Remedial Action Work Plan

Poestenkill Place Site

Brownfield Cleanup Project
NYSDEC Site No. C442058
City of Troy, Rensselaer County, New York
revision 2

Prepared For

Poestenkill Place Limited Partnership

90 State Street, Suite 602
Albany, New York 12207

June 2021

Remedial Action Work Plan
Poestenkill Place Site
City of Troy, Rensselaer County, New York
revision 3

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Prepared For:

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Prepared By:

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Certification Statement

I, the undersigned Engineer, certify that I am currently a NYS Registered Professional Engineer. This Remedial Action Work Plan was prepared in accordance with all applicable statutes and regulations, and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10). All activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

Scott D. Nostrand, P.E.
NYS P.E. No. 075454

June 4, 2021
Date

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1.0 INTRODUCTION

1.1 Site Description

The Poestenkill Place Site property (Site) is located at 244-246 First Street in the City of Troy, Rensselaer County, New York (Figure 1). The site is an irregular-shaped parcel of land occupying the majority of the city block bounded by Jefferson Street to the north, Second Street to the east, Ida Street to the south, and First Street to the west. The site, which will be developed by Poestenkill Place Limited Partnership, formerly supported a variety of industrial and commercial purposes such as a foundry and stove works, a junkyard, feed and fertilizer business, building materials warehouse, steel fabrication, and heavy construction equipment rental. The structures on the property are currently vacant and all businesses have vacated.

1.2 Site Development Plan

Poestenkill Place Limited Partnership (Poestenkill Place) intends to demolish existing buildings on the Site and construct a new four-story, 81-unit apartment building. This new 122,000 square foot building will accommodate one-, two-, and three-bedroom apartments on the three upper floors as well with parking, tenant amenities, and management offices located on the first floor. The parking lot will be located on the ground level of the building structure, therefore the first floor will be located on top of the parking lot structure. Amenities will include a community room, fitness gym, shared laundry room, onsite management offices, maintenance facilities, outdoor courtyard, playground, picnic areas, parking garage, and a landscaped courtyard.

1.3 Soil Cleanup Objectives

Because the site will be used for residential use, the developer intends to target the restricted-residential Soil Cleanup Objectives (SCOs) as defined in Table 375-6.8(b). In this Remedial Action Work Plan, an alternative capable of meeting unrestricted SCOs as defined in Table 375-6.8(a) is also evaluated.

2.0 DESCRIPTION OF INVESTIGATION FINDINGS

2.1 Summary of Previous Investigations

C.T. Male Associates (C.T. Male) performed a Phase II Environmental Site Assessment in April 2018. Results of this investigation found that historic fill material (HFM) was present beneath the Site and the Site's soil and groundwater were impacted by the following compounds exceeding regulatory standards and guidance values:

- VOCs and SVOCs in soil/HFM: acetone, 2-methylphenol, 3- and 4-methylphenol, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene,

chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, naphthalene, and phenol

- Pesticides in soil/HFM: 4,4'-DDE and 4,4'-DDT
- Metals in soil/HFM: chromium, copper, lead, manganese, mercury, nickel, and zinc
- SVOCs groundwater: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene
- Metals in groundwater: arsenic, barium, beryllium, chromium, iron, lead, manganese, mercury, selenium, sodium

Poestenkill Place entered into the NYSDEC Brownfield Cleanup Program (BCP) project (Site No. C442058) in 2018. Poestenkill Place then retained the services of Barton & Loguidice, D.P.C. (B&L) to perform a Remedial Investigation (RI) in accordance with a NYSDEC-approved Remedial Investigation Work Plan (RIWP) prepared by C.T. Male dated February 2019. Investigatory services were performed by B&L in accordance with the NYSDEC approved RIWP in September 2019.

Pursuant to the request of the NYSDEC and New York State Department of Health (NYSDOH) via letter correspondence dated March 24, 2020, B&L was asked to conduct a supplemental remedial investigation following Departmental review of the Draft RI report. Site activities were completed in June 2020 by B&L and conducted in accordance with the NYSDEC-approved Supplemental Remedial Investigation Work Plan prepared by B&L, dated May 15, 2020, in conjunction with the RIWP (February 2019) and supporting documents listed above.

The 2019 RI conducted by B&L included a review of available records, a Geophysics survey, a surface soil sampling program, a subsurface boring and subsurface soil sampling program, and a monitoring well installation and groundwater sampling program. The 2020 Supplemental RI conducted by B&L included a subsurface boring and subsurface soil sampling program, a monitoring well installation and groundwater sampling program, a soil vapor boring installation, and a soil vapor boring sampling program. Community Air Monitoring Program (CAMP) was implemented throughout both RI investigations conducted by B&L. The sequence of the 2019 remedial investigation and 2020 supplemental activities are presented below:

- Ground penetrating radar (GPR) survey: August 2, 2019
- Surface and subsurface soil boring investigation: September 16-24, 2019 and June 16-19, 2020
- Monitoring well installation and development: September 16-24, 2019 and June 16-19, 2020
- Well development and groundwater sampling: September 25, 2019 to September 30, 2019 and June 18 and 19, 2020

- Soil Vapor Sampling: June 17 and 18, 2020
- Community Air Monitoring Program (CAMP): September 16-24, 2019 and June 16-18, 2020

The results of the RI indicated that on-site soils consist of backfill material composed of sand, gravel, brick, wood, glass, various metals, concrete, and asphalt, situated stratigraphically above the native sand, clay, and silt material. The total depth of fill was indistinct and variable throughout the site. In such places where fill was noted, it was generally a heterogeneous mixture of the above noted fill materials ranging from half an inch to about 15 feet below grade. Groundwater was typically encountered around 12 to 17 feet below grade on the site. Bedrock was not encountered during the subsurface investigation. The direction of groundwater indicated a west-southwest flow towards the Hudson River. The majority of the site is covered with impervious asphalt and concrete or a thick layer of gravel.

Media sampled as part of the investigation included surface soil, subsurface soil, groundwater, soil vapor, and ambient air. The subsurface media was divided into two types: Historic Fill Material (HFM) and native soils. The 2019 investigation included 5 surface soil samples, a total of 37 subsurface soil samples, and 9 groundwater samples. The 2020 supplemental investigation included 19 subsurface soil samples, 3 groundwater samples, 10 soil vapor samples, and one ambient air sample. In addition, several Quality Assurance/Quality Control (QA/QC) samples were collected during both investigations. Figure 2 shows the location of the samples collected. In accordance with the February 2019 RIWP, the various media samples were analyzed for the presence of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, PCBs, and target analyte list (TAL) metals (including mercury and cyanide), and 1,4-Dioxane, during the September 2019 RI. In addition, select surface soil and groundwater samples were analyzed for the presence of per or polyfluoroalkyl substances (PFAS).

During the June 2020 Supplemental RI, in accordance with the May 2020 RIWP, the various media samples were analyzed for the presence of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, and target analyte list (TAL) metals (including mercury).

There were no soil or groundwater samples resulting in PCB concentrations in excess of the applicable NYSDEC Part 375 Restricted-Residential Soil Clean-up Objectives (SCOs) for soils or NY TOGS 1.1.1 Water Quality Standards and Guidance Values for groundwater. In addition, there were no soil or groundwater samples resulting in total per or polyfluoroalkyl substances (PFAS) concentrations in exceedance of the applicable USEPA perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) Drinking Water Health Advisory level. Levels were also compared to Part 375 Guidelines for Sampling and Analysis of PFAS with no observed exceedances.

Several surface samples had detections of metals and 4-4'-DDT that exceeded the Part 375 Unrestricted SCOs, but the concentrations were not greater than the applicable Part 375 SCOs for Restricted-Residential. Six subsurface samples (including one blind duplicate sample) exhibited several polycyclic aromatic hydrocarbons (PAHs) at concentrations greater than the applicable NYSDEC Part 375 Restricted-Residential standard. These compounds are very common in urban environments, and are often associated with historic fill material. Similarly, five subsurface samples (including one blind duplicate sample) exhibited at least one metal exceedance above the applicable Restricted-Residential SCO. Figure 4 summarizes the results of soil samples exceeding Part 375 SCOs.

Groundwater samples were collected from 11 monitoring wells on September 26, 2019, September 30, 2019, and June 19th, 2020. Thirteen groundwater samples (including two blind duplicate samples) exceeded the groundwater standards for at least one metal, while three groundwater samples exceeded the standard for the pesticide alpha-BHC. The majority of the metal exceedances (iron and manganese) may be attributable to the sample turbidity rather than indicators of actual groundwater quality conditions and the elevated sodium concentrations in the groundwater may be due to the urban character of the site and vicinity, and associated with the use of road salt for clearing snow and ice in the winter. In addition, one groundwater sample exhibited one SVOC (naphthalene) and three VOC (ethylbenzene, isopropylbenzene, and total xylenes) concentrations above their respective groundwater standards. No other collected groundwater samples exhibited exceedances of the applicable NY TOGS 1.1.1 Class GA standards for VOCs or SVOCs. Figure 3 summarizes the results of groundwater samples exceeding Class GA standards.

2.2 Qualitative Human Health Exposure Assessment

Table 1 presents the results of a qualitative human health exposure assessment. This table evaluates the following exposure pathways:

- Direct contact with surface and subsurface soils
- Ingestion of groundwater
- Direct contact with groundwater
- Inhalation of air

This assessment does not find any completed exposure pathways. However, appropriate health and safety precautions should be implemented during site redevelopment to minimize potential future threats should the site be disturbed in the future.

2.3 Summary of Findings

Soil contamination at the site is primarily characterized by low levels of PAHs, metals (including copper, lead mercury, and zinc) and the pesticides 4,4'-DDE and 4,4'-DDT. These contaminants are typical of urban fill. Although levels are above unrestricted and restricted-residential levels

in many sections of the site, NYSDEC and NYSDOH determined that the relatively low concentrations do not pose a significant threat to human health and the environment.

Limited groundwater hydrocarbon VOC contamination was found in the northwest portion of the site. Although these concentrations are above the Class GA groundwater standards, the concentrations in each of the compounds were only in the 10s of ppb and are unlikely to migrate offsite. Because groundwater is not used at the site or the surrounding neighborhood, NYSDEC and NYSDOH determined that this contamination does not pose a threat to human health and the environment.

2.4 Remedial Action Objectives

The following Remedial Action Objectives (RAOs) have been established for this Site.

2.4.1 Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater containing contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of, volatiles emanating from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer, to the extent practicable, to pre-disposal/pre-release conditions.
- Prevent the discharge of contaminants to surface water.
- Remove the source of ground or surface water contamination.

2.4.2 Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of, or exposure to, contaminants volatilizing from contaminated soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota due to ingestion/direct contact with contaminated soil that would cause toxicity or bioaccumulation through the terrestrial food chain.

2.4.3 Soil Vapor

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at the Site.

3.0 EVALUATION OF REMEDIAL ALTERNATIVES

B&L developed three alternatives for performing remediation under the BCP. The three alternatives provide varying levels of remedial effort to meet different remedial tracks as defined in Part 375-3.8(e). These alternatives are developed as means to meet the RAOs presented in Section 2.4.

Common Existing Structure Elements

For all three alternatives, the existing site structures will be removed to allow redevelopment of the site into the new four-story residential building described in Section 1.2. Each alternative includes performance of a sampling program to evaluate the presence of contamination under the currently existing buildings, and the results of these investigation may increase the amount of soil requiring excavation or covering.

Common Soil Vapor Intrusion Elements

For all three alternatives, the potential for soil vapor intrusion is addressed through the site reuse plans as described in Section 1.2. As detailed there, the ground floor of the proposed development will primarily consist of a parking garage. This garage will be open to the atmosphere, and thus breaks the intrusion pathway, eliminating these exposures. While the first floor will primarily be a parking garage, there will be maintenance facilities, an entry lobby, and a bike storage room. To further minimize the potential for Soil Vapor Intrusion into these non-residential first floor rooms, the building design will incorporate a passive vapor mitigation building elements such as a vapor membrane or inclusion of passive subslab vent piping.

Prior to finalization of the building design, the owners will confirm that passive mitigation systems are included. If there are changes to the first floor uses such as conversion of parking areas to building rooms, a further evaluation of the vapor intrusion pathway will be performed and additional migration barriers installed as necessary. Therefore, all alternatives inherently provide mitigation to the soil vapor intrusion exposure pathway.

3.1 Alternative Descriptions

3.1.1 Alternative 1: Site Cover (Track 4 alternative)

Under Alternative 1, following demolition of the buildings, a site cover would be implemented to restrict exposure to soil contamination. The nature of the site cover would vary with the planned redevelopment. For much of the site, the site cover would consist of the concrete foundation. While the residential units would be located on the upper floors of the planned redevelopment, the first floor would contain a parking garage and community amenities including a gym, shared laundry room, onsite management offices, and maintenance facilities. In these areas, the concrete foundation would serve as the cover.

In the center of the development, a courtyard would be constructed that would include landscaped areas in addition to playground, picnic areas. In these areas, two feet of clean soil meeting the Part 375 restricted-residential SCOs would be placed prior to site development.

Some soil would be excavated and disposed off site. The amount of soil excavated and disposed would be based on two factors. The first is whether any soils encountered during construction that have elevated organic vapor readings (measured with a photoionization detector [PID]) or visual/olfactory observations. These soils would be characterized and disposed offsite. These areas would include at a minimum three areas of known high PID measurements as shown on Figure 5. Figure 5 indicates the depths to which these soils required excavation.

Secondly, soil would be removed as needed for excavations required for foundation construction, and for achieving the desired final grade of the landscaped areas after placement of the two-foot cover material. Although the areas and depths of excavation would be governed by construction requirements, this excavation would remove some near-surface contaminated soils. This additional area of excavation is also shown on Figure 5.

The cover would serve as an Engineering Control (EC). To remain effective, this EC would require annual inspections and certifications by a professional engineer that the EC remained protective of human health. A Site Management Plan (SMP) would be required to describe how the ECs would be managed and how institutional controls such as an Environmental Easement would be maintained. An Excavation Work Plan (EWP), which would be included as a part of the SMP would be developed that would govern any future activities that would require breaching of the cover and/or excavation into the soil beneath the cover. The EWP would describe the characterization and handling

requirements of soil encountered during excavation and defines long term management of residual contamination.

Alternative 1 would require the implementation of Institutional Controls (ICs), including the following:

- Establish a groundwater monitoring program to track changes in groundwater contaminant concentrations.
- An environmental easement prohibiting use of groundwater at the site and limiting the usage of the site to restricted-residential uses.
- The requirement for production of a SMP that describes inspection frequencies and the requirements for certification that ICs and ECs remain in place and effective, and that any changes in use are made in accordance with the ECs and the EWP.

3.1.2 Alternative 2: Excavation of all Soil and HFM exceeding Restricted-Residential SCOs within 15 feet of the surface (Track 2 alternative)

Alternative 2 would call for excavation of all soil at the site with contamination exceeding restricted-residential SCOs to a maximum depth of fifteen feet below ground surface (bgs). Extrapolating from the soil sampling results, the extent of contamination is estimated as shown on Figure 6.

The area shown in the northwest portion of the site would require the greatest excavation. Since the sample collected from 14-16' bgs at location RI-1 exceeded restricted-residential SCOs for lead, PAHs totaling greater than 50 mg/kg (exceeding restricted-residential SCOs for 6 compounds) at a depth of 10-12' bgs at location GP-4, and a strong petroleum odor was observed throughout boring RI-3, for the purposes of this alternatives evaluation, excavation is assumed to be required to a depth of 15' bgs to comply with Track 2 requirements. Due to the depths of excavation, dewatering of the excavation areas would be required in this area. Groundwater recovered during dewatering would need to meet the requirements of the disposal facility accepting the water (such as the City of Troy publicly-owned treatment works [POTW]), and may require treatment prior to disposal.

Adjacent to this area is a smaller area defined by sample location RI-2. Lead and PAHs were found above restricted-residential SCOs at a depth of 2-4' at this location. Excavation at this location is assumed to extend to 4' bgs

In the southern portion of the site, several sample locations (GP-1, GP-2, GP-3, GP-6, RI-13, RI-6, and RI-14) exceeded restricted-residential SCOs for PAHs and metals (including lead, coper and mercury). With the exception of sample location RI-14 where the PAH

exceedance was limited to a single compound – chrysene – at only 1.1 mg/kg, all the exceedance were within 6' bgs. This area is assumed to be excavated to a depth of 6 feet.

Additional excavation may be required beyond this estimated extent. This additional excavation may result from one of the following situations:

1. At all excavation locations, end point sampling would be required at the frequency stated in DER-10 section 5.4(b)(5), specifically one sample per 30 linear feet of sidewall and one sample per 900 square feet of excavation bottom. Should results of the sampling exceed restricted-residential SCOs, excavation would continue horizontally until SCOs are met or the property boundary is reached, and vertically until SCOs are met or a depth of 15' is achieved.
2. No sampling has been performed under the buildings existing on site. These buildings will be demolished as part of the remediation and apartment building process. Following demolition, a pre-construction remedial design investigation will be scoped as part of the Construction Work Plan, to characterize the soil quality beneath the buildings. Any soil with contamination exceeding restricted-residential SCOs would also require excavation.
3. The RI did not find a specific source of groundwater contamination, and where groundwater standards were exceeded, none of the soils samples were found to have any of the groundwater parameters in soil above the protection of groundwater standards. However, based on the visual and olfactory observation of soils in the northwest portion of the site (e.g. in borings RI-3 and RI-16), it is reasonable to assume that these soils are acting as a source of groundwater contamination. The limit of excavation in this area may exceed the 15-foot depth of excavation if soils at the bottom of the excavation exhibit strong petroleum odors or show staining or the presence of sheen, indicating the presence of petroleum hydrocarbons that could act as a source of groundwater contamination. Excavation of all soils that are acting as a source of groundwater contamination, together with the dewatering performed during this excavation, will result in the mitigation of groundwater contamination at the site. This groundwater remediation will be documented through the installation and sampling of groundwater wells following the excavation activities.

Exclusive of these potential additional excavation extents, the estimated volumes of material to be excavated are:

- Northwest area (15-foot depth): 10,000 CY
- Northern (RI-2) area (4-foot depth): 590 CY

- Southern area (6-foot depth): 6,900 CY

These volumes are used for estimate of remediation costs for this alternative.

Excavated soil would be characterized and transported offsite for disposal at a permitted facility, and the excavation backfilled with imported fill meeting restricted-residential concentration requirements.

Alternative 2 would require the installation of monitoring wells as an EC.

Alternative 2 would require the implementation of Institutional Controls (ICs), including the following:

- Groundwater monitoring to document decreases in groundwater contamination following excavation of potential source material.
- An environmental easement prohibiting use of groundwater at the site and limiting the usage of the site to restricted-residential uses.
- The requirement for production of a SMP that describes inspection frequencies and the requirements for certification that ICs remain in place and effective, and that any changes in use are made in accordance with the ECs and a EWP that would govern any future activities that would require excavating soil at the site. The EWP would describe the characterization and handling requirements of soil encountered during excavation and defines long term management of residual contamination.

3.1.3 Alternative 3: Excavation of all Soil and HFM exceeding Unrestricted Use SCOs (Track 1 alternative)

This alternative is similar to Alternative 2, with the difference being excavation would continue until confirmatory sampling met unrestricted use concentrations defined in table 375-6.8(a). Excavation would not stop at 15 feet below surface in some areas. Meeting these SCOs would also remove soils that may pose a source of groundwater contamination as well. The complete removal of the source of groundwater contamination, together with the dewatering performed during this excavation, is intended to eliminate the exceedance of groundwater standards. This groundwater remediation will be documented through the installation and sampling of groundwater monitoring wells following the excavation activities.

Extrapolating from the soil sampling results, the extent of contamination is estimated as shown on Figure 7. This figure includes all the excavation areas shown on Figure 6 (Alternative 2) plus additional surface soil along the eastern edge of the site (defined by

DDT exceedances at location RI-5) and deeper and more laterally extensive excavation in the middle of the western portion of the site, as defined by RI-15.

As with Alternative 2, the extent of excavation may be adjusted based on the results of the confirmatory sampling, performed at the frequency presented in DER-10 section 5.4(b)(5), and may include excavation under the currently existing buildings, whose soil would have to be sampled and analyzed following building demolition, in accordance with a pre-construction remedial design investigation performed in accordance with the Construction Work Plan. All soil beneath the existing buildings would have to meet the unrestricted use SCOs.

Exclusive of these potential additional excavation extents, the estimated volumes of material to be excavated are:

- Northwest area (15-foot depth): 7,050 CY
- Northwest area (20-foot depth): 6,750 CY
- Northern (RI-2) area (4-foot depth): 590 CY
- Southern area (6-foot depth): 6,900 CY
- Eastern area (1-foot depth): 50 CY

These volumes are used for estimate of remediation costs for this alternative. Excavated soil would be characterized and transported offsite for disposal at a permitted facility, and the excavation backfilled with imported fill meeting restricted-residential concentration requirements.

To confirm that excavation has removed the source of groundwater contamination and successfully reduced concentrations below standards, groundwater monitoring wells will be installed and sampled. Post remediation groundwater monitoring will continue until it has been documented that that the detected groundwater contaminant concentrations have decreased to below the applicable standards.

Alternative 3 would require no long-term ICs or ECs.

3.2 Alternatives Analysis

Each alternative is evaluated in accordance with nine criteria below.

3.2.1 Alternative 1

Protection of human health and the environment

Alternative 1 is protective of human health and the environment through installation of a cover that prevents direct contact with soil above SCOs. Groundwater is not used at the site and thus does not present an exposure scenario. Prior to finalization of the building design, the owners will confirm that passive mitigation systems are included. If there are changes to the first floor uses such as conversion of parking areas to building rooms, a further evaluation of the vapor intrusion pathway will be performed and additional migration barriers installed as necessary. Therefore, this alternative provides mitigation to the soil vapor intrusion exposure pathway.

Compliance with standards, criteria, and guidelines (SCGs)

Alternative 1 would allow groundwater to remain with some contaminants above Class GA standards. This alternative also allows some soil to remain above restricted-residential SCOs.

Short-term effectiveness and impacts

Alternative 1 would present no short term impacts above the impacts that would already be present due to apartment building construction. These impacts would be noise and dust generation.

Long-term effectiveness and permanence

Although Alternative 1 would implement an Excavation Work Plan to guard against future exposures from future construction or repairs, it is possible that this plan may not be followed, resulting in future exposures. Alternative 1's cover serving as an EC may be removed if the use of the property changes in the future. Therefore Alternative 1 is not considered a long-term effective remedy.

Reduction of toxicity, mobility, or volume of contaminated material

This alternative does not employ treatment technologies that would reduce the toxicity, mobility, or volume of contaminated material.

Implementability

Alternative 1 uses standard construction techniques and is thus implementable. Alternative 1 requires only minimal excavation prior to placement of the cover materials

Cost effectiveness

Because Alternative 1 would be implemented as a component of the building construction rather than a discrete remedial action, the scope of its cost estimates do not include site restoration. For this alternative, it is assumed that excavation would be performed to a depth of two feet throughout the site, and at greater depths at the hot spot locations RI-3, RI-15, and RI-16 shown on Figure 5. This cost estimate assumes that imported fill will be placed to the elevation of soil prior to excavation.

Groundwater monitoring would require the installation of three new groundwater monitoring wells. Each well would be sampled once per year and analyzed for VOCs.

As presented in the cost estimate tables in Appendix D, Alternative 1 is estimated to cost $1,587,000. This includes a 10-year present worth cost of $48,000 for ongoing groundwater monitoring.

Community Acceptance

Community acceptance will be determined after NYSDEC presents the selected alternative to the community by issuing a fact sheet and soliciting comments.

Land use

This alternative is consistent with planned use of this land.

3.2.2 Alternative 2

Protection of human health and the environment

Alternative 2 is protective of human health and the environment through removal of soil above restricted-residential SCOs from the site. Confirmatory sampling during excavation will determine whether these standards are met throughout the site, and additional excavation will be performed if required to meet these standards.

Groundwater is not used at the site and thus does not present an exposure scenario. However, Alternative 2 removes soil that may serve as a source of contaminated groundwater, and thus would be more protective of the environment.

Prior to finalization of the building design, the owners will confirm that passive mitigation systems are included. If there are changes to the first floor uses such as conversion of parking areas to building rooms, a further evaluation of the vapor intrusion pathway will be performed and additional migration barriers installed as necessary. Therefore, this alternative provides mitigation to the soil vapor intrusion exposure pathway.

Compliance with standards, criteria, and guidelines (SCGs)

Alternative 2 would allow groundwater to remain with some contaminants above Class GA standards. However, Alternative 2 removes soil that may be acting as a source of groundwater contamination, and thus groundwater standards are more likely to be met over time.

Alternative 2 allows some soil to remain above restricted-residential SCOs. However, Alternative 2 removes all soil above restricted-residential SCOs to depths of 15 feet bgs.

Short-term effectiveness and impacts

Alternative 2 would have some short term impacts due to the excavation of soil to depths of up to 15 feet bgs. These impacts would include increased truck traffic needed for soil disposal and backfill import, construction of a dewatering system and associated connections to the POTW, and installation of shoring which may include pile driving and installation of tiebacks that may extend into the public rights-of-way.

Long-term effectiveness and permanence

Because a substantial amount of soil above restricted-residential SCOs is removed by Alternative 2 this remedy is effective over the long term. By removing the contaminated soil, this alternative provides a permanent remedy for the restricted-residential use scenario.

Reduction of toxicity, mobility, or volume of contaminated material

This alternative does not employ treatment technologies that would reduce the toxicity, mobility, or volume of contaminated material.

Implementability

Alternative 2 uses standard construction techniques and is thus implementable. However, this alternative requires the use of shoring for certain areas of excavation

increasing the complexity of the construction. Although shoring techniques are standard excavation technologies, they are more difficult to implement and potentially may impact the stability of structures located along the site property boundary. For example, in the northeast portion of the site, excavation would be required to depths of at least 15 feet immediately adjacent to neighboring properties that would remain following remediation and apartment building construction.

Cost effectiveness

Because Alternative 2 would be implemented as a component of the building construction rather than a discrete remedial action, the scope of its cost estimates do not include site restoration.

For Alternative 2 it is assumed that excavation would be performed to the depths shown on Figure 6. For the excavation in the northwest area, it is assumed that pile and lagging shoring system with tiebacks is installed (excavation with trench boxes would not be feasible due to the limitations of performing end-point sampling, and to extending the excavation should end-point samples exceed restricted-residential SCOs). Confirmatory sampling would be performed at the frequency required by DER-10 section 5.4(b)(5). Following successful confirmatory sampling, each area would be backfilled to within two feet of former grade.

Groundwater monitoring would require the installation of three new groundwater monitoring wells. Each well would be sampled once per year and analyzed for VOCs.

Based on these assumptions, the remedial of Alternative 2 is estimated to be $4,557,000. This includes a 10-year present worth cost of $48,000 for ongoing groundwater monitoring. Cost estimate tables are presented in Appendix D.

Community Acceptance

Community acceptance will be determined after NYSDEC presents the selected alternative to the community by issuing a fact sheet and soliciting comments.

Land use

This alternative is consistent with planned use of this land.

3.2.3 Alternative 3

Protection of human health and the environment

Alternative 3 would be protective of human health and the environment through removal of soil above unrestricted use SCOs from the site. Confirmatory sampling during excavation will determine whether these standards are met throughout the site, and additional excavation will be performed if required to meet these standards.

Groundwater is not used at the site and thus does not present an exposure scenario. However, both Alternatives 2 and 3 remove soil that may serve as a source of contaminated groundwater, and thus would be more protective of the environment.

Prior to finalization of the building design, the owners will confirm that passive mitigation systems are included. If there are changes to the first floor uses such as conversion of parking areas to building rooms, a further evaluation of the vapor intrusion pathway will be performed and additional migration barriers installed as necessary. Therefore, this alternative provides mitigation to the soil vapor intrusion exposure pathway.

Compliance with standards, criteria, and guidelines (SCGs)

Alternative 3 would allow groundwater to remain with some contaminants above Class GA standards. However, Alternative 3 removes soil that may be acting as a source of groundwater contamination, and thus groundwater standards are more likely to be met over time.

Alternative 3 removes all soil above unrestricted SCOs and this is in compliance with soil standards.

Short-term effectiveness and impacts

Alternative 3 would have some short term impacts due to the excavation of soil to depths required to meet unrestricted use SCOs throughout the site. These impacts would include increased truck traffic needed for soil disposal and backfill import, construction of a dewatering system and associated connections to the POTW, and installation of shoring which may include pile driving and installation of tiebacks that may extend into the public rights-of-way.

Long-term effectiveness and permanence

Because all soil above unrestricted use SCOs is removed by Alternative 3 this remedy is effective over the long term. By removing the contaminated soil, this alternative provides a permanent remedy for the unrestricted use scenario.

Reduction of toxicity, mobility, or volume of contaminated material

This alternative does not employ treatment technologies that would reduce the toxicity, mobility, or volume of contaminated material.

Implementability

Alternative 3 uses standard construction techniques and is thus implementable. However, this alternative requires the use of shoring for certain areas of excavation increasing the complexity of the construction. Although shoring techniques are standard excavation technologies, they are more difficult to implement and potentially may impact the stability of structures located along the site property boundary. For example, in the northeast portion of the site, excavation would be required to depths of at least 15 feet immediately adjacent to neighboring properties that would remain following remediation and apartment building construction.

Cost effectiveness

Because Alternative 3 would be implemented as a component of the building construction rather than a discrete remedial action, the scope of its cost estimates do not include site restoration.

For Alternative 3, it is assumed that excavation would be performed to the depths shown on Figure 7. For the excavation in the northwest area, it is assumed that pile and lagging shoring system with tiebacks is installed (excavation with trench boxes would not be feasible due to the limitations of performing end-point sampling, and to extending the excavation should end-point samples exceed restricted-residential SCOs). Confirmatory sampling would be performed at the frequency required by DER-10 section 5.4(b)(5). Following successful confirmatory sampling, each area would be backfilled to within two feet of former grade. Because there is no groundwater monitoring required, there are no operation and maintenance costs.

Based on these assumptions, the remedial cost for Alternative 3 is estimated to be $5,504,000. Cost estimate tables are presented in Appendix D.

Community Acceptance

Community acceptance will be determined after NYSDEC presents the selected alternative to the community by issuing a fact sheet and soliciting comments.

Land use

This alternative is consistent with planned use of this land.

3.3 Summary of Selected Alternative

Alternative 2 is the selected alternative. It provides greater removal of contaminated material than Alternative 1, eliminating the need for ECs to prevent exposure. Alternative 3 removes greater amounts of soil, allowing for designation of an unrestricted use. However, Alternative 3 does not provide additional protectiveness of human health and the environment to justify its approximately $1,000,000 higher cost that Alternative 2.

Alternative 2 would comprise the following steps to implement:

- Erosion and sediment control structures would be placed around the areas to be excavated.
- The ground surface would be cleared.
- Excavation would commence. Shoring would be installed as excavation proceeded as necessary.
- In the northwest excavation area, groundwater expected to be encountered during excavation. The excavation would be dewatered through means such as constructing sumps that are pumped as water accumulates. Extracted water would likely require treatment, filtration and potentially carbon adsoption prior to disposal, likely through the City of Troy sanitary sewer system leading to the city's POTW.
- Sampling would be performed on sidewalls and at excavation bottoms at the frequency stipulated in DER-10 section 5.4(b)(5). Samples would be analyzed for VOCs, SVOCs, metals, and pesticides. If excavation beyond the areas and depths shown on Figure 6 is warranted based on sample results, additional sampling would analyze only for the parameters that are exceeded during initial confirmation sampling.
- Once confirmation sampling samples indicate restricted-residential SCOs have been met, or that excavation depths have reached 15 feet bgs, excavation areas would be backfilled with clean soil meeting restricted-residential SCOs. Imported soil would be tested at the frequency outlined in Table 5.4(e)10 of DER-10. Imported

soil would be placed in two-foot lifts and compacted to meet the compaction requirements needed for the redevelopment plans.

4.0 REMEDIAL ACTION PROGRAM

The remedial action will be performed as part of the site construction activities rather than through a standalone remedial contract. The Site development general contractor will perform the remedial work or procure a separate remedial firm to perform the work. The work performed by the general contractor or its remedial subcontractor will follow the requirements of this RAWP.

Following approval of this RAWP, a Construction Work Plan (CWP) will be prepared and submitted to NYSDEC. The CWP will provide greater specificity for the elements of the remedial action. Elements of the CWP will include:

- Project Organization, including owner, general contractor, remedial contractor, subcontractors, remedial engineer, and lines of responsibility and authority among the parties and contact information
- Details on the site layout including site security, site entry/exit, truck decontamination location, stockpile locations, water treatment system location
- Erosion and sediment control operations, including the project Storm Water Pollution Prevention Plan (SWPPP)
- Hours of operation, and noise and vibration monitoring plans
- Shoring Plans
- Dewatering and water treatment plans and discharge permit testing requirements
- Disposal facility analytical requirements and precharacterization plans
- Identification of and truck routes to the selected disposal facility
- Excavation procedures including sequence, stockpiling and/or loading plans and approach to excavation beyond limits identified by RI data if confirmatory sampling does not meet standards.
- Groundwater monitoring well installation details including depths, screen size and lengths, packing material, grouting requirements, and development performance goals
- Project Schedule.

4.1 Standards, Criteria, and Guidance

The selected remedy is a soil excavation and offsite disposal remedy. Cleanup standards are defined as the restricted-residential SCOs listed on Table 375-6.8(b) of 6 NYCRR Part 375, as supplemented by NYSDEC document CP-51 (Soil Cleanup Guidance) and 6 NYCRR Part 703 New York State Groundwater Quality Standards.

4.2 Governing Documents

The remedial work performed by the general contractor or its remedial subcontractor would follow the following governing documents, included as appendices to this RAWP:

- Health and Safety Plan (HASP) (Appendix A)
- Quality Assurance Project Plan (QAPP) (Appendix B)
- Community Air Monitoring Plan (CAMP) (Included with the HASP in Appendix A)
- Community Participation Plan (CPP) (prepared by C.T. Male and approved by NYSDEC on December 6, 2018)
- Construction Work Plan (CWP)

The general contractor will prepare a SWPPP for the overall site redevelopment project. This SWPPP, which will be included in the CWP, will apply during all construction activities related to the remedial action.

The HASP will be strictly followed by all personnel on the site throughout the project. The CAMP will be implemented whenever intrusive operations, including drilling, are performed at the site.

4.3 Site Preparation

Site access will be from the west of the site from First Street. This will allow access to the site through areas that are not expected to require excavation, pending confirmatory sampling. This access way is already paved and thus does not require a new stabilized construction entrance to be constructed. A truck decontamination station will be installed inside the site close to the entrance.

Erosion and sediment controls will be established in accordance with the SWPPP to be included with the CWP. At a minimum, control elements such as silt fences or wattles will be placed around all excavation areas and truck transport routes prior to entrance to the decontamination station.

As the entire site will be redeveloped, all monitoring wells on the site will be decommissioned prior to remedial action. There are eleven monitoring wells on the site. Boring logs for these wells are presented in Appendix C. The monitoring wells will be decommissioned in accordance with CP-43, "Commissioner Policy on Groundwater Monitoring Well Decommissioning" (December 2009).

A utility location survey will be conducted to identify the locations of active and inactive utilities on site. This survey will be conducted by (a) review of record drawings of the existing buildings on the site, (b) contacting local utilities to request drawings of utilities on adjacent streets which

may show entrances of utilities into the site, and (c) retaining the services of a subsurface utility identification service to use geophysics to locate utilities. All identified utilities will be confirmed to be inactive and disconnected prior to start of excavation.

4.4 Excavation

The precise sequence of excavation activities will be detailed in the CWP. An overview of the elements that may be included in the CWP are presented below.

Building demolition may or may not precede excavation for remedial purposes. If buildings are pre-demolished, then the contractor will be required to maintain structural integrity of the buildings through shoring, underpinning, or other suitable techniques. Sidewall confirmation sampling will be required for all excavation sidewalls, including those adjacent to existing buildings. If sidewall samples do not meet restricted-residential criteria, then demolition of buildings located on the site will be required prior to additional excavation. Off-site buildings are present just northwest of the site, adjacent to areas requiring excavation. Excavation will not continue offsite; therefore the contractor will be required to stabilize the foundations of these offsite buildings through shoring or other means during excavation in this area.

The contractor may elect to pre-characterize soils for disposal prior to excavation in order to facilitate direct loading of excavated soil for offsite disposal. To pre-characterize the soil, the disposal location would be identified and the analytical requirements (parameters and frequency) would be provided. Then a boring program would be implemented to obtain the discrete and composite samples that would be sufficient to meet these analytical requirements. If more than one disposal facility is identified for possible use, the sampling program would be developed to meet the sampling requirements of all facilities. The sampling results would be provided to the disposal facilities for pre-approval of the waste. If the sampling results do not meet the requirements of the disposal facility, then alternate disposal facilities would have to be identified and additional sampling and analysis performed.

Alternatively, the contractor may elect to excavate and stockpile soil prior to disposal. Because more than half of the site is slated to be excavated, and buildings are located elsewhere on the site, there is limited area available for stockpiling, making this a less attractive alternative. If implemented, the stockpiled areas would require an impermeable liner with collection facilities to prevent release of water that contacts the stockpiled soil. Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC. Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced. Soil stockpiles will be continuously encircled with silt fences. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Shoring will be required for excavation. In the southern area, excavation is expected to be limited to six feet bgs. For excavation up to property lines in this areas, trench boxes may be used to excavate the areas adjacent to the property lines. Once confirmatory sampling determines that concentrations at the bottom meet restricted residential criteria, the excavations may be backfilled with clean soil (restricted-residential SCOs are not required to be met at the property boundary sidewall. After property boundary areas have been excavated and backfilled, then the rest of the shallow areas can be excavated, using sloped sides to obviate the need for additional shoring. If the sloped sides include soil that was not part of the trench box backfill, it will require sidewall confirmatory sampling.

For deeper excavation areas, shoring would be required. The CWP will provide details on the shoring or require the contractor to provide plans for shoring approved by a professional engineer. The shoring design would be required to allow for sidewall sampling as the excavation proceeds deeper. For example, a soldier pile and lagging system may be used, with samples collected from the sidewall prior to placement of lagging timber.

Depending on the results of pre-characterization work, if performed, the contractor may identify areas within those portions targeted for disposal that may contain reusable soil. Any soil that is a candidate for reuse would be stockpiled separately from soil destined for off-site disposal. Prior to reuse, the soil would be tested for the same parameters and at the same frequency as imported soil (see section 4.9). Results of the testing would be required to meet restricted-residential criteria. Excavated soil not meeting these criteria would be disposed of off-site.

Excavation would continue until the target depths shown on Figure 6 are reached. Once the target depths and horizontal extents are reached, samples will be collected from the bottom of the excavation and the sidewalls at the frequency required by DER-10 Table 5.4(e)10. Samples will be collected in accordance with the QAPP (Appendix B), including collection of Quality Assurance and Quality Control (QA/QC) samples at the frequency specified in the QAPP. If the results of the analyses indicate that the remaining soil does not meet the restricted-residential SCOs, then additional excavation along the surface(s) exceeding SCOs will be performed and sampling performed again. The one exception is for the bottom of the northwest excavation area. No additional vertical excavation will be performed in this area if results do not meet restricted-residential SCOs, as this area will be excavated to 15 feet bgs, which is sufficient for a Track 2 remediation. Sample results from the bottom of the 15-foot deep excavation will be compared to Protection of Groundwater SCOs in Table 375-6.8(b) of 6 NYCRR Part 375 to determine if any remaining contamination is acting as a source of groundwater contamination. If soil at a depth of 15 feet exceeds the Projection of Groundwater SCOs for the parameters in the groundwater exceeding Class GA standards, then additional vertical excavation would be required and resampling performed until these SCOs are met.

4.5 Dewatering

The excavation area in the northwest will extend to depths below the water table. The contractor will be required to dewater the excavation area such that excavation and final sampling are conducted in dry conditions. The preferred dewatering approach will be detailed in the CWP but may include formation of sumps in the excavation floor or installation of dewatering wells within or outside the excavation areas. Sumps and/or wells will be pumped, and the extracted water will either be discharged to the City of Troy POTW or contained and trucked off-site for treatment. If the water is to be disposed of at the City of Troy POTW, the contractor will have to procure a discharge permit. The permit conditions may require treatment prior to discharge to reduce suspended solids or certain chemicals. The permit conditions will likely require sampling of the water (following treatment as appropriate) to document compliance with permit conditions.

4.6 Soil Transport Off-Site

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded. The CWP will identify the selected disposal location and provide a route from the site to the facility. All trucks loaded with Site materials will exit the vicinity of the Site using only this approved truck route. Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site.

Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development. Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used. All trucks will be washed prior to leaving the Site. Truck wash waters will be collected and disposed of off-Site in an appropriate manner.

4.7 Materials Disposal Off-Site

The CWP will identify the disposal facility where excavated soil will be disposed. All soil/fill/solid waste excavated and removed from the Site will be treated as contaminated and regulated material and will be disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

Soils that are contaminated but non-hazardous and are being removed from the Site are considered by the Division of Materials Management (DMM) in NYSDEC to be Construction and

Demolition (C/D) materials with contamination not typical of virgin soils. These soils may be sent to a permitted Part 360 landfill.

Alternatively, they may be sent to a permitted C/D processing facility without permit modifications only upon prior notification of NYSDEC Region 4 DMM. In this case, as dictated by DMM, special procedures will include, at a minimum, a letter from the contractor to the C/D facility that provides a detailed explanation that the material is derived from a DER remediation Site, that the soil material is contaminated and that it must not be redirected to on-Site or off-Site Soil Recycling Facilities. The letter will include as an attachment a summary of all chemical data for the material being transported.

The following documentation will be obtained and reported by the contractor for each disposal location used in this project to fully demonstrate and document that the disposal of material derived from the Site conforms with all applicable laws: (1) a letter from the contractor to the receiving facility describing the material to be disposed and requesting formal written acceptance of the material. This letter will state that material to be disposed is contaminated material generated at an environmental remediation Site in New York State. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported (including Site Characterization data); and (2) a letter from all receiving facilities stating it is in receipt of the correspondence (above) and is approved to accept the material. These documents will be included in the FER.

4.8 Demarcation

After the completion of soil removal and any other invasive remedial activities and prior to backfilling, a land survey will be performed by a New York State licensed surveyor. The survey will define the top elevation of residual contaminated soils. A physical demarcation layer, consisting of orange snow fencing material or equivalent material will be placed on this surface to provide a visual reference. This demarcation layer will constitute the top of the 'Residuals Management Zone', the zone that requires adherence to special conditions for disturbance of contaminated residual soils defined in the Site Management Plan. The survey will measure the grade covered by the demarcation layer before the placement of cover soils, pavement and sub-soils, structures, or other materials. This survey and the demarcation layer placed on this grade surface will constitute the physical and written record of the upper surface of the 'Residuals Management Zone' in the Site Management Plan.

4.9 Backfill from Off-Site Sources

All imported soils will meet NYSDEC approved backfill quality objectives for this Site. These NYSDEC approved backfill or cover soil quality objectives are the lower of the protection of groundwater or the protection of public health soil cleanup objectives for restricted-residential

use as set forth in Table 375-6.8(b) of 6 NYCRR Part 375. Non-compliant soils will not be imported onto the Site without prior approval by NYSDEC. Nothing in the approved Remedial Action Work Plan or its approval by NYSDEC should be construed as an approval for this purpose.

The contractor will collect samples from the proposed backfill sources at the frequency specified by Table 5.4(e)10 of DER-10. Sampling and analysis will be performed in accordance with the requirements of the QAPP (Appendix B)

4.10 Monitoring Well Installation

Three monitoring wells will be installed in the northeast portion of the site where VOC contamination has been detected. The wells will be installed and developed as described in the CWP.

5.0 REPORTING DURING REMEDIATION

5.1 Weekly Reports

Weekly reports will be submitted to NYSDEC and NYSDOH Project Managers by the Monday following the reporting period and will include:

- An update of progress made during the week;
- Locations of work and quantities of material imported and exported from the Site;
- A summary of any and all complaints with relevant details (names, phone numbers);
- A summary of CAMP finding, including excursions;
- An explanation of notable Site conditions;
- Photographs representing the work performed during the reporting period.

Weekly reports are not intended to be the mode of communication for notification to the NYSDEC of emergencies (accident, spill), requests for changes to the RAWP or other sensitive or time critical information. However, such conditions must also be included in the daily reports. Emergency conditions and changes to the RAWP will be addressed directly to NYSDEC Project Manager via personal communication.

5.2 Monthly Reports

Monthly reports will be submitted to NYSDEC and NYSDOH Project Managers within one week following the end of the month of the reporting period and will include:

- Activities relative to the Site during the previous reporting period and those anticipated for the next reporting period, including a quantitative presentation of work performed (i.e. tons of material exported and imported, etc.);
- Description of approved activity modifications, including changes of work scope and/or schedule;
- Sampling results received following internal data review and validation, as applicable; and,
- An update of the remedial schedule including the percentage of project completion, unresolved delays encountered or anticipated that may affect the future schedule, and efforts made to mitigate such delays.

6.0 FINAL ENGINEERING REPORT

A Final Engineering Report (FER) will be submitted to NYSDEC following implementation of the Remedial Action defined in this RAWP providing written and photographic documentation of all remedial work performed under this remedy. The FER provides the documentation that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The FER will provide a comprehensive account of the locations and characteristics of all material removed from the Site including the surveyed locations of all sources. The FER will include as-built drawings for all excavation and backfill locations, certifications, manifests, and bills of lading. The FER will provide a description of the changes in the Remedial Action from the elements provided in the RAWP and associated design documents. The FER will provide a tabular summary of all performance evaluation sampling results and all material characterization results and other sampling and chemical analysis performed as part of the Remedial Action. The FER will be prepared in conformance with DER-10.

The FER will provide a thorough summary of all residual contamination left on the Site after the remedy is complete. Residual contamination includes all contamination that exceeds the Track 1 Unrestricted Use SCO in 6NYCRR Part 375-6. A table that shows exceedances from Track 1 Unrestricted SCOs for all soil/fill remaining at the Site after the Remedial Action and a map that shows the location and summarizes exceedances from Track 1 Unrestricted SCOs for all soil/fill remaining at the Site after the Remedial Action will be included in the FER.

The FER will provide a thorough summary of all residual contamination that exceeds the SCOs defined for the Site in the RAWP and must provide an explanation for why the material was not removed as part of the Remedial Action. A table that shows residual contamination in excess of Site SCOs and a map that shows residual contamination in excess of Site SCOs will be included in the FER.

The Final Engineering Report will include an accounting of the destination of all material removed from the Site, including excavated contaminated soil, historic fill, solid waste, hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. It will provide an accounting of the origin and chemical quality of all material imported onto the Site.

7.0 ENVIRONMENTAL EASEMENT AND ENGINEERING AND INSTITUTIONAL CONTROLS

An Environmental Easement, as defined in Article 71 Title 36 of the Environmental Conservation Law, is required when residual contamination is left on-Site after the Remedial Action is complete. As part of this remedy, an Environmental Easement approved by NYSDEC will be filed and recorded with the Rensselaer County Clerk's Office. The Environmental Easement will be submitted as part of the Final Engineering Report.

The Environmental Easement renders the Site a Controlled Property. The Environmental Easement must be recorded with the Rensselaer County Office of the City Register before the Certificate of Completion can be issued by NYSDEC.

The selected alternative includes two Engineering Controls:

- Installation of three new monitoring wells,
- Installation of a membrane or passive ventilation system below all enclosed rooms located on the first floor of the building constructed on the site.

A series of Institutional Controls are required under this remedy to prevent future exposure to residual contamination by controlling disturbances of the subsurface soil and restricting the use of the Site to restricted-residential use only. These Institutional Controls are requirements or restrictions placed on the Site that are listed in, and required by, the Environmental Easement. The ICs that apply to the Controlled Property are:

- Groundwater will be monitored through samples collected from the monitoring well network installed during remediation.
- Vegetable gardens and farming on the Controlled Property are prohibited;
- Use of groundwater underlying the Controlled Property is prohibited without treatment rendering it safe for intended purpose;
- All future activities on the Controlled Property that will disturb residual contaminated material are prohibited unless they are conducted in accordance with the soil management provisions in the Site Management Plan;
- The Controlled Property may be used for restricted-residential use only;
- The Controlled Property may not be used for a higher level of use, such as unrestricted residential use without an amendment or extinguishment of the Environmental Easement;
- Grantor agrees to submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and

all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow, and must be certified by an expert that the NYSDEC finds acceptable.

The Site Management Plan (SMP) describes appropriate methods and procedures to ensure compliance with ICs that are required by the Environmental Easement. Once the SMP has been approved by the NYSDEC, compliance with the SMP is required by the grantor of the Environmental Easement and grantor's successors and assigns.

8.0 SITE MANAGEMENT PLAN

The SMP is intended to provide a detailed description of the procedures required to manage residual contamination left in place at the Site following completion of the Remedial Action in accordance with the BCA with the NYSDEC. Site Management is the last phase of remediation and begins with the approval of the Final Engineering Report and issuance of the Certificate of Completion (COC) for the Remedial Action. Site Management continues in perpetuity or until released in writing by NYSDEC. The property owner is responsible to ensure that all Site Management responsibilities defined in the Environmental Easement and the Site Management Plan are performed.

The SMP will list all the ICs for the site. Because the remedy contains no ECs, and will not require ongoing groundwater monitoring, no operation, maintenance, and monitoring requirements will be included in the SMP. The SMP will contain an Excavation Work Plan (EWP) that describes the procedures that must be followed should excavation be performed in the future at the site and defines long term management of residual contamination. The EWP will require sampling to characterize the material for disposal or possible on-site reuse. Therefore, the SMP will also include a HASP, QAPP, and CAMP that all must be followed during future excavation activities.

The SMP will also specify the submittal of Site Management Reports, performance of inspections and certification of results (including the maintenance of the ICs), and demonstration of proper communication of Site information to NYSDEC. The SMP will be prepared in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation and the guidelines provided by NYSDEC.

Tables

Figures

Appendices

Table

Table 1

Qualitative Human Health Exposure Assessment

Environmental Media & Exposure Route	Human Exposure Assessment
Direct contact with surface and subsurface soils	The potential exists for construction workers to be exposed to the metals and PAHs detected in the surface and subsurface soils during the performance of future site redevelopment activities. However, the PAH and metals compounds are present at low concentrations that are typically encountered in urban areas and are not considered to pose a health threat if the appropriate health and safety precautions are implemented. Based on field observations the surrounding land-use is considered urban/industrial with little to no redevelopment or construction at this time. Therefore, the direct contact pathway does not appear to be a significant exposure pathway on or surrounding the site.
Ingestion of groundwater	There are no private water supply wells serving nearby residents (residents are on the city's public water supply), and as such, there are no complete exposure pathways for the ingestion of groundwater from the site. Health impacts through ingestion of groundwater is not a concern, given the fact that the surrounding area is on a publicly supplied water. Additionally, review of registered water wells within the vicinity of the site, indicate the closest registered groundwater wells from the site at a distance of 2.4 to 2.5 miles away. However, should drinking water wells be installed in the future near the site, a completed ingestion pathway may exist.
Direct contact with groundwater	Very low levels of metals and VOCs were detected in on site groundwater. The metals were primarily iron, manganese, and sodium, whose standards are set primarily for non-health-related impacts. The VOCs are present below 100 ppb and would not pose a direct contact threat at these levels.
Inhalation of air	One monitoring well (RI-3) exhibited several exceedances of VOC and SVOC compounds, with minimal contamination of VOCs and SVOCs present elsewhere in the groundwater. However, the concentrations of VOCs and SVOCs detected in monitoring well RI-3 are low, and hydrocarbons tend to aerobically degrade in the vadose zone during migration. It should be noted that results of the soil vapor survey detected concentrations of VOCs site wide. There are residential homes to the north of the site, however the type of contamination found in the soil vapor aerobically biodegrade before migrating into buildings. Based on the surrounding land-use (urban/industrial) at this time ground disturbance and development does not pose a risk. In the future, the area surrounding the site has the potential for redevelopment. Based on the type of ground disturbance and proximity to the Site, inhalation pathways can be avoided if appropriate health and safety precautions are implemented.

Figures

Barton & Loguidice

POESTENKILL PLACE LIMITED PARTNERSHIP

REMEDIAL ACTION WORK PLAN

SITE LOCATION MAP

TROY RENSSELAER COUNTY, NEW YORK

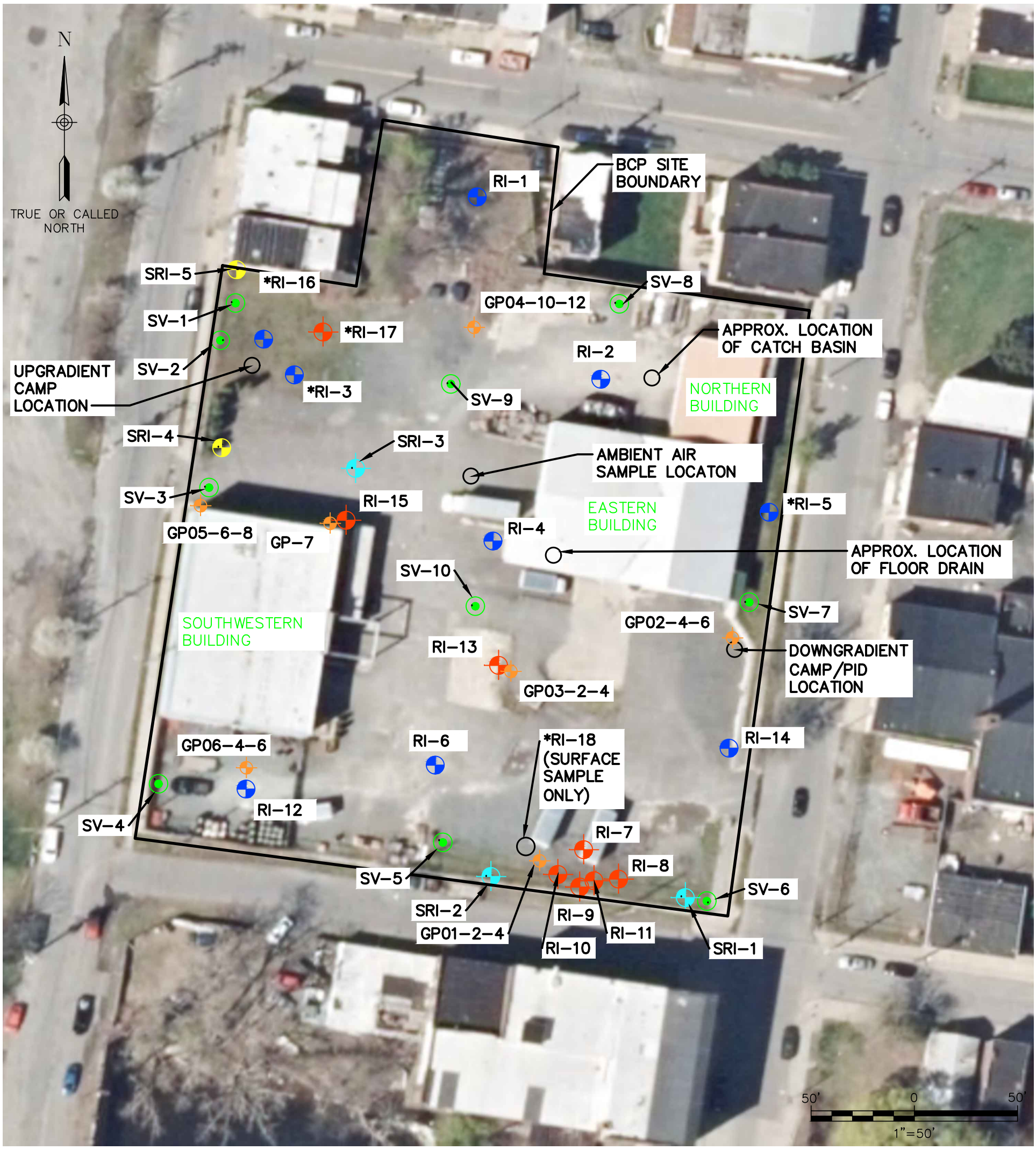
Date	Scale
DECEMBER 2020	1" = 2000'

Figure Number 1

Project Number 2248.001.001

Plotted: Feb 05, 2021 - 9:29AM SYR By: bas
Z:\BL-Vault\ID2\18217AD2-1C71-4823-8927-99D5C4054147\0\2212000-2212999\2212463\L\L\2248.001.001_RAWP_FIG 1 Site Location Map (ID 2212463).dwg

Plotted: Feb 05, 2021 – 10:11AM SYR By: bas
Z:\BL-Vault\ID2\18217AD2-1C71-4823-8927-99D5C4054147\0\2212000-2212999\2212468\L\L\2248.001.001_RAWP_FIG 2_All Well & Boring Locations_SITE PLAN (ID 2212468).dwg



LEGEND

- GP-## – SOIL BORING/MONITORING WELL LOCATON (INSTALLED MARCH 2018)
- RI-## – MONITORING WELL LOCATION (INSTALLED SEPT. 2019)
- RI-## – SOIL BORING LOCATION (INSTALLED SEPT. 2019)
- SRI-# – SUPPLEMENTAL SOIL BORING LOCATION (INSTALLED JUNE 2020)
- SRI-4 AND SRI-5 CONVERTED INTO SUPPLEMENTAL MONITORING WELL LOCATIONS (INSTALLED JUNE 2020)
- SV-# – SOIL VAPOR LOCATION (INSTALLED JUNE 2020)

NOTE: SURFACE SAMPLE COLLECTED FROM LOCATIONS DEPICTED WITH AN *ASTERISK (SAMPLED IN SEPTEMBER 2019)

GENERAL DIRECTION OF GROUNDWATER FLOW IS FROM EAST TO WEST

GROUND SURFACE ELEVATION (AMSL)			
LOCATION	ELEVATION (FT.)	LOCATION	ELEVATION (FT.)
RI-1	19.35	RI-10	21.85
RI-2	22.58	RI-11	22.21
RI-3	21.03	RI-12	22.21
RI-4	21.63	RI-13	22.21
RI-5	21.71	RI-14	21.77
RI-6	21.87	RI-15	21.99
RI-7	21.37	RI-16	21.12
RI-8	21.96	RI-17	20.64
RI-9	22.66	RI-18	21.54
SRI-1	22.13	SRI-2	21.50
SRI-3	21.68	SRI-4	20.56
SRI-5	21.07		

BLIND DUPLICATE & ASSOCIATED PARENT LOCATIONS					
SURFACE SOIL		SUBSURFACE SOIL		GROUNDWATER	
DUPE 1	RI-3 S 0-2" (9/16/19)	DUPE 3	RI-3 SS 18-20' (9/17/19)	DUPE 5	RI-5 (9/26/19) PFAS only*
DUPE 2	RI-16 SURFACE (9/17/19) PFAS only*	DUPE 4	RI-2 SS HFM (8/18/19)	DUPE 6	RI-12 (9/30/19)
		DUPE-X	SRI-4 FILL MATERIAL	DUPE-X	SRI-5 (6/19/20)

Barton & Loguidice

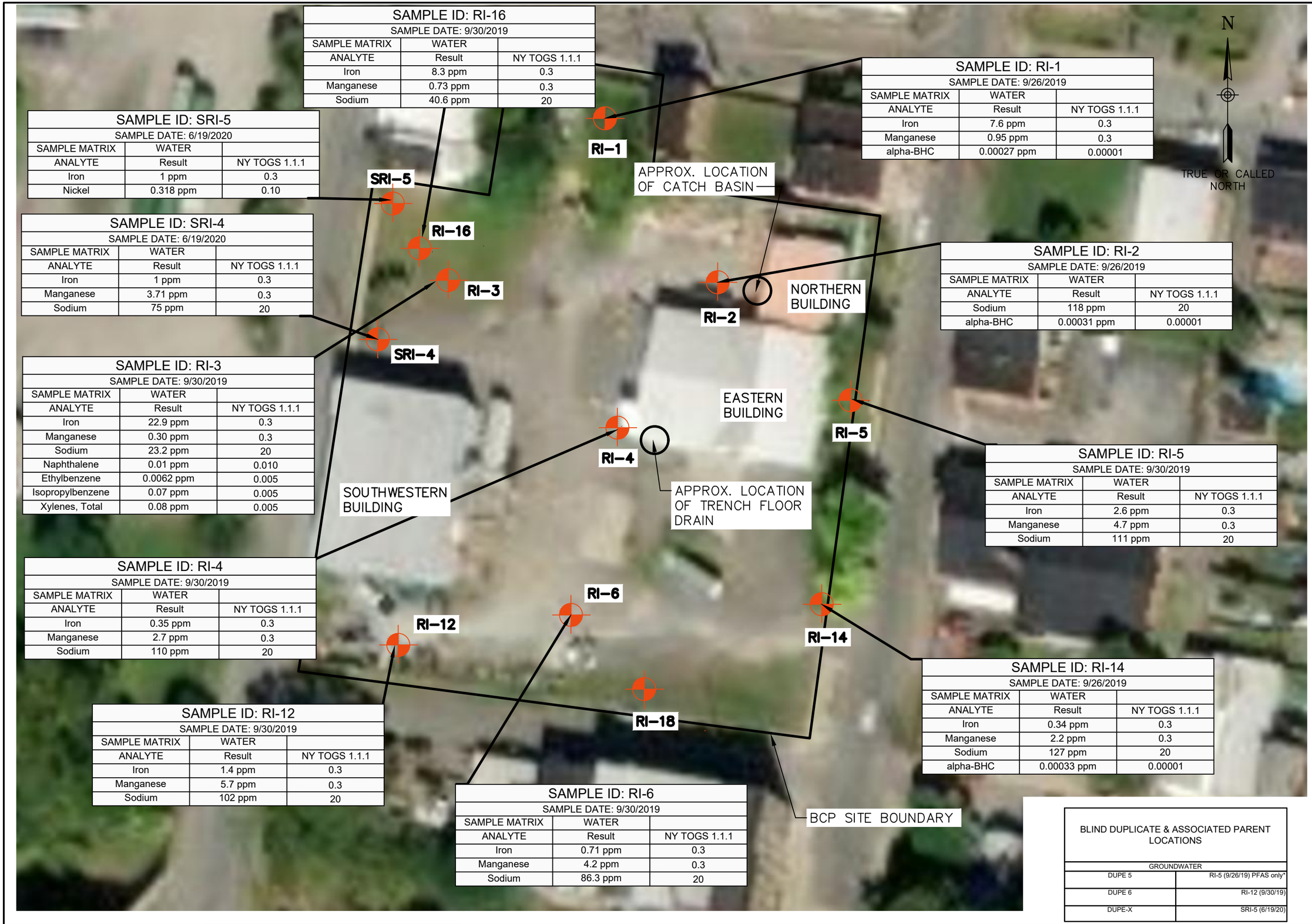
Date: DECEMBER 2020
Scale: AS SHOWN

POESTENKILL PLACE LIMITED PARTNERSHIP
REMEDIAL ACTION WORK PLAN
POESTENKILL PLACE

ALL INVESTIGATION SAMPLE LOCATIONS

TROY RENSSELAER COUNTY, NEW YORK

Figure Number: 2
Project Number: 2248.001.001



SAMPLE ID: RI-16		
SAMPLE DATE: 9/30/2019		
SAMPLE MATRIX	WATER	
ANALYTE	Result	NY TOGS 1.1.1
Iron	8.3 ppm	0.3
Manganese	0.73 ppm	0.3
Sodium	40.6 ppm	20

SAMPLE ID: RI-1		
SAMPLE DATE: 9/26/2019		
SAMPLE MATRIX	WATER	
ANALYTE	Result	NY TOGS 1.1.1
Iron	7.6 ppm	0.3
Manganese	0.95 ppm	0.3
alpha-BHC	0.00027 ppm	0.00001

SAMPLE ID: SRI-5		
SAMPLE DATE: 6/19/2020		
SAMPLE MATRIX	WATER	
ANALYTE	Result	NY TOGS 1.1.1
Iron	1 ppm	0.3
Nickel	0.318 ppm	0.10

SAMPLE ID: SRI-4		
SAMPLE DATE: 6/19/2020		
SAMPLE MATRIX	WATER	
ANALYTE	Result	NY TOGS 1.1.1
Iron	1 ppm	0.3
Manganese	3.71 ppm	0.3
Sodium	75 ppm	20

SAMPLE ID: RI-2		
SAMPLE DATE: 9/26/2019		
SAMPLE MATRIX	WATER	
ANALYTE	Result	NY TOGS 1.1.1
Sodium	118 ppm	20
alpha-BHC	0.00031 ppm	0.00001

SAMPLE ID: RI-3		
SAMPLE DATE: 9/30/2019		
SAMPLE MATRIX	WATER	
ANALYTE	Result	NY TOGS 1.1.1
Iron	22.9 ppm	0.3
Manganese	0.30 ppm	0.3
Sodium	23.2 ppm	20
Naphthalene	0.01 ppm	0.010
Ethylbenzene	0.0062 ppm	0.005
Isopropylbenzene	0.07 ppm	0.005
Xylenes, Total	0.08 ppm	0.005

SAMPLE ID: RI-5		
SAMPLE DATE: 9/30/2019		
SAMPLE MATRIX	WATER	
ANALYTE	Result	NY TOGS 1.1.1
Iron	2.6 ppm	0.3
Manganese	4.7 ppm	0.3
Sodium	111 ppm	20

SAMPLE ID: RI-4		
SAMPLE DATE: 9/30/2019		
SAMPLE MATRIX	WATER	
ANALYTE	Result	NY TOGS 1.1.1
Iron	0.35 ppm	0.3
Manganese	2.7 ppm	0.3
Sodium	110 ppm	20

SAMPLE ID: RI-14		
SAMPLE DATE: 9/26/2019		
SAMPLE MATRIX	WATER	
ANALYTE	Result	NY TOGS 1.1.1
Iron	0.34 ppm	0.3
Manganese	2.2 ppm	0.3
Sodium	127 ppm	20
alpha-BHC	0.00033 ppm	0.00001

SAMPLE ID: RI-12		
SAMPLE DATE: 9/30/2019		
SAMPLE MATRIX	WATER	
ANALYTE	Result	NY TOGS 1.1.1
Iron	1.4 ppm	0.3
Manganese	5.7 ppm	0.3
Sodium	102 ppm	20

SAMPLE ID: RI-6		
SAMPLE DATE: 9/30/2019		
SAMPLE MATRIX	WATER	
ANALYTE	Result	NY TOGS 1.1.1
Iron	0.71 ppm	0.3
Manganese	4.2 ppm	0.3
Sodium	86.3 ppm	20

BLIND DUPLICATE & ASSOCIATED PARENT LOCATIONS	
GROUNDWATER	
DUPE 5	RI-5 (9/26/19) PFAS only*
DUPE 6	RI-12 (9/30/19)
DUPE-X	SRI-5 (6/19/20)

POESTENKILL PLACE LIMITED PARTNERSHIP
REMEDIAL ACTION WORK PLAN – POESTENKILL PLACE

SUBSURFACE GROUNDWATER EXCEEDANCE LOCATIONS (2019 AND 2020)

RENSSELAER COUNTY, NEW YORK

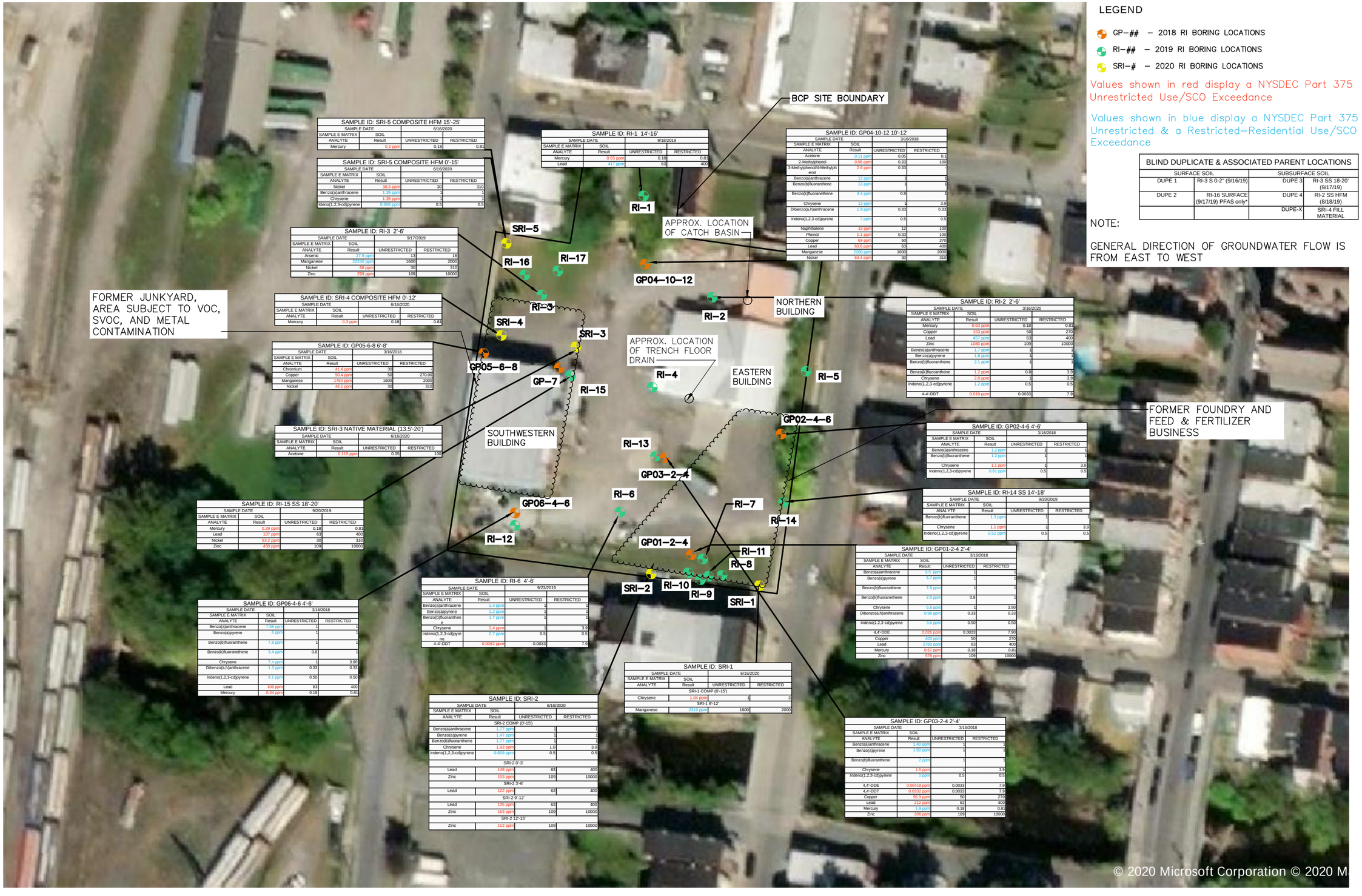
Barton & Loguidice
TROY

Date
DECEMBER 2020

Scale
1" = 50'

Figure Number
3

Project Number
2248.001.001



SAMPLE ID: SRI-5 COMPOSITE HFM 15'-25'

SAMPLE DATE		6/16/2020	
SAMPLE E MATRIX	SOIL		
ANALYTE	Result	UNRESTRICTED	RESTRICTED
Mercury	0.2 ppm	0.18	0.81

SAMPLE ID: SRI-5 COMPOSITE HFM 0'-15'

SAMPLE DATE		6/16/2020	
SAMPLE E MATRIX	SOIL		
ANALYTE	Result	UNRESTRICTED	RESTRICTED
Nickel	38.3 ppm	30	310
Benzo(a)anthracene	1.39 ppm	1	1
Chrysene	1.35 ppm	1	3.9
Ideno(1,2,3-cd)pyrene	0.506 ppm	0.5	0.5

SAMPLE ID: RI-3 2'-6'

SAMPLE DATE		9/17/2019	
SAMPLE E MATRIX	SOIL		
ANALYTE	Result	UNRESTRICTED	RESTRICTED
Arsenic	27.9 ppm	13	16
Manganese	22240 ppm	1600	2000
Nickel	68 ppm	30	310
Zinc	299 ppm	109	10000

SAMPLE ID: SRI-4 COMPOSITE HFM 0'-12'

SAMPLE DATE		6/16/2020	
SAMPLE E MATRIX	SOIL		
ANALYTE	Result	UNRESTRICTED	RESTRICTED
Mercury	0.3 ppm	0.18	0.81

SAMPLE ID: GP05-6-8 6'-8'

SAMPLE DATE		3/16/2018	
SAMPLE E MATRIX	SOIL		
ANALYTE	Result	UNRESTRICTED	RESTRICTED
Chromium	41.4 ppm	30	
Copper	50.4 ppm	50	270.00
Manganese	1760 ppm	1600	2000
Nickel	46.1 ppm	30	310

SAMPLE ID: SRI-3 NATIVE MATERIAL (13.5'-20')

SAMPLE DATE		6/16/2020	
SAMPLE E MATRIX	SOIL		
ANALYTE	Result	UNRESTRICTED	RESTRICTED
Acetone	0.115 ppm	0.05	100

SAMPLE ID: RI-15 SS 18'-20'

SAMPLE DATE		9/20/2019	
SAMPLE E MATRIX	SOIL		
ANALYTE	Result	UNRESTRICTED	RESTRICTED
Mercury	0.29 ppm	0.18	0.81
Lead	107 ppm	63	400
Nickel	53.2 ppm	30	310
Zinc	450 ppm	109	10000

SAMPLE ID: GP06-4-6 4'-6'

SAMPLE DATE		3/16/2018	
SAMPLE E MATRIX	SOIL		
ANALYTE	Result	UNRESTRICTED	RESTRICTED
Benzo(a)anthracene	7.58 ppm	1	1
Benzo(a)pyrene	6 ppm	1	1
Benzo(b)fluoranthene	7.8 ppm	1	1
Benzo(k)fluoranethene	3.4 ppm	0.8	1
Chrysene	7.4 ppm	1	3.90
Dibenzo(a,h)anthracene	1.3 ppm	0.33	0.33
Indeno(1,2,3-cd)pyrene	4.1 ppm	0.50	0.50
Lead	109 ppm	63	400
Mercury	0.34 ppm	0.18	0.81

SAMPLE ID: RI-1 14'-16'

SAMPLE DATE		9/18/2019	
SAMPLE E MATRIX	SOIL		
ANALYTE	Result	UNRESTRICTED	RESTRICTED
Mercury	0.55 ppm	0.18	0.81
Lead	417 ppm	63	400

SAMPLE ID: GP04-10-12 10'-12'

SAMPLE DATE		3/16/2018	
SAMPLE E MATRIX	SOIL		
ANALYTE	Result	UNRESTRICTED	RESTRICTED
Acetone	0.11 ppm	0.05	0.1
2-Methylphenol	0.98 ppm	0.33	100
3-Methylphenol/4-Methylphenol	2.6 ppm	0.33	
Benzo(a)anthracene	12 ppm	1	1
Benzo(b)fluoranthene	13 ppm	1	1
Benzo(k)fluoranethene	4.4 ppm	0.8	1
Chrysene	12 ppm	1	3.9
Dibenzo(a,h)anthracene	1.9 ppm	0.33	0.33
Indeno(1,2,3-cd)pyrene	7 ppm	0.5	0.5
Naphthalene	18 ppm	12	100
Phenol	1.1 ppm	0.33	100
Copper	69 ppm	50	270
Lead	53.6 ppm	63	400
Manganese	2200 ppm	1600	2000
Nickel	64.4 ppm	30	310

SAMPLE ID: RI-2 2'-6'

SAMPLE DATE		3/16/2020	
SAMPLE E MATRIX	SOIL		
ANALYTE	Result	UNRESTRICTED	RESTRICTED
Mercury	0.63 ppm	0.18	0.81
Copper	153 ppm	50	270
Lead	457 ppm	63	400
Zinc	1080 ppm	109	10000
Benzo(a)anthracene	1.7 ppm	1	1
Benzo(a)pyrene	1.8 ppm	1	1
Benzo(b)fluoranthene	2.1 ppm	1	1
Benzo(k)fluoranthene	1.2 ppm	0.8	3.9
Chrysene	2.0 ppm	1	3.9
Indeno(1,2,3-cd)pyrene	1.2 ppm	0.5	0.5
4-4'-DDT	0.019 ppm	0.0033	7.9

SAMPLE ID: GP02-4-6 4'-6'

SAMPLE DATE		3/16/2018	
SAMPLE E MATRIX	SOIL		
ANALYTE	Result	UNRESTRICTED	RESTRICTED
Benzo(a)anthracene	1.2 ppm	1	1
Benzo(b)fluoranthene	1.2 ppm	1	1
Chrysene	1.1 ppm	1	3.9
Indeno(1,2,3-cd)pyrene	0.61 ppm	0.5	0.5

SAMPLE ID: RI-14 SS 14'-18'

SAMPLE DATE		9/20/2019	
SAMPLE E MATRIX	SOIL		
ANALYTE	Result	UNRESTRICTED	RESTRICTED
Benzo(b)fluoranthene	1.3 ppm	1	1
Chrysene	1.1 ppm	1	3.9
Indeno(1,2,3-cd)pyrene	0.52 ppm	0.5	0.5

SAMPLE ID: GP01-2-4 2'-4'

SAMPLE DATE		3/16/2018	
SAMPLE E MATRIX	SOIL		
ANALYTE	Result	UNRESTRICTED	RESTRICTED
Benzo(a)anthracene	6.5 ppm	1	1
Benzo(a)pyrene	5.7 ppm	1	1
Benzo(b)fluoranthene	7.8 ppm	1	1
Benzo(k)fluoranethene	2.5 ppm	0.8	1
Chrysene	6.8 ppm	1	3.90
Dibenzo(a,h)anthracene	0.96 ppm	0.33	0.33
Indeno(1,2,3-cd)pyrene	3.6 ppm	0.50	0.50
4,4'-DDE	0.026 ppm	0.0033	7.90
Copper	403 ppm	50	270
Lead	2760 ppm	63	400
Mercury	0.57 ppm	0.18	0.81
Zinc	578 ppm	109	10000

SAMPLE ID: GP03-2-4 2'-4'

SAMPLE DATE		3/16/2018	
SAMPLE E MATRIX	SOIL		
ANALYTE	Result	UNRESTRICTED	RESTRICTED
Benzo(a)anthracene	1.40 ppm	1	1
Benzo(a)pyrene	1.50 ppm	1	1
Benzo(b)fluoranthene	2 ppm	1	1
Chrysene	1.5 ppm	1	3.9
Indeno(1,2,3-cd)pyrene	1 ppm	0.5	0.5
4,4'-DDE	0.00418 ppm	0.0033	7.9
4,4'-DDT	0.0332 ppm	0.0033	7.9
Copper	86.9 ppm	50	270
Lead	212 ppm	63	400
Mercury	1.9 ppm	0.18	0.81
Zinc	206 ppm	109	10000

SAMPLE ID: SRI-1

SAMPLE DATE		6/16/2020	
SAMPLE E MATRIX	SOIL		
ANALYTE	Result	UNRESTRICTED	RESTRICTED
SRI-1 COMP (0'-15')			
Chrysene	1.04 ppm	1	3
SRI-1 9'-12'			
Manganese	2310 ppm	1600	2000

SAMPLE ID: SRI-2

SAMPLE DATE		6/16/2020	
SAMPLE E MATRIX	SOIL		
ANALYTE	Result	UNRESTRICTED	RESTRICTED
SRI-2 COMP (0'-15')			
Benzo(a)anthracene	1.77 ppm	1	1
Benzo(a)pyrene	1.47 ppm	1	1
Benzo(b)fluoranthene	1.77 ppm	1	1
Chrysene	1.93 ppm	1.0	3.9
Indeno(1,2,3-cd)pyrene	0.809 ppm	0.5	0.5
SRI-2 0'-3'			
Lead	148 ppm	63	400
Zinc	153 ppm	109	10000
SRI-2 3'-6'			
Lead	122 ppm	63	400
SRI-2 9'-12'			
Lead	135 ppm	63	400
Zinc	153 ppm	109	10000
SRI-2 12'-15'			
Zinc	112 ppm	109	10000

LEGEND

- GP-## – 2018 RI BORING LOCATIONS
- RI-## – 2019 RI BORING LOCATIONS
- SRI-# – 2020 RI BORING LOCATIONS

Values shown in red display a NYSDEC Part 375 Unrestricted Use/SCO Exceedance

Values shown in blue display a NYSDEC Part 375 Unrestricted & a Restricted–Residential Use/SCO Exceedance

BLIND DUPLICATE & ASSOCIATED PARENT LOCATIONS

SURFACE SOIL		SUBSURFACE SOIL	
DUPE 1	RI-3 S 0-2" (9/16/19)	DUPE 3	RI-3 SS 18-20' (9/17/19)
DUPE 2	RI-16 SURFACE (9/17/19) PFAS only*	DUPE 4	RI-2 SS HFM (8/18/19)
		DUPE-X	SRI-4 FILL MATERIAL

NOTE:

GENERAL DIRECTION OF GROUNDWATER FLOW IS FROM EAST TO WEST

REVISIONS

POESTENKILL PLACE LIMITED PARTNERSHIP
REMEDIAL ACTION WORK PLAN - POESTENKILL PLACE
RENSSELAER COUNTY, NEW YORK

SUBSURFACE SOIL EXCEEDANCE LOCATIONS (2018. 2019, AND 2020 RI)

TROY

443 Electronics Parkway
Liverpool, NY
13088

B &L
Barton & Loguidice, D.P.C.

COMPLETED CONSTRUCTION

Significant Construction Changes Are Shown

By XXX Date XX/XX
Ck'd XXX Date XX/XX

Date
DECEMBER 2020

Scale
1" = 40'

Sheet Number
4

Project Number
2248.001.001

40' 0 40'
1"=40'

Checked by ____ Drawn by ____ Designed by ____ In charge of ____

Plotted: Apr 28, 2021 - 11:01AM SYR By: bas
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N

TRUE OR CALLED NORTH

RI-16: HIGH PID MEASUREMENTS 16'-18'

RI-3: STRONG PETROLEUM ODOR AND HIGH PID MEASUREMENTS 12'-24'

TOTAL DEPTH: 24'

TOTAL DEPTH: 8'

RI-15: HIGH PID MEASUREMENTS 6'-8'

TOTAL DEPTH: 2'

BCP SITE BOUNDARY

40' 0 40'

1"=40'

LEGEND

- TOTAL DEPTH 0-24'
- TOTAL DEPTH 0-8'
- TOTAL DEPTH 0-2'

NOTE:

1. DEPTHS OF EXCAVATION ARE BASED ON NYSDEC PART 375 RESTRICTED RESIDENTIAL USE SCO EXCEEDANCES
2. GENERAL DIRECTION OF GROUNDWATER FLOW IS FROM EAST TO WEST
3. ADDITIONAL EXCAVATION MAY BE REQUIRED UNDER EXISTING SITE BUILDINGS BASED ON SOIL SAMPLING RESULTS AFTER BUILDING DEMOLITION

POESTENKILL PLACE LIMITED PARTNERSHIP

REMEDIAL ACTION WORK PLAN - POESTENKILL PLACE

AREAS OF EXCAVATION - ALTERNATIVE 1 - TRACK 4

(NYSDEC PART 375 RESTRICTED RESIDENTIALUSE SCO)

RENSSELAER COUNTY, NEW YORK

B&L

Barton & Loguidice, D.P.C.

10 Airline Drive
Suite 200
Albany, NY
12205

TROY

Date
APRIL 2021

Scale
AS SHOWN

Figure Number
5

Project Number
2248.001.001

Plotted: Apr 28, 2021 - 11:13AM SYR By: bas

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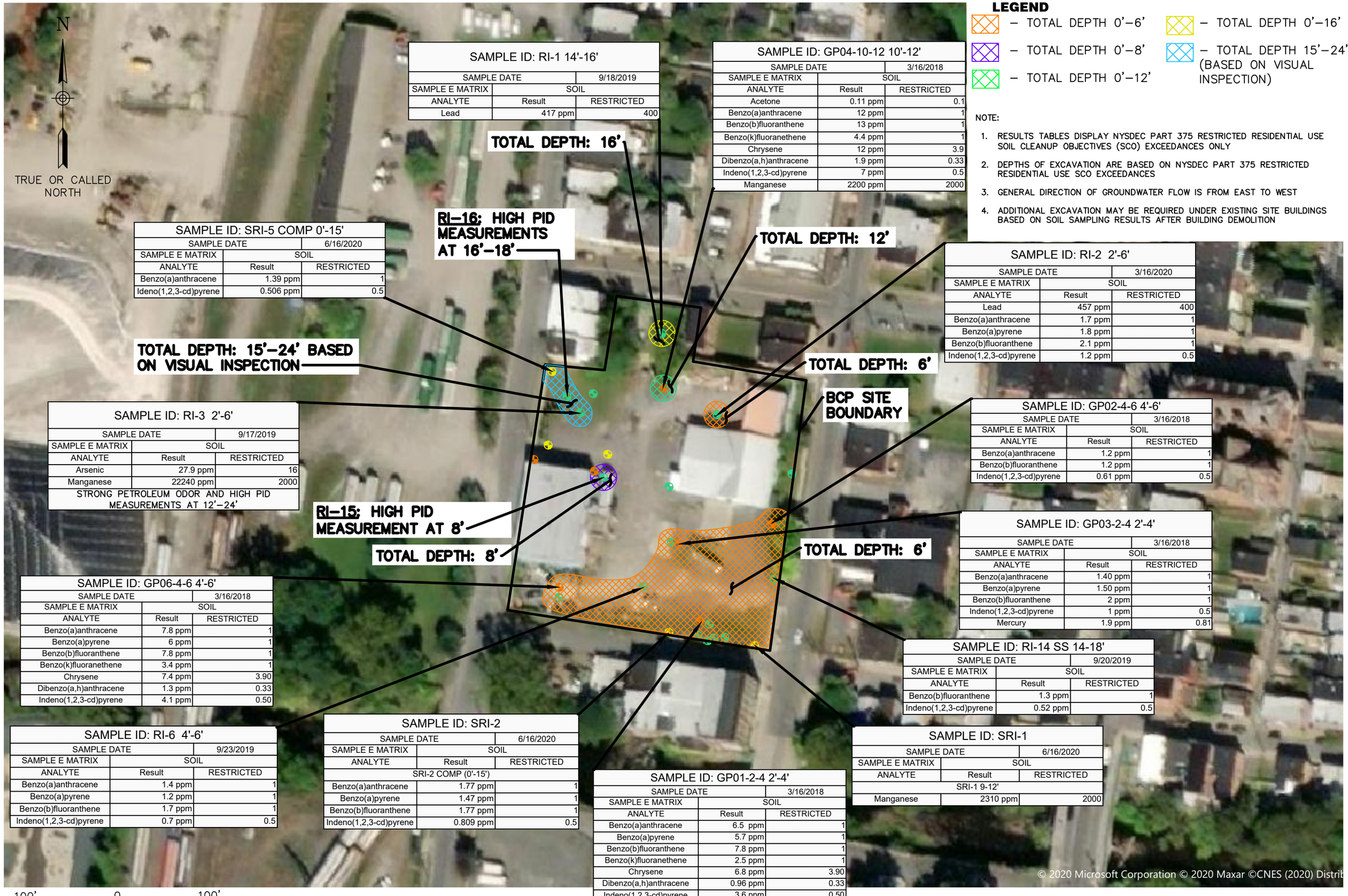

SAMPLE ID: RI-1 14'-16'

SAMPLE DATE		9/18/2019
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	RESTRICTED
Lead	417 ppm	400

SAMPLE ID: GP04-10-12 10'-12'

SAMPLE DATE		3/16/2018
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	RESTRICTED
Acetone	0.11 ppm	0.1
Benzo(a)anthracene	12 ppm	1
Benzo(b)fluoranthene	13 ppm	1
Benzo(k)fluoranethene	4.4 ppm	1
Chrysene	12 ppm	3.9
Dibenzo(a,h)anthracene	1.9 ppm	0.33
Indeno(1,2,3-cd)pyrene	7 ppm	0.5
Manganese	2200 ppm	2000

SAMPLE ID: SRI-5 COMP 0'-15'

SAMPLE DATE		6/16/2020
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	RESTRICTED
Benzo(a)anthracene	1.39 ppm	1
Ideno(1,2,3-cd)pyrene	0.506 ppm	0.5

SAMPLE ID: RI-2 2'-6'

SAMPLE DATE		3/16/2020
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	RESTRICTED
Lead	457 ppm	400
Benzo(a)anthracene	1.7 ppm	1
Benzo(a)pyrene	1.8 ppm	1
Benzo(b)fluoranthene	2.1 ppm	1
Indeno(1,2,3-cd)pyrene	1.2 ppm	0.5

SAMPLE ID: RI-3 2'-6'

SAMPLE DATE		9/17/2019
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	RESTRICTED
Arsenic	27.9 ppm	16
Manganese	22240 ppm	2000
STRONG PETROLEUM ODOR AND HIGH PID MEASUREMENTS AT 12'-24'		

SAMPLE ID: GP02-4-6 4'-6'

SAMPLE DATE		3/16/2018
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	RESTRICTED
Benzo(a)anthracene	1.2 ppm	1
Benzo(b)fluoranthene	1.2 ppm	1
Indeno(1,2,3-cd)pyrene	0.61 ppm	0.5

SAMPLE ID: GP03-2-4 2'-4'

SAMPLE DATE		3/16/2018
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	RESTRICTED
Benzo(a)anthracene	1.40 ppm	1
Benzo(a)pyrene	1.50 ppm	1
Benzo(b)fluoranthene	2 ppm	1
Indeno(1,2,3-cd)pyrene	1 ppm	0.5
Mercury	1.9 ppm	0.81

SAMPLE ID: GP06-4-6 4'-6'

SAMPLE DATE		3/16/2018
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	RESTRICTED
Benzo(a)anthracene	7.8 ppm	1
Benzo(a)pyrene	6 ppm	1
Benzo(b)fluoranthene	7.8 ppm	1
Benzo(k)fluoranethene	3.4 ppm	1
Chrysene	7.4 ppm	3.90
Dibenzo(a,h)anthracene	1.3 ppm	0.33
Indeno(1,2,3-cd)pyrene	4.1 ppm	0.50

SAMPLE ID: RI-14 SS 14-18'

SAMPLE DATE		9/20/2019
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	RESTRICTED
Benzo(b)fluoranthene	1.3 ppm	1
Indeno(1,2,3-cd)pyrene	0.52 ppm	0.5

SAMPLE ID: RI-6 4'-6'

SAMPLE DATE		9/23/2019
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	RESTRICTED
Benzo(a)anthracene	1.4 ppm	1
Benzo(a)pyrene	1.2 ppm	1
Benzo(b)fluoranthene	1.7 ppm	1
Indeno(1,2,3-cd)pyrene	0.7 ppm	0.5

SAMPLE ID: SRI-2

SAMPLE DATE		6/16/2020
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	RESTRICTED
SRI-2 COMP (0'-15')		
Benzo(a)anthracene	1.77 ppm	1
Benzo(a)pyrene	1.47 ppm	1
Benzo(b)fluoranthene	1.77 ppm	1
Indeno(1,2,3-cd)pyrene	0.809 ppm	0.5

SAMPLE ID: GP01-2-4 2'-4'

SAMPLE DATE		3/16/2018
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	RESTRICTED
Benzo(a)anthracene	6.5 ppm	1
Benzo(a)pyrene	5.7 ppm	1
Benzo(b)fluoranthene	7.8 ppm	1
Benzo(k)fluoranethene	2.5 ppm	1
Chrysene	6.8 ppm	3.90
Dibenzo(a,h)anthracene	0.96 ppm	0.33
Indeno(1,2,3-cd)pyrene	3.6 ppm	0.50
Copper	403 ppm	270
Lead	2760 ppm	400

SAMPLE ID: SRI-1

SAMPLE DATE		6/16/2020
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	RESTRICTED
SRI-1 9-12'		
Manganese	2310 ppm	2000

LEGEND

- TOTAL DEPTH 0'–6'
- TOTAL DEPTH 0'–8'
- TOTAL DEPTH 0'–12'
- TOTAL DEPTH 0'–16'
- TOTAL DEPTH 15'–24' (BASED ON VISUAL INSPECTION)

NOTE:

1. RESULTS TABLES DISPLAY NYSDEC PART 375 RESTRICTED RESIDENTIAL USE SOIL CLEANUP OBJECTIVES (SCO) EXCEEDANCES ONLY
2. DEPTHS OF EXCAVATION ARE BASED ON NYSDEC PART 375 RESTRICTED RESIDENTIAL USE SCO EXCEEDANCES
3. GENERAL DIRECTION OF GROUNDWATER FLOW IS FROM EAST TO WEST
4. ADDITIONAL EXCAVATION MAY BE REQUIRED UNDER EXISTING SITE BUILDINGS BASED ON SOIL SAMPLING RESULTS AFTER BUILDING DEMOLITION

POESTENKILL PLACE LIMITED PARTNERSHIP
REMEDIAL ACTION WORK PLAN - POESTENKILL PLACE

AREAS OF EXCAVATION - ALTERNATIVE 2 - TRACK 2

(NYSDEC PART 375 RESTRICTED RESIDENTIALUSE SCO)

RENSSELAER COUNTY, NEW YORK

B&L TROY
Barton & Loguidice, D.P.C.
10 Airline Drive
Suite 200
Albany, NY
12205

Date
APRIL 2021

Scale
AS SHOWN

Figure Number
6

Project Number
2248.001.001

Plotted: Apr 28, 2021 – 11:09AM SYR By: bas
Z:\BL-Vault\D2\18217AD2-1C71-4823-8927-99D5C4054147\0\2287000-2287999\2287182\L\2248.001.001- RAWP_FIG 6_AREAS OF EXCAVATION_ALT 2-TRACK 2_REVISED4192021 (ID 2287182).dwg

LEGEND

- – TOTAL DEPTH 0'–6'
- – TOTAL DEPTH 0'–12'
- – TOTAL DEPTH 0'–16'
- – TOTAL DEPTH 18'–24' (BASED ON VISUAL INSPECTION)

NOTE:

1. DEPTHS OF EXCAVATION ARE BASED ON NYSDEC PART 375 UNRESTRICTED RESIDENTIAL USE SCO EXCEEDANCES
2. GENERAL DIRECTION OF GROUNDWATER FLOW IS FROM EAST TO WEST
3. ADDITIONAL EXCAVATION MAY BE REQUIRED UNDER EXISTING SITE BUILDINGS BASED ON SOIL SAMPLING RESULTS AFTER BUILDING DEMOLITION

TOTAL DEPTH: 16'

RI–16: HIGH PID MEASUREMENTS AT 16'–18'

BCP SITE BOUNDARY

TOTAL DEPTH: 12'

TOTAL DEPTH: 6'

TOTAL DEPTH: 18'–24' BASED ON VISUAL INSPECTION

TOTAL DEPTH: 6'

SAMPLE ID: RI-1 14'-16'

SAMPLE DATE		9/18/2019
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	UNRESTRICTED
Mercury	0.55 ppm	0.18
Lead	417 ppm	63

SAMPLE ID: SRI-5 COMP 15'-25'

SAMPLE DATE		6/16/2020
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	UNRESTRICTED
Mercury	0.2 ppm	0.18

SAMPLE ID: SRI-5 COMP 0'-15'

SAMPLE DATE		6/16/2020
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	UNRESTRICTED
Nickel	38.3 ppm	30
Benzo(a)anthracene	1.39 ppm	1
Chrysene	1.35 ppm	1
Indeno(1,2,3-cd)pyrene	0.506 ppm	0.5

SAMPLE ID: GP04-10-12 10'-12'

SAMPLE DATE		3/16/2018
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	UNRESTRICTED
Acetone	0.11 ppm	0.05
2-Methylphenol	0.98 ppm	0.33
3-Methylphenol/4-Methylphenol	2.6 ppm	0.33
Benzo(a)anthracene	12 ppm	1
Benzo(b)fluoranthene	13 ppm	1
Benzo(k)fluoranethene	4.4 ppm	0.8
Chrysene	12 ppm	1
Dibenz(a,h)anthracene	1.9 ppm	0.33
Indeno(1,2,3-cd)pyrene	7 ppm	0.5
Naphthalene	18 ppm	12
Phenol	1.1 ppm	0.33
Copper	69 ppm	50
Lead	63.6 ppm	63
Manganese	2200 ppm	1600
Nickel	64.4 ppm	30

SAMPLE ID: RI-3 2'-6'

SAMPLE DATE		9/17/2019
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	UNRESTRICTED
Arsenic	27.9 ppm	13
Manganese	22240 ppm	1600
Nickel	68 ppm	30
Zinc	299 ppm	109
STRONG PETROLEUM ODOR AND HIGH PID MEASUREMENTS AT 12'–24'		

SAMPLE ID: SRI-4 COMP 0'-12'

SAMPLE DATE		6/16/2020
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	UNRESTRICTED
Mercury	0.3 ppm	0.18

SAMPLE ID: RI-2 2'-6'

SAMPLE DATE		3/16/2020
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	UNRESTRICTED
Mercury	0.63 ppm	0.18
Copper	153 ppm	50
Lead	457 ppm	63
Zinc	1080 ppm	109
Benzo(a)anthracene	1.7 ppm	1
Benzo(a)pyrene	1.8 ppm	1
Benzo(b)fluoranthene	2.1 ppm	1
Benzo(k)fluoranthene	1.2 ppm	0.8
Chrysene	2.0 ppm	1
Indeno(1,2,3-cd)pyrene	1.2 ppm	0.5
4-4'-DDT	0.019 ppm	0.0033

SAMPLE ID: GP05-6-8 6'-8'

SAMPLE DATE		3/16/2018
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	UNRESTRICTED
Chromium	41.4 ppm	30
Copper	50.4 ppm	50
Manganese	1760 ppm	1600
Nickel	46.1 ppm	30

SAMPLE ID: SRI-3 NATIVE MATERIAL (13.5'-20')

SAMPLE DATE		6/16/2020
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	UNRESTRICTED
Acetone	0.115 ppm	0.05

SAMPLE ID: GP02-4-6 4'-6'

SAMPLE DATE		3/16/2018
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	UNRESTRICTED
Benzo(a)anthracene	1.2 ppm	1
Benzo(b)fluoranthene	1.2 ppm	1
Chrysene	1.1 ppm	1
Indeno(1,2,3-cd)pyrene	0.61 ppm	0.5

SAMPLE ID: RI-15 SS 18'-20'

SAMPLE DATE		9/20/2019
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	UNRESTRICTED
Mercury	0.29 ppm	0.18
Lead	107 ppm	63
Nickel	53.2 ppm	30
Zinc	450 ppm	109
HIGH PID MEASUREMENT AT 8'		

SAMPLE ID: RI-14 SS 14'-18'

SAMPLE DATE		9/20/2019
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	UNRESTRICTED
Benzo(b)fluoranthene	1.3 ppm	1
Chrysene	1.1 ppm	1
Indeno(1,2,3-cd)pyrene	0.52 ppm	0.5

SAMPLE ID: GP01-2-4 2'-4'

SAMPLE DATE		3/16/2018
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	UNRESTRICTED
Benzo(a)anthracene	6.5 ppm	1
Benzo(a)pyrene	5.7 ppm	1
Benzo(b)fluoranthene	7.8 ppm	1
Benzo(k)fluoranethene	2.5 ppm	0.8
Chrysene	6.8 ppm	1
Dibenz(a,h)anthracene	0.96 ppm	0.33
Indeno(1,2,3-cd)pyrene	3.6 ppm	0.50
4,4'-DDE	0.026 ppm	0.0033
Copper	403 ppm	50
Lead	2760 ppm	63
Mercury	0.57 ppm	0.18
Zinc	578 ppm	109

SAMPLE ID: GP06-4-6 4'-6'

SAMPLE DATE		3/16/2018
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	UNRESTRICTED
Benzo(a)anthracene	7.8 ppm	1
Benzo(a)pyrene	6 ppm	1
Benzo(b)fluoranthene	7.6 ppm	1
Benzo(k)fluoranethene	3.4 ppm	0.8
Chrysene	7.4 ppm	1
Dibenz(a,h)anthracene	1.3 ppm	0.33
Indeno(1,2,3-cd)pyrene	4.1 ppm	0.50
Lead	109 ppm	63
Mercury	0.34 ppm	0.18

SAMPLE ID: RI-6 4'-6'

SAMPLE DATE		9/23/2019
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	UNRESTRICTED
Benzo(a)anthracene	1.4 ppm	1
Benzo(a)pyrene	1.2 ppm	1
Benzo(b)fluoranthene	1.7 ppm	1
Chrysene	1.4 ppm	1
Indeno(1,2,3-cd)pyrene	0.7 ppm	0.5
4-4'-DDT	0.0082 ppm	0.0033

SAMPLE ID: SRI-1

SAMPLE DATE		6/16/2020
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	UNRESTRICTED
SRI-1 COMP (0'-15')		
Chrysene	1.04 ppm	1
SRI-1 9'-12'		
Manganese	2310 ppm	1600

SAMPLE ID: SRI-2

SAMPLE DATE		6/16/2020
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	UNRESTRICTED
SRI-2 COMP (0'-15')		
Benzo(a)anthracene	1.77 ppm	1
Benzo(a)pyrene	1.47 ppm	1
Benzo(b)fluoranthene	1.77 ppm	1
Chrysene	1.93 ppm	1.0
Indeno(1,2,3-cd)pyrene	0.809 ppm	0.5
SRI-2 0'-3'		
Lead	148 ppm	63
Zinc	153 ppm	109
SRI-2 3'-6'		
Lead	122 ppm	63
SRI-2 9'-12'		
Lead	135 ppm	63
Zinc	153 ppm	109
SRI-2 12'-15'		
Zinc	112 ppm	109

SAMPLE ID: GP03-2-4 2'-4'

SAMPLE DATE		3/16/2018
SAMPLE E MATRIX	SOIL	
ANALYTE	Result	UNRESTRICTED
Benzo(a)anthracene	1.40 ppm	1
Benzo(a)pyrene	1.50 ppm	1
Benzo(b)fluoranthene	2 ppm	1
Chrysene	1.5 ppm	1
Indeno(1,2,3-cd)pyrene	1 ppm	0.5
4,4'-DDE	0.00418 ppm	0.0033
4,4'-DDT	0.0332 ppm	0.0033
Copper	96.9 ppm	50
Lead	212 ppm	63
Mercury	1.9 ppm	0.18
Zinc	306 ppm	109

40' 0 40'

1"=40'

Plotted: Apr 28, 2021 – 2:13PM SYR By: bas
Z:\BL-Vault\D2\18217A02--1C71--4823--8927--99D5C405414F\0\2304000--2304999\2304740\L\L\2248.001.001_RAWP_FIG 7_AREAS OF EXCAVATION_ALT 3 – TRACK 1_4282021 (ID 2304740).dwg

Checked by ____ Drawn by ____ Designed by ____ In charge of ____

REVISIONS

POESTENKILL PLACE LIMITED PARTNERSHIP
REMEDIAL ACTION WORK PLAN - POESTENKILL PLACE

AREAS OF EXCAVATION – ALTERNATIVE 3 – TRACK 1 (NYSDEC PART 375 UNRESTRICTED RESIDENTIAL USE SCO)

RENSSELAER COUNTY, NEW YORK
TROY

443 Electronics Parkway
Liverpool, NY
13088

B&L Barton & Loguidice, D.P.C.

COMPLETED CONSTRUCTION

Significant Construction Changes Are Shown

By XXX Date XX/XX
Ck'd XXX Date XX/XX

Date: APRIL 2021

Scale: AS SHOWN

Sheet Number: 7

Project Number: 2248.001.001

Appendix A

Poestenkill Place Site
Brownfield Cleanup Project
NYSDEC Site No. C442058
City of Troy, Rensselaer County, New York

Appendix A
Health and Safety Plan

December 2020

Poestenkill Place Site
Brownfield Cleanup Project
NYSDEC Site No. C442058
City of Troy, Rensselaer County, New York

Appendix A
Health and Safety Plan

December 2020

Prepared for:

Poestenkill Place Limited Partnership
90 State Street, Suite 602
Albany, New York 12207

Prepared by:

Barton & Loguidice, D.P.C.
10 Airline Drive
Albany, New York 12205

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Attachments

1.0 Introduction

This Health and Safety Plan (HASP) has been developed to provide both general procedures and specific requirements to be followed by Barton and Loguidice, D.P.C. (B&L) personnel while performing the Remedial Program (RP) activities at the Poestenkill Place Site in Troy, New York. This was prepared in accordance with 29 CFR 1910.120. This plan was prepared, and will be implemented, by a qualified person as defined under 29 CFR 1910.120; this is also in accordance with NYSDEC DER-10, *Technical Guidance for Site Investigation and Remediation*.

This HASP describes the responsibilities, training requirements, protective equipment, and standard operating procedures to be used by B&L personnel to address potential health and safety hazards while in work areas. This plan specifies procedures and equipment to be used by B&L personnel during work activities and emergency response to minimize exposures of B&L personnel to hazardous materials. The Plan is based on the site information available at this time and anticipated conditions to be encountered during the different phases of work. This Plan is subject to modification as data are collected and evaluated.

All personnel conducting activities on-site must comply with all applicable Federal and State rules and regulations regarding safe work practices. Personnel conducting field activities must also be familiar with the procedures, requirements and provisions of this Plan. In the event of conflicting Plans and requirements, personnel must implement those safety practices that afford the highest level of protection.

1.1 Poestenkill Place Site Location and Description

The Poestenkill Place site is an irregular-shaped parcel of land occupying the majority of the city block bounded by Jefferson Street to the north, Second Street to the east, Ida Street to the south, and First Street to the west. Three buildings currently occupy the 1.88-acre site. The southwestern building is currently occupied by a commercial tenant that uses the building for the sales and service of commercial water and wastewater equipment.

The subject property has supported a variety of industrial and commercial uses from the late 1800s to the present. The site uses included a foundry and stove works in the late 1800s to early 1900s, a junkyard in the 1950s, a feed and fertilizer business from the 1950s to the 1960s, and a building materials warehouses from the 1950s to the 1980s. From the 1980s until about 2001, the eastern building of the site was occupied by a steel fabricating company. It was then occupied by a limousine company from 2001 to 2004 and a heavy construction equipment rental company from 2005 to 2015. The southwestern building of the site was occupied by a heavy construction equipment and rental company from approximately 1985 to 2000.

1.2 Implementation of Health and Safety Plan

The requirements and guidelines presented in this HASP are based on a review of available information and an evaluation of potential hazards. This HASP incorporates by reference the applicable Occupational Safety and Health Administration (OSHA) requirements in 29 CFR Part 1910 and 29 CFR Part 1926. The protective equipment selection was made according to Subpart I of 29 CFR 1910. B&L personnel are required to read this HASP before beginning work. This HASP will be available for inspection and review by B&L employees while work activities are underway.

When conducting the Remedial Program (RP) activities listed in the Work Plan, B&L personnel will comply with this HASP. On-site, B&L personnel will notify the B&L Site Safety and Health Coordinator (SSHC) of matters of health and safety. The SSHC is responsible to the Project Manager for monitoring activities, monitoring compliance with the provisions of this HASP, and for modifying this HASP to the extent necessary if conditions change.

This HASP is specifically intended for guiding the conduct of B&L activities defined in the Work Plan in the areas of the Poestenkill Place Site specified for these work activities. Although this HASP can be made available to interested persons for informational purposes, B&L does not assume responsibility for the interpretations or activities of any persons or entities other than employees of Barton and Loguidice.

The health and safety considerations of subcontractors to B&L will be set forth in HASPs provided by each subcontractor. Documentation of the subcontractor's HASP will be obtained prior to the start of the subcontractor's work.

1.3 Project Organization

Personnel involved in the RP activities at the Poestenkill Place Site implicitly have a part in implementing the HASP. Among them, the Program Manager, the Project Manager, and the SSHC have specifically designated responsibilities. Their names and telephone numbers are listed in Table 1-1. Other key B&L project personnel, the project's organization, and other primary contacts for the project are presented in the Work Plan.

Key project personnel and their responsibilities with regard to the sampling activities are discussed below.

Program Manager: Scott Nostrand, P.E., Barton & Loguidice.

Project Manager: Steve Le Fevre, P.G., Barton & Loguidice. The Project Manager is directly responsible for the technical progress and financial control of the project.

Site Safety and Health Coordinator: The B&L Site Safety and Health Coordinator (SSHC) for this investigation will be designated by the B&L Project Manager. The SSHC reports to the Project Manager, coordinates his activities with the B&L Corporate Associate for Safety and Health, and establishes operating standards and coordinates overall project safety and health activities associated with implementation of the RP field activities. The SSHC reviews project plans and revisions to plans to determine that safety and health procedures are maintained throughout the investigation. The SSHC audits the effectiveness of the HASP on a continuing basis and suggests changes, if necessary, to the Project Manager.

Specifically, the SSHC is responsible for the conducting the following actions:

- Provide a complete copy of the HASP before the start of activities;
- Familiarize workers with the HASP;
- Conduct health and safety training and briefing sessions;
- Document the availability, use, and maintenance of personal protective and other safety or health equipment;
- Maintain safety awareness among B&L employees and communicating safety and health matters to them;
- Review field activities for performance in a manner consistent with B&L policy and this HASP;
- Monitor health and safety conditions during field activities;
- Coordinate with emergency response personnel and medical support facilities;
- Notify the Project Manager of the need to initiate corrective actions in the event of an emergency, an accident, or identification of a potentially unsafe condition;
- Notify the Project Manager of an emergency, an accident, the presence of a potentially unsafe condition, a health or safety problem encountered, or an exception to this HASP;
- Recommend improvements in safety and health measures to the Project Manager; and,
- Conduct safety and health performance and system audits.

The SSHC has the authority to recommend that the Project Manager take the following actions:

- Suspend field activities or otherwise limit exposures if the health or safety of any B&L employee appears to be endangered;

- Notify B&L personnel to alter work practices that the SSHC deems to not protect them; and
- Suspend a B&L employee from field activities for violating the requirements of this HASP.

Table 1-1. Project Personnel

Name and Title	Telephone
Scott Nostrand, P.E., Program Manager	(315) 457-5200
Steve Le Fevre, P.G., Project Manager	(518) 218-1801

1.4 Project Tasks

The following tasks are identified for this project:

- General site work
- Excavation/construction oversight
- Sub-surface/surface soil sampling

Both the potential health and safety hazards and the hazard and contaminant control procedures for these tasks are discussed in the sections below.

2.0 Health and Safety Risk Analysis

2.1 General RI Field Activity Hazards

2.1.1 Chemical Hazards

Chemical hazards that may be encountered during the remedy field implementation are related to inhalation, ingestion, and skin exposure to constituents of potential concern (COPCs). COPCs may include volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals (cadmium, chromium, copper, lead, mercury, nickel, zinc, sodium, and iron).

The potential for unprotected personnel for inhalation of constituents during intrusive field activities is low to moderate. The potential for unprotected personnel for dermal contact with soils, sediments or water containing COPCs during excavation and sampling operations is moderate to high. Proper use of personnel protective equipment is intended to reduce potential exposure to contaminants.

2.1.2 Environmental and Physical Hazards

Prior to initiating activity, the work conditions will be discussed with all employees. Hazards will be identified and protective measures will be explained.

A list of Environmental and Physical hazards associated with the site are:

1. *Slip, Trip, and Fall During All Activities (Uneven Terrain):* The site contains numerous potential safety hazards such as pits, broken glass, slippery surfaces and fire debris. The work itself may be a potential safety hazard. Site personnel should constantly look out for potential safety hazards and should immediately inform the SSHC of any new hazards.
2. *Excavation Debris:* Excavation projects pose potential safety hazards from materials falling from the excavator as they are removed from the working excavation. The excavation work is a potential safety hazard and the SSHC will provide oversight during demolition activities.
3. *Moving Parts of Heavy Equipment:* Heavy equipment poses dangers though moving parts. Where feasible, access to moving parts will be guarded and equipment will be equipped with backup alarms.
4. *Noise from Heavy Equipment:* Work around large equipment often creates excess noise. Engineering controls and personal protective equipment will be used to protect employees' hearing.

5. *Electrical Hazards:* As in all site work, overhead power lines, buried power lines, electrical wires and cables, site electrical equipment, and lightning also pose a potential hazard to site workers. Site personnel should constantly look out for potential safety hazards and should immediately inform the SSHC of any new hazards.

6. *Biological Hazards (Insects, Poison Ivy, etc.):* Other biological hazards that may be present at the site include rodents and insects. PPE can reduce the potential for exposure. The SSHC can assist in determining the correct PPE for the hazard present.

2.1.3 Hazard and Contaminant Control

Protective equipment will include boots with good treads and personnel will be reminded to remain alert of the area where they are walking to decrease the chance of slipping. Eye protection will be worn to minimize splashing into eyes.

The primary hazards for contaminant exposure for each task are summarized on Table 2-1. If odors are observed during field activities, air monitoring with a PID should be conducted to evaluate the concentrations that are present. Action levels for upgrading PPE are presented in Section 6.2.

Field equipment will be inspected and in proper working condition. Mechanical assistance will be provided for large lifting tasks. Ground Fault Circuit Interrupter (GFCI) will be used on all electric power tools and extension cords in outdoor work locations. Electrical extension cords will be protected or guarded from damage (i.e., cuts from other machinery) and be maintained in good condition.

Table 2-1. Assessment of Chemicals of Potential Concern						
Chemical Name	**PEL/TLV**	**Other Pertinent Limits (Specify)**	**Warning Properties – Odor Threshold**	**Potential Exposure Pathways**	**Acute Health Effects**	**Chronic Health Effects**
Decontamination Materials:						
Isopropyl Alcohol (for decontamination, if necessary)	400 ppm/ 400 ppm	STEL = 500 ppm IDLH = 2000 ppm	Colorless liquid with the odor of rubbing alcohol	Inhalation, Absorption, Ingestion, Contact	Eye, skin & respiratory irritation; headache, drowsiness, dizziness, dry cracking skin	Dermatitis
Methanol (for decontamination, if necessary)	200 ppm/ 200 ppm	IDLH = 6000	Colorless liquid with a pungent odor – 141 ppm	Inhalation, Absorption, Ingestion, Contact	Irritation of eyes, skin, respiratory system, headache, drowsiness, dizziness, vertigo, light-headedness, nausea, vomiting, visual disturbances	Optic nerve damage, dermatitis, damage to respiratory system and GI tract
VOCs:						
Benzene	1 ppm/ 0.5 ppm	STEL=5 ppm IDLH=500 ppm	Colorless to light yellow liquid with an aromatic odor – 8.65 ppm	Inhalation, Absorption, Ingestion, Contact	Eye, skin, nose & respiratory irritation; nausea, headache, staggered gait, fatigue, anorexia, weakness, exhaustion	Carcinogen, dermatitis, bone marrow depression, damage to the eyes, respiratory system. CNS
Ethylbenzene	100 ppm/ 100 ppm	STEL = 125 ppm IDLH = 800 ppm	Colorless liquid with an aromatic odor	Inhalation, Absorption, Ingestion, Contact	Eye, skin & respiratory irritation; CNS effects; headache	Dermatitis; CNS effects;
Methyl ethyl ketone (MEK, 2-butanone)	200 ppm/ 200 ppm	IDLH = 3000 ppm	Colorless liquid with a moderately sharp, fragrant, mint-or acetone-like odor	Inhalation, Absorption, Ingestion, Contact	Eye, skin & respiratory irritation; depression; CNS effects	Eyes; respiratory system; dermatitis; CNS; liver and kidneys
Tetrachloroethene	100 ppm/ 25 ppm	C=200 ppm STEL (5 min)=300 ppm IDLH=100 ppm	Colorless to pale yellow liquid with a pungent, chloroform-like odor	Inhalation, Absorption, Ingestion, Contact	Irritation of eyes, nose, throat; nausea; flushing of face and neck; vertigo, dizziness, incoherence; headache, somnolence; skin erythema	Liver damage. Target organs: eyes, skin, respiratory system, liver, kidneys, CNS.
Toluene	200 ppm/ 50 ppm	C=300 ppm STEL=150 ppm IDLH=500 ppm	Colorless liquid with a sweet, pungent, benzene-like odor	Inhalation, Absorption, Ingestion, Contact	Eye, skin & respiratory irritation; confusion, dizziness, headache	CNS effects; liver, kidney damage; dermatitis

Table 2-1. Assessment of Chemicals of Potential Concern						
Chemical Name	**PEL/TLV**	**Other Pertinent Limits (Specify)**	**Warning Properties – Odor Threshold**	**Potential Exposure Pathways**	**Acute Health Effects**	**Chronic Health Effects**
Total Xylenes	100 ppm/ 100 ppm	STEL = 150 ppm IDLH = 900 ppm	Colorless liquid with an aromatic odor	Inhalation, Absorption, Ingestion, Contact	Eye, skin & respiratory irritation; dizziness, drowsiness, nausea, vomiting, headache, abdominal pain	Dermatitis; CNS effects; liver/kidney damage; blood
SVOCs:						
4-Methyl phenol (p-cresol)	5 ppm/5 ppm	IDLH=250 ppm	Crystalline solid with a sweet, tarry odor (Note: liquid above 95 degree F	Inhalation Absorption Ingestion Contact	Eye, skin, mucous membrane irritation.; CNS effects: confusion, depression, respiratory failure; dyspnea, irregular rapid respiration, weak pulse; eye and skin burns; dermatitis.	Lung, liver, kidney, pancreas damage,
Naphthalene (and 2-methyl naphthalene)	10 ppm/10 ppm	IDLH=250 ppm	Colorless to brown solid with an odor of mothballs.	Inhalation Absorption Ingestion Contact	Eye irritation; headache, confusion, excitement, malaise; nausea, vomiting, abdominal pain; irritated blalder; profuse sweating; jaundice, hematuria, hemoglobinuria, renal shutdown; dermatitis; optical neuritis, corneal damage.	Target organs: eyes, skin, blood, liver, kidneys, CNS.
Polyaromatic Hydrocarbons (PAHs): *1.1 Benzo(a)anthracene* *1.2 Benzo(b)Fluoranthene* *1.3 Benzo(k)Fluoranthene* *1.4 Benzo(a)pyrene* *1.5 Chrysene* *1.6 Dibenzo(ah)anthracene* 1.7 *Floranthene* *1.8 Indeno(1,2,3-cd)pyrene* *1.9 Phenanthrene* *1.10 Pyrene*	Not available	Not available	White crystalline solid	Inhalation, Absorption, Ingestion, Contact	No information is available on the acute effects of dibenzofuran in humans or animals.	No information is available on the chronic effects of dibenzofuran in humans or animals.
PCBs	PEL=1 mg/m3 (42%) PEL=0.5 mg/m3 (54%) TLV=0.5 mg/m3	IDLH=5 mg/m^3	Mild hydrocarbon odor	Inhalation, Absorption, Ingestion, Contact	Eye irritation, acne, jaundice, dark urine.	Carcinogen; liver damage; reproductive effects.

Table 2-1. Assessment of Chemicals of Potential Concern						
Chemical Name	**PEL/TLV**	**Other Pertinent Limits (Specify)**	**Warning Properties – Odor Threshold**	**Potential Exposure Pathways**	**Acute Health Effects**	**Chronic Health Effects**
TAL Metals:						
Aluminum	15 mg/m^3/ 10 mg/m^3	STEL=20 mg/m^3	Odorless, silvery-white, soft, ductile, metallic solid or powder.	Inhalation, Absorption, Ingestion, Contact	Eye and respiratory tract irritation.	Lung and CNS damage.
Antimony	0.5 mg/m^3/ 0.5 mg/m^3	IDLH=50 mg/m^3	Silver-white, lustrous, hard, brittle solid; scale-like crystals; or a dark-gray, lustrous powder.	Inhalation, Absorption, Ingestion, Contact	Eye, skin, and respiratory tract irritation; cough, dizziness; headache; nausea; vomiting; diarrhea; stomach cramps.	Damage to eyes, skin, respiratory system, cardiovascular system; insomnia; anorexia; loss of sense of smell.
Arsenic	0.5 mg/m^3/ 0.01 mg/m^3	IDLH=5 mg/m^3	Silver-gray or tin-white, brittle, odorless solid.	Inhalation, Absorption, Ingestion, Contact	Ulceration of nasal septum, gastrointestinal disturbances, peripheral neuropathy.	Carcinogenic, damage to liver, kidneys, skin, lungs, and lymphatic system.
Barium	0.5 mg/m^3/ 0.5 mg/m^3	IDLH=50 mg/m^3	Soft, silvery solid; oxidizes easily in air.	Inhalation, Absorption, Ingestion, Contact	Irritation of eyes, skin, and upper respiratory system; abdominal cramps, diarrhea; vomiting; severe muscle weakness; cardiac arrhythmia; unconsciousness; respiratory arrest.	Eye, skin, respiratory system, cardiac, and CNS damage; gastrointestinal effects.
Beryllium	0.002 mg/m^3 / 0.002 mg/m^3	IDLH=4 mg/m^3	Gray-white, brittle solid.	Inhalation, Absorption, Contact	Irritation of the eyes and skin, high to extreme acute toxicity.	Berylliosis: anorexia, weight loss, weakness, chest pain, cough, cyanosis, pulmonary insufficiency; dermatitis; lung disease.
Cadmium	0.1 mg/m^3 / 0.01 mg/m^3	IDLH=9 mg/m^3	Blue-tinged silver-white, lustrous, odorless solid.	Inhalation, Ingestion	Respiratory tract irritation and high acute toxicity.	Kidney, liver, lung, bone, blood, immune system, and CNS damage.
Calcium	Not available	Not available	Semi-soft, gray, odorless solid.	Inhalation, Ingestion, Absorption, Contact	Tissue damage of eyes and skin, irritation of respiratory tract, lung damage, unconsciousness, death.	Severe lung and mucous membrane damage, dermatitis.
Chromium	1 mg/m^3 / 0.5 mg/m^3	IDLH =250 mg/m^3	Blue-white to steel-gray, lustrous, brittle, hard, odorless solid.	Inhalation, Ingestion, Contact	Irritation of eyes and skin.	Lung fibrosis (histologic).

Table 2-1. Assessment of Chemicals of Potential Concern						
Chemical Name	**PEL/TLV**	**Other Pertinent Limits (Specify)**	**Warning Properties – Odor Threshold**	**Potential Exposure Pathways**	**Acute Health Effects**	**Chronic Health Effects**
Cobalt	0.1 mg/m^3 / 0.02 mg/m^3	IDLH=20 mg/m^3	Silvery, bluish-white, odorless, magnetic metal. Fume and dust is odorless and black.	Inhalation, Absorption, Ingestion, Contact	Irritation of the eyes and skin, respiratory distress, nausea, vomiting, diarrhea, and a sensation of hotness.	Dermatitis, lung disease, polycythemia, hyperplasia of the bone marrow and thyroid gland, pericardial effusion, and pancreatic damage.
Copper	1 mg/m^3/ 1 mg/m^3	IDLH=100 mg/m^3	Reddish, lustrous, malleable, odorless solid.	Inhalation, Ingestion, Contact	Eye, nose, pharynx irritation; nasal perforation; metallic taste; dermatitis.	Target organs: Eyes, skin, respiratory system, liver, kidneys (increased risk with Wilson's disease).
Iron	10 mg/m^3/ 5 mg/m^3	IDLH=2500 mg/m^3	Silver to gray odorless solid, sometimes with a thin layer of reddish dust.	Inhalation, Ingestion, Contact	Irritation of the respiratory tract, gastrointestinal tract, and eyes. Liver damage and death possible with extreme ingestion.	Siderosis (lung damage), cardiac damage.
Lead	0.05 mg/m^3 / 0.05 mg/m^3	IDLH=100 mg/m^3	A heavy, gray ductile, soft solid	Inhalation, Absorption, Ingestion, Contact	Weakness, lassitude, insomnia, facial pallor	Encephalopathy, kidney disease, hypotension.
Magnesium	15 mg/m^3 / 10 mg/m^3	IDLH=750 mg/m^3	Odorless, silver-white solid.	Inhalation, Contact	Irritation of eyes and skin; metal fume fever, with chills, fever, coughing, nausea, vomiting, weakness.	Lung damage.
Manganese	5 mg/m^3 / 0.1 mg/m^3	IDLH=500 mg/m^3	Silvery, lustrous, brittle, odorless solid.	Inhalation, Ingestion	Irritation of skin.	Respiratory system, CNS, blood, kidney damage.
Mercury	0.1 mg/m^3 (C)/ 0.025 mg/m^3	IDLH = 10 mg/m^3	Silver-white, odorless, heavy liquid	Inhalation, Absorption, Ingestion, Contact	Irritation of eyes; cough, chest pain, dyspnea, bronchial pneuitis; tremor, insomnia, irritability, indecision, headache, fatigue, weakness; stomatitis, salivation.	Gastrointestinal disturbances, anorexia, proteinuria. Target organs include eyes, skin, respiratory system, central nervous system, and kidneys.
Nickel	1 mg/m^3 / 1.5 mg/m^3	IDLH=10 mg/m^3	Silver-white, hard, malleable solid or powder. Odorless.	Inhalation, Absorption, Ingestion, Contact	Irritation of the skin and respiratory tract.	Sensitization leading to contact dermatitis. Human carcinogen (lung and nasal)

Table 2-1. Assessment of Chemicals of Potential Concern						
Chemical Name	**PEL/TLV**	**Other Pertinent Limits (Specify)**	**Warning Properties – Odor Threshold**	**Potential Exposure Pathways**	**Acute Health Effects**	**Chronic Health Effects**
Potassium	Not available	Not available	Soft, odorless, silvery-white solid.	Inhalation, Absorption, Ingestion, Contact	Irritation of the skin, eyes, respiratory tract, and gastrointestinal tract.	Damage to the blood, heart, liver, kidneys, lungs, and upper respiratory tract.
Selenium	0.2 mg/m^3 / 0.2 mg/m^3	IDLH = 1 mg/m^3	Amorphous or crystalline, red to gray solid.	Inhalation, Ingestion, Contact	Eye, skin, nose, throat irritation; visual disturbances; headache, chills, fever; dyspnea, bronchitis; metallic taste, garlic breath, gastrointestinal disturbances; dermatitis; eye and skin burns.	Target organs include eyes, skin, respiratory system, liver, kidneys, blood, and spleen.
Silver	0.01 mg/m^3 / 0.1 mg/m^3	IDLH=10 mg/m^3	Silvery-white, lustrous, odorless solid.	Inhalation, Absorption, Ingestion, Contact	Irritation of the eyes, skin, gastrointestinal tract, and respiratory tract; metal fume fever.	Skin pigmentation and organ accumulation
Sodium	Not available	Not available	Light, soft, silvery, odorless solid.	Absorption, Ingestion, Contact	Irritation and inflammation of the eyes and skin.	Damage to mucous membranes and upper respiratory tract.
Thallium	0.1 mg/m^3 / 0.1 mg/m^3	IDLH=15 mg/m^3	Bluish-white, lead-like solid	Inhalation, Absorption, Ingestion, Contact	Irritation of the skin, eyes, and mucous membranes; headache; pulmonary edema; discoloration and loss of hair; albuminuria; lymphocytosis; gastrointestinal hemorrhage; nausea; vomiting.	Damage to the CNS including hallucinations, convulsions, and coma; respiratory failure; damage to the heart and kidneys; paralysis.
Vanadium	0.1 mg/m^3/ 0.05 mg/m^3	IDLH=35 mg/m^3	Soft, ductile, odorless, grayish-white solid.	Inhalation, Absorption, Ingestion, Contact	Irritation of the skin, eyes, and respiratory tract; nausea, vomiting, and greenish discoloration of the tongue; CNS effects like headache, dizziness, and tremors.	Damage to the kidneys and blood; respiratory effects like bronchitis and shortness of breath; asthma-like allergy may develop
Zinc	5 mg/m^3/ 2 mg/m^3	IDLH = 500 mg/m^3	Bluish-gray, lustrous, odorless solid.	Inhalation, Ingestion, Contact	Irritation of the eyes and skin; metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough, weakness; metallic taste; headache; blurred vision; vomiting; tightness in chest, dyspnea, rales, decreased pulmonary function.	Respiratory system effects such as lung damage and bronchitis. Suspected carcinogen.

Table 2-1. Assessment of Chemicals of Potential Concern

Chemical Name	PEL/TLV	Other Pertinent Limits (Specify)	Warning Properties – Odor Threshold	Potential Exposure Pathways	Acute Health Effects	Chronic Health Effects
Cyanide	5 mg/m^3/ 5 mg/m^3 (C)	IDLH=25 mg/m^3	White powder with a faint bitter, almond-like odor.	Inhalation, Absorption, Ingestion, Contact	Irritation of the eyes, skin, and respiratory tract; chest tightness; shortness of breath; enlargement of the thyroid; paralysis; asphyxia; death.	CNS effects like demyelination and ataxia, hypertonia; lesions of the optic nerve; Leber's optic atrophy; goiters; depressed thyroid function.

PEL = OSHA Permissible Exposure Limit; represents the maximum allowable 8-hour time-weighted average (TWA) exposure concentration.
TLV = ACGIH Threshold Limit Value; represents the maximum recommended 8-hour TWA exposure concentration.
STEL = OSHA Short-term Exposure Limit; represents the maximum allowable 15-minute TWA exposure concentration.
C = OSHA Ceiling Limit; represents the maximum exposure concentration above which an employee shall not be exposed during any period without respiratory protection.
IDLH = Immediately Dangerous to Life and Health; represents the exposure likely to cause death or immediate delayed permanent adverse health effects or prevent escape from such an environment

2.1.4 Heat and Cold Stress

Workers will be routinely observed by the SSHC for symptoms of heat stress or cold exposure, as dictated by the weather conditions and work being conducted. Heat stress and cold exposure can be avoided by periodic, regular rest breaks.

Heat stress may be a potential hazard for personnel wearing PPE, particularly working in hot and humid conditions. Workers should take regular rest breaks within a shaded area, removing their PPE, and drink electrolyte replacing liquids and/or water. The SSHC is responsible for scheduling the amount of time each individual can work under the existing site conditions, and how often and how long they will break. Workers will be required to take their breaks in the support zone after going through the decontamination area, or they may undergo partial decontamination and rest in a clean area within the decontamination/buffer area. Please refer to Section 7 (Site Control) of this HASP for a detailed description of the above referenced support zone and decontamination area/buffer zone.

2.2 Surface Water and Sediment Sampling

Samples of surface water and sediments will be collected for subsequent analysis and evaluation of potential impacts. The physical hazards of this operation are primarily associated with the coring activities and sample collection methods and procedures utilized (if any).

Health and safety procedures for water-related work apply to the surface water and sediment sampling tasks.

2.2.1 Potential Health Hazards and Contaminants

Surface water and sediments that are collected may contain contaminants. The potential exists for release of these materials into the atmosphere at levels that may present an inhalation hazard. The contaminants may be spread through the air and absorbed through direct contact.

Other physical hazards associated with probing/coring and sampling procedures are strains/sprains resulting from sample collection, and potential eye hazards resulting from splashes during sample collection activities.

2.2.2 Hazard and Contaminant Control

General PPE requirements and guidance for upgrading level of PPE are presented in Section 2.2 apply to this task. Control of water hazards are discussed in Section 2.8.

Chemical odors may be observed during surface water and sediment probing activities. If odors are observed, field personnel should move away to prevent exposure. Generally, odors

will be observed before a PID will detect exposure. If the odors do not dissipate, subsequent monitoring will be in accordance with Section 6.2 of this HASP to evaluate the proper level of protection required.

The potential for slipping on wet surfaces will be reduced by keeping work surfaces dry to the extent practicable. Also, boots with good treads will be worn and personnel will be reminded to remain alert in the area where they are walking to decrease the chance of slipping.

3.0 Training Program

3.1 Hazardous Waste Operations Health and Safety Training

Employees who are assigned to perform duties on hazardous waste sites will receive the OSHA initial 40-hour health and safety training prior to on-site activities, in accordance with 29 CFR 1910.120 (e). In addition, such personnel provide documentation of having received three days of supervised field experience applicable to this site, or receive three days of supervised field experience at this site. Applicable employees will receive yearly 8-hour refresher courses. On-site managers and supervisors who are directly responsible for or who supervise workers engaged in hazardous waste operations receive, in addition to the appropriate level of worker HAZWOPER training described above, eight additional hours of specialized supervisory training, in compliance with 29 CFR 1910.120(e)(4).

Because this site is meets the definition of a hazardous waste site, employees who work during field activities are required to have completed HAZWOPER initial and refresher training.

3.2 Additional Training

As site activities change, supplemental training will be provided to employees to address changes in identified hazards, risks, operations procedures, emergency response, site control, and personal protective equipment. Specialty training will be provided as determined by task and responsibility.

Site-specific training will be provided to each employee and will be reviewed at safety briefings. Specialized training will be provided as dictated by the nature of site activities. Specialized training will be provided for activities such as the handling of unidentified substances. Employees involved in these types of activities will be given off-site instruction regarding the potential hazards involved with such activities and the appropriate health and safety procedures to be followed. Off-site instruction is meant to include any areas where employees will not be exposed to site hazards.

3.3 Emergency Response Personnel

B&L employees who respond to emergency situations involving health and safety hazards must be trained in how to respond to such emergencies in accordance with the provisions of 29 CFR 1910.120(l). Skills such as cardiopulmonary resuscitation (CPR), mouth-to-mouth rescue breathing, and basic first aid skills may be necessary. Personnel who respond to emergencies on site will be briefed on potential hazards by the SSHC before being permitted to enter the buffer and exclusion zones.

3.4 Other Required Training

Other training that may be required by workers that is in addition to required training described above is detailed below:

- Hazard communication, in accordance with 29 CFR 1910.1200
- Respirator use, in accordance with 29 CFR 1910.134
- Hearing conservation, in accordance with 29 CFR 1910.95
- Working safely around heavy equipment
- Heat and cold stress prevention
- Confined space entry, in accordance with 289 CFR 1910.146

3.5 Training Records

A record of employee training completion will be maintained by the SSHC for each B&L employee who is trained. This record will include the dates of the completion of worker training, supervisor training, refresher training, emergency response training, and specific training for on-site B&L employees. Additionally, an employee sign off sheet indicating that each worker has reviewed a copy of this HASP and understands its contents is stored at the same location.

3.6 Pre-Entry Briefing

A site-specific briefing will be provided to all individuals, including site visitors, who enter this site beyond the site entry point. For visitors, the site-specific briefing provides information about site hazards, the site lay-out including work zones and places of refuge, the emergency alarm system and emergency evacuation procedures, and other pertinent safety and health requirements as appropriate.

The SSHC will brief personnel as to the potential hazards likely to be encountered. Topics will include:

- Availability of this HASP.
- General site hazards and specific hazards in the work areas, including those attributable to the chemicals present.
- Selection, use, testing and care of the body, eye, hand and foot protection being worn, with the limitations of each.
- Decontamination procedures for personnel, their personal protective equipment, and other equipment used on the site.

- Emergency response procedures and requirements.
- Emergency alarm systems and other forms of notification, and evacuation routes to be followed.
- Methods to obtain emergency assistance and medical attention.

4.0 Personnel Protection

The basic level of personal protective equipment (PPE) to be used during field activities associated with implementation of the RP is OSHA Level D. PPE may be upgraded based on air monitoring results or at the discretion of the Project Manager and based on the SSHC's recommendations. A downgrade of PPE must be approved by the SSHC and the Project Manager.

If the SSHC determines that field measurements or observations indicate that a potential exposure is greater than the protection afforded by the equipment or procedures specified in this or other sections of this HASP, the work will be stopped. B&L personnel will be removed from the site until the exposure has been reduced or the level of protection has been increased.

B&L respirator users have been trained, medically approved, and fit tested to use respiratory protection. Respirators issued are approved for protection against dust and organic vapors by the National Institute for Occupational Safety and Health (NIOSH). Respirators are issued for the exclusive use of one worker and will be cleaned and disinfected after each use by the worker. Respirator users must check the fit of the respirator before each day's use to see that it seals properly. The respirator must seal against the face so that the wearer receives air only through the air purifying cartridges attached to the respirator. No facial hair that interferes with the effectiveness of a respirator will be permitted on personnel required to wear respiratory PPE. Cartridges and filters for air-purifying respirators in use will be changed at the end of each workday that an air-purifying respirator is worn, unless the SSHC determines that a change is not necessary.

4.1 Protective Equipment Description

The level of PPE is categorized as Level A, B, C, or D, based upon the degree of protection required. For each level, hard hats will be required if dangers related to overhead objects may be present. For drilling and test pitting activities, hard hats will be worn at all times. For other tasks, hard hats will be worn, as necessary. The following is a brief summary of the PPE levels that may be used on this site.

Level C – The concentration(s) and type(s) of airborne substance(s) is known and the criteria for using air- purifying respirators are met. The following constitute Level C equipment:

- NIOSH approved full-face air purifying respirator with organic vapor/acid gases cartridges and P100 filters;
- Chemical-resistant clothing (polyethylene coated overalls, chemical-splash suit, disposable chemical- resistant overalls) with ankles and cuffs taped closed;

- Gloves, outer, nitrile, chemical-resistant;
- Gloves, inner, nitrile, chemical-resistant;
- Shoes, with steel toe and shank meeting ANSI requirements;
- Boots, outer neoprene or Chemical resistant (latex or neoprene) boot covers;
- Hearing protection, if necessary
- Hard hat, if necessary; and
- Face shield when not wearing a full-face respirator.

Level D – A work uniform affording minimal protection, used for nuisance contamination only. The following constitute Level D equipment:

- Coveralls or other appropriate work clothing;
- Shoes, with steel toe and shank meeting ANSI requirements;
- Optional chemical resistant boot covers;
- Safety glasses or chemical splash goggles;
- Gloves, nitrile if handling wet materials;
- Hearing protection, if necessary
- Hard hat, if necessary; and
- Escape mask (optional)
- Filtering respirator (i.e., dust mask) voluntary use.

4.2 Protective Equipment Failure

If an individual experiences a failure or other alteration of PPE that may affect its protective ability, that person is to leave the work area immediately. The Project Manager or the SSHC must be notified and, after reviewing the situation, is to determine the effect of the failure on the continuation of on-going operations. If the Project Manager or the SSHC determine that the failure affects the safety of workers, the work site, or the surrounding environment, workers are to be evacuated until corrective actions have been taken. The SSHC will not allow re- entry until the equipment has been repaired or replaced and the cause of the failure has been identified.

5.0 Medical Monitoring

5.1 Medical Surveillance Program

B&L has implemented a medical monitoring program in accordance with 29 CFR 1910.120, the Hazardous Waste Operations regulations and in 1910.134, the Respiratory Protection regulations. The B&L program is designed to monitor and reduce health risks to employees potentially exposed to hazardous materials and to provide baseline medical data for each employee involved in work activities. It is also designed to determine the employee's ability to wear personal protective equipment such as chemical resistant clothing and respirators. The examination may include the OSHA required Medical Questionnaire, Respirator Suitability Form, a Medical Examination, Audiology Test, Pulmonary Function Test, and testing for complete blood count and chemistry profile.

Medical examinations are administered on a post-employment and annual basis and as warranted by symptoms of exposure or specialized activities. These medical examinations and procedures are performed by or under the supervision of a licensed physician. The medical monitoring is provided to workers free of cost, without loss of pay and at a reasonable time and place. The examining physician is required to make a report to B&L of any medical condition that would increase the employee's risk when wearing a respirator or other PPE. B&L maintains site personnel medical records as required by 29 CFR 1910.120 and by 29 CFR 1910.1020, as applicable.

B&L employees performing the activities listed in the Work Plan of this document have or will receive medical tests as regulated by 29 CFR 1910.120. Where medical requirements of 29 CFR 1910.120 overlap those of 29 CFR 1910.134, the more stringent of the two will be enforced. In addition, the need to implement a more comprehensive medical surveillance program will be re-evaluated after an apparent over-exposure incident.

5.2 Respirator Clearance

Employees who wear, or may wear, respiratory protection will be provided respirators as regulated by 29 CFR 1910.134 before performing designated duties. Prior to issuance of a respirator, a medical professional must have medically certified the individual's ability to wear respiratory protection. It is not anticipated the respirator use will be required at the site.

5.3 Frequency

1. *Baseline Examinations:* Individuals who are assigned temporarily or permanently to fieldwork at hazardous waste sites or the use of a respirator will receive a baseline examination prior to job assignment.

2. *Periodic Examinations:* Individuals who are assigned temporarily or permanently to fieldwork at hazardous waste sites or the use of a respirator will receive periodic examinations as required.

3. *Termination Examinations:* Field employees permanently leaving the company who were in the medical surveillance program will receive an exit examination.

4. *Possible Exposure Examinations:* As soon as possible upon notification by an employee that the employee has developed signs or symptoms indicating possible overexposure to hazardous substances or health hazards, or that an employee has been injured or exposed above the permissible exposure limits in an emergency situation, that employee will be required to receive medical attention.

6.0 Community Air Monitoring Plan (CAMP)

This section of the HASP serves as the Community Air Monitoring Plan (CAMP) for the Poestenkill Place Site. Monitoring described in this CAMP will be implemented during invasive Remedial Program (RP) field activities, which may include Pre-Design Investigation (PDI) soil sampling and analysis, remedial excavation, as well as loading of materials for off-site disposal.

Unidentified organic vapors and/or dust particulate may be present in the investigation areas. Real time monitoring of these substances may be conducted on-site by, or under the supervision of, the SSHC. The SSHC will evaluate whether the personal protective measures employed during field activities are appropriate and will modify the protective measures accordingly. The SSHC will be responsible to maintain monitoring instruments throughout the remedial program.

The upwind and downwind perimeter of the exclusion zone will be monitored during intrusive work. A photoionization detector (PID) will be used to monitor total volatile organic vapors while a particulate meter will monitor particulate concentrations. The monitors will be equipped with audible and visual alarms, have recorders and display 15 minute time weighted averages. All readings will be downloaded and available for New York State Department of Health (NYSDOH) and NYSDEC personnel to review at the end of the project. Action levels for organic vapors and particulate emissions are outlined in the following subsections as well as on Table 1.

Further discussion on the Community Air Monitoring Program to screen VOC levels and fugitive dust emissions have been defined in Attachment 1 of this HASP

6.1 Organic Vapors

If the 15-minute average VOC level remains below 5 ppm above background, intrusive work activities may continue. If the 15-minute average VOCs level exceeds 5 ppm above background, intrusive work activities will be suspended. Monitoring will continue under the provisions of the Vapor Emission Response Plan described below. If the 15-minute average VOCs level exceeds 25 ppm above background, intrusive work will be stopped and the Major Vapor Emissions Plan described below will be activated. Monitoring will continue under the provisions of the Major Vapor Emission Plan described below.

Vapor Emission Response Plan

If the vapor levels increase above 5 ppm above background at the downwind perimeter of the exclusion zone but remain below 25 ppm above background, work can resume provided:

- The source of the vapors has been identified and corrective actions have been taken to abate the emissions. These actions must reduce the exclusion zone perimeter emissions below 5 ppm.
- The organic vapor level 200 feet downwind of the work area or half of the distance to the nearest residential or commercial structure, whichever is less, is less than 5 ppm over background. If the distance to the nearest occupied building is less than 20 feet, the monitor will be placed at the perimeter of the work area.
- Continuous monitoring continues.

Major Vapor Emission Plan

If organic levels greater than 25 ppm over background are identified 200 feet downwind from the work area or half of the distance to the nearest residential or commercial property, whichever is less, all work activities at the site will be halted.

If, following the cessation of the work activities, the downwind organic levels persist above 25 ppm above background, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20-Foot Zone).

If efforts to abate the emission source are unsuccessful and if organic vapors persist at levels ≥5 ppm for more than 30 minutes or any level ≥10 ppm in the 20-foot Zone, then the following actions will be taken:

1. Monitoring will be conducted continuously in the "20 foot zone" until VOC levels are below 5 ppm. All intrusive site activities will be halted during this time.
2. The site owner will be notified.
3. The NYSDEC will be notified.

Table 6-1. Vapor Monitoring Requirements

Total VOC Concentration (ppm)	Method	Monitoring Zone	Monitoring Requirements	Level of PPE
<5	PID	Work Zone	Periodically in the work zone at minimum 30-minute intervals	Level D
>5	PID	Work Zone	Continually in the work zone	Level C
>50	PID	Work Zone	Vacate area	Vacate area

6.2 Dust/Particles

When the 15-minute average dust level remains below 0.1 milligrams per cubic meter (mg/m3) above background, intrusive work activities may continue.

If the downwind PM-10 particulate level is 0.1 mg/m3 greater than background (upwind perimeter) for the 15- minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed.

If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 0.15 mg/m3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 0.15 mg/m3 of the upwind level and in preventing visible dust migration.

Particulate Emission Response Plan

If the particulate levels increase above 0.1 mg/m3 over background at the downwind perimeter of the exclusion zone but remain below 0.15 mg/m3 above background, work can resume provided dust suppression techniques are employed and no visible dust is migrating from the work area.

If the particulate levels increase above 0.15 mg/m3 over background at the downwind perimeter of the exclusion zone, work can resume provided dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration

6.3 Field Instrumentation and Sampling

Field health and safety air sampling for the RP field investigation will consist of organic vapor monitoring using a PID (Section 6.1.1) according to provisions of Section 2 and Table 2 1.

6.3.1 Photoionization Detector (PID)

The air will be monitored with a portable PID equipped with a 10.2 electron volt detector to determine the presence and concentration of organic vapors before sampling, during intrusive field activities (monitoring well installations and test pit excavations). PID monitoring is conducted in the work zone.

PID monitoring will be initiated before starting sampling and, if the action levels are exceeded, continuously in the breathing zone of the worker collecting the samples.

Personnel monitoring samples will be collected in the breathing zone and, if workers are wearing respiratory protective equipment, outside the face piece. The sampling strategies may change if work tasks or operations change. Monitoring instruments will be checked for appropriate response, in accordance with the manufacturer's instructions, before use each sampling day.

- Hazard Monitored: Many organic and some inorganic gases and vapors.
- Application: Detects the presence and total concentration of many organic and some inorganic gases and vapors.
- Detection Method: Ionizes molecules using UV radiation, produces a current that is proportional to the number of ions present.
- General Care and Maintenance: Recharge daily or replace the battery. Regularly clean the lamp window. Regularly clean and maintain the instrument and its accessories. Turn the function switch to "stand-by" and allow the instrument to "warm up" for 5 min.
- Typical Operating Time: 10 hours, or 5 hours with strip chart recorder.

Table 6-2. Community Air Monitoring Plan (CAMP) Action Levels

Contaminant (Equipment/Method)	Frequency	Downwind Action Levels*	SSHC Action/Response
Volatile Organic Vapors Odor Observations and PID (PID with 11.7 eV lamp)	1. Continuously downwind during invasive work activities. 2. When observations of any unusual odors are reported to the SSHC.	<5 ppm (at the exclusion zone perimeter)	1. Work may continue. 2. Readings shall be recorded and made available for NYSDEC/NYSDOH review.
		5 ppm (at the exclusion zone perimeter)	1. STOP work. 2. Move to a location 200' downwind or at half the distance between the exclusion zone and nearest dwelling (but not closer than 20') and continue air monitoring and recording readings at this location. If the VOC level at the downwind location is <5 ppm, return to the exclusion zone perimeter and take additional VOC readings. 3. Work may continue if exclusion zone perimeter readings are <5 pm and additional vapor controls have been implemented. 4. Monitoring must continue at the exclusion zone perimeter for as long as VOC levels are ≥5 ppm.
		25 ppm (at the exclusion zone perimeter)	1. STOP work. 2. Implement additional vapor emission controls to reduce VOC levels below 5 ppm (at the exclusion zone perimeter). 3. Notify the B&L Project Manager and SMC representative.
Dust Observations and Dust Meter (Dust Trak)	1. Continuously downwind during invasive work activities. 2. When observations of any unusual odors are reported to the SSHC.	<0.1 mg/m^3 (at the exclusion zone perimeter)	1. Work may continue. 2. Readings shall be recorded and made available for NYSDEC/DYSDOH review.
		0.1-0.15 mg/m^3 (at the exclusion zone perimeter)	1. Work may continue, but use dust suppression controls.
		>0.15 mg/m^3 (at the exclusion zone perimeter)	1. STOP work. 2. Work may continue if exclusion zone dust readings are <0.15 mg/m^3 and additional dust controls have been implemented. 3. Immediately notify the B&L Project Manager, B&L Manager of Corporate Health and Safety, and SMC representative. 4. Work will not restart until the cause of the elevated dust levels has been evaluated and corrective action identified.

7.0 Site Operating Procedures

These following guidelines comply with the established guidelines of the Barton & Loguidice, D.P.C., Corporate Health and Safety Program.

All field investigation activities must be coordinated through the Site Manager.

During any activity conducted on-site in which a potential exists for exposure to hazardous materials, accident or injury, at least two persons must be present who are in constant communication with each other. At least two persons must also be present during all demolition or excavation activities.

Samples obtained from areas known or suspected to contain contaminated substances or materials must be handled with appropriate personal protection equipment.

All equipment used to conduct the Site Investigation must be properly decontaminated and maintained in good working order. Equipment must be inspected for signs of defects and/or contamination before and after each use.

The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated will result in the evacuation of the activity zone until a complete evaluation of the hazard can be performed.

7.1 Daily Operating Procedures

The following are the daily operating procedures that are to be followed by on-site personnel:

- Hold Tailgate Safety Meetings prior to work start and as needed thereafter (suggest daily; however, minimum of weekly).
- Use monitoring instruments and follow designated protocol and contaminant action levels.
- Use PPE as specified.
- Use hearing protection around heavy equipment.
- Remain upwind of operations and airborne contaminants, if possible.
- Establish a work/rest regimen when ambient temperatures and protective clothing create potential thermal hazards.
- Eating, drinking, applying cosmetics and smoking are prohibited in work areas.

- Refer to the SSHC for specific safety concerns for each individual site task.
- On-site personnel are encouraged to be alert to their own physical condition, as well as their co-workers.
- **All accidents, no matter how minor,** must be immediately reported to the SSHC.

7.2 Site Security

Site security will be monitored and controlled by the Project Manager, the Site Supervisor, and the SSHC. Their duties will include limiting access to the work area to authorized personnel, overseeing project equipment and materials, and overseeing work activities. The procedures specified below will be followed to control access to each work site to prevent persons who may be unaware of site conditions from exposure to hazards. Work area control procedures may be modified as required by site conditions.

7.3 Site Control

Work zones will be required during site activities identified in this HASP. The following two categories of work zones will be established at each sampling point: an exclusion zone and a buffer zone. The remainder of the site will be the support zone.

7.3.1 Exclusion/Activity Zone

The exclusion zone is where sampling activities are conducted. The SSHC will identify this zone. It must be at least 30 ft. in diameter and centered on the work activities.

7.3.2 Buffer/Decontamination Zone

The buffer zone contains personnel and equipment decontamination stations and staging areas for samples. The buffer zone will be located upwind of the work activities. It will only be large enough to contain equipment and personnel necessary to keep potentially contaminated media and materials in the immediate work area.

7.3.3 Support Zone

The remainder of the area is defined as the support zone. The support zone contains support facilities, extra equipment, transport vehicles, and additional personnel and equipment necessary to manage and perform work activities.

7.4 Buddy System

Most activities in a contaminated or otherwise hazardous area should be conducted with a partner who is able to:

- Provide his or her partner with assistance.
- Observe his or her partner for signs of chemical or heat exposure.
- Periodically check the integrity of his or her partner's protective clothing.
- Notify the SSHC if emergency help is needed.

7.5 Site Access Procedures

Access during field activities will be limited to those personnel required. Such personnel are anticipated to include, but will not necessarily be limited to, B&L employees or subcontractors and those representatives as designated by the NYSDEC or local agencies. Site access will be monitored by the SSHC, who will maintain a log-in sheet. The log will include B&L and other personnel on the site, their arrival and departure times and their destination on the site.

7.6 Confined Space Entry

No entry of permit required confined spaces is expected while B&L personnel perform the tasks listed in the FAP. A confined space is defined as a space that has limited or restricted means for entry (for example tanks, vessels, silos, storage bins, hoppers, vaults, and pits), is not designed for continuous employee occupancy, and large enough to enter.

8.0 Decontamination

8.1 Personnel Decontamination Procedures

The SSHC will be responsible for supervising the proper use and decontamination of PPE. The SSHC will also establish and monitor the decontamination line.

Decontamination involves scrubbing with a soap and water solution followed by rinses with potable water. Decontamination will take place on a decontamination pad. Dirt, oil, grease, or other foreign materials that are visible will be removed from surfaces. Scrubbing with a brush may be required to remove materials that adhere to the surfaces. Splash protection garments will be washed with soap and potable water before removal. Non- disposable garments will be air dried before storage. Waste waters from personnel decontamination will be disposed of with the waste waters from equipment decontamination. Respirators will be sanitized as well as decontaminated each day before re-use. The manufacturer's instructions will be followed to sanitize the respirator masks.

The following decontamination protocol, or one providing the same level of decontamination, will be followed:

Station 1. Equipment Drop: Provide an area covered with a plastic drop cloth. Deposit equipment used on-site including tools, sampling devices and containers, monitoring instruments, radios and clipboards on the plastic drop cloth. During hot weather a cool down station with chairs, fans, and replenishing beverages may be set up in this area.

Station 2. Outer Garment, Boots, and Gloves Wash and Rinse: Establish a wash station for gloves, boots, and the protective suit (when worn). Scrub outer boots, outer gloves, and protective suit with detergent and water. Rinse with potable water.

Station 3a. Outer Boot and Glove Removal: Provide seating for use during the removal and collection of outer boots. Remove outer boots. Deposit them in a container with a plastic liner. If the boots are to be reused after cleaning, place them in a secure location near the work site. Provide a location for removal, collection, and disposal of outer gloves. Remove the outer gloves. Deposit them in a container for disposal.

Station 3b. Filter or Cartridge Exchange: This station will be established only if respirators are worn. The worker's respirator cartridges and filters can be exchanged, new outer gloves and outer boots donned, and joints taped at this station. From here the worker can return to work duties in the exclusion zone.

Station 4. Outer Garment Removal: This station will only be provided if a protective outer garment is worn. Provide a bench to sit on during the removal of the protective garment. If the garment is disposable, deposit it in a container with a plastic liner; otherwise, hang it up to air dry.

Station 5. Respirator Removal: This station will be established only if respirators are worn. Remove the respirator. Avoid touching the face with gloved fingers. Deposit the respirator on a plastic sheet.

Station 6. Inner Glove Removal: Remove and dispose of inner gloves. Deposit them in a container with a plastic liner. If the gloves are to be reused, place them in a secure location near the work site, preferably in a plastic container.

Station 7. Field Wash: Provide a place for a field wash. Wash hands and face thoroughly. Shower if body contamination is suspected.

8.2 Emergency Decontamination Procedures

Although no contact with chemicals that present a hazard is anticipated for the field program, this section has been included in the event of an emergency. The extent of emergency decontamination depends on the severity of the injury or illness and the nature of the contamination. Minimum decontamination will consist of detergent washing, rinsing and removal of contaminated outer clothing and equipment. If time does not permit the completion of all of these actions, it is acceptable to remove the contaminated clothing without washing it. If the situation is such that the contaminated clothing cannot be removed, the person should be given required first aid treatment, and then wrapped in plastic or a blanket prior to transport to medical care. If heat stress is a factor in the victim's illness/injury, outer clothing will be removed from the victim immediately.

8.3 Monitoring Equipment Decontamination Procedures

Sampling equipment used for health monitoring purposes will be cleaned of visible contamination and debris before initial use on site, between uses, and after final use. Monitoring equipment that contacts contaminated media will be decontaminated after each use by a low phosphate detergent brushing followed by a clean water rinse. After decontamination, monitoring equipment will be stored separately from personal protective equipment. Decontaminated or clean equipment not in use will be covered with plastic and stored in a designated storage area in the support zone.

8.4 Decontamination Supplies

The following supplies will be available on site for the decontamination of personnel and equipment:

- Plastic drop cloths;
- Plastic bags or DOT-approved fiberboard drums to collect non-reusable protective clothing;
- Plastic wash tubs;
- Soft bristled long-handle brushes;
- DOT-approved drums or appropriate other containers, to collect wash and rinse water;
- Hand spray units for decontamination;
- Soap, water, alcohol wipes, and towels to wash hands, faces, and respirators; and,
- Washable tables and benches or chairs.

8.5 Collection and Disposition of Contaminated Materials

Cuttings and field decontamination wastes are to be collected, drummed, and disposed of in accordance with the procedures in the FAP. Investigation derived waste will be managed as described in the FAP.

8.6 Refuse Disposal

Site refuse will be contained in appropriate areas or facilities. Trash from the project will be properly disposed.

9.0 Emergency Response

9.1 Notification of Site Emergencies

In an emergency, site personnel will signal distress either by yelling or with three blasts from a horn (vehicle horn, air horn and so forth). The SSHC, Site Supervisor, or the Project Manager will immediately be notified of the nature and extent of the emergency.

Directions to Samaritan Hospital located at 2215 Burdett Avenue in the City of Troy from the site are provided below:

- Exit Poestenkill Place site
- Head south on 1st St toward Ida St – 361 ft
- Turn left onto Canal Ave – 0.6 mi
- Turn right onto Spring Ave – 0.1 mi
- Turn left onto Linden Ave – 0.5 mi
- Turn left onto Pawling Ave – 377 ft
- Turn left onto Congress St – 374 ft
- Turn right onto Brunswick Ave – 0.2 mi
- Turn right onto Tibbits Ave – 0.1 mi
- Turn left onto Burdett Ave – 0.5 mi
- Turn left onto Peoples Ave – 141 ft
- Turn right – 72 ft
- Turn left – 66 ft

A map of the route to Samaritan Hospital from the Site is provided as Figure 1.

Should someone be transported to a hospital or doctor, a copy of this HASP should accompany them.

The following table contains emergency telephone numbers. This table will be kept with the portable telephone and updated as needed by the SSHC. The portable telephone will be used to notify off-site personnel of emergencies. The operating condition of this telephone will be determined daily before initiation of activities.

Table 9-1. Emergency Contact Numbers		
Contact	**Person or Agency**	**Phone Number**
Poestenkill Place Representative	Jesse Batus, Senior Project Manager	(516) 426-6784
NYSDEC Representative	Joshua Haugh, P.G.	(518) 357-2008
Law Enforcement	City of Troy PD	911 (518) 270-4421 {non-emergency}
Fire Department	City of Troy FD	911 (518) 270-4471 {non-emergency}
Confined Space Rescue (Fire Department)	City of Troy FD	911 (518) 270-4471 {non-emergency}
Ambulance	City of Troy FD	911 (518) 270-4471 {non-emergency}
Poison Control Center	n/a	1-800-222-1222
Hospital – Emergency	Samaritan Hospital	(518) 271-3300
B&L Site Manager/Site Safety Officer	Stephen Le Fevre, P.G.	(518) 218-1801 (518) 369-9290 {cell}
B&L Officer-in-Charge	Scott D. Nostrand, P.E.	(315) 457-5200

9.2 Responsibilities

The SSHC is responsible for responding to, or coordinating the response of off-site personnel to, emergencies. In the event of an emergency, the SSHC will direct notification and response, and will assist the Site Supervisor in arranging follow-up actions. Upon notification of an exposure incident, the SSHC will call the hospital, fire, and police emergency response personnel for recommended medical diagnosis, treatment if necessary, and transportation to the hospital.

Before the start of investigation activities, the SSHC will:

- Confirm that the following safety equipment is available: eyewash station, first aid supplies, and a fire extinguisher.
- Have a working knowledge of the B&L safety equipment.
- Confirm the most direct route to Samaritan Hospital is prominently posted with the emergency telephone numbers.
- Confirm that employees who will respond to emergencies have been appropriately trained.

Before work may resume following an emergency, used emergency equipment must be recharged, refilled, or replaced and government agencies must be notified as required.

The Project Manager, assisted by the SSHC and the Site Supervisor, must investigate the incident as soon as possible. The Project Manager will determine whether and to what extent exposure actually occurred, the cause of exposure, and the means to prevent similar incidents. The resulting report must be signed and dated by the Project Manager, the SSHC, and the Site Supervisor.

9.3 Accidents and Injuries

In the event of an accident or injury, workers will immediately implement emergency isolation measures to assist those who have been injured or exposed and to protect others from hazards. Upon notification of an exposure incident, the SSHC will contact emergency response personnel who can provide medical diagnosis and treatment. If necessary, immediate medical care will be provided by personnel trained in first aid procedures. Other on-site medical or first aid response to an injury or illness will be provided only by personnel competent in such matters. In addition, the B&L Corporate Associate for Safety and Health will be notified within 24-hours of an accident involving B&L personnel and/or its subcontractors.

9.4 Safe Refuge

Before commencing site activities the SSHC will identify the location that will serve as the place of refuge for B&L workers in case of an emergency evacuation. During an emergency evacuation, personnel in the exclusion zone should evacuate the work area both for their own safety and to prevent hampering rescue efforts. Following an evacuation, the SSHC will account for site personnel.

9.5 Fire Fighting Procedures

A fire extinguisher meeting the requirements of 29 CFR Part 1910 Subpart L, as a minimum, will be available in the support zone during on-site activities. This is intended to control small fires. When a fire cannot be controlled with the extinguisher, the exclusion zone will be evacuated, and the fire department will be contacted immediately. The SSHC or the Site Supervisor will determine when to contact the fire department.

9.6 Emergency Equipment

The following equipment, selected based on potential site hazards, will be maintained in the support zone for safety and emergency response purposes:

- Fire extinguisher;
- First aid kit; and
- Eye wash bottles.

9.7 Emergency Site Communications

There will be a cellular telephone located in either the Site Manager's and/or SSHC's vehicle for emergency use. Emergency telephone numbers are listed in Attachment 7 of this HASP. There will be air horns, walkie-talkies, and/or other audible emergency signals located within the exclusion zone and decontamination area to signal others of an emergency. The SSHC should brief all personnel regarding audible emergency signals to be used during the site activities prior to starting the work. Site personnel will use the following hand signals to inform others of emergencies:

- Hand gripping throat – out of air, cannot breathe.
- Grip partner's wrist or both hands around waist – leave area immediately.
- Hands on top of head – need assistance.
- Thumbs up – everything's OK, or I understand.
- Thumbs down – No.

9.8 Security and Control

Work zone security and control during emergencies, accidents, and incidents will be monitored by the SSHC or the Site Supervisor. The duties of the SSHC or the Site Supervisor include limiting access to the work zones to authorized personnel and overseeing emergency response activities.

10.0 Special Precautions and Procedures

The activities listed in the Work Plan may expose personnel to both chemical and physical hazards. The hazards associated with specific site activities are discussed in Section 2. The potential for exposure to hazardous situations will be significantly reduced through the use of air monitoring, PPE, hazard awareness training, and administrative and engineering controls. Other general hazards that may be present on a hazardous waste work site are discussed below.

10.1 Heat Stress

The timing and location of this project may be such that heat stress could pose a threat to the health and safety of site personnel. The SSHC will implement work and rest regimens so that B&L personnel do not suffer adverse effects from heat. These regimens will be developed by the SSHC following the guidelines in the 1997 edition of the ACGIH Threshold Limit Values for Physical Agents in the Work Environment. Special clothing and an appropriate diet and fluid intake will be recommended to B&L personnel involved in the activities specified in Section 2 to further reduce this hazard. In addition, ice and fluids will be provided as appropriate in the support zone.

10.2 Cold Injury

The project requires work over water and thus the timing and location of this project may be such that cold injury could pose a threat to the health and safety of site personnel. Factors that influence the development of a cold related injury include ambient temperatures, wind velocity and wet clothing and skin. The SSHC will implement work and rest regimens so that B&L personnel do not suffer adverse effects from cold. These regimens will be developed by the SSHC following the guidelines in the 1997 edition of the ACGIH Threshold Limit Values for Physical Agents in the Work Environment. Special clothing and an appropriate diet and fluid intake will be recommended to B&L personnel involved in the activities specified in Section 2 to further reduce this hazard. In addition, ice and fluids will be provided as appropriate in the support zone.

10.3 Heavy Equipment/Machinery

B&L employees performing site activities may use or work near operating heavy equipment and machinery. Respiratory protection and protective eyewear may be worn during portions of work activities. Since this protective equipment reduces peripheral vision of the wearer, B&L personnel should exercise extreme caution in the vicinity of operating equipment and machinery to avoid physical injury to themselves or others.

10.4 Additional Safety Practices

The following are important safety precautions that will be enforced during the completion of the activities listed in Section 2:

- Contact with potentially contaminated surfaces should be avoided whenever possible. Workers should minimize walking through puddles, mud, or other discolored surfaces; kneeling on ground; and leaning, sitting, or placing equipment on drums, containers, vehicles, or the ground.
- Medicine and alcohol can mask the effects of exposure to certain compounds. Consumption of prescribed drugs must be at the direction of a physician.
- B&L personnel and equipment in the work areas will be minimized consistent with effective site operations.
- Unsafe or inoperable equipment left unattended will be identified by a "DANGER, DO NOT OPERATE" tag.
- Activities in the exclusion zone will be conducted using the "Buddy System." The Buddy is another worker fully dressed in the appropriate personal protective equipment who can perform the following activities:
- Provide partner with assistance
- Observe partner for sign of chemical or heat exposure
- Periodically check the integrity of partner's PPE
- Notify others if emergency help is needed.
- The HASP will be reviewed frequently for its applicability to the current and upcoming operations and activities.

10.5 Daily Log Contents

The Project Manager and the SSHC will establish a system appropriate to the SMC Brownfield Site investigation areas that will record, at a minimum, the following information:

- The B&L Engineers personnel and other personnel conducting the site activities, their arrival and departure times, and their destination at the investigation areas
- Incidents and unusual activities that occur on the site such as, but not limited to, accidents, breaches of security, injuries, equipment failures and weather related problems
- Changes to the Work Plan and the HASP

- Daily Information such as:
    - Work accomplished and the current site status
    - Air monitoring results

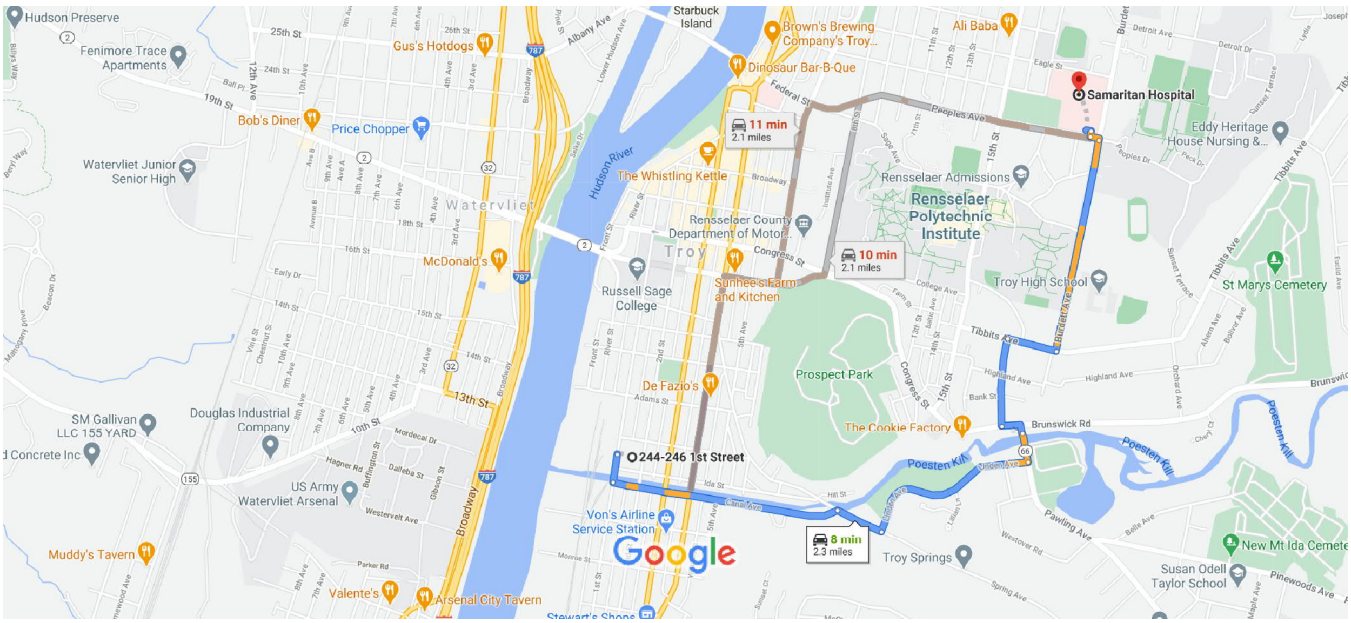
Figure 1

Route to Samaritan Hospital from Poestenkill Place Site

Google Maps

244-246 1st Street, Troy, NY to Samaritan Hospital

Drive 2.3 miles, 8 min



Map data ©2020 1000 ft

244-246 1st St

Troy, NY 12180

Take Canal Ave and Linden Ave to Pawling Ave

4 min (1.2 mi)

1. Head south on 1st St toward Ida St

361 ft

2. Turn left onto Canal Ave

0.6 mi

3. Turn right onto Spring Ave

0.1 mi

4. Turn left onto Linden Ave

0.5 mi

Continue on Pawling Ave to Brunswick Ave

50 s (0.1 mi)

5. Turn left onto Pawling Ave

377 ft

6. Turn left onto Congress St

374 ft

7. Turn right onto Brunswick Ave

46 s (0.2 mi)

Drive along Burdett Ave

2 min (0.7 mi)

8. Turn right onto Tibbits Ave

0.1 mi

9. Turn left onto Burdett Ave

0.5 mi

10. Turn left onto Peoples Ave

141 ft

Drive to your destination

19 s (138 ft)

11. Turn right

72 ft

12. Turn left

66 ft

Samaritan Hospital

2215 Burdett Ave, Troy, NY 12180

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Attachment 1

Appendix 1A
of
New York State Department of Health
Generic Community Air Monitoring Plan

and

Appendix 1B
of
Fugitive Dust and Particulate Monitoring

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

Attachment 2

Community Air Monitoring Form

IN-HOUSE COORDINATION	
INITIALS	DATE

Community Air Monitoring Form

PROJECT NAME:		REPORT NO:	
OWNER:		PROJECT NO:	
CONTRACTOR:		DATE:	
		DAY OF THE WEEK	

S	M	T	W	TH	F	SA

WORK FORCE:						WEATHER CONDITION	
						AM	PM
Superintendent ( )		Superintendent ( )					
Foreman ( )		Foreman ( )				TEMPERATURE	
Operators		Operators				AM	PM
Laborer		Laborer				F	F
Surveyors						WIND SPEED/DIRECTION	
Teamsters						AM	PM
Mechanic						MPH	MPH

EQUIPMENT USED:							
Bulldozer		Dump Truck		Dust Trak			
Excavator		Water Truck		Mini-RAE			
Loader		Smooth Drum Roller		Screen			
End Dump		Padfoot Roller		Skidsteer			

MAINTENANCE & PROTECTION OF TRAFFIC:

DESCRIPTION OF WORK ACCOMPLISHED:

DESCRIPTION OF WORK ACCOMPLISHED (CONTINUED):

DISCUSSIONS:

VISITORS:			

SKETCHES:

INSPECTOR: _____ **DATE:** _____

Appendix B

Poestenkill Place Site
Brownfield Cleanup Project
NYSDEC Site No. C442058
City of Troy, Rensselaer County, New York

Appendix B
Quality Assurance Project Plan

December 2020

Poestenkill Place Site
Brownfield Cleanup Project
NYSDEC Site No. C442058
City of Troy, Rensselaer County, New York

Appendix B
Quality Assurance Project Plan

December 2020

Prepared for:

Poestenkill Place Limited Partnership
90 State Street, Suite 602
Albany, New York 12207

Prepared by:

Barton & Loguidice, D.P.C.
10 Airline Dr.
Albany, New York 12205

Table of Contents

1.0 Introduction

This Quality Assurance Project Plan (QAPP) details specific Quality Assurance and Quality Control (QA/QC) requirements that apply to the Brownfield Cleanup Program (BCP) remediation for the Poestenkill Place site in Troy, New York. The QA/QC requirements are designed to assist in achieving the project data quality objectives (DQOs) and analytical DQOs for sampling activities and groundwater monitoring that will be performed at the site associated with the remedial action.

The Poestenkill Place site is an irregular-shaped parcel of land occupying the majority of the city block bounded by Jefferson Street to the north, Second Street to the east, Ida Street to the south, and First Street to the west. Three buildings currently occupy the 1.88-acre site. The southwestern building is currently occupied by a commercial tenant that uses the building for the sales and service of commercial water and wastewater equipment.

The subject property has supported a variety of industrial and commercial uses from the late 1800s to the present. The site uses included a foundry and stove works in the late 1800s to early 1900s, a junkyard in the 1950s, a feed and fertilizer business from the 1950s to the 1960s, and a building materials warehouses from the 1950s to the 1980s. From the 1980s until about 2001, the eastern building of the site was occupied by a steel fabricating company. It was then occupied by a limousine company from 2001 to 2004 and a heavy construction equipment rental company from 2005 to 2015. The southwestern building of the site was occupied by a heavy construction equipment and rental company from approximately 1985 to 2000.

Poestenkill Place Limited Partnership intends to demolish existing buildings on the Site and construct a new four-story, 82-unit apartment building. This new 132,000 square foot building will accommodate one-, two-, and three-bedroom apartments on the three upper floors as well with parking, tenant amenities, and management offices located on the first floor. The parking lot will be located on the ground level of the building structure, therefore the first floor will be located on top of the parking lot structure.

Prior to construction of the new apartment building, contaminated soil located within fifteen feet of ground surface that exceed the restricted-residential soil cleanup objectives on Table 375-6.8(b) of 6 NYCC Part 375 will be excavated and disposed offsite. Excavation will require some dewatering. Sampling will be required to confirm meeting the restricted-residential criteria, to characterize soil for offsite disposal, and to characterize water for offsite disposal.

2.0 Project Management

2.1 Purpose

The QAPP is intended to provide field and laboratory personnel with guidance for the field activities as well as sample handling activities within the laboratory for each sampling event. The QAPP contains general and specific guidance on sample collection methodology, sample handling, sample containers, and laboratory procedures. Project personnel will follow the guidelines during each sampling event.

2.2 Scope and Objectives

This QAPP is intended to provide guidance for the remedial contractor, Barton & Loguidice, D.P.C. (B&L), and analytical laboratories performing remedial actions, and other applicable activities at the site. This QAPP is not intended to replace the laboratory's QAPP. It is, however, intended to provide guidance for related field QC collection, method selection, DQOs, and program specific validation guidelines.

2.3 Project Management Responsibilities

This section provides a description of the organizational structure of personnel involved with this project. This description defines the lines of authority and identifies key personnel assigned to various activities. The project manager will be the key operational manager for project execution, and will have the primary responsibility for project plan development and implementation of the project tasks. The Consultant and contracted laboratories responsible for performing and/or coordinating the tasks associated with this QAPP are clearly defined in the following sections.

Lines of communication, management activities, and technical direction within this project team will follow this organization arrangement. Below identifies key team members and their respective responsibilities.

Company/Organization	Title	Name	Phone Number	Email
Regulatory Agency-NYSDEC	Project Manager	Joshua Haugh	518-357-2045	Joshua.haugh@dec.ny.gov
Poestenkill Place LP	Senior Project Manager	Jesse Batus	646-374-4754	JBatus@TCBINC.ORG
Barton & Loguidice, D.P.C.	Project Manager	Stephen Le Fevre PG	315-457-5200	slefevre@bartonandloguidice.com
	Project Engineer	Scott Nostrand, PE	716-436-7857	snostrand@bartonandloguidice.com
	Quality Assurance (QA) Officer	Andrew Barber	518-218-1801	abarber@bartonandloguidice.com

The staff performing the site activities will be directed by representatives of the project team. The personnel responsible for each of the site activities are to be determined.

The Analytical Laboratory Project Manager(s) will act as the primary liaison to the Consultant during implementation of project activities and will be responsible for the review of the final analytical reports submitted for this project. The Analytical Laboratory Project Manager(s) will also be responsible for coordination with the laboratory QA officer to implement the DQOs established in this program QAPP and alerting the Consultant to DQO and method updates prior to analysis and data submittal. The Analytical Laboratory Project Manager is responsible for the oversight and deliverables submitted by laboratories subcontracted by the originating laboratory.

Laboratory:	Alpha Analytical
Project Manager:	Candace Fox
Title:	Project Manager
Address:	8 Walkup Drive Westborough, MA 01581
Telephone Number:	716-427-5223

2.4 Project Goals

Data collection during the site management program for the Posetenkill Place site will be compared to the regulatory standards criteria and guidance values that apply for documentation, confirmatory and monitoring samples collected pursuant to the Remedial Action Work Plan (RAWP).

The soil analyses will be used to determine whether soils remaining after excavation meet the restricted-residential soil cleanup objectives defined in Table 375-6.8(b) of 6 NYCRR Part 375. Additionally, soil analysis will be performed to determine compliance with the requirements of the selected disposal facility, which is still to be determined. Water analysis results will be used to determine the compliance with the requirements of the facility receiving water from site dewatering. The facility and its requirements are still to be determined.

2.5 Project Documentation

The following list describes the documentation required for sites that are undergoing remedial activities or periodic groundwater and vapor sampling:

- Copies of all appropriate permits to complete the scope of work.
- Field notebook.
- Field sampling records, soil and water sampling, where appropriate, including the sample name, sample location, and purpose of sample.
- Sample chain-of-custody (COC) records.
- Sample COC records with the sample temperature at time of receipt at laboratory (for samples that are submitted to laboratory) noted.
- Final analytical data packages from the analyzing laboratory, completed as required in the Operation and Maintenance (O&M) Plan for the requested data deliverable level.
- Data validation report, if applicable.

The documentation listed above will be presented, if appropriate, in the remedial action report following completion of the remedial activities or in periodic groundwater monitoring reports. The Consultant will keep the documents on file for the duration of the project.

3.0 Field Measurement and Data Acquisition

3.1 Data Categories

The general categories of data that may be collected will include field screening data, and confirmational data, and system monitoring data for water samples. Site characterization samples may also be collected to determine the presence of site-related parameters in soil, sediment, soil gas, surface water and groundwater. The analytical methods to be used for soil, water and vapor analyses are summarized below.

3.1.1. Laboratory Analysis

The site data will be obtained by submitting soil, and water samples during the site management program to the laboratory to perform sample analysis. The fixed-based analytical laboratory will generate quantitative analytical data for soil, sediment, non-aqueous phase liquid, water and vapor using the methods listed in the Field Sampling Plan and SMP.

- Soil will be analyzed for TAL metals (EPA methods 6010D, 6020B, 7471B) ; TCL volatiles and semi-volatiles (EPA methods 8260C and 8270D), TCL pesticides (EPA method 8081B) and PCBs (EPA method 8151B)
- Soil may be characterized for disposal by analysis for toxicity characteristic leaching procedure (TCLP) parameters, with leaching performed by EPA Method 1131 and analysis of the leach by EPA Methods 8260, 8270, 8081, 8151, 6010, 6020, 7000, and 7470.
- Groundwater and treatment system effluent samples will be analyzed for volatile organic compounds (VOCs) by EPA Method 8260, metals by EPA methods 6010C and 7470, and other compounds that may be required by the discharge permit which has not yet been issued.

3.2 Sampling Procedures

The samples will be collected for each project as described in the RAWP and the Construction Work Plan (CWP).

3.3 Field Quality Control

The following Quality Control samples will be collected as part of the project as described in this section.

Equipment/Rinsate Blanks – An equipment or rinsate blank is used to indicate potential contamination from sample instruments used to collect and transfer samples, and also serves as a

measure of potential contamination from ambient sources during sample collection. When collecting solid or water samples, the equipment blank is a sample of laboratory demonstrated analyte-free water passed over and/or through cleaned sampling equipment. The water must originate from one common source within the laboratory and must be the same water used by the laboratory when performing the analyses (i.e., for method blanks). Equipment blanks will be collected, transported, and analyzed in the same manner as the samples acquired that day. Equipment blanks will be collected for all sampling except for when using dedicated and/or disposable sampling equipment.

Trip Blanks - Trip blanks are only required when collecting aqueous samples for volatile organics or dissolved gas analyses. They are not required for non-aqueous matrices or for analysis of any other parameters. They consist of a set of sample bottles filled at the laboratory with laboratory demonstrated analyte-free water. Trip blanks accompany the empty sample containers that are shipped from the laboratory into the field, and then back to the laboratory along with the collected samples for analysis. Trip blank are required at the rate of one per each cooler containing aqueous volatile organic or dissolved gas samples. These bottles are never opened in the field. Trip blanks must return to the laboratory with the same set of containers they accompanied to the field.

Field Duplicates – A field duplicate (FD) sample pair consists of two independent samples that are collected at approximately the same time and place, using the same collection methods. Both are containerized, handled, and analyzed in an identical manner. Field duplicates are useful in documenting the precision of the sampling process, and also provide a measure of analysis precision. Duplicate samples will be collected at a required frequency of 1 per 20 samples, unless otherwise specified in the site-specific QAPP addendum. Field duplicates are typically labeled so that the laboratory cannot determine or identify the location from which the field duplicate was collected.

4.0 Analytical Data Quality Assessment

This section of the QAPP presents the established criteria for assuring data quality and consistency for laboratory QA/QC, laboratory reporting, and data validation. This is of particular importance when utilizing more than one analytical laboratory. The analytical DQOs discussed in the following sections will provide guidance for the Consultant Project Manager, the Consultant Quality Assurance Officer, and the Analytical Laboratory. In general, data validation will be performed for soil characterization and will not be required for confirmation or routine samples collected during operation, maintenance and monitoring activities.

4.1 Analytical Data Quality Objectives

Analytical DQOs are used as a guide for data quality assessment. The DQOs are precision, accuracy, representativeness, completeness, and comparability (The PARCC Parameters). These qualitative and quantitative objectives ensure the data generated during the site characterization activities, and if warranted remedial actions, are scientifically valid, defensible, and meet the needs of each project. The DQOs are dependent on the intended data usage and are based on the premise that the ultimate use of a particular data set should dictate the quantity and quality of these data.

Precision is a measure of the reproducibility of concentrations reported for duplicate analyses, calculated by determining the relative percent difference (RPD) between the two values. Precision will be reviewed for the following analysis: LCS/LCSD, MS/MSD, and field duplicate (groundwater samples collected from the same location).

Accuracy is the degree to which the measurement data approaches the "true" value for each analyte. For soil samples, accuracy is assessed by calculating the percent recovery for a sample spiked with the analyte of concern (LCS, surrogates, matrix spike).

Representativeness refers to the comparability of the sample collection procedures to those delineated in the sampling and analysis plan and to the degree which the analytical data represents the subsurface contaminant concentrations. Representativeness will be accomplished by adhering to consistent field sampling and analytical procedures for samples.

Completeness is defined as the ratio of usable laboratory measurements to the total number of planned measurements for this investigation.

Comparability is an evaluation of the relative consistency of the laboratory measurement data. Since comparability cannot be measured quantitatively, professional judgment is relied upon. Internal comparability will be achieved for groundwater by adhering to consistent sample collection procedures and analyses methods for any site characterization activities.

4.2 Sample Custody and Holding Times

Proper documentation of sample collection and the methods used to control these documents are referred to as chain-of-custody procedures. Chain-of-custody procedures are essential for presenting sample analytical results as evidence in litigation or at administrative hearings held by regulatory agencies. Chain-of-custody procedures also serve to minimize loss or misidentification of samples and to ensure that unauthorized persons do not tamper with collected samples.

The procedures used in these investigations will follow the chain-of-custody guidelines of *NEIC Policies and Procedures*, prepared by the National Enforcement Investigations Center (NEIC) of the USEPA Office of Enforcement.

4.2.1 Custody Definitions

- Chain-of-Custody Officer - The employee responsible for oversight of all associated chain-of-custody activities is the Onsite Geologist (or his/her designee).
- Under Custody - A sample is "Under Custody" if:
    - It is in one's possession, or
    - It is in one's view, after being in one's possession, or
    - It was in one's possession and one locked it up, or
    - It is in a designated secure area.

4.2.2 Responsibilities

The onsite Environmental Scientist will be responsible for monitoring all chain-of-custody activities and for collecting legally admissible chain-of-custody documentation for the permanent project file. The onsite Environmental Scientist will be responsible for:

- Initially reviewing sample labels or tags, closure tapes, and chain-of-custody record forms. The onsite Environmental Scientist shall document this review for the project file.

- Training all field sampling personnel in the methodologies for carrying out chain-of-custody and the proper use of all chain-of-custody forms and record documents.
- Monitoring the implementation of chain-of-custody procedures.
- Submit copies of the completed chain-of-custody forms to the Project Manager daily.

4.2.3 Chain-of-Custody

Chain-of-custody is initiated in the laboratory when the sample containers are cleaned, packed, and shipped to the site for use in the field. When the containers are received from the laboratory, they will be checked for any breach of custody including, but not limited to incomplete chain-of-custody records, broken chain-of-custody seals, or any evidence of tampering. Upon receipt of the samples, the laboratory will check for breach of custody as previously described.

4.2.4 Sample Containers and Holding Times

The following tables identify the analytical method, container, preservation, and holding time requirements. All holding times begin with the date/time of sample collection.

Soil Characterization Samples				
Analyses	**Methods**	**Container**	**Preservative**	**Holding Time**
TCL Volatiles	8260C	VOA vials with Teflon-lined septum caps	4° C	2 Days (Extraction)
TCL Semivolatiles	8270D	8 oz Amber Glass, Teflon Lined	4° C	7 Days (Extraction)
TAL Metals	6010D, 6020B, 7471B	8 oz Amber Glass, Teflon Lined	4° C	7 Days (Extraction)
TCL Pesticides	8081B	8 oz Amber Glass, Teflon Lined	4° C	14 Days (Extraction)
PCBs	8151B	4 oz Large Amber Teflon Lined	4° C	14 Days (Extraction)

Soil TCLP Analyses				
Analyses	**Methods**	**Container**	**Preservative**	**Holding Time**
Mercury	1311, 1312, 7470A	4 oz Amber Glass	4° C	28 Days (Extraction)
Metals	1311, 1312, 6010D, 6020B, 7000A	4 oz Amber Glass	4° C	180 Days (Extraction)

Pesticides/Herbicides	1311, 1312, 8081B, 8151A	8 oz Amber Glass, Teflon Lined	4° C	14 Days (Extraction)
Semivolatiles	1311, 1312, 8270D	8 oz Amber Glass, Teflon Lined	4° C	14 Days (Extraction)
Volatiles	1311, 1312, 8260C	4 oz Large Amber Glass VOA Vial, Teflon Lined	4° C	14 Days (Extraction)

Water Analyses				
Analyses	**Methods**	**Container**	**Preservative**	**Holding Time**
Volatiles	8260	two 40-ml., glass vials with a teflon-lined septum cap	4° C, hydrochloric acid to pH below 2	14 Days
Metals	6010C, 7470	500 ml plastic	HNO3 to pH <2 Cool, 4°C	180 Days (28 days for Hg)

4.3 Calibration Procedures and Frequency

In order to obtain a high level of precision and accuracy during sample processing procedures, laboratory instruments must be calibrated properly. Several analytical support areas must be considered so the integrity of standards and reagents is upheld prior to instrument calibration. The following sections describe the analytical support areas and laboratory instrument calibration procedures.

4.3.1 Analytical Support Areas

Prior to generating quality data, several analytical support areas must be considered:

Standard/Reagent Preparation - Primary reference standards and secondary standard solutions shall be obtained from National Institute of Standards and Technology (NIST), or other reliable commercial sources to verify the highest purity possible. The preparation and maintenance of standards and reagents will be accomplished per the referenced methods. All standards and standard solutions are to be formally documented (i.e., in a bound logbook) and should identify the supplier, lot number, purity/concentration, receipt/preparation date, preparer's name, method of preparation, expiration date, and any other pertinent information. All standard solutions shall be validated prior to use. Care shall be exercised in the proper storage and handling of standard solutions (e.g., separating volatile standards from nonvolatile standards). The laboratory shall continually monitor the quality of the standards and reagents through well documented procedures.

Balances - The analytical balances shall be calibrated and maintained in accordance with American Society of Testing Materials (ASTM) specifications. Calibration is conducted with two Class-1 weights that bracket the expected balance use range. The laboratory shall check the accuracy of the balances daily and properly document results in permanently bound logbooks.

Refrigerators/Freezers - The temperature of the refrigerators and freezers within the laboratory shall be monitored and recorded daily. This will verify that the quality of the standards and reagents is not compromised and the integrity of the analytical samples is upheld. Appropriate acceptance ranges ($4^{o}C \pm 2^{o}C$ for refrigerators) shall be clearly posted on each unit in service.

Water Supply System - The laboratory must maintain a sufficient water supply for all project needs. The grade of the water must be of the highest quality (analyte-free) in order to eliminate false-positives from the analytical results. Ultraviolet cartridges or carbon absorption treatments are recommended for organic analyses. Appropriate documentation of the quality of the water supply system(s) will be performed on a regular basis.

Air Supply System - The laboratory must maintain a sufficient clean (analyte free) air supply for all project needs if required. The grade of the air must be of the highest quality (analyte-free) in order to eliminate false-positives from the analytical results. Appropriate documentation of the quality of the air supply system(s) will be performed on a regular basis by the laboratory.

4.3.2 Laboratory Instruments

Calibration of instruments is required to verify that the analytical system is operating properly and at the sensitivity necessary to meet method established quantitation limits. Each instrument for organic analysis shall be calibrated with standards appropriate to the type of instrument and linear range established within the analytical method(s).

Calibration of an instrument must be performed prior to the analysis of any samples (initial calibration) and then at periodic intervals (continuing calibration) during the sample analysis to verify that the instrument is still properly calibrated. If the contract laboratory cannot meet the method-required calibration requirements, corrective action shall be taken as discussed in Section 11.0. All corrective action procedures taken by the contract laboratory are to be documented, summarized within the case narrative, and submitted with the analytical results.

QA/QC procedures, if applicable, will be implemented using methods that ensure each project's data needs for completeness, comparability, representativeness, accuracy, and precision

are met. Based on these QA/QC objectives, the water sample analyses will be completed in accordance with USEPA or USEPA approved methodologies.

4.4 Laboratory Quality Assurance/Quality Control Procedures

QA/QC procedures, if applicable, will be implemented using methods that ensure each project's data needs for completeness, comparability, representativeness, accuracy, and precision are met. Based on these QA/QC objectives, the water sample analyses will be completed in accordance with USEPA or USEPA approved methodologies.

The laboratory will utilize QC samples to assess the validity of the analytical results of field samples. The laboratory QC samples will include: method blank analysis, laboratory control spike (LCS), surrogate spike analysis, MS/MSD analysis (duplicate analysis), and check standard analysis:

- A method blank is an analyte-free matrix similar to the field samples (solid or liquid), in which all of the reagents are added in the same proportion or concentration as used to process the field samples. Method blank analysis is performed to assess possible laboratory contamination each day of analysis, for each method of analysis and at a frequency of at least one per 20 samples analyzed. In the event compounds of interest are detected in the trip blank the raw data from the method blanks will be submitted with the analytical data package to determine the source of contamination. In the event that concentrations of constituents of concern are found to be greater than the PQL in the method blank, corrective action will be performed to identify and eliminate the source of contamination prior to proceeding with the analyses. The analytical data will not be corrected based on the presence of an analyte in the method blank, and corrective action is not necessary in the event that the analyte is detected in the method blank but not in the sample. If an analyte continues to be found in the method blank and in the sample, and corrective actions are not implemented, the affected result will be flagged with the appropriate validation qualifier.
- The LCS or blank spikes are analyte-free samples of water, which are spiked with a known concentration of specific analytes. The spiking standard must be from a source independent of that used for calibration standards. The LCS is used to evaluate each preparation sample and to assess the statistical control of the method at a frequency of at least one per 20 samples. Corrective action will be implemented in the event that the LCS is found to be outside of the recovery acceptance limit.

- Surrogate spike analysis is used to evaluate the efficiency of the analytical procedure in recovering the true amount of a known compound. The surrogates are organic compounds similar to the target analyte(s) in chemical composition and behavior in the analytical process, but do not normally occur in environmental samples. Surrogate spikes are added to all samples, including QC samples. Percent recovery values are provided along with the sample results. Corrective action will be implemented in the event that the surrogate recovery is found to be outside acceptable limits, and the sample will be prepared and analyzed again. If the surrogate continues to be found outside the acceptable QC limits, the affected result will be flagged with the appropriate validation qualifier.
- MS/MSD samples are used to evaluate the effect of the sample matrix on the analytical method. The spiking standard must be from a source independent of that used for calibration standards. MS/MSD samples are analyzed at a frequency of one pair per sample batch or at least one pair per 20 samples. Samples designated as (FB), and (TB) must not be used for MS/MSD analyses. The MS/MSD is intended to evaluate the matrix effect on the instrument, not to control the analytical process. If the MS or MSD is found to be outside the acceptable QC limits, the affected result will be flagged with the appropriate qualifier.

4.5 Quality Assurance/Quality Control Data Package

Data package documentation will be implemented as prescribed by the laboratory contract and the site specific needs. B&L Level II data deliverables are detailed below. All data packages will be reviewed for package completeness.

Level II Data Deliverables

- Cover page
- Report narrative
- Method Summary
- Sample Summary
- Chain of Custody
- Data Qualifier Definitions
- Dilution Log
- Sample Results
- Lab QC Results
- Surrogate Recoveries
- Spike Recoveries

4.6 Calculation of Data Quality Indicators

Precision

Precision is evaluated using results from field duplicate and/or MS/MSD analyses. The RPD between the parent sample/field duplicate or between the MS/MSD concentrations is used to evaluate precision and calculated by the following formula:

$$RPD = \left[\frac{|X_1 - X_2|}{(X_1 + X_2)/2} \right] x100\%$$

where:

X_1 = *Measured value of sample or matrix spike*
X_2 = *Measured value of duplicate or matrix spike duplicate*

RPD criteria for this project shall meet method-specific QC requirements.

Accuracy

Accuracy is defined as the degree of difference between the measured or calculated value and the true value. Analytical accuracy is expressed as the %R of a compound that has been added to the environmental sample or laboratory demonstrated analyte free matrix at known concentrations before analysis. Accuracy will be determined from MS, MSD, MSB (or LCS) samples as well as from surrogate compounds and is calculated as follows:

$$\%R = \frac{(X_s - X_u)}{K} x\ 100\%$$

where:

X_s = *Measured value of the spike sample*

X_u = *Measured value of the unspiked sample*

K = *Known amount of spike in the sample*

%R criteria for this project shall meet method-specific QC requirements.

Completeness

Completeness is calculated on a per matrix basis for the project and is calculated as follows:

$$\%\ Completeness = \frac{(N - X_n)}{N} x\ 100\%$$

where:

X_n = *Number of invalid measurements*

N = *Number of valid measurements expected to be obtained*

4.7 Corrective Actions

Laboratory corrective actions shall be implemented to resolve problems and restore proper functioning to the analytical system when errors, deficiencies, or out-of-control situations exist at the laboratory. Full documentation of the corrective action procedure needed to resolve the problem shall be filed in the project records, and the information summarized in the analytical report case narrative. A discussion of the corrective actions to be taken is presented in the following sections.

Incoming Samples

Problems noted during sample receipt shall be documented by the laboratory. The Project manager (or designee) shall be contacted immediately for problem resolution. All corrective actions shall be documented thoroughly.

Sample Holding Times

If any sample extractions and/or analyses exceed method holding time requirements, the Project manager (or designee) shall be notified immediately for problem resolution. All corrective actions shall be documented thoroughly.

Instrument Calibration

Sample analysis shall not be allowed until all laboratory instrumentation is properly calibrated in accordance with method requirements. If any initial/continuing calibration standards exceed method QC limits, recalibration must be performed and, if necessary, samples back to the previous acceptable continuing calibration standard must be reanalyzed.

Method QC

All QC, including blanks, matrix spikes, matrix spike duplicates, surrogate recoveries, matrix spike blank samples, and other method-specified QC samples, shall meet the requirements of the referenced methods. Failure of method-required QC will result in the possible qualification of all affected data. If the laboratory cannot find any errors, the affected sample(s) shall be reanalyzed within method-required holding times to verify the presence or absence of matrix effects. If matrix effect is confirmed, the corresponding data shall be flagged accordingly using the flagging symbols and criteria as defined by

the data validation guidelines identified in Section 12.2. If matrix effect is not confirmed, then the entire batch of samples may have to be reanalyzed. The Project manager shall be notified as soon as possible to discuss possible corrective actions should unusually difficult sample matrices be encountered.

Calculation Errors

All analytical results must be reviewed systematically for accuracy prior to submittal. If upon data review, calculation and/or reporting errors exist, the laboratory will be required to reissue the analytical data report with the corrective actions appropriately documented in the case narrative.

4.8 Data Reduction, Validation, and Usability

For all analyses, NYSDEC ASP Category B deliverable requirements will be employed for documentation and reporting of all data. The standard NYSDEC Data Package Summary will be completed by the analytical laboratory and included in the deliverable data packages. In addition, analytical results will be reported in a NYSDEC EQuIS electronic data deliverable (EDD) format.

Data Reduction

Laboratory analytical data are first generated in raw form at the instrument. These data may be either graphic or printed tabular form. Specific data generation procedures and calculations are found in each of the referenced methods. Analytical results must be reported consistently. Data for aqueous samples will be reported in concentrations of micrograms per liter (µg/L) or milligrams per liter (mg/L).

Identification of all analytes must be accomplished with an authentic standard of the analyte traceable to NIST or other reliable commercial sources. Individuals experienced with a particular analysis and knowledgeable of requirements will perform data reduction.

4.9 Data Evaluation

The effectiveness of the implementation of the QAPP and the QA/QC procedures will be assessed at various times to ensure that the data needs of each project continue to be met. This evaluation will include conducting data quality assessments on the data as it is received. In the event that the data is found to fall outside the parameters of the DQOs, additional assessments and corrective actions will be taken. The additional assessments may include, but are not limited to, a review of the sampling method, sample handling and storage methods, and or review of the laboratory management system.

4.9.1 Data Quality Assessment

An initial quality assessment of the data should be made by the laboratory to ensure that the analytical DQOs are achieved. The assessment will include, but not be limited to, ensuring that the sample preparation and analyses were performed within the specified holding times for each analysis, identification of any source of contamination, and performing a review for internal laboratory quality control. The laboratory will note any QC deficiencies in the final laboratory report.

Hold time criteria begins at the time of sample collection. In order to remain in compliance with each analytical method, the sample extraction or preparation process must be completed as described by each analytical method prior to any necessary extract cleanup and/or volume reduction procedures, and must be completed within the specified time frame in accordance with EPA guidelines. The analysis is considered finished when all analytical runs, including dilutions and any required re-analyses, are completed.

4.6.2 Data Validation

Data validation, if applicable, will be performed for any supplemental site characterization and design activities. Data validation of monitoring data will not be performed unless the assessment of the analytical results warrants further evaluation. Data validation will be performed by a qualified chemist or data validation Consultant. Data validation is a review of the supplied data documentation to assess data quality. All analytical data for which validation is performed will be evaluated against the DQOs presented in this program specific QAPP, and the analytical method criteria. All program analytical data will be reviewed and evaluated according to the criteria established in this QAPP, and summarized in validation memos thereafter. In the case of parameters for which no criteria have been established in this QAPP, the laboratory's control limits will be used. All qualification will be documented in the validation reports and all professional judgment assessments will be clearly documented.

5.0 References

United States Environmental Protection Agency. *USEPA Guidance for Quality Assurance Project Plans*, USEPA/QA/G-5, USEPA/600/R-98/018. February 1998.

United States Environmental Protection Agency. *USEPA Guidance for Quality Assurance Project Plans for Environmental Data Operations*. USEPA QA/R-5.March 2001.

United States Environmental Protection Agency. *Guidance for Data Quality Assessment, Practical Methods for Data Analysis.* USEPA QA/G-9, QA97 Version. July 2001.

United States Environmental Protection Agency. *Guidance for the Data Quality Objectives Process.* USEPA/QA/G-4, USEPA/600/R-96/055. August 2001.

United States Environmental Protection Agency. *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. USEPA*/540/R-99/008. October 1999.

Appendix C

Poestenkill Place Site
Brownfield Cleanup Project
NYSDEC Site No. C442058
City of Troy, Rensselaer County, New York

Appendix C
Boring Logs

SUBSURFACE INVESTIGATION LOG

BORING NO. **RI-1**

Project No. **2248.001.001**

PROJECT INFORMATION		DRILLING INFORMATION	
Project:	Remedial Investigation - Poestenkill Place	**Drilling Co:**	NYEG Drilling
Client:	Poestenkill Place Limited Partenership	**Driller:**	Chris Stone
Site Location:	Troy, NY	**Rig Type:**	CME 75
Job No:	2248.001.001	**Drilling Method(s):**	4.25" ID HSA
Project Manager:	Steve Le Fevre	**Hammer Wt/Drop:**	
Logged By:	Paige Pramik	**Hammer Type:**	
Dates Drilled:	9/18/2019	**Borehole Diam:**	8.0" **Total Depth:** 22.5'
LOCATION INFORMATION		**WELL INFORMATION**	
Horiz. Datum:	NYSP NAD 83 **Easting:**	**Ground Elevation:**	**Screen Type/Diam:** 2" PVC
Vert. Datum:	MSL NGVD1929 **Northing:**	**TOC Elevation:**	**Slot Size:** 0.010

Barton & Loguidice, D.P.C. | **Remedial Investigation - Poestenkill Place** | **BORING NO: RI-1**

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology	Notes / *Well Construction*
1	SS	0.1	Fill material: brown FM SAND, few FM angular Gravel, occasional brick and asphalt material, dry	-	0-2'	0.83'	-	-	FILL MATERIAL	
2										
3	SS	0.1	All brick material, mostly powdered	-	2-4'	0.5'	-	-		
4										
5	SS	1.1	Fill material: brown FM SAND, few FM angular Gravel, occasional brick and asphalt material, dry	-	4-6'	0.75'	-	-		
6										
7	SS	0.8	SAA, wet	-	6-8'	0.83'	-	-		
8										
9	SS	--	All brick material, mostly large pieces. Could not scan with PID.	-	8-10'	0.58'	-	-		
10										
11	SS	1.3	Fill material: brown FM SAND, few FM angular Gravel, occasional brick and asphalt material, dry	-	10-12'	0.42'	-	-		
12										
13	SS	2.4	Fill material: brown FM SAND, few FM angular Gravel, occasional brick and wood material, wet	-	12-14'	0.5'	-	-		* Water level * 12.02' bgs
14										
15	SS	2.6	0-0.7' SAA 0.7-16.0' Gray to brown clayey FM SAND, wet	-	14-16'	1.92'	-	-		
16										
17	SS	1.4	Gray FM SAND, occasional clay lenses, saturated	-	16-18'	2.0'	-	-		
18										
19	SS	2.3	18.0-19.0' SAA 19.0-20.0' Gray MC SAND, few subround to subangular Gravel, occasional wood debris, saturated	-	18-20'	2.3	-	-		
20										

Barton & Loguidice, D.P.C.	Remedial Investigation - Poestenkill Place	BORING NO: RI-1

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology	Notes / *Well Construction*
20			20.0-20.7' SAA 20.7-22.0' Gray FMC Gravel, some (-) MC Sand, saturated							
21	SS	1.2		-	20-22'	1.63'	-	-	NATIVE SOIL	
22										
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SUBSURFACE INVESTIGATION LOG

BORING NO. **RI-2**

Project No. **2248.001.001**

PROJECT INFORMATION		DRILLING INFORMATION	
Project:	Remedial Investigation - Poestenkill Place	**Drilling Co:**	NYEG Drilling
Client:	Poestenkill Place Limited Partenership	**Driller:**	Chris Stone
Site Location:	Troy, NY	**Rig Type:**	CME 75
Job No:	2248.001.001	**Drilling Method(s):**	4.25" ID HSA
Project Manager:	Steve Le Fevre	**Hammer Wt/Drop:**	
Logged By:	Paige Pramik	**Hammer Type:**	
Dates Drilled:	9/18/2019	**Borehole Diam:**	8.0" **Total Depth:** 22.5'
LOCATION INFORMATION		**WELL INFORMATION**	
Horiz. Datum:	NYSP NAD 83 **Easting:**	**Ground Elevation:**	**Screen Type/Diam:** 2" PVC
Vert. Datum:	MSL NGVD1929 **Northing:**	**TOC Elevation:**	**Slot Size:** 0.010

Barton & Loguidice, D.P.C. | **Remedial Investigation - Poestenkill Place** | **BORING NO: RI-2**

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology	Notes / *Well Construction*
1	SS	2.1	No sample 0.0-0.7' (solid concrete) 0.7-2.0' Fill material: brown FMC SANC, few (-) FM angualr Gravel, occasional brick and concrete material	-	0-2'	0.83'	-	-	FILL MATERIAL	
2										
3	SS	2.3	SAA, more brick material, and glass, dry	-	2-4'	1.17'	-	-		
4										
5	SS	6.8	SAA, more sand, less brick, dry	-	4-6'	1.29'	-	-		
6										
7	SS	2.8	SAA, slightly damp	-	6-8'	1.83'	-	-		
8										
9	SS	4.8	SAA	-	8-10'	1.5'	-	-		
10										
11	SS	2.8	SAA	-	10-12'	0.96'	-	-		
12										
13	SS	2.0	12.0-12.7' SAA 12.7-14.0' Fill material: brown CLAY, some MC angular Gravel, few FMC Sand, occasional brick material, wet	-	12-14'	1.33'	-	-		
14										
15	SS	2.1	SAA, wet	-	14-16'	0.66'	-	-		
16										* Water level * 15.41' bgs
17	SS	2.3	Fill material: brown FMC SAND, few FM subround to subangular Gravel, occasional brick and glass material, saturated	-	16-18'	0.96'	-	-		
18										
19	SS	3.0	18.0-19.1' SAA 19.1-20.0' Fill material: Gray F SAND, few Clay, occasional brick and coal material, saturated	-	18-20'	2.0'	-	-		
20										

Barton & Loguidice, D.P.C.	Remedial Investigation - Poestenkill Place	BORING NO: RI-2

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology	Notes / *Well Construction*
20			Gray FMC SAND, occasional clay lenses, saturated							
21	SS	2.5		-	20-22'	1.17'	-	-		
22			22.0-22.8' SAA 22.8-24.0' Gray FM subangular to subround GRAVEL, some FMC Sand, saturated							
23	SS	2.8		-	22-24'	1.0'	-	-	NATIVE SOIL	
24			SAA							
25	SS	2.6		-	24-26'	0.92'	-	-		
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SUBSURFACE INVESTIGATION LOG

BORING NO. **RI-3**

Project No. **2248.001.001**

PROJECT INFORMATION		DRILLING INFORMATION	
Project:	Remedial Investigation - Poestenkill Place	**Drilling Co:**	NYEG Drilling
Client:	Poestenkill Place Limited Partenership	**Driller:**	Chris Stone
Site Location:	Troy, NY	**Rig Type:**	CME 75
Job No:	2248.001.001	**Drilling Method(s):**	4.25" ID HSA
Project Manager:	Steve Le Fevre	**Hammer Wt/Drop:**	
Logged By:	Paige Pramik	**Hammer Type:**	
Dates Drilled:	9/17/2019	**Borehole Diam:**	8.0" **Total Depth:** 22.5'
LOCATION INFORMATION		**WELL INFORMATION**	
Horiz. Datum:	NYSP NAD 83 **Easting:**	**Ground Elevation:**	**Screen Type/Diam:** 2" PVC
Vert. Datum:	MSL NGVD1929 **Northing:**	**TOC Elevation:**	**Slot Size:** 0.010

Barton & Loguidice, D.P.C. | **Remedial Investigation - Poestenkill Place** | **BORING NO: RI-3**

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology	Notes / *Well Construction*
1	SS	1.8	0.0-0.3' Dark brown top soil 0.3-2.0' Fill material: dark brown FM SAND, few FM subangular Gravel, occasional brick, metal, and coal material, dry	-	0-2'	1.83'	-	-	FILL MATERIAL	
2										
3	SS	2.5	SAA	-	2-4'	1.5'	-	-		
4										
5	SS	3.1	SAA, occasional concrete material	-	4-6'	1.75'	-	-		
6										
7	SS	3.9	SAA, slightly damp	-	6-8'	1.58'	-	-		
8										
9	SS	2.2	SAA, damp	-	8-10'	1.5'	-	-		
10										
11	SS	4.5	SAA Soil has slight petroleum odor	-	10-12'	1.46'	-	-		
12										
13	SS	242.8	SAA, wet Soil has strong petroleum odor	-	12-14'	1.38'	-	-		* Water level * 12.90' bgs
14										
15	SS	663.1	SAA, saturated Odor also has 'fresh blacktop' smell	-	14-16'	1.42'	-	-		
16										
17	SS	704.7	Gray-black FMC SAND, occasional clay lenses, saturated Very strong odor	-	16-18'	1.58'	-	-	NATIVE SOIL	
18										
19	SS	681.5	Black clayey FM SAND, saturated	-	18-20'	1.83'	-	-		
20										

Barton & Loguidice, D.P.C.	Remedial Investigation - Poestenkill Place	BORING NO: RI-3

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology	Notes / *Well Construction*
20			No recovery							
21	SS	--		-	--	--	-	-	NATIVE SOIL	
22			Gray FMC SAND, strong odor, saturated							
23	SS	321.5		-	22-24'	1.58'	-	-		
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Barton & Loguidice

SUBSURFACE INVESTIGATION LOG

BORING NO. **RI-4**

Project No. **2248.001.001**

PROJECT INFORMATION		DRILLING INFORMATION	
Project:	Remedial Investigation - Poestenkill Place	**Drilling Co:**	NYEG Drilling
Client:	Poestenkill Place Limited Partenership	**Driller:**	Chris Stone
Site Location:	Troy, NY	**Rig Type:**	CME 75
Job No:	2248.001.001	**Drilling Method(s):**	4.25" ID HSA
Project Manager:	Steve Le Fevre	**Hammer Wt/Drop:**	
Logged By:	Paige Pramik	**Hammer Type:**	
Dates Drilled:	9/18/2019	**Borehole Diam:**	8.0" **Total Depth:** 22.5'
LOCATION INFORMATION		**WELL INFORMATION**	
Horiz. Datum:	NYSP NAD 83 **Easting:**	**Ground Elevation:**	**Screen Type/Diam:** 2" PVC
Vert. Datum:	MSL NGVD1929 **Northing:**	**TOC Elevation:**	**Slot Size:** 0.010

Barton & Loguidice, D.P.C. | **Remedial Investigation - Poestenkill Place** | **BORING NO: RI-4**

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology	Notes / *Well Construction*
1	SS	0.9	Dark brown FM SAND, occasional brick, coal, and glass material, dry	-	0-2'	1.54'	-	-	FILL MATERIAL	
2										
3	SS	1.3	SAA, come (-) FM angular Gravel, dry	-	2-4'	2.0'	-	-		
4										
5	SS	2.3	SAA, dark brown to black in color	-	4-6'	1.04'	-	-		
6										
7	SS	2.5	SAA	-	6-8'	1.67'	-	-		
8										
9	SS	2.1	SAA	-	8-10'	2.0'	-	-		
10										
11	SS	2.0	SAA, more brick and glass, slightly damp	-	10-12'	0.58'	-	-		
12										
13	SS	1.3	All brick material, damp	-	12-14'	0.5'	-	-		
14										
15	SS	2.2	Brown to black F SAND, some Clay, occasional clay lenses, wet	-	14-16'	2.0'	-	-		
16										
17	SS	2.2	SAA	-	16-18'	2.0'	-	-	NATIVE SOIL	* Water level * 15.81' bgs
18										
19	SS	1.1	Brown to black F SAND, some Clay, occasional brick material, saturated	-	18-20'	0.38'	-	-		
20										

Barton & Loguidice, D.P.C.	Remedial Investigation - Poestenkill Place	BORING NO: RI-4

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology	Notes / *Well Construction*
20										
21	SS	2.2	20.0-20.6' Brown FM SAND, few FM subround gravel, saturated 20.6-22.0' Brown FMC SAND AND FM subround to subangular GRAVEL, saturated	-	20-22'	1.58'	-	-	NATIVE SOIL	
22										
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Barton & Loguidice

SUBSURFACE INVESTIGATION LOG

BORING NO. **RI-5**

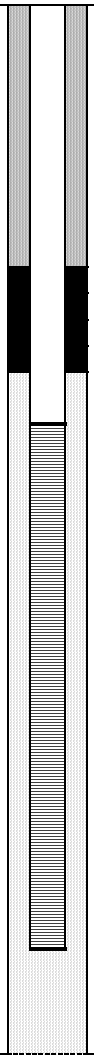
Project No. **2248.001.001**

PROJECT INFORMATION		DRILLING INFORMATION	
Project:	Remedial Investigation - Poestenkill Place	**Drilling Co:**	NYEG Drilling
Client:	Poestenkill Place Limited Partenership	**Driller:**	Chris Stone
Site Location:	Troy, NY	**Rig Type:**	CME 75
Job No:	2248.001.001	**Drilling Method(s):**	4.25" ID HSA
Project Manager:	Steve Le Fevre	**Hammer Wt/Drop:**	
Logged By:	Paige Pramik	**Hammer Type:**	
Dates Drilled:	9/16/2019	**Borehole Diam:**	8.0" **Total Depth:** 22.5'
LOCATION INFORMATION		**WELL INFORMATION**	
Horiz. Datum:	NYSP NAD 83 **Easting:**	**Ground Elevation:**	**Screen Type/Diam:** 2" PVC
Vert. Datum:	MSL NGVD1929 **Northing:**	**TOC Elevation:**	**Slot Size:** 0.010

Barton & Loguidice, D.P.C. | **Remedial Investigation - Poestenkill Place** | **BORING NO: RI-5**

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology
1	SS	1.1	0.0-1.0' Brown F SAND, dry 1.0-2.0' Dark brown MC SAND, little FM angular Gravel, little Clay, occasional brick, coal, and metal material, dry	-	0-2'	1.58'	-	-	FILL MATERIAL
2									
3	SS	1.3	SAA, slightly damp	-	2-4'	1.63'	-	-	
4									
5	SS	1.6	SAA, dark brown to black in color	-	4-6'	0.58'	-	-	
6									
7	SS	1.4	SAA	-	6-8'	0.97'	-	-	
8									
9	SS	1.8	SAA, wet	-	8-10'	1.75'	-	-	
10									
11	SS	2.0	SAA	-	10-12'	0.97'	-	-	
12									
13	SS	1.0	SAA, change to FM subangular to subround Gravel, saturated	-	12-14'	0.25'	-	-	
14									
15	SS	2.3	SAA	-	14-16'	0.25'	-	-	
16									
17	SS	2.5	Dark brown to gray CLAY, some (-) Silt, saturated	-	16-18'	0.54'	-	-	NATIVE SOIL
18									
19	SS	0.8	18.0-18.4' SAA 15.4-20.0' Gray FM SAND, saturated	-	18-20'	1.2'	-	-	
20									

Notes / *Well Construction*



* Water level * 13.27' bgs

Barton & Loguidice, D.P.C.	Remedial Investigation - Poestenkill Place	BORING NO: RI-5

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology	Notes / *Well Construction*
20			SAA, few Clay, saturated							
21	SS	0.7		-	20-22'	0.3'	-	-	NATIVE SOIL	
22										
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SUBSURFACE INVESTIGATION LOG

BORING NO. **RI-6**

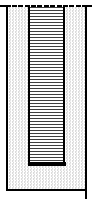
Project No. **2248.001.001**

PROJECT INFORMATION		DRILLING INFORMATION	
Project:	Remedial Investigation - Poestenkill Place	**Drilling Co:**	NYEG Drilling
Client:	Poestenkill Place Limited Partenership	**Driller:**	Chris Stone
Site Location:	Troy, NY	**Rig Type:**	CME 75
Job No:	2248.001.001	**Drilling Method(s):**	4.25" ID HSA
Project Manager:	Steve Le Fevre	**Hammer Wt/Drop:**	
Logged By:	Paige Pramik	**Hammer Type:**	
Dates Drilled:	9/23/2019	**Borehole Diam:**	8.0" **Total Depth:** 22.5'
LOCATION INFORMATION		**WELL INFORMATION**	
Horiz. Datum:	NYSP NAD 83 **Easting:**	**Ground Elevation:**	**Screen Type/Diam:** 2" PVC
Vert. Datum:	MSL NGVD1929 **Northing:**	**TOC Elevation:**	**Slot Size:** 0.010

Barton & Loguidice, D.P.C. | **Remedial Investigation - Poestenkill Place** | **BORING NO: RI-6**

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology	Notes / *Well Construction*
1	SS	0.2	0.0-0.8' Mostly concrete material 0.8-2.0' Dark brown FMC SAND, few FM subangular Gravel, dry	-	0-2'	1.38'	-	-	FILL MATERIAL	
2										
3	SS	0.7	Fill material: brown FM SAND, few M angular Gravel, occasional concrete and brick material, dry	-	2-4'	0.54'	-	-		
4										
5	SS	1.0	Fill material: brown FM sAND, some FM subround to rounded Gravel, occasional brick, coal, and concrete material, dry	-	4-6'	1.17'	-	-		
6										
7	SS	0.5	SAA	-	6-8'	1.83'	-	-		
8										
9	SS	24.8	SAA, occasional black staining, slight odor, dry	-	8-10'	1.04'	-	-		
10										
11	SS	8.7	SAA, damp to wet	-	10-12'	1.83'	-	-		
12										
13	SS	5.1	Brown FM SAND aND CLAY, damp	-	12-14'	1.17'	-	-	NATIVE SOILS	* Water level * 13.24' bgs
14										
15	SS	0.6	Brown SILT, few Clay, little FM Sand, wet	-	14-16'	1.8'	-	-		
16										
17	SS	1.0	Brown CLAY, few Silt, saturated	-	16-18'	2.0'	-	-		
18										
19	SS	0.9	SAA	-	18-20'	2.0'	-	-		
20										

Barton & Loguidice, D.P.C.	Remedial Investigation - Poestenkill Place	BORING NO: RI-6

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology	Notes / *Well Construction*
20										
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SUBSURFACE INVESTIGATION LOG

BORING NO. **RI-12**

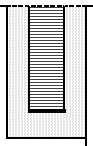
Project No. **2248.001.001**

PROJECT INFORMATION		DRILLING INFORMATION	
Project:	Remedial Investigation - Poestenkill Place	**Drilling Co:**	NYEG Drilling
Client:	Poestenkill Place Limited Partenership	**Driller:**	Chris Stone
Site Location:	Troy, NY	**Rig Type:**	CME 75
Job No:	2248.001.001	**Drilling Method(s):**	4.25" ID HSA
Project Manager:	Steve Le Fevre	**Hammer Wt/Drop:**	
Logged By:	Paige Pramik	**Hammer Type:**	
Dates Drilled:	9/19/2019 and 9/24/2019	**Borehole Diam:**	8.0" **Total Depth:** 22.5'
LOCATION INFORMATION		**WELL INFORMATION**	
Horiz. Datum:	NYSP NAD 83 **Easting:**	**Ground Elevation:**	**Screen Type/Diam:** 2" PVC
Vert. Datum:	MSL NGVD1929 **Northing:**	**TOC Elevation:**	**Slot Size:** 0.010

Barton & Loguidice, D.P.C. | **Remedial Investigation - Poestenkill Place** | **BORING NO: RI-12**

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology	Notes / *Well Construction*
1	SS	5.3	Fill material: Gray to brown FM SAND, some (-) FMC subround to angular Gravle, occasional brikc and concrete material, dry	-	0-2'	1.79'	-	-	FILL MATERIAL	0.0' to 4.0' drilled on 9/19/19. Tooth on auger head broke. Finished boring on 9/24/19.
2										
3	SS	2.4	2.0-2.4' SAA 2.4-4.0' Fill material: dark brown FMC SAND, few FM angular Gravel, occasional brick, concrete, and coal material, slightly damp	-	2-4'	1.67'	-	-		
4										
5	SS	0.4	SAA	-	4-6'	1.42'	-	-		
6										
7	SS	0.6	SAA, dry	-	6-8'	0.25'	-	-		
8										
9	SS	1.6	SAA, few clay, damp	-	8-10'	0.63'	-	-		
10										
11	SS	0.9	SAA	-	10-12'	0.2'	-	-		
12										
13	SS	1.1	12.0-12.7' SAA	-	12-14'	0.83'	-	-		
14										
15	SS	--	No sample	-	--	--	-	-		
16										
17	SS	8.9	16.0-17.1' Fill material: dark brown FMC SAND, few FM angular Gravel, occasional brick material, damp 17.1-18.0' Brown F SAND, some Clay, few Silt, occasional clay lenses, saturated	-	16-18'	2.0	-	-		* Water level * 17.27' bgs
18										
19	SS	1.2	18.0-18.4' SAA 18.4-20.0' Brown MC SAND, few (+) FM subround to round Gravel, black staining in some areas, satruated	-	18-20'	2.0'	-	-	NATIVE SOIL	
20										

Barton & Loguidice, D.P.C.	Remedial Investigation - Poestenkill Place	BORING NO: RI-12

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology	Notes / *Well Construction*
20										
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Barton & Loguidice

SUBSURFACE INVESTIGATION LOG

BORING NO. **RI-14**

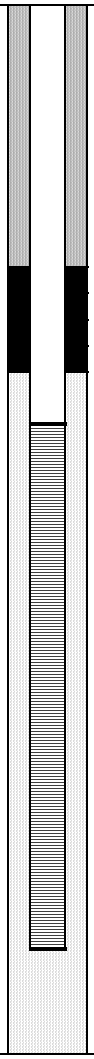
Project No. **2248.001.001**

PROJECT INFORMATION		DRILLING INFORMATION	
Project:	Remedial Investigation - Poestenkill Place	**Drilling Co:**	NYEG Drilling
Client:	Poestenkill Place Limited Partenership	**Driller:**	Chris Stone
Site Location:	Troy, NY	**Rig Type:**	CME 75
Job No:	2248.001.001	**Drilling Method(s):**	4.25" ID HSA
Project Manager:	Steve Le Fevre	**Hammer Wt/Drop:**	
Logged By:	Paige Pramik	**Hammer Type:**	
Dates Drilled:	9/16/2019 and 9/20/2019	**Borehole Diam:**	8.0" **Total Depth:** 22.5'
LOCATION INFORMATION		**WELL INFORMATION**	
Horiz. Datum:	NYSP NAD 83 **Easting:**	**Ground Elevation:**	**Screen Type/Diam:** 2" PVC
Vert. Datum:	MSL NGVD1929 **Northing:**	**TOC Elevation:**	**Slot Size:** 0.010

Barton & Loguidice, D.P.C. | **Remedial Investigation - Poestenkill Place** | **BORING NO: RI-14**

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology
1	SS	0.0	Fill material: brown to black FM SAND, some Clay, occasional brick and metal material, dry	-	0-2'	1.5'	-	-	FILL MATERIAL
2									
3	SS	0.5	2.0-2.3' SAA 2.3-4.0' Dark brown MC SAND, little F subround Gravel, slightly damp	-	2-4'	1.5'	-	-	
4									
5	SS	--	No sample	-	--	--	-	-	
6									
7	SS	0.9	Fill material: brown to gray FM SAND, some FM subround to subangular Gravel, occasional brick and concrete material, dry	-	6-8'	2.0'	-	-	
8									
9	SS	0.7	8.0-9.0' SAA 9.0-10.0' Light brown CLAY, few Silt, slightly damp	-	8-10'	1.75'	-	-	
10									
11	SS	1.1	10.0-10.3' SAA 10.3-12.0' Brown FM SAND, few Clay, occasional clay lenses, wet	-	10-12'	1.83'	-	-	
12									
13	SS	1.4	SAA, saturated	-	12-14'	1.25'	-	-	
14									NATIVE SOIL
15	SS	1.3	Brown FMC SAND, few subround to subangular Gravel, few Clay, saturated	-	14-16'	0.58'	-	-	
16									
17	SS	0.8	SAA, saturated	-	16-18'	2.0	-	-	
18									
19	SS	1.1	Gray FMC SAND, few FM subround Gravel, saturated	-	18-20'	1.38'	-	-	
20									

Notes / *Well Construction*



* Water level * 13.20' bgs

Barton & Loguidice

SUBSURFACE INVESTIGATION LOG

BORING NO. **RI-16**

Project No. **2248.001.001**

PROJECT INFORMATION		DRILLING INFORMATION	
Project:	Remedial Investigation - Poestenkill Place	**Drilling Co:**	NYEG Drilling
Client:	Poestenkill Place Limited Partenership	**Driller:**	Chris Stone
Site Location:	Troy, NY	**Rig Type:**	CME 75
Job No:	2248.001.001	**Drilling Method(s):**	4.25" ID HSA
Project Manager:	Steve Le Fevre	**Hammer Wt/Drop:**	
Logged By:	Paige Pramik	**Hammer Type:**	
Dates Drilled:	9/17/2019	**Borehole Diam:**	8.0" **Total Depth:** 22.5'
LOCATION INFORMATION		**WELL INFORMATION**	
Horiz. Datum:	NYSP NAD 83 **Easting:**	**Ground Elevation:**	**Screen Type/Diam:** 2" PVC
Vert. Datum:	MSL NGVD1929 **Northing:**	**TOC Elevation:**	**Slot Size:** 0.010

Barton & Loguidice, D.P.C. | **Remedial Investigation - Poestenkill Place** | **BORING NO: RI-16**

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology	Notes / *Well Construction*
1	SS	0.0	0.0-0.3' Brown sandy top soil 0.3-2.0' Brown F SAND, few FM angular Gravel, dry	-	0-2'	1.75'	-	-	FILL MATERIAL	
2										
3	SS	6.8	Fill material: Dark brown to black FM SAND, some FM angular Gravel, occasional brick, metal, and concrete material, dry	-	2-4'	1.33'	-	-		
4										
5	SS	29.3	SAA, dry	-	4-6'	1.42'	-	-		
6										
7	SS	10.7	SAA, dry	-	6-8'	1.5'	-	-		
8										
9	SS	8.2	SAA, occasional brick, metal, and coal material, dry	-	8-10'	1.38'	-	-		
10										
11	SS	5.7	SAA, slightly damp	-	10-12'	1.56'	-	-		
12										
13	SS	2.8	12.0-13.5' SAA, damp 13.5-14.0' SAA, wet	-	12-14'	1.75'	-	-		* Water level * 12.77' bgs
14										
15	SS	5.8	SAA, saturated	-	14-16'	0.2'	-	-		
16										
17	SS	143.3	Fill material: black FMC SAND, little Silt, little Clay, occasional brick, coal, and wood material, saturated	-	16-18'	1.0'	-	-		
18										
19	SS	20.8	18.0-18.2' SAA 18.2-20.0' Dark gray FMC SAND, some Clay, occasional clay lenses, saturated Slight odor	-	18-20'	2.0'	-	-	NATIVE SOIL	
20										

Barton & Loguidice, D.P.C.	Remedial Investigation - Poestenkill Place	BORING NO: RI-16

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology	Notes / *Well Construction*
20										
21	SS	--	No Sample	-	--	--	-	-	NATIVE SOIL	
22										
23	SS	11.2	Gray FMC SAND, some FM subangular to round Gravel, saturated	-	22-24'	2.0'	-	-		
24										
25										
26										
27										
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SUBSURFACE INVESTIGATION LOG

BORING NO. **SRI-4**

Project No. **2248.001.001**

PROJECT INFORMATION		DRILLING INFORMATION	
Project:	Remedial Investigation - Poestenkill Place	**Drilling Co:**	Northstar
Client:	Poestenkill Place Limited Partenership	**Driller:**	Steve Laramee
Site Location:	Troy, NY	**Rig Type:**	Geoprobe
Job No:	2248.001.001	**Drilling Method(s):**	Direct Push/Hollow Stem Auger
Project Manager:	Bryce Dingman	**Hammer Wt/Drop:**	
Logged By:	Brittany Schaub	**Hammer Type:**	
Dates Drilled:	6/16/2020	**Borehole Diam:**	8.0" **Total Depth:** 20'
LOCATION INFORMATION		**WELL INFORMATION**	
Horiz. Datum:	NYSP NAD 83 **Easting:**	**Ground Elevation:**	**Screen Type/Diam:** 2" PVC
Vert. Datum:	MSL NGVD1929 **Northing:**	**TOC Elevation:**	**Slot Size:** 0.010

Barton & Loguidice, D.P.C. | **Remedial Investigation - Poestenkill Place** | **BORING NO: SRI-4**

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology	Notes / *Well Construction*
1–5		0	0.0-0.5' Asphalt 0.5-3.5' Dark brown C SAND, loose w few F angular gravel. Brick fragments around 3.5' depth. Gravel size and frequency increases with depth. Very slightly moist	-	Composite fill material sample collected	3.5'	-	-	FILL MATERIAL	
5–10		8.9	1.0-2.0" SAA 2.0-3.0' SAA w/ FM angular gravel 3.0-4.0" Brown, moist, poorly sorted, slightly dense, M SAND. Petro odor.	-		4.0'	-	-		
10–15		0	1.0-2.0' ' Dark brown, loose, M SAND w/ few MC angular gravel. Few coal frags. Dry 2.0-2.5" Dense, wet light brown clayey silt, following by 1" shale lense. Displays mottling and oxidaton.	-		2.5'				
15–20		12.3	0.0-1.0' SAA, saturated. 1.0-2.0' Grey, loose, MC SAND, w/ some F angular Strong petro odor		Composite native material sample collected	2.0'			NATIVE SOIL	" Water Level: 16.85' bgs *

Barton & Loguidice, D.P.C.	Remedial Investigation - Poestenkill Place									BORING NO: SRI-4
Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology	Notes / *Well Construction*
20										
21			End of Boring at 20.0' bgs							
22										
23										
24										Screened Interval - 14.5-24.5' bgs
25										

SUBSURFACE INVESTIGATION LOG

BORING NO. **SRI-5**

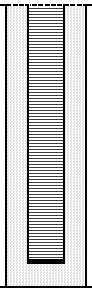
Project No. **2248.001.001**

PROJECT INFORMATION		DRILLING INFORMATION	
Project:	Remedial Investigation - Poestenkill Place	**Drilling Co:**	Northstar
Client:	Poestenkill Place Limited Partenership	**Driller:**	Steve Laramee
Site Location:	Troy, NY	**Rig Type:**	Geoprobe
Job No:	2248.001.001	**Drilling Method(s):**	Direct Push/ Hollow Stem Auger
Project Manager:	Bryce Dingman	**Hammer Wt/Drop:**	
Logged By:	Brittany Schaub	**Hammer Type:**	
Dates Drilled:	6/16/2020	**Borehole Diam:**	8.0" **Total Depth:** 25'
LOCATION INFORMATION		**WELL INFORMATION**	
Horiz. Datum:	NYSP NAD 83 **Easting:**	**Ground Elevation:**	**Screen Type/Diam:** 2" PVC
Vert. Datum:	MSL NGVD1929 **Northing:**	**TOC Elevation:**	**Slot Size:** 0.010

Barton & Loguidice, D.P.C. | **Remedial Investigation - Poestenkill Place** | **BORING NO: SRI-5**

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology	Notes / *Well Construction*
1–5		0	Dry, brown loose, FM SAND w/ some SM angular Glass and brick fragments.	-	Composit sample collected from fill material	3.0'	-	-	FILL MATERIAL	
5–10		0.3	Slightly dense, brown FM SAND w/ few (+) S angular gravel. Coal and brick fragments. PID reading 8-9' bgs.	-		3.0'	-	-		
10–15		0	0-1.0' SAA 1.0-1.5' Dense light tan clayey SILT, followed by 1", angular MC gravel lense. Very slightly moist. 1.5-2.0' Loose, tan M SAND. Wet. 2.0-4.0' Loose, tan M SAND w/ few F angular gravel. Highly oxidized.	-		4.0'	-	-		
15–20		0	Loose, grey MC SAND, with some (-) angular FM gravel. Saturated 18-20'	-	Composite sample collected from native material	4.0'		-	NATIVE MATERIAL	* Water Level: 15.65' bgs *

Barton & Loguidice, D.P.C.	Remedial Investigation - Poestenkill Place	BORING NO: SRI-5

Depth	Sample Type	PID (ppm)	Description	Sample No.	Sample Int.	Recovery	Blows Per 6"	N or RQD %	Lithology	Notes / *Well Construction*
20 21 22 23 24 25		0	0-2' Dark grey MC SAND with some (-) F angular 2-5" SAA, saturated.	-	Composite sample collected from native material	5.0'	-	-	NATIVE MATERIAL	 Screened Interval - 15-25" bgs
			End of Boring at 25.0'							

Appendix D

Prelimary Estimate for On-Site Soil Excavation
Poestenkill Environmental Project
Remedial Alternative 1 (Track 4 Alternative)
Option 1 - Excavate and Remove Site Soil Around Footers and Outside Building Footprint

Item	Unit cost	Unit	Quantity	Cost
Operation and Maintenance Costs (per year)				
Sampling (3 wells)	$2,500	ls	1	$2,500
Laboratory Analyses	$500	ls	1	$500
Annual Report	$2,500	ls	1	$2,500
Annual Cost				$5,500
10-year present-worth cost of O&M				$48,324
General				
Mobilization/Demobilization	$20,000	ls	1	$20,000
Silt fence and stormwater controls	$6,000	ls	1	$6,000
Demolition				
Building(s) demolition and disposal	$50,000	ls	1	$50,000
Monitoring Well Installation				
Well installation	$2,700	ls	3	$8,100
Excavation & Backfill				
Contaminated soil excavation, transport, & disposal (including backfill and compaction)	$85	ton	12000	$1,020,000
Density Testing (nuclear method)	$45	ea	36	$1,620
			Subtotal Remedial Work	$1,154,044
			Administration, Bonds, Insurance (10%)	$115,404
			Project Subtotal	$1,269,448
			Engineering (10%)	$126,945
			Contingency (15%)	$190,417
			Opinion of Probable Costs	$1,586,810

Prelimary Estimate for On-Site Soil Excavation
Poestenkill Environmental Project
Remedial Alternative 2 (Track 2 Alternative)
Option 2 - Excavate and Remove Site Soil from Areas of Impact

Item	Unit cost	Unit	Quantity	Cost
Operation and Maintenance Costs (per year)				
Sampling (3 wells)	$2,500	ls	1	$2,500
Laboratory Analyses	$500	ls	1	$500
Annual Report	$2,500	ls	1	$2,500
Annual Cost				$5,500
10-year present-worth cost of O&M				$48,324
General				
Mobilization/Demobilization	$20,000	ls	1	$20,000
Silt fence and stormwater controls	$6,000	ls	1	$6,000
Demolition				
Building(s) demolition and disposal	$50,000	ls	1	$50,000
Monitoring Well Installation				
Well installation	$2,700	ls	3	$8,100
Excavation & Backfill				
Contaminated soil excavation, transport, & disposal (including backfill and compaction) - 15 ft deep area	$85.00	ton	14,850	$1,262,250
Contaminated soil excavation, transport, & disposal (including backfill and compaction) - 6 ft deep area	$85.00	ton	10,230	$869,550
Contaminated soil excavation, transport, & disposal (including backfill and compaction) - 4 ft deep area	$85.00	ton	880	$74,800
Clearance sampling (VOCs, SVOCs, metals)	$400.00	sample	140	$56,000
Density testing (nuclear method)	$45.00	ea	100	$4,500
Excavation Protection				
Steel Sheet Pile Wall	$1,192.25	lf	610	$727,273
Dewatering				
Pump, treat and discharge to sanitary sewer (onsite connection) including all treatment equipment	$0.75	gallon	250,000	$187,500
			Subtotal Remedial Work	$3,314,296
			Administration, Bonds, Insurance (10%)	$331,430
			Project Subtotal	$3,645,726
			Engineering (10%)	$364,573
			Contingency (15%)	$546,859
			Opinion of Probable Costs	$4,557,157

Prelimary Estimate for On-Site Soil Excavation
Poestenkill Environmental Project
Remedial Alternative 3 (Track 1 Alternative)
Option 3 - Excavate and Remove Site Soil from Areas of Impact

Item	Unit cost	Unit	Quantity	Cost
General				
Mobilization/Demobilization	$20,000	ls	1	$20,000
Silt fence and stormwater controls	$6,000	ls	1	$6,000
Demolition				
Building(s) demolition and disposal	$50,000	ls	1	$50,000
Monitoring Well Installation and Sampling				
Well installation	$2,700	ls	3	$8,100
Sampling (3 wells)	$2,500	ls	1	$2,500
Laboratory Analyses	$500	ls	1	$500
Sampling Report	$2,500	ls	1	$2,500
Excavation & Backfill				
Contaminated soil excavation, transport, & disposal (including backfill and compaction) - 20 ft deep area	$85.00	ton	10010	$850,850
Contaminated soil excavation, transport, & disposal (including backfill and compaction) - 15 ft deep area	$85.00	ton	10,460	$889,100
Contaminated soil excavation, transport, & disposal (including backfill and compaction) - 6 ft deep area	$85.00	ton	10,230	$869,550
Contaminated soil excavation, transport, & disposal (including backfill and compaction) - 4 ft deep area	$85.00	ton	880	$74,800
Contaminated soil excavation, transport, & disposal (including backfill and compaction) - 1 ft deep area	$85.00	ton	75	$6,375
Clearance sampling (VOCs, SVOCs, metals)	$400.00	sample	150	$60,000
Density testing (nuclear method)	$45.00	ea	125	$5,625
Excavation Protection				
Steel Sheet Pile Wall	$1,192.25	lf	700	$834,575
Dewatering				
Pump, treat and discharge to sanitary sewer (onsite connection) including all treatment equipment	$0.75	gallon	430,000	$322,500
			Subtotal Remedial Work	$4,002,975
			Administration, Bonds, Insurance (10%)	$400,298
			Project Subtotal	$4,403,273
			Engineering (10%)	$440,327
			Contingency (15%)	$660,491
			Opinion of Probable Costs	$5,504,091

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