



Data Report

Snohomish County Airport – Swamp Creek Study Area
3220 100th Street SW, Suite A
Everett, Washington

for
Snohomish County Airport

November 6, 2024

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GEOENGINEERS 

Data Report

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3220 100th Street SW, Suite A
Everett, Washington

File No. 5530-014-05
November 6, 2024

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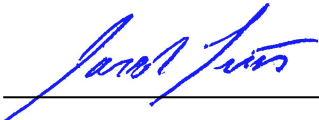
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List of Abbreviations and Acronyms

AFFF	aqueous film forming foam
ASTM	ASTM International
ATS	Aviation Technical Services, Inc.
bgs	below ground surface
CAP	Cleanup Action Plan
CLARC	Ecology's Cleanup Levels and Risk Calculation
COC	chain-of-custody
CUL	cleanup level
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
ERTS	Ecology's Environmental Reports Tracking System
FS	Feasibility Study
FTS	fluorotelomer sulfonate
HDPE	high density polyethylene
HFPO-DA (GenX)	hexafluoropropylene oxide dimer acid, or ammonium (2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)propanoate
IIFR	Initial Investigation Field Report
LDPE	low-density polyethylene
µg/kg	micrograms per kilogram
MCLs	Maximum Contaminant Levels
MTCA	Model Toxics Control Act
ng/L	nanograms per liter
NPDWR	National Primary Drinking Water Regulation
Paine Field/Airport	Paine Field/Snohomish County Airport
PCULs	preliminary cleanup levels
PFAS	per- and polyfluoroalkyl substances
PFBA	perfluorobutanoic acid
PFBS	perfluorobutanesulfonic acid, or perfluorobutane sulfonate
PFDA	perfluorodecanoic acid
PFHpA	perfluoroheptanoic acid
PFHxA	perfluorohexanoic acid, or perfluorohexanoate

PFHxS	perfluorohexane sulfonic acid, or perfluorohexane sulfonate
PFNA	perfluorononanoic acid, or perfluorononanoate
PFOA	perfluorooctanoic acid, or perfluorooctanoate
PFOS	perfluorooctane sulfonic acid, or perfluorooctane sulfonate
PFPeA	perfluoropentanoic acid
PFPeS	perfluoropentanesulfonic acid
PFUnA	perfluoroundecanoic acid
QAPP	quality assurance project plan
RI	Remedial Investigation
SGS	SGS Laboratories
SOP	standard operating procedure
Study Area	Swamp Creek basin
SWI	Shannon & Wilson, Inc.
WAC	Washington Administrative Code

1.0 Introduction

This report summarizes the results of the 2024 Supplemental Investigation conducted between January and March 2024 at the Swamp Creek Study Area located at the Paine Field/Snohomish County Airport (Paine Field/Airport). The Swamp Creek Study Area is located at the southeastern boundary of Paine Field adjacent to Airport Road and Beverly Park Road (Vicinity Map, Figure 1 and Site Plan and Sample Locations, Figure 2) and is situated within the Swamp Creek Drainage Basin. Aqueous film forming foam (AFFF) released from the Airport's tenant Aviation Technical Services (ATS) Hangar 1 Building in the 1990s through 2010s discharged to the Airport stormwater conveyance system, which consists of a series of stormwater drainages and ponds that ultimately discharge to Swamp Creek. The Airport conducted an initial per- and polyfluoroalkyl substances (PFAS) investigation in 2022 at the Swamp Creek Study Area that also included soil, groundwater and/or surface water sampling in Big Gulch Creek Subbasin 9, located in the southern portion of the Airport (Figure 1). The Swamp Creek portion of the 2022 investigation consisted of collecting one soil sample adjacent to a stormwater outfall (Figure 2), which had detectable concentrations of PFAS (Shannon & Wilson Inc. [SWI] 2022). No other sampling was completed at the Swamp Creek Study Area in 2022. The purpose of the 2024 supplemental investigation was to confirm the results of the 2022 investigation and to further characterize soil and surface water PFAS conditions and evaluate catch basin solids within the Swamp Creek Drainage Basin on the airport. Throughout this report, the term "study area" is used to describe the area of investigation at the Airport, and the term "Site" is used to describe the areas where PFAS have been detected in soil or surface water at concentrations greater than applicable cleanup standards.

2.0 Regulatory Framework

The results of the 2022 Swamp Creek soil sampling were reported to the Washington State Department of Ecology (Ecology) in a report that included the results of investigations completed for the Swamp Creek and Big Gulch Creek Subbasin 9 areas. Ecology completed an Initial Investigation Field Report (IIFR) on December 27, 2022 for Big Gulch Creek Subbasin 9 following review of the 2022 sampling data. The IIFR recommended the Site be added to the Confirmed and Suspected Contaminated Sites list. Ecology issued an Early Notice Letter for the "Big Gulch Creek Sub-basin 9" Site on April 18, 2023, and assigned Cleanup Site ID: 16778; Facility/Site ID: 9999916.

3.0 Location and Land Use

The Swamp Creek Study Area is located at the southeastern portion of the Paine Field Airport property in unincorporated Snohomish County (Figure 1). Most of the study area consists of mowed grass fields and paved surfaces surrounding hangars, taxiways and flight aprons. Commercial land use in the study area includes businesses and the Airport Road Recycling and Transfer Station (Figure 2). Stormwater from these operations is a major surface water input to Swamp Creek and is discussed in Section 3.2 below. A database review of current surface water and groundwater uses was completed for a 1-mile radius of the Swamp Creek Study Area (see Section 6.0 and Appendix A).

3.1 PHYSIOGRAPHIC SETTING AND CLIMATE

The Swamp Creek Study Area is situated in a broad glacial upland comprised of glacial till deposited during the Pleistocene Fraser glaciation (USGS 1982) with localized fill deposits in developed areas. Several streams and lakes are present east and/or southeast of the study area (see Figure 1). The elevation at the Snohomish County Airport is approximately 600 feet above sea level, with minor elevation difference forming drainage divides that define four separate drainage basins. The southern drainage basin at the Airport, identified as the Swamp Creek Drainage Basin, includes the Swamp Creek Study Area; surface water in this area discharges to Swamp Creek and Lake Washington before reaching Puget Sound.

Local climate and rainfall in this area of the Puget Lowland is influenced by marine air masses that form over the Pacific Ocean. These combine to generate a cool, wet season between September and April and a warm, dry season between May and August (US Climate Data 2024). The average annual precipitation recorded in Everett is about 36 inches based on data from the Western Regional Climate Center. Precipitation during the months of November through January averages 4.8 inches per month, whereas the average monthly precipitation in July through September is approximately 1.6 inches.

3.2 STORMWATER DRAINAGE AND UTILITY NETWORK

Stormwater originating from the southeastern portion of the Airport, including the Swamp Creek Study Area, is conveyed through a network of catch basins, enclosed pipes, trenches and wetlands to a stormwater detention pond located west of the intersection of Beverly Park Road and Airport Road (Figure 2). Stormwater originating from the following areas discharges to the detention pond: the eastern portion of the ATS Hangar 1 Building, Runway 16L/34R, private airplane hangars (Airport Buildings C-13 through C-18), Airport Buildings C-19 through C-23, Minuteman Drive, Beverly Park Road, and the Airport Road Recycling and Transfer Station (see Figure 2). Surface water in the detention pond discharges to the York Creek Tributary of Swamp Creek (Figures 1 and 2). York Creek flows into Swamp Creek, which feeds a small un-named water body and Lake Stickney further to the south before ultimately discharging to Lake Washington approximately 10 miles south of the Airport.

Stormwater originating at the ATS Hangar 1 Building, where releases of AFFF were documented in the 1990s through 2010s, is conveyed north and east across the Airport Runway 16L/34R, to the south of Buildings C-13 through C-18, beneath Minuteman Drive, and discharges through a stormwater outfall into Wetland P2/Stream (Figure 2). Surface water in Wetland P2/Stream flows southeast to a catch basin located southeast of the Airport Road Recycling and Transfer Station and enters a stormwater pipe, which conveys the water southwest and into the stormwater detention pond located north of Beverly Park Road. Stormwater in the detention pond exits the pond through a stormwater pipe inlet at Beverly Park Road and discharges to the York Creek Tributary of Swamp Creek (Figure 2).

4.0 2022 Soil Sampling

The Airport conducted a focused soil, groundwater and surface water investigation in 2022 at various locations in the Big Gulch Creek Drainage Subbasin 9 and Swamp Creek Drainage Basins, located in the southern portion of the Airport, to evaluate the two stormwater drainage areas for the potential presence of PFAS associated with historical releases of AFFF (SWI 2022). The investigation included the collection of one soil sample in the Swamp Creek Drainage Subbasin 8 at a location that receives stormwater from the

eastern portion of the Airport. The soil sample was collected approximately 8 feet downstream of an outfall pipe located between Minuteman Drive and the Airport Road Recycling and Transfer Station (BFG-HA2; see Figure 2). Perfluorohexanoic acid (PFHxA) was detected in the soil sample at concentrations greater than laboratory reporting limits (Table 1). No other PFAS were detected at concentrations greater than laboratory reporting limits; however, it is noted that the reporting limits for the soil sample collected from boring BFG-HA2 are elevated relative to the soil preliminary cleanup levels (PCULs). The findings from the soil sampling conducted in the Swamp Creek Drainage Subbasin 8 were reported together with the sampling results for the Big Gulch Creek Subbasin 9 (SWI 2022).

5.0 2024 Supplemental Investigation Results

The objectives of the 2024 Supplemental Investigation at the Swamp Creek Study Area were to further evaluate the extent of PFAS identified in soil during the 2022 investigation and evaluate stormwater catch basin solids and surface water for the presence of PFAS. The 2024 investigation did not include collection of groundwater samples. Exploration locations are shown on Figure 2. Soil/catch basin solids and surface water analytical results are summarized and compared to Ecology's PCULs in Tables 1 and 2, respectively (see Section 5.2). Field procedures and boring logs are included in Appendix B, and the laboratory analytical report is presented in Appendix C.

5.1 FIELD INVESTIGATION

Soil, catch basin solids and surface water samples were collected from the Study Area following the standard operating procedures for PFAS sampling described in Appendix B. The exploration locations shown on Figure 2, were selected based on the findings of the 2022 investigation and the configuration of the stormwater conveyance network in this portion of the Airport. Soil, catch basin solids, and surface water samples were delivered to SGS Laboratories (SGS) in Orlando, Florida (USEPA Federal Identification Number FL00946) for analysis of PFAS via U.S. Environmental Protection Agency (EPA) Method 1633.

5.1.1 Soil Sampling

Four soil samples were collected from two hand auger borings (SC-B1 and SC-B2) completed on February 12, 2024. Boring SC-B1 was completed downgradient of the stormwater outfall located south of Minuteman Drive. Boring SC-B2 was completed near the southeastern portion of the study area near Wetland P2/Stream upgradient of the stormwater detention pond. The hand auger borings were completed to depths of approximately 2.0 feet below ground surface (bgs). Soil conditions generally consisted of dark brown sand, silty fine sand with varying amounts of gravel or wood chips. Soil samples were collected from boring SC-B1 at depths of 1- and 2- feet bgs and from boring SC-B2 at depths of 0.5- and 2-feet bgs and submitted for laboratory analysis.

5.1.2 Catch Basin Sampling

One catch basin solids grab sample (SC-CB1) was collected from a stormwater catch basin located along Minuteman Drive, at the input to the enclosed pipe that discharges into Wetland P2/Stream (see Figure 2) and submitted for laboratory analysis. The sample was brown to gray in color and consisted of medium to coarse gravel with trace sand.

5.1.3 Surface Water Sampling

Two grab surface water samples (SC-SW1 and SC-SW2) were collected from locations that receive stormwater from the eastern portion of the Airport, including from the eastern portion of the ATS Hangar 1 Building. Sample SC-SW1 was collected at the upstream end of Wetland P2/Stream at the location where stormwater originating from the ATS Hangar 1 and Buildings C-13 through C-18 discharges (see Figure 2). Sample SC-SW2 was collected from the detention pond where surface water from the Swamp Creek wetlands leaves Airport property through an enclosed pipe under Beverly Park Road.

5.2 PRELIMINARY CLEANUP LEVELS

The screening levels presented in this report are based on the currently available regulatory requirements established by Ecology with the understanding that regulations for an emerging contaminant group such as PFAS may evolve over time. In June 2023, Ecology published guidance for investigating and remediating PFAS contamination (Ecology 2023) that included PCULs based on State Action Levels for drinking water for the following eight compounds: perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorononanoic acid (PFNA), perfluorohexane sulfonic acid (PFHxS), perfluorobutanesulfonic acid (PFBS), perfluorobutanoic acid (PFBA), PFHxA, and hexafluoropropylene oxide dimer acid (HFPO-DA [GenX]). On April 10, 2024, the EPA announced the final National Primary Drinking Water Regulation (NPDWR), which established Maximum Contaminant Levels (MCLs) for drinking water for the following five PFAS: PFOA, PFOS, PFHxS, PFNA and HFPO-DA. Additionally, a Hazard Index MCL was established for mixtures containing two or more of PFHxS, PFNA, HFPO-DA and PFBS. Ecology revised the June 2023 groundwater PCULs to match the new EPA MCLs and calculated new soil PCULs considering the EPA MCLs. The revised soil and groundwater PCULs were published in Ecology's Cleanup Levels and Risk Calculation (CLARC) data tables in July 2024.

Surface water cleanup levels are assumed to be based on the protection of potable water if surface water is or could potentially be used as a drinking water source (Ecology 2023). Default standard Methods B and C cleanup levels for PFAS chemicals in surface water are not available because chemical-specific bioconcentration factors have not been published by the EPA. Surface water at Swamp Creek is not currently used as a source of drinking water and is unlikely to be used as a future source of drinking water based on current and future anticipated uses at the Airport and surrounding area. However, the applicability of PCULs for surface water at Swamp Creek was also evaluated using the criteria published in Washington Administrative Code (WAC) 173-201A-600 (Use Designations for Fresh Waters). The Use Designations for Fresh Waters designates "All lakes and all feeder streams to lakes" as core summer salmonid use designation. Because Swamp Creek is a tributary to Lake Washington, the most conservative potable water-based PCULs for groundwater are applied to surface water in this report. Cleanup standards applicable to the Swamp Creek Study Area have not been selected by Ecology.

5.3 LABORATORY ANALYTICAL RESULTS

The following section describes the laboratory analytical results for PFAS in soil, catch basin solids and surface water at Swamp Creek. As discussed in Section 5.2, Ecology has established PCULs for the following eight PFAS compounds: PFOA, PFOS, PFNA, PFHxS, HFPO-DA, PFHxA, PFBS and PFBA. The PCULs for these eight PFAS compounds are used to evaluate the impacts at the Swamp Creek Study Area. Cleanup levels have not been established for other PFAS compounds. Summaries of laboratory analytical results are

presented below and in Tables 1 and 2. Sample Chemical Analytical Results, Figure 3, shows the locations of 2022 and 2024 samples and the analytical results for the eight PFAS compounds regulated by Ecology.

5.3.1 Soil Analytical Results (Table 1)

PFOS was detected in the soil sample collected from a depth of 1-foot bgs in boring SC-B1 at an estimated concentration of 0.16 micrograms per kilogram ($\mu\text{g}/\text{kg}$), which exceeds the PCUL for saturated soil of 0.0026 $\mu\text{g}/\text{kg}$. Boring SC-B1 was completed near the outfall into Wetland P2/Stream (see Figure 3). No other PFAS were detected at concentrations greater than laboratory reporting limits in the two soil samples collected from boring SC-B1.

PFOA, PFOS, PFNA and/or PFHxS were detected in soil samples collected from depths of 0.5 and 2 feet bgs in boring SC-B2, completed near the southern end of Wetland P2/Stream (see Figure 3), at concentrations greater than their respective PCULs. The detected concentrations ranged from 0.22 $\mu\text{g}/\text{kg}$ to 1.7 $\mu\text{g}/\text{kg}$. PFOS was the analyte with the highest detected concentration (1.7 $\mu\text{g}/\text{kg}$) in the soil sample collected from a depth of 0.5 feet bgs, which exceeds the PCUL for saturated soil of 0.0026 $\mu\text{g}/\text{kg}$. Other PFAS that were either detected in the two soil samples at concentrations less than their respective PCULs or which do not have established PCULs include: PFBA, PFHxA, perfluoropentanoic acid (PFPeA), perfluoroheptanoic acid (PFHpA), perfluorodecanoic acid (PFDA) and perfluoroundecanoic acid (PFUnA). No other PFAS were detected in the two soil samples collected from boring SC-B2. No trend was observed with respect to the depth of the collected sample and the detected PFAS concentrations.

The combination of PFOA, PFOS, PFNA and PFHxS detected in soil adjacent to Wetland 2/Stream may indicate a release of first-generation AFFF.

5.3.2 Catch Basin Solids Analytical Results (Table 1)

PFAS were not detected in the catch basin solids sample except for 8:2 fluorotelomer sulfonate (FTS), which was detected at an approximate concentration of 1 $\mu\text{g}/\text{kg}$. 8:2 FTS does not have an established cleanup standard that could serve as a screening level; comparison to soil PFAS PCULs is not interpreted as applicable to solid materials in stormwater catch basins but is included for informational purposes only.

5.3.3 Surface Water Analytical Results (Table 2)

PFOS was detected in surface water sample SC-SW1, collected near the outfall into Wetland P2/Stream south of Minuteman Drive, at a concentration of 5.6 nanograms per liter (ng/L), which exceeds the PCUL of 4 ng/L (Figure 3). PFOA, PFNA, PFHxS, PFBS, PFHxA, PFPeA and PFHpA were detected at concentrations less than their respective PCULs (if established).

PFOA, PFOS and PFHxS were detected in surface water sample SC-SW2, collected from the stormwater detention pond north of Beverly Park Road, at concentrations exceeding their respective PCULs. Detected concentrations of PFOA (6 ng/L) and PFOS (11.7 ng/L) exceeded the PCULs of 4 ng/L and the detected concentration of PFHxS (13.3 ng/L) exceeded the PCUL of 10 ng/L . PFNA, PFBS, PFBA, PFHxA, PFPeA, PFHpA and perfluoropentanesulfonic acid (PFPeS) were also detected at concentrations less than their respective PCULs (if established).

The combination of PFOA, PFOS, PFNA and PFHxS detected in surface water in Wetland 2/Stream and in surface water within the stormwater detention pond may indicate a release of first generation AFFF.

6.0 Beneficial Water User Database Review

Available information was reviewed to identify current or potential future surface water and groundwater users within a 1-mile radius of the stormwater detention pond that discharges to the York Creek Tributary of Swamp Creek. Available information reviewed included the following online resources:

- Snohomish County Drainage Inventory (County GIS portal)
- Mukilteo Stormwater Network Viewer (City GIS portal)
- Map Everett (City GIS portal)
- Alderwood Water and Wastewater District
- Washington Department of Ecology Well Report Database
- Washington Department of Ecology Water Rights Database
- Washington Department of Health Source Water Assessment Program (GIS portal)
- Washington Geological Survey (GIS portal)

Based on the available information reviewed, no active water supply wells or other beneficial uses were identified within a 1-mile radius of the Swamp Creek Study Area stormwater detention pond. Three active water rights claims from 1974 were identified within the search radius at a location northeast and hydraulically cross-gradient to the study area (see Database Review – Mapped Findings , Figure A-1). Two additional water rights claims from 1974 were identified south of the study area and just outside the search radius at a location west of Swamp Creek. Based on the age and location of the claims, the potential for surface water conditions at the Swamp Creek Study Area to have impacted groundwater and/or surface water associated with these claims is low. The findings of the Beneficial Water User Database Review are presented in Appendix A.

7.0 Conclusions

The results of the sampling completed in the Swamp Creek Study Area in 2024 have confirmed the presence of PFAS in soil and surface water at concentrations greater than applicable PCULs. PFAS-impacted surface water originating from the eastern portion of the Airport collects in the stormwater detention pond located southeast of Beverly Park Road before discharging off-property to the York Creek Tributary of Swamp Creek. In the Swamp Creek Study Area, the extents of PFAS in soil and surface water at concentrations greater than the PCULs have not been fully characterized. Stormwater solids in the Swamp Creek Study Area have not been fully characterized and groundwater conditions have not yet been assessed.

The analytical results from the 2024 Supplemental Investigation indicate PFAS compounds detected in soil and surface water in the study area that may be indicative of releases of first generation legacy AFFF. PFOA, PFOS, PFNA and PFHxS were detected in soil, and PFOA, PFOS and PFHxS were detected in surface water, at concentrations exceeding their respective PCULs during the 2024 investigation. PFOS is the compound with the highest detected concentrations in both soil and surface water. One solids sample collected from the catch basin had a detectable concentration of 8:2 FTS, which may be indicative of a release of fluorotelomer-based AFFF. Other PFAS compounds were detected in soil and/or surface water at the Study

Area, but the detected concentrations were either less than their respective PCULs, or the compound has no established PCUL. Future sampling events to further define the nature and extent of PFAS compounds may help to inform the overall fate and transport of PFAS for the Swamp Creek Site.

The depth of PFAS in soil exceeding the PCULs was not determined during the investigation. Based on the sloped topography of the wetlands, the lateral delineation for PFAS in soil is assumed to be the upland margins of the wetland areas; AFFF releases discharging from the ATS Hangar 1 Building have not likely impacted soils outside the wetland boundaries due to the surrounding paved surfaces and enclosed stormwater conveyance system.

Surface water in the Swamp Creek Site stormwater detention pond, which receives stormwater input from the eastern portion of the Airport, exits the pond through a stormwater outlet into the York Creek Tributary of Swamp Creek south of Beverly Park Road and off Airport property (Figures 2 and 3). Surface water conditions downstream of the stormwater detention pond have not been assessed. Additional investigation will be needed to complete a Site Remedial Investigation (RI) and Feasibility Study (FS) and Cleanup Action Plan (CAP). Future evaluation for potential interim remedial actions may be warranted; Paine Field will work in coordination with Ecology to determine appropriate interim measures, as needed, prior to implementation.

8.0 Limitations

We have prepared this report for the exclusive use of the Snohomish County Airport and their authorized agents and regulatory agencies. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices in this area at the time this report was prepared. The conclusions and opinions presented in this report are based on our professional knowledge, judgment, and experience. No warranty or other conditions, express or implied, should be understood.

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Please refer to Appendix D titled “Report Limitations and Guidelines for Use” for additional information pertaining to use of this report.

9.0 References

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Tables

Table 1
Soil and Catch Basin Solids Analytical Results¹
Per- and Polyfluoroalkyl Substances (PFAS)
Swamp Creek Study Area, Snohomish County Airport
Everett, Washington

Sample Location	Sample Identification ²	Sample Date	Sample Depth (feet bgs)	Analyte Group	EPA Method 1633 Per- and Polyfluoroalkyl Substances (µg/kg)														
				Washington PCUL								Carboxylic Acids							
				Analyte Name	Perfluorooctanoic acid	Perfluorooctanesulfonic acid	Perfluorononanoic acid	Perfluorohexanesulfonic acid	Perfluorobutanesulfonic acid	Perfluorobutanoic acid	Perfluorohexanoic acid	Hexafluoropropylene oxide dimer acid	3:3 Fluorotelomer carboxylate	5:3 Fluorotelomer carboxylate	7:3 Fluorotelomer carboxylate	4.8-Dioxo-3H-perfluorononanoic acid	Nonafluoro-3,6-dioxaheptanoic acid	Perfluoropentanoic acid	
				Abbreviation	PFOA	PFOS	PFNA	PFHxS	PFBS	PFBA	PFHxA	HFPO-DA (GenX)	3:3FTCA	5:3FTCA	7:3FTCA	ADONA	NFDHA	PFPeA	
2024 Soil Results (µg/kg)																			
SC-B1	SC-B1-1.0	02/12/2024	1.0	Vadose	0.12 U	0.16 J	0.14 U	0.19 U	0.12 U	0.6 U	0.12 U	0.34 U	0.61 U	1.4 U	1.5 U	0.4 U	0.29 U	0.12 U	
	SC-B1-2.0	02/12/2024	2.0	Vadose	0.12 U	0.12 U	0.14 U	0.19 U	0.12 U	0.61 U	0.12 U	0.35 U	0.62 U	1.4 U	1.5 U	0.41 U	0.3 U	0.12 U	
SC-B2	SC-B2-0.5	02/12/2024	0.5	Vadose	0.38	1.7	0.44	0.23 U	0.14 U	0.72 U	0.21 J	0.41 U	0.73 U	1.7 U	1.8 U	0.48 U	0.35 U	0.66	
	SC-B2-2.0	02/12/2024	2.0	Vadose	1.2	0.54	0.22 J	0.23 J	0.13 U	0.71 J	0.47	0.37 U	0.65 U	1.5 U	1.6 U	0.43 U	0.31 U	1.1	
SC-CB1	SC-CB1	02/12/2024	–	N/A	0.16 U	0.16 U	0.18 U	0.25 U	0.16 U	0.78 U	0.16 U	0.45 U	0.79 U	1.8 U	2 U	0.52 U	0.38 U	0.16 U	
Previous Investigation - SWI 2022 (µg/kg)																			
BFG-HA2	BFG-HA2:0.8	06/15/2022	0.8		0.25 U	0.26 U	0.24 U	0.23 U	0.23 U	–	0.12 J	0.23 U	–	–	–	0.23 U	–	–	
Soil Protective of Groundwater - Preliminary Cleanup Level (µg/kg) - Vadose ³					0.025	0.046	0.089	0.062	25	44	35	0.12	NE	NE	NE	NE	NE	NE	
Soil Protective of Groundwater - Preliminary Cleanup Level (µg/kg) - Saturated ³					0.0016	0.0026	0.0053	0.004	1.7	2.5	2.5	0.0069	NE	NE	NE	NE	NE	NE	

Sample Location	Sample Identification ²	Sample Date	Sample Depth (feet bgs)	Analyte Group	EPA Method 1633 Per- and Polyfluoroalkyl Substances (µg/kg)													
				Carboxylic Acids (continued)								Sulfonic Acids						
				Analyte Name	Perfluoroheptanoic acid	Perfluorodecanoic acid	Perfluoroundecanoic acid	Perfluorododecanoic acid	Perfluorotridecanoic acid	Perfluorotetradecanoic acid	Perfluoro-4-methoxybutanoic acid	Perfluoro-3-methoxypropanoic acid	11-Chloroeicosafluoro-3-oxaundecanoic-1-sulfonic acid	4:2 Fluorotelomer sulfonate	6:2 Fluorotelomer sulfonate	8:2 Fluorotelomer sulfonate	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	N-Ethylperfluorooctanesulfonamide
				Abbreviation	PFHpA	PFDA	PFUnA	PFDoDA	PFTeDA	PFTeDS	PFMBA	PFMPA	11Cl-PF30UdS (F-53B Minor)	4:2FTS	6:2FTS	8:2FTS	9Cl-PF30NS (F-53B Major)	EtFOSA
2024 Soil Results (µg/kg)																		
SC-B1	SC-B1-1.0	02/12/2024	1.0	Vadose	0.12 U	0.12 U	0.16 U	0.12 U	0.12 U	0.12 U	0.24 U	0.24 U	0.48 U	0.48 U	0.48 U	0.72 U	0.52 U	0.12 U
	SC-B1-2.0	02/12/2024	2.0	Vadose	0.12 U	0.12 U	0.16 U	0.12 U	0.12 U	0.12 U	0.24 U	0.24 U	0.49 U	0.49 U	0.49 U	0.73 U	0.53 U	0.12 U
SC-B2	SC-B2-0.5	02/12/2024	0.5	Vadose	0.19 J	0.26 J	0.21 J	0.14 U	0.15 U	0.14 U	0.29 U	0.29 U	0.57 U	0.57 U	0.57 U	0.86 U	0.63 U	0.14 U
	SC-B2-2.0	02/12/2024	2.0	Vadose	0.61	0.13 U	0.17 U	0.13 U	0.13 U	0.13 U	0.25 U	0.25 U	0.51 U	0.51 U	0.51 U	0.76 U	0.56 U	0.13 U
SC-CB1	SC-CB1	02/12/2024	--	N/A	0.16 U	0.16 U	0.21 U	0.16 U	0.16 U	0.16 U	0.31 U	0.31 U	0.62 U	0.62 U	0.62 U	1 J	0.68 U	0.16 U
Previous Investigation - SWI 2022 (µg/kg)																		
BFG-HA2	BFG-HA2:0.8	06/15/2022	0.8		0.23 U	0.23 U	0.29 U	0.23 U	0.28 U	0.27 U	--	--	0.31 U	--	--	--	0.30 U	--
Soil Protective of Groundwater - Preliminary Cleanup Level (µg/kg) - Vadose ³					NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Soil Protective of Groundwater - Preliminary Cleanup Level (µg/kg) - Saturated ³					NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Sample Location	Sample Identification ²	Sample Date	Sample Depth (feet bgs)	Analyte Group	EPA Method 1633 Per- and Polyfluoroalkyl Substances (µg/kg)											
				Sulfonic Acids (continued)												
				Analyte Name	N-Ethyl perfluorooctane sulonamidoacetic acid	N-Ethylperfluoro octanesulfonamidoethanol	N-Methylperfluorooctanesulfonamide	N-Methyl perfluorooctane sulfonamidoacetic acid	N-Methylperfluorooctanesulfonamidoethanol	Perfluorodecanesulfonic acid	Perfluorodecanesulfonic acid	Perfluorohexanesulfonic acid	Perfluorononanesulfonic acid	Perfluorooctanesulfonic acid	Perfluoro (2-ethoxyethane) sulfonic acid	Perfluorooctanesulfonamide
				Abbreviation	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFDS	PFDnDS	PFHpS	PFNS	PFPeS	PFEESA	PFOSA
2024 Soil Results (µg/kg)																
SC-B1	SC-B1-1.0	02/12/2024	1.0	Vadose	0.23 U	1.2 U	0.16 U	0.19 U	1.2 U	0.17 U	0.18 U	0.17 U	0.22 U	0.19 U	0.24 U	0.12 U
	SC-B1-2.0	02/12/2024	2.0	Vadose	0.24 U	1.2 U	0.17 U	0.19 U	1.2 U	0.17 U	0.18 U	0.18 U	0.22 U	0.19 U	0.24 U	0.12 U
SC-B2	SC-B2-0.5	02/12/2024	0.5	Vadose	0.28 U	1.4 U	0.19 U	0.23 U	1.4 U	0.2 U	0.21 U	0.21 U	0.26 U	0.22 U	0.29 U	0.14 U
	SC-B2-2.0	02/12/2024	2.0	Vadose	0.25 U	1.3 U	0.17 U	0.2 U	1.3 U	0.18 U	0.19 U	0.18 U	0.23 U	0.2 U	0.25 U	0.13 U
SC-CB1	SC-CB1	02/12/2024	--	N/A	0.31 U	1.6 U	0.21 U	0.25 U	1.6 U	0.22 U	0.23 U	0.23 U	0.28 U	0.24 U	0.31 U	0.16 U
Previous Investigation - SWI 2022 (µg/kg)																
BFG-HA2	BFG-HA2:0.8	06/15/2022	0.8		0.23 U	--	--	0.23 U	--	--	--	--	--	--	--	--
Soil Protective of Groundwater - Preliminary Cleanup Level (µg/kg) - Vadose ³					NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Soil Protective of Groundwater - Preliminary Cleanup Level (µg/kg) - Saturated ³					NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Notes:

¹ Laboratory analyses performed by SGS. BFG-HA2 laboratory analyses performed by Eurofins for Shannon & Wilson

² The interpretation of vadose and saturated soil samples was determined by GeoEngineers using the field logs.

³ Preliminary soil cleanup levels for PFOA, PFOS, PFNA, PFHxS, PFBS, PFBA, PFHxA, and HFPO-DA (GenX) were established by the Washington State Department of Ecology (Ecology 2024) (EPA 2024).
based on United States Environmental Protection Agency Maximum Contaminant Levels

bgs = below ground surface

µg/kg = micrograms per kilogram

U = Analyte not detected at a concentration greater than the listed reporting limit.

J = Analyte detected at less than reporting level but greater than or equal to the method detection limit and the concentration is an approximate value. Flag applied by the laboratory.

-- = Not analyzed

NE = Not established

Bolded value indicates analyte detected at the concentration shown.

Gray shaded value indicates the detected concentration is greater than the Preliminary Cleanup Level.

Italicized value indicates the analyte was not detected but the reporting limit is above the Preliminary Cleanup Level.

Table 2
Surface Water Analytical Results¹
Per- and Polyfluoroalkyl Substances (PFAS)
Swamp Creek Study Area, Snohomish County Airport
Everett, Washington

Sample Location	Sample Identification ²	Sample Date	Analyte Group	EPA Method 1633 Per- and Polyfluoroalkyl Substances (ng/L)													
				Washington PCUL									Carboxylic Acids				
			Analyte Name	Perfluoroocta noic acid	Perfluoroocta nesulfonic acid	Perfluoronona noic acid	Perfluorohexa nesulfonic acid	Perfluorobuta nesulfonic acid	Perfluorobuta noic acid	Perfluorohexa noic acid	Hexafluoropro pylene oxide dimer acid	Hazard Index ³	3:3 Fluorotelomer carboxylate	5:3 Fluorotelomer carboxylate	7:3 Fluorotelomer carboxylate	4.8-Dioxa-3H- perfluoronona noic acid	Nonafluoro- 3,6- dioxaheptanoi c acid
			Abbreviation	PFOA	PFOS	PFNA	PFHxS	PFBS	PFBA	PFHxA	HFPO-DA (GenX)	HI	3:3FTCA	5:3FTCA	7:3FTCA	ADONA	NFDHA
Surface Water Results (ng/L)																	
SC-SW1	SC-SW1-20240212	2/12/2024	Surface Water	1.9	5.6	0.89 J	7.2	0.99 J	3.6 U	3.2	1.8 U	1	4.5 U	9.1 U	9.1 U	1.8 U	1.1 U
SC-SW2	SC-SW2-20240328	3/28/2024	Surface Water	6	11.7	3.2	13.3	1 J	6.8 J	9.5	1.0 U	2	5.2 U	10 U	10 U	2.1 U	1.3 U
Equipment Blank (ng/L)																	
EB	EB-20240212	2/12/2024	Equipment Blank	0.45 U	0.91 U	0.55 U	0.91 U	0.91 U	3.6 U	0.45 U	1.8 U	0	4.5 U	9.1 U	9.1 U	1.8 U	1.1 U
EB	EB2-240328	3/28/2024	Equipment Blank	0.48 U	0.96 U	0.59 U	0.96 U	0.96 U	3.8 U	0.48 U	0.96 U	0	4.8 U	9.6 U	9.6 U	1.9 U	1.2 U
Groundwater Preliminary Cleanup Level (ng/L) ³				4	4	10	10	4,800	8,000	8,000	10	1	NE	NE	NE	NE	NE

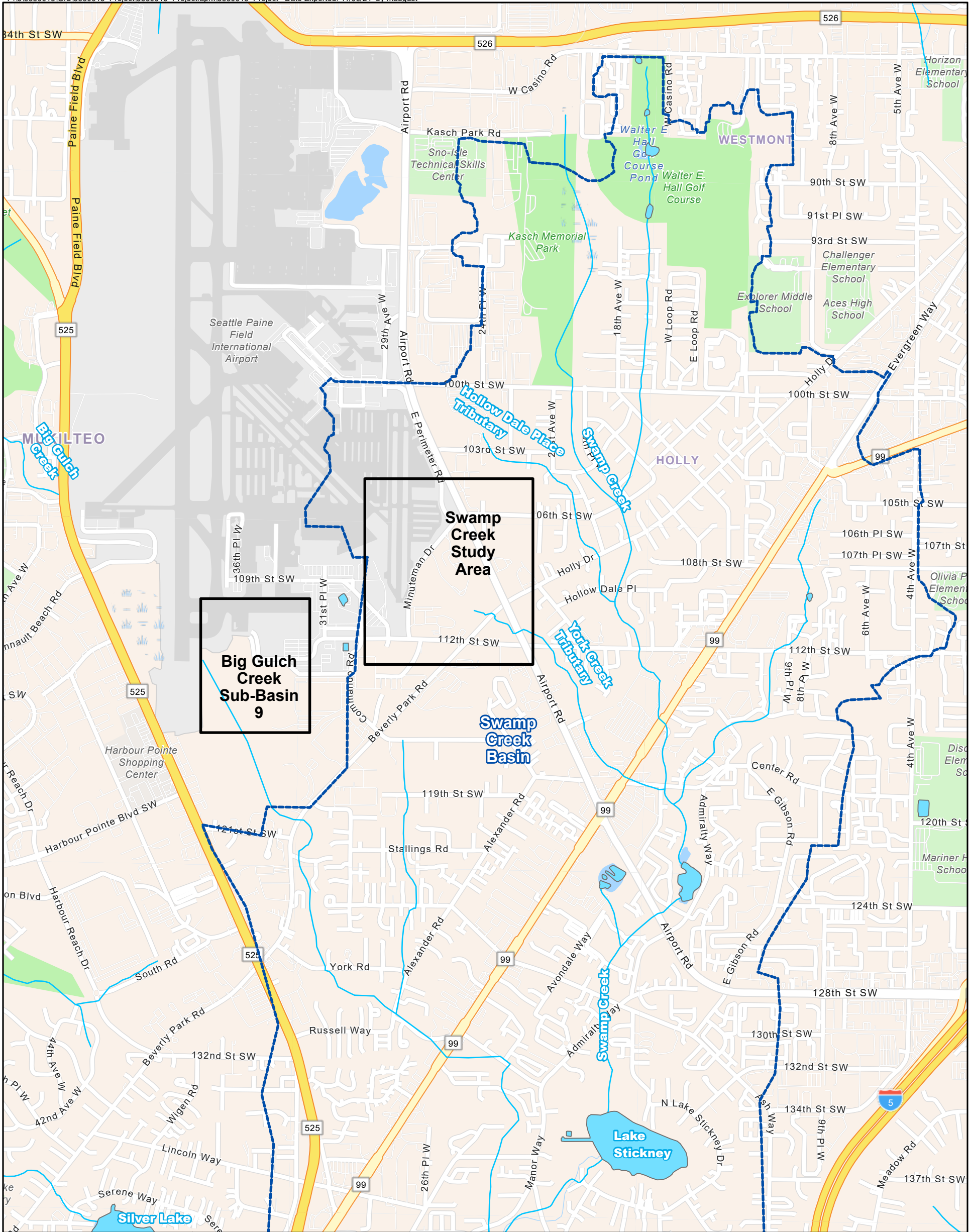
Sample Location	Sample Identification ²	Sample Date	Analyte Group	EPA Method 1633 Per- and Polyfluoroalkyl Substances (ng/L)														
				Carboxylic Acids (continued)								Sulfonic Acids						
			Analyte Name	Perfluoropentanoic acid	Perfluoroheptanoic acid	Perfluorodecanoic acid	Perfluoroundecanoic acid	Perfluorododecanoic acid	Perfluorotridecanoic acid	Perfluorotetradecanoic acid	Perfluoro-4-methoxybutanoic acid	Perfluoro-3-methoxypropanoic acid	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	4:2-Fluorotelomer sulfonate	6:2-Fluorotelomer sulfonate	8:2-Fluorotelomer sulfonate	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	N-Ethylperfluorooctanesulfonamide
			Abbreviation	PFPeA	PFHpA	PFDA	PFUnA	PFDODA	PFTeDA	PFTeDS	PFMBA	PFMPA	11Cl-PF30UdS (F-53B Minor)	4:2FTS	6:2FTS	8:2FTS	9Cl-PF30NS (F-53B Major)	EtFOSA
Surface Water Results (ng/L)																		
SC-SW1	SC-SW1-20240212	2/12/2024	Surface Water	5.5	3.2	0.45 U	0.55 U	0.55 U	0.76 U	0.45 U	1.0 U	0.91 U	1.8 U	3.6 U	3.6 U	3.7 U	1.8 U	0.91 U
SC-SW2	SC-SW2-20240328	3/28/2024	Surface Water	13.7	6.6	0.54 J	0.63 U	0.63 U	0.88 U	0.52 U	1.2 U	1.0 U	2.1 U	4.2 U	7.9 J	4.3 U	2.1 U	1.0 U
Equipment Blank (ng/L)																		
EB	EB-20240212	2/12/2024	Equipment Blank	0.91 U	0.45 U	0.45 U	0.55 U	0.55 U	0.76 U	0.45 U	1.0 U	0.91 U	1.8 U	3.6 U	3.6 U	3.7 U	1.8 U	0.91 U
EB	EB2-240328	3/28/2024	Equipment Blank	0.96 U	0.48 U	0.48 U	0.58 U	0.58 U	0.81 U	0.48 U	1.1 U	0.96 U	1.9 U	3.8 U	3.8 U	4.0 U	1.9 U	0.96 U
Groundwater Preliminary Cleanup Level (ng/L) ³				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Sample Location	Sample Identification ²	Sample Date	Analyte Group	EPA Method 1633 Per- and Polyfluoroalkyl Substances (ng/L)											
				Sulfonic Acids (continued)											
			Analyte Name	N-Ethylperfluorooctanesulphonamidoacetic acid	N-Ethylperfluorooctanesulfonamidothanol	N-Methylperfluorooctanesulfonamide	N-Methylperfluorooctanesulfonamidoacetic acid	N-Methylperfluorooctanesulfonamidothanol	Perfluorodecanesulfonic acid	Perfluorodecanesulfonic acid	Perfluorooctanesulfonic acid	Perfluorononanesulfonic acid	Perfluorooctanesulfonic acid	Perfluoro(2-ethoxyethane)sulfonic acid	Perfluorooctanesulfonamide
			Abbreviation	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFDS	PFDoDS	PFHpS	PFNS	PFPeS	PFEESA	PFOSA
Surface Water Results (ng/L)															
SC-SW1	SC-SW1-20240212	2/12/2024	Surface Water	1.2 U	9.1 U	0.91 U	0.91 U	9.1 U	0.91 U	1.0 U	0.91 U	0.91 U	1.0 U	0.91 U	0.91 U
SC-SW2	SC-SW2-20240328	3/28/2024	Surface Water	1.4 U	10 U	1.0 U	1.0 U	10 U	1.0 U	1.2 U	1.0 U	1.0 U	1.6 J	1.0 U	1.0 U
Equipment Blank (ng/L)															
EB	EB-20240212	2/12/2024	Equipment Blank	1.2 U	9.1 U	0.91 U	0.91 U	9.1 U	0.91 U	1.0 U	0.91 U	0.91 U	1.0 U	0.91 U	0.91 U
EB	EB2-240328	3/28/2024	Equipment Blank	1.3 U	9.6 U	0.96 U	0.96 U	9.6 U	0.96 U	1.1 U	0.96 U	0.96 U	1.1 U	0.96 U	0.96 U
Groundwater Preliminary Cleanup Level (ng/L) ³				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Notes:

- ¹ Laboratory analyses performed by SGS.
- ² Groundwater preliminary cleanup levels for PFOA, PFOS, PFNA, PFHxS, PFBS, PFBA, PFHxA, and HFPO-DA (GenX) were established by the Washington State Department of Ecology Contaminant Levels (EPA 2024). (Ecology 2024) based on U.S. Environmental Protection Agency Maximum
- ³ Hazard Index calculated according to methods established by the Washington State Department of Ecology (Ecology 2024), based on concentrations of PFNA, PFHxS, PFBS, and HFPO-DA (GenX).
- ng/L = nanograms per liter
- U = Analyte not detected at a concentration greater than the listed reporting limit.
- J = Analyte detected at less than reporting level but greater than or equal to the method detection limit and the concentration is an approximate value. Flag applied by the laboratory.
- = Not analyzed
- NE = Not established
- Bolded** value indicates analyte detected at the concentration shown.
- Gray shaded value indicates the detected concentration is greater than the Preliminary Cleanup Level.
- Italicized* value indicates the analyte was not detected but the reporting limit is above the Preliminary Cleanup Level.


Figures

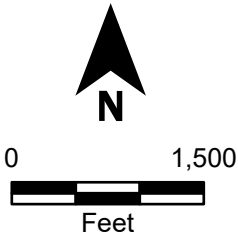



Source(s): ESRI

Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
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Legend

 Swamp Creek Drainage Basin (City of Everett 2022)



Vicinity Map	
Swamp Creek Study Area Snohomish County Airports, Paine Field Everett, Washington	
	Figure 1



Legend

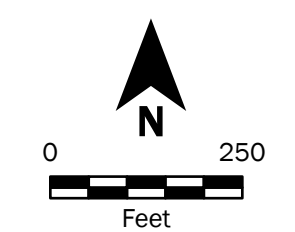
- Tier 1 Boring (GEI 2024)
- Surface Water Sample (GEI 2024)
- Catch Basin Sample (GEI 2024)
- Hand Auger Exploration (SWI 2023)
- Catch Basin
- Bioinfiltration Cell
- Pipe Out/Outfall
- Pipe
- Ditch/Swale
- Detention Pond; Infiltration Pond; Wet Pond
- Vault
- Wetland
- Surface Water Feature



Source(s): Bing Aerial Imagery 2022, ESRI, Snohomish County.

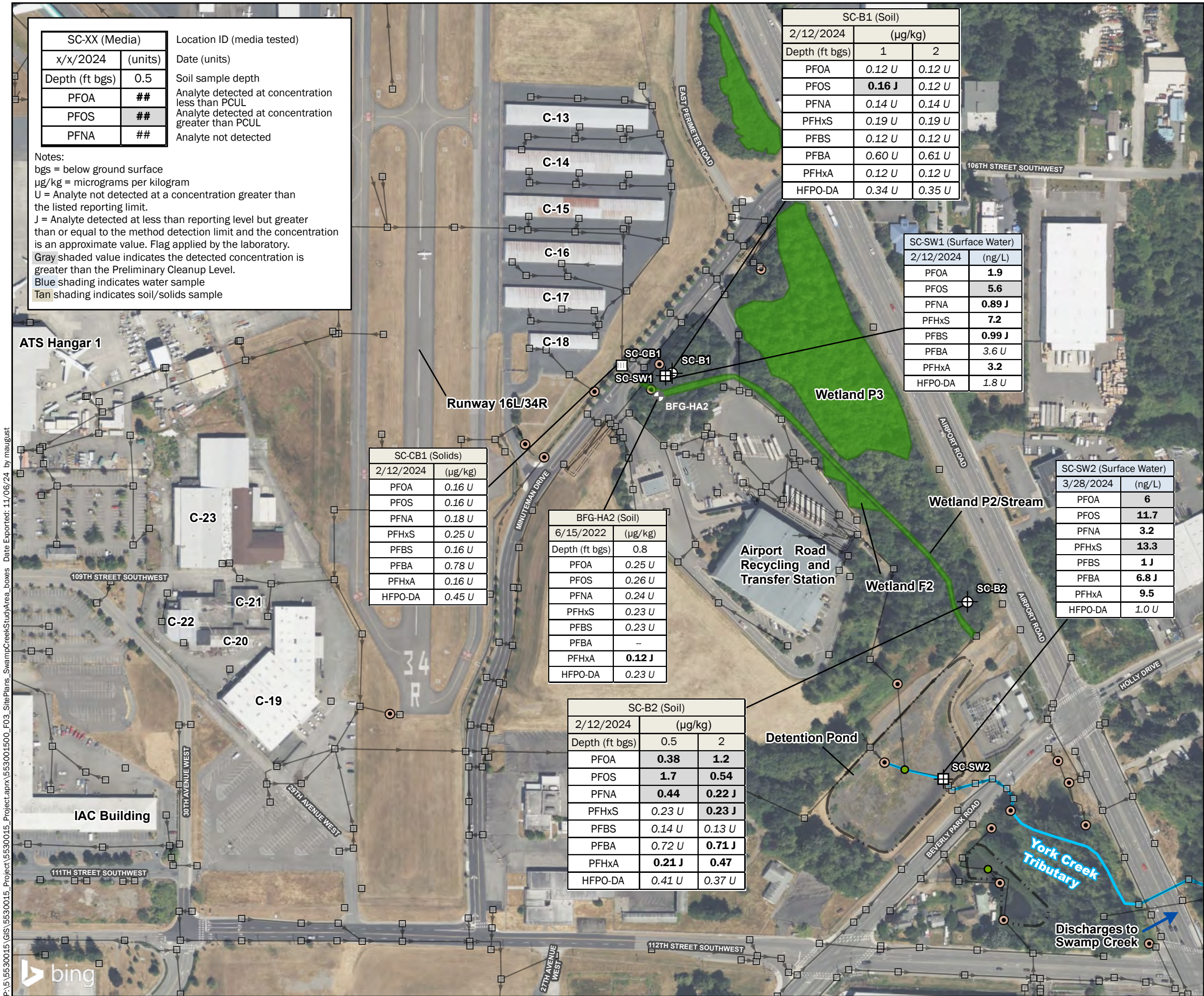
Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet

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Site Plan and Sample Locations	
Swamp Creek Study Area Snohomish County Airports, Paine Field Everett, Washington	
GEOENGINEERS	Figure 2

P:\5530015\GIS\5530015_Project\553001500_F02_SitePlans_SwampCreekStudyArea Date Exported: 11/06/24 by maugust



Source(s): Bing Aerial Imagery 2022, ESRI, Snohomish County.

Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet

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0 250 Feet

Sample Chemical Analytical Results

Swamp Creek Study Area
Snohomish County Airports, Paine Field
Everett, Washington

GEOENGINEERS

Figure 3

Appendices

Appendix A

Beneficial Water User Database Review

Appendix A

Beneficial Water User Database Review

1.0 Introduction and Purpose

This appendix presents the findings of a review of available information to identify current users of groundwater or surface water within a 1-mile radius of the Swamp Creek Study Area at the Snohomish County/Paine Field Airport. The Swamp Creek Study Area (study area) is located in the southeastern portion of the Paine Field Airport (Airport) within unincorporated Snohomish County (see report Vicinity Map, Figure 1). The study area comprises approximately 9 acres of vegetated wetland and surrounding areas developed for commercial and Airport uses. The Swamp Creek Study Area is part of Water Resource Inventory Area (WRIA) 8, Cedar-Sammamish, as defined in Washington Administrative Code (WAC) 173-201A-602.

As described in the accompanying report, historical releases of aqueous film forming foam (AFFF) from the Airport's Aviation Technical Services (ATS) Hangar 1 Building discharged to the Airport stormwater conveyance system and to the York Creek Tributary of Swamp Creek (see report Site Plan and Sample Locations, Figure 2). The purpose of this database review was to identify beneficial users of groundwater and surface water that may potentially be affected by the releases of AFFF from the Airport.

2.0 Summary of Findings

The database review included a search of publicly available literature and databases related to groundwater and surface water users in the vicinity of the Swamp Creek Study Area. A 1-mile search radius from the study area detention pond located along Beverly Park Road was selected for the survey. The information sources reviewed, and details related to the search findings from each resource are presented in Sections 3.0 and 4.0 below. The findings of the database review are summarized below and shown in Database Review – Mapped Findings, Figure A-1.

2.1 GROUNDWATER

No beneficial uses of groundwater associated with drinking water supplies were identified during our database review.

- One production well (Well 22B01) from the 1950s was identified in a prior study completed at Paine Field, though the well was reportedly abandoned and is no longer in use.
- One active water rights claim for use of groundwater (G1-163272CL) was identified approximately 2,000 feet northeast of the study area. The water rights claim was dated 1974 and was granted for the use of groundwater for stock/irrigation purposes. This location is considered cross-gradient to the study area.

2.2 SURFACE WATER

No beneficial uses of surface water associated with drinking water supplies were identified during our database review.

- Two active water rights claims for the use of surface water (S1-163271CL and S1-156060CL) were identified approximately 2,000 feet northeast of the study area. The water rights claims were dated 1974 and were granted for the use of surface water for stock/irrigation purposes. These locations are considered cross-gradient to the study area.
- Potential beneficial uses of surface water for recreational purposes were evaluated by reviewing available aerial photographs and property records for public parks. Two unnamed water bodies were identified within the search radius (Figure A-1). The western unnamed water body does not receive surface water in-flow from Swamp Creek. A small portion of the eastern unnamed water body falls within the search radius and has residences on two sides. Potential recreational uses at this water body are unknown.

3.0 Database Research

The following databases were accessed online to review available information related to current users of surface water and groundwater within a 1-mile radius of the stormwater detention pond where stormwater from the Airport discharges to surface water and leaves Airport property. A summary of the findings is presented in Section 4.0 below.

3.1 SNOHOMISH COUNTY DRAINAGE INVENTORY

The Snohomish County Drainage Inventory (Snohomish County 2024) identifies stormwater drainage systems on the airport as well as surface water features in the County. This data source was evaluated to assess the location of surface water bodies that are hydraulically downstream of the Airport stormwater detention pond that is impacted by per- and polyfluoroalkyl substances (PFAS). Stormwater infrastructure in the vicinity includes catch basins, media filter structures, culverts, enclosed pipes, open channels, closed detentions and ponds. Several surface water bodies were identified during the review, including tributaries to Swamp Creek. The tributary that drains the wetland and stormwater detention pond that is impacted by PFAS is identified as the York Creek Tributary, which intersects with the main channel of Swamp Creek approximately 1 mile downstream, east of the intersection of Highway 99 and Airport Road (see Figure A-1).

3.2 MAP EVERETT

The City of Everett provides a geographical information database on their “Map Everett” website (Everett 2024), which includes watershed boundaries, surface water features, and some boring and well log information. The database was reviewed to assess the watershed boundaries and identify information related to water wells in the vicinity. According to the database, Everett’s drinking water is sourced from the Spada Reservoir, located in the Upper Sultan River Watershed. No water supply wells were identified within the specified search radius. No beneficial water uses were identified for the City of Everett within the specified search radius.

3.3 ALDERWOOD WATER

Alderwood Water and Wastewater District comprises the area south and downstream of the study area. The northern boundary of the water district is located near the confluence of the York Creek Tributary and Swamp Creek (Alderwood 2024; Attachment A-1). Alderwood purchases water from the City of Everett, which sources water from the Spada Reservoir. No beneficial water uses were identified for the Alderwood Water and Wastewater District within the specified search radius.

3.4 ECOLOGY WATERSHED CHARACTERIZATION

The study area and locations within 1-mile downstream fall into the Puget Sound Watershed Characterization Project, Analysis Unit 8079. In this analysis unit, the overall water flow assessment Level of Importance is low, with the Level of Degradation rated moderate-high.

3.5 ECOLOGY WELL REPORT DATABASE

No active water supply wells were identified in the Washington State Department of Ecology (Ecology) well report database maps within a 1-mile radius of the study area. Two water supply wells listed as belonging to the City of Everett were identified at distances greater than 1 mile from the study area (Well ID ACR774 approximately 1.6 miles north, and Well ID APR240 approximately 1.9 miles east); however, the City of Everett water supply is listed as the Spada Reservoir and based on this information, these wells are likely inactive.

3.6 ECOLOGY WATER RIGHTS DATABASE

The Ecology Water Rights Database (Ecology 2024a) maintains a catalog of water right permits, certificates and claims. The database lists the following five water rights claims within the 1-mile radius of the study area, all from the 1970s (Attachment A-1): Two surface water claims for stock and irrigation, accessed with gravity flow headworks (S1-163271CL and S1-156060CL), and three groundwater claims list uses for stock, irrigation and domestic uses (G1-163272CL, G1-155067CL and G1-125701CL). Details regarding these water rights are included in the table below.

CLAIM NUMBER	STATUS	WR CLASS	USE	LAT	LONG	LINK
S1-163271CL	Active	Surface water	Stock, Irrigation	47.90019	-122.26061	Water Right Record
S1-156060CL	Active	Surface water	Stock, Irrigation	47.90019	-122.26061	Water Right Record
G1-163272CL	Active	Groundwater	Stock, Irrigation	47.90019	-122.26061	Water Right Record
G1-155067CL	Active	Groundwater	Domestic General, Stock, Irrigation	47.88571	-122.26041	Water Right Record
G1-125701CL	Active	Groundwater	Domestic General, Stock, Irrigation	47.88571	-122.26041	Water Right Record

3.7 DOH SOURCE WATER ASSESSMENT PROGRAM (SWAP)

The Washington Department of Health (DOH) Source Water Assessment Program (SWAP) mapping tool identifies drinking water systems and protection areas across the state. No Group A or Group B drinking water systems were found within the 1-mile search radius. There are no wellhead protection areas or surface water protection areas. The drinking water service areas include Mukilteo Water and Wastewater District (west), City of Everett Public Works Department (east) and Alderwood Water District (south).

The closest well system is the inactive Wandering Creek Group A community well system, located approximately 2 miles south of the study area.

One inactive Group A drinking water system, Clinton Heights system #13894, is inaccurately mapped within the 1-mile radius of the study area. This is a system located in Island County (on Whidbey Island) and is incorrectly positioned in the SWAP mapping tool.

3.8 WASHINGTON GEOLOGICAL SURVEY PORTAL

The Washington State Geological Survey information portal (WGS 2024) contains information collected from public agencies and is not considered comprehensive. The portal includes water wells and other soil borings. In the 1-mile radius search area, this portal identifies seven monitoring wells, but no drinking water wells.

3.9 PRIOR STUDIES AT PAINE FIELD

One inactive water supply well was identified during a prior survey of beneficial water users completed for the Airport in 2023 (SWI 2023). Production Well 22B01 was previously located at the Airport at the approximate location shown in Figure A-1. The well was identified as reportedly abandoned and unused.

4.0 Surface Water Recreational Uses

Recreational uses for surface water were considered during our database review, including potential on-water uses such as boating, swimming and fishing. Two small unnamed water bodies, located immediately south and east of the intersection of Airport Road and Highway 99 (see Figure A-1), were identified within the search radius during a review of available aerial photos (Google Maps 2024). Based on the reviewed aerial photos, the western water body is surrounded by wooded areas, a large, paved parking area, and an apartment complex. The western unnamed water body does not appear to receive stormwater drainage from the Swamp Creek Study Area. The eastern unnamed water body receives surface water from Swamp Creek and is surrounded by vegetation on the east and south, a large apartment complex on the west and an apparent single-family home on the north. No parking areas or obvious public access points to the lakeshore were identified in the aerial photos reviewed, though several apparent pathways to the lake were visible leading from the apartment complex to the lakeshore. It is unknown if the lake is used for recreational activities.

Lake Stickney is located approximately 1.5 miles south of the study area, which is outside the 1-mile radius, but receives stormwater originating from the Swamp Creek Study Area and the eastern unnamed lake. The reviewed aerial photo of the lake shows a small park located on the northwest shore of the lake and several docks/boats associated with single family residences along the lakeshore. Based on these findings,

it is likely Lake Stickney is used for recreational purposes. Surface water in Lake Stickney drains to the south and into Lake Washington.

5.0 References

Alderwood, Wash. 2024, Water Service Area Map. Available: <https://awwd.com/about-us/district-overview/service-area-maps/>, accessed September 24.

Everett, Wash., 2024, Map Everett online map viewer: Available: <https://gismaps.everettwa.gov/apps/mapeverettde/>, accessed September 18.

Mukilteo, Wash Surface Water Utility, 2024, Mukilteo stormwater network viewer: Available: <https://www.arcgis.com/apps/webappviewer/index.html?id=854d1c26481c40ebac5c7a2b465ac35f>, accessed September 18.

Newcomb, R.C., 1952, Ground-water resources of Snohomish County, Washington: U.S. Geological Survey Water-Supply Paper 1135, 133 p., 2 plates, available: <https://pubs.er.usgs.gov/publication/wsp1135>.

Snohomish County, Wash., 2024a, Snohomish County drainage inventory interactive map & data: Available: <https://snohomishcountywa.gov/1129/Drainage-GIS>, accessed September 18.

Shannon & Wilson (SWI) 2023. Data Report: Former Fire Training Pit, Snohomish County Airport, Everett, Washington. Prepared by SWI dated May 1, 2023.

Thomas, B.E.; Wilkinson, J.M.; and Embrey, S.S., 1997, The ground-water system and ground-water quality in western Snohomish County, Washington: U.S. Geological Survey Water-Resources Investigations Report 96-4312, 218 p., 9 plates, available: <https://pubs.er.usgs.gov/publication/wri964312>.

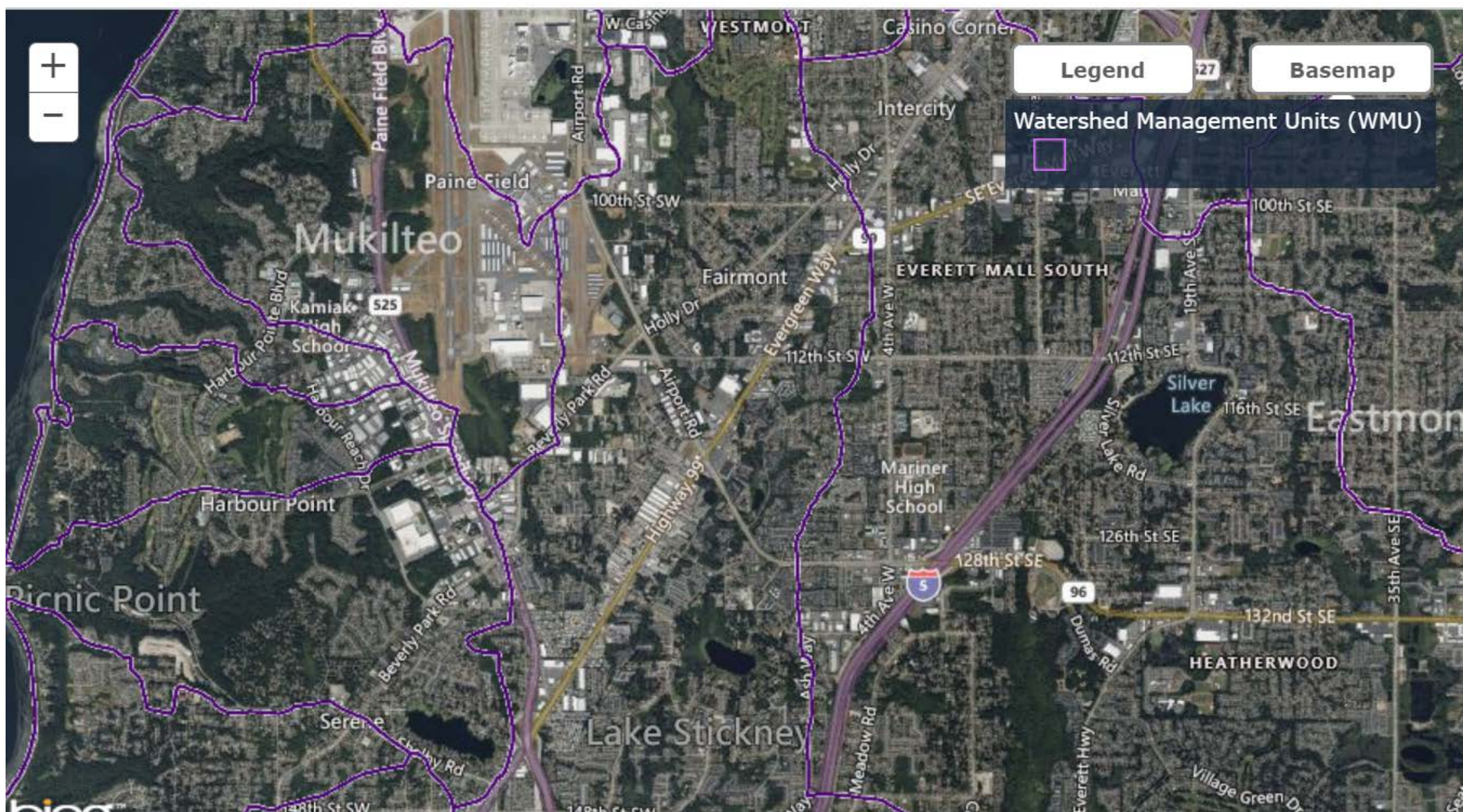
U.S. Geological Survey (USGS), 2024, National water information system: mapper: Available: <http://maps.waterdata.usgs.gov/mapper/index.html?state=wa>, accessed September 18.

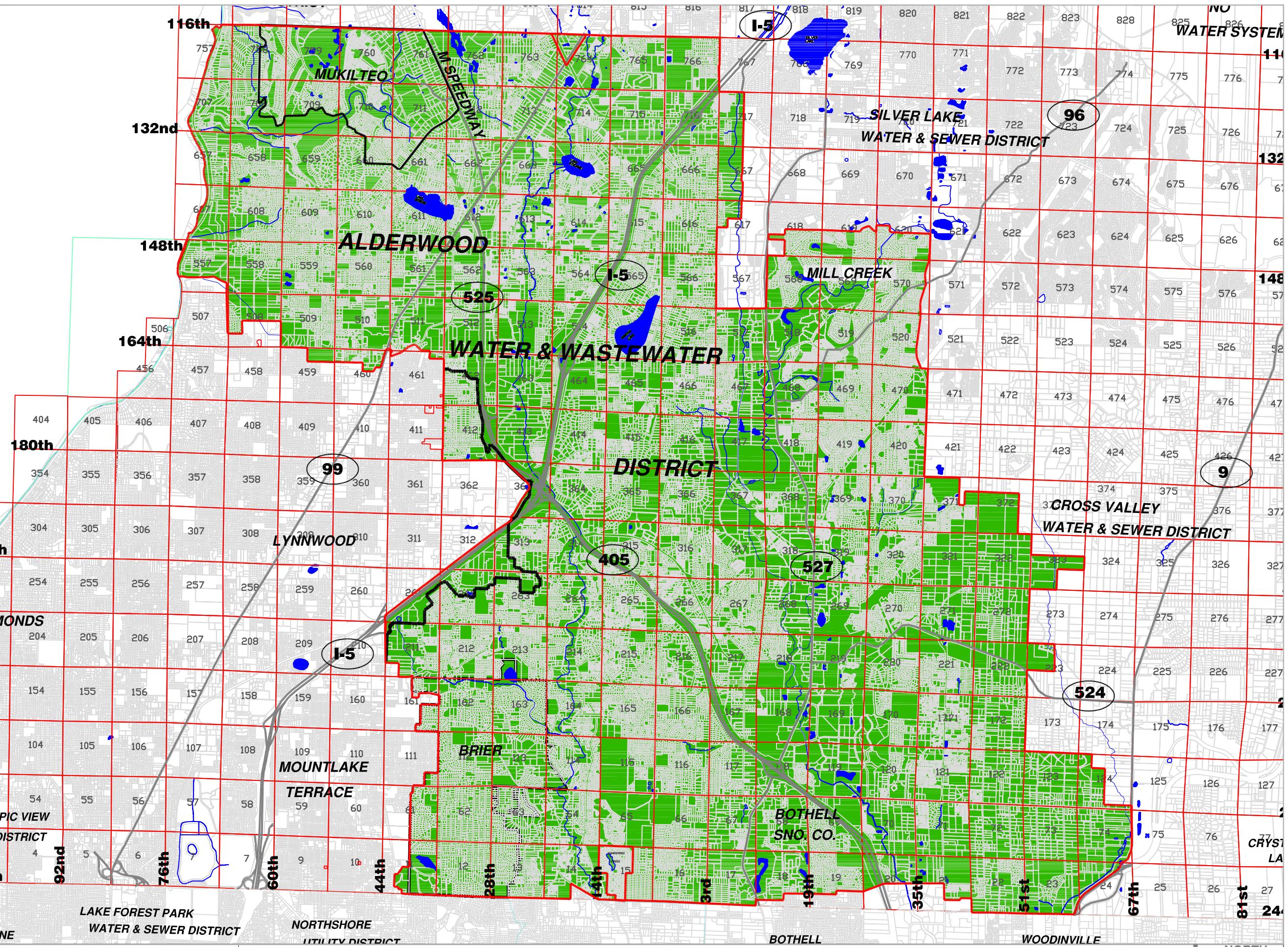
Washington Geological Survey, 2024, Geologic information portal: Available: <https://www.dnr.wa.gov/geologyportal>, accessed September 18.

Washington State Department of Ecology (Ecology), 2024a, Water Rights Search. Available: <https://apps.ecology.wa.gov/waterrightstrackingsystem/WaterRights/default.aspx>. Accessed September 18.

Washington State Department of Ecology (Ecology), 2024, Washington State well report viewer: Available: <https://fortress.wa.gov/ecy/waterresources/map/WCLWebMap/default.aspx>. Accessed September 18.

Attachment A-1
Water Rights Claims

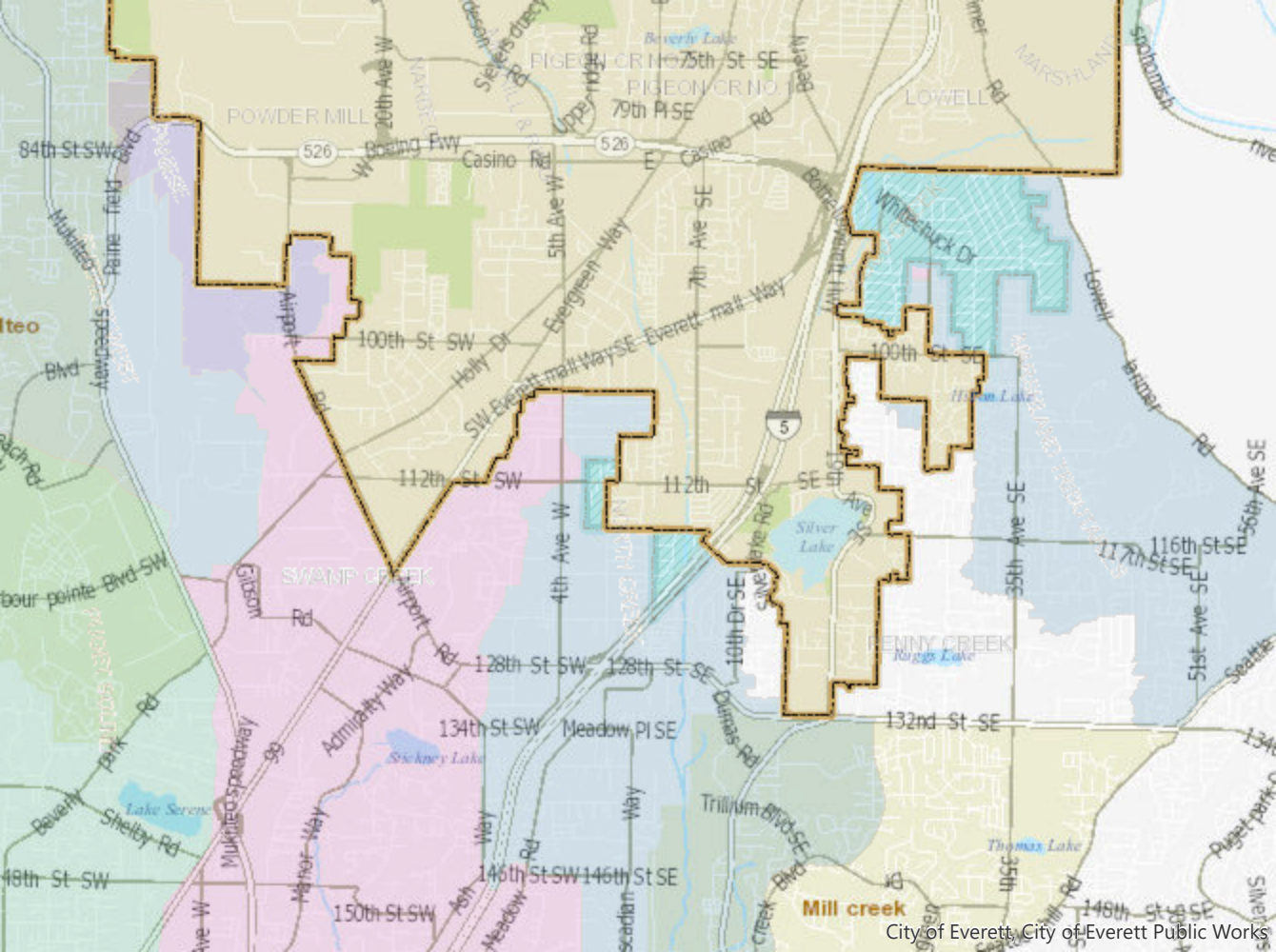


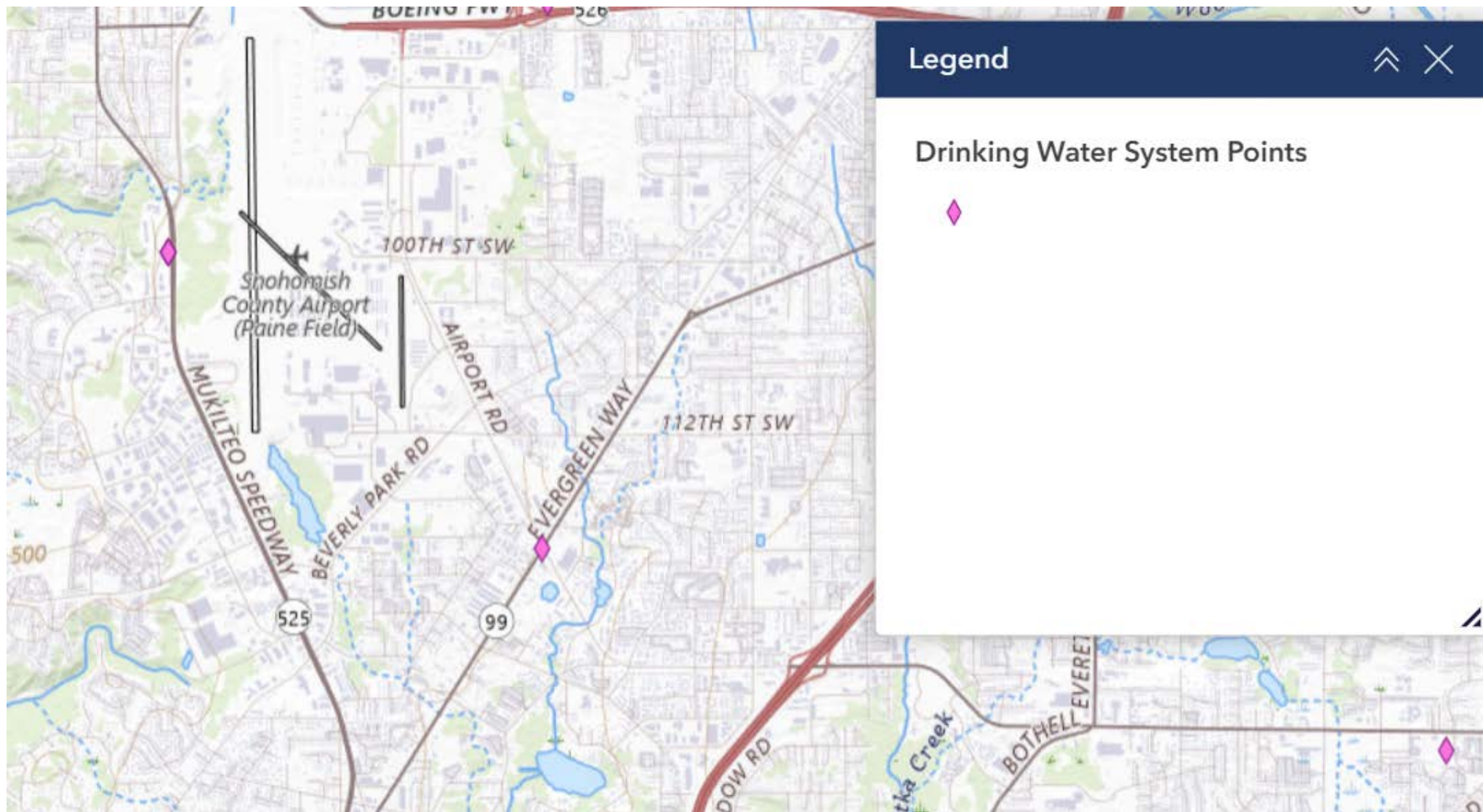


LOCAL WATER PURVEYORS

AWWD SERVICE AREA









STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION

WATER RIGHT CLAIM

RECEIVED
DEPARTMENT OF ECOLOGY

Jun 12 74 175627

CASH OTHER ✓ NONE

1. NAME BYRON JOHN HAGEDORN
ADDRESS 11622 ADMIRALTY WAY
EVERETT WASH ZIP CODE 98204

2. SOURCE FROM WHICH THE RIGHT TO TAKE AND MAKE USE OF WATER IS CLAIMED: SURFACE
(SURFACE OR GROUND WATER)
W.R.I.A. 08

A. IF GROUND WATER, THE SOURCE IS

B. IF SURFACE WATER, THE SOURCE IS SWAMP CREEK - UNNAMED POND -

3. THE QUANTITIES OF WATER AND TIMES OF USE CLAIMED:

THE QUANTITIES OF WATER AND TIMES OF USE CLAIMED:

A. QUANTITY OF WATER CLAIMED 450 GAL PER MIN PRESENTLY USED .25 GAL'S PER MIN
(CUBIC FEET PER SECOND OR GALLONS PER MINUTE)

B. ANNUAL QUANTITY CLAIMED ONE ACRE FOOT PER YEAR (ACRE FEET PER YEAR) PRESENTLY USED .02 ACRE FOOT PER YEAR

C. IF FOR IRRIGATION, ACRES CLAIMED 5 PRESENTLY IRRIGATED 3

D. TIME(S) DURING EACH YEAR WHEN WATER IS USED: STOCK 1/1 to 12/30) IRRIGATE 5/1 10/1

4. DATE OF FIRST PUTTING WATER TO USE: MONTH JUNE YEAR 1968

5. LOCATION OF THE POINT(S) OF DIVERSION/WITHDRAWAL: _____ FEET _____ AND _____

FEET _____ FROM THE _____ CORNER OF SECTION

FEET _____ FROM THE _____
BEING WITHIN _____ OF SECTION 23+26, T. 28 N., R. 4E (E. OR W.) W.M.

IF THIS IS WITHIN THE LIMITS OF A RECORDED PLATTED PROPERTY, LOTS 36 & 37 BLOCK 2 OF

FAIRMOUNT (VOLUME 10 OF PLATS) SNOHOMISH CO.
(GIVE NAME OF PLAT OR ADDITION)

6. LEGAL DESCRIPTION OF LANDS ON WHICH THE WATER IS USED:

7. PURPOSE(S) FOR WHICH WATER IS USED: STOCK & IRRIGATION

8. THE LEGAL DOCTRINE(S) UPON WHICH THE RIGHT OF CLAIM IS BASED:

DO NOT USE THIS SPACE

THE FILING OF A STATEMENT OF CLAIM DOES NOT CONSTITUTE AN ADJUDICATION OF ANY CLAIM TO THE RIGHT TO USE OF WATERS AS BETWEEN THE WATER USE CLAIMANT AND THE STATE OR AS BETWEEN ONE OR MORE WATER USE CLAIMANTS AND ANOTHER OR OTHERS. THIS ACKNOWLEDGEMENT CONSTITUTES RECEIPT FOR THE FILING FEE.

DATE RETURNED THIS HAS BEEN ASSIGNED
WATER RIGHT CLAIM REGISTRY NO.

I HEREBY SWEAR THAT THE ABOVE INFORMATION IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF

X BQ Hagedorn

DATE JUNE 10th 1974

DATE JUNE 12 1964
IF CLAIM FILED BY DESIGNATED REPRESENTATIVE, PRINT OR TYPE
FULL NAME AND MAILING ADDRESS OF AGENT BELOW.

☐ ADDITIONAL INFORMATION RELATING TO WATER QUALITY AND/OR WELL CONSTRUCTION IS AVAILABLE.

A FEE OF \$2.00 MUST ACCOMPANY THIS WATER RIGHT CLAIM

ORIGINAL DWR

RETURN ALL THREE COPIES WITH CARBONS INTACT, ALONG WITH YOUR FEE TO:
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION
P.O. BOX 829 OLYMPIA, WASHINGTON 98501

State of
Washington
Department
of Ecology



Water Right Claims Registration

Water Right Claim

Name Duane L & Lila G. Mattern

Address 833 1 Hardeson

Everett, WA Zip Code 98203

Phone No. 353-2249

- 1) Source from which the right to take and make use of water is claimed: ☐ Surface Water ☒ Ground Water
If surface water, please indicate source; give name if known:

(River, stream, lake, pond, spring, etc.)

- 2) Purpose(s) for which water is used:

☐ Domestic ☒ Stockwatering ☒ Irrigation (lawn and garden) ☐ Other Use (specify) _____

- 3) Legal description of lands on which water is used: _____

If located within the limits of a recorded platted property:

Lot _____ Block _____ of _____

(Give name of plat or addition)

In addition, please indicate Sec. 23 T. 28 N., R. 4 E/W, W.M.

County in which lands are located Snohomish

DO NOT USE THIS SPACE

The filing of a statement of claim does not constitute an adjudication of any claim to the right to use of waters as between the water use claimant and the state or as between one or more use claimants and another or others. This acknowledgment constitutes receipt for the filing fee.

Date Registered

This has been assigned
Water Right Claim Registry No.

JUN 13 1974 163272

Director, Department of Ecology

John Biggs

I hereby swear that the above information is true and accurate to the best of my knowledge and belief.

X _____

Date June 19, 1974

If claim filed by designated representative print or type full name and mailing address of agent below.

☐ Additional information relating to water quality and/or well construction is available.

ORIGINAL DOE

A FEE OF \$2.00 MUST ACCOMPANY THIS WATER RIGHT CLAIM

Return all three copies with carbons intact, along with your fee to:
Department of Ecology, Water Right Claims Registration, Olympia, Washington 98504

State of
Washington
Department
of Ecology



RECEIVED
DEPARTMENT OF ECOLOGY

JUN 19 1974 17 33 33

CASH OTHER NONE

Water Right Claims Registration

Water Right Claim

Name Duane L. & Gail Mattern

Address 2331 HARDEN

EVERETT, Wash. Zip Code 98203

Phone No. 353-3249
7737

- 1) Source from which the right to take and make use of water is claimed: ☒ Surface Water ☒ Ground Water
If surface water, please indicate source; give name if known:

Bear Creek
(River, stream, lake, pond, spring, etc.)

- 2) Purpose(s) for which water is used:

☐ Domestic ☒ Stockwatering ☒ Irrigation (lawn and garden) ☐ Other Use (specify) _____

- 3) Total description of lands on which water is used: _____

Tract 35, Block 2, Fairmount, according to plat thereof recorded in
Volume 10 of Plats, Page 91, records of Snohomish County, Washington.

PARCEL 3:

Tract 35, Block 2, Fairmount, according to plat thereof recorded in
Volume 10 of Plats, Page 91, records of Snohomish County, Washington,
EXCEPT that portion described as follows:
Beginning at the Northeastly corner of Tract 35, Block 2, Fairmount
according to plat thereof recorded in Volume 10 of Plats, Page 91,
records of Snohomish County, Washington; thence South 40°30'00" West
along the Southeastly line of said Tract 35, 105 feet; thence North
137.15 feet parallel with the Northeastly line of said Tract 35; 137.1
thence North 40°30'00" East parallel with the Southeastly line
of said Tract 35, 105 feet to intersection with the Northeastly line
of said Tract 35; thence South 48°30' East along said Northeastly
line 137.15 feet to the point of beginning.

DO NOT
The filing of a statement of claim does not constitute an acknowl-
edgment of any claim to the right to use of waters as between the water
use claimant and the state or as between one or more use claimants
and another or others. This acknowledgment constitutes receipt for
the filing fee.

Date Registered

This has been assigned
Water Right Claim Registry No.

JUN 13 1974 163271

Director, Department of Ecology

John Biggs

Date 6-19-74

If claim filed by designated representative print or type full
name and mailing address of agent below.

☐ Additional information relating to water quality and/or
well construction is available.

ORIGINAL DOE

A FEE OF \$2.00 MUST ACCOMPANY THIS WATER RIGHT CLAIM

Return all three copies with carbons intact, along with your fee to:
Department of Ecology, Water Right Claims Registration, Olympia, Washington 98504

443474 - 58336

[illegible]

08

Water Right Claim

Address 9414 Stone Avenue North

Seattle WA

Zip Code 98103

Phone No. 525 9818

(River, stream, lake, pond, spring, etc.)

2) Purpose(s) for which water is used:

☒ Domestic ☒ Stockwatering ☒ Irrigation (lawn and garden) ☐ Other Use (specify)

3) Legal description of lands on which water is used:

Lots, 21, 22, 23, Block 1, Avondale, Vol 10 Pg 108 of Plats, Snohomish
Cnty, WA., EXCEPT S 10 feet to Snohomish Cnty for Road and EXCEPT
portion of Lot 21 lying southeasterly of New Admiralty Way and North
of Gibson Road.

If located within the limits of a recorded platted property:

Lot 21, 22, 23 Block 1 of Avondale

In addition, please indicate Sec. 26 T. 28 N., R. 4E (Give name of plat or addition)
E/W, W.M.

County in which lands are located Snohomish

DO NOT USE THIS SPACE

The filing of a statement of claim does not constitute an adjudication of any claim to the right to use of waters as between the water use claimant and the state or as between one or more use claimants and another or others. This acknowledgment constitutes receipt for the filing fee.

Date Registered

This has been assigned
Water Right Claim Registry No.

Director, Department of Ecology

I hereby swear that the above information is true and accurate to the best of my knowledge and belief.

X John Martin
Date 5/24/74

Date 5/24/74

If claim filed by designated representative print or type full name and mailing address of agent below.

☐ Additional information relating to water quality and/or well construction is available.

ORIGINAL DOE

A FEE OF \$2.00 MUST ACCOMPANY THIS WATER RIGHT CLAIM

Return all three copies with carbons intact, along with your fee to:
Department of Ecology, Water Right Clinic

Department of Ecology, Water Right Claims Registration, Olympia, Washington 98504

State of
Washington
Department
of Ecology



Water Right Claims Registration

Water Right Claim

Name Robert B Walsh

Address 12102 ALEXANDER RD.

EVERETT WA Zip Code 98204

Phone No. 365-5965

- 1) Source from which the right to take and make use of water is claimed: ☐ Surface Water ☒ Ground Water
If surface water, please indicate source; give name if known:

(River, stream, lake, pond, spring, etc.)

- 2) Purpose(s) for which water is used:

☒ Domestic ☒ Stockwatering ☒ Irrigation (lawn and garden) ☒ Other Use (specify) SWIMMING POOL

- 3) Legal description of lands on which water is used:

If located within the limits of a recorded platted property:

Lot 110 Block NO-3 of PINE FIELD NO-3
(Give name of plat or addition)

In addition, please indicate Sec. 26 T. 28 N., R. 4E W. W.M.

County in which lands are located SNOHOMISH WA

DO NOT USE THIS SPACE

The filing of a statement of claim does not constitute an adjudication of any claim to the right to use of waters as between the water use claimant and the state or as between one or more use claimants and another or others. This acknowledgment constitutes receipt for the filing fee.

Date Registered

This has been assigned
Water Right Claim Registry No.

FEB 13 1975 125701

Director, Department of Ecology

I hereby swear that the above information is true and accurate to the best of my knowledge and belief.

X Robert B Walsh

Date 4/27/74

If claim filed by designated representative print or type full name and mailing address of agent below.

☐ Additional information relating to water quality and/or well construction is available.

ORIGINAL DOE

A FEE OF \$2.00 MUST ACCOMPANY THIS WATER RIGHT CLAIM

Return all three copies with carbons intact, along with your fee to:
Department of Ecology, Water Right Claims Registration, Olympia, Washington 98504

Appendix B

Field Procedures and Exploration Logs

Appendix B

Field Procedures and Exploration Logs

SOIL SAMPLING

Subsurface soil was evaluated by completing two shallow sub-surface borings using a hand auger (SC-B1 and SC-B2). Shallow sub-surface soil samples were collected by GeoEngineers, Inc. (GeoEngineers) staff using a hand auger and were sampled directly into laboratory-provided jars. Approximate boring locations are shown on Site Plan and Sample Locations, Figure 2.

A representative from GeoEngineers observed and classified the soil encountered in general accordance with ASTM International (ASTM) D 2488-94 and maintained a detailed log of each exploration.

The sampling equipment was decontaminated before each sampling attempt with an Alconox® solution wash and a laboratory-certified per- and polyfluoroalkyl substances (PFAS)-free distilled water rinse. Soil samples were obtained from the hand auger for field screening and possible laboratory analysis. Undisturbed portions of selected samples were placed in laboratory-prepared vials/jars for laboratory analytical testing at SGS North America. The soil samples were placed in a cooler with ice for transport to the laboratory within proper hold-times under standard chain-of-custody (COC) procedures.

SURFACE WATER SAMPLING

Surface water was evaluated by collecting water directly into laboratory-provided jars. Approximate surface water locations are shown on Figure 2.

SAMPLE IDENTIFICATION SCHEME

Each environmental sample obtained during the investigation was identified by a unique sample designation. The sample designation was documented in the field report and the boring log, and included on the sample container label and the laboratory COC. The soil sample designation scheme is as follows:

- Soil samples from borings: Boring number SC-B1- etc., followed by the depth from which the soil sample was collected, to the nearest 0.5 foot. For example, SC-B1-2.0 is from boring number SC-B1 sampled at a depth of 2 feet below the ground surface (bgs).
- Surface water samples: Numbered sequentially SC-SW1- etc., followed by the date. For example, SC-SW1-20240212 is the surface water sample collected from the first location and sampled on February 12, 2024.

INVESTIGATION-DERIVED WASTE MANAGEMENT

Incidental waste generated during sampling activities include items such as disposable gloves, plastic sheeting, sample bags, paper towels, and similar expended and discarded field supplies. These materials are considered de minimis and were disposed of in a trash receptacle or county disposal facility.

STANDARD OPERATING PROCEDURES

Objective

The objective of this technical standard operating procedure (SOP) is to define the techniques and requirements for PFAS sampling. Techniques discussed in this SOP include field sampling and preservation methods using the protocols intended to be analyzed for per- and polyfluoroalkyl substances (PFAS) by EPA Method 1633.

Background

DISCUSSION

Specialized techniques and procedures are used for collecting and analyzing samples for PFAS. The field procedures are outlined in the following sections showing restricted equipment and materials that can be used when sampling for PFAS. The EPA Method 1633 provides PFAS results with reporting limits of approximately 2 nanograms per liter. Acceptable materials for sampling include stainless steel, high density polyethylene (HDPE) and polypropylene.

Additional materials may be acceptable if proven not to contain PFAS. NOTE: Grundfos pumps and bladder pumps are known to contain fluorinated materials (e.g., Teflon™ washers for Grundfos pumps and low-density polyethylene (LDPE) bladders for bladder pumps). Selection of sampling devices must be carefully researched. All sampling equipment components and sample containers should not come in contact with aluminum foil, LDPE, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer. Standard two step decontamination using detergent and clean water rinse should be considered for equipment that does come in contact with polyfluorinated materials. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with polyfluorinated materials must be avoided. Many food and drink packaging materials and “plumbers thread seal tape” contain PFAS. The sampler must wear nitrile gloves while filling and sealing the sample bottles.

Pre-cleaned sample bottles with closures, coolers, ice, sample labels, and a COC form will be provided by the laboratory.

There are special laboratory requirements and sample coolers are clearly identified for PFAS sampling. This SOP outlines the sampling procedure typically used to collect PFAS samples for analysis.

General Responsibilities

Study Area Manager – The study area manager is responsible for ensuring that field personnel are trained in the use of this procedure and the required equipment, and for ensuring that PFAS samples are collected in accordance with this procedure and any other SOPs pertaining to specific media sampling. The study area manager must also ensure that the quantity and location of PFAS samples collected meet the requirements of the study area -specific sampling and/or work plans and that samples are handled under COC protocol.

Field Team Leader – The field team leader is responsible for ensuring that field personnel collect PFAS samples in accordance with this SOP and other relevant procedures.

Note: All field team member responsibilities are defined in the project-specific quality assurance project plan (QAPP).

Recommended and Prohibited Field Equipment

RECOMMENDED

- Study area -specific plans (e.g., sampling, work, health and safety)
- HDPE and silicone materials including tubing, bailers, tape, plumbing paste
- Loose paper
- Masonite or aluminum clipboard
- Ball-point pens
- Insulated cooler(s) provided by lab with sample containers
- Cotton is recommended for field clothing. Fabric softener and dryer sheets should be avoided. Rain gear should be made from polyurethane and wax-coated materials
- Plastic zip-top bags
- Decontamination supplies – Alconox®/Liquinox®
- Sample COC forms
- Custody seals
- Nitrile or appropriate gloves
- Lab supplied and verified “PFAS-free” water to be used for trip and decontamination blanks and decontamination procedures
- Bags of ice
- Labels and appropriate forms/documentation for sample shipment provided by the laboratory

PROHIBITED

- Teflon®-containing materials, when possible, should be avoided (e.g., tubing, bailers, tape, and plumbing paste). In cases where Teflon® -containing materials are unavoidable, ensure adequate purging is performed prior to sampling (e.g., in-well pumps) and/or rinse blanks are collected prior to sampling
- Paper products such as waterproof field books, plastic clipboards, binders, spiral hard cover notebooks, sticky notes, or glue materials
- Water resistant, waterproof, stain-treated clothing or shoes including Gore-Tex™ and Tyvek® materials
- LDPE or polypropylene containing materials (e.g., bags or containers used to transport samples)
- Markers
- Chemical (blue) ice packs
- Decontamination soaps containing fluorosurfactants such as Decon 90
- Water that is not verified to be “PFAS-free” to be used for trip and decontamination blanks and decontamination processes
- Aluminum foil

SOIL SAMPLING EQUIPMENT

Acceptable materials for sampling include stainless steel, HDPE and polypropylene. Additional materials may be acceptable if proven not to contain PFAS. All sampling equipment components and sample containers **should not** come in contact with aluminum foil, LDPE, glass or PTFE, Teflon™ materials including sample bottle cap liners with a PTFE layer. A list of acceptable equipment is provided below, but other equipment may be considered appropriate at a later date.

- Stainless steel spoon
- Stainless steel bowl

Procedures

PREPARATION

1. Review study area -specific health and safety plan and project plans before initiating sampling activity.
2. Don the appropriate personal protective clothing as indicated in the study area -specific health and safety plan.
3. Locate sampling location(s) in accordance with project documents (e.g., work plan) and document pertinent information in the appropriate field logbook. When possible, reference locations back to existing study area features such as buildings, roads, intersections, monitoring wells, etc.
4. Verify sampling depths in as specified in the study area -specific plans.
5. If decontamination of equipment and/or personnel is required, set up a decontamination zone.
6. Prepare an area near the sampling location to perform sample collection activities.

GROUNDWATER SAMPLE COLLECTION

The following steps must be followed when collecting groundwater samples for PFAS analysis.

- Wear clean nitrile gloves during handling of all sample containers and sampling devices.
- The sampler must wear nitrile gloves while filling and sealing the sample bottles.
- Acceptable materials for sampling include stainless steel, HDPE and polypropylene. Sampling with a low-flow pump and tubing with a check valve is the preferred method.
- Purge the well.
- Pre-cleaned sample bottles with closures, coolers, sample labels, and a COC form will be provided by the laboratory.
- Fill the laboratory-supplied bottle(s) with the sample.
- Cap the bottles with an acceptable cap and liner closure system.
- Label the sample bottles.
- Fill out the COC.
- Place in a cooler maintained at $4 \pm 2^{\circ}$ Celsius.

- Decontaminate reusable sampling equipment using PFAS-free water provided by lab and Alconox/Liquinox before proceeding to other sampling locations.
- Complete the field sampling form, being sure to record all relevant information before leaving the study area. All sampling information, including well ID, sample depth, sample volume and requisite analyses should be recorded in the field form as specified in the study area specific sampling/work plans. Field Log books shall not be used.
- Properly package all samples for shipment to laboratories and complete all necessary sample shipment documentation. Remand custody of the samples to appropriate personnel.

SOIL SAMPLE COLLECTION

- The sampler must wear nitrile gloves while conducting fieldwork and handling sample containers
- Sampling is often conducted in areas where a vegetative turf has been established. In these cases, a clean stainless-steel spoon should be used to carefully remove the turf so that it may be replaced at the conclusion of sampling. Surface soil samples (e.g., 0 to 6 inches below surface) shall then be collected using a pre-cleaned, stainless-steel spoon.
- Shallow subsurface soil samples (e.g., 6 to ~36 inches below surface) may be collected by digging a hole using a stainless-steel hand auger.
- When the desired subsurface depth is reached, a pre-cleaned hand auger shall be used to obtain the sample.

SAMPLE SHIPMENT

Place the samples in a cooler with wet ice. The ice should be double bagged. The samples should be shipped for next day delivery. Always include enough ice to keep samples around 4°C, especially during summer months. The cooler drain spout should be closed and taped so that water does not flow out of the cooler.

- Always package samples securely to prevent breakage/spillage.
- Check with laboratory if Saturday delivery of samples is required.
- Be sure to include a completed COC form in each shipment with all necessary information for both reporting and invoicing.
- Double check to make sure all samples are labeled correctly and correspond with the COC form.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS
		(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND
SANDS WITH FINES			SM	SILTY SANDS, SAND - SILT MIXTURES	
(APPRECIABLE AMOUNT OF FINES)			SC	CLAYEY SANDS, SAND - CLAY MIXTURES	
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

Sampler Symbol Descriptions

	Modified California Sampler (6-inch sleeve) or Dames & Moore
	Standard Penetration Test (SPT)
	Shelby tube
	Piston
	Direct-Push
	Bulk or grab
	Continuous Coring

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS		TYPICAL DESCRIPTIONS
GRAPH	LETTER	
	AC	Asphalt Concrete
	CC	Cement Concrete
	CR	Crushed Rock/Quarry Spalls
	SOD	Sod/Forest Duff
	TS	Topsoil

Groundwater Contact



Measured groundwater level in exploration, well, or piezometer



Measured free product in well or piezometer

Graphic Log Contact



Distinct contact between soil strata



Approximate contact between soil strata

Material Description Contact



Contact between geologic units



Contact between soil of the same geologic unit

Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DD	Dry density
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
Mohs	Mohs hardness scale
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PL	Point load test
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
UU	Unconsolidated undrained triaxial compression
VS	Vane shear

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

Key to Exploration Logs



Figure B-1

Appendix C

Laboratory Chemical Analytical Data Report

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

GeoEngineers, Inc.

Paine Field; Everett, WA

05530-015-00

SGS Job Number: FC13427

Sampling Date: 02/12/24

Report to:

GeoEngineers, Inc
1101 Fawcett Ave Suite 200
Tacoma, WA 98402
jletts@geoengineers.com; katakturk@geoengineers.com
ATTN: Jacob Letts

Total number of pages in report: 70



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable unless noted in the narrative, comments or footnotes.

Norm Farmer
Technical Director

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), NC(573), NJ(FL002), NY(12022), SC(96038001)

DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),

AL, AK, AR, CT, IA, KY, MA, MI, MS, ND, NH, NV, OK, OR, IL, UT, VT, WA, WI, WV

This report shall not be reproduced, except in its entirety, without the written approval of SGS.

Test results relate only to samples analyzed.

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Sample Summary

GeoEngineers, Inc.

Job No: FC13427

Paine Field; Everett, WA
Project No: 05530-015-00

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
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This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

FC13427-1	02/12/24	09:55	MBJE	02/16/24	SO Soil	SC-B1-1.0
FC13427-2	02/12/24	10:10	MBJE	02/16/24	SO Soil	SC-B1-2.0
FC13427-3	02/12/24	09:10	MBJE	02/16/24	SO Soil	SC-B2-0.5
FC13427-4	02/12/24	09:15	MBJE	02/16/24	SO Soil	SC-B2-2.0
FC13427-5	02/12/24	08:30	MBJE	02/16/24	SO Soil	SC-CB1
FC13427-6	02/12/24	09:45	MBJE	02/16/24	AQ Surface Water	SC-SW1-20240212
FC13427-7	02/12/24	10:55	MBJE	02/16/24	AQ Equipment Blank	EB-20240212

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

SAMPLE DELIVERY GROUP CASE NARRATIVE

2

Client: GeoEngineers, Inc.

Job No: FC13427

Site: Paine Field; Everett, WA

Report Date: 2/28/2024 3:45:14 PM

On 02/16/2024, 6 Sample(s), 0 Trip Blank(s), 1 Equip. Blank(s) and 0 Field Blank(s) were received at SGS North America Inc - Orlando. at a maximum corrected temperature of 4.8 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. - Orlando Job Number of FC13427 was assigned to the project.

Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section. Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

MS Semi-volatiles By Method EPA DRAFT 1633

Matrix: AQ

Batch ID: OP1744

Sample(s) FC13428-16MS, FC13428-17DUP were used as the QC samples indicated.

Blank Spike Recovery(s) for 3:3 Fluorotelomer carboxylate are outside control limits.

RPD(s) for Duplicate for Perfluorononanesulfonic acid are outside control limits for sample OP1744-DUP. Probable cause is due to sample non-homogeneity.

FC13427-7 for 3:3 Fluorotelomer carboxylate: Associated BS outside control limits high, sample was ND.

FC13427-6 for 3:3 Fluorotelomer carboxylate: Associated BS outside control limits high, sample was ND.

Matrix: SO

Batch ID: OP1753

Sample(s) FC13254-40MS, FC13254-40MSD were used as the QC samples indicated.

FC13427-1 for MeFOSAA: Associated Low Level CCV outside of control limits high, sample was ND.

FC13427-2 for MeFOSAA: Associated Low Level CCV outside of control limits high, sample was ND.

FC13427-3 for MeFOSAA: Associated Low Level CCV outside of control limits high, sample was ND.

FC13427-4 for MeFOSAA: Associated Low Level CCV outside of control limits high, sample was ND.

FC13427-5 for MeFOSAA: Associated Low Level CCV outside of control limits high, sample was ND.

General Chemistry By Method SM19 2540G

Matrix: SO

Batch ID: GN96738

Sample(s) FC13427-1DUP were used as the QC samples for Solids, Percent.

SGS North America Inc. - Orlando certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted. Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria. SGS North America Inc.- Orlando is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety.

Narrative prepared by:

Kim Benham, Report Generation (signature on file)

Summary of Hits

Page 1 of 2

Job Number: FC13427
Account: GeoEngineers, Inc.
Project: Paine Field; Everett, WA
Collected: 02/12/24



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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FC13427-1 SC-B1-1.0

Perfluorooctanesulfonic acid	0.16 J	0.24	0.12	ug/kg	EPA DRAFT 1633
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FC13427-2 SC-B1-2.0

No hits reported in this sample.

FC13427-3 SC-B2-0.5

Perfluoropentanoic acid	0.66	0.57	0.14	ug/kg	EPA DRAFT 1633
Perfluorohexanoic acid	0.21 J	0.29	0.14	ug/kg	EPA DRAFT 1633
Perfluoroheptanoic acid	0.19 J	0.29	0.14	ug/kg	EPA DRAFT 1633
Perfluorooctanoic acid	0.38	0.29	0.14	ug/kg	EPA DRAFT 1633
Perfluorononanoic acid	0.44	0.29	0.16	ug/kg	EPA DRAFT 1633
Perfluorodecanoic acid	0.26 J	0.29	0.14	ug/kg	EPA DRAFT 1633
Perfluoroundecanoic acid	0.21 J	0.29	0.19	ug/kg	EPA DRAFT 1633
Perfluorooctanesulfonic acid	1.7	0.29	0.14	ug/kg	EPA DRAFT 1633

FC13427-4 SC-B2-2.0

Perfluorobutanoic acid	0.71 J	1.0	0.63	ug/kg	EPA DRAFT 1633
Perfluoropentanoic acid	1.1	0.51	0.13	ug/kg	EPA DRAFT 1633
Perfluorohexanoic acid	0.47	0.25	0.13	ug/kg	EPA DRAFT 1633
Perfluoroheptanoic acid	0.61	0.25	0.13	ug/kg	EPA DRAFT 1633
Perfluorooctanoic acid	1.2	0.25	0.13	ug/kg	EPA DRAFT 1633
Perfluorononanoic acid	0.22 J	0.25	0.15	ug/kg	EPA DRAFT 1633
Perfluorohexanesulfonic acid	0.23 J	0.25	0.20	ug/kg	EPA DRAFT 1633
Perfluorooctanesulfonic acid	0.54	0.25	0.13	ug/kg	EPA DRAFT 1633

FC13427-5 SC-CB1

8:2 Fluorotelomer sulfonate	1.0 J	1.2	0.93	ug/kg	EPA DRAFT 1633
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FC13427-6 SC-SW1-20240212

Perfluoropentanoic acid	0.0055	0.0036	0.00091	ug/l	EPA DRAFT 1633
Perfluorohexanoic acid	0.0032	0.0018	0.00045	ug/l	EPA DRAFT 1633
Perfluoroheptanoic acid	0.0032	0.0018	0.00045	ug/l	EPA DRAFT 1633
Perfluorooctanoic acid	0.0019	0.0018	0.00045	ug/l	EPA DRAFT 1633
Perfluorononanoic acid	0.00089 J	0.0018	0.00055	ug/l	EPA DRAFT 1633
Perfluorobutanesulfonic acid	0.00099 J	0.0018	0.00091	ug/l	EPA DRAFT 1633
Perfluorohexanesulfonic acid	0.0072	0.0018	0.00091	ug/l	EPA DRAFT 1633
Perfluorooctanesulfonic acid	0.0056	0.0018	0.00091	ug/l	EPA DRAFT 1633

Summary of Hits

Job Number: FC13427
Account: GeoEngineers, Inc.
Project: Paine Field; Everett, WA
Collected: 02/12/24



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Analyte						

FC13427-7 EB-20240212

No hits reported in this sample.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	SC-B1-1.0	Date Sampled:	02/12/24
Lab Sample ID:	FC13427-1	Date Received:	02/16/24
Matrix:	SO - Soil	Percent Solids:	83.2
Method:	EPA DRAFT 1633 EPA 1633 DRAFT		
Project:	Paine Field; Everett, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6Q31443.D	1	02/25/24 16:48	MV	02/21/24 08:55	OP1753	S6Q443
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.04 g	5.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	ND	0.95	0.60	ug/kg	
2706-90-3	Perfluoropentanoic acid	ND	0.48	0.12	ug/kg	
307-24-4	Perfluorohexanoic acid	ND	0.24	0.12	ug/kg	
375-85-9	Perfluoroheptanoic acid	ND	0.24	0.12	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.24	0.12	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.24	0.14	ug/kg	
335-76-2	Perfluorodecanoic acid	ND	0.24	0.12	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	0.24	0.16	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	0.24	0.12	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	0.24	0.12	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	0.24	0.12	ug/kg	

PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.24	0.12	ug/kg	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.24	0.19	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.24	0.19	ug/kg	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.24	0.17	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.16	0.24	0.12	ug/kg	J
68259-12-1	Perfluorononanesulfonic acid	ND	0.24	0.22	ug/kg	
335-77-3	Perfluorodecanesulfonic acid	ND	0.24	0.17	ug/kg	
79780-39-5	Perfluorododecanesulfonic aci	ND	0.24	0.18	ug/kg	

FLUOROTELOMER SULFONIC ACIDS

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.95	0.48	ug/kg	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.95	0.48	ug/kg	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.95	0.72	ug/kg	

PERFLUOROCTANE SULFONAMIDES

754-91-6	PFOSA	ND	0.24	0.12	ug/kg	
31506-32-8	MeFOSA	ND	0.24	0.16	ug/kg	
4151-50-2	EtFOSA	ND	0.24	0.12	ug/kg	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SC-B1-1.0		
Lab Sample ID:	FC13427-1	Date Sampled:	02/12/24
Matrix:	SO - Soil	Date Received:	02/16/24
Method:	EPA DRAFT 1633 EPA 1633 DRAFT	Percent Solids:	83.2
Project:	Paine Field; Everett, WA		

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROOCTANE SULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA ^a	ND	0.24	0.19	ug/kg	
2991-50-6	EtFOSAA	ND	0.24	0.23	ug/kg	

PERFLUOROOCTANE SULFONAMIDO ETHANOLS

24448-09-7	MeFOSE	ND	2.4	1.2	ug/kg	
1691-99-2	EtFOSE	ND	2.4	1.2	ug/kg	

PER and POLYFLUOROETHER CARBOXYLIC ACIDS

13252-13-6	HFPO-DA (GenX)	ND	0.95	0.34	ug/kg	
919005-14-4	ADONA	ND	0.95	0.40	ug/kg	
377-73-1	PFMPA	ND	0.48	0.24	ug/kg	
863090-89-5	PFMBA	ND	0.48	0.24	ug/kg	
151772-58-6	NFDHA	ND	0.48	0.29	ug/kg	

PER and POLYFLUOROETHER SULFONIC ACIDS

756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.95	0.52	ug/kg	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.95	0.48	ug/kg	
113507-82-7	PFEESA	ND	0.48	0.24	ug/kg	

FLUOROTELOMER CARBOXYLIC ACIDS

356-02-5	3:3 Fluorotelomer carboxylate	ND	1.2	0.61	ug/kg	
914637-49-3	5:3 Fluorotelomer carboxylate	ND	6.0	1.4	ug/kg	
812-70-4	7:3 Fluorotelomer carboxylate	ND	6.0	1.5	ug/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFBA	71%		20-150%
13C5-PFPeA	74%		20-150%
13C5-PFHxA	71%		20-150%
13C4-PFHpA	73%		20-150%
13C8-PFOA	73%		20-150%
13C9-PFNA	66%		20-150%
13C6-PFDA	68%		20-150%
13C7-PFUnDA	72%		20-150%
13C2-PFDoDA	66%		20-150%
13C2-PFTeDA	71%		20-150%
13C3-PFBS	70%		20-150%
13C3-PFHxS	69%		20-150%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SC-B1-1.0	Date Sampled:	02/12/24
Lab Sample ID:	FC13427-1	Date Received:	02/16/24
Matrix:	SO - Soil	Percent Solids:	83.2
Method:	EPA DRAFT 1633 EPA 1633 DRAFT		
Project:	Paine Field; Everett, WA		

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C8-PFOS	71%		20-150%
	13C8-FOSA	76%		20-150%
	d3-MeFOSA	67%		20-150%
	d5-EtFOSA	77%		20-150%
	d3-MeFOSAA	76%		20-150%
	d5-EtFOSAA	80%		20-150%
	d7-MeFOSE	72%		20-150%
	d9-EtFOSE	76%		20-150%
	13C2-4:2FTS	85%		20-180%
	13C2-6:2FTS	87%		20-180%
	13C2-8:2FTS	87%		20-180%
	13C3-HFPO-DA	75%		20-150%

(a) Associated Low Level CCV outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SC-B1-2.0	Date Sampled:	02/12/24
Lab Sample ID:	FC13427-2	Date Received:	02/16/24
Matrix:	SO - Soil	Percent Solids:	83.1
Method:	EPA DRAFT 1633 EPA 1633 DRAFT		
Project:	Paine Field; Everett, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6Q31444.D	1	02/25/24 17:03	MV	02/21/24 08:55	OP1753	S6Q443
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.95 g	5.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	ND	0.97	0.61	ug/kg	
2706-90-3	Perfluoropentanoic acid	ND	0.49	0.12	ug/kg	
307-24-4	Perfluorohexanoic acid	ND	0.24	0.12	ug/kg	
375-85-9	Perfluoroheptanoic acid	ND	0.24	0.12	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.24	0.12	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.24	0.14	ug/kg	
335-76-2	Perfluorodecanoic acid	ND	0.24	0.12	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	0.24	0.16	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	0.24	0.12	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	0.24	0.12	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	0.24	0.12	ug/kg	

PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.24	0.12	ug/kg	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.24	0.19	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.24	0.19	ug/kg	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.24	0.18	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.24	0.12	ug/kg	
68259-12-1	Perfluorononanesulfonic acid	ND	0.24	0.22	ug/kg	
335-77-3	Perfluorodecanesulfonic acid	ND	0.24	0.17	ug/kg	
79780-39-5	Perfluorododecanesulfonic aci	ND	0.24	0.18	ug/kg	

FLUOROTELOMER SULFONIC ACIDS

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.97	0.49	ug/kg	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.97	0.49	ug/kg	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.97	0.73	ug/kg	

PERFLUOROCTANE SULFONAMIDES

754-91-6	PFOSA	ND	0.24	0.12	ug/kg	
31506-32-8	MeFOSA	ND	0.24	0.17	ug/kg	
4151-50-2	EtFOSA	ND	0.24	0.12	ug/kg	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SC-B1-2.0		
Lab Sample ID:	FC13427-2	Date Sampled:	02/12/24
Matrix:	SO - Soil	Date Received:	02/16/24
Method:	EPA DRAFT 1633 EPA 1633 DRAFT	Percent Solids:	83.1
Project:	Paine Field; Everett, WA		

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROOCTANE SULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA ^a	ND	0.24	0.19	ug/kg	
2991-50-6	EtFOSAA	ND	0.24	0.24	ug/kg	

PERFLUOROOCTANE SULFONAMIDO ETHANOLS

24448-09-7	MeFOSE	ND	2.4	1.2	ug/kg	
1691-99-2	EtFOSE	ND	2.4	1.2	ug/kg	

PER and POLYFLUOROETHER CARBOXYLIC ACIDS

13252-13-6	HFPO-DA (GenX)	ND	0.97	0.35	ug/kg	
919005-14-4	ADONA	ND	0.97	0.41	ug/kg	
377-73-1	PFMPA	ND	0.49	0.24	ug/kg	
863090-89-5	PFMBA	ND	0.49	0.24	ug/kg	
151772-58-6	NFDHA	ND	0.49	0.30	ug/kg	

PER and POLYFLUOROETHER SULFONIC ACIDS

756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.97	0.53	ug/kg	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.97	0.49	ug/kg	
113507-82-7	PFEESA	ND	0.49	0.24	ug/kg	

FLUOROTELOMER CARBOXYLIC ACIDS

356-02-5	3:3 Fluorotelomer carboxylate	ND	1.2	0.62	ug/kg	
914637-49-3	5:3 Fluorotelomer carboxylate	ND	6.1	1.4	ug/kg	
812-70-4	7:3 Fluorotelomer carboxylate	ND	6.1	1.5	ug/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	73%		20-150%
	13C5-PFPeA	71%		20-150%
	13C5-PFHxA	71%		20-150%
	13C4-PFHpA	66%		20-150%
	13C8-PFOA	80%		20-150%
	13C9-PFNA	68%		20-150%
	13C6-PFDA	78%		20-150%
	13C7-PFUnDA	74%		20-150%
	13C2-PFDoDA	71%		20-150%
	13C2-PFTeDA	72%		20-150%
	13C3-PFBS	82%		20-150%
	13C3-PFHxS	76%		20-150%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SC-B1-2.0	Date Sampled:	02/12/24
Lab Sample ID:	FC13427-2	Date Received:	02/16/24
Matrix:	SO - Soil	Percent Solids:	83.1
Method:	EPA DRAFT 1633 EPA 1633 DRAFT		
Project:	Paine Field; Everett, WA		

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C8-PFOS	66%		20-150%
	13C8-FOSA	74%		20-150%
	d3-MeFOSA	66%		20-150%
	d5-EtFOSA	72%		20-150%
	d3-MeFOSAA	67%		20-150%
	d5-EtFOSAA	72%		20-150%
	d7-MeFOSE	70%		20-150%
	d9-EtFOSE	68%		20-150%
	13C2-4:2FTS	103%		20-180%
	13C2-6:2FTS	91%		20-180%
	13C2-8:2FTS	84%		20-180%
	13C3-HFPO-DA	71%		20-150%

(a) Associated Low Level CCV outside of control limits high, sample was ND.

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

4.2
4

Report of Analysis

Client Sample ID:	SC-B2-0.5	Date Sampled:	02/12/24
Lab Sample ID:	FC13427-3	Date Received:	02/16/24
Matrix:	SO - Soil	Percent Solids:	69.5
Method:	EPA DRAFT 1633 EPA 1633 DRAFT		
Project:	Paine Field; Everett, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6Q31445.D	1	02/25/24 17:17	MV	02/21/24 08:55	OP1753	S6Q443
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.03 g	5.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	ND	1.1	0.72	ug/kg	
2706-90-3	Perfluoropentanoic acid	0.66	0.57	0.14	ug/kg	
307-24-4	Perfluorohexanoic acid	0.21	0.29	0.14	ug/kg	J
375-85-9	Perfluoroheptanoic acid	0.19	0.29	0.14	ug/kg	J
335-67-1	Perfluorooctanoic acid	0.38	0.29	0.14	ug/kg	
375-95-1	Perfluorononanoic acid	0.44	0.29	0.16	ug/kg	
335-76-2	Perfluorodecanoic acid	0.26	0.29	0.14	ug/kg	J
2058-94-8	Perfluoroundecanoic acid	0.21	0.29	0.19	ug/kg	J
307-55-1	Perfluorododecanoic acid	ND	0.29	0.14	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	0.29	0.15	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	0.29	0.14	ug/kg	

PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.29	0.14	ug/kg	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.29	0.22	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.29	0.23	ug/kg	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.29	0.21	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	1.7	0.29	0.14	ug/kg	
68259-12-1	Perfluorononanesulfonic acid	ND	0.29	0.26	ug/kg	
335-77-3	Perfluorodecanesulfonic acid	ND	0.29	0.20	ug/kg	
79780-39-5	Perfluorododecanesulfonic aci	ND	0.29	0.21	ug/kg	

FLUOROTELOMER SULFONIC ACIDS

757124-72-4	4:2 Fluorotelomer sulfonate	ND	1.1	0.57	ug/kg	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	1.1	0.57	ug/kg	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	1.1	0.86	ug/kg	

PERFLUOROCTANE SULFONAMIDES

754-91-6	PFOSA	ND	0.29	0.14	ug/kg	
31506-32-8	MeFOSA	ND	0.29	0.19	ug/kg	
4151-50-2	EtFOSA	ND	0.29	0.14	ug/kg	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SC-B2-0.5	Date Sampled:	02/12/24
Lab Sample ID:	FC13427-3	Date Received:	02/16/24
Matrix:	SO - Soil	Percent Solids:	69.5
Method:	EPA DRAFT 1633 EPA 1633 DRAFT		
Project:	Paine Field; Everett, WA		

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROOCTANE SULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA ^a	ND	0.29	0.23	ug/kg	
2991-50-6	EtFOSAA	ND	0.29	0.28	ug/kg	

PERFLUOROOCTANE SULFONAMIDO ETHANOLS

24448-09-7	MeFOSE	ND	2.9	1.4	ug/kg	
1691-99-2	EtFOSE	ND	2.9	1.4	ug/kg	

PER and POLYFLUOROETHER CARBOXYLIC ACIDS

13252-13-6	HFPO-DA (GenX)	ND	1.1	0.41	ug/kg	
919005-14-4	ADONA	ND	1.1	0.48	ug/kg	
377-73-1	PFMPA	ND	0.57	0.29	ug/kg	
863090-89-5	PFMBA	ND	0.57	0.29	ug/kg	
151772-58-6	NFDHA	ND	0.57	0.35	ug/kg	

PER and POLYFLUOROETHER SULFONIC ACIDS

756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	1.1	0.63	ug/kg	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	1.1	0.57	ug/kg	
113507-82-7	PFEESA	ND	0.57	0.29	ug/kg	

FLUOROTELOMER CARBOXYLIC ACIDS

356-02-5	3:3 Fluorotelomer carboxylate	ND	1.4	0.73	ug/kg	
914637-49-3	5:3 Fluorotelomer carboxylate	ND	7.2	1.7	ug/kg	
812-70-4	7:3 Fluorotelomer carboxylate	ND	7.2	1.8	ug/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFBA	78%	20-150%
13C5-PFPeA	76%	20-150%
13C5-PFHxA	75%	20-150%
13C4-PFHpA	73%	20-150%
13C8-PFOA	79%	20-150%
13C9-PFNA	88%	20-150%
13C6-PFDA	76%	20-150%
13C7-PFUnDA	83%	20-150%
13C2-PFDoDA	79%	20-150%
13C2-PFTeDA	73%	20-150%
13C3-PFBS	75%	20-150%
13C3-PFHxS	78%	20-150%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SC-B2-0.5	Date Sampled:	02/12/24
Lab Sample ID:	FC13427-3	Date Received:	02/16/24
Matrix:	SO - Soil	Percent Solids:	69.5
Method:	EPA DRAFT 1633 EPA 1633 DRAFT		
Project:	Paine Field; Everett, WA		

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C8-PFOS	73%		20-150%
	13C8-FOSA	80%		20-150%
	d3-MeFOSA	67%		20-150%
	d5-EtFOSA	75%		20-150%
	d3-MeFOSAA	80%		20-150%
	d5-EtFOSAA	75%		20-150%
	d7-MeFOSE	74%		20-150%
	d9-EtFOSE	78%		20-150%
	13C2-4:2FTS	102%		20-180%
	13C2-6:2FTS	89%		20-180%
	13C2-8:2FTS	93%		20-180%
	13C3-HFPO-DA	75%		20-150%

(a) Associated Low Level CCV outside of control limits high, sample was ND.

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SC-B2-2.0	Date Sampled:	02/12/24
Lab Sample ID:	FC13427-4	Date Received:	02/16/24
Matrix:	SO - Soil	Percent Solids:	78.6
Method:	EPA DRAFT 1633 EPA 1633 DRAFT		
Project:	Paine Field; Everett, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6Q31446.D	1	02/25/24 17:31	MV	02/21/24 08:55	OP1753	S6Q443
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.01 g	5.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.71	1.0	0.63	ug/kg	J
2706-90-3	Perfluoropentanoic acid	1.1	0.51	0.13	ug/kg	
307-24-4	Perfluorohexanoic acid	0.47	0.25	0.13	ug/kg	
375-85-9	Perfluoroheptanoic acid	0.61	0.25	0.13	ug/kg	
335-67-1	Perfluorooctanoic acid	1.2	0.25	0.13	ug/kg	
375-95-1	Perfluorononanoic acid	0.22	0.25	0.15	ug/kg	J
335-76-2	Perfluorodecanoic acid	ND	0.25	0.13	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	0.25	0.17	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	0.25	0.13	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	0.25	0.13	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	0.25	0.13	ug/kg	

PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.25	0.13	ug/kg	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.25	0.20	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	0.23	0.25	0.20	ug/kg	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.25	0.18	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.54	0.25	0.13	ug/kg	
68259-12-1	Perfluorononanesulfonic acid	ND	0.25	0.23	ug/kg	
335-77-3	Perfluorodecanesulfonic acid	ND	0.25	0.18	ug/kg	
79780-39-5	Perfluorododecanesulfonic aci	ND	0.25	0.19	ug/kg	

FLUOROTELOMER SULFONIC ACIDS

757124-72-4	4:2 Fluorotelomer sulfonate	ND	1.0	0.51	ug/kg	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	1.0	0.51	ug/kg	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	1.0	0.76	ug/kg	

PERFLUOROOCTANE SULFONAMIDES

754-91-6	PFOSA	ND	0.25	0.13	ug/kg	
31506-32-8	MeFOSA	ND	0.25	0.17	ug/kg	
4151-50-2	EtFOSA	ND	0.25	0.13	ug/kg	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SC-B2-2.0		
Lab Sample ID:	FC13427-4	Date Sampled:	02/12/24
Matrix:	SO - Soil	Date Received:	02/16/24
Method:	EPA DRAFT 1633 EPA 1633 DRAFT	Percent Solids:	78.6
Project:	Paine Field; Everett, WA		

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROOCTANE SULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA ^a	ND	0.25	0.20	ug/kg	
2991-50-6	EtFOSAA	ND	0.25	0.25	ug/kg	

PERFLUOROOCTANE SULFONAMIDO ETHANOLS

24448-09-7	MeFOSE	ND	2.5	1.3	ug/kg	
1691-99-2	EtFOSE	ND	2.5	1.3	ug/kg	

PER and POLYFLUOROETHER CARBOXYLIC ACIDS

13252-13-6	HFPO-DA (GenX)	ND	1.0	0.37	ug/kg	
919005-14-4	ADONA	ND	1.0	0.43	ug/kg	
377-73-1	PFMPA	ND	0.51	0.25	ug/kg	
863090-89-5	PFMBA	ND	0.51	0.25	ug/kg	
151772-58-6	NFDHA	ND	0.51	0.31	ug/kg	

PER and POLYFLUOROETHER SULFONIC ACIDS

756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	1.0	0.56	ug/kg	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	1.0	0.51	ug/kg	
113507-82-7	PFEESA	ND	0.51	0.25	ug/kg	

FLUOROTELOMER CARBOXYLIC ACIDS

356-02-5	3:3 Fluorotelomer carboxylate	ND	1.3	0.65	ug/kg	
914637-49-3	5:3 Fluorotelomer carboxylate	ND	6.3	1.5	ug/kg	
812-70-4	7:3 Fluorotelomer carboxylate	ND	6.3	1.6	ug/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	67%		20-150%
	13C5-PFPeA	64%		20-150%
	13C5-PFHxA	69%		20-150%
	13C4-PFHpA	63%		20-150%
	13C8-PFOA	66%		20-150%
	13C9-PFNA	69%		20-150%
	13C6-PFDA	63%		20-150%
	13C7-PFUnDA	64%		20-150%
	13C2-PFDoDA	58%		20-150%
	13C2-PFTeDA	52%		20-150%
	13C3-PFBS	64%		20-150%
	13C3-PFHxS	61%		20-150%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SC-B2-2.0	Date Sampled:	02/12/24
Lab Sample ID:	FC13427-4	Date Received:	02/16/24
Matrix:	SO - Soil	Percent Solids:	78.6
Method:	EPA DRAFT 1633 EPA 1633 DRAFT		
Project:	Paine Field; Everett, WA		

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C8-PFOS	59%		20-150%
	13C8-FOSA	68%		20-150%
	d3-MeFOSA	61%		20-150%
	d5-EtFOSA	66%		20-150%
	d3-MeFOSAA	61%		20-150%
	d5-EtFOSAA	61%		20-150%
	d7-MeFOSE	66%		20-150%
	d9-EtFOSE	68%		20-150%
	13C2-4:2FTS	67%		20-180%
	13C2-6:2FTS	78%		20-180%
	13C2-8:2FTS	74%		20-180%
	13C3-HFPO-DA	63%		20-150%

(a) Associated Low Level CCV outside of control limits high, sample was ND.

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SC-CB1		
Lab Sample ID:	FC13427-5	Date Sampled:	02/12/24
Matrix:	SO - Soil	Date Received:	02/16/24
Method:	EPA DRAFT 1633 EPA 1633 DRAFT	Percent Solids:	63.7
Project:	Paine Field; Everett, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6Q31449.D	1	02/25/24 18:14	MV	02/21/24 08:55	OP1753	S6Q443
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.04 g	5.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	ND	1.2	0.78	ug/kg	
2706-90-3	Perfluoropentanoic acid	ND	0.62	0.16	ug/kg	
307-24-4	Perfluorohexanoic acid	ND	0.31	0.16	ug/kg	
375-85-9	Perfluoroheptanoic acid	ND	0.31	0.16	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.31	0.16	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.31	0.18	ug/kg	
335-76-2	Perfluorodecanoic acid	ND	0.31	0.16	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	0.31	0.21	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	0.31	0.16	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	0.31	0.16	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	0.31	0.16	ug/kg	

PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.31	0.16	ug/kg	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.31	0.24	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.31	0.25	ug/kg	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.31	0.23	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.31	0.16	ug/kg	
68259-12-1	Perfluorononanesulfonic acid	ND	0.31	0.28	ug/kg	
335-77-3	Perfluorodecanesulfonic acid	ND	0.31	0.22	ug/kg	
79780-39-5	Perfluorododecanesulfonic aci	ND	0.31	0.23	ug/kg	

FLUOROTELOMER SULFONIC ACIDS

757124-72-4	4:2 Fluorotelomer sulfonate	ND	1.2	0.62	ug/kg	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	1.2	0.62	ug/kg	
39108-34-4	8:2 Fluorotelomer sulfonate	1.0	1.2	0.93	ug/kg	J

PERFLUOROCTANE SULFONAMIDES

754-91-6	PFOSA	ND	0.31	0.16	ug/kg	
31506-32-8	MeFOSA	ND	0.31	0.21	ug/kg	
4151-50-2	EtFOSA	ND	0.31	0.16	ug/kg	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SC-CB1		
Lab Sample ID:	FC13427-5	Date Sampled:	02/12/24
Matrix:	SO - Soil	Date Received:	02/16/24
Method:	EPA DRAFT 1633 EPA 1633 DRAFT	Percent Solids:	63.7
Project:	Paine Field; Everett, WA		

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROOCTANE SULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA ^a	ND	0.31	0.25	ug/kg	
2991-50-6	EtFOSAA	ND	0.31	0.31	ug/kg	

PERFLUOROOCTANE SULFONAMIDO ETHANOLS

24448-09-7	MeFOSE	ND	3.1	1.6	ug/kg	
1691-99-2	EtFOSE	ND	3.1	1.6	ug/kg	

PER and POLYFLUOROETHER CARBOXYLIC ACIDS

13252-13-6	HFPO-DA (GenX)	ND	1.2	0.45	ug/kg	
919005-14-4	ADONA	ND	1.2	0.52	ug/kg	
377-73-1	PFMPA	ND	0.62	0.31	ug/kg	
863090-89-5	PFMBA	ND	0.62	0.31	ug/kg	
151772-58-6	NFDHA	ND	0.62	0.38	ug/kg	

PER and POLYFLUOROETHER SULFONIC ACIDS

756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	1.2	0.68	ug/kg	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	1.2	0.62	ug/kg	
113507-82-7	PFEESA	ND	0.62	0.31	ug/kg	

FLUOROTELOMER CARBOXYLIC ACIDS

356-02-5	3:3 Fluorotelomer carboxylate	ND	1.6	0.79	ug/kg	
914637-49-3	5:3 Fluorotelomer carboxylate	ND	7.8	1.8	ug/kg	
812-70-4	7:3 Fluorotelomer carboxylate	ND	7.8	2.0	ug/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	55%		20-150%
	13C5-PFPeA	54%		20-150%
	13C5-PFHxA	52%		20-150%
	13C4-PFHpA	52%		20-150%
	13C8-PFOA	54%		20-150%
	13C9-PFNA	55%		20-150%
	13C6-PFDA	51%		20-150%
	13C7-PFUnDA	51%		20-150%
	13C2-PFDoDA	50%		20-150%
	13C2-PFTeDA	55%		20-150%
	13C3-PFBS	52%		20-150%
	13C3-PFHxS	51%		20-150%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SC-CB1	Date Sampled:	02/12/24
Lab Sample ID:	FC13427-5	Date Received:	02/16/24
Matrix:	SO - Soil	Percent Solids:	63.7
Method:	EPA DRAFT 1633 EPA 1633 DRAFT		
Project:	Paine Field; Everett, WA		

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C8-PFOS	49%		20-150%
	13C8-FOSA	47%		20-150%
	d3-MeFOSA	48%		20-150%
	d5-EtFOSA	55%		20-150%
	d3-MeFOSAA	53%		20-150%
	d5-EtFOSAA	47%		20-150%
	d7-MeFOSE	54%		20-150%
	d9-EtFOSE	53%		20-150%
	13C2-4:2FTS	64%		20-180%
	13C2-6:2FTS	67%		20-180%
	13C2-8:2FTS	77%		20-180%
	13C3-HFPO-DA	52%		20-150%

(a) Associated Low Level CCV outside of control limits high, sample was ND.

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SC-SW1-20240212	
Lab Sample ID:	FC13427-6	Date Sampled: 02/12/24
Matrix:	AQ - Surface Water	Date Received: 02/16/24
Method:	EPA DRAFT 1633 EPA 1633 DRAFT	Percent Solids: n/a
Project:	Paine Field; Everett, WA	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7Q0107.D	1	02/23/24 17:14	MV	02/21/24 08:30	OP1744	S7Q45
Run #2							

Run #	Initial Volume	Final Volume
Run #1	550 ml	5.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	ND	0.0073	0.0036	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0055	0.0036	0.00091	ug/l	
307-24-4	Perfluorohexanoic acid	0.0032	0.0018	0.00045	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0032	0.0018	0.00045	ug/l	
335-67-1	Perfluorooctanoic acid	0.0019	0.0018	0.00045	ug/l	
375-95-1	Perfluorononanoic acid	0.00089	0.0018	0.00055	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00045	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00055	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00055	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00076	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00045	ug/l	

PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.00099	0.0018	0.00091	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0072	0.0018	0.00091	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00091	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0056	0.0018	0.00091	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00091	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00091	ug/l	
79780-39-5	Perfluorododecanesulfonic aci	ND	0.0018	0.0010	ug/l	

FLUOROTELOMER SULFONIC ACIDS

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0073	0.0036	ug/l
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0073	0.0036	ug/l
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0073	0.0037	ug/l

PERFLUOROCTANE SULFONAMIDES

754-91-6	PFOSA	ND	0.0018	0.00091	ug/l
31506-32-8	MeFOSA	ND	0.0018	0.00091	ug/l
4151-50-2	EtFOSA	ND	0.0018	0.00091	ug/l

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SC-SW1-20240212	Date Sampled:	02/12/24
Lab Sample ID:	FC13427-6	Date Received:	02/16/24
Matrix:	AQ - Surface Water	Percent Solids:	n/a
Method:	EPA DRAFT 1633 EPA 1633 DRAFT		
Project:	Paine Field; Everett, WA		

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROOCTANE SULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0018	0.00091	ug/l	
2991-50-6	EtFOSAA	ND	0.0018	0.0012	ug/l	

PERFLUOROOCTANE SULFONAMIDO ETHANOLS

24448-09-7	MeFOSE	ND	0.018	0.0091	ug/l	
1691-99-2	EtFOSE	ND	0.018	0.0091	ug/l	

PER and POLYFLUOROETHER CARBOXYLIC ACIDS

13252-13-6	HFPO-DA (GenX)	ND	0.0073	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0073	0.0018	ug/l	
377-73-1	PFMPA	ND	0.0036	0.00091	ug/l	
863090-89-5	PFMBA	ND	0.0036	0.0010	ug/l	
151772-58-6	NFDHA	ND	0.0036	0.0011	ug/l	

PER and POLYFLUOROETHER SULFONIC ACIDS

756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0073	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0073	0.0018	ug/l	
113507-82-7	PFEESA	ND	0.0036	0.00091	ug/l	

FLUOROTELOMER CARBOXYLIC ACIDS

356-02-5	3:3 Fluorotelomer carboxylat ^a	ND	0.0091	0.0045	ug/l	
914637-49-3	5:3 Fluorotelomer carboxylate	ND	0.045	0.0091	ug/l	
812-70-4	7:3 Fluorotelomer carboxylate	ND	0.045	0.0091	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	107%		20-150%
	13C5-PFPeA	103%		20-150%
	13C5-PFHxA	110%		20-150%
	13C4-PFHpA	106%		20-150%
	13C8-PFOA	109%		20-150%
	13C9-PFNA	104%		20-150%
	13C6-PFDA	110%		20-150%
	13C7-PFUnDA	109%		20-150%
	13C2-PFDoDA	106%		20-150%
	13C2-PFTeDA	81%		20-150%
	13C3-PFBS	122%		20-150%
	13C3-PFHxS	116%		20-150%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SC-SW1-20240212	Date Sampled:	02/12/24
Lab Sample ID:	FC13427-6	Date Received:	02/16/24
Matrix:	AQ - Surface Water	Percent Solids:	n/a
Method:	EPA DRAFT 1633 EPA 1633 DRAFT		
Project:	Paine Field; Everett, WA		

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C8-PFOS	111%		20-150%
	13C8-FOSA	104%		20-150%
	d3-MeFOSA	85%		20-150%
	d5-EtFOSA	85%		20-150%
	d3-MeFOSAA	102%		20-150%
	d5-EtFOSAA	99%		20-150%
	d7-MeFOSE	91%		20-150%
	d9-EtFOSE	88%		20-150%
	13C2-4:2FTS	93%		20-180%
	13C2-6:2FTS	110%		20-180%
	13C2-8:2FTS	103%		20-180%
	13C3-HFPO-DA	110%		20-150%

(a) Associated BS outside control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-20240212	Date Sampled:	02/12/24
Lab Sample ID:	FC13427-7	Date Received:	02/16/24
Matrix:	AQ - Equipment Blank	Percent Solids:	n/a
Method:	EPA DRAFT 1633 EPA 1633 DRAFT		
Project:	Paine Field; Everett, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7Q0108.D	1	02/23/24 17:28	MV	02/21/24 08:30	OP1744	S7Q45
Run #2							

Run #	Initial Volume	Final Volume
Run #1	550 ml	5.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	ND	0.0073	0.0036	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0036	0.00091	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00045	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00045	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00045	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00055	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00045	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00055	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00055	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00076	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00045	ug/l	

PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00091	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00091	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00091	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00091	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00091	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00091	ug/l	
79780-39-5	Perfluorododecanesulfonic aci	ND	0.0018	0.0010	ug/l	

FLUOROTELOMER SULFONIC ACIDS

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0073	0.0036	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0073	0.0036	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0073	0.0037	ug/l	

PERFLUOROCTANE SULFONAMIDES

754-91-6	PFOSA	ND	0.0018	0.00091	ug/l	
31506-32-8	MeFOSA	ND	0.0018	0.00091	ug/l	
4151-50-2	EtFOSA	ND	0.0018	0.00091	ug/l	

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-20240212	Date Sampled:	02/12/24
Lab Sample ID:	FC13427-7	Date Received:	02/16/24
Matrix:	AQ - Equipment Blank	Percent Solids:	n/a
Method:	EPA DRAFT 1633 EPA 1633 DRAFT		
Project:	Paine Field; Everett, WA		

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROOCTANE SULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0018	0.00091	ug/l	
2991-50-6	EtFOSAA	ND	0.0018	0.0012	ug/l	

PERFLUOROOCTANE SULFONAMIDO ETHANOLS

24448-09-7	MeFOSE	ND	0.018	0.0091	ug/l	
1691-99-2	EtFOSE	ND	0.018	0.0091	ug/l	

PER and POLYFLUOROETHER CARBOXYLIC ACIDS

13252-13-6	HFPO-DA (GenX)	ND	0.0073	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0073	0.0018	ug/l	
377-73-1	PFMPA	ND	0.0036	0.00091	ug/l	
863090-89-5	PFMBA	ND	0.0036	0.0010	ug/l	
151772-58-6	NFDHA	ND	0.0036	0.0011	ug/l	

PER and POLYFLUOROETHER SULFONIC ACIDS

756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0073	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0073	0.0018	ug/l	
113507-82-7	PFEESA	ND	0.0036	0.00091	ug/l	

FLUOROTELOMER CARBOXYLIC ACIDS

356-02-5	3:3 Fluorotelomer carboxylat ^a	ND	0.0091	0.0045	ug/l	
914637-49-3	5:3 Fluorotelomer carboxylate	ND	0.045	0.0091	ug/l	
812-70-4	7:3 Fluorotelomer carboxylate	ND	0.045	0.0091	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	107%		20-150%
	13C5-PFPeA	107%		20-150%
	13C5-PFHxA	105%		20-150%
	13C4-PFHpA	105%		20-150%
	13C8-PFOA	106%		20-150%
	13C9-PFNA	107%		20-150%
	13C6-PFDA	108%		20-150%
	13C7-PFUnDA	110%		20-150%
	13C2-PFDoDA	100%		20-150%
	13C2-PFTeDA	85%		20-150%
	13C3-PFBS	99%		20-150%
	13C3-PFHxS	102%		20-150%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-20240212	Date Sampled:	02/12/24
Lab Sample ID:	FC13427-7	Date Received:	02/16/24
Matrix:	AQ - Equipment Blank	Percent Solids:	n/a
Method:	EPA DRAFT 1633 EPA 1633 DRAFT		
Project:	Paine Field; Everett, WA		

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C8-PFOS	103%		20-150%
	13C8-FOSA	96%		20-150%
	d3-MeFOSA	87%		20-150%
	d5-EtFOSA	93%		20-150%
	d3-MeFOSAA	91%		20-150%
	d5-EtFOSAA	96%		20-150%
	d7-MeFOSE	86%		20-150%
	d9-EtFOSE	89%		20-150%
	13C2-4:2FTS	102%		20-180%
	13C2-6:2FTS	110%		20-180%
	13C2-8:2FTS	107%		20-180%
	13C3-HFPO-DA	103%		20-150%

(a) Associated BS outside control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



SGS North America Inc - Orlando

Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, FL 32811
TEL: 407-425-6700 FAX: 407-425-0707
www.sgs.com

FC13427

SGS - ORLANDO JOB #:

PAGE 1 OF 1

Client / Reporting Information			Project Information			Analytical Information													Matrix Codes
Company Name: <u>GeoEngineers Inc</u>			Project Name: <u>Parkfield - former fire pit</u>			<div>ANALYTICAL INFORMATION</div> <div>Matrix Codes</div> <div>DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid</div>													LAB USE ONLY
Address: <u>2101 4th Ave, Suite 950</u>			Street																
City: <u>Seattle</u> State: <u>WA</u> Zip: <u>98121</u>			City: <u>Everett</u> State: <u>WA</u>																
Project Contact: <u>Jacob Letts</u> Email: <u>jletts@geoengineers.com</u>			Project # <u>05530-015-00</u>																
Phone #:			Fax #																
Sampler(s) Name(s) (Printed)			Client Purchase Order #																
Sampler 1: <u>Meredith Bush</u> Sampler 2: <u>Jason Edwards</u>																			
COLLECTION			CONTAINER INFORMATION																
SGS Orlando Sample #	Field ID / Point of Collection	DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	OTHER	NONE	HCl	HNO3	H2SO4	MAOH+ZNA	DI WATER	MESH					
1	<u>SC-B1-1.0</u>	<u>2/12/24</u>	<u>0955</u>	<u>GE</u>	<u>SO</u>	<u>1</u>													
2	<u>SC-B1-2.0</u>		<u>1010</u>			<u>1</u>													
3	<u>SC-B2-0.5</u>		<u>0910</u>			<u>1</u>													
4	<u>SC-B2-2.0</u>		<u>0915</u>			<u>1</u>													
5	<u>SC-CB-1</u>		<u>0830</u>		<u>↓</u>	<u>1</u>													
6	<u>SC-SW1-20240212</u>		<u>0945</u>		<u>SW</u>	<u>3</u>													
7	<u>EB-20240212</u>	<u>↓</u>	<u>1055</u>	<u>↓</u>	<u>NW</u>	<u>2</u>													
Turnaround Time (Business days)			Data Deliverable Information			Comments / Remarks													
10 Day (Business) Approved By: / Date: <u>standard</u>			<input type="checkbox"/> COMMERCIAL "A" (RESULTS ONLY)			<div>INITIAL ASSESSMENT <u>[Signature]</u></div> <div>LABEL VERIFICATION <u>[Signature]</u></div>													
7 Day			<input type="checkbox"/> COMMERCIAL "B" (RESULTS PLUS QC)																
5 Day			<input type="checkbox"/> REDT1 (EPA LEVEL 3)																
3 Day RUSH			<input type="checkbox"/> FULLT1 (EPA LEVEL 4)																
2 Day RUSH			<input type="checkbox"/> EDD'S																
1 Day RUSH																			
Other																			
Rush T/A Data Available VIA Email or Lablink																			
Sample Custody must be documented below each time samples change possession, including courier delivery.																			
Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation				
1 <u>Meredith Bush/GEI</u>	<u>2/14/24</u>	2 <u>385h</u> <u>2/16/24</u> <u>930</u>	3		4	5		6	7		8	9		10	11				
Relinquished by/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation				
5		6	7		8	9		10	11		12	13		14	15				
Lab Use Only: Cooler Temperature (s) Celsius (corrected): <u>3.8 IR1</u>																			

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

<http://www.sgs.com/en/terms-and-conditions>

FC13427: Chain of Custody

Page 1 of 2



SGS - Orlando Sample Receipt Summary

Job Number: fc13427

Client: GEOENGINEERS INC

Project: PAINE FIELD - FORMER FIRE PIT

Date / Time Received: 2/16/2024 9:30:00 AM

Delivery Method: FEDEX

Airbill #'s: 270996036894

Cooler Temps (Raw Measured) °C: Cooler 1: (3.8);

Cooler Temps (Corrected) °C: Cooler 1: (4.8);

Cooler Information

Y or N

- | | | |
|------------------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Temp criteria achieved: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Cooler temp verification: | | IR Gun |
| 5. Cooler media: | | Ice (Bag) |

Trip Blank Information

Y or N N/A

- | | | | |
|---------------------------------|--------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

W or S N/A

- | | | | |
|------------------------|--------------------------|--------------------------|-------------------------------------|
| 3. Type of TB Received | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|------------------------|--------------------------|--------------------------|-------------------------------------|

Sample Information

Y or N N/A

- | | | | |
|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Sample labels present on bottles: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 2. Samples presented properly | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 3. Sufficient volume/containers rec'd for analysis | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. Condition of sample: | | Intact | |
| 5. Sample rec'd within HT | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 6. Dates/Times/IDs on COC match sample label | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 7. VOCs have headspace | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8. Bottles received for unspecified tests | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 9. Compositing instructions clear | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10. Voa Soil Kits/Jars received past 48hrs? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11. % Solids Jar Received? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Residual Chlorine Present? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Misc Information

Number of Encores: 25 Gram 5 Gram

Number of Lab Filtered Metals:

Test Strip Lot #s: pH 0-3: 226422

pH 10-12: _____ Other: (Specify) pH 1.0 - 12.0 222221

Residual Chlorine Test Strip Lot # _____

Comments

Sample Receipt Summary 112723 EK Technician: ZANEB

Date: 2/16/2024 1:30:30 PM

Reviewer: _____ Date: _____

FC13427: Chain of Custody

Page 2 of 2

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Page 1 of 2

Job Number: FC13427

Account: GEOEWAT GeoEngineers, Inc.

Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1744-MB	7Q0105.D	1	02/23/24	MV	02/21/24	OP1744	S7Q45

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-6, FC13427-7

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0040	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.00050	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.00050	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.00050	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.00061	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.00050	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.00060	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.00060	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.00084	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.00050	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0011	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
79780-39-5	Perfluorododecanesulfonic acid	ND	0.0020	0.0011	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0040	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0040	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0041	ug/l	
754-91-6	PFOSA	ND	0.0020	0.0010	ug/l	
31506-32-8	MeFOSA	ND	0.0020	0.0010	ug/l	
4151-50-2	EtFOSA	ND	0.0020	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0020	0.0010	ug/l	
2991-50-6	EtFOSAA	ND	0.0020	0.0013	ug/l	
24448-09-7	MeFOSE	ND	0.020	0.010	ug/l	
1691-99-2	EtFOSE	ND	0.020	0.010	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
377-73-1	PFMPA	ND	0.0040	0.0010	ug/l	
863090-89-5	PFMBA	ND	0.0040	0.0011	ug/l	
151772-58-6	NFDHA	ND	0.0040	0.0012	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

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Job Number: FC13427

Account: GEOEWAT GeoEngineers, Inc.

Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1744-MB	7Q0105.D	1	02/23/24	MV	02/21/24	OP1744	S7Q45

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-6, FC13427-7

CAS No.	Compound	Result	RL	MDL	Units	Q
113507-82-7	PFEESA	ND	0.0040	0.0010	ug/l	
356-02-5	3:3 Fluorotelomer carboxylate	ND	0.010	0.0050	ug/l	
914637-49-35:3	Fluorotelomer carboxylate	ND	0.050	0.010	ug/l	
812-70-4	7:3 Fluorotelomer carboxylate	ND	0.050	0.010	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	113% 20-150%
	13C5-PFPeA	113% 20-150%
	13C5-PFHxA	111% 20-150%
	13C4-PFHpA	112% 20-150%
	13C8-PFOA	111% 20-150%
	13C9-PFNA	112% 20-150%
	13C6-PFDA	115% 20-150%
	13C7-PFUnDA	112% 20-150%
	13C2-PFDoDA	107% 20-150%
	13C2-PFTeDA	104% 20-150%
	13C3-PFBS	116% 20-150%
	13C3-PFHxS	115% 20-150%
	13C8-PFOS	107% 20-150%
	13C8-FOSA	84% 20-150%
	d3-MeFOSA	72% 20-150%
	d5-EtFOSA	76% 20-150%
	d3-MeFOSAA	111% 20-150%
	d5-EtFOSAA	101% 20-150%
	d7-MeFOSE	80% 20-150%
	d9-EtFOSE	85% 20-150%
	13C2-4:2FTS	112% 20-180%
	13C2-6:2FTS	118% 20-180%
	13C2-8:2FTS	108% 20-180%
	13C3-HFPO-DA	115% 20-150%

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Job Number: FC13427
Account: GEOEWAT GeoEngineers, Inc.
Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1753-MB	6Q31377.D	1	02/24/24	MV	02/21/24	OP1753	S6Q442

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-1, FC13427-2, FC13427-3, FC13427-4, FC13427-5

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.80	0.50	ug/kg	
2706-90-3	Perfluoropentanoic acid	ND	0.40	0.10	ug/kg	
307-24-4	Perfluorohexanoic acid	ND	0.20	0.10	ug/kg	
375-85-9	Perfluoroheptanoic acid	ND	0.20	0.10	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.20	0.10	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.20	0.12	ug/kg	
335-76-2	Perfluorodecanoic acid	ND	0.20	0.10	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	0.20	0.13	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	0.20	0.10	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	0.20	0.10	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	0.20	0.10	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	0.20	0.10	ug/kg	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.20	0.16	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.20	0.16	ug/kg	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.20	0.15	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.20	0.10	ug/kg	
68259-12-1	Perfluorononanesulfonic acid	ND	0.20	0.18	ug/kg	
335-77-3	Perfluorodecanesulfonic acid	ND	0.20	0.14	ug/kg	
79780-39-5	Perfluorododecanesulfonic acid	ND	0.20	0.15	ug/kg	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.80	0.40	ug/kg	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.80	0.40	ug/kg	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.80	0.60	ug/kg	
754-91-6	PFOSA	ND	0.20	0.10	ug/kg	
31506-32-8	MeFOSA	ND	0.20	0.14	ug/kg	
4151-50-2	EtFOSA	ND	0.20	0.10	ug/kg	
2355-31-9	MeFOSAA	ND	0.20	0.16	ug/kg	
2991-50-6	EtFOSAA	ND	0.20	0.20	ug/kg	
24448-09-7	MeFOSE	ND	2.0	1.0	ug/kg	
1691-99-2	EtFOSE	ND	2.0	1.0	ug/kg	
13252-13-6	HFPO-DA (GenX)	ND	0.80	0.29	ug/kg	
919005-14-4	ADONA	ND	0.80	0.34	ug/kg	
377-73-1	PFMPA	ND	0.40	0.20	ug/kg	
863090-89-5	PFMBA	ND	0.40	0.20	ug/kg	
151772-58-6	NFDHA	ND	0.40	0.24	ug/kg	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.80	0.44	ug/kg	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.80	0.40	ug/kg	

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Job Number: FC13427
Account: GEOEWAT GeoEngineers, Inc.
Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1753-MB	6Q31377.D	1	02/24/24	MV	02/21/24	OP1753	S6Q442

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-1, FC13427-2, FC13427-3, FC13427-4, FC13427-5

CAS No.	Compound	Result	RL	MDL	Units	Q
113507-82-7	PFEESA	ND	0.40	0.20	ug/kg	
356-02-5	3:3 Fluorotelomer carboxylate	ND	1.0	0.51	ug/kg	
914637-49-35:3	Fluorotelomer carboxylate	ND	5.0	1.2	ug/kg	
812-70-4	7:3 Fluorotelomer carboxylate	ND	5.0	1.3	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	50% 20-150%
	13C5-PFPeA	51% 20-150%
	13C5-PFHxA	48% 20-150%
	13C4-PFHpA	47% 20-150%
	13C8-PFOA	51% 20-150%
	13C9-PFNA	47% 20-150%
	13C6-PFDA	54% 20-150%
	13C7-PFUnDA	54% 20-150%
	13C2-PFDoDA	51% 20-150%
	13C2-PFTeDA	52% 20-150%
	13C3-PFBS	47% 20-150%
	13C3-PFHxS	51% 20-150%
	13C8-PFOS	45% 20-150%
	13C8-FOSA	55% 20-150%
	d3-MeFOSA	43% 20-150%
	d5-EtFOSA	47% 20-150%
	d3-MeFOSAA	47% 20-150%
	d5-EtFOSAA	47% 20-150%
	d7-MeFOSE	49% 20-150%
	d9-EtFOSE	47% 20-150%
	13C2-4:2FTS	54% 20-180%
	13C2-6:2FTS	50% 20-180%
	13C2-8:2FTS	50% 20-180%
	13C3-HFPO-DA	48% 20-150%

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Job Number: FC13427**Account:** GEOEWAT GeoEngineers, Inc.**Project:** Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1753-MB	6Q31439.D	1	02/25/24	MV	02/21/24	OP1753	S6Q443

The QC reported here applies to the following samples:**Method:** EPA DRAFT 1633

FC13427-1, FC13427-2, FC13427-3, FC13427-4, FC13427-5

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.80	0.50	ug/kg	
2706-90-3	Perfluoropentanoic acid	ND	0.40	0.10	ug/kg	
307-24-4	Perfluorohexanoic acid	ND	0.20	0.10	ug/kg	
375-85-9	Perfluoroheptanoic acid	ND	0.20	0.10	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.20	0.10	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.20	0.12	ug/kg	
335-76-2	Perfluorodecanoic acid	ND	0.20	0.10	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	0.20	0.13	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	0.20	0.10	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	0.20	0.10	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	0.20	0.10	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	0.20	0.10	ug/kg	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.20	0.16	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.20	0.16	ug/kg	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.20	0.15	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.20	0.10	ug/kg	
68259-12-1	Perfluorononanesulfonic acid	ND	0.20	0.18	ug/kg	
335-77-3	Perfluorodecanesulfonic acid	ND	0.20	0.14	ug/kg	
79780-39-5	Perfluorododecanesulfonic acid	ND	0.20	0.15	ug/kg	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.80	0.40	ug/kg	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.80	0.40	ug/kg	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.80	0.60	ug/kg	
754-91-6	PFOSA	ND	0.20	0.10	ug/kg	
31506-32-8	MeFOSA	ND	0.20	0.14	ug/kg	
4151-50-2	EtFOSA	ND	0.20	0.10	ug/kg	
2355-31-9	MeFOSAA	ND	0.20	0.16	ug/kg	
2991-50-6	EtFOSAA	ND	0.20	0.20	ug/kg	
24448-09-7	MeFOSE	ND	2.0	1.0	ug/kg	
1691-99-2	EtFOSE	ND	2.0	1.0	ug/kg	
13252-13-6	HFPO-DA (GenX)	ND	0.80	0.29	ug/kg	
919005-14-4	ADONA	ND	0.80	0.34	ug/kg	
377-73-1	PFMPA	ND	0.40	0.20	ug/kg	
863090-89-5	PFMBA	ND	0.40	0.20	ug/kg	
151772-58-6	NFDHA	ND	0.40	0.24	ug/kg	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.80	0.44	ug/kg	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.80	0.40	ug/kg	

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Job Number: FC13427
Account: GEOEWAT GeoEngineers, Inc.
Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1753-MB	6Q31439.D	1	02/25/24	MV	02/21/24	OP1753	S6Q443

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-1, FC13427-2, FC13427-3, FC13427-4, FC13427-5

CAS No.	Compound	Result	RL	MDL	Units	Q
113507-82-7	PFEESA	ND	0.40	0.20	ug/kg	
356-02-5	3:3 Fluorotelomer carboxylate	ND	1.0	0.51	ug/kg	
914637-49-35:3	Fluorotelomer carboxylate	ND	5.0	1.2	ug/kg	
812-70-4	7:3 Fluorotelomer carboxylate	ND	5.0	1.3	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	51% 20-150%
	13C5-PFPeA	52% 20-150%
	13C5-PFHxA	51% 20-150%
	13C4-PFHpA	49% 20-150%
	13C8-PFOA	50% 20-150%
	13C9-PFNA	49% 20-150%
	13C6-PFDA	57% 20-150%
	13C7-PFUnDA	52% 20-150%
	13C2-PFDoDA	46% 20-150%
	13C2-PFTeDA	53% 20-150%
	13C3-PFBS	50% 20-150%
	13C3-PFHxS	51% 20-150%
	13C8-PFOS	51% 20-150%
	13C8-FOSA	58% 20-150%
	d3-MeFOSA	47% 20-150%
	d5-EtFOSA	50% 20-150%
	d3-MeFOSAA	49% 20-150%
	d5-EtFOSAA	48% 20-150%
	d7-MeFOSE	52% 20-150%
	d9-EtFOSE	50% 20-150%
	13C2-4:2FTS	54% 20-180%
	13C2-6:2FTS	60% 20-180%
	13C2-8:2FTS	59% 20-180%
	13C3-HFPO-DA	48% 20-150%

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Job Number: FC13427

Account: GEOEWAT GeoEngineers, Inc.

Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S7Q45-IBLK	7Q0094.D	1	02/23/24	MV	n/a	n/a	S7Q45

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-6, FC13427-7

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.016	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0080	0.00094	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.00050	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.00050	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.00050	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.00061	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.00050	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.00060	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.00060	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.00084	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.00050	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.00050	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0050	0.0011	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.00070	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.00050	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.00054	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.00057	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.00064	ug/l	
79780-39-5	Perfluorododecanesulfonic acid	ND	0.0050	0.0011	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.020	0.0032	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.020	0.0035	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.020	0.0041	ug/l	
754-91-6	PFOSA	ND	0.0040	0.00067	ug/l	
31506-32-8	MeFOSA	ND	0.0080	0.0010	ug/l	
4151-50-2	EtFOSA	ND	0.0080	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0050	0.0010	ug/l	
2991-50-6	EtFOSAA	ND	0.0050	0.0013	ug/l	
24448-09-7	MeFOSE	ND	0.040	0.0044	ug/l	
1691-99-2	EtFOSE	ND	0.040	0.0074	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0010	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0019	ug/l	
377-73-1	PFMPA	ND	0.0080	0.0010	ug/l	
863090-89-5	PFMBA	ND	0.0080	0.0011	ug/l	
151772-58-6	NFDHA	ND	0.0080	0.0012	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0014	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0018	ug/l	

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Job Number: FC13427**Account:** GEOEWAT GeoEngineers, Inc.**Project:** Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S7Q45-IBLK	7Q0094.D	1	02/23/24	MV	n/a	n/a	S7Q45

The QC reported here applies to the following samples:**Method:** EPA DRAFT 1633

FC13427-6, FC13427-7

CAS No.	Compound	Result	RL	MDL	Units	Q
113507-82-7	PFEESA	ND	0.0080	0.00078	ug/l	
356-02-5	3:3 Fluorotelomer carboxylate	ND	0.020	0.0045	ug/l	
914637-49-35:3	Fluorotelomer carboxylate	ND	0.10	0.0087	ug/l	
812-70-4	7:3 Fluorotelomer carboxylate	ND	0.10	0.0079	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	100% 20-150%
	13C5-PFPeA	99% 20-150%
	13C5-PFHxA	101% 20-150%
	13C4-PFHpA	99% 20-150%
	13C8-PFOA	104% 20-150%
	13C9-PFNA	100% 20-150%
	13C6-PFDA	106% 20-150%
	13C7-PFUnDA	108% 20-150%
	13C2-PFDoDA	102% 20-150%
	13C2-PFTeDA	98% 20-150%
	13C3-PFBS	100% 20-150%
	13C3-PFHxS	102% 20-150%
	13C8-PFOS	100% 20-150%
	13C8-FOSA	99% 20-150%
	d3-MeFOSA	102% 20-150%
	d5-EtFOSA	102% 20-150%
	d3-MeFOSAA	99% 20-150%
	d5-EtFOSAA	105% 20-150%
	d7-MeFOSE	100% 20-150%
	d9-EtFOSE	98% 20-150%
	13C2-4:2FTS	109% 20-180%
	13C2-6:2FTS	107% 20-180%
	13C2-8:2FTS	103% 20-180%
	13C3-HFPO-DA	95% 20-150%

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Job Number: FC13427
Account: GEOEWAT GeoEngineers, Inc.
Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S6Q442-IBLK	6Q31316.D	1	02/23/24	MV	n/a	n/a	S6Q442

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-1, FC13427-2, FC13427-3, FC13427-4, FC13427-5

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	2.0	0.31	ug/kg	
2706-90-3	Perfluoropentanoic acid	ND	1.0	0.10	ug/kg	
307-24-4	Perfluorohexanoic acid	ND	1.0	0.10	ug/kg	
375-85-9	Perfluoroheptanoic acid	ND	1.0	0.10	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	1.0	0.10	ug/kg	
375-95-1	Perfluorononanoic acid	ND	1.0	0.12	ug/kg	
335-76-2	Perfluorodecanoic acid	ND	1.0	0.10	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	1.0	0.13	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	1.0	0.10	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	1.0	0.10	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	1.0	0.10	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	1.0	0.10	ug/kg	
2706-91-4	Perfluoropentanesulfonic acid	ND	1.0	0.16	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	1.0	0.16	ug/kg	
375-92-8	Perfluoroheptanesulfonic acid	ND	1.0	0.15	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	1.0	0.10	ug/kg	
68259-12-1	Perfluorononanesulfonic acid	ND	1.0	0.18	ug/kg	
335-77-3	Perfluorodecanesulfonic acid	ND	1.0	0.14	ug/kg	
79780-39-5	Perfluorododecanesulfonic acid	ND	1.0	0.15	ug/kg	
757124-72-44:2	Fluorotelomer sulfonate	ND	2.0	0.30	ug/kg	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	2.0	0.35	ug/kg	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	2.0	0.61	ug/kg	
754-91-6	PFOSA	ND	1.0	0.10	ug/kg	
31506-32-8	MeFOSA	ND	1.0	0.14	ug/kg	
4151-50-2	EtFOSA	ND	1.0	0.10	ug/kg	
2355-31-9	MeFOSAA	ND	1.0	0.16	ug/kg	
2991-50-6	EtFOSAA	ND	1.0	0.20	ug/kg	
24448-09-7	MeFOSE	ND	5.0	0.64	ug/kg	
1691-99-2	EtFOSE	ND	5.0	0.83	ug/kg	
13252-13-6	HFPO-DA (GenX)	ND	2.0	0.29	ug/kg	
919005-14-4	ADONA	ND	2.0	0.34	ug/kg	
377-73-1	PFMPA	ND	1.0	0.11	ug/kg	
863090-89-5	PFMBA	ND	1.0	0.10	ug/kg	
151772-58-6	NFDHA	ND	2.0	0.24	ug/kg	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	2.0	0.44	ug/kg	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	2.0	0.36	ug/kg	

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Job Number: FC13427
Account: GEOEWAT GeoEngineers, Inc.
Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S6Q442-IBLK	6Q31316.D	1	02/23/24	MV	n/a	n/a	S6Q442

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-1, FC13427-2, FC13427-3, FC13427-4, FC13427-5

CAS No.	Compound	Result	RL	MDL	Units	Q
113507-82-7	PFEESA	ND	1.0	0.10	ug/kg	
356-02-5	3:3 Fluorotelomer carboxylate	ND	2.5	0.51	ug/kg	
914637-49-35:3	Fluorotelomer carboxylate	ND	13	1.2	ug/kg	
812-70-4	7:3 Fluorotelomer carboxylate	ND	13	1.3	ug/kg	

CAS No.	ID Standard Recoveries	Limits	
	13C4-PFBA	100%	20-150%
	13C5-PFPeA	104%	20-150%
	13C5-PFHxA	104%	20-150%
	13C4-PFHpA	101%	20-150%
	13C8-PFOA	94%	20-150%
	13C9-PFNA	98%	20-150%
	13C6-PFDA	93%	20-150%
	13C7-PFUnDA	106%	20-150%
	13C2-PFDoDA	86%	20-150%
	13C2-PFTeDA	93%	20-150%
	13C3-PFBS	103%	20-150%
	13C3-PFHxS	97%	20-150%
	13C8-PFOS	95%	20-150%
	13C8-FOSA	98%	20-150%
	d3-MeFOSA	94%	20-150%
	d5-EtFOSA	101%	20-150%
	d3-MeFOSAA	94%	20-150%
	d5-EtFOSAA	103%	20-150%
	d7-MeFOSE	96%	20-150%
	d9-EtFOSE	99%	20-150%
	13C2-4:2FTS	109%	20-180%
	13C2-6:2FTS	104%	20-180%
	13C2-8:2FTS	104%	20-180%
	13C3-HFPO-DA	97%	20-150%

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Job Number: FC13427
Account: GEOEWAT GeoEngineers, Inc.
Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S6Q443-IBLK	6Q31434.D	1	02/25/24	MV	n/a	n/a	S6Q443

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-1, FC13427-2, FC13427-3, FC13427-4, FC13427-5

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	2.0	0.31	ug/kg	
2706-90-3	Perfluoropentanoic acid	ND	1.0	0.10	ug/kg	
307-24-4	Perfluorohexanoic acid	ND	1.0	0.10	ug/kg	
375-85-9	Perfluoroheptanoic acid	ND	1.0	0.10	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	1.0	0.10	ug/kg	
375-95-1	Perfluorononanoic acid	ND	1.0	0.12	ug/kg	
335-76-2	Perfluorodecanoic acid	ND	1.0	0.10	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	1.0	0.13	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	1.0	0.10	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	1.0	0.10	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	1.0	0.10	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	1.0	0.10	ug/kg	
2706-91-4	Perfluoropentanesulfonic acid	ND	1.0	0.16	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	1.0	0.16	ug/kg	
375-92-8	Perfluoroheptanesulfonic acid	ND	1.0	0.15	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	1.0	0.10	ug/kg	
68259-12-1	Perfluorononanesulfonic acid	ND	1.0	0.18	ug/kg	
335-77-3	Perfluorodecanesulfonic acid	ND	1.0	0.14	ug/kg	
79780-39-5	Perfluorododecanesulfonic acid	ND	1.0	0.15	ug/kg	
757124-72-44:2	Fluorotelomer sulfonate	ND	2.0	0.30	ug/kg	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	2.0	0.35	ug/kg	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	2.0	0.61	ug/kg	
754-91-6	PFOSA	ND	1.0	0.10	ug/kg	
31506-32-8	MeFOSA	ND	1.0	0.14	ug/kg	
4151-50-2	EtFOSA	ND	1.0	0.10	ug/kg	
2355-31-9	MeFOSAA	ND	1.0	0.16	ug/kg	
2991-50-6	EtFOSAA	ND	1.0	0.20	ug/kg	
24448-09-7	MeFOSE	ND	5.0	0.64	ug/kg	
1691-99-2	EtFOSE	ND	5.0	0.83	ug/kg	
13252-13-6	HFPO-DA (GenX)	ND	2.0	0.29	ug/kg	
919005-14-4	ADONA	ND	2.0	0.34	ug/kg	
377-73-1	PFMPA	ND	1.0	0.11	ug/kg	
863090-89-5	PFMBA	ND	1.0	0.10	ug/kg	
151772-58-6	NFDHA	ND	2.0	0.24	ug/kg	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	2.0	0.44	ug/kg	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	2.0	0.36	ug/kg	

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Job Number: FC13427

Account: GEOEWAT GeoEngineers, Inc.

Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S6Q443-IBLK	6Q31434.D	1	02/25/24	MV	n/a	n/a	S6Q443

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-1, FC13427-2, FC13427-3, FC13427-4, FC13427-5

CAS No.	Compound	Result	RL	MDL	Units	Q
113507-82-7	PFEESA	ND	1.0	0.10	ug/kg	
356-02-5	3:3 Fluorotelomer carboxylate	ND	2.5	0.51	ug/kg	
914637-49-35:3	Fluorotelomer carboxylate	ND	13	1.2	ug/kg	
812-70-4	7:3 Fluorotelomer carboxylate	ND	13	1.3	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	100% 20-150%
	13C5-PFPeA	96% 20-150%
	13C5-PFHxA	93% 20-150%
	13C4-PFHpA	92% 20-150%
	13C8-PFOA	97% 20-150%
	13C9-PFNA	102% 20-150%
	13C6-PFDA	103% 20-150%
	13C7-PFUnDA	97% 20-150%
	13C2-PFDoDA	97% 20-150%
	13C2-PFTeDA	90% 20-150%
	13C3-PFBS	103% 20-150%
	13C3-PFHxS	105% 20-150%
	13C8-PFOS	99% 20-150%
	13C8-FOSA	98% 20-150%
	d3-MeFOSA	98% 20-150%
	d5-EtFOSA	106% 20-150%
	d3-MeFOSAA	95% 20-150%
	d5-EtFOSAA	95% 20-150%
	d7-MeFOSE	97% 20-150%
	d9-EtFOSE	98% 20-150%
	13C2-4:2FTS	113% 20-180%
	13C2-6:2FTS	112% 20-180%
	13C2-8:2FTS	121% 20-180%
	13C3-HFPO-DA	97% 20-150%

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Job Number: FC13427

Account: GEOEWAT GeoEngineers, Inc.

Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S6Q443-ICCB	6Q31448.D	1	02/25/24	MV	n/a	n/a	S6Q443

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-5

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	2.0	0.31	ug/kg	
2706-90-3	Perfluoropentanoic acid	ND	1.0	0.10	ug/kg	
307-24-4	Perfluorohexanoic acid	ND	1.0	0.10	ug/kg	
375-85-9	Perfluoroheptanoic acid	ND	1.0	0.10	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	1.0	0.10	ug/kg	
375-95-1	Perfluorononanoic acid	ND	1.0	0.12	ug/kg	
335-76-2	Perfluorodecanoic acid	ND	1.0	0.10	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	1.0	0.13	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	1.0	0.10	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	1.0	0.10	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	1.0	0.10	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	1.0	0.10	ug/kg	
2706-91-4	Perfluoropentanesulfonic acid	ND	1.0	0.16	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	1.0	0.16	ug/kg	
375-92-8	Perfluoroheptanesulfonic acid	ND	1.0	0.15	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	1.0	0.10	ug/kg	
68259-12-1	Perfluorononanesulfonic acid	ND	1.0	0.18	ug/kg	
335-77-3	Perfluorodecanesulfonic acid	ND	1.0	0.14	ug/kg	
79780-39-5	Perfluorododecanesulfonic acid	ND	1.0	0.15	ug/kg	
757124-72-44:2	Fluorotelomer sulfonate	ND	2.0	0.30	ug/kg	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	2.0	0.35	ug/kg	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	2.0	0.61	ug/kg	
754-91-6	PFOSA	ND	1.0	0.10	ug/kg	
31506-32-8	MeFOSA	ND	1.0	0.14	ug/kg	
4151-50-2	EtFOSA	ND	1.0	0.10	ug/kg	
2355-31-9	MeFOSAA	ND	1.0	0.16	ug/kg	
2991-50-6	EtFOSAA	ND	1.0	0.20	ug/kg	
24448-09-7	MeFOSE	ND	5.0	0.64	ug/kg	
1691-99-2	EtFOSE	ND	5.0	0.83	ug/kg	
13252-13-6	HFPO-DA (GenX)	ND	2.0	0.29	ug/kg	
919005-14-4	ADONA	ND	2.0	0.34	ug/kg	
377-73-1	PFMPA	ND	1.0	0.11	ug/kg	
863090-89-5	PFMBA	ND	1.0	0.10	ug/kg	
151772-58-6	NFDHA	ND	2.0	0.24	ug/kg	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	2.0	0.44	ug/kg	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	2.0	0.36	ug/kg	

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Job Number: FC13427

Account: GEOEWAT GeoEngineers, Inc.

Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S6Q443-ICCB	6Q31448.D	1	02/25/24	MV	n/a	n/a	S6Q443

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-5

CAS No.	Compound	Result	RL	MDL	Units	Q
113507-82-7	PFEESA	ND	1.0	0.10	ug/kg	
356-02-5	3:3 Fluorotelomer carboxylate	ND	2.5	0.51	ug/kg	
914637-49-35:3	Fluorotelomer carboxylate	ND	13	1.2	ug/kg	
812-70-4	7:3 Fluorotelomer carboxylate	ND	13	1.3	ug/kg	

CAS No.	ID Standard Recoveries	Limits	
	13C4-PFBA	100%	20-150%
	13C5-PFPeA	101%	20-150%
	13C5-PFHxA	106%	20-150%
	13C4-PFHpA	96%	20-150%
	13C8-PFOA	109%	20-150%
	13C9-PFNA	104%	20-150%
	13C6-PFDA	103%	20-150%
	13C7-PFUnDA	106%	20-150%
	13C2-PFDoDA	99%	20-150%
	13C2-PFTeDA	99%	20-150%
	13C3-PFBS	97%	20-150%
	13C3-PFHxS	96%	20-150%
	13C8-PFOS	90%	20-150%
	13C8-FOSA	97%	20-150%
	d3-MeFOSA	92%	20-150%
	d5-EtFOSA	98%	20-150%
	d3-MeFOSAA	94%	20-150%
	d5-EtFOSAA	85%	20-150%
	d7-MeFOSE	93%	20-150%
	d9-EtFOSE	91%	20-150%
	13C2-4:2FTS	107%	20-180%
	13C2-6:2FTS	111%	20-180%
	13C2-8:2FTS	121%	20-180%
	13C3-HFPO-DA	99%	20-150%

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Job Number: FC13427

Account: GEOEWAT GeoEngineers, Inc.

Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S7Q45-ICCB	7Q0110.D	1	02/23/24	MV	n/a	n/a	S7Q45

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

OP1744-DUP, OP1744-MS

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.016	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0080	0.00094	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.00050	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.00050	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.00050	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.00061	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.00050	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.00060	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.00060	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.00084	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.00050	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.00050	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0050	0.0011	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.00070	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.00050	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.00054	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.00057	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.00064	ug/l	
79780-39-5	Perfluorododecanesulfonic acid	ND	0.0050	0.0011	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.020	0.0032	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.020	0.0035	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.020	0.0041	ug/l	
754-91-6	PFOSA	ND	0.0040	0.00067	ug/l	
31506-32-8	MeFOSA	ND	0.0080	0.0010	ug/l	
4151-50-2	EtFOSA	ND	0.0080	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0050	0.0010	ug/l	
2991-50-6	EtFOSAA	ND	0.0050	0.0013	ug/l	
24448-09-7	MeFOSE	ND	0.040	0.0044	ug/l	
1691-99-2	EtFOSE	ND	0.040	0.0074	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0010	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0019	ug/l	
377-73-1	PFMPA	ND	0.0080	0.0010	ug/l	
863090-89-5	PFMBA	ND	0.0080	0.0011	ug/l	
151772-58-6	NFDHA	ND	0.0080	0.0012	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0014	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0018	ug/l	

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Job Number: FC13427

Account: GEOEWAT GeoEngineers, Inc.

Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S7Q45-ICCB	7Q0110.D	1	02/23/24	MV	n/a	n/a	S7Q45

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

OP1744-DUP, OP1744-MS

CAS No.	Compound	Result	RL	MDL	Units	Q
113507-82-7	PFEESA	ND	0.0080	0.00078	ug/l	
356-02-5	3:3 Fluorotelomer carboxylate	ND	0.020	0.0045	ug/l	
914637-49-35:3	Fluorotelomer carboxylate	ND	0.10	0.0087	ug/l	
812-70-4	7:3 Fluorotelomer carboxylate	ND	0.10	0.0079	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	100% 20-150%
	13C5-PFPeA	100% 20-150%
	13C5-PFHxA	99% 20-150%
	13C4-PFHpA	99% 20-150%
	13C8-PFOA	100% 20-150%
	13C9-PFNA	102% 20-150%
	13C6-PFDA	106% 20-150%
	13C7-PFUnDA	107% 20-150%
	13C2-PFDoDA	101% 20-150%
	13C2-PFTeDA	95% 20-150%
	13C3-PFBS	96% 20-150%
	13C3-PFHxS	97% 20-150%
	13C8-PFOS	95% 20-150%
	13C8-FOSA	95% 20-150%
	d3-MeFOSA	97% 20-150%
	d5-EtFOSA	98% 20-150%
	d3-MeFOSAA	98% 20-150%
	d5-EtFOSAA	95% 20-150%
	d7-MeFOSE	100% 20-150%
	d9-EtFOSE	96% 20-150%
	13C2-4:2FTS	117% 20-180%
	13C2-6:2FTS	105% 20-180%
	13C2-8:2FTS	100% 20-180%
	13C3-HFPO-DA	92% 20-150%

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Job Number: FC13427

Account: GEOEWAT GeoEngineers, Inc.

Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S6Q442-ICCB	6Q31374.D	1	02/24/24	MV	n/a	n/a	S6Q442

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

OP1753-BS, OP1753-LLBS, OP1753-MB, OP1753-MS, OP1753-MSD

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	2.0	0.31	ug/kg	
2706-90-3	Perfluoropentanoic acid	ND	1.0	0.10	ug/kg	
307-24-4	Perfluorohexanoic acid	ND	1.0	0.10	ug/kg	
375-85-9	Perfluoroheptanoic acid	ND	1.0	0.10	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	1.0	0.10	ug/kg	
375-95-1	Perfluorononanoic acid	ND	1.0	0.12	ug/kg	
335-76-2	Perfluorodecanoic acid	ND	1.0	0.10	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	1.0	0.13	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	1.0	0.10	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	1.0	0.10	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	1.0	0.10	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	1.0	0.10	ug/kg	
2706-91-4	Perfluoropentanesulfonic acid	ND	1.0	0.16	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	1.0	0.16	ug/kg	
375-92-8	Perfluoroheptanesulfonic acid	ND	1.0	0.15	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	1.0	0.10	ug/kg	
68259-12-1	Perfluorononanesulfonic acid	ND	1.0	0.18	ug/kg	
335-77-3	Perfluorodecanesulfonic acid	ND	1.0	0.14	ug/kg	
79780-39-5	Perfluorododecanesulfonic acid	ND	1.0	0.15	ug/kg	
757124-72-44:2	Fluorotelomer sulfonate	ND	2.0	0.30	ug/kg	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	2.0	0.35	ug/kg	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	2.0	0.61	ug/kg	
754-91-6	PFOSA	ND	1.0	0.10	ug/kg	
31506-32-8	MeFOSA	ND	1.0	0.14	ug/kg	
4151-50-2	EtFOSA	ND	1.0	0.10	ug/kg	
2355-31-9	MeFOSAA	ND	1.0	0.16	ug/kg	
2991-50-6	EtFOSAA	ND	1.0	0.20	ug/kg	
24448-09-7	MeFOSE	ND	5.0	0.64	ug/kg	
1691-99-2	EtFOSE	ND	5.0	0.83	ug/kg	
13252-13-6	HFPO-DA (GenX)	ND	2.0	0.29	ug/kg	
919005-14-4	ADONA	ND	2.0	0.34	ug/kg	
377-73-1	PFMPA	ND	1.0	0.11	ug/kg	
863090-89-5	PFMBA	ND	1.0	0.10	ug/kg	
151772-58-6	NFDHA	ND	2.0	0.24	ug/kg	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	2.0	0.44	ug/kg	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	2.0	0.36	ug/kg	

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Job Number: FC13427

Account: GEOEWAT GeoEngineers, Inc.

Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S6Q442-ICCB	6Q31374.D	1	02/24/24	MV	n/a	n/a	S6Q442

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

OP1753-BS, OP1753-LLBS, OP1753-MB, OP1753-MS, OP1753-MSD

CAS No.	Compound	Result	RL	MDL	Units	Q
113507-82-7	PFEESA	ND	1.0	0.10	ug/kg	
356-02-5	3:3 Fluorotelomer carboxylate	ND	2.5	0.51	ug/kg	
914637-49-35:3	Fluorotelomer carboxylate	ND	13	1.2	ug/kg	
812-70-4	7:3 Fluorotelomer carboxylate	ND	13	1.3	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	101% 20-150%
	13C5-PFPeA	102% 20-150%
	13C5-PFHxA	103% 20-150%
	13C4-PFHpA	99% 20-150%
	13C8-PFOA	98% 20-150%
	13C9-PFNA	93% 20-150%
	13C6-PFDA	106% 20-150%
	13C7-PFUnDA	108% 20-150%
	13C2-PFDoDA	107% 20-150%
	13C2-PFTeDA	98% 20-150%
	13C3-PFBS	108% 20-150%
	13C3-PFHxS	104% 20-150%
	13C8-PFOS	95% 20-150%
	13C8-FOSA	106% 20-150%
	d3-MeFOSA	97% 20-150%
	d5-EtFOSA	104% 20-150%
	d3-MeFOSAA	101% 20-150%
	d5-EtFOSAA	101% 20-150%
	d7-MeFOSE	96% 20-150%
	d9-EtFOSE	101% 20-150%
	13C2-4:2FTS	120% 20-180%
	13C2-6:2FTS	105% 20-180%
	13C2-8:2FTS	105% 20-180%
	13C3-HFPO-DA	95% 20-150%

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Job Number: FC13427

Account: GEOEWAT GeoEngineers, Inc.

Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S6Q442-ICCB	6Q31387.D	1	02/24/24	MV	n/a	n/a	S6Q442

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

OP1753-BS, OP1753-LLBS, OP1753-MB, OP1753-MS, OP1753-MSD

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	2.0	0.31	ug/kg	
2706-90-3	Perfluoropentanoic acid	ND	1.0	0.10	ug/kg	
307-24-4	Perfluorohexanoic acid	ND	1.0	0.10	ug/kg	
375-85-9	Perfluoroheptanoic acid	ND	1.0	0.10	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	1.0	0.10	ug/kg	
375-95-1	Perfluorononanoic acid	ND	1.0	0.12	ug/kg	
335-76-2	Perfluorodecanoic acid	ND	1.0	0.10	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	1.0	0.13	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	1.0	0.10	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	1.0	0.10	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	1.0	0.10	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	1.0	0.10	ug/kg	
2706-91-4	Perfluoropentanesulfonic acid	ND	1.0	0.16	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	1.0	0.16	ug/kg	
375-92-8	Perfluoroheptanesulfonic acid	ND	1.0	0.15	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	1.0	0.10	ug/kg	
68259-12-1	Perfluorononanesulfonic acid	ND	1.0	0.18	ug/kg	
335-77-3	Perfluorodecanesulfonic acid	ND	1.0	0.14	ug/kg	
79780-39-5	Perfluorododecanesulfonic acid	ND	1.0	0.15	ug/kg	
757124-72-44:2	Fluorotelomer sulfonate	ND	2.0	0.30	ug/kg	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	2.0	0.35	ug/kg	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	2.0	0.61	ug/kg	
754-91-6	PFOSA	ND	1.0	0.10	ug/kg	
31506-32-8	MeFOSA	ND	1.0	0.14	ug/kg	
4151-50-2	EtFOSA	ND	1.0	0.10	ug/kg	
2355-31-9	MeFOSAA	ND	1.0	0.16	ug/kg	
2991-50-6	EtFOSAA	ND	1.0	0.20	ug/kg	
24448-09-7	MeFOSE	ND	5.0	0.64	ug/kg	
1691-99-2	EtFOSE	ND	5.0	0.83	ug/kg	
13252-13-6	HFPO-DA (GenX)	ND	2.0	0.29	ug/kg	
919005-14-4	ADONA	ND	2.0	0.34	ug/kg	
377-73-1	PFMPA	ND	1.0	0.11	ug/kg	
863090-89-5	PFMBA	ND	1.0	0.10	ug/kg	
151772-58-6	NFDHA	ND	2.0	0.24	ug/kg	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	2.0	0.44	ug/kg	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	2.0	0.36	ug/kg	

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Job Number: FC13427

Account: GEOEWAT GeoEngineers, Inc.

Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S6Q442-ICCB	6Q31387.D	1	02/24/24	MV	n/a	n/a	S6Q442

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

OP1753-BS, OP1753-LLBS, OP1753-MB, OP1753-MS, OP1753-MSD

CAS No.	Compound	Result	RL	MDL	Units	Q
113507-82-7	PFEESA	ND	1.0	0.10	ug/kg	
356-02-5	3:3 Fluorotelomer carboxylate	ND	2.5	0.51	ug/kg	
914637-49-35:3	Fluorotelomer carboxylate	ND	13	1.2	ug/kg	
812-70-4	7:3 Fluorotelomer carboxylate	ND	13	1.3	ug/kg	

CAS No.	ID Standard Recoveries	Limits	
	13C4-PFBA	99%	20-150%
	13C5-PFPeA	104%	20-150%
	13C5-PFHxA	97%	20-150%
	13C4-PFHpA	98%	20-150%
	13C8-PFOA	105%	20-150%
	13C9-PFNA	104%	20-150%
	13C6-PFDA	91%	20-150%
	13C7-PFUnDA	96%	20-150%
	13C2-PFDoDA	95%	20-150%
	13C2-PFTeDA	90%	20-150%
	13C3-PFBS	107%	20-150%
	13C3-PFHxS	100%	20-150%
	13C8-PFOS	109%	20-150%
	13C8-FOSA	105%	20-150%
	d3-MeFOSA	92%	20-150%
	d5-EtFOSA	114%	20-150%
	d3-MeFOSAA	114%	20-150%
	d5-EtFOSAA	116%	20-150%
	d7-MeFOSE	104%	20-150%
	d9-EtFOSE	108%	20-150%
	13C2-4:2FTS	107%	20-180%
	13C2-6:2FTS	100%	20-180%
	13C2-8:2FTS	97%	20-180%
	13C3-HFPO-DA	105%	20-150%

Blank Spike Summary

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Job Number: FC13427**Account:** GEOEWAT GeoEngineers, Inc.**Project:** Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1744-LLBS	7Q0104.D	1	02/23/24	MV	02/21/24	OP1744	S7Q45

The QC reported here applies to the following samples:**Method:** EPA DRAFT 1633

FC13427-6, FC13427-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.016	0.0141	88	40-150
2706-90-3	Perfluoropentanoic acid	0.008	0.0072	90	40-150
307-24-4	Perfluorohexanoic acid	0.004	0.0035	88	40-150
375-85-9	Perfluoroheptanoic acid	0.004	0.0036	90	40-150
335-67-1	Perfluorooctanoic acid	0.004	0.0037	93	40-150
375-95-1	Perfluorononanoic acid	0.004	0.0033	83	40-150
335-76-2	Perfluorodecanoic acid	0.004	0.0035	88	40-150
2058-94-8	Perfluoroundecanoic acid	0.004	0.0035	88	40-150
307-55-1	Perfluorododecanoic acid	0.004	0.0038	95	40-150
72629-94-8	Perfluorotridecanoic acid	0.004	0.0034	85	40-150
376-06-7	Perfluorotetradecanoic acid	0.004	0.0036	90	40-150
375-73-5	Perfluorobutanesulfonic acid	0.00355	0.0033	93	40-150
2706-91-4	Perfluoropentanesulfonic acid	0.00376	0.0034	90	40-150
355-46-4	Perfluorohexanesulfonic acid	0.00366	0.0033	90	40-150
375-92-8	Perfluoroheptanesulfonic acid	0.00381	0.0031	81	40-150
1763-23-1	Perfluorooctanesulfonic acid	0.00371	0.0035	94	40-150
68259-12-1	Perfluorononanesulfonic acid	0.00385	0.0035	91	40-150
335-77-3	Perfluorodecanesulfonic acid	0.00386	0.0034	88	40-150
79780-39-5	Perfluorododecanesulfonic acid	0.00388	0.0039	101	40-150
757124-72-44:2	Fluorotelomer sulfonate	0.015	0.0135	90	40-150
27619-97-2	6:2 Fluorotelomer sulfonate	0.0152	0.0143	94	40-150
39108-34-4	8:2 Fluorotelomer sulfonate	0.0154	0.0144	94	40-150
754-91-6	PFOSA	0.004	0.0036	90	40-150
31506-32-8	MeFOSA	0.008	0.0083	104	40-150
4151-50-2	EtFOSA	0.008	0.0072	90	40-150
2355-31-9	MeFOSAA	0.004	0.0037	93	40-150
2991-50-6	EtFOSAA	0.004	0.0042	105	40-150
24448-09-7	MeFOSE	0.02	0.0187	94	40-150
1691-99-2	EtFOSE	0.02	0.0187	94	40-150
13252-13-6	HFPO-DA (GenX)	0.008	0.0064	80	40-150
919005-14-4	ADONA	0.00756	0.0067	89	40-150
377-73-1	PFMPA	0.008	0.0069	86	40-150
863090-89-5	PFMBA	0.008	0.0070	88	40-150
151772-58-6	NFDHA	0.008	0.0072	90	40-150
756426-58-19	Cl-PF3ONS (F-53B Major)	0.00748	0.0068	91	40-150
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.00756	0.0063	83	40-150

* = Outside of Control Limits.

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Job Number: FC13427

Account: GEOEWAT GeoEngineers, Inc.

Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1744-LLBS	7Q0104.D	1	02/23/24	MV	02/21/24	OP1744	S7Q45

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-6, FC13427-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
113507-82-7	PFEESA	0.00712	0.0064	90	40-150
356-02-5	3:3 Fluorotelomer carboxylate	0.02	0.0164	82	40-150
914637-49-35:3	Fluorotelomer carboxylate	0.1	0.0858	86	40-150
812-70-4	7:3 Fluorotelomer carboxylate	0.1	0.0906	91	40-150

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	111%	20-150%
	13C5-PFPeA	113%	20-150%
	13C5-PFHxA	111%	20-150%
	13C4-PFHpA	112%	20-150%
	13C8-PFOA	109%	20-150%
	13C9-PFNA	109%	20-150%
	13C6-PFDA	112%	20-150%
	13C7-PFUnDA	116%	20-150%
	13C2-PFDoDA	105%	20-150%
	13C2-PFTeDA	103%	20-150%
	13C3-PFBS	108%	20-150%
	13C3-PFHxS	106%	20-150%
	13C8-PFOS	106%	20-150%
	13C8-FOSA	87%	20-150%
	d3-MeFOSA	81%	20-150%
	d5-EtFOSA	93%	20-150%
	d3-MeFOSAA	106%	20-150%
	d5-EtFOSAA	104%	20-150%
	d7-MeFOSE	79%	20-150%
	d9-EtFOSE	84%	20-150%
	13C2-4:2FTS	99%	20-180%
	13C2-6:2FTS	109%	20-180%
	13C2-8:2FTS	103%	20-180%
	13C3-HFPO-DA	111%	20-150%

* = Outside of Control Limits.

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Job Number: FC13427
Account: GEOEWAT GeoEngineers, Inc.
Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1753-LLBS	6Q31376.D	1	02/24/24	MV	02/21/24	OP1753	S6Q442

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-1, FC13427-2, FC13427-3, FC13427-4, FC13427-5

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
375-22-4	Perfluorobutanoic acid	1.6	1.5	94	40-150
2706-90-3	Perfluoropentanoic acid	0.8	0.77	96	40-150
307-24-4	Perfluorohexanoic acid	0.4	0.40	100	40-150
375-85-9	Perfluoroheptanoic acid	0.4	0.39	98	40-150
335-67-1	Perfluorooctanoic acid	0.4	0.43	108	40-150
375-95-1	Perfluorononanoic acid	0.4	0.36	90	40-150
335-76-2	Perfluorodecanoic acid	0.4	0.42	105	40-150
2058-94-8	Perfluoroundecanoic acid	0.4	0.42	105	40-150
307-55-1	Perfluorododecanoic acid	0.4	0.41	103	40-150
72629-94-8	Perfluorotridecanoic acid	0.4	0.48	120	40-150
376-06-7	Perfluorotetradecanoic acid	0.4	0.36	90	40-150
375-73-5	Perfluorobutanesulfonic acid	0.355	0.36	101	40-150
2706-91-4	Perfluoropentanesulfonic acid	0.376	0.35	93	40-150
355-46-4	Perfluorohexanesulfonic acid	0.366	0.36	98	40-150
375-92-8	Perfluoroheptanesulfonic acid	0.381	0.38	100	40-150
1763-23-1	Perfluorooctanesulfonic acid	0.371	0.42	113	40-150
68259-12-1	Perfluorononanesulfonic acid	0.385	0.37	96	40-150
335-77-3	Perfluorodecanesulfonic acid	0.386	0.37	96	40-150
79780-39-5	Perfluorododecanesulfonic acid	0.388	0.49	126	40-150
757124-72-44:2	Fluorotelomer sulfonate	1.5	1.4	93	40-150
27619-97-2	6:2 Fluorotelomer sulfonate	1.52	1.6	105	40-150
39108-34-4	8:2 Fluorotelomer sulfonate	1.54	1.2	78	40-150
754-91-6	PFOSA	0.4	0.40	100	40-150
31506-32-8	MeFOSA	0.8	0.83	104	40-150
4151-50-2	EtFOSA	0.8	0.90	113	40-150
2355-31-9	MeFOSAA	0.4	0.46	115	40-150
2991-50-6	EtFOSAA	0.4	0.36	90	40-150
24448-09-7	MeFOSE	2	2.4	120	40-150
1691-99-2	EtFOSE	2	1.9	95	40-150
13252-13-6	HFPO-DA (GenX)	0.8	0.84	105	40-150
919005-14-4	ADONA	0.756	0.74	98	40-150
377-73-1	PFMPA	0.8	0.71	89	40-150
863090-89-5	PFMBA	0.8	0.78	98	40-150
151772-58-6	NFDHA	0.8	0.70	88	40-150
756426-58-19	Cl-PF3ONS (F-53B Major)	0.748	0.76	102	40-150
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.756	0.76	101	40-150

* = Outside of Control Limits.

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Job Number: FC13427

Account: GEOEWAT GeoEngineers, Inc.

Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1753-LLBS	6Q31376.D	1	02/24/24	MV	02/21/24	OP1753	S6Q442

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-1, FC13427-2, FC13427-3, FC13427-4, FC13427-5

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
113507-82-7	PFEESA	0.712	0.64	90	40-150
356-02-5	3:3 Fluorotelomer carboxylate	2	1.8	90	40-150
914637-49-35:3	Fluorotelomer carboxylate	10	9.0	90	40-150
812-70-4	7:3 Fluorotelomer carboxylate	10	10.4	104	40-150

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	59%	20-150%
	13C5-PFPeA	61%	20-150%
	13C5-PFHxA	59%	20-150%
	13C4-PFHpA	56%	20-150%
	13C8-PFOA	60%	20-150%
	13C9-PFNA	61%	20-150%
	13C6-PFDA	60%	20-150%
	13C7-PFUnDA	57%	20-150%
	13C2-PFDoDA	55%	20-150%
	13C2-PFTeDA	60%	20-150%
	13C3-PFBS	58%	20-150%
	13C3-PFHxS	62%	20-150%
	13C8-PFOS	64%	20-150%
	13C8-FOSA	65%	20-150%
	d3-MeFOSA	55%	20-150%
	d5-EtFOSA	57%	20-150%
	d3-MeFOSAA	60%	20-150%
	d5-EtFOSAA	67%	20-150%
	d7-MeFOSE	65%	20-150%
	d9-EtFOSE	64%	20-150%
	13C2-4:2FTS	62%	20-180%
	13C2-6:2FTS	57%	20-180%
	13C2-8:2FTS	68%	20-180%
	13C3-HFPO-DA	58%	20-150%

* = Outside of Control Limits.

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Job Number: FC13427
Account: GEOEWAT GeoEngineers, Inc.
Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1753-LLBS	6Q31438.D	1	02/25/24	MV	02/21/24	OP1753	S6Q443

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-1, FC13427-2, FC13427-3, FC13427-4, FC13427-5

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
375-22-4	Perfluorobutanoic acid	1.6	1.4	88	40-150
2706-90-3	Perfluoropentanoic acid	0.8	0.75	94	40-150
307-24-4	Perfluorohexanoic acid	0.4	0.44	110	40-150
375-85-9	Perfluoroheptanoic acid	0.4	0.37	93	40-150
335-67-1	Perfluorooctanoic acid	0.4	0.42	105	40-150
375-95-1	Perfluorononanoic acid	0.4	0.40	100	40-150
335-76-2	Perfluorodecanoic acid	0.4	0.32	80	40-150
2058-94-8	Perfluoroundecanoic acid	0.4	0.33	83	40-150
307-55-1	Perfluorododecanoic acid	0.4	0.35	88	40-150
72629-94-8	Perfluorotridecanoic acid	0.4	0.42	105	40-150
376-06-7	Perfluorotetradecanoic acid	0.4	0.35	88	40-150
375-73-5	Perfluorobutanesulfonic acid	0.355	0.36	101	40-150
2706-91-4	Perfluoropentanesulfonic acid	0.376	0.33	88	40-150
355-46-4	Perfluorohexanesulfonic acid	0.366	0.43	118	40-150
375-92-8	Perfluoroheptanesulfonic acid	0.381	0.34	89	40-150
1763-23-1	Perfluorooctanesulfonic acid	0.371	0.38	102	40-150
68259-12-1	Perfluorononanesulfonic acid	0.385	0.33	86	40-150
335-77-3	Perfluorodecanesulfonic acid	0.386	0.38	98	40-150
79780-39-5	Perfluorododecanesulfonic acid	0.388	0.40	103	40-150
757124-72-44:2	Fluorotelomer sulfonate	1.5	1.2	80	40-150
27619-97-2	6:2 Fluorotelomer sulfonate	1.52	1.5	99	40-150
39108-34-4	8:2 Fluorotelomer sulfonate	1.54	1.4	91	40-150
754-91-6	PFOSA	0.4	0.43	108	40-150
31506-32-8	MeFOSA	0.8	0.76	95	40-150
4151-50-2	EtFOSA	0.8	0.80	100	40-150
2355-31-9	MeFOSAA	0.4	0.34	85	40-150
2991-50-6	EtFOSAA	0.4	0.40	100	40-150
24448-09-7	MeFOSE	2	2.3	115	40-150
1691-99-2	EtFOSE	2	2.2	110	40-150
13252-13-6	HFPO-DA (GenX)	0.8	0.85	106	40-150
919005-14-4	ADONA	0.756	0.75	99	40-150
377-73-1	PFMPA	0.8	0.77	96	40-150
863090-89-5	PFMBA	0.8	0.80	100	40-150
151772-58-6	NFDHA	0.8	0.91	114	40-150
756426-58-19	Cl-PF3ONS (F-53B Major)	0.748	0.83	111	40-150
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.756	0.75	99	40-150

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: FC13427

Account: GEOEWAT GeoEngineers, Inc.

Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1753-LLBS	6Q31438.D	1	02/25/24	MV	02/21/24	OP1753	S6Q443

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-1, FC13427-2, FC13427-3, FC13427-4, FC13427-5

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
113507-82-7	PFEESA	0.712	0.67	94	40-150
356-02-5	3:3 Fluorotelomer carboxylate	2	1.7	85	40-150
914637-49-35:3	Fluorotelomer carboxylate	10	9.3	93	40-150
812-70-4	7:3 Fluorotelomer carboxylate	10	9.7	97	40-150

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	58%	20-150%
	13C5-PFPeA	57%	20-150%
	13C5-PFHxA	56%	20-150%
	13C4-PFHpA	54%	20-150%
	13C8-PFOA	57%	20-150%
	13C9-PFNA	58%	20-150%
	13C6-PFDA	65%	20-150%
	13C7-PFUnDA	62%	20-150%
	13C2-PFDoDA	58%	20-150%
	13C2-PFTeDA	60%	20-150%
	13C3-PFBS	55%	20-150%
	13C3-PFHxS	60%	20-150%
	13C8-PFOS	67%	20-150%
	13C8-FOSA	63%	20-150%
	d3-MeFOSA	60%	20-150%
	d5-EtFOSA	61%	20-150%
	d3-MeFOSAA	65%	20-150%
	d5-EtFOSAA	63%	20-150%
	d7-MeFOSE	64%	20-150%
	d9-EtFOSE	65%	20-150%
	13C2-4:2FTS	66%	20-180%
	13C2-6:2FTS	61%	20-180%
	13C2-8:2FTS	62%	20-180%
	13C3-HFPO-DA	56%	20-150%

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: FC13427
Account: GEOEWAT GeoEngineers, Inc.
Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1744-BS	7Q0103.D	1	02/23/24	MV	02/21/24	OP1744	S7Q45

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-6, FC13427-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.1	0.0885	89	40-150
2706-90-3	Perfluoropentanoic acid	0.05	0.0440	88	40-150
307-24-4	Perfluorohexanoic acid	0.025	0.0218	87	40-150
375-85-9	Perfluoroheptanoic acid	0.025	0.0222	89	40-150
335-67-1	Perfluorooctanoic acid	0.025	0.0227	91	40-150
375-95-1	Perfluorononanoic acid	0.025	0.0211	84	40-150
335-76-2	Perfluorodecanoic acid	0.025	0.0218	87	40-150
2058-94-8	Perfluoroundecanoic acid	0.025	0.0226	90	40-150
307-55-1	Perfluorododecanoic acid	0.025	0.0234	94	40-150
72629-94-8	Perfluorotridecanoic acid	0.025	0.0219	88	40-150
376-06-7	Perfluorotetradecanoic acid	0.025	0.0231	92	40-150
375-73-5	Perfluorobutanesulfonic acid	0.0222	0.0196	88	40-150
2706-91-4	Perfluoropentanesulfonic acid	0.0235	0.0208	88	40-150
355-46-4	Perfluorohexanesulfonic acid	0.0229	0.0210	92	40-150
375-92-8	Perfluoroheptanesulfonic acid	0.0238	0.0209	88	40-150
1763-23-1	Perfluorooctanesulfonic acid	0.0232	0.0221	95	40-150
68259-12-1	Perfluorononanesulfonic acid	0.0241	0.0217	90	40-150
335-77-3	Perfluorodecanesulfonic acid	0.0241	0.0205	85	40-150
79780-39-5	Perfluorododecanesulfonic acid	0.0243	0.0207	85	40-150
757124-72-44:2	Fluorotelomer sulfonate	0.0938	0.0859	92	40-150
27619-97-2	6:2 Fluorotelomer sulfonate	0.095	0.0888	93	40-150
39108-34-4	8:2 Fluorotelomer sulfonate	0.096	0.0827	86	40-150
754-91-6	PFOSA	0.025	0.0233	93	40-150
31506-32-8	MeFOSA	0.05	0.0455	91	40-150
4151-50-2	EtFOSA	0.05	0.0459	92	40-150
2355-31-9	MeFOSAA	0.025	0.0220	88	40-150
2991-50-6	EtFOSAA	0.025	0.0217	87	40-150
24448-09-7	MeFOSE	0.125	0.110	88	40-150
1691-99-2	EtFOSE	0.125	0.111	89	40-150
13252-13-6	HFPO-DA (GenX)	0.05	0.0456	91	40-150
919005-14-4	ADONA	0.0473	0.0429	91	40-150
377-73-1	PFMPA	0.05	0.0210	42	40-150
863090-89-5	PFMBA	0.05	0.0459	92	40-150
151772-58-6	NFDHA	0.05	0.0444	89	40-150
756426-58-19	Cl-PF3ONS (F-53B Major)	0.0468	0.0411	88	40-150
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.0473	0.0406	86	40-150

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: FC13427

Account: GEOEWAT GeoEngineers, Inc.

Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1744-BS	7Q0103.D	1	02/23/24	MV	02/21/24	OP1744	S7Q45

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-6, FC13427-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
113507-82-7	PFEESA	0.0445	0.0404	91	40-150
356-02-5	3:3 Fluorotelomer carboxylate	0.125	0.205	164*	40-150
914637-49-35:3	Fluorotelomer carboxylate	0.625	0.550	88	40-150
812-70-4	7:3 Fluorotelomer carboxylate	0.625	0.566	91	40-150

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	28%	20-150%
	13C5-PFPeA	108%	20-150%
	13C5-PFHxA	112%	20-150%
	13C4-PFHpA	113%	20-150%
	13C8-PFOA	111%	20-150%
	13C9-PFNA	114%	20-150%
	13C6-PFDA	115%	20-150%
	13C7-PFUnDA	110%	20-150%
	13C2-PFDoDA	105%	20-150%
	13C2-PFTeDA	98%	20-150%
	13C3-PFBS	113%	20-150%
	13C3-PFHxS	110%	20-150%
	13C8-PFOS	107%	20-150%
	13C8-FOSA	94%	20-150%
	d3-MeFOSA	93%	20-150%
	d5-EtFOSA	90%	20-150%
	d3-MeFOSAA	111%	20-150%
	d5-EtFOSAA	112%	20-150%
	d7-MeFOSE	83%	20-150%
	d9-EtFOSE	88%	20-150%
	13C2-4:2FTS	101%	20-180%
	13C2-6:2FTS	109%	20-180%
	13C2-8:2FTS	114%	20-180%
	13C3-HFPO-DA	114%	20-150%

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: FC13427
Account: GEOEWAT GeoEngineers, Inc.
Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1753-BS	6Q31375.D	1	02/24/24	MV	02/21/24	OP1753	S6Q442

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-1, FC13427-2, FC13427-3, FC13427-4, FC13427-5

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
375-22-4	Perfluorobutanoic acid	10	9.7	97	40-150
2706-90-3	Perfluoropentanoic acid	5	4.8	96	40-150
307-24-4	Perfluorohexanoic acid	2.5	2.4	96	40-150
375-85-9	Perfluoroheptanoic acid	2.5	2.6	104	40-150
335-67-1	Perfluorooctanoic acid	2.5	2.3	92	40-150
375-95-1	Perfluorononanoic acid	2.5	2.7	108	40-150
335-76-2	Perfluorodecanoic acid	2.5	2.4	96	40-150
2058-94-8	Perfluoroundecanoic acid	2.5	2.5	100	40-150
307-55-1	Perfluorododecanoic acid	2.5	2.5	100	40-150
72629-94-8	Perfluorotridecanoic acid	2.5	2.7	108	40-150
376-06-7	Perfluorotetradecanoic acid	2.5	2.5	100	40-150
375-73-5	Perfluorobutanesulfonic acid	2.22	2.1	95	40-150
2706-91-4	Perfluoropentanesulfonic acid	2.35	2.1	89	40-150
355-46-4	Perfluorohexanesulfonic acid	2.29	2.2	96	40-150
375-92-8	Perfluoroheptanesulfonic acid	2.38	2.3	97	40-150
1763-23-1	Perfluorooctanesulfonic acid	2.32	2.1	91	40-150
68259-12-1	Perfluorononanesulfonic acid	2.41	2.3	96	40-150
335-77-3	Perfluorodecanesulfonic acid	2.41	2.4	99	40-150
79780-39-5	Perfluorododecanesulfonic acid	2.43	2.5	103	40-150
757124-72-44:2	Fluorotelomer sulfonate	9.38	10.8	115	40-150
27619-97-2	6:2 Fluorotelomer sulfonate	9.5	8.9	94	40-150
39108-34-4	8:2 Fluorotelomer sulfonate	9.6	8.1	84	40-150
754-91-6	PFOSA	2.5	2.5	100	40-150
31506-32-8	MeFOSA	5	5.1	102	40-150
4151-50-2	EtFOSA	5	4.7	94	40-150
2355-31-9	MeFOSAA	2.5	2.9	116	40-150
2991-50-6	EtFOSAA	2.5	2.5	100	40-150
24448-09-7	MeFOSE	12.5	14.3	114	40-150
1691-99-2	EtFOSE	12.5	13.9	111	40-150
13252-13-6	HFPO-DA (GenX)	5	4.6	92	40-150
919005-14-4	ADONA	4.73	4.4	93	40-150
377-73-1	PFMPA	5	4.8	96	40-150
863090-89-5	PFMBA	5	5.0	100	40-150
151772-58-6	NFDHA	5	4.8	96	40-150
756426-58-19	Cl-PF3ONS (F-53B Major)	4.68	4.3	92	40-150
763051-92-91	Cl-PF3OUdS (F-53B Minor)	4.73	4.8	102	40-150

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: FC13427

Account: GEOEWAT GeoEngineers, Inc.

Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1753-BS	6Q31375.D	1	02/24/24	MV	02/21/24	OP1753	S6Q442

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-1, FC13427-2, FC13427-3, FC13427-4, FC13427-5

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
113507-82-7	PFEESA	4.45	4.2	94	40-150
356-02-5	3:3 Fluorotelomer carboxylate	12.5	10.7	86	40-150
914637-49-35:3	Fluorotelomer carboxylate	62.5	57.3	92	40-150
812-70-4	7:3 Fluorotelomer carboxylate	62.5	57.1	91	40-150

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	61%	20-150%
	13C5-PFPeA	59%	20-150%
	13C5-PFHxA	58%	20-150%
	13C4-PFHpA	55%	20-150%
	13C8-PFOA	63%	20-150%
	13C9-PFNA	54%	20-150%
	13C6-PFDA	59%	20-150%
	13C7-PFUnDA	61%	20-150%
	13C2-PFDoDA	56%	20-150%
	13C2-PFTeDA	57%	20-150%
	13C3-PFBS	62%	20-150%
	13C3-PFHxS	60%	20-150%
	13C8-PFOS	68%	20-150%
	13C8-FOSA	57%	20-150%
	d3-MeFOSA	48%	20-150%
	d5-EtFOSA	55%	20-150%
	d3-MeFOSAA	61%	20-150%
	d5-EtFOSAA	64%	20-150%
	d7-MeFOSE	60%	20-150%
	d9-EtFOSE	55%	20-150%
	13C2-4:2FTS	54%	20-180%
	13C2-6:2FTS	61%	20-180%
	13C2-8:2FTS	71%	20-180%
	13C3-HFPO-DA	60%	20-150%

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: FC13427
Account: GEOEWAT GeoEngineers, Inc.
Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1753-BS	6Q31437.D	1	02/25/24	MV	02/21/24	OP1753	S6Q443

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-1, FC13427-2, FC13427-3, FC13427-4, FC13427-5

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
375-22-4	Perfluorobutanoic acid	10	9.6	96	40-150
2706-90-3	Perfluoropentanoic acid	5	4.9	98	40-150
307-24-4	Perfluorohexanoic acid	2.5	2.4	96	40-150
375-85-9	Perfluoroheptanoic acid	2.5	2.5	100	40-150
335-67-1	Perfluorooctanoic acid	2.5	2.3	92	40-150
375-95-1	Perfluorononanoic acid	2.5	2.4	96	40-150
335-76-2	Perfluorodecanoic acid	2.5	2.5	100	40-150
2058-94-8	Perfluoroundecanoic acid	2.5	2.3	92	40-150
307-55-1	Perfluorododecanoic acid	2.5	2.5	100	40-150
72629-94-8	Perfluorotridecanoic acid	2.5	2.6	104	40-150
376-06-7	Perfluorotetradecanoic acid	2.5	2.5	100	40-150
375-73-5	Perfluorobutanesulfonic acid	2.22	2.2	99	40-150
2706-91-4	Perfluoropentanesulfonic acid	2.35	2.1	89	40-150
355-46-4	Perfluorohexanesulfonic acid	2.29	2.1	92	40-150
375-92-8	Perfluoroheptanesulfonic acid	2.38	2.1	88	40-150
1763-23-1	Perfluorooctanesulfonic acid	2.32	2.1	91	40-150
68259-12-1	Perfluorononanesulfonic acid	2.41	2.5	104	40-150
335-77-3	Perfluorodecanesulfonic acid	2.41	2.4	99	40-150
79780-39-5	Perfluorododecanesulfonic acid	2.43	2.3	95	40-150
757124-72-44:2	Fluorotelomer sulfonate	9.38	8.1	86	40-150
27619-97-2	6:2 Fluorotelomer sulfonate	9.5	9.5	100	40-150
39108-34-4	8:2 Fluorotelomer sulfonate	9.6	8.1	84	40-150
754-91-6	PFOSA	2.5	2.6	104	40-150
31506-32-8	MeFOSA	5	5.4	108	40-150
4151-50-2	EtFOSA	5	4.6	92	40-150
2355-31-9	MeFOSAA	2.5	3.0	120	40-150
2991-50-6	EtFOSAA	2.5	2.4	96	40-150
24448-09-7	MeFOSE	12.5	14.1	113	40-150
1691-99-2	EtFOSE	12.5	13.0	104	40-150
13252-13-6	HFPO-DA (GenX)	5	5.0	100	40-150
919005-14-4	ADONA	4.73	4.9	104	40-150
377-73-1	PFMPA	5	5.0	100	40-150
863090-89-5	PFMBA	5	5.1	102	40-150
151772-58-6	NFDHA	5	5.1	102	40-150
756426-58-19	Cl-PF3ONS (F-53B Major)	4.68	4.7	101	40-150
763051-92-91	Cl-PF3OUdS (F-53B Minor)	4.73	4.8	102	40-150

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: FC13427

Account: GEOEWAT GeoEngineers, Inc.

Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1753-BS	6Q31437.D	1	02/25/24	MV	02/21/24	OP1753	S6Q443

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-1, FC13427-2, FC13427-3, FC13427-4, FC13427-5

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
113507-82-7	PFEESA	4.45	4.5	101	40-150
356-02-5	3:3 Fluorotelomer carboxylate	12.5	10.1	81	40-150
914637-49-35:3	Fluorotelomer carboxylate	62.5	56.9	91	40-150
812-70-4	7:3 Fluorotelomer carboxylate	62.5	59.5	95	40-150

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	61%	20-150%
	13C5-PFPeA	62%	20-150%
	13C5-PFHxA	61%	20-150%
	13C4-PFHpA	57%	20-150%
	13C8-PFOA	63%	20-150%
	13C9-PFNA	59%	20-150%
	13C6-PFDA	60%	20-150%
	13C7-PFUnDA	60%	20-150%
	13C2-PFDoDA	57%	20-150%
	13C2-PFTeDA	55%	20-150%
	13C3-PFBS	61%	20-150%
	13C3-PFHxS	65%	20-150%
	13C8-PFOS	62%	20-150%
	13C8-FOSA	56%	20-150%
	d3-MeFOSA	44%	20-150%
	d5-EtFOSA	53%	20-150%
	d3-MeFOSAA	54%	20-150%
	d5-EtFOSAA	64%	20-150%
	d7-MeFOSE	57%	20-150%
	d9-EtFOSE	56%	20-150%
	13C2-4:2FTS	75%	20-180%
	13C2-6:2FTS	67%	20-180%
	13C2-8:2FTS	83%	20-180%
	13C3-HFPO-DA	59%	20-150%

* = Outside of Control Limits.

Matrix Spike Summary

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Job Number: FC13427
Account: GEOEWAT GeoEngineers, Inc.
Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1744-MS	7Q0112.D	1	02/23/24	MV	02/21/24	OP1744	S7Q45
FC13428-16	7Q0111.D	1	02/23/24	MV	02/21/24	OP1744	S7Q45

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-6, FC13427-7

CAS No.	Compound	FC13428-16 ug/l	Spike Q	ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	0.0072	J	0.0909	0.0926	94	40-150
2706-90-3	Perfluoropentanoic acid	0.0163		0.0455	0.0581	92	40-150
307-24-4	Perfluorohexanoic acid	0.0101		0.0227	0.0313	93	40-150
375-85-9	Perfluoroheptanoic acid	0.0061		0.0227	0.0270	92	40-150
335-67-1	Perfluorooctanoic acid	0.0048		0.0227	0.0261	94	40-150
375-95-1	Perfluorononanoic acid	0.0017	J	0.0227	0.0217	88	40-150
335-76-2	Perfluorodecanoic acid	0.00093	J	0.0227	0.0212	89	40-150
2058-94-8	Perfluoroundecanoic acid	ND		0.0227	0.0213	94	40-150
307-55-1	Perfluorododecanoic acid	ND		0.0227	0.0216	95	40-150
72629-94-8	Perfluorotridecanoic acid	ND		0.0227	0.0218	96	40-150
376-06-7	Perfluorotetradecanoic acid	ND		0.0227	0.0212	93	40-150
375-73-5	Perfluorobutanesulfonic acid	0.0013	J	0.0202	0.0206	96	40-150
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0214	0.0211	99	40-150
355-46-4	Perfluorohexanesulfonic acid	0.0016	J	0.0208	0.0218	97	40-150
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0217	0.0203	94	40-150
1763-23-1	Perfluorooctanesulfonic acid	0.0034		0.0211	0.0240	98	40-150
68259-12-1	Perfluorononanesulfonic acid	ND		0.0219	0.0222	102	40-150
335-77-3	Perfluorodecanesulfonic acid	ND		0.0219	0.0203	93	40-150
79780-39-5	Perfluorododecanesulfonic aci	ND		0.022	0.0194	88	40-150
757124-72-44:2	Fluorotelomer sulfonate	ND		0.0852	0.0758	89	40-150
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0864	0.0837	97	40-150
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0873	0.0853	98	40-150
754-91-6	PFOSA	ND		0.0227	0.0212	93	40-150
31506-32-8	MeFOSA	ND		0.0455	0.0429	94	40-150
4151-50-2	EtFOSA	ND		0.0455	0.0445	98	40-150
2355-31-9	MeFOSAA	ND		0.0227	0.0229	101	40-150
2991-50-6	EtFOSAA	ND		0.0227	0.0217	95	40-150
24448-09-7	MeFOSE	ND		0.114	0.107	94	40-150
1691-99-2	EtFOSE	ND		0.114	0.112	99	40-150
13252-13-6	HFPO-DA (GenX)	ND		0.0455	0.0407	90	40-150
919005-14-4	ADONA	ND		0.043	0.0400	93	40-150
377-73-1	PFMPA	ND		0.0455	0.0428	94	40-150
863090-89-5	PFMBA	ND		0.0455	0.0419	92	40-150
151772-58-6	NFDHA	ND		0.0455	0.0417	92	40-150
756426-58-19	Cl-PF3ONS (F-53B Major)	ND		0.0425	0.0393	92	40-150
763051-92-911	Cl-PF3OUdS (F-53B Minor)	ND		0.043	0.0383	89	40-150

* = Outside of Control Limits.

Matrix Spike Summary

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Job Number: FC13427
Account: GEOEWAT GeoEngineers, Inc.
Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1744-MS	7Q0112.D	1	02/23/24	MV	02/21/24	OP1744	S7Q45
FC13428-16	7Q0111.D	1	02/23/24	MV	02/21/24	OP1744	S7Q45

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-6, FC13427-7

CAS No.	Compound	FC13428-16 ug/l	Spike Q	MS ug/l	MS %	Limits
113507-82-7	PFEESA	ND	0.0405	0.0396	98	40-150
356-02-5	3:3 Fluorotelomer carboxylate	ND	0.114	0.105	92	40-150
914637-49-35:3	Fluorotelomer carboxylate	ND	0.568	0.559	98	40-150
812-70-4	7:3 Fluorotelomer carboxylate	ND	0.568	0.537	95	40-150

CAS No.	ID Standard Recoveries	MS	FC13428-16	Limits
	13C4-PFBA	110%	107%	20-150%
	13C5-PFPeA	104%	101%	20-150%
	13C5-PFHxA	112%	109%	20-150%
	13C4-PFHpA	108%	103%	20-150%
	13C8-PFOA	109%	109%	20-150%
	13C9-PFNA	109%	110%	20-150%
	13C6-PFDA	112%	108%	20-150%
	13C7-PFUnDA	111%	107%	20-150%
	13C2-PFDoDA	103%	104%	20-150%
	13C2-PFTeDA	104%	100%	20-150%
	13C3-PFBS	119%	114%	20-150%
	13C3-PFHxS	110%	107%	20-150%
	13C8-PFOS	103%	105%	20-150%
	13C8-FOSA	104%	98%	20-150%
	d3-MeFOSA	96%	86%	20-150%
	d5-EtFOSA	89%	88%	20-150%
	d3-MeFOSAA	100%	94%	20-150%
	d5-EtFOSAA	98%	96%	20-150%
	d7-MeFOSE	99%	93%	20-150%
	d9-EtFOSE	93%	90%	20-150%
	13C2-4:2FTS	86%	86%	20-180%
	13C2-6:2FTS	103%	102%	20-180%
	13C2-8:2FTS	106%	102%	20-180%
	13C3-HFPO-DA	112%	108%	20-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 2

Job Number: FC13427
Account: GEOEWAT GeoEngineers, Inc.
Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1753-MS	6Q31380.D	1	02/24/24	MV	02/21/24	OP1753	S6Q442
OP1753-MSD	6Q31381.D	1	02/24/24	MV	02/21/24	OP1753	S6Q442
FC13254-40	6Q31379.D	1	02/24/24	MV	02/21/24	OP1753	S6Q442

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-1, FC13427-2, FC13427-3, FC13427-4, FC13427-5

CAS No.	Compound	FC13254-40 ug/kg	Spike Q	ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
375-22-4	Perfluorobutanoic acid	ND		11.5	11.3	98	11.6	11.4	98	1	40-150/30
2706-90-3	Perfluoropentanoic acid	ND		5.74	6.1	106	5.81	5.9	102	3	40-150/30
307-24-4	Perfluorohexanoic acid	0.15	J	2.87	3.1	103	2.91	2.9	95	7	40-150/30
375-85-9	Perfluoroheptanoic acid	ND		2.87	2.9	101	2.91	3.0	103	3	40-150/30
335-67-1	Perfluorooctanoic acid	ND		2.87	2.8	98	2.91	2.7	93	4	40-150/30
375-95-1	Perfluorononanoic acid	ND		2.87	3.1	108	2.91	3.1	107	0	40-150/30
335-76-2	Perfluorodecanoic acid	ND		2.87	2.8	98	2.91	3.4	117	19	40-150/30
2058-94-8	Perfluoroundecanoic acid	ND		2.87	3.0	104	2.91	2.9	100	3	40-150/30
307-55-1	Perfluorododecanoic acid	ND		2.87	3.2	111	2.91	2.9	100	10	40-150/30
72629-94-8	Perfluorotridecanoic acid	ND		2.87	2.9	101	2.91	3.0	103	3	40-150/30
376-06-7	Perfluorotetradecanoic acid	ND		2.87	2.8	98	2.91	2.6	89	7	40-150/30
375-73-5	Perfluorobutanesulfonic acid	ND		2.55	2.8	110	2.58	2.3	89	20	40-150/30
2706-91-4	Perfluoropentanesulfonic acid	ND		2.7	2.5	93	2.73	2.6	95	4	40-150/30
355-46-4	Perfluorohexanesulfonic acid	ND		2.62	2.5	95	2.66	2.8	105	11	40-150/30
375-92-8	Perfluoroheptanesulfonic acid	ND		2.74	2.6	95	2.77	2.7	97	4	40-150/30
1763-23-1	Perfluorooctanesulfonic acid	1.6		2.66	3.6	75	2.7	4.2	96	15	40-150/30
68259-12-1	Perfluorononanesulfonic acid	ND		2.76	2.5	91	2.8	2.9	104	15	40-150/30
335-77-3	Perfluorodecanesulfonic acid	ND		2.77	2.9	105	2.8	2.7	96	7	40-150/30
79780-39-5	Perfluorododecanesulfonic aci	ND		2.78	3.1	111	2.82	2.8	99	10	40-150/30
757124-72-44:2	Fluorotelomer sulfonate	ND		10.8	10.7	99	10.9	9.4	86	13	40-150/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		10.9	11.4	104	11	11.0	100	4	40-150/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		11	10.2	93	11.2	9.4	84	8	40-150/30
754-91-6	PFOSA	ND		2.87	2.7	94	2.91	2.5	86	8	40-150/30
31506-32-8	MeFOSA	ND		5.74	5.5	96	5.81	6.3	108	14	40-150/30
4151-50-2	EtFOSA	ND		5.74	5.9	103	5.81	5.7	98	3	40-150/30
2355-31-9	MeFOSAA	ND		2.87	3.2	111	2.91	3.7	127	14	40-150/30
2991-50-6	EtFOSAA	ND		2.87	2.3	80	2.91	3.0	103	26	40-150/30
24448-09-7	MeFOSE	ND		14.4	18.0	125	14.5	16.2	111	11	40-150/30
1691-99-2	EtFOSE	ND		14.4	14.1	98	14.5	14.8	102	5	40-150/30
13252-13-6	HFPO-DA (GenX)	ND		5.74	6.0	104	5.81	5.7	98	5	40-150/30
919005-14-4	ADONA	ND		5.43	5.4	100	5.49	5.3	97	2	40-150/30
377-73-1	PFMPA	ND		5.74	6.0	104	5.81	5.9	102	2	40-150/30
863090-89-5	PFMBA	ND		5.74	6.0	104	5.81	5.7	98	5	40-150/30
151772-58-6	NFDHA	ND		5.74	5.9	103	5.81	6.0	103	2	40-150/30
756426-58-19	Cl-PF3ONS (F-53B Major)	ND		5.37	5.6	104	5.43	5.5	101	2	40-150/30
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND		5.43	5.7	105	5.49	5.4	98	5	40-150/30

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

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Job Number: FC13427
Account: GEOEWAT GeoEngineers, Inc.
Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1753-MS	6Q31380.D	1	02/24/24	MV	02/21/24	OP1753	S6Q442
OP1753-MSD	6Q31381.D	1	02/24/24	MV	02/21/24	OP1753	S6Q442
FC13254-40	6Q31379.D	1	02/24/24	MV	02/21/24	OP1753	S6Q442

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-1, FC13427-2, FC13427-3, FC13427-4, FC13427-5

CAS No.	Compound	FC13254-40 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
113507-82-7	PFEEESA	ND	5.11	5.2	102	5.17	5.1	99	2	40-150/30
356-02-5	3:3 Fluorotelomer carboxylate	ND	14.4	12.3	86	14.5	12.9	89	5	40-150/30
914637-49-35:3	Fluorotelomer carboxylate	ND	71.8	65.4	91	72.6	68.1	94	4	40-150/30
812-70-4	7:3 Fluorotelomer carboxylate	ND	71.8	69.0	96	72.6	68.3	94	1	40-150/30

CAS No.	ID Standard Recoveries	MS	MSD	FC13254-40	Limits
	13C4-PFBA	70%	59%	68%	20-150%
	13C5-PFPeA	72%	60%	66%	20-150%
	13C5-PFHxA	72%	59%	67%	20-150%
	13C4-PFHpA	73%	58%	64%	20-150%
	13C8-PFOA	72%	62%	65%	20-150%
	13C9-PFNA	67%	53%	65%	20-150%
	13C6-PFDA	73%	50%	66%	20-150%
	13C7-PFUnDA	75%	59%	73%	20-150%
	13C2-PFDoDA	72%	59%	67%	20-150%
	13C2-PFTeDA	75%	62%	69%	20-150%
	13C3-PFBS	73%	57%	69%	20-150%
	13C3-PFHxS	81%	55%	65%	20-150%
	13C8-PFOS	70%	59%	68%	20-150%
	13C8-FOSA	71%	62%	71%	20-150%
	d3-MeFOSA	67%	49%	62%	20-150%
	d5-EtFOSA	61%	58%	65%	20-150%
	d3-MeFOSAA	64%	50%	74%	20-150%
	d5-EtFOSAA	69%	54%	73%	20-150%
	d7-MeFOSE	63%	59%	73%	20-150%
	d9-EtFOSE	68%	58%	68%	20-150%
	13C2-4:2FTS	81%	63%	79%	20-180%
	13C2-6:2FTS	70%	58%	67%	20-180%
	13C2-8:2FTS	91%	63%	76%	20-180%
	13C3-HFPO-DA	71%	61%	61%	20-150%

* = Outside of Control Limits.

Duplicate Summary

Page 1 of 2

Job Number: FC13427
Account: GEOEWAT GeoEngineers, Inc.
Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1744-DUP	7Q0114.D	1	02/23/24	MV	02/21/24	OP1744	S7Q45
FC13428-17	7Q0113.D	1	02/23/24	MV	02/21/24	OP1744	S7Q45

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-6, FC13427-7

CAS No.	Compound	FC13428-17 DUP		Q	RPD	Limits
		ug/l	Q ug/l			
375-22-4	Perfluorobutanoic acid	0.0306	0.0308		1	30
2706-90-3	Perfluoropentanoic acid	0.118	0.120		2	30
307-24-4	Perfluorohexanoic acid	0.0776	0.0796		3	30
375-85-9	Perfluoroheptanoic acid	0.0287	0.0297		3	30
335-67-1	Perfluorooctanoic acid	0.0230	0.0224		3	30
375-95-1	Perfluorononanoic acid	0.0087	0.0086		1	30
335-76-2	Perfluorodecanoic acid	0.0013	J 0.0012	J	8	30
2058-94-8	Perfluoroundecanoic acid	0.00063	J 0.00056	J	12	30
307-55-1	Perfluorododecanoic acid	ND	ND		nc	30
72629-94-8	Perfluorotridecanoic acid	ND	ND		nc	30
376-06-7	Perfluorotetradecanoic acid	ND	ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	0.0132	0.0141		7	30
2706-91-4	Perfluoropentanesulfonic acid	0.0236	0.0241		2	30
355-46-4	Perfluorohexanesulfonic acid	0.218	0.224		3	30
375-92-8	Perfluoroheptanesulfonic acid	0.0053	0.0052		2	30
1763-23-1	Perfluorooctanesulfonic acid	0.268	0.286		6	30
68259-12-1	Perfluorononanesulfonic acid	0.0013	J 0.0012	J	200*	30
335-77-3	Perfluorodecanesulfonic acid	ND	ND		nc	30
79780-39-5	Perfluorododecanesulfonic acid	ND	ND		nc	30
757124-72-44:2	Fluorotelomer sulfonate	ND	ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	0.208	0.210		1	30
39108-34-4	8:2 Fluorotelomer sulfonate	0.0176	0.0167		5	30
754-91-6	PFOSA	0.0014	J 0.0013	J	7	30
31506-32-8	MeFOSA	ND	ND		nc	30
4151-50-2	EtFOSA	ND	ND		nc	30
2355-31-9	MeFOSAA	ND	ND		nc	30
2991-50-6	EtFOSAA	ND	ND		nc	30
24448-09-7	MeFOSE	ND	ND		nc	30
1691-99-2	EtFOSE	ND	ND		nc	30
13252-13-6	HFPO-DA (GenX)	ND	ND		nc	30
919005-14-4	ADONA	ND	ND		nc	30
377-73-1	PFMPA	ND	ND		nc	30
863090-89-5	PFMBA	ND	ND		nc	30
151772-58-6	NFDHA	ND	ND		nc	30
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	ND		nc	30
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	ND		nc	30

* = Outside of Control Limits.

Duplicate Summary

Page 2 of 2

Job Number: FC13427
Account: GEOEWAT GeoEngineers, Inc.
Project: Paine Field; Everett, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP1744-DUP	7Q0114.D	1	02/23/24	MV	02/21/24	OP1744	S7Q45
FC13428-17	7Q0113.D	1	02/23/24	MV	02/21/24	OP1744	S7Q45

The QC reported here applies to the following samples:

Method: EPA DRAFT 1633

FC13427-6, FC13427-7

CAS No.	Compound	FC13428-17 ug/l	DUP Q ug/l	Q RPD	Limits
113507-82-7	PFEESA	ND	ND	nc	30
356-02-5	3:3 Fluorotelomer carboxylate	ND	ND	nc	30
914637-49-35:3	Fluorotelomer carboxylate	ND	ND	nc	30
812-70-4	7:3 Fluorotelomer carboxylate	ND	ND	nc	30

CAS No.	ID Standard Recoveries	DUP	FC13428-17	Limits
	13C4-PFBA	97%	99%	20-150%
	13C5-PFPeA	91%	96%	20-150%
	13C5-PFHxA	98%	104%	20-150%
	13C4-PFHpA	97%	101%	20-150%
	13C8-PFOA	96%	100%	20-150%
	13C9-PFNA	95%	98%	20-150%
	13C6-PFDA	99%	100%	20-150%
	13C7-PFUnDA	99%	103%	20-150%
	13C2-PFDoDA	91%	91%	20-150%
	13C2-PFTeDA	77%	82%	20-150%
	13C3-PFBS	110%	111%	20-150%
	13C3-PFHxS	102%	103%	20-150%
	13C8-PFOS	92%	98%	20-150%
	13C8-FOSA	97%	93%	20-150%
	d3-MeFOSA	80%	81%	20-150%
	d5-EtFOSA	75%	81%	20-150%
	d3-MeFOSAA	94%	87%	20-150%
	d5-EtFOSAA	86%	93%	20-150%
	d7-MeFOSE	85%	85%	20-150%
	d9-EtFOSE	82%	83%	20-150%
	13C2-4:2FTS	80%	85%	20-180%
	13C2-6:2FTS	99%	100%	20-180%
	13C2-8:2FTS	103%	105%	20-180%
	13C3-HFPO-DA	101%	99%	20-150%

* = Outside of Control Limits.

Appendix D

Report Limitations and Guidelines for Use

Appendix D

Report Limitations and Guidelines for Use¹

This appendix provides information to help you manage your risks with respect to the use of this report.

READ THESE PROVISIONS CLOSELY

Some clients, design professionals and contractors may not recognize that the geosciences practices (geotechnical engineering, geology and environmental science) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory “limitations” provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these “Report Limitations and Guidelines for Use” apply to your project or site.

ENVIRONMENTAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES, PERSONS AND PROJECTS

This report has been prepared for the exclusive use of Snohomish County Airport, their authorized agents and regulatory agencies. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, an environmental site assessment or remedial action study conducted for a property owner may not fulfill the needs of a prospective purchaser of the same property. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and project site. No one except the Snohomish County Airport should rely on this report without first conferring with GeoEngineers. This report should not be applied for any purpose or project except the one originally contemplated.

THIS ENVIRONMENTAL REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

This report applies to the Swamp Creek Study Area located at Paine Field Airport in Everett, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- Not prepared for you,
- Not prepared for your project,
- Not prepared for the specific site explored, or
- Completed before important project changes were made.

¹ Developed based on material provided by GBA, GeoProfessional Business Association; www.geoprofessional.org.

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

RELIANCE CONDITIONS FOR THIRD PARTIES

No third party may rely on the product of our services unless GeoEngineers agrees in advance, and in writing to such reliance. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions.

ENVIRONMENTAL REGULATIONS ARE ALWAYS EVOLVING

Some substances may be present in the site vicinity in quantities or under conditions that may have led, or may lead, to contamination of the subject site, but are not included in current local, state or federal regulatory definitions of hazardous substances or do not otherwise present current potential liability. GeoEngineers cannot be responsible if the standards for appropriate inquiry, or regulatory definitions of hazardous substance, change or if more stringent environmental standards are developed in the future.

SUBSURFACE CONDITIONS CAN CHANGE

This report is based on conditions that existed at the time our site studies were performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, by new releases of hazardous substances, or by natural events such as floods, earthquakes and slope instability or groundwater fluctuations. Always contact GeoEngineers before applying this report to determine if it is still applicable.

BIOLOGICAL POLLUTANTS

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants and no conclusions or inferences should be drawn regarding Biological Pollutants, as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria and viruses, and/or any of their byproducts.

If Client desires these specialized services, they should be obtained from a consultant who offers services in this specialized field.

DO NOT REDRAW THE EXPLORATION LOGS

Environmental scientists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in an environmental report should never be redrawn for inclusion in other design drawings. Only photographic or electronic reproduction is acceptable but recognize that separating logs from the report can elevate risk.

GEOTECHNICAL, GEOLOGIC AND ENVIRONMENTAL REPORTS SHOULD NOT BE INTERCHANGED

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

SOIL AND GROUNDWATER END USE

The cleanup levels referenced in this report are site- and situation-specific. The cleanup levels may not be applicable for other sites or for other on-site uses of the affected media (soil and/or groundwater). Note that hazardous substances may be present in some of the site soil and/or groundwater at detectable concentrations that are less than the referenced cleanup levels. GeoEngineers should be contacted prior to the export of soil or groundwater from the subject site or reuse of the affected media on Site to evaluate the potential for associated environmental liabilities. We cannot be responsible for potential environmental liability arising out of the transfer of soil and/or groundwater from the subject Site to another location or its reuse on site in instances that we were not aware of or could not control.

MOST ENVIRONMENTAL FINDINGS ARE PROFESSIONAL OPINIONS

Our interpretations of subsurface conditions are based on field observations and chemical analytical data from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ – sometimes significantly – from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

