

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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Tel: (916)373-5600

TestAmerica Job ID: 320-41851-1
TestAmerica Sample Delivery Group: 20074-012
Client Project/Site: PFAS

For:
Shannon & Wilson, Inc
2355 Hill Rd.
Fairbanks, Alaska 99709-5244

Attn: Kristen Freiburger



Authorized for release by:
8/22/2018 2:43:59 PM

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: PFAS

TestAmerica Job ID: 320-41851-1
SDG: 20074-012

Qualifiers

LCMS

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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)

Case Narrative

Client: Shannon & Wilson, Inc
Project/Site: PFAS

TestAmerica Job ID: 320-41851-1
SDG: 20074-012

Job ID: 320-41851-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative
320-41851-1

Receipt

The samples were received on 8/7/2018 10:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.6° C.

LCMS

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

Organic Prep

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



Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: PFAS

TestAmerica Job ID: 320-41851-1
SDG: 20074-012

Client Sample ID: ██████████-2018PFAS-PostTreat

Lab Sample ID: 320-41851-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	0.53	J B	1.8	0.31	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.25	J B	1.8	0.15	ng/L	1		537 (modified)	Total/NA
6:2 FTS	7.5	J B	18	1.8	ng/L	1		537 (modified)	Total/NA

Client Sample ID: ██████████I-2018PFAS-PreTreat

Lab Sample ID: 320-41851-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	3.1	B	1.8	0.32	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	4.1		1.8	0.45	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	3.8		1.8	0.53	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.4	J	1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	2.4		1.8	0.78	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	7.7		1.8	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.85	J	1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	3.8	B	1.8	0.16	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.5		1.8	0.50	ng/L	1		537 (modified)	Total/NA
6:2 FTS	18	B	18	1.8	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: PFAS

TestAmerica Job ID: 320-41851-1
SDG: 20074-012

Client Sample ID: ██████████ **2018PFAS-PostTreat**

Lab Sample ID: 320-41851-1

Date Collected: 08/03/18 13:40

Matrix: Water

Date Received: 08/07/18 10:10

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.53	J B	1.8	0.31	ng/L		08/10/18 10:24	08/12/18 20:56	1
Perfluoropentanoic acid (PFPeA)	ND		1.8	0.44	ng/L		08/10/18 10:24	08/12/18 20:56	1
Perfluorohexanoic acid (PFHxA)	ND		1.8	0.52	ng/L		08/10/18 10:24	08/12/18 20:56	1
Perfluoroheptanoic acid (PFHpA)	ND		1.8	0.22	ng/L		08/10/18 10:24	08/12/18 20:56	1
Perfluorooctanoic acid (PFOA)	ND		1.8	0.76	ng/L		08/10/18 10:24	08/12/18 20:56	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.24	ng/L		08/10/18 10:24	08/12/18 20:56	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.28	ng/L		08/10/18 10:24	08/12/18 20:56	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.98	ng/L		08/10/18 10:24	08/12/18 20:56	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.49	ng/L		08/10/18 10:24	08/12/18 20:56	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	1.2	ng/L		08/10/18 10:24	08/12/18 20:56	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.26	ng/L		08/10/18 10:24	08/12/18 20:56	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.8	0.18	ng/L		08/10/18 10:24	08/12/18 20:56	1
Perfluorohexanesulfonic acid (PFHxS)	0.25	J B	1.8	0.15	ng/L		08/10/18 10:24	08/12/18 20:56	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.8	0.17	ng/L		08/10/18 10:24	08/12/18 20:56	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.8	0.48	ng/L		08/10/18 10:24	08/12/18 20:56	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.29	ng/L		08/10/18 10:24	08/12/18 20:56	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.31	ng/L		08/10/18 10:24	08/12/18 20:56	1
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	ND		18	2.8	ng/L		08/10/18 10:24	08/12/18 20:56	1
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	ND		18	1.7	ng/L		08/10/18 10:24	08/12/18 20:56	1
6:2 FTS	7.5	J B	18	1.8	ng/L		08/10/18 10:24	08/12/18 20:56	1
8:2 FTS	ND		18	1.8	ng/L		08/10/18 10:24	08/12/18 20:56	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	94		25 - 150				08/10/18 10:24	08/12/18 20:56	1
13C5 PFPeA	90		25 - 150				08/10/18 10:24	08/12/18 20:56	1
13C2 PFHxA	86		25 - 150				08/10/18 10:24	08/12/18 20:56	1
13C4-PFHpA	89		25 - 150				08/10/18 10:24	08/12/18 20:56	1
13C4 PFOA	99		25 - 150				08/10/18 10:24	08/12/18 20:56	1
13C5 PFNA	97		25 - 150				08/10/18 10:24	08/12/18 20:56	1
13C2 PFDA	94		25 - 150				08/10/18 10:24	08/12/18 20:56	1
13C2 PFUnA	98		25 - 150				08/10/18 10:24	08/12/18 20:56	1
13C2 PFDoA	98		25 - 150				08/10/18 10:24	08/12/18 20:56	1
13C2-PFTeDA	112		25 - 150				08/10/18 10:24	08/12/18 20:56	1
13C3-PFBS	82		25 - 150				08/10/18 10:24	08/12/18 20:56	1
18O2 PFHxS	86		25 - 150				08/10/18 10:24	08/12/18 20:56	1
13C4 PFOS	92		25 - 150				08/10/18 10:24	08/12/18 20:56	1
13C8 FOSA	89		25 - 150				08/10/18 10:24	08/12/18 20:56	1
d3-NMeFOSAA	100		25 - 150				08/10/18 10:24	08/12/18 20:56	1
d5-NEtFOSAA	113		25 - 150				08/10/18 10:24	08/12/18 20:56	1
M2-6:2FTS	110		25 - 150				08/10/18 10:24	08/12/18 20:56	1
M2-8:2FTS	98		25 - 150				08/10/18 10:24	08/12/18 20:56	1

Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: PFAS

TestAmerica Job ID: 320-41851-1
SDG: 20074-012

Client Sample ID: [REDACTED] **I-2018PFAS-PreTreat**

Lab Sample ID: 320-41851-2

Date Collected: 08/03/18 13:43

Matrix: Water

Date Received: 08/07/18 10:10

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	3.1	B	1.8	0.32	ng/L		08/10/18 10:24	08/12/18 21:04	1
Perfluoropentanoic acid (PFPeA)	4.1		1.8	0.45	ng/L		08/10/18 10:24	08/12/18 21:04	1
Perfluorohexanoic acid (PFHxA)	3.8		1.8	0.53	ng/L		08/10/18 10:24	08/12/18 21:04	1
Perfluoroheptanoic acid (PFHpA)	1.4	J	1.8	0.23	ng/L		08/10/18 10:24	08/12/18 21:04	1
Perfluorooctanoic acid (PFOA)	2.4		1.8	0.78	ng/L		08/10/18 10:24	08/12/18 21:04	1
Perfluorononanoic acid (PFNA)	7.7		1.8	0.25	ng/L		08/10/18 10:24	08/12/18 21:04	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.28	ng/L		08/10/18 10:24	08/12/18 21:04	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	1.0	ng/L		08/10/18 10:24	08/12/18 21:04	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.51	ng/L		08/10/18 10:24	08/12/18 21:04	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	1.2	ng/L		08/10/18 10:24	08/12/18 21:04	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.27	ng/L		08/10/18 10:24	08/12/18 21:04	1
Perfluorobutanesulfonic acid (PFBS)	0.85	J	1.8	0.18	ng/L		08/10/18 10:24	08/12/18 21:04	1
Perfluorohexanesulfonic acid (PFHxS)	3.8	B	1.8	0.16	ng/L		08/10/18 10:24	08/12/18 21:04	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.8	0.17	ng/L		08/10/18 10:24	08/12/18 21:04	1
Perfluorooctanesulfonic acid (PFOS)	2.5		1.8	0.50	ng/L		08/10/18 10:24	08/12/18 21:04	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.29	ng/L		08/10/18 10:24	08/12/18 21:04	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.32	ng/L		08/10/18 10:24	08/12/18 21:04	1
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	ND		18	2.8	ng/L		08/10/18 10:24	08/12/18 21:04	1
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	ND		18	1.7	ng/L		08/10/18 10:24	08/12/18 21:04	1
6:2 FTS	18	B	18	1.8	ng/L		08/10/18 10:24	08/12/18 21:04	1
8:2 FTS	ND		18	1.8	ng/L		08/10/18 10:24	08/12/18 21:04	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	76		25 - 150				08/10/18 10:24	08/12/18 21:04	1
13C5 PFPeA	84		25 - 150				08/10/18 10:24	08/12/18 21:04	1
13C2 PFHxA	85		25 - 150				08/10/18 10:24	08/12/18 21:04	1
13C4-PFHpA	88		25 - 150				08/10/18 10:24	08/12/18 21:04	1
13C4 PFOA	96		25 - 150				08/10/18 10:24	08/12/18 21:04	1
13C5 PFNA	90		25 - 150				08/10/18 10:24	08/12/18 21:04	1
13C2 PFDA	90		25 - 150				08/10/18 10:24	08/12/18 21:04	1
13C2 PFUnA	87		25 - 150				08/10/18 10:24	08/12/18 21:04	1
13C2 PFDoA	92		25 - 150				08/10/18 10:24	08/12/18 21:04	1
13C2-PFTeDA	97		25 - 150				08/10/18 10:24	08/12/18 21:04	1
13C3-PFBS	83		25 - 150				08/10/18 10:24	08/12/18 21:04	1
18O2 PFHxS	85		25 - 150				08/10/18 10:24	08/12/18 21:04	1
13C4 PFOS	87		25 - 150				08/10/18 10:24	08/12/18 21:04	1
13C8 FOSA	86		25 - 150				08/10/18 10:24	08/12/18 21:04	1
d3-NMeFOSAA	91		25 - 150				08/10/18 10:24	08/12/18 21:04	1
d5-NEtFOSAA	95		25 - 150				08/10/18 10:24	08/12/18 21:04	1
M2-6:2FTS	116		25 - 150				08/10/18 10:24	08/12/18 21:04	1
M2-8:2FTS	98		25 - 150				08/10/18 10:24	08/12/18 21:04	1

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: PFAS

TestAmerica Job ID: 320-41851-1
SDG: 20074-012

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Water

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFBA (25-150)	PFPeA (25-150)	PFHxA (25-150)	PFHpA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)
320-41851-1	██████████-18PFAS-PostTrea	94	90	86	89	99	97	94	98
320-41851-2	██████████-2018PFAS-PreTreat	76	84	85	88	96	90	90	87
LCS 320-239218/2-A	Lab Control Sample	94	90	84	90	94	97	91	97
MB 320-239218/1-A	Method Blank	99	94	93	94	98	100	99	101

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFDaA (25-150)	PFTDA (25-150)	3C3-PFB: (25-150)	PFHxS (25-150)	PFOS (25-150)	PFOSA (25-150)	-NMeFOS/ (25-150)	-NEtFOS/ (25-150)
320-41851-1	██████████-1-2018PFAS-PostTrea	98	112	82	86	92	89	100	113
320-41851-2	██████████-2018PFAS-PreTreat	92	97	83	85	87	86	91	95
LCS 320-239218/2-A	Lab Control Sample	96	104	83	82	91	87	97	97
MB 320-239218/1-A	Method Blank	102	107	87	88	94	94	104	106

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	M262FTS (25-150)	M282FTS (25-150)
320-41851-1	██████████-2018PFAS-PostTrea	110	98
320-41851-2	██████████-2018PFAS-PreTreat	116	98
LCS 320-239218/2-A	Lab Control Sample	106	96
MB 320-239218/1-A	Method Blank	117	104

Surrogate Legend

- PFBA = 13C4 PFBA
- PFPeA = 13C5 PFPeA
- PFHxA = 13C2 PFHxA
- PFHpA = 13C4-PFHpA
- PFOA = 13C4 PFOA
- PFNA = 13C5 PFNA
- PFDA = 13C2 PFDA
- PFUnA = 13C2 PFUnA
- PFDaA = 13C2 PFDaA
- PFTDA = 13C2-PFTeDA
- 13C3-PFBS = 13C3-PFBS
- PFHxS = 18O2 PFHxS
- PFOS = 13C4 PFOS
- PFOSA = 13C8 FOSA
- d3-NMeFOSAA = d3-NMeFOSAA
- d5-NEtFOSAA = d5-NEtFOSAA
- M262FTS = M2-6:2FTS
- M282FTS = M2-8:2FTS

QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: PFAS

TestAmerica Job ID: 320-41851-1
SDG: 20074-012

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-239218/1-A

Matrix: Water

Analysis Batch: 239445

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 239218

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.383	J	2.0	0.35	ng/L		08/10/18 10:22	08/12/18 20:01	1
Perfluoropentanoic acid (PFPeA)	ND		2.0	0.49	ng/L		08/10/18 10:22	08/12/18 20:01	1
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.58	ng/L		08/10/18 10:22	08/12/18 20:01	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.25	ng/L		08/10/18 10:22	08/12/18 20:01	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.85	ng/L		08/10/18 10:22	08/12/18 20:01	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.27	ng/L		08/10/18 10:22	08/12/18 20:01	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		08/10/18 10:22	08/12/18 20:01	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		08/10/18 10:22	08/12/18 20:01	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		08/10/18 10:22	08/12/18 20:01	1
Perfluorotridecanoic Acid (PFTriA)	ND		2.0	1.3	ng/L		08/10/18 10:22	08/12/18 20:01	1
Perfluorotetradecanoic acid (PFTeA)	0.709	J	2.0	0.29	ng/L		08/10/18 10:22	08/12/18 20:01	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.20	ng/L		08/10/18 10:22	08/12/18 20:01	1
Perfluorohexanesulfonic acid (PFHxS)	0.271	J	2.0	0.17	ng/L		08/10/18 10:22	08/12/18 20:01	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		2.0	0.19	ng/L		08/10/18 10:22	08/12/18 20:01	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.54	ng/L		08/10/18 10:22	08/12/18 20:01	1
Perfluorodecanesulfonic acid (PFDS)	ND		2.0	0.32	ng/L		08/10/18 10:22	08/12/18 20:01	1
Perfluorooctane Sulfonamide (FOSA)	ND		2.0	0.35	ng/L		08/10/18 10:22	08/12/18 20:01	1
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	ND		20	3.1	ng/L		08/10/18 10:22	08/12/18 20:01	1
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	ND		20	1.9	ng/L		08/10/18 10:22	08/12/18 20:01	1
6:2 FTS	3.61	J	20	2.0	ng/L		08/10/18 10:22	08/12/18 20:01	1
8:2 FTS	ND		20	2.0	ng/L		08/10/18 10:22	08/12/18 20:01	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	99		25 - 150	08/10/18 10:22	08/12/18 20:01	1
13C5 PFPeA	94		25 - 150	08/10/18 10:22	08/12/18 20:01	1
13C2 PFHxA	93		25 - 150	08/10/18 10:22	08/12/18 20:01	1
13C4-PFHpA	94		25 - 150	08/10/18 10:22	08/12/18 20:01	1
13C4 PFOA	98		25 - 150	08/10/18 10:22	08/12/18 20:01	1
13C5 PFNA	100		25 - 150	08/10/18 10:22	08/12/18 20:01	1
13C2 PFDA	99		25 - 150	08/10/18 10:22	08/12/18 20:01	1
13C2 PFUnA	101		25 - 150	08/10/18 10:22	08/12/18 20:01	1
13C2 PFDoA	102		25 - 150	08/10/18 10:22	08/12/18 20:01	1
13C2-PFTeDA	107		25 - 150	08/10/18 10:22	08/12/18 20:01	1
13C3-PFBS	87		25 - 150	08/10/18 10:22	08/12/18 20:01	1
18O2 PFHxS	88		25 - 150	08/10/18 10:22	08/12/18 20:01	1
13C4 PFOS	94		25 - 150	08/10/18 10:22	08/12/18 20:01	1
13C8 FOSA	94		25 - 150	08/10/18 10:22	08/12/18 20:01	1
d3-NMeFOSAA	104		25 - 150	08/10/18 10:22	08/12/18 20:01	1
d5-NEtFOSAA	106		25 - 150	08/10/18 10:22	08/12/18 20:01	1
M2-6:2FTS	117		25 - 150	08/10/18 10:22	08/12/18 20:01	1
M2-8:2FTS	104		25 - 150	08/10/18 10:22	08/12/18 20:01	1

TestAmerica Sacramento

QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: PFAS

TestAmerica Job ID: 320-41851-1
SDG: 20074-012

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-239218/2-A

Matrix: Water

Analysis Batch: 239445

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 239218

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluorobutanoic acid (PFBA)	40.0	39.9		ng/L		100	70 - 130
Perfluoropentanoic acid (PFPeA)	40.0	38.3		ng/L		96	66 - 126
Perfluorohexanoic acid (PFHxA)	40.0	39.6		ng/L		99	66 - 126
Perfluoroheptanoic acid (PFHpA)	40.0	37.0		ng/L		93	66 - 126
Perfluorooctanoic acid (PFOA)	40.0	39.8		ng/L		100	64 - 124
Perfluorononanoic acid (PFNA)	40.0	39.8		ng/L		100	68 - 128
Perfluorodecanoic acid (PFDA)	40.0	40.3		ng/L		101	69 - 129
Perfluoroundecanoic acid (PFUnA)	40.0	32.3		ng/L		81	60 - 120
Perfluorododecanoic acid (PFDoA)	40.0	39.7		ng/L		99	71 - 131
Perfluorotridecanoic Acid (PFTriA)	40.0	42.9		ng/L		107	72 - 132
Perfluorotetradecanoic acid (PFTeA)	40.0	42.5		ng/L		106	68 - 128
Perfluorobutanesulfonic acid (PFBS)	35.4	37.7		ng/L		107	73 - 133
Perfluorohexanesulfonic acid (PFHxS)	36.4	36.4		ng/L		100	63 - 123
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	37.8		ng/L		99	68 - 128
Perfluorooctanesulfonic acid (PFOS)	37.1	38.6		ng/L		104	67 - 127
Perfluorodecanesulfonic acid (PFDS)	38.6	38.3		ng/L		99	68 - 128
Perfluorooctane Sulfonamide (FOSA)	40.0	41.3		ng/L		103	70 - 130
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	40.0	39.6		ng/L		99	67 - 127
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	40.0	38.9		ng/L		97	65 - 125
6:2 FTS	37.9	44.6		ng/L		118	66 - 126
8:2 FTS	38.3	38.8		ng/L		101	67 - 127

Isotope Dilution	LCS LCS		Limits
	%Recovery	Qualifier	
13C4 PFBA	94		25 - 150
13C5 PFPeA	90		25 - 150
13C2 PFHxA	84		25 - 150
13C4-PFHpA	90		25 - 150
13C4 PFOA	94		25 - 150
13C5 PFNA	97		25 - 150
13C2 PFDA	91		25 - 150
13C2 PFUnA	97		25 - 150
13C2 PFDoA	96		25 - 150
13C2-PFTeDA	104		25 - 150
13C3-PFBS	83		25 - 150
18O2 PFHxS	82		25 - 150
13C4 PFOS	91		25 - 150
13C8 FOSA	87		25 - 150

TestAmerica Sacramento

QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: PFAS

TestAmerica Job ID: 320-41851-1
SDG: 20074-012

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-239218/2-A

Matrix: Water

Analysis Batch: 239445

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 239218

<i>Isotope Dilution</i>	<i>LCS LCS</i>		<i>Limits</i>
	<i>%Recovery</i>	<i>Qualifier</i>	
<i>d3-NMeFOSAA</i>	97		25 - 150
<i>d5-NEtFOSAA</i>	97		25 - 150
<i>M2-6:2FTS</i>	106		25 - 150
<i>M2-8:2FTS</i>	96		25 - 150

QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: PFAS

TestAmerica Job ID: 320-41851-1
SDG: 20074-012

LCMS

Prep Batch: 239218

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41851-1	██████████018PFAS-PostTreat	Total/NA	Water	3535	
320-41851-2	██████████018PFAS-PreTreat	Total/NA	Water	3535	
MB 320-239218/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-239218/2-A	Lab Control Sample	Total/NA	Water	3535	

Analysis Batch: 239445

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41851-1	██████████018PFAS-PostTreat	Total/NA	Water	537 (modified)	239218
320-41851-2	██████████-2018PFAS-PreTreat	Total/NA	Water	537 (modified)	239218
MB 320-239218/1-A	Method Blank	Total/NA	Water	537 (modified)	239218
LCS 320-239218/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	239218

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: PFAS

TestAmerica Job ID: 320-41851-1
SDG: 20074-012

Client Sample ID: [REDACTED] **2018PFAS-PostTreat**

Lab Sample ID: 320-41851-1

Date Collected: 08/03/18 13:40

Matrix: Water

Date Received: 08/07/18 10:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			280.7 mL	10.00 mL	239218	08/10/18 10:24	KMK	TAL SAC
Total/NA	Analysis	537 (modified)		1			239445	08/12/18 20:56	JRB	TAL SAC

Client Sample ID: [REDACTED] **I-2018PFAS-PreTreat**

Lab Sample ID: 320-41851-2

Date Collected: 08/03/18 13:43

Matrix: Water

Date Received: 08/07/18 10:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			272.1 mL	10.00 mL	239218	08/10/18 10:24	KMK	TAL SAC
Total/NA	Analysis	537 (modified)		1			239445	08/12/18 21:04	JRB	TAL SAC

Laboratory References:

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

Accreditation/Certification Summary

Client: Shannon & Wilson, Inc
 Project/Site: PFAS

TestAmerica Job ID: 320-41851-1
 SDG: 20074-012

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
ANAB	DoD ELAP		L2468	01-20-21
Arizona	State Program	9	AZ0708	08-11-19
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-19
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-19
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Kansas	NELAP	7	E-10375	10-31-18
Louisiana	NELAP	6	30612	06-30-19
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-19
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-19
New York	NELAP	2	11666	03-31-19
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-19
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-19
USDA	Federal		P330-18-00239	01-17-21
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-19
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-19
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: PFAS

TestAmerica Job ID: 320-41851-1
SDG: 20074-012

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

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

Laboratory References:

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



Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: PFAS

TestAmerica Job ID: 320-41851-1
SDG: 20074-012

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-41851-1	[REDACTED]-2018PFAS-PostTreat	Water	08/03/18 13:40	08/07/18 10:10
320-41851-2	[REDACTED]I-2018PFAS-PreTreat	Water	08/03/18 13:43	08/07/18 10:10



CHAIN-OF-CUSTODY RECORD

Analytical Methods (include preservative if used)

Turn Around Time:
 Normal Rush
 Please Specify

Quote No:

J-Flags: Yes No

PFAS (see attached)

Sample Identity	Lab No.	Time	Date Sampled	Analytical Methods					Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
[REDACTED]	1340		8/3/18	X					2	6W
[REDACTED]	1343		8/3/18	X					2	L

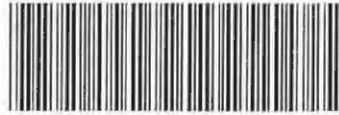
Project Information
 Number: 20074-012
 Name: FHRA PFAS
 Contact: KRF
 Ongoing Project? Yes No
 Sampler: ABM

Sample Receipt
 Total No. of Containers: _____
 COC Seals/Intact? Y/N/NA Y
 Received Good Cond./Cold
 Temp: 3.6C
 Delivery Method: goldstream

Relinquished By: 1.
 Signature: _____ Time: 1600
 Printed Name: _____ Date: 8/16/17
 Company: AMasters Shannon & Wilson Inc

Relinquished By: 2.
 Signature: _____ Time: _____
 Printed Name: _____ Date: _____
 Company: _____

Relinquished By: 3.
 Signature: _____ Time: _____
 Printed Name: _____ Date: _____
 Company: _____

Notes:

 320-41851 Chain of Custody

Received By: 1.
 Signature: [Signature] Time: 1610
 Printed Name: Ednie Chung Date: 8/17/18
 Company: TA-SAC

Received By: 2.
 Signature: _____ Time: _____
 Printed Name: _____ Date: _____
 Company: _____

Received By: 3.
 Signature: _____ Time: _____
 Printed Name: _____ Date: _____
 Company: _____

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
 Yellow - w/shipment - for consignee files
 Pink - Shannon & Wilson - job file



Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-41851-1

SDG Number: 20074-012

Login Number: 41851

List Number: 1

Creator: Turpen, Troy

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	Gel packs
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	