

PFAS Sampling Results in the Marinette and Peshtigo Area Due to Foam Sightings

In September 2019, following reports of foam sightings by community members, DNR mobilized an environmental consultant to collect and analyze foam and surface water microlayer (SML) samples (i.e., samples taken from the surface of the waterbody) from the Peshtigo River and at a roadside ditch near the intersection of Leaf and Kraus Roads in the Town of Peshtigo. The DNR received the sample results for the foam and SML samples that were collected from these two locations in Marinette County. All sample locations and sample results for PFOS and PFOA (perfluorooctane sulfonic acid and perfluorooctanoic acid) are displayed on the attached map. Analytical reports for the foam and SML samples are also attached. Additional information regarding the state-wide fish and water chemistry study can be found on the DNR's [Water quality PFAS initiatives page](#).

The sampling in September for the foam sighting is in addition to samples collected by the DNR in the Peshtigo River in August 2019 as part of a statewide monitoring project to sample fish tissue and water chemistry at select sites around the state near known or probable sources of per- and polyfluoroalkyl substances (PFAS). Three water samples were collected in the Peshtigo River associated with this initiative; fish tissue data were not collected. The August sampling was not due to a specific foam sighting incident.

PFOA and PFOS were detected in the September foam and SML samples, and the August surface water samples

Sample Results for Foam, SML, and Water (see attached map)								
Sample Location	Sample ID	Location Description	Water Body	Date Collected	Substance Sample	Sample Depth	PFOA (ppt)	PFOS (ppt)
1	1	Above HWY 64 at Boat Landing	Peshtigo River	8/14/2019	Water	3 - 6 in	0.73	0.19J
2	2	Below the City of Peshtigo Dam between Railroad Bridges	Peshtigo River	8/14/2019	Water	3 - 6 in	0.87	0.27J
3	3	Below the City of Peshtigo	Peshtigo River	8/14/2019	Water	3 - 6 in	1.0	0.41
4	4S	Below the City of Peshtigo Dam	Peshtigo River	9/18/2019	SML	top 2mm of water	2.1	6.2I
	4F	Below the City of Peshtigo Dam	Peshtigo River	9/18/2019	Foam	Surface	230	17,000E
5	5S	Roadside ditch leading to Little River	Leaf/Kraus Ditch	9/18/2019	SML	top 2mm of water	2.3	ND
	5F	Roadside ditch leading to Little River	Leaf/Kraus Ditch	9/18/2019	Foam	Surface	990	17,000E
Values are approximations. For additional information, please see the attached lab report.								

Sample results of varying concentration

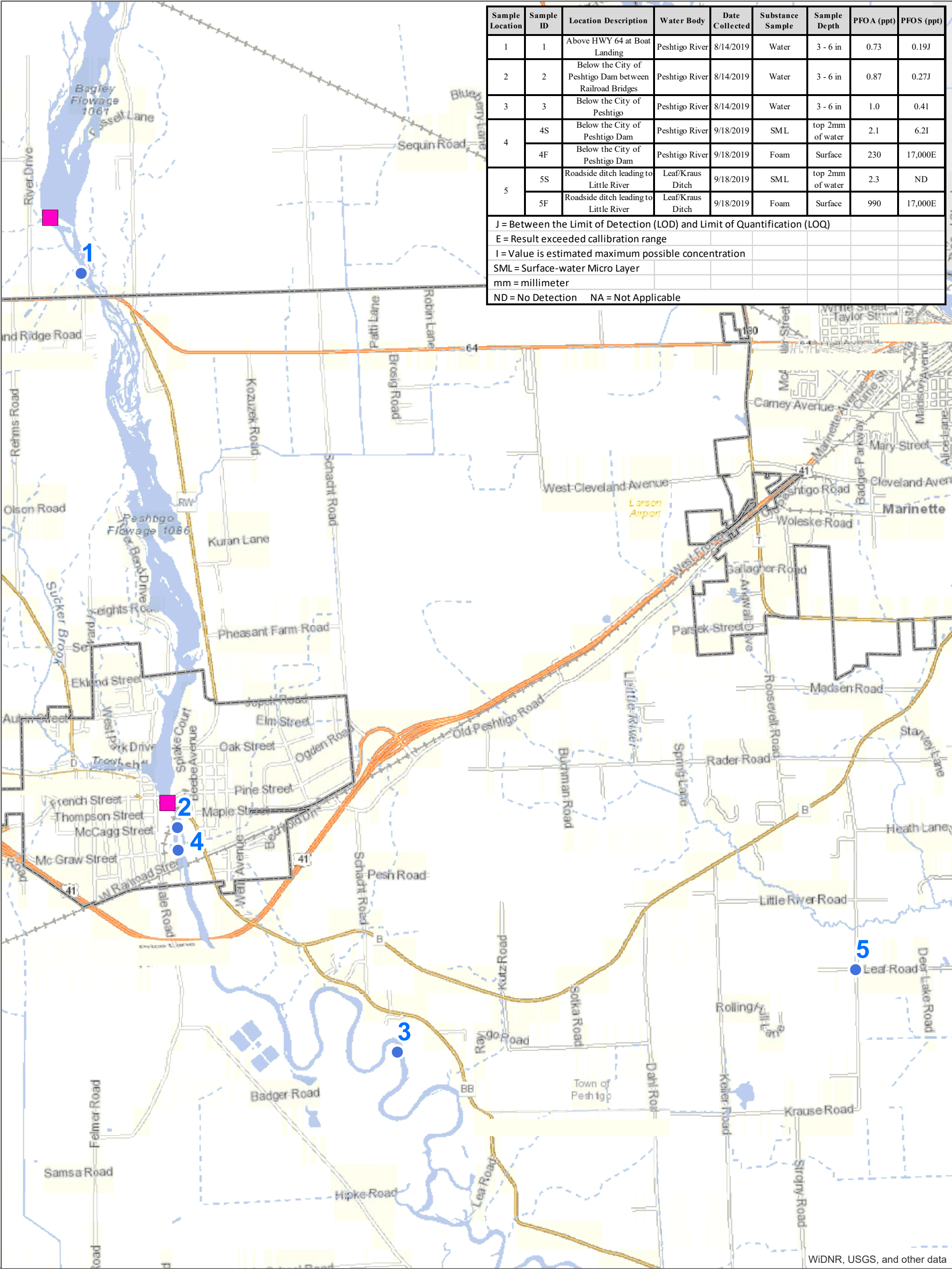
There are some likely reasons for the variation in water sample results. between the foam and the sampling at varying depths in the surface water for PFAS. PFAS substances are well known for

exhibiting “surfactant properties,” meaning that some PFAS may have a high affinity to reside at the water’s surface and the ambient air. To capture PFAS at where PFAS contaminated water intersects with air, SML samples were collected by ‘scooping’ water off the top 2 millimeters of the water’s surface using a sample bottle.

In contrast, the water samples collected as part of the August statewide monitoring project were collected 3-6 inches below the surface of the water as part of an effort to determine water chemistry conditions where fish are likely to reside. The difference in sample location combined with the surfactant properties of PFAS may explain why the September SML samples contained more PFAS than the August water samples. Finally, the foam appeared after a heavy rain event; high water conditions created turbulent flow which is a likely factor in the foam formation.

The DNR is responding to foam events in areas where there is known or suspected PFAS contamination and will identify PFAS compounds as well as the sources of PFAS which may be causing the foam. The DNR is also working closely with the Wisconsin Department of Health Services and local health officials to ensure that the public stays informed of these situations when they develop, and the [precautions to undertake](#) in these events.

PFAS SAMPLING LOCATIONS IN MARINETTE-PESHTIGO AREA



● Sample Location

■ Dam

▭ Municipal Boundary

00.512

Miles

Oct 29, 2019

Fiscal & Information Technology Section
Remediation & Redevelopment Program

The data shown on this map have been obtained from various sources, and are of varying age, reliability and resolution. This map is not intended to be used for navigation, nor is this map an authoritative source of information about legal land ownership or public access. Users of this map should confirm the ownership of land through other means in order to avoid trespassing. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map.

ANALYTICAL REPORT

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Tel: (916)373-5600

Laboratory Job ID: 320-54528-1

Client Project/Site: PFAS, Reactive Foam Water Way 60614940

For:

AECOM Technical Services Inc.
1555 North RiverCenter Drive
Suite 214
Milwaukee, Wisconsin 53212

Attn: Lanette Altenbach



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10/21/2019 5:45:54 PM

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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: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*	Isotope Dilution analyte is outside acceptance limits.
B	Compound was found in the blank and sample.
E	Result exceeded calibration range.
I	Value is EMPC (estimated maximum possible concentration).
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.
□	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: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Job ID: 320-54528-1

Laboratory: Eurofins TestAmerica, Sacramento

Narrative

Job Narrative 320-54528-1

Comments

No additional comments.

Receipt

The samples were received on 9/20/2019 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.6° C.

Receipt Exceptions

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): Equipment Blank-Leafrake+Cheesecloth (320-54528-2). The container labels list Equipment Blank, while the COC lists Equipment Blank-Leafrake+cloth.

LCMS

Method 537 (modified): Due to a shortage in the marketplace for 13C3-PFBS, the target analyte PFBS and/or Perfluoropentanesulfonic acid (PFPeS) could not be quantitated against 13C3-PFBS (its labeled variant) as listed in the SOP. PFBS and Perfluoropentanesulfonic acid (PFPeS) was quantitated versus 18O2-PFHxS instead. (ICV 320-330274/11)

Method 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for M2-8:2 FTS in the following samples: Field Blank (320-54528-1), Equipment Blank-Leafrake+Cheesecloth (320-54528-2) and 1-Surfacewater-Culvert (320-54528-4). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following sample is below the method recommended limit for 13C2 PFHxDA: 1-Surfacewater-Culvert (320-54528-4). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s).

Method 537 (modified): The "I" qualifier means the transition mass ratio for the indicated analyte(s) was outside of the established ratio limits. The qualitative identification of the analyte(s) has/have some degree of uncertainty. However, analyst judgement was used to positively identify the analyte(s). 2-Surfacewater-River (320-54528-6)

Method 537 (modified): The matrix spike / matrix spike duplicate (MS/MSD) recoveries for Perfluorododecanesulfonic acid (PFDoS) and F-53B Minor were outside control limits. Sample matrix interference are suspected because the associated laboratory control sample / laboratory control sample duplicate (LCS/LCSD) recovery was within acceptance limits.

Method 537 (modified): Several Isotope Dilution Analyte (IDA) recoveries associated with the following samples were below the method recommended limit: 1-Foam-Culvert (320-54528-3) and 2-Foam-River (320-54528-5). The samples were re-analyzed with concurring results. Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s).

Method 537 (modified): The concentration of Perfluorooctanesulfonic acid (PFOS) and Perfluorononanoic acid (PFNA) associated with the following sample exceeded the instrument calibration range: 1-Foam-Culvert (320-54528-3). These analytes have been qualified; however, the peak(s) did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range.

Method 537 (modified): The concentration Perfluorooctanesulfonic acid (PFOS) and N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA) associated with the following sample exceeded the instrument calibration range: 2-Foam-River (320-54528-5). These analytes have been qualified; however, the peak(s) did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range.

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

Organic Prep

Method 3535: Due to the matrix being turbid dark brown/black and contains lots of floating particulates, 10X dilution (25mL) were made for

Case Narrative

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Job ID: 320-54528-1 (Continued)

Laboratory: Eurofins TestAmerica, Sacramento (Continued)

the following samples: 1-Foam-Culvert (320-54528-3) and 2-Foam-River (320-54528-5). After diluting the samples into new container, they were fortified with IDA then extracted. The 10X dilution of these samples are brown and contain particulates floating in them.

320-326510
Method: 3535 PFC

Method 3535: The following sample is light brown contain particulates at the bottom of the bottle prior to extraction:
2-Surfacewater-River (320-54528-6)

320-326510
Method: 3535 PFC

Method 3535: The following sample is brown prior to extraction
1-Surfacewater-Culvert (320-54528-4)

320-326510
Method: 3535 PFC

Method 3535: During the solid phase extraction process, the following samples have non-settable particulates which clogged the extraction column: 1-Foam-Culvert (320-54528-3) and 2-Foam-River (320-54528-5).

320-326510
Method: 3535 PFC

Method 3535: The following samples are yellow after extraction:
1-Foam-Culvert (320-54528-3), 1-Surfacewater-Culvert (320-54528-4), 2-Foam-River (320-54528-5) and 2-Surfacewater-River (320-54528-6)

320-326510
Method: 3535 PFC

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

Detection Summary

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Client Sample ID: Field Blank

Lab Sample ID: 320-54528-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.27	J B	1.8	0.15	ng/L	1		537 (modified)	Total/NA

Client Sample ID: Equipment Blank-Leafrake+Cheesecloth

Lab Sample ID: 320-54528-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.29	J B	1.9	0.16	ng/L	1		537 (modified)	Total/NA

Client Sample ID: 1-Foam-Culvert

Lab Sample ID: 320-54528-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	34		20	3.5	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	13	J	20	4.9	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	21		20	5.8	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	210		20	2.5	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	990		20	8.5	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	5400	E	20	2.7	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	1800		20	3.1	ng/L	1		537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	590		20	11	ng/L	1		537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	31		20	5.5	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	23	B	20	1.7	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	60		20	1.9	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	17000	E	20	5.4	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonamide (FOSA)	21	B	20	3.5	ng/L	1		537 (modified)	Total/NA
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	19	J	200	19	ng/L	1		537 (modified)	Total/NA
6:2 FTS	180	J	200	20	ng/L	1		537 (modified)	Total/NA
8:2 FTS	24	J	200	20	ng/L	1		537 (modified)	Total/NA
NMeFOSE	140		40	14	ng/L	1		537 (modified)	Total/NA
NEtFOSE	36		20	8.5	ng/L	1		537 (modified)	Total/NA
10:2 FTS	4.8	J	20	1.9	ng/L	1		537 (modified)	Total/NA

Client Sample ID: 1-Surfacewater-Culvert

Lab Sample ID: 320-54528-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	15		1.8	0.32	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	7.3		1.8	0.45	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	5.6		1.8	0.53	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	7.9		1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	2.3		1.8	0.78	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	1.5	J	1.8	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.34	J	1.8	0.28	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.69	J	1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.50	J B	1.8	0.16	ng/L	1		537 (modified)	Total/NA

Client Sample ID: 2-Foam-River

Lab Sample ID: 320-54528-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	30		20	3.5	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	11	J	20	5.8	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	13	J	20	2.5	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	230		20	8.5	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	1300		20	2.7	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

Detection Summary

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Client Sample ID: 2-Foam-River (Continued)

Lab Sample ID: 320-54528-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorodecanoic acid (PFDA)	1300		20	3.1	ng/L	1		537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	550		20	11	ng/L	1		537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	51		20	5.5	ng/L	1		537 (modified)	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	26		20	8.9	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.5	J B	20	1.7	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	24		20	1.9	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	17000	E	20	5.4	ng/L	1		537 (modified)	Total/NA
Perfluorodecanesulfonic acid (PFDS)	6.5	J	20	3.2	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonamide (FOSA)	1400	B	20	3.5	ng/L	1		537 (modified)	Total/NA
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	220		200	31	ng/L	1		537 (modified)	Total/NA
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	8700	E	200	19	ng/L	1		537 (modified)	Total/NA
6:2 FTS	52	J	200	20	ng/L	1		537 (modified)	Total/NA
NEtFOSA	59		20	8.7	ng/L	1		537 (modified)	Total/NA
NMeFOSE	320		40	14	ng/L	1		537 (modified)	Total/NA
NEtFOSE	89		20	8.5	ng/L	1		537 (modified)	Total/NA

Client Sample ID: 2-Surfacewater-River

Lab Sample ID: 320-54528-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	6.3		1.8	0.32	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	2.5		1.8	0.45	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	2.2		1.8	0.53	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.5	J	1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	2.1		1.8	0.77	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.38	J	1.8	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.29	J	1.8	0.28	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.32	J	1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.36	J B	1.8	0.15	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	6.2	I	1.8	0.49	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonamide (FOSA)	0.90	J B	1.8	0.32	ng/L	1		537 (modified)	Total/NA
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	4.4	J	18	1.7	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Client Sample ID: Field Blank

Lab Sample ID: 320-54528-1

Date Collected: 09/18/19 11:45

Matrix: Water

Date Received: 09/20/19 09:15

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<0.31		1.8	0.31	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluoropentanoic acid (PFPeA)	<0.44		1.8	0.44	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluorohexanoic acid (PFHxA)	<0.52		1.8	0.52	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluoroheptanoic acid (PFHpA)	<0.22		1.8	0.22	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluorooctanoic acid (PFOA)	<0.76		1.8	0.76	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluorononanoic acid (PFNA)	<0.24		1.8	0.24	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluorodecanoic acid (PFDA)	<0.28		1.8	0.28	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluoroundecanoic acid (PFUnA)	<0.99		1.8	0.99	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluorododecanoic acid (PFDoA)	<0.49		1.8	0.49	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluorotridecanoic acid (PFTriA)	<1.2		1.8	1.2	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluorotetradecanoic acid (PFTeA)	<0.26		1.8	0.26	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.80		1.8	0.80	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluorobutanesulfonic acid (PFBS)	<0.18		1.8	0.18	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.41		1.8	0.41	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluoropentanesulfonic acid (PFPeS)	<0.27		1.8	0.27	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluorohexanesulfonic acid (PFHxS)	0.27	J B	1.8	0.15	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.17		1.8	0.17	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluorooctanesulfonic acid (PFOS)	<0.49		1.8	0.49	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluorononanesulfonic acid (PFNS)	<0.14		1.8	0.14	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluorodecanesulfonic acid (PFDS)	<0.29		1.8	0.29	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluorooctanesulfonamide (FOSA)	<0.31		1.8	0.31	ng/L		09/27/19 05:39	09/28/19 11:46	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<2.8		18	2.8	ng/L		09/27/19 05:39	09/28/19 11:46	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<1.7		18	1.7	ng/L		09/27/19 05:39	09/28/19 11:46	1
4:2 FTS	<4.7		18	4.7	ng/L		09/27/19 05:39	09/28/19 11:46	1
6:2 FTS	<1.8		18	1.8	ng/L		09/27/19 05:39	09/28/19 11:46	1
8:2 FTS	<1.8		18	1.8	ng/L		09/27/19 05:39	09/28/19 11:46	1
NEtFOSA	<0.78		1.8	0.78	ng/L		09/27/19 05:39	09/28/19 11:46	1
NMeFOSA	<0.39		1.8	0.39	ng/L		09/27/19 05:39	09/28/19 11:46	1
NMeFOSE	<1.3		3.6	1.3	ng/L		09/27/19 05:39	09/28/19 11:46	1
NEtFOSE	<0.76		1.8	0.76	ng/L		09/27/19 05:39	09/28/19 11:46	1
Perfluorododecanesulfonic acid (PFDoS)	<0.40		1.8	0.40	ng/L		09/27/19 05:39	09/28/19 11:46	1
F-53B Major	<0.22		1.8	0.22	ng/L		09/27/19 05:39	09/28/19 11:46	1
HFPO-DA (GenX)	<1.3		3.6	1.3	ng/L		09/27/19 05:39	09/28/19 11:46	1
F-53B Minor	<0.29		1.8	0.29	ng/L		09/27/19 05:39	09/28/19 11:46	1
10:2 FTS	<0.17		1.8	0.17	ng/L		09/27/19 05:39	09/28/19 11:46	1
DONA	<0.16		1.8	0.16	ng/L		09/27/19 05:39	09/28/19 11:46	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	101		25 - 150				09/27/19 05:39	09/28/19 11:46	1
13C5 PFPeA	104		25 - 150				09/27/19 05:39	09/28/19 11:46	1
13C2 PFHxA	102		25 - 150				09/27/19 05:39	09/28/19 11:46	1
13C4 PFHpA	104		25 - 150				09/27/19 05:39	09/28/19 11:46	1
13C4 PFOA	108		25 - 150				09/27/19 05:39	09/28/19 11:46	1
13C5 PFNA	100		25 - 150				09/27/19 05:39	09/28/19 11:46	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Client Sample ID: Field Blank

Lab Sample ID: 320-54528-1

Date Collected: 09/18/19 11:45

Matrix: Water

Date Received: 09/20/19 09:15

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	107		25 - 150	09/27/19 05:39	09/28/19 11:46	1
13C2 PFUnA	99		25 - 150	09/27/19 05:39	09/28/19 11:46	1
13C2 PFDoA	101		25 - 150	09/27/19 05:39	09/28/19 11:46	1
13C2 PFTeDA	108		25 - 150	09/27/19 05:39	09/28/19 11:46	1
18O2 PFHxS	110		25 - 150	09/27/19 05:39	09/28/19 11:46	1
13C4 PFOS	101		25 - 150	09/27/19 05:39	09/28/19 11:46	1
13C8 FOSA	101		25 - 150	09/27/19 05:39	09/28/19 11:46	1
d3-NMeFOSAA	99		25 - 150	09/27/19 05:39	09/28/19 11:46	1
d5-NEtFOSAA	102		25 - 150	09/27/19 05:39	09/28/19 11:46	1
M2-6:2 FTS	99		25 - 150	09/27/19 05:39	09/28/19 11:46	1
M2-8:2 FTS	157 *		25 - 150	09/27/19 05:39	09/28/19 11:46	1
M2-4:2 FTS	102		25 - 150	09/27/19 05:39	09/28/19 11:46	1
d9-N-EtFOSE-M	38		10 - 120	09/27/19 05:39	09/28/19 11:46	1
d-N-MeFOSA-M	69		20 - 150	09/27/19 05:39	09/28/19 11:46	1
d7-N-MeFOSE-M	47		10 - 120	09/27/19 05:39	09/28/19 11:46	1
d-N-EtFOSA-M	54		20 - 150	09/27/19 05:39	09/28/19 11:46	1
13C2 PFHxDA	92		25 - 150	09/27/19 05:39	09/28/19 11:46	1
13C3 HFPO-DA	89		25 - 150	09/27/19 05:39	09/28/19 11:46	1

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Client Sample ID: Equipment Blank-Leafrake+Cheesecloth

Lab Sample ID: 320-54528-2

Date Collected: 09/18/19 11:55

Matrix: Water

Date Received: 09/20/19 09:15

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<0.33		1.9	0.33	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluoropentanoic acid (PFPeA)	<0.46		1.9	0.46	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluorohexanoic acid (PFHxA)	<0.55		1.9	0.55	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluoroheptanoic acid (PFHpA)	<0.24		1.9	0.24	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluorooctanoic acid (PFOA)	<0.81		1.9	0.81	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluorononanoic acid (PFNA)	<0.26		1.9	0.26	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluorodecanoic acid (PFDA)	<0.29		1.9	0.29	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluoroundecanoic acid (PFUnA)	<1.0		1.9	1.0	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluorododecanoic acid (PFDoA)	<0.52		1.9	0.52	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluorotridecanoic acid (PFTriA)	<1.2		1.9	1.2	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluorotetradecanoic acid (PFTeA)	<0.28		1.9	0.28	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.84		1.9	0.84	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluorobutanesulfonic acid (PFBS)	<0.19		1.9	0.19	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.44		1.9	0.44	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluoropentanesulfonic acid (PFPeS)	<0.28		1.9	0.28	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluorohexanesulfonic acid (PFHxS)	0.29	J B	1.9	0.16	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.18		1.9	0.18	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluorooctanesulfonic acid (PFOS)	<0.51		1.9	0.51	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluorononanesulfonic acid (PFNS)	<0.15		1.9	0.15	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluorodecanesulfonic acid (PFDS)	<0.30		1.9	0.30	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluorooctanesulfonamide (FOSA)	<0.33		1.9	0.33	ng/L		09/27/19 05:39	09/28/19 11:56	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<2.9		19	2.9	ng/L		09/27/19 05:39	09/28/19 11:56	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<1.8		19	1.8	ng/L		09/27/19 05:39	09/28/19 11:56	1
4:2 FTS	<4.9		19	4.9	ng/L		09/27/19 05:39	09/28/19 11:56	1
6:2 FTS	<1.9		19	1.9	ng/L		09/27/19 05:39	09/28/19 11:56	1
8:2 FTS	<1.9		19	1.9	ng/L		09/27/19 05:39	09/28/19 11:56	1
NEtFOSA	<0.83		1.9	0.83	ng/L		09/27/19 05:39	09/28/19 11:56	1
NMeFOSA	<0.41		1.9	0.41	ng/L		09/27/19 05:39	09/28/19 11:56	1
NMeFOSE	<1.3		3.8	1.3	ng/L		09/27/19 05:39	09/28/19 11:56	1
NEtFOSE	<0.81		1.9	0.81	ng/L		09/27/19 05:39	09/28/19 11:56	1
Perfluorododecanesulfonic acid (PFDoS)	<0.43		1.9	0.43	ng/L		09/27/19 05:39	09/28/19 11:56	1
F-53B Major	<0.23		1.9	0.23	ng/L		09/27/19 05:39	09/28/19 11:56	1
HFPO-DA (GenX)	<1.4		3.8	1.4	ng/L		09/27/19 05:39	09/28/19 11:56	1
F-53B Minor	<0.30		1.9	0.30	ng/L		09/27/19 05:39	09/28/19 11:56	1
10:2 FTS	<0.18		1.9	0.18	ng/L		09/27/19 05:39	09/28/19 11:56	1
DONA	<0.17		1.9	0.17	ng/L		09/27/19 05:39	09/28/19 11:56	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	97		25 - 150				09/27/19 05:39	09/28/19 11:56	1
13C5 PFPeA	104		25 - 150				09/27/19 05:39	09/28/19 11:56	1
13C2 PFHxA	103		25 - 150				09/27/19 05:39	09/28/19 11:56	1
13C4 PFHpA	106		25 - 150				09/27/19 05:39	09/28/19 11:56	1
13C4 PFOA	111		25 - 150				09/27/19 05:39	09/28/19 11:56	1
13C5 PFNA	100		25 - 150				09/27/19 05:39	09/28/19 11:56	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Client Sample ID: Equipment Blank-Leafrake+Cheesecloth

Lab Sample ID: 320-54528-2

Date Collected: 09/18/19 11:55

Matrix: Water

Date Received: 09/20/19 09:15

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	110		25 - 150	09/27/19 05:39	09/28/19 11:56	1
13C2 PFUnA	99		25 - 150	09/27/19 05:39	09/28/19 11:56	1
13C2 PFDoA	75		25 - 150	09/27/19 05:39	09/28/19 11:56	1
13C2 PFTeDA	89		25 - 150	09/27/19 05:39	09/28/19 11:56	1
18O2 PFHxS	116		25 - 150	09/27/19 05:39	09/28/19 11:56	1
13C4 PFOS	103		25 - 150	09/27/19 05:39	09/28/19 11:56	1
13C8 FOSA	103		25 - 150	09/27/19 05:39	09/28/19 11:56	1
d3-NMeFOSAA	102		25 - 150	09/27/19 05:39	09/28/19 11:56	1
d5-NEtFOSAA	95		25 - 150	09/27/19 05:39	09/28/19 11:56	1
M2-6:2 FTS	104		25 - 150	09/27/19 05:39	09/28/19 11:56	1
M2-8:2 FTS	169	*	25 - 150	09/27/19 05:39	09/28/19 11:56	1
M2-4:2 FTS	105		25 - 150	09/27/19 05:39	09/28/19 11:56	1
d9-N-EtFOSE-M	42		10 - 120	09/27/19 05:39	09/28/19 11:56	1
d-N-MeFOSA-M	72		20 - 150	09/27/19 05:39	09/28/19 11:56	1
d7-N-MeFOSE-M	59		10 - 120	09/27/19 05:39	09/28/19 11:56	1
d-N-EtFOSA-M	46		20 - 150	09/27/19 05:39	09/28/19 11:56	1
13C2 PFHxDA	37		25 - 150	09/27/19 05:39	09/28/19 11:56	1
13C3 HFPO-DA	95		25 - 150	09/27/19 05:39	09/28/19 11:56	1

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Client Sample ID: 1-Foam-Culvert

Lab Sample ID: 320-54528-3

Date Collected: 09/18/19 12:00

Matrix: Water

Date Received: 09/20/19 09:15

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	34		20	3.5	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluoropentanoic acid (PFPeA)	13	J	20	4.9	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluorohexanoic acid (PFHxA)	21		20	5.8	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluoroheptanoic acid (PFHpA)	210		20	2.5	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluorooctanoic acid (PFOA)	990		20	8.5	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluorononanoic acid (PFNA)	5400	E	20	2.7	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluorodecanoic acid (PFDA)	1800		20	3.1	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluoroundecanoic acid (PFUnA)	590		20	11	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluorododecanoic acid (PFDoA)	31		20	5.5	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluorotridecanoic acid (PFTriA)	<13		20	13	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluorotetradecanoic acid (PFTeA)	<2.9		20	2.9	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<8.9		20	8.9	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluorobutanesulfonic acid (PFBS)	<2.0		20	2.0	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluoro-n-octadecanoic acid (PFODA)	<4.6		20	4.6	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluoropentanesulfonic acid (PFPeS)	<3.0		20	3.0	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluorohexanesulfonic acid (PFHxS)	23	B	20	1.7	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluoroheptanesulfonic Acid (PFHpS)	60		20	1.9	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluorooctanesulfonic acid (PFOS)	17000	E	20	5.4	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluorononanesulfonic acid (PFNS)	<1.6		20	1.6	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluorodecanesulfonic acid (PFDS)	<3.2		20	3.2	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluorooctanesulfonamide (FOSA)	21	B	20	3.5	ng/L		09/27/19 05:39	09/28/19 12:05	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<31		200	31	ng/L		09/27/19 05:39	09/28/19 12:05	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	19	J	200	19	ng/L		09/27/19 05:39	09/28/19 12:05	1
4:2 FTS	<52		200	52	ng/L		09/27/19 05:39	09/28/19 12:05	1
6:2 FTS	180	J	200	20	ng/L		09/27/19 05:39	09/28/19 12:05	1
8:2 FTS	24	J	200	20	ng/L		09/27/19 05:39	09/28/19 12:05	1
NEtFOSA	<8.7		20	8.7	ng/L		09/27/19 05:39	09/28/19 12:05	1
NMeFOSA	<4.3		20	4.3	ng/L		09/27/19 05:39	09/28/19 12:05	1
NMeFOSE	140		40	14	ng/L		09/27/19 05:39	09/28/19 12:05	1
NEtFOSE	36		20	8.5	ng/L		09/27/19 05:39	09/28/19 12:05	1
Perfluorododecanesulfonic acid (PFDoS)	<4.5		20	4.5	ng/L		09/27/19 05:39	09/28/19 12:05	1
F-53B Major	<2.4		20	2.4	ng/L		09/27/19 05:39	09/28/19 12:05	1
HFPO-DA (GenX)	<15		40	15	ng/L		09/27/19 05:39	09/28/19 12:05	1
F-53B Minor	<3.2		20	3.2	ng/L		09/27/19 05:39	09/28/19 12:05	1
10:2 FTS	4.8	J	20	1.9	ng/L		09/27/19 05:39	09/28/19 12:05	1
DONA	<1.8		20	1.8	ng/L		09/27/19 05:39	09/28/19 12:05	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	33		25 - 150	09/27/19 05:39	09/28/19 12:05	1
13C5 PFPeA	35		25 - 150	09/27/19 05:39	09/28/19 12:05	1
13C2 PFHxA	33		25 - 150	09/27/19 05:39	09/28/19 12:05	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Client Sample ID: 1-Foam-Culvert

Lab Sample ID: 320-54528-3

Date Collected: 09/18/19 12:00

Matrix: Water

Date Received: 09/20/19 09:15

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFHpA	31		25 - 150	09/27/19 05:39	09/28/19 12:05	1
13C4 PFOA	27		25 - 150	09/27/19 05:39	09/28/19 12:05	1
13C5 PFNA	23 *		25 - 150	09/27/19 05:39	09/28/19 12:05	1
13C2 PFDA	21 *		25 - 150	09/27/19 05:39	09/28/19 12:05	1
13C2 PFUnA	19 *		25 - 150	09/27/19 05:39	09/28/19 12:05	1
13C2 PFDoA	15 *		25 - 150	09/27/19 05:39	09/28/19 12:05	1
13C2 PFTeDA	15 *		25 - 150	09/27/19 05:39	09/28/19 12:05	1
18O2 PFHxS	41		25 - 150	09/27/19 05:39	09/28/19 12:05	1
13C4 PFOS	32		25 - 150	09/27/19 05:39	09/28/19 12:05	1
13C8 FOSA	17 *		25 - 150	09/27/19 05:39	09/28/19 12:05	1
d3-NMeFOSAA	15 *		25 - 150	09/27/19 05:39	09/28/19 12:05	1
d5-NEtFOSAA	15 *		25 - 150	09/27/19 05:39	09/28/19 12:05	1
M2-6:2 FTS	36		25 - 150	09/27/19 05:39	09/28/19 12:05	1
M2-8:2 FTS	41		25 - 150	09/27/19 05:39	09/28/19 12:05	1
M2-4:2 FTS	43		25 - 150	09/27/19 05:39	09/28/19 12:05	1
d9-N-EtFOSE-M	11		10 - 120	09/27/19 05:39	09/28/19 12:05	1
d-N-MeFOSA-M	15 *		20 - 150	09/27/19 05:39	09/28/19 12:05	1
d7-N-MeFOSE-M	15		10 - 120	09/27/19 05:39	09/28/19 12:05	1
d-N-EtFOSA-M	13 *		20 - 150	09/27/19 05:39	09/28/19 12:05	1
13C2 PFHxDA	9 *		25 - 150	09/27/19 05:39	09/28/19 12:05	1
13C3 HFPO-DA	18 *		25 - 150	09/27/19 05:39	09/28/19 12:05	1

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Client Sample ID: 1-Surfacewater-Culvert

Lab Sample ID: 320-54528-4

Date Collected: 09/18/19 12:00

Matrix: Water

Date Received: 09/20/19 09:15

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	15		1.8	0.32	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluoropentanoic acid (PFPeA)	7.3		1.8	0.45	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluorohexanoic acid (PFHxA)	5.6		1.8	0.53	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluoroheptanoic acid (PFHpA)	7.9		1.8	0.23	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluorooctanoic acid (PFOA)	2.3		1.8	0.78	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluorononanoic acid (PFNA)	1.5 J		1.8	0.25	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluorodecanoic acid (PFDA)	0.34 J		1.8	0.28	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluoroundecanoic acid (PFUnA)	<1.0		1.8	1.0	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluorododecanoic acid (PFDoA)	<0.50		1.8	0.50	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluorotridecanoic acid (PFTriA)	<1.2		1.8	1.2	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluorotetradecanoic acid (PFTeA)	<0.27		1.8	0.27	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.82		1.8	0.82	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluorobutanesulfonic acid (PFBS)	0.69 J		1.8	0.18	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.42		1.8	0.42	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluoropentanesulfonic acid (PFPeS)	<0.28		1.8	0.28	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluorohexanesulfonic acid (PFHxS)	0.50 J B		1.8	0.16	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.17		1.8	0.17	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluorooctanesulfonic acid (PFOS)	<0.50		1.8	0.50	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluorononanesulfonic acid (PFNS)	<0.15		1.8	0.15	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluorodecanesulfonic acid (PFDS)	<0.29		1.8	0.29	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluorooctanesulfonamide (FOSA)	<0.32		1.8	0.32	ng/L		09/27/19 05:39	09/28/19 12:15	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<2.8		18	2.8	ng/L		09/27/19 05:39	09/28/19 12:15	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<1.7		18	1.7	ng/L		09/27/19 05:39	09/28/19 12:15	1
4:2 FTS	<4.8		18	4.8	ng/L		09/27/19 05:39	09/28/19 12:15	1
6:2 FTS	<1.8		18	1.8	ng/L		09/27/19 05:39	09/28/19 12:15	1
8:2 FTS	<1.8		18	1.8	ng/L		09/27/19 05:39	09/28/19 12:15	1
NEtFOSA	<0.80		1.8	0.80	ng/L		09/27/19 05:39	09/28/19 12:15	1
NMeFOSA	<0.39		1.8	0.39	ng/L		09/27/19 05:39	09/28/19 12:15	1
NMeFOSE	<1.3		3.7	1.3	ng/L		09/27/19 05:39	09/28/19 12:15	1
NEtFOSE	<0.78		1.8	0.78	ng/L		09/27/19 05:39	09/28/19 12:15	1
Perfluorododecanesulfonic acid (PFDoS)	<0.41		1.8	0.41	ng/L		09/27/19 05:39	09/28/19 12:15	1
F-53B Major	<0.22		1.8	0.22	ng/L		09/27/19 05:39	09/28/19 12:15	1
HFPO-DA (GenX)	<1.4		3.7	1.4	ng/L		09/27/19 05:39	09/28/19 12:15	1
F-53B Minor	<0.29		1.8	0.29	ng/L		09/27/19 05:39	09/28/19 12:15	1
10:2 FTS	<0.17		1.8	0.17	ng/L		09/27/19 05:39	09/28/19 12:15	1
DONA	<0.17		1.8	0.17	ng/L		09/27/19 05:39	09/28/19 12:15	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	39		25 - 150				09/27/19 05:39	09/28/19 12:15	1
13C5 PFPeA	74		25 - 150				09/27/19 05:39	09/28/19 12:15	1
13C2 PFHxA	87		25 - 150				09/27/19 05:39	09/28/19 12:15	1
13C4 PFHpA	99		25 - 150				09/27/19 05:39	09/28/19 12:15	1
13C4 PFOA	105		25 - 150				09/27/19 05:39	09/28/19 12:15	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Client Sample ID: 1-Surfacewater-Culvert

Lab Sample ID: 320-54528-4

Date Collected: 09/18/19 12:00

Matrix: Water

Date Received: 09/20/19 09:15

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFNA	99		25 - 150	09/27/19 05:39	09/28/19 12:15	1
13C2 PFDA	101		25 - 150	09/27/19 05:39	09/28/19 12:15	1
13C2 PFUnA	99		25 - 150	09/27/19 05:39	09/28/19 12:15	1
13C2 PFDoA	78		25 - 150	09/27/19 05:39	09/28/19 12:15	1
13C2 PFTeDA	48		25 - 150	09/27/19 05:39	09/28/19 12:15	1
18O2 PFHxS	105		25 - 150	09/27/19 05:39	09/28/19 12:15	1
13C4 PFOS	95		25 - 150	09/27/19 05:39	09/28/19 12:15	1
13C8 FOSA	94		25 - 150	09/27/19 05:39	09/28/19 12:15	1
d3-NMeFOSAA	86		25 - 150	09/27/19 05:39	09/28/19 12:15	1
d5-NEtFOSAA	88		25 - 150	09/27/19 05:39	09/28/19 12:15	1
M2-6:2 FTS	121		25 - 150	09/27/19 05:39	09/28/19 12:15	1
M2-8:2 FTS	153 *		25 - 150	09/27/19 05:39	09/28/19 12:15	1
M2-4:2 FTS	94		25 - 150	09/27/19 05:39	09/28/19 12:15	1
d9-N-EtFOSE-M	37		10 - 120	09/27/19 05:39	09/28/19 12:15	1
d-N-MeFOSA-M	52		20 - 150	09/27/19 05:39	09/28/19 12:15	1
d7-N-MeFOSE-M	51		10 - 120	09/27/19 05:39	09/28/19 12:15	1
d-N-EtFOSA-M	34		20 - 150	09/27/19 05:39	09/28/19 12:15	1
13C2 PFHxDA	14 *		25 - 150	09/27/19 05:39	09/28/19 12:15	1
13C3 HFPO-DA	70		25 - 150	09/27/19 05:39	09/28/19 12:15	1

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Client Sample ID: 2-Foam-River

Lab Sample ID: 320-54528-5

Date Collected: 09/18/19 14:40

Matrix: Water

Date Received: 09/20/19 09:15

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	30		20	3.5	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluoropentanoic acid (PFPeA)	<4.9		20	4.9	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluorohexanoic acid (PFHxA)	11	J	20	5.8	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluoroheptanoic acid (PFHpA)	13	J	20	2.5	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluorooctanoic acid (PFOA)	230		20	8.5	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluorononanoic acid (PFNA)	1300		20	2.7	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluorodecanoic acid (PFDA)	1300		20	3.1	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluoroundecanoic acid (PFUnA)	550		20	11	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluorododecanoic acid (PFDoA)	51		20	5.5	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluorotridecanoic acid (PFTriA)	<13		20	13	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluorotetradecanoic acid (PFTeA)	<2.9		20	2.9	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	26		20	8.9	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluorobutanesulfonic acid (PFBS)	<2.0		20	2.0	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluoro-n-octadecanoic acid (PFODA)	<4.6		20	4.6	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluoropentanesulfonic acid (PFPeS)	<3.0		20	3.0	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluorohexanesulfonic acid (PFHxS)	6.5	J B	20	1.7	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluoroheptanesulfonic Acid (PFHpS)	24		20	1.9	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluorooctanesulfonic acid (PFOS)	17000	E	20	5.4	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluorononanesulfonic acid (PFNS)	<1.6		20	1.6	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluorodecanesulfonic acid (PFDS)	6.5	J	20	3.2	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluorooctanesulfonamide (FOSA)	1400	B	20	3.5	ng/L		09/27/19 05:39	09/28/19 12:24	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	220		200	31	ng/L		09/27/19 05:39	09/28/19 12:24	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	8700	E	200	19	ng/L		09/27/19 05:39	09/28/19 12:24	1
4:2 FTS	<52		200	52	ng/L		09/27/19 05:39	09/28/19 12:24	1
6:2 FTS	52	J	200	20	ng/L		09/27/19 05:39	09/28/19 12:24	1
8:2 FTS	<20		200	20	ng/L		09/27/19 05:39	09/28/19 12:24	1
NEtFOSA	59		20	8.7	ng/L		09/27/19 05:39	09/28/19 12:24	1
NMeFOSA	<4.3		20	4.3	ng/L		09/27/19 05:39	09/28/19 12:24	1
NMeFOSE	320		40	14	ng/L		09/27/19 05:39	09/28/19 12:24	1
NEtFOSE	89		20	8.5	ng/L		09/27/19 05:39	09/28/19 12:24	1
Perfluorododecanesulfonic acid (PFDoS)	<4.5		20	4.5	ng/L		09/27/19 05:39	09/28/19 12:24	1
F-53B Major	<2.4		20	2.4	ng/L		09/27/19 05:39	09/28/19 12:24	1
HFPO-DA (GenX)	<15		40	15	ng/L		09/27/19 05:39	09/28/19 12:24	1
F-53B Minor	<3.2		20	3.2	ng/L		09/27/19 05:39	09/28/19 12:24	1
10:2 FTS	<1.9		20	1.9	ng/L		09/27/19 05:39	09/28/19 12:24	1
DONA	<1.8		20	1.8	ng/L		09/27/19 05:39	09/28/19 12:24	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	69		25 - 150				09/27/19 05:39	09/28/19 12:24	1
13C5 PFPeA	91		25 - 150				09/27/19 05:39	09/28/19 12:24	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Client Sample ID: 2-Foam-River

Lab Sample ID: 320-54528-5

Date Collected: 09/18/19 14:40

Matrix: Water

Date Received: 09/20/19 09:15

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	90		25 - 150	09/27/19 05:39	09/28/19 12:24	1
13C4 PFHpA	88		25 - 150	09/27/19 05:39	09/28/19 12:24	1
13C4 PFOA	72		25 - 150	09/27/19 05:39	09/28/19 12:24	1
13C5 PFNA	57		25 - 150	09/27/19 05:39	09/28/19 12:24	1
13C2 PFDA	44		25 - 150	09/27/19 05:39	09/28/19 12:24	1
13C2 PFUnA	34		25 - 150	09/27/19 05:39	09/28/19 12:24	1
13C2 PFDoA	18 *		25 - 150	09/27/19 05:39	09/28/19 12:24	1
13C2 PFTeDA	11 *		25 - 150	09/27/19 05:39	09/28/19 12:24	1
18O2 PFHxS	107		25 - 150	09/27/19 05:39	09/28/19 12:24	1
13C4 PFOS	82		25 - 150	09/27/19 05:39	09/28/19 12:24	1
13C8 FOSA	44		25 - 150	09/27/19 05:39	09/28/19 12:24	1
d3-NMeFOSAA	30		25 - 150	09/27/19 05:39	09/28/19 12:24	1
d5-NEtFOSAA	31		25 - 150	09/27/19 05:39	09/28/19 12:24	1
M2-6:2 FTS	97		25 - 150	09/27/19 05:39	09/28/19 12:24	1
M2-8:2 FTS	81		25 - 150	09/27/19 05:39	09/28/19 12:24	1
M2-4:2 FTS	115		25 - 150	09/27/19 05:39	09/28/19 12:24	1
d9-N-EtFOSE-M	24		10 - 120	09/27/19 05:39	09/28/19 12:24	1
d-N-MeFOSA-M	29		20 - 150	09/27/19 05:39	09/28/19 12:24	1
d7-N-MeFOSE-M	30		10 - 120	09/27/19 05:39	09/28/19 12:24	1
d-N-EtFOSA-M	21		20 - 150	09/27/19 05:39	09/28/19 12:24	1
13C2 PFHxDA	8 *		25 - 150	09/27/19 05:39	09/28/19 12:24	1
13C3 HFPO-DA	56		25 - 150	09/27/19 05:39	09/28/19 12:24	1

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Client Sample ID: 2-Surfacewater-River

Lab Sample ID: 320-54528-6

Date Collected: 09/18/19 14:40

Matrix: Water

Date Received: 09/20/19 09:15

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	6.3		1.8	0.32	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluoropentanoic acid (PFPeA)	2.5		1.8	0.45	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluorohexanoic acid (PFHxA)	2.2		1.8	0.53	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluoroheptanoic acid (PFHpA)	1.5	J	1.8	0.23	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluorooctanoic acid (PFOA)	2.1		1.8	0.77	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluorononanoic acid (PFNA)	0.38	J	1.8	0.25	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluorodecanoic acid (PFDA)	0.29	J	1.8	0.28	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluoroundecanoic acid (PFUnA)	<1.0		1.8	1.0	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluorododecanoic acid (PFDoA)	<0.50		1.8	0.50	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluorotridecanoic acid (PFTriA)	<1.2		1.8	1.2	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluorotetradecanoic acid (PFTeA)	<0.26		1.8	0.26	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.81		1.8	0.81	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluorobutanesulfonic acid (PFBS)	0.32	J	1.8	0.18	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.42		1.8	0.42	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluoropentanesulfonic acid (PFPeS)	<0.27		1.8	0.27	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluorohexanesulfonic acid (PFHxS)	0.36	J B	1.8	0.15	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.17		1.8	0.17	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluorooctanesulfonic acid (PFOS)	6.2	I	1.8	0.49	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluorononanesulfonic acid (PFNS)	<0.15		1.8	0.15	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluorodecanesulfonic acid (PFDS)	<0.29		1.8	0.29	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluorooctanesulfonamide (FOSA)	0.90	J B	1.8	0.32	ng/L		09/27/19 05:39	09/28/19 12:34	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<2.8		18	2.8	ng/L		09/27/19 05:39	09/28/19 12:34	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	4.4	J	18	1.7	ng/L		09/27/19 05:39	09/28/19 12:34	1
4:2 FTS	<4.7		18	4.7	ng/L		09/27/19 05:39	09/28/19 12:34	1
6:2 FTS	<1.8		18	1.8	ng/L		09/27/19 05:39	09/28/19 12:34	1
8:2 FTS	<1.8		18	1.8	ng/L		09/27/19 05:39	09/28/19 12:34	1
NEtFOSA	<0.79		1.8	0.79	ng/L		09/27/19 05:39	09/28/19 12:34	1
NMeFOSA	<0.39		1.8	0.39	ng/L		09/27/19 05:39	09/28/19 12:34	1
NMeFOSE	<1.3		3.6	1.3	ng/L		09/27/19 05:39	09/28/19 12:34	1
NEtFOSE	<0.77		1.8	0.77	ng/L		09/27/19 05:39	09/28/19 12:34	1
Perfluorododecanesulfonic acid (PFDoS)	<0.41		1.8	0.41	ng/L		09/27/19 05:39	09/28/19 12:34	1
F-53B Major	<0.22		1.8	0.22	ng/L		09/27/19 05:39	09/28/19 12:34	1
HFPO-DA (GenX)	<1.4		3.6	1.4	ng/L		09/27/19 05:39	09/28/19 12:34	1
F-53B Minor	<0.29		1.8	0.29	ng/L		09/27/19 05:39	09/28/19 12:34	1
10:2 FTS	<0.17		1.8	0.17	ng/L		09/27/19 05:39	09/28/19 12:34	1
DONA	<0.16		1.8	0.16	ng/L		09/27/19 05:39	09/28/19 12:34	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
¹³ C4 PFBA	60		25 - 150				09/27/19 05:39	09/28/19 12:34	1
¹³ C5 PFPeA	90		25 - 150				09/27/19 05:39	09/28/19 12:34	1
¹³ C2 PFHxA	95		25 - 150				09/27/19 05:39	09/28/19 12:34	1
¹³ C4 PFHpA	104		25 - 150				09/27/19 05:39	09/28/19 12:34	1

Eurofins TestAmerica, Sacramento

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Client Sample ID: 2-Surfacewater-River

Lab Sample ID: 320-54528-6

Date Collected: 09/18/19 14:40

Matrix: Water

Date Received: 09/20/19 09:15

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	108		25 - 150	09/27/19 05:39	09/28/19 12:34	1
13C5 PFNA	102		25 - 150	09/27/19 05:39	09/28/19 12:34	1
13C2 PFDA	102		25 - 150	09/27/19 05:39	09/28/19 12:34	1
13C2 PFUnA	100		25 - 150	09/27/19 05:39	09/28/19 12:34	1
13C2 PFDoA	92		25 - 150	09/27/19 05:39	09/28/19 12:34	1
13C2 PFTeDA	75		25 - 150	09/27/19 05:39	09/28/19 12:34	1
18O2 PFHxS	111		25 - 150	09/27/19 05:39	09/28/19 12:34	1
13C4 PFOS	98		25 - 150	09/27/19 05:39	09/28/19 12:34	1
13C8 FOSA	99		25 - 150	09/27/19 05:39	09/28/19 12:34	1
d3-NMeFOSAA	95		25 - 150	09/27/19 05:39	09/28/19 12:34	1
d5-NEtFOSAA	96		25 - 150	09/27/19 05:39	09/28/19 12:34	1
M2-6:2 FTS	113		25 - 150	09/27/19 05:39	09/28/19 12:34	1
M2-8:2 FTS	126		25 - 150	09/27/19 05:39	09/28/19 12:34	1
M2-4:2 FTS	101		25 - 150	09/27/19 05:39	09/28/19 12:34	1
d9-N-EtFOSE-M	43		10 - 120	09/27/19 05:39	09/28/19 12:34	1
d-N-MeFOSA-M	60		20 - 150	09/27/19 05:39	09/28/19 12:34	1
d7-N-MeFOSE-M	47		10 - 120	09/27/19 05:39	09/28/19 12:34	1
d-N-EtFOSA-M	44		20 - 150	09/27/19 05:39	09/28/19 12:34	1
13C2 PFHxDA	41		25 - 150	09/27/19 05:39	09/28/19 12:34	1
13C3 HFPO-DA	75		25 - 150	09/27/19 05:39	09/28/19 12:34	1

Isotope Dilution Summary

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

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)
320-54528-1	Field Blank	101	104	102	104	108	100	107	99
320-54528-2	Equipment	97	104	103	106	111	100	110	99
320-54528-3	Blank-Leafrake+Cheesecloth								
320-54528-3	1-Foam-Culvert	33	35	33	31	27	23 *	21 *	19 *
320-54528-4	1-Surfacewater-Culvert	39	74	87	99	105	99	101	99
320-54528-5	2-Foam-River	69	91	90	88	72	57	44	34
320-54528-6	2-Surfacewater-River	60	90	95	104	108	102	102	100
LCS 320-326510/2-A	Lab Control Sample	102	110	104	111	110	105	103	101
LCSD 320-326510/3-A	Lab Control Sample Dup	100	102	102	108	106	105	104	104
MB 320-326510/1-A	Method Blank	102	107	102	105	106	101	98	97

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFDaA (25-150)	PFTDA (25-150)	PFHxS (25-150)	PFOS (25-150)	PFOSA (25-150)	-NMeFOS _i (25-150)	-NEtFOS _i (25-150)	M262FTS (25-150)
320-54528-1	Field Blank	101	108	110	101	101	99	102	99
320-54528-2	Equipment	75	89	116	103	103	102	95	104
320-54528-3	Blank-Leafrake+Cheesecloth								
320-54528-3	1-Foam-Culvert	15 *	15 *	41	32	17 *	15 *	15 *	36
320-54528-4	1-Surfacewater-Culvert	78	48	105	95	94	86	88	121
320-54528-5	2-Foam-River	18 *	11 *	107	82	44	30	31	97
320-54528-6	2-Surfacewater-River	92	75	111	98	99	95	96	113
LCS 320-326510/2-A	Lab Control Sample	107	112	116	109	103	101	97	90
LCSD 320-326510/3-A	Lab Control Sample Dup	104	103	110	95	92	92	96	143
MB 320-326510/1-A	Method Blank	98	109	108	100	94	95	98	89

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	M282FTS (25-150)	M242FTS (25-150)	NEFM (10-120)	I-MeFOSA _i (20-150)	NMFM (10-120)	↓-EtFOSA _i (20-150)	PFHxDA (25-150)	HFPODA (25-150)
320-54528-1	Field Blank	157 *	102	38	69	47	54	92	89
320-54528-2	Equipment	169 *	105	42	72	59	46	37	95
320-54528-3	Blank-Leafrake+Cheesecloth								
320-54528-3	1-Foam-Culvert	41	43	11	15 *	15	13 *	9 *	18 *
320-54528-4	1-Surfacewater-Culvert	153 *	94	37	52	51	34	14 *	70
320-54528-5	2-Foam-River	81	115	24	29	30	21	8 *	56
320-54528-6	2-Surfacewater-River	126	101	43	60	47	44	41	75
LCS 320-326510/2-A	Lab Control Sample	91	87	27	66	31	46	103	103
LCSD 320-326510/3-A	Lab Control Sample Dup	130	123	27	62	30	44	94	95
MB 320-326510/1-A	Method Blank	86	91	27	72	32	46	91	95

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
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS

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Isotope Dilution Summary

Client: AECOM Technical Services Inc.

Job ID: 320-54528-1

Project/Site: PFAS, Reactive Foam Water Way 60614940

PFOSA = 13C8 FOSA

d3-NMeFOSAA = d3-NMeFOSAA

d5-NEtFOSAA = d5-NEtFOSAA

M262FTS = M2-6:2 FTS

M282FTS = M2-8:2 FTS

M242FTS = M2-4:2 FTS

NEFM = d9-N-EtFOSE-M

d-N-MeFOSA-M = d-N-MeFOSA-M

NMFM = d7-N-MeFOSE-M

d-N-EtFOSA-M = d-N-EtFOSA-M

PFHxDA = 13C2 PFHxDA

HFPODA = 13C3 HFPO-DA

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-326510/1-A

Matrix: Water

Analysis Batch: 326873

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 326510

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<0.35		2.0	0.35	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluoropentanoic acid (PFPeA)	<0.49		2.0	0.49	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluorohexanoic acid (PFHxA)	<0.58		2.0	0.58	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluoroheptanoic acid (PFHpA)	<0.25		2.0	0.25	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluorooctanoic acid (PFOA)	<0.85		2.0	0.85	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluorononanoic acid (PFNA)	<0.27		2.0	0.27	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluorodecanoic acid (PFDA)	<0.31		2.0	0.31	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluoroundecanoic acid (PFUnA)	<1.1		2.0	1.1	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluorododecanoic acid (PFDoA)	<0.55		2.0	0.55	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluorotridecanoic acid (PFTriA)	<1.3		2.0	1.3	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluorotetradecanoic acid (PFTeA)	0.329	J	2.0	0.29	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.89		2.0	0.89	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluorobutanesulfonic acid (PFBS)	<0.20		2.0	0.20	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.46		2.0	0.46	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluoropentanesulfonic acid (PFPeS)	<0.30		2.0	0.30	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluorohexanesulfonic acid (PFHxS)	0.371	J	2.0	0.17	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.19		2.0	0.19	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluorooctanesulfonic acid (PFOS)	<0.54		2.0	0.54	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluorononanesulfonic acid (PFNS)	<0.16		2.0	0.16	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluorodecanesulfonic acid (PFDS)	<0.32		2.0	0.32	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluorooctanesulfonamide (FOSA)	0.541	J	2.0	0.35	ng/L		09/27/19 05:39	09/28/19 11:17	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<3.1		20	3.1	ng/L		09/27/19 05:39	09/28/19 11:17	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<1.9		20	1.9	ng/L		09/27/19 05:39	09/28/19 11:17	1
4:2 FTS	<5.2		20	5.2	ng/L		09/27/19 05:39	09/28/19 11:17	1
6:2 FTS	<2.0		20	2.0	ng/L		09/27/19 05:39	09/28/19 11:17	1
8:2 FTS	<2.0		20	2.0	ng/L		09/27/19 05:39	09/28/19 11:17	1
NEtFOSA	<0.87		2.0	0.87	ng/L		09/27/19 05:39	09/28/19 11:17	1
NMeFOSA	<0.43		2.0	0.43	ng/L		09/27/19 05:39	09/28/19 11:17	1
NMeFOSE	<1.4		4.0	1.4	ng/L		09/27/19 05:39	09/28/19 11:17	1
NEtFOSE	<0.85		2.0	0.85	ng/L		09/27/19 05:39	09/28/19 11:17	1
Perfluorododecanesulfonic acid (PFDoS)	<0.45		2.0	0.45	ng/L		09/27/19 05:39	09/28/19 11:17	1
F-53B Major	<0.24		2.0	0.24	ng/L		09/27/19 05:39	09/28/19 11:17	1
HFPO-DA (GenX)	<1.5		4.0	1.5	ng/L		09/27/19 05:39	09/28/19 11:17	1
F-53B Minor	<0.32		2.0	0.32	ng/L		09/27/19 05:39	09/28/19 11:17	1
10:2 FTS	<0.19		2.0	0.19	ng/L		09/27/19 05:39	09/28/19 11:17	1
DONA	<0.18		2.0	0.18	ng/L		09/27/19 05:39	09/28/19 11:17	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	102		25 - 150	09/27/19 05:39	09/28/19 11:17	1
13C5 PFPeA	107		25 - 150	09/27/19 05:39	09/28/19 11:17	1
13C2 PFHxA	102		25 - 150	09/27/19 05:39	09/28/19 11:17	1
13C4 PFHpA	105		25 - 150	09/27/19 05:39	09/28/19 11:17	1
13C4 PFOA	106		25 - 150	09/27/19 05:39	09/28/19 11:17	1

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

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

Lab Sample ID: MB 320-326510/1-A

Matrix: Water

Analysis Batch: 326873

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 326510

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFNA	101		25 - 150	09/27/19 05:39	09/28/19 11:17	1
13C2 PFDA	98		25 - 150	09/27/19 05:39	09/28/19 11:17	1
13C2 PFUnA	97		25 - 150	09/27/19 05:39	09/28/19 11:17	1
13C2 PFDoA	98		25 - 150	09/27/19 05:39	09/28/19 11:17	1
13C2 PFTeDA	109		25 - 150	09/27/19 05:39	09/28/19 11:17	1
18O2 PFHxS	108		25 - 150	09/27/19 05:39	09/28/19 11:17	1
13C4 PFOS	100		25 - 150	09/27/19 05:39	09/28/19 11:17	1
13C8 FOSA	94		25 - 150	09/27/19 05:39	09/28/19 11:17	1
d3-NMeFOSAA	95		25 - 150	09/27/19 05:39	09/28/19 11:17	1
d5-NEtFOSAA	98		25 - 150	09/27/19 05:39	09/28/19 11:17	1
M2-6:2 FTS	89		25 - 150	09/27/19 05:39	09/28/19 11:17	1
M2-8:2 FTS	86		25 - 150	09/27/19 05:39	09/28/19 11:17	1
M2-4:2 FTS	91		25 - 150	09/27/19 05:39	09/28/19 11:17	1
d9-N-EtFOSE-M	27		10 - 120	09/27/19 05:39	09/28/19 11:17	1
d-N-MeFOSA-M	72		20 - 150	09/27/19 05:39	09/28/19 11:17	1
d7-N-MeFOSE-M	32		10 - 120	09/27/19 05:39	09/28/19 11:17	1
d-N-EtFOSA-M	46		20 - 150	09/27/19 05:39	09/28/19 11:17	1
13C2 PFHxDA	91		25 - 150	09/27/19 05:39	09/28/19 11:17	1
13C3 HFPO-DA	95		25 - 150	09/27/19 05:39	09/28/19 11:17	1

Lab Sample ID: LCS 320-326510/2-A

Matrix: Water

Analysis Batch: 326873

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 326510

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	40.0	41.0		ng/L		103	70 - 130
Perfluoropentanoic acid (PFPeA)	40.0	38.4		ng/L		96	66 - 126
Perfluorohexanoic acid (PFHxA)	40.0	38.8		ng/L		97	66 - 126
Perfluoroheptanoic acid (PFHpA)	40.0	38.2		ng/L		96	66 - 126
Perfluorooctanoic acid (PFOA)	40.0	35.8		ng/L		89	64 - 124
Perfluorononanoic acid (PFNA)	40.0	34.2		ng/L		85	68 - 128
Perfluorodecanoic acid (PFDA)	40.0	40.3		ng/L		101	69 - 129
Perfluoroundecanoic acid (PFUnA)	40.0	37.0		ng/L		92	60 - 120
Perfluorododecanoic acid (PFDoA)	40.0	33.2		ng/L		83	71 - 131
Perfluorotridecanoic acid (PFTriA)	40.0	41.8		ng/L		104	72 - 132
Perfluorotetradecanoic acid (PFTeA)	40.0	39.2		ng/L		98	68 - 128
Perfluoro-n-hexadecanoic acid (PFHxDA)	40.0	43.0		ng/L		107	72 - 132
Perfluorobutanesulfonic acid (PFBS)	35.4	31.2		ng/L		88	73 - 133
Perfluoro-n-octadecanoic acid (PFODA)	40.0	42.9		ng/L		107	74 - 134
Perfluoropentanesulfonic acid (PFPeS)	37.5	34.1		ng/L		91	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	36.4	32.4		ng/L		89	63 - 123

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

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

Lab Sample ID: LCS 320-326510/2-A

Matrix: Water

Analysis Batch: 326873

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 326510

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	38.3		ng/L		101	68 - 128
Perfluorooctanesulfonic acid (PFOS)	37.1	34.3		ng/L		92	67 - 127
Perfluorononanesulfonic acid (PFNS)	38.4	38.1		ng/L		99	70 - 130
Perfluorodecanesulfonic acid (PFDS)	38.6	35.1		ng/L		91	68 - 128
Perfluorooctanesulfonamide (FOSA)	40.0	41.8		ng/L		104	70 - 130
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	40.0	39.1		ng/L		98	67 - 127
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	40.0	40.5		ng/L		101	65 - 125
4:2 FTS	37.4	39.8		ng/L		107	70 - 130
6:2 FTS	37.9	40.3		ng/L		106	66 - 126
8:2 FTS	38.3	39.1		ng/L		102	67 - 127
NEtFOSA	40.0	41.3		ng/L		103	65 - 135
NMeFOSA	40.0	41.7		ng/L		104	65 - 135
NMeFOSE	40.0	38.7		ng/L		97	65 - 135
NEtFOSE	40.0	39.8		ng/L		99	65 - 135
Perfluorododecanesulfonic acid (PFDoS)	38.7	35.2		ng/L		91	70 - 130
F-53B Major	37.3	36.1		ng/L		97	70 - 130
HFPO-DA (GenX)	40.0	41.7		ng/L		104	70 - 130
F-53B Minor	37.7	31.3		ng/L		83	70 - 130
10:2 FTS	38.6	38.3		ng/L		99	70 - 130
DONA	37.7	36.8		ng/L		98	70 - 130

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFBA	102		25 - 150
13C5 PFPeA	110		25 - 150
13C2 PFHxA	104		25 - 150
13C4 PFHpA	111		25 - 150
13C4 PFOA	110		25 - 150
13C5 PFNA	105		25 - 150
13C2 PFDA	103		25 - 150
13C2 PFUnA	101		25 - 150
13C2 PFDoA	107		25 - 150
13C2 PFTeDA	112		25 - 150
18O2 PFHxS	116		25 - 150
13C4 PFOS	109		25 - 150
13C8 FOSA	103		25 - 150
d3-NMeFOSAA	101		25 - 150
d5-NEtFOSAA	97		25 - 150
M2-6:2 FTS	90		25 - 150
M2-8:2 FTS	91		25 - 150
M2-4:2 FTS	87		25 - 150
d9-N-EtFOSE-M	27		10 - 120
d-N-MeFOSA-M	66		20 - 150
d7-N-MeFOSE-M	31		10 - 120

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

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

Lab Sample ID: LCS 320-326510/2-A

Matrix: Water

Analysis Batch: 326873

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 326510

Isotope Dilution	LCS		Limits
	%Recovery	Qualifier	
d-N-EtFOSA-M	46		20 - 150
13C2 PFHxDA	103		25 - 150
13C3 HFPO-DA	103		25 - 150

Lab Sample ID: LCSD 320-326510/3-A

Matrix: Water

Analysis Batch: 331773

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 326510

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec.		RPD	
							Limits		RPD	Limit
Perfluorobutanoic acid (PFBA)	40.0	40.6		ng/L		101	70 - 130		1	30
Perfluoropentanoic acid (PFPeA)	40.0	39.7		ng/L		99	66 - 126		3	30
Perfluorohexanoic acid (PFHxA)	40.0	40.3		ng/L		101	66 - 126		4	30
Perfluoroheptanoic acid (PFHpA)	40.0	39.5		ng/L		99	66 - 126		3	30
Perfluorooctanoic acid (PFOA)	40.0	37.4		ng/L		94	64 - 124		4	30
Perfluorononanoic acid (PFNA)	40.0	39.7		ng/L		99	68 - 128		15	30
Perfluorodecanoic acid (PFDA)	40.0	39.1		ng/L		98	69 - 129		3	30
Perfluoroundecanoic acid (PFUnA)	40.0	35.3		ng/L		88	60 - 120		5	30
Perfluorododecanoic acid (PFDoA)	40.0	42.3		ng/L		106	71 - 131		24	30
Perfluorotridecanoic acid (PFTriA)	40.0	38.7		ng/L		97	72 - 132		8	30
Perfluorotetradecanoic acid (PFTeA)	40.0	35.8		ng/L		90	68 - 128		9	30
Perfluoro-n-hexadecanoic acid (PFHxDA)	40.0	43.2		ng/L		108	72 - 132		1	30
Perfluorobutanesulfonic acid (PFBS)	35.4	31.8		ng/L		90	73 - 133		2	30
Perfluoro-n-octadecanoic acid (PFODA)	40.0	39.7		ng/L		99	74 - 134		8	30
Perfluoropentanesulfonic acid (PFPeS)	37.5	32.5		ng/L		87	70 - 130		5	30
Perfluorohexanesulfonic acid (PFHxS)	36.4	30.4		ng/L		83	63 - 123		7	30
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	39.5		ng/L		104	68 - 128		3	30
Perfluorooctanesulfonic acid (PFOS)	37.1	33.4		ng/L		90	67 - 127		3	30
Perfluorononanesulfonic acid (PFNS)	38.4	40.2		ng/L		105	70 - 130		5	30
Perfluorodecanesulfonic acid (PFDS)	38.6	37.5		ng/L		97	68 - 128		6	30
Perfluorooctanesulfonamide (FOSA)	40.0	40.7		ng/L		102	70 - 130		3	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	40.0	40.7		ng/L		102	67 - 127		4	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	40.0	41.8		ng/L		105	65 - 125		3	30
4:2 FTS	37.4	43.0		ng/L		115	70 - 130		8	30
6:2 FTS	37.9	37.2		ng/L		98	66 - 126		8	30
8:2 FTS	38.3	37.2		ng/L		97	67 - 127		5	30
NEtFOSA	40.0	43.8		ng/L		110	65 - 135		6	30
NMeFOSA	40.0	43.8		ng/L		110	65 - 135		5	30

Eurofins TestAmerica, Sacramento

QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

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

Lab Sample ID: LCSD 320-326510/3-A

Matrix: Water

Analysis Batch: 331773

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 326510

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
NMeFOSE	40.0	36.0		ng/L		90	65 - 135	7	30
NEtFOSE	40.0	40.0		ng/L		100	65 - 135	1	30
Perfluorododecanesulfonic acid (PFDoS)	38.7	40.0		ng/L		103	70 - 130	13	30
F-53B Major	37.3	40.6		ng/L		109	70 - 130	12	30
HFPO-DA (GenX)	40.0	35.9		ng/L		90	70 - 130	15	30
F-53B Minor	37.7	33.4		ng/L		89	70 - 130	7	30
10:2 FTS	38.6	31.5		ng/L		82	70 - 130	19	30
DONA	37.7	41.7		ng/L		111	70 - 130	13	30

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C4 PFBA	100		25 - 150
13C5 PFPeA	102		25 - 150
13C2 PFHxA	102		25 - 150
13C4 PFHpA	108		25 - 150
13C4 PFOA	106		25 - 150
13C5 PFNA	105		25 - 150
13C2 PFDA	104		25 - 150
13C2 PFUnA	104		25 - 150
13C2 PFDoA	104		25 - 150
13C2 PFTeDA	103		25 - 150
18O2 PFHxS	110		25 - 150
13C4 PFOS	95		25 - 150
13C8 FOSA	92		25 - 150
d3-NMeFOSAA	92		25 - 150
d5-NEtFOSAA	96		25 - 150
M2-6:2 FTS	143		25 - 150
M2-8:2 FTS	130		25 - 150
M2-4:2 FTS	123		25 - 150
d9-N-EtFOSE-M	27		10 - 120
d-N-MeFOSA-M	62		20 - 150
d7-N-MeFOSE-M	30		10 - 120
d-N-EtFOSA-M	44		20 - 150
13C2 PFHxDA	94		25 - 150
13C3 HFPO-DA	95		25 - 150

QC Association Summary

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

LCMS

Prep Batch: 326510

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-54528-1	Field Blank	Total/NA	Water	3535	
320-54528-2	Equipment Blank-Leafrake+Cheesecloth	Total/NA	Water	3535	
320-54528-3	1-Foam-Culvert	Total/NA	Water	3535	
320-54528-4	1-Surfacewater-Culvert	Total/NA	Water	3535	
320-54528-5	2-Foam-River	Total/NA	Water	3535	
320-54528-6	2-Surfacewater-River	Total/NA	Water	3535	
MB 320-326510/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-326510/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-326510/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 326873

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-54528-1	Field Blank	Total/NA	Water	537 (modified)	326510
320-54528-2	Equipment Blank-Leafrake+Cheesecloth	Total/NA	Water	537 (modified)	326510
320-54528-3	1-Foam-Culvert	Total/NA	Water	537 (modified)	326510
320-54528-4	1-Surfacewater-Culvert	Total/NA	Water	537 (modified)	326510
320-54528-5	2-Foam-River	Total/NA	Water	537 (modified)	326510
320-54528-6	2-Surfacewater-River	Total/NA	Water	537 (modified)	326510
MB 320-326510/1-A	Method Blank	Total/NA	Water	537 (modified)	326510
LCS 320-326510/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	326510

Analysis Batch: 331773

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 320-326510/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	326510

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Client Sample ID: Field Blank

Date Collected: 09/18/19 11:45

Date Received: 09/20/19 09:15

Lab Sample ID: 320-54528-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			278.2 mL	10.0 mL	326510	09/27/19 05:39	MTN	TAL SAC
Total/NA	Analysis	537 (modified)		1			326873	09/28/19 11:46	P1N	TAL SAC

Client Sample ID: Equipment Blank-Leafrake+Cheesecloth

Date Collected: 09/18/19 11:55

Date Received: 09/20/19 09:15

Lab Sample ID: 320-54528-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			263.5 mL	10.0 mL	326510	09/27/19 05:39	MTN	TAL SAC
Total/NA	Analysis	537 (modified)		1			326873	09/28/19 11:56	P1N	TAL SAC

Client Sample ID: 1-Foam-Culvert

Date Collected: 09/18/19 12:00

Date Received: 09/20/19 09:15

Lab Sample ID: 320-54528-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			25 mL	10.0 mL	326510	09/27/19 05:39	MTN	TAL SAC
Total/NA	Analysis	537 (modified)		1			326873	09/28/19 12:05	P1N	TAL SAC

Client Sample ID: 1-Surfacewater-Culvert

Date Collected: 09/18/19 12:00

Date Received: 09/20/19 09:15

Lab Sample ID: 320-54528-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			272.3 mL	10.0 mL	326510	09/27/19 05:39	MTN	TAL SAC
Total/NA	Analysis	537 (modified)		1			326873	09/28/19 12:15	P1N	TAL SAC

Client Sample ID: 2-Foam-River

Date Collected: 09/18/19 14:40

Date Received: 09/20/19 09:15

Lab Sample ID: 320-54528-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			25 mL	10.0 mL	326510	09/27/19 05:39	MTN	TAL SAC
Total/NA	Analysis	537 (modified)		1			326873	09/28/19 12:24	P1N	TAL SAC

Client Sample ID: 2-Surfacewater-River

Date Collected: 09/18/19 14:40

Date Received: 09/20/19 09:15

Lab Sample ID: 320-54528-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			275 mL	10.0 mL	326510	09/27/19 05:39	MTN	TAL SAC
Total/NA	Analysis	537 (modified)		1			326873	09/28/19 12:34	P1N	TAL SAC

Laboratory References:

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

Eurofins TestAmerica, Sacramento

Accreditation/Certification Summary

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Laboratory: Eurofins TestAmerica, Sacramento

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State Program	17-020	01-20-21
ANAB	Dept. of Defense ELAP	L2468	01-20-21
ANAB	Dept. of Energy	L2468.01	01-20-21
ANAB	ISO/IEC 17025	L2468	08-09-21
Arizona	State	AZ0708	08-11-20
Arkansas DEQ	State	19-042-0	06-17-20
Arkansas DEQ	State Program	88-0691	06-17-20
California	State	2897	01-31-20
Colorado	State	CA0004	08-31-20
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-20
Hawaii	State	<cert No.>	01-29-20
Illinois	NELAP	200060	03-17-20
Kansas	NELAP	E-10375	10-31-19
Louisiana	NELAP	01944	06-30-20
Maine	State	2018009	04-14-20
Maine	State Program	CA0004	04-14-20
Michigan	State	9947	01-29-20
Michigan	State Program	9947	01-31-20
Nevada	State	CA000442020-1	07-31-20
Nevada	State Program	CA00044	07-31-20
New Hampshire	NELAP	2997	04-20-20
New Hampshire	NELAP	2997	04-18-20
New Jersey	NELAP	CA005	06-30-20
New York	NELAP	11666	04-01-20
Oregon	NELAP	4040	01-29-20
Pennsylvania	NELAP	68-01272	03-31-20
Texas	NELAP	T104704399-19-13	05-31-20
US Fish & Wildlife	US Federal Programs	58448	07-31-20
USDA	US Federal Programs	P330-18-00239	07-31-21
USEPA UCMR	Federal	CA00044	12-31-20
Utah	NELAP	CA00044	02-29-20
Vermont	State	VT-4040	04-16-20
Virginia	NELAP	460278	03-14-20
Washington	State	C581	05-05-20
West Virginia (DW)	State	9930C	12-31-19
Wyoming	State Program	8TMS-L	01-28-19 *

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

Eurofins TestAmerica, Sacramento

Method Summary

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

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

Sample Summary

Client: AECOM Technical Services Inc.
Project/Site: PFAS, Reactive Foam Water Way 60614940

Job ID: 320-54528-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-54528-1	Field Blank	Water	09/18/19 11:45	09/20/19 09:15	
320-54528-2	Equipment Blank-Leafrake+Cheesecloth	Water	09/18/19 11:55	09/20/19 09:15	
320-54528-3	1-Foam-Culvert	Water	09/18/19 12:00	09/20/19 09:15	
320-54528-4	1-Surfacewater-Culvert	Water	09/18/19 12:00	09/20/19 09:15	
320-54528-5	2-Foam-River	Water	09/18/19 14:40	09/20/19 09:15	
320-54528-6	2-Surfacewater-River	Water	09/18/19 14:40	09/20/19 09:15	

Eurofins TestAmerica, Sacramento

880 Riverside Parkway
West Sacramento, CA 95605
Phone 916-373-5600 Fax 916-372-1059

Chain of Custody Record

Client Information Client Contact: Janel Dean Phone: 517-745-7192 E-Mail: sandie.fredrick@testamericainc.com Center Tracking No(s):		Lab Pkt: Fredrick, Sandie E-Mail: sandie.fredrick@testamericainc.com
Company Information Company: AECOM Address: 558 North Main Street City: Oshkosh State: WI 54902 Phone: 920-236-6723(Tel) Email: janel.dean@aecom.com Project Name: PFAS Testing Site: WDNR - as need PFAS sampling		
Analysis Requested Due Date Requested: TAT Requested (days): Standard TAT PO #: WO #: Project #: 50016595 SSCH#:		
Sample Identification Field Blank Equipment Blank - test ink & check cloth 1- Foam - culvert 1- Surface water - culvert 2- Foam - River 2- Surface water - River	Sample Date: 9-18-19 Sample Time: 1145 Sample Type (C=Comp, G=grab): G Matrix (W=water, S=solid, O=other): Water	Perform MS/MSD (Yes or No): ☒ No Field Filtered Sample (Yes or No): ☒ No PFC, IDA - PFAS: ☒ No See attached 9/18/19 320-54528 Chain of Custody
Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological Deliverable Requested: I, II, III, IV, Other (specify)		
Empty Kit Relinquished by Relinquished by: Janel Dean Date: 9/19/19 Time: 10:00 Method of Shipment:		

5	PFOA	Perfluorooctanoic acid	335-67-1	8	
6	PFNA	Perfluorononanoic acid	375-95-1	9	
7	PFDA	Perfluorodecanoic acid	335-76-2	10	
8	PFUnA	Perfluoroundecanoic acid	2058-94-8	11	PFUnA, PFDnA
9	PFDaA	Perfluorododecanoic acid	307-55-1	12	PFDaA, PFDnA
10	PFTriA	Perfluorotridecanoic acid	72629-94-8	13	PFTriA, PFTnA
11	PFTeA	Perfluorotetradecanoic acid	376-06-7	14	PFTeA, PFTnA
12	PFHxDA	Perfluorohexadecanoic acid	67905-19-5	16	
13	PFODA	Perfluorooctadecanoic acid	16517-11-6	18	
Sulfonic Acids					
14	PFBS	Perfluorobutanesulfonic acid	375-73-5	4	
15	PFPeS	Perfluoropentanesulfonic acid	2706-91-4	5	
16	PFHxS	Perfluorohexanesulfonic acid	355-46-4	6	
17	PFHpS	Perfluoroheptanesulfonic acid	375-92-8	7	
18	PFOS	Perfluorooctanesulfonic acid	1763-23-1	8	
19	PFNS	Perfluorononanesulfonic acid	68259-12-1	9	
20	PFDS	Perfluorodecanesulfonic acid	335-77-3	10	
21	PFDoS	Perfluorododecanesulfonic acid	79780-39-5	12	PFDoS
22	4:2 FTSA	4:2 Fluorotelomer sulfonic acid	757124-72-4	6	
23	6:2 FTSA	6:2 Fluorotelomer sulfonic acid	27619-97-2	8	
24	8:2 FTSA	8:2 Fluorotelomer sulfonic acid	39108-34-4	10	
25	10:2 FTSA	10:2 Fluorotelomer sulfonic acid	120226-60-0	12	
Sulfonamides, Sulfomidoacetic acids, Sulfonamidoethanols					
26	FOSA	Perfluorooctane sulfonamide	754-91-6	8	PFOSA
27	NMeFOSA	N-Methyl perfluorooctane sulfonamide	31506-32-8	9	MeFOSA
28	NEtFOSA	N-Ethyl perfluorooctane sulfonamide	4151-50-2	10	EtFOSA
29	NMeFOSAA	N-Methyl perfluorooctane sulfonamidoacetic acid	2355-31-9	11	MeFOSAA
30	NEtFOSAA	N-Ethyl perfluorooctane sulfonamidoacetic acid	2991-50-6	12	EtFOSAA
31	NMeFOSE	N-Methyl perfluorooctane sulfonamidoethanol	24448-09-7	11	MeFOSE
32	NEtFOSE	N-Ethyl perfluorooctane sulfonamidoethanol	1691-99-2	12	EtFOSE

	2 - Also available as the ammonium salt = ADONA (Ammonium 4,8-dioxa-3H-perfluorononanoate) # 958445-44-8	
	3 - Also available as the potassium salt = Potassium, 9-chlorohexadecafluoro-3-oxanone-1-sulfonate # 73606-19-6	
	4 - Also available as the potassium salt = Potassium, 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate # 83329-89-9	

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 320-54528-1

Login Number: 54528

List Source: Eurofins TestAmerica, Sacramento

List Number: 1

Creator: Nuval, Mark-Anthony M

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	747046
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	IDs on containers do not match the COC. Logged in per COC.
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 $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	