

1.0 BACKGROUND AND PROJECT OBJECTIVES

The Metco site is located at 325 Duffy Avenue in suburban Hicksville (**Figure 1**). The site is about 6.8 acres in size and is developed with one central building that was initially constructed in 1959. The Site is bound to the west by Henrietta Street, south and east by additional commercial lots, and north by Duffy Avenue. According to the USGS *Hicksville, New York 7.5-Minute* topographic map (1979), the Site lies at approximately 120 feet above mean sea level (amsl).

SITE FEATURES

The site is generally flat with some grass-cover landscape areas and a stormwater recharge basin. The majority of the site surface is covered with either the building or associated parking lots. An area on the southeast corner is used as a stormwater recharge basin. This area is vegetated and lower in elevation than the surrounding property.

CURRENT ZONING AND SURROUNDING LAND USE

The site is located on the south side of a larger commercial and industrial area of Hicksville. Businesses are located adjacent to the site in all directions. Residential areas are located to the east and south of the facility. The closest residence is located 150 ft southeast of the property.

OPERATIONAL HISTORY

Operational history was obtained from the previous reports prepared by CDM (CDM, 2008; CDM, 2010). CDM obtained information during visits to the Township of Oyster Bay Planning and Development Department in 2008. The subject property, Section 11, Block H, Lot 112, was changed from zoning type "Residential E" to "Industrial H," as requested by the original property owner, Elizabeth G. Trauth, and was adopted by Town Resolution on March 16, 1954.

In 1958, the property was owned and occupied by T.O.D Manufacturing Corporation. This business occupied 325 and 400 Duffy Avenue to the west. Original uses were documented as office space and "light manufacturing in the metal working field," with facility operations pertaining to fishing tackle hardware, storage, defense, and marine hardware. Trichlorethene (TCE) was stored in 55-gallon drums (for use as a degreasing agent); metal was stored in strip, bar, tube and wire forms; and packing materials were stored at the facility. Equipment used for the operations listed above included an automatic screw machine department, machine shop, punch press, tube bending, wire forming, spot welding, soldering and tumbling equipment, a polishing room, a tool room, an inspection department, and miscellaneous equipment, such as external grinders.

Various modifications and additions were made to the building from 1958 to 1979 including changes to the boiler room, mezzanine floor, partitions, toilets, sanitary structures, and the addition of a paved parking area. From 1979 to approximately 1995, Metco owned the Site. Metco machine shop operation and testing of new equipment by flame spraying (a process in which metals are melted and sprayed on a surface to form a coating) at the Site ceased in April 1999.

From 1987 through August 1997, the Site was listed as being owned by Sulzer Metco- Metco. During this time, the Site was registered as a Toxic or Hazardous Material Storage Facility for Bulk and Container Storage, per County Article XI, and also as a solid waste management facility. Operations at the Site under Sulzer Metco- Metco involved working on machine parts that were made of metals, such as brass, aluminum, copper and steel; equipment testing via spraying powders of aluminum, brass, copper, zinc or steel; and use of tetrachloroethene (PCE) and trichlorotrifluoroethane to clean parts of chilled degreasers. During this time, waste from the Metco

facility on Miller Place in Hicksville was brought to the Site, where it was staged for disposal by a licensed hauler. Vapor degreaser wastes were hauled away annually.

Chemicals stored in two separate indoor areas at the south part of the building included the following:

- 1,1,1-trichloroethane (1,1,1-TCA)
- cleaning solvent (trade name: Varsol) and paint solvent
- cutting oil
- waste TCE, waste cleaning solvent and waste cutting oil
- metal spray sludge

Manifests discussed in greater detail in the PRS, which was submitted under separate cover, list the following types of wastes generated at the Site from 1980 to 1985: ignitable (D001), corrosive (D002), lead-containing (D008), selenium-containing (D010), silver-containing (D011), halogenated solvents (F001), and non-halogenated solvents (F005).

SPDES discharge permits issued by the NYSDEC indicate three (3) onsite outfalls:

- Outfall 001: located on the south side of the building and discharging into the stormwater retention basin delivered effluent from process, noncontact cooling and storm drain flow as well as effluent containing oil and grease, iron, and copper;
- Outfall 002: located toward north of the building and discharged sanitary waste into the municipal sewer;
- Outfall 003: located east of outfall 002, also discharged sanitary waste into the municipal sewer.

The building historically pumped water for industrial use from a private well located on the south side of the building. Water for potable domestic use (i.e. washrooms, etc.) is drawn from the municipal water system. The DOH sampled the private well and sewer discharge points between 1978 and 1984 at the subject property.

Solvents, 1,1,1-TCA, PCE, and TCE were identified in the groundwater sample collected from the on-site private well. Concentrations are reported to have decreased relative to when T.O.D. operated the facility (TCE was used by T.O.D. in their facility operations). However, concentrations of PCE in the wastewater discharge were reported to have increased in 1984. The increase in PCE concentrations appears to have been associated with a vapor degreaser leak. The degreaser was decommissioned and replaced, after which point PCE concentrations decreased. According to a DOH letter, toluene and 1,1,1-TCA were used in facility operations at that time. A concern regarding groundwater at the site was raised prior to the letter, and it was acknowledged that upgradient sources might be responsible for the TCE and PCE contamination in Site groundwater. The DOH recommended that SPDES permits not be renewed for the Metco facilities at Duffy Ave and Miller place, "since both would be hooked up to the sewer, only non-contact cooling water would remain as a discharge and both sites would be regularly inspected as part of the Article XI program." However, the DOH recommended that the 1,1,1-TCA contamination be further investigated.

It is unknown as to whether the private well is still in use at the Site, and if so for what purpose(s). Additionally, the exact location and status of the well (i.e. existing or decommissioned) are unknown. (CDM, 2008).

SITE GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

Based on information provided the site is underlain by glacial outwash and moraine deposits consisting of mixtures of clay, silt, sand and gravel. Soil borings were advanced to approximately 60 ft below grade. Materials encountered were predominantly medium sand with occasional areas containing small amounts of fine gravel.

Groundwater occurs at approximately 51 feet below grade. Based on the previous investigation groundwater flow is toward the south-southeast but may be influenced by pumping of groundwater supply wells that reportedly are located within 1 mile south of the site.

PREVIOUS INVESTIGATIONS

A public records search (PRS) was completed by CDM in 2008 (CDM, 2008). The purpose of the PRS was to evaluate the site history and identify potential areas of concern that may have resulted in impacts to the ground water.

A Site Characterization investigation was subsequently conducted by CDM between October 2008 and February 2009 which was summarized in a report dated August 2010 (CDM, 2010).

ENVIRONMENTAL CONDITIONS

The Site Characterization investigation identified the presence of elevated concentration of metals in the soil samples collected at the site. The metals with elevated concentrations in surface soil were primarily chromium, iron, and zinc. Highest concentrations in surface soil samples were observed within the stormwater basin near the Outfall 1 discharge and zinc was highest in a sample collected in the vicinity of a former drywell southwest portion of the site (SS-5). Elevated metals in subsurface soil samples were chromium and iron. The elevated concentrations were observed in samples from both, the north side of the site and within the stormwater basin.

PAHs were detected in soil samples at concentrations that were just slightly greater than criteria. These exceedances were noted in samples collected from the northern and western edges of the site.

Groundwater contamination in the southern portion of the Site consists primarily of metals: sodium, nickel, selenium, and chromium. Sodium was detected at concentrations above applicable SCGs in all Site monitoring wells. Nickel and chromium were detected at concentrations exceeding the applicable SCGs in the southeast monitoring well, MW-2. Selenium was detected above the applicable SCGs in southwest monitoring well, MW-3. Contaminants identified in a groundwater grab sample from the stormwater retention basin at concentrations exceeding the applicable SCGs include cadmium, chromium, copper, lead, manganese, nickel, and thallium.

Groundwater at MW-3, located on the southwest corner of the site contained 1,1,1-TCA at concentrations just above the applicable SCGs

Soil vapor samples were collected at two depths at each of six locations on-site. The shallow sample was collected from a depth of approximately 8 ft and the deep sample was collected from just above the water table located at 51 ft below grade. The sample results identified the presence of VOCs in the soil vapor primarily on the south side of the Site. Concentrations of TCE and PCE were highest in shallow samples SV-2S and SV-3S while 1,1,1- TCA, trichlorotrifluoroethane, and 1,1,2-trichlorotrifluoroethane were highest in the deep sample collected from SV-4D located on the southwest corner of the site. These data suggest that there is likely to be a potential for vapor intrusion into the building at the Site. Each of the identified compounds, with the exception of acetone and methylene chloride, is known to have been used historically at the Site.

PROJECT OBJECTIVES

The focus of the Remedial Investigation will be to collect data for the purpose of evaluating the nature and extent of impacts to soil and groundwater so that potential exposure pathways can be evaluated. The results will then be used to develop a feasibility study to identify remedial alternatives, if warranted.

As identified by NYSDEC, the RI will focus on the further evaluating the presence and extent of metals and VOCs in the soil within the stormwater basin, groundwater on and off the site, as well as evaluation of the potential for vapor intrusion of VOCs into the building at the site and off-site migration of VOCs via soil vapor.

2.0 PRELIMINARY ACTIVITIES (TASK 1)

Preliminary activities include review of site-related historic information, preparation of this scope of work, schedule, solicitation of bids from subcontractors, and completion of NYSDEC contract-related forms.

Parsons will be involved with quality control/quality assurance reviews, safety reviews, project meetings as warranted, and reviews of draft deliverables related to this task.

3.0 RI AND REPORT (TASK 2)

SURFACE SOIL

Surface soil samples will be collected from up to fifteen locations, at direction of NYSDEC, to augment the initial samples which focused on metals SVOCs, and VOCs. The samples will be collected from a depth of 0 to 6 inches below the vegetative cover and possibly up to 2 ft below grade, advanced using hand augers. The collected samples will be analyzed for one or more of TAL metals, TCL SVOCs, TCL VOCs, pesticides, herbicides, and PCBs.

Assumptions:

- Samples will be collected from areas with exposed soil.
- Sampling can be completed in 2 days with associated per diem and accommodations.

SUBSURFACE SOIL

A total of six soil borings will be completed for the purpose of delineating the extent of metals and other site-related constituents (**Figure 2**). Soil borings will be completed using direct push methods to a depth of 15 ft. Based on information provided in the SC Report, access to the stormwater pond will require a ramp or regrading due to its depth. In addition, the stormwater pond is overgrown with vegetation and some tree cutting will need to be done to gain access to drilling locations.

Soil samples will be collected continuously to the base of the boring. Soil samples will be collected from 5 depths within each boring for analysis as follows: 3, 6, 9, 12 and 15 ft below grade. Each sample will be analyzed for TAL metals and VOCs and 7 samples will be analyzed for pesticides, herbicides, PCBs and SVOCs.

Assumptions:

- NYSDEC will be responsible for the overall property access agreement with the property owner(s); OBG will schedule and arrange daily access to the site for drilling and sampling.
- Drilling locations will be on-site.
- Drilling locations can be accessed with a track mounted geoprobe unit and no regrading will be required.
- Clearing in the recharge basin will be completed in advance for the utility locator and driller.
- Plastic liners will be used in the macrocore™.
- Decontamination of the macrocore™ will be with soap and water at the drill location.
- Work will be conducted in modified Level D personal protection without Tyvek®.
- Drilling can be completed in 1 day with associated per diem and accommodation.

GROUNDWATER

The investigation will include installation of multilevel wells constructed of ten individual screened casings installed within a single borehole. The borehole will be completed using hollow stem auger or sonic drilling techniques.

Up to Five (5) multilevel monitoring wells (piezometer nests) will be installed to up to 200 feet below grade. Boring to accomplish the well installation will be completed using hollow stem auger or Sonic drilling methods to 200 ft or refusal. Each multilevel well set will be constructed using a 1.5 inch diameter center well surrounded by up to nine 0.5 inch diameter piezometers. The screened intervals will be spaced approximately 15 ft apart or as directed in the field. The wells will be constructed using 2 ft lengths of 10-slot, screens flush-threaded to appropriate lengths of PVC riser casing necessary to bring the top of the well to grade. The exact number of piezometers will be dependent on the boring depth accomplished.

Assuming that the boring can be completed to 200 ft, the typical screen intervals are as follows:

- 0.5" diameter (ft bgs): 54-56, 70-72, 86-88, 102-104, 118-120, 134-136, 150-152, 166-168, 182-184.
- 1.5" diameter (ft bgs): 198-200

The well heads will be completed with bolt-down, water-tight traffic rated flush-mount road boxes. The road boxes will be set in a minimum 2-foot diameter concrete well pad, flush to the existing grade.

Soil cuttings will be contained in 55-gallon drums and staged in an area of the site specified by the owner.

The wells will be developed by removal of up to 5 well volumes of water. Wells will equilibrate for a minimum of 2 weeks prior to sampling. Low flow sampling techniques will be utilized to collect groundwater samples from each interval or as directed.

Samples will be collected using an inertial pump (Waterra). Field measurements consisting of temperature, pH, ORP, conductivity, dissolved oxygen and turbidity will be collected during purging and sampling.

Assumptions:

- NYSDEC will be responsible for the overall property access agreement with the property owner(s); OGB will schedule and arrange daily access to the site for drilling and sampling.
- Monitoring well/piezometer nest installation will be performed in 2 mobilizations. Up to 4 nests will be installed (**Figure 2**) and sampled. If groundwater sample results indicate that an additional downgradient nest is warranted, one nest (optional nest) will be installed at a downgradient location.
- No bedrock wells will be installed.
- Each well will be advanced using hollow stem auger or sonic drilling methods
- No soil sampling will be completed during well installation.
- Well installation is anticipated to take approximately 1 day per well nest with associated per diem and accommodations.
- Hand clearing to 5-ft below ground surface for each location.
- Work will be conducted in modified Level D personal protection without Tyvek®.
- Community air monitoring will be completed with one upwind and one downwind monitoring point.
- Monitoring well development will be completed immediately after well installation activities are completed.
- Development of 4 nests is assumed to take up to 6 days with associated travel, per diem and accommodations. Development of the optional nest is assumed to take up to 2 days.
- Sampling groundwater at 4 nests is assumed to take up to 11 days with associated travel, per diem and accommodations. Sampling of the optional nest is assumed to take up to 2 days.
- Quality assurance/quality control (QA/QC) samples will be collected at a frequency of 1 per 20 for field duplicate, matrix spike, and matrix spike duplicate. QA/QC samples are not included above.
- New tubing will be used for development and sampling as there is no way to save tubing in the well and plug the well to prevent water from entering the well.

SOIL VAPOR

Soil vapor samples will be collected at four locations. On-site or off-site depending on access. The soil vapor samples will be collected from a depth of 8 ft below grade to assess potential vapors at the depth of a standard basement.

Four (4) permanent soil vapor (SV) points will be installed to approximately 8 feet below grade. The SV points will be installed within a borehole to be advanced using direct push methods (Geoprobe® or equivalent). The SV points will be constructed with a 6-inch long, stainless steel, braided screen implant probe attached to ¼-inch outside diameter Teflon tubing. The annular space around the probe will be filled with 60-100 mesh glass beads to approximately 2 feet above the implant probe. A granular bentonite seal will be placed above the glass beads to surface grade to prevent ambient air infiltration. The well heads will be completed with 4-inch diameter, bolt-down, water-tight traffic rated flush-mount road boxes. The road boxes will be set in a 1-foot diameter concrete pad, flush to the existing grade.

Assumptions

- NYSDEC will be responsible for the overall site access agreement with the property owner(s); OBG will schedule and arrange daily access to the site for drilling and sampling.
- NYSDEC will provide OBG with contact information for the property owner and tenant.
- OBG will coordinate schedule requirements with the property owner and tenant.
- OBG will coordinate with a utility marking service within two weeks prior to installation of the soil vapor points.
- Work will be conducted in modified Level D personal protection without Tyvek®.
- Soil vapor points will be installed by OBG.
- The soil vapor sampling will take place concurrently with the vapor intrusion sampling.
- After installation of the soil vapor points, OBG will conduct tracer gas testing to verify the integrity of the seal on the tubing.
- Soil vapor samples will be collected into batch-certified 6 liter SUMMA® canisters.
- Soil vapor samples will have a 2-hour integrated sample period at a flow rate not to exceed 200 ml/min in accordance with *New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (NYSDOH, 2006).
- One field duplicate and one ambient sample will be collected as part of the soil vapor sampling
- Samples will be analyzed for the standard list of VOCs by USEPA Method TO-15.

VAPOR INTRUSION INVESTIGATION

Four sub-slab and four co-located indoor air samples will be collected from the on-site building to assess the potential for vapor intrusion. An ambient air sample will also be collected at the same time as the other samples to assess potential influence on indoor air concentrations. In addition, an indoor air blank will be collected for QA/QC purposes.

Sampling will be performed consistent with *New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (NYSDOH, 2006). Sub-slab soil vapor, indoor air, and ambient air samples will be collected in 6-liter SUMMA® canisters. The samples will have 8-hour integrated sample periods. Samples will be submitted for analysis of standard list VOCs by USEPA Method TO-15. OBG will summarize the results within two weeks of receipt of validated analytical results and provide them to NYSDEC and NYSDOH for review.

Assumptions

- OBG will prepare and distribute a letter notifying the owner of the site history and sampling dates and locations.
- NYSDEC will provide OBG with contact information for the building to be sampled.
- NYSDEC will prepare access agreements to be signed by owners prior to sampling activities, sampling agreements will be between NYSDEC and the owner and OBG will act as an agent of NYSDEC.
- OBG will provide NYSDEC with a building questionnaire to accompany the notification letter and access agreements.
- OBG will coordinate schedule requirements with the owners.
- An OBG representative will be readily available to answer site-related questions posed by the owners; NYSDEC will be available if necessary follow-up is needed.
- All sampling will be conducted on weekdays, no sampling will take place during weekends.
- The vapor intrusion sampling will be complete concurrently with the soil vapor sampling.
- OBG will complete a building survey and chemical inventory during sampling.
- OBG will provide two people to complete the sampling over a consecutive two day period, the sample team will be available for up to 11 hours on the first day and six hours on the second day, plus associated travel, per diem and accommodations.
- OBG will collect up to four sub-slab/indoor air sample pairs and one ambient air sample in 6L summa canisters.
- Sub-slab and soil vapor samples will be collected in batch-certified canisters and indoor/ambient air samples will be collected in individually-certified canisters;
- Helium tracer gas will be used on sub-slab sample points;
- Sub-slab, indoor air and ambient air samples will have an 8-hour integrated sample period;
- Samples will be analyzed for the standard list of TO-15 volatile organic compounds;
- OBG will collect and analyze one duplicate sample and one trip blank;
- OBG will summarize the results into a table for the property sampled within three weeks of receipt of validated test results;
- OBG will provide result letters to the NYSDEC; NYSDOH will provide results to property owners;
- The temporary sub-slab sample points will be installed into bare concrete (unfinished surface) that does not require re-finishing;
- Sub-slab sample holes will be filled with Geocel 3300 polyurethane caulk;
- It is assumed that the sampling will be conducted during the 2015-2016 heating season.

UTILITY CLEARANCE

Dig Safely New York (DSNY) will be contacted by the subcontractor prior to invasive work to locate utilities at the site prior to initiating the field program. It should be noted that DSNY will only coordinate location of utilities for those companies subscribing to the service. Furthermore, the utilities will only identify the locations of subsurface lines on public property and rights-of-way. Therefore, a private utility locator will be contracted to identify potential utilities in the areas where drilling will occur. In addition the utility locator will be requested to conduct a survey of the ware to the south and southwest of the on-site building for the purpose of locating the existing drywells and USTs that are reportedly present. The identified subsurface structures will be marked on the pavement for later surveying for the purpose of preparing a base map of the site.

Assumptions:

- A total of 2 days has been assumed for the utility locating company to identify utilities and on-site subsurface structures.

DECONTAMINATION

Decontamination will take place on-site. Assume that no water or power will be available for use. Water generated will need to be contained for off-site disposal. A temporary decontamination pad or water trough will be used for decontamination of augers and drill rods by use of steam cleaner. Decontamination (other than

augers and drill rods) will be completed using non-phosphate detergent (*e.g.* simple green®) bucket wash and potable water rinse.

SURVEY

Survey activities will be performed in one event. The survey event will be performed after completion of the soil boring, monitoring well installation, surface soil sampling, and soil vapor point installation field activities.

Each new soil boring, overburden monitoring well, surface soil sample, and soil vapor point location will be surveyed by a New York State-licensed surveyor. Horizontal datum will be referenced to North American Datum (NAD) 83 (2007) New York State Plane Eastern Zone and vertical datum to North American Vertical Datum (NAVD) 88. Elevation will be surveyed to 0.01 foot accuracy. The surveyor will provide a survey drawing signed by a professional surveyor and a spreadsheet listing the sample locations, northings, eastings, and elevations (ground surface, curb box and well casing).

Assumptions

- The surveyor will locate monitoring wells, soil borings, surface soil samples and underground structures that are identified by the utility locator.
- The surveyor will complete the survey in a single mobilization unless the optional fifth well cluster is installed.

INVESTIGATION DERIVED WASTE

IDW, including PPE, drill cuttings, decontamination rinsates, well development water, and purge water will be placed in DOT-approved 55-gallon drums and staged on the Metco property, at a location approved by the property owner. IDW generated on-site will remain on-site. IDW generated at off-site locations, if any, will also be staged in the approved location on the Metco property.

We assume that IDW generated at this site is not classified as a listed waste and will be disposed of as non-hazardous waste unless analysis indicates that it is characteristic waste per TCLP as outlined in 40-CFR Part 261.

Furthermore, in accordance with Article 10 I.v.j. of Contract D007623, OBG Engineers, Inc. is duly authorized and appointed by NYSDEC, as agent-in-fact for the NYSDEC, to act in all circumstances in the name, place and stead of the NYSDEC with respect to the completion and execution of manifests required by law for the storage, transportation and/or disposal of non-hazardous and regulated hazardous, or toxic materials and wastes from the Metco site as each of those terms is defined by applicable statute and regulation. In accepting this appointment the agent agrees to abide by all applicable law, statutes and regulations governing the storage, transportation and/or disposal of non-hazardous and hazardous waste. Manifests will be signed accordingly with the following: "as an agent of NYSDEC".

For waste profiling and manifesting purposes, the generator will be identified as follows:

Generator: NYSDEC – Metco Site
325 Duffy Ave.
Hicksville, NY 11801

Should additional information generated during the investigation indicate that the IDW would be a regulated Hazardous Waste, a USEPA Generator ID Number will be required. Should this need arise, OBG will notify NYSDEC and NYSDEC will provide a Generator ID Number for use.

Assumptions

- Consistent with Section 3.3(e) of DER-10, it is assumed that water IDW transported from off-site locations is non-hazardous until analysis indicates otherwise, precluding the need for a 6 NYCRR Part 364 permit
- One soil sample will be collected from the drummed soil IDW for analysis of TCLP/VOCs, ignitability, corrosivity and reactivity

- One composite water sample will be collected from the drums of purged groundwater and decontamination water for analysis of ignitability, corrosivity and reactivity. The VOC results of the groundwater samples collected during the RI sampling event will be used to characterize the VOCs in the water IDW
- The property owner will provide approval to stage drummed IDW in an accessible location within the parking lot. The specific staging location will be approved by the property owner.
- The drums will be labeled as IDW, pending sampling results, and left on the Metco property until picked up for disposal.

LABORATORY ANALYSES, DATA VALIDATION AND DATA MANAGEMENT

Soil, soil vapor, air and groundwater samples will be collected and submitted for laboratory analysis as part of the RI. **Table 1** provides a summary of the environmental media to be sampled, analytical parameters and associated methods, number of samples and associated quality assurance/quality control (QA/QC) samples. NYSDEC will contract laboratory services directly.

Laboratory generated analytical data will be validated in accordance with the QAPP and a data usability summary report (DUSR) conforming to Appendix 2B of DER-10 will be prepared.

Analytical data will be submitted as an Electronic Data Deliverable (EDD) in the current NYSDEC EQUIS format.

Assumptions

- The laboratory will provide NYSDEC-ASP Category B data packages.
- Analytical data will be submitted as an Electronic Data Deliverable (EDD) in the NYSDEC format.
- The laboratory will provide the analytical data in NYSDEC Electronic Data Deliverables (EDD) populated with NYSDEC valid values.

QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

A Qualitative Human Health Exposure Assessment (QHHEA) will be completed for the Site. The QHHEA will be developed in accordance with *DER-10* (NYSDEC, 2010). The overall objective of the QHHEA is to evaluate the linkages between the contaminant source(s) and potentially exposed human receptor populations. To satisfy this objective, the QHHEA will document and describe the contaminant source(s) and constituents of potential concern (COPCs), the current and reasonably anticipated future land use at the Site and at potentially affected off-Site areas, potential exposure pathways, and potentially exposed receptor populations.

Based on environmental investigations conducted to date at the Site, potentially affected environmental media include soil, overburden groundwater, soil vapor, and indoor air in on-Site buildings. Based on previous investigations it is assumed that the COPCs are chlorinated volatile organic compounds (CVOCs) and metals. As such, potential human exposure routes include incidental ingestion of soil/groundwater, dermal contact with soil/groundwater, inhalation of soil dust/ambient vapors, ingestion of drinking water, and inhalation of indoor air in occupied buildings. Current and reasonably anticipated future land use will guide the identification of potentially exposed human receptor populations and the determination of complete or incomplete exposure pathways at the Site.

Assumptions

- The current industrial land use at the Site and industrial or commercial land use at adjacent parcels is likely to continue for the foreseeable future.
- No comparison to standards or quantitative evaluation will be conducted.
- Costs include labor necessary to complete a draft and final QHHEA (based on one consolidated round of client comments).

RI REPORT

Upon completion of the tasks detailed in this document, a Remedial Investigation Report (RIR) will be produced in accordance with DER-10. The RIR will summarize the data collected during the RI, as well as relevant data

prior to the RI for the Site. This RIR will include tables and figures summarizing the data collected. It is expected that the tables will include detected VOCs, SVOCs, metals, PCBs, pesticides and herbicides compared to regulatory criteria and figures will illustrate groundwater flow direction and extent of impacts in soil and groundwater. Soil data will be compared to 6 NYCRR Part 375 Unrestricted Use SCOs and one other SCO to be determined by NYSDEC for all compounds and to Protection of Groundwater for compounds detected in groundwater. Groundwater data will be compared to Class GA water quality standards and guidance values as presented in Technical and Operational Guidance Series 1.1.1 (NYSDEC, 1998). Conclusions based on this data will be provided. The RIR will also identify data gaps, if any, and recommendations for potential IRMs and/or supplemental RI field activities. The information to be documented will consist of:

- Field investigation results
- Hydrologic interpretation
- Chemical analyses results
- On- and off-Site nature and extent characterization
- Qualitative Human health exposure assessment (QHHEA)

Assumptions

- A Fish and Wildlife Resource Impact Analysis (FWRIA) will not be required.
- One round of consolidated comments will be received from NYSDEC for incorporation into a final RIR.
- Assumes 2 compact disk containing the RI documents will be sent to the document repository

4.0 FEASIBILITY STUDY AND REPORT (TASK 3)

The objective of this task is to develop, screen and evaluate remedial alternatives for the site in order to present sufficient information for decision makers to compare alternatives and select a remedy. The completion of the Feasibility Study (FS) will be in accordance with DER-10 (NYSDEC, 2010).

The FS will be developed in two steps:

- Development of alternatives
- Detailed analysis of alternatives

The FS will be documented in the FS Report. The following describes the steps to be completed for the FS.

Development of Alternatives

The first step in the FS is the development, in a manner consistent with the above referenced guidance, of a range of remedial alternatives that are reflective of appropriate waste management options and which are protective of public health and the environment. The development of alternatives encompasses the following steps:

- Development of remedial objectives
- Development of general response actions
- Identification of volumes or areas of media
- Identification and screening of remedial technologies and process options
- Evaluation of process options
- Assembly of remedial alternatives.

For the purpose of this proposal, it is assumed that a total of three alternatives will be developed. It is also assumed that the screening of technologies will be presented in tabular format alone. Consistent with DER-10 (NYSDEC, 2010), one alternative will be the no further action alternative, and one alternative will represent restoration of the property to pre-disposal conditions. Media of concern to be addressed in this FS are assumed to consist of metals in overburden groundwater, soil, and sediment.

Detailed Analysis of Alternatives

The objective of this step is to evaluate the remedial alternatives in detail to provide the basis for selection of a remedy. The detailed analysis will include a technical and statutory assessment and a cost analysis, as presented below. Prior to the detailed analysis of alternatives, a description of each alternative will be prepared.

The alternatives will be evaluated based on specific regulatory requirements, technical, cost, and institutional considerations, and community and support agency acceptance. The detailed analysis will consist of an assessment of each alternative against the evaluation criteria described below. The detailed analysis will also include a comparative evaluation identifying the relative performance of each alternative against the criteria. The following criteria will be used to evaluate the alternatives in detail:

- Overall protection of human health and the environment
- Compliance with Standards, Criteria and Guidance (SCGs)s
- Long-term effectiveness and permanence
- Reduction of toxicity, mobility or volume through treatment
- Short term effectiveness
- Implementability
- Cost
- Land Use
- Community acceptance.

One alternative will be identified which is preferred over the others. In accordance with DER-10, the preferred alternatives must be protective of human health and the environment and must address promulgated standards and criteria that are directly applicable or are relevant and appropriate. The recommended alternative will be documented in the FS Report.

Feasibility Study Report

The objective of this task is to document the FS. Consistent with DER-10, the following format will be used to complete the FS Report.

1. Introduction
2. Site Description and History
3. Summary of Remedial Investigation and Exposure Assessment
5. Development of Remedial Alternatives
6. Detailed Analysis of Remedial Alternatives
7. Recommended Alternative

This scope of work and the associated fee estimate assume incorporation of one round of consolidated comments on the FS Report from NYSDEC.

Assumptions

- One round of consolidated comments will be received from NYSDEC for incorporation into a final RIR.
- Assumes 2 compact disk containing the FS documents will be sent to the document repository.

5.0 SCHEDULE

Field activities will be initiated within 30-days following NYSDEC approval of this Scope of Work provided subcontractors are available and access to on-site and off-site properties has been arranged. The following provides an estimated schedule assuming no significant delays due to uncontrollable circumstances:

- Complete field work portion of the RI 12 weeks
- Complete lab analyses and data validation 8 weeks after completion of field work

- Complete draft RI Report 8 weeks after receipt of validated analytical data
- Complete draft FS Report 12 weeks after NYSDEC approval of RI Report

6.0 REFERENCES

CDM. 2008. Public Records Search, Metco Site, (Site No.: 130179), Hicksville, NY. September 2008.

CDM. 2010. Site Characterization Report, Metco Site, 325 Duffy Ave., (Site No.: 130179), Hicksville, NY. August 2010.

NYSDEC. 1994. *Division of Fish and Wildlife – Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (FWIA)*. October 1, 1994.

NYSDEC. 1998. *Division of Water Technical and Operational Guidance Series (TOGS) – Ambient Water Quality Standards and Guidance Values and Ground Water Effluent Guidelines (TOGS 1.1.1)*. June 1998.

NYSDEC. 2006. Part 375 Environmental Remediation Programs. *New York Code of Rules and Regulations (NYCRR)*. December 14, 2006.

NYSDEC. 2010. Technical Guidance for Site Investigation and Remediation (DER-10). *Division of Environmental Remediation*.

Parsons and O'Brien & Gere, 2011a. *Field Activities Plan*. May 2011.

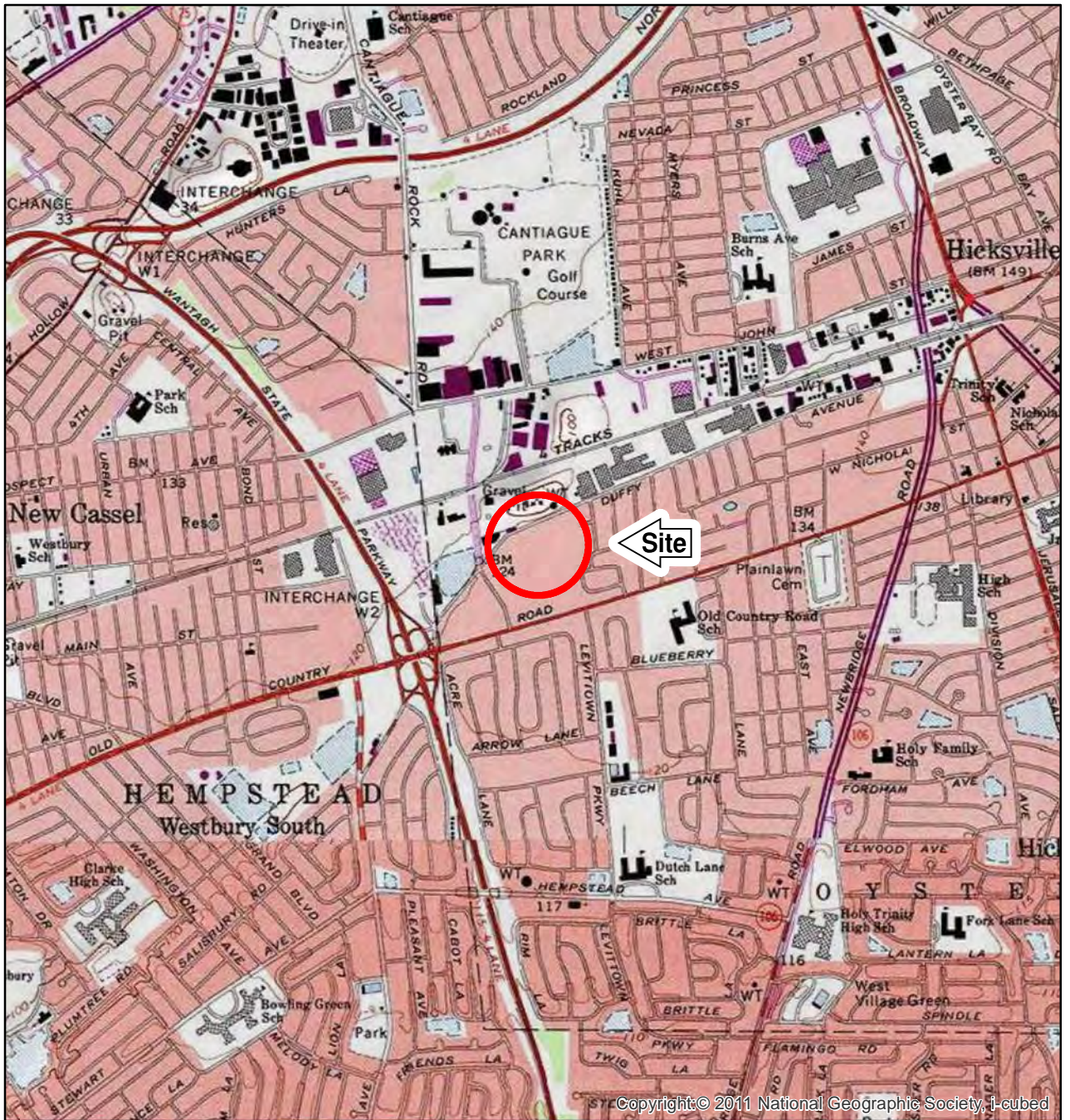
Parsons and O'Brien & Gere, 2011b. *Generic Quality Assurance Project Plan*. May 2011.

Parsons and O'Brien & Gere, 2011c. *Generic/Site-specific Health and Safety Plan*. May 2011.

Table 1
Sample Analysis and QA/QC Summary
Metco
Hicksville, NY

Task	Matrix	Analyses	Method	Number of Samples	Trip Blank	Field Blank	Field Duplicate	MS	MSD	Estimated Total Number of Samples	Deliverable	Validated (Y/N)
Surface Soil Samples	Soil	TCL Volatiles + 10	USEPA Method 8260C	15	1		1	1	1	19	Category B	Y
		TCL Semivolatiles + 20	USEPA Method 8270D	15			1	1	1	18		
		TCL Organochlorine Pesticides	USEPA Method 8081A	15			1	1	1	18		
		TCL Chlorinated Herbicides	USEPA Method 8151A	15			1	1	1	18		
		TCL PCBs	USEPA Method 8082	15			1	1	1	18		
		TAL Inorganics	USEPA Method 6010B	15			1	1	1	18		
		Cyanide	USEPA Method 9010B	15			1	1	1	18		
Mercury	USEPA Method 7471A	15			1	1	1	18				
Subsurface Soil	Soil	TCL Volatiles + 10	USEPA Method 8260C	30	3		2	2	2	39	Category B	Y
		TCL Semivolatiles + 20	USEPA Method 8270D	7			1	1	1	10		
		TCL Organochlorine Pesticides	USEPA Method 8081A	7			1	1	1	10		
		TCL Chlorinated Herbicides	USEPA Method 8151A	7			1	1	1	10		
		TCL PCBs	USEPA Method 8082	7			1	1	1	10		
		TAL Inorganics	USEPA Method 6010B	30			2	2	2	36		
		Cyanide	USEPA Method 9010B	30			2	2	2	36		
Mercury	USEPA Method 7471A	30			2	2	2	36				
Groundwater Samples	Water	TCL Volatiles + 10	USEPA Method 8260C	43	10		3	3	3	62	Category B	Y
		TCL Semivolatiles + 20	USEPA Method 8270D	7			1	1	1	10		
		TCL Organochlorine Pesticides	USEPA Method 8081A	7			1	1	1	10		
		TCL Chlorinated Herbicides	USEPA Method 8151A	7			1	1	1	10		
		TCL PCBs	USEPA Method 8082	7			1	1	1	10		
		TAL Inorganics	USEPA Method 6010B	43			3	3	3	52		
		Cyanide	USEPA Method 9010B	43			3	3	3	52		
Mercury	USEPA Method 7471A	43			3	3	3	52				
Soil Vapor	Air	VOCs	TO-15	4			1			5	Category B	Y
VI Samples	Air	VOCs	TO-15	10			1			11	Category B	Y
Waste Characterization Sampling	Soil	TCLP Method 1311									Category A	N
		TCLP Volatiles	USEPA Method 8260C									
		TCLP Semivolatiles	USEPA Method 8270D									
		TCLP Pesticides	USEPA Method 8080	2						2		
		TCLP Chlorinated Herbicides	USEPA Method 8150									
	TCLP Metals + Cyanide	USEPA Method 6010C/9014										
	TCL PCBs	USEPA Method 8082	2							2	Category A	N
	Corrosivity	USEPA Method 1110	2							2		
	Ignitability	USEPA Method 1030	2							2		
	Reactivity	USEPA Method 9010/9030	2							2		
	TCL Volatiles	USEPA Method 8260C	1							1		
	TCL Semivolatiles	USEPA Method 8270D	1							1		
	TCL PCBs	USEPA Method 8082	1							1		
	TCL Chlorinated Herbicides	USEPA Method 8150	1							1		
TCL Chlorinated Herbicides	USEPA Method 8150	1							1			
Corrosivity	USEPA Method 1110	1							1			
Ignitability	USEPA Method 1030	1							1			
Reactivity	USEPA Method 9010/9030	1							1			
Groundwater Samples (optional 5th nest)	Water	TCL Volatiles + 10	USEPA Method 8260C	10	3		1	1	1	16	Category B	Y
		TCL Semivolatiles + 20	USEPA Method 8270D	1			1	1	1	4		
		TCL Organochlorine Pesticides	USEPA Method 8081A	1			1	1	1	4		
		TCL Chlorinated Herbicides	USEPA Method 8151A	1			1	1	1	4		
		TCL PCBs	USEPA Method 8082	1			1	1	1	4		
		TAL Inorganics	USEPA Method 6010B	10			1	1	1	13		
		Cyanide	USEPA Method 9010B	10			1	1	1	13		
Mercury	USEPA Method 7471A	10			1	1	1	13				

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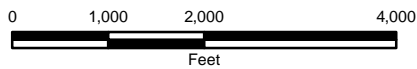


ADAPTED FROM: FREEPORT AND HICKSVILLE, NY USGS QUADRANGLE

METCO SITE HICKSVILLE, NY



SITE LOCATION



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8653.62345
NOVEMBER 2015








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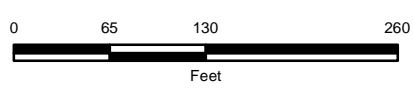
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LEGEND

-  PROPOSED MONITORING WELL / PIEZOMETER NEST LOCATION
-  PROPOSED SOIL BORING
-  PROPOSED SOIL VAPOR LOCATION
-  FORMER STORM WATER RETENTION BASIN
-  NASSAU COUNTY PARCEL (APPROXIMATE)

**METCO SITE
HICKSVILLE, NY**

SITE PLAN



8653.62345
DECEMBER 2015



O'BRIEN & GERE ENGINEERS, INC.