



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



**PROPOSED SCOPE OF WORK AND BUDGET ESTIMATE  
Fall 2022 Monitoring Round  
Troy Mills Landfill Superfund Site  
Troy, New Hampshire 03465**

**NHDES Site No.: 198405082  
Project Number: 104**

Prepared For:  
NH Department of Environmental Services  
Hazardous Waste Remediation Bureau  
29 Hazen Drive, PO Box 95  
Concord, New Hampshire 03302-0095  
Phone Number (603) 271-3649  
Contact Name: Mr. Michael Summerlin, P.E.  
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Prepared By:  
GZA GeoEnvironmental, Inc.  
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Date of Report: June 13, 2022



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## Via Email

June 13, 2022  
File No. 04.P000450.22

Mr. Michael Summerlin, P.E.  
New Hampshire Department of Environmental Services  
Waste Management Division  
29 Hazen Drive  
P.O. Box 95  
Concord, New Hampshire 03301-0095

Re: Proposed Scope of Services and Budget Estimate  
Supplemental per- and polyfluoroalkyl substance Assessment  
Troy Mills Landfill Superfund Site  
Troy, New Hampshire  
NHDES No. 198405082, Project No. 104

Dear Mr. Summerlin:

As requested, GZA GeoEnvironmental, Inc. (GZA) has prepared this proposed Scope of Services to assist the New Hampshire Department of Environmental Services (NHDES) and the United States Environmental Protection Agency (EPA) with a supplemental assessment to further evaluate the distribution of per- and polyfluoroalkyl substances (PFAS) at the Troy Mills Landfill Superfund Site located in Troy, New Hampshire (Site). The proposed supplemental assessment includes the installation of additional monitoring wells, soil sampling, and groundwater quality sampling at the existing and proposed monitoring locations.

The proposed Scope of Services has been developed based on our discussions with NHDES and our understanding of the field activities to be performed. The work will be performed in general accordance with our 2019 to 2023 contract for Site Investigations, Remediation Design and Implementation Oversight at Petroleum and Hazardous Waste Sites, and CERCLA and Brownfields Projects as approved by the Governor and Council on June 5, 2019.

## BACKGROUND

Sampling investigations for PFAS at all New Hampshire Federal NPL Sites, including the Troy Mills Landfill, was performed by NHDES over the past few years because PFAS have been widely used since the 1940s in industrial applications, including waterproofing of textiles, and their potential presence required evaluation. NHDES initiated screening of Site groundwater for PFAS in 2018 and screening of leachate and surface water samples for PFAS in 2019. A spring 2020 sampling program expanded on the 2018 and 2019 screening programs and included collecting water quality samples from each of the Site's 32 groundwater monitoring wells, two leachate sampling locations, and four surface water sampling locations. In addition, a water quality sample was collected from the recreational public beach area at Sand Dam Pond, located downstream of the Site on Rockwood Brook.



Screening levels (SLs) for the PFAS compounds perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), and perfluorobutane sulfonate (PFBS) in groundwater were developed by EPA using the Regional Screening Levels (RSL) calculator for a residential scenario and utilizing a Hazard Index (HI) = 0.1 to determine if the contaminant levels present at a site may warrant further investigation. This is consistent with standard practices for screening to identify contaminants of potential concern during a Remedial Investigation. The SLs for PFOA and PFOS are each 40 nanograms per liter (ng/L) and the SL for PFBS is 40,000 ng/L. Concentrations of PFOA or PFOS in groundwater that exceed 400 ng/L also exceed an HI of 1 in a risk-based scenario.

During May 2016, EPA issued a Lifetime Drinking Water Health Advisory (EPA Health Advisory) level of 70 ng/L for PFOA, PFOS, and for both PFOA and PFOS combined where these chemicals are present together. EPA recommends that the EPA Health Advisory level of 70 ng/L be used as the preliminary remediation goal (PRG) for contaminated groundwater that is a current or potential source of drinking water where no State Maximum Contaminant Level (MCL) or other ARARs are available or sufficiently protective (EPA, 2020).

Effective July 23, 2020, New Hampshire established MCLs in drinking water for PFOA (12 ng/L), PFOS (15 ng/L), perfluorononanoic acid (PFNA, 11 ng/L), and perfluorohexane sulfonic acid (PFHxS, 18 ng/L). New Hampshire also established Ambient Groundwater Quality Standards (AGQS) in groundwater for PFNA and PFHxS equivalent to the MCLs and lowered the AGQS for PFOA and PFOS to match the new MCLs.

EPA developed Site-specific SLs for PFOA (713 ng/L), PFOS (713 ng/L), and PFBS (713,000 ng/L) in surface water and issued them in a memorandum dated June 22, 2020. The Site-specific screening levels were developed for a recreational surface water exposure pathway for a child swimmer based on ingestion exposure since no dermal or inhalation toxicity values for the contaminants are currently available.

PFOA has been detected at concentrations exceeding the EPA SL, EPA Health Advisory, and AGQS in groundwater collected from certain monitoring wells on the Site, with a maximum concentration of 2,140 ng/L detected at well MW-102. The highest concentrations of PFOA in groundwater were generally observed in the central portion of the defined former drum area and immediately north of the former drum area, consistent with the historical extent of the volatile organic compound (VOC) and semi-volatile organic compound (SVOC) plumes. Concentrations generally decrease toward the west and northwest closer to Rockwood Brook along the general axis of groundwater flow. The existing well network does not provide data points to provide confirmation of downgradient and cross-gradient edges to the plume, with concentrations below regulatory values. Due to the presumed discharge of groundwater to the wetland and Rockwood Brook, few monitoring wells have been installed near the groundwater management zone (GMZ) boundaries and, therefore, the edges of the PFAS plume are not well delineated.<sup>1</sup> Well couplet MW-105, located at the northern, downgradient-most point of the GMZ, has detected concentrations of PFOA that exceed each of the regulatory and screening values except the HI=1 value.

Low levels of three PFAS compounds have been detected in the surface water samples collected from Rockwood Brook and Sand Dam Pond. Due to the low detected levels of PFAS in surface water, well below the Site-specific screening level developed by EPA, additional surface water sampling is not recommended at this time.

Relatively higher (compared to surface water) concentrations of 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.

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<sup>1</sup> Due to the presumed discharge of groundwater to the wetland and Rockwood Brook near the center of the GMZ area, the GMZ boundary, with the exception of the northern edge proximate to where Rockwood Brook crosses it, is interpreted as upgradient or cross-gradient to the Site plumes. Based on this understanding of Site conditions, the Site monitoring well network was focused on the interior area of the GMZ rather than along the GMZ boundaries.



Based on the extent and magnitude of the concentrations of PFAS in groundwater exceeding regulatory and screening levels at the Site, additional work is warranted to further the understanding of the potential PFAS source areas and the Site-wide PFAS distribution and to delineate the PFOA plume in groundwater.

## **SCOPE OF SERVICES**

The following describes the proposed Scope of Services. Standard Operating Procedures (SOPs) for drilling and sampling will be presented in detail in the Work Plan and Sampling and Analysis Plan (SAP) to be prepared following approval of this Scope of Services.

### **TASK 1 – HYDROGEOLOGIC MODEL UPDATE**

During 2015, GZA developed a digital three-dimensional hydrogeologic model depicting the interpreted geometry of the identified hydrogeologic units for the Site based on data from historical subsurface explorations and our understanding of local hydrogeology. GZA proposes updating the three-dimensional hydrogeologic model with stratigraphic data from the monitoring wells proposed herein and incorporating groundwater PFAS data collected at the Site, as well as using the model to select screen locations during the drilling program. Using the PFAS data, we will develop the interpreted three-dimensional PFAS distribution beneath the Site within the limits of the data.

The results of the modeling effort, the proposed well locations, and installed screen locations will be presented on figures. We will include the figures and a brief discussion of the overall modeling efforts and results in the work plan discussed in **Task 2**.

### **TASK 2 – WORK PLAN AND HEALTH AND SAFETY PLAN DEVELOPMENT**

GZA will prepare a work plan for the proposed well installation activities, including proposed monitoring well depths, screen locations, soil sample numbers and locations, and applicable SOPs. In addition, GZA will prepare a Site-specific Health and Safety Plan (HASP) for the protection of GZA field personnel, addressing potential risks of exposure and potential safety issues associated with the proposed well installation and sampling tasks. GZA's Site-specific HASP will be consistent with the Occupational Safety and Health Administration standards, including 29 CFR 1910 and 1926.

### **TASK 3 – MONITORING WELL INSTALLATIONS AND SOIL SAMPLING**

Subsurface exploration locations will be marked in the field prior to mobilizing to the Site, and a Dig Safe® ticket for utility clearance will be obtained by GZA's subcontractor, as required by law.

GZA proposes installing seven monitoring wells, including one bedrock monitoring well (to supplement the existing overburden monitoring well, MW-601B) and three monitoring well couplets (paired wells screened in overburden and bedrock). Refer to **Figure 1** for the proposed monitoring well locations and designations. GZA selected these well locations after discussions with NHDES and EPA to further delineate the distribution and magnitude of PFAS in groundwater at the Site and based the locations on current Site information. The proposed locations were also selected to preliminarily evaluate differences in water quality between the solid waste landfill and drum areas. The proposed well locations may change depending on the outcome of the Site model update in **Task 1**.

GZA proposes to use rotary sonic drilling methods to install one monitoring well couplet proposed for installation on the solid waste landfill (well couplet MW-901) due to the potential presence of textile waste, and drive and wash and bedrock coring drilling methods to install the remaining monitoring wells.



GZA will observe and document the drilling and well installation activities. GZA's field representative will classify soils and prepare boring logs summarizing observations of the conditions encountered while drilling each of the borings. GZA will also screen soil samples for evidence of non-PFAS contamination by making visual and olfactory observations and screening soil samples for total VOCs using a photoionization detector equipped with a 10.6 electron volt lamp and jar headspace methods. Soil samples will be collected using a split-spoon sampler using standard penetration test methods and the following sampling scheme within the explorations:

- Continuously from ground surface to split spoon refusal for monitoring wells installed using rotary sonic and for bedrock wells installed using drive and wash; and
- Minimum 5-foot sampling intervals for overburden monitoring wells.

At each couplet location, bedrock borings will be drilled first, and subsurface data will be used to preliminarily design the overburden monitoring wells. Soil samples for laboratory analysis of PFAS will be collected from up to three borings in the landfill and drum burial areas and up to three depth intervals in each boring, including from just below the ground surface, within the buried waste materials, and just below the buried waste materials (within natural deposits). Soil samples will be sent to Alpha Analytical Laboratory (Alpha) for laboratory analysis. The rock cores will remain on-Site for geologic characterization and subsequently buried at the Site with a backhoe as part of this task.

Monitoring wells will be completed in the borings using two-inch-diameter polyvinyl chloride (PVC) screen and riser sections. Screen depths and lengths will be designed based on the results of **Task 1** and observations made during drilling. The wells will be completed with locking, protective steel well casings. Monitoring wells will be developed in accordance with GZA's SOP for well development included in our Master Quality Assurance Project Plan (QAPP) (RFA20003, approved August 2020 by NHDES and EPA).

Soil cuttings will be returned to the subsurface using a backhoe at a site location mutually agreed upon by EPA and NHDES. Purge water generated during drilling and monitoring well development will be discharged to the ground surface in the vicinity of each monitoring well.

Monitoring wells will be developed using surge block and pumping methods to remove silt from the borehole, enhancing the hydraulic connection between the well and the surrounding aquifer, and seat the installed sand-pack filter effectively.

GZA will perform an elevation survey of the newly installed monitoring wells referenced to the previously established temporary benchmark. The horizontal datum used to identify Site monitoring wells is NAD 83/96 per NHDOT base station, following the New Hampshire state plane projection, in units of U.S. Survey feet. Well locations will be collected using a global positioning system (GPS) receiver with a 10-foot (+/-) accuracy and taped measurements from Site features.

For budgeting purposes, GZA has assumed the drilling program will take 16 field days to complete.

#### TASK 4 – SAMPLING AND ANALYSIS PLAN (SAP) DEVELOPMENT

GZA will prepare an updated SAP for groundwater sampling at the Site. The SAP will be consistent with NHDES' Hazardous Waste Remediation Bureau (HWRB) Master Quality Assurance Project Plan (QAPP), approved November 2017, Revision #1 (February 2018) and Revision #2 (October 2021), EQA RFA# 18008. The SAP will include tables for a comprehensive sampling round, including each of the original and new monitoring wells at the Site, and for a confirmatory groundwater sampling round focusing on the new monitoring wells. The SAP will reference the existing NHDES Master QAPP.



#### TASK 5 – COMPREHENSIVE GROUNDWATER QUALITY SAMPLING FOR PFAS

GZA proposes to collect one comprehensive round of groundwater level measurements from each of the Site groundwater monitoring wells (39 monitoring wells) to estimate groundwater-surface and hydraulic head equipotential contours, from which we will infer directions of groundwater flow beneath the Site and Site vicinity. Depth-to-water at the Site will be measured using an electronic water level indicator probe. Groundwater elevations will be calculated by subtracting the depth-to-groundwater from the reference elevation previously established for each well (top of PVC or casing).

GZA will also perform one comprehensive round of groundwater sampling from each of the Site groundwater monitoring wells<sup>2</sup> included within the Site monitoring well network. Groundwater samples will be collected following low-flow sampling methodology using a peristaltic pump in accordance with the Site-specific SOP *Groundwater Well Sampling – Low-Flow Using a Peristaltic Pump* or a bladder pump in accordance with the Site-specific SOP *Groundwater Well Sampling – Low-Flow Using a Bladder Pump*. GZA will use non-dedicated QED Sample Pro bladder pumps (containing 100-milliliter polyethylene bladders) for wells that require bladder pump use due to the depth of groundwater (i.e., groundwater deeper than 25 feet below the top of PVC).

NHDES' contract laboratory, Alpha, will perform analyses for the collected PFAS groundwater samples and quality control samples in accordance with the SAP developed in **Task 4**.

GZA will coordinate shipping and sample courier services, as needed, for groundwater samples going to Alpha.

#### TASK 6 – SUMMARY REPORT PREPARATION

GZA will prepare an electronic (pdf) copy of a draft report summarizing the drilling activities performed in **Task 3**. The draft report will include updated summary tables of water level data and groundwater analytical results for samples collected during the monitoring round, as well as figures depicting the distribution of PFAS detections. Water quality data, water level data, and quality assurance/quality control data for groundwater sampling will be summarized in tables and figures included in the summary report but will not be discussed within the text of this report. Water quality data, etc., will be discussed in the data report described in **Task 8**.

GZA will submit the draft report, including a complete bookmarked electronic copy (pdf) and a Microsoft Word version of the report text, to NHDES and EPA for review and comment. GZA anticipates receipt of comments from NHDES and EPA. For the purposes of this proposal, GZA has included time required to address comments and finalize the report, including preparation of a bookmarked electronic (pdf) copy of the final report to be uploaded to NHDES' OneStop.

As requested by NHDES, GZA will upload the data results from Alpha to NHDES' Environmental Monitoring Database (EMD), including adding station locations for monitoring wells recently added to the sampling program. GZA has been provided a template and will enter appropriate information into the database.

#### TASK 7 – GROUNDWATER QUALITY CONFIRMATION SAMPLING

GZA proposes to collect groundwater level measurements from the seven monitoring wells installed during **Task 3** to compare to measurements collected during the comprehensive water level round. Depth-to-water at the Site will be measured using an electronic water level indicator probe. Groundwater elevations will be calculated by subtracting the depth-to-groundwater from the reference elevation previously established for each well (top of PVC or casing).

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<sup>2</sup> Wells include the seven monitoring wells installed during **Task 3** in addition to the 32 existing wells of the Site monitoring well network.



Confirmatory groundwater sampling will be conducted at the seven monitoring wells installed during **Task 3**. Groundwater samples will be collected following low-flow sampling methodology using a peristaltic pump in accordance with the Site-specific SOP *Groundwater Well Sampling – Low-Flow Using a Peristaltic Pump* or a bladder pump in accordance with the Site-specific SOP *Groundwater Well Sampling – Low-Flow Using a Bladder Pump*. GZA will use non-dedicated QED Sample Pro bladder pumps (containing 100-milliliter polyethylene bladders) for wells that require bladder pump use due to the depth of groundwater (i.e., groundwater deeper than 25 feet below the top of PVC)

NHDES' contract laboratory, Alpha, will perform analyses for the collected PFAS groundwater samples and quality control samples in accordance with the SAP.

GZA will coordinate shipping and sample courier services, as needed, for groundwater samples going to Alpha.

#### TASK 8 – DATA EVALUATION AND DATA REPORT PREPARATION

GZA will assess the water quality concentration data collected during **Task 5** and **Task 7** relative to regulatory action limits and historical concentration data collected at the Site. GZA will prepare an electronic (pdf) copy of a draft report summarizing:

- Work performed;
- Results of the water quality sampling and analysis;
- Results of water level/hydraulic head measurements;
- An updated set of figures depicting the three-dimensional hydrogeologic model of stratigraphy and PFAS plume extent;
- An updated conceptual Site model;
- Quality assurance/quality control data; and
- Our conclusions and recommendations, as appropriate.

The draft report will include updated summary tables of water level data and groundwater analytical results for samples collected during both monitoring rounds. Water quality data and water level data will be summarized as appropriate to the project objectives in figures and plots.

GZA will submit the draft report, including a complete bookmarked electronic copy (pdf) and a Microsoft Word version of the report text, to NHDES and EPA for review and comment. GZA anticipates receipt of comments from NHDES and EPA. For the purposes of this proposal, GZA has included time required to address comments and finalize the report, including preparation of a bookmarked electronic (pdf) copy of the final report to be uploaded to NHDES' OneStop.

As requested by NHDES, GZA will upload the data results from Alpha to NHDES' Environmental Monitoring Database (EMD). GZA has been provided a template and will enter appropriate information into the database.

#### TASK 9 – PROJECT MANAGEMENT

GZA anticipates that this project will include coordination between GZA's Project Manager and Principal-In-Charge (PIC), select GZA technical staff, NHDES, and EPA during the course of the project, and may include meeting(s) with NHDES and EPA to discuss findings, model interpretations, task implementation, etc. Based on this, GZA has included time associated with overall project management and coordination and time for the Project Manager, PIC, and select technical staff to attend meetings with NHDES and EPA.





## SCHEDULE AND BUDGET ESTIMATE

GZA is prepared to initiate the proposed Scope of Services upon receipt of a Work Scope Authorization.

Billings will be based on accrued time and expenses in accordance with our Site Investigations, Remediation Design and Implementation Oversight at Petroleum and Hazardous Waste Sites, and CERCLA and Brownfields Projects as approved by the Governor and Council on June 5, 2019. The budget estimate to complete the proposed work is **\$309,350.32**.

TASK DESCRIPTION	ESTIMATED COST
TASK 1 - Hydrogeologic (Solids) Model Update	\$11,716.00
TASK 2 - Work Plan and Health and Safety Plan Development	\$9,869.00
TASK 3 - Monitoring Well Installations and Soil Sampling	\$147,944.40
TASK 4 - Sampling and Analysis Plan (SAP) Development	\$5,931.00
TASK 5 - Comprehensive Groundwater Quality Sampling for PFAS	\$70,664.31
TASK 6 - Summary Report Preparation	\$12,090.00
TASK 7 - Groundwater Quality Confirmation Sampling	\$25,550.61
TASK 8 - Data Evaluation and Data Report Preparation	\$17,245.00
TASK 9 - Project Management	\$8,340.00
<b>ESTIMATED TOTAL</b>	<b>\$309,350.32</b>
<b>Laboratory Fees (not included in total estimated cost):</b>	<b>\$19,550</b>

Refer to the attached **Work Scope Budget Sheet** for a breakdown of the cost estimate by task. This estimate is based on the anticipated Scope of Services outlined above and current subcontractor and lab pricing, which represents our present judgment as to the level of effort requested. Actual charges may vary, either upward or downward, depending upon the execution of the work.

GZA greatly appreciates the opportunity to work on this important project. If you have any questions regarding the Scope of Services, please do not hesitate to contact Ms. Megan Murphy directly at (603) 232-8731.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Megan E. Murphy  
Assistant Project Manager

James M. Wieck, P.G.  
Consultant / Reviewer

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

MEM/TPJ/SRL/CGL/DMZ/JCM: jkm

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Attachments: Work Scope Budget Sheet  
Figure





## **Work Scope Budget Sheet**

WORK SCOPE BUDGET SHEET - Troy Supplemental PFAS Investigation

Troy Mills Landfill

Facility Name: Superfund Site  
Owner:   
Town: Troy, NH  
Priority No.:

Mailing Address: NHDES  
29 Hazen Drive  
P.O. Box 95  
Concord, NH 03302-0095

NHDES No.: 198405082  
UST Facility No.:   
Date of Submittal: 06/09/22  
Env-Or 600 Phase Code: GMP

GZA Job No. 04.P000450.22  
GZA PM: Megan Murphy

				Overall Breakdown				Breakdown By Class							
Description By Task	Contractor	Description	Class Code	Units	Type	Rate	Cost	Eng./Hydro. Services	Lab	Subsurface	Cont. Soil T&D	GW Treatment/Product Recover	Other	Assumptions	
Task 1. Hydrogeologic (Solids) Model Update	GZA														
		Principal	E	6.0	hrs.	\$220.00	\$1,320.00	\$1,320.00	--	--	--	--	--		
		Senior Project Manager	E	36.0	hrs.	\$176.00	\$6,336.00	\$6,336.00	--	--	--	--	--		
		Professional Level III	E	16.0	hrs.	\$120.00	\$1,920.00	\$1,920.00	--	--	--	--	--		
		Drafter	E	20.0	hrs.	\$107.00	\$2,140.00	\$2,140.00	--	--	--	--	--		
						Task 1 Total:	\$11,716.00	\$11,716.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00		
Task 2. Work Plan and Health and Safety Plan Development	GZA													Includes Work Plan development (including bedrock well designs), a preliminary site walk, development of subcontract agreement with drillers, coordination with subcontractor, and assistance with access agreement	
		Principal	E	4.0	hrs.	\$220.00	\$880.00	\$880.00	--	--	--	--	--		
		Senior Project Manager	E	14.0	hrs.	\$176.00	\$2,464.00	\$2,464.00	--	--	--	--	--		
		Professional Level III	E	30.0	hrs.	\$120.00	\$3,600.00	\$3,600.00	--	--	--	--	--		
		Professional Level II	E	20.0	hrs.	\$99.00	\$1,980.00	\$1,980.00	--	--	--	--	--		
		Drafter	E	5.0	hrs.	\$107.00	\$535.00	\$535.00	--	--	--	--	--		
		Word Processing	E	4.0	hrs.	\$90.00	\$360.00	\$360.00	--	--	--	--	--		
		Expenses/Reproduction, etc.	E	2.0	ea	\$25.00	\$50.00	\$50.00	--	--	--	--	--		
				Task 2 Total:	\$9,869.00	\$9,869.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00				
Task 3. Monitoring Well Installations and Soil Sampling	GZA	Preparation												2 contingency days added	
		Word Processing (7 Boring and Monitoring Well logs)	E	14.0	hrs.	\$90.00	\$1,260.00	\$1,260.00	--	--	--	--	--		
		Senior Project Manager (4 hrs. for coordination, one 12-hr field day [including travel], and 2 hrs./day for remaining)	E	46.0	hrs.	\$176.00	\$8,096.00	\$8,096.00	--	--	--	--	--		
		Professional Level III (assumes 16, 10-hr field days, 8 hrs. for Dig safe, and 2 8-hr days for prep and wrap up activities)	E	184.0	hrs.	\$120.00	\$22,080.00	\$22,080.00	--	--	--	--	--		
		Professional Level II (assumes 2 people for 4, 10-hr days to develop wells, survey wells, cut sample tubing, and install sample	E	80.0	hrs.	\$99.00	\$7,920.00	\$7,920.00	--	--	--	--	--		
		Senior Geologist for bedrock core evaluations	E	7.0	hrs.	\$176.00	\$1,232.00	\$1,232.00	--	--	--	--	--		
		Principal	E	9.0	hrs.	\$220.00	\$1,980.00	\$1,980.00	--	--	--	--	--		
		Equipment Rental and Supplies												Assumes use during drilling and well development/survey activities	
		GZA Truck Rental (1 truck for 22 days)	E	22.0	day	\$126.50	\$2,783.00	\$2,783.00	--	--	--	--	--		
		PID (H&S)	E	16.0	day	\$104.61	\$1,673.76	\$1,673.76	--	--	--	--	--		
		Water level meter	E	20.0	day	\$28.60	\$572.00	\$572.00	--	--	--	--	--	Use during drilling and well development	
		Misc. Equipment and Supplies (decontamination supplies, paper towels/trash bags, etc.)	E	1.0	nte	\$500.00	\$500.00	\$500.00	--	--	--	--	--		
		Tubing for well development (3/8" ID x 1/2" OD)(cost per 500' roll)	E	2.0	roll	\$151.25	\$302.50	\$302.50	--	--	--	--	--	0.17 ID/0.25 OD should be used for bladder pump wells. Amount should be doubled to included water line.	
		Sample tubing (1/4" ID x 3/8 OD HDPE)(cost per 500' roll)	E	3.0	roll	\$140.25	\$420.75	\$420.75	--	--	--	--	--		
		Master Flex #15 Silicone tubing (per 25' roll)	E	1.0	roll	\$112.17	\$112.17	\$112.17	--	--	--	--	--		
		Master Flex #16 Silicone tubing (per 25' roll)	E	1.0	roll	\$83.61	\$83.61	\$83.61	--	--	--	--	--		
		Survey Equipment	E	1.0	day	\$86.90	\$86.90	\$86.90	--	--	--	--	--		
		Hydrolift (2 pumps for 2 days)	E	4.0	day	\$82.50	\$330.00	\$330.00	--	--	--	--	--		
		Locks for wells	E	7.0	ea	\$16.50	\$115.50	\$115.50	--	--	--	--	--		
		Lodging/Meals per person (1 person 12 nights, 2 people 3 nights)	E	18.0	day	\$182.16	\$3,278.88	\$3,278.88	--	--	--	--	--	Based on Holiday Inn Express rates (\$135.60 w/ tax), plus meals (\$30)	
		Subcontractors													
		Sonic	Well Installations (assumes 5 days of drilling)	X	1.0	nte	\$30,352.00	\$30,352.00	--	--	\$30,352.00	--	--	--	Assumes non-winter investigation, 2 contingency days added to each program
		Non-sonic	Well Installations (assumes 11 days of drilling)	X	1.0	nte	\$61,165.33	\$61,165.33	--	--	\$61,165.33	--	--	--	
		Backhoe	Soil cutting and rock core management	X	1.0	nte	\$3,600.00	\$3,600.00	--	--	\$3,600.00	--	--	--	
					Task 3 Total:	\$147,944.40	\$52,827.07	\$0.00	\$95,117.33	\$0.00	\$0.00	\$0.00			

WORK SCOPE BUDGET SHEET - Troy Supplemental PFAS Investigation

Troy Mills Landfill

Facility Name: Superfund Site

Owner:

Town: Troy, NH

Priority No.:

Mailing Address: NHDES

29 Hazen Drive

P.O. Box 95

Concord, NH 03302-0095

GZA Job No. 04.P000450.22

GZA PM: Megan Murphy

NHDES No.: 198405082

UST Facility No.:

Date of Submittal: 06/09/22

Env-Or 600 Phase Code: GMP

				Overall Breakdown				Breakdown By Class						
Description By Task	Contractor	Description	Class Code	Units	Type	Rate	Cost	Eng./Hydro. Services	Lab	Subsurface	Cont. Soil T&D	GW Treatment/Product Recover	Other	Assumptions
Task 4. Sampling and Analysis Plan (SAP) Development	GZA													Assumes EPA will not require the preparation of a QAPP or Work Plan for sampling. Assumes additional time for preparation/inclusion of confirmatory sampling round.  printing field SAPs
		Principal	E	2.0	hrs.	\$220.00	\$440.00	\$440.00	--	--	--	--	--	
		Senior Project Manager	E	14.0	hrs.	\$176.00	\$2,464.00	\$2,464.00	--	--	--	--	--	
		Professional Level III	E	22.0	hrs.	\$120.00	\$2,640.00	\$2,640.00	--	--	--	--	--	
		Drafter	E	1.0	hrs.	\$107.00	\$107.00	\$107.00	--	--	--	--	--	
		Word Processing	E	2.0	hrs.	\$90.00	\$180.00	\$180.00	--	--	--	--	--	
		Expenses/Reproduction, etc.	E	4.0	ea	\$25.00	\$100.00	\$100.00	--	--	--	--	--	
						Task 4 Total:	\$5,931.00	\$5,931.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
Task 5. Comprehensive Groundwater Quality Sampling for PFAS	GZA													Assumes 39 wells; Water level round 3 people - 1 Day, Groundwater sampling 3 people - 8 Days, prep/mobilization/demobilization - 6 man days
		Senior Project Manager / QA (2 full days and 3 hrs./remaining days)	E	45.0	hrs.	\$176.00	\$7,920.00	\$7,920.00	--	--	--	--	--	
		Professional Level III (assumes 1 11-hr and 8 12-hr field days)	E	107.0	hrs.	\$120.00	\$12,840.00	\$12,840.00	--	--	--	--	--	
		Professional Level II (assumes 1 11-hr and 8 12-hr field days, 3 8-hr days for prep, mobilization, and demobilization)	E	131.0	hrs.	\$99.00	\$12,969.00	\$12,969.00	--	--	--	--	--	
		Professional Level II (assumes 1 11-hr and 8 12-hr field days), and 3 8-hr days for prep, mobilization, and demobilization	E	131.0	hrs.	\$99.00	\$12,969.00	\$12,969.00	--	--	--	--	--	
		Professional Level I (assumes 3 6-hr days for sample pickup and processing time for lab samples)	E	18.0	hrs.	\$90.00	\$1,620.00	\$1,620.00	--	--	--	--	--	
		Mileage for sample pickup and delivery (3 trips 110 miles/trip)	E	330.0	miles	\$0.585	\$193.05	\$193.05	--	--	--	--	--	Assumes 15' truck and no insurance coverage
		Equipment Rental and Supplies												
		Moving Truck Rental	E	2.0	weeks	\$803.88	\$1,607.76	\$1,607.76	--	--	--	--	--	
		GZA Truck Rental (1 truck for 9 days, including fuel)	E	9.0	day	\$126.50	\$1,138.50	\$1,138.50	--	--	--	--	--	
		Gator rental	E	2.0	weeks	\$522.50	\$1,045.00	\$1,045.00	--	--	--	--	--	
		Gator delivery fee (drop off/pickup)	E	1.0	nte	\$787.91	\$787.91	\$787.91	--	--	--	--	--	
		Peristaltic Pump (3 pumps for 7 days)	E	21.0	day	\$25.80	\$541.70	\$541.70	--	--	--	--	--	Includes rental days for calibration
		Peristaltic Pump (backup)	E	7.0	day	\$18.44	\$129.05	\$129.05	--	--	--	--	--	
		Non-dedicated QED Sample Pro Bladder Pump (3 pumps for 7	E	24.0	day	\$49.97	\$1,199.35	\$1,199.35	--	--	--	--	--	
		Poly bladder kits (20 wells, plus 3 extra)	E	23.0	ea	\$33.00	\$759.00	\$759.00	--	--	--	--	--	
		In-Situ AquaTROLL 600 and Battery (3 units for 10 days)	E	30.0	day	\$140.25	\$4,207.50	\$4,207.50	--	--	--	--	--	
		In-Situ AquaTROLL 600 and Battery (backup)	E	10.0	day	\$140.25	\$1,402.50	\$1,402.50	--	--	--	--	--	Assumes 20 wells may require bladder pumps
		Tablets for use with SmarTROLL (3 units for 7 days)	E	21.0	day	\$27.50	\$577.50	\$577.50	--	--	--	--	--	
		Hach 2100Q Turbidity Meter (3 meters for 7 days)	E	21.0	day	\$25.80	\$541.70	\$541.70	--	--	--	--	--	
		Hach 2100Q Turbidity Meter (backup)	E	7.0	day	\$18.43	\$128.98	\$128.98	--	--	--	--	--	
		100 ft water Level meter (3 meters for 7 days)	E	21.0	day	\$25.80	\$541.70	\$541.70	--	--	--	--	--	
		Compressed Nitrogen gas tanks	E	10.0	ea	\$77.00	\$770.00	\$770.00	--	--	--	--	--	Based on Holiday Inn Express rates (\$135.60 w/ tax), plus meals (\$30)
		Calibration solution set (assumes 2 sets plus extra solutions)	E	1.0	ea	\$621.00	\$621.00	\$621.00	--	--	--	--	--	
		Decontamination Solution (1 4-L Hexane; includes estimated shipping charge)	E	1.0	ea	\$440.00	\$440.00	\$440.00						
		Misc. Equipment and Supplies (decontamination supplies, paper towels/trash bags, etc.)	E	1.0	nte	\$500.00	\$500.00	\$500.00	--	--	--	--	--	
		Cooler ice (2 coolers a day, 4 bags/cooler, for 8 days)	E	64.0	bag	\$2.75	\$176.00	\$176.00	--	--	--	--	--	
		Lodging/Meals per person (sampling crew 7 nights, QA manager 2 nights)	E	23.0	day	\$182.16	\$4,190	\$4,190	--	--	--	--	--	
	Strategic	Waste Disposal												
		Hexane decontamination disposal	O	1.0	ls	\$848.44	\$848	--	--	--	--	--	\$848.44	Lump sum disposal cost
						Task 5 Total:	\$70,664.31	\$69,815.86	\$0.00	\$0.00	\$0.00	\$0.00	\$848.44	

WORK SCOPE BUDGET SHEET - Troy Supplemental PFAS Investigation

Troy Mills Landfill

Facility Name: Superfund Site

Owner:

Town: Troy, NH

Priority No.:

Mailing Address: NHDES

29 Hazen Drive

P.O. Box 95

Concord, NH 03302-0095

GZA Job No. 04.P000450.22

GZA PM: Megan Murphy

NHDES No.: 198405082

UST Facility No.:

Date of Submittal: 06/09/22

Env-Or 600 Phase Code: GMP

				Overall Breakdown				Breakdown By Class						
Description By Task	Contractor	Description	Class Code	Units	Type	Rate	Cost	Eng./Hydro. Services	Lab	Subsurface	Cont. Soil T&D	GW Treatment/Product Recover	Other	Assumptions
Task 6. Summary Report Preparation	GZA	Principal	E	3.5	hrs.	\$220.00	\$770.00	\$770.00	--	--	--	--	--	Includes time for development of a report summarizing drilling activities and including tables and figures from the sampling round, response to comments after review by NHDES and EPA, and preparation and upload of sampling data to NHDES' EMD. Groundwater data and QAQC for groundwater data will not be summarized in this report.
		Senior Project Manager	E	15.0	hrs.	\$176.00	\$2,640.00	\$2,640.00	--	--	--	--	--	
		Technical Specialist	E	15.0	hrs.	\$140.00	\$2,100.00	\$2,100.00	--	--	--	--	--	
		Professional Level III	E	30.0	hrs.	\$120.00	\$3,600.00	\$3,600.00	--	--	--	--	--	
		Professional Level II	E	10.0	hrs.	\$99.00	\$990.00	\$990.00	--	--	--	--	--	
		Drafter	E	10.0	hrs.	\$107.00	\$1,070.00	\$1,070.00	--	--	--	--	--	
		Word Processing	E	8.0	hrs.	\$90.00	\$720.00	\$720.00	--	--	--	--	--	
		Expenses/Reproduction, etc.	E	2.0	ea	\$100.00	\$200.00	\$200.00	--	--	--	--	--	
						Task 6 Total:	\$12,090.00	\$12,090.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
Task 7. Groundwater Quality Confirmation Sampling	GZA	Senior Project Manager / QA (1 full day and 2 hrs./remaining days)	E	16.0	hrs.	\$176.00	\$2,816.00	\$2,816.00	--	--	--	--	--	Assumes 7 wells; Water Level round 2 people - 1 Day, Groundwater sampling 2 people - 3 days, prep/mobilization/demobilization - 3 man days
		Professional Level III (assumes 1 11-hr and 3 12-hr field days, and 8 hrs. for prep, mobilization, and demobilization)	E	55.0	hrs.	\$120.00	\$6,600.00	\$6,600.00	--	--	--	--	--	
		Professional Level II (assumes 1 11-hr and 3 12-hr field days, and 16 hrs. for prep, mobilization, and demobilization)	E	63.0	hrs.	\$99.00	\$6,237.00	\$6,237.00	--	--	--	--	--	
		Professional Level I (assumes no days for sample pickup and processing time for lab samples)	E	0.0	hrs.	\$90.00	--	--	--	--	--	--	--	
		Mileage for sample pickup and delivery	E	0.0	miles	\$0.585	--	--	--	--	--	--	--	
		Equipment Rental and Supplies												Assumes 15' truck and no insurance coverage
		Moving Truck Rental	E	1.0	week	\$803.88	\$803.88	\$803.88	--	--	--	--	--	
		GZA Truck Rental (1 truck for 4 days, including fuel)	E	4.0	day	\$126.50	\$506.00	\$506.00	--	--	--	--	--	
		Gator rental	E	1.0	week	\$522.50	\$522.50	\$522.50	--	--	--	--	--	
		Gator delivery fee (drop off/pickup)	E	1.0	nte	\$787.91	\$787.91	\$787.91	--	--	--	--	--	
		Peristaltic Pump (2 pumps for 3 days)	E	6.0	day	\$25.80	\$154.77	\$154.77	--	--	--	--	--	
		Peristaltic Pump (backup)	E	3.0	day	\$18.44	\$55.31	\$55.31	--	--	--	--	--	
		Non-dedicated QED Sample Pro Bladder Pump (2 pumps for 3	E	6.0	day	\$49.97	\$299.84	\$299.84	--	--	--	--	--	
		Poly bladder kits (8 wells, plus 1 extra)	E	9.0	ea	\$33.00	\$297.00	\$297.00	--	--	--	--	--	
		In-Situ AquaTROLL 600 and Battery (2 units for 6 days)	E	12.0	day	\$140.25	\$1,683.00	\$1,683.00	--	--	--	--	--	
		In-Situ AquaTROLL 600 and Battery (backup)	E	6.0	day	\$140.25	\$841.50	\$841.50	--	--	--	--	--	
		Tablets for use with SmarTROLL (2 units for 3 days)	E	6.0	day	\$27.50	\$165.00	\$165.00	--	--	--	--	--	
		Hach 2100Q Turbidity Meter (2 meters for 3 days)	E	6.0	day	\$25.80	\$154.77	\$154.77	--	--	--	--	--	
		Hach 2100Q Turbidity Meter (backup)	E	3.0	day	\$18.43	\$55.28	\$55.28	--	--	--	--	--	
		100 ft water Level meter (2 meters for 4 days)	E	8.0	day	\$25.80	\$206.36	\$206.36	--	--	--	--	--	
		Masterflex Silastic Tubing (#16)	E	0.0	ea	\$98.45	--	--	--	--	--	--	--	
		Masterflex Silastic Tubing (#15)	E	0.0	ea	\$107.36	--	--	--	--	--	--	--	
		Compressed Nitrogen gas tanks	E	4.0	ea	\$77.00	\$308.00	\$308.00	--	--	--	--	--	Assumes 10 wells may require bladder pumps
		Calibration solution set (assumes 1 set plus extra solutions)	E	1.0	ea	\$309.10	\$309.10	\$309.10	--	--	--	--	--	
		Decontamination Solution (1 4-L Hexane; includes estimated shipping charge)	E	1.0	ea	\$440.00	\$440.00	\$440.00						
		Misc. Equipment and Supplies (decontamination supplies, paper towels/trash bags, etc.)	E	1.0	nte	\$300.00	\$300.00	\$300.00	--	--	--	--	--	
		Cooler ice (2 coolers a day, 4 bags/cooler, for 3 days)	E	24.0	bag	\$2.75	\$66.00	\$66.00	--	--	--	--	--	
	Strategic	Lodging/Meals per person (sampling crew 3 nights)	E	6.0	day	\$182.16	\$1,093	\$1,093	--	--	--	--	--	Based on Holiday Inn Express rates (\$135.60 w/ tax), plus meals (\$30)
		Waste Disposal												
		Hexane decontamination disposal	O	1.0	ls	\$848.44	\$848.44	--	--	--	--	--	\$848.44	Lump sum disposal cost
						Task 7 Total:	\$25,550.61	\$24,702.17	\$0.00	\$0.00	\$0.00	\$0.00	\$848.44	

WORK SCOPE BUDGET SHEET - Troy Supplemental PFAS Investigation

Troy Mills Landfill

Facility Name: Superfund Site  
Owner:   
Town: Troy, NH  
Priority No.:

Mailing Address: NHDES  
29 Hazen Drive  
P.O. Box 95  
Concord, NH 03302-0095

NHDES No.: 198405082  
UST Facility No.:   
Date of Submittal: 06/09/22  
Env-Or 600 Phase Code: GMP

GZA Job No. 04.P000450.22  
GZA PM: Megan Murphy

				Overall Breakdown				Breakdown By Class						
Description By Task	Contractor	Description	Class Code	Units	Type	Rate	Cost	Eng./Hydro. Services	Lab	Subsurface	Cont. Soil T&D	GW Treatment/Product Recover	Other	Assumptions
Task 8. Data Evaluation and Data Report Preparation	GZA													Includes time for development of draft report, revision of report after receipt of NHDES and EPA comments, and preparation and upload of sampling data to NHDES' EMD.
		Principal	E	8.0	hrs.	\$220.00	\$1,760.00	\$1,760.00	--	--	--	--	--	
		Senior Project Manager	E	20.0	hrs.	\$176.00	\$3,520.00	\$3,520.00	--	--	--	--	--	
		Technical Specialist	E	20.0	hrs.	\$176.00	\$3,520.00	\$3,520.00	--	--	--	--	--	
		Professional Level III	E	40.0	hrs.	\$120.00	\$4,800.00	\$4,800.00	--	--	--	--	--	
		Professional Level II	E	12.0	hrs.	\$99.00	\$1,188.00	\$1,188.00	--	--	--	--	--	
		Drafter	E	11.0	hrs.	\$107.00	\$1,177.00	\$1,177.00	--	--	--	--	--	
		Word Processing	E	12.0	hrs.	\$90.00	\$1,080.00	\$1,080.00	--	--	--	--	--	
		Expenses/Reproduction, etc.	E	2.0	ea	\$100.00	\$200.00	\$200.00	--	--	--	--	--	
						Task 8 Total:	\$17,245.00	\$17,245.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
Task 9. Project Management	GZA													
		Principal	E	13.0	hrs.	\$220.00	\$2,860.00	\$2,860.00	--	--	--	--	--	
		Senior Project Manager	E	25.0	hrs.	\$176.00	\$4,400.00	\$4,400.00	--	--	--	--	--	
		Administrator (Billing Coordinator)	E	12.0	hrs.	\$90.00	\$1,080.00	\$1,080.00	--	--	--	--	--	
						Task 9 Total:	\$8,340.00	\$8,340.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
TOTAL PROPOSED:							\$309,350.32	\$212,536.10	\$0.00	\$95,117.33	\$0.00	\$0.00	\$1,696.89	

Env-Or 600 Phase Code

IRA - Initial Response Action  
FPR - Free Product Removal  
ISC - Initial Site Characterization  
SIR - Site Investigation/Reporting  
RAP - Remedial Action Plan  
RPI - Remedial Plan Implementation  
GMP - GW Monitoring/Permits

Class Codes:

E = Eng./Hydrogeology Services  
L = Laboratory Services  
X = Subsurface Explorations  
S = Cont. Soil Treatment/Disposal  
G = GW Treatment/Product Recovery  
O = Other

Comments: Lab sample co: \$19,550

Full groundwater sampling round - 46 samples at \$275.00 per sample = \$12,650.00  
Assumes 39 samples, 2 dups, 2 equipment blanks (bladder pump & WLM), and 3 field blanks sent to Alpha

Confirmatory groundwater sampling round - 12 samples at \$275.00 per sample = \$3,300.00  
Assumes 7 samples, 1 dup, 2 equipment blanks (bladder pump & WLM), and 2 field blanks sent to Alpha

Soil sampling - 12 samples at \$300.00 per sample = \$3,600.00  
Assumes 3 locations with 3 grab samples per location, 1 dup, 1 equipment blank (stainless steel bowl/spoon), and 1 field blank sent to Alpha



**Figure**



