WORK PLAN

Remedial Investigation Work Plan
Former Accurate Die Casting Site
Fayetteville, New York
Site No. C734052

FOUBU Environmental Services, LLC
Syracuse, New York

October 2019

OBG
Part of Ramboll

OCTOBER 2019 | 25179 | 60243

Remedial Investigation Work Plan
Former Accurate Die Casting Site
Site No. C734052

547 East Genesee Street
Fayetteville, New York

Prepared for:
FOUBU Environmental Services, LLC

I Douglas M. Crawford certify that I am currently a NYS registered professional engineer and that this Supplemental Remedial Investigation 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).

Douglas M Crawford

DOUGLAS M. CRAWFORD, P.E., VICE PRESIDENT
O'BRIEN & GERE ENGINEERS, INC.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1. INTRODUCTION

This Remedial Investigation Work Plan (RIWP) documents the remedial investigation (RI) activities that will be implemented at the Former Accurate Die Casting Site (Site) located at 547 East Genesee Street, Fayetteville, NY (**Figure 1**). This investigation is being conducted as a component of the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) at the Site.

An application for the Site to participate in the BCP was presented on behalf of FOUBU Environmental Services, LLC (FOUBU) to the NYSDEC on January 13, 2015, and accepted by NYSDEC as complete on February 17, 2015 based on additional information provided to the NYSDEC on February 11 and February 16, 2015. FOUBU has entered the BCP as a "volunteer". The Site was accepted into the BCP on June 1, 2015 following a public review period that ended on March 27, 2015, and execution of the Brownfield Site Cleanup Agreement Index C734052-03-15.

1.1. PROJECT OBJECTIVE

Under 6 CRR-NY Part 375-3, the Site remedial program will comply with a Track 4 cleanup. Under this cleanup track, institutional and engineering controls will be used to mitigate exposures to Site-related constituents as needed. Exposed surface soil will need to meet applicable Soil Cleanup Objectives (SCOs) established by 6 CRR-NY 375-6.8(b) or be covered by buildings, pavement, or other similar surfaces.

1.2. WORK PLAN ORGANIZATION

The remainder of this Work Plan describes the planned RI activities and is organized as follows:

Section 2 – provides a description of the Site, and summaries of the Site operational history, previous investigations and remedial work performed, the current groundwater monitoring program, deed restrictions, and Site use.

Section 3 – presents the specific objectives for the investigation followed by a description of the specific tasks that will be undertaken to gather information to meet the project objectives.

Section 4 – describes the Qualitative Human Health Exposure Assessment (QHHEA) process.

Section 5 – describes the contents of the RI Report.

Section 6 - describes the companion documents that are included as appendices to the Work Plan: Quality Control Document (QCD), Field Sampling and Analysis Plan (FSAP), and the Health and Safety Plan (HASP) with the Community Air Monitoring Plan (CAMP).

Section 7 – provides the anticipated project schedule.

2. BACKGROUND

2.1. SITE DESCRIPTION

The Site is approximately 30 acres in size and located at 547 East Genesee Street in Fayetteville, New York (**Figure 2**). The Site is bordered to the west by a former railroad bed that is no longer in use, and residential housing is located west of the former railroad bed. Residential housing also borders the Site to the east while Bishop Brook and vacant wooded land border the Site to the north. East Genesee Street followed by commercial properties and a cemetery border the Site to the South. The front portion of the property is currently zoned industrial while the back portion is zoned one family residential.

The former manufacturing building is approximately 130,000 square feet in size and occupies the southern side of the Site. This building is primarily a single story, high bay manufacturing space with several warehouse/storage areas, and 8,500 sq ft of office space. Parking lots are located to the east and north of the building. The remainder of the property is generally undeveloped and covered with grass, trees and other native vegetation.

2.2. SITE HISTORY

Accurate Die Casting and predecessor owners and operators of the facility conducted manufacturing operations at the Site from approximately 1950 until 1988 when Accurate Die Casting abandoned the facility. Accurate Die Casting and the predecessor owners and operators used the facility for die and casting operations to fabricate metal products for the automobile industry and other industries.

ITT Commercial Finance Corporation, a former subsidiary of ITT Industries, now ITT Corporation (ITT), acquired the Site in 1988 as a result of foreclosure proceedings. ITT never conducted manufacturing operations at the Site and did not own or operate the facility at any time that a disposal or release of hazardous substances occurred at the Site.

The Site was sold to O'Brien & Gere Technical Services, Inc. in 1999. In 2000, O'Brien & Gere Technical Services, Inc. sold the Site to 547 East Genesee Street, LLC. A deed was recorded with the Onondaga County Clerk on December 29, 20017 transferring title to the Site from the Site owner, 547 East Genesee Street, LLC, to FOUBU Environmental Services, LLC (FOUBU). FOUBU intends to demolish the existing facility and redevelop the Site.

2.3. PREVIOUS INVESTIGATIONS AND REMEDIAL MEASURES

Prior to participation in the BCP, previous investigations and remedial measures had been conducted at the Site under the New York State Superfund Program (SSF). Site work conducted under SSF is described below.

A Remedial Investigation was conducted at the Site between 1990 and 1993, and the results presented in the *Remedial Investigation Report* (Stearns & Wheler, 1993) dated December 1993.

In December 1994 the NYSDEC issued a *Record of Decision* (ROD) (NYSDEC, 1994) in which the NYSDEC selected (1) excavation and off-site disposal for contaminated soil, and (2) extraction and on-site treatment for the contaminated groundwater at the Site. The NYSDEC identified five areas (**Figure 2**) in the December 1994 ROD which were addressed by remedial actions completed between 1995 and 1999 as follows:

Area 1 - PCB/PAH/VOC Soils Area

In accordance with the NYSDEC-approved *PCB/PAH/VOCs Soils Area Excavation Plan* (O'Brien & Gere Engineers, Inc. [O'Brien & Gere], 1995a) dated March 1995, unsaturated soils exhibiting concentrations of polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and volatile organic compounds (VOCs) above remedial action objectives (RAOs) in the northwest area of the Site were excavated during 1995. After excavating approximately 600 cubic yards (cy) of soil, grab samples of soil were collected from the excavations and analyzed for PAHs, VOCs, and PCBs to evaluate if further action was required. Based on the results of the sampling and analyses, it was concluded that the unsaturated soils containing PAHs, PCBs and VOCs above the RAOs had been removed to the extent practicable.

In 1997, approximately 350 cy of the 600 cy of excavated soil was removed from the Site and transported to the ESMI facility in Fort Edward, New York for low temperature thermal destruction and subsequent off-site disposal. The remaining 250 cy of soil was mechanically processed on-site to enhance volatilization of VOCs in accordance with the ROD amendment issued in October 1997 (NYSDEC, 1997).

In April 1998, following analyses that indicated that the RAOs had been achieved, the 250 cy of mechanically processed soils were spread on-site in the Corrective Action Management Unit (CAMU)

(Area 1) identified in the ROD amendment (**Figure 2**). In accordance with the NYSDEC requirements, approximately 1 foot of general fill, topsoil, and grass seed was placed on top of the processed soils.

Pursuant to an *Explanation of Significant Differences* (ESD) Notice dated October 1998 (NYSDEC, 1998a), a groundwater collection trench was constructed to intercept groundwater (if any) containing VOCs present in the sand lenses observed in Area 1. Construction of the trench was completed in July 1999 and the collected groundwater is treated at the existing on-site treatment system.

Area 2 – Northeast Corner of Facility

In accordance with the NYSDEC-approved *IRM Work Plan* dated May 1994 (O'Brien & Gere, 1994a), the area outside the northeast corner of the facility was addressed as part of an Interim Remedial Measure (IRM) during 1994. As part of the IRM, soils exhibiting trichloroethylene (TCE) above the RAO were removed to the extent practicable without undermining the existing building foundations. The excavated soil was mechanically processed on-site to enhance volatilization of the VOCs until residual VOC concentrations were documented to be below the RAOs. Following achievement of the RAOs, the soils were used to backfill the excavation. A description of the soil remediation activities completed in this area is provided in the NYSDEC-approved *Soil Remediation Activities Summary Report* dated October 1994 (O'Brien & Gere, 1994b).

Area 3 - Overburden Groundwater

In accordance with the NYSDEC-approved IRM Work Plan (O'Brien & Gere, 1994a) and as part of the IRM which addressed the soils outside the northeast corner of the facility (Area 2), a groundwater collection sump was constructed within the excavation (S-1 on **Figure 2**). The sump extends to the till layer that was found to be present at the base of the excavation made during the soil remediation activities. This sump is being utilized when water is present as one of the groundwater recovery points for the groundwater recovery and treatment system constructed at the Site to address the shallow/overburden groundwater. However, the sump is typically dry as reported in the quarterly reports provided to the NYSDEC.

Also, an overburden recovery well designated as RW-1 (**Figure 2**) was constructed on-site as part of the IRM. This recovery well is being utilized to collect groundwater containing TCE in the overburden aquifer downgradient of the northeast corner of the facility. Recovered groundwater is treated on-Site using granular activated carbon and discharged to Bishop Brook under a SPDES permit.

Recovery and treatment of overburden groundwater using the sump and RW-1 has been ongoing since February 5, 1996 and is continuing.

Area 4 – Shallow Bedrock Groundwater

A second groundwater recovery well, designated as RW-2, is being utilized on-site to recover groundwater containing VOCs from the shallow bedrock in the vicinity of the northeast corner of the facility (**Figure 2**). This well was installed during 1995, and recovery and treatment of shallow bedrock groundwater using RW-2 was initiated on February 5, 1996 and is continuing.

Area 5 - Septic Tank

During 1995, the septic tank was uncovered and the contents were removed and disposed of at an off-site NYSDEC-approved landfill in accordance with the NYSDEC-approved *Remedial Design/Remedial Action Work Plan* dated March 1995 (O'Brien & Gere, 1995b). Once the contents were removed, the walls of the septic tank were cleaned using a pressure-washer as approved by the NYSDEC. Subsequent to decontaminating the floor and walls of the septic tank, the concrete vault was filled and buried, completing remediation of this area.

A *Final Engineering Report* (O'Brien & Gere, 2000) was provided to the NYSDEC in March 2000 certifying and documenting that the remedial actions required to address the five areas identified in the 1994 ROD were complete. The *Final Engineering Report* (O'Brien & Gere, 2000) provided commitment to on-going groundwater recovery from four groundwater recovery points constructed at the Site including recovery wells RW-1 and RW-2, the sump outside the northeast corner of the existing facility (Area 2), and the overburden groundwater interceptor trench downgradient of the Corrective Action Management Unit (CAMU) in Area 1. Operation of the groundwater recovery and treatment system continues and is required until achieving Class GA Standards or reaching an asymptotic level below which further reduction is not practicable.

In addition to the remedial activities conducted in the five areas identified above, three underground storage tanks (USTs) were abandoned in 1995. These tanks were as follows:

> ***1,000 gallon leaded gas*** – This tank was located on the west end of the building. On March 21 and 22, 1995, the tank was removed. Observations identified rust holes in the bottom of the tank. Directly below the tank was a 16 inch clay storm water drain pipe which drains to the back of the property near the CAMU. Field screening tests were performed and DEC was notified of the leaking tank. With the approval of DEC, the tank was removed and the excavation was backfilled.
>
> ***85 gallon #2 fuel*** – Located near the furnace room on the northwest corner of the building adjacent to the furnace room. This tank was removed.
>
> ***15,000 gallon #2 fuel oil*** – This tank is located beneath the furnace room. On April 28, 1995, the 15,000 gallon underground storage tank was pumped out, pressure washed and hand wiped. Approximately 6,000 gallons of aged virgin fuel oil was removed from the tank and disposed. The tank was closed in place as it is beneath the floor.

The approximate locations of the 1,000 gallon gasoline and the 15,000 gallon #2 fuel oil USTs are shown on **Figure 2**. Additional documentation regarding these tanks or the removal activity is not available.

2.4 CURRENT GROUNDWATER MONITORING PROGRAM

Groundwater samples have been collected and analyzed for VOCs since 1998 in accordance with the NYSDEC-approved *Sampling and Analysis Plan* (SAP) dated March 1996 (OBG, 1996). Presently, approved SAP requires sampling of select monitoring wells on two occasions each year, during the Spring and Fall, and analyses for VOCs.

- For the Spring monitoring event, also referred to as the semi-annual event, the approved SAP requires samples to be collected from five monitoring wells including MW-10, MW-11, MW-13, MW-18 and MW-24.
- For the Fall (or annual) event, the approved SAP requires samples to be collected from fifteen monitoring wells and two piezometers including MW-5, MW-6, MW-9, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15B, MW-16B, MW-17, MW-18, MW-21, MW-22, MW-24, PZ-1 and PZ-2.

TCE is the primary contaminant of concern, although other chlorinated compounds (cis-1,2-dichloroethene, methylene chloride, tetrachloroethene, and trans-1,2-dichloroethene) have been occasionally detected. The results of the groundwater monitoring events are provided to the NYSDEC with quarterly Operation and Maintenance Reports and annual Periodic Review Reports.

There are three areas on site where TCE concentrations are notable. One area is below the existing building as evidenced by monitoring wells MW-13 and MW-14 which exhibited TCE concentrations of 220 micrograms per liter (µg/L) and 250 µg/L respectively. Another area, located southeast of the former PCB/PAH/VOC soils area, as evidenced by monitoring well MW-17, which exhibited a TCE concentration of 200 µg/L. The third area is located near the former PCB/PAH/VOC soils area, as evidenced by monitoring wells MW-18 and MW-24, which exhibited TCE concentrations of 1,000 µg/L and 300 µg/L respectively.

Overburden and bedrock groundwater elevation contour maps are provided as **Figures 3 and 4**, respectively.

2.5. DEED RESTRICTIONS

Groundwater at the Site exhibits trichloroethene (TCE) above Class GA Standards. TCE is the primary contaminant of concern, although other chlorinated compounds (cis-1,2-dichloroethene, methylene chloride, tetrachloroethene, and trans-1,2-dichloroethene) have been occasionally detected. A groundwater recovery and treatment system is in operation at the Site, however it is likely that the concentration of TCE and other VOCs may remain above the Class GA drinking water standards in impacted overburden groundwater and bedrock groundwater for an indefinite period. Deed restrictions were filed on May 15, 2014 by the Site owner that prohibit use of on-site groundwater and requires future actions by the Site owner should the Site be occupied or redeveloped.

Also, excavation on-Site in the Corrective Action Management Unit (CAMU) (Area 1) established during the remedial action is not allowed, nor is construction of groundwater supply wells for consumption or production use allowed. The current site owner filed a Declaration of Covenants and Restrictions (deed restrictions), as required by the NYSDEC, on May 15, 2014 that prohibits the disturbance or excavation of the property which threatens the integrity of the engineering controls or which results in unacceptable human exposure to contaminated soils, and prohibits use of on-site groundwater.

The deed restrictions also require evaluation of the potential for soil vapor intrusion (SVI) by the site owner should the on-Site building become occupied and for any buildings being developed on the Site. In such cases, a SVI sampling work plan will be developed and submitted to NYSDEC and NYSDOH for approval prior to occupation of the building or construction of any new buildings.

2.6. SITE USE

The property has historically been used for industrial and commercial purposes. It currently contains a vacant building used for light manufacturing and offices.

3. REMEDIAL INVESTIGATION ACTIVITIES

3.1. INVESTIGATION OBJECTIVES

As previously discussed, a number of remedial activities have been conducted at this Site to mitigate contamination associated with historic operations at the Site. However, several data needs exist in consideration of the planned demolition of the existing building and the expected change in future use.

The purpose of the RI will be to:

1) Assess whether the top two feet of soil at the Site meets applicable SCOs identified in 6 CRR-NY Part 375.
2) Assess whether constituents are present in the surficial soil above applicable SCOs which may present a potential exposure to humans.
3) Evaluate whether grossly contaminated material such as non-aqueous phase liquid (NAPL) is present below the existing building;
4) Evaluate the concentration of constituents that may be present in the PCB/PAH/VOC area (Area 1).
5) Evaluate the residual petroleum-related constituents that may be present in the vicinity of the former USTs.
6) Evaluate surface water and sediment quality within Bishop Brook flowing through the northern portion of the BCP property.
7) Assess the potential exposure impact of Site related constituents on public health and the environment consistent with a Track 4 cleanup.
8) Provide information to support the development of a proposed Track 4 cleanup remedy to address the residual soil contamination, if required.

Groundwater will not be assessed as part of this investigation as there is an established ongoing groundwater monitoring program. However, the presence of VOCs in the groundwater will be incorporated into the qualitative human health assessment. A Fish and Wildlife Resources Impact Assessment (FWRIA) will not be completed as part of this RI as a Habitat Assessment was conducted as part of the original Remedial Investigation under the State Superfund Program.

Upon completion of the RI investigation, an RI Report will be completed. This report will summarize the data collected during the RI, as well as relevant data collected prior to the RI for the Site. The RI Report will include comparisons of soil data to New York State screening values as presented in 6 CRR-NY Part 375. Recent data generated by the groundwater monitoring program will be compared to screening values presented in the 6 CRR-NY Part 703. The RI Report will also include the habitat assessment that was completed during the original Remedial Investigation.

3.2. SHALLOW SOIL

Shallow soil samples will be collected from a total of 17 locations as identified on **Figure 5**. Two of the locations are within the CAMU (Area 1). The remaining 15 locations are distributed across the property and include grassed areas, areas near the parking lot and outdoor storage as well as wooded areas where it is assumed no historic activity occurred.

At each location, shallow soil samples will be collected from three depth intervals to 24 inches below any vegetative layer. Samples will be collected from 0 to 2 inches (surface soil) to provide information for assessment of human health exposures. , and the second and third samples will be collected from 2 to 12 inches (2 to 6 inches when sampling for VOCs) and 12 to 24 inches to assess whether the top 2 ft of material meet the criteria for soil cover. The shallow soil samples will be collected using a hand auger, shovel or similar manual equipment. Samples will be collected using methodologies provided in FSAP contained in Appendix A. Samples to be analyzed for per- and polyfluoroalkyl substances (PFAS) will be collected in general accordance with *PFC Shallow Soil Sampling Protocol, Revision 1.2* (NYSDEC, June 29, 2016).

The soil samples will be submitted to a NELAP certified laboratory for analysis. The soils collected from the 0 to 2-inch, 2 to 12 inch, and 12 to 24 inch intervals will be composite samples and will be analyzed for Target Compound List (TCL) semivolatile organic compounds (SVOCs), PCBs, Target Analyte List (TAL) Metals, and cyanide. Samples for VOC analysis will be collected as discrete grab samples from the 2 to 6 and 12 to 24-inch intervals. In addition, one soil sample will be collected for PFAS and 1,4-dioxane analysis from three locations as identified on Figure 5, one from a 0 to 2-inch interval, one from a 6 to 12-inch interval, and one from a 12 to 24-inch interval. Quality assurance/quality control (QA/QC) samples consisting of trip blanks (TB, VOCs only), matrix spikes (MS), matrix spike duplicates (MSD), field duplicates (FD), and a field reagent blank (FRB, for PFAS only) will also be analyzed as summarized on **Table 1**. Additional information pertaining to sample analysis is provided in Section 3.7 and in the Quality Control Document (QCD) included as **Appendix B**.

3.3. BUILDING AREA SOIL

The on-site building will be demolished as part of the Site redevelopment. The approach to assessing the sub-slab conditions varies based on the portion of the building that is being investigated. Previous investigations and remedial measures have revealed that chlorinated VOCs are present in groundwater located to the northeast of the building. Based on the groundwater quality data and the soil removal IRM in Area 2, there is potential for residual VOCs to be present beneath the eastern end of the building. Conversely, no VOCs have been identified in the overburden wells, MW-2 and MW-8, located downgradient of the western end of the building suggesting that no significant releases of VOCs have occurred. The investigation strategy for the building is as follows:

3.3.1. Eastern End of Building

As previously discussed, a groundwater plume consisting primarily of TCE is present northeast of the building and is the focus of the ongoing groundwater collection and treatment program. This plume was attributed to a release of TCE that reportedly occurred outside the northeast corner of the building (Area 2). Available information also suggests that the former Accurate Die Casting manufacturing operation utilized an above grade TCE degreasing system inside the existing facility near the northeast corner of the building extension. The approximate location of the degreasing system is shown on **Figure 6** as suggested by a patch in the concrete floor. The sidewalls of the excavation completed as an IRM in this area identified that VOCs were not fully removed due to the presence of the foundation which prevented further excavation. Furthermore, groundwater in monitoring wells MW-13 and MW-14 installed in this area have consistently contained TCE. The investigation on the eastern end of the building will therefore focus on the assessment of the nature and extent of VOCs that may still be present beneath the building.

The investigation on the eastern end of the building will include the use of direct sensing techniques, specifically a membrane interface probe (MIP), to identify the presence and extent of VOCs followed by completion of soil borings to facilitate visual inspection of the subsurface material and the collection of soil samples for analysis. The MIP probe will be initially completed in the vicinity MW-13, MW-14 and the location of the former degreasing unit as shown in **Figure 6**. The MIP will be advanced to refusal or the top of the bedrock that has been identified at depth of approximately 20 to 25 ft below grade. Based on observations at these locations, additional MIP probes will be completed to evaluate the extent of VOCs. Procedures for operating the MIP are provided in the FSAP included as **Appendix A**.

Following completion of the MIP investigation, soil borings will be completed in this area to further assess the subsurface and collect soil samples for analysis. Up to five borings will be completed at the location of the MIP probes. The exact number and location will be established based on the MIP results. The borings will be advanced using direct push methods. Soil samples will be collected continuously to the top of bedrock. Soil sampling intervals may vary based on the need to target specific depth intervals for sample collection. Should direct-push methods encounter refusal before the top of bedrock, hollow-stem auger methods may be employed if needed.

Upon retrieval, the on-site hydrogeologist will describe and record each soil sample on a soil boring log. The description shall include the following information: soil color, moisture content, grain-size, and any staining, sheens, visible NAPL, and/or chemical odors observed. A photoionization detector (PID) will also be used to screen the soil samples for the presence of VOCs. PID readings will be recorded on the boring log.

Up to ten soil samples will be collected for analysis of VOCs using EnCore® or Terra Core™ samplers. The sample interval for analysis will be selected based on the MIP readings and the analytical results will be used to correlate the MIP readings to VOC concentrations. In addition, one sample will be analyzed for PFAS and 1,4-dioxane.

The soil samples will be submitted to a NELAP certified laboratory and analyzed for Target Compound List (TCL) VOCs. Quality assurance/quality control (QA/QC) samples consisting of a TB (VOCs only), MS, MSD a FD, and a FRB (PFAS only) will also be analyzed as summarized on **Table 1**. Additional information pertaining to sample analysis is provided in Section 3.7 and in the QCD included as **Appendix B**.

3.3.2. Western End of Building

The western end of the building was used for manufacturing. The floor surface of the northern portion of the building is a mixture of concrete and brick that has been painted. The floor surface appears to darken as one moves northward within this area. As shown in **Figure 6**, a number of utilities, including stormwater lines, air handling lines and two oil/water separators, are present beneath the slab on this end of the building. The southern portion of this side of the building appears to have been used for different operations. The floor is concrete and there is only a single storm sewer line running along the south side. The floor surface in this area was not observed to be stained or dark in color.

Although groundwater quality and sub-slab air samples do not suggest that the soils beneath the western side of the building are impacted, soil borings will be completed in this area to evaluate conditions prior to demolition of the building. It is expected that soils encountered during removal of the slab or sub-slab utilities that exhibit staining or odors would be managed during the demolition process.

A total of twelve borings will be completed on the western end of the building. Eight soil borings will be completed within the northern portion of the manufacturing area as shown on **Figure 6**. These borings will be completed on the north side of the stormwater lines. Two additional borings will be completed next to the two oil water separators. Two additional borings will be completed within the southern area of the western side of the building and positioned near stormwater drains visible on the floor.

These borings will be completed to bedrock or refusal using direct-push methods. Soil samples will be collected continuously to the base of each boring, which is expected to be between 20 and 25 ft below grade. If refusal is encountered prior to reaching the bedrock surface, hollow stem auger drilling method with split barrel sampling will be employed to the top of the bedrock Additional information pertaining to drilling and soil sampling is provided in the FSAP which is included as **Appendix A**.

Upon retrieval, the on-site hydrogeologist will describe and record each soil sample on a soil boring log. The description shall include, but not be limited to the following information: soil color, moisture content, grain-size, and any staining, sheens, visible NAPL, and/or chemical odors observed. A PID will also be used to screen the soil samples for the presence of VOCs.

Up to twelve soil samples will be collected for analysis using EnCore® or Terra Core™ samplers. Samples will be biased towards locations where staining, odors or NAPL are observed. In addition, one soil sample will be analyzed for PFAS and 1,4-dioxane from the location shown on **Figure 6**. Should there be limited locations where staining, odors or NAPL are observed, a select number of samples will be collected from unimpacted materials to document what may be present in the underlying material.

The soil samples will be submitted to a NELAP certified laboratory and analyzed for TCL VOCs, TCL SVOCs, PCBs, TAL Metals, and cyanide. Quality assurance/quality control (QA/QC) samples consisting of a TB (VOCs only), MS, MSD, FD, and a FRB (PFAS only) will also be analyzed as summarized on **Table 1**. Additional information pertaining to sample analysis is provided in Section 3.7 and in the QCD included as **Appendix B**.

3.4. PCB/PAH/VOC AREA SOILS (AREA 1)

As discussed in Section 2, some of the soils originally removed from the PCB/PAH/VOC Area were treated on-Site and used for backfill within that excavation. To document the concentration of constituents that are present within the subsurface soils in this area, two soil borings will be completed. The approximate locations are shown on **Figure 5**. Exact locations will be selected in the field. Soil borings will be completed using direct push methods to a maximum depth of 15 ft below grade which was the maximum depth of the excavation. Soil samples will be collected continuously to the base of each boring. Additional information pertaining to drilling and soil sampling is provided in the FSAP which is included as **Appendix A**.

Upon retrieval, the on-site hydrogeologist will describe and record each soil sample on a soil boring log. The description shall include, but not be limited to the following information: soil color, moisture content, grain-size, and any staining, sheens, visible NAPL, and/or chemical odors observed. A PID will also be used to screen the soil samples for the presence of VOCs.

Two samples of the backfilled material will be collected for analysis. The selection of samples for analysis will be biased towards material exhibiting elevated PID readings, staining or odors to provide information as to the higher concentrations that may be present. Should no evidence of impacts be noted, the samples will be selected from fill material at each boring location.

The two collected soil samples will be submitted to a NELAP certified laboratory and analyzed for TCL VOCs, TCL SVOCs, PCBs, TAL Metals, cyanide. One sample will be collected for PFAS and 1,4-dioxane from the location identified on Figure 5. QA/QC samples consisting of a TB (VOCs only), MS, MSD, FD, and a FRB (PFAS only) will also be analyzed as summarized on **Table 1**. Additional information pertaining to sample analysis is provided in Section 3.7 and in the QCD included as **Appendix B**.

3.5. UNDERGROUND STORAGE TANKS

As discussed in Section 2, three USTs were removed or abandoned in place at the facility. The location of the former 85 gallon fuel oil UST is not known and therefore no investigation can be completed. The approximate location of the other two USTs is shown in **Figure 2**. Soil samples will be collected from the vicinity of these two USTs to document the presence and concentration of petroleum-related compounds.

One boring will be completed at each of the USTs locations as shown on **Figure 5**. Soil borings will be completed using direct push methods to the water table which is expected to be approximately 20 ft below grade. Soil samples will be collected continuously to the base of each boring. Additional information pertaining to drilling and soil sampling are provided in the FSAP which is included as **Appendix A**.

Upon retrieval, the on-site hydrogeologist will describe and record each soil sample on a soil boring log. The description shall include the following information: soil color, moisture content, grain-size, and any staining, sheens, visible NAPL, and/or chemical odors observed. A PID will also be used to screen the soil samples for the presence of VOCs.

One sample will be collected from each boring for analysis. The sample selection will be biased toward elevated PID readings, staining or odors.

The collected soil samples will be submitted to a NELAP certified laboratory for analysis. The sample collected from the location of the former gasoline UST will be analyzed for TCL VOCs and lead, and the sample collected from the vicinity of the heating oil tank will be analyzed for TCL VOCs and TCL SVOCs. The samples from these locations will be submitted with the samples from the building or the PCB/PAH/VOC area so that the QA/QC samples from those areas can be used for the UST samples as summarized on **Table 1**. Additional information pertaining to sample analysis is provided in Section 3.7 and in the QCD included as **Appendix B**.

3.6. SURFACE WATER AND SEDIMENT

To evaluate current potential impacts to Bishop Brook, three co-located surface water and sediment samples will be collected at locations shown on **Figure 5**. Procedures pertaining to collection of surface water and sediment samples are provided in the FSAP which is included as **Appendix A**.

Each surface water and sediment sample will be submitted to a NELAP certified laboratory and analyzed for TCL VOCs, TCL SVOCs, PCBs, TAL metals, and cyanide from the locations identified on **Figure 5**. In addition, each surface water sample will be analyzed for hardness, and each sediment sample will be analyzed for total organic carbon (TOC). QA/QC samples consisting of a TB (VOCs only), MS, MSD, and FD will also be analyzed as summarized on **Table 1**. Additional information pertaining to sample analysis is provided in Section 3.7 and in the QCD included as **Appendix B**.

3.7. LOCATION SURVEY

Following the completion of the field investigation activities, location of the borings and soil samples will be surveyed for placement onto a base map. The survey will be completed by a New York State-licensed surveyor. Ground surface will be surveyed to an accuracy of 0.01 ft and reported in feet above the North American Vertical Datum of 1988 (NAVD88). The horizontal position will be reported in New York State Plane feet relative to the North American Datum of 1983 (NAD83).

3.8. SAMPLE ANALYSIS

The collected samples will be shipped under chain-of-custody documentation to a NELAP certified laboratory for analysis. Samples will be analyzed for one or more of the following as discussed in Sections 3.2 through 3.5 and summarized on **Table 1**.

Parameter	Analytical Method
TCL Volatile Organics + 10	USEPA Method 8260C
TCL Semivolatile Organics + 20	USEPA Method 8270D
TCL PCBs	USEPA Method 8082A
TAL Metals	USEPA Method 6010C/7471B
Cyanide	USEPA Method 9014
Hardness	SM20 2340C
Total Organic Carbon	SM20 5310B/USEPA Method 9060/Lloyd Kahn
Per- and Polyfluoroalkyl substances	USEPA Method 537 Modified
1,4-Dioxane	USEPA Method 8270 SIM

Details pertaining to the sample methods and procedures, including QA/QC requirements, are provided in the QCD, which is included as **Appendix B**. QA/QC samples including field duplicates, matrix spikes (MS), and matrix spike duplicates (MSD) will be obtained at a frequency of 1 per 20 samples, and trip blanks will be placed in coolers containing samples to be analyzed for VOCs. Equipment blanks are required in situations where equipment such as a pump is reused at multiple sample locations. **Table 1** summarizes the anticipated number of samples to be collected for analysis by type and the expected QA/QC samples that will be needed. These numbers may change slightly based on field observations as described previously within this section.

In accordance with the QCD the analytical laboratory will be required to provide a data deliverable that meets the requirements of the NYSDEC ASP Category B package in effect at the time of analysis. An electronic data deliverable will also be requested that is compatible with Earthsoft's EQuIS® data management program. Data management and validation is discussed in Section 3.10.

3.9. EQUIPMENT DECONTAMINATION PROCEDURES

Split spoon and direct-push samplers will be decontaminated after each use using a non-phosphate detergent wash followed by a potable water rinse. The decontamination water will be periodically changed during the drilling program. These decontamination fluids will be transferred to 55-gallon drums.

Should hollow-stem auger drilling methods be employed, the hollow stem augers, drill rods, and other miscellaneous drilling tools that contact potentially impacted soil or groundwater will be decontaminated using a high-pressure steam cleaner. This decontamination procedure will be conducted on a temporary decontamination pad that allows for the collection and transfer of generated fluids to 55-gallon drums. More detailed information is provided in the FSAP (**Appendix A**).

Dedicated or disposable sampling equipment will not require decontamination.

3.10. INVESTIGATION DERIVED WASTE MANAGEMENT

The RI activities will produce investigation-derived wastes (IDW) which will require appropriate management. IDW includes the following:

- Drill cuttings
- Decontamination fluids resulting from decontamination of the drill rig and sampling equipment
- Personal protective equipment (PPE)
- Disposable materials and supplies.

Generated IDW will be disposed off-site in accordance with applicable regulations.

3.11. DATA MANAGEMENT AND VALIDATION

Analytical data from the laboratory will be received in electronic format as Electronic Data Deliverables (EDDs) compatible with EQuIS and Adobe Acrobat® or similar electronic format. The electronic data will be uploaded into an EQuIS database for storage and development of tables or output to other data analysis tools and GIS as needed.

The data package will be reviewed by a data validator. A Data Usability Summary Report (DUSR) will subsequently be prepared to document the usability of the data. Additional information pertaining to data validation and DUSR preparation is provided in the QCD (**Appendix B**).

Data qualifiers provided in the DUSR will be manually input into the database once received from the validator.

4. QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

The qualitative human health exposure assessment (QHHEA) will be conducted in accordance with Appendix 3B of DER-10, and will be documented in an Exposure Pathway Analysis Report (EPAR) and qualitative discussion of risk within the RI Report. The analysis will consist of evaluation of potential exposures of humans to Site constituents based on current and future potential uses of the Site. The assessment will include the following components:

- A description of the contaminant source(s) including the location of the contaminant release to the environment (waste disposal area or point of discharge) or, if the original source is unknown, the contaminated environmental medium (soil, indoor or outdoor air, biota, water) at the point of exposure
- An explanation of the contaminant release and transport mechanisms to the exposed population
- Identification of potential exposure point(s) where actual or potential human contact with a contaminated medium may occur
- Description(s) of the route(s) of exposure (i.e., ingestion, inhalation, dermal absorption)
- Characterization of the receptor populations who may be exposed to contaminants at a point of exposure.

The discussion will summarize potential exposure pathways at the Site and identify whether each pathway is complete or incomplete.

5. REMEDIAL INVESTIGATION REPORT

Upon completion of the RI investigation, an RI Report will be completed. This report will summarize the data collected during the RI, as well as relevant data collected prior to the RI for the Site. The RI Report will include comparisons of soil data to unrestricted use soil cleanup objectives (SCOs), current zoned use SCOs, and anticipated future use SCOs as presented in 6 CRR-NY Part 375. Recent data generated by the groundwater monitoring program will be compared to screening values presented in the *New York State Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, Technical and Operational Guidance*

Series (TOGS 1.1.1, NYSDEC 1998). Conclusions based on the data and analyses will be provided, as well as the following information:

- An updated Site description, if necessary
- Site maps
- Field investigation observations
- Hydrogeology
- Chemical analyses results (including a summary of the groundwater quality based on the ongoing monitoring program)
- Nature and extent characterization
- Human health exposure assessment based on the future use for multi-resident housing
- Conceptual site model

The RI Report will recommend either no further action or the need to evaluate remedial alternatives based on the information generated by the investigation.

6. ASSOCIATED WORK PLAN DOCUMENTS

6.1 FIELD SAMPLING PLAN

The Field Sampling Plan (FSAP) for the Site is provided in **Appendix A** of this RIWP. The FSAP presents the procedures for execution of field activities to be conducted as part of the RI as identified in Section 3. The FSAP also provides rationale and detailed procedures for collecting environmental samples including equipment and personnel requirements, drilling and well installation techniques, sampling techniques, and equipment decontamination procedures.

6.2 QUALITY CONTROL DOCUMENT

The Quality Control Document (QCD) for the Site is provided in **Appendix B** of this RIWP. The QCD provides quality assurance/quality control (QA/QC) criteria for work efforts associated with the sampling of environmental media as part of the RI.

This QCD will assist in generating data of a known and acceptable level of precision and accuracy. The QCD provides information regarding the project description and personnel responsibilities, and sets forth specific procedures to be used during sampling of relevant environmental matrices, other field activities, and the analyses of data. The procedures in this QCD will be followed by personnel participating in the field investigation and in the laboratory analyses of environmental samples.

6.3 HEALTH AND SAFETY PLAN

The Health and Safety Plan (HASP) for the Site is provided in **Appendix C** of this RIWP. The HASP has been developed to provide both general procedures and specific requirements to be followed by field personnel while performing RI activities at the Site.

The HASP describes the responsibilities, training requirements, protective equipment, and standard operating procedures to be used by personnel to address potential health and safety hazards while in investigation areas. The plan specifies procedures and equipment to be used by personnel during work activities and emergency response to minimize exposures of personnel to hazardous materials.

A Community Air Monitoring Plan (CAMP) that outlines the monitoring and response activities associated with monitoring VOCs and particulates at the property boundaries near the activities is included in the HASP. CAMP monitoring will only be required for invasive investigations conducted outside of the building.

6.4 CITIZEN PARTICIPATION PLAN

A Citizen Participation Plan (CPP) has been developed for the Site and is provided in **Appendix D** of this RIWP. The CPP provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the Site. The public information and involvement program will be carried out with assistance, as appropriate, from FOUBU (the Applicant). The CPP provides information such as project contacts, locations of reports, a site contact list, and timing of citizen participation activities.

7. SCHEDULE

Milestone Activity	Estimated Schedule
RI Work Plan Submittal to NYSDEC	October 2019
Public Comment Period	30 days following distribution of fact sheet
NYSDEC RI Work Plan Approval	To be determined
RI Work Plan Implementation	November 2019
RI Report	To be determined

REFERENCES

NYSDEC, 1994. *Record of Decision for Former Accurate Die Casting Site, Fayetteville, New York, Site Number 7-34-052,* December 1994.

NYSDEC, 1999. Letter from NYSDEC to O'Brien & Gere Engineers, Inc. regarding establishment of a Corrective Action Management Unit (CAMU) on Site, July 14, 1999.

O'Brien & Gere, 1994a. *Interim Remedial Measure (IRM) Soil Excavation Work Plan*, Former Accurate Die Casting Facility, Fayetteville, NY, May 1994.

O'Brien & Gere, 1994b. *Interim Remedial Measure Summary Report*, Former Accurate Die Casting Facility, Fayetteville, NY, October 1994.

O'Brien & Gere, 2000. *Final Engineering Report*, Former Accurate Die Casing Facility, Fayetteville, NY, March 2000.

Stearns & Wheler, 1993. *Remedial Investigation Report*, Accurate Die Casting Facility, Fayetteville, NY, December 1993.

Table

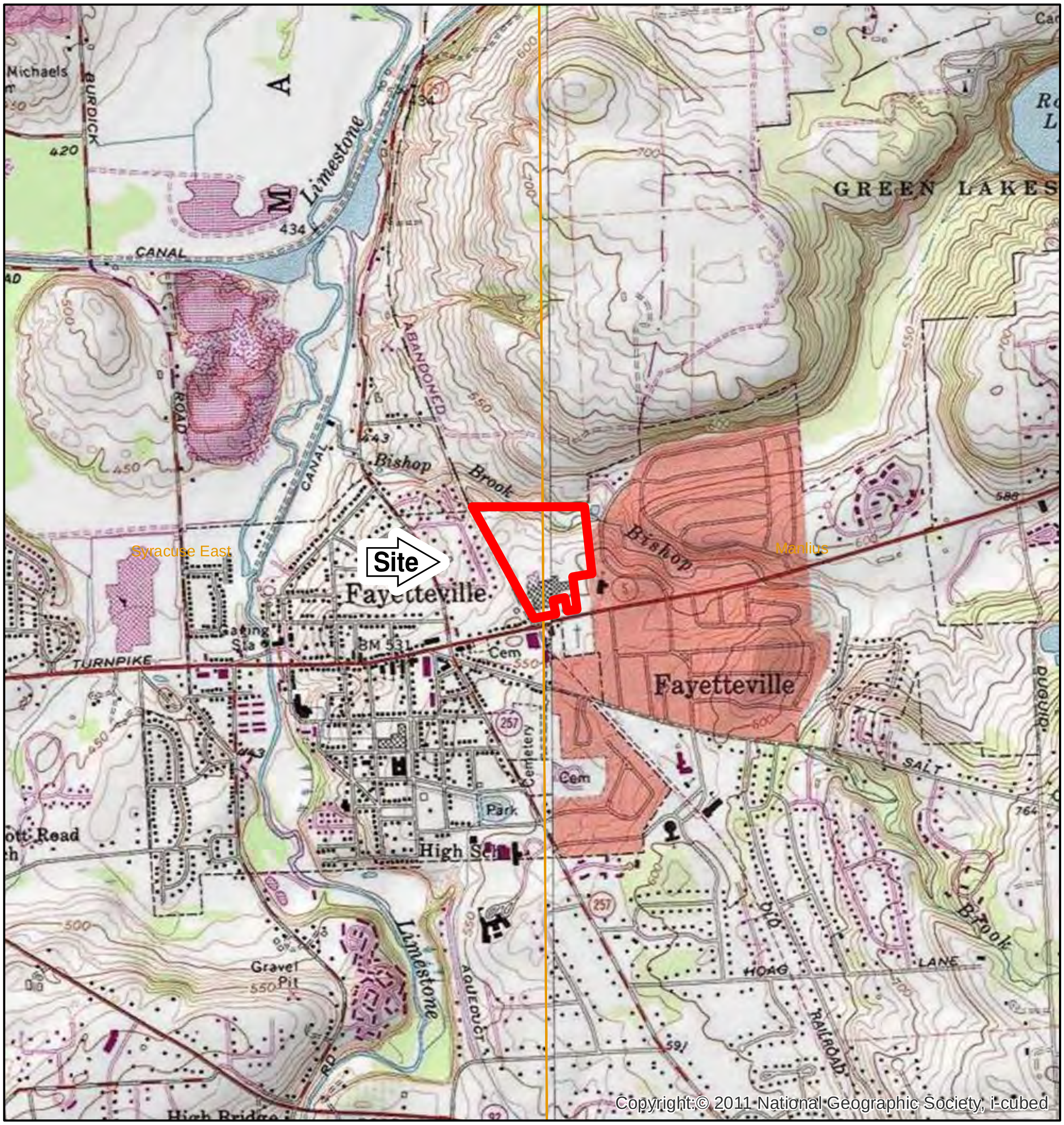
Table 1
Sample Analysis and QA/QC Summary
Remedial Investigation
Former Accurate Die Casting Site Site
No. C734052
Fayetteville, New York

Investigation Area	Environmental Media	Analyses	Method	Number of Samples	Trip Blank[1]	Field Duplicate[2]	MS[2]	MSD[2]	FRB	Total Number of Samples
Shallow Soil	**Soil**	TCL Volatiles + 10	USEPA Method 8260C	34	5	2	2	2	--	45
		TCL Semivolatiles + 20	USEPA Method 8270D	51	--	3	3	3	--	60
		TCL PCBs	USEPA Method 8082A	51	--	3	3	3	--	60
		TAL Metals	USEPA Method 6010C/7471B	51	--	3	3	3	--	60
		Mercury	USEPA Method 7471B	51	--	3	3	3	--	60
		Cyanide	USEPA Method 9014	51	--	3	3	3	--	60
		Lead	USEPA Method 6010C	51	--	3	3	3	--	60
		PFAS	USEPA Method 537 Modified	3	--	1	1	1	1	7
		1,4-Dioxane	USEPA Method 8270 SIM	3	--	1	1	1	--	6
Eastern Bulding Soil	**Soil**	TCL Volatiles + 10	USEPA Method 8260C	10	2	Combined with Western Building Samples				12
		PFAS	USEPA Method 537 Modified	1	--	Combined with Western Building Samples				1
		1,4-Dioxane	USEPA Method 8270 SIM	1	--	Combined with Western Building Samples				1
Western Building Soil	**Soil**	TCL Volatiles + 10	USEPA Method 8260C	12	2	2	2	2	--	20
		TCL Semivolatiles + 20	USEPA Method 8270D	12	--	2	2	2	--	18
		TCL PCBs	USEPA Method 8082A	12	--	2	2	2	--	18
		TAL Metals	USEPA Method 6010C/7471B	12	--	2	2	2	--	18
		Mercury	USEPA Method 7471B	12	--	2	2	2	--	18
		Cyanide	USEPA Method 9014	12	--	2	2	2	--	18
		Lead	USEPA Method 6010C	12	--	2	2	2	--	18
		PFAS	USEPA Method 537 Modified	1	--	1	1	1	1	5
		1,4-Dioxane	USEPA Method 8270 SIM	1	--	1	1	1	--	4
PCB/PAH VOC Area	**Soil**	TCL Volatiles + 10	USEPA Method 8260C	2	1	Combined with Western Building Samples				3
		TCL Semivolatiles + 20	USEPA Method 8270D	2	--	Combined with Western Building Samples				2
		TCL PCBs	USEPA Method 8082A	2	--	Combined with Western Building Samples				2
		TAL Metals	USEPA Method 6010C/7471B	2	--	Combined with Western Building Samples				2
		Mercury	USEPA Method 7471B	2	--	Combined with Western Building Samples				2
		Cyanide	USEPA Method 9014	2	--	Combined with Western Building Samples				2
		Lead	USEPA Method 6010C	2	--	Combined with Western Building Samples				2
		PFAS	USEPA Method 537 Modified	1	--	1	1	1	1	5
		1,4-Dioxane	USEPA Method 8270 SIM	1	--	1	1	1	--	4
Bishop Brook	**Surface Water**	TCL Volatiles + 10	USEPA Method 8260C	3	1	1	1	1	--	7
		TCL Semivolatiles + 20	USEPA Method 8270D	3	--	1	1	1	--	6
		TCL PCBs	USEPA Method 8082A	3	--	1	1	1	--	6
		TAL Metals	USEPA Method 6010C/7471B	3	--	1	1	1	--	6
		Mercury	USEPA Method 7471B	3	--	1	1	1	--	6
		Cyanide	USEPA Method 9014	3	--	1	1	1	--	6
		Hardness	SM20 2340C	3	--	--	--	--	--	3
		Lead	USEPA Method 6010C	3	--	1	1	1	--	6
Bishop Brook	**Sediment**	TCL Volatiles + 10	USEPA Method 8260C	3	1	1	1	1	--	7
		TCL Semivolatiles + 20	USEPA Method 8270D	3	--	1	1	1	--	6
		TCL PCBs	USEPA Method 8082A	3	--	1	1	1	--	6
		TAL Metals	USEPA Method 6010C/7471B	3	--	1	1	1	--	6
		Mercury	USEPA Method 7471B	3	--	1	1	1	--	6
		Cyanide	USEPA Method 9014	3	--	1	1	1	--	6
		Total Organic Carbon	SM20 5310B/USEPA Method 9060/Lloyd Kahn	3	--	--	--	--	--	3
		Lead	USEPA Method 6010C	3	--	1	1	1	--	6
USTs	**Soil**	TCL Volatiles + 10	USEPA Method 8260C	2	1	Combined with Western Building Samples				3
		TCL Semivolatiles + 20	USEPA Method 8270D	1	--	Combined with Western Building Samples				1
		Lead	USEPA Method 6010C	1	0	0	0	0	--	1

Notes: [1] - Trip Blanks are required in each cooler shipped that contain samples to be analyzed for VOCs. The trip blank will be analyzed for VOCs only.
[2] - Field Duplicates, MS and MSD samples are to be collected and analyzed at a frequency of 1 per 20 samples.

Figures

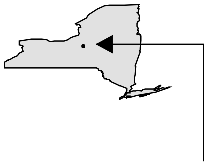
PLOTDATE: 08/13/15 4:44:49 PM Stantosa



Copyright:© 2011 National Geographic Society, i-cubed

ADAPTED FROM: (SYRACUSE EAST AND MANILUS, NY USGS QUADRANGLE

FORMER ACCURATE DIECASTING SITE
547 EAST GENESEE STREET
FAYETTEVILLE, NEW YORK
SITE NO. C734052



MAP LOCATION

N

SITE LOCATION

0	1,000	2,000	4,000

Feet

1:24,000

AUGUST 2015
25179.60243

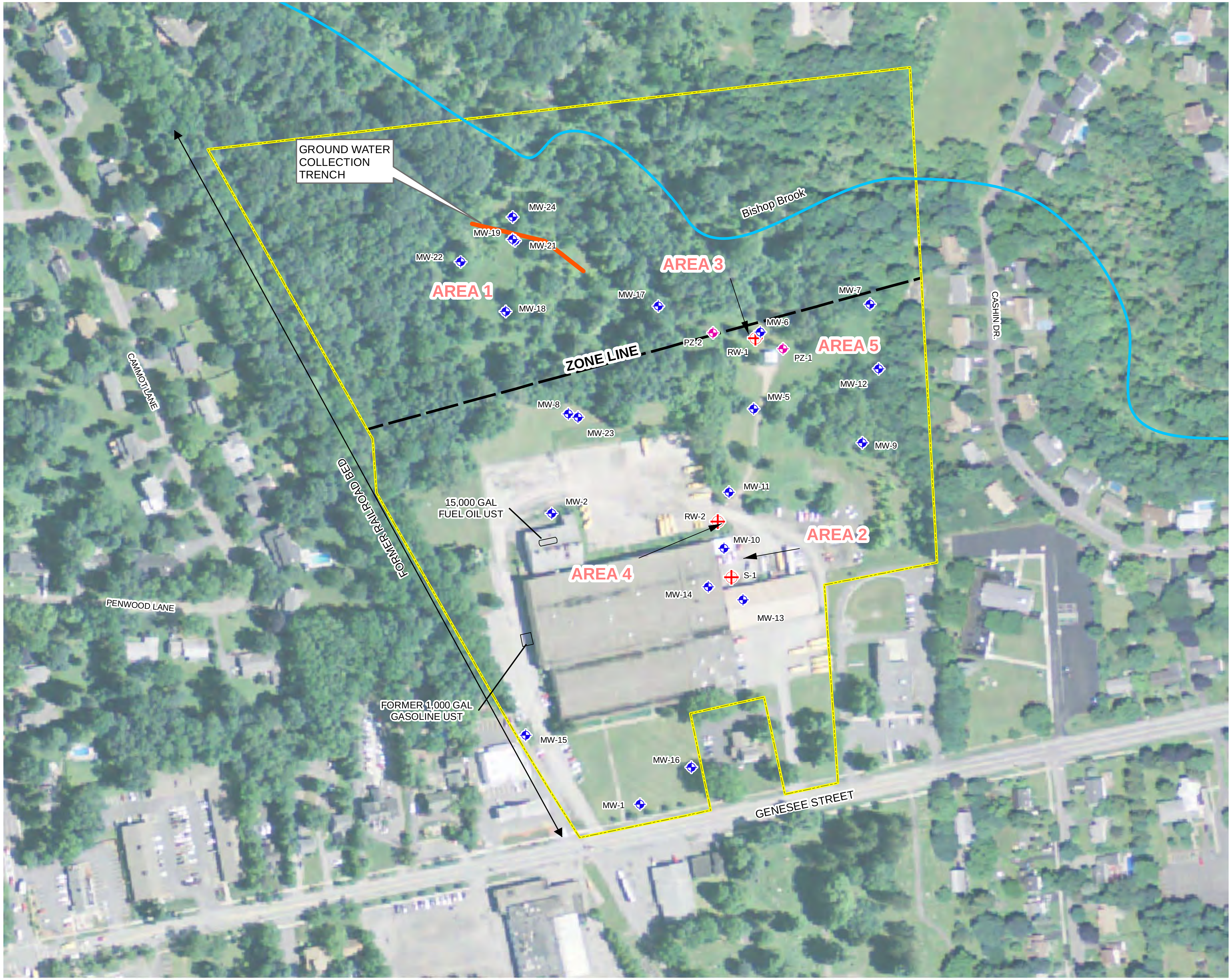
I:\Foubo-Env.25179\60243.Former-Accurate\Docs\DWG\MXD\Site_Loc.mxd

O'BRIEN & GERE ENGINEERS, INC.

PLOTDATE: 10/09/15 9:43:53 AM Stantosa

I:\Foubo-Env.25179\60243.Former-Accurate\Docs\DWG\MXD\SITE PLAN Wells.mxd

FIGURE 2



N

LEGEND

▭ PROPERTY BOUNDARY

SAMPLE TYPE

⌖ MONITORING WELL

⌖ PIEZOMETER

⊕ RECOVERY WELL

FORMER ACCURATE DIE
CASTING SITE
FAYETTEVILLE, NEW YORK
SITE CODE 7-34-052

SITE PLAN

0 100 200 400
Feet

OCTOBER 2015
25179.60243

O'BRIEN & GERE ENGINEERS, INC.

5/17/2019 11:01:01 AM

I:\Foubo-Env.25179\60243.Former-Accurate\Docs\DWG\MXD\RIWP\Figure3_OB_GRW_Elevations.mxd

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

N

LEGEND

⌖ OVERBURDEN MONITORING WELL

⌖ OVERBURDEN PIEZOMETER

+ OVERBURDEN RECOVERY WELL

▪ ▪ ▪ OVERBURDEN CONTOUR

▭ PROPERTY LINE (*approximate*)

(60.38) GROUNDWATER ELEVATION (msl)

60 GROUNDWATER CONTOUR

FORMER ACCURATE
DIE CASTING SITE
FAYETTEVILLE, NEW YORK

SITE CODE 7-34-052

OVERBURDEN
GROUNDWATER ELEVATIONS
(10/04/2018)

0 50 100 200
Feet

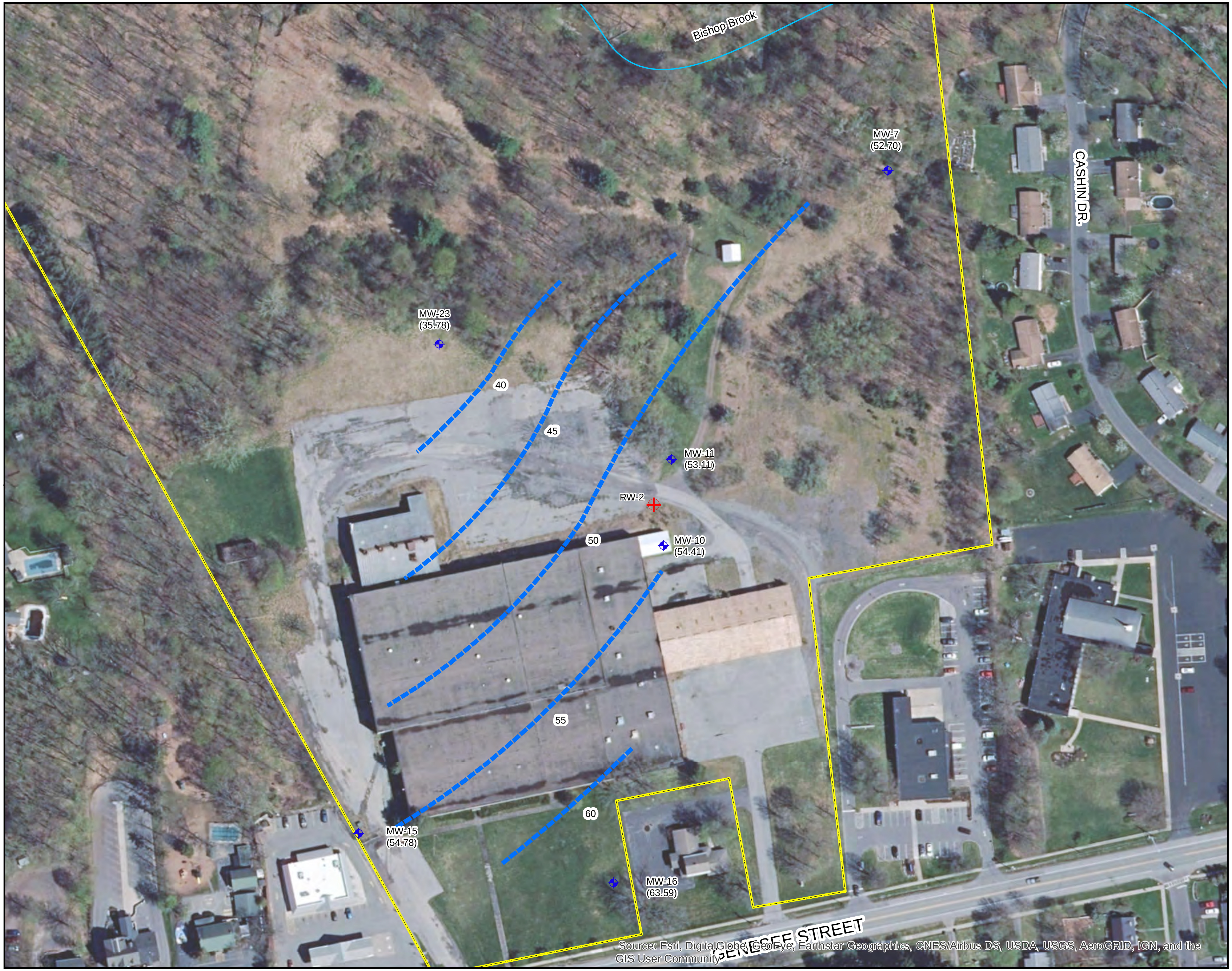
2488.45845
MAY 2019

O'BRIEN & GERE ENGINEERS, INC.

5/17/2019 11:10:38 AM

I:\Foubo-Env.25179\60243.Former-Accurate\Docs\DWG\MXD\RI\WP\Figure4_BR_GRW_Elevations.mxd

FIGURE 4



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

This document was developed in color. Reproduction in B/W may not represent the data as intended.

N

LEGEND

- ⌖ BEDROCK MONITORING WELL
- ✚ BEDROCK RECOVERY WELL
- ▬ ▬ GROUNDWATER CONTOUR LINE
- ▭ PROPERTY LINE (*approximate*)
- 60 GROUNDWATER CONTOUR
- (53.14) GROUNDWATER ELEVATION (msl)

FORMER ACCURATE
DIE CASTING SITE
FAYETTEVILLE, NEW YORK

SITE CODE 7-34-052

BEDROCK
GROUNDWATER ELEVATIONS
(10/04/2018)

0 65 130 260
Feet

2488.45845
MAY 2019

O'BRIEN & GERE ENGINEERS, INC.

10/10/2019 1:06:34 PM

I:\Foubo-Env.25179\60243.Former-Accurate\Docs\DWG\MXD\RIWP\Figure5_Prop_Shallow_SS_Locs_rev.mxd

FIGURE 5

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

N

LEGEND

LOCATIONS

- ✦ PROPOSED SHALLOW SOIL SAMPLE
- ✦ PROPOSED SHALLOW SOIL SAMPLE (TO INCLUDE PFAS AND 1,4-DIOXANE SAMPLES)
- ▲ PROPOSED SOIL BORING
- ▲ PROPOSED SOIL BORING (TO INCLUDE PFAS AND 1,4-DIOXANE SAMPLES)
- ☒ PROPOSED SURFACE WATER/SEDIMENT SAMPLE
- ◆ MONITORING WELL
- ◆ PIEZOMETER
- ✚ PIEZOMETER
- ✚ RECOVERY WELL
- ▭ ONONDAGA COUNTY PARCEL BOUNDARY 2014

FORMER ACCURATE DIE CASTING SITE FAYETTEVILLE, NEW YORK

SITE CODE 7-34-052

PROPOSED PROPERTY SAMPLE LOCATIONS

0 90 180 360
Feet

2488.45845
OCTOBER 2019

O'BRIEN & GERE ENGINEERS, INC.

5/28/2019 11:37:26 AM

I:\Foubo-Env.25179\60243.Former-Accurate\Docs\DWG\MXD\RIWP\Figure6_Prop_Building_Samp_Locs.mxd

NYS ITS GIS Program Office, Westchester County

N

LEGEND

LOCATIONS

● PROPOSED MIP

▲ PROPOSED SOIL BORING

▲ PROPOSED SOIL BORING (TO INCLUDE PFAS AND 1,4-DIOXANE SAMPLES)

⌖ MONITORING WELL

⌖ PIEZOMETER

✚ RECOVERY WELL

— AIR DUCT

- - - DIE COOLING & RETURN

— OTHER

— SANITARY SEWER

- · - STORM SEWER

— WALLS

▭ PROPERTY LINE (*APPROXIMATE*)

FORMER ACCURATE DIE CASTING SITE FAYETTEVILLE, NEW YORK

SITE CODE 7-34-052

PROPOSED BUILDING SAMPLE LOCATIONS

0 30 60 120
Feet

2488.45845
MAY 2019

O'BRIEN & GERE ENGINEERS, INC.

Appendices

Appendix A

Field Sampling and Analysis Plan

FIELD SAMPLING AND ANALYSIS PLAN

Remedial Investigation
Former Accurate Die Casting Site
Fayetteville, New York
Site No. C734052

FOUBU Environmental Services, LLC
Syracuse, New York

October 2019

OBG
Part of Ramboll

TABLE OF CONTENTS

LIST OF APPENDICES

1. INTRODUCTION

This Field Sampling and Analysis Plan (FSAP) has been developed by O'Brien & Gere Engineers, Inc. (OBG) on behalf of FOUBU Environmental Services, LLC to outline procedures to be followed during implementation of field investigation activities to support the Remedial Investigation (RI) at the Former Accurate Die Casting Site (Site) located at 547 East Genesee Street in Fayetteville, New York.

This FSAP is a component of the Remedial Investigation Work Plan (RIWP) developed by OBG for the Site. It should be noted that not all of the activities identified in this FSAP are currently identified to be conducted; however, methods and procedures have been provided herein should such sampling be warranted.

1.1 OVERVIEW OF FIELD ACTIVITIES

The following field activities may be completed as part of the RI:

- Utility locating
- Membrane Interface Probe (MIP) drilling
- Shallow Soil Sampling
- Soil boring and subsurface soil sampling
- Surface water and sediment sampling
- Decontamination of sampling equipment
- Management of Investigation Derived Waste (IDW)

2. GENERAL FIELD GUIDELINES

2.1 SITE HAZARDS

Generally, potential hazards within the Site will be identified during site reconnaissance by the project team prior to the initiation of RI field activities. Additional safety measures to be undertaken for the work performed as part of the RI will be addressed in the site-specific Health and Safety Plan (HASP).

2.2 UNDERGROUND UTILITIES

New York State law requires that Dig Safely of New York be notified at least two working days, and not more than 10 working days, before subsurface work is conducted. Dig Safely New York (800-272-4480) will be contacted to initiate the locating activities. Companies with subsurface utilities present will locate and mark out subsurface utility lines. However, Dig Safely New York contractors will only locate utilities on public property and rights-of-way.

If additional subsurface utility locating is considered necessary, a private locating company will be contracted to locate on-site utilities that have not been identified by Dig Safely New York.

2.3 FIELD LOG BOOKS

Field activities will be documented in field log books to provide a record of the activities conducted. Entries will be of sufficient detail that a complete daily record of significant events, observations, and measurements is developed. Accordingly:

- Field books will be assigned a unique identification number.
- Field books will be bound with consecutively numbered pages.
- Field books will be controlled by the Field Manager while fieldwork is in progress.
- Entries will be written with waterproof ink.
- Entries will be signed and dated at the conclusion of each day of fieldwork.
- Erroneous entries made while fieldwork is in progress will be corrected by the person that made the entries. Corrections will be made by drawing a line through the error, entering the correct information, and initialing the correction.
- Corrections necessary after departing the field will be made by the person who entered the original information. Corrections will be made by drawing a line through the error, entering the correct information, and initialing and dating the time of the correction.

Daily field book entries, for those days when field activities are on-going, will include the following information:

- Location of field activity
- Date and time of entry
- Names, titles of any site visitors, as well as the date and time entering and leaving the site
- Weather information, for example: temperature, cloud coverage, wind speed, and direction
- Purpose of field activity
- A detailed description of the fieldwork conducted
- Sample media (e.g. soil, groundwater, etc.)
- Description of sampling point(s)
- Analytical parameters (e.g. VOCs, SVOCs)
- Date and time of collection
- Sample identification number(s)
- Field observations
- Field measurements made (e.g.; volatile organic compounds (VOCs) using a photoionization detector (PID), pH, temperature, conductivity, water level)
- References for maps and photographs of the sampling site(s)
- Information pertaining to sample documentation such as:
    - Bottle lot numbers
    - Dates and method of sample shipments
    - Chain-of-custody record numbers
    - Shippers tracking number.

3. MEMBRANE INTERFACE PROBE PROCEDURES

The membrane interface probe (MIP), developed by Geoprobe®, measures soil conductivity (SC) and approximate concentration of VOCs in soil. The MIP/SC probe is approximately 12-inches (30 centimeters (cm)) in length and 1.5-inches (3.8 cm) in diameter. The probe is driven into the ground at the nominal rate of one foot per minute using Geoprobe® or similar direct push rig.

Soil conductivity (SC), the inverse of soil resistivity, is measured using a dipole arrangement. In this process, an alternating electrical current is transmitted through the soil from the center isolated pin of the probe. This current is then passed back to the probe body. The voltage response of the imposed current to the soil is measured across these same two points. Conductivity is measured in Siemens/meter, and due to the low conductivity of earth materials, the SC probe uses milliSiemens/meter (mS/m). The probe is reasonably accurate in the range of 5 to 400 mS/m. In general, at a given location, lower conductivity values indicate larger particles such as sands, while higher conductivities are representative of finer sized particles such as salts and clays. The operating principle behind the MIP is based on heating the soil and/or water around a semi-permeable polymer membrane to 121^{o}C, which allows the VOCs to partition across this membrane. The MIP can be used in saturated or unsaturated soils, as water does not pass through the membrane. Using nitrogen as a carrier gas, which sweeps across the back of the membrane, the VOCs are carried to the installed detectors. It takes approximately 37 seconds for the nitrogen gas stream to travel through 100 feet of inert tubing and reach the detectors.

Three detectors: a photoionization detector (PID), a flame ionization detector (FID) and an electron capture detector (ECD), mounted on a laboratory grade Shimadzu Model 14A gas chromatograph (or most current applicable model recommended by MIP manufacturer) can be utilized to evaluate the MIP data. The output signal from the detectors is captured by a MIP data logging system installed on a MIP field computer or laptop computer. Conductivity, speed, detector data and temperature are displayed continuously in real time during each push of the probe. In addition, the data logs can be printed for display of analysis following the data logging run or exported to common spreadsheet software for further analysis.

The PID detector consists of a special ultra violet (UV) lamp mounted on a thermostat controlled, low volume, flow-through cell. The temperature is adjustable from ambient temperature to 250^{o}C. The 10.2 electron volt (eV) UV lamp emits energy at a wavelength of 120 nanometers, which is sufficient to ionize most aromatics (benzene, toluene, xylene, etc.) and many other molecules (H2S, hexane, ethanol) whose ionization potential is below 10.2 eV. The PID also emits a lower response for chlorinated compounds such as TCE and PCE. Methanol and water, which have ionization potentials greater than 10.2 eV, do not respond on the PID. Detection limits for aromatics are in the low picogram range. Since the PID is non-destructive, it is often run first in series with other detectors for multiple analyses from a single injection. Use of the PID is mandated in several EPA methods (8021, TO-14 etc.) because of its sensitivity and selectivity.

The most commonly used GC detector is the FID, which responds linearly from its minimum detectable quantity of about 100 picograms. The FID response is very stable from day to day, and is not susceptible to contamination from dirty samples or column bleed. This detector responds to any molecule with a carbon-hydrogen bond, but poorly to compounds such as H2S, CCl4, or NH3. The carrier gas effluent from the GC column is mixed with hydrogen and burned. Hydrogen supports a flame and ionizes the analyte molecules. A collector electrode attracts the negative ions to the electrometer amplifier, producing an analog signal, which is directed to the data system input.

The ECD detector consists of a sealed stainless steel cylinder containing radioactive Nickel-63 emits beta particles (electrons), which collide with the carrier gas molecules, ionizing them in the process. This forms a stable cloud of free electrons in the ECD cell. When electro-negative compounds (especially chlorinated, fluorinated, or brominated molecules such as carbon tetrachloride or TCE enter the cell, they immediately combine with free electrons, temporarily reducing the number remaining in the electron cloud. The detector electronics, which maintain a constant current of about 1 nanoampere through the electron cloud, are forced to pulse at a faster rate to compensate for the decreased number of free electrons. The pulse rate is converted to an analog output, which is transmitted to the data system.

Prior to logging each MIP location, performance tests with specific compounds are conducted to evaluate sensitivity of the particular probe, transfer line and detector suite to be used. Using neat benzene to test the PID, and neat TCE to test the ECD, the headspace vapors are introduced to the membrane of the probe for four seconds. These values are compared to predetermined values and recorded.

4. SOIL BORING AND SUBSURFACE SAMPLING PROCEDURES

Soil borings will be advanced to facilitate the collection of subsurface soil samples and the installation of monitoring wells. Subsurface soil samples will be used to develop an understanding of site-specific geologic conditions, and to document those conditions. Subsurface soil samples will also be submitted for laboratory analysis to evaluate soil quality and potential remedial activities, if necessary.

Depending on site-specific objectives and/or drilling conditions, soil borings may be advanced using direct-push, conventional hollow stem auger, or sonic drilling methods.

4.1 SOIL BORING DRILLING METHODS

4.1.1 Direct-Push

This drilling method is typically used to collect shallow overburden soils and create boreholes for temporary monitoring well installations. This method is advantageous in that it typically allows for the advancement of numerous borings in a relatively short period of time. The disadvantage of this method is that it is typically limited to shallow overburden soils (less than 50 feet below grade) which exhibit relatively low densities.

4.1.2 Conventional Hollow Stem Auger Method

Hollow stem auger drilling method is typically used to collect shallow and deeper overburden soils and create boreholes for permanent monitoring well installations. This method is advantageous in that it typically allows for the advancement of borings through denser soils, and when coupled with split spoon sampling conducted in accordance with ASTM Method D1586, can provide geotechnical information. The disadvantage of this method is that it is typically more time consuming to drill and sample, and to decontaminate the equipment than direct-push methods. In addition, this method can generate a high volume of soil cuttings that may require off-site disposal.

4.1.3 Sonic

A sonic drill rig looks and operates very much like any conventional top-drive rotary or auger rig. The sonic drilling system employs simultaneous high frequency vibration and low speed rotational motion along with down pressure to advance the cutting shoes of the drill string. This technique provides a continuous soil core and generates minimal cuttings. Due to the true continuous sampling of the system, accurate depictions of the stratigraphy and lithology of the overburden are obtained (minimal sloughing). Additionally, few cuttings are mobilized to the surface. Most of the formation material enters the core barrel, except small amounts, that are pushed into the borehole wall.

Steel drill casing and core barrel are connected to the head from the work platform/support truck and are then hoisted to vertical in the derrick. Tool joints are connected and broken by a hydraulic vise/wrench that is in the base of the derrick. The sonic head is able to pivot 90 degrees to facilitate connection of the drilling rods.

The sonic drilling system uses an override core barrel system. A 4 or 6-inch diameter 10 or 20-foot long core barrel is first advanced into the ground. This is followed by the override casing drilled to the same depth as the core barrel cutting shoe. The core barrel is then removed and cores are extruded into plastic sleeves. The core barrel is sent back down the hole where it is advanced another 10 or 20 feet followed again by the override casing. The outer casing prevents cross contamination and formation mixing and allows for a very controlled placement of wells.

4.1.4 Air Rotary

An air rotary drill rig looks and operates very much like any conventional top-drive rotary or auger rig. Rotary air drilling uses a rotating drill bit combined with circulating air that clears the drill cuttings, blowing them to the surface. The major advantage of rotary air drilling is that groundwater-bearing formations tend to be easily identified when encountered. The disadvantage of rotary air drilling is the potential for oxidation and volatilization of chemicals of concern. The introduction of high pressure air may also disturb flow paths of an aquifer.

4.1.5 Fluid Rotary

Rotary mud drilling works on the same principle as rotary air drilling except that liquid is used as a circulation medium. This method is advantageous in that the fluid (a thick mud) can support an open hole in soft and unconsolidated formations. The disadvantage of this method is the effect the drilling fluids have on the surrounding aquifer including possibly sorbing or chemically altering the groundwater properties and possible restriction or blocking of groundwater flow paths.

4.2 SURFACE/SHALLOW SOIL SAMPLING AND FIELD SCREENING

- Using a clean tool, remove and discard a thin layer of soil from the area. If vegetation is present, remove vegetation and root mat prior to sampling. Record the characteristics of the soils including: 2) soil type; 3) color; 4) moisture content; 5) texture; 6) grain size and shape; 7) consistency; 8) evidence of staining or other chemically-related impacts; and 9) any other relevant observations.

- To collect a discrete soil sample for VOC analysis, use a new disposable sampling spoon or its equivalent. Immediately place the VOC sample into the appropriate sample container. Soil samples for VOC analysis are not to be mixed or homogenized. Continue sampling for other parameters. Subsequent samples may be homogenized for the remaining, non-VOC analyses. Place the homogenized sample into appropriate sample containers.

- Label the sample bottle with the appropriate sample tag. Label the tag carefully and clearly using indelible ink. Complete appropriate sampling forms and record in the field log book. Pre-labeled bottles are handy, particularly if you are wearing gloves or if the weather is inclement.

- Record sample on the Chain of Custody. An example chain-of-custody is included in **Appendix A**.

- Place the sample containers on ice in a cooler to maintain the samples at approximately 4°C. Ship the cooler to the laboratory for analysis as soon as reasonable.

- Clearly mark each location from which you collected the sample. Use a stake or flag displaying the sample number. Mark location on a map and record measurements of distance the sample location is from site features.

- Samples for laboratory analysis will be submitted to a NELAP certified laboratory under standard chain-of-custody procedures. Analyses will be conducted using United States Environmental Protection Agency (USEPA) methodologies as specified in **Section 10**. Samples will be managed in accordance with the Quality Control Document (QCD).

4.3 SUBSURFACE SOIL SAMPLING AND FIELD SCREENING

- Soil samples will be collected continuously from the ground surface to the bottom of the borings.

- Soil samples retrieved from the borehole will be described for: 1) percent recovery; 2) soil type; 3) color; 4) moisture content; 5) texture; 6) grain size and shape; 7) consistency; 8) evidence of staining or other chemically-related impacts; and 9) any other relevant observations. In addition, soil will be screened with a PID to allow evaluation of the bulk volatile organic concentration of each soil sample.

- Soils will be described in accordance with the Modified Wentworth classification system. This descriptive information will be recorded on a soil boring log form. An example of the typical soil boring log form is provided in **Appendix A**.

- If identified in the RIWP, a PID equipped with a 10.6 eV lamp will be used to screen the length of the soil core. Samples for headspace screening will be collected. A representative portion of each soil sample will be placed in a re-sealable plastic (e.g., Ziploc®) bag filled approximately half full. The bag will be labeled with the boring number and interval sampled. After allowing the bagged soil to warm, the tip of the sample probe attached to the PID will be inserted into the bag to measure the headspace for organic vapors.
- The bagged soil will also undergo an ultraviolet (UV) fluorescence examination using an ultraviolet lamp. The bags will be manipulated to move the bagged soil and expose it to the light. A positive UV fluorescence will be evaluated to distinguish between potential NAPL and material (historical backfill may also fluoresce) in soil that fluoresces.
- Sample intervals will be selected for soil sample collection based on visual, olfactory, UV fluorescence examination observations and/or PID screening.
- To collect a discrete soil sample for VOC analysis, use a new disposable sampling spoon or its equivalent. Immediately place the VOC sample into the appropriate sample container. Soil samples for VOC analysis are not to be mixed or homogenized. Continue sampling for other parameters. Subsequent samples may be homogenized for the remaining, non-VOC analyses. Place the homogenized sample into appropriate sample containers.
- Place the sample containers on ice in a cooler to maintain the samples at approximately 4°C. Ship the cooler to the laboratory for analysis as soon as reasonable.
- Record sample on the Chain of Custody. An example chain-of-custody is included in **Appendix A**.
- Samples for laboratory analysis will be submitted to a NYSDOH ELAP certified laboratory under standard chain-of-custody procedures. Analyses will be conducted using USEPA methodologies as specified in **Section 10**. Samples will be managed in accordance with the QCD.

4.4 BOREHOLE ABANDONMENT

Boreholes will be abandoned with a Portland cement or a Portland cement and bentonite grout mix.

5. SURFACE WATER AND SEDIMENT SAMPLING PROCEDURES

The following procedures will be followed when collecting surface water samples:

- Water depths will be obtained at each surface water sample location.
- Surface water samples will be collected from the most downstream location proceeding to the most upstream location.
- A new pair of clean disposable latex or nitrile gloves will be donned at each sampling location.
- The water column samples will be collected facing upstream in flowing surface water systems.
- For water depths less than two feet, a surface water sample will be collected by submerging a sample bottle below the water surface taking care not to overfill the sample bottle and expelling the sample preservatives.
- For water depths between two and four feet, a water column sample will be collected using a Kemmerer® sampler, or equivalent, submerged below the water surface to an approximate depth of 60% of the total depth. The surface water sample will then be transferred from the Kemmerer® sampler, or equivalent sampler, to the laboratory sample containers.

The following procedures will be followed when collecting sediment samples:

- Sediment sampling may be performed by boat or wading. For each core collected, observations of sediment type will be recorded in field logs.

- Sediment samples will be collected from the most downstream location proceeding to the most upstream location.
- Sediment samples will be collected from 0-6 inch in areas where sediment depth allows.
- Sediment samples will be collected using push core techniques or a technique that is appropriate for the site-specific sediment type.
- Push core sampling techniques employ manual penetration of sediment using a sampling device that contains a polycarbonate tube to collect the sediment core. The device includes a check valve to allow air to escape during sediment penetration and develops a vacuum to retain the core as it is recovered. It is anticipated that 2.75 or three-inch diameter polycarbonate tubes will be used.
- A Ponar dredge may be used to collect sediment samples from areas that contain coarse sediment.
- An auger and/or stainless steel shovel may be used in areas where the coring device or dredge will not penetrate (e.g., substrate primarily of rock and cobble) and the water column is thick enough to access the sediment.
- Upon retrieval, sediment cores will be processed in the field. Samples will be obtained from the inner portion of the core, avoiding sediment that has contacted the tube or sampling device, when possible.
- First, volatile organic compound samples will be obtained from the center of the core and placed in sample containers without headspace. The remainder of the interval will be extruded from the core, removing the outer portion of the core from the sample. The sample will be homogenized in a stainless-steel mixing bowl or dedicated/disposable aluminum pan and distributed to the appropriate sample jars. Subsequent depth intervals will be processed in the same manner for each interval collected.
- Non-dedicated equipment will be decontaminated prior to use at each location.

6. FIELD EQUIPMENT DECONTAMINATION AND MANAGEMENT OF INVESTIGATION-DERIVED WASTE

6.1 DECONTAMINATION AREA

A temporary decontamination area lined with polyethylene sheeting will be constructed on site for use during decontamination of the drilling equipment, if a suitable decontamination area does not exist at the Facility. Water collected from decontamination activities will be collected in 55-gallon drums and managed as described in **Section 8**.

6.2 EQUIPMENT DECONTAMINATION

The following procedures will be used to decontaminate equipment used during the RI activities.

- Drilling equipment such as augers, bits, rods, tools, split-spoon samplers, and tremie pipes will be cleaned with a high-pressure, hot water pressure washing unit before beginning work, following the completion of borings and wells, and prior to exiting the site.
- Tools, drill rods, and augers will be placed on polyethylene plastic sheets following pressure washing. Direct contact with the ground will be avoided.
- Augers, rods, and tools will be decontaminated between each drilling location according to the above procedures.
- The back of the drill rig and tools, augers, and rods will be decontaminated at the completion of the work and prior to leaving the site.

6.2.1 Sampling Equipment Decontamination

Prior to sampling, the non-dedicated sampling equipment (e.g., bowls, spoons, interface probes) will be washed with potable water and a phosphate-free detergent (e.g., Citra Solv, Simple Green®). Decontamination may take place at the sampling location as long as all liquids are contained in pails, buckets, etc.

The sampling equipment will then be rinsed with potable water. Equipment can be placed on polyethylene sheets or aluminum foil, if necessary. At no time will washed equipment be placed directly on the ground.

Equipment will be wrapped in aluminum foil for storage or transportation from the designated decontamination area to the sampling location.

6.3 MANAGEMENT OF INVESTIGATION-DERIVED WASTE

IDW produced during this project include soil, groundwater, decontamination water, personal protective equipment, and dedicated sampling equipment that may be potentially contaminated. Investigation derived wastes will be handled and disposed of in accordance with all applicable state and federal regulations. Disposal options will be evaluated after characterization of the wastes.

The following paragraphs describe procedures to be followed for handling each waste material.

6.3.1 Decontamination Fluids

Hot water pressure wash and decontamination fluids will be collected in 55-gallon drums. The drums will be labeled. The drums will be temporarily staged on-Site pending characterization and disposal.

6.3.2 Drilling Cuttings

Drilling cuttings will be contained in 55-gallon drums. The drums will be labeled. The drums will be temporarily staged on-Site pending characterization and disposal.

6.3.3 Sampling Equipment and Personal Protective Equipment (PPE)

Dedicated sampling equipment (e.g., direct-push sample liners, disposable polyethylene bailer and polypropylene line) and PPE will be managed and disposed of as solid waste.

7. FIELD INSTRUMENTS AND CALIBRATION

Field analytical equipment will be calibrated prior to each daily sampling, or more frequently if required. The calibration procedures will conform to manufacturer's standard instructions. Calibration will be conducted in accordance with manufacturer's instructions such that the equipment is functioning within the allowable tolerances established by the manufacturer and required by the project. Instrument calibrations will be documented in the project field book. Records of instrument calibration will be maintained by the Field Team Leader. Copies of the instrument manuals will be maintained on site by the Field Team Leader. All changes to instrumentation will be noted in the field log book.

The following field instruments will be used during the investigation:

- multi-gas meter
- particulate meter
- PID with 10.6 eV lamp
- pH probe
- specific conductivity probe
- temperature probe
- ORP probe
- dissolved oxygen probe
- turbidity probe

8. ANALYTICAL PROGRAM

8.1 ENVIRONMENTAL SAMPLE ANALYSES

The laboratory samples for each media and the chemical analyses to be performed, including the quality assurance/quality control (QA/QC) samples are summarized in Table 1 of the SRI Work Plan. A more detailed discussion of the analytical methods and procedures is provided in the QCD.

8.2 IDW CHARACTERIZATION

Samples of IDW generated during the investigation will be collected as needed and characterized for disposal based on the requirements of the designated disposal facility.

8.3 FIELD QUALITY CONTROL SAMPLES

Field quality control samples will be collected and analyzed to document the accuracy and precision of the samples. Field quality control samples will be analyzed for parameters as specified in Table 1 of the SRI Work Plan and as specified in the QCD. The quality control samples are described as follows:

- Trip Blank: One trip blank will accompany each shipment of samples for VOC analysis sent to the laboratory. The trip blank will be analyzed to test for any contaminants introduced while samples are being stored or transported to the laboratory. The trip blanks will be analyzed for VOCs only.
- Field Blank: The purpose of the equipment blank is to detect any contamination from sampling equipment, cross-contamination from previously sampled locations, and contamination caused by conditions at sampling locations (e.g., airborne contaminants).
- Field Duplicate: Field duplicates are collected to determine the precision of the soil samples collected. This is achieved by compositing soil and splitting it evenly between separate sample jars. The field duplicate is not identified by the location from which it was collected on the chain-of-custody but should be identified in a field book for later reference during the validation process.
- Matrix Spike and Matrix Spike Duplicate: These samples are laboratory quality control samples and will be completed as part of the laboratory analytical batch quality control. These samples will be collected in the same manner as the field duplicates. Both the matrix spike and matrix spike duplicate will be collected at the same sample location.

8.4 SAMPLE LOCATION NUMBERING SYSTEM

Field duplicate samples will be assigned identifiers that do not allow the laboratory to distinguish them as field duplicates. Each sample container will be labeled prior to packing for shipment. The sample identifier, site name, date and time of sampling, and analytical parameters will be written on the label in waterproof ink and recorded in the field book.

8.5 CHAIN-OF-CUSTODY

For aqueous and solid samples, chain-of-custody records will be kept starting at the time that sample containers are placed in the coolers for transportation to the laboratory. One completed chain-of-custody record must be kept with each sample cooler at all times.

Example chain-of-custody forms are provided in **Appendix A**. The laboratory will provide chain-of-custody forms with the sample containers.

The following measures will be taken when completing a chain-of-custody record:

- Chain-of-custody forms will be completed in waterproof, non-erasable ink.

- Chain-of-custody forms will be completed neatly using printed text. If a simple mistake is made, the error will be lined out with a single line and initialed and dated.
- Each separate sample entry will be unique.
- The use of "Ditto" or quotation marks to indicate repetitive information in columnar entries should be avoided. If numerous repetitive entries must be made in the same column, a continuous vertical arrow will be used between the first entry and the next different entry.
- When more than one chain-of-custody form is used for a single shipment, each form will be consecutively numbered using the "Page ___ of ___" format.
- If necessary, additional instructions will be placed directly onto the chain-of-custody form.
- Acronyms used on a chain-of-custody form will be defined.

More detailed information pertaining to completion of the chain-of-custody form is provided in the QCD.

Appendix A

Logs, Forms, Records

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING

Client:
Proj. Loc:

File No.:

Page **of**
Location:

Start Date:
End Date:

Boring Company:
Foreman:
Drill Rig:
Geologist:

Screen =
Riser ☐

\ **Grout**
▨ **Sand Pack**
■ **Bentonite**

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing	
									PID (ppm)	UV

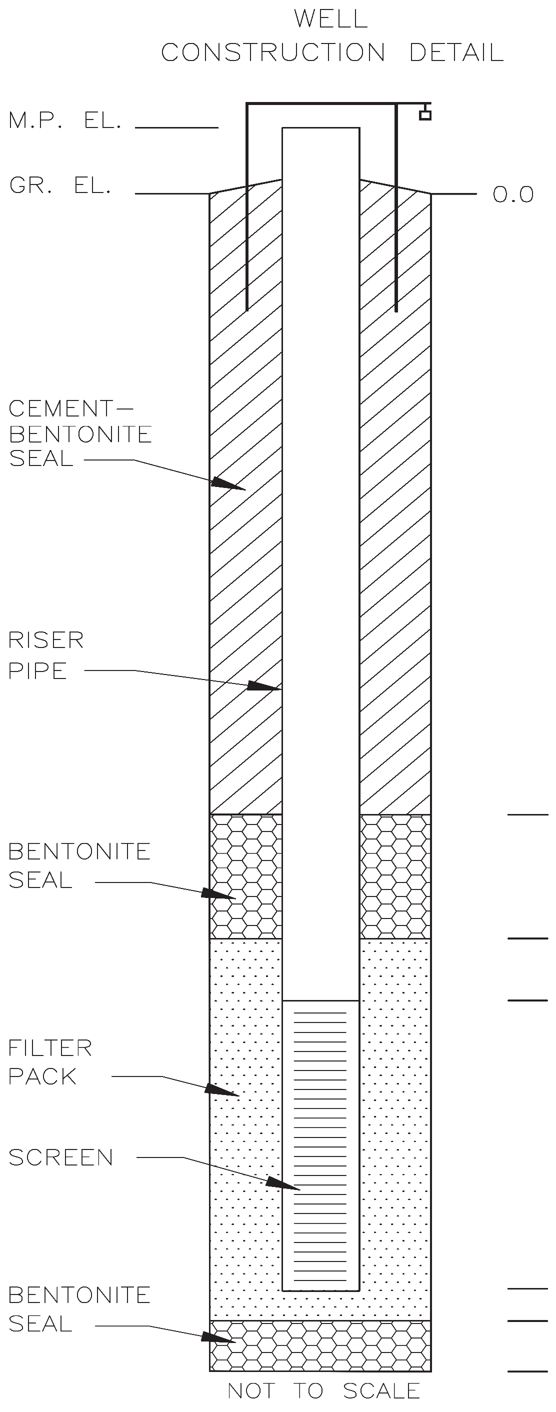
Notes:

WELL COMPLETION LOG

Well ID: ______

Project: ______
Location: ______
Project No.: ______

Client: ______
Date Drilled: ______
Date Developed: ______



Inspection Notes:

Inspector: ______
Drilling Contractor: ______
Type of Well: Environmental Monitoring Well

Static Water Level (ft bmp): ______ Date: ______
Measuring Point: Top of PVC
Total Depth of Well (ft bmp): ______

Drilling Method - Overburden:

Type: HSA Diameter: 4 1/4 " ID
Casing: NA

Sampling Method - Overburden:

Type: Split-Spoon Diameter: 2" OD
Weight: 140 # Fall: 30"
Interval: ______

Riser Pipe Left in Place:

Material: Sch 40 PVC Diameter: 2" ID
Length: ______ Joint Type Flush Thread

Screen:

Material: Sch 40 PVC Diameter: 2" ID
Slot Size: ______ Joint Type Flush Thread

Filter Pack:

Type: Sand Grade: ______
Interval: ______

Seal(s):

Type: Cement-Bentonite Interval: ______
Type: Bentonite Pellets Interval: ______
Type: Bentonite Pellets Interval: ______

Locking Casing: ☒ Yes ☐ No

O'BRIEN & GERE
ENGINEERS, INC.

Form 002

O'Brien & Gere Engineers, Inc. Low Flow Ground Water Sampling Log

Date
Personnel
Weather
Site Name
Evacuation Method
Well #
Site Location
Sampling Method
Project #

Well information:

Depth of Well * ft.
Depth to Water * ft.
Length of Water Column ft.

* Measurements taken from
☐ Top of Well Casing
☐ Top of Protective Casing
☐ (Other, Specify)

Start Purge Time:

Elapsed Time ( )	**Depth To Water ( )**	**Temperature ( )**	**pH**	**Conductivity ( )**	**Oxidation Reduction Potential**	**Dissolved Oxygen (mg/l)**	**Turbidity (NTU)**	**Flow Rate (ml/min).**

End Purge Time:

Desity Measurement

Water sample:

Time collected:

Total volume of purged water removed:

Physical appearance at start
Color
Odor
Sheen/Free Product

Physical appearance at sampling
Color
Odor
Sheen/Free Product

Field Test Results:
Dissolved ferrous iron:
Dissolved total iron:
Dissolved total manganese:

Analytical Parameters:

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH

O'BRIEN & GERE

Monitoring Well Development Log

Date: ____________
Personnel: ____________
Weather: ____________
Site Name: ____________
Pump/Controller ID#: ____________
Well #: ____________
Site Location: ____________
Purging Method: ____________
Project #: ____________
Water Quality Equip. Used (include ID#):

Well information:

* Measurements taken from
☐ Top of Well Casing
☐ Top of Protective Casing
☐ (Other, Specify)

Initial Depth of Well: * ________ ft.
Initial Depth to Water: * ________ ft.
Water Column Length: ________ ft.
Well Volume: ________ gal.
Final Depth of Well: * ________ ft.
Final Depth to Water: * ________ ft.
Volumes to be purged: ≥5

Start Purge Time: ____________

Elapsed Time (min)	Depth To Water (ft bmp)	Temperature (Celsius)	pH (SU)	Specific Conductivity (_______) *indicate units*	ORP (mV)	Dissolved Oxygen (mg/l)	Turbidity (NTU)	Flow Rate (gal/min)

End Purge Time: ____________

Total volume of purged water removed: ____________

Physical appearance at start:
Color: ____________
Odor: ____________
Sheen/Free Product: ____________

Physical appearance at end:
Color: ____________
Odor: ____________
Sheen/Free Product: ____________

Noles:

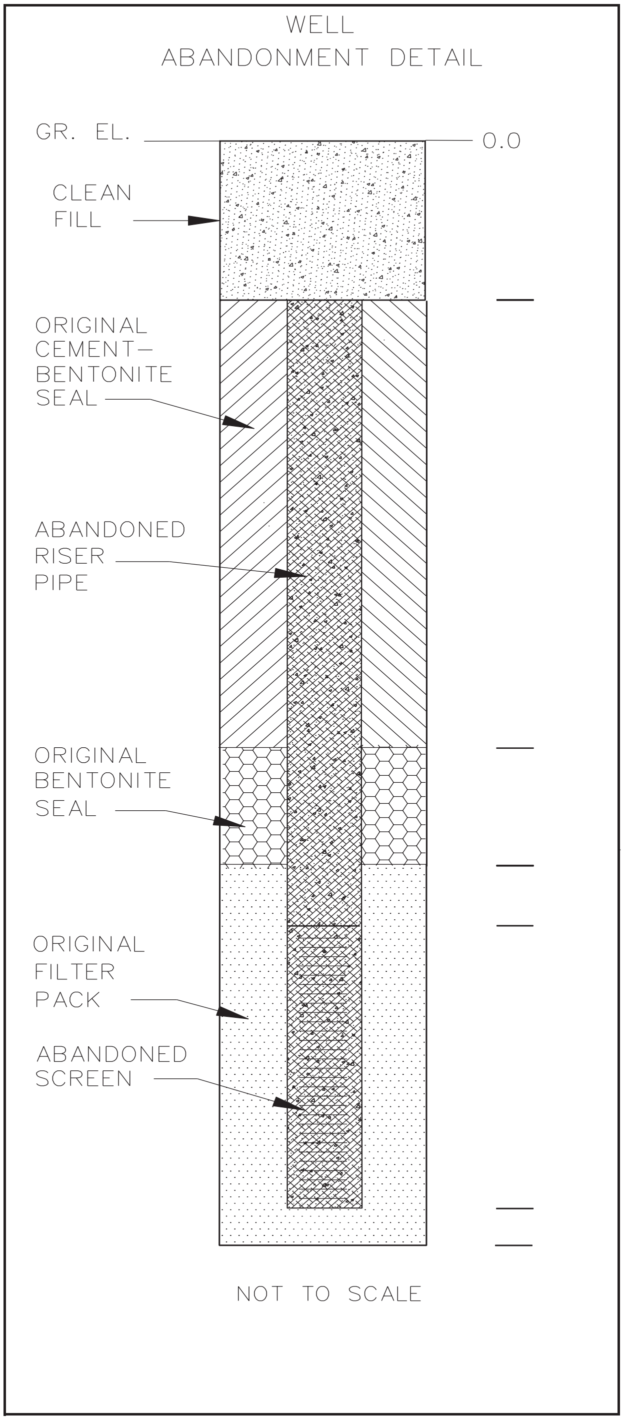
Geologist Signature: ____________

WELL ABANDONMENT LOG

Well ID:

Project:
Location:
Project No.:

Client:
Date Installed:
Date Abandoned:



Inspection Notes:

Inspector:
Drilling Contractor:
Type of Well:

Static Water Level: Date:
Measured Total Depth of Well: Date:
Measuring Point: Elev:
Height of Stickup (ft):

Abandonment Method:

Type:
Date of Casing Removal:

Drilling Method:

Type: Diameter:
Casing:

Seal(s):

Type: Interval:
Type: Interval:
Volume:

Riser Pipe Left in Place:

Material: Diameter:
Interval:

Screen Material Left In Place:

Material: Diameter:
Interval:

Notes:

1. Riser pipe removed to a depth of 2.8 feet below grade.
2. Steel protective casing and cement collar removed.
3. Ferrous metal marker placed at a depth of 2.0 feet below grade.
4. "NA" indicates not applicable.
5. "ft bg" indicates feet below grade.
6. All Elevations in feet above mean sea level.

O'BRIEN & GERE

Chain of Custody/Analysis Report

Page 1 of 1

Sampler(s): (Signature)

Contact:
Address:
Phone:
Email:
Project:
Location:

Laboratory:
Phone:

Holding Time:
Package Requirement:
EDD Format:

Lab Use Only
Project Number:
Job Number:
Lab ID:

	Sample Identification									**Analysis Required**								
										Preservatives: (see key at bottom)								
										0	0	0	0	0				
	Unique Field Sample ID (sys_sample_code)	**Sample Location**	**Date**	**Time**	**Sample Type (see key)**	**Sample Matrix (see key)**	**Number of Containers**	Grab (G) or Composite (C)	Field Filtered? (Y / N)	TCL VOC plus TICs (8260)	TCL SVOC plus TICs (8270)	TAL Metals	Pesticides	PCBs	Herbicides			**Lab Sample ID**
								Reporting Units										
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		

Special Instructions: Per QCD

Relinquished by: of:	Date Time	Received by: of:	Date Time	Condition:	Other Comments or Notes regarding condition of samples as received:
Relinquished by: of:	Date Time	Received by: of:	Date Time	Custody Seals intact?	
Use this space if shipped via courier (e.g., Fed Ex) Relinquished by: of:	Date Time	Courier Name:	Date Time	Cooler Temperature:	

Sample Type: N = Normal env. sample, FD = field duplicate, EB = Equipment Blank, TB = Trip Blank, MS = Lab Matrix Spike, Other (Specify):
Sample Matrix: SE = Sediment, SO = Soil, WG = Ground Water, WS = Surface Water, WW = Waste Water, WP = Potable Water, AA = Ambient Air, WQ = Quality Control, Other (Specify):
Preservatives Code: 0 = none, 1 = HCL, 2 = HNO3, 3 = H2SO4, 4 = NaOH, 5 = Zn Acetate, 6 = MeOH, 7 = NaHSO4, 8 = other

Appendix B

Quality Control Document

QUALITY CONTROL DOCUMENT

Remedial Investigation
Former Accurate Die Casting Site
Fayetteville, New York
Site No. C734052

FOUBU Environmental Services, LLC
Syracuse, New York

October 2019

OBG
Part of Ramboll

TABLE OF CONTENTS

QCD DOCUMENT DISTRIBUTION

1	Michael Belveg – NYSDEC
2	Eamonn O’Neil - NYSDOH
3	Deborah Wright – OBG
4	James Cavotta – FOUBU Environmental Services, Inc.
5	Karen Storne – OBG
6	Laboratory Representative – To be determined

LIST OF TABLES

1. INTRODUCTION

This Quality Control Document (QCD) has been developed by OBG, part of Ramboll (OBG) on behalf of FOUBU Environmental Services, LLC (FOUBU) for the Remedial Investigation (RI) at the Former Accurate Die Casting Site (the Site) located at 547 East Genesee Street in Fayetteville, New York. The RI is being conducted under the New York State Brownfield Cleanup Program (BCP) assigned as BCP Site #C734052. This document is provided as part of the RI Work Plan (O'Brien & Gere. 2018).

The primary objective of the RI activities is to collect soil samples to further assess the concentration of target constituents at the Site.

This QCD presents the investigation objectives and quality assurance/quality control (QA/QC) activities and associated work efforts associated with sampling and analysis of environmental samples at the Site. The procedures in this QCD are designed to be followed by personnel participating in the field investigation and in the laboratory analyses of environmental samples and the data validation performed on the samples.

2. PROJECT BACKGROUND AND DESCRIPTION

This section presents the project site location, description and brief site history.

2.1 PROJECT BACKGROUND

2.1.1 Site Description

The Site is approximately 33 acres in size and located at 547 East Genesee Street in Fayetteville, New York. The Site is bordered to the west by a former railroad bed that is no longer in use, and residential housing is located west of the former railroad bed. Residential housing also borders the Site to the east while Bishop Brook and vacant wooded land border the Site to the north.

The former manufacturing building is approximately 130,000 square feet in size and occupies the southern side of the site. This building is primarily a single story, high bay manufacturing space with several warehouse/storage areas, and 8,500 square feet of office space. Parking lots are located to the east and north of the building. The remainder of the property is generally undeveloped and covered with grass, trees and other native vegetation.

2.1.2 Site History

Accurate Die Casting and predecessor owners and operators of the facility conducted manufacturing operations at the Site from approximately 1950 until 1988 when Accurate Die Casting abandoned the facility. Accurate Die Casting and the predecessor owners and operators used the facility for die and casting operations to fabricate metal products for the automobile industry and other industries.

ITT Commercial Finance Corporation, a former subsidiary of ITT Industries, now ITT Corporation (ITT), acquired the Site in 1988 as a result of foreclosure proceedings. ITT never conducted manufacturing operations at the Site and did not own or operate the facility at any time that a disposal or release of hazardous substances occurred at the Site.

The Site is currently vacant.

2.2 PROJECT SCOPE

Several investigations and remedial actions have been completed on this Site. In addition, the on-site buildings were demolished. The primary objective of this RI is to collect soil samples to address data gaps for the purpose of identifying impacted areas that need to be addressed as part of the redevelopment program. These data gaps include:

- Evaluation of soil quality adjacent to storm sewer lines

- Evaluation of soil quality adjacent to historical degreasers and associated equipment
- Evaluation of soil quality adjacent to historical USTs
- Evaluation of surface water and sediment quality in Bishop Brook.

Sampling locations are presented in the Work Plan**.**

2.2.1 Laboratory Analysis

The soil, sediment, and surface samples will be submitted to and environmental laboratory that will be determined at a later date. The National Environmental Laboratory Accreditation Program) (NELAP) certified laboratory number will be provided for the analyses listed in **Table 1-1**.

Soil, sediment, and surface water samples will be shipped from the field location to the laboratory and analyzed for the methods listed in **Table 1-1**.

Table 1-1 presents the analytical methods, sample collection containers and volumes, preservation, holding times and associated quality control sample frequency.

The target analytes are listed in **Table 2-1, Table 2-2, Table 2-3, Table 2-4, and Table 2-5**.

The QC requirements and corrective actions listed in **Tables 3-1** through **3-5**, which supplement the method requirements, are to be followed by the laboratory.

The laboratory will perform the analyses for this project and will be responsible for the quality control of the data reported for this project. Samples will not be shipped to another laboratory without permission of the OBG Project Manager.

The laboratory will evaluate non-detected results for soils to the method detection limits (MDLs) and report the non-detected results referencing the reporting limit (RL). For the remaining data, results that are less than the RLs but greater than or equal to the MDLs will be reported using the “J” flag. For example, for a target analyte with a RL of 10 µg/L and an MDL of 2 µg/L, a non-detected result is reported as 10 µg/L "U", indicating that a concentration greater than or equal to the MDL was not detected by the laboratory. A detected concentration of 6 µg/L is reported as 6 "J" and a detected concentration of 23 µg/L is reported without a laboratory flag. The laboratory must include both RLs and MDLs on the sample result sheet reported to the data user.

Where applicable, the RLs and MDLs associated with target analytes listed in **Tables 2-1, 2-1a, 2-1b, 2-2, 2-2a, 2-2b, 2-3, 2-3a, 2-3b, 2-4, 2-4a, 2-4b, and 2-5**.

The laboratory will provide sample containers for the investigation, prepared in accordance with method requirements.

Communications with OBG will be documented by the laboratory in the data packages.

Data packages for the analytical data will be reported in New York State Department of Environmental Conservation (NYSDEC) Analytical Services Protocol (ASP) Category B deliverable format, including the forms described in the NYSDEC guidance, in electronic data format.

2.2.2 Data Validation

Following completion of investigation activities and receipt of final laboratory data, data validation will be performed in accordance with this QCD applying current NYSDEC Data Usability Summary Report (DUSR) guidance, USEPA Region II data validation guidance and professional judgment.

2.2.3 Documentation

Laboratory analytical data will be provided in electronic data deliverable (EDD) format, in accordance with the laboratory’s internal protocol for deliverable requirements for electronic data.

Data will be managed in a relational database management system (DBMS). Laboratory analytical data will be provided in EDD format for direct upload into the DBMS. Associated data validation qualifiers will be manually entered into the DBMS.

The RI Report will include the findings of the RI activities at the Site.

Records will be incorporated into the final project files for the samples. The field logs, data packages, and records will be included in the project files, which will be archived by OBG for a period of ten years.

3. DATA QUALITY OBJECTIVES AND CRITERIA

The Data Quality Objective (DQO) Process, as it has been applied to this RI, comprises the following steps, consistent with guidance presented in the United States Environmental Protection Agency (USEPA) *Guidance for the Data Quality Objectives Process (EPA QA/G-4)*, February 2006. The DQO process establishes the acceptance criteria, which serve as the basis for collecting data of sufficient quality and quantity to support the goals of the project activities.

3.1 DQO PROCESS

The process consists of the following seven iterative steps for the DQO process:

1. **Step 1** - State the Problem – Additional investigations are required to evaluate the extent of compounds of concern (COCs) in soil and to address data gaps at the Site for as part of the redevelopment program.

2. **Step 2** - Identify the Goal of the Study – To collect additional data to evaluate the extent of COCs in soil. Site activities include evaluation of lead containing soils on the Eastern Parcel and Western Parcel, environmental sampling on the Western Parcel and evaluation of the extent of the volatile organic compound (VOC) plume within the bedrock on the Site.

3. **Step 3** - Identify information inputs (the data types that will be required before project decisions can be made) - The primary required data types will be analytical results from soil from the Site.

4. **Step 4** - Define the Boundaries of the Study (the spatial and temporal features pertinent for decision making). - The sampling will be completed at the Former Accurate Die Casting Site located at 547 East Genesee Street in Fayetteville, New York. The Site is 33 acres in size including a manufacturing building of approximately 130,000 square feet.

5. **Step 5** - Develop the analytic approach (how will the study results will be analyzed, and conclusions made from the data) - Based on the results of previous investigations, additional RI activities are necessary to fill the data gaps that remain to fully characterize the Site.

6. **Step 6** - Specify performance or acceptance criteria (performance or acceptance criteria that the collected data will need to achieve) - Data must be of known quality relative to its intended purpose. Completeness is the measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained under normal conditions. If the completeness objective of 95 percent is not met, additional sampling may be justified.

7. **Step 7** - Develop the plan for obtaining data- The soil samples will be collected and analyzed as described in the Work Plan and this QCD.

4. PROJECT ORGANIZATION AND RESPONSIBILITY

OBG will be responsible for project management, sample collection, data validation and data reporting. The laboratory, which will be determined at a later date, will perform sample analyses for soil. Responsibilities for key project team members are summarized below.

4.1 REGULATORY AGENCY AND CLIENT KEY PERSONNEL

4.1.1 NYSDEC Project Manager

Mr. Michael Belveg is the NYSDEC Project Manager for the Site. As such, he will be responsible for reviewing submissions and overseeing project activities on behalf of NYSDEC.

4.1.2 NYSDOH Project Manager

Mr. Eamonn O'Neil is the NYSDOH Project Manager for the Site. As such, he will be responsible for reviewing submissions and overseeing project activities on behalf of NYSDOH.

4.1.3 FOUBU Environmental Services, LLC Project Manager

Mr. James Cavotta is the FOUBU Environmental Services, LLC Project Manager for the Site. As such, he will be responsible for reviewing submissions and overseeing project activities.

4.2 OBG KEY PERSONNEL

4.2.1 OBG Project Officer

Douglas M. Crawford, P.E., is the Project Officer for the Remedial Investigation activities. Brian White, P.E. will serve as the Project Officer for construction-related activities. The Project Officer is responsible for the overall administration and technical execution of the project. The Project Officer is further responsible for the acquisition and delegation of resources necessary for project completion and HASP implementation.

4.2.2 OBG Project Manager

Mr. David J. Carnevale is the OBG Project Manager and is responsible for implementing the project and has the authority to commit the resources necessary to meet project objectives and requirements. His primary function is to meet the technical, financial, and scheduling objectives and will provide direction to OBG Project Team.

4.2.3 OBG QA Officer

Ms. Karen Storne is the OBG QA Officer (QAO) for this project. She will manage and be responsible for QA/QC review of data generated during the sample collection activities. Data processing and validation will be overseen and reviewed by the OBG QAO. If QA problems or deficiencies requiring special action are identified, the OBG QAO, Project Manager, and Project Officer will determine the appropriate corrective action. The QAO will then be responsible for follow-up and oversight of corrective action implementation, to the satisfaction of FOUBU and the NYSDEC.

The QAO may perform data validation activities or designate additional data validators to work under her direction. Data validators will be responsible for review of laboratory data for compliance with the project-specific DQOs and for such parameters as precision, accuracy, representativeness, comparability, sensitivity and completeness. Data validators will notify the QAO of any major QA deficiencies.

4.2.4 OBG Field Investigation Manager

The OBG Field Investigation Manager will be responsible for directing and coordinating the day-to-day activities while field activities are underway.

The Field Investigation Manager's responsibilities include:

- Communication and coordination with the laboratory prior to sample collection and during shipment of sample coolers to the laboratory;

- Development and implementation of field-related sampling plans and schedule;
- Coordination and management of field staff;
- Supervise or act as the field sample custodian;
- Implement QC for technical data, including field measurements;
- Adhere to work schedules;
- Coordinate and oversee technical efforts of subcontractors assisting the field team;
- Identify problems at the field team level and resolve difficulties; and
- Implement and document corrective action procedures.

4.2.5 Field Sampling Personnel

OBG field sampling personnel will be responsible for collection, packaging, preservation, and shipping of environmental samples in accordance with the QCD and applicable NYSDEC requirements. Field sampling personnel will also collect field data and monitor Site health and safety.

4.2.6 Health and Safety Coordinator

The OBG Health & Safety Coordinator will be responsible for monitoring Site health and safety during the sampling events.

4.3 LABORATORY MANAGEMENT

The laboratory, which will be determined at a later date, will analyze soil samples submitted during the sampling activities. The laboratory shipping addresses and NELAP certification number will be provided.

4.3.1 Laboratory Project Manager

The laboratory Project Manager will be responsible for:

- Coordinating laboratory analysis for the laboratory;
- Supervising in-house chain-of-custody documents;
- Scheduling sample analysis;
- Overseeing data review; and
- Overseeing preparation of analytical reports.

It will be the responsibility of the Laboratory Project Manager to approve final analytical reports prior to submission to OBG.

5. CHAIN-OF-CUSTODY AND SAMPLING HANDLING PROCEDURES

5.1 FIELD AND LABORATORY CUSTODY PROCEDURES

Chain-of-custody procedures will be instituted and followed throughout the investigation. These procedures include field custody, laboratory custody, and evidence files. Samples are physical evidence and will be handled according to strict chain-of-custody protocols. The OBG Project Manager must be prepared to produce documentation that traces the samples from the field to the laboratory and through analysis. USEPA has defined custody of evidence as follows:

- In actual possession;
- In view after being in physical possession;
- In a locked laboratory; or
- In a secure, restricted area.

5.2 SAMPLE CONTAINERS AND FIELD STORAGE

The laboratory will supply appropriate sample containers for soil samples in coolers as well as preservatives (as presented in **Table 1-1**). QA measures for these samples will begin with the sample containers; pre-cleaned containers will be purchased from a USEPA-certified manufacturer (I-Chem 200 or equivalent).

Immediately after collection, samples will be transferred to properly labeled sample containers, and properly preserved. **Table 1-1** lists the proper sample container, sample volumes, preservation, and holding times.

Samples requiring refrigeration for preservation will be promptly transferred to coolers packed with wet ice and/or ice packs. If field storage is required, the samples will be stored in a secured storage facility and a cooler temperature of ≤6 °C will be maintained.

5.3 FIELD DOCUMENTATION

The field sampler is personally responsible for the care and custody of the sample until transferred.

A field logbook, sampling logs and /or electronic media will be used to note information regarding collection of samples and any observations. All entries will be signed and dated. Field logbooks will be waterproof and bound. The logbook will be dedicated to the project and pages will not be removed. Corrections will be made by drawing a single line through the incorrect data and initialing and dating the correction that was made to the side of the error. An initialed diagonal line will be used to indicate the end of an entry or the end of the day's activities. Field logs will be filled out completely with the appropriate information. If the information is not applicable NA should be used.

The following information will be recorded in the field logbook and/or sampling forms by the field sampling team:

- Name and title of author, date, and time of site entry, and physical/environmental conditions during the field activity;
- Meteorological data;
- Project number, client name, and Site name;
- Name and title of field crew members;
- Sample media;
- Sample collection method, including equipment utilized;
- Number and volume of samples collected;
- Description of sample locations;
- Date and start and end time of sample collection;
- Diagrams of sampling process;
- Sample and QA/QC identification numbers;
- Sample distribution;
- Field observations;

- Field measurements made and equipment used;
- Calculations, results, and calibration data for field sampling and measurements;
- References for maps and photographs of the sample location;
- Bottle lot numbers; and
- Dates and method of sample shipments.

A completed sample identification label or tag that will be sequentially numbered, will be attached to each investigative or QC sample and the sample placed in a shipping container. The identification on the label/tag must be sufficient to enable cross-reference with the logbook. The sample label/tag will be recorded using waterproof, non-erasable ink and will be attached to the sample container using adhesive.

The sample labels/tags will contain the following information:

- Sample location/number identification;
- Site/Project name;
- Date and time of sample collection;
- Designation of the sample as a grab or composite;
- Type of sample matrix;
- Name/initials of the sampler;
- Whether the sample is preserved or unpreserved;
- Space for laboratory sample number (only on the sample tag); and
- General types of analysis to be performed.

5.4 FIELD CUSTODY PROCEDURES AND DOCUMENTATION

For soil samples, chain-of-custody records will be kept starting at the time that sample containers are placed in the coolers for transportation to the laboratory. One completed chain-of-custody record must be kept with each sample cooler at all times. Example chain-of-custody forms are provided in the laboratory's Quality Assurance Manual (QAM).

The following measures will be taken when completing a chain-of-custody record:

- Chain-of-custody forms will be completed in waterproof, non-erasable ink;
- Chain-of-custody forms will be completed neatly using printed text. If a simple mistake is made, the error will be lined out with a single line and initialed and dated;
- Each separate sample entry will be sequentially numbered;
- The use of "Ditto" or quotation marks to indicate repetitive information in columnar entries should be avoided. If numerous repetitive entries must be made in the same column, a continuous vertical arrow will be used between the first entry and the next different entry;
- When more than one chain-of-custody form is used for a single shipment, each form will be consecutively numbered using the "Page ___ of ___" format;
- If necessary, additional instructions will be placed directly onto the chain-of-custody form; and
- Acronyms used on a chain-of-custody form will be defined.

For soil samples, the chain-of-custody form will contain the following information:

- Project identification and number;
- Sample description/location;
- Required analysis;
- Date and time of sample collection;
- Type and matrix of sample;
- Number of sample containers;
- Analysis requested/comments;
- Sampler signature/date/time;
- Date and signature of the field representative;
- Date and signature of the laboratory representative;
- Carrier used to ship coolers; and
- Air bill number (if shipped by a commercial carrier).

In the case that high concentrations are suspected to be present in the samples, a note to that effect will be included on the chain-of-custody form.

Environmental samples will be packed prior to shipment using the following procedures (where applicable):

- Select a sturdy cooler in good repair and clean. Secure and tape the drain plug with fiber or duct tape.
- Be sure the lids on all bottles are tight (will not leak) and baggies are sealed.
- Where applicable, add ice that has been placed in heavy-duty polyethylene bags and properly sealed on top of or between the samples. Pack samples securely to eliminate breakage during shipment with ice packs to maintain the inside temperature at ≤6 °C.
- Sampling containers will be packed with packing materials. When possible, sample container preparation and packing for shipment will be completed in a well-organized and clean area. Sample containers will be prepared for shipment by wiping containers clean of debris/water using paper towels. Paper towels will be disposed with the personal protective equipment (PPE).
- Place chain-of-custody record into a Ziploc plastic bag, tape the bag to the inner side of the cooler lid, and close the cooler and securely tape (preferably with fiber tape) the top of the cooler shut. Two custody seals will be affixed to the latch and lid of the cooler. The number of the security seal will be recorded on the chain-of-custody form. The custody seals will consist of adhesive-backed tape that easily rips if it is disturbed. The field sampler will initial and date the seal. The seals must be broken to open the cooler and will indicate tampering if the seal is broken before receipt at the laboratory.
- A label containing the name and address of the shipper will be placed on the outside of the container.

5.5 SAMPLE TRANSPORTATION

The field sampling team will either hand deliver or ship the cooler via an overnight delivery service or contact the laboratory to send a courier for pick up. Prior to shipment of sample coolers, the field sampling team will contact the laboratory to notify the laboratory of the shipment.

Samples will remain in the custody of the sampler until transfer of custody is completed. Transfer consists of:

- Delivery of samples to the Laboratory Sample Custodian; and/or
- Signature of the Laboratory Sample Custodian on the chain-of-custody form as receiving the samples and signature of sampler as relinquishing the samples.

The field sampling team will ship by commercial carrier the coolers containing samples to the laboratory.

The chain-of-custody document will be completed by the field sampler and provided for each sample cooler or box. When transferring the possession of samples, individuals relinquishing and receiving will sign, date, and note the time on the chain-of-custody. Custody of samples must be continuous between parties and time gaps must not be present. Each shipment of samples to the laboratory must have its own chain-of-custody record with the contents of the shipment, method of shipment, name of courier, and other pertinent information written on the record. The original record accompanies the shipment and the copies are kept with the field logbook and distributed to the OBG Project Manager. The laboratory will be notified daily of each sample shipment. Freight bills, postal service receipts, and bills of lading will be retained as permanent documentation.

If a carrier is used to take samples between the sampler and the laboratory, the air bill number must be written on the chain-of-custody.

Samples will arrive at the laboratory with sufficient time for analysis within the holding time of the samples.

5.6 LABORATORY CUSTODY PROCEDURES

Laboratory custody procedures continue when the samples are received by the laboratory. When the samples arrive at the laboratory, the Laboratory Sample Custodian will sign the courier's air bill or bill of lading (unless hand-delivered) and will note the cooler temperature on the chain-of-custody form, where applicable. If the cooler temperature is greater than 6 °C, the OBG Project Manager will be notified. If the samples were shipped, the courier's air bill number will be attached to the chain-of-custody and the air bill number will be written on the chain-of-custody form. If the cooler or box arrives at the laboratory after hours, an external chain-of-custody will be properly filled out and will accompany the cooler until the laboratory receives the cooler.

The Laboratory Sample Custodian's duties and responsibilities upon sample receipt will be to:

- Document receipt of samples by signing the record with the date and time of sample receipt.
- Note the cooler temperature on the chain-of-custody form.
- Inspect sample shipping containers for the presence or absence of custody seals (only if shipped via overnight courier) and for container integrity.
- Sign the appropriate forms or documents, verify, and record the agreement or disagreement of information on sample documents and, if there are discrepancies, record the problem and notify the OBG Project Manager.
- Assign a number for each sample upon receipt. That sample number will be placed on the sample label which will remain attached to the sample container.
- Log sample information into the laboratory sample tracking system.
- Label sample with a unique, sequential laboratory sample number.
- Place samples in the walk-in cooler or sample storage area that is a secure, limited-access storage.

If QC samples have not been properly identified during sample collection, the Laboratory Project Manager will contact the OBG Project Manager to assign QC samples prior to the start of sample analysis.

The laboratory will immediately contact the OBG Project Manager if issues pertaining to sample condition or documentation are detected (e.g., broken security seal; broken, open, or otherwise compromised sample containers; chain-of-custody information in disagreement with sample labels).

5.7 FINAL EVIDENCE FILES

The final evidence file will be the central repository for documents that constitute evidence relevant to sampling and analysis activities as described in this QCD. OBG is the custodian of the evidence file and maintains the contents of evidence files for the Site, including relevant records, reported, logs, field notebooks, pictures, subcontractor reports, and data reviews.

Copies of the laboratory data packages will be stored by the laboratory for incorporation into the sample file. The Laboratory Project Manager will be responsible for laboratory data packages.

Upon completion of the analyses, the OBG Project Manager will begin assimilating the field and laboratory data. In this way, the file for the samples will be generated. The final file for the sample will be stored at OBG and will consist of the following:

- Laboratory data packages, including summary and raw data from the analysis of environmental and QC samples, chromatograms, mass spectra, calibration data, work sheets, and sample preparation log
- Chain-of-custody records
- Data validation reports
- Field notebooks and data
- Field collection report
- Pictures and drawings, if applicable
- Progress and QA reports
- Contractor and subcontractor reports
- Correspondence.

The evidence file must be maintained in a secured, limited access area until submittals for the project have been reviewed and approved, and for a minimum of 10 years past the submittal date of the final report.

6. LABORATORY SAMPLE STORAGE AND HANDLING

At the laboratory, the analysts will be required to log samples and extracts in and out of storage as the analysis proceeds.

There must not be a lapse in the custody for the sample containers and exchanges of custody must be documented on the form. Samples will be returned to secure storage at the close of business. Care must be exercised to properly complete, date, and sign records needed to generate the data package.

Procedures to be followed by the laboratory include:

- Samples will be handled by the minimum number of people possible.
- The laboratory will set aside a secured sample storage area consisting of a clean, dry, refrigerated, isolated room.
- A specific person will be designated sample custodian. Incoming samples will be received by the custodian who will indicate receipt by signing the chain-of-custody form.
- The custodian will ensure that samples which are heat-sensitive, light-sensitive, radioactive, or which require special handling in other ways, are properly stored and maintained prior to analysis.
- The analytical area will be restricted to authorized personnel only.

After sample analyses are complete, the analytical data will be kept secured and released to authorized personnel only.

7. ANALYTICAL METHODS, TARGET ANALYTES AND REGULATORY CRITERIA

Tables 2-1, 2-1a, 2-1b, 2-2, 2-2a, 2-2b, 2-3, 2-3a, 2-3b, 2-4, 2-4a, 2-4b, and 2-5 present the analytical methods, target analytes, detection limits and regulatory limits for the sampling activities.

7.1 ANALYTICAL METHODS AND LABORATORY ANALYSIS

To obtain data of a quality sufficient to meet the project DQOs, the following methods will be used for analysis of the sample collected for the RI:

- VOCs and semivolatile organic compounds (SVOCs) analyses by gas chromatography/mass spectrometry (GC/MS)
- Polychlorinated biphenyls (PCBs) by GC
- Metals by inductively coupled plasma (ICP)
- Mercury by cold-vapor atomic absorption
- Total cyanide by colorimetric technique
- Per- and polyfluorinated alkyl substances (PFAS) by isotope dilution
- 1,4-dioxane by GC/MS with Selected Ion Monitoring (SIM)

The laboratory will adhere to the specific analyses and QA/QC requirements in the analytical methods listed in **Table 1-1** and additional requirements listed in this QCD. The most recent laboratory control limits for accuracy and precision, will be used to evaluate the sample data. In addition, the QC requirements and corrective actions listed in **Tables 3-1 to 3-5**, which augment the method requirements, will be followed by the laboratory.

In the event of an analytical system failure, the Laboratory Project Manager will identify the situation and provide corrective action guidance. The OBG QAO will be notified and the situation will be documented in the data package case narrative.

Matrix interferences will be identified and documented during the analytical process. Samples may be diluted only if analytes of concern generate responses in excess of the linear range of the instrument. MDLs and RLs may only be achieved in an undiluted sample free of matrix interferences or of high concentrations of target analytes. If matrix interferences are encountered or if high concentrations of target compounds are present, established MDLs and RLs may not be achievable without impacting the instrument quality. If the laboratory has taken appropriate actions and matrix interferences prevent the laboratory from achieving the specified detection limits, the OBG QAO will be contacted as soon as the situation is identified. The Laboratory Project Manager will document, in the data package case narrative, how the laboratory demonstrated good analytical practices in order to attempt to achieve the specified reporting detection limits.

Blanks will not be subtracted from target analyte results.

The generated data will be input into the laboratory DBMS.

Complete descriptions of analytical procedures to be used in the laboratory are described in the methods, the QC requirements and corrective actions listed in this QCD and the laboratory SOPs. The laboratory SOPs and QAM are available upon request.

7.2 TARGET ANALYTES AND DETECTION LIMITS

The MDL is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte. The RL is the lowest concentration that a method can achieve for a target analyte with the necessary degree of accuracy and precision. The RL for an organic compound from the lowest concentration standard as adjusted by sample preparation and analysis factors for dilution and solids. The RL for an inorganic compound is derived from the concentration of that analyte in the lowest level check standard or the lowest calibration standard.

The laboratory will evaluate non-detected results for soils to the MDLs and report the non-detected results referencing the RL. For the remaining data, results that are less than the RLs but greater than or equal to the MDLs will be reported using the “J” flag. For example, for a target analyte with a RL of 10 µg/L and an MDL of 2 µg/L, a non-detected result is reported as 10 µg/L "U", indicating that a concentration greater than or equal to the MDL was not detected by the laboratory. A detected concentration of 6 µg/L is reported as 6 "J" and a detected concentration of 23 µg/L is reported without a laboratory flag. The laboratory must include both RLs and MDLs on the sample result sheet reported to the data user.

The RLs and MDLs associated with the target analytes listed in **Tables 2-1, 2-1a, 2-1b, 2-2, 2-2a, 2-2b, 2-3, 2-3a, 2-3b, 2-4, 2-4a, 2-4b, and 2-5** will be reported by the laboratory on the sample result sheets. Laboratories periodically update the MDL and RL values as part of internal laboratory policy.

The lowest calibration standard will establish the RLs for the target analytes that will be reported by the laboratory.

7.3 REGULATORY CRITERIA

Tables 2-1, 2-1a, 2-1b, 2-2, 2-2a, 2-2b, 2-3, 2-3a, 2-3b, 2-4, 2-4a, and 2-4b present the applicable regulatory criteria which will be used to evaluate analytical data for the sampling activities. The following remediation standards are applicable to the RI activities and will be utilized to evaluate data from the sampling events:

For soil samples:

- Maximum Concentration of Contaminants for the Toxicity Characteristic concentrations current as of August 2018.
- Applicable Restricted Use SCOs provided in 6 CRR-NY Part 375 soil cleanup objectives current as of August 2018.
- Unrestricted Use SCOs provided in 6 CRR-NY Part 375 soil cleanup objectives, current as of August 2018.

8. QUALITY CONTROL REQUIREMENTS AND MEASUREMENT PERFORMANCE CRITERIA

The overall effectiveness of a QA/QC program depends on operating in the field and laboratory according to a program that systematically ensures the precision and accuracy of analyses by detecting errors and preventing their recurrence or measuring the degree of error inherent in the methods applied.

Quality Assurance is an integrated system of activities involving planning, quality assessment, reporting and quality improvement to ensure that a program meets defined standards of quality with a stated level of confidence. Quality Control involves the technical activities that measure the quality of a program so that it meets the needs of users.

The following sections describe the QC checks that will be utilized in the field and laboratory during this project.

8.1 LABORATORY QA/QC CHECKS

Tables 3-1 to 3-5 summarize the laboratory QC checks, frequency of analysis, control limits, and laboratory corrective actions for the analytical method to be used in this project. A brief description of laboratory QA/QC analyses is presented in the following subsections.

8.1.1 GC/MS Tuning

Tuning and performance criteria are established to verify mass resolution, identification, and to some degree, instrument sensitivity. These criteria are not sample specific; conformance is determined using standard materials. Therefore, these criteria should be met in all circumstances.

8.1.2 Calibration

Compliance requirements for satisfactory instrument calibration are established to verify that the instrument is capable of producing acceptable quantitative data. Initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of analysis, and continuing calibration and performance checks document satisfactory maintenance and adjustment of the instrument on a day-to-day basis.

8.1.3 Blanks

Several types of blanks will be analyzed by the laboratory. Corrective action procedures will be implemented for blank analyses if target compounds are detected at concentrations greater than the applicable criteria. The criteria for evaluation of blanks apply to any blank associated with a group of samples collected, prepared and/or analyzed at the same time, where applicable. If problems with a blank exist, data associated with the project must be carefully evaluated to determine whether or not there is an inherent variability in the data for the project, or if the problem is an isolated occurrence not affecting other data.

A method blank is an analyte-free blank that undergoes the preparation procedures applied to a sample. These samples are analyzed to examine whether sample preparation and analysis techniques result in sample contamination. The laboratory will prepare and analyze a method blank with each group of samples that are extracted, digested, or analyzed at the same time.

Field rinsate blanks are analyzed to assess contamination introduced during field sampling procedures and sample shipment, respectively. Field rinsate blank collection begins with two sets of identical bottles; one set filled with target analyte-free water provided by the laboratory, and one empty set of bottles identical to those provided for aqueous sample collection. At the field location, in an area suspected to be contaminated, the water is passed from the full set of bottles through the dedicated or field decontaminated sampling device(s) and into the empty set of bottles. This will constitute identical bottle to bottle transfer. The field rinsate blank samples will be subject to the same analyses as the environmental samples. One field rinsate blank will be collected during each day of the sampling event or one per 10 samples.

Trip blanks will be prepared as other samples submitted for VOC analysis and will contain analyte-free water or preservative, as appropriate. A trip blank will be prepared by the laboratory, using the same preservation technique as that used to prepare the sample containers, from the same source as the method blank water, and sent to the Site in the cooler with the other sample containers. The trip blank will undergo shipment from the sampling site to the laboratory in coolers with the environmental samples to be analyzed for VOCs. Trip blanks will be analyzed for VOCs to determine if contamination has taken place during sample handling and/or shipment. Trip blanks will be included in sample coolers at a frequency of one trip blank per cooler, consistent with OBG's internal policy.

8.1.4 Internal Standards Performance

Internal standards, which are compounds not found in environmental samples, will be spiked into samples, blanks, MS/MSDs, and laboratory control samples (LCSs) at the time of sample preparation. Internal standards must meet retention time and performance criteria specified in the analytical method or the sample will be reanalyzed.

8.1.5 Surrogate Recovery

Accuracy and matrix biases for individual samples are monitored for organic analyses using surrogate additions. Surrogates are compounds similar in nature to the target analytes; the surrogates are spiked into aqueous and solid samples, blanks, and QC samples prior to sample preparation for organic analyses. The evaluation of the results of these surrogate spikes is not necessarily straightforward. The sample itself may produce effects due to such factors as interferences and high concentrations of analytes. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the review and validation of data based on specific sample results is frequently subjective.

8.1.6 Laboratory Control Samples

LCSs are standard solutions that consist of known concentrations of the complete list of target analytes spiked into laboratory analyte-free water or sand. They are prepared or purchased from a certified manufacturer from a source independent from the calibration standards to provide an independent verification of the calibration procedure. These QC samples are then prepared and analyzed following the same procedures employed for environmental sample analysis to assess method accuracy independently of sample matrix effects. The laboratory will prepare and analyze a LCS with each group of samples of similar matrix that are extracted, digested, or analyzed at the same time. For VOC analysis, one LCS will be analyzed with each analytical sequence in a 12-hour period for each matrix. Percent recoveries will be evaluated to assess the efficiency of the preparation and analysis method independent of sample matrix effects.

8.1.7 MS/MSD Samples

MS/MSD data are generated to determine long-term precision and accuracy of the analytical method with respect to sample matrices. Generally, the MS/MSD data alone are not used to evaluate the precision and accuracy for associated organic samples since data may reflect specific matrix effects only present within one sample.

One set of MS/MSD samples will be collected for every 20 environmental samples (minimum frequency of 5%) or one per matrix for less than 20 samples. If less than 20 samples are collected, one MS/MSD set will be collected. Whenever possible, MS/MSD samples will be prepared and analyzed within the same batch as the environmental samples. MS/MSD samples will be spiked at the laboratory with the complete list of target analytes.

8.1.8 Compound Identification and Quantitation

The objective of the qualitative criteria is to minimize the number of erroneous identifications of compounds. An erroneous identification can either be a false positive (reporting a compound present when it is not) or a false negative (not reporting a compound that is present). The identification criteria can be applied much more easily in detecting false positives than false negatives. Negatives, or non-detect compounds on the other hand, represent an absence of data and are therefore much more difficult to assess. The objective for quantitative requirements is to maximize the accuracy of data and sensitivity of the instrument. Unless sample screening indicates the presence of high concentration target analytes, samples will be analyzed undiluted to maximize sensitivity. Samples must be reanalyzed at the appropriate dilution when concentrations exceed the linear calibration range to maximize accuracy. Matrix interferences will be identified and documented. Samples may be diluted only if analytes of concern generate responses in excess of the linear range of the instrument.

8.2 FIELD QA/QC CHECKS

In order to evaluate data quality, QA/QC samples will be collected during the sampling activities. **Table 1-1** lists the environmental samples and corresponding QC samples to be collected by analysis.

8.2.1 Field Duplicate Samples

Collection of field duplicate samples provides for the evaluation of the laboratory's precision performance by comparing analytical results of two samples from the same location. They are also collected to evaluate field sample collection precision procedures. Samples are collected from one location and sent to the laboratory blind (with two different sample identifications).

Duplicates of solid samples submitted for VOC analysis are obtained from discrete locations without mixing. Duplicates for the remaining analyses require homogenization by filling a decontaminated stainless steel tray or bowl with the sample and mixing it with a decontaminated stainless steel instrument. The mixed sample is divided in half and scooped alternatively from each half to fill the sample container. One field duplicate sample will be collected for every 20 environmental samples (minimum frequency of 5%) or one per matrix for less than 20 samples. If less than 20 samples are collected, one field duplicate sample will be collected.

8.2.2 MS/MSDs

MS/MSD samples are duplicate samples that are collected in the field and have spiking solutions added at the laboratory during sample preparation. MS/MSD samples are considered identical to the original sample. The percent recovery of the spiked amount indicates the accuracy of the extraction as well as interferences caused by the matrix. Relative percent differences (%RPD) between spike sample recoveries or between duplicate samples will indicate the precision of the data. One MS/MSD sample set will be collected for every 20 environmental samples submitted to the laboratory (minimum frequency of 5%) or one MS/MSD for less than 20 samples.

8.2.3 Field Rinsate Blanks

One field rinsate blank, presented in **Section 8.1.3**, will be collected per 10 samples or once per day, whichever is more conservative.

8.2.4 Trip Blanks

Trip blanks, presented in **Section 8.1.3**, will be included in sample coolers at a frequency of one trip blank per cooler, consistent with OBG's internal policy.

8.2.5 Temperature Blanks

Temperature blanks will consist of vials of water that have undergone shipment from the sampling site to the laboratory in coolers with the environmental samples to be analyzed for the sampling program. The temperature of these blanks will be measured at the laboratory upon receipt of the sample cooler to verify compliance with the cooler temperature requirement.

8.3 CORRECTIVE ACTION

Generally, the following corrective actions may be taken by the laboratory. When analytical parameters that are within the control of the laboratory, including calibration, instrument performance, and blank criteria, are not met, the cause of the problem will be located and corrected. The analytical system will then be recalibrated. Sample analysis will not begin until calibration, instrument performance, and blank criteria are met. When matrix spike, standard, or duplicate analyses are out of control, samples analysis will cease. The problem will be investigated. Depending on the results of the overall QC program for the sample set, the data may be accepted, accepted with qualification, or determined to be unusable.

If, through the application of the corrective actions listed in this QCD, the data is determined to be unusable, the QC analysis will be re-prepared and reanalyzed. If QC criteria are met upon reanalysis, only the new results are reported. If QC criteria are still not met upon reanalysis, both sets of sample results will be reported and the OBG QAO will be notified of the situation at the time of sample analysis.

If matrix interferences are suspected, the OBG QAO will be contacted. Unless sample screening indicates the presence of high concentration target analytes, samples may be diluted in the analysis only if analytes of concern generate responses in excess of the linear range of the instrument.

If the laboratory has taken appropriate actions and matrix interferences prevent the laboratory from achieving the specified detection limits, the OBG QAO will be contacted as soon as the situation is identified. The Laboratory Project Manager will document, in the data package case narrative, how the laboratory demonstrated good analytical practices in order to attempt to achieve the specified reporting detection limits.

9. DATA DELIVERABLES

Definitive data will be generated in the laboratory. The laboratory-generated data will be entered into the laboratory DBMS and presented in data packages. The laboratory will perform the data review process, including a minimum of 10 percent check of the data back to raw data in the secondary review by a laboratory supervisor. Validation of the sample data will be performed as described in this QCD.

Laboratory analytical data will be provided in EDD format, in accordance with the laboratory's internal protocol for NYSDEC deliverable requirements for electronic data.

Data will be managed in a relational DBMS. Laboratory analytical data will be provided in electronic disk deliverable format for direct upload into the DBMS.

Records will be incorporated into the final project files. Field logs, data packages, and records will be included in the OBG project file which will be archived for a period of ten years.

The laboratory is responsible for providing an EDD that matches the hardcopy and electronic data package for sample and analysis information. The EDD records must be the same format (i.e., flat file format). Field samples that are not collected from the project site should not be included in the laboratory report or EDD.

The DBMS will be used to provide custom queries and reports to support data validation, data analysis, and report preparation. Data validation qualifiers will be entered into the DBMS by hand. The DBMS will be checked independently to minimize data transmittal error and loss.

Generally, the information flow will include the following steps:

- Samples will be collected in the field and transported to the laboratory.
- Samples will be analyzed at the laboratory and data generated.
- The laboratory data will be sent to the data validator for evaluation and to the Project Manager for preliminary evaluation.
- Qualified data will be sent to data management personnel and entered into the DBMS.
- The final data set from the DBMS will be provided to the Project Manager for data evaluation in terms of project goals.
- Project decisions based on results of the data analysis will be reported to Sunoco.

Records will be incorporated into the final project files for the samples. The field logs, data packages, and records will be included in the project files. The project files will be archived by OBG for a period of ten years.

10. DATA VALIDATION AND USABILITY

Data validation will be performed on the data from the sampling activities. Data validators from OBG will provide data validation services. USEPA Region II validation guidance and NYSDEC DUSR guidance (NYSDEC, 2010) will be applied as described in the following section, using professional judgment.

Upon request by the data validator, the laboratory will provide additional or supplemental information within three working days of the request.

10.1 VALIDATION PROCEDURES

Data Validation is a process of determining the suitability of a measurement system for providing useful analytical data. Data validation is essentially a three-step process in which the analytical data's QA/QC information is first compared to a series of QA/QC criteria. Based on the results of this comparison, the analytical data are then assigned qualifiers, which provide an indication of the data's usability. Finally, an overall evaluation of the data's usability is performed.

Full validation will be performed on the data generated for this project for each analytical method.

Data will be evaluated during validation using the QA/QC criteria established in the analytical methods, the quality control requirements and corrective actions listed in **Tables 3-1 to 3-5** and laboratory established control limits.

Full data validation consists of a review of data summary forms and raw analytical data that are provided in the data packages. During the full validation, data validators will recalculate selected laboratory sample calculations using raw data when verifying sample results. In addition, data validators will review selected raw data to verify that compound identification was performed correctly and transcription errors are not present.

Utilizing the DUSR process as guidance, the following questions will be considered during the validation:

1. Is the data package complete as defined under the requirements for the most current DEC ASP Category B or USEPA Contract Laboratory Program (CLP) deliverables?
2. Have the holding times been met?
3. Do all the QC data: blanks, instrument tunings, calibration standards, calibration verifications, surrogate recoveries, spike recoveries, duplicate analyses, laboratory controls and sample data fall within the protocol required limits and specifications?
4. Have the data been generated using established and agreed upon analytical protocols?
5. Does an evaluation of the raw data confirm the results provided in the data summary sheets and quality control verification forms?
6. Have the correct data qualifiers been used?
7. Have any exceedances been specifically noted in the report?

The following parameters will be included in the full data validation for organic and inorganic analyses, where applicable for each analysis method, unless otherwise noted:

- QCD compliance
- Chain-of-custody records
- Sample collection and sample preservation
- Percent solids
- Holding times
- GC/MS tuning criteria
- Instrument performance
- Calibration
- Analytical sequence
- Blank analysis
- Surrogate recovery
- MS/MSD analysis
- Laboratory duplicate analysis
- Field duplicate analysis
- LCS analysis

- ICP interference check sample analysis
- ICP serial dilution analysis
- Internal standards performance
- Target analyte identification, quantitation, and RLs
- Confirmation analysis
- Deliverables and documentation completeness

Unless requested, Tentatively Identified Compounds (TICs) for VOC and SVOC analyses will not be evaluated as part of the validation process

10.2 ASSIGNMENT OF QUALIFIERS

Data affected by excursions from the QA/QC criteria will be qualified using the following USEPA Region II data validation guidance documents and professional judgment.

- USEPA. 2006. *USEPA Region II Data Validation SOP of PCBs by Gas Chromatography SW-846 Method 8082A, SOP HW-45 Revision 1*. New York, NY.
- USEPA. 2009. USEPA Region II Validating Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846 Method 8270D, SOP HW-22 Revision 4.
- USEPA. 2012. USEPA Region II Evaluation of Metals Data for the CLP Program, SOP HW-2a Revision 15.
- USEPA. 2012. USEPA Region II Mercury and Cyanide Data Validation, SOP HW-2c Revision 15.
- USEPA. 2014. USEPA Region II Validating Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846 Method 8260B, SOP HW-24 Revision 4.

The application of these validation guidelines will be modified to reflect method and QCD requirements

In accordance with the USEPA guidance and utilizing professional judgment, the following qualifiers will be used in the data validation:

"R" Indicates that the RL or sample result is determined to be unusable due to a major deficiency in the data generation process. The data should not be used for any qualitative or quantitative purposes.

"U" Indicates that the analyte was analyzed for, but a concentration was not detected. The sample RL is reported. This qualifier is also used in the validation process to signify that the detection limit of an analyte was revised due to blank contamination.

"J" Indicates that the concentration should be considered approximate. This qualifier is used when the data validation process identifies a deficiency in the data generation process. This qualifier is also applied by the laboratory when the analyte concentration is greater than the MDL but less than the RL. In the latter case, the identification of the analyte is not in question but the quantitation of the analyte concentration may be uncertain.

"J^+" The result is an approximate quantity, but the result may be biased high.

"J^-" The result is an approximate quantity, but the result may be biased low.

"UJ" Indicates that the analyte was analyzed for, but a concentration was not detected. The sample RL is reported and should be considered approximate. This qualifier is used when the data validation process identifies a deficiency in the data generation process.

“JN “ Indicates that there is presumptive evidence that the analyte is present, but it has not been confirmed due to confirmation excursions.

The following guidelines will be used regarding the assignment of qualifiers and the evaluation of data. The data quality evaluation results in only one type of qualifier (“U”, “J”, “UJ,” or “R”) for each analyte. In a case when several qualifiers are applicable for the same analyte, the cumulative effect of the various QA/QC excursions is employed in assigning the final data qualifiers. For example, the final data qualifier is the “R” qualifier if a sample result is affected by low surrogate recoveries, for which the “UJ” qualifier is applied, but low MS/MSD recoveries result in the rejection of the sample result (application of the “R” qualifier).

10.3 DATA USABILITY EVALUATION

The specific data quality requirements including precision, accuracy, representativeness, comparability, sensitivity, and completeness will be assessed during data validation. Data usability with respect to the DQOs and data uses will be compared to the project requirements. In the event that the completeness objective of 95 percent is not achieved, samples may be recollected at the discretion of the OBG Project Manager.

Based on the QA/QC information review and the qualifiers assigned to the analytical data, an overall evaluation of the data’s usability will be performed. Data usability is defined as the percentage of data that remains unqualified or is qualified as approximate or non-detected due to blank contamination, divided by the data reported by the laboratory times 100. The percent usability excludes the data qualified as rejected due to major QA/QC excursions. The non-usable data is defined as the percentage of the data qualified as rejected divided by the data reported by the laboratory times 100. The data usability will be provided for each type of analysis performed.

The data usability evaluation considers the data parameters of precision, sensitivity, accuracy, representativeness, comparability, and completeness which are described as follows:

- Precision is evaluated through the review of field duplicate samples, laboratory duplicates, and MS/MSD samples.
- Sensitivity is evaluated through the review of reported detection limits.
- Accuracy is evaluated through the review of MS/MSD samples, internal standards, surrogate recoveries, LCS recoveries, calibration, and instrument performance checks.
- Representativeness is evaluated through the review of holding times, sample preparation, blank analysis, and target compound identification and quantification.
- Comparability is evaluated through the review of the analytical methods and reporting procedures for consistency.
- Completeness is defined as the overall percentage of sample results that are determined to be usable.

10.4 DATA VALIDATION REPORT

The DUSR will contain separate QA sections in which data quality information collected during the investigation is summarized. The DUSR will include the following:

- Guidelines used to evaluate the data.
- Data qualifiers applied to sample results.
- Summary of samples collected and analyses performed.
- Narrative that identifies major and minor analysis excursions detected for each parameter evaluated for each analysis.
- Additional issues and information that may be beneficial to the data user are discussed.
- Data summary forms.
- Data usability.

The DUSR will be prepared under the direction of the QAO.

11. REFERENCES

AWWA, APHA and WEF. 1998. *Standard Methods for the Examination of Water and Wastewater, 20th Edition*. Washington, D.C.

NYSDEC. 2010. *DER-10 Technical Guidance for Site Investigation and Remediation*. Albany, NY.

USEPA. 1992. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, Update I*. Washington D.C.

USEPA. 1994. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, Update II.* Washington D.C.

USEPA. 2004. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, Update IIIB*. Washington D.C.

USEPA, 2006a. *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations (EPA QA/R-5)*. Washington, D.C.

USEPA, 2006b. *Guidance for the Data Quality Objectives Process (EPA QA/G-4)*. Washington, D.C.

USEPA. 2006c. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition*. Washington D.C.

USEPA. 2006d. *USEPA Region II Data Validation SOP of PCBs by Gas Chromatography SW-846 Method 8082A, SOP HW-45 Revision 1*. New York, NY.

USEPA. 2007. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, Update IV.* Washington D.C.

USEPA. 2009. USEPA Region II Validating Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846 Method 8270D, SOP HW-22 Revision 4.

USEPA. 2012a. USEPA Region II Evaluation of Metals Data for the CLP Program, SOP HW-2a Revision 15.

USEPA. 2012b. USEPA Region II Mercury and Cyanide Data Validation, SOP HW-2c Revision 15.

USEPA. 2014. USEPA Region II Validating Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846 Method 8260B, SOP HW-24 Revision 4.

Table 1-1. Field Sampling Summary

Parameter (Method)	Matrix	Sample Containers and Volumes	Preservation	Holding Times	Number of Investigative Samples	QC sample frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Rinsate Blank
VOCs Low Level (USEPA Methods 5035A/8000C/8260C)[1]	Solid	2- Encore samplers (5 Grams) used to collect and transport sample in accordance with USEPA Method 5035A	≤6°C Sealed and Headspace Free	Within 48 hours of collection: Extrude sample to a vial containing 5 ml of Deionized water. Record weight and freeze to -7°C. Analysis must be performed within 14 days from collection. For TCLP -14 days from collection to extract generation. 14 days from extract generation to analysis.	TBD	One per 20 samples or one per matrix (for less than 20 samples)	1 each in cooler with VOC samples	One per 20 samples or one per matrix (for less than 20 samples)	One per 10 samples or one per sampling event as required for each matrix

Table 1-1. Field Sampling Summary

Parameter (Method)	Matrix	Sample Containers and Volumes	Preservation	Holding Times	Number of Investigative Samples	QC sample frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Rinsate Blank
VOCs Low Level (USEPA Methods 5035A/8000C/8260C)[1]	Wet Solid	1-40 or 60 milliliter wide-mouth glass vials with Teflon® lined septum caps, for air-tight and headspace free seal.	≤6°C Sealed and Headspace Free	Within 48 hours of collection: An aliquot of 5 grams of sample is added to 5 ml of Deionized water. Record weight, and freeze to -7°C within 48 hours from collection. Analysis must be performed within 14 days from collection. For TCLP-14 days from collection to extract generation. 14 days from extract generation to analysis.	TBD	One per 20 samples or one per matrix (for less than 20 samples)	1 each in cooler with VOC samples	One per 20 samples or one per matrix (for less than 20 samples)	One per 10 samples or one per sampling event as required for each matrix
VOCs Medium Level (USEPA Methods 5035A/8000C/8260C)[1]	Solid	1- Encore sampler in accordance with USEPA Method 5035A. Or 1-40 milliliter glass vials with Teflon® lined septum caps, for	≤6°C Sealed and Headspace Free	Within 48 hours of collection: Extrude sample to a vial containing 5 ml of Methanol. Record weight, Prepare in accordance with USEPA Method	TBD	One per 20 samples or one per matrix (for less than 20 samples)	1 each in cooler with VOC samples	One per 20 samples or one per matrix (for less than 20 samples)	One per 10 samples or one per sampling event as required for each matrix

Table 1-1. Field Sampling Summary

Parameter (Method)	Matrix	Sample Containers and Volumes	Preservation	Holding Times	Number of Investigative Samples	QC sample frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Rinsate Blank
		air-tight and headspace free seal in accordance with USEPA Method 5035A. 5 grams sample volume required.		5035A. Analysis must be performed within 14 days from collection. For TCLP -14 days from collection to extract generation. 14 days from extract generation to analysis.					
Volatile Organic Compounds (USEPA Methods 5030B/5035A/8000C/ 8260B/8260C)[1]	Aqueous	Three 40-mL glass vials with Teflon® lined septum caps	< 6°C HCL to pH ≤ 2 FC Sealed and Headspace Free	Analysis within 14 days from collection for preserved samples. Analysis within 7 days from collection for samples not acid preserved.	TBD	One per 20 samples or one per matrix for less than 20 samples	One each in cooler with VOC samples	One per 20 samples or one per matrix for less than 20 samples	One per 20 samples or one per sampling event as required for each matrix

Table 1-1. Field Sampling Summary

Parameter (Method)	Matrix	Sample Containers and Volumes	Preservation	Holding Times	Number of Investigative Samples	QC sample frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Rinsate Blank
SVOCs (USEPA Methods 3541/3550C/8000C/ 8270D/SIM)[2]	Solid	250 milliliter wide mouth glass container with Teflon® lined lid. 100 grams sample volume required	≤6°C	14 days from collection to extraction; 40 days from extraction to analysis For TCLP: 14 days from collection to extraction, 7 days from extraction to extraction. 40 days from extraction to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 10 samples or one per sampling event as required for each matrix
Semivolatile Organic Compounds (USEPA Methods 3510C/3520C/8000C /8270C/8270D)[1]	Aqueous	One 1-L amber glass container with Teflon® lined screw caps	< 6°C	7 days from collection to extraction; 40 days from extraction to analysis	TBD	One per 20 samples or one per matrix for less than 20 samples	NA	One per 20 samples or one per matrix for less than 20 samples	One per 20 samples or one per sampling event as required for each matrix
PCBs (USEPA Methods 8000C/8082A)[2]	Solid	250 milliliter wide mouth glass container with Teflon® lined lid. 100 grams sample volume required	≤6°C	Project Holding Time: 14 days from collection to extraction; 40 days from extraction to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 10 samples or one per sampling event as required for each matrix

Table 1-1. Field Sampling Summary

Parameter (Method)	Matrix	Sample Containers and Volumes	Preservation	Holding Times	Number of Investigative Samples	QC sample frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Rinsate Blank
PCBs (USEPA Method 3510C/3520C/8000C/8082/8082A)[1]	Aqueous	One 1-L amber glass container with Teflon® lined screw caps	< 6°C	None Recommended Holding Time: 7 days from collection to extraction; 40 days from extraction to analysis	TBD	One per 20 samples or one per matrix for less than 20 samples	NA	One per 20 samples or one per matrix for less than 20 samples	One per 20 samples or one per sampling event as required for each matrix
Total Metals (USEPA Methods 3050B/6010C/6020A)[2]	Solid	4 ounce wide mouth polyethylene or fluorocarbon (TFE or PFA) container. 50 grams sample volume required.	≤6°C	180 days from collection to analysis For TCLP: 180 days from collection to extraction, 180 days from extraction to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 10 samples or one per sampling event as required for each matrix
Metals (USEPA Methods 3005A/6010B/6010C/6020/6020A)[1]	Aqueous	One 250-mL polyethylene or fluorocarbon (TFE or PFA) container. 100 mL sample volume required	< 6°C HNO_3 to pH < 2	180 days from collection to analysis	TBD	One per 20 samples or one per matrix for less than 20 samples	NA	One per 20 samples or one per matrix for less than 20 samples	One per 20 samples or one per sampling event as required for each matrix
Mercury (USEPA Method 7471B)[1]	Solid	4 ounce wide mouth polyethylene or fluorocarbon (TFE or PFA) container. 50 grams sample volume required.	≤6°C	28 days from collection to analysis For TCLP: 28 days from collection to extract generation, 28 days from extraction to analysis	TBD	One per 20 samples or one per matrix (for less than 20 samples)	NA	One per 20 samples or one per matrix (for less than 20 samples)	One per 10 samples or one per sampling event as required for each matrix

Table 1-1. Field Sampling Summary

Parameter (Method)	Matrix	Sample Containers and Volumes	Preservation	Holding Times	Number of Investigative Samples	QC sample frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Rinsate Blank
Mercury (USEPA Method 7470A)[1]	Aqueous	One 250-mL polyethylene or fluorocarbon (TFE or PFA) container. 200 mL sample volume required	< 6°C HNO_3 to pH < 2	28 days from collection to analysis	TBD	One per 20 samples or one per matrix for less than 20 samples	NA	One per 20 samples or one per matrix for less than 20 samples	One per 20 samples or one per sampling event as required for each matrix
Total Cyanide (USEPA Method 9012B)[1]	Solid	4-oz wide mouth glass container with Teflon® lined lid. 100 g sample volume required	< 6°C	14 days from collection to analysis	TBD	One per 20 samples or one per matrix for less than 20 samples	NA	One per 20 samples or one per matrix for less than 20 samples	One per 20 samples or one per sampling event as required for each matrix
Total Cyanide (USEPA Method 9012A/9012B/9014)[1]	Aqueous	One 1000-mL polyethylene or fluorocarbon (TFE or PFA) container. 500 mL sample volume required	< 6°C NaOH to pH ≥ 12 OA	14 days from collection to analysis	TBD	One per 20 samples or one per matrix for less than 20 samples	NA	One per 20 samples or one per matrix for less than 20 samples	One per 20 samples or one per sampling event as required for each matrix
Total Organic Carbon (SM20 5310B)[5] (USEPA Method 9060)[1] (Lloyd Kahn)[9]	Solid	4 ounce wide mouth glass container with Teflon® lined lid. 50 g sample volume required	4°C	28 days from collection to analysis Lloyd Kahn - 14 days from collection to analysis	TBD	One per 20 samples or one per matrix for less than 20 samples	NA	One per 20 samples or one per matrix for less than 20 samples	One per 20 samples or one per sampling event as required for each matrix

Table 1-1. Field Sampling Summary

Parameter (Method)	Matrix	Sample Containers and Volumes	Preservation	Holding Times	Number of Investigative Samples	QC sample frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Rinsate Blank
Total Hardness (SM20 2340C)[5]	Aqueous	One 250-mL polyethylene or fluorocarbon (TFE or PFA) container. 100 mL sample volume required	< 6°C HNO_3 to pH<2	180 days from collection to analysis	TBD	One per 20 samples or one per matrix for less than 20 samples	NA	One per 20 samples or one per matrix for less than 20 samples	One per 20 samples or one per sampling event as required for each matrix
TCLP (USEPA Method 1311)[5]	Solid	250 milliliter wide mouth glass container with Teflon® lined lid. See individual analyses	NA	NA	NA	NA	NA	NA	NA
Percent Solids (SM20 2540G)[6]	Solid	100 milliliter wide mouth glass container with Teflon® lined lid. 100 grams sample volume required	4°C	NA	NA	NA	NA	NA	NA

NOTES:

MS/MSD indicates matrix spike/matrix spike duplicate sample for organic analyses. Spike duplicate may be performed for inorganic analyses.

Field blank is required at a frequency of one per 10 samples or one per sampling event if less than 10 samples are collected, for each matrix type. Field blank is not required if disposable equipment is used.

VOCs indicate volatile organic compounds.

SVOCs indicates semivolatile organic compounds.

Table 1-1. Field Sampling Summary

Parameter (Method)	Matrix	Sample Containers and Volumes	Preservation	Holding Times	Number of Investigative Samples	QC sample frequency			
						Field Duplicate	Trip Blank	MS/MSD and Spike Duplicate	Field Rinsate Blank

PCBs indicates polychlorinated biphenyls.

TCLP indicates toxicity characteristic leaching procedure.

SIM indicates selected ion monitoring.

Method references:

1- USEPA. 2006. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition*. Washington D.C.

2- USEPA. 2007. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, Update IV.* Washington D.C.

3- USEPA. 1994. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, Update II.* Washington D.C.

4- USEPA. 2004. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, Update IIIB*. Washington D.C.

5- USEPA. 1992. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, Update I*. Washington D.C.

6- AWWA, APHA and WEF. 1998. *Standard Methods for the Examination of Water and Wastewater, 20th Edition*. Washington, D.C.

Source: O’Brien & Gere

Former Accurate Die Casting Site
547 East Genesee Street
Fayetteville, New York
Site No. C734052

Table 2-1. Laboratory Limits and Regulatory Limits for VOCs in Soil Samples

Target Analytes	USEPA Method	Laboratory Low Level Soil RL (ug/kg)	Laboratory Low Level Soil MDL (ug/kg)	Laboratory Medium Level Soil RL (ug/kg)	Laboratory Medium Level Soil MDL (ug/kg)	Un-restricted SCOs (mg/kg)	*Un-restricted SCOs (ug/kg)*	*Protection of Groundwater SCOs (ug/kg)*
1,1,1-Trichloroethane	8260C	TBD	TBD	TBD	TBD	0.68	680	680
1,1,2,2-Tetrachloroethane	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
1,1,2-Trichloro-1,2,2-trifluoroethane	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
1,1,2-Trichloroethane	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
1,1-Dichloroethane	8260C	TBD	TBD	TBD	TBD	0.27	270	270
1,1-Dichloroethene	8260C	TBD	TBD	TBD	TBD	0.33	330	330
1,2,3-Trichlorobenzene	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
1,2,4-Trichlorobenzene	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
1,2-Dibromo-3-chloropropane	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
1,2-Dibromoethane	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
1,2-Dichlorobenzene	8260C	TBD	TBD	TBD	TBD	1.1	1100	1100
1,2-Dichloroethane	8260C	TBD	TBD	TBD	TBD	0.02	20	20
1,2-Dichloropropane	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
1,3-Dichlorobenzene	8260C	TBD	TBD	TBD	TBD	2.4	2400	2400
1,4-Dichlorobenzene	8260C	TBD	TBD	TBD	TBD	1.8	1800	1800
2-Butanone (MEK)	8260C	TBD	TBD	TBD	TBD	0.12	120	120
2-Hexanone	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
4-Methyl-2-pentanone	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
Acetone	8260C	TBD	TBD	TBD	TBD	0.05	50	50
Benzene	8260C	TBD	TBD	TBD	TBD	0.06	60	60
Bromochloromethane	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
Bromodichloromethane	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
Bromoform	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
Bromomethane	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
Carbon disulfide	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
Carbon tetrachloride	8260C	TBD	TBD	TBD	TBD	0.76	760	760
Chlorobenzene	8260C	TBD	TBD	TBD	TBD	1.1	1100	1100
Chloroethane	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
Chloroform	8260C	TBD	TBD	TBD	TBD	0.37	370	370
Chloromethane	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
cis-1,2-Dichloroethene	8260C	TBD	TBD	TBD	TBD	0.25	250	250
cis-1,3-Dichloropropene	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
Cyclohexane	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
Dibromochloromethane	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
Dichlorodifluoromethane	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
Ethylbenzene	8260C	TBD	TBD	TBD	TBD	1	1000	1000
Isopropylbenzene	8260C	TBD	TBD	TBD	TBD	NL	NL	3900
Methyl acetate	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
Methyl tert-butyl ether	8260C	TBD	TBD	TBD	TBD	0.93	930	930
Methylcyclohexane	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
Methylene chloride	8260C	TBD	TBD	TBD	TBD	0.05	50	50
Styrene	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
Tetrachloroethene	8260C	TBD	TBD	TBD	TBD	1.3	1300	1300
Toluene	8260C	TBD	TBD	TBD	TBD	0.7	700	700
trans-1,2-Dichloroethene	8260C	TBD	TBD	TBD	TBD	0.19	190	190
trans-1,3-Dichloropropene	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
Trichloroethene	8260C	TBD	TBD	TBD	TBD	0.47	470	470
Trichlorofluoromethane	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
Vinyl chloride	8260C	TBD	TBD	TBD	TBD	0.02	20	20
Xylene-m,p	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
Xylene-o	8260C	TBD	TBD	TBD	TBD	NL	NL	NL
Xylenes (total)	8260C	TBD	TBD	TBD	TBD	0.26	260	1600

Notes:

RL indicates reporting limit.
MDL indicate method detection limit.
ug/Kg indicates microgram per killogram.
MDLs and RLs will be provided by the laboratory once the laboratory is identified.
TBD indicates to be determined at a later date.
NL indicates not listed.

VOC target analyte list source:

USEPA. August 2014. Statement of Work For Organic Superfund Methods, Multi-Media, Multi-Concentration (SOM02.2). Washington, D.C.

Method reference:

1. USEPA. 2006. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846. Washington D.C.

Regulatory Criteria:

SCOs indicates 6 NYCRR Part 375 soil cleanup objectives, current as of August 2015.

Former Accurate Die Casting Site
547 East Genesee Street
Fayetteville, New York
Site No. C734052

Table 2-1a. Laboratory limits and regulatory limits for VOCs in surface water samples

Target Analytes	USEPA Method	RL (ug/L)	MDL (ug/L)	Class C Surface Water Criteria (ug/L)
1,1,1-Trichloroethane	8260C	TBD	TBD	NL
1,1,2,2-Tetrachloroethane	8260C	TBD	TBD	NL
1,1,2-Trichloro-1,2,2-trifluoroethane	8260C	TBD	TBD	NL
1,1,2-Trichloroethane	8260C	TBD	TBD	NL
1,1-Dichloroethane	8260C	TBD	TBD	NL
1,1-Dichloroethene	8260C	TBD	TBD	NL
1,2,3-Trichlorobenzene	8260C	TBD	TBD	5**
1,2,4-Trichlorobenzene	8260C	TBD	TBD	5**
1,2-Dibromo-3-chloropropane	8260C	TBD	TBD	NL
1,2-Dibromoethane	8260C	TBD	TBD	NL
1,2-Dichlorobenzene	8260C	TBD	TBD	5*
1,2-Dichloroethane	8260C	TBD	TBD	NL
1,2-Dichloropropane	8260C	TBD	TBD	NL
1,3-Dichlorobenzene	8260C	TBD	TBD	5*
1,4-Dichlorobenzene	8260C	TBD	TBD	5*
2-Butanone (MEK)	8260C	TBD	TBD	NL
2-Hexanone	8260C	TBD	TBD	NL
4-Methyl-2-pentanone	8260C	TBD	TBD	NL
Acetone	8260C	TBD	TBD	NL
Benzene	8260C	TBD	TBD	10
Bromochloromethane	8260C	TBD	TBD	NL
Bromodichloromethane	8260C	TBD	TBD	NL
Bromoform	8260C	TBD	TBD	NL
Bromomethane	8260C	TBD	TBD	NL
Carbon disulfide	8260C	TBD	TBD	NL
Carbon tetrachloride	8260C	TBD	TBD	NL
Chlorobenzene	8260C	TBD	TBD	5
Chloroethane	8260C	TBD	TBD	NL
Chloroform	8260C	TBD	TBD	NL
Chloromethane	8260C	TBD	TBD	NL
cis-1,2-Dichloroethene	8260C	TBD	TBD	NL
cis-1,3-Dichloropropene	8260C	TBD	TBD	NL
Cyclohexane	8260C	TBD	TBD	NL
Dibromochloromethane	8260C	TBD	TBD	NL
Dichlorodifluoromethane	8260C	TBD	TBD	NL
Ethylbenzene	8260C	TBD	TBD	NL
Isopropylbenzene	8260C	TBD	TBD	NL
Methyl acetate	8260C	TBD	TBD	NL
Methyl tert-butyl ether	8260C	TBD	TBD	NL
Methylcyclohexane	8260C	TBD	TBD	NL
Methylene chloride	8260C	TBD	TBD	200
Styrene	8260C	TBD	TBD	NL
Tetrachloroethene	8260C	TBD	TBD	NL
Toluene	8260C	TBD	TBD	6,000
trans-1,2-Dichloroethene	8260C	TBD	TBD	NL
trans-1,3-Dichloropropene	8260C	TBD	TBD	NL
Trichloroethene	8260C	TBD	TBD	40
Trichlorofluoromethane	8260C	TBD	TBD	NL
Vinyl chloride	8260C	TBD	TBD	NL
Xylene-m,p	8260C	TBD	TBD	NL
Xylene-o	8260C	TBD	TBD	NL
Xylenes (total)	8260C	TBD	TBD	NL

Notes:

RL indicates reporting limit.
MDL indicate method detection limit.
ug/Kg indicates microgram per killogram.
MDLs and RLs will be provided by the laboratory once the laboratory is identified.
TBD indicates to be determined at a later date.
NL indicates not listed.
* - applies to the sum of 1,2-, 1,3-, and 1,4-dichlorobenzene
** - applies to the sum of 1,2,3- and 1,2,4-trichlorobenzene

VOC target analyte list source:

USEPA. August 2014. Statement of Work For Organic Superfund Methods, Multi-Media, Multi-Concentration (SOM02.2). W

Method reference:

1. USEPA. 2006. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846. Washington D.C.

Regulatory Criteria:

6 CRR-NY 703.5.

Former Accurate Die Casting Site
547 East Genesee Street
Fayetteville, New York
Site No. C734052

Table 2-1b. Laboratory limits and regulatory limits for VOCs in sediment samples

Target Analytes	USEPA Method	Laboratory Low Level Soil RL (ug/kg)	Laboratory Low Level Soil MDL (ug/kg)	Laboratory Medium Level Soil RL (ug/kg)	Laboratory Medium Level Soil MDL (ug/kg)	Class A Fresh Water Sediment Guidance Values (ug/kg)
1,1,1-Trichloroethane	8260C	TBD	TBD	TBD	TBD	<1,900
1,1,2,2-Tetrachloroethane	8260C	TBD	TBD	TBD	TBD	<2,800
1,1,2-Trichloro-1,2,2-trifluoroethane	8260C	TBD	TBD	TBD	TBD	NL
1,1,2-Trichloroethane	8260C	TBD	TBD	TBD	TBD	NL
1,1-Dichloroethane	8260C	TBD	TBD	TBD	TBD	NL
1,1-Dichloroethene	8260C	TBD	TBD	TBD	TBD	<520
1,2,3-Trichlorobenzene	8260C	TBD	TBD	TBD	TBD	<230
1,2,4-Trichlorobenzene	8260C	TBD	TBD	TBD	TBD	<35,000
1,2-Dibromo-3-chloropropane	8260C	TBD	TBD	TBD	TBD	NL
1,2-Dibromoethane	8260C	TBD	TBD	TBD	TBD	NL
1,2-Dichlorobenzene	8260C	TBD	TBD	TBD	TBD	<280
1,2-Dichloroethane	8260C	TBD	TBD	TBD	TBD	NL
1,2-Dichloropropane	8260C	TBD	TBD	TBD	TBD	NL
1,3-Dichlorobenzene	8260C	TBD	TBD	TBD	TBD	<1,800
1,4-Dichlorobenzene	8260C	TBD	TBD	TBD	TBD	<720
2-Butanone (MEK)	8260C	TBD	TBD	TBD	TBD	NL
2-Hexanone	8260C	TBD	TBD	TBD	TBD	NL
4-Methyl-2-pentanone	8260C	TBD	TBD	TBD	TBD	NL
Acetone	8260C	TBD	TBD	TBD	TBD	NL
Benzene	8260C	TBD	TBD	TBD	TBD	<530
Bromochloromethane	8260C	TBD	TBD	TBD	TBD	NL
Bromodichloromethane	8260C	TBD	TBD	TBD	TBD	NL
Bromoform	8260C	TBD	TBD	TBD	TBD	NL
Bromomethane	8260C	TBD	TBD	TBD	TBD	NL
Carbon disulfide	8260C	TBD	TBD	TBD	TBD	NL
Carbon tetrachloride	8260C	TBD	TBD	TBD	TBD	<1,070
Chlorobenzene	8260C	TBD	TBD	TBD	TBD	<200
Chloroethane	8260C	TBD	TBD	TBD	TBD	NL
Chloroform	8260C	TBD	TBD	TBD	TBD	NL
Chloromethane	8260C	TBD	TBD	TBD	TBD	NL
cis-1,2-Dichloroethene	8260C	TBD	TBD	TBD	TBD	NL
cis-1,3-Dichloropropene	8260C	TBD	TBD	TBD	TBD	NL
Cyclohexane	8260C	TBD	TBD	TBD	TBD	NL
Dibromochloromethane	8260C	TBD	TBD	TBD	TBD	NL
Dichlorodifluoromethane	8260C	TBD	TBD	TBD	TBD	NL
Ethylbenzene	8260C	TBD	TBD	TBD	TBD	<430
Isopropylbenzene	8260C	TBD	TBD	TBD	TBD	<210
Methyl acetate	8260C	TBD	TBD	TBD	TBD	NL
Methyl tert-butyl ether	8260C	TBD	TBD	TBD	TBD	NL
Methylcyclohexane	8260C	TBD	TBD	TBD	TBD	NL
Methylene chloride	8260C	TBD	TBD	TBD	TBD	NL
Styrene	8260C	TBD	TBD	TBD	TBD	NL
Tetrachloroethene	8260C	TBD	TBD	TBD	TBD	<16,000
Toluene	8260C	TBD	TBD	TBD	TBD	<930
trans-1,2-Dichloroethene	8260C	TBD	TBD	TBD	TBD	<1,200
trans-1,3-Dichloropropene	8260C	TBD	TBD	TBD	TBD	NL
Trichloroethene	8260C	TBD	TBD	TBD	TBD	<1,800
Trichlorofluoromethane	8260C	TBD	TBD	TBD	TBD	NL
Vinyl chloride	8260C	TBD	TBD	TBD	TBD	NL
Xylene-m,p	8260C	TBD	TBD	TBD	TBD	<480
Xylene-o	8260C	TBD	TBD	TBD	TBD	<820
Xylenes (total)	8260C	TBD	TBD	TBD	TBD	<590

Notes:

RL indicates reporting limit.
MDL indicate method detection limit.
ug/Kg indicates microgram per killogram.
MDLs and RLs will be provided by the laboratory once the laboratory is identified.
TBD indicates to be determined at a later date.
NL indicates not listed.

VOC target analyte list source:

USEPA. August 2014. Statement of Work For Organic Superfund Methods, Multi-Media, Multi-Concentration (SOM02.2). Washington, D.C.

Method reference:

1. USEPA. 2006. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846. Washington D.C.

Regulatory Criteria:

Screening and Assessment of Contaminated Sediment (NYSDEC, June 24, 2014)

Former Accurate Die Casting Site
547 East Genesee Street
Fayetteville, New York
Site No. C734052
Table 2-2. Laboratory limits and regulatory limits for SVOCs in soil samples

SVOC Target Analytes	Method Reference	Laboratory Soil RL (µg/Kg)	Laboratory Soil MDL (µg/Kg)	Unrestricted SCOs (mg/Kg)	Unrestricted SCOs (µg/Kg)	*Protection of Groundwater SCOs* (mg/Kg)
1,1´-Biphenyl	8270D	TBD	TBD	NL	NL	NL
1,2,4,5-Tetrachlorobenzene	8270D	TBD	TBD	NL	NL	NL
2,3,4,6-Tetrachlorophenol	8270D	TBD	TBD	NL	NL	NL
2,4,5-Trichlorophenol	8270D	TBD	TBD	NL	NL	NL
2,4,6-Trichlorophenol	8270D	TBD	TBD	NL	NL	NL
2,4-Dichlorophenol	8270D	TBD	TBD	NL	NL	NL
2,4-Dimethylphenol	8270D	TBD	TBD	NL	NL	NL
2,4-Dinitrophenol	8270D	TBD	TBD	NL	NL	NL
2,4-Dinitrotoluene	8270D	TBD	TBD	NL	NL	NL
2,6-Dinitrotoluene	8270D	TBD	TBD	NL	NL	NL
2-Chloronaphthalene	8270D	TBD	TBD	NL	NL	NL
2-Chlorophenol	8270D	TBD	TBD	NL	NL	NL
2-Methylnaphthalene	8270D	TBD	TBD	NL	NL	NL
2-Methylphenol	8270D	TBD	TBD	0.33	330	0.33
2-Nitroaniline	8270D	TBD	TBD	NL	NL	NL
2-Nitrophenol	8270D	TBD	TBD	NL	NL	NL
3,3´-Dichlorobenzidine	8270D	TBD	TBD	NL	NL	NL
3 & 4 -Methylphenol	8270D	TBD	TBD	0.33	330	0.33
3-Nitroaniline	8270D	TBD	TBD	NL	NL	NL
4,6-Dinitro-2-methylphenol	8270D	TBD	TBD	NL	NL	NL
4-Bromophenyl phenyl ether	8270D	TBD	TBD	NL	NL	NL
4-Chloro-3-methylphenol	8270D	TBD	TBD	NL	NL	NL
4-Chloroaniline	8270D	TBD	TBD	NL	NL	NL
4-Chlorophenyl phenyl ether	8270D	TBD	TBD	NL	NL	NL
4-Nitroaniline	8270D	TBD	TBD	NL	NL	NL
4-Nitrophenol	8270D	TBD	TBD	NL	NL	NL
Acenaphthene	8270D	TBD	TBD	20	20,000	98
Acenaphthylene	8270D	TBD	TBD	100	100,000	107
Acetophenone	8270D	TBD	TBD	NL	NL	NL
Anthracene	8270D	TBD	TBD	100	100,000	1,000
Atrazine	8270D	TBD	TBD	NL	NL	NL
Benzaldehyde	8270D	TBD	TBD	NL	NL	NL
Benzo[a]anthracene	8270D	TBD	TBD	1	1,000	1
Benzo[a]pyrene	8270D	TBD	TBD	1	1,000	22
Benzo[b]fluoranthene	8270D	TBD	TBD	1	1,000	1.7
Benzo[g,h,i]perylene	8270D	TBD	TBD	100	100,000	1,000
Benzo[k]fluoranthene	8270D	TBD	TBD	0.8	800	1.7
bis(2-Chloroethoxy)methane	8270D	TBD	TBD	NL	NL	NL
bis(2-chloroethyl)ether	8270D	TBD	TBD	NL	NL	NL
bis(2-chloroisopropyl)ether	8270D	TBD	TBD	NL	NL	NL
bis(2-Ethylhexyl)phthalate	8270D	TBD	TBD	NL	NL	NL
Butyl benzyl phthalate	8270D	TBD	TBD	NL	NL	NL
Caprolactam	8270D	TBD	TBD	NL	NL	NL
Carbazole	8270D	TBD	TBD	NL	NL	NL
Chrysene	8270D	TBD	TBD	1	1,000	1
Dibenz[a,h]anthracene	8270D	TBD	TBD	0.33	330	1,000
Dibenzofuran	8270D	TBD	TBD	NL	NL	NL
Diethyl phthalate	8270D	TBD	TBD	NL	NL	NL
Dimethyl phthalate	8270D	TBD	TBD	NL	NL	NL
Di-n-butyl phthalate	8270D	TBD	TBD	NL	NL	NL
Di-n-octyl phthalate	8270D	TBD	TBD	NL	NL	NL
Fluoranthene	8270D	TBD	TBD	100	100,000	1,000
Fluorene	8270D	TBD	TBD	30	30,000	NL
Hexachlorobenzene	8270D	TBD	TBD	NL	NL	NL
Hexachlorobutadiene	8270D	TBD	TBD	NL	NL	NL
Hexachlorocyclopentadiene	8270D	TBD	TBD	NL	NL	NL
Hexachloroethane	8270D	TBD	TBD	NL	NL	NL

Former Accurate Die Casting Site
547 East Genesee Street
Fayetteville, New York
Site No. C734052

Table 2-2. Laboratory limits and regulatory limits for SVOCs in soil samples

SVOC Target Analytes	Method Reference	Laboratory Soil RL (µg/Kg)	Laboratory Soil MDL (µg/Kg)	Unrestricted SCOs (mg/Kg)	Unrestricted SCOs (µg/Kg)	*Protection of Groundwater SCOs* (mg/Kg)
Indeno[1,2,3-cd]pyrene	8270D	TBD	TBD	0.5	500	8
Isophorone	8270D	TBD	TBD	NL	NL	NL
Naphthalene	8270D	TBD	TBD	12	12,000	12
Nitrobenzene	8270D	TBD	TBD	NL	NL	NL
N-Nitroso-di-n-propylamine	8270D	TBD	TBD	NL	NL	NL
N-Nitrosodiphenylamine	8270D	TBD	TBD	NL	NL	NL
Pentachlorophenol	8270D	TBD	TBD	0.8	800	0.8
Phenanthrene	8270D	TBD	TBD	100	100,000	1,000
Phenol	8270D	TBD	TBD	0.33	330	0.33
Pyrene	8270D	TBD	TBD	100	100,000	1,000

Notes:

RL indicates reporting limit.
MDL indicates method detection limit.
mg/kg indicates milligrams per kilogram.
NL indicates not listed
MDLs and RLs will be provided by the laboratory once the laboratory is identified.
TBD indicates to be determined at a later date.

SVOC target analyte list source:

USEPA. August 2014. Statement of Work For Organic Superfund Methods, Multi-Media, Multi-Concentration (SOM02.2). Washington,

Method reference:

1. USEPA. 2007. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, Update IV. Washington D.C.

Regulatory Criteria References:

SCOs indicates 6 NYCRR Part 375 soil cleanup objectives current as of August 2015.

Former Accurate Die Casting Site
547 East Genesee Street
Fayetteville, New York
Site No. C734052
Table 2-2a. Laboratory limits and regulatory limits for SVOCs in surface water samples

SVOC Target Analytes	Method Reference	RL (µg/L)	MDL (µg/L)	Class C Surface Water Criteria (ug/L)
1,1´-Biphenyl	8270D	TBD	TBD	NL
1,2,4,5-Tetrachlorobenzene	8270D	TBD	TBD	NL
2,3,4,6-Tetrachlorophenol	8270D	TBD	TBD	1
2,4,5-Trichlorophenol	8270D	TBD	TBD	1
2,4,6-Trichlorophenol	8270D	TBD	TBD	1
2,4-Dichlorophenol	8270D	TBD	TBD	1
2,4-Dimethylphenol	8270D	TBD	TBD	1,000
2,4-Dinitrophenol	8270D	TBD	TBD	400
2,4-Dinitrotoluene	8270D	TBD	TBD	NL
2,6-Dinitrotoluene	8270D	TBD	TBD	NL
2-Chloronaphthalene	8270D	TBD	TBD	NL
2-Chlorophenol	8270D	TBD	TBD	NL
2-Methylnaphthalene	8270D	TBD	TBD	NL
2-Methylphenol	8270D	TBD	TBD	NL
2-Nitroaniline	8270D	TBD	TBD	NL
2-Nitrophenol	8270D	TBD	TBD	NL
3,3´-Dichlorobenzidine	8270D	TBD	TBD	NL
3 & 4 -Methylphenol	8270D	TBD	TBD	NL
3-Nitroaniline	8270D	TBD	TBD	NL
4,6-Dinitro-2-methylphenol	8270D	TBD	TBD	NL
4-Bromophenyl phenyl ether	8270D	TBD	TBD	NL
4-Chloro-3-methylphenol	8270D	TBD	TBD	NL
4-Chloroaniline	8270D	TBD	TBD	NL
4-Chlorophenyl phenyl ether	8270D	TBD	TBD	NL
4-Nitroaniline	8270D	TBD	TBD	NL
4-Nitrophenol	8270D	TBD	TBD	NL
Acenaphthene	8270D	TBD	TBD	NL
Acenaphthylene	8270D	TBD	TBD	NL
Acetophenone	8270D	TBD	TBD	NL
Anthracene	8270D	TBD	TBD	NL
Atrazine	8270D	TBD	TBD	NL
Benzaldehyde	8270D	TBD	TBD	NL
Benzo[a]anthracene	8270D	TBD	TBD	NL
Benzo[a]pyrene	8270D	TBD	TBD	NL
Benzo[b]fluoranthene	8270D	TBD	TBD	NL
Benzo[g,h,i]perylene	8270D	TBD	TBD	NL
Benzo[k]fluoranthene	8270D	TBD	TBD	NL
bis(2-Chloroethoxy)methane	8270D	TBD	TBD	NL
bis(2-chloroethyl)ether	8270D	TBD	TBD	NL
bis(2-chloroisopropyl)ether	8270D	TBD	TBD	NL
bis(2-Ethylhexyl)phthalate	8270D	TBD	TBD	0.6
Butyl benzyl phthalate	8270D	TBD	TBD	NL
Caprolactam	8270D	TBD	TBD	NL
Carbazole	8270D	TBD	TBD	NL
Chrysene	8270D	TBD	TBD	NL
Dibenz[a,h]anthracene	8270D	TBD	TBD	NL
Dibenzofuran	8270D	TBD	TBD	6 x 10^{-10}
Diethyl phthalate	8270D	TBD	TBD	NL
Dimethyl phthalate	8270D	TBD	TBD	NL
Di-n-butyl phthalate	8270D	TBD	TBD	NL
Di-n-octyl phthalate	8270D	TBD	TBD	NL
Fluoranthene	8270D	TBD	TBD	NL
Fluorene	8270D	TBD	TBD	NL
Hexachlorobenzene	8270D	TBD	TBD	3 x 10^{-5}
Hexachlorobutadiene	8270D	TBD	TBD	1
Hexachlorocyclopentadiene	8270D	TBD	TBD	0.45
Hexachloroethane	8270D	TBD	TBD	0.6

Former Accurate Die Casting Site
547 East Genesee Street
Fayetteville, New York
Site No. C734052

Table 2-2a. Laboratory limits and regulatory limits for SVOCs in surface water samples

SVOC Target Analytes	Method Reference	RL (µg/L)	MDL (µg/L)	Class C Surface Water Criteria (ug/L)
Indeno[1,2,3-cd]pyrene	8270D	TBD	TBD	NL
Isophorone	8270D	TBD	TBD	NL
Naphthalene	8270D	TBD	TBD	NL
Nitrobenzene	8270D	TBD	TBD	NL
N-Nitroso-di-n-propylamine	8270D	TBD	TBD	NL
N-Nitrosodiphenylamine	8270D	TBD	TBD	NL
Pentachlorophenol	8270D	TBD	TBD	Calc based on pH
Phenanthrene	8270D	TBD	TBD	NL
Phenol	8270D	TBD	TBD	5
Pyrene	8270D	TBD	TBD	NL

Notes:

RL indicates reporting limit.

MDL indicates method detection limit.

mg/kg indicates milligrams per kilogram.

NL indicates not listed

MDLs and RLs will be provided by the laboratory once the laboratory is identified.

TBD indicates to be determined at a later date.

SVOC target analyte list source:

USEPA. August 2014. Statement of Work For Organic Superfund Methods, Multi-Media, Multi-Concentration (SOM02.2). Washington, D.C.

Method reference:

1. USEPA. 2007. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, Update IV. Washington D.C.

Regulatory Criteria References:

6 CRR-NY 703.5.

Former Accurate Die Casting Site
547 East Genesee Street
Fayetteville, New York
Site No. C734052

Table 2-2b. Laboratory limits and regulatory limits for SVOCs in sediment samples

SVOC Target Analytes	Method Reference	Laboratory Soil RL (µg/Kg)	Laboratory Soil MDL (µg/Kg)	Class A Fresh Water Sediment Guidance Values (ug/Kg)
1,1´-Biphenyl	8270D	TBD	TBD	NL
1,2,4,5-Tetrachlorobenzene	8270D	TBD	TBD	<3,000
2,3,4,6-Tetrachlorophenol	8270D	TBD	TBD	NL
2,4,5-Trichlorophenol	8270D	TBD	TBD	NL
2,4,6-Trichlorophenol	8270D	TBD	TBD	NL
2,4-Dichlorophenol	8270D	TBD	TBD	NL
2,4-Dimethylphenol	8270D	TBD	TBD	NL
2,4-Dinitrophenol	8270D	TBD	TBD	NL
2,4-Dinitrotoluene	8270D	TBD	TBD	NL
2,6-Dinitrotoluene	8270D	TBD	TBD	NL
2-Chloronaphthalene	8270D	TBD	TBD	NL
2-Chlorophenol	8270D	TBD	TBD	NL
2-Methylnaphthalene	8270D	TBD	TBD	NL
2-Methylphenol	8270D	TBD	TBD	NL
2-Nitroaniline	8270D	TBD	TBD	NL
2-Nitrophenol	8270D	TBD	TBD	NL
3,3´-Dichlorobenzidine	8270D	TBD	TBD	NL
3 & 4 -Methylphenol	8270D	TBD	TBD	NL
3-Nitroaniline	8270D	TBD	TBD	NL
4,6-Dinitro-2-methylphenol	8270D	TBD	TBD	NL
4-Bromophenyl phenyl ether	8270D	TBD	TBD	NL
4-Chloro-3-methylphenol	8270D	TBD	TBD	NL
4-Chloroaniline	8270D	TBD	TBD	NL
4-Chlorophenyl phenyl ether	8270D	TBD	TBD	NL
4-Nitroaniline	8270D	TBD	TBD	NL
4-Nitrophenol	8270D	TBD	TBD	NL
Acenaphthene	8270D	TBD	TBD	9,820
Acenaphthylene	8270D	TBD	TBD	9,040
Acetophenone	8270D	TBD	TBD	NL
Anthracene	8270D	TBD	TBD	11,880
Atrazine	8270D	TBD	TBD	NL
Benzaldehyde	8270D	TBD	TBD	NL
Benzo[a]anthracene	8270D	TBD	TBD	16,820
Benzo[a]pyrene	8270D	TBD	TBD	19,280
Benzo[b]fluoranthene	8270D	TBD	TBD	19,580
Benzo[g,h,i]perylene	8270D	TBD	TBD	21,900
Benzo[k]fluoranthene	8270D	TBD	TBD	19,580
bis(2-Chloroethoxy)methane	8270D	TBD	TBD	NL
bis(2-chloroethyl)ether	8270D	TBD	TBD	NL
bis(2-chloroisopropyl)ether	8270D	TBD	TBD	NL
bis(2-Ethylhexyl)phthalate	8270D	TBD	TBD	<360,000
Butyl benzyl phthalate	8270D	TBD	TBD	NL
Caprolactam	8270D	TBD	TBD	NL
Carbazole	8270D	TBD	TBD	NL
Chrysene	8270D	TBD	TBD	16,860
Dibenz[a,h]anthracene	8270D	TBD	TBD	22,440
Dibenzofuran	8270D	TBD	TBD	NL
Diethyl phthalate	8270D	TBD	TBD	NL
Dimethyl phthalate	8270D	TBD	TBD	NL
Di-n-butyl phthalate	8270D	TBD	TBD	NL
Di-n-octyl phthalate	8270D	TBD	TBD	NL
Fluoranthene	8270D	TBD	TBD	14,160
Fluorene	8270D	TBD	TBD	10,780
Hexachlorobenzene	8270D	TBD	TBD	NL
Hexachlorobutadiene	8270D	TBD	TBD	<1,200
Hexachlorocyclopentadiene	8270D	TBD	TBD	<810
Hexachloroethane	8270D	TBD	TBD	NL

Former Accurate Die Casting Site
547 East Genesee Street
Fayetteville, New York
Site No. C734052

Table 2-2b. Laboratory limits and regulatory limits for SVOCs in sediment samples

SVOC Target Analytes	Method Reference	Laboratory Soil RL (µg/Kg)	Laboratory Soil MDL (µg/Kg)	Class A Fresh Water Sediment Guidance Values (ug/Kg)
Indeno[1,2,3-cd]pyrene	8270D	TBD	TBD	22,300
Isophorone	8270D	TBD	TBD	NL
Naphthalene	8270D	TBD	TBD	7,770
Nitrobenzene	8270D	TBD	TBD	NL
N-Nitroso-di-n-propylamine	8270D	TBD	TBD	NL
N-Nitrosodiphenylamine	8270D	TBD	TBD	NL
Pentachlorophenol	8270D	TBD	TBD	<14,000
Phenanthrene	8270D	TBD	TBD	11,940
Phenol	8270D	TBD	TBD	NL
Pyrene	8270D	TBD	TBD	13,960

Notes:

RL indicates reporting limit.
MDL indicates method detection limit.
mg/kg indicates milligrams per kilogram.
NL indicates not listed
MDLs and RLs will be provided by the laboratory once the laboratory is identified.
TBD indicates to be determined at a later date.

SVOC target analyte list source:

USEPA. August 2014. Statement of Work For Organic Superfund Methods, Multi-Media, Multi-Concentration (SOM02.2). Washington, D.C.

Method reference:

1. USEPA. 2007. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, Update IV. Washington D.C.

Regulatory Criteria References:

Screening and Assessment of Contaminated Sediment (NYSDEC, June 24, 2014)

Former Accurate Die Casting Site

547 East Genesee Street

Fayetteville, New York

Site No. C734052

Table 2-3. Laboratory limits and regulatory limits for PCBs in soil samples

PCB Target Analytes	USEPA Method	Method Reference	Laboratory Soil RL (ug/kg)	Laboratory Soil MDL (ug/kg)	Unrestricted SCOs (mg/kg)	Unrestricted SCOs (ug/kg)	Protection of Groundwater SCOs (mg/kg)
Aroclor 1016	8082A	1	TBD	TBD	0.1	100	3.2
Aroclor 1221	8082A	1	TBD	TBD	0.1	100	3.2
Aroclor 1232	8082A	1	TBD	TBD	0.1	100	3.2
Aroclor 1242	8082A	1	TBD	TBD	0.1	100	3.2
Aroclor 1248	8082A	1	TBD	TBD	0.1	100	3.2
Aroclor 1254	8082A	1	TBD	TBD	0.1	100	3.2
Aroclor 1260	8082A	1	TBD	TBD	0.1	100	3.2
Aroclor 1262	8082A	1	TBD	TBD	0.1	100	3.2
Aroclor 1268	8082A	1	TBD	TBD	0.1	100	3.2

Notes:

PCBs indicates polychlorinated biphenyls.

RL indicates reporting limit.

MDL indicates method detection limit.

mg/Kg indicates milligram per kilogram.

ug/Kg indicates microgram per kilogram.

MDLs and RLs will be provided by the laboratory once the laboratory is identified.

TBD indicates to be determined at a later date.

PCB target analyte list source:

USEPA. August 2014. Statement of Work For Organic Superfund Methods, Multi-Media, Multi-Concentration (SOM02.2). Washington, D.C.

Method Reference:

1. USEPA. 2007. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, Update IV. Washington D.C.

Regulatory Criteria:

SCOs indicates 6 NYCRR Part 375 soil cleanup objectives current as of August 2015.

Former Accurate Die Casting Site
547 East Genesee Street
Fayetteville, New York
Site No. C734052

Table 2-3a. Laboratory limits and regulatory limits for PCBs in surface water samples

PCB Target Analytes	USEPA Method	Method Reference	Laboratory Soil RL (ug/kg)	Laboratory Soil MDL (ug/kg)	Class C Surface Water Criteria* (ug/L)
Aroclor 1016	8082A	1	TBD	TBD	1.2×10^{-4}
Aroclor 1221	8082A	1	TBD	TBD	
Aroclor 1232	8082A	1	TBD	TBD	
Aroclor 1242	8082A	1	TBD	TBD	
Aroclor 1248	8082A	1	TBD	TBD	
Aroclor 1254	8082A	1	TBD	TBD	
Aroclor 1260	8082A	1	TBD	TBD	
Aroclor 1262	8082A	1	TBD	TBD	
Aroclor 1268	8082A	1	TBD	TBD	

Notes:

PCBs indicates polychlorinated biphenyls.
RL indicates reporting limit.
MDL indicates method detection limit.
ug/L indicates microgram per liter.
MDLs and RLs will be provided by the laboratory once the laboratory is identified.
TBD indicates to be determined at a later date.
* Applies to the sum of these substances

PCB target analyte list source:

USEPA. August 2014. Statement of Work For Organic Superfund Methods, Multi-Media, Multi-Concentration (SOM02.2). Washington, D.C.

Method Reference:

1. USEPA. 2007. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, Update IV. Washington D.C

Regulatory Criteria:

6 CRR-NY 703.5.

Former Accurate Die Casting Site
547 East Genesee Street
Fayetteville, New York
Site No. C734052

Table 2-3b. Laboratory limits and regulatory limits for PCBs in sediment samples

PCB Target Analytes	USEPA Method	Method Reference	Laboratory Soil RL (ug/kg)	Laboratory Soil MDL (ug/kg)	Class A Fresh Water Sediment Guidance Values* (ug/kg)
Aroclor 1016	8082A	1	TBD	TBD	100
Aroclor 1221	8082A	1	TBD	TBD	
Aroclor 1232	8082A	1	TBD	TBD	
Aroclor 1242	8082A	1	TBD	TBD	
Aroclor 1248	8082A	1	TBD	TBD	
Aroclor 1254	8082A	1	TBD	TBD	
Aroclor 1260	8082A	1	TBD	TBD	
Aroclor 1262	8082A	1	TBD	TBD	
Aroclor 1268	8082A	1	TBD	TBD	

Notes:

PCBs indicates polychlorinated biphenyls.

RL indicates reporting limit.

MDL indicates method detection limit.

ug/Kg indicates microgram per kilogram.

MDLs and RLs will be provided by the laboratory once the laboratory is identified.

TBD indicates to be determined at a later date.

* Applies to Total PCBs

PCB target analyte list source:

USEPA. August 2014. Statement of Work For Organic Superfund Methods, Multi-Media, Multi-Concentration (SOM02.2). Washington, D.C.

Method Reference:

1. USEPA. 2007. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, Update IV. Washington D.C

Regulatory Criteria:

Screening and Assessment of Contaminated Sediment (NYSDEC, June 24, 2014)

Former Accurate Die Casting Site
547 East Genesee Street
Fayetteville, New York
Site No. C734052

Table 2-4. Laboratory limits and regulatory limits for metals and other inorganics in soil samples

Target Analytes	USEPA Method	Method Reference	Laboratory Soil RL (mg/Kg)	Laboratory Soil MDL (mg/Kg)	Unrestricted SCOs (mg/Kg)
Aluminum	6010C/6020A	1	TBD	TBD	NL
Antimony	6010C/6020A	1	TBD	TBD	NL
Arsenic	6010C/6020A	1	TBD	TBD	13
Barium	6010C/6020A	1	TBD	TBD	350
Beryllium	6010C/6020A	1	TBD	TBD	7.2
Cadmium	6010C/6020A	1	TBD	TBD	2.5
Calcium	6010C/6020A	1	TBD	TBD	NL
Chromium	6010C/6020A	1	TBD	TBD	30
Cobalt	6010C/6020A	1	TBD	TBD	NL
Copper	6010C/6020A	1	TBD	TBD	50
Iron	6010C/6020A	1	TBD	TBD	NL
Lead	6010C/6020A	1	TBD	TBD	63
Magnesium	6010C/6020A	1	TBD	TBD	NL
Manganese	6010C/6020A	1	TBD	TBD	1,600
Mercury	7471B	1	TBD	TBD	0.18
Nickel	6010C/6020A	1	TBD	TBD	30
Potassium	6010C/6020A	1	TBD	TBD	NL
Selenium	6010C/6020A	1	TBD	TBD	3.9
Silver	6010C/6020A	1	TBD	TBD	2
Sodium	6010C/6020A	1	TBD	TBD	NL
Thallium	6010C/6020A	1	TBD	TBD	NL
Vanadium	6010C/6020A	1	TBD	TBD	NL
Zinc	6010C/6020A	1	TBD	TBD	109
Other Analytes					
Total Cyanide	9012B	2	TBD	TBD	27

Notes:

RL indicates reporting limit.
MDL indicates method detection limit.
mg/Kg indicates milligram per kilogram.
MDLs and RLs will be provided by the laboratory once the laboratory is identified.
NL indicates not listed
TBD indicates to be determined at a later date.

Target analyte source List:

Metals- Target analyte list (TAL) resource - USEPA. 2014. Multi-Media, Multi-Concentration Inorganic Analysis (ISM02.2). Washington, D.C.

Method references:

1. USEPA. 2007. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, Update IV. Washington D.C.
2. USEPA. 2004. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, Update IIIB. Washington D.C.

Regulatory Criteria:

SCOs indicates 6 NYCRR Part 375 soil cleanup objectives current as of April 2008

Former Accurate Die Casting Site
547 East Genesee Street
Fayetteville, New York
Site No. C734052

Table 2-4a. Laboratory limits and regulatory limits for metals and other inorganics in surface water samples

Target Analytes	USEPA Method	Method Reference	Laboratory Soil RL (ug/L)	Laboratory Soil MDL (ug/L)	Class C Surface Water Criteria (ug/L)
Aluminum	6010C/6020A	1	TBD	TBD	100
Antimony	6010C/6020A	1	TBD	TBD	NL
Arsenic	6010C/6020A	1	TBD	TBD	150
Barium	6010C/6020A	1	TBD	TBD	NL
Beryllium	6010C/6020A	1	TBD	TBD	Calc based on hardness
Cadmium	6010C/6020A	1	TBD	TBD	Calc based on hardness
Calcium	6010C/6020A	1	TBD	TBD	NL
Chromium	6010C/6020A	1	TBD	TBD	Calc based on hardness
Cobalt	6010C/6020A	1	TBD	TBD	5
Copper	6010C/6020A	1	TBD	TBD	Calc based on hardness
Iron	6010C/6020A	1	TBD	TBD	NL
Lead	6010C/6020A	1	TBD	TBD	Calc based on hardness
Magnesium	6010C/6020A	1	TBD	TBD	NL
Manganese	6010C/6020A	1	TBD	TBD	NL
Mercury	7471B	1	TBD	TBD	0.77
Nickel	6010C/6020A	1	TBD	TBD	Calc based on hardness
Potassium	6010C/6020A	1	TBD	TBD	NL
Selenium	6010C/6020A	1	TBD	TBD	4.6
Silver	6010C/6020A	1	TBD	TBD	0.1
Sodium	6010C/6020A	1	TBD	TBD	NL
Thallium	6010C/6020A	1	TBD	TBD	8
Vanadium	6010C/6020A	1	TBD	TBD	14
Zinc	6010C/6020A	1	TBD	TBD	Calc based on hardness
Other Analytes					
Total Cyanide	9012B	2	TBD	TBD	5.2

Notes:

RL indicates reporting limit.
MDL indicates method detection limit.
ug/L indicates milligram per kilogram.
MDLs and RLs will be provided by the laboratory once the laboratory is identified.
NL indicates not listed
TBD indicates to be determined at a later date.

Target analyte source List:

Metals- Target analyte list (TAL) resource - USEPA. 2014. Multi-Media, Multi-Concentration Inorganic Analysis (ISM02.2). Washington, D.C.

Method references:

1. USEPA. 2007. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, Update IV. Washington D.C.
2. USEPA. 2004. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, Update IIIB. Washington D.C.

Regulatory Criteria:

6 CRR-NY 703.5.

Former Accurate Die Casting Site
547 East Genesee Street
Fayetteville, New York
Site No. C734052

Table 2-4b. Laboratory limits and regulatory limits for metals and other inorganics in sediment samples

Target Analytes	USEPA Method	Method Reference	Laboratory Soil RL (mg/Kg)	Laboratory Soil MDL (mg/Kg)	Class A Fresh Water Sediment Guidance Values (mg/Kg)
Aluminum	6010C/6020A	1	TBD	TBD	NL
Antimony	6010C/6020A	1	TBD	TBD	NL
Arsenic	6010C/6020A	1	TBD	TBD	<10
Barium	6010C/6020A	1	TBD	TBD	NL
Beryllium	6010C/6020A	1	TBD	TBD	NL
Cadmium	6010C/6020A	1	TBD	TBD	<1
Calcium	6010C/6020A	1	TBD	TBD	NL
Chromium	6010C/6020A	1	TBD	TBD	<43
Cobalt	6010C/6020A	1	TBD	TBD	NL
Copper	6010C/6020A	1	TBD	TBD	<32
Iron	6010C/6020A	1	TBD	TBD	NL
Lead	6010C/6020A	1	TBD	TBD	<36
Magnesium	6010C/6020A	1	TBD	TBD	NL
Manganese	6010C/6020A	1	TBD	TBD	NL
Mercury	7471B	1	TBD	TBD	<0.2
Nickel	6010C/6020A	1	TBD	TBD	<23
Potassium	6010C/6020A	1	TBD	TBD	NL
Selenium	6010C/6020A	1	TBD	TBD	NL
Silver	6010C/6020A	1	TBD	TBD	<1
Sodium	6010C/6020A	1	TBD	TBD	NL
Thallium	6010C/6020A	1	TBD	TBD	NL
Vanadium	6010C/6020A	1	TBD	TBD	NL
Zinc	6010C/6020A	1	TBD	TBD	<120
Other Analytes					
Total Cyanide	9012B	2	TBD	TBD	NL

Notes:

RL indicates reporting limit.
MDL indicates method detection limit.
mg/Kg indicates milligram per kilogram.
MDLs and RLs will be provided by the laboratory once the laboratory is identified.
NL indicates not listed
TBD indicates to be determined at a later date.

Target analyte source List:

Metals- Target analyte list (TAL) resource - USEPA. 2014. Multi-Media, Multi-Concentration Inorganic Analysis (ISM02.2). Washington, D.C.

Method references:

1. USEPA. 2007. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, Update IV. Washington D.C.
2. USEPA. 2004. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, Update IIIB. Washington D.C.

Regulatory Criteria:

Screening and Assessment of Contaminated Sediment (NYSDEC, June 24, 2014)

Former Accurate Die Casting Site
547 East Genesee Street
Fayetteville, New York
Site No. C734052
Table 2-5. Laboratory limits for PFAS and 1,4-Dioxane in soil samples

Target Analytes	**USEPA Method**	**Laboratory Soil RL (ug/Kg)**	**Laboratory Soil MDL (ug/Kg)**
Perfluorobutanoic acid (PFBA)	537 Modified	0.200	0.0280
Perfluoropentanoic acid (PFPeA)	537 Modified	0.200	0.0770
Perfluorohexanoic acid (PFHxA)	537 Modified	0.200	0.0420
Perfluoroheptanoic acid (PFHpA)	537 Modified	0.200	0.0290
Perfluorooctanoic acid (PFOA)	537 Modified	0.200	0.0860
Perfluorononanoic acid (PFNA)	537 Modified	0.200	0.0360
Perfluorodecanoic acid (PFDA)	537 Modified	0.200	0.0220
Perfluoroundecanoic acid (PFUnA)	537 Modified	0.200	0.0360
Perfluorododecanoic acid (PFDoA)	537 Modified	0.200	0.0670
Perfluorotridecanoic acid (PFTriA)	537 Modified	0.200	0.0510
Perfluorotetradecanoic acid (PFTeA)	537 Modified	0.200	0.0540
Perfluorobutanesulfonic acid (PFBS)	537 Modified	0.200	0.0250
Perfluorohexanesulfonic acid (PFHxS)	537 Modified	0.200	0.0310
Perfluoroheptanesulfonic Acid (PFHpS)	537 Modified	0.200	0.0350
Perfluorooctanesulfonic acid (PFOS)	537 Modified	0.500	0.200
Perfluorodecanesulfonic acid (PFDS)	537 Modified	0.200	0.0390
Perfluorooctanesulfonamide (FOSA)	537 Modified	0.200	0.0820
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	537 Modified	2.00	0.390
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	537 Modified	2.00	0.370
6:2 FTS	537 Modified	2.00	0.150
8:2 FTS	537 Modified	2.00	0.250
1,4-Dioxane	8270 SIM	200	55.0

Notes:

RL indicates reporting limit.

MDL indicates method detection limit.

ug/Kg indicates microgram per kilogram.

MDLs and RLs will be provided by the laboratory once the laboratory is identified.

NL indicates not listed

TBD indicates to be determined at a later date.

Table 3-1. VOCs using USEPA Methods 8000C/8260C quality control requirements and corrective actions.

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
Sample preservation	Samples must be preserved based on method and QCD requirements	For aqueous samples: cooler temperature ≤6°C, preserve with HCL to pH≤2, Sealed and Headspace Free. For solid samples: cooler temperature ≤6°C, See Table 1 for sample collection and preparation information.	1. Notify Project Manager since re-sampling may be required. 2. Document corrective action in the case narrative.
Solid sample collection	Samples must be prepared using USEPA Method 5035A	NA	NA
Holding times (Sensitivity)	Samples must be analyzed within holding time.	See Table 1 For aqueous and solid samples: Analyze within 14 days from collection for preserved samples. Analysis within 7 days from collection to analysis for aqueous samples not acid preserved. For vinyl chloride, styrene - analyze within 7 days from collection. For TCLP -14 days from collection to extract generation. 14 days from extract generation to analysis. See Table 1 for sample collection and preparation information.	3. If holding times are exceeded for initial or any re-analyses required due to QC excursions. 4. Notify QAO since re-sampling may be required. 5. Document corrective action in the case narrative.
MS Tuning (Accuracy)	Once every 12 hours prior to initial calibration and calibration verifications. Analytical sequence must be completed within 12 hours of the GC/MS Instrument Performance Check	1. Bromofluorobenzene (BFB) key ions and abundance criteria listed in the method Table 3 must be met for all 9 ions and analyses must be performed within 12 hours of injection of the BFB. 2. Part of the BFB peak will not be background subtracted to meet tune criteria. 3. Documentation of all bromofluorobenzene analyses and evaluation must be included in the data packages.	1. Tune the mass spectrometer. 2. Document corrective action in the case narrative. 3. Samples cannot be analyzed until control limit criteria have been met.

Table 3-1. VOCs using USEPA Methods 8000C/8260C quality control requirements and corrective actions.

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
Initial Calibration Initial Calibration Verification (ICV) (Accuracy)	Prior to sample analysis and when calibration verifications criteria are not met. Initial calibration will contain all target analytes in each standard. Quantitation of analyses will utilize the initial calibration results.	1. Five concentrations bracketing expected concentration range for all compounds of interest. 2. One second-source standard (ICV) must be analyzed immediately following the initial calibration at the mid-calibration concentration. This standard must be within 30% recovery or within laboratory control limits. It is also recommended that a separate standard at the MDL level be analyzed after calibration is complete to check sensitivity. 3. Response factor (RF) as listed in Table 4, Method 8260C. The following exceptions are allowed: RFs ≥ 0.010 for poor purging target analytes (ketones, acetonitrile, acrolein, propionitrile, vinyl acetate, 1,4-dioxane, alcohols, tetrahydrofuran, and cyclohexanone). For remaining target analytes not listed on Table 4, RFs greater than or equal to 0.050. For Ketones listed in Table 4 with RFs greater than or equal to 0.010 and less than 0.100, data will be qualified as approximate (UJ, J). 4. For compound with %RSD >20, quantitation must be performed using a separate calibration curve and the Coefficient of Determination (COD) must be ≥ 0.99. 5. If linear regression is used for the calibration curve, the low initial calibration standard, %D <30% from true value. 6. Relative retention time (RRT) for each target analyte in each calibration standard must agree within ± 0.06 RRT units	1. Identify and correct problem. 2. If criteria are still not met, recalibrate. 3. Document corrective action in the case narrative. 4. Samples should not be analyzed until calibration control limit criteria are met. 5. Contact QAO to discuss problem target analytes before proceeding with analysis.

Table 3-1. VOCs using USEPA Methods 8000C/8260C quality control requirements and corrective actions.

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
Calibration Verification (Accuracy)	Every 12 hours, following BFB. The calibration verification will contain all target analytes in each standard at a concentration that is representative of the midpoint of the initial calibration.	1. Within percent drift or percent difference (%D) ≤ 20 for compounds, RF same as listed in initial calibration. 2. The internal standards areas and retention times must meet the method criteria.	1. Reanalyze. 2. If criteria are still not met, identify and correct problem, recalibrate. 3. Document corrective action in the case narrative; samples should not be analyzed until calibration control limit criteria are met.
Preparation Blank Analysis (Sensitivity)	Every 12 hours, following calibration verification	Methylene chloride less than 3 times RL and 2-butanone and acetone less than 5 times RL remaining analytes less than RL will be provided along with the preparation blank results.	1. Reanalyze blank. 2. If limits are still exceeded, clean instrument, recalibrate analytical system, and reanalyze all samples if detected for same compounds as in blank. 3. Document corrective action in the case narrative - samples cannot be analyzed until blank criteria have been met.
Field Blank Analysis (Sensitivity)	Collected per QCD requirements.	Methylene chloride less than 3 times RL and 2-butanone and acetone less than 5 times RL remaining analytes less than RL will be provided along with the preparation blank results.	1. Investigate problem. 2. Document in the case narrative.
Trip Blank (Sensitivity)	1 per cooler containing VOC samples.	Methylene chloride less than 3 times RL and 2-butanone and acetone less than 5 times RL remaining analytes less than RL will be provided along with the preparation blank results.	1. Investigate problem. 2. Document in the case narrative.

Table 3-1. VOCs using USEPA Methods 8000C/8260C quality control requirements and corrective actions.

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
Laboratory Control Sample Analysis (Accuracy)	Each analytical batch (every 12 hours). Prepared independently from calibration standards. Spike must contain all target analytes and should be at a concentration, which is in the lower 1/2 of the calibration curve.	Recovery within laboratory control limits. For compounds without established laboratory control limits, 70-130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. If recovery failures are above control limits and these compounds are not detected in the associated samples, corrective action is not required. 2. If recovery failures are below control limits, reanalyze LCS and examine results of other QC analyses. 3. If other QC criteria have not been met, stop analysis, locate and correct problem, recalibrate instrument and reanalyze samples since last satisfactory LCS. 4. Document corrective action in the case narrative.
Internal Standards (Accuracy)	All samples and blanks (including MS/MSD)	1. Response -50% - +200% of internal standards from continuing calibration of the day. 2. RT must be ± 30 sec. from associated calibration verification standard of that sequence.	1. Reanalyze. 2. If still outside of the limits, report both analyses. 3. Document corrective action in the case narrative.
Surrogate Spike (Accuracy)	All samples and blanks (including MS/MSD)	Recovery within laboratory control limits. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze any environmental or QC sample with surrogates that exceed control limits. 2. If still outside of the limits, report both analyses. 3. Document corrective action in the case narrative.

Table 3-1. VOCs using USEPA Methods 8000C/8260C quality control requirements and corrective actions.

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
Matrix Spike/ Matrix Spike Dup. (MS/MSD) Analysis (Accuracy/Precision)	Collected per QCD requirements. Samples from the investigation must be used for MS/MSD analysis. Spike must contain complete list of target analytes.	Recovery and RPD within laboratory control limits. For compounds without established laboratory control limits, 70-130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze if <10%. 2. If reanalysis is still <10%, report both analyses and document in the case narrative. 3. If >10% and LCS criteria are met, document in case narrative; no additional corrective action required. 4. If LCS criteria are exceeded also, examine other QC data for source of problem; *i.e.,* surrogate recoveries for extraction efficiency and calibration data for instrument performance issues. 5. Reanalyze samples and associated MS/MSD and LCSs as required. 6. Document corrective action in the case narrative
Field Dup. Analysis (Precision)	Collected per QCD requirements. Field duplicate will not be identified to the laboratory.	Validation criteria: 30% RPD for waters, 50% RPD for solids. For sample results that are less than or equal to five times the RL, the criterion of plus or minus two times the RL will be applied to evaluate field duplicates.	No corrective action required of the laboratory since the laboratory will not know the identity of the field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis.

Table 3-1. VOCs using USEPA Methods 8000C/8260C quality control requirements and corrective actions.			
Audit Parameter (DQI)	**Frequency**	**Laboratory Control Limits**	**Laboratory Corrective Action**
Target Analyte Identification (Accuracy)	As required for identification of target analytes	1. The intensities of the characteristic ions of a compound maximize in the same scan or within one scan of each other. Selection of a peak by a data system target compound search routine where the search is based on the presence of a target chromatographic peak containing ions specific for the target compound at a compound-specific retention time will be accepted as meeting this criterion. 2. The relative retention time (RRT) of the sample component is within ± 0.06 RRT units of the RRT of the standard component. 3. The relative intensities of the characteristic ions agree within 30% of the relative intensities of these ions in the reference spectrum. (Example: For an ion with an abundance of 50% in the reference spectrum, the corresponding abundance in a sample spectrum can range between 20% and 80%.) 4. Structural isomers that produce very similar mass spectra should be identified as individual isomers if they have sufficiently different GC retention times 5. Identification is hampered when sample components are not resolved chromatographically and produce mass spectra containing ions contributed by more than one analyte. When gas chromatographic peaks obviously represent more than one sample component (i.e., a broadened peak with shoulder(s) or a valley between two or more maxima), appropriate selection of analyte spectra and background spectra is important.	Not applicable

Table 3-1. VOCs using USEPA Methods 8000C/8260C quality control requirements and corrective actions.

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
Target Analyte Identification (Accuracy)	As required for identification of target analytes	Examination of extracted ion current profiles of appropriate ions can aid in the selection of spectra, and in qualitative identification of compounds. When analytes co-elute (i.e., only one chromatographic peak is apparent), the identification criteria may be met, but each analyte spectrum will contain extraneous ions contributed by the coeluting compound.	Not applicable
Target Analyte Quantitation (Accuracy)	Apply USEPA Method 8000C for medium level extraction technique	Moisture correction in accordance with USEPA Method 8000C will be applied to the complete set of solid samples, regardless of the percent moisture content.	Not applicable
Tentatively Identified Compound (Accuracy)	If required, perform for each sample and blank analysis. Non-target compounds will be reported using a Mass Spectral Library search.	Not applicable	Not applicable

Table 3-1. VOCs using USEPA Methods 8000C/8260C quality control requirements and corrective actions.

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
Dilutions	1. When target analyte concentration exceeds upper limit of calibration curve. 2. When matrix interference is demonstrated by the lab and documented in the case narrative (highly viscous samples or a large number of nontarget peaks on the chromatogram). 3. It is recommended that a reagent blank be analyzed if an analyte saturates the detector or if highly concentrated analytes are detected. Otherwise data impacted from carryover cannot be used. 4. Laboratory will note in the data deliverables which analytical runs were reported.	1. The reagent blank will meet the method blank criteria.	1. Reanalyze reagent blank until method blank criteria are met. 2. Document corrective action in the case narrative.
pH Determination	Once sample aliquot is taken from the VOC vial, the pH of water samples must be determined.	Record pH and report in the case narrative.	Not applicable
Sample Batching	The laboratory will batch project samples together along with QC samples specified from the project. Non-project information will not be included in the data packages.	Not applicable	Not applicable

Table 3-1. VOCs using USEPA Methods 8000C/8260C quality control requirements and corrective actions.

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
Laboratory control limits	Generated with results for an analyte from a minimum of 20 sample analyses. The average of the sample results and the standard deviation are calculated. The internal warning limits are established at 2 times the standard deviation and the control limits are established at 3 times the standard deviation. The control limits are updated annually.	Not applicable	Not applicable
Deliverables	1. Full CLP-like deliverables must be provided to document each audit item for easy reference and inspection. 2. An example calculation will be provided for each analysis, for each type of matrix in the data package using samples from the project. 3. Any laboratory abbreviations or notations presented in the raw data or summary information will be explained or referenced in the case narrative. 4. Final spiking concentrations will be presented in summary form. 5. Standard tracing information will be provided. 6. Cooler temperatures and any observations of bubbles in sample containers will be provided in the data packages. 7. Run logs will be provided in the data packages.	Not applicable	Provide missing or additional deliverables for validation purposes.

Table 3-1. VOCs using USEPA Methods 8000C/8260C quality control requirements and corrective actions.			
Audit Parameter (DQI)	**Frequency**	**Laboratory Control Limits**	**Laboratory Corrective Action**
Method and QCD requirements	The laboratory will perform the method as presented in this QCD and will adhere to the QCD requirements presented herein. Otherwise the laboratory will specifically note any procedures that differ from the method or the QCD in the data package case narrative.	Not applicable	Not applicable

Notes:

Data validation will be performed in accordance with QA/QC criteria established in these tables and the analytical methods. Excursions from QA/QC criteria will be qualified based on guidance provided in this QCD.

Communications with O'Brien & Gere will be documented and included in the data packages.

Source: O'Brien & Gere

Table 3-2. SVOCs using USEPA Methods 8000C/8270D/SIM quality control requirements and corrective actions

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
Sample preservation	Samples must be preserved based on method and QAPP requirements	For aqueous and soil samples: cooler temperature ≤6°C. See Table 1 for sample collection and preparation information.	1. Notify Project Manager since re-sampling may be required. 2. Document corrective action in the case narrative.
Holding times (Sensitivity)	Samples must be extracted and analyzed within holding time.	Extract within 7 days from collection for aqueous samples; 14 days from collection for soil samples. Analyze extracts within 40 days of extraction. For TCLP - 14 days from collection to extract generation. 7 days from extract generation to extraction. 40 days from extraction to analysis See Table 1 for sample collection and preparation information.	If holding times are exceeded for initial or any re-analyses required due to QC excursions, notify the QAO since re-sampling may be required.
MS Tuning (Accuracy)	Once every 12 hours prior to initial calibration and calibration verification. Must contain 50ng/uL of 4,4-DDT, pentachlorophenol, and benzidine.	1. DFTPP key ions and abundance criteria listed in the method must be met for all 13 ions and analyses must be performed within 12 hours of injection of the DFTPP. 2. Part of the DFTPP peak will not be background subtracted to meet tune criteria. 3. Documentation of all DFTPP analyses and evaluations must be included in the data packages. 4. Degradation of 4,4-DDT <20%. Peak tailing must not be evident.	1. Tune the mass spectrometer. 2. Document any observations and corrective action in the case narrative - samples cannot be analyzed until control limit criteria have been met.

QUALITY CONTROL DOCUMENT

Table 3-2. SVOCs using USEPA Methods 8000C/8270D/SIM quality control requirements and corrective actions

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
Initial Calibration Initial Calibration Verification (ICV) (Accuracy)	Prior to sample analysis and when calibration verification criteria are not met. Initial calibration will contain all target analytes in each standard. Quantitation of analyses will utilize the initial calibration results.	1. Five concentrations bracketing expected concentration range for all compounds of interest with one standard at or less than the RL 2. One second-source standard should be analyzed immediately following the initial calibration at the mid-calibration concentration. This standard must be within 30% recovery or within laboratory control limits. 3. It is also recommended that a separate standard at the MDL level be analyzed after calibration is complete to check sensitivity. 4. RFs must meet criteria listed in Table 4 of Method 8270D. Remaining RFs must be 0.05. 6. For compounds with %RSD >20, quantification must be performed using a separate calibration curve and the COD must be ≥ 0.99. If linear regression is used for the calibration curve, the low level initial calibration standard %D < 30% from the true value. 8. Relative retention for each target analyte in each calibration standard must agree within ± 0.06 units.	1. Identify and correct problem. 2. If criteria are still not met, recalibrate. 3. Document any observations and corrective action in the case narrative - samples should not be analyzed until calibration control limit criteria are met.
Calibration Verification (Accuracy)	Every 12 hours, following DFTPP. Calibration verification will contain all target analytes in each standard at a concentration that is representative of the midpoint of the initial calibration.	1. Within method specified criteria, percent drift or percent difference (%D) ≤ 20 for target analytes. Response factor requirements as listed in initial calibration. *2.* The internal standards areas and retention times must meet the method criteria.	1. Reanalyze. 2. If criteria are still not met, identify and correct problem, recalibrate. 3. Document any observations and corrective action in the case narrative - samples should not be analyzed until calibration control limit criteria are met.

QUALITY CONTROL DOCUMENT

Table 3-2. SVOCs using USEPA Methods 8000C/8270D/SIM quality control requirements and corrective actions

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
Preparation Blank Analysis (Sensitivity)	Prepared with each extraction batch of no more than 20 analytical samples.	1. Common laboratory contaminants (phthalate) less than 5 x RL. Remaining analytes less than RL. 2. RLs and MDLS will be provided along with the preparation blank results.	1. Reanalyze blank. 2. If limits are still exceeded, clean instrument, recalibrate analytical system and re-extract and reanalyze all samples if detected for same compounds as in the blank. 3. Document any observations and corrective action in the case narrative - samples should not be analyzed until blank criteria have been met.
Field Blank Analysis (Sensitivity)	Collected per QAPP requirements.	1. Common laboratory contaminants (phthalate) less than 5 x RL. Remaining analytes less than RL. 2. RLs and MDLS will be provided along with the blank results.	1. Investigate problem. 2. Document any observations and corrective actions in the case narrative.
Laboratory Control Sample Analysis (Accuracy)	Prepared with each extraction batch, of no more than 20 analytical samples. Prepared independently from calibration standards. Spike must contain all target compounds and should be at a concentration that is approximately in the lower 1/2 of the calibration curve.	Recovery within laboratory control limits. For compounds without established laboratory control limits, 70 to 130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. If recovery failures are above control limits and these compounds are not detected in the associated samples, no corrective action is required. 2. If recovery failures are below the control limits, reanalyze LCS and examine results of other QC analyses. 3. If other QC criteria have not been met, stop analysis, locate and correct problem, recalibrate instrument and reanalyze samples since last satisfactory LCS. 4. Document any observations and corrective action in the case narrative.

Table 3-2. SVOCs using USEPA Methods 8000C/8270D/SIM quality control requirements and corrective actions

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
Internal Standards (Accuracy)	All samples and blanks (including MS/MSD).	Response -50% - +200% of the internal standards from the continuing cal of the day. RT must be ± 30 sec. from calibration verification of that sequence.	1. Reanalyze. 2. If the re-analysis meets criteria or demonstrates fewer excursions, report the re-analysis result. 3. If the re-analysis does not meet criteria or demonstrates fewer excursions, report the initial analysis and include raw data for both analyses in the data package. 4. Document corrective action in the case narrative.
Surrogate Spike (Accuracy)	All samples and blanks (including MS/MSD).	Recovery within laboratory control limits. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze if more than 1 AE or 1 BN fails or if any one surrogate recovery is < 10%. 2. If re-analysis meets criteria, report re-analysis result. 3. If reanalysis recovery fails criteria but recovery is >10%: a. Report the analysis that demonstrates fewer excursions and include raw data for both analyses in the data package. 4. If re-analysis recovery is < 10%, re-extract and re-analyze sample. 5. For re-extracted sample, report the analysis that meets criteria or demonstrates fewer excursions and include raw data for both analyses in the data package. 6. Document corrective action in the case narrative.

Table 3-2. SVOCs using USEPA Methods 8000C/8270D/SIM quality control requirements and corrective actions

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
Matrix Spike/ Matrix Spike Dup. (MS/MSD) Analysis (Accuracy/Precision)	Collected per QAPP requirements. Samples from the investigation must be used for MS/MSD analysis. Spike must contain complete list of target analytes.	Recovery and RPD within laboratory control limits. For compounds without established laboratory control limits, 70-130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze if <10%. 2. If reanalysis is < 10%, report both analyses and document in the case narrative. 3. If reanalysis is >10%, and LCS criteria are met, document in the case narrative. 4. If LCS criteria are exceeded also, examine other QC data for source of problem; i.e. surrogate recoveries for extraction efficiency and calibration data for instrument performance issues; re-extract or reanalyze samples and associated MS/MSD and LCSs as required.
Field Dup. Analysis (Precision)	Collected per QAPP requirements. Field duplicate will not be identified to the laboratory.	Validation criteria: 30% RPD for waters, 50% RPD for solids. For sample results that are less than or equal to five times the RL, the criterion of plus or minus two times the RL will be applied to evaluate field duplicates.	No corrective action required of the laboratory since the laboratory will not know the identity of the field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis.

Target Analyte Identification (Accuracy)	As required for identification of target analytes	1. The intensities of the characteristic ions of a compound maximize in the same scan or within one scan of each other. Selection of a peak by a data system target compound search routine where the search is based on the presence of a target chromatographic peak containing ions specific for the target compound at a compound-specific retention time will be accepted as meeting this criterion. 2. The relative retention time (RRT) of the sample component is within ± 0.06 RRT units of the RRT of the standard component. 3. The relative intensities of the characteristic ions agree within 30% of the relative intensities of these ions in the reference spectrum. (Example: For an ion with an abundance of 50% in the reference spectrum, the corresponding abundance in a sample spectrum can range between 20% and 80%.) 4. Structural isomers that produce very similar mass spectra should be identified as individual isomers if they have sufficiently different GC retention times. 5. Identification is hampered when sample components are not resolved chromatographically and produce mass spectra containing ions contributed by more than one analyte. When gas chromatographic peaks obviously represent more than one sample component (i.e., a broadened peak with shoulder(s) or a valley between two or more maxima), appropriate selection of analyte spectra and background spectra is important. 6. Examination of extracted ion current profiles of appropriate ions can aid in the selection of spectra, and in qualitative identification of compounds. When analytes co-elute (i.e., only one chromatographic peak is apparent), the	Not applicable

Table 3-2. SVOCs using USEPA Methods 8000C/8270D/SIM quality control requirements and corrective actions

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
		identification criteria may be met, but each analyte spectrum will contain extraneous ions contributed by the co-eluting compound.	
Screening samples	As required for samples suspected to contain high concentrations or matrix interferences	It is highly recommended that samples be screened prior to analysis. Screening data (performed prior to the initial analysis) does not need to be included in the data package. Data for samples analyzed at dilutions for initial or subsequent analyses is required to be included in the data package.	Not applicable
Cleanup	Gel permeation chromatography (GPC) should be performed for water extracts with high molecular weight contaminants.	Calibrate according to method. Criteria must be met as listed in method for calibration and blank analysis.	Clean GPC column or replace.
Tentatively Identified Compound (Accuracy)	If required, for each sample and blank analysis. Non-target compounds will be reported using a Mass Spectral Library search.	Not applicable	Not applicable
Sample Batching	The laboratory will batch project samples together along with QC samples specified from the project. Non-project information will not be included in the data packages.	Not applicable	Not applicable
Percent solids	For soil/ samples, the percent solids will be determined and sample results will be corrected for percent solids.	Not applicable	Not applicable

QUALITY CONTROL DOCUMENT

Table 3-2. SVOCs using USEPA Methods 8000C/8270D/SIM quality control requirements and corrective actions

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
Dilutions	1. When target analyte concentration exceed upper limit of calibration curve. 2. When matrix interference demonstrated by lab and documented in the case narrative (highly viscous samples or a large number of non-target peaks on the chromatogram). 3. Samples should be cleaned up during sample preparation/extraction procedure using appropriate methods when matrix interference is present. 4. Laboratory will note in the data deliverables which analytical runs were reported.	The laboratory will not dilute samples unless elevated concentrations of target analytes or matrix interference is demonstrated in the samples.	Not applicable
Laboratory control limits	1. Generated with results for an analyte from a minimum of 20 sample analyses. The average of the sample results and the standard deviation are calculated. The internal warning limits are established at 2 times the standard deviation and the control limits are established at 3 times the standard deviation. The control limits are updated annually.	Not applicable	Not applicable

Table 3-2. SVOCs using USEPA Methods 8000C/8270D/SIM quality control requirements and corrective actions

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
Deliverables	1. Full CLP-like deliverables must be provided to document each audit item for easy reference and inspection. 2. An example calculation will be provided for each analysis, for each type of matrix in the data package using samples from the project. 3. Any laboratory abbreviations or notations presented in the raw data or summary information will be explained or referenced in the case narrative. 4. Final spiking concentrations will be presented in summary form. 5. For the initial data package, standard tracing information will be provided. 6. Cooler temperatures will be provided in the data packages. 7. Run logs will be provided in the data packages.	Not applicable	Provide missing or additional deliverables for validation purposes.
Method and QAPP requirements	The laboratory will perform the method as presented in this QAPP and will adhere to the QAPP requirements presented herein. Otherwise the laboratory will specifically note any procedures that differ from the method or the QAPP in the data package case narrative.	Not applicable	Not applicable

Notes:

Data validation will be performed in accordance with QA/QC criteria established in these tables and the analytical methods that are currently used by the laboratory.
Excursions from QA/QC criteria will be qualified based on guidance provided in this QAPP.
Communications with the QAO will be documented and included in the data packages.

Source: O’Brien & Gere

QUALITY CONTROL DOCUMENT

Table 3-3. PCBs using USEPA Methods 8000C/8082A quality control requirements and corrective actions

Audit Parameter (DQI)	**Frequency (Applies to both primary and confirmation columns)**	**Laboratory Control Limits (Applies to both primary and confirmation columns)**	**Laboratory Corrective Action (Applies to both primary and confirmation columns)**
Sample preservation	Samples must be preserved based on method and QCD requirements	For aqueous and soil samples: cooler temperature ≤6°C. See Table 1 for sample collection and preparation information.	1. Notify Project Manager since re-sampling may be required. 2. Document corrective action in the case narrative.
Holding Times (Sensitivity)	Samples must be extracted and analyzed within holding time.	Extract within 7 days from collection for aqueous samples and 14 days from collection for solid samples. Analyze extracts within 40 days of extraction. For TCLP - 14 days from collection to extract generation. 7 days from extract generation to extraction. 40 days from extraction to analysis See Table 1 for sample collection and preparation information.	If holding times are exceeded for initial or any re-analyses required due to QC excursions, notify the QAO since re-sampling may be required.

QUALITY CONTROL DOCUMENT

Table 3-3. PCBs using USEPA Methods 8000C/8082A quality control requirements and corrective actions

Audit Parameter (DQI)	Frequency (Applies to both primary and confirmation columns)	Laboratory Control Limits (Applies to both primary and confirmation columns)	Laboratory Corrective Action (Applies to both primary and confirmation columns)
Initial Calibration Initial Calibration Verification (ICV) (Accuracy)	Prior to start up and when criteria are exceeded for continuing calibration. Calibrations must contain all target analytes. Quantitation of analyses will utilize the initial calibration results.	1. Minimally five concentrations for Aroclor 1016/1260 (one point calibration for the remaining Aroclors), one calibration standard must be at concentration less than or equal to the RL. 2. One second-source standard (ICV) should be analyzed immediately following the initial calibration at the mid-calibration concentration. This standard must be within 30% recovery. 3. It is recommended that if results are reported below the RL, a second-source standard (initial validation verification) at the MDL level analyzed after calibration is complete to check sensitivity with %D <30. at the mid-calibration concentration. 4. If RSD ≤20%, the average relative response factor (internal calibration) or average calibration factor (external calibration) is used for quantitation. If RSD >20%, a linear regression calibration that does not pass through the origin with a correlation coefficient (r) ≥0.990 is used for quantitation; or a nonlinear first or second order calibration curve with a coefficient of determination (COD) of ≥0.990 is used for quantitation.	1. Identify and correct problem. 2. If criteria are still not met, recalibrate. 3. Document any observations and corrective action in the case narrative - samples should not be analyzed until calibration control limit criteria are met.

QUALITY CONTROL DOCUMENT

Table 3-3. PCBs using USEPA Methods 8000C/8082A quality control requirements and corrective actions

Audit Parameter (DQI)	Frequency (Applies to both primary and confirmation columns)	Laboratory Control Limits (Applies to both primary and confirmation columns)	Laboratory Corrective Action (Applies to both primary and confirmation columns)
Calibration Verification (Accuracy)	Calibration standards must contain Aroclor 1016/1260 at the mid-range concentration. Calibration verification standards must be analyzed every 20 samples and must bracket each end of the sample sequence. In the case that Aroclors are detected above the MDL concentration in the associated samples, the identified Aroclor must be analyzed within the same 48 hour period as the sample in a valid analytical sequence.	Calibration verification response %D ≤ 20%. RT for each target analyte must be within established RT windows.	1. Reanalyze. 2. If criteria are still not met, identify and correct problem, recalibrate; reanalyze samples back to last compliant calibration standard. Samples must be bracketed by compliant calibration standards. 3. Document corrective action in the case narrative.
Retention Time Windows (Accuracy)	Retention time windows (absolute retention time) must be established in accordance with USEPA Method 8000B/8000C or relative retention times must be used if internal standards are employed.	Compounds must be within established retention time windows or within laboratory established relative retention time criteria for the succeeding calibration standards. Retention time windows must be provided for each calibration verification. Retention times for each surrogate analyzed for samples and QC samples must be provided on a summary form.	1. Reanalyze. 2. If criteria are still not met, identify and correct problem, recalibrate; reanalyze samples back to last compliant calibration standard. 3. Document corrective action in the case narrative.
Method Blank Analysis (Sensitivity)	Prepared with each extraction batch of no more than 20 analytical samples.	1. Less than RL. 2. RLs and MDLS will be provided along with the preparation blank results.	1. Reanalyze blank. 2. If limits are still exceeded, clean instrument, recalibrate analytical system and re-extract and reanalyze all samples if detected for same compounds as in the blank. 3. Document any observations and corrective action in the case narrative - samples should not be analyzed until blank criteria have been met.

Table 3-3. PCBs using USEPA Methods 8000C/8082A quality control requirements and corrective actions

Audit Parameter (DQI)	Frequency (Applies to both primary and confirmation columns)	Laboratory Control Limits (Applies to both primary and confirmation columns)	Laboratory Corrective Action (Applies to both primary and confirmation columns)
Field Blank Analysis (Sensitivity)	Collected per QCD requirements.	Less than RL	1. Investigate problem. 2. Document any observation or in the case narrative.
Instrument Blank Analysis (Sensitivity)	Must be analyzed at the beginning of 12 hour sequence, following the initial calibration verification standard.	Less than RL	1. Reanalyze. 2. If limits are still exceeded, re-extract and reanalyze method blank and associated samples. Samples must not be analyzed until method blank criteria are met. 3. Document corrective action in the case narrative.
Laboratory Control Sample Analysis (Accuracy)	Prepared with each extraction batch, of no more than 20 analytical samples. Prepared independently from calibration standards LCS must be spiked with the Aroclor suspected to be at the site at concentrations near the low end of the calibration curve. Otherwise, Aroclor 1016/1260 or other Aroclors may be used in the LCS analysis.	Recovery within laboratory control limits. For compounds without established laboratory control limits, 70 to 130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. If recovery failures are above control limits and these compounds are not detected in the associated samples, no corrective action is required. 2. If recovery failures are below the control limits, reanalyze LCS and examine results of other QC analyses. 3. If other QC criteria have not been met, stop analysis, locate and correct problem, recalibrate instrument and reanalyze samples since last satisfactory LCS. 4. Document any observations and corrective action in the case narrative.

QUALITY CONTROL DOCUMENT

Table 3-3. PCBs using USEPA Methods 8000C/8082A quality control requirements and corrective actions

Audit Parameter (DQI)	Frequency (Applies to both primary and confirmation columns)	Laboratory Control Limits (Applies to both primary and confirmation columns)	Laboratory Corrective Action (Applies to both primary and confirmation columns)
Matrix Spike/ Matrix Spike Dup. (MS/MSD) Analysis (Accuracy/Precision)	Field collected at a frequency listed in the QCD MS/MSDs must be spiked with the Aroclor suspected to be at the site at concentrations near the low end of the calibration curve. Otherwise, Aroclor 1016/1260 or other Aroclors may be used. Samples from the investigation must be used for MS/MSD analysis.	Recovery and RPD within laboratory control limits. For compounds without established laboratory control limits, 70-130% recovery will be used. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze if <10%. 2. If reanalysis is < 10%, report both analyses and document in the case narrative. 3. If reanalysis is >10%, and LCS criteria are met, document in the case narrative. 4. If LCS criteria are exceeded also, examine other QC data for source of problem; i.e. surrogate recoveries for extraction efficiency and calibration data for instrument performance issues; re-extract or reanalyze samples and associated MS/MSD and LCSs as required.
Surrogate Spike (Accuracy)	Samples, blanks, MS/MSDs, and LCSs must be spiked with method specified surrogate compounds on each column used in the analysis.	Recovery within laboratory control limits. Corrective action is not required if one of the four surrogates (for two columns) has recovery outside of control limits if the recovery is >10% and the remaining three surrogates are within control limits. Surrogate recoveries for each surrogate on each column must be provided in a summary form. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze. 2. If re-analysis meets criteria, report re-analysis result. 3. If reanalysis recovery fails criteria but recovery is >10%: a. Report the analysis that demonstrates fewer excursions and include raw data for both analyses in the data package. 4. If re-analysis recovery is < 10%, re-extract and re-analyze sample. 5. For re-extracted sample, report the analysis that meets criteria or demonstrates fewer excursions and include raw data for both analyses in the data package. 6. Document corrective action in the case narrative.

Table 3-3. PCBs using USEPA Methods 8000C/8082A quality control requirements and corrective actions

Audit Parameter (DQI)	Frequency (Applies to both primary and confirmation columns)	Laboratory Control Limits (Applies to both primary and confirmation columns)	Laboratory Corrective Action (Applies to both primary and confirmation columns)
Field Dup. Analysis (Precision)	Collected per QCD requirements. Field duplicate will not be identified to the laboratory.	Validation criteria: 30% RPD for waters, 50% RPD for solids. For sample results that are less than or equal to five times the RL, the criterion of plus or minus two times the RL will be applied to evaluate field duplicates.	No corrective action required of the laboratory since the laboratory will not know the identity of the field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis.
Target Analyte Identification (Accuracy)	As required for identification of target analytes	Retention times must be within established retention time windows or must meet relative retention time criteria. Confirmation analysis is required. Retention time windows must be provided for each calibration verification. USEPA CLP Form 10 Summary form, providing the percent difference and retention times for all detected analytes in samples and QC samples, will be provided.	1. Investigate problem; reanalyze calibration standards to check for retention time shift. 2. Document corrective action in the case narrative.

Table 3-3. PCBs using USEPA Methods 8000C/8082A quality control requirements and corrective actions

Audit Parameter (DQI)	Frequency (Applies to both primary and confirmation columns)	Laboratory Control Limits (Applies to both primary and confirmation columns)	Laboratory Corrective Action (Applies to both primary and confirmation columns)
Quantitation (Accuracy)	Samples, blanks, and QC data.	Confirmation analysis is required. Internal or external standard method may be used. Verify concentration is within linear calibration range of standards. Percent difference must be less than 40% (method requirement): Percent Difference - Difference between Primary column concentration and the Confirmation column divided by the Primary column times 100. If result for lower concentration is reported, Percent Difference - Difference between lower concentration and higher concentration divided by lower concentration times 100. Aroclor concentration is determined using response factor for each of the characteristic peaks and then averaging the five concentrations. Peak areas from a minimum of three Aroclor peaks unique to the target Aroclor will be used to quantitate the Aroclor concentration. Every effort must be made to meet specified RL requirements. Lab must state the technique used for quantitation of results for the samples.	1. If concentration is above linear calibration range, dilute sample and reanalyze. Dilution should result in concentration in the upper calibration range of the instrument. 2. Document corrective action in the case narrative.

Table 3-3. PCBs using USEPA Methods 8000C/8082A quality control requirements and corrective actions

Audit Parameter (DQI)	Frequency (Applies to both primary and confirmation columns)	Laboratory Control Limits (Applies to both primary and confirmation columns)	Laboratory Corrective Action (Applies to both primary and confirmation columns)
Chromatography Presentation	For each standard, sample and QC sample analysis.	Copies of chromatograms provided in the data package must be large enough to view during validation; detail of each peak involved in the Aroclor identification, including peak shape and associated baseline. In the case that matrix interference is detected or manual integration is performed, enlarged copies of those manipulations will be included in the data package for review.	1. Provide requested information.
Cleanup	Acid wash clean-up is required for PCB extracts.	Not applicable	Not applicable
Screening samples	As required for samples suspected to contain high concentrations or matrix interferences	It is highly recommended that samples be screened prior to analysis. Screening data (performed prior to the initial analysis) does not need to be included in the data package. Data for samples analyzed at dilutions for initial or subsequent analyses is required to be included in the data package.	Not applicable
Sample Batching	The laboratory will batch project samples together along with QC samples specified from the project. Non-project information will not be included in the data packages. USEPA Form 8 Summary form, providing the date, time of analysis of samples and QC samples, surrogate retention times and surrogate retention time window, will be provided.	Not applicable	Not applicable

Table 3-3. PCBs using USEPA Methods 8000C/8082A quality control requirements and corrective actions

Audit Parameter (DQI)	**Frequency (Applies to both primary and confirmation columns)**	**Laboratory Control Limits (Applies to both primary and confirmation columns)**	**Laboratory Corrective Action (Applies to both primary and confirmation columns)**
Confirmation Analysis	Dual column quantitation and qualitative confirmation is required. The information presented in CLP Form 10 will be provided in the data package for evaluation.	Not Applicable	Not Applicable
Laboratory control limits	Generated with results for an analyte from a minimum of 20 sample analyses. The average of the sample results and the standard deviation are calculated. The internal warning limits are established at 2 times the standard deviation and the control limits are established at 3 times the standard deviation. The control limits are updated annually.	Not applicable	Not applicable
Percent solids	For solids samples, the percent solids will be determined and sample results will be corrected for percent solids.	Not applicable	Not applicable
Dilutions	1. When target analyte concentration exceed upper limit of calibration curve. 2. When matrix interference demonstrated by lab and documented in the case narrative (highly viscous samples or a large number of non-target peaks on the chromatogram). 3. Samples should be cleaned up during sample preparation/extraction procedure using appropriate methods when matrix interference is present. 4. Laboratory will note in the data deliverables which analytical runs were reported.	The laboratory will not dilute samples unless elevated concentrations of target analytes or matrix interference is demonstrated in the samples.	Not applicable

Table 3-3. PCBs using USEPA Methods 8000C/8082A quality control requirements and corrective actions

Audit Parameter (DQI)	Frequency (Applies to both primary and confirmation columns)	Laboratory Control Limits (Applies to both primary and confirmation columns)	Laboratory Corrective Action (Applies to both primary and confirmation columns)
Deliverables	1. Full CLP-like deliverables must be provided to document each audit item for easy reference and inspection. 2. An example calculation will be provided for each analysis, for each type of matrix in the data package using samples from the project. 3. Any laboratory abbreviations or notations presented in the raw data or summary information will be explained or referenced in the case narrative. 4. Final spiking concentrations will be presented in summary form. 5. For the initial data package, standard tracing information will be provided. 6. Cooler temperatures will be provided in the data packages. 7. Run logs will be provided in the data packages.	Not applicable	Provide missing or additional deliverables for validation purposes.
Method and QCD requirements	The laboratory will perform the method as presented in this QCD and will adhere to the QCD requirements presented herein. Otherwise the laboratory will specifically note any procedures that differ from the method or the QCD in the data package case narrative.	Not applicable	Not applicable

Note

Data validation will be performed in accordance with QA/QC criteria established in these tables and the analytical methods that are currently used by the laboratory.
Excursions from QA/QC criteria will be qualified based on guidance provided in this QCD.
Communications with the QAO will be documented and included in the data packages.

Source: O'Brien & Gere

QUALITY CONTROL DOCUMENT

Table 3-4. Metals using USEPA Methods 6010C/6020A and mercury using Methods 7470A/7471B quality control requirements and corrective actions			
Audit Parameter (DQI)	**Frequency**	**Laboratory Control Limits**	**Laboratory Corrective Action**
Sample preservation	Samples must be preserved based on method and QCD requirements	For aqueous and soil samples: cooler temperature ≤6°C. See Table 1 for sample collection and preparation information.	1. Notify Project Manager since re-sampling may be required. 2. Document corrective action in the case narrative.
Holding times (Sensitivity)	Samples must be extracted and analyzed within holding time.	Metals: 180 days from collection to analysis for aqueous and solid samples. For TCLP: 180 days from collection to extraction, 180 days from extraction to analysis Mercury: 28 days from collection to analysis. For TCLP: 28 days from collection to extract generation, 28 days from extraction to analysis	If holding times are exceeded for initial or any re-analyses required due to QC excursions, notify the QAO since re-sampling may be required.
ICP/MS tuning, Mass Calibration and Resolution Checks (Accuracy)	Analyze tune solution at least 4 times after the instrument has equilibrated prior to sample analysis. Evaluate mass calibration and resolution checks in the mass regions of interest. Solution contains elements representing all of the mass regions of interest (such as Li, Co, In, Tl) to verify resolution and mass calibration within criteria.	1. Verify instrument stability by an analysis of the tuning solution for at least four integrations with relative standard deviations of <5% for the analytes contained in the tuning solution. 2. If mass calibration is >0.1amu from the true value, mass calibration must be adjusted to correct values. 3. Resolution must be less than 0.9 atomic mass units (amu) of full width at 10% of peak height. 4. Provide documentation of mass calibration and resolution evaluations in the data package.	1. Identify and correct problem, and retune instrument - samples cannot be analyzed until tune criteria is met.
Initial Calibration, Initial Calibration Verification (ICV) and Continuous Calibration Verification (CCV)	Five point calibration for ICP consisting of four standards and one blank. Five point calibration for AA with one standard at the RL level. Calibrate each time instrument is set up. After calibration, Initial calibration verification (ICV) is performed. The ICV is from a source independent of the calibration standards. A continuing calibration verification (CCV) is	ICV, CCV - 90% to 110% of expected value for ICP and AA. Correlation coefficient for first or second order curve must be ≥ 0.998. CCV for Mercury - 80% to 120% of expected true value	1. Reanalyze. 2. If criteria are still not met, identify and correct problem, recalibrate. 3. Document corrective action in the case narrative - samples should not be analyzed until calibration control limit criteria have been met.

I:\Foubo-Env.25179\60243.Former-Accurate\Docs\Reports\QCD\Final Revised\Accurate Die QCD Table 3-4 021419.Docx

Table 3-4. Metals using USEPA Methods 6010C/6020A and mercury using Methods 7470A/7471B quality control requirements and corrective actions			
Audit Parameter (DQI)	**Frequency**	**Laboratory Control Limits**	**Laboratory Corrective Action**
(Accuracy)	analyzed at the beginning of the run, at 10% or every 2 hours. Also verify at the end of each run.		
ICP/MS Initial Calibration (ICV) and Continuing Calibration Verification (CCV) (Accuracy)	Six point calibration at a minimum for ICP/MS consisting of a calibration blank and five calibration standards. Calibration standard solutions must contain appropriate internal standard for each target element. The initial calibration verification (ICV) must be prepared in the same matrix as the calibration standards but as an independent standard (second-source calibration verification [SCV]) near the midpoint and at the low concentration of the linear range at a concentration other than the calibration standards. Verify calibration with ICV, ICB immediately after calibration. Verify with CCV, CCB at frequency of every 10 samples and at the end of the sequence. For ICP/MS, prior to preparing standards, each stock solution must be analyzed separately to determine any interferences.	ICV, CCV must be 90% to 110% of expected value for ICP/MS. If the ICP/MS is re-sloped or recalibrated after the ICV is analyzed, a new CCV, CCB must be analyzed prior to sample analysis. Provide documentation of calibration standard monitoring and evaluation.	1. Reanalyze. 2. If criteria are still not met, terminate analysis, identify and correct problem, recalibrate, and contact QAO. 3. Document corrective action in case narrative - samples cannot be analyzed until calibration control limit criteria have been met.

Table 3-4. Metals using USEPA Methods 6010C/6020A and mercury using Methods 7470A/7471B quality control requirements and corrective actions			
Audit Parameter (DQI)	**Frequency**	**Laboratory Control Limits**	**Laboratory Corrective Action**
Lower Limit of Quantitation Check (LLQC) (Accuracy)	For ICP, LLQC is a standard at the RL concentration analyzed quarterly for all elements at the RL level.	The percent recovery of the LLQC must meet the laboratory established control limits.	1. The LLQC shall be re-analyzed immediately for those analytes; if the results of the re-analysis for those analytes fall within the control limits, no further corrective action is required. 2. If the results of the re-analysis for those analytes do not fall within the control limits, the analysis shall be terminated, the problem corrected, the instrument recalibrated, the LLQC analyzed, and the samples associated with the LLQC re-analyzed. 3. Document any observation or corrective action in the case narrative.
Internal Standard (Accuracy)	Monitored for all samples, blanks, standards, and QC samples analyzed.	Internal standard counts should be within 30% of Internal standard counts of the calibration standard for all samples and standards.	1. If internal standard area is not within 30%, review the internal areas of the closest calibration blanks for compliance. If the calibration blanks meet criteria; dilute the sample five fold and reanalyze. 2. If the internal standard area of the calibration blank is also outside of 30%, stop sample analysis and recalibrate.

Table 3-4. Metals using USEPA Methods 6010C/6020A and mercury using Methods 7470A/7471B quality control requirements and corrective actions

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
Internal Standard for ICP/MS (Accuracy)	Appropriate internal standard as listed in Method 6020 is required for each analyte. The internal standard should be no more than 50 amu from the target element. Recommended internal standards include 6Li, 45 Sc, 89Y, 103 Rh, 115In, 159Tb, 169Ho, 209Bi.	Intensity of all internal standards must be monitored for every analysis. The intensity of any internal standard must be >70% or <130% of the intensity of the internal standard in the initial calibration standard or blank. The intensity of the internal standard of the CCB and CCV must agree within ±20% of the intensity of the internal standard in the ICV or calibration blank. Document internal standard intensity and the evaluation for each analysis performed and include in the data package.	1. If sample analysis fails, dilute the sample fivefold (1+4), adjust internal standard and reanalyze. 2. Repeat until internal standard intensify meets criteria. 3. If the CCB or CCV intensity fails, terminate analysis, identify and correct problem, recalibrate, verify calibration and reanalyze samples, document in the case narrative, and contact QAO.
Contract Required Detection Limit (CRDL) Standard for ICP, ICPMS and AA. (Accuracy)	1. For ICP, the CRDL is the RL concentration at the beginning and end of each run for all elements at the RL level. 2. The CRDL shall be run for every wavelength used for analysis.	The percent recovery of the CRDL must meet the control limits of 70-130%.	1. The CRDL shall be re-analyzed immediately for those analytes; if the results of the re-analysis for those analytes fall within the control limits, no further corrective action is required. 2. If the results of the re-analysis for those analytes do not fall within the control limits, narrate the failure in the case narrative. 3. Document any corrective action in case narrative.
Initial and Continuing Calibration Blank (ICB/CCB) (Sensitivity)	After ICV, CCV, at beginning and end of run and at a rate of 10%.	The absolute value of the ICB and CCB must not exceed the RL.	1. Identify and correct problem. 2. If criteria are still not met, recalibrate and reanalyze affected samples. 3. Document corrective action in the case narrative - samples should not be analyzed until blank control limit criteria have been met.

Table 3-4. Metals using USEPA Methods 6010C/6020A and mercury using Methods 7470A/7471B quality control requirements and corrective actions			
Audit Parameter (DQI)	**Frequency**	**Laboratory Control Limits**	**Laboratory Corrective Action**
Preparation Blank Analysis (Sensitivity)	1 per batch of samples digested, or 1 in 20, whichever is greater. PB shall be carried through the complete procedure and contain the same acid concentration in the final solution as the sample solution used for analysis.	The absolute value of the method blank must not exceed the RL.	1. Reanalyze blank. 2. If limits are still exceeded, clean instrument and recalibrate analytical system and re-preparation and reanalyze affected samples if detected. 3. Document corrective action in the case narrative - samples cannot be analyzed until blank criteria are met.
Field Blank Analysis (Sensitivity)	Collected per QCD requirements.	Less than RL.	1. Investigate problem. 2. Document in the case narrative.
Rinse Blank	Rinse blank must be analyzed following every sample and standard to flush the instrument.	Not applicable.	Not applicable.
Laboratory Control Sample Analysis (Accuracy)	Every 20 samples or each digestion batch. Prepared independently from calibration standards. LCS must contain all target analytes.	Recovery within laboratory control limits. The lowest acceptable control limits for recovery will be 10%.	1. Reanalyze LCS and examine results of other QC analyses. 2. If recovery is still outside limits, and other QC criteria are met, report both runs. 3. If other QC criteria have not been met, stop analysis, locate and correct problem, recalibrate instrument and reanalyze samples since last satisfactory LCS. 4. Document corrective action in the case narrative.
Serial Dilution Analysis for ICP (Accuracy)	Required once per analytical batch when analyte concentration is >50 times the instrument IDL or MDL. Samples from the investigation must be used for Serial dilution analysis.	An analysis of a 1:5 dilution of the sample should provide a result with 90% to 110% of the original determination (for concentrations 50x the MDL.	1. Report results. 2. Document corrective action in the case narrative.

Table 3-4. Metals using USEPA Methods 6010C/6020A and mercury using Methods 7470A/7471B quality control requirements and corrective actions

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
Serial Dilution Analysis for ICP/MS (Accuracy)	Required when analyte concentration is >100 times the reagent blank and is within the linear range of the ICP/MS. Performed for every 20 samples for each matrix or per batch.	An analysis of a 1:4 dilution of the sample should provide a result with 90% to 110% of the original determination.	1. Qualify data. 2. Document corrective action in the case narrative.
Interference Check Sample Analysis for ICP (Accuracy)	Beginning of each analytical for ICP. Solution A consists of the interferents, and Solution AB consists of the analytes mixed with the interferents.	Results for the ICS Solution AB (ICSAB) during the analytical runs shall fall within the control limit of ±2 times the RL of the true value or ±20% of the true value, whichever is greater, for the analytes included in the ICSAB.	1. Reanalyze. 2. If limits are still exceeded, adjust instrument. 3. Restart analytical run and reanalyze samples analyzed since last satisfactory ICS. 4. Document corrective action in the case narrative.
Interference Check Sample Analysis for ICP/MS (Accuracy)	Beginning of each analytical run or once during every 12 hours, whichever is more frequent for ICP/MS. For measurement of elemental, molecular-ion isobaric interference corrections. ICSA/ICSAB contains known concentration of interfering elements that will demonstrate the magnitude of the molecular-ion isobaric interferences to verify that the interferences are corrected by the data system within the control limits.	Percent recovery of all elements must be within current laboratory control limits. Document the ICSA/ICSAB evaluations and include in the data package.	1. Reanalyze. 2. If limits are still exceeded, adjust interference corrections for instrument, contact QAO, samples cannot be analyzed until ICSA/ICSAB control limit criteria have been met. 3. Restart analytical run and reanalyze samples analyzed since last satisfactory ICS. 4. Document corrective action in the case narrative.
Matrix Spike/ Matrix Spike Dup. (MS/MSD) Analysis (Accuracy/Precision)	Collected per QCD requirements. Samples from the investigation must be used for MS/MSD analysis. Spike must contain complete list of target analytes.	Recovery within laboratory control limits or 75-125%, or in-house laboratory limits. Recovery does not apply if sample concentration > 4 X spike concentration. Spike must contain all analytes. The lowest acceptable laboratory control limits for recovery will be 10%.	1. Analyze post-digestion/post-distillation spike. 2. Document corrective action in the case narrative.
Post-Digestion Spike	Spike must contain all target elements. Performed every 20 samples as necessary.	Recovery within 75-125% of true value.	1. Dilute sample and reanalyze. 2. If recovery is outside limits, document in

Table 3-4. Metals using USEPA Methods 6010C/6020A and mercury using Methods 7470A/7471B quality control requirements and corrective actions			
Audit Parameter (DQI)	**Frequency**	**Laboratory Control Limits**	**Laboratory Corrective Action**
(Accuracy)			the case narrative. 3. Standard additions may be used to compensate for matrix effects.
Internal standard (Accuracy)	May be used for each sample instead of post-digestion spike.	Internal Standard counts must be within 30% of Internal Standard counts of ICB for ICP-MS.	Reanalyze.
Laboratory Duplicate or Matrix Spike Duplicate Analysis (Precision)	Field collected - Samples from the investigation must be used for Laboratory Duplicate and MSD analysis.	Laboratory control limit or 20% for RPD shall be used for original and duplicate sample values greater than or equal to five times the RL. A control limit of the RL value shall be used if either the sample or duplicate value is less than five times the CRRL.	1. Investigate problem and reanalyze. 2. Document corrective action in the case narrative.
Field Dup. Analysis (Precision)	Collected per QCD requirements. Field duplicate will not be identified to the laboratory.	Validation criteria: 30% RPD for waters, 50% RPD for solids. For sample results that are less than or equal to five times the RL, the criterion of plus or minus two times the RL will be applied to evaluate field duplicates.	No corrective action required of the laboratory since the laboratory will not know the identity of the field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis.
Percent Solids	For solid samples, the percent solids will be determined and sample results will be corrected for percent solids.	Not applicable.	Not applicable.
Laboratory Control Limits	Generated with results for an analyte from a minimum of 20 sample analyses. The average of the sample results and the standard deviation are calculated. The internal warning limits are established at 2 times the standard deviation and the control limits are established at 3 times the standard deviation. The control limits are updated annually.	Not applicable.	Not applicable.
System Operation for ICP/MS	Use an average of 3 integrations for both the calibration and sample analysis. All masses which could affect data quality will be monitored to determine the	Not applicable.	Not applicable.

Table 3-4. Metals using USEPA Methods 6010C/6020A and mercury using Methods 7470A/7471B quality control requirements and corrective actions			
Audit Parameter (DQI)	**Frequency**	**Laboratory Control Limits**	**Laboratory Corrective Action**
	potential effect from the matrix. Isotopes listed in the method should be used.		
Interference Monitoring for ICP/MS	The analyst is required to monitor potential sources of interferences by measuring the elements of interest or a molecular species that may indicate the presence of an interferent and by taking appropriate action to ensure data of known quality. Interferences must be corrected by using correction equations based on observed isotopic signals and by monitoring the intensity of the internal standards. Samples exhibiting isobaric elemental interferences (isotopes of different elements with similar mass to charge ratio or very high ion currents at adjacent masses) require resolution improvement, matrix separation, or alternate isotopes. The rinse period between samples must be long enough to eliminate significant memory interferences. 5. Extensive QC for interference corrections must be performed.	Not applicable.	Not applicable.
Analyte Quantitation (Accuracy)	Concentrations for ICP/MS analysis are reported based on dry weight of the sample. Calculations for the ICP/MS should include appropriate interference corrections, internal standard normalization, and summation of signals at 206, 207, and 208 mass to charge for lead. All QC criteria must be met when applying correction equations.	Not applicable.	Not applicable.

Table 3-4. Metals using USEPA Methods 6010C/6020A and mercury using Methods 7470A/7471B quality control requirements and corrective actions			
Audit Parameter (DQI)	**Frequency**	**Laboratory Control Limits**	**Laboratory Corrective Action**
	If interference is detected, elements impacted are flagged to indicate percentage interference correction applied to the data or an uncorrected interference because of the equation used for quantitation.		
Dilutions for ICP/MS	Analyze samples at a 1:5 dilution. Dilute and reanalyze samples with concentrations that are still greater than the linear range of the instrument. The laboratory will note in the data package which analytical runs were used to report the sample results.	Not applicable.	Not applicable.
MDL Determination	Before any field samples are analyzed, the MDLs shall be determined for non-prepared analyses, each digestion procedure and instrument used, prior to the start of analyses. MDL studies are conducted or verified at least annually.	Not applicable.	Not Applicable.
Linear Range Analysis for ICP	Every 6 months must be routinely monitored by analysis of high concentration standard.	Results for high point standard must be within 10% of true value.	Not applicable.
Interelement Correction For ICP	Within 6 months of the start of analysis and annually. Correction factors for Al, Ca, Fe, and Mg must be reported and for others if they are applied.	Not applicable.	Not applicable.
Sample Batching	The laboratory will batch project samples together along with QC samples specified from the project. Non-project information will not be included in the data packages.	Not applicable.	Not applicable.
Dilutions	1. When target analyte concentration exceed linear dynamic range of the instrument.	Not applicable.	Not applicable.

Table 3-4. Metals using USEPA Methods 6010C/6020A and mercury using Methods 7470A/7471B quality control requirements and corrective actions			
Audit Parameter (DQI)	**Frequency**	**Laboratory Control Limits**	**Laboratory Corrective Action**
	2. When matrix interference demonstrated by lab and documented in the case narrative. 3. Laboratory will note in the data deliverables which analytical runs were reported.		
Deliverables	1. Full CLP-like deliverables must be provided to document each audit item for easy reference and inspection. 2. An example calculation will be provided for each analysis, for each type of matrix in the data package using samples from the project. 3. Any laboratory abbreviations or notations presented in the raw data or summary information will be explained or referenced in the case narrative. 4. Final spiking concentrations will be presented in summary form. 5. Standard tracing information will be provided. 6. Cooler temperatures will be provided in the data packages. 7. Run logs will be provided in the data packages.	Not applicable.	Provide missing or additional deliverables for validation purposes.
Method and QCD Requirements	The laboratory will perform the method as presented in this QCD and will adhere to the QCD requirements presented herein. Otherwise the laboratory will specifically note any procedures that differ from the method or the QCD in the data package case narrative.	Not applicable.	Not applicable.

Notes:
Data validation will be performed in accordance with QA/QC criteria established in these tables and the analytical methods that are currently used by the laboratory. Excursions from QA/QC criteria will be qualified based on guidance provided in this QCD.
Communications with the QAO will be documented and included in the data packages.

Table 3-4. Metals using USEPA Methods 6010C/6020A and mercury using Methods 7470A/7471B quality control requirements and corrective actions

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action

Source: O’Brien & Gere

QUALITY CONTROL DOCUMENT

Table 3-5. Total cyanide using USEPA Method 9012B quality control requirements and corrective actions.

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
Sample preservation	Samples must be preserved based on method and QCD requirements	For aqueous and soil samples: cooler temperature ≤6°C. See Table 1 for sample preparation and collection information.	1. Notify Project Manager since re-sampling may be required. 2. Document corrective action in the case narrative.
Holding times (Sensitivity)	Samples must be analyzed within holding time.	Total Cyanide: Analyze 14 days from collection. See Table 1 for sample preparation and collection information.	1. If holding times are exceeded for initial or any re-analyses required due to QC excursions, notify the QAO since re-sampling may be required.
Initial Calibration, Initial Calibration Verification (ICV) and Continuing Calibration Verification (CCV) (Accuracy)	At a minimum three to five standards (depending on method requirements) and a blank, prior to sample analysis and when calibration verification criteria are not met. One standard must be at the RL concentration. ICV accompanies each initial calibration. CCV is analyzed following calibration, after every 10 samples and at the end of the sequence to bracket sample analyses.	For initial calibration, correlation coefficient for first or second order curve must be ≥ 0.995. For ICV, CCV - 90% to 110% of expected value.	1. Reanalyze. 2. If criteria are still not met, identify and correct problem, recalibrate. 3. Document corrective action in the case narrative - samples cannot be analyzed until calibration control limit criteria have been met.
Continuing Calibration Blank (CCB) (Sensitivity)	At beginning and end of run and at a rate of 10% during run.	Target analytes less than RL.	1. Identify and correct problem. 2. If criteria are still not met, recalibrate. 3. Document corrective action in the case narrative 4. Samples cannot be analyzed until blank control limit criteria have been met.
Preparation Blank Analysis (Sensitivity)	1 per batch of samples analyzed in the sample batch.	Target analytes less than RL.	1. Reanalyze blank. 2. If limits are still exceeded, clean instrument and recalibrate analytical system and reanalyze affected samples if detected. 3. Document corrective action - samples cannot be analyzed until blank criteria are met.

QUALITY CONTROL DOCUMENT

Table 3-5. Total cyanide using USEPA Method 9012B quality control requirements and corrective actions.			
Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
Laboratory Control Sample Analysis (Accuracy)	Every 20 samples or each batch. Prepared independently from calibration standards.	Recovery within laboratory control limits or 80% to 120%. The lowest acceptable control limits for recovery will be 10%.	1. other QC analyses. 2. If recovery is still outside limits, and other QC criteria are met, report both runs. 3. If other QC criteria have not been met, stop analysis, locate and correct problem, recalibrate instrument and reanalyze samples since last satisfactory LCS. 4. Document corrective action in the case narrative.
Matrix Spike/ Matrix Spike Dup. (MS/MSD) Analysis (Accuracy/Precision)	Collected per QCD requirements. Samples from the investigation must be used for MS/MSD analysis.	Recovery within laboratory control limits or 75-125%, or in-house laboratory limits. Recovery does not apply if sample concentration > 4 X spike concentration. The lowest acceptable laboratory control limits for recovery will be 10%.	1. Analyze post-digestion/post-distillation spike. 2. Document corrective action in the case narrative.
Laboratory Duplicate or Matrix Spike Duplicate Analysis (Precision)	Field collected - Samples from the investigation must be used for Laboratory Duplicate and MSD analysis.	Laboratory control limit or 20% for RPD shall be used for original and duplicate sample values greater than or equal to five times the RL. A control limit of the RL value shall be used if either the sample or duplicate value is less than five times the RL.	1. Investigate problem and reanalyze. 2. Document corrective action in the case narrative.
Field Blank Analysis (Sensitivity)	Collected per QCD requirements.	Less than RL.	1. Investigate problem. 2. Document in the case narrative.
Field Dup. Analysis (Precision)	Collected per QCD requirements. Field duplicate will not be identified to the laboratory.	Validation criteria: 30% RPD for waters, 50% RPD for solids. For sample results that are less than or equal to five times the RL, the criterion of plus or minus two times the RL will be applied to evaluate field duplicates.	No corrective action required of the laboratory since the laboratory will not know the identity of the field duplicate samples. If these criteria are not met, sample results will be evaluated on a case-by-case basis.
Dilutions	Dilute and reanalyze samples with concentrations that are greater than the linear range of the instrument or method technique. The laboratory will note in the data package which analytical runs were used to report the sample results.	Not applicable	Not applicable. .
Sample Batching	The laboratory will batch project samples together along with QC samples specified	Not applicable	Not applicable

Table 3-5. Total cyanide using USEPA Method 9012B quality control requirements and corrective actions.			
Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action
	from the project. Non-project information will not be included in the data packages.		
Laboratory control limits	Generated with results for an analyte from a minimum of 20 sample analyses. The average of the sample results and the standard deviation are calculated. The internal warning limits are established at 2 times the standard deviation and the control limits are established at 3 times the standard deviation. The control limits are updated annually.	Not applicable	Not applicable
Deliverables	1. Full CLP-like deliverables must be provided to document each audit item for easy reference and inspection. 2. An example calculation will be provided for each analysis, for each type of matrix in the data package using samples from the project. 3. Any laboratory abbreviations or notations presented in the raw data or summary information will be explained or referenced in the case narrative. 4. Final spiking concentrations will be presented in summary form. 5. Standard tracing information will be provided. 6. Cooler temperatures will be provided in the data packages. 7. Run logs will be provided in the data packages.	Not applicable	Provide missing or additional deliverables for validation purposes.
Method and QCD requirements	The laboratory will perform the method as presented in this QCD and will adhere to the QCD requirements presented herein. Otherwise the laboratory will specifically note any procedures that differ from the method or the QCD in the data package case narrative.	Not applicable	Not applicable

Table 3-5. Total cyanide using USEPA Method 9012B quality control requirements and corrective actions.

Audit Parameter (DQI)	Frequency	Laboratory Control Limits	Laboratory Corrective Action

Notes:

Data validation will be performed in accordance with QA/QC criteria established in these tables and the analytical methods that are currently used by the laboratory. Excursions from QA/QC criteria will be qualified based on guidance provided in this QCD.

Communications with the QAO will be documented and included in the data packages.

Source: O'Brien & Gere

Appendix C

Health and Safety Plan

HEALTH AND SAFETY PLAN

Remedial Investigation
Former Accurate Die Casting Site
Fayetteville, New York
Site No. C734052

FOUBU Environmental Services, LLC
Syracuse, New York

October 2019

OBG
Part of Ramboll

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. INTRODUCTION

1.1. PURPOSE AND REQUIREMENTS

This Health & Safety Plan (HASP) is specifically intended for guiding the conduct of OBG activities defined in the Remedial Investigation (RI) Work Plan for the Former Accurate Die Casting Site (Site) located at 547 East Genesee Street, Fayetteville, NY. Although this HASP can be made available to interested persons for informational purposes, OBG does not assume responsibility for the interpretations or activities of any persons or entities other than employees of OBG. Subcontractors will have their own activity specific health & safety plans as it relates to their scope of services.

1.2 SITE DESCRIPTION

The Site is located within the Village of Fayetteville, NY as shown on Figure 1-1. The brownfield cleanup program (BCP) property encompasses approximately 33 acres. The front portion of the property is zoned industrial and the back portion is zoned single-family residential. The Site is located in an area surrounded by the following:

- Former railroad bed and residential to the west
- Residential to the east
- Bishop Brook and vacant wooded land to the north
- Commercial properties and a cemetery to the south.

1.3 SCOPE OF WORK

Tasks to be conducted at the Site include:

- Drilling
- MIP drilling
- Soil sampling
- Surface water and sediment sampling
- Land surveying to locate borings and sample locations

1.4 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 on-site 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. OBG personnel are required to read this HASP before beginning work on the Site. This HASP will be available for inspection and review by OBG employees while work activities are underway.

When conducting the Site investigation activities listed in the Work Plan, OBG personnel will comply with this HASP. On-site OBG personnel will notify the OBG 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 Site conditions change.

1.5 PROJECT TEAM ORGANIZATION

All personnel involved in the activities at the Site implicitly have a part in implementing the HASP. Among them, the Project Officer, the Project Manager, the Corporate Associate for Safety and Health, the SSHC, and the Field Operations Manager have specifically designated responsibilities. Their names and telephone numbers are listed in Table 1-1, below. Other key OBG 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.

Project Officer

Douglas M. Crawford, P.E., is the Project Officer for the Supplemental Remedial Investigation activities. Brian White, P.E. will serve as the Project Officer for construction-related activities. The Project Officer is responsible for the overall administration and technical execution of the project. The Project Officer is further responsible for the acquisition and delegation of resources necessary for project completion and HASP implementation.

Project Manager

David J. Carnevale is the Project Manager and reports directly to the Project Officer. The Project Manager is directly responsible for the technical progress, the execution, and financial control of the project.

Associate for Safety and Health

Mr. Jeffrey R. Parsons, CIH is the Corporate Manager for Safety and Health. Mr. Parsons will be responsible for implementation of this HASP. Mr. Parsons must approve procedural changes and modifications to this HASP.

Site Safety and Health Coordinator

The OBG Site SSHC for this investigation will be designated by the OBG Project Manager. The SSHC for OBG employees report to the OBG Project Manager, coordinates activities with the OBG Associate for Safety and Health and establishes operating standards and coordinates overall project safety and health activities for the Site. 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 conducting the following actions:

- Provide a complete copy of the HASP at the Site before the start of activities
- Familiarize workers with the HASP
- Provide a complete copy of the HASP at the Site before the start of activities
- Conduct on-site 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 OBG employees on the Site and communicating safety and health matters to them
- Review field activities for performance in a manner consistent with OBG 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

- Conduct safety and health performance and system audits.

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

1. Suspend field activities or otherwise limit exposures, if the health or safety of any OBG employee appears to be endangered
2. Notify OBG personnel to alter work practices that the SSHC deems to not protect them
3. Suspend an OBG employee from field activities for violating the requirements of this HASP.

Field Operations Manager

The Field Operations Manager will be responsible for the implementation of sampling programs and overall Site coordination.

Table 1-1. Project Personnel

Name and Title	Telephone
Douglas M. Crawford, P.E. **Brian E. White, P.E.** **Project Officer** **Syracuse, New York**	(315) 956-6442 (315) 956-6862
David J. Carnevale **Project Manager** **Syracuse, New York**	(315) 956-6571
TBD **Field Operations Manager** **Syracuse, New York**	To be identified
Jeffrey R. Parsons., C.I.H., **Associate for Safety and Health** **Syracuse, New York**	(315) 956-6871 (315) 391-0639, cell
Site Safety & Health Coordinator **Syracuse, New York**	To be identified

2. HAZARD ANALYSIS

General Site chemical, physical, and environmental hazards are summarized in Section 2.1. Specific health and safety considerations for field tasks detailed in the RI Work Plan are presented in separate subsections as outlined below:

- Site reconnaissance, mobilizations, and observation (Section 2.2.1)
- Soil boring and MIP drilling field activities (Section 2.2.2)
- Surface water and sediment sampling (Section 2.2.3)

2.1 GENERAL HAZARDS

2.1.1 Chemical Hazards

Chemical hazards associated with Site operations are related to inhalation, ingestion, and skin exposure to Site constituents of potential concern (COPCs). Site COPCs may include volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and polychlorinated biphenyls (PCBs).

The potential for unprotected personnel for inhalation of constituents during intrusive Site operations is low to moderate. The potential for unprotected personnel for dermal contact with soils, sediments or water containing

COPCs during drilling and sampling operations is moderate to high. Proper use of personnel protective equipment is intended to reduce potential exposure to Site contaminants.

2.1.2 Environmental Hazards

Prior to initiating activity, the Site conditions will be discussed with the field personnel. Hazards will be identified and protective measures will be explained.

Environmental hazards, in addition to Site contaminants, include Site fauna and flora. Aggressive fauna (biological hazards), such as ticks, fleas, mosquitoes, bees, wasps, spiders and snakes may be present at the Site. Poison ivy and poison oak may also be present.

Safety controls for biological hazards include:

- Be able to identify hazardous plants, insects, and snakes commonly found in the area.
- Keep isopropyl alcohol or equivalent poison ivy cleanser on-site to wipe down exposed skin that may have come in contact with poison ivy.
- Persons known to be highly allergic to poison ivy should consider applying Ivy Block® to areas of exposed skin prior to entering areas where poison ivy has been identified.
- Perform a personal inspection of extremities when leaving the work area.
- Insect repellant should be utilized as follows when entering brushy/overgrown areas where ticks are known to exist:
    - Use DEET (≥ 25%) on exposed skin (ankles/calves, hands/arms, and neck).
    - Use permethrin repellent on clothes (pants and shirts). Apply according to container directions.

2.1.3 Physical Hazards

Physical Hazards involved with field activities are primarily associated with the Site environment. Weather related hazard include wet, muddy, slick, walking surfaces and unstable soil, sunburn, lightning, rain, snow, ice, and heat and cold related illnesses. There exists a potential for incidents involving personnel struck by or struck against objects resulting in fractures, cuts, punctures, or abrasions.

Materials handling and manual Site preparation may cause blisters, sore muscles, and joint and skeletal injuries; and may present eye, contusion, and laceration hazards. A common type of accident that occurs in material handling operations is the "caught between" situation when a load is being handled and a finger or toe gets caught between two objects. Extreme care must be taken when loading and unloading material. Proper lifting technique must be employed.

The work area presents hazards of slips, trips, and falls from scattered debris and irregular walking surfaces. Working surfaces that are slippery can increase the likelihood of back injuries and overexertion injuries. Walking and working surfaces during activities may involve slip, trip, and fall hazards. All personnel should frequently inspect working surfaces and keep working surfaces clear of debris and moisture.

Refer to Section 2.1.6 for information related to working near heavy equipment, including drilling rigs.

2.1.4 Heat Stress

General

The use of protective equipment, if required, may create heat stress. Monitoring of personnel wearing personal protective clothing should commence when the ambient temperature is 70° F or above. Monitoring frequency should increase as ambient temperature increases or as slow recovery rates are observed. A person who is trained to recognize heat stress symptoms should perform heat stress monitoring.

Monitoring

For monitoring the body's recuperative abilities, one or more of the following techniques will be used. Other methods for heat stress monitoring, such as the wet bulb globe temperature (WBGT) Index from the American Conference of Governmental Industrial Hygienists (ACGIH) TLV Booklet can be used. To monitor the worker, measure:

Heart Rate: Count the radial pulse during a 30-second period as early as possible in the rest period.

- If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.
- If the heart rate still exceeds 110 beats per minute at the beginning of the next rest period, shorten the following work cycle by one third.

Oral Temperature: Use a clinical thermometer or similar device for three minutes under the tongue to measure the oral temperature at the end of the work period. Measure before drinking.

- Do not permit a worker to remain in a semi-permeable or impermeable garment when the worker's oral temperature exceeds 100.6°F (38.1°C)
- If the oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one third without changing the rest period.
- If the oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following work cycle by one third.

Prevention

Proper training and preventive measures will aid in averting loss of worker productivity and serious illness. Heat stress prevention is of particular importance because once a person suffers from heat stroke or heat exhaustion, that person is more susceptible to additional heat related illness. To avoid heat stress, the following steps should be taken.

- Adjust work schedules
- Mandate work slowdowns as needed
- Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided.
- Provide shelter (air conditioned if possible) or shaded areas to protect personnel during rest periods.
- Maintain workers' body fluid at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must equal the amount of water lost in sweat. The normal thirst mechanism is not sensitive enough to ensure that enough water will be drunk to replace that lost in sweat. When heavy sweating occurs, require workers to increase drinking levels.
- Use the following strategy:

  - Maintain water temperature between 50º and 60º F (10º to 16º C)
  - Provide small individual cups that hold about four ounces of fluid
  - Require workers to drink 4 cups (16 ounces) of fluid before beginning work
  - Require workers to drink two cups every 20 minutes and at each monitoring break
  - Require workers to drink at least 42 cups (168 ounces) of fluid per day. More fluid may be necessary to maintain body weight.
- Train workers to recognize the symptoms of heat related illness in themselves and in co-workers.

2.1.5 Cold Weather Exposure

Work/rest schedules must be altered to minimize the potential for cold stress. Cold stress is defined as a decrease in core body temperature to 96.8°F and / or cold injury to body extremities. Decreases in core body temperature are associated with reduced mental alertness, reduction in rational decision making, or loss of consciousness in severe cases. Symptoms of cold stress include pain in extremities (i.e. hands and feet) and severe shivering. If workers experience these symptoms, then stop work and implement the following controls:

- Workers must don adequate dry insulating clothing
- Adjust the work / rest schedule to increase the amount of rest / rewarming time
- Toolbox safety meetings discussing symptoms of cold stress, clothing requirements, and work breaks must be held when the wind chill temperature drops below 0°F and EACH DAY the wind chill temperature is below 25°F.

The wind chill index provided below shows the effective cooling on exposed skin. When the wind blows across the skin, it removes the insulating layer of warm air adjacent to the skin. When all factors are the same, the faster the wind blows, the greater the heat loss, which results in a colder feeling. Wind chill temperatures that are **25°F** below zero or are extremely dangerous. Workers must protect any exposed skin, especially the face, ears, and fingers.

				Wind Speed - mph			
Calm	**5**	**10**	**15**	**20**	**25**	**30**	**35**
Temperature (Degrees F)				**Wind Chill**			
45	43	34	29	26	23	21	20
40	37	28	23	19	16	13	12
35	32	22	16	12	8	6	4
30	27	16	9	4	1	-2	-4
25	22	10	2	-3	-7	-10	-12
20	16	3	-5	-10	-15	-18	-20
15	11	-3	-11	-17	-22	**-25**	**-27**
10	6	-9	-18	-24	**-29**	**-33**	**-35**
5	0	-15	**-25**	**-31**	**-36**	**-41**	**-43**
0	-5	-22	**-31**	**-39**	**-44**	**-49**	**-52**
-5	-10	**-27**	**-38**	**-46**	**-51**	**-59**	**-64**
-10	-15	**-34**	**-45**	**-51**	**-59**	**-64**	**-67**
-15	-21	**-40**	**-51**	**-60**	**-66**	**-71**	**-74**
-20	**-26**	**-46**	**-58**	**-67**	**-74**	**-79**	**-82**
-25	**-31**	**-52**	**-65**	**-74**	**-81**	**-86**	**-89**

If you would like to calculate the wind chill index for combinations of temperature and wind other than those given in the chart above, you can use the formula:

WC = 91.4 - (0.474677 - 0.020425 * V + 0.303107 * SQRT(V)) * (91.4 - T)

Where: WC = wind chill index; V = wind speed (mph); T = temperature (° F)

2.1.6 Work Near Heavy Equipment

Precaution should be taken when working near heavy equipment. Heavy equipment machines include, but are not limited to, tractors, drilling rigs, front-end loaders, bulldozers, compacting rollers, and backhoes. Not included are vehicles, trucks, and tractor-trailers.

- Machine Inspection

  All vehicles in use shall be checked at the beginning of each shift to assure that the following parts, equipment, and accessories are in safe operating condition and free of apparent damage:

  1) Seat Belts are provided on equipment (and used by operators)
  2) Fire Extinguishers (Class A/B/C, 5 lb. or greater) must be on each machine
  3) Brakes - service brakes, parking/hand brake; emergency stopping brakes;
  4) Signal Devices - lights, reflectors, horn, backup alarm. Backup alarms are required for all heavy equipment
  5) Tires - proper inflation, tread is acceptable
  6) Cabs - no broken or cracked glass
  7) Kill switches - must be in working order.

- General Machine Safety

  1) Inspect each machine prior to operation on each shift.
  2) Verify that the manufacturer's operating instructions are in each machine and that safe operating guidelines are followed.
  3) Operators are responsible to ensure that the travel direction and work area is clear of other Site personnel or obstructions. For rotating equipment with counterweights, this includes keeping the counterweight area clear.
  4) Operators shall use seatbelts when provided by the manufacturer.
  5) No employee shall ride on any load, in bucket, or on part of machinery not designed for personnel.
  6) Machines shall be equipped with Rollover Protective Structures (ROPS) and Falling Object Protective Structures (FOPS), except for equipment where machines are capable of 360 degree rotation.
  7) Verify that the guarding is in place at all times the machine is in operation.
  8) Before the operator leaves the machine unattended: place the parking brake on, moving elements (blades, buckets, shears, etc.) shall be lowered to the ground (or blocked/pinned), and release hydraulic and pneumatic pressure as specified by the manufacturer. Control lockout levers shall also be engaged.
  9) Maintain the OBG required minimum safe distance to overhead powerlines of twenty (20) feet or make arrangements to de-energize powerlines prior to work if these clearances cannot be maintained. If

equipment must approach closer than 20' (but NEVER closer than the OSHA minimum clearance of 10'), then a dedicated spotter will be used to ensure that the equipment does not approach closer than the OSHA minimum distance of 10' or otherwise contact the power lines.

10) Identify and mark all underground utilities prior to excavation or drilling work.

11) Operators will maintain a safe distance to rotating and moving parts. Loose hair, clothing, jewelry, etc. will be secured.

12) Non-essential personnel will be kept clear of rotating and moving parts, pinch points, and blind spots.

2.2. TASK HAZARDS

Hazard controls for task hazards will identify personal protective equipment (PPE) as described in more detail in Section 3.7 of this HASP. Other safety controls and safety procedures will also be referenced as necessary to mitigate task hazards.

2.2.1 Site Reconnaissance, Mobilization and Observation

The Site reconnaissance task will include identifying locations for exclusion, contamination reduction, and support zones for field efforts. Project personnel will walk the Site to observe the existence of anticipated hazards and to identify safety and health issues that may have arisen since the writing of this plan.

Potential health hazards and contaminants

Surveying, Site reconnaissance, and observation activities may involve a potential for exposure to physical and health hazards. Hazards may be associated with the Site and the environmental conditions. The hazards of this phase of activity are associated with heavy equipment movement, manual materials handling, installation of temporary on-site facilities, and manual Site preparation.

Hazard and contaminant control

The initial level of protection will be Level D PPE. The SSHC will upgrade to Modified Level D PPE (including coveralls) when there is the potential for contact with contaminated soil or liquid. The SSHC will upgrade to Level C PPE will be available should activities result in dust generation. Disposable boot covers will be worn if muddy conditions exist due to the potential presence of contaminated surface soil.

2.2.2 Soil Boring and MIP Drilling Field Activities

Field operations will consist of MIP drilling, soil boring completion and collection of sub-surface soil samples. The physical hazards of this operation are primarily associated with operation of the driller and contact with soil boring contents.

Potential health hazards and contaminants

Hazards generally associated with drilling operations include noise levels exceeding the OSHA PEL of 90 dBA that are both a hazard and a hindrance to communication, carbon monoxide from the drill rig, and overhead electrical and telephone wires which can be hazardous when the drill rig boom is in the upright position. Moving parts on the drill rig may catch clothing. Free or falling parts from the cat head may cause head injury. Moving the drill rig over uneven terrain may cause the vehicle to roll over or get stuck in a rut or mud. High pressure hydraulic lines and air lines used on drill rigs are hazardous when they are in disrepair or incorrectly assembled. There may be underground utilities in the area where drilling is being performed.

During the retrieval of augers/drilling rods, the possibility exists for splashing of exposed subsurface materials onto the workers and release of dust and volatile materials onto workers' bodies and into the workers' breathing zones.

There is the potential for arm and back strain during the purging of the wells.

There is the potential for combustible gases to be released during drilling activities.

Hazard and contaminant control

General PPE requirements presented in Section 3.7 apply to this task. Personnel must wear Level D PPE including ear muffs and/or ear plugs when working near operating heavy machinery. Modified Level D PPE will be worn during drilling and when there is a need to handle or work with potentially impacted soil or liquid. Prior to approaching a drill rig, loose clothing will be secured and the boom position will be checked.

OBG personnel will remain upwind from the vehicle exhausts unless required by sampling work. During drilling, if wet methods are not used, air in the breathing zone of the worker will be sampled for respirable dust using a Real-time air meter (RAM) at approximately five-minute intervals. Air will be sampled for volatile organic vapors using a PID at approximately five-minute intervals. Subsequent monitoring and respirator wear will be in accordance with Chapter 3 of this HASP.

The drilling subcontractor will be required to inspect chains, lines, cables, and high-pressure lines daily for weak spots, frays, and other signs of wear. The drilling subcontractor will be required to make repairs as necessary. To avoid contact with overhead lines, the drilling subcontractor will be required to lower the drill rig boom prior to moving the rig. The drilling subcontractor will be required to verify the location of underground utilities with both the facility and the local power and utility companies prior to drilling. Overhead and underground utilities will be considered "live" until verified otherwise.

Back strain can be prevented by employing proper lifting and bailing techniques. Heavy equipment, such as pumps and generators, will only be lifted with the legs, preferably using two or three personnel.

Equipment that is potentially contaminated will be cleaned to the satisfaction of the Field Operations Manager or SSHO. The field sampling equipment will be cleaned and decontaminated using the equipment decontamination procedures outlined in the FAP. The field decontamination wastes will be collected and disposed of properly according to the FAP.

2.2.3 Surface Water and Sediment Sampling

Field operations will consist of collection of surface water and sediment samples from the portion of Bishop Brook that runs through the northern portion of the property. The physical hazards of this operation are primarily associated with gaining access to Bishop Brook due to steep banks containing the brook and working on and near water.

Potential health hazards and contaminants

The following list summarizes the potential chemical, environmental, and physical hazards that could be encountered during surface water sampling:

- Direct contact with surface water that may contain VOCs;
- Slips, trips and falls on uneven/slippery surfaces;
- Musculoskeletal injuries while bending during sample and equipment handling;
- Severe weather;
- Heat stress/cold stress;
- Aggressive fauna and flora (black flies, ticks, spiders, snakes, bees, wasps, rabid animals, poison ivy, poison oak, sumac, giant hogweed, etc.); and
- Drowning.

Hazard and contaminant control

The "buddy system" will be used during the surface water and sediment sampling activities. The buddy system is intended to provide immediate assistance to an individual in the event of an emergency. The "buddy" is an individual that must remain in direct line of sight with another group member during the sampling activity.

To minimize potential exposure to contaminants during sampling activities, disposable gloves and Level D PPE will be worn.

Wading to access surface water and sediment sampling locations is permitted provided water depths are 3 feet or less, the substrate of the surface water body is firm, and the water velocities are low. PPE for wading will include Modified Level D PPE plus waders and a United States Coast Guard (USCG)-approved Commercial Type I, II, or III personal flotation device (PFD), appropriate to the circumstance. A sediment probe should be used to evaluate water depth and bed conditions before wading. As the stream bed may be slippery and uneven, proceed with caution at all times.

When sampling water bodies where the water is greater than 3 ft in depth, samples will be collected either from the bank or by extending a sample container affixed to a pole to the sampling point. PPE will include Modified Level D PPE plus waders and a USCG-approved Commercial Type I, II, or III PFD, appropriate to the circumstance.

3. PERSONNEL TRAINING

3.1 SITE WORKERS

OBG employees performing the activities listed in the RI Work Plan and subcontractors performing intrusive work must have completed a training course of at least 40 hours meeting the requirements of 29 CFR 1910.120(e) for safety and health at hazardous waste operations. If the course was completed more than 12 months before the date of Site work, completion of an approved 8-hr refresher course on health and safety at hazardous waste operations is required. Training certificates will be made available upon request.

OBG employees must comply with the OBG Quality Assurance Manual. The respiratory protection program is specified in Section 004.2 of Vol. 3. The Hazard Communication Program is specified in Section 003 of Vol. 3. The Audit Program is specified in Section 019 of Vol. 3.

3.2 EMERGENCY RESPONSE PERSONNEL

OBG employees who respond as Good Samaritans 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, avoidance of blood-borne pathogens, and basic first aid skills may be necessary.

3.3 SITE-SPECIFIC TRAINING

Site-specific training will be provided to each OBG employee and reviewed before assignment. OBG personnel will be briefed daily by the Field Operations or by the SSHC as to the potential hazards that may be encountered during that day. Topics will include:

- Availability of this HASP
- Tasks to be performed
- General Site hazards and specific hazards in the work areas
- Selection, use, testing, and care of the body, eye, hand, foot, and respiratory protective equipment being worn and the limitations of each
- Decontamination procedures for OBG personnel, their personal protective equipment, and other equipment used on-site

- Emergency response procedures and requirements
- Emergency notification procedures and evacuation routes to be followed
- Time constraints (*e.g.*, rest breaks, cartridge changes)
- Hazards that may be encountered, including their effects, how to recognize symptoms or monitor them, concentration limits, or other danger signals
- Other emergency procedures.

3.4 TRAINING CERTIFICATION

A record of employee training completion will be maintained by the SSHC for each OBG employee who is trained. This record will include the dates of the completion of worker training, supervisor training, refresher training, emergency response training, and Site-specific training for on-site OBG employees.

3.5 MEDICAL MONITORING

OBG has implemented a medical monitoring program in accordance with 29 CFR 1910.120. The OBG 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 evaluate the employee’s ability to wear PPE such as chemical-resistant clothing and respirators.

Medical examinations are administered on a post-hire and annual basis and as warranted by symptoms of exposure or of specialized activities. The post-hire examination provides baseline data. The examining physician is required to make a report to OBG of any medical condition that would increase the employee’s risk when wearing a respirator or other PPE. OBG maintains Site personnel medical records as required by 29 CFR 1910.120 and by 29 CFR 1910.1020, as applicable.

OBG employees performing the activities listed in the SOW or this document have or will receive medical tests as regulated by 29 CFR 1910.120. Where medial requirements of 29 CFR 1910.120 overlap those of 29 CFR 1910.134 or 29 CFR 1910.1025, the more stringent standard will be enforced.

3.6 RESPIRATOR CERTIFICATION

Employees who wear or may wear respiratory protection have been provided respirators as required by 29 CFR 1910.134. This standard requires that an individual’s ability to wear respiratory protection be medically certified before performing designated duties.

3.7 PERSONNEL PROTECTION

3.7.1 General

Workers and authorized visitors will be required to wear personal protective equipment and clothing appropriate to their work task and potential exposure. The personal protective equipment has been selected in accordance with the applicable provisions of Subpart I, 29 CFR Part 1910. Each individual will be trained in the use of this safety equipment before the start of field activities. Safety equipment and protective clothing will be used as directed by this HASP. Personal protective equipment will be worn at times designated by this HASP. Equipment and clothing will be cleaned and maintained in accordance with manufacturer's instructions and within the guidance of Subpart I, 29 CFR Part 1910 by project personnel. The SSHC will monitor the protective equipment maintenance procedures.

Results from the Site walk-through and on-site monitoring will be used to set task and point specific action levels and levels of personal protection with respect to upgrading and downgrading. Each individual will be trained in the use of the protective equipment prior to the start of their on-site activities.

Personal protective equipment will be used during the investigation to minimize exposures to site-related chemical compounds and physical and biological hazards. Levels of protective clothing and equipment have been assigned to specific tasks at Level C, Modified Level D, or Level D as shown in Table 3-1, below. These personal protection levels are detailed below. If field measurements or observations indicate that an exposure is greater than the protection afforded by the equipment or procedures specified in the following sections of this HASP, work will be stopped and workers removed until the exposure has been reduced and/or the level of protection has been increased. The basic level of PPE to be used during activities 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. The SSHC and the Project Manager must approve a downgrade of PPE.

If the SSHC verifies 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. OBG personnel will be removed from the Site until the exposure has been reduced or the level of protection has been increased.

OBG respirator users have been trained and medically approved to use respiratory protection. Respirators issued are approved for protection against dust and organic vapors by 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 and verify the integrity of the respirator and 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 daily at a minimum.

Table 3-1. Protective Clothing and Respiratory Equipment Requirements

Task	Monitoring	Airborne Action Level*	Initial PPE Level
Site reconnaissance, mobilization and observation	VOCs	25 ppm	Modified Level D
Soil boring	VOCs	25 ppm	Modified Level D

Note: * Exceedance of airborne action level will require upgrade to Level C respiratory protection or implementation of engineering controls.

3.7.2 Protective Equipment Description

The level of PPE is categorized as Level A, B, C, or D, based upon the degree of protection required. Levels A and B require the use of supplied air respirators and are not anticipated for Site activities. The following is a brief summary of the levels that may be used on this Site.

Level C

All personnel will move upwind or upgrade the level of personal protection to Level C if the VOC concentration is consistently greater than 25 ppm. When it is necessary to upgrade to Level C, a full-face air-purifying respirator equipped with organic vapor and P 100 or N95 dust filter combination cartridges will be worn in addition to the level D Protection. All personnel will move upwind or upgrade the level of personal protection to Level C, if the VOC concentration is consistently above 25 ppm above background. For tasks with a potential for direct contact with contaminated materials, Modified Level D PPE will be worn in addition to respiratory protection.

Modified Level D

Modified Level D PPE is worn when direct contact with contaminated materials in anticipated. Chemical protective outer clothing will be required to protect Site personnel and to prevent spreading contaminated materials into support areas. At a minimum, Modified Level D PPE will include Level D PPE, chemical resistant gloves, such as nitrile gloves, and overboots or disposable boot covers. Modified Level D PPE will also include chemical protective clothing such as Tyvek to prevent contact with dry or dusty materials or polycoated Tyvek or Saranex to prevent contact with wet or corrosive materials when conditions warrant. A faceshield may also be required to prevent splashes to the face and must be worn over safety glasses or goggles.

Level D

Level D PPE includes "routine" field safety PPE and may include a work uniform affording minimal protection used for nuisance contamination only. Level D protection will be worn for initial entry on-site and initially for all activities. The following constitute Level D equipment:

- Overalls (cloth) or long pants.
- Gloves (leather or other cut resistant type)
- Boots or shoes, leather, steel toe and shank
- Eye protection (goggles, face shield or safety glasses)
- Hard hat (Class B), when overhead hazard exists near drill rigs
- Hearing protection when heavy equipment is operating, as defined in OBG's Quality Assurance Manual.

3.8 MONITORING REQUIREMENTS

3.8.1 Work Zone Air Monitoring

A photoionization detector (PID) will be used to periodically monitor the work zone area. Breathing zone action levels presented in Table 3-1 above will be used to establish whether respirator protection is needed. Organic vapor concentrations in the work zone will be monitored at the start and at 15-minute intervals during intrusive work using a PID. The instrument will be calibrated according to the manufacturer's instructions. Organic vapor concentrations will be compared to action level criteria (Table 3-1 above) for implementing additional precautions or procedures. Additional information pertaining to work zone air monitoring action levels for organic vapors and particulate emissions are outlined in Table 3-2.

3.9. COMMUNITY AIR MONITORING PLAN

Action levels identified in the following sections are assumed to be above background.

3.9.1. Monitoring Requirements

The upwind and downwind perimeter of the exclusion zone at the Site will be monitored during intrusive work. A PID will monitor total 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. Action levels for organic vapors and particulate emissions are outlined in the following subsections as well as in attached Table 3-3.

3.9.2. Organic Vapors

Organic vapor action levels

If the 15-minute average VOCs level remains below 5 ppm above background, intrusive work activities may continue.

If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 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. 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.

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 over 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 5 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 5 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.

3.9.3. Dust/Particulate

Dust/Particulate action levels

When the 15-minute average VOCs level remains below 100 micrograms per cubic meter (mcg/m^3) above background, intrusive work activities may continue.

If the downwind PM-10 particulate level is 100 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.

If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/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 150 mcg/m3 of the upwind level and in preventing visible dust migration.

Particulate emission response plan

If the particulate levels increase above 100 mcg/m^3 over background at the downwind perimeter of the exclusion zone but remain below 150 mcg/m^3 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 150 mcg/m^3 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.

4. WORK ZONES AND DECONTAMINATION

4.1 SITE WORK ZONES

To reduce the spread of hazardous materials by workers from the contaminated areas to the clean areas, work zones will be delineated at the Site. The flow of personnel between the zones shall be controlled. The establishment of the work zones will help ensure that: personnel are protected against the hazards present where they are working, that work activities and contamination are confined to the appropriate areas, and that personnel can be located and evacuated in an emergency.

An exclusion zone, a contamination reduction zone, and support zone will be established by the SSHC at the Site.

4.1.1. Exclusion zone

The exclusion zone is where sampling/drilling activities are conducted. The SSHC will identify this zone. It must be at least 30 ft in diameter and centered, when possible, on the work activities. This zone will be designated with red flags attached to portable stakes or cones installed before beginning the fieldwork. The zone may be enlarged to contain the necessary ancillary equipment and personnel for the work to be done.

4.1.2. Contamination reduction zone

The contamination reduction zone (CRZ) contains personnel and equipment decontamination stations. This zone will be established between the exclusion zone and the support zone. Personnel and equipment in the exclusion zone must pass through this zone before entering the support zone. The CRZ will be located upwind from the work activities. It will only be large enough to contain equipment and personnel necessary to keep potentially impacted media and materials in the immediate work area. This area will be designated with yellow flags attached to portable stakes or cones. The CRZ will be established on the day Site work commences within a particular exclusion zone, based on the direction of the wind on that day.

4.1.3. Support zone

The remainder of the Site is defined as the support zone. The support zone contains support facilities, extra equipment, transport vehicles, and the additional personnel and equipment necessary to manage and perform work activities. No equipment or personnel will be permitted to enter the support zone from the exclusion zone without passing through the CRZ. Eating, smoking, and drinking will be allowed only in this area

4.1.4 Site communications

A cellular telephone will be used during activities to facilitate communications for emergency response and other purposes and to serve as the primary off-site communication network. Hand signals may be used between on-site personnel during heavy equipment operation.

4.2 DECONTAMINATION

4.2.1 Decontamination of Personnel

Personnel decontamination will not be necessary if Level D protection is used. However, personnel will be encouraged to remove clothing and shower as soon as is practicable at the end of the day. All clothing should be machine-washed. All personnel must wash hands and face prior to eating.

Decontamination will be necessary if Level C protection is used. Decontamination involves scrubbing with a soap and water solution followed by rinses with potable water. 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. Wastewaters from personnel decontamination will be disposed of with the wastewaters from the sampling equipment decontamination. Respirators will be decontaminated each day as well as sanitized before re-use. The manufacturer's instructions will be followed to sanitize the respirator masks.

A line for decontamination from Level C, providing the same level of decontamination as the example in the OBG Hazardous Waste Health and Safety Training Manual will be established by the Project Manager and monitored by the SSHC.

4.2.2 Decontamination Equipment

The following equipment will be available on-site to decontaminate personnel and equipment.

- Plastic drop cloths
- DOT approved fiberboard drums with plastic liners, to collect non-reusable protective clothing. (unless facility dumpster is available)
- Plastic wash tubs
- Soft bristled toilet brushes
- Plastic drums or carboys, to collect wash and rinse water
- Hand spray units for decontamination
- Sufficient soap, water, alcohol wipes and towels to wash hands, faces and respirators.

4.2.3 Decontamination Protocol

As appropriate given the level of protection worn on-site, the following decontamination protocol will be used:

1. Segregated equipment and drop on plastic drop clothes. Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths. During hot weather operations, a cool down station may be set up within this area.
2. Wash station for gloves, boots and protective suit will be set up. Scrub outer boots, outer gloves and splash suit with detergent water. Rinse off using copious amounts of water.
3. Removal and disposal of outer boots. Remove outer boots. Deposit them in a container with a plastic liner. If the boots are to be reused (*e.g.,* when the worker is dressed in Level C protection), after cleaning, place them in a secure on-site location, preferably in plastic.
4. Removal and disposal of outer gloves. Remove outer gloves. Deposit them in a container with a plastic liner. At this station, the worker's filter can be exchanged, new outer gloves and outer boots donned, joints taped, and the worker can return to duty.
5. Removal and disposal of outer garment. Remove outer garment. Deposit it in a container with a plastic liner.
6. Removal of respirator. Remove respirator. Avoid touching face with fingers. Deposit respirator on a plastic sheet.

7. Removal and disposal of inner gloves. Remove inner gloves. Deposit them in a container with a plastic liner.
8. Field Wash. Wash hands and face thoroughly. Shower if body contamination is suspected.

4.2.4 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 impacted 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 PPE. Decontaminated or clean equipment not in use will be covered with plastic and stored in a designated storage area in the support zone.

Non-dedicated sample collecting equipment contacting samples will be decontaminated after each use by a low phosphate detergent brushing followed by a clean water rinse. A methanol rinse followed by a final rinse with analyte-free deionized or distilled water will complete the decontamination procedure. Decontaminated equipment will be allowed to air dry before wrapping in aluminum foil, shiny side out, for transport.

Monitoring equipment will be cleaned of all visible contamination prior to initial use on-site, between each use, and after final use. Monitoring equipment, after decontamination, will be stored separately from personal protective equipment. Decontaminated or clean sampling equipment not in use will be covered with plastic and stored in a designated storage area in the support zone.

The surface of the equipment will be washed as follows:

1. Detergent/water rinse
2. Tap water rinse
3. Deionized/distilled water rinse.

4.2.5 Collection and Disposition of Impacted Materials and Refuse

Used PPE will be placed in plastic garbage bags and disposed in regular trash pick-up.

Investigation derived waste (IDW) will be managed as described in the RI Work Plan and consistent with Section 3.3 of DER-10. If used, commercial laundries or cleaning establishments that decontaminate protective clothing or equipment will be informed of the potentially harmful effects of exposures.

5.0 ACCIDENT PREVENTION AND CONTINGENCY PLAN

5.1. ACCIDENT PREVENTION

All personnel must have received health and safety training prior to the initiation of Site activities. While working, personnel must be constantly alert for indicators of potentially hazardous situations and for signs and symptoms in themselves and others warning of hazardous conditions and exposures. Rapid recognition of dangerous situations can avert an emergency and an emergency response requirement.

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

Table 5-1 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 verified daily before initiation of activities.

Table 5-1. Emergency telephone numbers.

Location	Telephone
Fire Department	911
Police Department	911
Ambulance	911
Poison Control Center	1-800-942-5969
National Spill Response Center	1-800-424-8802
OBG Project Officer – Douglas Crawford, P.E.	315-956-6862
OBG Project Manager – David Carnevale	315-956-6571
OBG Corporate H&S – Jeffrey Parsons, CIH	315-391-0638 (cell)

In the event that a Hospital is needed, the closest hospital with an **Emergency Department** is the following:

Upstate Medical Hospital
750 East Adams St
Syracuse, NY 13210

Phone: (315) 464-5540

Directions to Upstate Medical Hospital from the Site are shown on Figure 5-1 and are as follows:

	DIRECTIONS	DISTANCE
1	Start out going WEST EAST GENESEE STRET/ NY-5 toward INTERSTATE 481.	3.8 miles
2	Slight RIGHT/MERGE onto INTERSTATE 481 SOUTH.	4.7 miles
3	Merge onto INTERSTATE 81 NORTH.	2.1 miles
4	Take EXIT 18 for ADAMS STREET	0.3 miles
5	Turn RIGHT onto EAST ADAMS STREET	< 0.1 miles
3	End at **750 East Adams Street** Syracuse, NY 13210, US	
	Total Est. Time: 17 minutes Total Est. Distance: 11.5 miles	

5.2 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 Field Operations Manager in arranging follow-up actions. Upon notification of an exposure incident, the SSHC will call 911 and request that hospital, fire, and police emergency response personnel as necessary recommend medical diagnosis, treatment if necessary, and provide transportation to the hospital. The Field Operations Manager will contact local, state, and federal government agencies, as appropriate.

Before the start of RI Work Plan activities at the Site, the SSHC will:

1. Confirm that the following safety equipment is available: eyewash, first aid supplies, and fire extinguisher.
2. Have a working knowledge of the OBG safety equipment.
3. Collect and maintain a file of MSDS for materials used at the Site.

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 Field Operations Manager, must investigate the incident as soon as possible. The Project Manager will assess 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, SSHC, and the Field Operations Manager.

5.3 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, personnel trained in first aid procedures will provide immediate medical care. Personnel competent in on-site medical or first aid response to an injury or illness will provide assistance in such matters. Accidents will be reported to OBG following the procedure in the OBG Health and Safety Manual including immediate verbal notification to Corporate Health & Safety (H&S) followed by a written Incident Report within 24 hours.

If the chemical is on the skin, the skin should be washed with copious amounts of water. If the chemical is on clothing, the chemical should be neutralized or clothing removed. In case of eye contact, use the emergency eyewash. Eyes should be rinsed for at least 15 minutes. All chemical exposure incidents must be reported in writing to the Manager for Safety and Health (Jeff Parsons). The SSHC or the Field Operations Manager is responsible for completing the accident report. An ambulance should be called to transport the victim to the nearest hospital or medical center. Only persons with very minor injuries should be transported by a company vehicle. Follow-up action should be taken to correct the situation that caused the accident.

5.3.1 Evacuation Procedures

In the event the Site must be evacuated, the following procedures should be followed:

- The Field Operations Manager will initiate evacuation procedure by signaling to leave the Site.
- All personnel in the work area will evacuate the area and meet in the designated safe refuge area.
- Al personnel must be accounted for and the whereabouts of missing persons determined immediately.
- The Field Operations Manager will give further instruction.

5.4 SAFE REFUGE

Before commencing Site activities, a place of refuge for OBG workers will be identified by the SSHC. For the purpose of this HASP, a location in the western parking lot will be selected as the place of safe refuge during a Site evacuation. In case of an emergency, 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. If evacuation from the on-site refuge location is necessary, the project vehicles will be used to transport personnel to the place of refuge.

5.5 FIREFIGHTING 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 Field Operations Manager will decide when to contact the fire department.

5.6 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
- Eye wash bottles.

5.7 EMERGENCY SITE COMMUNICATIONS

Hand and verbal signals will be used at the Site for emergency communications.

5.8 SECURITY AND CONTROL

The SSHC or the Field Operations Manager will monitor work zone security and control during emergencies, accidents, and incidents. The duties of the SSHC or the Field Operations Manager include limiting access to the work zones to authorized personnel and overseeing emergency response activities.

Tables

Table 3-2. Work Zone Air Monitoring Action Levels

Contaminant (equipment)	Frequency	Airborne Action Level*	Initial PPE Level
VOC Vapors **(PID)**	1. Continuously in work zones during intrusive activities (soil borings or excavations) 2. When odors are encountered or changing site conditions affect hazards 3. Prior to and continuous during confined space entry (i.e., excavations >4' and tanks)	*5 ppm	1. Increase to Level C PPE (half or full-face respirator) 2. Move to the downwind perimeter of the work zone conduct Community (fence line) monitoring per the Vapor Emission Response Plan (VERP).
		*50 ppm	1. Cessation of Site activities until engineering controls are implemented to decrease vapor levels 2. Conduct Community (fenceline) monitoring per the Vapor Emission Response Plan (VERP). 3. Notify the O'Brien & Gere Manager of Corporate H&S and the Project Manager.
DUST/ **PARTICULATE**	1. Continuously in work zones during intrusive activities (soil borings or excavation)	**1 mg/m^3	1. Increase to Level C PPE (half or full-face respirator) 2. Implement additional controls to keep dust levels below 1 mg/m^3. 3. Move to the downwind perimeter of the work zone and conduct Community (fence line) monitoring.
		*1.5 mg/m^3	1. Full-Face Level C PPE or implement additional controls to keep dust levels below 1.5 mg/m^3. 2. Move to the downwind perimeter of the work zone and conduct Community (fence line) monitoring. Work may proceed only if perimeter dust/particulate levels are below 1.5 mg/m^3. 3. Notify the O'Brien & Gere Manager of Corporate H&S and the Project Manager.

* VOCs - Sustained readings for 1 minute above background. Background readings are taken at upwind locations relative to Work zones.

** DUST/PARTICULATE - 15 minute time-weighted average above upwind background readings.

Table 3-3. Community Air Monitoring Plan (CAMP) Action Levels

Contaminant (equipment/method)	Frequency	Downwind Action Levels*	SSHC Action/Response
Volatile Organic Vapors (VOCs) **Odor observations and PID** **(PID with 11.7 eV lamp)**	1. Continuously downwind during boring activities. 2. When observations of any unusual odors are reported to the SSHC	<5 ppm (at the work zone perimeter)	1. Work may continue. 2. All readings shall be recorded and made available for review.
		5 ppm (at the work zone perimeter)	1. STOP work. 2. Move to a location 200' downwind or at half the distance between the work 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 work zone perimeter and take additional VOC readings. 3. Work may continue if work zone perimeter readings are <5 ppm and additional vapor emission controls have been implemented. 4. Monitoring must continue at the work zone perimeter for as long as VOC levels are ≥5 ppm.
		25 ppm (at the work zone perimeter)	1. STOP work. 2. Implement additional vapor emission controls to reduce VOC levels below 5 ppm (at the work zone perimeter) 3. Notify the O'Brien & Gere Project Manager.
DUST **Observations and Dust Meter** **(Dust Trak or MiniRam)**	1. When the work zone air monitoring dust action level of 1 mg/m^3 is exceeded (Table 3). 2. When observations of any unusual odors are reported to the SSHC	**<0.1 mg/m^3 (at work zone perimeter)**	1. Work may continue but if dust is observed leaving the site perimeter or fence line, then dust controls must be implemented. 2. If dust controls fail to prevent dust emissions from leaving the site, then **STOP** work and notify O'Brien & Gere Project Manager.

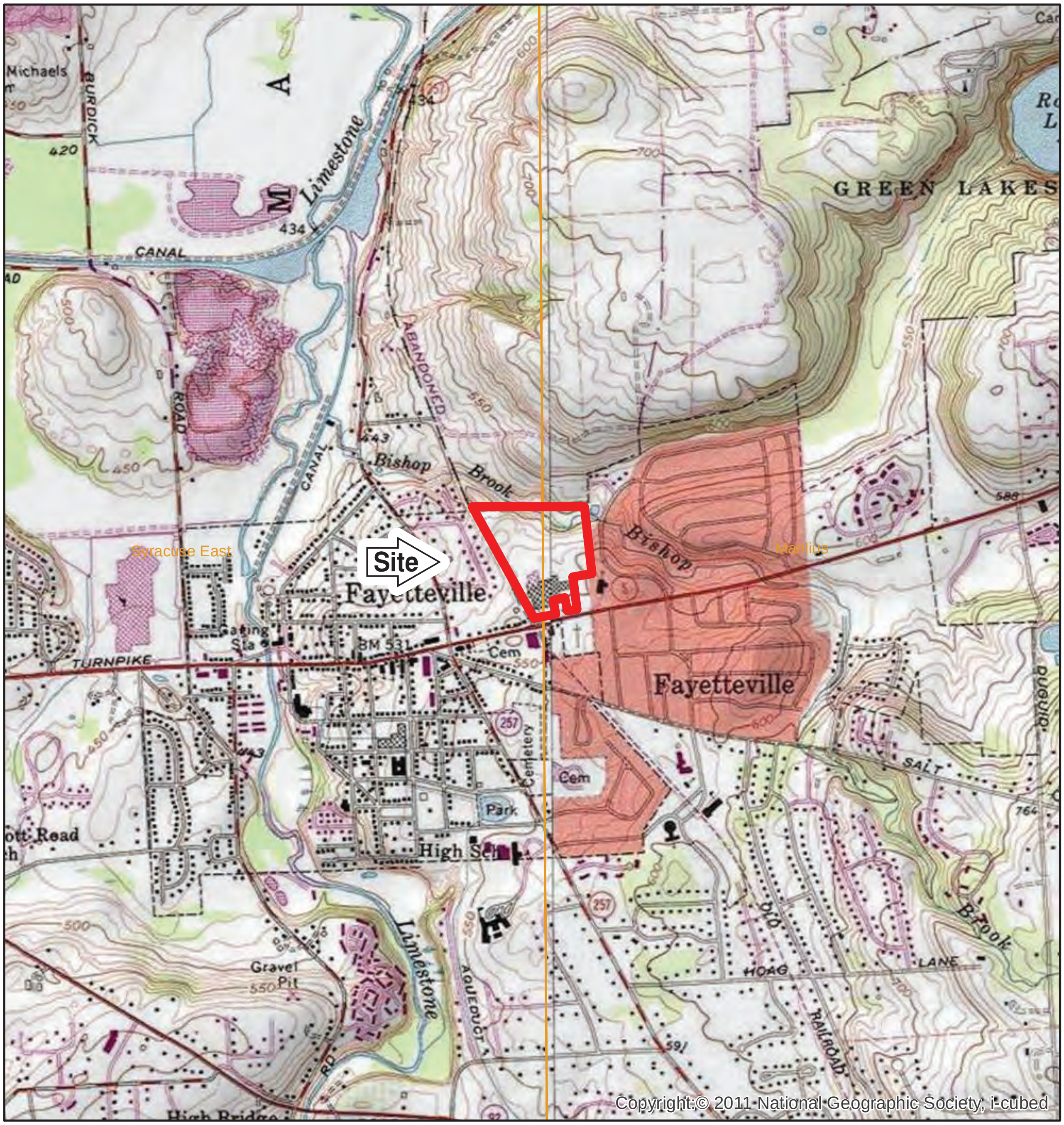
Table 3-3. Community Air Monitoring Plan (CAMP) Action Levels

Contaminant (equipment/method)	Frequency	Downwind Action Levels*	SSHC Action/Response
NOTE – Dust monitoring will not be performed in the snow or rain.		**0.1 mg/m^3 - 0.15 mg/m^3**	1. Work may continue but use dust suppression controls.
		>0.15 mg/m^3	1. **STOP** Work 2. Work may continue if work zone dust readings are <0.15 mg/m^3 and additional dust controls have been implemented. 3. Immediately notify the O'Brien & Gere Manager of Corporate H&S, O'Brien & Gere Project Manager. 4. Work will not restart until the cause of the elevated dust levels has been investigated and corrective actions identify.

* Sustained readings for 1 minute above background. Background readings are taken at upwind locations relative to Work zones.

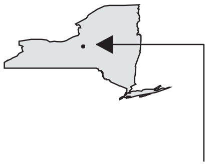
Figures

FIGURE 1-1



ADAPTED FROM: (SYRACUSE EAST AND MANILUS, NY USGS QUADRANGLE

FOUBU ENVIRONMENTAL SERVICES, LLC
547 EAST GENESEE STREET
FAYETTEVILLE, NEW YORK
SITE NO. C734052


MAP LOCATION

SITE LOCATION

0 1,000 2,000 4,000
Feet

1:24,000

AUGUST 2015
25179.60243

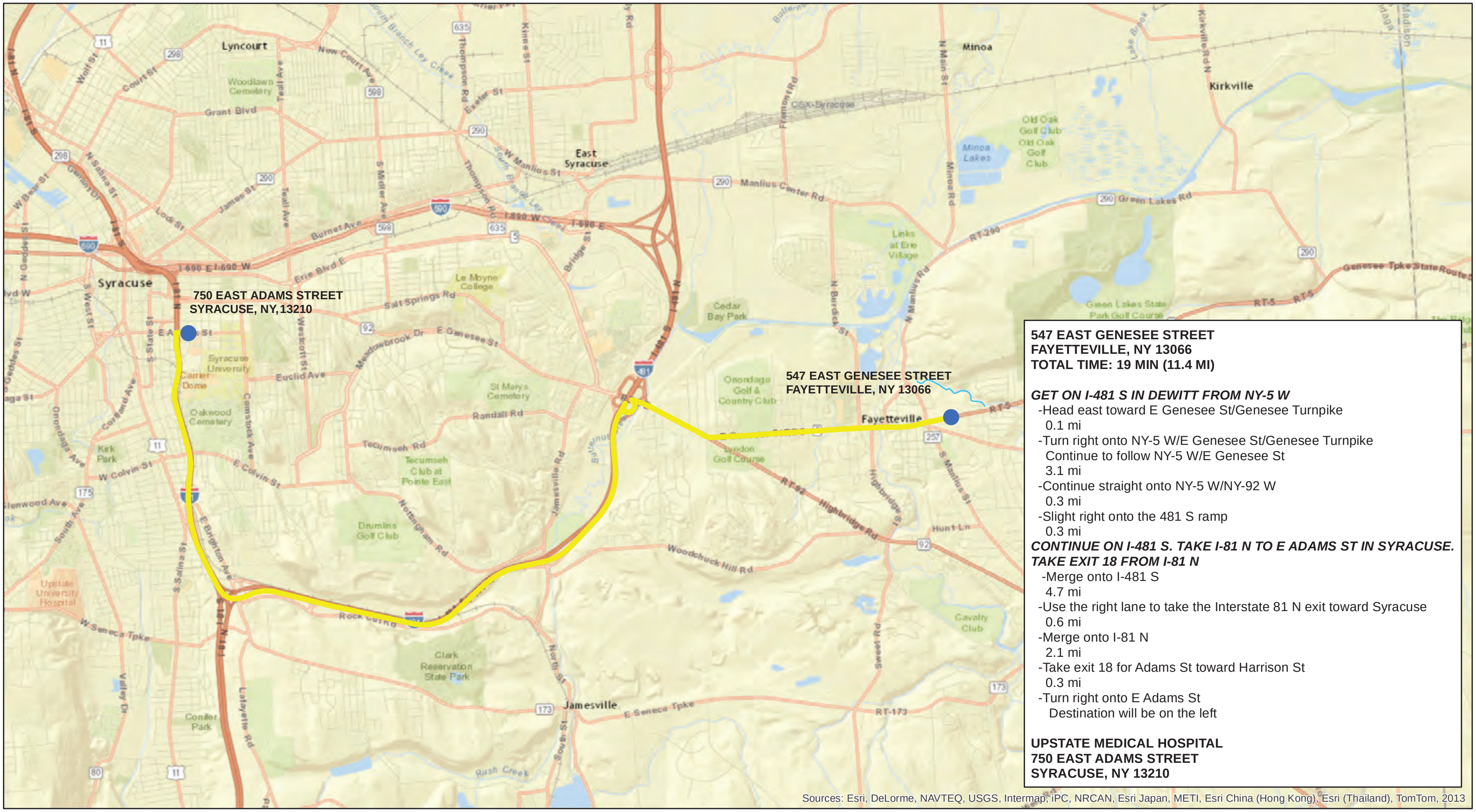
O'BRIEN & GERE ENGINEERS, INC.

PLOTDATE: 08/13/15 4:44:49 PM Stantosa

I:\Foubo-Env.25179\60243.Former-Accurate\Docs\DWG\MXD\Site_Loc.mxd

PLOTDATE: 08/12/15 10:29:27 AM Stantosa

FIGURE 5-1



547 EAST GENESEE STREET
FAYETTEVILLE, NY 13066
TOTAL TIME: 19 MIN (11.4 MI)

GET ON I-481 S IN DEWITT FROM NY-5 W
-Head east toward E Genesee St/Genesee Turnpike
0.1 mi
-Turn right onto NY-5 W/E Genesee St/Genesee Turnpike
Continue to follow NY-5 W/E Genesee St
3.1 mi
-Continue straight onto NY-5 W/NY-92 W
0.3 mi
-Slight right onto the 481 S ramp
0.3 mi
CONTINUE ON I-481 S. TAKE I-81 N TO E ADAMS ST IN SYRACUSE.
TAKE EXIT 18 FROM I-81 N
-Merge onto I-481 S
4.7 mi
-Use the right lane to take the Interstate 81 N exit toward Syracuse
0.6 mi
-Merge onto I-81 N
2.1 mi
-Take exit 18 for Adams St toward Harrison St
0.3 mi
-Turn right onto E Adams St
Destination will be on the left

UPSTATE MEDICAL HOSPITAL
750 EAST ADAMS STREET
SYRACUSE, NY 13210

Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013

FOUBU ENVIRONMENTAL SERVICES, LLC
547 EAST GENESEE STREET
FAYETTEVILLE, NEW YORK
SITE NO. C734052

0 1,0002,000 4,000 6,000 8,000
Feet

N

HOSPITAL ROUTE

AUGUST 2015
25179.60243

O'BRIEN & GERE ENGINEERS, INC.

I:\Foubo-Env.25179\60243.Former-Accurate\Docs\DWG\MXD\HSA_Directions.mxd

Appendix D

Citizen Participation Plan

NEW YORK
STATE OF
OPPORTUNITY.

Department of
Environmental
Conservation

Brownfield Cleanup Program

Citizen Participation Plan
for
Former Accurate Die Casting Site

October 2019

C734052
547 East Genesee Street
Fayetteville, Onondaga County, New York

Contents

* * * * *

Note: The information presented in this Citizen Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Citizen Participation Plan may be revised during the site's investigation and cleanup process.

Applicant: **FOUBU Environmental Services, LLC (“Applicant”)**
Site Name: **Former Accurate Die Casting Site (“Site”)**
Site Address: **547 East Genesee Street, Fayetteville, NY 13066**
Site County: **Onondaga County**
Site Number: **C734052**

1. What is New York’s Brownfield Cleanup Program?

New York’s Brownfield Cleanup Program (BCP) works with private developers to encourage the voluntary cleanup of contaminated properties known as “brownfields” so that they can be reused and developed. These uses include recreation, housing, and business.

A *brownfield* is any real property that is difficult to reuse or redevelop because of the presence or potential presence of contamination. A brownfield typically is a former industrial or commercial property where operations may have resulted in environmental contamination. A brownfield can pose environmental, legal, and financial burdens on a community. If a brownfield is not addressed, it can reduce property values in the area and affect economic development of nearby properties.

The BCP is administered by the New York State Department of Environmental Conservation (NYSDEC) which oversees Applicants who conduct brownfield site investigation and cleanup activities. An Applicant is a person who has requested to participate in the BCP and has been accepted by NYSDEC. The BCP contains investigation and cleanup requirements, ensuring that cleanups protect public health and the environment. When NYSDEC certifies that these requirements have been met, the property can be reused or redeveloped for the intended use.

For more information about the BCP, go online at:
http://www.dec.ny.gov/chemical/8450.html .

2. Citizen Participation Activities

Why NYSDEC Involves the Public and Why It Is Important

NYSDEC involves the public to improve the process of investigating and cleaning up contaminated sites, and to enable citizens to participate more fully in decisions that affect their health, environment, and social well-being. NYSDEC provides opportunities for citizen involvement and encourages early two-way communication with citizens before decision makers form or adopt final positions.

Involving citizens affected and interested in site investigation and cleanup programs is important for many reasons. These include:

- Promoting the development of timely, effective site investigation and cleanup programs that protect public health and the environment

- Improving public access to, and understanding of, issues and information related to a particular site and that site's investigation and cleanup process

- Providing citizens with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process

- Ensuring that NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives found within the affected community

- Encouraging dialogue to promote the exchange of information among the affected/interested public, State agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision making.

This Citizen Participation (CP) Plan provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the site identified above. The public information and involvement program will be carried out with assistance, as appropriate, from the Applicant.

Project Contacts
Appendix A identifies NYSDEC project contact(s) to whom the public should address questions or request information about the site's investigation and cleanup program. The public's suggestions about this CP Plan and the CP program for the site are always welcome. Interested people are encouraged to share their ideas and suggestions with the project contacts at any time.

Locations of Reports and Information
The locations of the reports and information related to the site's investigation and cleanup program also are identified in Appendix A. These locations provide convenient access to important project documents for public review and comment. Some documents may be placed on the NYSDEC web site. If this occurs, NYSDEC will inform the public in fact sheets distributed about the site and by other means, as appropriate.

Site Contact List
Appendix B contains the site contact list. This list has been developed to keep the community informed about, and involved in, the site's investigation and cleanup process. The site contact list will be used periodically to distribute fact sheets that

provide updates about the status of the project. These will include notifications of upcoming activities at the site (such as fieldwork), as well as availability of project documents and announcements about public comment periods.
The site contact list includes, at a minimum:

- chief executive officer and planning board chairperson of each county, city, town and village in which the site is located;
- residents, owners, and occupants of the site and properties adjacent to the site;
- the public water supplier which services the area in which the site is located;
- any person who has requested to be placed on the site contact list;
- the administrator of any school or day care facility located on or near the site for purposes of posting and/or dissemination of information at the facility;
- location(s) of reports and information.

The site contact list will be reviewed periodically and updated as appropriate. Individuals and organizations will be added to the site contact list upon request. Such requests should be submitted to the NYSDEC project contact(s) identified in Appendix A. Other additions to the site contact list may be made at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

Note: The first site fact sheet (usually related to the draft Remedial Investigation Work Plan) is distributed both by paper mailing through the postal service and through DEC Delivers, its email listserv service. The fact sheet includes instructions for signing up with the appropriate county listserv to receive future notifications about the site. See http://www.dec.ny.gov/chemical/61092.html .

Subsequent fact sheets about the site will be distributed exclusively through the listserv, except for households without internet access that have indicated the need to continue to receive site information in paper form. Please advise the NYSDEC site project manager identified in Appendix A if that is the case. Paper mailings may continue during the investigation and cleanup process for some sites, based on public interest and need.

CP Activities
The table at the end of this section identifies the CP activities, at a minimum, that have been and will be conducted during the site's investigation and cleanup program. The flowchart in Appendix D shows how these CP activities integrate with the site investigation and cleanup process. The public is informed about these CP activities through fact sheets and notices distributed at significant points during the program. Elements of the investigation and cleanup process that match up with the CP activities are explained briefly in Section 5.

- **Notices and fact sheets** help the interested and affected public to understand contamination issues related to a site, and the nature and progress of efforts to investigate and clean up a site.

- **Public forums, comment periods and contact with project managers** provide opportunities for the public to contribute information, opinions and perspectives that have potential to influence decisions about a site's investigation and cleanup.

The public is encouraged to contact project staff at any time during the site's investigation and cleanup process with questions, comments, or requests for information.

This CP Plan may be revised due to changes in major issues of public concern identified in Section 3 or in the nature and scope of investigation and cleanup activities. Modifications may include additions to the site contact list and changes in planned citizen participation activities.

Technical Assistance Grant
NYSDEC must determine if the site poses a significant threat to public health or the environment. This determination generally is made using information developed during the investigation of the site, as described in Section 5.

If the site is determined to be a significant threat, a qualifying community group may apply for a Technical Assistance Grant (TAG). The purpose of a TAG is to provide funds to the qualifying group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the site and the development/implementation of a remedy.

An eligible community group must certify that its membership represents the interests of the community affected by the site, and that its members' health, economic well-being or enjoyment of the environment may be affected by a release or threatened release of contamination at the site.

The site was added to NYSDEC's Registry of Inactive Hazardous Waste sites as a Class 2 site circa January 1990. At that time, the site was considered to constitute a significant threat to human health or the environment and that action was required to investigate, and if necessary, remediate the site. In accordance with the Record of Decision (ROD) (December 1994) and the Amended ROD (October 1997), remedial actions were completed between 1995 and 1999 to remediate areas of concern and mitigate exposures. Between 2008 and 2010 additional measures were completed to mitigate the potential for vapor intrusion into nearby buildings. On June 4, 2014, the NYSDEC changed the classification of the Site from a Class 2 site to a Class 4 site (meaning one where the site is properly closed but requires continued management). The site was transitioned to the Brownfield Cleanup Program (BCP) during 2015.

To verify the significant threat status of the site, the interested public may contact the NYSDEC project manager identified in Appendix A.

For more information about TAGs, go online at
http://www.dec.ny.gov/regulations/2590.html

The following table provides a summary of the citizen participation activities related to the site's investigation and cleanup program:

Citizen Participation Activities	Timing of CP Activity(ies)
Application Process:	
• Prepare site contact list • Establish document repository(ies)	At time of preparation of application to participate in the BCP.
• Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day public comment period • Publish above ENB content in local newspaper • Mail above ENB content to site contact list • Conduct 30-day public comment period	When NYSDEC determines that BCP application is complete. The 30-day public comment period begins on date of publication of notice in ENB. End date of public comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice, and notice to the site contact list should be provided to the public at the same time.
After Execution of Brownfield Site Cleanup Agreement (BCA):	
• Prepare Citizen Participation (CP) Plan	Before start of Remedial Investigation **Note:** Applicant must submit CP Plan to NYSDEC for review and approval within 20 days of the effective date of the BCA.
Before NYSDEC Approves Remedial Investigation (RI) Work Plan:	
• Distribute fact sheet to site contact list about proposed RI activities and announcing 30-day public comment period about draft RI Work Plan • Conduct 30-day public comment period	Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, public comment periods will be combined and public notice will include fact sheet. Thirty-day public comment period begins/ends as per dates identified in fact sheet.
After Applicant Completes Remedial Investigation:	
• Distribute fact sheet to site contact list that describes RI results	Before NYSDEC approves RI Report
Before NYSDEC Approves Remedial Work Plan (RWP):	
• Distribute fact sheet to site contact list about draft RWP and announcing 45-day public comment period • Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager) • Conduct 45-day public comment period	Before NYSDEC approves RWP. Forty-five day public comment period begins/ends as per dates identified in fact sheet. Public meeting would be held within the 45-day public comment period.
Before Applicant Starts Cleanup Action:	
• Distribute fact sheet to site contact list that describes upcoming cleanup action	Before the start of cleanup action.

Citizen Participation Activities	Timing of CP Activity(ies)
After Applicant Completes Cleanup Action:	
• Distribute fact sheet to site contact list that announces that cleanup action has been completed and that NYSDEC is reviewing the Final Engineering Report • Distribute fact sheet to site contact list announcing NYSDEC approval of Final Engineering Report and issuance of Certificate of Completion (COC)	At the time the cleanup action has been completed. **Note:** The two fact sheets are combined when possible if there is not a delay in issuing the COC.

3. Major Issues of Public Concern

This section of the CP Plan identifies major issues of public concern that relate to the site. Additional major issues of public concern may be identified during the course of the site's investigation and cleanup process.

3.1 Location

The Site is approximately 30.31 acres in size and located at 547 East Genesee Street in Fayetteville, New York (Section Map 9, Parcel 9-4-19.1 of Village of Fayetteville, Town of Manlius, Onondaga County). The Site is bordered to the west by a former railroad bed that is no longer in use, and residential housing is located west of the former railroad bed. Residential housing also borders the Site to the east while Bishop Brook completes the northern border (Figure 1 provided in Appendix C).

3.2 Site Ownership

Accurate Die Casting and predecessor owners and operators of the facility conducted manufacturing operations at the Site from approximately 1950 until 1988 when Accurate Die Casting abandoned the facility. Accurate Die Casting and the predecessor owners and operators used the facility for die and casting operations to fabricate metal products for the automobile industry and other industries.

ITT Commercial Finance Corporation, a former subsidiary of ITT Industries, now ITT Corporation (ITT), acquired the Site in 1988 as a result of foreclosure proceedings. ITT never conducted manufacturing operations at the Site and did not own or operate the facility at any time that a disposal or release of hazardous substances occurred at the Site.

The Site was sold to O'Brien & Gere Technical Services, Inc. in 1999. In 2000, O'Brien & Gere Technical Services, Inc. sold the Site to 547 East Genesee Street, LLC. A deed was recorded with the Onondaga County Clerk on December 29, 2017 transferring title to the Site from 547 East Genesee Street, LLC, to FOUBU Environmental Services, LLC (FOUBU).

3.3 Investigations and Record of Decision

Although ITT never conducted manufacturing operations at the Site, ITT conducted remedial assessments of the property and also completed a Remedial Investigation (RI) and Feasibility Study (FS) in accordance with NYSDEC Consent Order (CO) (Index # A7-0258-91-03) dated August 19, 1991 and amended on June 6, 1994.

The Final Report – Remedial Investigation (Stearns & Wheler, December 1993) concluded that:

- Trichloroethene (TCE) was observed in both overburden and bedrock groundwater at concentrations above the NYSDEC Class GA groundwater standards.

- The highest TCE concentrations in soils were observed at about 20 to 25 ft below grade in the vicinity of MW-3, at the interface between the sand/gravel and till layers. MW-3 was formerly located inside the excavation made during the IRM outside the northeast corner of the building (Area 2) and near the current location of the sump S-1 (Figure 2).

Following the investigation, a Record of Decision (ROD) (December 5, 1994) was prepared by the NYSDEC in which it selected (1) excavation and off-site disposal for the contaminated soil, and (2) extraction and on-site treatment for the contaminated groundwater. The NYSDEC identified five areas in the December 1994 ROD requiring remedial action (Figure 2 provided in Appendix C). The NYSDEC subsequently prepared an Amended ROD (October 2, 1997) and an Explanation of Significant Differences (ESD) (October 1998).

3.4 Remedial Actions

A Remedial Design (RD) was prepared and Remedial Construction was implemented under NYSDEC Consent Order (Index #A7-0318-94-10) dated April 26, 1995, and NYSDEC-approved Site remediation was conducted that included soil excavation and construction of a groundwater collection and treatment (GWC&T) system as summarized below for each area.

Area 1 - PCB/PAH/VOC Soils Area

In accordance with the NYSDEC-approved PCB/PAH/VOCs Soils Area Excavation Plan (O'Brien & Gere, 1995a) dated March 1995, unsaturated soils exhibiting concentrations of polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and volatile organic compounds (VOCs) above remedial action objectives (RAOs) in the northwest area of the site were excavated during 1995. After excavating approximately 600 cubic yards (cy) of soil, grab samples of soil were collected from the excavations and analyzed for PAHs, VOCs, and PCBs to evaluate if further action was required.

Based on the results of the sampling and analyses, it was concluded that the unsaturated soils containing PAHs, PCBs and VOCs above the RAOs had been removed to the extent practicable.

In 1997, approximately 350 cy of the 600 cy of excavated soil was removed from the site and transported to a waste treatment facility (ESMI) in Fort Edward, New York for low temperature thermal destruction and subsequent off-site disposal. The remaining 250 cy of soil was treated on site utilizing a mechanical volatilization process to increase the exposed surface area of the soil to enhance volatilization (e.g. evaporation and mass transfer) of VOCs in accordance with the ROD amendment issued in October 1997 (NYSDEC, 1997).

In April 1998, following analyses that indicated that the VOCs had been removed and RAOs had been achieved, the 250 cy of mechanically processed soils were spread on-site in the Corrective Action Management Unit (CAMU) (Area 1) identified in the ROD amendment (Figure 2). In accordance with the NYSDEC requirements, approximately 1 foot of general fill, topsoil, and grass seed was placed on top of the processed soils.

Pursuant to an Explanation of Significant Differences (ESD) Notice dated October 1998 (NYSDEC, 1998a), a groundwater collection trench was then constructed to intercept groundwater (if any) containing VOCs present in the sand lenses (e.g. thin layers of sand exhibiting perched groundwater in a typically unsaturated zone) observed in Area 1. Construction of the trench was completed in July 1999 and the collected groundwater is treated at the existing on-site treatment system.

Area 2 – Northeast Corner of Facility

In accordance with the NYSDEC-approved IRM Work Plan dated May 1994 (O'Brien & Gere, 1994a), the area outside the northeast corner of the facility was addressed as part of an Interim Remedial Measure (IRM) during 1994. As part of the IRM, soils exhibiting trichloroethylene (TCE) above the RAO were removed to the extent practicable without undermining the existing building foundations. Afterwards, the soil was mechanically processed on-site to enhance volatilization of the VOCs until residual levels were documented to be below the RAOs. Following achievement of the RAOs, the soils were used to backfill the excavation. A description of the soil remediation activities completed in this area is provided in the NYSDEC-approved Soil Remediation Activities Summary Report dated October 1994 (O'Brien & Gere, 1994b).

Area 3 - Overburden Groundwater

In accordance with the NYSDEC-approved IRM Work Plan (O'Brien & Gere, 1994a) and as part of the IRM which addressed the soils outside the northeast corner of the facility (Area 2), a groundwater collection sump was constructed within the excavation (S-1 on Figure 2). The sump extends to the clay layer that was found to be present at the base of the excavation made during the soil remediation activities. This sump is being utilized when water is present as one of the groundwater recovery points for the groundwater recovery and treatment system constructed at the Site to address the shallow/overburden groundwater. However, the sump is typically dry as reported in the quarterly reports provided to the NYSDEC.

Also, an overburden recovery well designated as RW-1 (Figure 2) was constructed on-site as part of the IRM. This recovery well is being utilized to collect groundwater containing TCE in the overburden aquifer downgradient of the northeast corner of the facility.
Recovery and treatment of overburden groundwater using the sump and RW-1 has been ongoing since February 5, 1996 and is continuing.

Area 4 – Shallow Bedrock Groundwater
A second groundwater recovery well, designated as RW-2, is being utilized on-site to recover groundwater containing VOCs from the shallow bedrock in the vicinity of the northeast corner of the facility (Figure 2). This well was installed during 1995, and recovery and treatment of shallow bedrock groundwater using RW-2 was initiated on February 5, 1996 and is continuing.

Area 5 - Septic Tank
During 1995, the septic tank was uncovered and the contents were removed and disposed of at an off-site NYSDEC-approved landfill in accordance with the NYSDEC-approved Remedial Design/Remedial Action Work Plan dated March 1995 (O'Brien & Gere, 1995b). Once the contents were removed, the walls of the septic tank were cleaned using a pressure-washer as approved by the NYSDEC. Subsequent to decontaminating the floor and walls of the septic tank, the concrete vault was filled and buried, completing remediation of this area.

A Final Engineering Report (O'Brien & Gere, 2000) was provided to the NYSDEC in March 2000 certifying and documenting that the remedial actions required by the Consent Order to address the five areas identified in the 1994 ROD were complete. The Final Engineering Report provided commitment to on-going groundwater recovery from RW-1, RW-2, the sump outside Area 2, and the overburden groundwater interceptor trench downgrade of Area 1 until achieving Class GA Standards or reaching an asymptotic level below which further reduction is not practicable.

3.5 Environmental Issues of Potential Public Concern
Groundwater at the site exhibits TCE above Class GA Standards. TCE is the primary contaminant of concern, although other chlorinated compounds (cis-1,2-dichloroethene, methylene chloride, tetrachloroethene, and trans-1,2-dichloroethene) have been occasionally detected. It is likely that the concentration of TCE and other VOCs may remain above the Class GA drinking water standards in impacted overburden groundwater and bedrock groundwater for an indefinite period. Deed restrictions were

filed on May 15, 2014 that prohibit use of on-site groundwater and requires future actions by the site owner should the site be occupied or redeveloped.

Digging on Site in the CAMU (Area 1) is not allowed, nor is construction of groundwater recovery wells for consumption or production use. The current site owner filed a Declaration of Covenants and Restrictions (deed restrictions), as required by the NYSDEC, on May 15, 2014 that prohibits the disturbance or excavation of the Property which threatens the integrity of the engineering controls or which results in unacceptable human exposure to contaminated soils, and prohibits use of on-site groundwater.

Also, the deed restrictions require evaluation of the potential for soil vapor intrusion by the site owner for any buildings developed on the site presently or in the future.

3.6 Other Potential Issues of Potential Public Concern

The public may have concern about the potential of short term nuisance conditions (noise and dust) during construction activities at the site. The developer will comply with NYSDEC and local rules and regulations during construction to address potential short-term nuisance conditions. The developers will also comply with a Community Air Monitoring Plan (CAMP) prepared in accordance with DER-10, Appendix 1A and approved for the site during ground intrusive activities (e.g. excavation).

4. Site Information

Appendix C contains a map identifying the location of the site.

Site Description

Site Location: **547 East Genesee Street, Village of Fayetteville, Onondaga County**
Setting: **Suburban**
Site size: **30.31 acres** (Section Map 9, Parcel 9-4-19.1 of Village of Fayetteville, Town of Manlius, Onondaga County)
Adjacent properties: **Residential to north, east and west; and commercial along south.**

History of Site Use, Investigation, and Cleanup

Sections 3.2 to 3.4 earlier provided a summary of the site history including prior ownership, site use, and completed site investigations and remedial actions conducted under the NYS State Superfund Site Remediation Program. The NYSDEC added the Site to the Registry of Inactive Hazardous Waste Disposal Sites in January 1990 as a Class 2 site (meaning a site where the disposal of hazardous waste has been confirmed and the presence of such hazardous waste or its components or breakdown products

represents a significant threat to public health or the environment and requires action), based on an environmental assessment conducted for ITT Commercial Finance Corporation (a former subsidiary of ITT Industries, now ITT Corporation (ITT)). A RI was then performed between 1990 and 1993, and the results presented in the Remedial Investigation Report (Stearns & Wheler, 1993) dated December 1993.
Following the investigation, a Record of Decision (ROD) (December 5, 1994) was prepared by the NYSDEC in which five areas were identified as requiring remedial action (Figure 2). The NYSDEC subsequently prepared an Amended ROD (October 2, 1997) and an Explanation of Significant Differences (ESD) (October 1998). The remedial actions required by the NYSDEC and described in these documents were completed between 1995 and 1999, as summarized in the Final Engineering Report (O'Brien & Gere, 2000).

On June 4, 2014, the NYSDEC changed the classification of the site from a Class 2 Site (meaning one presenting significant threat to the public health or environment – action required) to a Class 4 Site (meaning one where the site is properly closed – requires continued management) in the NYS State Superfund Site Remediation Program.

Current status

FOUBU submitted an application to the NYSDEC on January 15, 2015, as a "Volunteer", for the site to participate in the BCP. On March 31, 2015 the NYSDEC provided notice that the application was accepted, and on June 1, 2015 executed Brownfield Site Cleanup Agreement Index C734052-03-15 with FOUBU ("Applicant"). FOUBU subsequently provided notice to NYSDEC on June 15, 2015 of an intended Change of Use for the site, in accordance with the provisions of 6 NYCRR §375-1.11(d), as an initial action to allow demolition of the existing building in preparation for the site redevelopment.

5. Investigation and Cleanup Process

Application

The Applicant (FOUBU Environmental LLC) has applied for and been accepted into New York's Brownfield Cleanup Program as a Volunteer. This means that the Applicant was not responsible for the disposal or discharge of the contaminants or whose ownership or operation of the site took place after the discharge or disposal of contaminants. The Volunteer must fully characterize the nature and extent of contamination onsite, and must conduct a "qualitative exposure assessment," a process that characterizes the actual or potential exposures of people, fish and wildlife to contaminants on the site and to contamination that has migrated from the site.

The Applicant will submit a Remedial Investigation Work Plan (RIWP) to NYSDEC for approval. Once approved, the Applicant will conduct the RI in accordance with the approved RIWP with oversight provided by NYSDEC. Subsequent to completion of the Remedial Investigation, a Remedial Action Work Plan (RAWP) will be submitted to NYSDEC for approval, which will govern the cleanup activities at the site. The Brownfield Cleanup Agreement executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the site.

Investigation

A RI was performed between 1990 and 1993 when the Site was managed under the State Superfund Program, and the results were presented in the Remedial Investigation Report (Stearns & Wheler, 1993) dated December 1993. Following the investigation, a ROD (December 5, 1994) was prepared by the NYSDEC in which it identified 5 areas of concern and selected (1) excavation and off-site disposal for the contaminated soil, and (2) extraction and on-site treatment for the contaminated groundwater. A RD was prepared and Remedial Construction was implemented between 1995 and 1999 under NYSDEC Consent Order (Index #A7-0318-94-10) dated April 26, 1995.

The presence on site of the existing building may have restricted the activities during the RI and prior remedial actions, resulting in potential data gaps or residual contamination needing to be addressed under the BCP. As indicated above, the Applicant will conduct a RI under the BCP to further evaluate existing conditions where the previous RI or previously completed remedial actions may not have assessed conditions in the upper two feet of soil as required by a Track 4 cleanup. A Track 4 cleanup under the NYSDEC BCP allows restricted use with site-specific soil cleanup objectives, where the shallow exposed soils (to depth of 2 ft below ground surface) must meet the generic soil cleanup objectives (SCOs) based on the intended use of the property- restricted residential (single family houses not allowed) for this site (6 NYCRR Part 375).

The Applicant will conduct an investigation of the site officially called a “remedial investigation” (RI). This investigation will be performed with NYSDEC oversight. The Applicant must develop a remedial investigation workplan, which is subject to public comment.

The site investigation has several goals:

1) define the nature and extent of contamination in soil, surface water, groundwater and any other parts of the environment that may be affected;
2) identify the source(s) of the contamination;
3) assess the impact of the contamination on public health and the environment; and
4) provide information to support the development of a proposed remedy to address the contamination or the determination that cleanup is not necessary.

The Applicant submits a draft “Remedial Investigation Work Plan” to NYSDEC for review and approval. NYSDEC makes the draft plan available to the public review during a 30-day public comment period.

When the investigation is complete, the Applicant will prepare and submit a report that summarizes the results and incorporates data as appropriate obtained from previous site investigations and the on-going groundwater monitoring program. This report also will recommend whether cleanup action is needed to address site-related contamination. The investigation report is subject to review and approval by NYSDEC.

NYSDEC will use the information in the RI report to determine if the site poses a significant threat to public health or the environment. If the site is a “significant threat,” it must be cleaned up using a remedy selected by NYSDEC from an analysis of alternatives prepared by the Applicant and approved by NYSDEC. If the site does not pose a significant threat, the Applicant may select the remedy from the approved analysis of alternatives.

Interim Remedial Measures

An Interim Remedial Measure (IRM) is an action that can be undertaken at a site when a source of contamination or exposure pathway can be effectively addressed before the site investigation and analysis of alternatives are completed. If an IRM is likely to represent all or a significant part of the final remedy, NYSDEC will require a 30-day public comment period.

Remedy Selection

When the investigation of the site has been determined to be complete, the project likely would proceed in one of two directions:

1. The Applicant may recommend in its investigation report that no action is necessary at the site. In this case, NYSDEC would make the investigation report available for public comment for 45 days. NYSDEC then would complete its review, make any necessary revisions, and, if appropriate, approve the investigation report. NYSDEC would then issue a “Certificate of Completion” (described below) to the Applicant.

or

2. The Applicant may recommend in its investigation report that action needs to be taken to address site contamination. After NYSDEC approves the investigation report, the Applicant may then develop a cleanup plan, officially called a “Remedial Work Plan”. The Remedial Work Plan describes the Applicant’s proposed remedy following BCP Track 4 remedy for addressing contamination related to the site.

When the Applicant submits a proposed RAWP for approval, NYSDEC would announce the availability of the proposed plan for public review during a 45-day public comment period.

Cleanup Action

NYSDEC will consider public comments, and revise the draft cleanup plan if necessary, before approving the proposed Track 4 remedy. The New York State Department of Health (NYSDOH) must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy. The selected remedy is formalized in the site Decision Document.

The Applicant may then design and perform the cleanup action to address the site contamination. NYSDEC and NYSDOH oversee the activities. When the Applicant completes cleanup activities, it will prepare a final engineering report that certifies that cleanup requirements under the BCP Track 4 have been achieved or will be achieved within a specific time frame. NYSDEC will review the report to be certain that the cleanup is protective of public health and the environment for the intended use of the site.

Certificate of Completion

When NYSDEC is satisfied that Track 4 cleanup requirements have been achieved or will be achieved for the site, it will approve the final engineering report. NYSDEC then will issue a Certificate of Completion (COC) to the Applicant. The COC states that cleanup goals have been achieved, and relieves the Applicant from future liability for site-related contamination, subject to certain conditions. The Applicant would be eligible to redevelop the site after it receives a COC.

Site Management

The purpose of site management is to ensure the safe reuse of the property if contamination will remain in place. Site management is the last phase of the site cleanup program. This phase begins when the COC is issued. Site management incorporates any institutional and engineering controls required to ensure that the remedy implemented for the site remains protective of public health and the environment. All significant activities are detailed in a Site Management Plan.

An *institutional control* is a non-physical restriction on use of the site, such as a deed restriction that would prevent or restrict certain uses of the property. An institutional control may be used when the cleanup action leaves some contamination that makes the site suitable for some, but not all uses.

An *engineering control* is a physical barrier or method to manage contamination. Examples include: caps, covers, barriers, fences, and treatment of water supplies.

Site management also may include the operation and maintenance of a component of the remedy, such as a system that pumps and treats groundwater. Site management continues until NYSDEC determines that it is no longer needed.

Appendix A -
Project Contacts and Locations of Reports and Information

Project Contacts

For information about the site's investigation and cleanup program, the public may contact any of the following project staff:

New York State Department of Environmental Conservation (NYSDEC):

Mr. Michael Belveg
Project Manager
NYSDEC Region 7
Division of Environmental Remediation
615 Erie Boulevard West
Syracuse, NY 13204
315.426.7446
michael.belveg@dec.ny.gov

Ms. Stephanie Webb
Citizen Participation Specialist
NYSDEC Region 7
615 Erie Boulevard West
Syracuse, NY 13204
315.426.7441
stephanie.webb@dec.ny.gov

New York State Department of Health (NYSDOH):

Mr. Eamonn O'Neil
Project Manager
Corning Tower
Empire State Plaza
Albany, NY 12237
(518) 402-7860
eamonn.oneil@health.ny.gov

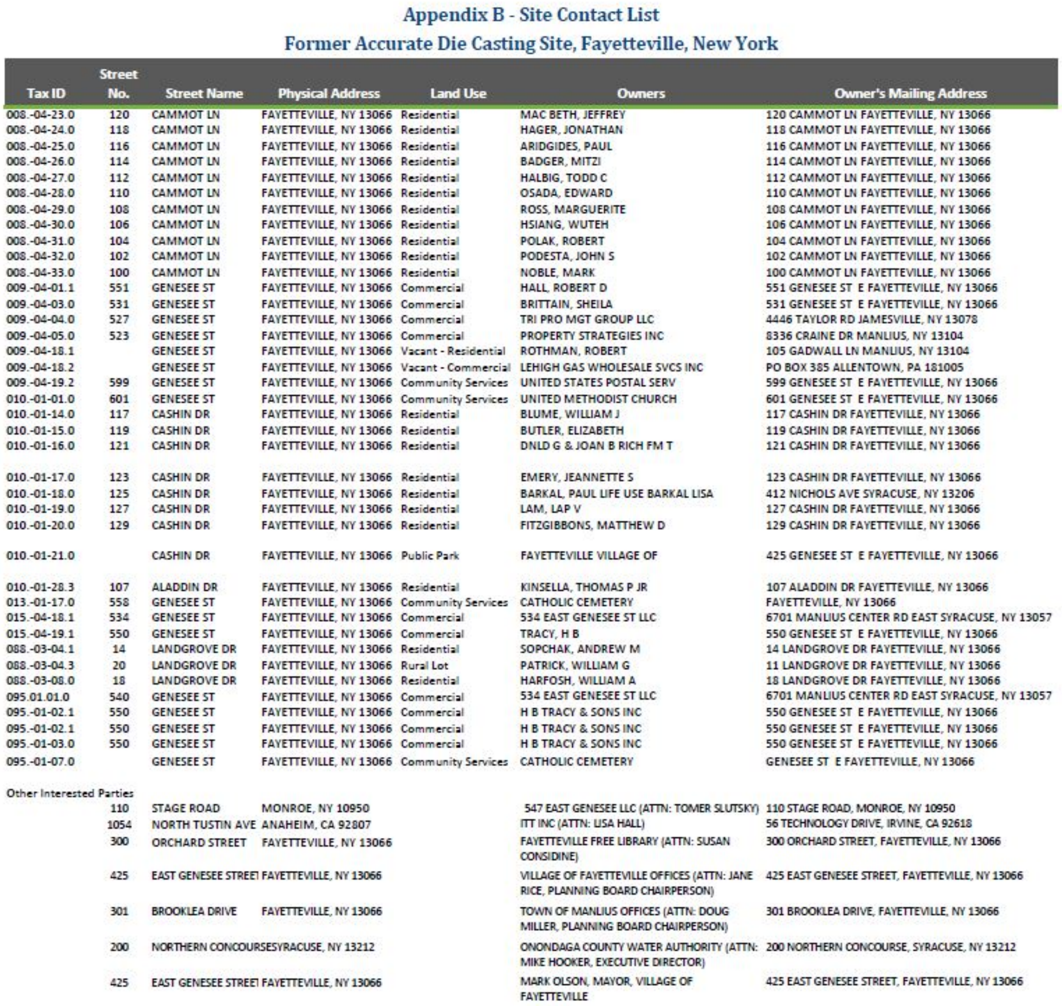
Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

Fayetteville Free Library
300 Orchard Street
Fayetteville, New York 13066
Attn: Ms. Susan Considine
Phone: (315) 637-6374
Hours: 9:00 AM to 9:00 PM M-Th
10:00 AM to 5:00 PM Fri

NYSDEC Region 7
Division of Environmental Remediation
615 Erie Boulevard West
Syracuse, NY 13204
Attn: Mr. Michael Belveg
Phone: (315) 426-7446
(call for appointment)

Appendix B - Site Contact List



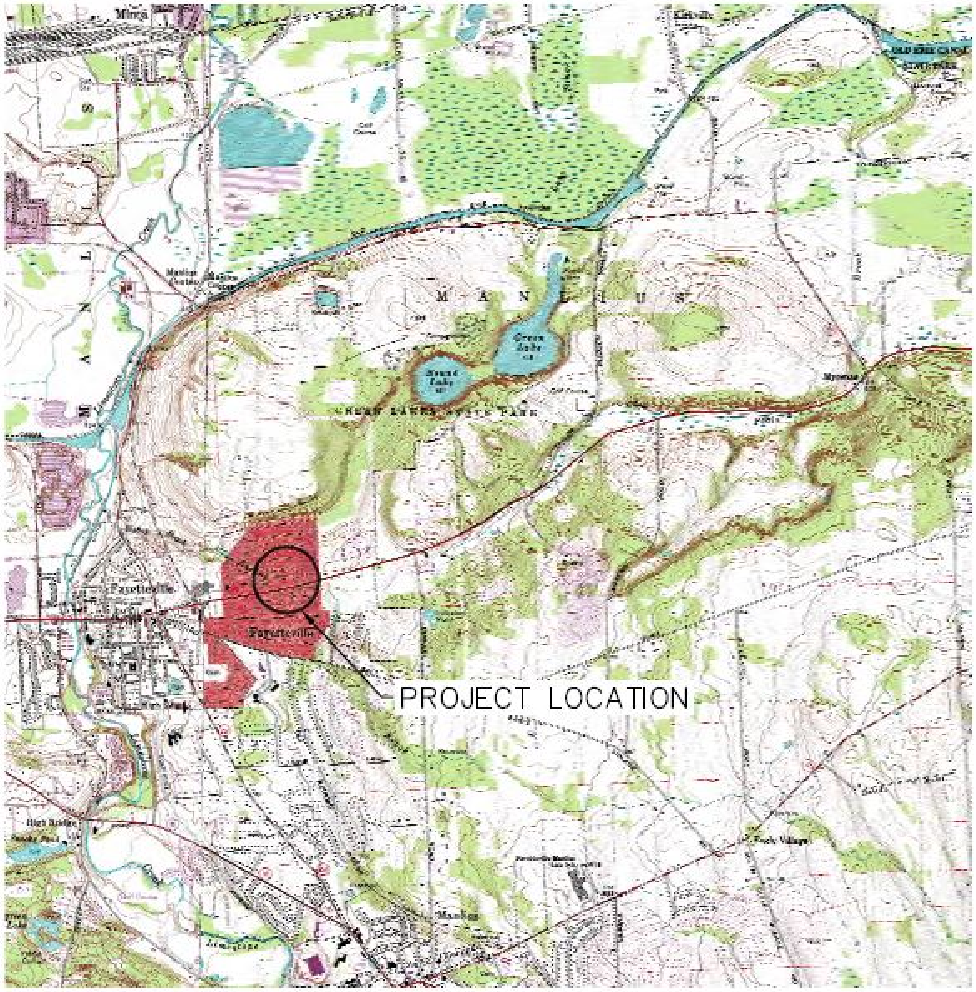
Appendix B - Site Contact List

Former Accurate Die Casting Site, Fayetteville, New York

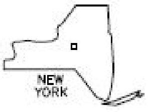
Tax ID	Street No.	Street Name	Physical Address	Land Use	Owners	Owner's Mailing Address
008.-04-23.0	120	CAMMOT LN	FAYETTEVILLE, NY 13066	Residential	MAC BETH, JEFFREY	120 CAMMOT LN FAYETTEVILLE, NY 13066
008.-04-24.0	118	CAMMOT LN	FAYETTEVILLE, NY 13066	Residential	HAGER, JONATHAN	118 CAMMOT LN FAYETTEVILLE, NY 13066
008.-04-25.0	116	CAMMOT LN	FAYETTEVILLE, NY 13066	Residential	ARIDGIDES, PAUL	116 CAMMOT LN FAYETTEVILLE, NY 13066
008.-04-26.0	114	CAMMOT LN	FAYETTEVILLE, NY 13066	Residential	BADGER, MITZI	114 CAMMOT LN FAYETTEVILLE, NY 13066
008.-04-27.0	112	CAMMOT LN	FAYETTEVILLE, NY 13066	Residential	HALBIG, TODD C	112 CAMMOT LN FAYETTEVILLE, NY 13066
008.-04-28.0	110	CAMMOT LN	FAYETTEVILLE, NY 13066	Residential	OSADA, EDWARD	110 CAMMOT LN FAYETTEVILLE, NY 13066
008.-04-29.0	108	CAMMOT LN	FAYETTEVILLE, NY 13066	Residential	ROSS, MARGUERITE	108 CAMMOT LN FAYETTEVILLE, NY 13066
008.-04-30.0	106	CAMMOT LN	FAYETTEVILLE, NY 13066	Residential	HSIANG, WUTEH	106 CAMMOT LN FAYETTEVILLE, NY 13066
008.-04-31.0	104	CAMMOT LN	FAYETTEVILLE, NY 13066	Residential	POLAK, ROBERT	104 CAMMOT LN FAYETTEVILLE, NY 13066
008.-04-32.0	102	CAMMOT LN	FAYETTEVILLE, NY 13066	Residential	PODESTA, JOHN S	102 CAMMOT LN FAYETTEVILLE, NY 13066
008.-04-33.0	100	CAMMOT LN	FAYETTEVILLE, NY 13066	Residential	NOBLE, MARK	100 CAMMOT LN FAYETTEVILLE, NY 13066
009.-04-01.1	551	GENESEE ST	FAYETTEVILLE, NY 13066	Commercial	HALL, ROBERT D	551 GENESEE ST E FAYETTEVILLE, NY 13066
009.-04-03.0	531	GENESEE ST	FAYETTEVILLE, NY 13066	Commercial	BRITTAIN, SHEILA	531 GENESEE ST E FAYETTEVILLE, NY 13066
009.-04-04.0	527	GENESEE ST	FAYETTEVILLE, NY 13066	Commercial	TRI PRO MGT GROUP LLC	4446 TAYLOR RD JAMESVILLE, NY 13078
009.-04-05.0	523	GENESEE ST	FAYETTEVILLE, NY 13066	Commercial	PROPERTY STRATEGIES INC	8336 CRAINE DR MANLIUS, NY 13104
009.-04-18.1		GENESEE ST	FAYETTEVILLE, NY 13066	Vacant - Residential	ROTHMAN, ROBERT	105 GADWALL LN MANLIUS, NY 13104
009.-04-18.2		GENESEE ST	FAYETTEVILLE, NY 13066	Vacant - Commercial	LEHIGH GAS WHOLESALE SVCS INC	PO BOX 385 ALLENTOWN, PA 181005
009.-04-19.2	599	GENESEE ST	FAYETTEVILLE, NY 13066	Community Services	UNITED STATES POSTAL SERV	599 GENESEE ST E FAYETTEVILLE, NY 13066
010.-01-01.0	601	GENESEE ST	FAYETTEVILLE, NY 13066	Community Services	UNITED METHODIST CHURCH	601 GENESEE ST E FAYETTEVILLE, NY 13066
010.-01-14.0	117	CASHIN DR	FAYETTEVILLE, NY 13066	Residential	BLUME, WILLIAM J	117 CASHIN DR FAYETTEVILLE, NY 13066
010.-01-15.0	119	CASHIN DR	FAYETTEVILLE, NY 13066	Residential	BUTLER, ELIZABETH	119 CASHIN DR FAYETTEVILLE, NY 13066
010.-01-16.0	121	CASHIN DR	FAYETTEVILLE, NY 13066	Residential	DNLD G & JOAN B RICH FM T	121 CASHIN DR FAYETTEVILLE, NY 13066
010.-01-17.0	123	CASHIN DR	FAYETTEVILLE, NY 13066	Residential	EMERY, JEANNETTE S	123 CASHIN DR FAYETTEVILLE, NY 13066
010.-01-18.0	125	CASHIN DR	FAYETTEVILLE, NY 13066	Residential	BARKAL, PAUL LIFE USE BARKAL LISA	412 NICHOLS AVE SYRACUSE, NY 13206
010.-01-19.0	127	CASHIN DR	FAYETTEVILLE, NY 13066	Residential	LAM, LAP V	127 CASHIN DR FAYETTEVILLE, NY 13066
010.-01-20.0	129	CASHIN DR	FAYETTEVILLE, NY 13066	Residential	FITZGIBBONS, MATTHEW D	129 CASHIN DR FAYETTEVILLE, NY 13066
010.-01-21.0		CASHIN DR	FAYETTEVILLE, NY 13066	Public Park	FAYETTEVILLE VILLAGE OF	425 GENESEE ST E FAYETTEVILLE, NY 13066
010.-01-28.3	107	ALADDIN DR	FAYETTEVILLE, NY 13066	Residential	KINSELLA, THOMAS P JR	107 ALADDIN DR FAYETTEVILLE, NY 13066
013.-01-17.0	558	GENESEE ST	FAYETTEVILLE, NY 13066	Community Services	CATHOLIC CEMETERY	FAYETTEVILLE, NY 13066
015.-04-18.1	534	GENESEE ST	FAYETTEVILLE, NY 13066	Commercial	534 EAST GENESEE ST LLC	6701 MANLIUS CENTER RD EAST SYRACUSE, NY 13057
015.-04-19.1	550	GENESEE ST	FAYETTEVILLE, NY 13066	Commercial	TRACY, H B	550 GENESEE ST E FAYETTEVILLE, NY 13066
088.-03-04.1	14	LANDGROVE DR	FAYETTEVILLE, NY 13066	Residential	SOPCHAK, ANDREW M	14 LANDGROVE DR FAYETTEVILLE, NY 13066
088.-03-04.3	20	LANDGROVE DR	FAYETTEVILLE, NY 13066	Rural Lot	PATRICK, WILLIAM G	11 LANDGROVE DR FAYETTEVILLE, NY 13066
088.-03-08.0	18	LANDGROVE DR	FAYETTEVILLE, NY 13066	Residential	HARFOSH, WILLIAM A	18 LANDGROVE DR FAYETTEVILLE, NY 13066
095.01.01.0	540	GENESEE ST	FAYETTEVILLE, NY 13066	Commercial	534 EAST GENESEE ST LLC	6701 MANLIUS CENTER RD EAST SYRACUSE, NY 13057
095.-01-02.1	550	GENESEE ST	FAYETTEVILLE, NY 13066	Commercial	H B TRACY & SONS INC	550 GENESEE ST E FAYETTEVILLE, NY 13066
095.-01-02.1	550	GENESEE ST	FAYETTEVILLE, NY 13066	Commercial	H B TRACY & SONS INC	550 GENESEE ST E FAYETTEVILLE, NY 13066
095.-01-03.0	550	GENESEE ST	FAYETTEVILLE, NY 13066	Commercial	H B TRACY & SONS INC	550 GENESEE ST E FAYETTEVILLE, NY 13066
095.-01-07.0		GENESEE ST	FAYETTEVILLE, NY 13066	Community Services	CATHOLIC CEMETERY	GENESEE ST E FAYETTEVILLE, NY 13066
Other Interested Parties						
	110	STAGE ROAD	MONROE, NY 10950		547 EAST GENESEE LLC (ATTN: TOMER SLUTSKY)	110 STAGE ROAD, MONROE, NY 10950
	1054	NORTH TUSTIN AVE	ANAHEIM, CA 92807		ITT INC (ATTN: LISA HALL)	56 TECHNOLOGY DRIVE, IRVINE, CA 92618
	300	ORCHARD STREET	FAYETTEVILLE, NY 13066		FAYETTEVILLE FREE LIBRARY (ATTN: SUSAN CONSIDINE)	300 ORCHARD STREET, FAYETTEVILLE, NY 13066
	425	EAST GENESEE STREET	FAYETTEVILLE, NY 13066		VILLAGE OF FAYETTEVILLE OFFICES (ATTN: JANE RICE, PLANNING BOARD CHAIRPERSON)	425 EAST GENESEE STREET, FAYETTEVILLE, NY 13066
	301	BROOKLEA DRIVE	FAYETTEVILLE, NY 13066		TOWN OF MANLIUS OFFICES (ATTN: DOUG MILLER, PLANNING BOARD CHAIRPERSON)	301 BROOKLEA DRIVE, FAYETTEVILLE, NY 13066
	200	NORTHERN CONCOURSE	SYRACUSE, NY 13212		ONONDAGA COUNTY WATER AUTHORITY (ATTN: MIKE HOOKER, EXECUTIVE DIRECTOR)	200 NORTHERN CONCOURSE, SYRACUSE, NY 13212
	425	EAST GENESEE STREET	FAYETTEVILLE, NY 13066		MARK OLSON, MAYOR, VILLAGE OF FAYETTEVILLE	425 EAST GENESEE STREET, FAYETTEVILLE, NY 13066

Appendix C - Site Location Map

FIGURE 1



ADAPTED FROM: MANLIUS QUADRANGLE, STATE OF NY U.S.G.S. 7.5 MIN. QUAD



QUADRANGLE LOCATION

FORMER ACCURATE DIE CASTING FACILITY
FAYETTEVILLE, NEW YORK

FILE NO. 2488.651
FEBRUARY 2015

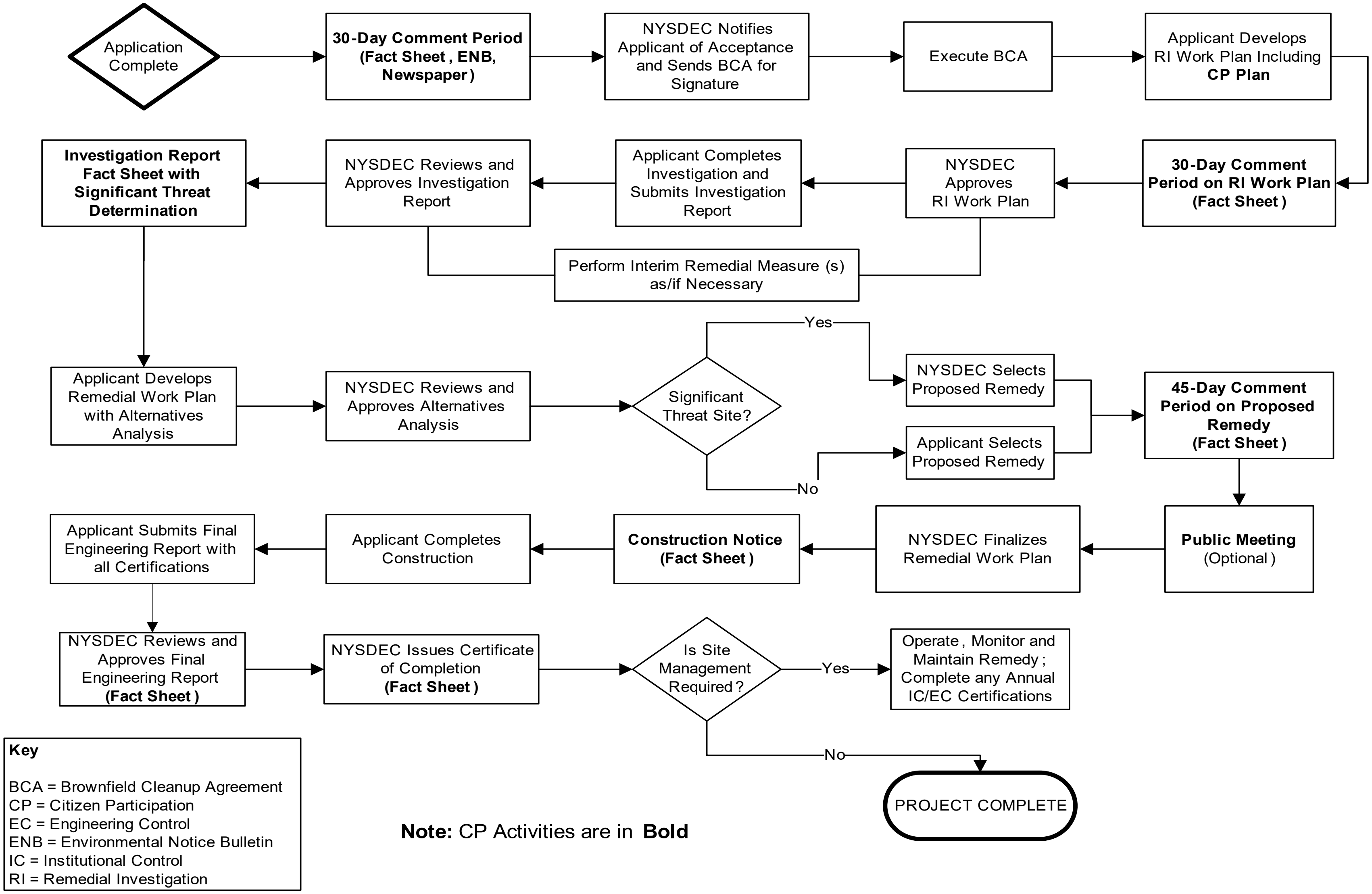
PROJECT LOCATION MAP

NOT TO SCALE

O'BRIEN & GERE

G:\DIV71\ACCURATE DIE\FAYETTEVILLE NY-FIG-1.DWG

Appendix D– Brownfield Cleanup Program Process



Key

BCA = Brownfield Cleanup Agreement
CP = Citizen Participation
EC = Engineering Control
ENB = Environmental Notice Bulletin
IC = Institutional Control
RI = Remedial Investigation

Note: CP Activities are in **Bold**