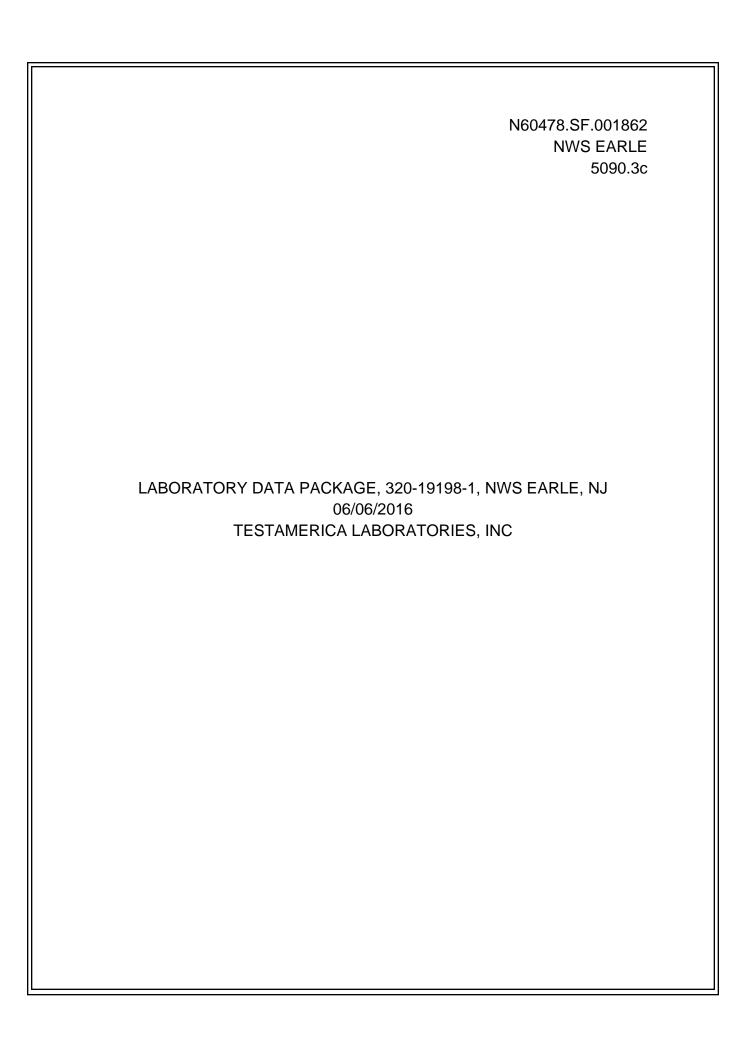


Groundwater Sample Results,
Combined Level 2 and Level 4 Laboratory Report,
Electronic Data Deliverable, Data Validation Report,
and the Sample Location Report, SDG 320-19198-1

Naval Weapons Station Earle Colts Neck, New Jersey

July 2019





ANALYTICAL REPORT

Job Number: 320-19198-1

Job Description: Ensafe-NWS-Earle, NJ PFCs Potable Water

For: Earth Toxics, Inc PO BOX 3382 Logan, UT 84321

Attention: Mike Dryden

Approved for release Michelle A Johnston Project Manager II 6/6/2016 2:26 PM

Michelle A Johnston, Project Manager II 4955 Yarrow Street, Arvada, CO, 80002 (303)736-0110 michelle.johnston@testamericainc.com 06/06/2016

Michelle A. Johns

cc: Tina Cantwell
Ms. Nicole Loos
Ms. Jennifer O'Keefe

The test results in this report relate only to the samples in this report and meet all requirements of NELAC, with any exceptions noted. Pursuant to NELAP, this report shall not be reproduced except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Denver Project Manager.

The Lab Certification ID# is 4025.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

TestAmerica Laboratories, Inc.

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Definitions/Glossary

Client: Earth Toxics, Inc TestAmerica Job ID: 320-19198-1

Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

Qualifiers

LCMS

Qualifier	Qualifier Description
M	Manual integrated compound.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
U	Undetected at the Limit of Detection.

Glossary

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

CASE NARRATIVE

Client: Earth Toxics, Inc.

Project: Ensafe-NWS Earle, NJ PFCs Potable Water

Report Number: 320-19198-1

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.

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.

Sample Receipt

The samples were received on 5/28/2016 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.6° C.

The sample collection time on the container labels for sample FB-DW-57 (320-19198-2) do not match the information on the chain of custody. The container labels list a collection time of 1128 while the chain of custody lists a collection time of 1105. The laboratory logged the sample collection time per the chain of custody. The client was notified on 5/31/2016.

The analyses were revised to a 4 business day turn around time per client request on 6/2/2016 and approval by TestAmerica Sacramento Operations.

No other anomalies were encountered during sample receipt.

Perfluorinated Hydrocarbons (PFAS)

Samples DW-57 (320-19198-1), FB-DW-57 (320-19198-2), DW-95 (320-19198-3), FB-DW-95 (320-19198-4) and DUP-052616 (320-19198-5) were analyzed for Perfluorinated Hydrocarbons (PFC) in accordance with WS-LC-0025. The samples were prepared on 06/01/2016 and analyzed on 06/03/2016 and 06/04/2016.

Reporting limits and method detection limits have been adjusted accordingly for the initial volumes extracted.

The MS/MSD associated with prep batch 320-112069 was performed on sample DW-57 (320-19198-1). The MS/MSD spike compound recoveries and RPD data could not be reliably calculated for Perfluorooctanesulfonic acid (PFOS) because the sample concentration was greater than four times the spike amounts. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary. The associated data in the parent sample has been flagged "J" in accordance with the DOD QSM.

The level 1 standard from the ICAL (ICV 320-112504/12) is used to evaluate the tune criteria. The instrument mass windows are set at +/ -0.5 amu. Detection of the analyte serves as verification that the assigned mass is within +/-0.5 amu of the true value, which meets the DOD tune criterion.

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

Detection Summary

Client: Earth Toxics, Inc

Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

TestAmerica Job ID: 320-19198-1

Client Sample ID: I	DW-57						Lab Sa	mple ID: 32	20-19198-
Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	2.9		2.4	1.9	0.88	ng/L		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.5		2.4	1.9	0.77	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	35	M	2.4	1.9	0.83	ng/L	1	WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	2.0	J	2.4	1.9	0.63	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	150	M J	3.8	2.9	1.2	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	17	M	2.4	1.9	0.72	ng/L	1	WS-LC-0025	Total/NA
Client Sample ID: F	FB-DW-5	7					Lab Sa	mple ID: 32	20-19198
Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	1.5	J	2.4	1.9	0.87	ng/L		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.83	J M	2.4	1.9	0.82	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	7.5	М	3.8	2.8	1.2	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	0.71	J	2.4	1.9	0.71	ng/L	1	WS-LC-0025	Total/NA
Client Sample ID: I	DW-95						Lab Sa	mple ID: 32	20-19198-
Client Sample ID: [- Analyte		Qualifier	LOQ	LOD	DL	Unit	Lab Sa	•	
• •		Qualifier	LOQ 2.3	LOD		Unit ng/L		•	
Analyte Perfluorobutanesulfonic	Result	Qualifier			0.85		Dil Fac D	Method	Prep Type
Analyte Perfluorobutanesulfonic acid (PFBS) Perfluoroheptanoic acid	Result 3.3		2.3	1.9	0.85 0.75	ng/L	Dil Fac D	Method WS-LC-0025	Prep Type Total/NA
Analyte Perfluorobutanesulfonic acid (PFBS) Perfluoroheptanoic acid (PFHpA) Perfluorohexanesulfonic	3.3 13	М	2.3	1.9	0.85 0.75 0.81	ng/L	<u>Dil Fac</u> <u>D</u>	Method WS-LC-0025 WS-LC-0025	Prep Type Total/NA Total/NA
Analyte Perfluorobutanesulfonic acid (PFBS) Perfluoroheptanoic acid (PFHpA) Perfluorohexanesulfonic acid (PFHxS) Perfluorononanoic acid	Result 3.3 13 6.6	M	2.3 2.3 2.3 2.3 3.7	1.9 1.9 1.9 1.9 2.8	0.85 0.75 0.81 0.61 1.2	ng/L ng/L ng/L ng/L	Dil Fac D 1 1 1	Method WS-LC-0025 WS-LC-0025 WS-LC-0025 WS-LC-0025	Prep Type Total/NA Total/NA Total/NA Total/NA Total/NA
Analyte Perfluorobutanesulfonic acid (PFBS) Perfluoroheptanoic acid (PFHpA) Perfluorohexanesulfonic acid (PFHxS) Perfluorononanoic acid (PFNA) Perfluorooctanesulfonic	Result 3.3 13 6.6 1.4	M J M	2.3 2.3 2.3 2.3	1.9 1.9 1.9	0.85 0.75 0.81 0.61 1.2	ng/L ng/L ng/L	Dil Fac D 1 1 1 1	Method WS-LC-0025 WS-LC-0025 WS-LC-0025 WS-LC-0025	Prep Type Total/NA Total/NA Total/NA Total/NA
Analyte Perfluorobutanesulfonic acid (PFBS) Perfluoroheptanoic acid (PFHpA) Perfluorohexanesulfonic acid (PFHxS) Perfluorononanoic acid (PFNA) Perfluorooctanesulfonic acid (PFOS) Perfluorooctanoic acid	Result 3.3 13 6.6 1.4 37 55	M J M	2.3 2.3 2.3 2.3 3.7	1.9 1.9 1.9 1.9 2.8	0.85 0.75 0.81 0.61 1.2	ng/L ng/L ng/L ng/L	Dil Fac D 1 1 1 1 1 1 1	Method WS-LC-0025 WS-LC-0025 WS-LC-0025 WS-LC-0025	Prep Type Total/NA Total/NA Total/NA Total/NA Total/NA Total/NA
Analyte Perfluorobutanesulfonic acid (PFBS) Perfluoroheptanoic acid (PFHpA) Perfluorohexanesulfonic acid (PFHxS) Perfluorononanoic acid (PFNA) Perfluorooctanesulfonic acid (PFOS) Perfluorooctanoic acid (PFOS)	Result 3.3 13 6.6 1.4 37 55	M J M	2.3 2.3 2.3 2.3 3.7	1.9 1.9 1.9 1.9 2.8	0.85 0.75 0.81 0.61 1.2 0.70	ng/L ng/L ng/L ng/L	Dil Fac D 1 1 1 1 1 1 1	Method WS-LC-0025 WS-LC-0025 WS-LC-0025 WS-LC-0025 WS-LC-0025 WS-LC-0025	Prep Type Total/NA Total/NA Total/NA Total/NA Total/NA Total/NA
Analyte Perfluorobutanesulfonic acid (PFBS) Perfluoroheptanoic acid (PFHpA) Perfluorohexanesulfonic acid (PFHxS) Perfluorononanoic acid (PFNA) Perfluorooctanesulfonic acid (PFOS) Perfluorooctanoic acid (PFOA) Client Sample ID: F	Result 3.3 13 6.6 1.4 37 55	M M M S Qualifier	2.3 2.3 2.3 2.3 3.7 2.3	1.9 1.9 1.9 1.9 2.8 1.9	0.85 0.75 0.81 0.61 1.2 0.70	ng/L ng/L ng/L ng/L ng/L	1 1 1 1 Lab Sa	Method WS-LC-0025 WS-LC-0025 WS-LC-0025 WS-LC-0025 WS-LC-0025 WS-LC-0025	Prep Type Total/NA Total/NA Total/NA Total/NA Total/NA Total/NA Total/NA
Analyte Perfluorobutanesulfonic acid (PFBS) Perfluoroheptanoic acid (PFHpA) Perfluorohexanesulfonic acid (PFHxS) Perfluorononanoic acid (PFNA) Perfluorooctanesulfonic acid (PFOS) Perfluorooctanoic acid (PFOA) Client Sample ID: F Analyte Perfluorobutanesulfonic	Result 3.3 13 6.6 1.4 37 55 FB-DW-9	M M M S Qualifier J	2.3 2.3 2.3 2.3 3.7 2.3	1.9 1.9 1.9 2.8 1.9	0.85 0.75 0.81 0.61 1.2 0.70 DL 0.86	ng/L ng/L ng/L ng/L ng/L	Dil Fac D 1 1 1 1 1 1 1 1 Dil Fac D	Method WS-LC-0025 WS-LC-0025 WS-LC-0025 WS-LC-0025 WS-LC-0025 WS-LC-0025	Prep Type Total/NA Total/NA Total/NA Total/NA Total/NA Total/NA Total/NA Prep Type
Analyte Perfluorobutanesulfonic acid (PFBS) Perfluoroheptanoic acid (PFHpA) Perfluorohexanesulfonic acid (PFHxS) Perfluorononanoic acid (PFNA) Perfluorooctanesulfonic acid (PFOS) Perfluorooctanoic acid (PFOA) Client Sample ID: F Analyte Perfluorobutanesulfonic acid (PFBS) Perfluorononanoic acid	Result 3.3 13 6.6 1.4 37 55 FB-DW-9 Result 1.2	M M M 5 Qualifier J	2.3 2.3 2.3 2.3 3.7 2.3 LOQ 2.3	1.9 1.9 1.9 2.8 1.9 LOD 1.9	0.85 0.75 0.81 0.61 1.2 0.70 DL 0.86 0.61	ng/L ng/L ng/L ng/L ng/L ng/L	Dil Fac D 1 1 1 1 1 1 1 1 Dil Fac D 1	Method WS-LC-0025 WS-LC-0025 WS-LC-0025 WS-LC-0025 WS-LC-0025 MS-LC-0025 MS-LC-0025	Prep Type Total/NA Total/NA Total/NA Total/NA Total/NA Total/NA Prep Type Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Detection Summary

Client: Earth Toxics, Inc

(PFOA)

Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

TestAmerica Job ID: 320-19198-1

Client Sample ID: DUP-052616 ((Continued)
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Client Sample ID: [OUP-052	Lab S	Lab Sample ID: 320-19198-5							
Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	3.1		2.4	1.9	0.88	ng/L	1	_	WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	13		2.4	1.9	0.77	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.9	M	2.4	1.9	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	1.8	J	2.4	1.9	0.63	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	46	М	3.8	2.9	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid	58	M	2.4	1.9	0.72	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Earth Toxics, Inc TestAmerica Job ID: 320-19198-1

Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

Client Sample ID: DW-57 Lab Sample ID: 320-19198-1

Date Collected: 05/26/16 11:01 Matrix: Water Date Received: 05/28/16 09:00

Analyte	Res	ult	Qualifier	L	.OQ	LOD	DL	Unit D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	7	2.9			2.4	1.9	0.88	ng/L	06/03/16 22:09	1
Perfluoroheptanoic acid (PFHpA)	4	1.5			2.4	1.9	0.77	ng/L	06/03/16 22:09	1
Perfluorohexanesulfonic acid (PFHxS)		35	M		2.4	1.9	0.83	ng/L	06/03/16 22:09	1
Perfluorononanoic acid (PFNA)	:	2.0	J		2.4	1.9	0.63	ng/L	06/03/16 22:09	1
Perfluorooctanesulfonic acid (PFOS)	1	50	ΜJ		3.8	2.9	1.2	ng/L	06/03/16 22:09	1
Perfluorooctanoic acid (PFOA)		17	M		2.4	1.9	0.72	ng/L	06/03/16 22:09	1
Isotope Dilution	%Recovery	Qu	ıalifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	87			25 - 150	_			06/01/16 11:06	06/03/16 22:09	1
13C4 PFOA	70			25 - 150				06/01/16 11:06	06/03/16 22:09	1
13C4 PFOS	112			25 - 150				06/01/16 11:06	06/03/16 22:09	1
13C4-PFHpA	80			25 - 150				06/01/16 11:06	06/03/16 22:09	1
13C5 PFNA	51			25 - 150				06/01/16 11:06	06/03/16 22:09	1
1802 PFHxS	128			25 - 150				06/01/16 11:06	06/03/16 22:09	1

Client: Earth Toxics, Inc TestAmerica Job ID: 320-19198-1

Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

Client Sample ID: FB-DW-57 Lab Sample ID: 320-19198-2

Date Collected: 05/26/16 11:05 Matrix: Water Date Received: 05/28/16 09:00

Method: WS-LC-0025 - Perfluorinated Hydrocarbons LOD Result Qualifier LOQ Analyte DL Unit D Dil Fac Analyzed Perfluorobutanesulfonic acid (PFBS) 1.5 J 2.4 1.9 0.87 ng/L 06/03/16 23:13 Perfluoroheptanoic acid (PFHpA) 1.9 U 2.4 06/03/16 23:13 1.9 0.76 ng/L 1 Perfluorohexanesulfonic acid 0.83 J M 2.4 1.9 0.82 ng/L 06/03/16 23:13 1 (PFHxS) Perfluorononanoic acid (PFNA) 1.9 U 2.4 1.9 0.62 ng/L 06/03/16 23:13 1 Perfluorooctanesulfonic acid (PFOS) 3.8 2.8 1.2 ng/L 06/03/16 23:13 7.5 M 1 Perfluorooctanoic acid (PFOA) 0.71 J 2.4 1.9 0.71 ng/L 06/03/16 23:13 1 Isotope Dilution %Recovery Qualifier Limits Prepared Analyzed Dil Fac 13C2 PFHxA 25 - 150 06/01/16 11:06 06/03/16 23:13 1 112 13C4 PFOA 123 25 - 150 06/01/16 11:06 06/03/16 23:13 1 13C4 PFOS 06/01/16 11:06 06/03/16 23:13 121 25 - 150 1 13C4-PFHpA 113 25 - 150 06/01/16 11:06 06/03/16 23:13 1 13C5 PFNA 117 25 - 150 06/01/16 11:06 06/03/16 23:13 1 1802 PFHxS 120 25 - 150 06/01/16 11:06 06/03/16 23:13 1

Client: Earth Toxics, Inc TestAmerica Job ID: 320-19198-1

Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

Client Sample ID: DW-95 Lab Sample ID: 320-19198-3

Date Collected: 05/26/16 11:26 Matrix: Water Date Received: 05/28/16 09:00

Analyte	Res	ult	Qualifier	L	.OQ	LOD	DL	Unit D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)		3.3			2.3	1.9	0.85	ng/L	06/03/16 23:34	1
Perfluoroheptanoic acid (PFHpA)		13			2.3	1.9	0.75	ng/L	06/03/16 23:34	1
Perfluorohexanesulfonic acid (PFHxS)		6.6	М		2.3	1.9	0.81	ng/L	06/03/16 23:34	1
Perfluorononanoic acid (PFNA)		1.4	J		2.3	1.9	0.61	ng/L	06/03/16 23:34	1
Perfluorooctanesulfonic acid (PFOS)	1	37	M		3.7	2.8	1.2	ng/L	06/03/16 23:34	1
Perfluorooctanoic acid (PFOA)		55	M		2.3	1.9	0.70	ng/L	06/03/16 23:34	1
Isotope Dilution	%Recovery	Qu	ıalifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	94			25 - 150	=			06/01/16 11:06	06/03/16 23:34	1
13C4 PFOA	59			25 - 150				06/01/16 11:06	06/03/16 23:34	1
13C4 PFOS	99			25 - 150				06/01/16 11:06	06/03/16 23:34	1
13C4-PFHpA	88			25 - 150				06/01/16 11:06	06/03/16 23:34	1
13C5 PFNA	35			25 - 150				06/01/16 11:06	06/03/16 23:34	1
1802 PFHxS	120			25 - 150				06/01/16 11:06	06/03/16 23:34	1

Client: Earth Toxics, Inc TestAmerica Job ID: 320-19198-1

Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

Client Sample ID: FB-DW-95 Lab Sample ID: 320-19198-4

Date Collected: 05/26/16 11:28 Matrix: Water Date Received: 05/28/16 09:00

Analyte	Res	ult	Qualifier	L	.OQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)) 1	1.2	J		2.3	1.9	0.86	ng/L	_	06/03/16 23:55	1
Perfluoroheptanoic acid (PFHpA)	1	1.9	U		2.3	1.9	0.75	ng/L		06/03/16 23:55	1
Perfluorohexanesulfonic acid (PFHxS)	1	1.9	U		2.3	1.9	0.81	ng/L		06/03/16 23:55	1
Perfluorononanoic acid (PFNA)	0.	64	J		2.3	1.9	0.61	ng/L		06/03/16 23:55	1
Perfluorooctanesulfonic acid (PFOS))	13	M		3.7	2.8	1.2	ng/L		06/03/16 23:55	1
Perfluorooctanoic acid (PFOA)	0.	75	J		2.3	1.9	0.70	ng/L		06/03/16 23:55	1
Isotope Dilution	%Recovery	Qu	alifier	Limits				Prepared		Analyzed	Dil Fac
13C2 PFHxA	108			25 - 150	-			06/01/16 11:0	06	06/03/16 23:55	1
13C4 PFOA	123			25 - 150				06/01/16 11:0	06	06/03/16 23:55	1
13C4 PFOS	117			25 - 150				06/01/16 11:0	06	06/03/16 23:55	1
13C4-PFHpA	109			25 - 150				06/01/16 11:0	26	06/03/16 23:55	1
13C5 PFNA	112			25 - 150				06/01/16 11:0	06	06/03/16 23:55	1
1802 PFHxS	115			25 - 150				06/01/16 11:0	26	06/03/16 23:55	1

Client: Earth Toxics, Inc TestAmerica Job ID: 320-19198-1

Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

Client Sample ID: DUP-052616 Lab Sample ID: 320-19198-5

Date Collected: 05/26/16 11:26 Matrix: Water Date Received: 05/28/16 09:00

Analyte	Res	ult	Qualifier	L	.OQ	LOD	DL	Unit D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)		3.1			2.4	1.9	0.88	ng/L	06/04/16 00:17	1
Perfluoroheptanoic acid (PFHpA)		13			2.4	1.9	0.77	ng/L	06/04/16 00:17	1
Perfluorohexanesulfonic acid (PFHxS)		6.9	M		2.4	1.9	0.83	ng/L	06/04/16 00:17	1
Perfluorononanoic acid (PFNA)		1.8	J		2.4	1.9	0.63	ng/L	06/04/16 00:17	1
Perfluorooctanesulfonic acid (PFOS)		46	M		3.8	2.9	1.2	ng/L	06/04/16 00:17	1
Perfluorooctanoic acid (PFOA)		58	M		2.4	1.9	0.72	ng/L	06/04/16 00:17	1
Isotope Dilution	%Recovery	Qu	alifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	80			25 - 150	-			06/01/16 11:06	06/04/16 00:17	1
13C4 PFOA	57			25 - 150				06/01/16 11:06	06/04/16 00:17	1
13C4 PFOS	98			25 - 150				06/01/16 11:06	06/04/16 00:17	1
13C4-PFHpA	77			25 - 150				06/01/16 11:06	06/04/16 00:17	1
13C5 PFNA	46			25 - 150				06/01/16 11:06	06/04/16 00:17	1
1802 PFHxS	116			25 - 150				06/01/16 11:06	06/04/16 00:17	1

Default Detection Limits

Client: Earth Toxics, Inc TestAmerica Job ID: 320-19198-1

Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Prep: 3535

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	2.5	0.92	ng/L	WS-LC-0025
Perfluoroheptanoic acid (PFHpA)	2.5	0.80	ng/L	WS-LC-0025
Perfluorohexanesulfonic acid (PFHxS)	2.5	0.87	ng/L	WS-LC-0025
Perfluorononanoic acid (PFNA)	2.5	0.65	ng/L	WS-LC-0025
Perfluorooctanesulfonic acid (PFOS)	4.0	1.3	ng/L	WS-LC-0025
Perfluorooctanoic acid (PFOA)	2.5	0.75	ng/L	WS-LC-0025

Isotope Dilution Summary

Client: Earth Toxics, Inc TestAmerica Job ID: 320-19198-1

Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Matrix: Water Prep Type: Total/NA

_		Percent Isotope Dilution Recovery (Acceptance Limits						
		3C2 PFHx	3C4 PFO/	3C4 PFOS	3C4-PFHp	3C5 PFN/	3O2 PFHx	
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	
20-19198-1	DW-57	87	70	112	80	51	128	
20-19198-1 MS	DW-57	79	61	102	72	49	117	
20-19198-1 MSD	DW-57	83	69	107	79	55	121	
20-19198-2	FB-DW-57	112	123	121	113	117	120	
)-19198-3	DW-95	94	59	99	88	35	120	
0-19198-4	FB-DW-95	108	123	117	109	112	115	
20-19198-5	DUP-052616	80	57	98	77	46	116	
CS 320-112069/2-A	Lab Control Sample	108	116	117	111	104	115	
1B 320-112069/1-A	Method Blank	107	116	112	116	117	116	

Surrogate Legend

13C2 PFHxA = 13C2 PFHxA

13C4 PFOA = 13C4 PFOA

13C4 PFOS = 13C4 PFOS

13C4-PFHpA = 13C4-PFHpA

13C5 PFNA = 13C5 PFNA

18O2 PFHxS = 18O2 PFHxS

QC Sample Results

Client: Earth Toxics, Inc

Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

TestAmerica Job ID: 320-19198-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-112069/1-A

Matrix: Water

Analysis Batch: 112504

Client Sample ID: Method Blank Prep Type: Total/NA Prep Batch: 112069

ı		MB	MB							
	Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Perfluorobutanesulfonic acid (PFBS)	2.0	U	2.5	2.0	0.92	ng/L		06/03/16 21:26	1
	Perfluoroheptanoic acid (PFHpA)	2.0	U	2.5	2.0	0.80	ng/L		06/03/16 21:26	1
	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	2.5	2.0	0.87	ng/L		06/03/16 21:26	1
	Perfluorononanoic acid (PFNA)	2.0	U	2.5	2.0	0.65	ng/L		06/03/16 21:26	1
	Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	3.0	1.3	ng/L		06/03/16 21:26	1
	Perfluorooctanoic acid (PFOA)	2.0	U	2.5	2.0	0.75	ng/L		06/03/16 21:26	1

MAD

Isotope Dilution	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	107	25 - 150	06/01/16 11:06	06/03/16 21:26	1
13C4 PFOA	116	25 - 150	06/01/16 11:06	06/03/16 21:26	1
13C4 PFOS	112	25 - 150	06/01/16 11:06	06/03/16 21:26	1
13C4-PFHpA	116	25 - 150	06/01/16 11:06	06/03/16 21:26	1
13C5 PFNA	117	25 - 150	06/01/16 11:06	06/03/16 21:26	1
1802 PFHxS	116	25 - 150	06/01/16 11:06	06/03/16 21:26	1

Lab Sample ID: LCS 320-112069/2-A

Matrix: Water

Analysis Batch: 112504

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

Prep Batch: 112069

7 man, 6 10 2 and 11 1 2 0 0 1	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Perfluorobutanesulfonic acid (PFBS)	35.4	35.9		ng/L		101	50 - 150
Perfluoroheptanoic acid (PFHpA)	40.0	44.8		ng/L		112	60 - 140
Perfluorohexanesulfonic acid (PFHxS)	36.4	37.5	М	ng/L		103	60 - 140
Perfluorononanoic acid (PFNA)	40.0	45.3		ng/L		113	60 - 140
Perfluorooctanesulfonic acid (PFOS)	37.1	38.5	М	ng/L		104	60 - 140
Perfluorooctanoic acid (PFOA)	40.0	39.7		ng/L		99	60 - 140
LCS	LCS						

S

Isotope Dilution	%Recovery	Qualifier	Limits
13C2 PFHxA	108		25 - 150
13C4 PFOA	116		25 - 150
13C4 PFOS	117		25 - 150
13C4-PFHpA	111		25 - 150
13C5 PFNA	104		25 - 150
1802 PFHxS	115		25 - 150

Lab Sample ID: 320-19198-1 MS

Matrix: Water

Analysis Batch: 112504

Client Sample ID: DW-57 Prep Type: Total/NA

Prep Batch: 112069

	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Perfluorobutanesulfonic acid (PFBS)	2.9		33.2	34.8		ng/L		96	50 - 150
Perfluoroheptanoic acid (PFHpA)	4.5		37.6	45.1		ng/L		108	60 - 140
Perfluorohexanesulfonic acid (PFHxS)	35	M	34.2	72.4	M	ng/L		110	60 - 140
Perfluorononanoic acid (PFNA)	2.0	J	37.6	44.0		ng/L		112	60 - 140

QC Sample Results

Client: Earth Toxics, Inc

TestAmerica Job ID: 320-19198-1 Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: 320-19198 Matrix: Water Analysis Batch: 112504								Clie	ent Sample ID: DW-57 Prep Type: Total/NA Prep Batch: 112069
	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Perfluorooctanesulfonic acid (PFOS)	150	M J	34.9	189	M 4	ng/L		120	60 - 140
Perfluorooctanoic acid (PFOA)	17	M	37.6	59.6	M	ng/L		113	60 ₋ 140
	MS	MS							
Isotope Dilution	%Recovery	Qualifier	Limits						
13C2 PFHxA	79		25 - 150						
13C4 PFOA	61		25 - 150						
13C4 PFOS	102		25 - 150						
13C4-PFHpA	72		25 - 150						
13C5 PFNA	49		25 - 150						
1802 PFHxS	117		25 - 150						

Lab Sample ID: 320-19198-1 MSD

Matrix: Water

Analysis Batch: 112504

Client Sample ID: DW-57

Prep Type: Total/NA Prep Batch: 112069

, , , , , , , , , , , , , , , , , , , ,	Sample	Sample	Spike	Men	MSD				%Rec.		RPD
	Sample	Sample	Shike	IVISD	MISD				MREC.		
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Perfluorobutanesulfonic acid (PFBS)	2.9		33.6	38.0		ng/L		104	50 - 150	9	30
Perfluoroheptanoic acid (PFHpA)	4.5		38.0	46.4		ng/L		110	60 - 140	3	30
Perfluorohexanesulfonic acid (PFHxS)	35	M	34.6	73.8	М	ng/L		113	60 - 140	2	30
Perfluorononanoic acid (PFNA)	2.0	J	38.0	41.9		ng/L		105	60 - 140	5	30
Perfluorooctanesulfonic acid (PFOS)	150	M J	35.3	198	M 4	ng/L		142	60 - 140	4	30
Perfluorooctanoic acid (PFOA)	17	M	38.0	54.8	M	ng/L		99	60 - 140	9	30
	MSD	MSD									

	MSD	MSD	
Isotope Dilution	%Recovery	Qualifier	Limits
13C2 PFHxA	83		25 - 150
13C4 PFOA	69		25 - 150
13C4 PFOS	107		25 - 150
13C4-PFHpA	79		25 - 150
13C5 PFNA	55		25 - 150
1802 PFHxS	121		25 - 150

QC Association Summary

Client: Earth Toxics, Inc

Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

LCMS

Prep Batch: 112069

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19198-1	DW-57	Total/NA	Water	3535	_
320-19198-1 MS	DW-57	Total/NA	Water	3535	
320-19198-1 MSD	DW-57	Total/NA	Water	3535	
320-19198-2	FB-DW-57	Total/NA	Water	3535	
320-19198-3	DW-95	Total/NA	Water	3535	
320-19198-4	FB-DW-95	Total/NA	Water	3535	
320-19198-5	DUP-052616	Total/NA	Water	3535	
LCS 320-112069/2-A	Lab Control Sample	Total/NA	Water	3535	
MB 320-112069/1-A	Method Blank	Total/NA	Water	3535	

Analysis Batch: 112504

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19198-1	DW-57	Total/NA	Water	WS-LC-0025	112069
320-19198-1 MS	DW-57	Total/NA	Water	WS-LC-0025	112069
320-19198-1 MSD	DW-57	Total/NA	Water	WS-LC-0025	112069
320-19198-2	FB-DW-57	Total/NA	Water	WS-LC-0025	112069
320-19198-3	DW-95	Total/NA	Water	WS-LC-0025	112069
320-19198-4	FB-DW-95	Total/NA	Water	WS-LC-0025	112069
320-19198-5	DUP-052616	Total/NA	Water	WS-LC-0025	112069
LCS 320-112069/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	112069
MB 320-112069/1-A	Method Blank	Total/NA	Water	WS-LC-0025	112069

TestAmerica Job ID: 320-19198-1

Lab Chronicle

Client: Earth Toxics, Inc.

Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

Lab Sample ID: 320-19198-1 Client Sample ID: DW-57

Date Collected: 05/26/16 11:01 **Matrix: Water**

Date Received: 05/28/16 09:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			523 mL	1.00 mL	112069	06/01/16 11:06	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	523 mL	1.00 mL	112504	06/03/16 22:09	JRB	TAL SAC
	Instrume	nt ID: A6								

Lab Sample ID: 320-19198-2 Client Sample ID: FB-DW-57

Date Collected: 05/26/16 11:05

Date Received: 05/28/16 09:00

Prep Type Total/NA	Batch Type Prep	Batch Method 3535	Run	Dil Factor	Initial Amount 530.2 mL	Final Amount 1.00 mL	Batch Number 112069	Prepared or Analyzed 06/01/16 11:06	Analyst	Lab TAL SAC
Total/NA	Analysis	WS-LC-0025 nt ID: A6		1	530.2 mL	1.00 mL	112504	06/03/16 23:13		TAL SAC

Lab Sample ID: 320-19198-3 Client Sample ID: DW-95

Date Collected: 05/26/16 11:26

Date Received: 05/28/16 09:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			537.1 mL	1.00 mL	112069	06/01/16 11:06	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	537.1 mL	1.00 mL	112504	06/03/16 23:34	JRB	TAL SAC
	Instrume	nt ID: A6								

Client Sample ID: FB-DW-95 Lab Sample ID: 320-19198-4 **Matrix: Water**

Date Collected: 05/26/16 11:28

Date Received: 05/28/16 09:00

		Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep T	ype	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/N	IA .	Prep	3535			535.7 mL	1.00 mL	112069	06/01/16 11:06	SNE	TAL SAC
Total/N	IA	Analysis	WS-LC-0025		1	535.7 mL	1.00 mL	112504	06/03/16 23:55	JRB	TAL SAC
		Instrumer	nt ID: A6								

Client Sample ID: DUP-052616 Lab Sample ID: 320-19198-5 **Matrix: Water**

Date Collected: 05/26/16 11:26

Date Received: 05/28/16 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			521.1 mL	1.00 mL	112069	06/01/16 11:06	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	521.1 mL	1.00 mL	112504	06/04/16 00:17	JRB	TAL SAC
	Instrume	nt ID: A6								

Laboratory References:

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

TestAmerica Job ID: 320-19198-1

Matrix: Water

Matrix: Water

Certification Summary

Client: Earth Toxics, Inc TestAmerica Job ID: 320-19198-1

Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

Laboratory: TestAmerica Sacramento

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17
New Jersey	NELAP	2	CA005	06-30-16

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

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP	· ·	2907.01	10-31-17
New Jersey	NELAP	2	CO004	06-30-16

Method Summary

Client: Earth Toxics, Inc

Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

TestAmerica Job ID: 320-19198-1

Method	Method Description	Protocol	Laboratory
WS-LC-0025	Perfluorinated Hydrocarbons	TAL SOP	TAL SAC

Protocol References:

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

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

Sample Summary

Client: Earth Toxics, Inc

Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

TestAmerica Job ID: 320-19198-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-19198-1	DW-57	Water	05/26/16 11:01	05/28/16 09:00
320-19198-2	FB-DW-57	Water	05/26/16 11:05	05/28/16 09:00
320-19198-3	DW-95	Water	05/26/16 11:26	05/28/16 09:00
320-19198-4	FB-DW-95	Water	05/26/16 11:28	05/28/16 09:00
320-19198-5	DUP-052616	Water	05/26/16 11:26	05/28/16 09:00

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 112504

Lab Sample ID: STD 320-112504/4 IC Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION				
	TIME	REASON	ANALYST	DATE		
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	barnettj	06/06/16 11:28		

Lab Sample ID: STD 320-112504/5 IC Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION				
	TIME	REASON	ANALYST	DATE		
Perfluorohexanesulfonic acid	9.49	Isomers	westendor	06/04/16 11:01		
(PFHxS)			fc			
Perfluorooctanesulfonic acid	11.52	Isomers	westendor	06/04/16 11:01		
(PFOS)			fc			

Lab Sample ID: STD 320-112504/6 IC Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	westendor fc	06/04/16 11:02
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendor fc	06/04/16 11:02

Lab Sample ID: STD 320-112504/7 IC Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorohexanesulfonic acid	9.49	Assigned Peak	westendor	06/04/16 11:33
(PFHxS)			fc	
Perfluorooctanesulfonic acid	11.54	Isomers	westendor	06/04/16 11:02
(PFOS)			fc	

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 112504

Lab Sample ID: STD 320-112504/8 IC Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	westendor fc	06/04/16 11:03
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendor fc	06/04/16 11:03

Lab Sample ID: STD 320-112504/9 IC Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION				
	TIME	REASON	ANALYST	DATE		
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	westendor fc	06/04/16 11:04		
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendor fc	06/04/16 11:04		

Lab Sample ID: STD 320-112504/10 IC Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION			
	TIME	REASON	ANALYST	DATE	
Perfluorohexanesulfonic acid (PFHxS)	9.50	Isomers	westendor fc	06/04/16 11:05	
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendor fc	06/04/16 11:05	

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 112504

Lab Sample ID: LCS 320-112069/2-A Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	westendor fc	06/04/16 11:18
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendor fc	06/04/16 11:18

Lab Sample ID: 320-19198-1 Client Sample ID: DW-57

COMPOUND NAME	RETENTION	MANUAL INTEGRATION			
	TIME	REASON	ANALYST	DATE	
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	barnettj	06/06/16 11:29	
Perfluorooctanoic acid (PFOA)	10.57	Isomers	westendor fc	06/04/16 11:19	
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendor fc	06/04/16 11:19	

Lab Sample ID: 320-19198-1 MS Client Sample ID: DW-57 MS

COMPOUND NAME	RETENTION	MANUAL INTEGRATION			
	TIME	REASON	ANALYST	DATE	
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	barnettj	06/06/16 11:30	
Perfluorooctanoic acid (PFOA)	10.58	Isomers	westendor fc	06/04/16 11:20	
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendor fc	06/04/16 11:20	

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 112504

Lab Sample ID: 320-19198-1 MSD Client Sample ID: DW-57 MSD

COMPOUND NAME	RETENTION	MANUAL INTEGRATION			
	TIME	REASON	ANALYST	DATE	
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	barnettj	06/06/16 11:30	
Perfluorooctanoic acid (PFOA)	10.57	Isomers	westendor fc	06/04/16 11:21	
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendor fc	06/04/16 11:21	

Lab Sample ID: 320-19198-2 Client Sample ID: FB-DW-57

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.51	Isomers	westendor fc	06/04/16 11:22
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendor fc	06/04/16 11:22

Lab Sample ID: 320-19198-3 Client Sample ID: DW-95

Date Analyzed: 06/03/16 23:34 Lab File ID: 03JUN2016A6A 021.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	westendor fc	06/04/16 11:23
Perfluorooctanoic acid (PFOA)	10.58	Isomers	westendor fc	06/04/16 11:23
Perfluorooctanesulfonic acid (PFOS)	11.54	Isomers	westendor fc	06/04/16 11:23

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 112504

Lab Sample ID: 320-19198-4 Client Sample ID: FB-DW-95

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendor fc	06/04/16 11:25

Lab Sample ID: 320-19198-5 Client Sample ID: DUP-052616

COMPOUND NAME	RETENTION	MANUAL INTE	EGRATION	
	TIME	REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	barnettj	06/06/16 11:32
Perfluorooctanoic acid (PFOA)	10.57	Isomers	westendor fc	06/04/16 11:26
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendor fc	06/04/16 11:26

Lab Sample ID: CCV 320-112504/25 Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTE	GRATION	
	TIME	REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.50	Isomers	westendor fc	06/04/16 11:27
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendor fc	06/04/16 11:27

Lab Na	ame:	TestAmerica	Sacramento	Job No.: 320-19198-1
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				Reagent	Parent Reager	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCMPFCSU_00042	11/23/16	05/27/16	Methanol, Lot Baker	5000 uL	LCM2PFHxDA_00005	100 uL	13C2-PFHxDA	1 ug/mL
			113333		LCM2PFTeDA 00005	100 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00005	100 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00006	100 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA 00009		13C8 FOSA	1 ug/mL
					LCMPFBA 00006	100 uL	13C4 PFBA	1 ug/mL
					LCMPFDA 00007	100 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA 00006	100 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00008	100 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00006	100 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA 00005	100 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00010		13C4 PFOA	1 ug/mL
					LCMPFOS 00012		13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00007		13C2 PFUnA	1 ug/mL
.LCM2PFHxDA 00005	01/07/21	Wellingt	on Laboratories, Lot M2	2PFHxDA1112	(Purchased Reag		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA 00005	12/07/20		on Laboratories, Lot M2		(Purchased Reag	ent)	13C2-PFTeDA	50 ug/mL
.LCM4PFHPA 00005	05/22/20		ton Laboratories, Lot M		(Purchased Reag		13C4-PFHpA	50 ug/mL
.LCM5PFPEA 00006	05/22/20		ton Laboratories, Lot M		(Purchased Reag		13C5-PFPeA	50 ug/mL
.LCM8FOSA 00009	12/22/17		ton Laboratories, Lot M		(Purchased Reag		13C8 FOSA	50 ug/mL
.LCMPFBA 00006	10/31/19		gton Laboratories, Lot		(Purchased Reag		13C4 PFBA	50 ug/mL
.LCMPFDA 00007	08/19/20		gton Laboratories, Lot		(Purchased Reag	ent)	13C2 PFDA	50 ug/mL
.LCMPFDoA 00006	07/17/19		ton Laboratories, Lot N		(Purchased Reag		13C2 PFDoA	50 ug/mL
.LCMPFHxA 00008	04/09/20		ton Laboratories, Lot M		(Purchased Reag		13C2 PFHxA	50 ug/mL
.LCMPFHxS 00006	10/23/20		ton Laboratories, Lot N		(Purchased Reag		1802 PFHxS	47.3 ug/mL
.LCMPFNA 00005	04/13/19		gton Laboratories, Lot		(Purchased Reag		13C5 PFNA	50 ug/mL
.LCMPFOA 00010	01/22/21		gton Laboratories, Lot		(Purchased Reag		13C4 PFOA	50 ug/mL
.LCMPFOS 00012	01/22/21		gton Laboratories, Lot		(Purchased Reag		13C4 PFOS	47.8 ug/mL
.LCMPFUdA 00007	10/31/19		ton Laboratories, Lot N		(Purchased Reag		13C2 PFUnA	50 ug/mL
LCPFC-L1_00020			MeOH/H2O, Lot 90285		LCMPFCSU 00040		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 00050	2.5 uT	Perfluorobutyric acid	0.5 ng/mL
						25 41	Perfluorobutanesulfonic acid (PFBS)	0.442 ng/mL
							Perfluorodecanoic acid	0.5 ng/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-19198-1

Reagent TD					Reagent	Parent Reager	nt		
Respent ID Date Date Used Volume Respent ID Added Analyte Concentration		Exp P	ren	Dilutant			Volume		
Perfluorodecame Sulfonic acid 0.487 tylend	Reagent ID	-	-			Reagent ID		Analyte	Concentration
Perfluorobetanesulfonic Acid								Perfluorododecanoic acid	0.5 ng/mL
Perfluorcheptanesulfonic Acid								Perfluorodecane Sulfonic acid	0.482 ng/mL
Perfluoronemanoic acid								-	0.5 ng/mL
Perfluoronexancia acid								Perfluoroheptanesulfonic Acid	0.476 ng/mL
Terfluoroctane (FPRA)									0.5 ng/mL
CEPTRAS								Perfluorohexadecanoic acid	0.5 ng/mL
Perfluoroctanica acid (PPOA) 0.5 ng/mt									0.455 ng/mL
Reffluoroctandecanic acid (PPOA) 0.5 ng/mt								Perfluorononanoic acid (PFNA)	0.5 ng/mL
LCMPFCSU 00040								Perfluorooctanoic acid (PFOA)	0.5 ng/mL
LCMPPFRDA 00005 1/07/21 Wellington Laboratories, Lot M2PFFRDA1112 CMPPFDA 00005 1/07/21 Wellington Laboratories, Lot M2PFFRDA1112 CMPPFDA 00005 1/07/20 Wellington Laboratories, Lot M2PFFRDA1112 CMPPFDA 00005 1/07/20 Wellington Laboratories, Lot M2PFFRDA1112 CMPPFDA 00005 1/07/20 Wellington Laboratories, Lot M2PFFRDA1115 CMPPFDA 00006 1/03/20 Wellington Laboratories, Lot M2PFRDA1115 CMPPCA 00006 1/03/20 Wellington Laboratories, Lot M2PFRDA115 CMPCA 00006 1/03/20 Wellington Laboratories, Lot M2PFRDA115 CMPCA 00006 1/03/20 Wellington Laboratories, Lot M2PFRDA115 CMPCA								Perfluorooctandecanoic acid	0.5 ng/mL
LCMPFCSU_00040									0.464 ng/mL
LCMPFFCSU_00040								Perfluorooctane Sulfonamide	0.5 ng/mL
CMPFCSU_00040								Perfluoropentanoic acid	0.5 ng/mL
LCMPFCSU_00040								Perfluorotetradecanoic acid	0.5 ng/mL
LCMPFFRSU_00040								Perfluorotridecanoic acid	0.5 ng/mL
LCM2PFTeDA 00005									0.5 ng/mL
LCM2PFPDA 00005	.LCMPFCSU_00040	11/05/16 05/	11/16		10000 uL	LCM2PFHxDA_00005	200 uL	13C2-PFHxDA	1 ug/mL
LCMSPFRA 00005 200 uL 13C4-PFRA 1 ug/ml				113933		I.CM2PFTADA 00005	200 ut.	13C2-PFTADA	1 110 /mT.
LCMSFORA 00006						_			
LCMPFDA 00009									
LCMPFDA 00006						_			
LCMPFDA 00007									
LCMPFDA 00006									1 ug/mL
LCMPFHA 00008 200 uL 13C2 PFHXA 1 ug/mI						LCMPFDoA 00006	200 uL	13C2 PFDoA	1 ug/mL
LCMPFNA 00005							200 uL	13C2 PFHxA	1 ug/mL
LCMPFOA 00010							200 uL	1802 PFHxS	0.946 ug/mL
LCMPFOS 00012						LCMPFNA 00005	200 uL	13C5 PFNA	1 ug/mL
LCM2PFHxDA 00005									1 ug/mL
CLCM2PFHxDA 00005									0.956 ug/mL
1.LCM2PFTeDA 00005									1 ug/mL
LCM4PFHPA 00005 05/22/20 Wellington Laboratories, Lot M4PFHpA0515 (Purchased Reagent) 13C4-PFHpA 50 ug/mILCM5PFPEA 00006 05/22/20 Wellington Laboratories, Lot M5PFPeA0515 (Purchased Reagent) 13C5-PFPeA 50 ug/mILCM8FOSA 00009 12/22/17 Wellington Laboratories, Lot M8FOSA1215I (Purchased Reagent) 13C8 FOSA 50 ug/mILCMPFBA 00006 10/31/19 Wellington Laboratories, Lot MPFBA1014 (Purchased Reagent) 13C4 PFBA 50 ug/mILCMPFDA 00007 08/19/20 Wellington Laboratories, Lot MPFDA0815 (Purchased Reagent) 13C2 PFDA 50 ug/mILCMPFDA 00006 07/17/19 Wellington Laboratories, Lot MPFDA0815 (Purchased Reagent) 13C2 PFDA 50 ug/mILCMPFHXA 00008 04/09/20 Wellington Laboratories, Lot MPFDA0415 (Purchased Reagent) 13C2 PFDA 50 ug/mILCMPFHXS 00006 10/23/20 Wellington Laboratories, Lot MPFHXA0415 (Purchased Reagent) 13C2 PFDXA 50 ug/mILCMPFNA 00005 04/13/19 Wellington Laboratories, Lot MPFHXS1015 (Purchased Reagent) 1802 PFHXS 47.3 ug/mILCMPFNA 00005 04/13/19 Wellington Laboratories, Lot MPFNA0414 (Purchased Reagent) 13C5 PFNA 50 ug/mILCMPFOA 00010 01/22/21 Wellington Laboratories, Lot MPFOA0116 (Purchased Reagent) 13C4 PFOA 50 ug/mILCMPFOS 00012 01/22/21 Wellington Laboratories, Lot MPFOA0116 (Purchased Reagent) 13C4 PFOA 50 ug/mI	_					,			
CLMSFFPEA 00006 05/22/20 Wellington Laboratories, Lot M5FFPeA0515 (Purchased Reagent) 13C5-PFPeA 50 ug/mI									50 ug/mL
1.10mm 1									
LCMPFBA 00006	_								
LCMPFDA 00007				-					
LCMPFDOA 00006 07/17/19 Wellington Laboratories, Lot MPFDOA0714 (Purchased Reagent) 13C2 PFDOA 50 ug/mI LCMPFHXA 00008 04/09/20 Wellington Laboratories, Lot MPFHXA0415 (Purchased Reagent) 13C2 PFHXA 50 ug/mI LCMPFHXS 00006 10/23/20 Wellington Laboratories, Lot MPFHXS1015 (Purchased Reagent) 1802 PFHXS 47.3 ug/mI LCMPFNA 00005 04/13/19 Wellington Laboratories, Lot MPFNA0414 (Purchased Reagent) 13C5 PFNA 50 ug/mI LCMPFOA 00010 01/22/21 Wellington Laboratories, Lot MPFOA0116 (Purchased Reagent) 13C4 PFOA 50 ug/mI LCMPFOS 00012 01/22/21 Wellington Laboratories, Lot MPFOS0116 (Purchased Reagent) 13C4 PFOS 47.8 ug/mI									
LCMPFHxA 00008									
LCMPFHxS 00006 10/23/20 Wellington Laboratories, Lot MPFHxS1015 (Purchased Reagent) 1802 PFHxS 47.3 ug/mI LCMPFNA 00005 04/13/19 Wellington Laboratories, Lot MPFNA0414 (Purchased Reagent) 13C5 PFNA 50 ug/mI LCMPFOA 00010 01/22/21 Wellington Laboratories, Lot MPFOA0116 (Purchased Reagent) 13C4 PFOA 50 ug/mI LCMPFOS 00012 01/22/21 Wellington Laboratories, Lot MPFOS0116 (Purchased Reagent) 13C4 PFOS 47.8 ug/mI									
LCMPFNA 00005 04/13/19 Wellington Laboratories, Lot MPFNA0414 (Purchased Reagent) 13C5 PFNA 50 ug/mILCMPFOA 00010 01/22/21 Wellington Laboratories, Lot MPFOA0116 (Purchased Reagent) 13C4 PFOA 50 ug/mILCMPFOS 00012 01/22/21 Wellington Laboratories, Lot MPFOS0116 (Purchased Reagent) 13C4 PFOS 47.8 ug/mI		10/23/20 WE							
LCMPFOA 00010 01/22/21 Wellington Laboratories, Lot MPFOA0116 (Purchased Reagent) 13C4 PFOA 50 ug/mILCMPFOS 00012 01/22/21 Wellington Laboratories, Lot MPFOS0116 (Purchased Reagent) 13C4 PFOS 47.8 ug/mI	_								
LCMPFOS 00012 01/22/21 Wellington Laboratories, Lot MPFOS0116 (Purchased Reagent) 13C4 PFOS 47.8 ug/mI				,					
				,					
LCMPFUdA 00007 10/31/19 Wellington Laboratories, Lot MPFUdA1014 (Purchased Reagent) 13C2 PFUnA 50 ug/mI	LCMPFUdA 00007					(Purchased Reag		13C2 PFUnA	50 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-19198-1

			Reagent	Parent Reag	ent		
	Exp Prep	Dilutant	Final		Volume		
Reagent ID	Date Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
.LCPFCSP 00050	11/17/16 05/18/16	Methanol, Lot 090285	10000 117.	LCPFCSP 00049	1000 117.	Perfluorobutyric acid	0.1 ug/mL
. Ec. 1 co. 1	11/1//10 03/10/10	licenanoi, Ecc 030203	10000 41		1000 42	Perfluorobutanesulfonic acid	0.0884 ug/mL
						(PFBS)	0.0001 ag/ ME
						Perfluorodecanoic acid	0.1 ug/mL
						Perfluorododecanoic acid	0.1 ug/mL
						Perfluorodecane Sulfonic acid	0.0964 ug/mL
						Perfluoroheptanoic acid	0.1 ug/mL
						(PFHpA)	
						Perfluoroheptanesulfonic Acid	0.0952 ug/mL
						Perfluorohexanoic acid	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
						Perfluorooctandecanoic acid	0.1 ug/mL
						Perfluorooctanesulfonic acid	0.0928 ug/mL
						(PFOS)	
						Perfluorooctane Sulfonamide	0.1 ug/mL
						Perfluoropentanoic acid	0.1 ug/mL
						Perfluorotetradecanoic acid	0.1 ug/mL
						Perfluorotridecanoic acid	0.1 ug/mL
						Perfluoroundecanoic acid	0.1 ug/mL
LCPFCSP_00049	11/17/16 05/17/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004		Perfluorobutyric acid	1 ug/mL
				LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid	0.884 ug/mL
				7.00004	000 -	(PFBS)	1 / -
				LCPFDA_00004		Perfluorodecanoic acid	1 ug/mL
				LCPFDoA_00004		Perfluorododecanoic acid	1 ug/mL
				LCPFDS_00005		Perfluorodecane Sulfonic acid	0.964 ug/mL
				LCPFHpA_00005	200 uL	Perfluoroheptanoic acid	1 ug/mL
				LCPFHpS 00008	200 11	(PFHpA) Perfluoroheptanesulfonic Acid	0.952 ug/mL
				LCPFHxA 00004		Perfluorohexanoic acid	1 ug/mL
				LCPFHxDA 00004		Perfluorohexadecanoic acid	1 ug/mL
				LCPFHxS-br_00001		Perfluorohexanesulfonic acid	0.91 ug/mL
				LCFFHX3-DI_00001	200 uL	(PFHxS)	0.91 ug/IIIL
				LCPFNA 00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
				LCPFOA 00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
				LCPFODA 00005		Perfluorooctandecanoic acid	1 ug/mL
				LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
				LCPFOSA 00006	200 117.	Perfluorooctane Sulfonamide	1 ug/mL
				LCPFPeA 00004		Perfluoropentanoic acid	1 ug/mL
				LCPFTeDA 00004		Perfluorotetradecanoic acid	1 ug/mL
				LCPFTrDA 00004	200 111.	Perfluorotridecanoic acid	1 ug/mL
				LCPFUdA 00004		Perfluoroundecanoic acid	1 ug/mL
LCPFBA 00004	01/30/20 Wellin	gton Laboratories, Lot	PFBA0115	(Purchased Rea		Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001		gton Laboratories, Lot I		(Purchased Rea		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL

Lab Na	ame:	TestAmerica	Sacramento	Job No.: 320-19198-1
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					Reagent	Parent Reag	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used		Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCPFDA 00004	07/02/20	Wellin	gton Laboratories,	, Lot	PFDA0615	(Purchased Rea	agent)	Perfluorodecanoic acid	50 ug/mL
LCPFDoA 00004	01/30/20		gton Laboratories,			(Purchased Rea	agent)	Perfluorododecanoic acid	50 ug/mL
LCPFDS 00005	07/02/20	Welling	gton Laboratories,	Lot	LPFDS0615	(Purchased Rea	agent)	Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA_00005	01/22/21	Welling	gton Laboratories,	Lot	PFHpA0116	(Purchased Rea	igent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpS 00008	11/06/20	Welling	ton Laboratories,	Lot	LPFHpS1115	(Purchased Rea	agent)	Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA 00004	12/22/20	Welling	gton Laboratories,	Lot	PFHxA1215	(Purchased Rea	agent)	Perfluorohexanoic acid	50 ug/mL
LCPFHxDA 00004	11/28/17	Welling	ton Laboratories,	Lot	PFHxDA0707	(Purchased Rea	agent)	Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00001	07/03/20	_	on Laboratories, l			(Purchased Rea	igent)	Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA 00005	10/23/20	Wellin	gton Laboratories,	, Lot	PFNA1015	(Purchased Rea	agent)	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA 00005	11/06/20		gton Laboratories,			(Purchased Rea	agent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA 00005	01/30/20	Welling	ton Laboratories,	Lot	PFODA0115	(Purchased Rea	agent)	Perfluorooctandecanoic acid	50 ug/mL
LCPFOS-br_00001	10/14/20	Wellingt	on Laboratories,	Lot h	orPFOSK1015	(Purchased Rea	igent)	Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00006	09/02/17	Welling	gton Laboratories,	Lot	FOSA0815I	(Purchased Rea	igent)	Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA_00004	01/30/20		gton Laboratories,			(Purchased Rea	igent)	Perfluoropentanoic acid	50 ug/mL
LCPFTeDA_00004	12/09/20		ton Laboratories,			(Purchased Rea	igent)	Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA_00004	12/10/18	Welling	ton Laboratories,	Lot	PFTrDA1213	(Purchased Rea	agent)	Perfluorotridecanoic acid	50 ug/mL
LCPFUdA_00004	08/19/20	Welling	gton Laboratories,	Lot	PFUdA0815	(Purchased Rea	agent)	Perfluoroundecanoic acid	50 ug/mL
LCPFC-L2 00021	11/05/16	05/18/16	MeOH/H2O, Lot 090)285	5 mL	LCMPFCSU 00040	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
								13C2 PFUnA	50 ng/mL
						LCPFCSP_00050	50 uI	Perfluorobutyric acid	1 ng/mL
								Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL
								Perfluorodecanoic acid	1 ng/mL
								Perfluorododecanoic acid	1 ng/mL
								Perfluorodecane Sulfonic acid	0.964 ng/mL
								Perfluoroheptanoic acid (PFHpA)	1 ng/mL
								Perfluoroheptanesulfonic Acid	0.952 ng/mL
								Perfluorohexanoic acid	1 ng/mL
								Perfluorohexadecanoic acid	1 ng/mL
								Perfluorohexanesulfonic acid (PFHxS)	0.91 ng/mL
								Perfluorononanoic acid (PFNA)	1 ng/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
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctandecanoic acid	1 ng/mL
							Perfluorooctanesulfonic acid	0.928 ng/mL
							(PFOS)	
							Perfluorooctane Sulfonamide	1 ng/mL
							Perfluoropentanoic acid	1 ng/mL
							Perfluorotetradecanoic acid	1 ng/mL
							Perfluorotridecanoic acid	1 ng/mL
							Perfluoroundecanoic acid	1 ng/mL
.LCMPFCSU_00040	11/05/16	05/11/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00005	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA 00005	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00005		13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00006	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA 00009	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA 00006	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA 00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA 00006	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00008		13C2 PFHxA	1 ug/mL
					LCMPFHxS 00006	200 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA 00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00010	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00012		13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00007		13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00005	01/07/21	Wellingto	on Laboratories, Lot M2PI	HxDA1112	(Purchased Rea		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00005			on Laboratories, Lot M2PH		(Purchased Rea		13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00005	05/22/20		on Laboratories, Lot M4P		(Purchased Rea		13C4-PFHpA	50 ug/mL
LCM5PFPEA 00006	05/22/20		on Laboratories, Lot M5P		(Purchased Rea		13C5-PFPeA	50 ug/mL
LCM8FOSA 00009	12/22/17		on Laboratories, Lot M8F		(Purchased Rea		13C8 FOSA	50 ug/mL
LCMPFBA 00006	10/31/19		ton Laboratories, Lot MP		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFDA 00007	08/19/20		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFDA	50 ug/mL
LCMPFDoA 00006	07/17/19		ton Laboratories, Lot MPI		(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFHxA 00008	04/09/20		ton Laboratories, Lot MPH		(Purchased Rea		13C2 PFHxA	50 ug/mL
LCMPFHxS 00006	10/23/20		ton Laboratories, Lot MPI		(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA 00005	04/13/19		ton Laboratories, Lot MP		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFOA 00010	01/22/21		ton Laboratories, Lot MP		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS 00012	01/22/21		ton Laboratories, Lot MP		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00007	10/31/19		ton Laboratories, Lot MPI		(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFCSP 00050			Methanol, Lot 090285		LCPFCSP 00049		Perfluorobutyric acid	0.1 ug/mL
	, - · , - ·						Perfluorobutanesulfonic acid	0.0884 ug/mL
							(PFBS)	2 %9/1112
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid	0.1 ug/mL
							(PFHpA)	
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
T .	1	1		1	1		Perfluorohexanoic acid	0.1 ug/mL

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				Dongont	Parent Reage	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Reagent ID	Volume Added	Analyte	Concentration
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid	0.091 ug/mL
							(PFHxS)	0.091 ug/III
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctandecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid	0.0928 ug/mL
							(PFOS)	0.0320 ag/2
							Perfluorooctane Sulfonamide	0.1 ug/mL
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
LCPFCSP 00049	11/17/16	05/17/16	Methanol, Lot 090285	10000 uL	LCPFBA 00004	200 uL	Perfluorobutyric acid	1 ug/mL
_			·		LCPFBSA 00001	200 uL	Perfluorobutanesulfonic acid	0.884 ug/mL
					_		(PFBS)	
					LCPFDA_00004		Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005		Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid	1 ug/mL
							(PFHpA)	
					LCPFHpS_00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004		Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004		Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid	0.91 ug/mL
							(PFHxS)	
					LCPFNA_00005		Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00005		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005		Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS-br_00001		Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00006		Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004		Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004		Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004		Perfluoroundecanoic acid	1 ug/mL
LCPFBA_00004	01/30/20		gton Laboratories, Lot 1		(Purchased Rea		Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001	10/09/19	-	gton Laboratories, Lot L		(Purchased Rea		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00004	07/02/20	Wellin	gton Laboratories, Lot 1	PFDA0615	(Purchased Rea		Perfluorodecanoic acid	50 ug/mL
LCPFDoA_00004	01/30/20		gton Laboratories, Lot P		(Purchased Rea		Perfluorododecanoic acid	50 ug/mL
LCPFDS_00005	07/02/20		gton Laboratories, Lot L		(Purchased Rea	igent)	Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA_00005	01/22/21	Welling	gton Laboratories, Lot P	FHpA0116	(Purchased Rea	igent)	Perfluoroheptanoic acid	50 ug/mL
T 07777 0 00000	11/06/00	77 77 1		DDT 01115	(5)		(PFHpA)	47.6 / -
LCPFHpS_00008	11/06/20		ton Laboratories, Lot L		(Purchased Rea		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00004	12/22/20		ton Laboratories, Lot P		(Purchased Rea	· '	Perfluorohexanoic acid	50 ug/mL
LCPFHxDA_00004	11/28/17		ton Laboratories, Lot Pl		(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00001	07/03/20	Wellingt	on Laboratories, Lot bri	PFHXSK0615	(Purchased Rea	igent)	Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL

Lab Name:	TestAmerica Sacramento	Job No.: 320-19198-1
SDG No.: _		

				Reagent	Parent Reagen	ıt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCPFNA 00005	10/23/20	Wellin	gton Laboratories, Lot F	FNA1015	(Purchased Reage	ent)	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00005	11/06/20		gton Laboratories, Lot F		(Purchased Reage	ent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00005	01/30/20	Welling	gton Laboratories, Lot P	FODA0115	(Purchased Reage		Perfluorooctandecanoic acid	50 ug/mL
LCPFOS-br_00001	10/14/20	Wellingt	on Laboratories, Lot br	PFOSK1015	(Purchased Reage	ent)	Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA 00006	09/02/17	Welling	ton Laboratories, Lot F	OSA0815I	(Purchased Reage	ent)	Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA 00004	01/30/20		ton Laboratories, Lot P		(Purchased Reage	ent)	Perfluoropentanoic acid	50 ug/mL
LCPFTeDA 00004	12/09/20	Welling	ton Laboratories, Lot PF	TeDA1215	(Purchased Reage	ent)	Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA 00004	12/10/18		ton Laboratories, Lot PF		(Purchased Reage		Perfluorotridecanoic acid	50 ug/mL
LCPFUdA 00004	08/19/20		gton Laboratories, Lot Pi	FUdA0815	(Purchased Reage	ent)	Perfluoroundecanoic acid	50 ug/mL
LCPFC-L3_00018	11/05/16	05/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU 00040	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_00050	250 uL	Perfluorobutyric acid	5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL
							Perfluorodecanoic acid	5 ng/mL
							Perfluorododecanoic acid	5 ng/mL
							Perfluorodecane Sulfonic acid	4.82 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5 ng/mL
							Perfluoroheptanesulfonic Acid	4.76 ng/mL
							Perfluorohexanoic acid	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
							Perfluorooctandecanoic acid	5 ng/mL
							Perfluorooctanesulfonic acid	4.64 ng/mL
							(PFOS)	
							Perfluorooctane Sulfonamide	5 ng/mL
							Perfluoropentanoic acid	5 ng/mL
							Perfluorotetradecanoic acid	5 ng/mL
							Perfluorotridecanoic acid	5 ng/mL
							Perfluoroundecanoic acid	5 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1	
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				Reagent	Parent Reage	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
.LCMPFCSU_00040	11/05/16	05/11/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00005	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA 00005	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00005	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00006	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA 00009	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA 00006	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA 00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA 00006	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00006	200 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA 00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00010	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00012		13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00007	200 uL	13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00005	01/07/21	Wellingt	on Laboratories, Lot M2F	FHxDA1112	(Purchased Read	gent)	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00005	12/07/20	Wellingt	on Laboratories, Lot M2F	FTeDA1115	(Purchased Read	gent)	13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00005	05/22/20	Wellingt	on Laboratories, Lot M4	PFHpA0515	(Purchased Read	gent)	13C4-PFHpA	50 ug/mL
LCM5PFPEA 00006	05/22/20	Wellingt	on Laboratories, Lot M5	PFPeA0515	(Purchased Read	gent)	13C5-PFPeA	50 ug/mL
LCM8FOSA 00009	12/22/17	Wellingt	on Laboratories, Lot M8	FOSA1215I	(Purchased Read	gent)	13C8 FOSA	50 ug/mL
LCMPFBA 00006	10/31/19	Welling	gton Laboratories, Lot M	PFBA1014	(Purchased Read	gent)	13C4 PFBA	50 ug/mL
LCMPFDA 00007	08/19/20	Welling	gton Laboratories, Lot M	PFDA0815	(Purchased Read	gent)	13C2 PFDA	50 ug/mL
LCMPFDoA 00006	07/17/19		ton Laboratories, Lot MF		(Purchased Read	gent)	13C2 PFDoA	50 ug/mL
LCMPFHxA 00008	04/09/20	Welling	ton Laboratories, Lot MF	FHxA0415	(Purchased Read	gent)	13C2 PFHxA	50 ug/mL
LCMPFHxS 00006	10/23/20	Welling	ton Laboratories, Lot MF	FHxS1015	(Purchased Read	gent)	1802 PFHxS	47.3 ug/mL
LCMPFNA 00005	04/13/19		ton Laboratories, Lot M		(Purchased Read	gent)	13C5 PFNA	50 ug/mL
LCMPFOA 00010	01/22/21	Welling	gton Laboratories, Lot M	PFOA0116	(Purchased Read	gent)	13C4 PFOA	50 ug/mL
LCMPFOS 00012	01/22/21	Welling	gton Laboratories, Lot M	PFOS0116	(Purchased Read	gent)	13C4 PFOS	47.8 ug/mL
LCMPFUdA 00007	10/31/19	Welling	ton Laboratories, Lot MF		(Purchased Read	gent)	13C2 PFUnA	50 ug/mL
.LCPFCSP 00050	11/17/16	05/18/16	Methanol, Lot 090285	10000 uL	LCPFCSP 00049	1000 uL	Perfluorobutyric acid	0.1 ug/mL
_					_		Perfluorobutanesulfonic acid	0.0884 ug/mL
							(PFBS)	
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid	0.1 ug/mL
							(PFHpA)	
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	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
							Perfluorooctandecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid	0.0928 ug/mL
							(PFOS)	0 1 - / -
	1	1	I	I		I	Perfluorooctane Sulfonamide	0.1 ug/mL

ab Name: TestAmerica Sacramento	Job No.: 320-19198-1
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				Reagent	Parent Reage	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
LCPFCSP_00049	11/17/16	05/17/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004		Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS 00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS 00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA 00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00005	200 uL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA 00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00004		Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA 00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA 00004		Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA 00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
LCPFBA 00004	01/30/20		gton Laboratories, Lot F	FBA0115	(Purchased Rea		Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001	10/09/19	Welling	gton Laboratories, Lot L	PFBS1014	(Purchased Rea	.gent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA 00004	07/02/20	Wellin	gton Laboratories, Lot F	FDA0615	(Purchased Rea	gent)	Perfluorodecanoic acid	50 ug/mL
LCPFDoA 00004	01/30/20		gton Laboratories, Lot Pi		(Purchased Rea	gent)	Perfluorododecanoic acid	50 ug/mL
LCPFDS 00005	07/02/20	Welling	gton Laboratories, Lot L	PFDS0615	(Purchased Rea	gent)	Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA_00005	01/22/21	-	gton Laboratories, Lot P.	-	(Purchased Rea	gent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpS_00008	11/06/20		ton Laboratories, Lot LF		(Purchased Rea	gent)	Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00004	12/22/20		gton Laboratories, Lot P		(Purchased Rea	gent)	Perfluorohexanoic acid	50 ug/mL
LCPFHxDA_00004	11/28/17	Welling	ton Laboratories, Lot PF	HxDA0707	(Purchased Rea	gent)	Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00001	07/03/20	Wellingt	on Laboratories, Lot brE	FHxSK0615	(Purchased Rea	gent)	Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA 00005	10/23/20	Wellin	gton Laboratories, Lot F	FNA1015	(Purchased Rea	gent)	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA 00005	11/06/20	Wellin	gton Laboratories, Lot F		(Purchased Rea	gent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA 00005	01/30/20	Welling	gton Laboratories, Lot Pi	FODA0115	(Purchased Rea	gent)	Perfluorooctandecanoic acid	50 ug/mL
LCPFOS-br_00001	10/14/20		ton Laboratories, Lot br		(Purchased Rea	gent)	Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA 00006	09/02/17		gton Laboratories, Lot F		(Purchased Rea	gent)	Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA 00004	01/30/20		gton Laboratories, Lot Pi		(Purchased Rea		Perfluoropentanoic acid	50 ug/mL
LCPFTeDA 00004	12/09/20		ton Laboratories, Lot PF		(Purchased Rea		Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA 00004	12/10/18	Welling	ton Laboratories, Lot PF	TrDA1213	(Purchased Rea	gent)	Perfluorotridecanoic acid	50 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-19198-1
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				Reagent	Parent Reag	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCPFUdA 00004	08/19/20	Welling	gton Laboratories, Lot P	FUdA0815	(Purchased Rea	agent)	Perfluoroundecanoic acid	50 ug/mL
LCPFC-L4 00021	11/05/16	05/18/16	MeOH/H2O, Lot 090285	5 mT.	LCMPFCSU 00040	250 117.	13C2-PFHxDA	50 ng/mL
100021	11/00/10	00/10/10	110011/1120/ 100 030200			200 41	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 FFOA	47.8 ng/mL
							13C4 PFOS 13C2 PFUnA	50 ng/mL
					LCPFCSP 00049	100	Perfluorobutyric acid	20 ng/mL
					LCPFCSP_00049	100 uL	Perfluorobutanesulfonic acid	
							(PFBS)	17.68 ng/mL
							Perfluorodecanoic acid	20 ng/mL
							Perfluorododecanoic acid	20 ng/mL
							Perfluorodecane Sulfonic acid	19.28 ng/mL
							Perfluoroheptanoic acid (PFHpA)	20 ng/mL
							Perfluoroheptanesulfonic Acid	19.04 ng/mL
							Perfluorohexanoic acid	20 ng/mL
							Perfluorohexadecanoic acid	20 ng/mL
							Perfluorohexanesulfonic acid	18.2 ng/mL
							(PFHxS)	18.2 NG/ML
							Perfluorononanoic acid (PFNA)	20 ng/mL
							Perfluorooctanoic acid (PFOA)	20 ng/mL
							Perfluorooctandecanoic acid	20 ng/mL
							Perfluorooctanesulfonic acid	18.56 ng/mL
							(PFOS)	10.30 119/1111
							Perfluorooctane Sulfonamide	20 ng/mL
							Perfluoropentanoic acid	20 ng/mL
							Perfluorotetradecanoic acid	20 ng/mL
							Perfluorotridecanoic acid	20 ng/mL
							Perfluoroundecanoic acid	20 ng/mL
.LCMPFCSU 00040	11/05/16	05/11/16	Methanol, Lot Baker	10000 111	LCM2PFHxDA 00005	200 117	13C2-PFHxDA	1 ug/mL
. LCMI FCSO_00040	11/03/10	03/11/10	115935	10000 41	LCM21FIIXDA_00005	200 41	1302 ITHADA	1 49/1111
			110300		LCM2PFTeDA 00005	200 uTi	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00005		13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00006		13C5-PFPeA	1 ug/mL
					LCM8FOSA 00009		13C8 FOSA	1 ug/mL
					LCMPFBA 00006		13C4 PFBA	1 ug/mL
					LCMPFDA 00007		13C2 PFDA	1 ug/mL
								1 ug/mL
								1 ug/mL
					LCMPFDoA_00006 LCMPFHxA_00008		13C2 PFDoA 13C2 PFHxA	

Lab Na	ame:	TestAmerica	Sacramento	Job No.: 320-19198-1
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				Reagent	Parent Reage	ent		
	Erm	Dwan	Dilutant	Final		Volume		
Decemb ID	Exp	Prep	Used	Volume	December ID		7	C
Reagent ID	Date	Date	usea	volume	Reagent ID	Added	Analyte	Concentration
					LCMPFHxS_00006		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00010		13C4 PFOA	1 ug/mL
					LCMPFOS_00012		13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00007		13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00005			on Laboratories, Lot M2F		(Purchased Rea		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00005	12/07/20		on Laboratories, Lot M2F		(Purchased Rea		13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00005	05/22/20		on Laboratories, Lot M4		(Purchased Rea		13C4-PFHpA	50 ug/mL
LCM5PFPEA_00006	05/22/20		on Laboratories, Lot M5		(Purchased Rea		13C5-PFPeA	50 ug/mL
LCM8FOSA_00009	12/22/17		on Laboratories, Lot M8		(Purchased Rea		13C8 FOSA	50 ug/mL
LCMPFBA_00006	10/31/19		gton Laboratories, Lot M		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFDA_00007	08/19/20	-	ton Laboratories, Lot M		(Purchased Rea		13C2 PFDA	50 ug/mL
LCMPFDoA_00006	07/17/19		ton Laboratories, Lot MF		(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFHxA_00008	04/09/20		ton Laboratories, Lot MF		(Purchased Rea		13C2 PFHxA	50 ug/mL
LCMPFHxS_00006	10/23/20		ton Laboratories, Lot MF		(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA_00005	04/13/19		gton Laboratories, Lot M		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFOA_00010	01/22/21		ton Laboratories, Lot M		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS_00012	01/22/21		gton Laboratories, Lot M		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA_00007	10/31/19		ton Laboratories, Lot MF		(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFCSP_00049	11/17/16	05/17/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004		Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00004	200 11	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00004		Perfluorododecanoic acid	1 ug/mL
					LCPFDS 00005		Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA 00005	200 ul	Perfluoroheptanoic acid	1 ug/mL
					_		(PFHpA)	
					LCPFHpS 00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004		Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid	0.91 ug/mL
							(PFHxS)	
					LCPFNA_00005		Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00005		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005		Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid	0.928 ug/mL
					TODEOGA OCCOO	200 -	(PFOS)	1 . / -
					LCPFOSA 00006		Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004		Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004		Perfluorotridecanoic acid	1 ug/mL
I CDED # 00004	01/20/00	W - 1 1 '	Land Tabanaha da Tabanaha	DD70115	LCPFUdA 00004		Perfluoroundecanoic acid	1 ug/mL
LCPFBA 00004	01/30/20		gton Laboratories, Lot F		(Purchased Rea		Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001	10/09/19	welling	ton Laboratories, Lot L	PFBS1014	(Purchased Rea	igent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00004	07/02/20		gton Laboratories, Lot F		(Purchased Rea	agent)	Perfluorodecanoic acid	50 ug/mL
LCPFDoA 00004	01/30/20		gton Laboratories, Lot Pi		(Purchased Rea	agent)	Perfluorododecanoic acid	50 ug/mL
LCPFDS 00005	07/02/20		ton Laboratories, Lot L		(Purchased Rea	agent)	Perfluorodecane Sulfonic acid	48.2 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-19198-1

				Reagent	Parent Reagen	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCPFHpA_00005	01/22/21	Welling	ton Laboratories, Lo	t PFHpA0116	(Purchased Reag	ent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpS 00008	11/06/20	Welling	ton Laboratories, Lot	LPFHpS1115	(Purchased Reage	ent)	Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00004	12/22/20		gton Laboratories, Lo		(Purchased Reage		Perfluorohexanoic acid	50 ug/mL
LCPFHxDA_00004	11/28/17		ton Laboratories, Lot		(Purchased Reage		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00001	07/03/20		on Laboratories, Lot		(Purchased Reage		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA_00005	10/23/20		gton Laboratories, Lo		(Purchased Reage		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00005	11/06/20		gton Laboratories, Lo		(Purchased Reage		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00005	01/30/20		gton Laboratories, Lo		(Purchased Reage		Perfluorooctandecanoic acid	50 ug/mL
LCPFOS-br_00001	10/14/20	ì	on Laboratories, Lot		(Purchased Reage		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00006	09/02/17		gton Laboratories, Lo		(Purchased Reage		Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA_00004	01/30/20		gton Laboratories, Lo		(Purchased Reage		Perfluoropentanoic acid	50 ug/mL
LCPFTeDA_00004	12/09/20	7	ton Laboratories, Lot		(Purchased Reage		Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA_00004	12/10/18		ton Laboratories, Lot		(Purchased Reage		Perfluorotridecanoic acid	50 ug/mL
LCPFUdA_00004	08/19/20		gton Laboratories, Lo		(Purchased Reage		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L5_00019	11/05/16	05/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00040	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 47.3 ng/mL
							1802 PFHxS 13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOA	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP 00049	250 uT	Perfluorobutyric acid	50 ng/mL
					Terrest_00049	250 41	Perfluorobutanesulfonic acid	44.2 ng/mL
							(PFBS)	11.2 119/1112
							Perfluorodecanoic acid	50 ng/mL
							Perfluorododecanoic acid	50 ng/mL
							Perfluorodecane Sulfonic acid	48.2 ng/mL
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL
							Perfluoroheptanesulfonic Acid	47.6 ng/mL
							Perfluorohexanoic acid	50 ng/mL
							Perfluorohexadecanoic acid	50 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ng/mL
							Perfluorononanoic acid (PFNA)	50 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
							Perfluorooctandecanoic acid	50 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
-					_		Perfluorooctanesulfonic acid (PFOS)	46.4 ng/mL
							Perfluorooctane Sulfonamide	50 ng/mL
							Perfluoropentanoic acid	50 ng/mL
							Perfluorotetradecanoic acid	50 ng/mL
							Perfluorotridecanoic acid	50 ng/mL
							Perfluoroundecanoic acid	50 ng/mL
.LCMPFCSU_00040	11/05/16	05/11/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00005		13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00005		13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00005		13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00006		13C5-PFPeA	1 ug/mL
					LCM8FOSA 00009		13C8 FOSA	1 ug/mL
					LCMPFBA 00006		13C4 PFBA	1 ug/mL
					LCMPFDA 00007		13C2 PFDA	1 ug/mL
					LCMPFDoA 00006		13C2 PFDoA	1 ug/mL
					LCMPFHxA_00008		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00006		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00005		13C5 PFNA	1 ug/mL
					LCMPFOA_00010		13C4 PFOA	1 ug/mL
					LCMPFOS_00012		13C4 PFOS	0.956 ug/mL
I CMODELL-DA 0000E	01/07/01	197 a 1 1 2 as aut.	an Tabanataniaa Tat MOD	DITD3 1 1 1 0	LCMPFUdA_00007		13C2 PFUnA	1 ug/mL 50 ug/mL
LCM2PFHxDA_00005 LCM2PFTeDA_00005	12/07/20		on Laboratories, Lot M2P: on Laboratories, Lot M2P:		(Purchased Rea		13C2-PFHxDA 13C2-PFTeDA	50 ug/mL
LCM2PF1eDA_00005	05/22/20		on Laboratories, Lot M2F.		(Purchased Rea (Purchased Rea		13C4-PFHpA	50 ug/mL
LCM4PFHPA_00003	05/22/20	Wellingt	on Laboratories, Lot M4F.	PROMOSIS	(Purchased Rea		13C5-PFPeA	50 ug/mL
LCM8FOSA 00009	12/22/17		on Laboratories, Lot MSF		(Purchased Rea		13C8 FOSA	50 ug/mL
LCMPFBA 00006	10/31/19	Welling	ton Laboratories, Lot MF	FB 1 1 1 1 4	(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFDA 00007	08/19/20		ton Laboratories, Lot MF		(Purchased Rea		13C2 PFDA	50 ug/mL
LCMPFDoA 00006	07/17/19		ton Laboratories, Lot MP:		(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFHxA 00008	04/09/20		ton Laboratories, Lot MP:		(Purchased Rea		13C2 PFHxA	50 ug/mL
LCMPFHxS 00006	10/23/20		ton Laboratories, Lot MP:		(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA 00005	04/13/19		ton Laboratories, Lot MF		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFOA 00010	01/22/21		ton Laboratories, Lot MF		(Purchased Rea	-	13C4 PFOA	50 ug/mL
LCMPFOS 00012	01/22/21		ton Laboratories, Lot MF		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00007	10/31/19		ton Laboratories, Lot MP:		(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFCSP 00049	11/17/16		Methanol, Lot 090285	10000 uL			Perfluorobutyric acid	1 ug/mL
_			•		LCPFBSA_00001		Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00004		Perfluorododecanoic acid	1 ug/mL
					LCPFDS 00005		Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005		Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS 00008	200 117	(PFHpA) Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00004		Perfluoroneptanesulionic Acid Perfluoronexanoic acid	1 ug/mL
					LCPFHxA_00004 LCPFHxDA 00004		Perfluoronexanoic acid	1 ug/mL 1 ug/mL
	I			1	TCLLUXDW_00004	200 UL	reiliuolonexadecanoic acid	I na/IIIT

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-19198-1

				Reagent	Parent Reage	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
					LCPFHxS-br_00001		Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA 00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00005		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005		Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS-br_00001		Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00006		Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004		Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA 00004		Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA 00004		Perfluoroundecanoic acid	1 ug/mL
LCPFBA_00004	01/30/20		gton Laboratories, Lot D		(Purchased Read		Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001	10/09/19	-	gton Laboratories, Lot L		(Purchased Read	gent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00004	07/02/20		gton Laboratories, Lot 1		(Purchased Read		Perfluorodecanoic acid	50 ug/mL
LCPFDoA_00004	01/30/20	-	gton Laboratories, Lot P		(Purchased Read	gent)	Perfluorododecanoic acid	50 ug/mL
LCPFDS_00005	07/02/20		gton Laboratories, Lot L		(Purchased Read		Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA_00005	01/22/21	-	gton Laboratories, Lot P	-	(Purchased Read		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpS_00008	11/06/20		ton Laboratories, Lot L		(Purchased Read		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00004	12/22/20		gton Laboratories, Lot P		(Purchased Read		Perfluorohexanoic acid	50 ug/mL
LCPFHxDA_00004	11/28/17		ton Laboratories, Lot Pl		(Purchased Read		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00001	07/03/20		on Laboratories, Lot bri		(Purchased Read		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA_00005	10/23/20		gton Laboratories, Lot 1		(Purchased Read		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00005	11/06/20		gton Laboratories, Lot D		(Purchased Read		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00005	01/30/20		gton Laboratories, Lot P		(Purchased Read		Perfluorooctandecanoic acid	50 ug/mL
LCPFOS-br_00001	10/14/20	_	ton Laboratories, Lot br		(Purchased Read	•	Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00006	09/02/17		gton Laboratories, Lot F		(Purchased Read		Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA_00004	01/30/20		gton Laboratories, Lot P		(Purchased Read		Perfluoropentanoic acid	50 ug/mL
LCPFTeDA_00004	12/09/20		ton Laboratories, Lot Pl		(Purchased Read		Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA_00004	12/10/18		ton Laboratories, Lot Pl		(Purchased Read		Perfluorotridecanoic acid	50 ug/mL
LCPFUdA_00004	08/19/20	-	gton Laboratories, Lot P		(Purchased Read	gent)	Perfluoroundecanoic acid	50 ug/mL
LCPFC-L6_00018	11/05/16	05/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00040	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
		1					13C4 PFOS	47.8 ng/mL

Lab N	lame:	TestAmerica	Sacramento	Job No.: 320-19198-1	
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					Parent Reage	nt		
		_	517	Reagent		1		
Decemb ID	Exp	Prep	Dilutant Used	Final Volume	December ID	Volume	7 7	C
Reagent ID	Date	Date	used	volume	Reagent ID	Added	Analyte	Concentration
						1000 -	13C2 PFUnA	50 ng/mL
					LCPFCSP_00049	1000 uL		200 ng/mL
							Perfluorobutanesulfonic acid	176.8 ng/mL
							(PFBS)	000 / -
							Perfluorodecanoic acid	200 ng/mL
							Perfluorododecanoic acid	200 ng/mL
							Perfluorodecane Sulfonic acid	192.8 ng/mL
							Perfluoroheptanoic acid (PFHpA)	200 ng/mL
							Perfluoroheptanesulfonic Acid	190.4 ng/mL
							Perfluorohexanoic acid	200 ng/mL
							Perfluorohexadecanoic acid	200 ng/mL
							Perfluorohexanesulfonic acid	182 ng/mL
							(PFHxS)	
							Perfluorononanoic acid (PFNA)	200 ng/mL
							Perfluorooctanoic acid (PFOA)	200 ng/mL
							Perfluorooctandecanoic acid	200 ng/mL
							Perfluorooctanesulfonic acid	185.6 ng/mL
							(PFOS)	
							Perfluorooctane Sulfonamide	200 ng/mL
							Perfluoropentanoic acid	200 ng/mL
							Perfluorotetradecanoic acid	200 ng/mL
							Perfluorotridecanoic acid	200 ng/mL
T CMP T COM	11/05/16 0	25 /11 /16	Mallace I Tal Dalace	10000 -	T C1(0 D D1) D 2 0000 F	000 -	Perfluoroundecanoic acid	200 ng/mL
.LCMPFCSU_00040	11/05/16	05/11/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00005	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA 00005	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00005	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00006	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA 00009		13C8 FOSA	1 ug/mL
					LCMPFBA_00006		13C4 PFBA	1 ug/mL
					LCMPFDA_00007		13C2 PFDA	1 ug/mL
					LCMPFDoA_00006		13C2 PFDoA	1 ug/mL
					LCMPFHxA_00008		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00006		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00005		13C5 PFNA	1 ug/mL
					LCMPFOA_00010		13C4 PFOA	1 ug/mL
					LCMPFOS_00012		13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00007		13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00005			on Laboratories, Lot M2P		(Purchased Read	<u> </u>	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00005			on Laboratories, Lot M2P		(Purchased Read	<u> </u>	13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00005			ton Laboratories, Lot M4F		(Purchased Read	<u> </u>	13C4-PFHpA	50 ug/mL
LCM5PFPEA_00006			ton Laboratories, Lot MSE		(Purchased Read		13C5-PFPeA	50 ug/mL
LCM8FOSA 00009			ton Laboratories, Lot M8F		(Purchased Read		13C8 FOSA	50 ug/mL
LCMPFBA_00006	10/31/19		gton Laboratories, Lot ME		(Purchased Read	<u>, , , , , , , , , , , , , , , , , , , </u>	13C4 PFBA 13C2 PFDA	50 ug/mL
LCMPFDA_00007	08/19/20		gton Laboratories, Lot ME		(Purchased Read			50 ug/mL
LCMPFDoA_00006	07/17/19		ton Laboratories, Lot MP: ton Laboratories, Lot MP:		(Purchased Read (Purchased Read	<u> </u>	13C2 PFDoA 13C2 PFHxA	50 ug/mL 50 ug/mL
··LCMFFRAA_UUUU0	04/03/20	Mettilld	CON LABORACULIES, LOT MP.	T IIVW04TO	(Fulchased Read	ACTIC)	TOCK FERNA	JU ug/mb

- 1		- 1	200 10100 1
Lab Name: TestAmerica	Sacramento	JOD NO.:	320-19198-1

				Doogont	Parent Reage	ent		
	Exp	Prep	Dilutant	Reagent Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCMPFHxS 00006	10/23/20		ton Laboratories, Lot MP		(Purchased Rea	gent)	1802 PFHxS	47.3 ug/mL
LCMPFNA 00005	04/13/19	Welling	ton Laboratories, Lot M	PFNA0414	(Purchased Rea	gent)	13C5 PFNA	50 ug/mL
LCMPFOA 00010	01/22/21		ton Laboratories, Lot M		(Purchased Rea	gent)	13C4 PFOA	50 ug/mL
LCMPFOS 00012	01/22/21		ton Laboratories, Lot M		(Purchased Rea	gent)	13C4 PFOS	47.8 ug/mL
LCMPFUdA 00007	10/31/19	Welling	ton Laboratories, Lot MP	PFUdA1014	(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFCSP 00049	11/17/16	05/17/16	Methanol, Lot 090285	10000 uL	LCPFBA 00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS 00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS 00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00004		Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001		Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA 00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00005	200 uL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA 00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA 00004		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA 00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA 00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
LCPFBA 00004	01/30/20	Wellin	gton Laboratories, Lot P	PFBA0115	(Purchased Rea	gent)	Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001	10/09/19	Welling	ton Laboratories, Lot L	PFBS1014	(Purchased Rea	gent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA 00004	07/02/20	Wellin	gton Laboratories, Lot P	PFDA0615	(Purchased Rea	gent)	Perfluorodecanoic acid	50 ug/mL
LCPFDoA 00004	01/30/20	Welling	ton Laboratories, Lot PI	FDoA0115	(Purchased Rea	gent)	Perfluorododecanoic acid	50 ug/mL
LCPFDS 00005	07/02/20	Welling	ton Laboratories, Lot Ll	PFDS0615	(Purchased Rea	gent)	Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA_00005	01/22/21	Welling	ton Laboratories, Lot PI	FHpA0116	(Purchased Rea	gent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpS_00008	11/06/20		ton Laboratories, Lot LP		(Purchased Rea	gent)	Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00004	12/22/20		ton Laboratories, Lot Pl		(Purchased Rea	gent)	Perfluorohexanoic acid	50 ug/mL
LCPFHxDA_00004	11/28/17		ton Laboratories, Lot PF		(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00001	07/03/20	Wellingt	on Laboratories, Lot brP	PFHxSK0615	(Purchased Rea	gent)	Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA 00005	10/23/20	Wellin	gton Laboratories, Lot P	PFNA1015	(Purchased Rea	gent)	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA 00005	11/06/20		gton Laboratories, Lot P		(Purchased Rea	gent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA 00005	01/30/20		ton Laboratories, Lot Pl		(Purchased Rea	gent)	Perfluorooctandecanoic acid	50 ug/mL
LCPFOS-br_00001	10/14/20	Wellingt	on Laboratories, Lot br	PFOSK1015	(Purchased Rea	gent)	Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA 00006	09/02/17	Welling	ton Laboratories, Lot F0	OSA0815I	(Purchased Rea	gent)	Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA 00004	01/30/20		ton Laboratories, Lot Pl		(Purchased Rea		Perfluoropentanoic acid	50 ug/mL
LCPFTeDA 00004	12/09/20		ton Laboratories, Lot PF		(Purchased Rea		Perfluorotetradecanoic acid	50 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 3	20-19198-1
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		1 -		Reagent	Parent Reage	nt		
Reagent ID	Exp Date		Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCPFTrDA 00004	12/10/18	Welling	ton Laboratories, Lot b	PFTrDA1213	(Purchased Read	gent)	Perfluorotridecanoic acid	50 ug/mL
LCPFUdA 00004	08/19/20		gton Laboratories, Lot		(Purchased Read		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L7 00018	_	-	MeOH/H2O, Lot 090285		LCMPFCSU 00040	_	13C2-PFHxDA	50 ng/mL
LCFFC-L7_00018	11/03/10	03/10/10	Medii/1120, Loc 030203	J IIII	LCMI FCSO_00040	250 41	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 00049	2000 uL	Perfluorobutyric acid	400 ng/mL
					_		Perfluorobutanesulfonic acid	353.6 ng/mL
							(PFBS)	
							Perfluorodecanoic acid	400 ng/mL
							Perfluorododecanoic acid	400 ng/mL
							Perfluorodecane Sulfonic acid	385.6 ng/mL
							Perfluoroheptanoic acid (PFHpA)	400 ng/mL
							Perfluoroheptanesulfonic Acid	380.8 ng/mL
							Perfluorohexanoic acid	400 ng/mL
							Perfluorohexadecanoic acid	400 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	364 ng/mL
							Perfluorononanoic acid (PFNA)	400 ng/mL
							Perfluorooctanoic acid (PFOA)	400 ng/mL
							Perfluorooctandecanoic acid	400 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	371.2 ng/mL
							Perfluorooctane Sulfonamide	400 ng/mL
							Perfluoropentanoic acid	400 ng/mL
							Perfluorotetradecanoic acid	400 ng/mL
							Perfluorotridecanoic acid	400 ng/mL
	11112						Perfluoroundecanoic acid	400 ng/mL
.LCMPFCSU_00040	11/05/16	05/11/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00005		13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00005		13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00005		13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00006		13C5-PFPeA	1 ug/mL
					LCM8FOSA_00009		13C8 FOSA	1 ug/mL
					LCMPFBA_00006		13C4 PFBA	1 ug/mL
					LCMPFDA_00007		13C2 PFDA	1 ug/mL
					LCMPFDoA_00006	200 uL	13C2 PFDoA	1 ug/mL

Lab	Name:	TestAmerica	Sacrament	to Job No.: 320-19198-1

				Reagent	Parent Reag	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
					LCMPFHxA 00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00006		1802 PFHxS	0.946 ug/mL
					LCMPFNA 00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00010	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00012	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00007	200 uL	13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00005			on Laboratories, Lot M2		(Purchased Rea	agent)	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00005	12/07/20 W	Vellingto	on Laboratories, Lot M2	PFTeDA1115	(Purchased Rea	agent)	13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00005	05/22/20 V	Wellingt	on Laboratories, Lot M4	4PFHpA0515	(Purchased Rea	agent)	13C4-PFHpA	50 ug/mL
LCM5PFPEA 00006			on Laboratories, Lot M5		(Purchased Rea		13C5-PFPeA	50 ug/mL
LCM8FOSA 00009	12/22/17 V	Wellingt	on Laboratories, Lot M8	BFOSA1215I	(Purchased Rea	agent)	13C8 FOSA	50 ug/mL
LCMPFBA 00006	10/31/19	Welling	ton Laboratories, Lot M	MPFBA1014	(Purchased Rea	agent)	13C4 PFBA	50 ug/mL
LCMPFDA 00007	08/19/20	Welling	ton Laboratories, Lot M	MPFDA0815	(Purchased Rea	agent)	13C2 PFDA	50 ug/mL
LCMPFDoA 00006	07/17/19	Wellingt	ton Laboratories, Lot M	PFDoA0714	(Purchased Rea	agent)	13C2 PFDoA	50 ug/mL
LCMPFHxA 00008			ton Laboratories, Lot M		(Purchased Rea		13C2 PFHxA	50 ug/mL
LCMPFHxS 00006			ton Laboratories, Lot M		(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA 00005	04/13/19		ton Laboratories, Lot M		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFOA 00010	01/22/21		ton Laboratories, Lot M		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS 00012			ton Laboratories, Lot M		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00007			ton Laboratories, Lot M		(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFCSP 00049			Methanol, Lot 090285		LCPFBA 00004		Perfluorobutyric acid	1 ug/mL
_			,		LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00004		Perfluorododecanoic acid	1 ug/mL
					LCPFDS 00005		Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS 00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001		Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA 00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00005	200 uL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS-br_00001		Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA 00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00004		Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA 00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA 00004		Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA 00004		Perfluoroundecanoic acid	1 ug/mL
LCPFBA 00004	01/30/20	Welling	gton Laboratories, Lot	PFBA0115	(Purchased Rea		Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001	10/09/19		ton Laboratories, Lot I		(Purchased Rea		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA 00004	07/02/20	Welling	gton Laboratories, Lot	PFDA0615	(Purchased Rea	agent)	Perfluorodecanoic acid	50 ug/mL
LCPFDoA 00004	01/30/20		ton Laboratories, Lot E		(Purchased Rea		Perfluorododecanoic acid	50 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-19198-1

				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCPFDS 00005	07/02/20	Welling	ton Laboratories, Lot I	LPFDS0615	(Purchased Rea	gent)	Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA_00005			ton Laboratories, Lot E		(Purchased Rea	gent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpS 00008	11/06/20 1	Welling	ton Laboratories, Lot L	PFHpS1115	(Purchased Rea		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA 00004	12/22/20	Welling	ton Laboratories, Lot E	PFHxA1215	(Purchased Rea	gent)	Perfluorohexanoic acid	50 ug/mL
LCPFHxDA 00004			ton Laboratories, Lot P		(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00001	07/03/20 We	_	on Laboratories, Lot br		(Purchased Rea	gent)	Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA 00005	10/23/20	Wellin	gton Laboratories, Lot	PFNA1015	(Purchased Rea	gent)	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA 00005	11/06/20		gton Laboratories, Lot		(Purchased Rea	gent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA 00005			ston Laboratories, Lot E		(Purchased Rea	gent)	Perfluorooctandecanoic acid	50 ug/mL
LCPFOS-br_00001	10/14/20 W	Vellingt	on Laboratories, Lot b	PFOSK1015	(Purchased Rea	gent)	Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00006	09/02/17	Welling	gton Laboratories, Lot E	OSA0815I	(Purchased Rea	gent)	Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA_00004	01/30/20	Welling	gton Laboratories, Lot E	PFPeA0115	(Purchased Rea	gent)	Perfluoropentanoic acid	50 ug/mL
LCPFTeDA_00004	12/09/20	Welling	ton Laboratories, Lot P	FTeDA1215	(Purchased Rea	gent)	Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA_00004			ton Laboratories, Lot P		(Purchased Rea		Perfluorotridecanoic acid	50 ug/mL
LCPFUdA_00004	08/19/20	Welling	gton Laboratories, Lot E	PFUdA0815	(Purchased Rea	gent)	Perfluoroundecanoic acid	50 ug/mL
LCPFCIC_00017	06/16/16 05	5/14/16	MeOH/H2O, Lot 09285	5 mL	LCMPFCSU 00040	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
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	47.25 ng/mL
							Perfluorononanoic acid (PFNA)	50 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	47.75 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
.LCMPFCSU_00040	11/05/16 05	5/11/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00005		13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00005		13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00005		13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00006		13C5-PFPeA	1 ug/mL
					LCM8FOSA_00009	200 uL	13C8 FOSA	1 ug/mL

Lab	Name: TestAmerica	Sacramento	Job No.: 320-19198-1

				Reagent	Parent Reag	gent		
Reagent ID	Exp Date		Dilutant Used	Final Volume	Reagent ID	Volume Added		Concentration
					LCMPFBA_00006	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00007		13C2 PFDA	1 ug/mL
					LCMPFDoA_00006	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00006		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00010	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00012		13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00007	200 uL	13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00005	01/07/21	Wellingt	on Laboratories, Lot M2	PFHxDA1112	(Purchased Re	agent)	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00005	12/07/20	Wellingt	on Laboratories, Lot M2	PFTeDA1115	(Purchased Re	agent)	13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00005	05/22/20	Wellingt	on Laboratories, Lot M4	PFHpA0515	(Purchased Re	agent)	13C4-PFHpA	50 ug/mL
LCM5PFPEA_00006	05/22/20		on Laboratories, Lot M5		(Purchased Re	agent)	13C5-PFPeA	50 ug/mL
LCM8FOSA 00009	12/22/17	Wellingt	on Laboratories, Lot M8	FOSA1215I	(Purchased Re	agent)	13C8 FOSA	50 ug/mL
LCMPFBA_00006	10/31/19	Welling	gton Laboratories, Lot M	MPFBA1014	(Purchased Re	agent)	13C4 PFBA	50 ug/mL
LCMPFDA_00007	08/19/20		gton Laboratories, Lot M		(Purchased Re	agent)	13C2 PFDA	50 ug/mL
LCMPFDoA_00006	07/17/19	Welling	ton Laboratories, Lot M	PFDoA0714	(Purchased Re	agent)	13C2 PFDoA	50 ug/mL
LCMPFHxA_00008	04/09/20		ton Laboratories, Lot M		(Purchased Re	agent)	13C2 PFHxA	50 ug/mL
LCMPFHxS 00006	10/23/20	Welling	ton Laboratories, Lot M	PFHxS1015	(Purchased Re	agent)	1802 PFHxS	47.3 ug/mL
LCMPFNA 00005	04/13/19	Welling	gton Laboratories, Lot M	MPFNA0414	(Purchased Re	agent)	13C5 PFNA	50 ug/mL
LCMPFOA 00010	01/22/21	Welling	gton Laboratories, Lot M	MPFOA0116	(Purchased Re	agent)	13C4 PFOA	50 ug/mL
LCMPFOS 00012	01/22/21	Welling	gton Laboratories, Lot M	MPFOS0116	(Purchased Rea	agent)	13C4 PFOS	47.8 ug/mL
LCMPFUdA 00007	10/31/19	Welling	ton Laboratories, Lot M	PFUdA1014	(Purchased Rea	agent)	13C2 PFUnA	50 ug/mL
.LCPFACMXB_00007	11/06/20	Wellingt	on Laboratories, Lot PF	FACMXB1115	(Purchased Rea	agent)	Perfluorobutanesulfonic acid (PFBS)	1.77 ug/mL
							Perfluoroheptanoic acid (PFHpA)	2 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	1.89 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctanesulfonic acid	1.91 ug/mL
							(PFOS)	
							Perfluorooctanoic acid (PFOA)	2 ug/mL
LCPFCSP 00049	11/17/16	05/17/16	Methanol, Lot 090285	10000 11T	LCPFBA 00004	200 11T.	Perfluorobutyric acid	1 ug/mL
	11/1/10	00/1//10	110011011, 200 030200	10000 42	LCPFBS 00003		Perfluorobutane Sulfonate	0.884 ug/mL
					LCPFBSA_00001		Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00004		Perfluorododecanoic acid	1 ug/mL
					LCPFDS 00005		Perfluorodecane Sulfonate	0.964 ug/mL
					_		Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS 00008	200 uL	Perfluoroheptane Sulfonate	0.952 ug/mL
							Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004		Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br 00001		Perfluorohexane Sulfonate	0.91 ug/mL

Lab	Name:	TestAmerica	Sacrament	to Job No.: 320-19198-1

				Reagent	Parent Reagent			
	Exp	Prep	Dilutant	Final		Volume	_	
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00005		Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00002	200 uL		0.96 ug/mL
					T GD TO 3	000 -	(Perflouro-1-nonanesulfonate)	1 / -
					LCPFOA_00005 LCPFODA 00005		Perfluorooctanoic acid (PFOA) Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS-br 00001		Perfluorooctandecanoic acid	1 ug/mL 0.928 ug/mL
					_		(PFOS)	
					LCPFOSA_00006		Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004		Perfluoropentanoic acid	1 ug/mL
					LCPFPeS_00002	200 uL	(Perflouro-1-pentanesulfonate)	0.938 ug/mL
					LCPFTeDA_00004		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA 00004		Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA 00004		Perfluoroundecanoic acid	1 ug/mL
.LCPFBA_00004	01/30/20		gton Laboratories, Lot Pl		(Purchased Rea	- ·	Perfluorobutyric acid	50 ug/mL
.LCPFBS_00003	10/09/19		Wellington Laboratories, Lot LPFBS1014		(Purchased Reagent)		Perfluorobutane Sulfonate	44.2 ug/mL
.LCPFBSA_00001	10/09/19	_	ton Laboratories, Lot LP		(Purchased Rea	igent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA_00004				(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL	
.LCPFDoA_00004	01/30/20		ton Laboratories, Lot PF		(Purchased Rea		Perfluorododecanoic acid	50 ug/mL
.LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
						Perfluorodecane Sulfonic acid	48.2 ug/mL	
.LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpS_00008	11/06/20	Wellingt	ton Laboratories, Lot LP1	FHpS1115	(Purchased Rea	agent)	Perfluoroheptane Sulfonate	47.6 ug/mL
							Perfluoroheptanesulfonic Acid	47.6 ug/mL
.LCPFHxA_00004	12/22/20		ton Laboratories, Lot PF		(Purchased Rea	7 '	Perfluorohexanoic acid	50 ug/mL
.LCPFHxDA_00004	11/28/17		ton Laboratories, Lot PFI		(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00001	07/03/20	Wellingto	on Laboratories, Lot brPl	FHxSK0615	(Purchased Rea	igent)	Perfluorohexane Sulfonate	45.5 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
.LCPFNA_00005	10/23/20		gton Laboratories, Lot Pl		(Purchased Rea		Perfluorononanoic acid (PFNA)	50 ug/mL
.LCPFNS_00002	07/04/17	Welling	ton Laboratories, Lot LP	FNS0712	(Purchased Rea	agent)	PFNS (Perflouro-1-nonanesulfonate)	48 ug/mL
.LCPFOA 00005	11/06/20	Welling	gton Laboratories, Lot Pl	FOA1115	(Purchased Rea	agent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA 00005	01/30/20		ton Laboratories, Lot PF		(Purchased Rea	igent)	Perfluorooctandecanoic acid	50 ug/mL
.LCPFOS-br_00001	10/14/20	Wellingt	on Laboratories, Lot brP	FOSK1015	(Purchased Rea	agent)	Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LCPFOSA 00006	09/02/17	Welling	ton Laboratories, Lot FO	SA0815I	(Purchased Rea	agent)	Perfluorooctane Sulfonamide	50 ug/mL
.LCPFPeA 00004	01/30/20		ton Laboratories, Lot PF		(Purchased Rea	agent)	Perfluoropentanoic acid	50 ug/mL
.LCPFPeS_00002	07/04/17	Welling	ton Laboratories, Lot LP	PeS0712	(Purchased Rea	igent)	PFPeS (Perflouro-1-pentanesulfonate)	46.9 ug/mL
.LCPFTeDA 00004	12/09/20	Wellingt	ton Laboratories, Lot PF	TeDA1215	(Purchased Rea	agent)	Perfluorotetradecanoic acid	50 ug/mL
.LCPFTrDA 00004	12/10/18		ton Laboratories, Lot PF		(Purchased Rea		Perfluorotridecanoic acid	50 ug/mL
.LCPFUdA 00004	08/19/20		ton Laboratories, Lot PF		(Purchased Rea		Perfluoroundecanoic acid	50 ug/mL

Reagent

LCM2PFHxDA_00005



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2PFHxDA

LOT NUMBER:

M2PFHxDA1112

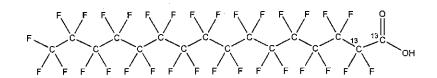
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₁₄HF₃₁O₂

 $50 \pm 2.5 \,\mu \text{g/ml}$

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

816.11

SOLVENT(S):

Methanol

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

Water (<1%) >99% ¹³C

CHEMICAL PURITY:

CONCENTRATION:

>98%

LAST TESTED: (mm/dd/yyyy)

01/07/2016

EXPIRY DATE: (mm/dd/yyyy)

01/07/2021

RECOMMENDED STORAGE:

Stere 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:

(mm/dd/ssss)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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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:

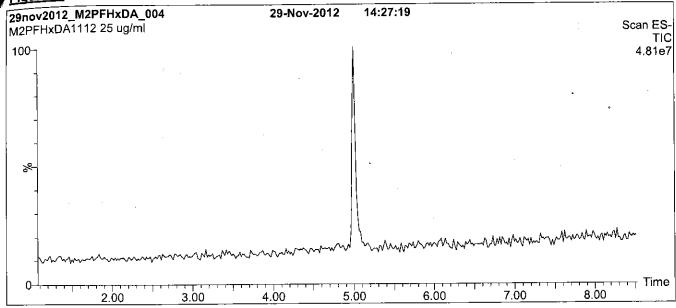
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

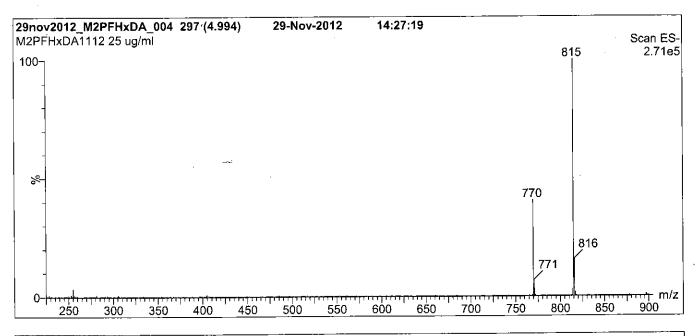


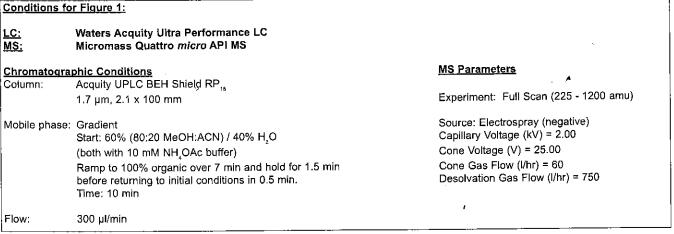


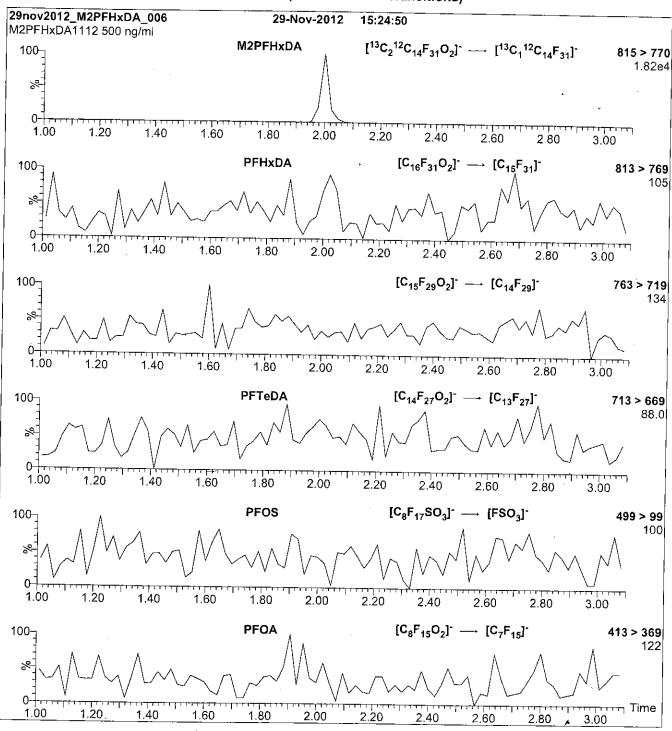
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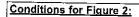












Injection:

Direct loop injection

10 μl (500 ng/ml M2PFHxDA)

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

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

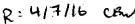
MS Parameters

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

Reagent

LCM2PFTeDA_00005

ID: LCM2PFTeDA 00005 Exp; 12/07/20 Prpd; CBW 13C2-PFTeDA at 50ug/mL





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2PFTeDA

LOT NUMBER:

M2PFTeDA1115

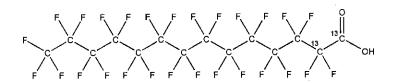
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

13C, 12C, HF, O,

CONCENTRATION:

 $50 \pm 2.5 \mu g/ml$

MOLECULAR WEIGHT:

716.10

SOLVENT(S):

ISOTOPIC PURITY:

Methanol

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

Water (<1%) ≥99% 13C

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/07/2015

EXPIRY DATE: (mm/dd/yyyy)

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

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.

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

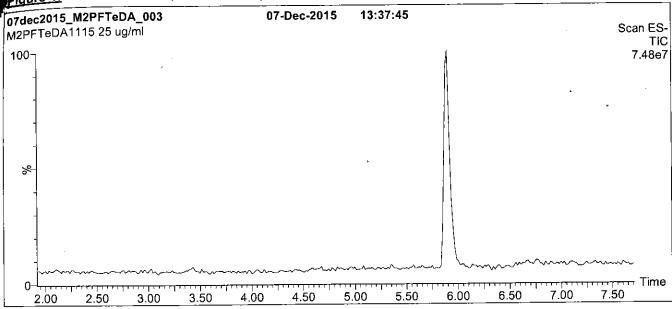
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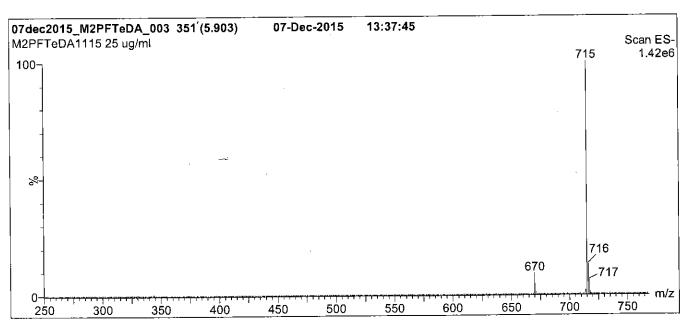




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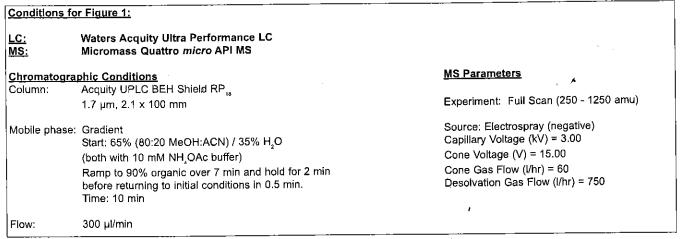
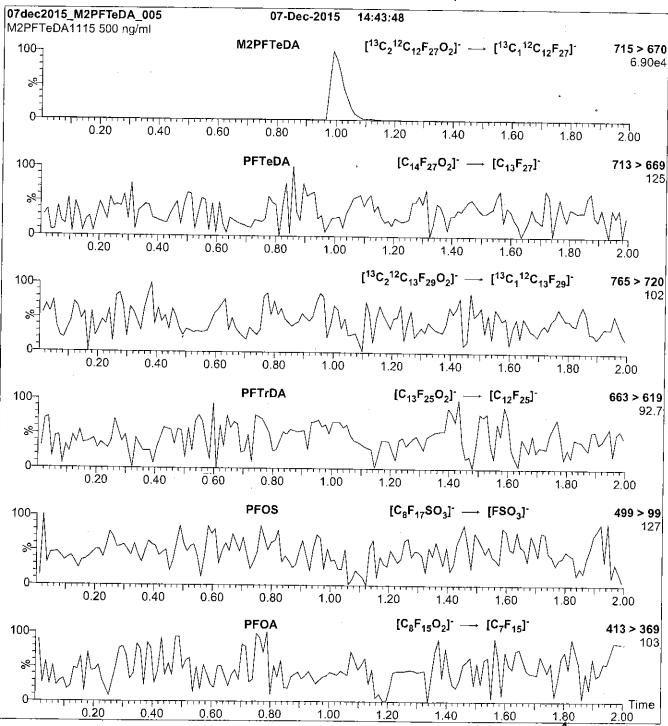
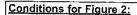


Figure 2: M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml M2PFTeDA)

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) = 3.28e-3 Collision Energy (eV) = 14

Reagent

LCM4PFHPA_00005

13C4-Perfluoroheptanoic



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M4PFHpA

LOT NUMBER:

M4PFHpA0515

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

F F F F F F

MOLECULAR FORMULA:

¹³C₄¹²C₃HF₁₃O₂

MOLECULAR WEIGHT: 368.03

CONCENTRATION:

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

Methanol

ISOTOPIC PURITY:

SOLVENT(S):

Water (<1%) ≥99%¹³C

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

CHEMICAL PURITY:

>98%

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date

05/25/2015

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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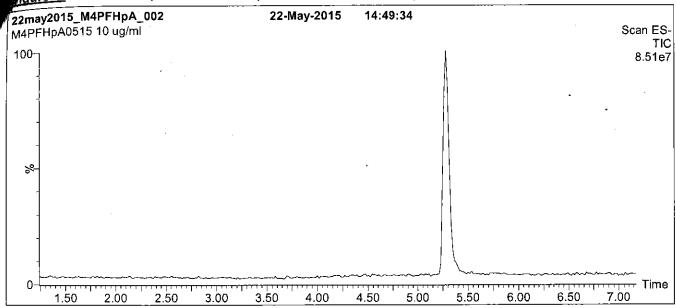
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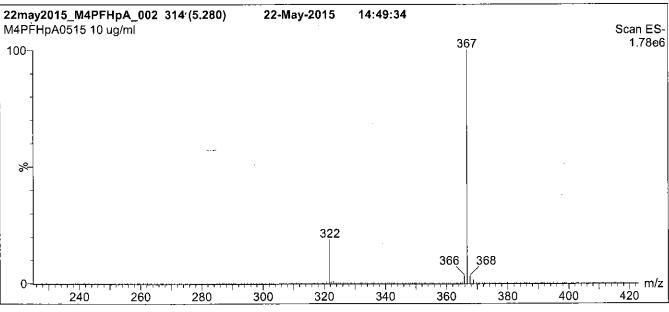




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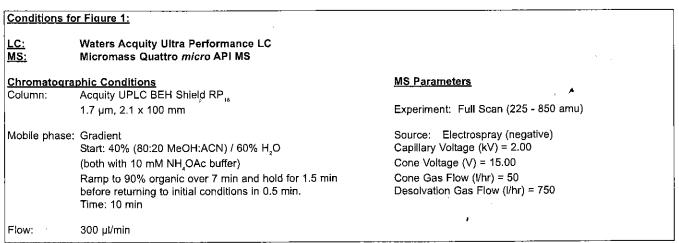
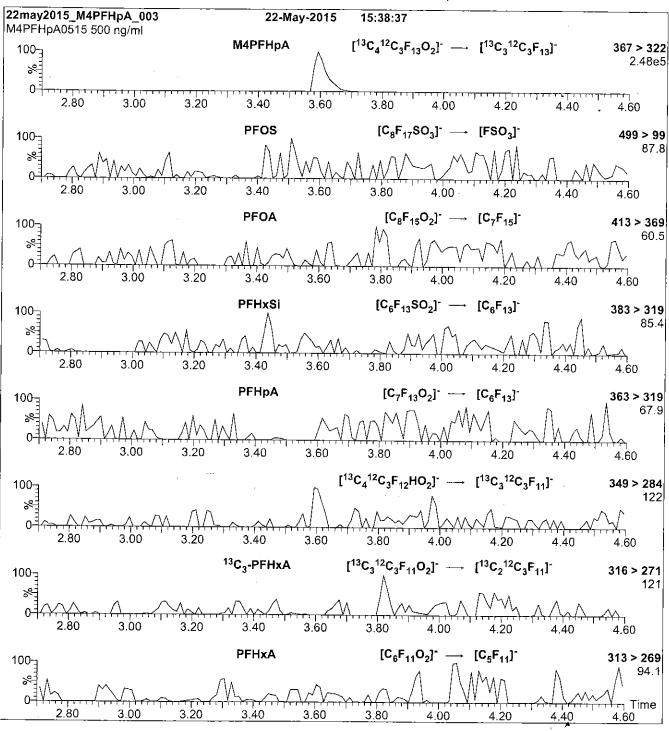
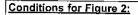


Figure 2: M4PFHpA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml M4PFHpA)

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

(both with 10 mM NH,OAc buffer)

Flow: 30

300 µl/min

MS Parameters

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

Reagent

LCM5PFPEA_00006



609706

ID: LCM5PFPEA_00006 Exp: 05/22/20 Prpd: CBW 13C5-Perfluoropentanoic R: 4/7/16



CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

M5PFPeA

LOT NUMBER:

M5PFPeA0515

COMPOUND:

Perfluoro-n-[13C_s]pentanoic acid

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₅HF₆O₉

MOLECULAR WEIGHT:

269,01

CONCENTRATION:

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

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

Water (<1%) ≥99% 13C

 $(^{13}C_{5})$

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:

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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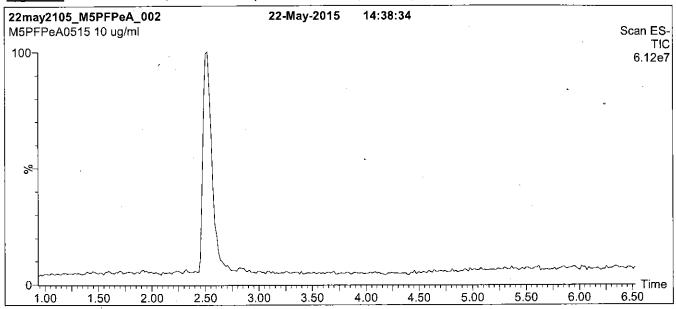
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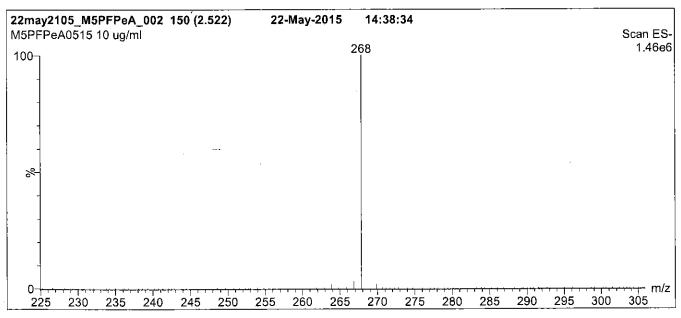




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Figure 1: M5PFPeA; LC/MS Data (TIC and Mass Spectrum)





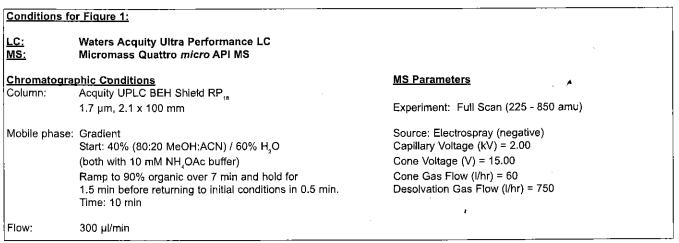
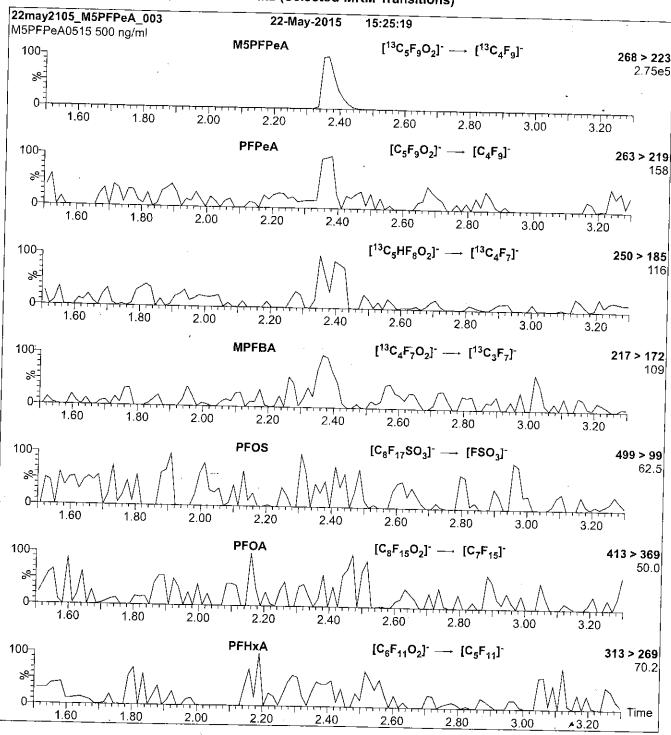
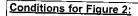


Figure 2: M5PFPeA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µI (500 ng/ml M5PFPeA)

, (--- ing..... mo; 11 5/1)

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) = 9

Reagent

LCM8FOSA_00009

ID: LCM8FOSA_00009 Exp: 12/22/17 Prpd: CBW 13C8-Perfluorooctanesulfo R=4/7/16 CBW



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M8FOSA-I

MOI COA-I

LOT NUMBER:

M8FOSA1215I

COMPOUND:

Perfluoro-1-[13C] octanesulfonamide

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

 $^{13}C_{_{8}}H_{_{2}}F_{_{17}}NO_{_{2}}S$

CONCENTRATION:

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

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/22/2015

EXPIRY DATE: (mm/dd/yyyy)

12/22/2017

RECOMMENDED STORAGE:

Refrigerate ampoule

MOLECULAR WEIGHT:

SOLVENT(S):

Isopropanol

507.09

ISOTOPIC PURITY:

≥99% ¹³C

 $(^{13}C_{_{\rm B}})$

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

<u>01/14/2016</u>

(mm/dd/yyyy)

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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.

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

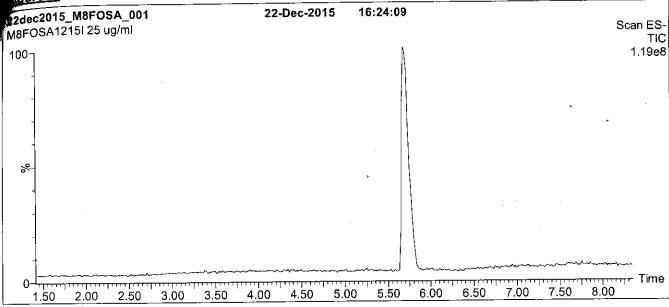
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

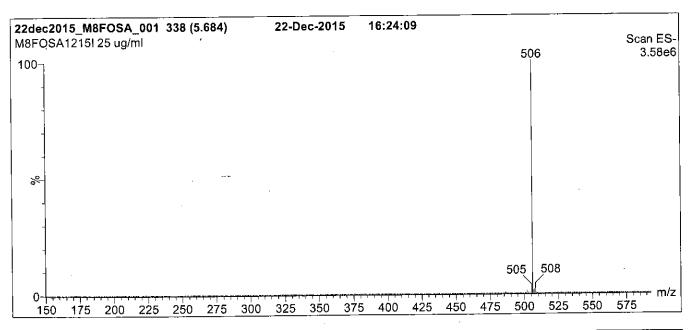




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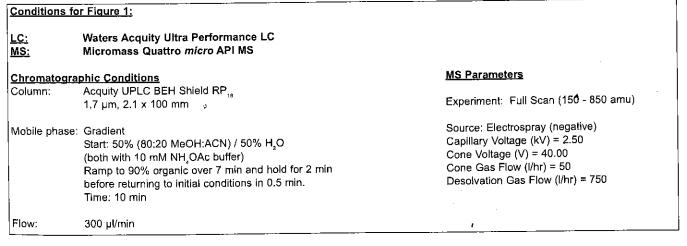
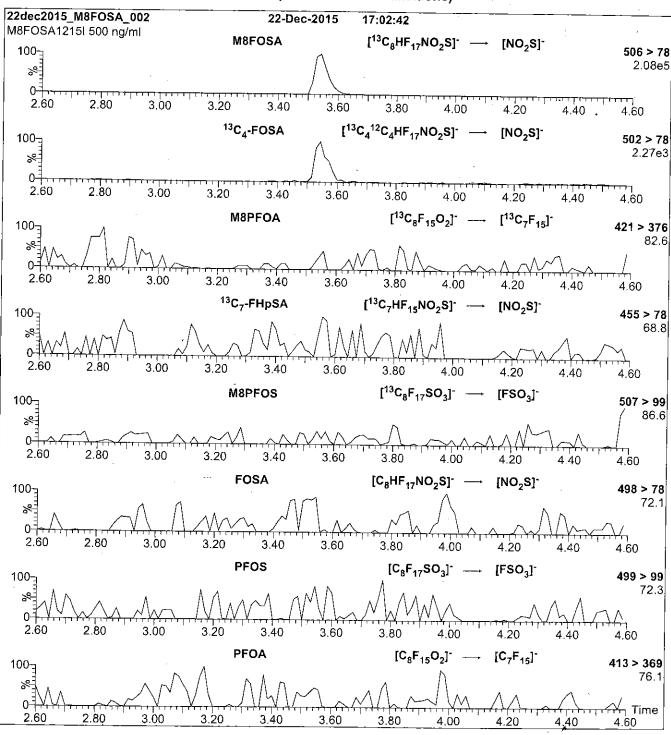
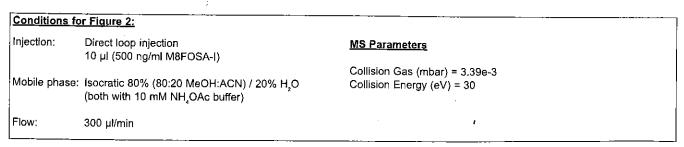


Figure 2: M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)





LCMPFBA_00006



13C4-Perfluorobutanoic ad



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFBA

LOT NUMBER:

MPFBA1014

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₄HF₂O,

MOLECULAR WEIGHT:

218.01

CONCENTRATION:

50 ± 2.5 μg/ml

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99%13C

LAST TESTED: (mm/dd/yyyy)

10/31/2014

(1,2,3,4-13C₁)

EXPIRY DATE: (mm/dd/yyyy)

10/31/2019

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:

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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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

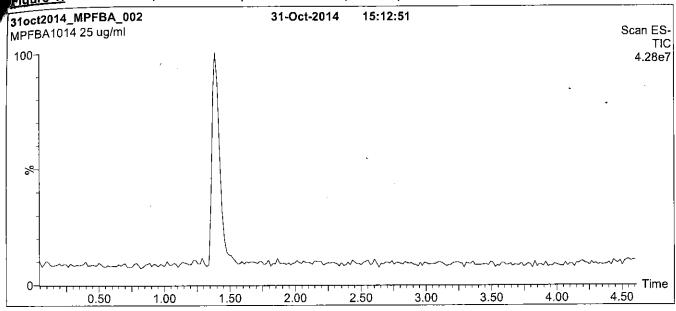
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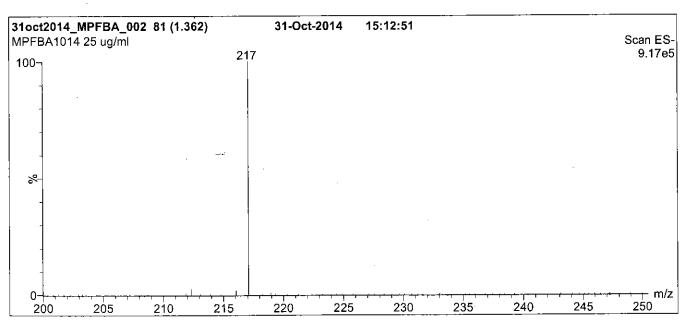




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MPFBA; LC/MS Data (TIC and Mass Spectrum)





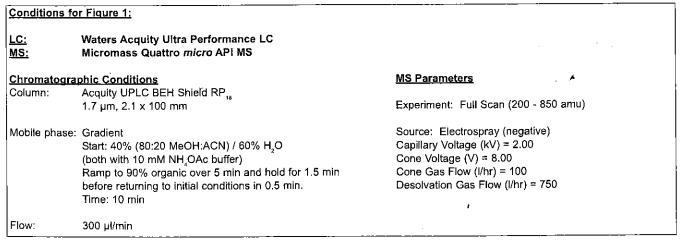
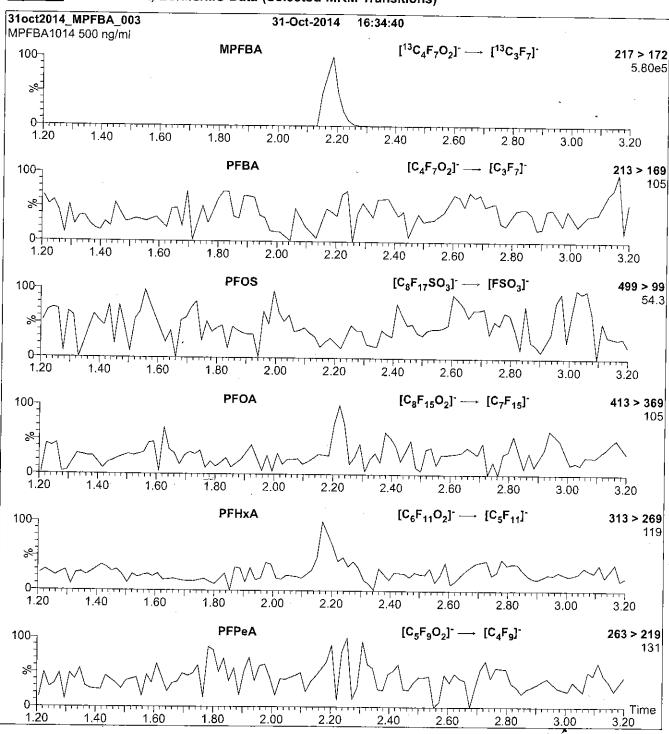
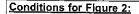


Figure 2: MPFBA; LC/MS/MS Data (Selected MRM Transitions)





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 µl/min

MS Parameters

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

LCMPFDA 00007

Exp: 08/19/20 Prpd; CBW 13C2-Perfluornodecanoic a



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFDA

LOT NUMBER:

MPFDA0815

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₂¹²C₄HF₁₀O₂

CONCENTRATION:

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

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

516.07

SOLVENT(S):

Methanol

(1,2-13C₂)

Water (<1%) ≥99% ¹³C

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.

Contains < 0.1% of ¹³C₄-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 08/21/2015

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:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

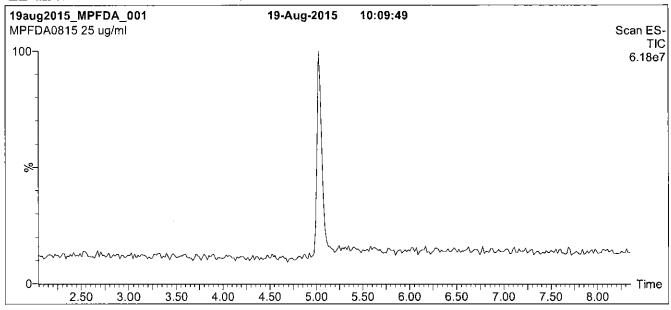
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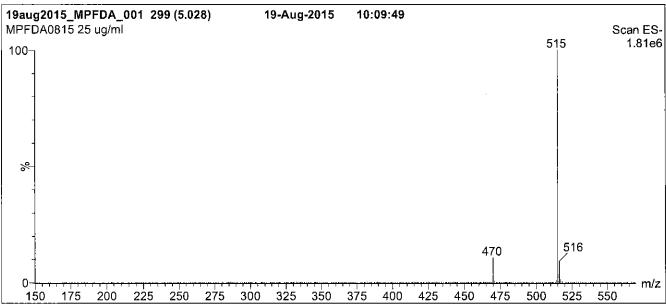




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Figure 1: MPFDA; LC/MS Data (TIC and Mass Spectrum)





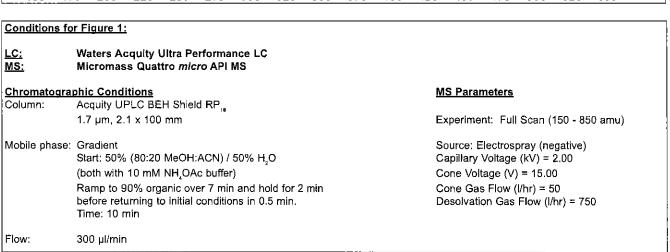
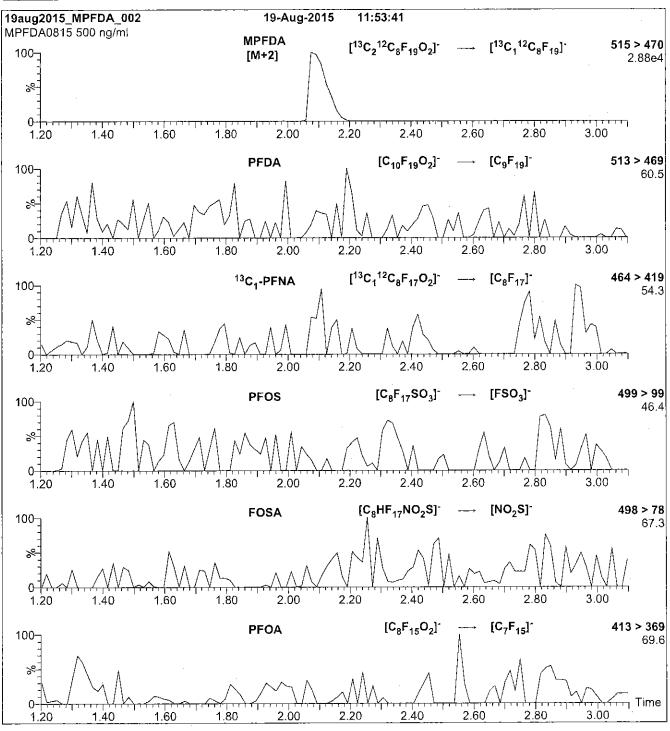
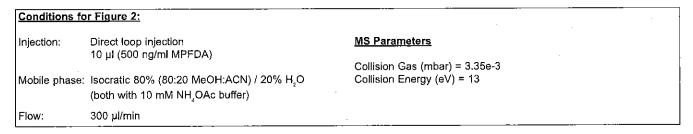


Figure 2: MPFDA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFDoA_00006



ID: LCMPFDoA_00006 Exp: 07/17/19 Prpd; CBW 13C2-Perfluornododecanoio R: 4/7/16



BORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFDoA

LOT NUMBER:

MPFDoA0714

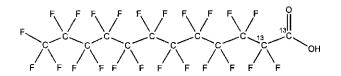
COMPOUND:

Perfluoro-n-[1,2-13C₂]dodecanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₁₀HF₂₃O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

616.08

SOLVENT(S):

Methanol

(1,2-13C₂)

Water (<1%) ≥99% ¹³C

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

07/17/2014

EXPIRY DATE: (mm/dd/yyyy)

07/17/2019

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:

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:

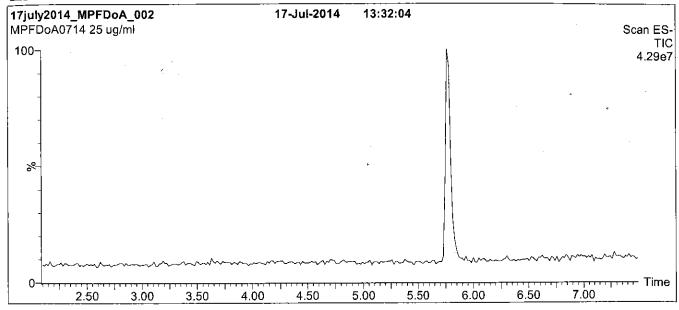
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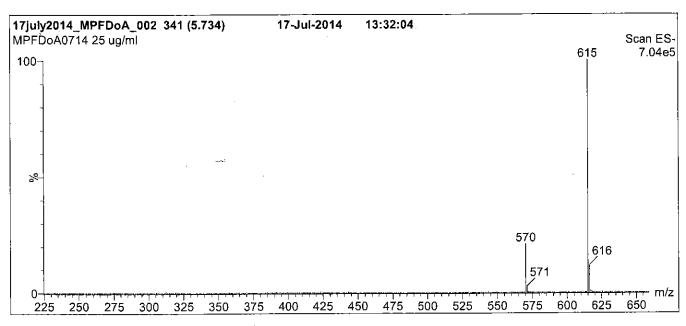




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Figure 1: MPFDoA; LC/MS Data (TIC and Mass Spectrum)





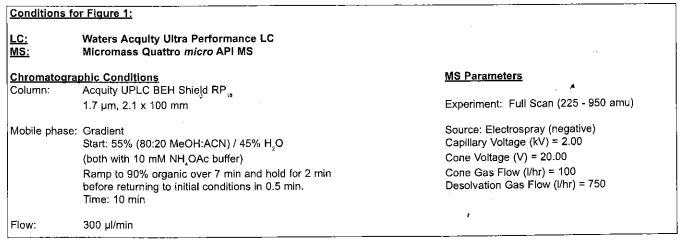
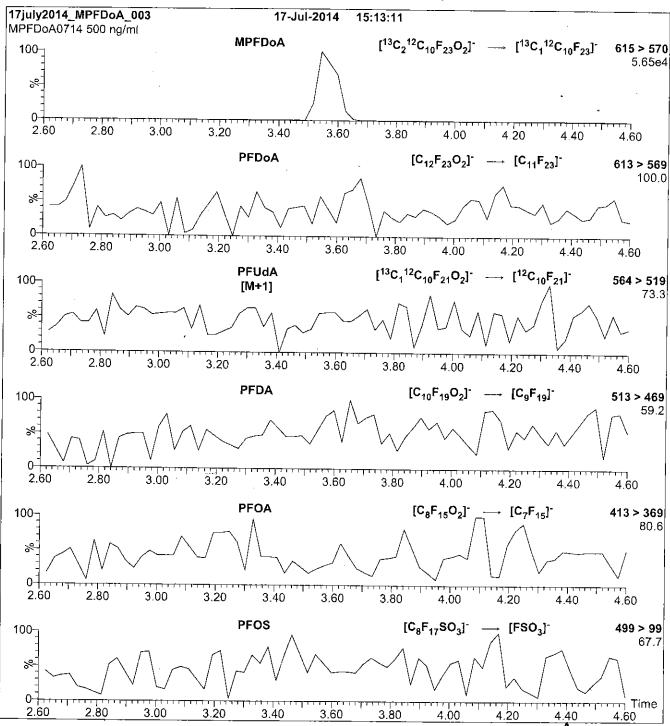
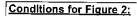


Figure 2: MPFDoA; LC/MS/MS Data (Selected MRM Transitions)





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) = 3.43e-3 Collision Energy (eV) = 13

LCMPFHxA_00008



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFHxA

LOT NUMBER:

MPFHxA0415

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₂¹²C₄HF₄O₉

MOLECULAR WEIGHT:

316.04

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)

04/09/2015

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

EXPIRY DATE: (mm/dd/yyyy)

04/09/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified Bv:

Date: 04/14/2015

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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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:

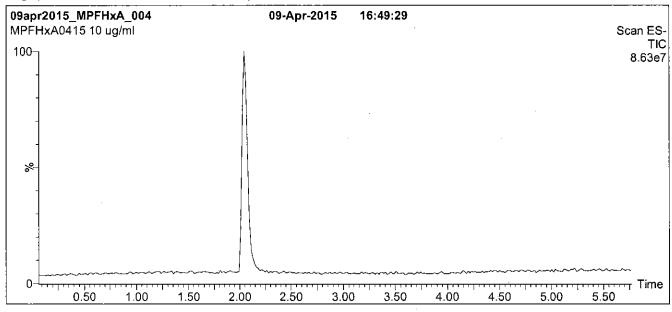
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

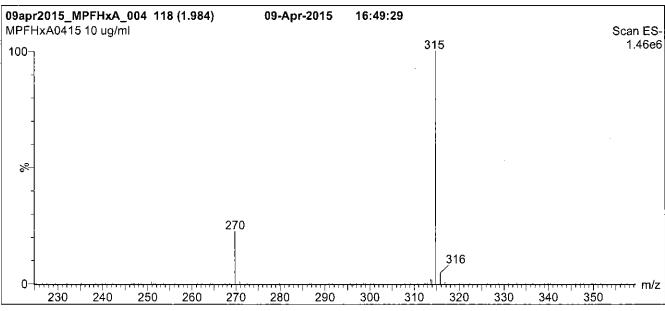




^{**}For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com**

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





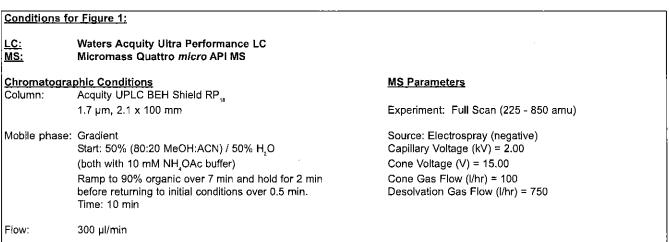
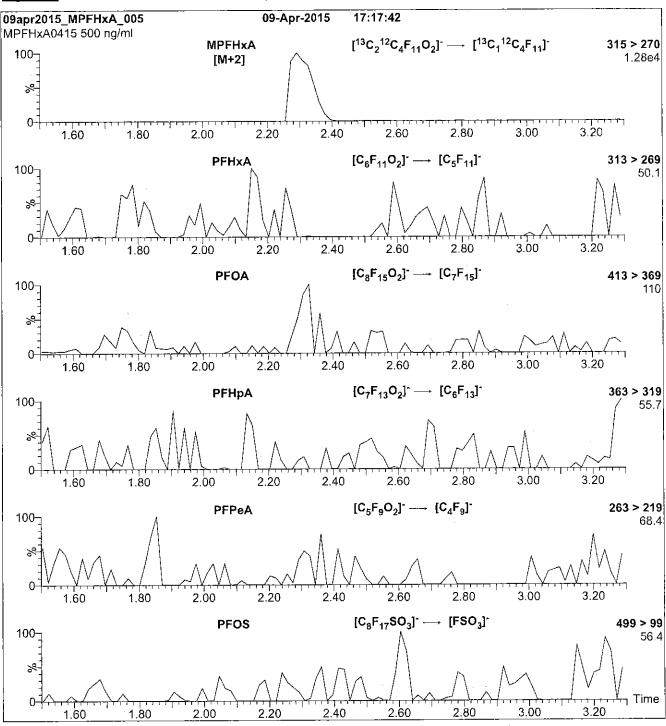
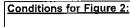


Figure 2: MPFHxA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml MPFHxA)

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

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCMPFHxS_00006



ID: LCMPFHxS_00006 18O2-Perfluorohexanesulfo R: 4/7/16 CBW



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFHxS

LOT NUMBER:

MPFHxS1015

COMPOUND:

Sodium perfluoro-1-hexane[180,]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) EXPIRY DATE: (mm/dd/yyyy)

10/23/2015 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 (C_sF₃S¹⁸O₃) 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:

B.G. Chittim

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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:

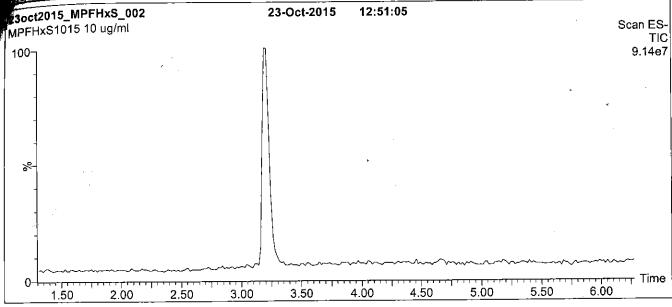
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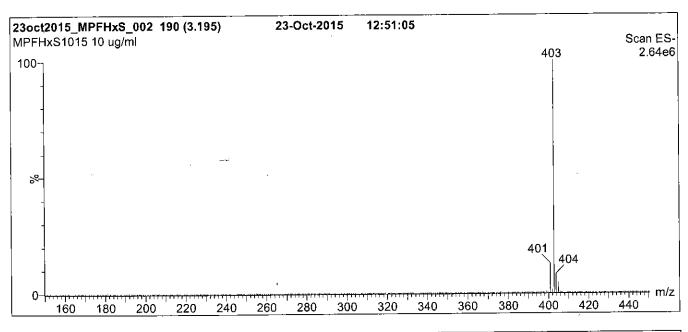




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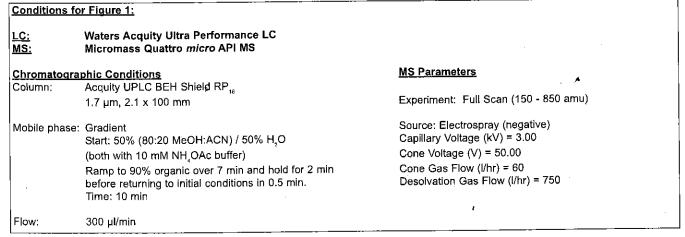
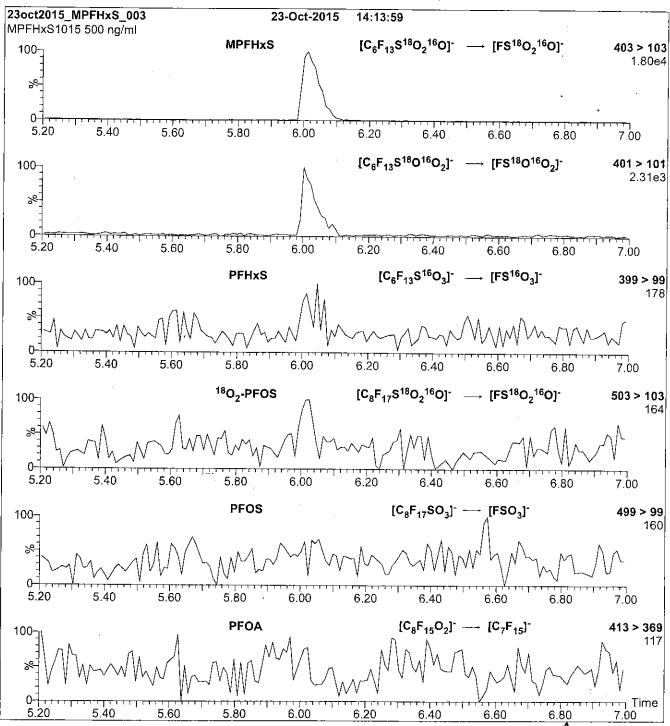
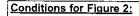


Figure 2: MPFHxS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μI (500 ng/ml MPFHxS)

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) = 30

LCMPFNA 00005



ID: LCMPFNA 00005 Exp: 04/13/19 Prpd: CBW 13C5-Perfluornonanoic aci



CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

MPFNA

LOT NUMBER:

MPFNA0414

COMPOUND:

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

CAS #:

Not available

STRUCTURE:

MOLECULAR FORMULA:

¹³C₅¹²C₄HF₁₇O₂

CONCENTRATION:

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

MOLECULAR WEIGHT:

469.04

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>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

ISOTOPIC PURITY:

>99%13C

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

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 Bv:

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:

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.

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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:

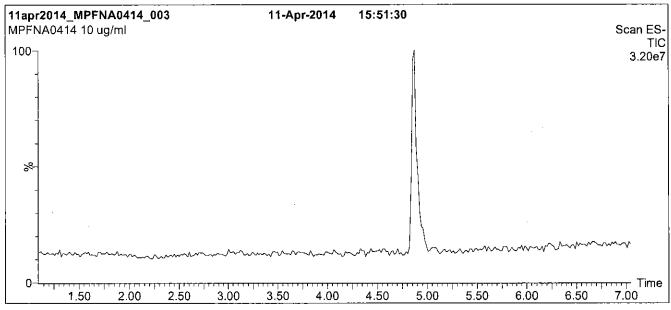
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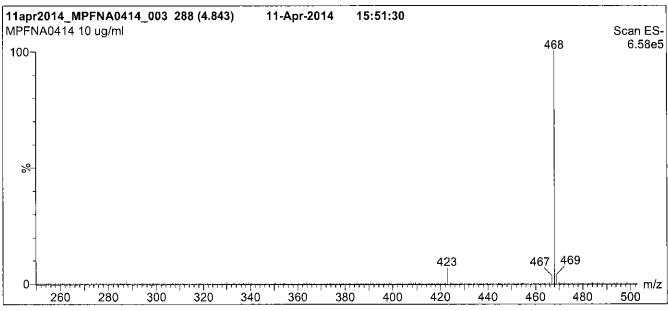




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Figure 1: MPFNA; LC/MS Data (TIC and Mass Spectrum)





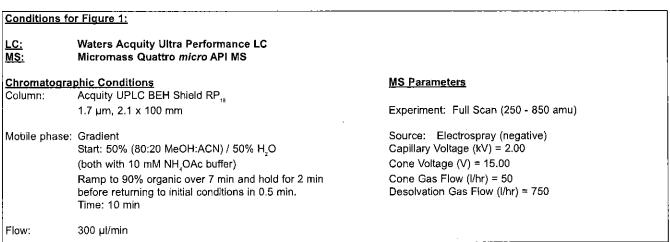
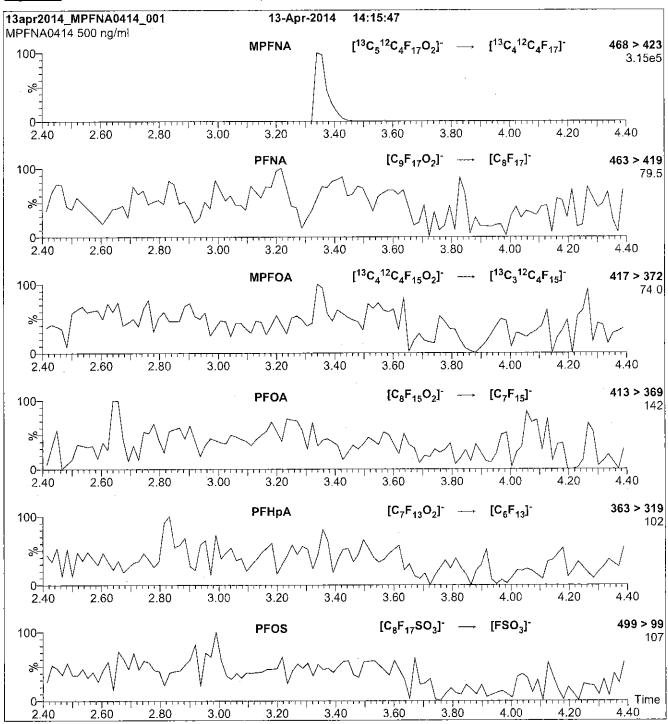
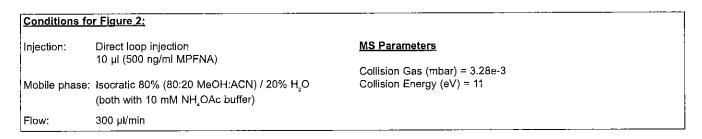


Figure 2: MPFNA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFOA 00010



ID: LCMPFOA 00010 Exp: 01/22/21 Prpd: CBW 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:

¹³C₄¹²C₄HF₁₅O₉

MOLECULAR WEIGHT:

418.04

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol Water (<1%)

ISOTOPIC PURITY:

≥99% ¹³C

(1,2,3,4-13C₄)

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

01/22/2016

EXPIRY DATE: (mm/ad/yyyy)

01/22/2021

RECOMMENDED STORAGE:

Störe 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)

<u>ADDITIONAL INFORMATION:</u>

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:

Date: 02/01/2016

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:

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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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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:

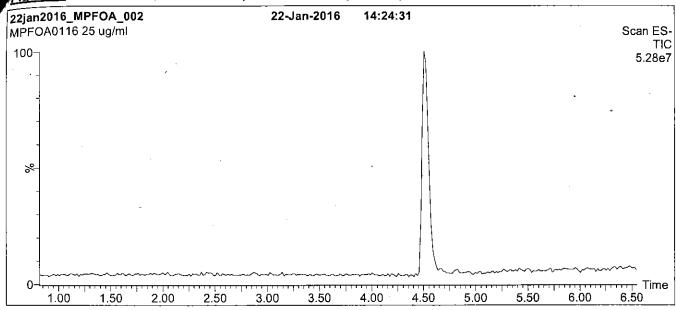
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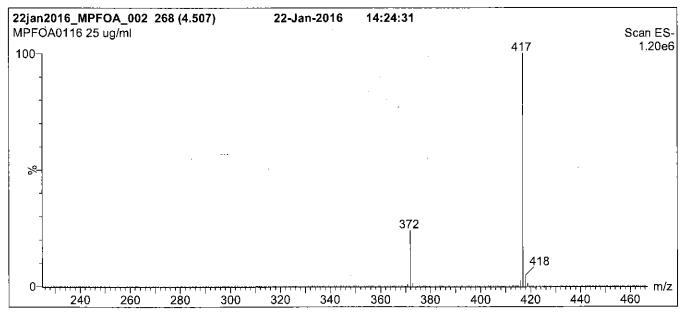




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Figure 1: MPFOA; LC/MS Data (TIC and Mass Spectrum)





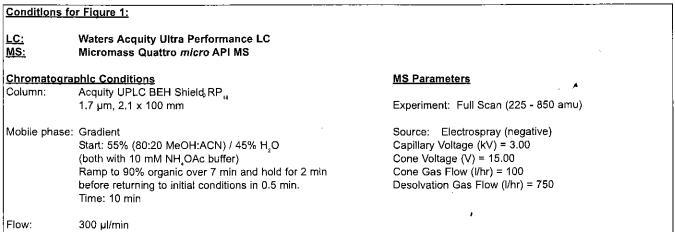
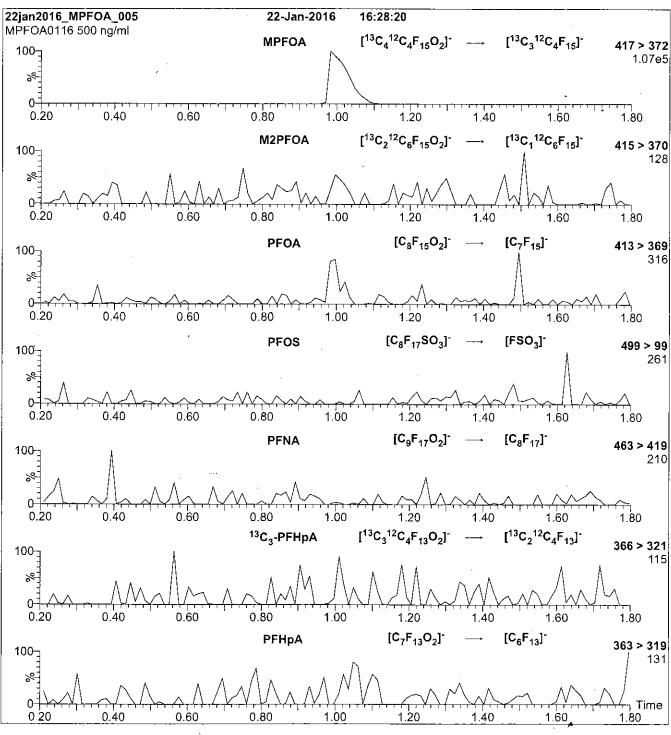
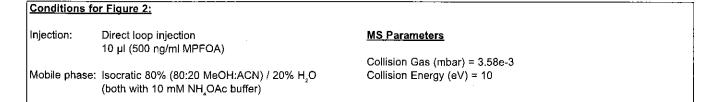


Figure 2: MPFOA; LC/MS/MS Data (Selected MRM Transitions)





300 µl/min

Flow:

LCMPFOS_00012



ID: LCMPFOS_00012 Exp: 01/22/21 Prpd: CBW 13C4-Perfluorooctanesulfo Rea 3/29/16

ID: LCMPFOS_00013 Exp: 01/22/21 Prpd: CBW 13C4-Perfluorooctanesulfo



ELLINGTON A B O R A T O R I E S

CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

MPFOS

LOT NUMBER:

MPFOS0116

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₄¹²C₄F₁₇SO₃Na

MOLECULAR WEIGHT:

526.08

CONCENTRATION:

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

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

>99% 13C $(1,2,3,4^{-13}C_{\lambda})$

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

 $47.8 \pm 2.4 \,\mu\text{g/ml}$ (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 Bv:

Chittim

Date: 02/01/2016

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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UNCERTAINTY:

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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:

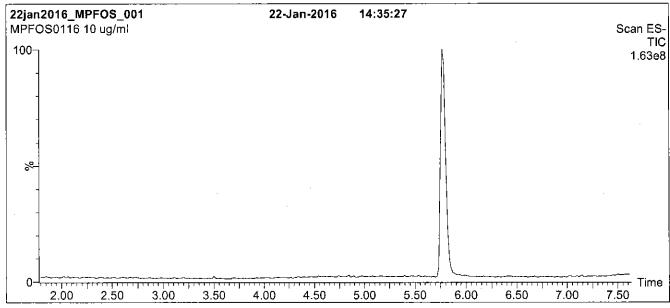
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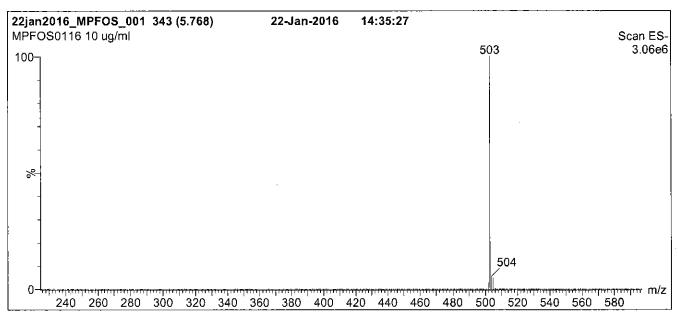




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Figure 1: MPFOS; LC/MS Data (TIC and Mass Spectrum)





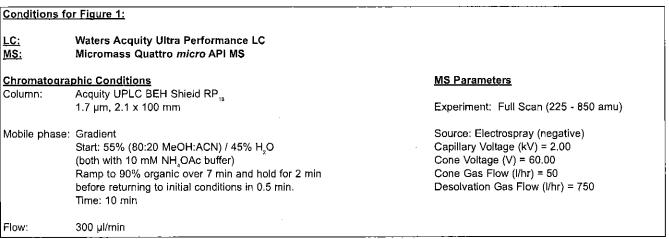
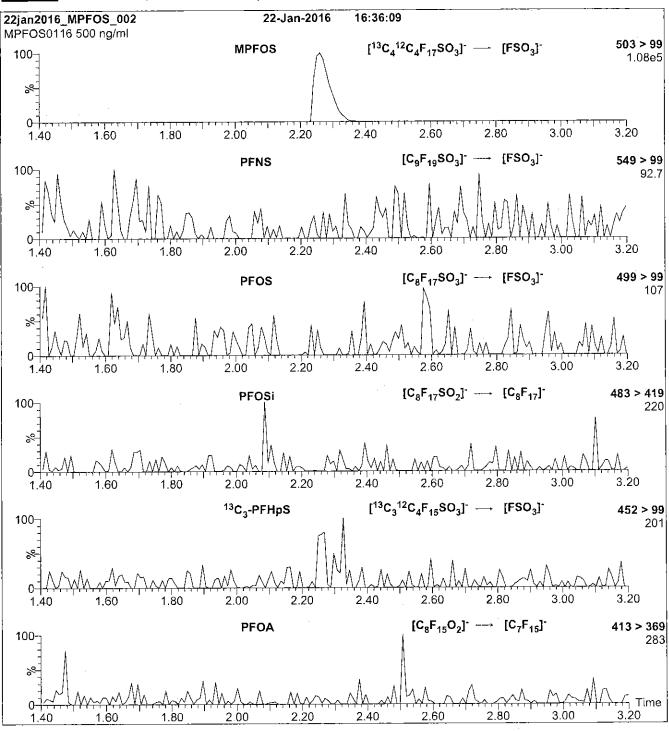
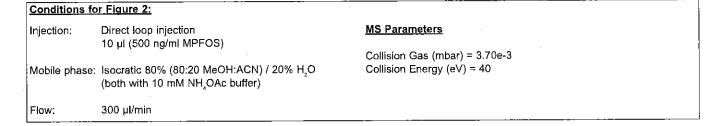


Figure 2: MPFOS; LC/MS/MS Data (Selected MRM Transitions)





LCMPFUdA_00007



ID: LCMPFUdA_00007
Exp: 10/31/19 Prpd: CBW
13C2-Perfluornoundecanoic

R: 4/7/16 CBW



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFUdA

LOT NUMBER:

MPFUdA1014

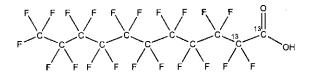
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₆HF₂₁O₂

50 + 0.5 + 10/mil

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

566.08

CONCENTRATION: $50 \pm 2.5 \,\mu\text{g/ml}$

SOLVENT(S):

Methanol

≥99% 13C

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

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/31/2014

EXPIRY DATE: (mm/dd/yyyy)

10/31/2019

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.

• 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 By:

B.G. Chittim

Date:

(mm/dd/yyyy)

(I)III(EUG/YYYY)

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

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

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

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±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:

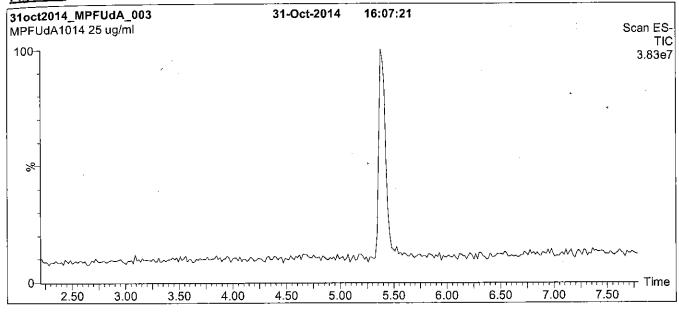
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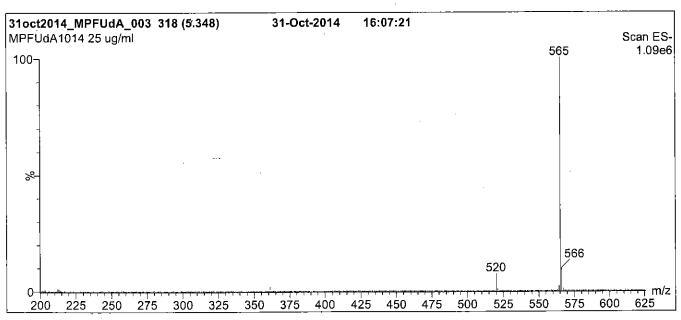




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Figure 1: MPFUdA; LC/MS Data (TIC and Mass Spectrum)





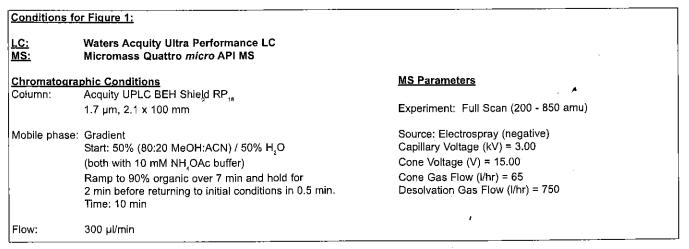
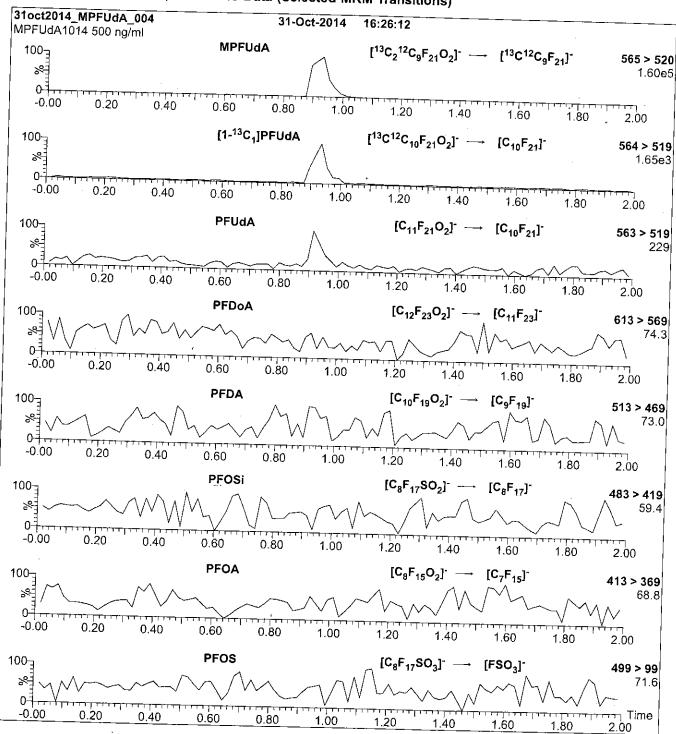
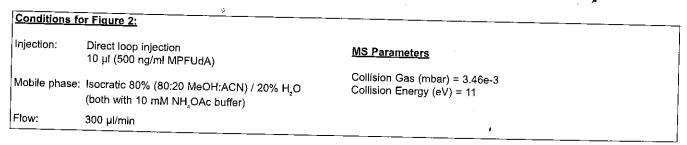


Figure 2: MPFUdA; LC/MS/MS Data (Selected MRM Transitions)





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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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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

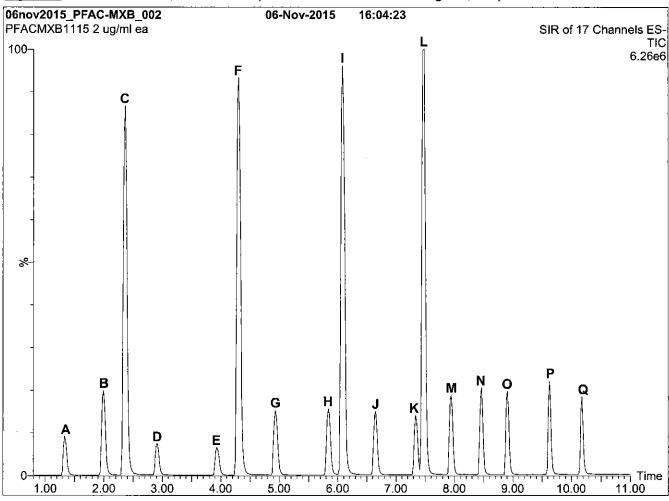
Name	Abbreviation	Concentration (ng/ml)		Peak Assignment In Figure 1
Perfluoro-n-butanoic acid	PFBA	2000		Α
Perfluoro-n-pentanoic acid	PFPeA	2000		В
Perfluoro-n-hexanoic acid	PFHxA	2000		D
Perfluoro-n-heptanoic acid	PFHpA	2000		E
Perfluoro-n-octanoic acid	PFOA	2000		G
Perfluoro-n-nonanoic acid	PFNA	2000		Н
Perfluoro-n-decanoic acid	PFDA	2000		J
Perfluoro-n-undecanoic acid	PFUdA	2000		K
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 salt	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	- 1
Sodium perfluoro-1-decanesulfonate	L-PFDS	2000	1930	L

Certified By:

B G Chittim

Date: 11/11/2015

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column:

Acquity UPLC BEH Shield RP,16

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

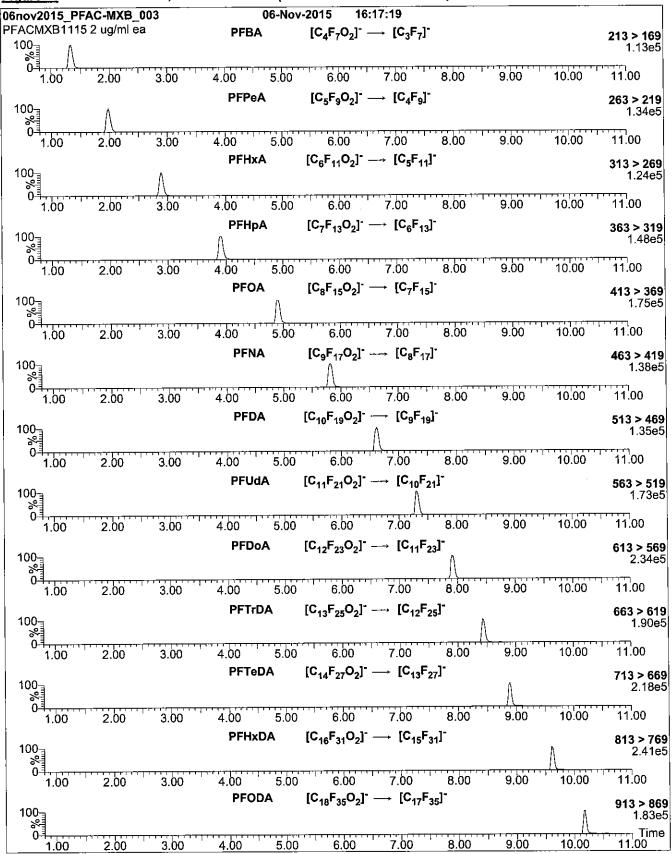
MS Parameters

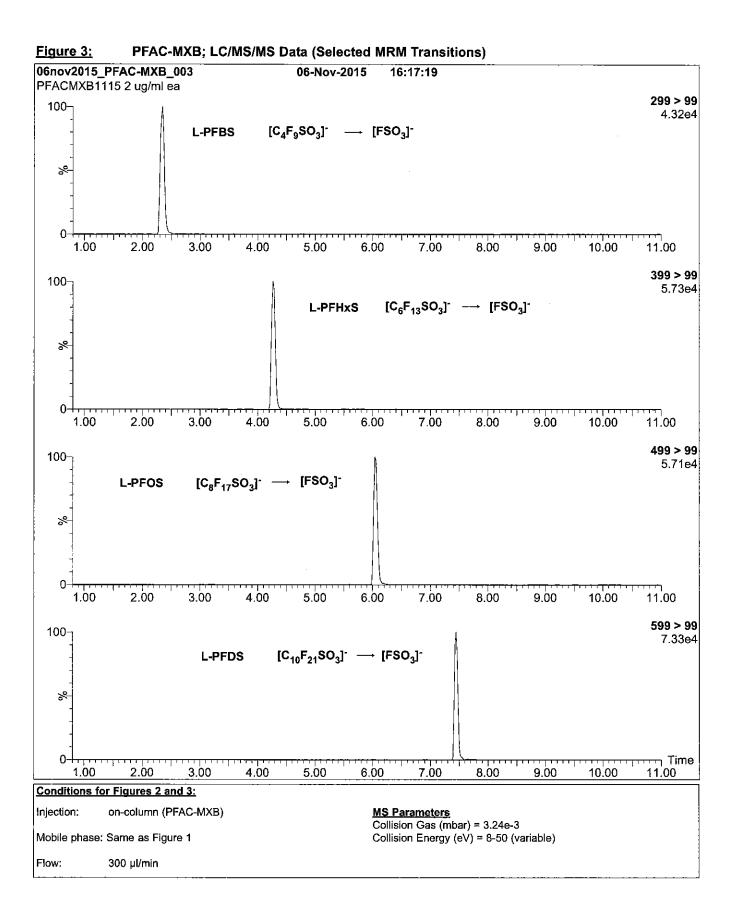
Experiment: SIR of 17 Channels

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 00004



ID: LCPFBA_00004 Exp: 01/30/20 Prpd: CBW PF-n-butanoic acid



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFBA

LOT NUMBER:

PFBA0115

COMPOUND:

Perfluoro-n-butanoic acid

STRUCTURE:

CAS #:

375-22-4

C₄HF₂O₂

MOLECULAR WEIGHT:

214.04

CONCENTRATION:

MOLECULAR FORMULA:

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

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.

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Certified By:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

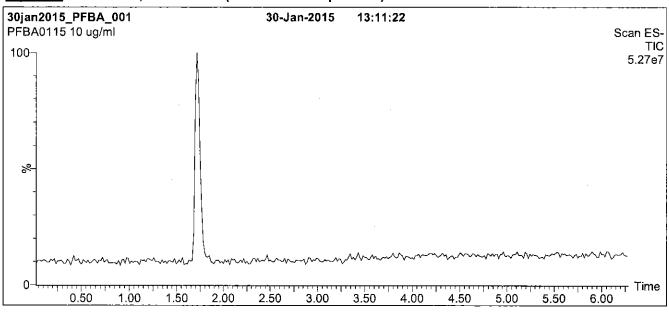
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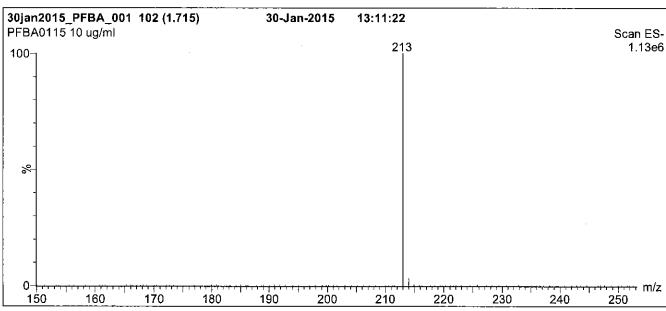


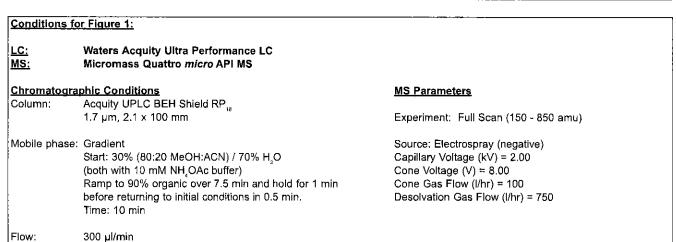


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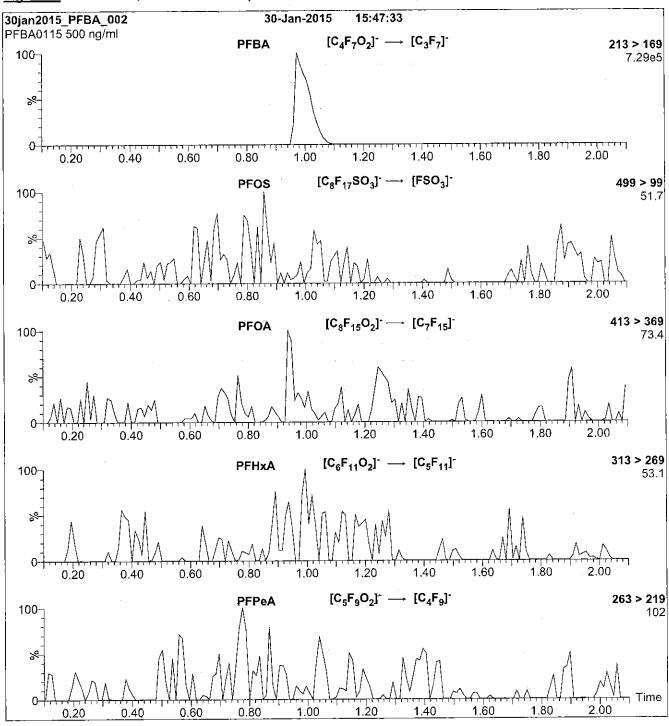
Figure 1: PFBA; LC/MS Data (TIC and Mass Spectrum)

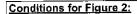






PFBA; LC/MS/MS Data (Selected MRM Transitions) Figure 2:





Injection:

Direct loop injection

10 µl (500 ng/ml PFBA)

 $\begin{array}{lll} \mbox{Mobile phase: Isocratic 80\% (80:20 MeOH:ACN) / 20\% \ H_{\rm 2}O \\ \mbox{(both with 10 mM NH}_{\rm 4}OAc \ buffer) \end{array}$

300 µl/min Flow:

MS Parameters

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

LCPFBS 00003



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFBS

LOT NUMBER:

MOLECULAR WEIGHT:

SOLVENT(S):

LPFBS1014

COMPOUND:

Potassium perfluoro-1-butanesulfonate

STRUCTURE:

CAS #:

29420-49-3

338.19

Methanol

F F F F F

MOLECULAR FORMULA:

C₄F₆SO₃K

50.0 ± 2.5 μg/ml (K salt)

44.2 ± 2.2 μg/ml (PFBS anion)

CHEMICAL PURITY:

CONCENTRATION:

>98%

LAST TESTED: (mm/dd/yyyy)

10/09/2014

EXPIRY DATE: (mm/dd/yyyy)

10/09/2019

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:

(mm/dd/www)

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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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 our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external, ISO/IEC 17025:2005 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

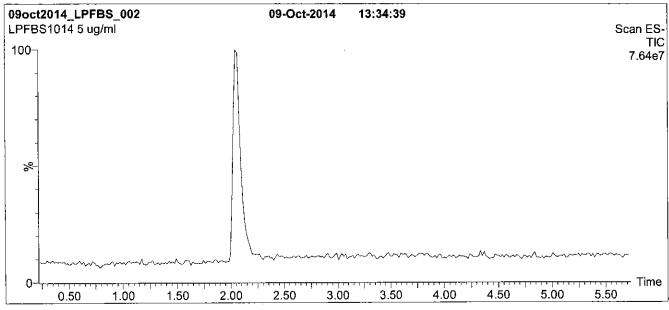
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

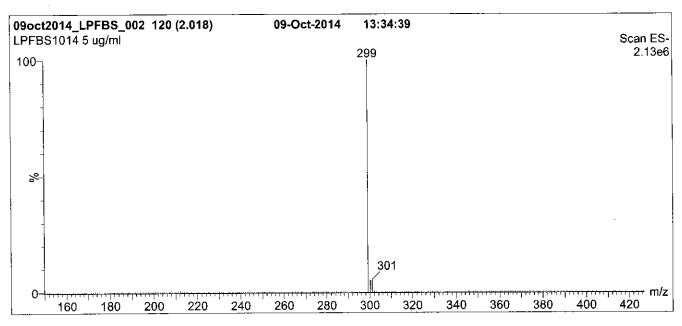




^{**}For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com**

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





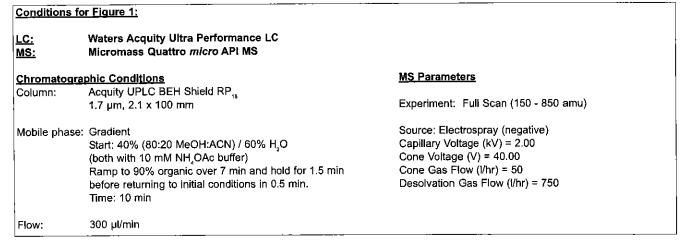
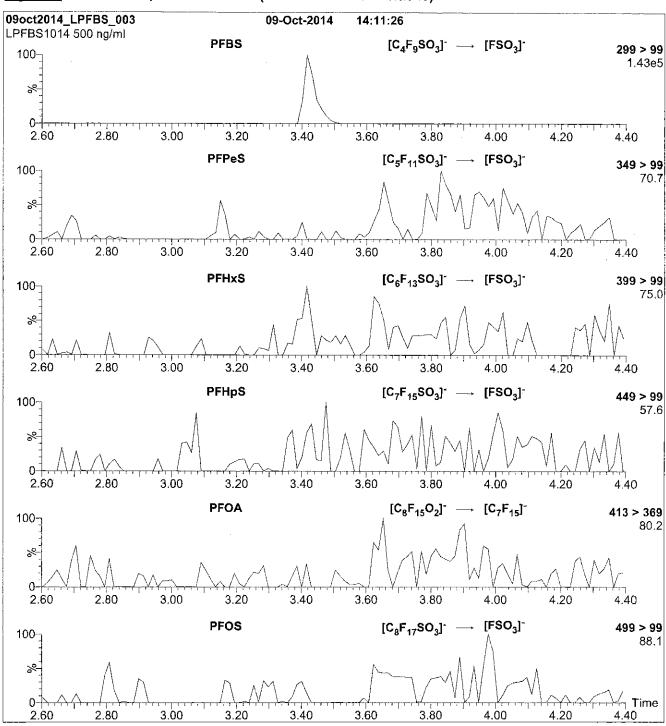
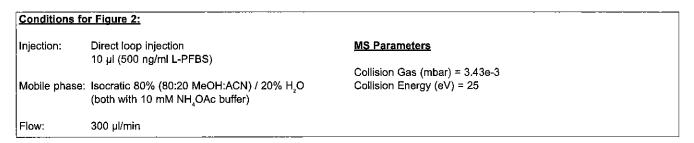


Figure 2: L-PFBS; LC/MS/MS Data (Selected MRM Transitions)





LCPFDA 00004



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDA

LOT NUMBER:

PFDA0615

COMPOUND:

Perfluoro-n-decanoic acid

STRUCTURE:

CAS #:

335-76-2

MOLECULAR FORMULA:

50 ± 2.5 μg/ml

MOLECULAR WEIGHT:

514.08

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

CONCENTRATION:

>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:

B G Chittim

Date:

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

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

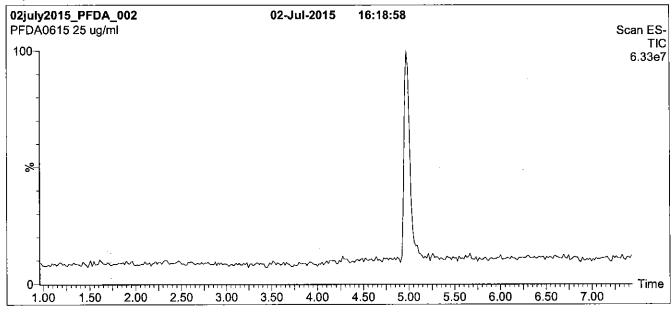
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

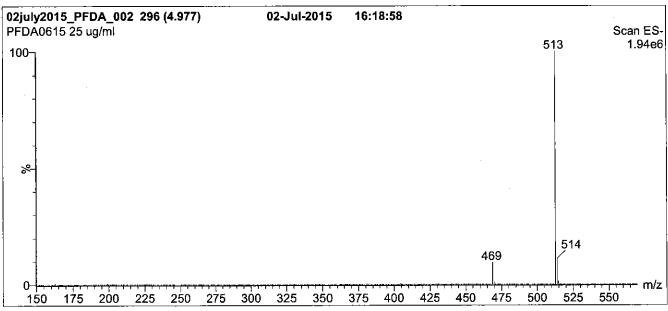




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Figure 1: PFDA; LC/MS Data (TIC and Mass Spectrum)





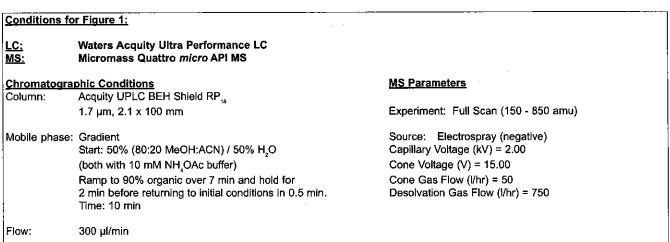
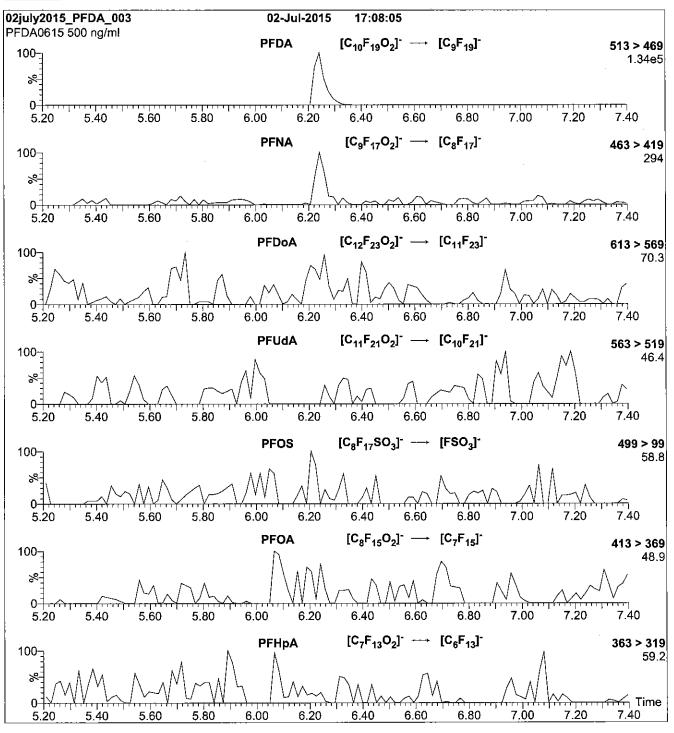
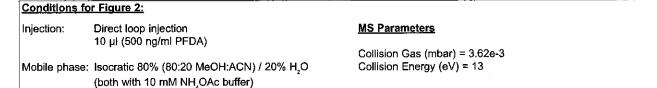


Figure 2: PFDA; LC/MS/MS Data (Selected MRM Transitions)





Flow: 300 µl/min

LCPFDoA_00004



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDoA

LOT NUMBER:

PFDoA0115

COMPOUND:

Perfluoro-n-dodecanoic acid

CAC #.

307-55-1

STRUCTURE:

<u>CAS #:</u>

MOLECULAR FORMULA: CONCENTRATION:

 $C_{12}HF_{23}O_2$

50 ± 2.5 μg/ml

MOLECULAR WEIGHT:

614.10

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:

D.C. Skilling

Date:

<u> 03/25/2015</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:

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:

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

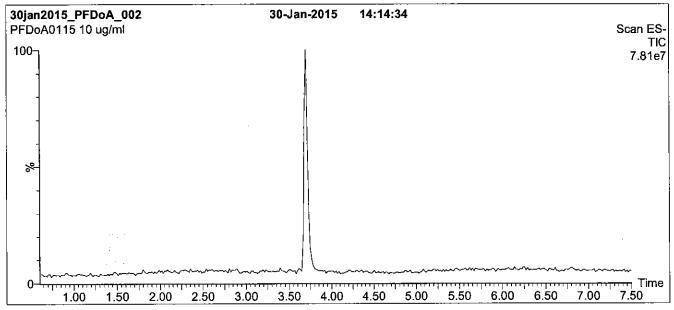
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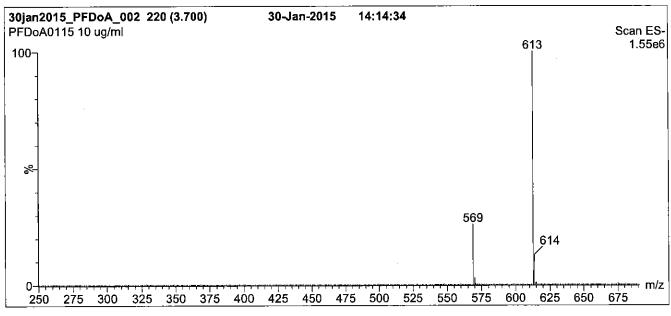




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





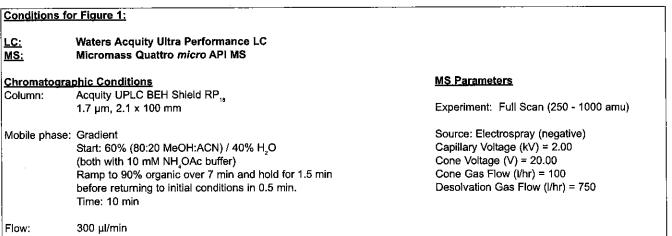
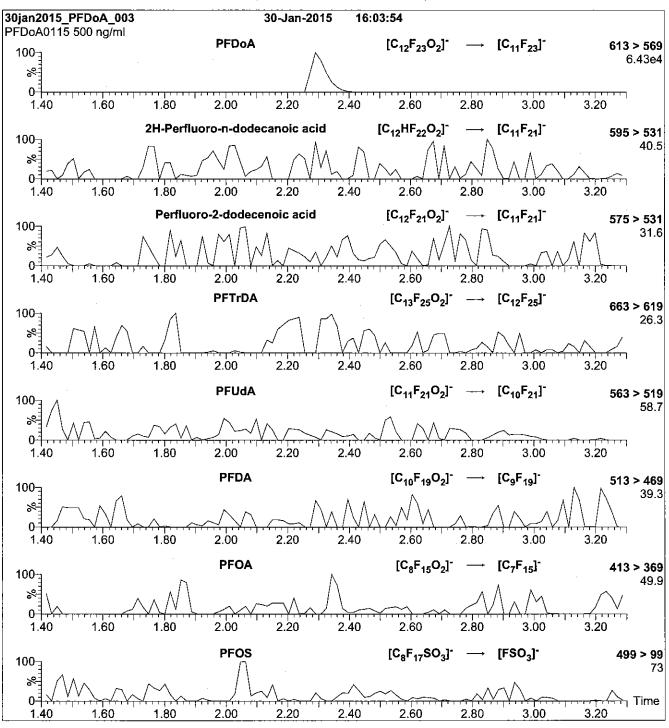
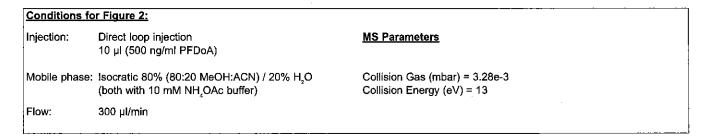


Figure 2: PFDoA; LC/MS/MS Data (Selected MRM Transitions)





LCPFDS_00005

ID: LCPFDS_00005 Exp: 07/02/20 Prpd; CBW PF-1-decanesulfonate sodi



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFDS

LOT NUMBER:

LPFDS0615

COMPOUND:

Sodium perfluoro-1-decanesulfonate

STRUCTURE:

CAS #:

2806-15-7

MOLECULAR FORMULA:

C₁₀F₂₁SO₃Na

MOLECULAR WEIGHT:

622,13

CONCENTRATION:

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

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

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/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 ~ 0.9% of sodium perfluoro-1-dodecanesulfonate (L-PFDoS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 12/07/2015

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:

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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 $x_a, x_a,...x_a$ on which it depends is:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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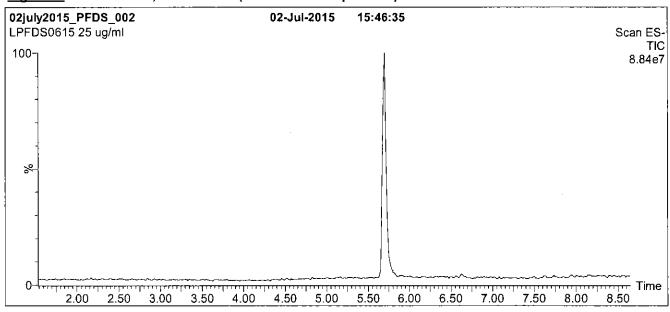
QUALITY MANAGEMENT:

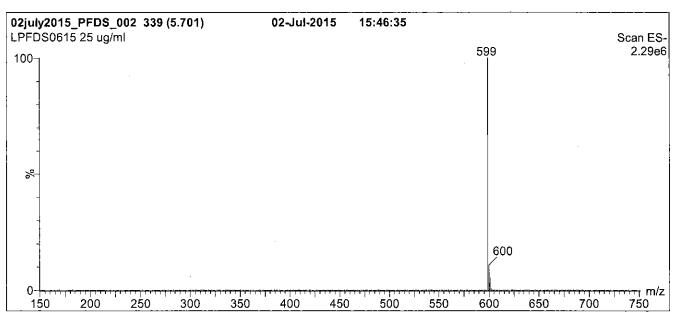
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Figure 1: L-PFDS; LC/MS Data (TIC and Mass Spectrum)





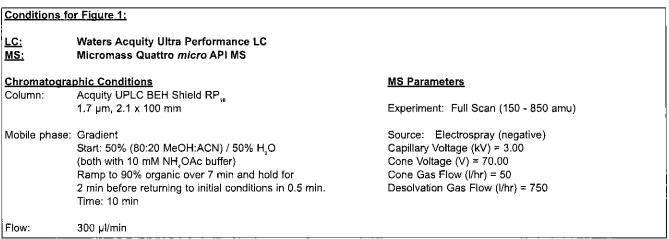
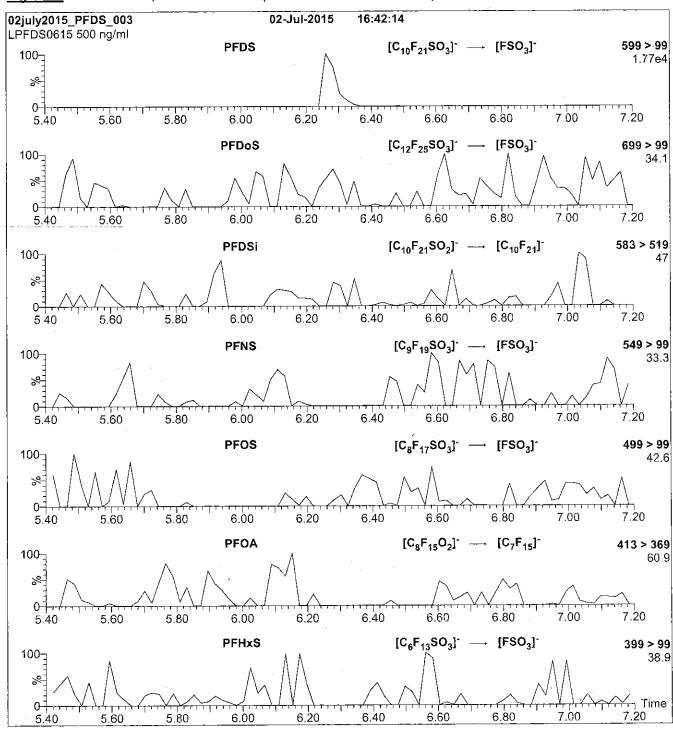
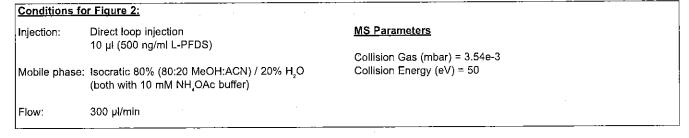


Figure 2: L-PFDS; LC/MS/MS Data (Selected MRM Transitions)





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:

SOLVENT(S):

364.06

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

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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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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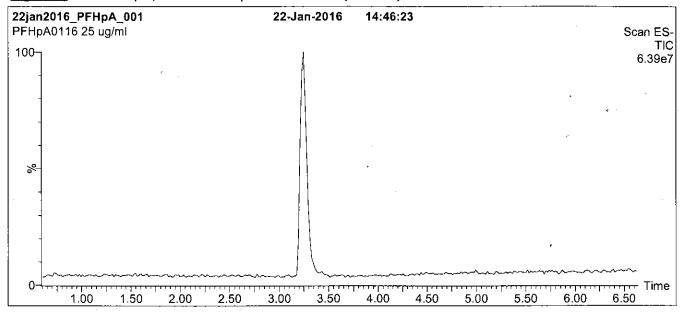
QUALITY MANAGEMENT:

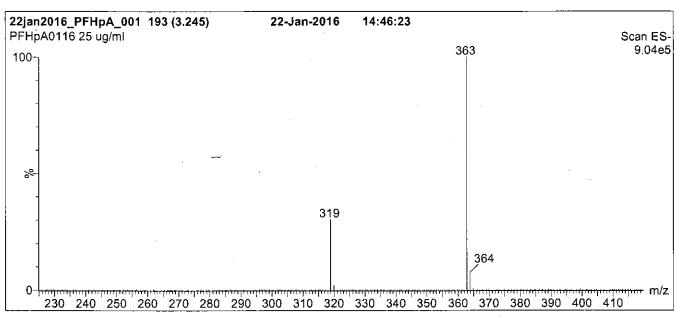
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Figure 1: PFHpA; LC/MS Data (TIC and Mass Spectrum)





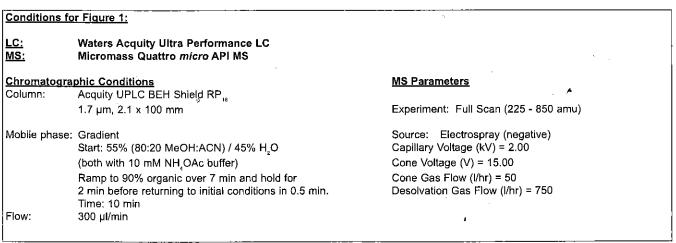
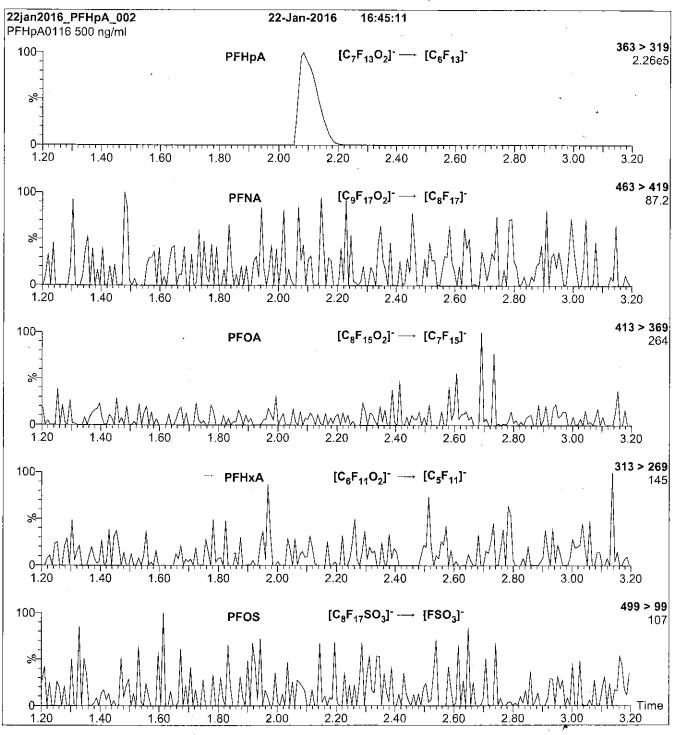
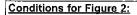


Figure 2: PFHpA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFHpA)

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

(both with 10 mM NH₂OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCPFHxA_00004

PF-n-hexanoic acid



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFHxA

LOT NUMBER:

PFHxA1215

COMPOUND:

Perfluoro-n-hexanoic acid

STRUCTURE:

CAS #:

307-24-4

MOLECULAR FORMULA:

C,HF,O,

CONCENTRATION:

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

MOLECULAR WEIGHT:

SOLVENT(S):

314.05 Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/22/2015

EXPIRY DATE: (mm/dd/yyyy)

12/22/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 12/23/2015

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

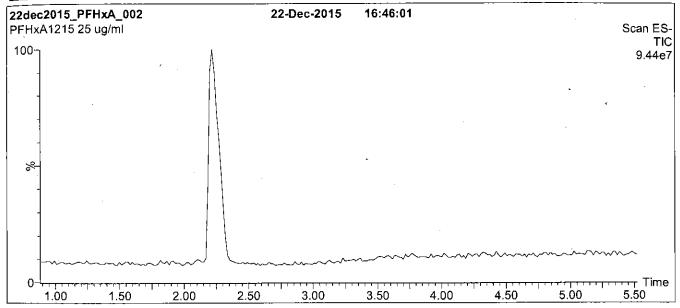
QUALITY MANAGEMENT:

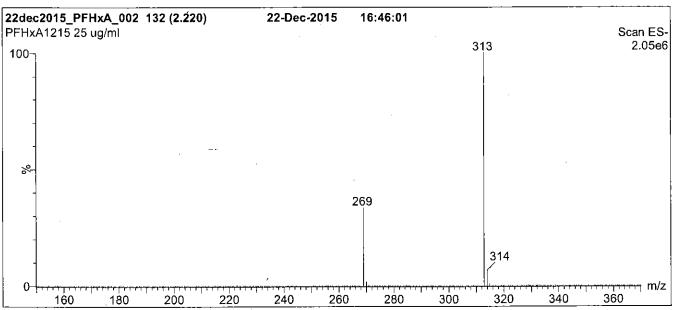
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





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





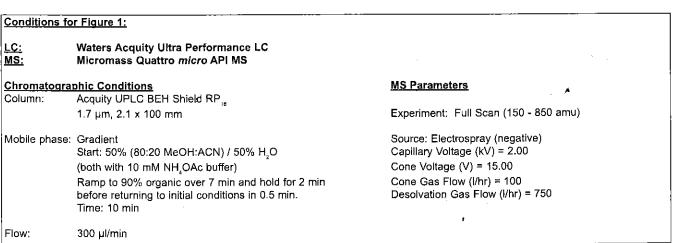
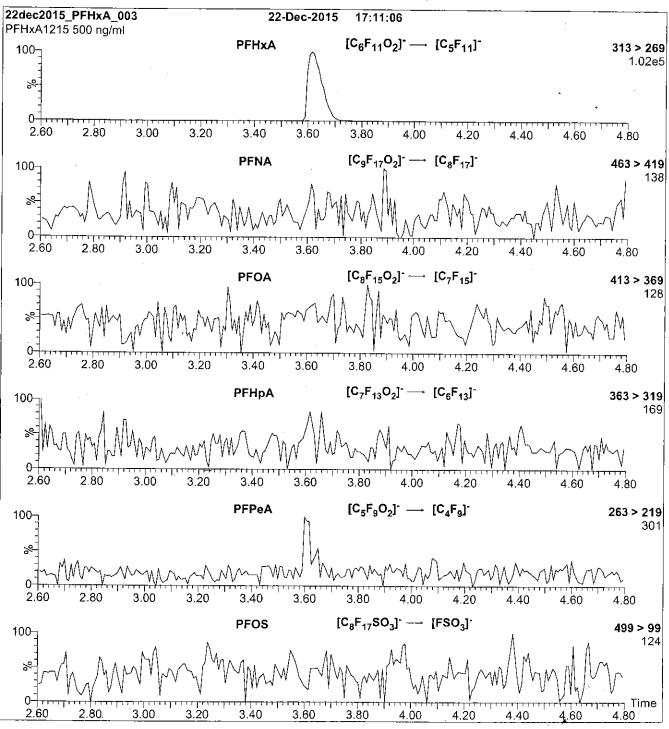
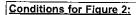


Figure 2: PFHxA; LC/MS/MS Data (Selected MRM Transitions)





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

LCPFHxS-br_00001





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)

 $45.5 \pm 2.3 \,\mu\text{g/ml}$ (total PFHxS anion)

SOLVENT(S):

Methanol

DATE PREPARED: (mm/dd/yyyy)

06/29/2015

LAST TESTED: (mm/dd/yyyy)

07/03/2015

EAGI ILGILD.

07/00/2010

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

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

$$x_4, x_9,...x_n$$
 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).





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

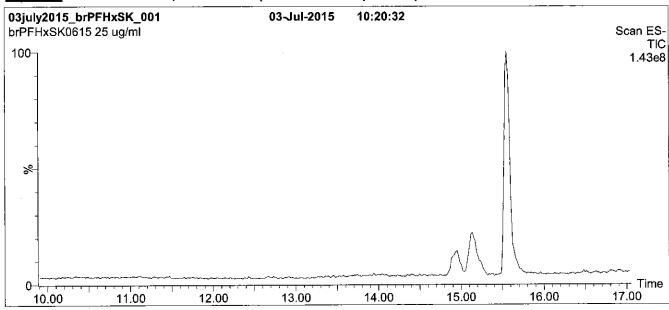
Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-hexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	CF ₃ 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

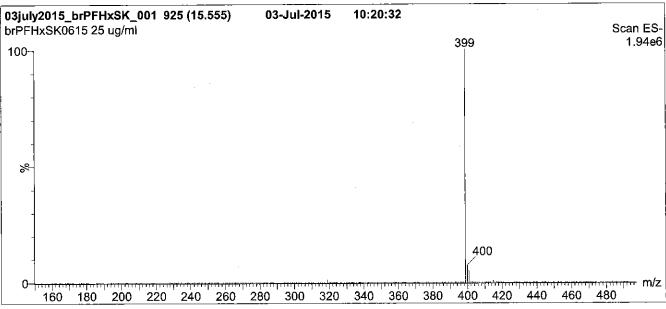
Percent of total perfluorohexanesulfonate isomers only.
 Systematic Name: Potassium perfluorohexane-2-sulfonate.

Certified By:

Date: 07/15/2015

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





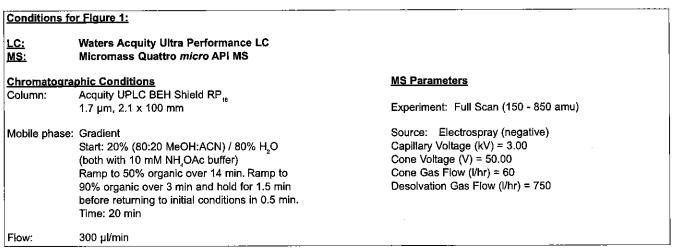
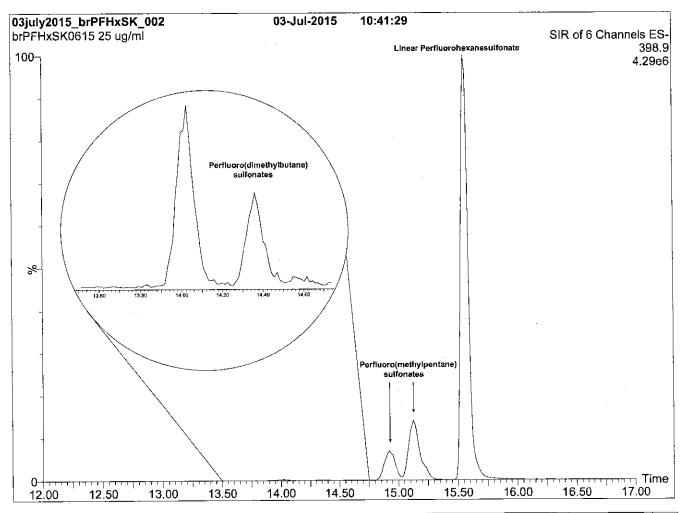


Figure 2: br-PFHxSK; LC/MS Data



Conditions for Figure 2:

<u>LC:</u> MS: Waters Acquity Ultra Performance LC Micromass Quattro *micro* API MS

Chromatographic Conditions

Column:

Acquity UPLC BEH Shield RP,

1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient

Start: 20% (80:20 MeOH:ACN) / 80% H₂O

(both with 10 mM NH₂OAc buffer) Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min

before returning to initial conditions in 0.5 min.

Time: 20 min

Flow:

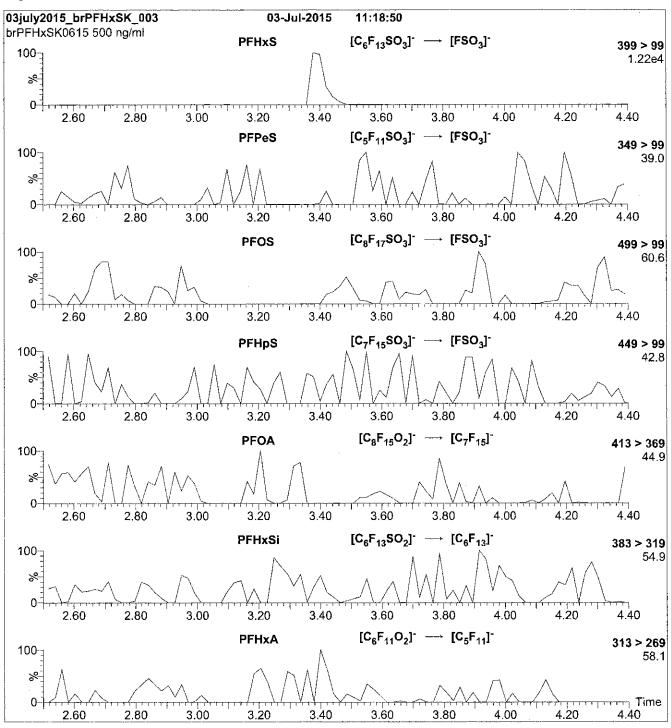
300 µl/min

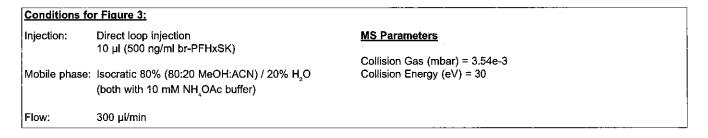
MS Parameters

Experiment: SIR (6 channels)

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

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

MOLECULAR FORMULA:

C_aHF₁₇O₂

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:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

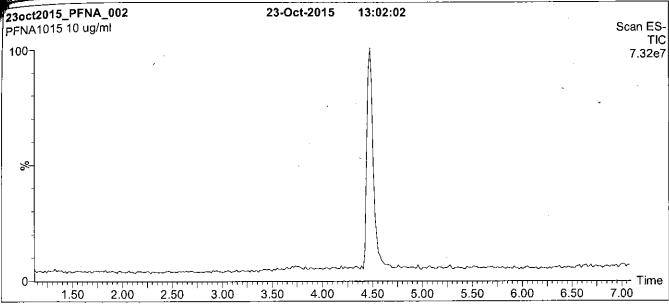
QUALITY MANAGEMENT:

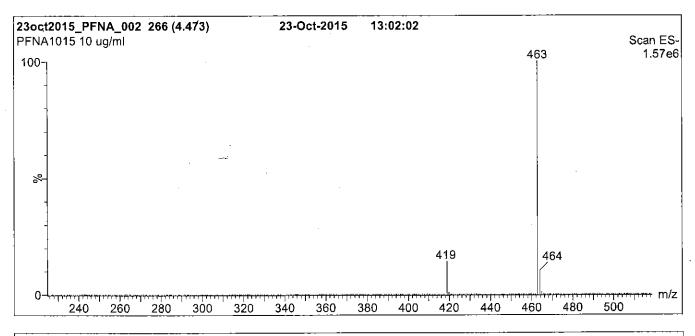
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).











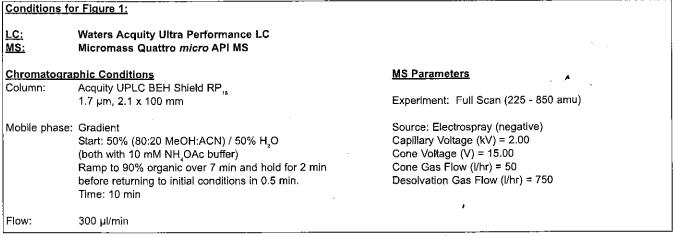
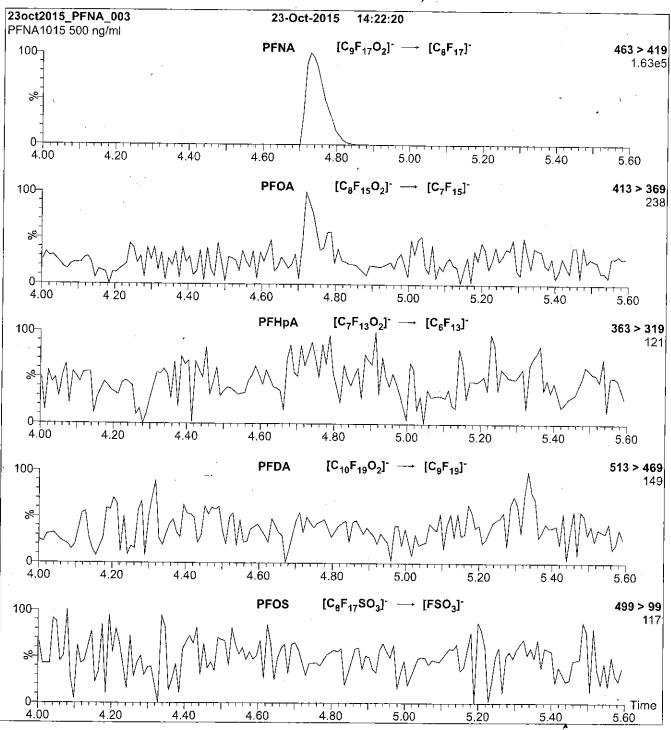
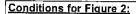


Figure 2: PFNA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µI (500 ng/ml PFNA)

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) ≈ 11

LCPFNS_00002



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFNS

LOT NUMBER:

LPFNS0712

COMPOUND:

Sodium perfluoro-1-nonanesulfonate

STRUCTURE:

CAS #:

98789-57-2

MOLECULAR FORMULA:

C_aF₁₉SO₃Na

MOLECULAR WEIGHT:

572.12

CONCENTRATION:

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

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

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

07/04/2012

EXPIRY DATE: (mm/dd/yyyy)

07/04/2017

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 01/15/2013

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

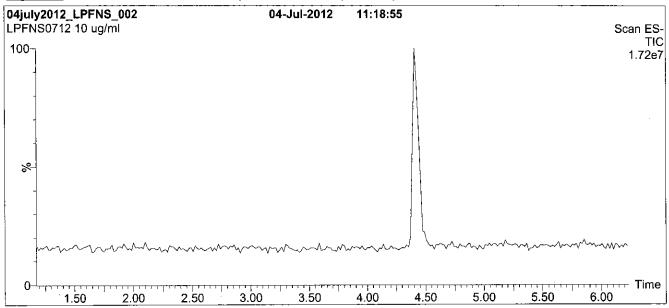
QUALITY MANAGEMENT:

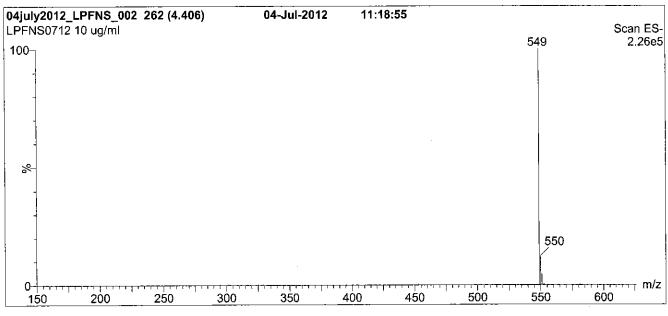
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).





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





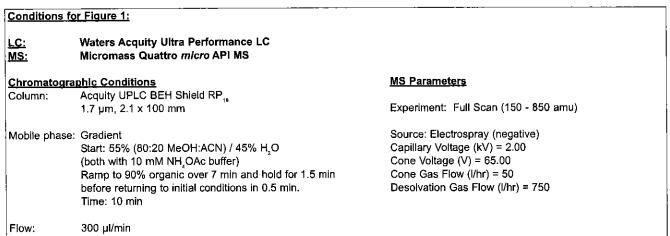
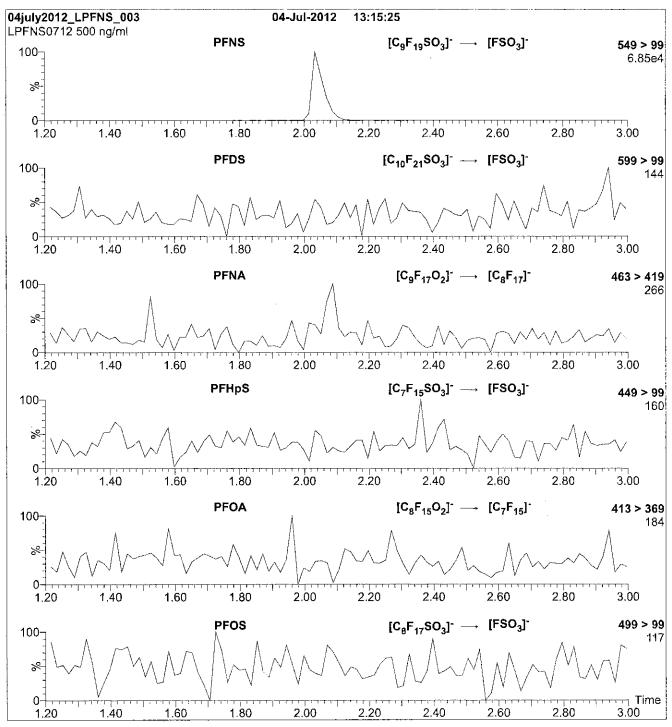
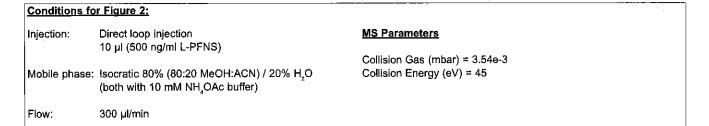


Figure 2: L-PFNS; LC/MS/MS Data (Selected MRM Transitions)





LCPFOA_00005



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,

MOLECULAR WEIGHT:

414.07

CONCENTRATION:

 $50 \pm 2.5 \mu g/ml$

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

11/06/2015

EXPIRY DATE: (mm/dd/yyyy)

(yyy) 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:

B G Chittim

Date:

11/11/2015

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:

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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

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

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

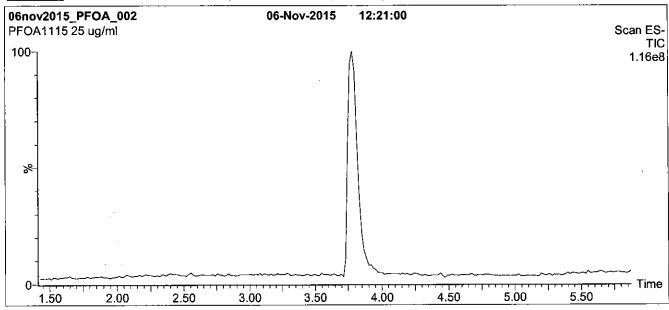
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

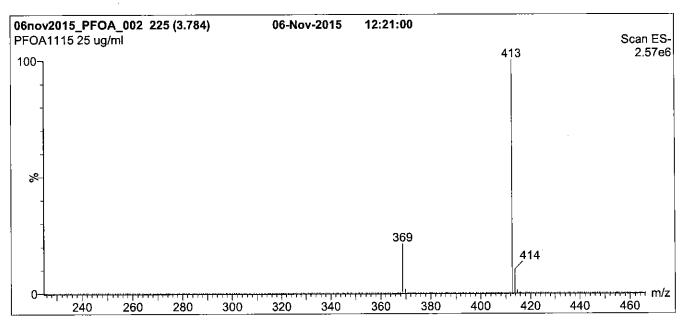




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Figure 1: PFOA; LC/MS Data (TIC and Mass Spectrum)





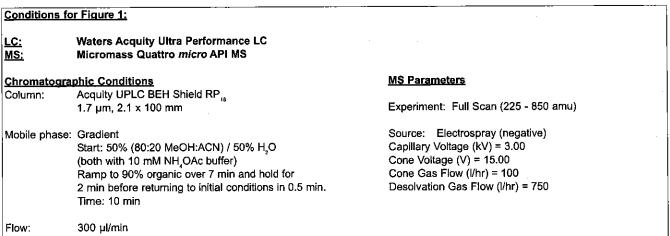
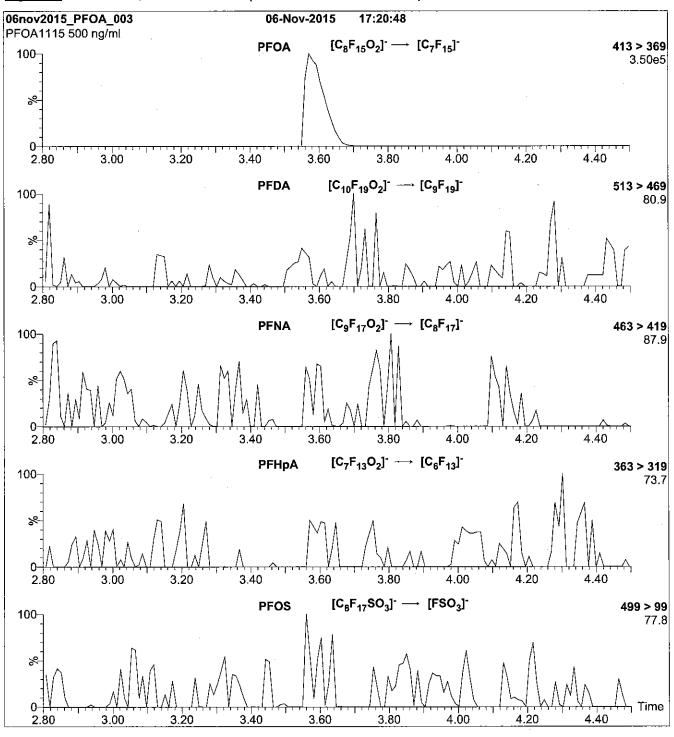
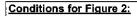


Figure 2: PFOA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml PFOA)

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

(both with 10 mM NH₄OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCPFODA 00005

Exp: 01/30/20 Prpd: CBW PFODA stock 50ug/mL

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFODA

LOT NUMBER:

PFODA0115

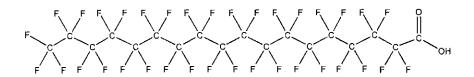
COMPOUND:

Perfluoro-n-octadecanoic acid

STRUCTURE:

CAS #:

16517-11-6



MOLECULAR FORMULA:

C, HF, O,

CONCENTRATION:

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

MOLECULAR WEIGHT:

914.14

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:

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ADDITIONAL INFORMATION:

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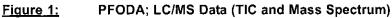
QUALITY MANAGEMENT:

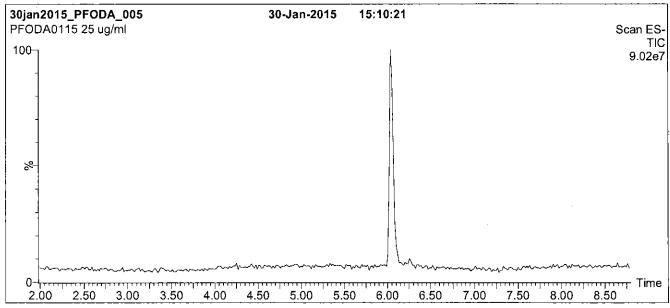
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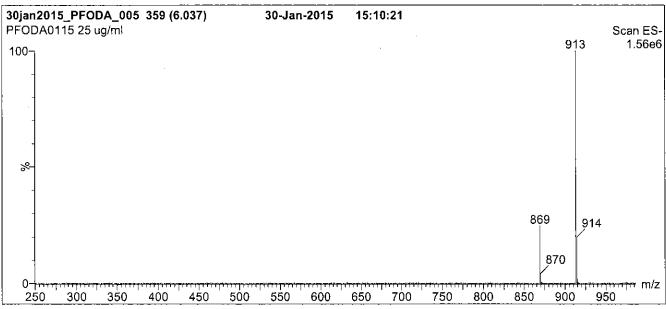




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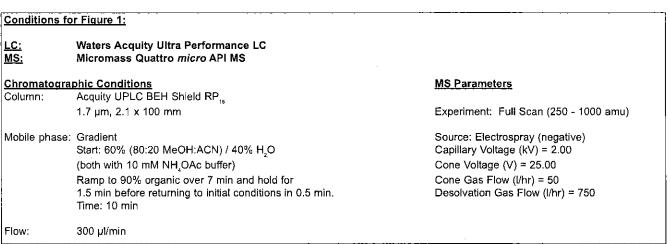
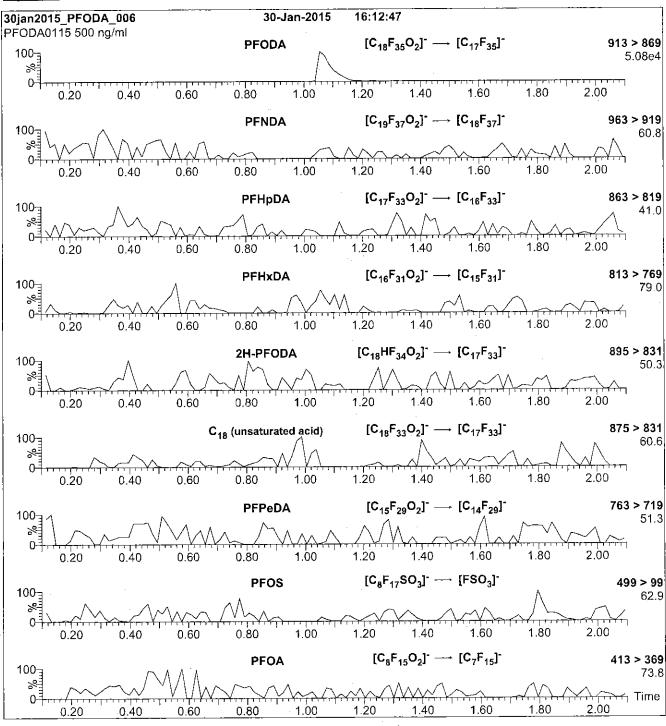
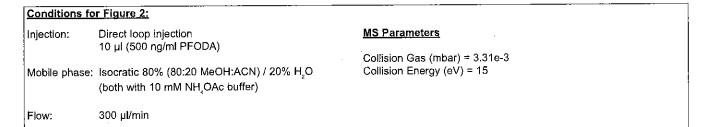


Figure 2: PFODA; LC/MS/MS Data (Selected MRM Transitions)





LCPFOS-br_00001



CERTIFICATE OF ANALYSIS DOCUMENTATION

<u>br-PFOSK</u>

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT_CODE:

br-PFOSK

LOT NUMBER:

brPFOSK1015

CONCENTRATION:

 $50 \pm 2.5 \mu g/ml$ (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 1	Potassium perfluoro-1-octanesulfonate	CF ₃ CF ₂ SO ₃ K*	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₃ K ⁺ CF ₃	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF 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 ₃ 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 -C-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	CF ₃ -CF-CF ₂ -CF-CF ₂ CF ₂ SO ₃ K ⁺ CF ₃ CF ₃	0.07

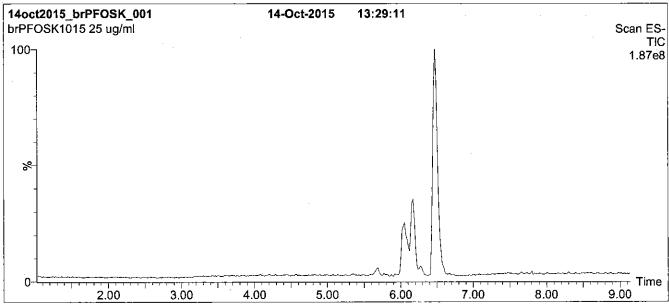
Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
 Systematic Name: Potassium perfluorooctane-2-sulfonate.

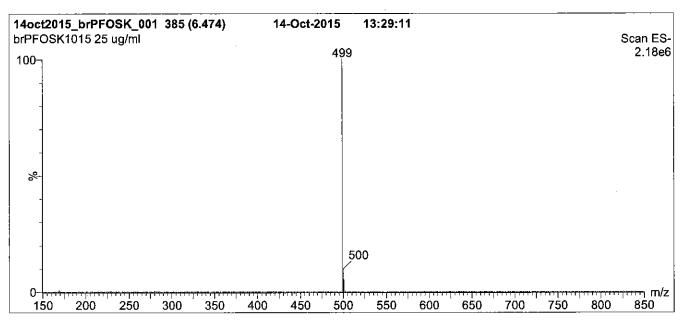
Certified By:

Date:

0/15/2015_

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





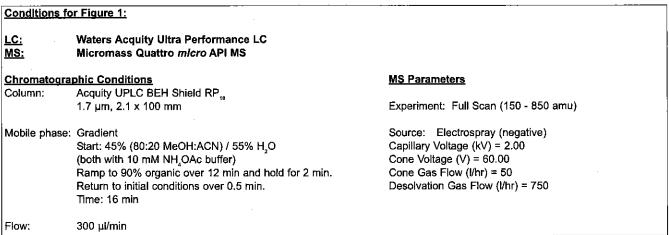
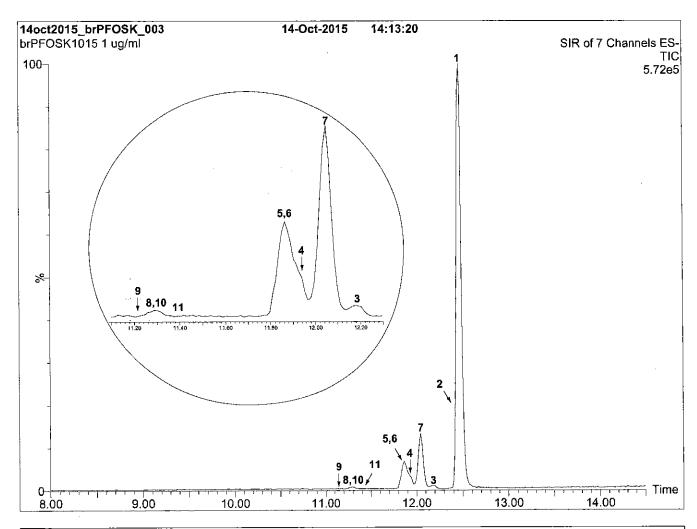


Figure 2: br-PFOSK; LC/MS Data (SIR)



Conditions for Figure 2:

<u>LC:</u> MS: Waters Acquity Ultra Performance LC Micromass Quattro micro API MS

Chromatographic Conditions:

Column:

Acquity UPLC BEH Shield RP18 (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 NH₂OAc buffer)

Ramp to 90% organic over 15 min and hold for 3 min. Return to initial conditions over 1 min.

Time: 20 min

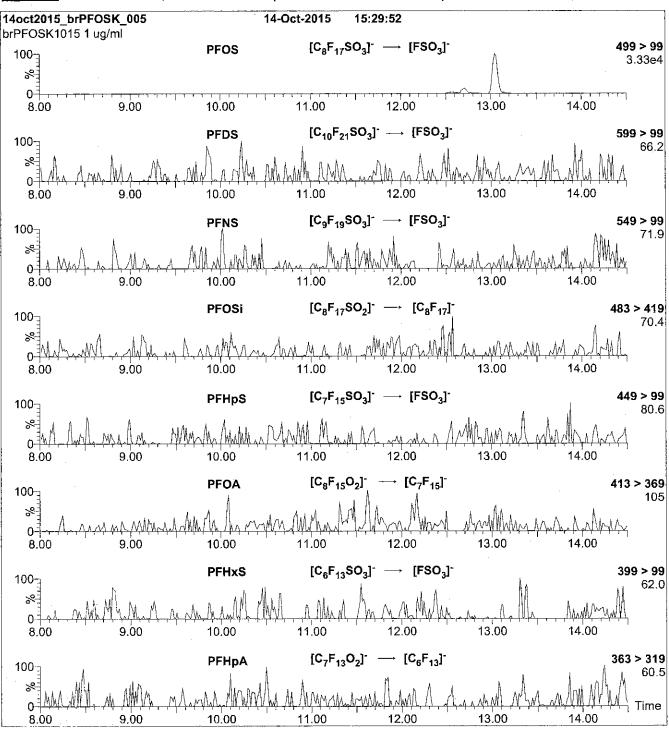
Flow:

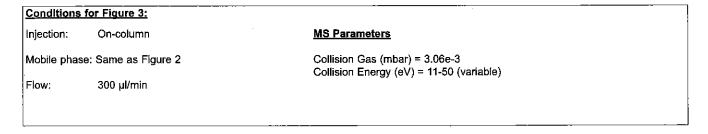
300 µl/min

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

STRUCTURE:

CAS #:

754-91-6

499.14

Isopropanol

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:

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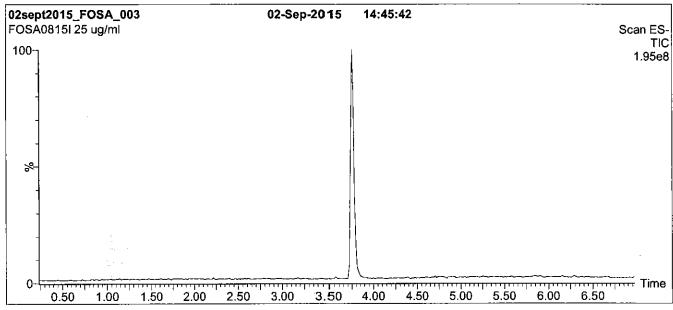
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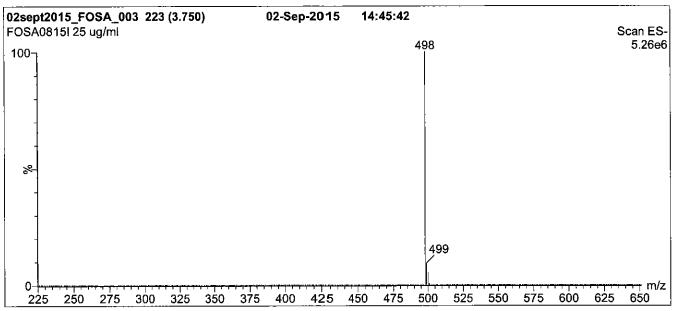




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Figure 1: FOSA-I; LC/MS Data (TIC and Mass Spectrum)





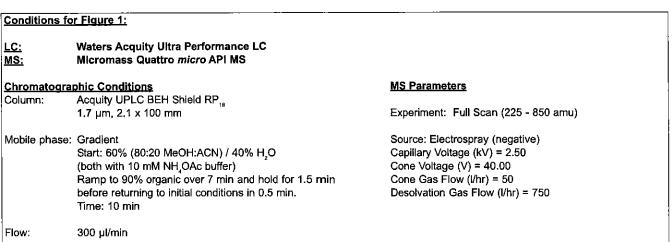
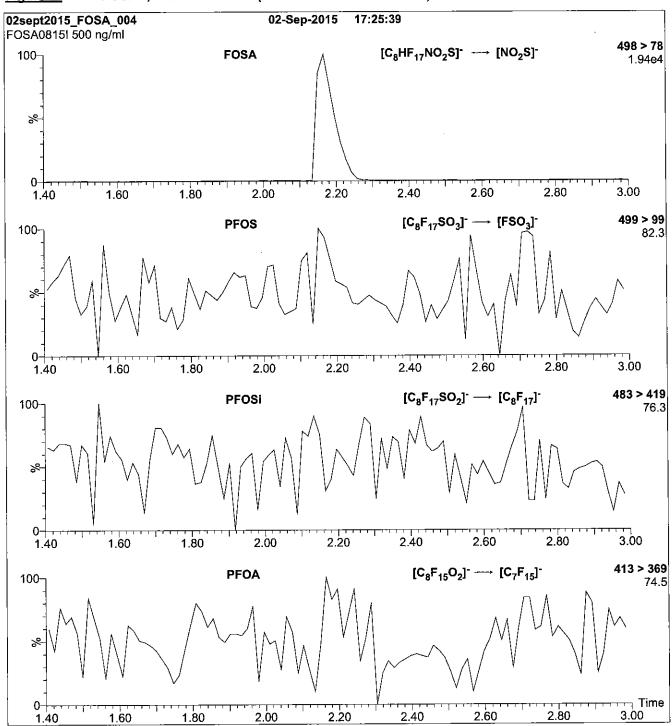
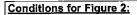


Figure 2: FOSA-I; LC/MS/MS Data (Selected MRM Transitions)





Injection:

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

LCPFPeA_00004



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFPeA

LOT NUMBER:

PFPeA0115

COMPOUND:

Perfluoro-n-pentanoic acid

STRUCTURE:

CAS #:

2706-90-3

C,HF,O,

MOLECULAR WEIGHT:

264.05

CONCENTRATION:

MOLECULAR FORMULA:

 $50 \pm 2.5 \,\mu\text{g/ml}$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/30/2015

EXPIRY DATE: (mrn/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 $C_5H_2F_8O_2$ (hydrido - derivative) as measured by ¹⁹F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B G Chittim

Date: _(

(mm/dd/yyyy)

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

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

$$x_{ij}, x_{2i}...x_{n}$$
 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 ±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:

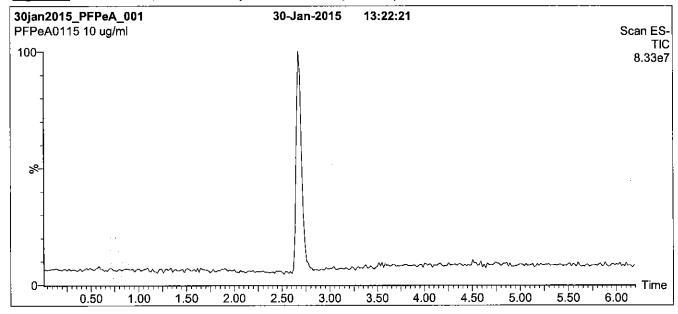
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

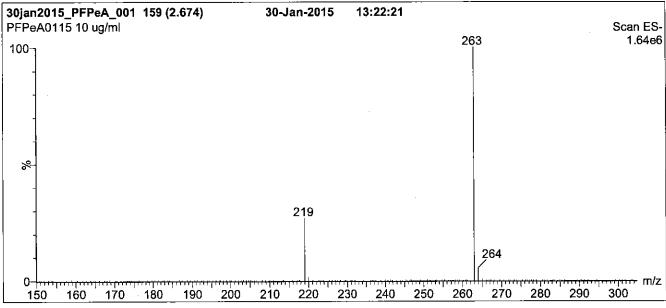




^{**}For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com**

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





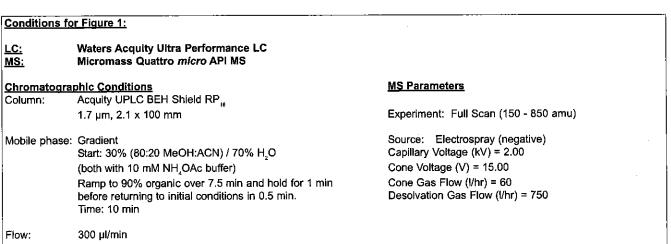
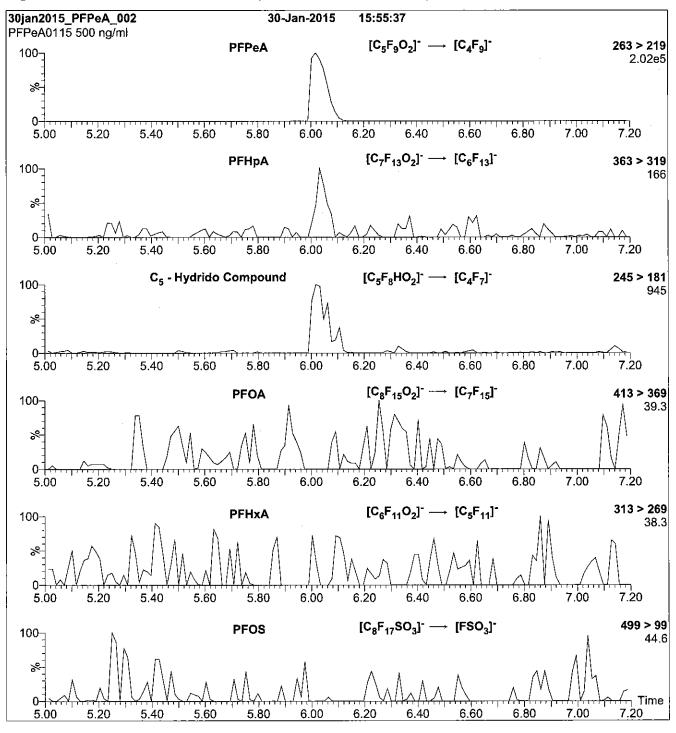


Figure 2: PFPeA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

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)

Flow:

300 µl/min

M\$ Parameters

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

LCPFPeS_00002



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFPe\$

LOT NUMBER:

LPFPeS0712

COMPOUND:

Sodium perfluoro-1-pentanesulfonate

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C₅F₄SO₃Na

MOLECULAR WEIGHT:

372.09

CONCENTRATION:

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

 $46.9 \pm 2.3 \mu g/ml$ (PFPeS anion)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

07/04/2012

EXPIRY DATE: (mm/dd/yyyy)

07/04/2017

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 01/15/2013

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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, u_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 our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external, ISO/IEC 17025:2005 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

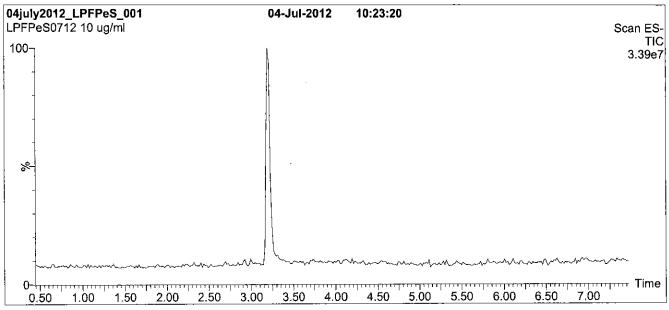
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

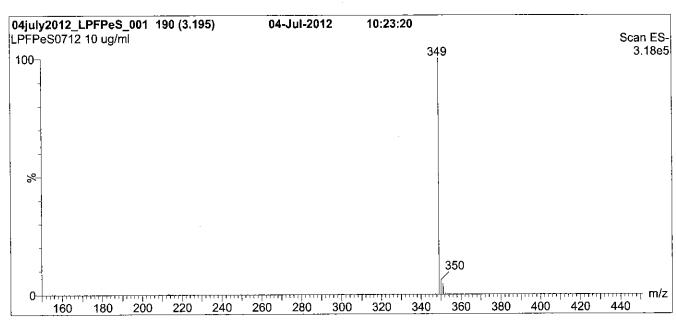




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Figure 1: L-PFPeS; LC/MS Data (TIC and Mass Spectrum)





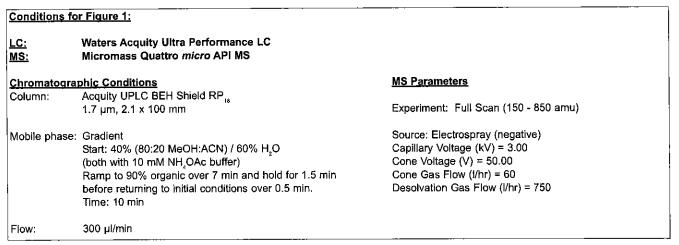
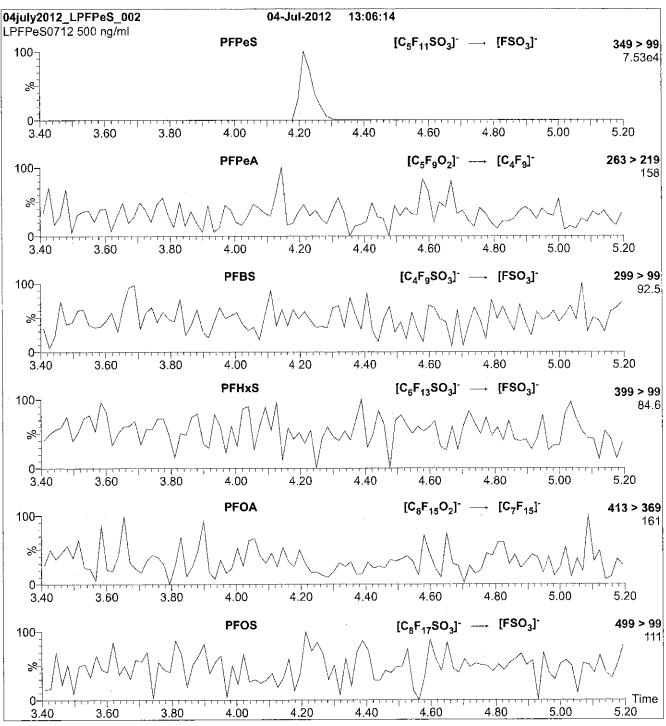
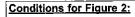


Figure 2: L-PFPeS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml L-PFPeS)

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) = 3.66e-3 Collision Energy (eV) = 30

LCPFTeDA_00004

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFTeDA

LOT NUMBER:

PFTeDA1215

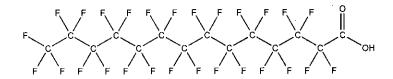
COMPOUND:

Perfluoro-n-tetradecanoic acid

STRUCTURE:

CAS #:

376-06-7



MOLECULAR FORMULA:

C₁₄HF₂₇O₂

MOLECULAR WEIGHT:

714.11

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

, >98%

LAST TESTED: (mm/dd/yyyy)

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 (C₁₅HF₂₃O₂).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/09/2015

(mm/dd/0000)

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:

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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:

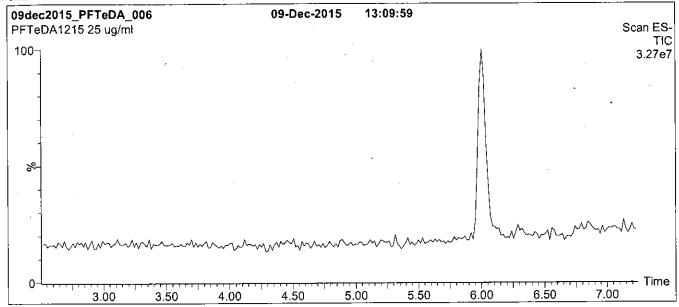
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

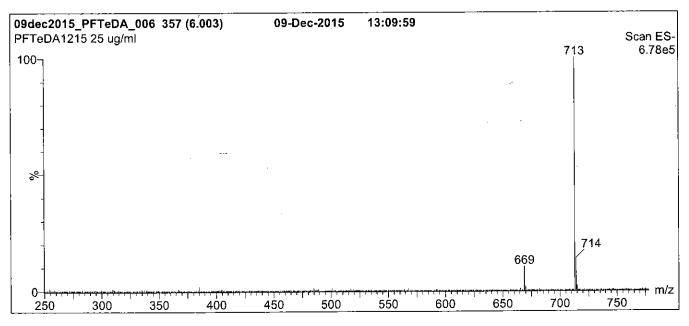




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Figure 1: PFTeDA; LC/MS Data (TIC and Mass Spectrum)





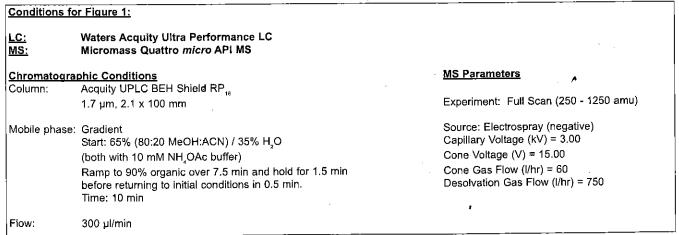
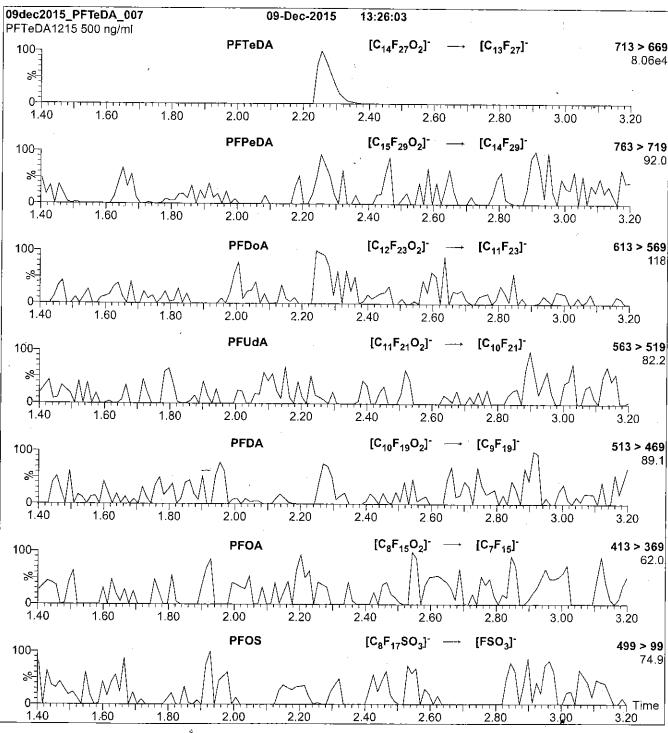
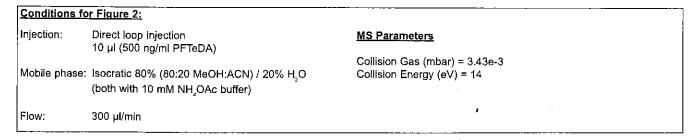


Figure 2: PFTeDA; LC/MS/MS Data (Selected MRM Transitions)





LCPFTrDA_00004



(D: LCPFTrDA_00004 Exp: 12/10/18 Prpd: CBW PF-n-tridecanoic acid



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFTrDA

LOT NUMBER:

PFTrDA1213

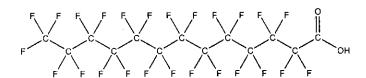
COMPOUND:

Perfluoro-n-tridecanoic acid

STRUCTURE:

CAS #:

72629-94-8



MOLECULAR FORMULA:

C, HF, O,

50 ± 2.5 μg/ml

MOLECULAR WEIGHT:

664.11

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

CONCENTRATION:

>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

INTENDED USE:

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

HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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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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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

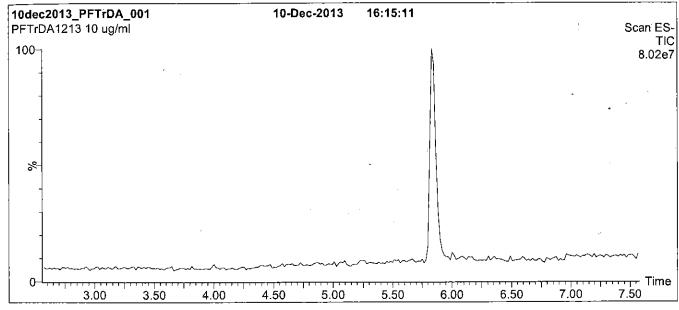
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDÉ 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

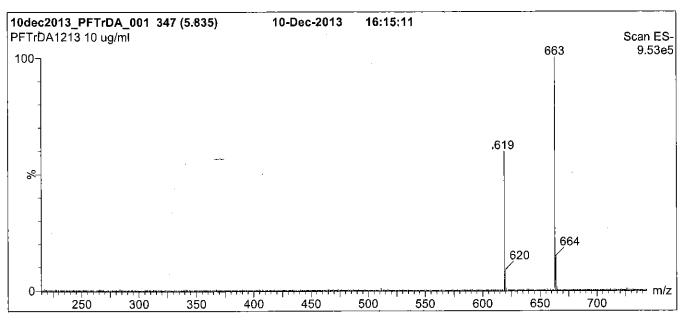




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com







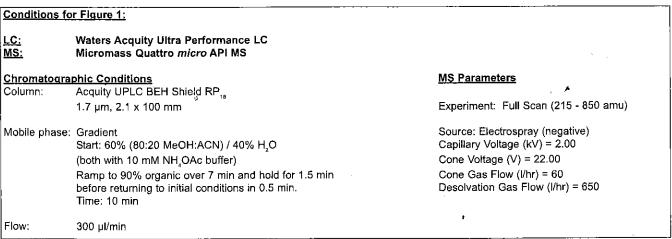
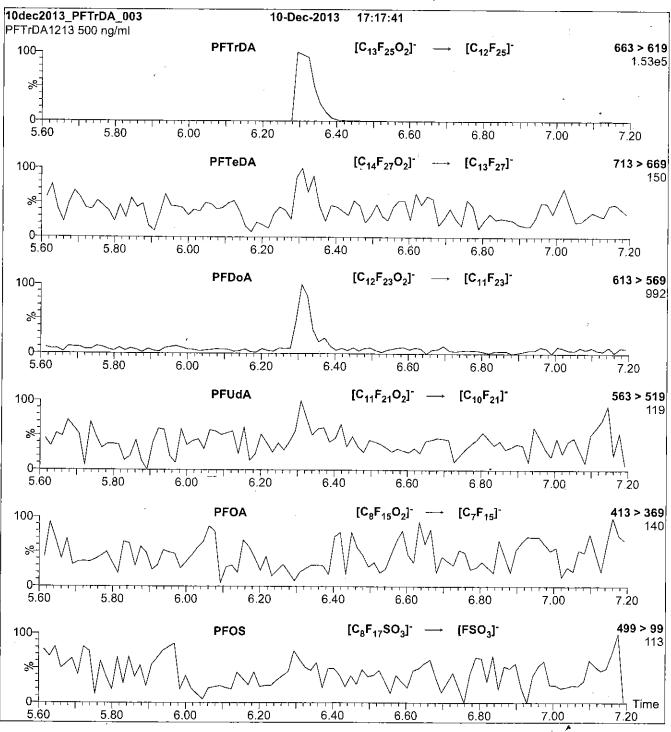
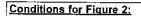


Figure 2: PFTrDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

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

Collision Gas (mbar) = 3.28e-3 Collision Energy (eV) ≈ 15

Reagent

LCPFUdA_00004



PF-n-undecanoic acid



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFUdA

LOT NUMBER:

PFUdA0815

COMPOUND:

Perfluoro-n-undecanoic acid

CAS #:

2058-94-8

STRUCTURE:

MOLECULAR FORMULA:

C,HF,O2

50 . 0 5

MOLECULAR WEIGHT:

564.09

CONCENTRATION:

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

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>

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

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

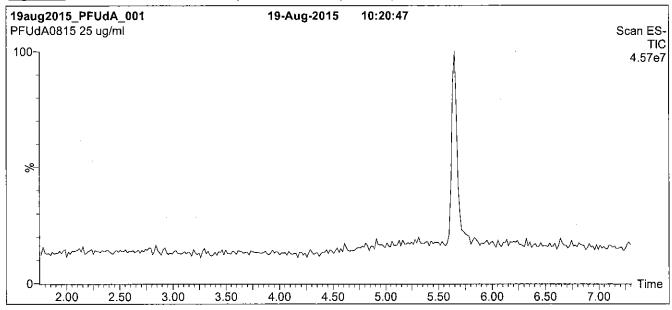
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

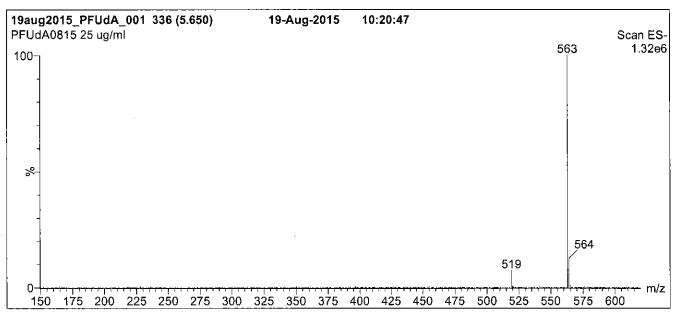


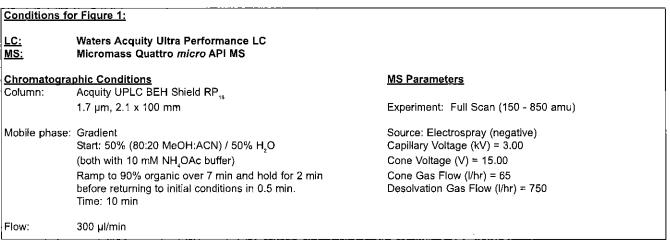


^{**}For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com**

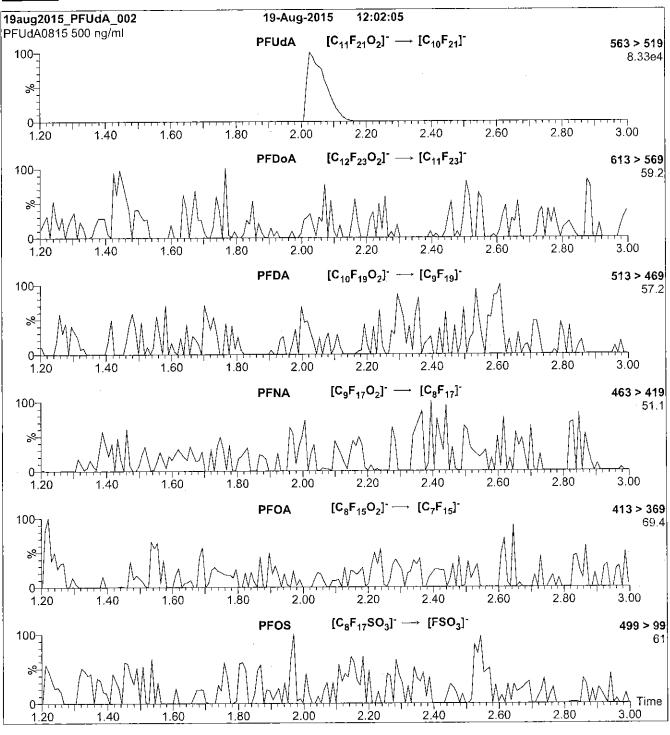
Figure 1: PFUdA; LC/MS Data (TIC and Mass Spectrum)

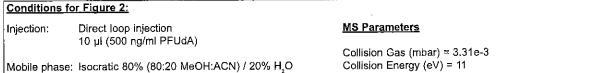






PFUdA; LC/MS/MS Data (Selected MRM Transitions) Figure 2:





(both with 10 mM NH,OAc buffer)

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

Flow:

300 µl/min

Method PFC DOD

Perfluronated Hydrocarbons (LC/MS) by Method PFC_DOD

FORM II LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job	No.: 320-19198-1
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SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	13CHpA #	PFHxS #	PFOA #	PFOS #	PFNA #
DW-57	320-19198-1	87	80	128	70	112	51
FB-DW-57	320-19198-2	112	113	120	123	121	117
DW-95	320-19198-3	94	88	120	59	99	35
FB-DW-95	320-19198-4	108	109	115	123	117	112
DUP-052616	320-19198-5	80	77	116	57	98	46
	MB 320-112069/1-A	107	116	116	116	112	117
	LCS 320-112069/2-A	108	111	115	116	117	104
DW-57 MS	320-19198-1 MS	79	72	117	61	102	49
DW-57 MSD	320-19198-1 MSD	83	79	121	69	107	55

	QC LIMITS
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

FORM III LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name	e: TestAmerica Sacra	amento	Job No.: 320)-19198-1
SDG No.:	. <u> </u>	_		
Matrix:	Water	Level: Low	Lab File ID:	03JUN2016A6A_016.d
Lab ID:	LCS 320-112069/2-A		Client ID:	

	SPIKE	LCS	LCS	QC	
	ADDED	CONCENTRATION	용	LIMITS	#
COMPOUND	(ng/L)	(ng/L)	REC	REC	
13C2 PFHxA	100	108	108	25-150	
13C4 PFOA	100	116	116	25-150	
13C4 PFOS	95.6	112	117	25-150	
13C4-PFHpA	100	111	111	25-150	
13C5 PFNA	100	104	104	25-150	
1802 PFHxS	94.6	109	115	25-150	
Perfluorobutanesulfonic acid (PFBS)	35.4	35.9	101	50-150	
Perfluoroheptanoic acid (PFHpA)	40.0	44.8	112	60-140	
Perfluorohexanesulfonic acid (PFHxS)	36.4	37.5	103	60-140	М
Perfluorononanoic acid (PFNA)	40.0	45.3	113	60-140	
Perfluorooctanesulfonic acid (PFOS)	37.1	38.5	104	60-140	М
Perfluorooctanoic acid (PFOA)	40.0	39.7	99	60-140	

 $[\]mbox{\#}$ Column to be used to flag recovery and RPD values FORM III WS-LC-0025

FORM III LCMS MATRIX SPIKE RECOVERY

∟ab	Name:	TestAmerica	Sacramento	Job No.:	320-19198-1
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SDG No.: ____

Matrix: Water Level: Low Lab File ID: 03JUN2016A6A_018.d

Lab ID: 320-19198-1 MS Client ID: DW-57 MS

	SPIKE	SAMPLE	MS	MS	QC	
	ADDED	CONCENTRATION	CONCENTRATION	%	LIMITS	#
COMPOUND	(ng/L)	(ng/L)	(ng/L)	REC	REC	
13C2 PFHxA	93.9	83	73.8	79	25-150	
13C4 PFOA	93.9	66	57.7	61	25-150	
13C4 PFOS	89.8	100	92.0	102	25-150	
13C4-PFHpA	93.9	76	67.9	72	25-150	
13C5 PFNA	93.9	48	46.3	49	25-150	
1802 PFHxS	88.9	120	104	117	25-150	
Perfluorobutanesulfonic acid	33.2	2.9	34.8	96	50-150	
(PFBS)						
Perfluoroheptanoic acid	37.6	4.5	45.1	108	60-140	
(PFHpA)						
Perfluorohexanesulfonic acid	34.2	35	72.4	110	60-140	M
(PFHxS)						
Perfluorononanoic acid (PFNA)	37.6	2.0 J	44.0	112	60-140	
Perfluorooctanesulfonic acid	34.9	150	189	120	60-140	M 4
(PFOS)						
Perfluorooctanoic acid (PFOA)	37.6	17	59.6	113	60-140	M

 $[\]mbox{\#}$ Column to be used to flag recovery and RPD values FORM III WS-LC-0025

FORM III LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab	Name:	TestAmerica	Sacramento	Job N	No.:	320-19198-1
				_		

SDG No.: ____

Matrix: Water Level: Low Lab File ID: 03JUN2016A6A_019.d

Lab ID: 320-19198-1 MSD Client ID: DW-57 MSD

	SPIKE ADDED	MSD CONCENTRATION	MSD %	0/0	QC LIMITS		#
COMPOUND	(ng/L)	(ng/L)	REC	RPD	RPD	REC	
13C2 PFHxA	95.1	78.8	83			25-150	
13C4 PFOA	95.1	65.7	69			25-150	
13C4 PFOS	90.9	96.9	107			25-150	
13C4-PFHpA	95.1	75.0	79			25-150	
13C5 PFNA	95.1	52.0	55			25-150	
1802 PFHxS	90.0	109	121			25-150	
Perfluorobutanesulfonic acid (PFBS)	33.6	38.0	104	9	30	50-150	
Perfluoroheptanoic acid (PFHpA)	38.0	46.4	110	3	30	60-140	
Perfluorohexanesulfonic acid (PFHxS)	34.6	73.8	113	2	30	60-140	М
Perfluorononanoic acid (PFNA)	38.0	41.9	105	5	30	60-140	
Perfluorooctanesulfonic acid (PFOS)	35.3	198	142	4	30	60-140	M 4
Perfluorooctanoic acid (PFOA)	38.0	54.8	99	9	30	60-140	М

 $[\]mbox{\#}$ Column to be used to flag recovery and RPD values FORM III WS-LC-0025

FORM IV LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento	Job No.: 320-19198-1
SDG No.:	
Lab File ID: 03JUN2016A6A_015.d	Lab Sample ID: MB 320-112069/1-A
Matrix: Water	Date Extracted: 06/01/2016 11:06
Instrument ID: A6	Date Analyzed: 06/03/2016 21:26
Level: (Low/Med) Low	

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

		LAB	
CLIENT SAMPLE ID	LAB SAMPLE ID	FILE ID	DATE ANALYZED
	LCS 320-112069/2-A	03JUN2016A6 A 016.d	06/03/2016 21:48
DW-57	320-19198-1	03JUN2016A6 A 017.d	06/03/2016 22:09
DW-57 MS	320-19198-1 MS	03JUN2016A6 A 018.d	06/03/2016 22:30
DW-57 MSD	320-19198-1 MSD	03JUN2016A6 A 019.d	06/03/2016 22:51
FB-DW-57	320-19198-2	03JUN2016A6 A 020.d	06/03/2016 23:13
DW-95	320-19198-3	03JUN2016A6 A 021.d	06/03/2016 23:34
FB-DW-95	320-19198-4	03JUN2016A6 A 022.d	06/03/2016 23:55
DUP-052616	320-19198-5	03JUN2016A6 A_023.d	06/04/2016 00:17

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Client Sample ID: DW-57 Lab Sample ID: 320-19198-1

Matrix: Water Lab File ID: 03JUN2016A6A_017.d

Analysis Method: WS-LC-0025 Date Collected: 05/26/2016 11:01

Extraction Method: 3535 Date Extracted: 06/01/2016 11:06

Sample wt/vol: 523(mL) Date Analyzed: 06/03/2016 22:09

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

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 112504 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.9		2.4	1.9	0.88
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.5		2.4	1.9	0.77
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	35	М	2.4	1.9	0.83
375-95-1	Perfluorononanoic acid (PFNA)	2.0	J	2.4	1.9	0.63
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	150	МJ	3.8	2.9	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	17	М	2.4	1.9	0.72

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		25-150
STL00990	13C4 PFOA	70		25-150
STL00991	13C4 PFOS	112		25-150
STL01892	13C4-PFHpA	80		25-150
STL00995	13C5 PFNA	51		25-150
STL00994	1802 PFHxS	128		25-150

Report Date: 06-Jun-2016 11:41:03 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_017.d

Lims ID: 320-19198-B-1-A

Client ID: DW-57 Sample Type: Client

Inject. Date: 03-Jun-2016 22:09:25 ALS Bottle#: 16 Worklist Smp#: 17

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-19198-b-1-a

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jun-2016 11:40:56 Calib Date: 03-Jun-2016 19:40:28

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

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

Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:19:21

F	First Level Reviewer: westendorfc				Date: 0		04-Jun-2016 11:19:21				
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
ſ	D 113C4 PFBA										
	217.0 > 172.0	5.785	5.784	0.001		1117584	41.6		83.1	70272	
	2 Perfluorobut	yric acid									
	212.9 > 169.0	5.785	5.786	-0.001	1.000	63973	2.31			327	
[3 13C5-PFPe	eΑ									
	267.9 > 223.0	6.937	6.939	-0.002		2876514	46.0		92.0	4567	
	4 Perfluoropen										
	262.9 > 219.0	6.941	6.941		1.000	194219	3.52			47.4	
	40 Perfluorobut				4 000	44000	4.50				
	298.9 > 80.0		7.069	-0.005	1.000	41200	1.53				
	5 Perfluorobuta 298.9 > 80.0	ane Sulfo 7.064	onate 7.069	-0.005	1.000	41200	NC			7.5	
	298.9 > 60.0 298.9 > 99.0	7.004	7.069	0.003	1.000	19400	NC	2.12(0.00-0.00)		40.3	
	7 Perfluorohex			0.002		.,		(0.00 0.00)		.0.0	
		8.214		-0.002	1.000	200973	3.80			150	
[O 6 13C2 PFHx										
	315.0 > 270.0	8.214	8.217	-0.003		2883985	43.6		87.2	27159	
[0 8 13C4-PFHp	ρA									
	367.0 > 322.0	9.458	9.456	0.002		2887320	39.8		79.5	32511	
	9 Perfluorohep										
	363.0 > 319.0	9.464	9.457	0.007	1.000	126747	2.35			113	
	D 11 18O2 PFH:										
	403.0 > 84.0	9.493	9.492	0.001		1908130	60.7		128	6033	
	41 Perfluorohe				1 000	F/44/4	10.0				M
	399.0 > 80.0		9.495	-0.002	1.000	561461	18.2				M
	10 Perfluorohe			0.0	1.000	0	NC			144	M M
	399.0 > 80.0	9.495	9.495	0.0	1.000	0	NC			166	IVI
	D 12 13C4 PFO 417.0 > 372.0	A 10.568	10 560	-0 001		Page22392 of 41	10 34 8		69.5	62102	
	117.0 > 372.0	10.000	10.507	0.001		rage-23 for 41	19 ^{57.0}		07.0	JZ 1UZ	

Data File:	\\Chr	omNA\Sa	acramen	to\Chrom	Data\A6\20160	604-31336.b	0\03JUN2016A6A_0	17.d	_	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid M										
		10.572	-0.004	1.000	411777	8.92			304	M
		10.572		1.000	166872		2.47(0.00-0.00)		189	M
14 Perfluorohe	ptane Su	ulfonate								
449.0 > 80.0	10.577	10.581	-0.004	1.000	205370	NC			95.7	
38 Perfluorohe 449.0 > 80.0	•			1.000	205370	7.39				
D 16 13C4 PFO	S									
503.0 > 80.0	11.527	11.525	0.002		2045569	53.3		112	29455	
15 Perfluorooc	tane sulf	onic acid	t							M
499.0 > 80.0		11.527		1.000	3695361	77.1			3460	M
499.0 > 99.0	11.527	11.527	0.0	1.000	1376916		2.68(0.00-0.00)		13100	M
D 17 13C5 PFN	A									
468.0 > 423.0	11.545	11.542	0.003		1797528	25.3		50.7	52333	
18 Perfluorono	nanoic a	ıcid								
463.0 > 419.0	11.545	11.543	0.002	1.000	25511	1.02			115	
D 19 13C2 PFD	Α									
515.0 > 470.0	12.373	12.373	0.0		1393593	24.3		48.6	85661	
20 Perfluorode	canoic a	cid								
513.0 > 469.0	12.373	12.373	0.0	1.000	15416	0.5016			366	
D 23 13C8 FOS	Α									
506.0 > 78.0	12.994	12.985	0.009		475021	4.18		8.4	31310	
24 Perfluorooc	tane Sul	fonamide	Э							
498.0 > 78.0	12.984	12.987	-0.003	1.000	11126	1.78			711	
39 Perfluorode	cane Su	Ifonic ac	id							
		13.033		1.000	9039	0.5523				
25 Perfluorode	cane Su	lfonate								
599.0 > 80.0		13.033	0.008	1.000	9039	NC			627	
D 26 13C2 PFU	nA									
565.0 > 520.0		13.076	0.0		2603844	32.1		64.2	92896	
27 Perfluoroun										
563.0 > 519.0			-0.001	1.000	48701	0.6412			1013	
D 28 13C2 PFD										
615.0 > 570.0		13 663	0.003		3971998	39.4		78.8	27322	
29 Perfluorodo			0.000		0771770	07.1		, 0.0	2,022	
613.0 > 569.0			0.0	1.000	21385	0.4223			263	
30 Perfluorotrio			0.0	1.000	21303	0.4223			200	
663.0 > 619.0			0.002	1.000	27631	0.3762			46.1	
		14.103	0.002	1.000	27031	0.3702			40.1	
D 33 13C2-PFT 715.0 > 670.0		14 500	0.0		2407572	46.2		92.4	13095	
			0.0		3687572	40.2		92.4	13093	
32 Perfluorotet			0.0	4 000	(007/	4.04			44.0	
713.0 > 669.0		14.589	0.0	1.000	60876	1.01			44.2	
D 35 13C2-PFH		4	0		- /				0	
815.0 > 770.0			0.002		5644899	43.3		86.6	8422	
34 Perfluorohe										
813.0 > 769.0	15.179	15.177	0.002	1.000	207730	0.9455			204	
36 Perfluorooc										
913.0 > 869.0	15.436	15.437	-0.001	1.000	Page 232 of 4	419 ^{1.50}			149	
					-					

Report Date: 06-Jun-2016 11:41:03

OC Flag Legend
Processing Flags
NC - Not Calibrated
Review Flags

M - Manually Integrated

Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 06-Jun-2016 11:41:03 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_017.d **Injection Date:** 03-Jun-2016 22:09:25 Instrument ID: Α6 Lims ID: 320-19198-B-1-A Lab Sample ID: 320-19198-1 Client ID: DW-57 Operator ID: **JRB** ALS Bottle#: 16 Worklist Smp#: 17 15.0 ul Dil. Factor: Injection Vol: 1.0000 LC PFC_DOD ICAL Method: PFAC_A6 Limit Group: D 113C4 PFBA 2 Perfluorobutyric acid D 3 13C5-PFPeA F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 35- 24 684**-**672-0030-0025-<u>8</u>20 ×₁₆ ×60 ∑20 ⁻48 12 15 36 10 24 12 5.3 5.9 5.8 6.5 5.2 5.5 6.1 5.9 6.5 7.1 7.7 7 Perfluorohexanoic acid 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F2:m/z 262.9 > 219.0:Moving11PtAverage_x2 F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 18 56- 6.941 .56 636 648 0648- 1240- <u>@</u>15 ∑12 \times_{40} >32 32 24 24 16 7.0 7.0 7.9 8.2 8.5 6.7 7.3 7.6 6.7 7.3 7.6 7.6 8.8 9.1 6.4 6.4 6 13C2 PFHxA 8 13C4-PFHpA 9 Perfluoroheptanoic acid F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 42 91- 0078-684 6072 ×30-×65 ×60 ~24° ≻48 ≻52 39 18 36 24 26 12 13 12 8.0 9.2 8.8 9.7 9.0 9.6 10.2 7.4 8.6 7.9 10.6 8.4 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid (M) D 12 13C4 PFOA F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 84 56 (00015⁻ X) 0048 0048 X40 ©72 ×60 -48 24 36 24 16 0008.9 Page 284h of 419 8.0 8.9 9.8 10.7 8.0 10.7 9.7 10.3 10.9 11.5

Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 06-Jun-2016 11:41:03

15.5

15.8

14.7

14.4

15.0

15.3

15.6

15.9

14.9

15.2

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_017.d

Injection Date: 03-Jun-2016 22:09:25 Instrument ID: A6

Lims ID: 320-19198-B-1-A Lab Sample ID: 320-19198-1

Client ID: DW-57

Operator ID: JRB ALS Bottle#: 16 Worklist Smp#: 17

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

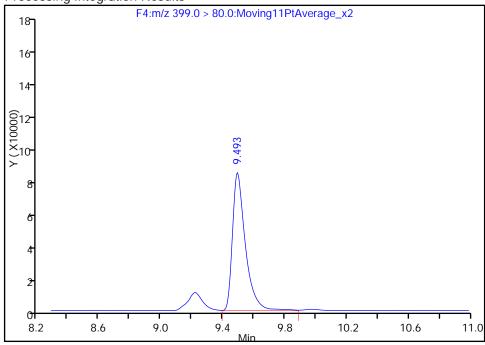
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

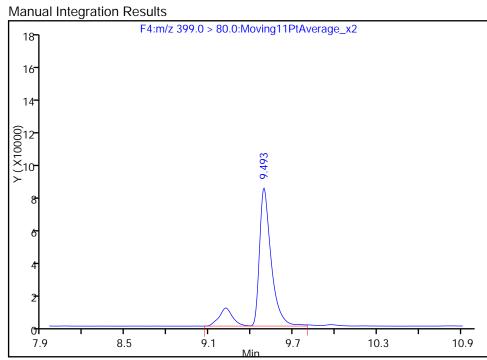
Signal: 1

RT: 9.49
Area: 490202
Amount: 15.926260
Amount Units: ng/ml

Processing Integration Results



RT: 9.49
Area: 561461
Amount: 18.241406
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:19:21

Audit Action: Assigned Compound ID

Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_017.d

Injection Date: 03-Jun-2016 22:09:25 Instrument ID: A6

Lims ID: 320-19198-B-1-A Lab Sample ID: 320-19198-1

Client ID: DW-57

Operator ID: JRB ALS Bottle#: 16 Worklist Smp#: 17

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

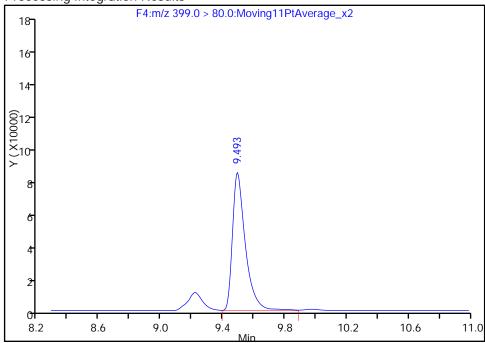
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

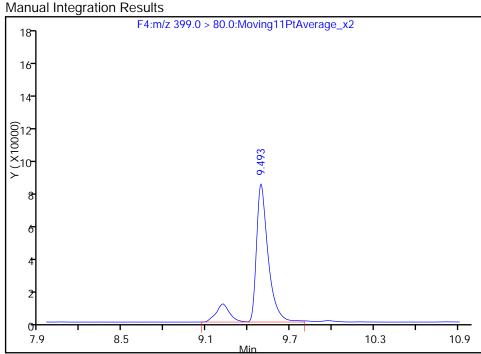
Signal: 1

RT: 9.49 Area: 490202 Amount: 15.926260 Amount Units: ng/ml

Processing Integration Results



RT: 9.49
Area: 561461
Amount: 18.241406
Amount Units: ng/ml



Reviewer: barnettj, 06-Jun-2016 11:29:45

Audit Action: Manually Integrated

Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_017.d

Injection Date: 03-Jun-2016 22:09:25 Instrument ID: A6

Lims ID: 320-19198-B-1-A Lab Sample ID: 320-19198-1

Client ID: DW-57

Operator ID: JRB ALS Bottle#: 16 Worklist Smp#: 17

Injection Vol: 15.0 ul Dil. Factor: 1.0000

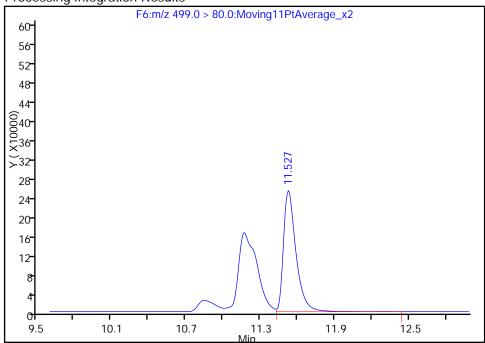
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

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

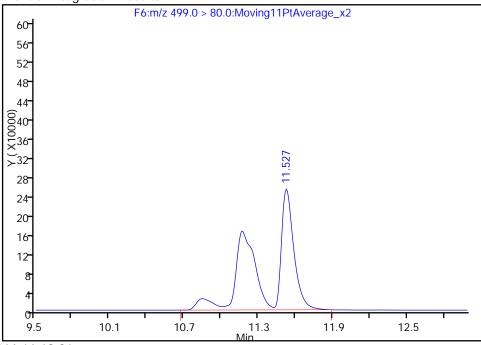
Signal: 1

RT: 11.53 Area: 1781088 Amount: 37.173776 Amount Units: ng/ml **Processing Integration Results**



RT: 11.53
Area: 3695361
Amount: 77.127308
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 04-Jun-2016 11:19:21

Audit Action: Manually Integrated

Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_017.d

Injection Date: 03-Jun-2016 22:09:25 Instrument ID: A6

Lims ID: 320-19198-B-1-A Lab Sample ID: 320-19198-1

Client ID: DW-57

Operator ID: JRB ALS Bottle#: 16 Worklist Smp#: 17

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

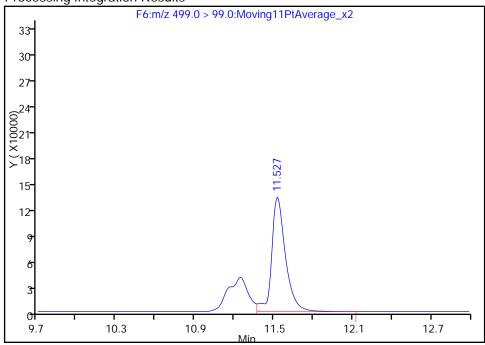
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

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

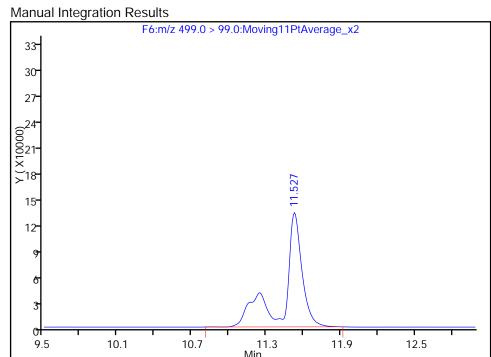
Signal: 2

RT: 11.53 Area: 964549 Amount: 37.173776 Amount Units: ng/ml

Processing Integration Results



RT: 11.53
Area: 1376916
Amount: 77.127308
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:19:21

Audit Action: Manually Integrated

Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_017.d

Injection Date: 03-Jun-2016 22:09:25 Instrument ID: Α6

Lims ID: Lab Sample ID: 320-19198-1 320-19198-B-1-A

Client ID: DW-57

ALS Bottle#: Operator ID: **JRB** 16 Worklist Smp#: 17

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

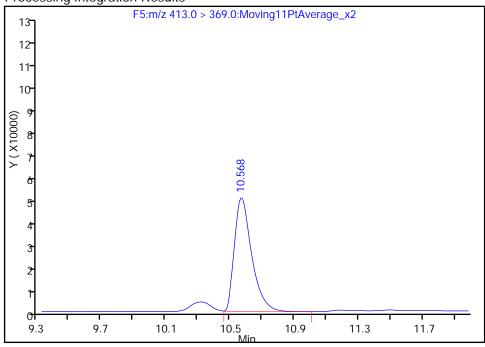
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

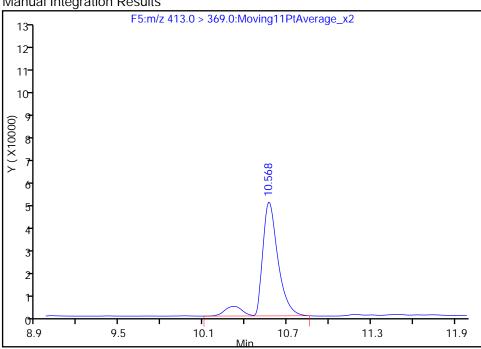
RT: 10.57 Area: 375431 Amount: 8.385713 Amount Units: ng/ml

Processing Integration Results



RT: 10.57 Area: 411777 Amount: 8.915225 Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 04-Jun-2016 11:19:21

Audit Action: Manually Integrated

Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_017.d

Injection Date: 03-Jun-2016 22:09:25 Instrument ID: A6

Lims ID: 320-19198-B-1-A Lab Sample ID: 320-19198-1

Client ID: DW-57

Operator ID: JRB ALS Bottle#: 16 Worklist Smp#: 17

Injection Vol: 15.0 ul Dil. Factor: 1.0000

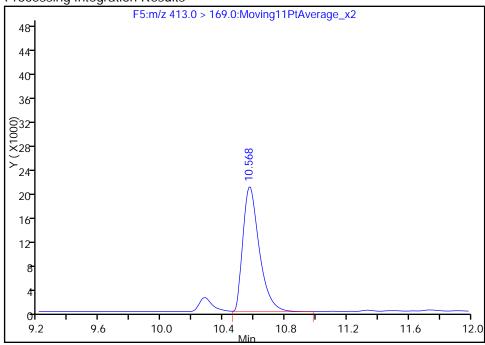
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

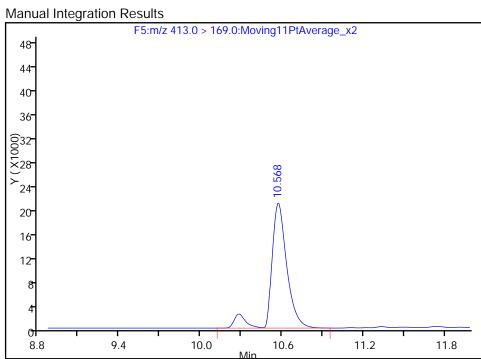
13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

RT: 10.57 Area: 152914 Amount: 8.385713 Amount Units: ng/ml **Processing Integration Results**



RT: 10.57
Area: 166872
Amount: 8.915225
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:19:21

Audit Action: Manually Integrated

Audit Reason: Isomers

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Client Sample ID: FB-DW-57 Lab Sample ID: 320-19198-2

Matrix: Water Lab File ID: 03JUN2016A6A_020.d

Analysis Method: WS-LC-0025 Date Collected: 05/26/2016 11:05

Extraction Method: 3535 Date Extracted: 06/01/2016 11:06

Sample wt/vol: 530.2(mL) Date Analyzed: 06/03/2016 23:13

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

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 112504 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.5	J	2.4	1.9	0.87
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	Ū	2.4	1.9	0.76
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.83	JМ	2.4	1.9	0.82
375-95-1	Perfluorononanoic acid (PFNA)	1.9	U	2.4	1.9	0.62
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	7.5	М	3.8	2.8	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	0.71	J	2.4	1.9	0.71

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	112		25-150
STL00990	13C4 PFOA	123		25-150
STL00991	13C4 PFOS	121		25-150
STL01892	13C4-PFHpA	113		25-150
STL00995	13C5 PFNA	117		25-150
STL00994	1802 PFHxS	120		25-150

Report Date: 06-Jun-2016 11:41:06 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_020.d

Lims ID: 320-19198-B-2-A Client ID: FB-DW-57

Sample Type: Client

Inject. Date: 03-Jun-2016 23:13:13 ALS Bottle#: 19 Worklist Smp#: 20

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-19198-b-2-a

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jun-2016 11:40:56 Calib Date: 03-Jun-2016 19:40:28

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

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

Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:22:26

I II St Level Neviewel. Westeriuolic					Date.	74-Juli-2010 11.22.2	2010 11.22.20			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.085	7.069	0.016	1.000	7249	0.7785				
D 613C2 PFH)	κA									
	8.219	8.217	0.002		3713195	56.1		112	34357	
D 8 13C4-PFH _I	nΑ									
367.0 > 322.0		9.456	0.002		4120059	56.7		113	31115	
9 Perfluorohe	otanoic a	icid								
		9.457	0.001	1.000	10870	0.1414			163	
D 11 1802 PFH	lxS									
403.0 > 84.0	9.493	9.492	0.001		1778109	56.5		120	18141	
41 Perfluorohe	xanesulf	fonic acid	ď							M
399.0 > 80.0	9.505			1.000	12578	0.4385				M
D 12 13C4 PFO	Α									
417.0 > 372.0	10.577	10.569	0.008		4918159	61.3		123	42762	
13 Perfluorooc	tanoic a	cid								
413.0 > 369.0		10.572	0.005	1.000	30671	0.3770			19.7	
413.0 > 169.0	10.586	10.572	0.014	1.001	14707		2.09(0.00-0.00)		48.9	
D 16 13C4 PFO	S									
503.0 > 80.0	11.527	11.525	0.002		2219404	57.8		121	21000	
15 Perfluorooc	tane sulf	fonic acid	t							M
499.0 > 80.0	11.527	11.527	0.0	1.000	205488	3.95			6349	M
499.0 > 99.0	11.527	11.527	0.0	1.000	91671		2.24(0.00-0.00)		2898	M
D 17 13C5 PFN	Α									
468.0 > 423.0	11.544	11.542	0.002		4154560	58.6		117	37355	
18 Perfluorono	nanoic a	icid								
463.0 > 419.0	11.544	11.543	0.001	1.000	16064	0.2789			211	

Report Date: 06-Jun-2016 11:41:06 Chrom Revision: 2.2 20-Apr-2016 13:59:46

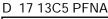
QC Flag Legend Review Flags

M - Manually Integrated

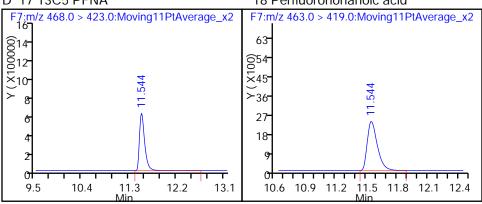
Report Date: 06-Jun-2016 11:41:06 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_020.d 03-Jun-2016 23:13:13 **Injection Date:** Instrument ID: Α6 Lims ID: 320-19198-B-2-A Lab Sample ID: 320-19198-2 Client ID: FB-DW-57 Operator ID: **JRB** ALS Bottle#: 19 Worklist Smp#: 20 Dil. Factor: Injection Vol: 15.0 ul 1.0000 LC PFC_DOD ICAL Method: PFAC A6 Limit Group: 40 Perfluorobutanesulfonic acid 6 13C2 PFHxA D 8 13C4-PFHpA F3;m/z 315.0 > 270.0:Moving11PtAverage_x2 F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 Y (X100000) (0000012 X) 30 8₂₅ 15 10 6.7 7.0 7.2 7.9 7.3 7.6 6.3 8.1 9.0 8.8 9.7 10.6 D 11 1802 PFHxS 9 Perfluoroheptanoic acid 41 Perfluorohexanesulfonic acid (M) F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage x2F4:m/z 403.0 > 84.0:Moving11PtAverage x242 56 35- 00048- ×30-830 ×25 <u>></u>24 <u></u>32⁻ ≻₂₀-18 24 15 12 16 10 9.9 9.7 8.6 9.5 10.4 9.3 9.1 9.4 10.0 7.7 8.7 10.5 8.8 D 12 13C4 PFOA 13 Perfluorooctanoic acid 13 Perfluorooctanoic acid F5:m/z 413.0 > 169.0:Moving11PtAverage_x2 F5:m/z 413.0 > 369.0:Moving11PtAverage_x2 F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 56**-**(0001x) × 848 ×40 10.577 10.586 577 ≻₃₂-24 16 9.7 10.2 10.5 10.8 11.1 11.4 10.3 10.6 10.9 8.8 10.6 11.5 9.9 10.0 D 16 13C4 PFOS 15 Perfluorooctane sulfonic acid (M) 15 Perfluorooctane sulfonic acid (M) F6:m/z 499.0 > 80.0:Moving11PtAverage_x2 F6:m/z 503.0 > 80.0:Moving11PtAverage_x2 F6:m/z 499.0 > 99.0:Moving11PtAverage_x2 28 77 0066 6⁴² 6₃₅ 6024 20-20-∑₂₈ ∑55- .527 ∑16⁻ -44 21 12 33 14 22 0 00 10.4 11.3 12.2 9.5 10.4 Page 246 of 419 12.2 9.5 10.4 11.3 12.2 9.5

Report Date: 06-Jun-2016 11:41:06 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_020.d



18 Perfluorononanoic acid



TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_020.d

Injection Date: 03-Jun-2016 23:13:13 Instrument ID: A6

Lims ID: 320-19198-B-2-A Lab Sample ID: 320-19198-2

Client ID: FB-DW-57

Operator ID: JRB ALS Bottle#: 19 Worklist Smp#: 20

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

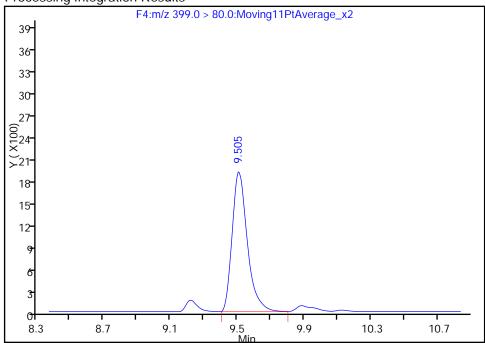
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

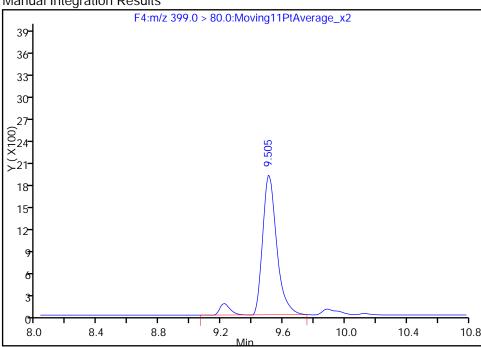
RT: 9.50
Area: 11981
Amount: 0.417716
Amount Units: ng/ml

Processing Integration Results



RT: 9.50
Area: 12578
Amount: 0.438531
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 04-Jun-2016 11:22:26

Audit Action: Assigned Compound ID Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_020.d

Injection Date: 03-Jun-2016 23:13:13 Instrument ID: A6

Lims ID: 320-19198-B-2-A Lab Sample ID: 320-19198-2

Client ID: FB-DW-57

Operator ID: JRB ALS Bottle#: 19 Worklist Smp#: 20

Injection Vol: 15.0 ul Dil. Factor: 1.0000

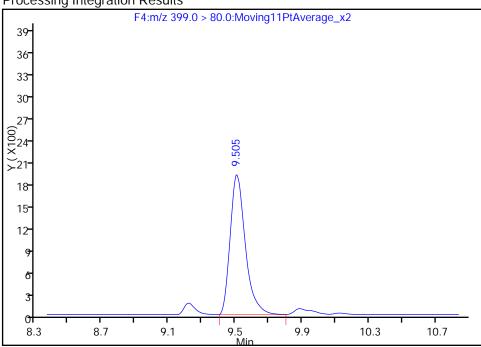
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

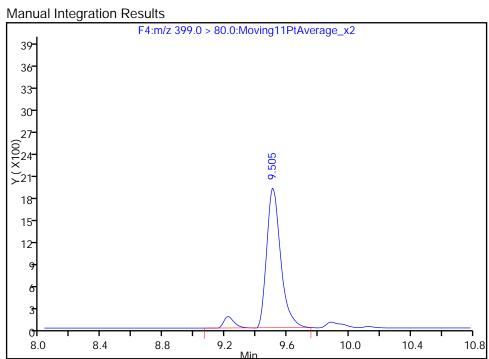
41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

RT: 9.50 Area: 11981 Amount: 0.417716 Amount Units: ng/ml **Processing Integration Results**



RT: 9.50
Area: 12578
Amount: 0.438531
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:22:26

Audit Action: Manually Integrated

Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_020.d

Injection Date: 03-Jun-2016 23:13:13 Instrument ID: A6

Lims ID: 320-19198-B-2-A Lab Sample ID: 320-19198-2

Client ID: FB-DW-57

Operator ID: JRB ALS Bottle#: 19 Worklist Smp#: 20

Injection Vol: 15.0 ul Dil. Factor: 1.0000

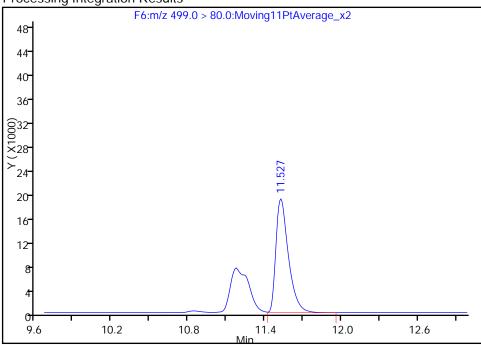
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

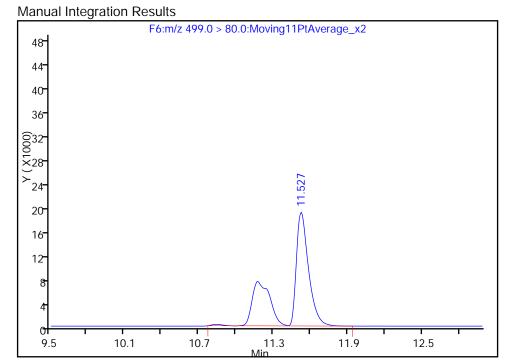
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

RT: 11.53 Area: 130701 Amount: 2.514247 Amount Units: ng/ml **Processing Integration Results**



RT: 11.53
Area: 205488
Amount: 3.952897
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:22:26

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:41:06 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_020.d

Injection Date: 03-Jun-2016 23:13:13 Instrument ID: A6

Lims ID: 320-19198-B-2-A Lab Sample ID: 320-19198-2

Client ID: FB-DW-57

Operator ID: JRB ALS Bottle#: 19 Worklist Smp#: 20

Injection Vol: 15.0 ul Dil. Factor: 1.0000

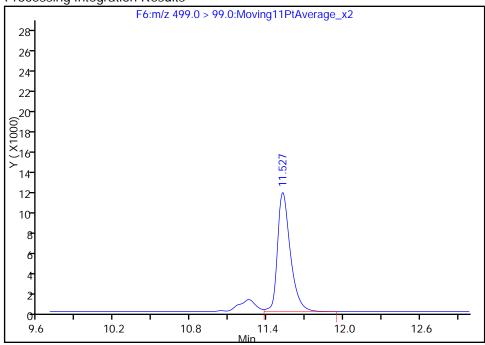
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

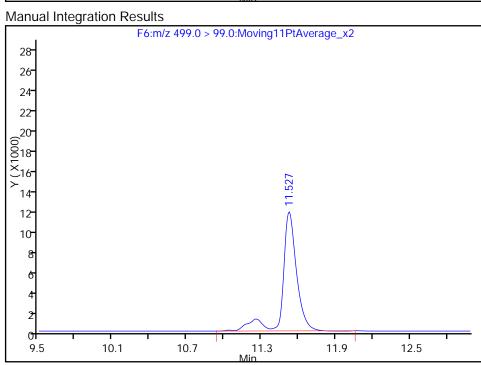
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

RT: 11.53 Area: 81010 Amount: 2.514247 Amount Units: ng/ml **Processing Integration Results**



RT: 11.53 Area: 91671 Amount: 3.952897 Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:22:26

Audit Action: Manually Integrated

Audit Reason: Isomers

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Client Sample ID: DW-95 Lab Sample ID: 320-19198-3

Matrix: Water Lab File ID: 03JUN2016A6A_021.d

Analysis Method: WS-LC-0025 Date Collected: 05/26/2016 11:26

Extraction Method: 3535 Date Extracted: 06/01/2016 11:06

Sample wt/vol: 537.1(mL) Date Analyzed: 06/03/2016 23:34

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

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 112504 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	3.3		2.3	1.9	0.85
375-85-9	Perfluoroheptanoic acid (PFHpA)	13		2.3	1.9	0.75
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.6	М	2.3	1.9	0.81
375-95-1	Perfluorononanoic acid (PFNA)	1.4	J	2.3	1.9	0.61
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	37	М	3.7	2.8	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	55	М	2.3	1.9	0.70

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	94		25-150
STL00990	13C4 PFOA	59		25-150
STL00991	13C4 PFOS	99		25-150
STL01892	13C4-PFHpA	88		25-150
STL00995	13C5 PFNA	35		25-150
STL00994	1802 PFHxS	120		25-150

Report Date: 06-Jun-2016 11:41:07 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_021.d

Lims ID: 320-19198-A-3-A

Client ID: DW-95 Sample Type: Client

Inject. Date: 03-Jun-2016 23:34:29 ALS Bottle#: 20 Worklist Smp#: 21

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-19198-a-3-a

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jun-2016 11:40:56 Calib Date: 03-Jun-2016 19:40:28

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

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

Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:23:23

I II SI LEVEI NEVIEWEI. WESIEHUUHC			Date.	· ·	74-Juli-2010 11.23.2	J				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobi	ıtanesulf	onic acid								
298.9 > 80.0	7.075	7.069	0.006	1.000	48675	1.77				
D 613C2 PFH	хA									
315.0 > 270.0	8.219	8.217	0.002		3122571	47.2		94.4	23023	
D 813C4-PFH	pA									
367.0 > 322.0	9.458	9.456	0.002		3209425	44.2		88.4	17461	
9 Perfluorohe	ptanoic a	icid								
363.0 > 319.0	•		0.007	1.000	405377	6.77			177	
D 11 1802 PF	HxS									
403.0 > 84.0	9.499	9.492	0.007		1792480	57.0		120	19304	
41 Perfluorohe	exanesult	fonic acid	ł							M
399.0 > 80.0	9.493	9.495	-0.002	1.000	103044	3.56				M
D 12 13C4 PFC	PΑ									
417.0 > 372.0	10.577	10.569	0.008		2386165	29.7		59.4	10082	
13 Perfluorood	ctanoic a	cid								M
413.0 > 369.0		10.572		1.000	1156534	29.3			393	M
413.0 > 169.0	10.577	10.572	0.005	1.000	426328		2.71(0.00-0.00)		768	M
D 16 13C4 PFC										
503.0 > 80.0	11.527	11.525	0.002		1824441	47.5		99.5	19832	
15 Perfluorood										M
499.0 > 80.0		11.527		1.000	854017	20.0	()		2948	M
499.0 > 99.0		11.527	0.008	1.000	338721		2.52(0.00-0.00)		7357	M
D 17 13C5 PFN										
	11.544		0.002		1235438	17.4		34.8	29740	
18 Perfluorono										
463.0 > 419.0	11.553	11.543	0.010	1.000	13090	0.7643			77.9	

Report Date: 06-Jun-2016 11:41:07 Chrom Revision: 2.2 20-Apr-2016 13:59:46

QC Flag Legend Review Flags

M - Manually Integrated

Report Date: 06-Jun-2016 11:41:07 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_021.d Data File: **Injection Date:** 03-Jun-2016 23:34:29 Instrument ID: Α6 Lims ID: 320-19198-A-3-A Lab Sample ID: 320-19198-3 Client ID: DW-95 Operator ID: **JRB** ALS Bottle#: 20 Worklist Smp#: 21 Injection Vol: Dil. Factor: 15.0 ul 1.0000 LC PFC_DOD ICAL Method: PFAC A6 Limit Group: D 813C4-PFHpA 40 Perfluorobutanesulfonic acid D 613C2 PFHxA F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 Y (X100000) Y (X100000) 18 (0015- X)12-X 8.3 9.5 6.8 7.1 7.4 6.5 7.4 9.2 7.7 8.6 10.4 11 18O2 PFHxS 9 Perfluoroheptanoic acid D 41 Perfluorohexanesulfonic acid (M) F4:m/z 363.0 > 319.0:Moving11PtAverage x2F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 56 30 X (X10000) 0048- 0048- 0048-6 25-_ ≻32 15 24 10 16- 8.4 9.3 9.9 9.1 9.4 9.7 10.0 10.3 10.2 9.3 10.5 8.8 7.5 8.7 D 12 13C4 PFOA 13 Perfluorooctanoic acid (M) 13 Perfluorooctanoic acid (M) F5:m/z 413.0 > 169.0:Moving11PtAverage_x2 F5:m/z 413.0 > 369.0:Moving11PtAverage_x2 F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 ©77- 6²⁸ 824 (X10000) X (X100000) ×55 ×20 ≻₁₆-33 12 22 9.7 11.5 9.4 10.3 9.5 10.4 11.3 10.6 8.5 11.2 8.6 8.8 D 16 13C4 PFOS 15 Perfluorooctane sulfonic acid (M) 15 Perfluorooctane sulfonic acid (M) F6:m/z 499.0 > 80.0:Moving11PtAverage_x2 F6:m/z 499.0 > 99.0:Moving11PtAverage_x2 F6:m/z 503.0 > 80.0:Moving11PtAverage_x2 77-(15-(000012-(X) 656 0048 <u>666</u> ×55- ×40 527 **≻**32 **≻44** 33 24 22 11 0 00 9.5 10.4 11.3 12.2 9.5 10.4 11.3 Page 25/5 of 419 12.2 9.5 10.4 11.3 12.2

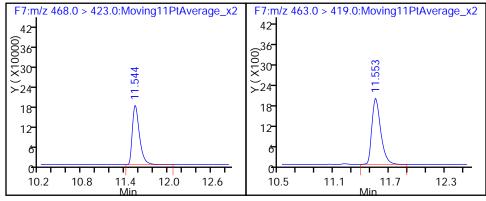
Report Date: 06-Jun-2016 11:41:07

Chrom Revision: 2.2 20-Apr-2016 13:59:46

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_021.d

D 17 13C5 PFNA

18 Perfluorononanoic acid



Report Date: 06-Jun-2016 11:41:07 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_021.d

Injection Date: 03-Jun-2016 23:34:29 Instrument ID: A6

Lims ID: 320-19198-A-3-A Lab Sample ID: 320-19198-3

Client ID: DW-95

Operator ID: JRB ALS Bottle#: 20 Worklist Smp#: 21

Injection Vol: 15.0 ul Dil. Factor: 1.0000

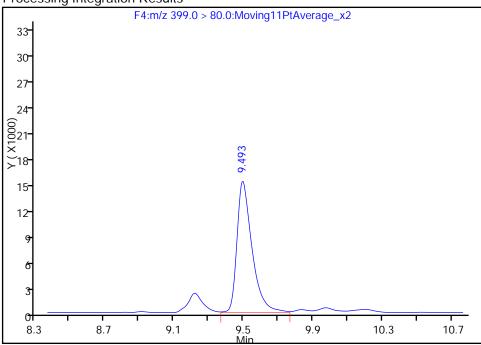
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

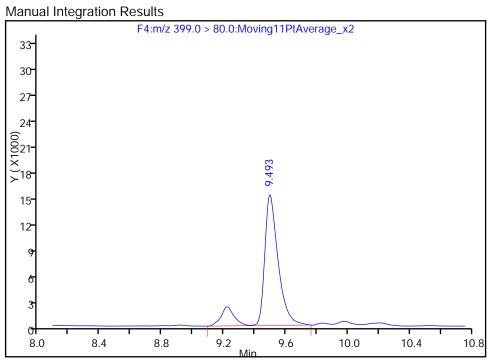
41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

RT: 9.49 Area: 92054 Amount: 3.183721 Amount Units: ng/ml **Processing Integration Results**



RT: 9.49
Area: 103044
Amount: 3.563814
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:23:23

Audit Action: Assigned Compound ID Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:41:07 Chrom Revision: 2.2 20-Apr-2016 13:59:46
Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_021.d

Injection Date: 03-Jun-2016 23:34:29 Instrument ID: A6

Lims ID: 320-19198-A-3-A Lab Sample ID: 320-19198-3

Client ID: DW-95

Operator ID: JRB ALS Bottle#: 20 Worklist Smp#: 21

Injection Vol: 15.0 ul Dil. Factor: 1.0000

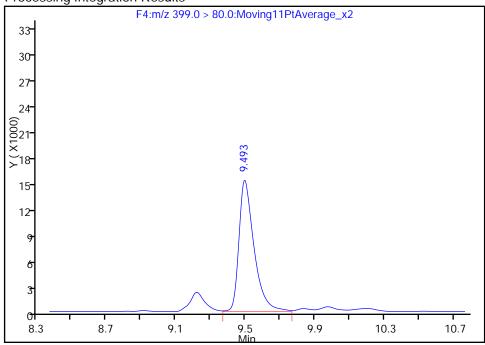
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

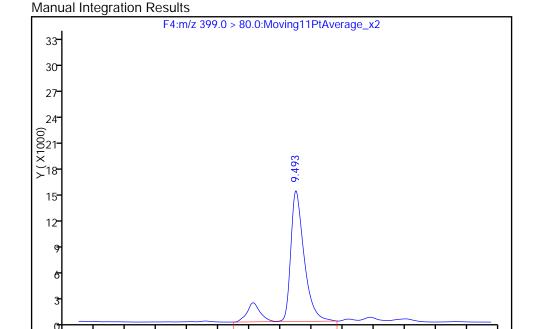
41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

RT: 9.49 Area: 92054 Amount: 3.183721 Amount Units: ng/ml **Processing Integration Results**



RT: 9.49
Area: 103044
Amount: 3.563814
Amount Units: ng/ml



10.0

10.4

10.8

Reviewer: westendorfc, 04-Jun-2016 11:23:23

8.0

8.4

Audit Action: Manually Integrated

Audit Reason: Isomers

9.2

9.6

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8.8

Report Date: 06-Jun-2016 11:41:08 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_021.d

Injection Date: 03-Jun-2016 23:34:29 Instrument ID: A6

Lims ID: 320-19198-A-3-A Lab Sample ID: 320-19198-3

Client ID: DW-95

Operator ID: JRB ALS Bottle#: 20 Worklist Smp#: 21

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

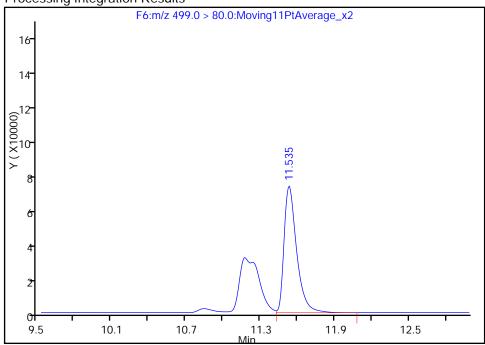
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

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

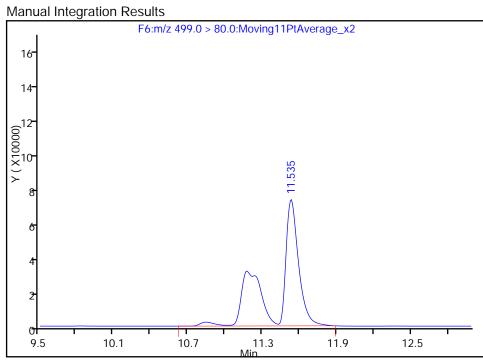
Signal: 1

RT: 11.54
Area: 501791
Amount: 11.742444
Amount Units: ng/ml

Processing Integration Results



RT: 11.54
Area: 854017
Amount: 19.984907
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:23:23

Audit Action: Manually Integrated Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:41:08 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_021.d

Injection Date: 03-Jun-2016 23:34:29 Instrument ID: A6

Lims ID: 320-19198-A-3-A Lab Sample ID: 320-19198-3

Client ID: DW-95

Operator ID: JRB ALS Bottle#: 20 Worklist Smp#: 21

Injection Vol: 15.0 ul Dil. Factor: 1.0000

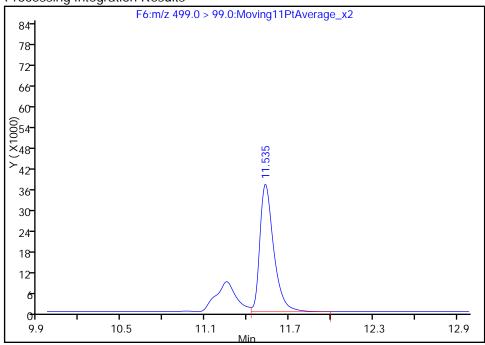
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

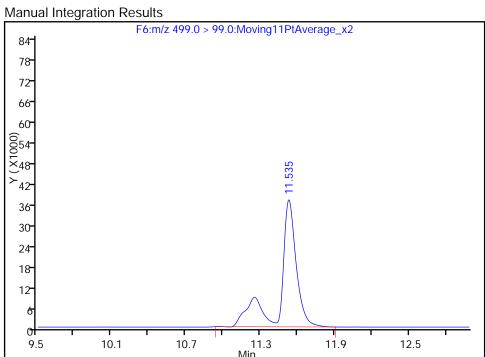
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

RT: 11.54 Area: 254736 Amount: 11.742444 Amount Units: ng/ml **Processing Integration Results**



RT: 11.54
Area: 338721
Amount: 19.984907
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:23:23

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:41:07 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_021.d

Injection Date: 03-Jun-2016 23:34:29 Instrument ID: A6

Lims ID: 320-19198-A-3-A Lab Sample ID: 320-19198-3

Client ID: DW-95

Operator ID: JRB ALS Bottle#: 20 Worklist Smp#: 21

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

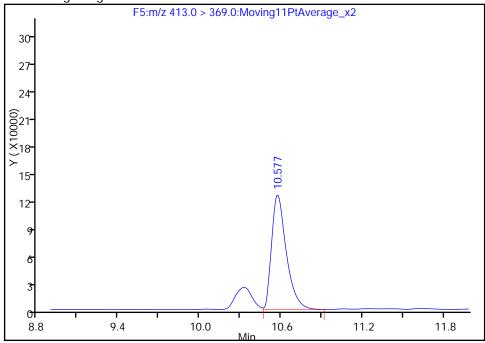
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

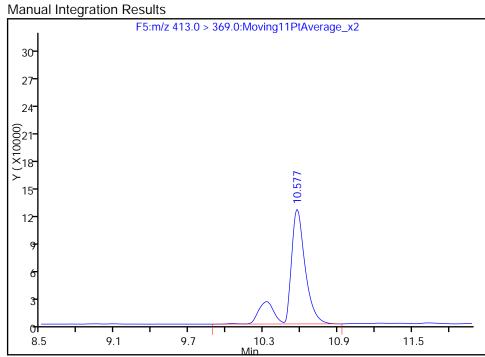
Signal: 1

RT: 10.58
Area: 947815
Amount: 24.772980
Amount Units: ng/ml

Processing Integration Results



RT: 10.58
Area: 1156534
Amount: 29.300393
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:23:23

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:41:07 Chrom Revision: 2.2 20-Apr-2016 13:59:46
Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_021.d

Injection Date: 03-Jun-2016 23:34:29 Instrument ID: A6

Lims ID: 320-19198-A-3-A Lab Sample ID: 320-19198-3

Client ID: DW-95

Operator ID: JRB ALS Bottle#: 20 Worklist Smp#: 21

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

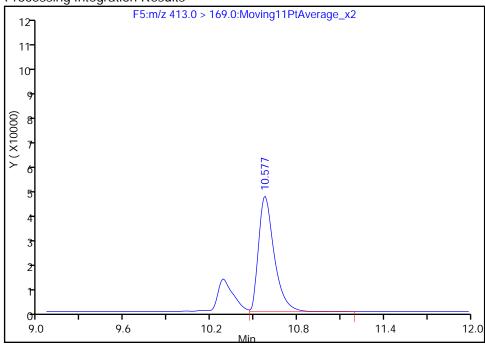
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

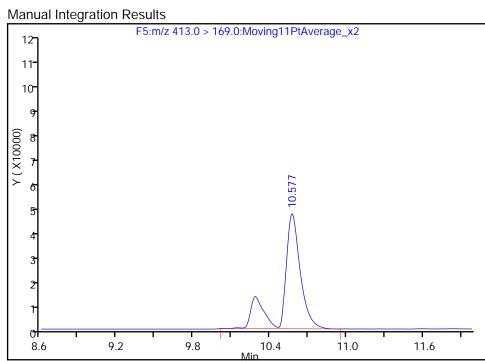
Signal: 2

RT: 10.58
Area: 336419
Amount: 24.772980
Amount Units: ng/ml

Processing Integration Results



RT: 10.58
Area: 426328
Amount: 29.300393
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:23:23

Audit Action: Manually Integrated

Audit Reason: Isomers

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Client Sample ID: FB-DW-95 Lab Sample ID: 320-19198-4

Matrix: Water Lab File ID: 03JUN2016A6A_022.d

Analysis Method: WS-LC-0025 Date Collected: 05/26/2016 11:28

Extraction Method: 3535 Date Extracted: 06/01/2016 11:06

Sample wt/vol: 535.7(mL) Date Analyzed: 06/03/2016 23:55

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

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 112504 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.2	J	2.3	1.9	0.86
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	U	2.3	1.9	0.75
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.3	1.9	0.81
375-95-1	Perfluorononanoic acid (PFNA)	0.64	J	2.3	1.9	0.61
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	13	М	3.7	2.8	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	0.75	J	2.3	1.9	0.70

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	108		25-150
STL00990	13C4 PFOA	123		25-150
STL00991	13C4 PFOS	117		25-150
STL01892	13C4-PFHpA	109		25-150
STL00995	13C5 PFNA	112		25-150
STL00994	1802 PFHxS	115		25-150

Report Date: 06-Jun-2016 11:41:09 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_022.d

Lims ID: 320-19198-A-4-A Client ID: FB-DW-95

Sample Type: Client

Inject. Date: 03-Jun-2016 23:55:45 ALS Bottle#: 21 Worklist Smp#: 22

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-19198-a-4-a

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jun-2016 11:40:56 Calib Date: 03-Jun-2016 19:40:28

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

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

Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:25:30

I II St Level Neviewel. Westerlaulic				Date.	·	74-3uii-2010 11.23.3	J				
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	40 Perfluorobu	ıtanesulfo	onic acid								
	298.9 > 80.0	7.075	7.069	0.006	1.000	1848	0.6497				
	D 6 13C2 PFH	κA									
	315.0 > 270.0	8.219	8.217	0.002		3579779	54.1		108	6969	
	D 8 13C4-PFH	ρA									
	367.0 > 322.0	9.458	9.456	0.002		3963754	54.6		109	6504	
	9 Perfluorohe	ptanoic a	cid								
	363.0 > 319.0	9.458	9.457	0.001	1.000	11063	0.1496			147	
	D 11 18O2 PFH	lxS									
	403.0 > 84.0	9.493	9.492	0.001		1708021	54.3		115	8916	
	41 Perfluorohe	xanesulf	onic acid	t							
	399.0 > 80.0	9.499	9.495	0.004	1.000	10039	0.3644				
	D 12 13C4 PFC	Α									
	417.0 > 372.0	10.568	10.569	-0.001		4933837	61.4		123	8855	
	13 Perfluorood	tanoic ad	cid								
	413.0 > 369.0		10.572		1.000	32640	0.3999			19.3	
	413.0 > 169.0	10.577	10.572	0.005	1.001	9638		3.39(0.00-0.00)		16.1	
	D 16 13C4 PFC										
	503.0 > 80.0	11.527	11.525	0.002		2143237	55.9		117	25409	
	15 Perfluorood										M
	499.0 > 80.0		11.527		1.000	339782	6.77	0.57/0.00.0.00		7884	M
	499.0 > 99.0		11.527	0.0	1.000	131984		2.57(0.00-0.00)		7894	M
	D 17 13C5 PFN		44 5 40	0.000		00/0476	F./ 0		110	F70//	
	468.0 > 423.0			0.003		3969172	56.0		112	57264	
	18 Perfluorono			0.000	1 000	107/0	0.0440			470	
	463.0 > 419.0	11.545	11.543	0.002	1.000	18762	0.3410			462	

Report Date: 06-Jun-2016 11:41:09 Chrom Revision: 2.2 20-Apr-2016 13:59:46

QC Flag Legend Review Flags

M - Manually Integrated

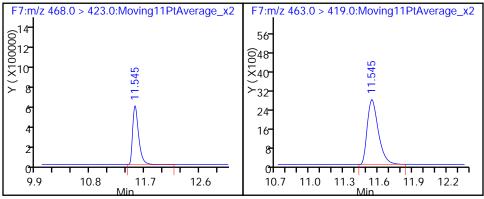
Report Date: 06-Jun-2016 11:41:09 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_022.d Data File: **Injection Date:** 03-Jun-2016 23:55:45 Instrument ID: Α6 Lims ID: 320-19198-A-4-A Lab Sample ID: 320-19198-4 Client ID: FB-DW-95 Operator ID: **JRB** ALS Bottle#: 21 Worklist Smp#: 22 Injection Vol: Dil. Factor: 1.0000 15.0 ul LC PFC_DOD ICAL Method: PFAC A6 Limit Group: 40 Perfluorobutanesulfonic acid 6 13C2 PFHxA D 813C4-PFHpA F3;m/z 315.0 > 270.0:Moving11PtAverage_x2 F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 √ (X100000) (12 X) X (X100000) X) X ×30 8 36 36 -24 18 7.075 12 7.0 7.3 7.9 8.5 7.3 9.1 7.8 8.7 9.6 10.5 9 Perfluoroheptanoic acid D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid F4:m/z 363.0 > 319.0:Moving11PtAverage x2F4:m/z 403.0 > 84.0:Moving11PtAverage x2F4:m/z 399.0 > 80.0:Moving11PtAverage x249 649⁻ 0042⁻ 28 6⁴² ×³⁵ <u>@</u>24 ×20 \times 35 <u></u>28⁻ ≻₂₈-≻16⁻ 21 12 21 14 14 9.5 9.0 9.0 10.2 8.6 10.4 9.6 10.2 9.6 7.7 8.4 D 12 13C4 PFOA 13 Perfluorooctanoic acid 13 Perfluorooctanoic acid F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 F5:m/z 413.0 > 369.0:Moving11PtAverage_x2 F5:m/z 413.0 > 169.0:Moving11PtAverage_x2 10 (0000012 ×) > 9 24 Y (X1000) 820 ×₁₆-12 9.6 10.5 10.6 10.9 11.2 11.5 10.4 10.7 11.0 11.4 10.0 10.3 10.1 8.7 D 16 13C4 PFOS 15 Perfluorooctane sulfonic acid (M) 15 Perfluorooctane sulfonic acid (M) F6:m/z 499.0 > 80.0:Moving11PtAverage_x2 F6:m/z 499.0 > 99.0:Moving11PtAverage_x2 F6:m/z 503.0 > 80.0:Moving11PtAverage_x2 42 70 670 660 ×30-860 ∑50 ×50 >40 **≻**40 18 30 30 20 12 20 10 10 00 0 10.5 11.4 12.3 9.5 10.4 11.3 Page 266 of 419 12.2 9.7 10.6 11.5 12.4 9.6

Report Date: 06-Jun-2016 11:41:09 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_022.d

D 17 13C5 PFNA

18 Perfluorononanoic acid



Report Date: 06-Jun-2016 11:41:09 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_022.d

Injection Date: 03-Jun-2016 23:55:45 Instrument ID: A6

Lims ID: 320-19198-A-4-A Lab Sample ID: 320-19198-4

Client ID: FB-DW-95

Operator ID: JRB ALS Bottle#: 21 Worklist Smp#: 22

Injection Vol: 15.0 ul Dil. Factor: 1.0000

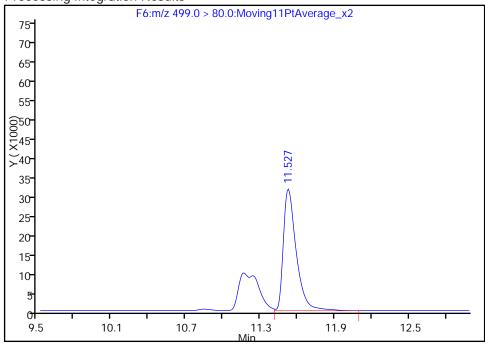
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

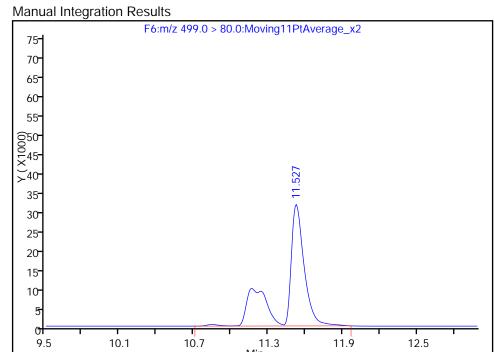
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

RT: 11.53 Area: 228896 Amount: 4.559670 Amount Units: ng/ml **Processing Integration Results**



RT: 11.53
Area: 339782
Amount: 6.768549
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:25:30

Audit Action: Manually Integrated Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:41:09 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_022.d

Injection Date: 03-Jun-2016 23:55:45 Instrument ID: A6

Lims ID: 320-19198-A-4-A Lab Sample ID: 320-19198-4

Client ID: FB-DW-95

Operator ID: JRB ALS Bottle#: 21 Worklist Smp#: 22

Injection Vol: 15.0 ul Dil. Factor: 1.0000

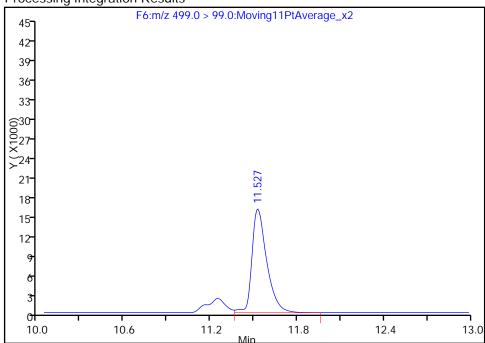
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

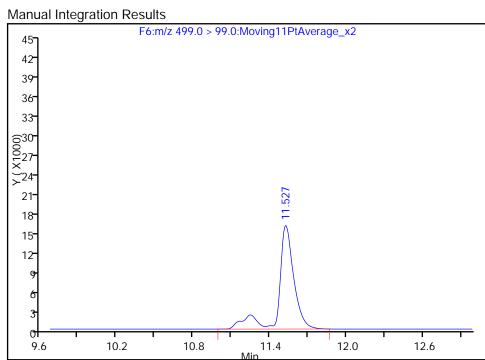
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

RT: 11.53 Area: 112925 Amount: 4.559670 Amount Units: ng/ml **Processing Integration Results**



RT: 11.53 Area: 131984 Amount: 6.768549 Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:25:30

Audit Action: Manually Integrated

Audit Reason: Isomers

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Client Sample ID: DUP-052616 Lab Sample ID: 320-19198-5

Matrix: Water Lab File ID: 03JUN2016A6A_023.d

Analysis Method: WS-LC-0025 Date Collected: 05/26/2016 11:26

Extraction Method: 3535 Date Extracted: 06/01/2016 11:06

Sample wt/vol: 521.1(mL) Date Analyzed: 06/04/2016 00:17

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

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 112504 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	3.1		2.4	1.9	0.88
375-85-9	Perfluoroheptanoic acid (PFHpA)	13		2.4	1.9	0.77
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.9	М	2.4	1.9	0.83
375-95-1	Perfluorononanoic acid (PFNA)	1.8	J	2.4	1.9	0.63
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	46	М	3.8	2.9	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	58	М	2.4	1.9	0.72

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	80		25-150
STL00990	13C4 PFOA	57		25-150
STL00991	13C4 PFOS	98		25-150
STL01892	13C4-PFHpA	77		25-150
STL00995	13C5 PFNA	46		25-150
STL00994	1802 PFHxS	116		25-150

Report Date: 06-Jun-2016 11:41:10 Chrom Revision: 2.2 20-Apr-2016 13:59:46

> TestAmerica Sacramento **Target Compound Quantitation Report**

\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_023.d Data File:

Lims ID: 320-19198-A-5-A DUP-052616 Client ID: Client

Sample Type:

Inject. Date: 04-Jun-2016 00:17:02 ALS Bottle#: 22 Worklist Smp#: 23

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-19198-a-5-a

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: **JRB** Instrument ID: Α6

\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m Method:

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jun-2016 11:40:56 Calib Date: 03-Jun-2016 19:40:28

Integrator: Picker

Isotopic Dilution Quant Method: Quant By: **Initial Calibration**

Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

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

Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:26:34

I II St Level Neviewel. Westerlaulic				Date.	· ·	74-Juli-2010 11.20.3	4			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobi	ıtanesulfo	onic acid	I							
298.9 > 80.0	7.067		-0.002	1.000	40090	1.60				
D 613C2 PFH										
	8.214	8.217	-0.003		2635972	39.8		79.7	18225	
D 813C4-PFH										
367.0 > 322.0	•	9.456	0.001		2802234	38.6		77.2	45306	
9 Perfluorohe										
	•	9.457	0.0	1.000	364351	6.97			175	
D 11 1802 PFF	HxS									
403.0 > 84.0	9.493	9.492	0.001		1733245	55.1		116	22788	
41 Perfluorohe	exanesulf	onic acid	d							M
399.0 > 80.0	9.493	9.495	-0.002	1.000	100184	3.58				M
D 12 13C4 PFC	DΑ									
417.0 > 372.0	10.568	10.569	-0.001		2288035	28.5		57.0	75444	
13 Perfluorood	ctanoic ac	cid								M
413.0 > 369.0	10.568	10.572	-0.004	1.000	1141211	30.2			478	M
413.0 > 169.0	10.568	10.572	-0.004	1.000	441722		2.58(0.00-0.00)		762	M
D 16 13C4 PFC)S									
503.0 > 80.0	11.526	11.525	0.001		1789646	46.6		97.6	11158	
15 Perfluorood	ctane sulf	onic acid	d							M
499.0 > 80.0	11.526			1.000	998786	23.8			2293	M
499.0 > 99.0	11.526	11.527	-0.001	1.000	396657		2.52(0.00-0.00)		7571	M
D 17 13C5 PFN	IA									
468.0 > 423.0	11.544	11.542	0.002		1618503	22.8		45.6	117331	
18 Perfluorono										
463.0 > 419.0	11.544	11.543	0.001	1.000	20893	0.9312			385	

Report Date: 06-Jun-2016 11:41:10 Chrom Revision: 2.2 20-Apr-2016 13:59:46

QC Flag Legend Review Flags

M - Manually Integrated

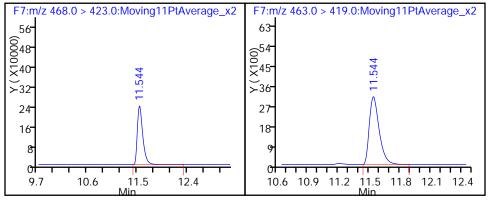
Report Date: 06-Jun-2016 11:41:10 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_023.d **Injection Date:** 04-Jun-2016 00:17:02 Instrument ID: Α6 Lims ID: 320-19198-A-5-A Lab Sample ID: 320-19198-5 Client ID: DUP-052616 Operator ID: **JRB** ALS Bottle#: 22 Worklist Smp#: 23 Dil. Factor: Injection Vol: 15.0 ul 1.0000 LC PFC_DOD ICAL Method: PFAC A6 Limit Group: D 813C4-PFHpA 40 Perfluorobutanesulfonic acid D 613C2 PFHxA F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 6072-7.067 ©72-(0012 ×10° × 8 ∑60 ×60 ≻48- ≻48 36**-**36 24 24 12 12 O 6.9 7.2 8.3 6.6 7.5 6.5 7.4 9.2 7.8 8.7 9.6 10.5 11 18O2 PFHxS 9 Perfluoroheptanoic acid 41 Perfluorohexanesulfonic acid (M) F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 649⁻ 6642⁻ (X10000) X (X10000) 24- 020-∑₁₆-×35 ≻₂₈-21 14 9.9 9.3 8.4 10.2 9.5 8.7 9.3 10.5 7.5 7.7 8.6 10.4 8.1 D 12 13C4 PFOA 13 Perfluorooctanoic acid (M) 13 Perfluorooctanoic acid (M) F5:m/z 413.0 > 369.0:Moving11PtAverage_x2 F5:m/z 413.0 > 169.0:Moving11PtAverage_x2 F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 77 12 (X10000) × (X10000) × (X10000) 630 625 0066 X10000 X155 \sum_{20}^{-1} 15- 33 10 22 9.9 10.8 9.4 10.3 9.4 10.3 11.2 11.7 8.5 11.2 8.5 9.0 D 16 13C4 PFOS 15 Perfluorooctane sulfonic acid (M) 15 Perfluorooctane sulfonic acid (M) F6:m/z 499.0 > 80.0:Moving11PtAverage_x2 F6:m/z 499.0 > 99.0:Moving11PtAverage_x2 F6:m/z 503.0 > 80.0:Moving11PtAverage_x2 21 12 (X10000) (X10000) (X10000) 656 6048 00018 15-526 **≥**40 <u></u> 12⁻ ≻₃₂ 24 16 $^{\circ}$ 0 0 9.9 10.8 11.7 12.6 9.5 10.4 Page 27/3h of 419 12.2 9.5 10.4 11.3 12.2

Report Date: 06-Jun-2016 11:41:10 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_023.d

D 17 13C5 PFNA

18 Perfluorononanoic acid



Report Date: 06-Jun-2016 11:41:10 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_023.d

Injection Date: 04-Jun-2016 00:17:02 Instrument ID: A6

Lims ID: 320-19198-A-5-A Lab Sample ID: 320-19198-5

Client ID: DUP-052616

Operator ID: JRB ALS Bottle#: 22 Worklist Smp#: 23

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

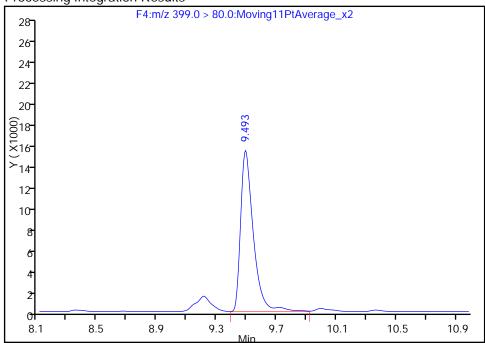
41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

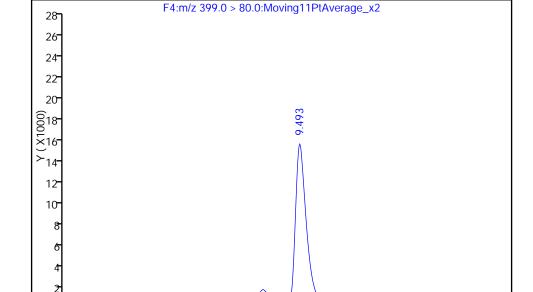
RT: 9.49
Area: 90108
Amount: 3.222924
Amount Units: ng/ml

Processing Integration Results

Manual Integration Results



RT: 9.49
Area: 100184
Amount: 3.583316
Amount Units: ng/ml



9.5

10.1

10.7

Reviewer: westendorfc, 04-Jun-2016 11:26:34

Audit Action: Assigned Compound ID

Audit Reason: Isomers

8.9

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8.3

7.7

Chrom Revision: 2.2 20-Apr-2016 13:59:46 Report Date: 06-Jun-2016 11:41:10 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_023.d

Injection Date: 04-Jun-2016 00:17:02 Instrument ID: Α6

Lims ID: 320-19198-A-5-A Lab Sample ID: 320-19198-5

DUP-052616 Client ID:

Operator ID: **JRB** ALS Bottle#: 22 Worklist Smp#: 23

Injection Vol: 15.0 ul Dil. Factor: 1.0000

PFAC A6 LC PFC DOD ICAL Method: Limit Group:

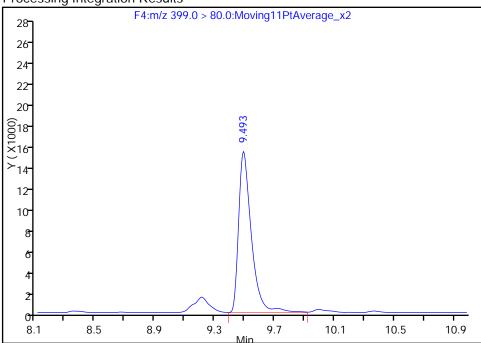
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

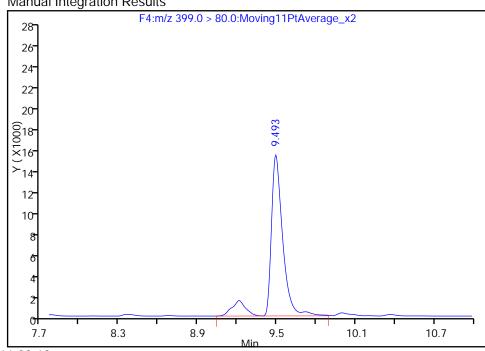
RT: 9.49 Area: 90108 Amount: 3.222924 Amount Units: ng/ml

Processing Integration Results



RT: 9.49 100184 Area: Amount: 3.583316 Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 06-Jun-2016 11:32:18

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:41:10 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_023.d

Injection Date: 04-Jun-2016 00:17:02 Instrument ID: A6

Lims ID: 320-19198-A-5-A Lab Sample ID: 320-19198-5

Client ID: DUP-052616

Operator ID: JRB ALS Bottle#: 22 Worklist Smp#: 23

Injection Vol: 15.0 ul Dil. Factor: 1.0000

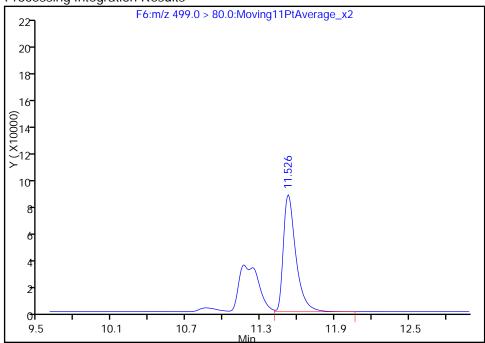
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

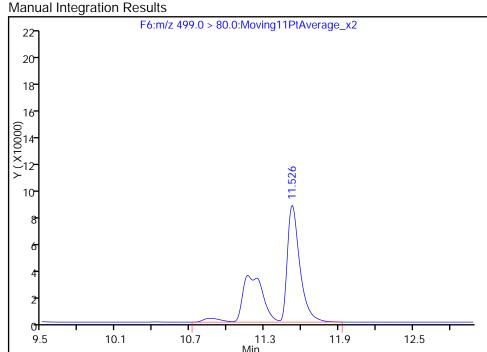
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

RT: 11.53 Area: 596734 Amount: 14.235709 Amount Units: ng/ml **Processing Integration Results**



RT: 11.53
Area: 998786
Amount: 23.827076
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:26:34

Audit Action: Manually Integrated Au

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:41:10 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_023.d

Injection Date: 04-Jun-2016 00:17:02 Instrument ID: A6

Lims ID: 320-19198-A-5-A Lab Sample ID: 320-19198-5

Client ID: DUP-052616

Operator ID: JRB ALS Bottle#: 22 Worklist Smp#: 23

Injection Vol: 15.0 ul Dil. Factor: 1.0000

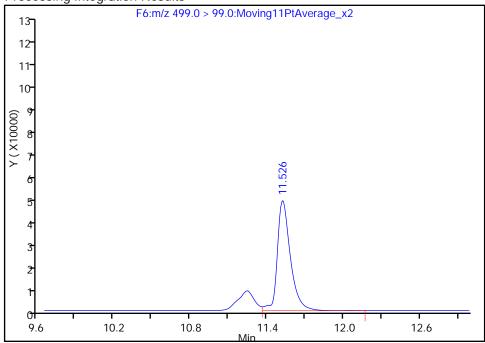
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

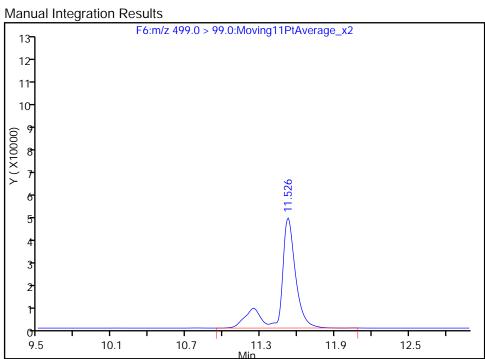
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

RT: 11.53 Area: 324689 Amount: 14.235709 Amount Units: ng/ml **Processing Integration Results**



RT: 11.53 Area: 396657 Amount: 23.827076 Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:26:34

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:41:10 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_023.d

Injection Date: 04-Jun-2016 00:17:02 Instrument ID:

Lims ID: Lab Sample ID: 320-19198-5 320-19198-A-5-A

Client ID: DUP-052616

ALS Bottle#: Operator ID: **JRB** 22 Worklist Smp#: 23

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

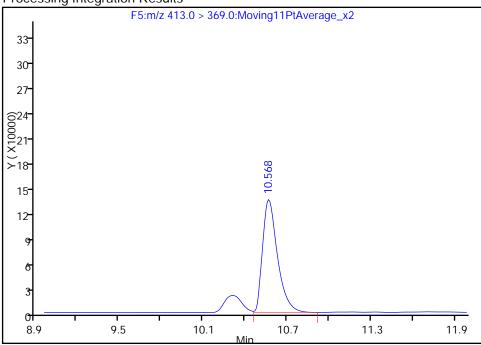
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

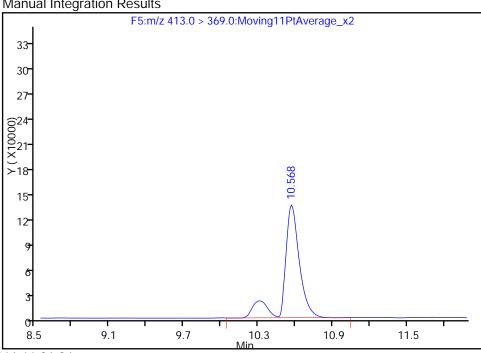
RT: 10.57 Area: 978457 Amount: 26.670689 Amount Units: ng/ml

Processing Integration Results



RT: 10.57 1141211 Area: Amount: 30.152186 Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 04-Jun-2016 11:26:34

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:41:10 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_023.d

Injection Date: 04-Jun-2016 00:17:02 Instrument ID: A6

Lims ID: 320-19198-A-5-A Lab Sample ID: 320-19198-5

Client ID: DUP-052616

Operator ID: JRB ALS Bottle#: 22 Worklist Smp#: 23

Injection Vol: 15.0 ul Dil. Factor: 1.0000

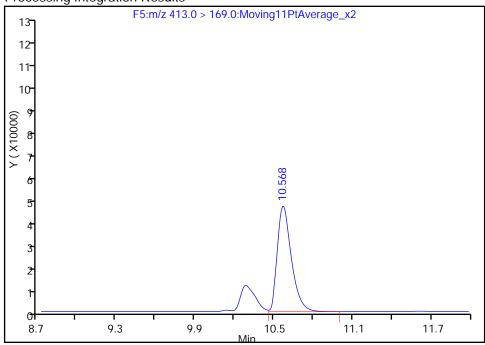
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

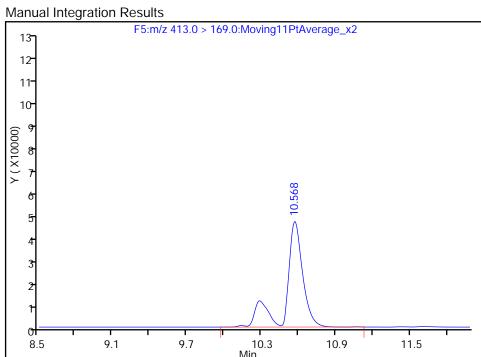
13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

RT: 10.57 Area: 349495 Amount: 26.670689 Amount Units: ng/ml **Processing Integration Results**



RT: 10.57
Area: 441722
Amount: 30.152186
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:26:34

Audit Action: Manually Integrated

Audit Reason: Isomers

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LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento

SDG No.:

Instrument ID: A6

GC Column: Acquity

Calibration Start Date: 06/03/2016 17:32

Calibration End Date: 06/03/2016 19:40

Calibration ID: 21964

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-112504/4	03JUN2016A6A 004.d
Level 2	STD 320-112504/5	03JUN2016A6A 005.d
Level 3	STD 320-112504/6	03JUN2016A6A 006.d
Level 4	STD 320-112504/7	03JUN2016A6A 007.d
Level 5	STD 320-112504/8	03JUN2016A6A 008.d
Level 6	STD 320-112504/9	03JUN2016A6A 009.d
Level 7	STD 320-112504/10	03JUN2016A6A 010.d

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	++++	5.779	5.785	5.788	5.788	5.785	5.788	5.536 - 6.036	5.786
Perfluoropentanoic acid (PFPeA)	+++++	6.937	6.941	6.946	6.941	6.941	6.941	6.691 - 7.191	6.941
Perfluorobutanesulfonic acid (PFBS)	+++++	7.064	7.067	7.071	7.071	7.071	+++++	6.819 - 7.319	7.069
Perfluorohexanoic acid (PFHxA)	+++++	8.214	8.214	8.220	8.219	8.219	8.219	7.966 - 8.466	8.218
Perfluoroheptanoic acid (PFHpA)	+++++	9.452	9.457	9.463	9.458	9.458	+++++	9.207 - 9.707	9.458
Perfluorohexanesulfonic acid (PFHxS)	+++++	9.493	9.493	9.493	9.493	9.493	9.499	9.245 - 9.745	9.494
Perfluorooctanoic acid (PFOA)	+++++	10.577	10.568	10.577	10.577	10.568	10.577	10.322 - 10.822	10.574
Perfluoroheptanesulfonic Acid (PFHpS)	+++++	10.577	10.577	10.586	10.586	10.577	+++++	10.331 - 10.831	10.581
Perfluorooctanesulfonic acid (PFOS)	+++++	11.518	11.526	11.535	11.527	11.527	11.527	11.277 - 11.777	11.527
Perfluorononanoic acid (PFNA)	++++	11.536	11.544	11.544	11.545	11.544	+++++	11.293 - 11.793	11.543
Perfluorodecanoic acid (PFDA)	12.373	12.373	12.373	12.373	12.373	12.373	+++++	12.123 - 12.623	12.373
Perfluorooctane Sulfonamide (FOSA)	+++++	12.984	12.984	12.994	12.994	12.984	+++++	12.737 - 13.237	12.988
Perfluorodecanesulfonic acid (PFDS)	13.032	13.032	13.032	13.041	13.032	13.032	13.031	12.783 - 13.283	13.033
Perfluoroundecanoic acid (PFUnA)	+++++	13.076	13.076	13.085	13.076	13.076	+++++	12.827 - 13.327	13.078
Perfluorododecanoic acid (PFDoA)	++++	13.657	13.666	13.675	13.666	13.666	+++++	13.416 - 13.916	13.666
Perfluorotridecanoic Acid (PFTriA)	+++++	14.159	14.167	14.174	14.167	14.167	+++++	13.915 - 14.415	14.167
Perfluorotetradecanoic acid (PFTeA)	+++++	14.583	14.589	14.596	14.589	14.589	+++++	14.339 - 14.839	14.589
Perfluoro-n-hexadecanoic acid (PFHxDA)	15.175	15.175	15.174	15.179	15.180	15.179	+++++	14.927 - 15.427	15.177
Perfluoro-n-octandecanoic acid (PFODA)	15.436	15.436	15.436	15.441	15.436	15.436	+++++	15.187 - 15.687	15.437
13C4 PFBA	5.782	5.782	5.785	5.788	5.785	5.785	5.785	5.534 - 6.034	5.785
13C5-PFPeA	6.937	6.937	6.941	6.941	6.937	6.941	6.937	6.689 - 7.189	6.939
13C2 PFHxA	8.214	8.214	8.214	8.220	8.219	8.219	8.219	7.967 - 8.467	8.217
13C4-PFHpA	9.452	9.452	9.457	9.457	9.458	9.458	+++++	9.206 - 9.706	9.456
1802 PFHxS	9.487	9.487	9.493	9.499	9.493	9.493	9.493	9.242 - 9.742	9.492
13C4 PFOA	10.568	10.568	10.568	10.577	10.568	10.568	+++++	10.319 - 10.819	10.570
13C4 PFOS	11.518	11.527	11.526	11.526	11.527	11.527	11.527	11.275 - 11.775	11.525
13C5 PFNA	11.536	11.536	11.544	11.544	11.545	11.544	+++++	11.292 - 11.792	11.542
13C2 PFDA	12.373	12.373	12.373	12.373	12.373	12.373	+++++	12.123 - 12.623	12.373
13C8 FOSA	12.984	12.984	12.984	12.994	12.984	12.984	+++++	12.735 - 13.235	12.986
13C2 PFUnA	13.076	13.067	13.076	13.085	13.076	13.076	+++++	12.826 - 13.326	13.076
13C2 PFDoA	13.657	13.657	13.666	13.666	13.666	13.666	+++++	13.413 - 13.913	13.663
13C2-PFTeDA	14.583	14.583	14.589	14.596	14.589	14.589	14.594	14.339 - 14.839	14.589
13C2-PFHxDA	15.175	15.175	15.174	15.179	15.180	15.179	15.178	14.927 - 15.427	15.177

FORM VI LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA

CURVE EVALUATION

Lab Name: TestAmerica Sacramento	Job No.: 320-19198-1	Analy Batch No.: 112504
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SDG No.:

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

Calibration Start Date: 06/03/2016 17:32 Calibration End Date: 06/03/2016 19:40 Calibration ID: 21964

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:	
Level 1	STD 320-112504/4	03JUN2016A6A 004.d	
Level 2	STD 320-112504/5	03JUN2016A6A 005.d	
Level 3	STD 320-112504/6	03JUN2016A6A 006.d	
Level 4	STD 320-112504/7	03JUN2016A6A 007.d	
Level 5	STD 320-112504/8	03JUN2016A6A 008.d	
Level 6	STD 320-112504/9	03JUN2016A6A 009.d	
Level 7	STD 320-112504/10	03JUN2016A6A 010.d	

ANALYTE		CF			CURVE		COEFFICIENT	#	MIN CF	%RSD			# MIN	
	LVL 1 LVL 5	LVL 2 LVL 6	LVL 3 LVL 7	LVL 4	TYPE	В	M1	M2			*K	SD OR COD	OR C	700
13C4 PFBA	28673 28006	30920 24022	28396 20243	28015	Ave		26896.3371			13.3	50	.0		
13C5-PFPeA	67620 65496	73202 55425	67968 44140	64092	Ave		62563.2429			15.6	50	.0		
13C2 PFHxA	72094 66643	76956 57445	70170 48172	71753	Ave		66176.0771			15.1	50	.0		
13C4-PFHpA	76896 70285	81969 56212	75320 ++++	75057	Ave		72623.3233			12.2	50	.0		
1802 PFHxS	33264 31366	38063 28374	34091 21328	33699	Ave		31454.8445			17.0	50	.0		
13C4 PFOA	87843 73577	94409 58045	88512 ++++	79383	Ave		80294.8467			16.4	50	.0		
13C4 PFOS	41140 38826	45507 33158	41242 26336	42397	Ave		38372.2833			17.0	50	.0		
13C5 PFNA	71371 67506	80702 55651	79795 ++++	70465	Ave		70914.9033			12.9	50	.0		
13C2 PFDA	56027 55307	67931 46123	59544 ++++	59367	Ave		57383.1700			12.4	50	.0		
13C8 FOSA	118618 107117	133881 88934	114447	119172	Ave		113694.830			13.2	50	.0		
13C2 PFUnA	87061 76741	92392 60515	87873 +++++	82041	Ave		81103.6633			14.1	50	.0		
13C2 PFDoA	105080 96889	114482 77641	110403	100671	Ave		100860.977			12.9	50	.0		
13C2-PFTeDA	88130 79362	93240 70608	83916 58544	84999	Ave		79828.2886			14.7	50	.0		
13C2-PFH×DA	136496 130488	155339 112444	142220 98750	136773	Ave		130358.649			14.6	50	.0		

Note: The ml coefficient is the same as Ave CF for an Ave curve type.

CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1 Analy Batch No.: 112504

SDG No.:

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

Calibration Start Date: 06/03/2016 17:32 Calibration End Date: 06/03/2016 19:40 Calibration ID: 21964

ANALYTE			RRF			CURVE		COEFFICIE	NT	# 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													
Perfluorobutanoic acid (PFBA)	+++++	32544	35805	32583	31156	AveID		1.2395			13.4		35.0		
	32353	30383													
Perfluoropentanoic acid (PFPeA)	++++ 53114	72612 47512	67387	56191	56404	AveID		0.9593			8.4		35.0		
Perfluorobutanesulfonic acid (PFBS)	++++	24192	30295	31042	29879	L1ID	-0.663	1.0994						0.9940	0.9900
	32426	+++++													
Perfluorohexanoic acid (PFHxA)	+++++	62673	61667	59886	57229	AveID		0.9171			13.3		35.0		
	56250	54752													
Perfluoroheptanoic acid (PFHpA)	++++ 57392	67944	72143	70601	64297	AveID		0.9326			7.5		35.0		
Perfluorohexanesulfonic acid (PFHxS)	+++++	27662	23447	23280	22440	AveID		0.7630			14.8	\vdash	35.0		
refiltuolomexamesuffomic actu (frmxs)	21910	21002	23447	23200	22110	Aveid		0.7030			14.0		33.0		
Perfluorooctanoic acid (PFOA)	+++++	58777	76274	65440	58760	AveID		0.8271			13.8		35.0		
	52312	45567													
Perfluoroheptanesulfonic Acid (PFHpS)	+++++	31663	27694	25698	24910	AveID		0.6497			5.3		50.0		
	21006	+++++													
Perfluorooctanesulfonic acid (PFOS)	+++++	45392	48995	42839	39328	AveID		1.1196			12.2		35.0		
Perfluorononanoic acid (PFNA)	38800	35254 51338	59150	49690	42702	AveID		0.6931			7.0		35.0		
Periluorononanoic acid (PFNA)	40874	51338 +++++	29120	49690	43/83	Avein		0.6931			7.0		35.0		
Perfluorodecanoic acid (PFDA)	73054	81032	67242	54654	54015	AveID		1.1027			12.7		35.0		
refiracioaccanore acra (fibil)	50414	+++++	0,212	01001	31013	1110010		1.1027			12.		55.0		
Perfluorooctane Sulfonamide (FOSA)	+++++	82881	80004	72940	71024	AveID		0.6561			6.0		35.0		
	61129	+++++													
Perfluorodecanesulfonic acid (PFDS)	12033	26898	30803	27899	26518	L2ID	-0.176	0.7006						0.9930	0.9900
	22006	17682													
Perfluoroundecanoic acid (PFUnA)	+++++	113910	77826	68285	60256	L2ID	0.4101	0.8189						0.9980	0.9900
D. Cl. and december 1 (DED. 2)	53328	63248	73508	63827	F.C.4.0.0	3 . TD		0.6274			10.0		25.0		
Perfluorododecanoic acid (PFDoA)	58426	63248 +++++	/3508	63827	56429	AveID		0.6374			12.2		35.0		
Perfluorotridecanoic Acid (PFTriA)	+++++	104371	101253	99736	85843	AveID		0.9245			4.2		50.0		
refractional neta (iffila)	71209	+++++	101233	55750	05045	110010		0.5245			7.2		50.0		
Perfluorotetradecanoic acid (PFTeA)	+++++	112067	83994	66095	62469	AveID		0.7622			17.6		50.0		
	59785	+++++													
Perfluoro-n-hexadecanoic acid (PFHxDA)	441322	306272	155803	120455	113515	L2ID	1.5132	1.1652						0.9960	0.9900
	100341	+++++	10501:	10005	445401			1 01 55			6 -		F.C		
Perfluoro-n-octandecanoic acid (PFODA)	127458	118261	135214	122276	117181	AveID		1.2167			9.7		50.0		
	109127	+++++													

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.: 320-19198-1 Analy Batch No.: 112504

SDG No.:

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

Calibration Start Date: 06/03/2016 17:32 Calibration End Date: 06/03/2016 19:40 Calibration ID: 21964

Calibration Files:

LEVEL:		LAB	SAMPLE ID:	LAB FILE ID:
Level	1	STD	320-112504/4	03JUN2016A6A 004.d
Level	2	STD	320-112504/5	03JUN2016A6A 005.d
Level	3	STD	320-112504/6	03JUN2016A6A 006.d
Level	4	STD	320-112504/7	03JUN2016A6A 007.d
Level	5	STD	320-112504/8	03JUN2016A6A 008.d
Level	6	STD	320-112504/9	03JUN2016A6A 009.d
Level	7	STD	320-112504/10	03JUN2016A6A 010.d

ANALYTE	CURVE			RESPONSE			CONCENTRATION (NG/ML)					
	TYPE	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	
13C4 PFBA	Ave	1433671 1201075	1546012 1012126	1419784	1400768	1400282	50.0 50.0	50.0 50.0	50.0	50.0	50.0	
13C5-PFPeA	Ave	3381013 2771254	3660075 2207013	3398375	3204622	3274783	50.0 50.0	50.0 50.0	50.0	50.0	50.0	
13C2 PFHxA	Ave	3604684 2872247	3847822 2408590	3508493	3587651	3332140	50.0 50.0	50.0 50.0	50.0	50.0	50.0	
13C4-PFHpA	Ave	3844822 2810580	4098464	3766006	3752872	3514253	50.0 50.0	50.0 ++++	50.0	50.0	50.0	
1802 PFHxS	Ave	1573402 1342070	1800359 1008805	1612487	1593964	1483612	47.3 47.3	47.3 47.3	47.3	47.3	47.3	
13C4 PFOA	Ave	4392169 2902241	4720448 +++++	4425597	3969152	3678847	50.0 50.0	50.0 ++++	50.0	50.0	50.0	
13C4 PFOS	Ave	1966495 1584944	2175222 1258865	1971377	2026588	1855875	47.8 47.8	47.8 47.8	47.8	47.8	47.8	
13C5 PFNA	Ave	3568543 2782565	4035116	3989744	3523227	3375276	50.0 50.0	50.0 ++++	50.0	50.0	50.0	
13C2 PFDA	Ave	2801343 2306152	3396542 ++++	2977215	2968340	2765359	50.0 50.0	50.0 ++++	50.0	50.0	50.0	
13C8 FOSA	Ave	5930916 4446696	6694027 ++++	5722353	5958609	5355848	50.0 50.0	50.0 ++++	50.0	50.0	50.0	
13C2 PFUnA	Ave	4353025 3025738	4619594 ++++	4393670	4102038	3837034	50.0 50.0	50.0 ++++	50.0	50.0	50.0	
13C2 PFDoA	Ave	5254008 3882040	5724119 +++++	5520133	5033532	4844461	50.0 50.0	50.0 ++++	50.0	50.0	50.0	
13C2-PFTeDA	Ave	4406508 3530381	4661979 2927207	4195809	4249936	3968081	50.0 50.0	50.0 50.0	50.0	50.0	50.0	
13C2-PFHxDA	Ave	6824804 5622192	7766962 4937522	7110984	6838654	6524409	50.0 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.: 320-19198-1 Analy Batch No.: 112504

SDG No.:

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

Calibration Start Date: 06/03/2016 17:32 Calibration End Date: 06/03/2016 19:40 Calibration ID: 21964

Calibration Files:

LEVEL:		LAB	SAMPLE ID:	LAB FILE ID:
Level	1	STD	320-112504/4	03JUN2016A6A 004.d
Level	2	STD	320-112504/5	03JUN2016A6A 005.d
Level	3	STD	320-112504/6	03JUN2016A6A 006.d
Level	4	STD	320-112504/7	03JUN2016A6A 007.d
Level	5	STD	320-112504/8	03JUN2016A6A 008.d
Level	6	STD	320-112504/9	03JUN2016A6A 009.d
Level	7	STD	320-112504/10	03JUN2016A6A 010.d

ANALYTE	IS CURVE			RESPONSE				CONCEN	ITRATION (N	G/ML)	
	REF TYPE	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)	AveII	+++++ 6470507	32544 12153239	179023	651668	1557786	+++++ 200	1.00	5.00	20.0	50.0
Perfluoropentanoic acid (PFPeA)	AveII	+++++ 10622898	72612 19004619	336933	1123821	2820215	+++++ 200	1.00 400	5.00	20.0	50.0
Perfluorobutanesulfonic acid (PFBS)	L1ID	+++++ 5732872	21386 ++++	133903	548826	1320665	+++++ 177	0.884	4.42	17.7	44.2
Perfluorohexanoic acid (PFHxA)	AveII	+++++ 11249940	62673 21900721	308334	1197711	2861454	+++++ 200	1.00 400	5.00	20.0	50.0
Perfluoroheptanoic acid (PFHpA)	AveII	+++++ 11478334	67944 ++++	360716	1412013	3214873	+++++ 200	1.00	5.00	20.0	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveII	+++++ 3987643	25172 7646391	106683	423692	1021016	+++++ 182	0.910 364	4.55	18.2	45.5
Perfluorooctanoic acid (PFOA)	AveII	+++++ 10462425	58777 18226991	381371	1308801	2937982	+++++ 200	1.00	5.00	20.0	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveII	+++++ 3999590	30143	131824	489285	1185733	+++++ 190	0.952 ++++	4.76	19.0	47.6
Perfluorooctanesulfonic acid (PFOS)	AveII	+++++ 7201323	42124 13086316	227335	795095	1824798	+++++ 186	0.928 371	4.64	18.6	46.4
Perfluorononanoic acid (PFNA)	AveII	+++++ 8174809	51338 ++++	295749	993809	2189140	+++++ 200	1.00	5.00	20.0	50.0
Perfluorodecanoic acid (PFDA)	AveII	36527 10082852	81032 ++++	336212	1093082	2700743	0.500 200	1.00	5.00	20.0	50.0
Perfluorooctane Sulfonamide (FOSA)	AveII	+++++ 12225896	82881 ++++	400018	1458806	3551181	+++++ 200	1.00	5.00	20.0	50.0
Perfluorodecanesulfonic acid (PFDS)	L2ID	5800 4242771	25930 6818278	148469	537885	1278184	0.482 193	0.964 386	4.82	19.3	48.2
Perfluoroundecanoic acid (PFUnA)	L2ID	+++++ 10665638	113910 ++++	389128	1365693	3012794	+++++	1.00	5.00	20.0	50.0
Perfluorododecanoic acid (PFDoA)	AveII	+++++ 11685203	63248 ++++	367538	1276533	2821435	+++++ 200	1.00	5.00	20.0	50.0

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Analy Batch No.: 112504 Job No.: 320-19198-1

SDG No.:

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

Calibration Start Date: 06/03/2016 17:32 Calibration End Date: 06/03/2016 19:40 Calibration ID: 21964

ANALYTE	IS REF		CURVE			RESPONSE		CONCENTRATION (NG/ML)					
			TYPE	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorotridecanoic Acid (PFTriA)		AveID	+++++ 14241779	104371	506263	1994716	4292140	+++++ 200	1.00	5.00	20.0	50.0	
Perfluorotetradecanoic acid (PFTeA)		AveID	+++++ 11956911	112067 ++++	419971	1321903	3123427	+++++ 200	1.00	5.00	20.0	50.0	
Perfluoro-n-hexadecanoic acid (PFHxDA)		L2ID	220661 20068210	306272 ++++	779014	2409097	5675759	0.500 200	1.00	5.00	20.0	50.0	
Perfluoro-n-octandecanoic acid (PFODA)		AveID	63729 21825371	118261 +++++	676071	2445515	5859044	0.500 200	1.00	5.00	20.0	50.0	

Curve Type Legend:

AveID = Average isotope dilution

L1ID = Linear 1/conc IsoDil

L2ID = Linear 1/conc^2 IsoDil

Report Date: 06-Jun-2016 11:40:42 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_004.d

Lims ID: Std L1

Client ID:

Sample Type: IC Calib Level: 1

Inject. Date: 03-Jun-2016 17:32:49 ALS Bottle#: 1 Worklist Smp#: 4

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L1

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Sublist: chrom-PFAC_A6*sub11

Method: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jun-2016 11:40:41 Calib Date: 03-Jun-2016 19:40:28

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

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

Process Host: XAWRK047

First Level Reviewer: barnettj Date: 06-Jun-2016 11:28:39

First Level Revie	wer: bar	nettj			Date: 06-Jun-2016 11:28:39					
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA	Δ									
217.0 > 172.0	、 5.782	5.784	-0.002		1433671	53.3		107	1372	
2 Perfluorobut	vric acid									
212.9 > 169.0	5.788	5.786	0.002	1.000	10508	0.2957		59.1	410	
D 3 13C5-PFP6	eΑ									
267.9 > 223.0	6.937	6.939	-0.002		3381013	54.0		108	16668	
4 Perfluoroper	ntanoic a	cid								
262.9 > 219.0	6.941	6.941	0.0	1.000	37076	0.5715		114	11.2	
40 Perfluorobu	tanesulfo	onic acio	ł							
298.9 > 80.0	7.071	7.069	0.002	1.000	7792	0.8162		185		
5 Perfluorobut	ane Sulf	onate								
298.9 > 80.0	7.071	7.069	0.002	1.000	7792	NC			4.0	
298.9 > 99.0	7.075	7.069	0.006	1.000	4056		1.92(0.00-0.00)		7.1	
7 Perfluorohex										
313.0 > 269.0	8.209	8.216	-0.007	1.000	20103	0.3041		60.8	741	
D 6 13C2 PFHx										
315.0 > 270.0	8.214	8.217	-0.003		3604684	54.5		109	90470	
D 8 13C4-PFH _F										
	9.452		-0.004		3844822	52.9		106	82643	
9 Perfluoroher										
363.0 > 319.0	9.452	9.457	-0.005	1.000	29599	0.4127		82.5	1762	
D 11 1802 PFH										
403.0 > 84.0	9.487	9.492	-0.005		1573402	50.0		106	2939	
41 Perfluorohe										
399.0 > 80.0	9.499	9.495	0.004	1.000	8302	0.3271		71.9		
10 Perfluorohe										
399.0 > 80.0	9.499	9.495	0.004	1.000	8302	NC			78.6	
					D 00- (4.4.0				

Report Date: 06- Data File:				Chrom Revision: 2.2 20-Apr-2016 13:59:46 o\ChromData\A6\20160604-31336.b\03JUN2016A6A_004.d						
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	10.568		-0.001		4392169	54.7		109	26106	
	tanoic ac 10.559 10.568	10.572		1.000 1.001	23946 8418	0.3296	2.84(0.00-0.00)	65.9 65.9	20.9 23.1	
	10.577	10.581		1.000	10805	NC			733	
38 Perfluorohe 449.0 > 80.0	10.577	fonic Aci 10.581		1.000	10805	0.4042		84.9		
D 16 13C4 PFO 503.0 > 80.0	11.518	11.525			1966495	51.2		107	90840	
15 Perfluorooc 499.0 > 80.0 499.0 > 99.0	11.527 11.518	onic acid 11.527 11.527	0.0	1.000 0.999	17027 5583	0.3697	3.05(0.00-0.00)	79.7 79.7	1174 376	M M M
	11.536		-0.006		3568543	50.3		101	51387	
18 Perfluorono 463.0 > 419.0	11.545		0.002	1.000	23515	0.4753		95.1	1740	
	12.373		0.0		2801343	48.8		97.6	28241	
20 Perfluorode 513.0 > 469.0	12.373		0.0	1.000	36527	0.5912		118	2276	
D 23 13C8 FOS 506.0 > 78.0	12.984	12.985			5930916	52.2		104	3313	
24 Perfluorooc 498.0 > 78.0	12.984	12.987	-0.003	1.000	34358	0.4415		88.3	2185	
	13.032	13.033		1.000	5800	0.4520		93.8		
25 Perfluorode 599.0 > 80.0			-0.001	1.000	5800	NC			415	
D 26 13C2 PFU 565.0 > 520.0		13.076	0.0		4353025	53.7		107	38464	
27 Perfluoroun 563.0 > 519.0			-0.001	1.000	71349	0.5000		100	3446	
D 28 13C2 PFD 615.0 > 570.0		13.663	-0.006		5254008	52.1		104	14087	
29 Perfluorodo 613.0 > 569.0			0.0	1.000	27774	0.4146		82.9	49.0	
30 Perfluorotrio 663.0 > 619.0			-0.006	1.000	40010	0.4118		82.4	38.3	
D 33 13C2-PFT		14.589	-0.006		4406508	55.2		110	11406	
32 Perfluorotet 713.0 > 669.0	radecan	oic acid		1.000	85586	1.07		214	54.9	
D 35 13C2-PFH 815.0 > 770.0		15.177	-0.002		6824804	52.4		105	6114	
34 Perfluorohe 813.0 > 769.0	xadecan	oic acid		1.000	Page 288 of			101	312	
					1 age 200 01	. 10				

Report Date: 06-Jun-2016 11:40:42 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_004.d Data File:

_											
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags

36 Perfluorooctandecanoic acid

0.4985 99.7 63729 51.7

OC Flag Legend Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L1_00020 Amount Added: 1.00 Units: mL

Report Date: 06-Jun-2016 11:40:42 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_004.d **Injection Date:** 03-Jun-2016 17:32:49 Instrument ID: Α6 Lims ID: Std L1 Client ID: Operator ID: **JRB** ALS Bottle#: Worklist Smp#: 15.0 ul Dil. Factor: 1.0000 Injection Vol: PFAC_A6 LC PFC_DOD ICAL Method: Limit Group: D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 63 ©35 ©30 6072-6⁵⁴ ×45 ×60 Σ_{25} **≻**36 ≻48 27 36 15 18 24 10 5.8 5.5 6.1 6.4 5.7 6.0 6.0 7.2 7.8 6.6 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid 7 Perfluorohexanoic acid F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F2:m/z 262.9 > 219.0:Moving11PtAverage_x2 F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 10 63 28 6.941 Y (X1000) ×45 ×20 ≻₁₆-**≻**36• 27 12 18 6.9 6.9 7.2 7.5 7.2 7.5 7.8 8.1 7.5 8.4 8.7 6.3 6.6 6.6 6 13C2 PFHxA 8 13C4-PFHpA 9 Perfluoroheptanoic acid F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 (X100000) X (X1000000) X (X1000000) 10 Y (X1000) Y (X100 7.2 8.1 9.0 9.4 8.9 9.2 9.5 9.8 8.5 10.3 10.1 6.3 7.6 8.6 D 11 1802 PFHxS D 12 13C4 PFOA 41 Perfluorohexanesulfonic acid F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 (00012-10-10-0036 36 <u>230</u> ₹30-<u>~</u>24 **≻**24 18 18 12 12 0 0 0 9.0 9.3 9.6 Page 290hof 419 8.6 9.2 9.8 10.4 8.7 8.5 9.4 10.3 11.2 8.0

13.3

14.2

12.0

12.6

13.2

13.8

12.4

11.8

11.2

12.4

13.0

15.5

15.8

14.7

14.4

15.0

15.3

15.6

15.9

14.9

Report Date: 06-Jun-2016 11:40:42 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_004.d

Injection Date: 03-Jun-2016 17:32:49 Instrument ID: A6

Lims ID: Std L1

Client ID:

Operator ID: JRB ALS Bottle#: 1 Worklist Smp#: 4

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

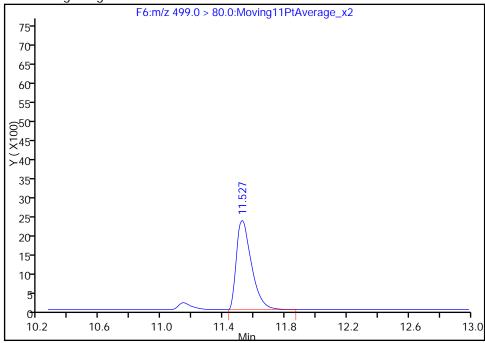
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

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

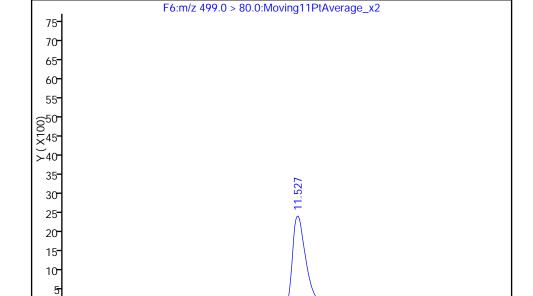
Signal: 1

RT: 11.53 Area: 15924 Amount: 0.345720 Amount Units: ng/ml **Processing Integration Results**

Manual Integration Results



RT: 11.53
Area: 17027
Amount: 0.369667
Amount Units: ng/ml



11.6

12.2

12.8

Reviewer: barnettj, 06-Jun-2016 11:28:39

Audit Action: Manually Integrated

Audit Reason: Isomers

11.0

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10.4

Chrom Revision: 2.2 20-Apr-2016 13:59:46 Report Date: 06-Jun-2016 11:40:42 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_004.d Data File:

Injection Date: 03-Jun-2016 17:32:49 Instrument ID: Α6

Lims ID: Std L1

Client ID:

JRB Operator ID: ALS Bottle#: 1 Worklist Smp#:

Injection Vol: 15.0 ul Dil. Factor: 1.0000

PFAC A6 LC PFC_DOD ICAL Method: Limit Group:

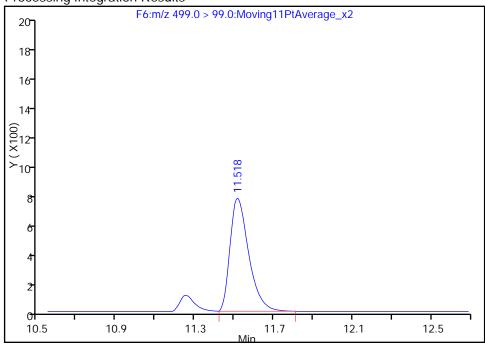
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

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

Signal: 2

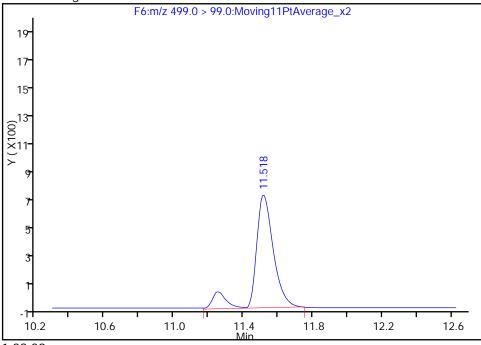
RT: 11.52 Area: 4957 Amount: 0.345720 Amount Units: ng/ml

Processing Integration Results



RT: 11.52 5583 Area: Amount: 0.369667 Amount Units: ng/ml





Reviewer: barnettj, 06-Jun-2016 11:28:39

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:40:44 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_005.d

Lims ID: Std L2

Client ID:

Sample Type: IC Calib Level: 2

Inject. Date: 03-Jun-2016 17:54:05 ALS Bottle#: 2 Worklist Smp#: 5

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L2

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Sublist: chrom-PFAC_A6*sub11

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jun-2016 11:40:43 Calib Date: 03-Jun-2016 19:40:28

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

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

Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:01:40

First Level Revie	ewer: wes	stendorf	С		Date: 04-Jun-2016 11:01:40					
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA	1									
217.0 > 172.0	5.782	5.784	-0.002		1546012	57.5		115	10217	
2 Perfluorobut										
212.9 > 169.0	5.779		-0.007	1.000	32544	0.8492		84.9	3874	
D 3 13C5-PFP6	eΑ									
267.9 > 223.0	6.937	6.939	-0.002		3660075	58.5		117	10507	
4 Perfluoroper	ntanoic a	cid								
262.9 > 219.0		6.941	-0.004	1.000	72612	1.03		103	18.8	
40 Perfluorobu	tanesulfo	onic acio	ł							
298.9 > 80.0	7.064	7.069	-0.005	1.000	21386	1.11		126		
5 Perfluorobut	ane Sulf	onate								
298.9 > 80.0	7.064	7.069	-0.005	1.000	21386	NC			10.6	
298.9 > 99.0	7.064	7.069	-0.005	1.000	10898		1.96(0.00-0.00)		18.1	
7 Perfluorohex										
313.0 > 269.0	8.214	8.216	-0.002	1.000	62673	0.8881		88.8	2365	
D 6 13C2 PFHx										
315.0 > 270.0	8.214	8.217	-0.003		3847822	58.1		116	21670	
D 8 13C4-PFHp										
367.0 > 322.0	9.452	9.456	-0.004		4098464	56.4		113	12230	
9 Perfluorohep										
363.0 > 319.0	9.452	9.457	-0.005	1.000	67944	0.8888		88.9	1219	
D 11 1802 PFH										
403.0 > 84.0	9.487	9.492	-0.005		1800359	57.2		121	5203	
41 Perfluorohe										M
399.0 > 80.0	9.493	9.495	-0.002	1.000	25172	0.8668		95.2		M
10 Perfluorohe										M
399.0 > 80.0	9.495	9.495	0.0	1.000	0	NC			140	M
					(

Report Date: 06- Data File:				Chrom Revision: 2.2 20-Apr-2016 13:59:46 o\ChromData\A6\20160604-31336.b\03JUN2016A6A_005.d						
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	10.568		-0.001		4720448	58.8		118	14949	
	tanoic ac 10.577 10.568	10.572		1.000 0.999	58777 20884	0.7527	2.81(0.00-0.00)	75.3 75.3	73.9 38.6	
14 Perfluorohe 449.0 > 80.0	10.577	10.581		1.000	30143	NC			2006	
38 Perfluorohe 449.0 > 80.0	10.577	fonic Act		1.000	30143	1.02		107		
D 16 13C4 PFO 503.0 > 80.0	11.527	11.525			2175222	56.7		119	19114	NA
15 Perfluorooc 499.0 > 80.0 499.0 > 99.0	11.518 11.527	11.527 11.527	-0.009	1.000 1.001	42124 19284	0.8268	2.18(0.00-0.00)	89.1 89.1	2854 1415	M M
	11.536		-0.006		4035116	56.9		114	19318	
18 Perfluorono 463.0 > 419.0	11.536		-0.007	1.000	51338	0.9178		91.8	1269	
	12.373		0.0		3396542	59.2		118	13339	
	12.373		0.0	1.000	81032	1.08		108	5039	
D 23 13C8 FOS 506.0 > 78.0	12.984	12.985			6694027	58.9		118	2746	
24 Perfluorooc 498.0 > 78.0	12.984	12.987	-0.003	1.000	82881	0.9435		94.4	5371	
	13.032	13.033		1.000	25930	1.06		110		
25 Perfluorode 599.0 > 80.0	13.032		-0.001	1.000	25930	NC			1805	
D 26 13C2 PFU 565.0 > 520.0	13.067		-0.009		4619594	57.0		114	9822	
27 Perfluoroun 563.0 > 519.0	13.076		-0.001	1.000	113910	1.00		100	1140	
D 28 13C2 PFD 615.0 > 570.0	13.657		-0.006		5724119	56.8		114	10996	
29 Perfluorodo 613.0 > 569.0	13.657	13.666	-0.009	1.000	63248	0.8667		86.7	101	
30 Perfluorotrio 663.0 > 619.0			-0.006	1.000	104371	0.9861		98.6	103	
D 33 13C2-PFT 715.0 > 670.0		14.589	-0.006		4661979	58.4		117	4200	
32 Perfluorotet 713.0 > 669.0	14.583		-0.006	1.000	112067	1.28		128	78.4	
D 35 13C2-PFH 815.0 > 770.0		15.177	-0.002		7766962	59.6		119	6229	
34 Perfluorohe 813.0 > 769.0			-0.002	1.000	Page 296 of	419 ^{1.00}		99.7	336	

Report Date: 06-Jun-2016 11:40:44 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_005.d Data File:

_											
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags

36 Perfluorooctandecanoic acid

0.8490 84.9 73.9 118261

OC Flag Legend Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L2_00021 Amount Added: 1.00 Units: mL

Report Date: 06-Jun-2016 11:40:44 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_005.d **Injection Date:** 03-Jun-2016 17:54:05 Instrument ID: Α6 Lims ID: Std L2 Client ID: Operator ID: **JRB** ALS Bottle#: 2 Worklist Smp#: 5 15.0 ul Dil. Factor: 1.0000 Injection Vol: PFAC_A6 Limit Group: LC PFC_DOD ICAL Method: D 113C4 PFBA 2 Perfluorobutyric acid D 3 13C5-PFPeA F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 636 630 636 684° 672° (00010 (00010 (00010 ×60 18 36 24 5.8 5.5 5.8 7.9 5.2 6.4 5.2 6.1 6.1 6.7 7.3 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid 7 Perfluorohexanoic acid F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F2:m/z 262.9 > 219.0:Moving11PtAverage x2F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 18-21 63 6.937 0015- ×12-618 0015 X 654**-**×45**-**-36- 27 18 6.9 7.2 7.8 6.7 7.7 8.0 8.3 8.6 6.3 6.6 7.5 7.0 7.3 7.6 7.4 8.9 6.4 6 13C2 PFHxA 8 13C4-PFHpA 9 Perfluoroheptanoic acid D F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 (0000012 (0000012 (0000012 (0000012) (0000012) (0000012) (0000012) (0000012) (0000012) (0000012) Y (X100000) 24 <u>≻</u>16-12 01 7.2 8.1 9.0 8.4 9.3 8.9 9.2 9.5 9.8 7.5 10.2 10.1 6.3 8.6 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid (M) D 12 13C4 PFOA F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 56- 0014 00012 X10 0648 0648 0648 0648 ×55- ≻₄₄-24 33 16 22 11 0 00 7.9 8.8 9.7 10.6 8.1 8.7 Page 296 of 419 10.5 9.1 9.7 10.3 10.9 11.5

Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 06-Jun-2016 11:40:44

14.7

14.4

15.0

15.3

15.6

15.9

15.3

15.6

15.9

16.2

15.0

Report Date: 06-Jun-2016 11:40:44 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_005.d

Injection Date: 03-Jun-2016 17:54:05 Instrument ID: A6

Lims ID: Std L2

Client ID:

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

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

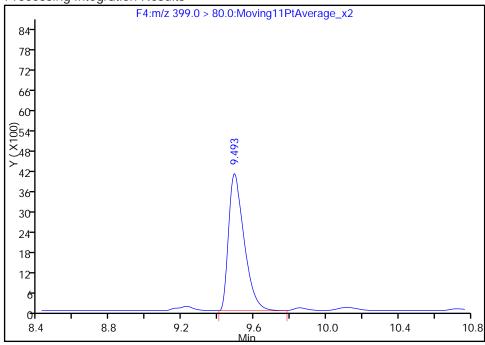
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

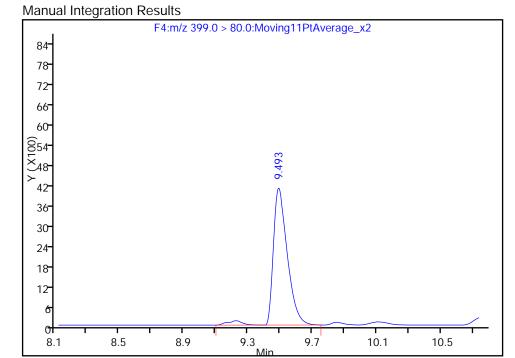
Signal: 1

RT: 9.49
Area: 24405
Amount: 1.058265
Amount Units: ng/ml

Processing Integration Results



RT: 9.49
Area: 25172
Amount: 0.866773
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:01:40

Audit Action: Assigned Compound ID Audit Reason: Isomers

Report Date: 06-Jun-2016 11:40:44 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_005.d

Injection Date: 03-Jun-2016 17:54:05 Instrument ID: A6

Lims ID: Std L2

Client ID:

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

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

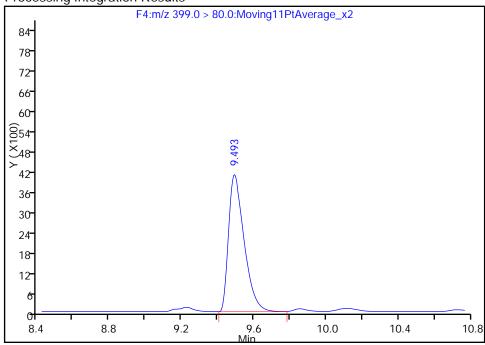
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

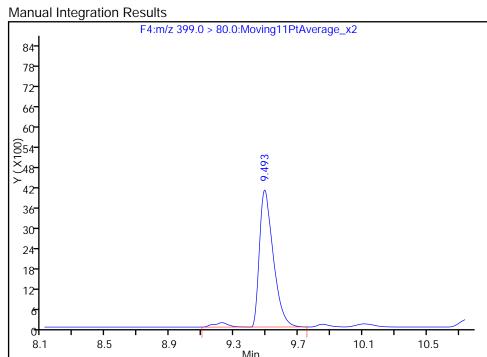
Signal: 1

RT: 9.49
Area: 24405
Amount: 1.058265
Amount Units: ng/ml

Processing Integration Results



RT: 9.49
Area: 25172
Amount: 0.866773
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:01:40

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:40:44 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_005.d

Injection Date: 03-Jun-2016 17:54:05 Instrument ID: A6

Lims ID: Std L2

Client ID:

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

Injection Vol: 15.0 ul Dil. Factor: 1.0000

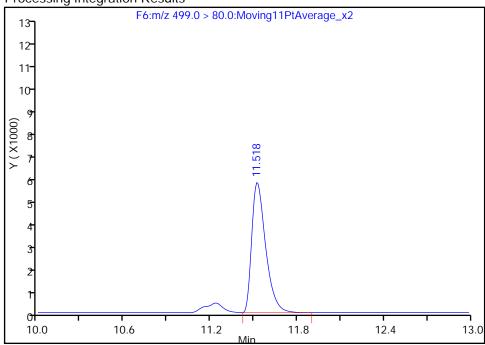
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

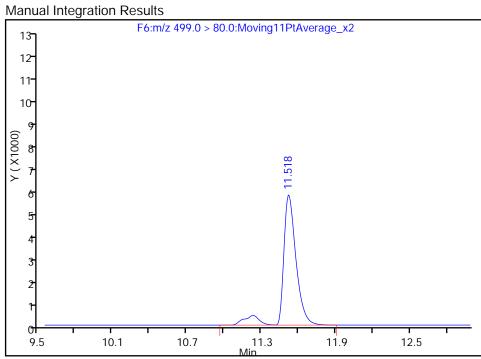
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

RT: 11.52 Area: 38335 Amount: 0.987467 Amount Units: ng/ml **Processing Integration Results**



RT: 11.52
Area: 42124
Amount: 0.826783
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:01:40

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:40:46 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_006.d

Lims ID: Std L3

Client ID:

Sample Type: IC Calib Level: 3

Inject. Date: 03-Jun-2016 18:15:20 ALS Bottle#: 3 Worklist Smp#: 6

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L3

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Sublist: chrom-PFAC_A6*sub11

Method: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jun-2016 11:40:45 Calib Date: 03-Jun-2016 19:40:28

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

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

Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:02:13

First Level Revie	wer: wes	stendorf	С		Date: 04-Jun-2016 11:02:13					
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA	1									
217.0 > 172.0	5 .785	5.784	0.001		1419784	52.8		106	3394	
2 Perfluorobut										
212.9 > 169.0	5.785	5.786	-0.001	1.000	179023	5.09		102	7830	
D 3 13C5-PFPe	eΑ									
267.9 > 223.0	6.941	6.939	0.002		3398375	54.3		109	7797	
4 Perfluoroper	ntanoic a	cid								
262.9 > 219.0	6.941	6.941	0.0	1.000	336933	5.17		103	45.7	
40 Perfluorobu	tanesulfo	onic acio	ł							
298.9 > 80.0	7.067	7.069	-0.002	1.000	133903	4.18		94.5		
5 Perfluorobut	ane Sulf	onate								
298.9 > 80.0	7.067	7.069	-0.002	1.000	133903	NC			50.6	
298.9 > 99.0	7.067	7.069	-0.002	1.000	75378		1.78(0.00-0.00)		97.3	
7 Perfluorohex										
313.0 > 269.0	8.214	8.216	-0.002	1.000	308334	4.79		95.8	7830	
D 6 13C2 PFHx										
315.0 > 270.0	8.214	8.217	-0.003		3508493	53.0		106	55684	
D 8 13C4-PFH _F										
367.0 > 322.0	9.457	9.456	0.001		3766006	51.9		104	160379	
9 Perfluoroher										
363.0 > 319.0	9.457	9.457	0.0	1.000	360716	5.14		103	12244	
D 11 18O2 PFH										
403.0 > 84.0		9.492	0.001		1612487	51.3		108	12974	
41 Perfluorohe										M
399.0 > 80.0			-0.002	1.000	106683	4.10		90.1		M
10 Perfluorohe										M
399.0 > 80.0	9.495	9.495	0.0	1.000	0	NC			57.2	M
					D 004 (440				

Report Date: 06- Data File:				Chrom Revision: 2.2 20-Apr-2016 13:59:46 o\ChromData\A6\20160604-31336.b\03JUN2016A6A_006.d						
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFO 417.0 > 372.0 13 Perfluorooc	10.568		-0.001		4425597	55.1		110	9951	
413.0 > 369.0 413.0 > 169.0	10.568 10.568	10.572 10.572		1.000 1.000	381371 143240	5.21	2.66(0.00-0.00)	104 104	355 223	
	10.577	10.581		1.000	131824	NC			2426	
38 Perfluorohe 449.0 > 80.0	10.577	fonic Aci 10.581		1.000	131824	4.92		103		
D 16 13C4 PFO 503.0 > 80.0	11.526	11.525			1971377	51.4		107	55182	
15 Perfluorooc 499.0 > 80.0 499.0 > 99.0	11.526 11.526		-0.001	1.000 1.000	227335 120418	4.92	1.89(0.00-0.00)	106 106	392 2040	M M M
D 17 13C5 PFN 468.0 > 423.0	A 11.544	11.542	0.002		3989744	56.3		113	12919	
18 Perfluorono 463.0 > 419.0			0.001	1.000	295749	5.35		107	1831	
D 19 13C2 PFD. 515.0 > 470.0	A 12.373	12.373	0.0		2977215	51.9		104	29918	
20 Perfluorode 513.0 > 469.0	canoic a 12.373		0.0	1.000	336212	5.12		102	20422	
D 23 13C8 FOS 506.0 > 78.0		12.985	-0.001		5722353	50.3		101	3091	
24 Perfluorooc 498.0 > 78.0	tane Sulf 12.984			1.000	400018	5.33		107	25936	
39 Perfluorode 599.0 > 80.0	cane Sul 13.032			1.000	148469	5.39		112		
25 Perfluorode 599.0 > 80.0			-0.001	1.000	148469	NC			10252	
D 26 13C2 PFU 565.0 > 520.0		13.076	0.0		4393670	54.2		108	77477	
27 Perfluoroun 563.0 > 519.0			-0.001	1.000	389128	4.91		98.1	10990	
D 28 13C2 PFD 615.0 > 570.0	οΑ				5520133	54.7		109	14241	
29 Perfluorodo	decanoic	acid		1 000						
613.0 > 569.0 30 Perfluorotric	decanoic	acid		1.000	367538	5.22		104	842	
663.0 > 619.0 D 33 13C2-PFT		14.165	0.002	1.000	506263	4.96		99.2	419	
715.0 > 670.0 32 Perfluorotet			0.0		4195809	52.6		105	4850	
713.0 > 669.0 D 35 13C2-PFH	14.589		0.0	1.000	419971	4.99		99.8	183	
815.0 > 770.0	15.174		-0.003		7110984	54.5		109	6739	
34 Perfluorohe 813.0 > 769.0			-0.003	1.000	Page 305 of 419	4.76		95.1	762	

Report Date: 06-Jun-2016 11:40:46 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_006.d Data File:

_											
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags

36 Perfluorooctandecanoic acid

5.03 101 437 676071

OC Flag Legend Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L3_00018 Amount Added: 1.00 Units: mL

Report Date: 06-Jun-2016 11:40:46 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_006.d **Injection Date:** 03-Jun-2016 18:15:20 Instrument ID: Α6 Lims ID: Std L3 Client ID: Operator ID: **JRB** ALS Bottle#: 3 Worklist Smp#: 15.0 ul Dil. Factor: 1.0000 Injection Vol: PFAC_A6 Limit Group: LC PFC_DOD ICAL Method: D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 49 (00001×)24 6072 560 (6₄₂--35- ~ ≻48 ≻28 18 36 21 12 14 24 12 5.3 5.9 7.0 5.4 6.0 6.6 5.6 6.2 5.8 6.4 7.6 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid 7 Perfluorohexanoic acid F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 F2:m/z 262.9 > 219.0:Moving11PtAverage_x2 35 84 77 666 6.941 630 025 872 ∑60 **_**20 ≻48 15 36 33 10 24 22 12 11 6.9 6.7 7.7 8.9 7.2 7.5 7.8 7.0 7.3 7.6 8.3 6.3 6.6 6.4 6 13C2 PFHxA 8 13C4-PFHpA 9 Perfluoroheptanoic acid D F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 Y (X100000) Y (X100000) × (×10000) 7.8 Mir 7.2 9.0 9.3 8.7 9.3 9.9 8.4 7.5 8.4 10.2 10.5 6.6 8.1 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid (M) D 12 13C4 PFOA F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 49 24 (000012 X) 0042 X35 <u>×</u>16 12 21 14 0 0 07.8 8.7 9.6 10.5 7.5 8.4 Page 307 of 419 10.2 9.1 9.7 10.3 10.9 11.5

13.3

14.2

11.8

12.4

13.0

13.6

14.2

12.4

0

11.0

11.6

12.8

13.4

Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 06-Jun-2016 11:40:46

Report Date: 06-Jun-2016 11:40:46 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_006.d

Injection Date: 03-Jun-2016 18:15:20 Instrument ID: A6

Lims ID: Std L3

Client ID:

Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 6

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

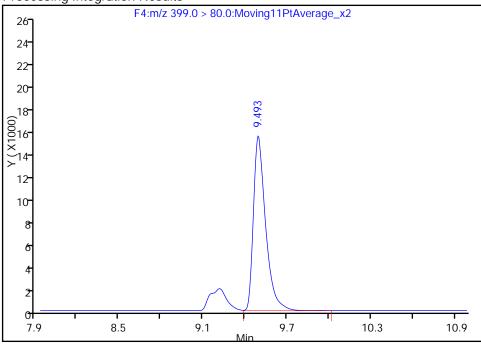
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

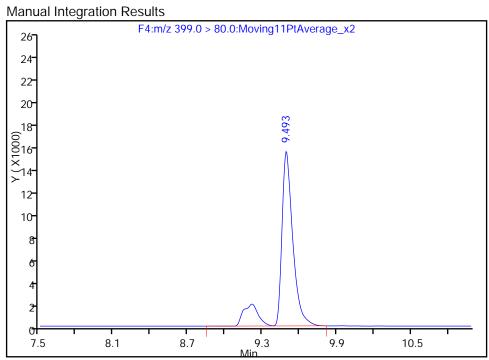
Signal: 1

RT: 9.49
Area: 91639
Amount: 4.390002
Amount Units: ng/ml

Processing Integration Results



RT: 9.49
Area: 106683
Amount: 4.101528
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:02:13

Audit Action: Assigned Compound ID

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:40:46 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_006.d

Injection Date: 03-Jun-2016 18:15:20 Instrument ID: A6

Lims ID: Std L3

Client ID:

Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 6

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

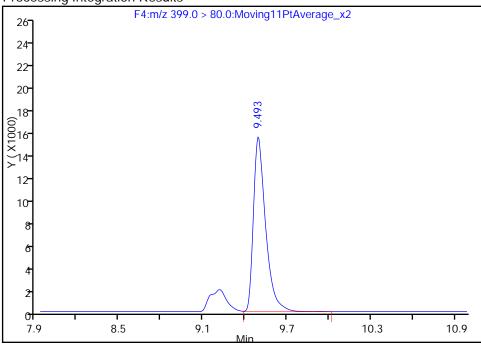
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

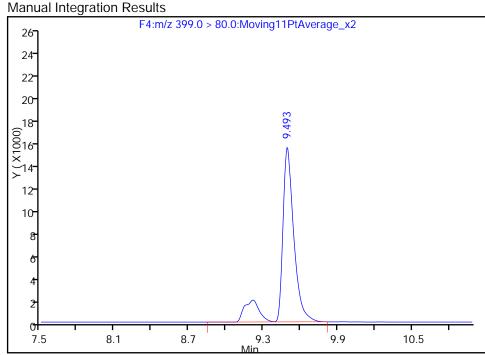
Signal: 1

RT: 9.49
Area: 91639
Amount: 4.390002
Amount Units: ng/ml

Processing Integration Results



RT: 9.49
Area: 106683
Amount: 4.101528
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:02:13

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:40:46 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_006.d

Injection Date: 03-Jun-2016 18:15:20 Instrument ID: Α6

Lims ID: Std L3

Client ID:

JRB ALS Bottle#: Operator ID: 3 Worklist Smp#: 6

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

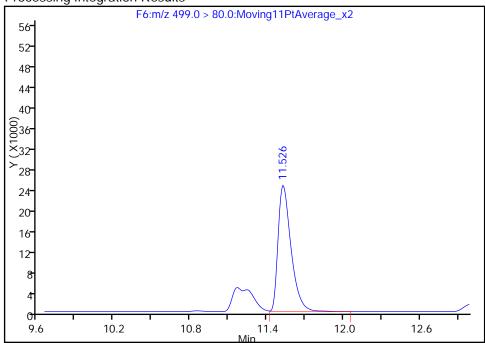
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

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

Signal: 1

RT: 11.53 Area: 175516 Amount: 4.902654 Amount Units: ng/ml

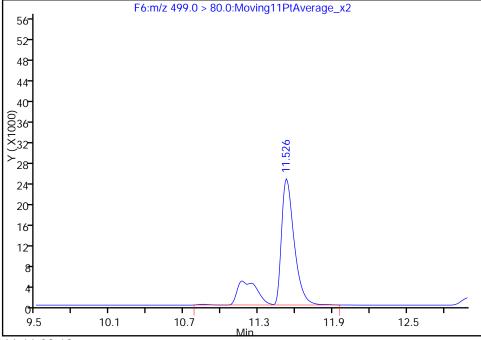
Processing Integration Results



RT: 11.53 Area: 227335 Amount: 4.923365 Amount Units: ng/ml



Manual Integration Results



Reviewer: westendorfc, 04-Jun-2016 11:02:13

Audit Action: Manually Integrated

Audit Reason: Isomers

Report Date: 06-Jun-2016 11:40:46 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_006.d

Injection Date: 03-Jun-2016 18:15:20 Instrument ID: A6

Lims ID: Std L3

Client ID:

Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 6

Injection Vol: 15.0 ul Dil. Factor: 1.0000

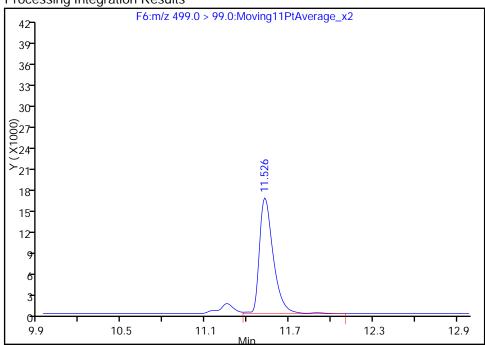
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

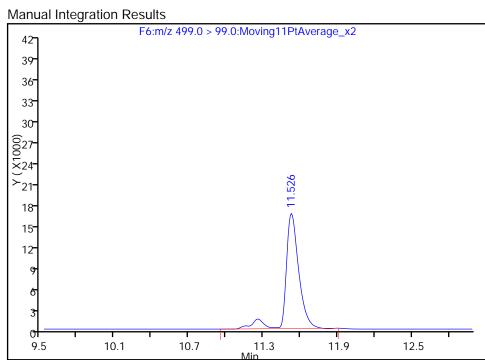
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

RT: 11.53 Area: 113761 Amount: 4.902654 Amount Units: ng/ml **Processing Integration Results**



RT: 11.53
Area: 120418
Amount: 4.923365
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:02:13

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:40:48 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_007.d

Lims ID: Std L4

Client ID:

Sample Type: IC Calib Level: 4

Inject. Date: 03-Jun-2016 18:36:37 ALS Bottle#: 4 Worklist Smp#: 7

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L4

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Sublist: chrom-PFAC_A6*sub11

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jun-2016 11:40:47 Calib Date: 03-Jun-2016 19:40:28

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

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

Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 10:54:01

First Level Revie	wer: wes	stendorfo			Date: 04-Jun-2016 10:54:0			1		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA	1									
217.0 > 172.0	5 .788	5.784	0.004		1400768	52.1		104	1519	
2 Perfluorobut										
212.9 > 169.0	5.788	5.786	0.002	1.000	651668	18.8		93.8	17759	
D 3 13C5-PFPe	eΑ									
267.9 > 223.0	6.941	6.939	0.002		3204622	51.2		102	2374	
4 Perfluoroper	ntanoic a	cid								
262.9 > 219.0	6.946	6.941	0.005	1.000	1123821	18.3		91.4	196	
40 Perfluorobu	tanesulfo	onic acid								
298.9 > 80.0	7.071	7.069	0.002	1.000	548826	15.4		87.2		
5 Perfluorobut	ane Sulf	onate								
298.9 > 80.0	7.071	7.069	0.002	1.000	548826	NC			135	
298.9 > 99.0	7.071	7.069	0.002	1.000	284395		1.93(0.00-0.00)		252	
7 Perfluorohex										
313.0 > 269.0	8.220	8.216	0.004	1.000	1197711	18.2		91.0	1113	
D 6 13C2 PFHx										
315.0 > 270.0	8.220	8.217	0.003		3587651	54.2		108	13921	
D 8 13C4-PFHp		0.457	0.004		0750070	E4 7		400	40770	
367.0 > 322.0	9.457	9.456	0.001		3752872	51.7		103	13778	
9 Perfluorohep			0.007	1 000	4.44.004.0	00.0		404	, oof	
363.0 > 319.0	9.463	9.457	0.006	1.000	1412013	20.2		101	6235	
D 11 1802 PFH		0.400	0.007		4500074	F0.7		407	0.4004	
403.0 > 84.0	9.499	9.492	0.007		1593964	50.7		107	24381	
41 Perfluorohe				1 000	422702	1/ 5		00.5		M
399.0 > 80.0		9.495	-0.002	1.000	423692	16.5		90.5		M
10 Perfluorohe			0.002	1 000	240004	NC			740	
399.0 > 80.0	9.493	9.495	-0.002	1.000	360096	NC			742	

Report Date: 06-Jun-2016 11:40:48 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Data File:				to\Chrom			20-Apr-2016 13:59: \\03JUN2016A6A_0			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFO 417.0 > 372.0		10.569	0.008		3969152	49.4		98.9	253098	
13 Perfluorooc 413.0 > 369.0 413.0 > 169.0	10.577 10.577	10.572 10.572		1.000 1.000	1308801 498076	19.9	2.63(0.00-0.00)	99.7 99.7	508 430	
14 Perfluorohe 449.0 > 80.0	10.586	10.581		1.000	489285	NC			31110	
38 Perfluorohe 449.0 > 80.0 D 16 13C4 PFO	10.586	10.581		1.000	489285	17.8		93.3		
503.0 > 80.0 15 Perfluorooc	11.526	11.525			2026588	52.8		110	141085	M
499.0 > 80.0 499.0 > 99.0	11.535 11.535	11.527 11.527	0.008	1.000 1.000	795095 385573	16.8	2.06(0.00-0.00)	90.2 90.2	570 6911	M M
	11.544		0.002		3523227	49.7		99.4	33379	
18 Perfluorono 463.0 > 419.0 D 19 13C2 PFD	11.544		0.001	1.000	993809	20.3		102	17887	
	12.373		0.0		2968340	51.7		103	179894	
	12.373		0.0	1.000	1093082	16.7		83.5	44084	
506.0 > 78.0 24 Perfluorooc	12.994				5958609	52.4		105	2567	
498.0 > 78.0 39 Perfluorode	12.994	12.987	0.007	1.000	1458806	18.7		93.3	5957	
599.0 > 80.0 25 Perfluorode	13.041	13.033		1.000	537885	18.4		95.2		
	13.041		0.008	1.000	537885	NC			36453	
565.0 > 520.0 27 Perfluoroun	13.085		0.009		4102038	50.6		101	9942	
563.0 > 519.0 D 28 13C2 PFD	13.085		0.008	1.000	1365693	19.8		99.1	64643	
615.0 > 570.0 29 Perfluorodo	13.666		0.003		5033532	49.9		99.8	18403	
613.0 > 569.0 30 Perfluorotrio	13.675	13.666	0.009	1.000	1276533	19.9		99.5	3288	
663.0 > 619.0	14.174		0.009	1.000	1994716	21.4		107	1008	
D 33 13C2-PFT 715.0 > 670.0	14.596		0.007		4249936	53.2		106	8080	
32 Perfluorotet 713.0 > 669.0	14.596		0.007	1.000	1321903	17.2		86.1	737	
D 35 13C2-PFH 815.0 > 770.0	15.179		0.002		6838654	52.5		105	6891	
34 Perfluorohe 813.0 > 769.0			0.002	1.000	Page 315 of 41	9 19.2		96.2	1696	

Report Date: 06-Jun-2016 11:40:48 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Data File:

EXP DLT **REL** Amount RT RT ng/ml Ratio(Limits) %Rec S/N Flags Signal RT RT Response

36 Perfluorooctandecanoic acid

913.0 > 869.0 15.441 15.437 0.004 20.0 99.8 1.000 2445515 1783

OC Flag Legend Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L4_00021 Amount Added: 1.00 Units: mL

Report Date: 06-Jun-2016 11:40:48 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_007.d **Injection Date:** 03-Jun-2016 18:36:37 Instrument ID: Α6 Lims ID: Std L4 Client ID: Operator ID: **JRB** ALS Bottle#: Worklist Smp#: 7 15.0 ul Dil. Factor: 1.0000 Injection Vol: PFAC_A6 LC PFC_DOD ICAL Method: Limit Group: D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 18 684 672 ©35 ©30 00015 X12 Σ_{25} ×60 **-**48 15 36 24 10 5.2 5.5 5.8 4.6 5.2 5.8 6.4 5.9 6.5 7.1 7.7 6.1 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid 7 Perfluorohexanoic acid F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F2:m/z 262.9 > 219.0:Moving11PtAverage x2F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 35 28 14 0024 ×20 (00012 X) × 8 030 025 × **∑**20 -16 15 10 7.2 7.8 8.4 7.2 7.5 6.7 7.0 7.3 7.6 9.0 6.3 6.6 6.4 8 13C4-PFHpA 6 13C2 PFHxA 9 Perfluoroheptanoic acid F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 Y (X100000) 6⁴² 636 Y (X100 \times 30 ≻₂₄-18 12 8.3 9.2 9.5 8.9 9.5 7.4 7.7 8.6 10.4 10.1 6.5 8.3 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid (M) D 12 13C4 PFOA F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 42 (X100000) (12-000010-X) (0001x) (036-18 12 0 0 0 8.4 9.3 10.2 7.6 8.5 Page 3M/nof 419 10.3 8.5 9.4 10.3 11.2 7.5

13.3

14.2

12.2

11.6

12.8

13.4

14.0

12.4

11.5

10.9

12.1

12.7

13.3

Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 06-Jun-2016 11:40:48

Report Date: 06-Jun-2016 11:40:48 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_007.d

Injection Date: 03-Jun-2016 18:36:37 Instrument ID: A6

Lims ID: Std L4

Client ID:

Operator ID: JRB ALS Bottle#: 4 Worklist Smp#: 7

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

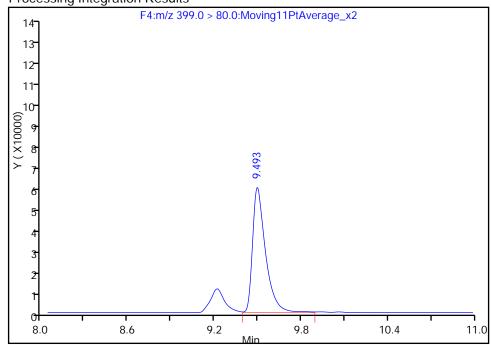
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

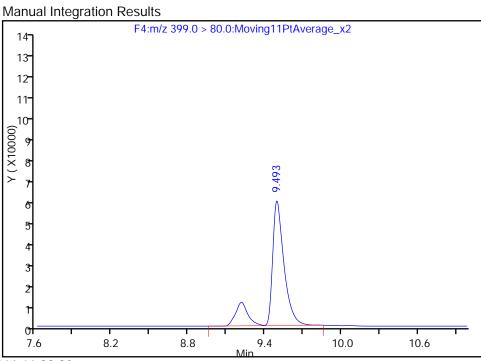
Signal: 1

RT: 9.49
Area: 360096
Amount: 17.380488
Amount Units: ng/ml

Processing Integration Results



RT: 9.49
Area: 423692
Amount: 16.478529
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:33:30

Audit Action: Manually Integrated/Assigned Compound IDAudit Reason:

Report Date: 06-Jun-2016 11:40:48 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_007.d

Injection Date: 03-Jun-2016 18:36:37 Instrument ID: A6

Lims ID: Std L4

Client ID:

Operator ID: JRB ALS Bottle#: 4 Worklist Smp#: 7

Injection Vol: 15.0 ul Dil. Factor: 1.0000

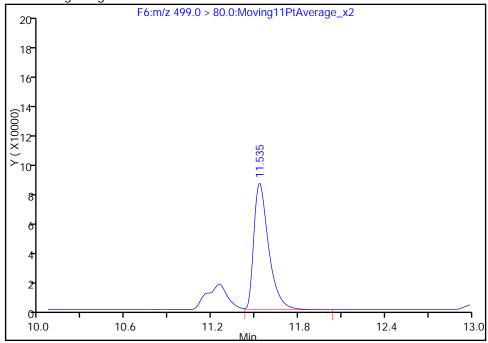
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

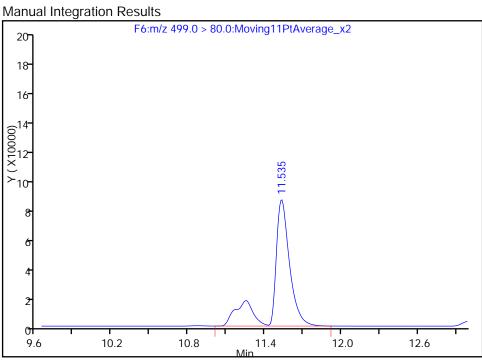
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

RT: 11.53 Area: 620359 Amount: 16.023209 Amount Units: ng/ml **Processing Integration Results**



RT: 11.53
Area: 795095
Amount: 16.750161
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:02:55

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:40:48 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_007.d

Injection Date: 03-Jun-2016 18:36:37 Instrument ID: A6

Lims ID: Std L4

Client ID:

Operator ID: JRB ALS Bottle#: 4 Worklist Smp#: 7

Injection Vol: 15.0 ul Dil. Factor: 1.0000

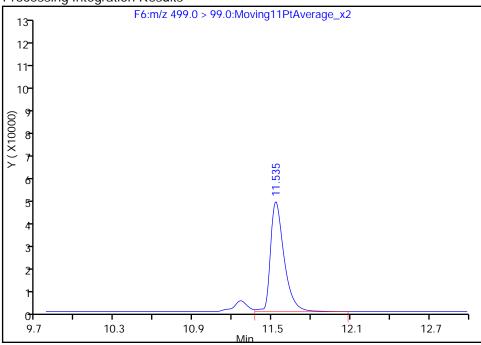
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

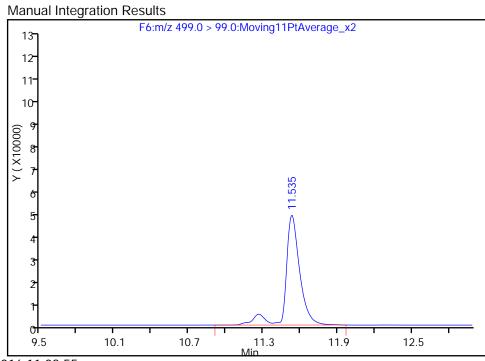
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

RT: 11.53 Area: 351383 Amount: 16.023209 Amount Units: ng/ml **Processing Integration Results**



RT: 11.53 Area: 385573 Amount: 16.750161 Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:02:55

Audit Action: Manually Integrated

Audit Reason: Isomers Page 322 of 419 Report Date: 06-Jun-2016 11:40:50 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_008.d

Lims ID: Std L5

Client ID:

Sample Type: IC Calib Level: 5

Inject. Date: 03-Jun-2016 18:57:54 ALS Bottle#: 5 Worklist Smp#: 8

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L5

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Sublist: chrom-PFAC_A6*sub11

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jun-2016 11:40:49 Calib Date: 03-Jun-2016 19:40:28

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

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

Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 10:57:15

Signal RT EXP RT DLT RT REL RT Response Amount ng/ml Ratio(Limits) %Rec S/ D 1 13C4 PFBA 217.0 > 172.0 5.785 5.784 0.001 1400282 52.1 104 340 2 Perfluorobutyric acid 212.9 > 169.0 5.788 5.786 0.002 1.000 1557786 44.9 89.8 618 D 3 13C5-PFPeA	33
217.0 > 172.0 5.785 5.784 0.001 1400282 52.1 104 340 2 Perfluorobutyric acid 212.9 > 169.0 5.788 5.786 0.002 1.000 1557786 44.9 89.8 618	35
217.0 > 172.0 5.785 5.784 0.001 1400282 52.1 104 340 2 Perfluorobutyric acid 212.9 > 169.0 5.786 0.002 1.000 1557786 44.9 89.8 618	35
212.9 > 169.0 5.788 5.786 0.002 1.000 1557786 44.9 89.8 618	
212.9 > 169.0 5.788 5.786 0.002 1.000 1557786 44.9 89.8 618	
D 3 13C5-PFPeA	32
	32
267.9 > 223.0 6.937 6.939 -0.002 3274783 52.3 105 172	
4 Perfluoropentanoic acid	
262.9 > 219.0 6.941 6.941 0.0 1.000 2820215 44.9 89.8 50	2
40 Perfluorobutanesulfonic acid	
298.9 > 80.0 7.071 7.069 0.002 1.000 1320665 38.9 88.0	
5 Perfluorobutane Sulfonate	
298.9 > 80.0 7.071 7.069 0.002 1.000 1320665 NC 19	
298.9 > 99.0 7.067 7.069 -0.002 0.999 688767 1.92(0.00-0.00) 85	3
7 Perfluorohexanoic acid	0
313.0 > 269.0 8.219 8.216 0.003 1.000 2861454 46.8 93.6 10 ⁻¹	8
D 6 13C2 PFHxA	0.4
315.0 > 270.0 8.219 8.217 0.002 3332140 50.4 101 162	34
D 8 13C4-PFHpA 367.0 > 322.0 9.458 9.456 0.002 3514253 48.4 96.8 835	2
	3
9 Perfluoroheptanoic acid 363.0 > 319.0 9.458 9.457 0.001 1.000 3214873 49.0 98.1 324	7.1
	/4
D 11 18O2 PFHxS 403.0 > 84.0 9.493 9.492 0.001 1483612 47.2 99.7 112	36
41 Perfluorohexanesulfonic acid	M
399.0 > 80.0 9.493 9.495 -0.002 1.000 1021016 42.7 93.8	M
10 Perfluorohexane Sulfonate	171
399.0 > 80.0 9.493 9.495 -0.002 1.000 851972 NC 123	.1
Page 323 of 419	-

Report Date: 06- Data File:				to\Chrom			20-Apr-2016 13:59: 0\03JUN2016A6A_0			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFO 417.0 > 372.0	A 10.568	10 540	0.001		3678847	45.8		91.6	16767	
13 Perfluorooc			-0.001		3070047	45.6		91.0	10707	
	10.577			1.000	2937982	48.3	0 (0(0 00 0 00)	96.6	2509	
413.0 > 169.0 14 Perfluorohe	10.577		0.005	1.000	1096033		2.68(0.00-0.00)	96.6	6162	
449.0 > 80.0	10.586		0.005	1.000	1185733	NC			7909	
38 Perfluorohe										
	10.586	10.581	0.005	1.000	1185733	47.0		98.8		
D 16 13C4 PFO 503.0 > 80.0	S 11.527	11 525	0.002		1855875	48.4		101	10787	
15 Perfluorooc					1033073	40.4		101	10707	M
499.0 > 80.0	11.527	11.527	0.0	1.000	1824798	42.0		90.5	407	М
499.0 > 99.0	11.527	11.527	0.0	1.000	776534		2.35(0.00-0.00)	90.5	61.4	
D 17 13C5 PFN 468.0 > 423.0	A 11.545	11 542	0 003		3375276	47.6		95.2	159163	
18 Perfluorono			0.003		3373270	47.0		70.2	107100	
	11.545		0.002	1.000	2189140	46.8		93.6	39144	
D 19 13C2 PFD										
	12.373		0.0		2765359	48.2		96.4	37472	
20 Perfluorode 513.0 > 469.0	canoic a 12.373		0.0	1.000	2700743	44.3		88.6	327059	
D 23 13C8 FOS										
506.0 > 78.0	12.984	12.985	-0.001		5355848	47.1		94.2	2535	
24 Perfluorooc 498.0 > 78.0				1 000	2551101	E0 E		101	2722	
498.0 > 78.0 39 Perfluorode	12.994 Icana Sul			1.000	3551181	50.5		101	2732	
599.0 > 80.0			-0.001	1.000	1278184	47.2		98.0		
25 Perfluorode	cane Sul	lfonate								
599.0 > 80.0		13.033	-0.001	1.000	1278184	NC			86451	
D 26 13C2 PFU 565.0 > 520.0		12 076	0.0		3837034	47.3		94.6	11076	
27 Perfluoroun			0.0		3037034	47.3		94.0	11070	
563.0 > 519.0			-0.001	1.000	3012794	47.4		94.9	60713	
D 28 13C2 PFD										
615.0 > 570.0			0.003		4844461	48.0		96.1	10646	
29 Perfluorodo 613.0 > 569.0			0.0	1.000	2821435	45.7		91.4	4124	
30 Perfluorotrio			0.0	1.000	2021100	10.7		71.1	1121	
663.0 > 619.0			0.002	1.000	4292140	47.9		95.8	2538	
D 33 13C2-PFT										
715.0 > 670.0			0.0		3968081	49.7		99.4	4883	
32 Perfluorotet 713.0 > 669.0			0.0	1.000	3123427	42.3		84.6	1729	
D 35 13C2-PFH					5.25.27	12.0		51.0	.,_,	
815.0 > 770.0		15.177	0.003		6524409	50.0		100	8488	

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98.0

4085

34 Perfluorohexadecanoic acid

Report Date: 06-Jun-2016 11:40:50 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_008.d Data File:

		EXP	DLT	REL		Amount				
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags

36 Perfluorooctandecanoic acid

49.7 99.4 5859044 3526

OC Flag Legend Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L5_00019 Amount Added: 1.00 Units: mL

Report Date: 06-Jun-2016 11:40:50 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_008.d **Injection Date:** 03-Jun-2016 18:57:54 Instrument ID: Α6 Lims ID: Std L5 Client ID: Operator ID: **JRB** ALS Bottle#: 5 Worklist Smp#: 8 15.0 ul Dil. Factor: Injection Vol: 1.0000 PFAC_A6 Limit Group: LC PFC_DOD ICAL Method: 2 Perfluorobutyric acid D 113C4 PFBA D 3 13C5-PFPeA F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 (35- (0030-©35 ©30 677 866 ×25 Σ_{25} ≥ 20 15 15 33 10 10 22 5.2 7.9 5.8 6.4 7.0 5.2 5.5 5.8 6.1 6.1 6.7 7.3 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid 7 Perfluorohexanoic acid F2:m/z 298.9 > 80.0:Moving11PtAverage x2 $F2:m/z \ 262.9 > 219.0:Moving11PtAverage \ x2$ F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 35 70 77 0066 0060 X50 6.941 ©30-025-×55 ∑20 >40 15 30 33 10 20 22 10 11 7.2 6.9 7.5 6.9 7.8 8.2 7.2 7.8 7.5 7.6 8.8 9.4 6.3 6.6 6.3 6.6 7.0 8 13C4-PFHpA 6 13C2 PFHxA 9 Perfluoroheptanoic acid F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 Y (X100000) Y (X100000) 91 0078 ×65 **≻**52 39 26 13 7.2 8.1 9.0 9.2 9.8 9.3 10.2 8.0 8.6 10.4 7.5 8.4 6.3 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid (M) D 12 13C4 PFOA F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 (X100000) (X100000) (X100000) 642 636 624 620 620 ×16-×30 12 18 0 0 07.8 8.7 9.6 10.5 7.5 8.4 Page 326 of 419 10.2 8.6 9.5 10.4 11.3

13.3

14.2

11.5

12.4

13.3

14.2

12.4

11.4

10.5

12.3

13.2

11.5

Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 06-Jun-2016 11:40:50

Report Date: 06-Jun-2016 11:40:50 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_008.d

Injection Date: 03-Jun-2016 18:57:54 Instrument ID: A6

Lims ID: Std L5

Client ID:

Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 8

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

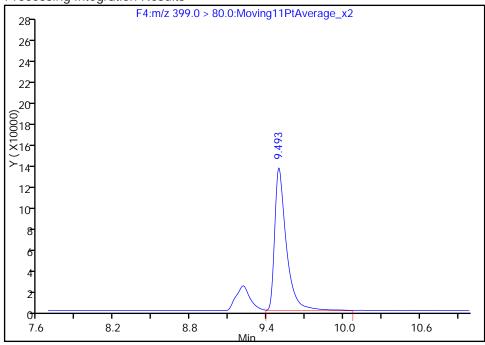
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

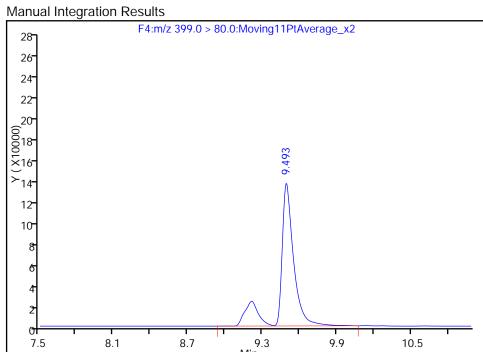
Signal: 1

RT: 9.49
Area: 851972
Amount: 43.706431
Amount Units: ng/ml

Processing Integration Results



RT: 9.49
Area: 1021016
Amount: 42.663737
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:03:39

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:40:50 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_008.d

Injection Date: 03-Jun-2016 18:57:54 Instrument ID: A6

Lims ID: Std L5

Client ID:

Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 8

Injection Vol: 15.0 ul Dil. Factor: 1.0000

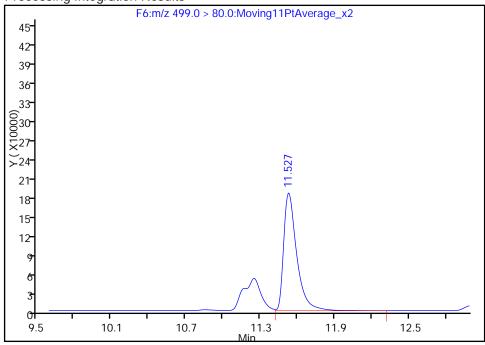
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

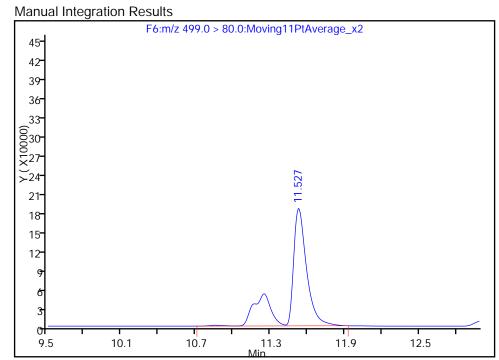
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

RT: 11.53 Area: 1341245 Amount: 36.356103 Amount Units: ng/ml **Processing Integration Results**



RT: 11.53
Area: 1824798
Amount: 41.978944
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:03:39

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:40:52 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_009.d

Lims ID: Std L6

Client ID:

Sample Type: IC Calib Level: 6

Inject. Date: 03-Jun-2016 19:19:10 ALS Bottle#: 6 Worklist Smp#: 9

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L6

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Sublist: chrom-PFAC_A6*sub11

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jun-2016 11:40:51 Calib Date: 03-Jun-2016 19:40:28

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

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

Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:04:20

First Level Revie	t Level Reviewer: westendorfc Date: 04-Jun-2016 11:04:20									
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA										
217.0 > 172.0	、 5.785	5.784	0.001		1201075	44.7		89.3	21789	
2 Perfluorobut										
212.9 > 169.0	5.785	5.786	-0.001	1.000	6470507	217.3		109	7976	
D 3 13C5-PFPe	·Α									
267.9 > 223.0	6.941	6.939	0.002		2771254	44.3		88.6	3984	
4 Perfluoropen	ntanoic a	cid								
262.9 > 219.0	6.941	6.941	0.0	1.000	10622898	199.8		99.9	1394	
40 Perfluorobut	tanesulfo	onic acio	l							
298.9 > 80.0	7.071	7.069	0.002	1.000	5732872	184.4		104		
5 Perfluorobuta	ane Sulf	onate								
298.9 > 80.0	7.071	7.069	0.002	1.000	5732872	NC			10986	
298.9 > 99.0	7.067	7.069	-0.002	0.999	2740506		2.09(0.00-0.00)		1158	
7 Perfluorohex										
313.0 > 269.0	8.219	8.216	0.003	1.000	11249940	213.6		107	710	
D 6 13C2 PFHx										
315.0 > 270.0	8.219	8.217	0.002		2872247	43.4		86.8	30176	
D 8 13C4-PFHp		0.457			0040500	00.7			44007	
367.0 > 322.0	9.458	9.456	0.002		2810580	38.7		77.4	11297	
9 Perfluorohep			0.004	1 000	44.70004	040.0		400	00750	
363.0 > 319.0	9.458	9.457	0.001	1.000	11478334	218.9		109	20750	
D 11 18O2 PFH:		0.400	0.001		1040070	40.7		00.0	04504	
403.0 > 84.0	9.493	9.492	0.001		1342070	42.7		90.2	21521	
41 Perfluorohe				1 000	2007/42	1040		101		M
399.0 > 80.0		9.495	-0.002	1.000	3987643	184.2		101		M
10 Perfluorohe			0.0	1 000	0	NC			12.4	M M
399.0 > 80.0	9.495	9.495	0.0	1.000	0	NC			42.6	IVI

Data File:	\\Chrc	mNA\Sa	acramen	to\Chrom	1Data\A6\20160	604-31336.k	o\03JUN2016A6A_0)09.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFO 417.0 > 372.0	A 10.568	10.569	-0.001		2902241	36.1		72.3	7774	
13 Perfluorooc	tanoic ac	cid		1 000						
413.0 > 169.0	10.568 10.568	10.572		1.000 1.000	10462425 3871236	217.9	2.70(0.00-0.00)	109 109	1932 3117	
	10.577	10.581		1.000	3999590	NC			2716	
38 Perfluorohe 449.0 > 80.0	ptanesul 10.577			1.000	3999590	185.7		97.5		
D 16 13C4 PFO 503.0 > 80.0	S 11.527	11.525	0.002		1584944	41.3		86.4	110036)
15 Perfluorooc	tane sulf	onic acio	4							M
	11.527 11.527	11.527	0.0	1.000 1.000	7201323 3379388	194.0	2.13(0.00-0.00)	105 105	339 3355	M M
D 17 13C5 PFN, 468.0 > 423.0	A 11.544	11.542	0.002		2782565	39.2		78.5	8026	
18 Perfluorono 463.0 > 419.0	nanoic a 11.544		0.001	1.000	8174809	211.9		106	4759	
D 19 13C2 PFD. 515.0 > 470.0		12.373	0.0		2306152	40.2		80.4	18451	
20 Perfluorode	canoic a	cid								
513.0 > 469.0	12.373		0.0	1.000	10082852	198.2		99.1	6520	
	12.984				4446696	39.1		78.2	3746	
24 Perfluorooci 498.0 > 78.0	tane Sulf 12.984			1.000	12225896	209.5		105	1343	
39 Perfluorode 599.0 > 80.0	cane Sul 13.032			1.000	4242771	182.9		94.9		
25 Perfluorode 599.0 > 80.0	cane Sul 13.032		-0.001	1.000	4242771	NC			20902	
D 26 13C2 PFU	nA									
565.0 > 520.0 27 Perfluoroun			0.0		3025738	37.3		74.6	7565	
563.0 > 519.0	13.076		-0.001	1.000	10665638	214.7		107	9276	
D 28 13C2 PFD6 615.0 > 570.0		13.663	0.003		3882040	38.5		77.0	16859	
29 Perfluorodo 613.0 > 569.0			0.0	1.000	11685203	236.1		118	6010	
30 Perfluorotrio 663.0 > 619.0			0.002	1.000	14241779	198.4		99.2	3142	
D 33 13C2-PFT6 715.0 > 670.0	eDA				3530381	44.2		88.4	6817	
32 Perfluorotet	radecan	oic acid		1 000						
713.0 > 669.0 D 35 13C2-PFH	xDA			1.000	11956911	202.1		101	2654	
815.0 > 770.0 34 Perfluorohe	15.179 xadecan		0.002		5622192	43.1		86.3	4926	
813.0 > 769.0			0.002	1.000	20068210 Page 332 of 4	419 ^{220.5}		110	3098	

Report Date: 06-Jun-2016 11:40:52 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Data File:

_											
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags

36 Perfluorooctandecanoic acid

3578 231.0 116 21825371

OC Flag Legend Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L6_00018 Amount Added: 1.00 Units: mL

Report Date: 06-Jun-2016 11:40:52 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_009.d 03-Jun-2016 19:19:10 **Injection Date:** Instrument ID: Α6 Lims ID: Std L6 Client ID: Operator ID: **JRB** ALS Bottle#: 6 Worklist Smp#: 9 15.0 ul Dil. Factor: 1.0000 Injection Vol: PFAC_A6 Limit Group: LC PFC_DOD ICAL Method: D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 5.785 28 060-×50-00024 X20 ≻16 _ ≻40 30 12 20 10 6.9 4.9 5.5 5.3 5.9 6.3 6.1 6.7 4.7 6.5 7.5 8.1 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid 7 Perfluorohexanoic acid F2:m/z 262.9 > 219.0:Moving11PtAverage_x2 F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F3:m/z 313.0 > 269.0:Moving11PtAverage x2630 60 60 625 00024 0020 6.941 ∑₁₆-×₂₀ 15 10 6.9 7.5 5.9 6.8 7.7 8.0 8.9 6.3 8.1 5.0 7.1 6.2 5.7 6 13C2 PFHxA 8 13C4-PFHpA 9 Perfluoroheptanoic acid F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 35- (70-0060-0030 0025 × 670⁻ 860 8.219 ×50 ×50-20 ≻₄₀-15 30 30 10 20 20 10 10 7.2 7.8 Mi 9.0 9.5 9.3 10.2 8.4 8.6 10.4 7.5 8.4 7.7 D 12 13C4 PFOA D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid (M) F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 91-635 630 (77- -65 ×25 $\times 55$ -52− \succ_{20} 39 33 15 26 22 10 13 11 0 0 $^{\circ}$ 8.5 9.4 10.3 7.7 8.6 Page 384h of 419 10.4 8.9 9.8 10.7 11.6 7.6 Min

13.3

14.2

11.5

12.4

13.3

14.2

12.4

11.5

10.6

12.4

13.3

11.5

Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 06-Jun-2016 11:40:52

Report Date: 06-Jun-2016 11:40:52 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_009.d

Injection Date: 03-Jun-2016 19:19:10 Instrument ID: A6

Lims ID: Std L6

Client ID:

Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 9

Injection Vol: 15.0 ul Dil. Factor: 1.0000

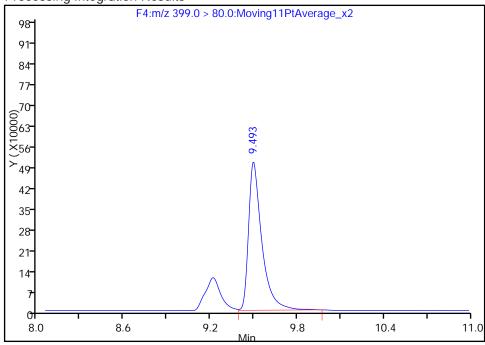
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

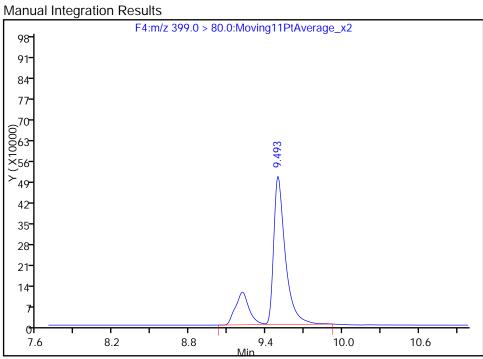
41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

RT: 9.49 Area: 3195031 Amount: 175.3317 Amount Units: ng/ml **Processing Integration Results**



RT: 9.49
Area: 3987643
Amount: 184.1992
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:04:20

Audit Action: Assigned Compound ID

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:40:52 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_009.d

Injection Date: 03-Jun-2016 19:19:10 Instrument ID: A6

Lims ID: Std L6

Client ID:

Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 9

Injection Vol: 15.0 ul Dil. Factor: 1.0000

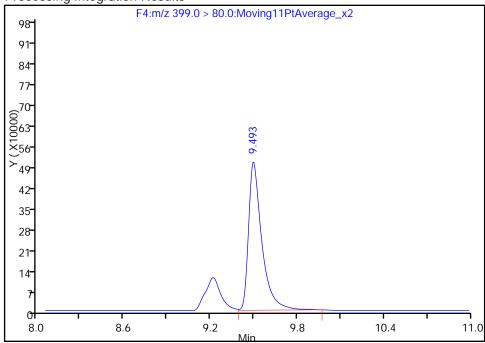
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

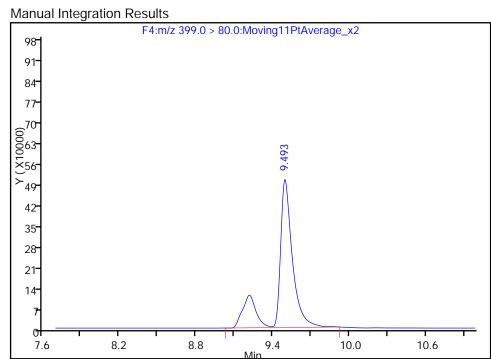
41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

RT: 9.49 Area: 3195031 Amount: 175.3317 Amount Units: ng/ml **Processing Integration Results**



RT: 9.49
Area: 3987643
Amount: 184.1992
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:04:20

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:40:52 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_009.d

Injection Date: 03-Jun-2016 19:19:10 Instrument ID: Α6

Lims ID: Std L6

Client ID:

JRB ALS Bottle#: Operator ID: 6 Worklist Smp#: 9

Injection Vol: 15.0 ul Dil. Factor: 1.0000

PFAC_A6 Method: Limit Group: LC PFC_DOD ICAL

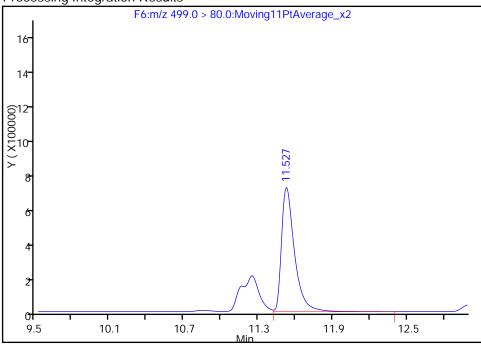
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

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

Signal: 1

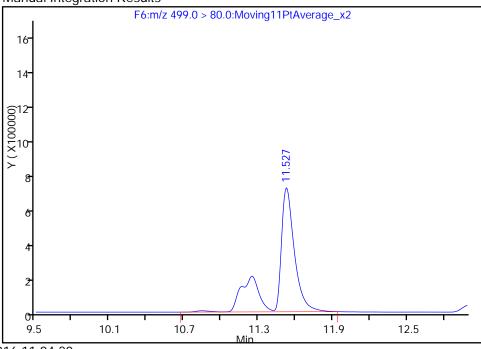
RT: 11.53 Area: 5167653 Amount: 156.6452 Amount Units: ng/ml

Processing Integration Results



RT: 11.53 Area: 7201323 193.9831 Amount: Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 04-Jun-2016 11:04:20

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:40:52 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_009.d

Injection Date: 03-Jun-2016 19:19:10 Instrument ID: A6

Lims ID: Std L6

Client ID:

Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 9

Injection Vol: 15.0 ul Dil. Factor: 1.0000

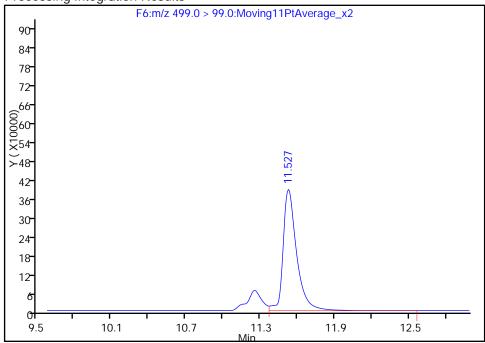
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

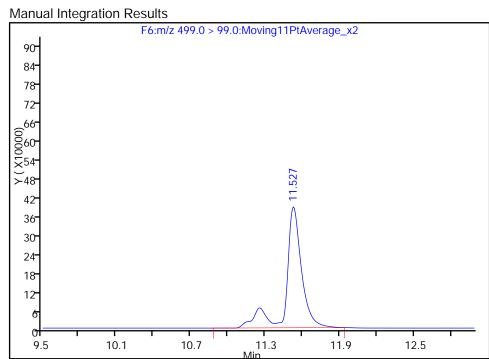
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

RT: 11.53 Area: 2915477 Amount: 156.6452 Amount Units: ng/ml **Processing Integration Results**



RT: 11.53 Area: 3379388 Amount: 193.9831 Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:04:20

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:40:54 Chrom Revision: 2.2 20-Apr-2016 13:59:46

> TestAmerica Sacramento **Target Compound Quantitation Report**

Data File:

Lims ID: Std L7

Client ID:

Sample Type: IC Calib Level: 7

Inject. Date: 03-Jun-2016 19:40:28 ALS Bottle#: 7 Worklist Smp#: 10

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L7

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: **JRB** Instrument ID: Α6

Sublist: chrom-PFAC_A6*sub11

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jun-2016 11:40:53 Calib Date: 03-Jun-2016 19:40:28

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: **Initial Calibration**

Last ICal File:

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

XAWRK047 Process Host:

201/11 05 11

First Level Revie	wer: wes	stendorf	С		Date:	C)4-Jun-2016 11:05:4	1		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA	Δ.									
217.0 > 172.0	5.785	5.784	0.001		1012126	37.6		75.3	1998	
2 Perfluorobut	yric acid									
212.9 > 169.0	5.788	5.786	0.002	1.000	12153239	484.4		121	3707	
D 3 13C5-PFP6	eΑ									
267.9 > 223.0	6.937	6.939	-0.002		2207013	35.3		70.6	30546	
4 Perfluoroper	ntanoic a	cid								
262.9 > 219.0	6.941	6.941	0.0	1.000	19004619	448.8		112	2518	
40 Perfluorobu	tanesulfo	onic acid	k							
298.9 > 80.0	7.067	7.069	-0.002	1.000	10194180	435.3		123		
5 Perfluorobut										
298.9 > 80.0	7.067	7.069	-0.002	1.000	10194180	NC			22968	
298.9 > 99.0	7.067	7.069	-0.002	1.000	5110083		1.99(0.00-0.00)		3140	
7 Perfluorohex			0.000	1 000	01000701	405.0		104	1047	
313.0 > 269.0	8.219	8.216	0.003	1.000	21900721	495.8		124	1946	
D 6 13C2 PFHx		0.017	0.000		2400500	27.4		72.0	11075	
315.0 > 270.0	8.219	8.217	0.002		2408590	36.4		72.8	11875	
D 8 13C4-PFH _k 367.0 > 322.0	9.458	9.456	0.002		2243855	30.9		61.8	31108	
			0.002		2243000	30.9		01.0	31100	
9 Perfluoroher 363.0 > 319.0	9.458	9.457	0.001	1.000	20711312	494.9		124	23490	
D 11 1802 PFH		7.437	0.001	1.000	20/11312	474.7		124	23470	
403.0 > 84.0	9.493	9.492	0.001		1008805	32.1		67.8	8890	
41 Perfluorohe					1000000	32.1		07.0	0070	M
399.0 > 80.0	9.499		0.004	1.000	7646391	469.9		129		M
10 Perfluorohe			3.001	1.000	, 5 , 5 5 7 1	107.7		,		•••
399.0 > 80.0	9.499	9.495	0.004	1.000	5994890	NC			1445	
					Dama 244 of					

n-2016 11:40:54 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d Report Date: 06-Jun-2016 11:40:54 Data File: EXP DLT REL Amount

	Signal	RT	RT RT	RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	D 12 13C4 PFO 417.0 > 372.0	A 10.568	10 560	0.001		2388152	29.7		59.5	21304	
	13 Perfluorooct			-0.001		2300132	29.1		59.5	21304	
	413.0 > 369.0	10.577 10.568	10.572		1.000 0.999	18226991 7045067	461.4	2.59(0.00-0.00)	115 115	8380 4120	
		10.586	10.581		1.000	7080563	NC			6877	
	38 Perfluorohe 449.0 > 80.0	ptanesulf 10.586			1.000	7080563	413.8		109		
	D 16 13C4 PFO: 503.0 > 80.0	S 11.527	11.525	0.002		1258865	32.8		68.6	14166	
	15 Perfluorooct										M
		11.527 11.527			1.000 1.000	13086316 5993191	443.8	2.18(0.00-0.00)	120 120	273 2004	M M
	D 17 13C5 PFN/			0.0		0770171		(0.00 0.00)	0		
		11.545		0.003		2235984	31.5		63.1	10416	
		11.545	11.543		1.000	14282710	460.8		115	5574	
	21 PFNS (Perfl 549.0 > 80.0	ouro-1-n 11.962		,	1.000	1500	NC			4.2	
	D 19 13C2 PFD/ 515.0 > 470.0	۹ 12.373	12.373	0.0		1778811	31.0		62.0	10121	
	20 Perfluorodeo 513.0 > 469.0	canoic ad 12.373		0.0	1.000	17999747	458.8		115	6339	
	D 23 13C8 FOS <i>i</i> 506.0 > 78.0	A 12.984	12.985	-0.001		3759095	33.1		66.1	2460	
	24 Perfluorooct 498.0 > 78.0	tane Sulfo 12.984			1.000	24069881	488.0		122	1654	
	39 Perfluorodeo	cane Sulf	fonic aci	d							
	599.0 > 80.0			-0.002	1.000	6818278	369.8		95.9		
		13.031		-0.002	1.000	6818278	NC			4829	
	D 26 13C2 PFUr 565.0 > 520.0		13.076	-0.001		2472427	30.5		61.0	28511	
	27 Perfluoround			0.000	1 000	10/4/254	4/0.0		115	E0.40	
	563.0 > 519.0 D 28 13C2 PFDo		13.077	-0.002	1.000	18646354	460.0		115	5840	
	615.0 > 570.0	13.664		0.001		3229930	32.0		64.0	8840	
	29 Perfluorodoo 613.0 > 569.0			-0.002	1.000	20268214	492.2		123	5246	
	30 Perfluorotrid 663.0 > 619.0			0.0	1.000	25656651	429.6		107	3420	
	D 33 13C2-PFTe 715.0 > 670.0		14.589	0.005		2927207	36.7		73.3	4090	
	32 Perfluorotetr 713.0 > 669.0			0.005	1.000	21548508	437.6		109	3388	
١	D 35 13C2-PFH; 815.0 > 770.0	xDA				Page 342 of 4			75.8	5814	
						Page 342 01 4	+19				

Report Date: 06-Jun-2016 11:40:54 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d Data File:

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
34 Perfluorohe 813.0 > 769.0			0.001	1.000	37181605	492.7		123	3487	
36 Perfluorood 913.0 > 869.0	tandecar 15.439			1.000	40595102	516.5		129	4892	

OC Flag Legend Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L7_00018 Units: mL Amount Added: 1.00

Report Date: 06-Jun-2016 11:40:54 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d **Injection Date:** 03-Jun-2016 19:40:28 Instrument ID: Α6 Lims ID: Std L7 Client ID: Operator ID: **JRB** ALS Bottle#: 7 Worklist Smp#: 10 15.0 ul Dil. Factor: 1.0000 Injection Vol: PFAC_A6 Limit Group: LC PFC_DOD ICAL Method: 2 Perfluorobutyric acid D 113C4 PFBA D 3 13C5-PFPeA F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 24 28-000024-120-042 0035 X ©20 ×16 ≻16 21 12 5.3 5.9 6.0 6.2 6.8 4.7 6.5 4.8 5.4 6.6 7.4 8.0 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid 7 Perfluorohexanoic acid F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F2:m/z 262.9 > 219.0:Moving11PtAverage_x2 F3:m/z 313.0 > 269.0:Moving11PtAverage x2(018 (X) X (X) X (049 (00042 (X35) (000001 30-30-≻28 18 21 12 5.9 8.9 6.0 6.9 7.8 6.8 7.7 7.1 8.0 5.0 6.2 5.1 6 13C2 PFHxA 8 13C4-PFHpA 9 Perfluoroheptanoic acid D F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 56- (056 0048 ×40 63 0054 8.219 00048 ×40 ×45 >32 24 24 27 16 18 16 8.3 9.2 8.7 9.6 10.5 9.3 10.2 7.4 7.8 7.5 8.4 6.5 11 1802 PFHxS 41 Perfluorohexanesulfonic acid (M) D 12 13C4 PFOA F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 0014 00012 63 0054 (0001×)16 ×45 **≻**36• 12 27 18 0 0 0 8.6 9.5 10.4 7.5 8.4 Page 344hof 419 10.2 8.8 9.7 10.6 11.5 7.7

13.3

14.2

11.5

12.4

13.3

14.2

12.4

0

11.5

10.6

11.5

12.4

13.3

Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 06-Jun-2016 11:40:54

Report Date: 06-Jun-2016 11:40:54 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Injection Date: 03-Jun-2016 19:40:28 Instrument ID: Α6

Lims ID: Std L7

Client ID:

JRB ALS Bottle#: 7 Operator ID: Worklist Smp#: 10

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

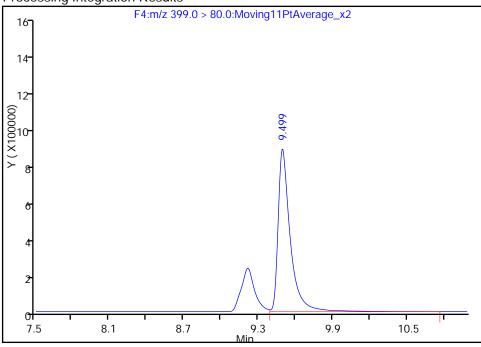
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

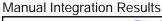
Signal: 1

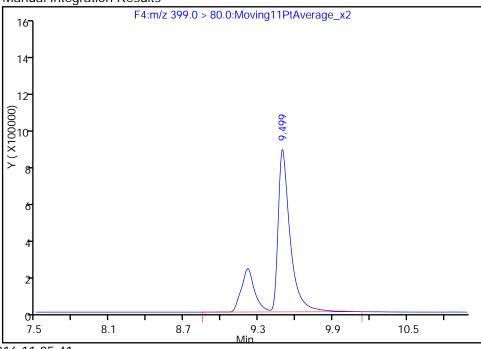
RT: 9.50 Area: 5994890 Amount: 371.6601 Amount Units: ng/ml

Processing Integration Results



RT: 9.50 Area: 7646391 469.8897 Amount: Amount Units: ng/ml





Reviewer: westendorfc, 04-Jun-2016 11:05:41

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:40:54 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Injection Date: 03-Jun-2016 19:40:28 Instrument ID: Α6

Lims ID: Std L7

Client ID:

JRB ALS Bottle#: 7 Operator ID: Worklist Smp#: 10

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

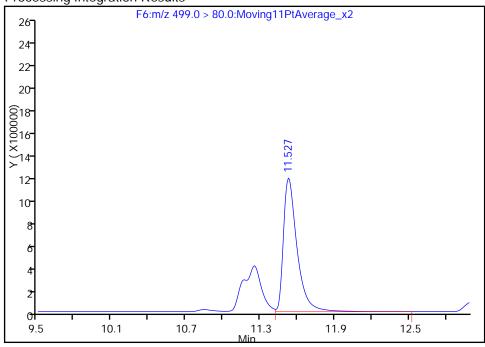
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

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

Signal: 1

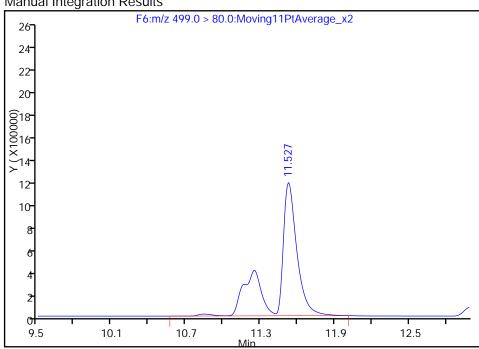
RT: 11.53 Area: 9003998 Amount: 325.6075 Amount Units: ng/ml

Processing Integration Results



RT: 11.53 Area: 13086316 Amount: 443.8167 Amount Units: ng/ml





Reviewer: westendorfc, 04-Jun-2016 11:05:41

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 06-Jun-2016 11:40:54 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_010.d

Injection Date: 03-Jun-2016 19:40:28 Instrument ID: A6

Lims ID: Std L7

Client ID:

Operator ID: JRB ALS Bottle#: 7 Worklist Smp#: 10

Injection Vol: 15.0 ul Dil. Factor: 1.0000

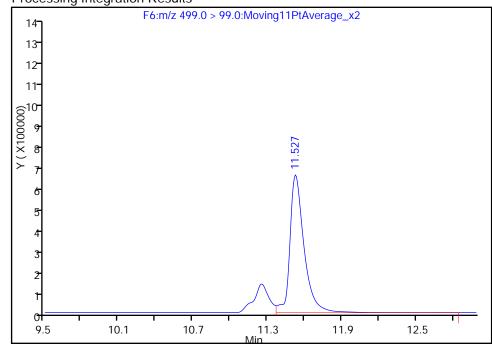
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

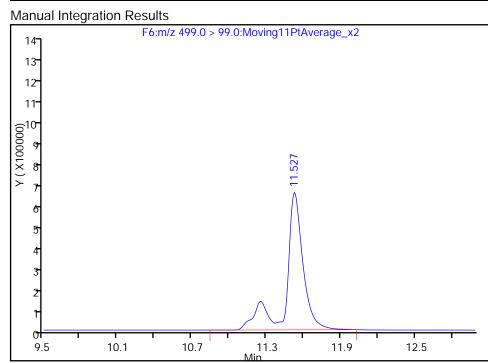
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

RT: 11.53 Area: 4978260 Amount: 325.6075 Amount Units: ng/ml **Processing Integration Results**



RT: 11.53 Area: 5993191 Amount: 443.8167 Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:05:41

Audit Action: Manually Integrated

Audit Reason: Isomers

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FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Lab Sample ID: <u>ICV 320-112504/12</u> Calibration Date: <u>06/03/2016</u> 20:23

Instrument ID: A6 Calib Start Date: 06/03/2016 17:32

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 06/03/2016 19:40

Lab File ID: 03JUN2016A6A_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.239	1.430		57.7	50.0	15.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9593	1.038		54.1	50.0	8.2	25.0
Perfluorobutanesulfonic acid (PFBS)	L1ID		1.157		47.2	44.3	6.6	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9171	1.020		55.6	50.0	11.2	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9326	1.076		57.7	50.0	15.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.7630	0.8748		54.2	47.3	14.7	25.0
Perfluorooctanoic acid (PFOA)	AveID	0.8017	0.9442		57.1	50.0	17.8	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.120	1.194		50.9	47.8	6.7	25.0
Perfluorononanoic acid (PFNA)	AveID	0.6931	0.7941		57.3	50.0	14.6	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.103	1.300		58.9	50.0	17.9	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.6561	0.6857		52.3	50.0	4.5	25.0
Perfluorodecanesulfonic acid (PFDS)	L2ID		0.8422		58.3	48.3	20.7	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		0.9449		57.2	50.0	14.4	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.6374	0.7532		59.1	50.0	18.2	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9245	1.058		57.2	50.0	14.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.7622	0.8082		53.0	50.0	6.0	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.464		61.5	50.0	23.1	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	1.217	1.485		61.0	50.0	22.0	25.0

Report Date: 06-Jun-2016 11:40:57 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_012.d

Lims ID: ICV

Client ID:

Sample Type: ICV

Inject. Date: 03-Jun-2016 20:23:01 ALS Bottle#: 8 Worklist Smp#: 12

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: ICV ICV

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Sublist: chrom-PFAC_A4*sub6

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jun-2016 11:40:56 Calib Date: 03-Jun-2016 19:40:28

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

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

Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 10:55:35

First Level Revie	ewer: wes	stendorf	С		Date:	C)4-Jun-2016 10:55:3	,5		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFB/	Δ									
217.0 > 172.0	5 .788	5.784	0.004		1385637	51.5		103	6900	
2 Perfluorobut	tvric acid									
212.9 > 169.0	,	5.786	0.002	1.000	1981137	57.7			12936	
D 3 13C5-PFP	eA									
267.9 > 223.0	6.941	6.939	0.002		3155069	50.4		101	7378	
4 Perfluorope	ntanoic a	cid								
262.9 > 219.0	6.941	6.941	0.0	1.000	3275580	54.1			553	
40 Perfluorobu	ıtanesulfo	onic acid	k							
298.9 > 80.0	7.067	7.069	-0.002	1.000	1628284	47.2				
5 Perfluorobut										
298.9 > 80.0	7.067	7.069	-0.002	1.000	1628284	NC	(643	
298.9 > 99.0	7.071	7.069	0.002	1.001	793367		2.05(0.00-0.00)		933	
7 Perfluorohe			0.000	1 000	2240224	FF /			4440	
313.0 > 269.0	8.219	8.216	0.003	1.000	3340334	55.6			4443	
D 6 13C2 PFH; 315.0 > 270.0		0 217	0.002		2274242	49.5		99.0	8006	
	8.219	8.217	0.002		3276243	49.5		99.0	8006	
D 8 13C4-PFH ₁ 367.0 > 322.0	рA 9.458	9.456	0.002		3390207	46.7		93.4	15569	
			0.002		3390207	40.7		93.4	13309	
9 Perfluorohe 363.0 > 319.0	9.458	9.457	0.001	1.000	3649359	57.7			27179	
D 11 1802 PFH		7.407	0.001	1.000	3047337	37.7			2/1//	
403.0 > 84.0	9.493	9.492	0.001		1504499	47.8		101	5451	
41 Perfluorohe					1001177	17.0			0.0.	
399.0 > 80.0		9.495		1.000	1314717	54.2				
10 Perfluorohe										
399.0 > 80.0	9.493	9.495	-0.002	1.000	1314717	NC			1557	
					Page 351 of	419				

Report Date: 06-Jun-2016 11:40:57 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Data File:				to\ChromI			20-Apr-2016 13:59:4 \03JUN2016A6A_01			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFO 417.0 > 372.0	A 10.568	10.569	-0.001		3805888	47.4		94.8	27081	
	tanoic ac 10.568 10.577	10.572		1.000 1.001	3593653 1256401	57.1	2.86(0.00-0.00)		2337 1991	
14 Perfluorohe 449.0 > 80.0	10.577		-0.004	1.000	1288382	NC			6252	
D 16 13C4 PFO 503.0 > 80.0	11.527				1783133	46.5		97.2	124638	
15 Perfluorooc 499.0 > 80.0 499.0 > 99.0	11.527 11.527	11.527	0.0	1.000 1.000	2127280 1129498	50.9	1.88(0.00-0.00)		576 15715	
	11.544		0.002		3253972	45.9		91.8	13653	
18 Perfluorono 463.0 > 419.0	11.544		0.001	1.000	2583824	57.3			73314	
D 19 13C2 PFD 515.0 > 470.0	12.373		0.0		2416412	42.1		84.2	8324	
	12.373		0.0	1.000	3141271	58.9			12676	
D 23 13C8 FOS 506.0 > 78.0	12.984				5655453	49.7		99.5	3959	
	12.994	12.987	0.007	1.000	3877669	52.3			5983	
39 Perfluorode 599.0 > 80.0	13.032	13.033		1.000	1515848	58.3				
25 Perfluorode 599.0 > 80.0	13.032		-0.001	1.000	1515848	NC			10264	
D 26 13C2 PFU 565.0 > 520.0	13.076		0.0		3847966	47.4		94.9	45203	
27 Perfluoroun 563.0 > 519.0	13.076		-0.001	1.000	3635775	57.2			14661	
D 28 13C2 PFD 615.0 > 570.0	13.666		0.003		4708330	46.7		93.4	15216	
29 Perfluorodo 613.0 > 569.0	13.666	13.666	0.0	1.000	3546519	59.1			5424	
30 Perfluorotrio 663.0 > 619.0			0.002	1.000	4979535	57.2			3193	
D 33 13C2-PFT 715.0 > 670.0		14.589	0.0		4014020	50.3		101	13394	
32 Perfluorotet 713.0 > 669.0			0.0	1.000	3805256	53.0			1816	
D 35 13C2-PFH 815.0 > 770.0	15.179		0.002		6376975	48.9		97.8	7934	
34 Perfluorohe 813.0 > 769.0			0.002	1.000	6895121	61.5			4512	
36 Perfluorooc 913.0 > 869.0			-0.001	1.000	Page 352 of 419	9 61.0			4012	

Report Date: 06-Jun-2016 11:40:57 Chrom Revision: 2.2 20-Apr-2016 13:59:46

OC Flag Legend
Processing Flags
NC - Not Calibrated

Reagents:

LCPFCIC_00017 Amount Added: 1.00 Units: mL

Report Date: 06-Jun-2016 11:40:57 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_012.d **Injection Date:** 03-Jun-2016 20:23:01 Instrument ID: Α6 Lims ID: **ICV** Client ID: Operator ID: **JRB** ALS Bottle#: 8 Worklist Smp#: 12 15.0 ul Dil. Factor: 1.0000 Injection Vol: PFAC_A6 Limit Group: LC PFC_DOD ICAL Method: 2 Perfluorobutyric acid D 113C4 PFBA D 313C5-PFPeA F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 (35-(030-(30-649 6042 6072 560 ×25 ×35 **≻**20 ≻₂₈-**≻**48 36 15 21 24 10 14 12 5.1 6.9 5.3 5.9 6.9 7.5 6.3 4.7 6.5 6.3 8.1 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid 7 Perfluorohexanoic acid F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 967 F2:m/z 262.9 > 219.0:Moving11PtAverage_x2 (77- 6.941 684 672 042 042 0435 ×55 ×60 <u>~28</u> >₄₈ 21 33 36 14 22 24 12 6.9 6.9 7.2 8.0 8.9 7.2 7.5 7.5 7.1 6.6 7.8 6.3 6.6 7.8 6.2 6.3 8 13C4-PFHpA 6 13C2 PFHxA 9 Perfluoroheptanoic acid F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 Y (X100000) X (X100000) 684 672 ×60 ≻₄₈-36 24 12 7.6 8.2 8.8 7.9 8.8 9.7 7.9 8.8 9.7 7.0 10.6 10.6 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid D 12 13C4 PFOA F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 (X100000) (X100000) (X100000) (0000 (0000 (0000 0036 ₹30-∑30-**≻**24 **≻**24 18 18 12 12 0 0 08.5 9.4 10.3 8.1 8.7 Page 35% of 419 10.5 8.7 9.6 10.5 11.4 7.6

13.3

14.2

12.4

11.8

13.0

13.6

14.2

12.4

0

11.5

01 - 11.5

12.4

13.3

14.2

14.9

15.5

16.1

14.3

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Lab Sample ID: <u>CCV 320-112504/25</u> Calibration Date: 06/04/2016 00:59

Instrument ID: A6 Calib Start Date: 06/03/2016 17:32

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 06/03/2016 19:40

Lab File ID: 03JUN2016A6A_025.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.239	1.238		49.9	50.0	-0.1	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9593	0.8382		43.7	50.0	-12.6	25.0
Perfluorobutanesulfonic acid (PFBS)	L1ID		0.9532		38.9	44.2	-11.9	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9171	0.8970		48.9	50.0	-2.2	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9326	0.9144		49.0	50.0	-2.0	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.7630	0.7375		44.0	45.5	-3.3	25.0
Perfluorooctanoic acid (PFOA)	AveID	0.8017	0.7786		47.1	50.0	-2.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.6497	0.6174		45.2	47.6	-5.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.120	1.028		42.6	46.4	-8.2	25.0
Perfluorononanoic acid (PFNA)	AveID	0.6931	0.6450		46.5	50.0	-7.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.103	1.019		46.2	50.0	-7.6	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.6561	0.6541		49.8	50.0	-0.3	25.0
Perfluorodecanesulfonic acid (PFDS)	L2ID		0.6751		46.7	48.2	-3.1	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		0.8313		50.3	50.0	0.5	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.6374	0.6576		51.6	50.0	3.2	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9245	0.9179		49.6	50.0	-0.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.7622	0.7125		46.7	50.0	-6.5	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.200		50.2	50.0	0.4	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	1.217	1.217		50.0	50.0	0.0	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_025.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 04-Jun-2016 00:59:36 ALS Bottle#: 5 Worklist Smp#: 25

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5 CCV L5

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Sublist: chrom-PFAC_A6*sub5

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jun-2016 11:41:12 Calib Date: 03-Jun-2016 19:40:28

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

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

Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:27:55

First Level Reviewer: westendorfc				Date: 04-Jun-2016 11:27:55						
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA										
217.0 > 172.0	、 5.785	5.784	0.001		1365648	50.8		102	3638	
2 Perfluorobut										
212.9 > 169.0	5.785	5.786	-0.001	1.000	1690159	49.9		99.9	4963	
D 3 13C5-PFPeA										
267.9 > 223.0	6.941	6.939	0.002		3347509	53.5		107	4325	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.941	6.941	0.0	1.000	2805939	43.7		87.4	459	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.071	7.069	0.002	1.000	1371867	38.9		88.1		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.071	7.069	0.002	1.000	1371867	NC			217	
298.9 > 99.0	7.067	7.069	-0.002	0.999	687691		1.99(0.00-0.00)		303	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.219	8.216	0.003	1.000	3002938	48.9		97.8	1153	
D 6 13C2 PFHx										
315.0 > 270.0	8.219	8.217	0.002		3347611	50.6		101	10224	
D 8 13C4-PFHp		0.457			0500440	40.4		07.0	10000	
367.0 > 322.0	9.458	9.456	0.002		3530142	48.6		97.2	18028	
9 Perfluorohep			0.007	1 000	0007050	40.0		00.0	0.4040	
363.0 > 319.0	9.464	9.457	0.007	1.000	3227959	49.0		98.0	36210	
D 11 1802 PFH:		0.400	0.007		1540155	40.0		104	10111	
403.0 > 84.0	9.499	9.492	0.007		1540155	49.0		104	121416	
41 Perfluorohe:				1 000	1002/42	44.0		0/ 7		M
399.0 > 80.0	9.499		0.004	1.000	1092642	44.0		96.7		M
10 Perfluorohe:			0.0	1 000	0	NIC			EO 0	M
399.0 > 80.0	9.495	9.495	0.0	1.000	0	NC			50.8	M

Report Date: 06-Jun-2016 11:41:12 Chrom Revision: 2.2 20-Apr-2016 13:59:46

	Report Date: 06 Data File:				to\Chrom			20-Apr-2016 13:59: 0\03JUN2016A6A_0			
Ė	ata i iie.	\\CIIIC	EXP	DLT	REL		Amount	710330112010A0A_0.	2J.u		
	Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
Е) 12 13C4 PFO	A									
2	117.0 > 372.0	10.568	10.569	-0.001		3911941	48.7		97.4	7870	
	13 Perfluorooct				4 000	0045044	47.4		0.1.1	04.47	
		10.577 10.577			1.000 1.000	3045961 1093084	47.1	2.79(0.00-0.00)	94.1	2147 2407	
-	14 Perfluorohe			0.003	1.000	1073004		2.77(0.00-0.00)		2407	
2		10.586		0.005	1.000	1165944	NC			8176	
	38 Perfluorohej	ptanesul	fonic Aci	d							
4	149.0 > 80.0	10.586	10.581	0.005	1.000	1165944	45.2		95.0		
	16 13C4 PFO										
ţ		11.527				1896441	49.4		103	3375	
,	15 Perfluorooct 199.0 > 80.0	ane sulfo 11.527			1.000	1891820	42.6		91.8	629	M M
		11.527			1.000	961386	42.0	1.97(0.00-0.00)	71.0	22407	M
	17 13C5 PFN							(1.11.1.1)			
		11.545	11.542	0.003		3408591	48.1		96.1	25338	
	18 Perfluoronoi	nanoic a	cid								
4	163.0 > 419.0	11.545	11.543	0.002	1.000	2198374	46.5		93.0	62486	
) 19 13C2 PFD/		40.070	0.010		0745444	47.0		05.7	00500	
ţ		12.383		0.010		2745114	47.8		95.7	20533	
F	20 Perfluorodeo 513.0 > 469.0	canoic a 12.383		0.010	1.000	2798213	46.2		92.4	30654	
) 23 13C8 FOS		12.373	0.010	1.000	2770213	40.2		72.4	30034	
		12.994	12.985	0.009		5521451	48.6		97.1	2768	
	24 Perfluorooct	ane Sulf	onamide	;							
2	198.0 > 78.0	12.994	12.987	0.007	1.000	3611453	49.8		99.7	3704	
	39 Perfluorodeo	cane Sul	fonic aci	d							
Ę	599.0 > 80.0	13.032	13.033	-0.001	1.000	1291051	46.7		96.9		
	25 Perfluorode			0.004	1 000	4004054	NO			100/1	
		13.032	13.033	-0.001	1.000	1291051	NC			13361	
) 26 13C2 PFUr 565.0 > 520.0		13 076	0.0		3961905	48.8		97.7	22247	
	27 Perfluoround			0.0		3701703	40.0		71.1	22271	
Ę	563.0 > 519.0			0.008	1.000	3293616	50.3		101	28893	
Е	28 13C2 PFD	οA									
ć	515.0 > 570.0	13.666	13.663	0.003		4672617	46.3		92.7	15804	
	29 Perfluorodo										
6	513.0 > 569.0	13.666	13.666	0.0	1.000	3072485	51.6		103	5511	
	30 Perfluorotrid			0.000	1 000	4000770	40.7		00.0	00.44	
	663.0 > 619.0		14.165	0.002	1.000	4288770	49.6		99.3	2841	
)33 13C2-PFT∈ 715.0 > 670.0		1/ 500	0.0		4273216	53.5		107	5209	
,	32 Perfluorotetr			0.0		4273210	55.5		107	3207	
-		14.589		0.0	1.000	3329094	46.7		93.5	1542	
	35 13C2-PFH										
		15.180	15.177	0.003		6644740	51.0		102	12424	
	34 Perfluorohex	xadecan	oic acid								
8	313.0 > 769.0	15.180	15.177	0.003	1.000	Page 359 of 419	50.2		100	4434	
						-					

Report Date: 06-Jun-2016 11:41:12 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Data File:

		EXP	DLT	REL		Amount				
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags

36 Perfluorooctandecanoic acid

100 5685837 50.0 3546

QC Flag Legend Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L5_00019 Amount Added: 1.00 Units: mL

Report Date: 06-Jun-2016 11:41:12 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_025.d **Injection Date:** 04-Jun-2016 00:59:36 Instrument ID: Α6 Lims ID: CCV L5 Client ID: Operator ID: **JRB** ALS Bottle#: 5 Worklist Smp#: 25 15.0 ul Dil. Factor: Injection Vol: 1.0000 PFAC_A6 Limit Group: LC PFC_DOD ICAL Method: 2 Perfluorobutyric acid D 113C4 PFBA D 3 13C5-PFPeA F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 42 630 625 ×30-677 666 666 ×55-15 18 33 10 12 22 5.9 7.0 5.4 6.0 6.6 4.7 5.3 6.5 5.8 6.4 7.6 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid 7 Perfluorohexanoic acid F2:m/z 262.9 > 219.0:Moving11PtAverage_x2 F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 30 00 25 63 0054 677 666 ×₂₀ ×45 ×55 ≻₃₆ >₄₄ 15 27 33 10 22 18 11 6.9 7.5 6.8 7.1 7.4 8.3 9.2 7.2 7.8 6.2 6.5 7.4 7.7 6.3 6.6 6.5 6 13C2 PFHxA 8 13C4-PFHpA 9 Perfluoroheptanoic acid F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 Y (X100000) (X100000) Y 91-0078 0078 ×65 **≻**52 39 26 13 7.5 8.1 8.7 9.5 9.4 6.9 9.3 7.7 8.6 10.4 8.5 10.3 7.6 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid (M) D 12 13C4 PFOA F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 (X100000) (X100000) (X100000) 624 620 620 0036 ×16-₹30-**≻**24 12 18 12 0 0 0 8.4 9.3 10.2 7.6 8.5 Page 36/1h of 419 10.3 9.1 9.7 10.3 10.9 11.5 7.5

12.8

13.4

14.0

11.9

12.5

13.1

13.7

12.2

11.6

10.6

11.5

12.4

13.3

Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 06-Jun-2016 11:41:12

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_025.d

Injection Date: 04-Jun-2016 00:59:36 Instrument ID: Α6

Lims ID: CCV L5

Client ID:

JRB ALS Bottle#: Operator ID: 5 Worklist Smp#: 25

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

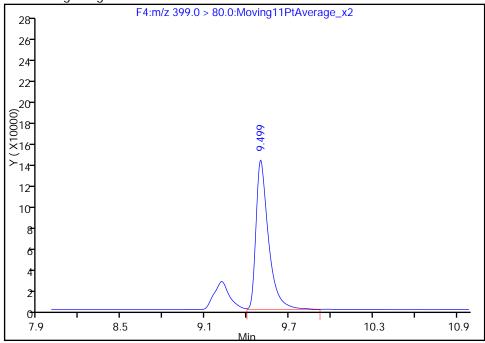
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

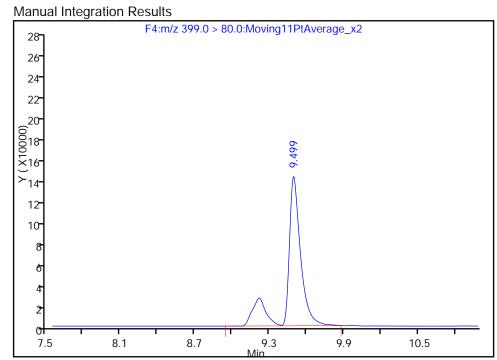
Signal: 1

RT: 9.50 Area: 897976 Amount: 36.144896 Amount Units: ng/ml

Processing Integration Results



RT: 9.50 1092642 Area: 43.980498 Amount: Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:27:55

Audit Action: Assigned Compound ID

Audit Reason: Isomers

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_025.d

Injection Date: 04-Jun-2016 00:59:36 Instrument ID: A6

Lims ID: CCV L5

Client ID:

Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 25

Injection Vol: 15.0 ul Dil. Factor: 1.0000

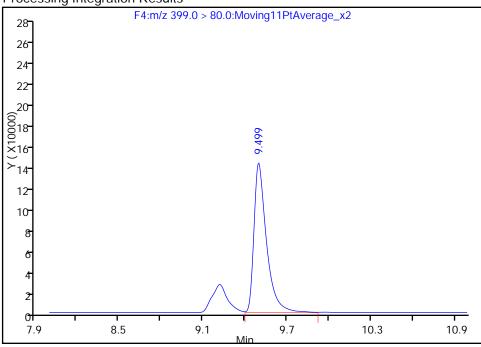
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

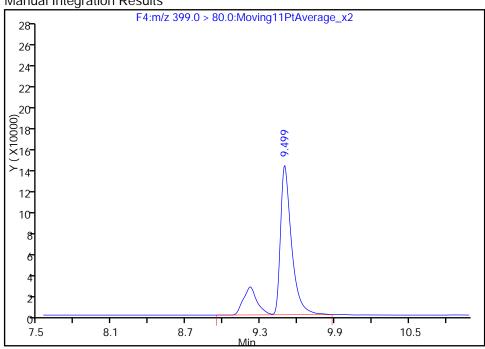
Signal: 1

RT: 9.50 Area: 897976 Amount: 36.144896 Amount Units: ng/ml **Processing Integration Results**



RT: 9.50
Area: 1092642
Amount: 43.980498
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 04-Jun-2016 11:27:55

Audit Action: Manually Integrated

Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_025.d

Injection Date: 04-Jun-2016 00:59:36 Instrument ID: A6

Lims ID: CCV L5

Client ID:

Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 25

Injection Vol: 15.0 ul Dil. Factor: 1.0000

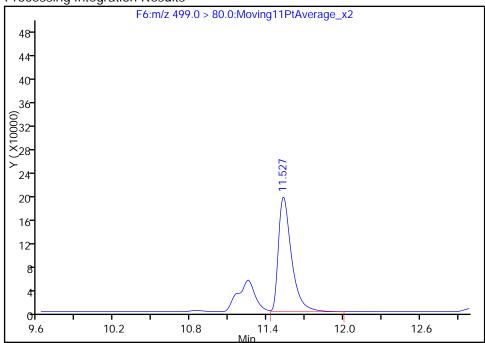
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

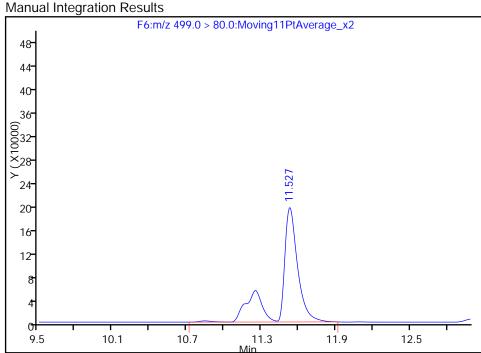
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

RT: 11.53 Area: 1386037 Amount: 31.203329 Amount Units: ng/ml **Processing Integration Results**



RT: 11.53
Area: 1891820
Amount: 42.589831
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:27:55

Audit Action: Manually Integrated Audit Action

Audit Reason: Isomers

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_025.d

Injection Date: 04-Jun-2016 00:59:36 Instrument ID: A6

Lims ID: CCV L5

Client ID:

Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 25

Injection Vol: 15.0 ul Dil. Factor: 1.0000

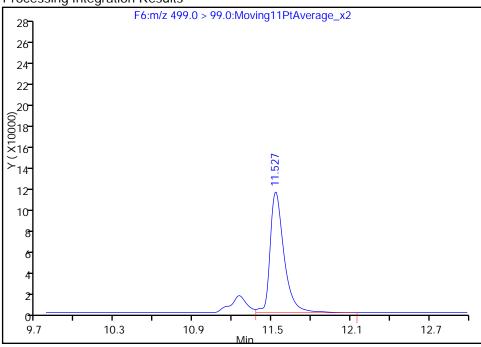
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

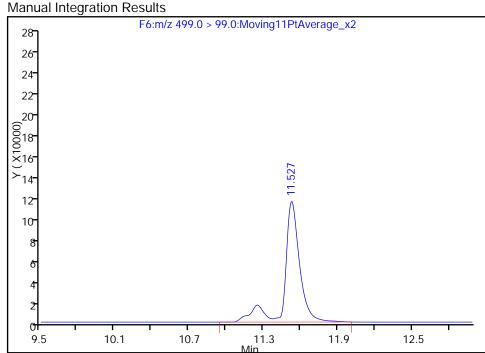
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

RT: 11.53 Area: 829492 Amount: 31.203329 Amount Units: ng/ml **Processing Integration Results**



RT: 11.53 Area: 961386 Amount: 42.589831 Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:27:55

Audit Action: Manually Integrated

Audit Reason: Isomers

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-19198-1
SDG No.:	
Client Sample ID:	Lab Sample ID: MB 320-112069/1-A
Matrix: Water	Lab File ID: 03JUN2016A6A_015.d
Analysis Method: WS-LC-0025	Date Collected:
Extraction Method: 3535	Date Extracted: 06/01/2016 11:06
Sample wt/vol: 500(mL)	Date Analyzed: 06/03/2016 21:26
Con. Extract Vol.: 1.00(mL)	Dilution Factor: 1
Injection Volume: 15(uL)	GC Column: Acquity ID: 2.1(mm)
% Moisture:	GPC Cleanup: (Y/N) N
Analysis Batch No.: 112504	Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	2.5	2.0	0.92
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.0	U	2.5	2.0	0.80
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	2.5	2.0	0.87
375-95-1	Perfluorononanoic acid (PFNA)	2.0	U	2.5	2.0	0.65
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	3.0	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	U	2.5	2.0	0.75

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	107		25-150
STL00990	13C4 PFOA	116		25-150
STL00991	13C4 PFOS	112		25-150
STL01892	13C4-PFHpA	116		25-150
STL00995	13C5 PFNA	117		25-150
STL00994	1802 PFHxS	116		25-150

Report Date: 06-Jun-2016 11:41:00 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_015.d

Lims ID: MB 320-112069/1-A

Client ID:

Sample Type: MB

Inject. Date: 03-Jun-2016 21:26:52 ALS Bottle#: 14 Worklist Smp#: 15

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: mb 320-112069/1-a BOX 85

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jun-2016 11:40:56 Calib Date: 03-Jun-2016 19:40:28

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

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

Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:17:18

First Level Revie	ewer: we	stendorfo)		Date:	(04-Jun-2016 11:17:1	8		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFB	Δ									
217.0 > 172.0	5 .785	5.784	0.001		1516401	56.4		113	49065	
2 Perfluorobut	tyric acid									
212.9 > 169.0	5.782		-0.004	1.000	8737	0.2324			1315	
D 3 13C5-PFP	eΑ									
267.9 > 223.0	6.941	6.939	0.002		3704283	59.2		118	12048	
4 Perfluorope	ntanoic a	cid								
262.9 > 219.0	6.951	6.941	0.010	1.000	13355	0.1879			2.0	
7 Perfluorohe:	xanoic ad	cid								
313.0 > 269.0	8.214	8.216	-0.002	1.000	6448	0.0994			52.5	
D 613C2 PFH										
315.0 > 270.0	8.220	8.217	0.003		3537643	53.5		107	16370	
D 8 13C4-PFH										
367.0 > 322.0		9.456	0.001		4210638	58.0		116	5103	
9 Perfluorohe			0.040	1 000	0.400	0.0445			000	
		9.457	0.012	1.000	3498	0.0445			223	
D 11 1802 PFH		0.400	0.001		1701005	F 4 7		11/	22201	
403.0 > 84.0	9.493	9.492	0.001		1721995	54.7		116	23381	
41 Perfluorohe		onic acid 9.495		1.000	1528	0.0550				
399.0 > 80.0			0.009	1.000	1528	0.0550				
10 Perfluorohe 399.0 > 80.0		9.495	0.009	1.000	1528	NC			12.8	
		9.490	0.009	1.000	1320	NC			12.0	
D 12 13C4 PFC 417.0 > 372.0	10.568	10 560	-0.001		4670150	58.2		116	76216	
13 Perfluorood			-0.001		4070130	30.2		110	70210	
	10.577		0.005	1.000	9724	0.1259			5.9	
	10.568			0.999	3099	0.1207	3.14(0.00-0.00)		10.6	
D 16 13C4 PFC		- · - · -					. (3.22 2.29)			
503.0 > 80.0		11.525	0.002		Page3169 of	419 53.8		112	58075	
					. 490 000 01					

Data File:	\\Chrc	mina\Sa	acrameni	to\Cnrom	1Data\A6\20160	604-31336.b	\03JUN2016A6A_0	15.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 17 13C5 PFN	Ą	,								
468.0 > 423.0	11.544	11.542	0.002		4152690	58.6		117	100500	
18 Perfluorono	nanoic a	cid								
463.0 > 419.0	11.544	11.543	0.001	1.000	1881	0.0327			150	
D 19 13C2 PFD										
515.0 > 470.0	12.373	12.373	0.0		2957449	51.5		103	180205	
20 Perfluorode										
513.0 > 469.0		12.373	0.0	1.000	11013	0.1688			687	
D 23 13C8 FOS										
	12.994	12.985	0.009		1716396	15.1		30.2	11823	
D 26 13C2 PFUi										
	13.076		0.0		4563435	56.3		113	40404	
27 Perfluoroun										
	13.085	13.077	0.008	1.000	41370	0.0528			1994	
D 28 13C2 PFD		10 ((0	0.010		550/500				0 / 400	
615.0 > 570.0			0.012		5586538	55.4		111	26403	
29 Perfluorodo			0.000	4 000	5004	0.0704			40.0	
613.0 > 569.0			0.009	1.000	5204	0.0731			12.3	
30 Perfluorotric			0.000	1 000	7040	0.07/0			15.0	
663.0 > 619.0		14.165	0.009	1.000	7942	0.0769			15.9	
D 33 13C2-PFT		14 500	0.0		4500107	F7 4		115	10441	
	14.589		0.0		4582106	57.4		115	12441	
32 Perfluoroteti			0.0	1 000	(4074	0.7550			27.0	
713.0 > 669.0		14.589	0.0	1.000	64374	0.7559			36.0	
D 35 13C2-PFH:	xda 15.169	1	0.000		7016303	F2 0		100	1 4770	
			-0.008		7010303	53.8		108	14778	
34 Perfluorohe: 813.0 > 769.0	xadecan 15.174		0.003	1.000	199682	0.2351			243	
				1.000	177082	U.Z331			243	
36 Perfluorooct				1.000	EE100	0.4053			33.1	
913.0 > 869.0	13.43 l	13.43/	-0.006	1.000	55102	0.4053			33. I	

OC Flag Legend Processing Flags

NC - Not Calibrated

Report Date: 06-Jun-2016 11:41:00 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_015.d **Injection Date:** 03-Jun-2016 21:26:52 Instrument ID: Α6 Lims ID: MB 320-112069/1-A Client ID: Operator ID: **JRB** ALS Bottle#: 14 Worklist Smp#: 15 15.0 ul Dil. Factor: Injection Vol: 1.0000 PFAC_A6 Limit Group: LC PFC_DOD ICAL Method: D 113C4 PFBA 2 Perfluorobutyric acid D 3 13C5-PFPeA F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 X (X100000) 56**-**×30-<u>9</u>48 ×40 ≻24 **≻**32 18 24 12 16 4.9 5.5 5.2 7.9 6.1 6.7 5.7 6.0 6.1 7.0 40 Perfluorobutanesulfonic acid (ND) 4 Perfluoropentanoic acid 7 Perfluorohexanoic acid F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 $F2:m/z \ 262.9 > 219.0:Moving11PtAverage \ x2$ F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 35 30 28 ³⁰ × 25 <u>24</u> ∑₂₀ ×20 -20 ≻₁₆-15 15 12 10 10 8 7.9 7.0 7.3 7.2 7.8 8.2 8.5 6.7 6.0 6.6 8.8 7.6 6 13C2 PFHxA 8 13C4-PFHpA D 9 Perfluoroheptanoic acid F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 Y (X100000) 14 (X100000) X (X1000000) X (X1000000) 8 (012 10 × 10 × 8 01 0 7.3 8.2 9.1 8.4 9.3 10.2 9.1 9.4 9.7 10.0 7.5 8.8 6.4 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid D 12 13C4 PFOA F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 56 (14[±] (2100000) (10[±] (10[±] (10[±] (10[±] (10[±] (10[±] (10[±] (10000) (100 (048 (00001X) 56**-**<u>6</u>48 ×40-<u></u>32− ≻₃₂-24 24 16 16 0 0 0 7.5 8.4 9.3 10.2 8.5 9.1 Page 37/1nof 419 10.3 9.5 10.4 11.3 8.6

13.3

14.2

11.9

12.5

13.1

13.7

12.4

0

11.3

11.9

12.5

13.1

11.5

15.7

16.0

15.1

14.8

14.7

14.4

15.0

15.3

15.6

15.9

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1 SDG No.: Lab Sample ID: LCS 320-112069/2-A Client Sample ID: Matrix: Water Lab File ID: 03JUN2016A6A 016.d Analysis Method: WS-LC-0025 Date Collected: Extraction Method: 3535 Date Extracted: 06/01/2016 11:06 Sample wt/vol: 500(mL) Date Analyzed: 06/03/2016 21:48 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1 Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm) % Moisture: GPC Cleanup:(Y/N) N Analysis Batch No.: 112504 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35.9		2.5	2.0	0.92
375-85-9	Perfluoroheptanoic acid (PFHpA)	44.8		2.5	2.0	0.80
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	37.5	М	2.5	2.0	0.87
375-95-1	Perfluorononanoic acid (PFNA)	45.3		2.5	2.0	0.65
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	38.5	М	4.0	3.0	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	39.7		2.5	2.0	0.75

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	108		25-150
STL00990	13C4 PFOA	116		25-150
STL00991	13C4 PFOS	117		25-150
STL01892	13C4-PFHpA	111		25-150
STL00995	13C5 PFNA	104		25-150
STL00994	1802 PFHxS	115		25-150

Report Date: 06-Jun-2016 11:41:01 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_016.d

Lims ID: LCS 320-112069/2-A

Client ID:

Sample Type: LCS

Inject. Date: 03-Jun-2016 21:48:09 ALS Bottle#: 15 Worklist Smp#: 16

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: lcs 320-112069/2-a

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jun-2016 11:40:56 Calib Date: 03-Jun-2016 19:40:28

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

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

Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:16:22

First Level Revie	wer: wes	stendorfo	2		Date:	C)4-Jun-2016 11:16:2	2		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA	7									
217.0 > 172.0	5.785	5.784	0.001		1452056	54.0		108	61774	
2 Perfluorobut	yric acid									
212.9 > 169.0	5.788	5.786	0.002	1.000	792056	22.0		110	17200	
D 3 13C5-PFP6	eΑ									
267.9 > 223.0	6.941	6.939	0.002		3579758	57.2		114	4541	
4 Perfluoroper	ntanoic a	cid								
262.9 > 219.0	6.946	6.941	0.005	1.000	1419231	20.7		103	262	
40 Perfluorobu										
298.9 > 80.0	7.071	7.069	0.002	1.000	688282	17.9		101		
5 Perfluorobut										
298.9 > 80.0	7.071	7.069	0.002	1.000	688282	NC	2.07(0.00.0.00)		121	
298.9 > 99.0	7.071	7.069	0.002	1.000	331951		2.07(0.00-0.00)		143	
7 Perfluorohex			0.002	1 000	150/557	23.3		11/	0/0	
313.0 > 269.0		8.216	0.003	1.000	1526557	23.3		116	968	
D 6 13C2 PFHx 315.0 > 270.0	(A 8.219	8.217	0.002		3579218	54.1		108	16419	
		0.217	0.002		33/9210	34.1		100	10419	
D 8 13C4-PFH _k 367.0 > 322.0		9.456	0.002		4034627	55.6		111	11419	
9 Perfluoroher			0.002		4034027	33.0			11417	
363.0 > 319.0	9.458	9.457	0.001	1.000	1683943	22.4		112	26586	
D 11 1802 PFH		7.107	0.001	1.000	1000710	22.1			20000	
403.0 > 84.0		9.492	0.001		1707747	54.3		115	3788	
41 Perfluorohe						00			0,00	M
399.0 > 80.0		9.495		1.000	516606	18.8		103		M
10 Perfluorohe										
399.0 > 80.0	9.493	9.495	-0.002	1.000	448054	NC			938	
D 12 13C4 PFO										
	10.568	10.569	-0.001		P4@e ¹ 375 of 41	9 58.1		116	8595	
					. ago o. o o 11	~				

Data File:	\\Chrc				Data\A6\20160		1	7 TO.G		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluoroo	ctanoic ac	id								
413.0 > 369.0	10.568	10.572	-0.004	1.000	1531972	19.9		99.3	1605	
413.0 > 169.0	10.577	10.572	0.005	1.001	599752		2.55(0.00-0.00)		1121	
14 Perfluoroh										
449.0 > 80.0	10.577	10.581	-0.004	1.000	641871	NC			41239	
38 Perfluoroh	•									
449.0 > 80.0		10.581	-0.004	1.000	641871	21.9		115		
D 16 13C4 PF0										
	11.527				2153749	56.1		117	6625	
15 Perfluoroo										M
499.0 > 80.0	11.527			1.000	971744	19.3	1 03/0 00 0 00)	104	1067	M
499.0 > 99.0	11.527	11.527	0.0	1.000	503349		1.93(0.00-0.00)		7706	M
D 17 13C5 PFN		11 540	0.002		2/01112	F2.0		104	F20F/	
	11.545		0.003		3691112	52.0		104	52856	
18 Perfluoron			0.000	1 000	1150151	22.7		110	420//	
463.0 > 419.0		11.543	0.002	1.000	1159151	22.7		113	42066	
D 19 13C2 PF[10 272	0.0		2044474	E1 7		102	15040	
	12.373		0.0		2966674	51.7		103	15062	
20 Perfluorod			0.0	1 000	1252004	20.7		102	EE024	
513.0 > 469.0		12.373	0.0	1.000	1352096	20.7		103	55034	
D 23 13C8 FOS 506.0 > 78.0	5A 12.994	12 005	0.000		1600201	14.1		28.1	17327	
					1000201	14.1		20.1	1/32/	
24 Perfluoroo 498.0 > 78.0		onamide 12.987		1.000	514549	24.5		123	5187	
				1.000	314349	24.3		123	3107	
39 Perfluorod 599.0 > 80.0				1.000	655610	21.0		109		
			-0.001	1.000	055010	21.0		109		
25 Perfluorod 599.0 > 80.0			0.001	1 000	455410	NC			29845	
		13.033	-0.001	1.000	655610	NC			29043	
D 26 13C2 PFU 565.0 > 520.0		12 074	0.0		4309461	53.1		106	202811	
			0.0		4309401	55.1		100	202011	
27 Perfluorou			0.001	1 000	1405040	22.4		117	14110	
563.0 > 519.0		13.077	-0.001	1.000	1685962	23.4		117	14110	
D 28 13C2 PFI		12 442	0.003		E/102140	E / /		100	20072	
615.0 > 570.0			0.003		5483168	54.4		109	28872	
29 Perfluorod			0.0	1 000	15 40000	22.1		110	20//	
613.0 > 569.0			U.U	1.000	1542098	22.1		110	3066	
30 Perfluorotr	idecanoic	acıd		1 000						

2144533

4415323

1667432

6246533

2524149

Page 376 of 419 14.8

21.2

55.3

19.9

47.9

18.5

106

111

99.7

95.8

92.3

74.2

2092

8446

709

7676

3484

1785

14.596 14.589 0.007 1.000

32 Perfluorotetradecanoic acid

34 Perfluorohexadecanoic acid

36 Perfluorooctandecanoic acid 913.0 > 869.0 15.436 15.437 -0.001

D 33 13C2-PFTeDA

713.0 > 669.0 14.5 D 35 13C2-PFHxDA Report Date: 06-Jun-2016 11:41:01

OC Flag Legend
Processing Flags
NC - Not Calibrated
Review Flags

M - Manually Integrated

Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 06-Jun-2016 11:41:02 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_016.d **Injection Date:** 03-Jun-2016 21:48:09 Instrument ID: Α6 Lims ID: LCS 320-112069/2-A Client ID: Operator ID: **JRB** ALS Bottle#: 15 Worklist Smp#: 16 15.0 ul Dil. Factor: Injection Vol: 1.0000 PFAC_A6 Limit Group: LC PFC_DOD ICAL Method: D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 21 Y (X100000) 0018-15-12-0030-0025-_20 15 10 5.3 5.9 5.9 7.0 6.5 4.7 5.3 6.5 5.8 6.4 7.6 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid 7 Perfluorohexanoic acid F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F2:m/z 262.9 > 219.0:Moving11PtAverage_x2 F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 18 42 42 X100036 0015 0015 ×12 (0)36-30-30-**≻**24 18 18 12 7.9 7.0 7.3 7.0 7.3 8.5 9.1 6.7 7.6 6.7 7.3 7.6 6.4 6.4 6 13C2 PFHxA 8 13C4-PFHpA 9 Perfluoroheptanoic acid F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 (0000012 (0000012 (0000012 (0000012) (0000012) (0000012) (0000012) (0000012) (0000012) (0000012) 49 (X100000) Y 0042 000 ×35 ∑28⁻ 21 01 7.3 8.2 9.1 7.9 8.8 9.7 9.2 9.8 10.6 8.0 8.6 10.4 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid (M) D 12 13C4 PFOA F5;m/z 417.0 > 372.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 000012 X10 (049 (042 ×35 ≻28 21 0 0 0 7.9 8.8 9.7 10.6 7.6 8.5 Page 37/8 of 419 10.3 9.2 9.8 10.4 11.0 11.6

13.3

14.2

11.9

12.5

13.1

13.7

12.4

10.8

11.7

12.6

13.5

11.5

Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 06-Jun-2016 11:41:02

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_016.d

Injection Date: 03-Jun-2016 21:48:09 Instrument ID: A6

Lims ID: LCS 320-112069/2-A

Client ID:

Operator ID: JRB ALS Bottle#: 15 Worklist Smp#: 16

Injection Vol: 15.0 ul Dil. Factor: 1.0000

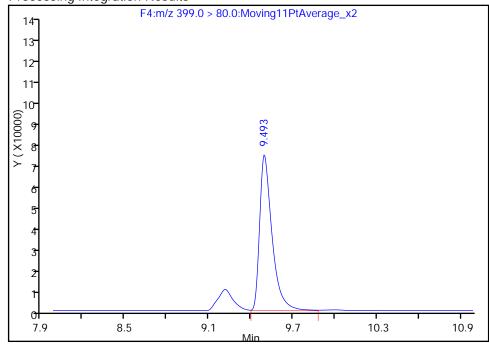
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

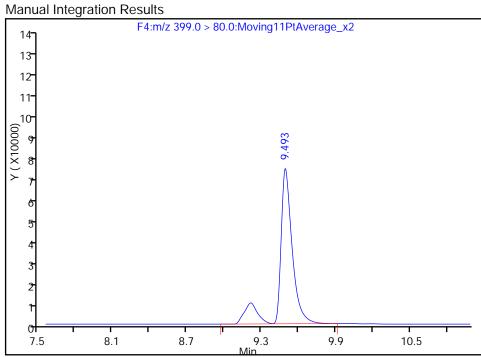
41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

RT: 9.49 Area: 448054 Amount: 16.264979 Amount Units: ng/ml **Processing Integration Results**



RT: 9.49
Area: 516606
Amount: 18.753511
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:18:12

Audit Action: Manually Integrated

Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_016.d

Injection Date: 03-Jun-2016 21:48:09 Instrument ID: A6

Lims ID: LCS 320-112069/2-A

Client ID:

Operator ID: JRB ALS Bottle#: 15 Worklist Smp#: 16

Injection Vol: 15.0 ul Dil. Factor: 1.0000

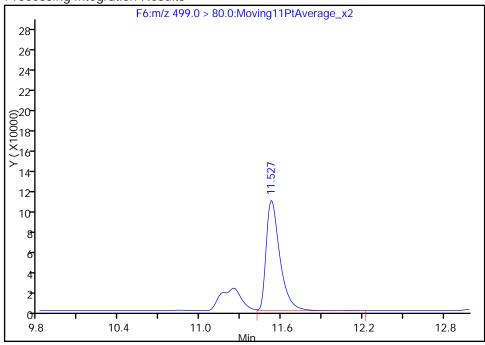
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

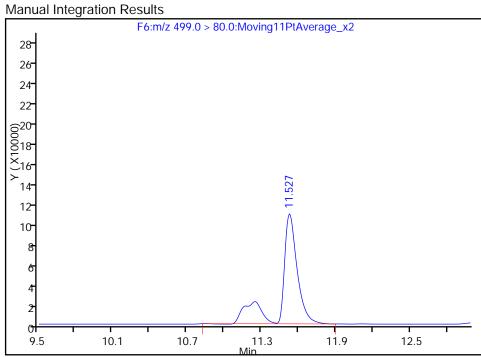
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

RT: 11.53 Area: 754799 Amount: 14.962414 Amount Units: ng/ml **Processing Integration Results**



RT: 11.53
Area: 971744
Amount: 19.262924
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:18:12

Audit Action: Manually Integrated

Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_016.d

Injection Date: 03-Jun-2016 21:48:09 Instrument ID: A6

Lims ID: LCS 320-112069/2-A

Client ID:

Operator ID: JRB ALS Bottle#: 15 Worklist Smp#: 16

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

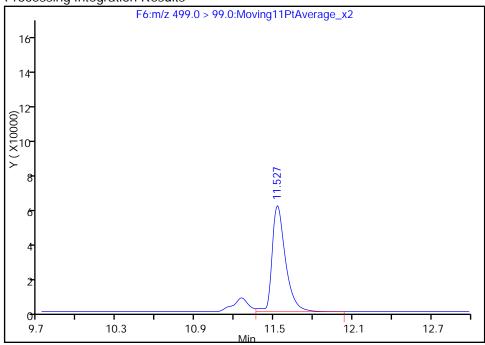
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

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

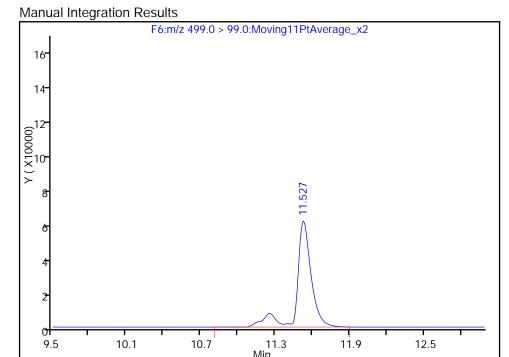
Signal: 2

RT: 11.53 Area: 439588 Amount: 14.962414 Amount Units: ng/ml

Processing Integration Results



RT: 11.53
Area: 503349
Amount: 19.262924
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:18:12

Audit Action: Manually Integrated

Audit Reason: Isomers

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Client Sample ID: DW-57 MS Lab Sample ID: 320-19198-1 MS

Matrix: Water Lab File ID: 03JUN2016A6A_018.d

Analysis Method: WS-LC-0025 Date Collected: 05/26/2016 11:01

Extraction Method: 3535 Date Extracted: 06/01/2016 11:06

Sample wt/vol: 532.3(mL) Date Analyzed: 06/03/2016 22:30

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

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 112504 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34.8		2.3	1.9	0.86
375-85-9	Perfluoroheptanoic acid (PFHpA)	45.1		2.3	1.9	0.75
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	72.4	М	2.3	1.9	0.82
375-95-1	Perfluorononanoic acid (PFNA)	44.0		2.3	1.9	0.61
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	189	M 4	3.8	2.8	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	59.6	М	2.3	1.9	0.70

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	79		25-150
STL00990	13C4 PFOA	61		25-150
STL00991	13C4 PFOS	102		25-150
STL01892	13C4-PFHpA	72		25-150
STL00995	13C5 PFNA	49		25-150
STL00994	1802 PFHxS	117		25-150

Report Date: 06-Jun-2016 11:41:04 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_018.d **Injection Date:** 03-Jun-2016 22:30:42 Instrument ID: Α6 Lims ID: 320-19198-A-1-A MS Client ID: DW-57 Operator ID: **JRB** ALS Bottle#: 17 Worklist Smp#: 18 Dil. Factor: Injection Vol: 15.0 ul 1.0000 LC PFC_DOD ICAL Method: PFAC_A6 Limit Group: D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 5.788 (18 (00015 X)12 670 860 (00001×)24 40 18 30 12 20 10 5.9 6.9 7.5 5.3 6.5 5.4 6.0 6.3 6.3 8.1 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid 7 Perfluorohexanoic acid F2:m/z 298.9 > 80.0:Moving11PtAverage x2F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 F2:m/z 262.9 > 219.0:Moving11PtAverage_x2 30 00 00 25 24- 0020-0030-036-<u>,</u> ∑₁₆ 724· 15 12 18 10 7.1 6.8 7.4 7.7 6.7 7.8 9.0 6.5 7.0 7.3 7.6 7.2 8.4 6.2 6.4 6 13C2 PFHxA 8 13C4-PFHpA 9 Perfluoroheptanoic acid F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 84 ©35- 684 6072 0072 ×60 ×25 ×60 >48 36 15 36 24 24 10 12 8.0 9.2 8.7 10.5 9.0 9.6 10.2 7.4 8.6 7.8 9.6 6.8 8.4 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid (M) D 12 13C4 PFOA F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 77-28- 0000140 × × 32 0066<u>-</u> ×55<u>-</u> ×20 -44 ≻16- 24 33 12 16 22 0 0 8.4 9.3 10.2 7.8 8.7 Page 385 of 419 10.5 9.1 9.7 10.3 10.9 11.5 7.5

Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 06-Jun-2016 11:41:04

Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 06-Jun-2016 11:41:04

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_018.d

Injection Date: 03-Jun-2016 22:30:42 Instrument ID: Α6

Lims ID: 320-19198-A-1-A MS

Client ID: DW-57

ALS Bottle#: Operator ID: **JRB** 17 Worklist Smp#: 18

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

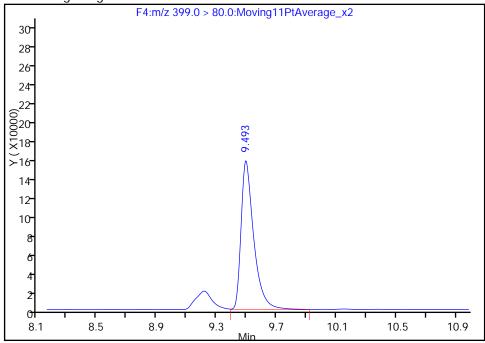
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

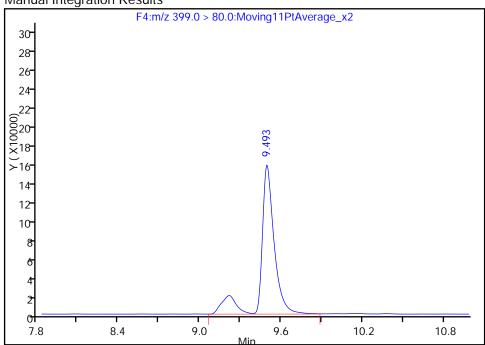
RT: 9.49 Area: 935984 Amount: 33.216721 Amount Units: ng/ml

Processing Integration Results



RT: 9.49 Area: 1085659 Amount: 38.528470 Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 04-Jun-2016 11:20:25

Audit Action: Assigned Compound ID Audit Reason: Isomers

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Chrom Revision: 2.2 20-Apr-2016 13:59:46 Report Date: 06-Jun-2016 11:41:04 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_018.d

Injection Date: 03-Jun-2016 22:30:42 Instrument ID: Α6

Lims ID: 320-19198-A-1-A MS

DW-57 Client ID:

Operator ID: **JRB** ALS Bottle#: 17 Worklist Smp#: 18

Injection Vol: 15.0 ul Dil. Factor: 1.0000

PFAC A6 LC PFC DOD ICAL Method: Limit Group:

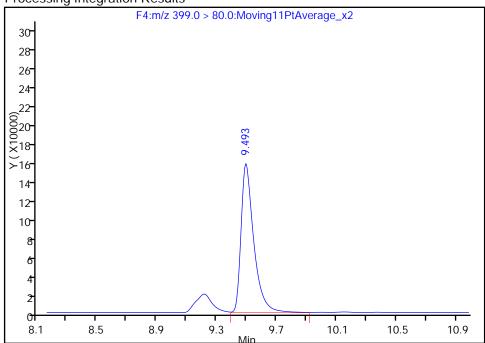
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

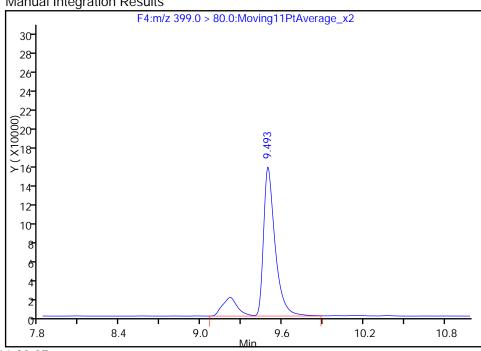
RT: 9.49 Area: 935984 Amount: 33.216721 Amount Units: ng/ml

Processing Integration Results



RT: 9.49 1085659 Area: Amount: 38.528470 Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 06-Jun-2016 11:30:07

Audit Action: Manually Integrated

Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_018.d

Injection Date: 03-Jun-2016 22:30:42 Instrument ID: A6

Lims ID: 320-19198-A-1-A MS

Client ID: DW-57

Operator ID: JRB ALS Bottle#: 17 Worklist Smp#: 18

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

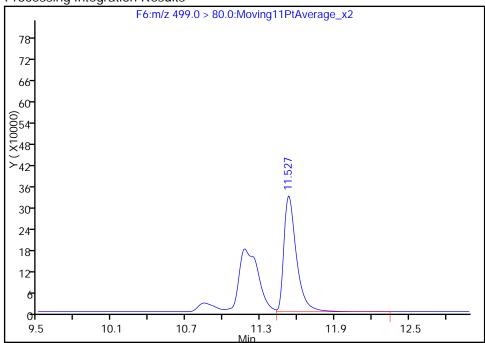
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

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

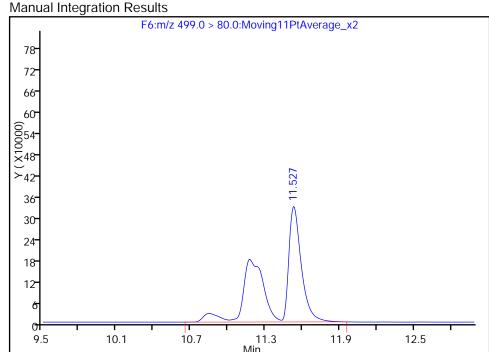
Signal: 1

RT: 11.53
Area: 2317113
Amount: 52.651202
Amount Units: ng/ml

Processing Integration Results



RT: 11.53
Area: 4437985
Amount: 100.8433
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:20:25

Audit Action: Manually Integrated Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_018.d

Injection Date: 03-Jun-2016 22:30:42 Instrument ID: A6

Lims ID: 320-19198-A-1-A MS

Client ID: DW-57

Operator ID: JRB ALS Bottle#: 17 Worklist Smp#: 18

Injection Vol: 15.0 ul Dil. Factor: 1.0000

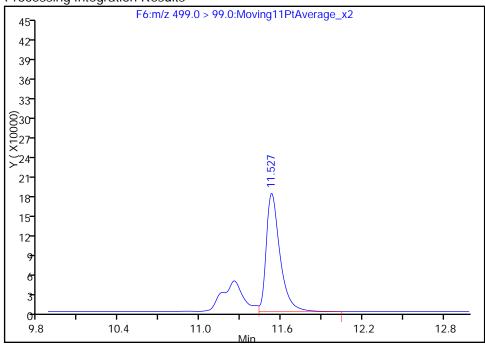
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

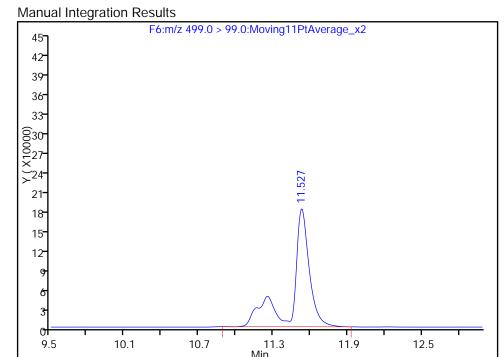
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

RT: 11.53 Area: 1274490 Amount: 52.651202 Amount Units: ng/ml **Processing Integration Results**



RT: 11.53 Area: 1759263 Amount: 100.8433 Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:20:25

Audit Action: Manually Integrated

Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_018.d

Injection Date: 03-Jun-2016 22:30:42 Instrument ID: A6

Lims ID: 320-19198-A-1-A MS

Client ID: DW-57

Operator ID: JRB ALS Bottle#: 17 Worklist Smp#: 18

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

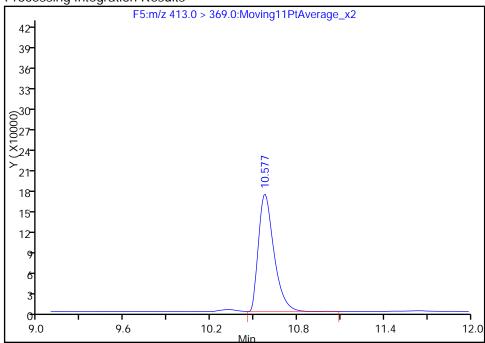
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

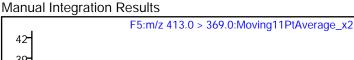
Signal: 1

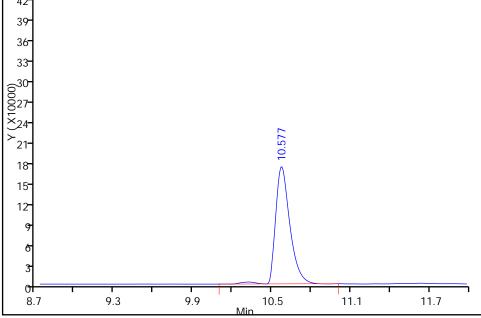
RT: 10.58
Area: 1280665
Amount: 32.394011
Amount Units: ng/ml

Processing Integration Results



RT: 10.58
Area: 1294684
Amount: 31.743392
Amount Units: ng/ml





Reviewer: westendorfc, 04-Jun-2016 11:20:25

Audit Action: Manually Integrated Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_018.d

Injection Date: 03-Jun-2016 22:30:42 Instrument ID: A6

Lims ID: 320-19198-A-1-A MS

Client ID: DW-57

Operator ID: JRB ALS Bottle#: 17 Worklist Smp#: 18

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

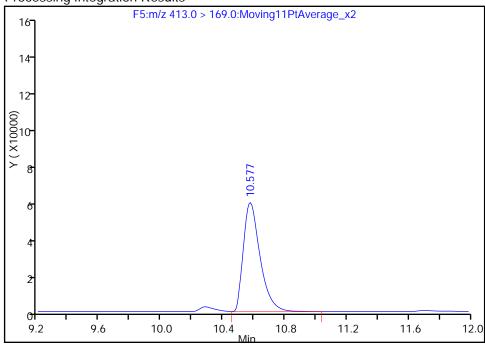
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

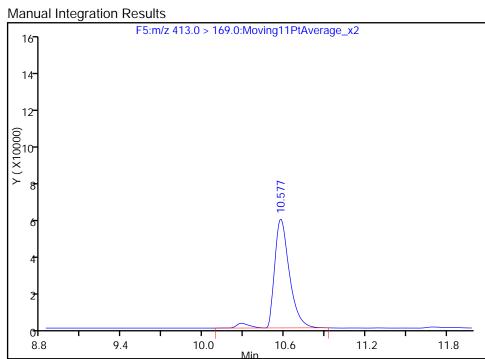
Signal: 2

RT: 10.58
Area: 430161
Amount: 32.394011
Amount Units: ng/ml

Processing Integration Results



RT: 10.58
Area: 443994
Amount: 31.743392
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:20:25

Audit Action: Manually Integrated

Audit Reason: Isomers

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Client Sample ID: DW-57 MSD Lab Sample ID: 320-19198-1 MSD

Matrix: Water Lab File ID: 03JUN2016A6A_019.d

Analysis Method: WS-LC-0025 Date Collected: 05/26/2016 11:01

Extraction Method: 3535 Date Extracted: 06/01/2016 11:06

Sample wt/vol: 525.8(mL) Date Analyzed: 06/03/2016 22:51

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

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 112504 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	38.0		2.4	1.9	0.87
375-85-9	Perfluoroheptanoic acid (PFHpA)	46.4		2.4	1.9	0.76
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	73.8	М	2.4	1.9	0.83
375-95-1	Perfluorononanoic acid (PFNA)	41.9		2.4	1.9	0.62
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	198	M 4	3.8	2.9	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	54.8	М	2.4	1.9	0.71

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	83		25-150
STL00990	13C4 PFOA	69		25-150
STL00991	13C4 PFOS	107		25-150
STL01892	13C4-PFHpA	79		25-150
STL00995	13C5 PFNA	55		25-150
STL00994	1802 PFHxS	121		25-150

Report Date: 06-Jun-2016 11:41:05 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_019.d

Lims ID: 320-19198-A-1-B MSD

Client ID: DW-57 Sample Type: MSD

Inject. Date: 03-Jun-2016 22:51:58 ALS Bottle#: 18 Worklist Smp#: 19

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-19198-a-1-b msd

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 06-Jun-2016 11:40:56 Calib Date: 03-Jun-2016 19:40:28

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

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

Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:21:33

First Level Revie	wer: wes	stendorfo			Date:	C	04-Jun-2016 11:21:3	3		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA										_
217.0 > 172.0	5.782	5.784	-0.002		1079871	40.1		80.3	7931	
2 Perfluorobut	vric acid									
212.9 > 169.0	5.785	5.786	-0.001	1.000	659854	24.6		123	1488	
D 3 13C5-PFPe	eΑ									
267.9 > 223.0	6.941	6.939	0.002		2764549	44.2		88.4	4501	
4 Perfluoroper	ntanoic a	cid								
262.9 > 219.0	6.941	6.941	0.0	1.000	1323235	24.9		125	321	
40 Perfluorobu										
298.9 > 80.0		7.069	-0.002	1.000	811457	20.0		113		
5 Perfluorobut										
298.9 > 80.0	7.067	7.069	-0.002	1.000	811457	NC	2 00(0 00 0 00)		122	
298.9 > 99.0	7.067	7.069	-0.002	1.000	390929		2.08(0.00-0.00)		450	
7 Perfluorohex 313.0 > 269.0		8.216	0.003	1.000	1323513	26.3		132	767	
D 6 13C2 PFHx		0.210	0.003	1.000	1323313	20.3		132	707	
315.0 > 270.0	8.214	8.217	-0.003		2741217	41.4		82.8	38978	
D 8 13C4-PFHp		0.217	0.000		2711217			02.0	00770	
367.0 > 322.0	9.458	9.456	0.002		2863732	39.4		78.9	8408	
9 Perfluorohep										
363.0 > 319.0	9.458	9.457	0.001	1.000	1303457	24.4		122	1062	
D 11 18O2 PFH:	xS									
403.0 > 84.0	9.493	9.492	0.001		1804019	57.4		121	8495	
41 Perfluorohe	xanesulf	onic acio	t							M
399.0 > 80.0	9.493	9.495	-0.002	1.000	1129755	38.8		213		M
10 Perfluorohe:	xane Sul	lfonate								M
399.0 > 80.0	9.495	9.495	0.0	1.000	0	NC			138	M
D 12 13C4 PFO	A									
417.0 > 372.0	10.568	10.569	-0.001		Page5395 of 41	9 34.6		69.1	61506	

Report Date: 06-Jun-2016 11:41:05 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 06- Data File:				o\Chrom			20-Apr-2016 13:59: \\03JUN2016A6A_0			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
413.0 > 169.0	10.568 10.568	10.572 10.572		1.000 1.000	1321953 486447	28.8	2.72(0.00-0.00)	144	718 1744	M M M
	10.577	10.581		1.000	844023	NC			611	
38 Perfluorohe 449.0 > 80.0	10.577			1.000	844023	31.8		167		
D 16 13C4 PFO 503.0 > 80.0	S 11.527	11.525	0.002		1954239	50.9		107	12218	
15 Perfluorooc 499.0 > 80.0 499.0 > 99.0	11.527 11.527	11.527	0.0	1.000 1.000	4755407 1915939	103.9	2.48(0.00-0.00)	560	8433 8039	M M M
D 17 13C5 PFN 468.0 > 423.0	A 11.544	11.542	0.002		1937731	27.3		54.6	70355	
18 Perfluorono 463.0 > 419.0	nanoic a 11.544		0.001	1.000	591275	22.0		110	21586	
21 PFNS (Perf 549.0 > 80.0	louro-1-n 12.001			1.000	2581	NC			19.4	
D 19 13C2 PFD 515.0 > 470.0	A 12.362	12.373	-0.011		1618800	28.2		56.4	99762	
20 Perfluorode 513.0 > 469.0	canoic ad 12.373		0.0	1.000	792540	22.2		111	48637	
D 23 13C8 FOS 506.0 > 78.0	A 12.984	12.985	-0.001		565887	4.98		10.0	14912	
24 Perfluorooc 498.0 > 78.0	tane Sulf 12.994			1.000	180043	24.2		121	3937	
39 Perfluorode 599.0 > 80.0	cane Sul	fonic aci	d	1.000	644363	22.7		118	0,0.	
25 Perfluorode	cane Sul	fonate						110	44162	
599.0 > 80.0 D 26 13C2 PFU	nA			1.000	644363	NC				
565.0 > 520.0 27 Perfluoroun	decanoic	acid			3100074	38.2		76.4	6057	
563.0 > 519.0 D 28 13C2 PFD		13.077	-0.001	1.000	1149788	22.1		111	32808	
615.0 > 570.0 29 Perfluorodo			0.012		4185113	41.5		83.0	23910	
613.0 > 569.0 30 Perfluorotrio	13.675	13.666	0.009	1.000	1226590	23.0		115	9291	
663.0 > 619.0	14.174		0.009	1.000	1570202	20.3		101	3494	
D 33 13C2-PFT6 715.0 > 670.0	14.596		0.007		3682308	46.1		92.3	16215	
32 Perfluorotet 713.0 > 669.0			0.007	1.000	1373339	21.5		108	616	
D 35 13C2-PFH 815.0 > 770.0		15.177	0.002		6504496	49.9		99.8	11436	
34 Perfluorohe 813.0 > 769.0			0.002	1.000	Page 396 of 419	9 ^{26.0}		130	2592	

Report Date: 06-Jun-2016 11:41:05 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_019.d

_											
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags

36 Perfluorooctandecanoic acid

23.6 118 1701 2401964

OC Flag Legend Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 06-Jun-2016 11:41:05 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_019.d **Injection Date:** 03-Jun-2016 22:51:58 Instrument ID: Α6 Lims ID: 320-19198-A-1-B MSD Client ID: DW-57 Operator ID: **JRB** ALS Bottle#: 18 Worklist Smp#: 19 15.0 ul Dil. Factor: Injection Vol: 1.0000 Limit Group: LC PFC_DOD ICAL Method: PFAC_A6 2 Perfluorobutyric acid D 113C4 PFBA D 313C5-PFPeA F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 21 (35-(030-(30-0018-15-12-(0066-×55-×25 **≻**20 33 15 22 10 11 5.2 6.9 7.5 5.1 5.4 6.0 6.3 5.5 5.8 6.1 6.3 8.1 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid 7 Perfluorohexanoic acid $F2:m/z \ 262.9 > 219.0:Moving11PtAverage \ x2$ F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 42 624- 620-636-630-(0036-30-30-∑₁₆-×₂₄ ≻24 12 18 18 12 12 6.9 7.2 6.5 7.1 7.7 7.8 7.4 8.0 8.6 9.2 5.9 6.3 6.6 7.5 6.8 8 13C4-PFHpA 6 13C2 PFHxA D 9 Perfluoroheptanoic acid F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 642 636 ©70 960 677<u>-</u> 866 \approx 30 ×50 ×55->₄₀ >₄₄ 30 33 18 12 20 22 10 11 7.5 8.7 8.8 10.0 7.9 8.8 9.7 6.9 8.1 9.3 8.2 9 4 10.6 10.6 D 12 13C4 PFOA D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid (M) F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 91-©28 ©24 656 6048 0 0 78 -65 **≥**40 ×20 **≻**52 ≻₃₂ ≻₁₆-39 24 12 26 16 13 0 0 $^{\circ}$ 8.6 9.5 10.4 7.9 8.8 Page 398 of 419 10.6 8.9 9.8 10.7 7.7 11.6 Min

13.0

13.6

14.2

11.9

12.5

13.1

13.7

12.4

11.8

10.8

11.7

12.6

13.5

Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 06-Jun-2016 11:41:05

14.7

14.1

15.3

15.9

15.4 15.7 16.0 16.3

14.5 14.8

15.1

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_019.d

Injection Date: 03-Jun-2016 22:51:58 Instrument ID: A6

Lims ID: 320-19198-A-1-B MSD

Client ID: DW-57

Operator ID: JRB ALS Bottle#: 18 Worklist Smp#: 19

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

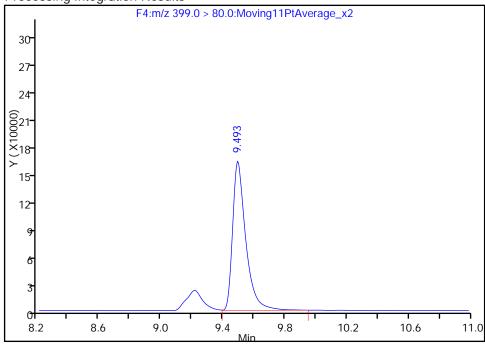
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

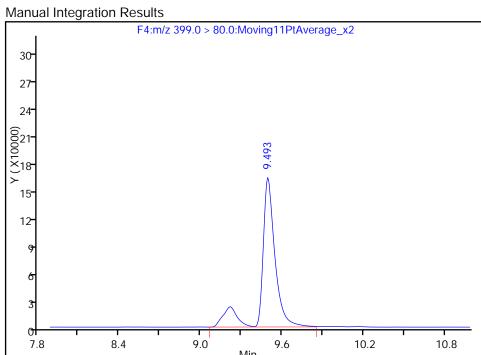
Signal: 1

RT: 9.49
Area: 961016
Amount: 33.024495
Amount Units: ng/ml

Processing Integration Results



RT: 9.49
Area: 1129755
Amount: 38.823067
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:21:33

Audit Action: Assigned Compound ID

Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\\03JUN2016A6A_019.d

Injection Date: 03-Jun-2016 22:51:58 Instrument ID: A6

Lims ID: 320-19198-A-1-B MSD

Client ID: DW-57

Operator ID: JRB ALS Bottle#: 18 Worklist Smp#: 19

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

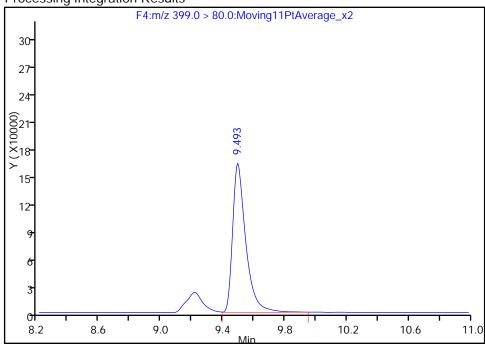
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

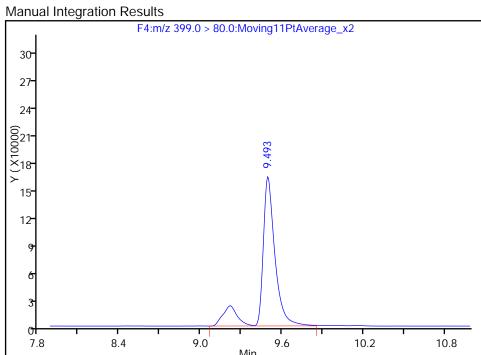
Signal: 1

RT: 9.49
Area: 961016
Amount: 33.024495
Amount Units: ng/ml

Processing Integration Results



RT: 9.49
Area: 1129755
Amount: 38.823067
Amount Units: ng/ml



Reviewer: barnettj, 06-Jun-2016 11:30:51

Audit Action: Manually Integrated

Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_019.d

Injection Date: 03-Jun-2016 22:51:58 Instrument ID: A6

Lims ID: 320-19198-A-1-B MSD

Client ID: DW-57

Operator ID: JRB ALS Bottle#: 18 Worklist Smp#: 19

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

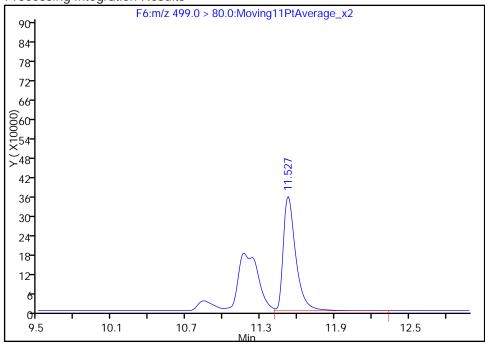
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

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

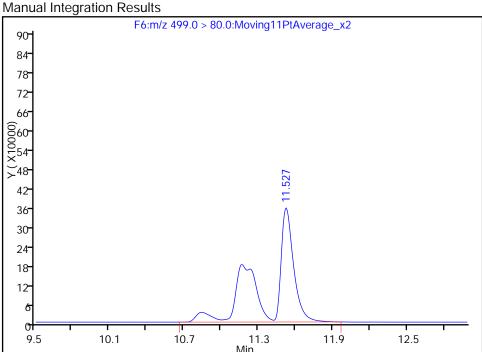
Signal: 1

RT: 11.53
Area: 2493654
Amount: 54.478351
Amount Units: ng/ml

Processing Integration Results



RT: 11.53 Area: 4755407 Amount: 103.8904 Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:21:33

Audit Action: Manually Integrated Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_019.d

Injection Date: 03-Jun-2016 22:51:58 Instrument ID: A6

Lims ID: 320-19198-A-1-B MSD

Client ID: DW-57

Operator ID: JRB ALS Bottle#: 18 Worklist Smp#: 19

Injection Vol: 15.0 ul Dil. Factor: 1.0000

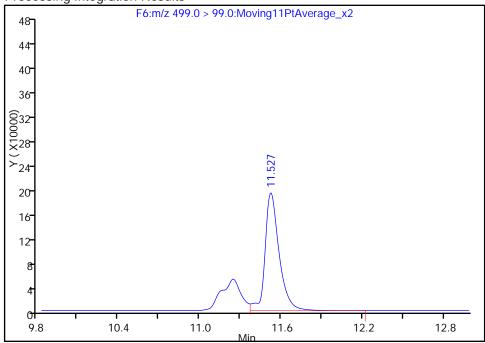
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

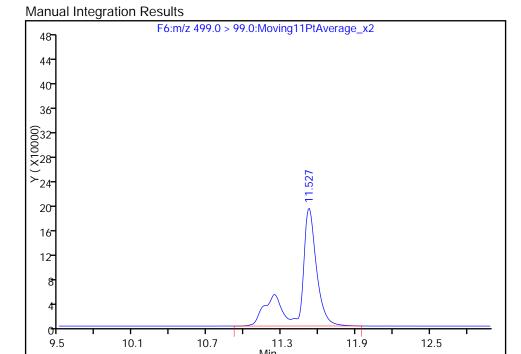
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

RT: 11.53 Area: 1400180 Amount: 54.478351 Amount Units: ng/ml **Processing Integration Results**



RT: 11.53 Area: 1915939 Amount: 103.8904 Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:21:33

Audit Action: Manually Integrated

Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_019.d

Injection Date: 03-Jun-2016 22:51:58 Instrument ID: A6

Lims ID: 320-19198-A-1-B MSD

Client ID: DW-57

Operator ID: JRB ALS Bottle#: 18 Worklist Smp#: 19

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

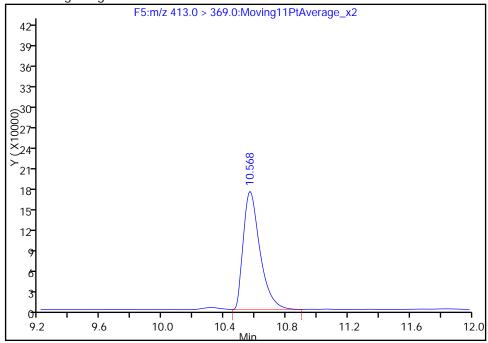
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

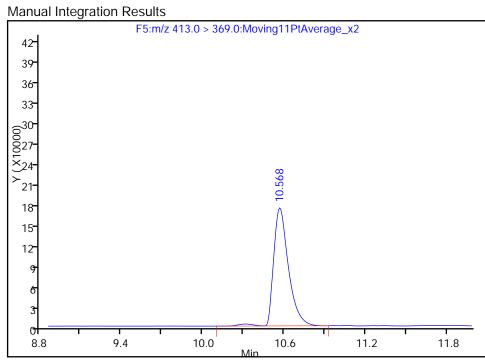
Signal: 1

RT: 10.57
Area: 1305144
Amount: 29.330900
Amount Units: ng/ml

Processing Integration Results



RT: 10.57
Area: 1321953
Amount: 28.796741
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:21:33

Audit Action: Manually Integrated

Audit Reason: Isomers

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TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_019.d

Injection Date: 03-Jun-2016 22:51:58 Instrument ID: A6

Lims ID: 320-19198-A-1-B MSD

Client ID: DW-57

Operator ID: JRB ALS Bottle#: 18 Worklist Smp#: 19

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

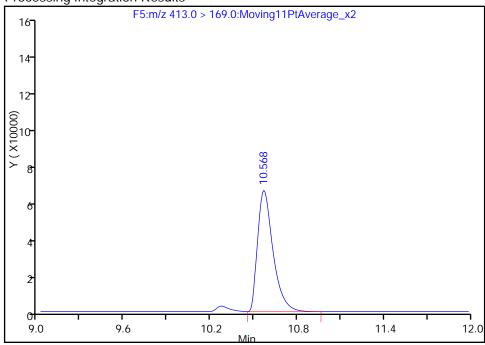
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

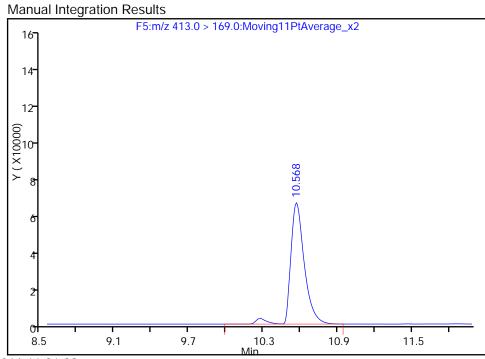
Signal: 2

RT: 10.57
Area: 468814
Amount: 29.330900
Amount Units: ng/ml

Processing Integration Results



RT: 10.57
Area: 486447
Amount: 28.796741
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:21:33

Audit Action: Manually Integrated

Audit Reason: Isomers

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LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento	JOD NO.: 32U-19198-1
SDG No.:	
Instrument ID: A6	Start Date: 06/03/2016 17:32
Analysis Batch Number: 112504	End Date: 06/04/2016 00:59

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD 320-112504/4 IC		06/03/2016 17:32	1	03JUN2016A6A_00 4.d	Acquity 2.1 (mm)
STD 320-112504/5 IC		06/03/2016 17:54	1	03JUN2016A6A_00 5.d	Acquity 2.1 (mm)
STD 320-112504/6 IC		06/03/2016 18:15	1	03JUN2016A6A 00	Acquity 2.1 (mm)
STD 320-112504/7 IC		06/03/2016 18:36	1	6.d 03JUN2016A6A_00 7.d	Acquity 2.1 (mm)
STD 320-112504/8 IC		06/03/2016 18:57	1	03JUN2016A6A_00 8.d	Acquity 2.1 (mm)
STD 320-112504/9 IC		06/03/2016 19:19	1	03JUN2016A6A_00 9.d	Acquity 2.1 (mm)
STD 320-112504/10 IC		06/03/2016 19:40	1	03JUN2016A6A_01 0.d	Acquity 2.1 (mm)
ZZZZZ		06/03/2016 20:01	1	0.0	Acquity 2.1(mm)
ICV 320-112504/12		06/03/2016 20:23	1	03JUN2016A6A_01 2.d	Acquity 2.1 (mm)
ZZZZZ		06/03/2016 20:44	1		Acquity 2.1(mm)
MB 320-112069/1-A		06/03/2016 21:26	1	03JUN2016A6A_01 5.d	Acquity 2.1 (mm)
LCS 320-112069/2-A		06/03/2016 21:48	1	03JUN2016A6A_01 6.d	Acquity 2.1 (mm)
320-19198-1		06/03/2016 22:09	1	03JUN2016A6A_01 7.d	Acquity 2.1 (mm)
320-19198-1 MS		06/03/2016 22:30	1	03JUN2016A6A_01 8.d	Acquity 2.1 (mm)
320-19198-1 MSD		06/03/2016 22:51	1	03JUN2016A6A_01 9.d	Acquity 2.1 (mm)
320-19198-2		06/03/2016 23:13	1	03JUN2016A6A_02 0.d	Acquity 2.1 (mm)
320-19198-3		06/03/2016 23:34	1	03JUN2016A6A_02 1.d	Acquity 2.1 (mm)
320-19198-4		06/03/2016 23:55	1	03JUN2016A6A_02 2.d	Acquity 2.1 (mm)
320-19198-5		06/04/2016 00:17	1	03JUN2016A6A_02 3.d	Acquity 2.1 (mm)
ZZZZZ		06/04/2016 00:38	1		Acquity 2.1 (mm)
CCV 320-112504/25		06/04/2016 00:59	1	03JUN2016A6A_02 5.d	Acquity 2.1 (mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Batch Number: 112069 Batch Start Date: 06/01/16 10:55 Batch Analyst: Edwards, Stephanie N

Batch Method: 3535 Batch End Date: 06/03/16 12:40

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00042	LCPFCSP 00049
MB 320-112069/1		3535, WS-LC-0025				500 mL	1.00 mL	50 uL	
LCS 320-112069/2		3535, WS-LC-0025				500 mL	1.00 mL	50 uL	20 uL
320-19198-B-1	DW-57	3535, WS-LC-0025	Т	567.02 g	44.07 g	523 mL	1.00 mL	50 uL	
320-19198-A-1 MS	DW-57	3535, WS-LC-0025	Т	576.93 g	44.63 g	532.3 mL	1.00 mL	50 uL	20 uL
320-19198-A-1 MSD	DW-57	3535, WS-LC-0025	Т	570.24 g	44.47 g	525.8 mL	1.00 mL	50 uL	20 uL
320-19198-B-2	FB-DW-57	3535, WS-LC-0025	Т	574.74 g	44.53 g	530.2 mL	1.00 mL	50 uL	
320-19198-A-3	DW-95	3535, WS-LC-0025	Т	582.94 g	45.84 g	537.1 mL	1.00 mL	50 uL	
320-19198-A-4	FB-DW-95	3535, WS-LC-0025	Т	579.88 g	44.23 g	535.7 mL	1.00 mL	50 uL	
320-19198-A-5	DUP-052616	3535, WS-LC-0025	Т	566.98 g	45.90 g	521.1 mL	1.00 mL	50 uL	

Batch	Notes
Balance ID	QA-070
Batch Comment	0.1N NaOH/H20 624176
H2O ID	5/24/16
Hexane ID	000135581
Manifold ID	6
Methanol ID	625013
Pipette ID	EC15219; EC15131
Analyst ID - Reagent Drop	SNE
Analyst ID - SU Reagent Drop	SNE
Analyst ID - SU Reagent Drop Witness	VPM
Solvent Lot #	636630
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	002736075A

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

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Batch Number: 112069 Batch Start Date: 06/01/16 10:55 Batch Analyst: Edwards, Stephanie N

Batch Method: 3535 Batch End Date: 06/03/16 12:40

Basis	Basis Description
Т	Total/NA

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



West Sacramento

HPLC/LCMS Data Review Checklist

	112504 9 -6-1 11 Level		N/A
A. Calibration/Instrument Run QC 1. ICAL locked in Chrom and TALS? ICAL Batch# 2. ICAL, CCV Frequency & Criteria met. • RF _{average} criteria appropriate for the method. • Linear Regression criteria appropriate if required (r ≥ 0.995). • 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. 3. Peaks correctly ID'd by data system.			N/A
 ICAL locked in Chrom and TALS? ICAL Batch# ICAL, CCV Frequency & Criteria met. RF_{average} criteria appropriate for the method. Linear Regression criteria appropriate if required (r ≥ 0.995). 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. Peaks correctly ID'd by data system. 	1st Level	2 nd Level	N/A
 ICAL locked in Chrom and TALS? ICAL Batch# ICAL, CCV Frequency & Criteria met. RF_{average} criteria appropriate for the method. Linear Regression criteria appropriate if required (r ≥ 0.995). 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. Peaks correctly ID'd by data system. 			
 RF_{average} criteria appropriate for the method. Linear Regression criteria appropriate if required (r ≥ 0.995). 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. Peaks correctly ID'd by data system. 			
 RF_{average} criteria appropriate for the method. Linear Regression criteria appropriate if required (r ≥ 0.995). 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. Peaks correctly ID'd by data system. 			
 Linear Regression criteria appropriate if required (r ≥ 0.995). 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. Peaks correctly ID'd by data system. 		\ \ \ \	
 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. Peaks correctly ID'd by data system. 		<i>/ / / /</i>	
 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. Peaks correctly ID'd by data system. 			
 ½ the reporting limit as described in CA-Q-S-005? All curve points show calculated concentrations. Peaks correctly ID'd by data system. 			
All curve points show calculated concentrations. 3. Peaks correctly ID'd by data system.			
Peaks correctly ID'd by data system.			
B. QAQC	The character and the second		
Are all QC samples properly linked in TALS?		V	
Method blank, LCS/LCSD and MS/SD frequencies met.	<i>y</i>		
LCS/LCSD and MB data are within control limits. If not, NCM is present.	V.	- V	
4. Are MS/MSD recoveries and RPD within control limits?		V,	
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?	<u> </u>		
3. If required, are positive hits confirmed and >40% RPD flagged?	<u> </u>		4/
Manual Integrations reviewed and appropriate.			_ U
All analytes correctly reported. (Primary, secondary, acceptable status)	- /-	V	
6. Correct reporting limits used. (based on client request, prep factors, and		/	
dilutions)		✓	
D. Documentation		26.7 / 26.4 / 20	margallar.
Are all non-conformances documented/attached? NCM# 53 \$4 D			
2. Do results make sense (e.g. dilutions, etc.)?	1		
Have all flags been reviewed for appropriateness?	Samuel		
4. For level 3 and 4 reports, have forms and raw data been reviewed?			•
5. Was QC Checker run for this job?	-		
*Upon completion of this checklist, the reviewer must scan and attach the checklist	o the TALS	S job.	
1 st Level (Analyst): Date:	/16	<u> </u>	
2 nd Level Reviewer: Mywwy Date: 66	12016		

Method Code: 320-3535_IVWT-320

Batch Number: 320-112069

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Edwards, Stephanie N

Batch Open: 6/1/2016 10:55:34AM Batch End: $(\mathcal{U}\mathcal{I})$

Solid-Phase Extraction (SPE)

	1		ı		ı		I		I		I		ı		ı		ŀ	
Output Sample Lab ID	M B 3 2 8 - 1 1 2 0 6 9 1 - A		2 5 6 9 5 7 7 7 7 7 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9		4 · · · · · · · · · · · · · · · · · · ·		3 2 6 - 19 19 8 - A - 1 - A M S		Q S W W 3 Z S S		3 2 4 - 1 9 9 8 8 B 5 7 7 A		3 2 6 - 8 9 8 8 A A - 3 - A		3 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		3 2 8 - 1 9 1 9 8 8 A - 5 - A	
Comments																		
Div Rank	N/A		N/A		4		4		4		4		4		4		4	
Analytical TAT	N/A		A/N		5_Day_RUSH		5_Day_RUSH		5_Day_RUSH		5_Day_RUSH		5_Day_RUSH		5_Day_RUSH		5_Day_RUSH	
Due Date	N/A		N/A		6/6/16		6/6/16		6/6/16		6/6/16		6/6/16		6/6/16		6/6/16	
Adj2							-											
PHs Adj1																		
Rcvd																		
GrossWt InitAmnt TareWt FinAmnt	500 mL	1.00 mL	500 mL	1.00 mL	523 mL	1.00 mL	532.3 mL	1.00 mL	525.8 mL	1.00 mL	530.2 mL	1.00 mL	537.1 mL	1.00 mL	535.7 mL	1.00 mL	521.1 mL	1.00 mL
GrossWt TareWt					567.02 g	44.07 g	576.93 g	44.63 g	570.24 g	44.47 g	574.74 g	44.53 g	582.94 g	45.84 g	579.88 g	44.23 g	566.98 g	45.90 g
SDG (Job#)	N/A		N/A		N/A (320-19198-1)		N/A (320-19198-1)		N/A (320-19198-1)		N/A (320-19198-1)		N/A (320-19198-1)		N/A (320-19198-1)		N/A (320-19198-1)	
Input Sample Lab ID (Analytical Method)	MB~320-112069/1 N/A		LCS~320-112069/2 N/A		320-19198-B-1 (PFC_IDA_DOD5)		320-19198-A-1~MS (PFC_IDA_DOD5)		320-19198-A-1~MSD (PFC_IDA_DOD5)		320-19198-B-2 (PFC_IDA_DOD5)		320-19198-A-3 (PFC_IDA_DOD5)		320-19198-A-4 (PFC_IDA_DOD5)		320-19198-A-5 (PFC_IDA_DOD5)	
	₩		7		m	Pa	igę 4	11 (of <u>4</u> 19)	. <u> </u>				∞		മ	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Edwards, Stephanie N

Method Code: 320-3535_IVWT-320

Batch Number: 320-112069

Batch Open: 6/1/2016 10:55:34AM

Batch End:

Batch Notes	Manifold ID 5- SNE 6//// 6	ianol ID 625013	Hexane ID 000135581	iorite ID NA	art time NA	nd time NA	ance ID QA-070	ge Type WAX 500mg	Disk ID 002736075A	H2O ID 5/24/16	Pipette ID EC15219; EC15131	Solvent Name 0.3% NH4OH/MeOH	nt Lot # 636630	nt Drop SNE	nt Drop SNE	It Drop $\sqrt{\varphi}\mathcal{N}$	iviliess ———————————————————————————————————	Acid ID NA	gent ID NA	vumber NA	VaCIID NA
	Manifold ID 5- SA	Methanol ID 625013	Hexane ID 00013	Sodium Hypochlorite ID NA	First Start time NA	First End time NA	Balance ID QA-070	SPE Cartridge Type WAX 500mg	Solid Phase Extraction Disk ID 002736075A	H2O ID 5/24/1	Pipette ID EC15	Solvent Name 0.3% I	Solvent Lot # 636630	Analyst ID - Reagent Drop SNE	Analyst ID - SU Reagent Drop SNE		Acid Name NA	Acid ID NA	Reagent ID NA	Reagent Lot Number NA	NaCIID NA

TestAmerica Sacramento

TestAmerica Sacramento

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Edwards, Stephanie N

Batch Open: 6/1/2016 10:55:34AM

Batch End:

SOP Number WS-LC-0025

Method Code: 320-3535_IVWT-320

Batch Number: 320-112069

Batch Comment 0.1N NaOH/H20 624176

		THE CONTRACT OF THE CONTRACT O
		Comments
320-19198-B-1	44 (M)	
320-19198-A-1~MS	Method Comments:	Coffirments: Q5Rev111215_StdVarApp_30day disposal
320_10108_A_1~MSD	Method Comments:	Comments: Q5Rev111213_StdVarApp_30day disposal
OOM 1-0-00161-070	Method Comments:	Comments: Q5Rev111213_StdVarApp_30day disposal
320-19198-B-2	Method Comments:	OSD 201111212 Ctd/V/cm 4 cm 20 drc. disc. cc. 1
320-19198-A-3		Commens. Corce 111213_StuvatApp_30day ulsposat
	Method Comments:	Comments: Q5Rev111213_StdVarApp_30day disposal
320-19198-A-4	:	
320-19198-A-5	Method Comments:	Comments: Q5Rev111213_StdVarApp_30day disposal
	Method Comments:	Comments: Q5Rev111213_StdVarApp_30day disposal

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Edwards, Stephanie N

Method Code: 320-3535_IVWT-320

Batch Number: 320-112069

Batch Open: 6/1/2016 10:55:34AM

Batch End:

Reagent Additions Worksheet

Witness	DE DE MAY											\
By	SNE 6/1/16											
Final Amount	1.00 mL	1.00 mL	1.00 mL	1.00 mL	1.00 mL	1.00 mL	1.00 mL	1.00 mL	1.00 mL	1.00 mL	1.00 mL	1.00 mL
Amount Added	20 nF	20 nF	20 uL	50 uL	50 uL	20 uL	50 uL	20 uL	50 uL	50 uL	50 uL	50 uL
 Reagent Code	LCMPFCSU_00042	LCMPFCSU_00042	LCPFCSP_00049	LCMPFCSU_00042	LCMPFCSU_00042	LCPFCSP_00049	LCMPFCSU_00042	LCPFCSP_00049	LCMPFCSU_00042	LCMPFCSU_00042	LCMPFCSU_00042	LCMPFCSU_00042
Lab ID	MB 320-112069/1	LCS 320-112069/2	LCS 320-112069/2	320-19198-B-1	320-19198-A-1 MS	320-19198-A-1 MS	320-19198-A-1 MSD	320-19198-A-1 MSD	320-19198-B-2	320-19198-A-3	320-19198-A-4	320-19198-A-5

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Edwards, Stephanie N

Method Code: 320-3535_IVWT-320

Batch Number: 320-112069

Batch Open: 6/1/2016 10:55:34AM

Batch End:

	Lot#:			
Other Reagents:	Amount/Units			
	Reagent		ţ	



Sacramento Preparation Data Review Checklist

Preparation Batch Number(s): 112069

Test: PFC_IDA_DODS

Earliest Holding Time: 6/2/16

	1 st Level	2 nd Level
Sample List Tab	Reviewer	Reviewer
Samples identified to the correct method		gamen and a
All necessary NCMs filed (including holding time)	NA	NA
Method/sample/login/QAS checked and correct		
Worksheef Tab	1 st Level Reviewer	2 nd Level Reviewer
All samples properly preserved	NA	NA
Weights in anticipated range and not targeted	1	
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and Cl Check)	V	
The pH is transcribed correctly in TALS	NA	NN
All additional information transcribed into TALS is correct and raw data is attached	1	
Comments are transcribed correctly in TALS		William III
Reagents Tab	1 st Level Reviewer	2 nd Level Reviewer
All necessary reagents not expired and entered into TALS	V	attacher 1
All spike amounts correct and added to necessary samples and QC		
Batch Information Date and time accurate and entered into TALS correctly	1 st Level Reviewer	2 nd Level Reviewer
All necessary 'batch information' complete and entered into TALS correctly	1/	ALL PARTY OF THE P

1 ^{sl} Level Reviewer: _	SNE	Date:	6/3/16	
2 nd Level Reviewer	H24	Date:	6-3-16	
Comments:				

Shipping and Receiving Documents

TestAmerica

Chain of Custody Record

Phone (916) 373-5600 Fax (303) 467-7248

West Sacramento, CA 95605-1500

880 Riverside Parkway

TestAmerica Sacramento

N - None
O - ANIADO2
P - Na2O4S
Q - Na2O4S
Q - Na2SSG3
R - Na2SSE03
S - H2SO4
T - TSP Dodecaltydrate
U - Acetone
U - Acetone
W - ph 4-5
Z - other (specify) Special Instructions/Note Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Return To Client Disposal By Lab Hrchive For Month COC No: |280-48902-18075,1 Preservation Codes 5900 A - HCI.
B - NaOH
C - Zn Acelate
C - Zn Acelate
D - Nitro Acid
E - Nan SO4
F - MeOH
G - Amchlor
H - Ascorbic Acid 1330 Page. Page 1 of 2 ethod of Shipmen **Analysis Requested** 320-19198 Chain of Custody Cooler Temperature(s) °C and Other Remarks Special Instructions/QC Requirements Lab PM Johnston, Michelle A E-Mail michelle johnston@testamericainc com PEOS, PEOA, PENA, PEHXS, PEHPA & PEBS (W=water, S=solid, O=waste/oif, Type (C=comp, Sample G=grab) Radiological D 9 0 1126 PO# Purchase Order Requested 321 Sample 92) 165 71-02-5-60 10 Date: TAT Requested (days): Due Date Requested: Ghknown 5/26/16 Sample Date Silde Sizully Sildle 9/197/S Project # 28014493 SSOW# Poison B * 1000 (m) @ 11 28 Skin Irritant Deliverable Requested I, II, III, IV, Other (specify Project Name: Ensafe-NWS - Earle, NJ PFCs Potable Water Custody Seal No. DUP- 052616 FB-DW-95 FB-DW-57 Flammable DV-95 Possible Hazard Identification mdryden@earthtoxics.com Custody Seals Intact.

A Yes A No Client Information Empty Kit Relinquished Non-Hazard Company* Earth Toxics, Inc PO BOX 3382 telinquished by. elinquished by delinquished by Mike Dryden Slate, Zip UT, 84321 Oity Logan

Page 418 419

Login Sample Receipt Checklist

Client: Earth Toxics, Inc Job Number: 320-19198-1

Login Number: 19198 List Source: TestAmerica Sacramento

List Number: 1

Creator: Hytrek, Cheryl

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
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.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Sample	Sample Name	Specific Method	CAS Number	Analyte	Result	Units	Qualifier	Limit	Reports To	Dilution	Result Basis	Batch	Sampled	Prepared	Analyzed	Analysis
320-19198-1	DW-57	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.9	ng/L		0.88	MDL	1.0	Total	112504	5/26/2016 11:01 AM	6/1/2016 11:06 AM	6/3/2016 10:09 PM	Perfluorinated Hydrocarbons
320-19198-1	DW-57	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	4.5	ng/L		0.77	MDL	1.0	Total	112504	5/26/2016 11:01 AM	6/1/2016 11:06 AM	6/3/2016 10:09 PM	Perfluorinated Hydrocarbons
320-19198-1	DW-57	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	35	ng/L	М	0.83	MDL	1.0	Total	112504	5/26/2016 11:01 AM	6/1/2016 11:06 AM	6/3/2016 10:09 PM	Perfluorinated Hydrocarbons
320-19198-1	DW-57	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	2.0	ng/L	J	0.63	MDL	1.0	Total	112504	5/26/2016 11:01 AM	6/1/2016 11:06 AM	6/3/2016 10:09 PM	Perfluorinated Hydrocarbons
320-19198-1	DW-57	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	150	ng/L	MJ	1.2	MDL	1.0	Total	112504	5/26/2016 11:01 AM	6/1/2016 11:06 AM	6/3/2016 10:09 PM	Perfluorinated Hydrocarbons
320-19198-1	DW-57	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	17	ng/L	М	0.72	MDL	1.0	Total	112504	5/26/2016 11:01 AM	6/1/2016 11:06 AM	6/3/2016 10:09 PM	Perfluorinated Hydrocarbons
320-19198-2	FB-DW-57	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.5	ng/L	J	0.87	MDL	1.0	Total	112504	5/26/2016 11:05 AM	6/1/2016 11:06 AM	6/3/2016 11:13 PM	Perfluorinated Hydrocarbons
320-19198-2	FB-DW-57	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	ng/L	U	0.76	MDL	1.0	Total	112504	5/26/2016 11:05 AM	6/1/2016 11:06 AM	6/3/2016 11:13 PM	Perfluorinated Hydrocarbons
320-19198-2	FB-DW-57	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.83	ng/L	J M	0.82	MDL	1.0	Total	112504	5/26/2016 11:05 AM	6/1/2016 11:06 AM	6/3/2016 11:13 PM	Perfluorinated Hydrocarbons
320-19198-2	FB-DW-57	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	1.9	ng/L	U	0.62	MDL	1.0	Total	112504	5/26/2016 11:05 AM	6/1/2016 11:06 AM	6/3/2016 11:13 PM	Perfluorinated Hydrocarbons
320-19198-2	FB-DW-57	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	7.5	ng/L	M	1.2	MDL	1.0	Total	112504	5/26/2016 11:05 AM	6/1/2016 11:06 AM	6/3/2016 11:13 PM	Perfluorinated Hydrocarbons
320-19198-2	FB-DW-57	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	0.71	ng/L	J	0.71	MDL	1.0	Total	112504	5/26/2016 11:05 AM	6/1/2016 11:06 AM	6/3/2016 11:13 PM	Perfluorinated Hydrocarbons
320-19198-3	DW-95	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	3.3	ng/L		0.85	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/3/2016 11:34 PM	Perfluorinated Hydrocarbons
320-19198-3	DW-95	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	13	ng/L		0.75	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/3/2016 11:34 PM	Perfluorinated Hydrocarbons
320-19198-3	DW-95	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.6	ng/L	M	0.81	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/3/2016 11:34 PM	Perfluorinated Hydrocarbons
320-19198-3	DW-95	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	1.4	ng/L	J	0.61	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/3/2016 11:34 PM	Perfluorinated Hydrocarbons
320-19198-3	DW-95	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	37	ng/L	M	1.2	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/3/2016 11:34 PM	Perfluorinated Hydrocarbons
320-19198-3	DW-95	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	55	ng/L	M	0.70	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/3/2016 11:34 PM	Perfluorinated Hydrocarbons
320-19198-4	FB-DW-95	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.2	ng/L	J	0.86	MDL	1.0	Total	112504	5/26/2016 11:28 AM	6/1/2016 11:06 AM	6/3/2016 11:55 PM	Perfluorinated Hydrocarbons
320-19198-4	FB-DW-95	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	ng/L	U	0.75	MDL	1.0	Total	112504	5/26/2016 11:28 AM	6/1/2016 11:06 AM	6/3/2016 11:55 PM	Perfluorinated Hydrocarbons
320-19198-4	FB-DW-95	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	ng/L	U	0.81	MDL	1.0	Total	112504	5/26/2016 11:28 AM	6/1/2016 11:06 AM	6/3/2016 11:55 PM	Perfluorinated Hydrocarbons
320-19198-4	FB-DW-95	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	0.64	ng/L	J	0.61	MDL	1.0	Total	112504	5/26/2016 11:28 AM	6/1/2016 11:06 AM	6/3/2016 11:55 PM	Perfluorinated Hydrocarbons
320-19198-4	FB-DW-95	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	13	ng/L	M	1.2	MDL	1.0	Total	112504	5/26/2016 11:28 AM	6/1/2016 11:06 AM	6/3/2016 11:55 PM	Perfluorinated Hydrocarbons
320-19198-4	FB-DW-95	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	0.75	ng/L	J	0.70	MDL	1.0	Total	112504	5/26/2016 11:28 AM	6/1/2016 11:06 AM	6/3/2016 11:55 PM	Perfluorinated Hydrocarbons
320-19198-5	DUP-052616	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	3.1	ng/L		0.88	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/4/2016 12:17 AM	Perfluorinated Hydrocarbons
320-19198-5	DUP-052616	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	13	ng/L		0.77	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/4/2016 12:17 AM	Perfluorinated Hydrocarbons
320-19198-5	DUP-052616	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.9	ng/L	M	0.83	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/4/2016 12:17 AM	Perfluorinated Hydrocarbons
320-19198-5	DUP-052616	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	1.8	ng/L	J	0.63	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/4/2016 12:17 AM	Perfluorinated Hydrocarbons
320-19198-5	DUP-052616	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	46	ng/L	М	1.2	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/4/2016 12:17 AM	Perfluorinated Hydrocarbons
320-19198-5	DUP-052616	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	58	ng/L	М	0.72	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/4/2016 12:17 AM	Perfluorinated Hydrocarbons



Naval Installation Restoration Information Solution (NIRIS) Environmental Restoration Program (ERP) Records Transmittal Form

Purpose

Complete one copy of this form to accompany the paper and electronic versions of Environmental Restoration Program (ERP) records submitted for inclusion to NIRIS.

Name:	
Organization:	
Email:	Phone:
rd Information:	
Installation:	
Program: ERN	BRAC Supporting: MRP LUC RAD PO
Document Title:	
AOC, SITE, SWMU, UST, UXO:	
Sample Delivery Groups (SDGs):	
Document Date: _	Number of Pages:
Contract Number:	CTO/DO Number:
Author/Affiliation:	
Distribution/Availab	ility Statement:
Sensitive Content	Yes No Cite Pages:
Recommended File 1	Type: Administrative Record Post Decision Site File
s:	



DATA VALIDATION REPORT

Site Name: Naval Weapons Station Earle, Colts Neck, New Jersey, Site 46 —

Military Sealift Command Firefighting School

Laboratory: TestAmerica, Sacramento, California.

Sample Delivery Groups: 320-19181-1 **Matrix**: Potable Water

Data Quality Level: Stage 4, Electronic and Manual

Analysis: Select perfluorinated compounds (PFCs) via Method 537 Modified

This report summarizes data review findings for potable water samples collected in May 2016 using the following reference documents:

- Internal Draft Perfluorinated Compound Groundwater Investigation Sampling and Analysis Plan, Site 46 Military Sealift Command, Naval Weapons Station Earle Newport, Colts Neck, New Jersey, Resolution Consultants (December 2015).
- Laboratory standard operating procedure (SOP) Perfluorinated Compounds (PFCs) in Water, Soils, Sediments, and Tissue [Method 37 Modified], TestAmerica, Sacramento, California, WS-LC-0025, Revision 1.5, (November 2015).
- Contract Laboratory Program National Functional Guidelines for Chlorinated Dioxin/Furan Data review, United States Environmental Protection Agency, (September 2011).
- Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.0. (July 2013).

Validation was performed on potable water and quality control (QC) samples, summarized in Attachment A, Table A-1. Samples discussed in this validation report were analyzed and reported as definitive data. A full deliverable data packages, QC summaries and raw data, were submitted for data review.

The data were evaluated based on the following review elements:

- * Data completeness
- Sample receipt and preservation
- * Initial calibration
- * Initial calibration verification
- * Continuing calibration verification
- Laboratory control sample/laboratory control sample duplicate results
- * Holding times
- Isotope dilution recoveries
- * Laboratory method blanks
 - Field Blanks
- * Field duplicate precision
 - Matrix spike/matrix spike duplicates (MS/MSDs)
- * Sample result transcriptions/recalculations

Acceptable data parameters for which all criteria were met or not qualified, as indicated above with an asterisk (*), are not discussed further.



Blanks

Blanks help determine how much, if any, contamination was introduced in the laboratory or the field. All results associated with a particular laboratory blank were evaluated to determine whether there was an inherent variability in the data, or if a problem was an isolated occurrence that did not affect the data.

For this project field blanks were collected assess potential ambient conditions cross-contamination that could potentially affect the quality of the associated samples. The field blanks consisted of laboratory blank water bottles that were opened in the field and transferred into another container at each sampling location. The primary purpose of this type of blank was to provide an additional check on possible sources of contamination beyond that which was intended for trip blanks.

Field Blanks

FB-DW-95 contained perfluorononanoic acid (PFNA) at a concentration of 0.64 nanograms per liter (ng/L). PFNA was detected below the limit of quantitation and was qualified as undetected "U" in DW-95 and its duplicate DUP-052616 due to potential cross-contamination.

Matrix Spikes/Matrix Spike Duplicates

MS/MSDs are generated to provide information about the effect of each sample matrix on the sample preparation and the measurement methodology. MS/MSD %Rs assess the effect of the sample matrix on the accuracy of the analytical results. %Rs above the laboratory control limit could indicate a potential high result bias while %Rs below QC limits could indicate a potential low result bias. The relative percent difference (RPD) between the MS and MSD results is evaluated to assess sample precision.

DW-57-0516 was spiked by the laboratory to assess accuracy and precision. Perfluorooctane sulfonic acid (PFOS) had a %R outside the control limits; however, since the native sample result was greater than four times the added spike amount, no qualification was performed.

Overall Assessment

The data from SDG 320-19181-1 was reviewed independently from the laboratory to assess data quality. PFNA in DW-95 and its duplicate were qualified as undetected due to suspected cross-contamination. The remaining results were acceptable without qualification; therefore, the data are usable for their intended purpose, according to U.S. Environmental Protection Agency and Department of Defense guidelines. Attachment B provides final results after data review.

Attachment A Sample and Analysis Summary

Table A-1 Sample Summary

Sample Delivery				Sample	
Group	Lab ID	Sample ID	Location	Date	Matrix
320191981	320-19198-1	DW-57-0516	DW-57	5/26/2016	Potable Water
320191981	320-19198-2	FB-DW-57-0516		5/26/2016	Field Blank
320191981	320-19198-3	DW-95-0516	DW-95	5/26/2016	Potable Water
320191981	320-19198-4	FB-DW-95-0516		5/26/2016	Field Blank
320191981	320-19198-5	DUP-052616	DW-95	5/26/2016	Duplicate of DW-95

Notes:

All samples were analyzed via laboratory standard operating procedure *Perfluorinated Compounds (PFCs) in Water, Soils, Sediments, and Tissue [Method 37 Modified]*, TestAmerica, Sacramento, California, WS-LC-0025, Revision 1.5, (November 2015) for the following select list of analytes: Perfluorobutanesulfonic Acid (PFBS), Perfluoroheptanoic Acid (PFHA), Perfluorooctane Sulfonic Acid (PFOS), and Perfluorooctanoic Acid (PFOA).

Attachment B
Final Validated Results after Data Review

Table B-1
Perfluorinated Compound Results – May 2016

	Sar	320	320191981			320191981			320191981			
		Lab Identif	ication	320-19198-1			320-19198-2			320-19198-3		.3
	Sa	ample Identif	ication	DW-57-0516			FB-DV	V-57-05	16	DW-	6	
		Samp	le Date	5/2	5/26/2016			5/26/2016			5/26/2016	
		Samp	le Type	Potak	Potable Water			Field Blank			Potable Water	
Method	Analyte	CAS No	Units	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC
TA_WS-LC-0025	PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	NG_L	2.9			1.5	J		3.3		
TA_WS-LC-0025	PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	NG_L	4.5			1.9	U		13		
TA_WS-LC-0025	PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	NG_L	35			0.83	J		6.6		
TA_WS-LC-0025	PERFLUORONONANOIC ACID (PFNA)	375-95-1	NG_L	2	J		1.9	U		1.9	U	bf
TA_WS-LC-0025	PERFLUOROOCTANE SULFONIC ACID (PFOS)	1763-23-1	NG_L	150	J		7.5			37		
TA_WS-LC-0025	PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	NG_L	17			0.71	J		55		

	Sai	320	191981		320	1				
	Lab Identification							320-19198-5		
	Sa	ample Identif	ication	FB-DV	V-95-05	16	DUP	6		
		Samp	le Date	5/2	6/2016		5/2)		
	·	Samp	е Туре	Fiel	d Blank		Duplicate			
Method	Analyte	CAS No	Units	Result	Qual	RC	Result	Qual	RC	
TA_WS-LC-0025	PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	NG_L	1.2	J		3.1			
TA_WS-LC-0025	PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	NG_L	1.9	U		13			
TA_WS-LC-0025	PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	NG_L	1.9	U		6.9			
TA_WS-LC-0025	PERFLUORONONANOIC ACID (PFNA)	375-95-1	NG_L	0.64	J		1.9	U	bf	
TA_WS-LC-0025	PERFLUOROOCTANE SULFONIC ACID (PFOS)	1763-23-1	NG_L	13			46			
TA_WS-LC-0025	PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	NG_L	0.75	J		58			

Notes:

ng/L = Nanograms per liter

Qual = Final qualifier

RC = Data qualification reason code

J = **Undetected** — The parameter was analyzed but undetected or was qualified as undetected during data review due to blank artifacts.

J = **Estimated Value** — One or more quality control parameters were outside control limits or the analyte concentration was less than the limit of quantitation.

Qualification Reason Codes

bf = Result qualified as undetected due to field-derived blank results

DODCMD_ID INSTALLATION_ID	SDG	SITE_NAME	NORM_SITE_NAI	ME LOCATION_NAI	ME LOCATION_TYPE	LOCATION_TYPE_DESC	COORD_X	COORD_Y CONTRACT_ID	DO_CTO_NUMBER	CONTR_NAME SAMPLE_NAME	SAMPLE_MATRIX_DESC	SAMPLE_TYPE_DESC	COLLECT_DATE ANALYTICAL_METHOD_GRP_DESC
MID_ATLANTICEARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492 N62470-11-D-8013	WE09	RESOLUTION CONS DW-95-0516	WP	Drinking water	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTICEARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492 N62470-11-D-8013	WE09	RESOLUTION CONS DW-95-0516	WP	Drinking water	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTICEARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492 N62470-11-D-8013	WE09	RESOLUTION CONS DUP-052616	WP	Drinking water	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTIC EARLE_NWS	320191981							N62470-11-D-8013	WE09	RESOLUTION CONS FB-DW-57-0516	WQ	Water for QC samples	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTIC EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492 N62470-11-D-8013	WE09	RESOLUTION CONS DW-95-0516	WP	Drinking water	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTIC EARLE_NWS	320191981							N62470-11-D-8013	WE09	RESOLUTION CONS FB-DW-57-0516	WQ	Water for QC samples	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTIC EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492 N62470-11-D-8013	WE09	RESOLUTION CONS DUP-052616	WP	Drinking water	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTIC EARLE_NWS	320191981							N62470-11-D-8013	WE09	RESOLUTION CONS FB-DW-57-0516	WQ	Water for QC samples	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTIC EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-57	DW	Domestic well	577074.2328	507231.8371 N62470-11-D-8013	WE09	RESOLUTION CONS DW-57-0516	WP	Drinking water	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTIC EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-57	DW	Domestic well	577074.2328	507231.8371 N62470-11-D-8013	WE09	RESOLUTION CONS DW-57-0516	WP	Drinking water	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTIC EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-57	DW	Domestic well	577074.2328	507231.8371 N62470-11-D-8013	WE09	RESOLUTION CONS DW-57-0516	WP	Drinking water	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTICEARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492 N62470-11-D-8013	WE09	RESOLUTION CONS DUP-052616	WP	Drinking water	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTIC EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492 N62470-11-D-8013	WE09	RESOLUTION CONS DW-95-0516	WP	Drinking water	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTIC EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492 N62470-11-D-8013	WE09	RESOLUTION CONS DUP-052616	WP	Drinking water	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTICEARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492 N62470-11-D-8013	WE09	RESOLUTION CONS DUP-052616	WP	Drinking water	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTICEARLE_NWS	320191981							N62470-11-D-8013	WE09	RESOLUTION CONS FB-DW-95-0516	WQ	Water for QC samples	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTICEARLE_NWS	320191981	SITE 00046	SITE 00046	DW-57	DW	Domestic well	577074.2328	507231.8371 N62470-11-D-8013	WE09	RESOLUTION CONS DW-57-0516	WP	Drinking water	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTICEARLE_NWS	320191981							N62470-11-D-8013	WE09	RESOLUTION CONS FB-DW-95-0516	WQ	Water for QC samples	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTICEARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492 N62470-11-D-8013	WE09	RESOLUTION CONS DUP-052616	WP	Drinking water	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTICEARLE_NWS	320191981	SITE 00046	SITE 00046	DW-57	DW	Domestic well	577074.2328	507231.8371 N62470-11-D-8013	WE09	RESOLUTION CONS DW-57-0516	WP	Drinking water	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTICEARLE_NWS	320191981							N62470-11-D-8013	WE09	RESOLUTION CONS FB-DW-57-0516	WQ	Water for QC samples	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTICEARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492 N62470-11-D-8013	WE09	RESOLUTION CONS DW-95-0516	WP	Drinking water	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTICEARLE_NWS	320191981							N62470-11-D-8013	WE09	RESOLUTION CONS FB-DW-57-0516	WQ	Water for QC samples	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTICEARLE_NWS	320191981	SITE 00046	SITE 00046	DW-57	DW	Domestic well	577074.2328	507231.8371 N62470-11-D-8013	WE09	RESOLUTION CONS DW-57-0516	WP	Drinking water	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTICEARLE_NWS	320191981							N62470-11-D-8013	WE09	RESOLUTION CONS FB-DW-95-0516	WQ	Water for QC samples	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTICEARLE_NWS	320191981							N62470-11-D-8013	WE09	RESOLUTION CONS FB-DW-95-0516	WQ	Water for QC samples	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTICEARLE_NWS	320191981							N62470-11-D-8013	WE09	RESOLUTION CONS FB-DW-95-0516	WQ	Water for QC samples	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTICEARLE_NWS	320191981							N62470-11-D-8013	WE09	RESOLUTION CONS FB-DW-57-0516	WQ	Water for QC samples	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTIC EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492 N62470-11-D-8013	WE09	RESOLUTION CONS DW-95-0516	WP	Drinking water	26-May-16 Perfluoroalkyl Compounds
MID_ATLANTICEARLE_NWS	320191981							N62470-11-D-8013	WE09	RESOLUTION CONS FB-DW-95-0516	WQ	Water for QC samples	26-May-16 Perfluoroalkyl Compounds