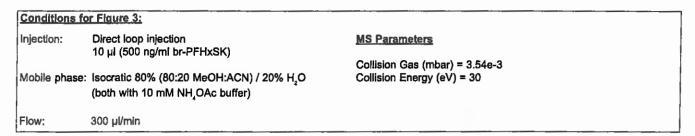
Figure 2: br-PFHxSK; LC/MS Data



Conditions for Figure 2: LC: MS: Waters Acquity Ultra Performance LC Micromass Quattro micro API MS Chromatographic Conditions **MS Parameters** Acquity UPLC BEH Shield RP, Column: 1.7 µm, 2.1 x 100 mm Experiment: SIR (6 channels) Mobile phase: Gradient Source: Electrospray (negative) Start: 20% (80:20 MeOH:ACN) / 80% H,O Capillary Voltage (kV) = 3.00 (both with 10 mM NH, OAc buffer) Cone Voltage (V) = 50.00 Ramp to 50% organic over 14 min. Ramp to Cone Gas Flow (I/hr) = 60 90% organic over 3 min and hold for 1.5 min Desolvation Gas Flow (I/hr) = 750 before returning to initial conditions in 0.5 min. Time: 20 min 300 µl/min Flow:

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





LCPFNA 00005

Exp: 10/23/20 Prpd: CBW

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFNA

LOT NUMBER:

PFNA1015

COMPOUND:

Perfluoro-n-nonanoic acid

STRUCTURE:

CAS #:

375-95-1

F F F F F F F

MOLECULAR FORMULA:

CONCENTRATION:

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

MOLECULAR WEIGHT:

464.08

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/23/2015

EXPIRY DATE: (mm/dd/yyyy)

10/23/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

 Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA) and < 0.1% of perfluoro-n-heptanoic acid (PFHpA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

<u> 10/30/2015</u>

(mm/dd/yyyy)

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

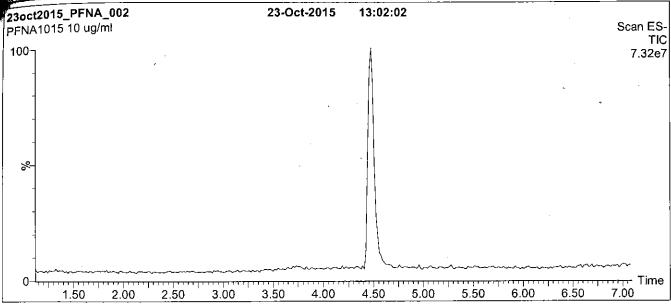
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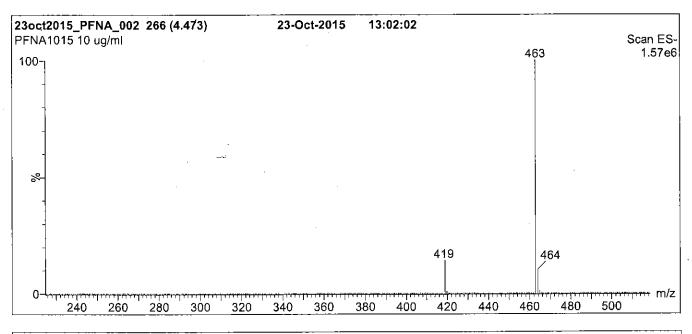


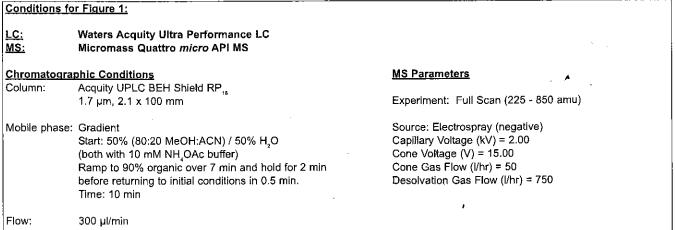


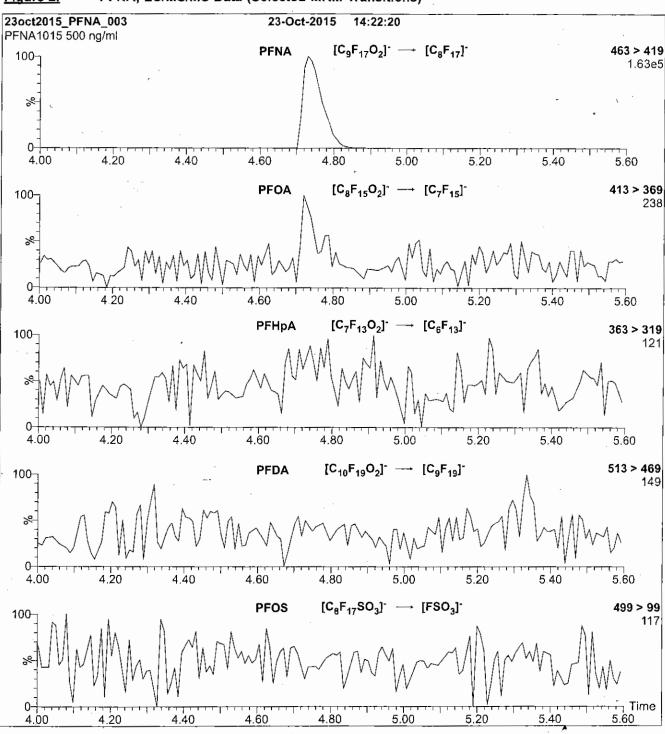
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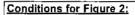












Injection:

Direct loop injection

10 μI (500 ng/ml PFNA)

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

(both with 10 mM NH OAc buffer)

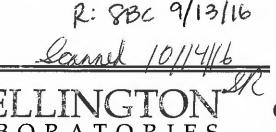
Flow:

300 µI/min

MS Parameters

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

LCPFNA 00006





ID: LCPFNA_00006 Exp: 10/23/20 Prpd: SBC PF-n-nonanoic acid



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFNA

LOT NUMBER:

PFNA1015

COMPOUND:

Perfluoro-n-nonanoic acid

CAS #:

375-95-1

STRUCTURE:

MOLECULAR FORMULA:

C,HF,O,

CONCENTRATION:

MOLECULAR WEIGHT:

SOLVENT(S):

464.08

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

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/23/2015

EXPIRY DATE: (mm/dd/yyyy)

10/23/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA) and < 0.1% of perfluoro-n-heptanoic acid (PFHpA).

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Certified By:

Date:

10/30/2015

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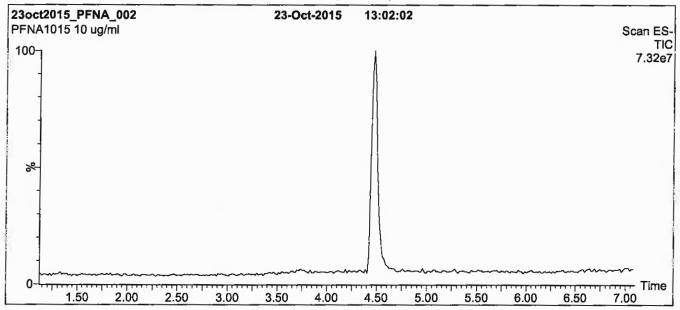
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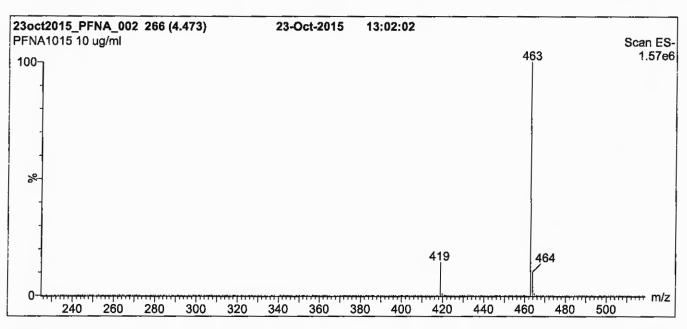




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Figure 1: PFNA; LC/MS Data (TIC and Mass Spectrum)





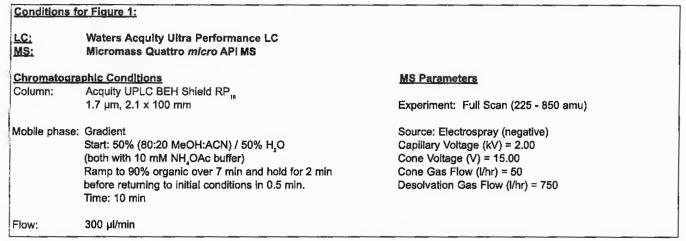
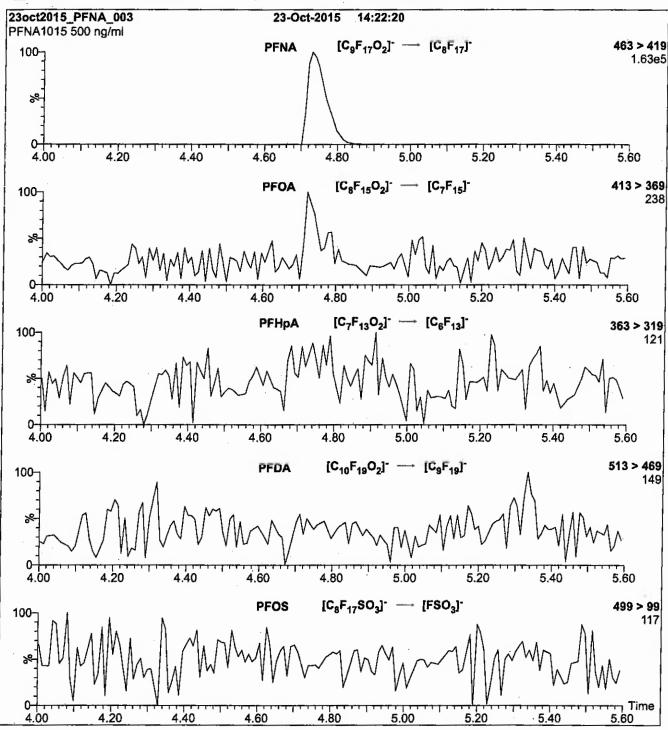
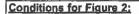


Figure 2: PFNA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Flow:

Direct loop injection

10 µl (500 ng/ml PFNA)

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

(both with 10 mM NH,OAc buffer)

MS Parameters

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

300 µl/min

LCPFOA 00006



VELLINGTON ABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFOA

LOT NUMBER:

PFOA1115

COMPOUND:

Perfluoro-n-octanoic acid

STRUCTURE:

CAS #:

335-67-1

MOLECULAR FORMULA:

C,HF,O,

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

414.07

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

11/06/2015

EXPIRY DATE: (mm/dd/yyyy)

11/06/2020

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.

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 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:

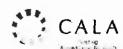
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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:

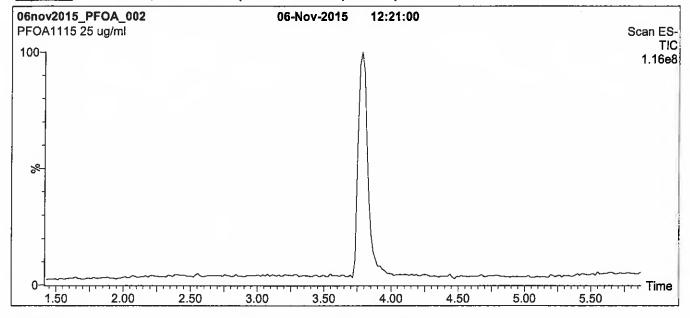
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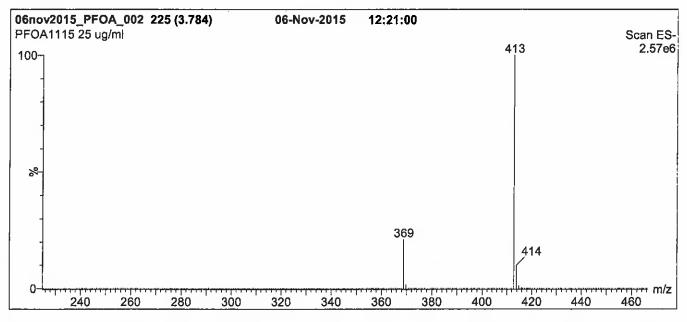




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Figure 1: PFOA; LC/MS Data (TIC and Mass Spectrum)





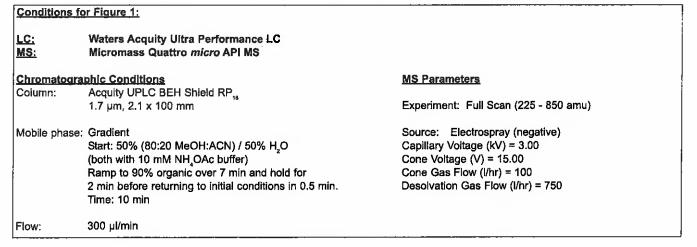
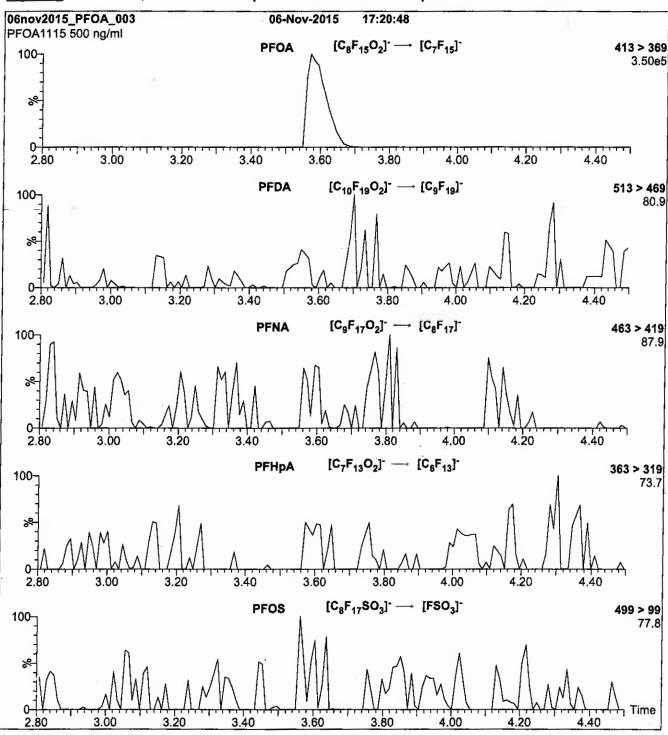


Figure 2; PFOA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml PFOA)

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

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3 Collision Energy (eV) = 10

LCPFODA_00005

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFODA

LOT NUMBER:

PFODA0115

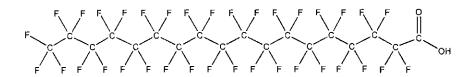
COMPOUND:

Perfluoro-n-octadecanoic acid

STRUCTURE:

CAS #:

16517-11-6



MOLECULAR FORMULA:

C, HF, O,

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

MOLECULAR WEIGHT:

914.14

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

CONCENTRATION:

>98%

LAST TESTED: (mm/dd/yyyy)

01/30/2015

EXPIRY DATE: (mm/dd/yyyy)

01/30/2020

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.

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Certified By:

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UNCERTAINTY:

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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:

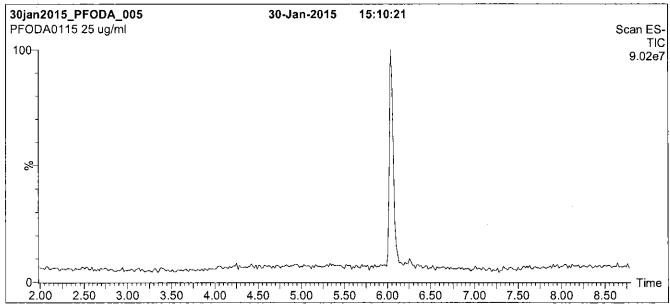
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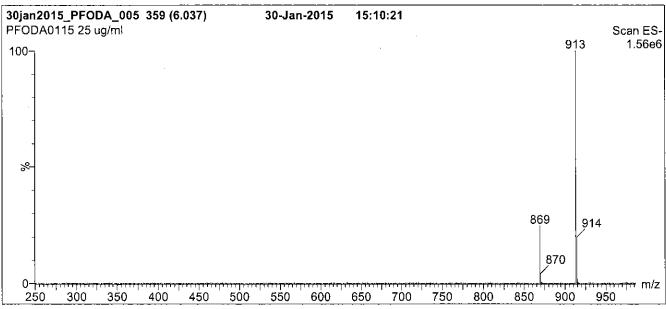




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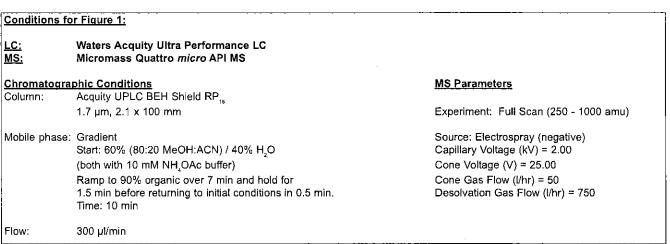
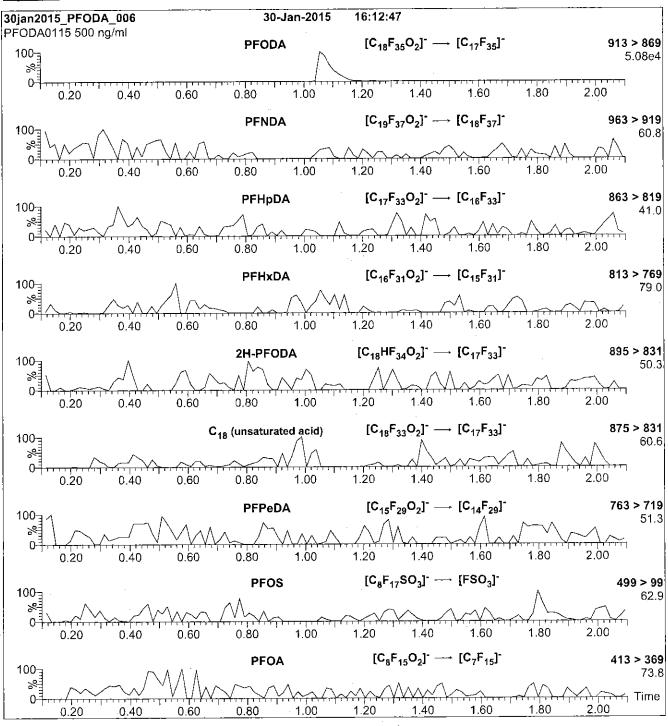
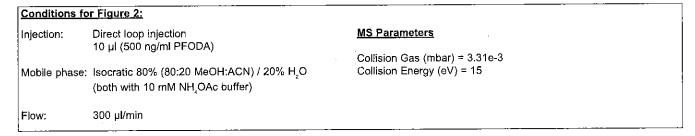
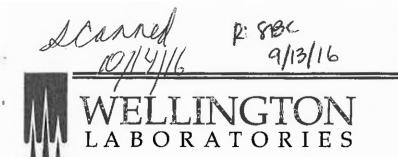


Figure 2: PFODA; LC/MS/MS Data (Selected MRM Transitions)





LCPFODA_00006





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFODA

LOT NUMBER:

PFODA0416

COMPOUND:

Perfluoro-n-octadecanoic acid

STRUCTURE:

CAS #:

16517-11-6



MOLECULAR FORMULA:

C₁₈HF₃₅O₂

MOLECULAR WEIGHT:

914.14

CONCENTRATION:

 $50 \pm 2.5 \mu g/ml$

SOLVENT(S):

Methanoi

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

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:

B G Chittim

Date:

(mm/dd/ssss)

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

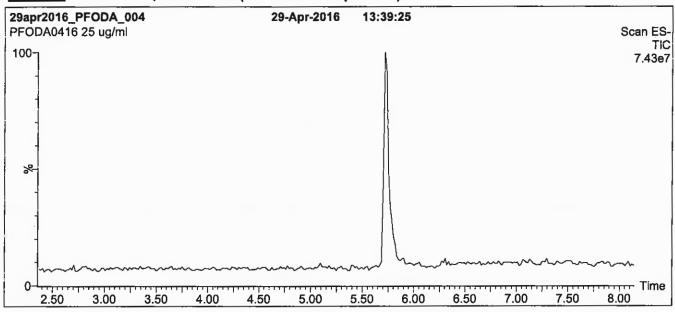
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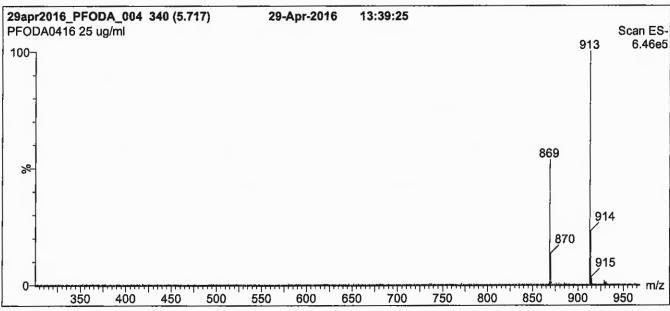




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Figure 1: PFODA; LC/MS Data (TIC and Mass Spectrum)





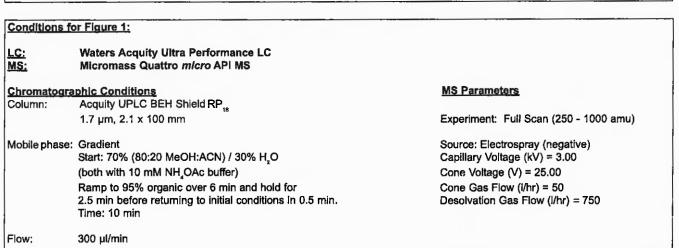
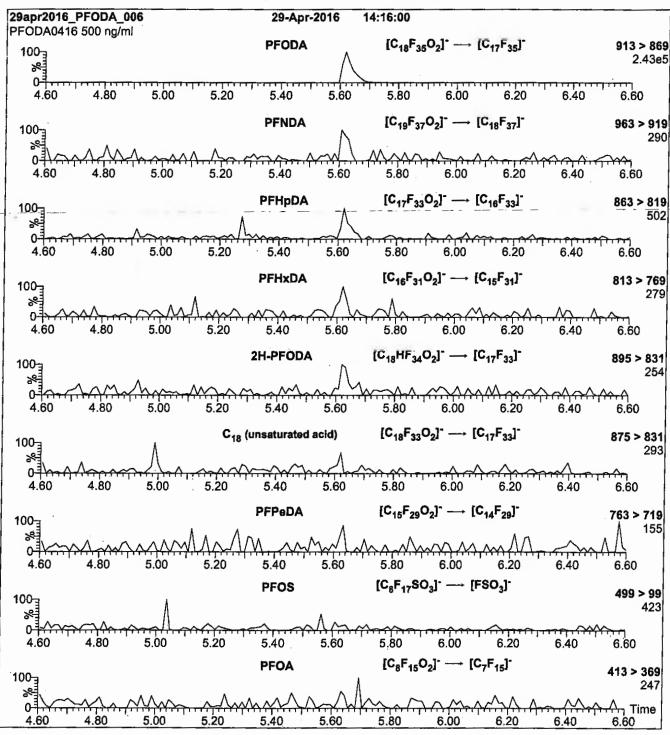
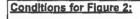


Figure 2: PFODA; LC/MS/MS Data (Selected MRM Transitions)





Injection: Direct loop injection

10 µl (500 ng/ml PFODA)

Mobile phase: Isocratic 90% (80:20 MeOH:ACN) / 10% H₂O

(both with 10 mM NH,OAc buffer)

MS Parameters

Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 15

Flow:

300 µl/min

LCPFOS-br_00002

Acanal R: SBC 9/13/16
101/4/16 SR
WELLINGTON
LABORATORIES



ID: LCPFOS-br_00002

Exp: 10/14/20 Prpd: SBC

Potassium Perfluorooctane

ID: LCPFOS-br_00003

Exp: 10/14/20 Prpd: SBC

Potassium Perfluorooctane



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 salt)

 $46.4 \pm 2.3 \,\mu\text{g/ml}$ (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).

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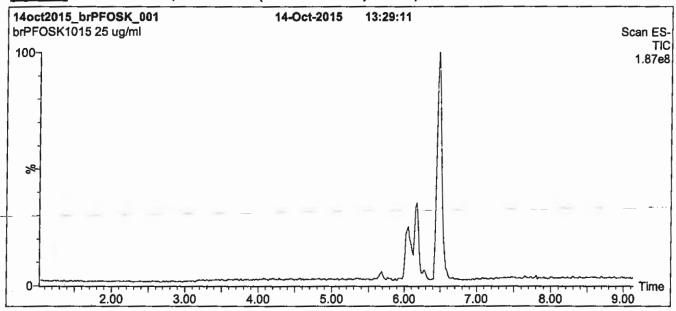
Table A: br-PFOSK; Isomeric Components and Percent Composition (by 19F-NMR)*

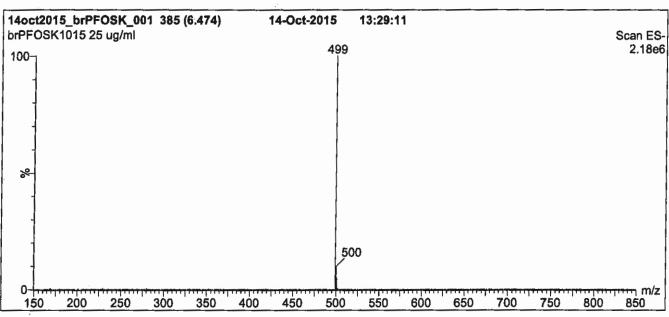
Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-octanesulfonate	CF ₃ CF ₂ SO ₃ K ⁴	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₃ CF ₃ CF ₃	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF 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 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 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)perfluorohexanesulfonate	CF3—CF—CF—CF—CF2CF2SO3K* CF3—CF3	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

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





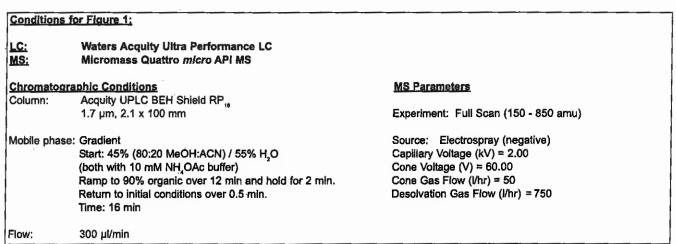
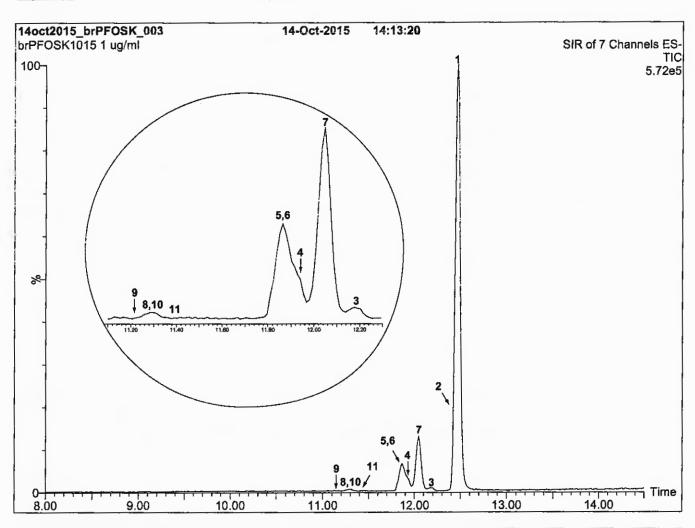


Figure 2: br-PFOSK; LC/MS Data (SIR)



Conditions for Figure 2:

LC: Waters Acquity Ultra Performance LC

MS: Micromass Quattro micro API MS

Chromatographic Conditions:

Column:

Acquity UPLC BEH Shield RP, (1.7 µm, 2.1 x 100 mm)

Injection:

1.0 µg/ml of br-PFOSK

Mobile Phase:

Gradient

45% (80:20 MeOH:ACN) / 55% H₂O (both with 10 mM NH₄OAc buffer)

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

Return to initial conditions over 1 min.

Time: 20 min

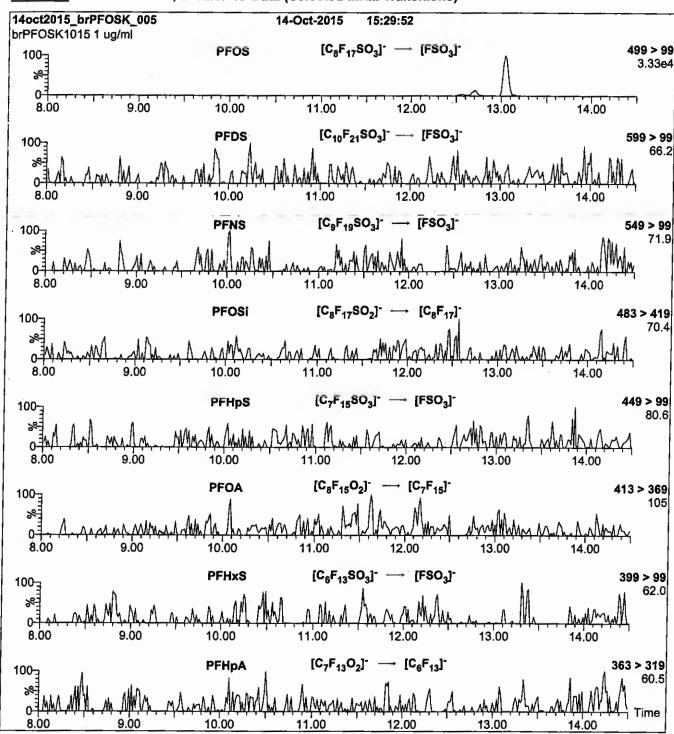
Flow:

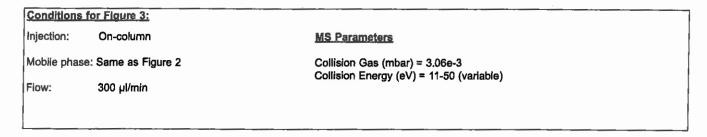
300 µl/min

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_00006



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

FOSA-I

LOT NUMBER:

MOLECULAR WEIGHT:

SOLVENT(S):

FOSA0815I

COMPOUND:

Perfluoro-1-octanesulfonamide

CAS #:

754-91-6

499.14

Isopropanol

STRUCTURE:

F F F F F F F F

MOLECULAR FORMULA:

C,H,F,NO,S

CONCENTRATION:

 $50 \pm 2.5 \mu g/ml$

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

09/02/2015

EXPIRY DATE: (mm/dd/yyyy)

09/02/2017

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:

B.G. Chittim

Date:

(mm/dd/vvvv)

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

$$x_{ij} x_{ij} ... x_{ij}$$
 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:

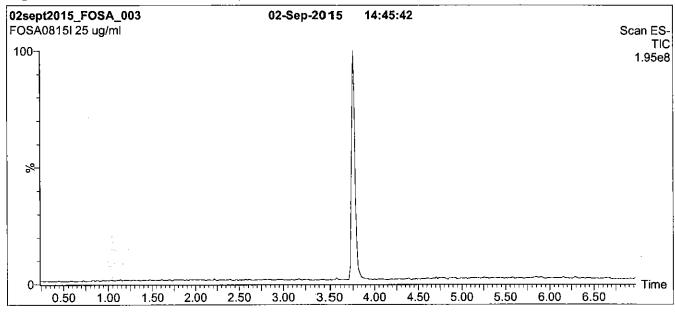
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

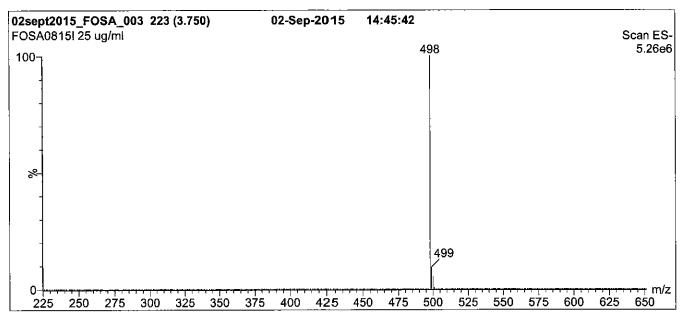




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





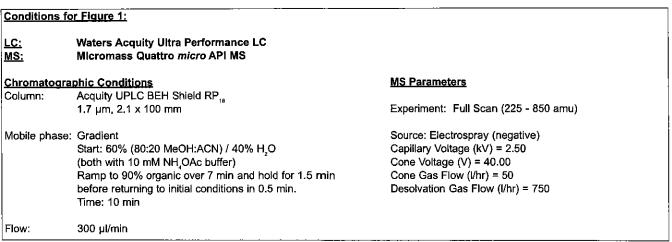
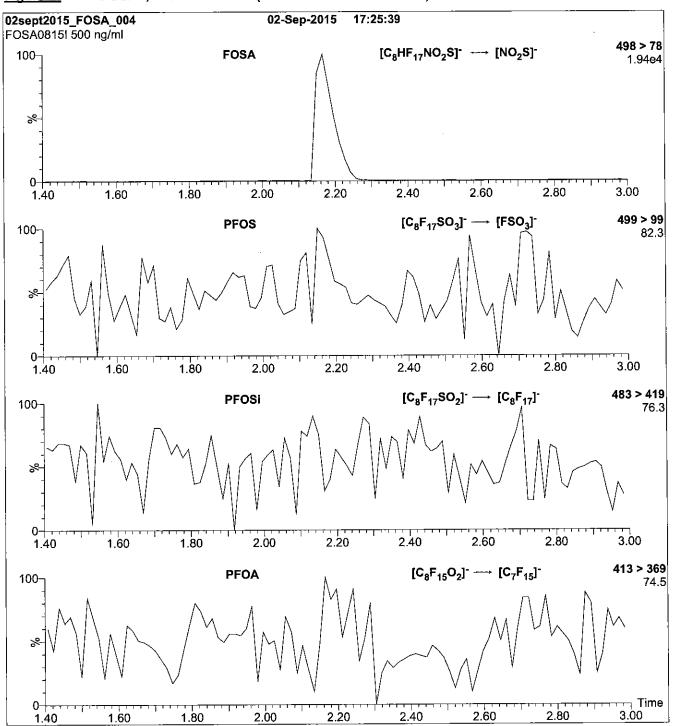
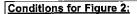


Figure 2: FOSA-I; LC/MS/MS Data (Selected MRM Transitions)





Direct loop injection

10 μl (500 ng/ml FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% $\rm H_2O$

(both with 10 mM NH OAc buffer)

Flow:

300 µl/min

MS Parameters

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

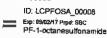
LCPFOSA_00008

R: 8BC 9/13/16

ID: LCPFOSA_00009

Exp: 09/02/17 Prpd: SBC PF-1-octanesulfonamide

ID: LCPFOSA_00008





CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

FOSA-I

LOT NUMBER:

MOLECULAR WEIGHT:

SOLVENT(\$):

FOSA08151

COMPOUND:

Perfluoro-1-octanesulfonamide

CAS #:

754-91-6

499.14

isopropanol

STRUCTURE:

MOLECULAR FORMULA:

C₈H₂F₁₇NO₂S

CONCENTRATION:

50 ± 2.5 µg/ml

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

09/02/2015

EXPIRY DATE: (mm/dd/yyyy)

09/02/2017

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>09/11/2015</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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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, $u_i(y)$, 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:

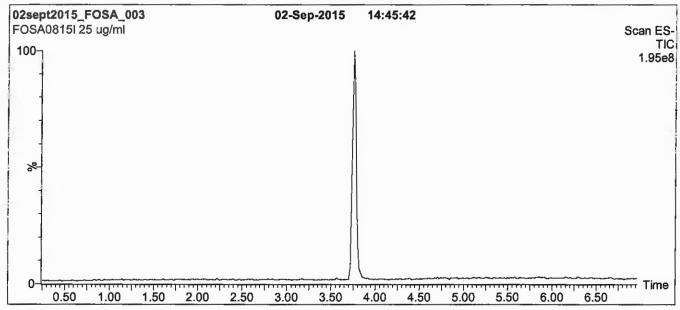
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

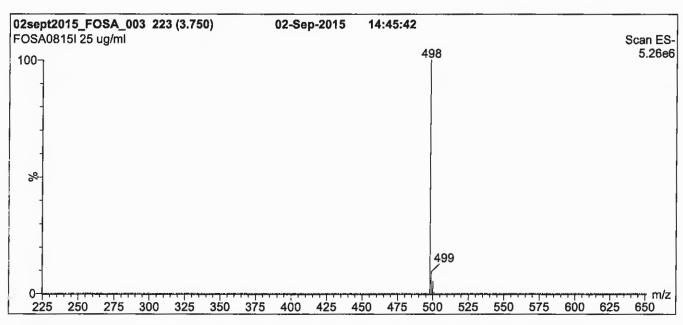




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Figure 1: FOSA-I; LC/MS Data (TIC and Mass Spectrum)





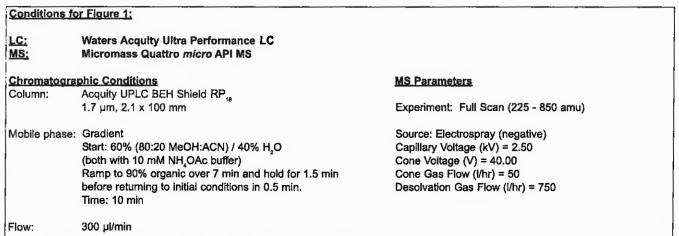
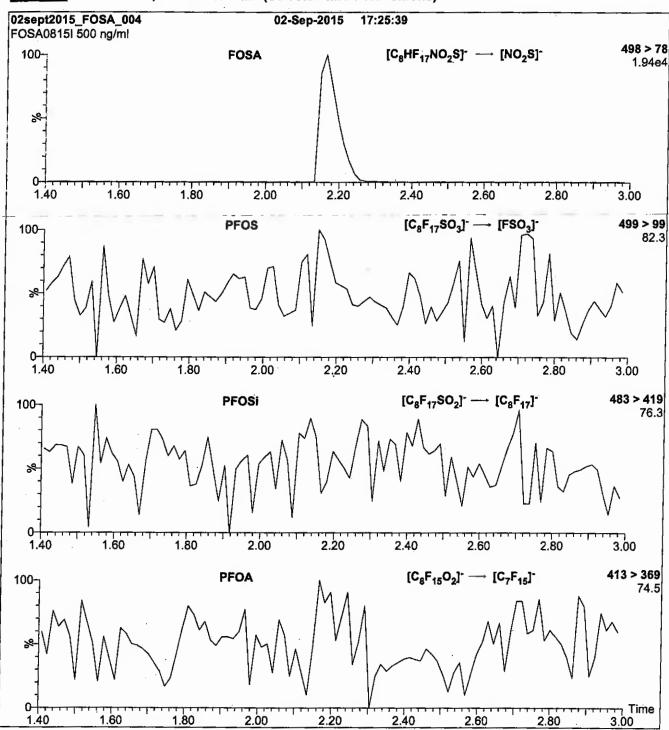


Figure 2: FOSA-I; LC/MS/MS Data (Selected MRM Transitions)





Direct loop injection

10 µl (500 ng/ml FOSA-I)

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

LCPFPeA_00005



ID: LCPFPeA 00005 Exp: 01/30/20 Prod: CBW PF-n-pentanoic acid



ELLINGTON BORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFPeA

LOT NUMBER:

PFPeA0115

COMPOUND:

Perfluoro-n-pentanoic acid

STRUCTURE:

CAS #:

2706-90-3

MOLECULAR FORMULA:

C,HF,O,

MOLECULAR WEIGHT:

264.05

CONCENTRATION:

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

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED; (mm/dd/yyyy)

01/30/2015

EXPIRY DATE: (mm/dd/yyyy)

01/30/2020

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 ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of C_sH₃F_sO₂ (hydrido - derivative) as measured by 19F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: <u>03/26/2015</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.

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:

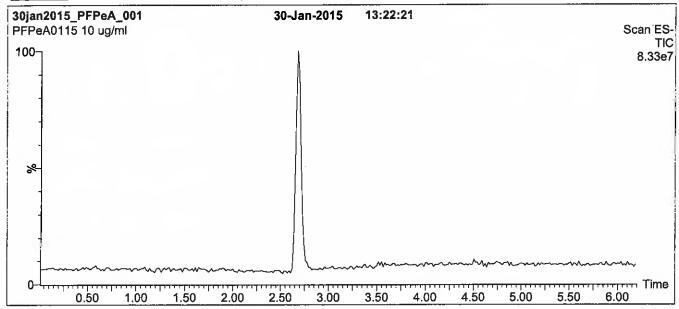
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

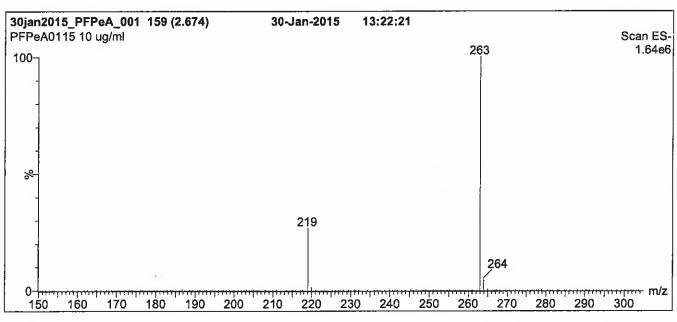




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.weil-labs.com or contact us directly at info@weil-labs.com

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





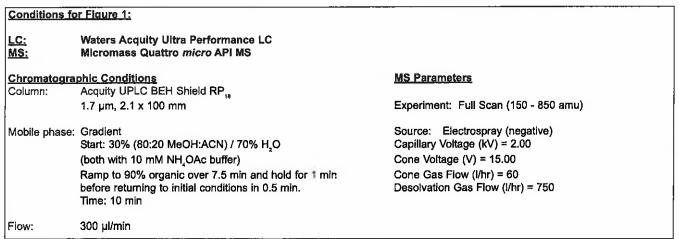
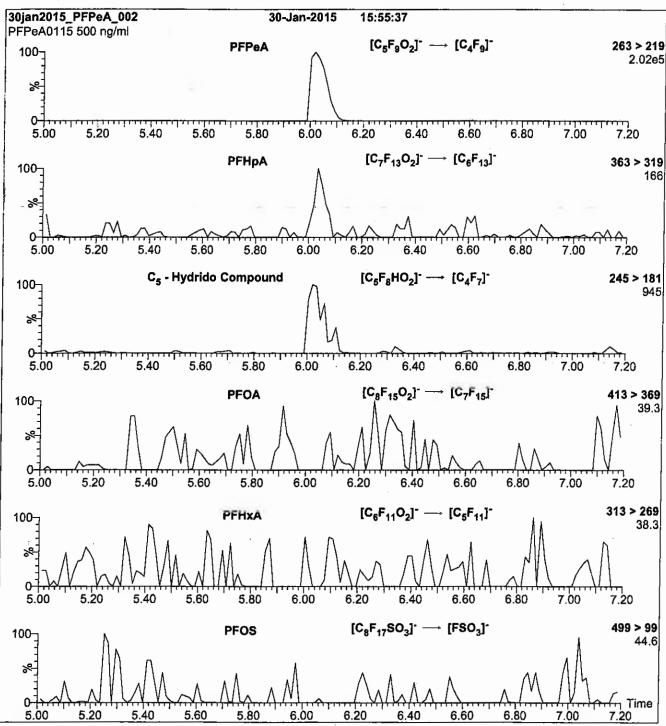
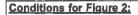


Figure 2: PFPeA; LC/MS/MS Data (Selected MRM Transitions)





Direct loop injection

10 µl (500 ng/ml PFPeA)

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

(both with 10 mM NH,OAc buffer)

MS Parameters

Collision Gas (mbar) = 3.35e-3 Collision Energy (eV) = 9

Flow:

300 μl/min

LCPFTeDA_00004



ID: LCPFTeDA_00004 Exp: 12/09/20 Prpd: CBW PF-n-tetradecanoic acid



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFTeDA

LOT NUMBER:

PFTeDA1215

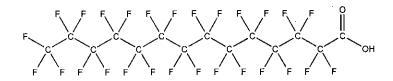
COMPOUND:

Perfluoro-n-tetradecanoic acid

STRUCTURE:

CAS #:

376-06-7



MOLECULAR FORMULA:

C, HF, O,

MOLECULAR WEIGHT:

714.11

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

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 ~ 0.2% of PFDoA ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{24}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 12/09/2015

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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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

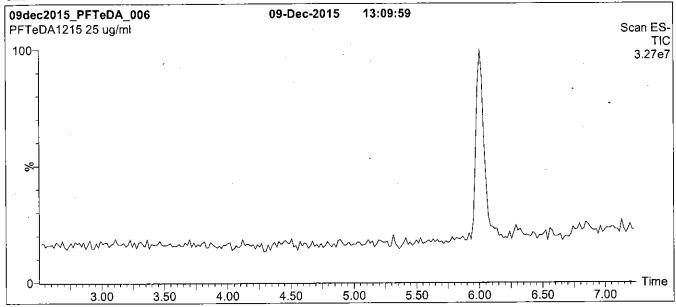
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

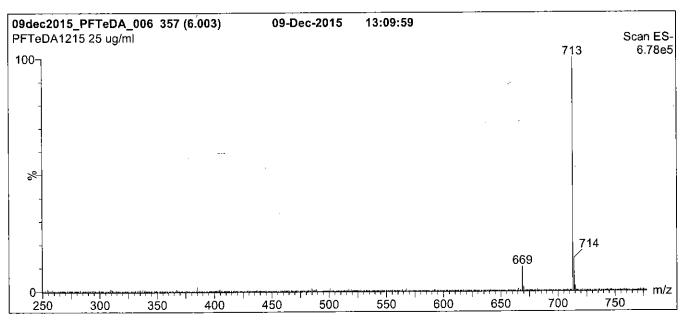




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





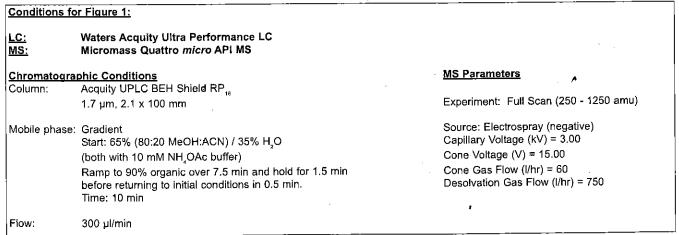
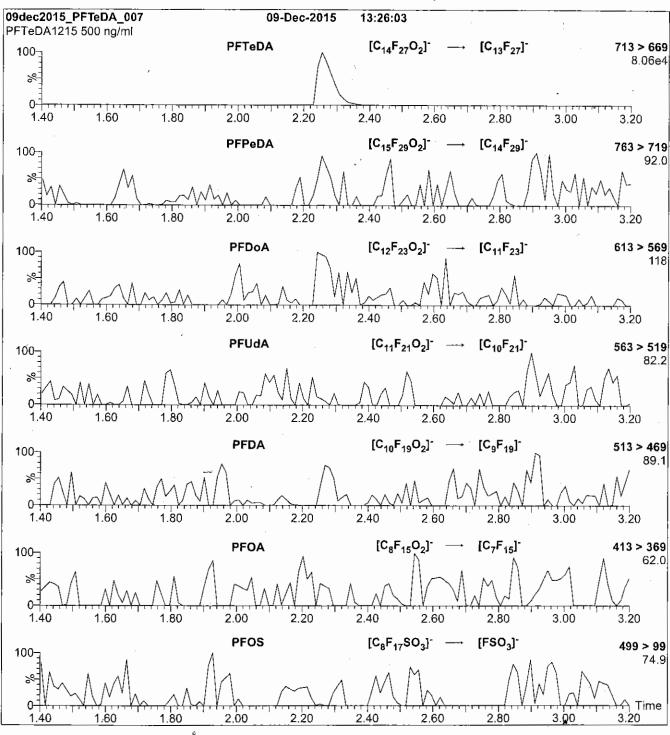
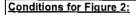


Figure 2: PFTeDA; LC/MS/MS Data (Selected MRM Transitions)





Direct loop injection

10 µl (500 ng/ml PFTeDA)

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) = 14

LCPFTeDA_00005



(D: LCPFTeDA_00005



ID: LCPFTeDA_00006

Exp: 12/09/20 Prpd: SBC

PF-n-tetradecanoic acid



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:

PFTeDA

LOT NUMBER:

PFTeDA1215

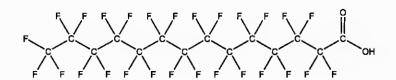
COMPOUND:

Perfluoro-n-tetradecanoic acid

STRUCTURE:

CAS #:

376-06-7



MOLECULAR FORMULA:

C, HF, O,

MOLECULAR WEIGHT:

714.11

CONCENTRATION:

50 ± 2.5 μg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

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 ~ 0.2% of PFDoA (C₁₂HF₂₃O₂) and ~ 0.2% of PFPeDA (C₁₅HF₂₉O₂).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chillim

Date:

12/09/2015

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 reguest.

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

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$$x_1, x_2, ... x_n$$
 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:

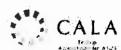
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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:

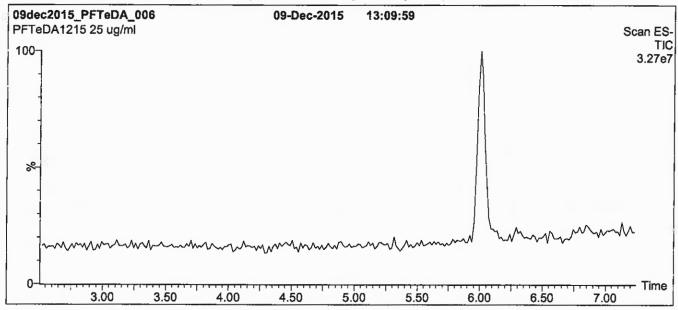
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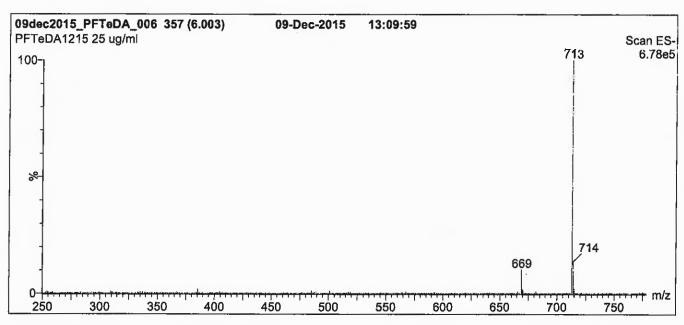




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Figure 1: PFTeDA; LC/MS Data (TIC and Mass Spectrum)





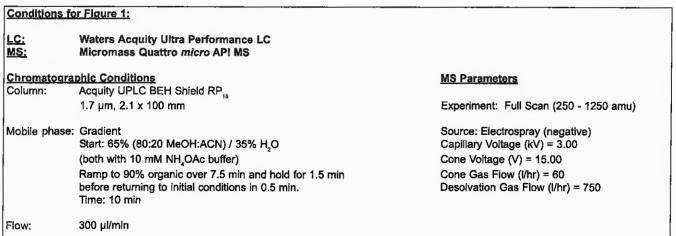
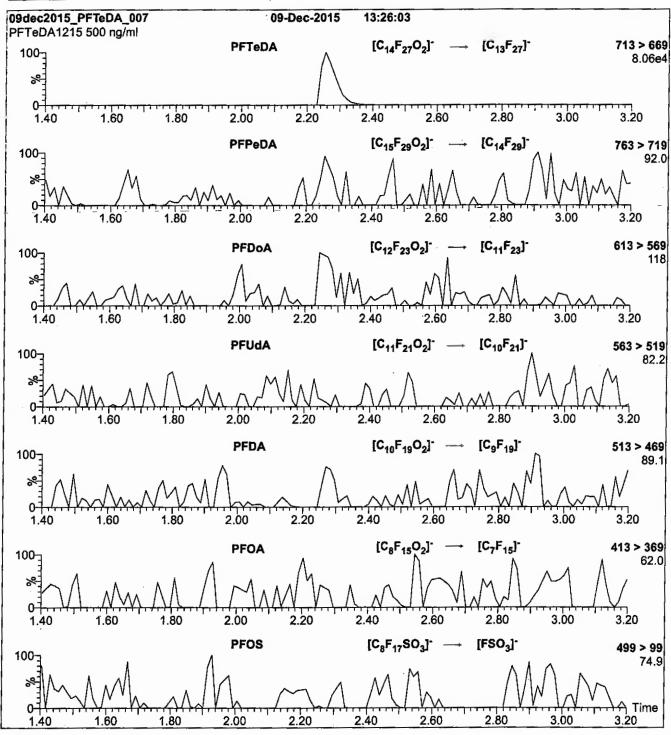
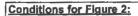


Figure 2: PFTeDA; LC/MS/MS Data (Selected MRM Transitions)





Direct loop injection

10 μl (500 ng/ml PFTeDA)

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

(both with 10 mM NH,OAc buffer)

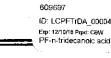
MS Parameters

Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 14

Flow:

300 µl/min

LCPFTrDA_00004





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFTrDA

LOT NUMBER:

PFTrDA1213

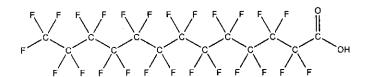
COMPOUND:

Perfluoro-n-tridecanoic acid

STRUCTURE:

CAS #:

72629-94-8



MOLECULAR FORMULA:

 $C_{13}HF_{25}O_{2}$

CONCENTRATION:

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

MOLECULAR WEIGHT:

664.11

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/10/2013

EXPIRY DATE: (mm/dd/yyyy)

12/10/2018

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

• 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:

B.G. Chittim

Date:

(mm/dd/www)

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.

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

$$X_1, X_2,...X_n$$
 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:

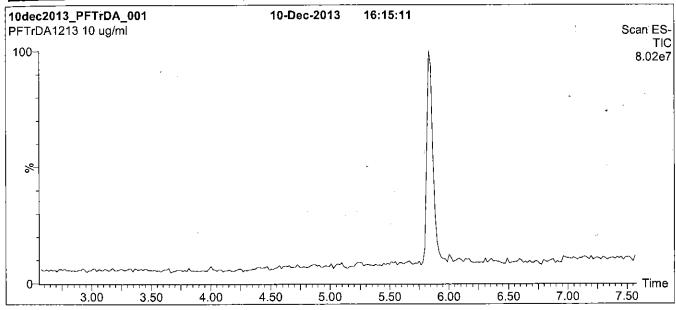
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDÉ 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

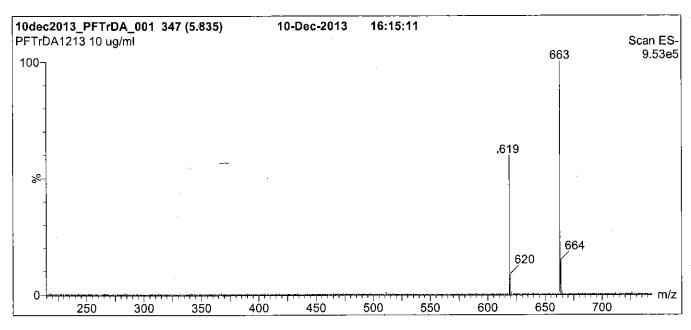




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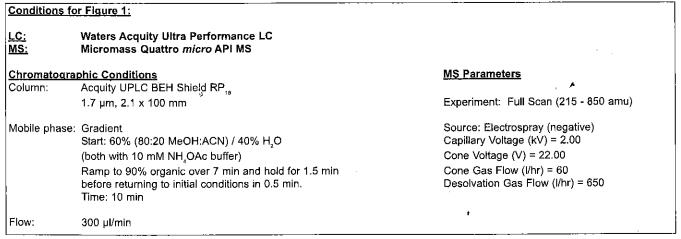
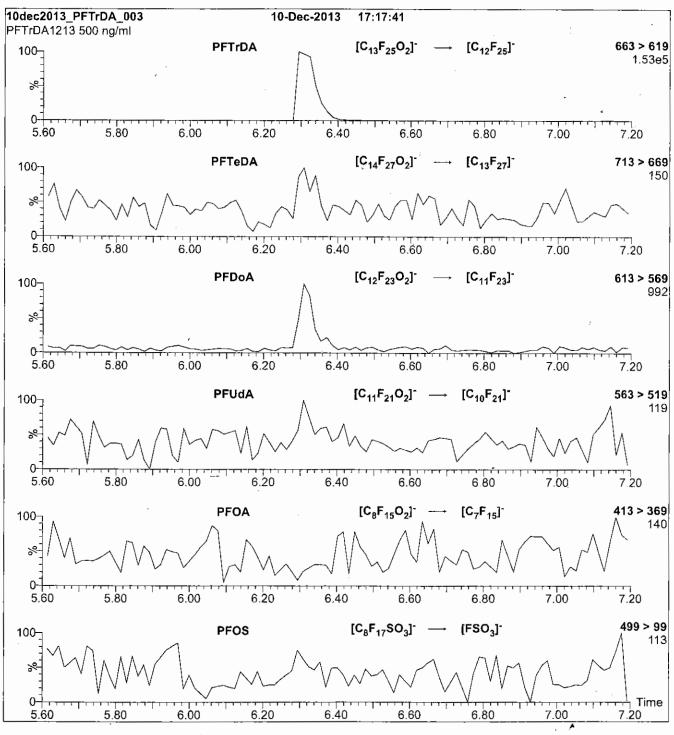
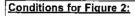


Figure 2: PFTrDA; LC/MS/MS Data (Selected MRM Transitions)





Direct loop injection

10 µl (500 ng/ml PFTrDA)

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) = 15

LCPFTrDA_00005



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



ID: LCPFTrDA 00006 Exp: 02/12/21 Prod: SBC



BORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFTrDA

LOT NUMBER:

PFTrDA0216

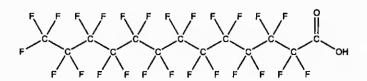
COMPOUND:

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: (mrn/ddi/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,HF,O,), ~ 0.4% of PFDoA (C,HF,O,), and ~ 0.1% of PFTeDA (C, HF, O,).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 02/16/2016

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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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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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

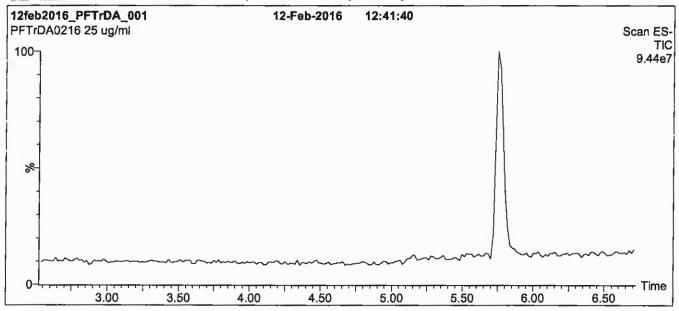
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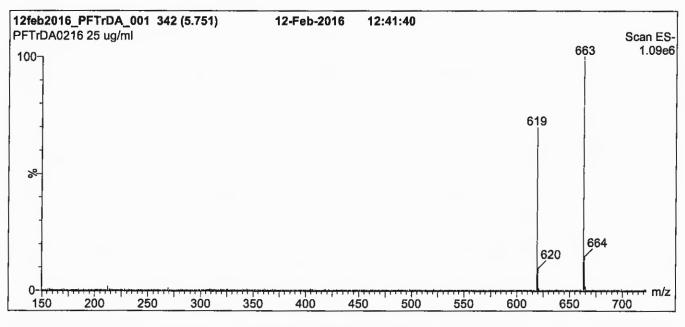




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Figure 1: PFTrDA; LC/MS Data (TIC and Mass Spectrum)





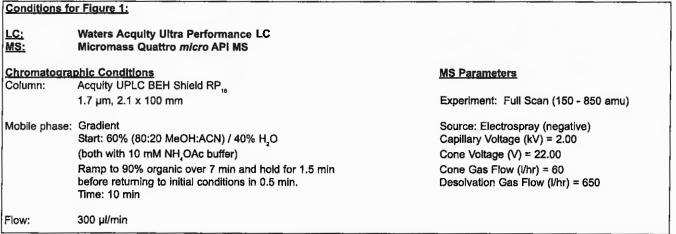
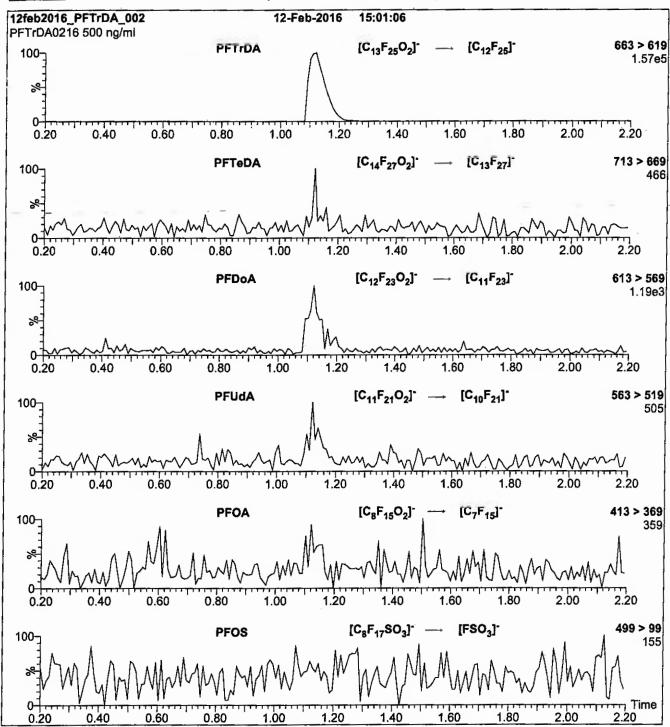
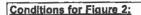


Figure 2: PFTrDA; LC/MS/MS Data (Selected MRM Transitions)





Direct loop injection

10 μl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% MeOH / 20% H2O

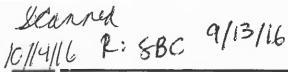
MS Parameters

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

Flow:

-300 µl/mln

LCPFUdA_00005





ID: LCPFUdA_00005 Exp: 08/19/20 Prpd: SBC PF-ri-undecanoic acid



ID: LCPFUdA_00006

Exp: 09/19/20 Prpd: SBC

PF-n-undecanoic acid



WELLINGTON

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFUdA

LOT NUMBER:

PFUdA0815

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)

08/19/2015

EXPIRY DATE: (mm/dd/yyyy)

08/19/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B G Chittim

Date:

<u> 08/21/2015</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:

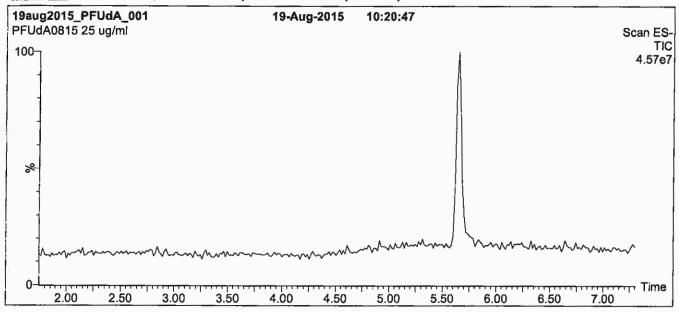
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

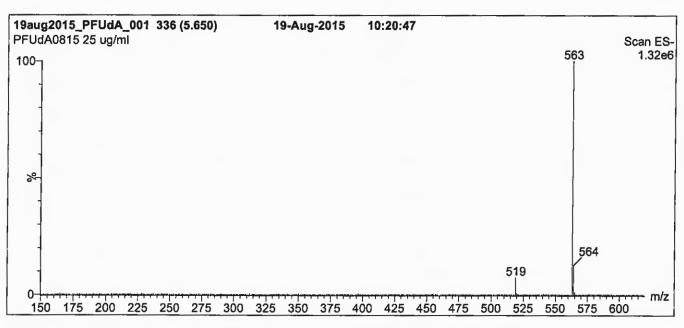




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





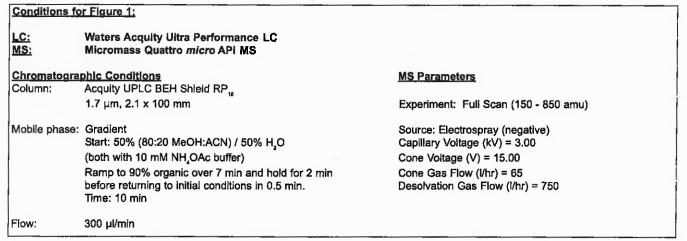
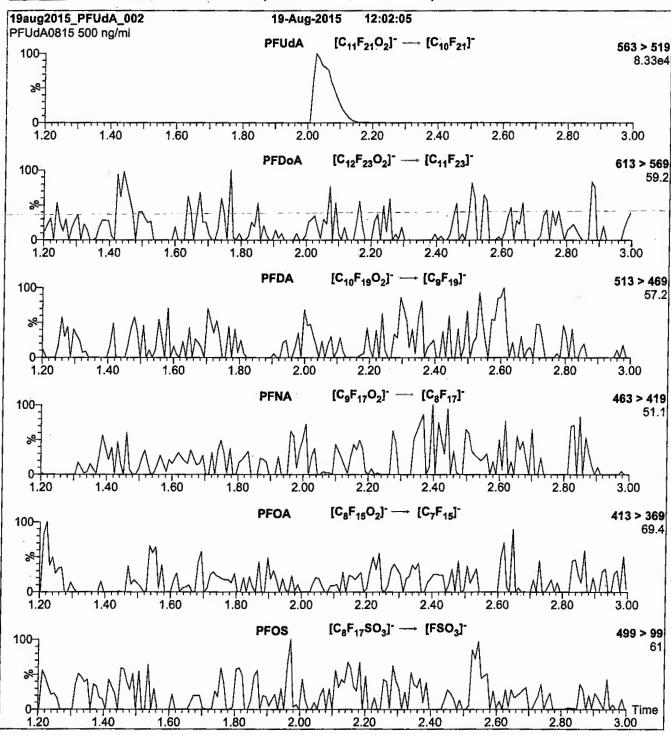


Figure 2: PFUdA; LC/MS/MS Data (Selected MRM Transitions)





Direct loop injection

10 μl (500 ng/ml PFUdA)

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) = 11

Flow:

300 µl/min

Method PFC DOD

Perfluronated Hydrocarbons (LC/MS) by Method PFC_DOD

Lab	Name:	TestAmerica	Sacramento	Job No.	: 320-24184-1

SDG No.: ____

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFBA	#	13CPeA #	PFHxA :	#	13CHpA	#	PFHxS	#	PFOA	#	PFNA	#	PFOS	#
308A51MW-LF-1216	320-24184-1	15	Q	24 Q	31	1	23 (Q	20	Q	49		39		38	
308A51MW-LF-1216 DL	320-24184-1 DL	117		130	118		98		112		140		120		125	
SWMU1-01-1216	320-24184-2	37		93	113		106		118		100		95		116	
FSS3TMW-1216	320-24184-3	25		22 Ç	17	Q	9 (Q	9	Q	12	Q	9	Q	6	Q
SWMU1-02-1216	320-24184-4	31		91	115		116		118		110		62		80	
SWMU1-02-1216 DL	320-24184-4 DL	93		148	125	1	123		139		114		96		123	
	MB 320-142967/1-A	131		137	131		132		130		133		126		126	
	LCS 320-142967/2-A	131		132	126		128		128		127		123		128	

	QC LIMITS
PFBA = 13C4 PFBA	25-150
13CPeA = 13C5-PFPeA	25-150
PFHxA = 13C2 PFHxA	25-150
13CHpA = 13C4-PFHpA	25-150
PFHxS = 1802 PFHxS	25-150
PFOA = 13C4 PFOA	25-150
PFNA = 13C5 PFNA	25-150
PFOS = 13C4 PFOS	25-150

 $[\]ensuremath{\text{\#}}$ Column to be used to flag recovery values

Lab Name	e: TestAmerica	Sacramento	Job No.:	320-24184-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	13C8FOS#	PFDA #	PFUnA #	PFDoA #
308A51MW-LF-1216	320-24184-1	10 Q	117	121	110
308A51MW-LF-1216 DL	320-24184-1 DL	11 Q	122	124	126
SWMU1-01-1216	320-24184-2	7 Q	96	103	104
FSS3TMW-1216	320-24184-3	32	46	119	113
SWMU1-02-1216	320-24184-4	12 Q	104	112	109
SWMU1-02-1216 DL	320-24184-4 DL	12 Q	98	99	101
	MB 320-142967/1-A	64	130	127	112
	LCS 320-142967/2-A	62	127	119	114

	QC LIMITS
13C8FOS = 13C8 FOSA	25-150
PFDA = 13C2 PFDA	25-150
PFUnA = 13C2 PFUnA	25-150
PFDoA = 13C2 PFDoA	25-150

 $\ensuremath{\text{\#}}$ Column to be used to flag recovery values

Lab Name: TestAmerica Sacramento	1
----------------------------------	---

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFBA #	13CPeA #	PFHxA #	13CHpA #	PFHxS #	PFOA #	PFOS #	PFNA
FSS3TMW-1216 DL	320-24184-3 DL	105	103	108	73	124	91	71	66

	QC LIMITS
PFBA = 13C4 PFBA	25-150
13CPeA = 13C5-PFPeA	25-150
PFHxA = 13C2 PFHxA	25-150
13CHpA = 13C4-PFHpA	25-150
PFHxS = 1802 PFHxS	25-150
PFOA = 13C4 PFOA	25-150
PFOS = 13C4 PFOS	25-150
PFNA = 13C5 PFNA	25-150

 $\ensuremath{\text{\#}}$ Column to be used to flag recovery values

Lab Name:	TestAmerica Sacramento	Job No.: <u>320-24184-1</u>	

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	13C8FOS#	PFDA #	PFUnA #	PFDoA #
FSS3TMW-1216 DL	320-24184-3 DL	73	106	105	117

 QC LIMITS

 13C8FOS = 13C8 FOSA
 25-150

 PFDA = 13C2 PFDA
 25-150

 PFUNA = 13C2 PFUNA
 25-150

 PFDoA = 13C2 PFDoA
 25-150

 $\ensuremath{\text{\#}}$ Column to be used to flag recovery values

Lab Name: TestAmerica Sacramento Job No.: 3	320-24184-1
---	-------------

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #
SWMU1-01-1216 RE	320-24184-2 RE	116
SWMU1-02-1216 RE	320-24184-4 RE	108
	MB	139
	320-144971/1-A	
	LCS	109
	320-144971/2-A	
	LCSD	117
	320-144971/3-A	

 $\frac{QC LIMITS}{25-150}$

PFHxA = 13C2 PFHxA

 $\ensuremath{\text{\#}}$ Column to be used to flag recovery values

Lab Name:	TestAmerica Sacramento	Job No.:	320-24184-1
SDG No.:			

Matrix: Water Level: Low

GC Column (1): <u>Acquity</u> ID: <u>2.1 (mm)</u>

Client Sample ID	Lab Sample ID	PFOS	#
FSS3TMW-1216 DL2	320-24184-3 DL2	105	
	MB 320-142967/1-A RA	113	
	LCS 320-142967/2-A RA	126	

 $\frac{QC LIMITS}{25-150}$

PFOS = 13C4 PFOS

FORM III LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name	e: TestAmerica Sacr	amento	Job No.:	320-24184-1
SDG No.	: <u></u>			
Matrix:	Water	Level: Low	Lab File	ID: 28DEC2016C_004.d
Lab ID:	LCS 320-142967/2-A		Client ID	:

	SPIKE	LCS	LCS	QC	
	ADDED	CONCENTRATION	ુ	LIMITS	#
COMPOUND	(ug/L)	(ug/L)	REC	REC	
Perfluorobutanoic acid (PFBA)	0.0400	0.0441	110	60-140	
Perfluoropentanoic acid	0.0400	0.0422	105	60-140	
(PFPeA)					
Perfluorohexanoic acid (PFHxA)	0.0400	0.0413	103		
Perfluoroheptanoic acid	0.0400	0.0418	104	60-140	
(PFHpA)					
Perfluorooctanoic acid (PFOA)	0.0400	0.0406	101	60-140	
Perfluorononanoic acid (PFNA)	0.0400	0.0384	96	60-140	
Perfluorodecanoic acid (PFDA)	0.0400	0.0399	100		
Perfluoroundecanoic acid	0.0400	0.0382	95	60-140	
(PFUnA)					
Perfluorododecanoic acid	0.0400	0.0386	96	60-140	
(PFDoA)	0.0400	0.0204	0.6	FO 1FO	
Perfluorotridecanoic Acid (PFTriA)	0.0400	0.0384	96	50-150	
Perfluorotetradecanoic acid	0.0400	0.0478	120	50-150	
(PFTeA)	0.0400	0.0478	120	30-130	
Perfluorobutanesulfonic acid	0.0354	0.0432	122	50-150	
(PFBS)					
Perfluorohexanesulfonic acid	0.0364	0.0397	109	60-140	
(PFHxS)					
Perfluorodecanesulfonic acid	0.0386	0.0385	100	50-150	
(PFDS)					
Perfluorooctane Sulfonamide	0.0400	0.0384	96	60-140	
(FOSA) 13C8 FOSA	0.100	0.0621	62	25-150	
		0.0621		25-150	
13C4 PFBA	0.100		131		
13C5-PFPeA	0.100	0.132	132	25-150	
13C2 PFHxA	0.100	0.126	126	25-150	
13C4-PFHpA	0.100	0.128	128		
13C4 PFOA	0.100	0.127	127	25-150	
13C5 PFNA	0.100	0.123	123		
13C2 PFDA	0.100	0.127	127	25-150	
13C2 PFUnA	0.100	0.119	119	25-150	
13C2 PFDoA	0.100	0.114	114	25-150	
1802 PFHxS	0.0946	0.121	128		
13C4 PFOS	0.0956	0.123	128	25-150	

[#] Column to be used to flag recovery and RPD values FORM III 537 (Modified)

FORM III LCMS LAB CONTROL SAMPLE RECOVERY

Lab Nam	o Name: TestAmerica Sacramento		Job No.: 320-24184-1	
SDG No.	:			
Matrix:	Water	Level: Low	Lab File ID: 30DEC2016B_033.d	
Lab ID:	LCS 320-142967/2-A	RA	Client ID:	

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	0.0371	0.0511	138	60-140	
13C4 PFOS	0.0956	0.121	126	25-150	

[#] Column to be used to flag recovery and RPD values FORM III 537 (Modified)

FORM III LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name	e: TestAmerica Sacr	amento	Job No.:	320-	-24184-1
SDG No.	: _	<u>-</u>			
Matrix:	Water	Level: Low	Lab File	ID:	05JAN2017B_006.d
Lab ID:	LCS 320-144971/2-A		Client II	D:	

	SPIKE ADDED	LCS CONCENTRATION	LCS	QC LIMITS	#
COMPOUND	(ug/L)	(ug/L)	REC	REC	
Perfluorohexanoic acid (PFHxA)	0.0400	0.0402	101	60-140	
13C2 PFHxA	0.100	0.109	109	25-150	

[#] Column to be used to flag recovery and RPD values FORM III 537 (Modified)

FORM III LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name	e: <u>TestAmerica Sacı</u>	ramento	Job No.: <u>3</u>	20-24184-1
SDG No.	:			
Matrix:	Water	Level: Low	Lab File I	D: 05JAN2017B_007.d
Lab ID:	LCSD 320-144971/3-	-A	Client ID:	

	SPIKE	LCSD	LCSD		QC L	IMITS	
	ADDED	CONCENTRATION	용	용			#
COMPOUND	(ug/L)	(ug/L)	REC	RPD	RPD	REC	
Perfluorohexanoic acid (PFHxA)	0.0400	0.0424	106	5	30	60-140	
13C2 PFHxA	0.100	0.117	117			25-150	

[#] Column to be used to flag recovery and RPD values FORM III 537 (Modified)

FORM IV LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento	Job No.: 320-24184-1
SDG No.:	
Lab File ID: 28DEC2016C_003.d	Lab Sample ID: MB 320-142967/1-A
Matrix: Water	Date Extracted: 12/19/2016 14:38
Instrument ID: A8_N	Date Analyzed: 12/29/2016 00:06
Level: (Low/Med) Low	

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

		LAB	
CLIENT SAMPLE ID	LAB SAMPLE ID	FILE ID	DATE ANALYZED
	LCS 320-142967/2-A	28DEC2016C_	12/29/2016 00:14
		004.d	
308A51MW-LF-1216	320-24184-1	28DEC2016C_ 009.d	12/29/2016 00:52
FSS3TMW-1216	320-24184-3	28DEC2016C_ 011.d	12/29/2016 01:07

FORM IV LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento	Job No.: 320-24184-1
SDG No.:	
Lab File ID: 30DEC2016B_032.d	Lab Sample ID: MB 320-142967/1-A
Matrix: Water	Date Extracted: 12/19/2016 14:38
Instrument ID: A8_N	Date Analyzed: 12/30/2016 16:11
Level: (Low/Med) Low	

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

		LAB	
CLIENT SAMPLE ID	LAB SAMPLE ID	FILE ID	DATE ANALYZED
FSS3TMW-1216 DL	320-24184-3 DL	30DEC2016B_ 004.d	12/30/2016 12:41
308A51MW-LF-1216 DL	320-24184-1 DL	30DEC2016B_ 011.d	12/30/2016 13:33
SWMU1-01-1216	320-24184-2	30DEC2016B_ 012.d	12/30/2016 13:41
SWMU1-02-1216 DL	320-24184-4 DL	30DEC2016B_ 015.d	12/30/2016 14:03
SWMU1-02-1216	320-24184-4	30DEC2016B_ 016.d	12/30/2016 14:11
	LCS 320-142967/2-A RA	30DEC2016B_ 033.d	12/30/2016 16:19
FSS3TMW-1216 DL2	320-24184-3 DL2	04JAN2017A_ 045.d	01/04/2017 21:33

FORM IV LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento	Job No.: 320-24184-1
SDG No.:	
Lab File ID: 05JAN2017B_005.d	Lab Sample ID: MB 320-144971/1-A
Matrix: Water	Date Extracted: 01/04/2017 16:57
Instrument ID: A8_N	Date Analyzed: 01/05/2017 15:15
Level: (Low/Med) Low	

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

		LAB	
CLIENT SAMPLE ID	LAB SAMPLE ID	FILE ID	DATE ANALYZED
	LCS 320-144971/2-A	05JAN2017B_ 006.d	01/05/2017 15:23
	LCSD 320-144971/3-A	05JAN2017B_ 007.d	01/05/2017 15:30
SWMU1-01-1216 RE	320-24184-2 RE	05JAN2017B_ 008.d	01/05/2017 15:38
SWMU1-02-1216 RE	320-24184-4 RE	05JAN2017B_ 009.d	01/05/2017 15:45

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Client Sample ID: 308A51MW-LF-1216 Lab Sample ID: 320-24184-1

Matrix: Water Lab File ID: 28DEC2016C_009.d

Analysis Method: 537 (Modified) Date Collected: 12/07/2016 13:40

Extraction Method: 3535 Date Extracted: 12/19/2016 14:38

Sample wt/vol: 271(mL) Date Analyzed: 12/29/2016 00:52

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 144253 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	2.9	E	0.0023	0.00092	0.00042
2706-90-3	Perfluoropentanoic acid (PFPeA)	1.6	E	0.0023	0.0018	0.00091
307-24-4	Perfluorohexanoic acid (PFHxA)	1.4	E B	0.0023	0.0018	0.00073
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.3	E	0.0023	0.0018	0.00074
335-67-1	Perfluorooctanoic acid (PFOA)	1.6	E M	0.0023	0.0018	0.00069
375-95-1	Perfluorononanoic acid (PFNA)	0.13		0.0023	0.0018	0.00060
335-76-2	Perfluorodecanoic acid (PFDA)	0.0027		0.0023	0.00092	0.00041
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0018	Ū	0.0023	0.0018	0.00069
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0018	Ū	0.0023	0.0018	0.00054
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0018	U	0.0023	0.0018	0.00051
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00047	J	0.0023	0.00092	0.00037
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.6	E M	0.0023	0.0018	0.00085
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	4.9	E	0.0023	0.0018	0.00080
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0028	Ū	0.0037	0.0028	0.0011
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0021	J	0.0023	0.0018	0.00059

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

 SDG No.:
 Client Sample ID: 308A51MW-LF-1216
 Lab Sample ID: 320-24184-1

 Matrix: Water
 Lab File ID: 28DEC2016C_009.d

 Analysis Method: 537 (Modified)
 Date Collected: 12/07/2016 13:40

Extraction Method: 3535 Date Extracted: 12/19/2016 14:38

Sample wt/vol: 271(mL) Date Analyzed: 12/29/2016 00:52

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

Dilution Factor: 1

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

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

Analysis Batch No.: 144253 Units: ug/L

Con. Extract Vol.: 0.5(mL)

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	10	Q	25-150
STL00992	13C4 PFBA	15	Q	25-150
STL01893	13C5-PFPeA	24	Q	25-150
STL00993	13C2 PFHxA	31		25-150
STL01892	13C4-PFHpA	23	Q	25-150
STL00990	13C4 PFOA	49		25-150
STL00995	13C5 PFNA	39		25-150
STL00996	13C2 PFDA	117		25-150
STL00997	13C2 PFUnA	121		25-150
STL00998	13C2 PFDoA	110		25-150
STL00994	1802 PFHxS	20	Q	25-150
STL00991	13C4 PFOS	38		25-150

Report Date: 06-Jan-2017 09:10:39 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_009.d

Lims ID: 320-24184-A-1-A Client ID: 308A51MW-LF-1216

Sample Type: Client

Inject. Date: 29-Dec-2016 00:52:01 ALS Bottle#: 7 Worklist Smp#: 9

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-24184-a-1-a Misc. Info.: Plate: 1 Rack: 3

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jan-2017 09:10:39 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK020

First Level Reviewer: phomsophat Date: 29-Dec-2016 17:38:40

First Level Reviewer: phomsophat Date: 29-Dec-2016 17:38:40										
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA 217.00 > 172.00	1.533	1.534	-0.001		2635456	7.58		15.2	141716	
1 Perfluorobut 212.90 > 169.00	1.533	1.534	-0.001	1.000	71875746	1597.3			95156	E E
D 413C5-PFPe 267.90 > 223.00	1.810	1.810	0.0		3131274	11.8		23.5	72327	_
3 Perfluoroper 262.90 > 219.00	1.829	1.810	0.019	1.000	53098406	859.2			4242	E E
5 Perfluorobut 298.90 > 80.00 298.90 > 99.00	1.877	1.849 1.849	0.028 -0.001	1.000 0.985	77801104 70621103	844.1	1.10(0.00-0.00)			EM EM
D 613C2 PFHx 315.00 > 270.00	2.087	2.097	-0.010		3760373	15.3		30.7	305961	_
7 Perfluorohex 313.00 > 269.00	2.118	2.097	0.021	1.000	51347497	735.1			1440	E E
9 Perfluorohex 399.00 > 80.00	2.401		-0.021	1.000	176864369	2639.7				E E
D 11 13C4-PFH 367.00 > 322.00	2.409	2.429	-0.020		2591290	11.4		22.9	223927	
12 Perfluorohe 363.00 > 319.00	2.409	acid 2.429	-0.020	1.000	63180739	1245.5			12131	E E
D 10 1802 PFH: 403.00 > 84.00	2.436	2.452	-0.016		3076914	9.41		19.9	26164	
D 14 13C4 PFO. 417.00 > 372.00	2.785	2.790	-0.005		5670316	24.6		49.2	215745	
15 Perfluorooct 413.00 > 369.00 413.00 > 169.00	2.777	2.790 2.790	-0.013 -0.030	1.000 0.994	100330883 86802281	881.9	1.16(0.90-1.10)		179240 313754	
					Page 411 of 8	309				

Report Date: 06-Jan-2017 09:10:39 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File:

L	Data File:	NCIII	JIIIVa\5a	acrament	.0\C110111	Dala/A8_IN/201	01229-38288	3.D/28DEC2016C_C	109.u		
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	18 Perfluorooct	ane sulf	onic acid	t						•	E
	499.00 > 80.00	2.986	3.134	-0.148	1.000	293011367	3124.9			0.0	E
	499.00 > 99.00	3.132	3.134	-0.002	1.049	123012967		2.38(0.90-1.10)		285109	
[D 17 13C4 PFO	S									
	503.00 > 80.00	3.149	3.158	-0.009		4507038	18.1		37.9	33691	
	20 Perfluorono	nanoic a	cid								
	463.00 > 419.00	3.149	3.158	-0.009	1.000	4523216	67.9			28055	
[D 19 13C5 PFN	Д									
	468.00 > 423.00	3.149	3.166	-0.017		3500273	19.7		39.4	130737	
[D 21 13C8 FOS	A									
	506.00 > 78.00	3.484	3.481	0.003		1893842	4.93		9.9	80624	
	22 Perfluorooct	ane Sulf	onamide	Э							
	498.00 > 78.00	3.355	3.481	-0.126	1.000	39989	1.13			1243	
[D 23 13C2 PFD/	Д									
	515.00 > 470.00	3.509	3.523	-0.014		9225214	58.6		117	672269	
	24 Perfluorode	canoic a	cid								
	513.00 > 469.00			-0.014	1.000	250704	1.44			2574	
	26 Perfluorode	cane Sul	fonic ac	id							
	599.00 > 80.00			-0.013	1.000	438	0.007955				
[D 27 13C2 PFU	nΑ									
	565.00 > 520.00	3.838	3.851	-0.013		7084892	60.4		121	697440	
	28 Perfluoroun		: acid								
	563.00 > 519.00		3.851	-0.004	1.000	22884	0.1689			325	
	D 30 13C2 PFD										
	615.00 > 570.00		4.134	0.002		6124484	55.2		110	195991	
	33 Perfluoroteti										
	712.50 > 668.90		4.652	0.003	1.000	49801	0.2565			736	
	713.00 > 169.00		4.652	-0.017	0.996	6986	0.2000	7.13(0.00-0.00)		2959	
								,(=====)			

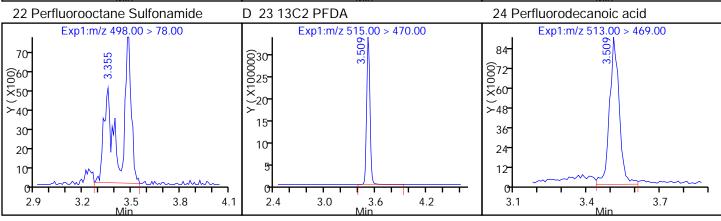
OC Flag Legend Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 06-Jan-2017 09:10:39 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 29-Dec-2016 00:52:01 Instrument ID: A8_N Lims ID: 320-24184-A-1-A Lab Sample ID: 320-24184-1 Client ID: 308A51MW-LF-1216 Operator ID: A8-PC\A8 ALS Bottle#: 7 Worklist Smp#: 9 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 (X100000) (77- ×55 ∑₁₀ 33 22 2.0 1.0 1.9 1.1 1.4 1.7 0.7 1.3 1.6 1.2 1.5 1.8 2.1 5 Perfluorobutanesulfonic acid (M) 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 (X1000000) (X1000000) (X1000000) (0000015 12 X) (00000012-2.0 2.0 1.5 2.4 1.4 1.7 2.3 1.1 1.4 1.7 2.3 1.2 1.8 2.1 1.1 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 313,00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 399.00 > 80.00 16 (0000012 0012 (00000015⁻ X) × 9 (X100000) X (X1000000) ∑₁₀-2.0 2.3 2.6 1.8 1.6 2.2 2.8 1.4 1.7 1.5 2.1 2.4 1.0 3.4 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 (00000012-10-77-84 0066 X⁵⁵ 0072 ×60 -48 -44 33 36 22 24 00| 2.0 2.6 3.2 1.7 2.9 1.9 2.2 2.5 2.8 2.0 2.3 2.6 Page 4M3nof 809 3.1 1.4 1.6



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Report Date: 06-Jan-2017 09:10:39 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_009.d

Injection Date: 29-Dec-2016 00:52:01 Instrument ID: A8_N

Lims ID: 320-24184-A-1-A Lab Sample ID: 320-24184-1

Client ID: 308A51MW-LF-1216

Operator ID: A8-PC\A8 ALS Bottle#: 7 Worklist Smp#: 9

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

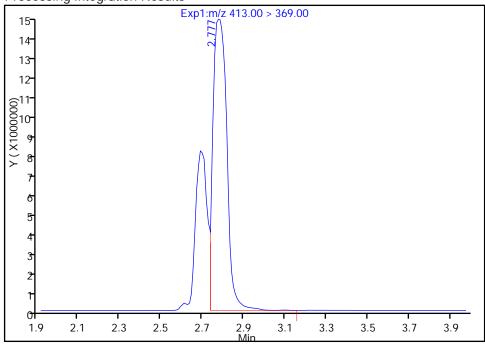
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

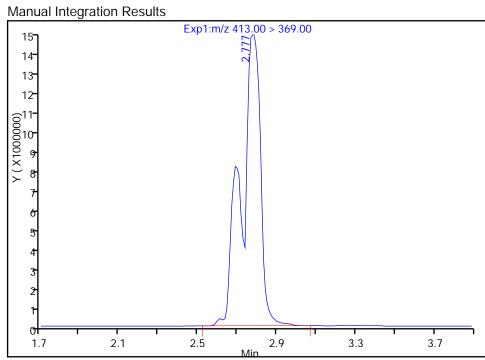
Signal: 1

RT: 2.78
Area: 68212625
Amount: 599.6040
Amount Units: ng/ml

Processing Integration Results



RT: 2.78
Area: 100330883
Amount: 881.9305
Amount Units: ng/ml



Reviewer: phomsophat, 29-Dec-2016 17:38:40

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

Page 416 of 809

Report Date: 06-Jan-2017 09:10:39 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_009.d

Injection Date: 29-Dec-2016 00:52:01 Instrument ID: A8_N

Lims ID: 320-24184-A-1-A Lab Sample ID: 320-24184-1

Client ID: 308A51MW-LF-1216

Operator ID: A8-PC\A8 ALS Bottle#: 7 Worklist Smp#: 9

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

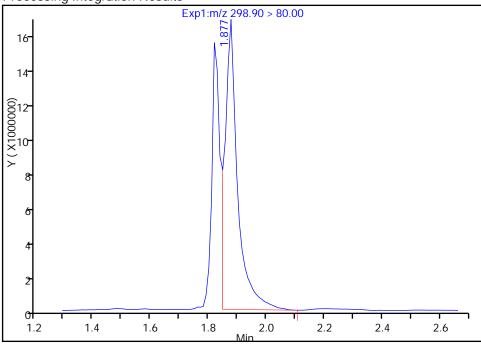
Column: Detector EXP1

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

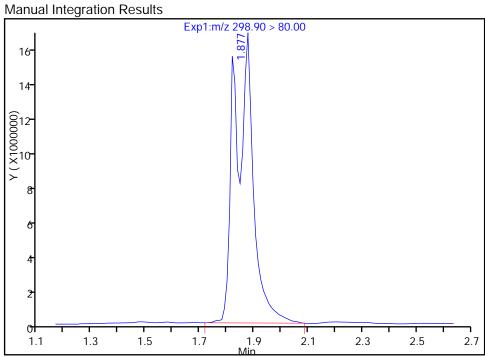
Signal: 1

RT: 1.88
Area: 48045385
Amount: 521.2446
Amount Units: ng/ml

Processing Integration Results



RT: 1.88
Area: 77801104
Amount: 844.0646
Amount Units: ng/ml



Reviewer: phomsophat, 06-Jan-2017 09:10:39

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Client Sample ID: 308A51MW-LF-1216 DL Lab Sample ID: 320-24184-1 DL

Matrix: Water Lab File ID: 30DEC2016B_011.d

Analysis Method: 537 (Modified) Date Collected: 12/07/2016 13:40

Extraction Method: 3535 Date Extracted: 12/19/2016 14:38

Sample wt/vol: 271(mL) Date Analyzed: 12/30/2016 13:33

Con. Extract Vol.: 0.5(mL) Dilution Factor: 50

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 144510 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	5.3	D	0.12	0.046	0.021
2706-90-3	Perfluoropentanoic acid (PFPeA)	9.1	D	0.12	0.092	0.046
307-24-4	Perfluorohexanoic acid (PFHxA)	11	DВ	0.12	0.092	0.036
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.3	D	0.12	0.092	0.037
335-67-1	Perfluorooctanoic acid (PFOA)	2.6	D M	0.12	0.092	0.035
375-95-1	Perfluorononanoic acid (PFNA)	0.13	D	0.12	0.092	0.030
335-76-2	Perfluorodecanoic acid (PFDA)	0.046	U	0.12	0.046	0.020
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.092	U	0.12	0.092	0.035
307-55-1	Perfluorododecanoic acid (PFDoA)	0.092	U	0.12	0.092	0.027
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.092	U	0.12	0.092	0.025
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.046	U	0.12	0.046	0.018
375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.3	D	0.12	0.092	0.042
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	17	D	0.12	0.092	0.040
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	11	D	0.18	0.14	0.059
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.14	U	0.18	0.14	0.056
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.092	U	0.12	0.092	0.029

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Con. Extract Vol.: 0.5(mL)

Client Sample ID: 308A51MW-LF-1216 DL Lab Sample ID: 320-24184-1 DL

Matrix: Water Lab File ID: 30DEC2016B_011.d

Analysis Method: 537 (Modified) Date Collected: 12/07/2016 13:40

Extraction Method: 3535 Date Extracted: 12/19/2016 14:38

Sample wt/vol: 271(mL) Date Analyzed: 12/30/2016 13:33

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

Dilution Factor: 50

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

Analysis Batch No.: 144510 Units: ug/L

			1	1
CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	11	Q	25-150
STL00992	13C4 PFBA	117		25-150
STL01893	13C5-PFPeA	130		25-150
STL00993	13C2 PFHxA	118		25-150
STL01892	13C4-PFHpA	98		25-150
STL00990	13C4 PFOA	140		25-150
STL00995	13C5 PFNA	120		25-150
STL00996	13C2 PFDA	122		25-150
STL00997	13C2 PFUnA	124		25-150
STL00998	13C2 PFDoA	126		25-150
STL00994	1802 PFHxS	112		25-150
STL00991	13C4 PFOS	125		25-150

Report Date: 03-Jan-2017 14:28:17 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_011.d

Lims ID: 320-24184-A-1-A Client ID: 308A51MW-LF-1216

Sample Type: Client

Inject. Date: 30-Dec-2016 13:33:55 ALS Bottle#: 7 Worklist Smp#: 21

Injection Vol: 2.0 ul Dil. Factor: 50.0000

Sample Info: 320-24184-a-1-a 50X

Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 03-Jan-2017 14:28:00 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK026

First Level Reviewer: phomsophat Date: 03-Jan-2017 13:53:24

First Level Revie	wer: pho	msopha	at		Date:	C				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00		1.534	0.0		405325	1.17		2.3	35516	
1 Perfluorobut										
212.90 > 169.00	•	1.534	0.0	1.000	20026093	57.9			98201	
D 4 13C5-PFPe	eΑ									
267.90 > 223.00	1.811	1.810	0.001		346473	1.30		2.6	28591	
3 Perfluoroper	ntanoic a	cid								
262.90 > 219.00	1.811	1.810	0.001	1.000	33672303	98.5			202827	
5 Perfluorobut	anesulfo	nic acid								
298.90 > 80.00		1.849	0.0	1.000	23946105	46.3				
298.90 > 99.00	1.849	1.849	0.0	1.000	11474977		2.09(0.00-0.00)			
D 613C2 PFHx										
315.00 > 270.00	2.097	2.098	-0.001		288562	1.18		2.4	36793	
7 Perfluorohex										
313.00 > 269.00	2.097	2.098	-0.001	1.000	31613950	118.0			322845	
9 Perfluorohex										
399.00 > 80.00		2.424	-0.058	1.000	67333605	179.1				
D 11 13C4-PFH										
367.00 > 322.00		2.431	0.0		222530	0.9831		2.0	40929	
12 Perfluorohe	•									
363.00 > 319.00		2.431	0.0	1.000	10051162	46.1			38673	
D 10 1802 PFH:										
403.00 > 84.00		2.454	-0.009		345299	1.06		2.2	29917	
D 14 13C4 PFO										
417.00 > 372.00	2.790	2.791	-0.001		321384	1.40		2.8	25903	
15 Perfluorooct										M
413.00 > 369.00		2.791	-0.001	1.000	9018319	28.0	1 40/0 00 1 10		123153	M
413.00 > 169.00	2.790	2.791	-0.001	1.000	6050367		1.49(0.90-1.10)		216182	
					Dogg 120 of (200				

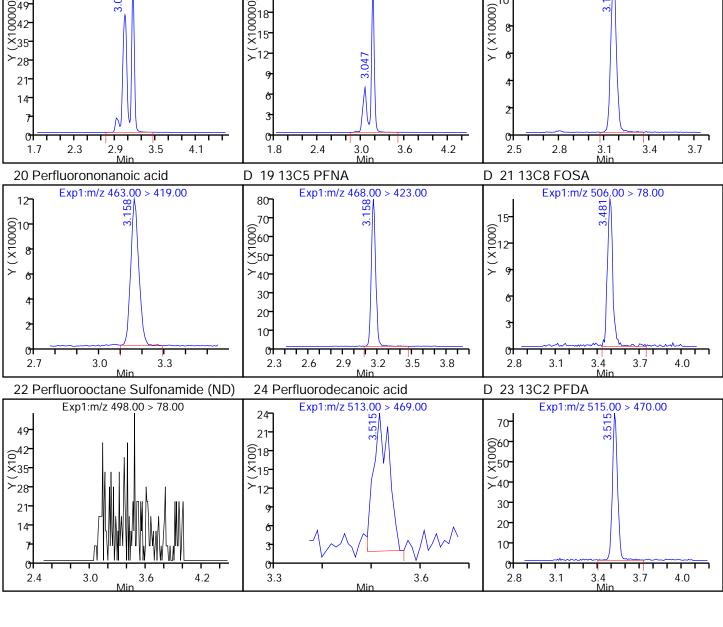
Report Date: 03-Jan-2017 14:28:17 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_011.d

	Data File:	//Cnromiva/Sacramento/Cnrombata/A8_iv/20161230-38358.b/30DEC2016B_011.d						11.0			
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooctane sulfonic acid											
	499.00 > 80.00	3.037	3.135	-0.098	1.000	36734800	119.1			342022	
	499.00 > 99.00	3.047	3.135	-0.088	1.003	8331631		4.41(0.90-1.10)		110948	
	D 17 13C4 PFO										
	503.00 > 80.00		3.159	-0.001		296454	1.19		2.5	17439	
	20 Perfluorono										
	463.00 > 419.00		3.159	-0.001	1.000	286356	1.42			5758	
	D 19 13C5 PFN/		0.4/7	0.000		040504	1.00		0.4	20/02	
	468.00 > 423.00		3.167	-0.009		212581	1.20		2.4	39683	
	D 21 13C8 FOSA 506.00 > 78.00		3.474	0.007		43868	0.1142		0.2	4027	
				0.007		43000	0.1142		0.2	4027	
	24 Perfluorode 513.00 > 469.00		3.524	-0 009	1.000	4906	0.0270			221	
	D 23 13C2 PFD/		J.JZ-1	0.007	1.000	4700	0.0270			221	
	515.00 > 470.00		3.524	-0.009		192414	1.22		2.4	6157	
	26 Perfluorode										
	599.00 > 80.00				1.000	310	0.001712				
	D 27 13C2 PFU	nA									
	565.00 > 520.00	3.851	3.853	-0.002		144823	1.24		2.5	19288	
	D 30 13C2 PFD	οΑ									
	615.00 > 570.00	4.147	4.149	-0.002		139426	1.26		2.5	6818	

QC Flag Legend Review Flags

M - Manually Integrated

Report Date: 03-Jan-2017 14:28:17 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 30-Dec-2016 13:33:55 Instrument ID: A8_N Lims ID: 320-24184-A-1-A Lab Sample ID: 320-24184-1 Client ID: 308A51MW-LF-1216 Operator ID: A8-PC\A8 ALS Bottle#: 7 Worklist Smp#: 21 Injection Vol: 2.0 ul Dil. Factor: 50.0000 Limit Group: LC PFC_DOD ICAL Method: $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 63 (000054- ×45-00012 X X X 8 ∑36**-**27 18 1.7 2.0 0.9 1.8 1.2 1.5 1.8 1.2 1.5 2.1 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.00 49 (X1000000) X 684 672 042 000 0035 ×60 **28** ≻48- 21 36 24 12 2.2 1.7 2.0 2.1 2.4 1.3 1.6 1.9 1.2 1.5 1.8 2.3 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 399.00 > 80.00 12 96 760 (0000001X), 8 <u>8</u>84 872- Y (X1000 ×60-≻₄₈-36 24 12 1.9 2.2 2.0 2.3 1.9 2.5 1.6 2.5 2.8 1.7 2.6 2.2 2.8 3.1 1.3 1.6 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 363,00 > 319.00 Exp1:m/z 403.00 > 84.00 12 (35- 77-(X10000) 8 666<u>-</u> ×55<u>-</u> -25 ×44 -20 33 15 22 10 0 0 2.0 2.3 2.6 2.9 3.2 2.0 Page 422hof 809 2.9 1.9 2.2 2.5 2.8 1.7

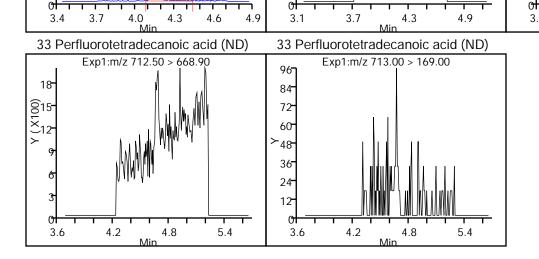


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4.6 Min

3.4

4.0



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Report Date: 03-Jan-2017 14:28:17 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_011.d

Client ID: 308A51MW-LF-1216

Operator ID: A8-PC\A8 ALS Bottle#: 7 Worklist Smp#: 21

Injection Vol: 2.0 ul Dil. Factor: 50.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

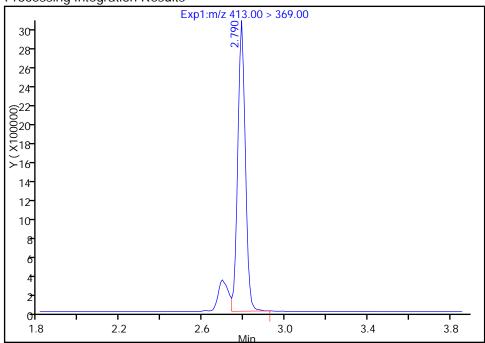
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

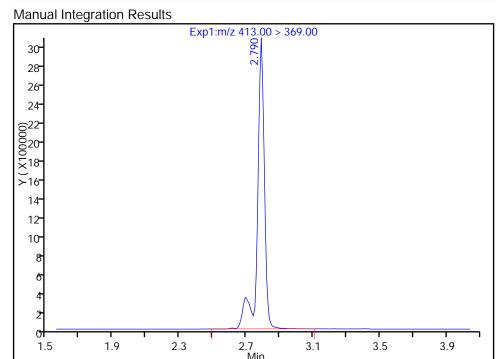
Signal: 1

RT: 2.79
Area: 7803626
Amount: 24.205229
Amount Units: ng/ml

Processing Integration Results



RT: 2.79
Area: 9018319
Amount: 27.972954
Amount Units: ng/ml



Reviewer: phomsophat, 03-Jan-2017 13:53:24

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Client Sample ID: SWMU1-01-1216 Lab Sample ID: 320-24184-2

Matrix: Water Lab File ID: 30DEC2016B_012.d

Analysis Method: 537 (Modified) Date Collected: 12/07/2016 14:45

Extraction Method: 3535 Date Extracted: 12/19/2016 14:38

Sample wt/vol: 253.5(mL) Date Analyzed: 12/30/2016 13:41

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 144510 Units: ug/L

		I	1			
CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.020	М	0.0025	0.00099	0.00045
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0039	М	0.0025	0.0020	0.00098
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0057	В	0.0025	0.0020	0.00078
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.0020	0.00079
335-67-1	Perfluorooctanoic acid (PFOA)	0.0028		0.0025	0.0020	0.00074
375-95-1	Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.0020	0.00064
335-76-2	Perfluorodecanoic acid (PFDA)	0.00099	Ū	0.0025	0.00099	0.00043
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0020	Ū	0.0025	0.0020	0.00074
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0020	Ū	0.0025	0.0020	0.00058
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0020	Ū	0.0025	0.0020	0.00054
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0011	J	0.0025	0.00099	0.00039
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.00092	J	0.0025	0.0020	0.00091
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0034		0.0025	0.0020	0.00086
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0030	Ū	0.0039	0.0030	0.0013
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0030	Ū	0.0039	0.0030	0.0012
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0020	Ū	0.0025	0.0020	0.00063

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

 SDG No.:
 Client Sample ID: SWMU1-01-1216
 Lab Sample ID: 320-24184-2

 Matrix: Water
 Lab File ID: 30DEC2016B_012.d

 Analysis Method: 537 (Modified)
 Date Collected: 12/07/2016 14:45

Dilution Factor: 1

Extraction Method: 3535

Date Extracted: 12/19/2016 14:38

Sample wt/vol: 253.5(mL) Date Analyzed: 12/30/2016 13:41

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

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

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

Analysis Batch No.: 144510 Units: ug/L

Con. Extract Vol.: 0.5(mL)

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	7	Q	25-150
STL00992	13C4 PFBA	37		25-150
STL01893	13C5-PFPeA	93		25-150
STL00993	13C2 PFHxA	113		25-150
STL01892	13C4-PFHpA	106		25-150
STL00990	13C4 PFOA	100		25-150
STL00995	13C5 PFNA	95		25-150
STL00996	13C2 PFDA	96		25-150
STL00997	13C2 PFUnA	103		25-150
STL00998	13C2 PFDoA	104		25-150
STL00994	1802 PFHxS	118		25-150
STL00991	13C4 PFOS	116		25-150

Report Date: 03-Jan-2017 14:28:19 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_012.d

Lims ID: 320-24184-A-2-A Client ID: SWMU1-01-1216

Sample Type: Client

Inject. Date: 30-Dec-2016 13:41:27 ALS Bottle#: 8 Worklist Smp#: 22

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-24184-a-2-a Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 03-Jan-2017 14:28:00 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK026

First Level Reviewer: phomsophat Date: 03-Jan-2017 13:31:36

First Level Reviewer: phomsophat					Date:	03-Jan-2017 13:31:36				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00		1.534	0.0		6514109	18.7		37.5	455238	
1 Perfluorobuty	yric acid									M
212.90 > 169.00	1.534	1.534	0.0	1.000	1107392	9.96			764	M
D 413C5-PFPe										
267.90 > 223.00	1.811	1.810	0.001		12314086	46.3		92.6	313682	
3 Perfluoropen										M
262.90 > 219.00		1.810	0.001	1.000	477682	1.97			425	M
5 Perfluorobuta			0.010	1 000	25.4000	0.4/74				
298.90 > 80.00 298.90 > 99.00	1.839	1.849 1.849	-0.010 -0.010	1.000 1.000	254980 110638	0.4671	2.30(0.00-0.00)			
D 6 13C2 PFHx		1.049	-0.010	1.000	110030		2.30(0.00-0.00)			
315.00 > 270.00		2.098	-0.002		13809910	56.3		113	644809	
7 Perfluorohex			0.002		.00077.0	00.0			011007	
313.00 > 269.00			-0.002	1.000	741385	2.89			3615	
9 Perfluorohex	anesulfo	onic acid								
399.00 > 80.00	2.448	2.424	0.024	1.000	680311	1.71				
D 11 13C4-PFH	ρA									
367.00 > 322.00	2.426	2.431	-0.005		12014815	53.1		106	618416	
D 10 1802 PFH										
403.00 > 84.00		2.454	-0.006		18220363	55.7		118	671305	
D 14 13C4 PFO										
417.00 > 372.00		2.791	-0.006		11499742	49.9		99.8	871605	
	15 Perfluorooctanoic acid									
413.00 > 369.00 413.00 > 169.00		2.791 2.791	0.002	1.000 0.997	324140 241952	1.40	1.34(0.90-1.10)		2096 7886	
D 17 13C4 PFO		2.171	5.000	0.777	271/32		1.54(0.70-1.10)		7000	
503.00 > 80.00		3.159	-0.006		13837125	55.6		116	436081	
22.22		- · · · · ·			Page 428 of 2					

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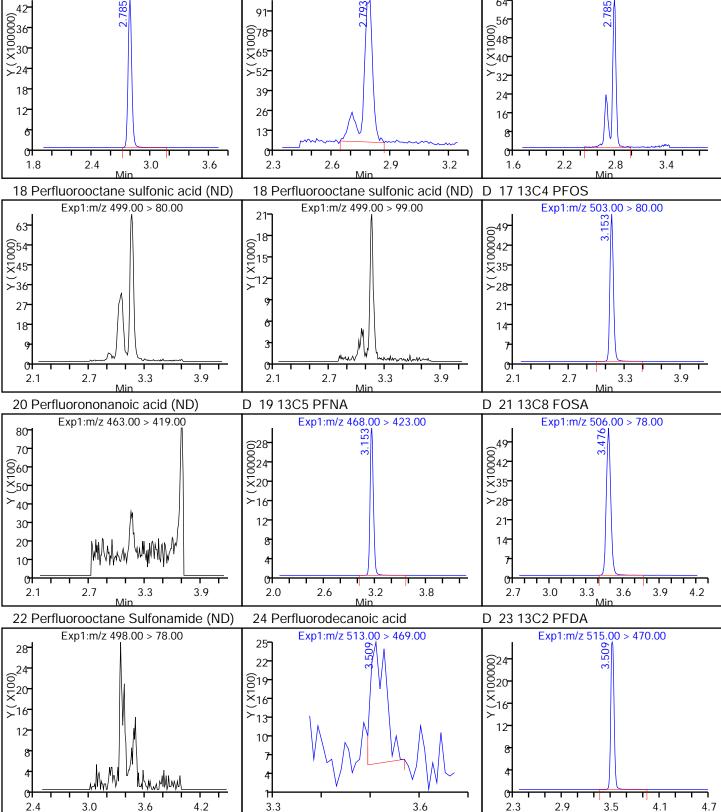
Report Date: 03-Jan-2017 14:28:19 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File:

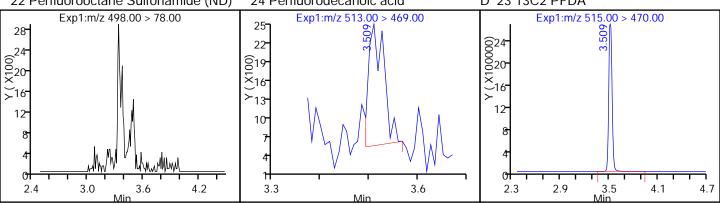
Data File:	\\C \ \ota\ \alpha\ \a									
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.0		3.167	-0.014		8447718	47.5		95.1	766445	
D 21 13C8 FOS	SA									
506.00 > 78.00		3.474	0.002		1363915	3.55		7.1	107412	
24 Perfluorod	ecanoic a	cid								
513.00 > 469.0	0 3.509	3.524	-0.015	1.000	4164	0.0291			97.3	
D 23 13C2 PF	PΑ									
515.00 > 470.0	0 3.509	3.524	-0.015		7582688	48.2		96.4	651891	
26 Perfluorodo	ecane Su									
599.00 > 80.00	3.811	3.836	-0.025	1.000	2904	0.0172				
D 27 13C2 PFU										
565.00 > 520.0	0 3.837	3.853	-0.016		6018129	51.3		103	446220	
28 Perfluoroui										
563.00 > 519.0		3.853	-0.008	1.000	19100	0.1659			442	
D 30 13C2 PFI		4.4.40	0.000		5700070	F0.0		404	457050	
615.00 > 570.0			-0.022		5793870	52.2		104	457959	
33 Perfluorote			0.010	1 000	1000//	0.5/5/			1001	
712.50 > 668.9 713.00 > 169.0		4.664 4.664		1.000 0.998	103866 8884	0.5656	11.69(0.00-0.00)		1201 1678	
113.00 > 109.0	0 4.044	4.004	-0.020	0.770	0004		11.07(0.00-0.00)		10/0	

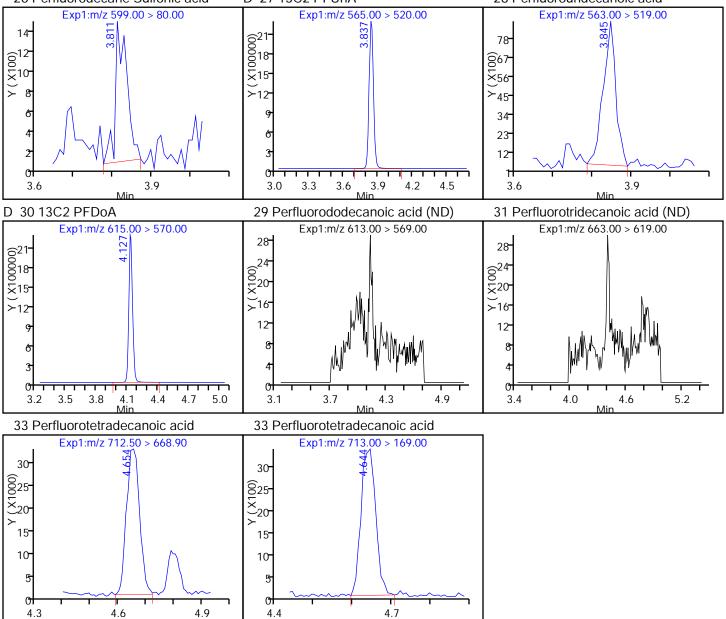
OC Flag Legend Review Flags

M - Manually Integrated

Report Date: 03-Jan-2017 14:28:19 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 30-Dec-2016 13:41:27 Instrument ID: A8_N Lims ID: 320-24184-A-2-A Lab Sample ID: 320-24184-2 Client ID: SWMU1-01-1216 Operator ID: A8-PC\A8 ALS Bottle#: 8 Worklist Smp#: 22 Injection Vol: Dil. Factor: 1.0000 2.0 ul Method: LC PFC_DOD ICAL $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid (M) D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 25 (21-000018-15-00042 0005 35 <u></u>∠28 21 14 1.2 1.5 1.8 1.1 1.4 1.7 1.2 1.5 1.8 2.1 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid (M) 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 17 58 33 (015- 000013-X)11-X 26 18 13 10 1.9 1.9 1.9 1.6 1.6 1.6 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 399.00 > 80.00 (000001X) 32 960 21-30-0025-0018 ×15-×12 15 24 10 16 1.9 2.2 2.1 2.4 2.1 2.4 2.7 3.0 1.6 2.5 2.8 1.8 1.8 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid (ND) D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 (63-00054-1×45-42 (000001X) 30-836**-**∑30− **≻24** >36 18 18 27 12 18 12 0 1.8 2.1 2.4 2.7 Page 480h of 809 3.2 1.8 2.1 2.4 2.7 1.5 3.0 1.4 3.0







Min

Report Date: 03-Jan-2017 14:28:19 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_012.d

Injection Date: 30-Dec-2016 13:41:27 Instrument ID: A8_N

Lims ID: 320-24184-A-2-A Lab Sample ID: 320-24184-2

Client ID: SWMU1-01-1216

Operator ID: A8-PC\A8 ALS Bottle#: 8 Worklist Smp#: 22

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

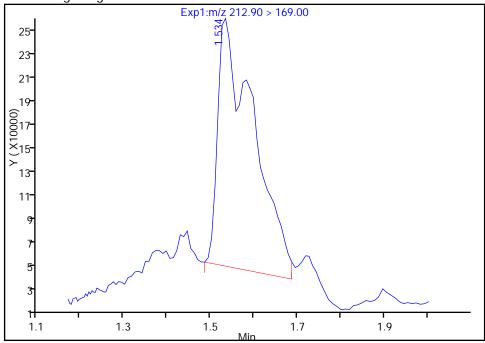
Column: Detector EXP1

1 Perfluorobutyric acid, CAS: 375-22-4

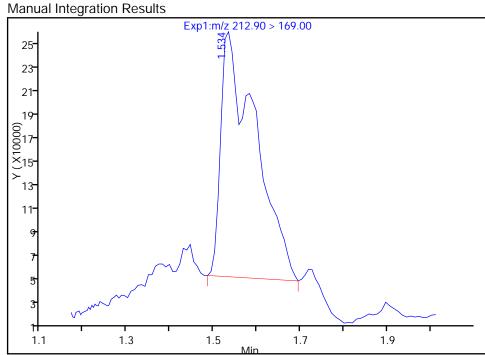
Signal: 1

RT: 1.53
Area: 1163603
Amount: 10.461981
Amount Units: ng/ml

Processing Integration Results



RT: 1.53
Area: 1107392
Amount: 9.956586
Amount Units: ng/ml



Reviewer: phomsophat, 03-Jan-2017 13:55:44

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

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Report Date: 03-Jan-2017 14:28:19 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_012.d

Injection Date: 30-Dec-2016 13:41:27 Instrument ID: A8_N

Lims ID: 320-24184-A-2-A Lab Sample ID: 320-24184-2

Client ID: SWMU1-01-1216

Operator ID: A8-PC\A8 ALS Bottle#: 8 Worklist Smp#: 22

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

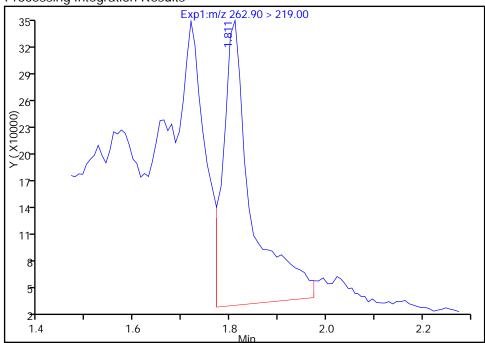
Column: Detector EXP1

3 Perfluoropentanoic acid, CAS: 2706-90-3

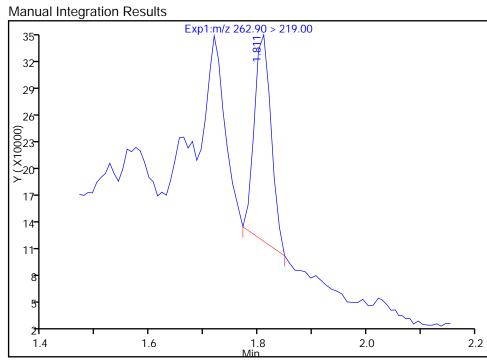
Signal: 1

RT: 1.81
Area: 1248201
Amount: 5.136013
Amount Units: ng/ml

Processing Integration Results



RT: 1.81 Area: 477682 Amount: 1.965534 Amount Units: ng/ml



Reviewer: phomsophat, 03-Jan-2017 13:55:44

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

Page 434 of 809

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Client Sample ID: SWMU1-01-1216 RE Lab Sample ID: 320-24184-2 RE

Matrix: Water Lab File ID: 05JAN2017B_008.d

Analysis Method: 537 (Modified) Date Collected: 12/07/2016 14:45

Extraction Method: 3535 Date Extracted: 01/04/2017 16:57

Sample wt/vol: 264.7(mL) Date Analyzed: 01/05/2017 15:38

Con. Extract Vol.: 0.50 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 145242 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0057	Н	0.0024	0.0019	0.00074

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	116		25-150

Report Date: 06-Jan-2017 09:59:31 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170106-38534.b\05JAN2017B_008.d

Lims ID: 320-24184-B-2-A Client ID: SWMU1-01-1216

Sample Type: Client

Inject. Date: 05-Jan-2017 15:38:14 ALS Bottle#: 19 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-24184-b-2-a Misc. Info.: Plate: 1 Rack: 3

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20170106-38534.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jan-2017 09:59:23 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

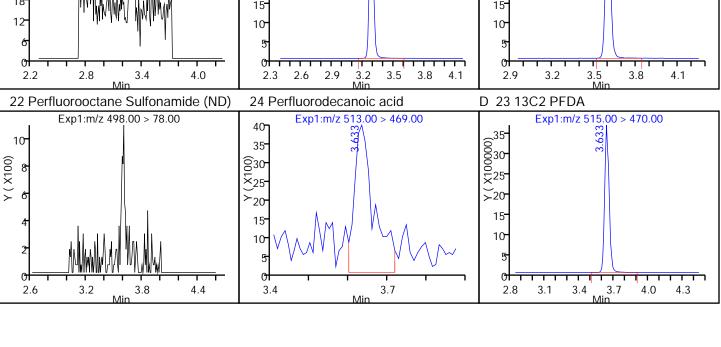
Process Host: XAWRK021

First Level Reviewer: chandrasenas Date: 06-Jan-2017 09:54:43

First Level Revie	wer: cha	ndrasen	nas		Date:	C	06-Jan-2017 09:54:4	3		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00		1.598	0.0		6792321	19.5		39.1	371110	
1 Perfluorobut	vric acid									
212.90 > 169.00	•	1.606	0.0	1.000	959720	8.28			700	
D 4 13C5-PFPe	eA.									
267.90 > 223.00	1.887	1.887	0.0		13655884	51.3		103	349998	
3 Perfluoroper	ntanoic a	cid								
262.90 > 219.00	1.887	1.887	0.0	1.000	624914	2.32			446	
5 Perfluorobut	anesulfo	nic acid								
298.90 > 80.00		1.935	-0.009	1.000	249807	0.4390				
298.90 > 99.00		1.935	-0.009	1.000	107017		2.33(0.00-0.00)			
D 613C2 PFHx										
315.00 > 270.00		2.195	0.001		14263849	58.2		116	670396	
7 Perfluorohex										
313.00 > 269.00		2.195	0.001	1.000	798706	3.01			2566	
9 Perfluorohex				4 000	(4007/	4.57				
399.00 > 80.00		2.476	0.074	1.000	643976	1.56				
D 11 13C4-PFH		2.527	0.001		1410011/	(0.7		105	102455	,
367.00 > 322.00			-0.001		14189116	62.7		125	103455	5
12 Perfluorohe	•		0.001	1 000	04/74	0.2400			277	
363.00 > 319.00		2.536	-0.001	1.000	94674	0.3408			377	
D 10 1802 PFH: 403.00 > 84.00		2.552	-0.002		18995191	58.1		123	113279	1
			-0.002		10993191	30.1		123	113219	9
15 Perfluorooct 413.00 > 369.00		2.902	0.0	1.000	588915	2.03			2994	
413.00 > 369.00 413.00 > 169.00		2.902		0.992	445669	2.03	1.32(0.90-1.10)		2994 8085	
D 14 13C4 PFO		2.702	3.02 T	5.772	110007		1.02(0.70 1.10)		3000	
417.00 > 372.00		2.902	0.0		14493963	62.9		126	129740	1
	,				Dogo 426 of 6			0	10	-

Data File.	NCIIIC	JIIIIVa\36	acrament		Dala/Ao_IN/201	70100-3033	4.D(U3JAN2U176_U	uo.u		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 17 13C4 PFO	S									
503.00 > 80.00	3.276	3.275	0.001		14866307	59.7		125	357937	
D 19 13C5 PFN										
468.00 > 423.00		3.283	-0.007		11152256	62.8		126	957455	
D 21 13C8 FOS 506.00 > 78.00		3.600	-0.001		1024124	2.67		5.3	77744	
24 Perfluorode	canoic a	cid								
513.00 > 469.00	3.633	3.642	-0.009	1.000	13800	0.0732			189	
D 23 13C2 PFD	A									
515.00 > 470.00					9989708	63.5		127	306572	
26 Perfluorode				4 000	2027	0.0440				
599.00 > 80.00			-0.008	1.000	2036	0.0112				
28 Perfluoroun 563.00 > 519.00		3.963	-0.008	1.000	20295	0.1512			368	
D 27 13C2 PFU	nA									
565.00 > 520.00	3.963	3.972	-0.009		7018615	59.9		120	431080	
D 30 13C2 PFD										
615.00 > 570.00	4.256	4.265	-0.009		5938735	53.5		107	211557	
33 Perfluorotet			0.000	1 000	(2202	0.0070			22.0	
712.50 > 668.90 713.00 > 169.00			-0.009 -0.017	1.000 0.998	63292 8857	0.3362	7.15(0.00-0.00)		32.0 1776	
113.00 / 107.00	7.733	7.112	-0.017	0.770	0037		7.13(0.00-0.00)		1770	

Report Date: 06-Jan-2017 09:59:31 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 05-Jan-2017 15:38:14 Instrument ID: A8_N Lims ID: 320-24184-B-2-A Lab Sample ID: 320-24184-2 Client ID: SWMU1-01-1216 Operator ID: A8-PC\A8 ALS Bottle#: 19 Worklist Smp#: 8 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: LC PFC_DOD ICAL $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 26 (21-000018-15-(00042 (00042 (35 0022 ×18 ≻28 14 21 10 14 2.3 1.8 1.1 1.7 1.2 1.5 1.8 1.2 1.5 2.1 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.0017-51- 38 (015- 000013-X)11-X 0033 ×28 0644 0644 1537 1537 **≻**23 <u>≻</u>30 18 23 13 16 2.1 2.0 2.0 1.8 1.7 1.7 1.5 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 399.00 > 80.00Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 217 28 049 00042 ×35 (018-00015-× 012-0024- 0001 ×20-_ ≻16- ≻28 12 21 1.9 2.2 2.5 2.0 2.3 2.6 1.9 2.2 2.5 Min 2.8 1.6 2.8 1.7 3.1 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 (000001X) 63⁻ 00054⁻ ×45⁻ 0025<u>-</u> >36 23 21 27 17 14 18 0 5 2.1 2.7 3.3 2.3 2.0 2.3 2.6 2.9 3.2 1.5 1.7 Page 48% of 809



10

0

4.4

5.0

0

4.4

4.7 Mir 4.7

5.0

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Client Sample ID: FSS3TMW-1216 Lab Sample ID: 320-24184-3

Matrix: Water Lab File ID: 28DEC2016C_011.d

Analysis Method: 537 (Modified) Date Collected: 12/07/2016 08:55

Extraction Method: 3535 Date Extracted: 12/19/2016 14:38

Sample wt/vol: 280.7(mL) Date Analyzed: 12/29/2016 01:07

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 144253 Units: ug/L

		I				
CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	1.6	E	0.0022	0.00089	0.00041
2706-90-3	Perfluoropentanoic acid (PFPeA)	1.4	E	0.0022	0.0018	0.00088
307-24-4	Perfluorohexanoic acid (PFHxA)	3.4	E B	0.0022	0.0018	0.00070
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.2	E	0.0022	0.0018	0.00071
335-67-1	Perfluorooctanoic acid (PFOA)	6.9	E	0.0022	0.0018	0.00067
375-95-1	Perfluorononanoic acid (PFNA)	0.19		0.0022	0.0018	0.00058
335-76-2	Perfluorodecanoic acid (PFDA)	0.067		0.0022	0.00089	0.00039
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0021	J	0.0022	0.0018	0.00067
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0018	Ū	0.0022	0.0018	0.00052
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0018	U	0.0022	0.0018	0.00049
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00042	J	0.0022	0.00089	0.00036
375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.4	E M	0.0022	0.0018	0.00082
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	9.6	E	0.0022	0.0018	0.00077
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	E Q	0.0036	0.0027	0.0011
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.51	E	0.0036	0.0027	0.0011
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.61	E	0.0022	0.0018	0.00057

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1 SDG No.: Client Sample ID: FSS3TMW-1216 Lab Sample ID: 320-24184-3 Matrix: Water Lab File ID: 28DEC2016C_011.d Analysis Method: 537 (Modified) Date Collected: 12/07/2016 08:55 Date Extracted: 12/19/2016 14:38 Extraction Method: 3535 Sample wt/vol: 280.7(mL) Date Analyzed: 12/29/2016 01:07 Con. Extract Vol.: 0.5(mL) Dilution Factor: 1 Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm) % Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 144253 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	32		25-150
STL00992	13C4 PFBA	25		25-150
STL01893	13C5-PFPeA	22	Q	25-150
STL00993	13C2 PFHxA	17	Q	25-150
STL01892	13C4-PFHpA	9	Q	25-150
STL00990	13C4 PFOA	12	Q	25-150
STL00995	13C5 PFNA	9	Q	25-150
STL00996	13C2 PFDA	46		25-150
STL00997	13C2 PFUnA	119		25-150
STL00998	13C2 PFDoA	113		25-150
STL00994	1802 PFHxS	9	Q	25-150
STL00991	13C4 PFOS	6	Q	25-150

Report Date: 06-Jan-2017 09:11:04 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_011.d

Lims ID: 320-24184-A-3-A Client ID: FFTA3TMW-1216

Sample Type: Client

Inject. Date: 29-Dec-2016 01:07:00 ALS Bottle#: 9 Worklist Smp#: 11

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-24184-a-3-a Misc. Info.: Plate: 1 Rack: 3

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jan-2017 09:11:03 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK020

First Level Reviewer: phomsophat Date: 29-Dec-2016 17:44:23

First Level Revie	wer: pho	msopha	<u>it</u>		Date:	2	29-Dec-2016 17:44:2	:3		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA 217.00 > 172.00 1 Perfluorobut	1.526	1.534	-0.008		4322321	12.4		24.9	242531	E
212.90 > 169.00	1.566	1.534	0.032	1.000	64885359	879.2			32379	
D 4 13C5-PFPe 267.90 > 223.00 3 Perfluoroper	1.800	1.810	-0.010		2862784	10.8		21.5	127013	E
262.90 > 219.00	1.820	1.810	0.010	1.000	42890132	759.1			1390	Е
5 Perfluorobut 298.90 > 80.00 298.90 > 99.00	1.887	nic acid 1.849 1.849	0.038 0.009	1.000 0.985	105310686 106579625	2468.5	0.99(0.00-0.00)			EM EM M
D 6 13C2 PFHx 315.00 > 270.00		2.097	-0.013		2025794	8.26		16.5	216511	
7 Perfluorohex 313.00 > 269.00		2.097	0.018	1.000	71316876	1895.2			1287	E E
9 Perfluorohex 399.00 > 80.00			-0.114	1.000	166337778	5364.0				E E
D 11 13C4-PFH 367.00 > 322.00		2.429	-0.036		993136	4.39		8.8	138279	
12 Perfluorohe 363.00 > 319.00		acid 2.429	-0.036	1.000	34756826	1787.7			7480	E E
D 10 18O2 PFH: 403.00 > 84.00	2.402	2.452	-0.050		1424100	4.36		9.2	8654	
D 14 13C4 PFO. 417.00 > 372.00	2.760	2.790	-0.030		1393746	6.05		12.1	157325	
15 Perfluorooct 413.00 > 369.00 413.00 > 169.00	2.737	2.790 2.790	-0.053 -0.030	1.000 1.008	107585864 99895432	3847.5	1.08(0.90-1.10)		66780 0.0	E E
					Page 443 of 8	309				

Report Date: 06-Jan-2017 09:11:04 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_011.d

	Data File:	\\Chrc	mina\Sa	acrament	:o\Chrom	Data\A8_N\201	61229-3828	8.b\28DEC2016C_0)TT.d		
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
•	18 Perfluorooct										E
	499.00 > 80.00	3.196	3.134	0.062	1.000	182562270	11564	0 (0(0 00 1 10)		647	Е
	499.00 > 99.00		3.134	0.011	0.984	263633259		0.69(0.90-1.10)		22672	
	D 17 13C4 PFO: 503.00 > 80.00		2 150	-0.047		758828	3.05		6.4	5271	
	20 Perfluoronoi			-0.047		730020	3.03		0.4	3271	
	463.00 > 419.00			-0.057	1.000	1576083	107.0			10635	
	D 19 13C5 PFN/		000	0.007		.0.000					
	468.00 > 423.00		3.166	-0.065		774040	4.36		8.7	33848	
	D 21 13C8 FOS	Д									
	506.00 > 78.00	3.462	3.481	-0.019		6064549	15.8		31.6	60022	
	22 Perfluorooct	ane Sulf	onamide	Э							E
	498.00 > 78.00	3.462	3.481	-0.019	1.000	39005144	344.8			2061	E
	D 23 13C2 PFD/										
	515.00 > 470.00			-0.012		3612203	23.0		45.9	116229	
	24 Perfluorode										
	513.00 > 469.00		3.523		1.000	2573438	37.7			9441	
	26 Perfluorode				1 000	27.5.4020	207.4				E
	599.00 > 80.00		3.834	-0.016	1.000	2654928	286.4				E
	D 27 13C2 PFUr 565.00 > 520.00		3.851	-0.013		6963526	59.4		119	373469	
	28 Perfluoround			-0.013		0903320	39.4		119	373409	
	563.00 > 519.00		3.851	-0.013	1.000	157312	1.18			1306	
	D 30 13C2 PFD		3.031	-0.013	1.000	13/312	1.10			1300	
	615.00 > 570.00		4.134	-0.007		6266359	56.5		113	235668	
	29 Perfluorodo										
	613.00 > 569.00		4.141	-0.022	1.000	17161	0.1492			203	
	33 Perfluorotetr	adecan	oic acid								
	712.50 > 668.90		4.652	0.0	1.000	46921	0.2362			735	
	713.00 > 169.00	4.633	4.652	-0.019	0.996	8018		5.85(0.00-0.00)		1613	

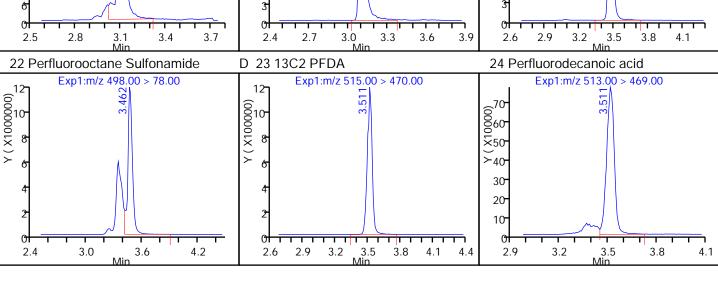
OC Flag Legend Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 06-Jan-2017 09:11:04 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_011.d **Injection Date:** 29-Dec-2016 01:07:00 Instrument ID: A8_N Lims ID: 320-24184-A-3-A Lab Sample ID: 320-24184-3 Client ID: FFTA3TMW-1216 Operator ID: A8-PC\A8 ALS Bottle#: 9 Worklist Smp#: 11 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: LC PFC_DOD ICAL $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267,90 > 223.00 (0000010⁻ ×) × (X100000) 1.0 1.9 1.2 1.5 1.3 1.3 1.6 0.9 1.8 2.1 1.6 1.9 5 Perfluorobutanesulfonic acid (M) 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid (M) Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00Exp1:m/z 298.90 > 99.00 (X1000000) (X1000000) (X1000000) (0015⁻ 12-12-12-(00000012-2.0 2.3 2.0 1.9 2.2 1.4 1.7 1.1 1.4 1.7 2.3 1.0 1.3 1.6 1.1 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00Exp1:m/z 399.00 > 80.00 16 (0000012 0012 (00000015⁻ X) × 9 <u>656</u> 848 ∑₁₀-×40 ≻₃₂-24 2.0 2.3 2.0 1.4 1.7 2.6 1.7 2.3 2.6 1.0 1.6 2.2 2.8 3.4 1.4 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 (X1000000) (X10000000) 8 40 6³⁵ 630 (36⁻ 00001× ×)24⁻ ×25 ≻20 18 15 12 10 0 0 2.0 2.3 2.6 2.9 1.9 2.2 2.5 Page 44/5 of 809 1.9 2.2 2.5 2.8 1.7 3.2 1.6 3.1 1.6



10

0

4.3

4.9

0

4.3

4.6

4.6

4.9

Report Date: 06-Jan-2017 09:11:04 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_011.d

Injection Date: 29-Dec-2016 01:07:00 Instrument ID: A8_N

Lims ID: 320-24184-A-3-A Lab Sample ID: 320-24184-3

Client ID: FFTA3TMW-1216

Operator ID: A8-PC\A8 ALS Bottle#: 9 Worklist Smp#: 11

Injection Vol: 2.0 ul Dil. Factor: 1.0000

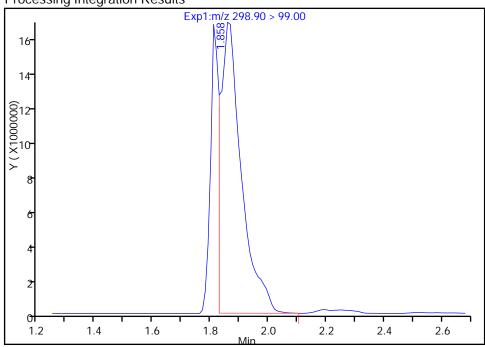
Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

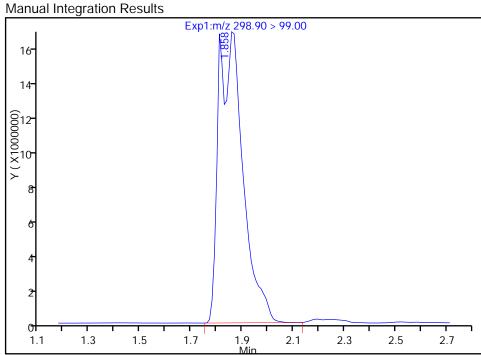
5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

RT: 1.86 Area: 77390697 Amount: 1925.8841 Amount Units: ng/ml **Processing Integration Results**



RT: 1.86
Area: 106579625
Amount: 2468.5232
Amount Units: ng/ml



Reviewer: phomsophat, 06-Jan-2017 09:08:17

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

Report Date: 06-Jan-2017 09:11:04 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_011.d

Injection Date: 29-Dec-2016 01:07:00 Instrument ID: A8_N

Lims ID: 320-24184-A-3-A Lab Sample ID: 320-24184-3

Client ID: FFTA3TMW-1216

Operator ID: A8-PC\A8 ALS Bottle#: 9 Worklist Smp#: 11

Injection Vol: 2.0 ul Dil. Factor: 1.0000

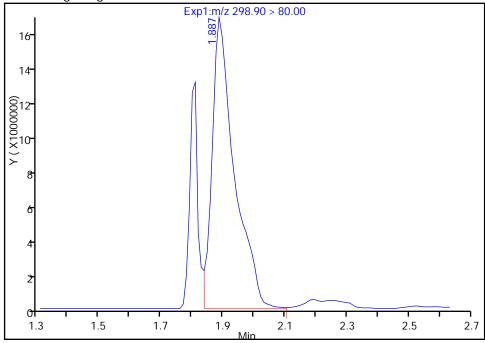
Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

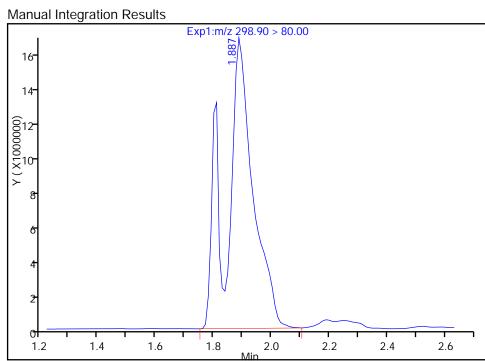
5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

RT: 1.89 Area: 82160934 Amount: 1925.8841 Amount Units: ng/ml **Processing Integration Results**



RT: 1.89
Area: 105310686
Amount: 2468.5232
Amount Units: ng/ml



Reviewer: phomsophat, 06-Jan-2017 09:11:03

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

Page 449 of 809

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Client Sample ID: FSS3TMW-1216 DL2 Lab Sample ID: 320-24184-3 DL2

Matrix: Water Lab File ID: 04JAN2017A_045.d

Analysis Method: 537 (Modified) Date Collected: 12/07/2016 08:55

Extraction Method: 3535 Date Extracted: 12/19/2016 14:38

Sample wt/vol: 280.7(mL) Date Analyzed: 01/04/2017 21:33

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 145022 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	300		7.1	5.3	2.3

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	105		25-150

Report Date: 10-Jan-2017 11:01:24 Chrom Revision: 2.2 09-Jan-2017 13:04:14

> TestAmerica Sacramento **Target Compound Quantitation Report**

Data File:

Lims ID: 320-24184-A-3-G Client ID: FSS3TMW-1216

Sample Type: Client

04-Jan-2017 21:33:08 Inject. Date: ALS Bottle#: 24 Worklist Smp#: 46

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-24184-a-3-a 2000X CD

Misc. Info.: Plate: 1 Rack: 3

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method:

Limit Group: LC PFC_DOD ICAL

Last Update: 10-Jan-2017 11:01:13 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution **Initial Calibration** Quant By:

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK032

0047440040

First Level Revie	wer: pho	msopha	ıt		Date:	1	0-Jan-2017 11:00:1	9		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA	ı									
217.00 > 172.00	1.614	1.617	-0.003		19015635	54.7		109	814026	
1 Perfluorobuty	•									
212.90 > 169.00		1.617	-0.003	1.000	685918	2.11			4446	
D 4 13C5-PFPe 267.90 > 223.00		1.909	-0.003		14590726	54.8		110	108583	7
3 Perfluoropen			-0.003		14370720	34.0		110	100303	,
262.90 > 219.00		1.909	-0.003	1.000	913276	3.17			8847	
5 Perfluorobuta	anesulfo	nic acid								
	1.945	1.948	-0.003	1.000	3823928	8.12				
	1.945	1.948	-0.003	1.000	1594266		2.40(0.00-0.00)			
7 Perfluorohex 313.00 > 269.00		id 2.209	0.003	1.000	3173313	12.9			118743	
D 6 13C2 PFHx		2.209	0.003	1.000	31/3313	12.9			110/43	
315.00 > 270.00		2.217	-0.005		13227488	54.0		108	809825	
D 11 13C4-PFH _I										
367.00 > 322.00		2.558	-0.006		11576518	51.1		102	138730	2
12 Perfluorohe										
363.00 > 319.00		2.558	0.002	1.000	187933	0.8297			2154	
D 10 18O2 PFH:		0.570	0.000		45740477	40.1		100	17000/	2
403.00 > 84.00		2.573	0.002		15718477	48.1		102	179026	3
9 Perfluorohex 399.00 > 80.00		2.573	-0.081	1.000	11693385	34.2				
D 14 13C4 PFO		2.070	0.001	1.000	11070000	01.2				
417.00 > 372.00		2.927	0.0		12612862	54.8		109	728359	
15 Perfluorooct	anoic ac	id								М
413.00 > 369.00		2.927	0.0	1.000	771229	3.05			7710	М
413.00 > 169.00	2.822	2.927	-0.105	0.964	495776		1.56(0.90-1.10)		4128	

Report Date: 10-Jan-2017 11:01:24 Chrom Revision: 2.2 09-Jan-2017 13:04:14 Data File:

Data File.	\\CIIIC	JIIIVa	acrament		Dala Ao_IN201	70103-3040	0.b\04JAN2017A_0	45.u		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooct	ane sulf	onic acid	<u>'</u>							
499.00 > 80.00		3.271	-0.094	1.000	21532020	82.9			207288	
499.00 > 99.00	3.294	3.271	0.023	1.037	4594007		4.69(0.90-1.10)		135486	
D 17 13C4 PFO	S									
503.00 > 80.00	3.294	3.294	0.0		12489359	50.2		105	550558	
D 19 13C5 PFN										
468.00 > 423.00	3.302	3.301	0.001		9213951	51.9		104	792243	
20 Perfluorono			0.015	1 000		0.0057				
463.00 > 419.00		3.301		1.000	6258	0.0357			116	
22 Perfluorooct				1 000	47100	0 1145			2047	
498.00 > 78.00		3.021	-0.001	1.000	47192	0.1145			2046	
D 21 13C8 FOSA 506.00 > 78.00		3.621	-0.001		22102484	57.5		115	769025	
D 23 13C2 PFD/		3.021	-0.001		22102404	37.3		113	707023	
515.00 > 470.00		3 665	-0.011		9407102	59.8		120	283048	
24 Perfluorode			0.0		7.07.02	07.0		0		
513.00 > 469.00			-0.011	1.000	9926	0.0559			210	
26 Perfluorode	cane Sul	lfonic ac	id							
599.00 > 80.00		3.971		1.000	2192	0.0144				
28 Perfluoround	decanoio	c acid								
563.00 > 519.00	3.985	3.990	-0.005	1.000	21309	0.1493			606	
D 27 13C2 PFU	nΑ									
565.00 > 520.00	3.985	3.990	-0.005		7466253	63.7		127	446665	
D 30 13C2 PFD	Αc									
615.00 > 570.00	4.267	4.284	-0.017		6858186	61.8		124	217114	
33 Perfluoroteti										
712.50 > 668.90			-0.006	1.000	12557	0.0578	0.00(0.00.0.00)		3.9	
713.00 > 169.00	4.760	4.783	-0.023	0.997	5489		2.29(0.00-0.00)		512	

QC Flag Legend Review Flags

M - Manually Integrated

Report Date: 10-Jan-2017 11:01:25 Chrom Revision: 2.2 09-Jan-2017 13:04:14 TestAmerica Sacramento Data File: **Injection Date:** 04-Jan-2017 21:33:08 Instrument ID: A8_N Lims ID: 320-24184-A-3-G Lab Sample ID: 320-24184-3 Client ID: FSS3TMW-1216 Operator ID: A8-PC\A8 ALS Bottle#: 24 Worklist Smp#: 46 Injection Vol: 2.0 ul Dil. Factor: 1.0000 LC PFC_DOD ICAL Method: $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 212,90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 56**-**21 <u>8</u>48 0018-00015-×) 00 × \times 35 ≻28 24 21 1.5 1.2 1.8 1.9 0.9 1.2 1.8 2.1 1.5 2.1 1.3 1.6 2.2 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 (0000012 |X) X 63 630 625 0054 ×45 **≻**36 15 10 18 2.0 2.3 1.9 2.2 1.7 1.9 2.2 1.4 1.6 1.6 D 11 13C4-PFHpA 7 Perfluorohexanoic acid D 6 13C2 PFHxA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 49 42 Y (X100000) 00030- 842 <u>8</u>35− \<u>\.</u> 21 18 14 12 1.9 2.2 2.5 1.7 2.3 2.9 3.3 2.8 1.1 2.1 2.7 1.6 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399,00 > 80.00 77 649 0042 0042 030 000 25 <u>666</u> ∑55- \(\Sigma_{20}\) ×35-**≻**28 33 21 10 22 14 0 0 2.6 2.0 Page 45% of 809 3.2 2.1 2.4 2.7 3.3 2.3 1.4 1.8 3.0

Min

Chrom Revision: 2.2 09-Jan-2017 13:04:14

Report Date: 10-Jan-2017 11:01:25 Chrom Revision: 2.2 09-Jan-2017 13:04:14 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\04JAN2017A_045.d 26 Perfluorodecane Sulfonic acid 28 Perfluoroundecanoic acid D 27 13C2 PFUnA Exp1:m/z 599.00 > 80.00 Exp1:m/z 563,00 > 519.00 Exp1:m/z 565.00 > 520.00 71-(00 LX 12 X) > g 61° 51° 51° **≻**41 31 21 11 3.9 4.2 4.0 4.3 3.0 4.2 4.8 3.6 3.7 3.6 D 30 13C2 PFDoA 29 Perfluorododecanoic acid (ND) 31 Perfluorotridecanoic acid (ND) Exp1:m/z 613.00 > 569.00 Exp1:m/z 615.00 > 570.00 Exp1:m/z 663.00 > 619.00 24 4.267 18 ©21- 0218-(0015-X12-X 0 ≻16- \mathbf{o} 0 0 3.8 3.8 5.0 4.4 5.0 3.5 4.1 4.7 5.3 4.4 4.1 Min 33 Perfluorotetradecanoic acid 33 Perfluorotetradecanoic acid Exp1:m/z 712.50 > 668.90 Exp1:m/z 713.00 > 169.00 21 61 18 654 ×47 0 0 15 × 12 ≻40 33

26-19-12-

4.5

4.7

5.0

0

4.4

4.8

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Client Sample ID: FSS3TMW-1216 DL Lab Sample ID: 320-24184-3 DL

Matrix: Water Lab File ID: 30DEC2016B_004.d

Analysis Method: 537 (Modified) Date Collected: 12/07/2016 08:55

Extraction Method: 3535 Date Extracted: 12/19/2016 14:38

Sample wt/vol: 280.7(mL) Date Analyzed: 12/30/2016 12:41

Con. Extract Vol.: 0.5(mL) Dilution Factor: 200

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 144510 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	8.6	D	0.45	0.18	0.082
2706-90-3	Perfluoropentanoic acid (PFPeA)	12	D	0.45	0.36	0.18
307-24-4	Perfluorohexanoic acid (PFHxA)	38	DВ	0.45	0.36	0.14
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	D	0.45	0.36	0.14
335-67-1	Perfluorooctanoic acid (PFOA)	13	D M	0.45	0.36	0.13
375-95-1	Perfluorononanoic acid (PFNA)	0.16	JD	0.45	0.36	0.12
335-76-2	Perfluorodecanoic acid (PFDA)	0.18	U	0.45	0.18	0.078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.36	U	0.45	0.36	0.13
307-55-1	Perfluorododecanoic acid (PFDoA)	0.36	U	0.45	0.36	0.10
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.36	U	0.45	0.36	0.098
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.18	U	0.45	0.18	0.071
375-73-5	Perfluorobutanesulfonic acid (PFBS)	19	D	0.45	0.36	0.16
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	61	D	0.45	0.36	0.15
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	260	E D	0.71	0.53	0.23
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.53	U	0.71	0.53	0.22
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.63	D	0.45	0.36	0.11

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Client Sample ID: FSS3TMW-1216 DL Lab Sample ID: 320-24184-3 DL

Matrix: Water Lab File ID: 30DEC2016B_004.d

Analysis Method: 537 (Modified) Date Collected: 12/07/2016 08:55

Extraction Method: 3535 Date Extracted: 12/19/2016 14:38

Sample wt/vol: 280.7(mL) Date Analyzed: 12/30/2016 12:41

Con. Extract Vol.: 0.5(mL) Dilution Factor: 200

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 144510 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	73		25-150
STL00992	13C4 PFBA	105		25-150
STL01893	13C5-PFPeA	103		25-150
STL00993	13C2 PFHxA	108		25-150
STL01892	13C4-PFHpA	73		25-150
STL00990	13C4 PFOA	91		25-150
STL00995	13C5 PFNA	66		25-150
STL00996	13C2 PFDA	106		25-150
STL00997	13C2 PFUnA	105		25-150
STL00998	13C2 PFDoA	117		25-150
STL00994	1802 PFHxS	124		25-150
STL00991	13C4 PFOS	71		25-150

Report Date: 03-Jan-2017 14:28:06 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_004.d

Lims ID: 320-24184-A-3-A Client ID: FFTA3TMW-1216

Sample Type: Client

Inject. Date: 30-Dec-2016 12:41:23 ALS Bottle#: 2 Worklist Smp#: 14

Injection Vol: 2.0 ul Dil. Factor: 200.0000

Sample Info: 320-24184-a-3-a 200X

Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 03-Jan-2017 14:28:00 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK026

First Level Reviewer: phomsophat Date: 03-Jan-2017 13:48:02

First Level Reviewer: phomsophat						Date: 03-Jan-2017 13:48:02					
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	D 2 13C4 PFBA										
	217.00 > 172.00		1.534	0.002		91207	0.2623		0.5	7853	
	1 Perfluorobuty 212.90 > 169.00	•	1.534	0.002	1.000	7477614	24.0			39874	
	D 4 13C5-PFPe			0.002		, ,,,,,,,,				0707.	
	267.90 > 223.00		1.810	0.002		68538	0.2576		0.5	9458	
	3 Perfluoropen										
	262.90 > 219.00		1.810	0.002	1.000	9362280	34.6			93200	
	5 Perfluorobuta 298.90 > 80.00		nic acid 1.849	0.002	1.000	30427836	53.0				
		1.851	1.849	0.002	1.000	30427836 15518274	53.0	1.96(0.00-0.00)			
	D 6 13C2 PFHx	Α						,			
	315.00 > 270.00	2.104	2.098	0.006		66193	0.2701		0.5	13214	
	7 Perfluorohex			0.007	1 000	0/077470	10/0			F / 0070	
	313.00 > 269.00		2.098	0.006	1.000	26077179	106.0			568978	
	9 Perfluorohex 399.00 > 80.00		2.424	-0.046	1.000	71808489	171.9				
	D 11 13C4-PFH _I										
	367.00 > 322.00		2.431	0.007		41095	0.1816		0.4	7785	
	12 Perfluorohe										
	363.00 > 319.00		2.431	0.007	1.000	1795160	11.2			6967	
	D 10 18O2 PFH; 403.00 > 84.00		2.454	-0.001		95911	0.2933		0.4	8472	
	D 14 13C4 PFO		2.454	-0.001		95911	0.2933		0.6	8472	
	417.00 > 372.00		2.791	-0.002		52213	0.2267		0.5	10053	
	15 Perfluorooct	anoic ac	id								M
	413.00 > 369.00		2.791	-0.002	1.000	7397543	35.3			141464	М
	413.00 > 169.00	2.798	2.791	0.007	1.003	4727748		1.56(0.90-1.10)		186825	
						Dogg 450 of 0	200				

Report Date: 03-Jan-2017 14:28:06 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_004.d

L	pata File:	\\Cnrc	miva	acrament	(O/Chrom	Data\A8_N\201	61230-3835	8.D\30DEC2016B_0	04.a		
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	18 Perfluorooct	ane sulf	onic aci	H							E
2	199.00 > 80.00		3.135	-0.089	1.000	128012948	730.9			383935	
	199.00 > 99.00		3.135	-0.080	1.003	34430327		3.72(0.90-1.10)		132254	
Е	17 13C4 PFO	S									
Ę	503.00 > 80.00	3.165	3.159	0.006		42093	0.1692		0.4	1553	
	20 Perfluoronoi	nanoic a	cid								
4	163.00 > 419.00	3.173	3.159	0.014	1.000	50943	0.4582			971	
Е	19 13C5 PFN	Д									
4	168.00 > 423.00	3.173	3.167	0.006		29200	0.1643		0.3	2983	
	21 13C8 FOS										
Ę	506.00 > 78.00		3.474	0.009		70403	0.1833		0.4	3075	
	22 Perfluorooct				4 000	4/70/4	4.70			4000	
2	198.00 > 78.00		3.482	0.009	1.000	467864	1.78			4832	
	24 Perfluorode			0.007	1.000	20524	0 1074			000	
	513.00 > 469.00		3.524	-0.007	1.000	29534	0.1874			908	
) 23 13C2 PFD, 515.00 > 470.00		3.524	0.001		41740	0.2653		0.5	1266	
•	26 Perfluorode					41740	0.2033		0.5	1200	
F	599.00 > 80.00		3.836	0.001	1.000	11130	0.1082				
) 27 13C2 PFUi		0.000	0.001	1.000	11100	0.1002				
	565.00 > 520.00		3.853	0.001		30720	0.2620		0.5	6832	
	30 13C2 PFD		, .								
	515.00 > 570.00		4.149	0.0		32544	0.2933		0.6	1426	

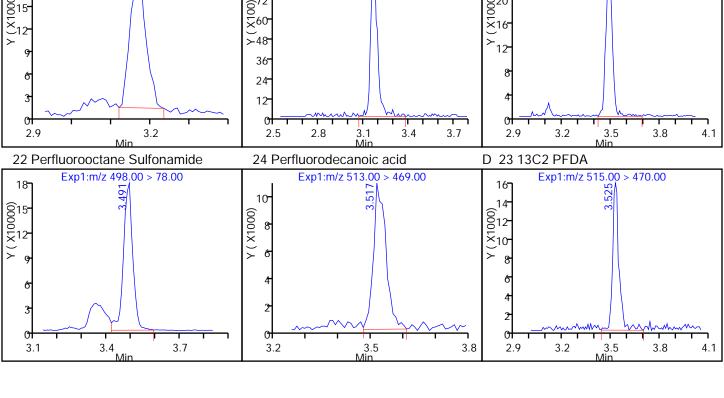
QC Flag Legend Processing Flags

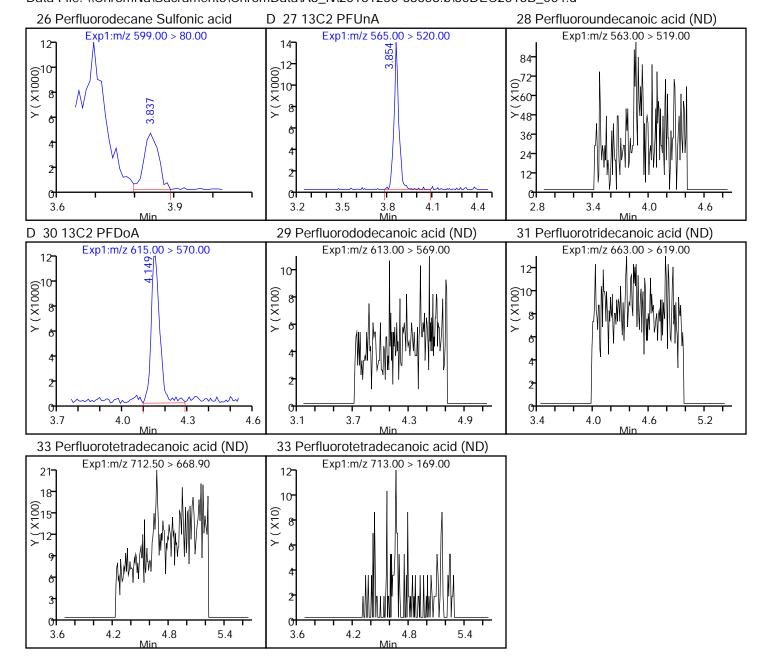
E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 03-Jan-2017 14:28:06 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_004.d **Injection Date:** 30-Dec-2016 12:41:23 Instrument ID: A8_N Lims ID: 320-24184-A-3-A Lab Sample ID: 320-24184-3 Client ID: FFTA3TMW-1216 Operator ID: A8-PC\A8 ALS Bottle#: Worklist Smp#: 14 Injection Vol: 2.0 ul Dil. Factor: 200.0000 LC PFC_DOD ICAL Method: $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 28 28 624 0001 X ©24 ∑₁₆ $\stackrel{\smile}{\times}_{20}$ ∑16- 12 12 1.3 1.9 1.0 1.9 1.8 1.0 1.6 1.3 1.6 1.5 2.1 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00Exp1:m/z 298.90 > 99.00 35 12 64 (X1000000) X 00000 0000 25 056 0648 ∑₂₀ ×40• ≻₃₂ 15 10 16 1.7 2.0 1.7 2.0 1.8 2.1 2.4 2.3 1.2 1.5 2.3 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 399.00 > 80.00 80 (0000012 10 10 10 24 970- 960-<u>0</u>20 ×₁₆ ×50-≻₄₀-30 20 10 1.9 2.2 2.5 1.7 2.0 2.3 1.9 2.2 2.5 1.4 2.6 2.8 3.1 1.6 1.6 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 16 63 30 (00054-X45-<u>0</u>12 <u>6</u>25 ∑₂₀ ∑₁₀ -36 27 10 18 0 01.8 2.1 2.4 2.7 3.0 2.1 2.7 1.9 2.2 2.5 2.8 Page 460h of 809





Report Date: 03-Jan-2017 14:28:06 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_004.d

Injection Date: 30-Dec-2016 12:41:23 Instrument ID: A8_N

Lims ID: 320-24184-A-3-A Lab Sample ID: 320-24184-3

Client ID: FFTA3TMW-1216

Operator ID: A8-PC\A8 ALS Bottle#: 2 Worklist Smp#: 14

Injection Vol: 2.0 ul Dil. Factor: 200.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

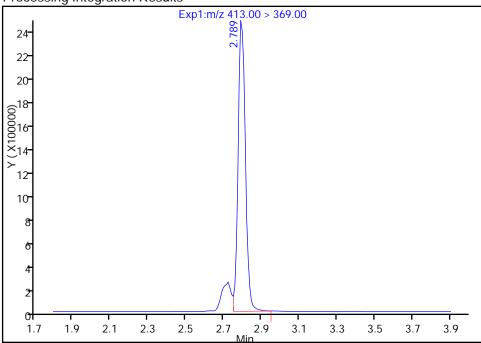
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

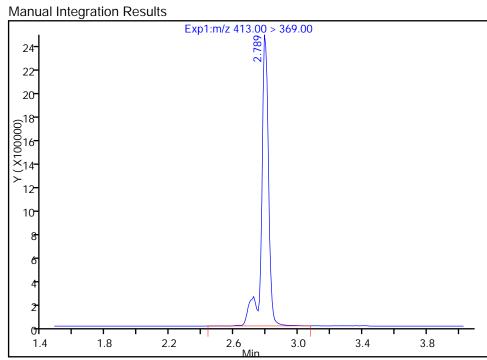
Signal: 1

RT: 2.79
Area: 6484400
Amount: 30.950535
Amount Units: ng/ml

Processing Integration Results



RT: 2.79
Area: 7397543
Amount: 35.309036
Amount Units: ng/ml



Reviewer: phomsophat, 03-Jan-2017 13:48:02

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

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Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Client Sample ID: SWMU1-02-1216 Lab Sample ID: 320-24184-4

Matrix: Water Lab File ID: 30DEC2016B_016.d

Analysis Method: 537 (Modified) Date Collected: 12/07/2016 12:00

Extraction Method: 3535 Date Extracted: 12/19/2016 14:38

Sample wt/vol: 279.8(mL) Date Analyzed: 12/30/2016 14:11

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 144510 Units: ug/L

				T 1		
CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.016	М	0.0022	0.00089	0.00041
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0049	М	0.0022	0.0018	0.00088
307-24-4	Perfluorohexanoic acid (PFHxA)	0.012	В	0.0022	0.0018	0.00070
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.00081	J	0.0022	0.0018	0.00072
335-67-1	Perfluorooctanoic acid (PFOA)	0.0047	М	0.0022	0.0018	0.00067
375-95-1	Perfluorononanoic acid (PFNA)	0.0018	U	0.0022	0.0018	0.00058
335-76-2	Perfluorodecanoic acid (PFDA)	0.00072	J	0.0022	0.00089	0.00039
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0018	U	0.0022	0.0018	0.00067
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0018	U	0.0022	0.0018	0.00052
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0018	U	0.0022	0.0018	0.00049
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00044	J	0.0022	0.00089	0.00036
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.010		0.0022	0.0018	0.00082
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.033	М	0.0022	0.0018	0.00078
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.99	E	0.0036	0.0027	0.0011
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0064		0.0036	0.0027	0.0011
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.018		0.0022	0.0018	0.00057

 SDG No.:
 Client Sample ID: SWMU1-02-1216
 Lab Sample ID: 320-24184-4

 Matrix: Water
 Lab File ID: 30DEC2016B_016.d

 Analysis Method: 537 (Modified)
 Date Collected: 12/07/2016 12:00

 Extraction Method: 3535
 Date Extracted: 12/19/2016 14:38

 Sample wt/vol: 279.8 (mL)
 Date Analyzed: 12/30/2016 14:11

Con. Extract Vol.: 0.5 (mL) Dilution Factor: 1

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 144510 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	12	Q	25-150
STL00992	13C4 PFBA	31		25-150
STL01893	13C5-PFPeA	91		25-150
STL00993	13C2 PFHxA	115		25-150
STL01892	13C4-PFHpA	116		25-150
STL00990	13C4 PFOA	110		25-150
STL00995	13C5 PFNA	62		25-150
STL00996	13C2 PFDA	104		25-150
STL00997	13C2 PFUnA	112		25-150
STL00998	13C2 PFDoA	109		25-150
STL00994	1802 PFHxS	118		25-150
STL00991	13C4 PFOS	80		25-150

Report Date: 03-Jan-2017 14:28:26 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_016.d

Lims ID: 320-24184-A-4-A Client ID: SWMU1-02-1216

Sample Type: Client

Inject. Date: 30-Dec-2016 14:11:26 ALS Bottle#: 10 Worklist Smp#: 26

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-24184-a-4-a Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 03-Jan-2017 14:28:20 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK026

First Level Reviewer: phomsophat Date: 03-Jan-2017 13:32:29

First Level Reviewer: phomsophat					Date: 03-Jan-2017 13:32:29					
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA		1 504	0.007		E 4000E 0	1F /		21.1	224245	
217.00 > 172.00		1.526	0.007		5409058	15.6		31.1	324245	N 4
1 Perfluorobuty 212.90 > 169.00	•	1.534	-0.001	1.000	841311	9.11			929	M M
D 4 13C5-PFPe	Α									
267.90 > 223.00		1.801	0.009		12148186	45.7		91.3	245805	
3 Perfluoropen	tanoic a	cid								M
262.90 > 219.00	1.810	1.811	-0.001	1.000	662034	2.76			692	M
5 Perfluorobuta										
298.90 > 80.00	1.848	1.840	0.008	1.000	3127372	5.71	2 40/0 00 0 00)			
298.90 > 99.00		1.840	0.008	1.000	1258187		2.49(0.00-0.00)			
D 6 13C2 PFHx 315.00 > 270.00		2.092	0.003		14117216	57.6		115	637697	
7 Perfluorohex			0.003		14117210	37.0		113	037077	
313.00 > 269.00		2.092	0.003	1.000	1726543	6.58			6211	
9 Perfluorohex	anesulfo	onic acid								M
399.00 > 80.00	2.445	2.410	0.035	1.000	7261186	18.2				M
D 11 13C4-PFH _I	οA									
367.00 > 322.00	2.423	2.421	0.002		13124560	58.0		116	998245	
12 Perfluorohe										
363.00 > 319.00		2.421	0.002	1.000	116436	0.4532			480	
D 10 1802 PFH		0.440	0.000		10007750	F./ 0		440	744040	
403.00 > 84.00		2.443	0.002		18297750	56.0		118	741248	
D 14 13C4 PFO 417.00 > 372.00		2.773	0.008		12645440	54.9		110	649104	
			0.006		12045440	34.9		110	049104	N 4
15 Perfluorooct 413.00 > 369.00		2.780	0.001	1.000	664339	2.62			3981	M M
413.00 > 369.00		2.780	-0.022	0.992	454526	2.02	1.46(0.90-1.10)		4169	1 4 1
					Page 466 of 8	809	,			

Report Date: 03-Jan-2017 14:28:26 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_016.d

L	Data File:	\\Cnrc	miva\Sa	acrament	:o\Cnrom	Data\A8_N\201	61230-3835	8.b\30DEC2016B_C)16.d		
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
_	18 Perfluorooct	ane sulf	onic acid	4							E
	499.00 > 80.00			-0.008	1.000	108750083	552.5			249818	
	499.00 > 99.00		3.044	0.105	1.037	31513038	002.0	3.45(0.90-1.10)		765061	_
) 17 13C4 PFO	S									
	503.00 > 80.00	3.149	3.148	0.001		9461850	38.0		79.5	240197	
) 19 13C5 PFN	4									
	468.00 > 423.00	3.149	3.148	0.001		5544704	31.2		62.4	254481	
	22 Perfluorooct	ane Sulf	onamide	Э							
	498.00 > 78.00	3.480	3.470	0.010	1.000	411088	9.95			5183	
	21 13C8 FOS	A									
!	506.00 > 78.00	3.472	3.478	-0.006		2214578	5.77		11.5	139348	
	24 Perfluorode	canoic a	cid								
ļ	513.00 > 469.00	3.514	3.504	0.010	1.000	62421	0.4029			990	
	23 13C2 PFD/	Д									
ļ	515.00 > 470.00	3.505	3.512	-0.007		8206994	52.2		104	434399	
	26 Perfluorode	cane Sul									
!	599.00 > 80.00	3.816	3.822	-0.006	1.000	411523	3.56				
	27 13C2 PFUr										
!	565.00 > 520.00	3.842	3.839	0.003		6541283	55.8		112	586517	
	28 Perfluoround										
ļ	563.00 > 519.00	3.833	3.839	-0.006	1.000	22546	0.1802			461	
	30 13C2 PFD										
(615.00 > 570.00	4.133	4.138	-0.005		6042160	54.5		109	248300	
	31 Perfluorotrid										
(663.00 > 619.00	4.395	4.403	-0.007	1.000	2608	0.0238			104	
	33 Perfluorotetr										
	712.50 > 668.90			0.001	1.000	47619	0.2486	E 00/0 05 5 55°		933	
	713.00 > 169.00	4.642	4.651	-0.009	0.998	8837		5.39(0.00-0.00)		2017	

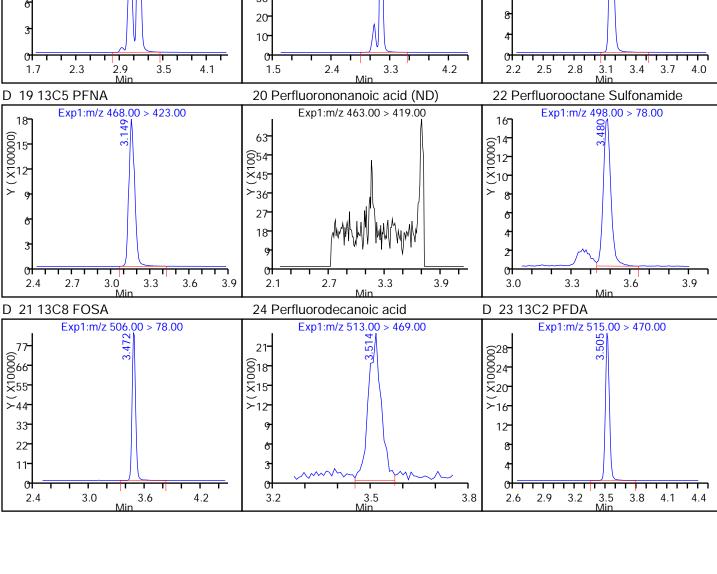
OC Flag Legend Processing Flags

E - Exceeded Maximum Amount

Review Flags

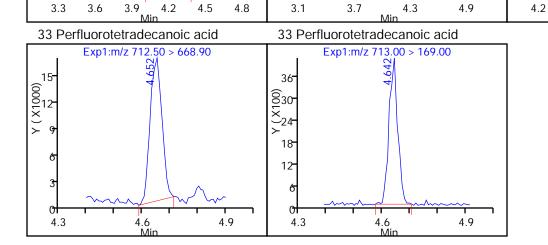
M - Manually Integrated

Report Date: 03-Jan-2017 14:28:26 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 30-Dec-2016 14:11:26 Instrument ID: A8_N Lims ID: 320-24184-A-4-A Lab Sample ID: Client ID: SWMU1-02-1216 Operator ID: A8-PC\A8 ALS Bottle#: 10 Worklist Smp#: 26 Injection Vol: Dil. Factor: 2.0 ul 1.0000 LC PFC_DOD ICAL Method: $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid (M) D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 (000042 X35 618 600 15 \sum_{12} ∑28⁻ 13 21 14 0.9 1.2 1.5 1.8 1.1 1.4 1.7 2.0 2.3 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid (M) 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 56 (0000012-(X) X 8 (0036-0648- 0640-×31 <u></u>32-**≻**26 24 21 16 16 11 1.9 1.8 2.1 2.1 1.5 1.8 1.6 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid (M) Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 399.00 > 80.00 24 56 095 63- ©21**-**0218-8₄₀ ×₃₂ ×45 ×15 ×36• 27 16 18 2.0 2.3 1.9 2.5 1.9 2.2 3.1 1.4 1.7 2.6 2.2 2.5 2.8 1.6 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 63⁻ 000054⁻ ×45⁻ 54 (0042 0000135 ×)28 847 ×40 **≻**33- 21 27 26 18 19 12 5 1.8 2.1 2.4 2.7 2.2 1.8 2.1 2.4 2.7 1.5 3.0 3.0 Page 46% of 809



4.5

Min



TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_016.d

Injection Date: 30-Dec-2016 14:11:26 Instrument ID: A8_N

Lims ID: 320-24184-A-4-A Lab Sample ID:

Client ID: SWMU1-02-1216

Operator ID: A8-PC\A8 ALS Bottle#: 10 Worklist Smp#: 26

Injection Vol: 2.0 ul Dil. Factor: 1.0000

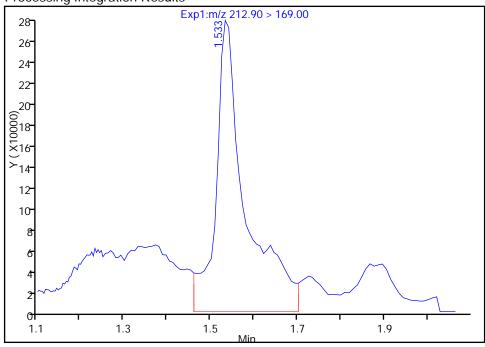
Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

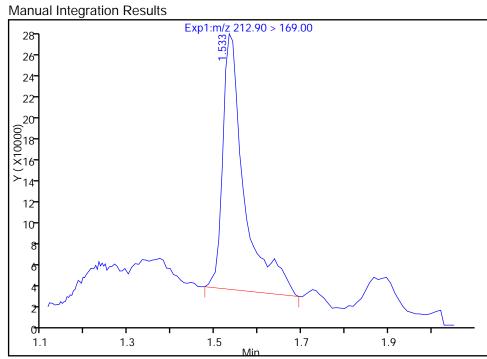
1 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

RT: 1.53 Area: 1307251 Amount: 14.154726 Amount Units: ng/ml **Processing Integration Results**



RT: 1.53
Area: 841311
Amount: 9.109594
Amount Units: ng/ml



Reviewer: phomsophat, 03-Jan-2017 14:01:14

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

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TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_016.d

Injection Date: 30-Dec-2016 14:11:26 Instrument ID: A8_N

Lims ID: 320-24184-A-4-A Lab Sample ID:

Client ID: SWMU1-02-1216

Operator ID: A8-PC\A8 ALS Bottle#: 10 Worklist Smp#: 26

Injection Vol: 2.0 ul Dil. Factor: 1.0000

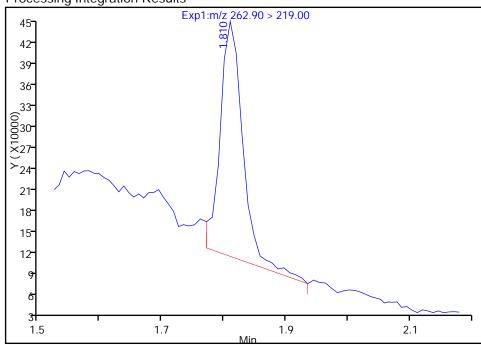
Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

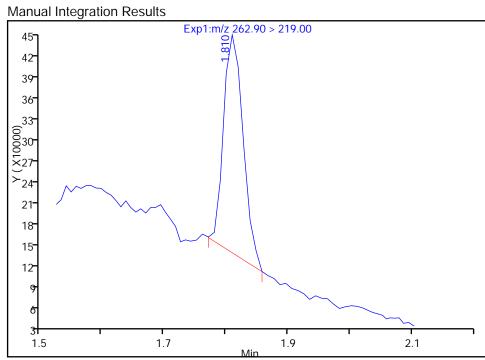
3 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

RT: 1.81 Area: 831696 Amount: 3.468941 Amount Units: ng/ml **Processing Integration Results**



RT: 1.81 Area: 662034 Amount: 2.761294 Amount Units: ng/ml



Reviewer: phomsophat, 03-Jan-2017 14:01:14

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

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TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_016.d

Injection Date: 30-Dec-2016 14:11:26 Instrument ID: A8_N

Lims ID: 320-24184-A-4-A Lab Sample ID:

Client ID: SWMU1-02-1216

Operator ID: A8-PC\A8 ALS Bottle#: 10 Worklist Smp#: 26

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

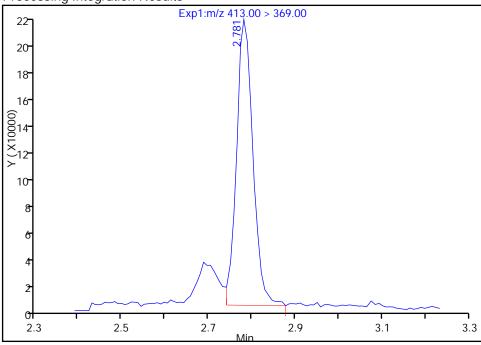
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

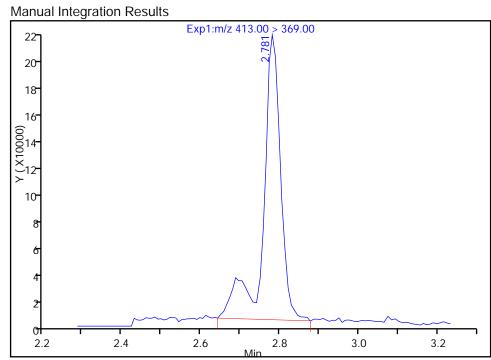
Signal: 1

RT: 2.78
Area: 566285
Amount: 2.232072
Amount Units: ng/ml

Processing Integration Results



RT: 2.78
Area: 664339
Amount: 2.618562
Amount Units: ng/ml



Reviewer: phomsophat, 03-Jan-2017 14:01:14

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

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TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_016.d

Injection Date: 30-Dec-2016 14:11:26 Instrument ID: A8_N

Lims ID: 320-24184-A-4-A Lab Sample ID:

Client ID: SWMU1-02-1216

Operator ID: A8-PC\A8 ALS Bottle#: 10 Worklist Smp#: 26

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

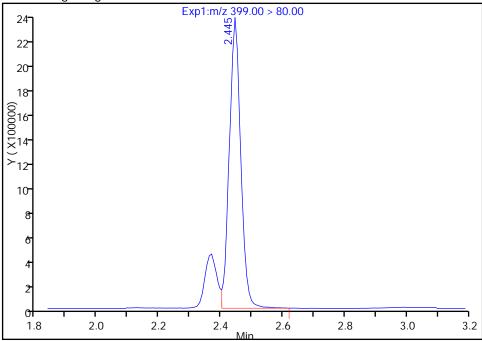
Column: Detector EXP1

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

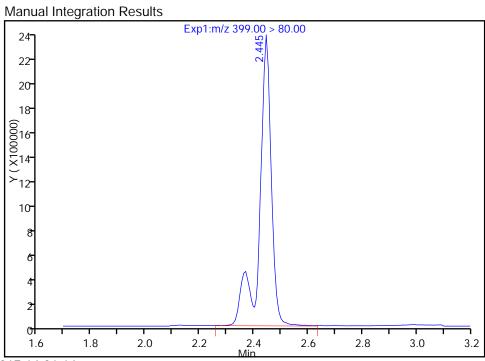
Signal: 1

RT: 2.44
Area: 6017505
Amount: 15.102748
Amount Units: ng/ml

Processing Integration Results



RT: 2.44
Area: 7261186
Amount: 18.224142
Amount Units: ng/ml



Reviewer: phomsophat, 03-Jan-2017 14:01:14

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Client Sample ID: SWMU1-02-1216 RE Lab Sample ID: 320-24184-4 RE

Matrix: Water Lab File ID: 05JAN2017B_009.d

Analysis Method: 537 (Modified) Date Collected: 12/07/2016 12:00

Extraction Method: 3535 Date Extracted: 01/04/2017 16:57

Sample wt/vol: 272.4 (mL) Date Analyzed: 01/05/2017 15:45

Con. Extract Vol.: 0.50 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 145242 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0081	Н М	0.0023	0.0018	0.00072

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	108		25-150

Report Date: 06-Jan-2017 09:59:32 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8_N\20170106-38534.b\05JAN2017B_009.d

Lims ID: 320-24184-B-4-A Client ID: SWMU1-02-1216

Sample Type: Client

Inject. Date: 05-Jan-2017 15:45:44 ALS Bottle#: 20 Worklist Smp#: 9

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-24184-b-4-a Misc. Info.: Plate: 1 Rack: 3

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20170106-38534.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jan-2017 09:59:23 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK021

First Level Reviewer: chandrasenas Date: 06-Jan-2017 09:55:15

First Level Reviewer: chandrasenas Date: 06-J						06-Jan-2017 09:55:1	5			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA	\									
217.00 > 172.00		1.598	-0.005		5729494	16.5		33.0	311446	
1 Perfluorobut	yric acid									
212.90 > 169.00	1.593	1.606	-0.013	1.000	1245840	12.7			1049	
D 4 13C5-PFPe	eΑ									
267.90 > 223.00	1.881	1.887	-0.006		12393311	46.6		93.2	237576	
3 Perfluoroper		cid								
262.90 > 219.00	1.890	1.887	0.003	1.000	1172333	4.79			737	
5 Perfluorobut										
	1.919	1.935	-0.016	1.000	1719778	3.14	2 (2(2 22 2 22)			
298.90 > 99.00		1.935	-0.016	1.000	641071		2.68(0.00-0.00)			
D 6 13C2 PFHx 315.00 > 270.00		2.195	-0.012		13215226	53.9		108	695957	
			-0.012		13213220	33.9		106	093937	N //
7 Perfluorohex 313.00 > 269.00		2.195	-0 003	1.000	1081372	4.41			3041	M M
9 Perfluorohex				1.000	1001372	4.41			3041	IVI
399.00 > 80.00			-0.004	1.000	5121769	12.9				
D 11 13C4-PFH		2	0.00.		0.207	,				
367.00 > 322.00		2.536	-0.003		13437025	59.4		119	124873	9
12 Perfluorohe	ntanoic a	acid								
363.00 > 319.00	•	2.536	-0.003	1.000	79879	0.3037			375	
D 10 1802 PFH:	xS									
403.00 > 84.00	2.548	2.552	-0.004		18263040	55.9		118	736678	
15 Perfluorooct	tanoic ac	cid								
413.00 > 369.00	2.907	2.902	0.005	1.000	439777	1.63			2223	
413.00 > 169.00	2.794	2.902	-0.108	0.961	366698		1.20(0.90-1.10)		4633	
D 14 13C4 PFO										
417.00 > 372.00	2.899	2.902	-0.003		13432178	58.3		117	567090	
					Page 476 of 8	309				

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Report Date: 06-Jan-2017 09:59:32 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File:

Bata Filo:	110111	J ta 10 c	201 G1110111	.0 (0111 0111	Bata # 10_11201	70100 0000	1101000711120172	5 7 . G		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooct	ane sulf	onic aci	4							E
499.00 > 80.00		3.259	0.013	1.000	59452550	222.0			110422	
499.00 > 99.00		3.259	0.005	0.998	14513692	222.0	4.10(0.90-1.10)		428928	<i>,</i> _
D 17 13C4 PFO							,			
503.00 > 80.00		3.275	-0.003		12873171	51.7		108	264112	
20 Perfluorono	nanoic a	cid								
463.00 > 419.00	3.264	3.275	-0.011	1.000	7109	0.0441			84.7	
D 19 13C5 PFN/	Д									
468.00 > 423.00	3.272	3.283	-0.011		8465524	47.6		95.3	138176	2
D 21 13C8 FOS	Α									
506.00 > 78.00	3.595	3.600	-0.005		3032390	7.89		15.8	124509	
22 Perfluorooct	ane Sulf	fonamid	е							
498.00 > 78.00	3.595	3.600	-0.005	1.000	273870	4.84			6130	
24 Perfluorode	canoic a	cid								
513.00 > 469.00	3.628	3.642	-0.014	1.000	29052	0.1512			557	
D 23 13C2 PFD/	Д									
515.00 > 470.00	3.637	3.642	-0.005		10181594	64.7		129	406150	
26 Perfluorode	cane Su	lfonic ac	id							
599.00 > 80.00	3.946	3.945	0.001	1.000	414560	2.64				
28 Perfluoround	decanoi	c acid								
563.00 > 519.00	3.964	3.963	0.001	1.000	33824	0.2066			592	
D 27 13C2 PFU										
565.00 > 520.00	3.964	3.972	-0.008		8559775	73.0		146	729289	
29 Perfluorodo										
613.00 > 569.00	4.243	4.265	-0.022	1.000	6984	0.0498			99.7	
D 30 13C2 PFD										
615.00 > 570.00	4.251	4.265	-0.014		7644692	68.9		138	256121	
33 Perfluoroteti										
712.50 > 668.90				1.000	55674	0.2298	5 05 (0 00 0 0 °)		22.6	
713.00 > 169.00	4.751	4.772	-0.021	0.998	10406		5.35(0.00-0.00)		2022	

OC Flag Legend Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 06-Jan-2017 09:59:32 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 05-Jan-2017 15:45:44 Instrument ID: A8_N Lims ID: 320-24184-B-4-A Lab Sample ID: 320-24184-4 Client ID: SWMU1-02-1216 Operator ID: A8-PC\A8 ALS Bottle#: 20 Worklist Smp#: 9 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: LC PFC_DOD ICAL $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 (000001X), 88 642 636 © 20 ∑₁₆ \times_{30} 18 12 0.9 1.2 1.8 1.0 1.6 1.9 2.1 0.9 1.5 2.1 2.7 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.0028 73 632 627 663- 53-×53-624 620 620 ∑₁₆--¥3- 17 33 12 23 13 2.3 1.9 2.2 1.9 2.2 1.7 2.0 1.4 1.6 1.6 D 6 13C2 PFHxA 7 Perfluorohexanoic acid (M) 9 Perfluorohexanesulfonic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 399.00 > 80.00 49 183 (0000012 ×) > 9 637-631-<u>8</u>42 <u>8</u>35-∑₂₈- $\stackrel{\smile}{\sim}_{25}$ 19 21 13 2.4 3.0 1.9 2.2 2.5 1.9 2.2 2.8 3.1 1.8 2.5 1.2 1.6 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 46 63⁻ 000054⁻ ×45⁻ (0042 0000135 ×)28 41 ©36 ×31• ≻₂₆-21 27 21 18 16 11 6

1.9

1.6

2.2

2.5

2.8

3.1

2.3

Page 4**r**⁄8h of 809

2.0

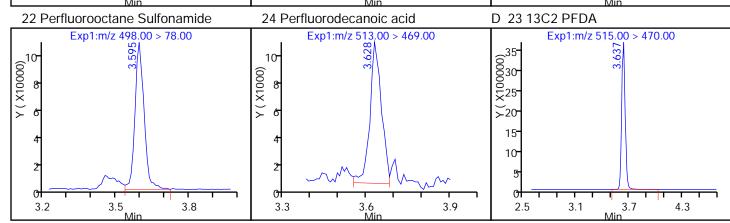
1.7

2.3

2.6

2.9

3.2



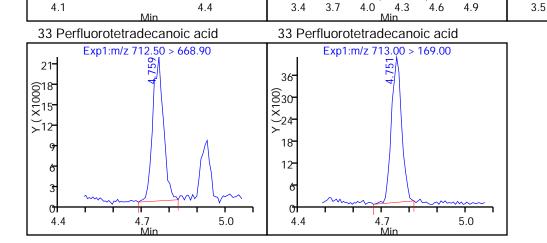
0

4.1

4.7

Min

5.3



13 8

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20170106-38534.b\05JAN2017B_009.d

Injection Date: 05-Jan-2017 15:45:44 Instrument ID: A8_N

Lims ID: 320-24184-B-4-A Lab Sample ID: 320-24184-4

Client ID: SWMU1-02-1216

Operator ID: A8-PC\A8 ALS Bottle#: 20 Worklist Smp#: 9

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

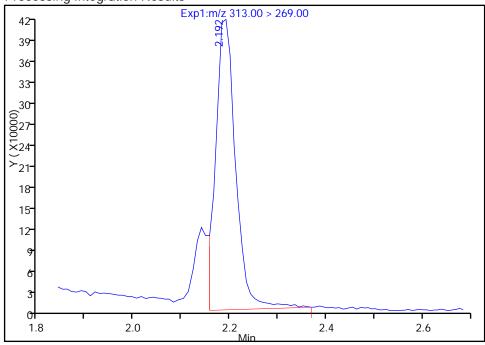
Column: Detector EXP1

7 Perfluorohexanoic acid, CAS: 307-24-4

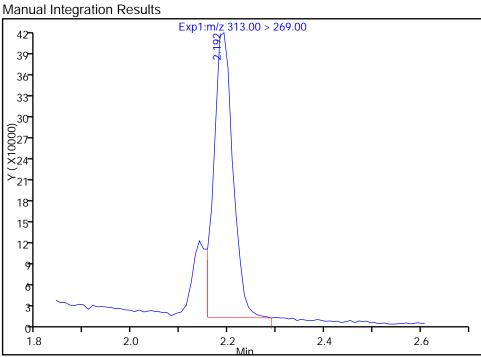
Signal: 1

RT: 2.19
Area: 1155996
Amount: 4.709084
Amount Units: ng/ml

Processing Integration Results



RT: 2.19
Area: 1081372
Amount: 4.405095
Amount Units: ng/ml



Reviewer: chandrasenas, 06-Jan-2017 09:55:15

Audit Action: Manually Integrated

Audit Reason: Baseline

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Client Sample ID: SWMU1-02-1216 DL Lab Sample ID: 320-24184-4 DL

Matrix: Water Lab File ID: 30DEC2016B_015.d

Analysis Method: 537 (Modified) Date Collected: 12/07/2016 12:00

Extraction Method: 3535 Date Extracted: 12/19/2016 14:38

Sample wt/vol: 279.8(mL) Date Analyzed: 12/30/2016 14:03

Con. Extract Vol.: 0.5(mL) Dilution Factor: 10

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 144510 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.016	JDM	0.022	0.0089	0.0041
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.018	U M	0.022	0.018	0.0088
307-24-4	Perfluorohexanoic acid (PFHxA)	0.011	JDB	0.022	0.018	0.0070
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.018	U	0.022	0.018	0.0072
335-67-1	Perfluorooctanoic acid (PFOA)	0.018	U	0.022	0.018	0.0067
375-95-1	Perfluorononanoic acid (PFNA)	0.018	U	0.022	0.018	0.0058
335-76-2	Perfluorodecanoic acid (PFDA)	0.0089	U	0.022	0.0089	0.0039
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.018	U	0.022	0.018	0.0067
307-55-1	Perfluorododecanoic acid (PFDoA)	0.018	U	0.022	0.018	0.0052
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.018	U	0.022	0.018	0.0049
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0089	U	0.022	0.0089	0.0036
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0095	JD	0.022	0.018	0.0082
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.030	D	0.022	0.018	0.0078
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.2	D	0.036	0.027	0.011
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.027	U	0.036	0.027	0.011
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.017	JD	0.022	0.018	0.0057

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Client Sample ID: SWMU1-02-1216 DL Lab Sample ID: 320-24184-4 DL

Matrix: Water Lab File ID: 30DEC2016B_015.d

Analysis Method: 537 (Modified) Date Collected: 12/07/2016 12:00

Extraction Method: 3535 Date Extracted: 12/19/2016 14:38

Sample wt/vol: 279.8(mL) Date Analyzed: 12/30/2016 14:03

Con. Extract Vol.: 0.5 (mL) Dilution Factor: 10 Injection Volume: 2 (uL) GC Column: Acquity ID: 2.1 (mm)

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

Analysis Batch No.: 144510 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	12	Q	25-150
STL00992	13C4 PFBA	93		25-150
STL01893	13C5-PFPeA	148		25-150
STL00993	13C2 PFHxA	125		25-150
STL01892	13C4-PFHpA	123		25-150
STL00990	13C4 PFOA	114		25-150
STL00995	13C5 PFNA	96		25-150
STL00996	13C2 PFDA	98		25-150
STL00997	13C2 PFUnA	99		25-150
STL00998	13C2 PFDoA	101		25-150
STL00994	1802 PFHxS	139		25-150
STL00991	13C4 PFOS	123		25-150

Report Date: 03-Jan-2017 14:28:24 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_015.d

Lims ID: 320-24184-A-4-A Client ID: SWMU1-02-1216

Sample Type: Client

Inject. Date: 30-Dec-2016 14:03:57 ALS Bottle#: 9 Worklist Smp#: 25

Injection Vol: 2.0 ul Dil. Factor: 10.0000

Sample Info: 320-24184-a-4-a 10X

Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 03-Jan-2017 14:28:20 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK026

First Level Reviewer: phomsophat Date: 03-Jan-2017 13:31:55

First Level Revie	wer: pho	omsopha	at	Date: 03-Jan-2017 13:31:55						
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA	١									
217.00 > 172.00	1.534	1.526	0.008		1624959	4.67		9.3	137676	
1 Perfluorobut	,									M
212.90 > 169.00		1.534	0.0	1.000	241532	0.8706			703	M
D 4 13C5-PFPe		1 001			10/0071	7.00		446	100700	
267.90 > 223.00		1.801	0.009		1962871	7.38		14.8	103703	
3 Perfluoroper 262.90 > 219.00		cid 1.811	-0.001	1.000	107333	0.2771			312	M M
5 Perfluorobut			-0.001	1.000	107333	0.2771			312	IVI
	1.849	1.840	0.009	1.000	339773	0.5294				
298.90 > 99.00		1.840	0.009	1.000	133969		2.54(0.00-0.00)			
D 613C2 PFHx	Α									
315.00 > 270.00	2.103	2.092	0.011		1530052	6.24		12.5	157636	
7 Perfluorohex										
313.00 > 269.00		2.092	0.011	1.000	180239	0.6342			2082	
9 Perfluorohex				1 000	77774	1 / 7				
399.00 > 80.00		2.410	0.034	1.000	777714	1.67				
D 11 13C4-PFH 367.00 > 322.00		2.421	0.008		1389359	6.14		12.3	174426	
D 10 1802 PFH:		2.421	0.000		1307337	0.14		12.5	174420	
403.00 > 84.00		2.443	0.001		2142261	6.55		13.9	283629	
D 14 13C4 PFO										
417.00 > 372.00		2.773	0.009		1316049	5.71		11.4	71540	
18 Perfluorooct	tane sulf	onic acid	b							
499.00 > 80.00	3.047	3.044	0.003	1.000	20598654	67.7			99353	
	3.047	3.044	0.003	1.000	4939720		4.17(0.90-1.10)		36916	
D 17 13C4 PFO		0.446	0.045		4.44000=	5.00		10.0	0047	
503.00 > 80.00	3.158	3.148	0.010		1462097	5.88		12.3	89166	
					Page 484 of	809				

Report Date: 03-Jan-2017 14:28:24 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File: \\ChromNa\Sacramento\ChromData\A8 N\20161230-38358.b\30DEC2016B 015.d

Data File:	\\Cnr	omiva\Sa	acrament	.o\Cnrom	Data\A8_N\201	01230-38358	8.D\30DEC2016B_0	15.0		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFN	A									
468.00 > 423.00	3.150	3.148	0.002		850912	4.79		9.6	59476	
22 Perfluorooc	tane Sulf	fonamide	Э							
498.00 > 78.00	3.481	3.470	0.011	1.000	40418	0.9508			1899	
D 21 13C8 FOS										
506.00 > 78.00		3.478	0.003		227905	0.5933		1.2	12074	
24 Perfluorode			0.011	1 000	7004	0.0507			105	
513.00 > 469.00		3.504	0.011	1.000	7804	0.0537			185	
D 23 13C2 PFD 515.00 > 470.00		3.512	0.003		769457	4.89		9.8	35785	
26 Perfluorode					707437	4.07		7.0	33703	
599.00 > 80.00			0.012	1.000	39996	0.2239				
D 27 13C2 PFU		0.022	0.0.2		07770	0.2207				
565.00 > 520.00		3.839	0.004		581926	4.96		9.9	60153	
D 30 13C2 PFD	оА									
615.00 > 570.00	4.133	4.138	-0.005		559119	5.04		10.1	27393	
33 Perfluorotet	radecan	oic acid								
712.50 > 668.90		4.651	0.011	1.000	8190	0.0462			231	
713.00 > 169.00	4.624	4.651	-0.027	0.992	930		8.81(0.00-0.00)		287	

OC Flag Legend Review Flags

M - Manually Integrated

Report Date: 03-Jan-2017 14:28:24 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_015.d **Injection Date:** 30-Dec-2016 14:03:57 Instrument ID: A8_N Lims ID: 320-24184-A-4-A Lab Sample ID: 320-24184-4 Client ID: SWMU1-02-1216 Operator ID: A8-PC\A8 ALS Bottle#: 9 Worklist Smp#: 25 Injection Vol: Dil. Factor: 2.0 ul 10.0000 LC PFC_DOD ICAL Method: $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid (M) D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 56 83 649 642 73- 263-0066 ×55 \times_{35} ×53 ≻₂₈->44≻₄₃-33 21 33 23 11 13 1.0 1.9 1.3 1.6 1.4 1.7 2.0 2.3 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid (M) Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 16 64 69 6014 0012 56 636 648 661° ×53 ∑₁₀ \times_{40} ≻₄₅-32 37 24 29 16 21 13 1.9 1.9 1.9 1.6 1.6 1.6 Min D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 399.00 > 80.00 64 24 64- ©⁵⁶ ©48 (0) 20-20-655- ×46 <u>≻</u>16-×40 >₃₂ **≻**37· 12 28 19 16 10 2.0 2.3 2.1 2.4 1.7 2.0 2.9 1.7 2.6 2.3 2.6 1.8 12 Perfluoroheptanoic acid (ND) D 11 13C4-PFHpA D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 49 (77 (0) (66 (66 15- 0042 ×35 (00012 X) ×55 -28 21 33 14 22 11 0 0 1.9 2.2 2.5 2.8 3.1 1.4 Page 48/6 of 809 3.2 1.9 2.2 2.5 2.8 3.1 1.6 1.6

3.5

3.8

2.7

3.0

3.3

3.6

3.9

4.2

33- 22- 11-

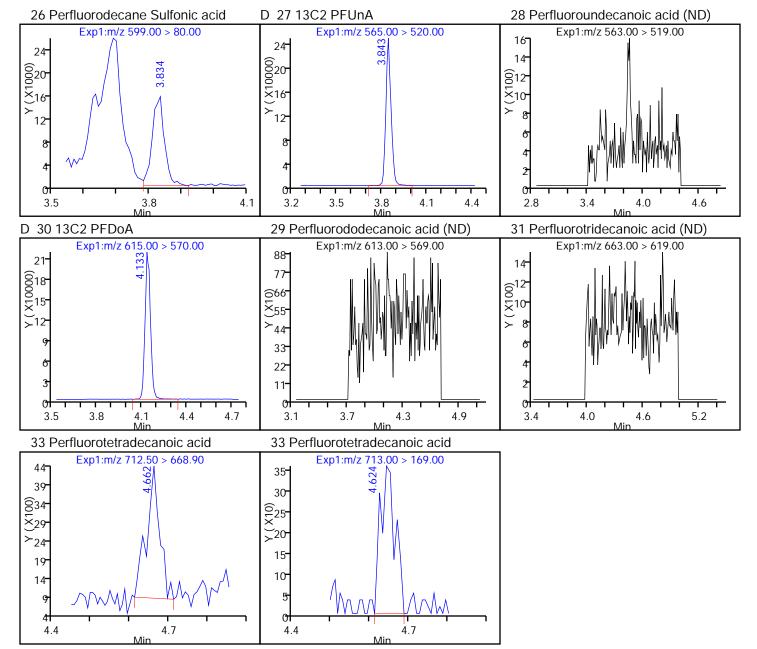
2.9

3.2

3.5

3.8

3.2



TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_015.d

Injection Date: 30-Dec-2016 14:03:57 Instrument ID: A8_N

Lims ID: 320-24184-A-4-A Lab Sample ID: 320-24184-4

Client ID: SWMU1-02-1216

Operator ID: A8-PC\A8 ALS Bottle#: 9 Worklist Smp#: 25

Injection Vol: 2.0 ul Dil. Factor: 10.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

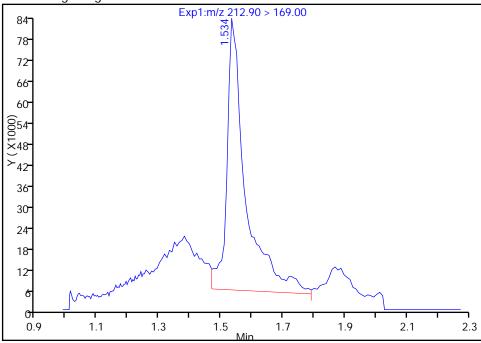
Column: Detector EXP1

1 Perfluorobutyric acid, CAS: 375-22-4

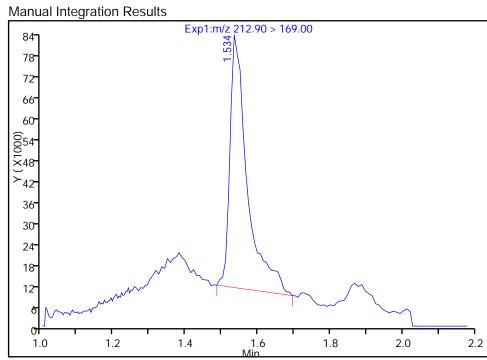
Signal: 1

RT: 1.53
Area: 325380
Amount: 1.172769
Amount Units: ng/ml

Processing Integration Results



RT: 1.53
Area: 241532
Amount: 0.870555
Amount Units: ng/ml



Reviewer: phomsophat, 03-Jan-2017 13:59:25

Audit Action: Manually Integrated

Audit Reason: Baseline

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_015.d

Injection Date: 30-Dec-2016 14:03:57 Instrument ID: A8_N

Lims ID: 320-24184-A-4-A Lab Sample ID: 320-24184-4

Client ID: SWMU1-02-1216

Operator ID: A8-PC\A8 ALS Bottle#: 9 Worklist Smp#: 25

Injection Vol: 2.0 ul Dil. Factor: 10.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

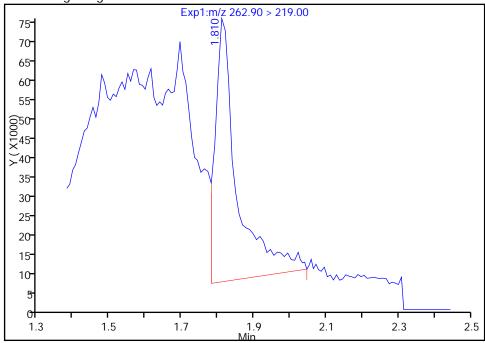
Column: Detector EXP1

3 Perfluoropentanoic acid, CAS: 2706-90-3

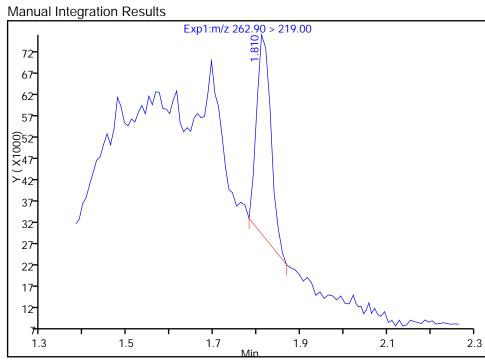
Signal: 1

RT: 1.81
Area: 282281
Amount: 0.728675
Amount Units: ng/ml

Processing Integration Results



RT: 1.81
Area: 107333
Amount: 0.277067
Amount Units: ng/ml



Reviewer: phomsophat, 03-Jan-2017 13:59:25

Audit Action: Manually Integrated

Audit Reason: Baseline

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LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1 Analy Batch No.: 142379

SDG No.:

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

Calibration Files:

LEVEL:	:	LAB SAMPLE ID:	LAB FILE ID:
Level	1	IC 320-142379/4	15DEC2016B 004.d
Level	2	IC 320-142379/13	15DEC2016BB 013.d
Level	3	IC 320-142379/5	15DEC2016B 005.d
Level	4	IC 320-142379/14	15DEC2016B 014.d
Level	5	IC 320-142379/6	15DEC2016B 006.d
Level	6	IC 320-142379/15	15DEC2016B 015.d
Level	7	IC 320-142379/7	15DEC2016B 007.d
Level	8	IC 320-142379/16	15DEC2016B 016.d
Level	9	IC 320-142379/8	15DEC2016B 008.d
Level	10	IC 320-142379/17	15DEC2016B 017.d
Level	11	IC 320-142379/9	15DEC2016B 009.d
Level	12	IC 320-142379/18	15DEC2016B_018.d

ANALYTE	LVL 1 LVL 11	LVL 2 LVL 12	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	1.542 1.537		1.530		1.534		1.534		1.533		1.285 - 1.785	1.535
Perfluoropentanoic acid (PFPeA)	1.810 1.813		1.805		1.810		1.810		1.810		1.560 - 2.060	1.810
Perfluorobutanesulfonic acid (PFBS)	1.849 1.852		1.844		1.849		1.849		1.848		1.668 - 2.028	1.849
Perfluorohexanoic acid (PFHxA)	2.097 2.096		2.092		2.097		2.093		2.098		1.846 - 2.346	2.096
Perfluorohexanesulfonic acid (PFHxS)	+++++ 2.444		2.445		2.364		2.440		2.446		2.181 - 2.681	2.428
Perfluoroheptanoic acid (PFHpA)	2.430 2.426		2.430		2.432		2.426		2.424		2.178 - 2.678	2.428
6:2FTS		+++++ 2.769		2.761		2.768		2.767		2.767	2.518 - 3.018	2.766
Perfluorooctanoic acid (PFOA)	2.783		2.781		2.783		2.785		2.782		2.533 - 3.033	2.783
Perfluoroheptanesulfonic Acid (PFHpS)	2.790 2.791		2.789		2.792		2.785		2.791		2.540 - 3.040	2.790
Perfluorooctanesulfonic acid (PFOS)	+++++ 2.977		3.149		3.153		3.129		3.151		2.868 - 3.368	3.112
Perfluorononanoic acid (PFNA)	3.159 3.160		3.157		3.153		3.153		3.151		2.905 - 3.405	3.156
Perfluorooctane Sulfonamide (FOSA)	3.490 3.491		3.489		3.492		3.492		3.490		3.241 - 3.741	3.491
Perfluorodecanoic acid (PFDA)	3.515 3.516		3.506		3.509		3.509		3.507		3.260 - 3.760	3.510
8:2FTS		3.511 3.516		3.502		3.511		3.511		3.512	3.261 - 3.761	3.511

LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1 Analy Batch No.: 142379

SDG No.:

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

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
	LVL 11	LVL 12	_									
N-methyl perfluorooctane sulfonamidoacetic		3.684		3.673		3.683		3.683		3.684	3.431 - 3.931	3.681
acid (NMeFOSAA)		3.680										
Perfluorodecanesulfonic acid (PFDS)	3.826 3.819		3.824		3.819		3.827		3.818		3.572 - 4.072	3.822
Perfluoroundecanoic acid (PFUnA)	3.834 3.845		3.833		3.837		3.844		3.844		3.589 - 4.089	3.840
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		3.865 3.853		3.855		3.847		3.847		3.857	3.604 - 4.104	3.854
MeFOSA		3.998 4.004		3.997		3.997		3.997		3.999	3.749 - 4.249	3.999
Perfluorododecanoic acid (PFDoA)	4.141 4.136		4.133		4.136		4.135		4.135		3.886 - 4.386	4.136
N-EtFOSA-M	1.100	4.187 4.193		4.179		4.186		4.186		4.189	3.937 - 4.437	4.187
Perfluorotridecanoic Acid (PFTriA)	4.404	1,130	4.396		4.398		4.398		4.398		4.150 - 4.650	4.400
Perfluorotetradecanoic acid (PFTeA)	4.643		4.643		4.645		4.644		4.645		4.392 - 4.892	4.643
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++		5.058		5.059		5.059		5.059		4.809 - 5.309	5.059
Perfluoro-n-octadecanoic acid (PFODA)	5.413 5.414		5.413		5.414		5.413		5.413		5.164 - 5.664	5.413
13C4 PFBA	1.534		1.530		1.534		1.534		1.533		1.284 - 1.784	1.534
13C5-PFPeA	1.810		1.805		1.810		1.810		1.810		1.560 - 2.060	1.810
13C2 PFHxA	2.097		2.092		2.097		2.102		2.098		1.847 - 2.347	2.097
13C4-PFHpA	2.430		2.423		2.425		2.426		2.424		2.176 - 2.676	2.426
1802 PFHxS	2.452		2.445		2.447		2.440		2.446		2.196 - 2.696	2.446
M2-6:2FTS		2.760 2.776		2.761		2.768		2.767		2.767	2.517 - 3.017	2.767
13C4 PFOA	2.782		2.781		2.783		2.785		2.782		2.533 - 3.033	2.783
13C4 PFOS	3.151 3.152		3.149		3.153		3.153		3.151		2.901 - 3.401	3.152
13C5 PFNA	3.159 3.152		3.149		3.153		3.153		3.151		2.903 - 3.403	3.153
13C8 FOSA	3.490 3.491		3.489		3.484		3.484		3.490		3.238 - 3.738	3.488
13C2 PFDA	3.515 3.508		3.514		3.509		3.517		3.516		3.263 - 3.763	3.513

LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1 Analy Batch No.: 142379

SDG No.:

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

ANALYTE	LVL 1 LVL 2 LVL 11 LVL 12		LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
M2-8:2FTS	3.51 3.51		3.511		3.511		3.511		3.520	3.263 - 3.763	3.513
d3-NMeFOSAA	3.68	ł	3.673		3.673		3.673		3.675	3.426 - 3.926	3.676
13C2 PFUnA	3.843 3.845	3.842		3.845		3.835		3.844		3.592 - 4.092	3.842
d5-NEtFOSAA	3.84 3.84		3.838		3.838		3.838		3.848	3.592 - 4.092	3.843
d-N-MeFOSA-M	3.98 3.99		3.987		3.987		3.997		3.999	3.742 - 4.242	3.992
13C2 PFDoA	4.134 4.129	4.133		4.129		4.135		4.135		3.882 - 4.382	4.133
d-N-EtFOSA-M	4.18 4.18		4.172		4.179		4.179		4.182	3.930 - 4.430	4.180
13C2-PFTeDA	4.643 4.635	4.633		4.645		4.644		4.645		4.391 - 4.891	4.641
13C2-PFHxDA	5.058 5.060	5.047		5.059		5.059		5.059		4.807 - 5.307	5.057

LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1 Analy Batch No.: 142379

SDG No.:

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

Calibration Files:

LEVEL:		LAB SAMPLE ID:	LAB FILE ID:
Level	1	IC 320-142379/4	15DEC2016B 004.d
Level	2	IC 320-142379/13	15DEC2016BB 013.d
Level	3	IC 320-142379/5	15DEC2016B 005.d
Level	4	IC 320-142379/14	15DEC2016B 014.d
Level	5	IC 320-142379/6	15DEC2016B 006.d
Level	6	IC 320-142379/15	15DEC2016B 015.d
Level	7	IC 320-142379/7	15DEC2016B 007.d
Level	8	IC 320-142379/16	15DEC2016B 016.d
Level	9	IC 320-142379/8	15DEC2016B 008.d
Level	10	IC 320-142379/17	15DEC2016B 017.d
Level	11	IC 320-142379/9	15DEC2016B 009.d
Level	12	IC 320-142379/18	15DEC2016B_018.d

ANALYTE		C	₹		CURVE		COEFFICIENT		# MIN CF	%RSD	# MAX %RSI	R^2 OR COD	# MIN R^2
	LVL 1 LVL 5 LVL 9	LVL 2 LVL 6 LVL 10	LVL 3 LVL 7 LVL 11	LVL 4 LVL 8 LVL 12	TYPE	В	M1	M2			8851	OR COD	OR COD
13C4 PFBA	365277 360742 345484		364028 351708 299221		Ave		347743.167			7.2	50.0		
13C5-PFPeA	282426 281261 261073		281354 272343 217976		Ave		266072.353			9.4	50.0)	
13C2 PFHxA	253106 254198 247986		256296 252164 206910		Ave		245109.910			7.7	50.0)	
13C4-PFHpA	244814 245211 216032		244964 235764 171281		Ave		226344.393			12.9	50.0)	
1802 PFHxS	341723 342975 323020		340234 339593 274309		Ave		326975.747			8.2	50.0)	
M2-6:2FTS		112694 117279 110718		107543 136249 117410			116982.140			8.7	50.0)	
13C4 PFOA	250090 252701 222856		252554 236364 167605		Ave		230361.637			14.3	50.0		

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

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

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1 Analy Batch No.: 142379

SDG No.:

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

ANALYTE		CI	ਦ		CURVE		COEFFICIENT		#	MIN CF	%RSD	 MAX R^2 # MIN R^2
	LVL 1 LVL 5 LVL 9	LVL 2 LVL 6 LVL 10	LVL 3 LVL 7 LVL 11	LVL 4 LVL 8 LVL 12	11111	В	M1	М2				%RSD OR COD OR COD
13C4 PFOS	256822 261188 249930		260657 254876 209612		Ave		248847.249				7.9	50.0
13C5 PFNA	189110 195552 171630		190741 184721 134367		Ave		177686.923				12.8	50.0
13C8 FOSA	407109 400699 376084		404776 394065 322114		Ave		384141.077				8.4	50.0
13C2 PFDA	168454 164694 153437		169609 162695 124922		Ave		157301.833				10.7	50.0
M2-8:2FTS		100584 111541 99917		96024 124933 111666	Ave		107444.339				10.0	50.0
d3-NMeFOSAA		72700 80292 68450		71182 87583 71744	Ave		75324.9433				9.6	50.0
13C2 PFUnA	127043 125252 113156		124385 124531 89132		Ave		117249.927				12.5	50.0
d5-NEtFOSAA		77796 84707 69727		75140 88209 74518	Ave		78349.4833				8.8	50.0
d-N-MeFOSA-M		86501 102439 90246		92791 105280 93163	Ave		95069.8233				7.6	50.0
13C2 PFDoA	116302 115598 108083		116442 116336 92982		Ave		110957.213				8.5	50.0
d-N-EtFOSA-M		75857 91238 82985		82198 93456 88971	Ave		85784.0067				7.7	50.0
13C2-PFTeDA	239125 244965 219010		237709 233101 190415		Ave		227387.480				8.8	50.0
13C2-PFHxDA	131492 130859 120547		133987 126716 103803		Ave		124567.543				9.0	50.0

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8 N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

ANALYTE			RRF			CURVE		COEFFICIEN	T	#	MIN RRF	%RSD	#	MAX	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	LVL 8	LVL 9	LVL 10												
	LVL 11	LVL 12															
Perfluorobutanoic acid (PFBA)	310962		310647		310088	AveID		0.8537				9.1		35.0			
		334546		308231													
	213818																
Perfluoropentanoic acid (PFPeA)	304642		287573		271648	AveID		0.9868				10.7		35.0			
	171455	288512		263221													
Perfluorobutanesulfonic acid (PFBS)	490041		479895		500362	AveID		1.4170				14.1		50.0			
Torridoros acamedarionio acra (1120)	130011	557732		487779		111.012		11170						00.0			
	286903																
Perfluorohexanoic acid (PFHxA)	252858		239458		236657	AveID		0.9288				7.3		35.0			
	4.664.00	246488		230141													
Perfluorohexanesulfonic acid (PFHxS)	166120		382940		220101	AveID		1.0300				7.4		35.0			
refiliuofonexamesulfonic acid (FFRXS)	+++++	363991	302940	335246	339121	Avein		1.0300				/ • 4		33.0			
	253974	303331		333240													
Perfluoroheptanoic acid (PFHpA)	258208		237734		235022	AveID		0.9788				5.9		35.0			
		237386		215989													
	151171																
6:2FTS	05456	+++++	127446	112813	109001	AveID		0.8914				15.8		35.0			
	85456	89174	-		109001												
Perfluorooctanoic acid (PFOA)	++++		254861		247908	AveID		1.0031				6.0		35.0			
,		255488		228712													
	153922																
Perfluoroheptanesulfonic Acid (PFHpS)	283576		279184		283857	AveID		1.1019				8.2		50.0			
	001005	315862		286553													
Perfluorooctanesulfonic acid (PFOS)	201995		237468		247033	AveID		0.9945				6.4		35.0			
refilidoloccamesullomic acid (Fros)	77777	272566		253058	24/933	Aveid		0.9943				0.4		33.0			
	215911	272300		233030													
Perfluorononanoic acid (PFNA)	180132		188341		180502	AveID		0.9518				2.7		35.0			
		178149		164925													
	123966		004055		000000							10 -		0.5.			
Perfluorooctane Sulfonamide (FOSA)	391498	399542	381363	354739	397863	AveID		0.9327				10.5		35.0			
	239019	399342		334/39													
	1 233013			L							1						

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8 N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

ANALYTE			RRF			CURVE		COEFFICIE	NT	# MIN RRF	%RSD	#	MAX	R^2	# 1	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	LVL 8	LVL 9	LVL 10											
	LVL 11	LVL 12														
Perfluorodecanoic acid (PFDA)	164274		155537		154381	AveID		0.9438			3.1		35.0			
	113084	158337		146490												
8:2FTS		83106		79051		AveID		0.8473			12.1		35.0			
	83185	84092	116095		100536											
N-methyl perfluorooctane		59646		57389		AveID		0.8846			15.4		35.0			
sulfonamidoacetic acid (NMeFOSAA)	57133	64621	85412		74839											
Perfluorodecanesulfonic acid (PFDS)	143714	04021	145051		147895	AveTD		0.5840			4.8		50.0			
refiracioaccanesationie acta (fisc)		159960	110001	150246		IIIVCID		0.0010			1.0		30.0			
	124235		110100		100010	3 75		0.0560			4 0		25.0			
Perfluoroundecanoic acid (PFUnA)	130000	121036	119189	108755	109942	AvelD		0.9563			4.9		35.0			
	84265	50000		50.600							4.5.4		0.5.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	53544	59930 59690	75946	53623	68286	AveID		0.7929			15.1		35.0			
MeFOSA		72138		70049		AveID		0.8376			13.3		35.0			
	68699	80570	97349		88147											
Perfluorododecanoic acid (PFDoA)	105614		103481		101274	AveID		0.9180			3.5		35.0			
	87129	111590		101460												
N-EtFOSA-M		61986		62962		AveID		0.8640			13.9		35.0			
	65375	78901	90659		85286											
Perfluorotridecanoic Acid (PFTriA)	106640		109461		105018	AveID		0.9069			2.9		50.0			
	80194	104393		99013												
Perfluorotetradecanoic acid (PFTeA)	197042		187123		180115	AveID		1.5848			4.6		50.0			
	136554	183949		172910												
Perfluoro-n-hexadecanoic acid (PFHxDA)	136554		173261		119906	L1TD	0.5185	0.9555				\vdash		1.0000		0.9900
(113395		106364												
Perfluoro-n-octadecanoic acid (PFODA)	123098		114997		116752	AveID		1.0304			3.9		50.0			
	91965	122262		117393												
Perfluoro-n-octadecanoic acid (PFODA)		122262	114997			AveID		1.0304			3.9		50.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1 Analy Batch No.: 142379

SDG No.:

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

Calibration Files:

LEVEL:	LAE	B SAMPLE ID:	LAB FILE ID:
Level 1	L IC	320-142379/4	15DEC2016B 004.d
Level 2	2 IC	320-142379/13	15DEC2016BB 013.d
Level 3	3 IC	320-142379/5	15DEC2016B 005.d
Level 4	1 IC	320-142379/14	15DEC2016B 014.d
Level 5	5 IC	320-142379/6	15DEC2016B 006.d
Level 6	5 IC	320-142379/15	15DEC2016B 015.d
Level 7	7 IC	320-142379/7	15DEC2016B 007.d
Level 8	3 IC	320-142379/16	15DEC2016B 016.d
Level 9) IC	320-142379/8	15DEC2016B 008.d
Level 1	LO IC	320-142379/17	15DEC2016B 017.d
Level 1	L1 IC	320-142379/9	15DEC2016B 009.d
Level 1	L2 IC	320-142379/18	15DEC2016B 018.d

ANALYTE	CURVE			RESPONSE		CONCENTRATION (NG/ML)						
	TYPE	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	
13C4 PFBA	Ave	18263829 14961055	17585378	18201393	17274187	18037108	50.0	50.0	50.0	50.0	50.0	
13C5-PFPeA	Ave	14121285	13617158	14067714	13053659	14063070	50.0	50.0	50.0	50.0	50.0	
13C2 PFHxA	Ave	12655304	12608210	12814780	12399280	12709919	50.0	50.0	50.0	50.0	50.0	
13C4-PFHpA	Ave	12240718 8564025	11788221	12248222	10801604	12260528	50.0 50.0	50.0	50.0	50.0	50.0	
1802 PFHxS	Ave	16163510 12974829	16062766	16093048	15278828	16222736	47.3 47.3	47.3	47.3	47.3	47.3	
M2-6:2FTS	Ave	5570739	5352965 5576967	6471813	5108306	5259120	47.5	47.5 47.5	47.5	47.5	47.5	
13C4 PFOA	Ave	12504504 8380251	11818203	12627691	11142777	12635065	50.0	50.0	50.0	50.0	50.0	
13C4 PFOS	Ave	12276070 10019454	12183062	12459383	11946650	12484772	47.8 47.8	47.8	47.8	47.8	47.8	

LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1	Analy Batch No.: 142379
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SDG No.:

Instrument ID: A8 N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

ANALYTE	CURVE			RESPONSE		CONCENTRATION (NG/ML)						
	TYPE	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	
13C5 PFNA	Ave	9455492 6718354	9236073	9537045	8581504	9777609	50.0	50.0	50.0	50.0	50.0	
13C8 FOSA	Ave	20355431 16105707	19703272	20238792	18804188	20034933	50.0 50.0	50.0	50.0	50.0	50.0	
13C2 PFDA	Ave	8422718 6246112	8134734	8480447	7671861	8234678	50.0 50.0	50.0	50.0	50.0	50.0	
M2-8:2FTS	Ave	5342826	4817997 5348797	5984276	4599569	4786038	47.9	47.9 47.9	47.9	47.9	47.9	
d3-NMeFOSAA	Ave	4014623	3634985 3587176	4379131	3559083	3422485	50.0	50.0	50.0	50.0	50.0	
13C2 PFUnA	Ave	6352135 4456593	6226562	6219248	5657823	6262617	50.0	50.0	50.0	50.0	50.0	
d5-NEtFOSAA	Ave	4235352	3889792 3725902	4410456	3757014	3486329	50.0	50.0 50.0	50.0	50.0	50.0	
d-N-MeFOSA-M	Ave	5121953	4325034	5263980	4639527	4512300	50.0	50.0	50.0	50.0	50.0	
13C2 PFDoA	Ave	5815120 4649092	5816809	5822114	5404154	5779875	50.0 50.0	50.0	50.0	50.0	50.0	
d-N-EtFOSA-M	Ave	4561882	3792851 4448546	4672820	4109875	4149228	50.0	50.0	50.0	50.0	50.0	
13C2-PFTeDA	Ave	11956257 9520749	11655048	11885446	10950502	12248242	50.0 50.0	50.0	50.0	50.0	50.0	
13C2-PFHxDA	Ave	6574607 5190172	6335821	6699329	6027362	6542972	50.0 50.0	50.0	50.0	50.0	50.0	

Curve Type Legend:

Ave = Average

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1 Analy Batch No.: 142379

SDG No.:

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

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-142379/4	15DEC2016B 004.d
Level 2	IC 320-142379/13	15DEC2016BB 013.d
Level 3	IC 320-142379/5	15DEC2016B 005.d
Level 4	IC 320-142379/14	15DEC2016B 014.d
Level 5	IC 320-142379/6	15DEC2016B 006.d
Level 6	IC 320-142379/15	15DEC2016B 015.d
Level 7	IC 320-142379/7	15DEC2016B 007.d
Level 8	IC 320-142379/16	15DEC2016B 016.d
Level 9	IC 320-142379/8	15DEC2016B 008.d
Level 10	IC 320-142379/17	15DEC2016B 017.d
Level 11	IC 320-142379/9	15DEC2016B 009.d
Level 12	IC 320-142379/18	15DEC2016B 018.d

ANALYTE	IS	CURVE			RESPONSE				CONCE	ITRATION (N	G/ML)	
	REF	TYPE	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Perfluorobutanoic acid (PFBA)		AveID	155481 42763611	6690917	310647	15411527	1550440	0.500	20.0	1.00	50.0	5.00
Perfluoropentanoic acid (PFPeA)		AveID	152321 34291076	5770240	287573	13161065	1358239	0.500	20.0	1.00	50.0	5.00
Perfluorobutanesulfonic acid (PFBS)		AveID	216598 50724469	9860707	424227	21559838	2211602	0.442	17.7	0.884	44.2	4.42
Perfluorohexanoic acid (PFHxA)		AveID	126429 33223923	4929766	239458	11507044	1183286	0.500	20.0	1.00	50.0	5.00
Perfluorohexanesulfonic acid (PFHxS)		AveID	+++++ 46223186	6624638	348475	15253691	1543002	182	18.2	0.910	45.5	4.55
Perfluoroheptanoic acid (PFHpA)		AveID	129104 30234194	4747711	237734	10799449	1175112	0.500	20.0	1.00	50.0	5.00
6:2FTS		AveID	405060	+++++ 16907459	2416384	106947	5166665	4.74	+++++ 190	19.0	0.948	47.4
Perfluorooctanoic acid (PFOA)		AveID	+++++ 30784387	5109766	254861	11435583	1239541	200	20.0	1.00	50.0	5.00

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1 Analy Batch No.: 142379

SDG No.:

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

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

ANALYTE	IS REF	CURVE TYPE	RESPONSE						CONCENTRATION (NG/ML)					
			LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10		
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	134982 38459925	6014021	265783	13639927	1351160	0.476	19.0	0.952	47.6	4.76		
Perfluorooctanesulfonic acid (PFOS)		AveID	+++++ 40073141	5058824	220370	11741891	1150410	+++++ 186	18.6	0.928	46.4	4.64		
Perfluorononanoic acid (PFNA)		AveID	90066 24793148	3562981	188341	8246252	902512	0.500	20.0	1.00	50.0	5.00		
Perfluorooctane Sulfonamide (FOSA)		AveID	195749 47803717	7990835	381363	17736944	1989314	0.500	20.0	1.00	50.0	5.00		
Perfluorodecanoic acid (PFDA)		AveID	82137 22616781	3166735	155537	7324495	771905	0.500	20.0	1.00	50.0	5.00		
8:2FTS		AveID	398457	39808 16111959	2224381	75731	4815680	4.79	0.479	19.2	0.958	47.9		
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	285665	29823 12924122	1708231	57389	3741936	5.00	0.500	20.0	1.00	50.0		
Perfluorodecanesulfonic acid (PFDS)		AveID	69270 23952412	3084031	139829	7241868	712852	0.482	19.3	0.964	48.2	4.82		
Perfluoroundecanoic acid (PFUnA)		AveID	65000 16852945	2420719	119189	5437764	549708	0.500	20.0	1.00	50.0	5.00		
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	267721	29965 11938061	1518918	53623	3414301	5.00	0.500	20.0	1.00	50.0		
MeFOSA		AveID	343493	36069 16114020	1946985	70049	4407328	5.00	0.500	20.0	1.00	50.0		
Perfluorododecanoic acid (PFDoA)		AveID	52807 17425873	2231794	103481	5072994	506369	0.500	20.0	1.00	50.0	5.00		
N-EtFOSA-M		AveID	326877	30993 15780196	1813178	62962	4264314	5.00	0.500	20.0	1.00	50.0		

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8 N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

ANALYTE	IS REF	CURVE	RESPONSE						CONCENTRATION (NG/ML)					
		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 8	LVL 9	LVL 10	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10		
			LVL 11	LVL 12				LVL 11	LVL 12					
Perfluorotridecanoic Acid (PFTriA)		AveID	53320		109461		525090	0.500		1.00		5.00		
				2087859		4950651			20.0		50.0			
			16038809					200						
Perfluorotetradecanoic acid (PFTeA)		AveID	98521		187123		900575	0.500		1.00		5.00		
				3678976		8645519			20.0		50.0			
			27310864					200						
Perfluoro-n-hexadecanoic acid		L1ID	++++		173261		599529	++++		1.00		5.00		
(PFHxDA)				2267892		5318207			20.0		50.0			
			17754908					200						
Perfluoro-n-octadecanoic acid		AveID	61549		114997		583761	0.500		1.00		5.00		
(PFODA)				2445236		5869666			20.0		50.0			
			18392980					200						

Curve Type Legend:

AveID = Average isotope dilution L1ID = Linear 1/conc IsoDil Report Date: 16-Dec-2016 14:34:12 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d

Lims ID: IC L1

Client ID:

Sample Type: IC Calib Level: 1

Inject. Date: 15-Dec-2016 12:29:18 ALS Bottle#: 37 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L1_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:11 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:48:59

				_				_		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA	7									
217.00 > 172.00		1.534	0.0		18263829	52.5		105	146908	9
1 Perfluorobut	yric acid									
212.90 > 169.00	•	1.535	0.007	1.000	155481	0.4986		99.7	1121	
D 4 13C5-PFP6	eΑ									
267.90 > 223.00	1.810	1.810	0.0		14121285	53.1		106	107932	3
3 Perfluoroper	ntanoic a	cid								
262.90 > 219.00	1.810	1.810	0.0	1.000	152321	0.5465		109	1332	
5 Perfluorobut										
	1.849	1.848	0.001	1.000	216598	0.4473		101		
298.90 > 99.00	1.849	1.848	0.001	1.000	87630		2.47(0.00-0.00)	101		
7 Perfluorohex			0.004	1 000	10/100	0.5070		400	4447	
313.00 > 269.00		2.096	0.001	1.000	126429	0.5378		108	4416	
D 6 13C2 PFHx		2 007	0.0		12/55204	F1 /		100	E00404	
315.00 > 270.00		2.097	0.0		12655304	51.6		103	589404	
D 11 13C4-PFH 367.00 > 322.00	•	2.426	0.004		12240718	54.1		108	647338	
			0.004		12240718	54.1		108	04/338	D 4
12 Perfluorohe 363.00 > 319.00	•	acia 2.428	0.002	1.000	129104	0.5388		108	1246	M M
				1.000	129104	0.5566		106	1240	
9 Perfluorohex 399.00 > 80.00		2.431	0.013	1.000	204063	0.5798		127		M M
D 10 18O2 PFH		2.431	0.013	1.000	204003	0.5770		127		IVI
403.00 > 84.00		2.446	0.006		16163510	49.4		105	140532	Ω
D 14 13C4 PFO		2.440	0.000		10103310	47.4		103	140002	O
417.00 > 372.00		2.783	-0.001		12504504	54.3		109	532215	
717.00 / 372.00	2.102	2.703	-0.00 I		12304304	34.3		107	552215	

Data File:	\\Chr	omNa\S	acramen	to\Chrom	Data\A8_N\201	61215-3788	1.b\15DEC2016B_0	004.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooct	annic ac	rid.								
413.00 > 369.00		2.783	-0.001	1.000	145696	0.5807		116	1257	
413.00 > 169.00		2.783	0.007	1.003	87089		1.67(0.90-1.10)	116	4416	
13 Perfluorohe	ptanesul	fonic Ac	id							
449.00 > 80.00	•	2.790		1.000	134982	0.4770		100		
18 Perfluorooct	ane sulf	onic aci	d							M
499.00 > 80.00		3.118	0.033	1.000	116569	0.4564		98.4	7996	M
499.00 > 99.00	3.159	3.118	0.041	1.003	24244		4.81(0.90-1.10)	98.4	1329	M
D 17 13C4 PFO										
503.00 > 80.00		3.151	0.0		12276070	49.3		103	112800	19
D 19 13C5 PFN/		0.450	0.007		0.455.400	F0.0		407	500740	
468.00 > 423.00		3.153	0.006		9455492	53.2		106	520740)
20 Perfluorono			0.004	1 000	000//	0.5004		100	1240	
463.00 > 419.00		3.155	0.004	1.000	90066	0.5004		100	1349	
D 21 13C8 FOSA 506.00 > 78.00		3.488	0.002		20355431	53.0		106	727464	
22 Perfluorooct					20333431	33.0		100	727404	
498.00 > 78.00		3.491		1.000	195749	0.5155		103	25454	
24 Perfluorode			0.00.		.,.,,	0.0.00			20.0.	
513.00 > 469.00		3.510	0.005	1.000	82137	0.5166		103	2772	
D 23 13C2 PFD/	Д									
515.00 > 470.00		3.513	0.002		8422718	53.5		107	284895	,
26 Perfluorode	cane Su	lfonic ac	id							
599.00 > 80.00	3.826	3.822	0.004	1.000	69270	0.4619		95.8		
28 Perfluoround	decanoi	c acid								
563.00 > 519.00	3.834	3.839	-0.005	1.000	65000	0.5350		107	1918	
D 27 13C2 PFU										
565.00 > 520.00		3.842	0.001		6352135	54.2		108	398643	}
D 30 13C2 PFD										
615.00 > 570.00		4.132	0.002		5815120	52.4		105	205155	ì
29 Perfluorodo			0.005	1 000	50007	0.4047			1001	M
613.00 > 569.00		4.136	0.005	1.000	52807	0.4946		98.9	1204	M
31 Perfluorotrid			0.004	1 000	E2220	0.5055		101	1054	
663.00 > 619.00		4.400	0.004	1.000	53320	0.5055		101	1256	
D 32 13C2-PFT6 715.00 > 670.00		4.641	0.002		11956257	52.6		105	663687	,
			0.002		11730237	32.0		103	003007	
33 Perfluoroteti 712.50 > 668.90		4.642	0.001	1.000	98521	0.5345		107	1284	
713.00 > 169.00		4.642	-0.009	0.998	17902	0.5545	5.50(0.00-0.00)	107	7022	
D 34 13C2-PFH				2.1.70	, 		(2.20 0.00)		·	
815.00 > 770.00		5.057	0.001		6574607	52.8		106	132486)
35 Perfluorohe										
813.00 > 769.00		5.059		1.000	125860	0.5899		118	92.5	
36 Perfluorooct	adecano	oic acid								
913.00 > 869.00			-0.001	1.000	61549	0.5136		103	54.0	

Report Date: 16-Dec-2016 14:34:12 Chrom Revision: 2.2 05-Dec-2016 12:37:22

QC Flag Legend Review Flags

M - Manually Integrated

Reagents:

LCPFC-L1_00022 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:12 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: 15-Dec-2016 12:29:18 **Injection Date:** Instrument ID: A8_N Lims ID: IC L1 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 56 (000001X) (000001X) (0001X) ∑35• ∑32-≻28 24 24 21 16 16 14 2.2 1.7 1.3 1.9 1.0 1.6 1.4 2.0 1.0 1.6 2.2 2.5 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 96 59 36- 84 684 672 630-630-051- ×43- ∑₂₄ ×60 -35 ≻₄₈-18 27 36 12 19 24 11 12 1.9 1.9 1.7 2.0 1.6 1.6 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 48 49 760 (32 (00036 (30 (30 042 036 000 35 × >28 ×30-**≻24** ≻₂₄-18 18 12 12 2.0 1.8 2.1 2.4 2.7 2.0 2.6 2.3 1.5 1.4 3.2 12 Perfluoroheptanoic acid (M) 9 Perfluorohexanesulfonic acid (M) D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 56 000048- 000040 × 63 (0001 ×)28-654- ×45 ≻₃₆-21 24 27 14 16 18 0 0 1.9 2.0 2.3 1.8 2.1 Page 506 of 809 2.7 3.0 1.3 2.5 3.1 2.6

3.4

3.7

3.1

3.4

3.7

20-

3.1

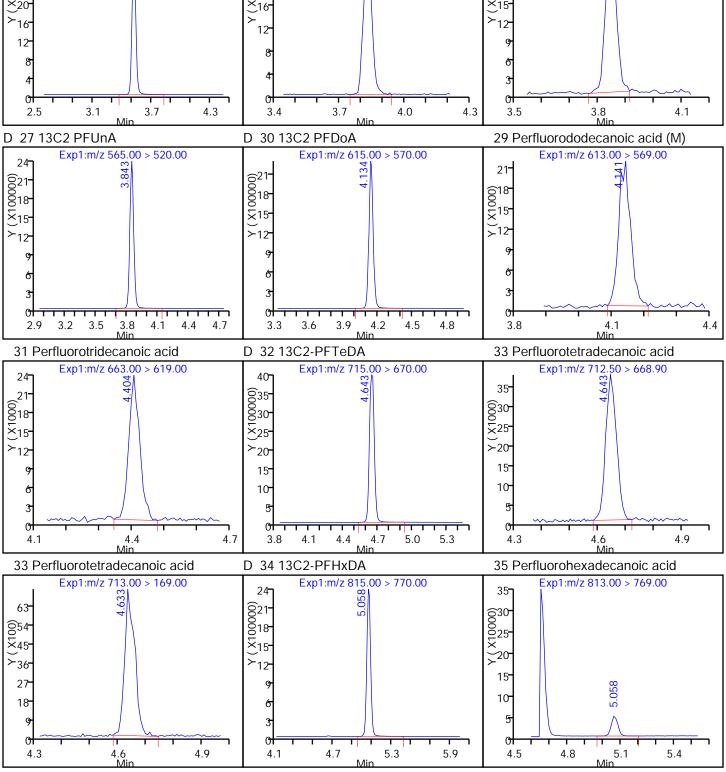
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2.4

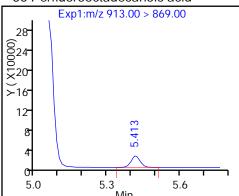
3.0

3.6

4.2



36 Perfluorooctadecanoic acid



TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d

Injection Date: 15-Dec-2016 12:29:18 Instrument ID: A8_N

Lims ID: IC L1

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

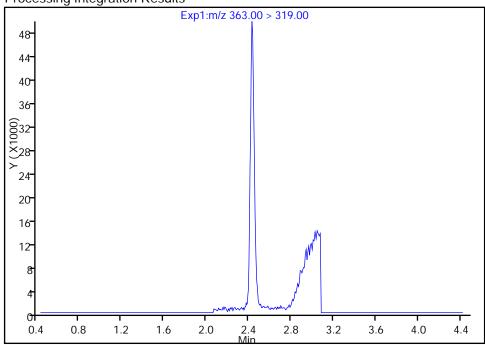
12 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

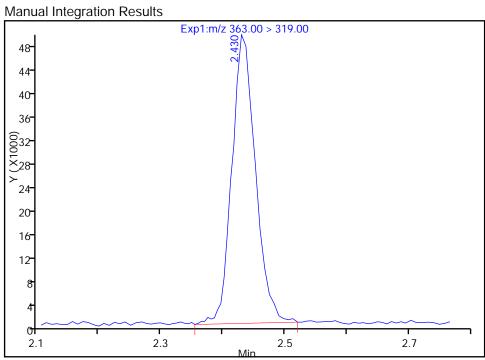
Not Detected

Expected RT: 2.43

Processing Integration Results



RT: 2.43
Area: 129104
Amount: 0.538766
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:48:59

Audit Action: Manually Integrated

Audit Reason: Assign Peak

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d

Injection Date: 15-Dec-2016 12:29:18 Instrument ID: A8_N

Lims ID: IC L1

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

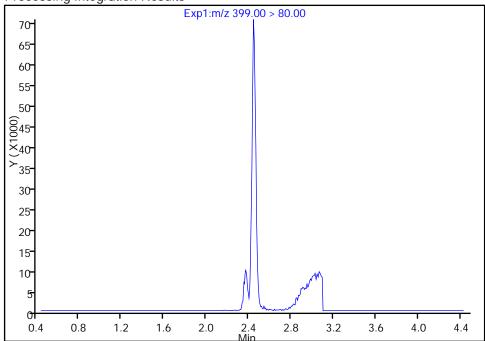
9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

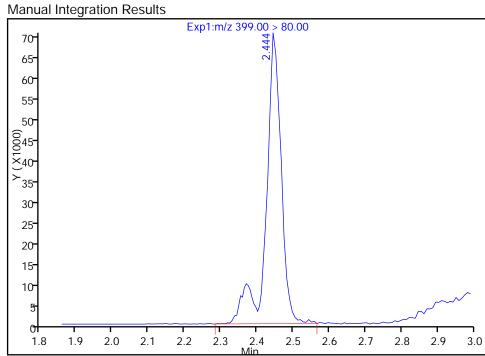
Not Detected

Expected RT: 2.43

Processing Integration Results



RT: 2.44
Area: 204063
Amount: 0.579783
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:48:59

Audit Action: Manually Integrated

Audit Reason: Assign Peak

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TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d

Injection Date: 15-Dec-2016 12:29:18 Instrument ID: A8_N

Lims ID: IC L1

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

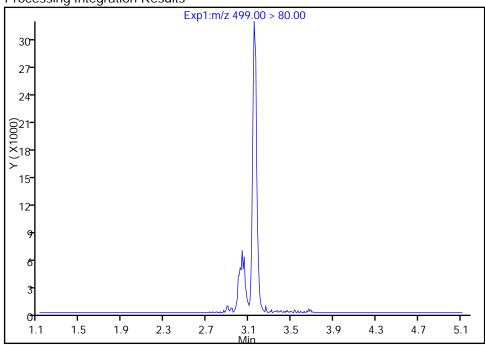
18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

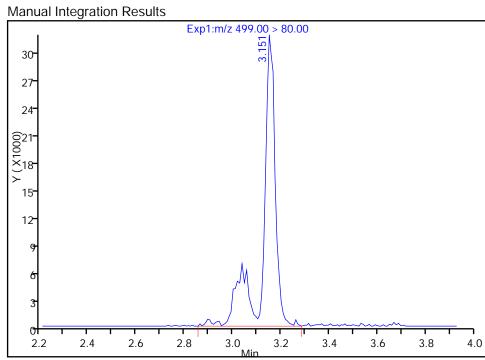
Not Detected

Expected RT: 3.12

Processing Integration Results



RT: 3.15
Area: 116569
Amount: 0.456423
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:48:59

Audit Action: Manually Integrated

Audit Reason: Assign Peak

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TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d

Injection Date: 15-Dec-2016 12:29:18 Instrument ID: A8_N

Lims ID: IC L1

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

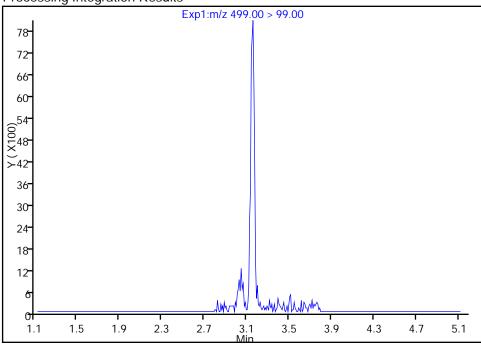
18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

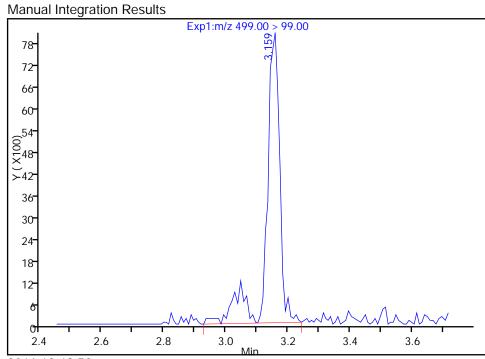
Not Detected

Expected RT: 3.12

Processing Integration Results



RT: 3.16 Area: 24244 Amount: 0.456423 Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:48:59

Audit Action: Manually Integrated

Audit Reason: Assign Peak

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TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d

Injection Date: 15-Dec-2016 12:29:18 Instrument ID: A8_N

Lims ID: IC L1

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

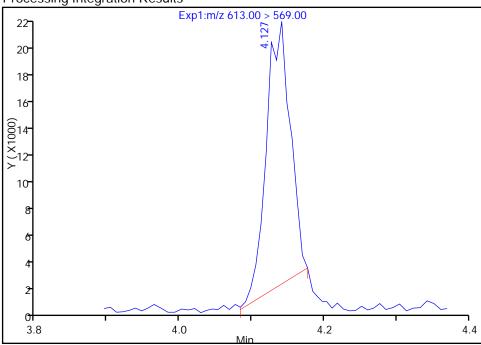
Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

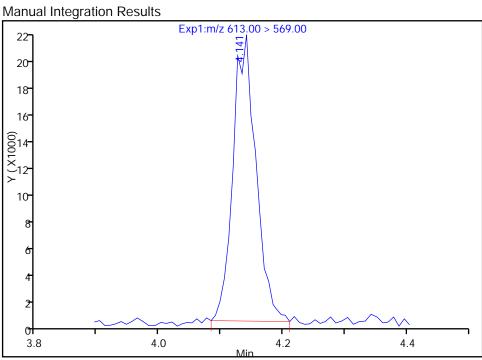
29 Perfluorododecanoic acid, CAS: 307-55-1

Signal: 1

RT: 4.13 Area: 43489 Amount: 0.419548 Amount Units: ng/ml **Processing Integration Results**



RT: 4.14
Area: 52807
Amount: 0.494620
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:48:59

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

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Report Date: 16-Dec-2016 14:34:16 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_005.d

Lims ID: IC L2

Client ID:

Sample Type: IC Calib Level: 2

Inject. Date: 15-Dec-2016 12:36:48 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L2_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:15 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:50:02

_ :	inst Edver Neviewer: enandraserias			Bate.		10 DCC 2010 10.00.0					
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
ſ	D 2 13C4 PFBA										
	217.00 > 172.00		1.534	-0.004		18201393	52.3		105	100029	1
	1 Perfluorobuty	yric acid									
	212.90 > 169.00	1.530	1.535	-0.005	1.000	310647	1.00		100.0	2583	
	O 4 13C5-PFPe										
	267.90 > 223.00		1.810	-0.005		14067714	52.9		106	109344	7
	3 Perfluoropen			0.005	1 000	007570	4.04		101	0005	
	262.90 > 219.00		1.810	-0.005	1.000	287573	1.04		104	2935	
	5 Perfluorobuta 298.90 > 80.00		nic acid 1.848	-0.004	1.000	424227	0.8800		99.5		
	298.90 > 80.00 298.90 > 99.00			-0.004	1.000	171864	0.8800	2.47(0.00-0.00)	99.5 99.5		
	7 Perfluorohex										
	313.00 > 269.00			-0.004	1.000	239458	1.01		101	6854	
[O 6 13C2 PFHx	Α									
	315.00 > 270.00	2.092	2.097	-0.005		12814780	52.3		105	582538	
	D 11 13C4-PFH _I										
	367.00 > 322.00	2.423	2.426	-0.003		12248222	54.1		108	431068	
	12 Perfluorohe				1 000	007704	0.00		00.4	1001	
	363.00 > 319.00			0.002	1.000	237734	0.99		99.1	1884	
	9 Perfluorohex 399.00 > 80.00		onic acid 2.431	0.014	1.000	348475	0.99		109		
	399.00 > 60.00 D 10 18O2 PFH:		2.431	0.014	1.000	346475	0.99		109		
	403.00 > 84.00		2 446	-0.001		16093048	49.2		104	960828	
	D 14 13C4 PFO		2.110	3.001		.0070010	17.2		101	,00020	
	417.00 > 372.00		2.783	-0.002		12627691	54.8		110	657205	

Data File:	\\Chrc	mNa\Sa	acrament	to\Chrom	Data\A8_N\201	61215-3788	1.b\15DEC2016B_0	005.d		
		EXP	DLT	REL		Amount				
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctan		id								
413.00 > 369.00 2.		2.783	-0.002	1.000	254861	1.01		101	2003	
413.00 > 169.00 2.				1.000	159259		1.60(0.90-1.10)	101	7007	
13 Perfluorohepta				1 000	2/5702	0.0054		07.0		
449.00 > 80.00 2.		2.790		1.000	265783	0.9254		97.2		
18 Perfluorooctan 499.00 > 80.00 3.		onic acio 3.118	d 0.031	1.000	220370	0.8502		91.6	15877	M M
499.00 > 99.00 3.		3.118	0.031	1.003	52990	0.0302	4.16(0.90-1.10)	91.6	5530	M
D 17 13C4 PFOS										
503.00 > 80.00 3.	149	3.151	-0.002		12459383	50.1		105	110546	7
D 19 13C5 PFNA										
468.00 > 423.00 3.	149	3.153	-0.004		9537045	53.7		107	472742	
20 Perfluorononar	noic a	cid								
463.00 > 419.00 3.	157	3.155	0.002	1.000	188341	1.04		104	2906	
D 21 13C8 FOSA										
506.00 > 78.00 3.	489	3.488	0.001		20238792	52.7		105	766772	
22 Perfluorooctan										
498.00 > 78.00 3.	489	3.491	-0.002	1.000	381363	1.01		101	46576	
24 Perfluorodecar			0.004	1 000	45557	0.071/		07.0	F040	
513.00 > 469.00 3.	506	3.510	-0.004	1.000	155537	0.9716		97.2	5243	
D 23 13C2 PFDA 515.00 > 470.00 3.	E11	3.513	0.001		8480447	53.9		108	439565	
					0400447	55.9		100	437303	
26 Perfluorodecar 599.00 > 80.00 3.		3.822	0.002	1.000	139829	0.9186		95.3		
28 Perfluorounded			0.002	1.000	107027	0.7100		70.0		
563.00 > 519.00 3.			-0.006	1.000	119189	1.00		100	2937	
D 27 13C2 PFUnA										
565.00 > 520.00 3.	842	3.842	0.0		6219248	53.0		106	280274	
D 30 13C2 PFDoA										
615.00 > 570.00 4.	133	4.132	0.001		5822114	52.5		105	270055	
29 Perfluorododeo	canoic	acid								
613.00 > 569.00 4.	133	4.136	-0.003	1.000	103481	0.9681		96.8	2745	
31 Perfluorotridec	anoic	acid								
663.00 > 619.00 4.	396	4.400	-0.004	1.000	109461	1.04		104	2155	
D 32 13C2-PFTeDA										
715.00 > 670.00 4.		4.641	-0.008		11885446	52.3		105	710542	
33 Perfluorotetrad										
712.50 > 668.90 4.		4.642	0.001	1.000	187123	1.01	E 04 (0 00 0 00)	101	2896	
713.00 > 169.00 4.		4.042	-0.009	0.998	31916		5.86(0.00-0.00)	101	12057	
D 34 13C2-PFHxD/ 815.00 > 770.00 5.		5 057	-0.010		6699329	53.8		108	126940	
			-0.010		0077327	55.0		100	120740	
35 Perfluorohexac 813.00 > 769.00 5.		oic acid 5.059	-0 001	1.000	173261	1.01		101	135	
36 Perfluorooctad			0.001	1.000	170201	1.01		.01	.55	
913.00 > 869.00 5.		5.414	-0.001	1.000	114997	0.9585		95.8	91.0	
713.00 / 007.00 5.	413	J.4 I4	-0.001	1.000	11477/	0.7000		70.0	7 I.U	

Report Date: 16-Dec-2016 14:34:16 Chrom Revision: 2.2 05-Dec-2016 12:37:22

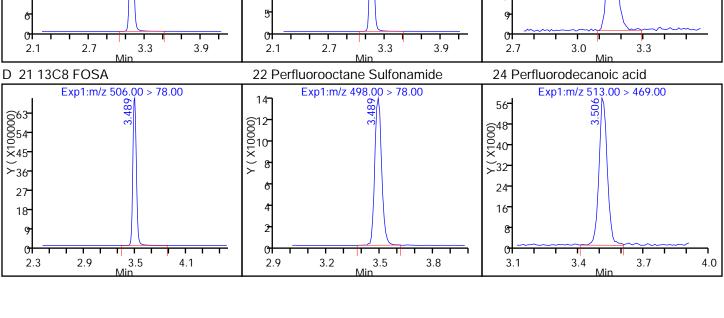
QC Flag Legend Review Flags

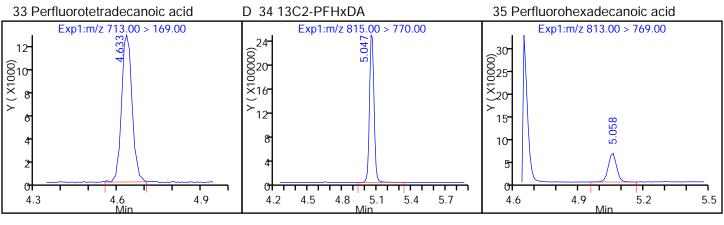
M - Manually Integrated

Reagents:

LCPFC-L2_00023 Amount Added: 1.00 Units: mL

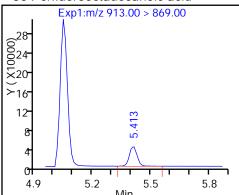
Report Date: 16-Dec-2016 14:34:16 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 15-Dec-2016 12:36:48 Instrument ID: A8_N Lims ID: IC L2 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 Y (X10000) (56⁻ 00048⁻ ∑40 \times 35 ≻28 24 21 16 1.9 1.7 1.0 1.3 1.6 1.1 1.4 2.0 1.2 1.5 1.8 2.1 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298,90 > 99.00 12 80 18 70 7 (X10000) 0015 ×12 660 660 ×50 ≻₄₀-30 20 10 1.5 1.8 2.4 1.8 2.1 1.9 1.2 2.1 1.5 1.6 D 11 13C4-PFHpA 7 Perfluorohexanoic acid D 6 13C2 PFHxA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 42 84 042 0036 X30-©72 ×60 ×30 <u>~</u>24 >48 18 36 18 12 24 12 12 2.0 1.8 2.1 2.7 1.9 2.2 2.3 1.5 2.4 2.5 2.8 3.1 1.6 1.7 12 Perfluoroheptanoic acid 9 Perfluorohexanesulfonic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 12 56 84 00048 00048 ×40 (X10000) 8 ©72 ×60 _32 -48 24 36 16 24 12 0 0 2.4 2.7 1.8 2.1 Page 51/8h of 809^{2.7} 3.0 1.8 2.1 2.4 2.7 2.1 1.5 3.0





Report Date: 16-Dec-2016 14:34:16 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File: $\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_005.d$

36 Perfluorooctadecanoic acid



TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_005.d

Injection Date: 15-Dec-2016 12:36:48 Instrument ID: A8_N

Lims ID: IC L2

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

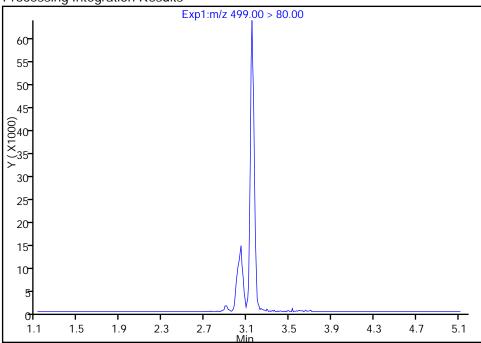
18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

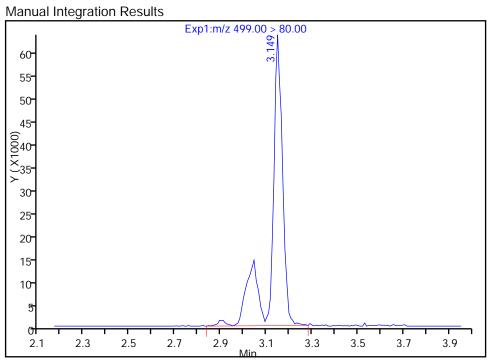
Not Detected

Expected RT: 3.12

Processing Integration Results



RT: 3.15
Area: 220370
Amount: 0.850158
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:50:02

Audit Action: Manually Integrated

Audit Reason: Assign Peak

Page 522 of 809

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_005.d

Injection Date: 15-Dec-2016 12:36:48 Instrument ID: A8_N

Lims ID: IC L2

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

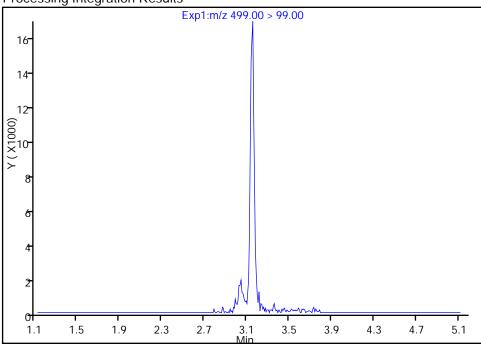
Column: Detector EXP1

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

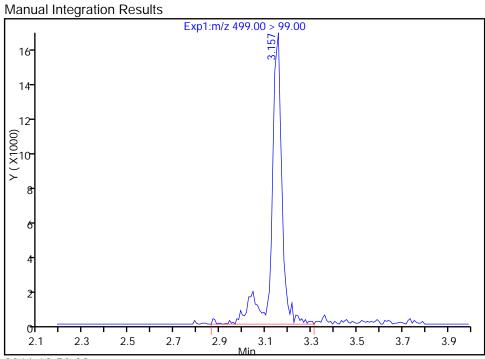
Signal: 2

Not Detected Expected RT: 3.12

Processing Integration Results



RT: 3.16
Area: 52990
Amount: 0.850158
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:50:02

Audit Action: Manually Integrated

Audit Reason: Assign Peak Page 523 of 809 Report Date: 16-Dec-2016 14:34:19 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_006.d

Lims ID: IC L3

Client ID:

Sample Type: IC Calib Level: 3

Inject. Date: 15-Dec-2016 12:44:16 ALS Bottle#: 39 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L3_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:18 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:50:22

iist Eevel Neviewell Ghaharasenas			Date: 10 Dec 2010			100.EE				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00		1.534	0.0		18037108	51.9		104	828248	
1 Perfluorobuty	yric acid									
212.90 > 169.00	1.534	1.535	-0.001	1.000	1550440	5.03		101	13427	
D 4 13C5-PFPe	A									
267.90 > 223.00	1.810	1.810	0.0		14063070	52.9		106	107869	7
3 Perfluoropen										
262.90 > 219.00		1.810		1.000	1358239	4.89		97.9	15178	
5 Perfluorobuta										
298.90 > 80.00 298.90 > 99.00		1.848 1.848	0.001 0.001	1.000 1.000	2211602	4.55	2.41(0.00-0.00)	103 103		
			0.001	1.000	918055		2.41(0.00-0.00)	103		
7 Perfluorohex 313.00 > 269.00		2.096	0.001	1.000	1183286	5.01		100	39266	
D 6 13C2 PFHx		2.070	0.001	1.000	1100200	3.01		100	37200	
315.00 > 270.00		2.097	0.0		12709919	51.9		104	753338	
D 11 13C4-PFH _I										
367.00 > 322.00		2.426	-0.001		12260528	54.2		108	1467079	9
12 Perfluorohe	otanoic a	acid								
363.00 > 319.00	2.432	2.428	0.004	1.000	1175112	4.90		97.9	8914	
9 Perfluorohex	anesulfo	nic acid	I							
399.00 > 80.00	2.364	2.431	-0.067	1.000	1543002	4.37		96.0		
D 10 18O2 PFH	xS									
403.00 > 84.00		2.446	0.001		16222736	49.6		105	651458	
D 14 13C4 PFO						_				
417.00 > 372.00	2.783	2.783	0.0		12635065	54.8		110	746410	

Data File:	\\Chr	omNa\S	acrament	to\Chrom	Data\A8_N\201	61215-3788	1.b\15DEC2016B_(006.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
			101	101	rtosponso	119/1111	rtatio(Eirinto)	701100	Ont	riago
15 Perfluorooct 413.00 > 369.00		2.783	0.0	1.000	1239541	4.89		97.8	9812	
413.00 > 369.00		2.783	0.0	1.000	731249	4.09	1.70(0.90-1.10)	97.8 97.8	28264	
13 Perfluorohe					, 5 . 2 . ,			77.0		
449.00 > 80.00	-	2.790	0.002	1.000	1351160	4.69		98.6		
18 Perfluorooct	tane sulf	onic aci	d							
499.00 > 80.00	3.153	3.118	0.035	1.000	1150410	4.43		95.5	65030	
499.00 > 99.00	3.153	3.118	0.035	1.000	246751		4.66(0.90-1.10)	95.5	15530	
D 17 13C4 PFO										
503.00 > 80.00		3.151	0.002		12484772	50.2		105	473035	
D 19 13C5 PFN		0.450	0.0		0777/00	FF 0		110	(50004	
468.00 > 423.00		3.153	0.0		9777609	55.0		110	653324	
20 Perfluorono 463.00 > 419.00			-0.002	1.000	902512	4.85		97.0	13825	
D 21 13C8 FOS		5.155	-0.002	1.000	702312	4.03		77.0	13023	
506.00 > 78.00		3.488	-0.004		20034933	52.2		104	309657	
22 Perfluorooct										
498.00 > 78.00		3.491	0.001	1.000	1989314	5.32		106	140153	
24 Perfluorode	canoic a	cid								
513.00 > 469.00	3.509	3.510	-0.001	1.000	771905	4.97		99.3	27905	
D 23 13C2 PFD	A									
515.00 > 470.00	3.509	3.513	-0.004		8234678	52.3		105	259288	
26 Perfluorode										
599.00 > 80.00			-0.003	1.000	712852	4.67		97.0		
28 Perfluoroun			0.000	1 000	F 40700	4.50		01.0	14017	
563.00 > 519.00		3.839	-0.002	1.000	549708	4.59		91.8	14816	
D 27 13C2 PFU ₁ 565.00 > 520.00		3.842	0.003		6262617	53.4		107	379922	
D 30 13C2 PFD		3.042	0.003		0202017	55.4		107	317722	
615.00 > 570.00		4.132	-0.003		5779875	52.1		104	227122	
29 Perfluorodo			0.000		0	02				
613.00 > 569.00		4.136	0.0	1.000	506369	4.77		95.4	11299	
31 Perfluorotrio	decanoic	acid								
663.00 > 619.00	4.398	4.400	-0.002	1.000	525090	5.01		100	10475	
D 32 13C2-PFT	eDA									
715.00 > 670.00	4.645	4.641	0.004		12248242	53.9		108	104927	4
33 Perfluoroteti	radecan									
712.50 > 668.90		4.642	0.003	1.000	900575	4.92	(0 1 (0 0 0 0 0 0)	98.3	12522	
713.00 > 169.00		4.642	-0.007	0.998	149199		6.04(0.00-0.00)	98.3	58819	
D 34 13C2-PFH:		F 0F7	0.000		/ F 42072	F2 F		105	140/05	
815.00 > 770.00		5.057	0.002		6542972	52.5		105	140605	
35 Perfluorohe: 813.00 > 769.00		oic acid 5.059		1.000	599529	4.89		97.7	502	
36 Perfluorooct			0.0	1.000	377327	7.07		71.1	302	
913.00 > 869.00			0.0	1.000	583761	4.90		98.0	536	

Report Date: 16-Dec-2016 14:34:19 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC-L3_00020 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:19 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_006.d **Injection Date:** 15-Dec-2016 12:44:16 Instrument ID: A8_N Lims ID: IC L3 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 39 Worklist Smp#: 6 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 56 000048 40 40 0042 ×35 ∑35• -28 ≻28 24 21 21 16 14 1.0 1.9 1.3 1.6 2.2 1.1 1.4 1.7 2.0 1.2 1.5 1.8 2.1 Mir 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 56 40 91 6³⁵ 65-65-×35 ×25 ∑52- ≻₂₈ ≻₂₀ 39 21 15 26 10 13 1.8 1.8 2.1 1.5 2.1 2.4 1.5 1.5 1.8 2.1 1.2 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 315.00 > 270.00 42 760 (42 0036 X30 642 0036 ×30 00036-30-× 24-~24° ≻24 18 18 18 12 12 12 1.9 2.2 2.5 1.8 2.1 2.7 1.9 2.5 1.5 2.4 1.3 3.1 1.6 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 42 56⁻ (00048⁻ (100001) (10001) 642 636 (036 00001 × × × 24 ×30 -32 **≻**24 18 24 18 12 16 12 0 0 2.0 2.3 2.6 2.9 1.8 2.1 2.4 2.7 1.7 1.5 3.0

3.0

2.7

3.3

3.6

3.9

4.2

2.7

3.0

3.3

3.6

3.9

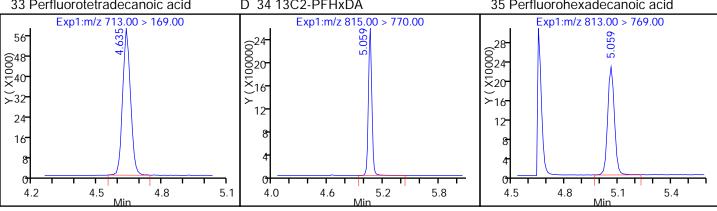
4.2

3.0

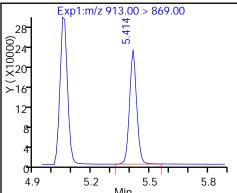
3.3

3.6

3.9



36 Perfluorooctadecanoic acid



Report Date: 16-Dec-2016 14:34:22 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_007.d

Lims ID: IC L4

Client ID:

Sample Type: IC Calib Level: 4

Inject. Date: 15-Dec-2016 12:51:47 ALS Bottle#: 40 Worklist Smp#: 7

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L4_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:21 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:46:14

THIST ECVEL TREVIE	115t Level Neviewer, orialiaraserias				Date.		10 DCC 2010 10.10.1	2010 10:10:11				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags		
D 2 13C4 PFBA	1											
217.00 > 172.00		1.534	0.0		17585378	50.6		101	114097	7		
1 Perfluorobut	vric acid											
212.90 > 169.00	,		-0.001	1.000	6690917	22.3		111	52374			
D 4 13C5-PFPe	eΑ											
267.90 > 223.00	1.810	1.810	0.0		13617158	51.2		102	860552			
3 Perfluoroper	ntanoic a	cid										
262.90 > 219.00	1.810	1.810	0.0	1.000	5770240	21.5		107	61088			
5 Perfluorobut	anesulfo	nic acid										
298.90 > 80.00		1.848	0.001	1.000	9860707	20.5		116				
298.90 > 99.00	1.849	1.848	0.001	1.000	4111615		2.40(0.00-0.00)	116				
7 Perfluorohex												
313.00 > 269.00		2.096	-0.003	1.000	4929766	21.0		105	144495			
D 6 13C2 PFHx												
315.00 > 270.00		2.097	0.005		12608210	51.4		103	627430			
D 11 13C4-PFH	•	0.407			44700004	50.4		404				
367.00 > 322.00			0.0		11788221	52.1		104	459454			
12 Perfluorohe	•		0.000	1 000	47.47744	00.7		400	44470			
363.00 > 319.00				1.000	4747711	20.6		103	44179			
9 Perfluorohex				1 000	((24/20	10.0		104				
399.00 > 80.00		2.431	0.009	1.000	6624638	18.9		104				
D 10 18O2 PFH		2.447	0.007		1/0/27//	40.1		104	(07270			
403.00 > 84.00		2.446	-0.006		16062766	49.1		104	697379			
D 14 13C4 PFO 417.00 > 372.00		2.783	0.002		11818203	51.3		103	403727			
417.00 > 372.00	2.700	2.703	0.002		11010203	31.3		103	403727			

Data File:	\\Chr	mNa\S	acramen [*]	to\Chrom	Data\A8_N\201	61215-3788	1.b\15DEC2016B_(007.d		
Signal	RT	EXP RT	DLT RT	REL RT	Docnanco	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flogs
			KI	KI	Response	rig/iiii	Ratio(Limits)	70 Rec	3/11	Flags
15 Perfluorooct			0.000	1 000	F1007//	21 (100	40000	
413.00 > 369.00 413.00 > 169.00		2.783 2.783	0.002 0.002	1.000 1.000	5109766 3083663	21.6	1.66(0.90-1.10)	108 108	40900 124075	
13 Perfluorohep				1.000	3003003		1.00(0.70 1.10)	100	124073	
449.00 > 80.00			-0.005	1.000	6014021	21.4		112		
18 Perfluoroocta	ane sulf	onic aci	d							
499.00 > 80.00		3.118	0.011	1.000	5058824	20.0		108	109804	
499.00 > 99.00		3.118	0.035	1.008	1125313		4.50(0.90-1.10)	108	92390	
D 17 13C4 PFOS		0 1 5 1	0.000		121020/2	40.0		100	250702	
503.00 > 80.00		3.151	0.002		12183062	49.0		102	250792	
D 19 13C5 PFNA 468.00 > 423.00		3.153	0.0		9236073	52.0		104	341338	
20 Perfluoronor			0.0		7200070	02.0		101	011000	
463.00 > 419.00			-0.002	1.000	3562981	20.3		101	53054	
D 21 13C8 FOSA	4									
506.00 > 78.00	3.484	3.488	-0.004		19703272	51.3		103	612200	
22 Perfluoroocta										
498.00 > 78.00		3.491	0.001	1.000	7990835	21.7		109	298669	
24 Perfluorodeo			0.001	1 000	24//725	20.7		100	04047	
513.00 > 469.00		3.510	-0.001	1.000	3166735	20.6		103	81817	
D 23 13C2 PFDA 515.00 > 470.00		3.513	0.004		8134734	51.7		103	195073	
26 Perfluoroded					0104704	31.7		105	175075	
599.00 > 80.00		3.822	0.005	1.000	3084031	20.7		107		
28 Perfluoround	decanoio	c acid								
563.00 > 519.00	3.844	3.839	0.005	1.000	2420719	20.3		102	65024	
D 27 13C2 PFUn										
565.00 > 520.00		3.842	-0.007		6226562	53.1		106	471162	
D 30 13C2 PFDc					504/000	50 4		405	000045	
615.00 > 570.00		4.132	0.003		5816809	52.4		105	222845	
29 Perfluorodoc 613.00 > 569.00		4.136	-0.001	1.000	2231794	20.9		104	47124	
31 Perfluorotrid			-0.001	1.000	2231794	20.9		104	4/124	
663.00 > 619.00		4.400	-0.002	1.000	2087859	19.8		98.9	37986	
D 32 13C2-PFTe										
715.00 > 670.00		4.641	0.003		11655048	51.3		103	471362	
33 Perfluorotetr	adecan	oic acid								
712.50 > 668.90		4.642	0.002	1.000	3678976	20.0		99.8	48461	
713.00 > 169.00		4.642	-0.007	0.998	596997		6.16(0.00-0.00)	99.8	56132	
D 34 13C2-PFHx		F 0F7	0.000		/225024	F0.0		100	100001	
815.00 > 770.00		5.057	0.002		6335821	50.9		102	120381	
35 Perfluorohex 813.00 > 769.00		oic acid 5.059		1.000	2267892	19.9		99.3	1990	
36 Perfluoroocta			0.0	1.000	2201072	17.7		97.J	1770	
913.00 > 869.00		5.414	-0.001	1.000	2445236	20.4		102	2369	

Report Date: 16-Dec-2016 14:34:22 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC-L4_00024 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:22 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 15-Dec-2016 12:51:47 Instrument ID: A8_N Lims ID: IC L4 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 7 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Limit Group: LC PFC_DOD ICAL Method: $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 56 (000042 X35 534 000048 40 40 ∑28⁻ 24 21 16 14 2.2 1.0 1.6 1.1 1.4 1.7 2.0 1.0 1.3 1.6 1.9 2.2 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.0018 (21⁻ 00018 ×15 00030-036-(00005 X12 2 3 4 9 × ~24 18 12 2.2 1.9 1.8 2.1 1.3 1.6 1.5 1.5 1.8 2.1 D 11 13C4-PFHpA 7 Perfluorohexanoic acid D 6 13C2 PFHxA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 42 (0000015-X12 42 (000001X 30-30-00030- \. \. 24 18 18 12 12 1.8 2.1 2.0 2.3 2.6 1.8 2.1 2.4 3.0 1.5 2.4 1.4 1.7 2.7 12 Perfluoroheptanoic acid 9 Perfluorohexanesulfonic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399,00 > 80.00 Exp1:m/z 403.00 > 84.00 18 21 56- (00005 X) 000015 X 049 042 ×35 ≻28 21 0| 0 1.9 2.2 2.5 2.8 1.9 2.2 2.5 2.8 Page 584h of 809 3.1 1.8 2.1 2.4 2.7 1.6 3.0

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3.6

4.2

2.8

3.1

Page 536 of 809

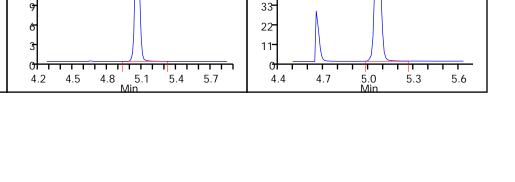
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4.1

4.4

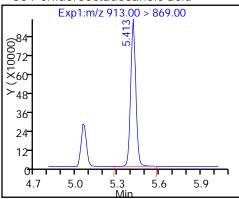
4.7

5.0



Report Date: 16-Dec-2016 14:34:22 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File: $\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_007.d$

36 Perfluorooctadecanoic acid



Report Date: 16-Dec-2016 14:34:25 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_008.d

Lims ID: IC L5

Client ID:

Sample Type: IC Calib Level: 5

Inject. Date: 15-Dec-2016 12:59:16 ALS Bottle#: 41 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L5_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:24 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:51:06

	Thist Edver Reviewer, charlandsends				Bate.		0 200 2010 10.01.0				
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1	D 2 13C4 PFBA								•		
	217.00 > 172.00		1.534	-0.001		17274187	49.7		99.4	927175	
	1 Perfluorobuty	yric acid									
	212.90 > 169.00	1.533	1.535	-0.002	1.000	15411527	52.3		105	124871	
[O 4 13C5-PFPe	·Α									
	267.90 > 223.00	1.810	1.810	0.0		13053659	49.1		98.1	126110	4
	3 Perfluoropen										
	262.90 > 219.00		1.810	0.0	1.000	13161065	51.1		102	158308	
	5 Perfluorobuta				4 000	0.1550000	47.4		407		
	298.90 > 80.00 298.90 > 99.00		1.848 1.848	0.0	1.000 1.000	21559838 10128422	47.1	2.13(0.00-0.00)	107 107		
				0.0	1.000	10128422		2.13(0.00-0.00)	107		
	7 Perfluorohex 313.00 > 269.00		2.096	0.002	1.000	11507044	50.0		99.9	330809	
	O 6 13C2 PFHx		2.070	0.002	1.000	11307044	30.0		77.7	330007	
	315.00 > 270.00		2.097	0.001		12399280	50.6		101	688050	
	D 11 13C4-PFH _I										
	367.00 > 322.00		2.426	-0.002		10801604	47.7		95.4	530896	
	12 Perfluorohe	otanoic a	acid								
	363.00 > 319.00	2.424	2.428	-0.004	1.000	10799449	51.1		102	85838	
	9 Perfluorohex	anesulfo	nic acid								
	399.00 > 80.00	2.446	2.431	0.015	1.000	15253691	45.8		101		
[D 10 18O2 PFH	xS									
	403.00 > 84.00	2.446	2.446	0.0		15278828	46.7		98.8	104673	7
	D 14 13C4 PFO										
	417.00 > 372.00	2.782	2.783	-0.001		11142777	48.4		96.7	755641	

Report Date: 16-Dec-2016 14:34:25 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Data File: \ChromNa\Sacramento\ChromData\A8 N\20161215-37881 b\15DEC2016B 008 d

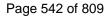
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_008.d										
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooct	tanoic ac	·id					•			
413.00 > 369.00		2.783	-0.001	1.000	11435583	51.2		102	92940	
413.00 > 169.00	2.782	2.783	-0.001	1.000	6849991		1.67(0.90-1.10)	102	293728	
13 Perfluorohe	ptanesul	fonic Ac	cid							
449.00 > 80.00	2.791	2.790	0.001	1.000	13639927	49.5		104		
18 Perfluorooct										
499.00 > 80.00		3.118	0.033	1.000	11741891	47.2	4.4/(0.00.1.10)	102	399791	
499.00 > 99.00		3.118	0.033	1.000	2632984		4.46(0.90-1.10)	102	139087	
D 17 13C4 PFO: 503.00 > 80.00		3.151	0.0		11946650	48.0		100	237614	
D 19 13C5 PFN		5.151	0.0		11740030	40.0		100	237014	
468.00 > 423.00		3.153	-0.002		8581504	48.3		96.6	574194	
20 Perfluorono										
463.00 > 419.00			-0.004	1.000	8246252	50.5		101	123521	
D 21 13C8 FOS	Α									
506.00 > 78.00	3.490	3.488	0.002		18804188	49.0		97.9	642404	
22 Perfluorooct	tane Sul	fonamid	е							
498.00 > 78.00	3.490	3.491	-0.001	1.000	17736944	50.6		101	676782	
24 Perfluorode										
513.00 > 469.00		3.510	-0.003	1.000	7324495	50.6		101	172410	
D 23 13C2 PFD		0.540	0.000		7/740/4	40.0		07.5	040004	
515.00 > 470.00			0.003		7671861	48.8		97.5	212001	
26 Perfluorode 599.00 > 80.00			-0.004	1.000	7241868	49.6		103		
28 Perfluoroun			-0.004	1.000	7241000	47.0		103		
563.00 > 519.00		3.839	0.005	1.000	5437764	50.3		101	105822	
D 27 13C2 PFUi		0.007	0.000		0.0770.	00.0			.000	
565.00 > 520.00		3.842	0.002		5657823	48.3		96.5	259964	
D 30 13C2 PFD	οA									
615.00 > 570.00	4.135	4.132	0.003		5404154	48.7		97.4	211794	
29 Perfluorodo	decanoi	c acid								
613.00 > 569.00	4.135	4.136	-0.001	1.000	5072994	51.1		102	98593	
31 Perfluorotric										
663.00 > 619.00		4.400	-0.002	1.000	4950651	50.5		101	84213	
D 32 13C2-PFT			0.004		40050500	40.0		04.0	E0.400E	
715.00 > 670.00		4.641	0.004		10950502	48.2		96.3	504805	
33 Perfluorotetradecanoic acid 712.50 > 668.90 4.645 4.642 0.003 1.000 8645519						FO F		101	1450/2	
712.50 > 668.90 713.00 > 169.00		4.642	0.003 -0.007	1.000 0.998	8645519 1380699	50.5	6.26(0.00-0.00)	101 101	145963 249413	
D 34 13C2-PFH		4.042	-0.007	0.770	1300077		0.20(0.00-0.00)	101	247413	
815.00 > 770.00		5.057	0.002		6027362	48.4		96.8	112750	
35 Perfluorohe								· - ·	33	
813.00 > 769.00		5.059		1.000	5318207	51.0		102	4484	
36 Perfluorooct	tadecand	oic acid								
913.00 > 869.00			-0.001	1.000	5869666	52.7		105	5549	

Report Date: 16-Dec-2016 14:34:25 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:25 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 15-Dec-2016 12:59:16 Instrument ID: A8_N Lims ID: IC L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 8 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Limit Group: LC PFC_DOD ICAL Method: $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 56 49 049 042 000042 X 35 8 235 \times_{35} ²⁸ <u></u>∠28 ≻₂₈-21 21 21 14 1.0 1.3 1.6 1.9 2.2 8.0 1.1 1.4 1.7 2.0 1.2 1.5 1.8 2.1 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 42 (77- 00042 35 (000001 X1000000 30--55- ∑28- **≻44** 18 21 33 12 22 11 1.7 2.0 1.8 2.1 1.4 2.3 1.8 2.1 1.1 1.5 1.5 D 11 13C4-PFHpA 7 Perfluorohexanoic acid D 6 13C2 PFHxA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 40 42 (35-0030-1×25-035- <u>830</u>-×24-×25 ≻₂₀ ≻20 18 15 12 10 10 2.0 2.0 2.3 2.6 2.1 2.4 1.7 2.3 2.6 1.4 1.7 1.8 2.7 3.0 1.4 12 Perfluoroheptanoic acid 9 Perfluorohexanesulfonic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 (000001X 30⁴² (35-0030-1×25-(49⁻ 0042⁻ ×35⁻ -20 ≻28 15 18 21 12 10 14 0 0 1.8 2.1 2.4 2.7 Page 54/1nof 809 2.0 2.3 2.6 2.9 1.5 3.0 2.0 3.2 1.7 1.4 2.6



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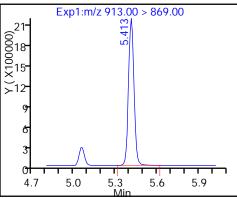
5.4

4.3

4.6

Report Date: 16-Dec-2016 14:34:25 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File: $\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_008.d$

36 Perfluorooctadecanoic acid



Report Date: 16-Dec-2016 14:34:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_009.d

Lims ID: IC L6

Client ID:

Sample Type: IC Calib Level: 6

Inject. Date: 15-Dec-2016 13:06:46 ALS Bottle#: 42 Worklist Smp#: 9

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L6_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:27 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:51:28

	That Edvar Reviewor, and large las				Bate.		10 000 2010 10:01:2				
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1	D 213C4 PFBA										
	217.00 > 172.00		1.534	0.003		14961055	43.0		86.0	920014	
	1 Perfluorobuty	vric acid									
	212.90 > 169.00	,	1.535	0.002	1.000	42763611	167.4		83.7	246189	
ı	D 4 13C5-PFPe	A									
	267.90 > 223.00	1.813	1.810	0.003		10898820	41.0		81.9	100702	5
	3 Perfluoropen	itanoic a	cid								
	262.90 > 219.00	1.813	1.810	0.003	1.000	34291076	159.4		79.7	297823	
	5 Perfluorobuta	anesulfo	nic acid								
	298.90 > 80.00		1.848	0.004	1.000	50724469	130.5		73.8		
	298.90 > 99.00		1.848	-0.006	0.995	28243355		1.80(0.00-0.00)	73.8		
	7 Perfluorohex										
	313.00 > 269.00		2.096	0.0	1.000	33223923	172.9		86.4	549724	
	D 6 13C2 PFHx		0 007	0.004		10015100	40.0			500001	
	315.00 > 270.00		2.097	-0.001		10345480	42.2		84.4	508201	
	D 11 13C4-PFH		2.427	0.0		05/4005	27.0		75 7	407707	
	367.00 > 322.00		2.426	0.0		8564025	37.8		75.7	487796	
	12 Perfluorohe; 363.00 > 319.00			0.002	1.000	30234194	180.3		90.2	213534	
					1.000	30234194	100.3		90.2	213334	
	9 Perfluorohex 399.00 > 80.00		2.431	0.013	1.000	46223186	163.6		89.9		
	3 9 9 .00 > 60 .00 D 10 1802 PFH)		2.431	0.013	1.000	40223100	103.0		07.7		
	403.00 > 84.00		2 446	-0.002		12974829	39.7		83.9	628886	
	403.00 > 64.00 D 14 13C4 PFO		2,740	-0.002		12714027	37.1		03.7	020000	
	417.00 > 372.00		2.783	0.0		8380251	36.4		72.8	402245	
	117.00 > 372.00	2.700	2.700	0.0		0000201	30.4		72.0	1022-10	

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_009.d										
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
			KI	KI	Response	rig/iiii	Ratio(Littits)	70 KeC	3/11	riays
15 Perfluorooct			0.0	1 000	20704207	100.1		01 5	220101	
413.00 > 369.00 413.00 > 169.00		2.783 2.783	0.0	1.000 1.000	30784387 20338648	183.1	1.51(0.90-1.10)	91.5 91.5	229181 70063	
13 Perfluorohe				1.000	20330040		1.51(0.70-1.10)	71.5	70003	
449.00 > 80.00		2.790	0.001	1.000	38459925	166.5		87.5		
18 Perfluorooct	ane sulf	onic aci	d							
499.00 > 80.00	2.977	3.118	-0.141	1.000	40073141	192.2		104	5896	
499.00 > 99.00	3.152	3.118	0.034	1.059	9632026		4.16(0.90-1.10)	104	407968	
D 17 13C4 PFO										
503.00 > 80.00		3.151	0.001		10019454	40.3		84.2	105595	
D 19 13C5 PFN/ 468.00 > 423.00		3.153	-0.001		6718354	37.8		75.6	515582	
			-0.001		0710334	37.0		73.0	313362	
20 Perfluoronoi 463.00 > 419.00		3.155	0.005	1.000	24793148	193.9		96.9	307568	
D 21 13C8 FOS		0.100	0.000	1.000	21770110	170.7		, 0. ,	007000	
506.00 > 78.00		3.488	0.003		16105707	41.9		83.9	486146	
22 Perfluorooct	ane Sul	fonamid	е							
498.00 > 78.00	3.491	3.491	0.0	1.000	47803717	159.1		79.6	542400	
24 Perfluorodeo	canoic a	cid								
513.00 > 469.00	3.516	3.510	0.006	1.000	22616781	191.8		95.9	376094	
D 23 13C2 PFD										
515.00 > 470.00			-0.005		6246112	39.7		79.4	243806	
26 Perfluorodeo 599.00 > 80.00				1.000	23952412	195.7		101		
			-0.004	1.000	23932412	193.7		101		
28 Perfluoround 563.00 > 519.00		3.839	0.006	1.000	16852945	197.7		98.9	570796	
D 27 13C2 PFUr		0.007	0.000	1.000	10002710	. , , , ,		, 0. ,	0,0,70	
565.00 > 520.00		3.842	0.003		4456593	38.0		76.0	208308	
D 30 13C2 PFD	οA									
615.00 > 570.00	4.129	4.132	-0.003		4649092	41.9		83.8	168499	
29 Perfluorodo	decanoi	c acid								
613.00 > 569.00	4.136	4.136	0.0	1.000	17425873	204.2		102	228085	
31 Perfluorotrid										
663.00 > 619.00		4.400	0.007	1.000	16038809	190.2		95.1	237459	
D 32 13C2-PFT6			0.007		0500740	44.0		00.7	074044	
715.00 > 670.00		4.641	-0.006		9520749	41.9		83.7	374846	
33 Perfluorotetr 712.50 > 668.90		4.642	-0.007	1.000	27310864	185.3		92.7	329988	
713.00 > 169.00		4.642		1.000	4963804	100.3	5.50(0.00-0.00)	92.7 92.7	195544	
D 34 13C2-PFH			2.007		.,00001		3.55(3.55 0.55)	. = . 1		
815.00 > 770.00		5.057	0.003		5190172	41.7		83.3	150380	
35 Perfluorohex										
813.00 > 769.00		5.059	0.001	1.000	17754908	199.3		99.6	19037	
36 Perfluorooct	adecan	oic acid								
913.00 > 869.00	5.414	5.414	0.0	1.000	18392980	192.0		96.0	19845	

Report Date: 16-Dec-2016 14:34:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC-L6_00020 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 15-Dec-2016 13:06:46 Instrument ID: A8_N Lims ID: IC L6 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 42 Worklist Smp#: 9 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 (X1000000) 042 0036 ©36 00 00 30 ∑₂₄ \approx 30 ≻₂₄-18 18 12 1.5 0.9 1.2 1.8 2.1 0.9 1.2 1.5 1.8 1.2 1.5 1.8 2.1 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 16 (X1000000) X (0000001 12-(91° (00078 ×65 ∑₁₀ **≻**52 39 26 13 1.9 2.2 2.5 1.6 1.9 2.2 1.7 2.0 1.0 1.3 1.6 1.3 2.3 1.4 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 35 960 28-0024-0024-0024-(91⁻ 00078⁻ ×65⁻ 830 8₂₅-Ç₂₀ ~16- ≻52 15 39 10 26 1.9 2.2 2.5 1.8 2.1 2.7 2.1 2.4 1.6 2.8 1.5 2.4 1.8 2.7 3.0 1.5 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 (X1000000) (0000 36-1 30-684 0072 ∑60 **≻**48 18 36 12 24 0 0 2.1 2.4 2.7 3.0 1.4 Page 546 of 809 3.2 1.8 2.1 2.4 2.7 1.8 3.0

3.4

3.7

4.0

3.0

2.7

3.3

3.6

3.9

4.2

2.4

3.0

3.6

4.2

2.5

2.8

3.1

4.4

4.1

4.7

5.0

4.2

4.5

4.8

5.1

5.4

5.7

4.6

4.9

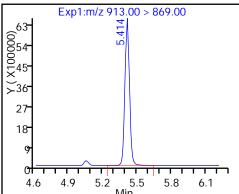
5.2

5.5

5.8

Report Date: 16-Dec-2016 14:34:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File: $\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_009.d$

36 Perfluorooctadecanoic acid



Report Date: 16-Dec-2016 14:34:45 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016BB_013.d

Lims ID: IC L1 Add-on

Client ID:

Sample Type: IC Calib Level: 1

Inject. Date: 15-Dec-2016 13:41:05 ALS Bottle#: 46 Worklist Smp#: 13

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L1 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:44 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:37:58

i iist Level Neviewel, chandraselias			ias		Date.	J	13-Dec-2010 10.37.30			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS	:									
429.00 > 409.00		2.767	-0.007		5352965	45.8		96.3		
48 Sodium 1H,	1H,2H,2I	H-perflu	orooctan	е						
427.00 > 407.00	2.776	2.768	0.008	1.000	48011	0.4779		101		
43 Sodium 1H,	1H,2H,2I	H-perflu	orooctan	е						
527.00 > 507.00	3.511	3.511	0.0	1.000	39808	0.4671		97.5		
D 42 M2-8:2FTS										
529.00 > 509.00	3.511	3.513	-0.002		4817997	44.8		93.6		
D 45 d3-NMeFO	SAA									
573.00 > 419.00	3.684	3.676	0.008		3634985	48.3		96.5		
44 N-methyl pe	rfluorood	ctane su	lfonami							
570.00 > 419.00	3.684	3.681	0.003	1.000	29823	0.4637		92.7		
D 46 d5-NEtFOS	SAA									
589.00 > 419.00	3.848	3.842	0.006		3889792	49.6		99.3		
49 N-ethyl perfl	uoroocta	ane sulfo	onamid							
584.00 > 419.00	3.865	3.854	0.011	1.005	29965	0.4858		97.2		
D 52 d-N-MeFO	SA-M									
515.00 > 169.00	3.988	3.992	-0.004		4325034	45.5		91.0		
54 MeFOSA										
512.00 > 169.00	3.998	3.999	-0.001	1.000	36069	0.4978		99.6		
D 51 d-N-EtFOS	A-M									
531.00 > 169.00	4.180	4.180	0.0		3792851	44.2		88.4		
53 N-ethylperflu	uoro-1-o	ctanesu	lfonami							
526.00 > 169.00	4.187	4.187	0.0	1.000	30993	0.4729		94.6		

Report Date: 16-Dec-2016 14:34:45 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC2-L1_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:45 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016BB_013.d

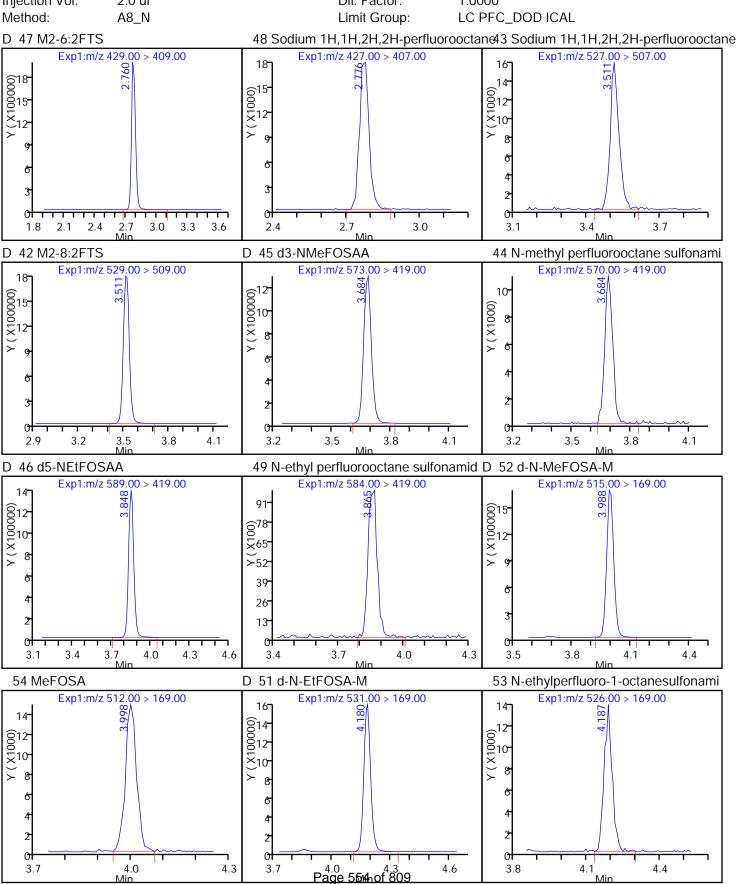
Injection Date: 15-Dec-2016 13:41:05 Instrument ID: A8_N

Lims ID: IC L1 Add-on

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 46 Worklist Smp#: 13

Injection Vol: 2.0 ul Dil. Factor: 1.0000



Chrom Revision: 2.2 05-Dec-2016 12:37:22

Report Date: 16-Dec-2016 14:34:47 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_014.d

Lims ID: IC L2 Add-on

Client ID:

Sample Type: IC Calib Level: 2

Inject. Date: 15-Dec-2016 13:48:34 ALS Bottle#: 47 Worklist Smp#: 14

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L2 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:46 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:38:07

i iist Level Neviewel. Chandrasenas			ias		Date.	ı	13-Dec-2010 10.30.07			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS	:									
429.00 > 409.00		2.767	-0.006		5108306	43.7		91.9		
48 Sodium 1H,	1H,2H,2I	H-perflu	orooctan	е						
427.00 > 407.00	2.761	2.768	-0.007	1.000	106947	1.12		118		
43 Sodium 1H,	1H,2H,2I	H-perflu	orooctan	е						
527.00 > 507.00	3.502	3.511	-0.009	0.998	75731	0.9308		97.2		
D 42 M2-8:2FTS										
529.00 > 509.00	3.511	3.513	-0.002		4599569	42.8		89.4		
D 45 d3-NMeFO	SAA									
573.00 > 419.00	3.673	3.676	-0.003		3559083	47.2		94.5		
44 N-methyl pe	rfluorood	ctane su	lfonami							
570.00 > 419.00	3.673	3.681	-0.008	1.000	57389	0.9114		91.1		
D 46 d5-NEtFOS	SAA									
589.00 > 419.00	3.838	3.842	-0.004		3757014	48.0		95.9		
49 N-ethyl perfl	uoroocta	ane sulfo	onamid							
584.00 > 419.00	3.855	3.854	0.001	1.005	53623	0.9000		90.0		
D 52 d-N-MeFO	SA-M									
515.00 > 169.00	3.987	3.992	-0.005		4639527	48.8		97.6		
54 MeFOSA										
512.00 > 169.00	3.997	3.999	-0.002	1.000	70049	0.9013		90.1		
D 51 d-N-EtFOS	A-M									
531.00 > 169.00	4.172	4.180	-0.008		4109875	47.9		95.8		
53 N-ethylperflu	uoro-1-o	ctanesul	lfonami							
526.00 > 169.00	4.179	4.187	-0.008	1.000	62962	0.8865		88.7		

Report Date: 16-Dec-2016 14:34:47 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC2-L2_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:47 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File:

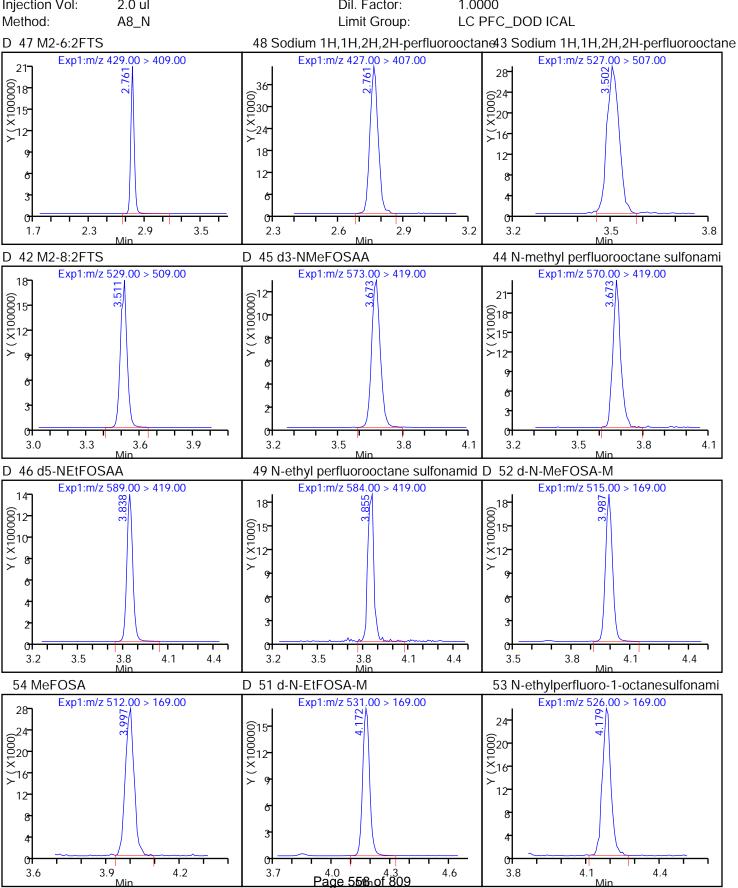
Injection Date: 15-Dec-2016 13:48:34 Instrument ID: A8_N

Lims ID: IC L2 Add-on

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 47 Worklist Smp#: 14

Injection Vol: 2.0 ul Dil. Factor: 1.0000



Chrom Revision: 2.2 05-Dec-2016 12:37:22

Report Date: 16-Dec-2016 14:34:48 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_015.d

Lims ID: IC L3 Add-on

Client ID:

Sample Type: IC Calib Level: 3

Inject. Date: 15-Dec-2016 13:56:03 ALS Bottle#: 48 Worklist Smp#: 15

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L3 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:48 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:38:17

<u> </u>	1131 Level Neviewel, Chandrasellas			ias	Date.			13-Dec-2010 10.30.17			
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
Г	O 47 M2-6:2FTS	:									
	429.00 > 409.00		2.767	0.001		5570739	47.6		100		
	48 Sodium 1H,	1H,2H,2I	H-perflu	orooctan	е						
	427.00 > 407.00	2.768	2.768	0.0	1.000	405060	3.87		81.7		
	43 Sodium 1H,	1H,2H,2I	H-perflu	orooctan	е						
	527.00 > 507.00	3.511	3.511	0.0	1.000	398457	4.22		88.0		
	O 42 M2-8:2FTS	;									
	529.00 > 509.00	3.511	3.513	-0.002		5342826	49.7		104		
	O 45 d3-NMeFO	SAA									
	573.00 > 419.00	3.673	3.676	-0.003		4014623	53.3		107		
	44 N-methyl pe	rfluorood	ctane su	lfonami							
	570.00 > 419.00	3.683	3.681	0.002	1.003	285665	4.02		80.4		
	O 46 d5-NEtFOS	SAA									
ļ	589.00 > 419.00	3.838	3.842	-0.004		4235352	54.1		108		
	49 N-ethyl perfl	uoroocta	ane sulfo	onamid							
ļ	584.00 > 419.00	3.847	3.854	-0.007	1.002	267721	3.99		79.7		
	52 d-N-MeFO	SA-M									
ļ	515.00 > 169.00	3.987	3.992	-0.005		5121953	53.9		108		
	54 MeFOSA										
!	512.00 > 169.00	3.997	3.999	-0.002	1.000	343493	4.00		80.1		
	51 d-N-EtFOS	A-M									
!	531.00 > 169.00	4.179	4.180	-0.001		4561882	53.2		106		
	53 N-ethylperflu	uoro-1-o	ctanesul	lfonami							
ļ	526.00 > 169.00	4.186	4.187	-0.001	1.000	326877	4.15		82.9		

Report Date: 16-Dec-2016 14:34:48 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC2-L3_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:48 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_015.d

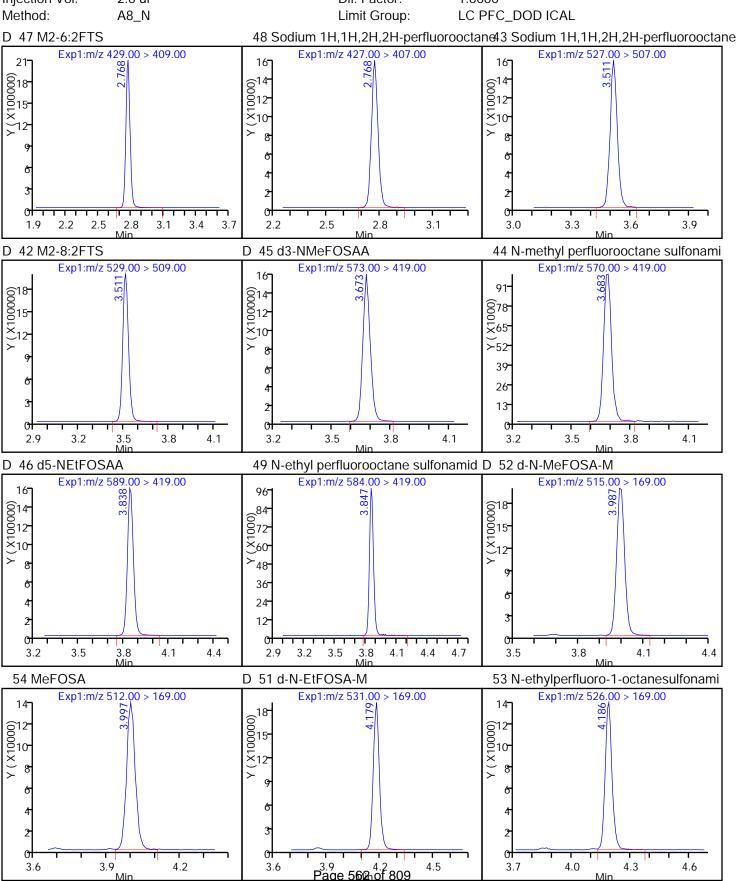
Injection Date: 15-Dec-2016 13:56:03 Instrument ID: A8_N

Lims ID: IC L3 Add-on

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 48 Worklist Smp#: 15

Injection Vol: 2.0 ul Dil. Factor: 1.0000



Report Date: 16-Dec-2016 14:34:48 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_015.d

Report Date: 16-Dec-2016 14:34:50 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_016.d

Lims ID: IC L4 Add-on

Client ID:

Sample Type: IC Calib Level: 4

Inject. Date: 15-Dec-2016 14:03:33 ALS Bottle#: 49 Worklist Smp#: 16

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L4 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:49 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:37:50

_											
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D	47 M2-6:2FTS	.									
	29.00 > 409.00		2.767	0.0		6471813	55.3		116		
	48 Sodium 1H,	1H,2H,2	H-perflu	orooctan	е						
4	27.00 > 407.00	2.767	2.768	-0.001	1.000	2416384	19.9		105		
	43 Sodium 1H,		-								
	27.00 > 507.00		3.511	0.0	1.000	2224381	21.0		110		
	42 M2-8:2FTS		0.540	0.000		500407/	FF 7		447		
	29.00 > 509.00		3.513	-0.002		5984276	55.7		116		
	45 d3-NMeFO 73.00 > 419.00		2 676	-0.003		4379131	58.1		116		
	44 N-methyl pe					4377131	30.1		110		
	570.00 > 419.00		3.681	0.002	1.003	1708231	22.0		110		
D	46 d5-NEtFOS										
	89.00 > 419.00		3.842	-0.004		4410456	56.3		113		
	49 N-ethyl perf	luoroocta	ane sulfo	onamid							
5	84.00 > 419.00	3.847	3.854	-0.007	1.002	1518918	21.7		109		
	52 d-N-MeFO										
	15.00 > 169.00	3.997	3.992	0.005		5263980	55.4		111		
	54 MeFOSA	0.007	0.000	0.000	1 000	404/005	00.4		440		
	12.00 > 169.00		3.999	-0.002	1.000	1946985	22.1		110		
	51 d-N-EtFOS 31.00 > 169.00		/ 100	0.001		4672820	54.5		109		
						40/2020	34.3		109		
	53 N-ethylperflu 26.00 > 169.00		4.187		1.000	1813178	22.5		112		
J	20.00 / 107.00		1.107	3.001	1.000	1010170	22.0		112		

Report Date: 16-Dec-2016 14:34:50 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC2-L4_00003 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:50 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_016.d **Injection Date:** 15-Dec-2016 14:03:33 Instrument ID: A8_N Lims ID: IC L4 Add-on Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 49 Worklist Smp#: 16 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 47 M2-6:2FTS 48 Sodium 1H,1H,2H,2H-perfluorooctane43 Sodium 1H,1H,2H,2H-perfluorooctane Exp1:m/z 429.00 > 409.00 Exp1:m/z 427.00 > 407.00 Exp1:m/z 527.00 > 507.00 88 ©21- (277- (266-(270 (260 (260 ∑₁₅- $\stackrel{\smile}{\times}_{55}$ $\stackrel{\smile}{\times}_{50}$ ≻₄₀ 33 30 22 20 10 2.3 2.9 3.5 3.0 3.3 3.2 3.5 3.8 2.4 D 42 M2-8:2FTS D 45 d3-NMeFOSAA 44 N-methyl perfluorooctane sulfonami Exp1:m/z 570.00 > 419.00 Exp1:m/z 529.00 > 509.00 Exp1:m/z 573.00 > 419.00511 (21⁻ 00018 ×15 56- (0048-1240-1240-**≻**32 24 4.0 3.9 3.2 3.5 3.8 3.4 3.7 4.3 3.3 4.2 2.9 4.1 3.1 3.0 3.6 49 N-ethyl perfluorooctane sulfonamid D 52 d-N-MeFOSA-M D 46 d5-NEtFOSAA Exp1:m/z 589.00 > 419.00 Exp1:m/z 584.00 > 419.00 > 169.00 16 217 847 0014 00 0012 00 (049-0042-000015-× ×35-<u>≻</u>10 ≻28-21 3.6 3.9 4.2 3.3 3.9 4.2 3.8 4.1 3.3 3.6 4.5 54 MeFOSA D 51 d-N-EtFOSA-M 53 N-ethylperfluoro-1-octanesulfonami Exp1:m/z 512.00 > 169.00 Exp1:m/z 531.00 > 169.00 Exp1:m/z 526.00 > 169.00 (70-(060-63 0054 ×45 ×50 ≻40 ≻₃₆-30 27 20 18 10 00| 3.8 4.1 4.4 3.5 4.7 3.7 4.0 4.3 4.6 3.5 ^{3,8} Page 566 of 809

Chrom Revision: 2.2 05-Dec-2016 12:37:22

Report Date: 16-Dec-2016 14:34:51 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_017.d

Lims ID: IC L5 Add-on

Client ID:

Sample Type: IC Calib Level: 5

Inject. Date: 15-Dec-2016 14:11:03 ALS Bottle#: 50 Worklist Smp#: 17

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L5 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:51 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:38:32

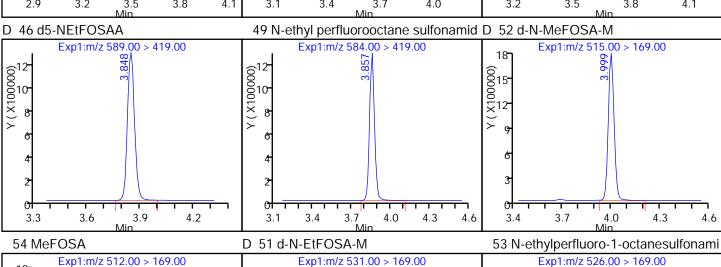
riist Level Revie	wei. Ciia	nurasen	ias		Date. 13-Dec-2010 10.30.32					
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS	:									
429.00 > 409.00		2.767	0.0		5259120	45.0		94.6		
48 Sodium 1H,				e						
427.00 > 407.00		•			5166665	52.3		110		
43 Sodium 1H,										
527.00 > 507.00		•		0.998	4815680	56.9		119		
D 42 M2-8:2FTS										
529.00 > 509.00		3.513	0.007		4786038	44.5		93.0		
D 45 d3-NMeFC)SAA									
573.00 > 419.00		3.676	-0.001		3422485	45.4		90.9		
44 N-methyl pe	erfluorood	ctane su	lfonami							
570.00 > 419.00			0.003	1.003	3741936	61.8		124		
D 46 d5-NEtFOS	SAA									
589.00 > 419.00		3.842	0.006		3486329	44.5		89.0		
49 N-ethyl perf	luoroocta	ane sulfo	namid							
584.00 > 419.00		3.854		1.002	3414301	61.8		124		
D 52 d-N-MeFO	SA-M									
515.00 > 169.00	3.999	3.992	0.007		4512300	47.5		94.9		
54 MeFOSA										
512.00 > 169.00	3.999	3.999	0.0	1.000	4407328	58.3		117		
D 51 d-N-EtFOS	SA-M									
531.00 > 169.00	4.182	4.180	0.002		4149228	48.4		96.7		
53 N-ethylperfl	uoro-1-o	ctanesul	fonami							
526.00 > 169.00				1.000	4264314	59.5		119		

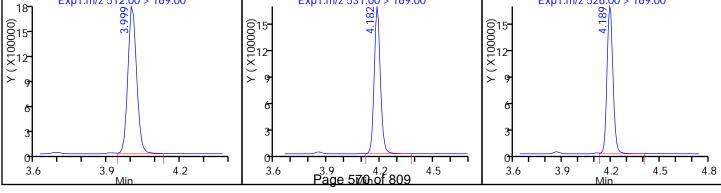
Report Date: 16-Dec-2016 14:34:51 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC2-L5_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:51 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 15-Dec-2016 14:11:03 Instrument ID: A8_N Lims ID: IC L5 Add-on Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 50 Worklist Smp#: 17 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 47 M2-6:2FTS 48 Sodium 1H,1H,2H,2H-perfluorooctane43 Sodium 1H,1H,2H,2H-perfluorooctane Exp1:m/z 429.00 > 409.00 Exp1:m/z 427.00 > 407.00 Exp1:m/z 527.00 > 507.00 (0000015 (X) (X) (18 (000015 X12 18 15 \tau \(\tau \) 2.8 3.0 3.3 2.8 2.5 3.1 3.4 2.1 2.4 3.1 3.7 4.0 D 42 M2-8:2FTS D 45 d3-NMeFOSAA 44 N-methyl perfluorooctane sulfonami Exp1:m/z 529.00 > 509.00 Exp1:m/z 573.00 > 419.00Exp1:m/z 570.00 > 419.0018 12 14 Y (X100000) (X100000) × (X100000) × (X100000) (0000015⁻12⁻2 × 9 4.0 3.2 3.5 3.8 3.4 3.7 3.2 3.5 3.8 2.9 4.1 3.1 4.1 D 46 d5-NEtFOSAA 49 N-ethyl perfluorooctane sulfonamid D 52 d-N-MeFOSA-M





Chrom Revision: 2.2 05-Dec-2016 12:37:22

Report Date: 16-Dec-2016 14:34:53 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Lims ID: IC L6 Add-on

Client ID:

Sample Type: IC Calib Level: 6

Inject. Date: 15-Dec-2016 14:18:33 ALS Bottle#: 51 Worklist Smp#: 18

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L6 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:52 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:38:39

_											
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D	47 M2-6:2FTS	<u>,</u>									
	29.00 > 409.00		2.767	0.009		5576967	47.7		100		
	48 Sodium 1H,	1H,2H,2	H-perflu	orooctan	е						
4	27.00 > 407.00	2.769	2.768	0.001	1.000	16907459	161.5		85.2		
	43 Sodium 1H,		•								
	27.00 > 507.00		3.511	0.005	1.000	16111959	170.3		88.9		
D 42 M2-8:2FTS 529.00 > 509.00 3.516 3.51				0.002		E240707	40.0		104		
			3.313	0.003		5348797	49.8		104		
	45 d3-NMeFO 73.00 > 419.00		3.676	0.004		3587176	47.6		95.2		
44 N-methyl perfluorooctane sulfonami											
	570.00 > 419.00		3.681		1.000	12924122	203.6		102		
D	46 d5-NEtFOS	SAA									
5	89.00 > 419.00	3.845	3.842	0.003		3725902	47.6		95.1		
	49 N-ethyl perf										
5	84.00 > 419.00	3.853	3.854	-0.001	1.002	11938061	202.0		101		
	52 d-N-MeFO			0.000		4/50450	40.0		00.0		
	15.00 > 169.00	3.995	3.992	0.003		4658153	49.0		98.0		
	54 MeFOSA 12.00 > 169.00	4.004	3.999	0.005	1.000	16114020	206.5		103		
	51 d-N-EtFOS		3.777	0.003	1.000	10114020	200.5		103		
	31.00 > 169.00		4.180	0.006		4448546	51.9		104		
	53 N-ethylperflu						5				
	26.00 > 169.00		4.187	0.006	1.000	15780196	205.3		103		

Report Date: 16-Dec-2016 14:34:53 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC2-L6_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:53 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

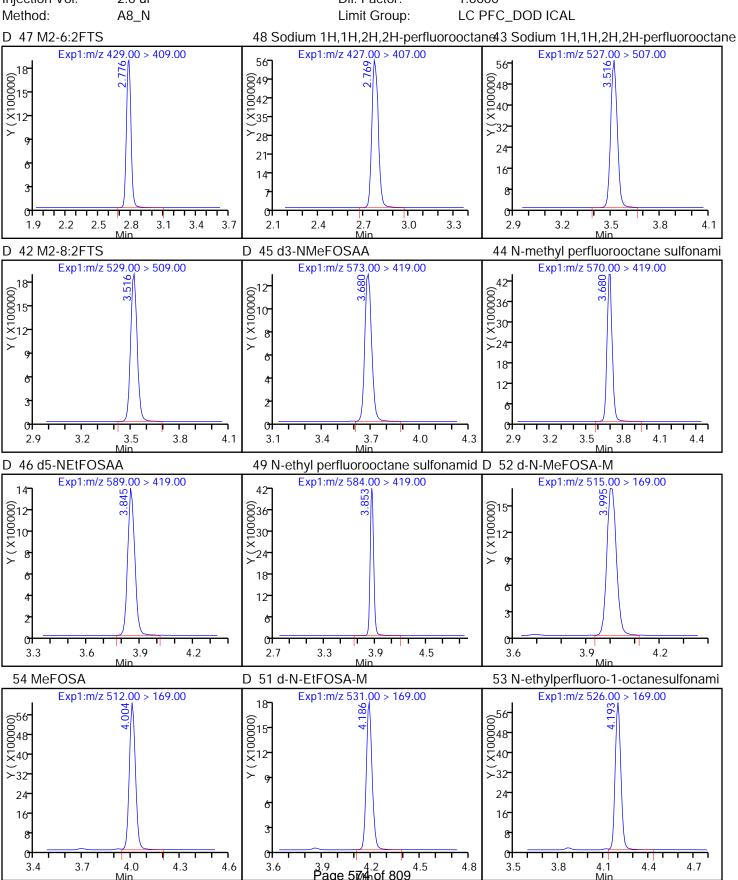
Injection Date: 15-Dec-2016 14:18:33 Instrument ID: A8_N

Lims ID: IC L6 Add-on

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 51 Worklist Smp#: 18

Injection Vol: 2.0 ul Dil. Factor: 1.0000



Chrom Revision: 2.2 05-Dec-2016 12:37:22

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Lab Sample ID: <u>ICV 320-142379/11</u> Calibration Date: <u>12/15/2016</u> 13:21

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 15DEC2016B_011.d Conc. Units: ng/mL

Septimin Septimin	ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ferfilus Perfilus Perfilus		AveID	0.8537	0.8479		49.7	50.0	-0.7	25.0
Perfulorobutanesulfonic acid AveID 1.417 1.478 46.2 44.3 4.3 25.	Perfluoropentanoic acid	AveID	0.9868	0.9654		48.9	50.0	-2.2	25.0
Perfluorohexanolc acid AveID 0.9288 0.9123 49.1 50.0 -1.8 25.	Perfluorobutanesulfonic acid	AveID	1.417	1.478		46.2	44.3	4.3	25.0
Perfluorcheptanoic acid AveID 0.9788 0.9679 49.4 50.0 -1.1 25.	Perfluorohexanoic acid	AveID	0.9288	0.9123		49.1	50.0	-1.8	25.0
Perfiluronexanesulfonic acid AveID 1.030 0.9556 43.8 47.3 -7.2 25.	Perfluoroheptanoic acid	AveID	0.9788	0.9679		49.4	50.0	-1.1	25.0
Ferfivorocotanoic acid AveID 1.003 1.000 49.9 50.0 -0.3 25.	Perfluorohexanesulfonic acid	AveID	1.030	0.9556		43.8	47.3	-7.2	25.0
Rerfiuoroheptanesulfonic AveID AveID 0.9518 0.9360 49.2 50.0 -1.7 25.	Perfluorooctanoic acid	AveID	1.003	1.000		49.9	50.0	-0.3	25.0
Perfluoronananic acid AveID 0.9518 0.9360 49.2 50.0 -1.7 25.	Perfluoroheptanesulfonic	AveID	1.102	1.160		50.1	47.6	5.2	25.0
Perfluorocctanesulfonic acid AveID 0.9945 0.9040 43.4 47.8 -9.1 25.	Perfluorononanoic acid	AveID	0.9518	0.9360		49.2	50.0	-1.7	25.0
Perfluoroctane Sulfonamide AveID 0.9327 0.9182 49.2 50.0 -1.5 25.	Perfluorooctanesulfonic acid	AveID	0.9945	0.9040		43.4	47.8	-9.1	25.0
Perfluorodecanoic acid AveID 0.9438 0.9109 48.3 50.0 -3.5 25.	Perfluorooctane Sulfonamide	AveID	0.9327	0.9182		49.2	50.0	-1.5	25.0
Perfluorodecanesulfonic acid AveID 0.5840 0.5921 48.9 48.3 1.4 25.	Perfluorodecanoic acid	AveID	0.9438	0.9109		48.3	50.0	-3.5	25.0
Perfluoroundecanoic acid AveID 0.9563 0.9285 48.5 50.0 -2.9 25.	Perfluorodecanesulfonic acid	AveID	0.5840	0.5921		48.9	48.3	1.4	25.0
Perfluorododecanoic acid AveID 0.9180 0.8958 48.8 50.0 -2.4 25.	Perfluoroundecanoic acid	AveID	0.9563	0.9285		48.5	50.0	-2.9	25.0
Perfluorotridecanoic Acid AveID 0.9069 0.9189 50.7 50.0 1.3 25.	Perfluorododecanoic acid	AveID	0.9180	0.8958		48.8	50.0	-2.4	25.0
Perfluorotetradecanoic acid AveID 1.585 1.555 49.1 50.0 -1.9 25.0	Perfluorotridecanoic Acid	AveID	0.9069	0.9189		50.7	50.0	1.3	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	Perfluorotetradecanoic acid	AveID	1.585	1.555		49.1	50.0	-1.9	25.0
Perfluoro-n-octadecanoic acid (PFODA) Ave ID 1.030 0.8547 41.5 50.0 -17.0 25. 13C4 PFBA Ave 347743 335296 48.2 50.0 -3.6 50. 13C5-PFPeA Ave 266072 251719 47.3 50.0 -5.4 50. 13C2 PFHxA Ave 245110 240514 49.1 50.0 -1.9 50. 13C4-PFHpA Ave 226344 215455 47.6 50.0 -4.8 50. 1802 PFHxS Ave 326976 320282 46.3 47.3 -2.0 50. 13C4 PFOA Ave 230362 219488 47.6 50.0 -4.7 50. 13C4 PFOS Ave 248847 244549 47.0 47.8 -1.7 50. 13C5 PFNA Ave 177687 171464 48.2 50.0 -3.5 50. 13C2 PFDA Ave 157302 151370 48.1 50.0 -3.8 50.	Perfluoro-n-hexadecanoic	L1ID		0.9309		48.2	50.0	-3.7	25.0
13C4 PFBA Ave 347743 335296 48.2 50.0 -3.6 50. 13C5-PFPeA Ave 266072 251719 47.3 50.0 -5.4 50. 13C2 PFHxA Ave 245110 240514 49.1 50.0 -1.9 50. 13C4-PFHpA Ave 226344 215455 47.6 50.0 -4.8 50. 1802 PFHxS Ave 326976 320282 46.3 47.3 -2.0 50. 13C4 PFOA Ave 230362 219488 47.6 50.0 -4.7 50. 13C4 PFOA Ave 248847 244549 47.0 47.8 -1.7 50. 13C5 PFNA Ave 177687 171464 48.2 50.0 -3.5 50. 13C8 FOSA Ave 384141 381142 49.6 50.0 -0.8 50. 13C2 PFDA Ave 157302 151370 48.1 50.0 -0.8 50. <td< td=""><td>Perfluoro-n-octadecanoic</td><td>AveID</td><td>1.030</td><td>0.8547</td><td></td><td>41.5</td><td>50.0</td><td>-17.0</td><td>25.0</td></td<>	Perfluoro-n-octadecanoic	AveID	1.030	0.8547		41.5	50.0	-17.0	25.0
13C2 PFHxA Ave 245110 240514 49.1 50.0 -1.9 50. 13C4-PFHpA Ave 226344 215455 47.6 50.0 -4.8 50. 1802 PFHxS Ave 326976 320282 46.3 47.3 -2.0 50. 13C4 PFOA Ave 230362 219488 47.6 50.0 -4.7 50. 13C4 PFOS Ave 248847 244549 47.0 47.8 -1.7 50. 13C5 PFNA Ave 177687 171464 48.2 50.0 -3.5 50. 13C8 FOSA Ave 384141 381142 49.6 50.0 -0.8 50. 13C2 PFDA Ave 157302 151370 48.1 50.0 -3.8 50. 13C2 PFUnA Ave 117250 116265 49.6 50.0 -0.8 50. 13C2-PFTeDA Ave 110957 105818 47.7 50.0 -5.9 50. <		Ave	347743	335296		48.2	50.0	-3.6	50.0
13C4 - PFHAR Ave 226344 215455 47.6 50.0 -4.8 50. 1802 PFHxS Ave 326976 320282 46.3 47.3 -2.0 50. 13C4 PFOA Ave 230362 219488 47.6 50.0 -4.7 50. 13C4 PFOS Ave 248847 244549 47.0 47.8 -1.7 50. 13C5 PFNA Ave 177687 171464 48.2 50.0 -3.5 50. 13C8 FOSA Ave 384141 381142 49.6 50.0 -0.8 50. 13C2 PFDA Ave 157302 151370 48.1 50.0 -3.8 50. 13C2 PFUNA Ave 117250 116265 49.6 50.0 -0.8 50. 13C2 PFDOA Ave 227387 214066 47.1 50.0 -5.9 50. 13C2-PFTEDA Ave 227387 214066 47.1 50.0 -5.9 50.	13C5-PFPeA	Ave	266072	251719		47.3	50.0	-5.4	50.0
1802 PFHxS Ave 326976 320282 46.3 47.3 -2.0 50. 13C4 PFOA Ave 230362 219488 47.6 50.0 -4.7 50. 13C4 PFOS Ave 248847 244549 47.0 47.8 -1.7 50. 13C5 PFNA Ave 177687 171464 48.2 50.0 -3.5 50. 13C8 FOSA Ave 384141 381142 49.6 50.0 -0.8 50. 13C2 PFDA Ave 157302 151370 48.1 50.0 -3.8 50. 13C2 PFUnA Ave 117250 116265 49.6 50.0 -0.8 50. 13C2 PFDOA Ave 110957 105818 47.7 50.0 -4.6 50. 13C2-PFTeDA Ave 227387 214066 47.1 50.0 -5.9 50.	13C2 PFHxA	Ave	245110	240514		49.1	50.0	-1.9	50.0
1802 PFHxS Ave 326976 320282 46.3 47.3 -2.0 50. 13C4 PFOA Ave 230362 219488 47.6 50.0 -4.7 50. 13C4 PFOS Ave 248847 244549 47.0 47.8 -1.7 50. 13C5 PFNA Ave 177687 171464 48.2 50.0 -3.5 50. 13C8 FOSA Ave 384141 381142 49.6 50.0 -0.8 50. 13C2 PFDA Ave 157302 151370 48.1 50.0 -3.8 50. 13C2 PFUnA Ave 117250 116265 49.6 50.0 -0.8 50. 13C2 PFDOA Ave 110957 105818 47.7 50.0 -4.6 50. 13C2-PFTeDA Ave 227387 214066 47.1 50.0 -5.9 50.	13C4-PFHpA	Ave	226344	215455		47.6	50.0	-4.8	50.0
13C4 PFOA Ave 230362 219488 47.6 50.0 -4.7 50. 13C4 PFOS Ave 248847 244549 47.0 47.8 -1.7 50. 13C5 PFNA Ave 177687 171464 48.2 50.0 -3.5 50. 13C8 FOSA Ave 384141 381142 49.6 50.0 -0.8 50. 13C2 PFDA Ave 157302 151370 48.1 50.0 -3.8 50. 13C2 PFUnA Ave 117250 116265 49.6 50.0 -0.8 50. 13C2 PFDOA Ave 110957 105818 47.7 50.0 -4.6 50. 13C2-PFTeDA Ave 227387 214066 47.1 50.0 -5.9 50.	•	Ave	326976	320282		46.3	47.3	-2.0	50.0
13C4 PFOS Ave 248847 244549 47.0 47.8 -1.7 50. 13C5 PFNA Ave 177687 171464 48.2 50.0 -3.5 50. 13C8 FOSA Ave 384141 381142 49.6 50.0 -0.8 50. 13C2 PFDA Ave 157302 151370 48.1 50.0 -3.8 50. 13C2 PFUNA Ave 117250 116265 49.6 50.0 -0.8 50. 13C2 PFDOA Ave 110957 105818 47.7 50.0 -4.6 50. 13C2-PFTeDA Ave 227387 214066 47.1 50.0 -5.9 50.			230362	219488		47.6	50.0	-4.7	50.0
13C5 PFNA Ave 177687 171464 48.2 50.0 -3.5 50. 13C8 FOSA Ave 384141 381142 49.6 50.0 -0.8 50. 13C2 PFDA Ave 157302 151370 48.1 50.0 -3.8 50. 13C2 PFUnA Ave 117250 116265 49.6 50.0 -0.8 50. 13C2 PFDOA Ave 110957 105818 47.7 50.0 -4.6 50. 13C2-PFTeDA Ave 227387 214066 47.1 50.0 -5.9 50.			248847	244549		47.0	47.8	-1.7	50.0
13C8 FOSA Ave 384141 381142 49.6 50.0 -0.8 50. 13C2 PFDA Ave 157302 151370 48.1 50.0 -3.8 50. 13C2 PFUnA Ave 117250 116265 49.6 50.0 -0.8 50. 13C2 PFDOA Ave 110957 105818 47.7 50.0 -4.6 50. 13C2-PFTeDA Ave 227387 214066 47.1 50.0 -5.9 50.						48.2	50.0	-3.5	50.0
13C2 PFDA Ave 157302 151370 48.1 50.0 -3.8 50. 13C2 PFUnA Ave 117250 116265 49.6 50.0 -0.8 50. 13C2 PFDoA Ave 110957 105818 47.7 50.0 -4.6 50. 13C2-PFTeDA Ave 227387 214066 47.1 50.0 -5.9 50.								-0.8	50.0
13C2 PFUNA Ave 117250 116265 49.6 50.0 -0.8 50. 13C2 PFDOA Ave 110957 105818 47.7 50.0 -4.6 50. 13C2-PFTeDA Ave 227387 214066 47.1 50.0 -5.9 50.									50.0
13C2 PFDOA Ave 110957 105818 47.7 50.0 -4.6 50. 13C2-PFTeDA Ave 227387 214066 47.1 50.0 -5.9 50.									50.0
13C2-PFTeDA Ave 227387 214066 47.1 50.0 -5.9 50.									50.0
1002 111001									50.0
									50.0

Report Date: 16-Dec-2016 14:41:15 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_011.d

Lims ID: ICV

Client ID:

Sample Type: ICV

Inject. Date: 15-Dec-2016 13:21:44 ALS Bottle#: 44 Worklist Smp#: 11

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: ICV_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist:

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:41:15 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:56:27

I II St Level I tevie	WCI. CIIG	Harasci	ius		Date.	<u> </u>	0 DCC 2010 10.00.2	,		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00		1.534	-0.001		16764776	48.2		96.4	106845	7
1 Perfluorobuty	yric acid									
212.90 > 169.00	1.541	1.535	0.006	1.000	14214515	49.7			107570	
D 413C5-PFPe	Α									
267.90 > 223.00	1.810	1.810	0.0		12585925	47.3		94.6	118615	0
3 Perfluoropen										
262.90 > 219.00		1.810	0.0	1.000	12149802	48.9			115067	
5 Perfluorobuta				1 000	00054044	44.0				
298.90 > 80.00 298.90 > 99.00		1.848 1.848	0.0	1.000 1.000	20951066 9653760	46.2	2.17(0.00-0.00)			
7 Perfluorohex			0.0	1.000	9053700		2.17(0.00-0.00)			
313.00 > 269.00		2.096	0.004	1.000	10971106	49.1			243419	
D 6 13C2 PFHx		2.070	0.001	1.000	10771100	17.1			210117	
315.00 > 270.00		2.097	0.003		12025693	49.1		98.1	480449	
D 11 13C4-PFH	οΑ									
367.00 > 322.00		2.426	-0.001		10772772	47.6		95.2	728689	
12 Perfluorohe	otanoic a	acid								
363.00 > 319.00	2.433	2.428	0.005	1.000	10426957	49.4			97176	
9 Perfluorohex	anesulfo	nic acid								
399.00 > 80.00	2.449	2.431	0.018	1.000	14462013	43.8				
D 10 18O2 PFH										
403.00 > 84.00	2.449	2.446	0.003		15149334	46.3		98.0	878432	
D 14 13C4 PFO										
417.00 > 372.00	2.785	2.783	0.002		10974392	47.6		95.3	756643	

Data File:	\\Chr	omNa\Sa	acramen	to\Chrom	Data\A8_N\201	61215-3788	1.b\15DEC2016B_0	011.d		
Cimmal.	рт	EXP	DLT	REL	D	Amount	Detic (Lineite)	0/ Date	C/N	Ela ma
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooc										
413.00 > 369.00 413.00 > 169.00		2.783 2.783	0.002 0.010	1.000 1.003	10976634 6473539	49.9	1.70(0.90-1.10)		90975 241007	
13 Perfluorohe				1.003	0473339		1.70(0.90-1.10)		241007	
449.00 > 80.00	•	2.790	0.003	1.000	13497259	50.1				
18 Perfluorooc										
499.00 > 80.00		3.118	0.044	1.000	10556247	43.4			368282	
499.00 > 99.00	3.154	3.118	0.036	0.997	2582918		4.09(0.90-1.10)		118191	
D 17 13C4 PFO		0.454	0.011		11/00/50	47.0		00.0	005005	
503.00 > 80.00		3.151	0.011		11689450	47.0		98.3	325285	
D 19 13C5 PFN. 468.00 > 423.00		3.153	0.009		8573219	48.2		96.5	485749	
20 Perfluorono			0.009		03/3219	40.2		70.5	403747	
463.00 > 419.00		3.155	0.007	1.000	8024621	49.2			123355	
D 21 13C8 FOS										
506.00 > 78.00	3.495	3.488	0.007		19057117	49.6		99.2	610709	
22 Perfluorooc	tane Sul	fonamid	е							
498.00 > 78.00	3.495	3.491	0.004	1.000	17498900	49.2			383568	
24 Perfluorode										
513.00 > 469.00		3.510	0.010	1.000	6894043	48.3			189508	
D 23 13C2 PFD. 515.00 > 470.00		3.513	0.007		7568491	48.1		96.2	377092	
26 Perfluorode					7300491	40.1		70.2	377072	
599.00 > 80.00		3.822	0.008	1.000	6986242	48.9				
28 Perfluoroun										
563.00 > 519.00		3.839	0.009	1.000	5397748	48.5			115044	
D 27 13C2 PFU	nA									
565.00 > 520.00	3.848	3.842	0.006		5813248	49.6		99.2	413801	
D 30 13C2 PFD										
615.00 > 570.00		4.132	0.007		5290885	47.7		95.4	272661	
29 Perfluorodo 613.00 > 569.00		c acid 4.136	0.003	1.000	4739775	48.8			99907	
31 Perfluorotric			0.003	1.000	4/39//5	40.0			99907	
663.00 > 619.00		4.400	0.011	1.000	4861713	50.7			113110	
D 32 13C2-PFT										
715.00 > 670.00		4.641	0.001		10703301	47.1		94.1	614243	
33 Perfluorotet	radecan	oic acid								
712.50 > 668.90		4.642	0.010	1.000	8229099	49.1			142471	
713.00 > 169.00	4.642	4.642	0.0	0.998	1339943		6.14(0.00-0.00)		99778	
D 34 13C2-PFH		F 057	0.001		F04000F	47.		04.0	100000	
815.00 > 770.00		5.057	0.001		5910325	47.4		94.9	128290	
35 Perfluorohe 813.00 > 769.00		oic acid 5.059	-0.001	1.000	4925242	48.2			4012	
36 Perfluorooc			-0.001	1.000	772J242	40.2			4012	
913.00 > 869.00		5.414	0.007	1.000	4522136	41.5			4448	

Report Date: 16-Dec-2016 14:41:15 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents: LCPFCIC_00020

LCPFCIC_00020 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:41:15 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_011.d **Injection Date:** 15-Dec-2016 13:21:44 Instrument ID: A8_N Lims ID: **ICV** Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 44 Worklist Smp#: 11 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 649 00042 642 636 642 636 ∑35 ×30- \times_{30} ≻28 **≻**24 21 18 18 12 12 1.5 1.8 1.9 0.9 1.2 2.1 0.7 1.0 1.3 1.6 1.2 1.5 1.8 2.1 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00Exp1:m/z 298.90 > 99.00 80 642 000 36 036-036-×₂₄ ×30 ×50 ≻₄₀-18 18 30 12 20 12 10 2.0 1.5 1.8 2.1 2.4 1.7 2.3 1.8 2.1 1.5 1.2 1.4 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 (35⁻ (0030-(30-(35⁻ (35⁻ (35 42 (35- (000001) 30-×25 ∑20⁻ **≻**20 18 15 15 12 10 10 1.8 2.1 1.8 2.1 2.7 2.0 2.6 2.4 2.7 1.5 2.4 1.4 3.2 1.5 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 49 (49⁻ 0042⁻ ×35⁻ 000042 00001 X _28− _20 ≻28 21 15 21 14 10 14 0 0 3.0 1.8 2.1 2.4 2.7 3.0 1.8 2.1 2.4 2.7 3.0 1.8 2.1 Page 580hof 809

2.4

3.0

3.6

4.2

2.7

3.0

3.3

3.6

3.9

4.2

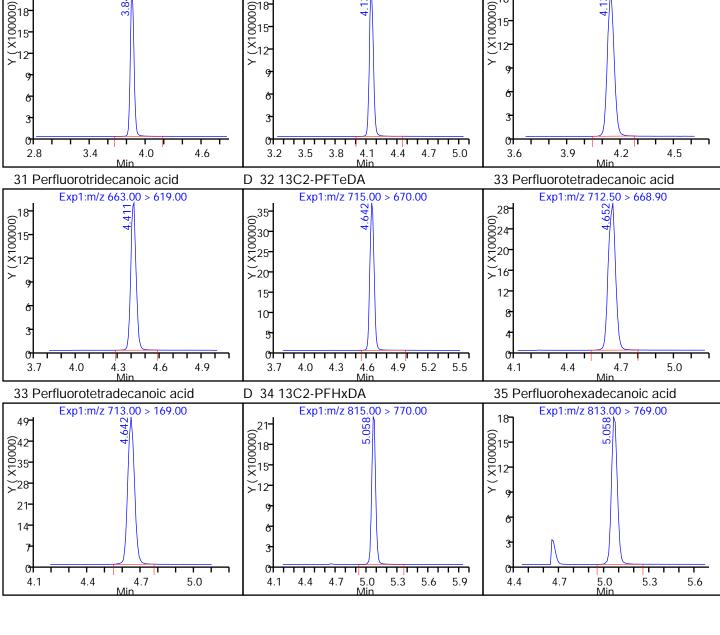
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3.5 <u>Min</u>

3.8

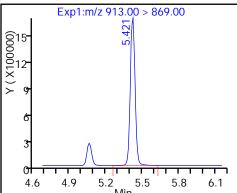
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Report Date: 16-Dec-2016 14:41:16 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File: $\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_011.d$

36 Perfluorooctadecanoic acid



FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Lab Sample ID: <u>CCV 320-144213/5</u> Calibration Date: <u>12/28/2016</u> 16:51

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 28DEC2016A_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.8656		1.01	1.00	1.4	50.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.001		1.01	1.00	1.4	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.456		0.908	0.884	2.7	50.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9272		0.998	1.00	-0.2	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	1.064		1.09	1.00	8.7	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.125		0.994	0.910	9.2	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.002		0.998	1.00	-0.2	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.048		0.906	0.952	-4.9	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	0.8790		0.820	0.928	-11.6	50.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9848		1.03	1.00	3.5	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9365		1.00	1.00	0.4	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9439		1.00	1.00	0.0	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.5550		0.916	0.964	-5.0	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9717		1.02	1.00	1.6	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9171		0.999	1.00	-0.1	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.8522		0.940	1.00	-6.0	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.712		1.08	1.00	8.0	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.417		0.884	1.00	-11.6	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.7315		0.710	1.00	-29.0	50.0
13C4 PFBA	Ave	347743	355066		51.1	50.0	2.1	50.0
13C5-PFPeA	Ave	266072	270624		50.9	50.0	1.7	50.0
13C2 PFHxA	Ave	245110	240678		49.1	50.0	-1.8	50.0
13C4-PFHpA	Ave	226344	220126		48.6	50.0	-2.7	50.0
1802 PFHxS	Ave	326976	329704		47.7	47.3	0.8	50.0
13C4 PFOA	Ave	230362	245518		53.3	50.0	6.6	50.0
13C4 PFOS	Ave	248847	263177		50.6	47.8	5.8	50.0
13C5 PFNA	Ave	177687	180751		50.9	50.0	1.7	50.0
13C8 FOSA	Ave	384141	395895		51.5	50.0	3.1	50.0
13C2 PFDA	Ave	157302	168440		53.5	50.0	7.1	50.0
13C2 PFUnA	Ave	117250	126785		54.1	50.0	8.1	50.0
13C2 PFDoA	Ave	110957	118866		53.6	50.0	7.1	50.0
13C2-PFTeDA	Ave	227387	227697		50.1	50.0	0.1	50.0
13C2-PFHxDA	Ave	124568	120137		48.2	50.0	-3.6	50.0

Report Date: 29-Dec-2016 08:18:58 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161228-38280.b\28DEC2016A_005.d

Lims ID: CCV L2

Client ID:

Sample Type: CCVL

Inject. Date: 28-Dec-2016 16:51:42 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L2

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Method: \ChromNa\Sacramento\ChromData\A8_N\20161228-38280.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 29-Dec-2016 08:18:58 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK027

First Level Reviewer: phomsophat Date: 29-Dec-2016 08:08:48

I list Eevel Revie	TTOIL PITO	поорпа			- Bate:		7 200 2010 00:00:			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00		1.542	0.0		17753284	51.1		102	833839	
1 Perfluorobut	yric acid									
212.90 > 169.00	•	1.542	0.008	1.000	307354	1.01		101	2672	
D 4 13C5-PFPe	eΑ									
267.90 > 223.00	1.829	1.820	0.009		13531215	50.9		102	108589	5
3 Perfluoropen										
262.90 > 219.00	1.829	1.820	0.009	1.000	270830	1.01		101	2562	
5 Perfluorobuta										
298.90 > 80.00		1.858	0.010	1.000	424261	0.9081	0.07(0.00.0.00)	103		
298.90 > 99.00		1.858	0.010	1.000	178637		2.37(0.00-0.00)			
D 6 13C2 PFHx 315.00 > 270.00		2.119	0.008		12033921	49.1		98.2	683858	
7 Perfluorohex			0.008		12033921	47.1		90.2	003030	
313.00 > 269.00			0.008	1.000	223163	1.00		99.8	8261	
9 Perfluorohex				1.000	223103	1.00		77.0	0201	
399.00 > 80.00		2.388	0.100	1.000	337485	0.99		109		
D 11 13C4-PFH										
367.00 > 322.00	•	2.456	0.009		11006279	48.6		97.3	107577	0
12 Perfluorohe	ptanoic a	acid								
363.00 > 319.00	-	2.456	0.009	1.000	234263	1.09		109	2097	
D 10 18O2 PFH:	xS									
403.00 > 84.00	2.481	2.471	0.010		15594977	47.7		101	195965	7
D 14 13C4 PFO	A									
417.00 > 372.00	2.828	2.817	0.011		12275919	53.3		107	932197	

Data File:	\\Chr	omNa\Sa	acramen	to\Chrom	Data\A8_N\201	61228-3828	0.b\28DEC2016A_(005.d		
Cianal	DT	EXP RT	DLT	REL	Doctores	Amount	Datio (Limita)	0/ Doc	C/NI	Elogo
Signal	RT		RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooct 413.00 > 369.00			0.011	1 000	245004	1.00		00.0	2401	
413.00 > 369.00 413.00 > 169.00		2.817 2.817	0.011 0.011	1.000 1.000	245886 156155	1.00	1.57(0.90-1.10)	99.8	2401 12227	
13 Perfluoroher							(1)			
449.00 > 80.00	2.836	2.817	0.019	1.000	262642	0.9057		95.1		
18 Perfluorooct				1 000	244/00	0.0000		00.4	10040	M
499.00 > 80.00 499.00 > 99.00		3.079 3.079	0.127 0.127	1.000 1.000	214680 51818	0.8203	4.14(0.90-1.10)	88.4	12042 2851	M M
D 17 13C4 PFOS		0.077	0.127	1.000	01010		1.11(0.70 1.10)		2001	141
503.00 > 80.00		3.185	0.021		12579869	50.6		106	336319	
20 Perfluoronor										
463.00 > 419.00		3.194	0.020	1.000	177998	1.03		103	3453	
D 19 13C5 PFNA 468.00 > 423.00		3.194	0.012		9037543	50.9		102	752908	
22 Perfluorooct					7037343	30.7		102	732700	
498.00 > 78.00			0.012	1.000	370736	1.00		100	35031	
D 21 13C8 FOSA	4									
506.00 > 78.00		3.492	0.012		19794760	51.5		103	663074	
D 23 13C2 PFDA		2 551	0.020		8422000	E2 E		107	202155	
515.00 > 470.00 24 Perfluorodeo		3.551	0.020		8422000	53.5		107	302155	
513.00 > 469.00		3.551	0.020	1.000	158994	1.00		100	5153	
26 Perfluorodeo	cane Su	lfonic ac	id							
599.00 > 80.00	3.885	3.864	0.021	1.000	140805	0.9162		95.0		
D 27 13C2 PFUr		0.004	0.001		(000011			400	077700	
565.00 > 520.00		3.881	0.021		6339241	54.1		108	377702	
28 Perfluoround 563.00 > 519.00		3.890	0.012	1.000	123194	1.02		102	2930	
29 Perfluorodoo			0.012	1.000	120171	1.02		102	2700	
613.00 > 569.00		4.182	0.017	1.000	109006	1.00		99.9	2470	
D 30 13C2 PFDc	Α									
615.00 > 570.00		4.182	0.017		5943315	53.6		107	136723	
31 Perfluorotrid 663.00 > 619.00			0.010	1.000	101293	0.9397		94.0	1670	
D 32 13C2-PFTe		4.455	0.019	1.000	101293	0.9397		94.0	1070	
715.00 > 670.00		4.688	0.030		11384865	50.1		100	107163	9
33 Perfluorotetr	adecan	oic acid								
712.50 > 668.90		4.705	0.013	1.000	203447	1.08		108	163	
713.00 > 169.00		4.705	0.004	0.998	33649		6.05(0.00-0.00)		6782	
D 34 13C2-PFHx 815.00 > 770.00		5.123	0.020		6006834	48.2		96.4	82597	
35 Perfluorohex			0.020		0000034	40.2		70.4	02371	
813.00 > 769.00		5.123	0.020	1.000	168382	0.8841		88.4	139	
36 Perfluorooct	adecan	oic acid								
913.00 > 869.00	5.522	5.492	0.030	1.000	86951	0.7100		71.0	97.5	

Report Date: 29-Dec-2016 08:18:58 Chrom Revision: 2.2 05-Dec-2016 12:37:22

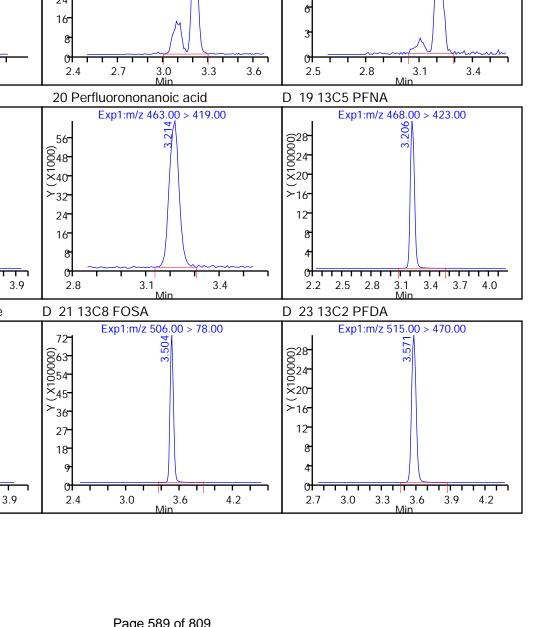
QC Flag Legend Review Flags

M - Manually Integrated

Reagents:

LCPFC-L2_00023 Amount Added: 1.00 Units: mL

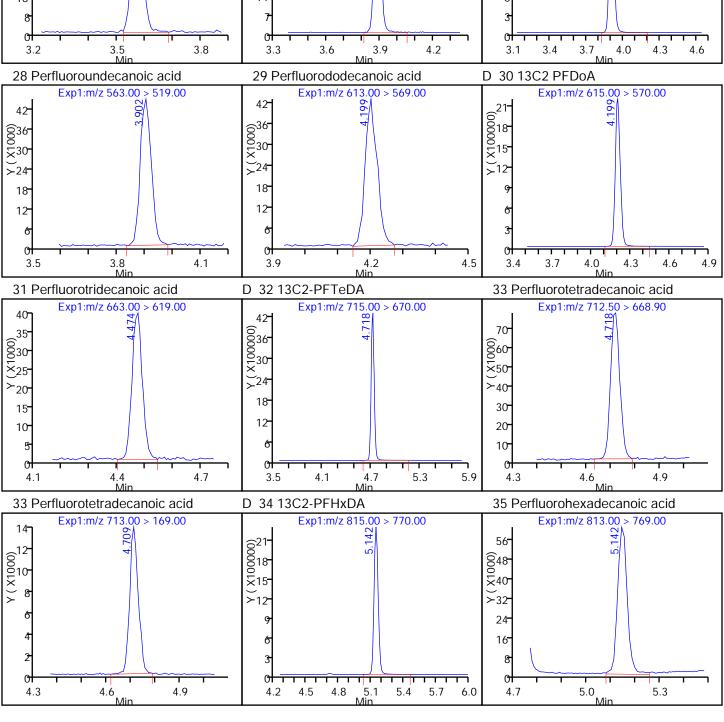
Report Date: 29-Dec-2016 08:18:58 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 28-Dec-2016 16:51:42 Instrument ID: A8_N Lims ID: CCV L2 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 V (X10000) (000001X) (000001X) 049 0042 ×35 ≻28 24 21 16 14 1.9 1.9 1.0 1.3 1.6 1.0 1.3 1.6 1.3 1.6 1.9 2.2 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00Exp1:m/z 298.90 > 99.00 12 18 77 × (×10000) 0015 ×12 066 ×55 ×44 33 22 11-2.1 1.9 1.9 1.8 1.5 1.6 1.6 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 399.00 > 80.00 48 V (X10000) 84 042 0036 ×30->₂₄ **≻**48 36 18 24 12 12 1.9 2.2 2.5 2.0 2.4 2.7 2.8 2.3 1.8 2.1 3.0 1.6 1.7 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 96 (200001X) (000001X) 56-00048-140-140-84 872-×60 _32 ≻₄₈-18 24 36**-**12 16 24 12 0 0 1.9 2.0 2.6 3.2 2.1 2.7 2.5 3.1 1.4 1.3 Page 58% of 809



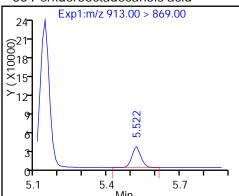
3.0

3.3

3.6



36 Perfluorooctadecanoic acid



Report Date: 29-Dec-2016 08:18:58 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161228-38280.b\28DEC2016A_005.d

Injection Date: 28-Dec-2016 16:51:42 Instrument ID: A8_N

Lims ID: CCV L2

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

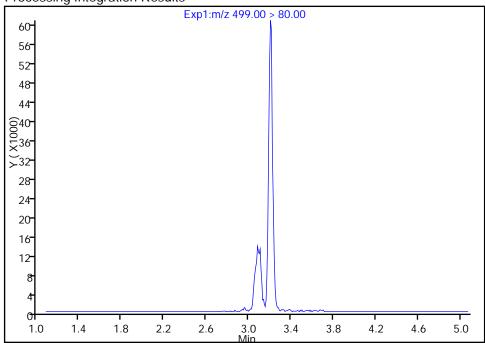
18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

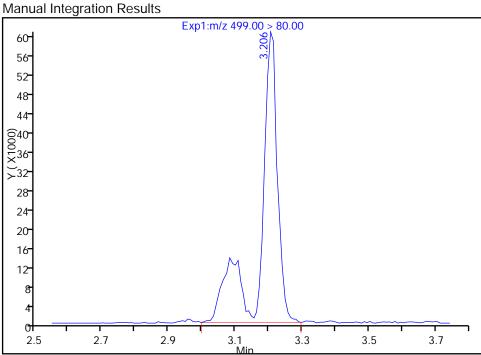
Not Detected

Expected RT: 3.08

Processing Integration Results



RT: 3.21
Area: 214680
Amount: 0.820274
Amount Units: ng/ml



Reviewer: phomsophat, 29-Dec-2016 08:10:27

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 592 of 809

Report Date: 29-Dec-2016 08:18:58 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File:

Injection Date: 28-Dec-2016 16:51:42 Instrument ID: A8_N

Lims ID: CCV L2

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: LC PFC_DOD ICAL A8_N Limit Group:

Column: Detector EXP1

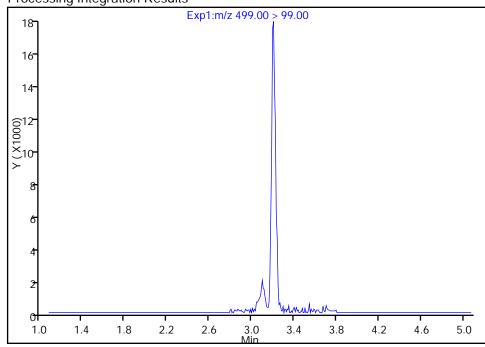
18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

Not Detected

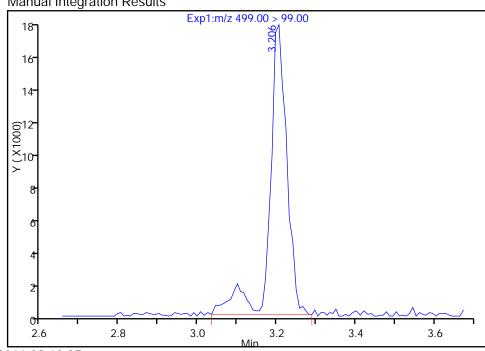
Expected RT: 3.08

Processing Integration Results



RT: 3.21 Area: 51818 Amount: 0.820274 Amount Units: ng/ml

Manual Integration Results



Reviewer: phomsophat, 29-Dec-2016 08:10:27

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 593 of 809

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Lab Sample ID: CCV 320-144253/1 Calibration Date: 12/28/2016 23:51

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/15/2016 14:18

Lab File ID: <u>28DEC2016C_001.d</u> Conc. Units: <u>ng/mL</u>

					G7.T.C	antur.	0 D	147.57
ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9184		53.8	50.0	7.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.004		50.9	50.0	1.8	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.571		49.0	44.2	10.9	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9262		49.9	50.0	-0.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.039		45.9	45.5	0.9	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9668		49.4	50.0	-1.2	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.014		50.5	50.0	1.1	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.159		50.1	47.6	5.2	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.020		47.6	46.4	2.5	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9429		49.5	50.0	-0.9	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9367		50.2	50.0	0.4	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9134		48.4	50.0	-3.2	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6145		50.7	48.2	5.2	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9734		50.9	50.0	1.8	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9555		52.0	50.0	4.1	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9470		52.2	50.0	4.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.767		55.7	50.0	11.5	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9675		50.1	50.0	0.1	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.9509		46.1	50.0	-7.7	25.0
13C4 PFBA	Ave	347743	332486		47.8	50.0	-4.4	50.0
13C5-PFPeA	Ave	266072	256668		48.2	50.0	-3.5	50.0
13C2 PFHxA	Ave	245110	233864		47.7	50.0	-4.6	50.0
13C4-PFHpA	Ave	226344	205873		45.5	50.0	-9.0	50.0
1802 PFHxS	Ave	326976	311153		45.0	47.3	-4.8	50.0
13C4 PFOA	Ave	230362	203726		44.2	50.0	-11.6	50.0
13C4 PFOS	Ave	248847	241553		46.4	47.8	-2.9	50.0
13C5 PFNA	Ave	177687	158038		44.5	50.0	-11.1	50.0
13C8 FOSA	Ave	384141	368886		48.0	50.0	-4.0	50.0
13C2 PFDA	Ave	157302	145119		46.1	50.0	-7.7	50.0
13C2 PFUNA	Ave	117250	102694		43.8	50.0	-12.4	50.0
13C2 PFDOA		110957	94764		42.7	50.0	-14.6	50.0
	Ave	227387	193811		42.6	50.0	-14.8	50.0
13C2-PFTeDA	Ave				41.8	50.0	-16.4	50.0
13C2-PFHxDA	Ave	124568	104139		41.8] 30.0	10.4] 50.0

Report Date: 29-Dec-2016 17:01:09 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_001.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 28-Dec-2016 23:51:58 ALS Bottle#: 41 Worklist Smp#: 1

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Method: \ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 29-Dec-2016 17:01:08 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK027

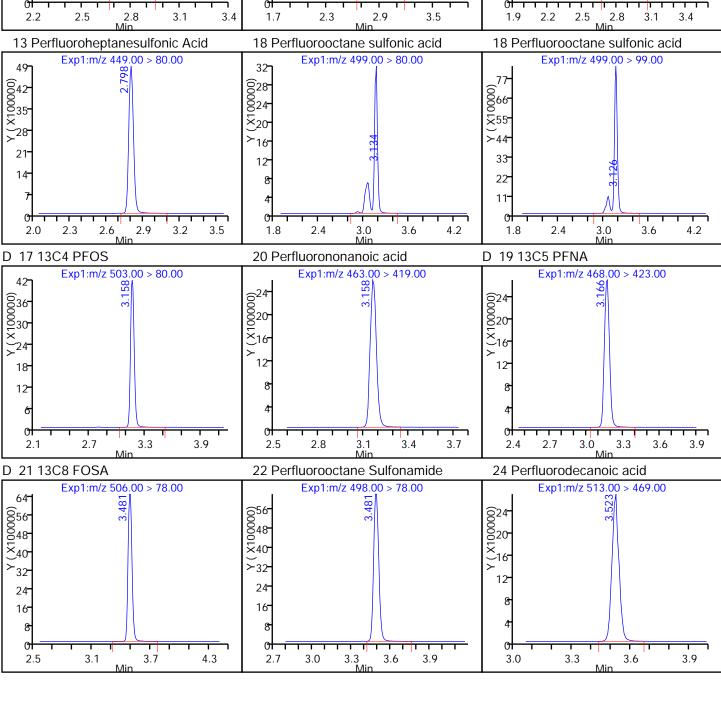
First Level Reviewer: phomsophat Date: 29-Dec-2016 17:01:08

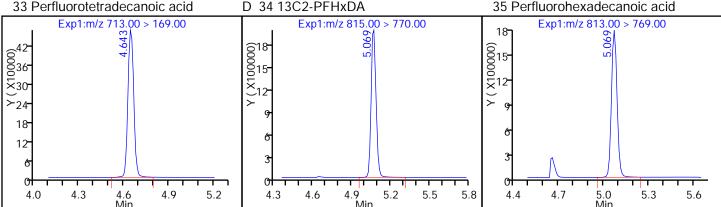
First Level Revie	wer: pho	msopha	ıt		Date:	2	29-Dec-2016 17:01:0	18		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA 217.00 > 172.00		1.534	0.0		16624320	47.8		95.6	925377	
1 Perfluorobut 212.90 > 169.00	yric acid	1.534		1.000	15266981	53.8		108	110446	
D 4 13C5-PFPe 267.90 > 223.00	eΑ	1.810	0.0		12833423	48.2		96.5	1316019	9
3 Perfluoroper 262.90 > 219.00	ntanoic a		0.0	1.000	12888689	50.9		102	177404	
5 Perfluorobut 298.90 > 80.00	anesulfo		0.0	1.000	21604204	49.0		111		
298.90 > 99.00 D 6 13C2 PFHx	1.849	1.849	0.0	1.000	10146627		2.13(0.00-0.00)			
315.00 > 270.00 7 Perfluorohex	2.097	2.097	0.0		11693176	47.7		95.4	619154	
313.00 > 269.00 9 Perfluorohex	2.097	2.097		1.000	10830616	49.9		99.7	231755	
399.00 > 80.00 D 11 13C4-PFH	2.422	2.422		1.000	14709912	45.9		101		
367.00 > 322.00 12 Perfluorohe	2.429	2.429 acid	0.0		10293642	45.5		91.0	624414	
363.00 > 319.00 D 10 1802 PFH	2.429	2.429	0.0	1.000	9952085	49.4		98.8	82047	
403.00 > 84.00 15 Perfluorooci	2.452	2.452	0.0		14717535	45.0		95.2	2635796	5
413.00 > 369.00 413.00 > 169.00	2.790	2.790 2.790	0.0	1.000 1.000	10327177 6394459	50.5	1.62(0.90-1.10)	101	125041 334298	
D 14 13C4 PFO 417.00 > 372.00	A	2.790	0.0		10186279 Page 595 of 8	309 ^{44.2}	, ,	88.4	494871	

Data File:	\\Chr	omNa\Sa	acrament	o\Chrom	Data\A8_N\201	61229-3828	8.b\28DEC2016C_()01.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorohe	ntanosu	Ifonic Ac	id							
449.00 > 80.00	•	2.798		1.000	13327794	50.1		105		
18 Perfluorooc				1.000	13327774	30.1		100		
499.00 > 80.00		3.134		1.000	11428139	47.6		103	102690	
499.00 > 99.00		3.134		0.997	2551692	47.0	4.48(0.90-1.10)	103	25550	
D 17 13C4 PFO		0	0.000	0.777	200.072					
503.00 > 80.00		3.158	0.0		11546223	46.4		97.1	228118	
20 Perfluorono			0.0		11040223	70.7		77.1	220110	
463.00 > 419.00		3.158	0.0	1.000	7450382	49.5		99.1	133158	
		5.150	0.0	1.000	7430302	47.5		77.1	133130	
D 19 13C5 PFN. 468.00 > 423.00		3.166	0.0		7901917	44.5		88.9	333521	
		3.100	0.0		7901917	44.3		00.9	333321	
D 21 13C8 FOS		2 401	0.0		10444004	40.0		07.0	400070	
506.00 > 78.00		3.481	0.0		18444294	48.0		96.0	492872	
22 Perfluorooc				1 000	4707/700	50.0		400	004040	
498.00 > 78.00	3.481	3.481	0.0	1.000	17276703	50.2		100	384812	
24 Perfluorode										
513.00 > 469.00	3.523	3.523	0.0	1.000	6627751	48.4		96.8	219166	
D 23 13C2 PFD	A									
515.00 > 470.00	3.523	3.523	0.0		7255928	46.1		92.3	267881	
26 Perfluorode	cane Su	lfonic ac	id							
599.00 > 80.00	3.834	3.834	0.0	1.000	7154348	50.7		105		
D 27 13C2 PFU	nA									
565.00 > 520.00	3.851	3.851	0.0		5134724	43.8		87.6	381125	
28 Perfluoroun	decanoi	c acid								
563.00 > 519.00		3.851	0.0	1.000	4997905	50.9		102	127088	
D 30 13C2 PFD	οA									
615.00 > 570.00		4.134	0.0		4738189	42.7		85.4	135575	
29 Perfluorodo										
613.00 > 569.00			0.0	1.000	4527542	52.0		104	111125	
31 Perfluorotrio			0.0	1.000	1027012	02.0			20	
663.00 > 619.00		4.404	0.0	1.000	4486883	52.2		104	95678	
		4.404	0.0	1.000	4400003	32.2		104	73070	
D 32 13C2-PFT		4 4 5 0	0.0		0400572	42.4		OF 2	025047	
715.00 > 670.00		4.652	0.0		9690572	42.6		85.2	825947	
33 Perfluorotet				1 000	0074744				105000	
712.50 > 668.90		4.652		1.000	8371714	55.7	(52(0.00.0.00)	111	135933	
713.00 > 169.00		4.652	-0.009	0.998	1282949		6.53(0.00-0.00)		116932	
D 34 13C2-PFH										
815.00 > 770.00	5.069	5.069	0.0		5206932	41.8		83.6	88741	
35 Perfluorohe	xadecan	oic acid								
813.00 > 769.00	5.069	5.069	0.0	1.000	4584090	50.1		100	4999	
36 Perfluorooc	tadecan	oic acid								
913.00 > 869.00	5.421	5.421	0.0	1.000	4505672	46.1		92.3	5951	
Reagents:										
LCPFC-L5_0002	22		Д	mount A	dded: 1.00	Units	: mL			
			•			21				

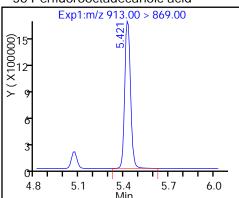
Page 596 of 809

Report Date: 29-Dec-2016 17:01:09 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_001.d **Injection Date:** 28-Dec-2016 23:51:58 Instrument ID: A8_N Lims ID: CCV L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 56 49 (49 (00042 (35 049 042 \succeq_{35} ∑28- ≻₂₈-≻28 21 21 21 14 14 14 1.9 1.0 1.3 1.6 2.2 0.9 1.2 1.5 1.8 1.2 1.5 1.8 2.1 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 (000001x) (000001x) (42-00036-130-077- ×55 -28 -24 ≻₄₄-21 18 33 14 22 11 2.0 2.0 2.3 1.7 2.3 1.8 2.1 1.4 1.7 1.5 1.1 1.4 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 399.00 > 80.00 40 60 760 (000036 X) > 24 (000035 00035 X100001 30-×25-<u></u> ∠24 ≻₂₀-18 18 15- 12 12 10 1.8 2.1 2.7 1.8 1.9 2.5 1.5 2.4 1.5 2.1 2.4 2.7 2.2 2.8 3.1 1.6 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 (35-(00030-(25-(35-0030-1×25-(49 00042 ×35 <u></u>20⁻ -20 ≻28 15- 15 21 10 10 14 0 01.9 1.8 2.1 2.4 2.7 3.0 3.3 1.8 2.1 Page 59% of 809 3.0 2.5 3.1 1.5 2.7 1.3





36 Perfluorooctadecanoic acid



FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Lab Sample ID: CCV 320-144253/13 Calibration Date: 12/29/2016 01:22

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 28DEC2016C_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9514		22.3	20.0	11.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.068		21.6	20.0	8.2	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.668		20.8	17.7	17.7	25.0
Perfluorohexanoic acid	AveID	0.9288	0.9850		21.2	20.0	6.1	25.0
(PFHxA) Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.124		19.9	18.2	9.1	25.0
Perfluoroheptanoic acid	AveID	0.9788	1.016		20.8	20.0	3.8	25.0
(PFHpA) Perfluoroheptanesulfonic	AveID	1.102	1.272		22.0	19.0	15.4	25.0
Acid (PFHpS) Perfluorooctanoic acid	AveID	1.003	1.090		21.7	20.0	8.6	25.0
(PFOA) Perfluorooctanesulfonic acid	AveID	0.9945	1.254		23.4	18.6	26.1*	25.0
(PFOS) Perfluorononanoic acid	AveID	0.9518	0.9750		20.5	20.0	2.4	25.0
(PFNA) Perfluorooctane Sulfonamide	AveID	0.9327	0.9669		20.7	20.0	3.7	25.0
(FOSA) Perfluorodecanoic acid	AveID	0.9438	0.9733		20.6	20.0	3.1	25.0
(PFDA) Perfluorodecanesulfonic acid	AveID	0.5840	0.6138		20.3	19.3	5.1	25.0
(PFDS) Perfluoroundecanoic acid	AveID	0.9563	0.9948		20.8	20.0	4.0	25.0
(PFUnA) Perfluorododecanoic acid	AveID	0.9180	0.9697		21.1	20.0	5.6	25.0
(PFDoA) Perfluorotridecanoic Acid	AveID	0.9069	0.9223		20.3	20.0	1.7	25.0
(PFTriA) Perfluorotetradecanoic acid	AveID	1.585	1.902		24.0	20.0	20.0	25.0
(PFTeA) Perfluoro-n-hexadecanoic	L1ID		1.009		20.5	20.0	2.7	25.0
acid (PFHxDA) Perfluoro-n-octadecanoic	AveID	1.030	0.9673		18.8	20.0	-6.1	25.0
acid (PFODA) 13C4 PFBA	Ave	347743	342518		49.2	50.0	-1.5	50.0
13C5-PFPeA	Ave	266072	262744		49.4	50.0	-1.3	50.0
13C2 PFHxA	Ave	245110	238568		48.7	50.0	-2.7	50.0
13C4-PFHpA	Ave	226344	211766		46.8	50.0	-6.4	50.0
1802 PFHxS	Ave	326976	335196		48.5	47.3	2.5	50.0
13C4 PFOA	Ave	230362	214043		46.5	50.0	-7.1	50.0
13C4 PFOS	Ave	248847	245728		47.2	47.8	-1.3	50.0
13C5 PFNA	Ave	177687	162840		45.8	50.0	-8.4	50.0
13C8 FOSA	Ave	384141	381422		49.6	50.0	-0.7	50.0
13C2 PFDA	Ave	157302	144495		45.9	50.0	-8.1	50.0
13C2 PFUnA	Ave	117250	107091		45.7	50.0	-8.7	50.0
13C2 PFDoA	Ave	110957	97562		44.0	50.0	-12.1	50.0
13C2-PFTeDA	Ave	227387	208904		45.9	50.0	-8.1	50.0
13C2-PFHxDA	Ave	124568	110672		44.4	50.0	-11.2	50.0

Report Date: 29-Dec-2016 17:46:42 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_013.d

Lims ID: CCV L4

Client ID:

Sample Type: CCV

Inject. Date: 29-Dec-2016 01:22:01 ALS Bottle#: 40 Worklist Smp#: 13

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L4

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Method: \ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 29-Dec-2016 17:46:41 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK027

First Level Reviewer: phomsophat Date: 29-Dec-2016 17:46:41

I list Ectel Revie	WCI. PIIC	ппоорпс	41		Date.		7 Bee 2010 17:10:1			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA	1									
217.00 > 172.00		1.525	0.0		17125907	49.2		98.5	144846	3
1 Perfluorobut	yric acid									
212.90 > 169.00	1.525	1.525	0.0	1.000	6517453	22.3		111	41917	
D 4 13C5-PFP6	eΑ									
267.90 > 223.00	1.800	1.800	0.0		13137184	49.4		98.7	103776	8
3 Perfluoroper										
262.90 > 219.00		1.800	0.0	1.000	5610971	21.6		108	57269	
5 Perfluorobut			0.0	1 000	0007403	20.0		110		
298.90 > 80.00 298.90 > 99.00		1.839 1.839	0.0	1.000 1.000	9886492 4160873	20.8	2.38(0.00-0.00)	118		
D 6 13C2 PFHx		1.007	0.0	1.000	4100073		2.30(0.00 0.00)			
315.00 > 270.00		2.091	0.0		11928405	48.7		97.3	722281	
7 Perfluorohex	kanoic ac	cid								
313.00 > 269.00	2.091	2.091	0.0	1.000	4699929	21.2		106	50077	
9 Perfluorohex	kanesulfo	onic acid	l							
399.00 > 80.00	2.409	2.409	0.0	1.000	6855996	19.9		109		
D 11 13C4-PFH	•									
367.00 > 322.00		2.420	0.0		10588317	46.8		93.6	426500	
12 Perfluorohe	•		0.0	1 000	4202452	20.0		104	05744	
363.00 > 319.00		2.420	0.0	1.000	4303153	20.8		104	35744	
D 10 18O2 PFH 403.00 > 84.00		2.440	0.0		1505/750	48.5		103	115590°	1
D 14 13C4 PFO		2.440	0.0		15854752	48.5		103	115590	I
417.00 > 372.00		2.776	0.0		10702171	46.5		92.9	543495	
717.00 × 372.00	2.110	2.770	0.0		10/021/1	70.5		12.1	575775	

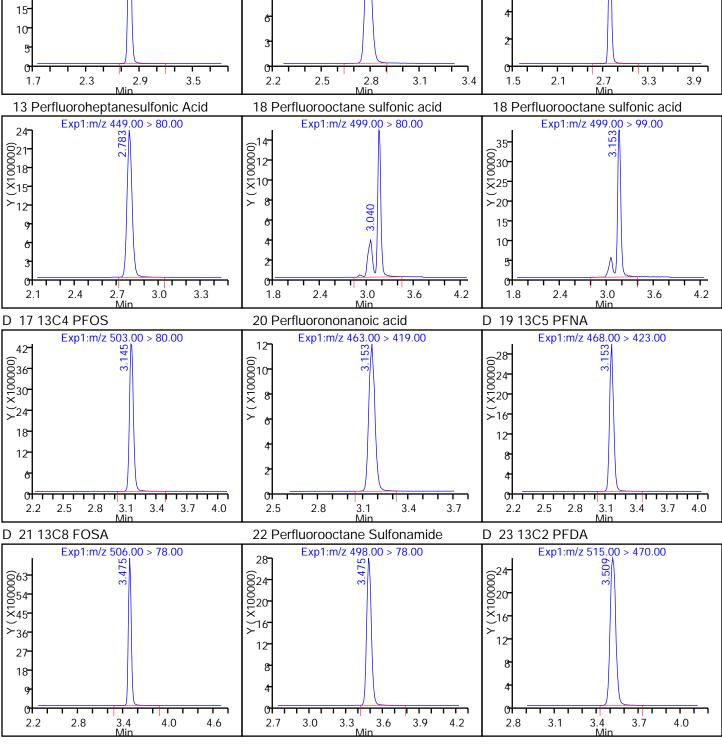
Data File:	\\Chr	mNa\S	acrament	to\Chrom	Data\A8_N\201	61229-3828	8.b\28DEC2016C_()13.d		
Ciamal	DT	EXP	DLT	REL	D	Amount	Datia (Limata)	0/ D	C/N	Пата
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluoroocta				1 000	4445400	0.4 7		400	10011	
413.00 > 369.00 2 413.00 > 169.00 2		2.783 2.783	0.0	1.000 1.000	4665690 2835945	21.7	1.65(0.90-1.10)	109	40841 87156	
13 Perfluorohept				1.000	2033743		1.03(0.70-1.10)		07130	
449.00 > 80.00		2.783		1.000	5949735	22.0		115		
18 Perfluoroocta	ne sulf	onic aci	d							
499.00 > 80.00		3.040		1.000	5718911	23.4		126	22893	
499.00 > 99.00	3.153	3.040	0.113	1.037	1268366		4.51(0.90-1.10)		31102	
D 17 13C4 PFOS	2 1 1 5	2 1 4 5	0.0		11745000	47.0		00.7	407 441	
503.00 > 80.00 3		3.145	0.0		11745822	47.2		98.7	426441	
20 Perfluoronona 463.00 > 419.00		3.153	0.0	1.000	3175364	20.5		102	69260	
D 19 13C5 PFNA	3.100	0.100	0.0	1.000	0170001	20.0		.02	0,200	
468.00 > 423.00	3.153	3.153	0.0		8141980	45.8		91.6	371980	
D 21 13C8 FOSA										
506.00 > 78.00	3.475	3.475	0.0		19071099	49.6		99.3	140491	6
22 Perfluoroocta										
498.00 > 78.00	3.475	3.475	0.0	1.000	7376087	20.7		104	209667	
D 23 13C2 PFDA 515.00 > 470.00 3	2 500	3.509	0.0		7224747	45.9		91.9	167612	
24 Perfluorodeca			0.0		1224141	45.9		91.9	10/012	
513.00 > 469.00 3		3.509	0.0	1.000	2812790	20.6		103	79992	
26 Perfluorodeca										
599.00 > 80.00		3.825		1.000	2907866	20.3		105		
D 27 13C2 PFUnA										
565.00 > 520.00 3		3.834	0.0		5354567	45.7		91.3	281959	
28 Perfluorounde			0.0	1 000	0400/0/	00.0		101	00405	
563.00 > 519.00 3		3.834	0.0	1.000	2130686	20.8		104	39405	
D 30 13C2 PFDoA 615.00 > 570.00 4		4.126	0.0		4878096	44.0		87.9	160960	
29 Perfluorodode			0.0		1070070	11.0		07.7	100700	
613.00 > 569.00		4.133	0.0	1.000	1892015	21.1		106	44644	
31 Perfluorotride	canoic	acid								
663.00 > 619.00	4.404	4.404	0.0	1.000	1799712	20.3		102	45896	
D 32 13C2-PFTeD										
715.00 > 670.00		4.644	0.0		10445200	45.9		91.9	888356	
33 Perfluorotetra			0.0	1 000	2710420	04.0		100	40.407	
712.50 > 668.90 4 713.00 > 169.00 4		4.644 4.644	0.0 -0.010	1.000 0.998	3710429 564729	24.0	6.57(0.00-0.00)	120	48436 72644	
D 34 13C2-PFHxI		4.044	-0.010	0.770	304727		0.37 (0.00-0.00)		72044	
815.00 > 770.00 5		5.058	0.0		5533616	44.4		88.8	97966	
35 Perfluorohexa										
813.00 > 769.00 5		5.058		1.000	1968416	20.5		103	2410	
36 Perfluoroocta	decano	oic acid								
913.00 > 869.00 5	5.414	5.414	0.0	1.000	1887512	18.8		93.9	2374	

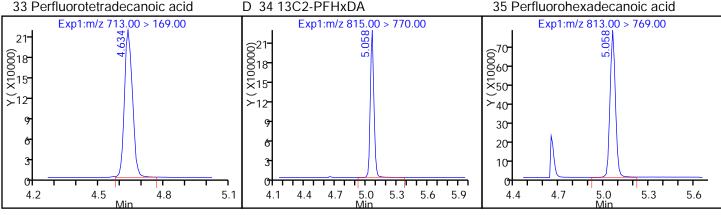
Report Date: 29-Dec-2016 17:46:42 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

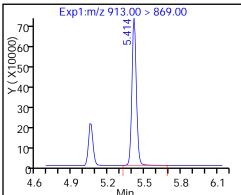
LCPFC-L4_00024 Amount Added: 1.00 Units: mL

Report Date: 29-Dec-2016 17:46:42 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_013.d **Injection Date:** 29-Dec-2016 01:22:01 Instrument ID: A8_N Lims ID: CCV L4 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 13 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Limit Group: LC PFC_DOD ICAL Method: $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 56 (000042 X35 000048 40 40 <u></u>28 24 21 16 14 2.2 1.9 1.0 1.6 0.7 1.0 1.3 1.6 1.2 1.5 1.8 2.1 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.00 42 (21⁻ 00018 ×15 (100000) 18 12 1.8 2.1 1.8 2.1 2.1 1.2 1.5 2.4 1.5 1.5 1.8 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 399.00 > 80.00 217 (000036 X) > 24 00018-000015-× 12-18 12 1.7 2.0 1.8 1.9 2.2 1.4 2.3 2.6 1.5 2.1 2.4 2.5 2.8 3.1 1.6 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 56 (0000012-(000001 X 635 630 30 ×25 _32 ≻20 24 15 16 00 0 1.9 1.8 2.1 2.4 2.7 1.9 2.8 2.5 3.1 1.5 3.0 3.3 Page 60/5 of 809 1.3





36 Perfluorooctadecanoic acid



FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Lab Sample ID: CCV 320-144253/24 Calibration Date: 12/29/2016 02:44

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/15/2016 14:18

Lab File ID: <u>28DEC2016C_024.d</u> Conc. Units: <u>ng/mL</u>

ANALYTE	CURVE	AVE RRF	RRF	MIN RRF	CALC	SPIKE	%D	MAX
ANADITE	TYPE	71.4 17.77	1111		AMOUNT	AMOUNT		%D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9103		53.3	50.0	6.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.002		50.8	50.0	1.5	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.518		47.4	44.2	7.1	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9373		50.5	50.0	0.9	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9872		50.4	50.0	0.9	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.017		44.9	45.5	-1.3	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.014		50.5	50.0	1.1	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.146		49.5	47.6	4.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.039		48.5	46.4	4.5	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9749		51.2	50.0	2.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9299		49.9	50.0	-0.3	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9310		49.3	50.0	-1.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6145		50.7	48.2	5.2	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9649		50.4	50.0	0.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9297		50.6	50.0	1.3	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9277		51.1	50.0	2.3	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.822		57.5	50.0	14.9	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9504		49.2	50.0	-1.6	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8968		43.5	50.0	-13.0	25.0
13C4 PFBA	Ave	347743	325636		46.8	50.0	-6.4	50.0
13C5-PFPeA	Ave	266072	251309		47.2	50.0	-5.5	50.0
13C2 PFHxA	Ave	245110	229354		46.8	50.0	-6.4	50.0
13C4-PFHpA	Ave	226344	198107		43.8	50.0	-12.5	50.0
1802 PFHxS	Ave	326976	316319		45.8	47.3	-3.3	50.0
13C4 PFOA	Ave	230362	201878		43.8	50.0	-12.4	50.0
13C4 PFOS	Ave	248847	239275		46.0	47.8	-3.8	50.0
13C5 PFNA	Ave	177687	153674		43.2	50.0	-13.5	50.0
13C8 FOSA	Ave	384141	369122		48.0	50.0	-3.9	50.0
13C2 PFDA	Ave	157302	142705		45.4	50.0	-9.3	50.0
13C2 PFUnA	Ave	117250	102236		43.6	50.0	-12.8	50.0
13C2 PFDOA		110957	95597		43.1	50.0	-13.8	50.0
	Ave	227387	200570		44.1	50.0	-11.8	50.0
13C2-PFTeDA	Ave				43.0	50.0	-14.0	50.0
13C2-PFHxDA	Ave	124568	107082		43.0] 30.0	14.0	

Report Date: 29-Dec-2016 18:19:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_024.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 29-Dec-2016 02:44:36 ALS Bottle#: 41 Worklist Smp#: 24

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Method: \ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 29-Dec-2016 18:19:26 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK027

First Level Reviewer: phomsophat Date: 29-Dec-2016 18:19:26

That Zever Reviewer: phornsophat				Bate.		27 000 2010 10.17.20				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00		1.534	0.0		16281815	46.8		93.6	677597	
1 Perfluorobut	yric acid									
212.90 > 169.00	,		0.0	1.000	14820494	53.3		107	95898	
D 4 13C5-PFP6	eΑ									
267.90 > 223.00	1.810	1.810	0.0		12565456	47.2		94.5	999938	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	12587077	50.8		102	156965	
5 Perfluorobut										
298.90 > 80.00		1.849	0.0	1.000	21225697	47.4	2.15(0.00.0.00)	107		
298.90 > 99.00		1.849	0.0	1.000	9866236		2.15(0.00-0.00)			
D 6 13C2 PFHx 315.00 > 270.00		2 097	0.0		11467711	46.8		93.6	833422	
7 Perfluorohex			0.0		11407711	40.0		75.0	033422	
313.00 > 269.00			0.0	1.000	10749072	50.5		101	178961	
9 Perfluorohex										
399.00 > 80.00		2.444		1.000	14631165	44.9		98.7		
D 11 13C4-PFH	pA									
367.00 > 322.00	2.429	2.429	0.0		9905365	43.8		87.5	699380	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.429	2.429	0.0	1.000	9778298	50.4		101	78576	
D 10 18O2 PFH	xS									
403.00 > 84.00	2.444	2.444	0.0		14961866	45.8		96.7	1088399	9
D 14 13C4 PFO										
417.00 > 372.00	2.782	2.782	0.0		10093908	43.8		87.6	720484	

Data File:	\\Chrc	mNa\S	acrament	to\Chrom	Data\A8_N\201	61229-3828	8.b\28DEC2016C_(024.d		
	БТ	EXP	DLT	REL		Amount	D !! (! ! !!)	0/ 5	0/11	
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluoroocta		cid								
413.00 > 369.00 2		2.782		1.000	10236784	50.5	1 (0(0.00.1.10)	101	108198	
413.00 > 169.00 2		2.782		1.000	6391113		1.60(0.90-1.10)		294563	
13 Perfluorohept 449.00 > 80.00 2				1.000	13050163	49.5		104		
18 Perfluoroocta				1.000	13030103	47.5		104		
499.00 > 80.00 3		3.134		1.000	11536175	48.5		104	89792	
499.00 > 99.00		3.134	0.016	1.005	2519405		4.58(0.90-1.10)		111514	
D 17 13C4 PFOS										
503.00 > 80.00	3.150	3.150	0.0		11437346	46.0		96.2	317387	
20 Perfluoronona										
463.00 > 419.00 3	3.150	3.150	0.0	1.000	7491071	51.2		102	153620	
D 19 13C5 PFNA		0.450			7/00/00	40.0		0.4 5	0/4505	
468.00 > 423.00 3	3.150	3.150	0.0		7683680	43.2		86.5	264525	
D 21 13C8 FOSA 506.00 > 78.00 3	0 401	3.481	0.0		18456100	48.0		96.1	510613	
22 Perfluoroocta					16430100	46.0		90.1	510013	
498.00 > 78.00		3.481		1.000	17162031	49.9		99.7	561871	
24 Perfluorodeca			0.0	1.000	17102001	17.7		, , , ,	001071	
513.00 > 469.00 3		3.515	0.0	1.000	6642927	49.3		98.6	149068	
D 23 13C2 PFDA										
515.00 > 470.00 3	3.515	3.515	0.0		7135273	45.4		90.7	262734	
26 Perfluorodeca	ane Sul	lfonic ac	id							
599.00 > 80.00	3.825	3.825	0.0	1.000	7086922	50.7		105		
D 27 13C2 PFUnA										
565.00 > 520.00 3		3.842	0.0		5111813	43.6		87.2	231347	
28 Perfluorounde			0.0	1 000	4000070	FO 4		404	400707	
563.00 > 519.00 3		3.842	0.0	1.000	4932270	50.4		101	129727	
D 30 13C2 PFDoA 615.00 > 570.00 4		4.134	0.0		4779865	43.1		86.2	192636	
29 Perfluorodode			0.0		4779003	43.1		00.2	192030	
613.00 > 569.00 ⁴		4.134	0.0	1.000	4443824	50.6		101	121756	
31 Perfluorotride			0.0			00.0				
663.00 > 619.00		4.396	0.0	1.000	4434488	51.1		102	103218	
D 32 13C2-PFTeD	DΑ									
715.00 > 670.00	1.643	4.643	0.0		10028507	44.1		88.2	508850	
33 Perfluorotetra	decan	oic acid								
712.50 > 668.90		4.643	0.0	1.000	8707596	57.5		115	154088	
713.00 > 169.00	1.633	4.643	-0.010	0.998	1309974		6.65(0.00-0.00)		161247	
D 34 13C2-PFHxE						4.5.5		0.4.5	40==:=	
815.00 > 770.00 5		5.058			5354087	43.0		86.0	107062	
35 Perfluorohexa				1 000	4E 40740	40.0		00.4	40/0	
813.00 > 769.00 5		5.058	0.0	1.000	4542769	49.2		98.4	4862	
36 Perfluoroocta 913.00 > 869.00 5		5.413	0.0	1.000	4286501	43.5		87.0	5637	
/13.00 / 007.00 3	J. 4 13	J. + 13	0.0	1.000	4200001	40.0		07.0	5057	

Report Date: 29-Dec-2016 18:19:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Chrom Revision: 2.2 05-Dec-2016 12:37:22 Report Date: 29-Dec-2016 18:19:28 TestAmerica Sacramento Data File: Injection Date: 29-Dec-2016 02:44:36 Instrument ID: A8_N Lims ID: CCV L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 24 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267,90 > 223.00 49 049 0042 00042 X <u>8</u>35-. Š₂₈ ×35 28 **≻**28 21 21 21 14 14 1.9 1.9 1.0 1.3 1.6 1.0 1.3 1.6 1.3 1.6 1.9 2.2 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 42 (000001X) 677- 00001 00030-∑55 24 ∑28- **≻44**-18 21 33 14 22 11 1.8 2.1 1.8 2.1 1.8 2.1 1.2 1.5 2.4 1.5 1.5 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 399.00 > 80.00 42 40 760 42 X30-<u>8</u>36 035- <u>§</u>30 ∑₂₄-×25-<u>></u>24 ≻₂₀-18 18 15- 12 12 10 2.0 2.3 2.0 1.9 2.5 1.4 1.7 2.6 1.7 2.3 2.6 2.2 2.8 3.1 1.4 1.6 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 35- 35- 049 0042 0042 <u>ĕ</u>25-×35 ∑₂₀ ∑20 ≻28 15 15 21 10 10 0 0 1.9 1.9 2.2 2.5 2.8 3.1 1.7 2.9 2.5 3.1 1.3 1.6 2.0 Page 6M3nof 809

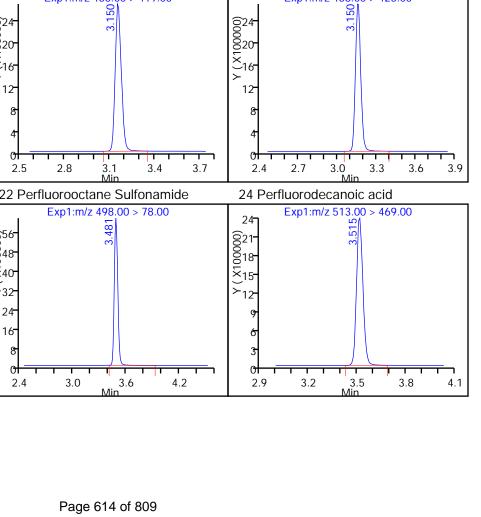
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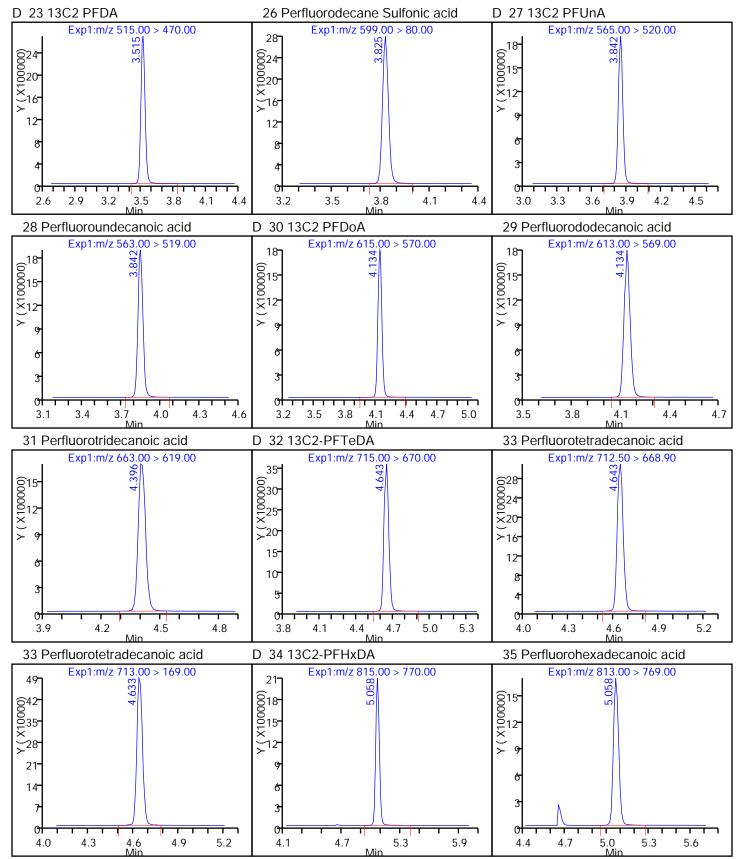
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3.4

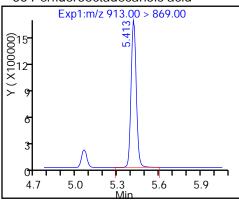
3.7

4.0





36 Perfluorooctadecanoic acid



FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Lab Sample ID: <u>CCV 320-144510/5</u> Calibration Date: <u>12/30/2016</u> 11:26

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 30DEC2016A_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.8643		1.01	1.00	1.2	50.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.009		1.02	1.00	2.3	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.429		0.892	0.884	0.9	50.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9073		0.977	1.00	-2.3	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	1.013		1.04	1.00	3.5	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.157		1.02	0.910	12.3	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.014		1.01	1.00	1.1	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.030		0.890	0.952	-6.6	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.149		1.07	0.928	15.6	50.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9818		1.03	1.00	3.1	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9433		1.01	1.00	1.1	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9103		0.965	1.00	-3.5	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.5594		0.923	0.964	-4.2	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9808		1.03	1.00	2.6	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.8913		0.971	1.00	-2.9	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.8794		0.970	1.00	-3.0	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.765		1.11	1.00	11.3	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.482		0.953	1.00	-4.7	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8004		0.777	1.00	-22.3	50.0
13C4 PFBA	Ave	347743	348590		50.1	50.0	0.2	50.0
13C5-PFPeA	Ave	266072	269109		50.6	50.0	1.1	50.0
13C2 PFHxA	Ave	245110	231169		47.2	50.0	-5.7	50.0
13C4-PFHpA	Ave	226344	212196		46.9	50.0	-6.3	50.0
1802 PFHxS	Ave	326976	321838		46.6	47.3	-1.6	50.0
13C4 PFOA	Ave	230362	226735		49.2	50.0	-1.6	50.0
13C4 PFOS	Ave	248847	259288		49.8	47.8	4.2	50.0
13C5 PFNA	Ave	177687	175863		49.5	50.0	-1.0	50.0
13C8 FOSA	Ave	384141	399484		52.0	50.0	4.0	50.0
13C2 PFDA	Ave	157302	161458		51.3	50.0	2.6	50.0
13C2 PFUnA	Ave	117250	123160		52.5	50.0	5.0	50.0
13C2 PFDoA	Ave	110957	113101		51.0	50.0	1.9	50.0
13C2-PFTeDA	Ave	227387	227042		49.9	50.0	-0.2	50.0
13C2-PFHxDA	Ave	124568	117083		47.0	50.0	-6.0	50.0

Report Date: 03-Jan-2017 10:09:32 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016A_005.d

Lims ID: CCV L2

Client ID:

Sample Type: CCVL

Inject. Date: 30-Dec-2016 11:26:29 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L2

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Method: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 03-Jan-2017 10:09:31 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1

Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 03-Jan-2017 10:09:16

_ :	HOLECTOL ITOTIC	wci. cha	Harasor	ius		Date.		70 3dil 2017 10.07.1			
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
Ī	D 2 13C4 PFBA										
	217.00 > 172.00		1.534	0.0		17429482	50.1		100	119287	8
	1 Perfluorobuty										
	212.90 > 169.00		1.542	0.0	1.000	301293	1.01		101	1576	
[O 4 13C5-PFPe	Α									
	267.90 > 223.00		1.820	0.0		13455441	50.6		101	107720	2
	3 Perfluoropen	tanoic a	cid								
	262.90 > 219.00	1.820	1.820	0.0	1.000	271656	1.02		102	3384	
	5 Perfluorobuta	anesulfo	nic acid								
	298.90 > 80.00		1.849	0.010	1.000	406676	0.8918		101		
	298.90 > 99.00	1.849	1.849	0.0	0.995	167755		2.42(0.00-0.00)			
	O 6 13C2 PFHx										
	315.00 > 270.00		2.107	-0.001		11558452	47.2		94.3	491471	
	7 Perfluorohex										
	313.00 > 269.00				1.000	209736	0.9769		97.7	6314	
	9 Perfluorohex				1 000	000754	4.00		440		M
	399.00 > 80.00		2.379	0.079	1.000	338751	1.02		112		M
	D 11 13C4-PFH		0.440	0.0		10/00001	47.0		00.7	(4 4050	
	367.00 > 322.00		2.443	0.0		10609801	46.9		93.7	644950	
	12 Perfluorohe; 363.00 > 319.00			0.0	1 000	214002	1.04		104	2221	
			2.443	0.0	1.000	214982	1.04		104	2231	
	D 10 18O2 PFH) 403.00 > 84.00		2.458	0.0		15222930	46.6		98.4	710820	
			2.408	0.0		13222930	40.0		70.4	7 10020	
	D 14 13C4 PFO 417.00 > 372.00		2.796	0.009		11336736	49.2		98.4	104170	n
	417.00 > 372.00	2.003	2.170	0.009		11330730	47.∠		70.4	104170	J

Data File:	\\Chr	omNa\Sa	acramen	to\Chrom	Data\A8_N\201	61230-3835	8.b\30DEC2016A_0)05.d		
Ci	DT	EXP	DLT	REL	Decree	Amount	Della (Lia III.)	0/ D	C/N	
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooct										
413.00 > 369.00		2.796 2.796	0.009	1.000 1.000	229992	1.01	1 (2(0 00 1 10)	101	2890	
413.00 > 169.00			0.009	1.000	142324		1.62(0.90-1.10)		6313	
13 Perfluorohe ₁ 449.00 > 80.00		2.805	0.008	1.000	254153	0.8895		93.4		
18 Perfluorooct										М
499.00 > 80.00	3.173	3.054	0.119	1.000	276496	1.07		116	11754	M
499.00 > 99.00		3.054	0.119	1.000	58719		4.71(0.90-1.10)		2679	M
D 17 13C4 PFO		0.470	0.004		1000000	40.0		404	4.5750	
503.00 > 80.00		3.172	0.001		12393983	49.8		104	145758	8
D 19 13C5 PFN/ 468.00 > 423.00		3.172	0.009		8793150	49.5		99.0	810272	
20 Perfluorono			0.009		0773130	47.5		77.0	010272	
463.00 > 419.00		3.172	0.009	1.000	172658	1.03		103	3650	
D 21 13C8 FOS	А									
506.00 > 78.00	3.480	3.478	0.002		19974201	52.0		104	715848	
22 Perfluorooct			Э							
498.00 > 78.00	3.489	3.478	0.011	1.000	376845	1.01		101	27717	
24 Perfluorode			0.040	1 000	444074	0.0/45		0/5	7454	
513.00 > 469.00		3.529	0.010	1.000	146974	0.9645		96.5	7151	
D 23 13C2 PFD/ 515.00 > 470.00		3.537	0.002		8072885	51.3		103	338129	
26 Perfluorode					0072003	31.3		103	330127	
599.00 > 80.00		3.848	0.002	1.000	139829	0.9235		95.8		
28 Perfluoround	decanoio	c acid								
563.00 > 519.00		3.857	0.019	1.000	120798	1.03		103	4769	
D 27 13C2 PFU	nΑ									
565.00 > 520.00		3.866	0.010		6158011	52.5		105	247557	
D 30 13C2 PFD			0.010		E/EE070	F4.0		400	00/100	
615.00 > 570.00		4.160	0.010		5655073	51.0		102	236100	
29 Perfluorodo 613.00 > 569.00		2 acid 4.160	0.010	1.000	100811	0.9710		97.1	3925	
31 Perfluorotrid			0.010	1.000	100811	0.7710		77.1	3723	
663.00 > 619.00		4.433	0.009	1.000	99462	0.9697		97.0	2636	
D 32 13C2-PFTe	eDA									
715.00 > 670.00		4.670	0.011		11352096	49.9		99.8	824753	
33 Perfluoroteti	radecan	oic acid								
712.50 > 668.90		4.670	0.019	1.000	199589	1.11		111	1614	
713.00 > 169.00		4.670	0.011	0.998	33300		5.99(0.00-0.00)		12401	
D 34 13C2-PFH		E 000	0.000		EOE/1/7	47.0		04.0	122204	
815.00 > 770.00		5.090	0.023		5854167	47.0		94.0	132204	
35 Perfluorohe: 813.00 > 769.00		5.101	0.012	1.000	167625	0.9527		95.3	192	
36 Perfluorooct			0.012		107020	0.7021		70.0	. / _	
913.00 > 869.00		5.459	0.016	1.000	90527	0.7768		77.7	106	

Report Date: 03-Jan-2017 10:09:32 Chrom Revision: 2.2 05-Dec-2016 12:37:22

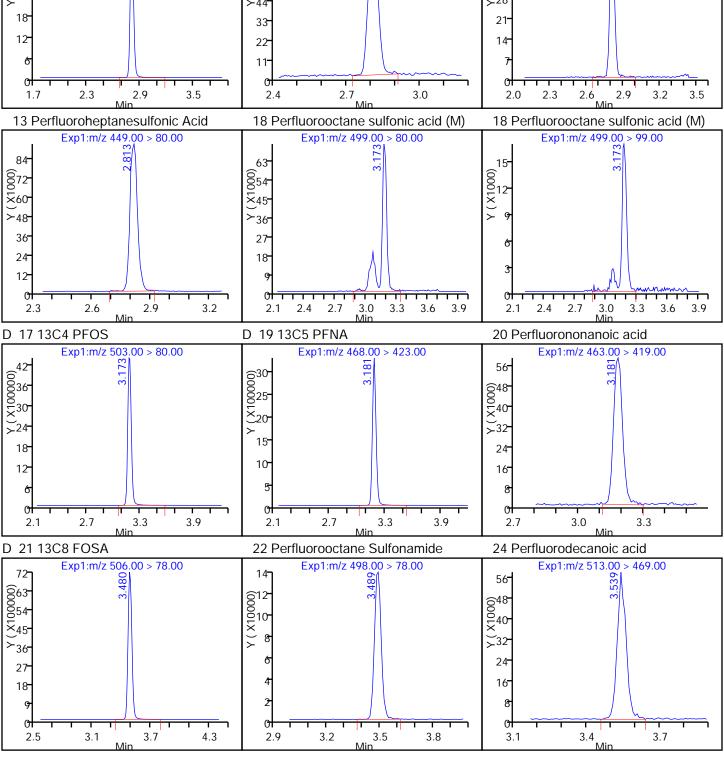
QC Flag Legend Review Flags

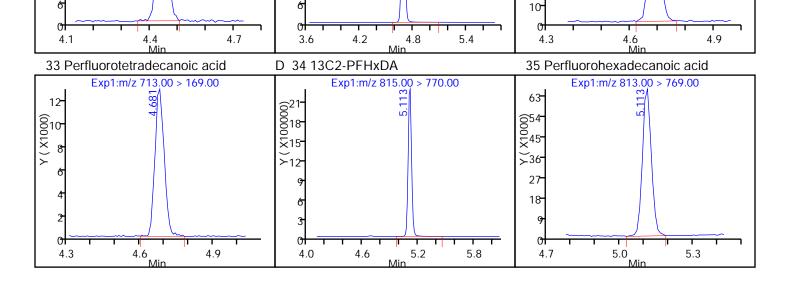
M - Manually Integrated

Reagents:

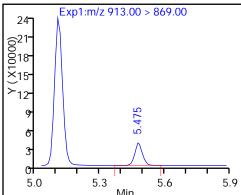
LCPFC-L2_00023 Amount Added: 1.00 Units: mL

Report Date: 03-Jan-2017 10:09:32 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016A_005.d **Injection Date:** 30-Dec-2016 11:26:29 Instrument ID: A8_N Lims ID: CCV L2 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 V (X10000) (000048 (00001×40 ∑35 -32 ≻28 24 21 1.9 1.9 1.0 1.3 1.6 1.0 1.3 1.6 1.2 1.5 1.8 2.1 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00Exp1:m/z 298.90 > 99.00 12 18 70 7 (X10000) (000015 X) × (10000 <u>6</u>60 ∑50 ≻40- 30 20 10 2.2 1.9 1.9 1.9 1.3 1.6 1.6 1.6 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid (M) Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 399.00 > 80.00 V (X10000) (00036 X30 77 0665 X555 ≻44- 18 33 12 22 11 1.9 2.2 2.5 2.1 2.4 1.7 2.0 2.3 2.9 2.8 1.6 1.8 2.6 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 56 77 635 0030 000048- 000040-00040-<u>666</u> -55- ×25 **≻**44 ≻20 24 33 15 16 22 11 0 1.8 2.1 2.4 2.7 2.1 2.7 1.9 2.2 2.5 2.8 1.5 3.0 3.1 1.6 Page 62/11n of 809





36 Perfluorooctadecanoic acid



Report Date: 03-Jan-2017 10:09:32 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016A_005.d

Injection Date: 30-Dec-2016 11:26:29 Instrument ID: A8_N

Lims ID: CCV L2

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

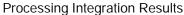
Column: Detector EXP1

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

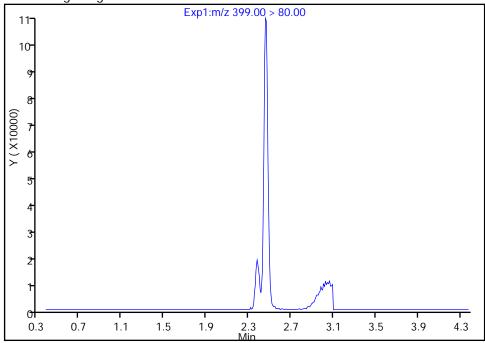
Signal: 1

Not Detected

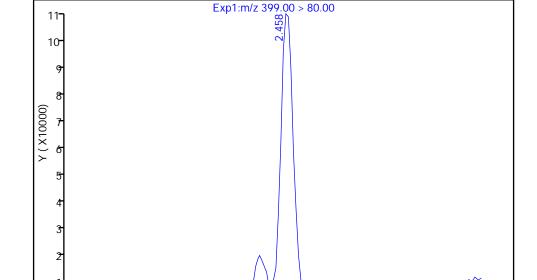
Expected RT: 2.38



Manual Integration Results



RT: 2.46
Area: 338751
Amount: 1.021926
Amount Units: ng/ml



Reviewer: chandrasenas, 03-Jan-2017 10:09:16

Audit Action: Manually Integrated

Audit Reason: Assign Peak

2.4

2.6

2.8

3.0

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2.2

2.0

1.8

Report Date: 03-Jan-2017 10:09:32 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016A_005.d

Injection Date: 30-Dec-2016 11:26:29 Instrument ID: A8_N

Lims ID: CCV L2

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

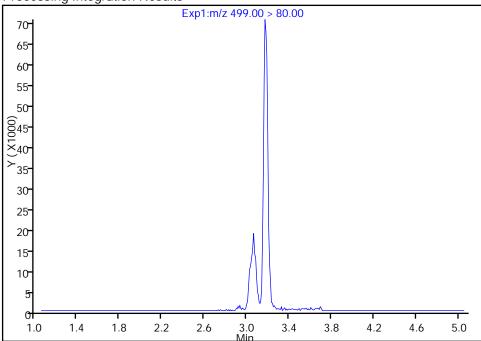
18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

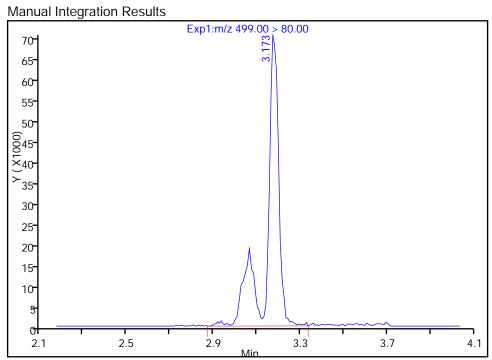
Not Detected

Expected RT: 3.05

Processing Integration Results



RT: 3.17
Area: 276496
Amount: 1.072313
Amount Units: ng/ml



Reviewer: chandrasenas, 03-Jan-2017 10:09:16

Audit Action: Manually Integrated

Audit Reason: Assign Peak

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Report Date: 03-Jan-2017 10:09:32 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016A_005.d

Injection Date: 30-Dec-2016 11:26:29 Instrument ID: A8_N

Lims ID: CCV L2

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

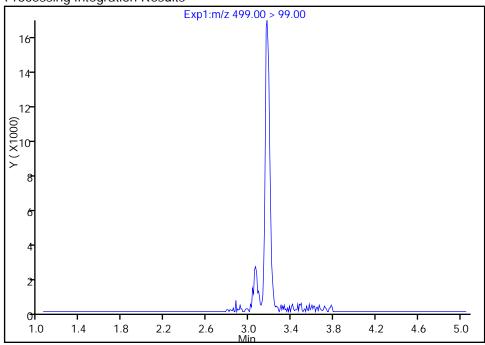
Column: Detector EXP1

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

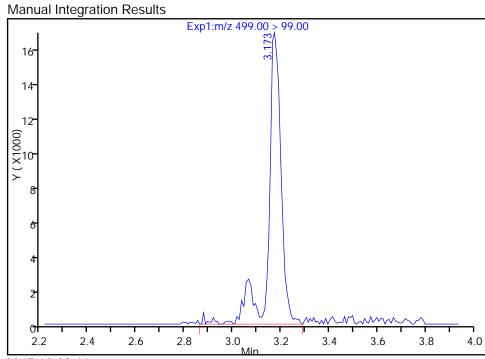
Signal: 2

Not Detected Expected RT: 3.05

Processing Integration Results



RT: 3.17
Area: 58719
Amount: 1.072313
Amount Units: ng/ml



Reviewer: chandrasenas, 03-Jan-2017 10:09:16

Audit Action: Manually Integrated

Audit Reason: Assign Peak

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FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Lab Sample ID: CCV 320-144510/11 Calibration Date: 12/30/2016 12:18

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 30DEC2016B_001.d Conc. Units: ng/mL

Perfluorobutanoic acid (PFBA) Perfluoropentanoic acid (PFPeA) Perfluorobutanesulfonic acid (PFBS) Perfluorohexanoic acid (PFHxA) Perfluorohexanesulfonic acid (PFHxS) Perfluorohexanesulfonic acid (PFHpA) Perfluoroctanoic acid (PFOA) Perfluoroheptanesulfonic Acid (PFHpS) Perfluoroctanesulfonic Acid (PFHpS) Perfluorooctanesulfonic Acid (PFOS)	TYPE EVEID EVEID	0.8537 0.9868 1.417 0.9288 1.030 0.9788 1.003	0.9150 1.002 1.519 0.9327 1.032 0.9805 0.997	MIN RRF	CALC AMOUNT 53.6 50.8 47.4 50.2 45.6	\$PIKE AMOUNT 50.0 50.0 44.2 50.0 45.5	7.2 1.6 7.2	MAX %D 25.0 25.0 25.0
(PFBA) Perfluoropentanoic acid (PFPeA) Perfluorobutanesulfonic acid (PFBS) Perfluorohexanoic acid (PFHxA) Perfluorohexanesulfonic acid (PFHxA) Perfluoroheptanoic acid (PFHxB) Perfluoroctanoic acid (PFOA) Perfluoroctanoic acid (PFOA) Perfluoroheptanesulfonic Acid (PFHpS) Perfluoroctanesulfonic Acid (PFHpS) Perfluoroctanesulfonic acid (PFOS) Perfluorononanoic acid Acid (PFOS)	aveID aveID aveID aveID aveID aveID aveID aveID	0.9868 1.417 0.9288 1.030 0.9788 1.003	1.002 1.519 0.9327 1.032 0.9805		50.8 47.4 50.2	50.0 44.2 50.0	1.6 7.2 0.4	25.0
Perfluoropentanoic acid (PFPeA) Perfluorobutanesulfonic acid (PFBS) Perfluorohexanoic acid (PFHxA) Perfluorohexanesulfonic acid (PFHxS) Perfluoroheptanoic acid (PFHpA) Perfluoroctanoic acid (PFOA) Perfluoroheptanesulfonic Acid (PFHpS) Perfluoroctanesulfonic acid (PFOS) Perfluorononanoic acid Argeros	aveID aveID aveID aveID aveID aveID	1.417 0.9288 1.030 0.9788 1.003	1.519 0.9327 1.032 0.9805		47.4	44.2	7.2	25.0
Perfluorobutanesulfonic acid (PFBS) Perfluorohexanoic acid (PFHxA) Perfluorohexanesulfonic acid (PFHxS) Perfluoroheptanoic acid (PFHpA) Perfluorooctanoic acid (PFOA) Perfluoroheptanesulfonic Acid (PFHpS) Perfluorooctanesulfonic Acid (PFHpS) Perfluorooctanesulfonic acid (PFOS) Perfluorononanoic acid Acid (PFOS)	aveID aveID aveID aveID aveID	0.9288 1.030 0.9788 1.003	0.9327 1.032 0.9805		50.2	50.0	0.4	
Perfluorohexanoic acid (PFHxA) Perfluorohexanesulfonic acid (PFHxS) Perfluoroheptanoic acid (PFHpA) Perfluorooctanoic acid (PFOA) Perfluoroheptanesulfonic Acid (PFHpS) Perfluorooctanesulfonic acid (PFOS) Perfluorononanoic acid Acid (PFHS)	aveID aveID	1.030 0.9788 1.003	1.032					25.0
Perfluorohexanesulfonic acid (PFHxS) Perfluoroheptanoic acid (PFHpA) Perfluorooctanoic acid (PFOA) Perfluoroheptanesulfonic Acid (PFHpS) Perfluorooctanesulfonic acid (PFOS) Perfluorononanoic acid Acid (PFOS)	aveID aveID	0.9788	0.9805		45.6	45.5	0 0	
Perfluoroheptanoic acid (PFHpA) Perfluorooctanoic acid (PFOA) Perfluoroheptanesulfonic Acid (PFHpS) Perfluorooctanesulfonic acid (PFOS) Perfluorononanoic acid Acid Acid (PFOS)	veID	1.003			1		0.2	25.0
Perfluorooctanoic acid A' (PFOA) Perfluoroheptanesulfonic A: Acid (PFHpS) Perfluorooctanesulfonic acid A' (PFOS) Perfluorononanoic acid A'	veID		0.997		50.1	50.0	0.2	25.0
Perfluoroheptanesulfonic A: Acid (PFHpS) Perfluorooctanesulfonic acid A: (PFOS) Perfluorononanoic acid A:		1.102			49.7	50.0	-0.6	25.0
Perfluorooctanesulfonic acid A (PFOS) Perfluorononanoic acid A	AveID		1.158		50.0	47.6	5.1	25.0
Perfluorononanoic acid A		0.9945	1.051		49.0	46.4	5.6	25.0
	AveID	0.9518	0.9590		50.4	50.0	0.7	25.0
Perfluorooctane Sulfonamide A: (FOSA)	AveID	0.9327	0.9380		50.3	50.0	0.6	25.0
	AveID	0.9438	0.9600		50.9	50.0	1.7	25.0
	AveID	0.5840	0.6245		51.5	48.2	6.9	25.0
	AveID	0.9563	0.9844		51.5	50.0	2.9	25.0
	AveID	0.9180	0.9512		51.8	50.0	3.6	25.0
	AveID	0.9069	0.9195		50.7	50.0	1.4	25.0
	AveID	1.585	1.738		54.8	50.0	9.7	25.0
	L1ID		0.9588		49.6	50.0	-0.8	25.0
	AveID	1.030	0.8949		43.4	50.0	-13.1	25.0
	Ave	347743	324883		46.7	50.0	-6.6	50.0
13C5-PFPeA A	Ave	266072	242051		45.5	50.0	-9.0	50.0
13C2 PFHxA A	Ave	245110	217750		44.4	50.0	-11.2	50.0
13C4-PFHpA A	Ave	226344	191733		42.4	50.0	-15.3	50.0
1802 PFHxS A	Ave	326976	295171		42.7	47.3	-9.7	50.0
13C4 PFOA A	Ave	230362	196038		42.5	50.0	-14.9	50.0
	Ave	248847	237649		45.6	47.8	-4.5	50.0
	Ave	177687	149415		42.0	50.0	-15.9	50.0
	Ave	384141	372821		48.5	50.0	-2.9	50.0
	Ave	157302	143393		45.6	50.0	-8.8	50.0
	Ave	117250	105103		44.8	50.0	-10.4	50.0
	Ave	110957	100899		45.5	50.0	-9.1	50.0
	Ave	227387	207725		45.7	50.0	-8.6	50.0
	Ave	124568	111894		44.9	50.0	-10.2	50.0

Report Date: 03-Jan-2017 14:28:00 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_001.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 30-Dec-2016 12:18:55 ALS Bottle#: 41 Worklist Smp#: 11

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Method: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 03-Jan-2017 14:28:00 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1

Process Host: XAWRK026

First Level Reviewer: phomsophat Date: 03-Jan-2017 13:45:15

Til St Ecver Neviewer: prioritsopriat				41		Date.		70 3411 2017 10:10:1	<u> </u>		
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	D 2 13C4 PFBA										
	217.00 > 172.00		1.534	0.0		16244137	46.7		93.4	921797	
	1 Perfluorobuty	yric acid									
	212.90 > 169.00	1.534	1.534	0.0	1.000	14863478	53.6		107	83783	
	D 413C5-PFPe										
	267.90 > 223.00	1.810	1.810	0.0		12102553	45.5		91.0	121663	7
	3 Perfluoropen										
	262.90 > 219.00		1.810		1.000	12131372	50.8		102	141916	
	5 Perfluorobuta				1 000	1001004/	47.4		107		
	298.90 > 80.00 298.90 > 99.00		1.849 1.849	0.0	1.000 1.000	19819046 9168809	47.4	2.16(0.00-0.00)	107		
	D 6 13C2 PFHx		1.049	0.0	1.000	9100009		2.10(0.00-0.00)			
	315.00 > 270.00		2.098	0.0		10887491	44.4		88.8	103961	7
	7 Perfluorohex			0.0		10007171			00.0	100701	,
	313.00 > 269.00		2.098	0.0	1.000	10154370	50.2		100	252812	
	9 Perfluorohex	anesulfo	nic acid	l							
	399.00 > 80.00		2.424		1.000	13864224	45.6		100		
	D 11 13C4-PFH	οA									
	367.00 > 322.00	2.431	2.431	0.0		9586637	42.4		84.7	381274	
	12 Perfluorohe		acid								
	363.00 > 319.00	2.431	2.431	0.0	1.000	9399949	50.1		100	82536	
	D 10 18O2 PFH										
	403.00 > 84.00		2.454	0.0		13961607	42.7		90.3	101705	5
	D 14 13C4 PFO										
	417.00 > 372.00	2.791	2.791	0.0		9801886	42.5		85.1	702218	

Report Date: 03-Jan-2017 14:28:00 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Data File: \ChromNa\Sacramento\ChromData\A8 N\20161230-38358 b\30DEC2016B 001 d

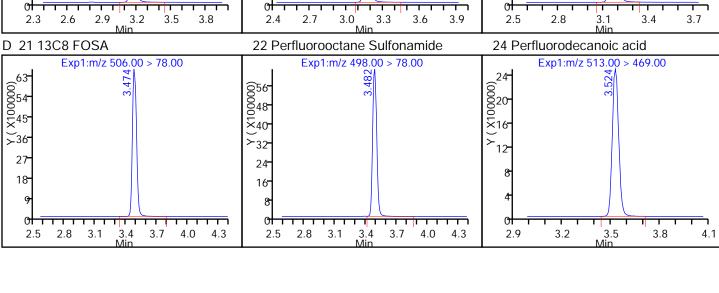
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_001.d										
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooc	tanoic ac	-id	•							
413.00 > 369.00		2.791	0.0	1.000	9771100	49.7		99.4	112119	
413.00 > 169.00		2.791	0.0	1.000	6157508	.,	1.59(0.90-1.10)	,,,,	309395	
13 Perfluorohe	ptanesul	fonic Ac	id							
449.00 > 80.00	2.799	2.799	0.0	1.000	13100197	50.0		105		
18 Perfluorooc		onic aci	d							
	3.135	3.135		1.000	11584220	49.0		106	112621	
499.00 > 99.00		3.135	-0.007	0.997	2472749		4.68(0.90-1.10)		33641	
D 17 13C4 PFO		2.150	0.0		11250/10	45 /		05.5	224002	
503.00 > 80.00		3.159	0.0		11359619	45.6		95.5	224083	
D 19 13C5 PFN. 468.00 > 423.00		3.167	0.0		7470749	42.0		84.1	417920	
20 Perfluorono			0.0		7470747	42.0		04.1	417720	
463.00 > 419.00		3.159	0.0	1.000	7164116	50.4		101	151222	
D 21 13C8 FOS		007	0.0		, , , , , , ,	00				
506.00 > 78.00		3.474	0.0		18641065	48.5		97.1	545779	
22 Perfluorooc	tane Sul	fonamid	е							
498.00 > 78.00		3.482		1.000	17485990	50.3		101	621296	
24 Perfluorode	canoic a	cid								
513.00 > 469.00	3.524	3.524	0.0	1.000	6883163	50.9		102	206646	
D 23 13C2 PFD										
515.00 > 470.00	3.524	3.524	0.0		7169647	45.6		91.2	332690	
26 Perfluorode										
599.00 > 80.00		3.836	0.0	1.000	7152869	51.5		107		
28 Perfluoroun			0.0	4 000	5470407	54 5		400	4 / 0770	
563.00 > 519.00		3.853	0.0	1.000	5173107	51.5		103	160779	
D 27 13C2 PFU		2 052	0.0		E255154	44.0		00.4	200741	
565.00 > 520.00		3.853	0.0		5255156	44.8		89.6	399741	
D 30 13C2 PFD 615.00 > 570.00		4.149	0.0		5044964	45.5		90.9	285176	
29 Perfluorodo			0.0		3044704	43.3		70.7	203170	
613.00 > 569.00		4.149	0.0	1.000	4798853	51.8		104	127920	
31 Perfluorotrio										
663.00 > 619.00		4.421	0.0	1.000	4639071	50.7		101	104461	
D 32 13C2-PFT	eDA									
715.00 > 670.00	4.664	4.664	0.0		10386247	45.7		91.4	553285	
33 Perfluorotet	radecan	oic acid								
712.50 > 668.90	4.664	4.664	0.0	1.000	8769752	54.8		110	134380	
713.00 > 169.00	4.655	4.664	-0.009	0.998	1358976		6.45(0.00-0.00)		129225	
D 34 13C2-PFH										
815.00 > 770.00	5.081	5.081	0.0		5594701	44.9		89.8	117329	
35 Perfluorohe				1 000	4007400	40.7		00.0	F0/0	
813.00 > 769.00		5.081	0.0	1.000	4837108	49.6		99.2	5263	
36 Perfluorooc			0.0	1 000	4514704	40.4		0/.0	4007	
913.00 > 869.00	5.444	5.444	0.0	1.000	4514794	43.4		86.9	4927	

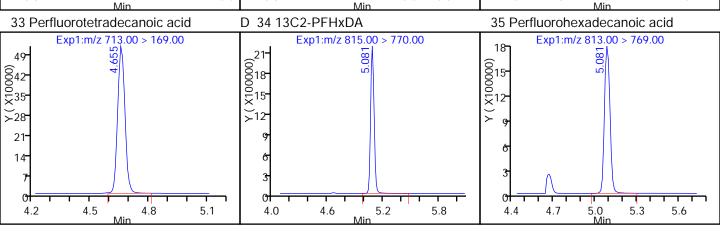
Report Date: 03-Jan-2017 14:28:00 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

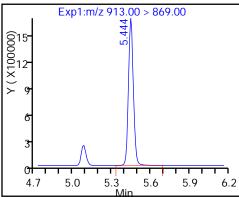
LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 03-Jan-2017 14:28:01 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: Injection Date: 30-Dec-2016 12:18:55 Instrument ID: A8_N Lims ID: CCV L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 11 Injection Vol: 2.0 ul Dil. Factor: 1.0000 LC PFC_DOD ICAL Method: $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 56 49 049 042 ×35 ∑28- ≻₂₈-21 21 21 14 14 1.9 1.9 1.0 1.3 1.6 1.0 1.3 1.6 1.2 1.5 1.8 2.1 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00Exp1:m/z 298.90 > 99.00 40 80-000042 0035 ©70-060-035- ×50-×25 ≻₄₀ ≻₂₀ 21 30 15 10 20 10 1.7 2.0 2.3 1.7 2.0 2.3 1.8 2.1 1.4 1.5 1.1 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 399.00 > 80.00 42 42 860 (00030-125-(00000 30-30-836 <u>8</u>30-∑₂₄->20 18 18 15 12 10 2.0 2.3 2.6 2.0 1.9 2.5 1.4 1.7 1.7 2.3 2.6 2.2 2.8 1.4 3.1 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 35- 49 030 025 00042 0005 00042 830 <u>6</u>25 ×₂₀ ∑₂₀ _28− 15 21 10 10 0 0 2.0 2.3 2.6 2.9 3.2 1.9 2.8 1.8 2.1 2.4 2.7 Page 68@ of 809 3.0 1.7





36 Perfluorooctadecanoic acid



FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Lab Sample ID: CCV 320-144510/23 Calibration Date: 12/30/2016 13:48

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 30DEC2016B_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9534		22.3	20.0	11.7	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.069		21.7	20.0	8.3	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.629		20.3	17.7	15.0	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9596		20.7	20.0	3.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.093		19.3	18.2	6.1	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	1.016		20.8	20.0	3.8	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.082		21.6	20.0	7.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.256		21.7	19.0	14.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.061		19.8	18.6	6.7	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9887		20.8	20.0	3.9	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9949		21.3	20.0	6.7	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9782		20.7	20.0	3.6	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6426		21.2	19.3	10.0	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9532		19.9	20.0	-0.3	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9935		21.6	20.0	8.2	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9813		21.6	20.0	8.2	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.910		24.1	20.0	20.5	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9790		19.9	20.0	-0.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8906		17.3	20.0	-13.6	25.0
13C4 PFBA	Ave	347743	347084		49.9	50.0	-0.2	50.0
13C5-PFPeA	Ave	266072	255513		48.0	50.0	-4.0	50.0
13C2 PFHxA	Ave	245110	228632		46.6	50.0	-6.7	50.0
13C4-PFHpA	Ave	226344	205754		45.5	50.0	-9.1	50.0
1802 PFHxS	Ave	326976	313069		45.3	47.3	-4.3	50.0
13C4 PFOA	Ave	230362	211330		45.9	50.0	-8.3	50.0
13C4 PFOS	Ave	248847	240305		46.2	47.8	-3.4	50.0
13C5 PFNA	Ave	177687	161152		45.3	50.0	-9.3	50.0
13C8 FOSA	Ave	384141	372199		48.4	50.0	-3.1	50.0
13C2 PFDA	Ave	157302	153027		48.6	50.0	-2.7	50.0
13C2 PFUnA	Ave	117250	115232		49.1	50.0	-1.7	50.0
13C2 PFDoA	Ave	110957	102687		46.3	50.0	-7.5	50.0
13C2-PFTeDA	Ave	227387	224263		49.3	50.0	-1.4	50.0
13C2-PFHxDA	Ave	124568	109648		44.0	50.0	-12.0	50.0

Report Date: 03-Jan-2017 14:28:20 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_013.d

Lims ID: CCV L4

Client ID:

Sample Type: CCV

Inject. Date: 30-Dec-2016 13:48:58 ALS Bottle#: 40 Worklist Smp#: 23

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L4

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Method: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 03-Jan-2017 14:28:20 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1

Process Host: XAWRK026

Signal RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA 217.00 > 172.00 1.520	5 1.526	0.0		17354181	49.9		99.8	1471536	5
1 Perfluorobutyric ac 212.90 > 169.00 1.534		0.0	1.000	6618387	22.3		112	39955	
D 4 13C5-PFPeA 267.90 > 223.00 1.80	I 1.801	0.0		12775664	48.0		96.0	126824	5
3 Perfluoropentanoio 262.90 > 219.00 1.81		0.0	1.000	5461558	21.7		108	70924	
5 Perfluorobutanesu 298.90 > 80.00 1.840 298.90 > 99.00 1.840	1.840	0.0	1.000 1.000	9018675 3803807	20.3	2.37(0.00-0.00)	115		
D 6 13C2 PFHxA 315.00 > 270.00 2.092		0.0		11431607	46.6		93.3	482267	
7 Perfluorohexanoic 313.00 > 269.00 2.092	2.092		1.000	4387890	20.7		103	123480	
9 Perfluorohexanesu 399.00 > 80.00 2.410			1.000	6229504	19.3		106		
D 11 13C4-PFHpA 367.00 > 322.00 2.42		0.0		10287724	45.5		90.9	638332	
12 Perfluoroheptanoi 363.00 > 319.00 2.42		0.0	1.000	4180596	20.8		104	43082	
D 10 1802 PFHxS 403.00 > 84.00 2.443	3 2.443	0.0		14808159	45.3		95.7	274964	1
D 14 13C4 PFOA 417.00 > 372.00 2.773		0.0		10566500	45.9		91.7	339047	
15 Perfluorooctanoic 413.00 > 369.00 2.780 413.00 > 169.00 2.780	2.780	0.0	1.000 1.000	4574857 2783863	21.6	1.64(0.90-1.10)	108	57655 145611	

Data i ile.	//CITIC	Jiliva	aciamen		Data AO_IN201	01230-3033	6.D/30DLC2010B_C	713.u		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorohe	ptanesul	fonic Ac	id							
449.00 > 80.00	•	2.788		1.000	5748483	21.7		114		
18 Perfluorooc	tane sulf	onic acid	b							
499.00 > 80.00	3.044	3.044	0.0	1.000	4730914	19.8		107	35230	
499.00 > 99.00	3.148	3.044	0.104	1.034	1036506		4.56(0.90-1.10)		48186	
D 17 13C4 PFO	S									
503.00 > 80.00	3.148	3.148	0.0		11486595	46.2		96.6	327960	
20 Perfluorono										
463.00 > 419.00	3.156	3.156	0.0	1.000	3186454	20.8		104	69726	
D 19 13C5 PFN										
468.00 > 423.00	3.148	3.148	0.0		8057576	45.3		90.7	391742	
D 21 13C8 FOS										
506.00 > 78.00		3.478			18609948	48.4		96.9	945996	
22 Perfluorooc										
498.00 > 78.00		3.470	0.0	1.000	7406316	21.3		107	272228	
24 Perfluorode				1 000	00007/0	00.7		101	101010	
513.00 > 469.00		3.504	0.0	1.000	2993760	20.7		104	101040	
D 23 13C2 PFD										
515.00 > 470.00					7651347	48.6		97.3	259633	
26 Perfluorode				1 000	0077400	0.1.0		440		
599.00 > 80.00		3.822	0.0	1.000	2977189	21.2		110		
D 27 13C2 PFU		0.000	0.0		57/4/00	40.4		00.0	000000	
565.00 > 520.00		3.839	0.0		5761609	49.1		98.3	320888	
28 Perfluoroun				1 000	0404000	40.0		00.7	50.45 7	
563.00 > 519.00		3.839	0.0	1.000	2196888	19.9		99.7	58457	
D 30 13C2 PFD					5404040	44.0		00.5	4 / 5 7 0 4	
615.00 > 570.00		4.138	0.0		5134343	46.3		92.5	165701	
29 Perfluorodo										
613.00 > 569.00			0.0	1.000	2040304	21.6		108	58082	
31 Perfluorotrio										
663.00 > 619.00		4.403	0.0	1.000	2015289	21.6		108	49581	
D 32 13C2-PFT										
715.00 > 670.00		4.641	0.0		11213172	49.3		98.6	996370	
33 Perfluorotet										
712.50 > 668.90		4.651	0.0	1.000	3921816	24.1	(01(0 00 0 00)	120	66194	
713.00 > 169.00		4.651	-0.010	0.998	575761		6.81(0.00-0.00)		72601	
D 34 13C2-PFH		F 0F7	0.0		F 40000/	44.0		00.0	101110	
815.00 > 770.00		5.057	0.0		5482396	44.0		88.0	131410	
35 Perfluorohe				1 000	00405/7	40.0		00.5	00/0	
813.00 > 769.00		5.067	0.0	1.000	2010567	19.9		99.5	2068	
36 Perfluorooc				4.055	100557	4		o., .	0.45=	
913.00 > 869.00	5.421	5.421	0.0	1.000	1828964	17.3		86.4	2405	
Reagents:										
LCPFC-L4_0002	24		Α	mount A	dded: 1.00	Units	: mL			

Report Date: 03-Jan-2017 14:28:20 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 30-Dec-2016 13:48:58 Instrument ID: A8_N Lims ID: CCV L4 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 23 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 24 (000001X) (000001X) 526 8 00042 0005 35 818 ×15 24 21 16 1.0 2.2 1.0 1.9 1.6 0.7 1.3 1.6 1.1 2.0 2.3 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.00(21⁻ 00018⁻ ×15⁻ (0015⁻ 0000012⁻ × 9 635- ×25 **≻20** 15 10 2.2 1.9 1.8 2.1 1.8 2.1 1.3 1.6 1.5 1.5 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 399.00 > 80.00 (0000012 (0000012) × 9 (018 (000015 (X) (12) (000036 X) > 24 18 12 1.9 2.2 1.8 1.9 2.2 2.5 3.1 1.6 2.5 2.8 1.5 2.1 2.4 2.8 1.3 1.6 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 421 (0000012-049 0042 635 630 30 ×25 ×35 ≻20 ≻28 21 15 0 0 1.9 2.2 2.5 2.8 3.1 2.0 2.9 1.8 2.4 3.0 3.6 Page 689 of 809 1.2 1.6

3.3

3.6

3.9

2.9

3.2

3.5 /lin 3.8

4.1

18

2.6

2.9

3.2

3.5

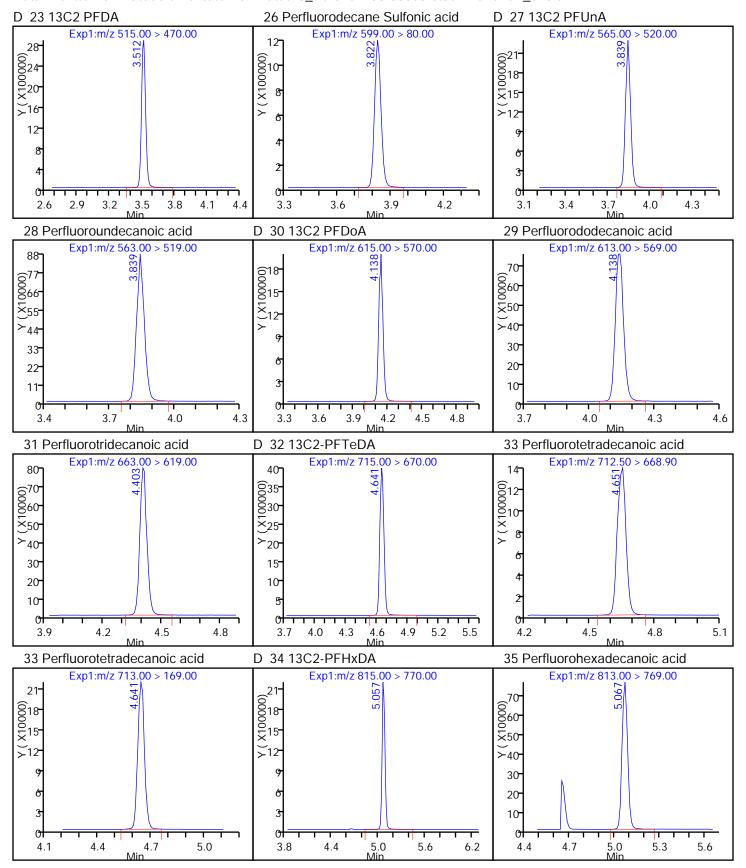
3.8

4.1

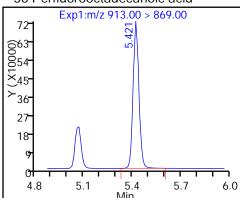
4.4

2.7

3.0



36 Perfluorooctadecanoic acid



FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Lab Sample ID: CCV 320-144510/34 Calibration Date: 12/30/2016 15:11

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 30DEC2016B_024.d Conc. Units: ng/mL

Ferritor Ferritor	ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ferrituron Average A		AveID	0.8537	0.9060		53.1	50.0	6.1	25.0
Ferfilurorobutanesulfonic acid AveID 0.9288 0.9288 50.0 50.0 50.0 0.0 25	Perfluoropentanoic acid	AveID	0.9868	1.002		50.8	50.0	1.5	25.0
Perfiluronchexanolic acid AveID 0.9288 0.9288 50.0 50.0 0.0 25	Perfluorobutanesulfonic acid	AveID	1.417	1.492		46.5	44.2	5.3	25.0
Perfluoroheptanoic acid AveID 0.9788 0.9647 49.3 50.0 -1.4 25	Perfluorohexanoic acid	AveID	0.9288	0.9288		50.0	50.0	0.0	25.0
Perfluorohexanesulfonic acid AveID 1.030 1.016 44.9 45.5 -1.4 25	Perfluoroheptanoic acid	AveID	0.9788	0.9647		49.3	50.0	-1.4	25.0
Perfluoroheptanesulfonic AveID 1.102 1.179 50.9 47.6 7.0 25	Perfluorohexanesulfonic acid	AveID	1.030	1.016		44.9	45.5	-1.4	25.0
Perf Decriporation Ave 1.003 1.024 51.1 50.0 2.1 25	Perfluoroheptanesulfonic	AveID	1.102	1.179		50.9	47.6	7.0	25.0
Perfluoronamanic acid AveID 0.9518 0.9743 51.2 50.0 2.4 25	Perfluorooctanoic acid	AveID	1.003	1.024		51.1	50.0	2.1	25.0
Perfluoroctanesulfonic acid AveID 0.9945 1.035 48.3 46.4 4.1 25	Perfluorononanoic acid	AveID	0.9518	0.9743		51.2	50.0	2.4	25.0
Perfluoroctane Sulfonamide RaveID 0.9327 0.9279 49.7 50.0 -0.5 25 25 25 25 25 25 25	Perfluorooctanesulfonic acid	AveID	0.9945	1.035		48.3	46.4	4.1	25.0
Perfluorodecanoic acid AveID 0.9438 0.9530 50.5 50.0 1.0 25	Perfluorooctane Sulfonamide	AveID	0.9327	0.9279		49.7	50.0	-0.5	25.0
Perfluorodecanesulfonic acid AveID 0.5840 0.6065 50.1 48.2 3.9 25	Perfluorodecanoic acid	AveID	0.9438	0.9530		50.5	50.0	1.0	25.0
Perfluoroundecanoic acid AveID 0.9563 0.9788 51.2 50.0 2.4 25	Perfluorodecanesulfonic acid	AveID	0.5840	0.6065		50.1	48.2	3.9	25.0
Perfluorododecanoic acid (PFDDA) 0.9180 0.9437 0.9437 0.9437 0.9437 0.9437 0.9089 0.8909 0.	Perfluoroundecanoic acid	AveID	0.9563	0.9788		51.2	50.0	2.4	25.0
Perfluorotridecanoic Acid AveID 0.9069 0.8909 49.1 50.0 -1.8 25	Perfluorododecanoic acid	AveID	0.9180	0.9437		51.4	50.0	2.8	25.0
Perfluorotetradecanoic acid (PFPA)	Perfluorotridecanoic Acid	AveID	0.9069	0.8909		49.1	50.0	-1.8	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	Perfluorotetradecanoic acid	AveID	1.585	1.778		56.1	50.0	12.2	25.0
Perfluoro-n-octadecanoic acid (PFODA) Ave 347743 319330 45.9 50.0 -16.4 25 13C4 PFBA Ave 266072 236584 44.5 50.0 -11.1 50 13C2 PFHxA Ave 245110 209255 42.7 50.0 -14.6 50 13C4-PFHpA Ave 226344 192958 42.6 50.0 -14.8 50 13C4 PFDA Ave 230362 188480 40.9 50.0 -18.2 50 13C4 PFOS Ave 230362 188480 40.9 50.0 -18.2 50 13C4 PFOS Ave 248847 222836 42.8 47.8 -10.5 50 13C5 PFNA Ave 177687 146822 41.3 50.0 -17.4 50 13C8 PGDA Ave 384141 352469 45.9 50.0 -8.2 50 13C2 PFDA Ave 157302 138409 44.0 50.0 -12.0 50 13C2 PFDOA Ave 117250 104402 44.5 50.0 -11.0 50 13C2 PFDOA Ave 110957 96104 43.3 50.0 -13.4 50 13C2-PFTEDA Ave 227387 199997 44.0 50.0 -12.0 50 50 13C2-PFTEDA Ave 227387 199997 44.0 50.0 -12.0 50 50 13C2-PFTEDA Ave 227387 199997 44.0 50.0 -12.0 50 50 13C2-PFTEDA Ave 227387 199997 44.0 50.0 -12.0 50 50 13C2-PFTEDA Ave 227387 199997 44.0 50.0 -12.0 50 50 13C2-PFTEDA Ave 227387 199997 44.0 50.0 -12.0 50 50 13C2-PFTEDA Ave 227387 199997 44.0 50.0 -12.0 50 50 13C2-PFTEDA Ave 227387 199997 44.0 50.0 -12.0 50 50 13C2-PFTEDA Ave 227387 199997 44.0 50.0 -12.0 50 50 13C2-PFTEDA Ave 227387 199997 44.0 50.0 -12.0 50 50 13C2-PFTEDA Ave 227387 199997 44.0 50.0 -12.0 50 50 13C2-PFTEDA Ave 227387 199997 44.0 50.0 -12.0 50 50 13C2-PFTEDA Ave 227387 199997 44.0 50.0 -12.0 50 50 13C2-PFTEDA Ave 227387 199997 44.0 50.0 -12.0 50 50 13C2-PFTEDA Ave 227387 199997 44.0 50.0 -12.0 50 50 13C2-PFTEDA Ave 227387 199997 44.0 50.0 -12.0 50 50 13C2-PFTEDA Ave 227387 199997 44.0 50.0 -12.0 50 50 13C2-PFTEDA Ave 227387 19997 44.0 50.0 -12.0 50 13C2	Perfluoro-n-hexadecanoic	L1ID		0.9509		49.2	50.0	-1.6	25.0
13C4 PFBA Ave 347743 319330 45.9 50.0 -8.2 50 13C5-PFPeA Ave 266072 236584 44.5 50.0 -11.1 50 13C2 PFHxA Ave 245110 209255 42.7 50.0 -14.6 50 13C4-PFHpA Ave 226344 192958 42.6 50.0 -14.8 50 1802 PFHxS Ave 326976 289218 41.8 47.3 -11.5 50 13C4 PFOA Ave 230362 188480 40.9 50.0 -18.2 50 13C4 PFOS Ave 248847 222836 42.8 47.8 -10.5 50 13C5 PFNA Ave 177687 146822 41.3 50.0 -17.4 50 13C8 FOSA Ave 384141 352469 45.9 50.0 -8.2 50 13C2 PFDA Ave 117250 104402 44.0 50.0 -11.0 50 1	Perfluoro-n-octadecanoic	AveID	1.030	0.8617		41.8	50.0	-16.4	25.0
13C2 PFHxA Ave 245110 209255 42.7 50.0 -14.6 50 13C4-PFHpA Ave 226344 192958 42.6 50.0 -14.8 50 1802 PFHxS Ave 326976 289218 41.8 47.3 -11.5 50 13C4 PFOA Ave 230362 188480 40.9 50.0 -18.2 50 13C4 PFOS Ave 248847 222836 42.8 47.8 -10.5 50 13C5 PFNA Ave 177687 146822 41.3 50.0 -17.4 50 13C8 FOSA Ave 384141 352469 45.9 50.0 -8.2 50 13C2 PFDA Ave 157302 138409 44.0 50.0 -12.0 50 13C2 PFDOA Ave 117250 104402 44.5 50.0 -11.0 50 13C2-PFTeDA Ave 227387 199997 44.0 50.0 -12.0 50		Ave	347743	319330		45.9	50.0	-8.2	50.0
13C4 - PFHAR Ave 226344 192958 42.6 50.0 -14.8 50 1802 PFHxS Ave 326976 289218 41.8 47.3 -11.5 50 13C4 PFOA Ave 230362 188480 40.9 50.0 -18.2 50 13C4 PFOS Ave 248847 222836 42.8 47.8 -10.5 50 13C5 PFNA Ave 177687 146822 41.3 50.0 -17.4 50 13C8 FOSA Ave 384141 352469 45.9 50.0 -8.2 50 13C2 PFDA Ave 157302 138409 44.0 50.0 -12.0 50 13C2 PFDAA Ave 117250 104402 44.5 50.0 -11.0 50 13C2 PFDOA Ave 110957 96104 43.3 50.0 -12.0 50 13C2-PFTeDA Ave 227387 199997 44.0 50.0 -12.0 50	13C5-PFPeA	Ave	266072	236584		44.5	50.0	-11.1	50.0
1802 PFHxS Ave 326976 289218 41.8 47.3 -11.5 50 13C4 PFOA Ave 230362 188480 40.9 50.0 -18.2 50 13C4 PFOS Ave 248847 222836 42.8 47.8 -10.5 50 13C5 PFNA Ave 177687 146822 41.3 50.0 -17.4 50 13C8 FOSA Ave 384141 352469 45.9 50.0 -8.2 50 13C2 PFDA Ave 157302 138409 44.0 50.0 -12.0 50 13C2 PFUNA Ave 117250 104402 44.5 50.0 -11.0 50 13C2 PFDOA Ave 110957 96104 43.3 50.0 -12.0 50 13C2-PFTeDA Ave 227387 199997 44.0 50.0 -12.0 50	13C2 PFHxA	Ave	245110	209255		42.7	50.0	-14.6	50.0
1802 PFHxS Ave 326976 289218 41.8 47.3 -11.5 50 13C4 PFOA Ave 230362 188480 40.9 50.0 -18.2 50 13C4 PFOS Ave 248847 222836 42.8 47.8 -10.5 50 13C5 PFNA Ave 177687 146822 41.3 50.0 -17.4 50 13C8 FOSA Ave 384141 352469 45.9 50.0 -8.2 50 13C2 PFDA Ave 157302 138409 44.0 50.0 -12.0 50 13C2 PFUnA Ave 117250 104402 44.5 50.0 -11.0 50 13C2 PFDOA Ave 110957 96104 43.3 50.0 -13.4 50 13C2-PFTeDA Ave 227387 199997 44.0 50.0 -12.0 50	13C4-PFHpA	Ave	226344	192958		42.6	50.0	-14.8	50.0
13C4 PFOA Ave 230362 188480 40.9 50.0 -18.2 50 13C4 PFOS Ave 248847 222836 42.8 47.8 -10.5 50 13C5 PFNA Ave 177687 146822 41.3 50.0 -17.4 50 13C8 FOSA Ave 384141 352469 45.9 50.0 -8.2 50 13C2 PFDA Ave 157302 138409 44.0 50.0 -12.0 50 13C2 PFUnA Ave 117250 104402 44.5 50.0 -11.0 50 13C2 PFDOA Ave 110957 96104 43.3 50.0 -13.4 50 13C2-PFTeDA Ave 227387 199997 44.0 50.0 -12.0 50	•	Ave	326976	289218		41.8	47.3	-11.5	50.0
13C4 PFOS Ave 248847 222836 42.8 47.8 -10.5 50 13C5 PFNA Ave 177687 146822 41.3 50.0 -17.4 50 13C8 FOSA Ave 384141 352469 45.9 50.0 -8.2 50 13C2 PFDA Ave 157302 138409 44.0 50.0 -12.0 50 13C2 PFUNA Ave 117250 104402 44.5 50.0 -11.0 50 13C2 PFDOA Ave 110957 96104 43.3 50.0 -13.4 50 13C2-PFTeDA Ave 227387 199997 44.0 50.0 -12.0 50			230362	188480		40.9	50.0	-18.2	50.0
13C5 PFNA Ave 177687 146822 41.3 50.0 -17.4 50 13C8 FOSA Ave 384141 352469 45.9 50.0 -8.2 50 13C2 PFDA Ave 157302 138409 44.0 50.0 -12.0 50 13C2 PFUnA Ave 117250 104402 44.5 50.0 -11.0 50 13C2 PFDOA Ave 110957 96104 43.3 50.0 -13.4 50 13C2-PFTeDA Ave 227387 199997 44.0 50.0 -12.0 50			248847	222836		42.8	47.8	-10.5	50.0
13C8 FOSA Ave 384141 352469 45.9 50.0 -8.2 50 13C2 PFDA Ave 157302 138409 44.0 50.0 -12.0 50 13C2 PFUnA Ave 117250 104402 44.5 50.0 -11.0 50 13C2 PFDOA Ave 110957 96104 43.3 50.0 -13.4 50 13C2-PFTeDA Ave 227387 199997 44.0 50.0 -12.0 50							50.0	-17.4	50.0
13C2 PFDA Ave 157302 138409 44.0 50.0 -12.0 50 13C2 PFUnA Ave 117250 104402 44.5 50.0 -11.0 50 13C2 PFDoA Ave 110957 96104 43.3 50.0 -13.4 50 13C2-PFTeDA Ave 227387 199997 44.0 50.0 -12.0 50								-8.2	50.0
13C2 PFUnA Ave 117250 104402 44.5 50.0 -11.0 50 13C2 PFDoA Ave 110957 96104 43.3 50.0 -13.4 50 13C2-PFTeDA Ave 227387 199997 44.0 50.0 -12.0 50									50.0
13C2 PFTOIR Ave 110957 96104 43.3 50.0 -13.4 50 13C2-PFTeDA Ave 227387 199997 44.0 50.0 -12.0 50									50.0
13C2-PFTeDA Ave 227387 199997 44.0 50.0 -12.0 50									50.0
1302 111601									50.0
	13C2-PFTeDA 13C2-PFHxDA	Ave	124568	106062		42.6	50.0	-14.9	50.0

Report Date: 03-Jan-2017 14:28:36 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_024.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 30-Dec-2016 15:11:35 ALS Bottle#: 41 Worklist Smp#: 34

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Limit Group: LC PFC_DOD ICAL

Last Update: 03-Jan-2017 14:28:36 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

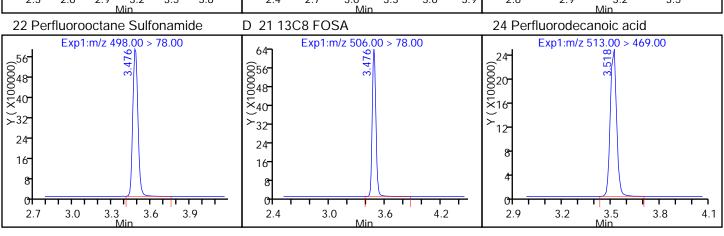
Column 1 : Det: EXP1

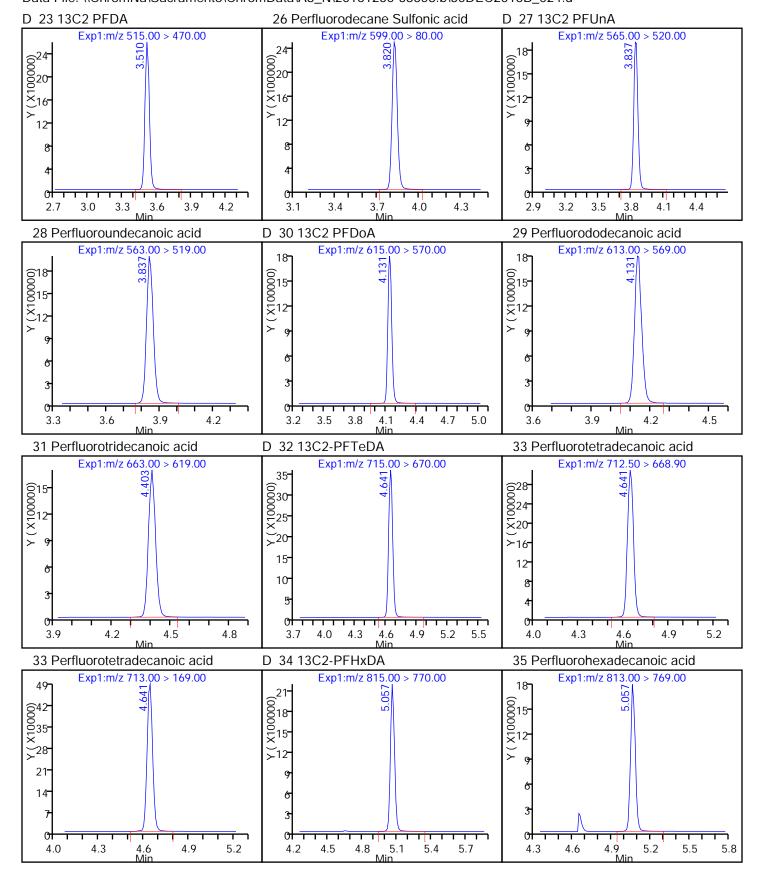
Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA 217.00 > 172.00		1.534	0.0		15966492	45.9		91.8	889900	
1 Perfluorobut			0.0		13900492	43.9		91.0	009900	
212.90 > 169.00	,	1.542	0.0	1.000	14466281	53.1		106	77794	
D 4 13C5-PFP6		1 011	0.0		11000100	44 =		00.0	150/05/	•
267.90 > 223.00		1.811	0.0		11829188	44.5		88.9	1596351	
3 Perfluoroper 262.90 > 219.00		1.811	0.0	1.000	11852936	50.8		102	180727	
5 Perfluorobut										
	1.849 1.849	1.849 1.849	0.0	1.000 1.000	19068053 8593710	46.5	2.22(0.00-0.00)	105		
D 6 13C2 PFHx		1.047	0.0	1.000	8373710		2.22(0.00-0.00)			
315.00 > 270.00		2.100	0.0		10462764	42.7		85.4	690688	
7 Perfluorohex										
313.00 > 269.00		2.100	0.0	1.000	9717826	50.0		100	307055	
9 Perfluorohex 399.00 > 80.00				1.000	12240545	44.9		98.6		
		2.448	0.0	1.000	13369545	44.9		90.0		
D 11 13C4-PFH 367.00 > 322.00		2.420	0.0		9647918	42.6		85.2	695428	
12 Perfluorohe	•									
363.00 > 319.00		2.426	0.0	1.000	9306824	49.3		98.6	82233	
D 10 18O2 PFH 403.00 > 84.00		2.448	0.0		12400021	41.8		88.5	1420050	.
D 14 13C4 PFO		2.448	0.0		13680031	41.8		88.3	1628958)
417.00 > 372.00		2.778	0.0		9424004	40.9		81.8	471090	
15 Perfluorooc	tanoic ac	cid								
413.00 > 369.00		2.786	0.0	1.000	9652878	51.1	1 (5(0.00.1.15)	102	120863	
413.00 > 169.00	2.778	2.786	-0.008	0.997	5850255		1.65(0.90-1.10)		214127	

Signal	Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_024.d										
449,00 > 80.00 2.786 2.786 0.0 1.000 12509326 50.9 107 18 Perfluorooctane sulfonic acid 499,00 > 80.00 3.153 3.153 0.0 1.000 2340753 4.57(0.90-1.10) 148153 17 13C4 PFCS 503,00 > 80.00 3.153 3.153 0.0 1.000 2340753 4.57(0.90-1.10) 148153 17 13C4 PFCS 503,00 > 80.00 3.146 3.146 0.0 10651583 42.8 89.5 206479	Signal	RT		1		Response		Ratio(Limits)	%Rec	S/N	Flags
449,00 > 80.00 2.786 2.786 0.0 1.000 12509326 50.9 107 18 Perfluorooctane sulfonic acid 499,00 > 80.00 3.153 3.153 0.0 1.000 2340753 4.57(0.90-1.10) 148153 17 13C4 PFCS 503,00 > 80.00 3.153 3.153 0.0 1.000 2340753 4.57(0.90-1.10) 148153 17 13C4 PFCS 503,00 > 80.00 3.146 3.146 0.0 10651583 42.8 89.5 206479	13 Portlugrahantanosulfanic Acid										
18 Perfluorootcane sulforce 10					1 000	12509326	50.9		107		
A99.00 > 80.00 3.153 3.153 3.153 0.0 1.000 10699209 48.3 4.57(0.90-1.10) 148153 148153 1070 148153 1070 148153 1070 148153 1070 148153 1070 148153 1070 148153 1070 148153 1070 148153 1070 148153 1070 148153 1070 1071 13C5 PFNA 1070 13C5 PFNA 1080 13C5 PFNA 1					1.000	12307320	30.7		107		
A99.00 99.00 3.153 3.153 3.153 0.0 1.000 2340753 4.57(0.90-1.10) 148153 D 17 13C4 FPCS 503.00 80.00 3.146 3.146 0.0 10651583 42.8 89.5 206479 D 19 13C5 FFNA 468.00 423.00 3.153 3.153 0.0 7341115 41.3 82.6 307038 20 Perfluoronomanomic actication 20 20 20 20 20 20 463.00 3.470 3.476 3.476 0.0 1.000 7152069 51.2 99.5 390206 22 Perfluorodecanomic actication 3.476 0.0 1.000 16352092 49.7 99.5 390206 24 Perfluorodecanomic actication 3.518 3.518 0.0 1.000 16352092 49.7 99.5 390206 24 Perfluorodecanomic actication 3.518 3.518 0.0 1.000 6595460 50.5 90.0 91.8 91.534 24 Perfluorodecanomic actication 3.510 3.510 0.0 6920447 44.0 88.0 229932 25 Perfluorodecanomic actication 3.510 3.510 0.0 6920447 44.0 88.0 229932 26 Perfluorodecanomic actication 3.510 3.510 0.0 509489 50.1 90.0 49.0 49.0 49.0 49.0 49.0 28 Perfluorodecanomic acticatication 3.837 0.0 1.000 6514108 50.1 90.0 49.0					1 000	10699209	48 3		104	376250	
D 17 13C4 PFOS 503.00 80.00 3.146 3.146 0.0 10651583 42.8 89.5 206479 2019 13C5 PFNA 468.00 423.00 3.153 3.153 0.0 7341115 41.3 82.6 307038 20 Perfluorononanoic acid 463.00 419.00 3.153 3.153 0.0 1.000 7152069 51.2 102 138815 22 Perfluoroctane Sulformamide 498.00 78.00 3.476 3.476 0.0 1.000 16352092 49.7 99.5 390206 21 13C8 FOSA 506.00 78.00 3.476 3.476 0.0 1.000 16352092 49.7 99.5 390206 24 Perfluorodecanoic acid 45 Perfluorodecanoic acid 513.00 469.00 3.518 3.518 0.0 1.000 6595460 50.5 101 185377 23 13C2 PFDA 515.00 470.00 3.510 3.510 0.0 6920447 44.0 88.0 229932 26 Perfluorodecanoic acid 599.00 80.00 3.820 3.820 0.0 1.000 6514108 50.1 104 565.00 520.00 3.837 3.837 0.0 5220103 44.5 89.0 270501 28 Perfluoroundecanoic acid 563.00 519.00 3.837 3.837 0.0 1.000 5109489 51.2 102 160428 29 Perfluorodedecanoic acid 613.00 559.00 4.131 4.131 0.0 4805222 43.3 86.6 222994 29 Perfluorodedecanoic acid 613.00 559.00 4.131 4.131 0.0 4334816 51.4 103 102487 31 Perfluorotidecanoic acid 63.00 569.00 4.131 4.131 0.0 1.000 4534816 51.4 103 102487 31 Perfluorotidecanoic acid 63.00 569.00 4.131 4.131 0.0 1.000 4534816 51.4 103 102487 31 Perfluorotidecanoic acid 63.00 569.00 4.131 4.131 0.0 1.000 4534816 51.4 103 102487 31 Perfluorotidecanoic acid 63.00 569.00 4.403 4.641 0.0 1.000 4534816 51.4 103 102487 31 Perfluorotidecanoic acid 63.00 569.00 4.403 4.641 0.0 1.000 4280712 49.1 98.2 87982 102 102487							40.5	4 57(0 90-1 10)	104		
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D 19 13C5 PFNA			3 146	0.0		10651583	42 8		89 5	206479	
468.00 > 423.00 3.153			0.110	0.0		10001000	12.0		07.0	200177	
20 Perfluorononanoic acide 463.00 > 419.00 3.153 3.153 0.0 1.000 7152069 51.2 102 138815 22 Perfluorocctane Sulfonamide 498.00 > 78.00 3.476 3.476 0.0 1.000 16352092 49.7 99.5 390206 0.2 13028 FOSA 506.00 > 78.00 3.476 3.476 0.0 1.000 16352092 49.7 99.5 390206 0.2 13028 FOSA 506.00 > 78.00 3.476 3.476 0.0 1.000 6595460 50.5 101 185377 0.2 23 13C2 PFDA 515.00 > 470.00 3.510 0.0			3 153	0.0		7341115	<i>4</i> 1 3		82.6	307038	
463.00 > 419.00 3.153				0.0		7541115	71.0		02.0	307030	
22 Perfluorooctane Sulformander 498.00 > 78.00 3.476 3.476 0.0 1.000 16352092 49.7 99.5 390206 D 21 13C8 FOSA 506.00 > 78.00 3.476 3.476 0.0 17623448 45.9 91.8 910534 24 Perfluorodecanoic acid 513.00 > 469.00 3.518 3.518 0.0 1.000 6595460 50.5 101 185377 D 23 13C2 PFDA 515.00 > 470.00 3.510 3.510 0.0 6920447 44.0 88.0 229932 26 Perfluorodecane Sulfornic acid 599.00 > 80.00 3.820 3.820 0.0 1.000 6514108 50.1 104 D 27 13C2 PFUA 555.00 > 520.00 3.837 3.837 0.0 5220103 44.5 89.0 270501 28 Perfluoroundecanoic acid 563.00 > 519.00 3.837 3.837 0.0 5109489 51.2 102 160428 D 30 13C2 PFDOA 615.00 > 569.00 4.131 4.131 0.0 4805222 43.3 86.6 222994 29 Perfluorododecanoic acid 613.00 > 569.00 4.131 4.131 0.0 4805222 43.3 86.6 222994 29 Perfluorotodedecanoic acid 663.00 > 619.00 4.403 4.403 0.0 1.000 4280712 49.1 98.2 87982 D 32 13C2-PFTEDA 715.00 > 670.00 4.641 4.641 0.0 9999849 44.0 88.0 896418 33 Perfluorototetradecanoic acid 712.50 > 668.90 4.641 4.641 0.0 1.000 8541976 56.1 6.78(0.00-0.00) 120161 713.00 > 169.00 4.641 4.641 0.0 1.000 8541976 56.1 6.78(0.00-0.00) 120161 713.00 > 169.00 4.641 4.641 0.0 1.000 8541976 56.1 6.78(0.00-0.00) 120161 713.00 > 770.00 5.057 5.057 0.0 5303084 42.6 85.1 117437				0.0	1 000	7152060	51.2		102	130015	
March Marc					1.000	7132009	31.2		102	130013	
D 21 13C8 FOSA 506.00 > 78.00					1 000	14252002	40.7		00 F	200204	
506.00 > 78.00 3.476 3.476 0.0 17623448 45.9 91.8 910.8 910534 24 Perfluorodezarolic actor 513.00 > 469.00 3.518 3.518 0.0 1.000 6595460 50.5 101 185377 D 23 13C2 PFDA 515.00 > 470.00 3.510 0.0 6920447 44.0 88.0 229932 26 Perfluorodezarole Sulfonic actor 599.00 > 80.00 3.820 3.820 0.0 1.000 6514108 50.1 104 104 599.00 > 80.00 3.837 3.837 0.0 5220103 44.5 89.0 270501 28 Perfluorodezarolezar			3.476	0.0	1.000	16352092	49.7		99.5	390206	
24 Perfluorodecanoic acid 513.00 > 469.00 3.518 3.518 0.0 1.000 6595460 50.5 101 185377 D 23 13C2 PFDA 515.00 > 470.00 3.510 3.510 0.0 6920447 44.0 88.0 229932 26 Perfluorodecane Sulfonic acid 599.00 > 80.00 3.820 3.820 0.0 1.000 6514108 50.1 104 D 27 13C2 PFUnA 565.00 > 520.00 3.837 3.837 0.0 5220103 44.5 89.0 270501 28 Perfluoroundecanoic acid 563.00 > 519.00 3.837 3.837 0.0 1.000 5109489 51.2 102 160428 D 30 13C2 PFDOA 615.00 > 570.00 4.131 4.131 0.0 4805222 43.3 86.6 222994 29 Perfluoroddecanoic acid 613.00 > 569.00 4.131 4.131 0.0 1.000 4534816 51.4 103 102487 31 Perfluorotridecanoic acid 663.00 > 619.00 4.403 4.403 0.0 1.000 4280712 49.1 98.2 87982 D 32 13C2-PFT-DA 715.00 > 670.00 4.641 4.641 0.0 9999849 44.0 88.0 896418 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 103.00 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 103.00 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 103.00 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 103.00 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 103.00 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 103.00 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 103.00 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 103.00 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 103.00 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 103.00 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 103.00 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 103.00 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 103.00 4.00 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 103.00 4.600 4.601 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 103.00 4.000 5.000			0.477	0.0		17/00///0	45.0		01.0	040504	
513.00 > 469.00 3.518 3.518 0.0 1.000 6595460 50.5 101 185377 D 23 13C2 PFDA 515.00 > 470.00 3.510 3.510 0.0 6920447 44.0 48.0 229932 26 Perfluorodecane Sulfonic acid 599.00 > 80.00 3.820 0.0 1.000 6514108 50.1 104 104 D 27 13C2 PFUnA 565.00 > 520.00 3.837 3.837 0.0 5220103 44.5 89.0 270501 28 Perfluoroundecanoic acid 563.00 > 519.00 3.837 3.837 0.0 1.000 5109489 51.2 102 160428 D 30 13C2 PFDOA 615.00 > 570.00 4.131 4.131 0.0 4805222 43.3 86.6 222994 29 Perfluorododecanoic acid 663.00 > 619.00 4.403 4.403 0.0 1.000 4280712 49.1 98.2 87982 D 32 13C2-PFTeDA 715.00 > 670.00 4.641 4.641 0.0 9999849 44.0 88.0 896418 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 169.00 4.641 4.641 0.0 1.000 8541976 56.1 6.78(0.00-0.00) 120161 D 34 13C2-PFHXDA 815.00 > 770.00 5.057 5.057 0.0 5.05 70.0 5303084 42.6 85.1 117437 815.00 > 770.00 5.057 5.057 5.057 0.0 5303084 42.6 85.1 117437				0.0		17623448	45.9		91.8	910534	
D 23 13C2 PFDA 515.00 > 470.00 3.510 3.510 0.0 6920447 44.0 88.0 229932 26 Perfluorodecane Sulfonic acid 599.00 > 80.00 3.820 3.820 0.0 1.000 6514108 50.1 104 D 27 13C2 PFUnA 565.00 > 520.00 3.837 3.837 0.0 5220103 44.5 89.0 270501 28 Perfluoroundecanoic acid 563.00 > 519.00 3.837 3.837 0.0 1.000 5109489 51.2 102 160428 D 30 13C2 PFDoA 615.00 > 570.00 4.131 4.131 0.0 4805222 43.3 86.6 222994 29 Perfluorododecanoic acid 613.00 > 569.00 4.131 4.131 0.0 1.000 4534816 51.4 103 102487 31 Perfluorotridecanoic acid 663.00 > 619.00 4.403 4.403 0.0 1.000 4280712 49.1 98.2 87982 D 32 13C2-PFTeDA 715.00 > 670.00 4.641 4.641 0.0 9999849 44.0 88.0 896418 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 169.00 4.641 4.641 0.0 1.000 1259708 6.78(0.00-0.00) 120161 D 34 13C2-PFHXDA 815.00 > 770.00 5.057 5.057 0.0 5303084 42.6 85.1 117437											
515.00 > 470.00			3.518	0.0	1.000	6595460	50.5		101	185377	
26 Perfluorodecane Sulfonic acid 599.00 > 80.00											
599.00 > 80.00 3.820 3.820 0.0 1.000 6514108 50.1 104 D 27 13C2 PFUnA 565.00 > 520.00 3.837 3.837 0.0 5220103 44.5 89.0 270501 28 Perfluoroundecanoic acid 563.00 > 519.00 3.837 0.0 1.000 5109489 51.2 102 160428 D 30 13C2 PFDoA 615.00 > 570.00 4.131 4.131 0.0 4805222 43.3 86.6 222994 29 Perfluorododecanoic acid 613.00 > 569.00 4.131 4.131 0.0 1.000 4534816 51.4 103 102487 31 Perfluorotridecanoic acid 663.00 > 619.00 4.403 0.0 1.000 4280712 49.1 98.2 87982 D 32 13C2-PFTeDA 715.00 > 670.00 4.641 0.0 9999849 44.0 88.0 896418 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 169.00 4.641 4.641 0.0 1.000 1259708 6.78(0.00-0.00)	515.00 > 470.00	3.510	3.510	0.0		6920447	44.0		88.0	229932	
D 27 13C2 PFUNA 565.00 > 520.00 3.837 3.837 0.0 5220103 44.5 89.0 270501 28 Perfluoroundecanoic acid 563.00 > 519.00 3.837 3.837 0.0 1.000 5109489 51.2 102 160428 D 30 13C2 PFDOA 615.00 > 570.00 4.131 4.131 0.0 4805222 43.3 86.6 222994 29 Perfluorododecanoic acid 613.00 > 569.00 4.131 4.131 0.0 1.000 4534816 51.4 103 102487 31 Perfluorotridecanoic acid 663.00 > 619.00 4.403 4.403 0.0 1.000 4280712 49.1 98.2 87982 D 32 13C2-PFTEDA 715.00 > 670.00 4.641 4.641 0.0 9999849 44.0 88.0 896418 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 169.00 4.641 4.641 0.0 1.000 1259708 6.78(0.00-0.00) 120161 D 34 13C2-PFHXDA 815.00 > 770.00 5.057 5.057 0.0 5303084 42.6 85.1 117437	26 Perfluorodeo	cane Su									
565.00 > 520.00 3.837 3.837 0.0 5220103 44.5 89.0 270501 28 Perfluoroundecanoic acid 563.00 > 519.00 3.837 3.837 0.0 1.000 5109489 51.2 102 160428 D 30 13C2 PFDoA 615.00 > 570.00 4.131 4.131 0.0 4805222 43.3 86.6 222994 29 Perfluorododecanoic acid 613.00 > 569.00 4.131 4.131 0.0 1.000 4534816 51.4 103 102487 31 Perfluorotridecanoic acid 663.00 > 619.00 4.403 4.403 0.0 1.000 4280712 49.1 98.2 87982 D 32 13C2-PFTEDA 715.00 > 670.00 4.641 4.641 0.0 9999849 44.0 88.0 896418 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 169.00 4.641 4.641 0.0 1.000 1259708 6.78(0.00-0.00) 120161 D 34 13C2-PFHxDA 815.00 > 770.00 5.057 5.057 0.0 5303084 42.6 85.1 117437 35 Perfluorohexadecanoi	599.00 > 80.00	3.820	3.820	0.0	1.000	6514108	50.1		104		
28 Perfluoroundecanoic acid 563.00 > 519.00 3.837 3.837 0.0 1.000 5109489 51.2 102 160428 D 30 13C2 PFDoA 615.00 > 570.00 4.131 4.131 0.0 4805222 43.3 86.6 222994 29 Perfluorododecanoic acid 613.00 > 569.00 4.131 4.131 0.0 1.000 4534816 51.4 103 102487 31 Perfluorotridecanoic acid 663.00 > 619.00 4.403 4.403 0.0 1.000 4280712 49.1 98.2 87982 D 32 13C2-PFTeDA 715.00 > 670.00 4.641 4.641 0.0 9999849 44.0 88.0 896418 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 169.00 4.641 4.641 0.0 1.000 1259708 6.78(0.00-0.00) 120161 D 34 13C2-PFHxDA 815.00 > 770.00 5.057 5.057 0.0 5303084 42.6 85.1 117437	D 27 13C2 PFUr	nΑ									
563.00 > 519.00 3.837 3.837 0.0 1.000 5109489 51.2 102 160428 D 30 13C2 PFDoA 615.00 > 570.00 4.131 4.131 0.0 4805222 43.3 86.6 222994 29 Perfluorododecanoic acid 613.00 > 569.00 4.131 4.131 0.0 1.000 4534816 51.4 103 102487 31 Perfluorotridecanoic acid 663.00 > 619.00 4.403 4.403 0.0 1.000 4280712 49.1 98.2 87982 D 32 13C2-PFTeDA 715.00 > 670.00 4.641 4.641 0.0 9999849 44.0 88.0 896418 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 169.00 4.641 4.641 0.0 1.000 1259708 6.78(0.00-0.00) 120161 D 34 13C2-PFHxDA 815.00 > 770.00 5.057 5.057 0.0 5303084 42.6 85.1 117437	565.00 > 520.00	3.837	3.837	0.0		5220103	44.5		89.0	270501	
D 30 13C2 PFDoA 615.00 > 570.00 4.131 4.131 0.0 4805222 43.3 86.6 222994 29 Perfluorododecanoic acid 613.00 > 569.00 4.131 4.131 0.0 1.000 4534816 51.4 103 102487 31 Perfluorotridecanoic acid 663.00 > 619.00 4.403 4.403 0.0 1.000 4280712 49.1 98.2 87982 D 32 13C2-PFTeDA 715.00 > 670.00 4.641 4.641 0.0 9999849 44.0 88.0 896418 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 169.00 4.641 4.641 0.0 1.000 1259708 6.78(0.00-0.00) 120161 D 34 13C2-PFHxDA 815.00 > 770.00 5.057 5.057 0.0 5303084 42.6 85.1 117437	28 Perfluoround	decanoi	c acid								
615.00 > 570.00 4.131	563.00 > 519.00	3.837	3.837	0.0	1.000	5109489	51.2		102	160428	
29 Perfluorododecanoic acid 613.00 > 569.00 4.131	D 30 13C2 PFDc	οA									
613.00 > 569.00 4.131	615.00 > 570.00	4.131	4.131	0.0		4805222	43.3		86.6	222994	
31 Perfluorotridecanoic acid 663.00 > 619.00 4.403 4.403 0.0 1.000 4280712 49.1 98.2 87982 D 32 13C2-PFTeDA 715.00 > 670.00 4.641 4.641 0.0 9999849 44.0 88.0 896418 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 169.00 4.641 4.641 0.0 1.000 1259708 6.78(0.00-0.00) 120161 D 34 13C2-PFHxDA 815.00 > 770.00 5.057 5.057 0.0 5303084 42.6 85.1 117437 35 Perfluorohexadecanoic acid	29 Perfluorodoo	decanoio	c acid								
663.00 > 619.00 4.403 4.403 0.0 1.000 4280712 49.1 98.2 87982 D 32 13C2-PFTeDA 715.00 > 670.00 4.641 4.641 0.0 9999849 44.0 88.0 896418 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 169.00 4.641 4.641 0.0 1.000 1259708 6.78(0.00-0.00) 120161 D 34 13C2-PFHxDA 815.00 > 770.00 5.057 5.057 0.0 5303084 42.6 85.1 117437	613.00 > 569.00	4.131	4.131	0.0	1.000	4534816	51.4		103	102487	
663.00 > 619.00 4.403 4.403 0.0 1.000 4280712 49.1 98.2 87982 D 32 13C2-PFTeDA 715.00 > 670.00 4.641 4.641 0.0 9999849 44.0 88.0 896418 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 169.00 4.641 4.641 0.0 1.000 1259708 6.78(0.00-0.00) 120161 D 34 13C2-PFHxDA 815.00 > 770.00 5.057 5.057 0.0 5303084 42.6 85.1 117437	31 Perfluorotrid	lecanoic	acid								
D 32 13C2-PFTeDA 715.00 > 670.00 4.641				0.0	1.000	4280712	49.1		98.2	87982	
715.00 > 670.00 4.641 4.641 0.0 9999849 44.0 88.0 896418 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 169.00 4.641 4.641 0.0 1.000 1259708 6.78(0.00-0.00) 120161 D 34 13C2-PFHxDA 815.00 > 770.00 5.057 5.057 0.0 5303084 42.6 85.1 117437 35 Perfluorohexadecanoic acid	D 32 13C2-PFTe	-DΑ									
33 Perfluorotetradecanoic acid 712.50 > 668.90 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 169.00 4.641 4.641 0.0 1.000 1259708 6.78(0.00-0.00) 120161 D 34 13C2-PFHxDA 815.00 > 770.00 5.057 5.057 0.0 5303084 42.6 85.1 117437 35 Perfluorohexadecanoic acid			4.641	0.0		9999849	44.0		88.0	896418	
712.50 > 668.90 4.641 4.641 0.0 1.000 8541976 56.1 112 169018 713.00 > 169.00 4.641 4.641 0.0 1.000 1259708 6.78(0.00-0.00) 120161 D 34 13C2-PFHxDA 815.00 > 770.00 5.057 5.057 0.0 5303084 42.6 85.1 117437 35 Perfluorohexadecanoic acid											
713.00 > 169.00 4.641 4.641 0.0 1.000 1259708 6.78(0.00-0.00) 120161 D 34 13C2-PFHxDA 815.00 > 770.00 5.057 5.057 0.0 5303084 42.6 85.1 117437 35 Perfluorohexadecanoic acid				0.0	1 000	8541976	56.1		112	169018	
D 34 13C2-PFHxDA 815.00 > 770.00 5.057 5.057 0.0 5303084 42.6 85.1 117437 35 Perfluorohexadecanoic acid							30.1	6.78(0.00-0.00)	112		
815.00 > 770.00 5.057 5.057 0.0 5303084 42.6 85.1 117437 35 Perfluorohexadecanoic acid				0.0		.207700		0.7 0(0.00 0.00)		0.0.	
35 Perfluorohexadecanoic acid			5.057	0.0		5303084	12.6		Q5 1	117/137	
				0.0		3303004	42.0		00.1	117437	
013.00 > 707.00 3.037 3.037 0.0 1.000 4309234 49.2 98.4 5550				0.0	1 000	4540254	40.2		00 4	EEEO	
				0.0	1.000	4507254	47.2		70.4	5550	
36 Perfluorooctadecanoic acid				0.0	1 000	44.40757	44.0		00.7	F 407	
913.00 > 869.00 5.413 5.413 0.0 1.000 4140756 41.8 83.6 5407		5.413	5.413	0.0	1.000	4140/56	41.8		83.6	5407	
Reagents:											
LCPFC-L5_00022 Amount Added: 1.00 Units: mL	LCPFC-L5_0002	2			Amount A	dded: 1.00	Units	a: mL			

Report Date: 03-Jan-2017 14:28:36 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 30-Dec-2016 15:11:35 Instrument ID: A8_N Lims ID: CCV L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 34 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 49 649 00042 642 636 <u>8</u>35-\<u>\.</u> ∑35 \times_{30} ≻28 21 21 18 1.0 1.3 1.6 1.9 0.5 1.1 1.7 2.3 1.1 1.4 2.0 2.3 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.0048 ()70⁻ 042 0036 635- ∑50 ×25 ×30 ≻40 **≻20** 30 15- 18 20 10 12 10 1.9 2.2 2.5 1.8 2.1 1.8 2.1 1.3 1.6 1.5 1.5 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 399.00 > 80.00 42 40 8 035- 836 <u>8</u>30-∑₂₄- \times 25 ×20 ≻₂₀ 18 15 15 12 10 10 2.0 2.3 2.6 1.9 2.2 1.9 2.5 1.4 1.7 2.5 2.8 2.2 2.8 1.6 3.1 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 35- 49 420 030 025 830 <u>6</u>25 ×₂₀ ∑₂₀ 28 21 15 10 10 0 1.8 2.1 2.4 2.7 1.8 2.1 Page 64/6 of 809 1.8 2.4 3.0 3.6 1.5 3.0 1.2

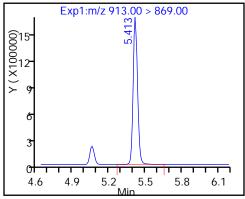




Report Date: 03-Jan-2017 14:28:36 Chrom Revision: 2.2 05-Dec-2016 12:37:22

 $\dot{\text{Data File: $\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_024.d}}$

36 Perfluorooctadecanoic acid



FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Lab Sample ID: CCV 320-144510/40 Calibration Date: 12/30/2016 15:56

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 30DEC2016B_030.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid	AveID	0.8537	0.9594		22.5	20.0	12.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.074		21.8	20.0	8.9	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.593		19.9	17.7	12.4	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9257		19.9	20.0	-0.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.072		18.9	18.2	4.1	25.0
Perfluoroheptanoic acid	AveID	0.9788	1.000		20.4	20.0	2.2	25.0
(PFHpA) Perfluorooctanoic acid	AveID	1.003	1.038		20.7	20.0	3.5	25.0
(PFOA) Perfluoroheptanesulfonic	AveID	1.102	1.209		20.9	19.0	9.7	25.0
Acid (PFHpS) Perfluorooctanesulfonic acid	AveID	0.9945	1.039		19.4	18.6	4.5	25.0
(PFOS) Perfluorononanoic acid	AveID	0.9518	0.9805		20.6	20.0	3.0	25.0
(PFNA) Perfluorooctane Sulfonamide	AveID	0.9327	1.007		21.6	20.0	7.9	25.0
(FOSA) Perfluorodecanoic acid	AveID	0.9438	0.9676		20.5	20.0	2.5	25.0
(PFDA) Perfluorodecanesulfonic acid	AveID	0.5840	0.6194		20.5	19.3	6.1	25.0
(PFDS) Perfluoroundecanoic acid	AveID	0.9563	0.9441		19.7	20.0	-1.3	25.0
(PFUnA) Perfluorododecanoic acid	AveID	0.9180	0.9531		20.8	20.0	3.8	25.0
(PFDoA) Perfluorotridecanoic Acid	AveID	0.9069	0.9256		20.4	20.0	2.1	25.0
(PFTriA) Perfluorotetradecanoic acid	AveID	1.585	1.761		22.2	20.0	11.1	25.0
(PFTeA) Perfluoro-n-hexadecanoic	L1ID		0.999		20.3	20.0	1.7	25.0
acid (PFHxDA) Perfluoro-n-octadecanoic	AveID	1.030	0.8610		16.7	20.0	-16.4	25.0
acid (PFODA) 13C4 PFBA	Ave	347743	341519		49.1	50.0	-1.8	50.0
13C5-PFPeA	Ave	266072	255380		48.0	50.0	-4.0	50.0
13C2 PFHxA	Ave	245110	226422		46.2	50.0	-7.6	50.0
13C4-PFHpA	Ave	226344	206560		45.6	50.0	-8.7	50.0
1802 PFHxS	Ave	326976	311209		45.0	47.3	-4.8	50.0
13C4 PFOA	Ave	230362	208805		45.3	50.0	-9.4	50.0
13C4 PFOS	Ave	248847	248442		47.7	47.8	-0.2	50.0
13C5 PFNA	Ave	177687	164227		46.2	50.0	-7.6	50.0
13C8 FOSA	Ave	384141	361910		47.1	50.0	-5.8	50.0
13C2 PFDA	Ave	157302	147175		46.8	50.0	-6.4	50.0
13C2 PFUnA	Ave	117250	114584		48.9	50.0	-2.3	50.0
13C2 PFDoA	Ave	110957	101956		45.9	50.0	-8.1	50.0
13C2-PFTeDA	Ave	227387	211949		46.6	50.0	-6.8	50.0

Report Date: 03-Jan-2017 14:28:47 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_030.d

Lims ID: CCV L4

Client ID:

Sample Type: CCV

Inject. Date: 30-Dec-2016 15:56:38 ALS Bottle#: 40 Worklist Smp#: 40

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L4

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Method: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 03-Jan-2017 14:28:47 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK026

First Level Reviewer: phomsophat Date: 03-Jan-2017 14:18:31

I II St Level Revie	wer. prie	ппоорпс	41		Date.		00 3011 2017 11:10:0	<u> </u>		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00		1.534	0.0		17075966	49.1		98.2	141237	8
1 Perfluorobut	yric acid									
212.90 > 169.00	•		0.0	1.000	6552772	22.5		112	33297	
D 4 13C5-PFPe	eΑ									
267.90 > 223.00	1.810	1.810	0.0		12768980	48.0		96.0	124808	5
3 Perfluoroper	ntanoic a	cid								
262.90 > 219.00	1.810	1.810	0.0	1.000	5486217	21.8		109	62469	
5 Perfluorobut										
298.90 > 80.00		1.849		1.000	8763438	19.9	(112		
298.90 > 99.00		1.849	0.0	1.000	3745932		2.34(0.00-0.00)			
D 6 13C2 PFHx		0.000	0.0		44004004	47.0		00.4	,,,,,,,,,,	
315.00 > 270.00		2.093	0.0		11321091	46.2		92.4	698736	
7 Perfluorohex 313.00 > 269.00			0.0	1.000	4101024	10.0		00.7	110470	
		2.093	0.0	1.000	4191824	19.9		99.7	110478	
D 11 13C4-PFH 367.00 > 322.00		2 424	0.0		10327993	45.6		91.3	539197	
			0.0		10327993	45.0		91.3	339197	
12 Perfluorohe 363.00 > 319.00	•		0.0	1.000	4132492	20.4		102	45398	
9 Perfluorohex				1.000	4132472	20.4		102	43370	
399.00 > 80.00				1.000	6072620	18.9		104		
D 10 1802 PFH		2.502	0.0	1.000	0072020	10.7		104		
403.00 > 84.00		2.447	0.0		14720183	45.0		95.2	888745	
D 14 13C4 PFO		/	0.0		. 1720100	10.0		, 0.2	3007 10	
417.00 > 372.00		2.791	0.0		10440251	45.3		90.6	522217	
			2.0					,		

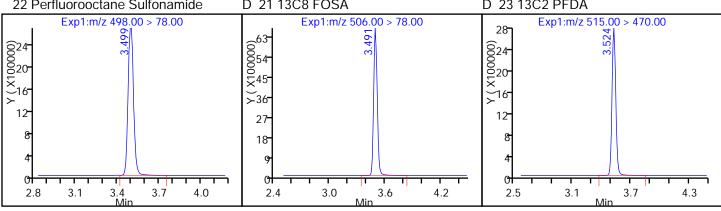
Data File:	\\Chr	omNa\Sa	acrament	:o\Chrom	Data\A8_N\201	61230-3835	8.b\30DEC2016B_0	030.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Danilla and a st					·	_				_
15 Perfluorooct 413.00 > 369.00		2.791	0.0	1.000	4336621	20.7		104	57790	
413.00 > 369.00		2.791	0.0	1.000	2590932	20.7	1.67(0.90-1.10)	104	106630	
				1.000	2370732		1.07 (0.70-1.10)		100030	
13 Perfluorohe _l 449.00 > 80.00		2.799		1.000	5717047	20.9		110		
		2.177	0.0	1.000	3717047	20.7		110		
D 17 13C4 PFOS 503.00 > 80.00		3.160	0.0		11875524	47.7		99.8	479973	
					11073324	47.7		99.0	4/99/3	
18 Perfluorooct				1 000	4701007	10.4		405	70770	
499.00 > 80.00		3.058		1.000	4791996	19.4	4 47(0 00 1 10)	105	72778	
499.00 > 99.00		3.058	0.102	1.033	1071826		4.47(0.90-1.10)		66019	
D 19 13C5 PFN/										
468.00 > 423.00	3.160	3.160	0.0		8211358	46.2		92.4	449488	
20 Perfluoronoi										
463.00 > 419.00	3.167	3.167	0.0	1.000	3220603	20.6		103	69218	
22 Perfluorooct	ane Sulf	fonamid	е							
498.00 > 78.00	3.499	3.499	0.0	1.000	7286394	21.6		108	326460	
D 21 13C8 FOS	A									
506.00 > 78.00		3.491	0.0		18095510	47.1		94.2	833695	
D 23 13C2 PFD/										
515.00 > 470.00		3.524	0.0		7358769	46.8		93.6	338941	
			0.0		7330707	40.0		75.0	330741	
24 Perfluorodeo 513.00 > 469.00			0.0	1.000	2848236	20.5		103	96014	
				1.000	2848230	20.5		103	90014	
26 Perfluorode				4 000	00/7040	00.5		407		
599.00 > 80.00		3.836	0.0	1.000	2967013	20.5		106		
D 27 13C2 PFUr										
565.00 > 520.00	3.853	3.853	0.0		5729203	48.9		97.7	309718	
28 Perfluoround	decanoid	c acid								
563.00 > 519.00	3.853	3.853	0.0	1.000	2163651	19.7		98.7	74794	
D 30 13C2 PFD	οA									
615.00 > 570.00	4.144	4.144	0.0		5097778	45.9		91.9	222716	
29 Perfluorodo	decanoio	c acid								
613.00 > 569.00		4.144	0.0	1.000	1943448	20.8		104	68308	
31 Perfluorotrid										
663.00 > 619.00			0.0	1.000	1887364	20.4		102	48163	
		4.410	0.0	1.000	1007304	20.4		102	40100	
D 32 13C2-PFT6		1 4 10	0.0		10507444	166		02.2	971253	
715.00 > 670.00		4.648	0.0		10597466	46.6		93.2	9/1200	
33 Perfluorotetr										
712.50 > 668.90		4.658		1.000	3590915	22.2	(()	111	64708	
713.00 > 169.00	4.648	4.658	-0.010	0.998	567305		6.33(0.00-0.00)		75619	
D 34 13C2-PFH	xDA									
815.00 > 770.00	5.072	5.072	0.0		5407394	43.4		86.8	138834	
35 Perfluorohex	xadecan	oic acid								
813.00 > 769.00	5.072	5.072	0.0	1.000	2037936	20.3		102	2633	
36 Perfluorooct	adecan	oic acid								
913.00 > 869.00		5.415	0.0	1.000	1755603	16.7		83.6	2610	
			-			- * *				

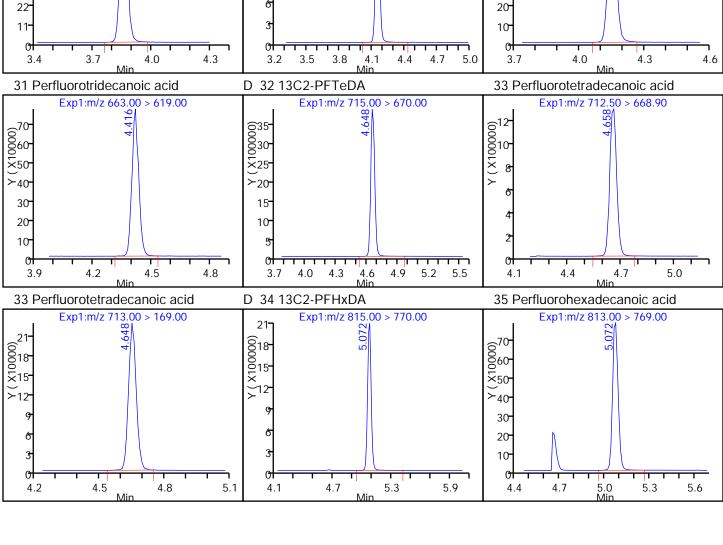
Report Date: 03-Jan-2017 14:28:47 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC-L4_00024 Amount Added: 1.00 Units: mL

Report Date: 03-Jan-2017 14:28:47 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 30-Dec-2016 15:56:38 Instrument ID: A8_N Lims ID: CCV L4 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 40 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267,90 > 223.00 24 56**-**00048 × 32 × 32 00042 X <u>8</u>18 ×15 28 24 21 16 1.0 2.2 1.2 1.5 1.6 1.8 2.1 1.2 1.5 1.8 2.1 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.00 24 (0015⁻ 0000012⁻ × 9 635- ©21- ∑₁₅-×25 **≻20**-15 10 2.1 1.5 1.8 2.1 2.4 1.8 1.8 2.1 1.2 1.5 1.5 D 6 13C2 PFHxA 7 Perfluorohexanoic acid D 11 13C4-PFHpA Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 367.00 > 322.00 42 16 093 (35 (00030 (25 (35) 000012 836 <u>§</u>30 ∑₁₀-∑₂₄-≻20 18 15 12 10 01 2.0 2.3 1.9 2.2 2.5 2.0 2.6 1.4 1.7 2.6 1.4 3.2 1.6 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 16- (18-(0000015-(12-(000001 00042 00012 00012 ∑₁₀ ×35 ≻28 21 14 0| 0 0 2.0 2.3 2.6 2.9 1.5 3.0 2.0 3.2 1.4 2.6

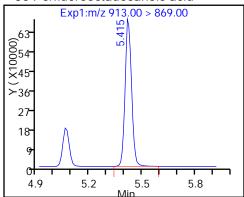




Report Date: 03-Jan-2017 14:28:48 Chrom Revision: 2.2 05-Dec-2016 12:37:22

 $\dot{\text{Data File: $\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_030.d}}$

36 Perfluorooctadecanoic acid



FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Lab Sample ID: CCV 320-144510/49 Calibration Date: 12/30/2016 17:04

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 30DEC2016B_039.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9164		53.7	50.0	7.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.000		50.6	50.0	1.3	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.507		47.0	44.2	6.3	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9591		51.6	50.0	3.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.025		45.3	45.5	-0.5	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9808		50.1	50.0	0.2	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.022		51.0	50.0	1.9	25.0
Perfluoroheptanesulfonic	AveID	1.102	1.164		50.3	47.6	5.7	25.0
Acid (PFHpS) Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.032		48.1	46.4	3.8	25.0
Perfluorononanoic acid	AveID	0.9518	0.9463		49.7	50.0	-0.6	25.0
(PFNA) Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9704		52.0	50.0	4.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9340		49.5	50.0	-1.0	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6207		51.2	48.2	6.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9673		50.6	50.0	1.2	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9182		50.0	50.0	0.0	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9263		51.1	50.0	2.1	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.715		54.1	50.0	8.2	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9745		50.4	50.0	0.9	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8764		42.5	50.0	-14.9	25.0
13C4 PFBA	Ave	347743	320194		46.0	50.0	-7.9	50.0
13C5-PFPeA	Ave	266072	241278		45.3	50.0	-9.3	50.0
13C2 PFHxA	Ave	245110	210024		42.8	50.0	-14.3	50.0
13C4-PFHpA	Ave	226344	190561		42.1	50.0	-15.8	50.0
1802 PFHxS	Ave	326976	290267		42.0	47.3	-11.2	50.0
13C4 PFOA	Ave	230362	189989		41.2	50.0	-17.5	50.0
13C4 PFOS	Ave	248847	229944		44.2	47.8	-7.6	50.0
13C5 PFNA	Ave	177687	149963		42.2	50.0	-15.6	50.0
13C8 FOSA	Ave	384141	346067		45.0	50.0	-9.9	50.0
13C2 PFDA	Ave	157302	137352		43.7	50.0	-12.7	50.0
13C2 PFUnA	Ave	117250	103045		43.9	50.0	-12.1	50.0
13C2 PFDoA	Ave	110957	95867		43.2	50.0	-13.6	50.0
13C2-PFTeDA	Ave	227387	196571		43.2	50.0	-13.6	50.0
TO CO TTTC P11	1			I .	1	1	1	1

Report Date: 03-Jan-2017 14:28:59 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_039.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 30-Dec-2016 17:04:13 ALS Bottle#: 41 Worklist Smp#: 49

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Method: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 03-Jan-2017 14:28:59 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK026

First Level Reviewer: phomsophat Date: 03-Jan-2017 14:26:34

I list Level Revie	wer. pric	ппоорпс	41		Date.		70 3dil 2017 11.20.0			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA	\									
217.00 > 172.00		1.528	0.0		16009719	46.0		92.1	903423	
1 Perfluorobut										
212.90 > 169.00	,	1.528	0.0	1.000	14671667	53.7		107	75038	
D 4 13C5-PFPe										
267.90 > 223.00		1.803	0.0		12063917	45.3		90.7	976521	
3 Perfluoroper	ntanoic a	cid								
262.90 > 219.00		1.803	0.0	1.000	12059305	50.6		101	178809	
5 Perfluorobut	anesulfo	nic acid								
298.90 > 80.00	1.842	1.842	0.0	1.000	19329899	47.0		106		
298.90 > 99.00	1.842	1.842	0.0	1.000	8798573		2.20(0.00-0.00)			
D 613C2 PFHx										
315.00 > 270.00	2.090	2.090	0.0		10501207	42.8		85.7	483955	
7 Perfluorohex										
313.00 > 269.00	2.090	2.090	0.0	1.000	10071498	51.6		103	272120	
9 Perfluorohex										
399.00 > 80.00	2.415	2.415	0.0	1.000	13541179	45.3		99.5		
D 11 13C4-PFH	•									
367.00 > 322.00			0.0		9528041	42.1		84.2	892988	
12 Perfluorohe	•			1 000	0044040	50.4		400	70000	
363.00 > 319.00		2.420	0.0	1.000	9344962	50.1		100	79338	
D 10 1802 PFH		0.440	0.0		10700/10	40.0		00.0	(01007	
403.00 > 84.00		2.440	0.0		13729613	42.0		88.8	621387	
D 14 13C4 PFO		2.704	0.0		0.400.47.0	41.0		02.5	F7F400	
417.00 > 372.00	2.784	2.784	0.0		9499469	41.2		82.5	575488	

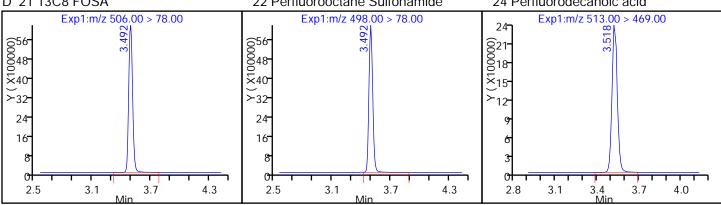
Data File:	\\Chr	omNa\S	acramen [*]	to\Chrom	Data\A8_N\201	61230-3835	8.b\30DEC2016B_0)39.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
J			I	IXI	Кезропзе	rig/iiii	Ratio(Elititis)	701100	3/11	i iags
15 Perfluorooc 413.00 > 369.00		2.784	0.0	1.000	9711530	51.0		102	111933	
413.00 > 169.00		2.784	0.0	1.000	5918630	31.0	1.64(0.90-1.10)	102	231815	
13 Perfluorohe	ptanesul	lfonic Ac	cid				, ,			
449.00 > 80.00	2.792	2.792	0.0	1.000	12742346	50.3		106		
18 Perfluorooc										
499.00 > 80.00		3.049		1.000	11010160	48.1	4 52/0 00 1 10)	104	65083	
499.00 > 99.00 D. 17.13C4 DEC		3.049	0.104	1.034	2437905		4.52(0.90-1.10)		123587	
D 17 13C4 PFO 503.00 > 80.00		3.161	0.0		10991329	44.2		92.4	260466	
D 19 13C5 PFN		0.101	0.0		10771027			,	200 100	
468.00 > 423.00		3.161	0.0		7498138	42.2		84.4	530697	
20 Perfluorono	nanoic a	cid								
463.00 > 419.00	3.161	3.161	0.0	1.000	7095077	49.7		99.4	156672	
D 21 13C8 FOS										
506.00 > 78.00		3.492			17303363	45.0		90.1	512626	
22 Perfluorooc 498.00 > 78.00				1.000	14701740	52.0		104	514139	
498.00 > 78.00 24 Perfluorode		3.492	0.0	1.000	16791762	52.0		104	514139	
513.00 > 469.00		3.518	0.0	1.000	6414580	49.5		99.0	198376	
D 23 13C2 PFD		0.010	0.0	1.000	0111000	17.0		77.0	170070	
515.00 > 470.00		3.518	0.0		6867607	43.7		87.3	281914	
26 Perfluorode	cane Su	lfonic ac	cid							
599.00 > 80.00	3.837	3.837	0.0	1.000	6879630	51.2		106		
D 27 13C2 PFU										
565.00 > 520.00		3.854	0.0		5152261	43.9		87.9	276866	
28 Perfluoroun			0.0	1 000	4002027	FO /		101	10/250	
563.00 > 519.00		3.854	0.0	1.000	4983936	50.6		101	126359	
D 30 13C2 PFD 615.00 > 570.00		4.144	0.0		4793333	43.2		86.4	132765	
29 Perfluorodo			0.0		1770000	10.2		00.1	102700	
613.00 > 569.00		4.144	0.0	1.000	4401414	50.0		100	111491	
31 Perfluorotrio	decanoic	acid								
663.00 > 619.00	4.415	4.415	0.0	1.000	4440147	51.1		102	94370	
D 32 13C2-PFT										
715.00 > 670.00		4.647	0.0		9828535	43.2		86.4	120214!	5
33 Perfluorotet			0.0	1 000	0000500	F.1.4		400	400/00	
712.50 > 668.90 713.00 > 169.00		4.647 4.647	0.0 0.0	1.000 1.000	8222522 1286223	54.1	6.39(0.00-0.00)	108	120682 127368	
D 34 13C2-PFH		4.047	0.0	1.000	1200223		0.39(0.00-0.00)		127300	
815.00 > 770.00		5.060	0.0		5198148	41.7		83.5	115546	
35 Perfluorohe						- · · · ·		- -		
813.00 > 769.00		5.060		1.000	4671297	50.4		101	6128	
36 Perfluorooc	tadecan	oic acid								
913.00 > 869.00	5.415	5.415	0.0	1.000	4200954	42.5		85.1	5503	

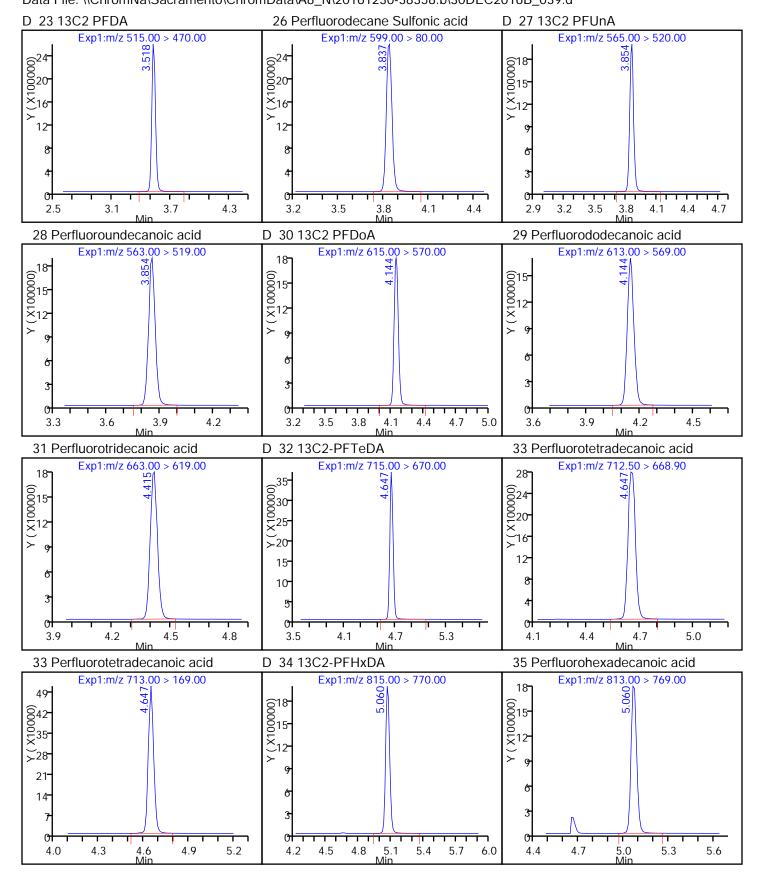
Report Date: 03-Jan-2017 14:28:59 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

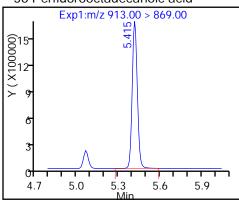
LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 03-Jan-2017 14:28:59 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 30-Dec-2016 17:04:13 Instrument ID: A8_N Lims ID: CCV L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 49 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Limit Group: LC PFC_DOD ICAL Method: $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 (00042 (0005 (00042 (0005) (00042 (00042) (00042) (00042) 049 0042 ×35 _28- ≻₂₈ 21 21 21 14 14 1.9 0.9 1.0 1.3 1.6 1.2 1.5 1.8 1.2 1.5 1.8 2.1 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 298.90 > 80.00670 6060 635- 0042 00001 35 ×25 ∑₂₈ ×50∙ ≻₄₀ **≻20** 21 30 15 20 10 10 2.0 2.1 2.4 1.7 2.1 1.2 1.5 1.8 2.7 1.5 1.8 1.4 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 399.00 > 80.00 40 060 (35- 635- ©35- ×25 ×25 \times 25 **≻**20 ≻20 ≻₂₀ 15 15 15 10 10 10 1.9 2.2 1.9 2.2 1.9 2.5 2.8 2.5 2.8 2.2 2.5 2.8 3.1 1.6 1.3 1.6 1.6 D 10 1802 PFHxS D 11 13C4-PFHpA 12 Perfluoroheptanoic acid Exp1:m/z 367.00 > 322.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 35- 35 00000 25-X <u>ĕ</u>25 _20 **_**28 15 21 15 10 10 0 0 1.9 2.5 3.1 1.9 Page 662h of 809 2.8 1.8 2.1 2.4 2.7 1.3 3.0





36 Perfluorooctadecanoic acid



FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Lab Sample ID: <u>CCV 320-145022/5</u> Calibration Date: <u>01/04/2017 16:33</u>

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 04JAN2017A_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid	AveID	0.8537	0.8636		1.01	1.00	1.2	50.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	0.9645		0.977	1.00	-2.3	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.509		0.941	0.884	6.5	50.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9092		0.979	1.00	-2.1	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9904		1.01	1.00	1.2	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.126		0.995	0.910	9.3	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.016		0.878	0.952	-7.8	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.064		1.06	1.00	6.1	50.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9221		0.969	1.00	-3.1	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	0.9802		0.915	0.928	-1.4	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9608		1.03	1.00	3.0	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9301		0.985	1.00	-1.5	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6368		1.05	0.964	9.0	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9470		0.990	1.00	-1.0	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.8506		0.927	1.00	-7.3	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9022		0.995	1.00	-0.5	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.622		1.02	1.00	2.4	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.452		0.921	1.00	-7.9	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.7664		0.744	1.00	-25.6	50.0
13C4 PFBA	Ave	347743	369981		53.2	50.0	6.4	50.0
13C5-PFPeA	Ave	266072	290939		54.7	50.0	9.3	50.0
13C2 PFHxA	Ave	245110	275813		56.3	50.0	12.5	50.0
13C4-PFHpA	Ave	226344	243310		53.7	50.0	7.5	50.0
1802 PFHxS	Ave	326976	335997		48.6	47.3	2.8	50.0
13C4 PFOA	Ave	230362	259754		56.4	50.0	12.8	50.0
13C4 PFOS	Ave	248847	267176		51.3	47.8	7.4	50.0
13C5 PFNA	Ave	177687	198032		55.7	50.0	11.4	50.0
13C8 FOSA	Ave	384141	414261		53.9	50.0	7.8	50.0
13C2 PFDA	Ave	157302	193976		61.7	50.0	23.3	50.0
13C2 PFUnA	Ave	117250	149637		63.8	50.0	27.6	50.0
13C2 PFDoA	Ave	110957	139645		62.9	50.0	25.9	50.0
13C2-PFTeDA	Ave	227387	258482		56.8	50.0	13.7	50.0
13C2-PFHxDA	Ave	124568	138561		55.6	50.0	11.2	50.0

Report Date: 05-Jan-2017 09:08:05 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\04JAN2017A_005.d

Lims ID: CCV L2

Client ID:

Sample Type: CCVL

Inject. Date: 04-Jan-2017 16:33:05 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L2

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Method: \ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 05-Jan-2017 09:08:05 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK034

First Level Reviewer: chandrasenas Date: 05-Jan-2017 09:05:50

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA	1									
217.00 > 172.00		1.614	0.0		18499065	53.2		106	113412	0
1 Perfluorobut	vric acid									
212.90 > 169.00	•	1.622	0.0	1.000	319502	1.01		101	2230	
D 4 13C5-PFP6	eΑ									
267.90 > 223.00		1.906	0.010		14546928	54.7		109	103005	8
3 Perfluoroper	ntanoic a	cid								
262.90 > 219.00		1.916	0.0	1.000	280611	0.9774		97.7	2894	
5 Perfluorobut	anesulfo	nic acid								
298.90 > 80.00	1.954	1.945	0.009	1.000	448064	0.9411		106		
298.90 > 99.00	1.945	1.945	0.0	0.995	177691		2.52(0.00-0.00)			
D 613C2 PFH	κA									
315.00 > 270.00	2.221	2.215	0.006		13790655	56.3		113	120946	1
7 Perfluorohex										
313.00 > 269.00	2.221	2.224	-0.003	1.000	250780	0.9790		97.9	10022	
D 11 13C4-PFH	•									
367.00 > 322.00	2.571	2.560	0.011		12165517	53.7		107	103811	4
12 Perfluorohe	•									
363.00 > 319.00	2.571	2.568	0.003	1.000	240963	1.01		101	2810	
D 10 1802 PFH										
403.00 > 84.00		2.575	0.011		15892642	48.6		103	180127	0
9 Perfluorohex										
399.00 > 80.00		2.583	-0.005	1.000	344252	0.99		109		
D 14 13C4 PFO		0.65-	0.015		1000=:			4.5	005:5-	
417.00 > 372.00	2.940	2.927	0.013		12987692	56.4		113	885490	

Data File:	\\Chr	omNa\Sa	acramen	to\Chrom	Data\A8_N\201	70105-3848	0.b\04JAN2017A_0	05.d	05.d				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags			
15 Perfluorooct	anoic ac	hi.											
413.00 > 369.00		2.936	0.004	1.000	276395	1.06		106	2689				
413.00 > 169.00	2.940	2.936	0.004	1.000	154508		1.79(0.90-1.10)		7608				
13 Perfluorohe	ptanesul	fonic Ac	id										
449.00 > 80.00	2.940	2.936	0.004	1.000	258440	0.8778		92.2					
18 Perfluorooct										M			
	3.314	3.282	0.032	1.000	243025	0.9147	4.4.4(0.00.4.4.0)	98.6	16267	M			
499.00 > 99.00		3.282	0.025	0.998	58677		4.14(0.90-1.10)		1932	M			
D 17 13C4 PFOS 503.00 > 80.00		3.305	0.002		12770994	51.3		107	606987				
D 19 13C5 PFN/		3.303	0.002		12110994	31.3		107	000907				
468.00 > 423.00		3.312	0.002		9901596	55.7		111	812506				
20 Perfluoronoi			0.002		7701070	00.7			012000				
463.00 > 419.00			-0.006	1.000	182596	0.9687		96.9	4450				
22 Perfluorooct	ane Sul	fonamid	е										
498.00 > 78.00		3.611	0.007	1.000	398020	1.03		103	28871				
D 21 13C8 FOS	Α												
506.00 > 78.00	3.618	3.611	0.007		20713068	53.9		108	497303				
D 23 13C2 PFD/	4												
515.00 > 470.00	3.672	3.673	-0.001		9698776	61.7		123	199231				
24 Perfluorode													
513.00 > 469.00			-0.001	1.000	180416	0.9855		98.5	6095				
26 Perfluorode				1 000	1/4007	4.05		100					
599.00 > 80.00		3.981	0.009	1.000	164007	1.05		109					
28 Perfluoround 563.00 > 519.00		4.000	0.009	1.000	141709	0.99		99.0	3455				
D 27 13C2 PFUr		4.000	0.009	1.000	141709	0.77		77.0	3433				
565.00 > 520.00		4.000	0.009		7481855	63.8		128	274074				
D 30 13C2 PFD			0.007		, 101000	00.0		.20	2, 10, 1				
615.00 > 570.00		4.297	0.005		6982236	62.9		126	124187				
29 Perfluorodo	decanoi	c acid											
613.00 > 569.00		4.297	0.005	1.000	118786	0.9266		92.7	218				
31 Perfluorotrid	lecanoic	acid											
663.00 > 619.00	4.573	4.567	0.007	1.000	125993	0.99		99.5	100				
D 32 13C2-PFT	eDA												
715.00 > 670.00	4.810	4.810	0.0		12924102	56.8		114	581770				
33 Perfluorotetr													
712.50 > 668.90		4.810	0.0	1.000	226569	1.02	(0 4 (0 00 0 00)	102	79.5				
713.00 > 169.00		4.810	-0.008	0.998	35718		6.34(0.00-0.00)		2587				
D 34 13C2-PFH		E 220	0.011		4020020	EE /		111	70101				
815.00 > 770.00		5.229	0.011		6928038	55.6		111	79131				
35 Perfluorohex 813.00 > 769.00		oic acid 5.229	0.001	1.000	202802	0.9215		92.1	139				
36 Perfluorooct			0.001	1.000	202002	0.7213		/2.1	137				
913.00 > 869.00		5.604	0.007	1.000	107022	0.7438		74.4	90.0				
. 10.00 > 00 7.00	5.511	0.00 1	0.007		10,022	5.7 100		, , , ,	, 5.0				

Report Date: 05-Jan-2017 09:08:05 Chrom Revision: 2.2 05-Dec-2016 12:37:22

QC Flag Legend Review Flags

M - Manually Integrated

Reagents:

LCPFC-L2_00023 Amount Added: 1.00 Units: mL

Report Date: 05-Jan-2017 09:08:05 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 04-Jan-2017 16:33:05 Instrument ID: A8_N Lims ID: CCV L2 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 Y (X10000) 56**-**(0042 0042 ×35 <u>8</u>48 0001 × × × 32 <u></u>28⁻ 24 21 16 14 2.3 1.3 1.9 8.0 2.0 1.1 1.7 1.0 1.6 1.4 2.6 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.0012 18 70 × (×10000) 0015 ×12 <u>6</u>60 ∑50 ≻40 30 20 10 1.8 2.1 2.4 2.0 2.0 1.7 1.5 1.7 D 6 13C2 PFHxA 7 Perfluorohexanoic acid D 11 13C4-PFHpA Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 367.00 > 322.00 49 42 84 00030- <u>8</u>42 [©]72− ×60− <u>8</u>35-. ≥₂₄ ∑₂₈-×48- 21 18 36 12 24 12 1.9 2.2 2.1 2.1 2.5 2.8 1.8 2.4 2.7 3.3 1.6 D 10 1802 PFHxS 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399,00 > 80.00 (X10000) 049 0042 77-<u>866</u> ×55 ×35-≻28-21 33 22 11 0 0 2.1 Page 6**7**00 of 809 2.5 2.8 1.5 3.3 1.9 2.2 2.5 2.8 3.1 2.2

3.8

4.4

2.8

3.1

3.4

3.7

4.0

4.3

4.6

3.2

18

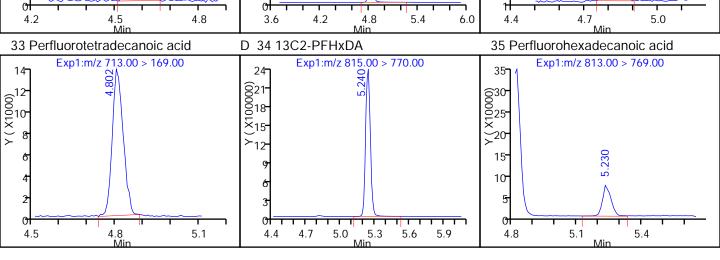
2.6

4.1

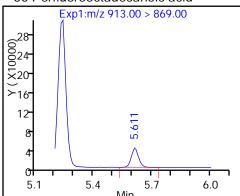
ol = 3.2

3.5

3.8



36 Perfluorooctadecanoic acid



Report Date: 05-Jan-2017 09:08:05 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\04JAN2017A_005.d

Injection Date: 04-Jan-2017 16:33:05 Instrument ID: A8_N

Lims ID: CCV L2

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

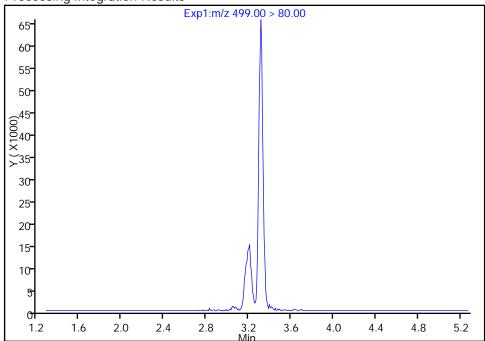
18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

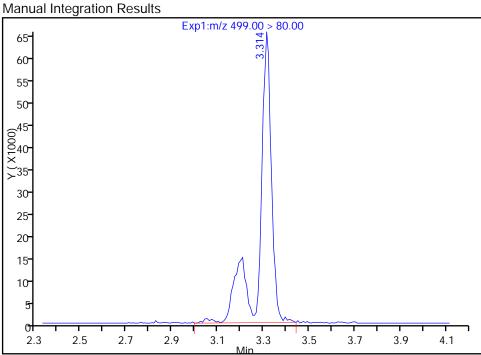
Not Detected

Expected RT: 3.28

Processing Integration Results



RT: 3.31
Area: 243025
Amount: 0.914682
Amount Units: ng/ml



Reviewer: chandrasenas, 05-Jan-2017 09:05:50

Audit Action: Manually Integrated

Audit Reason: Assign Peak

Page 674 of 809

Report Date: 05-Jan-2017 09:08:05 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\04JAN2017A_005.d

Injection Date: 04-Jan-2017 16:33:05 Instrument ID: A8_N

Lims ID: CCV L2

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

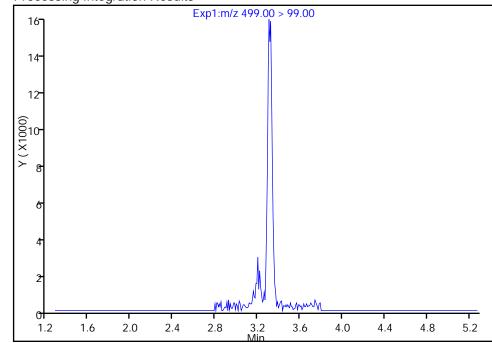
Column: Detector EXP1

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

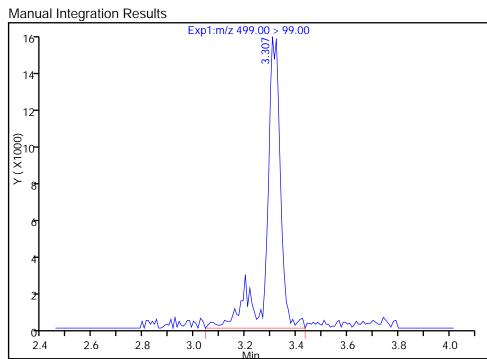
Signal: 2

Not Detected Expected RT: 3.28

Processing Integration Results



RT: 3.31
Area: 58677
Amount: 0.914682
Amount Units: ng/ml



Reviewer: chandrasenas, 05-Jan-2017 09:05:50

Audit Action: Manually Integrated

Audit Reason: Assign Peak

Page 675 of 809

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Lab Sample ID: CCV 320-145022/41 Calibration Date: 01/04/2017 21:03

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 04JAN2017A_041.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid	AveID	0.8537	0.9676		22.7	20.0	13.3	25.0
(PFBA) Perfluoropentanoic acid	AveID	0.9868	1.064		21.6	20.0	7.9	25.0
(PFPeA) Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.735		21.6	17.7	22.4	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9742		21.0	20.0	4.9	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	1.002		20.5	20.0	2.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.092		19.3	18.2	6.0	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.220		21.1	19.0	10.8	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.091		21.7	20.0	8.7	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.096		20.4	18.6	10.2	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9690		20.4	20.0	1.8	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	1.025		22.0	20.0	9.9	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9511		20.2	20.0	0.8	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6968		23.0	19.3	19.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.999		20.9	20.0	4.5	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9541		20.8	20.0	3.9	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9110		20.1	20.0	0.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.658		20.9	20.0	4.6	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.8552		17.3	20.0	-13.4	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.7199		14.0	20.0	-30.1*	25.0
13C4 PFBA	Ave	347743	388079		55.8	50.0	11.6	50.0
13C5-PFPeA	Ave	266072	298168		56.0	50.0	12.1	50.0
13C2 PFHxA	Ave	245110	269713		55.0	50.0	10.0	50.0
13C4-PFHpA	Ave	226344	234033		51.7	50.0	3.4	50.0
1802 PFHxS	Ave	326976	355474		51.4	47.3	8.7	50.0
13C4 PFOA	Ave	230362	248295		53.9	50.0	7.8	50.0
13C4 PFOS	Ave	248847	286019		54.9	47.8	14.9	50.0
13C5 PFNA	Ave	177687	199182		56.0	50.0	12.1	50.0
13C8 FOSA	Ave	384141	426463		55.5	50.0	11.0	50.0
13C2 PFDA	Ave	157302	186581		59.3	50.0	18.6	50.0
13C2 PFUnA	Ave	117250	138581		59.1	50.0	18.2	50.0
13C2 PFDoA	Ave	110957	136382		61.5	50.0	22.9	50.0
13C2-PFTeDA	Ave	227387	248685		54.7	50.0	9.4	50.0
13C2-PFHxDA	Ave	124568	128222		51.5	50.0	2.9	50.0

Report Date: 05-Jan-2017 09:51:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\04JAN2017A_041.d

Lims ID: CCV L4

Client ID:

Sample Type: CCV

Inject. Date: 04-Jan-2017 21:03:10 ALS Bottle#: 40 Worklist Smp#: 41

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L4

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Method: \ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 05-Jan-2017 09:51:27 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK034

First Level Reviewer: chandrasenas Date: 05-Jan-2017 09:50:46

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA	7									
217.00 > 172.00		1.617	0.0		19403972	55.8		112	996975	
1 Perfluorobut	vric acid									
212.90 > 169.00	•	1.617	0.0	1.000	7509888	22.7		113	55122	
D 4 13C5-PFP6	eΑ									
267.90 > 223.00	1.909	1.909	0.0		14908418	56.0		112	917558	
3 Perfluoroper	ntanoic a	cid								
262.90 > 219.00	1.909	1.909	0.0	1.000	6347957	21.6		108	89232	
5 Perfluorobut	anesulfo	nic acid								
298.90 > 80.00	1.948	1.948	0.0	1.000	10903916	21.6		122		
298.90 > 99.00	1.948	1.948	0.0	1.000	4606012		2.37(0.00-0.00)			
7 Perfluorohex										
313.00 > 269.00	2.209	2.209	0.0	1.000	5255047	21.0		105	188504	
D 613C2 PFHx										
315.00 > 270.00	2.217	2.217	0.0		13485657	55.0		110	962527	
D 11 13C4-PFH	•									_
367.00 > 322.00		2.558	0.0		11701632	51.7		103	101436	7
12 Perfluorohe	•									
363.00 > 319.00		2.558	0.0	1.000	4688733	20.5		102	61667	
D 10 1802 PFH		0.570	0.0		1/010040	F4 4		100	F00000	0
403.00 > 84.00		2.573	0.0		16813943	51.4		109	592082	9
9 Perfluorohex				4 000	70/0047	40.0		407		
399.00 > 80.00		2.573	0.0	1.000	7062347	19.3		106		
D 14 13C4 PFO		0.007	0.0		10444700	F2.0		100	477400	
417.00 > 372.00	2.927	2.927	0.0		12414738	53.9		108	477130	

Data File:	\\Chr	omNa\S	acramen	to\Chrom	Data\A8_N\201	70105-3848	0.b\04JAN2017A_0	41.d		
Clausel.	БТ	EXP	DLT	REL	D	Amount	Datte (Linette)	0/ D	C/N	-
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooct										
413.00 > 369.00 413.00 > 169.00		2.927 2.927	0.0 0.0	1.000 1.000	5417348 3158677	21.7	1.72(0.90-1.10)	109	59672 161373	
13 Perfluoroher				1.000	3136077		1.72(0.90-1.10)		101373	
449.00 > 80.00		2.927		1.000	6646280	21.1		111		
18 Perfluorooct	ane sulf	onic aci	d							
499.00 > 80.00		3.271		1.000	5815921	20.4		110	34393	
499.00 > 99.00		3.271	0.023	1.007	1283797		4.53(0.90-1.10)		76362	
D 17 13C4 PFOS		2 204	0.0		10/71710	F.4.0		445	E0E 400	
503.00 > 80.00		3.294	0.0		13671710	54.9		115	525402	
D 19 13C5 PFNA 468.00 > 423.00		3.301	0.0		9959076	56.0		112	488010	
20 Perfluoronor			0.0		7707070	00.0		112	100010	
463.00 > 419.00		3.301	0.0	1.000	3860216	20.4		102	73111	
22 Perfluorooct	ane Sul	fonamid	е							
498.00 > 78.00	3.621	3.621	0.0	1.000	8739968	22.0		110	347736	
D 21 13C8 FOSA										_
506.00 > 78.00		3.621	0.0		21323143	55.5		111	107106	9
24 Perfluorodeo 513.00 > 469.00		cid 3.665	0.0	1.000	3549276	20.2		101	92525	
D 23 13C2 PFDA		3.003	0.0	1.000	3349270	20.2		101	92525	
515.00 > 470.00		3.665	0.0		9329059	59.3		119	321795	
26 Perfluorodeo										
599.00 > 80.00	3.971	3.971	0.0	1.000	3842625	23.0		119		
28 Perfluoround										
563.00 > 519.00		3.990	0.0	1.000	2768992	20.9		104	90005	
D 27 13C2 PFUr		0.000	0.0		,,,,,,,,,	FO 4		440	40.47.40	•
565.00 > 520.00		3.990	0.0		6929028	59.1		118	124763	2
29 Perfluorodoc 613.00 > 569.00		4.284	0.0	1.000	2602512	20.8		104	17502	
D 30 13C2 PFDc		4.204	0.0	1.000	2002012	20.0		104	17502	
615.00 > 570.00		4.284	0.0		6819112	61.5		123	221726	
31 Perfluorotrid	ecanoic	acid								
663.00 > 619.00	4.538	4.538	0.0	1.000	2484796	20.1		100	2280	
D 32 13C2-PFT6										
715.00 > 670.00		4.783	0.0		12434260	54.7		109	752448	
33 Perfluorotetr			0.0	1 000	4522002	20.0		105	1575	
712.50 > 668.90 713.00 > 169.00		4.783 4.783	0.0 -0.008	1.000 0.998	4523003 717967	20.9	6.30(0.00-0.00)	105	1575 53183	
D 34 13C2-PFH		4.703	0.000	0.770	717707		0.30(0.00 0.00)		33103	
815.00 > 770.00		5.191	0.0		6411097	51.5		103	81203	
35 Perfluorohex	kadecan	oic acid								
813.00 > 769.00	5.202	5.202	0.0	1.000	2332640	17.3		86.6	1437	
36 Perfluorooct										
913.00 > 869.00	5.554	5.554	0.0	1.000	1963724	14.0		69.9	1512	

Report Date: 05-Jan-2017 09:51:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC-L4_00024 Amount Added: 1.00 Units: mL

Report Date: 05-Jan-2017 09:51:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 04-Jan-2017 21:03:10 Instrument ID: A8_N Lims ID: CCV L4 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 41 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 56 24 (000048 (00001×40 (00020 ×16 842 $\stackrel{\smile}{\times}_{35}$ -32 28 24 21 14 1.5 0.9 1.2 1.8 2.1 1.1 1.4 1.7 2.0 1.4 1.7 2.0 2.3 2.6 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 (18-(200000) (18-(20000) (18-(2000) (18-(2000) (18-(2000) (18-(2000) (18-(2000) (18-(2000) (18-(2000) (19-(200) (19-(2000) (19-(2000) (19-(2000) (19-(2000) (19-24 42 (000001 X16 (0000 30-30-18 12 2.2 1.9 2.2 2.5 2.8 1.9 1.9 2.2 1.3 1.6 1.6 1.6 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 49 (000015⁻ ×12-036-036-842 <u>8</u>35-18 21 12 1.9 2.2 2.5 2.4 3.0 1.9 2.2 2.5 2.8 2.8 1.2 1.8 3.1 1.6 12 Perfluoroheptanoic acid D 10 1802 PFHxS 9 Perfluorohexanesulfonic acid Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 (000001X (000001X (015-0000012-X) -32 24 16- 0 0 2.4 2.7 3.0 2.0 Page 680hof 809 3.2 2.0 2.3 2.6 2.9 3.2 2.1 1.4 1.7

3.7

4.3

3.1

3.4

3.7

4.0

20-

2.5

3.1

3.0

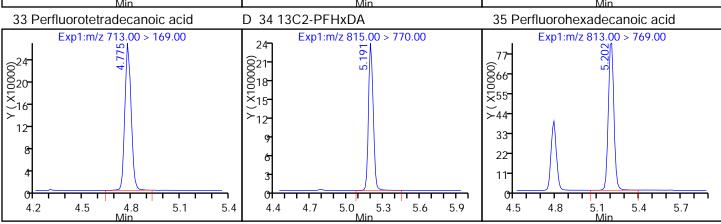
2.7

3.3

3.6

3.9

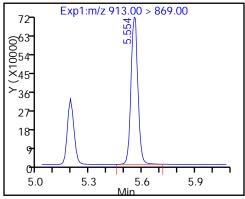
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Report Date: 05-Jan-2017 09:51:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22

 $\dot{\text{Data File: $\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\04JAN2017A_041.d}}$

36 Perfluorooctadecanoic acid



FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Lab Sample ID: CCV 320-145022/47 Calibration Date: 01/04/2017 21:48

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 04JAN2017A_047.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9150		53.6	50.0	7.2	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	0.9931		50.3	50.0	0.6	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.644		51.3	44.2	16.0	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9193		49.5	50.0	-1.0	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9915		50.6	50.0	1.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.060		46.8	45.5	2.9	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.040		51.8	50.0	3.7	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.147		49.5	47.6	4.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.059		49.4	46.4	6.5	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9663		50.8	50.0	1.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9338		50.1	50.0	0.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9708		51.4	50.0	2.9	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6866		56.7	48.2	17.6	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9440		49.4	50.0	-1.3	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9619		52.4	50.0	4.8	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9353		51.6	50.0	3.1	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.574		49.7	50.0	-0.7	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.8476		43.8	50.0	-12.4	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.7016		34.0	50.0	-31.9*	25.0
13C4 PFBA	Ave	347743	352162		50.6	50.0	1.3	50.0
13C5-PFPeA	Ave	266072	268991		50.5	50.0	1.1	50.0
13C2 PFHxA	Ave	245110	248725		50.7	50.0	1.5	50.0
13C4-PFHpA	Ave	226344	208761		46.1	50.0	-7.8	50.0
1802 PFHxS	Ave	326976	313413		45.3	47.3	-4.1	50.0
13C4 PFOA	Ave	230362	215277		46.7	50.0	-6.5	50.0
13C4 PFOS	Ave	248847	252933		48.6	47.8	1.6	50.0
13C5 PFNA	Ave	177687	170900		48.1	50.0	-3.8	50.0
13C8 FOSA	Ave	384141	399782		52.0	50.0	4.1	50.0
13C2 PFDA	Ave	157302	167759		53.3	50.0	6.6	50.0
13C2 PFUnA	Ave	117250	125429		53.5	50.0	7.0	50.0
		110957	117767		53.1	50.0	6.1	50.0
13C2 PFDoA	Ave	227387	224797		49.4	50.0	-1.1	50.0
13C2-PFTeDA	Ave				45.8	50.0	-8.4	50.0
13C2-PFHxDA	Ave	124568	114118		45.8	30.0	0.4	50.0

Report Date: 06-Jan-2017 12:50:33 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\04JAN2017A_047.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 04-Jan-2017 21:48:07 ALS Bottle#: 41 Worklist Smp#: 47

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Method: \ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jan-2017 12:50:33 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK021

First Level Reviewer: chandrasenas Date: 06-Jan-2017 12:50:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 213C4 PFBA										
217.00 > 172.00		1.609	0.0		17608110	50.6		101	756280	
		1.007	0.0		17000110	30.0		101	750200	
1 Perfluorobuty 212.90 > 169.00		1.609	0.0	1.000	16111211	53.6		107	111070	
		1.009	0.0	1.000	10111211	55.0		107	111070	
D 4 13C5-PFPe		1 000	0.0		10440541	F0 F		101	100010	2
267.90 > 223.00		1.899	0.0		13449541	50.5		101	1230139	9
3 Perfluoropent										
262.90 > 219.00	1.899	1.899	0.0	1.000	13356659	50.3		101	150572	
5 Perfluorobuta										
	1.938	1.938	0.0	1.000	22768020	51.3		116		
298.90 > 99.00	1.938	1.938	0.0	1.000	10348324		2.20(0.00-0.00)			
7 Perfluorohexa	anoic ac	id								
313.00 > 269.00	2.200	2.200	0.0	1.000	11432599	49.5		99.0	310194	
D 6 13C2 PFHxA	Α									
315.00 > 270.00	2.209	2.209	0.0		12436270	50.7		101	744569	
D 11 13C4-PFHp	ρA									
367.00 > 322.00		2.553	0.0		10438028	46.1		92.2	706465	
12 Perfluorohep	ntanoic a	ncid								
363.00 > 319.00		2.553	0.0	1.000	10348940	50.6		101	139328	
D 10 1802 PFHx		2.000	0.0			00.0			.07020	
403.00 > 84.00		2.560	0.0		14824443	45.3		95.9	1362100	1
					14024443	43.3		75.7	1302100	,
9 Perfluorohexa				1 000	15120172	47.0		102		
399.00 > 80.00		2.560	0.0	1.000	15120173	46.8		103		
D 14 13C4 PFOA										
417.00 > 372.00	2.911	2.911	0.0		10763855	46.7		93.5	893940	

Data File:	\\Chrc	mNa\S	acrament	to\Chrom	Data\A8_N\201	70105-3848	0.b\04JAN2017A_0	47.d		
Signal	DT	EXP	DLT	REL	Docnopco	Amount	Dotio/Limits)	0/ Dog	C/NI	Floors
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluoroocta										
413.00 > 369.00 413.00 > 169.00		2.911 2.911	0.0	1.000 1.000	11195879 6628457	51.8	1.69(0.90-1.10)	104	94970 324610	
				1.000	0020437		1.09(0.90-1.10)		324010	
13 Perfluorohep 449.00 > 80.00		2.919		1.000	13803677	49.5		104		
18 Perfluoroocta				1.000	10000077	17.0		101		
499.00 > 80.00		3.269		1.000	12427636	49.4		106	214215	
499.00 > 99.00	3.285	3.269	0.016	1.005	2669926		4.65(0.90-1.10)		166755	
D 17 13C4 PFOS										
503.00 > 80.00	3.285	3.285	0.0		12090178	48.6		102	239816	
D 19 13C5 PFNA										
468.00 > 423.00		3.292	0.0		8545021	48.1		96.2	555561	
20 Perfluoronon			0.0	1 000	0057040	F0.0		400	407540	
463.00 > 419.00		3.292		1.000	8257342	50.8		102	127549	
22 Perfluoroocta 498.00 > 78.00		onamid 3.610		1.000	18665943	50.1		100	383545	
		3.010	0.0	1.000	10003943	50.1		100	303343	
D 21 13C8 FOSA 506.00 > 78.00		3.610	0.0		19989096	52.0		104	527554	
D 23 13C2 PFDA		0.010	0.0		17707070	02.0		101	027001	
515.00 > 470.00		3.644	0.0		8387961	53.3		107	228946	
24 Perfluorodec										
513.00 > 469.00		3.644	0.0	1.000	8142956	51.4		103	170745	
26 Perfluorodeca	ane Sul	lfonic ac	id							
599.00 > 80.00	3.958	3.958	0.0	1.000	8370907	56.7		118		
28 Perfluoround										
563.00 > 519.00		3.976	0.0	1.000	5920259	49.4		98.7	130948	
D 27 13C2 PFUn										
565.00 > 520.00		3.976	0.0		6271451	53.5		107	310642	
29 Perfluorodod 613.00 > 569.00			0.0	1.000	E442004	E2 4		105	E0402	
		4.262	0.0	1.000	5663986	52.4		105	59693	
D 30 13C2 PFDo. 615.00 > 570.00		4.270	0.0		5888362	53.1		106	187137	
31 Perfluorotride			0.0		3000302	55.1		100	107137	
663.00 > 619.00		4.537	0.0	1.000	5507635	51.6		103	5541	
D 32 13C2-PFTel										
715.00 > 670.00		4.768	0.0		11239869	49.4		98.9	389960	
33 Perfluorotetra	adecan	oic acid								
712.50 > 668.90	4.777	4.777	0.0	1.000	9270288	49.7		99.3	3274	
713.00 > 169.00	4.759	4.777	-0.018	0.996	1519691		6.10(0.00-0.00)		112603	
D 34 13C2-PFHx										
815.00 > 770.00		5.182	0.0		5705894	45.8		91.6	79527	
35 Perfluorohexa			0.0	4 000	4004005	40.0		67 (0.400	
813.00 > 769.00		5.182	0.0	1.000	4991225	43.8		87.6	3408	
36 Perfluoroocta			0.0	1 000	4121407	24.0		40 1	2227	
913.00 > 869.00	5.539	5.539	0.0	1.000	4131486	34.0		68.1	3226	

Report Date: 06-Jan-2017 12:50:33 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 06-Jan-2017 12:50:33 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 04-Jan-2017 21:48:07 Instrument ID: A8_N Lims ID: CCV L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 47 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 49 (00001 200001 35 835<u>-</u> <u>8</u>35-. Š₂₈. 28 ≻28 21 21 21 1.9 1.9 1.9 1.0 1.6 1.0 1.3 1.6 1.3 1.6 2.2 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 42 (77- 000042 0035 () 30-30-30--55- **≻44** 21 18 33 12 22 11 1.9 2.2 1.8 1.8 2.5 2.1 2.4 2.1 1.6 1.5 1.5 1.3 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 35 (000001 X30 0036 0030 0030 0025 × ∑₂₀ **≻24** 18 15 18 12 10 12 2.0 2.3 2.6 2.9 1.8 2.4 3.0 2.1 1.7 1.2 2.7 3.3 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 049 0042 ×35-∑24- _20 ≻28- 18 15 21 12 10 0 1.9 2.2 2.5 2.8 3.1 1.9 2.0 2.3 2.6 2.9 3.2 1.7

3.7

4.3

3.0

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18

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18

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3.2

3.5

3.8

4.1

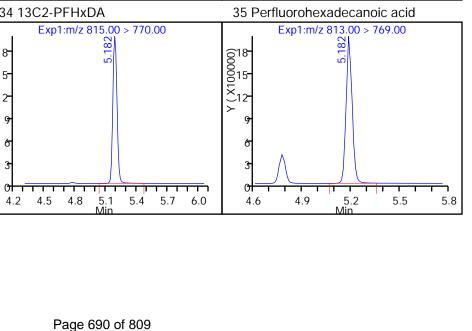
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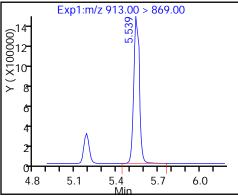
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Report Date: 06-Jan-2017 12:50:33 Chrom Revision: 2.2 05-Dec-2016 12:37:22 $\dot{\text{Data File: $\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\04JAN2017A_047.d}}$





FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Lab Sample ID: CCV 320-145242/2 Calibration Date: 01/05/2017 14:53

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 05JAN2017B_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid	AveID	0.8537	0.9204		53.9	50.0	7.8	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.013		51.3	50.0	2.7	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.620		50.5	44.2	14.3	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9243		49.8	50.0	-0.5	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.053		46.5	45.5	2.2	25.0
Perfluoroheptanoic acid	AveID	0.9788	0.9859		50.4	50.0	0.7	25.0
(PFHpA) Perfluorooctanoic acid	AveID	1.003	1.034		51.6	50.0	3.1	25.0
(PFOA) Perfluoroheptanesulfonic	AveID	1.102	1.161		50.2	47.6	5.4	25.0
Acid (PFHpS) Perfluorooctanesulfonic acid	AveID	0.9945	1.056		49.3	46.4	6.2	25.0
(PFOS) Perfluorononanoic acid	AveID	0.9518	0.9745		51.2	50.0	2.4	25.0
(PFNA) Perfluorooctane Sulfonamide	AveID	0.9327	0.9372		50.2	50.0	0.5	25.0
(FOSA) Perfluorodecanoic acid	AveID	0.9438	0.9245		49.0	50.0	-2.0	25.0
(PFDA) Perfluorodecanesulfonic acid	AveID	0.5840	0.6829		56.4	48.2	16.9	25.0
(PFDS) Perfluoroundecanoic acid	AveID	0.9563	0.9906		51.8	50.0	3.6	25.0
(PFUnA) Perfluorododecanoic acid	AveID	0.9180	0.9512		51.8	50.0	3.6	25.0
(PFDoA) Perfluorotridecanoic Acid	AveID	0.9069	0.9410		51.9	50.0	3.8	25.0
(PFTriA) Perfluorotetradecanoic acid	AveID	1.585	1.795		56.6	50.0	13.2	25.0
(PFTeA) Perfluoro-n-hexadecanoic	L1ID		0.8258		42.6	50.0	-14.7	25.0
acid (PFHxDA) Perfluoro-n-octadecanoic	AveID	1.030	0.5832		28.3	50.0	-43.4*	25.0
acid (PFODA) 13C4 PFBA	Ave	347743	377525		54.3	50.0	8.6	50.0
13C5-PFPeA	Ave	266072	281801		53.0	50.0	5.9	50.0
13C2 PFHxA	Ave	245110	258642		52.8	50.0	5.5	50.0
13C4-PFHpA	Ave	226344	217457		48.0	50.0	-3.9	50.0
1802 PFHxS	Ave	326976	329627		47.7	47.3	0.8	50.0
13C4 PFOA	Ave	230362	225059		48.8	50.0	-2.3	50.0
13C4 PFOS	Ave	248847	266154		51.1	47.8	7.0	50.0
13C5 PFNA	Ave	177687	180943		50.9	50.0	1.8	50.0
13C8 FOSA	Ave	384141	420046		54.7	50.0	9.3	50.0
13C2 PFDA	Ave	157302	181454		57.7	50.0	15.4	50.0
13C2 PFUnA	Ave	117250	132398		56.5	50.0	12.9	50.0
13C2 PFDoA	Ave	110957	123931		55.8	50.0	11.7	50.0
13C2-PFTeDA	Ave	227387	243417		53.5	50.0	7.0	50.0
	,							

Report Date: 06-Jan-2017 09:59:21 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170106-38534.b\05JAN2017B_002.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 05-Jan-2017 14:53:18 ALS Bottle#: 41 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jan-2017 09:59:21 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK021

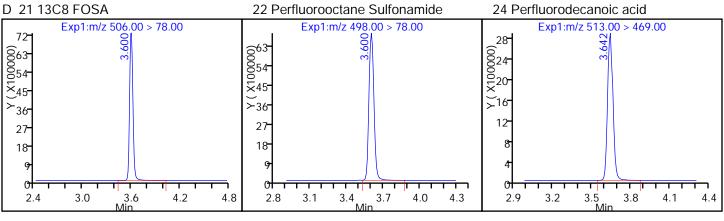
First Level Reviewer: chandrasenas Date: 06-Jan-2017 09:41:37

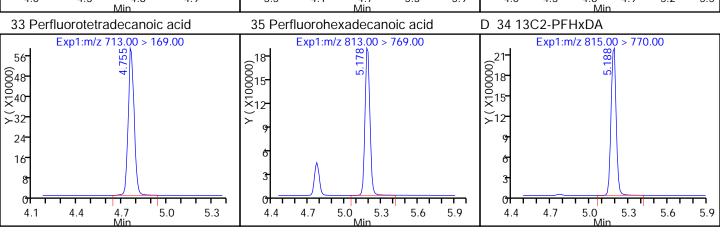
Fi	rst Level Revie	wer: cha	ndrasen	as		Date:	0	6-Jan-2017 09:41:3	7		
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	2 13C4 PFBA 17.00 > 172.00		1.598	0.0		18876268	54.3		109	945067	
	1 Perfluorobuty 12.90 > 169.00	yric acid	1.606	0.0	1.000	17374360	53.9		108	145123	
	4 13C5-PFPe 67.90 > 223.00		1.887	0.0		14090073	53.0		106	1018033	3
2	3 Perfluoropen 62.90 > 219.00		cid 1.887	0.0	1.000	14274441	51.3		103	142736	
		1.935	1.935	0.0	1.000	23598940	50.5		114		
D	6 13C2 PFHx		1.935	-0.009	0.995	10752949		2.19(0.00-0.00)			
	15.00 > 270.00 7 Perfluorohex	anoic ac		0.0		12932078	52.8		106	787179	
	13.00 > 269.00 9 Perfluorohex	anesulfo			1.000	11953110	49.8		99.5	343034	
D	99.00 > 80.00 11 13C4-PFH	рΑ	2.476		1.000	15790470	46.5		102	100000	2
	67.00 > 322.00 12 Perfluorohe	ptanoic a		0.0	1 000	10872873	48.0		96.1	1290283	3
D	63.00 > 319.00 10 18O2 PFH:	xS	2.536	0.0	1.000	10719114	50.4		101	160146	
	03.00 > 84.00 15 Perfluorooct	anoic ac		0.0	1 000	15591366	47.7		101	783835	
4	13.00 > 369.00 13.00 > 169.00	2.902	2.902 2.902	0.0	1.000 1.000	11640842 7031669	51.6	1.66(0.90-1.10)	103	128331 335091	
	14 13C4 PFO 17.00 > 372.00		2.902	0.0		11252959 Page 693 of 80	9 48.8		97.7	641187	

EXP DLT REL Amount Signal **RT** RT RT RT Response ng/ml Ratio(Limits) %Rec S/N Flags 13 Perfluoroheptanesulfonic Acid 449.00 > 80.00 2.910 2.910 0.0 1.000 14714792 50.2 105 18 Perfluorooctane sulfonic acid 1.000 49.3 499.00 > 80.00 3.259 3.259 0.0 106 198714 13037780 499.00 > 99.00 3.275 3.259 0.016 4.61(0.90-1.10) 143196 1.005 2826394 D 17 13C4 PFOS 503.00 > 80.00 3.275 3.275 0.0 12722140 51.1 107 222414 D 19 13C5 PFNA 468.00 > 423.00 3.283 3.283 0.0 9047140 50.9 102 771300 20 Perfluorononanoic acid 463.00 > 419.00 3.275 1.000 51.2 131929 3.275 0.0 8816365 102 D 21 13C8 FOSA 506.00 > 78.00 3.600 3.600 0.0 21002313 54.7 109 1204876 22 Perfluorooctane Sulfonamide 498.00 > 78.00 3.600 3.600 0.0 1.000 19683048 50.2 100 358361 24 Perfluorodecanoic acid 513.00 > 469.00 3.642 49.0 3.642 0.0 1.000 8387491 98.0 237554 D 23 13C2 PFDA 515.00 > 470.00 3.642 9072678 57.7 154937 3.642 0.0 115 26 Perfluorodecane Sulfonic acid 599.00 > 80.00 3.945 3.945 0.0 1.000 8760493 56.4 117 28 Perfluoroundecanoic acid 563.00 > 519.00 3.963 3.963 0.0 1.000 6557406 51.8 104 186777 D 27 13C2 PFUnA 565.00 > 520.00 3.972 3.972 0.0 6619921 56.5 113 438106 29 Perfluorododecanoic acid 613.00 > 569.00 4.265 4.265 0.0 1.000 5894209 51.8 104 88638 D 30 13C2 PFDoA 615.00 > 570.00 4.265 160763 4.265 0.0 6196561 55.8 112 31 Perfluorotridecanoic acid 663.00 > 619.00 4.526 4.526 0.0 1.000 5831202 51.9 104 6297 D 32 13C2-PFTeDA 715.00 > 670.00 4.764 4.764 0.0 12170859 53.5 107 899275 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.772 4.772 0.0 1.000 11120763 56.6 113 3415 713.00 > 169.00 4.755 4.772 -0.017 6.87(0.00-0.00) 0.996 1618506 146114 35 Perfluorohexadecanoic acid 813.00 > 769.00 5.178 5.178 0.0 1.000 5117000 42.6 85.3 2985 D 34 13C2-PFHxDA 815.00 > 770.00 5.188 5.188 0.0 6043137 48.5 97.0 60305 36 Perfluorooctadecanoic acid 913.00 > 869.00 5.536 5.536 0.0 1.000 3613945 28.3 56.6 2679 Reagents:

LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 06-Jan-2017 09:59:22 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 05-Jan-2017 14:53:18 Instrument ID: A8_N Lims ID: CCV L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 2 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 56**-**(49⁻ 00042⁻ ×35⁻ 00042 0005 35 <u>8</u>48 00 40 × <u></u>∠28 -28 24 21 21 16 14 14 1.9 2.2 0.9 1.0 1.6 0.4 1.0 1.6 1.5 2.1 2.7 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 42 (000001x) (000001x) 677- 00001 0036 ∑55 24 -28 **≻**44 18 21 33 14 22 11 1.8 2.0 2.3 2.6 2.1 2.4 1.9 2.2 1.4 1.7 1.5 1.1 1.6 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 399.00 > 80.00 48 195 (000001X) (42⁻ (0036⁻ (30⁻ 042 0036 ×30-**≻24** ~24° >₂₄ 18 18 18 12 12 12 2.4 3.0 2.1 2.4 2.7 1.9 2.2 2.5 2.8 1.8 1.8 3.1 1.2 1.5 1.6 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 635- 049 0042 635 630 30 ×35 ×25 ×25 ≻20 ≻20 ≻28 15- 21 15 10 10 0 0 2.1 2.7 3.3 1.9 2.2 Page 6955 of 809 3.1 1.9 2.2 2.5 2.8 3.1 1.5 3.4 1.6

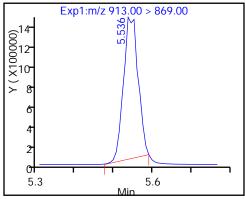




Report Date: 06-Jan-2017 09:59:22 Chrom Revision: 2.2 05-Dec-2016 12:37:22

 $\dot{\text{Data File: $\ChromNa\Sacramento\ChromData\A8_N\20170106-38534.b\05JAN2017B_002.d}}$

36 Perfluorooctadecanoic acid



FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Lab Sample ID: CCV 320-145242/11 Calibration Date: 01/05/2017 16:00

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 05JAN2017B_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9829		23.0	20.0	15.1	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.085		22.0	20.0	9.9	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.780		22.2	17.7	25.6*	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9685		20.9	20.0	4.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.104		19.5	18.2	7.2	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	1.029		21.0	20.0	5.1	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.067		21.3	20.0	6.4	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.186		20.5	19.0	7.7	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.067		19.9	18.6	7.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	1.003		21.1	20.0	5.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	1.018		21.8	20.0	9.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9793		20.8	20.0	3.8	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6539		21.6	19.3	12.0	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9462		19.8	20.0	-1.1	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9582		20.9	20.0	4.4	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9108		20.1	20.0	0.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.765		22.3	20.0	11.4	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.8369		16.9	20.0	-15.3	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.7569		14.7	20.0	-26.5*	25.0
13C4 PFBA	Ave	347743	393687		56.6	50.0	13.2	50.0
13C5-PFPeA	Ave	266072	298049		56.0	50.0	12.0	50.0
13C2 PFHxA	Ave	245110	274774		56.1	50.0	12.1	50.0
13C4-PFHpA	Ave	226344	233124		51.5	50.0	3.0	50.0
1802 PFHxS	Ave	326976	352109		50.9	47.3	7.7	50.0
13C4 PFOA	Ave	230362	248354		53.9	50.0	7.8	50.0
13C4 PFOS	Ave	248847	289320		55.6	47.8	16.3	50.0
13C5 PFNA	Ave	177687	194068		54.6	50.0	9.2	50.0
13C8 FOSA	Ave	384141	422735		55.0	50.0	10.0	50.0
13C2 PFDA	Ave	157302	183776		58.4	50.0	16.8	50.0
13C2 PFUnA	Ave	117250	140710		60.0	50.0	20.0	50.0
13C2 PFDoA	Ave	110957	128262		57.8	50.0	15.6	50.0
13C2-PFTeDA	Ave	227387	239486		52.7	50.0	5.3	50.0
13C2-PF1eDA	Ave	124568	120671		48.4	50.0	-3.1	50.0
TOCK-REHXDW	Ave	124300	120011		1	50.0	""	30.0

Report Date: 06-Jan-2017 09:59:36 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8_N\20170106-38534.b\05JAN2017B_011.d

Lims ID: CCV L4

Client ID:

Sample Type: CCV

Inject. Date: 05-Jan-2017 16:00:45 ALS Bottle#: 40 Worklist Smp#: 11

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L4

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Method: \ChromNa\Sacramento\ChromData\A8_N\20170106-38534.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jan-2017 09:59:35 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

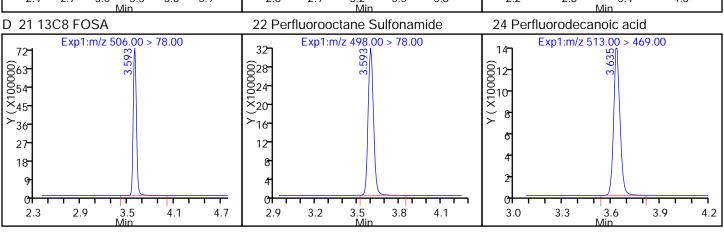
Process Host: XAWRK021

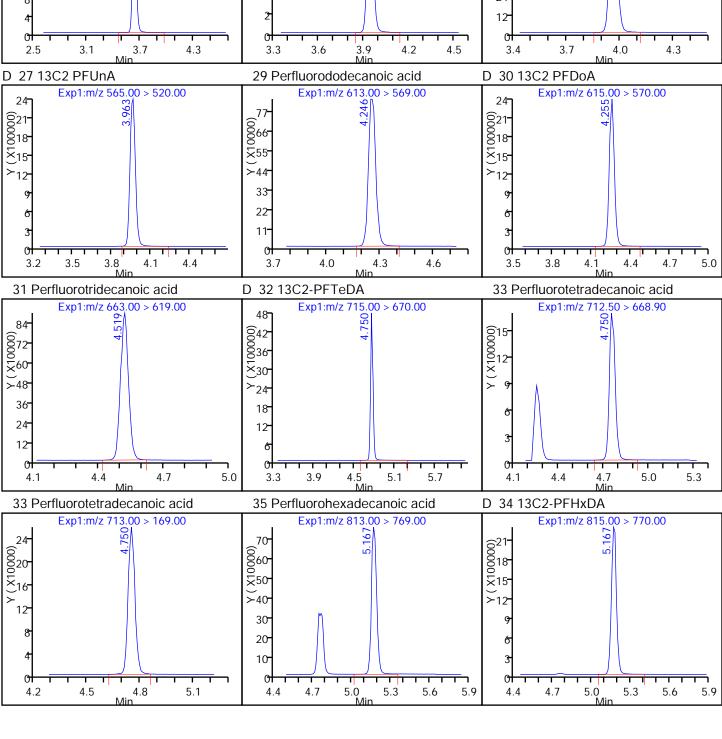
First Level Reviewer: chandrasenas Date: 06-Jan-2017 09:56:07

First Level Revie	wer: cha	ndrasen	as		Date:	0	6-Jan-2017 09:56:0	7		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA 217.00 > 172.00		1.598	0.0		19684341	56.6		113	101461	2
1 Perfluorobuty		1.070	0.0		17001011	00.0		110	101101	_
212.90 > 169.00		1.598	0.0	1.000	7739007	23.0		115	57859	
D 4 13C5-PFPe 267.90 > 223.00		1.887	0.0		14902472	56.0		112	178542	4
3 Perfluoroper 262.90 > 219.00		cid 1.887	0.0	1.000	6466957	22.0		110	79052	
5 Perfluorobuta 298.90 > 80.00	1.925	1.925	0.0	1.000	11081705	22.2	2.41(0.00.0.00)	126		
298.90 > 99.00 D 6 13C2 PFHx	1.925 A	1.925	0.0	1.000	4589305		2.41(0.00-0.00)			
315.00 > 270.00	2.184	2.184	0.0		13738716	56.1		112	989116	
7 Perfluorohex 313.00 > 269.00			0.0	1.000	5322432	20.9		104	195424	
9 Perfluorohex	anesulfo	nic acid								
399.00 > 80.00		2.472	0.0	1.000	7073050	19.5		107		
D 11 13C4-PFH ₁ 367.00 > 322.00	•	2.528	0.0		11656182	51.5		103	775575	
12 Perfluorohe 363.00 > 319.00	-	acid 2.535	0.0	1.000	4796247	21.0		105	64853	
D 10 18O2 PFH: 403.00 > 84.00		2.550	0.0		16654766	50.9		108	144999	3
15 Perfluorooct										_
413.00 > 369.00	2.896	2.896	0.0	1.000	5301897	21.3		106	53740	
413.00 > 169.00		2.896	0.008	1.003	3168631		1.67(0.90-1.10)		110905	
D 14 13C4 PFO 417.00 > 372.00		2.896	0.0		12417692 Page 700 of 8	09 ^{53.9}		108	877108	

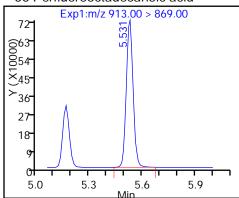
Data File:	\\Cnr	ominarsa	acramer	10/Chrom	Data\A8_N\201	70106-3853	4.D\05JAN2017B_0	11.0		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
J						J	, ,			3
13 Perfluorohe	•			1 000	/52501/	20 F		100		
449.00 > 80.00		2.904		1.000	6535016	20.5		108		
18 Perfluorooc 499.00 > 80.00	tane suit 3.271	onic acio 3.271		1.000	5727684	19.9		107	190464	
499.00 > 80.00 499.00 > 99.00		3.271	0.0 0.0	1.000	1224245	19.9	4.68(0.90-1.10)	107	92727	
D 17 13C4 PFO		5.271	0.0	1.000	1224243		4.00(0.70 1.10)		72121	
503.00 > 80.00		3.271	0.0		13829478	55.6		116	363607	
20 Perfluorono			0.0		10027170	00.0		110	000007	
463.00 > 419.00		3.278	0.0	1.000	3892254	21.1		105	82696	
D 19 13C5 PFN		0.270	0.0	1.000	0072201	2		.00	02070	
468.00 > 423.00		3.271	0.0		9703397	54.6		109	801567	
D 21 13C8 FOS		0.27	0.0		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	00			00.007	
506.00 > 78.00		3.593	0.0		21136743	55.0		110	104041	0
22 Perfluorooc						00.0				
498.00 > 78.00		3.593		1.000	8605329	21.8		109	263486	
24 Perfluorode			0.0		0000027				200.00	
513.00 > 469.00		3.635	0.0	1.000	3599537	20.8		104	93882	
D 23 13C2 PFD		0.000	0.0		0077001	20.0			70002	
515.00 > 470.00		3.635	0.0		9188780	58.4		117	242345	
26 Perfluorode					7100700	00.1		,	212010	
599.00 > 80.00		3.937		1.000	3647254	21.6		112		
28 Perfluoroun			0.0	1.000	0017201	21.0				
563.00 > 519.00		3.963	0.0	1.000	2662905	19.8		98.9	63711	
D 27 13C2 PFU		0.700	0.0	1.000	2002700	17.0		70.7	00711	
565.00 > 520.00		3.963	0.0		7035510	60.0		120	265301	
29 Perfluorodo			0.0		7000010	00.0		120	200001	
613.00 > 569.00		4.246	0.0	1.000	2458098	20.9		104	49219	
D 30 13C2 PFD		7.270	0.0	1.000	2430070	20.7		104	7/21/	
615.00 > 570.00		1 255	0.0		6413083	57.8		116	153937	
			0.0		0413003	37.0		110	133737	
31 Perfluorotric 663.00 > 619.00		4.519	0.0	1.000	2336335	20.1		100	2792	
D 32 13C2-PFT		4.517	0.0	1.000	2330333	20.1		100	2172	
715.00 > 670.00		4.750	0.0		11974298	52.7		105	947951	
			0.0		11774270	32.7		103	747731	
33 Perfluorotet 712.50 > 668.90		4.750	0.0	1.000	4527915	22.3		111	1332	
712.30 > 000.40		4.750	0.0	1.000	679277	22.3	6.67(0.00-0.00)	111	83627	
35 Perfluorohe			0.0	1.000	077277		0.07 (0.00 0.00)		03027	
813.00 > 769.00		5.167	0.0	1.000	2146884	16.9		84.7	1578	
		5.107	0.0	1.000	2140004	10.7		04.7	1370	
D 34 13C2-PFH 815.00 > 770.00		5.167	0.0		6033570	48.4		96.9	71219	
			0.0		0033370	40.4		70.7	11417	
36 Perfluorooc 913.00 > 869.00		5.531	0.0	1.000	10/1400	14.7		73.5	1612	
	0.001	J.JJ I	0.0	1.000	1941608	14.7		13.3	1012	
Reagents:	1			Amount A	ddod: 100		. ml			
LCPFC-L4_0002	.4		4	AIIIUUIII A	dded: 1.00	Units	. IIIL			

Report Date: 06-Jan-2017 09:59:36 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: 05-Jan-2017 16:00:45 **Injection Date:** Instrument ID: A8_N Lims ID: CCV L4 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 11 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 24 (56⁻ 00048⁻ 0049 00042 (00020 ×16 ∑40 ×35 ≻28 24 21 16 14 2.3 1.9 0.9 1.1 1.7 1.0 1.3 1.6 1.5 2.1 2.7 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 (24⁻ 00020 ×16⁻ (000001 0036 (518 (5000015 (512 (518) ∑30 **≻24** 18 12 1.9 1.8 2.1 1.9 2.2 2.2 2.5 1.5 1.3 1.6 1.6 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 313.00 > 269.00Exp1:m/z 315.00 > 270.00 Exp1:m/z 399.00 > 80.00 49 84 (0000015 X)12 (000018-) 12-<u>8</u>42 ∑35<u>-</u> × × × 2.4 3.0 2.1 2.7 1.9 2.2 2.5 2.8 1.2 1.8 1.5 1.8 2.4 3.1 1.6 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 18 (56⁻ (00048⁻ (2000) (1000) (00000 15-12-12-635 630 30 ×25 -32 ≻20 24 15 16 10 0 0 2.9 2.1 2.7 3.3 2.0 Page 700 of 809 1.9 2.2 2.5 2.8 3.1 1.5 3.4 1.6





36 Perfluorooctadecanoic acid



FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: <u>320-24184-1</u>
SDG No.:	
Client Sample ID:	Lab Sample ID: MB 320-142967/1-A
Matrix: Water	Lab File ID: 28DEC2016C_003.d
Analysis Method: 537 (Modified)	Date Collected:
Extraction Method: 3535	Date Extracted: 12/19/2016 14:38
Sample wt/vol: 250(mL)	Date Analyzed: 12/29/2016 00:06
Con. Extract Vol.: 0.5(mL)	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: Acquity ID: 2.1(mm)
% Moisture:	GPC Cleanup:(Y/N) N
Analysis Batch No.: 144253	Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.0010	U	0.0025	0.0010	0.00046
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0020	U	0.0025	0.0020	0.00099
307-24-4	Perfluorohexanoic acid (PFHxA)	0.00147	J	0.0025	0.0020	0.00079
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.0020	0.00080
335-67-1	Perfluorooctanoic acid (PFOA)	0.00116	J	0.0025	0.0020	0.00075
375-95-1	Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.0020	0.00065
335-76-2	Perfluorodecanoic acid (PFDA)	0.0010	U	0.0025	0.0010	0.00044
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0020	Ū	0.0025	0.0020	0.00075
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0020	Ū	0.0025	0.0020	0.00058
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0020	Ū	0.0025	0.0020	0.00055
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0010	Ū	0.0025	0.0010	0.00040
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.0020	0.00092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.000944	J	0.0025	0.0020	0.00087
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0030	Ū	0.0040	0.0030	0.0012
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0020	Ū	0.0025	0.0020	0.00064

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-24184-1
SDG No.:	
Client Sample ID:	Lab Sample ID: MB 320-142967/1-A
Matrix: Water	Lab File ID: 28DEC2016C_003.d
Analysis Method: 537 (Modified)	Date Collected:
Extraction Method: 3535	Date Extracted: 12/19/2016 14:38
Sample wt/vol: 250(mL)	Date Analyzed: 12/29/2016 00:06
Con. Extract Vol.: 0.5(mL)	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: Acquity ID: 2.1(mm)
% Moisture:	GPC Cleanup:(Y/N) N
Analysis Batch No.: 144253	Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	64		25-150
STL00992	13C4 PFBA	131		25-150
STL01893	13C5-PFPeA	137		25-150
STL00993	13C2 PFHxA	131		25-150
STL01892	13C4-PFHpA	132		25-150
STL00990	13C4 PFOA	133		25-150
STL00995	13C5 PFNA	126		25-150
STL00996	13C2 PFDA	130		25-150
STL00997	13C2 PFUnA	127		25-150
STL00998	13C2 PFDoA	112		25-150
STL00994	1802 PFHxS	130		25-150
STL00991	13C4 PFOS	126		25-150

Report Date: 29-Dec-2016 17:33:15 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_003.d

Lims ID: MB 320-142967/1-A

Client ID:

Sample Type: MB

Inject. Date: 29-Dec-2016 00:06:57 ALS Bottle#: 1 Worklist Smp#: 3

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: mb 320-142967/1-a Misc. Info.: Plate: 1 Rack: 3

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 29-Dec-2016 17:32:20 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK027

First Level Reviewer: phomsophat Date: 29-Dec-2016 17:26:53

First Level Revie	wer: pho	msopha	t		Date:	2	9-Dec-2016 17:26:5	:53				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags		
D 2 13C4 PFBA												
217.00 > 172.00		1.534	-0.001		22721769	65.3		131	925685			
1 Perfluorobuty	yric acid											
212.90 > 169.00	1.533	1.534	-0.001	1.000	68891	0.1776			395			
D 413C5-PFPe	eΑ											
267.90 > 223.00	1.810	1.810	0.0		18203986	68.4		137	141924	5		
3 Perfluoropen												
262.90 > 219.00		1.810	0.0	1.000	129663	0.3609			1124			
D 6 13C2 PFHx		0.007	0.000		1/010100	.		404	055/70			
315.00 > 270.00		2.097	-0.002		16019429	65.4		131	855679			
7 Perfluorohex 313.00 > 269.00		2.097	0.002	1.000	218047	0.7328			5026			
9 Perfluorohex				1.000	210047	0.7320			3020			
399.00 > 80.00		2.422	0.018	1.000	207215	0.4721						
D 11 13C4-PFH _I		2. 122	0.010	1.000	207210	0.1721						
367.00 > 322.00		2.429	-0.004		14896126	65.8		132	901870			
D 10 1802 PFH	xS											
403.00 > 84.00		2.452	-0.012		20159010	61.7		130	182325	5		
48 Sodium 1H,	1H,2H,2	H-perflu	orooctan	е								
427.00 > 407.00	2.745	2.773	-0.028	1.000	4852	NR						
D 47 M2-6:2FTS	5											
429.00 > 409.00	2.754	2.781	-0.027		1527	0.0131		0.0				
D 14 13C4 PFO												
417.00 > 372.00	2.785	2.790	-0.005		15351124	66.6		133	1373543	3		
15 Perfluorooct												
413.00 > 369.00		2.790	-0.013	1.000	178217	0.5786	1 51(0 00 1 10)		1647			
413.00 > 169.00		2.190	-0.013	1.000	118363		1.51(0.90-1.10)		4542			
D 17 13C4 PFOS 503.00 > 80.00		3.158	-0.004		1 500 <i>4</i> 380	000 60 3		126	1809672)		
303.00 / 00.00	J. 1J4	3.130	-0.004		P45987880f	809 00.3		120	1007072	<u>-</u>		

Report Date: 29-Dec-2016 17:33:15 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File: \\ChromNa\Sacramento\ChromData\A8 N\20161229-38288 b\28DFC2016C 003 d

Data File:	\\Chr	omNa\Sa	acrament	to\Chrom	Data\A8_N\201	61229-38288	3.b\28DEC2016C_0	03.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFN		0.4.4			44040507	, 0. 1		10/	4/0445	
468.00 > 423.00 D 21 13C8 FOS		3.166	-0.020		11219527	63.1		126	468115	
506.00 > 78.00		3.481	-0.004		12344298	32.1		64.3	469588	
22 Perfluorooct										
498.00 > 78.00			-0.004		18875	0.0820			1393	
43 Sodium 1H, 527.00 > 507.00		•		e 1.000	328	NR				
D 23 13C2 PFD	A									
515.00 > 470.00			-0.012		10192833	64.8		130	457986	
24 Perfluorode 513.00 > 469.00			-0.020	1.000	4780	0.0248			192	
D 45 d3-NMeFO		3.323	-0.020	1.000	4700	0.0240			172	
573.00 > 419.00		3.683	-0.019		15222	0.2021		0.0		
26 Perfluorode				1 000	004	0.004040				
599.00 > 80.00 D 27 13C2 PFUi		3.834	-0.021	1.000	231	0.001260				
565.00 > 520.00		3.851	-0.012		7424245	63.3		127	379052	
28 Perfluoroun	decanoio	c acid								
563.00 > 519.00		3.851	-0.012	1.000	16579	0.1168			479	
D 46 d5-NEtFOS 589.00 > 419.00		3 855	-0.016		19849	0.2533		0.0		
49 N-ethyl perfl					17047	0.2333		0.0		
584.00 > 419.00		3.864		0.970	702	NR				
D 52 d-N-MeFO										
515.00 > 169.00		3.997	-0.486		851904	8.96		0.0		
D 30 13C2 PFD6 615.00 > 570.00		4.134	0.002		6231043	56.2		112	238714	
D 51 d-N-EtFOS										
531.00 > 169.00	4.213	4.180	0.033		342	0.003987		0.0		
D 32 13C2-PFT6		4 / 50	0.005		14045000	/2/		105	1014000	.
715.00 > 670.00 33 Perfluoroteti			-0.005		14245009	62.6		125	1014829)
712.50 > 668.90			-0.005	1.000	33805	0.1712			351	
713.00 > 169.00	4.637	4.652	-0.015	0.998	5978		5.65(0.00-0.00)		2064	
D 34 13C2-PFH:		E 0/0	0.000		4510422	EO 0		105	105075	
815.00 > 770.00 35 Perfluorohe:			-0.009		6519433	52.3		105	185875	
813.00 > 769.00		5.069	-0.009	1.000	83401	0.1013			163	
36 Perfluorooct	tadecand	oic acid								
913.00 > 869.00	5.415	5.421	-0.006	1.000	4279	0.0333			3.5	

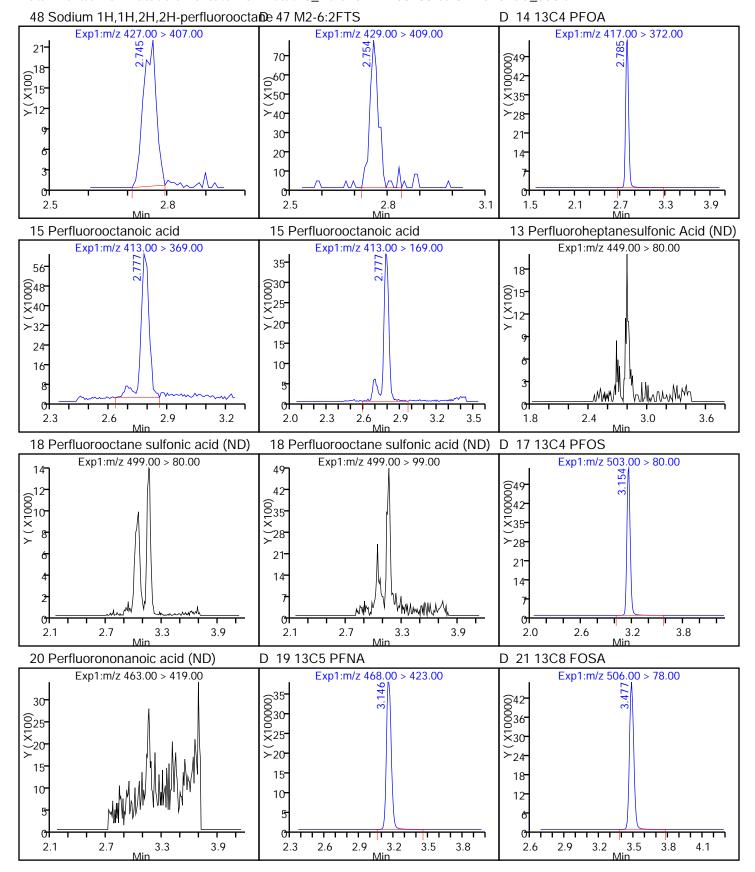
Chrom Revision: 2.2 05-Dec-2016 12:37:22

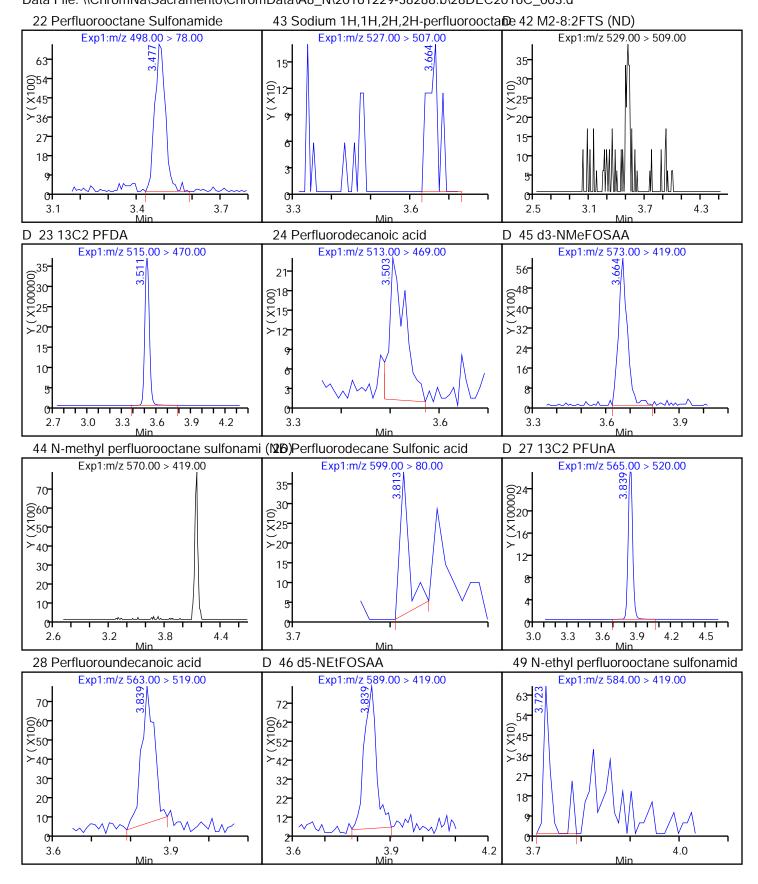
Report Date: 29-Dec-2016 17:33:15

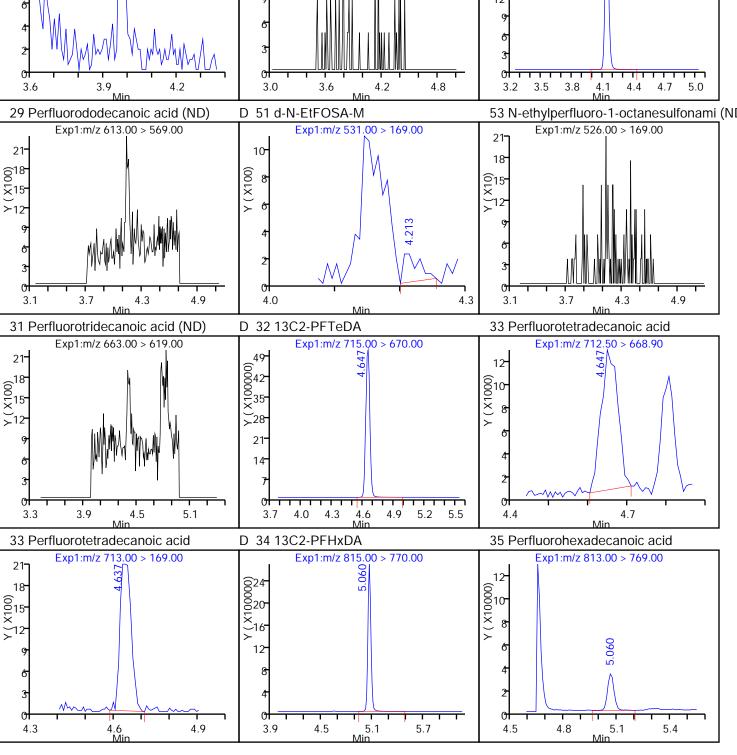
OC Flag Legend Processing Flags

NR - Missing Quant Standard

Report Date: 29-Dec-2016 17:33:15 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 29-Dec-2016 00:06:57 Instrument ID: A8_N Lims ID: MB 320-142967/1-A Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 1 Worklist Smp#: 3 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 (00000 X) (00000 X) 24 ∑₁₆--40 **-**36 30 27 20 18 10 1.9 1.3 1.9 1.0 1.3 1.6 1.4 1.7 0.7 2.5 5 Perfluorobutanesulfonic acid (ND) 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid (ND) Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00Exp1:m/z 298.90 > 99.00 14 52 30 @45**-**825**-**∑38 ×₂₀ **≻**31 15- 10 17 10 2.3 1.7 2.0 1.4 2.0 2.6 2.0 2.6 8.0 8.0 1.4 1.4 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 399.00 > 80.00 72 (0000048-1240-12 77 63 666 666 6 854 ×45 ×55- >32 ≻₄₄-≻₃₆-24 33 27 16 22 18 11 1.8 2.1 2.4 2.7 2.0 2.3 2.4 2.7 1.5 1.8 2.1 3.0 1.7 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid (ND) D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 72 18 049 0042 063 0054 <u>0</u>15 ×35 ×45 ≻28 36 21 27 18 0 0 1.9 2.5 3.1 1.4 2.0 Page 71/11nof 809 3.2 1.9 2.5 3.1 1.3 1.3

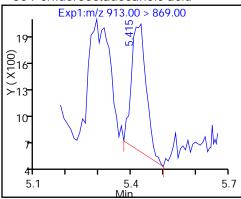






Page 714 of 809

36 Perfluorooctadecanoic acid



FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Te	stAmerica Sacramento	Job No	Job No.: 320-24184-1							
SDG No.:										
Client Sample	e ID:	Lab Sa	Lab Sample ID: MB 320-142967/1-A RA							
Matrix: Wate:	r	Lab File ID: 30DEC2016B_032.d								
Analysis Meth	hod: 537 (Modified)	 Date C	Date Collected:							
Extraction Me	ethod: 3535	Date E	Date Extracted: 12/19/2016 14:38							
Sample wt/vo	1: 250 (mL)	Date A	Date Analyzed: 12/30/2016 16:11							
Con. Extract	Vol.: 0.5 (mL)	 Diluti	Dilution Factor: 1							
Injection Vol	lume: 2(uL)	GC Col	GC Column: Acquity ID: 2.1 (mm)							
% Moisture:		GPC Cl	GPC Cleanup:(Y/N) N							
Analysis Bate	ch No.: 144510	Units:	ug/L							
CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL				
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0030	U	0.0040	0.0030	0.0013				
CAS NO.	ISOTOPE DI	LUTION		%REC	Q	LIMITS				
STL00991	13C4 PFOS			113		25-150				

Report Date: 03-Jan-2017 14:28:51 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_032.d

Lims ID: MB 320-142967/1-A

Client ID:

Sample Type: MB

Inject. Date: 30-Dec-2016 16:11:36 ALS Bottle#: 22 Worklist Smp#: 42

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: mb 320-142967/1-a Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 03-Jan-2017 14:28:47 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK026

First Level Reviewer: phomsophat Date: 03-Jan-2017 13:27:27

First Level Reviewer: phomsophat					Date:	0	3-Jan-2017 13:27:2	7				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags		
D 2 13C4 PFBA												
217.00 > 172.00		1.534	0.0		19948771	57.4		115	112987	6		
1 Perfluorobuty	yric acid											
212.90 > 169.00	•	1.534	0.0	1.000	76986	0.2260			273			
D 413C5-PFPe	A											
267.90 > 223.00	1.811	1.810	0.001		15664834	58.9		118	126568	2		
3 Perfluoropen	itanoic a	cid										
262.90 > 219.00	1.820	1.810	0.010	1.000	100082	0.3237			959			
D 613C2 PFHx	Α											
315.00 > 270.00	2.106	2.093	0.013		12684975	51.8		104	704879			
7 Perfluorohex												
313.00 > 269.00	2.106	2.093	0.013	1.000	165186	0.7010			3485			
D 11 13C4-PFH												
367.00 > 322.00		2.424	0.013		12441009	55.0		110	488472			
D 10 1802 PFH												
403.00 > 84.00		2.447	0.005		17145709	52.4		111	679373			
48 Sodium 1H,		•										
427.00 > 407.00		2.773	-0.014	1.000	2686	NR						
D 47 M2-6:2FTS												
429.00 > 409.00		2.781	-0.031		962	0.008223		0.0				
D 14 13C4 PFO		0.704			10700011	4		440	547/04			
417.00 > 372.00		2.791	0.007		12703011	55.1		110	517684			
15 Perfluorooct			0.045	4 000	450040	0.5007			4700			
413.00 > 369.00 413.00 > 169.00		2.791 2.791	0.015 0.007	1.000 0.997	150010 104355	0.5886	1.44(0.90-1.10)		1732 4136			
		2.791	0.007	0.997	104355		1.44(0.90-1.10)		4130			
D 17 13C4 PFOS 503.00 > 80.00		3.160	0.007		13397237	53.8		113	976866			
		3.100	0.007		1337/23/	ევ.გ		113	7/0000			
D 19 13C5 PFNA 468.00 > 423.00		3.160	0.007		50620474	000 542		108	163581	5		
400.00 > 423.00	3.107	3.100	0.007		Page87175 of 8	809 54.2		100	103301	J		

Report Date: 03-Jan-2017 14:28:51 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File:

Data File:	\\Chr	omina\Sa	acrament	io\Chrom	Data\A8_N\201	61230-38358	8.b\30DEC2016B_C)32.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
	3.499	3.491	0.008		10446875	27.2		54.4	446128	
22 Perfluorooct	tane Sulf	fonamide	е							
498.00 > 78.00	3.515	3.499	0.016	1.000	16139	0.0828			1012	
D 42 M2-8:2FTS	5									
529.00 > 509.00	3.524	3.519	0.005		1098	0.0102		0.0		
24 Perfluorode										
513.00 > 469.00		3.524	0.008	1.000	4824	0.0298			248	
D 23 13C2 PFD/										
515.00 > 470.00		3.524	0.008		8589040	54.6		109	270154	
D 45 d3-NMeFO		2 (02	0.005		45505	0.00/0		0.0		
573.00 > 419.00		3.683	0.005		15585	0.2069		0.0		
44 N-methyl pe			onami: -0.004	1 000	200	ND				
570.00 > 419.00				1.000	290	NR				
26 Perfluorodeo 599.00 > 80.00			0.007	1.000	682	0.004167				
D 27 13C2 PFU		3.030	0.007	1.000	002	0.004107				
565.00 > 520.00		3.853	0.007		6561505	56.0		112	314957	
28 Perfluoround			0.007		0001000	00.0		112	011707	
563.00 > 519.00			-0.001	1.000	17755	0.1415			406	
D 46 d5-NEtFOS										
589.00 > 419.00		3.855	-0.003		25005	0.3191		0.0		
D 52 d-N-MeFO	SA-M									
515.00 > 169.00		3.997	0.005		2820	0.0297		0.0		
D 30 13C2 PFD	οA									
615.00 > 570.00	4.148	4.144	0.004		5549360	50.0		100	210714	
D 51 d-N-EtFOS	A-M									
531.00 > 169.00	4.155	4.180	-0.025		1749	0.0204		0.0		
D 32 13C2-PFT	eDA									
715.00 > 670.00	4.663	4.648	0.015		12674070	55.7		111	683445	
33 Perfluoroteti		oic acid								
712.50 > 668.90		4.658	0.005	1.000	28048	0.1595			336	
713.00 > 169.00		4.658	-0.004	0.998	5491		5.11(0.00-0.00)		2423	
D 34 13C2-PFH:		F 070	0.000		5040740	47.7		05.4	470004	
815.00 > 770.00		5.072	-0.003		5940740	47.7		95.4	178094	
35 Perfluorohe			0.000	1 000	707/0	0.0074			105	
813.00 > 769.00		5.072	0.008	1.000	73762	0.0964			135	
36 Perfluorooct			0.014	1 000	2001	0.0252			2 F	
913.00 > 869.00	5.429	5.415	0.014	1.000	2881	0.0252			3.5	

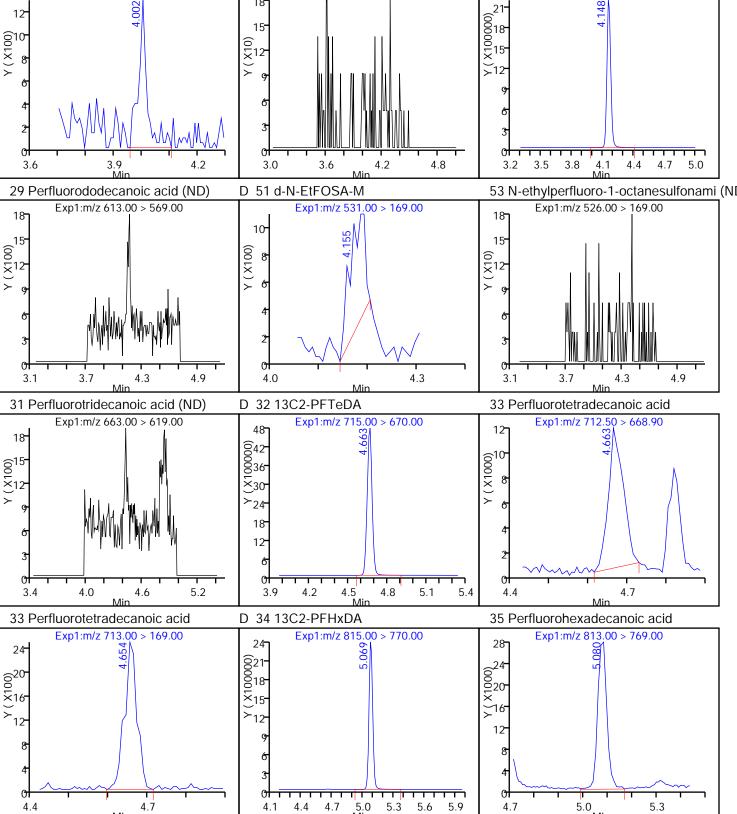
QC Flag Legend Processing Flags

NR - Missing Quant Standard

Report Date: 03-Jan-2017 14:28:51 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 30-Dec-2016 16:11:36 Instrument ID: A8_N Lims ID: MB 320-142967/1-A Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 22 Worklist Smp#: 42 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 (000054-1×45-21 ĕ48 >36 27 24 18 16 2.3 1.1 1.7 8.0 1.1 1.4 1.7 2.0 1.2 1.5 1.8 2.1 5 Perfluorobutanesulfonic acid (ND) 5 Perfluorobutanesulfonic acid (ND) 3 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 28 39 (12⁻ (00010⁻ (2) 8 6 6 3 3 7 ©24- ×20-∑16- 21 15 1.8 2.1 0.8 1.4 2.0 2.6 2.0 2.6 8.0 1.4 1.5 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid (ND) Exp1:m/z 399.00 > 80.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 49 56 63 <u>8</u>42 054- 0054- ×45- 048 048 ×40 ∑35<u>-</u> × × × -32 **≻**36 27 24 18 16 1.9 2.2 2.5 2.1 2.4 1.9 2.5 1.6 2.8 1.8 1.3 3.1 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid (ND) D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 18 (000001X) (056 000 48 (000 LX 12-×40 **≻**32 18 24 12 16 0 0 1.9 2.2 2.5 2.8 3.1 1.4 Page 71/9h 2.6 3.2 1.9 2.2 2.5 2.8 3.1 1.6 1.6

48 Sodium 1H,1H,2H,2H-perfluorooctabe 47 M2-6:2FTS Exp1:m/z 427.00 > 407.00 Exp1:m/z 429.00 > 409.00 Exp1:m/z 417.00 > 372.00 42 642 636 36 (012 X) X) X) ²30⋅ \approx 30 18 18 12 12 2.9 2.5 2.8 2.3 2.6 3.2 2.0 2.3 2.6 2.9 3.2 3.5 15 Perfluorooctanoic acid 15 Perfluorooctanoic acid 13 Perfluoroheptanesulfonic Acid (ND) Exp1:m/z 413.00 > 369.00 Exp1:m/z 413.00 > 169.00 Exp1:m/z 449.00 > 80.00 30 15- \sum_{20} 15- 21 10 2.9 3.2 3.0 3.3 3.0 2.6 2.1 2.4 1.8 2.4 3.6 18 Perfluorooctane sulfonic acid (ND) 18 Perfluorooctane sulfonic acid (ND) D 17 13C4 PFOS Exp1:m/z 499.00 > 80.00 Exp1:m/z 499.00 > 99.00 Exp1:m/z 503.00 > 80.00 49 14 0042 00035 42 0012 X 100 X <u>835</u>-⁻28 28 21 21 14 3.2 3.8 2.0 2.6 3.2 3.8 2.9 3.5 3.8 2.0 2.6 2.3 2.6 3.2 4.1 Min D 19 13C5 PFNA D 21 13C8 FOSA 20 Perfluorononanoic acid (ND) Exp1:m/z 468.00 > 423.00 Exp1:m/z 463.00 > 419.00 Exp1:m/z 506.00 > 78.00 3.167 21 (30 00 00 25 00001× × × 24 618 ×15 15 18 10 12 0 3.2 Min 2.0 2.6 3.8 4.4 2.1 2.7 3.3 3.9 2.5 3.1 3.7 4.3

22 Perfluorooctane Sulfonamide 43 Sodium 1H,1H,2H,2H-perfluoroocta De (12/10)/2-8:2FTS Exp1:m/z 498.00 > 78.00 Exp1:m/z 527.00 > 507.00 Exp1:m/z 529.00 > 509.00 56 18 48 935 ×35 ×28 ©15-×12-6 ×40 21 24 16 3.1 4.3 3.6 3.1 3.4 3.7 2.5 3.7 3.3 24 Perfluorodecanoic acid D 23 13C2 PFDA D 45 d3-NMeFOSAA Exp1:m/z 573.00 > 419.00 Exp1:m/z 513.00 > 469.00 Exp1:m/z 515.00 > 470.00 56- 21 630 00 00 025 9⁴⁸ ×40 618 ×15 **≻**32 15- 24 10 16 0 3.9 3.0 3.6 3.6 3.3 3.6 3.9 3.3 44 N-methyl perfluorooctane sulfonami 26 Perfluorodecane Sulfonic acid D 27 13C2 PFUnA Exp1:m/z 570.00 > 419.00 Exp1:m/z 599.00 > 80.00 Exp1:m/z 565.00 > 520.00 35 35- 30 30- 25- ©25 ^{∠20} ≻20 15 15 10 10 0 0 3.9 3.8 3.5 3.8 4.4 3.5 3.2 4.1 3.6 D 46 d5-NEtFOSAA 49 N-ethyl perfluorooctane sulfonamid (ND) 28 Perfluoroundecanoic acid Exp1:m/z 584.00 > 419.00 Exp1:m/z 563.00 > 519.00 Exp1:m/z 589.00 > 419.00 48 63 77 42 654 ×45 <u> 966</u> <u>⊝</u>36 Σ_{30} ×55-<u>></u>36 >₄₄-≻₂₄· 27 33 18 18 22 12 11 0 3.9 3.7 4.0 2.8 3.4 4.0 4.6 3.6 3.4 Min

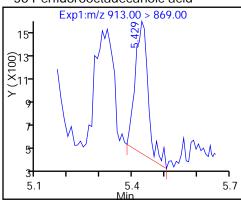


4.1

4.4

Min

36 Perfluorooctadecanoic acid



FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Te	stAmerica Sacramento	Job No	·.: <u>320-</u>	-24184-1					
SDG No.:									
Client Sample	e ID:	Lab Sa	mple II): MB 320-14	14971/1-A				
Matrix: Wate	r	Lab Fi	le ID:	05JAN2017B_	_005.d				
Analysis Met	hod: 537 (Modified)	Date C	ollecte	ed:					
Extraction M	ethod: 3535	Date E	Date Extracted: 01/04/2017 16:57						
Sample wt/vo	1: 250.00(mL)	Date A	nalyzed	d: 01/05/201	7 15:15				
Con. Extract	Vol.: 0.50 (mL)	 Diluti	Dilution Factor: 1						
Injection Vo	lume: 2(uL)	GC Col	umn: Ac	cquity	ID: 2	.1 (mm)			
% Moisture:		GPC Cl	GPC Cleanup:(Y/N) N						
Analysis Bat	ch No.: 145242	 Units:	ug/L						
CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL			
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0020	U	0.0025	0.0020	0.00079			
CAS NO.	ISOTOPE D	ILUTION		%REC	Q	LIMITS			
STL00993	13C2 PFHxA		<u> </u>	139		25-150			

Report Date: 06-Jan-2017 09:59:27 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170106-38534.b\05JAN2017B_005.d

Lims ID: MB 320-144971/1-A

Client ID:

Sample Type: MB

Inject. Date: 05-Jan-2017 15:15:45 ALS Bottle#: 16 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: mb 320-144971/1-a Misc. Info.: Plate: 1 Rack: 3

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20170106-38534.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jan-2017 09:59:23 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK021

First Level Reviewer: chandrasenas Date: 06-Jan-2017 09:42:31

First Level Reviewer: chandrasenas					Date:	0	6-Jan-2017 09:42:3	1		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA	4									
217.00 > 172.00		1.598	0.0		24791747	71.3		143	106765	3
1 Perfluorobut	yric acid									
212.90 > 169.00	1.630	1.606	0.024	1.000	97284	0.2298			455	
D 4 13C5-PFPe	eΑ									
267.90 > 223.00	1.887	1.887	0.0		8286031	31.1		62.3	34588	
3 Perfluoroper	ntanoic a	cid								
262.90 > 219.00	1.887	1.887	0.0	1.000	32329	0.1977			250	
D 613C2 PFHx	κA									
315.00 > 270.00	2.194	2.195	-0.001		17046370	69.5		139	859937	
7 Perfluorohex										
313.00 > 269.00	2.186	2.195	-0.009	1.000	19665	0.0621			475	
D 11 13C4-PFH	•									
367.00 > 322.00		2.536	-0.004		14978396	66.2		132	102134	2
D 10 1802 PFH										
403.00 > 84.00		2.552	-0.004		20298038	62.1		131	173716	1
D 47 M2-6:2FTS										
429.00 > 409.00		2.879	0.004		2739	0.0234		0.0		
48 Sodium 1H,		•			10000	ND				
427.00 > 407.00		2.879	0.004	1.000	10220	NR				
D 14 13C4 PFO		0.000	0.000		1//07007	70.0		111	007400	
417.00 > 372.00		2.902	-0.003		16637297	72.2		144	807488	
D 17 13C4 PFO		2 275	0.004		1/2/0170	/ F 0		120	0071/7	
503.00 > 80.00		3.275	-0.004		16369178	65.8		138	807167	
D 19 13C5 PFN		2 202	0.004		12540244	70.7		1 / 1	470220	
468.00 > 423.00		3.283	-0.004		12560266	70.7		141	479320	
D 21 13C8 FOS 506.00 > 78.00		2 600	-0.005		6913923	18.0		36.0	380507	
300.00 > 78.00	3.070	3.000	-0.005					30.0	300007	
					Page 725 of	009				

Data File:	\\Chr	omNa\S	acrament	to\Chrom	Data\A8_N\201	70106-3853	4.b\05JAN2017B_0	05.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
22 Perfluorooc	tane Sul	lfonamid	e							
498.00 > 78.00		3.600		1.000	6956	0.0539			522	
D 42 M2-8:2FTS	5									
529.00 > 509.00	3.611	3.626	-0.015		3215	0.0299		0.0		
43 Sodium 1H,		•								
527.00 > 507.00			-0.006	1.002	847	NR				
24 Perfluorode			0.005	1 000	0.400	0.0000			04.0	
513.00 > 469.00		3.642	-0.005	1.000	8692	0.0380			210	
D 23 13C2 PFD 515.00 > 470.00		3 642	-0.005		12127067	77.1		154	542620	
D 45 d3-NMeFC		3.042	-0.003		12127007	77.1		134	342020	
573.00 > 419.00		3.792	0.010		20104	0.2669		0.0		
44 N-methyl pe						0.2007		0.0		
570.00 > 419.00			-0.018	0.995	3622	NR				
26 Perfluorode	cane Su	ılfonic ac	id							
599.00 > 80.00	3.942	3.945	-0.003	1.000	3543	0.0177				
D 46 d5-NEtFO	SAA									
589.00 > 419.00	3.933	3.957	-0.024		20132	0.2570		0.0		
28 Perfluoroun										
563.00 > 519.00		3.963	0.005	1.000	32393	0.1846			874	
49 N-ethyl perf				1 011	0000	ND				
584.00 > 419.00		3.965	0.012	1.011	8892	NR				
D 27 13C2 PFU 565.00 > 520.00		2 072	-0.004		9175084	78.3		157	439515	
D 52 d-N-MeFO		3.912	-0.004		9173064	70.3		137	439313	
515.00 > 169.00		4.089	0.001		1768	0.0186		0.0		
54 MeFOSA	1.070	1.007	0.001		1700	0.0.00		0.0		
512.00 > 169.00	4.098	4.089	0.009	1.000	484	NR				
29 Perfluorodo	decanoi	c acid								
613.00 > 569.00			-0.008	1.000	5690	0.0383			139	
D 30 13C2 PFD	οA									
615.00 > 570.00	4.257	4.265	-0.008		8089794	72.9		146	183239	
53 N-ethylperfl	uoro-1-c	octanesu	lfonami							
526.00 > 169.00	4.274	4.275	-0.001	1.000	1037	NR				
D 51 d-N-EtFOS										
531.00 > 169.00	4.266	4.275	-0.009		4502	0.0525		0.0		
31 Perfluorotrio										
663.00 > 619.00		4.526	-0.007	1.000	2892	0.0197			6.5	
D 32 13C2-PFT		47/4	0.000		10//170/	00.1		1/1	1000/0	,
715.00 > 670.00		4.764	0.002		18661726	82.1		164	138868	б
33 Perfluorotet 712.50 > 668.90		4.772	-0.006	1.000	60728	0.2368			15.4	
713.00 > 169.00		4.772	-0.006	0.998	11541	0.2300	5.26(0.00-0.00)		2107	
35 Perfluorohe				2.,,0			3.23(3.33 3.33)		,	
813.00 > 769.00		5.178		1.000	111766	0.1239			118	
D 34 13C2-PFH			-	-					_	
815.00 > 770.00		5.188	-0.010		8232534	66.1		132	138326	
					Page 726 of 8	309				
					. 590 . 20 01 (

Report Date: 06-Jan-2017 09:59:27 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File:

_											
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags

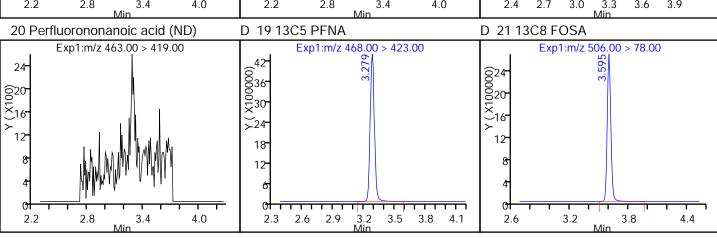
36 Perfluorooctadecanoic acid

913.00 > 869.00 5.529 5.536 -0.007 1.000 4158 0.0249 2.5

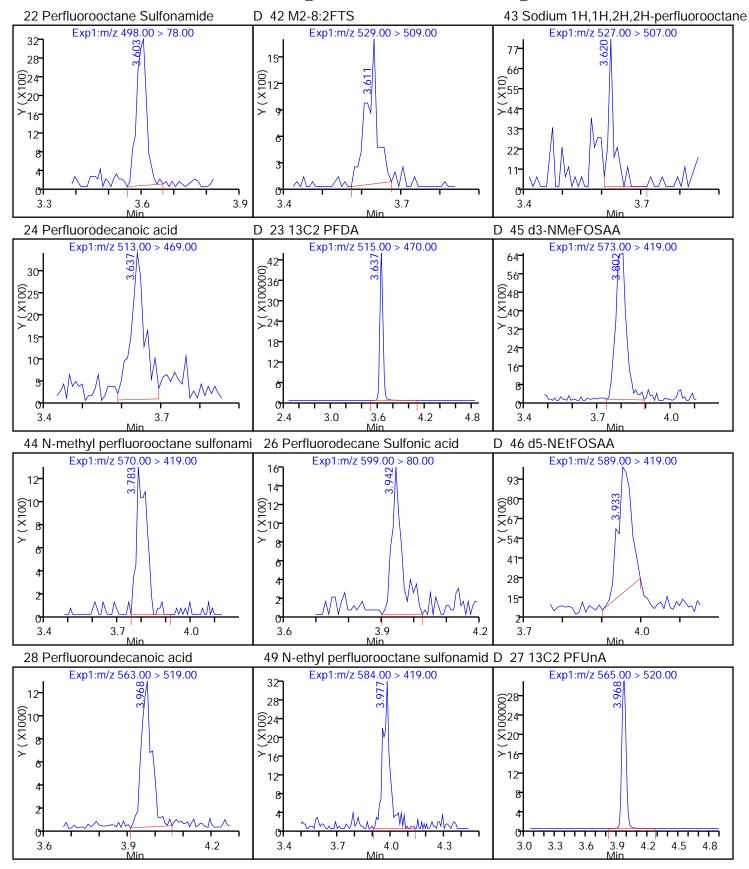
OC Flag Legend Processing Flags

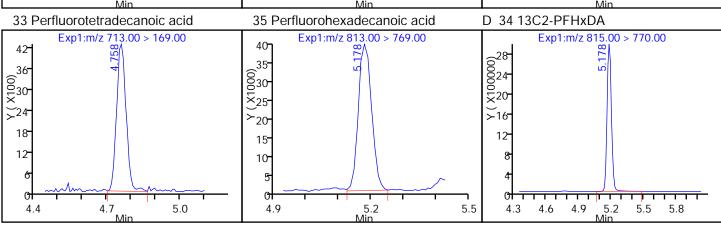
NR - Missing Quant Standard

Report Date: 06-Jan-2017 09:59:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 05-Jan-2017 15:15:45 Instrument ID: A8_N Lims ID: MB 320-144971/1-A Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 16 Worklist Smp#: 5 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 (00000 X) (00000 X) 28 ©24 ×20 _ ≻16- **≻**36 30 12 27 20 18 10 1.9 1.9 1.0 1.3 1.6 1.1 1.4 1.7 2.0 1.6 5 Perfluorobutanesulfonic acid (ND) 5 Perfluorobutanesulfonic acid (ND) 3 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 24 10 (00015 ×)13 ©20-×16-Y (X1000) 1.9 Min 1.5 2.7 2.2 0.9 2.1 0.9 2.1 2.7 1.5 1.6 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid (ND) Exp1:m/z 313.00 > 269.00Exp1:m/z 315.00 > 270.00 Exp1:m/z 399.00 > 80.00 28 (56⁻ (0000048⁻ (×40⁻ 72 624 00 20 × 62 52 52 .16 >32 >42 24 32 16 22 12 1.8 2.4 3.0 1.9 2.0 2.6 1.2 2.2 1.4 3.2 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid (ND) D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 12 (000042 (0000135 (X1000) 663 0054 ×45 **≻**36• 21 27 14 18 0 0 2.0 2.6 3.2 1.5 3.3 1.5 2.1 2.7 3.3 1.4 Min

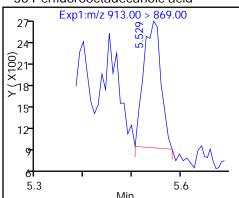


Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170106-38534.b\05JAN2017B_005.d





36 Perfluorooctadecanoic acid



FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-24184-1	
SDG No.:		
Client Sample ID:	Lab Sample ID: LCS 320-142967/2-A	
Matrix: Water	Lab File ID: 28DEC2016C_004.d	
Analysis Method: 537 (Modified)	Date Collected:	
Extraction Method: 3535	Date Extracted: 12/19/2016 14:38	
Sample wt/vol: 250(mL)	Date Analyzed: 12/29/2016 00:14	
Con. Extract Vol.: 0.5(mL)	Dilution Factor: 1	
Injection Volume: 2(uL)	GC Column: Acquity ID: 2.1(mm)	
% Moisture:	GPC Cleanup: (Y/N) N	
Analysis Batch No · 144253	IInits· na/I.	

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.0441		0.0025	0.0010	0.00046
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0422		0.0025	0.0020	0.00099
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0413		0.0025	0.0020	0.00079
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0418		0.0025	0.0020	0.00080
335-67-1	Perfluorooctanoic acid (PFOA)	0.0406		0.0025	0.0020	0.00075
375-95-1	Perfluorononanoic acid (PFNA)	0.0384		0.0025	0.0020	0.00065
335-76-2	Perfluorodecanoic acid (PFDA)	0.0399		0.0025	0.0010	0.00044
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0382		0.0025	0.0020	0.00075
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0386		0.0025	0.0020	0.00058
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0384		0.0025	0.0020	0.00055
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0478		0.0025	0.0010	0.00040
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0432		0.0025	0.0020	0.00092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0397		0.0025	0.0020	0.00087
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0385		0.0040	0.0030	0.0012
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0384		0.0025	0.0020	0.00064

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	JOD NO.: 32U-24184-1	
SDG No.:		
Client Sample ID:	Lab Sample ID: LCS 320-142	967/2-A
Matrix: Water	Lab File ID: 28DEC2016C_00	1.d
Analysis Method: 537 (Modified)	Date Collected:	
Extraction Method: 3535	Date Extracted: 12/19/201	5 14:38
Sample wt/vol: 250(mL)	Date Analyzed: 12/29/2016	00:14
Con. Extract Vol.: 0.5(mL)	Dilution Factor: 1	
Injection Volume: 2 (uL)	GC Column: Acquity	ID: 2.1 (mm)
% Moisture:	GPC Cleanup:(Y/N) N	
Analysis Batch No.: 144253	Units: ug/L	

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	62		25-150
STL00992	13C4 PFBA	131		25-150
STL01893	13C5-PFPeA	132		25-150
STL00993	13C2 PFHxA	126		25-150
STL01892	13C4-PFHpA	128		25-150
STL00990	13C4 PFOA	127		25-150
STL00995	13C5 PFNA	123		25-150
STL00996	13C2 PFDA	127		25-150
STL00997	13C2 PFUnA	119		25-150
STL00998	13C2 PFDoA	114		25-150
STL00994	1802 PFHxS	128		25-150
STL00991	13C4 PFOS	128		25-150

Report Date: 29-Dec-2016 17:32:59 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_004.d

Lims ID: LCS 320-142967/2-A

Client ID:

Sample Type: LCS

Inject. Date: 29-Dec-2016 00:14:27 ALS Bottle#: 2 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: lcs 320-142967/2-a Misc. Info.: Plate: 1 Rack: 3

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 29-Dec-2016 17:32:20 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK027

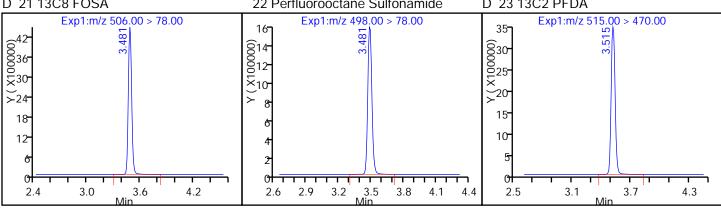
First Level Reviewer: phomsophat Date: 29-Dec-2016 17:32:58

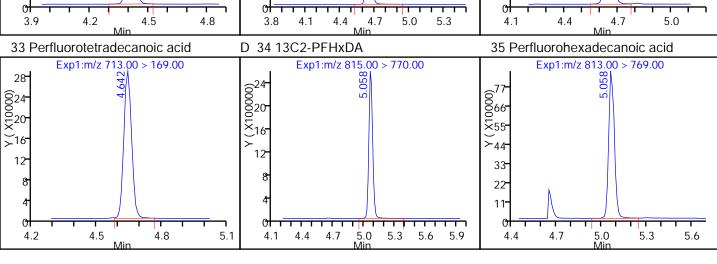
First Level Revie	wer: pho	omsopha	ıt		Date:	29-Dec-2016 17:32:58				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA	١									
217.00 > 172.00	1.533	1.534	-0.001		22745171	65.4		131	907829	
1 Perfluorobut	•		0.001	1 000	0555///	22.0		110	, 0505	
212.90 > 169.00 D 4 13C5-PFP6		1.534	-0.001	1.000	8555666	22.0		110	60595	
267.90 > 223.00		1.810	0.0		17512342	65.8		132	963502	
3 Perfluoroper		cid								
262.90 > 219.00		1.810	0.0	1.000	7290750	21.1		105	80268	
5 Perfluorobut										
298.90 > 80.00 298.90 > 99.00	1.848	1.849 1.849	-0.001 -0.001	1.000 1.000	12771474 5467672	21.6	2.34(0.00-0.00)	122		
D 6 13C2 PFHx		1.047	-0.001	1.000	3407072		2.34(0.00-0.00)			
315.00 > 270.00		2.097	0.001		15456996	63.1		126	807976	
7 Perfluorohex	canoic ac	cid								
313.00 > 269.00		2.097	0.001	1.000	5929814	20.7		103	124616	
9 Perfluorohex				1 000	0545040	10.0		100		
399.00 > 80.00		2.422	0.0	1.000	8545949	19.9		109		
D 11 13C4-PFH 367.00 > 322.00		2.429	0.0		14459227	63.9		128	885210	
12 Perfluorohe	ptanoic a	acid								
363.00 > 319.00	2.429	2.429	0.0	1.000	5914551	20.9		104	54434	
D 10 18O2 PFH										
403.00 > 84.00		2.452	-0.001		19756760	60.4		128	119070)
D 14 13C4 PFO 417.00 > 372.00		2.790	-0.001		14658582	63.6		127	636565	
15 Perfluorooc			-0.001		14030302	03.0		121	030303	
413.00 > 369.00		2.790	-0.001	1.000	5964939	20.3		101	77218	
413.00 > 169.00	2.789	2.790	-0.001	1.000	3669201		1.63(0.90-1.10)		186769	
					Page 735 of	309				

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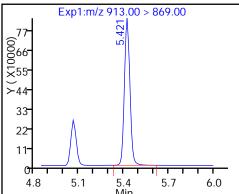
Data File:	\\Chr	omNa\S	acrament	to\Chrom	Data\A8_N\201	61229-3828	8.b\28DEC2016C_0)04.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorohe	ntanesul	lfonic Ac	id							
449.00 > 80.00	•			1.000	7509937	21.3		112		
18 Perfluorooct	tane sulf	onic aci	d							
499.00 > 80.00		3.134		1.000	8156406	25.7		138	88097	
499.00 > 99.00	3.126	3.134	-0.008	0.997	1805462		4.52(0.90-1.10)		35073	
D 17 13C4 PFO	S									
503.00 > 80.00	3.158	3.158	0.0		15283766	61.4		128	411196	
20 Perfluorono										
463.00 > 419.00	3.158	3.158	0.0	1.000	4000873	19.2		96.1	61812	
D 19 13C5 PFN										
468.00 > 423.00	3.158	3.166	-0.008		10934977	61.5		123	912296	
D 21 13C8 FOS										
506.00 > 78.00		3.481			11918495	31.0		62.1	557879	
22 Perfluorooct				1 000	4070000	100		0.4.4	005705	
498.00 > 78.00		3.481	0.0	1.000	4273200	19.2		96.1	225795	
D 23 13C2 PFD		2.522	0.000		0050/45	(2.2		107	0.47700	
515.00 > 470.00			-0.008		9953645	63.3		127	347732	
24 Perfluorode 513.00 > 469.00			0.000	1.000	274/4/0	10.0		00.7	11010/	
				1.000	3746468	19.9		99.7	112186	
26 Perfluorode 599.00 > 80.00			-0.009	1.000	3595209	19.3		99.9		
D 27 13C2 PFU		3.034	-0.009	1.000	3373207	17.3		77.7		
565.00 > 520.00		3.851	-0.009		6963884	59.4		119	347347	
28 Perfluoroun			-0.007		0703004	57.4		117	347347	
563.00 > 519.00		3.851	0.0	1.000	2541473	19.1		95.4	61115	
D 30 13C2 PFD		0.001	0.0	1.000	2011170			70.1	01110	
615.00 > 570.00		4.134	-0.001		6345418	57.2		114	229094	
29 Perfluorodo			0.00.		00.00	07.2				
613.00 > 569.00			-0.008	1.000	2247085	19.3		96.4	62721	
31 Perfluorotrio										
663.00 > 619.00		4.404	0.0	1.000	2212049	19.2		96.1	48978	
D 32 13C2-PFT	eDA									
715.00 > 670.00		4.652	-0.010		14637408	64.4		129	847727	
33 Perfluoroteti	radecan	oic acid								
712.50 > 668.90		4.652	0.0	1.000	4810498	23.9		120	62833	
713.00 > 169.00	4.642	4.652	-0.010	0.998	728141		6.61(0.00-0.00)		95577	
D 34 13C2-PFH	xDA									
815.00 > 770.00	5.058	5.069	-0.011		6676700	53.6		107	161695	
35 Perfluorohe:	xadecan	oic acid								
813.00 > 769.00	5.058	5.069	-0.011	1.000	2269575	18.1		90.7	3449	
36 Perfluorooct	tadecand	oic acid								
913.00 > 869.00	5.421	5.421	0.0	1.000	2160389	16.5		82.6	2214	

Report Date: 29-Dec-2016 17:32:59 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 29-Dec-2016 00:14:27 Instrument ID: A8_N Lims ID: LCS 320-142967/2-A Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 2 Worklist Smp#: 4 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Limit Group: LC PFC_DOD ICAL Method: $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 72 <u>663</u> Š54**-** \succeq_{45} ≻₃₆ **≻**16 **≻**36' 12 27 27 18 18 1.2 1.5 1.8 0.4 1.0 1.6 2.2 1.2 1.5 1.8 2.1 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.0056 28 24 (000020 ×16 (00001 20-20-0049- ×35 ∑16⁻ ≻₂₈-21 14 2.0 2.3 1.8 2.1 1.8 2.1 1.4 1.7 1.5 1.5 1.1 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 399.00 > 80.00 28 56 (21-000018-15-0024- (G₄₈-00 × × × 32 16 2.0 2.3 1.8 1.9 2.2 1.4 1.7 2.6 1.5 2.1 2.4 2.7 2.5 2.8 3.1 1.6 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 72 21- 000018-15-649 000 42 663 654 **×**35 \times_{45} -12 **≻28**-≻36• 21 27 18 0 1.8 2.1 2.4 2.7 1.9 2.8 1.9 2.5 1.5 3.0 1.3 3.1 Page 787 of 809





36 Perfluorooctadecanoic acid



FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Te	stAmerica Sacramento	Job No	Job No.: <u>320-24184-1</u>							
SDG No.:										
Client Sample	e ID:	Lab Sa	mple ID	: LCS 320-1	42967/2-	A RA				
Matrix: Wate	r	Lab Fi	le ID:	30DEC2016B_	_033.d					
Analysis Met	hod: 537 (Modified)	Date C	ollecte	d:						
Extraction M	ethod: 3535	Date E	Date Extracted: 12/19/2016 14:38							
Sample wt/vo	1: 250(mL)	Date A	nalyzed	12/30/201	6 16:19					
Con. Extract	Vol.: 0.5(mL)	Diluti	Dilution Factor: 1							
Injection Vo	lume: 2(uL)	GC Col	umn: Ac	quity	ID: 2	.1 (mm)				
% Moisture:		GPC Cl	eanup:(Y/N) N						
Analysis Bat	ch No.: 144510	Units:	ug/L							
CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL				
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0511		0.0040	0.0030	0.0013				
CAS NO.	ISOTOPE DI	LUTION		%REC	Q	LIMITS				
STL00991	13C4 PFOS	·		126		25-150				

Report Date: 03-Jan-2017 14:28:53 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_033.d

Lims ID: LCS 320-142967/2-A

Client ID:

Sample Type: LCS

Inject. Date: 30-Dec-2016 16:19:09 ALS Bottle#: 23 Worklist Smp#: 43

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: lcs 320-142967/2-a Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 03-Jan-2017 14:28:47 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK026

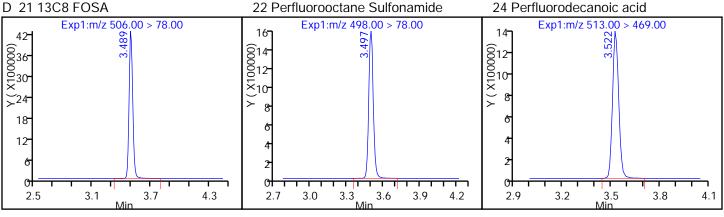
First Level Reviewer: phomsophat Date: 03-Jan-2017 14:19:46

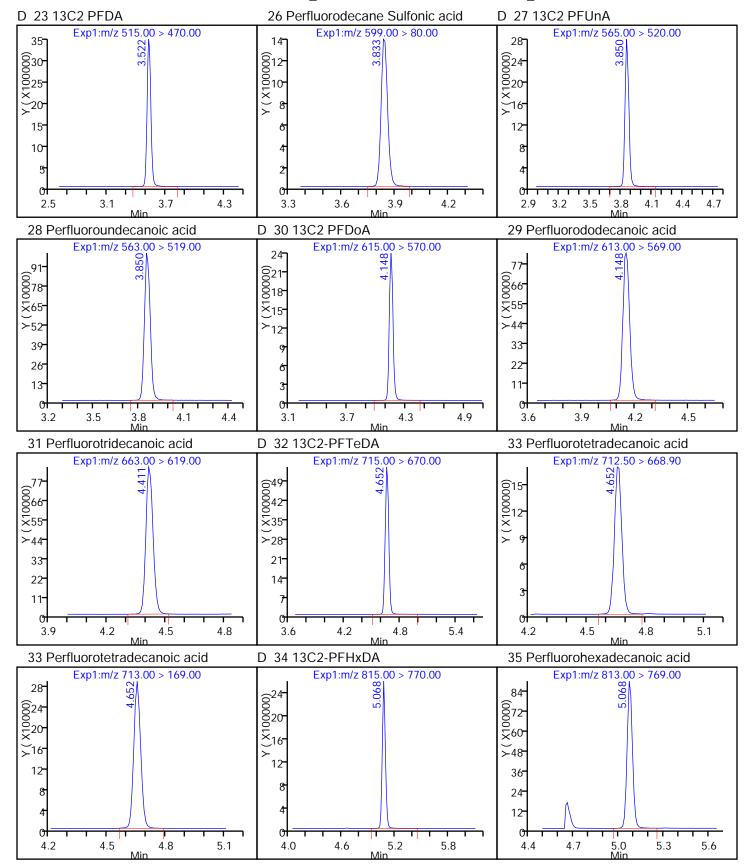
First Level Revie	wer: pho	omsopha	t		Date:	: 03-Jan-2017 14:19:46				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA	١									
217.00 > 172.00		1.534	-0.006		21990959	63.2		126	973508	
1 Perfluorobut 212.90 > 169.00	•	1.534	0.002	1.000	8240189	21.9		110	40088	
D 4 13C5-PFPe										
267.90 > 223.00		1.810	0.003		17147382	64.4		129	1080293	3
3 Perfluoroper 262.90 > 219.00		cid 1.810	0.003	1.000	7164736	21.2		106	92618	
5 Perfluorobut										
298.90 > 80.00	1.851	1.849	0.002	1.000	11666172	20.5	2 20/2 00 0 00)	116		
298.90 > 99.00 D 6 13C2 PFHx		1.849	-0.008	0.995	5081397		2.30(0.00-0.00)			
315.00 > 270.00		2.093	0.007		14303512	58.4		117	491614	
7 Perfluorohex										
313.00 > 269.00		2.093	0.007	1.000	5364684	20.2		101	110148	
9 Perfluorohex 399.00 > 80.00		2.362	0.054	1.000	8338277	20.2		111		
D 11 13C4-PFH										
367.00 > 322.00		2.424	0.005		13796559	61.0		122	704065	
12 Perfluorohe 363.00 > 319.00	•	acid 2.432	-0.003	1.000	5529405	20.5		102	42528	
D 10 1802 PFH		2.102	0.000	1.000	0027100	20.0		102	12020	
403.00 > 84.00		2.447	-0.004		18956697	58.0		123	162874	4
D 14 13C4 PFO 417.00 > 372.00		2.791	-0.010		13574629	58.9		118	585037	
15 Perfluorooc			-0.010		13374029	30.9		110	363037	
413.00 > 369.00		2.791	-0.002	1.000	5557698	20.4		102	80738	
413.00 > 169.00	2.789	2.791	-0.002	1.000	3473579		1.60(0.90-1.10)		112124	
					Page 742 of 8	809				

Report Date: 03-Jan-2017 14:28:53 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File: \ChromNa\Sacramento\ChromData\A8 N\20161230-38358.b\30DFC2016B 033.d

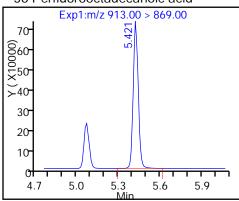
Data File:	\\Chr	omNa\Sa	acrament	to\Chrom	Data\A8_N\201	61230-3835	8.b\30DEC2016B_0)33.d		
		EXP	DLT	REL		Amount				
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.797	2.799	-0.002	1.000	7097453	20.5		108		
18 Perfluorooc										
499.00 > 80.00	3.055	3.058	-0.003	1.000	7981662	25.5	4 52/0 00 1 10)	138	70927 86795	
499.00 > 99.00 D. 17.13C4 DEC		3.058	0.107	1.036	1763327		4.53(0.90-1.10)		80/93	
D 17 13C4 PFO 503.00 > 80.00		3.160	0.005		15022345	60.4		126	435048	
D 19 13C5 PFN		0.100	0.000		10022010	00.1		120	100010	
468.00 > 423.00		3.160	0.005		10289260	57.9		116	593967	
20 Perfluorono	nanoic a	cid								
463.00 > 419.00	3.165	3.167	-0.002	1.000	3860899	19.7		98.6	68965	
D 21 13C8 FOS										
506.00 > 78.00		3.491			11186702	29.1		58.2	532677	
22 Perfluorooc				1 000	10/0010	40.5		07.0	004050	
498.00 > 78.00			-0.002	1.000	4060018	19.5		97.3	221852	
24 Perfluorode 513.00 > 469.00		3.524	-0.002	1.000	3610274	20.1		100	122598	
D 23 13C2 PFD		3.324	-0.002	1.000	3010274	20.1		100	122370	
515.00 > 470.00		3.524	-0.002		9525414	60.6		121	494928	
26 Perfluorode										
599.00 > 80.00	3.833	3.836	-0.003	1.000	3499950	19.1		98.9		
D 27 13C2 PFU	nA									
565.00 > 520.00	3.850	3.853	-0.003		7162965	61.1		122	386832	
28 Perfluoroun										
563.00 > 519.00		3.853	-0.003	1.000	2694267	19.7		98.3	82597	
D 30 13C2 PFD 615.00 > 570.00		4.144	0.004		6318440	56.9		114	337271	
29 Perfluorodo			0.004		0310440	30.9		114	33/2/1	
613.00 > 569.00			0.004	1.000	2254931	19.4		97.2	69019	
31 Perfluorotrio			0.001	1.000	2201701	. , , ,		,,,_	0,0.,	
663.00 > 619.00			-0.005	1.000	2184499	19.1		95.3	49483	
D 32 13C2-PFT	eDA									
715.00 > 670.00	4.652	4.648	0.004		14493754	63.7		127	133962	0
33 Perfluorotet		oic acid								
712.50 > 668.90		4.658		1.000	4574658	22.8	(00(0 00 0 00)	114	65058	
713.00 > 169.00		4.658	-0.006	1.000	717193		6.38(0.00-0.00)		143757	
D 34 13C2-PFH 815.00 > 770.00		5.072	-0.004		6351590	51.0		102	198415	
			-0.004		0301070	51.0		102	170413	
35 Perfluorohe 813.00 > 769.00			-0.004	1.000	2249702	18.0		90.2	3843	
36 Perfluorooc					, , , ,	. 0.0			0	
913.00 > 869.00		5.415	0.006	1.000	1858495	14.3		71.4	2216	

Report Date: 03-Jan-2017 14:28:53 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 30-Dec-2016 16:19:09 Instrument ID: A8_N Lims ID: LCS 320-142967/2-A Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 23 Worklist Smp#: 43 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 28 63⁻ 00054⁻ 00024 20 20 <u>6</u>56 Š48 ∑45 ∑16- >36 32 12 27 24 18 16 1.9 1.5 1.8 0.7 1.0 1.3 1.6 1.2 1.5 1.8 2.1 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00Exp1:m/z 298.90 > 99.00 49 28-000024-1×20-21- 0042 0005 0035 ∠28-21 2.0 2.3 1.5 1.8 2.1 1.8 2.1 1.4 1.7 1.5 1.1 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 399.00 > 80.00 (0000015 X)12 (24⁻ 00020 049 0042 0042 ×35 <u>≻</u>16• ≻28 21 1.8 2.1 2.4 2.7 1.8 1.8 2.1 2.4 1.5 1.5 2.1 2.4 2.7 3.0 1.5 12 Perfluoroheptanoic acid D 11 13C4-PFHpA D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 21 63-00054-145-(018 15 X (0042 0000135 ×)28 _36 21 27 14 18 0 0 2.0 2.6 3.2 1.9 Page 7444 of 809 2.8 2.0 3.2 1.4 1.4 2.6





36 Perfluorooctadecanoic acid



FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Te	stAmerica Sacramento	Job No	Job No.: 320-24184-1							
SDG No.:										
Client Sample	e ID:	Lab Sa	Lab Sample ID: LCS 320-144971/2-A							
Matrix: Wate:	r	Lab Fi	Lab File ID: 05JAN2017B_006.d							
Analysis Metl	hod: 537 (Modified)	Date C	Date Collected:							
Extraction Me	ethod: 3535	Date E	Date Extracted: 01/04/2017 16:57							
Sample wt/vo	1: 250.00(mL)	Date A	Date Analyzed: 01/05/2017 15:23							
Con. Extract	Vol.: 0.50 (mL)	Diluti	Dilution Factor: 1							
Injection Vol	lume: 2(uL)	GC Col	GC Column: Acquity ID: 2.1(mm)							
% Moisture:		GPC Cl	GPC Cleanup: (Y/N) N							
Analysis Bate	ch No.: 145242	Units:	Units: ug/L							
						_				
CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL				
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0402		0.0025	0.0020	0.00079				
CAS NO.	ISOTOPE D	ILUTION		%REC	Q	LIMITS				
STL00993	13C2 PFHxA		·	109 25-150						

Report Date: 06-Jan-2017 09:59:29 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170106-38534.b\05JAN2017B_006.d

Lims ID: LCS 320-144971/2-A

Client ID:

Sample Type: LCS

Inject. Date: 05-Jan-2017 15:23:14 ALS Bottle#: 17 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: lcs 320-144971/2-a Misc. Info.: Plate: 1 Rack: 3

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20170106-38534.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jan-2017 09:59:23 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK021

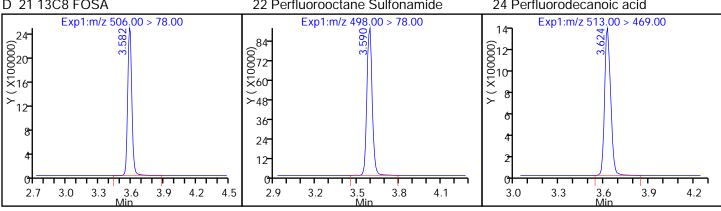
First Level Reviewer: chandrasenas Date: 06-Jan-2017 09:52:08

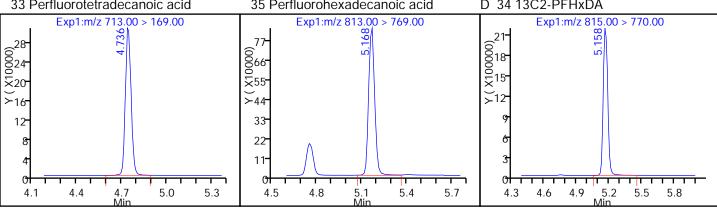
First Level Reviewer: chandrasenas					Date:	: 06-Jan-2017 09:52:08				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.590	1.598	-0.008		20068008	57.7		115	102839	5
1 Perfluorobuty	•		0.017	1 000	75 400 40	22.0		110	E4004	
212.90 > 169.00 D 4 13C5-PFPe		1.606	-0.016	1.000	7549948	22.0		110	51034	
267.90 > 223.00		1.887	-0.010		15582645	58.6		117	116083	3
3 Perfluoropen	itanoic a	cid								
262.90 > 219.00	1.877	1.887	-0.010	1.000	6319213	20.5		103	53764	
5 Perfluorobuta			0.010	1 000	10721240	21.0		104		
298.90 > 80.00 298.90 > 99.00		1.935 1.935	-0.019 -0.019	1.000 1.000	10731240 4458963	21.9	2.41(0.00-0.00)	124		
D 613C2 PFHx							(3 2 2 2 2 2 7			
315.00 > 270.00	2.181	2.195	-0.014		13360123	54.5		109	714824	
7 Perfluorohex			0.044	1 000	4000700	00.4		101	151007	
313.00 > 269.00			-0.014	1.000	4993729	20.1		101	154887	
9 Perfluorohex 399.00 > 80.00			-0.011	1.000	6919944	19.5		107		
D 11 13C4-PFH										
367.00 > 322.00	2.520	2.536	-0.016		11837395	52.3		105	709715	
12 Perfluorohe			0.000	4 000	4004.450	04.4		407	(0(47	
363.00 > 319.00 D 10 1802 PFH)		2.536	-0.009	1.000	4891459	21.1		106	63647	
403.00 > 84.00		2.552	-0.010		16326675	49.9		106	116199	0
15 Perfluorooct										
413.00 > 369.00		2.902		1.000	5140748	20.5		102	65742	
413.00 > 169.00		2.902	-0.008	1.000	3051290		1.68(0.90-1.10)		157538	
D 14 13C4 PFO/ 417.00 > 372.00		2.902	-0.008		12522789	54.4		109	847003	
1.7.00 > 072.00	2.071	2.702	3.000		Page 749 of 8			107	017000	

Page 749 of 809

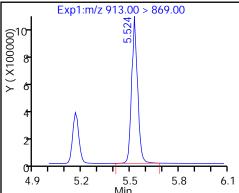
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170106-38534.b\05JAN2017B_006.d									
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorohe	13 Perfluoroheptanesulfonic Acid									
449.00 > 80.00			-0.016	1.000	6064601	20.2		106		
18 Perfluorooc										
	3.243	3.259		1.000	5544383	20.5		110	128951	
499.00 > 99.00	3.260	3.259	0.001	1.005	1220881		4.54(0.90-1.10)		76638	
D 17 13C4 PFO	S									
503.00 > 80.00	3.260	3.275	-0.015		13009941	52.3		109	313704	
20 Perfluorono		cid								
463.00 > 419.00	3.268	3.275	-0.007	1.000	3757453	19.9		99.7	77605	
D 19 13C5 PFN										
468.00 > 423.00		3.283	-0.015		9903644	55.7		111	372146	
D 21 13C8 FOS		0.400	0.010		(705/00	47.5		05.0	07/470	
506.00 > 78.00			-0.018		6725638	17.5		35.0	276172	
22 Perfluorooc 498.00 > 78.00				1 000	2472421	19.7		98.6	102402	
			-0.010	1.000	2473421	19.7		98.0	183692	
24 Perfluorode 513.00 > 469.00			-0.018	1.000	3699603	20.2		101	100390	
D 23 13C2 PFD		3.042	-0.010	1.000	3077003	20.2		101	100370	
515.00 > 470.00		3 642	-0.018		9694873	61.6		123	267148	
26 Perfluorode					7071070	01.0		120	207110	
599.00 > 80.00			-0.014	1.000	3418802	21.5		112		
28 Perfluoroun										
563.00 > 519.00			-0.015	1.000	2879436	20.0		99.8	82423	
D 27 13C2 PFU	nA									
565.00 > 520.00		3.972	-0.024		7543368	64.3		129	441329	
29 Perfluorodo	decanoio	c acid								
613.00 > 569.00	4.249	4.265	-0.016	1.000	2297087	19.3		96.5	50860	
D 30 13C2 PFD	οΑ									
615.00 > 570.00	4.241	4.265	-0.024		6484451	58.4		117	158514	
31 Perfluorotrio	decanoic	acid								
663.00 > 619.00	4.508	4.526	-0.018	1.000	2440395	20.7		104	6080	
D 32 13C2-PFT	eDA									
715.00 > 670.00	4.744	4.764	-0.020		14466941	63.6		127	937907	
33 Perfluorotet										
712.50 > 668.90			-0.019	1.000	5431334	26.4	((7(0,00,000)	132	1814	
713.00 > 169.00			-0.036	0.997	814510		6.67(0.00-0.00)		100594	
35 Perfluorohe				1 000	2272217	10 /		00.0	2050	
813.00 > 769.00		ე. I / გ	-0.010	1.000	2372317	18.6		92.8	3050	
D 34 13C2-PFH 815.00 > 770.00		E 100	0.020		6/1071/	<u> </u>		102	115100	
			-0.030		6410714	51.5		103	115180	
36 Perfluorooc 913.00 > 869.00			-0.012	1.000	2552878	19.1		95.5	1935	
713.00 > 007.00	J.JZ4	5.550	-0.012	1.000	2552070	17.1		70.0	1733	

Report Date: 06-Jan-2017 09:59:29 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 05-Jan-2017 15:23:14 Instrument ID: A8_N Lims ID: LCS 320-144971/2-A Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 17 Worklist Smp#: 6 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 24 ©56 00 48 (00020 ×16 (00048 0048 140 140 ×40 **≻**32 <u></u>32⁺ 24 24 16 16 1.9 1.0 1.6 0.5 1.1 1.7 2.3 0.9 1.5 2.1 2.7 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.0042 (0000015⁻ (21000001) 24 (000001 X16 00036-30-<u></u> 24 18 12 2.2 1.9 2.2 1.9 1.9 2.2 1.3 1.6 1.6 1.6 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 399.00 > 80.00 217 8 8 00018-000015-× 12-@₄₂ ×35 ×28 21 1.9 2.2 2.5 2.8 2.1 1.9 2.2 2.5 1.6 1.5 1.8 2.4 2.7 2.8 3.1 1.6 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 18 56⁻ (00048⁻ (100001) (10001) (000001X) × 24 (00000 15-12-(X) _32 18 24 12 16 0 0 2.1 2.7 3.3 2.0 Page 75/1n of 809 2.9 1.5 2.1 2.7 3.3 1.5 Min





36 Perfluorooctadecanoic acid



FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Te	stAmerica Sacramento	Job No	Job No.: <u>320-24184-1</u>					
SDG No.:								
Client Sample	e ID:	Lab Sa	mple ID): LCSD 320-	-144971/3	-A		
Matrix: Wate:	r	Lab Fi	le ID:	05JAN2017B	_007.d			
Analysis Metl	hod: 537 (Modified)	Date C	ollecte	ed:				
Extraction Me	ethod: 3535	Date E	xtracte	ed: 01/04/2	2017 16:	57		
Sample wt/vo	Date A	nalyzed	d: 01/05/201	L7 15:30				
Con. Extract	Diluti	Dilution Factor: 1						
Injection Vo	lume: 2(uL)	GC Col	GC Column: Acquity ID: 2.1(mm)					
% Moisture:		GPC Cl	GPC Cleanup: (Y/N) N					
Analysis Bate	ch No.: 145242	Units:	Units: ug/L					
CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL		
307-24-4 Perfluorohexanoic acid (PFHxA)		0.0424		0.0025	0.0020	0.00079		
CAS NO.	ILUTION		%REC	Q	LIMITS			
STL00993	L00993 13C2 PFHxA			117		25-150		

Report Date: 06-Jan-2017 09:59:30 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170106-38534.b\05JAN2017B_007.d

Lims ID: LCSD 320-144971/3-A

Client ID:

Sample Type: LCSD

Inject. Date: 05-Jan-2017 15:30:45 ALS Bottle#: 18 Worklist Smp#: 7

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: lcsd 320-144971/3-a Misc. Info.: Plate: 1 Rack: 3

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20170106-38534.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jan-2017 09:59:23 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK021

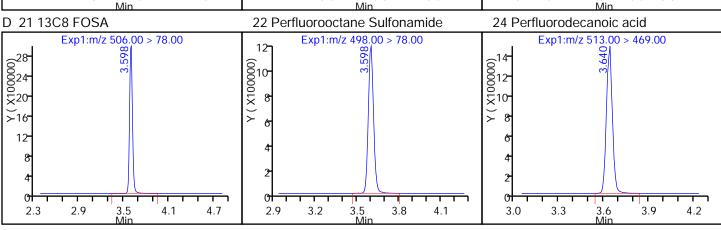
First Level Reviewer: chandrasenas Date: 06-Jan-2017 09:54:33

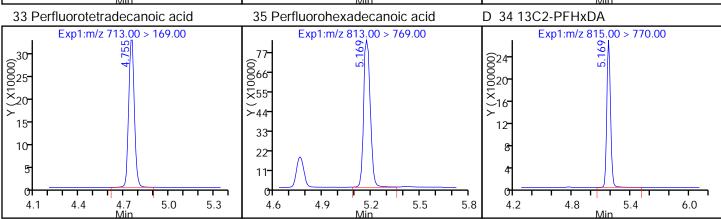
First Level Reviewer: chandrasenas			Date:	0	6-Jan-2017 09:54:3	3				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00		1.598	0.0		21131365	60.8		122	106379	7
1 Perfluorobut	vric acid									
212.90 > 169.00	•	1.606	-0.008	1.000	8432768	23.4		117	56811	
D 4 13C5-PFPe	eA.									
267.90 > 223.00	1.887	1.887	0.0		16600736	62.4		125	100655	2
3 Perfluoroper	ntanoic a	cid								
262.90 > 219.00	1.887	1.887	0.0	1.000	7128523	21.8		109	72150	
5 Perfluorobut	anesulfo	nic acid								
298.90 > 80.00		1.935	-0.009	1.000	11942908	22.9		129		
298.90 > 99.00		1.935	-0.009	1.000	4969882		2.40(0.00-0.00)			
D 6 13C2 PFHx										
315.00 > 270.00		2.195	0.0		14324383	58.4		117	872638	
7 Perfluorohex				4 000	E (0 (1 0 1	04.0		407	150710	
313.00 > 269.00			-0.009	1.000	5636101	21.2		106	159740	
9 Perfluorohex				1 000	7/52050	20.2		111		
399.00 > 80.00		2.476	-0.003	1.000	7653959	20.2		111		
D 11 13C4-PFH 367.00 > 322.00		2.536	0.0		10744114	F4 2		110	014744	
			0.0		12744114	56.3		113	916764	
12 Perfluorohe 363.00 > 319.00	-	2.536	0.0	1.000	5455891	21.9		109	65012	
		2.536	0.0	1.000	3433891	21.9		109	00012	
D 10 1802 PFH 403.00 > 84.00		2 552	-0.001		17425681	53.3		113	158046	0
			-0.001		17423061	55.5		113	130040	Б
15 Perfluorooci 413.00 > 369.00		2.902	0.0	1.000	5729059	21.4		107	58752	
413.00 > 367.00		2.902	-0.008	0.997	3317387	21.4	1.73(0.90-1.10)	107	127768	
D 14 13C4 PFO			2.300	J.,,,			(6.76 1116)		,00	
417.00 > 372.00		2.902	0.0		13317083	57.8		116	878647	
					Dogo 756 of G					

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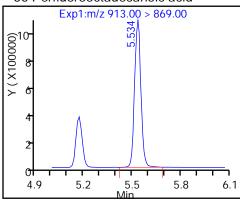
Data File:	\\Chr	omNa\S	acrament	o\Chrom	Data\A8_N\201	70106-3853	4.b\05JAN2017B_0	07.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorohe	ntanesul	Ifonic Ac	rid							
449.00 > 80.00	•	2.910		1.000	6819933	21.3		112		
18 Perfluorooc	tane sulf	onic aci	d							
	3.251	3.259	-0.008	1.000	5996003	20.8		112	130274	
499.00 > 99.00	3.275	3.259	0.016	1.007	1301463		4.61(0.90-1.10)		81845	
D 17 13C4 PFO	S									
503.00 > 80.00	3.275	3.275	0.0		13881164	55.8		117	472820	
20 Perfluorono										
463.00 > 419.00		3.275	0.0	1.000	4113690	20.2		101	70620	
D 19 13C5 PFN		0.000	0.000		40/70070	10.1		100	504075	
468.00 > 423.00		3.283	-0.008		10673078	60.1		120	504265	
D 21 13C8 FOS		2 400	0.002		7040426	20.7		41.2	114071	
506.00 > 78.00			-0.002		7940426	20.7		41.3	416871	
22 Perfluorooc 498.00 > 78.00			e -0.002	1.000	3001234	20.3		101	113290	
24 Perfluorode			-0.002	1.000	3001234	20.5		101	113270	
513.00 > 469.00			-0.002	1.000	3943571	20.9		104	108271	
D 23 13C2 PFD		0.012	0.002	1.000	0710071	20.7		101	100271	
515.00 > 470.00		3.642	-0.010		10000886	63.6		127	224538	
26 Perfluorode										
599.00 > 80.00				1.000	3578238	21.1		109		
28 Perfluoroun	decanoi	c acid								
563.00 > 519.00		3.963	-0.004	1.000	2866129	20.4		102	77225	
D 27 13C2 PFU	nA									
565.00 > 520.00	3.959	3.972	-0.013		7334883	62.6		125	212889	
29 Perfluorodo	decanoi	c acid								
613.00 > 569.00	4.256	4.265	-0.009	1.000	2434433	19.8		98.8	44602	
D 30 13C2 PFD	οA									
615.00 > 570.00	4.256	4.265	-0.009		6708219	60.5		121	217493	
31 Perfluorotrio										
663.00 > 619.00	4.517	4.526	-0.009	1.000	2629342	21.6		108	4405	
D 32 13C2-PFT										
715.00 > 670.00		4.764	-0.009		15407982	67.8		136	591496	
33 Perfluorotet			0.017	4 000	50//470	07.4		100	1000	
712.50 > 668.90 713.00 > 169.00			-0.017 -0.017	1.000 1.000	5866478 866111	27.6	6.77(0.00-0.00)	138	1983 107658	
				1.000	000111		0.77(0.00-0.00)		107036	
35 Perfluorohe 813.00 > 769.00			-0.009	1.000	2424000	18.3		91.6	3188	
		5.170	-0.007	1.000	2724000	10.5		71.0	5100	
D 34 13C2-PFH 815.00 > 770.00		5 188	-0.019		6990982	56.1		112	130252	
36 Perfluorooc			0.017		0770702	50.1		112	100202	
913.00 > 869.00			-0.002	1.000	2860553	20.7		103	1941	
710.00 2 007.00	0.007	0.000	0.002	1.000	200000	20.7		100	1771	

Report Date: 06-Jan-2017 09:59:30 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 05-Jan-2017 15:30:45 Instrument ID: A8_N Lims ID: LCSD 320-144971/3-A Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 18 Worklist Smp#: 7 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Limit Group: LC PFC_DOD ICAL Method: $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 (56⁻ 00048⁻ 1×40⁻ 056 0848 ∑₁₆-×40 12 24 16 1.9 1.9 1.0 1.3 1.6 0.7 1.0 1.3 1.6 0.9 1.5 2.1 2.7 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00Exp1:m/z 298.90 > 99.00 49 28 21**-**(00001 20-20-042-0035-∑16⁻ **-28**-21 14 2.2 2.1 2.4 1.9 1.9 2.2 1.2 1.5 1.8 1.6 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 399.00 > 80.00 21 24 (00042 (00042 (35 000018 000015 X ©21**-**0218-×15 -28 21 1.9 2.2 1.7 2.0 2.3 2.9 1.9 2.2 2.5 1.6 2.5 2.8 2.6 2.8 3.1 1.4 1.6 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 21 64 (000001 X30 (018 15-12-056**-** \times_{40} **≻**24 32 18 24 12 16 0 1.9 2.2 2.5 2.1 3.0 1.5 2.1 2.7 3.3 2.8 3.1 1.6 <u>Page 7566 of 809</u>





36 Perfluorooctadecanoic acid



Lab	Name:	TestAmerica	Sacramento	Job No.:	320-24184-1
SDG	No.:				

Instrument ID: A8_N Start Date: 12/15/2016 12:06

Analysis Batch Number: 142379 End Date: 12/15/2016 19:54

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-142379/1 CCB		12/15/2016 12:06	1		Acquity 2.1(mm)
RB 320-142379/2 CCB		12/15/2016 12:14	1		Acquity 2.1(mm)
RB 320-142379/3 CCB		12/15/2016 12:21	1		Acquity 2.1(mm)
IC 320-142379/4		12/15/2016 12:29	1	15DEC2016B_004.	Acquity 2.1 (mm)
IC 320-142379/5		12/15/2016 12:36	1	15DEC2016B_005.	Acquity 2.1 (mm)
IC 320-142379/6		12/15/2016 12:44	1	15DEC2016B_006.	Acquity 2.1 (mm)
IC 320-142379/7		12/15/2016 12:51	1	15DEC2016B_007.	Acquity 2.1 (mm)
IC 320-142379/8		12/15/2016 12:59	1	15DEC2016B_008.	Acquity 2.1 (mm)
IC 320-142379/9		12/15/2016 13:06	1	15DEC2016B_009.	Acquity 2.1 (mm)
ICB 320-142379/10		12/15/2016 13:14	1	~	Acquity 2.1(mm)
ICV 320-142379/11		12/15/2016 13:21	1	15DEC2016B_011.	Acquity 2.1 (mm)
IC 320-142379/13		12/15/2016 13:41	1	15DEC2016BB_013	Acquity 2.1 (mm)
IC 320-142379/14		12/15/2016 13:48	1	15DEC2016B_014.	Acquity 2.1 (mm)
IC 320-142379/15		12/15/2016 13:56	1	15DEC2016B_015.	Acquity 2.1 (mm)
IC 320-142379/16		12/15/2016 14:03	1	15DEC2016B_016.	Acquity 2.1 (mm)
IC 320-142379/17		12/15/2016 14:11	1	15DEC2016B_017.	Acquity 2.1 (mm)
IC 320-142379/18		12/15/2016 14:18	1	15DEC2016B_018.	Acquity 2.1 (mm)
ICB 320-142379/19		12/15/2016 14:26	1		Acquity 2.1(mm)
ICV 320-142379/20		12/15/2016 14:33	1		Acquity 2.1(mm)
RB 320-142379/21 CCB		12/15/2016 14:41	1		Acquity 2.1 (mm)
CCV 320-142379/24		12/15/2016 15:46	1		Acquity 2.1(mm)
RB 320-142379/25 CCB		12/15/2016 15:54	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:01	1		Acquity 2.1(mm)
CCV 320-142379/27		12/15/2016 16:09	1		Acquity 2.1(mm)
RB 320-142379/28 CCB		12/15/2016 16:16	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:24	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:31	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:39	1		Acquity 2.1 (mm)
ZZZZZ		12/15/2016 16:46	1		Acquity 2.1 (mm)
ZZZZZ		12/15/2016 16:54	1		Acquity 2.1 (mm)
ZZZZZ		12/15/2016 17:01	1		Acquity 2.1 (mm)
ZZZZZ		12/15/2016 17:09	1		Acquity 2.1 (mm)
ZZZZZ		12/15/2016 17:16	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 17:24	1		Acquity 2.1 (mm)
RB 320-142379/44 CCB		12/15/2016 19:47	1		Acquity 2.1 (mm)
CCV 320-142379/42		12/15/2016 19:54	1		Acquity 2.1(mm)

Lab Name: TestAmerica Sacramento	Job No.: 320-24184-1
SDG No.:	
Instrument ID: A8_N	Start Date: 12/28/2016 16:21
Analysis Batch Number: 144213	End Date: 12/28/2016 18:29

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-144213/1 CCB		12/28/2016 16:21	1		Acquity 2.1 (mm)
RB 320-144213/2 CCB		12/28/2016 16:29	1		Acquity 2.1(mm)
RB 320-144213/3 CCB		12/28/2016 16:36	1		Acquity 2.1 (mm)
RB 320-144213/4 CCB		12/28/2016 16:44	1		Acquity 2.1 (mm)
CCV 320-144213/5 CCVL		12/28/2016 16:51	1	28DEC2016A_005. d	Acquity 2.1 (mm)
CCV 320-144213/6 CCVL		12/28/2016 16:59	1		Acquity 2.1 (mm)
CCV 320-144213/7		12/28/2016 17:06	1		Acquity 2.1 (mm)
RB 320-144213/8 CCB		12/28/2016 17:14	1		Acquity 2.1 (mm)
CCV 320-144213/17		12/28/2016 18:21	1		Acquity 2.1 (mm)
RB 320-144213/18 CCB		12/28/2016 18:29	1		Acquity 2.1 (mm)

Lab Name:	: TestAmerica Sacramento	Job No.: 320-24184-1
SDG No.:		
Instrumer	nt ID: A8_N	Start Date: 12/28/2016 23:51

Analysis Batch Number: 144253 End Date: 12/29/2016 03:44

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-144253/1		12/28/2016 23:51	1	28DEC2016C_001.	Acquity 2.1 (mm)
ZZZZZ		12/28/2016 23:59	1	<u>u</u>	Acquity 2.1 (mm)
MB 320-142967/1-A		12/29/2016 00:06	1	28DEC2016C_003.	Acquity 2.1 (mm)
LCS 320-142967/2-A		12/29/2016 00:14	1	28DEC2016C_004.	Acquity 2.1 (mm)
ZZZZZ		12/29/2016 00:21	1	<u>u</u>	Acquity 2.1 (mm)
ZZZZZ		12/29/2016 00:29	1		Acquity 2.1 (mm)
ZZZZZ		12/29/2016 00:36	1		Acquity 2.1 (mm)
ZZZZZ		12/29/2016 00:44	1		Acquity 2.1 (mm)
320-24184-1		12/29/2016 00:52	1	28DEC2016C_009.	Acquity 2.1 (mm)
ZZZZZ		12/29/2016 00:59	1	<u>u</u>	Acquity 2.1 (mm)
320-24184-3		12/29/2016 01:07	1	28DEC2016C_011.	Acquity 2.1 (mm)
ZZZZZ		12/29/2016 01:14	1	<u>u</u>	Acquity 2.1 (mm)
CCV 320-144253/13		12/29/2016 01:22	1	28DEC2016C_013.	Acquity 2.1 (mm)
ZZZZZ		12/29/2016 01:29	1	u	Acquity 2.1 (mm)
ZZZZZ		12/29/2016 01:37	1		Acquity 2.1 (mm)
ZZZZZ		12/29/2016 01:44	1		Acquity 2.1 (mm)
ZZZZZ		12/29/2016 01:52	1		Acquity 2.1 (mm)
ZZZZZ		12/29/2016 01:59	1		Acquity 2.1 (mm)
ZZZZZ		12/29/2016 02:07	1		Acquity 2.1 (mm)
ZZZZZ		12/29/2016 02:14	1		Acquity 2.1 (mm)
ZZZZZ		12/29/2016 02:22	1		Acquity 2.1 (mm)
ZZZZZ		12/29/2016 02:29	1		Acquity 2.1 (mm)
ZZZZZ		12/29/2016 02:37	1		Acquity 2.1 (mm)
CCV 320-144253/24		12/29/2016 02:44	1	28DEC2016C_024. d	Acquity 2.1 (mm)
ZZZZZ		12/29/2016 02:52	1	<u> </u>	Acquity 2.1 (mm)
ZZZZZ		12/29/2016 02:59	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 03:07	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 03:14	1		Acquity 2.1 (mm)
CCV 320-144253/29		12/29/2016 03:22	1		Acquity 2.1 (mm)
ZZZZZ		12/29/2016 03:29	1		Acquity 2.1 (mm)
ZZZZZ		12/29/2016 03:37	1		Acquity 2.1 (mm)
ZZZZZ		12/29/2016 03:44	1		Acquity 2.1(mm)

Lab Name:	TestAmerica Sacramento	Job No.:	320-24184-1
SDG No.:			

Instrument ID: A8_N ____ Start Date: 12/30/2016 10:56

Analysis Batch Number: 144510 End Date: 12/30/2016 17:11

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ZZZZZ		12/30/2016 10:56	1		Acquity 2.1 (mm)
ZZZZZ		12/30/2016 11:03	1		Acquity 2.1 (mm)
ZZZZZ		12/30/2016 11:11	1		Acquity 2.1 (mm)
ZZZZZ		12/30/2016 11:18	1		Acquity 2.1 (mm)
CCV 320-144510/5 CCVL		12/30/2016 11:26	1	30DEC2016A_005. d	Acquity 2.1 (mm)
CCV 320-144510/6 CCVL		12/30/2016 11:33	1		Acquity 2.1 (mm)
CCV 320-144510/7		12/30/2016 11:41	1		Acquity 2.1(mm)
RB 320-144510/8 CCB		12/30/2016 11:48	1		Acquity 2.1 (mm)
CCV 320-144510/9		12/30/2016 12:03	1		Acquity 2.1 (mm)
RB 320-144510/10 CCB		12/30/2016 12:11	1		Acquity 2.1 (mm)
CCV 320-144510/11		12/30/2016 12:18	1	30DEC2016B_001. d	Acquity 2.1 (mm)
ZZZZZ		12/30/2016 12:26	1		Acquity 2.1 (mm)
ZZZZZ		12/30/2016 12:33	200		Acquity 2.1 (mm)
320-24184-3 DL		12/30/2016 12:41	200	30DEC2016B_004. d	Acquity 2.1 (mm)
ZZZZZ		12/30/2016 12:48	200		Acquity 2.1 (mm)
ZZZZZ		12/30/2016 12:56	1		Acquity 2.1 (mm)
ZZZZZ		12/30/2016 13:03	10		Acquity 2.1 (mm)
ZZZZZ		12/30/2016 13:11	1		Acquity 2.1 (mm)
ZZZZZ		12/30/2016 13:18	1		Acquity 2.1 (mm)
ZZZZZ		12/30/2016 13:26	1		Acquity 2.1 (mm)
320-24184-1 DL		12/30/2016 13:33	50	30DEC2016B_011.	Acquity 2.1 (mm)
320-24184-2		12/30/2016 13:41	1	30DEC2016B_012.	Acquity 2.1 (mm)
CCV 320-144510/23		12/30/2016 13:48	1	30DEC2016B_013.	Acquity 2.1 (mm)
ZZZZZ		12/30/2016 13:56	1		Acquity 2.1 (mm)
320-24184-4 DL		12/30/2016 14:03	10	30DEC2016B_015. d	Acquity 2.1 (mm)
320-24184-4		12/30/2016 14:11	1	30DEC2016B_016. d	Acquity 2.1 (mm)
ZZZZZ		12/30/2016 14:18	50		Acquity 2.1 (mm)
ZZZZZ		12/30/2016 14:26	20		Acquity 2.1 (mm)
ZZZZZ		12/30/2016 14:34	20		Acquity 2.1 (mm)
ZZZZZ		12/30/2016 14:41	20		Acquity 2.1 (mm)
ZZZZZ		12/30/2016 14:49	1		Acquity 2.1 (mm)
ZZZZZ		12/30/2016 14:56	50		Acquity 2.1 (mm)
ZZZZZ		12/30/2016 15:04	50		Acquity 2.1 (mm)
CCV 320-144510/34		12/30/2016 15:11	1	30DEC2016B_024. d	Acquity 2.1 (mm)
ZZZZZ		12/30/2016 15:19	1		Acquity 2.1 (mm)
CCV 320-144510/40		12/30/2016 15:56	1	30DEC2016B_030.	Acquity 2.1 (mm)
ZZZZZ		12/30/2016 16:04	1		Acquity 2.1 (mm)
MB 320-142967/1-A RA		12/30/2016 16:11	1	30DEC2016B_032.	Acquity 2.1 (mm)
LCS 320-142967/2-A RA		12/30/2016 16:19	1	30DEC2016B_033.	Acquity 2.1 (mm)

Lab Name: TestAmerica Sacramento	Job No.: 320-24184-1
SDG No.:	
Instrument ID: A8_N	Start Date: 12/30/2016 10:56
Analysis Batch Number: 144510	End Date: 12/30/2016 17:11

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID	
ZZZZZ		12/30/2016 16:26	1		Acquity 2.1 (mm)	
ZZZZZ		12/30/2016 16:34	1		Acquity 2.1 (mm)	
ZZZZZ		12/30/2016 16:41	1		Acquity 2.1 (mm)	
ZZZZZ		12/30/2016 16:49	1		Acquity 2.1 (mm)	
ZZZZZ		12/30/2016 16:56	1		Acquity 2.1 (mm)	
CCV 320-144510/49		12/30/2016 17:04	1	30DEC2016B_039. d	Acquity 2.1 (mm)	
ZZZZZ		12/30/2016 17:11	1		Acquity 2.1(mm)	

Lab Name: TestAmerica Sacramento	Job No.: 320-24184-1
SDG No.:	
Instrument ID: A8_N	Start Date: 01/04/2017 16:33
Analysis Batch Number: 145022	End Date: 01/04/2017 22:03

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION	LAB FILE ID	COLUMN ID
			FACTOR		
CCV 320-145022/5		01/04/2017 16:33	1	04JAN2017A_005.	Acquity 2.1(mm)
CCVL CCV 320-145022/6		01/04/2017 16:40	1	d	Acquity 2.1 (mm)
CCVL					1 1
CCV 320-145022/7		01/04/2017 16:48	1		Acquity 2.1(mm)
CCV 320-145022/8		01/04/2017 16:55	1		Acquity 2.1 (mm)
ZZZZZ		01/04/2017 17:03	1		Acquity 2.1 (mm)
ZZZZZ		01/04/2017 17:18	1		Acquity 2.1(mm)
ZZZZZ		01/04/2017 17:25	1		Acquity 2.1 (mm)
ZZZZZ		01/04/2017 17:33	1		Acquity 2.1(mm)
CCV 320-145022/18		01/04/2017 18:10	1		Acquity 2.1 (mm)
CCV 320-145022/19		01/04/2017 18:18	1		Acquity 2.1 (mm)
ZZZZZ		01/04/2017 18:25	1		Acquity 2.1 (mm)
CCV 320-145022/31		01/04/2017 19:48	1		Acquity 2.1 (mm)
CCV 320-145022/32		01/04/2017 19:55	1		Acquity 2.1(mm)
ZZZZZ		01/04/2017 20:03	1		Acquity 2.1 (mm)
CCV 320-145022/41		01/04/2017 21:03	1	04JAN2017A_041.	Acquity 2.1 (mm)
CCV 320-145022/42		01/04/2017 21:10	1		Acquity 2.1 (mm)
ZZZZZ		01/04/2017 21:18	1		Acquity 2.1 (mm)
ZZZZZ		01/04/2017 21:25	1		Acquity 2.1(mm)
320-24184-3 DL2		01/04/2017 21:33	1	04JAN2017A_045.	Acquity 2.1 (mm)
ZZZZZ		01/04/2017 21:40	1		Acquity 2.1 (mm)
CCV 320-145022/47		01/04/2017 21:48	1	04JAN2017A_047. d	Acquity 2.1 (mm)
CCV 320-145022/48		01/04/2017 21:55	1		Acquity 2.1(mm)
ZZZZZ		01/04/2017 22:03	1		Acquity 2.1 (mm)

Lab Name: TestAmerica Sacramento	Job No.: 320-24184-1
SDG No.:	
Instrument ID: A8_N	Start Date: 01/05/2017 14:45
Analysis Batch Number: 145242	End Date: 01/05/2017 21:08

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-145242/1 CCB		01/05/2017 14:45	1		Acquity 2.1 (mm)
CCV 320-145242/2		01/05/2017 14:53	1	05JAN2017B_002. d	Acquity 2.1 (mm)
CCV 320-145242/3		01/05/2017 15:00	1	ū.	Acquity 2.1 (mm)
ZZZZZ		01/05/2017 15:08	1		Acquity 2.1 (mm)
MB 320-144971/1-A		01/05/2017 15:15	1	05JAN2017B_005. d	Acquity 2.1 (mm)
LCS 320-144971/2-A		01/05/2017 15:23	1	05JAN2017B_006. d	Acquity 2.1 (mm)
LCSD 320-144971/3-A		01/05/2017 15:30	1	05JAN2017B_007. d	Acquity 2.1 (mm)
320-24184-2 RE		01/05/2017 15:38	1	05JAN2017B_008. d	Acquity 2.1 (mm)
320-24184-4 RE		01/05/2017 15:45	1	05JAN2017B_009. d	Acquity 2.1 (mm)
ZZZZZ		01/05/2017 15:53	1		Acquity 2.1 (mm)
CCV 320-145242/11		01/05/2017 16:00	1	05JAN2017B_011. d	Acquity 2.1 (mm)
CCV 320-145242/12		01/05/2017 16:08	1		Acquity 2.1 (mm)
RB 320-145242/13 CCB		01/05/2017 16:15	1		Acquity 2.1 (mm)
RB 320-145242/23 CCB		01/05/2017 17:30	1		Acquity 2.1 (mm)
CCV 320-145242/24		01/05/2017 17:38	1		Acquity 2.1 (mm)
CCV 320-145242/25		01/05/2017 17:45	1		Acquity 2.1 (mm)
RB 320-145242/26 CCB		01/05/2017 17:53	1		Acquity 2.1 (mm)
CCV 320-145242/36		01/05/2017 19:08	1		Acquity 2.1 (mm)
CCV 320-145242/37		01/05/2017 19:15	1		Acquity 2.1 (mm)
RB 320-145242/38 CCB		01/05/2017 19:23	1		Acquity 2.1 (mm)
RB 320-145242/49 CCB		01/05/2017 20:45	1		Acquity 2.1 (mm)
CCV 320-145242/50		01/05/2017 20:53	1		Acquity 2.1 (mm)
CCV 320-145242/51		01/05/2017 21:00	1		Acquity 2.1 (mm)
RB 320-145242/52 CCB		01/05/2017 21:08	1		Acquity 2.1 (mm)

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Batch Number: 142967 Batch Start Date: 12/19/16 14:38 Batch Analyst: Marchenko, Veronika P

Batch Method: 3535 Batch End Date: 12/20/16 18:14

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00046	LCPFCSP 00073
MB 320-142967/1		3535, 537				250 mL	0.5 mL	25 uL	
LCS		(Modified) 3535, 537				250 mL	0.5 mL	25 uL	20 uL
320-142967/2		(Modified)				250 ML	U.5 ML	25 UL	20 UL
320-24184-A-1	308A51MW-LF-1216	3535, 537 (Modified)	Т	298.32 g	27.31 g	271 mL	0.5 mL	25 uL	
320-24184-A-2	SWMU1-01-1216	3535, 537 (Modified)	Т	280.69 g	27.19 g	253.5 mL	0.5 mL	25 uL	
320-24184-A-3	FSS3TMW-1216	3535, 537 (Modified)	Т	307.26 g	26.57 g	280.7 mL	0.5 mL	25 uL	
320-24184-A-4	SWMU1-02-1216	3535, 537 (Modified)	Т	306.47 g	26.67 g	279.8 mL	0.5 mL	25 uL	

Batch Notes						
Balance ID	QA-070					
Batch Comment	0.1N NaOH/H2O: 794893					
H2O ID	12/15/16					
Hexane ID	0000135581					
Manifold ID	5,6					
Methanol ID	798085					
Pipette ID	MD05306					
Analyst ID - Reagent Drop	VPM					
Analyst ID - SU Reagent Drop	VPM					
Analyst ID - SU Reagent Drop Witness	OM					
Solvent Lot #	800649					
Solvent Name	0.3% NH4OH/MeOH					
SOP Number	WS-LC-0025					
SPE Cartridge Type	WAX 150mg					
Solid Phase Extraction Disk ID	002836112A					

Basis	Basis Description
Т	Total/NA

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Batch Number: 142967 Batch Start Date: 12/19/16 14:38 Batch Analyst: Marchenko, Veronika P

Batch Method: 3535 Batch End Date: 12/20/16 18:14

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00046	
320-24184-A-3	FSS3TMW-1216	3535, Dilution, 537 (Modified)	Т	307.26 g	26.57 g	280.7 mL	0.5 mL	25 uL	

Batch Notes					
Balance ID	QA-070				
Batch Comment	0.1N NaOH/H2O: 794893				
H2O ID	12/15/16				
Hexane ID	0000135581				
Manifold ID	5,6				
Methanol ID	798085				
Pipette ID	MD05306				
Analyst ID - Reagent Drop	VPM				
Analyst ID - SU Reagent Drop	VPM				
Analyst ID - SU Reagent Drop Witness	OM				
Solvent Lot #	800649				
Solvent Name	0.3% NH4OH/MeOH				
SOP Number	WS-LC-0025				
SPE Cartridge Type	WAX 150mg				
Solid Phase Extraction Disk ID	002836112A				

Basis	Basis Description
T	Total/NA

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Batch Number: 144971 Batch Start Date: 01/04/17 16:57 Batch Analyst: Reed, Jonathan E

Batch Method: 3535 Batch End Date: 01/05/17 11:40

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00046	LCPFCSP 00073
MB 320-144971/1		3535, 537				250.00 mL	0.50 mL	25 uL	
		(Modified)							
LCS		3535 , 537				250.00 mL	0.50 mL	25 uL	20 uL
320-144971/2		(Modified)							
LCSD		3535 , 537				250.00 mL	0.50 mL	25 uL	20 uL
320-144971/3		(Modified)							
320-24184-B-2	SWMU1-01-1216	3535 , 537	Т	292.17 g	27.43 g	264.7 mL	0.50 mL	25 uL	
		(Modified)							
320-24184-B-4	SWMU1-02-1216	3535, 537	Т	299.13 g	26.69 g	272.4 mL	0.50 mL	25 uL	
		(Modified)		_	_				

Batch Notes									
Balance ID	QA-070								
H2O ID	1/03/17								
Hexane ID	0000146278								
Manifold ID	7								
Methanol ID	816942								
Sodium Hydroxide ID	0.1N NaOH/H2O: 794894								
Pipette ID	MD05306								
Analyst ID - Reagent Drop	JER								
Analyst ID - SU Reagent Drop	JER								
Analyst ID - SU Reagent Drop Witness	NSH								
Solvent Lot #	811075								
Solvent Name	0.3% NH4OH/MeOH								
SOP Number	WS-LC-0025								
SPE Cartridge Type	WAX 500mg								
Solid Phase Extraction Disk ID	186004647								

Basis	Basis Description
Т	Total/NA

Lab Name: TestAmerica Sacramento Job No.: 320-24184-1

SDG No.:

Batch Number: 145739 Batch Start Date: 12/19/16 14:38 Batch Analyst: Phomsopha, Thep

Batch Method: Dilution Batch End Date: 12/20/16 18:14

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialVolume1	FinalVolume1	InitialVolume2	FinalVolume2	InitialVolume3	FinalVolume3
320-24184-A-3-A	FSS3TMW-1216	Dilution, 537 (Modified)	Т	30 uL	300 uL	15 uL	300 uL	30 uL	300 uL
Lab Sample ID	Client Sample ID	Method Chain	Basis	DilutionFactor	CalcMsg	LCMPFCSU 00046			
320-24184-A-3-A	FSS3TMW-1216	Dilution, 537 (Modified)	Т	2000 No Unit	OK	15 uL			

	Batch Notes	
Batch Comment	0.1N NaOH/H2O: 794893	

Basis	Basis Description
T	Total/NA



West Sacramento

HPLC/LCMS Data Review Checklist

Job Number(s): 24149; 24184; 24236 Work List ID(s): 383	288 - 383	58; 384	37
Extraction Batch: 142967 Analysis Batch(es): 1		4510; 144	867
Delivery Rank 4 Due Date: 12/2	-3/16		
A, Calibration/Instrument Run QC	1 st Level	2 nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch# 142379	1	,	
2. ICAL, CCV Frequency & Criteria met.	~	V/.	
RF _{average} criteria appropriate for the method.	/	1/2	-
 Linear Regression criteria appropriate if required (r ≥ 0.995). 	/		
 Quadratic fit criteria appropriate if required (r² ≥ 0.990). 	Ť	·	_/
For Linear Regression and Quadratic fit – Does the y-intercept support			
½ the reporting limit as described in CA-Q-S-005?	/	_	
All curve points show calculated concentrations.	1		
Peaks correctly ID'd by data system.	V	(/ ₂	
5. Tune check frequency & criteria met and Tune check report attached.	7	//	
B. QA/QC		,	
Are all QC samples properly linked in TALS?		/	
Method blank, LCS/LCSD and MS/SD frequencies met.		7.	
3. LCS/LCSD and MB data are within control limits. If not, NCM is present.	V	-/-	
4. Are MS/MSD recoveries and RPD within control limits?	V		
5. Holding Times were met for prep and analytical.	~		
IS/Surrogate recoveries meet criteria or properly noted.			
C Sample Analysis			
Was correct analysis performed and were project instructions followed?	1		
2. If required, are compounds within RT windows?	V		
3. If required, are positive hits confirmed and >40% RPD flagged?		·	V
Manual Integrations reviewed and appropriate.	V	V	
5. All analytes correctly reported. (Primary, secondary, acceptable status)	√		
6. Correct reporting limits used. (based on client request, prep factors, and	1	./	
dilutions)			
D. Documentation			
Are all non-conformances documented/attached? NCM#	✓		
Do results make sense (e.g. dilutions, etc.)?	/		
Have all flags been reviewed for appropriateness?	V		
4. For level 3 and 4 reports, have forms and raw data been reviewed?		1/	
5. Was QC Checker run for this job?	V	/	

1 st Level (Analyst):	Date: _	1/5/17
2 nd Level Reviewer:	Date: _	116/2017
ICMS: 74501; 74503; 74504; 74505; 74534; 74535	74506	; 73213; 74508; 74533;

^{*}Upon completion of this checklist, the reviewer must scan and attach the checklist to the TALS job.

TAL BATCH: 144283

TestAmerica Laboratories Worklist QC Batch Report

Worklist Name:

28DEC2016C_PFC

Worklist Number: 38288

Chrom Method:

Instrument Name: A8_N

A8_N \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b

Data Directory: QC Batching:

Disabled

Limit Group Batching: Enabled

-	QC Batch 1	LC PFC_DOD ICAL	LC PFC ICAL	LC PFAS ICAL
	<u> </u>	Raw Batch 144253	Raw Batch: 144254	Raw Batch: 144255
# 1	CCV L5	#1 CCV L5	# 1 CCV L5	#1 CCV L5
#2	RB	#2 RB	# 2 RB	# 2 RB
#3	MB 320-142967/1-A	# 3 MB 320-142967/1-A	AD as ataux	
#4	LCS 320-142967/2-A	# 4 LCS 320-142967/2-A	MB contamination	
		# 5 320-24149-A-1-A	NCM 74501	
	320-24149-A-2-A	# 6 320-24149-A-2-A		
#7		# 7 320-24149 - A-3-A	MS/MSD high targo	cts NCM 74503
# 8		# 8 320-24149-A-4-A	146/1467 166 00 1	
#9	320-24184-A-1-A	# 9 320-24184-A-1 - A	MS/MSD CCS grod	NCM 74504
#10	320-24184-A-2-A - Repres	#10 320-24184-A-2-A	IDA low NCM 74505	
/ #11	320-24184-A-3-A	#11 320-24184-A-3-A		
#12	320-24184-A-4-A - Report	#12 320-24184-A-4-A	Efiag Nem 74506	
	CCV L4 - PFOS Failed			#13 CCV L4
#14		#14 RB	#14 RB	#14 RB
/ #15	320-24236-A-1-A			
/ #16	320-24236-A-2-A	#16 320-24236-A-2-A	i .	
#17	320-24236-A-3-A	#17 320-24236-A-3-A		
#18	320-24236-A-3-A 320-24236-A-3-B MS	#18 320-24236-A-3-B MS	i	
#19	320-24236-A-3-C MSD	#19 320-24236-A-3-C MSD	1	
		#20 320-24236-A-4-A]	
		#21 320-24236-A-5-A	1	
		#22 320-24236-A-6-A		
		#23 320-24236-A-7-A		
		#24 CCV L5		#24 CCV L5
#25		#25 RB	#25 RB	#25 RB
		#26 320-24236-A-8-A		
		#27 320-24236-A-9-A		
		#28 320-24236-A-10-A		
				#29 CCV L4
#30				#30 RB
#31		#31 RB		#31 RB
#32	RB	#32 RB	#32 RB	#32 RB

CCV L2 144213 ICV 142379

The NCM 73213

TAL DOD -

TestAmerica Laboratories Worklist QC Batch Report

Worklist Name: 30DEC2016A_PFC

Worklist Number: 38358 Chrom Method: A8_N

Instrument Name: A8_N Data Directory: \\Chro

\\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b

QC Batching: Disabled

Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 144510	LC PFC ICAL	LC PFAS ICAL
	Haw Batch: 144510		Raw Batch: 144512
#1 RB	#1 RB	#1 RB	#1 RB
# 2 RB	#2 RB	#2 RB	# 2 RB
#3 RB	#3 RB	#3 RB	#3 RB
#4 RB	#4 RB	#4 RB	#4 RB
#5 CCV L2	# 3 RB # 4 RB # 5 CCV L2	#3 RB #4 RB #5 CCV L2	#5 CCV L2
#6 CCV L2 ADD ON	# 6 CCV L2 ADD ON	#6 CCV L2 ADD ON	# 6 CCV L2 ADD ON
#7 CCV L5	#7 CCV/1 6	47 COVIE	# 7 CCV L5
#8 RB	#8 RB	# 8 RB	#8 RB
# 0 CCV/ I 4	#8 RB #9 CCV L4 #10 RB	# 7 CCV LS # 8 RB # 9 CCV L4 # 10 RB # 11 CCV L5 # 12 RB	# 9 CCV L4
# 9 CCV L4 #10 RB #11 CCV L5 #12 RB	#10 RB	#10 RB	#10 RB
#11 CCV L5	#11 CCV L5	#11 CCV L5	#11 CCV L5
#12 RB	#12 RB	#12 RB	#12 RB
#13 320-24149-A-1-A	#13 320-24149-A-1-A	WIZ TO	# 12 11B
#14 320-24184-A-3-A	#14 320-24184-A-3-A - Ne	as complex DL	1
#15 320-24104-A-3-A	#12 RB #13 320-24149-A-1-A #14 320-24184-A-3-A #15 320-24236-A-2-A	,	
#16 RB	#16 RB	#16 RB	#16 RB
#17 320-24149-A-2-A	#10 ND	#10 KD	#10 KD
#17 320 - 24149-A-2-A	#17 320-24149-A-2-A		
#18 320-24149-A-2-A	1,1,4,4	DD	
#19 RB #20 320-24149-A-3-A #21 320-24184-A-1-A	#19 RB	#19 RB	#19 RB
#20 320-24149-A-3-A	#20 320-24149-A-3-A	NCM 74501	
#21 320-24184-A-1-A	#21 320-24184-A-1-A		
#22 320-24184-A-2-A	#22 320-24184-A-2-A		
#23 CCV L4	#23 CCV L4		#23 CCV L4
#24 RB	#24 RB	#24 RB	#24 RB
#24 RB #25 320-24184-A-4-A #26 320-24184-A-4-A #27 320-24236-A-1-A #28 320-24236-A-3-A	#25 320-24184-A-4-A		
#26 320-24184-A-4-A	#26 320-24184-A-4-A	_ •	1
#27 320-24236-A-1 - A	#27 320-24236-A-1-A	RI DI	<u> </u>
#28 320-24236-A-3-A	#28 320-24236-A-3-A		
#29 320-24236-A-3-B MS	#29 320-24236-A-3-B MS	Nem 74	1508
#30 320-24236-A-3-C MSD	#30 320-24236-A-3-C MSD]
#31 320-24236-A-4-A #32 320-24236-A-9-A	#32 320-24236-A-9-A		
#33 320-24236-A-10-A	#33 320-24236-A-10-A		
#34 CCV L5	#34 CCV L5	#34 CCV L5	#34 CCV L5
#35 RB	#35 RB		
	#00 NB	#35 RB	#35 RB
#36 320-24282-A-1-A			#36 320-24282-A-1-A
#37 320-24282-A-2-A			#37 320-24282-A-2-A
#38 320-24282-A-2-B MS			#38 320-24282-A-2-B MS
#39 320-24282-A-2-C MSD			#39 320-24282-A-2-C MSD
#40 CCV L4	#40 CCV L4		#40 CCV L4
41 RB	#41 RB	#41 RB	#41 RB
42 MB 320-142967/1-A	#42 MB 320-142967/1-A		
43 LCS 320-142967/2-A	#43 LCS 320-142967/2-A		
44 320-24149-A-4-A	#44 320-24149-A-4-A		
45 320-24236-A-5-A	#45 320-24236-A-5-A		
46 320-24236-A-6-A	#46 320-24236-A-6-A		
47 320-24236-A-7-A	#47 320-24236-A-7-A		
48 320-24236-A-8-A	#48 320-24236-A-8-A		
49 CCV L5	#49 CCV L5	#49 CCV L5	#49 CCV L5
#50 RB			
-30 KD	#50 RB	#50 RB	#50 RB

38437

TestAmerica Laboratories Worklist QC Batch Report

Worklist Name:

03JAN2017C_PFC

Worklist Number:

Instrument Name: A8_N

Chrom Method: A8_N

Data Directory:

\\ChromNa\Sacramento\ChromData\A8_N\20170104-38437.b

QC Batching:

Disabled

Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL	LC PFC ICAL	LC PFAS ICAL
	Raw Batch: 144867	Raw Batch: 144868	Raw Batch: 144869
#1 RB	#1 RB	#1 RB	#1 RB
#2 CCV L5		#2 CCV L5	# 2 CCV L5
#3 CCV L5 ADD ON	#3 CCV L5 ADD ON	#3 CCV L5 ADD ON	#3 CCV L5 ADD ON
#4 RB		#4 RB	#4 RB
# 5 320-24209-A-4-B			# 5 320-24209-A-4-B
#6 RB	i e	#6 RB	#6 RB
# 7 MB 320-143624/1-A			# 7 MB 320-143624/1-A
# 8 320-23317-A-88-A MDLV			# 8 320-23317-A-88-A MDLV
# 9 320-23317-A-89-A MDLV		# 9 320-23317-A-89-A MDLV	# 9 320-23317-A-89-A MDLV
#10 320-23317-A-90-A MDLV		ſ	#10 320-23317-A-90-A MDLV
#11 320-23317-A-91-A LOQV	1		#11 320-23317-A-91-A LOQV
#12 320-23317-A-92-A LOQV	1		#12 320-23317-A-92-A LOQV
#13 RB			#13 RB
#14 CCV L4			#14 CCV L4
			#15 CCV L4 ADD ON
#16 RB			#16 RB
#17 MB 320-143618/1-A			#17 MB 320-143618/1-A
#18 320-23317-A-82-A MDLV			#18 320-23317-A-82-A MDLV
#19 320-23317-A-83-A MDLV			#19 320-23317-A-83-A MDLV
#20 320-23317-A-84-A LOQV			#20 320-23317-A-84-A LOQV
#21 QC MB 01683632913			#21 QC MB 01683632913
#22 QC LCS 01683632913		#22 QC LCS 01683632913	#22 QC LCS 01683632913
	#23 320-24236-A-1-A		
	#24 320-24236-A-9-A		
	#25 320-24236-A-10-A		
			#26 CCV L5
			#27 CCV L5 ADD ON
#28 RB	#28 RB	#28 RB	#28 RB

142379 SBC

1CV 142380

CCVL2 1447 94

IDA FUSA ION NCM 74533 IDA high NCM 74534 Dilution NCM 74535 M

Aqueous Extraction Analysis Sheet

AB 12/28/16

(To Accompany Samples to Instruments)

Analyst: Marchenko, Veronika P

Batch Open: 12/19/2016 2:38:00PM

Batch End: 12 120114 18:14

Batch Number: 320-142967

Method Code: 320-3535_PFC-320

DIL 1

Solid-Phase Extraction (SPE)

ue	12/29

		6 WE - 129										
	Input Sample Lab ID (Analytical Method)	SDG (Job#)	GrossWt TareWt	InitAmnt FinAmnt	Rcvd	PHs Adj1	Adj2	Due Date	Analytical TAT	DIv Rank	Comments	Output Sample Lab ID
1	MB~320-142967/1 N/A	N/A		250 mL 0.5 mL				N/A	N/A	N/A	KI	ANDREA AND A TANGET OF THE PROPERTY OF THE PRO
2	LCS~320-142967/2 N/A	N/A		250 mL 0.5 mL				N/A	N/A	N/A	RI	
3	320-24149-A-1 (PFC_IDA_DOD5)	N/A (320-24149-1)	308.46 g 27.04 g	281.4 mL				12/23/16	12_Days	4	2004 100X	
Page 77	320-24149-A-2 (PFC_IDA_DOD5)	N/A (320-24149-1)	313.10 g 27.07 g	286 mL 0.5 mL				12/23/16	12_Days	4	10× 1×	
7 01 809	320-24149-A-3 (PFC_IDA_DOD5)	N/A (320-24149-1)	301.18 g 27.02 g	274.2 mL 0.5 mL				12/23/16	12_Days	4	1×	
6	320-24149-A-4 (PFC_IDA_DOD5)	N/A (320-24149-1)	291.97 g 27.13 g	264.8 mL 0.5 mL				12/23/16	12_Days	4	50×012/29/11	
7	320-24184-A-1 (PFC_IDA_DOD5)	N/A (320-24184-1)	298.32 g 27.31 g	271 mL 0.5 mL				12/27/16	12_Days	4	Sox	
8	320-24184-A-2 (PFC_IDA_DOD5)	N/A (320-24184-1)	280.69 g 27.19 g	253.5 mL 0.5 mL				12/27/16	12_Days	4	1×	
9	320-24184-A-3 (PFC_IDA_DOD5)	N/A (320-24184-1)	307.26 g 26.57 g	280.7 mL 0.5 mL				12/27/16	12_Days	4	200X	
10	320-24184-A-4 (PFC_IDA_DOD5)	N/A (320-24184-1)	306.47 g 26.67 g	279.8 mL 0.5 mL				12/27/16	12_Days	4	104	
											,	

Printed: 12/19/2016

Page 1 of 6

TestAmerica Sacramento

(To Accompany Samples to Instruments)

Batch Number: 320-142967

Analyst: Marchenko, Veronika P

Batch Open: 12/19/2016 2:38:00PM

320-24236-A-1 (PFC_IDA_DOD5) (320-24236-1) 271.48 g 245.3 mL (12/28/16 12_Days 4 50 x 1005) (12/28/16 12_Days 4 50 x 1005)	
26.16 g 0.5 mL	
12 320-24236-A-2 N/A (320-24236-1) 280.04 g 253 mL 12/28/16 12_Days 4 300 \(\frac{1}{2} \)	II BI MEMILIN TO MITTALISI MININTA BINTA MININTA BINTA MININTA BINTA MININTA BINTA MININTA BINTA MININTA BINTA
27.00 g 0.5 mL	
13 (PFC_IDA_DOD5) (320-24236-1) 268.47 g 241.5 mL 12/28/16 12_Days 4	3 2 0 - 2 4 2 3 6 - A - 3 - A
14 320-24236-A-3~MS N/A (320-24236-1) 264.35 g 233.7 mL 12/28/16 12_Days 4	
po.org 0.5 mil	
28.01 g 0.5 mL	
27.17 g 0.5 mL	
17 G 320-24236-A-5 N/A (320-24236-1) 286.26 g 259.2 mL 12/28/16 12_Days 4	
1	
18 320-24236-A-6 N/A (PFC_IDA_DOD5) (320-24236-1) 269.41 g 241.5 mL 12/28/16 12_Days 4	
[
19 320-24236-A-7 N/A (PFC_IDA_DOD5) (320-24236-1) 292.74 g 266.1 mL 12/28/16 12_Days 4	
26.64 g 0.5 mL	
20 320-24236-A-8 N/A (PFC_IDA_DOD5) (320-24236-1) 299.51 g 273 mL 12/28/16 12_Days 4	
26.49 g 0.5 mL	
27.77 g 0.5 mL	
22 320-24236-A-10 N/A (PFC_IDA_DOD5) (320-24236-1) 289.02 g 260.7 mL 12/28/16 12_Days 4	
28.33 g 0.5 mL 600 K	

(To Accompany Samples to Instruments)

Analyst: Marchenko, Veronika P

Method Code: 320-3535_PFC-320

Batch Number: 320-142967

Batch Open: 12/19/2016 2:38:00PM

Batch End:

		Batch Notes
	Manifold ID	5,6
	Methanol ID	798085
	Hexane ID	0000135581
	Sodium Hydroxide ID	NA
	First Start time	NA
	First End time	NA
1	SPE Cartridge Type	WAX 150mg
Page 779 of 809	Solid Phase Extraction Disk ID	002836112A
779	Balance ID	QA-070
व ब्र	H2O ID	12/15/16
3	Pipette ID	MD05306
	Solvent Name	0.3% NH4OH/MeOH
	Solvent Lot #	800649
	Analyst ID - Reagent Drop	VPM
	Analyst ID - SU Reagent Drop	
	Analyst ID - SU Reagent Drop Witness	9m
	Acid Name	
	Acid ID	NA
	Reagent ID	NA
	Reagent Lot Number	NA
	SOP Number	WS-LC-0025

Printed: 12/19/2016

Batch Number: 320-142967

Method Code: 320-3535_PFC-320

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Marchenko, Veronika P

Batch Open: 12/19/2016 2:38:00PM

Batch End:

Batch Comment 0.1N	NaOH/H2O: 794893				

Comments

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Printed: 12/19/2016 Page 4 of 6 TestAmerica Sacramento

(To Accompany Samples to Instruments)

Analyst: Marchenko, Veronika P

Batch Open: 12/19/2016 2:38:00PM

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	о∧ Ву	Witness
MB 320-142967/1	LCMPFCSU_00046	25 uL	Final Amount	VPM12/9/16	ON 12/19/16
LCS 320-142967/2	LCMPFCSU_00046	25 uL	250 mL		
LCS 320-142967/2	LCPFCSP_00073	20 uL	.250 mL		
320-24149-A-1	LCMPFCSU_00046	25 uL			
320-24149-A-2	LCMPFCSU_00046	25 uL			
320-24149-A-3	LCMPFCSU_00046	25 uL			
320-24149-A-4	LCMPFCSU_00046	25 uL			
320-24184-A-1	LCMPFCSU_00046	25 uL			
320-24184-A-2	LCMPFCSU_00046	25 uL			
320-24184-A-3	LCMPFCSU_00046	25 uL			
320-24184-A-4	LCMPFCSU_00046	25 uL			
320-24236-A-1	LCMPFCSU_00046	25 uL			
320-24236-A-2	LCMPFCSU_00046	25 uL			
320-24236-A-3	LCMPFCSU_00046	25 uL			
320-24236-A-3 MS	LCMPFCSU_00046	25 uL			
320-24236-A-3 MS	LCPFCSP_00073	20 uL			
320-24236-A-3 MSD	LCMPFCSU_00046	25 uL			
320-24236-A-3 MSD	LCPFCSP_00073	20 uL	1		7

Printed: 12/19/2016

Batch Number: 320-142967

Method Code: 320-3535_PFC-320

(To Accompany Samples to Instruments)

Batch Number: 320-142967

Analyst: Marchenko, Veronika P

Batch Open: 12/19/2016 2:38:00PM

Batch End:

Method	Code:	320-3535_	_PFC-320
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320-24236-A-4	LCMPFCSU_00046	25 uL	OSML	VPMIZIPIIO	OM 12/19/16
320-24236-A-5	LCMPFCSU_00046	25 uL			
320-24236-A-6	LCMPFCSU_00046	25 uL			
320-24236-A-7	LCMPFCSU_00046	25 uL			
320-24236-A-8	LCMPFCSU_00046	25 uL			
320-24236-A-9	LCMPFCSU_00046	25 uL			
320-24236-A-10	LCMPFCSU_00046	25 uL	7	\downarrow	$\overline{}$

Page		Other Reagents:	
ge 782	Reagent	Amount/Units	Lot#:
요			
809			

Printed: 12/19/2016

(To Accompany Samples to Instruments)

Analyst: Marchenko, Veronika P

Batch Open: 12/19/2016 2:38:00PM

Batch End:

Reagent Additions Worksheet

	Lab ID	Reagent Code	Amount Added	Final Amount	Ву	Witness
Ī	MB 320-142967/1	LCMPFCSU_00046	25 uL	0.5 mL		
	LCS 320-142967/2	LCMPFCSU_00046	25 uL	0.5 mL		
	LCS 320-142967/2	LCPFCSP_00073	20 uL	0.5 mL		
	320-24149-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
	320-24149-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
ارج	320-24149-A-3	LCMPFCSU_00046	25 uL	0.5 mL		
Page 7	320-24149-A-4	LCMPFCSU_00046	25 uL	0.5 mL		
783 of	320-24184-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
f 809	320-24184-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
	320-24184-A-3	LCMPFCSU_00046	25 uL	0.5 mL		
	320-24184-A-4	LCMPFCSU_00046	25 uL	0.5 mL		
	320-24236-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
	320-24236-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
	320-24236-A-3	LCMPFCSU_00046	25 uL	0.5 mL		
	320-24236-A-3 MS	LCMPFCSU_00046	25 uL	0.5 mL		
	320-24236-A-3 MS	LCPFCSP_00073	20 uL	0.5 mL		
	320-24236-A-3 MSD	LCMPFCSU_00046	25 uL	0.5 mL		
	320-24236-A-3 MSD	LCPFCSP_00073	20 uL	0.5 mL		

Printed: 12/19/2016

Batch Number: 320-142967

Method Code: 320-3535_PFC-320

(To Accompany Samples to instruments)

Batch Number: 320-142967

Analyst: Marchenko, Veronika P

. D-4-1-E--1-

Batch Open: 12/19/2016 2:38:00PM

Method Code: 320-3535_PFC-320

Batch End:

320-24236-A-4	LCMPFCSU_00046	25 uL	0.5 mL	
320-24236-A-5	LCMPFCSU_00046	25 uL	0.5 mL	
320-24236-A-6	LCMPFCSU_00046	25 uL	0.5 mL	
320-24236-A-7	LCMPFCSU_00046	25 uL	0.5 mL	
320-24236-A-8	LCMPFCSU_00046	25 uL	0.5 mL	
320-24236-A-9	LCMPFCSU_00046	25 uL	0.5 mL	
320-24236-A-10	LCMPFCSU_00046	25 uL	0.5 mL	

	Other Reagents:	
Reagent	Amount/Units	Lot#:
	Reagent	

Printed: 12/19/2016 Page 6 of 6 TestAmerica Sacramento



Sacramento Preparation Data Review Checklist

Preparation Batch Number(s): 142 907 Test: PFC-10A	-DONE	5(L)
Earliest Holding Time: 12/20110		
Sample List Tab	1 st Level Reviewer	2 nd Level Reviewe
Samples identified to the correct method "	1//	
All necessary NCMs filed (including holding time)	1//	
Method/sample/login/QAS checked and correct	1	
Minutes hand Tale	1 st Level	2 nd Level
Worksheet Tab All samples properly preserved	Reviewer	Reviewe
Weights in anticipated range and not targeted	1 NA	IVA
All additional test requirements performed, documented, and uploaded to TALS	-/	
correctly (e.g. final amount, initial amount, turbidity, and CI Check)		
The pH is transcribed correctly in TALS	TVA-	MA
All additional information transcribed into TALS is correct and raw data is attached		
Comments are transcribed correctly in TALS		
Reagents Tab	1 st Level Reviewer	2 nd Level Reviewer
All necessary reagents not expired and entered into TALS	//	
All spike amounts correct and added to necessary samples and QC		
	1 st Level	2 nd Level
Batch Information	Reviewer	Reviewer
Date and time accurate and entered into TALS correctly		
All necessary 'batch information' complete and entered into TALS correctly		
St Level Berlevon	วไว้กมไ	0

2nd Level Reviewer: _____

Comments: ____



Test America - Sacramento

Sample Dilution Record

Method ID PPC _ 1DA	Job# 320-24149,3>0-24184,20-
Analyst (Print Name) The Phonsophe	Analyst Initials
Date /2/30/16	· · · · · · · · · · · · · · · · · · ·

Sample#	Original F.V.	Aliquot (uL)	Dilution F.V.	Dilution Factor
	(uL)		(uL)	
320-24149-1	500	30	300	10×
320-24149-110	300	15	300	2007
320-24144-2	500	30	300	10%
320-24184-1	500	30	1500	50%
220-24/843	500	30	300	\@X
320-24184-3(10)	300	15	300	200×
320-24184-4	500	30	300	10%
370-24236-1	500	30	1500	50×
320-24236-2	500	30	300	104
320-24236-2 (19	300	15	300	200%
320-24236-3	500	15	300	20%
320-24236-3MS	Soo	15	300	20/
320-24236-3MSD		.15	300	20X
20-2136.9	500	30	1506	SOX
320-24236-10	500	30	1500	50%
,				
		a particle and the second second	The second secon	
, ,	- Transaction	The state of the s		
		·		
				TP 12/30/1

Comments:		



Test America - Sacramento

Sample Dilution Record

Method ID PFC_IDA	Job#	320-24236	
Analyst (Print Name) They Phonsophe	Analyst	Initials	
Date			

Sample#	Original F.V.	Aliquot (uL)	Dilution F.V.	Dilution Factor
	(uL)		(uL)	
24236-1	500	15	1500	100%
1 -9	SOO	15	1500	100X
V -10		ıS	1500	100%
0 -10	300		1300	1007
				<u> </u>
		<u> </u>		
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				<u> </u>
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				TO Ilila
				1/4/17

Comments:			
	 	 	



West Sacramento

HPLC/LCMS Data Review Checklist

Job Number(s): 24144, 24184, 24236	Work List ID(s):	38480						
Extraction Batch: 4 145299 145739 Delivery Rank	Analysis Batch(es):	145022	<u> </u>					
Delivery Rank 4	Due Date: 12/23/1		116; 12/2	5/16				
A. Calibration/Instrument Run QC		1 st Level	2 nd Level	N/A				
1. ICAL locked in Chrom and TALS? ICAL Batch# /42	379							
ICAL, CCV Frequency & Criteria met.								
 RF_{average} criteria appropriate for the method. 		/	1					
Linear Regression criteria appropriate if required	$(r \ge 0.995)$.	V						
 Quadratic fit criteria appropriate if required (r² ≥ 0 				/				
For Linear Regression and Quadratic fit – Does the control of								
1/2 the reporting limit as described in CA-Q-S-005								
 All curve points show calculated concentrations. 								
Peaks correctly ID'd by data system.		V	V.					
5. Tune check frequency & criteria met and Tune check re	eport attached.	/	V					
B. QA/QC								
Are all QC samples properly linked in TALS?		✓						
2. Method blank, LCS/LCSD and MS/SD frequencies met		_	1					
3. LCS/LCSD and MB data are within control limits. If not		1	V					
4. Are MS/MSD recoveries and RPD within control limits?			7					
5. Holding Times were met for prep and analytical.		V	7,					
6. IS/Surrogate recoveries meet criteria or properly noted		/						
C. Sample Analysis								
1. Was correct analysis performed and were project instru	ictions followed?	√						
2. If required, are compounds within RT windows?		V						
3. If required, are positive hits confirmed and >40% RPD	flagged?			V				
4. Manual Integrations reviewed and appropriate.		/	/					
5. All analytes correctly reported. (Primary, secondary, ac	ceptable status)	~						
6. Correct reporting limits used. (based on client request,	prep factors, and	_/						
dilutions)								
D. Documentation								
1. Are all non-conformances documented/attached? NCN	1# 74664	_	V.,					
2. Do results make sense (e.g. dilutions, etc.)?		V						
3. Have all flags been reviewed for appropriateness?		<u> </u>	/_					
4. For level 3 and 4 reports, have forms and raw data bee	en reviewed?		//					
5. Was QC Checker run for this job?		√						
Pupon completion of this checklist, the reviewer must scan and attach the checklist to the TALS job. Date: 1/6/17 Date: 1/6/17								
υ								

Report Date: 06-Jan-2017 12:41:45

TestAmerica Laboratories Worklist QC Batch Report

Worklist Name: 04JAN2017_PFC Worklist Number: 38480
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b
QC Batching: Disabled Limit Group Batching: Enabled

QC batching: Disable	ed Lim	it Group Batching: Enabled	
QC Batch 1	LC PFC_DOD ICAL	LC PFC ICAL	LC PFAS ICAL
	Raw Batch 145022	Raw Batch 145023	Raw Batch: 145024
# 1 RB	#1 RB	#1 RB	#1 RB
#2 RB	# 2 RB	#2 RB	#2 RB
#3 RB	#3 RB	#3 RB	#3 RB
#4 RB	#4 RB	#4 RB	# 4 RB
# 5 CCV L2	# 5 CCV L2	#5 CCV L2	#5 CCV L2
# 6 CCV L2 ADD ON	#6 CCV L2 ADD ON	#6 CCV L2 ADD ON	#6 CCV L2 ADD ON
#7 CCV L5	#7 CCV L5	#7 CCV L5	#7 CCV L5
#8 CCV L5 ADD ON	#8 CCV L5 ADD ON	#8 CCV L5 ADD ON	#8 CCV L5 ADD ON
#9 RB	#9 RB	#9 RB	#9 RB
#10 320-23763-A-20-A		#10 320-23763-A-20-A	#10 320-23763-A-20-A
#11 RB	#11 RB	#11 RB	#11 RB
#12 RB	#12 RB	#12 RB	#12 RB
#13 RB	#13 RB	#13 RB	#13 RB
#14 MB 320-144781/1-A		#14 MB 320-144781/1-A	#14 MB 320-144781/1-A
#15 LCS 320-144781/2-A		#15 LCS 320-144781/2-A	#15 LCS 320-144781/2-A
#16 LCSD 320-144781/3-A		#16 LCSD 320-144781/3-A	#16 LCSD 320-144781/3-A
#17 320-24608-B-6-A		#17 320-24608-B-6-A	#17 320-24608-B-6-A
#18 CCV L4	#18 CCV L4	#18 CCV L4	#18 CCV L4
#19 CCV L4 ADD ON	#19 CCV L4 ADD ON	#19 CCV L4 ADD ON	#19 CCV L4 ADD ON
#20 RB	#20 RB	#20 RB	#20 RB
#21 MB 320-144783/1-A		#21 MB 320-144783/1-A	#21 MB 320-144783/1-A
#22 LCS 320-144783/2-A		#22 LCS 320-144783/2-A	#22 LCS 320-144783/2-A
#23 320-24645-A-1-A		#23 320-24645-A-1-A	#23 320-24645-A-1-A
#24 320-24645-A-2-A		#24 320-24645-A-2-A	#24 320-24645-A-2-A
#25 320-24645-A-3-A		#25 320-24645-A-3-A	#25 320-24645-A-3-A
#26 320-24645-A-4-A		#26 320-24645-A-4-A	#26 320-24645-A-4-A
#27 320-24645-A-5-A		#27 320-24645-A-5-A	#27 320-24645-A-5-A
#28 320-24645-A-6-A		#28 320-24645-A-6-A	#28 320-24645-A-6-A
#29 320-24645-A-6-B MS		#29 320-24645-A-6-B MS	#29 320-24645-A-6-B MS
#30 320-24645-A-6-C MSD	W24 2214 -	#30 320-24645-A-6-C MSD	#30 320-24645-A-6-C MSD
#31 CCV L5	#31 CCV L5	#31 CCV L5	#31 CCV L5
#32 CCV L5 ADD ON		#32 CCV L5 ADD ON	#32 CCV L5 ADD ON
#33 RB	#33 RB	#33 RB	#33 RB
#34 320-24645-A-7-A		#34 320-24645-A-7-A	#34 320-24645-A-7-A
#35 320-24645-A-8-A	i e	#35 320-24645-A-8-A	#35 320-24645-A-8-A
#36 320-24645-A-9-A		#36 320-24645-A-9-A	#36 320-24645-A-9-A
#37 320-24645-A-10-A		#37 320-24645-A-10-A	#37 320-24645-A-10-A
#38 320-24645-A-11-A	i i	#38 320-24645-A-11-A	#38 320-24645-A-11-A #39 320-24645-A-12-A
#39 320-24645-A-12-A #40 320-24645-A-13-A	NCM 74664	#39 320-24645-A-12-A #40 320-24645-A-13-A	#40 320-24645-A-13-A
#41 CCV L4	#41 CCV L4	#40 320-24645-A-13-A #41 CCV L4	#41 CCV L4
#42 CCV L4 ADD ON		#41 CCV L4 #42 CCV L4 ADD ON	#42 CCV L4 ADD ON
#43 RB		#42 CCV L4 ADD ON #43 RB	#42 CCV L4 ADD ON #43 RB
#44 320-24149-A-1-F	#43 RB #44 320-24149-A-1-F	# **** O ND	טא פדייו
#46 320-24184-A-3-F	#46 320-24184-A-3-F		
#45 320-24236-A-2-F	#45 320-24184-A-3-F		
#47 CCV L5		#47 CCV L5	#47 CCV L5
#48 CCV L5 ADD ON		#48 CCV L5 ADD ON	#48 CCV L5 ADD ON
#49 RB		#49 RB	#49 RB

1CV 142379

(To Accompany Samples to Instruments)

Analyst: Phomsopha, Thep

Batch Open: 12/19/2016 2:38:00PM

Batch End: 12/20/2016 6:14:00PM

Dilution and Re-foritfication of Standards

	Input Sample Lab ID (Analytical Method)	SDG (Job #)		InitAmnt FinAmnt		PHs Adj1	Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1	320-24149-A-1-A (PFC_IDA_DOD5)	N/A (320-24149-1)						12/23/16	12_Days	4		
	(* 1 6_12, (_5 656)	(020 21140 1)	-	300 uL								1111 3 2 0 - 2 4 1 4 9 - A - 1 - G 1111
2	320-24184-A-3-A (PFC_IDA_DOD5)	N/A (320-24184-1)					·	12/27/16	12_Days	4		
				300 uL								
3	320-24236-A-2-A (PFC_IDA_DOD5)	N/A (320-24236-1)						12/28/16	12_Days	4		
Pag				300 uL								
Ф												
790							В	atch Note	es			
<u></u>												
809	Batch Comment 0.1N NaOH/H2O: 794893											

Batch Number: 320-145739

Method Code: 320-PFC_Dil-320

Comments

TestAmerica Sacramento Page 1 of 2 Printed 1/10/2017

(To Accompany Samples to Instruments)

Analyst: Phomsopha, Thep

Batch Open: 12/19/2016 2:38:00PM

Batch End: 12/20/2016 6:14:00PM

Method Code: 320-PFC_Dil-320

Batch Number: 320-145739

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	Ву	Witness
320-24149-A-1-A	LCMPFCSU_00046	15 uL	300 uL		
320-24184-A-3-A	LCMPFCSU_00046	15 uL	300 uL		
320-24236-A-2-A	LCMPFCSU_00046	15 uL	300 uL		

	Other Reagents:				
Reagent	Amount/Units Lot#:				

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Printed: 1/10/2017



West Sacramento

HPLC/LCMS Data Review Checklist

Job Number(s): 24184 - 24209 Work List ID(s):	385 34 -	38535	
Extraction Batch: 144971; 142632 Analysis Batch(es):_		145 24	5 1/6
			- 12
Delivery Rank 2, 4 Due Date: 12/2:		•	
A, Calibration/Instrument Run QC	1 st Level	2 nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch# 142379: 142390	/	V	
2. ICAL, CCV Frequency & Criteria met.	V		
RF _{average} criteria appropriate for the method.	/	/	
 Linear Regression criteria appropriate if required (r ≥ 0.995). 	V	_/_	
 Quadratic fit criteria appropriate if required (r² ≥ 0.990). 			
 For Linear Regression and Quadratic fit – Does the y-intercept support 	//		
½ the reporting limit as described in CA-Q-S-005?			
All curve points show calculated concentrations.	V_		
Peaks correctly ID'd by data system.	V		
5. Tune check frequency & criteria met and Tune check report attached.	/		
B. QA/QC			
Are all QC samples properly linked in TALS?			
Method blank, LCS/LCSD and MS/SD frequencies met.	/		
3. LCS/LCSD and MB data are within control limits. If not, NCM is present.			
Are MS/MSD recoveries and RPD within control limits?	· _		
Holding Times were met for prep and analytical.	✓		
IS/Surrogate recoveries meet criteria or properly noted.	/	_/	
C. Sample Analysis			
Was correct analysis performed and were project instructions followed?	/		
If required, are compounds within RT windows?	V	V	
If required, are positive hits confirmed and >40% RPD flagged?	-,		\checkmark
Manual Integrations reviewed and appropriate.	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		
5. All analytes correctly reported. (Primary, secondary, acceptable status)	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	_/	
6. Correct reporting limits used. (based on client request, prep factors, and			
dilutions)		-	
D. Documentation		,	
Are all non-conformances documented/attached? NCM#		// 	
2. Do results make sense (e.g. dilutions, etc.)?	1		
Have all flags been reviewed for appropriateness?	/		-
4. For level 3 and 4 reports, have forms and raw data been reviewed?			
5. Was QC Checker run for this job?	V		
*Upon completion of this checklist, the reviewer must scan and attach the checkli	st to the TALS	S job.	
1 st Level (Analyst): Date: 1/2 2 nd Level Reviewer: Manalyst Date: 1/4			
2 nd Level Reviewer: Date:/_	12017		
NCM 5. 74637, 72210, 74110			

TestAmerica Laboratories Worklist QC Batch Report

Worklist Name: 05JAN2017B_PFC

Worklist Number: 38534

Instrument Name: A8_N

Chrom Method: A8_N

Data Directory:

\\ChromNa\Sacramento\ChromData\A8_N\20170106-38534.b

QC Batching: Disabled

Limit Group Batching: Enabled

QC Batch. 1	LC PFC_DOD ICAL	LC PFC ICAL	LC PFAS ICAL
GO Baton.	Raw Batch 145242	Raw Batch: 145243	Raw Batch 145244
# 1 RB	#1 RB	# 1 RB	# 1 RB
# 2 CCV L5		#2 CCV L5	# 2 CCV L5
#3 CCV L5 ADD ON		#3 CCV L5 ADD ON	# 3 CCV L5 ADD ON
# 4 RB		#4 RB	#4 RB
# 5 MB 320-144971/1-A	# 5 MB 320-144971/1-A	# 4 NB	# 4 ND
# 6 LCS 320-144971/2-A	# 6 LCS 320-144971/2-A		
# 7 LCSD 320-144971/3-A	# 7 LCSD 320-144971/3-A		1
# 8 320-24184-B-2-A	# 8 320-24184-B-2-A		
# 9 320-24184-B-4-A	# 9 320-24184-B-4-A		1
#10 RB		#10 DB	#10 RB
#11 CCV L4	#10 KB #11 CCV L4	#10 RB #11 CCV L4	#10 RB #11 CCV L4
#12 CCV L4 ADD ON	#12 CCV L4 ADD ON	#12 CCV L4 ADD ON	#12 CCV L4 ADD ON
#13 RB		#12 CCV L4 ADD ON	#12 CCV L4 ADD ON
#14 MB 320-144960/1-A		#14 MB 320-144960/1-A	#14 MB 320-144960/1-A
#15 LCS 320-144960/1-A		#15 LCS 320-144960/1-A	#14 MB 320-144960/1-A #15 LCS 320-144960/2-A
#16 LCSD 320-144960/3-A	13713	#16 LCSD 320-144960/2-A	#16 LCSD 320-144960/2-A
#17 320-24606-B-1-A		#17 320-24606-R-1-A	#17 320-24606-B-1-A
#18 320-24614-B-2-A		#17 320-24606-B-1-A #18 320-24614-B-2-A #19 320-24614-B-1-A	#17 320-24000-B-1-A #18 320-24614-B-2-A
#19 320-24614-B-1-A	INT	#19 320-24614-B-1-A	#19 320-24614-B-1-A
#20 320-24614-B-3-A	107,50	#20 320-24614-B-3-A	#20 320-24614-B-3-A
#21 320-24614-B-4-A		#21 320-24614-B-4-A	#20 320-24614-B-3-A
#22 320-24614-B-5-A		#22 320-24614-B-5-A	#22 320-24614-B-5-A
#23 RB		#23 RB	#23 RB
#24 CCV L5		#24 CCV L5	#24 CCV L5
#25 CCV L5 ADD ON		#25 CCV L5 ADD ON	#25 CCV L5 ADD ON
#26 RB		#26 RB	#26 RB
#27 MB 320-144944/1-A		#27 MB 320-144944/1-A	#27 MB 320-144944/1-A
#28 LCS 320-144944/2-A		#28 LCS 320-144944/2-A	#28 LCS 320-144944/2-A
#29 320-24735-A-1-A		#29 320-24735-A-1-A	#29 320-24735-A-1-A
#30 320-24735-A-1-B MS		#30 320-24735-A-1-B MS	#30 320-24735-A-1-B MS
#31 320-24735-A-1-C DU		#31 320-24735-A-1-C DU	#31 320-24735-A-1-C DU
#32 320-24735-A-2-A		#32 320-24735-A-2-A	#32 320-24735-A-2-A
#33 320-24735-A-3-A		#33 320-24735-A-3-A	#33 320-24735-A-3-A
#34 320-24735-A-4-A		#34 320-24735-A-4-A	#34 320-24735-A-4-A
#35 MB 320-144928/1-A		#35 MB 320-144928/1-A	#35 MB 320-144928/1-A
#36 CCV L4		#36 CCV L4	#36 CCV L4
#37 CCV L4 ADD ON		#37 CCV L4 ADD ON	#37 CCV L4 ADD ON
#38 RB		#38 RB	#38 RB
#39 LCS 320-144928/2-A			#39 LCS 320-144928/2-A
#40 LCSD 320-144928/3-A		#40 LCSD 320-144928/3-A	#40 LCSD 320-144928/3-A
#41 320-24713-A-1-A		#41 320-24713-A-1-A	#41 320-24713-A-1-A
#42 320-24713-A-2-A		#42 320-24713-A-2-A	#42 320-24713-A-2-A
#43 320-24697-A-1-A		#43 320-24697-A-1-A	#43 320-24697-A-1-A
#44 320-24697-A-2-A		#44 320-24697-A-2-A	#44 320-24697-A-2-A
#45 320-24671-A-1-A		#45 320-24671-A-1-A	#45 320-24671-A-1-A
#46 320-24671-A-2-A		#46 320-24671-A-2-A	#46 320-24671-A-2-A
#47 320-24671-A-3-A		#47 320-24671-A-3-A	#47 320-24671-A-3-A
#48 320-24671-A-4-A	1	#48 320-24671-A-4-A	#48 320-24671-A-4-A
#49 RB		#49 RB	#49 RB
#50 CCV L5	#50 CCV L5	#50 CCV L5	#50 CCV L5
#51 CCV L5 ADD ON		#51 CCV L5 ADD ON	#51 CCV L5 ADD ON
#52 RB		#52 RB	#52 RB
	p. 0 = 1 to p		NOT 110

TestAmerica Laboratories Worklist QC Batch Report

Worklist Name:

05JAN2017C_PFC

38535 Worklist Number:

Instrument Name: A8_N

Chrom Method: A8_N

Data Directory: QC Batching:

\\ChromNa\Sacramento\ChromData\A8_N\20170106-38535.b

Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC DOD ICAL	LC PFC ICAL	LC PFAS ICAL
QC Batch 1	_		
	Raw Batch: 145245	Raw Batch: 145246	Raw Batch: 145247
#1 RB		#1 RB	#1 RB
# 2 CCV L5	# 2 CCV L5	#2 CCV L5	# 2 CCV L5
#3 CCV L5 ADD ON	#3 CCV L5 ADD ON	#3 CCV L5 ADD ON	#3 CCV L5 ADD ON
#4 RB	#4 RB	#4 RB	#4 RB
# 5 320-24209-A-1-B		# 5 320-24209-A-1-B	# 5 320-24209-A-1-B
# 6 320-24209-A-2-B	10× not	# 6 320-24209-A-2-B	# 6 320-24209-A-2-B
# 7 320-24209-A-3-B	,	# 7 320-24209-A-3-B	# 7 320-24209-A-3-B
# 8 320-24209-B-3-B DU		# 8 320-24209-B-3-B DU	# 8 320-24209-B-3-B DU
# 9 320-24209-A-1-B	8:2 10% high NCM 74637	# 9 320-24209-A-1-B	# 9 320-24209-A-1-B
#10 320-24209-A-2-B	NCM THE	#10 320-24209-A-2-B	#10 320-24209-A-2-B
#11 320-24209-A-3-B	14637	#11 320-24209-A-3-B	#11 320-24209-A-3-B
#12 320-24209-B-3-B DU		#12 320-24209-B-3-B DU	#12 320-24209-B-3-B DU
#13 RB	#13 RB	#13 RB	#13 RB
#14 CCV L5	#14 CCV L5	#14 CCV L5	#14 CCV L5
#15 CCV L5 ADD ON	#15 CCV L5 ADD ON	#15 CCV L5 ADD ON	#15 CCV L5 ADD ON
#16 RB		#16 RB	#16 RB
#17 QC LCMPFC2SU_00010			#17 QC LCMPFC2SU_00010
1/2	1/2	1/2	1/2
#18 QC LCMPFC2SU_00010		#18 QC LCMPFC2SU_00010	#18 QC LCMPFC2SU_00010
2/2		2/2	2/2
			#19 CCV L5 ADD ON

Reporting 8:2FTS only
1cv 142380
CCV L2 145138

43 2

Aqueous Extraction Analysis Sheet

A8 1/5/17

Batch Number: 320-144971

Method Code: 320-3535_PFC-320

(To Accompany Samples to Instruments)

Analyst: Reed, Jonathan E

Batch Open: 1/4/2017 4:57:00PM Batch End: 1/5/17 11:40

Solid-Phase Extraction (SPE)

Due 12/30

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	1	PHs Adj1	Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-144971/1 N/A	N/A		250.00 mL				N/A	N/A	N/A		A Michael III in heir in heir in in heir in in heir in
				0.50 mL	!		1			1 1		
2	LCS~320-144971/2 N/A	N/A		250.00 mL				N/A	N/A	N/A		
				0.50 mL	1							
3	LCSD~320-144971/3 N/A	N/A		250.00 mL				N/A	N/A	N/A		
1				0.50 mL								
Page	320-24184-B-2 (PFC_IDA_DOD5)	N/A (320-24184-1)	292.17 g	264.7 mL		-		12/27/16	12_Days	4		
795			27.43 g	0.50 mL								
ஓ	320-24184-B-4 (PFC_IDA_DOD5)	N/A (320-24184-1)	299.13 g	272.4 mL				12/27/16	12_Days	4		
809			26.69 g	0.50 mL								

Rx for PFHXA in MB and <10x in samples 2 of 4

(To Accompany Samples to Instruments)

Analyst: Reed, Jonathan E

Batch Open: 1/4/2017 4:57:00PM

Batch End:

Batch Number: 320-144971

Method Code: 320-3535_PFC-320

	Batch Notes
Manifold ID	7
Methanol ID	816942
Hexane ID	0000146278
Sodium Hydroxide ID	0.1N NaOH/H2O: 794894
First Start time	NA NA
First End time	NA NA
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	186004647
Balance ID	QA-070
H2O ID	1/03/17
Pipette ID	MD05306
Solvent Name	0.3% NH4OH/MeOH
Solvent Lot #	811075
Analyst ID - Reagent Drop	JER
Analyst ID - SU Reagent Drop	
Analyst ID - SU Reagent Drop Witness	ust
Acid Name	NA
Acid ID	NA
Reagent ID	NA
Reagent Lot Number	NA
SOP Number	WS-LC-0025

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Reed, Jonathan E

Batch Open: 1/4/2017 4:57:00PM

Batch End:

Batch Comment

Comments

320-24184-B-2

Batch Number: 320-144971

Method Code: 320-3535_PFC-320

Rework Comments: MB above 1/2 the RL for PFHxA

320-24184-B-4

Rework Comments: MB above 1/2 the RL for PFHxA

Printed: 1/4/2017 Page 3 of 4 TestAmerica Sacramento

(To Accompany Samples to Instruments)

Analyst: Reed, Jonathan E

Batch Open: 1/4/2017 4:57:00PM

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	Ву	Witness
MB 320-144971/1	LCMPFCSU_00046	25 uL	0.50 mL	KNW Ulorfie	NSH 1-4-17
LCS 320-144971/2	LCMPFCSU_00046	25 uL	0.50 mL	11 94	% ,
LCS 320-144971/2	LCPFCSP_00073	20 uL	0.50 mL		
LCSD 320-144971/3	LCMPFCSU_00046	25 uL	0.50 mL		
LCSD 320-144971/3	LCPFCSP_00073	20 uL	0.50 mL		
320-24184-B-2	LCMPFCSU_00046	25 uL	0.50 mL	,	
320-24184-B-4	LCMPFCSU_00046	25 uL	0.50 mL	V	V

Other Reagents:						
Reagent	Amount/Units	Lot#:				

_ . . .

Printed: 1/4/2017

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TestAmerica Sacramento

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Batch Number: 320-144971

Method Code: 320-3535_PFC-320



4

Sacramento Preparation Data Review Checklist

Preparation Batch Number(s): 520-144971 Test: 5535	>- 4-4 C	<u> </u>
Earliest Holding Time: /2/21/16		
	1st Level	2 nd Level
Sample List Tab	Reviewer	Reviewer
Samples identified to the correct method	1	1
All necessary NCMs filed (including holding time)	NA	MA
Method/sample/login/QAS checked and correct		7
	1 st Level	2 nd Level
Worksheet Tab	Reviewer	Reviewer
All samples properly preserved	NA	NA
Weights in anticipated range and not targeted		
All additional test requirements performed, documented, and uploaded to TALS	1	/
correctly (e.g. final amount, initial amount, turbidity, and CI Check)		J
The pH is transcribed correctly in TALS	NΔ	NA
All additional information transcribed into TALS is correct and raw data is		/
attached	7	-/-
Comments are transcribed correctly in TALS		√ .
	1 st Level	2 nd Level
Reagents Tab	Reviewer	Reviewer
All necessary reagents not expired and entered into TALS	4,	V,
All spike amounts correct and added to necessary samples and QC		
	1 st Level	2 nd Level
Batch Information	Reviewer	Reviewer
Date and time accurate and entered into TALS correctly		
All necessary 'batch information' complete and entered into TALS correctly		✓
•	, 1	
1 st Level Reviewer: VPM Date: 1/2 nd Level Reviewer: Date: 1/2	5117	
1 st Level Reviewer: VPM Date: 1/2 nd Level Reviewer: Date: 1/2	5/17	
	2/11	
Comments:		

Batch Number: 320-142632

Method Code: 320-3535_IVWT-320

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Reed, Jonathan E

Batch Open: 12/16/2016 5:40:00PM

Batch End: /2/16/1K 4:25

[X 1/5/17 Figure 1/10]

Solid-Phase Extraction (SPE)

	Input Sample Lab ID (Analytical Method)	SDG (Job#)	GrossWt TareWt	InitAmnt FinAmnt	Rcvd	PHs Adj1	Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1	MB~320-142632/1 N/A	N/A		250.00 mL	. ==			N/A	N/A	N/A		
				0.5 mL								
2	LCS~320-142632/2 N/A	N/A		250.00 mL				N/A	N/A	N/A		
				0.5 mL								
3	LCSD~320-142632/3 N/A	N/A		250.00 mL				N/A	N/A	N/A		
\downarrow				0.5 mL								
Page 8	320-24209-A-1 (PFC_IDA)	N/A (320-24209-1)	270.14 g	242.6 mL				12/21/16	8_Days	2	ix	
800			27.51 g	0.5 mL							sover 100	Y-
of 809	320-24209-A-2 (PFC_IDA)	N/A (320-24209-1)	265.26 g	238.2 mL				12/21/16	8 Days	2		
ၑ			27.02 g	0.5 mL								
6	320-24209-A-3 (PFC_IDA)	N/A (320-24209-1)	262.55 g	235.8 mL				12/21/16	8_Days	2		
			26.71 g	0.5 mL							[]	
7	320-24209-B-3~DU (PFC_IDA)	N/A (320-24209-1)	266.53 g	239.3 mL				12/21/16	8_Days	2		
			27.28 g	0.5 mL	<u> </u>			<u> </u>			4	
8	320-24209-A-4 (PFC_IDA)	N/A (320-24209-1)	272.35 g	245.5 mL				12/21/16	8_Days	2	V	
			26.87 g	0.5 mL	<u> </u>						RIG IX	

(To Accompany Samples to Instruments)

Analyst: Reed, Jonathan E

Batch Open: 12/16/2016 5:40:00PM

Batch End:

Batch Number: 320-142632

Method Code: 320-3535_IVWT-320

		Batch Notes
	Manifold ID	5
	Methanol ID	807182
	Hexane ID	0000135581
	Sodium Hypochlorite ID	NA
-	First Start time	NA
	First End time	NA
	Balance ID	QA-070
Pag	SPE Cartridge Type	WAX 500mg
Page 801 of 809	Solid Phase Extraction Disk ID	002836112A
9	H2O ID	12/15/16
8	Pipette ID	MD05306
İ	Solvent Name	0.3% NH4OH/MeOH
	Solvent Lot #	800649
	Analyst ID - Reagent Drop	JER
	Analyst ID - SU Reagent Drop	JER
	Analyst ID - SU Reagent Drop Witness	VIM
	Acid Name	
	Acid ID	NA NA
	Reagent ID	NA
	Reagent Lot Number	NA
	NaCi ID	NA

Printed: 12/16/2016

(To Accompany Samples to Instruments)

Batch Number: 320-142632

Method Code: 320-3535_IVWT-320

Analyst: Reed, Jonathan E

Batch Open: 12/16/2016 5:40:00PM

Batch End:

SOP Number	WS-LC-0025
Batch Comment	

			Comments
	320-24209-A-1	Method Comments:	include add-on spikes for 6:2FTS and 8:2FTS
	320-24209-A-2		include add-on spikes for 6:2FTS and 8:2FTS
	320-24209-A-3		Use this sample to extract a duplicate in the batch include add-on spikes for 6:2FTS and 8:2FTS
Page	320-24209-B-3~DU	Sample Comments:	Use this sample to extract a duplicate in the batch
Page 802 of 80	320-24209-A-4		include add-on spikes for 6:2FTS and 8:2FTS
의 교 교		Method Comments:	include add-on spikes for 6:2FTS and 8:2FTS

Printed: 12/16/2016

(To Accompany Samples to Instruments)

Analyst: Reed, Jonathan E

Batch Open: 12/16/2016 5:40:00PM

Batch End:

Method Code: 320-3535_IVWT-320

Batch Number: 320-142632

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	Ву	Witness
MB 320-142632/1	LCMPFC2SU_00010	25 uL	0.5 mL	And 12/10/10	VPM 12/16/16
MB 320-142632/1	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-142632/2	LCMPFC2SU_00010	25 uL	0.5 mL		
LCS 320-142632/2	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-142632/2	LCPFC2SP_00016	20 uL	0.5 mL		
LCS 320-142632/2	LCPFCSP_00073	20 uL	0.5 mL		
LCSD 320-142632/3	LCMPFC2SU_00010	25 uL	0.5 mL		
LCSD 320-142632/3	LCMPFCSU_00046	25 uL	0.5 mL		
LCSD 320-142632/3	LCPFC2SP_00016	20 uL	0.5 mL		
LCSD 320-142632/3	LCPFCSP_00073	20 uL	0.5 mL		
320-24209-A-1	LCMPFC2SU_00010	25 uL	0.5 mL		
320-24209-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-24209-A-2	LCMPFC2SU_00010	25 uL	0.5 mL		
320-24209-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-24209-A-3	LCMPFC2SU_00010	25 uL	0.5 mL		
320-24209-A-3	LCMPFCSU_00046	25 uL	0.5 mL		
320-24209-B-3 DU	LCMPFC2SU_00010	25 ul.	0.5 mL	V	
320-24209-B-3 DU	LCMPFCSU_00046	25 uL	0.5 mL	N N	T T

Printed: 12/16/2016

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TestAmerica Sacramento

(To Accompany Samples to Instruments)

Batch Number: 320-142632

Analyst: Reed, Jonathan E

Method Code: 320-3535_IVWT-320

Batch Open: 12/16/2016 5:40:00PM

Batch End:

320-24209-A-4	LCMPFC2SU_00010	25 uL	0.5 mL	par pricete	VPM 12/26/16
320-24209-A-4	LCMPFCSU_00046	25 uL	0.5 mL	J	1

	Other Reagents:	
Reagent	Amount/Units	Lot#:

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Sacramento Preparation Data Review Checklist

Preparation Batch Number(s): 142 632 Test: Fe_10 Earliest Holding Time: /2/2///C	DA	
Earliest Holding Time: /2/2///C		
	481	and
Sample List Tab	1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method	Keviewei	Verienci
All necessary NCMs filed (including holding time)	1/	//
Method/sample/login/QAS checked and correct	1	//
	1 st Level	2 nd Level
Worksheet Tab	Reviewer	Reviewer
All samples properly preserved	M	NA
Weights in anticipated range and not targeted	1	1
All additional test requirements performed, documented, and uploaded to TALS	1	
correctly (e.g. final amount, initial amount, turbidity, and Cl Check)	1	
The pH is transcribed correctly in TALS	M	NA
All additional information transcribed into TALS is correct and raw data is	V	
attached	/	//
Comments are transcribed correctly in TALS	<i>y</i>	/
	1 st Leve!	2 nd Level
Reagents Tab	Reviewer	Reviewer
All necessary reagents not expired and entered into TALS	V	/
All spike amounts correct and added to necessary samples and QC	V	
	1 st Level	2 nd Level
Batch Information	Reviewer	Reviewer
Date and time accurate and entered into TALS correctly	1	//
All necessary 'batch information' complete and entered into TALS correctly	s/	
1 st Level Reviewer:	11/10	
1st Level Reviewer:	1211	7110
Comments:		
		



Test America - Sacramento

Sample Dilution Record

Method ID PFC_IDA	Job# 320-24209
Analyst (Print Name) They Phonesogue	Analyst Initials
Date 12/31/14	

Sample#	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
24209	500	15	1500	loox
14209-2	300		1500	100%
24209-2	5.00	15		
4.4	500	15	1500	100%
24209-4	500	15	1500	100%
			7,300	1057
/			· ·	+
(<i>\$</i>			
				T/12/31/16

Comments:			
		·	

Shipping and Receiving Documents

6	3	CHAIN OF C	JSTODY AND AN	ALYTICAL F	REQUEST	RECOF	RD		COC N	10. E.	Mize	716	Page		of			
		Project Name: FA 5 G	samuste - 1	· stars	100-						5 2 9		Proje	ct No.30	1279	La Phas	efi	£ '5
DEGUI	TIPTOM	Site Location: ARS TO.		,					Sam	iple A	nalysis l	Reque	sted (Enter nu	mber of c	ontainers	for each	test)
	Lution Ltants	CTO No. JAY 7 9	RC Project Manager:	Tour a	L' bev				(3)→									
Sampler/S	ite Phone#				7	,			1	531							/MSD	
Lab Name	Test H	merica Sacrema	Tur	maround Time	(specify):	21 -	Du		ntainers	- 3							for MS	
Lab ID	Sample ID (sys_samp_co		Location ID (sys_loc_code)	Date (mm/dd/yy)	Time (Military) (hhmm)	Matrix Code (1)	Sample Type (2)	Field Filtered (Y/N)	Total No. of Containers	みない 海							Extra Volume for MS/MSD	НОГР
	308 A.	1 MU - LF - 1214	30 2 A 5 1 MW.	12 7 14	1345	199	7	1	2	X								
	7 winus	-61-1514	Susmal-of	12/7/16	1445	49	H	N	2	4								
	TETAS!	1.ML - 1214	FITH STAN	12/7/14	0355	Win	N	14	2	X								
	SIJMHI	- 62 - 1216	50,000 1 - 02	12/7/14	1250	WG	/-	N	2	X								
											-	-						
						-											=	
											_	320-241	84 Ch	ain of Cus	stody	1 1	_	
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Relinquist	ned by (signal	ture) ¹	Date	Time 1630	Received 1 Juny 2	by (sign	ature)	Thoy	.Tur	pen	Date 12/9/1	Time ([C	00	The same of the	of Shipm	eck) Yes_ ent: 46		
3					3					-			Ħ		nipped: 1	-1-1-	2016	-

(1) AA=Ambient air, AQ=Air quality control, ASB=Asbestos, CK=Caulk, DS=Storm drain sediment, GS=Soil gas, 1C=IDW Concrete, IDD=IDW Solid, IDS=IDW water, LF=Free Product, MA=Mastic, PC=Paint Chips, SC=Cement/Concrete, SE=Sediment, SL=Sludge, SO=Soil, SQ=Soil/Solid quality control, SSD=Subsurface sediment, SU=Surface soil (<6 in), SW=Swab or wipe, TA=Animal tissue, TP=Plant tissue, TQ=Tissue quality control, WG=Ground water, WL=Leachate, WO=Ocean water, WQ=Water quality control, WR=Ground water effluent, WS=Surface water, WU=Storm water, WW=Water quality control, WR=Ground water effluent, WS=Surface water, WU=Storm water, WW=Water quality control, WR=Ground water, WD=Drinking water, WD=Drin

(2) Sample Type: AB=Ambient Blk, EB=Equipment Blk, FB=Field Blk, FD=Field Duplicate Sample, IDW=Investigative-Derived Waste, MIS=Incremental Sampling Methodology, N=Normal Environmental Sample, TB=Trip Blk

(3) Preservative added: HA=Hydrochloric Acid, NI=Nitric Acid, SH=Sodium Hydroxide, SA=Sulfuric Acid, ME=Methanol, SB=sodium bisulfate, ST=Sodium Thiosulfate, If NO preservative added leave blank

Rev 5/12

Login Sample Receipt Checklist

Client: EnSafe, Inc.

Job Number: 320-24184-1

Login Number: 24184 List Source: TestAmerica Sacramento

List Number: 1

Creator: Edman, Connor M

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

SOUTHEAST DALLAS_NAS 320-24184-1 SWMU 00001 SWMU 00001 30809MW Monitoring well 2438588.837 6952047.867 N6247011D8013 JM37 RESOLUTION CONSULTANTS SWMU1-02-1216 Ground water Normal (Regular) 7-Dec-16 537_MOD Perfluoroalkyl Compounds 20170918061901.																		
SOUTHEAST DALLAS_NAS 320-24184-1 SWMU 00001 SWMU 00001 30809MW Monitoring well 2438588.837 6952047.867 N6247011D8013 JM37 RESOLUTION CONSULTANTS SWMU1-02-1216 Ground water Normal (Regular) 7-Dec-16 537_MOD Perfluoroalkyl Compounds 20170918061901.	DODCMD_ID INSTALLATION	N_ID SDG	SITE_NAME NORM_SITE_N	IAME LOCATION_NAN	ME LOCATION_TYPE_DESC	COORD_X	COORD_Y	CONTRACT_ID	DO_CTO_NUMBER	R CONTR_NAME		SAMPLE_NAME	SAMPLE_MATRIX_	DESC SAMPLE_TYPE_DESC	COLLECT_DAT	E ANALYTICAL_METHOD	ANALYTICAL_METHOD_GRP_DESC	RES_META_ID
	SOUTHEAST DALLAS_NAS	320-2418	84-1 SWMU 00001 SWMU 00001	30807MW	Monitoring well	2438337.552	6951512.294	N6247011D8013	JM37	RESOLUTION CONSU	JLTANTS	SWMU1-01-1216	Ground water	Normal (Regular)	7-Dec-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00
	SOUTHEAST DALLAS_NAS	320-2418	84-1 SWMU 00001 SWMU 00001	30809MW	Monitoring well	2438588.837	6952047.867	N6247011D8013	JM37	RESOLUTION CONSU	JLTANTS	SWMU1-02-1216	Ground water	Normal (Regular)	7-Dec-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00
SOUTHEAST DALLAS_NAS 320-24184-1 SWMU 00004 SWMU 00004 FSS3TMW Temporary well point 2440456.543 6956806.25 N6247011D8013 JM37 RESOLUTION CONSULTANTS FSS3TMW-1216 Ground water Normal (Regular) 7-Dec-16 537_MOD Perfluoroalkyl Compounds 20170918061901.0	SOUTHEAST DALLAS_NAS	320-2418	84-1 SWMU 00004 SWMU 00004	FSS3TMW	Temporary well point	2440456.543	6956806.25	N6247011D8013	JM37	RESOLUTION CONSU	JLTANTS	FSS3TMW-1216	Ground water	Normal (Regular)	7-Dec-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00
SOUTHEAST DALLAS_NAS 320-24184-1 SWMU 00006 SWMU 00006 308A51MW Monitoring well 2437817.046 6952017.295 N6247011D8013 JM37 RESOLUTION CONSULTANTS 308A51MW-LF-1216 Ground water Normal (Regular) 7-Dec-16 537_MOD Perfluoroalkyl Compounds 20170918061901.	SOUTHEAST DALLAS_NAS	320-2418	84-1 SWMU 00006 SWMU 00006	308A51MW	Monitoring well	2437817.046	6952017.295	N6247011D8013	JM37	RESOLUTION CONSU	JLTANTS	308A51MW-LF-1216	Ground water	Normal (Regular)	7-Dec-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00
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