



Groundwater & Environmental Services, Inc.

410 Eagleview Blvd, Suite 110  
Exton, PA 19341

T. 800.426.9871

November 12, 2025

Mr. Dustin Armstrong  
Hazardous Sites Cleanup Program  
Southeast Regional Office  
Pennsylvania Department of Environmental Protection  
2 East Main Street  
Norristown, Pennsylvania 19401

Re: GTAC-8 Data Gap Pre-Design Investigation Work Plan  
Bishop Tube HSCA Site (8-1-472)  
1 S. Malin Road, East Whiteland Township, Chester County, Pennsylvania

Groundwater & Environmental Services, Inc. (GES) is pleased to submit this Data Gap Pre-Design Investigation Work Plan to complete the following activities that were included in the Pennsylvania Department of Environmental Protection (DEP) July 31, 2025 Scope of Work issued for the Bishop Tube Hazardous Sites Cleanup Act (HSCA) Site.

- Conduct a background soil investigation for select inorganics, including total metals and fluoride, and per- and polyfluoroalkyl substances (PFAS).
- Conduct a Site soil investigation to address data gaps, including an evaluation of PFAS and fluoride concentrations.
- Install a nested bedrock monitoring well set (shallow, intermediate, and deep) via a stepwise approach:
  - Complete installation of the borehole via sonic drilling methods to an assumed maximum depth of 400 feet below ground surface (bgs)
  - Conduct downhole geophysical analyses (3-arm caliper, optical televiewer, acoustic televiewer, and heat pulse flow meter) to identify fracture zone and groundwater flow conditions and to establish the primary intervals to be monitored in each zone
  - Conduct packer testing on each selected zone to collect hydrological data and initial groundwater samples for analysis
  - Ream the borehole to final width needed for the nested well construction
  - Construct the nested poly-vinyl chloride (PVC) monitoring wells within the borehole at the selected intervals
- Conduct a round of groundwater monitoring of the full monitoring well network to evaluate the Site constituents of concern (COCs) and obtain a baseline round of data for PFAS in groundwater.
- Perform a round of surface water sampling to evaluate the Site constituents of concern and obtain a baseline round of data for PFAS in surface water.

The following paragraphs provide details (in numerical task order) related to the activities to be completed. The Site-Specific Health and Safety Plan (HASP) and Sampling and Analysis Plan (SAP)/Quality Assurance Project Plan (QAPP) are included as **Appendices A** and **B**, respectively. The proposed project schedule is included as **Appendix C**. A cost estimate for the scope of work is provided in **Appendix D**.

## 1 Background

This section provides a discussion of Site background information including: the location and description of the Site physical conditions, the physiographic setting, and Site history.

### 1.1 Location and Description

The Site is an approximate 13.7-acre former manufacturing facility located at 1 South Malin Road in Malvern, East Whiteland Township, Chester County, Pennsylvania. The approximate geographical coordinates of the center of the property site are 40 degrees, 02 minutes, 23 seconds north (latitude) by 75 degrees, 32 minutes, 12 seconds west (longitude). The area defined as the Site includes the area within the Property boundaries and the extent of groundwater contamination beyond the property boundaries. **Figure 1** (Site Location Map) illustrates the location of the site on the U.S. Geological Survey (USGS) 7.5-Minute Topographic Map for Malvern, Pennsylvania. **Figure 2** (Site Map) is an aerial photograph, which illustrates the layout of the Site.

Current features include two large vacant structures identified as Building 5 and Building 8 that cover approximately 3.7 acres of the Site. The area immediately surrounding the two buildings predominantly consists of concrete covered surfaces formerly used for facility driveways, parking and loading areas. The remainder of the Site, primarily in the southern and eastern portions, is overgrown with vegetation and trees. The Site was historically zoned industrial; however, the Site was rezoned by East Whiteland Township for residential use in 2014.

Surrounding land use consists of commercial, residential, and industrial properties. A Norfolk Southern rail line is located immediately north of the Site, with commercial properties bordering Lancaster Avenue (Route 30) located beyond the rail line. A tributary of Little Valley Creek is located along the eastern property boundary with a residential development (General Warren Village) located beyond the stream. South Malin Road is located immediately west of the Site with a bulk petroleum storage terminal owned and operated by Buckeye Partners, L.P., located beyond the road. A wooded area is located south of the Site, beyond which contains an Amtrak rail line.

### 1.2 General Physiographic Setting

This section provides a discussion of the Site physiographic setting (including the topography and drainage, the geology, and the hydrogeology) as presented in the Remedial Investigation Report dated January 13, 2021. [Please note that complete references for any citations in this section are presented in the RIR and not in this document.]

### 1.2.1 Topography and Drainage

The topography of the Site is moderately sloped, ranging from a topographic high of 450 feet above mean seal level (amsl) in the southwestern corner to a topographic low of 375 feet amsl in the northeast corner. Portions of the Site (e.g., the former southern parking area and Building 8 area) reportedly were topographically altered through cut-and fill activities to produce a “benched” condition more suitable for construction and use.

Little Valley Creek runs south to north just within the eastern property boundary. Beyond the Site, the stream travels north and runs through a culvert beneath the Norfolk Southern rail line and Lancaster Avenue. Approximately 500 feet after exiting the culvert to the north of Lancaster Avenue, the stream begins a northeasterly trend, joins Little Valley Creek, and travels approximately 5,000 feet crossing Conestoga Road and Route 29. Little Valley Creek then begins a more easterly trend.

### 1.2.2 Geology

The Site and surrounding area are located within the Piedmont Physiographic Province and are underlain by rocks that are folded, faulted and metamorphosed. The Site is located primarily within the northeast trending Chester Valley. Chester Valley is predominantly underlain by less resistant carbonate rocks and is bounded by more resistant upland areas to the north and south. These upland areas are also northeast trending, bounding the valley itself, and are referred to as the North Valley Hills and South Valley Hills, respectively.

The carbonate rocks in the vicinity of the Site are the Ordovician Conestoga Formation. According to Sloto (1987, 1990) and Senior and others (1997), the upper portion of the Conestoga Formation in the Chester Valley area consists of blue-gray to light gray, thin-bedded, argillaceous limestone with intervals of purer, granular limestone. In addition, the carbonate rock of the upper portion of the Conestoga Formation has a finely laminated appearance with shaley partings along bedding planes. The South Valley Hills are underlain by non-carbonate metamorphic phyllite and schist rocks that, in the vicinity of the Site, make up the Octoraro Formation. According to Sloto, the Octoraro Formation in the vicinity of the Site consists of green to silver-gray, fine to medium grained phyllite.

### 1.2.3 Hydrogeology

Groundwater transport in Chester Valley is primarily through fractures, joints, faults, foliation parting planes and bedding planes, some of which have been enlarged by solution. According to Sloto, the primary porosity in the carbonate rocks of Chester Valley is virtually non-existent (Sloto 1990). In the Chester Valley, groundwater reportedly flows through a network of fractures that more closely resembles a fractured rock groundwater system than a karst terrain flow system (Sloto 1990). On a regional scale, groundwater flow in eastern Chester Valley converges from the North Valley Hills and South Valley Hills toward the center of Chester Valley and then flows to the east-northeast with discharge to the Schuylkill River (Sloto 1990). However, Sloto also reports that most groundwater flow in Valley Creek Basin, the portion of Chester Valley where the Site is located, is local with discharge to local streams (Sloto 1990).



Field observations, water level elevation data and precipitation data indicate that the overburden aquifer within the Site exhibits characteristics of a hydraulically unconfined system (i.e., water table conditions exist). The bedrock aquifer within the Site also largely exhibits characteristics of a hydraulically unconfined system. However, in some locations the bedrock aquifer exhibits hydraulically confined or semi-confined characteristics and likely becomes increasingly confined with depth as a result of decreasing fracture density and connectivity. Water levels from some of the deeper bedrock monitoring wells indicate that the bedrock fractures encountered by those wells are hydraulically isolated or are in poor communication with the shallower portions of the bedrock aquifer.

### 1.3 Site Background and History

In 1951, J. Bishop & Co. Platinum Works was the first entity known to begin manufacturing operations at the Site. The plant was used primarily for the manufacturing of tubing from stainless steel and also, among other things, for specialty metal fabrication. The facility that was built in 1951 (referred to as “Plant 5”) is the more southerly of the two current buildings. In 1958, a second building was constructed, referred to as “Plant 8.” The facility continued to operate under various owners and operators as a metal alloy tube manufacturing facility until 1999. Metal alloy tube production concentrated on seamless stainless-steel products for much of the period of operation. During certain periods of time, chlorinated solvents were used for degreasing at the Site. From 1951 to 1999, various entities owned and operated manufacturing operations at the Site. The Site is currently owned by Constitution Drive Partners, L.P. (CDP), who purchased it from the Central and Western Chester County Industrial Development Authority in 2005. The Site has been vacant from 1999 to present.

Roux Associates (Roux) submitted a Remedial Investigation Report and Feasibility Study (RI/FS) to DEP in 2021, which were approved by DEP. The RI/FS identified the Site COCs to include compounds related to historical manufacturing operations at the Site. Specifically, the RI/FS COCs for the Site included chlorinated volatile organic carbons (CVOCs) and inorganics (metals and fluoride). The primary source areas for CVOCs were identified in the RI/FS as the former Building 8 vapor degreaser area (VDA), former drum storage area 3 outside Building 8, and the former Building 5 VDA. The source areas for inorganics (metals and fluoride) were identified in the RI/FS to include, among other areas, the area east of Building 8, area south of the eastern portion of Building 8, and area south of the central portion of Building 5. Additionally, arsenic, nickel, and vanadium were detected at concentrations above the DEP Direct Contact Numeric Values for a Residential Area (0-15 feet) in soils samples collected across the Site as part of the RI/FS.

In 2021 and 2022, Roux conducted additional investigation activities to complete soil delineation, refine the COC list for the Site, and evaluate PFAS in groundwater and surface water. These activities involved collection of soil samples from select treatment areas previously identified by GES in the 2020 Remedial Alternatives Analysis (RAA) and 2020 Technology Assessment Memorandum (TAM). Roux identified the treatment areas as Areas of Concern (AOCs) in their documentation. The locations of the GES treatment areas are identified on **Figure 3**. The soil samples were analyzed for total chromium, hexavalent chromium, nickel, and fluoride. The results



of this sampling concluded that the hexavalent chromium was not detected at concentrations above DEP medium specific concentrations (MSCs). However, fluoride was detected at concentrations above the DEP MSCs in multiple locations. These locations are identified on **Figure 4**. Also, a partial round of groundwater samples were collected from the monitoring well network and analyzed for PFAS. It was determined that select PFAS compounds were detected at concentrations above the DEP MSCs. As a result of the additional investigation activities, the COC list for the Site was updated to include PFAS in addition to the originally-defined list presented in the RI/FS; and it was determined that additional delineation of fluoride in soils and of PFAS in soils and groundwater is needed.

## **2 Task 1000 – Project Management**

Project management will be completed throughout the execution of all phases of the investigation and will include: preparation of field work orders for sampling events; coordination and preparation of field personnel; scheduling of subcontractors and vendors; management and verification of laboratory and field data; preparation and communication of scope changes, if needed; budget review and management; regulatory interaction and reporting; and completion of required contract documentation. Daily activity reports, monthly project status reports, and the project close out report will be prepared on forms provided by the DEP. GES will provide these reports via e-mail as requested by the DEP.

## **3 Task 1040 – Subcontractor Procurement**

Based on the tasks that will be completed during the scope of work outlined herein, GES identified the following tasks that will require subcontractor involvement:

- Brush/tree clearing and cutting vegetation services to clear the entire work area;
- Drilling services (soil boring installation);
- Drilling services (monitoring well installation);
- Geophysical investigation services (downhole);
- Laboratory analytical services; and
- Investigation derived waste (IDW) drum disposal services.

GES will solicit bids from a minimum of three qualified subcontractors, including companies that qualify as Pennsylvania Small Diverse Businesses (SDBs) when possible, to complete the required tasks. To solicit bids, GES will prepare bid packages that will include a scope of work, specifications, bid forms, and instructions to bidders. A site visit will be conducted with bidding subcontractors to allow for visual inspection of Site features related to the work being subcontracted (e.g., physical access to buildings, wooded areas, etc.). GES will provide DEP with the proposed list of bidders and the bid specifications. GES will evaluate the bids for technical quality, responsiveness, soundness of approach, health and safety, cost, and insurance requirements. A bid abstract will be prepared and provided to the DEP Project Officer along with the Subcontractor Approval Request and copies of the bids and solicitation documents. The proposed waste disposal facilities, if applicable to the work being subcontracted, will also be



submitted to DEP for approval. Following DEP approval, GES will issue work orders and/or purchase orders to selected subcontractors/vendors for the scope of work and contracted amount specified in the bid. Sole-source subcontracting may be requested whenever it is more cost effective and applicable.

Prior to mobilization for any field activities, DEP will complete the proper notifications to all affected property owners to arrange for access and to specify the type of work and duration on their property.

## **4 Task 2070 – Report Preparation**

A Data Gap Pre-Design Investigation Report will be prepared and submitted to the DEP. The report will include the following components.

- A brief summary of project activities and methodologies used to complete each investigation activity.
- A presentation and evaluation of data collected from the various investigation activities that will be conducted as part of this Work Plan, including:
  - Soil boring logs to document lithologies encountered during soil sampling and monitoring well drilling activities
  - Monitoring well construction logs and the final construction details of the nested wells
  - Downhole geophysical testing data results and decisions made from these data regarding monitoring zones and final monitoring well construction
  - Packer testing data results and decisions made from these data regarding monitoring zones and final monitoring well construction
  - Soil and groundwater tables with a comparison of the analytical results to the DEP Statewide Health Standards (SHS) or other applicable standard(s). [The groundwater summary tables will also include groundwater elevation data (feet above MSL) for each monitoring well sample location, light non-aqueous phase liquid (LNAPL) thicknesses (if detected), dense non-aqueous phase liquid (DNAPL) thicknesses (if detected), and product adjusted groundwater elevation data for monitoring wells with measured LNAPL.]
  - Groundwater elevation contour map, groundwater analytical maps, and soil analytical maps.
- Recommendations for addressing any additional data gaps that may be necessary for improved planning during the remedial design investigation phase.
- Recommendations for addressing the remediation of any previously unidentified areas of contamination discovered during the Data Gap Pre-Design Investigation.
- Site photographs.
- Certificates of final disposal or destruction of waste.
- A breakdown of all costs, including both labor hours and materials expended. [These cost breakdowns will be reported in tabular format, with a final total cost.]



The report will be provided to the DEP in draft for review. Following the DEP's review of the draft report, GES will incorporate any comments the DEP has regarding the draft and submit a final report. Draft and final deliverables will be provided to the DEP as interactive electronic files. Hard copies can be provided upon request.

## 5 Task 3011 – Soil Sampling

The soil investigation activities will comprise background soil investigation and a data gap soil investigation to address current data gaps in soil at the Site. The background soil investigation will be completed to identify the potential for pre-existing concentrations of select inorganics (arsenic, manganese, nickel, and fluoride) and PFAS for comparison to the contaminated soils on Site.

The background soil investigation will be conducted on the source property where no known activities related to the Site operations occurred. A total of four (4) background soil borings will be installed to collect representative soil samples. The proposed locations for the background borings are depicted on **Figure 5**.

A data gap soil investigation will be completed to determine the horizontal and vertical extent of the following:

- Fluoride near the former cesspool area;
- Fluoride near the acid rinsewater handling/spill area at the eastern end of Building 8; and
- PFAS in the former pipe drawing and vapor degreasing areas in Building 8.
- PFAS and/or fluoride in all areas of concern identified in the GES Technology Evaluation Memo and shown on **Figure 3** as follows:
  - AOC 1 – Two (2) Fluoride samples
  - AOC 2 – One (1) PFAS sample
  - AOC 3 – Two (2) PFAS samples
  - AOC 4 – One (1) PFAS sample / One (1) Fluoride sample
  - AOC 5 – One (1) PFAS sample / One (1) Fluoride sample (surface soil)
  - AOC 6 – Two (2) PFAS samples / Two (2) Fluoride samples
  - AOC 7 – Two (2) PFAS samples
  - AOC 8 – One (1) PFAS sample
  - AOC 9 – Two (2) PFAS samples / Two (2) Fluoride samples
  - AOC 10 – One (1) PFAS sample

The proposed soil boring locations for the data gap investigation activities are shown on **Figure 6**.



A Geoprobe® Model 7822 or similar will be mobilized to the Site to complete the advancement of soil borings via direct push methodologies. All underground utilities will be identified prior to installation of the soil borings via PA One Call notification. Prior to soil boring advancement, each location will be hand cleared to five (5) feet bgs with a hand auger and/or vacuum excavation methodologies.

The soil borings will be advanced to approximately 20 feet below ground surface (bgs) or to bedrock refusal. During the soil boring installation, soil cores will be collected continuously within each soil sample location for lithologic evaluation and sampling. The borings will be logged for lithology and PID readings. The composition, color, texture, and moisture content of the soil will be monitored as it is recovered and recorded on a subsurface log. Additionally, during the background soil sampling and data-gap soil sampling for fluoride, each one-foot interval of soil will be field screened utilizing X-Ray Fluorescence (XRF) technology to evaluate the presence/absence of metals. The fluoride delineation borings will be sampled from the 0'-2' interval (surface soil) and the interval with the highest field screening results via XRF or the soil/bedrock interface (if no impacts are identified via XRF screening). The PFAS investigation soil boring locations will be sampled from the depth of the historically identified impacts and the soil/water interface or soil/bedrock interface.

A total of 20% of the soil boring locations will include collection of a saturated soil sample for analysis. These locations will be selected based on field observation. Additionally, up to 20 samples may be collected for VOC analysis from select AOCs based on field observations. The PFAS and inorganic samples from the proposed boring locations in the GES AOCs (as shown on **Figure 6**) will be collected from the same boring location, when possible, with the exception of individual boring locations located within GES AOCs 2 and 10.

Soil samples will be collected directly from the acetate sleeves and placed directly into laboratory supplied bottleware.

## 6 Task 3012 – Groundwater Sampling

Following the installation and development of the proposed nested monitoring wells detailed under Task 3030, GES will conduct groundwater monitoring and sampling of the full monitoring well network. The full monitoring well network, including the addition of the nested well set, will consist of 57 overburden, 42 shallow bedrock, 16 intermediate bedrock, and 23 deep bedrock monitoring wells on- and off-property. The monitoring wells will be sampled utilizing hydrasleeves. The attached cost estimate (**Attachment D**) assumes one groundwater sampling event will be completed prior to the submittal of the Data Gap Pre-Design Investigation Report. The sampling methods and laboratory analyses are included in the SAP/QAPP (**Attachment B**).

In addition, GES will conduct surface water monitoring and sampling at the previously established Roux surface water sample locations, SW-1 through SW-10. The attached cost estimate assumes one surface water sampling event will be completed prior to the submittal of the Data Gap Pre-Design Investigation Report. Surface water sample locations will be sampled following the Surface Water and Sediment Sampling SOP included in the SAP/QAPP (**Appendix B**).



## 7 Task 3020 – Laboratory Analysis

The soil, groundwater, and surface water samples collected will be packed in a cooler on ice and shipped under proper chain-of custody procedures to a contract laboratory for standard turn-around time (TAT) analyses. The soil background sample locations will be submitted for laboratory analysis of total metals (including arsenic, manganese, and nickel) via EPA Method 6010D, fluoride via EPA Method 9056A, and PFAS via EPA Method 1633. Soil samples from the fluoride data-gap analysis investigation areas will be submitted for fluoride analysis via EPA Method 9056A. Soil samples from the PFAS investigation areas will be analyzed for PFAS via EPA Method 1633. Additionally, an estimated 20 samples from the data-gap analysis soil samples will be submitted for laboratory analysis of target compound list (TCL) volatile organic compounds (VOCs) [including trichloroethene (TCE) and tetrachloroethene (PCE) and all daughter products]. These locations will be based on field observations.

The groundwater and surface water samples will be submitted for laboratory analysis of TCL VOCs via EPA method 8260D, dissolved metals via EPA Method 6010D, dissolved hexavalent chromium via EPA Method 218.6, dissolved fluoride via EPA Method 9056A, and PFAS via EPA Method 1633. Note groundwater samples from all monitoring wells south of Lancaster Avenue will be analyzed for inorganics (dissolved metals, hexavalent chromium, and fluoride). In addition, surface water samples will be submitted for laboratory analysis of total manganese and dissolved magnesium and calcium (for total hardness calculation) via EPA Method 6010D.

QA/QC samples for soil, groundwater, and surface water sampling activities will include one duplicate sample, one field blank, and one equipment blank (soil samples only) per every 20 samples or fraction thereof. One trip blank per day, per cooler with VOC samples will also be submitted. The soil, groundwater, and surface water sampling methodologies and laboratory analyses are detailed in the SAP/QAPP (**Attachment B**).

## 8 Task 3030 – Monitoring Point Installation

GES will subcontract a Pennsylvania-licensed driller to complete the installation of a new nested monitoring well set (i.e., a nested set of shallow, intermediate, and deep monitoring wells) within the same borehole. The new wells will be identified as MW-85A (shallow), MW-85B (intermediate), and MW-85C (deep). The location for the nested monitoring well set is anticipated to be located on the east side of Little Valley Creek at the end of Village Way (see **Figure 7**), and the purpose of this well set is to evaluate groundwater in the northeast corner of the on-property portion of the Site.

The nested monitoring well set will be installed via sonic drilling methodologies in a step-wise approach. During the initial mobilization, a pilot open rock borehole will be advanced to the anticipated terminal depth of the well (i.e., a maximum depth of 400 feet) to allow for completion of downhole geophysics to evaluate bedrock fracture depth and orientation, vertical groundwater flow components, and conduct packer testing to collect hydrological data on each selected zone. The composition, color, texture, and moisture content of the soil/bedrock will be monitored as it is recovered and recorded on a subsurface log.



After the downhole geophysical investigation (Task 3040) and packer testing (Task 3050) is complete and the groundwater quality data from the discrete sampling is obtained, three zones (shallow, intermediate, and deep) in the borehole will be selected for the construction of the nested monitoring wells. The nested monitoring wells will be constructed with two-inch Schedule 40 PVC riser and 0.020-inch slotted Schedule 40 PVC screen. The annular space between the borehole wall and the PVC screen will be filled with No. 2 sand to approximately two feet above the top of the screened interval. The sand pack for the intermediate and shallow nested wells will also extend approximately two feet below the screened interval. A bentonite seal will be placed between the sand packs of each nested monitoring well screen. Sufficient time (one-hour minimum) will be allotted for each bentonite seal to set before installing the next nested monitoring well. A three-foot thick bentonite seal will be placed above the sand pack of the shallow nested monitoring well and the remaining annular space will be grouted to surface grade. Watertight locking gripper plugs and GES padlocks will be fitted to each nested monitoring well to restrict access.

Following installation of the nested monitoring well and prior to initiating on-site groundwater monitoring activities, GES will develop the newly installed monitoring well in accordance with generally accepted practices outlined in the GES SOP for Monitoring Well Development included in the SAP/QAPP (**Attachment B**).

## **9 Task 3040 – Geophysical Investigation**

Prior to the final installation of the proposed nested well set (detailed under Task 3030), GES will subcontract a downhole geophysical investigation of the newly installed borehole to assist with locating water bearing zones and/or fractures, confirming groundwater flow conditions, and identifying primary monitoring intervals in each zone. GES recommends the following suite of downhole geophysics: heat pulse flowmeter, optical televiewer, acoustic televiewer, and 3-arm caliper. The geophysical investigation will provide a record of borehole features, borehole diameter, fracture depth/location/orientation, vertical water flow within the borehole, and current borehole conditions. This data will be utilized to finalize the scope and recommendations for packer testing (detailed under Task 3050) and ultimately make recommendations for screened intervals (i.e., shallow, intermediate, deep) within each bedrock zone of the nested well set.

## **10 Task 3050 – Packer Testing**

After the water bearing zones and/or fracture zones have been identified through the downhole geophysical investigation (Task 3040), packer testing will be conducted at discrete intervals to obtain information regarding the yield and groundwater quality in each targeted fracture location. The packer testing will consist of collecting static head pressure data, purging groundwater in an appropriate amount, collecting discrete groundwater samples, and collecting recovery head pressure data for each targeted fracture location. Due to the potential for encountering numerous fractures in the nested monitoring well set, a bias toward fracture zones consistent with known impacted intervals at the Site will be used for selecting the packer testing intervals in this investigation. For the purposes of this Work Plan and the attached cost estimate, monitoring well



MW-26 was evaluated and used to estimate the anticipated screened intervals of the proposed new MW-85 monitoring well nest as follows: shallow 90-100 feet bgs; intermediate 175-185 feet bgs; and deep 220-230 feet bgs.

In conjunction with the packer testing, a submersible pump will be utilized to purge at least three (3) packer interval volumes and collect initial samples from each targeted fracture location. The groundwater samples will be submitted to the subcontracted laboratory for analysis of TCL VOCs (including TCE and PCE and all daughter products) via EPA method 8260D.

## 11 Task 3080 – Investigation Derived Waste Disposal

Any used personal protective equipment (PPE) and sampling materials will be drummed for subsequent disposal. Additionally, soil cuttings and/or recovered groundwater from the soil boring investigation, monitoring well installation, and groundwater sampling event will be drummed by media for subsequent disposal. As part of the data gap evaluation and groundwater sampling, waste classification samples will be submitted for laboratory analysis to characterize the generated waste for proper disposal. All drums on-site will be transported off-site by the approved waste disposal subcontractor and will be disposed of at a DEP-approved facility.

## 12 Task 4100 – Site Preparation

Prior to the mobilization to conduct pre-design investigation activities, brush clearing activities will be completed via brush hog and hand tools to allow safe and easy access to all of the planned soil boring and monitoring well locations. Brush clearing activities include clearing of the shrubs/trees and cutting vegetation to allow access to the area off of the Village Way cul-de-sac for installation of the nested monitoring well set; near the former cesspool area; and along the eastern end of Building 8. All vegetative debris will be left onsite and located in areas that will not affect pre-design investigation activities. A site visit/bid walk will be held with potential subcontractors to all proper scoping/costing of the clearing activities.

## 13 Schedule

GES is prepared to initiate work on this project upon written receipt of a Notice to Proceed. A schedule in Gantt chart format is included in **Attachment C**.

## 14 Cost Estimate

The costs associated with the tasks described above are detailed in the Cost Estimate, which is included as **Attachment D**. If you have any questions or comments, please feel free to contact either of the undersigned at 610-458-1077.

Respectfully Submitted,  
Groundwater & Environmental Services, Inc.



Timothy F. Uhler  
Principal Project Manager



Frank J. DiGnazio, P.G.  
Principal Geologist II

## Attachments

- Figure 1 - Site Location Map
- Figure 2 - Site Map
- Figure 3 - GES Treatment Area Map
- Figure 4 - 2021 Roux Associates Soil Investigation with Exceedances of Fluoride
- Figure 5 - Proposed Background Sample Location Map
- Figure 6 - Proposed Data Gap Analysis Soil Boring Location Map
- Figure 7 - Proposed Monitoring Well Location Map

- Attachment A Site-Specific Health and Safety Plan
- Attachment B Sampling and Analysis Plan/Quality Assurance Project Plan
- Attachment C Project Schedule
- Attachment D Cost Estimate



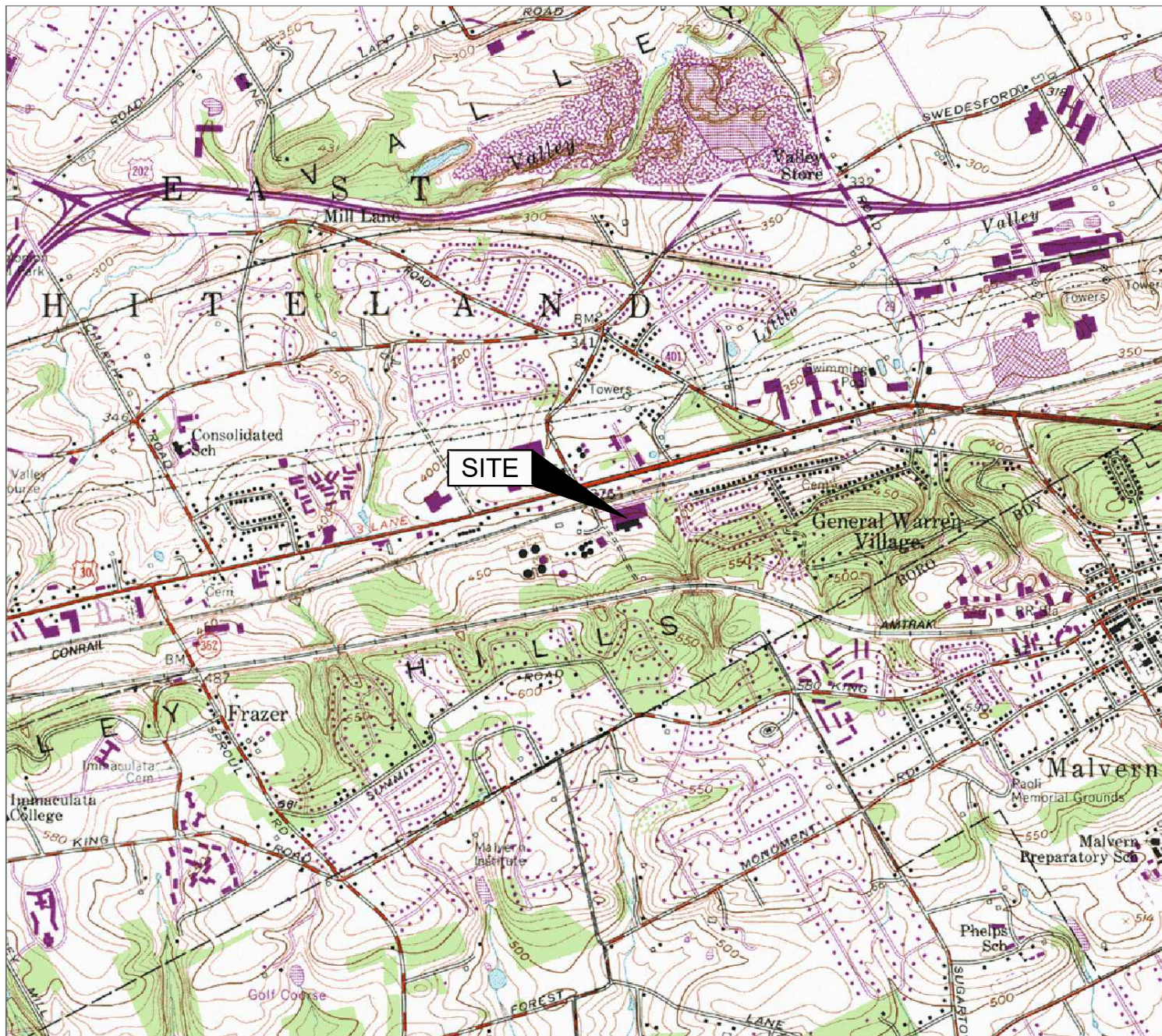
## Figures

---

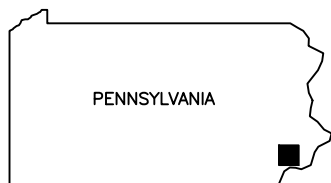


**Figure 1 – Site Location Map**





Source:  
USGS 7.5 Minute Series  
Topographic Quadrangle, 1966 (1983)  
Malvern, Pennsylvania  
Contour Interval = 10'



QUADRANGLE LOCATION

### Site Location Map

Pennsylvania Dept of Environmental Protection  
Bishop Tube  
1 South Malin Road  
Frazer, Pennsylvania

Drawn  
T.P.  
Designed  
A.G.  
Approved  
D.N.G.

Date  
10/13/25  
Figure  
1



Scale In Feet

0 2,000



Groundwater & Environmental Services, Inc.





**Figure 2 – Site Map**





SOURCE: MAP DEVELOPED UTILIZING PASDA OVERHEAD  
IMAGERY AND INFORMATION FROM ROUX ASSOCIATES, INC.

Site Map

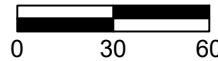
Pennsylvania Dept of Environmental Protection  
Bishop Tube  
1 South Malin Road  
Frazer, Pennsylvania

Drawn  
T.P.  
Designed  
B.A.H.  
Approved  
D.N.G.

Date  
09/28/20  
Figure  
1



Scale In Feet

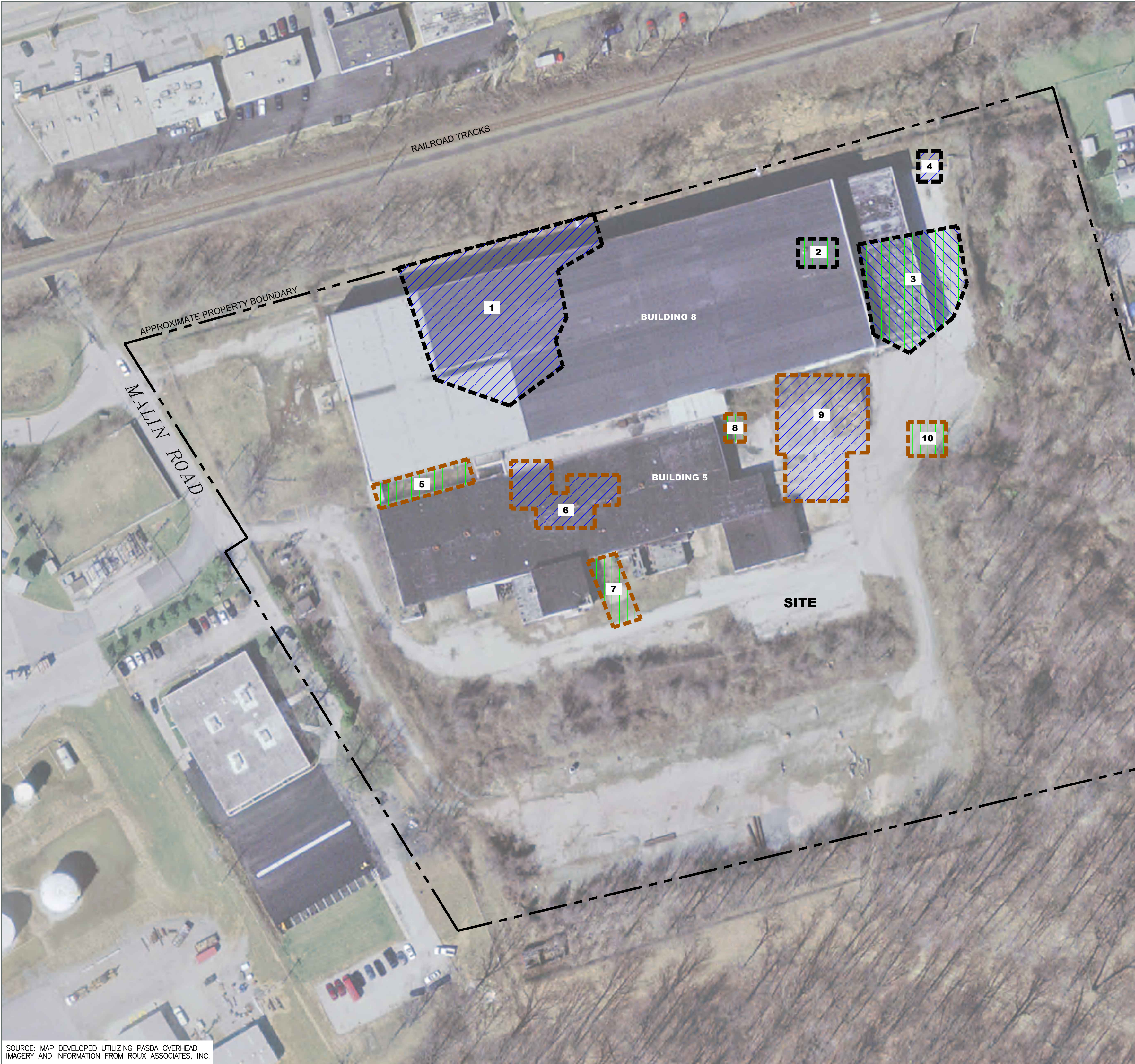









**Figure 3 – GES Treatment Area Map**





LEGEND

- BLACK OUTLINE    UNSATURATED OVERBURDEN = 0-6 FEET BGS  
SATURATED OVERBURDEN = 6-12 FEET BGS  
TOP OF BEDROCK = 12 FEET BGS
- ORANGE OUTLINE    UNSATURATED OVERBURDEN = 0-12 FEET BGS  
SATURATED OVERBURDEN = 12-26 FEET BGS  
TOP OF BEDROCK = 26 FEET BGS
-     VOCs ARE THE PRIMARY DRIVER
-     INORGANICS ARE THE PRIMARY DRIVER
-     VOCs AND INORGANICS ARE THE PRIMARY DRIVER
- BGS    BELOW GRADE SURFACE  
VOCs    VOLATILE ORGANIC COMPOUNDS

NOTES:

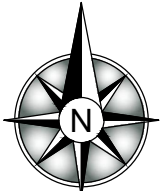
1) THE TARGETED TREATMENT AREAS ARE APPROXIMATE AND BASED ON REMEDIAL INVESTIGATIONS BY OTHERS. ADDITIONAL SOIL SAMPLING MAY NEED TO BE CONDUCTED DURING PRE-DESIGN ACTIVITIES TO CONFIRM TREATMENT AREA BOUNDARIES.

2) PINNACLED BEDROCK IS PRESENT AT THE PROPERTY AND THEREFORE THE DEPTH TO BEDROCK IS HIGHLY VARIABLE. THE TOP OF BEDROCK IN EACH AREA REPRESENTS AN ESTIMATED AVERAGE IN THE IMMEDIATE AREA.

Target Treatment Areas Map

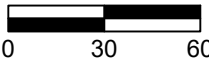
Pennsylvania Dept of Environmental Protection  
Bishop Tube  
1 South Malin Road  
Frazer, Pennsylvania

Drawn  
T.P.  
Designed  
B.A.H.  
Approved  
D.N.G.



Date  
10/31/25  
Figure  
3

Scale In Feet



Groundwater & Environmental Services, Inc.

SOURCE: MAP DEVELOPED UTILIZING PASDA OVERHEAD  
IMAGERY AND INFORMATION FROM ROUX ASSOCIATES, INC.





**Figure 4 – 2021 Roux Associates Soil Investigation with Exceedances of Fluoride**



G:\PROJECTS-09\0539 - Saul Ewing - SX\0003\PROJECT DATABASE\GIS\2021 Activities Memo\F1(CL)SoilSampleLocations\_NData.mxd



#### Legend

- Stream
- Drainage Swale
- Property Boundary
- Parcels
- Historical Soil Sample Location
- 2021 Additional Soil Boring Locations
- November 2020 GES AOC (Approximate)
- Exceedance of DEP MSC (Fluoride)

#### Notes:

- Service Layer Credits: ESRI, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Layer Access Date: 7/21/2021.
- Select soil boring locations are based on historical documents available to Roux Associates, Inc. Boring locations are therefore approximate.

Title:

#### SOIL BORING LOCATIONS

FORMER BISHOP TUBE FACILITY  
CHESTER COUNTY, PENNSYLVANIA

Prepared For:

BISHOP TUBE PROJECT TEAM

**ROUX**  
ROUX ASSOCIATES, INC.  
Environmental Consulting  
& Management

Compiled by: SSPR	Date: 7/21/2021	FIGURE
Prepared by: SSPR	Scale: 1:480	
Project Mgr: SSPR	Office: NJ	
File No: 9016.F1(CL)	Project: 0539.0003.J000	

FIGURE 4 - 2021 Roux Associates Soil Investigation with Exceedances of Fluoride







**Figure 5 – Proposed Background Sample Location Map**





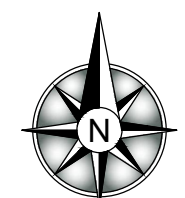
SOURCE: MAP DEVELOPED UTILIZING PASDA OVERHEAD IMAGERY AND INFORMATION FROM ROUX ASSOCIATES, INC.

Proposed Background Soil Sample Locations

Pennsylvania Dept of Environmental Protection  
Bishop Tube  
1 South Malin Road  
Frazer, Pennsylvania

Drawn  
T.P.  
Designed  
TFU  
Approved  
FJD

Date  
10/31/25  
Figure  
5



Scale In Feet  
0 30 60



LEGEND

● Proposed Background Sample Location





## Figure 6 – Proposed Data Gap Analysis Soil Boring Location Map



G:\PROJECTS-09\0539 - Saul Ewing - SX\0003\PROJECT DATABASE\GIS\2021 Activities Memo\F1(CL)SoilSampleLocations\_NData.mxd



#### Legend

- |  |                   |  |                                       |  |                                    |
|--|-------------------|--|---------------------------------------|--|------------------------------------|
|  | Stream            |  | Historical Soil Sample Location       |  | Primary PFAS Investigation Area    |
|  | Drainage Swale    |  | 2021 Additional Soil Boring Locations |  | Primary Fluoride Delineation Areas |
|  | Property Boundary |  | November 2020 GES AOC (Approximate)   |  |                                    |
|  | Parcels           |  | Exceedance of DEP MSC (Fluoride)      |  |                                    |
|  |                   |  | Proposed Soil Boring (Fluoride)       |  |                                    |
|  |                   |  | Proposed Soil Boring (PFAS)           |  |                                    |

#### Notes:

1. Service Layer Credits: ESRI, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Layer Access Date: 7/21/2021.
2. Select soil boring locations are based on historical documents available to Roux Associates, Inc. Boring locations are therefore approximate.

FIGURE 6 - Proposed Data Gap Analysis Soil Boring Locations



Title:

#### SOIL BORING LOCATIONS

FORMER BISHOP TUBE FACILITY  
CHESTER COUNTY, PENNSYLVANIA

Prepared For:

BISHOP TUBE PROJECT TEAM



Compiled by: SSPR	Date: 7/21/2021	FIGURE
Prepared by: SSPR	Scale: 1:480	
Project Mgr: SSPR	Office: NJ	
File No: 9016.F1(CL)	Project: 0539.0003.J000	





## Figure 7 – Proposed Monitoring Well Location Map





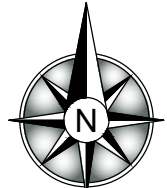
SOURCE: MAP DEVELOPED UTILIZING PASDA OVERHEAD IMAGERY AND INFORMATION FROM ROUX ASSOCIATES, INC.

Proposed Monitoring Well Location Map

Pennsylvania Dept of Environmental Protection  
Bishop Tube  
1 South Malin Road  
Frazer, Pennsylvania

Drawn  
T.P.  
Designed  
T.F.U.  
Approved  
F.D.

Date  
10/10/2025  
Figure  
7



Scale In Feet



LEGEND

● Proposed Monitoring Well





## **Attachment A – Site-Specific Health and Safety Plan**

---



## **Attachment B – Sampling and Analysis Plan/Quality Assurance Project Plan**

---



## Attachment C – Project Schedule

---



## Attachment D – Cost Estimate

---