NAVFAC
Naval Facilities Engineering Command

Off-Base Drinking Water Sample Results, Combined Level 2 and Level 4 Laboratory Report, Electronic Data Deliverable, Data Validation Report, and the Sample Location Figure, SDG 320-37095-1

Naval Air Warfare Center Warminster
Warminster, Pennsylvania

August 2019

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WARMINSTER_NAWC
SSIC 5000-33c

LABORATORY DATA PACKAGE, 320-37095-1, NAS WILLOW GROVE NAWC WARMINSTER PA

03/29/2018

TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

ANALYTICAL REPORT

Job Number: 320-37095-1

Job Description: Warminster: PFAS, NAS JRB Willow Grove

For:
Tetra Tech, Inc.
234 Mall Boulevard
Suite 260
King of Prussia, PA 19406

Attention: Andy Frebowitz

Approved for release.
David R Alltucker
Project Manager I
3/29/2018 3:04 PM

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03/29/2018

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Qualifiers

LCMS

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.

Glossary

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

Job Narrative
320-37095-1

Receipt
The samples were received on 3/14/2018 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.9º C.

Receipt Exceptions
The container label for the following samples did not match the information listed on the Chain-of-Custody (COC): NAWC-031318-RW-0263 (320-37095-5), NAWC-031318-FRB-0263 (320-37095-6), NAWC-031318-RW-4840 (320-37095-7) and NAWC-031318-FRB-4840 (320-37095-8). The container labels list WGNA before -031318- while the COC lists NAWC-031318-. Labeled according to COC.

LCMS
Method(s) 537: The following samples were re-extracted to confirm the original results. NAWC-031318-RW-061 (320-37095-3) and NAWC-031318-FRB-061 (320-37095-4) The prep chemists verified that the client labels on the bottles matched the laboratory labels. Sample switch was suspected as the RW is non-detect while the FRB sample has some J values detection. The re-extraction confrimed the oriignal results.

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

Organic Prep
Method(s) 537: The following sample: NAWC-031318-RW-4840 (320-37095-7) in preparation batch 320-213605 was inadvertently dropped prior to starting the extraction. The back up bottle was used for the extraction.

Method(s) 537: The following sample has a pH of 6, in preparation batch 320-213605. 320-37095-5 (NAWC-031318-RW-263)

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-213605.

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-214769.

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

Detection Summary

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-37095-1

Client Sample ID: NAWC-031318-RW-185 — Lab Sample ID: 320-37095-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	19	J M	38	6.4	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	16	J M	19	2.7	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	10	J	28	5.2	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	9.8		9.5	1.8	ng/L	1		537	Total/NA

Client Sample ID: NAWC-031318-FRB-185 — Lab Sample ID: 320-37095-2

No Detections.

Client Sample ID: NAWC-031318-RW-061 — Lab Sample ID: 320-37095-3

No Detections.

Client Sample ID: NAWC-031318-FRB-061 — Lab Sample ID: 320-37095-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	28	J M	38	6.4	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	18	J	19	2.6	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	11	J	28	5.2	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.6	J	9.4	1.8	ng/L	1		537	Total/NA

Client Sample ID: NAWC-031318-RW-0263 — Lab Sample ID: 320-37095-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	19	J M	39	6.6	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	18	J	19	2.7	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	9.0	J	29	5.3	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	5.0	J	9.7	1.8	ng/L	1		537	Total/NA

Client Sample ID: NAWC-031318-FRB-0263 — Lab Sample ID: 320-37095-6

No Detections.

Client Sample ID: NAWC-031318-RW-4840 — Lab Sample ID: 320-37095-7

No Detections.

Client Sample ID: NAWC-031318-FRB-4840 — Lab Sample ID: 320-37095-8

No Detections.

Client Sample ID: WGNA-031318-DUP029 — Lab Sample ID: 320-37095-9

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	15	J	19	2.7	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	10	J	29	5.3	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	9.7		9.6	1.8	ng/L	1		537	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: NAWC-031318-RW-185 — Lab Sample ID: 320-37095-1

Date Collected: 03/13/18 10:10 — **Matrix: Water**
Date Received: 03/14/18 09:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**19**	**J M**	38	6.4	ng/L		03/19/18 07:47	03/22/18 23:02	1
Perfluorooctanoic acid (PFOA)	**16**	**J M**	19	2.7	ng/L		03/19/18 07:47	03/22/18 23:02	1
Perfluorononanoic acid (PFNA)	19	U	23	7.6	ng/L		03/19/18 07:47	03/22/18 23:02	1
Perfluorohexanesulfonic acid (PFHxS)	**10**	**J**	28	5.2	ng/L		03/19/18 07:47	03/22/18 23:02	1
Perfluoroheptanoic acid (PFHpA)	**9.8**		9.5	1.8	ng/L		03/19/18 07:47	03/22/18 23:02	1
Perfluorobutanesulfonic acid (PFBS)	34	U	85	15	ng/L		03/19/18 07:47	03/22/18 23:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*90*		*70 - 130*	*03/19/18 07:47*	*03/22/18 23:02*	*1*
13C2 PFDA	*92*		*70 - 130*	*03/19/18 07:47*	*03/22/18 23:02*	*1*

Client Sample ID: NAWC-031318-FRB-185 — Lab Sample ID: 320-37095-2

Date Collected: 03/13/18 10:05 — **Matrix: Water**
Date Received: 03/14/18 09:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	39	6.6	ng/L		03/19/18 07:47	03/22/18 23:07	1
Perfluorooctanoic acid (PFOA)	7.8	U	19	2.7	ng/L		03/19/18 07:47	03/22/18 23:07	1
Perfluorononanoic acid (PFNA)	19	U	23	7.8	ng/L		03/19/18 07:47	03/22/18 23:07	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.3	ng/L		03/19/18 07:47	03/22/18 23:07	1
Perfluoroheptanoic acid (PFHpA)	3.9	U	9.7	1.8	ng/L		03/19/18 07:47	03/22/18 23:07	1
Perfluorobutanesulfonic acid (PFBS)	35	U	87	16	ng/L		03/19/18 07:47	03/22/18 23:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*90*		*70 - 130*	*03/19/18 07:47*	*03/22/18 23:07*	*1*
13C2 PFDA	*97*		*70 - 130*	*03/19/18 07:47*	*03/22/18 23:07*	*1*

Client Sample ID: NAWC-031318-RW-061 — Lab Sample ID: 320-37095-3

Date Collected: 03/13/18 10:35 — **Matrix: Water**
Date Received: 03/14/18 09:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	39	6.6	ng/L		03/19/18 07:47	03/22/18 23:11	1
Perfluorooctanoic acid (PFOA)	7.8	U	19	2.7	ng/L		03/19/18 07:47	03/22/18 23:11	1
Perfluorononanoic acid (PFNA)	19	U	23	7.8	ng/L		03/19/18 07:47	03/22/18 23:11	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.3	ng/L		03/19/18 07:47	03/22/18 23:11	1
Perfluoroheptanoic acid (PFHpA)	3.9	U	9.7	1.8	ng/L		03/19/18 07:47	03/22/18 23:11	1
Perfluorobutanesulfonic acid (PFBS)	35	U	87	16	ng/L		03/19/18 07:47	03/22/18 23:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*90*		*70 - 130*	*03/19/18 07:47*	*03/22/18 23:11*	*1*
13C2 PFDA	*92*		*70 - 130*	*03/19/18 07:47*	*03/22/18 23:11*	*1*

Client Sample ID: NAWC-031318-FRB-061 — Lab Sample ID: 320-37095-4

Date Collected: 03/13/18 10:40 **Matrix: Water**
Date Received: 03/14/18 09:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**28**	**J M**	38	6.4	ng/L		03/19/18 07:47	03/22/18 23:16	1
Perfluorooctanoic acid (PFOA)	**18**	**J**	19	2.6	ng/L		03/19/18 07:47	03/22/18 23:16	1
Perfluorononanoic acid (PFNA)	19	U	23	7.5	ng/L		03/19/18 07:47	03/22/18 23:16	1
Perfluorohexanesulfonic acid (PFHxS)	**11**	**J**	28	5.2	ng/L		03/19/18 07:47	03/22/18 23:16	1
Perfluoroheptanoic acid (PFHpA)	**4.6**	**J**	9.4	1.8	ng/L		03/19/18 07:47	03/22/18 23:16	1
Perfluorobutanesulfonic acid (PFBS)	34	U	85	15	ng/L		03/19/18 07:47	03/22/18 23:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*88*		*70 - 130*	*03/19/18 07:47*	*03/22/18 23:16*	*1*
13C2 PFDA	*95*		*70 - 130*	*03/19/18 07:47*	*03/22/18 23:16*	*1*

Client Sample ID: NAWC-031318-RW-0263 — Lab Sample ID: 320-37095-5

Date Collected: 03/13/18 13:40 **Matrix: Water**
Date Received: 03/14/18 09:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**19**	**J M**	39	6.6	ng/L		03/19/18 07:47	03/22/18 23:21	1
Perfluorooctanoic acid (PFOA)	**18**	**J**	19	2.7	ng/L		03/19/18 07:47	03/22/18 23:21	1
Perfluorononanoic acid (PFNA)	19	U	23	7.7	ng/L		03/19/18 07:47	03/22/18 23:21	1
Perfluorohexanesulfonic acid (PFHxS)	**9.0**	**J**	29	5.3	ng/L		03/19/18 07:47	03/22/18 23:21	1
Perfluoroheptanoic acid (PFHpA)	**5.0**	**J**	9.7	1.8	ng/L		03/19/18 07:47	03/22/18 23:21	1
Perfluorobutanesulfonic acid (PFBS)	35	U	87	16	ng/L		03/19/18 07:47	03/22/18 23:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*100*		*70 - 130*	*03/19/18 07:47*	*03/22/18 23:21*	*1*
13C2 PFDA	*97*		*70 - 130*	*03/19/18 07:47*	*03/22/18 23:21*	*1*

Client Sample ID: NAWC-031318-FRB-0263 — Lab Sample ID: 320-37095-6

Date Collected: 03/13/18 13:35 **Matrix: Water**
Date Received: 03/14/18 09:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	U	38	6.5	ng/L		03/19/18 07:47	03/22/18 23:25	1
Perfluorooctanoic acid (PFOA)	7.7	U	19	2.7	ng/L		03/19/18 07:47	03/22/18 23:25	1
Perfluorononanoic acid (PFNA)	19	U	23	7.7	ng/L		03/19/18 07:47	03/22/18 23:25	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.3	ng/L		03/19/18 07:47	03/22/18 23:25	1
Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	1.8	ng/L		03/19/18 07:47	03/22/18 23:25	1
Perfluorobutanesulfonic acid (PFBS)	35	U	86	15	ng/L		03/19/18 07:47	03/22/18 23:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*102*		*70 - 130*	*03/19/18 07:47*	*03/22/18 23:25*	*1*
13C2 PFDA	*96*		*70 - 130*	*03/19/18 07:47*	*03/22/18 23:25*	*1*

Client Sample ID: NAWC-031318-RW-4840 — Lab Sample ID: 320-37095-7

Date Collected: 03/13/18 14:10 — **Matrix: Water**
Date Received: 03/14/18 09:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	U	38	6.5	ng/L		03/19/18 07:47	03/22/18 23:30	1
Perfluorooctanoic acid (PFOA)	7.6	U	19	2.7	ng/L		03/19/18 07:47	03/22/18 23:30	1
Perfluorononanoic acid (PFNA)	19	U	23	7.6	ng/L		03/19/18 07:47	03/22/18 23:30	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	28	5.2	ng/L		03/19/18 07:47	03/22/18 23:30	1
Perfluoroheptanoic acid (PFHpA)	3.8	U	9.5	1.8	ng/L		03/19/18 07:47	03/22/18 23:30	1
Perfluorobutanesulfonic acid (PFBS)	34	U	85	15	ng/L		03/19/18 07:47	03/22/18 23:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*105*		*70 - 130*	*03/19/18 07:47*	*03/22/18 23:30*	*1*
13C2 PFDA	*110*		*70 - 130*	*03/19/18 07:47*	*03/22/18 23:30*	*1*

Client Sample ID: NAWC-031318-FRB-4840 — Lab Sample ID: 320-37095-8

Date Collected: 03/13/18 14:05 — **Matrix: Water**
Date Received: 03/14/18 09:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	U	38	6.5	ng/L		03/19/18 07:47	03/22/18 23:44	1
Perfluorooctanoic acid (PFOA)	7.6	U	19	2.7	ng/L		03/19/18 07:47	03/22/18 23:44	1
Perfluorononanoic acid (PFNA)	19	U	23	7.6	ng/L		03/19/18 07:47	03/22/18 23:44	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	29	5.2	ng/L		03/19/18 07:47	03/22/18 23:44	1
Perfluoroheptanoic acid (PFHpA)	3.8	U	9.5	1.8	ng/L		03/19/18 07:47	03/22/18 23:44	1
Perfluorobutanesulfonic acid (PFBS)	34	U	86	15	ng/L		03/19/18 07:47	03/22/18 23:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*97*		*70 - 130*	*03/19/18 07:47*	*03/22/18 23:44*	*1*
13C2 PFDA	*98*		*70 - 130*	*03/19/18 07:47*	*03/22/18 23:44*	*1*

Client Sample ID: WGNA-031318-DUP029 — Lab Sample ID: 320-37095-9

Date Collected: 03/13/18 07:00 — **Matrix: Water**
Date Received: 03/14/18 09:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	U	39	6.5	ng/L		03/19/18 07:47	03/22/18 23:49	1
Perfluorooctanoic acid (PFOA)	**15**	**J**	19	2.7	ng/L		03/19/18 07:47	03/22/18 23:49	1
Perfluorononanoic acid (PFNA)	19	U	23	7.7	ng/L		03/19/18 07:47	03/22/18 23:49	1
Perfluorohexanesulfonic acid (PFHxS)	**10**	**J**	29	5.3	ng/L		03/19/18 07:47	03/22/18 23:49	1
Perfluoroheptanoic acid (PFHpA)	**9.7**		9.6	1.8	ng/L		03/19/18 07:47	03/22/18 23:49	1
Perfluorobutanesulfonic acid (PFBS)	35	U	87	16	ng/L		03/19/18 07:47	03/22/18 23:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*97*		*70 - 130*	*03/19/18 07:47*	*03/22/18 23:49*	*1*
13C2 PFDA	*100*		*70 - 130*	*03/19/18 07:47*	*03/22/18 23:49*	*1*

Default Detection Limits

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-37095-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

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

Prep: 537

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	90	16	ng/L	537
Perfluoroheptanoic acid (PFHpA)	10	1.9	ng/L	537
Perfluorohexanesulfonic acid (PFHxS)	30	5.5	ng/L	537
Perfluorononanoic acid (PFNA)	24	8.0	ng/L	537
Perfluorooctanesulfonic acid (PFOS)	40	6.8	ng/L	537
Perfluorooctanoic acid (PFOA)	20	2.8	ng/L	537

Surrogate Summary

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-37095-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	PFHxA (70-130)	PFDA (70-130)
320-37095-1	NAWC-031318-RW-185	90	92
320-37095-2	NAWC-031318-FRB-185	90	97
320-37095-3	NAWC-031318-RW-061	90	92
320-37095-4	NAWC-031318-FRB-061	88	95
320-37095-5	NAWC-031318-RW-0263	100	97
320-37095-6	NAWC-031318-FRB-0263	102	96
320-37095-7	NAWC-031318-RW-4840	105	110
320-37095-8	NAWC-031318-FRB-4840	97	98
320-37095-9	WGNA-031318-DUP029	97	100
LLCS 320-213605/2-A	Lab Control Sample	101	98
LLCSD 320-213605/3-A	Lab Control Sample Dup	96	94
MB 320-213605/1-A	Method Blank	100	98

Surrogate Legend

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA

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

Lab Sample ID: MB 320-213605/1-A **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 214496 **Prep Batch: 213605**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		03/19/18 07:47	03/22/18 22:48	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		03/19/18 07:47	03/22/18 22:48	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		03/19/18 07:47	03/22/18 22:48	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		03/19/18 07:47	03/22/18 22:48	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		03/19/18 07:47	03/22/18 22:48	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		03/19/18 07:47	03/22/18 22:48	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*100*		*70 - 130*	*03/19/18 07:47*	*03/22/18 22:48*	*1*
13C2 PFDA	*98*		*70 - 130*	*03/19/18 07:47*	*03/22/18 22:48*	*1*

Lab Sample ID: LLCS 320-213605/2-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 214496 **Prep Batch: 213605**

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	40.2	43.0	M	ng/L		107	50 - 150
Perfluorooctanoic acid (PFOA)	20.1	21.2		ng/L		106	50 - 150
Perfluorononanoic acid (PFNA)	20.0	21.2	J	ng/L		106	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	30.0	33.2		ng/L		111	50 - 150
Perfluoroheptanoic acid (PFHpA)	10.0	11.0		ng/L		110	50 - 150
Perfluorobutanesulfonic acid (PFBS)	90.0	85.8	J	ng/L		95	50 - 150

Surrogate	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
13C2 PFHxA	*101*		*70 - 130*
13C2 PFDA	*98*		*70 - 130*

Lab Sample ID: LLCSD 320-213605/3-A **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 214496 **Prep Batch: 213605**

Analyte	Spike Added	LLCSD Result	LLCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)	40.2	43.6	M	ng/L		109	50 - 150	1	50
Perfluorooctanoic acid (PFOA)	20.1	20.4		ng/L		101	50 - 150	4	50
Perfluorononanoic acid (PFNA)	20.0	20.6	J	ng/L		103	50 - 150	3	50
Perfluorohexanesulfonic acid (PFHxS)	30.0	33.2		ng/L		111	50 - 150	0.05	50
Perfluoroheptanoic acid (PFHpA)	10.0	10.9		ng/L		109	50 - 150	0.9	50
Perfluorobutanesulfonic acid (PFBS)	90.0	84.9	J	ng/L		94	50 - 150	1	50

Surrogate	*LLCSD %Recovery*	*LLCSD Qualifier*	*Limits*
13C2 PFHxA	*96*		*70 - 130*
13C2 PFDA	*94*		*70 - 130*

LCMS

Prep Batch: 213605

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-37095-1	NAWC-031318-RW-185	Total/NA	Water	537	
320-37095-2	NAWC-031318-FRB-185	Total/NA	Water	537	
320-37095-3	NAWC-031318-RW-061	Total/NA	Water	537	
320-37095-4	NAWC-031318-FRB-061	Total/NA	Water	537	
320-37095-5	NAWC-031318-RW-0263	Total/NA	Water	537	
320-37095-6	NAWC-031318-FRB-0263	Total/NA	Water	537	
320-37095-7	NAWC-031318-RW-4840	Total/NA	Water	537	
320-37095-8	NAWC-031318-FRB-4840	Total/NA	Water	537	
320-37095-9	WGNA-031318-DUP029	Total/NA	Water	537	
MB 320-213605/1-A	Method Blank	Total/NA	Water	537	
LLCS 320-213605/2-A	Lab Control Sample	Total/NA	Water	537	
LLCSD 320-213605/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 214496

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-37095-1	NAWC-031318-RW-185	Total/NA	Water	537	213605
320-37095-2	NAWC-031318-FRB-185	Total/NA	Water	537	213605
320-37095-3	NAWC-031318-RW-061	Total/NA	Water	537	213605
320-37095-4	NAWC-031318-FRB-061	Total/NA	Water	537	213605
320-37095-5	NAWC-031318-RW-0263	Total/NA	Water	537	213605
320-37095-6	NAWC-031318-FRB-0263	Total/NA	Water	537	213605
320-37095-7	NAWC-031318-RW-4840	Total/NA	Water	537	213605
MB 320-213605/1-A	Method Blank	Total/NA	Water	537	213605
LLCS 320-213605/2-A	Lab Control Sample	Total/NA	Water	537	213605
LLCSD 320-213605/3-A	Lab Control Sample Dup	Total/NA	Water	537	213605

Analysis Batch: 214497

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-37095-8	NAWC-031318-FRB-4840	Total/NA	Water	537	213605
320-37095-9	WGNA-031318-DUP029	Total/NA	Water	537	213605

Client Sample ID: NAWC-031318-RW-185 — Lab Sample ID: 320-37095-1

Date Collected: 03/13/18 10:10 — **Matrix: Water**
Date Received: 03/14/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			213605	03/19/18 07:47	SK	TAL SAC
Total/NA	Analysis	537		1	214496	03/22/18 23:02	JRB	TAL SAC

Client Sample ID: NAWC-031318-FRB-185 — Lab Sample ID: 320-37095-2

Date Collected: 03/13/18 10:05 — **Matrix: Water**
Date Received: 03/14/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			213605	03/19/18 07:47	SK	TAL SAC
Total/NA	Analysis	537		1	214496	03/22/18 23:07	JRB	TAL SAC

Client Sample ID: NAWC-031318-RW-061 — Lab Sample ID: 320-37095-3

Date Collected: 03/13/18 10:35 — **Matrix: Water**
Date Received: 03/14/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			213605	03/19/18 07:47	SK	TAL SAC
Total/NA	Analysis	537		1	214496	03/22/18 23:11	JRB	TAL SAC

Client Sample ID: NAWC-031318-FRB-061 — Lab Sample ID: 320-37095-4

Date Collected: 03/13/18 10:40 — **Matrix: Water**
Date Received: 03/14/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			213605	03/19/18 07:47	SK	TAL SAC
Total/NA	Analysis	537		1	214496	03/22/18 23:16	JRB	TAL SAC

Client Sample ID: NAWC-031318-RW-0263 — Lab Sample ID: 320-37095-5

Date Collected: 03/13/18 13:40 — **Matrix: Water**
Date Received: 03/14/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			213605	03/19/18 07:47	SK	TAL SAC
Total/NA	Analysis	537		1	214496	03/22/18 23:21	JRB	TAL SAC

Client Sample ID: NAWC-031318-FRB-0263 — Lab Sample ID: 320-37095-6

Date Collected: 03/13/18 13:35 — **Matrix: Water**
Date Received: 03/14/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			213605	03/19/18 07:47	SK	TAL SAC
Total/NA	Analysis	537		1	214496	03/22/18 23:25	JRB	TAL SAC

Lab Chronicle

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-37095-1

Client Sample ID: NAWC-031318-RW-4840

Lab Sample ID: 320-37095-7
Date Collected: 03/13/18 14:10
Matrix: Water
Date Received: 03/14/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			213605	03/19/18 07:47	SK	TAL SAC
Total/NA	Analysis	537		1	214496	03/22/18 23:30	JRB	TAL SAC

Client Sample ID: NAWC-031318-FRB-4840

Lab Sample ID: 320-37095-8
Date Collected: 03/13/18 14:05
Matrix: Water
Date Received: 03/14/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			213605	03/19/18 07:47	SK	TAL SAC
Total/NA	Analysis	537		1	214497	03/22/18 23:44	JRB	TAL SAC

Client Sample ID: WGNA-031318-DUP029

Lab Sample ID: 320-37095-9
Date Collected: 03/13/18 07:00
Matrix: Water
Date Received: 03/14/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			213605	03/19/18 07:47	SK	TAL SAC
Total/NA	Analysis	537		1	214497	03/22/18 23:49	JRB	TAL SAC

Laboratory References:

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

Accreditation/Certification Summary

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-37095-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
Arizona	State Program	9	AZ0708	08-11-18
Arkansas DEQ	State Program	6	88-0691	06-17-18
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-18
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-18
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-18 *
Kansas	NELAP	7	E-10375	10-31-18
L-A-B	DoD ELAP		L2468	01-20-21
Louisiana	NELAP	6	30612	06-30-18
Maine	State Program	1	CA0004	04-14-18
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-18
New Hampshire	NELAP	1	2997	04-18-18
New Jersey	NELAP	2	CA005	06-30-18
New York	NELAP	2	11666	04-01-18
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-18 *
Texas	NELAP	6	T104704399	05-31-18
US Fish & Wildlife	Federal		LE148388-0	07-31-18
USDA	Federal		P330-11-00436	01-17-21
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-18
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-37095-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Method	Method Description	Protocol	Laboratory
537	Perfluorinated Alkyl Acids (LC/MS)	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

Client: Tetra Tech, Inc.
TestAmerica Job ID: 320-37095-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-37095-1	NAWC-031318-RW-185	Water	03/13/18 10:10	03/14/18 09:15
320-37095-2	NAWC-031318-FRB-185	Water	03/13/18 10:05	03/14/18 09:15
320-37095-3	NAWC-031318-RW-061	Water	03/13/18 10:35	03/14/18 09:15
320-37095-4	NAWC-031318-FRB-061	Water	03/13/18 10:40	03/14/18 09:15
320-37095-5	NAWC-031318-RW-0263	Water	03/13/18 13:40	03/14/18 09:15
320-37095-6	NAWC-031318-FRB-0263	Water	03/13/18 13:35	03/14/18 09:15
320-37095-7	NAWC-031318-RW-4840	Water	03/13/18 14:10	03/14/18 09:15
320-37095-8	NAWC-031318-FRB-4840	Water	03/13/18 14:05	03/14/18 09:15
320-37095-9	WGNA-031318-DUP029	Water	03/13/18 07:00	03/14/18 09:15

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 214409

Lab Sample ID: IC 320-214409/4 Client Sample ID:

Date Analyzed: 03/22/18 14:53 Lab File ID: 2018.03.22_537ICAL_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	1.68	Baseline	roycea	03/22/18 15:17
Perfluorooctanoic acid (PFOA)	1.87	Baseline	roycea	03/22/18 15:18
Perfluorooctanesulfonic acid (PFOS)	2.13	Assign Peak	roycea	03/22/18 15:19

Lab Sample ID: IC 320-214409/5 Client Sample ID:

Date Analyzed: 03/22/18 14:57 Lab File ID: 2018.03.22_537ICAL_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	1.68	Baseline	roycea	03/22/18 15:21
Perfluorooctanoic acid (PFOA)	1.88	Baseline	roycea	03/22/18 15:21
Perfluorooctanesulfonic acid (PFOS)	2.13	Peak assignment corrected	roycea	03/22/18 15:20

Lab Sample ID: IC 320-214409/6 Client Sample ID:

Date Analyzed: 03/22/18 15:02 Lab File ID: 2018.03.22_537ICAL_006.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	1.68	Baseline	roycea	03/22/18 15:23
Perfluorooctanesulfonic acid (PFOS)	2.13	Peak assignment corrected	roycea	03/22/18 15:22

Lab Sample ID: IC 320-214409/7 ICISAV Client Sample ID:

Date Analyzed: 03/22/18 15:07 Lab File ID: 2018.03.22_537ICAL_007.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.13	Peak assignment corrected	roycea	03/22/18 15:23

537

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 214409

Lab Sample ID: IC 320-214409/8 Client Sample ID:

Date Analyzed: 03/22/18 15:11 Lab File ID: 2018.03.22_537ICAL_008.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.13	Peak assignment corrected	roycea	03/22/18 15:31

Lab Sample ID: IC 320-214409/9 Client Sample ID:

Date Analyzed: 03/22/18 15:16 Lab File ID: 2018.03.22_537ICAL_009.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.12	Peak assignment corrected	barnettj	03/22/18 16:01

Lab Sample ID: CCVL 320-214409/11 Client Sample ID:

Date Analyzed: 03/22/18 15:25 Lab File ID: 2018.03.22_537ICAL_011.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.12	Peak assignment corrected	barnettj	03/22/18 16:07

Lab Sample ID: ICV 320-214409/13 Client Sample ID:

Date Analyzed: 03/22/18 15:35 Lab File ID: 2018.03.22_537ICAL_013.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.12	Peak assignment corrected	barnettj	03/22/18 16:08

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 214496

Lab Sample ID: CCV 320-214496/17 CCVIS Client Sample ID:

Date Analyzed: 03/22/18 22:39 Lab File ID: 2018.03.22_537B_020.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.11	Peak assignment corrected	barnettj	03/23/18 14:19

Lab Sample ID: LLCS 320-213605/2-A Client Sample ID:

Date Analyzed: 03/22/18 22:53 Lab File ID: 2018.03.22_537B_023.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.12	Peak assignment corrected	barnettj	03/23/18 14:23

Lab Sample ID: LLCSD 320-213605/3-A Client Sample ID:

Date Analyzed: 03/22/18 22:57 Lab File ID: 2018.03.22_537B_024.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.12	Peak assignment corrected	barnettj	03/23/18 14:23

Lab Sample ID: 320-37095-1 Client Sample ID: NAWC-031318-RW-185

Date Analyzed: 03/22/18 23:02 Lab File ID: 2018.03.22_537B_025.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	1.87	Baseline	barnettj	03/23/18 14:24
Perfluorooctanesulfonic acid (PFOS)	2.12	Baseline	barnettj	03/23/18 14:24

537

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 214496

Lab Sample ID: 320-37095-4 Client Sample ID: NAWC-031318-FRB-061

Date Analyzed: 03/22/18 23:16 Lab File ID: 2018.03.22_537B_028.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.12	Peak assignment corrected	barnettj	03/23/18 14:25

Lab Sample ID: 320-37095-5 Client Sample ID: NAWC-031318-RW-0263

Date Analyzed: 03/22/18 23:21 Lab File ID: 2018.03.22_537B_029.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.02	Baseline	barnettj	03/23/18 14:26

Lab Sample ID: CCV 320-214496/29 CCVIS Client Sample ID:

Date Analyzed: 03/22/18 23:35 Lab File ID: 2018.03.22_537B_032.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.12	Peak assignment corrected	barnettj	03/23/18 14:19

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 214497

Lab Sample ID: CCV 320-214497/29 CCVIS Client Sample ID:

Date Analyzed: 03/22/18 23:35 Lab File ID: 2018.03.22_537B_032.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.12	Peak assignment corrected	barnettj	03/23/18 14:19

Lab Sample ID: CCV 320-214497/33 CCVIS Client Sample ID:

Date Analyzed: 03/22/18 23:53 Lab File ID: 2018.03.22_537B_036.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.11	Peak assignment corrected	barnettj	03/23/18 14:19

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-ICV_00030	07/30/18	02/15/18	MeOH/H2O, Lot 067374	10 mL	LC537-IS_00059	1000 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
.LC537-IS_00059	07/30/18	01/30/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
LC537-ICV_00030	07/30/18	02/15/18	MeOH/H2O, Lot 067374	10 mL	LC537-SU_00059	1000 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
					LC537ICIM2_00001	400 uL	Perfluorobutanesulfonic acid (PFBS)	100.092 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	20.1619 ng/mL
							Perfluorononanoic acid (PFNA)	20.1641 ng/mL
							Perfluorooctanoic acid (PFOA)	20.167 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	20.1702 ng/mL
.LC537-SU_00059	07/30/18	01/30/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LC537ICIM2_00001	08/15/18	02/15/18	Methanol, Lot 090285	10 mL	LC537ICIM_00020	0.5 mL	Perfluorobutanesulfonic acid (PFBS)	2.5023 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.25 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.504047 ug/mL
							Perfluorononanoic acid (PFNA)	0.504103 ug/mL
							Perfluorooctanoic acid (PFOA)	0.504176 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.504255 ug/mL
..LC537ICIM_00020	08/15/18	02/15/18	Methanol, Lot 090285	25 mL	LC537-PFBS2_00009	0.625 mL	Perfluorobutanesulfonic acid (PFBS)	50.0459 ug/mL
					LC537-PFHpA2_00012	0.0625 mL	Perfluoroheptanoic acid (PFHpA)	5 ug/mL
					LC537-PFHxS2_00009	0.126 mL	Perfluorohexanesulfonic acid (PFHxS)	10.0809 ug/mL
					LC537-PFNA2_00010	0.126 mL	Perfluorononanoic acid (PFNA)	10.0821 ug/mL
					LC537-PFOA2_00011	0.126 mL	Perfluorooctanoic acid (PFOA)	10.0835 ug/mL
					LC537-PFOS2_00011	0.126 mL	Perfluorooctanesulfonic acid (PFOS)	10.0851 ug/mL
...LC537-PFBS2_00009	08/15/18	02/15/18	Methanol, Lot 090285	17.1 mL	LC537_PFBS2_00002	0.0343 g	Perfluorobutanesulfonic acid (PFBS)	2001.84 ug/mL
....LC537_PFBS2_00002	09/08/22	Santa Cruz Biotechnology, Lot F0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	0.998 g/g

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC537-PFHpA2_00012	08/15/18	02/15/18	Methanol, Lot 09092	23.95 mL	LC537_PFHpA2_00002	0.0479 g	Perfluoroheptanoic acid (PFHpA)	2000 ug/mL
....LC537_PFHpA2_00002	06/13/22		Afla Aesar, Lot 10200390		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	1 g/g
...LC537-PFHxS2_00009	08/15/18	02/15/18	Methanol, Lot 090285	25.87 mL	LC537_PFHxS2_00002	0.0569 g	Perfluorohexanesulfonic acid (PFHxS)	2000.19 ug/mL
....LC537_PFHxS2_00002	06/08/22		Santa Cruz Biotechnology, Lot G2516		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA2_00010	08/15/18	02/15/18	Methanol, Lot 090285	16.58 mL	LC537_PFNA2_00002	0.0333 g	Perfluorononanoic acid (PFNA)	2000.41 ug/mL
....LC537_PFNA2_00002	06/14/22		Aldrich, Lot MKCC0699		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.996 g/g
...LC537-PFOA2_00011	08/15/18	02/15/18	Methanol, Lot 090285	22.96 mL	LC537_PFOA2_00002	0.0464 g	Perfluorooctanoic acid (PFOA)	2000.7 ug/mL
....LC537_PFOA2_00002	06/09/22		Afla Aesar, Lot 10199078		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.99 g/g
...LC537-PFOS2_00011	08/15/18	02/15/18	Methanol, Lot 090285	14.71 mL	LC537_PFOS2_00002	0.0378 g	Perfluorooctanesulfonic acid (PFOS)	2001.01 ug/mL
....LC537_PFOS2_00002	06/14/22		Sigma, Lot BCBQ0108V		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.7787 g/g
LC537-IS_00063	08/27/18	02/27/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
.LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCMPFOS_00021	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
LC537-L1_00021	04/01/18	02/15/18	MeOH/H2O, Lot 090285	5 mL	LC537-IS_00059	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-MSP_00032	60 uL	Perfluorobutanesulfonic acid (PFBS)	9.0018 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1.00031 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	3.00134 ng/mL
							Perfluorononanoic acid (PFNA)	2.00088 ng/mL
							Perfluorooctanoic acid (PFOA)	2.01129 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.01756 ng/mL
					LC537-SU_00059	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-IS_00059	07/30/18	01/30/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-MSP_00032	04/01/18	01/30/18	Methanol, Lot 141039	40000 uL	LC537SPIM_00026	333.4 uL	Perfluorobutanesulfonic acid (PFBS)	750.15 ng/mL
							Perfluoroheptanoic acid (PFHpA)	83.3591 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	250.111 ng/mL
							Perfluorononanoic acid (PFNA)	166.74 ng/mL
							Perfluorooctanoic acid (PFOA)	167.608 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	334.797 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LC537SPIM_00026	04/01/18	01/30/18	Methanol, Lot 104453	20000 uL	LC537-PFBS_00009	900 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00016	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0011 ug/mL
					LC537-PFHxS_00011	300 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0074 ug/mL
					LC537-PFNA_00014	400 uL	Perfluorononanoic acid (PFNA)	20.0048 ug/mL
					LC537-PFOA_00015	400 uL	Perfluorooctanoic acid (PFOA)	20.1089 ug/mL
					LC537-PFOS_00009	800 uL	Perfluorooctanesulfonic acid (PFOS)	40.1676 ug/mL
...LC537-PFBS_00009	04/01/18	01/30/18	Methanol, Lot 090285	48.7 mL	LC537_PFBS_00002	0.0974 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00016	04/01/18	01/30/18	Methanol, Lot 090285	59.74 mL	LC537_PFHpA_00002	0.1207 g	Perfluoroheptanoic acid (PFHpA)	2.00022 mg/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00011	04/01/18	01/30/18	Methanol, Lot 090285	38.64 mL	LC537_PFHxS_00002	0.085 g	Perfluorohexanesulfonic acid (PFHxS)	2.00049 mg/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00014	04/01/18	01/30/18	Methanol, Lot 090285	62.58 mL	LC537_PFNA_00002	0.065 g	Perfluorononanoic acid (PFNA)	1000.24 ug/mL
....LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00015	07/30/18	01/30/18	Methanol, Lot 090285	31 mL	LC537_PFOA_00003	0.0312 g	Perfluorooctanoic acid (PFOA)	1.00545 mg/mL
....LC537_PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00009	07/30/18	01/30/18	Methanol, Lot 090285	36 mL	LC537_PFOS_00003	0.0397 g	Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-SU_00059	07/30/18	01/30/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L2_00021	04/01/18	02/05/18	MeOH/H2O, Lot 090285	20 mL	LC537-HSP_00027	320 uL	Perfluorobutanesulfonic acid (PFBS)	20.0016 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.22264 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	6.66884 ng/mL
							Perfluorononanoic acid (PFNA)	4.44587 ng/mL
							Perfluorooctanoic acid (PFOA)	4.469 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	8.92684 ng/mL
					LC537-IS_00059	2 mL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00059	2 mL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LC537-HSP_00027	04/01/18	01/30/18	Methanol, Lot 141039	40000 uL	LC537SPIM_00026	555.6 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.915 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.802 ng/mL
							Perfluorononanoic acid (PFNA)	277.867 ng/mL
							Perfluorooctanoic acid (PFOA)	279.313 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	557.928 ng/mL
..LC537SPIM_00026	04/01/18	01/30/18	Methanol, Lot 104453	20000 uL	LC537-PFBS_00009	900 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00016	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0011 ug/mL
					LC537-PFHxS_00011	300 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0074 ug/mL
					LC537-PFNA_00014	400 uL	Perfluorononanoic acid (PFNA)	20.0048 ug/mL
					LC537-PFOA_00015	400 uL	Perfluorooctanoic acid (PFOA)	20.1089 ug/mL
					LC537-PFOS_00009	800 uL	Perfluorooctanesulfonic acid (PFOS)	40.1676 ug/mL
...LC537-PFBS_00009	04/01/18	01/30/18	Methanol, Lot 090285	48.7 mL	LC537_PFBS_00002	0.0974 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00016	04/01/18	01/30/18	Methanol, Lot 090285	59.74 mL	LC537_PFHpA_00002	0.1207 g	Perfluoroheptanoic acid (PFHpA)	2.00022 mg/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00011	04/01/18	01/30/18	Methanol, Lot 090285	38.64 mL	LC537_PFHxS_00002	0.085 g	Perfluorohexanesulfonic acid (PFHxS)	2.00049 mg/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00014	04/01/18	01/30/18	Methanol, Lot 090285	62.58 mL	LC537_PFNA_00002	0.065 g	Perfluorononanoic acid (PFNA)	1000.24 ug/mL
....LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00015	07/30/18	01/30/18	Methanol, Lot 090285	31 mL	LC537_PFOA_00003	0.0312 g	Perfluorooctanoic acid (PFOA)	1.00545 mg/mL
....LC537_PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00009	07/30/18	01/30/18	Methanol, Lot 090285	36 mL	LC537_PFOS_00003	0.0397 g	Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00059	07/30/18	01/30/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00059	07/30/18	01/30/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-L3_00024	04/01/18	02/05/18	MeOH/H2O, Lot 090285	20 mL	LC537-HSP_00027	720 uL	Perfluorobutanesulfonic acid (PFBS)	45.0036 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5.00094 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	15.0049 ng/mL
							Perfluorononanoic acid (PFNA)	10.0032 ng/mL
							Perfluorooctanoic acid (PFOA)	10.0553 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	20.0854 ng/mL
					LC537-IS_00059	2 mL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00059	2 mL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00027	04/01/18	01/30/18	Methanol, Lot 141039	40000 uL	LC537SPIM_00026	555.6 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.915 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.802 ng/mL
							Perfluorononanoic acid (PFNA)	277.867 ng/mL
							Perfluorooctanoic acid (PFOA)	279.313 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	557.928 ng/mL
..LC537SPIM_00026	04/01/18	01/30/18	Methanol, Lot 104453	20000 uL	LC537-PFBS_00009	900 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00016	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0011 ug/mL
					LC537-PFHxS_00011	300 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0074 ug/mL
					LC537-PFNA_00014	400 uL	Perfluorononanoic acid (PFNA)	20.0048 ug/mL
					LC537-PFOA_00015	400 uL	Perfluorooctanoic acid (PFOA)	20.1089 ug/mL
					LC537-PFOS_00009	800 uL	Perfluorooctanesulfonic acid (PFOS)	40.1676 ug/mL
...LC537-PFBS_00009	04/01/18	01/30/18	Methanol, Lot 090285	48.7 mL	LC537_PFBS_00002	0.0974 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00016	04/01/18	01/30/18	Methanol, Lot 090285	59.74 mL	LC537_PFHpA_00002	0.1207 g	Perfluoroheptanoic acid (PFHpA)	2.00022 mg/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00011	04/01/18	01/30/18	Methanol, Lot 090285	38.64 mL	LC537_PFHxS_00002	0.085 g	Perfluorohexanesulfonic acid (PFHxS)	2.00049 mg/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00014	04/01/18	01/30/18	Methanol, Lot 090285	62.58 mL	LC537_PFNA_00002	0.065 g	Perfluorononanoic acid (PFNA)	1000.24 ug/mL
....LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00015	07/30/18	01/30/18	Methanol, Lot 090285	31 mL	LC537_PFOA_00003	0.0312 g	Perfluorooctanoic acid (PFOA)	1.00545 mg/mL
....LC537_PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC537-PFOS_00009	07/30/18	01/30/18	Methanol, Lot 090285	36 mL	LC537_PFOS_00003	0.0397 g	Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00059	07/30/18	01/30/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00059	07/30/18	01/30/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L4_00021	04/01/18	02/15/18	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00027	360 uL	Perfluorobutanesulfonic acid (PFBS)	90.0072 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10.0019 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	30.0098 ng/mL
							Perfluorononanoic acid (PFNA)	20.0064 ng/mL
							Perfluorooctanoic acid (PFOA)	20.1105 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	40.1708 ng/mL
					LC537-IS_00059	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00059	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00027	04/01/18	01/30/18	Methanol, Lot 141039	40000 uL	LC537SPIM_00026	555.6 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.915 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.802 ng/mL
							Perfluorononanoic acid (PFNA)	277.867 ng/mL
							Perfluorooctanoic acid (PFOA)	279.313 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	557.928 ng/mL
..LC537SPIM_00026	04/01/18	01/30/18	Methanol, Lot 104453	20000 uL	LC537-PFBS_00009	900 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00016	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0011 ug/mL
					LC537-PFHxS_00011	300 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0074 ug/mL
					LC537-PFNA_00014	400 uL	Perfluorononanoic acid (PFNA)	20.0048 ug/mL
					LC537-PFOA_00015	400 uL	Perfluorooctanoic acid (PFOA)	20.1089 ug/mL
					LC537-PFOS_00009	800 uL	Perfluorooctanesulfonic acid (PFOS)	40.1676 ug/mL
...LC537-PFBS_00009	04/01/18	01/30/18	Methanol, Lot 090285	48.7 mL	LC537_PFBS_00002	0.0974 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00016	04/01/18	01/30/18	Methanol, Lot 090285	59.74 mL	LC537_PFHpA_00002	0.1207 g	Perfluoroheptanoic acid (PFHpA)	2.00022 mg/mL
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00011	04/01/18	01/30/18	Methanol, Lot 090285	38.64 mL	LC537_PFHxS_00002	0.085 g	Perfluorohexanesulfonic acid (PFHxS)	2.00049 mg/mL
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00014	04/01/18	01/30/18	Methanol, Lot 090285	62.58 mL	LC537_PFNA_00002	0.065 g	Perfluorononanoic acid (PFNA)	1000.24 ug/mL
....LC537_PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00015	07/30/18	01/30/18	Methanol, Lot 090285	31 mL	LC537_PFOA_00003	0.0312 g	Perfluorooctanoic acid (PFOA)	1.00545 mg/mL
....LC537_PFOA_00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00009	07/30/18	01/30/18	Methanol, Lot 090285	36 mL	LC537_PFOS_00003	0.0397 g	Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
....LC537_PFOS_00003	04/17/19		sigma alrich, Lot SZBE107XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00059	07/30/18	01/30/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00059	07/30/18	01/30/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21		Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L5_00025	04/01/18	02/05/18	MeOH/H2O, Lot 090285	20 mL	LC537-HSP_00027	2160 uL	Perfluorobutanesulfonic acid (PFBS)	135.011 ng/mL
							Perfluoroheptanoic acid (PFHpA)	15.0028 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.0147 ng/mL
							Perfluorononanoic acid (PFNA)	30.0096 ng/mL
							Perfluorooctanoic acid (PFOA)	30.1658 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	60.2562 ng/mL
					LC537-IS_00059	2 mL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00059	2 mL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00027	04/01/18	01/30/18	Methanol, Lot 141039	40000 uL	LC537SPIM_00026	555.6 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.915 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.802 ng/mL
							Perfluorononanoic acid (PFNA)	277.867 ng/mL
							Perfluorooctanoic acid (PFOA)	279.313 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	557.928 ng/mL
..LC537SPIM_00026	04/01/18	01/30/18	Methanol, Lot 104453	20000 uL	LC537-PFBS_00009	900 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00016	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0011 ug/mL
					LC537-PFHxS_00011	300 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0074 ug/mL
					LC537-PFNA_00014	400 uL	Perfluorononanoic acid (PFNA)	20.0048 ug/mL
					LC537-PFOA_00015	400 uL	Perfluorooctanoic acid (PFOA)	20.1089 ug/mL
					LC537-PFOS_00009	800 uL	Perfluorooctanesulfonic acid (PFOS)	40.1676 ug/mL
...LC537-PFBS_00009	04/01/18	01/30/18	Methanol, Lot 090285	48.7 mL	LC537_PFBS_00002	0.0974 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00016	04/01/18	01/30/18	Methanol, Lot 090285	59.74 mL	LC537_PFHpA_00002	0.1207 g	Perfluoroheptanoic acid (PFHpA)	2.00022 mg/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00011	04/01/18	01/30/18	Methanol, Lot 090285	38.64 mL	LC537_PFHxS_00002	0.085 g	Perfluorohexanesulfonic acid (PFHxS)	2.00049 mg/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00014	04/01/18	01/30/18	Methanol, Lot 090285	62.58 mL	LC537_PFNA_00002	0.065 g	Perfluorononanoic acid (PFNA)	1000.24 ug/mL
....LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00015	07/30/18	01/30/18	Methanol, Lot 090285	31 mL	LC537_PFOA_00003	0.0312 g	Perfluorooctanoic acid (PFOA)	1.00545 mg/mL
....LC537_PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00009	07/30/18	01/30/18	Methanol, Lot 090285	36 mL	LC537_PFOS_00003	0.0397 g	Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00059	07/30/18	01/30/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00059	07/30/18	01/30/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L6_00021	04/01/18	02/15/18	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00027	720 uL	Perfluorobutanesulfonic acid (PFBS)	180.014 ng/mL
							Perfluoroheptanoic acid (PFHpA)	20.0038 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	60.0196 ng/mL
							Perfluorononanoic acid (PFNA)	40.0128 ng/mL
							Perfluorooctanoic acid (PFOA)	40.221 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	80.3416 ng/mL
					LC537-IS_00059	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00059	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00027	04/01/18	01/30/18	Methanol, Lot 141039	40000 uL	LC537SPIM_00026	555.6 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.915 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.802 ng/mL
							Perfluorononanoic acid (PFNA)	277.867 ng/mL
							Perfluorooctanoic acid (PFOA)	279.313 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	557.928 ng/mL
..LC537SPIM_00026	04/01/18	01/30/18	Methanol, Lot 104453	20000 uL	LC537-PFBS_00009	900 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00016	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0011 ug/mL
					LC537-PFHxS_00011	300 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0074 ug/mL
					LC537-PFNA_00014	400 uL	Perfluorononanoic acid (PFNA)	20.0048 ug/mL
					LC537-PFOA_00015	400 uL	Perfluorooctanoic acid (PFOA)	20.1089 ug/mL
					LC537-PFOS_00009	800 uL	Perfluorooctanesulfonic acid (PFOS)	40.1676 ug/mL
...LC537-PFBS_00009	04/01/18	01/30/18	Methanol, Lot 090285	48.7 mL	LC537_PFBS_00002	0.0974 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00016	04/01/18	01/30/18	Methanol, Lot 090285	59.74 mL	LC537_PFHpA_00002	0.1207 g	Perfluoroheptanoic acid (PFHpA)	2.00022 mg/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00011	04/01/18	01/30/18	Methanol, Lot 090285	38.64 mL	LC537_PFHxS_00002	0.085 g	Perfluorohexanesulfonic acid (PFHxS)	2.00049 mg/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00014	04/01/18	01/30/18	Methanol, Lot 090285	62.58 mL	LC537_PFNA_00002	0.065 g	Perfluorononanoic acid (PFNA)	1000.24 ug/mL
....LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00015	07/30/18	01/30/18	Methanol, Lot 090285	31 mL	LC537_PFOA_00003	0.0312 g	Perfluorooctanoic acid (PFOA)	1.00545 mg/mL
....LC537_PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00009	07/30/18	01/30/18	Methanol, Lot 090285	36 mL	LC537_PFOS_00003	0.0397 g	Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00059	07/30/18	01/30/18	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LC537-SU_00059	07/30/18	01/30/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-LSP_00029	04/01/18	01/30/18	Methanol, Lot 090285	40000 uL	LC537SPIM_00026	100 uL	Perfluorobutane Sulfonate	225 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	225 ng/mL
							Perfluoroheptanoic acid (PFHpA)	25.0027 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	75.0184 ng/mL
							Perfluorononanoic acid (PFNA)	50.012 ng/mL
							Perfluorooctanoic acid (PFOA)	50.2723 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	100.419 ng/mL
.LC537SPIM_00026	04/01/18	01/30/18	Methanol, Lot 104453	20000 uL	LC537-PFBS_00009	900 uL	Perfluorobutane Sulfonate	90 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00016	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0011 ug/mL
					LC537-PFHxS_00011	300 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0074 ug/mL
					LC537-PFNA_00014	400 uL	Perfluorononanoic acid (PFNA)	20.0048 ug/mL
					LC537-PFOA_00015	400 uL	Perfluorooctanoic acid (PFOA)	20.1089 ug/mL
					LC537-PFOS_00009	800 uL	Perfluorooctanesulfonic acid (PFOS)	40.1676 ug/mL
..LC537-PFBS_00009	04/01/18	01/30/18	Methanol, Lot 090285	48.7 mL	LC537_PFBS_00002	0.0974 g	Perfluorobutane Sulfonate	2 mg/mL
							Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
...LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutane Sulfonate	1 g/g
							Perfluorobutanesulfonic acid (PFBS)	1 g/g
..LC537-PFHpA_00016	04/01/18	01/30/18	Methanol, Lot 090285	59.74 mL	LC537_PFHpA_00002	0.1207 g	Perfluoroheptanoic acid (PFHpA)	2.00022 mg/mL
...LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
..LC537-PFHxS_00011	04/01/18	01/30/18	Methanol, Lot 090285	38.64 mL	LC537_PFHxS_00002	0.085 g	Perfluorohexanesulfonic acid (PFHxS)	2.00049 mg/mL
...LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
..LC537-PFNA_00014	04/01/18	01/30/18	Methanol, Lot 090285	62.58 mL	LC537_PFNA_00002	0.065 g	Perfluorononanoic acid (PFNA)	1000.24 ug/mL
...LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
..LC537-PFOA_00015	07/30/18	01/30/18	Methanol, Lot 090285	31 mL	LC537_PFOA_00003	0.0312 g	Perfluorooctanoic acid (PFOA)	1.00545 mg/mL
...LC537_PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
..LC537-PFOS_00009	07/30/18	01/30/18	Methanol, Lot 090285	36 mL	LC537_PFOS_00003	0.0397 g	Perfluorooctanesulfonic acid (PFOS)	1.00419 mg/mL
...LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
LC537-SU_00061	08/27/18	02/27/18	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFHxA_00015	60 uL	13C2 PFHxA	0.1 ug/mL
.LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFHxA_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL

Reagent

LC537_PFBS_00002

R: 4/1/15 SPV

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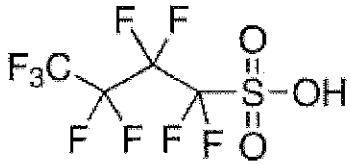
3050 Spruce Street, Saint Louis, MO 63103, USA
Website: www.sigmaaldrich.com
Email USA: techserv@sial.com
Outside USA: eurtechserv@sial.com

Certificate of Analysis

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

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



PFBS

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

Jamie Gleason

Jamie Gleason, Manager
Quality Control
Milwaukee, Wisconsin US

Reagent

LC537_PFBS2_00002

"NAWC-031318-RW-185","537","RES","320-37095-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","19","ng/L","J M","6.4","DL","","TRG","","","38","LOQ","YES","-99","","263.6","1.00","15",""
"NAWC-031318-RW-185","537","RES","320-37095-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","16","ng/L","J M","2.7","DL","","TRG","","","19","LOQ","YES","-99","","263.6","1.00","7.6",""
"NAWC-031318-RW-185","537","RES","320-37095-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","10","ng/L","J","5.2","DL","","TRG","","","28","LOQ","YES","-99","","263.6","1.00","11",""
"NAWC-031318-RW-185","537","RES","320-37095-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","34","ng/L","U","15","DL","","TRG","","","85","LOQ","YES","-99","","263.6","1.00","34",""
"NAWC-031318-RW-185","537","RES","320-37095-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","9.8","ng/L","","1.8","DL","","TRG","","","9.5","LOQ","YES","-99","","263.6","1.00","3.8",""
"NAWC-031318-RW-185","537","RES","320-37095-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","19","ng/L","U","7.6","DL","","TRG","","","23","LOQ","YES","-99","","263.6","1.00","19",""
"NAWC-031318-RW-185","537","RES","320-37095-1","TALSAC","STL00993","13C2 PFHxA","34","ng/L","","-99","DL","","SURR","90","","-99","LOQ","YES","37.9","","263.6","1.00","0",""
"NAWC-031318-RW-185","537","RES","320-37095-1","TALSAC","STL00996","13C2 PFDA","35","ng/L","","-99","DL","","SURR","92","","-99","LOQ","YES","37.9","","263.6","1.00","0",""
"NAWC-031318-FRB-185","537","RES","320-37095-2","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.6","DL","","TRG","","","39","LOQ","YES","-99","","257.8","1.00","16",""
"NAWC-031318-FRB-185","537","RES","320-37095-2","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.8","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES","-99","","257.8","1.00","7.8",""
"NAWC-031318-FRB-185","537","RES","320-37095-2","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.3","DL","","TRG","","","29","LOQ","YES","-99","","257.8","1.00","12",""
"NAWC-031318-FRB-185","537","RES","320-37095-2","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35","ng/L","U","16","DL","","TRG","","","87","LOQ","YES","-99","","257.8","1.00","35",""
"NAWC-031318-FRB-185","537","RES","320-37095-2","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.9","ng/L","U","1.8","DL","","TRG","","","9.7","LOQ","YES","-99","","257.8","1.00","3.9",""
"NAWC-031318-FRB-185","537","RES","320-37095-2","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","19","ng/L","U","7.8","DL","","TRG","","","23","LOQ","YES","-99","","257.8","1.00","19",""
"NAWC-031318-FRB-185","537","RES","320-37095-2","TALSAC","STL00993","13C2 PFHxA","35","ng/L","","-99","DL","","SURR","90","","-99","LOQ","YES","38.8","","257.8","1.00","0",""
"NAWC-031318-FRB-185","537","RES","320-37095-2","TALSAC","STL00996","13C2 PFDA","38","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","38.8","","257.8","1.00","0",""
"NAWC-031318-RW-061","537","RES","320-37095-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.6","DL","","TRG","","","39","LOQ","YES","-99","","258","1.00","16",""
"NAWC-031318-RW-061","537","RES","320-37095-3","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.8","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES","-99","","258","1.00","7.8",""
"NAWC-031318-RW-061","537","RES","320-37095-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.3","DL","","TRG","","","29","LOQ","YES","-99","","258","1.00","12",""
"NAWC-031318-RW-061","537","RES","320-37095-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35","ng/L","U","16","DL","","TRG","","","87","LOQ","YES","-99","","258","1.00","35",""
"NAWC-031318-RW-061","537","RES","320-37095-3","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.9","ng/L","U","1.8","DL","","TRG","","","9.7","LOQ","YES","-99","","258","1.00","3.9",""
"NAWC-031318-RW-061","537","RES","320-37095-3","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","19","ng/L","U","7.8","DL","","TRG","","","23","LOQ","YES","-99","","258","1.00","19",""
"NAWC-031318-RW-061","537","RES","320-37095-3","TALSAC","STL00993","13C2 PFHxA","35","ng/L","","-99","DL","","SURR","90","","-99","LOQ","YES","38.8","","258","1.00","0",""
"NAWC-031318-RW-061","537","RES","320-37095-3","TALSAC","STL00996","13C2 PFDA","36","ng/L","","-99","DL","","SURR","92","","-99","LOQ","YES","38.8","","258","1.00","0",""
"NAWC-031318-FRB-061","537","RES","320-37095-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","28","ng/L","J M","6.4","DL","","TRG","","","38","LOQ","YES","-99","","265","1.00","15",""
"NAWC-031318-FRB-061","537","RES","320-37095-4","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","18","ng/L","J","2.6","DL","","TRG","","","19","LOQ","YES","-99","","265","1.00","7.5",""
"NAWC-031318-FRB-061","537","RES","320-37095-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid

(PFHxS)","11","ng/L","J","5.2","DL","","TRG","","","28","LOQ","YES","-99","","265","1.00","11",""
"NAWC-031318-FRB-061","537","RES","320-37095-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","34","ng/L","U","15","DL","","TRG","","","85","LOQ","YES","-99","","265","1.00","34",""
"NAWC-031318-FRB-061","537","RES","320-37095-4","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.6","ng/L","J","1.8","DL","","TRG","","","9.4","LOQ","YES","-99","","265","1.00","3.8",""
"NAWC-031318-FRB-061","537","RES","320-37095-4","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","19","ng/L","U","7.5","DL","","TRG","","","23","LOQ","YES","-99","","265","1.00","19",""
"NAWC-031318-FRB-061","537","RES","320-37095-4","TALSAC","STL00993","13C2
PFHxA","33","ng/L","","-99","DL","","SURR","88","","-99","LOQ","YES","37.7","","265","1.00","0",""
"NAWC-031318-FRB-061","537","RES","320-37095-4","TALSAC","STL00996","13C2
PFDA","36","ng/L","","-99","DL","","SURR","95","","-99","LOQ","YES","37.7","","265","1.00","0",""
"NAWC-031318-RW-0263","537","RES","320-37095-5","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","19","ng/L","J M","6.6","DL","","TRG","","","39","LOQ","YES","-99","","258.3","1.00","15",""
"NAWC-031318-RW-0263","537","RES","320-37095-5","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","18","ng/L","J","2.7","DL","","TRG","","","19","LOQ","YES","-99","","258.3","1.00","7.7",""
"NAWC-031318-RW-0263","537","RES","320-37095-5","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","9.0","ng/L","J","5.3","DL","","TRG","","","29","LOQ","YES","-99","","258.3","1.00","12",""
"NAWC-031318-RW-0263","537","RES","320-37095-5","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","35","ng/L","U","16","DL","","TRG","","","87","LOQ","YES","-99","","258.3","1.00","35",""
"NAWC-031318-RW-0263","537","RES","320-37095-5","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","5.0","ng/L","J","1.8","DL","","TRG","","","9.7","LOQ","YES","-99","","258.3","1.00","3.9",""
"NAWC-031318-RW-0263","537","RES","320-37095-5","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","19","ng/L","U","7.7","DL","","TRG","","","23","LOQ","YES","-99","","258.3","1.00","19",""
"NAWC-031318-RW-0263","537","RES","320-37095-5","TALSAC","STL00993","13C2
PFHxA","39","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","38.7","","258.3","1.00","0",""
"NAWC-031318-RW-0263","537","RES","320-37095-5","TALSAC","STL00996","13C2
PFDA","37","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","38.7","","258.3","1.00","0",""
"NAWC-031318-FRB-0263","537","RES","320-37095-6","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","15","ng/L","U","6.5","DL","","TRG","","","38","LOQ","YES","-99","","260.8","1.00","15",""
"NAWC-031318-FRB-0263","537","RES","320-37095-6","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","7.7","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES","-99","","260.8","1.00","7.7",""
"NAWC-031318-FRB-0263","537","RES","320-37095-6","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.3","DL","","TRG","","","29","LOQ","YES","-99","","260.8","1.00","12",""
"NAWC-031318-FRB-0263","537","RES","320-37095-6","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","35","ng/L","U","15","DL","","TRG","","","86","LOQ","YES","-99","","260.8","1.00","35",""
"NAWC-031318-FRB-0263","537","RES","320-37095-6","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.8","ng/L","U","1.8","DL","","TRG","","","9.6","LOQ","YES","-99","","260.8","1.00","3.8",""
"NAWC-031318-FRB-0263","537","RES","320-37095-6","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","19","ng/L","U","7.7","DL","","TRG","","","23","LOQ","YES","-99","","260.8","1.00","19",""
"NAWC-031318-FRB-0263","537","RES","320-37095-6","TALSAC","STL00993","13C2
PFHxA","39","ng/L","","-99","DL","","SURR","102","","-99","LOQ","YES","38.3","","260.8","1.00","0",""
"NAWC-031318-FRB-0263","537","RES","320-37095-6","TALSAC","STL00996","13C2
PFDA","37","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","38.3","","260.8","1.00","0",""
"NAWC-031318-RW-4840","537","RES","320-37095-7","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","15","ng/L","U","6.5","DL","","TRG","","","38","LOQ","YES","-99","","263.2","1.00","15",""
"NAWC-031318-RW-4840","537","RES","320-37095-7","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","7.6","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES","-99","","263.2","1.00","7.6",""
"NAWC-031318-RW-4840","537","RES","320-37095-7","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","11","ng/L","U","5.2","DL","","TRG","","","28","LOQ","YES","-99","","263.2","1.00","11",""
"NAWC-031318-RW-4840","537","RES","320-37095-7","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","34","ng/L","U","15","DL","","TRG","","","85","LOQ","YES","-99","","263.2","1.00","34",""
"NAWC-031318-RW-4840","537","RES","320-37095-7","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.8","ng/L","U","1.8","DL","","TRG","","","9.5","LOQ","YES","-99","","263.2","1.00","3.8",""
"NAWC-031318-RW-4840","537","RES","320-37095-7","TALSAC","375-95-1","Perfluorononanoic acid

(PFNA)","19","ng/L","U","7.6","DL","","TRG","","","23","LOQ","YES","-99","","263.2","1.00","19",""
"NAWC-031318-RW-4840","537","RES","320-37095-7","TALSAC","STL00993","13C2
PFHxA","40","ng/L","","-99","DL","","SURR","105","","-99","LOQ","YES","38.0","","263.2","1.00","0",""
"NAWC-031318-RW-4840","537","RES","320-37095-7","TALSAC","STL00996","13C2
PFDA","42","ng/L","","-99","DL","","SURR","110","","-99","LOQ","YES","38.0","","263.2","1.00","0",""
"NAWC-031318-FRB-4840","537","RES","320-37095-8","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","15","ng/L","U","6.5","DL","","TRG","","","38","LOQ","YES","-99","","262.9","1.00","15",""
"NAWC-031318-FRB-4840","537","RES","320-37095-8","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","7.6","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES","-99","","262.9","1.00","7.6",""
"NAWC-031318-FRB-4840","537","RES","320-37095-8","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","11","ng/L","U","5.2","DL","","TRG","","","29","LOQ","YES","-99","","262.9","1.00","11",""
"NAWC-031318-FRB-4840","537","RES","320-37095-8","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","34","ng/L","U","15","DL","","TRG","","","86","LOQ","YES","-99","","262.9","1.00","34",""
"NAWC-031318-FRB-4840","537","RES","320-37095-8","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.8","ng/L","U","1.8","DL","","TRG","","","9.5","LOQ","YES","-99","","262.9","1.00","3.8",""
"NAWC-031318-FRB-4840","537","RES","320-37095-8","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","19","ng/L","U","7.6","DL","","TRG","","","23","LOQ","YES","-99","","262.9","1.00","19",""
"NAWC-031318-FRB-4840","537","RES","320-37095-8","TALSAC","STL00993","13C2
PFHxA","37","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","38.0","","262.9","1.00","0",""
"NAWC-031318-FRB-4840","537","RES","320-37095-8","TALSAC","STL00996","13C2
PFDA","37","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","38.0","","262.9","1.00","0",""
"WGNA-031318-DUP029","537","RES","320-37095-9","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","15","ng/L","U","6.5","DL","","TRG","","","39","LOQ","YES","-99","","259.6","1.00","15",""
"WGNA-031318-DUP029","537","RES","320-37095-9","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","15","ng/L","J","2.7","DL","","TRG","","","19","LOQ","YES","-99","","259.6","1.00","7.7",""
"WGNA-031318-DUP029","537","RES","320-37095-9","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","10","ng/L","J","5.3","DL","","TRG","","","29","LOQ","YES","-99","","259.6","1.00","12",""
"WGNA-031318-DUP029","537","RES","320-37095-9","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","35","ng/L","U","16","DL","","TRG","","","87","LOQ","YES","-99","","259.6","1.00","35",""
"WGNA-031318-DUP029","537","RES","320-37095-9","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","9.7","ng/L","","1.8","DL","","TRG","","","9.6","LOQ","YES","-99","","259.6","1.00","3.9",""
"WGNA-031318-DUP029","537","RES","320-37095-9","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","19","ng/L","U","7.7","DL","","TRG","","","23","LOQ","YES","-99","","259.6","1.00","19",""
"WGNA-031318-DUP029","537","RES","320-37095-9","TALSAC","STL00993","13C2
PFHxA","37","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","38.5","","259.6","1.00","0",""
"WGNA-031318-DUP029","537","RES","320-37095-9","TALSAC","STL00996","13C2
PFDA","38","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","38.5","","259.6","1.00","0",""
"LLCS 320-213605/2-A","537","RES","LLCS 320-213605/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic
acid (PFOS)","43.0","ng/L","M","6.8","DL","","SPK","107","","40","LOQ","YES","40.2","","250","1.00","16",""
"LLCS 320-213605/2-A","537","RES","LLCS 320-213605/2-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","21.2","ng/L","","2.8","DL","","SPK","106","","20","LOQ","YES","20.1","","250","1.00","8.0",""
"LLCS 320-213605/2-A","537","RES","LLCS 320-213605/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","33.2","ng/L","","5.5","DL","","SPK","111","","30","LOQ","YES","30.0","","250","1.00","12",""
"LLCS 320-213605/2-A","537","RES","LLCS 320-213605/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","85.8","ng/L","J","16","DL","","SPK","95","","90","LOQ","YES","90.0","","250","1.00","36",""
"LLCS 320-213605/2-A","537","RES","LLCS 320-213605/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","11.0","ng/L","","1.9","DL","","SPK","110","","10","LOQ","YES","10.0","","250","1.00","4.0",""
"LLCS 320-213605/2-A","537","RES","LLCS 320-213605/2-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","21.2","ng/L","J","8.0","DL","","SPK","106","","24","LOQ","YES","20.0","","250","1.00","20",""
"LLCS 320-213605/2-A","537","RES","LLCS 320-213605/2-A","TALSAC","STL00993","13C2
PFHxA","40.2","ng/L","","-99","DL","","SURR","101","","-99","LOQ","YES","40.0","","250","1.00","0",""
"LLCS 320-213605/2-A","537","RES","LLCS 320-213605/2-A","TALSAC","STL00996","13C2
PFDA","39.1","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","40.0","","250","1.00","0",""
"LLCSD 320-213605/3-A","537","RES","LLCSD 320-213605/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic

acid (PFOS)","43.6","ng/L","M","6.8","DL","","SPK","109","1","40","LOQ","YES","40.2","LLCS 320-213605/2-A","250","1.00","16",""
"LLCSD 320-213605/3-A","537","RES","LLCSD 320-213605/3-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","20.4","ng/L","","2.8","DL","","SPK","101","4","20","LOQ","YES","20.1","LLCS 320-213605/2-A","250","1.00","8.0",""
"LLCSD 320-213605/3-A","537","RES","LLCSD 320-213605/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","33.2","ng/L","","5.5","DL","","SPK","111","0.05","30","LOQ","YES","30.0","LLCS 320-213605/2-A","250","1.00","12",""
"LLCSD 320-213605/3-A","537","RES","LLCSD 320-213605/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","84.9","ng/L","J","16","DL","","SPK","94","1","90","LOQ","YES","90.0","LLCS 320-213605/2-A","250","1.00","36",""
"LLCSD 320-213605/3-A","537","RES","LLCSD 320-213605/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","10.9","ng/L","","1.9","DL","","SPK","109","0.9","10","LOQ","YES","10.0","LLCS 320-213605/2-A","250","1.00","4.0",""
"LLCSD 320-213605/3-A","537","RES","LLCSD 320-213605/3-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20.6","ng/L","J","8.0","DL","","SPK","103","3","24","LOQ","YES","20.0","LLCS 320-213605/2-A","250","1.00","20",""
"LLCSD 320-213605/3-A","537","RES","LLCSD 320-213605/3-A","TALSAC","STL00993","13C2 PFHxA","38.4","ng/L","","-99","DL","","SURR","96","5","-99","LOQ","YES","40.0","LLCS 320-213605/2-A","250","1.00","0",""
"LLCSD 320-213605/3-A","537","RES","LLCSD 320-213605/3-A","TALSAC","STL00996","13C2 PFDA","37.4","ng/L","","-99","DL","","SURR","94","4","-99","LOQ","YES","40.0","LLCS 320-213605/2-A","250","1.00","0",""
"MB 320-213605/1-A","537","RES","MB 320-213605/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.8","DL","","TRG","","","40","LOQ","YES","-99","","250","1.00","16",""
"MB 320-213605/1-A","537","RES","MB 320-213605/1-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","8.0","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","250","1.00","8.0",""
"MB 320-213605/1-A","537","RES","MB 320-213605/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","250","1.00","12",""
"MB 320-213605/1-A","537","RES","MB 320-213605/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250","1.00","36",""
"MB 320-213605/1-A","537","RES","MB 320-213605/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","4.0","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","250","1.00","4.0",""
"MB 320-213605/1-A","537","RES","MB 320-213605/1-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","250","1.00","20",""
"MB 320-213605/1-A","537","RES","MB 320-213605/1-A","TALSAC","STL00993","13C2 PFHxA","39.8","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","40.0","","250","1.00","0",""
"MB 320-213605/1-A","537","RES","MB 320-213605/1-A","TALSAC","STL00996","13C2 PFDA","39.3","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","40.0","","250","1.00","0",""
"Unknown","Unknown","NAWC-031318-RW-185","03/13/2018 10:10","AQ","320-37095-1","NM","","1.90","537","METHOD","RES","03/19/2018 07:47","03/22/2018 23:02","TALSAC","COA","WET","NA","1","NA","NA","","100","320-213605","320-213605","NA","320-214496","320-37095-1","03/14/2018 09:15","03/15/2018 12:35",""
"Unknown","Unknown","NAWC-031318-FRB-185","03/13/2018 10:05","AQ","320-37095-2","FB","","1.90","537","METHOD","RES","03/19/2018 07:47","03/22/2018 23:07","TALSAC","COA","WET","NA","1","NA","NA","","100","320-213605","320-213605","NA","320-214496","320-37095-1","03/14/2018 09:15","03/15/2018 12:35",""
"Unknown","Unknown","NAWC-031318-RW-061","03/13/2018 10:35","AQ","320-37095-3","NM","","1.90","537","METHOD","RES","03/19/2018 07:47","03/22/2018 23:11","TALSAC","COA","WET","NA","1","NA","NA","","100","320-213605","320-213605","NA","320-214496","320-37095-1","03/14/2018 09:15","03/15/2018 12:35",""
"Unknown","Unknown","NAWC-031318-FRB-061","03/13/2018 10:40","AQ","320-37095-4","FB","","1.90","537","METHOD","RES","03/19/2018 07:47","03/22/2018 23:16","TALSAC","COA","WET","NA","1","NA","NA","","100","320-213605","320-213605","NA","320-

214496","320-37095-1","03/14/2018 09:15","03/15/2018 12:35",""
"Unknown","Unknown","NAWC-031318-RW-0263","03/13/2018 13:40","AQ","320-37095-
5","NM","","1.90","537","METHOD","RES","03/19/2018 07:47","03/22/2018
23:21","TALSAC","COA","WET","NA","1","NA","NA","","100","320-213605","320-213605","NA","320-
214496","320-37095-1","03/14/2018 09:15","03/15/2018 12:35",""
"Unknown","Unknown","NAWC-031318-FRB-0263","03/13/2018 13:35","AQ","320-37095-
6","FB","","1.90","537","METHOD","RES","03/19/2018 07:47","03/22/2018
23:25","TALSAC","COA","WET","NA","1","NA","NA","","100","320-213605","320-213605","NA","320-
214496","320-37095-1","03/14/2018 09:15","03/15/2018 12:35",""
"Unknown","Unknown","NAWC-031318-RW-4840","03/13/2018 14:10","AQ","320-37095-
7","NM","","1.90","537","METHOD","RES","03/19/2018 07:47","03/22/2018
23:30","TALSAC","COA","WET","NA","1","NA","NA","","100","320-213605","320-213605","NA","320-
214496","320-37095-1","03/14/2018 09:15","03/15/2018 12:35",""
"Unknown","Unknown","NAWC-031318-FRB-4840","03/13/2018 14:05","AQ","320-37095-
8","FB","","1.90","537","METHOD","RES","03/19/2018 07:47","03/22/2018
23:44","TALSAC","COA","WET","NA","1","NA","NA","","100","320-213605","320-213605","NA","320-
214497","320-37095-1","03/14/2018 09:15","03/15/2018 12:35",""
"Unknown","Unknown","WGNA-031318-DUP029","03/13/2018 07:00","AQ","320-37095-
9","FD","","1.90","537","METHOD","RES","03/19/2018 07:47","03/22/2018
23:49","TALSAC","COA","WET","NA","1","NA","NA","","100","320-213605","320-213605","NA","320-
214497","320-37095-1","03/14/2018 09:15","03/15/2018 12:35",""
"Unknown","Unknown","LLCS 320-213605/2-A","","AQ","LLCS 320-213605/2-
A","LCS","","-99","537","METHOD","RES","03/19/2018 07:47","03/22/2018
22:53","TALSAC","COA","WET","NA","1","NA","NA","","100","320-213605","320-213605","NA","320-
214496","320-37095-1","03/19/2018 07:47","03/15/2018 12:35",""
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A","LCSD","","-99","537","METHOD","RES","03/19/2018 07:47","03/22/2018
22:57","TALSAC","COA","WET","NA","1","NA","NA","","100","320-213605","320-213605","NA","320-
214496","320-37095-1","03/19/2018 07:47","03/15/2018 12:35",""
"Unknown","Unknown","MB 320-213605/1-A","","AQ","MB 320-213605/1-
A","MB","","-99","537","METHOD","RES","03/19/2018 07:47","03/22/2018
22:48","TALSAC","COA","WET","NA","1","NA","NA","","100","320-213605","320-213605","NA","320-
214496","320-37095-1","03/19/2018 07:47","03/15/2018 12:35",""

TETRA TECH

INTERNAL CORRESPONDENCE

TO: **A. FREBOWITZ** **DATE:** **APRIL 19, 2018**

FROM: **TERRI L. SOLOMON** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)**
NAS JRB WILLOW GROVE
SAMPLE DELIVERY GROUP (SDG) 320-37095-1

SAMPLES: 4/Field Reagent Blank (FRB)

NAWC-031318-FRB-061	NAWC-031318-FRB-185
WGNA-031318-FRB-0263	WGNA-031318-FRB-4840

5/Drinking Water

NAWC-031318-RW-061	NAWC-031318-RW-185
WGNA-031318-RW-0263	WGNA-031318-RW-4840
WGNA-031318-DUP029	

Overview

The sample set for NAS JRB Willow Grove, SDG 320-37095-1, consisted of five (5) drinking water samples and four (4) FRB samples. All samples were analyzed for select perfluorinated alkyl acids including pentadecafluorooctanoic acid (PFOA), perfluorobutane sulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA) and perfluorooctane sulfonic acid (PFOS). One (1) field duplicate pair, NAWC-031318-RW-185/ WGNA-031318-DUP029, was included in this SDG.

The samples were collected by Tetra Tech on March 13, 2018 and analyzed by Test America-Sacramento. All sample analyses were conducted in accordance with EPA Method 537 version 1.1 analytical and reporting protocols.

The data contained in this SDG was validated with regard to the following parameters: data completeness, holding times, mass calibration, mass spectral acquisition rate, tune check, instrument sensitivity check, initial/continuing calibrations, ion transitions, laboratory method/FRBs, surrogate spike recoveries, laboratory control sample / laboratory control sample duplicate results, injected internal standard areas and recoveries, chromatographic resolution, analyte identification, analyte quantitation, and detection limits. Areas of concern are listed below.

Major

None.

Minor

Detected results reported below the limit of quantitation (LOQ) but above the detection limit (DL) were qualified as estimated (J).

Notes

The original case narrative did not confirm that the instrument tune met the Department of Defense Quality Systems Manual (DoD QSM) criteria. The laboratory was contacted and confirmed there were no problems with the instrument tune and the case narrative was amended.

As per the project manager the following changes were made to the sample IDs on the Form Is and electronic deliverable:

- Samples NAWC-031318-RW-0263 and NAWC-031318-FRB-0263 were changed to WGNA-031318-RW-0263 and WGNA-031318-FRB-0263.
- Samples NAWC-031318-RW-4840 and NAWC-031318-FRB-4840 were changed to WGNA-031318-RW-4840 and WGNA-031318-FRB-4840.
- For the original analyses, the results for sample NAWC-031318-FRB-061 had some detected results and sample NAWC-031318-RW-061 had all nondetected results. The laboratory verified that the client labels on the bottles matched the laboratory labels. The laboratory re-extracted the samples with comparable results. It is suspected that the sample IDs were switched in the field and were changed to reflect sample NAWC-031318-FRB-061 with no detected results and sample NAWC-031318-RW-061 with detected results.

It was noted that sample NAWC-031318-RW-061 had a pH of 6. No validation actions were required.

Samples with detections and their associated FRBs are summarized below. No detected results were present in the FRBs.

Sample	**Associated FRB**
NAWC-031318-RW-061	NAWC-031318-FRB-061
NAWC-031318-RW-185	NAWC-031318-FRB-185
WGNA-031318-RW-0263	WGNA-031318-FRB-0263
WGNA-031318-RW-4840	WGNA-031318-FRB-0263
WGNA-031318-DUP029	NAWC-031318-RW-185

Non-detected results were reported to the Limit of Detection (LOD).

The buffering agent Trizma was added to all drinking water samples.

Executive Summary

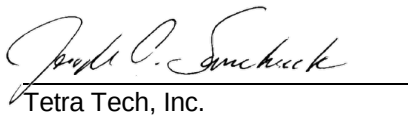
Laboratory Performance: None.

Other Factors Affecting Data Quality: Results below the RL were estimated.

The data for these analyses were reviewed with reference to the Environmental Protection Agency document EPA/600/R-08/092, Method 537, “Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)”, (September 2009), US EPA National Functional Guidelines for Organic Data Review (January 2017), and the Department of Defense (DoD) document entitled “Quality Systems Manual (QSM) for Environmental Laboratories” (July 2013) as applicable. The text of this report has been formulated to address only those areas affecting data quality.

Terri L. Solomon

Tetra Tech, Inc.
Terri L. Solomon
Chemist/Data Validator



Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted method detection limit for sample and method.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

Appendix A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate
Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04	NSAMPLE	NAWC-031318-FRB-061			NAWC-031318-FRB-185			NAWC-031318-RW-061			NAWC-031318-RW-185		
SDG: 320-37095-1	LAB_ID	320-37095-3			320-37095-2			320-37095-4			320-37095-1		
FRACTION: PFAS	SAMP_DATE	3/13/2018			3/13/2018			3/13/2018			3/13/2018		
MEDIA: WATER	QC_TYPE	NM			FB			FB			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		7.8	U		7.8	U		18	J	P	16	J	P
PERFLUOROBUTANESULFONIC ACID		35	U		35	U		34	U		34	U	
PERFLUOROHEPTANOIC ACID		3.9	U		3.9	U		4.6	J	P	9.8		
PERFLUOROHEXANESULFONIC ACID		12	U		12	U		11	J	P	10	J	P
PERFLUORONONANOIC ACID		19	U		19	U		19	U		19	U	
PERFLUOROOCTANE SULFONIC ACID		16	U		16	U		28	J	P	19	J	P

PROJ_NO: 08005-WE04	NSAMPLE	WGNA-031318-DUP029			WGNA-031318-FRB-0263			WGNA-031318-FRB-4840			WGNA-031318-RW-0263		
SDG: 320-37095-1	LAB_ID	320-37095-9			320-37095-6			320-37095-8			320-37095-5		
FRACTION: PFAS	SAMP_DATE	3/13/2018			3/13/2018			3/13/2018			3/13/2018		
MEDIA: WATER	QC_TYPE	FD			FB			FB			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF	NAWC-031318-RW-185											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		15	J	P	7.7	U		7.6	U		18	J	P
PERFLUOROBUTANESULFONIC ACID		35	U		35	U		34	U		35	U	
PERFLUOROHEPTANOIC ACID		9.7			3.8	U		3.8	U		5	J	P
PERFLUOROHEXANESULFONIC ACID		10	J	P	12	U		11	U		9	J	P
PERFLUORONONANOIC ACID		19	U		19	U		19	U		19	U	
PERFLUOROOCTANE SULFONIC ACID		15	U		15	U		15	U		19	J	P

PROJ_NO: 08005-WE04	NSAMPLE	WGNA-031318-RW-4840		
SDG: 320-37095-1	LAB_ID	320-37095-7		
FRACTION: PFAS	SAMP_DATE	3/13/2018		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		7.6	U	
PERFLUOROBUTANESULFONIC ACID		34	U	
PERFLUOROHEPTANOIC ACID		3.8	U	
PERFLUOROHEXANESULFONIC ACID		11	U	
PERFLUORONONANOIC ACID		19	U	
PERFLUOROOCTANE SULFONIC ACID		15	U	

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37095-1

SDG No.:

Client Sample ID: NAWC-031318-RW-185 | Lab Sample ID: 320-37095-1

Matrix: Water | Lab File ID: 2018.03.22_537B_025.d

Analysis Method: 537 | Date Collected: 03/13/2018 10:10

Extraction Method: 537 | Date Extracted: 03/19/2018 07:47

Sample wt/vol: 263.6(mL) | Date Analyzed: 03/22/2018 23:02

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

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

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

Analysis Batch No.: 214496 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J ~~M~~	38	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	16	J ~~M~~	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	10	J	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	9.8		9.5	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	92		70-130

04/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37095-1

SDG No.:

Client Sample ID: NAWC-031318-FRB-185 | Lab Sample ID: 320-37095-2

Matrix: Water | Lab File ID: 2018.03.22_537B_026.d

Analysis Method: 537 | Date Collected: 03/13/2018 10:05

Extraction Method: 537 | Date Extracted: 03/19/2018 07:47

Sample wt/vol: 257.8(mL) | Date Analyzed: 03/22/2018 23:07

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

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

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

Analysis Batch No.: 214496 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	7.8	U	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.7	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	97		70-130


04/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37095-1

SDG No.:

Client Sample ID: NAWC-031318~~-RW-~~FRB061 | Lab Sample ID: 320-37095-3

Matrix: Water | Lab File ID: 2018.03.22_537B_027.d

Analysis Method: 537 | Date Collected: 03/13/2018 10:35

Extraction Method: 537 | Date Extracted: 03/19/2018 07:47

Sample wt/vol: 258(mL) | Date Analyzed: 03/22/2018 23:11

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

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

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

Analysis Batch No.: 214496 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	7.8	U	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.7	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	92		70-130

04/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37095-1

SDG No.:

Client Sample ID: NAWC-031318~~-FRB-~~RW061 | Lab Sample ID: 320-37095-4

Matrix: Water | Lab File ID: 2018.03.22_537B_028.d

Analysis Method: 537 | Date Collected: 03/13/2018 10:40

Extraction Method: 537 | Date Extracted: 03/19/2018 07:47

Sample wt/vol: 265(mL) | Date Analyzed: 03/22/2018 23:16

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

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

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

Analysis Batch No.: 214496 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	28	J ~~M~~	38	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	18	J	19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	J	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.6	J	9.4	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	88		70-130
STL00996	13C2 PFDA	95		70-130

Dawn L Salerno
04/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37095-1

SDG No.:

Client Sample ID: ~~NAWC~~ WGNA-031318-RW-0263 | Lab Sample ID: 320-37095-5

Matrix: Water | Lab File ID: 2018.03.22_537B_029.d

Analysis Method: 537 | Date Collected: 03/13/2018 13:40

Extraction Method: 537 | Date Extracted: 03/19/2018 07:47

Sample wt/vol: 258.3(mL) | Date Analyzed: 03/22/2018 23:21

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

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

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

Analysis Batch No.: 214496 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J ~~M~~	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	18	J	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	9.0	J	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.0	J	9.7	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	97		70-130

04/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37095-1

SDG No.:

Client Sample ID: ~~NAWC~~ WGNA 031318-FRB-0263 | Lab Sample ID: 320-37095-6

Matrix: Water | Lab File ID: 2018.03.22_537B_030.d

Analysis Method: 537 | Date Collected: 03/13/2018 13:35

Extraction Method: 537 | Date Extracted: 03/19/2018 07:47

Sample wt/vol: 260.8(mL) | Date Analyzed: 03/22/2018 23:25

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

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

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

Analysis Batch No.: 214496 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	7.7	U	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	86	35	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	96		70-130

04/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37095-1

SDG No.:

Client Sample ID: ~~NAWC~~ WGNA-031318-RW-4840 | Lab Sample ID: 320-37095-7

Matrix: Water | Lab File ID: 2018.03.22_537B_031.d

Analysis Method: 537 | Date Collected: 03/13/2018 14:10

Extraction Method: 537 | Date Extracted: 03/19/2018 07:47

Sample wt/vol: 263.2(mL) | Date Analyzed: 03/22/2018 23:30

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

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

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

Analysis Batch No.: 214496 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	7.6	U	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.5	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	105		70-130
STL00996	13C2 PFDA	110		70-130

Toni L Salomon
04/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37095-1

SDG No.:

Client Sample ID: ~~NAWC~~ WGNA-031318-FRB-4840 | Lab Sample ID: 320-37095-8

Matrix: Water | Lab File ID: 2018.03.22_537B_034.d

Analysis Method: 537 | Date Collected: 03/13/2018 14:05

Extraction Method: 537 | Date Extracted: 03/19/2018 07:47

Sample wt/vol: 262.9(mL) | Date Analyzed: 03/22/2018 23:44

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

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

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

Analysis Batch No.: 214497 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	7.6	U	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	29	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.5	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	86	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	98		70-130

04/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37095-1

SDG No.:

Client Sample ID: WGNA-031318-DUP029 | Lab Sample ID: 320-37095-9

Matrix: Water | Lab File ID: 2018.03.22_537B_035.d

Analysis Method: 537 | Date Collected: 03/13/2018 07:00

Extraction Method: 537 | Date Extracted: 03/19/2018 07:47

Sample wt/vol: 259.6(mL) | Date Analyzed: 03/22/2018 23:49

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

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

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

Analysis Batch No.: 214497 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	39	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	15	J	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	10	J	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	9.7		9.6	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	100		70-130

04/19/2018

Appendix B

Results as Reported by the Laboratory

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37095-1

SDG No.:

Client Sample ID: NAWC-031318-RW-185 | Lab Sample ID: 320-37095-1

Matrix: Water | Lab File ID: 2018.03.22_537B_025.d

Analysis Method: 537 | Date Collected: 03/13/2018 10:10

Extraction Method: 537 | Date Extracted: 03/19/2018 07:47

Sample wt/vol: 263.6(mL) | Date Analyzed: 03/22/2018 23:02

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

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

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

Analysis Batch No.: 214496 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J M	38	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	16	J M	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	10	J	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	9.8		9.5	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	92		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37095-1

SDG No.:

Client Sample ID: NAWC-031318-FRB-185 | Lab Sample ID: 320-37095-2

Matrix: Water | Lab File ID: 2018.03.22_537B_026.d

Analysis Method: 537 | Date Collected: 03/13/2018 10:05

Extraction Method: 537 | Date Extracted: 03/19/2018 07:47

Sample wt/vol: 257.8(mL) | Date Analyzed: 03/22/2018 23:07

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

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

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

Analysis Batch No.: 214496 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	7.8	U	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.7	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	97		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37095-1

SDG No.:

Client Sample ID: NAWC-031318-~~RW~~FRB-061 | Lab Sample ID: 320-37095-3

Matrix: Water | Lab File ID: 2018.03.22_537B_027.d

Analysis Method: 537 | Date Collected: 03/13/2018 10:35

Extraction Method: 537 | Date Extracted: 03/19/2018 07:47

Sample wt/vol: 258(mL) | Date Analyzed: 03/22/2018 23:11

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

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

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

Analysis Batch No.: 214496 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	7.8	U	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.7	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	92		70-130

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FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37095-1

SDG No.:

Client Sample ID: NAWC-031318-~~FRB~~ RW 061 | Lab Sample ID: 320-37095-4

Matrix: Water | Lab File ID: 2018.03.22_537B_028.d

Analysis Method: 537 | Date Collected: 03/13/2018 10:40

Extraction Method: 537 | Date Extracted: 03/19/2018 07:47

Sample wt/vol: 265(mL) | Date Analyzed: 03/22/2018 23:16

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

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

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

Analysis Batch No.: 214496 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	28	J M	38	15	6.4
335-67-1	Perfluorooctanoic acid (PFOA)	18	J	19	7.5	2.6
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.5
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	J	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.6	J	9.4	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	88		70-130
STL00996	13C2 PFDA	95		70-130

Dawn L Salemen
04/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37095-1

SDG No.:

Client Sample ID: ~~NAWC-~~WGNA-031318-RW-0263 | Lab Sample ID: 320-37095-5

Matrix: Water | Lab File ID: 2018.03.22_537B_029.d

Analysis Method: 537 | Date Collected: 03/13/2018 13:40

Extraction Method: 537 | Date Extracted: 03/19/2018 07:47

Sample wt/vol: 258.3(mL) | Date Analyzed: 03/22/2018 23:21

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

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

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

Analysis Batch No.: 214496 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	J M	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	18	J	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	9.0	J	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.0	J	9.7	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	97		70-130

04/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37095-1

SDG No.:

Client Sample ID: ~~NAWC-~~WGNA-031318-FRB-0263 | Lab Sample ID: 320-37095-6

Matrix: Water | Lab File ID: 2018.03.22_537B_030.d

Analysis Method: 537 | Date Collected: 03/13/2018 13:35

Extraction Method: 537 | Date Extracted: 03/19/2018 07:47

Sample wt/vol: 260.8(mL) | Date Analyzed: 03/22/2018 23:25

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

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

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

Analysis Batch No.: 214496 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	7.7	U	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	86	35	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	96		70-130

04/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37095-1

SDG No.:

Client Sample ID: ~~NAWC~~ WGNA-031318-RW-4840 | Lab Sample ID: 320-37095-7

Matrix: Water | Lab File ID: 2018.03.22_537B_031.d

Analysis Method: 537 | Date Collected: 03/13/2018 14:10

Extraction Method: 537 | Date Extracted: 03/19/2018 07:47

Sample wt/vol: 263.2(mL) | Date Analyzed: 03/22/2018 23:30

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

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

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

Analysis Batch No.: 214496 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	7.6	U	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.5	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	105		70-130
STL00996	13C2 PFDA	110		70-130

04/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37095-1

SDG No.:

Client Sample ID: ~~NAWC-~~WGNA-031318-FRB-4840 | Lab Sample ID: 320-37095-8

Matrix: Water | Lab File ID: 2018.03.22_537B_034.d

Analysis Method: 537 | Date Collected: 03/13/2018 14:05

Extraction Method: 537 | Date Extracted: 03/19/2018 07:47

Sample wt/vol: 262.9(mL) | Date Analyzed: 03/22/2018 23:44

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

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

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

Analysis Batch No.: 214497 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	7.6	U	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	29	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.5	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	86	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	98		70-130

04/19/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37095-1

SDG No.:

Client Sample ID: WGNA-031318-DUP029 | Lab Sample ID: 320-37095-9

Matrix: Water | Lab File ID: 2018.03.22_537B_035.d

Analysis Method: 537 | Date Collected: 03/13/2018 07:00

Extraction Method: 537 | Date Extracted: 03/19/2018 07:47

Sample wt/vol: 259.6(mL) | Date Analyzed: 03/22/2018 23:49

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

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

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

Analysis Batch No.: 214497 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	39	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	15	J	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	10	J	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	9.7		9.6	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	100		70-130

Appendix C

Support Documentation

ANALYTE	ORIGINAL NAWC-031318-RW-185	DUPLICATE WGNA-031318-DUP029	RL	RPD	RPD > 50%	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2XRL
Perfluorooctanoic acid (PFOA)	16	15	19	6.452	FALSE	FALSE	FALSE	FALSE
Perfluoroheptanoic acid (PFHpA)	9.8	9.7	9.5	1.026	FALSE	FALSE	FALSE	FALSE
Perfluorohexanesulfonic acid (PFHxS)	10	10	28	0.000	FALSE	FALSE	FALSE	FALSE
Perfluorooctanesulfonic acid (PFOS)	19	15	38	23.529	FALSE	FALSE	FALSE	FALSE

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605-1500
phone 916.373.5600 fax 303.467.7248

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.

Regulatory Program: ☑DW ☐NPDES ☐RCRA ☐Other:

Client Contact	Project Manager: Andy Frebowitz	Site Contact: Mary Kay Bond	Date: 3/13/2018	COC No:
TetraTech	Tel/Fax: 610.382.1170	Lab Contact: Dave Alltucker	Carrier: FedEx	1 of 1 COCs
234 Mall Boulevard Suite 260	Analysis Turnaround Time			Sampler: Mary Kay Bond
King of Prussia, PA 19406	☐CALENDAR DAYS ☐WORKING DAYS			For Lab Use Only:
610-382-1174	TAT if different from Below 21			Walk-in Client:
610-491-9688	☐ 2 weeks			Lab Sampling:
Project Name: WE04	☐ 1 week			
Site: WE04	☐ 2 days			Job / SDG No.:
P O # 1132358 (through EarthToxics)	☐ 1 day			

320-37095 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	EPA 537 UCMR3	Sample Specific Notes:
NAWC-031318-RW-185	3/13/2018	10:10	G	DW	2	N	N	Y	
NAWC-031318-FRB-185	3/13/2018	10:05	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-031318-RW-061	3/13/2018	10:35	G	DW	2	N	N	Y	
NAWC-031318-FRB-061	3/13/2018	10:40	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-031318-RW-0263	3/13/2018	13:40	G	DW	2	N	N	Y	
NAWC-031318-FRB-0263	3/13/2018	13:35	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-031318-RW-4840	3/13/2018	14:10	G	DW	2	N	N	Y	
NAWC-031318-FRB-4840	3/13/2018	14:05	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-031318-DUP029	3/13/2018	07:00	G	DW	2	N	N	Y	Duplicate

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

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the

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

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

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

Fed Ex Tracking: 7800 0267 9889

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: 1.9 1.2 Corr'd:_____ | Therm ID No.: AK2

Relinquished by: Mary Kay Bond	Company: Tetra Tech	Date/Time: 3/13/2018 16:00	Received by:	Company:	Date/Time: 3/14/18 915
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.11, dated 1/24/2017

* Sample 5-6 Labeled with WGNA instead of NAWC-

Qualifiers

LCMS

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.

Glossary

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

Job Narrative
320-37095-1

requested revised case narrative

Receipt
The samples were received on 3/14/2018 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.9º C.

Receipt Exceptions
The container label for the following samples did not match the information listed on the Chain-of-Custody (COC): NAWC-031318-RW-0263 (320-37095-5), NAWC-031318-FRB-0263 (320-37095-6), NAWC-031318-RW-4840 (320-37095-7) and NAWC-031318-FRB-4840 (320-37095-8). The container labels list WGNA before -031318- while the COC lists NAWC-031318-. Labeled according to COC.

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

Method(s) 537: The following samples were re-extracted to confirm the original results. NAWC-031318-RW-061 (320-37095-3) and NAWC-031318-FRB-061 (320-37095-4) The prep chemists verified that the client labels on the bottles matched the laboratory labels. Sample switch was suspected as the RW is non-detect while the FRB sample has some J values detection. The re-extraction confrimed the oriignal results.

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

Organic Prep
Method(s) 537: The following sample: NAWC-031318-RW-4840 (320-37095-7) in preparation batch 320-213605 was inadvertently dropped prior to starting the extraction. The back up bottle was used for the extraction.

Method(s) 537: The following sample has a pH of 6, in preparation batch 320-213605. 320-37095-5 (NAWC-031318-RW-263)

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-213605.

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-214769.

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

Job Narrative
320-37095-1

Receipt
The samples were received on 3/14/2018 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.9º C.

Receipt Exceptions
The container label for the following samples did not match the information listed on the Chain-of-Custody (COC): NAWC-031318-RW-0263 (320-37095-5), NAWC-031318-FRB-0263 (320-37095-6), NAWC-031318-RW-4840 (320-37095-7) and NAWC-031318-FRB-4840 (320-37095-8). The container labels list WGNA before -031318- while the COC lists NAWC-031318-. Labeled according to COC.

LCMS
Method(s) 537: The following samples were re-extracted to confirm the original results. NAWC-031318-RW-061 (320-37095-3) and NAWC-031318-FRB-061 (320-37095-4) The prep chemists verified that the client labels on the bottles matched the laboratory labels. Sample switch was suspected as the RW is non-detect while the FRB sample has some J values detection. The re-extraction confrimed the oriignal results.

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

Organic Prep
Method(s) 537: The following sample: NAWC-031318-RW-4840 (320-37095-7) in preparation batch 320-213605 was inadvertently dropped prior to starting the extraction. The back up bottle was used for the extraction.

Method(s) 537: The following sample has a pH of 6, in preparation batch 320-213605. 320-37095-5 (NAWC-031318-RW-263)

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-213605.

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-214769.

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

Method Summary

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-37095-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Method	Method Description	Protocol	Laboratory
537	Perfluorinated Alkyl Acids (LC/MS)	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

Client: Tetra Tech, Inc.
TestAmerica Job ID: 320-37095-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-37095-1	NAWC-031318-RW-185	Water	03/13/18 10:10	03/14/18 09:15
320-37095-2	NAWC-031318-FRB-185	Water	03/13/18 10:05	03/14/18 09:15
320-37095-3	NAWC-031318-RW-061	Water	03/13/18 10:35	03/14/18 09:15
320-37095-4	NAWC-031318-FRB-061	Water	03/13/18 10:40	03/14/18 09:15
320-37095-5	NAWC-031318-RW-0263	Water	03/13/18 13:40	03/14/18 09:15
320-37095-6	NAWC-031318-FRB-0263	Water	03/13/18 13:35	03/14/18 09:15
320-37095-7	NAWC-031318-RW-4840	Water	03/13/18 14:10	03/14/18 09:15
320-37095-8	NAWC-031318-FRB-4840	Water	03/13/18 14:05	03/14/18 09:15
320-37095-9	WGNA-031318-DUP029	Water	03/13/18 07:00	03/14/18 09:15

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-031318-RW-185	320-37095-1	90	92
NAWC-031318-FRB-185	320-37095-2	90	97
NAWC-031318-RW-061	320-37095-3	90	92
NAWC-031318-FRB-061	320-37095-4	88	95
NAWC-031318-RW-0263	320-37095-5	100	97
NAWC-031318-FRB-0263	320-37095-6	102	96
NAWC-031318-RW-4840	320-37095-7	105	110
NAWC-031318-FRB-4840	320-37095-8	97	98
WGNA-031318-DUP029	320-37095-9	97	100
	MB 320-213605/1-A	100	98
	LLCS 320-213605/2-A	101	98
	LLCSD 320-213605/3-A	96	94

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

Column to be used to flag recovery values

FORM II 537

FORM III
LCMS LOW LEVEL CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.03.22_537B_023.d

Lab ID: LLCS 320-213605/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LLCS CONCENTRATION (ng/L)	LLCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	40.2	43.0	107	50-150	M
Perfluorooctanoic acid (PFOA)	20.1	21.2	106	50-150	
Perfluorononanoic acid (PFNA)	20.0	21.2 J	106	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.0	33.2	111	50-150	
Perfluoroheptanoic acid (PFHpA)	10.0	11.0	110	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.0	85.8 J	95	50-150	

Column to be used to flag recovery and RPD values

FORM III 537

FORM III
LCMS LOW LEVEL CONTROL STANDARD DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.03.22_537B_024.d

Lab ID: LLCSD 320-213605/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LLCSD CONCENTRATION (ng/L)	LLCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	40.2	43.6	109	1	50	50-150	M
Perfluorooctanoic acid (PFOA)	20.1	20.4	101	4	50	50-150	
Perfluorononanoic acid (PFNA)	20.0	20.6 J	103	3	50	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.0	33.2	111	0.05	50	50-150	
Perfluoroheptanoic acid (PFHpA)	10.0	10.9	109	0.9	50	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.0	84.9 J	94	1	50	50-150	

Column to be used to flag recovery and RPD values

FORM III 537

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Lab File ID: 2018.03.22_537B_022.d Lab Sample ID: MB 320-213605/1-A

Matrix: Water Date Extracted: 03/19/2018 07:47

Instrument ID: A8_N Date Analyzed: 03/22/2018 22:48

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LLCS 320-213605/2-A	2018.03.22_537B_023.d	03/22/2018 22:53
	LLCSD 320-213605/3-A	2018.03.22_537B_024.d	03/22/2018 22:57
NAWC-031318-RW-185	320-37095-1	2018.03.22_537B_025.d	03/22/2018 23:02
NAWC-031318-FRB-185	320-37095-2	2018.03.22_537B_026.d	03/22/2018 23:07
NAWC-031318-RW-061	320-37095-3	2018.03.22_537B_027.d	03/22/2018 23:11
NAWC-031318-FRB-061	320-37095-4	2018.03.22_537B_028.d	03/22/2018 23:16
NAWC-031318-RW-0263	320-37095-5	2018.03.22_537B_029.d	03/22/2018 23:21
NAWC-031318-FRB-0263	320-37095-6	2018.03.22_537B_030.d	03/22/2018 23:25
NAWC-031318-RW-4840	320-37095-7	2018.03.22_537B_031.d	03/22/2018 23:30
NAWC-031318-FRB-4840	320-37095-8	2018.03.22_537B_034.d	03/22/2018 23:44
WGNA-031318-DUP029	320-37095-9	2018.03.22_537B_035.d	03/22/2018 23:49

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37095-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-213605/1-A

Matrix: Water | Lab File ID: 2018.03.22_537B_022.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 03/19/2018 07:47

Sample wt/vol: 250(mL) | Date Analyzed: 03/22/2018 22:48

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

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

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

Analysis Batch No.: 214496 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	8.0	U	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	98		70-130

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Instrument ID: A8_N Calibration Start Date: 03/22/2018 14:53

GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 03/22/2018 15:16

Calibration ID: 38271

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		1135154	1.88	2676273	2.13		
UPPER LIMIT		1702731	2.38	4014410	2.63		
LOWER LIMIT		567577	1.38	1338137	1.63		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 320-214409/11		1124949	1.87	2668897	2.12		
ICV 320-214409/13		1113554	1.87	2591357	2.12		
CCV 320-214496/17 CCVIS		1061344	1.86	2562497	2.11		
MB 320-213605/1-A		1183939	1.86	2858911	2.11		
LLCS 320-213605/2-A		1193958	1.87	2767282	2.12		
LLCSD 320-213605/3-A		1165436	1.87	2642732	2.12		
320-37095-1	NAWC-031318-RW-185	1194198	1.87	2803216	2.12		
320-37095-2	NAWC-031318-FRB-185	1143703	1.87	2818540	2.12		
320-37095-3	NAWC-031318-RW-061	1214448	1.86	2783982	2.11		
320-37095-4	NAWC-031318-FRB-061	1247919	1.87	2855259	2.12		
320-37095-5	NAWC-031318-RW-0263	1212739	1.86	2832225	2.11		
320-37095-6	NAWC-031318-FRB-0263	1112915	1.87	2609476	2.12		
320-37095-7	NAWC-031318-RW-4840	1159734	1.86	2743707	2.11		
CCV 320-214496/29 CCVIS		1083335	1.87	2688937	2.12		
CCV 320-214497/29 CCVIS		1083335	1.87	2688937	2.12		
320-37095-8	NAWC-031318-FRB-4840	1214422	1.86	2767074	2.11		
320-37095-9	WGNA-031318-DUP029	1247086	1.86	2882762	2.11		
CCV 320-214497/33 CCVIS		1116403	1.86	2705453	2.11		

13PFOA = 13C2-PFOA
PFOS = 13C4 PFOS

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Sample No.: CCV 320-214496/17 Date Analyzed: 03/22/2018 22:39

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

Lab File ID (Standard): 2018.03.22_537B_020 Heated Purge: (Y/N) N

Calibration ID: 38271

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1061344	1.86	2562497	2.11		
UPPER LIMIT		1485882	2.36	3587496	2.61		
LOWER LIMIT		742941	1.36	1793748	1.61		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-213605/1-A		1183939	1.86	2858911	2.11		
LLCS 320-213605/2-A		1193958	1.87	2767282	2.12		
LLCSD 320-213605/3-A		1165436	1.87	2642732	2.12		
320-37095-1	NAWC-031318-RW-185	1194198	1.87	2803216	2.12		
320-37095-2	NAWC-031318-FRB-185	1143703	1.87	2818540	2.12		
320-37095-3	NAWC-031318-RW-061	1214448	1.86	2783982	2.11		
320-37095-4	NAWC-031318-FRB-061	1247919	1.87	2855259	2.12		
320-37095-5	NAWC-031318-RW-0263	1212739	1.86	2832225	2.11		
320-37095-6	NAWC-031318-FRB-0263	1112915	1.87	2609476	2.12		
320-37095-7	NAWC-031318-RW-4840	1159734	1.86	2743707	2.11		

13PFOA = 13C2-PFOA
PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Sample No.: CCV 320-214496/29 Date Analyzed: 03/22/2018 23:35

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

Lab File ID (Standard): 2018.03.22_537B_032 Heated Purge: (Y/N) N

Calibration ID: 38271

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1083335	1.87	2688937	2.12		
UPPER LIMIT		1516669	2.37	3764512	2.62		
LOWER LIMIT		758335	1.37	1882256	1.62		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-213605/1-A		1183939	1.86	2858911	2.11		
LLCS 320-213605/2-A		1193958	1.87	2767282	2.12		
LLCSD 320-213605/3-A		1165436	1.87	2642732	2.12		
320-37095-1	NAWC-031318-RW-185	1194198	1.87	2803216	2.12		
320-37095-2	NAWC-031318-FRB-185	1143703	1.87	2818540	2.12		
320-37095-3	NAWC-031318-RW-061	1214448	1.86	2783982	2.11		
320-37095-4	NAWC-031318-FRB-061	1247919	1.87	2855259	2.12		
320-37095-5	NAWC-031318-RW-0263	1212739	1.86	2832225	2.11		
320-37095-6	NAWC-031318-FRB-0263	1112915	1.87	2609476	2.12		
320-37095-7	NAWC-031318-RW-4840	1159734	1.86	2743707	2.11		

13PFOA = 13C2-PFOA
PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Sample No.: CCV 320-214497/29 Date Analyzed: 03/22/2018 23:35

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

Lab File ID (Standard): 2018.03.22_537B_032 Heated Purge: (Y/N) N

Calibration ID: 38271

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1083335	1.87	2688937	2.12		
UPPER LIMIT		1516669	2.37	3764512	2.62		
LOWER LIMIT		758335	1.37	1882256	1.62		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-37095-8	NAWC-031318-FRB-4840	1214422	1.86	2767074	2.11		
320-37095-9	WGNA-031318-DUP029	1247086	1.86	2882762	2.11		

13PFOA = 13C2-PFOA
PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Sample No.: CCV 320-214497/33 Date Analyzed: 03/22/2018 23:53

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

Lab File ID (Standard): 2018.03.22_537B_036 Heated Purge: (Y/N) N

Calibration ID: 38271

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1116403	1.86	2705453	2.11		
UPPER LIMIT		1562964	2.36	3787634	2.61		
LOWER LIMIT		781482	1.36	1893817	1.61		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-37095-8	NAWC-031318-FRB-4840	1214422	1.86	2767074	2.11		
320-37095-9	WGNA-031318-DUP029	1247086	1.86	2882762	2.11		

13PFOA = 13C2-PFOA
PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537

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

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1 Analy Batch No.: 214409

SDG No.:

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

Calibration Start Date: 03/22/2018 14:53 Calibration End Date: 03/22/2018 15:16 Calibration ID: 38271

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-214409/4	2018.03.22_537ICAL_004.d
Level 2	IC 320-214409/5	2018.03.22_537ICAL_005.d
Level 3	IC 320-214409/6	2018.03.22_537ICAL_006.d
Level 4	IC 320-214409/7	2018.03.22_537ICAL_007.d
Level 5	IC 320-214409/8	2018.03.22_537ICAL_008.d
Level 6	IC 320-214409/9	2018.03.22_537ICAL_009.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid (PFBS)	0.9228 +++++	0.9814	1.0233	0.9496	0.8750	Ave		0.9504				5.9		30.0			
Perfluoroheptanoic acid (PFHpA)	0.9563 0.9830	1.0069	0.9814	1.0007	0.9818	Ave		0.9850				1.8		30.0			
Perfluorohexanesulfonic acid (PFHxS)	1.4834 1.5253	1.5335	1.6094	1.5943	1.5814	Ave		1.5546				3.1		30.0			
Perfluorooctanoic acid (PFOA)	0.9018 0.9905	0.9485	0.9598	1.0006	0.9943	Ave		0.9659				3.9		30.0			
Perfluorooctanesulfonic acid (PFOS)	0.8712 0.9390	0.9308	0.9384	0.9647	0.9421	Ave		0.9310				3.4		30.0			
Perfluorononanoic acid (PFNA)	0.6586 0.7466	0.7314	0.7293	0.7533	0.7403	Ave		0.7266				4.8		30.0			
13C2 PFHxA	0.9719 1.1086	0.9969	1.0249	1.0236	1.0436	Ave		1.0283				4.5		30.0			
13C2 PFDA	0.8190 0.8921	0.8318	0.8286	0.8353	0.8726	Ave		0.8466				3.4		30.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1 Analy Batch No.: 214409

SDG No.:

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

Calibration Start Date: 03/22/2018 14:53 Calibration End Date: 03/22/2018 15:16 Calibration ID: 38271

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-214409/4	2018.03.22_537ICAL_004.d
Level 2	IC 320-214409/5	2018.03.22_537ICAL_005.d
Level 3	IC 320-214409/6	2018.03.22_537ICAL_006.d
Level 4	IC 320-214409/7	2018.03.22_537ICAL_007.d
Level 5	IC 320-214409/8	2018.03.22_537ICAL_008.d
Level 6	IC 320-214409/9	2018.03.22_537ICAL_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	Ave	796972 +++++	1844935	4174655	7866195	10901700	9.00 +++++	20.0	45.0	90.0	135
Perfluoroheptanoic acid (PFHpA)	13PFOA	Ave	113714 2227166	257474	561923	1097097	1617482	1.00 20.0	2.22	5.00	10.0	15.0
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	427157 8696268	961162	2189176	4403638	6568926	3.00 60.0	6.67	15.0	30.0	45.0
Perfluorooctanoic acid (PFOA)	13PFOA	Ave	215607 4512279	487639	1104922	2205621	3293471	2.01 40.2	4.47	10.1	20.1	30.2
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	335816 7166468	780931	1708604	3566785	5238684	4.02 80.3	8.93	20.1	40.2	60.3
Perfluorononanoic acid (PFNA)	13PFOA	Ave	156653 3383462	374107	835301	1652004	2439501	2.00 40.0	4.45	10.0	20.0	30.0
13C2 PFHxA	13PFOA	Ave	1155395 1255631	1146847	1173423	1122030	1145956	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PFOA	Ave	973562 1010441	956972	948738	915618	958136	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:
Ave = Average ISTD

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

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1 Analy Batch No.: 214409

SDG No.:

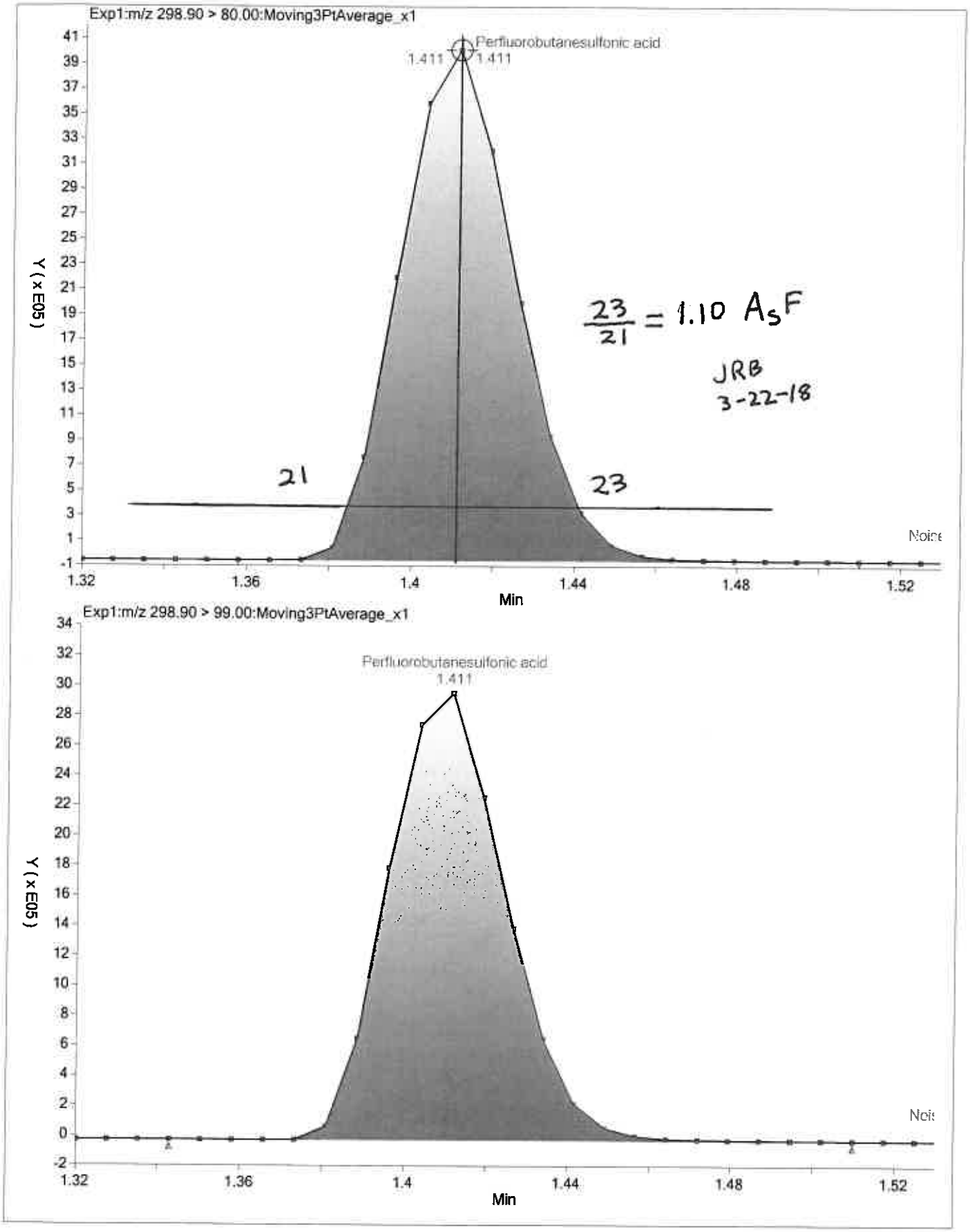
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

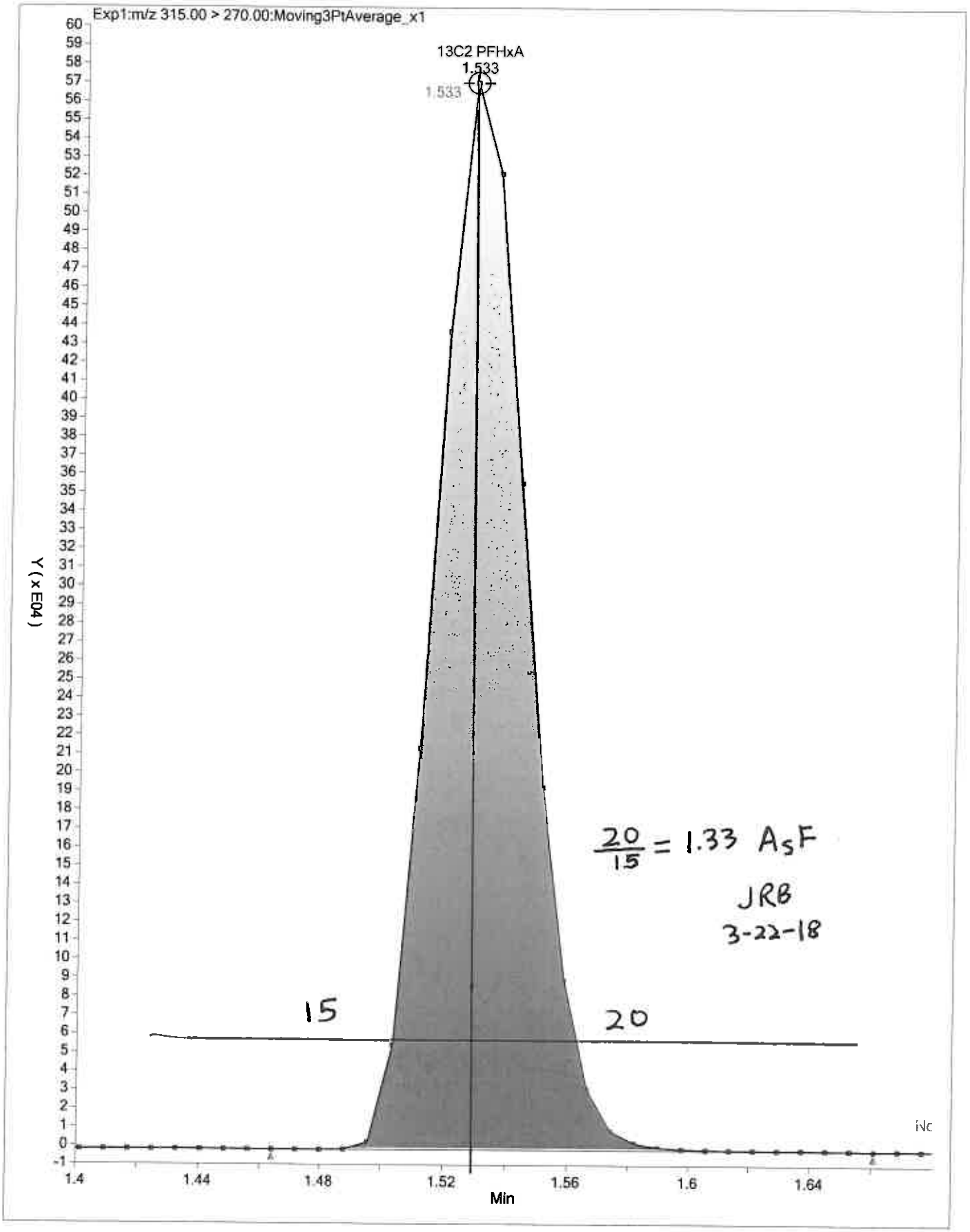
Calibration Start Date: 03/22/2018 14:53 Calibration End Date: 03/22/2018 15:16 Calibration ID: 38271

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-214409/4	2018.03.22_537ICAL_004.d
Level 2	IC 320-214409/5	2018.03.22_537ICAL_005.d
Level 3	IC 320-214409/6	2018.03.22_537ICAL_006.d
Level 4	IC 320-214409/7	2018.03.22_537ICAL_007.d
Level 5	IC 320-214409/8	2018.03.22_537ICAL_008.d
Level 6	IC 320-214409/9	2018.03.22_537ICAL_009.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid (PFBS)	-2.9	3.3	7.7	-0.1	-7.9	+++++	50	30	30	30	30	
Perfluoroheptanoic acid (PFHpA)	-2.9	2.2	-0.4	1.6	-0.3	-0.2	50	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	-4.6	-1.4	3.5	2.6	1.7	-1.9	50	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	-6.6	-1.8	-0.6	3.6	2.9	2.5	50	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-6.4	0.0	0.8	3.6	1.2	0.9	50	30	30	30	30	30
Perfluorononanoic acid (PFNA)	-9.4	0.7	0.4	3.7	1.9	2.8	50	30	30	30	30	30
13C2 PFHxA	-5.5	-3.1	-0.3	-0.4	1.5	7.8	30	30	30	30	30	30
13C2 PFDA	-3.3	-1.7	-2.1	-1.3	3.1	5.4	30	30	30	30	30	30


Exp1:m/z 298.90 > 80.00:Moving3PtAverage_x1
Perfluorobutanesulfonic acid
1.411
1.411
Y (x E05)
Min
21
23
$\frac{23}{21} = 1.10$ $A_S F$
JRB
3-22-18
Exp1:m/z 298.90 > 99.00:Moving3PtAverage_x1
Perfluorobutanesulfonic acid
1.411
Y (x E05)
Min


Exp1:m/z 315.00 > 270.00:Moving3PtAverage_x1
13C2 PFHxA
1.533
1.533
Y (x E04)
Min
1.4
1.44
1.48
1.52
1.56
1.6
1.64
15
20
20/15 = 1.33 AsF
JRB
3-22-18

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Lab Sample ID: CCVL 320-214409/11 Calibration Date: 03/22/2018 15:25

Instrument ID: A8_N Calib Start Date: 03/22/2018 14:53

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 03/22/2018 15:16

Lab File ID: 2018.03.22_537ICAL_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.9504	1.016		21.4	20.0	6.9	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9850	1.032		2.33	2.22	4.8	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.555	1.662		7.13	6.67	6.9	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9659	0.9767		4.52	4.47	1.1	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9310	0.9593		9.20	8.93	3.0	50.0
Perfluorononanoic acid (PFNA)	Ave	0.7266	0.7728		4.73	4.45	6.4	50.0
13C2 PFHxA	Ave	1.028	1.059		10.3	10.0	3.0	30.0
13C2 PFDA	Ave	0.8466	0.8103		9.57	10.0	-4.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Lab Sample ID: ICV 320-214409/13 Calibration Date: 03/22/2018 15:35

Instrument ID: A8_N Calib Start Date: 03/22/2018 14:53

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 03/22/2018 15:16

Lab File ID: 2018.03.22_537ICAL_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.9504	0.9521		103	100	0.2	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9850	1.009		10.2	10.0	2.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.555	1.659		21.5	20.2	6.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9659	0.9076		18.9	20.2	-6.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9310	0.9726		21.1	20.2	4.5	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7266	0.7677		21.3	20.2	5.7	30.0
13C2 PFHxA	Ave	1.028	1.034		10.1	10.0	0.6	30.0
13C2 PFDA	Ave	0.8466	0.8275		9.77	10.0	-2.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Lab Sample ID: CCV 320-214496/17 Calibration Date: 03/22/2018 22:39

Instrument ID: A8_N Calib Start Date: 03/22/2018 14:53

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 03/22/2018 15:16

Lab File ID: 2018.03.22_537B_020.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.9504	0.9454		149	135	-0.5	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9850	1.041		15.9	15.0	5.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.555	1.648		47.7	45.0	6.0	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9659	0.995		31.1	30.2	3.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9310	0.9870		63.9	60.3	6.0	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7266	0.7386		30.5	30.0	1.7	30.0
13C2 PFHxA	Ave	1.028	1.127		11.0	10.0	9.6	30.0
13C2 PFDA	Ave	0.8466	0.8736		10.3	10.0	3.2	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Lab Sample ID: CCV 320-214496/29 Calibration Date: 03/22/2018 23:35

Instrument ID: A8_N Calib Start Date: 03/22/2018 14:53

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 03/22/2018 15:16

Lab File ID: 2018.03.22_537B_032.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.9504	1.022		45.5	45.0	7.5	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9850	1.041		5.29	5.00	5.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.555	1.619		15.6	15.0	4.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9659	0.9856		10.3	10.1	2.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9310	0.9632		20.8	20.1	3.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7266	0.7867		10.8	10.0	8.3	30.0
13C2 PFHxA	Ave	1.028	1.079		10.5	10.0	4.9	30.0
13C2 PFDA	Ave	0.8466	0.8865		10.5	10.0	4.7	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Lab Sample ID: CCV 320-214497/29 Calibration Date: 03/22/2018 23:35

Instrument ID: A8_N Calib Start Date: 03/22/2018 14:53

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 03/22/2018 15:16

Lab File ID: 2018.03.22_537B_032.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.9504	1.022		45.5	45.0	7.5	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9850	1.041		5.29	5.00	5.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.555	1.619		15.6	15.0	4.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9659	0.9856		10.3	10.1	2.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9310	0.9632		20.8	20.1	3.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7266	0.7867		10.8	10.0	8.3	30.0
13C2 PFHxA	Ave	1.028	1.079		10.5	10.0	4.9	30.0
13C2 PFDA	Ave	0.8466	0.8865		10.5	10.0	4.7	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Lab Sample ID: CCV 320-214497/33 Calibration Date: 03/22/2018 23:53

Instrument ID: A8_N Calib Start Date: 03/22/2018 14:53

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 03/22/2018 15:16

Lab File ID: 2018.03.22_537B_036.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.9504	0.9088		142	135	-4.4	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9850	1.028		15.7	15.0	4.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.555	1.585		45.9	45.0	1.9	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9659	0.9697		30.3	30.2	0.4	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9310	0.9732		63.0	60.3	4.5	30.0
Perfluorononanoic acid (PFNA)	Ave	0.7266	0.7251		29.9	30.0	-0.2	30.0
13C2 PFHxA	Ave	1.028	1.052		10.2	10.0	2.3	30.0
13C2 PFDA	Ave	0.8466	0.8639		10.2	10.0	2.0	30.0

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 22MAR2018_537C Worklist Number: 55733
Instrument Name: A8_N Chrom Method: 537_A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180323-55733.b
QC Batching: Enabled Limit Group Batching: Enabled

QC Batch: 1	LC 537 ICAL Raw Batch: 214493
# 1 CCV L5	# 1 CCV L5
# 2 RB	# 2 RB
# 3 MB 320-213852/1-A	# 3 MB 320-213852/1-A
# 4 LCS 320-213852/2-A	# 4 LCS 320-213852/2-A
# 5 320-37185-A-1-A	# 5 320-37185-A-1-A
# 6 320-37185-A-2-A	# 6 320-37185-A-2-A
# 7 320-37185-A-3-A	# 7 320-37185-A-3-A
# 8 320-37185-A-3-B MS	# 8 320-37185-A-3-B MS
# 9 320-37185-A-3-C MSD	# 9 320-37185-A-3-C MSD
#10 320-37185-A-4-A	#10 320-37185-A-4-A
#11 320-37185-A-5-A	#11 320-37185-A-5-A
#12 320-37185-A-6-A	#12 320-37185-A-6-A
#13 CCV L3	#13 CCV L3

QC Batch: 2	LC 537 ICAL Raw Batch: 214494
#13 CCV L3	#13 CCV L3
#14 RB	#14 RB
#15 320-37183-A-1-A	#15 320-37183-A-1-A
#16 320-37183-A-2-A	#16 320-37183-A-2-A
#17 CCV L5	#17 CCV L5

QC Batch: 3	LC 537 ICAL Raw Batch: 214496
#17 CCV L5	#17 CCV L5
#18 RB	#18 RB
#19 MB 320-213605/1-A	#19 MB 320-213605/1-A
#20 LLCS 320-213605/2-A	#20 LLCS 320-213605/2-A
#21 LLCSD 320-213605/3-A	#21 LLCSD 320-213605/3-A
#22 320-37095-A-1-A	#22 320-37095-A-1-A
#23 320-37095-A-2-A	#23 320-37095-A-2-A
#24 320-37095-A-3-A	#24 320-37095-A-3-A
#25 320-37095-A-4-A	#25 320-37095-A-4-A
#26 320-37095-A-5-A	#26 320-37095-A-5-A
#27 320-37095-A-6-A	#27 320-37095-A-6-A
#28 320-37095-B-7-A	#28 320-37095-B-7-A
#29 CCV L3	#29 CCV L3

QC Batch: 4	LC 537 ICAL Raw Batch: 214497
#29 CCV L3	#29 CCV L3
#30 RB	#30 RB
#31 320-37095-A-8-A	#31 320-37095-A-8-A
#32 320-37095-A-9-A	#32 320-37095-A-9-A
#33 CCV L5	#33 CCV L5
#34 RB	#34 RB

Run after ICAL

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 22MAR2018_537C Worklist Num: 55733
Instrument: A8_N Method: 537_A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180323-55733.b
Anaylysis Type: SemiVOA Creator: Hannigan, Alyssa B
Inj Volume: 2.00 Inj Vol Units: ul

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
CCV L5	320-0055733-001	CCVIS	22-Mar-2018 21:24:32	2018.03.22_537B_004.d	5	1.0		sv
RB	320-0055733-002	RB	22-Mar-2018 21:29:11	2018.03.22_537B_005.d	8	1.0		sv
MB 320-213852/1-A	320-0055733-003	MB	22-Mar-2018 21:33:51	2018.03.22_537B_006.d	31	1.0		sv
LCS 320-213852/2-A	320-0055733-004	LCS	22-Mar-2018 21:38:31	2018.03.22_537B_007.d	32	1.0		sv
320-37185-A-1-A	320-0055733-005	Client	22-Mar-2018 21:43:12	2018.03.22_537B_008.d	33	1.0	WS-036	sv
320-37185-A-2-A	320-0055733-006	Client	22-Mar-2018 21:47:51	2018.03.22_537B_009.d	34	1.0	POET-3-MID	sv
320-37185-A-3-A	320-0055733-007	Client	22-Mar-2018 21:52:32	2018.03.22_537B_010.d	35	1.0	POET-3-POST	sv
320-37185-A-3-B MS	320-0055733-008	MS	22-Mar-2018 21:57:12	2018.03.22_537B_011.d	36	1.0	POET-3-POST	sv
320-37185-A-3-C MSD	320-0055733-009	MSD	22-Mar-2018 22:01:52	2018.03.22_537B_012.d	37	1.0	POET-3-POST	sv
320-37185-A-4-A	320-0055733-010	Client	22-Mar-2018 22:06:33	2018.03.22_537B_013.d	38	1.0	DUP-039	sv
320-37185-A-5-A	320-0055733-011	Client	22-Mar-2018 22:11:13	2018.03.22_537B_014.d	39	1.0	FIELD BLANK	sv
320-37185-A-6-A	320-0055733-012	Client	22-Mar-2018 22:15:53	2018.03.22_537B_015.d	40	1.0	WS-036-KITCHEN	sv
CCV L3	320-0055733-013	CCVIS	22-Mar-2018 22:20:35	2018.03.22_537B_016.d	3	1.0		sv
RB	320-0055733-014	RB	22-Mar-2018 22:25:15	2018.03.22_537B_017.d	8	1.0		sv
320-37183-A-1-A	320-0055733-015	Client	22-Mar-2018 22:29:55	2018.03.22_537B_018.d	41	1.0	WS-090	sv
320-37183-A-2-A	320-0055733-016	Client	22-Mar-2018 22:34:36	2018.03.22_537B_019.d	42	1.0	POET-4-MID	sv
CCV L5	320-0055733-017	CCVIS	22-Mar-2018 22:39:16	2018.03.22_537B_020.d	5	1.0		sv
RB	320-0055733-018	RB	22-Mar-2018 22:43:55	2018.03.22_537B_021.d	8	1.0		sv
MB 320-213605/1-A	320-0055733-019	MB	22-Mar-2018 22:48:34	2018.03.22_537B_022.d	43	1.0		sv
LLCS 320-213605/2-A	320-0055733-020	LLCS	22-Mar-2018 22:53:14	2018.03.22_537B_023.d	44	1.0		sv
LLCSD 320-213605/3-A	320-0055733-021	LLCSD	22-Mar-2018 22:57:54	2018.03.22_537B_024.d	45	1.0		sv
320-37095-A-1-A	320-0055733-022	Client	22-Mar-2018 23:02:34	2018.03.22_537B_025.d	46	1.0	NAWC-031318-RW-185	sv
320-37095-A-2-A	320-0055733-023	Client	22-Mar-2018 23:07:14	2018.03.22_537B_026.d	47	1.0	NAWC-031318-FRB-185	sv
320-37095-A-3-A	320-0055733-024	Client	22-Mar-2018 23:11:56	2018.03.22_537B_027.d	48	1.0	NAWC-031318-RW-061	sv
320-37095-A-4-A	320-0055733-025	Client	22-Mar-2018 23:16:38	2018.03.22_537B_028.d	49	1.0	NAWC-031318-FRB-061	sv

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
320-37095-A-5-A	320-0055733-026	Client	22-Mar-2018 23:21:18	2018.03.22_537B_029.d	50	1.0	NAWC-031318-RW-0263	sv
320-37095-A-6-A	320-0055733-027	Client	22-Mar-2018 23:25:58	2018.03.22_537B_030.d	51	1.0	NAWC-031318-FRB-0263	sv
320-37095-B-7-A	320-0055733-028	Client	22-Mar-2018 23:30:38	2018.03.22_537B_031.d	52	1.0	NAWC-031318-RW-4840	sv
CCV L3	320-0055733-029	CCVIS	22-Mar-2018 23:35:18	2018.03.22_537B_032.d	3	1.0		sv
RB	320-0055733-030	RB	22-Mar-2018 23:39:57	2018.03.22_537B_033.d	8	1.0		sv
320-37095-A-8-A	320-0055733-031	Client	22-Mar-2018 23:44:37	2018.03.22_537B_034.d	53	1.0	NAWC-031318-FRB-4840	sv
320-37095-A-9-A	320-0055733-032	Client	22-Mar-2018 23:49:18	2018.03.22_537B_035.d	54	1.0	WGNA-031318-DUP029	sv
CCV L5	320-0055733-033	CCVIS	22-Mar-2018 23:53:58	2018.03.22_537B_036.d	5	1.0		sv
RB	320-0055733-034	RB	22-Mar-2018 23:58:39	2018.03.22_537B_037.d	8	1.0		sv

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 23MAR2018_537A Worklist Number: 55772
Instrument Name: A8_N Chrom Method: 537_A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180323-55772.b
QC Batching: Enabled Limit Group Batching: Enabled

QC Batch: 1	LC 537 ICAL Raw Batch: 214639	LC 537 CS ICAL Raw Batch: 214640
# 1 CCVL	# 1 CCVL	# 1 CCVL
# 2 CCV L5	# 2 CCV L5	# 2 CCV L5
# 3 RB	# 3 RB	# 3 RB
# 4 320-37250-A-6-A		# 4 320-37250-A-6-A
# 5 320-37250-A-7-A		# 5 320-37250-A-7-A
# 6 320-37185-A-1-A	# 6 320-37185-A-1-A	
# 7 320-37095-A-3-A	# 7 320-37095-A-3-A	
# 8 320-37095-A-4-A	# 8 320-37095-A-4-A	
# 9 CCV L3	# 9 CCV L3	# 9 CCV L3

QC Batch: 2	LC 537 ICAL Raw Batch: 214641	LC 537 CS ICAL Raw Batch: 214642
# 9 CCV L3	# 9 CCV L3	# 9 CCV L3
#10 RB	#10 RB	
#11 MB 320-214253/1-A	#11 MB 320-214253/1-A	
#12 LLCS 320-214253/2-A	#12 LLCS 320-214253/2-A	
#13 320-37246-A-1-A	#13 320-37246-A-1-A	
#14 320-37246-A-2-A	#14 320-37246-A-2-A	
#15 320-37246-A-3-A	#15 320-37246-A-3-A	
#16 320-37246-A-3-B LMS	#16 320-37246-A-3-B LMS	
#17 320-37246-A-3-C LMSD	#17 320-37246-A-3-C LMSD	
#18 320-37246-A-4-A	#18 320-37246-A-4-A	
#19 320-37246-A-5-A	#19 320-37246-A-5-A	
#20 320-37290-A-1-A	#20 320-37290-A-1-A	
#21 CCV L5	#21 CCV L5	

QC Batch: 3	LC 537 ICAL Raw Batch: 214644
#21 CCV L5	#21 CCV L5
#22 RB	#22 RB
#23 320-37290-A-2-A	#23 320-37290-A-2-A
#24 320-35085-A-5-D	#24 320-35085-A-5-D
#25 LCS 320-214470/2-A	#25 LCS 320-214470/2-A
#26 LCS 320-214470/3-A	#26 LCS 320-214470/3-A
#27 LCS 320-214470/4-A	#27 LCS 320-214470/4-A
#28 LCS 320-214470/5-A	#28 LCS 320-214470/5-A
#29 CCV L3	#29 CCV L3
#30 RB	#30 RB

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 23MAR2018_537A Worklist Num: 55772
Instrument: A8_N Method: 537_A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180323-55772.b
Anaylysis Type: SemiVOA Creator: Royce, Amani A
Inj Volume: 2.00 Inj Vol Units: ul

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
CCVL	320-0055772-001	CCVL	23-Mar-2018 15:48:15	2018.03.23_537A_004.d	2	1.0		sv
CCV L5	320-0055772-002	CCVIS	23-Mar-2018 15:52:55	2018.03.23_537A_005.d	5	1.0		sv
RB	320-0055772-003	RB	23-Mar-2018 15:57:35	2018.03.23_537A_006.d	8	1.0		sv
320-37250-A-6-A	320-0055772-004	Client	23-Mar-2018 16:02:16	2018.03.23_537A_007.d	1	100.	GC031918-LHWA-PT	sv
320-37250-A-7-A	320-0055772-005	Client	23-Mar-2018 16:06:56	2018.03.23_537A_008.d	2	1.0	FRB-LH-031918	sv
320-37185-A-1-A	320-0055772-006	Client	23-Mar-2018 16:11:38	2018.03.23_537A_009.d	3	10.0	WS-036	sv
320-37095-A-3-A	320-0055772-007	Client	23-Mar-2018 16:16:20	2018.03.23_537A_010.d	4	1.0	NAWC-031318-RW-061	sv
320-37095-A-4-A	320-0055772-008	Client	23-Mar-2018 16:21:00	2018.03.23_537A_011.d	5	1.0	NAWC-031318-FRB-061	sv
CCV L3	320-0055772-009	CCVIS	23-Mar-2018 16:25:41	2018.03.23_537A_012.d	3	1.0		sv
RB	320-0055772-010	RB	23-Mar-2018 16:30:20	2018.03.23_537A_013.d	8	1.0		sv
MB 320-214253/1-A	320-0055772-011	MB	23-Mar-2018 16:34:59	2018.03.23_537A_014.d	6	1.0		sv
LLCS 320-214253/2-A	320-0055772-012	LLCS	23-Mar-2018 16:39:40	2018.03.23_537A_015.d	7	1.0		sv
320-37246-A-1-A	320-0055772-013	Client	23-Mar-2018 16:44:21	2018.03.23_537A_016.d	8	1.0	WS-019	sv
320-37246-A-2-A	320-0055772-014	Client	23-Mar-2018 16:49:00	2018.03.23_537A_017.d	9	1.0	POET-5-MID	sv
320-37246-A-3-A	320-0055772-015	Client	23-Mar-2018 16:53:41	2018.03.23_537A_018.d	10	1.0	POET-5-POST	sv
320-37246-A-3-B LMS	320-0055772-016	LMS	23-Mar-2018 16:58:23	2018.03.23_537A_019.d	11	1.0		sv
320-37246-A-3-C LMSD	320-0055772-017	LMSD	23-Mar-2018 17:03:05	2018.03.23_537A_020.d	12	1.0		sv
320-37246-A-4-A	320-0055772-018	Client	23-Mar-2018 17:07:47	2018.03.23_537A_021.d	13	1.0	DUP-040	sv
320-37246-A-5-A	320-0055772-019	Client	23-Mar-2018 17:12:27	2018.03.23_537A_022.d	14	1.0	FIELD BLANK	sv
320-37290-A-1-A	320-0055772-020	Client	23-Mar-2018 17:17:09	2018.03.23_537A_023.d	15	1.0	WS-134	sv
CCV L5	320-0055772-021	CCVIS	23-Mar-2018 17:21:49	2018.03.23_537A_024.d	5	1.0		sv
RB	320-0055772-022	RB	23-Mar-2018 17:26:28	2018.03.23_537A_025.d	8	1.0		sv
320-37290-A-2-A	320-0055772-023	Client	23-Mar-2018 17:31:07	2018.03.23_537A_026.d	16	1.0	DUP-041	sv
320-35085-A-5-D	320-0055772-024	Client	23-Mar-2018 17:35:47	2018.03.23_537A_027.d	17	1.0	IDOC - Shamiran Kouchari	sv
LCS 320-214470/2-A	320-0055772-025	LCS	23-Mar-2018 17:40:28	2018.03.23_537A_028.d	18	1.0		sv

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
LCS 320-214470/3-A	320-0055772-026	LCS	23-Mar-2018 17:45:08	2018.03.23_537A_029.d	19	1.0		sv
LCS 320-214470/4-A	320-0055772-027	LCS	23-Mar-2018 17:49:49	2018.03.23_537A_030.d	20	1.0		sv
LCS 320-214470/5-A	320-0055772-028	LCS	23-Mar-2018 17:54:29	2018.03.23_537A_031.d	21	1.0		sv
CCV L3	320-0055772-029	CCVIS	23-Mar-2018 17:59:10	2018.03.23_537A_032.d	3	1.0		sv
RB	320-0055772-030	RB	23-Mar-2018 18:03:51	2018.03.23_537A_033.d	8	1.0		sv

AB 3/22/18
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AB 3/23/18

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-213605

Method Code: 320-537_Prep-320

Analyst: Kouchari, Shamiran

Batch Open: 3/19/2018 7:47:00AM

Batch End: 3/22/2018 3:23:00PM

Extraction of Perfluorinated Alkyl Acids

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-213605/1 N/A	N/A		250 mL	7			N/A	N/A	N/A	Chlorine, ND	MB 320-213605/1-A
				1.00 mL								
2	LLCS~320-213605/2 N/A	N/A		250 mL	7			N/A	N/A	N/A	Chlorine, ND	LLCS 320-213605/2-A
				1.00 mL								
3	LLCSD~320-213605/3 N/A	N/A		250 mL	7			N/A	N/A	N/A	Chlorine, ND	LLCSD 320-213605/3-A
				1.00 mL								
4	320-37095-A-1 (537_DOD5)	N/A (320-37095-1)	291.43 g	263.6 mL	7			3/18/18	16_Days	4	Chlorine, ND	320-37095-A-1-A
			27.83 g	1.00 mL								
5	320-37095-A-2 (537_DOD5)	N/A (320-37095-1)	286.40 g	257.8 mL	7			3/18/18	16_Days	4	Chlorine, ND	320-37095-A-2-A
			28.56 g	1.00 mL								
6	320-37095-A-3 (537_DOD5)	N/A (320-37095-1)	286.61 g	258 mL	7			3/18/18	16_Days	4	Chlorine, ND RI	320-37095-A-3-A
			28.61 g	1.00 mL								
7	320-37095-A-4 (537_DOD5)	N/A (320-37095-1)	293.71 g	265 mL	6			3/18/18	16_Days	4	Chlorine, ND RI	320-37095-A-4-A
			28.68 g	1.00 mL								
8	320-37095-A-5 (537_DOD5)	N/A (320-37095-1)	286.92 g	258.3 mL	7			3/18/18	16_Days	4	Chlorine, ND	320-37095-A-5-A
			28.63 g	1.00 mL								
9	320-37095-A-6 (537_DOD5)	N/A (320-37095-1)	291.03 g	260.8 mL	7			3/18/18	16_Days	4	Chlorine, ND	320-37095-A-6-A
			30.25 g	1.00 mL								
10	320-37095-B-7 (537_DOD5)	N/A (320-37095-1)	291.92 g	263.2 mL	7			3/18/18	16_Days	4	Chlorine, ND	320-37095-B-7-A
			28.72 g	1.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-213605

Analyst: Kouchari, Shamiran

Batch Open: 3/19/2018 7:47:00AM

Method Code: 320-537_Prep-320

Batch End: 3/22/2018 3:23:00PM

11	320-37095-A-8 (537_DOD5)	N/A (320-37095-1)	291.37 g 28.48 g	262.9 mL 1.00 mL	7			3/18/18	16_Days	4	Chlorine, ND	
12	320-37095-A-9 (537_DOD5)	N/A (320-37095-1)	288.93 g 29.34 g	259.6 mL 1.00 mL	7			3/18/18	16_Days	4	Chlorine, ND	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-213605

Method Code: 320-537_Prep-320

Analyst: Kouchari, Shamiran

Batch Open: 3/19/2018 7:47:00AM

Batch End: 3/22/2018 3:23:00PM

Batch Notes

Manifold ID	7
pH Indicator ID	3817
Trizma ID	SLBR5241V
SPE Cartridge Lot ID	6369499-08
Methanol ID	1175196
Reagent Water ID	03/16/18
Internal Standard ID#	1169781
Pipette ID	H14930F
Analyst ID - TA Reagent Drop	KMK
Analyst ID - TA Reagent Drop Witness	SKD
Analyst ID - SU Reagent Drop	KMK
Analyst ID - SU Reagent Drop Witness	SKD
Analyst ID - IS Reagent Drop	TWL
Analyst ID - IS Reagent Drop Witness	SKD
Analyst ID - Concentration	SKD
Analyst ID - Aliquot Step	SKD
Analyst ID - Final Volume Step	SKD
Batch Comment	Client labels match TA labels, 03/19/18 SKD

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Instrument ID: A8_N Start Date: 03/22/2018 14:53

Analysis Batch Number: 214409 End Date: 03/22/2018 15:35

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-214409/4		03/22/2018 14:53	1	2018.03.22_537I CAL 004.d	GeminiC18 3x100 3(mm)
IC 320-214409/5		03/22/2018 14:57	1	2018.03.22_537I CAL 005.d	GeminiC18 3x100 3(mm)
IC 320-214409/6		03/22/2018 15:02	1	2018.03.22_537I CAL 006.d	GeminiC18 3x100 3(mm)
IC 320-214409/7 ICISAV		03/22/2018 15:07	1	2018.03.22_537I CAL 007.d	GeminiC18 3x100 3(mm)
IC 320-214409/8		03/22/2018 15:11	1	2018.03.22_537I CAL 008.d	GeminiC18 3x100 3(mm)
IC 320-214409/9		03/22/2018 15:16	1	2018.03.22_537I CAL 009.d	GeminiC18 3x100 3(mm)
ZZZZZ		03/22/2018 15:21	1		GeminiC18 3x100 3(mm)
CCVL 320-214409/11		03/22/2018 15:25	1	2018.03.22_537I CAL 011.d	GeminiC18 3x100 3(mm)
ZZZZZ		03/22/2018 15:30	1		GeminiC18 3x100 3(mm)
ICV 320-214409/13		03/22/2018 15:35	1	2018.03.22_537I CAL 013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Instrument ID: A8_N Start Date: 03/22/2018 22:39

Analysis Batch Number: 214496 End Date: 03/22/2018 23:35

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-214496/17 CCVIS		03/22/2018 22:39	1	2018.03.22_537B_020.d	GeminiC18 3x100 3(mm)
ZZZZZ		03/22/2018 22:43	1		GeminiC18 3x100 3(mm)
MB 320-213605/1-A		03/22/2018 22:48	1	2018.03.22_537B_022.d	GeminiC18 3x100 3(mm)
LLCS 320-213605/2-A		03/22/2018 22:53	1	2018.03.22_537B_023.d	GeminiC18 3x100 3(mm)
LLCSD 320-213605/3-A		03/22/2018 22:57	1	2018.03.22_537B_024.d	GeminiC18 3x100 3(mm)
320-37095-1		03/22/2018 23:02	1	2018.03.22_537B_025.d	GeminiC18 3x100 3(mm)
320-37095-2		03/22/2018 23:07	1	2018.03.22_537B_026.d	GeminiC18 3x100 3(mm)
320-37095-3		03/22/2018 23:11	1	2018.03.22_537B_027.d	GeminiC18 3x100 3(mm)
320-37095-4		03/22/2018 23:16	1	2018.03.22_537B_028.d	GeminiC18 3x100 3(mm)
320-37095-5		03/22/2018 23:21	1	2018.03.22_537B_029.d	GeminiC18 3x100 3(mm)
320-37095-6		03/22/2018 23:25	1	2018.03.22_537B_030.d	GeminiC18 3x100 3(mm)
320-37095-7		03/22/2018 23:30	1	2018.03.22_537B_031.d	GeminiC18 3x100 3(mm)
CCV 320-214496/29 CCVIS		03/22/2018 23:35	1	2018.03.22_537B_032.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Instrument ID: A8_N Start Date: 03/22/2018 23:35

Analysis Batch Number: 214497 End Date: 03/22/2018 23:53

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-214497/29 CCVIS		03/22/2018 23:35	1	2018.03.22_537B_032.d	GeminiC18 3x100 3(mm)
ZZZZZ		03/22/2018 23:39	1		GeminiC18 3x100 3(mm)
320-37095-8		03/22/2018 23:44	1	2018.03.22_537B_034.d	GeminiC18 3x100 3(mm)
320-37095-9		03/22/2018 23:49	1	2018.03.22_537B_035.d	GeminiC18 3x100 3(mm)
CCV 320-214497/33 CCVIS		03/22/2018 23:53	1	2018.03.22_537B_036.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Batch Number: 213605 Batch Start Date: 03/19/18 07:47 Batch Analyst: Kouchari, Shamiran

Batch Method: 537 Batch End Date: 03/22/18 15:23

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00063
MB 320-213605/1		537, 537				250 mL	1.00 mL	7 SU	100 uL
LLCS 320-213605/2		537, 537				250 mL	1.00 mL	7 SU	100 uL
LLCSD 320-213605/3		537, 537				250 mL	1.00 mL	7 SU	100 uL
320-37095-A-1	NAWC-031318-RW-185	537, 537	T	291.43 g	27.83 g	263.6 mL	1.00 mL	7 SU	100 uL
320-37095-A-2	NAWC-031318-FRB-185	537, 537	T	286.40 g	28.56 g	257.8 mL	1.00 mL	7 SU	100 uL
320-37095-A-3	NAWC-031318-RW-061	537, 537	T	286.61 g	28.61 g	258 mL	1.00 mL	7 SU	100 uL
320-37095-A-4	NAWC-031318-FRB-061	537, 537	T	293.71 g	28.68 g	265 mL	1.00 mL	6 SU	100 uL
320-37095-A-5	NAWC-031318-RW-0263	537, 537	T	286.92 g	28.63 g	258.3 mL	1.00 mL	7 SU	100 uL
320-37095-A-6	NAWC-031318-FRB-0263	537, 537	T	291.03 g	30.25 g	260.8 mL	1.00 mL	7 SU	100 uL
320-37095-B-7	NAWC-031318-RW-4840	537, 537	T	291.92 g	28.72 g	263.2 mL	1.00 mL	7 SU	100 uL
320-37095-A-8	NAWC-031318-FRB-4840	537, 537	T	291.37 g	28.48 g	262.9 mL	1.00 mL	7 SU	100 uL
320-37095-A-9	WGNA-031318-DUP029	537, 537	T	288.93 g	29.34 g	259.6 mL	1.00 mL	7 SU	100 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-LSP 00029	LC537-SU 00061	AnalysisComment			
MB 320-213605/1		537, 537			100 uL	Chlorine, ND			
LLCS 320-213605/2		537, 537		100 uL	100 uL	Chlorine, ND			
LLCSD 320-213605/3		537, 537		100 uL	100 uL	Chlorine, ND			
320-37095-A-1	NAWC-031318-RW-185	537, 537	T		100 uL	Chlorine, ND			
320-37095-A-2	NAWC-031318-FRB-185	537, 537	T		100 uL	Chlorine, ND			
320-37095-A-3	NAWC-031318-RW-061	537, 537	T		100 uL	Chlorine, ND			
320-37095-A-4	NAWC-031318-FRB-061	537, 537	T		100 uL	Chlorine, ND			
320-37095-A-5	NAWC-031318-RW-0263	537, 537	T		100 uL	Chlorine, ND			

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

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-37095-1

SDG No.:

Batch Number: 213605 Batch Start Date: 03/19/18 07:47 Batch Analyst: Kouchari, Shamiran

Batch Method: 537 Batch End Date: 03/22/18 15:23

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-LSP 00029	LC537-SU 00061	AnalysisComment			
320-37095-A-6	NAWC-031318-FRB-0263	537, 537	T		100 uL	Chlorine, ND			
320-37095-B-7	NAWC-031318-RW-4840	537, 537	T		100 uL	Chlorine, ND			
320-37095-A-8	NAWC-031318-FRB-4840	537, 537	T		100 uL	Chlorine, ND			
320-37095-A-9	WGNA-031318-DUP029	537, 537	T		100 uL	Chlorine, ND			

Batch Notes	
Analyst ID - Aliquot Step	SKD
Batch Comment	Client labels match TA labels, 03/19/18 SKD
Analyst ID - Concentration	SKD
Analyst ID - Final Volume Step	SKD
Internal Standard ID#	1169781
Manifold ID	7
Methanol ID	1175196
pH Indicator ID	3817
Pipette ID	H14930F
Analyst ID - IS Reagent Drop	TWL
Analyst ID - IS Reagent Drop Witness	SKD
Analyst ID - SU Reagent Drop	KMK
Analyst ID - SU Reagent Drop Witness	SKD
Analyst ID - TA Reagent Drop	KMK
Analyst ID - TA Reagent Drop Witness	SKD
SPE Cartridge Lot ID	6369499-08
Trizma ID	SLBR5241V
Reagent Water ID	03/16/18

Basis	Basis Description
T	Total/NA

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

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180322-55711.b\2018.03.22_537ICAL_004.d
Lims ID: IC L1
Client ID:
Sample Type: IC
Calib Level: 1
Inject. Date: 22-Mar-2018 14:53:07
ALS Bottle#: 1
Worklist Smp#: 4
Injection Vol: 2.0 ul
Dil. Factor: 1.0000
Sample Info: L1_537
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01
Instrument ID: A8_N
Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180322-55711.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 23-Mar-2018 11:11:17
Calib Date: 22-Mar-2018 15:16:28
Integrator: Picker
Quant Method: Internal Standard
Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180322-55711.b\2018.03.22_537ICAL_009.d

Column 1 :
Det: EXP1
Process Host: XAWRK008

First Level Reviewer: roycea
Date: 22-Mar-2018 15:20:27

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.404	1.410	-0.006	1.000	796972	8.74		321	
298.90 > 99.00	1.404	1.410	-0.006	1.000	599936		1.33(0.00-0.00)	1354	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.533	1.534	-0.001	1.000	1155395	9.45		11985	
4 Perfluoroheptanoic acid									M
363.00 > 319.00	1.684	1.684	0.0	1.000	113714	0.9711		30.3	M
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.684	1.684	0.0	1.000	427157	2.86		577	
* 6 13C2-PFOA									
415.00 > 370.00	1.874	1.878	-0.004		1188768	10.0		8447	
5 Perfluorooctanoic acid									M
413.00 > 369.00	1.874	1.879	-0.005	1.000	215607	1.88		23.7	M
413.00 > 169.00	1.874	1.879	-0.005	1.000	115508		1.87(0.00-0.00)	103	M
8 Perfluorooctane sulfonic acid									Ma
499.00 > 80.00	2.132	2.124	0.008	1.000	335816	3.76		198	M
499.00 > 99.00	2.124	2.124	0.0	0.996	73456		4.57(0.00-0.00)	169	M
* 7 13C4 PFOS									
503.00 > 80.00	2.124	2.128	-0.004		2751643	28.7		3734	
9 Perfluorononanoic acid									
463.00 > 419.00	2.140	2.140	0.0	1.000	156653	1.81		25.2	
$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.291	0.0	1.000	973562	9.67		7533	

Report Date: 23-Mar-2018 11:11:17 Chrom Revision: 2.2 13-Mar-2018 08:45:20

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180322-55711.b\2018.03.22_537ICAL_004.d

Injection Date: 22-Mar-2018 14:53:07 Instrument ID: A8_N

Lims ID: IC L1

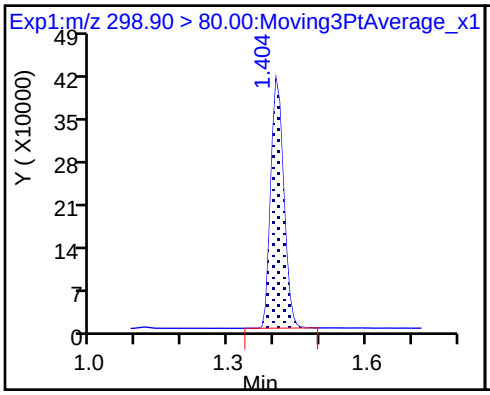
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4

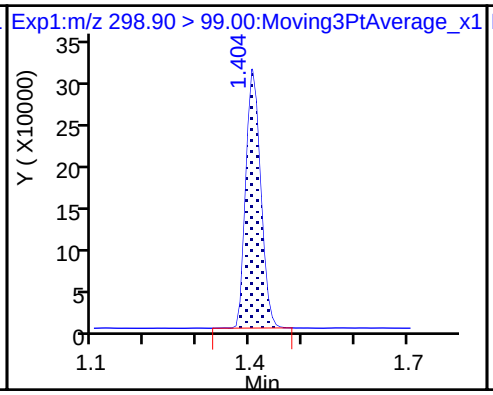
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

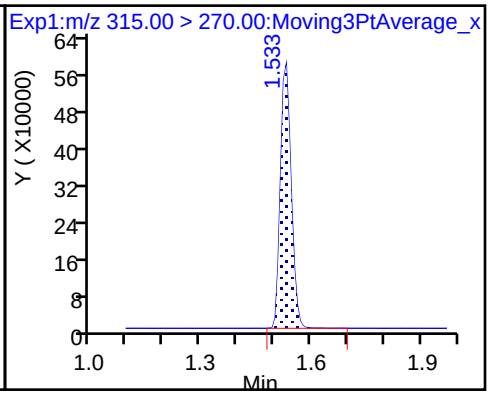
1 Perfluorobutanesulfonic acid



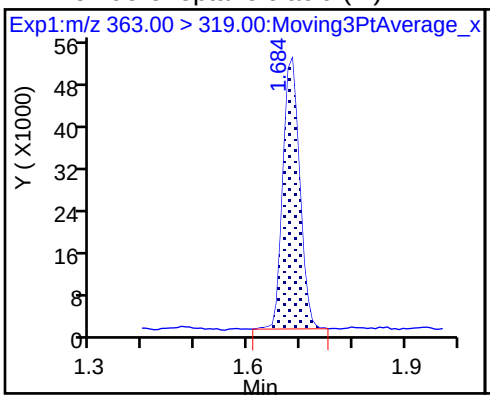
1 Perfluorobutanesulfonic acid



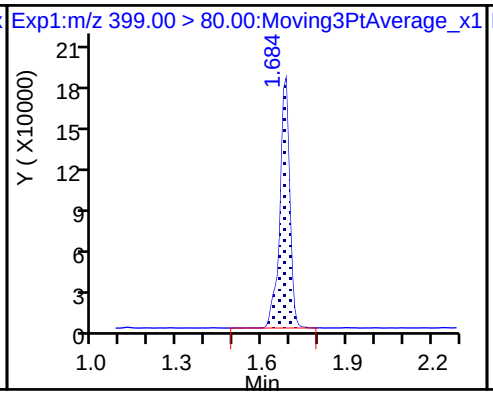
$ 2 13C2 PFHxA



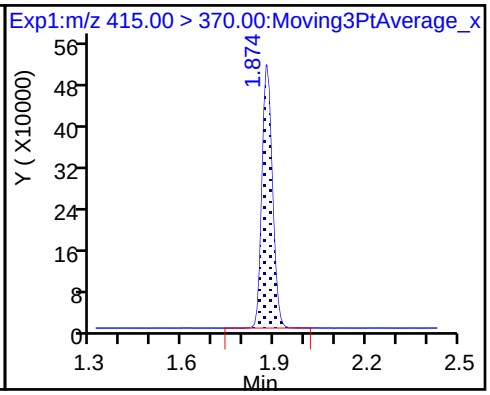
4 Perfluoroheptanoic acid (M)



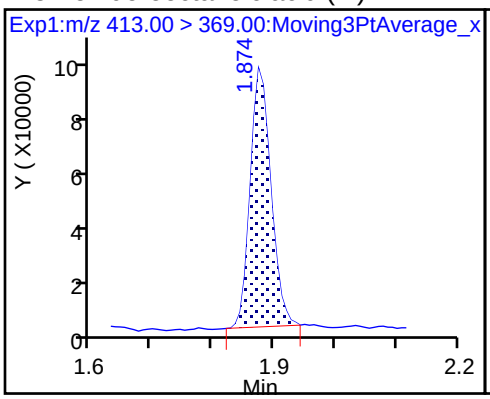
3 Perfluorohexanesulfonic acid



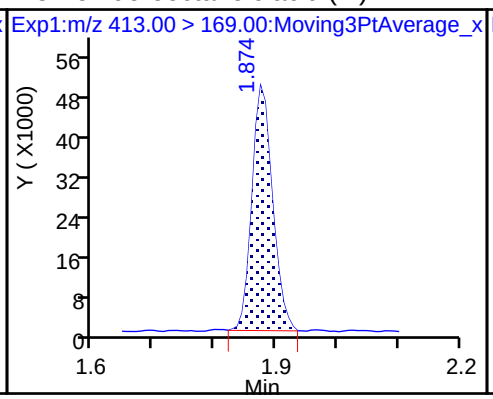
* 6 13C2-PFOA



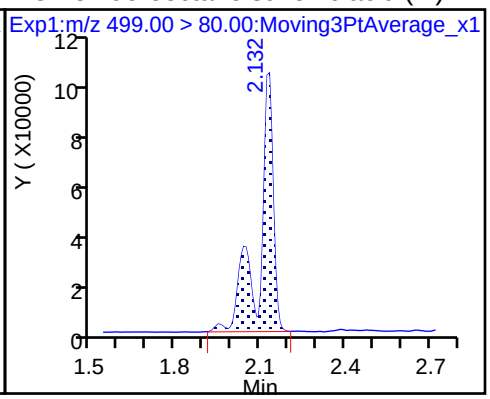
5 Perfluorooctanoic acid (M)



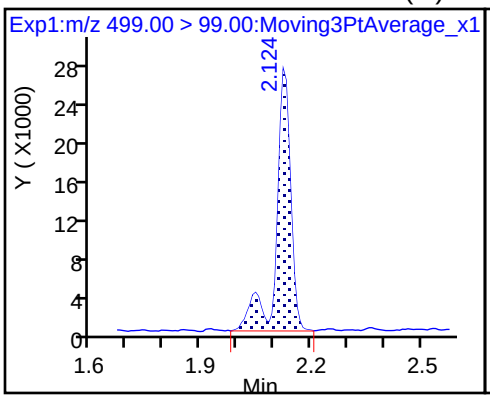
5 Perfluorooctanoic acid (M)



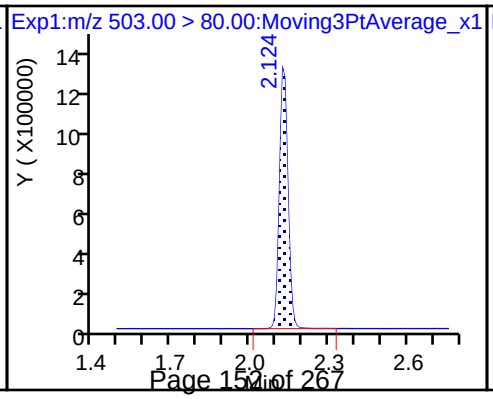
8 Perfluorooctane sulfonic acid (M)



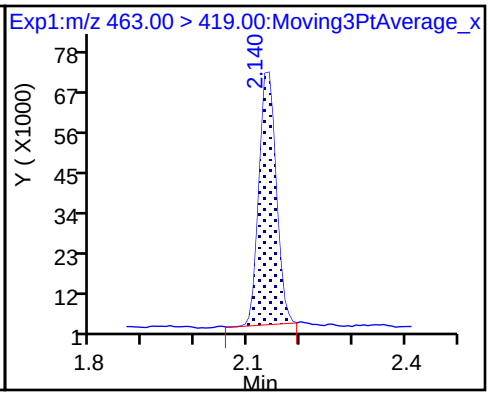
8 Perfluorooctane sulfonic acid (M)



* 7 13C4 PFOS



9 Perfluorononanoic acid



PFAS Calibration Calculations:

Initial Calibration 3/22/2018
Instrument A8_N

PFOS

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	Reported RRF
4.02	335816	2751643	28.7	0.8713	0.8712
8.93	780931	2695592	28.7	0.9311	0.9308
20.1	1708604	2599868	28.7	0.9384	0.9384
40.2	3566785	2639658	28.7	0.9647	0.9647
60.3	5238684	2646569	28.7	0.9421	0.9421
80.3	7166468	2724308	28.7	0.9402	0.939
			Average	0.93129	0.931
			Standard Deviation	0.0315	
			RSD	0.0338	
			%RSD	3.38238	3.4

Continuing Calibration 03/22/2018 @ 23:35

PFOS

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	%D	Reported RRF	Reported %D
20.1	1813770	2688937	28.7	0.9631	3.4517271	0.9632	3.4

Willow Grove
SDG 320-37095-1

Sample Identification	NAWC-031318-RW-061 (originally FRB sample)	
Compound	Perfluorooctane sulfonic acid	
Compound Area	678929	
Internal Standard Amount (ng)	28.7	
Dilution Factor	1	
Internal Standard Area	2855259	
Average RRF	0.931	
Sample Volume(L)	0.265	
Volume Extract (ml)	1	
Injection Volume (µl)	1	
Concentration	27.6608	ng/L

C:\All_Projects\112G08005\WE04\FS.DR.03\NAWC_201901.mxd MKB 1/24/2019

N

WARRINGTON

WARWICK

NORTHAMPTON

IVYLAND

WARMINSTER

HAGS

NASJRB
Willow Grove

HORSHAM

HATBORO

UPPER SOUTHAMPTON

UPPER MORELAND

LEGEND

- PFOA & PFOS BELOW DETECTION LIMITS
- SUM OF PFOA & PFOS CONCENTRATIONS AT OR BELOW 40 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS BETWEEN 40 PPT AND 70 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS ABOVE 70 PPT
- PUBLIC WATER CONNECTION (SOME NOT BY NAVY)
- SAMPLING AREA
- FORMER NAWC WARMINSTER
- TOWNSHIP BOUNDARY

3,000 1,500 0 3,000 6,000
Feet

NAVFAC

PFC SAMPLE RESULTS MAP
FORMER NAWC WAMINSTER
MONTGOMERY COUNTY, PENNSYLVANIA

SCALE	AS NOTED
FILE	NAWC
REV	0
DATE	01/24/19
FIGURE NUMBER	FIGURE 1