Evergreen Resources Management
2 Righter Parkway, Suite 120
Wilmington, DE 19803

September 30, 2021

VIA ELECTRONIC SUBMISSION

C. David Brown, P.G.
Professional Geologist Manager
Environmental Cleanup & Brownfields Program
Pennsylvania Department of Environmental Protection
Southeast Regional Office
2 East Main Street, Norristown, PA 19401

Re: PFAS Lower Aquifer Sampling Results
Former Philadelphia Refining Complex
3144 Passyunk Avenue, Philadelphia, Pennsylvania

Dear Mr. Brown:

In July 2021, Sanborn Head & Associates (Sanborn Head) completed groundwater sampling in twenty-nine lower aquifer wells for per- and polyfluorinated alkyl substances (PFAS) in accordance with the June 30, 2021 Desktop Review and Sampling Plan. The results of the lower aquifer PFAS sampling show that groundwater concentrations are below Statewide Health Standard (SHS) Medium Specific Concentrations (MSCs) for PFAS in twenty-one of twenty-nine wells sampled. For the wells that had PFAS detections above the SHS MSCs, there was no apparent correlation between the historical fire activity, foam storage/loading areas, and fire training areas identified in the June 30, 2021 Desktop Review and Sampling Plan.

Please see the attached memorandum from Sanborn Head that presents more detail on the July 2021 lower aquifer PFAS groundwater sampling results, as well as regional surface water information and regional PFAS sampling. As discussed in the September 1, 2021 meeting with the PADEP and EPA, a shallow aquifer well sampling workplan will follow this submittal. The target submittal date for the shallow groundwater workplan is October 2021.

If you have any questions regarding this submittal, please do not hesitate to contact me at your convenience.

Regards,

Evergreen Resources Management Operations

Tiffani L. Doerr, P.G.

Cc:
Scott Cullinan, PE, Evergreen Resources Management Operations
Kevin Bilash, EPA
Patrick O'Neill, City of Philadelphia
Colleen Costello, PG, Sanborn Head & Associates, Inc.
Andrew Buchy, Sanborn Head & Associates, Inc.

SANBORN HEAD

Building Trust. Engineering Success.

MEMORANDUM

To: **Tiffani Doerr, P.G.**
Evergreen Resources Management Operations
From: Andrew Buchy and Colleen Costello (Sanborn Head & Associates, Inc.)
File: 4796
Date: September 30, 2021
Re: July 2021 Lower Aquifer PFAS Sampling Results
cc: Scott Cullinan – Evergreen Resources Management Operations

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This memorandum presents the results of the July 2021 lower aquifer groundwater sampling event at the former Philadelphia Refinery site (Site) in Philadelphia, Pennsylvania for per- and polyfluorinated alkyl substances (PFAS).

1.0 INTRODUCTION

At the request of the Pennsylvania Department of Environmental Protection (PADEP) to investigate PFAS on the Site, twenty-nine lower aquifer monitoring wells were selected for sampling based on a PFAS desktop study. The PFAS desktop study identified lower aquifer monitoring well locations in areas of historical fire events, fire training, and firefighting foam storage and loading areas. The twenty-nine lower aquifer sample locations can be seen on **Figure 1**. In addition, **Figure 2** presents the lower aquifer groundwater contours which were used in well selection and are representative of groundwater flow direction in the lower aquifer. The PFAS sampling event was completed in accordance with Evergreen's June 30, 2021 Desktop Review and Sampling Plan, which is included as **Attachment A** and is briefly summarized in Section 2.0. The PFAS sampling plan was approved for use by PADEP and EPA on June 7, 2021. The PFAS sampling activities are being completed at the request of the PADEP but are not part of Evergreen's Act 2 investigation and reporting for the Site.

2.0 DESKTOP REVIEW

As summarized in the June 30, 2021 Desktop Review and Sampling Plan, Sanborn Head and Evergreen reviewed multiple sources of information in order to identify potential sources of PFAS to inform the June 30, 2021 sampling plan. The information that was reviewed included:

- Review of readily available media articles and other publicly available information about past fires at the Site.
- Review of relevant Site maps, including Site operational maps that were included in historic environmental reports, existing and historic utility maps, and historic Site knowledge.

- Completion of a Site inspection on June 2, 2021, identifying fire suppression systems, firefighting foam concentrate storage (including both labeled totes and drums) and inspection of locations of past fires (where possible).
- Review of Safety Data Sheets (SDS) provided by Hilco Redevelopment Partners (HRP) for firefighting foam used on Site.

Based on the desktop review, areas where firefighting foam may have been previously used at the Site were identified. These are summarized below and shown on **Figure 3**.

- Fire Training Areas
  - Routine/Annual Training Areas – application of firefighting foam as part of fire training activities.
  - Select Training Areas – Less frequently used training areas.
- Fires –Firefighting foam was reported to be used to address additional fires at the Refinery.
- Storage/Loading Areas and Fire Stations – Though firefighting foam was historically present at these locations, there is no indication that Aqueous Film Forming Foam (AFFF), containing materials, which can contain PFAS, came into the contact with the environment.

3.0 JULY 2021 LOWER AQUIFER GROUNDWATER SAMPLING

From July 19 to July 23, 2021, Sanborn Head collected 37 samples (including eight Quality Control [QC] samples) across twenty-nine lower aquifer monitoring well locations at the Site in accordance with the July 30, 2021 sampling plan. The groundwater samples were collected using EPA and PADEP low-flow sampling procedures detailed in the June 30, 2021 sampling plan.

Upon arriving at each well, Sanborn Head collected an initial depth to water with a water level meter and recorded the reading on a log form. This information was used to calculate groundwater elevations, which are summarized on **Table 1.** These groundwater elevations were consistent with previous lower aquifer groundwater elevations shown on **Figure 2**.

To complete the sample collection, a Teflon/PFAS-free submersible pump with high-density polyethylene (HDPE) tubing was inserted to the approximate mid-screen of the monitoring well. After installation, low-flow pumping commenced through a water quality meter measuring for pH, specific conductivity, oxidation-reduction potential, and dissolved oxygen until stabilizing geochemical conditions were observed. Stabilized water quality readings for each sampled well are summarized in **Table 1**. PFAS samples were collected into 2 x 250 milliliter (ml) HDPE bottle sets from each well, labeled, recorded on a chain-of-custody form, and immediately stored on ice within a cooler. After sampling each well, non-dedicated sampling equipment were thoroughly washed in a Liquinox and deionized water solution and rinsed with laboratory-provided PFAS-free water (PFAS-free water).

QC samples collected during the July 2021 sampling event included field duplicates, field blanks, and equipment rinsate blanks. For the two field duplicate samples, an additional set of 250 ml bottles were collected simultaneously with the associated sampled well. Four total

field blanks were collected by transferring PFAS-free water into 2 x 250 ml HDPE bottles. Two total equipment rinsate blanks were collected from decontaminated non-dedicated sampling equipment by pouring PFAS-free water through the equipment into 2 x 250 ml bottles. All QC samples were stored on ice immediately following collection and submitted to the laboratory on chain-of-custody forms.

All samples from the July 2021 sampling event were submitted to Eurofins Lancaster Laboratories Env, LLC located in Lancaster, PA for analysis of Unregulated Contaminant Monitoring Rule (UCMR) 3 via USEPA Modified Method 537.1 Isotope Dilution. Analytes on the UCMR 3 list of PFAS compounds include Perfluorooctanoic Acid (PFOA), Perfluorooctanesulfonic acid (PFOS), Perfluoronanoic Acid (PFNA), Perfluorohexanesulfonic Acid (PFHxS), Perfluoroheptanoic Acid (PFHpA), and Perfluorobutanesulfonic Acid (PFBS).

4.0 ANALYTICAL RESULTS FROM JULY 2021 GROUNDWATER SAMPLING

The PADEP non-residential statewide health standard (SHS) medium specific concentrations (MSC) for groundwater are:

Analyte	PADEP SHS MSC (µg/l)
PFOA	0.07
PFAS	0.07
Combined PFOA and PFAS	0.07
PFBS	1,900

Notes:
µg/L = micrograms per liter

The results of the July 2021 sampling event are summarized on **Table 2** and shown on **Figure 4** and **Figure 5**. **Figure 4** presents the data in databox format. **Figure 5**, which depicts historical fire activity onsite from the Desktop Review and Sampling Plan, was updated to show PFAS results by well location. The red symbol at a monitoring well location indicates that at least one of the analyzed PFAS substances had a detected result at a concentration higher than the SHS MSC, while green indicates all results are below the SHS MSCs for these parameters.

These results are also summarized below:

- Twenty-one of the twenty-nine lower aquifer monitoring wells sampled had concentrations that were below the SHS MSCs for PFOA, PFAS and PFBS, as summarized on **Table 2**.
- None of the wells had PFBS concentrations above the SHS MSC.
- Four wells (A-19D, S-110DSRTF, S-115DSRTF, S-143SRTF, plus duplicate sample S-143SRTF_Dup) had concentrations above the SHS MSC for only PFOA.
- One well (S-389D) had concentrations above the SHS MSC for only PFOS.
- One well (B-134D) had concentrations above the SHS MSC for both PFOA and PFOS.
- Two wells (A-21D and W-27) were below SHS MSCs for both PFOA and PFOS but exceeded the combination MSC.
- All field blanks and equipment rinsate blanks were non-detect.

- Three (W-27, S-110DSRTF, and S-115DSRTF) of the eight wells, with detections above the SHS MSCs, represent potential impacts from off-site or hydraulically upgradient groundwater conditions.
- Only five (A-19D, A-21D, B-134D, S-143SRTF and S-389D) of the eight wells with detections above the SHS MSCs are located down gradient from Site operations (note, all wells sampled were on-Site wells, no off-Site wells were included in the lower aquifer groundwater sampling). There was no apparent correlation between locations of the historical fire activity, foam storage/loading areas, and fire training areas with any wells with PFAS detections above the SHS MSCs, including these locations.

5.0 REGIONAL DISCUSSION

Prior to sampling in the lower aquifer, a regional assessment of drinking water sources, intakes, and potential offsite PFAS discharges to the environment was conducted. The following summarizes the findings from this regional assessment, as depicted on **Figure 6**:

- Drinking water for the City of Philadelphia is served by the Philadelphia Water Department (PWD) and sourced from surface intakes along the Schuylkill and Delaware Rivers. Two locations, Queen Lane and Belmont Water Treatment Plants, are located along the Schuylkill River, more than one mile upstream and a third drinking water intake, Baxter Water Treatment Plant, is located roughly 14 miles to the northeast along the Delaware River and upstream of the site, as shown on **Figure 6.**
- Surface water data were collected and characterized for PFAS at the three water intakes by the Philadelphia Water Department[1]. For all samples collected between April 2019 – February 2020, results showed PFOA + PFOS concentrations below the SHS MSC on **Figure 6.**
- Surface water samples collected by the PADEP and PWD, in conjunction with the United States Geologic Survey, further upstream in the Schuylkill River watershed at four locations ranged from 9.6 nanograms per liter (ng/L) to 21 ng/L for PFOA + PFOS concentrations, which are below the SHS MSC on **Figure 6**.
- Shallow aquifer groundwater samples collected by a Department of the Navy consultant at the Former Naval Fire Training Unit reveal a PFOA + PFOS concentration range of 380 ng/L to 27,910 ng/L, as shown on **Figure 6**.
- The potential PFAS sources to the environment within 1 mile of the Site include are also shown on **Figure 6**.

The information depicted in **Figure 6** further support that PFAS is ubiquitous in the region due to its use in commerce and industry, including several upgradient locations within 1 mile of the Site, and locations across the greater Philadelphia area. The information on **Figure 5** and **Figure 6** support that the Site will not have impacts to the PWD drinking water intakes due to the direction of groundwater and surface water flow. Groundwater in the lower aquifer across the Site has a general flow direction to the south toward the Schuylkill-Delaware River confluence and no drinking water intakes have been identified in the downgradient direction.

[1] Philadelphia Water Department. PFAS Water Resources Characterization Study. November 2020

6.0 CLOSING

Lower aquifer results from the Site are below SHS MSCs for PFAS substances in twenty-one of twenty-nine wells sampled. Of the eight wells with at least one PFAS substance above the SHS MSC, three well locations are representative of upgradient conditions. Only five of the eight wells with detections above the SHS MSCs are located down gradient of Site features. However, there was no apparent correlation between historical fire activity, foam storage/loading areas, and fire training areas with any of the wells which had PFAS detections above the SHS MSCs.

In addition, the surface water withdrawal points for the PWD are located at more than one mile upstream of the Site. Groundwater conditions at the Site will not impact the PWD drinking water intakes due to the direction of groundwater and surface water flow, as well as the distance between the Site and these features.

Enclosures

Figure 1	July 2021 PFAS Sampling Locations in the Lower Aquifer
Figure 2	Lower Aquifer Groundwater Flow Direction
Figure 3	Potential Areas Where Firefighting Foam May Have Been Previously Used at the Former Philadelphia Refinery
Figure 4	July 2021 Lower Aquifer PFAS Groundwater Results in Data Boxes
Figure 5	Potential Areas Where Firefighting Foam May Have Been Previously Used at the Former Philadelphia Refinery with July 2021 Lower Aquifer Sampling Results
Figure 6	Summary of PFAS Background Conditions and Potential Off-Site Sources
Table 1	Summary of Water Elevations and Field Measurements
Table 2	Summary of Analytical Results
Attachment A	Evergreen Desktop Review and Sampling Plan
Attachment B	Analytical Laboratory Packages

FIGURES

Figure 1

July 2021 PFAS Sampling Locations in the Lower Aquifer

Former Philadelphia Refinery

Philadelphia, PA

Drawn By: M. Fuerte / H. Pothier
Designed By: P. Troy
Reviewed By: P. Troy
Project No: 4796.01
Date: August, 2021

Notes

1. Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- AOI Boundary Lines
- PGW Boundary
- Lower Aquifer Monitoring Wells
- Lower Aquifer July 2021 PFAS Sampling Location

750 375 0 750 1,500 Feet

EVERGREEN

Figure 2

Lower Aquifer Groundwater Flow Direction

Former Philadelphia Refinery

Philadelphia, PA

Drawn By:	M. Fuerte / H. Pothier
Designed By:	P. Troy
Reviewed By:	P. Troy
Project No:	4796.01
Date:	September, 2021

Notes

1. Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- AOI Boundary Lines
- PGW Boundary
- Lower Aquifer Monitoring Wells
- July 2021 Lower Aquifer Downgradient Boundary Well Sampling Location
- July 2021 Lower Aquifer Upgradient/Background Well Sampling Location
- July 2021 Lower Aquifer Well Sampling Location in Storage/Loading Area
- July 2021 Lower Aquifer Well Sampling based on Reported Fire or Training Area
- 2.5 Groundwater Elevation (Feet NAVD 88)

750 375 0 750 1,500 Feet

Last Edited By: mfuerte

Path: P:\4700s\4796.00\Graphics Files\ArcGIS\Figures\20210428 Evergreen PFAS\Fire History_for Discussion\20210616_AFFF_Sampling Plan_LowerAquifer.mxd

Figure 3

Potential Areas Where Firefighting Foam May Have Been Previously Used at the Former Philadelphia Refinery

Former Philadelphia Refinery

Philadelphia, PA

Drawn By:	M. Fuerte / H. Pothier
Designed By:	P. Troy
Reviewed By:	P. Troy
Project No:	4796.01
Date:	June 23, 2021

Notes

1. Aerial imagery provided by Google Earth. (2018). Philadelphia, PA, USA. 39°54'27.86"N, 75°12'00.94"W. Eye alt 24246 ft.

2. Fire Department locations identified from historical certified Sanborn Maps.

3. Onsite foam assets are approximate locations determined from Site visit on 6/2/2021.

4. Lower aquifer contours sourced from 2020 First Half Semi-Annual Remediation Status Report Figure 5.

Legend

- AOI Boundary Lines
- PGW Boundary
- Lower Aquifer Contours
- Lower Aquifer Monitoring Wells
- Proposed Lower Aquifer Downgradient Boundary Well Sampling Location
- Proposed Lower Aquifer Upgradient/Background Well Sampling Location
- Proposed Lower Aquifer Well Sampling Location in Storage/Loading Area
- Proposed Lower Aquifer Well Sampling based on Reported Fire or Training Area
- Historical Fire Incident
- Fire Department
- Firefighting Asset - No Reported Firefighting Foam Storage
- Reported Firefighting foam Storage and Loading Area
- Reported Fire Training Area with Application of Firefighting Foam

750 375 0 750 1,500 Feet

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N-163		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	2.4
PFHpA	NS	3.1
PFHxS	NS	< 1.7
PFNA	NS	14
PFOS	70	6.2
PFOA	70	12
PFOS + PFOA	70	18.2

N-69		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	3.9
PFHpA	NS	4.3
PFHxS	NS	< 1.8
PFNA	NS	7.1
PFOS	70	3.8
PFOA	70	8.9
PFOS + PFOA	70	12.7

N-9		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	3.5 I
PFHpA	NS	3.1
PFHxS	NS	2.7
PFNA	NS	< 1.6
PFOS	70	1.6
PFOA	70	9.5
PFOS + PFOA	70	11.1

PGW-MW-8D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	2.8 I,*5+
PFHpA	NS	35
PFHxS	NS	3.2
PFNA	NS	2.1
PFOS	70	6.3 I
PFOA	70	37 I
PFOS + PFOA	70	43.3 I

S-294D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	4.3 I
PFHpA	NS	38
PFHxS	NS	3.6
PFNA	NS	2.9
PFOS	70	6.4 I
PFOA	70	37 I
PFOS + PFOA	70	43.4 I

S-393D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	1.7 I
PFHpA	NS	5.9
PFHxS	NS	2.6
PFNA	NS	1.9
PFOS	70	4.1
PFOA	70	11
PFOS + PFOA	70	15.1

N-38D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	2.5 I,*5+
PFHpA	NS	20
PFHxS	NS	< 1.6
PFNA	NS	3.9 I
PFOS	70	< 1.6
PFOA	70	5
PFOS + PFOA	70	5

S-80D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	2.9 I
PFHpA	NS	270
PFHxS	NS	3.8
PFNA	NS	5.4
PFOS	70	3.6
PFOA	70	53
PFOS + PFOA	70	56.6

S-80D_Dup		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	3.2 I
PFHpA	NS	250
PFHxS	NS	3.8
PFNA	NS	5.5
PFOS	70	3.8
PFOA	70	54
PFOS + PFOA	70	57.8

N-149D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	< 20
PFHpA	NS	< 20 *5+
PFHxS	NS	< 20
PFNA	NS	< 20 *5+
PFOS	70	< 20 *5+
PFOA	70	< 20 *5+
PFOS + PFOA	70	ND

S-302D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	< 1.7
PFHpA	NS	8.5
PFHxS	NS	< 1.7
PFNA	NS	< 1.7
PFOS	70	< 1.7 *5+
PFOA	70	14 I
PFOS + PFOA	70	14 I

S-391D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	< 1.6
PFHpA	NS	42
PFHxS	NS	3.7
PFNA	NS	11
PFOS	70	6.6 I
PFOA	70	51
PFOS + PFOA	70	57.6 I

S-389D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	18
PFHpA	NS	14 *5+
PFHxS	NS	220 *5+
PFNA	NS	< 1.6
PFOS	70	**280**
PFOA	70	68 I
PFOS + PFOA	70	**348 I**

W-27		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	7.8
PFHpA	NS	49
PFHxS	NS	8.6
PFNA	NS	27
PFOS	70	53
PFOA	70	53
PFOS + PFOA	70	**106**

S-69D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	2.5 I
PFHpA	NS	12
PFHxS	NS	3.9
PFNA	NS	76
PFOS	70	6.9
PFOA	70	36
PFOS + PFOA	70	42.9

S-388D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	4.8 I
PFHpA	NS	1.8
PFHxS	NS	13
PFNA	NS	< 1.6
PFOS	70	21
PFOA	70	10 I
PFOS + PFOA	70	31 I

C-129D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	1.6 I
PFHpA	NS	1.9
PFHxS	NS	2
PFNA	NS	8.5
PFOS	70	3.5
PFOA	70	8.8
PFOS + PFOA	70	12.3

S-264D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	7.7 I *5+
PFHpA	NS	< 1.8 *5+
PFHxS	NS	23 *5+
PFNA	NS	< 1.8
PFOS	70	41
PFOA	70	16 I
PFOS + PFOA	70	57 I

C-144D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	< 1.6 *5+
PFHpA	NS	12
PFHxS	NS	< 1.6
PFNA	NS	5.7 *5+
PFOS	70	< 1.6
PFOA	70	19
PFOS + PFOA	70	19

S-284D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	2.3 I
PFHpA	NS	25
PFHxS	NS	3.5
PFNA	NS	19
PFOS	70	12
PFOA	70	28
PFOS + PFOA	70	40

C-134D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	3.6 *5+
PFHpA	NS	32
PFHxS	NS	2.4
PFNA	NS	23
PFOS	70	7.7
PFOA	70	41
PFOS + PFOA	70	48.7

S-39D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	< 20
PFHpA	NS	< 20
PFHxS	NS	< 20
PFNA	NS	< 20 *5+
PFOS	70	< 20 *5+
PFOA	70	20
PFOS + PFOA	70	20

S-110DSRTF		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	9.8 I,*5+
PFHpA	NS	40
PFHxS	NS	11
PFNA	NS	86
PFOS	70	26
PFOA	70	**580**
PFOS + PFOA	70	**606**

A-19D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	< 20
PFHpA	NS	39
PFHxS	NS	< 20
PFNA	NS	370
PFOS	70	33
PFOA	70	**99 I**
PFOS + PFOA	70	**132 I**

S-38D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	< 1.6
PFHpA	NS	< 1.6
PFHxS	NS	< 1.6
PFNA	NS	<1.6 *5+
PFOS	70	2.1
PFOA	70	< 1.6
PFOS + PFOA	70	2.1

S-115DSRTF		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	3.3 *5+
PFHpA	NS	56
PFHxS	NS	11
PFNA	NS	87
PFOS	70	37
PFOA	70	**550**
PFOS + PFOA	70	**587**

B-134D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	3.4 I,*5+
PFHpA	NS	89
PFHxS	NS	18
PFNA	NS	60
PFOS	70	**73**
PFOA	70	**97**
PFOS + PFOA	70	**170**

B-48D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	< 1.7
PFHpA	NS	3.7
PFHxS	NS	3.6
PFNA	NS	43
PFOS	70	8.2
PFOA	70	23
PFOS + PFOA	70	31.2

S-143SRTF		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	4.8 I
PFHpA	NS	11
PFHxS	NS	8.2
PFNA	NS	13
PFOS	70	14
PFOA	70	**200**
PFOS + PFOA	70	**214**

S-143SRTF_Dup		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	4.9 I
PFHpA	NS	11
PFHxS	NS	8
PFNA	NS	13
PFOS	70	14
PFOA	70	**200**
PFOS + PFOA	70	**214**

A-21D		
Analyte	PADEP MSC	Result (ng/L)
PFBS	1,900,000	2.6 *5+
PFHpA	NS	32
PFHxS	NS	24
PFNA	NS	24
PFOS	70	36
PFOA	70	38
PFOS + PFOA	70	**74**

Figure 4

July 2021 Lower Aquifer PFAS Groundwater Results in Data Boxes

Former Philadelphia Refinery

Philadelphia, PA

Drawn By: M. Fuerte
Designed By: C. Costello
Reviewed By: C. Costello
Project No: 4796.00
Date: August, 2021

Notes

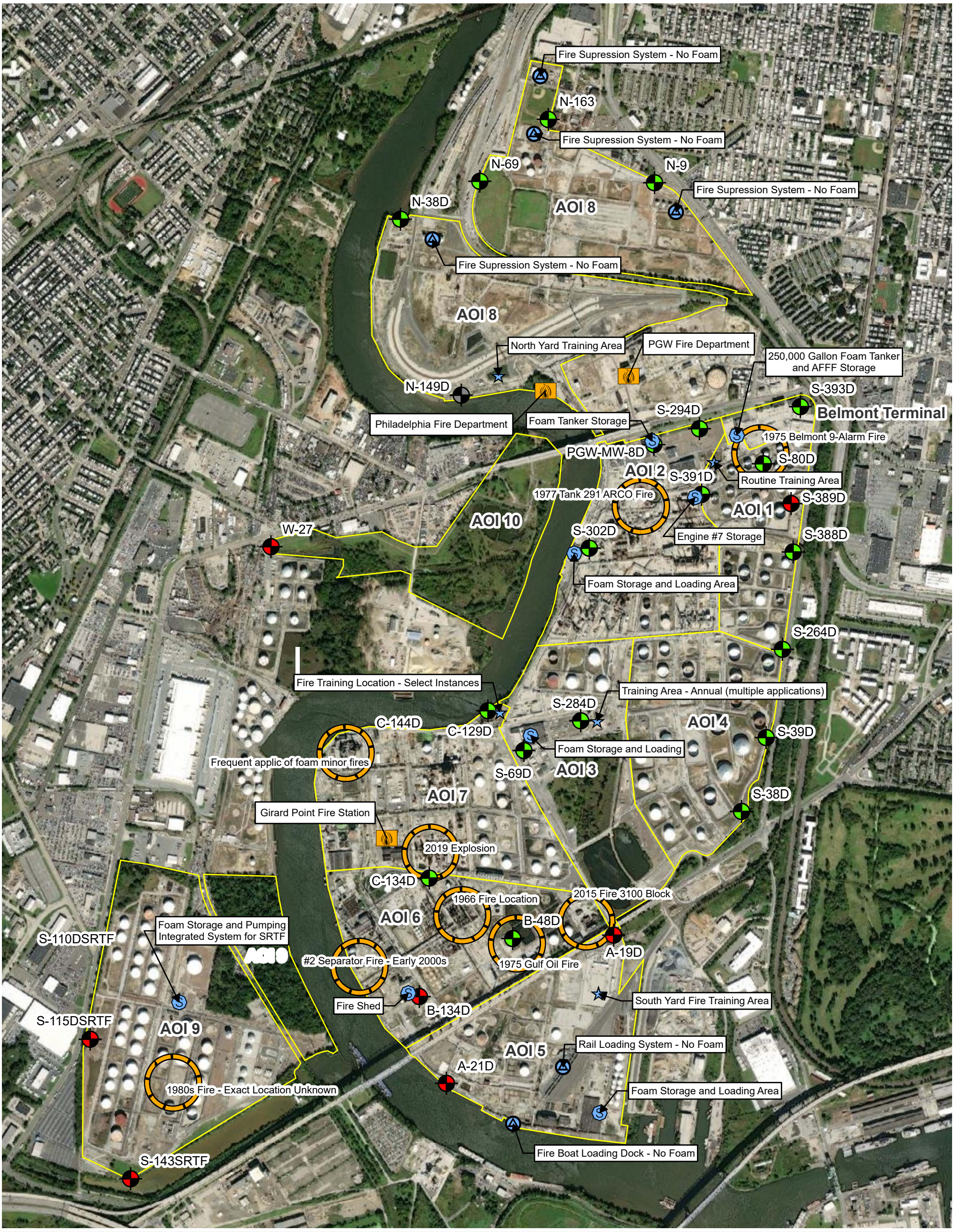
1. Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
2. Samples were collected by Sanborn, Head & Associates, Inc. personnel on the dates indicated and analyzed by Eurofins Lancaster Laboratories Env, LLC of Lancaster, Pennsylvania for per- and polyfluroinated alkyl substances (PFAS) compounds by United States Environmental Protection Agency (USEPA) Method 537 (modified) with isotope dilution.
3. Concentrations are presented in nanograms per liter (ng/L).
4. PADEP medium-specific concentrations (MSCs) for organic regulated substances in groundwater (TDS ≤ 2500 mg/L) from Appendix A, Table 1.
5. Appendix A, Table 1 notes that "PFOA and PFOS values listed are for individual or total combined."
6. "I" indicates the laboratory qualified this result as "EMPC (Estimated Maximum Possible Concentration)."
"*5+" indicates the laboratory qualified this result as"Isotope dilution analyte is outside acceptance limits, high biased."
7. Bold gray-shaded values exceed the PADEP MSC
8. Perfluorobutanesulfonic Acid (PFBS)
9. Perfluoroheptanoic Acid (PFHpA)
10. Perfluorohexanesulfonic Acid (PFHxS)
11. Perfluorononanoic Acid (PFNA)
12. Perfluorooctanesulfonic Acid (PFOS)
13. Perfluorooctanoic Acid (PFOA)

Legend

- Sampled Lower Aquifer Monitoring Well PFOS + PFOA: Nondetect to 70 ng/L
- Sampled Lower Aquifer Monitoring Well PFOS + PFOA: > 70 ng/L
- Lower Aquifer Monitoring Wells
- AOI Boundary Lines

750 375 0 750 1,500 Feet

EVERGREEN



N
W E
S

600 300 0 600 1,200 Feet

Legend

- Firefighting Asset - No Foam
- Foam Storage and Loading Area
- Foam Training Application Area
- Fire Department
- Fire Event

PFOS + PFOA (ng/L)

- Nondetect
- 0.001 - 70 ng/L
- Exceeds 70 ng/L
- AOI Boundaries

Notes

1. Fire Department locations identified from historical certified Sanborn Maps.
2. Onsite foam assets are approximate locations determined from Site visit on 6/2/2021.
3. Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 5

Potential Areas Where Firefighting Foam May Have Been Previously Used at the Former Philadelphia Refinery with July 2021 Lower Aquifer Sampling Results

Evergreen Resources Group

Philadelphia, PA

Drawn By:	M. Fuerte
Designed By:	A. Buchy
Reviewed By:	A. Buchy
Project No:	4796.00
Date:	September, 2021

Last Edited By: mfuerte
Path: P:\4700s\4796.00\Graphics Files\ArcGIS\Figures\20210428 Evergreen PFAS\20210719 GW Sampling\Evergreen PES - PFAS Regional Figure.mxd

N
W E
S

Willow Grove Naval Air Base Groundwater
PFOS = 4050 ng/L
Source: 2020 ATSDR Health Evaluation

WQN 121
PFOS+PFOA = 34 ng/L

WQN 121
PFOS+PFOA = 36 ng/L

WISS
PFOS+PFOA = 20 ng/L

WQN 193
PFOS+PFOA = 21 ng/L

PENN
PFOS+PFOA = 28.7 ng/L

POQU
PFOS+PFOA = 29.9 ng/L

Defense Supply Center Philadelphia

WQN 115
PFOS+PFOA = 15.7 ng/L

WQN 110
PFOS+PFOA = 9.6 ng/L

Baxter PWD Intake
DELA
PFOS+PFOA = 8.1 ng/L

Queen Lane PWD Intake
SCHU 1
PFOS+PFOA = 12.1 ng/L

Belmont PWD Intake
SCHU 2
PFOS = 3.5
PFOA = 6.1 ng/L

PGW

Former DSCP

Naval Hospital Philadelphia

Former Naval Fire Training Unit

Naval Base Philadelphia

PHL International Airport

Naval Fire Training Unit Groundwater

Location	PFOS + PFOA (ng/L)
NSP-MW-02	1100
NSP-MW-03	1790
NSP-MW-04	410
NSP-MW-07	27910
NSP-MW-08	380

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

Figure 6

Summary of PFAS Background Conditions and Potential Off-Site Sources

PFAS Background Evaluation

Evergreen Resources

Philadelphia, PA

Drawn By:	M. Fuerte
Designed By:	S. Zemba
Reviewed By:	A. Buchy
Project No:	4796.00
Date:	September, 2021

Notes

1. Black and white canvas basemap provided by ESRI.
2. Wastewater Treatment Facilities, Pennsylvania streams, and military installations sourced from Pennsylvania Spatial Data Access (https://www.pasda.psu.edu)
3. Potential Industiral Sources in Philadelphia sourced from Enforcement Compliance History Online Database. Locations are approximate
4. Sum of PFOS and PFOA concentrations for monitoring wells in the Philadelphia Naval Base former fire training unit sourced from Tetra Tech report "Final Per and Polyfluoroalkyl Substances Groundwater Preliminary Assessment and Site Inspection: Site 13 Former Fire Training Unit NS, Philadelphia, PA (September 2020).
5. ng/L = nanograms per liter

Legend

PFOA + PFOS (ng/L)

Water Quality Network	Philadelphia Water Department
0.01 - 10 ng/L	0.01 - 10 ng/L
10 - 20 ng/L	10 - 20 ng/L
20 - 30 ng/L	20 - 30 ng/L
30 - 40 ng/L	30 - 40 ng/L

Possible industrial sources of PFAS contamination (EPA ECHO)

Wastewater Treatment Facilities (PASDA)

Evergreen Philadelphia Refinery

Philadelphia Airport Infrastructure

Pennsylvania Military Installations

PWD Intake Locations

6,000 3,000 0 6,000 12,000 Feet

SANBORN HEAD

TABLES

Table 1
Summary of Water Elevations and Field Measurements
July 2021
Former Philadelphia Refinery
Philadelphia, Pennsylvania

Sampling Location	Sample Name	Sample Date	Ref. Point	Depth to Water (ft)	Top of Casing Elevation (ft)	Corrected Water Level Elevation (ft)	Depth to Bottom (ft bgs)	pH (S.U.)	Specific Conductance (µS/cm)	Temp. (°C)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
N-69	N-69	7/19/21	TOC	13.54	23.20	9.66	42	7.9	1,060	19.1	0.0	-261.0	10.8
N-163	N-163	7/19/21	TOC	17.91	27.23	9.32	39.75	6.9	683	18.6	0.0	-159.0	59.0
W-27	W-27	7/23/21	TOC	9.90	10.86	0.96	20.4	6.7	1,190	21.0	0.2	74.0	0.0
S-38D	S-38D	7/22/21	TOC	20.40	17.70	-2.70	132	7.2	218	19.80	0.1	-121.0	36.4
B-134D	B-134D	7/22/21	TOC	11.00	8.12	-2.88	82	6.5	1,260	18.38	0.0	-78.0	13.1
C-144D	C-144D	7/22/21	TOC	13.54	8.963	-4.58	74	6.3	953	17.7	0.00	-52	46.6
C-129D	C-129D	7/21/21	TOC	8.65	9.191	0.54	68.12	7.0	944	18.7	0.31	-152	5.3
S-69D	S-69D	7/21/21	TOC	11.00	11.354	0.35	62.3	6.6	979	18.8	0.00	89	22.8
S-80D	S-80D	7/21/21	TOC	29.20	31.74	2.54	79	5.9	941	19.1	0.16	12	8.0
S-80D	S-80D-Dup	7/22/21	-	-	-	-	-	-	-	-	-	-	-
S-389D	S-389D	7/20/21	TOC	24.50	26.30	1.80	82	6.4	988	19.3	0.27	-56	2.6
S-391D	S-391D	7/20/21	TOC	28.70	31.46	2.76	98	6.3	943	20.2	0.00	-28	180
S-294D	S-294D	7/20/21	TOC	31.82	34.68	2.86	99	6.4	1,080	18.4	0.00	-62	65.0
N-38D	N-38D	7/19/21	TOC	10.00	10.432	0.43	84	6.8	2,120	18.3	0.56	-140	24.5
N-9	N-9	7/19/21	TOC	31.70	38.21	6.51	63	6.4	1,230	20.5	0.20	-24	282
S-143SRTF	S-143SRTF	7/23/21	TOC	16.27	6.77	-9.50	70	6.5	858	18.0	1.3	-84	2.9
S-143SRTF	S-143SRTF-Dup	7/23/21	-	-	-	-	-	-	-	-	-	-	-
S-264D	S-264D	7/20/21	TOC	25.29	26.63	1.34	81	6.1	1,300	17.5	1.1	22	7.3
A-19D	A-19D	7/22/21	TOC	12.32	10.64	-1.68	60	6.4	516	16.9	2.3	-123	15.8
S-302D	S-302D	7/20/21	TOC	22.67	24.602	1.93	92	6.0	1,400	19.7	0.80	-69	47.9
S-284D	S-284D	7/21/21	TOC	11.09	12.02	0.93	78	6.1	1,140	18.8	0.84	21	0.0
PGW-MW-8D	PGW-MW-8D	7/20/21	TOC	32.36	35.11	2.75	80	6.4	1,120	18.3	0.00	-99	45.6
S-388D	S-388D	7/20/21	TOC	24.61	26.19	1.58	91.8	6.1	1,300	20.9	0.00	-25	11.5
N-149D	N-149D	7/21/21	TOC	10.90	10.29	-0.61	77	6.3	1,840	20.6	0.00	-89	37.0
S-393D	S-393D	7/21/21	TOC	29.20	32.06	2.86	102	6.1	951	19.3	0.00	8	41.0
S-39D	S-39D	7/21/21	TOC	23.85	24.51	0.66	132	7.0	1,110	18.4	0.00	-96	3.0
A-21D	A-21D	7/22/21	TOC	16.10	11.25	-4.85	85	6.7	700	18.0	0.00	-85	53.6
C-134D	C-134D	7/22/21	TOC	10.90	9.399	-1.50	70	6.6	929	18.9	0.00	8.0	76.3
B-48D	B-48D	7/22/21	TOC	10.78	9.42	-1.36	55	6.5	792	23.0	0.00	-78	108
S-110DSRTF	S-110DSRTF	7/23/21	TOC	10.93	2.67	-8.26	60	6.4	1,680	18.5	0.00	30	195
S-115DSRTF	S-115DSRTF	7/23/21	TOC	11.20	2.702	-8.50	61	6.6	1,800	16.8	0.00	-59	25.1
QC_EB	EB-01	7/19/21	-	-	-	-	-	-	-	-	-	-	-
QC_FB	FB-01	7/19/21	-	-	-	-	-	-	-	-	-	-	-
QC_FB	FB-02	7/20/21	-	-	-	-	-	-	-	-	-	-	-
QC_FB	FB-03	7/21/21	-	-	-	-	-	-	-	-	-	-	-
QC_FB	FB-04	7/23/21	-	-	-	-	-	-	-	-	-	-	-
QC_EB	EB-02	7/23/21	-	-	-	-	-	-	-	-	-	-	-

Notes:
°C = degrees centigrade
µS/cm = microsiemens per centimeter
bgs = below ground surface
EB = Equipment Blank
FB = Field Blank
ft = feet
mg = milligrams
mV = millivolt
NTU = Nephelometric Turbidity Units
TOC = Top of Casing
QC = Quality control
S.U. = Standard Units

TABLE 2
Summary of Analytical Results
July 2021
Former Philadelphia Refinery
Philadelphia, Pennsylvania

ANALYTE	SAMPLE DATE	PFBS[7]		PFHpA[8]		PFHxS[9]		PFNA[10]		PFOS[11]		PFOA[12]		PFOS + PFOA	
PADEP MSC		1,900,000		NS		NS		NS		70		70		70	
UNIT		ng/L		ng/L		ng/L		ng/L		ng/L		ng/L		ng/L	
A-19D	7/22/2021	< 20		39		< 20		370		33		**99**	I	**132**	I
A-21D	7/22/2021	2.6	*5+	32		24		24		36		38		**74**	
B-134D	7/22/2021	3.4	I, *5+	89		18		60		**73**		**97**		**170**	
B-48D	7/22/2021	< 1.7		3.7		3.6		43		8.2		23		31.2	
C-129D	7/21/2021	1.6	I	1.9		2.0		8.5		3.5		8.8		12.3	
C-134D	7/22/2021	3.6	*5+	32		2.4		23		7.7		41		48.7	
C-144D	7/22/2021	< 1.6	*5+	12		< 1.6		5.7	*5+	< 1.6		19		19	
N-149D	7/21/2021	< 20		< 20	*5+	< 20		< 20	*5+	< 20	*5+	< 20	*5+	ND	
N-163	7/19/2021	2.4		3.1		< 1.7		14		6.2		12		18.2	
N-38D	7/19/2021	2.5	I, *5+	20		< 1.6		3.9	I	< 1.6		5.0		5.0	
N-69	7/19/2021	3.9		4.3		< 1.8		7.1		3.8		8.9		12.7	
N-9	7/19/2021	3.5	I	3.1		2.7		< 1.6		1.6		9.5		11.1	
PGW-MW-8D	7/20/2021	2.8	I, *5+	35		3.2		2.1		6.3	I	37	I	43.3	I
S-110DSRTF	7/23/2021	9.8	I, *5+	40		11		86		26		**580**		**606**	
S-115DSRTF	7/23/2021	3.3	*5+	56		11		87		37		**550**		**587**	
S-143SRTF	7/23/2021	4.8	I	11		8.2		13		14		**200**		**214**	
S-143SRTF_Dup	7/23/2021	4.9	I	11		8.0		13		14		**200**		**214**	
S-264D	7/20/2021	7.7	I, *5+	< 1.8	*5+	23	*5+	< 1.8		41		16	I	57	I
S-284D	7/21/2021	2.3	I	25		3.5		19		12		28		40	
S-294D	7/20/2021	4.3	I	38		3.6		2.9		6.4	I	37	I	43.4	I
S-302D	7/20/2021	< 1.7		8.5		< 1.7		< 1.7		< 1.7	*5+	14	I	14	I
S-388D	7/20/2021	4.8	I	1.8		13		< 1.6		21		10	I	31	I
S-389D	7/20/2021	18		14	*5+	220	*5+	< 1.6		**280**		68	I	**348**	I
S-38D	7/22/2021	< 1.6		< 1.6		< 1.6		< 1.6	*5+	2.1		< 1.6		2.1	
S-391D	7/20/2021	< 1.6		42		3.7		11		6.6	I	51		57.6	I
S-393D	7/21/2021	1.7	I	5.9		2.6		1.9		4.1		11		15.1	
S-39D	7/21/2021	< 20		< 20		< 20		< 20	*5+	< 20	*5+	20		20	
S-69D	7/21/2021	2.5	I	12		3.9		76		6.9		36		42.9	
S-80D	7/21/2021	2.9	I	270		3.8		5.4		3.6		53		56.6	
S-80D_Dup	7/21/2021	3.2	I	250		3.8		5.5		3.8		54		57.8	
W-27	7/23/2021	7.8		49		8.6		27		53		53		**106**	
EB-01	7/19/2021	< 2.1		< 2.1		< 2.1		< 2.1		< 2.1		< 2.1		ND	
EB-02	7/23/2021	< 1.9		< 1.9		< 1.9		< 1.9		< 1.9		< 1.9		ND	
FB-01	7/19/2021	< 2.0		< 2.0		< 2.0		< 2.0		< 2.0		< 2.0		ND	
FB-02	7/20/2021	< 1.8		< 1.8		< 1.8		< 1.8		< 1.8		< 1.8		ND	
FB-03	7/21/2021	< 1.7		< 1.7		< 1.7		< 1.7		< 1.7		< 1.7		ND	
FB-04	7/23/2021	< 1.7		< 1.7		< 1.7		< 1.7		< 1.7		< 1.7		ND	

Notes:
1. Samples were collected by Sanborn, Head & Associates, Inc. personnel on the dates indicated and analyzed by Eurofins Lancaster Laboratories Env, LLC of Lancaster, Pennsylvania for per- and polyfluroinated alkyl substances (PFAS) compounds by United States Environmental Protection Agency (USEPA) Method 537 (modified) with isotope dilution.
2. Concentrations are presented in nanograms per liter (ng/L).
3. PADEP medium-specific concentrations (MSCs) for organic regulated substances in groundwater (TDS ≤ 2500 mg/L) from Appendix A, Table 1 (http://www.pacodeandbulletin.gov/Display/pabull?file=/secure/pabulletin/data/vol50/50-7/238.html&d=reduce).
4. Appendix A, Table 1 notes that "PFOA and PFOS values listed are for individual or total combined."
5. "I" indicates the laboratory qualified this result as "EMPC (Estimated Maximum Possible Concentration)."
"*5+" indicates the laboratory qualified this result as"Isotope dilution analyte is outside acceptance limits, high biased."
6. Bold gray-shaded values exceed the PADEP MSC
7. Perfluorobutanesulfonic Acid (PFBS)
8. Perfluoroheptanoic Acid (PFHpA)
9. Perfluorohexanesulfonic Acid (PFHxS)
10. Perfluorononanoic Acid (PFNA)
11. Perfluorooctanesulfonic Acid (PFOS)
12. Perfluorooctanoic Acid (PFOA)

ATTACHMENT A

EVERGREEN DESKTOP REVIEW AND SAMPLING PLAN (JUNE 2021)

SANBORN HEAD

Evergreen Resources Management
2 Righter Parkway, Suite 120
Wilmington, DE 19803

June 30, 2021

VIA ELECTRONIC SUBMISSION

C. David Brown, P.G.
Professional Geologist Manager
Environmental Cleanup & Brownfields Program
Pennsylvania Department of Environmental Protection
Southeast Regional Office
2 East Main Street, Norristown, PA 19401

Re: Desktop Review and Sampling Plan for PFAS
former Philadelphia Refining Complex
3144 Passyunk Avenue, Philadelphia, Pennsylvania

Dear Mr. Brown:

At the request of the Pennsylvania Department of Environmental Protection (PADEP), Evergreen Resources Management Operations (Evergreen) completed groundwater remediation system sampling in February 2021 for per and polyfluoroalkyl substances (PFAS) at the former Philadelphia Refinery (Site). The results of this sampling were sent to the PADEP on March 22, 2021 and discussed with the PADEP, United States Environmental Protection Agency (USEPA), and the City of Philadelphia (City) on May 5, 2021. On May 14, 2021, the PADEP requested that Evergreen:

- Should research refinery records to determine the locations of all fire training areas, locations of fires where aqueous film forming foam (AFFF) was used, and any other locations where AFFF might have been discharged to the surface or subsurface, including groundwater.

- Sample deep (also referred to as lower aquifer) groundwater monitoring wells at the Site for PFAS and prepare a scope of work to identify wells for sampling based on findings of the desktop review.

The PADEP also recommended that Evergreen complete a soil investigation to characterize PFAS in potentially impacted areas. Evergreen's proposed approach to address the PADEP's May 14, 2021 request was submitted to the PADEP on May 21, 2021 and includes the following tasks:

Task 1 – Prepare a summary of the desktop review of available resources which detail historic fires, fire training areas and possible AFFF storage facilities on-site since 1960. A target date of June 30, 2021 was proposed for the report summarizing the findings of Task 1.

Task 2 – Prepare a lower aquifer groundwater sampling plan to evaluate potential PFAS impacts. A target of June 30, 2021 was proposed for a sampling plan.

Task 3 – Have a discussion with the PADEP and USEPA on the report and sampling plan from Task 1 and 2. This meeting was proposed for the week of July 12th. As noted in Section 3.0, Evergreen requests that this meeting be held on July 12, 2021.

Task 4 – Perform Task 2 groundwater sampling for PFAS subsequent to the July 12th meeting and concurrence with the sampling plan.

Task 5 – Submit lower aquifer groundwater PFAS findings to the agencies by September 30, 2021.

Task 6 – Have a discussion with PADEP and USEPA in early November 2021 to review lower aquifer groundwater findings and determine if additional investigation is warranted.

This letter presents the findings from the completion of Task 1 and a sampling plan in accordance with Task 2.

1.0 SUMMARY OF DESKTOP REVIEW

Multiple sources of information were reviewed in order to identify potential sources of PFAS at the site in accordance with Task 1, as summarized below.

- Review of readily available media articles and other publicly available information about past fires at the Site. Attachment A summarizes the fires that were covered in the media since the 1960's at the refinery.

- Review of relevant available site maps, including site operational maps (including tank numbers, refining unit numbers, and other relevant operational features) that were incorporated in historic environmental reports, existing and historic utility maps and historic site knowledge.

- Site inspection on June 2, 2021, identifying fire suppression systems, firefighting foam concentrate storage (including both labeled totes and drums) and inspection of locations of past fires (where possible). Photos from this site inspection are included in Attachment B.

- Review of Safety Data Sheets (SDS) provided by Hilco Redevelopment Partners (HRP) for firefighting foam used on site. Cross checking known databases of PFAS constituents identified in specific foam brand names.

Based on the desktop review, areas where firefighting foam may have been previously used at the Site were identified. These are summarized below and shown on Figure 1 and summarized in Table 1.

1. Fire Training Areas
   a. Routine/Annual Training Areas – application of firefighting foam as part of fire training activities.
   b. Select Training Areas – Less frequently used training areas.

2. Fires –Firefighting foam was reported to be used to address additional fires at the Refinery, as shown on Figure 1 and Table 1.

3. Storage/Loading Areas and Fire Stations – Though firefighting foam was present at these locations, there is no indication that AFFF containing materials came into the contact with the environment.

2.0 PROPOSED SAMPLING PLAN

An important consideration in determining a sampling plan is the direction of groundwater flow and the potential for background PFAS concentrations migrating onto the Site. Given the ubiquitous nature of PFAS in commerce and industry and the nearby potential sources (some, like Philadelphia Gas Works, with potential use of AFFF foam for fire suppression), it is possible that PFAS may have migrated onto the Site from one of these sources. Figure 1 includes lower aquifer groundwater contours to assist in selection of sampling locations representative of upgradient/background conditions. In addition, since there is no groundwater use at the Site and the majority of the Site is to be capped as part of the planned redevelopment, the proposed sampling plan also includes downgradient sampling locations to assess the potential for PFAS migration off-site.

The proposed sampling plan has been developed in response to the PADEP's request to sample for PFAS at the Site. The proposed approach is to investigate the lower aquifer wells with respect to potential AFFF release areas based on the results of the desktop study. As mentioned in Section 2.0, areas where firefighting foam may have been previously used at the Site were identified, including:

1. Fire Training Areas
2. Fires
3. Storage/Loading Areas and Fire Stations

The sampling plan includes lower aquifer sampling locations proximate to each of these areas, but with the recognition that Evergreen is including proposed sampling locations even in areas with a low potential for release of AFFF to the environment. The proposed sampling locations are shown in Figure 1 and are summarized on Table 1.

The lower aquifer groundwater samples will be collected in accordance with the PFAS-specific SOP included in Attachment C. PFAS sampling requires special considerations to avoid potential PFAS-cross contamination from the sampling equipment and a higher level of QA/QC samples to

check for sample contamination. In general, Teflon-containing materials will be avoided, and samples will be collected in containers that do not absorb PFAS.

Analytical Approach

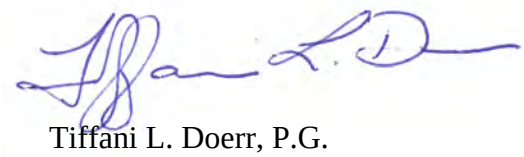
Only three PFAS are currently regulated by PADEP under Act 2 (PFOS, PFOA, and PFBS). Evergreen proposes to report the results for these three analytes during the lower aquifer groundwater sampling event. The analyte list could be expanded; however, to include all six of the PFAS compounds that were previously analyzed the Site.

3.0 CLOSING

We would like to have a meeting with the PADEP to review the desktop study, proposed sampling locations and analyte list on July 12, 2021. We have scheduled the groundwater sampling described in the sampling plan for the end of July 2021.

Regards,

Evergreen Resources Management Operations



Tiffani L. Doerr, P.G.

Cc: Scott Cullinan, PE, Evergreen Resources Management Operations
Kevin Bilash, EPA
Colleen Costello, PG, Sanborn Head & Associates, Inc.

TABLE

TABLE 1
Proposed Lower Aquifer Sampling Locations
Former Philadelphia Refinery
Philadelphia, PA

Proposed Investigation		
Description	**Detail**	**Monitoring Well**
North Yard Training Area	Firefighting foam was reportedly applied to this area for annual training each May from 2012 to the end of operations in 2019.	N-149D
Girard Point Training Area - Annual Training	Reported multiple applications of firefighting foam for training.	S-284D
Fire Boat Loading Area - Training Area	Reportedly not consistently used as a training area	C-129D
7 Still Refining Unit Fires	Reported frequent incidental fires requiring the application of firefighting foam	C-144D
2019 Explosion	2019 explosion and fire	C-134D
1975 Gulf Refinery Platt Bridge Fire	Large multi-alarm fire with reported application of firefighting foam	B-48D
1977 Tank 291 Arco Fire	Explosion resulting in 250 Firefighters on scene - reported application of firefighting foam	S-302D
1975 Belmont Terminal 9-Alarm Fire	Terminal line and Tank 27 Fire - reported application of firefighting foam.	S-80D
Engine #7 Storage	Firefighting foam equipped fire tanker was reportedly stored at this location	S-391D
Point Breeze Visitor's Entrance Fire Engine Garage	Firefighting foam equipped fire tanker was reportedly stored at this location	PGW-MW-8D
Belmont Terminal 25,000 Foam Tanker and firefighting Storage	Firefighting foam equipped fire tanker and additional firefighting concentrate totes were reportedly stored at this location	S-80D
Girard Point Warehouse firefighting Loading and Storage	Firefighting foam concentrate was reportedly stored in totes at this location	S-69D
Girard Point Fire Equipment Storage Shed	Reported firefighting foam concentrate drum storage area	B-134D
Upgradient Background Locations	Upgradient Locations to evaluate background	N-38D
		N-69
		N-163
		N-9
		W-27
		S-110DSRTF
		S-115DSRTF
		S-294D
		S-393D
Downgradient Boundary Locations	Downgradient Boundary Locations	S-143SRTF
		A-21D
		A-19D
		S-38D
		S-39D
		S-264D
		S-388D
		S-389D

FIGURE

Last Edited By: mfuerte

Path: P:\4700\s\4796.00\Graphics Files\ArcGIS\Figures\20210428 Evergreen PFAS\Fire History_for Discussion\20210616_AFFF Sampling Plan_LowerAquifer.mxd

Figure 1

Proposed Sampling Locations in the Lower Aquifer

Former Philadelphia Refinery

Philadelphia, PA

Drawn By:	M. Fuerte / H. Pothier
Designed By:	P. Troy
Reviewed By:	P. Troy
Project No:	4796.01
Date:	June 23, 2021

Figure Narrative

...

Notes

1. Aerial imagery provided by Google Earth. (2018). Philadelphia, PA, USA. 39°54'27.86"N, 75°12'00.94"W. Eye alt 24246 ft.

2. Fire Department locations identified from historical certified Sanborn Maps.

3. Onsite foam assets are approximate locations determined from Site visit on 6/2/2021.

4. Lower aquifer contours sourced from 2020 First Half Semi-Annual Remediation Status Report Figure 5.

Legend

- AOI Boundary Lines
- PGW Boundary
- Lower Aquifer Contours
- Lower Aquifer Monitoring Wells
- Proposed Lower Aquifer Downgradient Boundary Well Sampling Location
- Proposed Lower Aquifer Upgradient/Background Well Sampling Location
- Proposed Lower Aquifer Well Sampling Location in Storage/Loading Area
- Proposed Lower Aquifer Well Sampling based on Reported Fire or Training Area
- Historical Fire Incident
- Fire Department
- Firefighting Asset - No Reported Firefighting Foam Storage
- Reported Firefighting foam Storage and Loading Area
- Reported Fire Training Area with Application of Firefighting Foam

Feet

750 375 0 750 1,500

SANBORN HEAD

ATTACHMENT A

SUMMARY OF PUBLIC INFORMATION AND MEDIA ARTICLES REVIEWED

Attachment A

Summary of Public Information and Media Articles Reviewed

Date	Description	Citations		
9/9/1960	**Girard Point** - Gulf Refinery Fire: "*Well into the second half of the 20th century, what is now the PES complex was split between several refineries. One of them was the 600-acre Girard Point Refinery, owned by the former Gulf Oil Corp. In 1960, a blaze erupted in a six-story building and raged for hours through the warm September evening. Gulf Oil Corp. estimated damage at around $1 million — about $8.5 million today, adjusted for inflation. No deaths or injuries were reported.* "	Doyle, Jack. "Burning Philadelphia: Refinery Inferno, 1975." The Pop History Dig, 15 Feb. 2015.	Marin, Max. "South Philly Refinery's Long History of Fires, Explosions, Deaths and Injuries." Billy Penn, 21 June 2019, 1:15 PM.	
5/23/1966	**Girard Point** - Gulf Refinery Fire - "*The Philadelphia Inquirer front-page story on May 24,1966, would sound familiar to current observers: "5-Alarmer At Refinery Shoots Flames 400 Feet In the Air." This particular blaze snarled traffic and closed bridges. No one was killed or injured this time either, according to archived news reports. But such fires had become a frightening routine for emergency responders, the papers noted* ."	Marin, Max. "South Philly Refinery's Long History of Fires, Explosions, Deaths and Injuries." Billy Penn, 21 June 2019, 1:15 PM.	Ingraham, Bill. "A Spectacular Multi-Alarm Fire Hit the Gulf Oil Refinery on May 24, 1966." Billy Penn, Philadelphia, 21 June 2019.	
5/11/1970	**Point Breeze** - Explosion of 13-story Catalytic Unit at the ARCO Refinery.	Doyle, Jack. "Burning Philadelphia: Refinery Inferno, 1975." The Pop History Dig, 15 Feb. 2015.	Marin, Max. "South Philly Refinery's Long History of Fires, Explosions, Deaths and Injuries." Billy Penn, 21 June 2019, 1:15 PM.	
1966-1975	**Girard Point** - Gulf Refinery Fires - Generic mention that 8 fires that occurred at the Gulf Refinery during this time period	Doyle, Jack. "Burning Philadelphia: Refinery Inferno, 1975." The Pop History Dig, 15 Feb. 2015.		
10/12/1975	**Point Breeze - Belmont Terminal Line and Tank 27 Fire** - Coordinated Foam Attack Ordered, dirt dike built around the loading racks to contain the product and fill with foam. *"Engine 33, responding on the fourth alarm, brought a foam unit from the Allied Chemical Company. On the fifth alarm, Engine 125 drove the Rohm & Haas Company foam unit into the refinery. Gulf sent its newly acquired foam pumper to assist, as did the Johnsville Naval Air Station. A nearby foam manufacturer dispatched two new units destined for shipment to China to stand by.* "	Burns, Robert. "9-Alarm Fire Starts In Trench for Piping at Philadelphia Refinery." Fire Engineering, 3 Sept. 2019.	Bartosz, Robert C. Fire Engineering, Philadelphia, 17 Aug. 1975.	
10/20/1975	**Girard Point** - Gulf Refinery Fire -*This fire was centered in a 125-foothigh distillation tower. Pumps had been bringing in crude oil from a Gulf storage facility at Darby Creek. At the peak of the fire, it covered an area with a 250-foot radius around the base of the tower, but the fire was confined to the lower section. "Following the sixth alarm, Rizzo issued a special call for Engine 33 to and Allied Chemical's foam unit."*	Burns, Robert. "9-Alarm Fire Starts In Trench for Piping at Philadelphia Refinery." Fire Engineering, 3 Sept. 2019.		
10/30/1975	**Girard Point** - Gulf Refinery - 1 Alarm Fire - Contained on site, exact location unknown	Burns, Robert. "9-Alarm Fire Starts In Trench for Piping at Philadelphia Refinery." Fire Engineering, 3 Sept. 2019.		
8/17/1975 - 8/26/1975	**Girard Point** - Gulf Refinery - 6 Alarm Fire - Caused by overfilling of Tank 231 - "The fire had already expanded eastward in the refinery, taking with it two fire department engines – No. 160 and No.133 – and also a refinery foam pumper."	Doyle, Jack. "Burning Philadelphia: Refinery Inferno, 1975." The Pop History Dig, 15 Feb. 2015.	Philadelphia Evening Bulletin. Hidden City Philadelphia, Philadelphia, 10 Dec. 2013.	Philadelphia Inquirer, et al. The Pop History Dig, Philadelphia, 15 Feb. 2015.
1/24/1977	**Point Breeze** - Arco Refinery Tank 291 - "*Four were injured in another Arco explosion that blasted the windows out of buildings blocks away. The fire lasted for hours, even with 250 firefighters on the scene."*	Rush, Mariah. "In Philly, a History of Oil Refinery Fires Going Back Decades." The Philadelphia Inquirer, The Philadelphia Inquirer, LLC, 21 June 2019.	Cramer, Richard Ben. "4 Hurt in ARCO Blast, Fire." *The Philadelphia Inquirer* , 25 Jan. 1977, pp. 1C–9A.	
4/9/1977	**Girard Point** - Gulf Refinery - "*an aerial photo of another blaze in 1977 in which a barge sunk, releasing oil which caught fire in the river* "	Dougherty, Christopher R. "A Petaled Rose Of Hell: Refineries, Fire Risk, And The New Geography Of Oil In Philadelphia's Tidewater." Hidden City Philadelphia, 10 Dec. 2013.	D'Angelo, Ed. "Entrance to Gulf Oil Refinery Frames Fire." Temple University Libraries, Philadelphia Evening Bulletin, 9 Apr. 1977.	Philadelphia Evening Bulletin. Hidden City Philadelphia, Philadelphia, 10 Dec. 2013.
Early 1980s	**Schuylkill River Tank Farm** - At SR58 Tank a notable fire occurred resulting in the application of AFFF	Former employee accuonts		
8/1/1982	**Girard Point** - Gulf Refinery - "*a Gulf worker was seriously burned after a 125-foot heating tower exploded into flames in the middle of the night, leaving yet another trail of thick black smoke on the South Philly horizon."*	Marin, Max. "South Philly Refinery's Long History of Fires, Explosions, Deaths and Injuries." Billy Penn, 21 June 2019, 1:15 PM.		
1/11/1988	**Point Breeze** - "*In 1988, Cherry Hill and Bucks County residents were ripped awake by another explosion at the South Philly plant, newspapers reported. A steel-welded lid blew off one of the oil tanks and flew about 150 feet in the blast. A spokesperson for the oil company acknowledged that it was a stroke of luck the lid didn't crash with one of the other tanks* ."	Marin, Max. "South Philly Refinery's Long History of Fires, Explosions, Deaths and Injuries." Billy Penn, 21 June 2019, 1:15 PM.	Rush, Mariah. "In Philly, a History of Oil Refinery Fires Going Back Decades." The Philadelphia Inquirer, The Philadelphia Inquirer, LLC, 21 June 2019.	
8/24/2011	**Girard Point** - "*A small fire at Girard Point was declared under control an hour later. According to a Sunoco spokesperson, the fire began at a pump.* "	Rush, Mariah. "In Philly, a History of Oil Refinery Fires Going Back Decades." The Philadelphia Inquirer, The Philadelphia Inquirer, LLC, 21 June 2019.		
5/22/2015	**Girard Point** - "*The fire broke out shortly before 6 p.m. at Philadelphia Energy Solutions on the 3100 block of Pennrose Ave. No injuries have been reported. By 6:30 p.m., the bulk of the fire appeared to have been knocked down.* "	Breaking News Desk, PHILLY.COM. "Fire at South Phila. Refinery Appears under Control." The Philadelphia Inquirer, The Philadelphia Inquirer, LLC, 22 May 2015.		

12/10/2016	**Point Breeze** - "*Firefighters, hazmat teams and Philadelphia police all responded to the one-alarm blaze which started on the Point Breeze side of the refinery on 3144 W. Passyunk Avenue around 10:50 p.m. Saturday. Police also closed streets in the area.* *Crews were eventually able to bring the flames under control at 11:49 p.m. No injuries were reported and all workers at the refinery have been accounted for. Officials have not yet revealed the exact cause of the fire.*"	Chang, David. "Crews Battle Fire at Philadelphia Energy Solutions Refinery." NBC10 Philadelphia, NBC Universal Media, LLC, 11 Dec. 2016.		
6/21/2019	**Girard Point** - Large Explosion and Fire	Rush, Mariah. "In Philly, a History of Oil Refinery Fires Going Back Decades." The Philadelphia Inquirer, The Philadelphia Inquirer, LLC, 21 June 2019.	Gambardello, Joseph A., et al. "Explosions Rip through South Philadelphia Refinery, Triggering Major Fire and Injuring 5." The Philadelphia Inquirer, The Philadelphia Inquirer, LLC, 22 June 2019, 5:14 PM.	

ATTACHMENT B

SITE PHOTOS

ATTACHMENT B
PROJECT PHOTOGRAPHS

Photo 1: Drum in Fire Shed

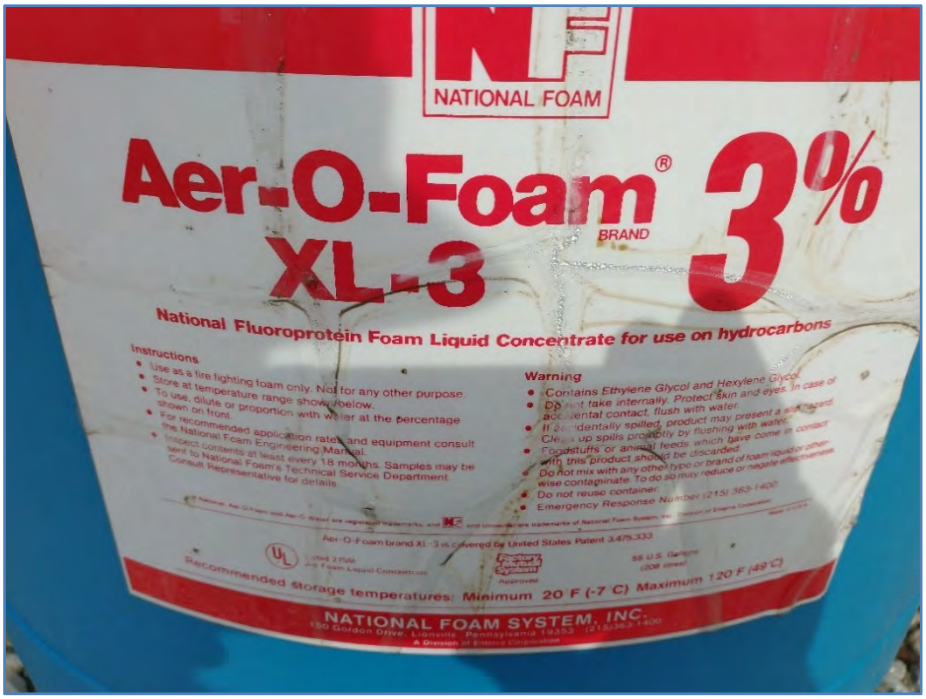


Photo 2: Drum Label

Photo 3: Foam Tote Label

Photo 4: Empty Foam Totes

Photo 5: Fire Hose

Photo 6: Fire Shed with Foam Drums

Photo 7: Fire Trailer

Photo 8: Foam Loading Area-1200 Tanks

Photo 9: Foam Loading Inspection Tag

Photo 10: Foam Nozzle

ATTACHMENT C

PFAS SAMPLING STANDARD OPERATING PROCEDURES (SOPs)

SOP
PFAS FIELD QA/QC, AND SAMPLING PROTOCOL

TABLE OF CONTENTS

1.0 SCOPE AND APPLICABILITY

This Standard Operating Procedure (SOP) provides groundwater sampling protocols for per- and polyfluoroalkyl substances (PFAS).

2.0 LABORATORY REQUIREMENTS

The samples will be analyzed for both linear and branched PFAS isomers using a modified U.S. Environmental Protection Agency (USEPA) Method 537.1 with isotope dilution for the USEPA Unregulated Contaminant Monitoring Rule 3 list (listed below) by a laboratory accredited in accordance with Act 90 of 2002 (27 Pa. C.S. §§ 4101-4113) and 25 Pa. Code Chapter 252. Undiluted reporting limits should be 5 nanograms per liter (ng/L) or lower.

Analytical Parameter	CAS No.	Molecular Formula
Perfluoroheptanoic acid - PFHpA	375-85-9	C7HF13O2
Perfluorooctanoic acid - PFOA	335-67-1	C8HF15O2
Perfluorononanoic acid - PFNA	375-95-1	C9HF17O2
Perfluorobutanesulfonic acid - PFBS	375-73-5	C4HF9O3S
Perfluorohexanesulfonic acid - PFHxS	355-46-4	C6HF13SO3
Perfluorooctanesulfonic acid - PFOS	1763-23-1	C8HF17SO3

3.0 FIELD QA/QC

The following table provides a summary of QA/QC samples that will be collected in the field and analyzed by the laboratory. PFAS-free water will be supplied by the analytical laboratory for collection of the field blank.

QA/QC Sample Types	Frequency	Description	Nomenclature
Field Blank	1 per sample event.	Collected by pouring an aliquot of laboratory-provided PFAS-free water into a laboratory-supplied sample container.	FB-1
Blind Field Duplicate	1 per sample event	Collected by filling a second set of laboratory-provided containers at a monitoring location and comparing to parent sample.	Dup-1

The following table provides a summary of items that are likely to contain PFAS (i.e., prohibited items) and the allowable alternatives.

Item Category	Allowable Items	Prohibited Items
Pumps and Tubing	High-density polyethylene (HDPE), low-density polyethylene (LDPE), polyvinyl chloride (PVC), silicon, buna-nitrile, or stainless steel (SS) materials. • All Polyethylene (PE), PVC, or SS Bailer and nylon rope; • Peristaltic pump (with appropriate tubing); • Waterra® inertial foot valve (Acetal thermoplastic or SS); • PFAS-Free Geotech Snap Sampler®; • PFAS-Free Geotech Portable Bladder Pump; and • Proactive® SS Monsoon submersible pumps with PVC wire lead.	Teflon®, polytetrafluoroethylene (PTFE), ethylene tetrafluoroethylene (ETFE), Viton®, perfluoroalkoxy (PFA) coating, and other fluoropolymer containing materials. • Grundfos Redi-Flo Submersible Pump; • QED Well Wizard® bladder pump; • QED Sample Pro® bladder pump[1]; • Standard Geotech Snap Sampler®[2]; • Standard Geotech Portable Bladder Pump; and • Geotech SS Geosub Pump submersible pump with PVC wire lead.
Decontamination	Alconox® and/or Liquinox®, deionized rinse, and a final PFAS-free water rinse.	Decon 90.
Sample Storage and Preservation	Laboratory-provided sample container (HDPE or polypropylene bottles), regular ice in re-sealable plastic bags. After sampling, containers will be stored individually in re-sealable plastic bags.	LDPE or glass bottles, PTFE- or Teflon®-lined caps, chemical ice packs. Samples cannot be field filtered due to potential PFAS adsorption onto the filter.
Field Documentation	Plain paper, metal clipboard, Sharpies®, pens.	Waterproof/treated paper or field books, plastic clipboards, non-Sharpies® markers, Post-It®, and other adhesive paper products.
Field Clothing	Well-laundered (more than six times washed after purchase) clothing made of synthetic or cotton material, no fabric softener. Polyurethane and wax coated materials. Boots made with polyurethane and PVC, well-worn or untreated leather boots. PFAS-free Tyvek® material.	Clothing (including boots) made of Gore-Tex™ or other synthetic water resistant and/or stain resistant material, coated Tyvek® material. Fabric softener.

[1] Laboratory data were provided by QED indicating the Sample Pro pump body, housing and check balls, LDPE bladder, Viton® O-rings, polyethylene tubing, Teflon®-lined tubing, and all Teflon® tubing did not result in PFAS greater than the 5-10 ng/l method reporting limits in water that these materials were soaked in.

[2] Laboratory data were provided by Geotech indicating the Snap Sampler® (including the PFA coated spring, the molded PFA "Snap Cap" and the Viton® o-ring) did not result in PFAS greater than the 1.2 ng/l method reporting limits in PFAS-free water sampled by Snap Samplers®.

Item Category	Allowable Items	Prohibited Items
Personal Care Products (for the day of sampling)	**Sunscreens –** Alba Organics Natural Sunscreen, Yes To Cucumbers, Aubrey Organics, Jason Natural Sun Block, Kiss My Face, Baby sunscreens that are "free" or "natural". **Insect Repellents** – Jason Natural Quit Bugging Me, Repel Lemon Eucalyptus Insect repellant, Herbal Armor, California Baby Natural Bug Spray, BabyGanics. **Sunscreen and insect repellant** – Avon Skin So Soft Bug Guard – SPF 30 Lotion.	Cosmetics, moisturizers, hand cream, and other related products.
Food and Beverage	Bottled water and hydration drinks.	Pre-packaged food, fast food wrappers and containers.
Shelter	The use of a canopy/gazebo/tent, which can be erected over the sample location to provide shelter, may be considered. Note that the canopy is likely to have a PFAS-treated surface and must be handled with care. Gloves must be worn when setting up and moving the tent and then changed immediately afterwards. Further contact with the tent must be avoided until all PFAS samples have been collected and properly stored.	

Notes:
If an item is expected to come in direct contact with field samples, it may be necessary to have the products analyzed for PFAS to confirm that a specific batch or lot number does not contain PFAS. If an item is not expected to come into direct contact with field samples, then the product Safety Data Sheet and/or manufacturing specifications may be reviewed to determine if the item is PFAS-containing by checking for any chemicals with "fluoro" in the name or the acronyms PTFE, TPE, FEP, ETFE, or PFA.

4.0 SAMPLING PRECAUTIONS

Particular care will be taken for sampling personnel to don a new pair of nitrile gloves for each new sampling location. Nitrile gloves should be replaced immediately before handling sample bottles, immediately before handling sampling equipment, and immediately before collecting the PFAS samples. Gloves need to be replaced more frequently than typical to limit cross-contamination potential. Additionally, if feasible (and PFAS concentration data are available), locations should generally be sampled in order of least anticipated PFAS concentrations to greatest anticipated PFAS concentrations.

PFAS samples should be collected first, prior to collecting samples for any other parameters into any other containers. The sample bottle caps should not be placed on any surface during sampling and, after samples are collected, the bottles should be capped, labeled, and sealed in individual re-sealable plastic (e.g., Ziploc®) bags.

4.1 Groundwater Sampling

An allowable sampling device (as outlined above – Teflon®/PFAS-free) will be used for field sampling. When feasible, peristaltic pumps with disposable PE tubing and silicone tubing are a preferred sampling method at locations with a depth to groundwater of less than approximately 25 feet because less agitation of the water column is likely compared to an inertial pumping method. Turbidity and suspended solids in samples may interfere with laboratory methods, potentially elevating reporting limits, and may also cause variation in

analytical data. Dedicated PE tubing with SS or acetal thermoplastic Waterra® inertial pumps are preferred sampling methods at locations with greater depths to groundwater and/or greater sampling depths. Dedicated or disposable all PE, PVC or SS bailers are also acceptable alternatives. As necessary, PFAS-free plastic sheeting will be used to prevent contact with potentially contaminated soil and other surfaces during storage and deployment of downhole sampling equipment.

The Waterra® hand pump may be used and will consist of ½-inch HDPE tubing and a Delrin acetal thermoplastic standard foot valve. The standard foot valve typically comes in two sizes, a Model D-25 (3-inches in length and 1-inch outside diameter) and Model D-16 (1-inch in length and 0.625-inch outside diameter). Model D-25 foot valves are anticipated for use at the site. A new foot valve will be used at each monitoring location.

5.0 EQUIPMENT/SUPPLIES

- Laboratory-supplied sample containers and PFAS-free DI water
- Field Sampling Forms
- Peristaltic pump
- Inertial pump (i.e., Waterra®-type D-16 or D-25 check valve or equivalent)
- Dedicated polyethylene bailer with new nylon rope
- Polyethylene tubing (½-inch HDPE or similar)
- Glass jar (quart or liter capacity) for field parameters
- 5-gallon bucket (with graduations)
- Silicon tubing
- Multi-parameter sonde (Hydrolab Quanta [with turbidity probe])
- Slope Indicator or QED (or equivalent) electronic water level meter
- Stainless steel spade(s), scoop(s), mixing bowl(s)
- Decontamination buckets and brushes, paper towels, non-phosphatic detergent, potable water, distilled/de-ionized water, and PFAS-free water for equipment decontamination between sampling locations
- Field documentation materials
- Personal protective equipment (PPE)

ATTACHMENT B

ANALYTICAL DATA PACKAGES

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-48086-1
Client Project/Site: Evergreen Philadelphia PFAS

For:
Sanborn Head & Associates Inc
1015 Virginia Drive
Suite 100
Fort Washington, Pennsylvania 19034

Attn: Patrick Troy

Authorized for release by:
7/27/2021 9:22:47 AM

Nicole Maljovec, Client Services Manager
(717)556-7259
Nicole.Maljovec@eurofinset.com

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

This report shall not be reproduced except in full, without the written approval of the laboratory.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Nicole Maljovec
Client Services Manager
7/27/2021 9:22:47 AM

Table of Contents

Definitions/Glossary

Client: Sanborn Head & Associates Inc
Job ID: 410-48086-1
Project/Site: Evergreen Philadelphia PFAS

Qualifiers

LCMS

Qualifier	Qualifier Description
*5+	Isotope dilution analyte is outside acceptance limits, high biased.
I	Value is EMPC (estimated maximum possible concentration).

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-48086-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative
410-48086-1

Receipt
The samples were received on 7/21/2021 4:35 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 2.0°C and 5.2°C

PFAS
Method PFC_IDA: The sample injection standard peak areas in the following sample: N-38D_20210719 (410-48086-4) are outside of the QC limits for both the initial injection and the re-injection. The values here are from the initial injection of the sample.The recovery for the labeled isotope(s) in the following sample: N-38D_20210719 (410-48086-4) is outside the QC acceptance limits due to the matrix of the sample.

Method PFC_IDA: The sample injection standard peak areas in the following samples: S-69D_20210721 (410-48086-17) and S-284D_20210721 (410-48086-18) are outside of the QC limits for both the initial injection and the re-injection. The values here are from the initial injection of the sample.

Method PFC_IDA: Reporting limits were raised for the following samples: EB-01_20210719 (410-48086-5) and FB-01_20210719 (410-48086-6) due to limited sample volume.

Method PFC_IDA: The sample injection standard peak areas in the following samples: S-294D_20210720 (410-48086-7), PGW-MW-8D_20210720 (410-48086-8), S-302D_20210720 (410-48086-10), S-264D_20210720 (410-48086-11), S-388D_20210720 (410-48086-12) and S-389D_20210720 (410-48086-13) are outside of the QC limits for both the initial injection and the re-injection. The values here are from the initial injection of the sample.The recovery for the labeled isotope(s) in the following samples: S-294D_20210720 (410-48086-7), PGW-MW-8D_20210720 (410-48086-8), S-302D_20210720 (410-48086-10), S-264D_20210720 (410-48086-11), S-388D_20210720 (410-48086-12) and S-389D_20210720 (410-48086-13) were outside the QC acceptance limits. These failures were due to the matrix of the sample.

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

Detection Summary

Client: Sanborn Head & Associates Inc
Project/Site: Evergreen Philadelphia PFAS

Job ID: 410-48086-1

Client Sample ID: N-163_20210719 — Lab Sample ID: 410-48086-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	3.1		1.7		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	12		1.7		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	14		1.7		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	2.4		1.7		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	6.2		1.7		ng/L	1		537 IDA	Total/NA

Client Sample ID: N-9_20210719 — Lab Sample ID: 410-48086-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	3.1		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	9.5		1.6		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	3.5	I	1.6		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	2.7		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	1.6		1.6		ng/L	1		537 IDA	Total/NA

Client Sample ID: N-69_20210719 — Lab Sample ID: 410-48086-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	4.3		1.8		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	8.9		1.8		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	7.1		1.8		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	3.9		1.8		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	3.8		1.8		ng/L	1		537 IDA	Total/NA

Client Sample ID: N-38D_20210719 — Lab Sample ID: 410-48086-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	20		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	5.0		1.6		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	3.9	I	1.6		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	2.5	I	1.6		ng/L	1		537 IDA	Total/NA

Client Sample ID: EB-01_20210719 — Lab Sample ID: 410-48086-5

No Detections.

Client Sample ID: FB-01_20210719 — Lab Sample ID: 410-48086-6

No Detections.

Client Sample ID: S-294D_20210720 — Lab Sample ID: 410-48086-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	38		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	37	I	1.6		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	2.9		1.6		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	4.3	I	1.6		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	3.6		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	6.4	I	1.6		ng/L	1		537 IDA	Total/NA

Client Sample ID: PGW-MW-8D_20210720 — Lab Sample ID: 410-48086-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	35		1.8		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	37	I	1.8		ng/L	1		537 IDA	Total/NA

This Detection Summary does not include radiochemical test results.

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Client Sample ID: PGW-MW-8D_20210720 (Continued) — Lab Sample ID: 410-48086-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorononanoic acid	2.1		1.8		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	2.8	I	1.8		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	3.2		1.8		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	6.3	I	1.8		ng/L	1		537 IDA	Total/NA

Client Sample ID: S-391D_20210720 — Lab Sample ID: 410-48086-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	42		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	51		1.6		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	11		1.6		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	3.7		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	6.6	I	1.6		ng/L	1		537 IDA	Total/NA

Client Sample ID: S-302D_20210720 — Lab Sample ID: 410-48086-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	8.5		1.7		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	14	I	1.7		ng/L	1		537 IDA	Total/NA

Client Sample ID: S-264D_20210720 — Lab Sample ID: 410-48086-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid	16	I	1.8		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	7.7	I	1.8		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	23		1.8		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	41		1.8		ng/L	1		537 IDA	Total/NA

Client Sample ID: S-388D_20210720 — Lab Sample ID: 410-48086-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	1.8		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	10	I	1.6		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	4.8	I	1.6		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	13		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	21		1.6		ng/L	1		537 IDA	Total/NA

Client Sample ID: S-389D_20210720 — Lab Sample ID: 410-48086-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	14		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	68	I	1.6		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	18		1.6		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	220		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	280		1.6		ng/L	1		537 IDA	Total/NA

Client Sample ID: FB-02_20210720 — Lab Sample ID: 410-48086-14

No Detections.

Client Sample ID: S-80D_20210721 — Lab Sample ID: 410-48086-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid	53		1.6		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	5.4		1.6		ng/L	1		537 IDA	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: S-80D_20210721 (Continued)
Lab Sample ID: 410-48086-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid	2.9	I	1.6		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	3.8		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	3.6		1.6		ng/L	1		537 IDA	Total/NA
Perfluoroheptanoic acid - DL	270		16		ng/L	10		537 IDA	Total/NA

Client Sample ID: S-80D-DUP_20210721
Lab Sample ID: 410-48086-16

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid	54		1.6		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	5.5		1.6		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	3.2	I	1.6		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	3.8		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	3.8		1.6		ng/L	1		537 IDA	Total/NA
Perfluoroheptanoic acid - DL	250		16		ng/L	10		537 IDA	Total/NA

Client Sample ID: S-69D_20210721
Lab Sample ID: 410-48086-17

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	12		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	36		1.6		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	76		1.6		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	2.5	I	1.6		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	3.9		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	6.9		1.6		ng/L	1		537 IDA	Total/NA

Client Sample ID: S-284D_20210721
Lab Sample ID: 410-48086-18

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	25		1.7		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	28		1.7		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	19		1.7		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	2.3	I	1.7		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	3.5		1.7		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	12		1.7		ng/L	1		537 IDA	Total/NA

Client Sample ID: FB-03_20210721
Lab Sample ID: 410-48086-19

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: N-163_20210719
Lab Sample ID: 410-48086-1

Date Collected: 07/19/21 11:50
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	3.1		1.7		ng/L		07/22/21 08:59	07/22/21 23:34	1
Perfluorooctanoic acid	12		1.7		ng/L		07/22/21 08:59	07/22/21 23:34	1
Perfluorononanoic acid	14		1.7		ng/L		07/22/21 08:59	07/22/21 23:34	1
Perfluorobutanesulfonic acid	2.4		1.7		ng/L		07/22/21 08:59	07/22/21 23:34	1
Perfluorohexanesulfonic acid	<1.7		1.7		ng/L		07/22/21 08:59	07/22/21 23:34	1
Perfluorooctanesulfonic acid	6.2		1.7		ng/L		07/22/21 08:59	07/22/21 23:34	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*94*		*30 - 144*	*07/22/21 08:59*	*07/22/21 23:34*	*1*
13C8 PFOA	*87*		*49 - 127*	*07/22/21 08:59*	*07/22/21 23:34*	*1*
13C9 PFNA	*101*		*47 - 136*	*07/22/21 08:59*	*07/22/21 23:34*	*1*
13C3 PFBS	*107*		*19 - 178*	*07/22/21 08:59*	*07/22/21 23:34*	*1*
13C3 PFHxS	*84*		*32 - 145*	*07/22/21 08:59*	*07/22/21 23:34*	*1*
13C8 PFOS	*98*		*49 - 126*	*07/22/21 08:59*	*07/22/21 23:34*	*1*

Client Sample ID: N-9_20210719
Lab Sample ID: 410-48086-2

Date Collected: 07/19/21 12:40
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	3.1		1.6		ng/L		07/22/21 08:59	07/22/21 23:45	1
Perfluorooctanoic acid	9.5		1.6		ng/L		07/22/21 08:59	07/22/21 23:45	1
Perfluorononanoic acid	<1.6		1.6		ng/L		07/22/21 08:59	07/22/21 23:45	1
Perfluorobutanesulfonic acid	3.5	I	1.6		ng/L		07/22/21 08:59	07/22/21 23:45	1
Perfluorohexanesulfonic acid	2.7		1.6		ng/L		07/22/21 08:59	07/22/21 23:45	1
Perfluorooctanesulfonic acid	1.6		1.6		ng/L		07/22/21 08:59	07/22/21 23:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*88*		*30 - 144*	*07/22/21 08:59*	*07/22/21 23:45*	*1*
13C8 PFOA	*87*		*49 - 127*	*07/22/21 08:59*	*07/22/21 23:45*	*1*
13C9 PFNA	*101*		*47 - 136*	*07/22/21 08:59*	*07/22/21 23:45*	*1*
13C3 PFBS	*121*		*19 - 178*	*07/22/21 08:59*	*07/22/21 23:45*	*1*
13C3 PFHxS	*85*		*32 - 145*	*07/22/21 08:59*	*07/22/21 23:45*	*1*
13C8 PFOS	*97*		*49 - 126*	*07/22/21 08:59*	*07/22/21 23:45*	*1*

Client Sample ID: N-69_20210719
Lab Sample ID: 410-48086-3

Date Collected: 07/19/21 14:30
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	4.3		1.8		ng/L		07/22/21 08:59	07/22/21 23:56	1
Perfluorooctanoic acid	8.9		1.8		ng/L		07/22/21 08:59	07/22/21 23:56	1
Perfluorononanoic acid	7.1		1.8		ng/L		07/22/21 08:59	07/22/21 23:56	1
Perfluorobutanesulfonic acid	3.9		1.8		ng/L		07/22/21 08:59	07/22/21 23:56	1
Perfluorohexanesulfonic acid	<1.8		1.8		ng/L		07/22/21 08:59	07/22/21 23:56	1
Perfluorooctanesulfonic acid	3.8		1.8		ng/L		07/22/21 08:59	07/22/21 23:56	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*94*		*30 - 144*	*07/22/21 08:59*	*07/22/21 23:56*	*1*
13C8 PFOA	*90*		*49 - 127*	*07/22/21 08:59*	*07/22/21 23:56*	*1*
13C9 PFNA	*107*		*47 - 136*	*07/22/21 08:59*	*07/22/21 23:56*	*1*

Client Sample ID: N-69_20210719
Lab Sample ID: 410-48086-3

Date Collected: 07/19/21 14:30
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 PFBS	*107*		*19 - 178*	*07/22/21 08:59*	*07/22/21 23:56*	*1*
13C3 PFHxS	*83*		*32 - 145*	*07/22/21 08:59*	*07/22/21 23:56*	*1*
13C8 PFOS	*96*		*49 - 126*	*07/22/21 08:59*	*07/22/21 23:56*	*1*

Client Sample ID: N-38D_20210719
Lab Sample ID: 410-48086-4

Date Collected: 07/19/21 14:40
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	**20**		1.6		ng/L		07/22/21 08:59	07/23/21 00:07	1
Perfluorooctanoic acid	**5.0**		1.6		ng/L		07/22/21 08:59	07/23/21 00:07	1
Perfluorononanoic acid	**3.9**	**I**	1.6		ng/L		07/22/21 08:59	07/23/21 00:07	1
Perfluorobutanesulfonic acid	**2.5**	**I**	1.6		ng/L		07/22/21 08:59	07/23/21 00:07	1
Perfluorohexanesulfonic acid	<1.6		1.6		ng/L		07/22/21 08:59	07/23/21 00:07	1
Perfluorooctanesulfonic acid	<1.6		1.6		ng/L		07/22/21 08:59	07/23/21 00:07	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*70*		*30 - 144*	*07/22/21 08:59*	*07/23/21 00:07*	*1*
13C8 PFOA	*79*		*49 - 127*	*07/22/21 08:59*	*07/23/21 00:07*	*1*
13C9 PFNA	*91*		*47 - 136*	*07/22/21 08:59*	*07/23/21 00:07*	*1*
13C3 PFBS	*211*	**5+*	*19 - 178*	*07/22/21 08:59*	*07/23/21 00:07*	*1*
13C3 PFHxS	*78*		*32 - 145*	*07/22/21 08:59*	*07/23/21 00:07*	*1*
13C8 PFOS	*85*		*49 - 126*	*07/22/21 08:59*	*07/23/21 00:07*	*1*

Client Sample ID: EB-01_20210719
Lab Sample ID: 410-48086-5

Date Collected: 07/19/21 11:30
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	<2.1		2.1		ng/L		07/22/21 08:59	07/23/21 00:18	1
Perfluorooctanoic acid	<2.1		2.1		ng/L		07/22/21 08:59	07/23/21 00:18	1
Perfluorononanoic acid	<2.1		2.1		ng/L		07/22/21 08:59	07/23/21 00:18	1
Perfluorobutanesulfonic acid	<2.1		2.1		ng/L		07/22/21 08:59	07/23/21 00:18	1
Perfluorohexanesulfonic acid	<2.1		2.1		ng/L		07/22/21 08:59	07/23/21 00:18	1
Perfluorooctanesulfonic acid	<2.1		2.1		ng/L		07/22/21 08:59	07/23/21 00:18	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*110*		*30 - 144*	*07/22/21 08:59*	*07/23/21 00:18*	*1*
13C8 PFOA	*108*		*49 - 127*	*07/22/21 08:59*	*07/23/21 00:18*	*1*
13C9 PFNA	*106*		*47 - 136*	*07/22/21 08:59*	*07/23/21 00:18*	*1*
13C3 PFBS	*94*		*19 - 178*	*07/22/21 08:59*	*07/23/21 00:18*	*1*
13C3 PFHxS	*93*		*32 - 145*	*07/22/21 08:59*	*07/23/21 00:18*	*1*
13C8 PFOS	*102*		*49 - 126*	*07/22/21 08:59*	*07/23/21 00:18*	*1*

Client Sample ID: FB-01_20210719
Lab Sample ID: 410-48086-6

Date Collected: 07/19/21 11:50
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	<2.0		2.0		ng/L		07/22/21 08:59	07/23/21 00:29	1
Perfluorooctanoic acid	<2.0		2.0		ng/L		07/22/21 08:59	07/23/21 00:29	1
Perfluorononanoic acid	<2.0		2.0		ng/L		07/22/21 08:59	07/23/21 00:29	1
Perfluorobutanesulfonic acid	<2.0		2.0		ng/L		07/22/21 08:59	07/23/21 00:29	1
Perfluorohexanesulfonic acid	<2.0		2.0		ng/L		07/22/21 08:59	07/23/21 00:29	1
Perfluorooctanesulfonic acid	<2.0		2.0		ng/L		07/22/21 08:59	07/23/21 00:29	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*109*		*30 - 144*	*07/22/21 08:59*	*07/23/21 00:29*	*1*
13C8 PFOA	*102*		*49 - 127*	*07/22/21 08:59*	*07/23/21 00:29*	*1*
13C9 PFNA	*102*		*47 - 136*	*07/22/21 08:59*	*07/23/21 00:29*	*1*
13C3 PFBS	*102*		*19 - 178*	*07/22/21 08:59*	*07/23/21 00:29*	*1*
13C3 PFHxS	*94*		*32 - 145*	*07/22/21 08:59*	*07/23/21 00:29*	*1*
13C8 PFOS	*104*		*49 - 126*	*07/22/21 08:59*	*07/23/21 00:29*	*1*

Client Sample ID: S-294D_20210720
Lab Sample ID: 410-48086-7

Date Collected: 07/20/21 09:40
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	**38**		1.6		ng/L		07/22/21 08:51	07/26/21 11:01	1
Perfluorooctanoic acid	**37**	**I**	1.6		ng/L		07/22/21 08:51	07/26/21 11:01	1
Perfluorononanoic acid	**2.9**		1.6		ng/L		07/22/21 08:51	07/26/21 11:01	1
Perfluorobutanesulfonic acid	**4.3**	**I**	1.6		ng/L		07/22/21 08:51	07/26/21 11:01	1
Perfluorohexanesulfonic acid	**3.6**		1.6		ng/L		07/22/21 08:51	07/26/21 11:01	1
Perfluorooctanesulfonic acid	**6.4**	**I**	1.6		ng/L		07/22/21 08:51	07/26/21 11:01	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*85*		*30 - 144*	*07/22/21 08:51*	*07/26/21 11:01*	*1*
13C8 PFOA	*63*		*49 - 127*	*07/22/21 08:51*	*07/26/21 11:01*	*1*
13C9 PFNA	*79*		*47 - 136*	*07/22/21 08:51*	*07/26/21 11:01*	*1*
13C3 PFBS	*151*		*19 - 178*	*07/22/21 08:51*	*07/26/21 11:01*	*1*
13C3 PFHxS	*68*		*32 - 145*	*07/22/21 08:51*	*07/26/21 11:01*	*1*
13C8 PFOS	*71*		*49 - 126*	*07/22/21 08:51*	*07/26/21 11:01*	*1*

Client Sample ID: PGW-MW-8D_20210720
Lab Sample ID: 410-48086-8

Date Collected: 07/20/21 11:15
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	**35**		1.8		ng/L		07/22/21 08:51	07/26/21 11:11	1
Perfluorooctanoic acid	**37**	**I**	1.8		ng/L		07/22/21 08:51	07/26/21 11:11	1
Perfluorononanoic acid	**2.1**		1.8		ng/L		07/22/21 08:51	07/26/21 11:11	1
Perfluorobutanesulfonic acid	**2.8**	**I**	1.8		ng/L		07/22/21 08:51	07/26/21 11:11	1
Perfluorohexanesulfonic acid	**3.2**		1.8		ng/L		07/22/21 08:51	07/26/21 11:11	1
Perfluorooctanesulfonic acid	**6.3**	**I**	1.8		ng/L		07/22/21 08:51	07/26/21 11:11	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*98*		*30 - 144*	*07/22/21 08:51*	*07/26/21 11:11*	*1*
13C8 PFOA	*79*		*49 - 127*	*07/22/21 08:51*	*07/26/21 11:11*	*1*
13C9 PFNA	*117*		*47 - 136*	*07/22/21 08:51*	*07/26/21 11:11*	*1*

Client Sample ID: PGW-MW-8D_20210720
Lab Sample ID: 410-48086-8

Date Collected: 07/20/21 11:15
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 PFBS	*221*	**5+*	*19 - 178*	*07/22/21 08:51*	*07/26/21 11:11*	*1*
13C3 PFHxS	*76*		*32 - 145*	*07/22/21 08:51*	*07/26/21 11:11*	*1*
13C8 PFOS	*99*		*49 - 126*	*07/22/21 08:51*	*07/26/21 11:11*	*1*

Client Sample ID: S-391D_20210720
Lab Sample ID: 410-48086-9

Date Collected: 07/20/21 11:25
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	**42**		1.6		ng/L		07/22/21 08:51	07/26/21 11:22	1
Perfluorooctanoic acid	**51**		1.6		ng/L		07/22/21 08:51	07/26/21 11:22	1
Perfluorononanoic acid	**11**		1.6		ng/L		07/22/21 08:51	07/26/21 11:22	1
Perfluorobutanesulfonic acid	<1.6		1.6		ng/L		07/22/21 08:51	07/26/21 11:22	1
Perfluorohexanesulfonic acid	**3.7**		1.6		ng/L		07/22/21 08:51	07/26/21 11:22	1
Perfluorooctanesulfonic acid	**6.6**	**I**	1.6		ng/L		07/22/21 08:51	07/26/21 11:22	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*93*		*30 - 144*	*07/22/21 08:51*	*07/26/21 11:22*	*1*
13C8 PFOA	*76*		*49 - 127*	*07/22/21 08:51*	*07/26/21 11:22*	*1*
13C9 PFNA	*101*		*47 - 136*	*07/22/21 08:51*	*07/26/21 11:22*	*1*
13C3 PFBS	*142*		*19 - 178*	*07/22/21 08:51*	*07/26/21 11:22*	*1*
13C3 PFHxS	*75*		*32 - 145*	*07/22/21 08:51*	*07/26/21 11:22*	*1*
13C8 PFOS	*86*		*49 - 126*	*07/22/21 08:51*	*07/26/21 11:22*	*1*

Client Sample ID: S-302D_20210720
Lab Sample ID: 410-48086-10

Date Collected: 07/20/21 12:45
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	**8.5**		1.7		ng/L		07/22/21 08:51	07/26/21 11:32	1
Perfluorooctanoic acid	**14**	**I**	1.7		ng/L		07/22/21 08:51	07/26/21 11:32	1
Perfluorononanoic acid	<1.7		1.7		ng/L		07/22/21 08:51	07/26/21 11:32	1
Perfluorobutanesulfonic acid	<1.7		1.7		ng/L		07/22/21 08:51	07/26/21 11:32	1
Perfluorohexanesulfonic acid	<1.7		1.7		ng/L		07/22/21 08:51	07/26/21 11:32	1
Perfluorooctanesulfonic acid	<1.7		1.7		ng/L		07/22/21 08:51	07/26/21 11:32	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*80*		*30 - 144*	*07/22/21 08:51*	*07/26/21 11:32*	*1*
13C8 PFOA	*65*		*49 - 127*	*07/22/21 08:51*	*07/26/21 11:32*	*1*
13C9 PFNA	*88*		*47 - 136*	*07/22/21 08:51*	*07/26/21 11:32*	*1*
13C3 PFBS	*152*		*19 - 178*	*07/22/21 08:51*	*07/26/21 11:32*	*1*
13C3 PFHxS	*91*		*32 - 145*	*07/22/21 08:51*	*07/26/21 11:32*	*1*
13C8 PFOS	*199*	**5+*	*49 - 126*	*07/22/21 08:51*	*07/26/21 11:32*	*1*

Client Sample ID: S-264D_20210720
Lab Sample ID: 410-48086-11

Date Collected: 07/20/21 14:45
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	<1.8		1.8		ng/L		07/22/21 08:51	07/26/21 11:43	1
Perfluorooctanoic acid	**16**	**I**	1.8		ng/L		07/22/21 08:51	07/26/21 11:43	1
Perfluorononanoic acid	<1.8		1.8		ng/L		07/22/21 08:51	07/26/21 11:43	1
Perfluorobutanesulfonic acid	**7.7**	**I**	1.8		ng/L		07/22/21 08:51	07/26/21 11:43	1
Perfluorohexanesulfonic acid	**23**		1.8		ng/L		07/22/21 08:51	07/26/21 11:43	1
Perfluorooctanesulfonic acid	**41**		1.8		ng/L		07/22/21 08:51	07/26/21 11:43	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*218*	**5+*	*30 - 144*	*07/22/21 08:51*	*07/26/21 11:43*	*1*
13C8 PFOA	*64*		*49 - 127*	*07/22/21 08:51*	*07/26/21 11:43*	*1*
13C9 PFNA	*83*		*47 - 136*	*07/22/21 08:51*	*07/26/21 11:43*	*1*
13C3 PFBS	*203*	**5+*	*19 - 178*	*07/22/21 08:51*	*07/26/21 11:43*	*1*
13C3 PFHxS	*251*	**5+*	*32 - 145*	*07/22/21 08:51*	*07/26/21 11:43*	*1*
13C8 PFOS	*82*		*49 - 126*	*07/22/21 08:51*	*07/26/21 11:43*	*1*

Client Sample ID: S-388D_20210720
Lab Sample ID: 410-48086-12

Date Collected: 07/20/21 14:55
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	**1.8**		1.6		ng/L		07/22/21 08:51	07/26/21 11:53	1
Perfluorooctanoic acid	**10**	**I**	1.6		ng/L		07/22/21 08:51	07/26/21 11:53	1
Perfluorononanoic acid	<1.6		1.6		ng/L		07/22/21 08:51	07/26/21 11:53	1
Perfluorobutanesulfonic acid	**4.8**	**I**	1.6		ng/L		07/22/21 08:51	07/26/21 11:53	1
Perfluorohexanesulfonic acid	**13**		1.6		ng/L		07/22/21 08:51	07/26/21 11:53	1
Perfluorooctanesulfonic acid	**21**		1.6		ng/L		07/22/21 08:51	07/26/21 11:53	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*111*		*30 - 144*	*07/22/21 08:51*	*07/26/21 11:53*	*1*
13C8 PFOA	*64*		*49 - 127*	*07/22/21 08:51*	*07/26/21 11:53*	*1*
13C9 PFNA	*91*		*47 - 136*	*07/22/21 08:51*	*07/26/21 11:53*	*1*
13C3 PFBS	*168*		*19 - 178*	*07/22/21 08:51*	*07/26/21 11:53*	*1*
13C3 PFHxS	*118*		*32 - 145*	*07/22/21 08:51*	*07/26/21 11:53*	*1*
13C8 PFOS	*89*		*49 - 126*	*07/22/21 08:51*	*07/26/21 11:53*	*1*

Client Sample ID: S-389D_20210720
Lab Sample ID: 410-48086-13

Date Collected: 07/20/21 14:40
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	**14**		1.6		ng/L		07/22/21 08:51	07/26/21 12:15	1
Perfluorooctanoic acid	**68**	**I**	1.6		ng/L		07/22/21 08:51	07/26/21 12:15	1
Perfluorononanoic acid	<1.6		1.6		ng/L		07/22/21 08:51	07/26/21 12:15	1
Perfluorobutanesulfonic acid	**18**		1.6		ng/L		07/22/21 08:51	07/26/21 12:15	1
Perfluorohexanesulfonic acid	**220**		1.6		ng/L		07/22/21 08:51	07/26/21 12:15	1
Perfluorooctanesulfonic acid	**280**		1.6		ng/L		07/22/21 08:51	07/26/21 12:15	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*332*	**5+*	*30 - 144*	*07/22/21 08:51*	*07/26/21 12:15*	*1*
13C8 PFOA	*62*		*49 - 127*	*07/22/21 08:51*	*07/26/21 12:15*	*1*
13C9 PFNA	*97*		*47 - 136*	*07/22/21 08:51*	*07/26/21 12:15*	*1*

Client Sample ID: S-389D_20210720
Lab Sample ID: 410-48086-13

Date Collected: 07/20/21 14:40
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 PFBS	*165*		*19 - 178*	*07/22/21 08:51*	*07/26/21 12:15*	*1*
13C3 PFHxS	*390*	*5+	*32 - 145*	*07/22/21 08:51*	*07/26/21 12:15*	*1*
13C8 PFOS	*93*		*49 - 126*	*07/22/21 08:51*	*07/26/21 12:15*	*1*

Client Sample ID: FB-02_20210720
Lab Sample ID: 410-48086-14

Date Collected: 07/20/21 10:00
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	<1.8		1.8		ng/L		07/22/21 08:51	07/26/21 12:25	1
Perfluorooctanoic acid	<1.8		1.8		ng/L		07/22/21 08:51	07/26/21 12:25	1
Perfluorononanoic acid	<1.8		1.8		ng/L		07/22/21 08:51	07/26/21 12:25	1
Perfluorobutanesulfonic acid	<1.8		1.8		ng/L		07/22/21 08:51	07/26/21 12:25	1
Perfluorohexanesulfonic acid	<1.8		1.8		ng/L		07/22/21 08:51	07/26/21 12:25	1
Perfluorooctanesulfonic acid	<1.8		1.8		ng/L		07/22/21 08:51	07/26/21 12:25	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*100*		*30 - 144*	*07/22/21 08:51*	*07/26/21 12:25*	*1*
13C8 PFOA	*99*		*49 - 127*	*07/22/21 08:51*	*07/26/21 12:25*	*1*
13C9 PFNA	*103*		*47 - 136*	*07/22/21 08:51*	*07/26/21 12:25*	*1*
13C3 PFBS	*92*		*19 - 178*	*07/22/21 08:51*	*07/26/21 12:25*	*1*
13C3 PFHxS	*96*		*32 - 145*	*07/22/21 08:51*	*07/26/21 12:25*	*1*
13C8 PFOS	*94*		*49 - 126*	*07/22/21 08:51*	*07/26/21 12:25*	*1*

Client Sample ID: S-80D_20210721
Lab Sample ID: 410-48086-15

Date Collected: 07/21/21 09:35
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid	**53**		1.6		ng/L		07/22/21 08:59	07/23/21 00:40	1
Perfluorononanoic acid	**5.4**		1.6		ng/L		07/22/21 08:59	07/23/21 00:40	1
Perfluorobutanesulfonic acid	**2.9**	**I**	1.6		ng/L		07/22/21 08:59	07/23/21 00:40	1
Perfluorohexanesulfonic acid	**3.8**		1.6		ng/L		07/22/21 08:59	07/23/21 00:40	1
Perfluorooctanesulfonic acid	**3.6**		1.6		ng/L		07/22/21 08:59	07/23/21 00:40	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*91*		*30 - 144*	*07/22/21 08:59*	*07/23/21 00:40*	*1*
13C8 PFOA	*89*		*49 - 127*	*07/22/21 08:59*	*07/23/21 00:40*	*1*
13C9 PFNA	*106*		*47 - 136*	*07/22/21 08:59*	*07/23/21 00:40*	*1*
13C3 PFBS	*118*		*19 - 178*	*07/22/21 08:59*	*07/23/21 00:40*	*1*
13C3 PFHxS	*84*		*32 - 145*	*07/22/21 08:59*	*07/23/21 00:40*	*1*
13C8 PFOS	*102*		*49 - 126*	*07/22/21 08:59*	*07/23/21 00:40*	*1*

Method: 537 IDA - EPA 537 Isotope Dilution - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	**270**		16		ng/L		07/22/21 08:59	07/25/21 14:13	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*126*		*30 - 144*	*07/22/21 08:59*	*07/25/21 14:13*	*10*

Client Sample ID: S-80D-DUP_20210721
Lab Sample ID: 410-48086-16

Date Collected: 07/21/21 09:35
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid	54		1.6		ng/L		07/22/21 08:59	07/23/21 00:51	1
Perfluorononanoic acid	5.5		1.6		ng/L		07/22/21 08:59	07/23/21 00:51	1
Perfluorobutanesulfonic acid	3.2	I	1.6		ng/L		07/22/21 08:59	07/23/21 00:51	1
Perfluorohexanesulfonic acid	3.8		1.6		ng/L		07/22/21 08:59	07/23/21 00:51	1
Perfluorooctanesulfonic acid	3.8		1.6		ng/L		07/22/21 08:59	07/23/21 00:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*91*		*30 - 144*	*07/22/21 08:59*	*07/23/21 00:51*	*1*
13C8 PFOA	*87*		*49 - 127*	*07/22/21 08:59*	*07/23/21 00:51*	*1*
13C9 PFNA	*101*		*47 - 136*	*07/22/21 08:59*	*07/23/21 00:51*	*1*
13C3 PFBS	*110*		*19 - 178*	*07/22/21 08:59*	*07/23/21 00:51*	*1*
13C3 PFHxS	*89*		*32 - 145*	*07/22/21 08:59*	*07/23/21 00:51*	*1*
13C8 PFOS	*93*		*49 - 126*	*07/22/21 08:59*	*07/23/21 00:51*	*1*

Method: 537 IDA - EPA 537 Isotope Dilution - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	250		16		ng/L		07/22/21 08:59	07/25/21 14:25	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*115*		*30 - 144*	*07/22/21 08:59*	*07/25/21 14:25*	*10*

Client Sample ID: S-69D_20210721
Lab Sample ID: 410-48086-17

Date Collected: 07/21/21 11:55
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	12		1.6		ng/L		07/22/21 08:59	07/23/21 01:14	1
Perfluorooctanoic acid	36		1.6		ng/L		07/22/21 08:59	07/23/21 01:14	1
Perfluorononanoic acid	76		1.6		ng/L		07/22/21 08:59	07/23/21 01:14	1
Perfluorobutanesulfonic acid	2.5	I	1.6		ng/L		07/22/21 08:59	07/23/21 01:14	1
Perfluorohexanesulfonic acid	3.9		1.6		ng/L		07/22/21 08:59	07/23/21 01:14	1
Perfluorooctanesulfonic acid	6.9		1.6		ng/L		07/22/21 08:59	07/23/21 01:14	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*85*		*30 - 144*	*07/22/21 08:59*	*07/23/21 01:14*	*1*
13C8 PFOA	*87*		*49 - 127*	*07/22/21 08:59*	*07/23/21 01:14*	*1*
13C9 PFNA	*91*		*47 - 136*	*07/22/21 08:59*	*07/23/21 01:14*	*1*
13C3 PFBS	*127*		*19 - 178*	*07/22/21 08:59*	*07/23/21 01:14*	*1*
13C3 PFHxS	*98*		*32 - 145*	*07/22/21 08:59*	*07/23/21 01:14*	*1*
13C8 PFOS	*96*		*49 - 126*	*07/22/21 08:59*	*07/23/21 01:14*	*1*

Client Sample ID: S-284D_20210721
Lab Sample ID: 410-48086-18

Date Collected: 07/21/21 11:55
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	25		1.7		ng/L		07/22/21 08:59	07/23/21 01:25	1
Perfluorooctanoic acid	28		1.7		ng/L		07/22/21 08:59	07/23/21 01:25	1
Perfluorononanoic acid	19		1.7		ng/L		07/22/21 08:59	07/23/21 01:25	1
Perfluorobutanesulfonic acid	2.3	I	1.7		ng/L		07/22/21 08:59	07/23/21 01:25	1
Perfluorohexanesulfonic acid	3.5		1.7		ng/L		07/22/21 08:59	07/23/21 01:25	1

Client Sample ID: S-284D_20210721
Lab Sample ID: 410-48086-18

Date Collected: 07/21/21 11:55
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	12		1.7		ng/L		07/22/21 08:59	07/23/21 01:25	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*93*		*30 - 144*	*07/22/21 08:59*	*07/23/21 01:25*	*1*
13C8 PFOA	*91*		*49 - 127*	*07/22/21 08:59*	*07/23/21 01:25*	*1*
13C9 PFNA	*99*		*47 - 136*	*07/22/21 08:59*	*07/23/21 01:25*	*1*
13C3 PFBS	*131*		*19 - 178*	*07/22/21 08:59*	*07/23/21 01:25*	*1*
13C3 PFHxS	*104*		*32 - 145*	*07/22/21 08:59*	*07/23/21 01:25*	*1*
13C8 PFOS	*118*		*49 - 126*	*07/22/21 08:59*	*07/23/21 01:25*	*1*

Client Sample ID: FB-03_20210721
Lab Sample ID: 410-48086-19

Date Collected: 07/21/21 11:50
Matrix: Water
Date Received: 07/21/21 16:35

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	<1.7		1.7		ng/L		07/22/21 08:59	07/23/21 01:36	1
Perfluorooctanoic acid	<1.7		1.7		ng/L		07/22/21 08:59	07/23/21 01:36	1
Perfluorononanoic acid	<1.7		1.7		ng/L		07/22/21 08:59	07/23/21 01:36	1
Perfluorobutanesulfonic acid	<1.7		1.7		ng/L		07/22/21 08:59	07/23/21 01:36	1
Perfluorohexanesulfonic acid	<1.7		1.7		ng/L		07/22/21 08:59	07/23/21 01:36	1
Perfluorooctanesulfonic acid	<1.7		1.7		ng/L		07/22/21 08:59	07/23/21 01:36	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*104*		*30 - 144*	*07/22/21 08:59*	*07/23/21 01:36*	*1*
13C8 PFOA	*95*		*49 - 127*	*07/22/21 08:59*	*07/23/21 01:36*	*1*
13C9 PFNA	*97*		*47 - 136*	*07/22/21 08:59*	*07/23/21 01:36*	*1*
13C3 PFBS	*96*		*19 - 178*	*07/22/21 08:59*	*07/23/21 01:36*	*1*
13C3 PFHxS	*88*		*32 - 145*	*07/22/21 08:59*	*07/23/21 01:36*	*1*
13C8 PFOS	*99*		*49 - 126*	*07/22/21 08:59*	*07/23/21 01:36*	*1*

Isotope Dilution Summary

Client: Sanborn Head & Associates Inc
Project/Site: Evergreen Philadelphia PFAS

Job ID: 410-48086-1

Method: 537 IDA - EPA 537 Isotope Dilution

Matrix: Water

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	C4PFHA (30-144)	C8PFOA (49-127)	C9PFNA (47-136)	C3PFBS (19-178)	C3PFHS (32-145)	C8PFOS (49-126)		
410-48086-1	N-163_20210719	94	87	101	107	84	98		
410-48086-2	N-9_20210719	88	87	101	121	85	97		
410-48086-3	N-69_20210719	94	90	107	107	83	96		
410-48086-4	N-38D_20210719	70	79	91	211 *5+	78	85		
410-48086-5	EB-01_20210719	110	108	106	94	93	102		
410-48086-6	FB-01_20210719	109	102	102	102	94	104		
410-48086-7	S-294D_20210720	85	63	79	151	68	71		
410-48086-8	PGW-MW-8D_20210720	98	79	117	221 *5+	76	99		
410-48086-9	S-391D_20210720	93	76	101	142	75	86		
410-48086-10	S-302D_20210720	80	65	88	152	91	199 *5+		
410-48086-11	S-264D_20210720	218 *5+	64	83	203 *5+	251 *5+	82		
410-48086-12	S-388D_20210720	111	64	91	168	118	89		
410-48086-13	S-389D_20210720	332 *5+	62	97	165	390 *5+	93		
410-48086-14	FB-02_20210720	100	99	103	92	96	94		
410-48086-15	S-80D_20210721	91	89	106	118	84	102		
410-48086-15 - DL	S-80D_20210721	126							
410-48086-16	S-80D-DUP_20210721	91	87	101	110	89	93		
410-48086-16 - DL	S-80D-DUP_20210721	115							
410-48086-17	S-69D_20210721	85	87	91	127	98	96		
410-48086-18	S-284D_20210721	93	91	99	131	104	118		
410-48086-19	FB-03_20210721	104	95	97	96	88	99		
LCS 410-151535/2-A	Lab Control Sample	81	73	85	80	72	80		
LCS 410-151547/2-A	Lab Control Sample	100	92	92	95	84	92		
LCSD 410-151535/3-A	Lab Control Sample Dup	103	101	115	97	93	100		
LCSD 410-151547/3-A	Lab Control Sample Dup	99	95	93	84	90	92		
MB 410-151535/1-A	Method Blank	97	92	103	87	86	92		
MB 410-151547/1-A	Method Blank	101	93	93	91	89	92		

Surrogate Legend

C4PFHA = 13C4 PFHpA
C8PFOA = 13C8 PFOA
C9PFNA = 13C9 PFNA
C3PFBS = 13C3 PFBS
C3PFHS = 13C3 PFHxS
C8PFOS = 13C8 PFOS

Method: 537 IDA - EPA 537 Isotope Dilution

Lab Sample ID: MB 410-151535/1-A
Matrix: Water
Analysis Batch: 152591

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 151535

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	<2.0		2.0		ng/L		07/22/21 08:51	07/26/21 09:46	1
Perfluorooctanoic acid	<2.0		2.0		ng/L		07/22/21 08:51	07/26/21 09:46	1
Perfluorononanoic acid	<2.0		2.0		ng/L		07/22/21 08:51	07/26/21 09:46	1
Perfluorobutanesulfonic acid	<2.0		2.0		ng/L		07/22/21 08:51	07/26/21 09:46	1
Perfluorohexanesulfonic acid	<2.0		2.0		ng/L		07/22/21 08:51	07/26/21 09:46	1
Perfluorooctanesulfonic acid	<2.0		2.0		ng/L		07/22/21 08:51	07/26/21 09:46	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*97*		*30 - 144*	*07/22/21 08:51*	*07/26/21 09:46*	*1*
13C8 PFOA	*92*		*49 - 127*	*07/22/21 08:51*	*07/26/21 09:46*	*1*
13C9 PFNA	*103*		*47 - 136*	*07/22/21 08:51*	*07/26/21 09:46*	*1*
13C3 PFBS	*87*		*19 - 178*	*07/22/21 08:51*	*07/26/21 09:46*	*1*
13C3 PFHxS	*86*		*32 - 145*	*07/22/21 08:51*	*07/26/21 09:46*	*1*
13C8 PFOS	*92*		*49 - 126*	*07/22/21 08:51*	*07/26/21 09:46*	*1*

Lab Sample ID: LCS 410-151535/2-A
Matrix: Water
Analysis Batch: 152591

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 151535

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Perfluoroheptanoic acid			25.6	25.7		ng/L		101	66 - 141		
Perfluorooctanoic acid			25.6	26.7		ng/L		104	65 - 136		
Perfluorononanoic acid			25.6	27.3		ng/L		107	65 - 140		
Perfluorobutanesulfonic acid			22.7	22.6		ng/L		100	65 - 132		
Perfluorohexanesulfonic acid			23.3	22.8		ng/L		97	60 - 128		
Perfluorooctanesulfonic acid			23.7	23.9		ng/L		101	51 - 126		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFHpA	*81*		*30 - 144*
13C8 PFOA	*73*		*49 - 127*
13C9 PFNA	*85*		*47 - 136*
13C3 PFBS	*80*		*19 - 178*
13C3 PFHxS	*72*		*32 - 145*
13C8 PFOS	*80*		*49 - 126*

Lab Sample ID: LCSD 410-151535/3-A
Matrix: Water
Analysis Batch: 152591

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 151535

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroheptanoic acid			25.6	26.3		ng/L		103	66 - 141	2	30
Perfluorooctanoic acid			25.6	26.1		ng/L		102	65 - 136	2	30
Perfluorononanoic acid			25.6	26.5		ng/L		104	65 - 140	3	30
Perfluorobutanesulfonic acid			22.7	24.5		ng/L		108	65 - 132	8	30
Perfluorohexanesulfonic acid			23.3	22.2		ng/L		95	60 - 128	3	30
Perfluorooctanesulfonic acid			23.7	24.1		ng/L		102	51 - 126	1	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C4 PFHpA	*103*		*30 - 144*

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCSD 410-151535/3-A
Matrix: Water
Analysis Batch: 152591

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 151535

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C8 PFOA	101		49 - 127
13C9 PFNA	115		47 - 136
13C3 PFBS	97		19 - 178
13C3 PFHxS	93		32 - 145
13C8 PFOS	100		49 - 126

Lab Sample ID: MB 410-151547/1-A
Matrix: Water
Analysis Batch: 151710

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 151547

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	<2.0		2.0		ng/L		07/22/21 08:59	07/22/21 20:26	1
Perfluorooctanoic acid	<2.0		2.0		ng/L		07/22/21 08:59	07/22/21 20:26	1
Perfluorononanoic acid	<2.0		2.0		ng/L		07/22/21 08:59	07/22/21 20:26	1
Perfluorobutanesulfonic acid	<2.0		2.0		ng/L		07/22/21 08:59	07/22/21 20:26	1
Perfluorohexanesulfonic acid	<2.0		2.0		ng/L		07/22/21 08:59	07/22/21 20:26	1
Perfluorooctanesulfonic acid	<2.0		2.0		ng/L		07/22/21 08:59	07/22/21 20:26	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFHpA	101		30 - 144	07/22/21 08:59	07/22/21 20:26	1
13C8 PFOA	93		49 - 127	07/22/21 08:59	07/22/21 20:26	1
13C9 PFNA	93		47 - 136	07/22/21 08:59	07/22/21 20:26	1
13C3 PFBS	91		19 - 178	07/22/21 08:59	07/22/21 20:26	1
13C3 PFHxS	89		32 - 145	07/22/21 08:59	07/22/21 20:26	1
13C8 PFOS	92		49 - 126	07/22/21 08:59	07/22/21 20:26	1

Lab Sample ID: LCS 410-151547/2-A
Matrix: Water
Analysis Batch: 151710

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 151547

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid	25.6	23.8		ng/L		93	66 - 141
Perfluorooctanoic acid	25.6	26.5		ng/L		103	65 - 136
Perfluorononanoic acid	25.6	27.6		ng/L		108	65 - 140
Perfluorobutanesulfonic acid	22.7	23.6		ng/L		104	65 - 132
Perfluorohexanesulfonic acid	23.3	24.4		ng/L		105	60 - 128
Perfluorooctanesulfonic acid	23.7	24.6		ng/L		104	51 - 126

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFHpA	100		30 - 144
13C8 PFOA	92		49 - 127
13C9 PFNA	92		47 - 136
13C3 PFBS	95		19 - 178
13C3 PFHxS	84		32 - 145
13C8 PFOS	92		49 - 126

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCSD 410-151547/3-A
Matrix: Water
Analysis Batch: 151710

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 151547

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroheptanoic acid			25.6	25.2		ng/L		99	66 - 141	6	30
Perfluorooctanoic acid			25.6	26.3		ng/L		103	65 - 136	1	30
Perfluorononanoic acid			25.6	26.9		ng/L		105	65 - 140	3	30
Perfluorobutanesulfonic acid			22.7	23.4		ng/L		103	65 - 132	1	30
Perfluorohexanesulfonic acid			23.3	23.9		ng/L		102	60 - 128	2	30
Perfluorooctanesulfonic acid			23.7	23.9		ng/L		101	51 - 126	3	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C4 PFHpA	*99*		*30 - 144*
13C8 PFOA	*95*		*49 - 127*
13C9 PFNA	*93*		*47 - 136*
13C3 PFBS	*84*		*19 - 178*
13C3 PFHxS	*90*		*32 - 145*
13C8 PFOS	*92*		*49 - 126*

LCMS

Prep Batch: 151535

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-48086-7 - RA	S-294D_20210720	Total/NA	Water	537 IDA	
410-48086-7	S-294D_20210720	Total/NA	Water	537 IDA	
410-48086-8	PGW-MW-8D_20210720	Total/NA	Water	537 IDA	
410-48086-8 - RA	PGW-MW-8D_20210720	Total/NA	Water	537 IDA	
410-48086-9	S-391D_20210720	Total/NA	Water	537 IDA	
410-48086-10 - RA	S-302D_20210720	Total/NA	Water	537 IDA	
410-48086-10	S-302D_20210720	Total/NA	Water	537 IDA	
410-48086-11 - RA	S-264D_20210720	Total/NA	Water	537 IDA	
410-48086-11	S-264D_20210720	Total/NA	Water	537 IDA	
410-48086-12	S-388D_20210720	Total/NA	Water	537 IDA	
410-48086-12 - RA	S-388D_20210720	Total/NA	Water	537 IDA	
410-48086-13 - RA	S-389D_20210720	Total/NA	Water	537 IDA	
410-48086-13	S-389D_20210720	Total/NA	Water	537 IDA	
410-48086-14	FB-02_20210720	Total/NA	Water	537 IDA	
MB 410-151535/1-A	Method Blank	Total/NA	Water	537 IDA	
LCS 410-151535/2-A	Lab Control Sample	Total/NA	Water	537 IDA	
LCSD 410-151535/3-A	Lab Control Sample Dup	Total/NA	Water	537 IDA	

Prep Batch: 151547

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-48086-1	N-163_20210719	Total/NA	Water	537 IDA	
410-48086-2	N-9_20210719	Total/NA	Water	537 IDA	
410-48086-3	N-69_20210719	Total/NA	Water	537 IDA	
410-48086-4 - RA	N-38D_20210719	Total/NA	Water	537 IDA	
410-48086-4	N-38D_20210719	Total/NA	Water	537 IDA	
410-48086-5	EB-01_20210719	Total/NA	Water	537 IDA	
410-48086-6	FB-01_20210719	Total/NA	Water	537 IDA	
410-48086-15 - DL	S-80D_20210721	Total/NA	Water	537 IDA	
410-48086-15	S-80D_20210721	Total/NA	Water	537 IDA	
410-48086-16 - DL	S-80D-DUP_20210721	Total/NA	Water	537 IDA	
410-48086-16	S-80D-DUP_20210721	Total/NA	Water	537 IDA	
410-48086-17 - RA	S-69D_20210721	Total/NA	Water	537 IDA	
410-48086-17	S-69D_20210721	Total/NA	Water	537 IDA	
410-48086-18 - RA	S-284D_20210721	Total/NA	Water	537 IDA	
410-48086-18	S-284D_20210721	Total/NA	Water	537 IDA	
410-48086-19	FB-03_20210721	Total/NA	Water	537 IDA	
MB 410-151547/1-A	Method Blank	Total/NA	Water	537 IDA	
LCS 410-151547/2-A	Lab Control Sample	Total/NA	Water	537 IDA	
LCSD 410-151547/3-A	Lab Control Sample Dup	Total/NA	Water	537 IDA	

Analysis Batch: 151710

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-48086-1	N-163_20210719	Total/NA	Water	537 IDA	151547
410-48086-2	N-9_20210719	Total/NA	Water	537 IDA	151547
410-48086-3	N-69_20210719	Total/NA	Water	537 IDA	151547
410-48086-4	N-38D_20210719	Total/NA	Water	537 IDA	151547
410-48086-5	EB-01_20210719	Total/NA	Water	537 IDA	151547
410-48086-6	FB-01_20210719	Total/NA	Water	537 IDA	151547
410-48086-15	S-80D_20210721	Total/NA	Water	537 IDA	151547
410-48086-16	S-80D-DUP_20210721	Total/NA	Water	537 IDA	151547
410-48086-17	S-69D_20210721	Total/NA	Water	537 IDA	151547

LCMS (Continued)

Analysis Batch: 151710 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-48086-18	S-284D_20210721	Total/NA	Water	537 IDA	151547
410-48086-19	FB-03_20210721	Total/NA	Water	537 IDA	151547
MB 410-151547/1-A	Method Blank	Total/NA	Water	537 IDA	151547
LCS 410-151547/2-A	Lab Control Sample	Total/NA	Water	537 IDA	151547
LCSD 410-151547/3-A	Lab Control Sample Dup	Total/NA	Water	537 IDA	151547

Analysis Batch: 151966

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-48086-4 - RA	N-38D_20210719	Total/NA	Water	537 IDA	151547
410-48086-17 - RA	S-69D_20210721	Total/NA	Water	537 IDA	151547
410-48086-18 - RA	S-284D_20210721	Total/NA	Water	537 IDA	151547

Analysis Batch: 152457

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-48086-15 - DL	S-80D_20210721	Total/NA	Water	537 IDA	151547
410-48086-16 - DL	S-80D-DUP_20210721	Total/NA	Water	537 IDA	151547

Analysis Batch: 152591

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-48086-7	S-294D_20210720	Total/NA	Water	537 IDA	151535
410-48086-7 - RA	S-294D_20210720	Total/NA	Water	537 IDA	151535
410-48086-8	PGW-MW-8D_20210720	Total/NA	Water	537 IDA	151535
410-48086-8 - RA	PGW-MW-8D_20210720	Total/NA	Water	537 IDA	151535
410-48086-9	S-391D_20210720	Total/NA	Water	537 IDA	151535
410-48086-10	S-302D_20210720	Total/NA	Water	537 IDA	151535
410-48086-10 - RA	S-302D_20210720	Total/NA	Water	537 IDA	151535
410-48086-11	S-264D_20210720	Total/NA	Water	537 IDA	151535
410-48086-11 - RA	S-264D_20210720	Total/NA	Water	537 IDA	151535
410-48086-12	S-388D_20210720	Total/NA	Water	537 IDA	151535
410-48086-12 - RA	S-388D_20210720	Total/NA	Water	537 IDA	151535
410-48086-13	S-389D_20210720	Total/NA	Water	537 IDA	151535
410-48086-13 - RA	S-389D_20210720	Total/NA	Water	537 IDA	151535
410-48086-14	FB-02_20210720	Total/NA	Water	537 IDA	151535
MB 410-151535/1-A	Method Blank	Total/NA	Water	537 IDA	151535
LCS 410-151535/2-A	Lab Control Sample	Total/NA	Water	537 IDA	151535
LCSD 410-151535/3-A	Lab Control Sample Dup	Total/NA	Water	537 IDA	151535

Lab Chronicle

Client: Sanborn Head & Associates Inc
Project/Site: Evergreen Philadelphia PFAS

Job ID: 410-48086-1

Client Sample ID: N-163_20210719
Lab Sample ID: 410-48086-1
Date Collected: 07/19/21 11:50
Matrix: Water
Date Received: 07/21/21 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			151547	07/22/21 08:59	X4HV	ELLE
Total/NA	Analysis	537 IDA		1	151710	07/22/21 23:34	QD9Y	ELLE

Client Sample ID: N-9_20210719
Lab Sample ID: 410-48086-2
Date Collected: 07/19/21 12:40
Matrix: Water
Date Received: 07/21/21 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			151547	07/22/21 08:59	X4HV	ELLE
Total/NA	Analysis	537 IDA		1	151710	07/22/21 23:45	QD9Y	ELLE

Client Sample ID: N-69_20210719
Lab Sample ID: 410-48086-3
Date Collected: 07/19/21 14:30
Matrix: Water
Date Received: 07/21/21 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			151547	07/22/21 08:59	X4HV	ELLE
Total/NA	Analysis	537 IDA		1	151710	07/22/21 23:56	QD9Y	ELLE

Client Sample ID: N-38D_20210719
Lab Sample ID: 410-48086-4
Date Collected: 07/19/21 14:40
Matrix: Water
Date Received: 07/21/21 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			151547	07/22/21 08:59	X4HV	ELLE
Total/NA	Analysis	537 IDA		1	151710	07/23/21 00:07	QD9Y	ELLE
Total/NA	Prep	537 IDA	RA		151547	07/22/21 08:59	X4HV	ELLE
Total/NA	Analysis	537 IDA	RA	1	151966	07/23/21 16:27	QD9Y	ELLE

Client Sample ID: EB-01_20210719
Lab Sample ID: 410-48086-5
Date Collected: 07/19/21 11:30
Matrix: Water
Date Received: 07/21/21 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			151547	07/22/21 08:59	X4HV	ELLE
Total/NA	Analysis	537 IDA		1	151710	07/23/21 00:18	QD9Y	ELLE

Client Sample ID: FB-01_20210719
Lab Sample ID: 410-48086-6
Date Collected: 07/19/21 11:50
Matrix: Water
Date Received: 07/21/21 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			151547	07/22/21 08:59	X4HV	ELLE
Total/NA	Analysis	537 IDA		1	151710	07/23/21 00:29	QD9Y	ELLE

Lab Chronicle

Client: Sanborn Head & Associates Inc
Job ID: 410-48086-1
Project/Site: Evergreen Philadelphia PFAS

Client Sample ID: S-294D_20210720
Lab Sample ID: 410-48086-7
Date Collected: 07/20/21 09:40
Matrix: Water
Date Received: 07/21/21 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			151535	07/22/21 08:51	X4HV	ELLE
Total/NA	Analysis	537 IDA		1	152591	07/26/21 11:01	MT26	ELLE
Total/NA	Prep	537 IDA	RA		151535	07/22/21 08:51	X4HV	ELLE
Total/NA	Analysis	537 IDA	RA	1	152591	07/26/21 20:42	MT26	ELLE

Client Sample ID: PGW-MW-8D_20210720
Lab Sample ID: 410-48086-8
Date Collected: 07/20/21 11:15
Matrix: Water
Date Received: 07/21/21 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			151535	07/22/21 08:51	X4HV	ELLE
Total/NA	Analysis	537 IDA		1	152591	07/26/21 11:11	MT26	ELLE
Total/NA	Prep	537 IDA	RA		151535	07/22/21 08:51	X4HV	ELLE
Total/NA	Analysis	537 IDA	RA	1	152591	07/26/21 20:53	MT26	ELLE

Client Sample ID: S-391D_20210720
Lab Sample ID: 410-48086-9
Date Collected: 07/20/21 11:25
Matrix: Water
Date Received: 07/21/21 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			151535	07/22/21 08:51	X4HV	ELLE
Total/NA	Analysis	537 IDA		1	152591	07/26/21 11:22	MT26	ELLE

Client Sample ID: S-302D_20210720
Lab Sample ID: 410-48086-10
Date Collected: 07/20/21 12:45
Matrix: Water
Date Received: 07/21/21 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			151535	07/22/21 08:51	X4HV	ELLE
Total/NA	Analysis	537 IDA		1	152591	07/26/21 11:32	MT26	ELLE
Total/NA	Prep	537 IDA	RA		151535	07/22/21 08:51	X4HV	ELLE
Total/NA	Analysis	537 IDA	RA	1	152591	07/26/21 21:03	MT26	ELLE

Client Sample ID: S-264D_20210720
Lab Sample ID: 410-48086-11
Date Collected: 07/20/21 14:45
Matrix: Water
Date Received: 07/21/21 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			151535	07/22/21 08:51	X4HV	ELLE
Total/NA	Analysis	537 IDA		1	152591	07/26/21 11:43	MT26	ELLE
Total/NA	Prep	537 IDA	RA		151535	07/22/21 08:51	X4HV	ELLE
Total/NA	Analysis	537 IDA	RA	1	152591	07/26/21 21:14	MT26	ELLE

Lab Chronicle

Client: Sanborn Head & Associates Inc
Project/Site: Evergreen Philadelphia PFAS

Job ID: 410-48086-1

Client Sample ID: S-388D_20210720

Lab Sample ID: 410-48086-12

Date Collected: 07/20/21 14:55

Matrix: Water

Date Received: 07/21/21 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			151535	07/22/21 08:51	X4HV	ELLE
Total/NA	Analysis	537 IDA		1	152591	07/26/21 11:53	MT26	ELLE
Total/NA	Prep	537 IDA	RA		151535	07/22/21 08:51	X4HV	ELLE
Total/NA	Analysis	537 IDA	RA	1	152591	07/26/21 21:25	MT26	ELLE

Client Sample ID: S-389D_20210720

Lab Sample ID: 410-48086-13

Date Collected: 07/20/21 14:40

Matrix: Water

Date Received: 07/21/21 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			151535	07/22/21 08:51	X4HV	ELLE
Total/NA	Analysis	537 IDA		1	152591	07/26/21 12:15	MT26	ELLE
Total/NA	Prep	537 IDA	RA		151535	07/22/21 08:51	X4HV	ELLE
Total/NA	Analysis	537 IDA	RA	1	152591	07/26/21 21:35	MT26	ELLE

Client Sample ID: FB-02_20210720

Lab Sample ID: 410-48086-14

Date Collected: 07/20/21 10:00

Matrix: Water

Date Received: 07/21/21 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			151535	07/22/21 08:51	X4HV	ELLE
Total/NA	Analysis	537 IDA		1	152591	07/26/21 12:25	MT26	ELLE

Client Sample ID: S-80D_20210721

Lab Sample ID: 410-48086-15

Date Collected: 07/21/21 09:35

Matrix: Water

Date Received: 07/21/21 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			151547	07/22/21 08:59	X4HV	ELLE
Total/NA	Analysis	537 IDA		1	151710	07/23/21 00:40	QD9Y	ELLE
Total/NA	Prep	537 IDA	DL		151547	07/22/21 08:59	X4HV	ELLE
Total/NA	Analysis	537 IDA	DL	10	152457	07/25/21 14:13	PY4D	ELLE

Client Sample ID: S-80D-DUP_20210721

Lab Sample ID: 410-48086-16

Date Collected: 07/21/21 09:35

Matrix: Water

Date Received: 07/21/21 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			151547	07/22/21 08:59	X4HV	ELLE
Total/NA	Analysis	537 IDA		1	151710	07/23/21 00:51	QD9Y	ELLE
Total/NA	Prep	537 IDA	DL		151547	07/22/21 08:59	X4HV	ELLE
Total/NA	Analysis	537 IDA	DL	10	152457	07/25/21 14:25	PY4D	ELLE

Lab Chronicle

Client: Sanborn Head & Associates Inc
Job ID: 410-48086-1
Project/Site: Evergreen Philadelphia PFAS

Client Sample ID: S-69D_20210721
Lab Sample ID: 410-48086-17
Date Collected: 07/21/21 11:55
Matrix: Water
Date Received: 07/21/21 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			151547	07/22/21 08:59	X4HV	ELLE
Total/NA	Analysis	537 IDA		1	151710	07/23/21 01:14	QD9Y	ELLE
Total/NA	Prep	537 IDA	RA		151547	07/22/21 08:59	X4HV	ELLE
Total/NA	Analysis	537 IDA	RA	1	151966	07/23/21 16:38	QD9Y	ELLE

Client Sample ID: S-284D_20210721
Lab Sample ID: 410-48086-18
Date Collected: 07/21/21 11:55
Matrix: Water
Date Received: 07/21/21 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			151547	07/22/21 08:59	X4HV	ELLE
Total/NA	Analysis	537 IDA		1	151710	07/23/21 01:25	QD9Y	ELLE
Total/NA	Prep	537 IDA	RA		151547	07/22/21 08:59	X4HV	ELLE
Total/NA	Analysis	537 IDA	RA	1	151966	07/23/21 16:49	QD9Y	ELLE

Client Sample ID: FB-03_20210721
Lab Sample ID: 410-48086-19
Date Collected: 07/21/21 11:50
Matrix: Water
Date Received: 07/21/21 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			151547	07/22/21 08:59	X4HV	ELLE
Total/NA	Analysis	537 IDA		1	151710	07/23/21 01:36	QD9Y	ELLE

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Sanborn Head & Associates Inc
Job ID: 410-48086-1
Project/Site: Evergreen Philadelphia PFAS

Laboratory: Eurofins Lancaster Laboratories Env, LLC

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	36-00037	01-31-22

Method Summary

Client: Sanborn Head & Associates Inc
Project/Site: Evergreen Philadelphia PFAS

Job ID: 410-48086-1

Method	Method Description	Protocol	Laboratory
537 IDA	EPA 537 Isotope Dilution	EPA	ELLE
537 IDA	EPA 537 Isotope Dilution	EPA	ELLE

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: Sanborn Head & Associates Inc
Project/Site: Evergreen Philadelphia PFAS

Job ID: 410-48086-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-48086-1	N-163_20210719	Water	07/19/21 11:50	07/21/21 16:35
410-48086-2	N-9_20210719	Water	07/19/21 12:40	07/21/21 16:35
410-48086-3	N-69_20210719	Water	07/19/21 14:30	07/21/21 16:35
410-48086-4	N-38D_20210719	Water	07/19/21 14:40	07/21/21 16:35
410-48086-5	EB-01_20210719	Water	07/19/21 11:30	07/21/21 16:35
410-48086-6	FB-01_20210719	Water	07/19/21 11:50	07/21/21 16:35
410-48086-7	S-294D_20210720	Water	07/20/21 09:40	07/21/21 16:35
410-48086-8	PGW-MW-8D_20210720	Water	07/20/21 11:15	07/21/21 16:35
410-48086-9	S-391D_20210720	Water	07/20/21 11:25	07/21/21 16:35
410-48086-10	S-302D_20210720	Water	07/20/21 12:45	07/21/21 16:35
410-48086-11	S-264D_20210720	Water	07/20/21 14:45	07/21/21 16:35
410-48086-12	S-388D_20210720	Water	07/20/21 14:55	07/21/21 16:35
410-48086-13	S-389D_20210720	Water	07/20/21 14:40	07/21/21 16:35
410-48086-14	FB-02_20210720	Water	07/20/21 10:00	07/21/21 16:35
410-48086-15	S-80D_20210721	Water	07/21/21 09:35	07/21/21 16:35
410-48086-16	S-80D-DUP_20210721	Water	07/21/21 09:35	07/21/21 16:35
410-48086-17	S-69D_20210721	Water	07/21/21 11:55	07/21/21 16:35
410-48086-18	S-284D_20210721	Water	07/21/21 11:55	07/21/21 16:35
410-48086-19	FB-03_20210721	Water	07/21/21 11:50	07/21/21 16:35

Env, LLC

Chain of Custody Record

eurofins Environment Testing America

410-48086 Chain of Custody

Michael Fuerte	Sampler: Michael Fuerte	Lab PM: Maljovec, Nicole	Carrier Tracking No(s):	COC No: 410-29329-9098.2
	Phone: 262-496-9759	E-Mail: Nicole.Maljovec@eurofinset.com	State of Origin: PA	Page: Page ~~2 of 4~~ 1 of 2
Company: Sanborn Head & Associates Inc	PWSID:			Job #:
Address: 1015 Virginia Drive Suite 100	Due Date Requested:			
City: Fort Washington	TAT Requested (days): 5			
State, Zip: PA, 19034	Compliance Project: Δ Yes Δ No			
Phone: 603-415-6136(Tel)	PO #: 4796.01			
Email: MFuerte@sanbornhead.com	WO #:			
Project Name: Evergreen Philadelphia PFAS	Project #: 41006783			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	PFC_IDA - UCMR3 6 PFAS with UMCR5 contingent	Total Number of containers	Special Instructions/Note:
			Preserv.	Bot. Code	N			
N-163_20210719	7/19	1150	G	W		X		← only 1 bottle filled due to leak
N-9_20210719	7/19	1240	G	W		X		
N-69_20210719	7/19	1430	G	W		X		
N-38D_20210719	7/19	1440	G	W		X		please cc Kdubois@sanbornhead.com on all correspondence
EB-01_20210719	7/19	1130	G	W		X		
FB-01_20210719	7/19	1150	G	W		X		
S-29D_20210720	7/20	940	G	W		X		
PGH-MW-8D_20210720	7/20	1115	G	W		X		
S-39ID_20210720	7/20	1125	G	W		X		
S-302D_20210720	7/20	1245	G	W		X		
S-26D_20210720	7/20	1495	G	W		X		

Possible Hazard Identification

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

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

☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) Type II

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:			
Relinquished by: Michael Fuerte	Date/Time: 7/21/21 1335	Company: SHA	Received by:	Date/Time: 7/21/21 13:35	Company: ELE	
Relinquished by:	Date/Time: 7/21 1605	Company:	Received by:	Date/Time:	Company:	
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time: 7/22/21 11:35	Company: ELE	

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 2.0 - 5.2

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Phone (717) 656-2300

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: Michael Fuerte	Lab PM: Maljovec, Nicole	Carrier Tracking No(s):	COC No: 410-29329-9098.3
Client Contact: Michael Fuerte	Phone: 262-496-9759	E-Mail: Nicole.Maljovec@eurofinset.com	State of Origin: PA	Page: Page ~~3 of 4~~ 2 of 2
Company: Sanborn Head & Associates Inc	PWSID:	Analysis Requested		Job #:
Address: 1015 Virginia Drive Suite 100	Due Date Requested:			Preservation Codes:
City: Fort Washington	TAT Requested (days): 5			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
State, Zip: PA, 19034	Compliance Project: Δ Yes Δ No			
Phone: 603-415-6136(Tel)	PO #: 4796.01			Other:
Email: MFuerte@sanbornhead.com	WO #:			
Project Name: Evergreen Philadelphia PFAS	Project #: 41006783			
Site:	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IDA - UCMR3 6 PFAS with UMCR5 contingent	Special Instructions/Note:
			Preservation Code:				N	
S-38D_20210720	7/20	1455	G	W			X	
S-39D_20210720	7/20	1440	G	W			X	please cc
FB-02_20210720	7/20	1000	G	W			X	
S-8D_20210721	7/21	935	G	W			X	Kdubois@sanborn
S-8D-Dup_20210721	7/21	935	G	W			X	head.com
S-69D_20210721	7/21	1155	G	W			X	on all correspondence
S-28D_20210721	7/21	1155	G	W			X	
FB-03_20210721	7/21	1150	G	W			X	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) Type II

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by: Michael Fuerte	Date/Time: 7/21/21 1335	Company: SHA	Received by:	Date/Time: 7/21/21 1335	Company: EHS
Relinquished by:	Date/Time: 7/21 1605	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 7/21/21 1605	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 2.0 - 5.2

Login Sample Receipt Checklist

Client: Sanborn Head & Associates Inc

Job Number: 410-48086-1

Login Number: 48086

List Source: Eurofins Lancaster Laboratories Env, LLC

List Number: 1

Creator: Jeremiah, Cory T

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	N/A	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified.	N/A	
Residual Chlorine Checked.	N/A	
Sample custody seals are intact.	N/A	

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ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-48541-1
Client Project/Site: Evergreen Philadelphia PFAS

For:
Sanborn Head & Associates Inc
1015 Virginia Drive
Suite 100
Fort Washington, Pennsylvania 19034

Attn: Patrick Troy

Authorized for release by:
7/30/2021 11:00:25 AM

Nicole Maljovec, Client Services Manager
(717)556-7259
Nicole.Maljovec@eurofinset.com

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

This report shall not be reproduced except in full, without the written approval of the laboratory.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Nicole Maljovec
Client Services Manager
7/30/2021 11:00:25 AM

Table of Contents

Definitions/Glossary

Client: Sanborn Head & Associates Inc
Job ID: 410-48541-1
Project/Site: Evergreen Philadelphia PFAS

Qualifiers

LCMS

Qualifier	Qualifier Description
*5+	Isotope dilution analyte is outside acceptance limits, high biased.
I	Value is EMPC (estimated maximum possible concentration).

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-48541-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative
410-48541-1

Receipt
The samples were received on 7/23/2021 4:05 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.3°C and 5.3°C

PFAS
Method PFC_IDA: The labeled isotope recovery is outside of the QC acceptance limits in the method blank and laboratory control spike(s) associated with the following samples: N-149D_20210721 (410-48541-1), S-393D_20210721 (410-48541-2), S-39D_20210721 (410-48541-3), C-129D_20210721 (410-48541-4), C-144D_20210722 (410-48541-8) and A-21D_20210722 (410-48541-9). Since the recovery is biased high, the associated target analytes are not detected in the method blank, and the associated target analytes are within the QC limits in the laboratory control spike(s), the data is reported.

Method PFC_IDA: The labeled isotope recovery is outside of the QC acceptance limits in the following samples: N-149D_20210721 (410-48541-1) and S-39D_20210721 (410-48541-3). Since the recovery is biased high and the associated target analytes are not detected in the samples, the data is reported.Reporting limits were raised for the following samples: N-149D_20210721 (410-48541-1) and S-39D_20210721 (410-48541-3) due to interference from the sample matrix.

Method PFC_IDA: The sample injection standard peak areas in the following samples:C-129D_20210721 (410-48541-4), C-144D_20210722 (410-48541-8) and A-21D_20210722 (410-48541-9) are outside of the QC limits for both the initial injection and re-injection. The values here are from the initial injection of the sample.

Method PFC_IDA: The labeled isotope recovery is outside of the QC acceptance limits in the following samples due to interference from sample matrix: C-144D_20210722 (410-48541-8) and A-21D_20210722 (410-48541-9).

Method PFC_IDA: The recovery for the labeled isotope(s) in the following sample: S-110DSRTF_20210723 (410-48541-12) is outside the QC acceptance limits due to the matrix of the sample.

Method PFC_IDA: The recovery for the labeled isotope(s) in the following sample: S-115DSRTF_20210723 (410-48541-13) is outside the QC acceptance limits due to the matrix of the sample.The sample injection standard peak areas in the following sample: S-115DSRTF_20210723 (410-48541-13) are outside of the QC limits for both the initial injection and the re-injection. The values here are from the initial injection of the sample.

Method PFC_IDA: The recovery for the labeled isotope(s) in the following sample: S-38D_20210722 (410-48541-6) is outside the QC acceptance limits. Since the recovery is high and the native analyte is not detected in the sample, the data is reported.

Method PFC_IDA: The sample injection standard peak areas in the following samples: B-134D_20210722 (410-48541-7) and C-134D_20210722 (410-48541-10) are outside of the QC limits for both the initial injection and the re-injection. The values here are from the initial injection of the sample.The recovery for the labeled isotope(s) in the following sample(s): B-134D_20210722 (410-48541-7) and C-134D_20210722 (410-48541-10) is outside the QC acceptance limits due to the matrix of the sample.

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

Detection Summary

Client: Sanborn Head & Associates Inc
Project/Site: Evergreen Philadelphia PFAS

Job ID: 410-48541-1

Client Sample ID: N-149D_20210721 — Lab Sample ID: 410-48541-1

No Detections.

Client Sample ID: S-393D_20210721 — Lab Sample ID: 410-48541-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	5.9		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	11		1.6		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	1.9		1.6		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	1.7	I	1.6		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	2.6		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	4.1		1.6		ng/L	1		537 IDA	Total/NA

Client Sample ID: S-39D_20210721 — Lab Sample ID: 410-48541-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid	20		20		ng/L	1		537 IDA	Total/NA

Client Sample ID: C-129D_20210721 — Lab Sample ID: 410-48541-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	1.9		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	8.8		1.6		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	8.5		1.6		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	1.6	I	1.6		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	2.0		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	3.5		1.6		ng/L	1		537 IDA	Total/NA

Client Sample ID: A-19D_20210722 — Lab Sample ID: 410-48541-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	39		20		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	99	I	20		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	370		20		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	33		20		ng/L	1		537 IDA	Total/NA

Client Sample ID: S-38D_20210722 — Lab Sample ID: 410-48541-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid	2.1		1.6		ng/L	1		537 IDA	Total/NA

Client Sample ID: B-134D_20210722 — Lab Sample ID: 410-48541-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	89		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	97		1.6		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	60		1.6		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	3.4	I	1.6		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	18		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	73		1.6		ng/L	1		537 IDA	Total/NA

Client Sample ID: C-144D_20210722 — Lab Sample ID: 410-48541-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	12		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	19		1.6		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	5.7		1.6		ng/L	1		537 IDA	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Lancaster Laboratories Env, LLC

Detection Summary

Client: Sanborn Head & Associates Inc
Project/Site: Evergreen Philadelphia PFAS

Job ID: 410-48541-1

Client Sample ID: A-21D_20210722 — Lab Sample ID: 410-48541-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	32		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	38		1.6		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	24		1.6		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	2.6		1.6		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	24		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	36		1.6		ng/L	1		537 IDA	Total/NA

Client Sample ID: C-134D_20210722 — Lab Sample ID: 410-48541-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	32		1.7		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	41		1.7		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	23		1.7		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	3.6		1.7		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	2.4		1.7		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	7.7		1.7		ng/L	1		537 IDA	Total/NA

Client Sample ID: B-48D_20210722 — Lab Sample ID: 410-48541-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	3.7		1.7		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	23		1.7		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	43		1.7		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	3.6		1.7		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	8.2		1.7		ng/L	1		537 IDA	Total/NA

Client Sample ID: S-110DSRTF_20210723 — Lab Sample ID: 410-48541-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	40		1.7		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	86		1.7		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	9.8	I	1.7		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	11		1.7		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	26		1.7		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid - DL2	580		17		ng/L	10		537 IDA	Total/NA

Client Sample ID: S-115DSRTF_20210723 — Lab Sample ID: 410-48541-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	56		1.6		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	87		1.6		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	3.3		1.6		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	11		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	37		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid - DL	550		16		ng/L	10		537 IDA	Total/NA

Client Sample ID: S-143SRTF_20210723 — Lab Sample ID: 410-48541-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	11		1.7		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	200		1.7		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	13		1.7		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	4.8	I	1.7		ng/L	1		537 IDA	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Lancaster Laboratories Env, LLC

Client Sample ID: S-143SRTF_20210723 (Continued) — Lab Sample ID: 410-48541-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid	8.2		1.7		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	14		1.7		ng/L	1		537 IDA	Total/NA

Client Sample ID: W-27_20210723 — Lab Sample ID: 410-48541-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	49		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	53		1.6		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	27		1.6		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	7.8		1.6		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	8.6		1.6		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	53		1.6		ng/L	1		537 IDA	Total/NA

Client Sample ID: FB-04_20210723 — Lab Sample ID: 410-48541-16

No Detections.

Client Sample ID: EB-02_20210723 — Lab Sample ID: 410-48541-17

No Detections.

Client Sample ID: S-143SRTF-Dup_20210723 — Lab Sample ID: 410-48541-18

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid	11		1.8		ng/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	200		1.8		ng/L	1		537 IDA	Total/NA
Perfluorononanoic acid	13		1.8		ng/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	4.9	I	1.8		ng/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	8.0		1.8		ng/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	14		1.8		ng/L	1		537 IDA	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Sanborn Head & Associates Inc
Job ID: 410-48541-1
Project/Site: Evergreen Philadelphia PFAS

Client Sample ID: N-149D_20210721
Lab Sample ID: 410-48541-1
Date Collected: 07/21/21 12:15
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	<20		20		ng/L		07/26/21 07:58	07/27/21 02:25	1
Perfluorooctanoic acid	<20		20		ng/L		07/26/21 07:58	07/27/21 02:25	1
Perfluorononanoic acid	<20		20		ng/L		07/26/21 07:58	07/27/21 02:25	1
Perfluorobutanesulfonic acid	<20		20		ng/L		07/26/21 07:58	07/27/21 02:25	1
Perfluorohexanesulfonic acid	<20		20		ng/L		07/26/21 07:58	07/27/21 02:25	1
Perfluorooctanesulfonic acid	<20		20		ng/L		07/26/21 07:58	07/27/21 02:25	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*145*	*5+*	*30 - 144*	*07/26/21 07:58*	*07/27/21 02:25*	*1*
13C8 PFOA	*128*	*5+*	*49 - 127*	*07/26/21 07:58*	*07/27/21 02:25*	*1*
13C9 PFNA	*147*	*5+*	*47 - 136*	*07/26/21 07:58*	*07/27/21 02:25*	*1*
13C3 PFBS	*146*		*19 - 178*	*07/26/21 07:58*	*07/27/21 02:25*	*1*
13C3 PFHxS	*132*		*32 - 145*	*07/26/21 07:58*	*07/27/21 02:25*	*1*
13C8 PFOS	*137*	*5+*	*49 - 126*	*07/26/21 07:58*	*07/27/21 02:25*	*1*

Client Sample ID: S-393D_20210721
Lab Sample ID: 410-48541-2
Date Collected: 07/21/21 09:50
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	**5.9**		1.6		ng/L		07/26/21 07:58	07/27/21 02:36	1
Perfluorooctanoic acid	**11**		1.6		ng/L		07/26/21 07:58	07/27/21 02:36	1
Perfluorononanoic acid	**1.9**		1.6		ng/L		07/26/21 07:58	07/27/21 02:36	1
Perfluorobutanesulfonic acid	**1.7**	I	1.6		ng/L		07/26/21 07:58	07/27/21 02:36	1
Perfluorohexanesulfonic acid	**2.6**		1.6		ng/L		07/26/21 07:58	07/27/21 02:36	1
Perfluorooctanesulfonic acid	**4.1**		1.6		ng/L		07/26/21 07:58	07/27/21 02:36	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*128*		*30 - 144*	*07/26/21 07:58*	*07/27/21 02:36*	*1*
13C8 PFOA	*120*		*49 - 127*	*07/26/21 07:58*	*07/27/21 02:36*	*1*
13C9 PFNA	*134*		*47 - 136*	*07/26/21 07:58*	*07/27/21 02:36*	*1*
13C3 PFBS	*156*		*19 - 178*	*07/26/21 07:58*	*07/27/21 02:36*	*1*
13C3 PFHxS	*119*		*32 - 145*	*07/26/21 07:58*	*07/27/21 02:36*	*1*
13C8 PFOS	*122*		*49 - 126*	*07/26/21 07:58*	*07/27/21 02:36*	*1*

Client Sample ID: S-39D_20210721
Lab Sample ID: 410-48541-3
Date Collected: 07/21/21 14:30
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	<20		20		ng/L		07/26/21 07:58	07/27/21 02:47	1
Perfluorooctanoic acid	**20**		20		ng/L		07/26/21 07:58	07/27/21 02:47	1
Perfluorononanoic acid	<20		20		ng/L		07/26/21 07:58	07/27/21 02:47	1
Perfluorobutanesulfonic acid	<20		20		ng/L		07/26/21 07:58	07/27/21 02:47	1
Perfluorohexanesulfonic acid	<20		20		ng/L		07/26/21 07:58	07/27/21 02:47	1
Perfluorooctanesulfonic acid	<20		20		ng/L		07/26/21 07:58	07/27/21 02:47	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*138*		*30 - 144*	*07/26/21 07:58*	*07/27/21 02:47*	*1*
13C8 PFOA	*127*		*49 - 127*	*07/26/21 07:58*	*07/27/21 02:47*	*1*
13C9 PFNA	*143*	*5+*	*47 - 136*	*07/26/21 07:58*	*07/27/21 02:47*	*1*

Client Sample ID: S-39D_20210721
Lab Sample ID: 410-48541-3

Date Collected: 07/21/21 14:30
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 PFBS	142		19 - 178	07/26/21 07:58	07/27/21 02:47	1
13C3 PFHxS	128		32 - 145	07/26/21 07:58	07/27/21 02:47	1
13C8 PFOS	137	*5+	49 - 126	07/26/21 07:58	07/27/21 02:47	1

Client Sample ID: C-129D_20210721
Lab Sample ID: 410-48541-4

Date Collected: 07/21/21 14:10
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	1.9		1.6		ng/L		07/26/21 07:58	07/27/21 02:58	1
Perfluorooctanoic acid	8.8		1.6		ng/L		07/26/21 07:58	07/27/21 02:58	1
Perfluorononanoic acid	8.5		1.6		ng/L		07/26/21 07:58	07/27/21 02:58	1
Perfluorobutanesulfonic acid	1.6	I	1.6		ng/L		07/26/21 07:58	07/27/21 02:58	1
Perfluorohexanesulfonic acid	2.0		1.6		ng/L		07/26/21 07:58	07/27/21 02:58	1
Perfluorooctanesulfonic acid	3.5		1.6		ng/L		07/26/21 07:58	07/27/21 02:58	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFHpA	105		30 - 144	07/26/21 07:58	07/27/21 02:58	1
13C8 PFOA	107		49 - 127	07/26/21 07:58	07/27/21 02:58	1
13C9 PFNA	132		47 - 136	07/26/21 07:58	07/27/21 02:58	1
13C3 PFBS	172		19 - 178	07/26/21 07:58	07/27/21 02:58	1
13C3 PFHxS	106		32 - 145	07/26/21 07:58	07/27/21 02:58	1
13C8 PFOS	125		49 - 126	07/26/21 07:58	07/27/21 02:58	1

Client Sample ID: A-19D_20210722
Lab Sample ID: 410-48541-5

Date Collected: 07/22/21 12:25
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	39		20		ng/L		07/28/21 15:31	07/29/21 20:08	1
Perfluorooctanoic acid	99	I	20		ng/L		07/28/21 15:31	07/29/21 20:08	1
Perfluorononanoic acid	370		20		ng/L		07/28/21 15:31	07/29/21 20:08	1
Perfluorobutanesulfonic acid	<20		20		ng/L		07/28/21 15:31	07/29/21 20:08	1
Perfluorohexanesulfonic acid	<20		20		ng/L		07/28/21 15:31	07/29/21 20:08	1
Perfluorooctanesulfonic acid	33		20		ng/L		07/28/21 15:31	07/29/21 20:08	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFHpA	122		30 - 144	07/28/21 15:31	07/29/21 20:08	1
13C8 PFOA	100		49 - 127	07/28/21 15:31	07/29/21 20:08	1
13C9 PFNA	127		47 - 136	07/28/21 15:31	07/29/21 20:08	1
13C3 PFBS	137		19 - 178	07/28/21 15:31	07/29/21 20:08	1
13C3 PFHxS	101		32 - 145	07/28/21 15:31	07/29/21 20:08	1
13C8 PFOS	116		49 - 126	07/28/21 15:31	07/29/21 20:08	1

Client Sample ID: S-38D_20210722
Lab Sample ID: 410-48541-6

Date Collected: 07/22/21 14:35
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	<1.6		1.6		ng/L		07/28/21 15:31	07/29/21 20:19	1
Perfluorooctanoic acid	<1.6		1.6		ng/L		07/28/21 15:31	07/29/21 20:19	1
Perfluorononanoic acid	<1.6		1.6		ng/L		07/28/21 15:31	07/29/21 20:19	1
Perfluorobutanesulfonic acid	<1.6		1.6		ng/L		07/28/21 15:31	07/29/21 20:19	1
Perfluorohexanesulfonic acid	<1.6		1.6		ng/L		07/28/21 15:31	07/29/21 20:19	1
Perfluorooctanesulfonic acid	**2.1**		1.6		ng/L		07/28/21 15:31	07/29/21 20:19	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*114*		*30 - 144*	*07/28/21 15:31*	*07/29/21 20:19*	*1*
13C8 PFOA	*105*		*49 - 127*	*07/28/21 15:31*	*07/29/21 20:19*	*1*
13C9 PFNA	*140*	*5+	*47 - 136*	*07/28/21 15:31*	*07/29/21 20:19*	*1*
13C3 PFBS	*136*		*19 - 178*	*07/28/21 15:31*	*07/29/21 20:19*	*1*
13C3 PFHxS	*100*		*32 - 145*	*07/28/21 15:31*	*07/29/21 20:19*	*1*
13C8 PFOS	*118*		*49 - 126*	*07/28/21 15:31*	*07/29/21 20:19*	*1*

Client Sample ID: B-134D_20210722
Lab Sample ID: 410-48541-7

Date Collected: 07/22/21 12:10
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	**89**		1.6		ng/L		07/28/21 15:31	07/29/21 20:29	1
Perfluorooctanoic acid	**97**		1.6		ng/L		07/28/21 15:31	07/29/21 20:29	1
Perfluorononanoic acid	**60**		1.6		ng/L		07/28/21 15:31	07/29/21 20:29	1
Perfluorobutanesulfonic acid	**3.4**	I	1.6		ng/L		07/28/21 15:31	07/29/21 20:29	1
Perfluorohexanesulfonic acid	**18**		1.6		ng/L		07/28/21 15:31	07/29/21 20:29	1
Perfluorooctanesulfonic acid	**73**		1.6		ng/L		07/28/21 15:31	07/29/21 20:29	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*91*		*30 - 144*	*07/28/21 15:31*	*07/29/21 20:29*	*1*
13C8 PFOA	*79*		*49 - 127*	*07/28/21 15:31*	*07/29/21 20:29*	*1*
13C9 PFNA	*104*		*47 - 136*	*07/28/21 15:31*	*07/29/21 20:29*	*1*
13C3 PFBS	*237*	*5+	*19 - 178*	*07/28/21 15:31*	*07/29/21 20:29*	*1*
13C3 PFHxS	*85*		*32 - 145*	*07/28/21 15:31*	*07/29/21 20:29*	*1*
13C8 PFOS	*88*		*49 - 126*	*07/28/21 15:31*	*07/29/21 20:29*	*1*

Client Sample ID: C-144D_20210722
Lab Sample ID: 410-48541-8

Date Collected: 07/22/21 10:00
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	**12**		1.6		ng/L		07/26/21 07:58	07/27/21 03:42	1
Perfluorooctanoic acid	**19**		1.6		ng/L		07/26/21 07:58	07/27/21 03:42	1
Perfluorononanoic acid	**5.7**		1.6		ng/L		07/26/21 07:58	07/27/21 03:42	1
Perfluorobutanesulfonic acid	<1.6		1.6		ng/L		07/26/21 07:58	07/27/21 03:42	1
Perfluorohexanesulfonic acid	<1.6		1.6		ng/L		07/26/21 07:58	07/27/21 03:42	1
Perfluorooctanesulfonic acid	<1.6		1.6		ng/L		07/26/21 07:58	07/27/21 03:42	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*121*		*30 - 144*	*07/26/21 07:58*	*07/27/21 03:42*	*1*
13C8 PFOA	*126*		*49 - 127*	*07/26/21 07:58*	*07/27/21 03:42*	*1*
13C9 PFNA	*152*	*5+	*47 - 136*	*07/26/21 07:58*	*07/27/21 03:42*	*1*

Client Sample ID: C-144D_20210722
Lab Sample ID: 410-48541-8

Date Collected: 07/22/21 10:00
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 PFBS	232	*5+	19 - 178	07/26/21 07:58	07/27/21 03:42	1
13C3 PFHxS	109		32 - 145	07/26/21 07:58	07/27/21 03:42	1
13C8 PFOS	126		49 - 126	07/26/21 07:58	07/27/21 03:42	1

Client Sample ID: A-21D_20210722
Lab Sample ID: 410-48541-9

Date Collected: 07/22/21 14:55
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	32		1.6		ng/L		07/26/21 07:58	07/27/21 04:04	1
Perfluorooctanoic acid	38		1.6		ng/L		07/26/21 07:58	07/27/21 04:04	1
Perfluorononanoic acid	24		1.6		ng/L		07/26/21 07:58	07/27/21 04:04	1
Perfluorobutanesulfonic acid	2.6		1.6		ng/L		07/26/21 07:58	07/27/21 04:04	1
Perfluorohexanesulfonic acid	24		1.6		ng/L		07/26/21 07:58	07/27/21 04:04	1
Perfluorooctanesulfonic acid	36		1.6		ng/L		07/26/21 07:58	07/27/21 04:04	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFHpA	108		30 - 144	07/26/21 07:58	07/27/21 04:04	1
13C8 PFOA	109		49 - 127	07/26/21 07:58	07/27/21 04:04	1
13C9 PFNA	122		47 - 136	07/26/21 07:58	07/27/21 04:04	1
13C3 PFBS	198	*5+	19 - 178	07/26/21 07:58	07/27/21 04:04	1
13C3 PFHxS	100		32 - 145	07/26/21 07:58	07/27/21 04:04	1
13C8 PFOS	105		49 - 126	07/26/21 07:58	07/27/21 04:04	1

Client Sample ID: C-134D_20210722
Lab Sample ID: 410-48541-10

Date Collected: 07/22/21 09:35
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	32		1.7		ng/L		07/28/21 15:31	07/29/21 20:40	1
Perfluorooctanoic acid	41		1.7		ng/L		07/28/21 15:31	07/29/21 20:40	1
Perfluorononanoic acid	23		1.7		ng/L		07/28/21 15:31	07/29/21 20:40	1
Perfluorobutanesulfonic acid	3.6		1.7		ng/L		07/28/21 15:31	07/29/21 20:40	1
Perfluorohexanesulfonic acid	2.4		1.7		ng/L		07/28/21 15:31	07/29/21 20:40	1
Perfluorooctanesulfonic acid	7.7		1.7		ng/L		07/28/21 15:31	07/29/21 20:40	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFHpA	96		30 - 144	07/28/21 15:31	07/29/21 20:40	1
13C8 PFOA	85		49 - 127	07/28/21 15:31	07/29/21 20:40	1
13C9 PFNA	124		47 - 136	07/28/21 15:31	07/29/21 20:40	1
13C3 PFBS	223	*5+	19 - 178	07/28/21 15:31	07/29/21 20:40	1
13C3 PFHxS	88		32 - 145	07/28/21 15:31	07/29/21 20:40	1
13C8 PFOS	107		49 - 126	07/28/21 15:31	07/29/21 20:40	1

Client Sample ID: B-48D_20210722
Lab Sample ID: 410-48541-11

Date Collected: 07/22/21 12:05
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	3.7		1.7		ng/L		07/26/21 07:58	07/28/21 06:31	1
Perfluorooctanoic acid	23		1.7		ng/L		07/26/21 07:58	07/28/21 06:31	1
Perfluorononanoic acid	43		1.7		ng/L		07/26/21 07:58	07/28/21 06:31	1
Perfluorobutanesulfonic acid	<1.7		1.7		ng/L		07/26/21 07:58	07/28/21 06:31	1
Perfluorohexanesulfonic acid	3.6		1.7		ng/L		07/26/21 07:58	07/28/21 06:31	1
Perfluorooctanesulfonic acid	8.2		1.7		ng/L		07/26/21 07:58	07/28/21 06:31	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*99*		*30 - 144*	*07/26/21 07:58*	*07/28/21 06:31*	*1*
13C8 PFOA	*100*		*49 - 127*	*07/26/21 07:58*	*07/28/21 06:31*	*1*
13C9 PFNA	*115*		*47 - 136*	*07/26/21 07:58*	*07/28/21 06:31*	*1*
13C3 PFBS	*174*		*19 - 178*	*07/26/21 07:58*	*07/28/21 06:31*	*1*
13C3 PFHxS	*97*		*32 - 145*	*07/26/21 07:58*	*07/28/21 06:31*	*1*
13C8 PFOS	*99*		*49 - 126*	*07/26/21 07:58*	*07/28/21 06:31*	*1*

Client Sample ID: S-110DSRTF_20210723
Lab Sample ID: 410-48541-12

Date Collected: 07/23/21 10:05
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	40		1.7		ng/L		07/26/21 15:42	07/28/21 15:23	1
Perfluorononanoic acid	86		1.7		ng/L		07/26/21 15:42	07/28/21 15:23	1
Perfluorobutanesulfonic acid	9.8	I	1.7		ng/L		07/26/21 15:42	07/28/21 15:23	1
Perfluorohexanesulfonic acid	11		1.7		ng/L		07/26/21 15:42	07/28/21 15:23	1
Perfluorooctanesulfonic acid	26		1.7		ng/L		07/26/21 15:42	07/28/21 15:23	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*87*		*30 - 144*	*07/26/21 15:42*	*07/28/21 15:23*	*1*
13C8 PFOA	*84*		*49 - 127*	*07/26/21 15:42*	*07/28/21 15:23*	*1*
13C9 PFNA	*98*		*47 - 136*	*07/26/21 15:42*	*07/28/21 15:23*	*1*
13C3 PFBS	*206*	*5+	*19 - 178*	*07/26/21 15:42*	*07/28/21 15:23*	*1*
13C3 PFHxS	*97*		*32 - 145*	*07/26/21 15:42*	*07/28/21 15:23*	*1*
13C8 PFOS	*96*		*49 - 126*	*07/26/21 15:42*	*07/28/21 15:23*	*1*

Method: 537 IDA - EPA 537 Isotope Dilution - DL2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid	580		17		ng/L		07/26/21 15:42	07/28/21 15:34	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 PFOA	*96*		*49 - 127*	*07/26/21 15:42*	*07/28/21 15:34*	*10*

Client Sample ID: S-115DSRTF_20210723
Lab Sample ID: 410-48541-13

Date Collected: 07/23/21 09:40
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	56		1.6		ng/L		07/26/21 15:42	07/28/21 04:06	1
Perfluorononanoic acid	87		1.6		ng/L		07/26/21 15:42	07/28/21 04:06	1
Perfluorobutanesulfonic acid	3.3		1.6		ng/L		07/26/21 15:42	07/28/21 04:06	1
Perfluorohexanesulfonic acid	11		1.6		ng/L		07/26/21 15:42	07/28/21 04:06	1
Perfluorooctanesulfonic acid	37		1.6		ng/L		07/26/21 15:42	07/28/21 04:06	1

Client Sample ID: S-115DSRTF_20210723
Lab Sample ID: 410-48541-13

Date Collected: 07/23/21 09:40
Matrix: Water
Date Received: 07/23/21 16:05

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFHpA	85		30 - 144	07/26/21 15:42	07/28/21 04:06	1
13C8 PFOA	86		49 - 127	07/26/21 15:42	07/28/21 04:06	1
13C9 PFNA	106		47 - 136	07/26/21 15:42	07/28/21 04:06	1
13C3 PFBS	253	*5+	19 - 178	07/26/21 15:42	07/28/21 04:06	1
13C3 PFHxS	99		32 - 145	07/26/21 15:42	07/28/21 04:06	1
13C8 PFOS	95		49 - 126	07/26/21 15:42	07/28/21 04:06	1

Method: 537 IDA - EPA 537 Isotope Dilution - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid	550		16		ng/L		07/26/21 15:42	07/28/21 15:57	10

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 PFOA	99		49 - 127	07/26/21 15:42	07/28/21 15:57	10

Client Sample ID: S-143SRTF_20210723
Lab Sample ID: 410-48541-14

Date Collected: 07/23/21 09:50
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	11		1.7		ng/L		07/26/21 15:42	07/28/21 04:17	1
Perfluorooctanoic acid	200		1.7		ng/L		07/26/21 15:42	07/28/21 04:17	1
Perfluorononanoic acid	13		1.7		ng/L		07/26/21 15:42	07/28/21 04:17	1
Perfluorobutanesulfonic acid	4.8	I	1.7		ng/L		07/26/21 15:42	07/28/21 04:17	1
Perfluorohexanesulfonic acid	8.2		1.7		ng/L		07/26/21 15:42	07/28/21 04:17	1
Perfluorooctanesulfonic acid	14		1.7		ng/L		07/26/21 15:42	07/28/21 04:17	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFHpA	91		30 - 144	07/26/21 15:42	07/28/21 04:17	1
13C8 PFOA	94		49 - 127	07/26/21 15:42	07/28/21 04:17	1
13C9 PFNA	112		47 - 136	07/26/21 15:42	07/28/21 04:17	1
13C3 PFBS	168		19 - 178	07/26/21 15:42	07/28/21 04:17	1
13C3 PFHxS	94		32 - 145	07/26/21 15:42	07/28/21 04:17	1
13C8 PFOS	100		49 - 126	07/26/21 15:42	07/28/21 04:17	1

Client Sample ID: W-27_20210723
Lab Sample ID: 410-48541-15

Date Collected: 07/23/21 12:20
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	49		1.6		ng/L		07/26/21 15:42	07/28/21 04:40	1
Perfluorooctanoic acid	53		1.6		ng/L		07/26/21 15:42	07/28/21 04:40	1
Perfluorononanoic acid	27		1.6		ng/L		07/26/21 15:42	07/28/21 04:40	1
Perfluorobutanesulfonic acid	7.8		1.6		ng/L		07/26/21 15:42	07/28/21 04:40	1
Perfluorohexanesulfonic acid	8.6		1.6		ng/L		07/26/21 15:42	07/28/21 04:40	1
Perfluorooctanesulfonic acid	53		1.6		ng/L		07/26/21 15:42	07/28/21 04:40	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFHpA	93		30 - 144	07/26/21 15:42	07/28/21 04:40	1
13C8 PFOA	96		49 - 127	07/26/21 15:42	07/28/21 04:40	1
13C9 PFNA	109		47 - 136	07/26/21 15:42	07/28/21 04:40	1
13C3 PFBS	163		19 - 178	07/26/21 15:42	07/28/21 04:40	1
13C3 PFHxS	95		32 - 145	07/26/21 15:42	07/28/21 04:40	1

Client Sample ID: W-27_20210723
Lab Sample ID: 410-48541-15
Date Collected: 07/23/21 12:20
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 PFOS	*103*		*49 - 126*	*07/26/21 15:42*	*07/28/21 04:40*	*1*

Client Sample ID: FB-04_20210723
Lab Sample ID: 410-48541-16
Date Collected: 07/23/21 10:00
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	<1.7		1.7		ng/L		07/26/21 15:42	07/28/21 04:51	1
Perfluorooctanoic acid	<1.7		1.7		ng/L		07/26/21 15:42	07/28/21 04:51	1
Perfluorononanoic acid	<1.7		1.7		ng/L		07/26/21 15:42	07/28/21 04:51	1
Perfluorobutanesulfonic acid	<1.7		1.7		ng/L		07/26/21 15:42	07/28/21 04:51	1
Perfluorohexanesulfonic acid	<1.7		1.7		ng/L		07/26/21 15:42	07/28/21 04:51	1
Perfluorooctanesulfonic acid	<1.7		1.7		ng/L		07/26/21 15:42	07/28/21 04:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*101*		*30 - 144*	*07/26/21 15:42*	*07/28/21 04:51*	*1*
13C8 PFOA	*103*		*49 - 127*	*07/26/21 15:42*	*07/28/21 04:51*	*1*
13C9 PFNA	*104*		*47 - 136*	*07/26/21 15:42*	*07/28/21 04:51*	*1*
13C3 PFBS	*112*		*19 - 178*	*07/26/21 15:42*	*07/28/21 04:51*	*1*
13C3 PFHxS	*103*		*32 - 145*	*07/26/21 15:42*	*07/28/21 04:51*	*1*
13C8 PFOS	*102*		*49 - 126*	*07/26/21 15:42*	*07/28/21 04:51*	*1*

Client Sample ID: EB-02_20210723
Lab Sample ID: 410-48541-17
Date Collected: 07/23/21 11:45
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	<1.9		1.9		ng/L		07/26/21 15:42	07/28/21 05:02	1
Perfluorooctanoic acid	<1.9		1.9		ng/L		07/26/21 15:42	07/28/21 05:02	1
Perfluorononanoic acid	<1.9		1.9		ng/L		07/26/21 15:42	07/28/21 05:02	1
Perfluorobutanesulfonic acid	<1.9		1.9		ng/L		07/26/21 15:42	07/28/21 05:02	1
Perfluorohexanesulfonic acid	<1.9		1.9		ng/L		07/26/21 15:42	07/28/21 05:02	1
Perfluorooctanesulfonic acid	<1.9		1.9		ng/L		07/26/21 15:42	07/28/21 05:02	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*102*		*30 - 144*	*07/26/21 15:42*	*07/28/21 05:02*	*1*
13C8 PFOA	*105*		*49 - 127*	*07/26/21 15:42*	*07/28/21 05:02*	*1*
13C9 PFNA	*106*		*47 - 136*	*07/26/21 15:42*	*07/28/21 05:02*	*1*
13C3 PFBS	*119*		*19 - 178*	*07/26/21 15:42*	*07/28/21 05:02*	*1*
13C3 PFHxS	*102*		*32 - 145*	*07/26/21 15:42*	*07/28/21 05:02*	*1*
13C8 PFOS	*102*		*49 - 126*	*07/26/21 15:42*	*07/28/21 05:02*	*1*

Client Sample ID: S-143SRTF-Dup_20210723
Lab Sample ID: 410-48541-18
Date Collected: 07/23/21 09:50
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	**11**		1.8		ng/L		07/26/21 15:42	07/28/21 05:13	1
Perfluorooctanoic acid	**200**		1.8		ng/L		07/26/21 15:42	07/28/21 05:13	1

Client: Sanborn Head & Associates Inc
Job ID: 410-48541-1
Project/Site: Evergreen Philadelphia PFAS

Client Sample ID: S-143SRTF-Dup_20210723
Lab Sample ID: 410-48541-18
Date Collected: 07/23/21 09:50
Matrix: Water
Date Received: 07/23/21 16:05

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid	13		1.8		ng/L		07/26/21 15:42	07/28/21 05:13	1
Perfluorobutanesulfonic acid	4.9	I	1.8		ng/L		07/26/21 15:42	07/28/21 05:13	1
Perfluorohexanesulfonic acid	8.0		1.8		ng/L		07/26/21 15:42	07/28/21 05:13	1
Perfluorooctanesulfonic acid	14		1.8		ng/L		07/26/21 15:42	07/28/21 05:13	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*91*		*30 - 144*	*07/26/21 15:42*	*07/28/21 05:13*	*1*
13C8 PFOA	*94*		*49 - 127*	*07/26/21 15:42*	*07/28/21 05:13*	*1*
13C9 PFNA	*105*		*47 - 136*	*07/26/21 15:42*	*07/28/21 05:13*	*1*
13C3 PFBS	*159*		*19 - 178*	*07/26/21 15:42*	*07/28/21 05:13*	*1*
13C3 PFHxS	*95*		*32 - 145*	*07/26/21 15:42*	*07/28/21 05:13*	*1*
13C8 PFOS	*100*		*49 - 126*	*07/26/21 15:42*	*07/28/21 05:13*	*1*

Isotope Dilution Summary

Client: Sanborn Head & Associates Inc
Project/Site: Evergreen Philadelphia PFAS

Job ID: 410-48541-1

Method: 537 IDA - EPA 537 Isotope Dilution

Matrix: Water

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)					
		C4PFHA	C8PFOA	C9PFNA	C3PFBS	C3PFHS	C8PFOS
Lab Sample ID	Client Sample ID	(30-144)	(49-127)	(47-136)	(19-178)	(32-145)	(49-126)
410-48541-1	N-149D_20210721	145 *5+	128 *5+	147 *5+	146	132	137 *5+
410-48541-2	S-393D_20210721	128	120	134	156	119	122
410-48541-3	S-39D_20210721	138	127	143 *5+	142	128	137 *5+
410-48541-4	C-129D_20210721	105	107	132	172	106	125
410-48541-5	A-19D_20210722	122	100	127	137	101	116
410-48541-6	S-38D_20210722	114	105	140 *5+	136	100	118
410-48541-7	B-134D_20210722	91	79	104	237 *5+	85	88
410-48541-8	C-144D_20210722	121	126	152 *5+	232 *5+	109	126
410-48541-9	A-21D_20210722	108	109	122	198 *5+	100	105
410-48541-10	C-134D_20210722	96	85	124	223 *5+	88	107
410-48541-11	B-48D_20210722	99	100	115	174	97	99
410-48541-12	S-110DSRTF_20210723	87	84	98	206 *5+	97	96
410-48541-12 - DL2	S-110DSRTF_20210723		96				
410-48541-13	S-115DSRTF_20210723	85	86	106	253 *5+	99	95
410-48541-13 - DL	S-115DSRTF_20210723		99				
410-48541-14	S-143SRTF_20210723	91	94	112	168	94	100
410-48541-15	W-27_20210723	93	96	109	163	95	103
410-48541-16	FB-04_20210723	101	103	104	112	103	102
410-48541-17	EB-02_20210723	102	105	106	119	102	102
410-48541-18	S-143SRTF-Dup_20210723	91	94	105	159	95	100
LCS 410-152579/2-A	Lab Control Sample	148 *5+	144 *5+	147 *5+	145	141	143 *5+
LCS 410-152792/2-A	Lab Control Sample	93	94	92	102	93	91
LCS 410-153868/2-A	Lab Control Sample	117	115	117	123	108	113
LCSD 410-152579/3-A	Lab Control Sample Dup	146 *5+	138 *5+	146 *5+	130	136	141 *5+
LCSD 410-152792/3-A	Lab Control Sample Dup	100	98	99	107	99	98
LCSD 410-153868/3-A	Lab Control Sample Dup	121	119	117	110	113	109
MB 410-152579/1-A	Method Blank	157 *5+	145 *5+	146 *5+	143	143	141 *5+
MB 410-152792/1-A	Method Blank	81	85	85	93	81	84
MB 410-153868/1-A	Method Blank	117	111	119	117	102	113

Surrogate Legend

C4PFHA = 13C4 PFHpA
C8PFOA = 13C8 PFOA
C9PFNA = 13C9 PFNA
C3PFBS = 13C3 PFBS
C3PFHS = 13C3 PFHxS
C8PFOS = 13C8 PFOS

Method: 537 IDA - EPA 537 Isotope Dilution

Lab Sample ID: MB 410-152579/1-A
Matrix: Water
Analysis Batch: 152856

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 152579

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	<2.0		2.0		ng/L		07/26/21 07:58	07/27/21 01:29	1
Perfluorooctanoic acid	<2.0		2.0		ng/L		07/26/21 07:58	07/27/21 01:29	1
Perfluorononanoic acid	<2.0		2.0		ng/L		07/26/21 07:58	07/27/21 01:29	1
Perfluorobutanesulfonic acid	<2.0		2.0		ng/L		07/26/21 07:58	07/27/21 01:29	1
Perfluorohexanesulfonic acid	<2.0		2.0		ng/L		07/26/21 07:58	07/27/21 01:29	1
Perfluorooctanesulfonic acid	<2.0		2.0		ng/L		07/26/21 07:58	07/27/21 01:29	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*157*	*5+	*30 - 144*	*07/26/21 07:58*	*07/27/21 01:29*	*1*
13C8 PFOA	*145*	*5+	*49 - 127*	*07/26/21 07:58*	*07/27/21 01:29*	*1*
13C9 PFNA	*146*	*5+	*47 - 136*	*07/26/21 07:58*	*07/27/21 01:29*	*1*
13C3 PFBS	*143*		*19 - 178*	*07/26/21 07:58*	*07/27/21 01:29*	*1*
13C3 PFHxS	*143*		*32 - 145*	*07/26/21 07:58*	*07/27/21 01:29*	*1*
13C8 PFOS	*141*	*5+	*49 - 126*	*07/26/21 07:58*	*07/27/21 01:29*	*1*

Lab Sample ID: LCS 410-152579/2-A
Matrix: Water
Analysis Batch: 152856

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 152579

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Perfluoroheptanoic acid			25.6	20.8		ng/L		81	66 - 141		
Perfluorooctanoic acid			25.6	21.8		ng/L		85	65 - 136		
Perfluorononanoic acid			25.6	23.3		ng/L		91	65 - 140		
Perfluorobutanesulfonic acid			22.7	19.3		ng/L		85	65 - 132		
Perfluorohexanesulfonic acid			23.3	18.8		ng/L		81	60 - 128		
Perfluorooctanesulfonic acid			23.7	20.1		ng/L		85	51 - 126		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFHpA	*148*	*5+	*30 - 144*
13C8 PFOA	*144*	*5+	*49 - 127*
13C9 PFNA	*147*	*5+	*47 - 136*
13C3 PFBS	*145*		*19 - 178*
13C3 PFHxS	*141*		*32 - 145*
13C8 PFOS	*143*	*5+	*49 - 126*

Lab Sample ID: LCSD 410-152579/3-A
Matrix: Water
Analysis Batch: 152856

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 152579

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroheptanoic acid			25.6	20.6		ng/L		81	66 - 141	1	30
Perfluorooctanoic acid			25.6	23.4		ng/L		92	65 - 136	7	30
Perfluorononanoic acid			25.6	22.6		ng/L		88	65 - 140	3	30
Perfluorobutanesulfonic acid			22.7	19.5		ng/L		86	65 - 132	1	30
Perfluorohexanesulfonic acid			23.3	19.3		ng/L		83	60 - 128	3	30
Perfluorooctanesulfonic acid			23.7	20.4		ng/L		86	51 - 126	1	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C4 PFHpA	*146*	*5+	*30 - 144*

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCSD 410-152579/3-A
Matrix: Water
Analysis Batch: 152856

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 152579

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C8 PFOA	138	*5+	49 - 127
13C9 PFNA	146	*5+	47 - 136
13C3 PFBS	130		19 - 178
13C3 PFHxS	136		32 - 145
13C8 PFOS	141	*5+	49 - 126

Lab Sample ID: MB 410-152792/1-A
Matrix: Water
Analysis Batch: 153242

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 152792

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	<2.0		2.0		ng/L		07/26/21 15:42	07/28/21 02:38	1
Perfluorooctanoic acid	<2.0		2.0		ng/L		07/26/21 15:42	07/28/21 02:38	1
Perfluorononanoic acid	<2.0		2.0		ng/L		07/26/21 15:42	07/28/21 02:38	1
Perfluorobutanesulfonic acid	<2.0		2.0		ng/L		07/26/21 15:42	07/28/21 02:38	1
Perfluorohexanesulfonic acid	<2.0		2.0		ng/L		07/26/21 15:42	07/28/21 02:38	1
Perfluorooctanesulfonic acid	<2.0		2.0		ng/L		07/26/21 15:42	07/28/21 02:38	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFHpA	81		30 - 144	07/26/21 15:42	07/28/21 02:38	1
13C8 PFOA	85		49 - 127	07/26/21 15:42	07/28/21 02:38	1
13C9 PFNA	85		47 - 136	07/26/21 15:42	07/28/21 02:38	1
13C3 PFBS	93		19 - 178	07/26/21 15:42	07/28/21 02:38	1
13C3 PFHxS	81		32 - 145	07/26/21 15:42	07/28/21 02:38	1
13C8 PFOS	84		49 - 126	07/26/21 15:42	07/28/21 02:38	1

Lab Sample ID: LCS 410-152792/2-A
Matrix: Water
Analysis Batch: 153242

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 152792

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid	25.6	28.0		ng/L		109	66 - 141
Perfluorooctanoic acid	25.6	25.9		ng/L		101	65 - 136
Perfluorononanoic acid	25.6	27.3		ng/L		106	65 - 140
Perfluorobutanesulfonic acid	22.7	21.6		ng/L		95	65 - 132
Perfluorohexanesulfonic acid	23.3	24.1		ng/L		103	60 - 128
Perfluorooctanesulfonic acid	23.7	24.8		ng/L		105	51 - 126

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFHpA	93		30 - 144
13C8 PFOA	94		49 - 127
13C9 PFNA	92		47 - 136
13C3 PFBS	102		19 - 178
13C3 PFHxS	93		32 - 145
13C8 PFOS	91		49 - 126

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCSD 410-152792/3-A
Matrix: Water
Analysis Batch: 153242

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 152792

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroheptanoic acid			25.6	28.1		ng/L		110	66 - 141	1	30
Perfluorooctanoic acid			25.6	28.0		ng/L		110	65 - 136	8	30
Perfluorononanoic acid			25.6	28.8		ng/L		113	65 - 140	6	30
Perfluorobutanesulfonic acid			22.7	22.1		ng/L		98	65 - 132	2	30
Perfluorohexanesulfonic acid			23.3	25.4		ng/L		109	60 - 128	5	30
Perfluorooctanesulfonic acid			23.7	26.0		ng/L		110	51 - 126	5	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C4 PFHpA	*100*		*30 - 144*
13C8 PFOA	*98*		*49 - 127*
13C9 PFNA	*99*		*47 - 136*
13C3 PFBS	*107*		*19 - 178*
13C3 PFHxS	*99*		*32 - 145*
13C8 PFOS	*98*		*49 - 126*

Lab Sample ID: MB 410-153868/1-A
Matrix: Water
Analysis Batch: 154548

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 153868

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid	<2.0		2.0		ng/L		07/28/21 15:31	07/29/21 19:36	1
Perfluorooctanoic acid	<2.0		2.0		ng/L		07/28/21 15:31	07/29/21 19:36	1
Perfluorononanoic acid	<2.0		2.0		ng/L		07/28/21 15:31	07/29/21 19:36	1
Perfluorobutanesulfonic acid	<2.0		2.0		ng/L		07/28/21 15:31	07/29/21 19:36	1
Perfluorohexanesulfonic acid	<2.0		2.0		ng/L		07/28/21 15:31	07/29/21 19:36	1
Perfluorooctanesulfonic acid	<2.0		2.0		ng/L		07/28/21 15:31	07/29/21 19:36	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFHpA	*117*		*30 - 144*	*07/28/21 15:31*	*07/29/21 19:36*	*1*
13C8 PFOA	*111*		*49 - 127*	*07/28/21 15:31*	*07/29/21 19:36*	*1*
13C9 PFNA	*119*		*47 - 136*	*07/28/21 15:31*	*07/29/21 19:36*	*1*
13C3 PFBS	*117*		*19 - 178*	*07/28/21 15:31*	*07/29/21 19:36*	*1*
13C3 PFHxS	*102*		*32 - 145*	*07/28/21 15:31*	*07/29/21 19:36*	*1*
13C8 PFOS	*113*		*49 - 126*	*07/28/21 15:31*	*07/29/21 19:36*	*1*

Lab Sample ID: LCS 410-153868/2-A
Matrix: Water
Analysis Batch: 154548

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 153868

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid			25.6	26.5		ng/L		103	66 - 141
Perfluorooctanoic acid			25.6	27.1		ng/L		106	65 - 136
Perfluorononanoic acid			25.6	26.8		ng/L		105	65 - 140
Perfluorobutanesulfonic acid			22.7	22.8		ng/L		101	65 - 132
Perfluorohexanesulfonic acid			23.3	23.9		ng/L		102	60 - 128
Perfluorooctanesulfonic acid			23.7	23.8		ng/L		100	51 - 126

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFHpA	*117*		*30 - 144*

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCS 410-153868/2-A
Matrix: Water
Analysis Batch: 154548

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 153868

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C8 PFOA	115		49 - 127
13C9 PFNA	117		47 - 136
13C3 PFBS	123		19 - 178
13C3 PFHxS	108		32 - 145
13C8 PFOS	113		49 - 126

Lab Sample ID: LCSD 410-153868/3-A
Matrix: Water
Analysis Batch: 154548

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 153868

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroheptanoic acid			25.6	26.0		ng/L		101	66 - 141	2	30
Perfluorooctanoic acid			25.6	27.8		ng/L		109	65 - 136	3	30
Perfluorononanoic acid			25.6	25.8		ng/L		101	65 - 140	4	30
Perfluorobutanesulfonic acid			22.7	23.4		ng/L		103	65 - 132	3	30
Perfluorohexanesulfonic acid			23.3	23.3		ng/L		100	60 - 128	2	30
Perfluorooctanesulfonic acid			23.7	24.6		ng/L		104	51 - 126	3	30

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C4 PFHpA	121		30 - 144
13C8 PFOA	119		49 - 127
13C9 PFNA	117		47 - 136
13C3 PFBS	110		19 - 178
13C3 PFHxS	113		32 - 145
13C8 PFOS	109		49 - 126

LCMS

Prep Batch: 152579

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-48541-1	N-149D_20210721	Total/NA	Water	537 IDA	
410-48541-2	S-393D_20210721	Total/NA	Water	537 IDA	
410-48541-3	S-39D_20210721	Total/NA	Water	537 IDA	
410-48541-4 - RA	C-129D_20210721	Total/NA	Water	537 IDA	
410-48541-4	C-129D_20210721	Total/NA	Water	537 IDA	
410-48541-8	C-144D_20210722	Total/NA	Water	537 IDA	
410-48541-8 - RA	C-144D_20210722	Total/NA	Water	537 IDA	
410-48541-9	A-21D_20210722	Total/NA	Water	537 IDA	
410-48541-9 - RA	A-21D_20210722	Total/NA	Water	537 IDA	
410-48541-11	B-48D_20210722	Total/NA	Water	537 IDA	
MB 410-152579/1-A	Method Blank	Total/NA	Water	537 IDA	
LCS 410-152579/2-A	Lab Control Sample	Total/NA	Water	537 IDA	
LCSD 410-152579/3-A	Lab Control Sample Dup	Total/NA	Water	537 IDA	

Prep Batch: 152792

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-48541-12 - DL2	S-110DSRTF_20210723	Total/NA	Water	537 IDA	
410-48541-12	S-110DSRTF_20210723	Total/NA	Water	537 IDA	
410-48541-13 - DL	S-115DSRTF_20210723	Total/NA	Water	537 IDA	
410-48541-13	S-115DSRTF_20210723	Total/NA	Water	537 IDA	
410-48541-13 - RA	S-115DSRTF_20210723	Total/NA	Water	537 IDA	
410-48541-14	S-143SRTF_20210723	Total/NA	Water	537 IDA	
410-48541-15	W-27_20210723	Total/NA	Water	537 IDA	
410-48541-16	FB-04_20210723	Total/NA	Water	537 IDA	
410-48541-17	EB-02_20210723	Total/NA	Water	537 IDA	
410-48541-18	S-143SRTF-Dup_20210723	Total/NA	Water	537 IDA	
MB 410-152792/1-A	Method Blank	Total/NA	Water	537 IDA	
LCS 410-152792/2-A	Lab Control Sample	Total/NA	Water	537 IDA	
LCSD 410-152792/3-A	Lab Control Sample Dup	Total/NA	Water	537 IDA	

Analysis Batch: 152856

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-48541-1	N-149D_20210721	Total/NA	Water	537 IDA	152579
410-48541-2	S-393D_20210721	Total/NA	Water	537 IDA	152579
410-48541-3	S-39D_20210721	Total/NA	Water	537 IDA	152579
410-48541-4	C-129D_20210721	Total/NA	Water	537 IDA	152579
410-48541-8	C-144D_20210722	Total/NA	Water	537 IDA	152579
410-48541-9	A-21D_20210722	Total/NA	Water	537 IDA	152579
MB 410-152579/1-A	Method Blank	Total/NA	Water	537 IDA	152579
LCS 410-152579/2-A	Lab Control Sample	Total/NA	Water	537 IDA	152579
LCSD 410-152579/3-A	Lab Control Sample Dup	Total/NA	Water	537 IDA	152579

Analysis Batch: 153027

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-48541-4 - RA	C-129D_20210721	Total/NA	Water	537 IDA	152579
410-48541-8 - RA	C-144D_20210722	Total/NA	Water	537 IDA	152579
410-48541-9 - RA	A-21D_20210722	Total/NA	Water	537 IDA	152579
410-48541-11	B-48D_20210722	Total/NA	Water	537 IDA	152579

LCMS

Analysis Batch: 153242

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-48541-13	S-115DSRTF_20210723	Total/NA	Water	537 IDA	152792
410-48541-14	S-143SRTF_20210723	Total/NA	Water	537 IDA	152792
410-48541-15	W-27_20210723	Total/NA	Water	537 IDA	152792
410-48541-16	FB-04_20210723	Total/NA	Water	537 IDA	152792
410-48541-17	EB-02_20210723	Total/NA	Water	537 IDA	152792
410-48541-18	S-143SRTF-Dup_20210723	Total/NA	Water	537 IDA	152792
MB 410-152792/1-A	Method Blank	Total/NA	Water	537 IDA	152792
LCS 410-152792/2-A	Lab Control Sample	Total/NA	Water	537 IDA	152792
LCSD 410-152792/3-A	Lab Control Sample Dup	Total/NA	Water	537 IDA	152792

Analysis Batch: 153507

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-48541-12	S-110DSRTF_20210723	Total/NA	Water	537 IDA	152792
410-48541-12 - DL2	S-110DSRTF_20210723	Total/NA	Water	537 IDA	152792
410-48541-13 - RA	S-115DSRTF_20210723	Total/NA	Water	537 IDA	152792
410-48541-13 - DL	S-115DSRTF_20210723	Total/NA	Water	537 IDA	152792

Prep Batch: 153868

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-48541-5	A-19D_20210722	Total/NA	Water	537 IDA	
410-48541-6	S-38D_20210722	Total/NA	Water	537 IDA	
410-48541-7	B-134D_20210722	Total/NA	Water	537 IDA	
410-48541-7 - RA	B-134D_20210722	Total/NA	Water	537 IDA	
410-48541-10 - RA	C-134D_20210722	Total/NA	Water	537 IDA	
410-48541-10	C-134D_20210722	Total/NA	Water	537 IDA	
MB 410-153868/1-A	Method Blank	Total/NA	Water	537 IDA	
LCS 410-153868/2-A	Lab Control Sample	Total/NA	Water	537 IDA	
LCSD 410-153868/3-A	Lab Control Sample Dup	Total/NA	Water	537 IDA	

Analysis Batch: 154548

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-48541-5	A-19D_20210722	Total/NA	Water	537 IDA	153868
410-48541-6	S-38D_20210722	Total/NA	Water	537 IDA	153868
410-48541-7	B-134D_20210722	Total/NA	Water	537 IDA	153868
410-48541-7 - RA	B-134D_20210722	Total/NA	Water	537 IDA	153868
410-48541-10	C-134D_20210722	Total/NA	Water	537 IDA	153868
410-48541-10 - RA	C-134D_20210722	Total/NA	Water	537 IDA	153868
MB 410-153868/1-A	Method Blank	Total/NA	Water	537 IDA	153868
LCS 410-153868/2-A	Lab Control Sample	Total/NA	Water	537 IDA	153868
LCSD 410-153868/3-A	Lab Control Sample Dup	Total/NA	Water	537 IDA	153868

Lab Chronicle

Client: Sanborn Head & Associates Inc
Job ID: 410-48541-1
Project/Site: Evergreen Philadelphia PFAS

Client Sample ID: N-149D_20210721
Lab Sample ID: 410-48541-1
Date Collected: 07/21/21 12:15
Matrix: Water
Date Received: 07/23/21 16:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			152579	07/26/21 07:58	W5MU	ELLE
Total/NA	Analysis	537 IDA		1	152856	07/27/21 02:25	QD9Y	ELLE

Client Sample ID: S-393D_20210721
Lab Sample ID: 410-48541-2
Date Collected: 07/21/21 09:50
Matrix: Water
Date Received: 07/23/21 16:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			152579	07/26/21 07:58	W5MU	ELLE
Total/NA	Analysis	537 IDA		1	152856	07/27/21 02:36	QD9Y	ELLE

Client Sample ID: S-39D_20210721
Lab Sample ID: 410-48541-3
Date Collected: 07/21/21 14:30
Matrix: Water
Date Received: 07/23/21 16:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			152579	07/26/21 07:58	W5MU	ELLE
Total/NA	Analysis	537 IDA		1	152856	07/27/21 02:47	QD9Y	ELLE

Client Sample ID: C-129D_20210721
Lab Sample ID: 410-48541-4
Date Collected: 07/21/21 14:10
Matrix: Water
Date Received: 07/23/21 16:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			152579	07/26/21 07:58	W5MU	ELLE
Total/NA	Analysis	537 IDA		1	152856	07/27/21 02:58	QD9Y	ELLE
Total/NA	Prep	537 IDA	RA		152579	07/26/21 07:58	W5MU	ELLE
Total/NA	Analysis	537 IDA	RA	1	153027	07/28/21 05:46	QD9Y	ELLE

Client Sample ID: A-19D_20210722
Lab Sample ID: 410-48541-5
Date Collected: 07/22/21 12:25
Matrix: Water
Date Received: 07/23/21 16:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			153868	07/28/21 15:31	QLP7	ELLE
Total/NA	Analysis	537 IDA		1	154548	07/29/21 20:08	MT26	ELLE

Client Sample ID: S-38D_20210722
Lab Sample ID: 410-48541-6
Date Collected: 07/22/21 14:35
Matrix: Water
Date Received: 07/23/21 16:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			153868	07/28/21 15:31	QLP7	ELLE
Total/NA	Analysis	537 IDA		1	154548	07/29/21 20:19	MT26	ELLE

Lab Chronicle

Client: Sanborn Head & Associates Inc
Project/Site: Evergreen Philadelphia PFAS

Job ID: 410-48541-1

Client Sample ID: B-134D_20210722

Lab Sample ID: 410-48541-7

Date Collected: 07/22/21 12:10
Matrix: Water
Date Received: 07/23/21 16:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			153868	07/28/21 15:31	QLP7	ELLE
Total/NA	Analysis	537 IDA		1	154548	07/29/21 20:29	MT26	ELLE
Total/NA	Prep	537 IDA	RA		153868	07/28/21 15:31	QLP7	ELLE
Total/NA	Analysis	537 IDA	RA	1	154548	07/30/21 10:51	MT26	ELLE

Client Sample ID: C-144D_20210722

Lab Sample ID: 410-48541-8

Date Collected: 07/22/21 10:00
Matrix: Water
Date Received: 07/23/21 16:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			152579	07/26/21 07:58	W5MU	ELLE
Total/NA	Analysis	537 IDA		1	152856	07/27/21 03:42	QD9Y	ELLE
Total/NA	Prep	537 IDA	RA		152579	07/26/21 07:58	W5MU	ELLE
Total/NA	Analysis	537 IDA	RA	1	153027	07/28/21 05:58	QD9Y	ELLE

Client Sample ID: A-21D_20210722

Lab Sample ID: 410-48541-9

Date Collected: 07/22/21 14:55
Matrix: Water
Date Received: 07/23/21 16:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			152579	07/26/21 07:58	W5MU	ELLE
Total/NA	Analysis	537 IDA		1	152856	07/27/21 04:04	QD9Y	ELLE
Total/NA	Prep	537 IDA	RA		152579	07/26/21 07:58	W5MU	ELLE
Total/NA	Analysis	537 IDA	RA	1	153027	07/28/21 06:20	QD9Y	ELLE

Client Sample ID: C-134D_20210722

Lab Sample ID: 410-48541-10

Date Collected: 07/22/21 09:35
Matrix: Water
Date Received: 07/23/21 16:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			153868	07/28/21 15:31	QLP7	ELLE
Total/NA	Analysis	537 IDA		1	154548	07/29/21 20:40	MT26	ELLE
Total/NA	Prep	537 IDA	RA		153868	07/28/21 15:31	QLP7	ELLE
Total/NA	Analysis	537 IDA	RA	1	154548	07/30/21 11:02	MT26	ELLE

Client Sample ID: B-48D_20210722

Lab Sample ID: 410-48541-11

Date Collected: 07/22/21 12:05
Matrix: Water
Date Received: 07/23/21 16:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			152579	07/26/21 07:58	W5MU	ELLE
Total/NA	Analysis	537 IDA		1	153027	07/28/21 06:31	QD9Y	ELLE

Lab Chronicle

Client: Sanborn Head & Associates Inc
Job ID: 410-48541-1
Project/Site: Evergreen Philadelphia PFAS

Client Sample ID: S-110DSRTF_20210723
Lab Sample ID: 410-48541-12
Date Collected: 07/23/21 10:05
Matrix: Water
Date Received: 07/23/21 16:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			152792	07/26/21 15:42	QLP7	ELLE
Total/NA	Analysis	537 IDA		1	153507	07/28/21 15:23	ZG8V	ELLE
Total/NA	Prep	537 IDA	DL2		152792	07/26/21 15:42	QLP7	ELLE
Total/NA	Analysis	537 IDA	DL2	10	153507	07/28/21 15:34	ZG8V	ELLE

Client Sample ID: S-115DSRTF_20210723
Lab Sample ID: 410-48541-13
Date Collected: 07/23/21 09:40
Matrix: Water
Date Received: 07/23/21 16:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			152792	07/26/21 15:42	QLP7	ELLE
Total/NA	Analysis	537 IDA		1	153242	07/28/21 04:06	PY4D	ELLE
Total/NA	Prep	537 IDA	RA		152792	07/26/21 15:42	QLP7	ELLE
Total/NA	Analysis	537 IDA	RA	1	153507	07/28/21 15:45	ZG8V	ELLE
Total/NA	Prep	537 IDA	DL		152792	07/26/21 15:42	QLP7	ELLE
Total/NA	Analysis	537 IDA	DL	10	153507	07/28/21 15:57	ZG8V	ELLE

Client Sample ID: S-143SRTF_20210723
Lab Sample ID: 410-48541-14
Date Collected: 07/23/21 09:50
Matrix: Water
Date Received: 07/23/21 16:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			152792	07/26/21 15:42	QLP7	ELLE
Total/NA	Analysis	537 IDA		1	153242	07/28/21 04:17	PY4D	ELLE

Client Sample ID: W-27_20210723
Lab Sample ID: 410-48541-15
Date Collected: 07/23/21 12:20
Matrix: Water
Date Received: 07/23/21 16:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			152792	07/26/21 15:42	QLP7	ELLE
Total/NA	Analysis	537 IDA		1	153242	07/28/21 04:40	PY4D	ELLE

Client Sample ID: FB-04_20210723
Lab Sample ID: 410-48541-16
Date Collected: 07/23/21 10:00
Matrix: Water
Date Received: 07/23/21 16:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			152792	07/26/21 15:42	QLP7	ELLE
Total/NA	Analysis	537 IDA		1	153242	07/28/21 04:51	PY4D	ELLE

Lab Chronicle

Client: Sanborn Head & Associates Inc
Job ID: 410-48541-1
Project/Site: Evergreen Philadelphia PFAS

Client Sample ID: EB-02_20210723
Lab Sample ID: 410-48541-17
Date Collected: 07/23/21 11:45
Matrix: Water
Date Received: 07/23/21 16:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			152792	07/26/21 15:42	QLP7	ELLE
Total/NA	Analysis	537 IDA		1	153242	07/28/21 05:02	PY4D	ELLE

Client Sample ID: S-143SRTF-Dup_20210723
Lab Sample ID: 410-48541-18
Date Collected: 07/23/21 09:50
Matrix: Water
Date Received: 07/23/21 16:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537 IDA			152792	07/26/21 15:42	QLP7	ELLE
Total/NA	Analysis	537 IDA		1	153242	07/28/21 05:13	PY4D	ELLE

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Sanborn Head & Associates Inc
Job ID: 410-48541-1
Project/Site: Evergreen Philadelphia PFAS

Laboratory: Eurofins Lancaster Laboratories Env, LLC

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	36-00037	01-31-22

Method Summary

Client: Sanborn Head & Associates Inc
Project/Site: Evergreen Philadelphia PFAS

Job ID: 410-48541-1

Method	Method Description	Protocol	Laboratory
537 IDA	EPA 537 Isotope Dilution	EPA	ELLE
537 IDA	EPA 537 Isotope Dilution	EPA	ELLE

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: Sanborn Head & Associates Inc
Project/Site: Evergreen Philadelphia PFAS

Job ID: 410-48541-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-48541-1	N-149D_20210721	Water	07/21/21 12:15	07/23/21 16:05
410-48541-2	S-393D_20210721	Water	07/21/21 09:50	07/23/21 16:05
410-48541-3	S-39D_20210721	Water	07/21/21 14:30	07/23/21 16:05
410-48541-4	C-129D_20210721	Water	07/21/21 14:10	07/23/21 16:05
410-48541-5	A-19D_20210722	Water	07/22/21 12:25	07/23/21 16:05
410-48541-6	S-38D_20210722	Water	07/22/21 14:35	07/23/21 16:05
410-48541-7	B-134D_20210722	Water	07/22/21 12:10	07/23/21 16:05
410-48541-8	C-144D_20210722	Water	07/22/21 10:00	07/23/21 16:05
410-48541-9	A-21D_20210722	Water	07/22/21 14:55	07/23/21 16:05
410-48541-10	C-134D_20210722	Water	07/22/21 09:35	07/23/21 16:05
410-48541-11	B-48D_20210722	Water	07/22/21 12:05	07/23/21 16:05
410-48541-12	S-110DSRTF_20210723	Water	07/23/21 10:05	07/23/21 16:05
410-48541-13	S-115DSRTF_20210723	Water	07/23/21 09:40	07/23/21 16:05
410-48541-14	S-143SRTF_20210723	Water	07/23/21 09:50	07/23/21 16:05
410-48541-15	W-27_20210723	Water	07/23/21 12:20	07/23/21 16:05
410-48541-16	FB-04_20210723	Water	07/23/21 10:00	07/23/21 16:05
410-48541-17	EB-02_20210723	Water	07/23/21 11:45	07/23/21 16:05
410-48541-18	S-143SRTF-Dup_20210723	Water	07/23/21 09:50	07/23/21 16:05

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Phone (717) 656-2300

Chain of Custody

410-48541 Chain of Custody

eurofins | Environment Testing America

Client Information	Sampler: Michael Fuerte	Lab PM:	Carrier(s):	COC No: 410-29329-9098.1
Client Contact: Michael Fuerte	Phone: 262-496-7759	E-Mail: Nicole.Maljovec@eurofinset.com		Page: Page ~~1 of 4~~ 1 of 2
Company: Sanborn Head & Associates Inc	PWSID:			Job #:
Address: 1015 Virginia Drive Suite 100	Due Date Requested:			Preservation Codes:
City: Fort Washington	TAT Requested (days): 5			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
State, Zip: PA, 19034	Compliance Project: Δ Yes Δ No			
Phone: 603-415-6136(Tel)	PO #: 4796.01			Other:
Email: MFuerte@sanbornhead.com	WO #:			
Project Name: Evergreen Philadelphia PFAS	Project #: 41006783			
Site: Former Philadelphia Refinery (PA)	SSOW#:			

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	PFC_IDA - UCMR3 6 PFAS with UMCR5 contingent	Total Number of containers	Special Instructions/Note:
			Preservation Code:		N	X		
N-149D-20210721	7/21/21	1215	G	W	N	X		
S-393D-20210721	7/21/21	950	G	W	N	X		
S-390-20210721	7/21/21	1430	G	W	N	X		Please cc kdubois@sanbornhead.com on all correspondence
C-129D-20210721	7/21/21	1410	G	W	N	X		
A-19D-20210722	7/22/21	1225	G	W	N	X		
S-381D-20210722	7/22/21	1435	G	W	N	X		
B-134D-20210722	7/22/21	1210	G	W	N	X		
C-144D-20210722	7/22/21	1000	G	W	N	X		
A-21D-20210722	7/22/21	1455	G	W	N	X		
C-134D-20210722	7/22/21	935	G	W	N	X		
B-48D-20210722	7/22/21	1205	G	W	N	X		

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) Type II

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Michael Fuerte	7/23/21 1250	SHA			
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
	7/23/21 1515			7/23/21 1755	
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
				7/23/21 1605	

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 0.3-5.3

Ver: 01/16/2019

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Phone (717) 656-2300

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: Michael Fuerte	Lab PM: Maljovec, Nicole	Carrier Tracking No(s):	COC No: 410-29329-9098.2
Client Contact: Michael Fuerte	Phone: 262-496-9759	E-Mail: Nicole.Maljovec@eurofinset.com	State of Origin: PA	Page: Page 2 of 4 2 of 2
Company: Sanborn Head & Associates Inc	PWSID:	Analysis Requested		Job #:
Address: 1015 Virginia Drive Suite 100	Due Date Requested:			Preservation Codes:
City: Fort Washington	TAT Requested (days): 5			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
State, Zip: PA, 19034	Compliance Project: Δ Yes Δ No			
Phone: 603-415-6136(Tel)	PO #: 4796.01			Other:
Email: MFuerte@sanbornhead.com	WO #:			
Project Name: Evergreen Philadelphia PFAS	Project #: 41006783			
Site:	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IDA - UCMR3 6 PFAS with UMCR5 contingent	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N		
S-110DSRTF_20210723	7/23/21	1005	G	W	N		X		
S-115DSRTF_20210723	7/23/21	940	G	W	N		X		Please cc
S-143SRTF_20210723	7/23/21	950	G	W	N		X		kdubois@
W-27_20210723	7/23/21	1220	G	W	N		X		sanbornhead.
FB-01_20210723	7/23/21	1000	G	W	N		X		com
EB-02_20210723	7/23/21	1145	G	W	N		X		on all
S-143SRTF-Dup-20210723	7/23/21	950	G	W	N		X		communications

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) Type II

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Michael Fuerte	7/23/21 1250	SHA	Fedex	7/23/21 1250	
Relinquished by: Fedex	Date/Time: 7/23/21 15??	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 7/23/21 1620	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 0.3 - 5.3

Login Sample Receipt Checklist

Client: Sanborn Head & Associates Inc

Job Number: 410-48541-1

Login Number: 48541

List Source: Eurofins Lancaster Laboratories Env, LLC

List Number: 1

Creator: Jeremiah, Cory T

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	N/A	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified.	N/A	
Residual Chlorine Checked.	N/A	
Sample custody seals are intact.	N/A	