PFAS Evaluation Report

Washington State Fire Training Academy
50810 SE Grouse Ridge Road
North Bend, Washington

Prepared for:
Washington State Patrol
PO Box 42626
Olympia, Washington 98504-2626

State of Washington Department of Enterprise Services
PO Box 41476
Olympia, Washington 98504-1476

May 5, 2023
State Agreement No.: 2022-130 S
PBS Project 40535.498

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1 INTRODUCTION

PBS Engineering and Environmental Inc. (PBS) provided environmental consulting services to Washington State Patrol (WSP) and Washington State Department of Enterprise Services (DES) regarding per- and polyfluoroalkyl substances (PFAS) evaluation work conducted at the Fire Training Academy (FTA) facility, located at 50810 SE Grouse Ridge Road in North Bend, Washington (Property or Site).

1.1 Site Location

The FTA facility is located on Grouse Ridge Road, near the southwest side of Mailbox Peak; Township 23, Range 9, Section 28. The facility was first developed in the 1980s and comprises approximately 50 acres of developed area. Access to the subject property is via Grouse Ridge Road, which begins at the terminus of SE Homestead Valley Road.

1.2 Site Use

The FTA facility includes numerous training props for various firefighting scenarios, such as a container ship and an apartment building. Many firefighting props are located on a flat, paved area called the "burn pad."

The facility also includes offices, classrooms, mechanical/maintenance garages, and vehicle storage.

1.3 Regional Geology and Hydrogeology

The site lies on Grouse Ridge, a glacial moraine near the base of Mailbox Peak in the Snoqualmie Pass. The site is reportedly underlain by recessional glacial outwash, consisting of loose, stratified fluvial silt, sand, and gravel; well-rounded and moderately to well sorted.[1]

2 PFAS OVERVIEW AND REGULATION

PFAS are a large group of manufactured chemicals that are not expected to break down naturally. It is currently understood the natural degradation of PFAS will not occur in a timeframe of hundreds or thousands of years, which is why they're called "forever chemicals." They are water soluble, highly mobile, can easily contaminate groundwater, and are difficult to remove. PFAS were manufactured to be used to make coatings and products resistant to oil and water, or to reduce friction. The following are examples of consumer and industrial products that can contain PFAS:

- Firefighting foam used to fight fuel-based fires
- Nonstick cookware (Teflon)
- Waterproof apparel (shoes, clothing)

PFAS compounds are not manufactured in Washington but have been released into the environment through consumer and industrial products.

2.1 Federal Regulation

PFAS are not yet regulated under the Resource Conservation and Recovery Act (RCRA), the Safe Drinking Water Act, or other major US environmental laws such as the Clean Air Act and the Clean Water Act. However, the Environmental Protection Agency (EPA) has developed a PFAS Action Plan (last revision 2020a). The Plan includes pursuing "hazardous substance" designation and developing maximum contaminant levels (MCLs) for perfluorooctanoic acid (PFOA), PFOS, and developing groundwater cleanup recommendations.

[1] *Geologic Map of the Snoqualmie Pass 30x60 Minute Quadrangle Washington*, R. W. Tabor et al., 2000.

2.2 State Regulation

The Washington State Department of Ecology (Ecology) is the agency that administers federal and state laws designed to protect Washington's land, air, and water. The State Department of Health (Health) administers human health and drinking water regulations.

As related to PFAS, Ecology and Health together (state regulators) are authorized to administer and enforce the following rules and regulations:

Applicable State Laws

The Children's Safe Product Act (CSPA) - Chapter 70A.305 of the Revised Code of Washington (RCW)
Safer Products for Washington program – Chapter 70A.350 RCW
Firefighting Agents and Equipment Toxic Chemical Use – Chapter 70A-400 RCW
Packages Containing Metals and Toxic Chemicals Law – Chapter 70A.222 RCW

Applicable State Rules

Dangerous Waste Regulations – Chapter 173-340 of the Washington Administrative Code (WAC)
Hazardous Waste Law – Chapter 173-333 WAC
Children's Safe Products Act – Chapter 173-334 WAC
PFAS in Public Water Systems (Group A) – Chapter 246-290 WAC

Ecology and Health developed a statewide Chemical Action Plan (CAP) for PFAS to address human exposure and environmental contamination.[2] The CAP identifies, characterizes, and evaluates uses and releases of PFAS compounds and recommends actions to protect human health or the environment.

The Washington State Board of Health completed rulemaking to regulate PFAS in Group A drinking water systems. The rule sets State Action Levels (SALs) for five PFAS compounds. The rulemaking is further detailed as follows:

- SALs are levels of chemicals that are set for long-term daily drinking water to protect people's health.
- If you have been drinking water with PFAS above a SAL, it does not mean you will get sick or have health problems.
- Health does not have enough information to recommend SALs for every type of PFAS that may be in drinking water.
- When applicable, Health recommends removal technologies effective on a wide variety of PFAS.
- State toxicologists developed SALs to protect humans, including sensitive groups, from harmful health effects of drinking water with PFAS in the long-term.

Table 1: Health SALs

Type of PFAS	SAL in parts per trillion
PFOA – perfluorooctanoic acid	10
PFOS – perfluorooctanesulfonic acid	15
PFNA – perfluorononanoic acid	9
PFHxS – perflurohexanesulfonic acid	65
PFBS – perflurobutanesulfonic acid	345

[2] *Per- and Polyfluoroalkyl Substances Chemical Action Plan*. Hazardous Waste and Toxics Reduction Program Washington State Department of Ecology Olympia, Washington November 2021, Publication 21-04-048.

Washington Department of Ecology established Investigatory Levels for PFOA and PFOS, which are considered Advisory Levels by Ecology until regulation of PFAS is adopted under Model Toxics Control Act (MTCA) and cleanup levels are formally adopted.

Contaminated site assessment and cleanup is conducted in accordance with the substantive requirements of the MTCA, Chapter 70.105D of the RCW and its implementation regulations, Chapter 173-340 of the WAC.

Though PFAS are not currently regulated under MTCA, it is understood that formalization is largely administrative. As such, PBS will continue to undertake site characterization and cleanup actions related to PFAS in substantial accordance with MTCA.

Health SALs, EPA Screening Levels, and Ecology Investigatory Levels for PFAS are presented in the attached Table 2, along with analytical results.

2.3 Laboratory Methods

The EPA published Method 537.1 in November 2018.[3] The laboratory method also includes information relevant for environmental consultants conducting sampling for PFAS analysis:

- Samples must be collected in a 250-milliliter (mL) polypropylene bottle fitted with a polypropylene screw cap.
- Sample containers are preserved with 5 grams of Trizma, a buffering agent that removes free chlorine, prior to leaving the laboratory for sample collection in the field.
- The sample handler must wash their hands before sampling and wear nitrile gloves while filling and sealing the sample bottles.
- If sampling drinking water from a tap, open the tap and allow the system to flush until the water temperature has stabilized (approximately 3 to 5 minutes).
- Collect samples from a flowing system.
- Fill sample bottles, taking care not to flush out the sample preservation reagent. Samples do not need to be collected headspace free.
- After collecting the sample, cap the bottle and agitate by hand until preservative is dissolved.
- Keep the sample sealed from time of collection until extraction.
- Samples must be chilled during shipment and must not exceed 10°C during the first 48 hours after collection. Sample temperature must be confirmed to be at or below 10°C when the samples are received at the laboratory.

2.4 Adopted Regulatory Criteria

Site characterization and cleanup activities (if any) are conducted in accordance with MTCA.

The Health SALs are the currently adopted cleanup levels.

[3] *Determination of Selected Per- and Polyfluorinated Alkyl Substances in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)*. US Environmental Protection Agency, Office of Research and Development, National Center for Environmental Assessment, Washington, DC, 2018.

3 PFAS SAMPLING

3.1 Sampling – October 2017

PBS understands that PFAS sampling was undertaken on October 31, 2017, by Water and Wastewater Services from Mount Vernon, Washington. Samples were collected from the drinking well and three on-site ponds. The ponds are lined and part of the site's pre-discharge water treatment system. The samples were analyzed by Edge Analytical laboratory in Burlington, Washington. PBS was provided with laboratory reports of the analysis.

The location of the ponds and the pump house are presented in Figure 2: Site Plan.

3.2 Sampling – September 2022

A sampling event was conducted on September 13, 2022, and included the sampling of water from the pump house and two monitoring wells (MW-4 and MW-6).

PBS personnel wore new disposable nitrile gloves and followed the laboratory method sampling procedures for PFAS analysis (described in Section 2.3) when collecting samples.

All samples were collected in laboratory-supplied containers, placed on ice in a cooler, and shipped to Eurofins laboratory in West Sacramento, California, within specified holding times and under chain-of-custody documentation. Analyses were conducted under a two-week turnaround time and included the following:

- PFAS by EPA Method 537.1 DW or
- PFAS by EPA Method 537 (modified)

The pump house and groundwater monitoring well locations are presented in Figure 2: Site Plan.

3.3 Sampling – December 2022

A second sampling event was conducted on December 15, 2022, and included the sampling of potable water from the pump house, the kitchen sink in the dining hall, and the lounge/kitchen sink on the lower level of the dormitory building.

PBS personnel wore new disposable nitrile gloves and followed the laboratory method sampling procedures for PFAS analysis (described in Section 2.3) when collecting samples.

All samples were collected in laboratory-supplied containers, placed on ice in a cooler, and shipped to Eurofins laboratory in West Sacramento, California, within specified holding times and under chain-of-custody documentation. Analyses were conducted under a two-week turnaround time and included the following:

- PFAS by EPA Method 537.1 DW

The location of the sampled sinks and the pump house are presented in Figure 2: Site Plan.

The laboratory report corresponding to each of the three sampling events is included in Attachment A.

4 SUMMARY AND FINDINGS

Regarding the PFAS evaluation conducted at the Fire Training Academy, the following summary and conclusions are presented:

- Three PFAS sampling events have occurred at the property.
- Concentrations of PFAS exceeded the SALs in samples collected from shallow groundwater on site.
- Concentrations of PFAS (PFHpA, PFOA, and PFOS) exceeded the SALs in samples collected from the on-site drinking water well.
- Drinking water at the facility is currently supplied by an off-site water vendor (dispensers and 5-gallon jug exchange).

Analytical results are presented in Table 2.

Copies of laboratory reports and chain-of-custody documentation are presented in Appendix A.

5 LIMITATIONS

PBS has prepared this report for use by the Washington State Patrol and Department of Enterprise Services and is not intended for use by others without the written consent of PBS. The findings and conclusions of this report are based on professional judgment concerning the significance of the data gathered during this investigation.

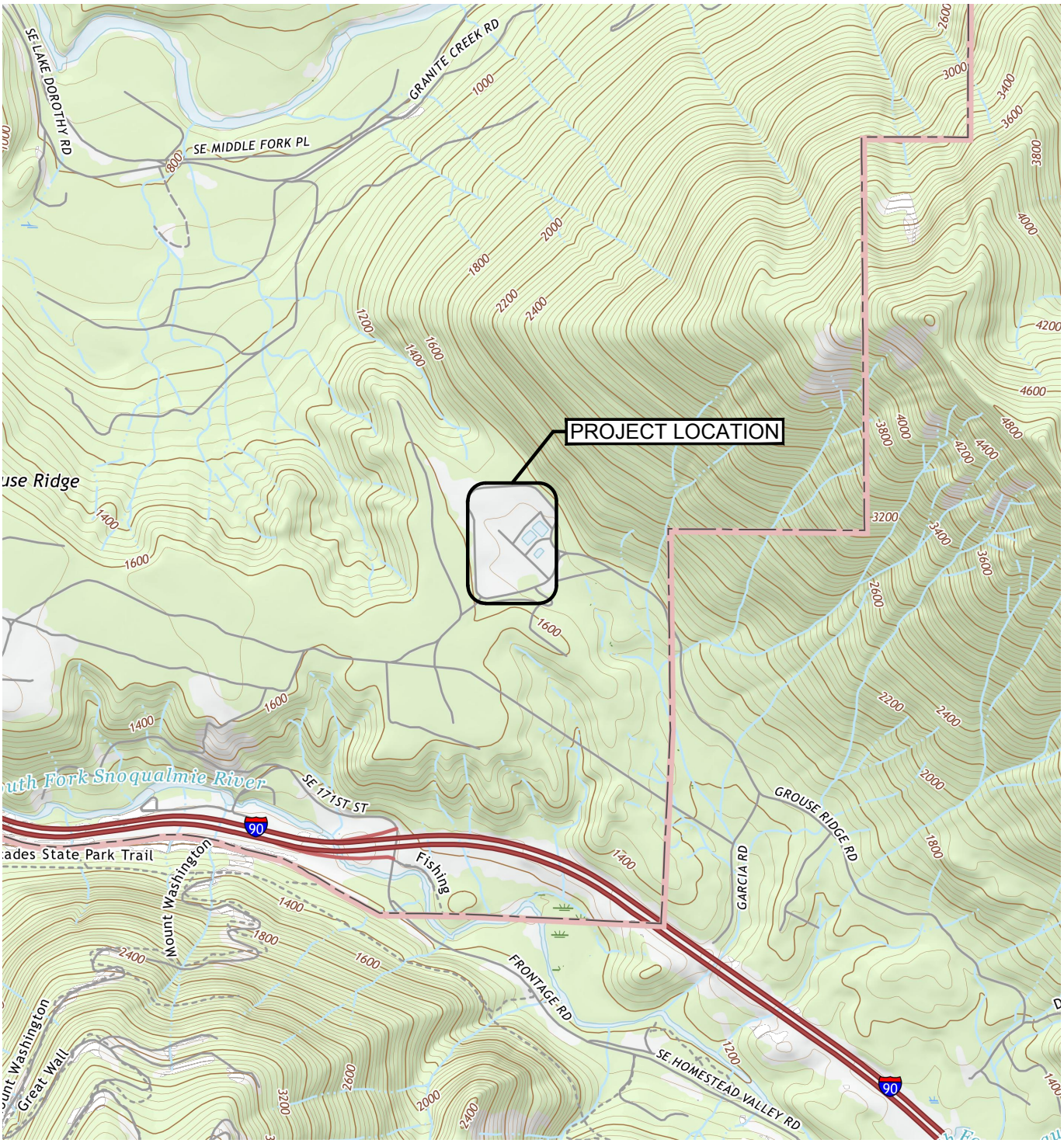
Sincerely,
PBS Engineering and Environmental Inc.

Digitally signed by Ken Nogeire
Date: 2023.05.05 16:59:08 -07'00'

Ken Nogeire, LHG
Senior Hydrogeologist

Reviewed by: Sarah Newport

Figures



SOURCE: USGS CHESTER MORSE LAKE, WA QUADRANGLE 2020.

WASHINGTON

Scale 1" = 2000'

0' 1000' 2000' 4000'

PREPARED FOR: WASHINGTON STATE PATROL

VICINITY MAP

50810 GROUSE RIDGE ROAD
NORTH BEND, WASHINGTON

APR 2023
40535.498

FIGURE
1

SOURCE: © 2021 MICROSOFT CORPORATION © 2021 MAXAR © CNES (2021) DISTRIBUTION AIRBUS DS

LEGEND

MW-1 MONITORING WELL NUMBER AND LOCATION

Scale 1" = 300'

0' 150' 300' 600'

PREPARED FOR: WASHINGTON STATE PATROL

SITE PLAN

50810 GROUSE RIDGE ROAD
NORTH BEND, WASHINGTON

APR 2023
40535.498

FIGURE
2

Table

Table 2. PFAS in Water Analytical Results

TABLE 2

PFAS IN WATER ANALYTICAL RESULTS

FIRE TRAINING ACADEMY

50810 GROUSE RIDGE ROAD NORTH BEND, WASHINGTON 98045

PBS PROJECT NO. 40535.498

Sample Identification	Location Description	Date	Results by EPA Method 537.1 and 537mod (ng/L)								
			PFAS - Per- and Polyfluoroalkyl Substances								
			PFHxA	**PFHpA**	**PFOA**	**PFNA**	**PFDA**	**PFUnA**	**PFBS**	**PFHxS**	**PFOS**
Health SAL[a]			NE	12	10	9	NE	NE	345	65	15
Ecology Investigatory Level[b]			NE	NE	10	NE	NE	NE	NE	NE	15
EPA Groundwater[c]			NE	NE	40	NE	NE	NE	NE	NE	40
Surface Water and Groundwater											
Pond 1	Surface Water	10/31/2017	110	**29.2**	**41.4**	**28.9**	--	--	<90	--	**623**
Pond 2	Surface Water	10/31/2017	80.1	**17.5**	**28.4**	**15.1**	--	--	<90	--	**504**
Pond 3	Surface Water	10/31/2017	62.6	**14.3**	**19.6**	**13.6**	--	--	<90	--	**588**
MW4	Shallow monitoring well	9/13/2022	35	**34**	**25**	**12**	7.9	13	9.9	**82**	**150**
MW6	Shallow monitoring well	9/13/2022	58	**51**	**56**	**40**	4.3	12	28	**300**	**520**
Drinking Water											
Well	Water Supply Well	10/31/2017	45.9	10	<20	<20	--	--	<90	--	**18**
PH-1		9/13/2022	47	11	9.5	5.3	<1.8	<1.8	31	52	**30**
PH-2		12/15/2022	52	**12**	**10**	5.7	<1.8	<1.8	29	52	**29**
DHall-1	Dining Hall Kitchen Tap	12/15/2022	51	**12**	**10**	6.0	<1.9	<1.9	30	54	**31**
Dorm-1	Dormitory Ground Floor Kitchen Tap	12/15/2022	51	**12**	9.8	5.8	<1.8	<1.8	30	55	**30**

[a] Washington State Board of Health - State Action Level - ng/L

[b] Washington Department of Ecology Investigatory Level - Considered an Advisory Level by Ecology, until regulation of PFAS is adopted under MTCA and Cleanup Levels are formally adopted.

[c] Environmental Protection Agency - Recommended Screening Levels for groundwater, to determine if further attention warranted.

ng/L - nanograms per litre

BOLD indicates above the adopted criteria

<50 - less than the method detection limit (mdl)

NE - not established

-- not analyzed

Appendix A

Laboratory Reports and Chain-of-Custody Documentation

EDGE ANALYTICAL

Burlington, WA *Corporate Laboratory (a)*
1620 S Walnut St - Burlington, WA 98233 - **800.755.9295** • 360.757.1400

Bellingham, WA *Microbiology (b)*
805 Orchard Dr Ste 4 - Bellingham, WA 98225 - 360.715.1212

Portland, OR *Microbiology/Chemistry (c)*
9150 SW Pioneer Ct Ste W - Wilsonville, OR 97070 - 503.682.7802

Corvallis, OR *Microbiology/Chemistry (d)*
540 SW Third Street - Corvallis, OR 97333 - 541.753.4946

Bend, OR *Microbiology (e)*
20332 Empire Blvd Ste 4 - Bend, OR 97701 - 541.639.8425

WSDOE Lab C567

DATA REPORT

Client Name: Water and Wastewater Services
14263 Calhoun Road
Mount Vernon, WA 98273

Reference Number: **17-31133**
Project: Fire Training Academy

Lab Number: 67429
Field ID:
Sample Description: Well
Matrix: Drinking Water
Sample Date: 10/31/17
Extraction Date:
Extraction Method:

Report Date: 12/1/17
Date Analyzed: 11/22/17
Analyst: TGT
Analytical Method: 537
Batch: ANAT_171120
Approved By: fm

Authorized by:

Lawrence J Henderson, PhD
Director of Laboratories, Vice President

CAS	Compound	RESULT	Flag	UNITS	Lab QL	MDL	D.F.	Lab	COMMENT
	Perfluorinated Compounds								
1763-23-1	PERFLUOROOCTANESULFONIC ACID (	**0.0180**		ug/L	0.04		1.00	a	Analyzed by Anatek
335-67-1	PERFLUOROOCTANOIC ACID (PFOA)	**ND**		ug/L	0.02		1.00	a	Analyzed by Anatek
375-95-1	PERFLUORONONANOIC ACID (PFNA)	**ND**		ug/L	0.02		1.00	a	Analyzed by Anatek
355-46-4	PERFLUOROHEXANESULFONIC ACID (	**0.0459**		ug/L	0.03		1.00	a	Analyzed by Anatek
375-85-9	PERFLUOROHEPTANOIC ACID (PFHPA	**0.0104**		ug/L	0.01		1.00	a	Analyzed by Anatek
375-73-5	PERFLUOROBUTANESULFONIC ACID (I	**ND**		ug/L	0.09		1.00	a	Analyzed by Anatek

Notes:

Flags are data qualifiers. If there are data qualifiers on your report definitions can be found on an accompanying sheet.
ND - indicates the compound was not detected above the PQL or MDL.
Lab QL = Laboratory Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions.
Permit QL = Quantitation Limt required by permit (listed in Appendix A) or other regulatory requirement.
D.F. - Dilution Factor.

If you have any questions concerning this report contact us at the above phone number.

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Burlington, WA *Corporate Laboratory (a)*
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Bend, OR *Microbiology (e)*
20332 Empire Blvd Ste 4 - Bend, OR 97701 - 541.639.8425

WSDOE Lab C567

DATA REPORT

Client Name: Water and Wastewater Services
14263 Calhoun Road
Mount Vernon, WA 98273

Reference Number: **17-31133**
Project: Fire Training Academy

Lab Number: 67430
Field ID:
Sample Description: Pond #1
Matrix: Surface Water
Sample Date: 10/31/17
Extraction Date:
Extraction Method:

Report Date: 12/1/17
Date Analyzed: 11/22/17
Analyst: TGT
Analytical Method: 537
Batch: ANAT_171120
Approved By: fm

Authorized by:

Lawrence J Henderson, PhD
Director of Laboratories, Vice President

CAS	Compound	RESULT	Flag	UNITS	Lab QL	MDL	D.F.	Lab	COMMENT
	Perfluorinated Compounds								
1763-23-1	PERFLUOROOCTANESULFONIC ACID (	**0.623**		ug/L	0.04		1.00	a	Analyzed by Anatek
335-67-1	PERFLUOROOCTANOIC ACID (PFOA)	**0.0414**		ug/L	0.02		1.00	a	Analyzed by Anatek
375-95-1	PERFLUORONONANOIC ACID (PFNA)	**0.0289**		ug/L	0.02		1.00	a	Analyzed by Anatek
355-46-4	PERFLUOROHEXANESULFONIC ACID (	**0.110**		ug/L	0.03		1.00	a	Analyzed by Anatek
375-85-9	PERFLUOROHEPTANOIC ACID (PFHPA	**0.0292**		ug/L	0.01		1.00	a	Analyzed by Anatek
375-73-5	PERFLUOROBUTANESULFONIC ACID (I	**ND**		ug/L	0.09		1.00	a	Analyzed by Anatek

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540 SW Third Street - Corvallis, OR 97333 - 541.753.4946

Bend, OR *Microbiology (e)*
20332 Empire Blvd Ste 4 - Bend, OR 97701 - 541.639.8425

WSDOE Lab C567

DATA REPORT

Client Name: Water and Wastewater Services
14263 Calhoun Road
Mount Vernon, WA 98273

Reference Number: **17-31133**
Project: Fire Training Academy

Lab Number: 67431
Field ID:
Sample Description: Pond #2
Matrix: Surface Water
Sample Date: 10/31/17
Extraction Date:
Extraction Method:

Report Date: 12/1/17
Date Analyzed: 11/22/17
Analyst: TGT
Analytical Method: 537
Batch: ANAT_171120
Approved By: fm

Authorized by:

Lawrence J Henderson, PhD
Director of Laboratories, Vice President

CAS	Compound	RESULT	Flag	UNITS	Lab QL	MDL	D.F.	Lab	COMMENT
	Perfluorinated Compounds								
1763-23-1	PERFLUOROOCTANESULFONIC ACID (	**0.504**		ug/L	0.04		1.00	a	Analyzed by Anatek
335-67-1	PERFLUOROOCTANOIC ACID (PFOA)	**0.0284**		ug/L	0.02		1.00	a	Analyzed by Anatek
375-95-1	PERFLUORONONANOIC ACID (PFNA)	**0.0151**		ug/L	0.02		1.00	a	Analyzed by Anatek
355-46-4	PERFLUOROHEXANESULFONIC ACID (	**0.0801**		ug/L	0.03		1.00	a	Analyzed by Anatek
375-85-9	PERFLUOROHEPTANOIC ACID (PFHPA	**0.0175**		ug/L	0.01		1.00	a	Analyzed by Anatek
375-73-5	PERFLUOROBUTANESULFONIC ACID (I	**ND**		ug/L	0.09		1.00	a	Analyzed by Anatek

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540 SW Third Street - Corvallis, OR 97333 - 541.753.4946

Bend, OR *Microbiology (e)*
20332 Empire Blvd Ste 4 - Bend, OR 97701 - 541.639.8425

WSDOE Lab C567

DATA REPORT

Client Name: Water and Wastewater Services
14263 Calhoun Road
Mount Vernon, WA 98273

Reference Number: **17-31133**
Project: Fire Training Academy

Lab Number: 67432
Field ID:
Sample Description: Pond #3
Matrix: Surface Water
Sample Date: 10/31/17
Extraction Date:
Extraction Method:

Report Date: 12/1/17
Date Analyzed: 11/22/17
Analyst: TGT
Analytical Method: 537
Batch: ANAT_171120
Approved By: fm

Authorized by:

Lawrence J Henderson, PhD
Director of Laboratories, Vice President

CAS	Compound	RESULT	Flag	UNITS	Lab QL	MDL	D.F.	Lab	COMMENT
	Perfluorinated Compounds								
1763-23-1	PERFLUOROOCTANESULFONIC ACID (	**0.588**		ug/L	0.04		1.00	a	Analyzed by Anatek
335-67-1	PERFLUOROOCTANOIC ACID (PFOA)	**0.0196**		ug/L	0.02		1.00	a	Analyzed by Anatek
375-95-1	PERFLUORONONANOIC ACID (PFNA)	**0.0136**		ug/L	0.02		1.00	a	Analyzed by Anatek
355-46-4	PERFLUOROHEXANESULFONIC ACID (	**0.0626**		ug/L	0.03		1.00	a	Analyzed by Anatek
375-85-9	PERFLUOROHEPTANOIC ACID (PFHPA	**0.0143**		ug/L	0.01		1.00	a	Analyzed by Anatek
375-73-5	PERFLUOROBUTANESULFONIC ACID (I	**ND**		ug/L	0.09		1.00	a	Analyzed by Anatek

Notes:

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eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

Laboratory Job ID: 320-92002-1
Client Project/Site: FTA AST

For:
PBS Engineering and Environmental
214 E. Galer Street, Suite 300
Seattle, Washington 98102

Attn: Ken Nogeire

Authorized for release by:
9/29/2022 6:17:10 PM

Afsaneh Salimpour, Senior Project Manager
(925)484-1919
Afsaneh.Salimpour@et.eurofinsus.com

Table of Contents

Definitions/Glossary

Client: PBS Engineering and Environmental
Project/Site: FTA AST

Job ID: 320-92002-1

Qualifiers

LCMS

Qualifier	Qualifier Description
E	Result exceeded calibration range.

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
CFU	Colony Forming Unit
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)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
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)
TNTC	Too Numerous To Count

Job ID: 320-92002-1

Laboratory: Eurofins Sacramento

Narrative

Job Narrative
320-92002-1

Comments
No additional comments.

Receipt
The samples were received on 9/14/2022 10:20 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.4º C.

Receipt Exceptions

The following sample: #4(A,B) - ((REAGENT FIELD BLANK - 250 ml. Trizma)) for job# 320-92002 was received, not listed on the COC. REAGENT FIELD BLANK (320-92002-4).

LCMS
Method 537 (modified): The concentration of one or more analytes associated with the following sample exceeded the instrument calibration range: MW6-0922 (320-92002-3). 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.

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

Organic Prep
Method 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-617928.
3535 PFC
Water
320-617928

Method 537.1 DW: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-620273.
320-620273
Method:537.1_DW_prep
Matrix: Water

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

Detection Summary

Client: PBS Engineering and Environmental
Project/Site: FTA AST

Job ID: 320-92002-1

Client Sample ID: PH-1 — Lab Sample ID: 320-92002-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	47		1.8		ng/L	1		537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	11		1.8		ng/L	1		537.1 DW	Total/NA
Perfluorooctanoic acid (PFOA)	9.5		1.8		ng/L	1		537.1 DW	Total/NA
Perfluorononanoic acid (PFNA)	5.3		1.8		ng/L	1		537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	31		1.8		ng/L	1		537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	52		1.8		ng/L	1		537.1 DW	Total/NA
Perfluorooctanesulfonic acid (PFOS)	30		1.8		ng/L	1		537.1 DW	Total/NA

Client Sample ID: MW4-0922 — Lab Sample ID: 320-92002-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	35		1.8		ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	34		1.8		ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	25		1.8		ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	12		1.8		ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	7.9		1.8		ng/L	1		537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	13		1.8		ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	9.9		1.8		ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	82		1.8		ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	150		1.8		ng/L	1		537 (modified)	Total/NA

Client Sample ID: MW6-0922 — Lab Sample ID: 320-92002-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	58		1.7		ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	51		1.7		ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	56		1.7		ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	40		1.7		ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	4.3		1.7		ng/L	1		537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	12		1.7		ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	28		1.7		ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	300		1.7		ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	520	E	1.7		ng/L	1		537 (modified)	Total/NA

Client Sample ID: REAGENT FIELD BLANK — Lab Sample ID: 320-92002-4

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins Sacramento

Client Sample ID: PH-1

Date Collected: 09/13/22 09:55
Date Received: 09/14/22 10:20

Lab Sample ID: 320-92002-1

Matrix: Water

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**47**		1.8		ng/L		09/16/22 05:45	09/19/22 12:10	1
Perfluoroheptanoic acid (PFHpA)	**11**		1.8		ng/L		09/16/22 05:45	09/19/22 12:10	1
Perfluorooctanoic acid (PFOA)	**9.5**		1.8		ng/L		09/16/22 05:45	09/19/22 12:10	1
Perfluorononanoic acid (PFNA)	**5.3**		1.8		ng/L		09/16/22 05:45	09/19/22 12:10	1
Perfluorodecanoic acid (PFDA)	ND		1.8		ng/L		09/16/22 05:45	09/19/22 12:10	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8		ng/L		09/16/22 05:45	09/19/22 12:10	1
Perfluorododecanoic acid (PFDoA)	ND		1.8		ng/L		09/16/22 05:45	09/19/22 12:10	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.8		ng/L		09/16/22 05:45	09/19/22 12:10	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8		ng/L		09/16/22 05:45	09/19/22 12:10	1
Perfluorobutanesulfonic acid (PFBS)	**31**		1.8		ng/L		09/16/22 05:45	09/19/22 12:10	1
Perfluorohexanesulfonic acid (PFHxS)	**52**		1.8		ng/L		09/16/22 05:45	09/19/22 12:10	1
Perfluorooctanesulfonic acid (PFOS)	**30**		1.8		ng/L		09/16/22 05:45	09/19/22 12:10	1
NMeFOSAA	ND		1.8		ng/L		09/16/22 05:45	09/19/22 12:10	1
NEtFOSAA	ND		1.8		ng/L		09/16/22 05:45	09/19/22 12:10	1
9Cl-PF3ONS	ND		1.8		ng/L		09/16/22 05:45	09/19/22 12:10	1
11Cl-PF3OUdS	ND		1.8		ng/L		09/16/22 05:45	09/19/22 12:10	1
HFPO-DA (GenX)	ND		1.8		ng/L		09/16/22 05:45	09/19/22 12:10	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8		ng/L		09/16/22 05:45	09/19/22 12:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*80*		*70 - 130*	*09/16/22 05:45*	*09/19/22 12:10*	*1*
13C2 PFDA	*87*		*70 - 130*	*09/16/22 05:45*	*09/19/22 12:10*	*1*
d5-NEtFOSAA	*93*		*70 - 130*	*09/16/22 05:45*	*09/19/22 12:10*	*1*
13C3 HFPO-DA	*77*		*70 - 130*	*09/16/22 05:45*	*09/19/22 12:10*	*1*

Client Sample ID: MW4-0922

Date Collected: 09/13/22 11:20
Date Received: 09/14/22 10:20

Lab Sample ID: 320-92002-2

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**35**		1.8		ng/L		09/19/22 08:27	09/21/22 16:53	1
Perfluoroheptanoic acid (PFHpA)	**34**		1.8		ng/L		09/19/22 08:27	09/21/22 16:53	1
Perfluorooctanoic acid (PFOA)	**25**		1.8		ng/L		09/19/22 08:27	09/21/22 16:53	1
Perfluorononanoic acid (PFNA)	**12**		1.8		ng/L		09/19/22 08:27	09/21/22 16:53	1
Perfluorodecanoic acid (PFDA)	**7.9**		1.8		ng/L		09/19/22 08:27	09/21/22 16:53	1
Perfluoroundecanoic acid (PFUnA)	**13**		1.8		ng/L		09/19/22 08:27	09/21/22 16:53	1
Perfluorododecanoic acid (PFDoA)	ND		1.8		ng/L		09/19/22 08:27	09/21/22 16:53	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.8		ng/L		09/19/22 08:27	09/21/22 16:53	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8		ng/L		09/19/22 08:27	09/21/22 16:53	1
Perfluorobutanesulfonic acid (PFBS)	**9.9**		1.8		ng/L		09/19/22 08:27	09/21/22 16:53	1
Perfluorohexanesulfonic acid (PFHxS)	**82**		1.8		ng/L		09/19/22 08:27	09/21/22 16:53	1
Perfluorooctanesulfonic acid (PFOS)	**150**		1.8		ng/L		09/19/22 08:27	09/21/22 16:53	1
NEtFOSAA	ND		4.5		ng/L		09/19/22 08:27	09/21/22 16:53	1

Client Sample ID: MW4-0922

Date Collected: 09/13/22 11:20
Date Received: 09/14/22 10:20

Lab Sample ID: 320-92002-2

Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
NMeFOSAA	ND		4.5		ng/L		09/19/22 08:27	09/21/22 16:53	1
HFPO-DA (GenX)	ND		3.6		ng/L		09/19/22 08:27	09/21/22 16:53	1
9Cl-PF3ONS	ND		1.8		ng/L		09/19/22 08:27	09/21/22 16:53	1
11Cl-PF3OUdS	ND		1.8		ng/L		09/19/22 08:27	09/21/22 16:53	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8		ng/L		09/19/22 08:27	09/21/22 16:53	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*96*		*25 - 150*	*09/19/22 08:27*	*09/21/22 16:53*	*1*
13C4 PFHpA	*94*		*25 - 150*	*09/19/22 08:27*	*09/21/22 16:53*	*1*
13C4 PFOA	*96*		*25 - 150*	*09/19/22 08:27*	*09/21/22 16:53*	*1*
13C5 PFNA	*100*		*25 - 150*	*09/19/22 08:27*	*09/21/22 16:53*	*1*
13C2 PFDA	*88*		*25 - 150*	*09/19/22 08:27*	*09/21/22 16:53*	*1*
13C2 PFUnA	*91*		*25 - 150*	*09/19/22 08:27*	*09/21/22 16:53*	*1*
13C2 PFDoA	*86*		*25 - 150*	*09/19/22 08:27*	*09/21/22 16:53*	*1*
13C2 PFTeDA	*86*		*25 - 150*	*09/19/22 08:27*	*09/21/22 16:53*	*1*
13C3 PFBS	*95*		*25 - 150*	*09/19/22 08:27*	*09/21/22 16:53*	*1*
18O2 PFHxS	*93*		*25 - 150*	*09/19/22 08:27*	*09/21/22 16:53*	*1*
13C4 PFOS	*94*		*25 - 150*	*09/19/22 08:27*	*09/21/22 16:53*	*1*
d3-NMeFOSAA	*105*		*25 - 150*	*09/19/22 08:27*	*09/21/22 16:53*	*1*
d5-NEtFOSAA	*108*		*25 - 150*	*09/19/22 08:27*	*09/21/22 16:53*	*1*
13C3 HFPO-DA	*95*		*25 - 150*	*09/19/22 08:27*	*09/21/22 16:53*	*1*

Client Sample ID: MW6-0922

Date Collected: 09/13/22 12:15
Date Received: 09/14/22 10:20

Lab Sample ID: 320-92002-3

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**58**		1.7		ng/L		09/19/22 08:27	09/21/22 17:03	1
Perfluoroheptanoic acid (PFHpA)	**51**		1.7		ng/L		09/19/22 08:27	09/21/22 17:03	1
Perfluorooctanoic acid (PFOA)	**56**		1.7		ng/L		09/19/22 08:27	09/21/22 17:03	1
Perfluorononanoic acid (PFNA)	**40**		1.7		ng/L		09/19/22 08:27	09/21/22 17:03	1
Perfluorodecanoic acid (PFDA)	**4.3**		1.7		ng/L		09/19/22 08:27	09/21/22 17:03	1
Perfluoroundecanoic acid (PFUnA)	**12**		1.7		ng/L		09/19/22 08:27	09/21/22 17:03	1
Perfluorododecanoic acid (PFDoA)	ND		1.7		ng/L		09/19/22 08:27	09/21/22 17:03	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.7		ng/L		09/19/22 08:27	09/21/22 17:03	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.7		ng/L		09/19/22 08:27	09/21/22 17:03	1
Perfluorobutanesulfonic acid (PFBS)	**28**		1.7		ng/L		09/19/22 08:27	09/21/22 17:03	1
Perfluorohexanesulfonic acid (PFHxS)	**300**		1.7		ng/L		09/19/22 08:27	09/21/22 17:03	1
Perfluorooctanesulfonic acid (PFOS)	**520**	**E**	1.7		ng/L		09/19/22 08:27	09/21/22 17:03	1
NEtFOSAA	ND		4.3		ng/L		09/19/22 08:27	09/21/22 17:03	1
NMeFOSAA	ND		4.3		ng/L		09/19/22 08:27	09/21/22 17:03	1
HFPO-DA (GenX)	ND		3.5		ng/L		09/19/22 08:27	09/21/22 17:03	1
9Cl-PF3ONS	ND		1.7		ng/L		09/19/22 08:27	09/21/22 17:03	1
11Cl-PF3OUdS	ND		1.7		ng/L		09/19/22 08:27	09/21/22 17:03	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.7		ng/L		09/19/22 08:27	09/21/22 17:03	1

Client Sample ID: MW6-0922

Lab Sample ID: 320-92002-3

Date Collected: 09/13/22 12:15

Matrix: Water

Date Received: 09/14/22 10:20

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	109		25 - 150	09/19/22 08:27	09/21/22 17:03	1
13C4 PFHpA	100		25 - 150	09/19/22 08:27	09/21/22 17:03	1
13C4 PFOA	106		25 - 150	09/19/22 08:27	09/21/22 17:03	1
13C5 PFNA	105		25 - 150	09/19/22 08:27	09/21/22 17:03	1
13C2 PFDA	100		25 - 150	09/19/22 08:27	09/21/22 17:03	1
13C2 PFUnA	94		25 - 150	09/19/22 08:27	09/21/22 17:03	1
13C2 PFDoA	81		25 - 150	09/19/22 08:27	09/21/22 17:03	1
13C2 PFTeDA	85		25 - 150	09/19/22 08:27	09/21/22 17:03	1
13C3 PFBS	109		25 - 150	09/19/22 08:27	09/21/22 17:03	1
18O2 PFHxS	110		25 - 150	09/19/22 08:27	09/21/22 17:03	1
13C4 PFOS	105		25 - 150	09/19/22 08:27	09/21/22 17:03	1
d3-NMeFOSAA	109		25 - 150	09/19/22 08:27	09/21/22 17:03	1
d5-NEtFOSAA	106		25 - 150	09/19/22 08:27	09/21/22 17:03	1
13C3 HFPO-DA	105		25 - 150	09/19/22 08:27	09/21/22 17:03	1

Client Sample ID: REAGENT FIELD BLANK

Lab Sample ID: 320-92002-4

Date Collected: 09/13/22 12:15

Matrix: Water

Date Received: 09/14/22 10:20

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		1.6		ng/L		09/26/22 19:27	09/27/22 15:04	1
Perfluoroheptanoic acid (PFHpA)	ND		1.6		ng/L		09/26/22 19:27	09/27/22 15:04	1
Perfluorooctanoic acid (PFOA)	ND		1.6		ng/L		09/26/22 19:27	09/27/22 15:04	1
Perfluorononanoic acid (PFNA)	ND		1.6		ng/L		09/26/22 19:27	09/27/22 15:04	1
Perfluorodecanoic acid (PFDA)	ND		1.6		ng/L		09/26/22 19:27	09/27/22 15:04	1
Perfluoroundecanoic acid (PFUnA)	ND		1.6		ng/L		09/26/22 19:27	09/27/22 15:04	1
Perfluorododecanoic acid (PFDoA)	ND		1.6		ng/L		09/26/22 19:27	09/27/22 15:04	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.6		ng/L		09/26/22 19:27	09/27/22 15:04	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.6		ng/L		09/26/22 19:27	09/27/22 15:04	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.6		ng/L		09/26/22 19:27	09/27/22 15:04	1
Perfluorohexanesulfonic acid (PFHxS)	ND		1.6		ng/L		09/26/22 19:27	09/27/22 15:04	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.6		ng/L		09/26/22 19:27	09/27/22 15:04	1
NMeFOSAA	ND		1.6		ng/L		09/26/22 19:27	09/27/22 15:04	1
NEtFOSAA	ND		1.6		ng/L		09/26/22 19:27	09/27/22 15:04	1
9Cl-PF3ONS	ND		1.6		ng/L		09/26/22 19:27	09/27/22 15:04	1
11Cl-PF3OUdS	ND		1.6		ng/L		09/26/22 19:27	09/27/22 15:04	1
HFPO-DA (GenX)	ND		1.6		ng/L		09/26/22 19:27	09/27/22 15:04	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.6		ng/L		09/26/22 19:27	09/27/22 15:04	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	70		70 - 130	09/26/22 19:27	09/27/22 15:04	1
13C2 PFDA	77		70 - 130	09/26/22 19:27	09/27/22 15:04	1
d5-NEtFOSAA	86		70 - 130	09/26/22 19:27	09/27/22 15:04	1
13C3 HFPO-DA	70		70 - 130	09/26/22 19:27	09/27/22 15:04	1

Surrogate Summary

Client: PBS Engineering and Environmental
Project/Site: FTA AST

Job ID: 320-92002-1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	PFHxA (70-130)	PFDA (70-130)	d5NEFOS (70-130)	HFPODA (70-130)
320-92002-1	PH-1	80	87	93	77
320-92002-4	REAGENT FIELD BLANK	70	77	86	70
LCS 320-617235/2-A	Lab Control Sample	81	86	87	79
LCS 320-620273/2-A	Lab Control Sample	76	84	83	79
LCSD 320-620273/3-A	Lab Control Sample Dup	78	81	80	78
MB 320-617235/1-A	Method Blank	80	86	88	75
MB 320-620273/1-A	Method Blank	76	81	90	75

Surrogate Legend

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA
d5NEFOS = d5-NEtFOSAA
HFPODA = 13C3 HFPO-DA

Isotope Dilution Summary

Client: PBS Engineering and Environmental
Project/Site: FTA AST

Job ID: 320-92002-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Water

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		PFHxA	C4PFHA	PFOA	PFNA	PFDA	PFUnA	PFDoA	PFTDA
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)
320-92002-2	MW4-0922	96	94	96	100	88	91	86	86
320-92002-3	MW6-0922	109	100	106	105	100	94	81	85
LCS 320-617928/2-A	Lab Control Sample	89	89	88	93	87	89	83	85
LCSD 320-617928/3-A	Lab Control Sample Dup	101	100	104	103	105	102	99	96
MB 320-617928/1-A	Method Blank	88	88	91	93	89	91	81	78

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		C3PFBS	PFHxS	PFOS	d3NMFOS	d5NEFOS	HFPODA		
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)		
320-92002-2	MW4-0922	95	93	94	105	108	95		
320-92002-3	MW6-0922	109	110	105	109	106	105		
LCS 320-617928/2-A	Lab Control Sample	90	88	89	105	100	87		
LCSD 320-617928/3-A	Lab Control Sample Dup	109	107	105	120	118	103		
MB 320-617928/1-A	Method Blank	92	91	86	105	104	93		

Surrogate Legend

PFHxA = 13C2 PFHxA
C4PFHA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDoA = 13C2 PFDoA
PFTDA = 13C2 PFTeDA
C3PFBS = 13C3 PFBS
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS
d3NMFOS = d3-NMeFOSAA
d5NEFOS = d5-NEtFOSAA
HFPODA = 13C3 HFPO-DA

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-617928/1-A
Matrix: Water
Analysis Batch: 618440

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 617928

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		2.0		ng/L		09/19/22 08:27	09/21/22 14:51	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0		ng/L		09/19/22 08:27	09/21/22 14:51	1
Perfluorooctanoic acid (PFOA)	ND		2.0		ng/L		09/19/22 08:27	09/21/22 14:51	1
Perfluorononanoic acid (PFNA)	ND		2.0		ng/L		09/19/22 08:27	09/21/22 14:51	1
Perfluorodecanoic acid (PFDA)	ND		2.0		ng/L		09/19/22 08:27	09/21/22 14:51	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0		ng/L		09/19/22 08:27	09/21/22 14:51	1
Perfluorododecanoic acid (PFDoA)	ND		2.0		ng/L		09/19/22 08:27	09/21/22 14:51	1
Perfluorotridecanoic acid (PFTrDA)	ND		2.0		ng/L		09/19/22 08:27	09/21/22 14:51	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0		ng/L		09/19/22 08:27	09/21/22 14:51	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0		ng/L		09/19/22 08:27	09/21/22 14:51	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0		ng/L		09/19/22 08:27	09/21/22 14:51	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0		ng/L		09/19/22 08:27	09/21/22 14:51	1
NEtFOSAA	ND		5.0		ng/L		09/19/22 08:27	09/21/22 14:51	1
NMeFOSAA	ND		5.0		ng/L		09/19/22 08:27	09/21/22 14:51	1
HFPO-DA (GenX)	ND		4.0		ng/L		09/19/22 08:27	09/21/22 14:51	1
9Cl-PF3ONS	ND		2.0		ng/L		09/19/22 08:27	09/21/22 14:51	1
11Cl-PF3OUdS	ND		2.0		ng/L		09/19/22 08:27	09/21/22 14:51	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0		ng/L		09/19/22 08:27	09/21/22 14:51	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*88*		*25 - 150*	*09/19/22 08:27*	*09/21/22 14:51*	*1*
13C4 PFHpA	*88*		*25 - 150*	*09/19/22 08:27*	*09/21/22 14:51*	*1*
13C4 PFOA	*91*		*25 - 150*	*09/19/22 08:27*	*09/21/22 14:51*	*1*
13C5 PFNA	*93*		*25 - 150*	*09/19/22 08:27*	*09/21/22 14:51*	*1*
13C2 PFDA	*89*		*25 - 150*	*09/19/22 08:27*	*09/21/22 14:51*	*1*
13C2 PFUnA	*91*		*25 - 150*	*09/19/22 08:27*	*09/21/22 14:51*	*1*
13C2 PFDoA	*81*		*25 - 150*	*09/19/22 08:27*	*09/21/22 14:51*	*1*
13C2 PFTeDA	*78*		*25 - 150*	*09/19/22 08:27*	*09/21/22 14:51*	*1*
13C3 PFBS	*92*		*25 - 150*	*09/19/22 08:27*	*09/21/22 14:51*	*1*
18O2 PFHxS	*91*		*25 - 150*	*09/19/22 08:27*	*09/21/22 14:51*	*1*
13C4 PFOS	*86*		*25 - 150*	*09/19/22 08:27*	*09/21/22 14:51*	*1*
d3-NMeFOSAA	*105*		*25 - 150*	*09/19/22 08:27*	*09/21/22 14:51*	*1*
d5-NEtFOSAA	*104*		*25 - 150*	*09/19/22 08:27*	*09/21/22 14:51*	*1*
13C3 HFPO-DA	*93*		*25 - 150*	*09/19/22 08:27*	*09/21/22 14:51*	*1*

Lab Sample ID: LCS 320-617928/2-A
Matrix: Water
Analysis Batch: 618440

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 617928

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanoic acid (PFHxA)	40.0	40.3		ng/L		101	73 - 133
Perfluoroheptanoic acid (PFHpA)	40.0	40.5		ng/L		101	72 - 132
Perfluorooctanoic acid (PFOA)	40.0	40.4		ng/L		101	70 - 130
Perfluorononanoic acid (PFNA)	40.0	39.3		ng/L		98	75 - 135
Perfluorodecanoic acid (PFDA)	40.0	38.9		ng/L		97	76 - 136
Perfluoroundecanoic acid (PFUnA)	40.0	40.7		ng/L		102	68 - 128

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

Lab Sample ID: LCS 320-617928/2-A
Matrix: Water
Analysis Batch: 618440

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 617928

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorododecanoic acid (PFDoA)	40.0	41.0		ng/L		103	71 - 131
Perfluorotridecanoic acid (PFTrDA)	40.0	40.2		ng/L		101	71 - 131
Perfluorotetradecanoic acid (PFTeA)	40.0	39.1		ng/L		98	70 - 130
Perfluorobutanesulfonic acid (PFBS)	35.5	34.3		ng/L		97	67 - 127
Perfluorohexanesulfonic acid (PFHxS)	36.5	34.9		ng/L		96	59 - 119
Perfluorooctanesulfonic acid (PFOS)	37.2	37.0		ng/L		99	70 - 130
NEtFOSAA	40.0	38.6		ng/L		96	76 - 136
NMeFOSAA	40.0	38.1		ng/L		95	76 - 136
HFPO-DA (GenX)	40.0	40.1		ng/L		100	51 - 173
9Cl-PF3ONS	37.4	37.8		ng/L		101	75 - 135
11Cl-PF3OUdS	37.8	35.8		ng/L		95	54 - 114
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	37.8	37.8		ng/L		100	79 - 139

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*89*		*25 - 150*
13C4 PFHpA	*89*		*25 - 150*
13C4 PFOA	*88*		*25 - 150*
13C5 PFNA	*93*		*25 - 150*
13C2 PFDA	*87*		*25 - 150*
13C2 PFUnA	*89*		*25 - 150*
13C2 PFDoA	*83*		*25 - 150*
13C2 PFTeDA	*85*		*25 - 150*
13C3 PFBS	*90*		*25 - 150*
18O2 PFHxS	*88*		*25 - 150*
13C4 PFOS	*89*		*25 - 150*
d3-NMeFOSAA	*105*		*25 - 150*
d5-NEtFOSAA	*100*		*25 - 150*
13C3 HFPO-DA	*87*		*25 - 150*

Lab Sample ID: LCSD 320-617928/3-A
Matrix: Water
Analysis Batch: 618440

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 617928

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	40.0	40.4		ng/L		101	73 - 133	0	30
Perfluoroheptanoic acid (PFHpA)	40.0	40.3		ng/L		101	72 - 132	0	30
Perfluorooctanoic acid (PFOA)	40.0	40.3		ng/L		101	70 - 130	0	30
Perfluorononanoic acid (PFNA)	40.0	40.8		ng/L		102	75 - 135	4	30
Perfluorodecanoic acid (PFDA)	40.0	39.4		ng/L		98	76 - 136	1	30
Perfluoroundecanoic acid (PFUnA)	40.0	40.4		ng/L		101	68 - 128	1	30
Perfluorododecanoic acid (PFDoA)	40.0	41.3		ng/L		103	71 - 131	1	30

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

Lab Sample ID: LCSD 320-617928/3-A
Matrix: Water
Analysis Batch: 618440

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 617928

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorotridecanoic acid (PFTrDA)			40.0	39.6		ng/L		99	71 - 131	2	30
Perfluorotetradecanoic acid (PFTeA)			40.0	38.7		ng/L		97	70 - 130	1	30
Perfluorobutanesulfonic acid (PFBS)			35.5	33.1		ng/L		93	67 - 127	4	30
Perfluorohexanesulfonic acid (PFHxS)			36.5	33.5		ng/L		92	59 - 119	4	30
Perfluorooctanesulfonic acid (PFOS)			37.2	37.8		ng/L		102	70 - 130	2	30
NEtFOSAA			40.0	38.8		ng/L		97	76 - 136	1	30
NMeFOSAA			40.0	37.6		ng/L		94	76 - 136	1	30
HFPO-DA (GenX)			40.0	40.3		ng/L		101	51 - 173	0	30
9Cl-PF3ONS			37.4	37.6		ng/L		101	75 - 135	0	30
11Cl-PF3OUdS			37.8	35.7		ng/L		95	54 - 114	0	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)			37.8	37.9		ng/L		100	79 - 139	0	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFHxA	*101*		*25 - 150*
13C4 PFHpA	*100*		*25 - 150*
13C4 PFOA	*104*		*25 - 150*
13C5 PFNA	*103*		*25 - 150*
13C2 PFDA	*105*		*25 - 150*
13C2 PFUnA	*102*		*25 - 150*
13C2 PFDoA	*99*		*25 - 150*
13C2 PFTeDA	*96*		*25 - 150*
13C3 PFBS	*109*		*25 - 150*
18O2 PFHxS	*107*		*25 - 150*
13C4 PFOS	*105*		*25 - 150*
d3-NMeFOSAA	*120*		*25 - 150*
d5-NEtFOSAA	*118*		*25 - 150*
13C3 HFPO-DA	*103*		*25 - 150*

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Lab Sample ID: MB 320-617235/1-A
Matrix: Water
Analysis Batch: 618033

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 617235

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		2.0		ng/L		09/16/22 05:45	09/19/22 16:28	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0		ng/L		09/16/22 05:45	09/19/22 16:28	1
Perfluorooctanoic acid (PFOA)	ND		2.0		ng/L		09/16/22 05:45	09/19/22 16:28	1
Perfluorononanoic acid (PFNA)	ND		2.0		ng/L		09/16/22 05:45	09/19/22 16:28	1
Perfluorodecanoic acid (PFDA)	ND		2.0		ng/L		09/16/22 05:45	09/19/22 16:28	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0		ng/L		09/16/22 05:45	09/19/22 16:28	1
Perfluorododecanoic acid (PFDoA)	ND		2.0		ng/L		09/16/22 05:45	09/19/22 16:28	1
Perfluorotridecanoic acid (PFTrDA)	ND		2.0		ng/L		09/16/22 05:45	09/19/22 16:28	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0		ng/L		09/16/22 05:45	09/19/22 16:28	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0		ng/L		09/16/22 05:45	09/19/22 16:28	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: MB 320-617235/1-A
Matrix: Water
Analysis Batch: 618033

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 617235

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0		ng/L		09/16/22 05:45	09/19/22 16:28	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0		ng/L		09/16/22 05:45	09/19/22 16:28	1
NMeFOSAA	ND		2.0		ng/L		09/16/22 05:45	09/19/22 16:28	1
NEtFOSAA	ND		2.0		ng/L		09/16/22 05:45	09/19/22 16:28	1
9Cl-PF3ONS	ND		2.0		ng/L		09/16/22 05:45	09/19/22 16:28	1
11Cl-PF3OUdS	ND		2.0		ng/L		09/16/22 05:45	09/19/22 16:28	1
HFPO-DA (GenX)	ND		2.0		ng/L		09/16/22 05:45	09/19/22 16:28	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0		ng/L		09/16/22 05:45	09/19/22 16:28	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*80*		*70 - 130*	*09/16/22 05:45*	*09/19/22 16:28*	*1*
13C2 PFDA	*86*		*70 - 130*	*09/16/22 05:45*	*09/19/22 16:28*	*1*
d5-NEtFOSAA	*88*		*70 - 130*	*09/16/22 05:45*	*09/19/22 16:28*	*1*
13C3 HFPO-DA	*75*		*70 - 130*	*09/16/22 05:45*	*09/19/22 16:28*	*1*

Lab Sample ID: LCS 320-617235/2-A
Matrix: Water
Analysis Batch: 618033

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 617235

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanoic acid (PFHxA)	80.0	74.7		ng/L		93	70 - 130
Perfluoroheptanoic acid (PFHpA)	80.0	72.0		ng/L		90	70 - 130
Perfluorooctanoic acid (PFOA)	80.0	77.0		ng/L		96	70 - 130
Perfluorononanoic acid (PFNA)	80.0	78.4		ng/L		98	70 - 130
Perfluorodecanoic acid (PFDA)	80.0	70.4		ng/L		88	70 - 130
Perfluoroundecanoic acid (PFUnA)	80.0	72.4		ng/L		91	70 - 130
Perfluorododecanoic acid (PFDoA)	80.0	77.7		ng/L		97	70 - 130
Perfluorotridecanoic acid (PFTrDA)	80.0	81.9		ng/L		102	70 - 130
Perfluorotetradecanoic acid (PFTeA)	80.0	70.4		ng/L		88	70 - 130
Perfluorobutanesulfonic acid (PFBS)	70.7	79.5		ng/L		112	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	72.8	83.4		ng/L		115	70 - 130
Perfluorooctanesulfonic acid (PFOS)	74.2	81.2		ng/L		109	70 - 130
NMeFOSAA	80.0	82.2		ng/L		103	70 - 130
NEtFOSAA	80.0	79.6		ng/L		100	70 - 130
9Cl-PF3ONS	74.7	79.7		ng/L		107	70 - 130
11Cl-PF3OUdS	75.4	78.8		ng/L		105	70 - 130
HFPO-DA (GenX)	80.0	62.7		ng/L		78	70 - 130
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	75.4	68.3		ng/L		91	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*81*		*70 - 130*

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: LCS 320-617235/2-A
Matrix: Water
Analysis Batch: 618033

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 617235

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFDA	*86*		*70 - 130*
d5-NEtFOSAA	*87*		*70 - 130*
13C3 HFPO-DA	*79*		*70 - 130*

Lab Sample ID: MB 320-620273/1-A
Matrix: Water
Analysis Batch: 620516

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 620273

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		2.0		ng/L		09/26/22 19:27	09/27/22 14:19	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0		ng/L		09/26/22 19:27	09/27/22 14:19	1
Perfluorooctanoic acid (PFOA)	ND		2.0		ng/L		09/26/22 19:27	09/27/22 14:19	1
Perfluorononanoic acid (PFNA)	ND		2.0		ng/L		09/26/22 19:27	09/27/22 14:19	1
Perfluorodecanoic acid (PFDA)	ND		2.0		ng/L		09/26/22 19:27	09/27/22 14:19	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0		ng/L		09/26/22 19:27	09/27/22 14:19	1
Perfluorododecanoic acid (PFDoA)	ND		2.0		ng/L		09/26/22 19:27	09/27/22 14:19	1
Perfluorotridecanoic acid (PFTrDA)	ND		2.0		ng/L		09/26/22 19:27	09/27/22 14:19	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0		ng/L		09/26/22 19:27	09/27/22 14:19	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0		ng/L		09/26/22 19:27	09/27/22 14:19	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0		ng/L		09/26/22 19:27	09/27/22 14:19	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0		ng/L		09/26/22 19:27	09/27/22 14:19	1
NMeFOSAA	ND		2.0		ng/L		09/26/22 19:27	09/27/22 14:19	1
NEtFOSAA	ND		2.0		ng/L		09/26/22 19:27	09/27/22 14:19	1
9Cl-PF3ONS	ND		2.0		ng/L		09/26/22 19:27	09/27/22 14:19	1
11Cl-PF3OUdS	ND		2.0		ng/L		09/26/22 19:27	09/27/22 14:19	1
HFPO-DA (GenX)	ND		2.0		ng/L		09/26/22 19:27	09/27/22 14:19	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0		ng/L		09/26/22 19:27	09/27/22 14:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*76*		*70 - 130*	*09/26/22 19:27*	*09/27/22 14:19*	*1*
13C2 PFDA	*81*		*70 - 130*	*09/26/22 19:27*	*09/27/22 14:19*	*1*
d5-NEtFOSAA	*90*		*70 - 130*	*09/26/22 19:27*	*09/27/22 14:19*	*1*
13C3 HFPO-DA	*75*		*70 - 130*	*09/26/22 19:27*	*09/27/22 14:19*	*1*

Lab Sample ID: LCS 320-620273/2-A
Matrix: Water
Analysis Batch: 620595

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 620273

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanoic acid (PFHxA)	160	131		ng/L		82	70 - 130
Perfluoroheptanoic acid (PFHpA)	160	134		ng/L		84	70 - 130
Perfluorooctanoic acid (PFOA)	160	141		ng/L		88	70 - 130
Perfluorononanoic acid (PFNA)	160	135		ng/L		85	70 - 130
Perfluorodecanoic acid (PFDA)	160	137		ng/L		85	70 - 130
Perfluoroundecanoic acid (PFUnA)	160	140		ng/L		87	70 - 130
Perfluorododecanoic acid (PFDoA)	160	139		ng/L		87	70 - 130

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: LCS 320-620273/2-A
Matrix: Water
Analysis Batch: 620595

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 620273

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Perfluorotridecanoic acid (PFTrDA)			160	150		ng/L		94	70 - 130		
Perfluorotetradecanoic acid (PFTeA)			160	166		ng/L		104	70 - 130		
Perfluorobutanesulfonic acid (PFBS)			142	128		ng/L		90	70 - 130		
Perfluorohexanesulfonic acid (PFHxS)			146	138		ng/L		94	70 - 130		
Perfluorooctanesulfonic acid (PFOS)			149	131		ng/L		88	70 - 130		
NMeFOSAA			160	148		ng/L		93	70 - 130		
NEtFOSAA			160	142		ng/L		89	70 - 130		
9Cl-PF3ONS			149	120		ng/L		80	70 - 130		
11Cl-PF3OUdS			151	124		ng/L		82	70 - 130		
HFPO-DA (GenX)			160	117		ng/L		73	70 - 130		
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)			151	108		ng/L		71	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*76*		*70 - 130*
13C2 PFDA	*84*		*70 - 130*
d5-NEtFOSAA	*83*		*70 - 130*
13C3 HFPO-DA	*79*		*70 - 130*

Lab Sample ID: LCSD 320-620273/3-A
Matrix: Water
Analysis Batch: 620516

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 620273

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)			160	133		ng/L		83	70 - 130	5	30
Perfluoroheptanoic acid (PFHpA)			160	135		ng/L		84	70 - 130	7	30
Perfluorooctanoic acid (PFOA)			160	146		ng/L		91	70 - 130	4	30
Perfluorononanoic acid (PFNA)			160	138		ng/L		86	70 - 130	2	30
Perfluorodecanoic acid (PFDA)			160	134		ng/L		84	70 - 130	2	30
Perfluoroundecanoic acid (PFUnA)			160	134		ng/L		84	70 - 130	2	30
Perfluorododecanoic acid (PFDoA)			160	141		ng/L		88	70 - 130	4	30
Perfluorotridecanoic acid (PFTrDA)			160	152		ng/L		95	70 - 130	3	30
Perfluorotetradecanoic acid (PFTeA)			160	170		ng/L		106	70 - 130	5	30
Perfluorobutanesulfonic acid (PFBS)			142	140		ng/L		99	70 - 130	10	30
Perfluorohexanesulfonic acid (PFHxS)			146	147		ng/L		100	70 - 130	9	30
Perfluorooctanesulfonic acid (PFOS)			149	133		ng/L		90	70 - 130	4	30
NMeFOSAA			160	152		ng/L		95	70 - 130	4	30
NEtFOSAA			160	147		ng/L		92	70 - 130	3	30
9Cl-PF3ONS			149	124		ng/L		83	70 - 130	4	30
11Cl-PF3OUdS			151	131		ng/L		87	70 - 130	8	30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: LCSD 320-620273/3-A
Matrix: Water
Analysis Batch: 620516

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 620273

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
HFPO-DA (GenX)			160	121		ng/L		76	70 - 130	6	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)			151	107		ng/L		71	70 - 130	4	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFHxA	*78*		*70 - 130*
13C2 PFDA	*81*		*70 - 130*
d5-NEtFOSAA	*80*		*70 - 130*
13C3 HFPO-DA	*78*		*70 - 130*

LCMS

Prep Batch: 617235

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-92002-1	PH-1	Total/NA	Water	537.1 DW	
MB 320-617235/1-A	Method Blank	Total/NA	Water	537.1 DW	
LCS 320-617235/2-A	Lab Control Sample	Total/NA	Water	537.1 DW	

Prep Batch: 617928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-92002-2	MW4-0922	Total/NA	Water	3535	
320-92002-3	MW6-0922	Total/NA	Water	3535	
MB 320-617928/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-617928/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-617928/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 617982

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-92002-1	PH-1	Total/NA	Water	537.1 DW	617235

Analysis Batch: 618033

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-617235/1-A	Method Blank	Total/NA	Water	537.1 DW	617235
LCS 320-617235/2-A	Lab Control Sample	Total/NA	Water	537.1 DW	617235

Analysis Batch: 618440

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-92002-2	MW4-0922	Total/NA	Water	537 (modified)	617928
320-92002-3	MW6-0922	Total/NA	Water	537 (modified)	617928
MB 320-617928/1-A	Method Blank	Total/NA	Water	537 (modified)	617928
LCS 320-617928/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	617928
LCSD 320-617928/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	617928

Prep Batch: 620273

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-92002-4	REAGENT FIELD BLANK	Total/NA	Water	537.1 DW	
MB 320-620273/1-A	Method Blank	Total/NA	Water	537.1 DW	
LCS 320-620273/2-A	Lab Control Sample	Total/NA	Water	537.1 DW	
LCSD 320-620273/3-A	Lab Control Sample Dup	Total/NA	Water	537.1 DW	

Analysis Batch: 620516

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-92002-4	REAGENT FIELD BLANK	Total/NA	Water	537.1 DW	620273
MB 320-620273/1-A	Method Blank	Total/NA	Water	537.1 DW	620273
LCSD 320-620273/3-A	Lab Control Sample Dup	Total/NA	Water	537.1 DW	620273

Analysis Batch: 620595

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 320-620273/2-A	Lab Control Sample	Total/NA	Water	537.1 DW	620273

Lab Chronicle

Client: PBS Engineering and Environmental
Project/Site: FTA AST

Job ID: 320-92002-1

Client Sample ID: PH-1
Date Collected: 09/13/22 09:55
Date Received: 09/14/22 10:20

Lab Sample ID: 320-92002-1
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	537.1 DW			271.1 mL	1.00 mL	617235	09/16/22 05:45	NSS	EET SAC
Total/NA	Analysis	537.1 DW		1	1 mL	1 mL	617982	09/19/22 12:10	SS	EET SAC

Client Sample ID: MW4-0922
Date Collected: 09/13/22 11:20
Date Received: 09/14/22 10:20

Lab Sample ID: 320-92002-2
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			277.2 mL	10.0 mL	617928	09/19/22 08:27	VP	EET SAC
Total/NA	Analysis	537 (modified)		1	1 mL	1 mL	618440	09/21/22 16:53	RS1	EET SAC

Client Sample ID: MW6-0922
Date Collected: 09/13/22 12:15
Date Received: 09/14/22 10:20

Lab Sample ID: 320-92002-3
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			288.2 mL	10.0 mL	617928	09/19/22 08:27	VP	EET SAC
Total/NA	Analysis	537 (modified)		1	1 mL	1 mL	618440	09/21/22 17:03	RS1	EET SAC

Client Sample ID: REAGENT FIELD BLANK
Date Collected: 09/13/22 12:15
Date Received: 09/14/22 10:20

Lab Sample ID: 320-92002-4
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	537.1 DW			307.4 mL	1.0 mL	620273	09/26/22 19:27	PV	EET SAC
Total/NA	Analysis	537.1 DW		1	1 mL	1 mL	620516	09/27/22 15:04	D1R	EET SAC

Laboratory References:

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

Accreditation/Certification Summary

Client: PBS Engineering and Environmental
Job ID: 320-92002-1
Project/Site: FTA AST

Laboratory: Eurofins Sacramento

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Washington	State	C581	05-05-23

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
537.1 DW	537.1 DW	Water	11Cl-PF3OUdS
537.1 DW	537.1 DW	Water	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)
537.1 DW	537.1 DW	Water	9Cl-PF3ONS
537.1 DW	537.1 DW	Water	HFPO-DA (GenX)
537.1 DW	537.1 DW	Water	NEtFOSAA
537.1 DW	537.1 DW	Water	NMeFOSAA
537.1 DW	537.1 DW	Water	Perfluorobutanesulfonic acid (PFBS)
537.1 DW	537.1 DW	Water	Perfluorodecanoic acid (PFDA)
537.1 DW	537.1 DW	Water	Perfluorododecanoic acid (PFDoA)
537.1 DW	537.1 DW	Water	Perfluoroheptanoic acid (PFHpA)
537.1 DW	537.1 DW	Water	Perfluorohexanesulfonic acid (PFHxS)
537.1 DW	537.1 DW	Water	Perfluorohexanoic acid (PFHxA)
537.1 DW	537.1 DW	Water	Perfluorononanoic acid (PFNA)
537.1 DW	537.1 DW	Water	Perfluorooctanesulfonic acid (PFOS)
537.1 DW	537.1 DW	Water	Perfluorooctanoic acid (PFOA)
537.1 DW	537.1 DW	Water	Perfluorotetradecanoic acid (PFTeA)
537.1 DW	537.1 DW	Water	Perfluorotridecanoic acid (PFTrDA)
537.1 DW	537.1 DW	Water	Perfluoroundecanoic acid (PFUnA)

Method Summary

Client: PBS Engineering and Environmental
Project/Site: FTA AST

Job ID: 320-92002-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	EET SAC
537.1 DW	Perfluorinated Alkyl Acids (LC/MS)	EPA	EET SAC
3535	Solid-Phase Extraction (SPE)	SW846	EET SAC
537.1 DW	Extraction of Perfluorinated Alkyl Acids	EPA	EET 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:

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

Sample Summary

Client: PBS Engineering and Environmental
Project/Site: FTA AST

Job ID: 320-92002-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-92002-1	PH-1	Water	09/13/22 09:55	09/14/22 10:20
320-92002-2	MW4-0922	Water	09/13/22 11:20	09/14/22 10:20
320-92002-3	MW6-0922	Water	09/13/22 12:15	09/14/22 10:20
320-92002-4	REAGENT FIELD BLANK	Water	09/13/22 12:15	09/14/22 10:20

Chain of Custody Record

606901 eurofins | Environment Testing TestAmerica

Address: _____

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

TAL-8210

Client Contact	Project Manager: Ken Nogeire	Site Contact: Mike Bagley	Date: 9/13/22	COC No:
Company Name: PBS	Tel/Email: Ken.Nogeire@pbsusa.com	Lab Contact: A. Sallmpour	Carrier:	1 of 1 COCs
Address: 214 E Galer St Suite 300	Analysis Turnaround Time			Sampler:
City/State/Zip: Seattle WA 98102	☐ CALENDAR DAYS ☒ WORKING DAYS			For Lab Use Only:
Phone: 206-233-9639	TAT if different from Below _____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: FTA AST	☐ 1 week			Job / SDG No.:
Site: FTA	☐ 2 days			
PO# 40535.498	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	EPA Method 537.1	EPA Method 537 mod.	Sample Specific Notes:
PH-1	9/13/22	9:55	G	water	2	N	N	X		
MW4-0922	9/13/22	11:20	G	GW	2	N	N		X	
MW6-0922	9/13/22	12:15	G	GW	2	N	N		X	

320-92002 Chain of Custody

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

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

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

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

☐ Return to Client ☒ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: Ken.Nogeire@pbsusa.com
email results to ken and Mike: mike.bagley@pbsusa.com

Custody Seals Intact: ☑ Yes ☐ No	Custody Seal No.: 1649767	Cooler Temp. (°C): Obs'd: 2.4	Corr'd: 2.4	Therm ID No.: Lab
Relinquished by:	Company: PBS	Date/Time: 9/13/22 14:00	Received by:	Company:	Date/Time: 9.14.22 1020
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

9/29/2022

Login Sample Receipt Checklist

Client: PBS Engineering and Environmental

Job Number: 320-92002-1

Login Number: 92002
List Number: 1
Creator: Her, David A

List Source: Eurofins Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	1848762
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.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Ken Nogeire
PBS Engineering and Environmental
214 E. Galer Street, Suite 300
Seattle, Washington 98102

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JOB DESCRIPTION

FTA

JOB NUMBER

320-95381-1

Eurofins Sacramento
880 Riverside Parkway
West Sacramento CA 95605

See page two for job notes and contact information.

Job Notes

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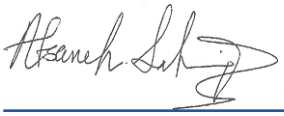
The data in the report relate to the field sample(s) as received by the laboratory and associated QC. All results have been reviewed and have been found to be compliant with laboratory and accreditation requirements, with the exception of the noted deviation(s). For questions, please contact the Project Manager.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northern California, LLC Project Manager.

Authorization



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Authorized for release by
Afsaneh Salimpour, Senior Project Manager
Afsaneh.Salimpour@et.eurofinsus.com
(925)484-1919

Table of Contents

Definitions/Glossary

Client: PBS Engineering and Environmental
Project/Site: FTA

Job ID: 320-95381-1

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
CFU	Colony Forming Unit
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)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
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)
TNTC	Too Numerous To Count

Case Narrative

Client: PBS Engineering and Environmental
Project/Site: FTA

Job ID: 320-95381-1

Job ID: 320-95381-1

Laboratory: Eurofins Sacramento

Narrative

Job Narrative
320-95381-1

Comments
No additional comments.

Receipt
The samples were received on 12/16/2022 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.6º 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: PBS Engineering and Environmental
Project/Site: FTA

Job ID: 320-95381-1

Client Sample ID: PH-2 — Lab Sample ID: 320-95381-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	52		1.8		ng/L	1		537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	12		1.8		ng/L	1		537.1 DW	Total/NA
Perfluorooctanoic acid (PFOA)	10		1.8		ng/L	1		537.1 DW	Total/NA
Perfluorononanoic acid (PFNA)	5.7		1.8		ng/L	1		537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	29		1.8		ng/L	1		537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	52		1.8		ng/L	1		537.1 DW	Total/NA
Perfluorooctanesulfonic acid (PFOS)	29		1.8		ng/L	1		537.1 DW	Total/NA

Client Sample ID: OHall-1 — Lab Sample ID: 320-95381-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	51		1.9		ng/L	1		537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	12		1.9		ng/L	1		537.1 DW	Total/NA
Perfluorooctanoic acid (PFOA)	10		1.9		ng/L	1		537.1 DW	Total/NA
Perfluorononanoic acid (PFNA)	6.0		1.9		ng/L	1		537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	30		1.9		ng/L	1		537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	54		1.9		ng/L	1		537.1 DW	Total/NA
Perfluorooctanesulfonic acid (PFOS)	31		1.9		ng/L	1		537.1 DW	Total/NA

Client Sample ID: Dorm-1 — Lab Sample ID: 320-95381-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	51		1.8		ng/L	1		537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	12		1.8		ng/L	1		537.1 DW	Total/NA
Perfluorooctanoic acid (PFOA)	9.8		1.8		ng/L	1		537.1 DW	Total/NA
Perfluorononanoic acid (PFNA)	5.8		1.8		ng/L	1		537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	30		1.8		ng/L	1		537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	55		1.8		ng/L	1		537.1 DW	Total/NA
Perfluorooctanesulfonic acid (PFOS)	30		1.8		ng/L	1		537.1 DW	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: PH-2

Date Collected: 12/15/22 12:00
Date Received: 12/16/22 09:30

Lab Sample ID: 320-95381-1

Matrix: Water

Method: EPA 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**52**		1.8		ng/L		12/29/22 05:39	12/29/22 17:08	1
Perfluoroheptanoic acid (PFHpA)	**12**		1.8		ng/L		12/29/22 05:39	12/29/22 17:08	1
Perfluorooctanoic acid (PFOA)	**10**		1.8		ng/L		12/29/22 05:39	12/29/22 17:08	1
Perfluorononanoic acid (PFNA)	**5.7**		1.8		ng/L		12/29/22 05:39	12/29/22 17:08	1
Perfluorodecanoic acid (PFDA)	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:08	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:08	1
Perfluorododecanoic acid (PFDoA)	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:08	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:08	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:08	1
Perfluorobutanesulfonic acid (PFBS)	**29**		1.8		ng/L		12/29/22 05:39	12/29/22 17:08	1
Perfluorohexanesulfonic acid (PFHxS)	**52**		1.8		ng/L		12/29/22 05:39	12/29/22 17:08	1
Perfluorooctanesulfonic acid (PFOS)	**29**		1.8		ng/L		12/29/22 05:39	12/29/22 17:08	1
NMeFOSAA	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:08	1
NEtFOSAA	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:08	1
9Cl-PF3ONS	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:08	1
11Cl-PF3OUdS	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:08	1
HFPO-DA (GenX)	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:08	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*97*		*70 - 130*	*12/29/22 05:39*	*12/29/22 17:08*	*1*
13C2 PFDA	*100*		*70 - 130*	*12/29/22 05:39*	*12/29/22 17:08*	*1*
d5-NEtFOSAA	*99*		*70 - 130*	*12/29/22 05:39*	*12/29/22 17:08*	*1*
13C3 HFPO-DA	*99*		*70 - 130*	*12/29/22 05:39*	*12/29/22 17:08*	*1*

Client Sample ID: OHall-1

Date Collected: 12/15/22 11:25
Date Received: 12/16/22 09:30

Lab Sample ID: 320-95381-2

Matrix: Water

Method: EPA 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**51**		1.9		ng/L		12/29/22 05:39	12/29/22 17:15	1
Perfluoroheptanoic acid (PFHpA)	**12**		1.9		ng/L		12/29/22 05:39	12/29/22 17:15	1
Perfluorooctanoic acid (PFOA)	**10**		1.9		ng/L		12/29/22 05:39	12/29/22 17:15	1
Perfluorononanoic acid (PFNA)	**6.0**		1.9		ng/L		12/29/22 05:39	12/29/22 17:15	1
Perfluorodecanoic acid (PFDA)	ND		1.9		ng/L		12/29/22 05:39	12/29/22 17:15	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9		ng/L		12/29/22 05:39	12/29/22 17:15	1
Perfluorododecanoic acid (PFDoA)	ND		1.9		ng/L		12/29/22 05:39	12/29/22 17:15	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.9		ng/L		12/29/22 05:39	12/29/22 17:15	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9		ng/L		12/29/22 05:39	12/29/22 17:15	1
Perfluorobutanesulfonic acid (PFBS)	**30**		1.9		ng/L		12/29/22 05:39	12/29/22 17:15	1
Perfluorohexanesulfonic acid (PFHxS)	**54**		1.9		ng/L		12/29/22 05:39	12/29/22 17:15	1
Perfluorooctanesulfonic acid (PFOS)	**31**		1.9		ng/L		12/29/22 05:39	12/29/22 17:15	1
NMeFOSAA	ND		1.9		ng/L		12/29/22 05:39	12/29/22 17:15	1
NEtFOSAA	ND		1.9		ng/L		12/29/22 05:39	12/29/22 17:15	1

Client Sample ID: OHall-1

Date Collected: 12/15/22 11:25
Date Received: 12/16/22 09:30

Lab Sample ID: 320-95381-2

Matrix: Water

Method: EPA 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
9Cl-PF3ONS	ND		1.9		ng/L		12/29/22 05:39	12/29/22 17:15	1
11Cl-PF3OUdS	ND		1.9		ng/L		12/29/22 05:39	12/29/22 17:15	1
HFPO-DA (GenX)	ND		1.9		ng/L		12/29/22 05:39	12/29/22 17:15	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9		ng/L		12/29/22 05:39	12/29/22 17:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*94*		*70 - 130*	*12/29/22 05:39*	*12/29/22 17:15*	*1*
13C2 PFDA	*104*		*70 - 130*	*12/29/22 05:39*	*12/29/22 17:15*	*1*
d5-NEtFOSAA	*100*		*70 - 130*	*12/29/22 05:39*	*12/29/22 17:15*	*1*
13C3 HFPO-DA	*102*		*70 - 130*	*12/29/22 05:39*	*12/29/22 17:15*	*1*

Client Sample ID: Dorm-1

Date Collected: 12/15/22 11:45
Date Received: 12/16/22 09:30

Lab Sample ID: 320-95381-3

Matrix: Water

Method: EPA 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**51**		1.8		ng/L		12/29/22 05:39	12/29/22 17:38	1
Perfluoroheptanoic acid (PFHpA)	**12**		1.8		ng/L		12/29/22 05:39	12/29/22 17:38	1
Perfluorooctanoic acid (PFOA)	**9.8**		1.8		ng/L		12/29/22 05:39	12/29/22 17:38	1
Perfluorononanoic acid (PFNA)	**5.8**		1.8		ng/L		12/29/22 05:39	12/29/22 17:38	1
Perfluorodecanoic acid (PFDA)	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:38	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:38	1
Perfluorododecanoic acid (PFDoA)	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:38	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:38	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:38	1
Perfluorobutanesulfonic acid (PFBS)	**30**		1.8		ng/L		12/29/22 05:39	12/29/22 17:38	1
Perfluorohexanesulfonic acid (PFHxS)	**55**		1.8		ng/L		12/29/22 05:39	12/29/22 17:38	1
Perfluorooctanesulfonic acid (PFOS)	**30**		1.8		ng/L		12/29/22 05:39	12/29/22 17:38	1
NMeFOSAA	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:38	1
NEtFOSAA	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:38	1
9Cl-PF3ONS	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:38	1
11Cl-PF3OUdS	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:38	1
HFPO-DA (GenX)	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:38	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8		ng/L		12/29/22 05:39	12/29/22 17:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*94*		*70 - 130*	*12/29/22 05:39*	*12/29/22 17:38*	*1*
13C2 PFDA	*98*		*70 - 130*	*12/29/22 05:39*	*12/29/22 17:38*	*1*
d5-NEtFOSAA	*94*		*70 - 130*	*12/29/22 05:39*	*12/29/22 17:38*	*1*
13C3 HFPO-DA	*96*		*70 - 130*	*12/29/22 05:39*	*12/29/22 17:38*	*1*

Surrogate Summary

Client: PBS Engineering and Environmental
Project/Site: FTA

Job ID: 320-95381-1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		PFHxA	PFDA	d5NEFOS	HFPODA
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)	(70-130)
320-95381-1	PH-2	97	100	99	99
320-95381-2	OHall-1	94	104	100	102
320-95381-2 MS	OHall-1	92	96	93	97
320-95381-2 MSD	OHall-1	98	100	94	102
320-95381-3	Dorm-1	94	98	94	96
LCS 320-643181/2-A	Lab Control Sample	89	91	90	94
MB 320-643181/1-A	Method Blank	90	90	91	90

Surrogate Legend

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA
d5NEFOS = d5-NEtFOSAA
HFPODA = 13C3 HFPO-DA

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Lab Sample ID: MB 320-643181/1-A
Matrix: Water
Analysis Batch: 643451

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 643181

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		2.0		ng/L		12/29/22 05:39	12/29/22 16:38	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0		ng/L		12/29/22 05:39	12/29/22 16:38	1
Perfluorooctanoic acid (PFOA)	ND		2.0		ng/L		12/29/22 05:39	12/29/22 16:38	1
Perfluorononanoic acid (PFNA)	ND		2.0		ng/L		12/29/22 05:39	12/29/22 16:38	1
Perfluorodecanoic acid (PFDA)	ND		2.0		ng/L		12/29/22 05:39	12/29/22 16:38	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0		ng/L		12/29/22 05:39	12/29/22 16:38	1
Perfluorododecanoic acid (PFDoA)	ND		2.0		ng/L		12/29/22 05:39	12/29/22 16:38	1
Perfluorotridecanoic acid (PFTrDA)	ND		2.0		ng/L		12/29/22 05:39	12/29/22 16:38	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0		ng/L		12/29/22 05:39	12/29/22 16:38	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0		ng/L		12/29/22 05:39	12/29/22 16:38	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0		ng/L		12/29/22 05:39	12/29/22 16:38	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0		ng/L		12/29/22 05:39	12/29/22 16:38	1
NMeFOSAA	ND		2.0		ng/L		12/29/22 05:39	12/29/22 16:38	1
NEtFOSAA	ND		2.0		ng/L		12/29/22 05:39	12/29/22 16:38	1
9Cl-PF3ONS	ND		2.0		ng/L		12/29/22 05:39	12/29/22 16:38	1
11Cl-PF3OUdS	ND		2.0		ng/L		12/29/22 05:39	12/29/22 16:38	1
HFPO-DA (GenX)	ND		2.0		ng/L		12/29/22 05:39	12/29/22 16:38	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0		ng/L		12/29/22 05:39	12/29/22 16:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*90*		*70 - 130*	*12/29/22 05:39*	*12/29/22 16:38*	*1*
13C2 PFDA	*90*		*70 - 130*	*12/29/22 05:39*	*12/29/22 16:38*	*1*
d5-NEtFOSAA	*91*		*70 - 130*	*12/29/22 05:39*	*12/29/22 16:38*	*1*
13C3 HFPO-DA	*90*		*70 - 130*	*12/29/22 05:39*	*12/29/22 16:38*	*1*

Lab Sample ID: LCS 320-643181/2-A
Matrix: Water
Analysis Batch: 643451

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 643181

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanoic acid (PFHxA)	80.0	75.8		ng/L		95	70 - 130
Perfluoroheptanoic acid (PFHpA)	80.0	70.9		ng/L		89	70 - 130
Perfluorooctanoic acid (PFOA)	80.0	70.0		ng/L		88	70 - 130
Perfluorononanoic acid (PFNA)	80.0	74.9		ng/L		94	70 - 130
Perfluorodecanoic acid (PFDA)	80.0	75.5		ng/L		94	70 - 130
Perfluoroundecanoic acid (PFUnA)	80.0	72.8		ng/L		91	70 - 130
Perfluorododecanoic acid (PFDoA)	80.0	74.4		ng/L		93	70 - 130
Perfluorotridecanoic acid (PFTrDA)	80.0	77.6		ng/L		97	70 - 130
Perfluorotetradecanoic acid (PFTeA)	80.0	73.4		ng/L		92	70 - 130
Perfluorobutanesulfonic acid (PFBS)	71.0	72.5		ng/L		102	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	73.0	73.8		ng/L		101	70 - 130
Perfluorooctanesulfonic acid (PFOS)	74.4	75.7		ng/L		102	70 - 130

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: LCS 320-643181/2-A
Matrix: Water
Analysis Batch: 643451

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 643181

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
NMeFOSAA	80.0	78.3		ng/L		98	70 - 130
NEtFOSAA	80.0	75.7		ng/L		95	70 - 130
9Cl-PF3ONS	74.7	79.6		ng/L		107	70 - 130
11Cl-PF3OUdS	75.5	78.8		ng/L		104	70 - 130
HFPO-DA (GenX)	80.0	75.0		ng/L		94	70 - 130
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	75.5	64.9		ng/L		86	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*89*		*70 - 130*
13C2 PFDA	*91*		*70 - 130*
d5-NEtFOSAA	*90*		*70 - 130*
13C3 HFPO-DA	*94*		*70 - 130*

Lab Sample ID: 320-95381-2 MS
Matrix: Water
Analysis Batch: 643451

Client Sample ID: OHall-1
Prep Type: Total/NA
Prep Batch: 643181

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanoic acid (PFHxA)	51		74.7	113		ng/L		82	70 - 130
Perfluoroheptanoic acid (PFHpA)	12		74.7	80.3		ng/L		91	70 - 130
Perfluorooctanoic acid (PFOA)	10		74.7	79.4		ng/L		93	70 - 130
Perfluorononanoic acid (PFNA)	6.0		74.7	77.5		ng/L		96	70 - 130
Perfluorodecanoic acid (PFDA)	ND		74.7	72.6		ng/L		97	70 - 130
Perfluoroundecanoic acid (PFUnA)	ND		74.7	68.3		ng/L		92	70 - 130
Perfluorododecanoic acid (PFDoA)	ND		74.7	70.9		ng/L		95	70 - 130
Perfluorotridecanoic acid (PFTrDA)	ND		74.7	73.0		ng/L		98	70 - 130
Perfluorotetradecanoic acid (PFTeA)	ND		74.7	74.3		ng/L		99	70 - 130
Perfluorobutanesulfonic acid (PFBS)	30		66.3	93.6		ng/L		96	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	54		68.1	121		ng/L		98	70 - 130
Perfluorooctanesulfonic acid (PFOS)	31		69.5	98.3		ng/L		97	70 - 130
NMeFOSAA	ND		74.7	74.1		ng/L		99	70 - 130
NEtFOSAA	ND		74.7	71.6		ng/L		96	70 - 130
9Cl-PF3ONS	ND		69.8	71.8		ng/L		103	70 - 130
11Cl-PF3OUdS	ND		70.5	69.1		ng/L		98	70 - 130
HFPO-DA (GenX)	ND		74.7	71.6		ng/L		96	70 - 130
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		70.5	63.2		ng/L		90	70 - 130

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
13C2 PFHxA	*92*		*70 - 130*
13C2 PFDA	*96*		*70 - 130*
d5-NEtFOSAA	*93*		*70 - 130*

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: 320-95381-2 MS
Matrix: Water
Analysis Batch: 643451

Client Sample ID: OHall-1
Prep Type: Total/NA
Prep Batch: 643181

Surrogate	MS %Recovery	MS Qualifier	Limits
13C3 HFPO-DA	*97*		*70 - 130*

Lab Sample ID: 320-95381-2 MSD
Matrix: Water
Analysis Batch: 643451

Client Sample ID: OHall-1
Prep Type: Total/NA
Prep Batch: 643181

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	51		76.1	120		ng/L		91	70 - 130	7	30
Perfluoroheptanoic acid (PFHpA)	12		76.1	79.8		ng/L		89	70 - 130	1	30
Perfluorooctanoic acid (PFOA)	10		76.1	79.0		ng/L		91	70 - 130	0	30
Perfluorononanoic acid (PFNA)	6.0		76.1	80.6		ng/L		98	70 - 130	4	30
Perfluorodecanoic acid (PFDA)	ND		76.1	74.2		ng/L		98	70 - 130	2	30
Perfluoroundecanoic acid (PFUnA)	ND		76.1	68.1		ng/L		89	70 - 130	0	30
Perfluorododecanoic acid (PFDoA)	ND		76.1	74.1		ng/L		97	70 - 130	4	30
Perfluorotridecanoic acid (PFTrDA)	ND		76.1	78.2		ng/L		103	70 - 130	7	30
Perfluorotetradecanoic acid (PFTeA)	ND		76.1	77.0		ng/L		101	70 - 130	4	30
Perfluorobutanesulfonic acid (PFBS)	30		67.6	93.7		ng/L		95	70 - 130	0	30
Perfluorohexanesulfonic acid (PFHxS)	54		69.4	118		ng/L		92	70 - 130	3	30
Perfluorooctanesulfonic acid (PFOS)	31		70.7	98.1		ng/L		95	70 - 130	0	30
NMeFOSAA	ND		76.1	72.7		ng/L		96	70 - 130	2	30
NEtFOSAA	ND		76.1	70.9		ng/L		93	70 - 130	1	30
9Cl-PF3ONS	ND		71.1	72.3		ng/L		102	70 - 130	1	30
11Cl-PF3OUdS	ND		71.8	69.3		ng/L		97	70 - 130	0	30
HFPO-DA (GenX)	ND		76.1	74.3		ng/L		98	70 - 130	4	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		71.8	66.7		ng/L		93	70 - 130	5	30

Surrogate	MSD %Recovery	MSD Qualifier	Limits
13C2 PFHxA	*98*		*70 - 130*
13C2 PFDA	*100*		*70 - 130*
d5-NEtFOSAA	*94*		*70 - 130*
13C3 HFPO-DA	*102*		*70 - 130*

QC Association Summary

Client: PBS Engineering and Environmental
Project/Site: FTA

Job ID: 320-95381-1

LCMS

Prep Batch: 643181

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-95381-1	PH-2	Total/NA	Water	537.1 DW	
320-95381-2	OHall-1	Total/NA	Water	537.1 DW	
320-95381-3	Dorm-1	Total/NA	Water	537.1 DW	
MB 320-643181/1-A	Method Blank	Total/NA	Water	537.1 DW	
LCS 320-643181/2-A	Lab Control Sample	Total/NA	Water	537.1 DW	
320-95381-2 MS	OHall-1	Total/NA	Water	537.1 DW	
320-95381-2 MSD	OHall-1	Total/NA	Water	537.1 DW	

Analysis Batch: 643451

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-95381-1	PH-2	Total/NA	Water	537.1 DW	643181
320-95381-2	OHall-1	Total/NA	Water	537.1 DW	643181
320-95381-3	Dorm-1	Total/NA	Water	537.1 DW	643181
MB 320-643181/1-A	Method Blank	Total/NA	Water	537.1 DW	643181
LCS 320-643181/2-A	Lab Control Sample	Total/NA	Water	537.1 DW	643181
320-95381-2 MS	OHall-1	Total/NA	Water	537.1 DW	643181
320-95381-2 MSD	OHall-1	Total/NA	Water	537.1 DW	643181

Lab Chronicle

Client: PBS Engineering and Environmental
Project/Site: FTA

Job ID: 320-95381-1

Client Sample ID: PH-2

Lab Sample ID: 320-95381-1

Date Collected: 12/15/22 12:00

Matrix: Water

Date Received: 12/16/22 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537.1 DW			270.7 mL	1.0 mL	643181	12/29/22 05:39	HK	EET SAC
Total/NA	Analysis	537.1 DW		1	1 mL	1 mL	643451	12/29/22 17:08	SS	EET SAC

Client Sample ID: OHall-1

Lab Sample ID: 320-95381-2

Date Collected: 12/15/22 11:25

Matrix: Water

Date Received: 12/16/22 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537.1 DW			268.1 mL	1.0 mL	643181	12/29/22 05:39	HK	EET SAC
Total/NA	Analysis	537.1 DW		1	1 mL	1 mL	643451	12/29/22 17:15	SS	EET SAC

Client Sample ID: Dorm-1

Lab Sample ID: 320-95381-3

Date Collected: 12/15/22 11:45

Matrix: Water

Date Received: 12/16/22 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537.1 DW			271.9 mL	1.0 mL	643181	12/29/22 05:39	HK	EET SAC
Total/NA	Analysis	537.1 DW		1	1 mL	1 mL	643451	12/29/22 17:38	SS	EET SAC

Laboratory References:

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

Accreditation/Certification Summary

Client: PBS Engineering and Environmental
Job ID: 320-95381-1
Project/Site: FTA

Laboratory: Eurofins Sacramento

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Washington	State	C581	05-05-23

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
537.1 DW	537.1 DW	Water	11Cl-PF3OUdS
537.1 DW	537.1 DW	Water	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)
537.1 DW	537.1 DW	Water	9Cl-PF3ONS
537.1 DW	537.1 DW	Water	HFPO-DA (GenX)
537.1 DW	537.1 DW	Water	NEtFOSAA
537.1 DW	537.1 DW	Water	NMeFOSAA
537.1 DW	537.1 DW	Water	Perfluorobutanesulfonic acid (PFBS)
537.1 DW	537.1 DW	Water	Perfluorodecanoic acid (PFDA)
537.1 DW	537.1 DW	Water	Perfluorododecanoic acid (PFDoA)
537.1 DW	537.1 DW	Water	Perfluoroheptanoic acid (PFHpA)
537.1 DW	537.1 DW	Water	Perfluorohexanesulfonic acid (PFHxS)
537.1 DW	537.1 DW	Water	Perfluorohexanoic acid (PFHxA)
537.1 DW	537.1 DW	Water	Perfluorononanoic acid (PFNA)
537.1 DW	537.1 DW	Water	Perfluorooctanesulfonic acid (PFOS)
537.1 DW	537.1 DW	Water	Perfluorooctanoic acid (PFOA)
537.1 DW	537.1 DW	Water	Perfluorotetradecanoic acid (PFTeA)
537.1 DW	537.1 DW	Water	Perfluorotridecanoic acid (PFTrDA)
537.1 DW	537.1 DW	Water	Perfluoroundecanoic acid (PFUnA)

Method Summary

Client: PBS Engineering and Environmental
Project/Site: FTA

Job ID: 320-95381-1

Method	Method Description	Protocol	Laboratory
537.1 DW	Perfluorinated Alkyl Acids (LC/MS)	EPA	EET SAC
537.1 DW	Extraction of Perfluorinated Alkyl Acids	EPA	EET SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

Client: PBS Engineering and Environmental
Project/Site: FTA

Job ID: 320-95381-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-95381-1	PH-2	Water	12/15/22 12:00	12/16/22 09:30
320-95381-2	OHall-1	Water	12/15/22 11:25	12/16/22 09:30
320-95381-3	Dorm-1	Water	12/15/22 11:45	12/16/22 09:30

Address: _____

Chain of Custody Record 588495

eurofins | Environment Testing TestAmerica

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

TAL-8210

Client Contact	Project Manager: Ken Nogiec	Site Contact: M. Bagley	Date: 12/15/22	COC No:
Company Name: PBS	Tel/Email: Ken.Nogiec@pbsusa.com	Lab Contact: A. Salimpour	Carrier:	___1___ of ___1___ COCs
Address: 214 E. Galer St. St. 300	Analysis Turnaround Time			Sampler:
City/State/Zip: Seattle, WA 98102	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: 360 836 2359	TAT if different from Below			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: FTA	☐ 1 week			Job / SDG No.:
Site: FTA	☐ 2 days			
PO # 40535.498	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	EPA Meth. 537.1	Sample Specific Notes:
PH-2	12/15	12:00	G	W	2	N	N	X	
OHall-1	12/15	11:25	G	W	6	N	Y	X	MS
Dorm-1	12/15	11:45	G	W	2	N	N	X	

320-95381 Chain of Custody

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

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

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

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

☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☑ Yes ☐ No | Custody Seal No.: 212381 / 212382 | Cooler Temp. (°C): Obs'd: 0.6 Corr'd: 2.6 Therm ID No.: 6-02

Relinquished by:	Company: PBS	Date/Time: 12/15/22	Received by:	Company:	Date/Time: 12/16/22 930
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

1/3/2023

Login Sample Receipt Checklist

Client: PBS Engineering and Environmental

Job Number: 320-95381-1

Login Number: 95381
List Number: 1
Creator: Oropeza, Salvador

List Source: Eurofins Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	2123816/2123817
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?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	