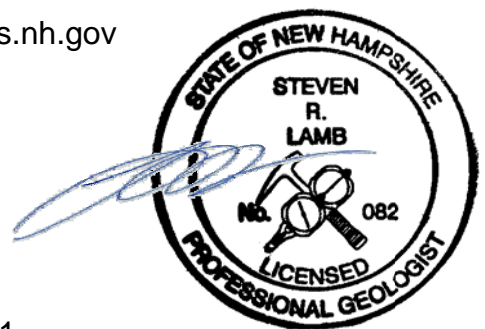


**DES Waste Management Division
29 Hazen Drive; PO Box 95
Concord, NH 03302-0095**

**SPRING 2019 PFAS SURFACE WATER AND
LEACHATE SAMPLING REPORT
TROY MILLS LANDFILL SUPERFUND SITE
TROY, NEW HAMPSHIRE
NHDES SITE NO. 198405082
NHDES PROJECT NO. 104
CERCLIS ID NO. NHD980520217**

Prepared For:
New Hampshire Department of
Environmental Services
Waste Management Division
29 Hazen Drive; PO Box 95
Concord, NH 03302-0095
Contact Number: Mr. Michael Summerlin
Phone Number: 603-271-3649
Contact Email: michael.summerlinjr@des.nh.gov

Prepared By:
GZA GeoEnvironmental, Inc.
5 Commerce Park North, Suite 201
Bedford, NH 03110
Phone Number: (603) 232-8765
Contact Name: Ms. Tanya P. Justham
Contact Email: tanya.justham@gza.com



Date of Report: June 26, 2019



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SPRING 2019 PFAS SURFACE WATER AND LEACHATE SAMPLING REPORT TROY MILLS LANDFILL SUPERFUND SITE TROY, NEW HAMPSHIRE NHDES NO. 198405082 CERCLIS ID NO. NHD980520217

June 2019
04.0190325.28

Prepared for:

New Hampshire Department of Environmental Services
Hazardous Waste Remediation Bureau
Concord, New Hampshire

Prepared by:

GZA GeoEnvironmental, Inc.

5 Commerce Park North, Suite 201 | Bedford, NH 03110-6984
603-623-3600

Offices Nationwide
www.gza.com

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5 Commerce Park North
Suite 201
Bedford, NH 03110
T: 603.623.3600
F: 603.624.9463
www.gza.com



Via Email

June 26, 2019
File No. 04.0190325.28

Mr. Michael Summerlin, P.E.
New Hampshire Department of Environmental Services
Waste Management Division
29 Hazen Drive
P.O. Box 95
Concord, New Hampshire 03302-0095

Re: Spring 2019 PFAS Surface Water and Leachate Sampling Report
Troy Mills Landfill Superfund Site (Site)
NHDES Site # 198405082
Troy, New Hampshire

Dear Michael:

GZA GeoEnvironmental, Inc. (GZA) is pleased to submit the attached report summarizing the spring 2019 surface water and leachate sampling event to New Hampshire Department of Environmental Services for the above-referenced Site. This report summarizes the work performed and findings of GZA's supplemental monitoring, as well as our conclusions and recommendations.

We appreciate the opportunity to have worked with you on this project. Should you have any questions, please call the undersigned at (603) 232-8765.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Tanya P. Justham
Project Manager

Claire G. Lund, P.E.
Consultant/Reviewer

Steven R. Lamb, P.G., C.G.W.P.
Principal

TPJ/SRL/CGL:kr

\\GZABedford\Jobs\04\Jobs\0190300s\04.0190325.00 NHDES 2015-2019 Contract\04.0190325.28 - Troy 2018 Monitoring Round\Report\2019 PFAS Sampling\Text\FINAL Troy 2019 PFAS Data Report 062619.docx

Attachment: Report



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1.0 INTRODUCTION

This report presents a summary of the spring 2019 supplemental sampling round conducted by GZA GeoEnvironmental, Inc. (GZA) on behalf of the United States Environmental Protection Agency (EPA) and the New Hampshire Department of Environmental Services (NHDES) at the Troy Mills Landfill Superfund Site (Site) in Troy, New Hampshire (NHDES Site # 198405082; CERCLIS Site ID Number NHD980520217).

The sampling was performed in accordance with the Hazardous Waste Remediation Bureau (HWRB) Master Quality Assurance Project Plan (QAPP) EPA RFA# 18008 current at the time of sampling and the EPA- and NHDES-approved October 2018 Sampling and Analysis Plan (SAP).

The work was performed in general accordance with our 2015-2019 contract for Site Investigations, Remediation Design, Implementation Oversight at Petroleum and Hazardous Waste Sites, CERCLA and Brownfields Projects as approved by the Governor and Council on August 26, 2015.

This report presents GZA's field observations, results, technical opinions, and recommendations. The opinions included in this report are subject to modification based on additional information obtained by GZA or provided to GZA by other parties and the Limitations presented in **Appendix A**.

2.0 BACKGROUND SITE INFORMATION

The Site is an undeveloped 2-acre former drum disposal area located in Troy, New Hampshire (Cheshire County) about 1.5 miles south of the Center of Troy (refer to **Figure 1**). The 2-acre Site is a portion of a larger 10-acre landfill within the 270-acre property formerly owned by Troy Mills, Inc. (TMI). The landfill was used by TMI for the disposal of solid wastes including fabric scraps from the textile mill. Drummed solids and liquids were primarily disposed within the 2-acre area currently referred to as the Site, including the Lower Drum Area and Upper Drum Area. The remaining 8 acres of landfill located to the north of the Site is generally referred to as the solid waste landfill (refer to **Figure 1**). Access to the Site is off Rockwood Pond Road via a separately owned, private gravel pit access road in Fitzwilliam, New Hampshire.

The Site and a portion of the 8-acre solid waste landfill is encompassed by a Groundwater Management Zone (GMZ) comprising 16.86 acres and including downgradient land beyond the landfill area. Groundwater flow in the overburden is to the west or northwest, toward Rockwood Brook. Rockwood Brook flows south to north and continues downstream to Sand Dam Pond, a recreational area located approximately 1 mile north of the Site. The former drum disposal area is located in an area outside of the 100-year floodplain of Rockwood Brook.

TMI disposed of hazardous substances that were generated at its acrylic fabric manufacturing facility in Troy between 1967 and 1978. An estimated 6,000 to 10,000 fifty-five-gallon drums of waste liquid and sludge containing mostly plasticizers such as bis(2 ethylhexyl)phthalate (DEHP) and a petroleum-based solvent known as VarsoTM (also known as Stoddard solvent or mineral spirits) were disposed of on Site. Other drummed wastes included pigments, surplus mixes, and tank residuals of vinyl resins, paint resins, and top coating products.



A full summary of Site history and previous investigation activities as well as the Conceptual Site Model are provided in the Fall 2018 Monitoring Report.¹

3.0 SUMMARY OF THE SPRING 2019 PFAS SURFACE WATER SAMPLING ROUND

The spring 2019 supplemental sampling round included the collection of seven surface water and two leachate samples. Refer to **Table 1** for locations and depths sampled and analyses performed, **Appendix B** for copies of GZA's field notes, and **Appendix C** for photographic documentation of the sampling locations and general Site observations. A photograph of surface water sampling location SW-1 was not collected. Refer to **Section 4.0** below for a summary of quality assurance/quality control (QA/QC) measures relating to PFAS groundwater sampling and **Section 5.0** below for a discussion of the data results.

3.1 GENERAL SITE OBSERVATIONS

GZA observed the following field and maintenance related conditions during the May 2019 sampling event:

- A "Private Property" sign had been removed from a post near the northern entrance to the Site. GZA will replace the sign during the next field event; and
- A sink hole over a culvert was observed in the northern portion of the access road, outside of the gated area and proximate to the most northern gravel pit.

3.2 PFAS SCREENING

PFAS are emerging contaminants, known to be stable, persistent, and bioaccumulative in the environment. In 2016, NHDES established an Ambient Groundwater Quality Standard (AGQS) of 70 nanograms per liter (ng/L) for the PFAS compounds perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS) and for both PFOA and PFOS combined where these chemicals are present together. The AGQS is based on the Reference Dose established in EPA's Drinking Water Health Advisory for PFOA and PFOS, issued during May 2016. Currently, no EPA or NHDES standard for surface water exists.

PFOS, PFOA, and perfluorobutane sulfonate (PFBS) screening levels (SLs) for groundwater were developed by EPA using the Regional Screening Levels (RSL) calculator for a residential scenario and utilizing a Hazard Index (HI) = 0.1. This is consistent with standard practices for screening to identify contaminants of potential concern during a remedial investigation.

During 2018, NHDES initiated screening of Site groundwater for PFAS. The initial screening for PFAS in groundwater indicates that concentrations of PFOA exceeding the SL and AGQS are prevalent at sampling locations on the Site. Based on the results of the groundwater screening, NHDES initiated a surface water screening program to assess the presence of PFAS concentrations in surface water.

¹ Report titled "Fall 2018 Monitoring Report, Troy Mills Landfill Superfund Site, Troy, New Hampshire, NHDES No. 198405082, CERCLIS No. NHD980520217," dated April 29, 2019.



3.3 SURFACE WATER SAMPLING

GZA collected surface water samples from four locations along Rockwood Brook (SW-1, SW-3, SW-4, and SW-100) and at the swimming area at Sand Dam Pond at varying depths. Sand Dam Pond is located downstream of the Site on Rockwood Brook. Refer to **Figure 1** for an illustration of sampling locations. The rationale for sampling surface water was to assess possible impacts from groundwater migrating downgradient from the former drum disposal area.

With the exception of the samples at Sand Dam Pond, which were collected last, samples were collected from downstream to upstream. Surface water samples were collected using the laboratory-provided high-density polyethylene (HDPE) sample containers. Except where noted below, sampling was performed in accordance with Standard Operating Procedure (SOP) #B-9 Surface Water and Stream Sediments Sampling Procedure and SOP #B-13 Sampling for Per- & Poly-Fluorinated Alkyl Substances included in the SAP.

Samples collected from the swimming area at Sand Dam Pond were collected at three depths in a 5-foot water column: at the water's surface, approximately 2.5 feet below the water surface, and approximately 4.5 feet below the water surface. Samples collected from below the surface of the water were collected using a Geotech GeoPump Series II Variable Speed peristaltic pump equipped with a pump head designed to accommodate thin wall silastic tubing and attached to dedicated HDPE tubing. The intake of the HDPE tubing was situated 6 inches from the bottom of a stainless-steel, graduated pole and attached with plastic zip-ties. The pole was held in the water at the designated depth for the duration of sample collection.

Each of the surface water samples collected was submitted to GZA's subcontract laboratory Alpha Analytical (Alpha) of Mansfield, Massachusetts for laboratory analysis of PFAS.

Field parameters were collected using an In-Situ SmarTroll multi-parameter sonde (SmarTroll) equipped with a probe guard (for specific conductance, oxidation-reduction potential [ORP], dissolved oxygen [DO], pH, and temperature) and a Hach Model 2100Q turbidity meter (Hach).

The decontamination of non-dedicated equipment used at the Site (the metal pole) was done in accordance with SOP #B-13 Sampling for Per- & Poly-Fluorinated Alkyl Substances and SOP #B-11 Sampling Equipment Decontamination Procedure.

Refer to **Appendix D** for the *Surface Water / Sediment Worksheet*. Refer to **Table 2A** for a summary of analytical results, **Table 2B** for the field parameters, and **Appendix F** for the laboratory analytical report.

3.4 LEACHATE SAMPLING

The fall 2018 monitoring round included the collection of two leachate samples (SW-LEACHATE and SW-LEACH-B). SW-LEACHATE was collected within the boom area from the discharge of the culvert under the Lower Access Road. SW-LEACH-B is located immediately south of the former beaver dam on the eastern side of Rockwood Brook. Consistent with historical observations, leachate was not observed to be flowing at location SW-LEACH-A and no sample was collected at this location; however, iron staining at SW-LEACH-A indicated that there had been flow at that location prior to the sampling event. Refer to **Figure 1** for the leachate sampling locations.

Consistent with our historical observations at SW-LEACHATE, the sample collection location was visibly impacted by orange-colored iron floc that had accumulated on the bottom of the leachate location at the culvert outfall.



The area of the culvert outfall was observed to have approximately 3 inches of clear, running water above floc and orange-stained leaf litter. Vegetation was observed around and within the water.

The sample collection location at SW-LEACH-B was observed to have red staining on the bottom sediment (silt through fine gravel sizes) with approximately 1 inch of clear, running water. Vegetation was observed around and within the water.

Leachate was collected using a dedicated, laboratory-cleaned HDPE sample container in accordance with SOP #B-8 Leachate Sampling Procedure. Refer to **Table 2A** for a summary of analytical results for leachate and **Appendix F** for the laboratory analytical reports.

4.0 PROJECT QUALITY ASSURANCE / QUALITY CONTROL SUMMARY OF FIELD WORK

QA/QC measures implemented during the spring 2019 sampling activities are defined in the SAP.² Quality Control steps designed to evaluate the reliability of the monitoring data collected include: 1) field equipment maintenance and calibration; 2) field QC sample collection (i.e., duplicates, trip blanks, and field blanks); and 3) data verification and validation. These QC steps have been established to confirm that the performance acceptance criteria are achieved relative to the project-specific DQOs outlined in the SAP.

Except as specifically noted herein, GZA followed the procedures outlined in the SAP. Overall, the data collected during the spring 2019 sampling activities were found by GZA to be acceptable for the intended use. Of the samples collected, no results were rejected. From a completeness perspective, the goal of 90 percent completeness was achieved for the spring 2019 sampling activities.

4.1 FIELD EQUIPMENT MAINTENANCE AND CALIBRATION

Field equipment requiring maintenance and calibration that was used on Site included the SmarTroll and Hach. Certifications were obtained from the vendor documenting that the appropriate routine maintenance had been performed on the equipment (refer to **Appendix E** for a copy of the certification). Equipment was successfully calibrated by GZA in the office before field activities commenced to determine if the condition of the equipment and standards met the project requirements (refer to **Appendix E** for a copy of the *Instrument Calibration/Maintenance Log* for each instrument). If an instrument failed a pre-field calibration check, it was replaced prior to the sampling event.

The SmarTroll and Hach calibrations are typically checked at the beginning of the first day of sampling to determine if the instrument was calibrated properly. Because the instruments had been used the day before at the New Hampshire Plating Company Superfund Site for a similar sampling event and the calibrations had been successfully checked at the beginning and end of that day, the morning calibration check was not performed in accordance with SOP #B-4 Calibration of YSI, In-Situ and Hach Field Instruments. The calibration was checked subsequently at the end of the sampling day to document instrument calibration. In accordance with SOP #B-4, the following describes the corrective actions taken if appropriate acceptance criteria were not met during the calibration check process:

² The NHDES- and EPA-approved SAP for the fall 2018 monitoring activities dated October 26, 2018 is available electronically on NHDES' OneStop database (<http://des.nh.gov/onestop/index.htm>).



- If the morning calibration check failed, the individual parameters were recalibrated. If the recalibration failed, the appropriate standards were replaced and a thorough inspection and/or any required cleaning or maintenance activities were performed (i.e., changing DO caps, cleaning probe heads, etc.) and then the parameter(s) were recalibrated. If the calibration failed again, the instrument was replaced with a backup instrument;
- If a calibration check at the end of the day was not within the acceptable range for that parameter, the data collected that day for that parameter was qualified and the individual parameters were recalibrated; and
- If erratic or uncharacteristic readings occurred between calibration and checks, the instrument was recalibrated.

Calibration and associated checks of the SmarTroll and Hach were successful and no data required qualification by GZA during the sampling activities.

4.2 FIELD QUALITY CONTROL SAMPLE COLLECTION

Field QC samples including a field duplicate, trip blank, and field blank were collected during the sampling activities in accordance with the SAP. The following provides a brief summary of the field quality control results. Refer to **Appendix F** for the laboratory analytical data package.

4.2.1 Duplicate Sample Results

Refer to **Table 3** and the individual laboratory data report for specific details regarding the calculated relative percent difference (RPD) for duplicate samples. No samples exceeded the acceptance criteria for the calculated RPD (30 percent for aqueous samples).

4.2.2 Trip Blanks

The trip blank was found free of contamination. No corrective action was required.

4.2.3 Field Blanks

A field blank is a sample that is collected in the field by each field sampler to evaluate the potential for cross contamination of a sample from ambient conditions. The field blank was collected by GZA field sampler, Ms. Kathryn Moran, prior to collection of the first PFAS sample. The field blank was found free of contamination. No corrective action was required.

4.3 DATA VERIFICATION AND VALIDATION

As part of the data verification process, GZA performed an in-house review of the data to check that the data have been recorded, transmitted, and processed correctly, which includes the evaluation of completeness, correctness, and conformance/compliance of a specific data set. In general, GZA found that the data generated during the spring 2019 sampling activities were complete. Outliers and/or inconsistencies that may indicate a problem with the sampling equipment or procedures were not identified.



5.0 SUMMARY OF FALL 2018 MONITORING DATA RESULTS

The laboratory analytical reports for surface water samples are provided in **Appendix F**. Refer to **Table 2A** and **Table 2B** for a summary of the surface water and leachate analytical results. Refer to **Figure 2** for the distribution of PFAS in Site leachate and surface water from data collected during May 2019. The following summarizes the leachate and surface water analytical results.

5.1 SURFACE WATER

Of the 24 PFAS compounds analyzed for during 2019, five were detected within the surface water samples collected for PFAS analysis. The detected concentrations ranged from 1.82 ng/L (perfluorohexanoic acid [PFHxA] at SW-SDP-2.5) to 5.38 ng/L (perfluorobutanoic acid [PFBA] at SW-SDP-2.5). Stratification of PFAS concentrations was not indicated by the results of the Sand Dam Pond samples collected at multiple depths.

PFAS compounds were not detected above the laboratory reporting limit (maximum reporting limit of 1.85 ng/L) in the surface water samples collected from upstream sampling location SW-1 and from SW-4, which is located near the upstream edge of expected impacts to Rockwood Brook.

Currently, no EPA or NHDES standard for surface water exists.

5.2 LEACHATE

Of the 24 PFAS compounds analyzed for during 2019, nine were detected within the leachate sample collected for PFAS analysis from SW-LEACHATE and 10 were detected in the sample collected from SW-LEACH-B. The detected concentrations ranged from 2.94 ng/L (perfluorohexane sulfonic acid [PFHxS] at SW-LEACH-B) to 343 ng/L (PFOA at SW-LEACHATE).

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the findings presented above, low levels of five PFAS compounds were detected in the surface water samples collected from Rockwood Brook and Sand Dam Pond. The five compounds detected were also detected in Site groundwater during 2018 (refer to Table 6 of the 2018 Monitoring Report).

Due to the low detected levels and the lack of surface water regulatory standards or screening levels, GZA does not recommend additional surface water sampling at this time.

Relatively higher (compared to surface water) concentrations of 10 PFAS compounds were detected in the two leachate samples collected. The PFAS compounds detected within the leachate samples are consistent with the compounds detected in Site groundwater during fall 2018 (refer to Table 6 of the 2018 Monitoring Report).

Although there are no regulatory standards or screening levels for PFAS that directly apply to the leachate samples at the Site, the leachate does represent the concentrations of PFAS in groundwater as it discharges to the wetland. Because the detected concentrations of PFOA exceed the AGQS, GZA recommends collecting samples of leachate for PFAS analysis in conjunction with future groundwater samples collected for PFAS.



Tables

TABLE 1
MULTIMEDIA SAMPLING - SUMMARY OF SPRING 2019 SAMPLING ACTIVITIES
Troy Mills Landfill Superfund Site
Troy, New Hampshire

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Page 1 of 1

Sample Location	Sample Identification	Date Collected	Sampling Method	Sample Depth (ft below water surface)	PFAS (122,537M)	Field NA Parameters ¹
Leachate Sampling Locations						
Inside GMZ	TRY_SW-LEACHATE	5/24/2019	HDPE Sample Container	0	x	
	TRY_SW-LEACH-A	ns				
North of GMZ	TRY_SW-LEACHB	5/24/2019	HDPE Sample Container	0	x	
Surface Water Sampling Locations						
Inside GMZ	TRY_SW-1	5/24/2019	HDPE Sample Container	0	x	x
	TRY_SW-3	5/24/2019			x	x
	TRY_SW-3 DUP				x	
	TRY_SW-4	5/24/2019			x	x
North of GMZ	TRY_SW-100	5/24/2019			x	x
Sand Dam Pond	TRY_SW-SDP-0	5/24/2019	Peristaltic Pump ²	2.5	x	x
	TRY_SW-SDP-2.5	5/24/2019			x	x
	TRY_SW-SDP-4.5	5/24/2019			x	x

TABLE KEY:

ns = not sampled

na = not applicable

ft = feet

PFAS = Per- and Polyfluoroalkyl Substances

NA = Natural Attenuation

HDPE = high density polyethylene

SPECIFIC NOTES:

1. Field NA parameters include specific conductance, oxidation-reduction potential (ORP), dissolved oxygen (DO), pH, temperature and turbidity using an In-Situ SmartROLL multi-parameter meter and a Hach 2100Q turbidity meter.
2. A Geotech GeoPump Series II Variable Speed 300 + 600 RPM peristaltic pump was used to collect subsurface samples.

TABLE 2A
SUMMARY OF DETECTED PFAS COMPOUNDS IN LEACHATE AND SURFACE WATER SAMPLES
Troy Mills Landfill Superfund Site
Troy, New Hampshire

Sample ID	Sample Date	Carboxylic Acids											Sulfonic Acids							Potential Precursors						Parameter Calculations					
		Perfluorobutanoic Acid (PFBA) [4]	Perfluoropentanoic Acid (PFPeA) [5]	Perfluorohexanoic Acid (PFHxA) [6]	Perfluoroheptanoic Acid (PFHpA) [7]	Perfluorooctanoic Acid (PFOA) [8]	Perfluorononanoic Acid (PFNA) [9]	Perfluorodecanoic Acid (PFDA) [10]	Perfluoroundecanoic Acid (PFUnA) [11]	Perfluorododecanoic Acid (PFDoA) [12]	Perfluorotridecanoic Acid (PFTeA) [13]	Perfluorotetradecanoic Acid (PFTeA) [14]	Perfluorobutane Sulfonic Acid (PFBS) [4S]	Perfluoropentane Sulfonic Acid (PFPeS) [5S]	Perfluorohexane Sulfonic Acid (PFHxS) [6S]	Perfluoroheptane Sulfonic Acid (PFHpS) [7S]	Perfluorooctane Sulfonic Acid (PFOS) [8S]	Perfluorononanesulfonic Acid (PFNS) [9S]	Perfluorodecane Sulfonic Acid (PFDS) [10S]	8:2 Fluorotelomer Sulfonic Acid (8:2FTSA)	6:2 Fluorotelomer Sulfonic Acid (6:2FTSA)	4:2 Fluorotelomer Sulfonic Acid (4:2FTSA)	Perfluorooctanesulfonamide (FOSA)	N-Ethyl Perfluorooctane Sulfonamido Acetic Acid (NEFOSAA)	N-Methyl Perfluorooctane Sulfonamido Acetic Acid (NMeFOSAA)	Total PFOA + PFOS	Total Measured PFAS	% PFOA vs. Total PFOA+PFOS	% PFOA + PFOS vs. Total PFAS		
	CAS	375-22-4	2706-90-3	307-24-4	375-85-9	335-67-1	375-95-1	335-76-2	2058-94-8	307-55-1	72629-94-8	376-06-7	375-73-5	2706-91-4	355-46-4	375-92-8	1763-23-1	68259-12-1	335-77-3	89108-34-4	7619-97-5	57124-72-5	754-91-6	2991-50-8	2355-31-4	N/A	N/A	N/A	N/A		
Field Samples																															
TRY_SW-LEACHATE	5/24/2019	42.1	102	131	164	343	23.1	<1.91	<1.91	<1.91	<1.91	<1.91	10.8	<1.91	8.71	<1.91	10.3	<1.91	<1.91	<1.91	<1.91	<1.91	<1.91	<1.91	<1.91	353	835	97%	42%		
TRY_SW-LEACHB	5/24/2019	32.8	71.4	119	147	220	20.7	8.72	<1.94	<1.94	<1.94	<1.94	7.92	<1.94	2.94	<1.94	14.3	<1.94	<1.94	<1.94	<1.94	<1.94	<1.94	<1.94	<1.94	234	645	94%	36%		
TRY_SW-1	5/24/2019	<1.75	<1.75	<1.75	<1.75	<1.75	<1.75	<1.75	<1.75	<1.75	<1.75	<1.75	<1.75	<1.75	<1.75	<1.75	<1.75	<1.75	<1.75	<1.75	<1.75	<1.75	<1.75	<1.75	<1.75	ND	ND	N/A	N/A		
TRY_SW-3	5/24/2019	<1.80	<1.80	2.26	2.44	4.07	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	4.1	8.8	100%	46%		
	5/24/2019 DUP	<1.77	1.87	2.49	2.62	4.34	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	4.3	11.3	100%	38%		
TRY_SW-4	5/24/2019	<1.85	<1.85	<1.85	<1.85	<1.85	<1.85	<1.85	<1.85	<1.85	<1.85	<1.85	<1.85	<1.85	<1.85	<1.85	<1.85	<1.85	<1.85	<1.85	<1.85	<1.85	<1.85	<1.85	<1.85	ND	ND	N/A	N/A		
TRY_SW-100	5/24/2019	<1.77	2.29	3.19	3.66	5.34	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	5.3	14.5	37%	37%		
TRY_SW-SDP-0	5/24/2019	4.72	<1.82	1.93	2.14	3.51	<1.82	<1.82	<1.82	<1.82	<1.82	<1.82	<1.82	<1.82	<1.82	<1.82	<1.82	<1.82	<1.82	<1.82	<1.82	<1.82	<1.82	<1.82	<1.82	3.5	12.3	29%	29%		
TRY_SW-SDP-2.5	5/24/2019	5.38	<1.80	1.82	2.04	3.09	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	3.1	12.3	25%	25%		
TRY_SW-SDP-4.5	5/24/2019	4.39	<1.80	1.96	2.27	3.66	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	<1.80	3.7	12.3	30%	30%		
Field Quality Control Samples																															
TRIP BLANK	5/24/2019	<1.84	<1.84	<1.84	<1.84	<1.84	<1.84	<1.84	<1.84	<1.84	<1.84	<1.84	<1.84	<1.84	<1.84	<1.84	<1.84	<1.84	<1.84	<1.84	<1.84	<1.84	<1.84	<1.84	<1.84	ND	ND	N/A	N/A		
FIELD BLANK-MORAN	5/24/2019	<1.89	<1.89	<1.89	<1.89	<1.89	<1.89	<1.89	<1.89	<1.89	<1.89	<1.89	<1.89	<1.89	<1.89	<1.89	<1.89	<1.89	<1.89	<1.89	<1.89	<1.89	<1.89	<1.89	<1.89	ND	ND	N/A	N/A		

TABLE KEY:
PFAS = per- and polyfluoroalkyl substances
[4] = Number of fluorinated carbon chains for perfluorinated carboxylic acids
[4S] = Number of fluorinated carbon chains for perfluorinated sulfonates
N/A = not applicable
ND =not detected above the laboratory reporting limit
< = analyte not detected above the laboratory reporting limit
Bold indicates that the concentration was detected above the laboratory reporting detection limit

GENERAL NOTES:
* All concentrations reported in nanograms per liter (ng/L) which are roughly equivalent to parts per trillion (ppt).
* Values in light gray were not detected above the Reporting Limit, as indicated by a "<" symbol preceding the Reporting Limit value.
* A total of 24 PFAS compounds were measured by the analysis. The presence or absence of other compounds has not been confirmed.
* Compound names reflect the New Hampshire Department of Environmental Services accepted names. These names may differ from those presented by Alpha Analytical in the laboratory reports. CAS numbers were not altered.
* Surface water screening or regulatory values for PFAS have not yet been developed for the Site.

TABLE 2B
SUMMARY OF FIELD PARAMETERS
Troy Mills Landfill Superfund Site
Troy, New Hampshire

04.0190325.28

Page 1 of 1

Sample ID	Sampling Event Date	Temperature (°C)	Specific Conductance (µS/cm)	pH (SU)	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (ntu)
TRY_SW-1	5/24/2019	16	28	6.3	100	9.3	1
TRY_SW-3	5/24/2019	15	26	6.4	88	9.4	1
TRY_SW-4	5/24/2019	15	25	6.4	91	9.2	1
TRY_SW-100	5/24/2019	15	27	7.4	75	9.2	2
TRY_SW-SDP-0	5/24/2019	21	34	6.3	99	7.8	7
TRY_SW-SDP-2.5	5/24/2019	18	32	6.3	100	8.4	2
TRY_SW-SDP-4.5	5/24/2019	18	32	6.3	97	8.1	4

TABLE KEY:

ORP = Oxidation Reduction Potential

mg/L = milligrams per Liter

SU = Standard Units

mV = milliVolts

µS/cm = micro Siemens per centimeter

ntu = Nephelometric Turbidity Units

°C = degrees Celsius

TABLE 3
RELATIVE PERCENT DIFFERENCE (RPD) CALCULATIONS FOR DUPLICATE SAMPLES
 Troy Mills Landfill Superfund Site
 Troy, New Hampshire

Sample ID	Sample Date	Carboxylic Acids (ng/L)			
		Perfluoropentanoic Acid (PFPeA) [5]	Perfluorohexanoic Acid (PFHxA) [6]	Perfluoroheptanoic Acid (PFHpA) [7]	Perfluorooctanoic Acid (PFOA) [8]
TRY_SW-3	5/24/19	<1.80	2.26	2.44	4.07
TRY_SW-3 DUP		1.87	2.49	2.62	4.34
RPD		N/A	9.7%	7.1%	6.4%

TABLE KEY:

[4] = Number of fluorinated carbon chains for perfluorinated carboxylic acids

DUP = Duplicate sample

PFAS = Per- and Polyfluoroalkyl Substances

RPD = Relative Percent Difference

N/A = Not Applicable

ng/L = nanograms per liter

< = analyte not detected above the laboratory reporting limit

Bold indicates that the concentration was detected above the laboratory reporting detection limit

Green shading indicates the RPD exceeded the acceptance criteria of 30% for aqueous samples

GENERAL NOTES:

- * Values in light gray were not detected above the Reporting Limit, as indicated by a "<" symbol preceding the Reporting Limit value.
- * Compound names reflect the New Hampshire Department of Environmental Services accepted names. These names may differ from those presented by Alpha Analytical in the laboratory reports. CAS numbers were not altered.



Figures



Appendix A – Limitations



USE OF REPORT

1. GZA GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of our Client for the stated purpose(s) and location(s) identified in the Proposal for Services and/or Report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not expressly identified in the agreement, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

STANDARD OF CARE

2. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the Proposal for Services and/or Report and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. Conditions other than described in this report may be found at the subject location(s).
3. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made. Specifically, GZA does not and cannot represent that the Site contains no hazardous material, oil, or other latent condition beyond that observed by GZA during its study. Additionally, GZA makes no warranty that any response action or recommended action will achieve all of its objectives or that the findings of this study will be upheld by a local, state or federal agency.
4. In conducting our work, GZA relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Inconsistencies in this information which we have noted, if any, are discussed in the Report.

SUBSURFACE CONDITIONS

5. The generalized soil profile(s) provided in our Report are based on widely-spaced subsurface explorations and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and were based on our assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs. The nature and extent of variations between these explorations may not become evident until further exploration or construction. If variations or other latent conditions then become evident, it will be necessary to reevaluate the conclusions and recommendations of this report.
6. Water level readings have been made, as described in this Report, in and monitoring wells at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this report. Fluctuations in the level of the groundwater however occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, the presence of subsurface utilities, and/or natural or artificially induced perturbations. The observed water table may be other than indicated in the Report.

COMPLIANCE WITH CODES AND REGULATIONS

7. We used reasonable care in identifying and interpreting applicable codes and regulations necessary to execute our scope of work. These codes and regulations are subject to various, and possibly contradictory, interpretations. Interpretations and compliance with codes and regulations by other parties is beyond our control.



SCREENING AND ANALYTICAL TESTING

8. GZA collected environmental samples at the locations identified in the Report. These samples were analyzed for the specific parameters identified in the report. Additional constituents, for which analyses were not conducted, may be present in soil, groundwater, surface water, sediment and/or air. Future Site activities and uses may result in a requirement for additional testing.
9. Our interpretation of field screening and laboratory data is presented in the Report. Unless otherwise noted, we relied upon the laboratory's QA/QC program to validate these data.
10. Variations in the types and concentrations of contaminants observed at a given location or time may occur due to release mechanisms, disposal practices, changes in flow paths, and/or the influence of various physical, chemical, biological or radiological processes. Subsequently observed concentrations may be other than indicated in the Report.

INTERPRETATION OF DATA

11. Our opinions are based on available information as described in the Report, and on our professional judgment. Additional observations made over time, and/or space, may not support the opinions provided in the Report.

ADDITIONAL INFORMATION

12. In the event that the Client or others authorized to use this report obtain additional information on environmental or hazardous waste issues at the Site not contained in this report, such information shall be brought to GZA's attention forthwith. GZA will evaluate such information and, on the basis of this evaluation, may modify the conclusions stated in this report.

ADDITIONAL SERVICES

13. GZA recommends that we be retained to provide services during any future investigations, design, implementation activities, construction, and/or property development/ redevelopment at the Site. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.



Appendix B – Field Notes

Troy Mills LF

(65)

5/24/19

04.0190325.28

NHDES

Weather: partly cloudy, occasional sprinkles,

low 70s, windy

Purpose: surface water PFAS sampling

onsite 0915 Tanya Justham (TPS), Erik Pyrmass

(EBD), Kathryn Moran (KCM)

start @ TRY SW-100, no issues

1010 walk northern access road to check

on signs & site conditions. Gates & boulders

for engineering controls in good condition.

"No trespassing" sign missing at intersection

of rail trail and access road. Pole still

in place. Sinkhole observed at culvert

under access road by northern gravel pit

(see photos).

1025 mob to TRY SW-LEACH-B

red staining w/ very thin layer of iron

floc on sediment on bottom of sampling

(66)

5/24/19

04.0190325.28

Troy Mills LF SF

(67)

NHDES

location, sediment silt to fine gravel

in s.e. ~1" of water at sampling

location w/ visible flow, Sample: 1030

1040 mob to TRY-SW-3, no issues

1055 mob to TRY-SW-LEACHATE

- ~3" of clear water above iron floc

and leaf litter. Visible but low

velocity flow.

1110 mob to TRY-SW-4, no issues

1140 mob to TRY-SW-1, no issues

1200 leave site, mob to Sand Dam Pond

swimming beach

- Assessed conditions. Multiple people

fishing from dam + dock at beach.

- Used boat to get out to 5-foot water
column.

- high wind caused boat to drift during

collection of 4.5 sample

1500 GA off site

TP



Appendix C – Photograph Log



Photo No. 1

Missing "Private Property" sign at intersection of DRED trail and northern access road



Photo No. 2

Sinkhole over culvert on northern access road



Photo No. 3

Sampling location SW-100



Photo No. 4

Close-up of sampling location SW-100



Photo No. 5

Sampling location SW-3



Photo No. 6

Close-up of sampling location SW-3



Photo No. 7

Sampling location SW-4



Photo No. 8

Close-up of sampling location SW-4



Photo No. 9

Sampling location SW-LEACH-B



Photo No. 10

Close-up of sampling location SW-LEACH-B



Photo No. 11

Sampling location SW-LEACHATE



Photo No. 12

Close-up of sampling location SW-LEACHATE



Photo No. 13

Sampling at Sand Dam Pond



Appendix D – Surface Water Sampling Sheet

1 of 2

Surface Water / Sediment Worksheet
Troy Mills Landfill Superfund Site, Troy, New Hampshire

W

Date: 5/24/19

Time: 0950

Field Personnel: TPJ, EAD, KCM

WEATHER CONDITIONS									
CURRENT		Weather Station Location Used For Historical data: Keene, Dillant-Hopkins Airport (KEEN)							
Barometric Pressure (in mm/Hg)	29.73 in Hg / 755 mm Hg	PAST 7 DAYS							
Storm (heavy rain): circle one	Yes or No	Date	5/17	5/18	5/19	5/20	5/21	5/22	5/23
Rain (Steady Rain): circle one	Yes or No	Barometric Pressure (in mm/Hg)	29.3	29.4	29.5	29.2	29.4	29.6	29.5
Intermittent Showers: circle one	Yes or No	Estimated Rainfall (in)	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Cloud Cover (%)	90%	Comments							
Clear/Sunny: circle one	Yes or No								
Comments									
STREAM / SAMPLING LOCATION CHARACTERIZATION									
Provide physical description of sampling locations at the time of sampling. Provide a physical description of sediment samples if collected.	Sample Location:	TRY_SW-100 sand and cobbles on bottom, clear water, high flow, some algae growth on cobbles, 6" depth @ sample location, 2 ft overall depth, small brook stream observed 100 ft downstream							
	Photograph #, date & time								
	Sample Location:	TRY_SW-3 sand and gravel bottom, some grass and dead wood, 2 ft depth at sample location (deepest location), moderate flow speed							
	Photograph #, date & time								
	Sample Location:	TRY_SW-4 sand, gravel, & organic silt, some grasses, high swift flow, 5" depth at sample location up to 3 ft in depth overall							
	Photograph #, date & time								
	Sample Location:	TRY_SW-1 cobbles covered in thick algae growth, swiftly flowing, clear, ~6" in depth @ sample location, up to 1 ft in depth							
	Photograph #, date & time								
IN SITU SURFACE WATER QUALITY DATA									
Minimum 2 minute parameter stabilization period met (Y/N)?									
Sample Location ID	Temperature (°C)	Specific Conductivity (µS/cm)	pH units	ORP/Eh (mV)	DO (mg/L)	Turbidity (NTU)	Sample Time	Comments	
TRY_SW-1	16	28	6.3	100	9.3	1	1145		
TRY_SW-3	15	26	6.4	88	9.4	1	1045	collected Duplicate	
TRY_SW-4	15	25	6.4	91	9.2	1	1120		
TRY_SW-4 STREAM-STAGE MEASUREMENT (FT)									
Initial Synoptic Stream-Stage (from Water Level Measurement Form)	Date:	5/24/19	Depth of Water (ft):	1.52	Comments:				
Stream-stage when sampling TRY_MW-104S/D cluster	Date:		Depth of Water (ft):		Comments:				
Stream-stage when sampling surface water TRY_SW-4	Date:		Depth of Water (ft):		Comments:				

Notes: 1. Surface Water Quality Parameters are collected using the multiparameter meter and Hach 2100P/2100Q units. Both units are calibrated in accordance with the calibration SOP in the SAP.

TRY_SW-100

15

15.27

7.4

75

9.2

2

1000

TRY_SW-LEACHB

TPJ

TRY_SW-LEACHATE

1030

1105

red staining, thin layer of floor ~ 1" of flow
5" clear water above iron floor + 12" of water low flow

2 of 2

Surface Water / Sediment Worksheet
Troy Mills Landfill Superfund Site, Troy, New Hampshire

Date: 5/24/19

Time: 1300

Field Personnel: TPJ, KCM, EBD

WEATHER CONDITIONS									
CURRENT		Weather Station Location Used For Historical data: Keene, Dillant-Hopkins Airport (KEEN)							
Barometric Pressure (in mm/hg)	29.73 inHg / 755 mm Hg	PAST 7 DAYS							
Storm (heavy rain): circle one	Yes or (No)	Date	5/17	5/18	5/19	5/20	5/21	5/22	5/23
Rain (Steady Rain): circle one	Yes or (No)	Barometric Pressure (in mm/hg)	29.3	29.4	29.5	29.2	29.4	29.6	29.5
Intermittent Showers: circle one	Yes or (No)	Estimated Rainfall (in)	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Cloud Cover (%)	90%	Comments							
Clear/Sunny: circle one	Yes or (No)								
Comments									
STREAM / SAMPLING LOCATION CHARACTERIZATION									
Provide physical description of sampling locations at the time of sampling. Provide a physical description of sediment samples if collected.	Sample Location: Clear, fine to coarse sand, leaf + organic litter on ~ 35% of bottom, no obvious flow TRY_SW-SDP-0 by beach								
	Photograph #, date & time								
	Sample Location:								
	Photograph #, date & time								
	Sample Location:								
Photograph #, date & time									
Sample Location:									
Photograph #, date & time									
IN SITU SURFACE WATER QUALITY DATA									
Minimum 2 minute parameter stabilization period met (Y/N)?									
Sample Location ID	Temperature (°C)	Specific Conductivity (µS/cm)	pH units	ORP/Eh (mV)	DO (mg/L)	Turbidity (NTU)	Sample Time	Comments	
TRY_SW-SDP-0	21	34	6.3	99	7.8	7	1345		
TRY_SW-SDP-2.5	18	32	6.3	100	8.4	2	1410		
TRY_SW-SDP-4.5	18	32	6.3	97	8.1	4	1430		
TRY_SW-4 STREAM-STAGE MEASUREMENT (FT)									
Initial Synoptic Stream-Stage (from Water Level Measurement Form)	Date:		Depth of Water (ft):		Comments:				
Stream-stage when sampling TRY_MW-104S/D cluster	Date:		Depth of Water (ft):		Comments:				
Stream-stage when sampling surface water TRY_SW-4	Date:		Depth of Water (ft):		Comments:				

Notes: 1. Surface Water Quality Parameters are collected using the multiparameter meter and Hach 2100P/2100Q units. Both units are calibrated in accordance with the calibration SOP in the SAP.



Appendix E – Vendor Certifications and Instrument Calibration / Maintenance Logs



Vendor Equipment Certifications



U.S. Environmental
Rentals • Sales • Service
DEVICE & DATA EXPERTISE

UNIT #2

Sonde: 358284

Battery: 490690

Multi-parameter Sonde Instrument Calibration Report

Date : 5/8/2019 Ambient Temp. : 21°C Order Number : 24944
Time : 12:00:00 AM Rel. Humidity : 53% Organization : GZA
Location : Waltham, MA Technician : BP Contact Name : MATT

Man./Model: In Situ SmartROLL Serial Number: 358284

pH

Value	Accuracy	Pre-Cal	Post-Cal	Dev %	mV	Pass / Fail
7.00	± .1	7.02	7.00	0.0%	-31	Pass
4.00	± .1	3.97	4.00	0.0%	139	Pass
10.00	± .1	10.03	10.00	0.0%	-204	Pass

Conductivity

Value	Accuracy	Pre-Cal	Post-Cal	Dev %	Pass / Fail
1413 μ S/cm	± 1%	1389.9	1413	0.0%	Pass

ORP

Value	Accuracy	Pre-Cal	Post-Cal	Dev %	Pass / Fail
238 mV	± 20mV	232.2	238	0.0%	Pass

Dissolved Oxygen

Value	Accuracy	Pre-Cal	Post-Cal	Dev %	Pass / Fail
100.00 %	± 1%	99.89	100	0.0%	Pass
0.00 %			0		

Zero DO Sodium Sulfite Check: 0mg/L DO Probe Reconditioned: 5/8/2019

Value	Accuracy	Pre-Cal	Post-Cal	Dev %	Pass / Fail
-	-	-	-	-	-
-	-	-	-	-	-

Thermometer

Check during cal	Accuracy	In Situ	Difference	Model	SN	Pass / Fail
19.70 °C	± .1°C	19.8 °C	-0.1	9327K19	170389932	Pass

Solutions used during the calibration

Description	Manufacturer	Lot Number	Expiration Date
1413 uS/cm Conductivity	AquaPhoenix Scientific	8GK603	November-19
pH Buffer Solution 7	AquaPhoenix Scientific	8GE250	May-19
pH Buffer Solution 4	AquaPhoenix Scientific	7G1006	September-19
pH Buffer Solution 10	AquaPhoenix Scientific	8GE347	May-20
ORP	aquaPhoenix Scientific	9GA444	October-19
Zero Oxygen Standard	AquaPhoenix Scientific	9GA574	January-20

This document certifies that the instrument listed above has been cleaned and calibrated according to manufacturer's specifications and that all information within is correct and accurate. It is the end-user's responsibility verify, maintain, and calibrate (if necessary) this instrument in accordance with manufacturer's and/or their own specifications.


Technician

U.S. Environmental Rental Corporation

Waltham, MA: (781) 899-1560 | East Hartford, CT: (860) 289-8700 | Hamilton, NJ: (609) 570-8555 | Tampa, FL: (813) 628-4200 | Elmhurst, IL (630) 501-1847

NIST
Thermometer
Used
E3D



U.S. Environmental
Rentals • Sales • Service
DEVICE & DATA EXPERTISE

UNIT #2

Turbidimeter Instrument Calibration Report

Date : 5/8/2019 **Ambient Temp. :** 67.9°C **Order Number :** 24944
Time : 8:46:00 AM **Rel. Humidity :** 53% **Organization :** GZA
Location : Waltham, MA **Technician :** Dinesh **Contact Name :** Matt

Man./Model: Hach 2100Q

Serial Number: 13110C029620

Turbidity

Value		Post-Cal		Dev %	Pass / Fail
20.00	NTU	19.80	NTU	-1.0%	Pass
100.00	NTU	97.10	NTU	-2.9%	Pass
800.00	NTU	783.00	NTU	-2.1%	Pass
10.00	NTU	9.80	NTU	-2.0%	Pass

Solutions used during calibration

Description	Manufacturer	Lot Number	Expiration Date
20 NTU	Hach	A8079	March-20
100 NTU	Hach	A7194	July-19
800 NTU	Hach	A8080	March-20
10 NTU	Hach	A8351	December-20

This document certifies that US Environmental Rental Corporation has provided this rental equipment and all accessories in good working order. It is the renter's responsibility to: a) review all included items upon receipt, b) verify that all items are in acceptable condition and function properly, and c) contact a US Environmental associate immediately if any item is missing, damaged, and/or not functioning properly. Any delay in notifying US Environmental will be considered as the Renter taking responsibility for such missing, damaged, and/or malfunctioning item.

Missing, damaged, and/or malfunctioning equipment and accessories will result in additional fees.

Technician

U.S. Environmental Rental Corporation

Waltham, MA: (781) 899-1560 | East Hartford, CT: (860) 289-8700 | Hamilton, NJ: (609) 570-8555 | Tampa, FL: (813) 628-4200 | Elmhurst, IL (630) 501-1847



Instrument Calibration Logs

Beginning Cal

UNIT #2

OG/KSD INSTRUMENT CALIBRATION / MAINTENANCE LOG							
Date: 5/4/19 Time: 0915		Field Personnel: E. Dymess					
Meter: (circle one) YSI: Model 600XL or 600XLM In-Situ: SmartROLL		Rental Company: US Env.					
Multimeter Serial Numbers (Sonde & Meter): 358284							
Probe Pre-cleaned Certification Provided By (Personnel): BP						Date: 5/3/19	
Temperature Calibration: Personnel: BP						Date: 5/8/19	
Manufacturer's Accuracy Range of Sensor: +/- 0.2°C Vendor's check results Unit: 19.8 NIST: 12.7 Difference: 0.1							
* When performing calibration checks, wait for temperature and parameter readings to stabilize before recording the results. *							
BEGINNING CALIBRATION CHECK							
Date: 5/4/19 Time: 1040		Personnel: E. Dymess					
Calibration Check	Value of Standard	Check Results	Acceptable Range	Within Range (yes/no)	Lot #	Expiration Date	Comments
Zero DO check (mg/l)	0	0.0	0 to 0.5 mg/L	✓	86K016	11/19	
pH 7 check	7	7.04	+/- 5%	✓	8770	4/20	Range 6.65 - 7.35 pH
Specific Conductance (µS/cm)	1413	1411	+/- 5%	✓	3342	9/23	Range 682 - 754 µS/cm (718) or Range 1342 - 1484 µS/cm (1413)
Second standard used for check							
ORP check - Zobell (mV)	235	232	+/- 5%	✓	17410070	11/22	See Chart on Page 2 for ORP Zobell Solution mV Value Based on Temperature
Zobell Solution	22 °C						
Turbidity Standard (NTU) 2100P	20	NA	+/- 5%	NA	NA	NA	Range 19.0 - 21.0 NTU (2100P)
Turbidity Standard (NTU) 2100Q	10	10.0	+/- 10%	✓	18221	8/20	Range 9.0 - 11.0 NTU (2100Q)

- Notes:
- 1) If the post calibration check is not within the acceptable range the meter must be recalibrated.
 - 2) All calibration checks must be made in the run mode (on a run/measurement screen) or on the live readings screen, not the calibration mode.
 - 3) If the lot numbers and expiration dates are the same as the initial calibration, place a check mark ✓ in the appropriate box.
 - 4) Either standard (718 or 1413 µS/cm) may be used to calibrate specific conductance; the second standard is used to check it.
 - 5) Record N/A (Not Applicable) in the boxes for the turbidity meter that was not used.

Calibration Check Performed by: Erik Dymess (Print) Erik Dymess (Sign)

END OF DAY INSTRUMENT CALIBRATION CHECK							
Calibration Check	Value of Standard	Check Results	Acceptable Range	Within Range (yes/no)	Lot #	Expiration Date	Comments
Date: Time: Personnel:							
Zero DO check (mg/l)	0		0 to 0.5 mg/L				
pH 7 check	7		+/- 5%	ERD			Range 6.65 - 7.35 pH
Specific Conductance (µS/cm)			+/- 5%				Range 682 - 754 µS/cm (718) or Range 1342 - 1484 µS/cm (1413)
Second standard used for check							
ORP check - Zobell (mV)			+/- 5%				See Chart on Page 2 for ORP Zobell Solution mV Value Based on Temperature
Zobell Solution							
Turbidity Standard (NTU) 2100P ⁵	20		+/- 5%				Range 19.0 - 21.0 NTU (2100P)
Turbidity Standard (NTU) 2100Q ⁵	10		+/- 10%				Range 9.0 - 11.0 NTU (2100Q)

- Notes:
- 1) If the end of the day calibration check is not within the acceptable range, the data collected that day for that parameter shall be qualified in it's use.
 - 2) All calibration checks must be made in the run mode (on a run/measurement screen), not the calibration mode.
 - 3) If the lot numbers and expiration dates are the same as the initial calibration, place a check mark ✓ in the appropriate box.
 - 4) Either standard (718 or 1413 µS/cm) may be used to calibrate specific conductance; the second standard is used to check it.
 - 5) Record N/A (Not Applicable) in the boxes for the turbidity meter that was not used.

Calibration Check Performed by: NA (Print) NA (Sign)

List wells sampled using this equipment on this day ONLY IF DATA NEEDS TO BE QUALIFIED.

NA
|
|
|

NA
|
|
|

UNIT #2

INSTRUMENT CALIBRATION					
Date: <u>5/9/19</u> Time: <u>0915</u>					
Multimeter Calibration	Value of Standard	Check as Completed	Lot #	Expiration Date	Comments
DO (% saturation)	100%	✓			Allow time for stabilization per manufacturer
DO mg/l reading	<u>8.55</u>	✓			Record these values immediately after calibration
DO Temp. (°C) reading	<u>22.13</u>	✓			
DO (0% Saturation)-SmarTROLL	0%	✓	<u>86K016</u>	<u>11/19</u>	2 point DO Calibration for SmarTROLL only (100 & 0%)
pH 1st Standard	7	✓	<u>8770</u>	<u>04/20</u>	
2nd Standard	4	✓	<u>1526</u>	<u>05/22</u>	
3rd Standard	10	✓	<u>8398</u>	<u>12/19</u>	
Specific Conductance (µS/cm)	<u>718</u>	✓	<u>861667</u>	<u>9/19</u>	One standard is used to calibrate, second one to check (1413 and 718 standards) Using one standard for both is unacceptable.
Zobell Solution <u>22 °C</u>		✓			See Chart below for ORP Zobell Solution mV Value Based on Temperature
ORP using Zobell Solution	<u>235</u>	✓	<u>17L100520</u>	<u>11/22</u>	
Additional Information for Dissolved Oxygen Calibration					
Barometric Pressure of Meter: <u>NA</u> mm Hg (BP inches <u>NA</u> x 25.4 + BP <u>NA</u> mm Hg)					
Dissolved Oxygen Charge (YSI Meters): <u>NA</u> (Acceptable Range: 25 to 75) You MUST change the membrane if charge is out of range.					
Inspected DO membrane/RDO CAP for nicks or bubbles (check as completed) <input checked="" type="checkbox"/> Personnel: <u>E. Dymess</u>					
Changed YSI Dissolved Oxygen Membrane and Electrolyte Solution (circle one) YES or NO <u>(NO)</u>					
Replaced SmarTROLL Rugged Dissolved Oxygen CAP (circle one) YES or NO <u>(NO)</u>					
HACH 2100P or 2100Q * Turbidimeter Calibration	Value of Standard	Check as Completed	Lot #	Expiration Date	Comments
Turbidity 1st Standard (blank)	<0.1 NTU	<u>NA</u>	<u>NA</u>	<u>NA</u>	Calibrate w/ StabiCal® Formazin Primary Turbidity Standards
2nd Standard	20 NTU	✓	<u>A8074</u>	<u>3/20</u>	
3rd Standard	100 NTU	✓	<u>A8229</u>	<u>8/20</u>	
4th Standard	800 NTU	✓	<u>A8220</u>	<u>8/20</u>	
HACH Model (circle one) P or Q <u>Q</u> Serial Number: <u>131100029620</u> Rental Company: <u>US Env.</u>					

* NOTE: the 2100Q does not have a <0.1 standard, record N/A (not applicable) in the <0.1 standard boxes as appropriate.

Calibration Performed by Erik Dymess
Print Name

Erik Dymess
Signature

Zobell Solution mV Value Based on Temperature for ORP Calibration								
Calibration Check Range Values (+/- 5%)								
Round off temperature to whole number (e.g., 23.5 °C rounds up to 24 °C)								
Temp. °C	ORP Zobell Solution mV Value	Calibration Check Range Values +/- 5%	Temp. °C	ORP Zobell Solution mV Value	Calibration Check Range Values +/- 5%	Temp. °C	ORP Zobell Solution mV Value	Calibration Check Range Values +/- 5%
-3	267	254-280	10	251	238-264	23	234	222-246
-2	266	253-279	11	249	237-261	24	232	220-244
-1	265	252-278	12	248	236-260	25	231	219-243
0	264	251-277	13	247	235-259	26	230	219-242
1	262	249-275	14	245	233-257	27	228	217-239
2	261	248-274	15	244	232-256	28	227	216-238
3	260	247-273	16	243	231-255	29	226	215-237
4	258	245-271	17	241	229-253	30	225	214-236
5	257	244-270	18	240	228-252	31	223	212-234
6	256	243-269	19	239	227-251	32	222	211-233
7	254	241-267	20	238	226-250	33	221	210-232
8	253	240-266	21	236	224-248	34	219	208-230
9	252	239-265	22	235	223-247	35	218	207-229

NHPC INSTRUMENT CALIBRATION / MAINTENANCE LOG

Date: 5/23/19 Time: 0840 Field Personnel: E. Dymness
 Meter: (circle one) YSI: Model 600XL or 600XLM In-Situ SmarTROLL Rental Company: US Env.
 Multimeter Serial Numbers (Sonde & Meter): 358284
 Probe Pre-cleaned Certification Provided By (Personnel): BP Date: 5/8/19
 Temperature Calibration: Personnel: BP Date: 5/3/19
 Manufacturer's Accuracy Range of Sensor: $\pm 0.2^{\circ}\text{C}$ Vendor's check results Unit: 19.8 NIST: 19.7 Difference: 0.1
 * When performing calibration checks, wait for temperature and parameter readings to stabilize before recording the results. *

BEGINNING CALIBRATION CHECK

Date: <u>5/23/19</u> Time: <u>0840</u>		Personnel: <u>E. Dymness</u>					
Calibration Check	Value of Standard	Check Results	Acceptable Range	Within Range (yes/no)	Lot #	Expiration Date	Comments
Zero DO check (mg/l)	0	0.00	0 to 0.5 mg/L	✓	86K016	11/19	
pH 7 check	7	7.02	$\pm 5\%$	✓	8770	4/20	Range 6.65 - 7.35 pH
Specific Conductance ($\mu\text{S}/\text{cm}$) Second standard used for check	1413	1382	$\pm 5\%$	✓	86K003	11/19	Range 682 - 754 $\mu\text{S}/\text{cm}$ (718) or Range 1342 - 1484 $\mu\text{S}/\text{cm}$ (1413)
ORP check - Zobell (mV) <u>25</u> °C Zobell Solution	240	237	$\pm 5\%$	✓	176100320	11/22	See Chart on Page 2 for ORP Zobell Solution mV Value Based on Temperature
Turbidity Standard (NTU) 2100P	20	N/A	$\pm 5\%$	N/A	N/A	N/A	Range 19.0 - 21.0 NTU (2100P)
Turbidity Standard (NTU) 2100Q	10	10.4	$\pm 10\%$	✓	A8351	12/20	Range 9.0 - 11.0 NTU (2100Q)

- Notes:
- 1) If the post calibration check is not within the acceptable range the meter must be recalibrated.
 - 2) All calibration checks must be made in the run mode (on a run/measurement screen) or on the live readings screen, not the calibration mode.
 - 3) If the lot numbers and expiration dates are the same as the initial calibration, place a check mark ✓ in the appropriate box.
 - 4) Either standard (718 or 1413 $\mu\text{S}/\text{cm}$) may be used to calibrate specific conductance; the second standard is used to check it.
 - 5) Record N/A (Not Applicable) in the boxes for the turbidity meter that was not used.

Calibration Check Performed by: E. Dymness (Print) E. Dymness (Sign)

END OF DAY INSTRUMENT CALIBRATION CHECK

Date: <u>5/23/19</u> Time: <u>1430</u>		Personnel: <u>E. Dymness</u>					
Calibration Check	Value of Standard	Check Results	Acceptable Range	Within Range (yes/no)	Lot #	Expiration Date	Comments
Zero DO check (mg/l)	0	0.02	0 to 0.5 mg/L	✓	86K016	11/19	
pH 7 check	7	7.01	$\pm 5\%$	✓	A270	4/20	Range 6.65 - 7.35 pH
Specific Conductance ($\mu\text{S}/\text{cm}$) Second standard used for check	1413	1373	$\pm 5\%$	✓	86K003	11/19	Range 682 - 754 $\mu\text{S}/\text{cm}$ (718) or Range 1342 - 1484 $\mu\text{S}/\text{cm}$ (1413)
ORP check - Zobell (mV) <u>19</u> °C Zobell Solution	239	236	$\pm 5\%$	✓	176100320	11/22	See Chart on Page 2 for ORP Zobell Solution mV Value Based on Temperature
Turbidity Standard (NTU) 2100P ⁵	20	N/A	$\pm 5\%$	N/A	N/A	N/A	Range 19.0 - 21.0 NTU (2100P)
Turbidity Standard (NTU) 2100Q ⁵	10	10.9	$\pm 10\%$	✓	A8351	12/20	Range 9.0 - 11.0 NTU (2100Q)

- Notes:
- 1) If the end of the day calibration check is not within the acceptable range, the data collected that day for that parameter shall be qualified in it's use.
 - 2) All calibration checks must be made in the run mode (on a run/measurement screen), not the calibration mode.
 - 3) If the lot numbers and expiration dates are the same as the initial calibration, place a check mark ✓ in the appropriate box.
 - 4) Either standard (718 or 1413 $\mu\text{S}/\text{cm}$) may be used to calibrate specific conductance; the second standard is used to check it.
 - 5) Record N/A (Not Applicable) in the boxes for the turbidity meter that was not used.

Calibration Check Performed by: E. Dymness (Print) E. Dymness (Sign)

List wells sampled using this equipment on this day ONLY IF DATA NEEDS TO BE QUALIFIED.

N/A
J

N/A
J

INSTRUMENT CALIBRATION

Date: 5/23/19 Time: 0840

Multimeter Calibration	Value of Standard	Check as Completed	Lot #	Expiration Date	Comments
DO (% saturation)	100%				Allow time for stabilization per manufacturer
DO mg/l reading					Record these values immediately after calibration
DO Temp. (°C) reading					
DO (0% Saturation)-SmarTROLL	0%				2 point DO Calibration for SmarTROLL only (100 & 0%)
pH 1st Standard	7				
2nd Standard	4				
3rd Standard	10				
Specific Conductance (µS/cm)					One standard is used to calibrate, second one to check (1413 and 718 standards) Using one standard for both is unacceptable.
Zobell Solution _____ °C					See Chart below for ORP Zobell Solution mV Value Based on Temperature
ORP using Zobell Solution					

Additional Information for Dissolved Oxygen Calibration

Barometric Pressure of Meter: NB mm Hg [BP inches NB x 25.4 + BP NB mm Hg]

Dissolved Oxygen Charge (YSI Meters): NB (Acceptable Range: 25 to 75) You MUST change the membrane if charge is out of range.

Inspected DO membrane/RDO CAP for nicks or bubbles (check as completed) ☒ Personnel: K. Moran

Changed YSI Dissolved Oxygen Membrane and Electrolyte Solution (circle one) YES or NO NB

Replaced SmarTROLL Rugged Dissolved Oxygen CAP (circle one) YES or NO NB

HACH 2100P or 2100Q * Turbidimeter Calibration	Value of Standard	Check as Completed	Lot #	Expiration Date	Comments
Turbidity 1st Standard (blank)	<0.1 NTU	NA	NA	NA	Calibrate w/ StabiCal® Formazin Primary Turbidity Standards
2nd Standard	20 NTU	✓	A7079	3/20	
3rd Standard	100 NTU	✓	A7194	7/19	
4th Standard	800 NTU	✓	A8080	3/20	

HACH Model (circle one) P or Q Q Serial Number: 13110C029620

Rental Company: US ENV

* NOTE: the 2100Q does not have a <0.1 standard, record N/A (not applicable) in the <0.1 standard boxes as appropriate.

Calibration Performed by KC Moran
Print Name

Katlyn
Signature

Zobell Solution mV Value Based on Temperature for ORP Calibration Calibration Check Range Values (+/- 5%) Round off temperature to whole number (e.g., 23.5 °C rounds up to 24 °C)

Temp. °C	ORP Zobell Solution mV Value	Calibration Check Range Values +/- 5%	Temp. °C	ORP Zobell Solution mV Value	Calibration Check Range Values +/- 5%	Temp. °C	ORP Zobell Solution mV Value	Calibration Check Range Values +/- 5%
-3	267	254-280	10	251	238-264	23	234	222-246
-2	266	253-279	11	249	237-261	24	232	220-244
-1	265	252-278	12	248	236-260	25	231	219-243
0	264	251-277	13	247	235-259	26	230	219-242
1	262	249-275	14	245	233-257	27	228	217-239
2	261	248-274	15	244	232-256	28	227	216-238
3	260	247-273	16	243	231-255	29	226	215-237
4	258	245-271	17	241	229-253	30	225	214-236
5	257	244-270	18	240	228-252	31	223	212-234
6	256	243-269	19	239	227-251	32	222	211-233
7	254	241-267	20	238	226-250	33	221	210-232
8	253	240-266	21	236	224-248	34	219	208-230
9	252	239-265	22	235	223-247	35	218	207-229

Instrument used on 5/23/19 @ NHPC

TROY INSTRUMENT CALIBRATION / MAINTENANCE LOG

Date: <u>5/24/19</u> Time: <u>1700</u>	Field Personnel: <u>E. Dyrness</u>
Meter: (circle one) YSI: Model 600XL or 600XLM In-Situ: <u>SmartROLL</u>	Rental Company: <u>US Env.</u>
Multimeter Serial Numbers (Sonde & Meter): <u>358284</u>	
Probe Pre-cleaned Certification Provided By (Personnel): <u>BS</u>	Date: <u>5/8/19</u>
Temperature Calibration: Personnel: <u>BS</u>	Date: <u>5/8/19</u>
Manufacturer's Accuracy Range of Sensor: $\pm 0.2^{\circ}\text{C}$ Vendor's check results Unit: <u>19.8</u> NIST: <u>19.7</u> Difference: <u>0.1</u>	

* When performing calibration checks, wait for temperature and parameter readings to stabilize before recording the results. *

BEGINNING CALIBRATION CHECK

Date:	Time:	Personnel:	Value of Standard	Check Results	Acceptable Range	Within Range (yes/no)	Lot #	Expiration Date	Comments
			Zero DO check (mg/l)	<u>0</u>	<u>0 to 0.5 mg/L</u>				
			pH 7 check	<u>7</u>	<u>$\pm 5\%$</u>				Range 6.65 - 7.35 pH
			Specific Conductance ($\mu\text{S}/\text{cm}$)		<u>$\pm 5\%$</u>				Range 682 - 754 $\mu\text{S}/\text{cm}$ (718) or
			Second standard used for check		<u>$\pm 5\%$</u>				Range 1342 - 1484 $\mu\text{S}/\text{cm}$ (1413)
			ORP check - Zobell (mV)		<u>$\pm 5\%$</u>				See Chart on Page 2 for ORP Zobell
			Zobell Solution <u> </u> $^{\circ}\text{C}$						Solution mV Value Based on Temperature
			Turbidity Standard (NTU) 2100P	<u>20</u>	<u>$\pm 5\%$</u>				Range 19.0 - 21.0 NTU (2100P)
			Turbidity Standard (NTU) 2100Q	<u>10</u>	<u>$\pm 10\%$</u>				Range 9.0 - 11.0 NTU (2100Q)

- Notes:
- 1) If the post calibration check is not within the acceptable range the meter must be recalibrated.
 - 2) All calibration checks must be made in the run mode (on a run/measurement screen) or on the live readings screen, not the calibration mode.
 - 3) If the lot numbers and expiration dates are the same as the initial calibration, place a check mark \checkmark in the appropriate box.
 - 4) Either standard (718 or 1413 $\mu\text{S}/\text{cm}$) may be used to calibrate specific conductance; the second standard is used to check it.
 - 5) Record N/A (Not Applicable) in the boxes for the turbidity meter that was not used.

Calibration Check Performed by: NA (Print) NA (Sign)

END OF DAY INSTRUMENT CALIBRATION CHECK

Date:	Time:	Personnel:	Value of Standard	Check Results	Acceptable Range	Within Range (yes/no)	Lot #	Expiration Date	Comments
			Zero DO check (mg/l)	<u>0.02</u>	<u>0 to 0.5 mg/L</u>	\checkmark	<u>86K016</u>	<u>11/19</u>	
			pH 7 check	<u>7.04</u>	<u>$\pm 5\%$</u>	\checkmark	<u>8770</u>	<u>4/20</u>	Range 6.65 - 7.35 pH
			Specific Conductance ($\mu\text{S}/\text{cm}$)	<u>1413</u>	<u>$\pm 5\%$</u>	\checkmark	<u>86K603</u>	<u>11/19</u>	Range 682 - 754 $\mu\text{S}/\text{cm}$ (718) or
			Second standard used for check	<u>1380</u>	<u>$\pm 5\%$</u>	\checkmark	<u>17L00320</u>	<u>11/22</u>	Range 1342 - 1484 $\mu\text{S}/\text{cm}$ (1413)
			ORP check - Zobell (mV)	<u>232</u>	<u>$\pm 5\%$</u>	\checkmark			See Chart on Page 2 for ORP Zobell
			Zobell Solution <u>21</u> $^{\circ}\text{C}$						Solution mV Value Based on Temperature
			Turbidity Standard (NTU) 2100P ^s	<u>20</u>	<u>$\pm 5\%$</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	Range 19.0 - 21.0 NTU (2100P)
			Turbidity Standard (NTU) 2100Q ^s	<u>10</u>	<u>$\pm 10\%$</u>	\checkmark	<u>A8351</u>	<u>12/20</u>	Range 9.0 - 11.0 NTU (2100Q)

- Notes:
- 1) If the end of the day calibration check is not within the acceptable range, the data collected that day for that parameter shall be qualified in it's use.
 - 2) All calibration checks must be made in the run mode (on a run/measurement screen), not the calibration mode.
 - 3) If the lot numbers and expiration dates are the same as the initial calibration, place a check mark \checkmark in the appropriate box.
 - 4) Either standard (718 or 1413 $\mu\text{S}/\text{cm}$) may be used to calibrate specific conductance; the second standard is used to check it.
 - 5) Record N/A (Not Applicable) in the boxes for the turbidity meter that was not used.

Calibration Check Performed by: E. Dyrness (Print) E. Dyrness (Sign)

List wells sampled using this equipment on this day ONLY IF DATA NEEDS TO BE QUALIFIED.

NA

J

NA

J

INSTRUMENT CALIBRATION

Date: _____ Time: _____					
Multimeter Calibration	Value of Standard	Check as Completed	Lot #	Expiration Date	Comments
DO (% saturation)	100%				Allow time for stabilization per manufacturer
DO mg/l reading					Record these values immediately after calibration
DO Temp. (°C) reading					
DO (0% Saturation)-SmarTROLL	0%				2 point DO Calibration for SmarTROLL only (100 & 0%)
pH 1st Standard	7				
2nd Standard	4				
3rd Standard	10				
Specific Conductance (µS/cm)					One standard is used to calibrate, second one to check (1413 and 718 standards) Using one standard for both is unacceptable.
Zobell Solution _____ °C					See Chart below for ORP Zobell Solution mV Value Based on Temperature
ORP using Zobell Solution					

Additional Information for Dissolved Oxygen Calibration

Barometric Pressure of Meter: NA mm Hg [BP inches NA x 25.4 + BP NA mm Hg]

Dissolved Oxygen Charge (YSI Meters): NA (Acceptable Range: 25 to 75) You MUST change the membrane if charge is out of range.

Inspected DO membrane/RDO CAP for nicks or bubbles (check as completed) ☒ Personnel: E. Dymess

Changed YSI Dissolved Oxygen Membrane and Electrolyte Solution (circle one) YES or NO (NA)

Replaced SmarTROLL Rugged Dissolved Oxygen CAP (circle one) YES or NO (NO)

HACH 2100P or 2100Q * Turbidimeter Calibration	Value of Standard	Check as Completed	Lot #	Expiration Date	Comments
Turbidity 1st Standard (blank)	<0.1 NTU				Calibrate w/ StablCal® Formazin Primary Turbidity Standards
2nd Standard	20 NTU				
3rd Standard	100 NTU				
4th Standard	800 NTU				

HACH Model (circle one) P or Q Serial Number: _____ Rental Company: _____

* NOTE: the 2100Q does not have a <0.1 standard, record N/A (not applicable) in the <0.1 standard boxes as appropriate.

Calibration Performed by E. Dymess
Print Name

E. Dymess
Signature

Zobell Solution mV Value Based on Temperature for ORP Calibration Calibration Check Range Values (+/- 5%) Round off temperature to whole number (e.g., 23.5 °C rounds up to 24 °C)

Temp. °C	ORP Zobell Solution mV Value	Calibration Check Range Values +/- 5%	Temp. °C	ORP Zobell Solution mV Value	Calibration Check Range Values +/- 5%	Temp. °C	ORP Zobell Solution mV Value	Calibration Check Range Values +/- 5%
-3	267	254-280	10	251	238-264	23	234	222-246
-2	266	253-279	11	249	237-261	24	232	220-244
-1	265	252-278	12	248	236-260	25	231	219-243
0	264	251-277	13	247	235-259	26	230	219-242
1	262	249-275	14	245	233-257	27	228	217-239
2	261	248-274	15	244	232-256	28	227	216-238
3	260	247-273	16	243	231-255	29	226	215-237
4	258	245-271	17	241	229-253	30	225	214-236
5	257	244-270	18	240	228-252	31	223	212-234
6	256	243-269	19	239	227-251	32	222	211-233
7	254	241-267	20	238	226-250	33	221	210-232
8	253	240-266	21	236	224-248	34	219	208-230
9	252	239-265	22	235	223-247	35	218	207-229



Appendix F - Laboratory Data Package



ANALYTICAL REPORT

Lab Number:	L1922309
Client:	GZA GeoEnvironmental, Inc. 5 Commerce Park N. Suite 201 Bedford, NH 03110
ATTN:	Tanya Justham
Phone:	(603) 232-8765
Project Name:	TROY MILLS SUPERFUND SITE
Project Number:	04.0190325.28
Report Date:	06/11/19

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com



Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1922309-01	TRIP BLANK	WATER	TROY, NH	05/24/19 08:00	05/28/19
L1922309-02	FIELD BLANK-MORAN	WATER	TROY, NH	05/24/19 09:45	05/28/19
L1922309-03	TRY_SW-1	WATER	TROY, NH	05/24/19 11:45	05/28/19
L1922309-04	TRY_SW-3	WATER	TROY, NH	05/24/19 10:45	05/28/19
L1922309-05	TRY_SW-3 DUP	WATER	TROY, NH	05/24/19 10:45	05/28/19
L1922309-06	TRY_SW-4	WATER	TROY, NH	05/24/19 11:20	05/28/19
L1922309-07	TRY_SW-100	WATER	TROY, NH	05/24/19 10:00	05/28/19
L1922309-08	TRY_SW-LEACHATE	WATER	TROY, NH	05/24/19 11:05	05/28/19
L1922309-09	TRY_SW-LEACHB	WATER	TROY, NH	05/24/19 10:30	05/28/19
L1922309-10	TRY_SW-SDP-0	WATER	TROY, NH	05/24/19 13:45	05/28/19
L1922309-11	TRY_SW-SDP-2.5	WATER	TROY, NH	05/24/19 14:10	05/28/19
L1922309-12	TRY_SW-SDP-4.5	WATER	TROY, NH	05/24/19 14:30	05/28/19

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

Case Narrative (continued)

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:  Elizabeth Porta

Title: Technical Director/Representative

Date: 06/11/19

ORGANICS

SEMIVOLATILES

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-01
Client ID: TRIP BLANK
Sample Location: TROY, NH

Date Collected: 05/24/19 08:00
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 122,537(M)
Analytical Date: 06/06/19 05:11
Analyst: JW

Extraction Method: EPA 537
Extraction Date: 06/05/19 06:59

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.84	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.84	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.84	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.84	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.84	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.84	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.84	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.84	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.84	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.84	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.84	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.84	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.84	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.84	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.84	--	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.84	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.84	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.84	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.84	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.84	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.84	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.84	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.84	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.84	--	1

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-01
Client ID: TRIP BLANK
Sample Location: TROY, NH

Date Collected: 05/24/19 08:00
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	86		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	114		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	80		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	38		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	82		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	83		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	81		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	85		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	36		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	86		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	77		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	77		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	39		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	57		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	84		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	34		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	49		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	82		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	86		33-143

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-02
Client ID: FIELD BLANK-MORAN
Sample Location: TROY, NH

Date Collected: 05/24/19 09:45
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 122,537(M)
Analytical Date: 06/06/19 05:28
Analyst: JW

Extraction Method: EPA 537
Extraction Date: 06/05/19 06:59

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.89	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.89	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.89	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.89	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.89	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.89	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.89	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.89	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.89	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.89	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.89	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.89	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.89	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.89	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.89	--	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.89	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.89	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.89	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.89	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.89	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.89	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.89	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.89	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.89	--	1

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-02
Client ID: FIELD BLANK-MORAN
Sample Location: TROY, NH

Date Collected: 05/24/19 09:45
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	90		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	104		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	87		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	38		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	88		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	88		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	86		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	89		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	39		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	85		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	87		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	79		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	43		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	62		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	86		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	36		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	52		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	85		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	89		33-143

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-03
Client ID: TRY_SW-1
Sample Location: TROY, NH

Date Collected: 05/24/19 11:45
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 122,537(M)
Analytical Date: 06/06/19 05:44
Analyst: JW

Extraction Method: EPA 537
Extraction Date: 06/05/19 07:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.75	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.75	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.75	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.75	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.75	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.75	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.75	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.75	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.75	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.75	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.75	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.75	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.75	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.75	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.75	--	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.75	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.75	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.75	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.75	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.75	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.75	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.75	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.75	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.75	--	1

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-03
Client ID: TRY_SW-1
Sample Location: TROY, NH

Date Collected: 05/24/19 11:45
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	89		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	102		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	88		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	75		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	86		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	86		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	87		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	86		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	57		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	85		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	88		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	80		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	44		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	55		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	83		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	37		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	43		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	77		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	81		33-143

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-04
Client ID: TRY_SW-3
Sample Location: TROY, NH

Date Collected: 05/24/19 10:45
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 122,537(M)
Analytical Date: 06/06/19 06:01
Analyst: JW

Extraction Method: EPA 537
Extraction Date: 06/05/19 07:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.80	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.80	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.80	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.80	--	1
Perfluorohexanoic Acid (PFHxA)	2.26		ng/l	1.80	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.80	--	1
Perfluoroheptanoic Acid (PFHpA)	2.44		ng/l	1.80	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.80	--	1
Perfluorooctanoic Acid (PFOA)	4.07		ng/l	1.80	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.80	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.80	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.80	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.80	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.80	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.80	--	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.80	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.80	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.80	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.80	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.80	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.80	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.80	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.80	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.80	--	1

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-04
Client ID: TRY_SW-3
Sample Location: TROY, NH

Date Collected: 05/24/19 10:45
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	93		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	107		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	103		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	86		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	93		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	91		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	100		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	89		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	58		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	90		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	104		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	83		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	71		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	49		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	88		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	32		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	51		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	81		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	86		33-143

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-05
Client ID: TRY_SW-3 DUP
Sample Location: TROY, NH

Date Collected: 05/24/19 10:45
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 122,537(M)
Analytical Date: 06/07/19 01:55
Analyst: JW

Extraction Method: EPA 537
Extraction Date: 06/05/19 18:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.77	--	1
Perfluoropentanoic Acid (PFPeA)	1.87		ng/l	1.77	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.77	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.77	--	1
Perfluorohexanoic Acid (PFHxA)	2.49		ng/l	1.77	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.77	--	1
Perfluoroheptanoic Acid (PFHpA)	2.62		ng/l	1.77	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.77	--	1
Perfluorooctanoic Acid (PFOA)	4.34		ng/l	1.77	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.77	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.77	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.77	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.77	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.77	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.77	--	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.77	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.77	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.77	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.77	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.77	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.77	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.77	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.77	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.77	--	1

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-05
Client ID: TRY_SW-3 DUP
Sample Location: TROY, NH

Date Collected: 05/24/19 10:45
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	103		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	120		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	101		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	83		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	100		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	100		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	93		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	101		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	61		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	103		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	104		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	100		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	77		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	60		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	106		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	32		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	59		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	99		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	99		33-143

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-06
Client ID: TRY_SW-4
Sample Location: TROY, NH

Date Collected: 05/24/19 11:20
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 122,537(M)
Analytical Date: 06/07/19 02:28
Analyst: JW

Extraction Method: EPA 537
Extraction Date: 06/05/19 18:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.85	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.85	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.85	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.85	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.85	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.85	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.85	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.85	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.85	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.85	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.85	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.85	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.85	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.85	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.85	--	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.85	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.85	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.85	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.85	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.85	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.85	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.85	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.85	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.85	--	1

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-06
Client ID: TRY_SW-4
Sample Location: TROY, NH

Date Collected: 05/24/19 11:20
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	102		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	117		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	104		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	88		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	97		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	97		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	90		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	99		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	63		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	100		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	110		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	98		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	60		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	67		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	104		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	31		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	57		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	98		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	95		33-143

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-07
Client ID: TRY_SW-100
Sample Location: TROY, NH

Date Collected: 05/24/19 10:00
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 122,537(M)
Analytical Date: 06/07/19 02:44
Analyst: JW

Extraction Method: EPA 537
Extraction Date: 06/05/19 18:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.77	--	1
Perfluoropentanoic Acid (PFPeA)	2.29		ng/l	1.77	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.77	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.77	--	1
Perfluorohexanoic Acid (PFHxA)	3.19		ng/l	1.77	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.77	--	1
Perfluoroheptanoic Acid (PFHpA)	3.66		ng/l	1.77	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.77	--	1
Perfluorooctanoic Acid (PFOA)	5.34		ng/l	1.77	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.77	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.77	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.77	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.77	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.77	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.77	--	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.77	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.77	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.77	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.77	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.77	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.77	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.77	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.77	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.77	--	1

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-07
Client ID: TRY_SW-100
Sample Location: TROY, NH

Date Collected: 05/24/19 10:00
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	98		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	111		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	96		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	86		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	90		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	89		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	87		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	92		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	60		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	95		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	99		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	93		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	66		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	62		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	97		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	28		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	52		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	93		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	94		33-143

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-08
Client ID: TRY_SW-LEACHATE
Sample Location: TROY, NH

Date Collected: 05/24/19 11:05
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 122,537(M)
Analytical Date: 06/07/19 03:01
Analyst: JW

Extraction Method: EPA 537
Extraction Date: 06/05/19 18:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	42.1		ng/l	1.91	--	1
Perfluoropentanoic Acid (PFPeA)	102		ng/l	1.91	--	1
Perfluorobutanesulfonic Acid (PFBS)	10.8		ng/l	1.91	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.91	--	1
Perfluorohexanoic Acid (PFHxA)	131		ng/l	1.91	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.91	--	1
Perfluoroheptanoic Acid (PFHpA)	164		ng/l	1.91	--	1
Perfluorohexanesulfonic Acid (PFHxS)	8.71		ng/l	1.91	--	1
Perfluorooctanoic Acid (PFOA)	343		ng/l	1.91	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.91	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.91	--	1
Perfluorononanoic Acid (PFNA)	23.1		ng/l	1.91	--	1
Perfluorooctanesulfonic Acid (PFOS)	10.3		ng/l	1.91	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.91	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.91	--	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.91	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.91	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.91	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.91	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.91	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.91	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.91	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.91	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.91	--	1

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-08
Client ID: TRY_SW-LEACHATE
Sample Location: TROY, NH

Date Collected: 05/24/19 11:05
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	105		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	116		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	95		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	144		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	94		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	100		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	95		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	101		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	115		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	111		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	102		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	100		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	86		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	69		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	106		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	39		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	59		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	90		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	88		33-143

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-09
Client ID: TRY_SW-LEACHB
Sample Location: TROY, NH

Date Collected: 05/24/19 10:30
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 122,537(M)
Analytical Date: 06/07/19 15:58
Analyst: JW

Extraction Method: EPA 537
Extraction Date: 06/05/19 18:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	32.8		ng/l	1.94	--	1
Perfluoropentanoic Acid (PFPeA)	71.4		ng/l	1.94	--	1
Perfluorobutanesulfonic Acid (PFBS)	7.92		ng/l	1.94	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.94	--	1
Perfluorohexanoic Acid (PFHxA)	119		ng/l	1.94	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.94	--	1
Perfluoroheptanoic Acid (PFHpA)	147		ng/l	1.94	--	1
Perfluorohexanesulfonic Acid (PFHxS)	2.94		ng/l	1.94	--	1
Perfluorooctanoic Acid (PFOA)	220		ng/l	1.94	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.94	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.94	--	1
Perfluorononanoic Acid (PFNA)	20.7		ng/l	1.94	--	1
Perfluorooctanesulfonic Acid (PFOS)	14.3		ng/l	1.94	--	1
Perfluorodecanoic Acid (PFDA)	8.72		ng/l	1.94	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.94	--	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.94	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.94	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.94	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.94	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.94	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.94	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.94	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.94	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.94	--	1

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-09
Client ID: TRY_SW-LEACHB
Sample Location: TROY, NH

Date Collected: 05/24/19 10:30
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	103		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	111		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	102		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	128		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	100		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	101		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	104		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	101		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	92		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	109		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	103		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	99		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	82		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	73		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	107		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	43		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	67		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	94		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	103		33-143

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-10
Client ID: TRY_SW-SDP-0
Sample Location: TROY, NH

Date Collected: 05/24/19 13:45
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 122,537(M)
Analytical Date: 06/07/19 16:14
Analyst: JW

Extraction Method: EPA 537
Extraction Date: 06/05/19 18:48

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	4.72		ng/l	1.82	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.82	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.82	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.82	--	1
Perfluorohexanoic Acid (PFHxA)	1.93		ng/l	1.82	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.82	--	1
Perfluoroheptanoic Acid (PFHpA)	2.14		ng/l	1.82	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.82	--	1
Perfluorooctanoic Acid (PFOA)	3.51		ng/l	1.82	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.82	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.82	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.82	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.82	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.82	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.82	--	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.82	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.82	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.82	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.82	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.82	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.82	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.82	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.82	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.82	--	1

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-10
Client ID: TRY_SW-SDP-0
Sample Location: TROY, NH

Date Collected: 05/24/19 13:45
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	98		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	111		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	98		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	95		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	99		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	93		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	100		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	98		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	70		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	95		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	101		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	97		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	80		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	75		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	100		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	33		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	67		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	95		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	98		33-143

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-11
Client ID: TRY_SW-SDP-2.5
Sample Location: TROY, NH

Date Collected: 05/24/19 14:10
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 122,537(M)
Analytical Date: 06/07/19 16:31
Analyst: JW

Extraction Method: EPA 537
Extraction Date: 06/05/19 18:48

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	5.38		ng/l	1.80	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.80	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.80	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.80	--	1
Perfluorohexanoic Acid (PFHxA)	1.82		ng/l	1.80	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.80	--	1
Perfluoroheptanoic Acid (PFHpA)	2.04		ng/l	1.80	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.80	--	1
Perfluorooctanoic Acid (PFOA)	3.09		ng/l	1.80	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.80	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.80	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.80	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.80	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.80	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.80	--	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.80	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.80	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.80	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.80	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.80	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.80	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.80	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.80	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.80	--	1

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-11
Client ID: TRY_SW-SDP-2.5
Sample Location: TROY, NH

Date Collected: 05/24/19 14:10
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	100		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	114		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	104		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	99		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	101		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	96		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	103		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	98		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	71		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	99		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	103		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	98		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	76		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	73		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	104		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	38		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	64		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	95		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	98		33-143

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-12
Client ID: TRY_SW-SDP-4.5
Sample Location: TROY, NH

Date Collected: 05/24/19 14:30
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 122,537(M)
Analytical Date: 06/07/19 16:47
Analyst: JW

Extraction Method: EPA 537
Extraction Date: 06/05/19 18:48

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	4.39		ng/l	1.80	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.80	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.80	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.80	--	1
Perfluorohexanoic Acid (PFHxA)	1.96		ng/l	1.80	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.80	--	1
Perfluoroheptanoic Acid (PFHpA)	2.27		ng/l	1.80	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.80	--	1
Perfluorooctanoic Acid (PFOA)	3.66		ng/l	1.80	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.80	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.80	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.80	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.80	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.80	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.80	--	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.80	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.80	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.80	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.80	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.80	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.80	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.80	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.80	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.80	--	1

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

SAMPLE RESULTS

Lab ID: L1922309-12
Client ID: TRY_SW-SDP-4.5
Sample Location: TROY, NH

Date Collected: 05/24/19 14:30
Date Received: 05/28/19
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	95		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	106		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	91		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	85		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	92		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	87		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	85		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	88		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	69		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	87		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	89		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	89		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	73		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	67		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	95		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	32		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	59		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	88		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	92		33-143

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

Method Blank Analysis Batch Quality Control

Analytical Method: 122,537(M)
Analytical Date: 06/05/19 23:23
Analyst: JW

Extraction Method: EPA 537
Extraction Date: 06/05/19 06:55

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-04 Batch: WG1244665-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.00	--
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.00	--
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	--
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	2.00	--
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	2.00	--
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	2.00	--
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	--
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	--
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.00	--
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.00	--
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.00	--
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	--
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.00	--
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	--
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.00	--
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	2.00	--
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	2.00	--
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	--
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	2.00	--
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	2.00	--
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	2.00	--
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	--
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	2.00	--
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	2.00	--

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

Method Blank Analysis Batch Quality Control

Analytical Method: 122,537(M)
Analytical Date: 06/05/19 23:23
Analyst: JW

Extraction Method: EPA 537
Extraction Date: 06/05/19 06:55

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-04 Batch: WG1244665-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	99		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	109		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	107		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	63		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	96		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	96		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	99		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	96		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	78		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	103		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	108		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	95		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	95		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	82		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	97		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	32		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	73		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	94		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	97		33-143

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

Method Blank Analysis Batch Quality Control

Analytical Method: 122,537(M)
Analytical Date: 06/07/19 03:18
Analyst: JW

Extraction Method: EPA 537
Extraction Date: 06/05/19 18:30

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 05-12 Batch: WG1244997-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.00	--
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.00	--
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	--
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	2.00	--
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	2.00	--
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	2.00	--
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	--
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	--
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.00	--
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.00	--
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.00	--
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	--
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.00	--
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	--
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.00	--
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	2.00	--
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	2.00	--
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	--
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	2.00	--
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	2.00	--
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	2.00	--
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	--
Perfluorotridecanoic Acid (PFTTrDA)	ND		ng/l	2.00	--
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	2.00	--

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

Method Blank Analysis Batch Quality Control

Analytical Method: 122,537(M)
Analytical Date: 06/07/19 03:18
Analyst: JW

Extraction Method: EPA 537
Extraction Date: 06/05/19 18:30

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 05-12 Batch: WG1244997-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	98		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	111		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	90		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	44		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	92		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	92		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	81		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	93		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	56		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	101		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	94		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	93		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	67		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	73		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	97		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	21		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	62		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	92		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	94		33-143

Lab Control Sample Analysis **Batch Quality Control**

Project Name: TROY MILLS SUPERFUND SITE

Lab Number: L1922309

Project Number: 04.0190325.28

Report Date: 06/11/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04 Batch: WG1244665-2 WG1244665-3								
Perfluorobutanoic Acid (PFBA)	99		99		67-148	0		30
Perfluoropentanoic Acid (PFPeA)	99		101		63-161	2		30
Perfluorobutanesulfonic Acid (PFBS)	102		109		65-157	7		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	111		111		37-219	0		30
Perfluorohexanoic Acid (PFHxA)	107		108		69-168	1		30
Perfluoropentanesulfonic Acid (PFPeS)	107		111		52-156	4		30
Perfluoroheptanoic Acid (PFHpA)	97		100		58-159	3		30
Perfluorohexanesulfonic Acid (PFHxS)	110		114		69-177	4		30
Perfluorooctanoic Acid (PFOA)	96		98		63-159	2		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	108		112		49-187	4		30
Perfluoroheptanesulfonic Acid (PFHpS)	94		105		61-179	11		30
Perfluorononanoic Acid (PFNA)	107		109		68-171	2		30
Perfluorooctanesulfonic Acid (PFOS)	85		94		52-151	10		30
Perfluorodecanoic Acid (PFDA)	102		102		63-171	0		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	120		97		56-173	21		30
Perfluorononanesulfonic Acid (PFNS)	102		97		48-150	5		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	102		102		60-166	0		30
Perfluoroundecanoic Acid (PFUnA)	90		92		60-153	2		30
Perfluorodecanesulfonic Acid (PFDS)	104		103		38-156	1		30
Perfluorooctanesulfonamide (FOSA)	84		87		46-170	4		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	93		104		45-170	11		30
Perfluorododecanoic Acid (PFDoA)	97		98		67-153	1		30

Lab Control Sample Analysis **Batch Quality Control**

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04 Batch: WG1244665-2 WG1244665-3								
Perfluorotridecanoic Acid (PFTrDA)	112		110		48-158	2		30
Perfluorotetradecanoic Acid (PFTA)	109		114		59-182	4		30

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	98		98		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	106		105		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	99		94		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	64		66		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	96		98		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	97		97		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	90		85		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	98		97		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	79		74		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	101		99		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	97		92		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	94		89		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	78		93		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	71		75		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	94		96		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	29		31		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	72		74		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	91		95		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	97		94		33-143

Lab Control Sample Analysis **Batch Quality Control**

Project Name: TROY MILLS SUPERFUND SITE

Lab Number: L1922309

Project Number: 04.0190325.28

Report Date: 06/11/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-12 Batch: WG1244997-2 WG1244997-3								
Perfluorobutanoic Acid (PFBA)	93		98		67-148	5		30
Perfluoropentanoic Acid (PFPeA)	94		99		63-161	5		30
Perfluorobutanesulfonic Acid (PFBS)	100		107		65-157	7		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	109		117		37-219	7		30
Perfluorohexanoic Acid (PFHxA)	102		110		69-168	8		30
Perfluoropentanesulfonic Acid (PFPeS)	110		100		52-156	10		30
Perfluoroheptanoic Acid (PFHpA)	93		98		58-159	5		30
Perfluorohexanesulfonic Acid (PFHxS)	118		107		69-177	10		30
Perfluorooctanoic Acid (PFOA)	93		95		63-159	2		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	99		104		49-187	5		30
Perfluoroheptanesulfonic Acid (PFHpS)	86		95		61-179	10		30
Perfluorononanoic Acid (PFNA)	101		107		68-171	6		30
Perfluorooctanesulfonic Acid (PFOS)	74		85		52-151	14		30
Perfluorodecanoic Acid (PFDA)	97		105		63-171	8		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	80		99		56-173	21		30
Perfluorononanesulfonic Acid (PFNS)	88		95		48-150	8		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	90		99		60-166	10		30
Perfluoroundecanoic Acid (PFUnA)	86		88		60-153	2		30
Perfluorodecanesulfonic Acid (PFDS)	76		93		38-156	20		30
Perfluorooctanesulfonamide (FOSA)	92		89		46-170	3		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	103		90		45-170	13		30
Perfluorododecanoic Acid (PFDoA)	92		104		67-153	12		30

Lab Control Sample Analysis **Batch Quality Control**

Project Name: TROY MILLS SUPERFUND SITE
Project Number: 04.0190325.28

Lab Number: L1922309
Report Date: 06/11/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-12 Batch: WG1244997-2 WG1244997-3								
Perfluorotridecanoic Acid (PFTrDA)	97		114		48-158	16		30
Perfluorotetradecanoic Acid (PFTA)	103		108		59-182	5		30

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	96		101		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	109		116		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	92		98		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	48		53		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	88		94		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	91		96		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	77		97		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	93		102		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	59		70		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	95		107		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	100		101		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	89		91		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	81		80		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	68		74		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	92		101		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	23		21		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	60		71		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	90		93		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	95		104		33-143

Lab Duplicate Analysis Batch Quality Control

Project Name: TROY MILLS SUPERFUND SITE

Project Number: 04.0190325.28

Lab Number: L1922309

Report Date: 06/11/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-12 QC Batch ID: WG1244997-5 QC Sample: L1922309-05 Client ID: TRY_SW-3 DUP						
Perfluorobutanoic Acid (PFBA)	ND	ND	ng/l	NC		30
Perfluoropentanoic Acid (PFPeA)	1.87	ND	ng/l	NC		30
Perfluorobutanesulfonic Acid (PFBS)	ND	ND	ng/l	NC		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	ND	ng/l	NC		30
Perfluorohexanoic Acid (PFHxA)	2.49	2.45	ng/l	2		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	ND	ng/l	NC		30
Perfluoroheptanoic Acid (PFHpA)	2.62	2.71	ng/l	3		30
Perfluorohexanesulfonic Acid (PFHxS)	ND	ND	ng/l	NC		30
Perfluorooctanoic Acid (PFOA)	4.34	4.31	ng/l	1		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	ND	ng/l	NC		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	ND	ng/l	NC		30
Perfluorononanoic Acid (PFNA)	ND	ND	ng/l	NC		30
Perfluorooctanesulfonic Acid (PFOS)	ND	ND	ng/l	NC		30
Perfluorodecanoic Acid (PFDA)	ND	ND	ng/l	NC		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	ND	ng/l	NC		30
Perfluorononanesulfonic Acid (PFNS)	ND	ND	ng/l	NC		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	ND	ng/l	NC		30
Perfluoroundecanoic Acid (PFUnA)	ND	ND	ng/l	NC		30
Perfluorodecanesulfonic Acid (PFDS)	ND	ND	ng/l	NC		30
Perfluorooctanesulfonamide (FOSA)	ND	ND	ng/l	NC		30

Lab Duplicate Analysis Batch Quality Control

Project Name: TROY MILLS SUPERFUND SITE

Project Number: 04.0190325.28

Lab Number: L1922309

Report Date: 06/11/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-12 QC Batch ID: WG1244997-5 QC Sample: L1922309-05 Client ID: TRY_SW-3 DUP						
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	ND	ng/l	NC		30
Perfluorododecanoic Acid (PFDoA)	ND	ND	ng/l	NC		30
Perfluorotridecanoic Acid (PFTrDA)	ND	ND	ng/l	NC		30
Perfluorotetradecanoic Acid (PFTA)	ND	ND	ng/l	NC		30

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	103		104		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	120		118		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	101		108		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	83		99		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	100		101		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	100		99		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	93		99		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	101		100		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	61		72		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	103		104		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	104		116		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	100		98		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	77		76		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	60		58		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	106		104		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	32		27		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	59		57		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	99		92		24-161

Lab Duplicate Analysis

Batch Quality Control

Project Name: TROY MILLS SUPERFUND SITE

Project Number: 04.0190325.28

Lab Number: L1922309

Report Date: 06/11/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-12 QC Batch ID: WG1244997-5 QC Sample: L1922309-05 Client ID: TRY_SW-3 DUP						

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	99		95		33-143

Project Name: TROY MILLS SUPERFUND SITE**Lab Number:** L1922309**Project Number:** 04.0190325.28**Report Date:** 06/11/19**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1922309-01A	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-02A	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-03A	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-03B	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-04A	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-04B	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-05A	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-05B	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-06A	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-06B	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-07A	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-07B	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-08A	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-08B	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-09A	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-09B	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-10A	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-10B	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-11A	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-11B	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-12A	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)
L1922309-12B	2 Plastic/1 Plastic/1 H2O Plastic	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(14)

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GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
	Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

Report Format: Data Usability Report



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- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Report Format: Data Usability Report



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REFERENCES

- 122 Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS). EPA Method 537, EPA/600/R-08/092. Version 1.1, September 2009.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at its own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

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Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility**EPA 624/624.1:** m/p-xylene, o-xylene**EPA 8260C:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.**EPA 8270D:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.**EPA 6860:** SCM: Perchlorate**SM4500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.**Mansfield Facility****SM 2540D:** TSS**EPA 8082A:** NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.**Biological Tissue Matrix:** EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:**Drinking Water****EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,****EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B****EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.**Microbiology:** **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.****Non-Potable Water****SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.**EPA 624.1:** Volatile Halocarbons & Aromatics,**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.****Mansfield Facility:****Drinking Water****EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg. EPA 522.****Non-Potable Water****EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.**EPA 245.1 Hg.****SM2340B**

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

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